

## Type 8692, 8693

Positioner and process controller

Positioner und Prozessregler

Positionneur et régulateur de process

## Quickstart



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

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## 1 QUICKSTART GUIDE

The quickstart guide contains the most important information and notes regarding the use of the device. A detailed description can be found in the operating instructions for Type 8692/8693.

Keep the quickstart guide in a location which is easily accessible to every user and make it available to every new owner of the device.

### Important Safety Information!

Read Quickstart carefully and thoroughly. Study in particular the chapters entitled "[Basic safety instructions](#)", and "[Authorized use](#)".

► Quickstart must be read and understood.



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



### 1.1 Definition of the term 'Device'

In these instructions, the term "device" always refers to the Type 8692, 8693.

## 1.2 Symbols

The following symbols are used in these instructions.



### 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!



Important tips and recommendations.



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

→ Designates a procedure which you must carry out.

## 2 AUTHORIZED USE

**Non-authorized use of the positioner Type 8692 and the process controller Type 8693 can be dangerous 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.

- ▶ In a potentially explosive atmosphere, Type 8692 and 8693 may be used only in accordance with the specification on the separate Ex type label. For the use, observe the ATEX manual with safety instructions for the Ex area.
- ▶ Devices without a separate Ex type label may not be used in a potentially explosive atmosphere.
- ▶ Do not expose the device to direct sunlight.
- ▶ A pulsating direct voltage (rectified alternating voltage without smoothing) must not be used as the operating voltage.
- ▶ Use according to the authorized data, operating conditions, and conditions of use specified in the contract documents and operating instructions. These are described in Chapter ["6 Technical data"](#).
- ▶ Use the device 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 device is suitable for the actual use planned.
- ▶ Correct transportation, storage and installation, as well as careful use and maintenance are essential for reliable and faultless operation.
- ▶ Use Type 8692 and 8693 only as intended.

### 3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- Contingencies and events which may arise during the assembly, operation, and maintenance of the devices.
- Local safety regulations – the operator is responsible for observing these regulations, also in relation to the installation personnel.



#### **Risk of injury from high pressure in the system/device.**

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

#### **Risk of electric shock!**

- ▶ Before reaching into the device or the equipment, 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 injuries:

- ▶ Ensure that the system cannot be activated unintentionally.
- ▶ The device must only be operated when in a perfect condition and in consideration of the operating instructions.
- ▶ Installation and maintenance work may be carried out only by authorized technicians with the appropriate tools.

- ▶ After an interruption in the electrical or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ The general rules of technology must be observed for application planning and operation of the device.

To prevent damage to the device:

- ▶ When unscrewing and screwing the housing jacket (with transparent cap) in, do not hold the actuator but the electrical connection housing of Type 8692/8693.
- ▶ Do not supply the pilot air port with aggressive or flammable media or fluids.
- ▶ Do not physically stress the housing (e.g. by placing objects on it or standing on it).
- ▶ Do not make any external alterations to the housing of the device. Do not paint housing parts or screws.

#### **NOTE!**

##### **Electrostatic sensitive components/modules!**

The device contains electronic components which react sensitively to electrostatic discharge (ESD). Contact with electrostatically charged persons or objects are hazardous to these components. In the worst case scenario, they will be destroyed immediately or will fail after start-up.

- Observe the requirements in accordance with DIN EN 61340-5-1 to minimize or avoid the possibility of damage caused by sudden electrostatic discharge!
- Do not touch electronic components while the operating voltage is switched on!

## 4 GENERAL INFORMATION

### 4.1 Contact address

#### Germany

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

#### International

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

And also on the Internet at:

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

### 4.2 Warranty

The warranty is only valid if the Types 8692/8693 are used as intended in accordance with the specified application conditions.

### 4.3 Information on the Internet

The operating instructions and data sheets for Types 8692/8693 can be found on the Internet at:

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

## 5 SYSTEM DESCRIPTION

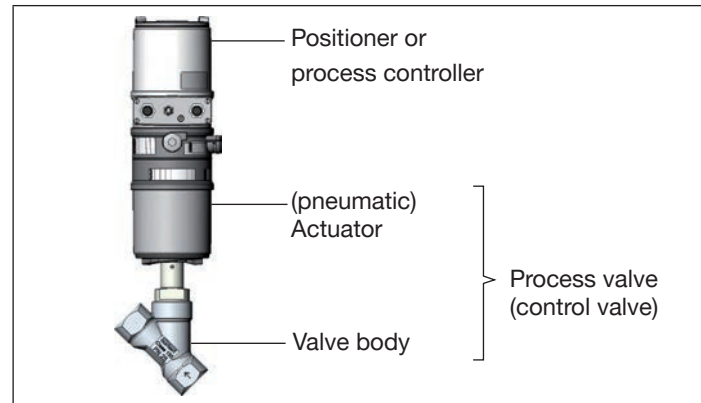


Fig. 1: Structure, Type 8692/8693 with process valve

The positioner Type 8692 and the process controller Type 8693 are electropneumatic position controllers for pneumatically actuated control valves with single-acting or double-acting actuators.

Together with the pneumatic actuator the positioner and process controller form an optical and functional unit.

The control valve systems can be used for a wide range of control tasks in fluid technology and, depending on the application conditions, different process valves from the Bürkert range can be combined with the positioner or the process controller. Angle seat valves, straight seat valves, control valves, diaphragm or ball valves are suitable.

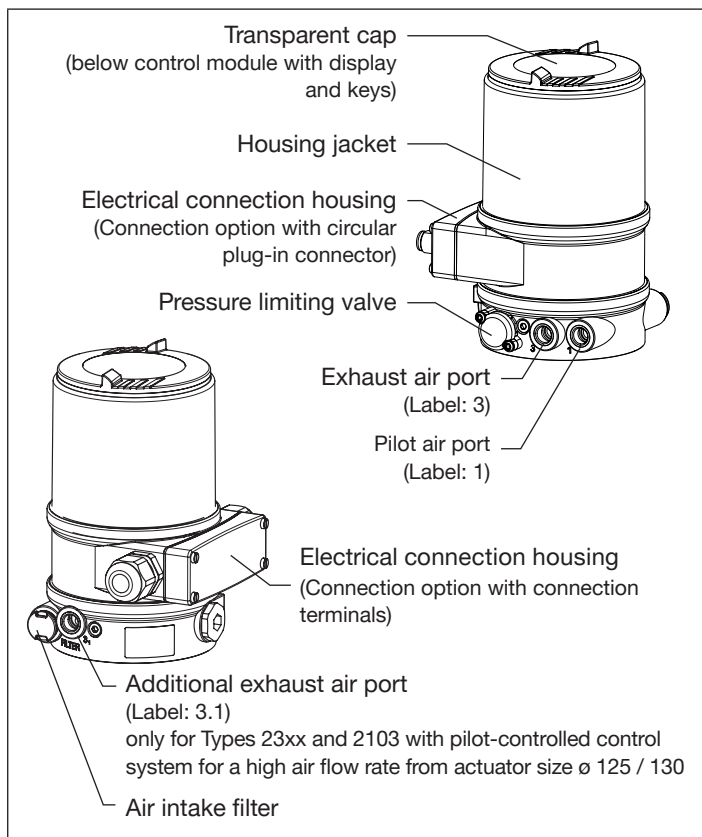


Fig. 2: Structure Type 8692/8693

## 5.1 Functions

### Type 8692 - Positioner (position controller)

The position of the actuator (stroke) is regulated according to the position set-point value. The position set-point value can be specified by an external standard signal (or via field bus).

### Type 8693 - Process controller

The process controller is linked to a control circuit. The position set-point value of the valve is calculated from the process set-point value and the process actual value via the control parameters (PID controller). The process set-point value can be set by an external signal.



## 6 TECHNICAL DATA

### 6.1 Conformity

Types 8692/8693 conform to the EU directives according to the EU Declaration of Conformity.

### 6.2 Standards

The applied standards which are used to demonstrate compliance with the EU Directives 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.
- ▶ The permitted ambient temperature may not exceed the maximum value or drop below the minimum value.

Ambient temperature:

The permitted temperature range is given on the rating plate of the device.

Degree of protection

Evaluated by the manufacturer:	Evaluated by UL:
IP65 / IP67 according to EN 60529 *	UL Type 4x Rating indoor only*
* only if cables, plugs and sockets have been connected correctly and in compliance with the exhaust air concept (see Chapter <a href="#">"10.5 Pneumatic connection"</a> , page 20).	

Operating altitude

up to 2000 m above sea level

Relative air humidity

max. 90% at 55 °C (non condensing)

### 6.5 Type label

Explanation of the device-specific specifications on the type label:

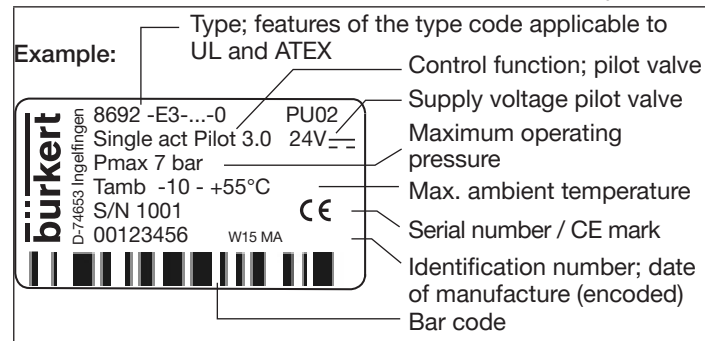


Fig. 3: Example of type label

### 6.5.1 UL additional label

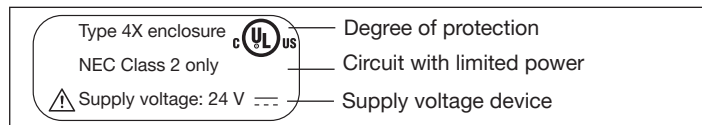


Fig. 4: UL additional label (example)

## 6.6 Mechanical data

Dimensions	see data sheet
Housing material	outside: PPS, PC, VA, interior: PA 6; ABS
Sealing material	NBR / EPDM
Stroke range valve spindle	3 ... 45 mm

## 6.7 Pneumatic data

Control medium	Neutral gases, air Quality classes as per ISO 8573-1
Dust content	Quality class 7, max. particle size 40 µm, max. particle density 10 mg/m <sup>3</sup>
Water content	Quality class 3, max. pressure dew point - 20 °C or min. 10°C below the lowest oper- ating temperature
Oil content	Quality class X: max. 25 mg/m <sup>3</sup>

Temperature range control medium	0 ... + 50 °C
Pressure range control medium	3 ... 7 bar
Air flow rate pilot valve	7 l <sub>N</sub> / min (for aeration and deaer- ation) (Q <sub>Nn</sub> - value according to definition for pressure drop from 7 to 6 bar absolute) optional: 130 l <sub>N</sub> / min (for aeration and deaeration) (only single-acting connections)
Connections	Plug-in hose connector ø 6 mm / 1/4" socket connection G1/8

## 6.8 Electrical data



### WARNING!

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


Protection class	III as per DIN EN 61140 (VDE 0140-1)		
Connections	Cable gland M16 x 1.5, SW22 (clamping area 5 ... 10 mm) with connection terminals for cable cross-sections 0.14 ... 1.5 mm <sup>2</sup> (24 V DC) or circular plug-in connector (M12 x 1) (24 V DC, PROFIBUS DP)		
Operating voltage	24 V $\pm$ 10 % - max. residual ripple 10 %		
Power consumption	< 5 W		
Input data for actual value signal			
4 ... 20 mA:	Input resistance	180 $\Omega$	
	Resolution	12 bit	
Frequency:	Measurement range	0 ... 1000 Hz	
	Input resistance	17 k $\Omega$	
	Resolution	1% of measurement value	
	Input signal	> 300 mV <sub>ss</sub>	
	Waveform	sine, square, triangle	
Pt 100:	Measurement range	-20 ... +220 °C	
	Resolution	< 0.1 °C	
	Measurement current	< 1 mA	

Input data for set-point value signal	
0/4 ... 20 mA:	Input resistance 180 Ω Resolution 12 bit
0 ... 5/10 V:	Input resistance 19 kΩ Resolution 12 bit
Analogue feedback	
Max. current	10 mA (for voltage output 0 ... 5/10 V)
Burden (load)	0 ... 560 Ω (for current output 0/4 ... 20 mA)
Inductive proximity switches	100 mA current limitation
Binary outputs	galvanically isolated, PNP
Current limitation	100 mA, output is clocked if overload occurs
Binary input	galvanically isolated, PNP 0 ... 5 V = log "0", 10 ... 30 V = log "1" inverted input in reverse order (input current < 6 mA)
Communication interface	Direct connection to PC via USB adapter with integrated interface driver
Communications software	Communicator

## 7 OPERATION


### 7.1 Description of the operating and display elements

#### Display elements of the process level:

 Save symbol

 Symbol for position control

 Symbol for process control

 Symbol for the AUTOMATIC operating state  
Other symbols are displayed according to the activated functions. See operating instructions type 8692/8693

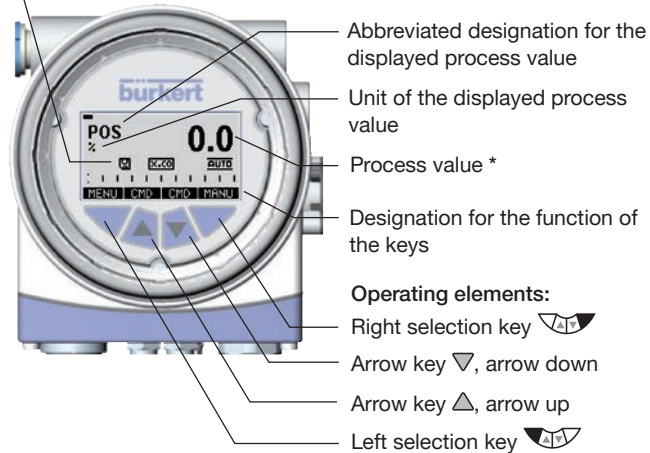


Fig. 5: Display elements of the process level; operating elements

#### Display elements of the setting level:

Menu designation

Submenu

Designation for the function of the keys

Operating elements:  
For description see "Fig. 5"

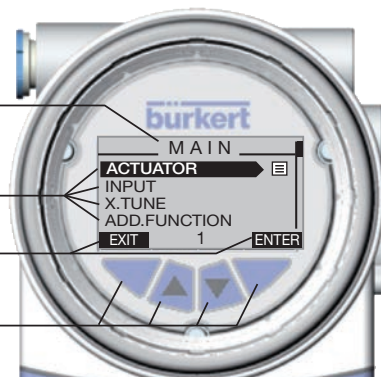


Fig. 6: Display elements of the setting level



The display is adjusted to the set functions and operating levels. In principle, a distinction can be made between the display view for the process level and the setting level. When the operating voltage has been applied, the process level is displayed.



\* The process values which can be displayed in the AUTOMATIC operating state depend on type.  
A detailed description can be found in the operating instructions for Type 8692/8693.

## 7.2 Function of the keys

The function of the 4 keys in the control field differs depending on the operating state (AUTOMATIC or MANUAL) and operating level (process level or setting level).

The function of the keys is displayed in the gray text field which is above the key.

Function of the keys on the process level:			
Key	Function of the keys	Description of the function	Operating state
Arrow key ▲	OPN (OPEN)	Manual opening of the actuator	MANUAL
		Change the displayed value (e.g. POS-CMD-TEMP-...)	AUTOMATIC
Arrow key ▼	CLS (CLOSE)	Manual closing of the actuator	MANUAL
		Change the displayed value (e.g. POS-CMD-TEMP-...)	AUTOMATIC
Selection key 	MENU	Change to the setting level Note: Press key for approx. 3 s.	AUTOMATIC or MANUAL
Selection key 	AUTO	Return to AUTOMATIC operating state	MANUAL
	MANUAL	Change to MANUAL operating state	AUTOMATIC

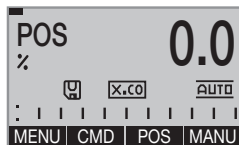
Function of the keys on the setting level:		
Key	Function of the keys	Description of the function
Arrow key ▲		Scroll up in the menus
	+	Increase numerical values
Arrow key ▼		Scroll down in the menus
	-	Decrease numerical values
	←	Change by one digit to the left; when entering numerical values
Selection key 	EXIT (BACK)	Return to the process level
		Gradually return from a submenu option
	ESC	Leave a menu
Selection key 	STOP	Stop a sequence
	ENTER SELEC OK INPUT	Select, activate or deactivate a menu option
	EXIT (BACK)	Gradually return from a submenu option
	RUN	Start a sequence
	STOP	Stop a sequence

Tab. 1: Function of the keys

## 8 OPERATING STATES

Type 8692/8693 has 2 operating states:  
AUTOMATIC and MANUAL.

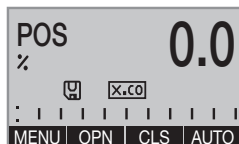
### AUTOMATIC



In the AUTOMATIC operating state normal controlled operation is implemented.

(The symbol for AUTOMATIC **AUTO** is shown on the display. (A bar runs along the upper edge of the display).

### MANUAL



In the MANUAL operating state the valve can be manually opened or closed via the arrow keys  $\blacktriangle$   $\blacktriangledown$  (key function **OPN** and **CLS**).

(The symbol for AUTOMATIC **AUTO** is hidden. No bar running along the upper edge of the display).

## 8.1 Changing the operating state

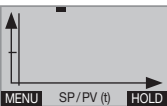


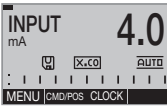

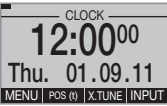



Change to MANUAL operating state (only available for process value display: POS, CMD, PV, SP)	<b>MANU</b>	Press
Return to AUTOMATIC operating state	<b>AUTO</b>	Press


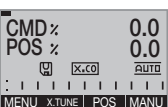
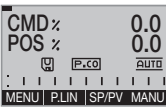
## 8.2 Displays in the AUTOMATIC operating state

Type 8692	Description of the display	Type 8693
	Actual position of the valve actuator (0 ... 100%)	
	Set-point position of the valve actuator (0 ... 100%)	
	Internal temperature in the housing of the type 8692/8693 ( °C)	
	Process actual value	
	Process set-point value	
	Simultaneous display of the set-point position and the actual position of the valve actuator (0 ... 100 %)	

## Type 8692, 8693

### Operating states

Type 8692	Description of the display	Type 8693
	Graphical display of <i>SP</i> and <i>PV</i> with time axis	
	Graphical display of <i>POS</i> and <i>CMD</i> with time axis	
	Input signal for set-point position (0 ... 5/10 V / 0/4 ... 20 mA)	
	Time, weekday and date	
	Automatic adjustment of the positioner (position controller)	
	Automatic optimization of the process controller parameters	

Type 8692	Description of the display	Type 8693
	Automatic linearization of the process characteristics	
	Simultaneous display of the set-point position and the actual position of the valve actuator (0 ... 100 %)	

### 8.3 Master code

Operation of the device can be locked via a freely selectable user code. In addition, there is a non-changeable master code with which you can perform all operator actions on the device. This 4-digit master code can be found on the last pages of this quickstart guide in the Chapter "*Master code*".

If required, cut out the code and keep it separate from this quickstart guide.

## 9 OPERATING LEVELS

There is the process level and the setting level for the operation and setting of type 8692/8693.

### Process level:

The running process is displayed and operated on this level.

Operating state: **AUTOMATIC** – Displaying the process data  
**MANUAL** – Manually opening and closing the valve



### Setting level:

The basic settings for the process are made on the setting level.  
– Inputting the operating parameters  
– Activating auxiliary functions



If the device is in the **AUTOMATIC** operating state when changing to the setting level, the process continues running during the setting.

### 9.1 Switching between the operating levels

Change to the setting level	<b>MENU</b>	 Press for 3 seconds
Return to the process level	<b>EXIT</b>	 Press briefly

## 10 INSTALLATION



Only for positioners and process controllers without pre-assembled process valve.

### 10.1 Installation of devices for the Ex area

When installing devices in the explosion-protected area, observe the "ATEX manual for use in the Ex area" enclosed with the Ex-devices.

### 10.2 Safety instructions



#### **DANGER!**

**Risk of injury from high pressure in the system/device.**

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

**Risk of injury due to electrical shock!**

- ▶ Before reaching into the device or the equipment, 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 assembly!**

- ▶ Assembly may be carried out by authorized technicians only and with the appropriate tools!

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

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



## 10.3 Installation on process valves, types 2103, 2300 and 2301

### NOTE!

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



The installation of the switch spindle and the form seal is described in the operating instructions for Type 8692/8693. You can find the instructions on the Bürkert homepage.

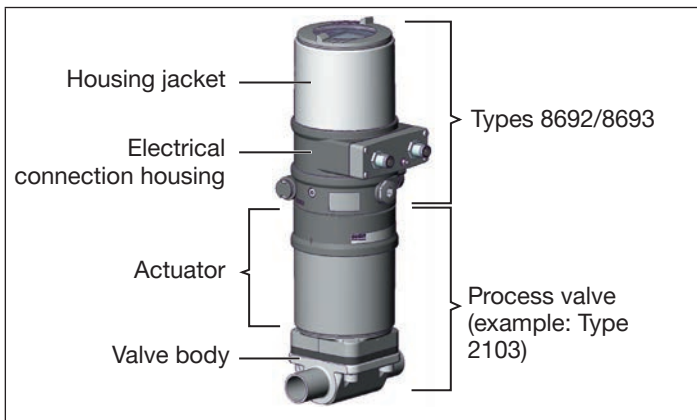


Fig. 7: Installation on process valve, example type 2301



During the installation, the collets of the pilot air ports must not be fitted to the actuator.

→ Aligning actuator with type 8692/8693:

1. Align the pilot air ports of the actuator with the connection pieces of Type 8692/8693 (see "Fig. 8").

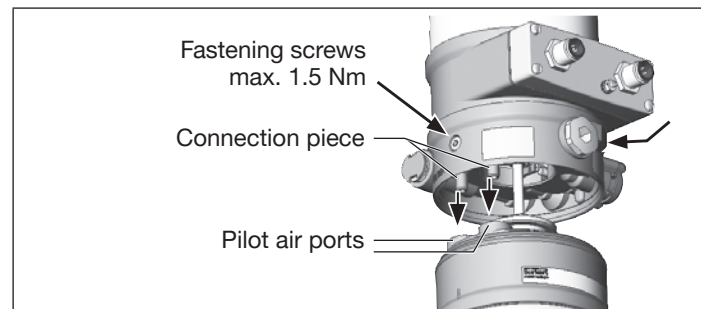


Fig. 8: Aligning the pilot air ports

2. Align the puck of the actuator with the guide rail of Type 8692/8693 (see "Fig. 9")

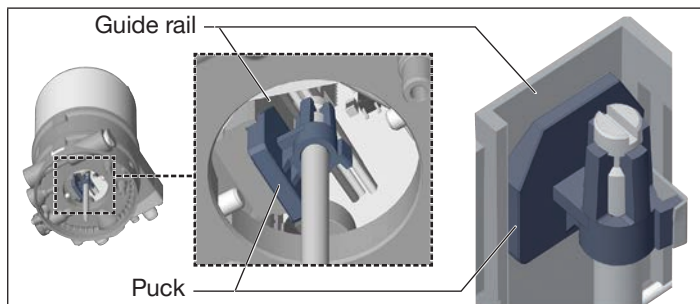


Fig. 9: Aligning the puck

**NOTE!**

**Damage to the PCB or malfunction!**

- Ensure that the puck lies flat on the guide rail.

- Push Type 8692/8693 without turning it onto the actuator until no gap is visible on the form seal.

**NOTE!**

**To comply with the degree of protection IP65 / IP67, do not fasten the fastening screws too tightly.**

- Maximum tightening torque: 1.5 Nm.

- Attach Type 8692/8693 to the actuator using the two side fastening screws. In doing so, tighten the screws only hand-tight (max. tightening torque: 1.5 Nm).

## 10.4 Installation on process valves, series 26xx and 27xx



The installation of the switch spindle is described in the operating instructions for Type 8692/8693. You can find the instructions on the Bürkert homepage.

- Place Type 8692/8693 onto the actuator. In doing so, align the puck of the actuator with the guide rail of Type 8692/8693 (see "Fig. 10").

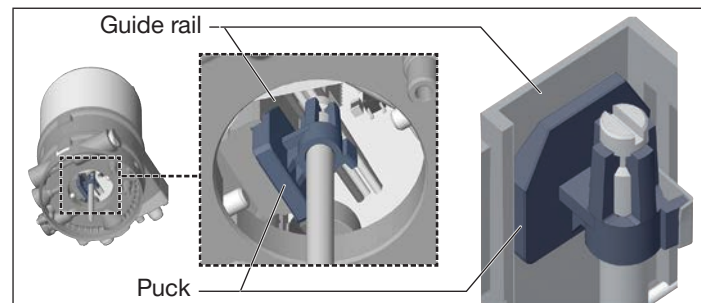


Fig. 10: Aligning the puck

**NOTE!**

**Damage to the PCB or malfunction!**

- Ensure that the puck lies flat on the guide rail.

- Press Type 8692/8693 all the way down as far as the actuator and turn it into the required position.



Ensure that the pneumatic connections of Type 8692/8693 and those of the valve actuator are situated preferably vertically one above the other (see "Fig. 11").

### NOTE!

To comply with the degree of protection IP65 / IP67, do not fasten the fastening screws too tightly.

- Maximum tightening torque: 1.5 Nm.

- Attach Type 8692/8693 to the actuator using the two side fastening screws. In doing so, tighten the screws only hand-tight (max. tightening torque: 1.5 Nm).

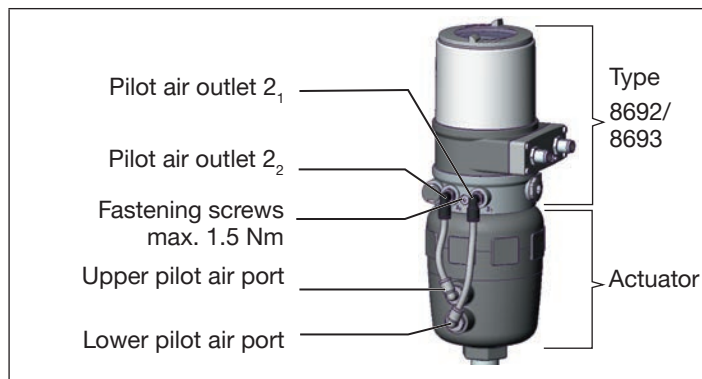


Fig. 11: Installation of the pneumatic connections, series 26xx and 27xx

- Observe the pneumatic connection that matches the desired control function. See "Tab. 2: Pneumatic connection to actuator".

- Establish the pneumatic connection between Type 8692/8693 and the actuator.

### NOTE!

**Damage or malfunction due to ingress of dirt and moisture!**

- To comply with the 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 Type 8692/8693 are isolated or not actuated.



If the ambient air is humid, a hose can be connected between pilot air outlet 2<sub>2</sub> of the positioner / process controller 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 Type 8692/8693.

Control function		Pneumatic connection Type 8692, 8693 with actuator	
		Pilot air outlet Types 8692 and 8693	Pilot air port actuator
A	Process valve closed in rest position (by spring force)	2 <sub>1</sub>	lower pilot air port of the actuator
		2 <sub>2</sub>	should be connected to the upper pilot air port of the actuator
B	Process valve open in rest position (by spring force)	2 <sub>1</sub>	upper pilot air port of the actuator
		2 <sub>2</sub>	should be connected to the lower pilot air port of the actuator
I	Process valve closed in rest position	2 <sub>1</sub>	lower pilot air port of the actuator
		2 <sub>2</sub>	upper pilot air port of the actuator
	Process valve open in rest position	2 <sub>1</sub>	upper pilot air port of the actuator
		2 <sub>2</sub>	lower pilot air port of the actuator

Tab. 2: Pneumatic connection to actuator

## 10.5 Pneumatic connection



### DANGER!

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

- Before working on the system or device, switch off the pressure and vent/drain lines.



Observe the following for the proper functioning of the device:

- The installation must not cause back pressure to build up.
- To make the connection, select a hose with sufficient cross section.
- Design the exhaust air line in such a way that no water or other liquid can get into the device through the exhaust air port (3 or 3.1).

#### Exhaust air concept:

- In compliance with the degree of protection IP67, an exhaust air line must be installed in the dry area.
- **Always** maintain an applied control pressure of at least 0.5 ... 1 bar above the pressure which is required to move the pneumatic actuator to its end position. This ensures that the control behavior is not negatively affected in the upper stroke range on account of too little pressure difference.
- During operation, keep the fluctuations of the control pressure as low as possible (max. ±10 %). If fluctuations are greater, the control parameters measured with the X.TUNE function are not optimum.

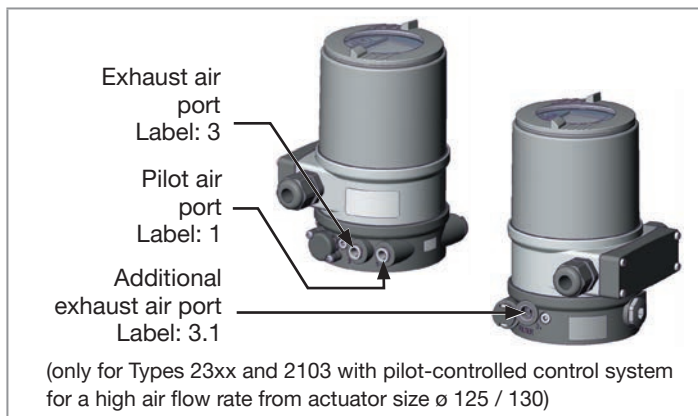


Fig. 12: Pneumatic connection

#### Procedure:

- Connect the control medium to the pilot air port (1)  
(3 ... 7 bar; instrument air, free of oil, water and dust).
- Mount the exhaust air line or a silencer on the exhaust air port (3) and, if present, on the exhaust air port (3.1).

## 11 ELECTRICAL INSTALLATION

There are 2 connection options for Type 8692/8693:

- Multi-pole with circular plug-in connector
- Cable gland with connection terminals

### Signal values

Operating voltage:	24 V DC
Set-point value (process/position controller):	0 ... 20 mA; 4 ... 20 mA 0 ... 5 V; 0 ... 10 V
Actual value (only process controller):	4 ... 20 mA; frequency; Pt 100

### 11.1 Safety instructions



#### **DANGER!**

**Risk of injury due to electrical shock!**

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



## WARNING!

### Risk of injury from improper 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 uncontrolled restart!

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

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

## 11.2 Electrical installation with circular plug-in connector

### Procedure:

→ Connect Type 8692/8693 according to the tables.

In designs with proximity switch:

Set the proximity switch (see ["11.2.1 Setting the proximity switch - optional"](#))

When the operating voltage is applied, Type 8692/8693 is operating.

→ Now make the required basic settings and adjustments for the positioner/process controller. For description see Chapter ["13 Start-up"](#).

### Designation of the circular plug-in connectors:

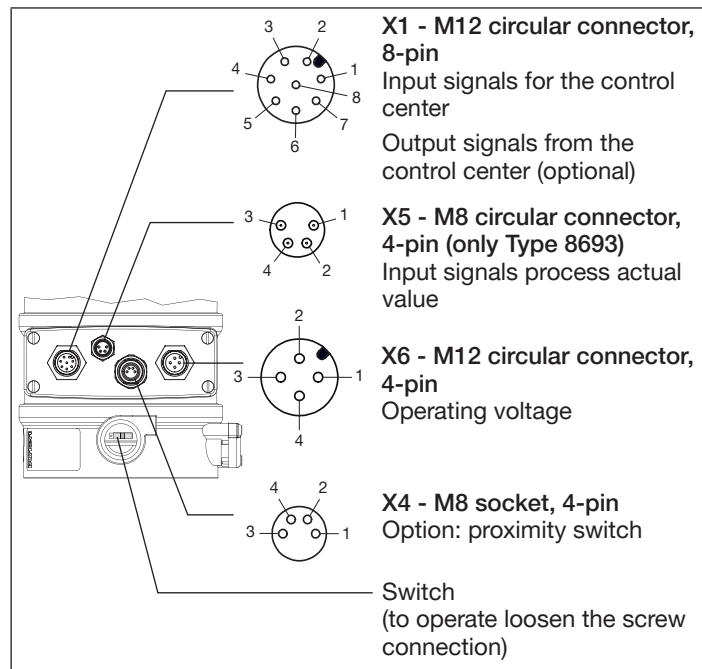


Fig. 13: Electrical connection with 24 V DC circular plug-in connector

### X1 - M12 circular connector, 8-pin

Pin	Wire color*	Assignment
<b>Input signals of the control centre (e.g. PLC)</b>		
8	red	Set-point value (0/4 ... 20 mA / 0 ... 5/10 V) +
7	blue	Set-point value GND
1	white	Binary input +
<b>Output signals to the control centre (e.g. PLC) (required for analogue output and/or binary output option only)</b>		
6	pink	Analog position feedback +
5	gray	Analog position feedback GND
4	yellow	Binary output 1
3	green	Binary output 2
2	brown	Binary outputs GND
* The indicated colors refer to the connection cable available as an accessory (919061).		






Tab. 3: X1 - M12 circular connector, 8-pin

### X6 - M12 circular connector, 4-pin

Pin	Wire color*	Assignment
1	brown	Operating voltage + 24 V DC
3	blue	Operating voltage GND
* The indicated colors refer to the connection cable available as an accessory (918038).		

Tab. 4: X6 - M12 circular connector, 4-pin (operating voltage)

### X5 - M8 circular connector, 4-pin (process actual value) - only Type 8693

Input type **	Pin	Wire color*	Assignment	Switch
4 ... 20 mA - internally supplied	1	brown	+ 24 V supply Transmitter	 Switch on left
	2	white	output of transmitter	
	3	blue	GND	
	4	black	bridge after GND	
4 ... 20 mA - exter- nally supplied	1	brown	not assigned	 Switch on right
	2	white	Process actual +	
	3	blue	not assigned	
	4	black	Process actual -	
Frequency - internally supplied	1	brown	+ 24 V sensor supply	 Switch on left
	2	white	Clock input +	
	3	blue	Clock input - (GND)	
	4	black	not assigned	
Frequency - externally supplied	1	brown	not assigned	 Switch on right
	2	white	Clock input +	
	3	blue	Clock input -	
	4	black	not assigned	
Pt 100 (*** see note)	1	brown	not assigned	 Switch on right
	2	white	Process actual 1 (current feed)	
	3	blue	Process actual 3 (GND)	
	4	black	Process actual 2 (compensation)	

\* The indicated colors refer to the connection cable available as an accessory (264602).

\*\* Can be adjusted via software (see operating instructions Type 8692/8693 "Setting the input signal").

Tab. 5: X5 - M8 circular connector, 4-pin (process actual value) - Type 8693



\*\*\* For reasons of wire resistance compensation, connect the Pt 100 sensor via 3 wires. Always bridge Pin 3 and Pin 4 on the sensor.

#### X4 - M8 socket, 4-pin (proximity switch) - option only

Pin	Wire color*	Assignment
1	brown	proximity switch 1 out
2	white	GND
3	blue	24 V DC

*The indicated colors refer to the connection cable available as an accessory (917131).*

Tab. 6: X4 - M8 socket, 4-pin (proximity switch)

#### 11.2.1 Setting the proximity switch - optional



##### **DANGER!**

##### **Risk of injury due to electrical shock!**

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

##### 1. Removing housing jacket and electronics module:

- ⚠ Disconnect operating voltage at Type 8692/8693 and proximity switch connector.

#### **NOTE!**

**Breakage of the pneumatic connection pieces due to rotational impact!**

- ▶ When unscrewing the housing jacket, **do not hold the actuator** but the electrical connection housing above.

- Hold the electrical connection housing in place.
- Unscrew the housing jacket in a counter-clockwise direction and remove.
- Remove electronics module.

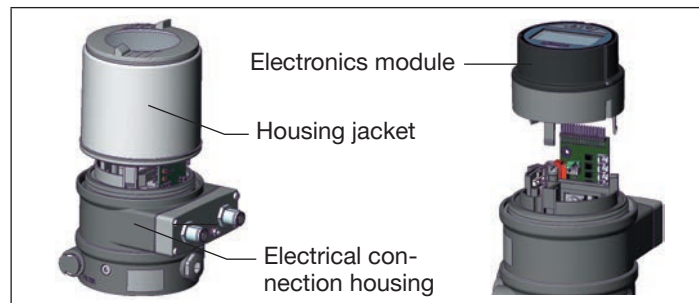


Fig. 14: Removing housing jacket and electronics module.



## 2. Setting the proximity switch



The proximity switch can be set to the bottom or the top end position. The handling of the settings differs for the various control functions.

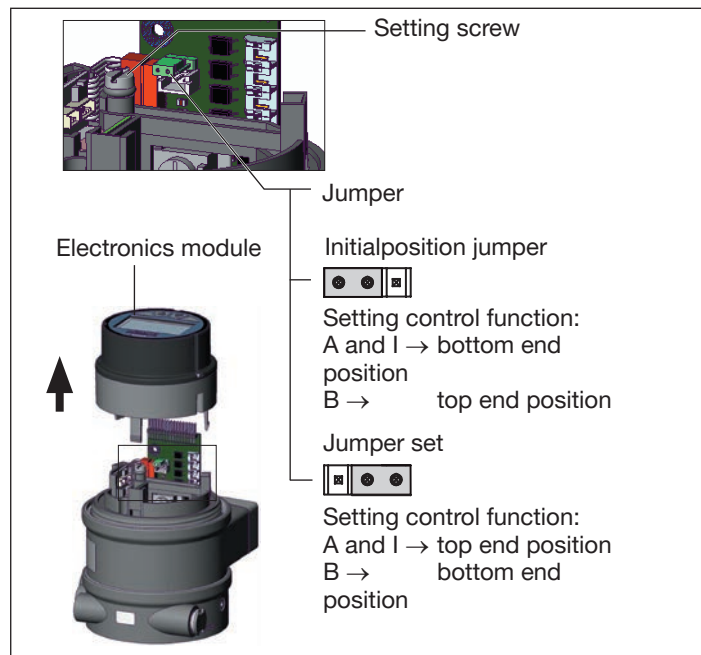


Fig. 15: Setting the proximity switch

### Bottom end position for control function A or top end position for control function B

- Switch on operating voltage at the proximity switch connector.
- Using a screwdriver, set proximity switch at the setting screw to end position.
- ⚠ Switch off operating voltage at the proximity switch connector.

### Bottom end position for control function I

- Connect the pilot air.



#### **WARNING!**

**Valve moves after electrical voltage has been connected!**

After connecting the electrical voltage, the actuator moves to the set end position!

- ▶ Never adjust the proximity switch while the process is running!

- Connect operating voltage at Type 8692/8693 and proximity switch connector.
- Move actuator to the bottom end position.
- Using a screwdriver, set proximity switch at the setting screw to end position.
- ⚠ Switch off the pilot air.
- ⚠ Disconnect operating voltage at Type 8692/8693 and proximity switch connector.

**Top end position for control function A and I or  
bottom end position for control function B**

- Set jumper (see "[Fig. 15: Setting the proximity switch](#)").
- Connect the pilot air.



**WARNING!**

**Valve moves after electrical voltage has been connected!**

After connecting the electrical voltage, the actuator moves to the set end position!

- ▶ Never adjust the proximity switch while the process is running!

- Connect operating voltage at Type 8692/8693 and proximity switch connector.
- Move valve to the top end position (for control function A and I) or bottom end position (for control function B).
- Using a screwdriver, set proximity switch at the setting screw to end position.
- ⚠ Switch off the pilot air.
- ⚠ Switch off operating voltage at the device and the proximity switch connector.
- Return jumper to home position ("[Fig. 15](#)").

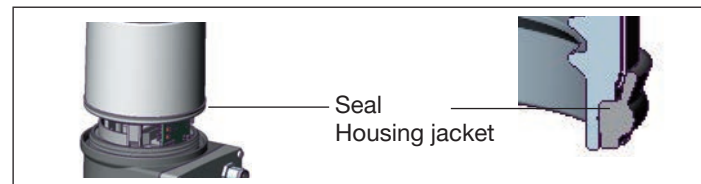
**3. Installing electronics module and housing jacket:**

**NOTE!**

**Be careful not to damage the pins at the PCB!**

- Position the electronics module straight and do not tilt when pressing down.

- Attach electronics module carefully and press down evenly until the holders snap into place.
- Check that the seal is correctly positioned on the housing jacket.



*Fig. 16: Position seal housing jacket*

**NOTE!**

**Breakage of the pneumatic connection pieces due to rotational impact!**

- ▶ When inserting the housing jacket, **do not hold the actuator** but the electrical connection housing above.

- Place the housing jacket over the electronics module and screw it in until the stop position; while doing so, hold the electrical connection housing (screwing tool available via the Bürkert Sales Center. Order number 674077).

**NOTE!**

**Malfunction due to ingress of dirt and moisture!**

To comply with the degree of protection IP65 / IP67, make sure that the housing jacket and the electrical connection housing are screwed together tightly.

- Switch on operating voltage at the device and the proximity switch connector.
- Restart operation of Type 8692/8693.

## 11.3 Electrical installation with cable gland

### Procedure:

- Loosen the 4 screws of the connection cover and remove the cover. The connection terminals are now accessible.
- Push the cables through the cable gland.
- Connect the wires.
- Tighten the union nut of the cable gland (tightening torque approx. 1.5 Nm).
- Place the connection cover with inserted seal onto the electrical connection housing and tighten cross-wise (tightening torque max. 0.7 Nm).

### NOTE!

#### Damage or malfunction due to ingress of dirt and moisture!

To comply with the degree of protection IP65 / IP 67:

- ▶ Close all unused cable glands with dummy plugs.
- ▶ Tighten the union nut of the cable gland.  
Tightening torque depends on cable size or dummy plug approx. 1.5 Nm.
- ▶ Only screw on connection cover with the seal inserted.  
Tightening torque max. 0.7 Nm.

When the operating voltage is applied, Type 8692/8693 is operating.

- Now make the required basic settings and adjustments for the positioner/process controller. For description see Chapter ["13 Start-up"](#).

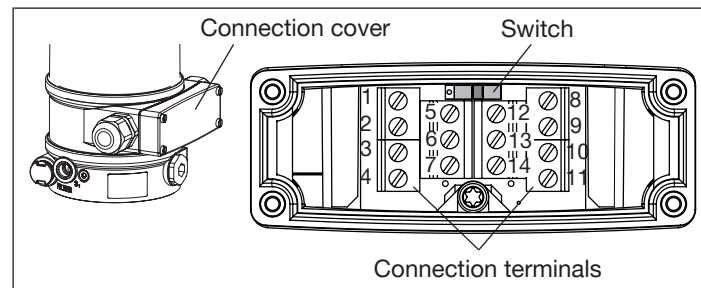







Fig. 17: Cable gland connection

Terminal	Assignment
11	Set-point value + (0/4 ... 20 mA / 0 ... 5/10 V)
10	Set-point value GND
14	Operating voltage + 24 V DC
13	Operating voltage GND
12	Binary input +
13	Binary input GND
optional	9 Analog position feedback +
	8 Analog position feedback GND
	5 Binary output 1
	6 Binary output GND
7	Binary output 2

Tab. 7: Cable gland connection

## Process actual value - Type 8693

Input type*	Terminal	Assignment	Switch
4 ... 20 mA - internally supplied	1 2 3 4	+ 24 V transmitter supply Transmitter output bridge to GND GND	 Switch on left
4 ... 20 mA - externally supplied	1 2 3 4	not assigned Process actual + Process actual - not assigned	 Switch on right
Frequency - internally supplied	1 2 3 4	+ 24 V sensor supply Clock input + not assigned Clock input - (GND)	 Switch on left
Frequency - externally supplied	1 2 3 4	not assigned Clock input + not assigned Clock input -	 Switch on right
Pt 100 (** see note)	1 2 3 4	not assigned Process actual 1 (current feed) Process actual 2 (compensation) Process actual 3 (GND)	 Switch on right
* Can be adjusted via software (see operating instructions Type 8692/8693 "Setting the input signal").			

Tab. 8: Process actual value - Type 8693



**\*\*** For reasons of wire resistance compensation, connect the Pt 100 sensor via 3 wires.  
Always bridge terminal 3 and terminal 4 on the sensor.

## 11.4 Electrical installation of fluid quantity controller Type 8750



The electrical installation for the fluid quantity controller can be found in the quickstart guide for Type 8750.

## 12 PROFIBUS DP

The quickstart guide only describes the electrical installation of Type 8692/8693 and the specification of the basic settings.



The settings for the bus communication via the *BUS*. *COMM* menu are described in the operating instructions of Type 8692/8693.

## 12.1 Electrical installation

### Procedure:

→ Connect Type 8692/8693 according to the tables.

On the electrical connection housing is a setscrew with nut for connection of the technical earth. (see ["Fig. 18: Electrical connection Profibus DP"](#)).

→ Connect setscrew to a suitable grounding point. To ensure electromagnetic compatibility (EMC), ensure that the cable is as short as possible (max. 30 cm, Ø 1.5 mm²).

When the operating voltage is applied, Type 8692/8693 is operating.

→ Now make the required basic settings and adjustments for the positioner/process controller. See Chapter ["13 Start-up"](#).

## Designation of the circular plug-in connectors - PROFIBUS DP:

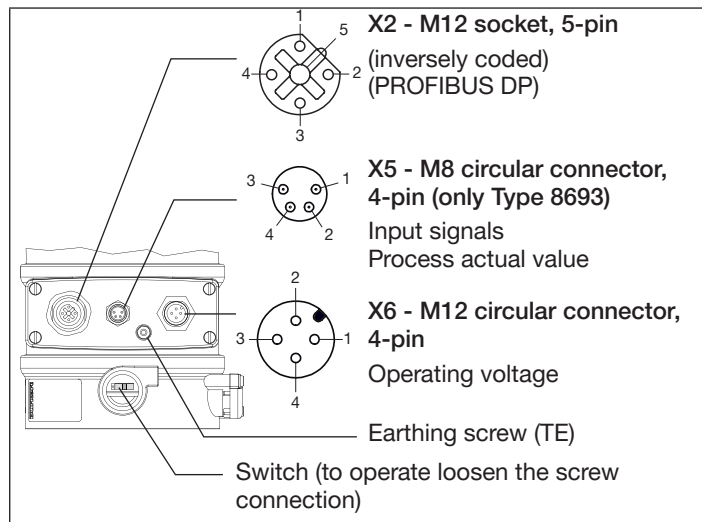


Fig. 18: Electrical connection Profibus DP

### X2 - M12 socket, 5-pin (bus connection)

Pin	Signal
1	VP+5
2	RxD/TxD-N
3	DGND
4	RxD/TxD-N
5	Shielding

Tab. 9: X2 - M12 socket, 5-pin (bus connection - PROFIBUS DP)

### X5 - M8 circular connector, 4-pin (process actual value) - only Type 8693

Input type **	Pin	Wire color*	Assignment	Switch
4 ... 20 mA - internally supplied	1 2 3 4	brown white blue black	+ 24 V supply Transmitter output of transmitter GND bridge to GND	 Switch on left
4 ... 20 mA - externally supplied	1 2 3 4	brown white blue black	not assigned Process actual + not assigned Process actual -	 Switch on right
Frequency - internally supplied	1 2 3 4	brown white blue black	+ 24 V sensor supply Clock input + Clock input - (GND) not assigned	 Switch on left
Frequency - externally supplied	1 2 3 4	brown white blue black	not assigned Clock input + Clock input - not assigned	 Switch on right
Pt 100 (*** see note)	1 2 3 4	brown white blue black	not assigned Process actual 1 (current feed) Process actual 3 (GND) Process actual 2 (compensation)	 Switch on right

\* The indicated colors refer to the connection cable available as an accessory (264602).

\*\* Can be adjusted via software (see operating instructions Type 8692/8693 "Setting up the process controller").

Tab. 10: X5 - M8 circular connector, 4-pin (process actual value) - Type 8693

## X6 - M12 circular connector, 4-pin

Pin	Wire color*	Assignment
1	brown	Operating voltage + 24 V DC
3	blue	Operating voltage GND

\* The indicated colors refer to the connection cable available as an accessory (918038).

X6 - M12 circular connector, 4-pin (operating voltage)



\*\*\* For reasons of wire resistance compensation, connect the Pt 100 sensor via 3 wires. Always bridge Pin 3 and Pin 4 on the sensor.

## 13 START-UP



A detailed description of the start-up and operating procedures can be found at our homepage in the operating instructions for Type 8692/8693.



### 13.1 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 start up the equipment/the device.

## 13.2 Starting-up Type 8692

### 13.2.1 Specifying the basic settings

**!** The basic settings are made on the setting level. To switch from the process to the setting level, press the **MENU** key for approx. 3 seconds.

For starting up you must specify the following basic settings:

- Setting the input signal (*INPUT*)
- Automatic adjustment of the positioner (*X.TUNE*)

Applies only to process valves that are not pre-assembled:

- Setting of the operating mode for the pneumatic actuator (*ACTUATOR*)  
The setting of the operating mode (control function A, B or I) in the *ACTUATOR* menu, is described in the operating instructions for Type 8692/8693.

**!** In general, Type 8692/8693 is supplied with a pre-assembled process valve. In this case the operating mode of the actuator is already pre-set. For this reason, the input of the control function (A, B or I) is not required in case of a pre-assembled process valve.

### Setting the input signal (INPUT)

→ Select the input signal for the set-point value in the *INPUT* menu option. (4 ... 20 mA; 0 ... 20 mA; 0 ... 10 V or 0 ... 5 V).

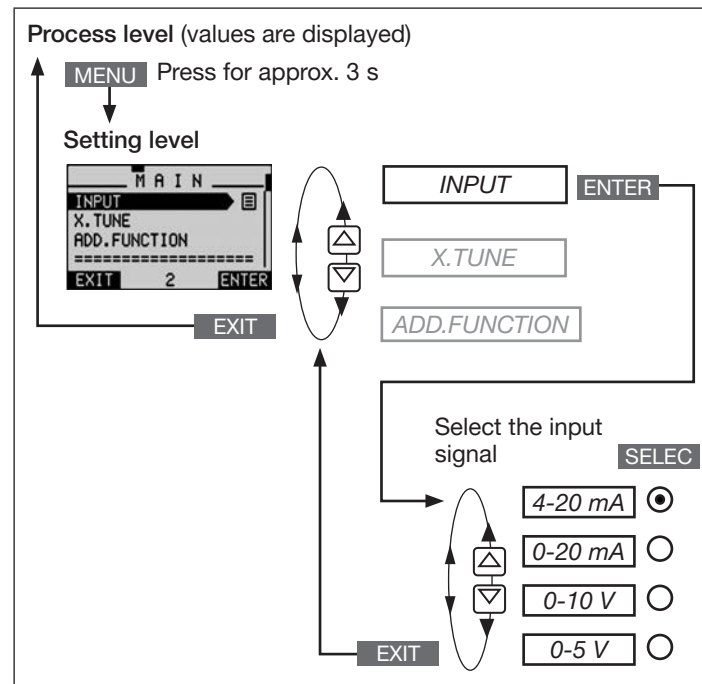


Fig. 19: Operating structure *INPUT*; setting the input signal

## Automatic adjustment of the positioner to the operating conditions (X.TUNE)



### WARNING!

**Danger due to the valve position changing when the X.TUNE function is run!**

When the X.TUNE function is run under operating pressure, there is an acute risk of injury.

- ▶ *Never run X.TUNE while the process is running!*
- ▶ Secure system against unintentional activation!

### NOTE!

**An incorrect supply pressure or incorrectly connected operating medium pressure may cause the controller to be wrongly adjusted!**

- ▶ *Run X.TUNE in each case at the supply pressure available in subsequent operation (= pneumatic auxiliary power).*
- Run the X.TUNE function preferably **without** operating medium pressure to exclude interference due to flow forces.

The following functions are actuated automatically:




- Adjustment of the sensor signal to the (physical) stroke of the actuator used.
- Determination of parameters of the PWM signals to control the solenoid valves integrated in type 8692/8693.

- Setting of the controller parameters of the positioner. Optimization occurs according to the criteria of the shortest possible transient time with simultaneous freedom from overshoot.




To stop X.TUNE, press the left or right selection key **STOP**.

### Procedure:

Key	Action	Description
<b>MENU</b>	Press  for approx. 3 s	Switching from process level ⇒ setting level
<b>▲ / ▼</b>	Select X.TUNE	
<b>RUN</b>	 Hold down as long as countdown (5 ...) is running	During the automatic adjustment messages are displayed indicating the progress of the X.TUNE "TUNE #1... X.TUNE ready" <sup>1)</sup> .
	Press any key	Return to main menu (MAIN)
<b>EXIT</b>	Press 	Switching from setting level ⇒ process level

Tab. 11: Automatic adjustment of X.TUNE



You must exit the main menu by pressing the left selection key **EXIT** before the modified data is saved to the memory (EEPROM). During the save process, the save symbol  on the display.

<sup>1)</sup> "TUNE err/break" if a fault occurs.



### 13.3 Starting-up Type 8693





To operate the positioner as a process controller, implement the following steps:

#### 1. Setting up the positioner (position controller):

For description see ["13.2.1 Specifying the basic settings"](#)

#### 2. Setting up the process controller:

→ Add the auxiliary function *P.CONTROL* to the main menu (MAIN) using the configuration menu (*ADD.FUNCTION*).

Key	Action
<b>MENU</b>	Press  for approx. 3 s
<b>▲ / ▼</b>	Select <i>ADD.FUNCTION</i>
<b>ENTER</b>	Press 
<b>▲ / ▼</b>	Select <i>P.CONTROL</i>
<b>ENTER</b>	Press 
<b>EXIT</b>	Press 
The <i>P.CONTROL</i> function is now activated and incorporated into the main menu (MAIN).	

Tab. 12: Incorporating *P.CONTROL* into the main menu (MAIN)

#### 13.3.1 Basic settings of the process controller

→ In the main menu (MAIN) select the *P.CONTROL* function and implement the basic settings.

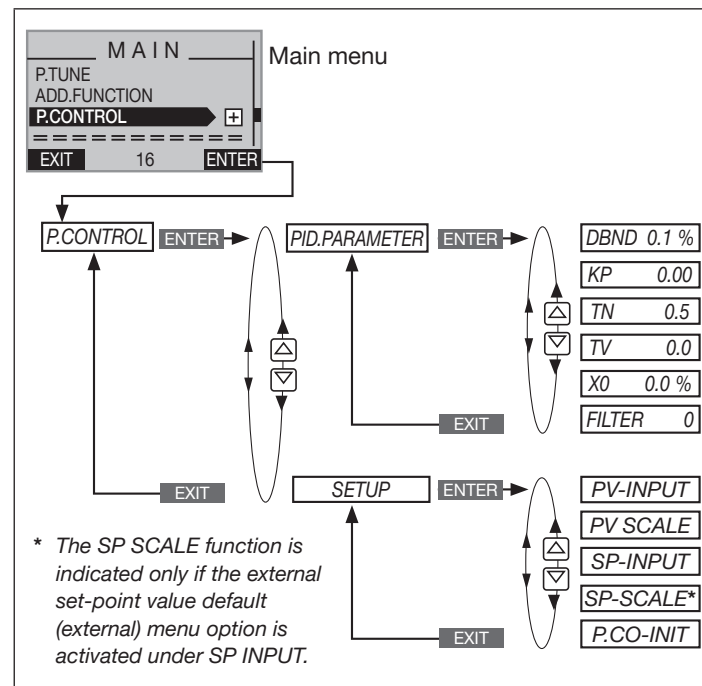



Fig. 20: Operating structure - basic settings for process controller

## P.CONTROL - settings:

<b>PID.PARAMETER</b>	Parameterization of the process controller
<b>DBND 0.1 %</b>	Insensitivity range (dead band) of the PID process controller
<b>KP 0.00</b>	Amplification factor of the process controller
<b>TN 0.5</b>	Reset time
<b>TV 0.0</b>	Hold-back time
<b>X0 0.0 %</b>	Operating point
<b>FILTER 0</b>	Filtering of the process actual value input
<b>SETUP</b>	Setting up the process controller
<b>PV-INPUT</b>	Indication of the signal type for process actual value
<b>PV SCALE</b>	Scaling the process controller
<b>SP-INPUT</b>	Type of the set-point value default (internal or external)
<b>SP-SCALE*</b>	Scaling the positioner (position controller) (for external set-point value default only)
<b>P.CO-INIT</b>	Enables a smooth switchover between operating states AUTOMATIC and MANUAL

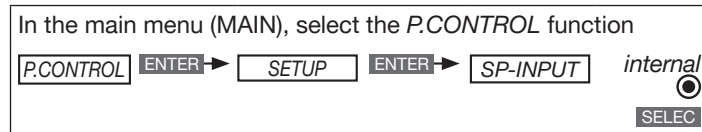
Tab. 13: Basic settings of the process controller

 The parameter settings can be created automatically with the help of the **P.TUNE** function (description see "operating instructions for Type 8692/8693").

## 13.3.2 Manually changing the process set-point value



Procedure:

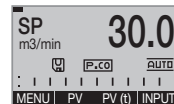
1. Set the set-point value default on the setting level:



→ Use the **EXIT** key (press 4 x) to return to the process level.

2. On the process level, manually change the process set-point value:

→ Use the arrow keys   to select the display for the process set-point value (SP).



→ Press the key **INPUT**.

→ Insert process set-point value (as shown on the right-hand image)

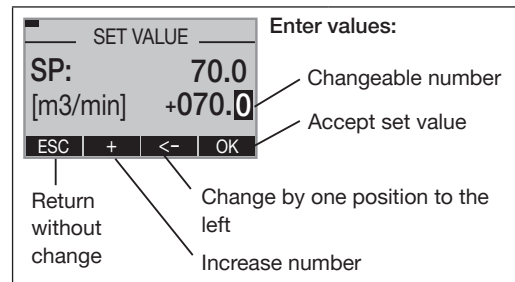


Fig. 21: Enter values

## 14 SAFETY END POSITIONS

Actuator system	Designation	Safety end positions after failure of the auxiliary power	
		electrical	pneumatic
	single-acting Control function A	down	control system for high air flow rate (DN 2,5): down control system for low air flow rate (DN 0,6): not defined
	single-acting Control function B	up	control system for high air flow rate (DN 2,5): up control system for low air flow rate (DN 0,6): not defined
	double-acting Control function I	down / up (depending on the installation of the pneumatic connection)	not defined

Tab. 14: Safety end positions

## 15 DISASSEMBLY OF TYPE 8692/8693



### 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 uncontrolled restart!**

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

### Sequence:

1. Remove the pneumatic connections.
2. Disconnect the electrical connection.
3. Remove Type 8692/8693.

## 15.1 Disconnecting the pneumatic connections



### **DANGER!**

**Risk of injury from high pressure!**

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

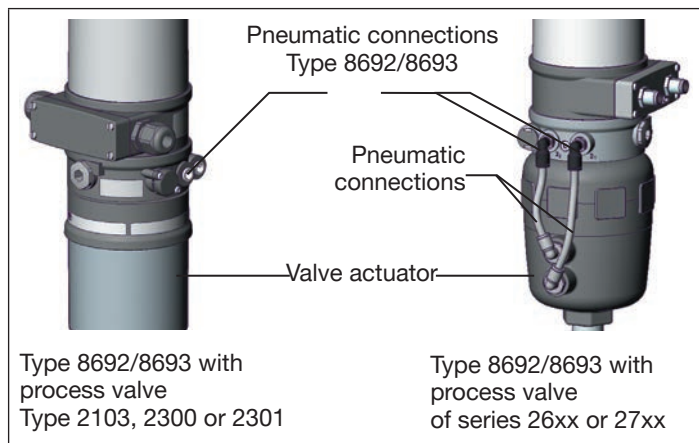


Fig. 22: Removing the pneumatic connections

→ Disconnect the pneumatic connections to Type 8693/8693.

**For process valves belonging to series 26xx and 27xx:**

→ Disconnect the pneumatic connections to the actuator.

## 15.2 Disconnecting electrical connections



### **DANGER!**

**Risk of injury due to electrical shock!**

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

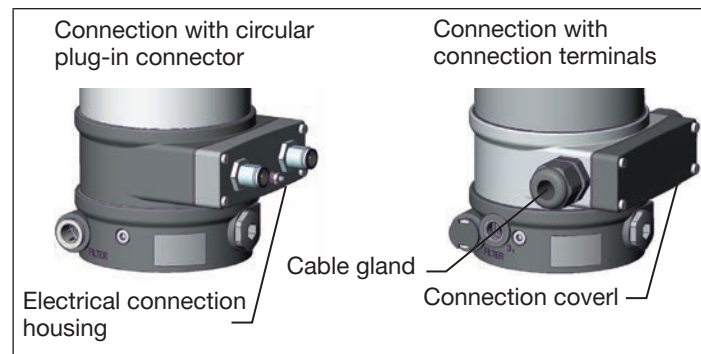


Fig. 23: Disconnecting electrical connections

**Connection with circular plug-in connector:**

→ Remove circular plug-in connector.

#### Connection with connection terminals:

- Loosen the 4 screws of the connection cover and remove the cover.
- Loosen the connection terminals and pull out the cable.

### 15.3 Removing Type 8692/8693

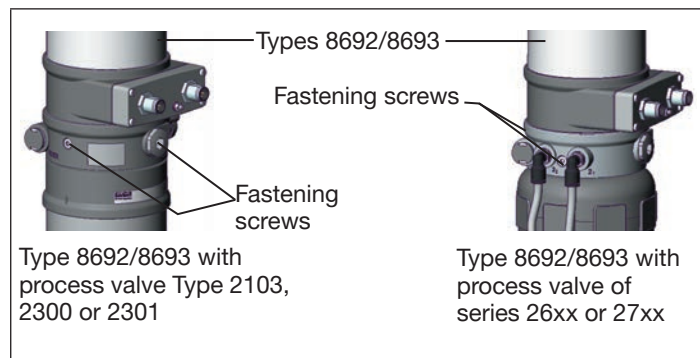


Fig. 24: Disconnect electrical connections.

- Release the fastening screws.
- Remove Type 8692/8693.

## 16 ACCESSORIES

Designation	Order no.
M12 socket, 8-pin, 5 m prefabricated cable	919267
M12 socket, 4-pin, 5 m prefabricated cable	918038
M8 connector, 4-pin, proximity switch	917131
M8 socket, 4-pin, 5 m cable, process actual value	264602
USB adapter for connection to a PC in conjunction with an extension cable	227093
Communicator: Information at <a href="http://www.burkert.com">www.burkert.com</a>	
Screwing tool for opening/closing the transparent cap	674077

Tab. 15: Accessories

### 16.1 Communications software

The PC operating program "Communicator" is designed for communication with the devices from the Bürkert positioner family (valid since serial number 20000).



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

### 16.2 USB interface

The PC requires an USB interface for communication with the positioners as well as an additional adapter with interface driver ("Tab. 15").

### 16.3 Download

Download the software at: [www.burkert.com](http://www.burkert.com)

## 17 TRANSPORT, STORAGE, DISPOSAL

### NOTE!

#### **Transport damage!**

Inadequately protected devices may be damaged during transportation.

- ▶ Protect the device against moisture and dirt in shock-resistant packaging during transportation.
- ▶ The permitted storage temperature may not exceed the maximum value or drop below the minimum value.

#### **Incorrect storage may damage the device.**

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

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

### NOTE!

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

- ▶ Observe applicable disposal and environmental regulations.



#### **Note:**

Observe the national regulations for the disposal of waste.



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