

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.

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Operating Instructions 1902/10_EU-ML_00806076 / Original DE

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1 OPERATING INSTRUCTIONS

The operating instructions describes 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.



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 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 moderate or minor injury.

NOTE!

Warns of damage to property!

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



Indicates important additional information, tips and recommendations.



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

- ▶ designates instructions for risk prevention.
- Designates a procedure which you must carry out.

1.2 Definition of term / abbreviation

The term “device” used in these instructions always stands for the globe valve Type 2101.

2 AUTHORIZED USE

Non-authorized use of the globe valve Type 2101 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 potentially explosive atmospheres, only use devices approved for use in those areas. These devices are labeled with a separate Ex type label. For such use, note the information provided on the separate Ex type label and the additional explosion-related information or separate explosion-related operating instructions.
- ▶ 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 [“Product description”](#).
- ▶ 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.
- ▶ The exhaust air may be contaminated with lubricants in the actuator.
- ▶ Use the device for its intended purpose only.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- contingencies and events which may arise during the installation, operation and maintenance of the devices.
- local safety regulations, whereby the operator is responsible for their compliance, by the installation personnel too.



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.



WARNING!

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.



WARNING!

Risk of burns or fire from hot device surface.

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

- ▶ Do not touch the device unless wearing protective gloves.
- ▶ Keep the device away from highly flammable substances and media

Leaking medium when the packing gland is worn.

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

Risk of injury caused by the lines and device rupturing.

- ▶ Due to the risk of water hammer, valves with a flow direction above the seat must not be used for liquid media.
- ▶ Consider the type of flow direction and the type of medium for operation of the device.

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.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.

4 GENERAL INFORMATION

4.1 Contact address

Germany

Bürkert Fluid Control Systems
Sales Center
Chr.-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. : 07940 - 10 91 111
Fax: 07940 - 10 91 448
E-mail: info@buerkert.com

International

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

You can also find information on the Internet under:

www.burkert.com

4.2 Warranty

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

4.3 Information on the Internet

The operating instructions and data sheets for Type 2101 can be found on the Internet at: www.burkert.com

5 PRODUCT DESCRIPTION

5.1 General description

The 2/2-way globe valve Type 2101 is suitable for liquid and gaseous media.

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

A special feature of globe valves are screwed-in seats which can be used to reduce the orifice of the control valve in particular.



Definition DN

DN designates the orifice of the seat, not the orifice of the line connection.

5.2 Properties

- High tightness by self-adjusting packing glands (spindle sealing element).
- High seat tightness by swivel plate.
- Actuator can be rotated steplessly through 360 °.
- Maintenance-free under normal conditions.

5.2.1 Options

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

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

5.2.2 Device versions

The globe valve is available for the following actuator sizes:

ø 50 mm, ø 70 mm, ø 90 mm, ø 130 mm.

5.2.3 Restrictions



WARNING!

Risk of injury from water hammer.

A water hammer could crack the lines and device.

Due to the risk of water hammer, **valves with a flow direction above seat must not be used for liquid media.**

- ▶ Consider the type of flow direction and the type of medium for operation of the device.

5.3 Designated application area



Observe the maximum pressure range according to the type label!

- Neutral gases and liquids up to 16 bar.
- Steam up to 11 bar absolute / 185 °C.
- Aggressive media.

6 STRUCTURE AND FUNCTION

6.1 Structure

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

The actuator is manufactured from polyphenylene sulphide (PPS). The tried and tested, self-adjusting packing gland ensures high tightness. The flow-enhancing valve body made of stainless steel enables high flow values.

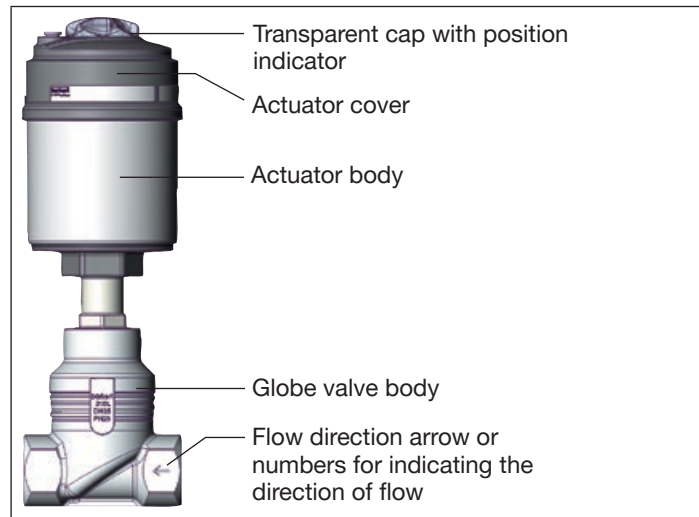


Fig. 1: Globe valve Type 2101, structure and description (1)

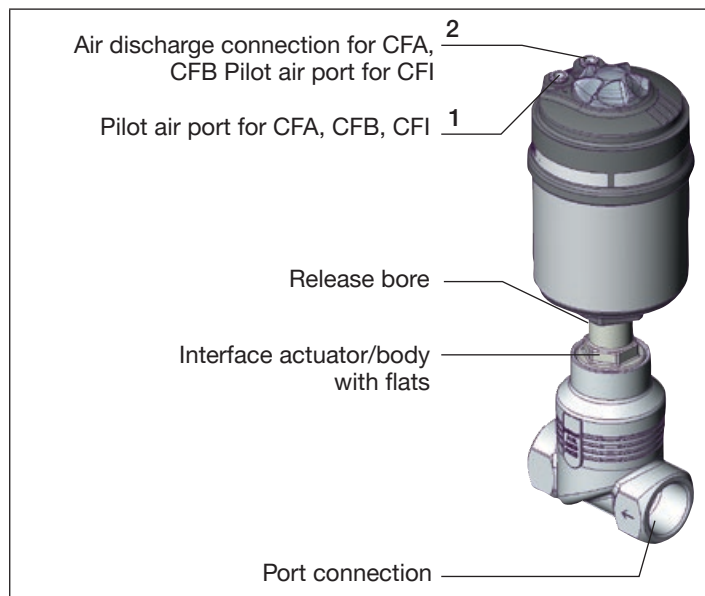


Fig. 2: Globe valve Type 2101, Structure and Description (2)

6.2 Function

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

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

6.2.1 Control functions (CF)



WARNING!

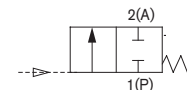
For control function I – Danger if pilot pressure fails!

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

► To ensure a controlled restart, first pressurise the device with pilot pressure, then switch on the medium.

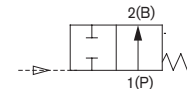
Control function A (CFA)

Normally closed by spring action.



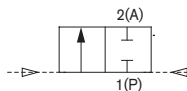
Control function B (CFB)

Normally open by spring action.



Control function I (CFI)

Actuating function via reciprocal pressurisation.



6.2.2 Flow direction below 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 swivel plate, 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 entitled "7.4.1 Temperature ranges".

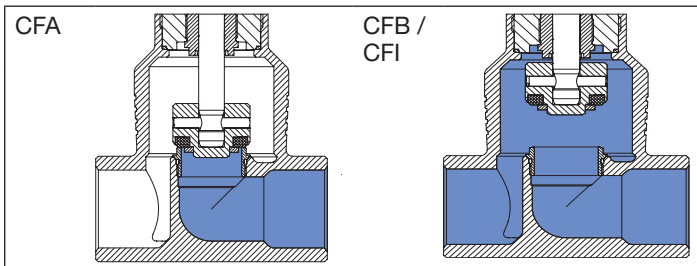


Fig. 3: Flow direction below seat
(Rest open/closed, closing against medium)

6.2.3 Flow direction above seat

The valve is closed by spring force (control function A, CFA) with the medium flow. As the medium pressure is over the swivel plate, it supports the closing process of the valve and also contributes to the sealing of the valve seat. The valve is opened by the pilot pressure.



WARNING!

Risk of injury from water hammer.

A water hammer could crack the lines and device.

Due to the risk of water hammer, **valves with a flow direction above seat must not be used for liquid media.**

- ▶ Consider the type of flow direction and the type of medium for operation of the device.



To ensure complete opening, the minimum pilot pressure must be used!

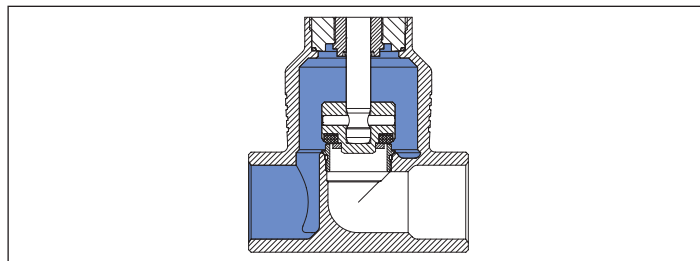


Fig. 4: Flow direction above seat (rest closed, closing with medium)

7 TECHNICAL DATA

7.1 Conformity

Type 2101 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 (if applicable).

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

Orifice DN (Line connection)	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

Example:

bürkert 2101 A 32M PTFE VA Pilot 4,8-10bar
Made in Germany Tmed -10°C - +185°C Pmed 8,5bar
00218445 Flow 1 ← 2 Da=42,4 s=2,0 Kv 19,5 W11MS



Fig. 5: Example of type label

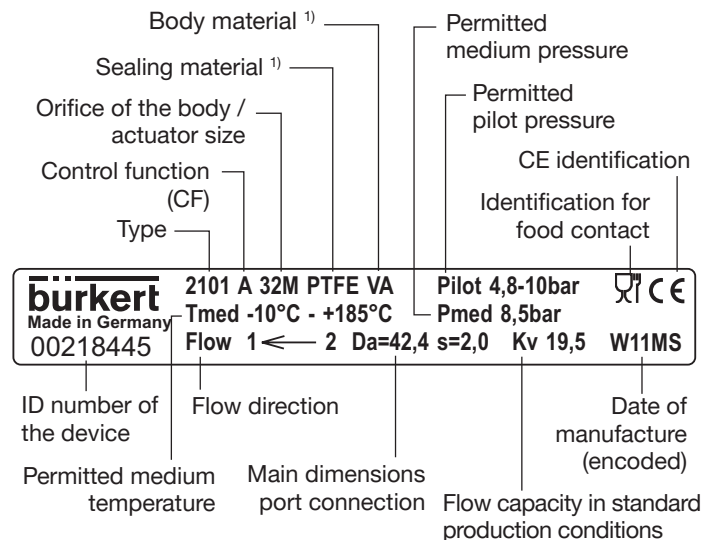


WARNING!

Risk of injury from high pressure!

Important device-specific technical specifications are indicated on the type label.

- Observe permitted pressure range on the type label of the device.



¹⁾ For a description of the versions see "7.5 General technical data".

7.4 Operating conditions

7.4.1 Temperature ranges

Actuator size [mm]	Actuator material	Medium (for PTFE seal)	Environment ²⁾
ø 50, ø 70	PPS	-10 – +185 °C	-10 ... +60 °C ³⁾
ø 90, ø 130			-10 ... +100 °C ⁴⁾

Tab. 1: Temperature Ranges



The globe valve is suitable for steam sterilization.

7.4.2 Pressure ranges

Actuator size [mm]	Maximum pilot pressure ⁵⁾
ø 50, ø 70, ø 90,	10 bar
ø 130	7 bar

Tab. 2: Pressure Ranges

²⁾ If a pilot valve is used, the max. ambient temperature is +55 °C.

³⁾ Pilot air ports with push-in connector

⁴⁾ Pilot air ports with threaded bushing

⁵⁾ For the device version ø 70 / Orifice 50 / MC 13 the maximum permitted pilot pressure is limited to 7 bar.

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

Orifice 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				
10/15	25	25	-	-	5.2	4.8	-	-				
20	16	20										
25	9	16										
32	-	8.5	16		-		-		5	5		
40		6	16									
50		4	10	16								
65		-	5.0	16 (15 ⁶)		-		-			-	5.6
80			-	10								
100	6											

Tab. 3: Medium and pilot pressure for CFA, standard

⁶⁾ 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)

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

Orifice 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
10/15	14	16	-	-	3.2	2.5	-	-
20	6	12						
25	3	6						
32	-	3.5	9	16	-	-	2.5	2.5
40		2	6					
50		-	3.5					
65	-		7.5	-	-	3.2		
80							-	5

Tab. 4: Medium and pilot pressure for CFA, reduced pressure spring force (EC04)

Required minimum pilot pressure depending on medium pressure

The following graphs illustrate the required minimum pilot pressure depending on the medium pressure for control functions A, B and I.

Control function A, flow direction above seat

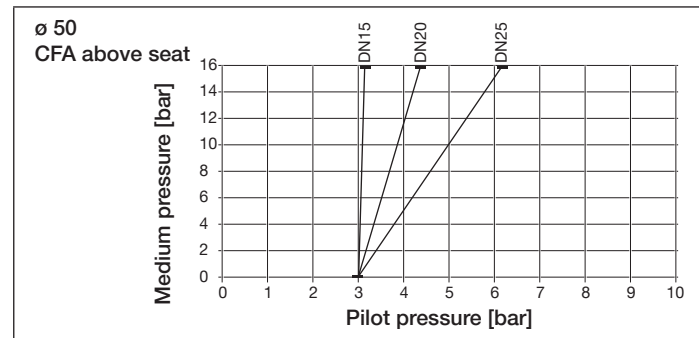


Fig. 6: Pressure graph, actuator ø 50 mm, control function A, flow direction above seat

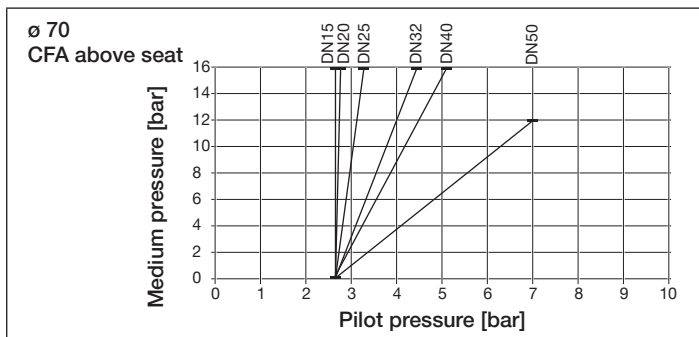


Fig. 7: Pressure graph, actuator ø 70 mm, control function A, flow direction above seat

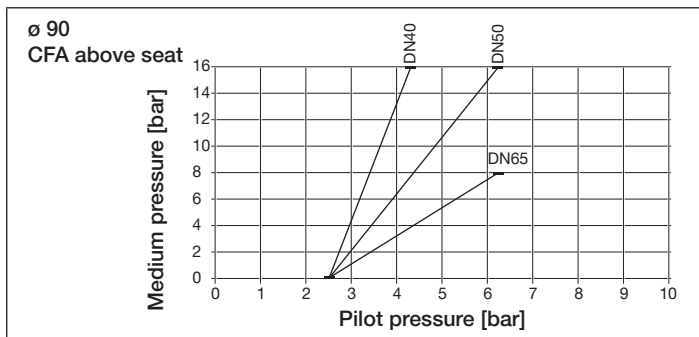


Fig. 8: Pressure graph, actuator ø 90 mm, control function A, flow direction above seat

Control functions B and I, flow direction below seat

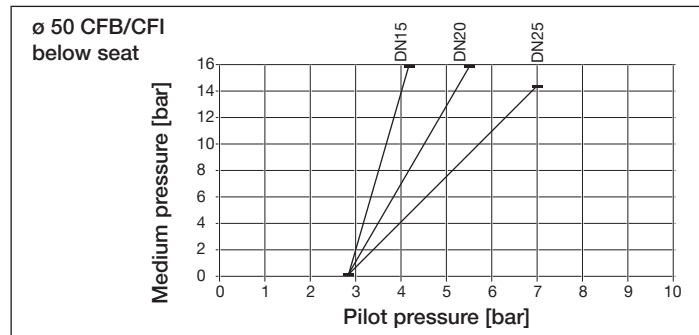


Fig. 9: Pressure graph, actuator ø 50 mm, control functions B and I, flow direction below seat

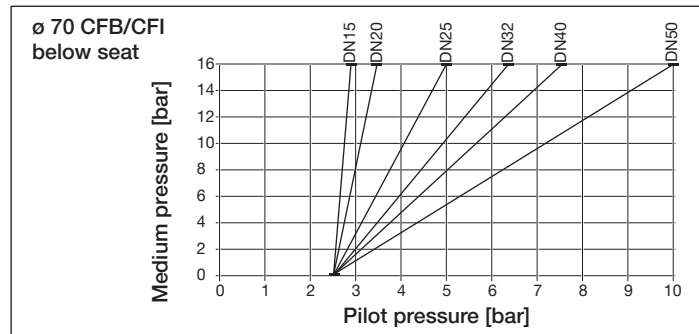


Fig. 10: Pressure graph, actuator ø 70 mm, control functions B and I, flow direction below seat

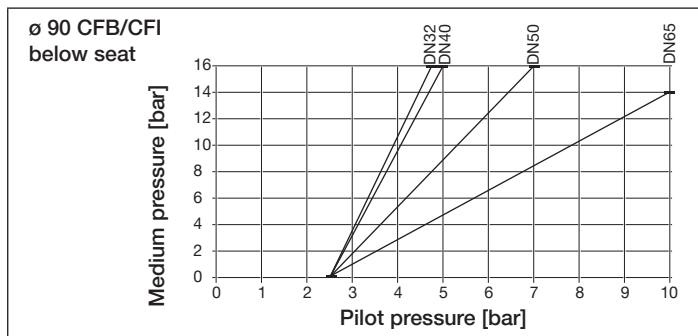


Fig. 11: Pressure graph, actuator ø 90 mm, control functions B and I, flow direction below seat

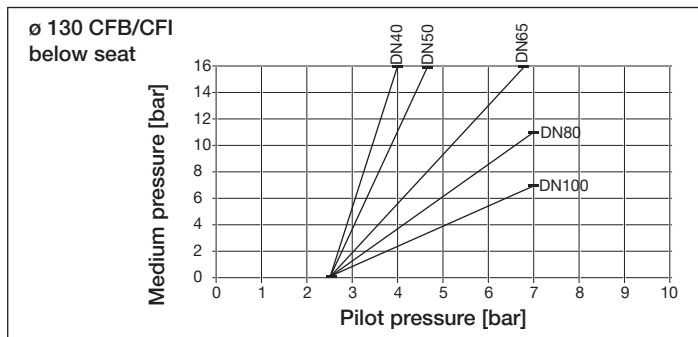


Fig. 12: Pressure graph, actuator ø 130 mm, control functions B and I, flow direction below seat

7.5 General technical data

Actuator size	see type label
Control function	see type label, description of control functions see chapter “6.2”
Installation	as required, preferably with actuator in upright position
Protection class	IP67 in accordance with IEC 529 / EN 60529

Media

Control medium	Neutral gases, air
Flow media	Water, alcohol, fuel, hydraulic liquids, saline solutions, lye, organic solvents

Materials

Body	316L
Actuator	PPS and stainless steel
Sealing elements	FKM and EPDM
Spindle sealing (with silicone grease)	PTFE V rings with spring compensation
Seat seal	PTFE (NBR, EPDM, FKM on request)
Swivel plate	
Spindle	1.4401 / 1.4404
Spindle guide	
DN10-65	PEEK
DN80-100	1.4401 / 1.4404

Connections

Pilot air port

Plug-in connector 6/4 mm or 1/4"
others on request

Medium connection

Socket: G ½ – G 4 (NPT, RC on request)
Weld end connection: in accordance
with ISO 4200, DIN 11850 R2
other connections on request

8 INSTALLATION

8.1 Safety instructions



DANGER!

Risk of injury from high pressure and leaking medium!

- 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 authorized technicians only and with the appropriate tools!

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

- Secure system from unintentional activation.
- Following installation, 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 valve can be installed in any installation position, preferably with the actuator face up.
- Before connecting the valve, ensure the lines are flush.
- Observe direction of flow (see type label).

8.2.1 Preparatory work

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

8.2.2 Remove the actuator from the valve body

Only 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 (see installation chapter in the operating instructions for the corresponding control).

- Clamp the valve body in a holding device.

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 with compressed air (5 bar): valve opens.
- Using a suitable open-end wrench, place the wrench flat on the tube.
- Unscrew the actuator from the valve body.

Other device versions

- Do not remove actuator unless this is a customer-specific requirement.

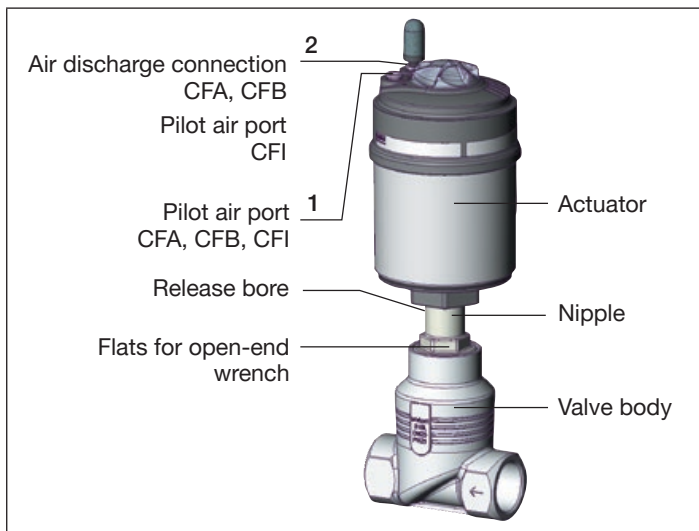


Fig. 13: Installation

8.3 Installation



WARNING!

Risk of injury from improper assembly!

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: Tightening torques of valve body / nipples”](#)).

Dirt trap for devices with authorization in accordance 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.

- If the authorisation also applies to stainless steel bodies, the same type of dirt trap must be attached in front of the globe valve.

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. 14: 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 authorised 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 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"](#)).

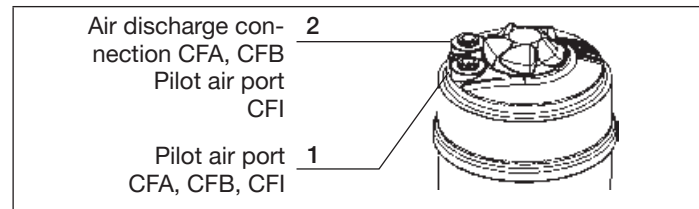


Fig. 15: Connections

Tightening torques of valve body / nipples

Orifice DN	Tightening torque [Nm]
13/15	45 ±3
20	50 ±3
25	60 ±3
32	65 ±3
40	70 ±3
50	100 ± 3
65	120 ± 5
80	150 ± 5
100	

Tab. 5: Tightening torques of valve body / nipples

8.3.3 Install control



Description see Installation chapter in the operating instructions for the corresponding control.

8.3.4 Rotating the actuator

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

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 pressurize the pilot air port 1 with compressed air (5 bar): valve opens.
- Counter on the flats of the nipple with a suitable open-end wrench.
- Actuator with hexagon:
Place suitable open-end wrench on the hexagon of the actuator.
- Actuator without hexagon:
Fit special wrench⁷⁾ exactly to the underside of the actuator.

⁷⁾ The special key (identification number 665 702) is available from your Bürkert sales office.



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 (see "Fig. 16")!

- Actuator with hexagon:
Rotate **counter-clockwise** (as seen from below) to bring the actuator module into the required position.
- Actuator without hexagon:
Rotate **clockwise** (as seen from below) to bring the actuator module into the required position.

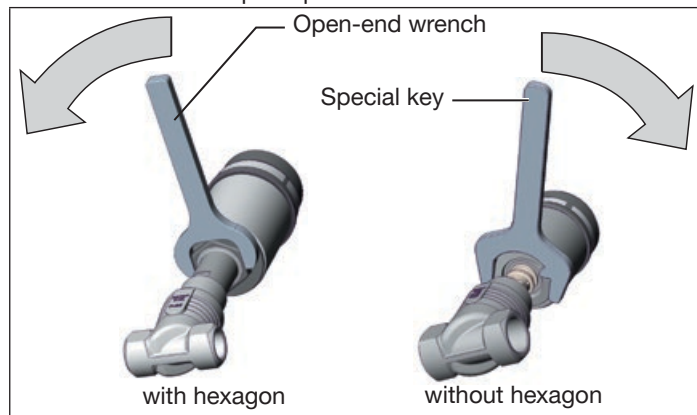


Fig. 16: Rotating with special key / open-end wrench

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!

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 authorised for the indicated pressure and temperature range.
- ▶ Observe the data sheet specifications from the hose manufacturers.

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.

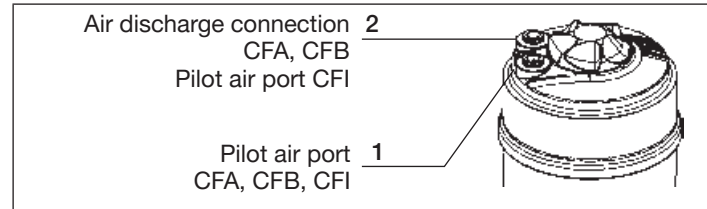


Fig. 17: Pneumatic connection

Control functions A and B:

- Connect the control medium to the pilot air port 1 of the actuator (see [“Fig. 17”](#)).

Silencer

For the versions with a plug-in connection the silencer for reducing the exhaust air noise is supplied loose.

- Plug the silencer into the free air discharge connection 2 (see [“Fig. 17”](#)).



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

8.4.1 Connection of the control medium



If the position of the pilot air ports for installation of the hoses is unfavorable, these can be aligned steplessly by rotating the actuator through 360°.

The procedure is described in the chapter entitled [“8.3.4 Rotating the actuator”](#).

Control function I:

- Connect the control medium to the pilot air port 1 and 2 of the actuator (see [“Fig. 18: Pneumatic connection”](#))
- Pressure on connection 1 opens the valve.
- Pressure on connection 2 closes the valve.

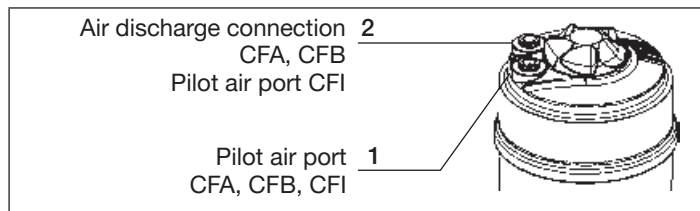


Fig. 18: Pneumatic connection

Control air hose:

6/4 mm or 1/4" control air hoses can be used.

Optionally a pilot air port is possible via a G 1/8 thread.

8.5 Start-up

After installing the device, run the teach function. This function presets the control parameters.



Description – see operating instructions for the control.

8.6 Removal



DANGER!

Risk of injury from discharge of medium and pressure!

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

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

Procedure:

- Loosen the pneumatic connection.
- Remove the device.

9 ELECTRICAL CONTROL UNIT

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

- Type 8690 Pneumatic Control Unit
- Type 8691 Control head (actuator size $\varnothing 70 - \varnothing 130$)
- Type 8695 Control head (actuator size $\varnothing 50$)
- Type 8645 Automation system FreeLINE
- Type 6012 Pilot valve
- Type 6014 P Pilot valve



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

10 MAINTENANCE, CLEANING

10.1 Safety instructions



DANGER!

Danger – high pressure in the equipment!

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

Risk of injury due to electrical shock!

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



WARNING!

Risk of injury from improper maintenance!

- ▶ Maintenance may be performed by authorised technicians only!
- ▶ To screw on or unscrew valve body or actuator, use an open-end wrench, never a pipe wrench, and observe tightening torques.

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

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



WARNING!

For control function I – Danger if 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.

10.2 Maintenance work

Actuator:

The actuator of the globe valve is maintenance-free provided it is used according to these operating instructions.

Wearing parts of the globe valve:

Parts which are subject to natural wear:

- Seals
- Swivel plate

→ If leaks occur, replace the particular wearing part with an appropriate spare part.

(For spare-part sets and installation tools see chapter entitled [“12 Replacement parts”](#)).



The replacing of the wearing parts is described in chapter [“10.3 Replacing the wearing parts”](#).

Visual inspection:

Perform regular visual inspections according to the application conditions:

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

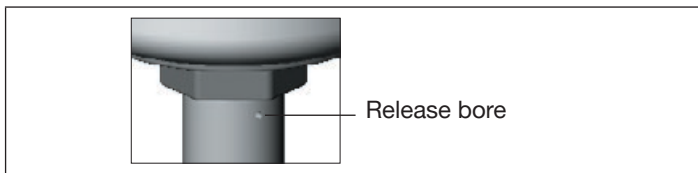


Fig. 19: Release bore

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 the body materials and seals.

10.3 Replacing the wearing parts

10.3.1 Replacing the valve set

The valve set consists of

- Swivel plate
- Pin
- Seal

Before the valve set can be replaced, the actuator must be removed from the valve body.



DANGER!

Risk of injury from discharge of medium and pressure!

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

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



WARNING!

Risk of injury if the wrong tools are used!

It is dangerous to use unsuitable tools for installation work as the device may be damaged.

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

Remove the actuator from the valve body:

- Clamp the valve body in a holding device (applies only to valves which have not yet been installed).

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 and I pressurize the pilot air port 1 with compressed air (5 bar): valve opens.
- Using a suitable open-end wrench, place the wrench flat on the tube.
- Unscrew the actuator from the valve body.

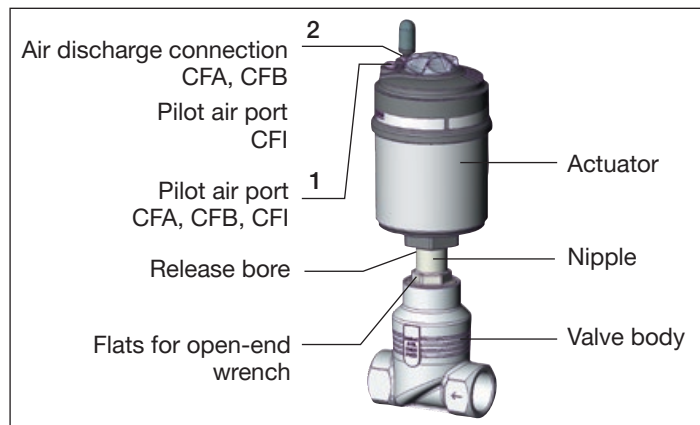


Fig. 20: Designation parts

Replacing valve set

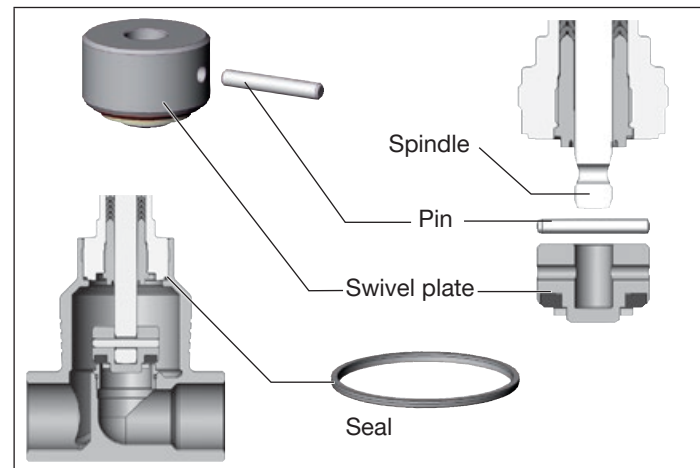


Fig. 21: Valve set

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

- Support swivel plate on the cylindrical part with the aid of a prism or something similar.
- Insert pin into the bore.
- Swage pin bores on both sides of the swivel plate using a chisel or center punch.

Installing the actuator on the valve body

- 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 authorised 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 and I pressurize the pilot air port 1 with compressed air (5 bar): valve opens.
- Screw actuator into the valve body.
Observe tightening torque (see [“Tab. 6: Tightening torques of valve body / nipples”](#)).

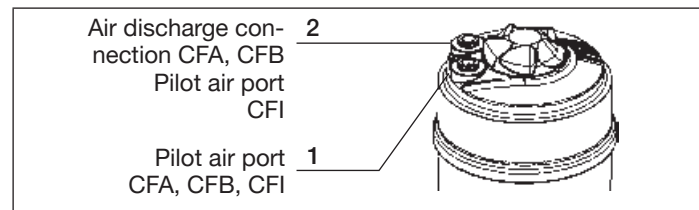


Fig. 22: Connections

Tightening torques of valve body / nipples	
Orifice	Tightening torque [Nm]
13/15	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. 6: Tightening torques of valve body / nipples



If the position of the pilot air ports for installation of the hoses is unfavorable, these can be aligned steplessly by rotating the actuator through 360°.

The procedure is described in the chapter entitled [“8.3.4 Rotating the actuator”](#).

10.3.2 Replacing the valve seat set



When replacing the valve seat, the actuator must be removed.
The necessary work steps are described in the previous sub chapter [“10.3.1 Replacing the valve set”, page 24.](#)

The valve seat set consists of

- Valve seat
- O-ring (depending on the version)
- Graphite seal
- Lubricant



DANGER!

Risk of injury from discharge of medium and pressure.

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

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



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.

- ▶ Replacement only with special installation tools (for order numbers refer to chapter entitled [“12.2 Installation tools”](#)).
- ▶ Observe the tightening torque (see [“Tab. 7”](#) and [“Tab. 8”](#)).

Procedure:

- With the actuator being removed, replace the valve seat as follows.

Replacing the valve seat

- Unscrew the old valve seat using the installation tool (with matching tool insert) and a spanner.
- Clean the thread of the body and the sealing surface with compressed air.
- Place the new valve seat onto the installation tool.

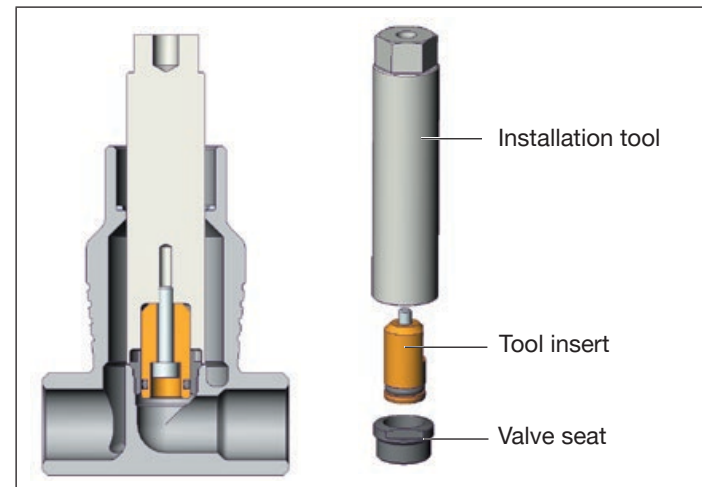


Fig. 23: Replacing the valve seat



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 authorised lubricants only.

- Grease the thread of the valve seat with stainless steel lubricant (e.g. with Klüber paste UH1 96-402 from Klüber).
- Manually screw the fitted valve seat into the thread of the body.
- Screw the valve seat in place using a torque wrench. Observe the tightening torque (see “Tab. 7”).

Valve seat size	Tightening torque [Nm]
	Valve seat coated
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. 7: Tightening torques for valve seat installation

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

- 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 authorised lubricants only.

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

NOTE!

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

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

- **Control function A and I:**

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.

- Screw actuator into the valve body.
Observe tightening torque (see “Tab. 8”).

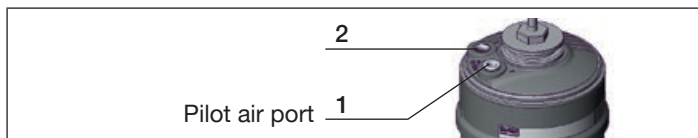


Fig. 24: Connections

Tightening torques of valve body / nipples	
Nominal width of valve body	Tightening torques [Nm]
13/15	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 of valve body / nipples



If the position of the pilot air ports for installation of the hoses is unfavorable, these can be aligned steplessly by rotating the actuator through 360°.

The procedure is described in the chapter entitled [“8.3.4 Rotating the actuator”](#), page 20.

10.3.3 Replacing the packing gland



The packing gland can be changed for the device combination ø 70 / DN50 as of series-production status January 2017.

The seal set for the packing gland contains

SP10 / SP14

- 1 support ring
- 7 chevron seals
- 2 pressure rings
- 1 pressure spring
- 1 spindle guide
- 1 seal
- Lubricant



SP22

- 1 support ring
- 7 chevron seals
- 2 pressure rings
- 1 pressure spring
- 1 spacer
- 1 seal
- Lubricant



Fig. 25: Seal set for packing gland



DANGER!

Risk of injury from discharge of medium and pressure!

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

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



WARNING!

Risk of injury if the wrong tools are used!

It is dangerous to use unsuitable tools for installation work as the device may be damaged.

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

Before the packing gland can be replaced, the actuator must be removed from the valve body and the swivel plate removed.

Remove the actuator from the valve body:

- Clamp the valve body in a holding device (applies only to valves which have not yet been installed).

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 and I pressurize the pilot air port 1 with compressed air (5 bar): valve opens.
- Using a suitable open-end wrench, place the wrench flat on the tube.
- Unscrew the actuator from the valve body.

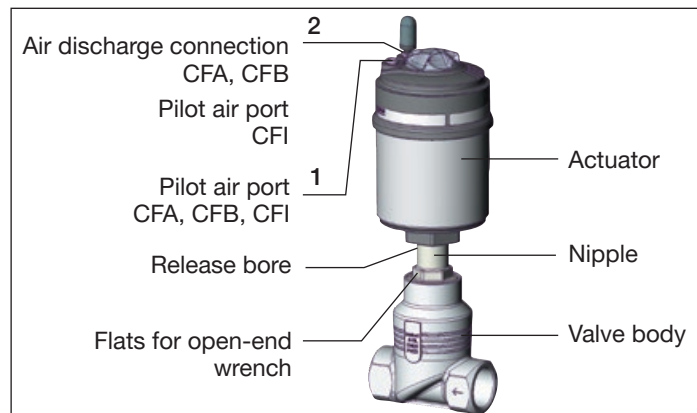


Fig. 26: Designation parts

Removing the swivel plate

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

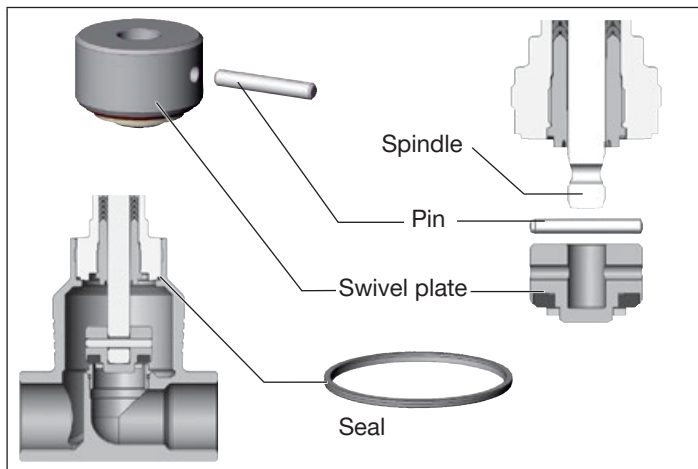


Fig. 27: Valve set

Replacing packing gland

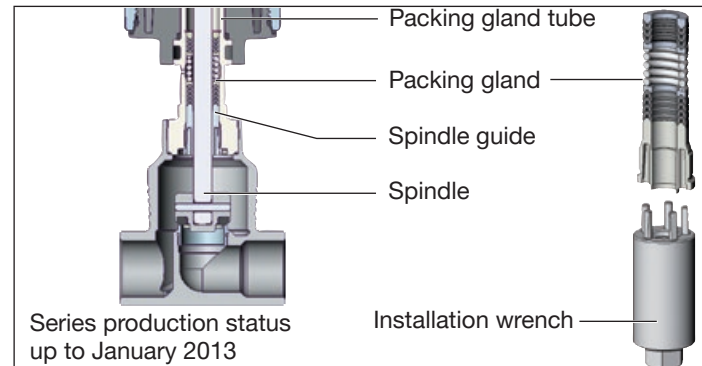


Fig. 28: Replacing packing gland (series production status up to January 2013)

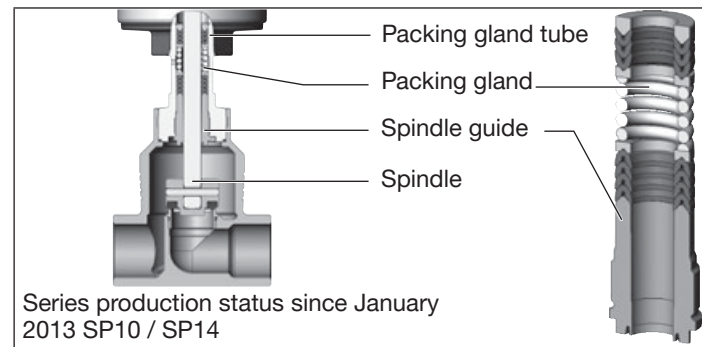


Fig. 29: Replacing packing gland SP10 / SP14 (series production status since January 2013)

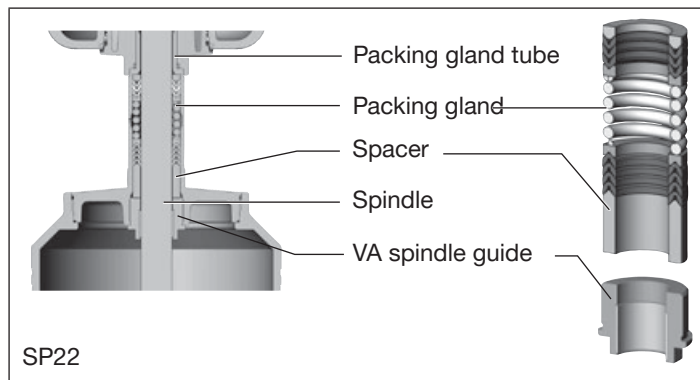


Fig. 30: Replacing packing gland SP22

Series production status up to January 2013:

- Unscrew the spindle guide with the aid of the installation wrench⁸⁾ and an open-end wrench.

Series production status since January 2013 SP10 / SP14:

- Unscrew the spindle guide with the aid of a modified socket wrench⁷⁾.

SP22:

- Unscrew the VA spindle guide with the aid of an open-end wrench.



WARNING!

Risk of injury from parts jumping out!

When the spindle opening is exposed, the individual parts of the packing gland are pressed out at an undefined speed when the pilot air ports are pressurized.

- Before pressurizing with control air, safeguard the ambient area of the discharge opening (e.g. place spindle on a firm base).

- **Control function A and I** Pressurize pilot air port 1 with 6 – 8 bar (see [“Fig. 26: Designation parts”](#)).
- **Control function B** Pressurize pilot air port 2 with 6 – 8 bar (see [“Fig. 26: Designation parts”](#)).
- Grease the individual parts of the new packing gland with the applied lubricant.
- Connect the individual parts to the spindle in the specified direction and sequence (as illustrated in [“Fig. 31: Seal set for packing gland”](#)).
- Push packing gland into the packing gland tube.
- Screw spindle guide / VA spindle guide back in using the socket wrench / open-end wrench. Observe torque (see [“Tab. 9: Tightening torques of spindle”](#)).

⁸⁾ The installation wrench or modified socket wrench is available from your Bürkert sales office.

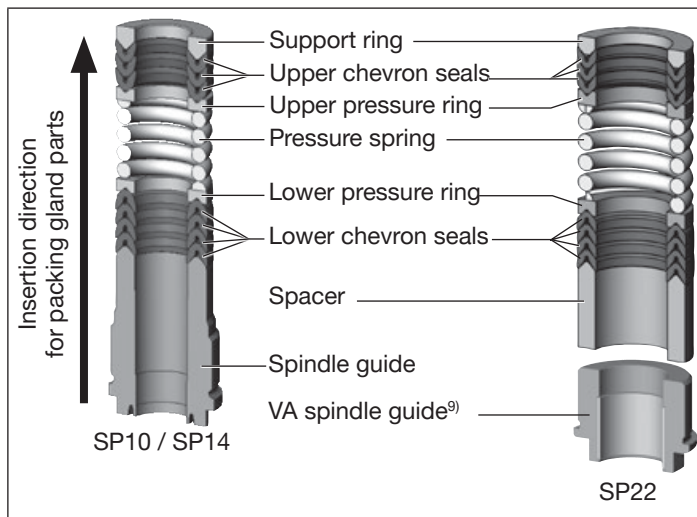


Fig. 31: Seal set for packing gland

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

Tab. 9: Tightening torques of spindle

⁹) Is not included in the seal set

Installing swivel plate

- Connect swivel plate to the spindle.
- Align bores of the swivel plate and spindle.
- Support swivel plate on the cylindrical part with the aid of a prism or something similar.
- Insert pin into the bore.
- Swage pin bores on both sides of the swivel plate using a chisel or center punch.

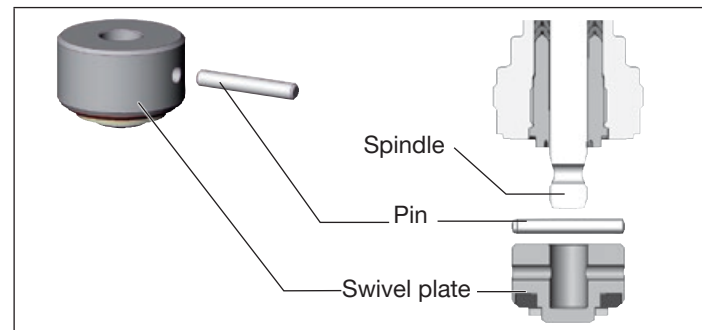


Fig. 32: Swivel plate

Installing the actuator on the valve body

For description see chapter entitled [“Installing the actuator on the valve body”](#), page 26.

11 MALFUNCTIONS

Malfunction	Remedial action
Actuator does not switch	Pilot air port interchanged ¹⁰⁾ CFA: → Connecting pilot air port 1 CFB: → Connecting pilot air port 1 CFI: → Pilot air port 1: Open Pilot air port 2: Close
	Pilot pressure too low → Observe pressure specifications on the type label
	Medium pressure too high → Observe pressure specifications on the type label
	Flow direction reversed → Observe direction arrow on the body

Malfunction	Remedial action
Valve is not sealed	Dirt between seal and valve seat → Installing dirt trap
	Seat seal worn → Installing new swivel plate
	Flow direction reversed → Observe direction arrow on the body
	Medium pressure too high → Observe pressure specifications on the type label
Valve is leaking on the release bore	Pilot pressure too low → Observe pressure specifications on the type label
	Packing gland worn → Renew packing gland or replace actuator

¹⁰⁾ See "8.4 Pneumatic connection".

12 REPLACEMENT PARTS



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.



CAUTION!

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

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

- Use only original accessories and original replacement parts from Bürkert.

12.1 Replacement part sets

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

- Valve set
consists of swivel plate with seal, pin and seal.
- Sealing set for packing gland
consists of the individual parts of the packing gland, seal and lubricant (the (modified) socket wrench is not included in the sealing set).
- Valve seat set
consists of valve seat, o-ring and seal.

Valve set	
Orifice	Order no.
15	149 606
20	011 171
25	160 737
32	011 208
40	011 209
50	216 431
50 (Actuator size \varnothing 70) ¹¹⁾	307 392
65	241 777
80	155 492
100	155 493

Tab. 10: Valve set

Sealing set for packing gland			
Spindle \varnothing	Orifice	Actuator size	Order no.
10	15 – 50 ¹⁰⁾	\varnothing 50, \varnothing 70	216 433
14	32 – 65	\varnothing 90, \varnothing 130	216 435
22	80 – 100	\varnothing 130	252 545

Tab. 11: Sealing set for packing gland

¹¹⁾ As of series-production status January 2017 change also possible for DN50 spindle \varnothing 10

VA spindle guide for packing gland			
Spindle Ø	Orifice	Actuator size	Order no.
22	80 – 100	Ø 130	252 543

Tab. 12: VA spindle guide for packing gland

Valve seat set	
Contents: Valve seat, O-ring (depending on version), seal	
Orifice DN	Order no.
15	262152
20	262157
25	262170
32	262174
40	262177
50	262179
65	262204
80	262207
100	262210

Fig. 33: Valve seat set

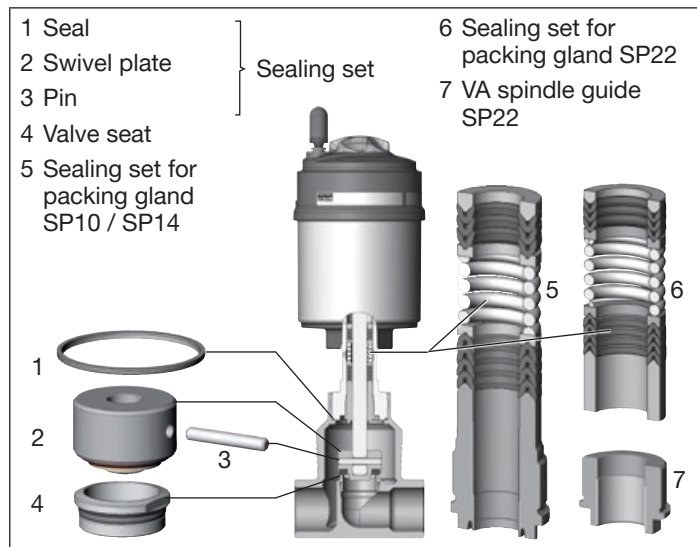


Fig. 34: Replacement parts

12.2 Installation tools


Installation wrench for packing gland (Only for removal of packing glands up to January 2013)		
Installation wrench	Orifice	Order no.
Spindle Ø 10 mm	15 – 40	665 700
Spindle Ø 14 mm	32 – 65	665 701

Tab. 13: Installation wrench

Type 2101

Replacement parts

Modified socket wrench for packing gland (Series production status since January 2013)

	Socket wrench	Orifice	AF	Order no.
	Spindle Ø 10 mm	15 – 50 ¹¹⁾	19	683 221
	Spindle Ø 14 mm	32 – 65	21	683 223

¹²⁾ As of series-production status January 2017 also for DN50

Tab. 14: Modified socket wrench

Installation tools for the replacement of the valve seat

Orifice DN	Order no.
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. 15: Installation tool

Special wrench for rotating the actuator (Series-production status until end of 2011)

Order no.	665 702
-----------	---------

Tab. 16: Special wrench



If you have any queries, please contact your Bürkert sales office.

13 PACKAGING, TRANSPORT, STORAGE

NOTE!

Transport damages!

Inadequately protected equipment may be damaged during transport.

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

Incorrect storage may damage the device.

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

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

- Dispose of the device and packaging in an environmentally friendly manner.
- Observe applicable regulations on disposal and the environment.
- Observe national waste disposal regulations.

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