Type 8692, 8693 REV.2

Positioner / Process Controller

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1 THE QUICKSTART

The quickstart 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 on the Internet at: www.buerkert.com

1.1 Definition of the term „Device“
In these instructions, the term „device“ always refers to the type 8692/8693 REV. 2.
1.2 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.

 ▪ Important tips and recommendations.

 ▪ Refers to information in these operating instructions or in other documentation.
  ▪ Designates an instruction to avoid a danger.
  ▪ Designates a work step to be performed.
  ▪ Indicates a result.

2 AUTHORIZED USE

Incorrect use of the type 8692 and 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 area, type 8692 and 8693 may be used only in accordance with the specification on the separate Ex rating plate. For the use, observe the ATEX manual with safety instructions for the Ex area.

 ▪ Devices without a separate Ex rating plate may not be used in a potentially explosive area.

 ▪ The device must not be exposed to direct sunlight.

 ▪ Pulsating direct voltage (rectified alternating voltage without smoothing) must not be used as operating voltage.

 ▪ During use observe the permitted data, the operating conditions and conditions of use specified in the contract documents and operating instructions, as described in chapter “6 Technical data” in this manual and in the valve manual for the respective pneumatically actuated valve.

 ▪ The device may be used only in conjunction with third-party devices and components recommended and authorised by Bürkert.

 ▪ In view of the wide range of possible application cases, check whether the device is suitable for the specific application case and check this out if required.

 ▪ Correct transportation, correct storage and installation and careful use and maintenance are essential for reliable and faultless operation.

 ▪ Use the 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@buerkert.com

International
Contact addresses can be found on the final pages of the printed operating instructions.
And also on the Internet at: www.burkert.com

4.2 Warranty
The warranty is only valid if the 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

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.
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
The electromotive valves, types 8692 and 8693, are compliant with EU directives as stated in the EU Declaration of Conformity (if applicable).

6.2 Standards
The applied standards, which are used to demonstrate conformity with the EU Directives, are listed in 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 2 and 22 in accordance with ATEX directive 94/9/EC 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

WARNUNG
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: IP65 / IP67 according to EN 60529
- Evaluated by UL: UL type 4x Rating

Operating altitude
up to 2000 m above sea level
6.5 Type label

Example:

8692 -E3-...-0
Single act Pilot 3.0
Pmax 7 bar
Tamb -10 - +55°C REV.2
S/N 1001
00123456

Fig. 3: Example of type label

2) only if cables, plugs and sockets have been connected correctly and in compliance with the exhaust air concept (see Chapter “10.5 Pneumatic connection”, page 21.)

6.5.1 UL additional label

Example:

Degree of protection
Circuit with limited power
Supply voltage device

Type 4X enclosure
NEC Class 2 only
Supply voltage: 24V

Fig. 4: UL additional label (example)

6.6 Mechanische Daten

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

6.7 Pneumatische Daten

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/m³
Water content Quality class 3,
max. pressure dew point -20 °C (-4 °F)
or min. 10°C (50 °F) below the lowest operating temperature
Oil content Quality class X: max. 25 mg/m³
Temperature range control medium 0...+ 50 °C (32...122 °F)
Pressure range control medium 3...7 bar (44...102 psi)
Air flow rate pilot valve 7 lN / min (for aeration and deaeration)
(QNn-value according to definition)
## Technical data

**Connections**

- for pressure drop from 7 to 6 bar absolute)
- optional: 130 \( I_N \) / min (for aeration and deaeration) (only single-acting connections)

- Plug-in hose connector \( 6 \) 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”.

<table>
<thead>
<tr>
<th>Protection class</th>
<th>III as per DIN EN 61140 (VDE 0140-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anschlüsse</td>
<td>Cable gland M16 x 1.5, size 22 (clamping area 5...10 mm) with connection terminals for cable cross-sections 0.14...1.5 mm² (24 V DC) or circular plug-in connectors (M12 x 1) (24 V DC, PROFIBUS DP, DeviceNet, EtherNet/IP, PROFINET I/O, Modbus TCP)</td>
</tr>
<tr>
<td>Pilot valve operating voltage</td>
<td>24 V DC ± 10 %, max. residual ripple 10 %</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 5 W</td>
</tr>
<tr>
<td>Input data for actual value signal</td>
<td></td>
</tr>
<tr>
<td>4...20 mA:</td>
<td>Input resistance 70Ω, Resolution 12 bit</td>
</tr>
<tr>
<td>Frequency:</td>
<td>Measurement range 0...1000 Hz, Input resistance 20 kΩ, Resolution 1% of measurement value</td>
</tr>
<tr>
<td>Input signal Waveform</td>
<td>&gt; 300 mVss, Sine wave, square wave, triangle wave</td>
</tr>
</tbody>
</table>
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 70Ω
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 current limitation galvanically isolated, PNP
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

Communications software Bürkert-Communicator

7  OPERATION
7.1  Description of the operating and display elements

Display elements of the process level:

- 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
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.

<table>
<thead>
<tr>
<th>Key</th>
<th>Function of the keys</th>
<th>Description of the function</th>
<th>Operating state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrow key ▲</td>
<td>OPN</td>
<td>Manual opening of the actuator</td>
<td>MANUAL</td>
</tr>
<tr>
<td>Arrow key ▼</td>
<td>CLS</td>
<td>Manual closing of the actuator</td>
<td>MANUAL</td>
</tr>
<tr>
<td>Selection key</td>
<td>MENU</td>
<td>Change to the setting level</td>
<td>AUTOMATIC or MANUAL</td>
</tr>
<tr>
<td>Selection key</td>
<td>AUTO</td>
<td>Return to AUTOMATIC operating state</td>
<td>MANUAL</td>
</tr>
<tr>
<td></td>
<td>MANUAL</td>
<td>Change to MANUAL operating state</td>
<td>AUTOMATIC</td>
</tr>
</tbody>
</table>

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.

3) 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.
Function of the keys on the setting level:

<table>
<thead>
<tr>
<th>Key</th>
<th>Function of the keys</th>
<th>Description of the function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrow key</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▲</td>
<td>Scroll up in the menus</td>
<td></td>
</tr>
<tr>
<td>▼</td>
<td>Scroll down in the menus</td>
<td></td>
</tr>
<tr>
<td>—</td>
<td>Decrease numerical values</td>
<td></td>
</tr>
<tr>
<td>←</td>
<td>Change by one digit to the left; when entering numerical values</td>
<td></td>
</tr>
<tr>
<td>Selection key</td>
<td>EXIT (BACK)</td>
<td>Return to the process level</td>
</tr>
<tr>
<td></td>
<td>ESC</td>
<td>Leave a menu</td>
</tr>
<tr>
<td></td>
<td>STOP</td>
<td>Stop a sequence</td>
</tr>
<tr>
<td>Selection key</td>
<td>ENTER</td>
<td>Select, activate or deactivate a menu option</td>
</tr>
<tr>
<td></td>
<td>SELECT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INPUT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXIT (BACK)</td>
<td>Gradually return from a submenu option</td>
</tr>
<tr>
<td></td>
<td>RUN</td>
<td>Start a sequence</td>
</tr>
<tr>
<td></td>
<td>STOP</td>
<td>Stop a sequence</td>
</tr>
</tbody>
</table>

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 ▲ ▼ (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) | MANU Press |
| Return to AUTOMATIC operating state | AUTO Press |
### 8.2 Displays in the AUTOMATIC operating state

<table>
<thead>
<tr>
<th>Type 8692</th>
<th>Description of the display</th>
<th>Type 8693</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POS</strong> X</td>
<td>Actual position of the valve actuator (0 ... 100%)</td>
<td><strong>POS</strong> X</td>
</tr>
<tr>
<td><strong>CMD</strong> X</td>
<td>Set-point position of the valve actuator (0 ... 100%)</td>
<td><strong>CMD</strong> X</td>
</tr>
<tr>
<td><strong>TEMP</strong> °C</td>
<td>Internal temperature in the housing of the type 8692/8693 (°C)</td>
<td><strong>TEMP</strong> °C</td>
</tr>
<tr>
<td><strong>PV</strong> m³/min</td>
<td>Process actual value</td>
<td><strong>PV</strong> m³/min</td>
</tr>
<tr>
<td><strong>SP</strong> m³/min</td>
<td>Process set-point value</td>
<td><strong>SP</strong> m³/min</td>
</tr>
<tr>
<td><strong>ST</strong> m³/min</td>
<td>Simultaneous display of the set-point position and the actual position of the valve actuator (0 ... 100 %)</td>
<td><strong>ST</strong> m³/min</td>
</tr>
</tbody>
</table>

#### Type 8692 - Description of the display
- **Graphical display of SP and PV with time axis**
- **Graphical display of POS and CMD 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**
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

Switch to the setting level as follows:
→ Select **MENU** and press for 3 seconds.
✓ You are on the setting level.

Switch to the process level as follows:
→ Select **EXIT**.
✓ You are on the process level.
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](image)

2. Align the puck of the actuator with the guide rail of type 8692/8693 (see “Fig. 9”).

![Fig. 9: Aligning the puck](image)

**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 (1.1 lbf ft).

→ 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)).
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”).

![Guide rail and puck alignment](image)

**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 (1.1 lbf ft).

→ 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)).

![Diagram of pneumatic connections](image)

**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”.

**Fig. 11:** Installation of the pneumatic connections, series 26xx and 27xx
→ 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 2₂ 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.

<table>
<thead>
<tr>
<th>Control function</th>
<th>Pneumatic connection type 8692, 8693 with actuator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pilot air outlet types 8692 and 8693</td>
</tr>
<tr>
<td></td>
<td>Pilot air port actuator</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td></td>
</tr>
<tr>
<td>Process valve</td>
<td>2₁</td>
</tr>
<tr>
<td>closed in rest</td>
<td>lower pilot air port of the actuator</td>
</tr>
<tr>
<td>position (by</td>
<td></td>
</tr>
<tr>
<td>spring force)</td>
<td>2₂</td>
</tr>
<tr>
<td></td>
<td>should be connected to the upper pilot air</td>
</tr>
<tr>
<td></td>
<td>port of the actuator</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td></td>
</tr>
<tr>
<td>Process valve</td>
<td>2₁</td>
</tr>
<tr>
<td>open in rest</td>
<td>upper pilot air port of the actuator</td>
</tr>
<tr>
<td>position (by</td>
<td></td>
</tr>
<tr>
<td>spring force)</td>
<td>2₂</td>
</tr>
<tr>
<td></td>
<td>should be connected to the lower pilot air</td>
</tr>
<tr>
<td></td>
<td>port of the actuator</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td></td>
</tr>
<tr>
<td>Process valve</td>
<td>2₁</td>
</tr>
<tr>
<td>closed in rest</td>
<td>lower pilot air port of the actuator</td>
</tr>
<tr>
<td>position</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2₂</td>
</tr>
<tr>
<td>Process valve</td>
<td>2₁</td>
</tr>
<tr>
<td>open in rest</td>
<td>upper pilot air port of the actuator</td>
</tr>
<tr>
<td>position</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2₂</td>
</tr>
</tbody>
</table>

**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.

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).

![Fig. 12: Pneumatic connection](image-url)
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.

Using the 4...20 mA set-point value input
If several devices of type 8692, 8693 are connected in series and the power supply to a device in this series connection fails, the input of the failed device becomes highly resistive. As a result, the 4...20 mA standard signal fails. In this case please contact Bürkert Service directly.
11.2 Electrical installation with circular plug-in connector

Procedure:

→ 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. For description see Chapter “12.2 Start-up type 8692”, page 28.

Designation of the circular plug-in connectors:

X1 - M12 circular connector, 8-pole

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color*</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>white</td>
<td>Digital input +</td>
</tr>
<tr>
<td>8</td>
<td>red</td>
<td>Set-point value + (0/4...20 mA / 0...5/10 V)</td>
</tr>
<tr>
<td>7</td>
<td>blue</td>
<td>Set-point value GND</td>
</tr>
</tbody>
</table>

Input signals of the control centre (e.g. PLC)

Output signals to the control centre (e.g. PLC)
(required for analogue output and/or binary output option only)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color*</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>brown</td>
<td>Digital outputs GND</td>
</tr>
<tr>
<td>3</td>
<td>green</td>
<td>Digital output 2</td>
</tr>
<tr>
<td>4</td>
<td>yellow</td>
<td>Digital output 1</td>
</tr>
<tr>
<td>5</td>
<td>gray</td>
<td>Analog position feedback GND</td>
</tr>
<tr>
<td>6</td>
<td>pink</td>
<td>Analog position feedback +</td>
</tr>
</tbody>
</table>

* The indicated colors refer to the connection cable available as an accessory (919061).

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

X5 - M8 circular connector, 4-pole (only Type 8693)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color*</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>brown</td>
<td>Operating voltage + 24 V DC</td>
</tr>
<tr>
<td>3</td>
<td>blue</td>
<td>Operating voltage GND</td>
</tr>
<tr>
<td>2</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

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

Tab. 4:  X6 - M12 circular connector, 4-pole (operating voltage)
### X5 - M8 circular connector, 4-pole - (for type 8693 only)

<table>
<thead>
<tr>
<th>Input type*</th>
<th>Pin</th>
<th>Assignment</th>
<th>Switch **</th>
</tr>
</thead>
<tbody>
<tr>
<td>4...20 mA - internally supplied</td>
<td>1</td>
<td>+24 V transmitter power supply</td>
<td>□ □ □</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Output from transmitter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>GND (identical to GND operating voltage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Bridge to GND (GND from 3-conductor transmitter)</td>
<td></td>
</tr>
<tr>
<td>4...20 mA - externally supplied</td>
<td>1</td>
<td>Not assigned</td>
<td>□ □ □</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Process actual +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Process actual –</td>
<td></td>
</tr>
<tr>
<td>Frequency - internally supplied</td>
<td>1</td>
<td>+24 V sensor power supply</td>
<td>□ □ □</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Clock input +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Clock input – (GND)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>Frequency - externally supplied</td>
<td>1</td>
<td>Not assigned</td>
<td>□ □ □</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Clock input +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Clock input –</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>Pt 100 (see information below)</td>
<td>1</td>
<td>Not assigned</td>
<td>□ □ □</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Process actual 1 (power supply)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Process actual 3 (GND)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Process actual 2 (compensation)</td>
<td></td>
</tr>
</tbody>
</table>

* Adjustable via software (see operating instructions type 8692/8693 Rev.2 “Setting the input signal”).
** Position of the switch, see “Fig. 14: Cable gland connection”.

---

**11.2.1 Slide switch position**

<table>
<thead>
<tr>
<th>Supplied</th>
<th>Assignment</th>
<th>Slide switch position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internally supplied</td>
<td>GND operating voltage</td>
<td>Slide switch on left</td>
</tr>
<tr>
<td>Externally supplied</td>
<td>GND is galvanically isolated from the operating voltage.</td>
<td>Slide switch on right</td>
</tr>
</tbody>
</table>

---

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

**Tab. 6: Slide switch position**

The description EtherNet/IP, PROFINET and Modbus TCP can be found in chapter “13”.

The description option büS can be found in chapter “14”.

---

Tab. 5: X5 - M8 circular plug, 4-pole, input signals process actual value
### 11.3 Electrical installation with cable gland

**WARNING**

Risk of injury from improper installation.
- Installation may be carried out by authorized technicians only and using 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.

**DANGER**

Risk of injury due to electric shock.
- Before reaching into the system, switch off the power supply and secure to prevent reactivation.
- Observe the applicable accident prevention regulations and safety regulations for electrical equipment.

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. 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, type 8692, 8693 is operating.
→ Now make the required basic settings and adjustments for the position controller and process controller. The procedure is described in chapter “12 Start-up”.

**Fig. 14: Cable gland connection**

---

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

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Digital input +</td>
</tr>
<tr>
<td>7</td>
<td>Set-point value GND</td>
</tr>
<tr>
<td>8</td>
<td>Set-point value +</td>
</tr>
<tr>
<td>13</td>
<td>Not assigned</td>
</tr>
<tr>
<td>14</td>
<td>Digital input GND</td>
</tr>
</tbody>
</table>

Tab. 7: Terminal assignment; input signals of the control center

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

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Analog position feedback GND</td>
</tr>
<tr>
<td>2</td>
<td>Analog position feedback +</td>
</tr>
<tr>
<td>3</td>
<td>Digital output GND</td>
</tr>
<tr>
<td>4</td>
<td>Digital output 2</td>
</tr>
<tr>
<td>5</td>
<td>Digital output 1</td>
</tr>
</tbody>
</table>

Tab. 8: Terminal assignment; output signals to the control center

11.3.3 Process actual value input (for Type 8693 only)

<table>
<thead>
<tr>
<th>Input type*</th>
<th>Terminal</th>
<th>Assignment</th>
<th>Switch **</th>
</tr>
</thead>
<tbody>
<tr>
<td>4...20 mA - internally supplied</td>
<td>9</td>
<td>GND (identical to GND operating voltage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Bridge after GND (GND from 3-conductor transmitter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Output from transmitter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>+24 V transmitter power supply</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency - internally supplied</th>
<th>Terminal</th>
<th>Assignment</th>
<th>Switch **</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>4...20 mA - externally supplied</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Process actual -</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Process actual +</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency - externally supplied</th>
<th>Terminal</th>
<th>Assignment</th>
<th>Switch **</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Clock input – (GND)</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Clock input +</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>+24 V sensor power supply</td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

*Input type
**Switch
### 11.3.4 Terminal assignment: Operating voltage

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Assignment</th>
<th>On the device side</th>
<th>External circuit / signal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Operating voltage +24V</td>
<td><img src="image" alt="Diagram" /></td>
<td>24 V DC ± 10 % max. residual ripple 10 %</td>
</tr>
<tr>
<td>15</td>
<td>Operating voltage GND</td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>

Tab. 10: 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. For a description see chapter “12 Start-up.”

### 11.3.5 Slide switch position

<table>
<thead>
<tr>
<th>Supplied</th>
<th>Assignment</th>
<th>Slide switch position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internally supplied</td>
<td>GND operating voltage</td>
<td>Slide switch below</td>
</tr>
<tr>
<td>Externally supplied</td>
<td>GND is galvanically isolated from the operating voltage.</td>
<td>Slide switch above</td>
</tr>
</tbody>
</table>

Tab. 11: Slide switch position

The description EtherNet/IP, PROFINET and Modbus TCP can be found in chapter “13.”
The description option büS can be found in chapter “14.”

---

**Tab. 9: Terminal assignment; process actual value input (for type 8693 only)**

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

---

**Tab. 11: Slide switch position**
12  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.

12.1  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.

12.2  Start-up type 8692

12.2.1  Specifying the basic settings

The basic settings are made on the setting level. To switch from the process level 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 position controller (X.TUNE)

Setting the input signal (INPUT)

This setting is used to select the input signal for the set-point value.

Set the input signal as follows:
→ Press MENU for 3 s. Switching from process level ⇔ setting level.
→ Select INPUT.
→ Select ENTER. The possible input signals for INPUT are displayed.
→ Select input signal (4...20 mA, 0...20 mA, ...).
→ Select SELECT. The selected input signal is now marked by a filled circle.
→ Select EXIT. Return to the main menu (MAIN).
→ Select EXIT. Switching from setting level ⇔ process level.
✓ You have entered the operating mode of the valve actuator.
Automatic adjustment of the position controller to the operating conditions (X.TUNE)

**WARNING**

Danger due to the valve position changing when the X.TUNE function is running.

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.

For starting up you must specify the following basic settings:

- Setting the input signal (INPUT)
- Automatic adjustment of the position controller (X.TUNE)
- Adjustment of the controller parameters for the position controller. 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.

Automatically adjust the position controller as follows:

→ Press MENU for 3 s. Switching from process level ⇒ setting level.

→ ▲ / ▼ Select X.TUNE.

→ Hold down RUN as long as countdown (5 ...) is running.

During the automatic adjustment messages are displayed indicating the progress of the X.TUNE (e.g. “TUNE #1...”).

When the automatic adjustment ends, the message “TUNE ready” is indicated.

→ Press any key. Return to the main menu (MAIN).

→ ▲▼ Select EXIT. Switching from setting level ⇒ process level.

✓ You have automatically adjusted the position controller.

You must exit the main menu by pressing the left selection key EXIT before the modified data is saved in the memory (EEPROM).

3) “TUNE err/break” if a fault occurs.
12.3 Start-up type 8693

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

1. Setting up the position controller:
   Description see “12.2.1 Specifying the basic settings”.

2. Setting up the process controller:

   → Add the auxiliary function \textit{P.CONTROL} to the main menu (MAIN) using the configuration menu (\textit{ADD.FUNCTION}).

   Activate the process controller as follows:
   → Press \textbf{MENU} for 3 s. Switching from process level \(\leftrightarrow\) setting level.
   → \(\uparrow/\downarrow\) Select \textbf{ADD.FUNCTION}.
   → \(\uparrow/\downarrow\) Select \textbf{ENTER}. The possible auxiliary functions are displayed.
   → \(\uparrow/\downarrow\) Select \textbf{P.CONTROL}.
   → \(\uparrow/\downarrow\) Select \textbf{ENTER}. \textit{P.CONTROL} is now marked by a cross \(\times\).
   → \(\uparrow/\downarrow\) Select \textbf{EXIT}. Acknowledgment and simultaneous return to the main menu (MAIN).

   \(\textbf{P.CONTROL}\) is now activated and incorporated into the main menu.

   \(\checkmark\) You have activated the process controller.

12.3.1 Basic settings of the process controller

→ In the main menu (MAIN) select the \textit{P.CONTROL} function and implement the basic settings.

Set up the process controller as follows:

→ \(\uparrow/\downarrow\) Press \textbf{MENU} for 3 s. Switching from process level \(\leftrightarrow\) setting level.

→ \(\uparrow/\downarrow\) Select \textbf{P.CONTROL}. Selection in the main menu (MAIN).

→ \(\uparrow/\downarrow\) Select \textbf{ENTER}. The submenu options for the basic setting are displayed.

→ \(\uparrow/\downarrow\) Select \textbf{SETUP}.

→ \(\uparrow/\downarrow\) Select \textbf{ENTER}. The menu for setting up the process controller is displayed.

Setup is described in the operating instructions in chapter “15.2 SETUP – Setting up the process controller”.

→ \(\uparrow/\downarrow\) Select \textbf{EXIT}. Return to \textbf{P.CONTROL}.

\(\checkmark\) You have set up the process controller.
Parameterize the process controller as follows:
→ 

Press **MENU** for 3 s. Switching from process level ⇔ setting level.

→ ▲ / ▼ Select P.CONTROL. Selection in the main menu (MAIN).
→ 

Select **ENTER**. The submenu options for the basic setting are displayed.

→ ▲ / ▼ Select **PID.PARAMETER**.
→ 

Select **ENTER**. The menu for parameterizing the process controller is displayed. Parameterization is described in the operating instructions in chapter “15.3 PID.PARAMETER – Parameterization of the process controller”.
→ 

Select **EXIT**. Return to P.CONTROL.
→ 

Select **EXIT**. Return to the main menu (MAIN).
→ 

Select **EXIT**. Switching from setting level ⇔ process level.

✔ You have parameterized the process controller.

---

**P.CONTROL - settings:**

<table>
<thead>
<tr>
<th><strong>PID.PARAMETER</strong></th>
<th>Parameterization of the process controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DBND</strong> 0,1 %</td>
<td>Insensitivity range (dead band) of the PID process controller</td>
</tr>
<tr>
<td><strong>KP</strong> 0,00</td>
<td>Amplification factor of the process controller</td>
</tr>
<tr>
<td><strong>TN</strong> 0,5</td>
<td>Reset time</td>
</tr>
<tr>
<td><strong>TV</strong> 0,0</td>
<td>Hold-back time</td>
</tr>
<tr>
<td><strong>X0</strong> 0,0 %</td>
<td>Operating point</td>
</tr>
<tr>
<td><strong>FILTER</strong> 0</td>
<td>Filtering of the process actual value input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SETUP</strong></th>
<th>Setting up the process controller</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PV-INPUT</strong></td>
<td>Indication of the signal type for process actual value</td>
</tr>
<tr>
<td><strong>PV-SCALE</strong></td>
<td>Scaling the process controller</td>
</tr>
<tr>
<td><strong>SP-INPUT</strong></td>
<td>Type of the set-point value default (internal or external)</td>
</tr>
<tr>
<td><strong>SP-SCALE</strong></td>
<td>Scaling the position controller (for external set-point value default only)</td>
</tr>
<tr>
<td><strong>P.CO-INIT</strong></td>
<td>Enables a smooth switchover between operating states AUTOMATIC and MANUAL</td>
</tr>
</tbody>
</table>

---

Tab. 12: 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”).

english
12.3.2 Manually changing the process set-point value

Procedure:
1. Set the set-point value default on the setting level:
   
   In the main menu (MAIN), select the P.CONTROL function
   
   ![Diagram of menu selection]

   → 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)

   ![Diagram of value entry]

Fig. 15: Enter values

13 ETHERNET/IP, PROFINET AND MODBUS TCP

The quickstart describes only 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.

13.1 Electrical installation

Procedure:
→ Connect type 8692, 8693 according to the tables.

A setscrew with nut is located on the electrical connection housing for connection of the technical ground.

→ Connect setscrew to a suitable grounding point. To guarantee 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 position controller/process controller. See chapter “12 Start-up”.
13.2 View Field bus connection

![Field bus connection diagram](image)

**Fig. 16: Field bus connection**

13.3 Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network speed</td>
<td>10/100 mbps</td>
</tr>
<tr>
<td>Auto negotiation</td>
<td>Yes</td>
</tr>
<tr>
<td>Switch function</td>
<td>Yes</td>
</tr>
<tr>
<td>Network diagnostics</td>
<td>Yes, via fault telegram</td>
</tr>
<tr>
<td>MAC-ID</td>
<td>Individual identification number, stored in the module and on the outside of the device (see type label)</td>
</tr>
<tr>
<td>Device name Ethernet (factory settings)</td>
<td>Positioner / process controller (name can be changed)</td>
</tr>
</tbody>
</table>

13.4 Electrical connection

**DANGER**

Risk of injury due to electric shock.
- Before reaching into the system, switch off the power supply and secure to prevent reactivation.
- Observe the applicable accident prevention regulations 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.
- Secure system against unintentional activation.
- Following installation, ensure a controlled restart.

The EtherNet/IP is connected with an M12 circular plug-in connector, 4-pole D-coded.

**Table 13: Electrical assignment EtherNet/IP**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transmit +</td>
</tr>
<tr>
<td>2</td>
<td>Receive +</td>
</tr>
<tr>
<td>3</td>
<td>Transmit –</td>
</tr>
<tr>
<td>4</td>
<td>Receive –</td>
</tr>
</tbody>
</table>

Risk of injury from unintentional activation of the system and uncontrolled restart.
- Secure system against unintentional activation.
- Following installation, ensure a controlled restart.
X6 - M12 circular connector, 4-pole:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color*</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>brown</td>
<td>Operating voltage + 24 V DC</td>
</tr>
<tr>
<td>2</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>blue</td>
<td>Operating voltage GND</td>
</tr>
<tr>
<td>4</td>
<td>Not assigned</td>
<td></td>
</tr>
</tbody>
</table>

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

Tab. 14: X6 - M12 circular connector, 4-pole (operating voltage)

**NOTE**

To ensure electromagnetic compatibility (EMC), use a shielded Ethernet cable. Ground the cable shield on both sides, on each of the connected devices. For the grounding use a short line (max. 1 m) with a cross-section of at least 1.5 mm².

---

**13.5 Bus status display**

The bus status is indicated on the display on the device.

<table>
<thead>
<tr>
<th>Display (is displayed approx. every 3 seconds)</th>
<th>Device state</th>
<th>Explanation</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUS no connection</strong></td>
<td>Online, No connection to the master.</td>
<td>Device is connected correctly to the bus, the network access procedure has ended without errors, however there is no established connection to the master.</td>
<td>New connection established by master.</td>
</tr>
<tr>
<td><strong>BUS critical err</strong></td>
<td>Critical bus fault.</td>
<td>Other device with the same address in the network. <strong>BUS offline</strong> due to communication problems.</td>
<td>Change address of the device and restart device. Fault analysis in the network with a bus monitor.</td>
</tr>
</tbody>
</table>

Tab. 15: Bus status display; EtherNet
13.5.1 BUS.COMM – Settings on type 8692, 8693
Set the following menu options in the BUS.COMM menu for start-up of the EtherNet version:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUS FAIL</strong></td>
<td>Activate or deactivate approach of the safety position</td>
</tr>
</tbody>
</table>

**Selection SafePos off** – The actuator remains in the position which corresponds to the set-point value last transferred (default setting).

**Selection SafePos on** – If there is a fault in the bus communication, the behavior of the actuator depends on the activation of the SAFEPOS auxiliary function. See chapter “16.1.13 SAFEPOS – Inputting the safety position”.

SAFEPOS activated: The actuator moves to the safety position which is specified in the SAFEPOS auxiliary function.

SAFEPOS deactivated: The actuator moves to the safety end position which it would assume if the electrical and pneumatic auxiliary power failed. See chapter “10.9 Safety end positions after failure of the electrical or pneumatic auxiliary power”.

14 büS OPTION

14.1 Electrical installation
Procedure:
→ Connect type 8692, 8693 according to the tables. A setscrew with nut is located on the electrical connection housing for connection of the technical ground.

→ Connect setscrew to a suitable grounding point. To guarantee 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 position controller/process controller. See chapter “12 Start-up”.

14.2 Definition
büS is a field bus which is based on CANopen with additional functionality for networking several devices.
14.3 Electrical installation - büS

**DANGER**

Risk of injury due to electric shock.
- Before reaching into the system, switch off the power supply and secure to prevent reactivation.
- Observe the applicable accident prevention regulations 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.

### 14.3.1 Electrical connection

X3 - circular plug-in connector M12x1, 5-pole, male:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAN shield</td>
<td>CAN shield</td>
</tr>
<tr>
<td>2</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Black</td>
<td>Black GND / CAN_GND</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>White CAN_H</td>
</tr>
<tr>
<td>5</td>
<td>Blue</td>
<td>Blue CAN_L</td>
</tr>
</tbody>
</table>

*Table 16: Connection of the circular plug-in connector*

X6 - M12 circular connector, 4-pole:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire color*</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>brown</td>
<td>Operating voltage</td>
</tr>
<tr>
<td>2</td>
<td>Not assigned</td>
<td>+ 24 V DC</td>
</tr>
<tr>
<td>3</td>
<td>blue</td>
<td>Operating voltage</td>
</tr>
<tr>
<td>4</td>
<td>Not assigned</td>
<td>GND</td>
</tr>
</tbody>
</table>

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

*Table 17: X6 - M12 circular connector, 4-pole (operating voltage)*

**Electrical installation with or without büS network:**
To be able to use the büS network (CAN interface), a 5-pole circular connector and a shielded 5-wire cable must be used.

**Fig. 18: 5-pole M12 plug (example type 8693)**
### SAFETY END POSITIONS

<table>
<thead>
<tr>
<th>Actuator system</th>
<th>Designation</th>
<th>Safety end positions after failure of the</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>electrical auxiliary power</td>
<td>pneumatic auxiliary power</td>
</tr>
<tr>
<td></td>
<td></td>
<td>down</td>
<td>down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control system for high air flow rate (DN 2,5):</td>
<td>control system for low air flow rate (DN 0,6):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>down</td>
<td>not defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control system for high air flow rate (DN 2,5):</td>
<td>control system for low air flow rate (DN 0,6):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>up</td>
<td>not defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>down / up (depending on the installation of the pneumatic connection)</td>
<td>not defined</td>
</tr>
</tbody>
</table>

*Tab. 18: Safety end positions*

### REMOVAL OF TYPE 8692, 8693

**WARNING**

Risk of injury from improper disassembly.
- Removal may be carried out by authorized technicians only and using 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.
16.1 Disconnecting the pneumatic connections

**DANGER**

Risk of injury from high pressure.
- Before loosening lines and valves, turn off the pressure and vent the lines.

![Diagram of pneumatic connections](image)

Type 8692, 8693 with process valve of type 2103, 2300 or 2301

Type 8692, 8693 with process valve of series 26xx or 27xx

**Fig. 19:** Removing the pneumatic connections

→ Disconnect the pneumatic connections to type 8692, 8693.

For process valves belonging to series 26xx and 27xx:
→ Disconnect the pneumatic connections to the actuator.

16.2 Disconnecting electrical connections

**DANGER**

Risk of injury due to electric shock.
- Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation.
- Observe the applicable accident prevention regulations and safety regulations for electrical equipment.

![Diagram of electrical connections](image)

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 cables.

**Fig. 20:** Disconnecting electrical connections

Connection with circular plug-in connector

Connection with connection terminals

Electrical connection housing

Cable gland

Connection cover
16.3 Removing Type 8692, 8693

Fig. 21: Disconnecting electrical connections
→ Release the fastening screws.
→ Remove type 8692, 8693.

17 ACCESSORIES

17.1 Communications software
The PC software Bürkert-Communicator is designed for communication with Bürkert devices.

A detailed description for installing and operating the PC software can be found in the associated operating instructions.

Download the software from: www.buerkert.de

17.2 USB interface
To communicate with the devices, the PC requires a USB interface and the USB büS interface set available as an accessory.

USB büS interface set

| büS standard set (büS stick + 0.7 m cable with M12 plug) | Order no. 772551 |
| büS adapter for büS service interface (M12 to büS service interface micro USB) | Order no. 773254 |

Fig. 22: Components USB büS interface set

The data transfer must be according to CANopen specification.

Information on type 8692, 8693 can be found on the Internet at www.buerkert.de

• Additional accessories (in the operating instructions)
18 PACKAGING, TRANSPORT, STORAGE

NOTE

Transportschäden.

Inadequately protected devices may be damaged during transportation.

▶ Protect the device against moisture and dirt in shock-resistant packaging during transportation.
▶ Prevent the temperature from exceeding or dropping below the permitted storage temperature.

Incorrect storage may damage the device.

▶ Store the device in a dry and dust-free location.
▶ Storage temperature: -20…+65 °C (-40...158 °F).

18.1 DISPOSAL

NOTE

Damage to the environment caused by parts contaminated with media.

▶ Dispose of the device and packaging in an environmentally friendly manner.
▶ Observe applicable disposal and environmental regulations.

⚠️ Observe the national waste disposal regulations.