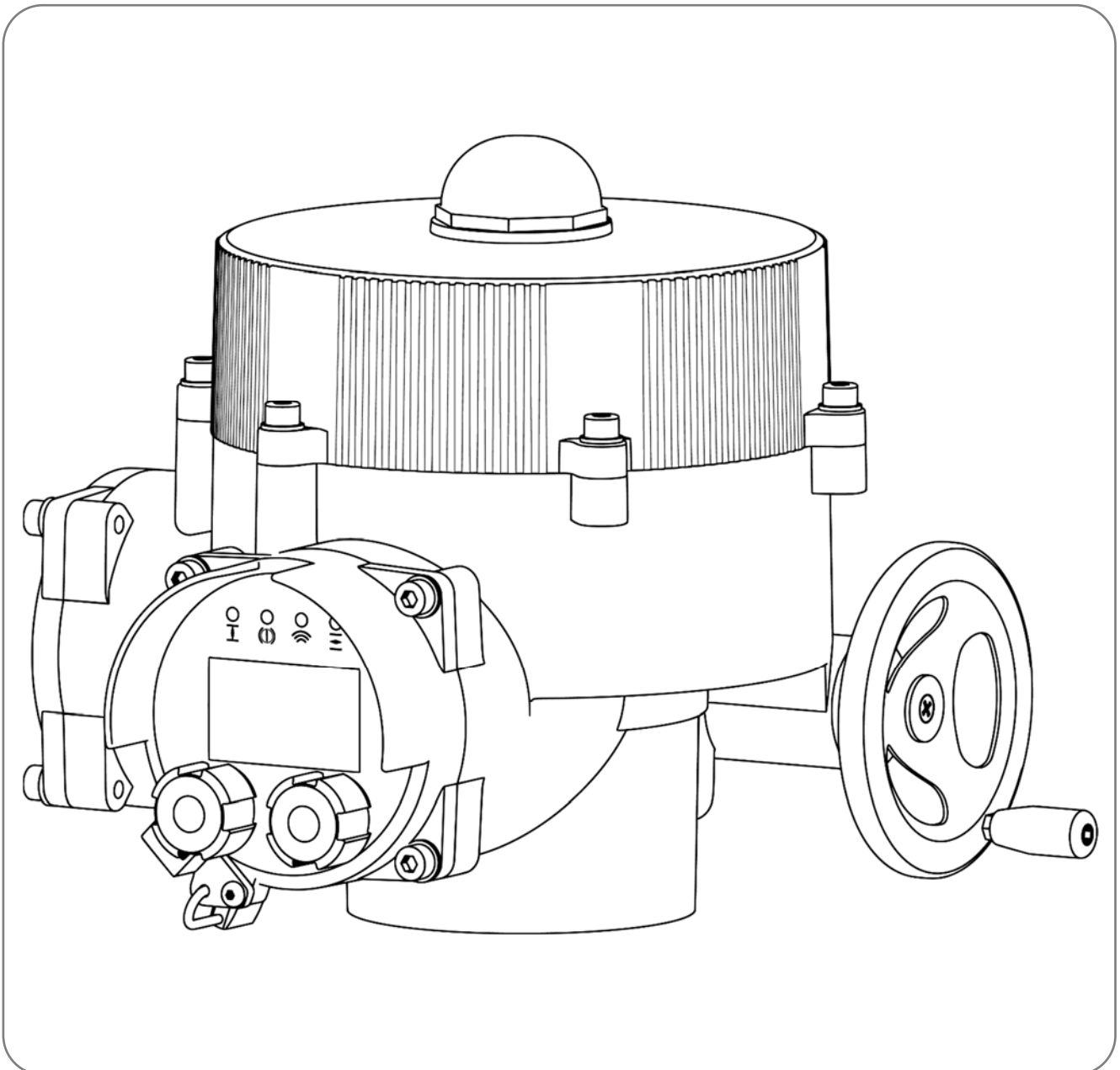


# Operating Instructions

## PS-AMS Series PSQ-S



Subject to changes!

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# 1. Symbols and safety

## General dangers of non-compliance with safety regulations

PS-AMS PSQ actuators are built at state-of the art technology and are safe to operate. Despite of this, the actuators may be hazardous if operated by personnel that has not been sufficiently trained or at least instructed, and if the actuators are handled improperly, or not used as per specification.

This may

- cause danger to life and limb of the user or a third party,
- damage the actuator and other property belonging to the owner,
- reduce safety and function of the actuator.

To prevent such problems, please ensure that these operating instructions and the safety regulations in particular have been read and understood by all personnel involved in the installation, commissioning, operation, maintenance and repair of the actuators.

## Basic safety notes

- The actuators may only be operated by skilled and authorized operating personnel.
- Make sure to follow all security advices mentioned in this manual, any national rules for accident prevention, as well as the owner's instructions for work, operation and safety.
- The isolating procedures specified in these Operating Instructions must be followed for all work pertaining to the installation, commissioning, operation, change of operating conditions and modes, maintenance, inspection, repair and installation of accessories
- Before opening the actuator cover, ensure that mains supply is isolated and prevented from unintended re-connection.
- Areas that can be under voltage have to be isolated before working on them.
- Ensure that the actuators are always operated in faultless condition. Any damage or faults, and changes in the operational characteristics that may affect safety, must be reported at once.

## Danger signs

The following danger signs are used in this operating manual:



**Caution!** There is a general risk of damage related to health and/or properties.



**Danger!** Electrical voltages are present that may lead to death. Life threatening risks may occur due to electrical voltages! Avoid personal or material damages by observing applicable regulations and safety standards!



**Danger!** This sign warns of hazards posing a risk to health. Ignoring these instructions can lead to injuries.



**Attention!** Observe precautions for handling. Electrostatic sensitive devices.

## Other notes

- The motor surface temperature may rise when maintaining, inspecting and repairing the actuator immediately after the operation. There is a danger of burning the skin!
- Always consult the relevant operating instructions when mounting accessories or operating the actuator with accessories supplied by PS Automation.
- Connections for signal in- and output are double isolated from circuits that can be under dangerous voltage.

## 2. Usage as per specification

- The PS-AMS PSQ-S quarter-turn actuators are constructed exclusively for use as electric valve actuators. They are designed for assembly with valves and their motorised operation.
- Any use other than this is considered unintended use. The manufacturer is not liable for damage resulting from this.
- The PS-AMS PSQ-S quarter-turn actuators shall not be used outside the limit values cited in the datasheet, catalogue and/or order documentation. Infringement negates all liability on the part of the manufacturer for any resultant damages.
- Proper intended use also includes compliance with the operating, maintenance and repair conditions from the manufacturer.
- Mounting and adjustment of the PS-AMS PSQ-S quarter-turn actuator as well as the implementation of maintenance are not considered as intended use. Enhanced safety precautions must be implemented in such situations!
- The PS-AMS PSQ-S quarter-turn actuators may only be used, serviced and repaired by persons who are familiar with them and who have been briefed with regard to the hazards. Observe the applicable national accident prevention regulations.
- Unauthorised modifications to the PS-AMS PSQ-S quarter-turn actuators negate all liability on the part of the manufacturer for any resultant damages.

## 3. Storage

The following points must be observed for proper storage:

- Store on a rack, on wooden pallet or similar to protect from ground moisture
- Cover to protect from dust and dirt
- Protect quarter-turn actuators from mechanical damage
- Seal hood, cover and cable glands

## 4. Disposal and recycling



According to 2012/19/EU on waste electrical and electronic equipment (WEEE), the devices described here must not be disposed of via municipal waste disposal companies. If you are unable or unwilling to arrange for disposal by a specialist company, you may return the equipment to the manufacturer, who will then ensure that the equipment is disposed of properly for a flat fee.

## 5. Method of operation

The PS-AMS PSQ-S electrical quarter-turn actuator is designed for the actuation of quarter-turn valves. Due to the use of an exchangeable drive bush, the quarter-turn actuator can be simply adapted to the valve shaft.

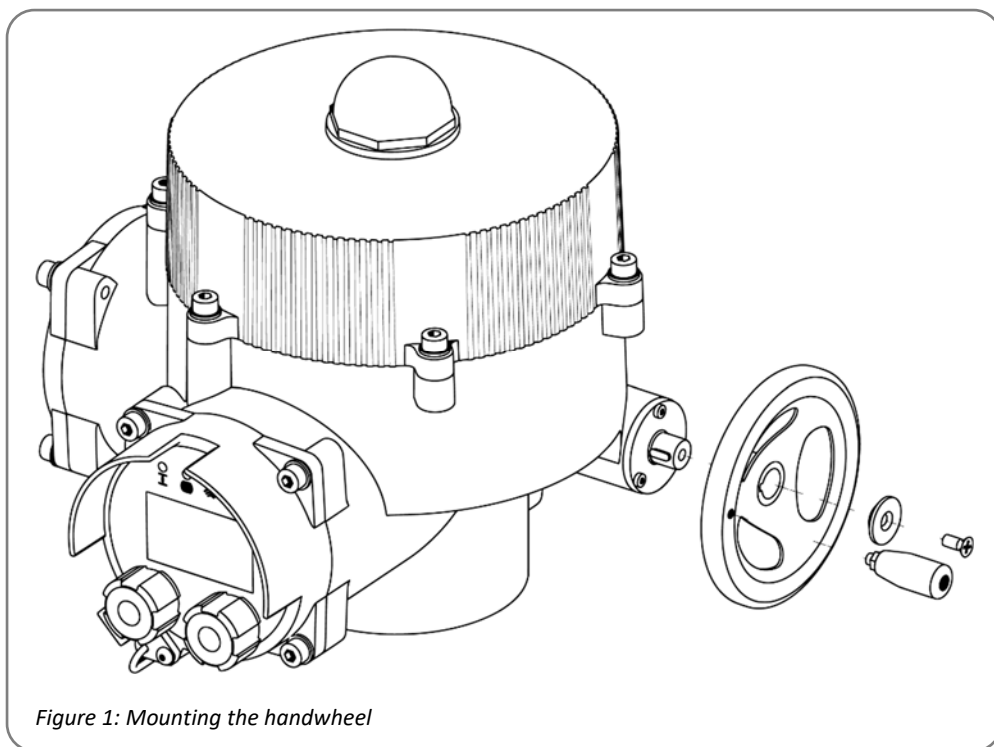
The rotary movement of the output drive is detected by a contactless, absolutely encoded sensor system and electronically evaluated. The powerful and energy-efficient brushless DC is regulated and monitored by the electronics. Its torque is transferred to the output drive via compact multi-stage planetary gear.

The torque of the actuator is electronically monitored and limited.

The valve position is indicated by a contactless mechanical position indication in the cover of the quarter-turn actuator.

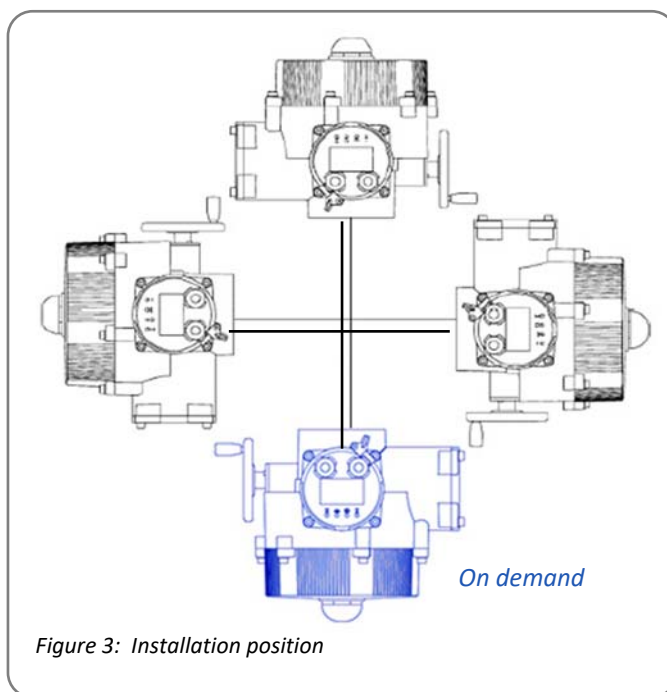
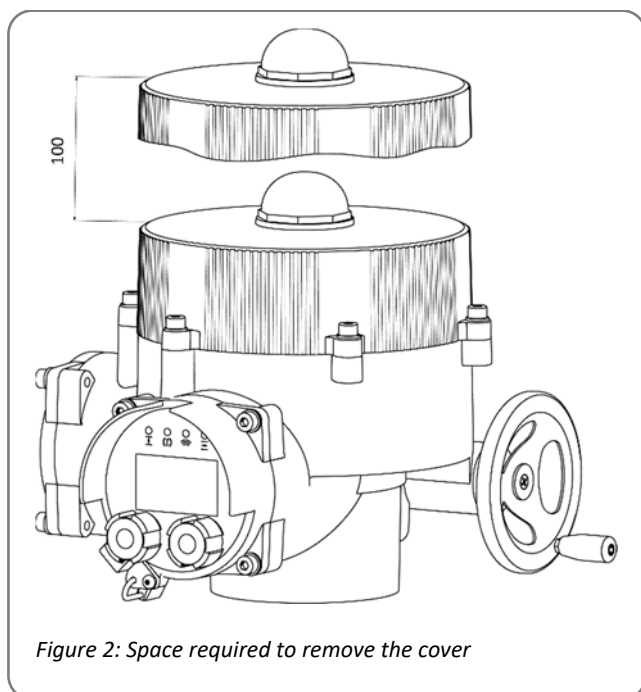
## 6. Mechanical assembly

### 6.1 Mounting the manual override



### 6.2 Installation position

The actuator may be installed in any orientation.



### 6.3 Flange connection / valve mounting

The quarter-turn actuator is designed for universal mounting on ISO 5211 flanges.

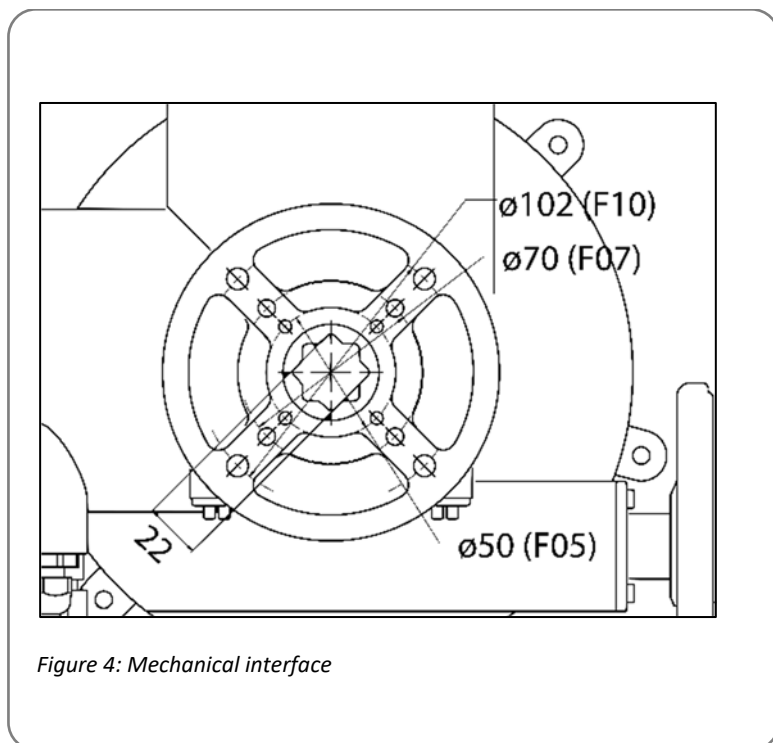


Figure 4: Mechanical interface

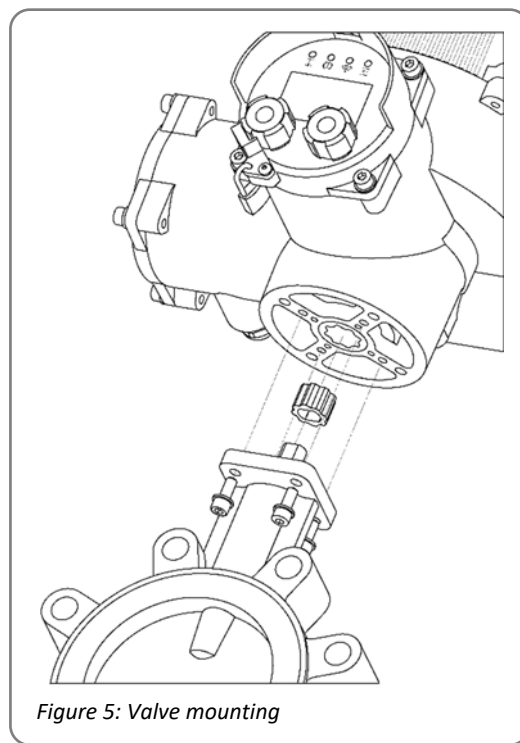


Figure 5: Valve mounting

### 6.4 Adjusting the mechanical end positions

Two adjustable mechanical end stops allow the mechanical limitation of the travel angle of the actuator. The setting shown here is for valves closing in clockwise direction. For valves closing in counter-clockwise direction, the respective opposite screws must be adjusted.



**When adjusting the mechanical end stops, the actuator shall be actuated only with the handwheel (not electrically).**

- Remove the protective caps (Fig. 6; item 3) from the two adjusting screws.
- Unscrew the two hexagon socket screws underneath by ca. 5 revolutions.
- Turn the actuator in clockwise direction via the handwheel until the valve is closed.
- Screw in the adjusting screw for the CLOSED position (Fig. 6; item 1) until it reaches the stop.
- Turn the actuator in counter-clockwise direction via the handwheel until the valve is open.
- Screw in the adjusting screw for the OPEN position (Fig. 6; item 2) until it reaches the stop.
- Put the protective covers in place and tighten carefully.

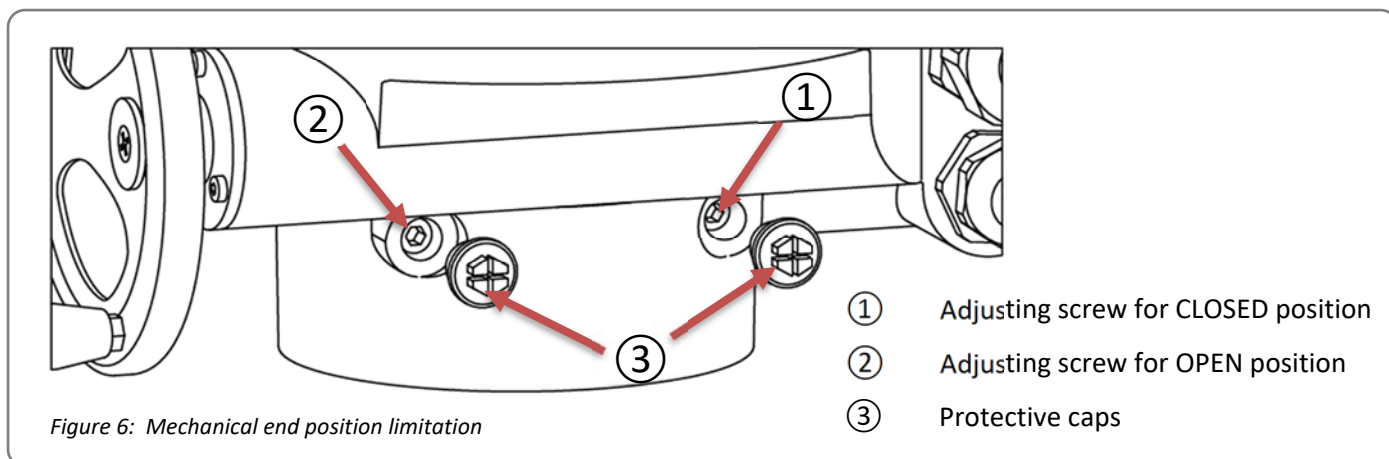


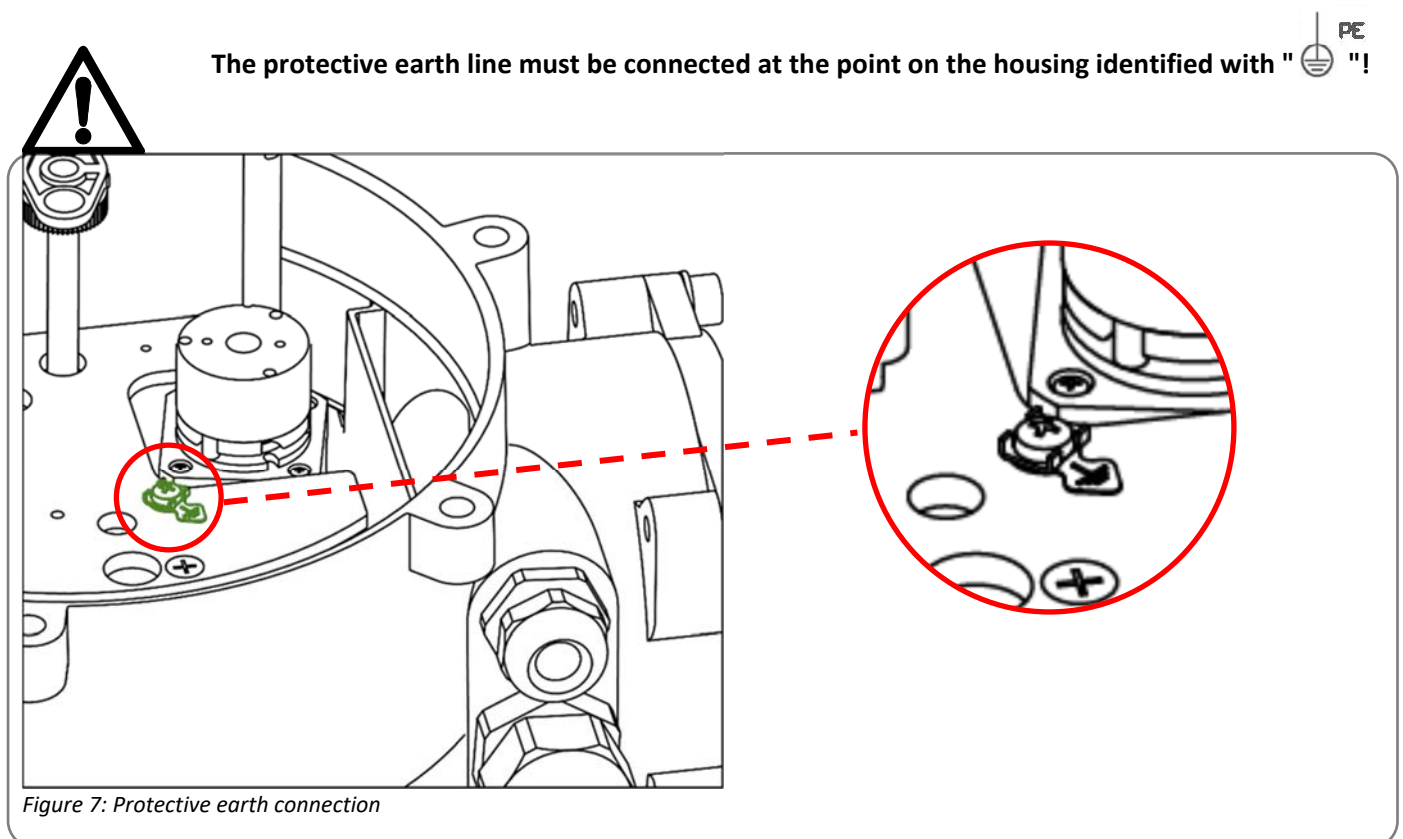
Figure 6: Mechanical end position limitation

## 7. Electric supply

### 7.1 Safety instructions

- During the connection of the mains voltage, this must be disconnected and secured against unintended reactivation!
- Electrical connections shall be implemented only by an electrician and in compliance with DGUV regulation 3 [German accident prevention regulations]!
- Observe EN 60204-1 (VDE 0113 Part 1) in order to guarantee the safety of personnel and property as well as the maintenance of functional capability.
- The mains connection wiring must be rated for the largest current draw of the device and must comply with IEC 227 and IEC 245.
- Yellow-green coloured wiring shall be used only for connecting the protective earth connections.
- When feeding the cables through the cable gland on the actuator side, observe their minimum bend radius.
- The PS-AMS PSQ-S electrical actuators do not have an internal device for electrical disconnection, so a switch or circuit breaker must be provided in the building installation. This must be located close to the actuator, easily accessible to the operator and identified as a disconnection device for the actuator.
- The building installation and the over-current protection devices must be designed to be compliant with the DIN IEC 60364-4-41 standard for the connection of actuators of protection class I or protection class III at 24 VAC / 24 VDC.
- All mains connection lines and control lines must be mechanically secured ahead of the terminals with suitable measures to prevent unintentional loosening. Mains connection lines and control lines shall not be routed together in one line but rather two separated lines shall be used in all situations!

### 7.2 Protective earth connection



### 7.3 Mains connection

Attention: Mains voltage, mains frequency and available power must be compliant with the data on the name plate!

### 7.3.1 Connection to terminals on the control board of the actuator

#### 7.3.1.1 Supply voltage 24 VDC

Connection to the control board with reverse polarity protection integrated.

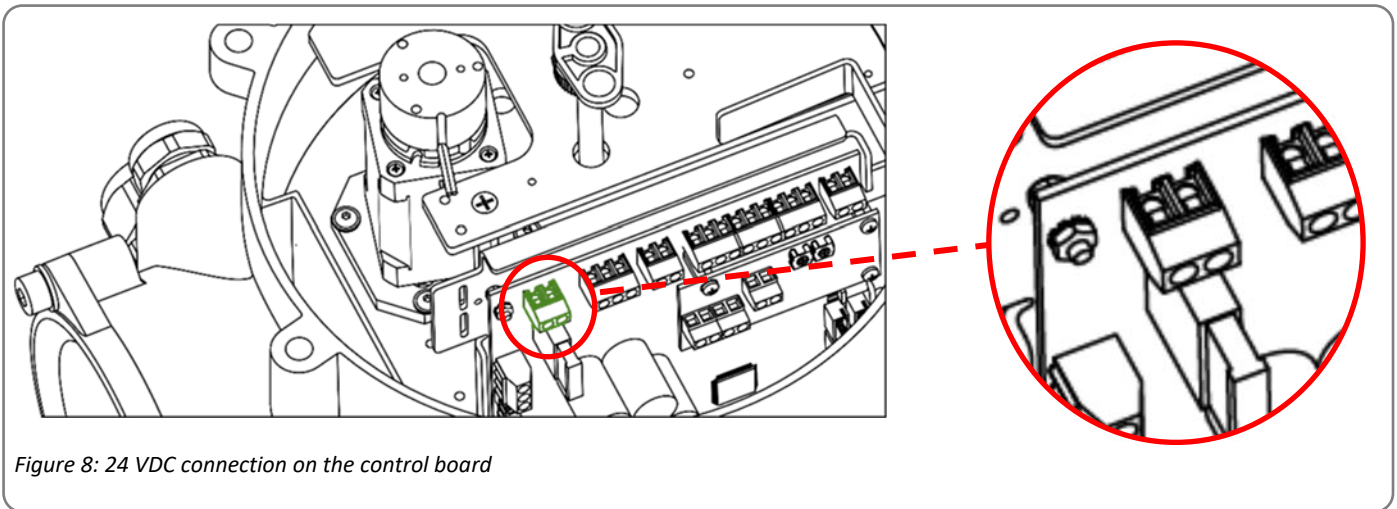


Figure 8: 24 VDC connection on the control board

| Power supply voltage | Binary input signals |   |    |    |   | Position Feedback |                |               | Set value A |                |               | Set value B |                |               | auxiliary voltage output    |                |  |
|----------------------|----------------------|---|----|----|---|-------------------|----------------|---------------|-------------|----------------|---------------|-------------|----------------|---------------|-----------------------------|----------------|--|
| Spannungsversorgung  | Binäre Ansteuerung   |   |    |    |   | Position Istwert  |                |               | Sollwert A  |                |               | Sollwert B  |                |               | Hilfs-Spg.-Ausgang (Option) |                |  |
| 24VDC                | 24 VAC/DC - 230 VAC  |   |    |    |   |                   |                |               |             |                |               |             |                |               |                             |                |  |
| PE gear casing       |                      |   |    |    |   |                   |                |               |             |                |               |             |                |               |                             |                |  |
| - GND                | BA                   | N | BB | BC | N | - GND             | + 0(4) - 20 mA | + 0(2) - 10 V | - GND       | + 0(4) - 20 mA | + 0(2) - 10 V | - GND       | + 0(4) - 20 mA | + 0(2) - 10 V | - GND                       | + 24V max 42mA |  |
| +24VDC               | 3                    | 4 | 5  | 6  | 7 | 8                 | 9              | 10            | 11          | 12             | 13            | 14          | 15             | 16            | 17                          | 18             |  |

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### 7.3.1.2 Supply voltage 24 VAC 1~ (optional)

Connection to the rectifier module for 24 VAC or DC

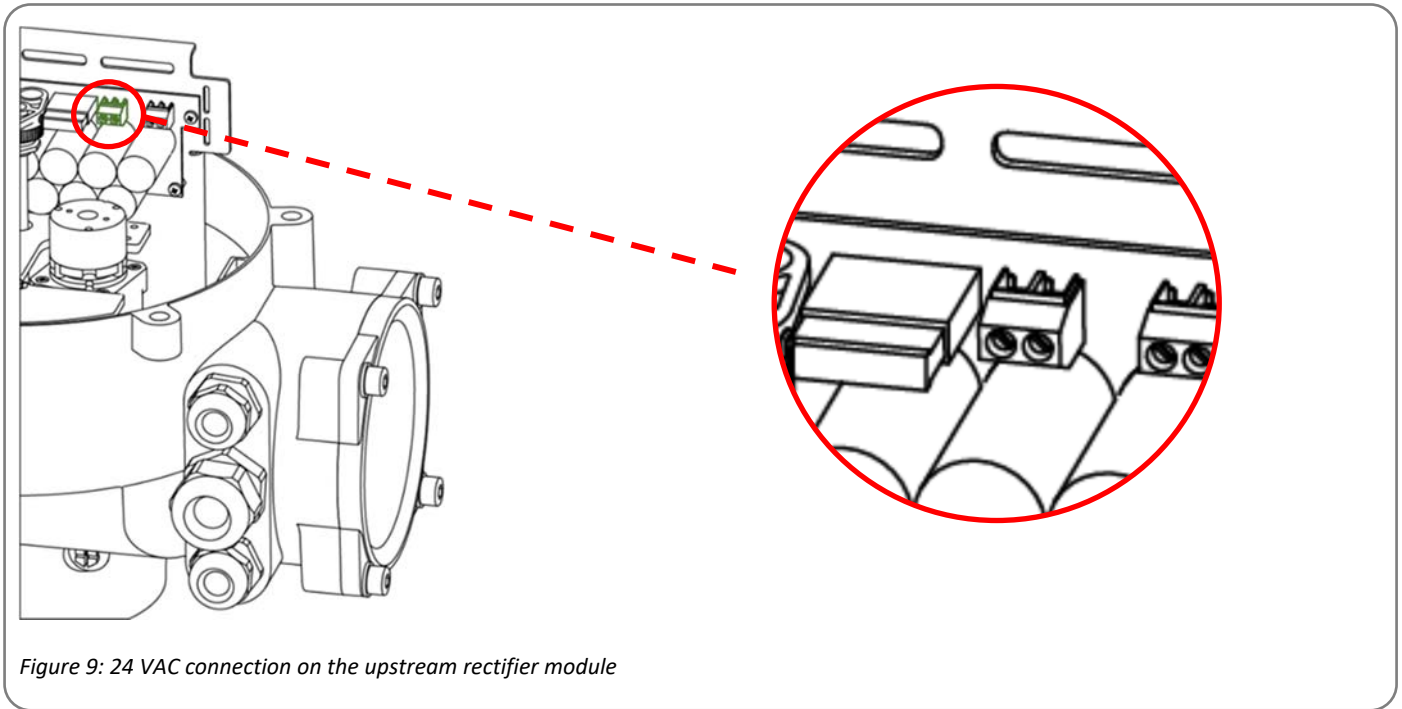


Figure 9: 24 VAC connection on the upstream rectifier module

| Power supply voltage<br>Spannungsversorgung<br>24VAC/DC | Binary input signals<br>Binäre Ansteuerung<br>24 VAC/DC<br>- 230 VAC | Position Feedback<br>Position Istwert    | Set value A<br>Sollwert A                | Set value B<br>Sollwert B                | auxiliary voltage output<br>Hilfs-Spg.-Ausgang (Option) |
|---|--|--|--|--|---|
| PE gear casing<br>N/- GND<br>L/+24VAC                   | BA<br>N<br>BB<br>BC<br>N   | - GND<br>+ 0(4) - 20 mA<br>+ 0(2) - 10 V | - GND<br>+ 0(4) - 20 mA<br>+ 0(2) - 10 V | - GND<br>+ 0(4) - 20 mA<br>+ 0(2) - 10 V | - GND<br>+ 24V max 42mA                                 |
| 19<br>20  | 3<br>4<br>5<br>6<br>7  | 8<br>9<br>10                             | 11<br>12<br>13                           | 14<br>15<br>16                           | 17<br>18  |

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### 7.3.1.3 Supply voltage 100-240 VAC 1~ (optional)

Connection to the wide-range power converter unit for 1~ AC

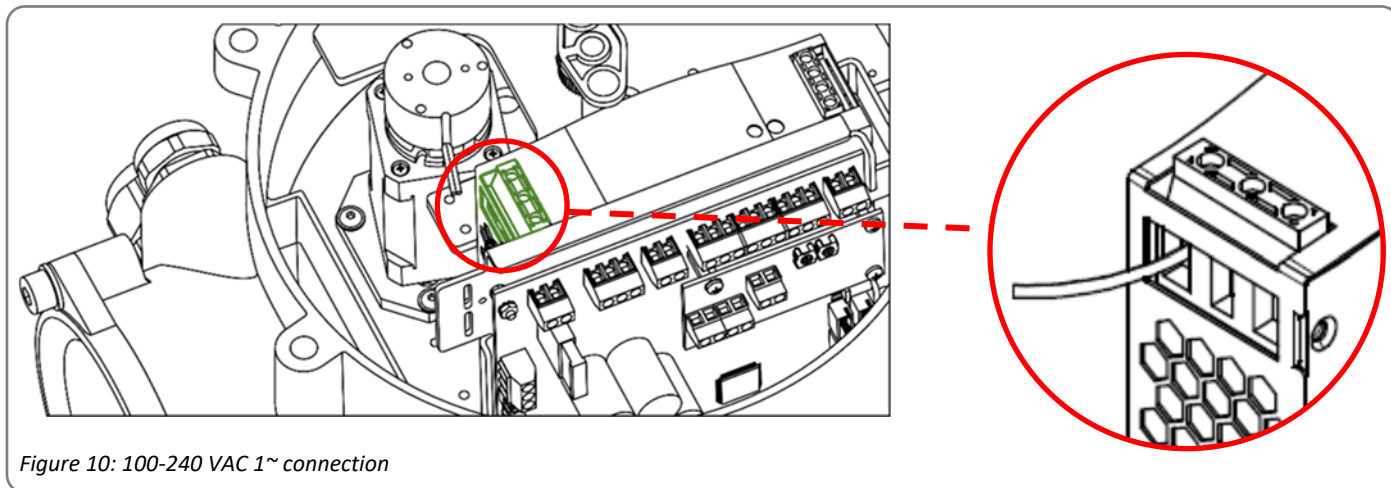


Figure 10: 100-240 VAC 1~ connection

| Power supply voltage                    | Binary input signals |   |    |   |    | Position Feedback |   |       | Set value A    |               |       | Set value B    |               |       | auxiliary voltage output    |               |       |                |
|---|----------------------|---|----|---|----|-------------------|---|-------|----------------|---------------|-------|----------------|---------------|-------|-----------------------------|---------------|-------|----------------|
| Spannungsversorgung                     | Binäre Ansteuerung   |   |    |   |    | Position Istwert  |   |       | Sollwert A     |               |       | Sollwert B     |               |       | Hilfs-Spg.-Ausgang (Option) |               |       |                |
| 100-240VAC                              | 24 VAC/DC - 230 VAC  |   |    |   |    |                   |   |       |                |               |       |                |               |       |                             |               |       |                |
| Anschluss Netzteil<br>connect HV Supply |                      |   |    |   |    |                   |   |       |                |               |       |                |               |       |                             |               |       |                |
| PE gear casing                          |                      |   |    |   |    |                   |   |       |                |               |       |                |               |       |                             |               |       |                |
| PE                                      | N                    | L | BA | N | BB | BC                | N | - GND | + 0(4) - 20 mA | + 0(2) - 10 V | - GND | + 0(4) - 20 mA | + 0(2) - 10 V | - GND | + 0(4) - 20 mA              | + 0(2) - 10 V | - GND | + 24V max 42mA |
| ↓                                       | ↓                    | ↓ | ↓  | ↓ | ↓  | ↓                 | ↓ | ↑     | ↑              | ↑             | ↓     | ↓              | ↓             | ↓     | ↓                           | ↓             | ↑     | ↑              |
| ⊕                                       | N                    | L | 3  | 4 | 5  | 6                 | 7 | 8     | 9              | 10            | 11    | 12             | 13            | 14    | 15                          | 16            | 17    | 18             |

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### 7.3.1.4 Supply voltage 180-500 VAC 3~ (optional)

Connection to the wide-range power converter unit for 3~ AC

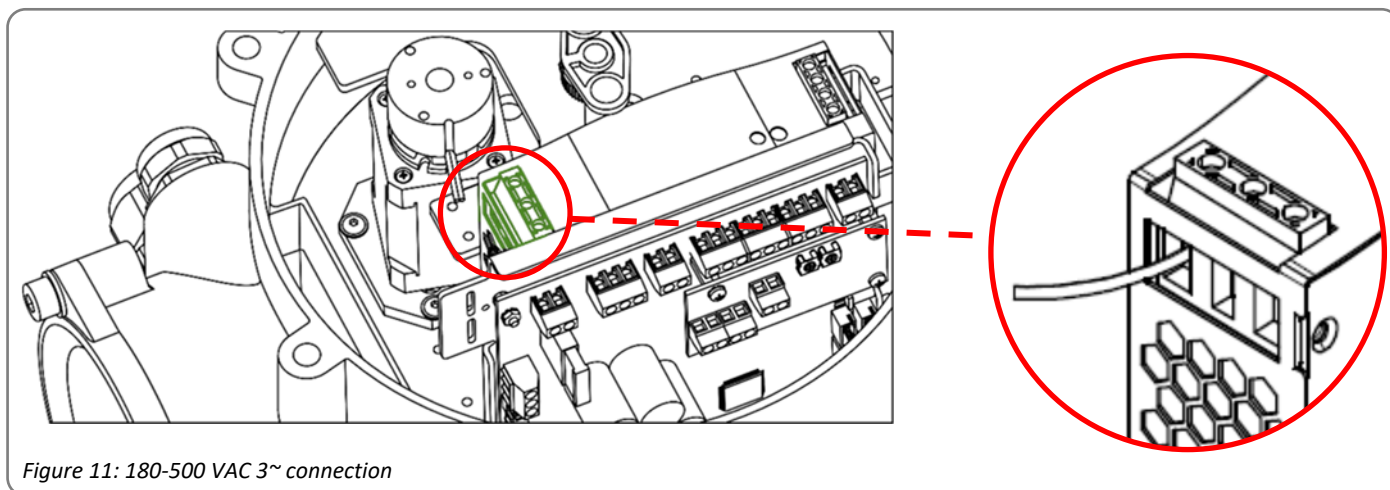


Figure 11: 180-500 VAC 3~ connection

Two phases of the power supply must be connected to the power supply unit to distribute the mains load. Unused cables must be isolated.

| Power supply voltage                    |    |    | Binary input signals |   |    |    |   | Position Feedback |                |               | Set value A |                |               | Set value B |                |               | auxiliary voltage output    |                |
|---|----|----|----------------------|---|----|----|---|-------------------|----------------|---------------|-------------|----------------|---------------|-------------|----------------|---------------|-----------------------------|----------------|
| Spannungsversorgung                     |    |    | Binäre Ansteuerung   |   |    |    |   | Position Istwert  |                |               | Sollwert A  |                |               | Sollwert B  |                |               | Hilfs-Spg.-Ausgang (Option) |                |
| 200-500VAC                              |    |    | 24 VAC/DC - 230 VAC  |   |    |    |   |                   |                |               |             |                |               |             |                |               |                             |                |
| Anschluss Netzteil<br>connect HV Supply |    |    |                      |   |    |    |   |                   |                |               |             |                |               |             |                |               |                             |                |
| PE                                      | L1 | L2 | BA                   | N | BB | BC | N | - GND             | + 0(4) - 20 mA | + 0(2) - 10 V | - GND       | + 0(4) - 20 mA | + 0(2) - 10 V | - GND       | + 0(4) - 20 mA | + 0(2) - 10 V | - GND                       | + 24V max 42mA |
| gear casing                             |    |    |                      |   |    |    |   |                   |                |               |             |                |               |             |                |               |                             |                |
|   | N  | L  | 3                    | 4 | 5  | 6  | 7 | 8                 | 9              | 10            | 11          | 12             | 13            | 14          | 15             | 16            | 17                          | 18             |

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### 7.3.2 Connection to plug module (optional)

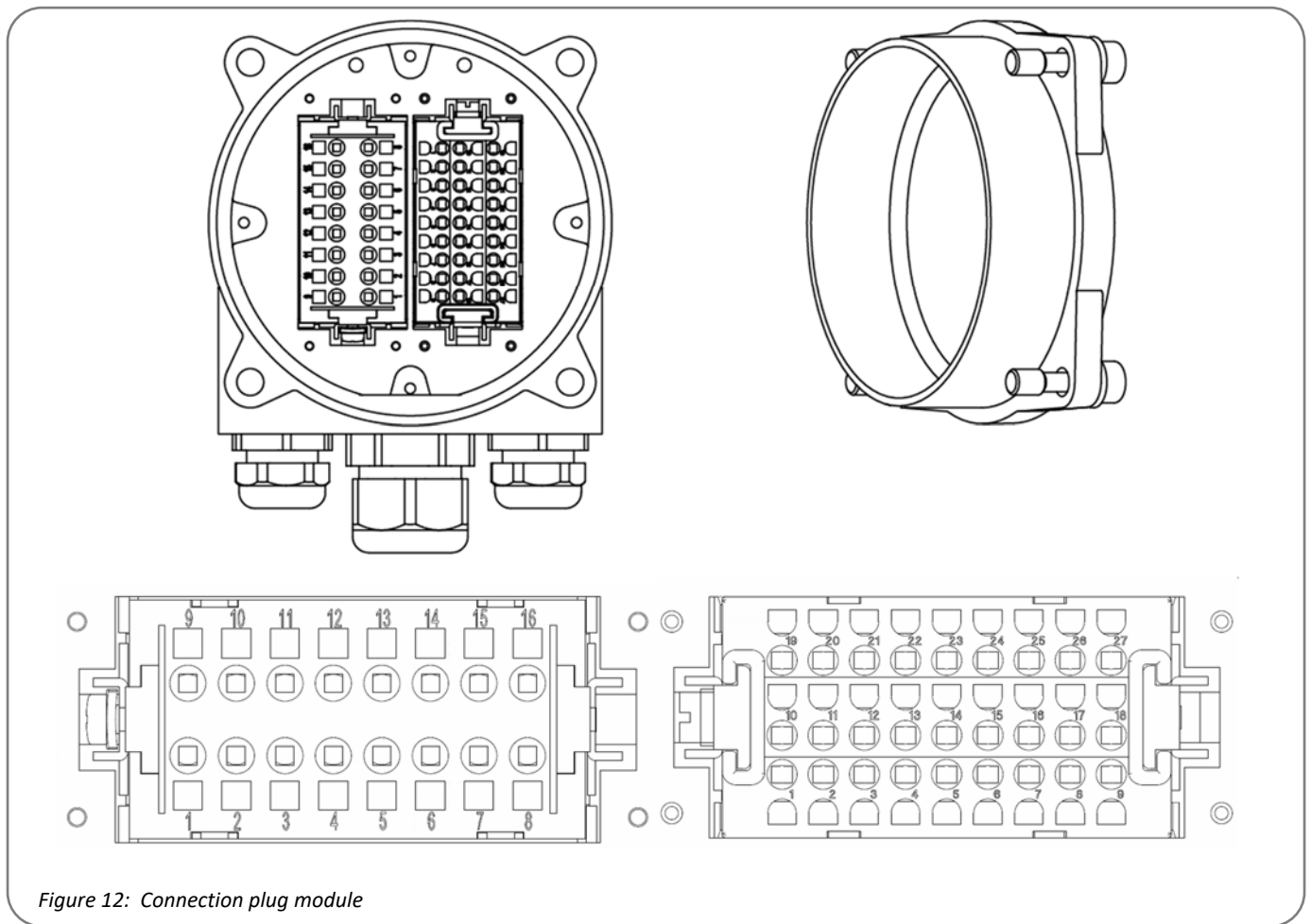
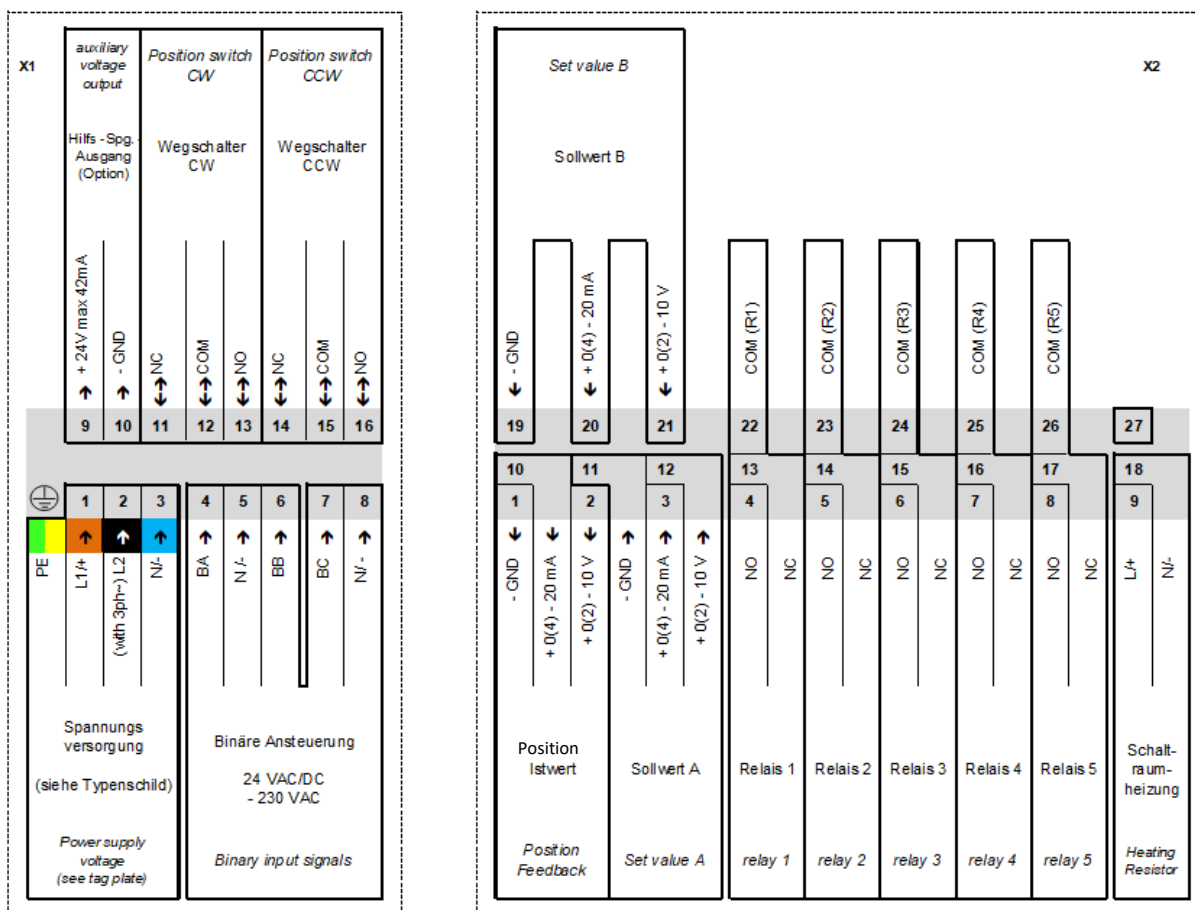


Figure 12: Connection plug module



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## 7.4 Interfaces

### 7.4.1 Inputs with galvanic isolation

#### 7.4.1.1 Analogue Set value A

Connection of the parameterisable set value A as position set value, range 0 (4)-20 mA or 0 (2)-10 V.

#### 7.4.1.2 Analogue Set value B

Connection of the parameterisable set value B, output from a process sensor as process actual value for use with PSIC or as set value for the speed controller, range 0 (4) -20 mA or 0 (2)-10 V.

#### 7.4.1.3 Binary input ports BA / BB / BC

Connection of parameterisable binary actuator commands, range 24 V – 230 V AC/DC

The actuator has galvanically isolated binary multi-voltage ports, BA/BB have a common neutral line connection COM. BC is galvanically isolated from BA/BB.

If a voltage is present at a binary port, the system drives to the parameterised corresponding position regardless of the analogue or digital set value applied. The prioritisation is implemented from BA (highest priority) to BC. Exception when parametrising BA PWM.

#### 7.4.1.4 Fieldbus interface (optional)

A fieldbus interface is available as an option for the PS-AMS PSQ-S actuators.

### 7.4.2 Outputs with galvanic isolation

#### 7.4.2.1 Analogue Position Feedback

Connection of the parameterisable position feedback, range 0 (4)-20 mA or 0 (2)-10 V.

#### 7.4.2.2 Auxiliary voltage output (optional)

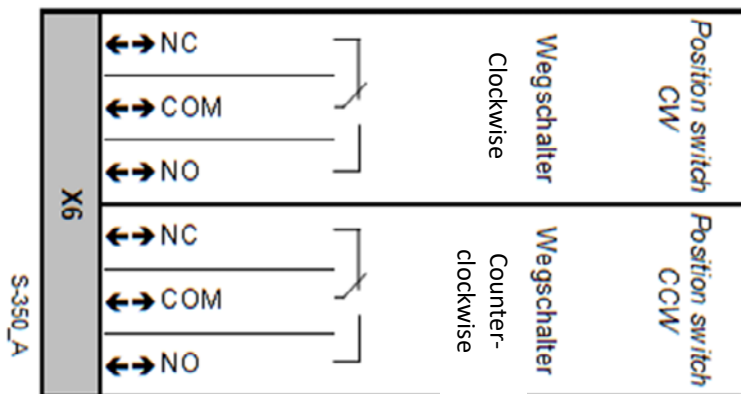
This output provides a regulated voltage of 24 VDC max. 42mA, e.g. for the direct supply of binary signal inputs.

#### 7.4.2.3 Potential-free position signal switches (optional)

For PS-AMS PSQ-S, two potential-free position switches can be provided as a factory option for position feedback:

|                                    |                    |
|------------------------------------|--------------------|
| Switches with silver contacts      | Max. 230 VAC / 5 A |
| Switches with gold-plated contacts | Max. 30 V / 100 mA |

Wiring to be made to terminal X6, or to terminals 22/27/28 and 23/29/30 in case of connections with connection plug module.



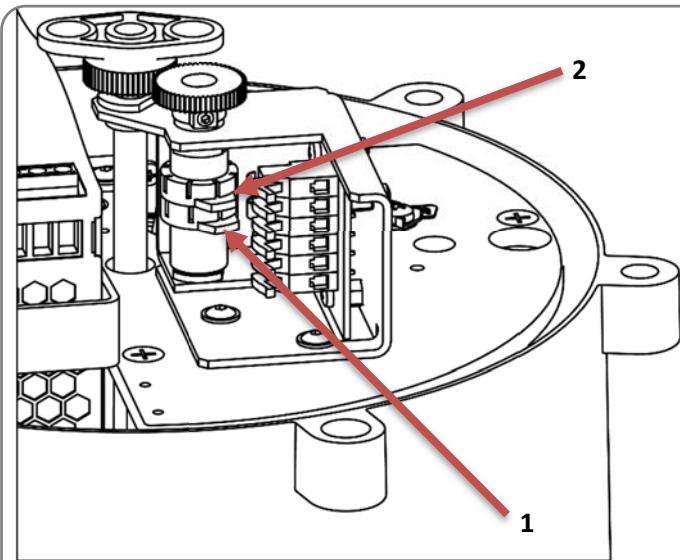
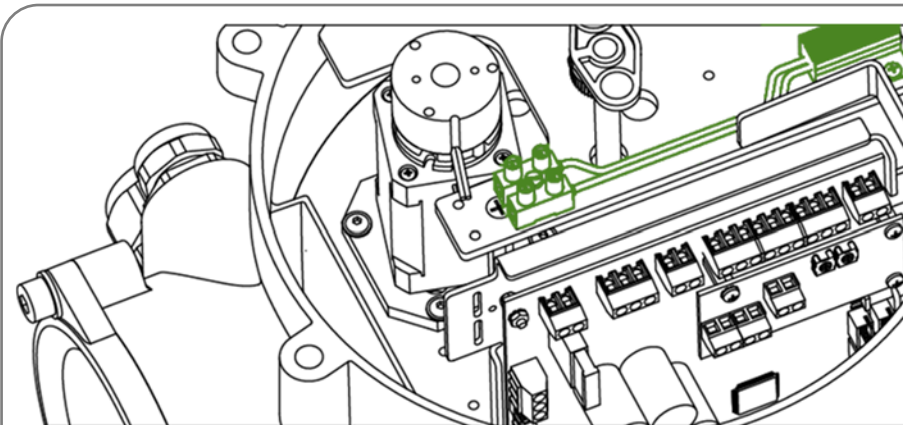


Figure 13: Switching cams setting

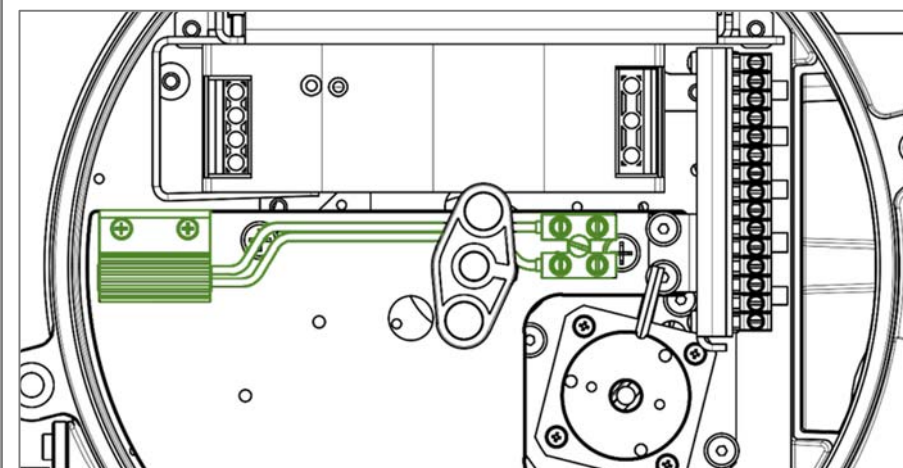
The switching cams for activating the position switches are mounted on the switching shaft by means of a friction clutch. They can be adjusted with a flat-blade screwdriver, using the metal bracket as a counter bearing. For an actuator closing clockwise, the lower cam (1) activates the switch for the CLOSE direction and the upper cam (2) activates the switch for the OPEN direction.

#### 7.4.2.4 Heating resistor (optional)

The PS-AMS PSQ-S actuators can be equipped with an optional heating resistor. Recommended for outdoor installations, with severely fluctuating ambient temperature or high levels of humidity in order to prevent condensation in the interior of the actuator.



The supply voltage for the heating resistor must be fed to a separate terminal. The heating resistor is available for 110 V - 230 V and for 24 V.

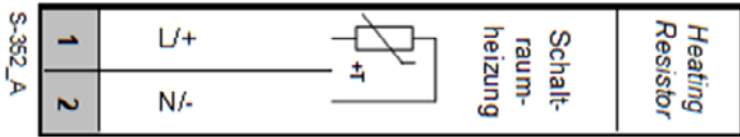


The heating resistor is mounted at the position indicated on the base plate using the screws provided.

Figure 14: Mounting and connection of the heating resistor



With the internal cable routing, ensure that the cable is not pinched by the cover and that it does not come into contact with moving parts.



NTC heating resistor to prevent condensation

#### 7.4.2.5 Potential-free Signal relays with changeover contact 1-5 (optional)

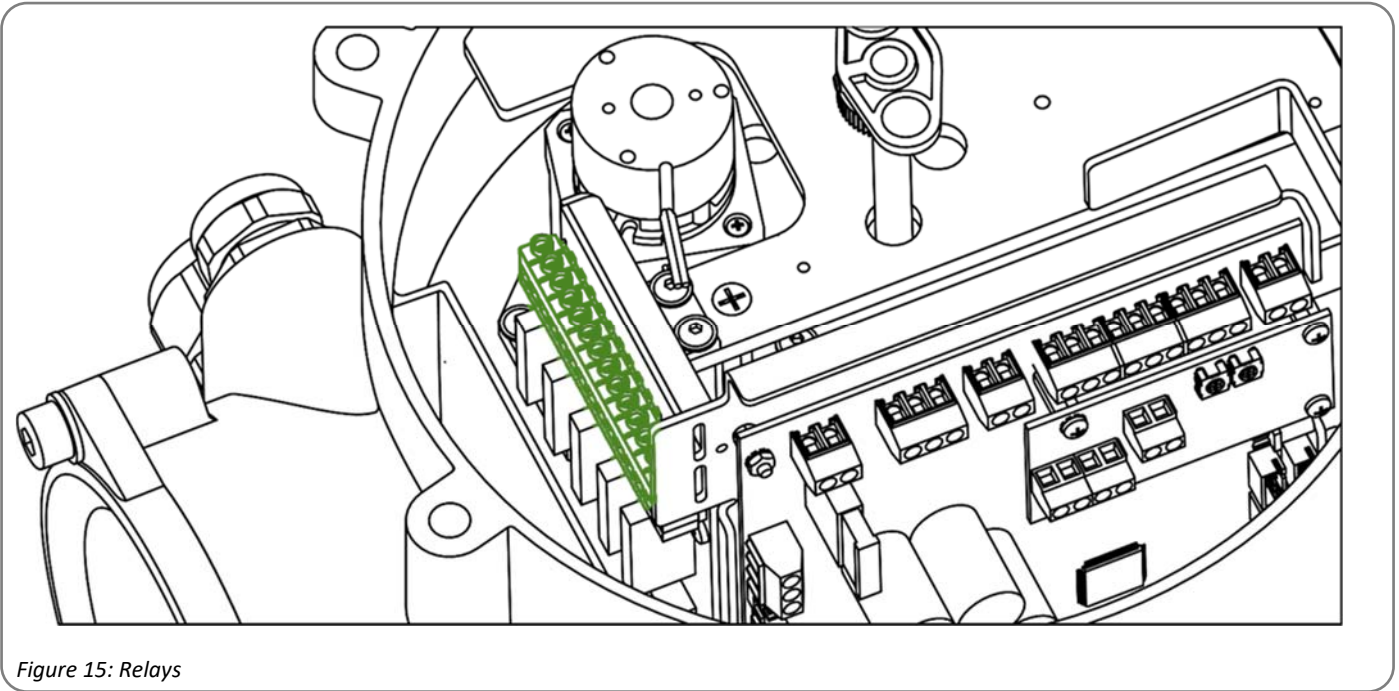
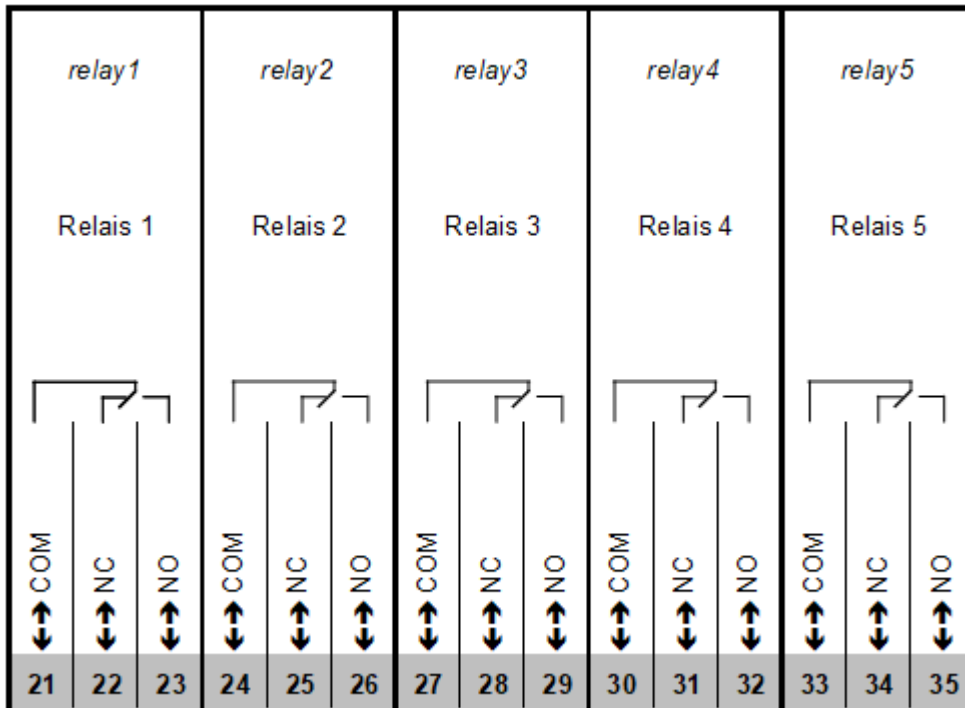


Figure 15: Relays

Connection for parameterisable feedback information, range 24 V to 230 V AC/DC @ 0.1 A – 1 A



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### 7.4.2.6 Communication interface

The actuator has a TTL communication interface, enabling communication with the actuator via the AMS.2-USB communication cable and the PSCS.2 communication software.

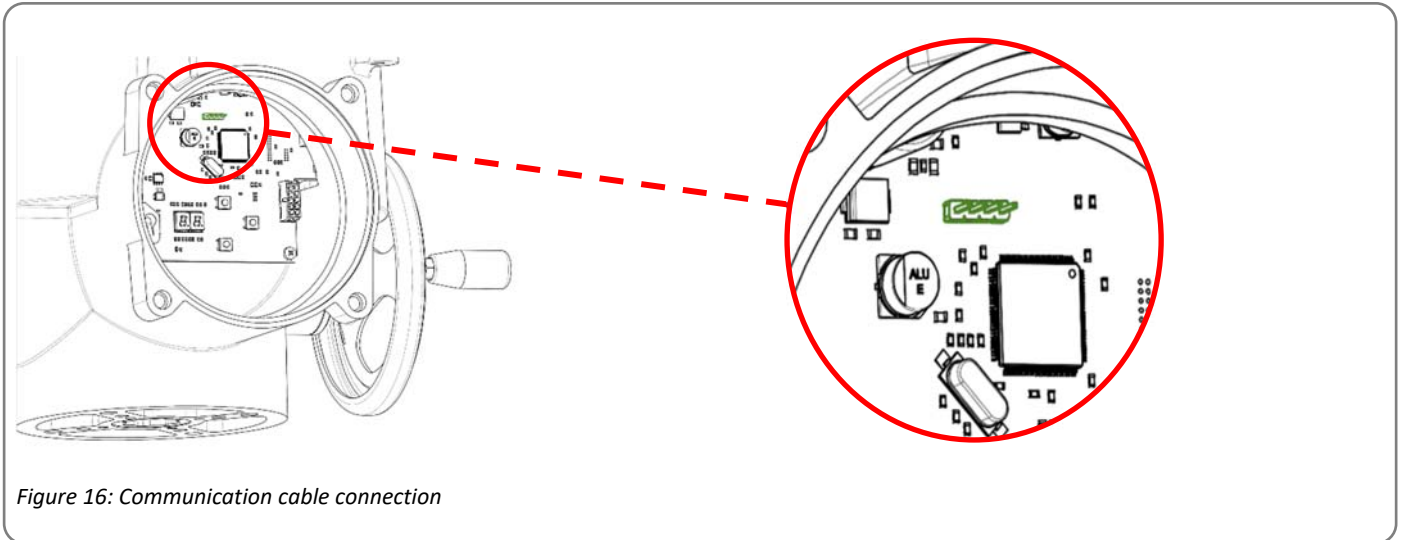


Figure 16: Communication cable connection

## 8. Operation

### 8.1 Manual override

The handwheel moves the complete planetary gear set via a worm shaft. It does not move during automated operation but is available in each position without clutching. Turning the handwheel clockwise turns the actuator output clockwise, when viewed from above.



**Attention:** If the (optional) PSCP power failure backup is active, manual override is not possible as the actuator will return to the fail-safe position.

**Attention:** In modulating operation, the actuator counteracts the manual override. In this case, to move by hand, the actuator must be electrically de-energised or the selector switch on the (optional) local control PSC.3 must be set to "OFF".

### 8.2 Mechanical position indication

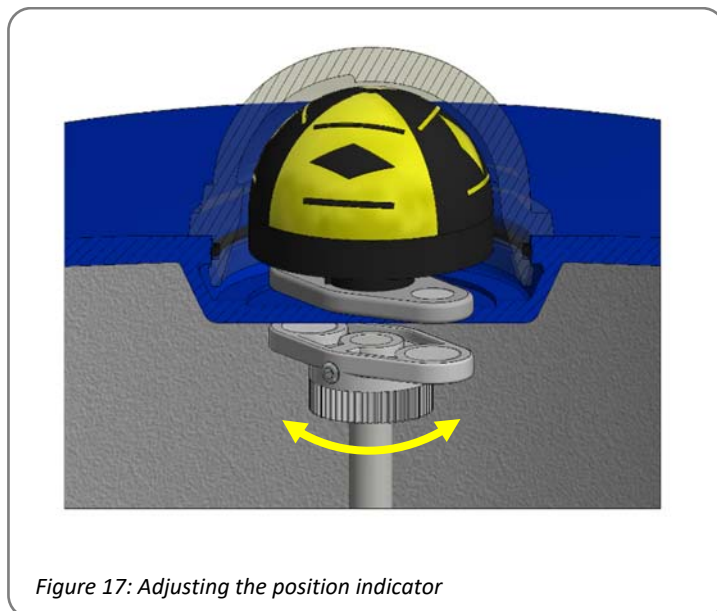


Figure 17: Adjusting the position indicator

A contactless mechanical position indicator is installed underneath the dome on the cover of the actuator. The orientation of the indicator can be adapted to the valve by turning the magnetic driver under the cover to the corresponding position.



### 8.3 Integrated operating buttons and status display

There is an integrated control unit located on the PS-AMS PSQ-S control board, comprising a 7-segment LED display and three push buttons.

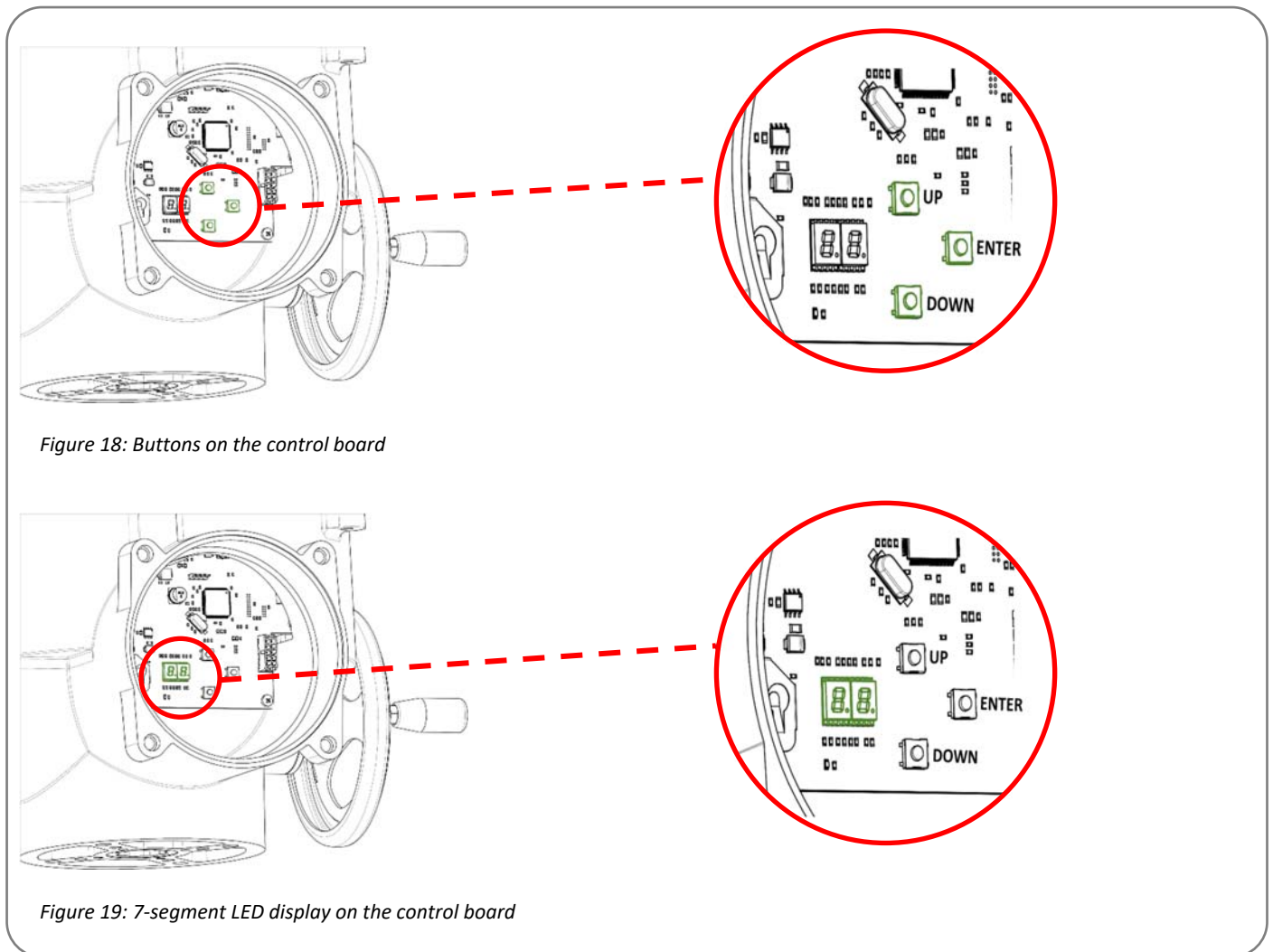


Figure 18: Buttons on the control board

Figure 19: 7-segment LED display on the control board

#### 8.3.1 Actuator position / status

In operation, the actuator position is indicated as a percentage on the 7-segment actuator position display. At 0% actuator position a bar is shown at the bottom " \_ " and at 100% a bar is shown at the top " — ".

In the event of a change in status, a corresponding status number is displayed:

| NE107 | Status no. | Message                  |
|-------|------------|--------------------------|
| C     | 2          | Not commissioned         |
| F     | 7          | Motor fault              |
| F     | 9          | CRC fault                |
| S     | 17         | Over-voltage             |
| S     | 8          | Over-temperature         |
| S     | 16         | Under-temperature        |
| C     | 5          | Mains power failure      |
| S     | 11         | Under-voltage            |
| C     | 14         | Torque error CLOSE       |
| C     | 4          | Torque error OPEN        |
| S     | 6          | Set value B error        |
| S     | 3          | Set value A error        |
| C     | 13         | End position not reached |
| C     | 12         | End position overrun     |

During manual commissioning:

| Manual commissioning |            |  |
|----------------------|------------|--|
| NE107                | Status no. | Message  |
| C                    | 18         | Manual commissioning only possible for cut-offs by position! |
| C                    | 19         | Travel/angle cannot be changed!                              |
| C                    | 20         | Manual commissioning - error: travel/angle too small         |
| C                    | 21         | Manual commissioning - OPEN end position reached             |
| C                    | 22         | Manual commissioning - CLOSED end position reached           |
| C                    | 23         | Manual commissioning - torque error OPEN                     |
| C                    | 24         | Manual commissioning - torque error CLOSE                    |

During automatic commissioning:

| Automatic commissioning |            |  |
|-------------------------|------------|--|
| NE107                   | Status no. | Message  |
| C                       | 1          | Automatic commissioning running                                  |
| C                       | 25         | Automatic commissioning completed                                |
| C                       | 26         | Automatic commissioning - error, OPEN end position               |
| C                       | 27         | Automatic commissioning - error, CLOSED end position             |
| C                       | 28         | Automatic commissioning - error, no movement                     |
| C                       | 29         | Automatic commissioning - error, travel/angle too small          |
| C                       | 30         | Automatic commissioning not possible! No cut-off by force/torque |

### 8.3.2 Manual operation

The ENTER button must be pressed for 5 seconds to start manual operation (see Figure 18). If the mode is active, two dots illuminate on the 7-segment display.

The actuator position can be set between the end positions with the UP / DOWN buttons.

### 8.3.3 Function menu

Functions can be called up directly on the actuator with the function menu. It also allows to start the commissioning run.

The UP and DOWN buttons must be pressed simultaneously for 10 seconds to access the function menu. The functions can then be selected by pressing the UP / DOWN buttons.

The ENTER button must be pressed to start the function.

The system exits the function menu automatically if there is no activity for 60 seconds.

#### 8.3.3.1 Functions

|    |            |  |
|----|------------|--|
| P0 | Wi-Fi Auto | Wi-Fi switches OFF automatically if no one is logged on at the actuator or if there is no activity for a defined period of time. This prevents the actuator having a permanent Wi-Fi connection. |
| P1 |            |  |
| P2 |            |  |
| P3 |            |  |
| P4 |            |  |
| P5 |            |  |
| P6 |            |  |

|    |                                |   |
|----|--------------------------------|---|
| P7 |                                |   |
| P8 |                                |   |
| P9 | Automatic commissioning torque | <p>If at least one valve end position is set to torque, the valve compensation can be automatically carried out.</p> <p>The actuator runs through the stroke of the valve with reduced speed in the parametrised direction valve OPEN and/or valve CLOSE. If a torque is detected, the actuator saves this position.</p> <p>If both end positions have been parametrised to torque, the actuator determines the intermediate angle autonomously.</p> <p>If only one end position has been parametrised to torque, the actuator adds the pre-adjusted angle from the recognised torque position. In doing so, the actuator does not check whether the parametrised angle is too large for the remaining range.</p> |

## 8.4 PSC.3 local control panel (optional)

The PSC.3 local control panel allows manual operation of the actuator and modification of its parameters. A display and four LEDs show the actuator position and status. Information on the operation of the local control can be found in the "PSC.3 Local Control for PS-AMS PSQ-S" operating instructions.

## 8.5 Operation

### 8.5.1 Power regulation

During operation, the power consumption of the actuator is regulated and limited. This prevents the actuator controller and the power converter from being overloaded at short operating times with high torque levels.

Upon reaching the maximum power limit, the motor reduces its rotational speed in order to continue to generate the required torque.

**Note:** When the power regulation is active, the operating time will increase!

### 8.5.2 Torque regulation

If the maximum torque is reached apart from the stored end positions, the actuator limits the rotational speed until it comes to a standstill. The actuator controller holds the torque constant for a defined period of time in this condition and then reports a torque error, or will try for three times (at setting "Re-Try") to travel back and pass the detected hard point.

The torque of the output drive will then be maintained through the integrated holding brake.

## 8.6 Commissioning



**The electrical connection and commissioning with mains voltage applied may only be carried out by trained specialist personnel!**

**Do not touch any connection lines during commissioning!**

## 8.7 Diagnostics

The actuator is equipped with comprehensive diagnostics functionality which can be used to optimise the process and carry out a targeted assessment in the event of an error.

The actuator saves various diagnostics data records during operation.

## 8.7.1 Event logging

The actuator saves up to 25600 events arising during operation.

|            |          |                  |                                    |
|------------|----------|------------------|------------------------------------|
| 06.11.2019 | 12:09:07 | Sysmode-Change   | Mode: Goto_Automatik               |
| 06.11.2019 | 12:09:07 | Sysmode-Change   | Mode: Automatik                    |
| 06.11.2019 | 12:09:12 | Parameter-Change | Par.Nr.: 00825 Par.Val.:0000000000 |
| 06.11.2019 | 12:10:45 | Parameter-Change | Par.Nr.: 00825 Par.Val.:0000000000 |

## 8.7.2 Logg-Time

The actuator saves up to 153000 measurements of the actuator status and the set/actual value, in cycles with an adjustable period of between 10 and 3600 seconds. For setting the cycle rate refer to 3.5.12.1 Logg-Time [P.12.1] in the "Operating Instruction PSC.3 Local control for PS-AMS PSQ-S".

| Datum      | Uhrzeit  | Event   | Sollwert_A | Sollwert_B | Binär | Istwert | Drehzahl |
|------------|----------|---------|------------|------------|-------|---------|----------|
| 06.11.2019 | 14:53:00 | Timelog | 00000      | 00000      | 0     | 00476   | 00000    |
| 06.11.2019 | 14:53:10 | Timelog | 00000      | 00000      | 0     | 00476   | 00000    |
| 06.11.2019 | 14:53:20 | Timelog | 00000      | 00000      | 0     | 00476   | 00000    |
| 06.11.2019 | 14:53:30 | Timelog | 00000      | 00000      | 0     | 00476   | 00000    |
| 00.00.2000 | 02:33:37 | Timelog | 00000      | 00000      | 0     | 01000   | 00000    |

## 8.7.3 Daily logging

The actuator saves the status of the internal counters every 24 hours and calculates histograms.

|   | Log    | Datum      | Uhrzeit  | Event    | Einschaltvorgänge | Motorlaufzeit | Betriebszeit | Position_0-10 | Position |
|---|--------|------------|----------|----------|-------------------|---------------|--------------|---------------|----------|
| ▶ | 000001 | 06.11.2019 | 12:19:58 | Dailylog | 0000000004        | 0000000186    | 0000000018   | 0             | 0        |
|   | 000002 | 06.11.2019 | 13:26:19 | Dailylog | 0000000004        | 0000000186    | 0000000024   | 0             | 0        |

## 8.7.4 Histogram

### 8.7.4.1 Reaction histogram

This histogram shows whether the actuator is stationary, driving or oscillating, in relation to the total operating time.

### 8.7.4.2 Position histogram

This histogram shows how often the actuator stopped in a particular position, in relation to the starts.

## 9. Accessories

# Accessories / options

|  |          |   |
|--|----------|---|
| Additional position switches             | 2WE      | Potential-free position signal switches with silver contacts (0.1 A - 5 A switching current)  |
| Additional position switches Gold        | 2WE Gold | Potential-free additional position switches with gold contacts (0.1 mA - 100 mA switching current)  |
| Integrated process controller            | PSIC     | Enables the autonomous control of a process so that an external controller is not required  |
| Fail safe*                               | PSCP     | Emergency power supply based on supercapacitors, safety position OPEN, CLOSED or free defined position  |
| Fieldbus interface*                      |          | Digital transmission of nominal and actual value per mill or percent, report of monitoring and diagnostic data using PROFIBUS-DP, CANopen, PROFINET, MODBUS-RTU interfaces, additional interfaces available on request  |
| Local control                            | PSC.3    | Illuminated display to show the actuator status and lockable selector to switch between modes: automatic, manual process ON/OFF, STOP and parameter menu. Control buttons for manual movement, menu operation and adjustment of parameters, display of diagnostic information. Also available for mounting separately from the actuator (incl. 10 m connection cable) |
| Rotational speed controller, set value B |          | External regulation of the rotational speed via set value B.  |
| Relay module                             |          | 5 potential-free relays with changeover contacts for reporting parameterisable events. Suitable for switching currents 0.1 A to 1 A at voltages 24 V to 230 VAC/DC.   |
| Heating resistor                         | HR       | Heating resistor to prevent condensation.   |
| Connection plug module                   |          | IP68 terminal box with screwed contacts.  |

\* Cannot be retrofitted

# 10. CE Declaration of Conformity

## Declaration of Incorporation of Part Completed Machinery and EC Declaration of Conformity in compliance with the Directives on EMC and Low Voltage

We,

**PS Automation GmbH**  
**Philipp-Krämer-Ring 13**  
**D-67098 Bad Dürkheim**

Declare under our sole responsibility that we manufacture electric actuator series

**PSQ-S...;**

according to the requirements of the

**EC Directive 2006/42/EC**

as part completed machinery. These actuators are designed to be installed on industrial valves. It is prohibited to take the actuator into service until it has been ensured that the complete machine conforms to the applicable machinery directives. The technical documentation described in Annex VII, part B has been prepared.

The above actuators further comply with the requirements of the following directives.

|                                 |  |
|---------------------------------|--|
| <b>2014/30/EU</b>               | Electromagnetic Compatibility (EMC)        |
| <b>2014/35/EU</b>               | Low Voltage (LVD)                          |
| <b>2014/53/EU</b>               | radio equipment directive                  |
| <b>2011/65/EU + 2015/863/EU</b> | Restriction of Hazardous Substances (RoHS) |

furthermore, the following harmonised standards have been applied:

|                                     |  |
|-------------------------------------|--|
| <b>EN 61000-6-2: 2005</b>           | Electromagnetic compatibility (EMC), Generic standards-Immunity for industrial environments  |
| <b>EN 61000-6-3: 2007</b>           | Electromagnetic compatibility (EMC), Generic standards-Emission standard for residential, commercial and light-industrial environments |
| <b>EN 61010-1: 2020</b>             | Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use   |
| <b>EN 301 489-1 V2.1.1:2017-02</b>  | Electromagnetic compatibility (EMC), standard for radio equipment and services - Part 1  |
| <b>EN 301 489-17 V3.1.1:2017-02</b> | Electromagnetic compatibility (EMC), standard for radio equipment and services - Part 17   |
| <b>EN 300 328 V2.1.1:2016-11</b>    | Wideband transmission systems. Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques |

Bad Dürkheim, 2021



Christian Schmidhuber  
(General Manager)

### CAUTION!

To ensure compliance of these actuators with the above directives, it is the responsibility of the specifier, purchaser, installer and user to observe the relevant specifications and limitations when taking the product into service. Details are available on request, and are mentioned in the Installation and Maintenance Instructions.

# 11. CA Declaration of Conformity

## Declaration of Incorporation of Part Completed Machinery and CA Declaration of Conformity in compliance with the Legislation on EMC and Low Voltage

We,

**PS Automation GmbH**  
**Philipp-Krämer-Ring 13**  
**D-67098 Bad Dürkheim**

Declare under our sole responsibility that we manufacture electric actuator series

**PSQ-S...;**

according to the requirements of the

**2008 No. 1597**

Supply of machinery (safety) regulations

as part completed machinery. These actuators are designed to be installed on industrial valves. It is prohibited to take the actuator into service until it has been ensured that the complete machine conforms to the applicable machinery legislations. The technical documentation described in Annex VII, part B has been prepared.

The above actuators further comply with the requirements of the following legislation.

**UK SI 2016 No. 1091 and Amendments**

The Electromagnetic Compatibility Regulations 2016

**UK SI 2016 No. 1101 and Amendments**

The Electrical Equipment (Safety) Regulations 2016

**UK SI 2017 No. 1206 and Amendments**

Radio Equipment Regulations 2017

**UK SI 2012 No. 3032 and Amendments**

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

the provisions of the legislations and their compliance are given by the following named standard(s), which have been applied:

**EN 61000-6-2: 2005**

Electromagnetic compatibility (EMC), Generic standards-Immunity for industrial environments

**EN 61000-6-3: 2007**

Electromagnetic compatibility (EMC), Generic standards-Emission standard for residential, commercial and light-industrial environments

**EN 61010-1: 2020**

Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use

**EN 301 489-1 V2.1.1:2017-02**

Electromagnetic compatibility (EMC), standard for radio equipment and services - Part 1

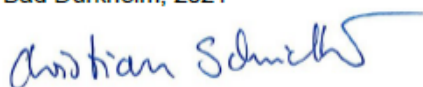
**EN 301 489-17 V3.1.1:2017-02**

Electromagnetic compatibility (EMC), standard for radio equipment and services - Part 17

**EN 300 328 V2.1.1:2016-11**

Wideband transmission systems. Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques

Bad Dürkheim, 2021



Christian Schmidhuber  
(General Manager)

### CAUTION!

To ensure compliance of these actuators with the above directives, it is the responsibility of the specifier, purchaser, installer and user to observe the relevant specifications and limitations when taking the product into service. Details are available on request, and are mentioned in the Installation and Maintenance Instructions.

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