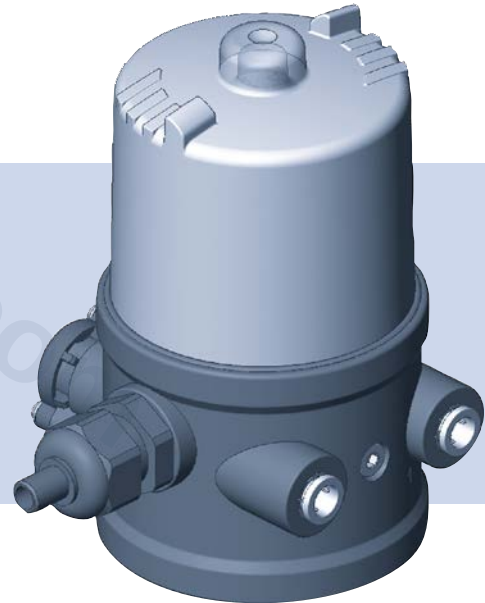


Type 8697

Pneumatic Control Unit
Pneumatische Ansteuerung
Unité de commande pneumatique



Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

valvesgo.com

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

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Operating Instructions 2405/08_EU-ml_00810081 / 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.

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 will 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.

- Indicates an instruction to prevent risks.

→ 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 Pneumatic Control Unit Type 8697.

The abbreviation “Ex” used in these instructions always stands for “potentially explosive atmosphere”.

2. AUTHORIZED USE

Non-authorized use of the Pneumatic Control Unit Type 8697 may be a hazard to people, nearby equipment and the environment.

- ▶ The device is designed to be mounted on pneumatic actuators of process valves for the control of media.
- ▶ Do not expose the device to direct sunlight.
- ▶ Use according to the authorized data, operating conditions and conditions of use specified in the contract documents and operating instructions. These are described in the chapter entitled "6. Technical data".
- ▶ The device may be used only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ In view of the large number of options for use, before installation, it is essential to study and if necessary to test whether the Pneumatic Control Unit is suitable for the actual use planned.
- ▶ Correct transportation, correct storage and installation and careful use and maintenance are essential for reliable and faultless operation.
- ▶ Use the Pneumatic Control Unit Type 8697 only as intended.

2.1. Designs with explosion protection



DANGER!

Explosion hazard.

Improper use in a potentially explosive atmosphere represents an explosion hazard.

- ▶ Observe the information in the EC Declaration of Conformity as well.
- ▶ For designs with Ex approval, the information in the EC-Type Examination Certificate and the additional instructions of Type 8697 must also be observed.

2.1.1. Ex approval

The Ex approval is only valid if the modules and components authorized by Bürkert are used as described in the additional instructions for Type 8697.

The Pneumatic Control Unit may be used only in combination with the additional components released by Bürkert, otherwise the Ex approval will be voided!

If any unauthorized changes are made to the device, modules or components, the Ex approval will also be voided.

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/device.

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

Risk of electric shock.

- ▶ 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.

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.
- ▶ The general rules of technology apply to application planning and operation of the device.

To prevent damage to property of the device, ensure:

- ▶ Do not feed any aggressive or flammable media into the pressure supply connection.
- ▶ Do not feed any liquids into the pressure supply connection.
- ▶ Do not put any loads on the body (e.g. by placing objects on it or standing on it).
- ▶ Do not make any external modifications to the device housing.
- ▶ The device may be operated only with the transparent cap closed.

4. GENERAL INFORMATION

4.1. Contact address

Germany Bürkert Fluid Control Systems
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
E-mail: info@burkert.com

International

Contact addresses are found on the final pages of the printed operating manual and also on the Internet at: 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 8697 can be found on the Internet at: www.burkert.com

5. DESCRIPTION OF SYSTEM

5.1. Configuration and function

The Pneumatic Control Unit Type 8697 can control single or double-acting process valves. The Pneumatic Control Unit Type 8697 has been optimized for integrated, modular installation on process valves of the 21xx series (Element actuator size Ø 50). The module configuration permits a variety of expansion steps.

For installation on the 20xx series there is a special model which is described in Chapter "5.1.2".

5.1.1. Pneumatic Control Unit for integrated installation on 21xx series (Element actuator size Ø 50)

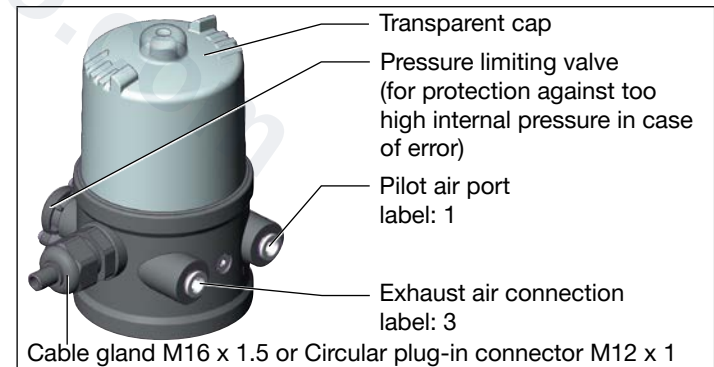


Fig. 1: Configuration and function (1)

Optical position indicator:

The device status is displayed on the Pneumatic Control Unit (yellow mark).

Option: Electrical position feedback

Optionally mechanical limit switches (micro switches) or inductive proximity switches can measure the valve position.

View without transparent cap:

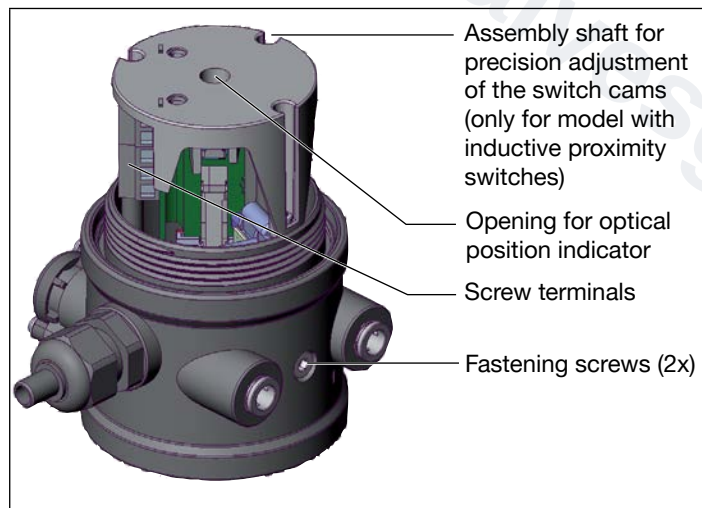


Fig. 2: Configuration and function (2)

5.1.2. Model for control of process valves belonging to the 20xx series

A special model enables the Pneumatic Control Unit Type 8697 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.

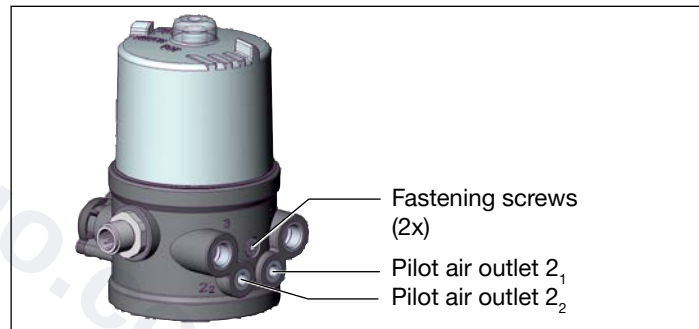


Fig. 3: Connection module for process valves, 20xx series

6. TECHNICAL DATA

6.1. Conformity

In accordance with the EU Declaration of conformity, the Pneumatic Control Unit Type 8697 is compliant with the EU Directives (if applicable).

6.2. 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).

6.3. Licenses

The product is approved for use in zone 1, 2, 21 and 22 in accordance with ATEX directive 2014/34/EU category 2 GD and 3GD.



Observe instructions on operation in a potentially explosive atmosphere (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

without pilot valve (feedback head) –20...+60 °C (–4...+140 °F)

with pilot valve (control head) –10...+55 °C
(+14...+131 °F)

with ATEX approval see ATEX additional instructions

Degree of protection

Evaluated by the manufacturer:	Evaluated by UL:
IP65/IP67 according to EN 60529*	UL Type 4x Rating indoor only*

Operating altitude up to 2000 m above sea level

Relative air humidity max. 90% at 55 °C
(non condensing)

** Only if cables, plugs and sockets have been connected correctly and in compliance with the exhaust air concept.*

Mechanical data

Dimensions	see data sheet	
Body material	external PPS, PC	
Sealing material	external EPDM, internal FKM	
Stroke range of valve spindle	Micro switch	4...36 mm
	Proximity switch	2...36 mm

6.5. Type label (example)

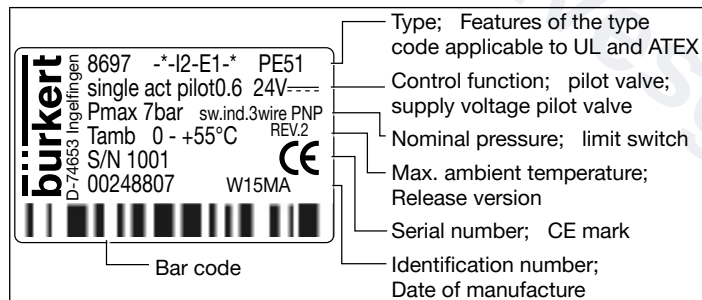


Fig. 4: Example of type label

6.6. UL additional label

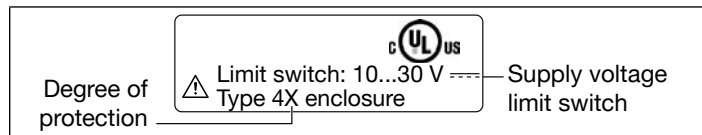


Fig. 5: Example of UL additional label (example)

6.7. Pneumatic data

Control medium	neutral gases, air, Quality classes in accordance with DIN 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	0...+50 °C (32...+122 °F)	
Pressure range	3...7 bar (43.5...101.5 psi)	
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 Socket connection G1/8	
20xx (Classic)	Socket connection G1/8 Connection M5 for connecting the actuator	

6.8. Electrical data

Connections Cable gland M16 x 1.5, wrench size 19 (clamping area 4...8 mm) with screw terminals for cable cross-sections 0.14...1.5 mm²
Circular plug-in connector M12 x 1, 8-pin or circular plug-in connector M12 x 1, 4-pin

Supply voltage
Pilot valve 24 V DC $\pm$ 10 %, residual ripple 10 %
UL: NEC Class 2, 24 V DC, 1 W

Power consumption
of pilot valve 1 W

Micro switch For maximum current load see table

Variant for safety extra-low voltage (0...48 V AC/DC)

	24 V	48 V
resistive load and semi-conductor load	2 A AC 2 A DC	2 A AC 2 A DC
inductive load ($\cos \varphi = 0.3$)	2 A AC 2 A DC	1,5 A AC 1 A DC

Variant for low voltage (50...250 V AC/DC)¹⁾

	110/127 V	220/240 V
resistive load and semi-conductor load	2 A AC 0,4 A DC	2 A AC 0,2 A DC
inductive load ($\cos \varphi = 0.3$)	0,5 A AC 0,2 A DC	0,2 A AC 0,1 A DC

Proximity switches

3-wire PNP 10...30 V DC max. 100 mA per proximity switch
2-wire 24 V DC normally open 10...30 V DC max. 100 mA, min. 3 mA per proximity switch, Voltage drop < 5 V Residual current < 0.6 mA
2-wire NAMUR 8,2 V DC, 1,2/2.1 mA (actuated/not actuated) UL: NEC Class 2

Position feedback (option)

Protection class III acc. to DIN EN 61140 (VDE 0140-1):
2 microswitches 0...48 V AC/DC,
2 initiators 10...30 V DC, normally open contact PNP (3-wire),
2 initiators 10...30 V DC, normally open contact (2-wire),
2 initiators NAMUR (8.2 V DC) (2-wire)
Protection class II acc. to DIN EN 61140 (VDE 0140-1): 2 microswitches 50...250 V AC/DC

¹⁾ When used in the UL area, voltage and current are limited to 125 V AC

1 A. Also both micro switches must be fed from the same power supply.

7. INSTALLATION



Only for Pneumatic Control Unit without pre-assembled process valve.

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 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 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.

7.2. Installation on process valves of series 21xx

Procedure:

1. Install switch spindle

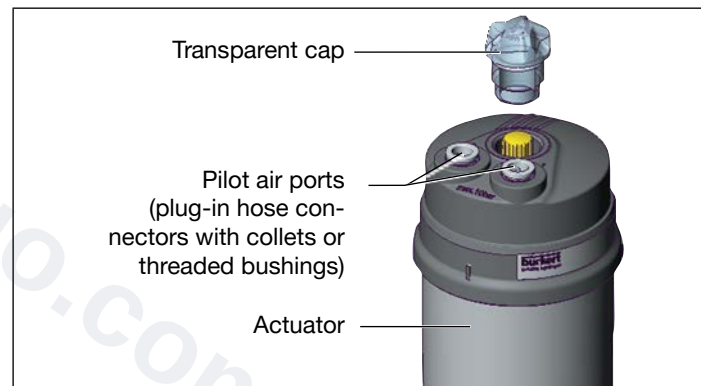


Fig. 6: Installation of the switch spindle (1), 21xx series

- Unscrew the transparent cap on the actuator and unscrew the position display (yellow cap) on the spindle extension.
- For version with plug-in hose connector, remove the collets (white nozzles) from both pilot air ports (if present).

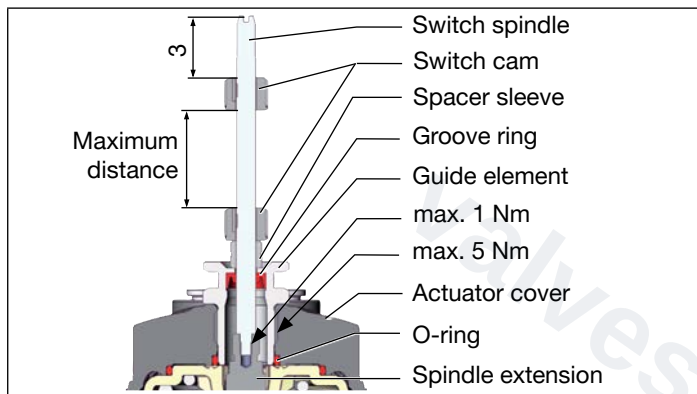


Fig. 7: Installation of switch spindle (2), 21xx series

NOTE!

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.

NOTE!

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 spacer sleeve onto the switch spindle up to the guide element.

Position switch cams on the switch spindle:

- Push lower switch cam up to the spacer sleeve.
- Push upper switch cam until 3 mm from the start of the switch spindle.



Ensure that the distance between both switch cams is maximum (see “Fig. 7”).

2. Install sealing rings

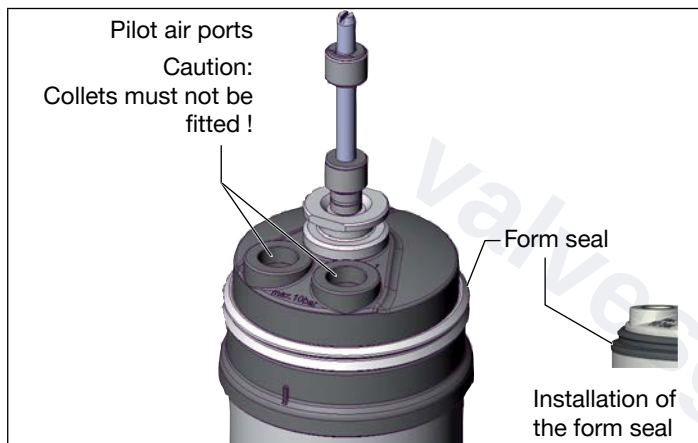


Fig. 8: Installing of the sealing rings, 21xx series

- 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 Pneumatic Control Unit is being installed, the collets of the pilot air ports must not be fitted to the actuator.

3. Installation of the Pneumatic Control Unit

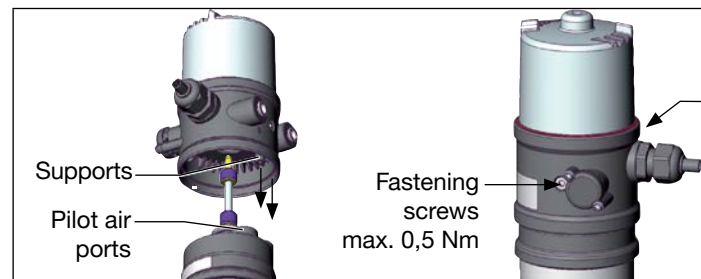


Fig. 9: Installation of the Pneumatic Control Unit, 21xx series

- Align the Pneumatic Control Unit until the supports of the Pneumatic Control Unit can be inserted into the pilot air ports of the actuator (see also "Fig. 9").
- Push the Pneumatic Control Unit, without turning it, onto the actuator until no gap is visible on the form seal.

NOTE!

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

- ▶ The fastening screws may be tightened to a maximum torque of 0.5 Nm only.

- Attach the Pneumatic Control Unit to the actuator using the two side fastening screws. In doing so, tighten the screws only hand-tight (maximum torque: 0.5 Nm).

7.3. Installation on process valves of series 20xx

Procedure:

1. Install switch spindle

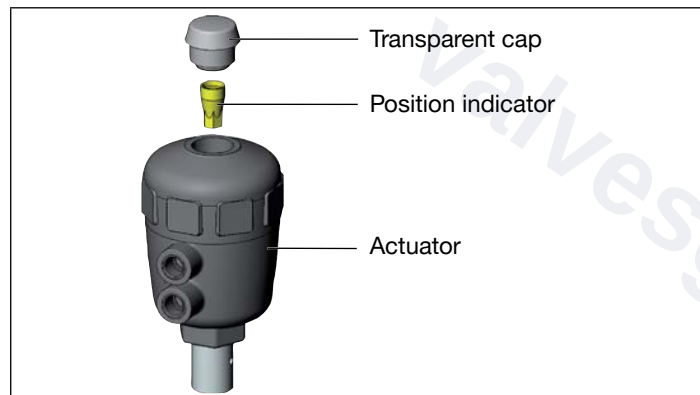


Fig. 10: Installation of the switch spindle (1), series 20xx

- Unscrew the transparent cap on the actuator.
- Using a hexagon socket key, unscrew the orange/yellow position indicator from the inside of the actuator.
- Press the O-ring downwards into the cover of the actuator (see "Fig. 11").
- 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.

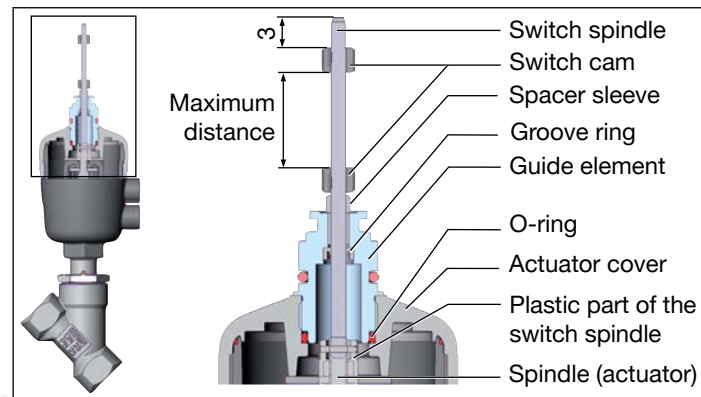


Fig. 11: Installation of the switch spindle (2), series 20xx

- Tighten the guide element with a wrench SW19 into the actuator cover (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 (torque: 1.0 Nm).
- Push spacer sleeve onto the switch spindle up to the guide element.
- Position switch cams on the switch spindle:
- Push lower switch cam up to the spacer sleeve.
- Push upper switch cam until 3 mm from the start of the switch spindle.



Ensure that the distance between both switch cams is maximum (see "Fig. 11").

2. Installation of the Pneumatic Control Unit

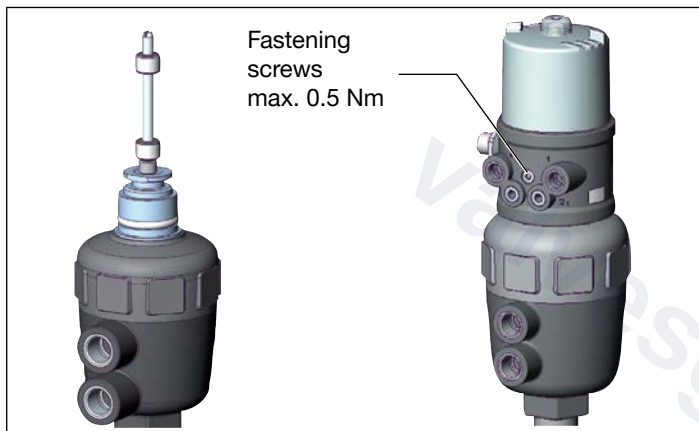


Fig. 12: Installation of the Pneumatic Control Unit, series 20xx

- Push the Pneumatic Control Unit onto the actuator.
- Press the Pneumatic Control Unit all the way down as far as the actuator and turn it into the required position.



Ensure that the pneumatic connections of the Pneumatic Control Unit and those of the actuator are situated preferably vertically one above the other (see “Fig. 12”).

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

NOTE!

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 0.5 Nm only.

- Attach the Pneumatic Control Unit to the actuator using the two side fastening screws. In doing so, tighten the fastening screws hand-tight only (maximum torque: 0.5 Nm).

3. Installation of the pneumatic connection on the actuator

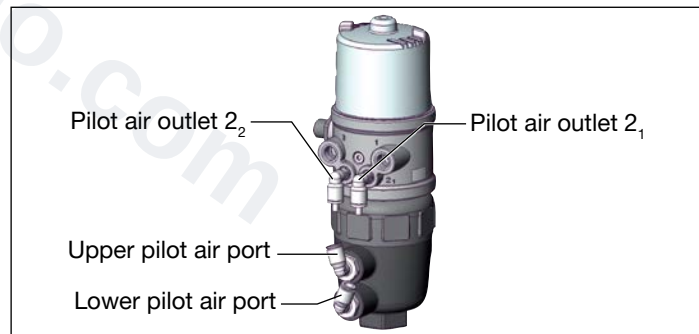


Fig. 13: Installation of the pneumatic connection, 20xx series

- Screw the plug-in hose connectors onto the Pneumatic Control Unit and the actuator.
- Using the hoses supplied in the accessory kit, make the connection between the Pneumatic Control Unit and the actuator with the following [“Tab. 1: Pneumatic connection to actuator”](#).

NOTE!

Damage or malfunction due to ingress of dirt and moisture.

- To comply with degree of protection IP65 / IP67, connect the pilot air outlet 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 Pneumatic Control Unit Type 8697 are isolated or not actuated.



If the ambient air is humid, a hose can be connected between pilot air outlet 2₂ of the Pneumatic Control Unit 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 Pneumatic Control Unit.

Control function		Pneumatic connection Type 8697 with actuator	
		Pilot air outlet Type 8697	Pilot air port actuator
A	Process valve closed in rest position (by spring force)	2 ₁	lower pilot air port of the actuator
		2 ₂	should be connected to the upper pilot air port of the actuator
B	Process valve open in rest position (by spring force)	2 ₁	upper pilot air port of the actuator
		2 ₂	should be connected to the lower pilot air port of the actuator

Tab. 1: Pneumatic connection to actuator

7.4. Rotating the actuator module



The actuator module (Pneumatic Control Unit and actuator) can be rotated for straight seat valves and angle seat valves only.

The position of the connections can be aligned steplessly by rotating the actuator module (Pneumatic Control Unit and actuator) through 360°.



Only the entire actuator module can be rotated. The Pneumatic Control Unit cannot be rotated contrary to the actuator. The process valve must be in the open position for alignment of the actuator module.

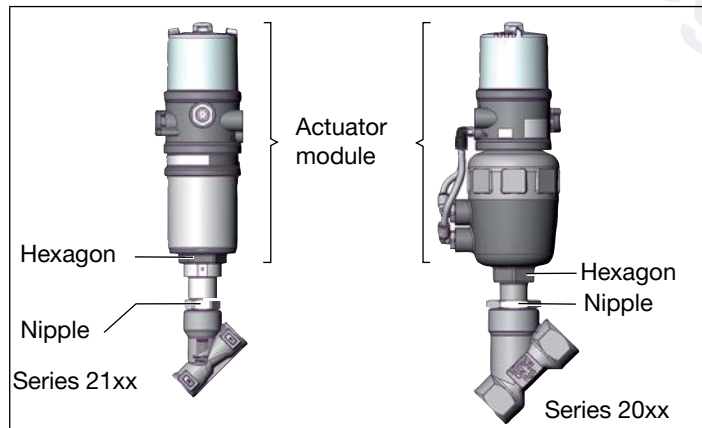


Fig. 14: Rotating the actuator module



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.
- 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 in the specified direction only (see "Fig. 15").

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

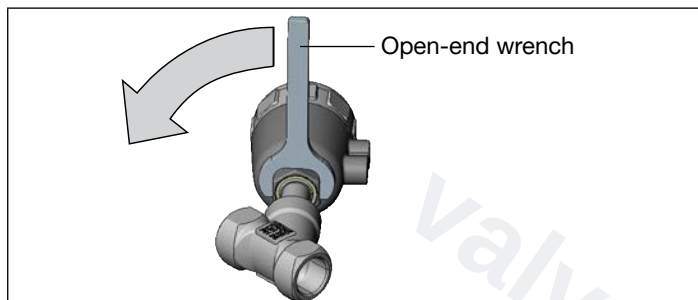


Fig. 15: Rotating with open-end wrench

7.5. Rotating the Pneumatic Control Unit for process valves belonging to series 20xx

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

Procedure

- Loosen the pneumatic connection between the Pneumatic Control Unit and the actuator.
- Loosen the fastening screws (hexagon socket wrench size 2.5).
- Rotate the Pneumatic Control Unit into the required position.

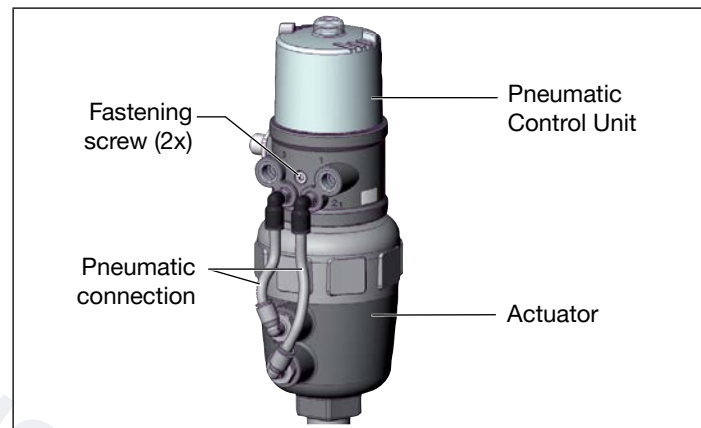


Fig. 16: Rotating the Pneumatic Control Unit, series 20xx

NOTE!

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

- ▶ The fastening screw may be tightened to a maximum torque of 0.5 Nm only.

- Tighten the fastening screws hand-tight only (maximum torque: 0.5 Nm).
- Re-attach the pneumatic connections between the Pneumatic Control Unit and the actuator. If required, use longer hoses.

7.6. Manual actuation of the actuator via pilot valve

The actuator can be moved without a power supply from the rest position to its end position and back again, when the control air is connected.

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

NOTE!

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

- Do not press the hand lever when turning it.

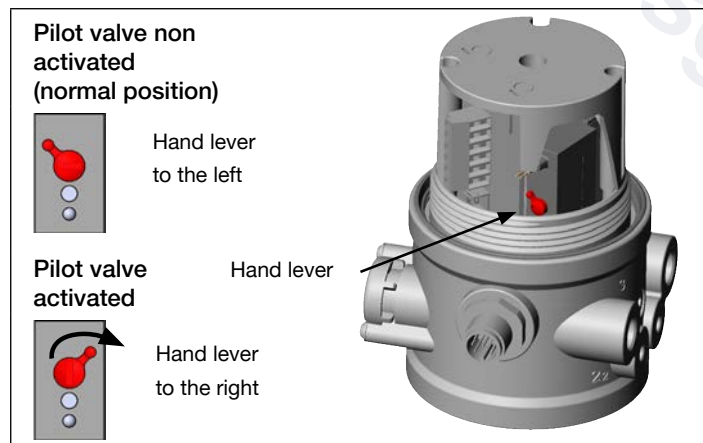


Fig. 17: Pilot valve for aerate and deaerate the actuator

Move actuator to end position

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

Note: Do not press the hand lever when turning it

Move actuator back to the rest position

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

Note: Do not press the hand lever when turning it

8. FLUID INSTALLATION

The dimensions of the Pneumatic Control Unit and the different complete device models, consisting of Pneumatic Control Unit, actuator and valve, can be found in the relevant data sheets.

8.1. 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.



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.

8.2. Installing the process valve

Thread type and dimensions can be found in the corresponding data sheet.

→ Connect the valve according to the operating instructions for the valve.

8.3. Pneumatic connection of the Pneumatic Control Unit



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:

- Connect the control medium to the pilot air port (1) (3...7 bar, oil, water and dust-free instrument air).
- 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.

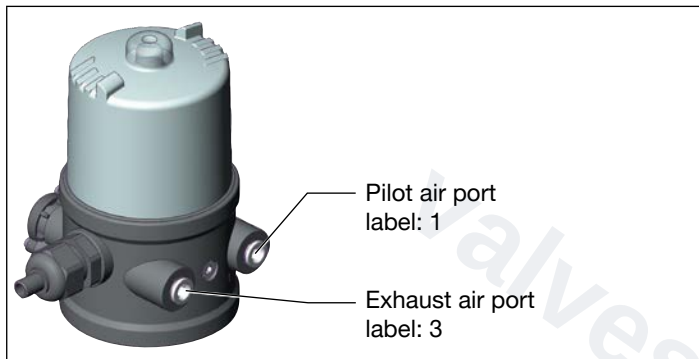


Fig. 18: Pneumatic connection



Caution: (Exhaust air concept):

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

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.

9. ELECTRICAL INSTALLATION

Two kinds of connections are used for the electrical bonding of the Pneumatic Control Unit:

- **Cable bushing**
with cable gland M16 x 1.5 and screw-type terminals
- **Multi-pole**
with circular plug-in connector M12 x 1, 8-pin or 4-pin

9.1. Safety instructions



DANGER!

Risk of electric shock.

- ▶ 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 from improper installation.

- ▶ Installation may be carried out by authorized technicians only and with the appropriate tools.
- ▶ In the case of devices with UL approval for the electrical installation use only cables which are approved for a temperature of at least 70 °C.

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

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

Minimum temperature rating of the cable to be connected to the field wiring terminals: 75 °C

9.2. Electrical installation with cable gland



DANGER!

Risk of electric shock.

- ▶ 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.

Procedure:

- Open the Pneumatic Control Unit: unscrewing the transparent cap in an anticlockwise direction.
- Push the cables through the cable gland.
- Connect the wires according to the model (options) of the Pneumatic Control Unit.

NOTE!

Damage or malfunction due to penetration of dirt and humidity.

To ensure degree of protection IP65 / IP67:

- ▶ Tighten the union nut on the cable gland according to the cable size or dummy plugs used. (ca. 1.5 Nm).
- ▶ Screw the transparent cap in all the way.

→ Tighten union nut on the cable gland (torque approx. 1.5 Nm).

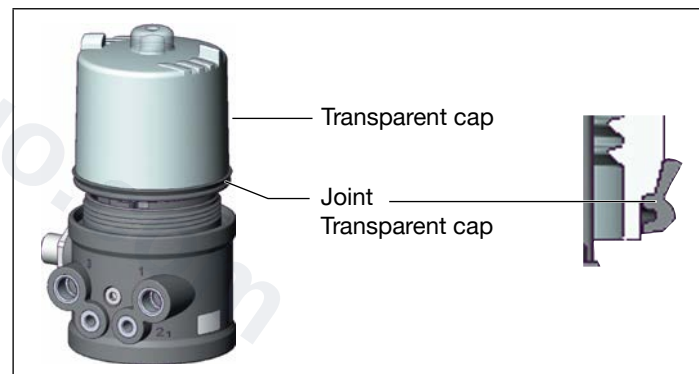


Fig. 19: Position of the seal in the transparent cap

- Check that the seal is correctly positioned in the transparent cap.
- Close the Pneumatic Control Unit (assembly tool: 674078²⁾).

²⁾ The assembly tool (674078) is available from your Bürkert sales office.

9.2.1. Connection diagram with micro switches (mechanical limit switches)

Terminal	Configuration	External circuit
1	Micro switch top	1 — NO
2		2 — NC
3		3 — Joint connection
4	Micro switch bottom	4 — NO
5		5 — NC
6		6 — Joint connection

Tab. 2: Connection diagram with micro switches

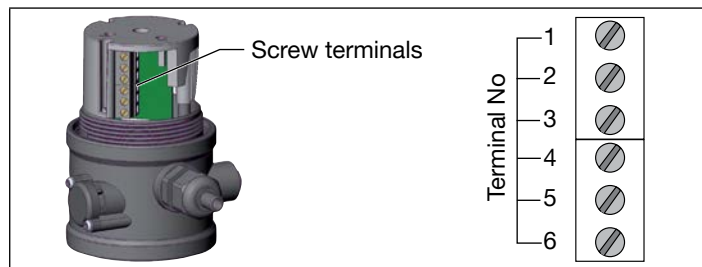


Fig. 20: Position of the screw terminals

9.2.2. Connection diagram with 3-wire proximity switches (inductive limit switches)

Terminal	Configuration	External circuit
1	INI + (24 V DC) Supply	
2	INI GND Supply	
3	INI Top OUT Output 1	
4	INI Bottom OUT Output 2	
5	Valve control 0 / 24 V DC	
6	Valve control GND	

Tab. 3: Connection diagram with 3-wire proximity switches

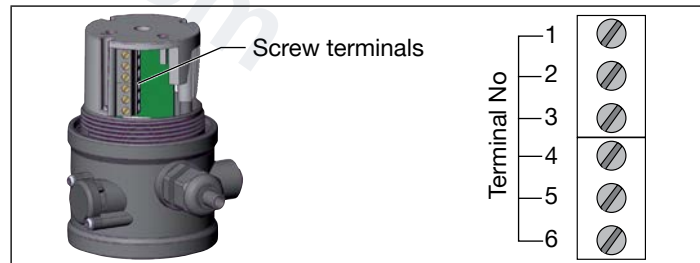
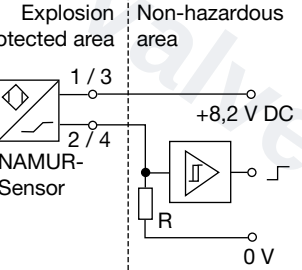
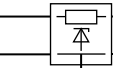


Fig. 21: Position of the screw terminals

9.2.3. Connection diagram with 2-wire proximity switches (inductive NAMUR limit switches)

Terminal	Configuration	External circuit	
1	INI Top +	Explosion protected area  NAMUR-Sensor Non-hazardous area  +8,2 V DC 0 V	3)
2	INI Top -		
3	INI Bottom +		
4	INI Bottom -		
5	Valve control +	Explosion protected area Non-hazardous area Safety barrier  PA	4)
6	Valve control GND		

Tab. 4: Connection diagram with 2-wire proximity switches

3) (Recommended by NAMUR) Observe the max. values of the intrinsically safe circuits in the ATEX additional instructions.

4) Signal from barrier see PTB 07 ATEX 2048

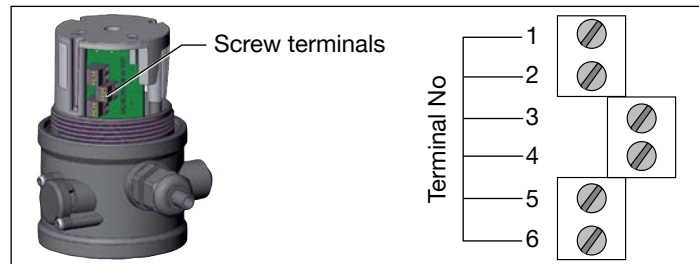
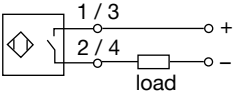
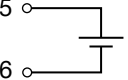


Fig. 22: Position of the screw terminals

9.2.4. Connection diagram with 2-wire proximity switches 24 V (inductive limit switches, normally open)

Terminal	Configuration	External circuit
1	INI Top +	
2	INI Top -	
3	INI Bottom +	
4	INI Bottom -	
5	Valve control +	
6	Valve control GND	

Tab. 5: Connection diagram with 2-wire proximity switches 24 V

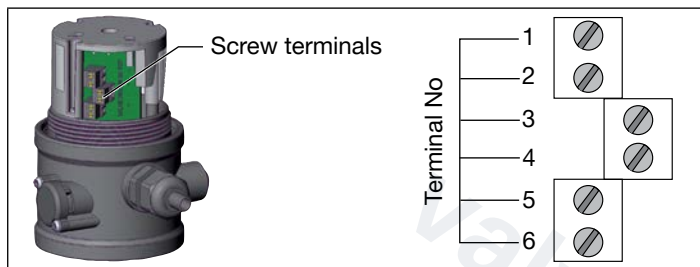


Fig. 23: Position of the screw terminals

9.3. Electrical installation with circular plug-in connector



DANGER!

Risk of electric shock.

- ▶ 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.

→ Connect the pins.

Pin assignment with 3-wire proximity switches (inductive limit switches)

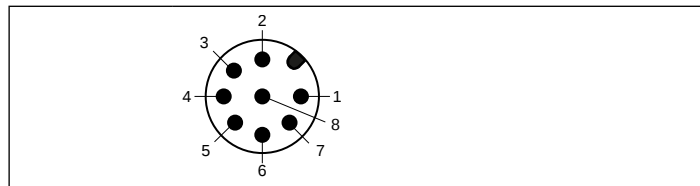


Fig. 24: Circular connector M12x1, 8-pin

Pin	Wire color ⁵⁾	Configuration	External circuit
1	white	INI Bottom OUT Output	
2	brown	INI Top OUT Output	
3	green	INI - (GND) Supply	
4	yellow	INI + (24 V DC) Supply	
5	grey	Valve control 0/24 V	
6	pink	Valve control GND	

Tab. 6: Pin assignment with 3-wire proximity switches

⁵⁾ The indicated colors refer to the connecting cable available as an accessory (919061)

Pin assignment, variant without pilot valve (feedback head) with 3-wire proximity switches (inductive limit switches)

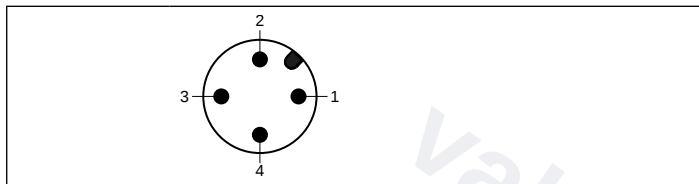


Fig. 25: Circular connector M12x1, 4-pin

Pin	Configuration	External circuit
1	INI + (24 V DC) Supply	
2	INI Top OUT Output 2	
3	INI - (GND) Supply	
4	INI Bottom OUT Output 1	

Tab. 7: Pin assignment, variant without pilot valve (feedback head) with 3-wire proximity switches

9.4. Display elements: End position LEDs

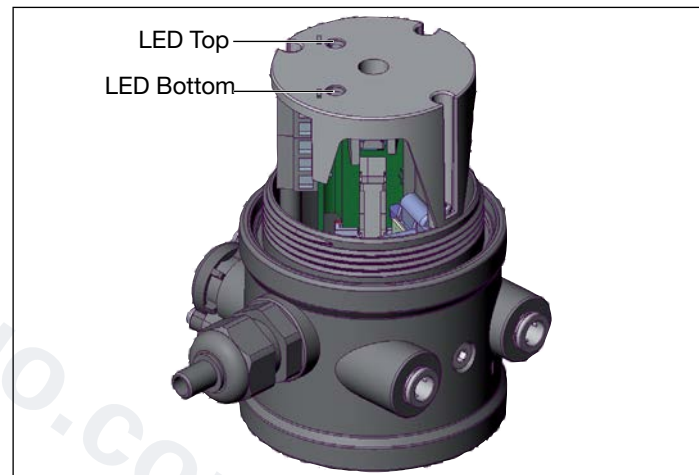


Fig. 26: End position LEDs

9.4.1. Display elements LEDs

	Version with 3-wire proximity switches	Version with 2-wire proximity switches	Version with 2-wire proximity switches by NAMUR (Ex version) ⁶⁾
End position top	LED Top		
	is lit yellow	is lit yellow	goes out
End position bottom	LED Bottom		
	is lit yellow	is lit yellow	goes out

Tab. 8: End position LED yellow

The version with micro switches (mechanical limit switches) does not include any LED to indicate position.

⁶⁾ In the case of the version with 2-wire initiators according to NAMUR the LED function is inverse for technical reasons, i.e. the LED glows when the end position is not reached and goes out when the end position is reached.

9.4.2. Display elements LEDs REV.2

	Version with 3-wire proximity switches	Version with 2-wire proximity switches	Version with 2-wire proximity switches by NAMUR (Ex version) ⁷⁾
End position top	LED Top		
	is lit yellow	is lit yellow	green off
End position bottom	LED Bottom		
	is lit green	is lit green	yellow off

Tab. 9: End position LEDs REV.2

The version with microswitches (mechanical limit switches) does not include any LEDs for the position indicator.

⁷⁾ In the case of the version with 2-wire initiators according to NAMUR the LED function is inverse for technical reasons, i.e. the LED glows when the end position is not reached and goes out when the end position is reached.

9.5. Adjustment of the micro switches or the proximity switches (option)



DANGER!

Risk of electric shock.

- ▶ 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.

Procedure:

- Open the Pneumatic Control Unit: unscrewing the transparent cap in an anticlockwise direction.
- Ensure that the distance between both switch cams is maximum (see [“7. Installation”](#)).

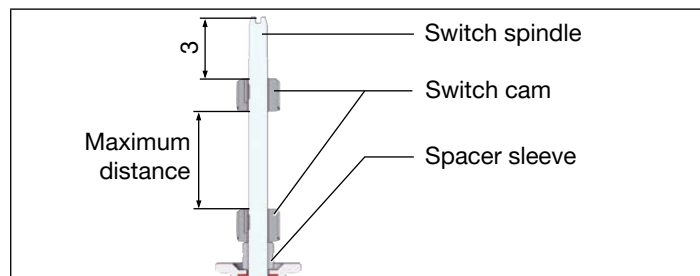


Fig. 27: Distance between the switch cams

- Pressurize pilot air port 1 with compressed air (5 bar) or, if fitted, actuate the hand lever of the pilot valve in the control unit: Actuator moves to the 2nd end position.

The switch cams (and switch points) have now been set.

- Check the switching point(s) using suitable measuring equipment.
- If required, the switch points can still be finely adjusted: Using a screwdriver, push switch cams towards the middle (see [“Fig. 28”](#)).
- Check that the seal is correctly positioned in the transparent cap. ([“Fig. 19: Position of the seal in the transparent cap”](#), page 23).

NOTE!

Damage or malfunction due to penetration of dirt and humidity.

To ensure degree of protection IP65 / IP67:

- ▶ Screw the transparent cap in all the way.

- Close the Pneumatic Control Unit (assembly tool: 674078⁸⁾).

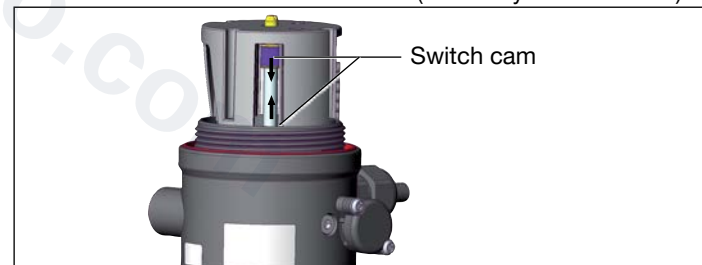
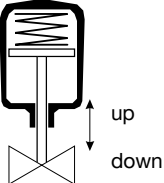
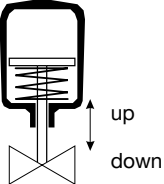


Fig. 28: Adjustment of the micro switch and the proximity switches

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

10. SAFETY POSITIONS

Safety positions after failure of the electric or pneumatic auxiliary energy:

Operating mode	Designation	Safety positions after failure of the auxiliary energy	
		Electrical	Pneumatic
	Single-acting control function A	down	down
	Single-acting control function B	up	up

Tab. 10: Safety positions

11. ACCESSORIES

Designation	Order no.
Connection cable M12 x 1, 8-pin	919061
Assembly tool	674078

Tab. 11: Accessories

12. DISASSEMBLY

12.1. 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 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 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.

12.2. Disassembly the Pneumatic Control Unit

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.

→ Series 20xx:
Loosen the pneumatic connection between Pneumatic Control Unit and actuator.

2. Electrical connection



DANGER!

Risk of electric shock.

- ▶ 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.

Circular plug-in connector:

→ Loosen the circular connector.

Cable gland:

→ Open the Pneumatic Control Unit: unscrewing the transparent cap in an anticlockwise direction.

→ Unscrew the screw terminals and pull out cables.

3. Mechanical connection

→ Loosen the fastening screws.

→ Remove the Pneumatic Control Unit upwards.

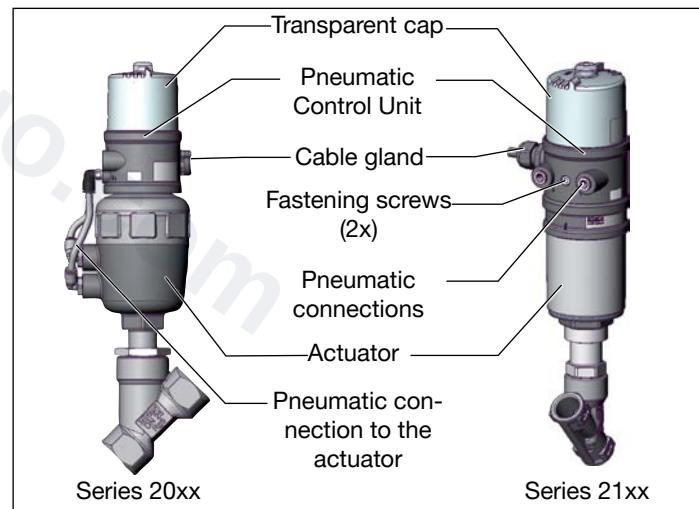


Fig. 29: Disassembly the Pneumatic Control Unit

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.
- ▶ Protect the electrical interfaces and the pneumatic connections from damage by placing protective caps on them.

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature $-20...+65\text{ °C}$ ($-4...+149\text{ °F}$).

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.

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