bürkert
FLUID CONTROL SYSTEMS

Type 8692/8693 REV.2
Positioner and process controller

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Important information for devices with UL approval

1 Intended use

Non-intended use of the positioner Type 8692 and the process controller Type 8693 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 use the device outdoors without protection from the weather.
- Use according to the authorized data, operating conditions and conditions of use specified as described in this document.
- The device may be used only in conjunction with third-party devices and components recommended and authorized by Bürkert.

Explosion hazard!

Only those devices are permitted to be installed in a potentially explosive atmosphere/ hazardous (classified) location that bear the corresponding labeling for the respective area.

2 Basic safety instructions

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

Risk of injury from high pressure in the equipment/device

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

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.

To prevent damage to property of the device, ensure:

- Do not feed any aggressive or flammable media into the pilot air port.
- Do not feed any liquids into the pilot air port.
- When unscrewing and screwing in the body casing or the transparent cap, do not hold the actuator of the process valve but the connection housing of the device.
- 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 bodies. Do not paint the body parts or screws.

3 Operating conditions

Altitude	restricted to max. 2000 m above sea level
Relative air humidity	max. 90% at 55 °C / 60 °C (non condensing)
Ambient temperature	see type label
Degree of protection	
evaluated by the manufacturer	IP65/IP67 according to EN 60529[1)]
evaluated by UL	UL Type 4x Rating indoor only[1)]

4 Pneumatic data

Control medium	neutral gases, air Quality classes in accordance with DIN ISO 8573-1
Pressure range	3...7 bar (43.5...101.5 psi)
Temperature range	0...+50 °C (+32...+122 °F)

5 Electrical data

⚠ The device must be supplied by one of the following:

a) Limited Energy Circuit (LEC) according to UL/ IEC 61010-1
b) Limited Power Source (LPS) according to UL/ IEC 60950
c) SELV/ PELV with UL Recognized Overcurrent Protection dimensioned according to UL/ IEC 61010-1 Table 18
d) NEC Class 2 power source

Protection class	III as per DIN EN 61140 (VDE 0140-1)
Connection	cable gland M16 × 1.5, size 22 (clamping area 5...10 mm) with connection terminals for cable cross-sections 0.14...1.5 mm² (24 V ⎓) or circular plug-in connectors (M12 × 1) (24 V ⎓, PROFIBUS DP, DeviceNet, EtherNet/IP, PROFINET I/O, Modbus TCP)
Pilot valve Operating voltage Power consumption	 24 V ⎓ ± 10%, max. residual ripple 10 % < 5 W

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

Input data for actual value signal

4...20 mA:	
Input resistance	70 Ω
Resolution	12 bit
Frequency:	
Measurement range	0...1000 Hz
Input resistance	20 kΩ
Resolution	1‰ of measurement value
Input signal	> 300 mVss
Waveform	sine, square, triangle
Pt 100:	
Measurement range	-20...+220 °C (-4...+428 °F)
Resolution	< 0.1 °C
Measurement current	< 1 mA

Input data for set-point value signal

0/4...20 mA:	
Input resistance	70 Ω
Resolution	12 bit
0...5/10 V:	
Input resistance	22 kΩ
Resolution	12 bit (only 11 bit for 0...5 V)

Analogue feedback

max. current	10 mA (for voltage output 0...5/10 V)
load	0...560 Ω (for current output 0/4...20 mA)

Digital outputs	galvanically isolated, PNP
current limitation	100 mA, output is clocked if overload occurs
Digital input	PNP 0...5 V = log “0”, 10...30 V = log “1” inverted input reversed accordingly (input current < 6 mA)
Communications interface	connection to PC with USB büS interface set

6 Installation

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.

6.1 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.

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

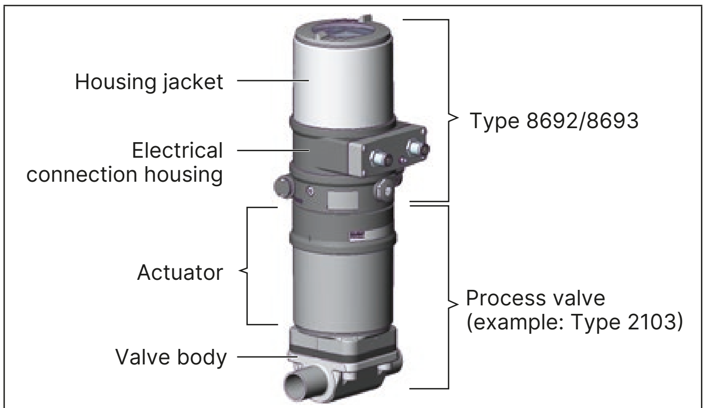


Fig. 1: Installation on process valve, example type 2301

- 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. 2).
2. Align the puck of the actuator with the guide rail of type 8692/8693 (see Fig. 3).

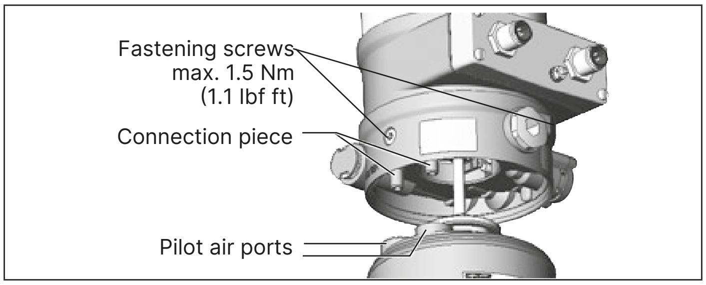


Fig. 2: Aligning the pilot air ports

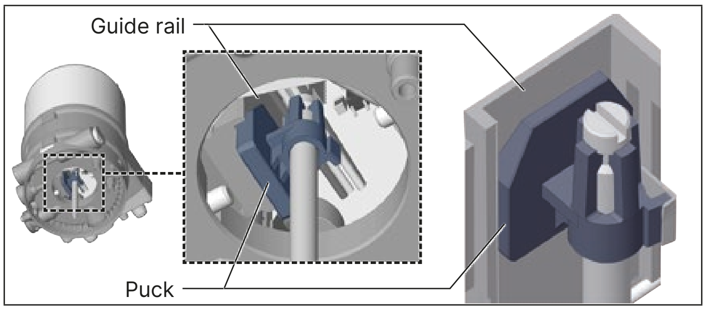


Fig. 3: Aligning the puck

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.
- 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 (1.1 lbf ft)**).

6.2 Installation on process valves, series 26xx, 27xx

- 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. 4).

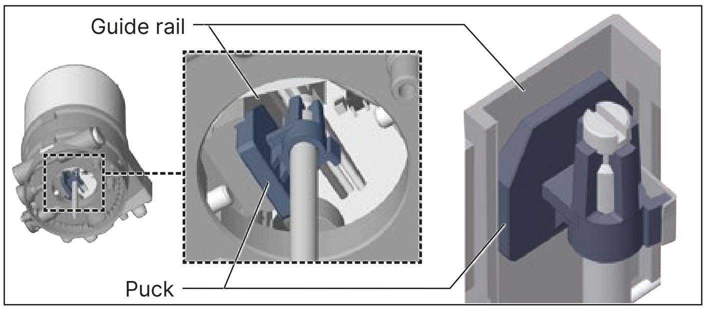


Fig. 4: Aligning the puck

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. 5).

- 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 (1.1 lbf ft)**).

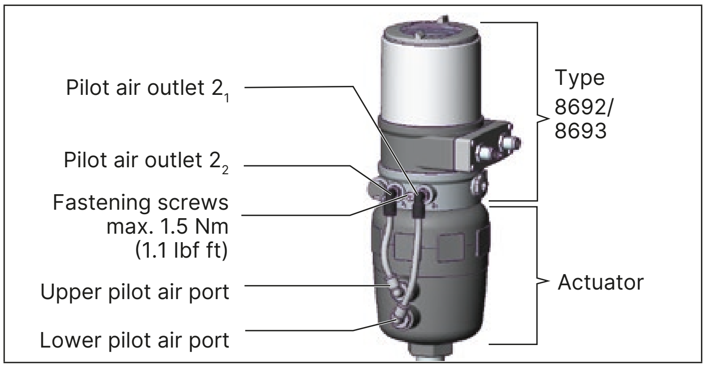


Fig. 5: Installation of the pneumatic connections, series 26xx and 27xx

- Observe the pneumatic connection that matches the desired control function. See operating instructions type 8692/8693 REV.2.
- 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.

If the ambient air is humid, a hose can be connected between pilot air outlet 2_2 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.

7 Electrical connection

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

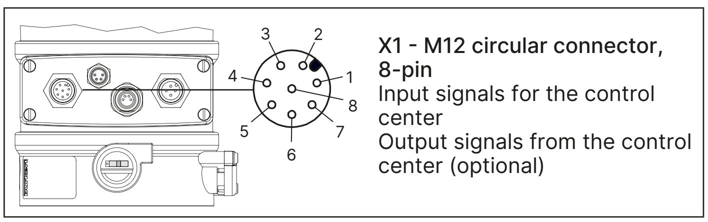
7.1 Electrical installation with circular plug-in connector

- Connect type 8692/8693 according to the tables.

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

- Now make the required basic settings and adjustments for the positioner/process controller.

Designation of the circular plug-in connectors:



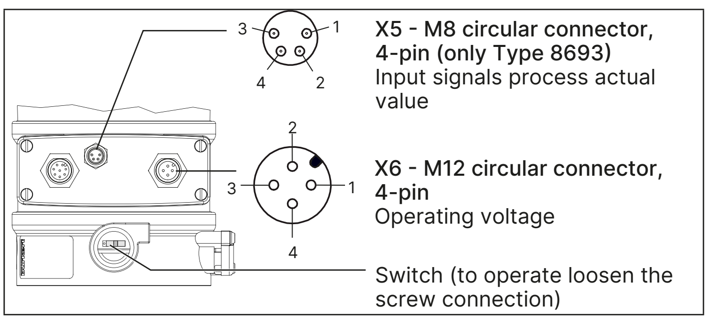


Fig. 6: Electrical connection with 24 V ⎓ circular plug-in connector

X1 - M12 circular connector, 8-pin

Pin	Wire color[2]	Assignment
Input signals of the control centre (e.g. PLC)		
1	white	Digital input +
8	red	Set-point value + (0/4...20 mA / 0...5/10 V)
7	blue	Set-point value GND
Output signals to the control centre (e.g. PLC) (required for analogue output and/or binary output option only)		
2	brown	Digital outputs GND
3	green	Digital output 2
4	yellow	Digital output 1
5	gray	Analog position feedback GND
6	pink	Analog position feedback +

Tab. 1: X1 - M12 circular connector, 8-pin

X6 - M12 circular connector, 4-pin

Pin	Wire color[3]	Assignment
1	brown	Operating voltage + 24 V ⎓
2	Not assigned	
3	blue	Operating voltage GND
4	Not assigned	

Tab. 2: X6 - M12 circular connector, 4-pin (operating voltage)

X5 - M8 circular connector, 4-pin - (for type 8693 only)

Input type[4]	Pin	Assignment	Switch
4...20 mA - internally supplied	1	+24 V transmitter power supply	Switch on left
	2	Output from transmitter	
	3	GND (identical to GND operating voltage)	
	4	Bridge to GND (GND from 3-conductor transmitter)	
4...20 mA - externally supplied	1	Not assigned	Switch on right
	2	Process actual +	
	3	Not assigned	
	4	Process actual –	
Frequency - internally supplied	1	+24 V sensor power supply	Switch on left
	2	Clock input +	
	3	Clock input – (GND)	
	4	Not assigned	
Frequency - externally supplied	1	Not assigned	Switch on right
	2	Clock input +	
	3	Clock input –	
	4	Not assigned	
Pt 100 (see information below)	1	Not assigned	Switch on right
	2	Process actual 1 (power supply)	
	3	Process actual 3 (GND)	
	4	Process actual 2 (compensation)	

Tab. 3: X5 - M8 circular plug, 4-pin, input signals process actual value

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

2) The indicated colors refer to the connection cable available as an accessory (919061).
3) The indicated colors refer to the connection cable available as an accessory (918038).
4) Adjustable via software (see operating instructions type 8692/8693 Rev.2)

7.1.1 Slide switch position

Supplied	Assignment	Slide switch position
Internally supplied	GND operating voltage	Slide switch on left
Externally supplied	GND is galvanically isolated from the operating voltage.	Slide switch on right

Tab. 4: Slide switch position

The description EtherNet/IP, PROFINET, Modbus TCP and option büS can be found in operating instruction.

7.2 Electrical installation with cable gland

- 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. The terminal assignment can be found in the tables below.
- Tighten the union nut of the cable gland (tightening torque approx. 1.5 Nm (1.1 lbf ft)).
- Place the connection cover with inserted seal onto the electrical connection housing and tighten cross-wise (tightening torque max. 0.7 Nm (0.5 lbf ft)).

NOTE

Damage or malfunction due to ingress of dirt and moisture.
To comply with the degree of protection IP65 / IP67:
- Close all unused cable glands with dummy plugs.
- Tighten the union nut on the cable gland.
  Tightening torque depends on cable size or dummy plug approx. 1.5 Nm (1.1 lbf ft).
- Only screw on connection cover with the seal inserted.
  Tightening torque max. 0.7 Nm (0.5 lbf ft).

When the operating voltage is applied, device is operating.
- Now make the required basic settings and adjustments for the position controller and process controller.

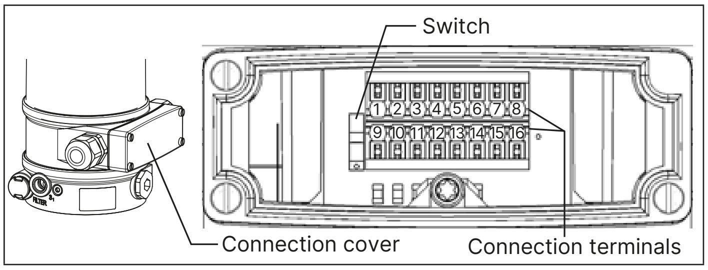


Fig. 7: Cable gland connection

7.2.1 Input signals from the control center (e.g. PLC)

Terminal	Assignment
6	Digital input +
7	Set-point value GND
8	Set-point value +
13	Not assigned
14	Digital input GND

Tab. 5: Terminal assignment; input signals of the control center

7.2.2 Output signals to the control center (e.g. PLC)

Terminal	Assignment
1	Analog position feedback GND
2	Analog position feedback +
3	Digital output GND
4	Digital output 2
5	Digital output 1

Tab. 6: Terminal assignment; output signals to the control center

7.2.3 Process actual value input (for Type 8693 only)

Input type[4]	Terminal	Assignment	Switch
4...20 mA - internally supplied	9	GND (identical to GND operating voltage)	Switch below
	10	Bridge after GND (GND from 3-conductor transmitter)	
	11	Output from transmitter	
	12	+24 V transmitter power supply	
4...20 mA - externally supplied	9	Not assigned	Switch above
	10	Process actual -	
	11	Process actual +	
	12	Not assigned	
Frequency - internally supplied	9	Clock input – (GND)	Switch below
	10	Not assigned	
	11	Clock input +	
	12	+24 V sensor power supply	
Frequency - externally supplied	9	Clock input –	Switch above
	10	Not assigned	
	11	Clock input +	
	12	Not assigned	
Pt 100[5]	9	Process actual 3 (GND)	Switch above
	10	Process actual 2 (compensation)	
	11	Process actual 1 (power supply)	
	12	Not assigned	

Tab. 7: Terminal assignment; process actual value input (for type 8693 only)

7.2.4 Terminal assignment: Operating voltage

Terminal	Assignment	On the device side	External circuit / signal level
16	Operating voltage +24V		24 V DC ± 10 % max. residual ripple 10 %
15	Operating voltage GND		

Tab. 8: Terminal assignment; operating voltage

When the operating voltage is applied, type 8692, 8693 is operating.
- Now make the required basic settings and adjustments for the position controller/process controller.

7.2.5 Slide switch position

Supplied	Assignment	Slide switch position
Internally supplied	GND operating voltage	Slide switch below
Externally supplied	GND is galvanically isolated from the operating voltage.	Slide switch above

Tab. 9: Slide switch position

The description EtherNet/IP, PROFINET, Modbus TCP and option büS can be found in operating instruction.

[5] For reasons of wire resistance compensation, connect the Pt 100 sensor via 3 wires. Always bridge Terminal 3 and Terminal 4 on the sensor.