

Type 8695 REV.2

Control Head



Operating Instructions

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

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Control head Type 8695 REV.2

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1 ABOUT THESE INSTRUCTIONS

The operating instructions describe the entire life cycle of the device.

→ Keep these instructions ready to hand at the operation site.

Important safety information.

- ▶ Carefully read these instructions.
- ▶ Observe in particular the safety instructions, intended use and operating conditions.
- ▶ Persons, who work on the device, must read and understand these instructions.

1.1 Symbols

DANGER

Warns of an immediate danger.

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

WARNING

Warns of a potentially dangerous situation.

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

CAUTION


Warns of a possible danger.

- ▶ Failure to observe the warning may result in moderate or minor injuries.

ATTENTION

Warns of damage to property.

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

 Indicates important additional information, tips and recommendations.

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

▶ Indicates an instruction for risk prevention.

→ Indicates a procedure which you must carry out.

 Indicates a result.

Menu Indicates a interface text.

1.2 Definition of terms

In these instructions the term “device” denotes the following device types:

Control head Type 8695.

The term “bÜS” (Bürkert system bus) used in this instruction stands for the communication bus developed by Bürkert and based on the CANopen protocol.

In these instructions, the abbreviation “Ex” always refers to “potentially explosive area”.

2 INTENDED USE

The control head Type 8695 REV.2 is designed to be mounted on pneumatic actuators of process valves for the control of media. The permitted fluid media are listed in the technical data.

- ▶ Use the device for its intended purpose only. Non-intended use of the device may be dangerous to people, nearby equipment and the environment.
- ▶ Correct transportation, correct storage as well as correct installation, commissioning, operation and maintenance are essential for reliable and problem-free operation.
- ▶ When using the device, observe the permitted data, operating conditions and application conditions. This information can be found in the contractual documents, the operating instructions and on the type label.
- ▶ Use the device only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Do not use the device outdoors without protection from the weather.
- ▶ In areas at risk of explosion, 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.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not consider any contingencies or incidents which occur during installation, operation and maintenance.

The operator is responsible for observing the location-specific safety regulations, also with reference to the personnel.

DANGER

Risk of injury from high pressure and discharge of medium.

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

DANGER

Risk of injury from electric shock.

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



To prevent injury, ensure the following:

- ▶ Secure device or system to prevent unintentional activation.
- ▶ Only trained technicians may perform installation and maintenance work.
- ▶ Perform installation and maintenance with suitable tools only.
- ▶ Do not make any changes to the device and do not subject it to mechanical stress.
- ▶ Operate the device only in perfect state and in consideration of the operating instructions.
- ▶ Observe the general rules of technology.
- ▶ Install the device according to the regulations applicable in the respective country.
- ▶ Do not feed corrosive or flammable media into the device connections.
- ▶ Do not feed any fluids into the connections of the device.
- ▶ After the process is interrupted, restart in a controlled manner. Observe sequence:
 1. Connect electrical or pneumatic power supply.
 2. Charge the device with medium.
- ▶ Observe intended use.
- ▶ When unscrewing and screwing in the body casing or the transparent cap, do not hold the actuator of the process valve but the basic housing of the device.

4 GENERAL INFORMATION

4.1 Contact address

Germany

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

International

Contact addresses can be found on the final pages of the printed operating instructions.

And also on the Internet at:

www.burkert.com

4.2 Warranty

The warranty is only valid if the control head Type 8695 is used as intended in accordance with the specified application conditions.

4.3 Trademarks

Brands and trademarks listed below are trademarks of the corresponding companies / associations / organizations

Loctite Henkel Loctite Deutschland GmbH

4.4 Information on the internet

The operating instructions and data sheets for Type 8695 can be found on the Internet at:

www.burkert.com

5 SYSTEM DESCRIPTION

5.1 Structure and function

The control head Type 8695 can control single or double-acting process valves.

The control head Type 8695 has been optimized for the integrated modular fitting of series 21xx process valves (ELEMENT) with actuator size $\varnothing 50$. Various expansion stages are possible thanks to the modular design.

For installation on the 20xx series (CLASSIC) there is a special model which is described in chapter "5.1.2".

The valve position is recorded via a contactless, analog sensor element which automatically detects and saves the valve end positions by means of the teach function during start-up.

Option: Communication possible via IO-Link and büS.

5.1.1 Control head for integrated installation on 21xx series (ELEMENT)

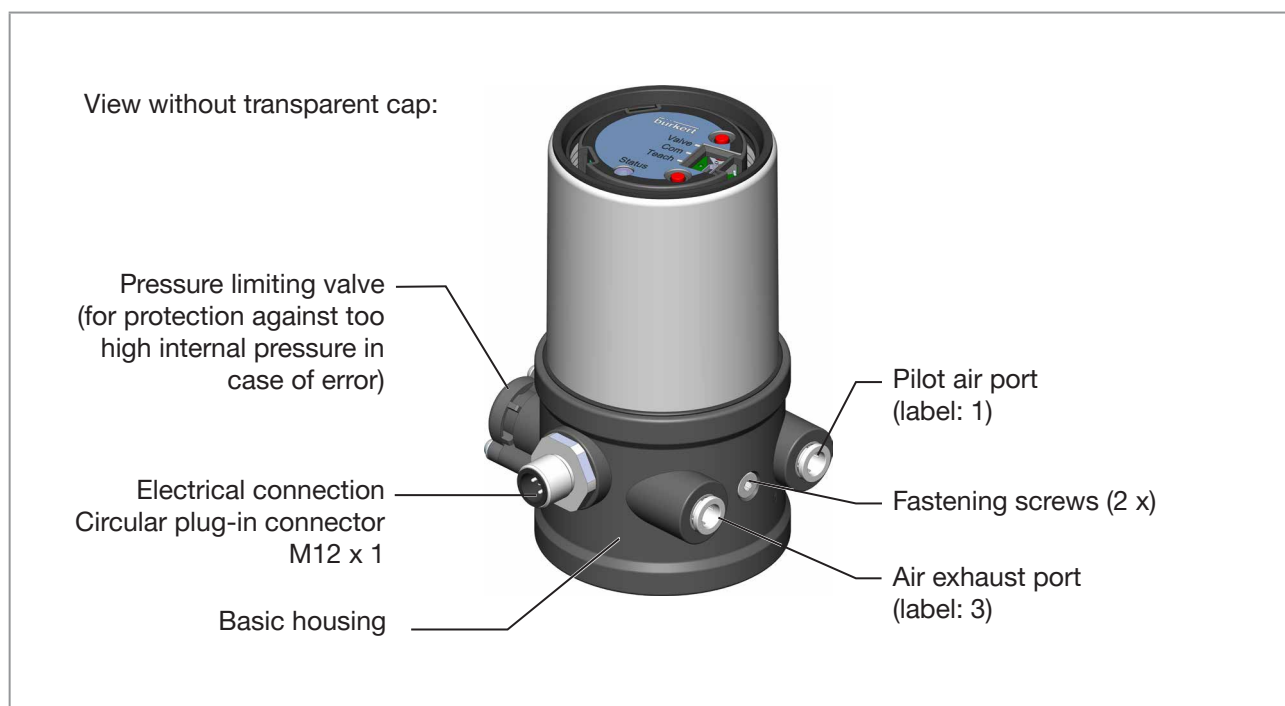


Figure 1: Structure and function

5.1.2 Model for control of process valves belonging to the 20xx series (CLASSIC)

A special model enables the control head Type 8695 to be attached to process valves belonging to the 20xx series.

This model has a different pneumatic connection module so that the pilot air ports can be connected to the outside of the actuator (see "Figure 2").

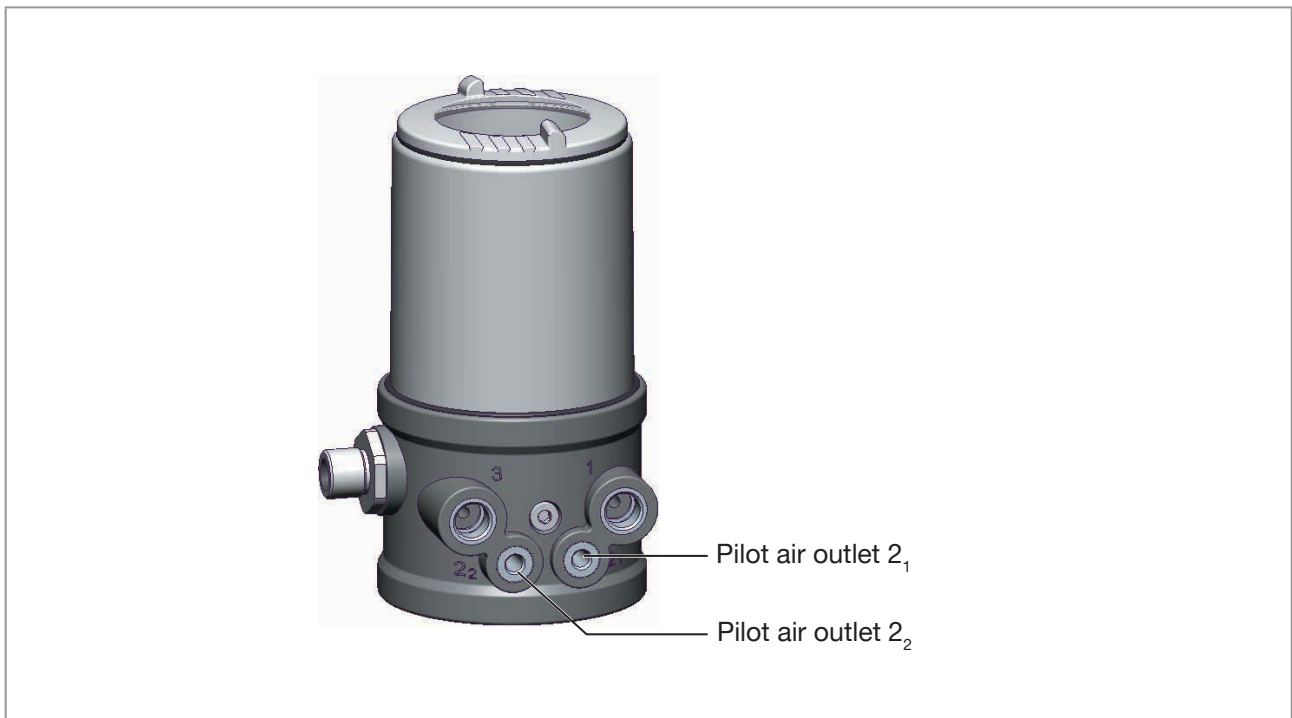


Figure 2: Model for control of process valves, 20xx series

6 TECHNICAL DATA

6.1 Conformity

In accordance with the EU Declaration of conformity, the control head Type 8695 is compliant with the EU Directives.

6.2 Standards

The applied standards on the basis of which compliance with the EU Directives is confirmed are listed in the EU-Type-Examination Certificate and/or the EU Declaration of Conformity.

6.3 Licenses

The product is approved for use in zone 2 and 22 in accordance with ATEX directive 2014/34/EU category 3GD.



Observe instructions on operation in an explosion-risk (Ex) area.
Observe the ATEX additional instructions.

The product is cULus approved. Instructions for use in the UL area see chapter [“6.8 Electrical data”](#).

6.4 Operating conditions



WARNING!

Solar radiation and temperature fluctuations may cause malfunctions or leaks.

- ▶ If the device is used outdoors, do not expose it unprotected to the weather conditions.
- ▶ Ensure that the permitted ambient temperature does not exceed the maximum value or drop below the minimum value.

Ambient temperature see type label

Degree of protection

Evaluated by the manufacturer:	Evaluated by UL:
IP65 / IP67 according to EN 60529 ¹⁾	UL Type 4x Rating ¹⁾

Operating altitude up to 2000 m above sea level

¹⁾ Only if cables, plugs and sockets have been connected correctly and in compliance with the exhaust air concept see chapter [“8 Pneumatic installation”](#).

6.5 Mechanical data

Dimensions See data sheet

Body material exterior PPS, PC, VA
interior PA6; ABS

Sealing material exterior EPDM / FKM

Stroke range of valve spindle

21xx series (ELEMENT)
and 20xx series (CLASSIC) 2 – 35 mm

Third-party devices
(modified guide element required) 2 – 44 mm

6.6 Type labels

6.6.1 Type label standard

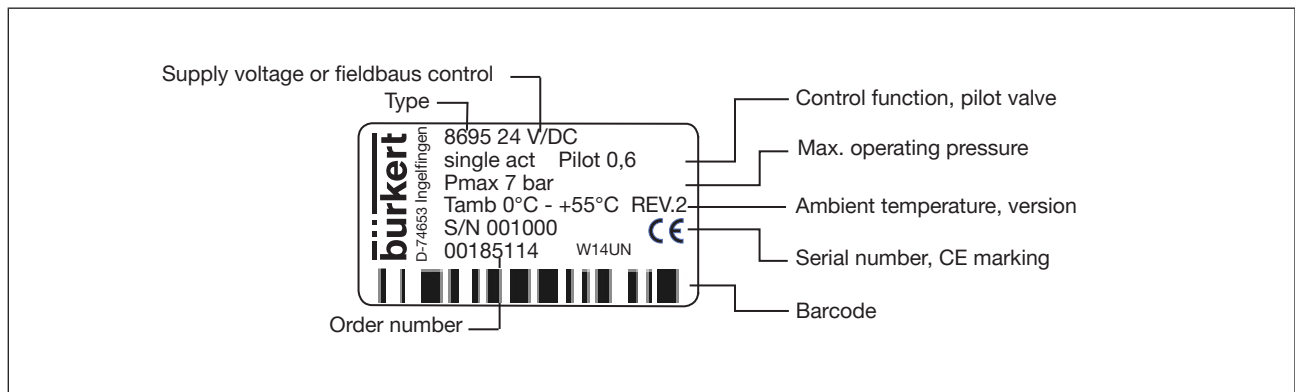


Figure 3: Type label (example)

6.6.2 UL type label

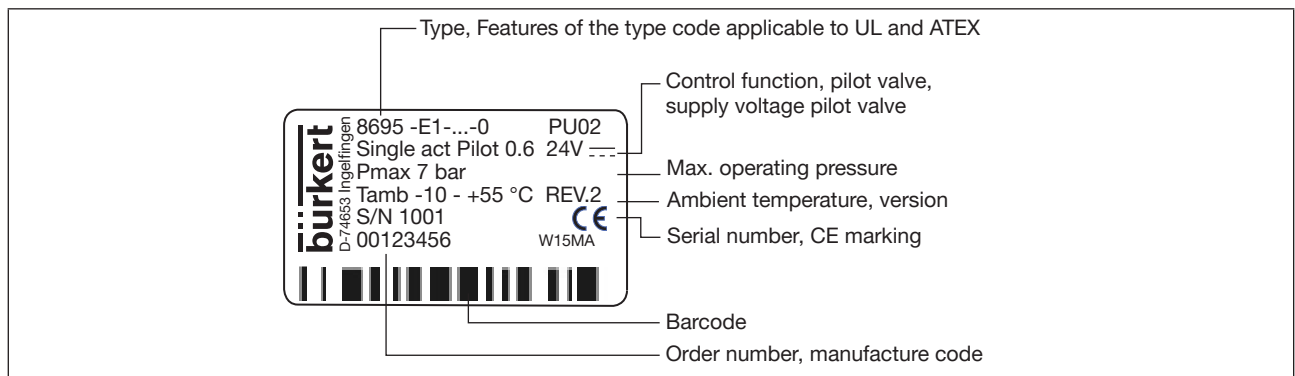


Figure 4: UL type label (example)

6.6.3 UL additional label


Degree of protection	Type 4X enclosure	 E238179
Circuit with limited power	NEC Class 2 only	
Communication, supply voltage	Power Supply: bÜS 24V ±25% ---	
Power consumption	max. 3,5 W	

Figure 5: UL additional label (example)

6.7 Pneumatic data

Control medium		neutral gases, air Quality classes in accordance with ISO 8573-1
Dust content	Class 7	max. particle size 40 µm, max. particle density 10 mg/m ³
Water content	Class 3	max. pressure dew point - 20 °C or min. 10 °C below the lowest operating temperature
Oil content	Class X	max. 25 mg/m ³
Temperature range		-10 – +50 °C
Pressure range		3 – 7 bar
Air output of pilot valve		7 l _N / min (for aeration and deaeration) (Q _{Nn} - value according to definition for pressure drop from 7 to 6 bar absolute)
Connections	21xx (ELEMENT)	Plug-in hose connector Ø6 mm (1/4") Socket connection G 1/8
	20xx (CLASSIC)	Socket connection G 1/8 with M5 connection for connecting to the actuator

6.8 Electrical data



WARNING!

Only circuits with limited power may be used for UL approved components according to “NEC Class 2”.

6.8.1 Electrical data without field bus communication

Protection class	III as per DIN EN 61140 (VDE 0140-1)
Connections	Circular plug-in connector (M12 x 1, 8-pole)
Operating voltage	24 V DC \pm 25 %, max. residual ripple 10 %
Current consumption	max. 150 mA
Power consumption	max. 3.5 W
Output	max. 100 mA per output
Display	max. 20 mA per illustrated illuminated display (LED)
Communications interface	Connection to PC via USB bus interface set
Communication software	Bürkert Communicator

6.8.2 Electrical data, IO-Link

Protection class	III as per DIN EN 61140 (VDE 0140-1)
Connection	Circular plug-in connector M12 x 1, 5-pin, A-coded
Operating voltage	
System supply (Pin 1+3)	24 V DC \pm 25 % (according to specification)
Actuator supply (Pin 2+5) ²⁾	24 V DC \pm 25 % (according to specification)
Current consumption	
System supply (Pin 1+3)	max. 50 mA
Actuator supply (Pin 2+5)	max. 100 mA, only with installed pilot valves
Total power consumption	max. 3.5 W

²⁾ Actuator supply is galvanically isolated from system supply in accordance with IEC 60664 and for electrical safety in accordance with SELV from IEC 61010-2-201

6.8.3 Electrical data, bÜS

Protection class	III as per DIN EN 61140 (VDE 0140-1)
Connection	Circular plug-in connector M12 x 1, 5-pin, A coded
Operating voltage	24 V DC \pm 25 %
Current consumption	max. 150 mA
Total power consumption	max. 3.5 W

7 INSTALLATION

7.1 Safety instructions



DANGER!

Risk of injury from high pressure in the equipment/device.

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

Risk of electric shock.

- ▶ Before working on equipment or 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 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 assembly, ensure a controlled restart.

7.2 Installation of the control head Type 8695 on process valves of series 21xx (ELEMENT)

ATTENTION!

When mounting on process valves with a welded connection, follow the installation instructions in the operating instructions for the process valve.

Procedure:

1. Install switch spindle

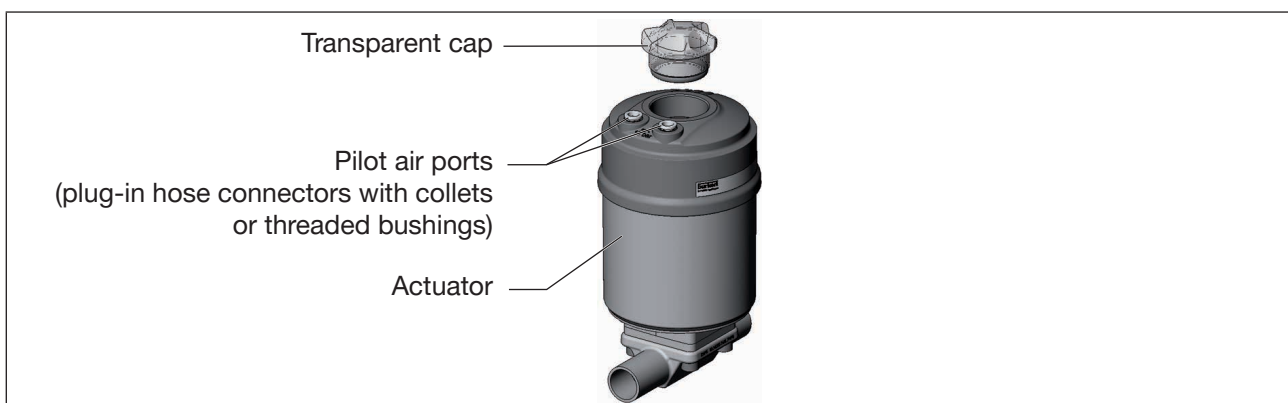


Figure 6: Installation of switch spindle (1), series 21xx

→ Unscrew the transparent cap on the actuator and unscrew the position display (yellow cap) on the spindle extension (if present).

→ For version with plug-in hose connector, remove the collets (white nozzles) from both pilot air ports (if present).

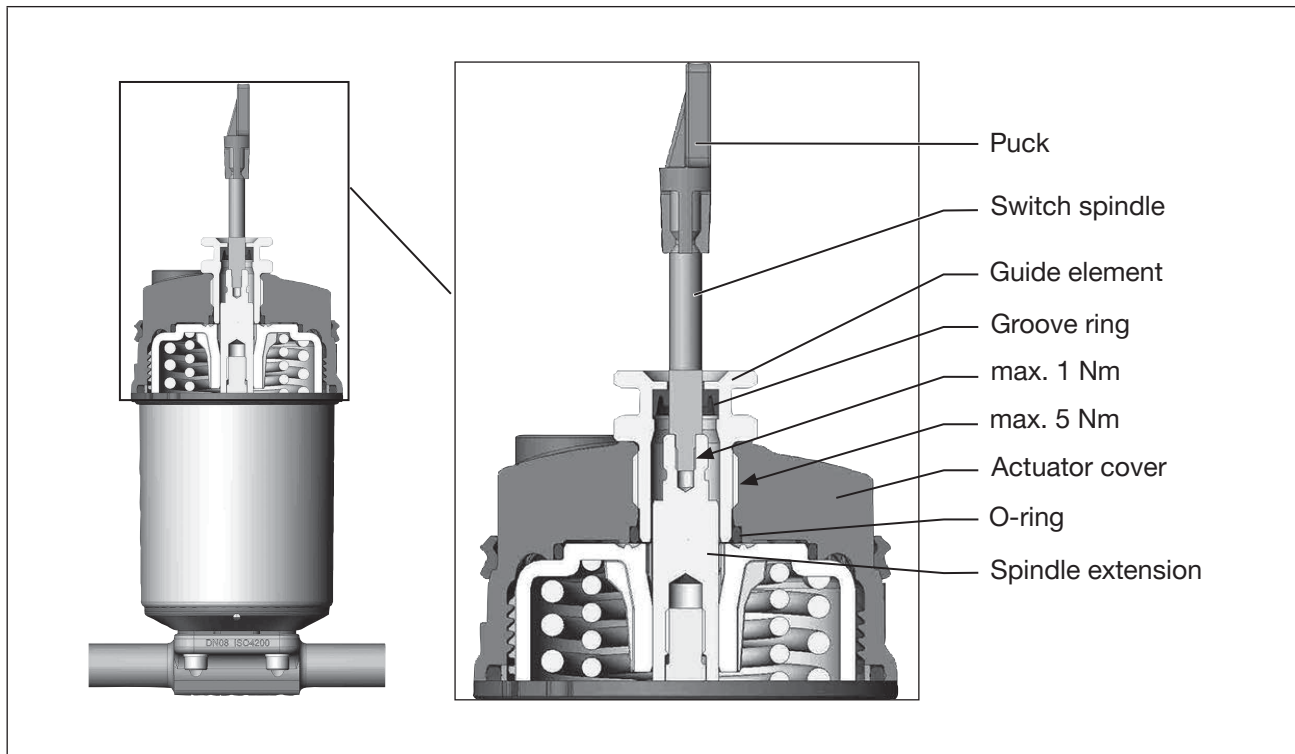


Figure 7: Installation of the switch spindle (2), series 21xx

ATTENTION!

Improper installation may damage the groove ring in the guide element.

The groove ring is already pre-assembled in the guide element and must be “locked into position” in the undercut.

- ▶ When installing the switch spindle, do not damage the groove ring.

→ Push the switch spindle through the guide element.

ATTENTION!

Screw locking paint may contaminate the groove ring.

- ▶ Do not apply any screw locking paint to the switch spindle.

→ To secure the switch spindle, apply some screw locking paint (Loctite 290) in the tapped bore of the spindle extension in the actuator.

→ Check that the O-ring is correctly positioned.

→ Screw the guide element to the actuator cover (maximum torque: 5 Nm).

→ Screw switch spindle onto the spindle extension. To do this, there is a slot on the upper side (maximum torque: 1 Nm).

→ Push puck onto the switch spindle and lock into position.

2. Install sealing rings

→ Pull the form seal onto the actuator cover (smaller diameter points upwards).

→ Check that the O-rings are correctly positioned in the pilot air ports.



When the control head is being installed, the collets of the pilot air ports must not be fitted to the actuator.

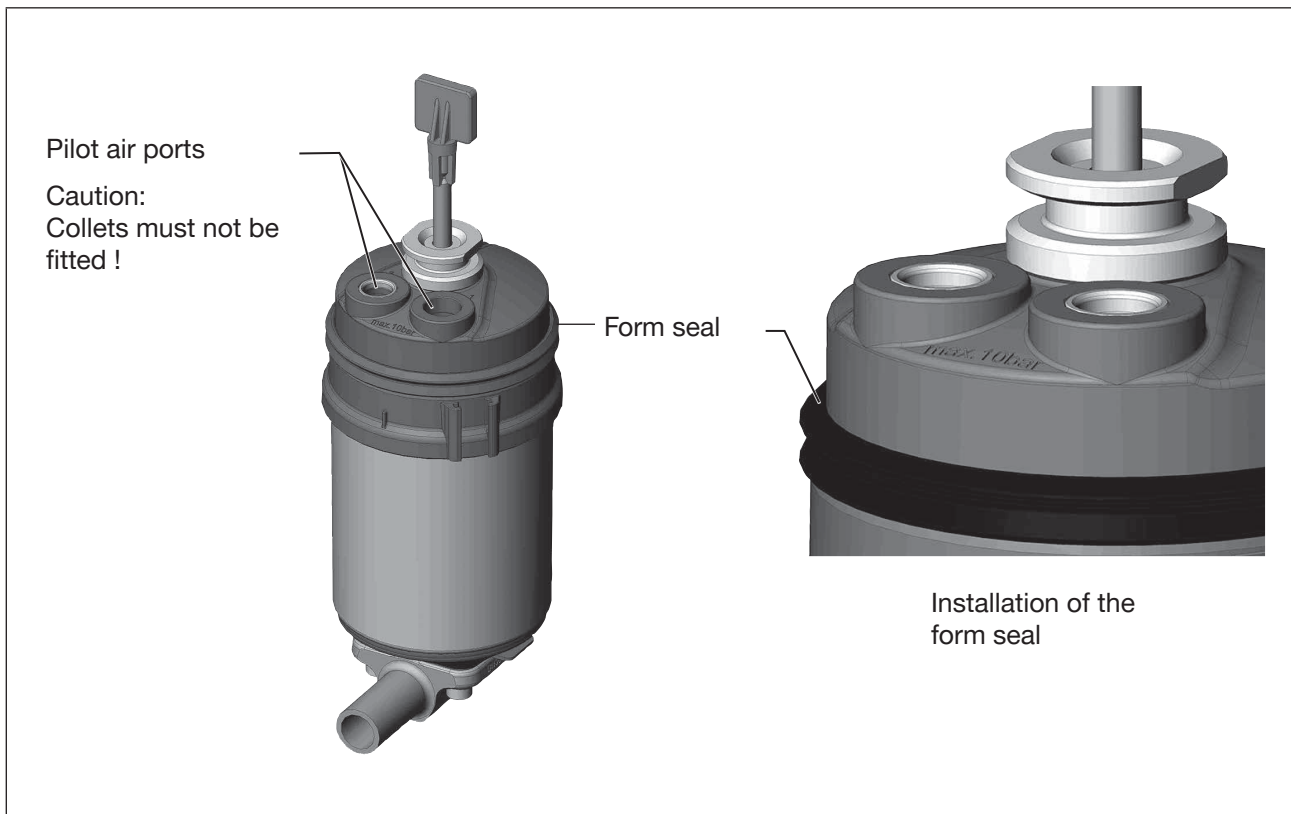


Figure 8: Installation of the sealing rings

3. Install control head

ATTENTION!

Damaged printed circuit board or malfunction.

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

→ Align the puck and the control head until

1. the puck can be inserted into the guide rail of the control head and
2. the connection pieces of the control head can be inserted into the pilot air ports of the actuator.

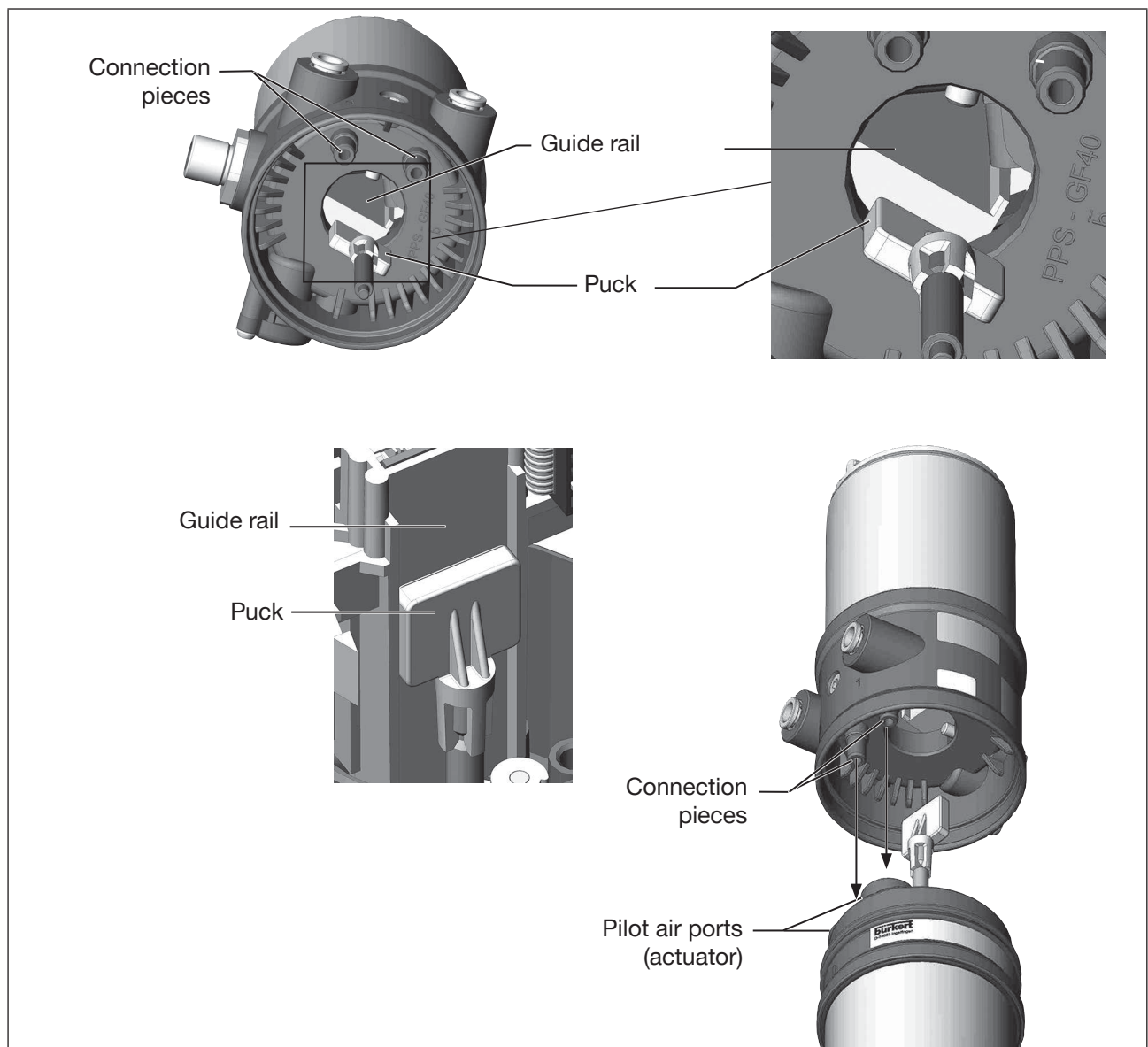


Figure 9: Aligning the puck and the connection pieces

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

ATTENTION!

Too high torque when screwing in the fastening screw does not ensure degree of protection IP65 / IP67.

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

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

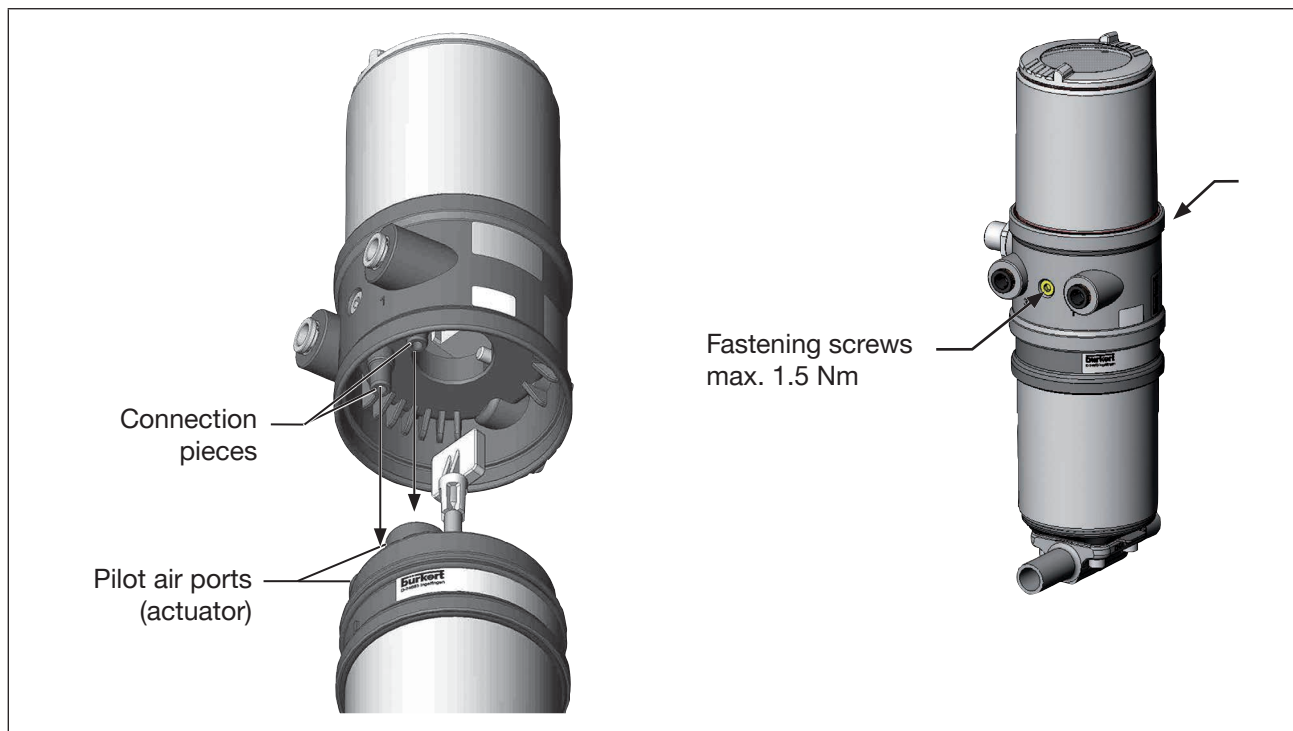


Figure 10: Installation of control head

7.3 Installation of the control head Type 8695 on process valves of series 20xx (CLASSIC)

Procedure:

1. Install switch spindle

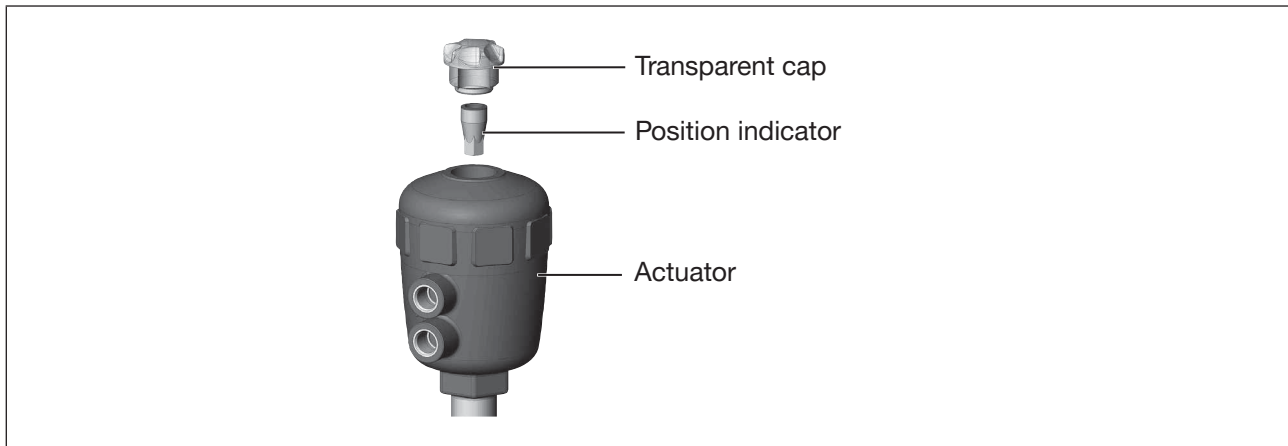


Figure 11: Installation of the switch spindle (1), series 20xx

→ Unscrew the transparent cap on the actuator.

→ Using a hexagon socket key, unscrew the orange/yellow position indicator from the inside of the actuator.

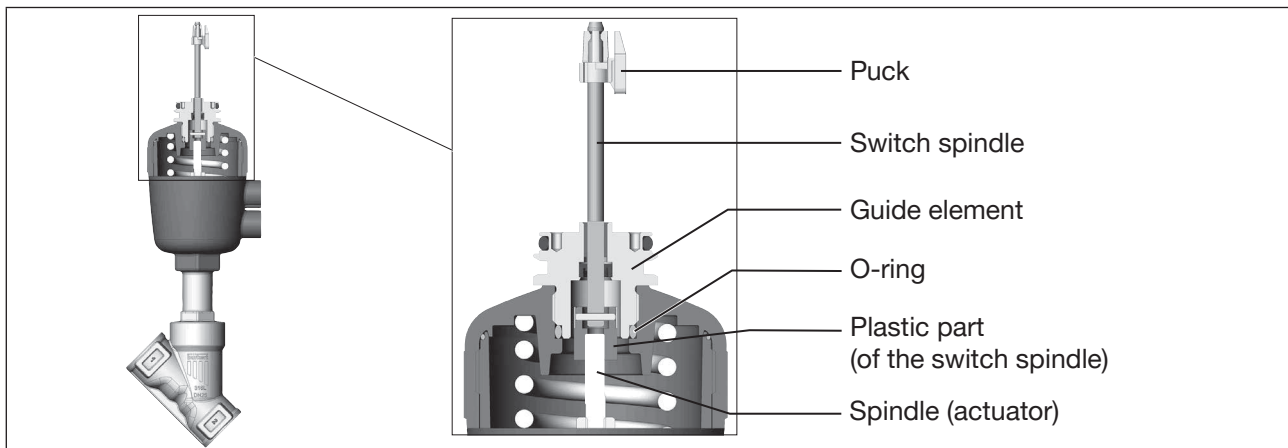


Figure 12: Installation of the switch spindle (2), series 20xx

→ Press the O-ring downwards into the cover of the actuator.

→ Manually screw the switch spindle (and the plugged-on guide element) together with the plastic part onto the spindle of the actuator, but do not tighten spindle yet.

→ Tighten the guide element with a face wrench³⁾ into the actuator cover (maximum torque: 8.0 Nm).

→ Tighten the switch spindle on the spindle of the actuator. To do this, there is a slot on the upper side (maximum torque: 1.0 Nm).

→ Push the puck onto the switch spindle until it engages.

2. Install control head

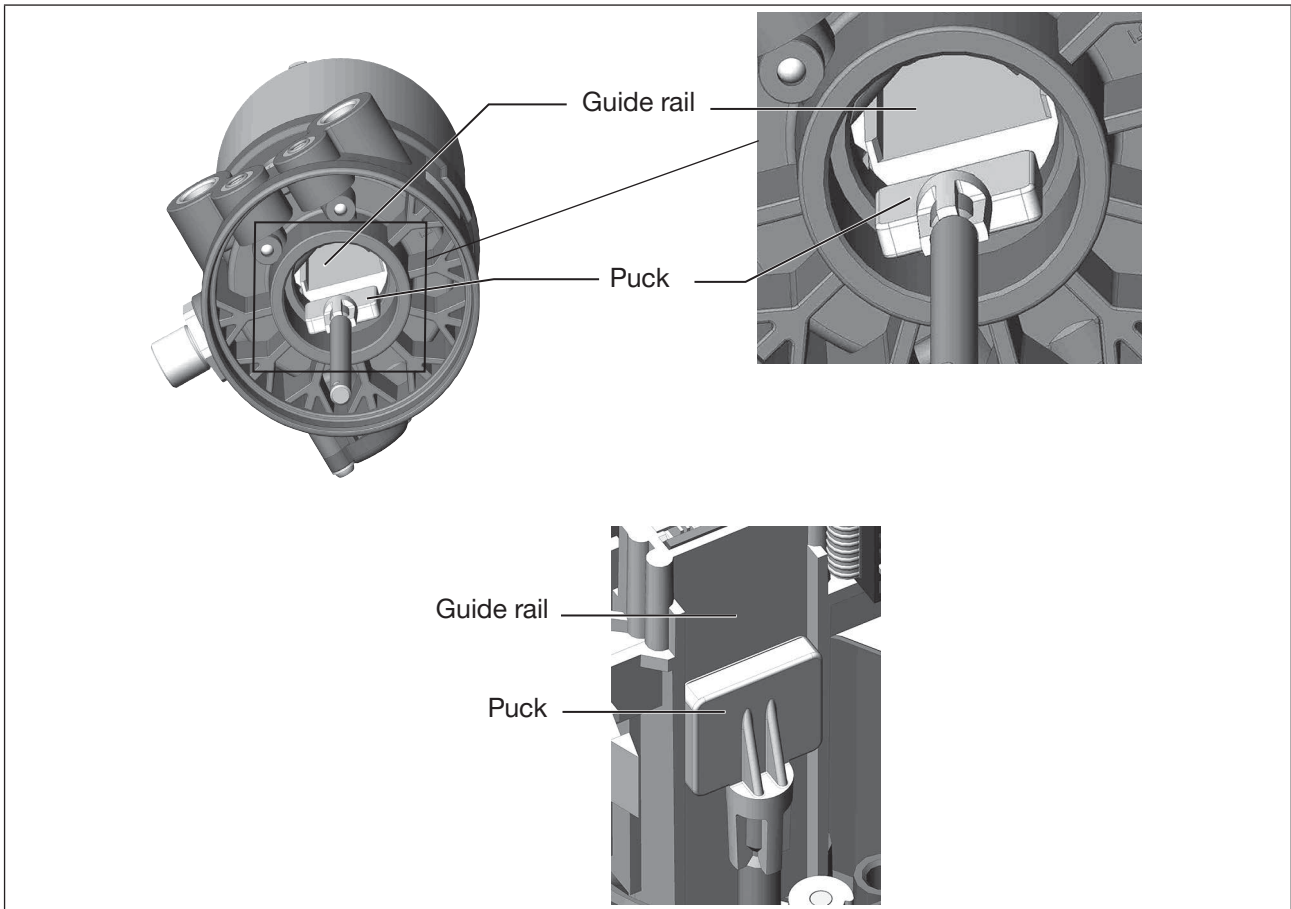


Figure 13: Aligning the puck, series 20xx

ATTENTION!

Damaged printed circuit board or malfunction.

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

→ Push the control head onto the actuator. The puck must be aligned in such a way that it is inserted into the guide rail of the control head.

→ Press the control head all the way down as far as the actuator and turn it into the required position.



Ensure that the pneumatic connections of the control head and those of the valve actuator are situated preferably vertically one above the other (see [“Figure 14: Installing the control head, series 20xx”](#)).

If they are positioned differently, longer hoses may be required other than those supplied in the accessory kit.

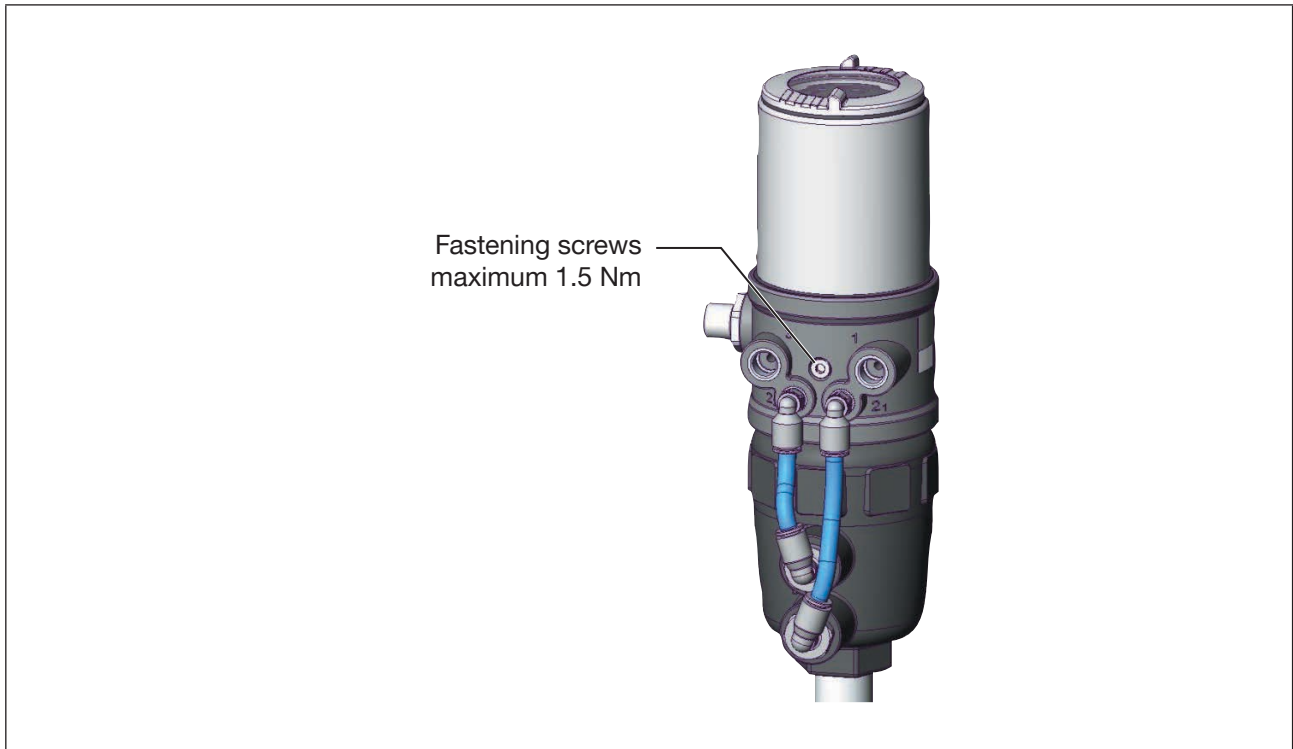


Figure 14: Installing the control head, series 20xx

ATTENTION!

Too high torque when screwing in the fastening screw does not ensure degree of protection IP65 / IP67.

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

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

3. Install pneumatic connection between control head and actuator

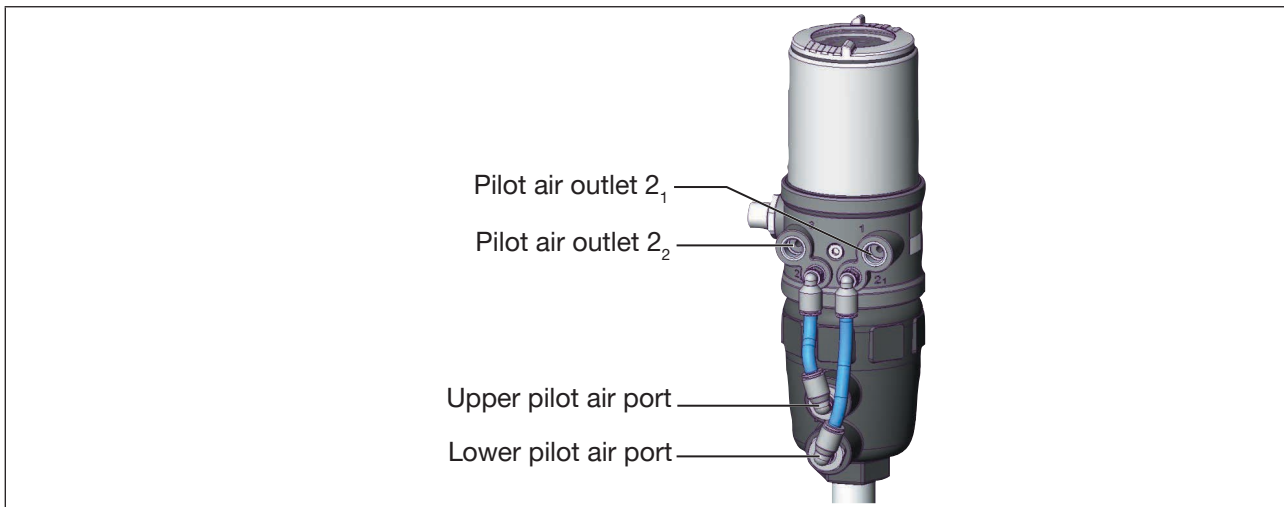


Figure 15: Installing the pneumatic connection between control head and actuator, series 20xx

- Screw the plug-in hose connectors onto the control head and the actuator.
- Using the hoses supplied in the accessory kit, make the pneumatic connection between the control head and actuator with the following [“Table 1: Pneumatic connection to actuator CFA and CFB”](#) or [“Table 2: Pneumatic connection to actuator CFI”](#).

ATTENTION!

Damage or malfunction due to ingress of dirt and moisture.

- ▶ To comply with degree of protection IP65 / IP67, connect the pilot air outlet (only for CFA or CFB) which is not required to the free pilot air port of the actuator or seal with a plug.



“In rest position” means that the pilot valves of the control head Type 8695 are isolated or not actuated.

Control function A (CFA)		Process valve closed in rest position (by spring force)	
Control head	Pilot air outlet		or
Actuator	Upper pilot air port		
	Lower pilot air port		
Control function B (CFB)		Process valve open in rest position (by spring force)	
Control head	Pilot air outlet		or
Actuator	Upper pilot air port		
	Lower pilot air port		

Table 1: Pneumatic connection to actuator CFA and CFB

Control function I (CFI)		
Process valve closed in rest position		
Control head	Pilot air outlet	
Actuator	Upper pilot air port	
	Lower pilot air port	
Process valve open in rest position		
Control head	Pilot air outlet	
Actuator	Upper pilot air port	
	Lower pilot air port	

Table 2: Pneumatic connection to actuator CFI



If the ambient air is humid, a hose can be connected between pilot air outlet 2_2 of the control head and the unconnected pilot air port of the actuator for control function A or control function B. As a result, the spring chamber of the actuator is supplied with dry air from the vent duct of the control head.

7.4 Rotating the actuator module on process valves of series 2100, 2101, 2000 and 2012



The actuator module (control head and actuator) can be rotated for globe valves and angle-seat valves belonging to series 2100, 2101, 2000 and 2012 only.

The process valve must be in the open position for alignment of the actuator module.

The position of the ports can be aligned steplessly by rotating the actuator module (control head and actuator) through 360°.



Series 2100 and 2101:

Only the entire actuator module can be rotated. The control head cannot be rotated contrary to the actuator.


DANGER!

Risk of injury from high pressure in the equipment/device.

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

Procedure:

- Clamp valve body in a holding device (only required if the process valve has not yet been installed).
- Control function A: Open process valve.

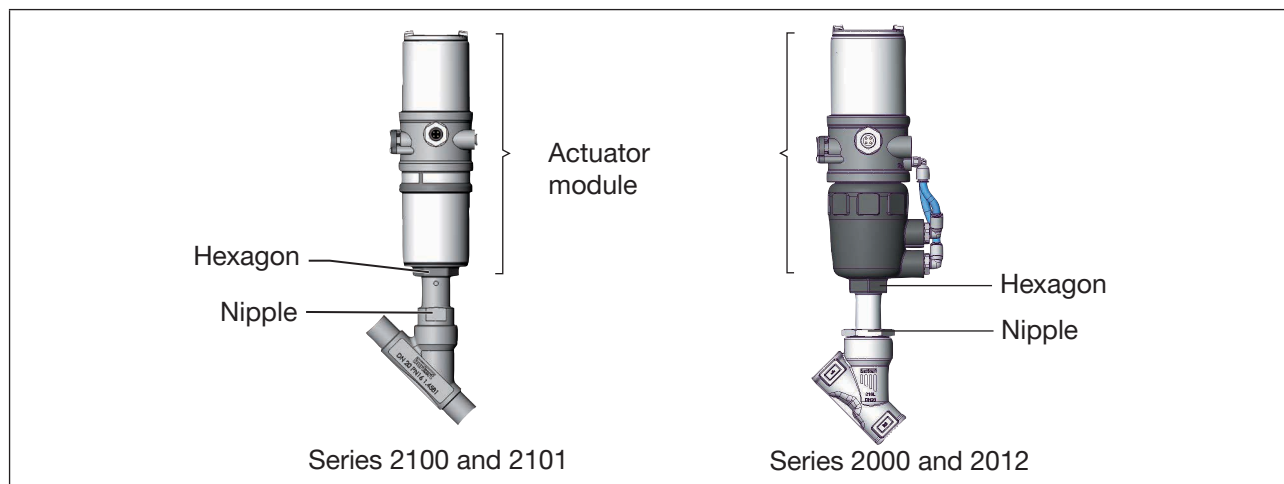


Figure 16: Rotating the actuator module

- Using a suitable open-end wrench, counter the wrench flat on the pipe.
- Place suitable open-end wrench on the hexagon of the actuator.


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 counter-clockwise only (see “Figure 17”).

- Rotate counter-clockwise (as seen from below) to bring the actuator module into the required position.

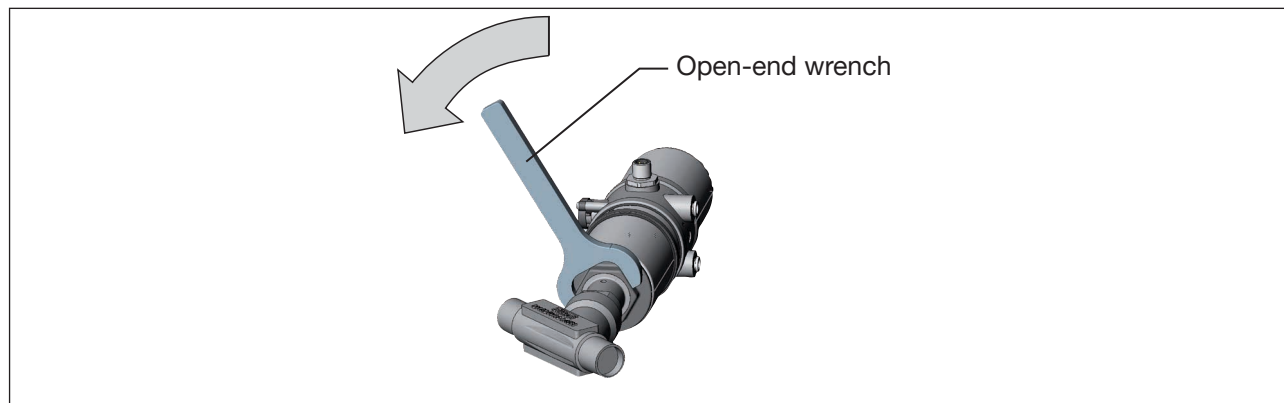


Figure 17: Rotating with open-end wrench

7.5 Rotating the control head for process valves belonging to series 20xx

If the connecting cables or hoses cannot be fitted properly following installation of the process valve, the control head can be rotated contrary to the actuator.

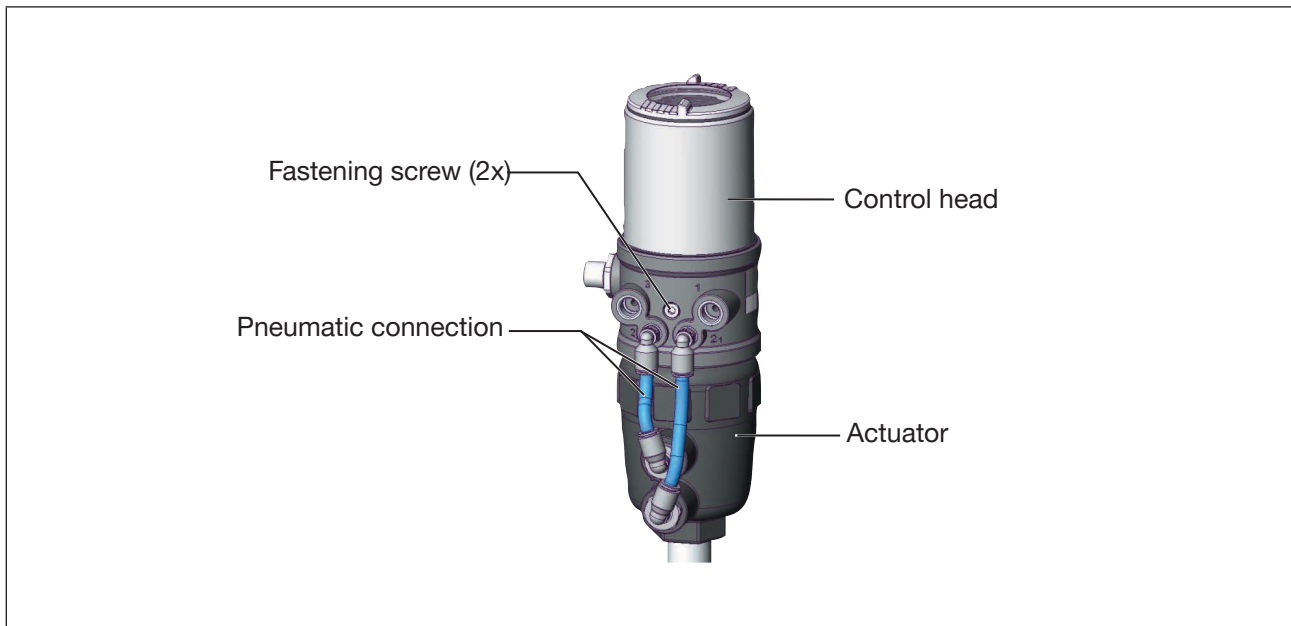


Figure 18: Rotating the control head, series 20xx

Procedure

- Loosen the pneumatic connection between the control head and the actuator.
- Loosen the fastening screws countersunk in the side of the body (hexagon socket wrench size 2.5).
- Rotate the control head into the required position.

ATTENTION!

Too high torque when screwing in the fastening screw does not ensure degree of protection IP65 / IP67.

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

- Tighten the fastening screws hand-tight only (maximum torque: 1.5 Nm).
- Re-attach the pneumatic connections between the control head and the actuator. If required, use longer hoses.

8 PNEUMATIC INSTALLATION



DANGER!

Risk of injury from high pressure in the equipment/device.

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

Risk of electric shock.

- ▶ Before working on equipment or 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 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.

Procedure:

- Connect the control medium to the pilot air port (1)
(3 – 7 bar; instrument air, free of oil, water and dust).
- Attach the exhaust airline or a silencer to the exhaust air port (3).



Important information for the problem-free functioning of the device:

- ▶ The installation must not cause back pressure to build up.
- ▶ Select a hose for the connection with an adequate cross-section.
- ▶ The exhaust air line must be designed in such a way that no water or other liquid can get into the device through the exhaust air port.
- ▶ Keep the adjacent supply pressure **always** at least 0.5 – 1 bar above the pressure which is required to move the actuator to its end position.

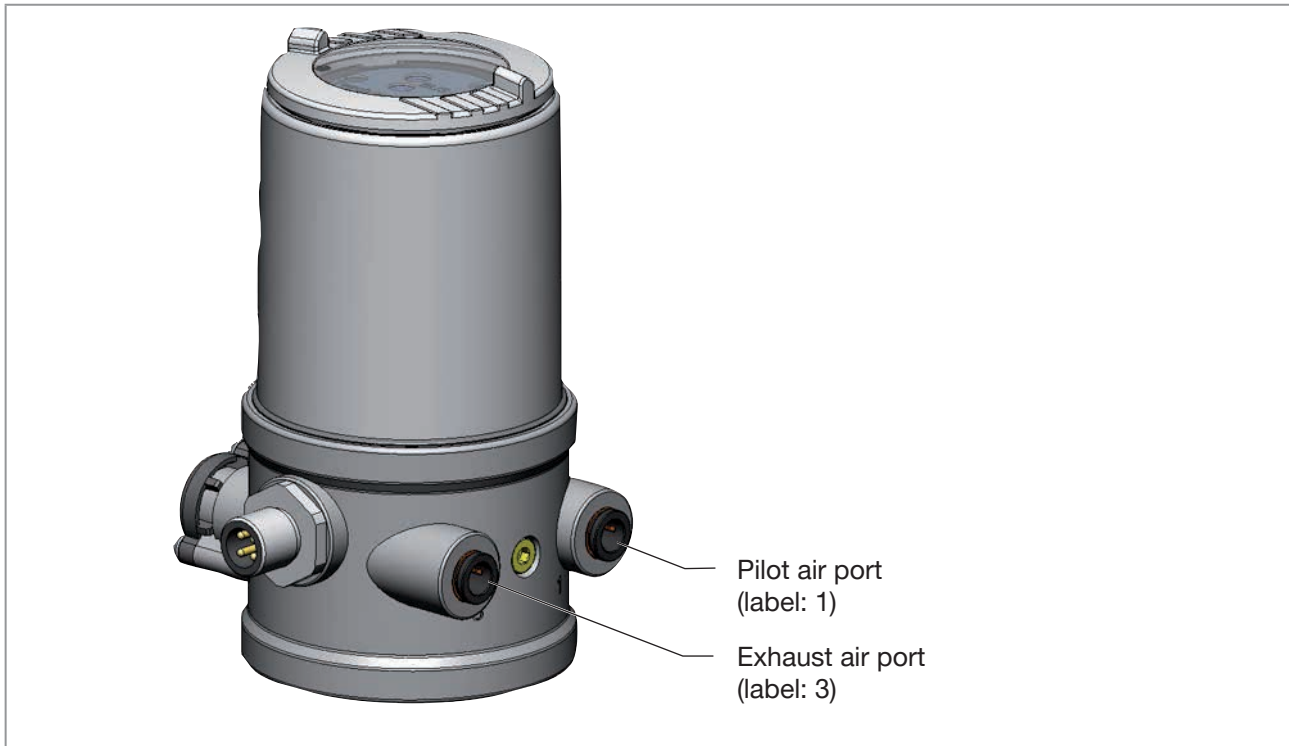


Figure 19: *Pneumatic connection*



Air exhaust concept:

- ▶ In compliance with degree of protection IP67, an air exhaust line must be installed in the dry area.

9 ELECTRICAL INSTALLATION

9.1 Safety instructions



DANGER!

Risk of electric shock.

- ▶ Before working on equipment or 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 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.

9.2 Electrical installation, without fieldbus communication

Configuration circular plug (M12 x 1, 8-pin):

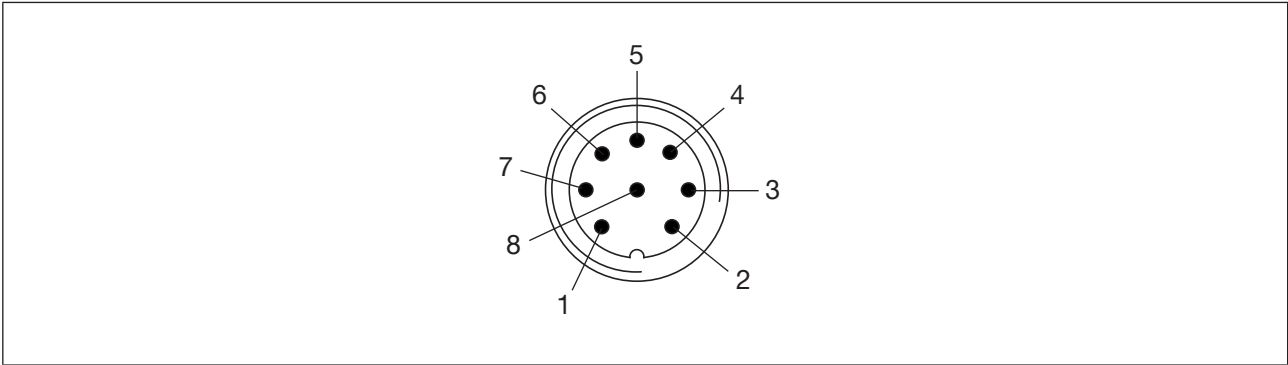


Figure 20: Circular plug M12 x 1, 8-pin

Pin	Wire color ⁴⁾	Designation	Configuration	External circuit / signal level
1	white	Digital output top position	DO 1 (=Top)	
2	brown	Digital output bottom position	DO 2 (=Bot)	
3	green	Operating voltage	GND	3 ○ → GND
4	yellow	Operating voltage +	24 V DC	4 ○ → 24 V
5	grey	Valve control +	Valve +	5 ○ → 24 V
6	pink	Valve control -	Valve -	6 ○ → GND
7		-	not used	
8		-	not used	

Table 3: Connection with circular plug-in connector

→ Connect the control head according to the table.

⁴⁾ The indicated colors refer to the connecting cable available as an accessory (919061).

9.3 Electrical installation, IO-Link Port Class B and Port Class A

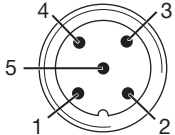
Port Class B	Pin	Designation	Configuration	
	1	L +	24 V DC	System supply
	2	P24	24 V DC	Actuator supply
	3	L -	0 V (GND)	System supply
	4	C/Q	IO-Link	
	5	M24	0 V (GND)	Actuator supply

Table 4: Pin assignment, Port Class B

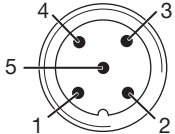
Port Class A	Pin	Designation	Configuration	
	1	L +	24 V DC	System supply
	2	Do not connect		
	3	L -	0 V (GND)	System supply
	4	C/Q	IO-Link	
	5	Do not connect		

Table 5: Pin assignment, Port Class A

9.4 Electrical installation, bÜS

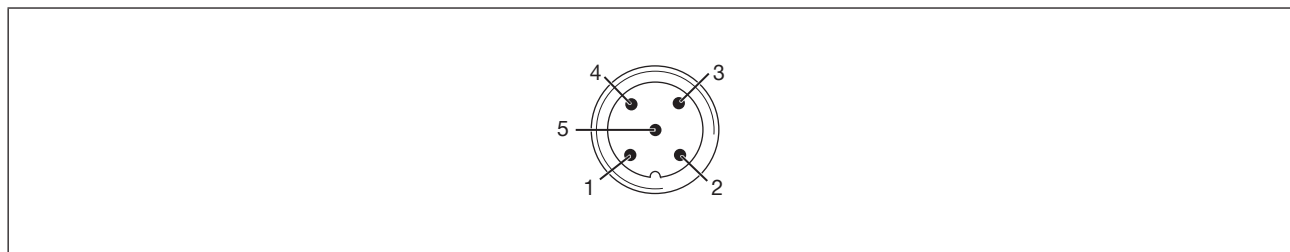


Figure 21: Pin assignment

Pin	Wire color	Configuration
1	CAN plate/shielding	CAN plate/shielding
2	red	+24 V DC \pm 25%, max. residual ripple 10%
3	black	GND / CAN_GND
4	white	CAN_H
5	blue	CAN_L

Table 6: Pin assignment

! For electrical installation with bÜS network, note:
Use a 5-pin round plug and shielded 5-core cable.
The shielding in the device is not connected to the functional earth.

10 START-UP

10.1 Safety instructions



WARNING!

Risk of injury from improper operation.

Improper operation may result in injuries as well as damage to the device and the area around it.

- ▶ Before start-up, ensure that the operating personnel are familiar with and completely understand the contents of the operating instructions.
- ▶ Observe the safety instructions and intended use.
- ▶ Only adequately trained personnel may operate the equipment/the device.

10.2 Teach function: Determine end positions and save these, REV.2

- **Automatic teach function:** For devices with pilot valve
The teach function automatically identifies and saves the end positions of the valve.
- **Manual teach function:** For devices without pilot valve
The end positions are captured and saved automatically.

10.2.1 Automatic teach function

For devices with pilot valve:

The teach function automatically identifies and saves the end positions of the valve.



With the IO-Link variant, the teach function can also be started with an acyclic IO-Link parameter (see parameter list) or with the Bürkert Communicator.



With the büS variant, the teach function can also be started with the Bürkert Communicator.

Essential requirements:

- The device is mounted on the actuator.
- The supply voltage is connected.
- The compressed air supply is connected.
- So that the correct reference conditions are identified, the pilot pressure must correspond to the operating conditions.

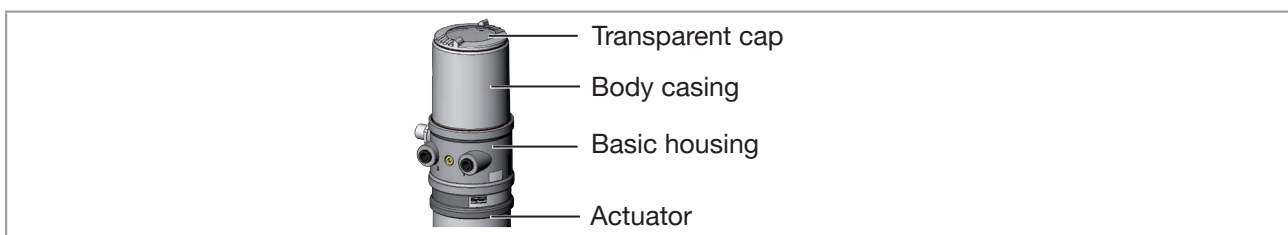


Figure 22: Open device

ATTENTION

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When opening or closing the device, do not press against the actuator, but against the basic housing.

→ Open the device: turning the transparent cap anti-clockwise.

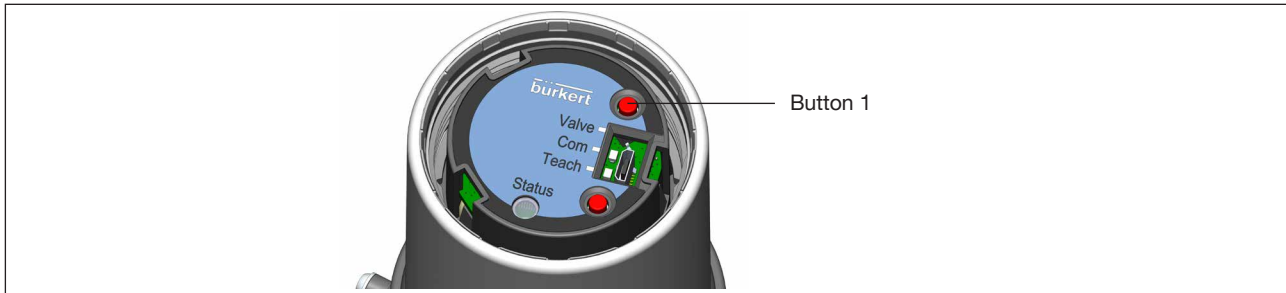


Figure 23: Teach function

→ Hold down the button 1 to start the teach function for approx. 5 s until the teach LED flashes.

→ When the teach LED starts flashing, release the button within 5 seconds.

- ✔ When the teach LED stops flashing, the teach function is terminated.
- ✔ The end positions of the valve have been identified and saved.

ATTENTION

Damage or malfunction due to ingress of dirt or moisture.

To observe the degree of protection IP65 or IP67:

- ▶ Screw in transparent cap to the stop.

→ Close the device (wrench⁵⁾: 674078).

Description of workflow for teach function:

The teach LED flashes red when the teach function is running.

- The end position is scanned in.
- The pilot valve switches.
- The actuator moves automatically to the upper position.
- The upper end position is scanned in.
- The pilot valve is switched off.
- The actuator moves to the lower position.
- In order to determine the opening time and the closing time, the actuator moves again into the upper and lower end position.

⁵⁾ The wrench (674078) is available from your Bürkert sales office..

10.2.2 Manual teach function

For devices without pilot valve:

The end positions are captured and saved manually by the user.



With the IO-Link variant, the teach function can also be started with an acyclic IO-Link parameter (see parameter list) or with the Bürkert Communicator.



With the bÜS variant, the teach function can also be started with the Bürkert Communicator.

Essential requirements:

- The device is mounted on the actuator.
- The supply voltage is connected.
- The compressed air supply is connected.
- So that the correct reference conditions are identified, the pilot pressure must correspond to the operating conditions.
- Provide the possibility for the user to switch the pneumatic actuator (open and closed).

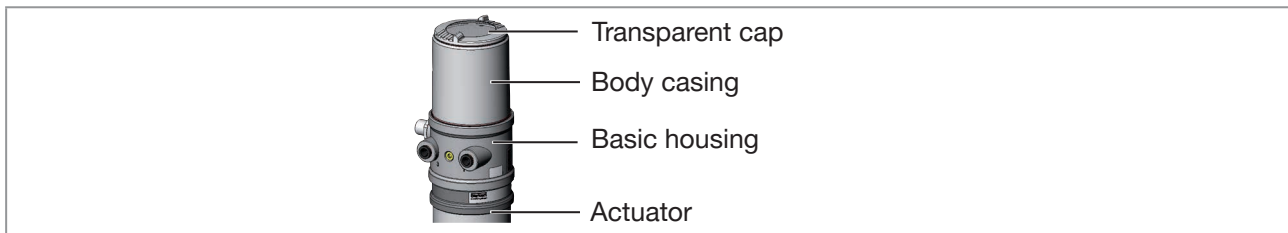


Figure 24: Opening or closing the device

ATTENTION

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When opening or closing the device, do not press against the actuator, but against the basic housing.

→ Screw off the transparent cap by turning counterclockwise.

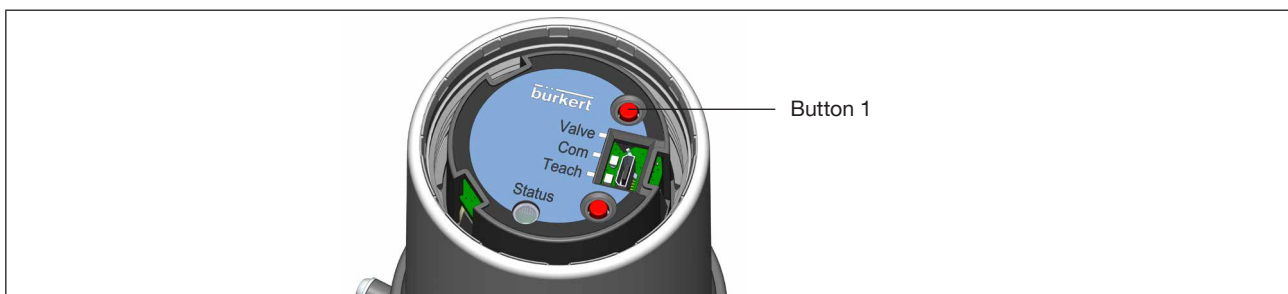


Figure 25: Starting teach function

→ Air bleed the pneumatic actuator: move to the unactuated end position.

→ Hold down the button 1 to start the teach function for at least 10 s.

After 5 s, the red teach LED will start flashing. Keep the button pressed down. After a further 5 s, the red teach LED flashes very quickly. Only then release the button.

- ✔ Teach LED red flashes once every second: The manual teach function is active.
 - Check whether the pneumatic actuator is in the deaerated, unactuated end position.
 - This end position is confirmed by briefly pressing the button 1.
- ✔ Yellow valve LED is lit.
 - Move the pneumatic actuator into the aerated, switched end position.
 - This end position is confirmed by briefly pressing the button 1.
- ✔ Yellow valve LED is not lit.
 - Air bleed the pneumatic actuator: move to the unactuated end position.
- ✔ Yellow valve LED is lit.

To determine the opening times and closing times, aerate and deaerate the pneumatic actuator:

Measurement of opening time (Opening_Time):

→ Move the pneumatic actuator into the aerated, switched end position.

- ✔ Yellow valve LED is not lit.

Measurement of closing time (Closing_Time):

→ Air bleed the pneumatic actuator: move to the unactuated end position.

- ✔ When the red teach LED stops lighting, the teach function is terminated.
- ✔ The end positions of the valve have been identified and saved.

Note: If the red teach LED is lit, the manual teach function is defective and must be repeated.

ATTENTION

Damage or malfunction due to ingress of dirt or moisture.

To observe the degree of protection IP65 or IP67:

- ▶ Screw in transparent cap to the stop.

→ Close the device (wrench⁶⁾: 674078).

⁶⁾ The wrench (674078) is available from your Bürkert sales office.

10.3 Setting with Bürkert Communicator

The Bürkert Communicator can be used to make all settings on the device.



The settings in the Bürkert Communicator can be found in the operating manual.

10.3.1 Connecting IO-Link device with Bürkert Communicator

To ensure clear communication, the IO-Link devices should not be parameterised simultaneously by the higher-level controller (PLC) via the IO-Link master and with the Bürkert Communicator (via the service).

Required components:

- Communications software: Bürkert Communicator for PC
- USB-büS interface set (see accessories)
- büS adapter for communication interface (see accessories)
- If necessary, a büS cable extension (see accessories)

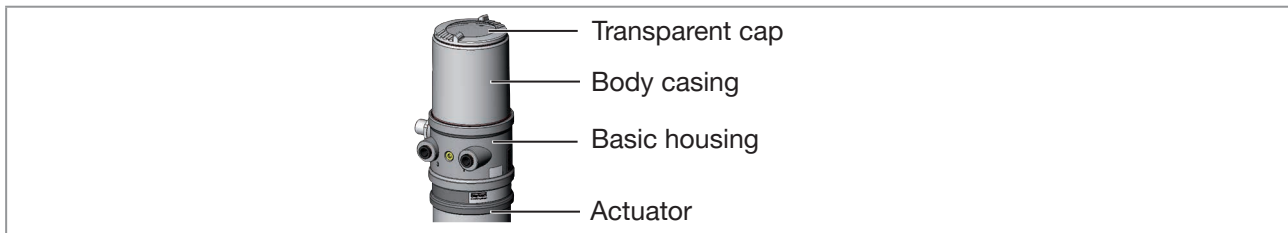


Figure 26: Opening or closing the device

ATTENTION

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When opening or closing the device, do not press against the actuator, but against the basic housing.

→ Screw off the transparent cap by turning counterclockwise.

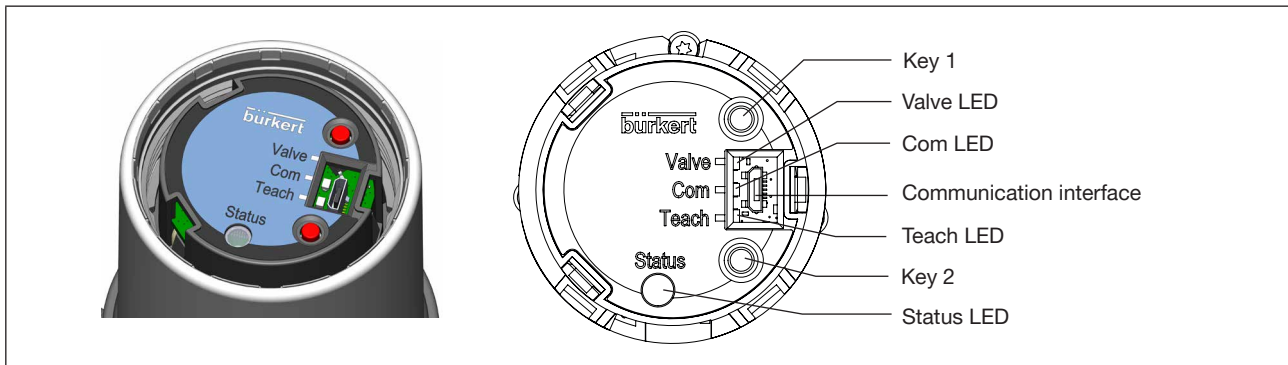


Figure 27: Communication interface

- Insert micro USB plug in communication interface.
- Establish connection to PC with USB-büS interface set.
- Starting Bürkert Communicator.
- Implementing settings.

10.3.2 Connecting büS device with Bürkert Communicator

Required components:

- Communications software: Bürkert Communicator for PC
- USB-büS interface set (see accessories)

- Establish connection to PC with USB-büS interface set.
- Starting Bürkert Communicator.
- Implementing settings.

11 IO-LINK

11.1 Information, IO-Link

IO-Link is an internationally standardized IO technology (IEC 61131-9) to enable sensors and actuators to communicate.

IO-Link is a point-to-point communication with 3-wire connection technology for sensors and actuators and unshielded standard sensor cables.

To ensure clear communication, the IO-Link devices should not be parameterised simultaneously by the higher-level controller (PLC) via the IO-Link master and with the Bürkert Communicator (via the communication interface).

11.2 Technical specifications, IO-Link

Port Class	A	B
IO-Link Specification	V1.1.2	
Supply	via IO-Link (M12 x 1, 5-pin, A-coded)	
SIO mode	No	
IODD file	see Internet	
VendorID	0x0078, 120	
DeviceID	see IODD file	
ProductID	8695 Class A	8695 Class B
Transmission speed	COM3 (230,4 kbit/s)	
PD Input Bits	48	
PD Output Bits	8	
M-sequence Cap.	0x0D	
Min. cycle time	5 ms	
Data Storage	Yes	
Max. cable length	20 m	

11.3 Configuration of the fieldbus

The required start-up files and the description of the process data and acyclic parameters are available on the Internet.



Download from:

www.burkert.com / Type 8695 / Software

12 BÜS

12.1 Information, büS

büS is a system bus developed by Bürkert with a communication protocol based on CANopen.

12.2 Configuration of the fieldbus

The required start-up files and the description of objects are available on the Internet.



Download from:

www.burkert.com / Type 8695 / Software

13 CONTROL AND DISPLAY ELEMENTS

The following chapter describes the operating states as well as the control and display elements of the control head.

For further information on the operation of the control, refer to chapter [“10 Start-up”](#)

13.1 Operating state



To operate the buttons, make sure that the local control lock is deactivated/unlocked (factory setting): with communication software or fieldbus communication.

AUTOMATIC (AUTO)

Normal controller mode is implemented and monitored in AUTOMATIC operating state.

MANUAL (MANU)

In MANUAL operating state the valve can be opened and closed manually via the button 2.

The status LED flashes orange (function check, see [“13.4.2.3 NAMUR mode”](#)).

The buttons can be used to switch between the two operating states AUTOMATIC and MANUAL:

→ Press both buttons simultaneously between 2 s and 10 s (com LED flashes 0 – 2 s at 5 Hz).

13.2 Control and display elements

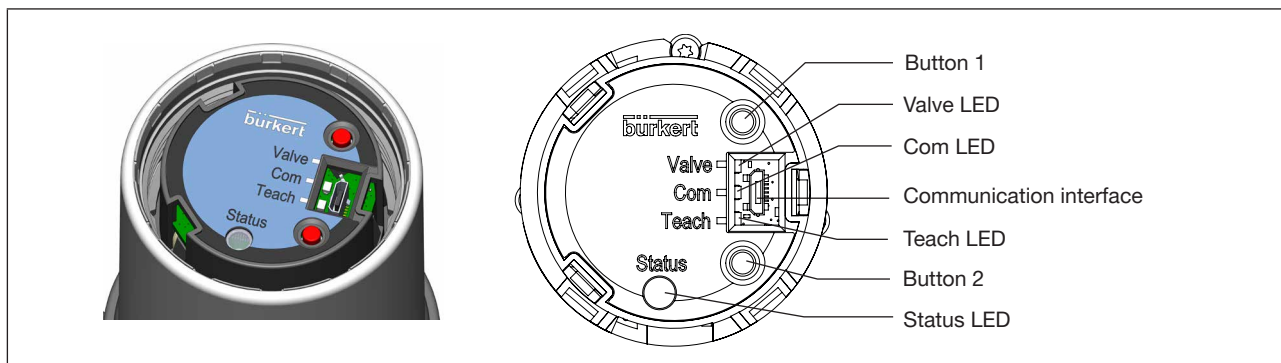


Figure 28: Description control and display elements

ATTENTION!

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When unscrewing and screwing in the transparent cap, do not hold the actuator of the process valve but the basic housing.

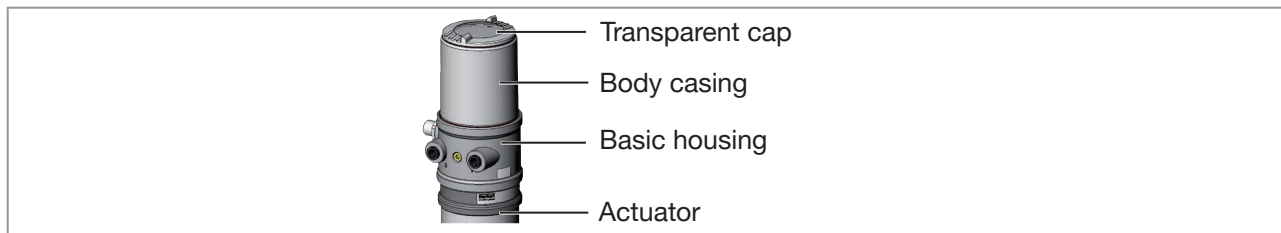


Figure 29: Open device

→ Screw off the transparent cap of the device to operate the buttons.

ATTENTION!

Damage or malfunction due to penetration of dirt and humidity.

- ▶ To observe degree of protection IP65 / IP67, screw the transparent cap in all the way.

→ Close the device (assembly tool: 674078⁷⁾).

⁷⁾ The assembly tool (674078) is available from your Bürkert sales office.

13.3 Configuration of the buttons

! To operate the buttons, make sure that the local control lock is deactivated/unlocked (factory setting): with communication software or fieldbus communication.

The configuration of the 2 buttons varies depending on the operating state (AUTOMATIC / MANUAL).

The description of the operating states (AUTOMATIC / MANUAL) can be found in the chapter entitled [“13.1 Operating state”](#)

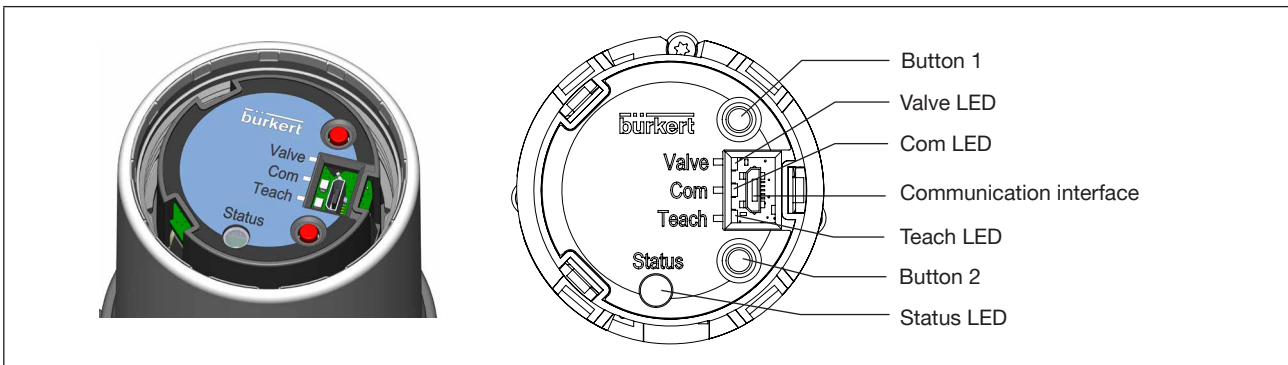


Figure 30: Description buttons

ATTENTION!

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When unscrewing and screwing in the transparent cap, do not hold the actuator of the process valve but the basic housing.

→ To operate the buttons unscrew the transparent cap.

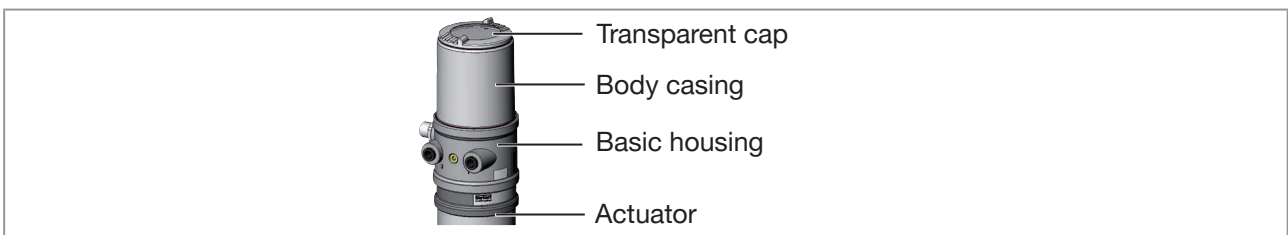


Figure 31: Open device

ATTENTION!

Damage or malfunction due to penetration of dirt and humidity.

- ▶ To observe degree of protection IP65 / IP67, screw the transparent cap in all the way.

→ Close the device (assembly tool: 674078⁸⁾).

⁸⁾ The assembly tool (674078) is available from your Bürkert sales office.

MANUAL operating state (status LED flashes orange, function check):

Button		Function	LED
1	-	-	
2	Press briefly	Valve switches	Valve LED is lit yellow
1 and 2 simultaneously	Press longer than 2 s (< 10 s)	Switching to AUTOMATIC operating state	Com LED flashes at 5 Hz (0 – 2 s)
	Press longer than 10 s (< 30 s)	Device restart	Valve LED, Com LED and Teach LED flash at 5 Hz (10 – 30 s)
	Press longer than 30 s	Reset device to factory setting	Valve LED, Com LED and Teach LED flash at 10 Hz (> 30 s)

Table 7: Configuration of the buttons for MANUAL operating state

AUTOMATIC operating state:

Button		Function	LED
1	Press longer than 5 s (< 10 s)	Starting the automatic teach function	Teach LED flashes at 5 Hz (5 – 10 s)
	Press longer than 10 s (< 30 s)	Starting the manual teach function	Teach LED flashes at 10 Hz (> 10 s)
2	-	-	
1 and 2 simultaneously	Press longer than 2 s (< 10 s)	Switching to AUTOMATIC operating state	Com LED flashes at 5 Hz (0 – 2 s) Status LED flashes orange
	Press longer than 10 s (< 30 s)	Device restart	Valve LED, Com LED and Teach LED flash at 5 Hz (10 – 30 s)
	Press longer than 30 s	Reset device to factory setting	Valve LED, Com LED and Teach LED flash at 10 Hz (> 30 s)

Table 8: Configuration of the buttons for AUTOMATIC operating state

13.4 Display of the LEDs

The following status are displayed with LEDs:

- Valve LED yellow: Activation of the pilot valve
- Status LED RGB: status indicator (errors, warnings) and valve position
- Com LED green: fieldbus communication (IO-Link)
- Teach LED red: teach function, error

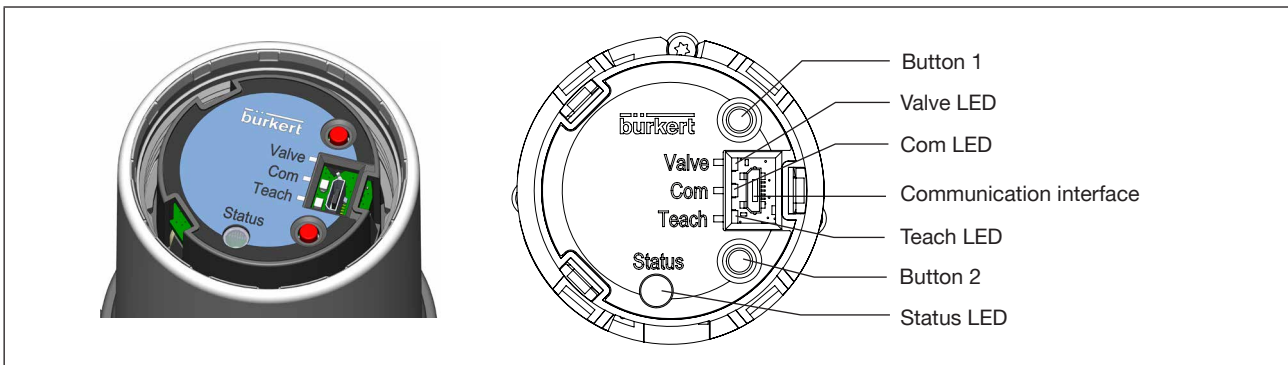


Figure 32: Description LEDs

ATTENTION!

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When unscrewing and screwing in the transparent cap, do not hold the actuator of the process valve but the basic housing.

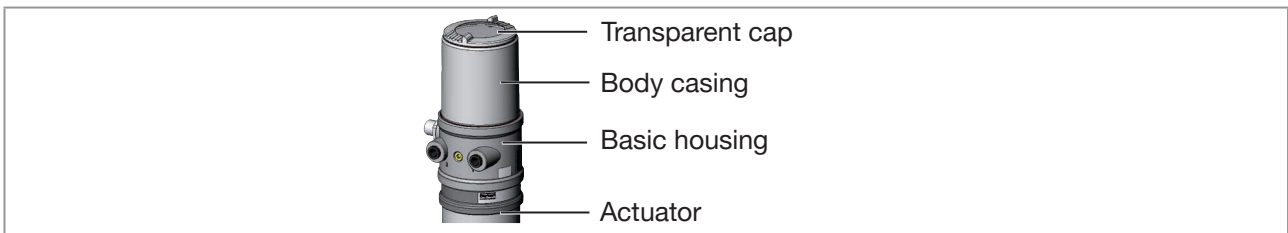


Figure 33: Open control head

ATTENTION!

Damage or malfunction due to penetration of dirt and humidity.

- ▶ To observe degree of protection IP65 / IP67, screw the transparent cap in all the way.

13.4.1 Valve LED, activation of the pilot valve

Color	Status	Description
yellow	is lit	Pilot valve is activated
yellow	is not lit	Pilot valve is not activated

Table 9: Valve LED

13.4.2 Status indicator

The status LED (RGB) show the device status.

The user can set the following LED modes for the display of device status and valve position.

- NAMUR mode
- Valve mode
- Valve mode with warnings (factory setting)
- Fixed color
- LED off

The LED mode and the colors of the valve position can be set with the Bürkert Communicator.

IO-Link:

The LED mode and the colors of the valve position can be also set with an acyclic parameter (see parameter list).



The description for setting the LED mode can be found in the chapter [“13.6 Setting the LED mode, status indicator”](#), page 52.

13.4.2.1 Valve mode

Displays in valve mode:

- Valve position: open, half-way, closed
- Device status: failure

Valve position	Valve position status, color	Device status: Error status, color	
Open	is lit yellow*	flashes red	alternately with yellow*
Half-way	LED off*	flashes red	alternately with LED off*
Closed	is lit green*	flashes red	alternately with green*

Table 10: Valve mode

* Factory setting, selectable colors for the valve position: Off, white, green, blue, yellow, orange, red

13.4.2.2 Valve mode + warnings

Displays in valve mode + warnings:

- Valve position: open, half-way, closed
- Device status: failure, function check, out of specification, maintenance required (according to NAMUR)

Valve position		Device status
	Status, color	Normal operation
Open	is lit yellow*	--
Half-way	LED off*	--
Closed	is lit green*	--

Table 11: Valve mode + warnings, normal operation

If several device statuses exist simultaneously, the device status with the highest priority is displayed.

Valve position	Device status				
	Failure	Function check	Out of specification	Maintenance required	
	Status, color	Status, color	Status, color	Status, color	
Open	flashes red	flashes orange	flashes yellow	flashes blue	alternately with yellow*
Half-way	flashes red	flashes orange	flashes yellow	flashes blue	alternately with LED off*
Closed	flashes red	flashes orange	flashes yellow	flashes blue	alternately with green*

Table 12: Valve mode + warnings, device status

For warning messages, the LEDs are briefly switched off between the change of the colors.

For localizations, the colors are only shown momentarily.

* Factory setting, selectable colors for the valve position: Off, white, green, blue, yellow, orange, red

13.4.2.3 NAMUR mode

The device status LED show the device status.

The display elements change color in accordance with NAMUR NE 107.

If several device statuses exist simultaneously, the device status with the highest priority is displayed. The priority is determined by the severity of the deviation from controlled operation (red LED = failure = highest priority).

Status display in accordance with NE 107, edition 2006-06-12			
Color	Color code	Status	Description
Red	5	Outage, error or malfunction	Normal operation is not possible due to a malfunction in the device or on its peripheral equipment.
Orange	4	Function check	Work is being carried out on the device; normal operation is therefore temporarily not possible
Yellow	3	Out of specification	Ambient conditions or process conditions for the device are outside the specified area.
Blue	2	Maintenance required	The device is in normal operation, although a function is briefly restricted. → Service device.
Green	1	Diagnostics active	Device is operating perfectly. Status changes are indicated in different colors. Messages are transmitted via a fieldbus if connected.

Table 13: Description of the colors

13.4.3 Com LED, fieldbus communication (IO-Link)

Color	Status	Description
green	is not lit	IO-Link communication inactive
green	flashes	IO-Link communication active

Table 14: Com LED, green

13.4.4 Teach LED, teach function

Color	Status	Description
red	is lit	Teach function error
red	is not lit	After restart or successful teach function
red	flashes	Teach function active

Table 15: Teach LED, red

13.5 Manual actuation of the actuator with pilot valve

The actuator can be moved without a supply voltage from the rest position to its end position and back again *when pilot air is connected*.

To do this, the pilot valves must be actuated with a screwdriver.

Opening the device:

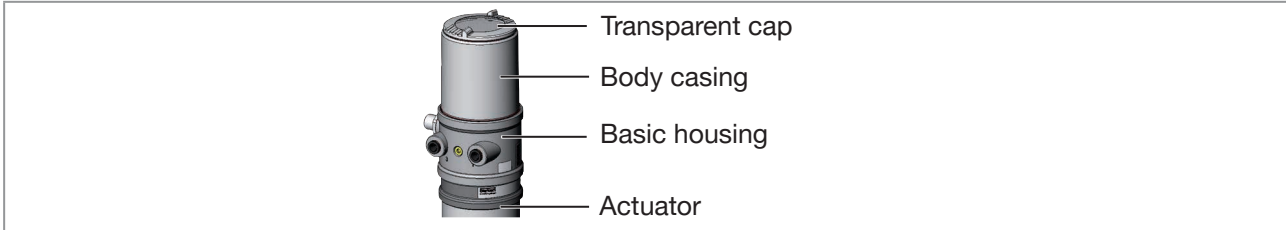


Figure 34: Opening the device

ATTENTION!

Breakage of the pneumatic connection pieces due to rotational impact.

- ▶ When unscrewing and screwing in the body casing or transparent cap, do not hold the actuator of the process valve but the basic housing.

→ To activate the device manually, unscrew the body casing (wrench⁹⁾: 674078).

Manual activation:

ATTENTION!

The hand lever may be damaged if it is simultaneously pressed and turned.

- ▶ Do not press the hand lever when turning it.

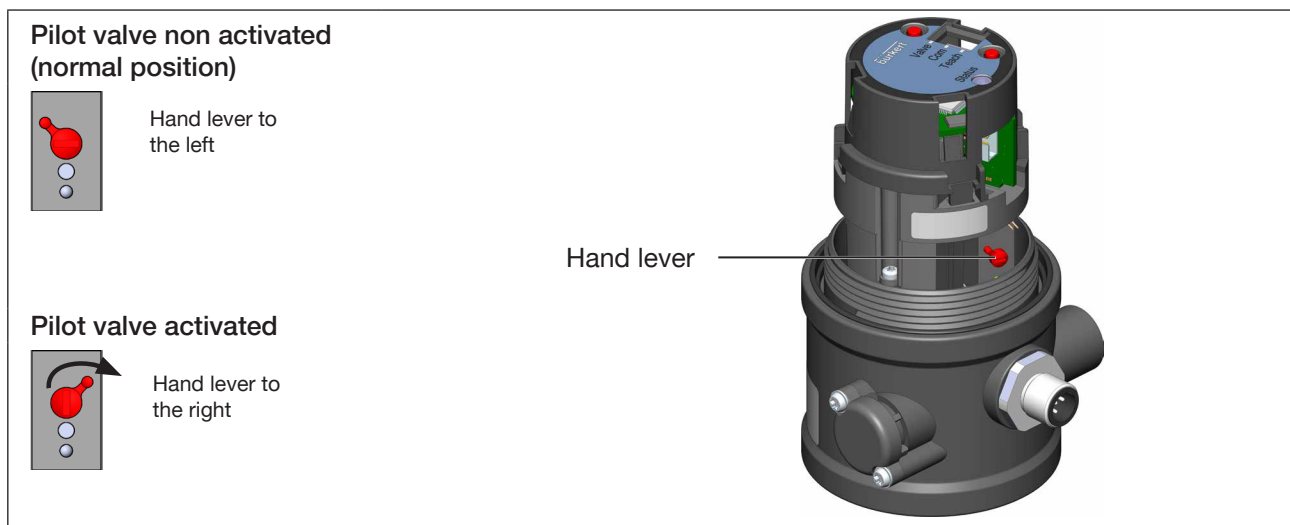


Figure 35: Pilot valves for aerate and deaerate the actuator

⁹⁾ The wrench (674078) is available from your Bürkert sales office.

Move actuator to end position

→ Turn the hand levers to the right using a screwdriver.

Note: do not press the hand levers when turning them

Move actuator back to the rest position

→ Turn the hand levers to the left using a screwdriver.

Note: do not press the hand levers when turning them



Caution:

If the pilot valves are actuated, electrical control is not possible.

- ▶ Move hand levers to normal position before starting up the device.

Closing the device:

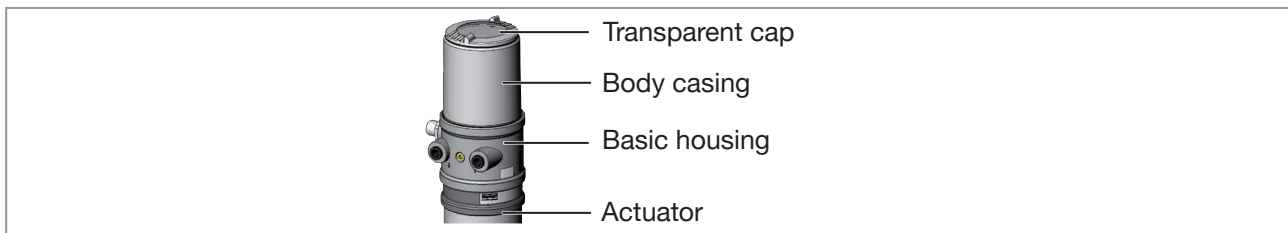


Figure 36: Closing the device

ATTENTION

Damage or malfunction due to ingress of dirt or moisture.

To observe the degree of protection IP65 or IP67:

- ▶ Screw in body casing to the stop.

→ Close the device (wrench¹⁰⁾: 674078).

¹⁰⁾ The wrench (674078) is available from your Bürkert sales office..

13.6 Setting the LED mode, status indicator

User level: installer

Factory setting: valve mode + warnings

Menu or function		Values or description
Device		
>	General settings	
>	Parameter	
>	Status LED	
	Mode	<input type="radio"/> NAMUR mode <input type="radio"/> Valve mode <input checked="" type="radio"/> Valve mode + Warnings <input type="radio"/> Fixed color <input type="radio"/> LED off

Setting the LED mode, status indicator:

→ Status LED

→ Mode

Possible selection:

- NAMUR mode
- Valve mode
- Valve mode + Warnings
- Fixed color
- LED off

→ Select mode.

The mode is set.

14 SAFETY END POSITIONS

Safety end positions after failure of the electrical or pneumatic auxiliary power:

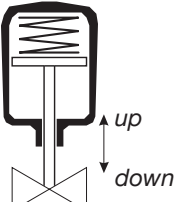
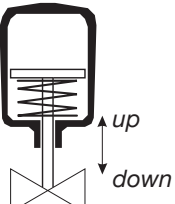
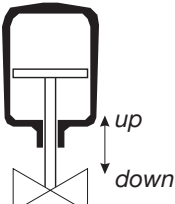
Actuator system	Designation	Safety end positions after failure of the auxiliary power	
		electrical	pneumatic
	single-acting Control function A	down	down
	single-acting Control function B	up	up
	double-acting Control function B	down	not defined

Table 16: Safety end positions

15 MAINTENANCE

The control head Type 8695 is maintenance-free when operated according to the instructions in this manual.

16 DISASSEMBLY

16.1 Safety instructions

DANGER!

Risk of injury from high pressure in the equipment/device.

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

Risk of electric shock.

- ▶ Before working on equipment or 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 from improper disassembly.

- ▶ Disassembly 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 disassembly, ensure a controlled restart.

16.2 Disassembly the control head

Procedure:

1. Pneumatic connection

DANGER!

Risk of injury from high pressure in the equipment/device.

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

→ Loosen the pneumatic connection.

→ 20xx series:

Loosen the pneumatic connection to the actuator.

2. Electrical connection



DANGER!

Risk of electric shock.

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

→ Loosen the circular plug-in connector.

3. Mechanical connection

→ Loosen the fastening screws.

→ Remove the control head upwards.

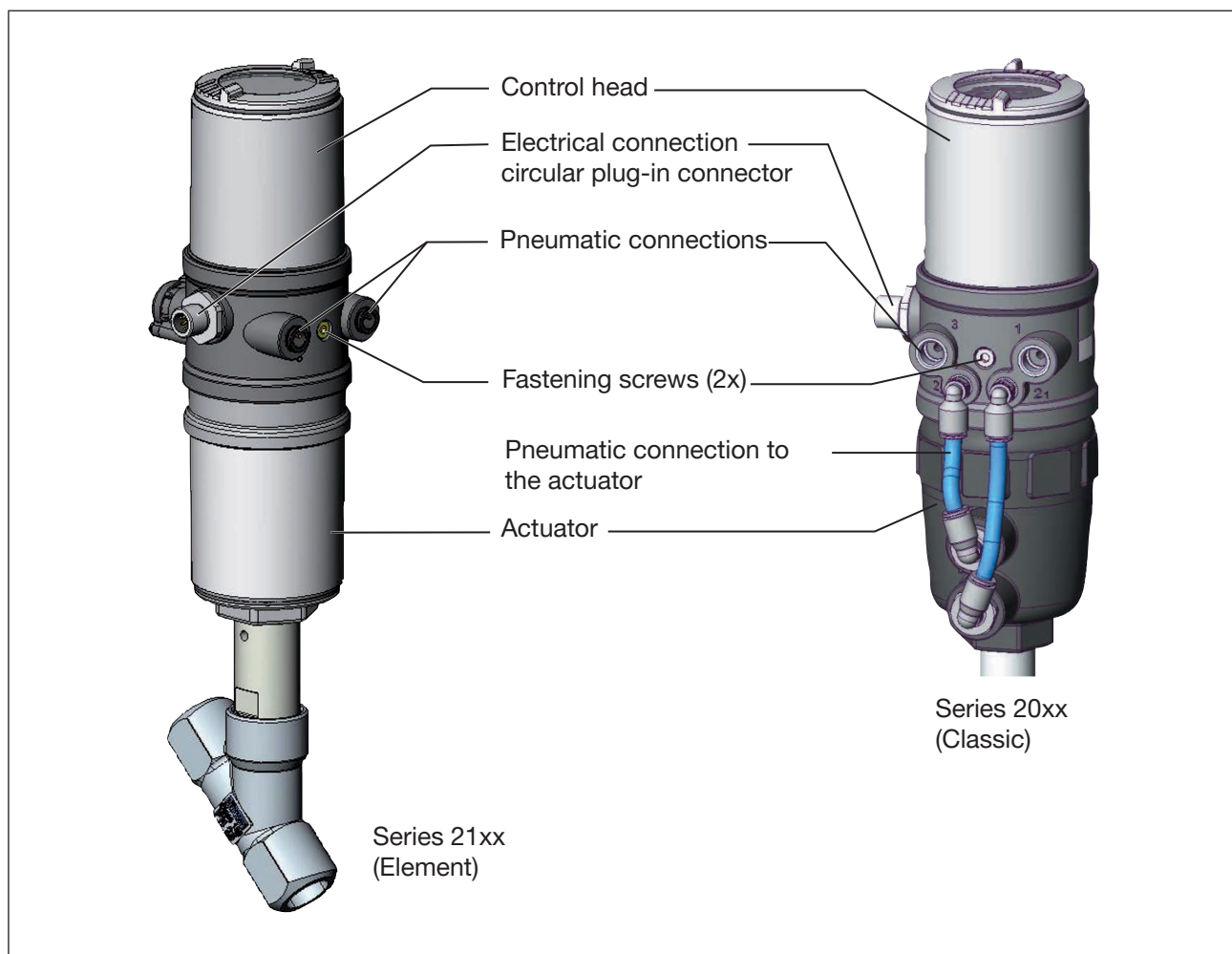


Figure 37: Disassembly the control head

17 ACCESSORIES

Designation	Order no.
Connection cable M12 x 1, 8-pin	919061
Wrench for opening/closing the transparent cap	674078
Communication software Bürkert Communicator	Information at www.burkert.com

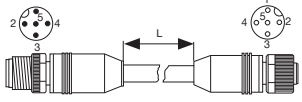
USB-büS interface set:	
USB-büS interface set (büS stick + 0.7 m cable with M12 plug)	772551
büS adapter for communication interface (M12 on büS service interface Micro-USB)	773254
	
büS cable extension (M12 pin to M12 socket), length 1 m	772404
büS cable extension (M12 pin to M12 socket), length 3 m	772405
büS cable extension (M12 pin to M12 socket), length 5 m	772406
büS cable extension (M12 pin to M12 socket), length 10 m	772407

Table 17: Accessories

17.1 Communications software

The PC operating program Bürkert Communicator is designed for communication with the devices Type 8695. If you have any questions regarding compatibility, please contact the Bürkert Sales Center.



A detailed description and precise schedule of the procedure for the installation and operation of the software can be found in the associated documentation.

Download the software at: www.burkert.com

18 PACKAGING AND TRANSPORT

ATTENTION!

Transport damages.

Inadequately protected equipment may be damaged during transport.

- ▶ During transportation protect the device against wet and dirt in shock-resistant packaging.
- ▶ Avoid the effects of heat and cold which could result in temperatures above or below the permitted storage temperature.

19 STORAGE

ATTENTION!

Incorrect storage may damage the device.

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

20 DISPOSAL

→ Dispose of the device and packaging in an environmentally friendly manner.

ATTENTION!

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

- ▶ Observe the relevant disposal and environmental protection regulations.



Note:

Observe national waste disposal regulations.

