



Part-turn actuators  
SG 04.2 – SG 10.2  
with actuator controls  
MEC 03.1  
Marine version



**Read operation instructions first.**

- Observe safety instructions.
- These operation instructions are part of the product.
- Store operation instructions during product life.
- Pass on instructions to any subsequent user or owner of the product.

**Target group:**

This document contains information for assembly, commissioning and maintenance staff.

**Reference documents:**

Reference documents are available on the Internet at: <http://www.auma.com>.

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## 1. Safety instructions

### 1.1. Prerequisites for the safe handling of the product

<b>Standards/directives</b>	The end user or the contractor must ensure that all legal requirements, directives, guidelines, national regulations and recommendations with respect to assembly, electrical connection, commissioning and operation are met at the place of installation.
<b>Safety instructions/warnings</b>	All personnel working with this device must be familiar with the safety and warning instructions in this manual and observe the instructions given. Safety instructions and warning signs on the device must be observed to avoid personal injury or property damage.
<b>Qualification of staff</b>	<p>Assembly, electrical connection, commissioning, operation, and maintenance must be carried out by suitably qualified personnel authorised by the end user or contractor of the plant only.</p> <p>Prior to working on this product, the staff must have thoroughly read and understood these instructions and, furthermore, know and observe officially recognised rules regarding occupational health and safety.</p>
<b>Commissioning</b>	Prior to commissioning, imperatively check that all settings meet the requirements of the application. Incorrect settings might present a danger to the application, e.g. cause damage to the valve or the installation. The manufacturer will not be held liable for any consequential damage. Such risk lies entirely with the user.
<b>Operation</b>	<p>Prerequisites for safe and smooth operation:</p> <ul style="list-style-type: none"> <li>• Correct transport, proper storage, mounting and installation, as well as careful commissioning.</li> <li>• Only operate the device if it is in perfect condition while observing these instructions.</li> <li>• Immediately report any faults and damage and allow for corrective measures.</li> <li>• Observe recognised rules for occupational health and safety.</li> <li>• Observe national regulations.</li> <li>• During operation, the housing warms up and surface temperatures &gt; 60 °C may occur. To prevent possible burns, we recommend checking the surface temperature prior to working on the device using an appropriate thermometer and wearing protective gloves.</li> </ul>
<b>Protective measures</b>	The end user or the contractor are responsible for implementing required protective measures on site, such as enclosures, barriers, or personal protective equipment for the staff.
<b>Maintenance</b>	<p>To ensure safe device operation, the maintenance instructions included in this manual must be observed.</p> <p>Any device modification requires prior written consent of the manufacturer.</p>

### 1.2. Range of application

AUMA part-turn actuators are designed for the operation of valves, e.g. butterfly valves and ball valves.

Other applications require explicit (written) confirmation by the manufacturer.

The following applications are not permitted, e.g.:

- Industrial trucks according to EN ISO 3691
- Lifting appliances according to EN 14502
- Passenger lifts according to DIN 15306 and 15309
- Service lifts according to EN 81-1/A1
- Escalators
- Continuous duty

- Buried service
- Continuous submersion (observe enclosure protection)
- Potentially explosive atmospheres
- Radiation exposed areas in nuclear power plants

No liability can be assumed for inappropriate or unintended use.

Observance of these operation instructions is considered as part of the device's designated use.

**Information** These operation instructions are only valid for the "clockwise closing" standard version, i.e. driven shaft turns clockwise to close the valve.

### 1.3. Warnings and notes

The following warnings draw special attention to safety-relevant procedures in these operation instructions, each marked by the appropriate signal word (DANGER, WARNING, CAUTION, NOTICE).



**Indicates an imminently hazardous situation with a high level of risk. Failure to observe this warning results in death or serious injury.**



**Indicates a potentially hazardous situation with a medium level of risk. Failure to observe this warning could result in death or serious injury.**



**Indicates a potentially hazardous situation with a low level of risk. Failure to observe this warning could result in minor or moderate injury. May also be used with property damage.**



**Potentially hazardous situation. Failure to observe this warning could result in property damage. Is not used for personal injury.**

Safety alert symbol  warns of a potential personal injury hazard.

The signal word (here: DANGER) indicates the level of hazard.

### 1.4. References and symbols

The following references and symbols are used in these instructions:

**Information** The term **Information** preceding the text indicates important notes and information.

 Symbol for CLOSED (valve closed)

 Symbol for OPEN (valve open)

 **Result of a process step**

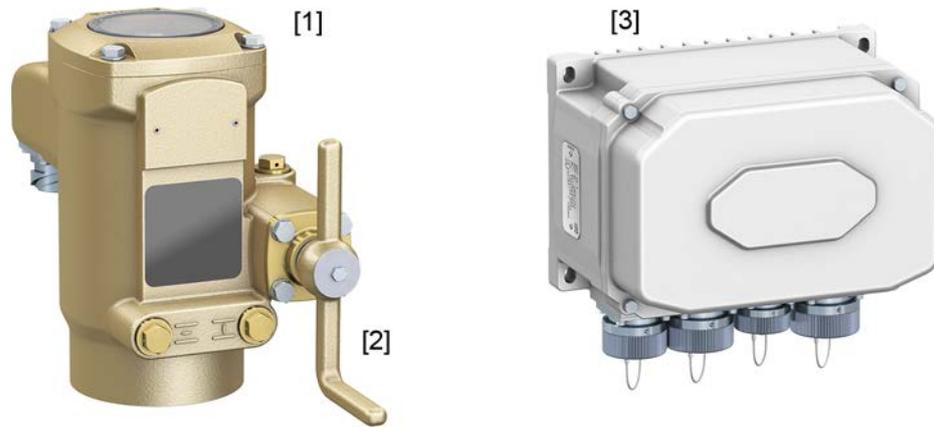
Describes the result of a preceding process step.

## 2. Short description

**Part-turn actuator** Definition in compliance with EN 15714-2/EN ISO 5211:

A part-turn actuator is an actuator which transmits a torque to the valve for less than one full revolution. It need not be capable of withstanding thrust.

**AUMA part-turn actuator** Figure 1: AUMA SG 05.2 part-turn actuator with MEC 03.1



- [1] Part-turn actuator
- [2] Crank handle/handwheel
- [3] Actuator controls

AUMA part-turn actuators SG 05.2 - SG 10.2 [1] are part-turn actuators for the automation of butterfly and ball valves and are driven by an electric motor. For manual operation, a crank handle [2] or a handwheel is provided. Manual operation is possible without change-over. In end position OPEN, the limitation of travel is implemented via end position sensors. In end position CLOSED, the actuator is switched off via torque seating (excess current measuring) or via end position sensors. AUMA actuator controls of the MEC [3] are required to operate or process the actuator signals.

### Software

Using the **AUMA CDT** software for Windows-based computers (notebooks or tablets), actuator data can be uploaded and read, settings can be modified and stored. With the **AUMA Cloud**, we provide an interactive platform to collect and assess e.g. detailed device data of all actuators within a plant.

**AUMA CDT** AUMA CDT is a user-friendly setting and operation program for AUMA actuators.<sup>1)</sup>



**AUMA Cloud**



The connection to the computer (notebook, tablet) is made via the respective AUMA service cable which is connected to the 17-pole XG4 connection outside the MEC 03.1 actuator controls.

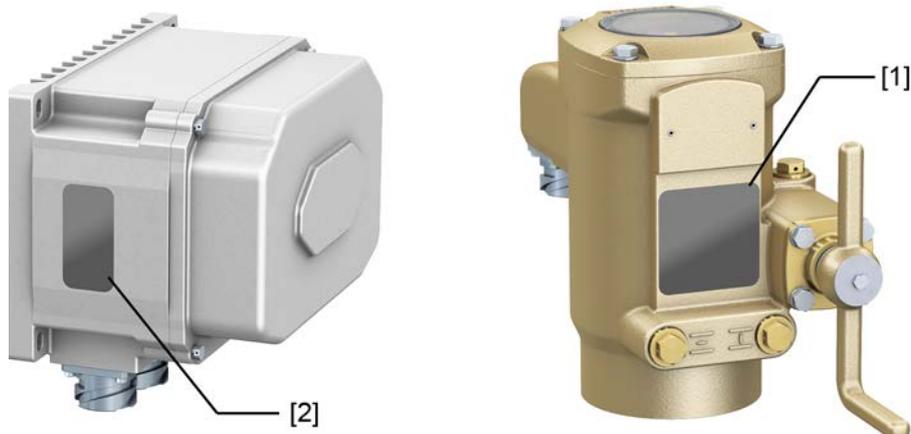
AUMA CDT software can be downloaded free of charge from our website [www.auma.com](http://www.auma.com).

The AUMA Cloud is the driving element of the digital AUMA world, acting as interactive platform for efficient maintenance of AUMA actuators at moderate cost. The AUMA Cloud collects all device data of all actuators within one site and provides a clear overview at a glance. Detailed analysis provides valuable information on potential maintenance requirements. Additional functions foster smooth asset management.

1) For the supported actuator ranges, refer to our website.

### 3. Name plate

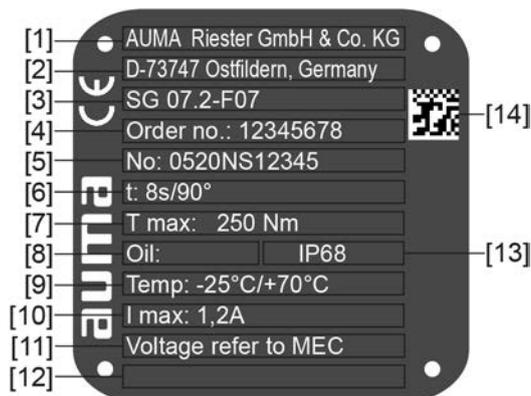
Figure 2: Arrangement of name plates



- [1] Actuator name plate
- [2] Actuator controls name plate

#### Actuator name plate

Figure 3: Actuator name plate (example)

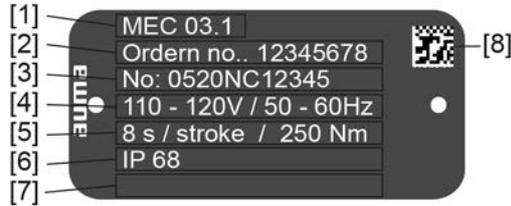


**auma** (= manufacturer logo); **CE** (= CE mark)

- [1] Name of manufacturer
- [2] Address of manufacturer
- [3] **Type designation**
- [4] **Order number**
- [5] **Serial number**
- [6] Operating time
- [7] Maximum torque
- [8] Type of lubricant
- [9] Permissible ambient temperature
- [10] Current at max. torque
- [11] Mains voltage
- [12] Can be assigned as an option upon customer request
- [13] Enclosure protection
- [14] **Data Matrix code**

**Actuator controls name plate**

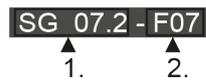
Figure 4: Name plate for actuator controls (example)



- [1] **Type designation**
- [2] **Order number**
- [3] **Serial number**
- [4] Mains voltage, mains frequency
- [5] Operating time per stroke
- [6] Enclosure protection
- [7] Can be assigned as an option upon customer request
- [8] Data Matrix code

**Descriptions referring to name plate indications**

**Type designation** Figure 5: Type designation (example)



- 1. Type and size of actuator
- 2. Flange size

These instructions apply to the following device types and sizes:

Part-turn actuators for open-close and modulating duty: SG 04.2, 05.2, 07.2, 10.2

**Order number** The product can be identified using this number and the technical data as well as order-related data pertaining to the device can be requested.

Please always state this number for any product inquiries.

On the Internet at <http://www.auma.com> > Service & Support > myAUMA, we offer a service allowing authorised users to download order-related documents such as wiring diagrams and technical data (both in German and English), inspection certificate and the operation instructions when entering the order number.

**Serial number Actuator**

Table 1:

Description of serial number (example of 0520NS12345)		
05	20	NS12345
05	Positions 1+2: Assembly in week = week 05	
	20	Positions 3+4: Year of manufacture = 2020
	NS12345	Internal number for unambiguous product identification

**Data Matrix code** When registered as authorised user, you may use our **AUMA Assistant App** to scan the Data Matrix code and directly access the order-related product documents without having to enter order number or serial number.

Figure 6: Link to AUMA Assistant App:



For further Service & Support, Software/Apps/... refer to [www.auma.com](http://www.auma.com)

## 4. Transport and storage

### 4.1. Transport

For transport to place of installation, use sturdy packaging.

#### DANGER

#### **Suspended load!**

*Risk of death or serious injury.*

- Do NOT stand below suspended load.
- Attach ropes or hooks for the purpose of lifting by hoist only to housing and NOT to handwheel.
- Actuators mounted on valves: Attach ropes or hooks for the purpose of lifting by hoist to valve and NOT to actuator.

### 4.2. Storage

#### NOTICE

#### **Risk of corrosion due to inappropriate storage!**

- Store in a well-ventilated, dry room.
- Protect against floor dampness by storage on a shelf or on a wooden pallet.
- Cover to protect against dust and dirt.
- Apply suitable corrosion protection agent to uncoated surfaces.

#### **Long-term storage**

For long-term storage (more than 6 months), observe the following points:

1. Prior to storage:  
Protect uncoated surfaces, in particular the output drive parts and mounting surface, with long-term corrosion protection agent.
2. At an interval of approx. 6 months:  
Check for corrosion. If first signs of corrosion show, apply new corrosion protection.

Plastic protective caps supplied when leaving the factory are for transport protection only. They have to be replaced for long-term storage. (Heed protection type indicated on name plate.)

**5. Assembly**

**5.1. Mounting position**

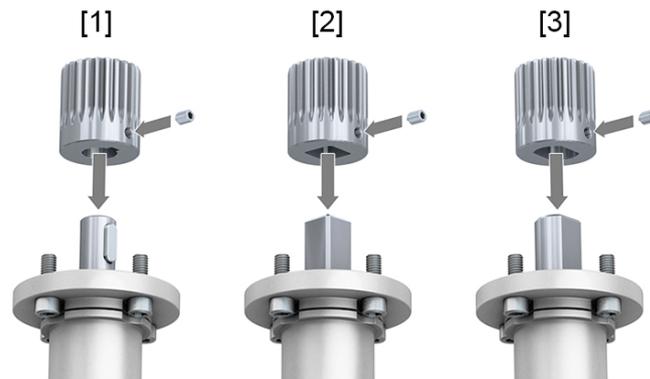
The product described in this document can be operated without restriction in any mounting position.

**5.2. Mount actuator to valve**

The actuator is mounted to the valve using a coupling.

**5.2.1. Overview on coupling variants**

**Design principle** Figure 7: Coupling variants



- [1] Bore with keyway
- [2] Square bore
- [3] Bore with two-flats

- Application**
- For valve attachments according to EN ISO 5211
  - For rotating, non-rising valve stem

**5.2.2. Mount actuator (with coupling)**

Unbored couplings or couplings with pilot bore must be machined to match the valve shaft prior to mounting the actuator to the valve (e.g. with bore and keyway, two-flat or square bore).

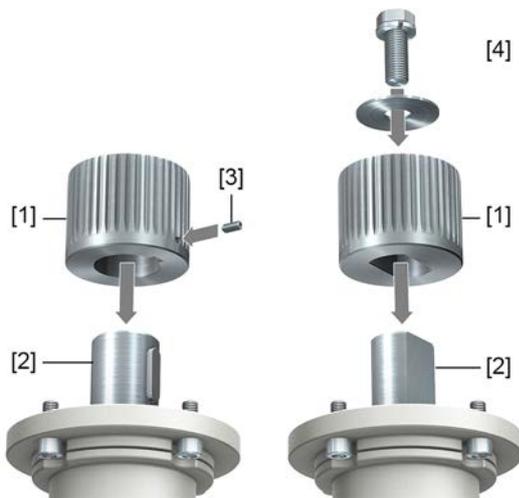
**➔ Assemble valve and actuator in the same end position. As standard, the actuator is supplied in end position CLOSED.**

- Recommended mounting position for **butterfly valves**: End position CLOSED.
- Recommended mounting position for **ball valves**: End position OPEN.

- Assembly steps**
1. If required, move actuator in same end position as valve using the handwheel.
  2. Clean mounting faces, thoroughly degrease uncoated mounting surfaces.
  3. Apply a small quantity of grease to the valve shaft [2].

- Place coupling [1] onto valve shaft [2] and secure against axial slipping by using a grub screw [3] or a clamping washer and a screw with curved spring lock washer [4]. Thereby, ensure that dimensions X, Y or L are observed (refer to figure and table <Mounting positions for coupling>).

Figure 8: Examples: Fit coupling



- [1] Coupling
- [2] Valve shaft
- [3] Grub screw
- [4] Clamping washer and screw with curved spring lock washer

Figure 9: Mounting positions for coupling

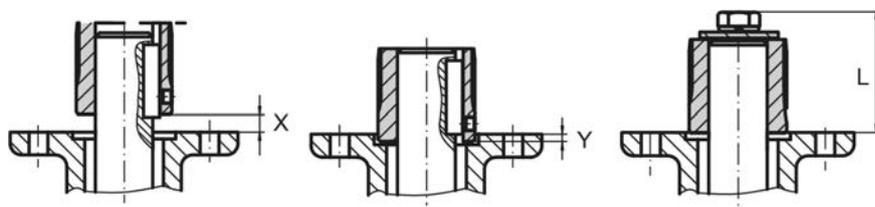


Table 2:

Mounting position of the coupling within fitting dimensions according to AUMA definition				
Dimensions [mm]	SG 04.2	SG 05.2	SG 07.2	SG 10.2
EN ISO 5211	F07	F07	F07	F07
X max	3	3	3	3
Y max	5	6	5	10
L max	35	35	35	35

- Apply non-acidic grease at splines of coupling (e.g. Gleitmo by Fuchs).

6. Fit actuator. If required, slightly turn actuator until splines of coupling engage.  
Figure 10:



**Information** Ensure that the spigot (if provided) fits uniformly in the recess and that the flanges are in complete contact.

7. If flange bores do not match thread:
  - 7.1 Slightly rotate handwheel until bores line up.
  - 7.2 If required, shift actuator by one tooth on the coupling.
8. Fasten actuator with screws.
- Information:** We recommend applying liquid thread sealing material to the screws to avoid contact corrosion.
9. Fasten screws crosswise to a torque according to table.

Table 3:

Tightening torques for screws	
Threads	Tightening torque [Nm]
	Strength class A2–80
M6	10
M8	24
M10	48
M12	82

## 6. Electrical connection

### 6.1. Basic information



#### **Electric shock due to presence of hazardous voltage!**

*Risk of death or serious injury!*

- The electrical connection must be carried out exclusively by suitably qualified personnel.
- Prior to connection, observe basic information contained in this chapter.

#### **Wiring diagram/terminal plan**

The pertaining wiring diagram/terminal plan (in German or English) is attached to the device in a weather-proof bag, together with these operation instructions. It can also be requested from AUMA (state order number, refer to name plate) or downloaded directly from the Internet (<http://www.auma.com>).

#### **Permissible networks (supply networks)**

The actuators are suitable for use in TN and TT networks with directly earthed star point. Use in IT networks is permitted while heeding the indications with regard to on-site protection.

#### **Current type, mains voltage, mains frequency**

Type of current, mains voltage and mains frequency must match the data on the name plate.

#### **Protection and sizing on site**

For short-circuit protection and for disconnecting the actuator from the mains, fuses and disconnect switches have to be provided by the customer.

The current value for sizing the protection is derived from the current consumption of the actuator (refer to name plate).

We recommend refraining from using residual current devices (RCD). However, if an RCD is used within the mains, the residual current device must be of type B.

Consider length and cross section of connecting cables between actuator controls and actuator when defining the protection required.

#### **Safety standards**

Safety measures and safety equipment must comply with the respectively valid national on site specifications. All externally connected devices shall comply with the relevant safety standards applicable for the place of installation.

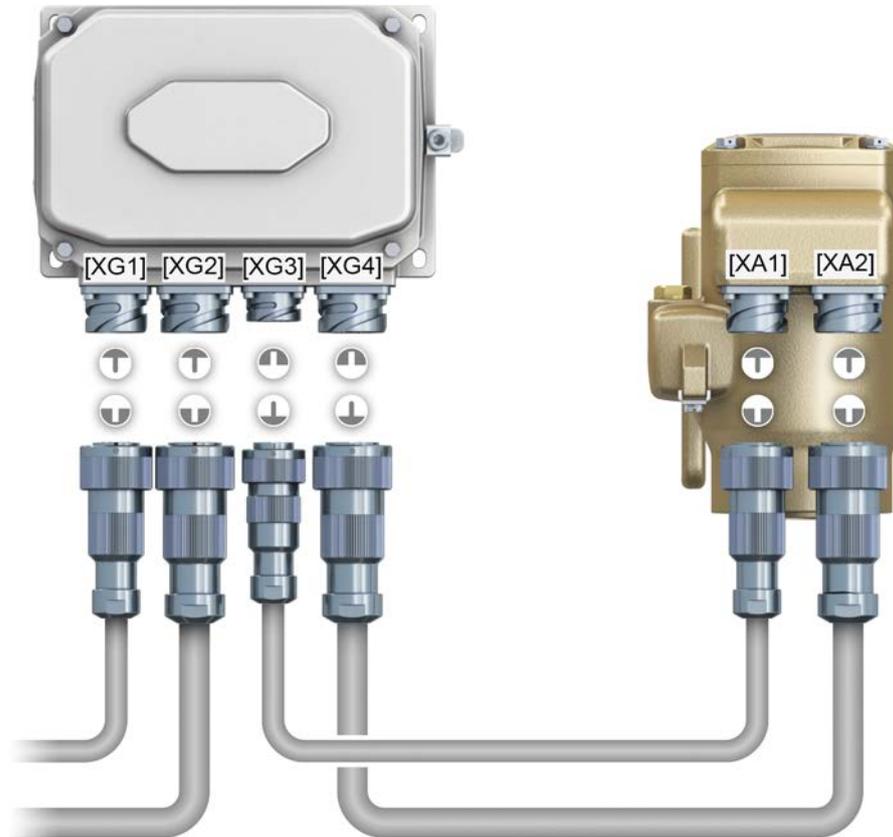
All connected electric circuits shall comply with the requirements for protective separation.

#### **Connecting cables, cable glands, reducers, blanking plugs**

- We recommend using connecting cables and connecting terminals according to rated current ( $I_N$ ) (refer to motor or electrical data sheet).
- For device insulation, appropriate (voltage-proof) cables must be used. Specify cables for the highest occurring rated voltage.
- To avoid contact corrosion, we recommend the use of sealing agents for cable glands and blanking plugs made of metal.
- It is advised to use a shielded cable.
- For connecting cables exposed to UV radiation (outdoor installation), use UV resistant cables.
- The cross-sectional area of every protective earthing conductor which does not form part of the supply cable or the cable enclosure, shall, in any case, not be less than:
  - For mechanical protection: minimum 2.5 mm<sup>2</sup>
  - Without mechanical protection: minimum 4 mm<sup>2</sup>
- For the connection of position transmitters, screened cables must be used.

**6.2. Overview of connections and wiring**

Figure 11: Connections and wiring for MEC 03.1 with actuator



Symbols:

 pins; 
  sockets

Sockets:

- [XG1] Power supply (mains voltage)
- [XG2] Control and signalling
- [XG3] Motor control
- [XG4] Signals to and from the actuator
- [XA1] Motor
- [XA2] Actuator signals

The permissible cable length between MEC 03.1 actuator controls and the actuator amounts to 50 m maximum.

Use suitable flexible and screened connecting cables.

### 6.3. Connection via bayonet connector

Figure 12: Connections at MEC 03.1 (standard)



- [XG1] 5 contacts, VDE compliant socket, for power plug (power supply)
- [XG2] 19 contacts, socket for signal connector
- [XG3] 5 contacts, socket for power plug to actuator
- [XG4] 17 contacts, socket for signal connector to the actuator

Figure 13: Connections to MEC 03.1 (compatible with MEC 02.1)



- [XG1] 5 contacts, socket, for power plug (power supply)
- [XG2] 17 contacts, socket for signal connector
- [XG3] 5 contacts, socket for power plug to actuator
- [XG4] 17 contacts, socket for signal connector to the actuator

Figure 14: Connections at actuator



[XA1] 5 contacts, socket for motor power plug  
 [XA2] 17 contacts, socket for signal connector

#### Suitable connectors

If indicated on the order, suitable connectors for the connections XG1] – [XG4] will be supplied. The cable diameter must be indicated on the order.

For the pin assignment (A, B, C, ...) for connecting the cables and wires to the connector, refer to the enclosed wiring diagram. For further data such as terminal cross sections, cable diameters and tools e.g. crimping pliers refer to separate Technical data "ITT Cannon connector" (AUMA document number: Y007.274)



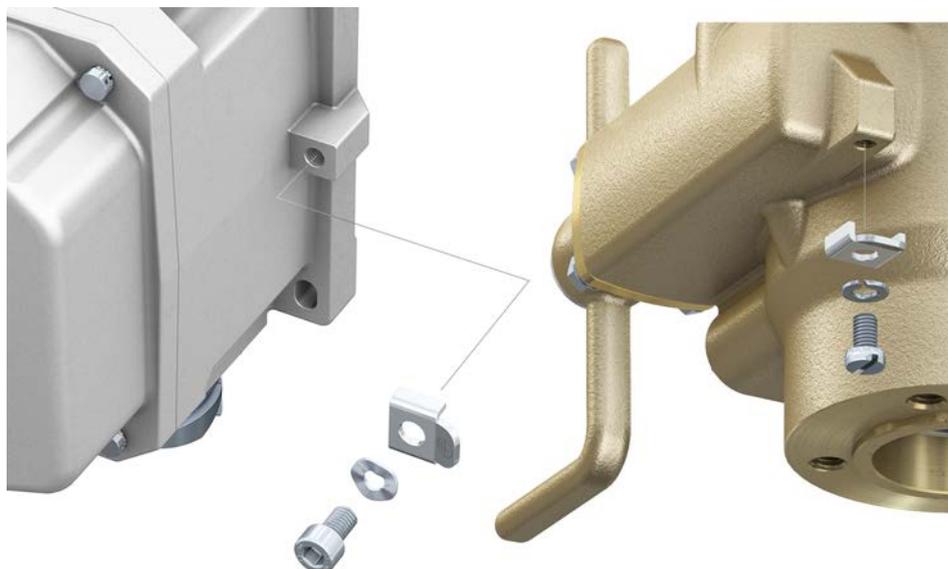
#### Hazardous voltage at open connector (capacitor discharge)!

*Risk of electric shock.*

→ After disconnecting the power supply (removing connector for power terminals), wait at least 5 seconds before touching the pins/sockets.

**6.4. External earth connection**

Figure 15: Earth connection at MEC 03.1 and actuator



**Application** External earth connection (U-bracket) for connection to equipotential compensation.



**Hazardous voltage due to insulating impact of powder coating!**

*Risk of electric shock.*

- Free (file off) the surface below the U-bracket of MEC actuator controls from powder.
- Connect all protective earth conductors.
- Connect PE connection to external protective earth conductor of connection cable.
- Only connect the device to mains voltage and commission once the external earth connection has been connected.

Table 4:

Terminal cross sections and earth connection tightening torques		
Conductor type	Terminal cross sections	Tightening torques
Solid wire and stranded	2.5 mm <sup>2</sup> to 6 mm <sup>2</sup>	3 – 4 Nm
Fine stranded	1.5 mm <sup>2</sup> to 4 mm <sup>2</sup>	3 – 4 Nm

For fine stranded (flexible) wires, connection is made via cable lugs/ring terminals. When connecting two individual wires with a U-bracket, cross sections have to be identical.

**6.5. Accessories for electrical connection****6.5.1. Local controls**

Figure 16: MEC 03.1 actuator controls with local controls (option)



During motor operation, the actuator may be operated from LOCAL via the push buttons of local controls.

## 7. Commissioning

### 7.1. Mechanical end stop setting

The mechanical end stops in actuator limit the swing angle. They protect the valve during motor operation and serve the purpose as travel limitation for manual operation via crank handle or handwheel.

End stop setting is generally performed by the valve manufacturer **prior** to installing the valve into the pipework.



#### Exposed, rotating parts (discs/balls) at the valve!

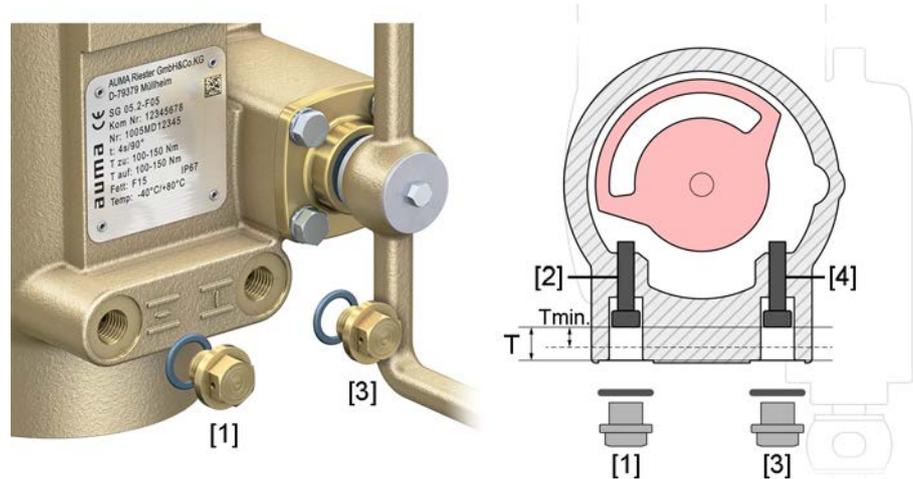
*Pinching and damage by valve or actuator.*

- End stops should be set by suitably qualified personnel only.
- Never completely remove the setting screws [2] and [4] to avoid oil leakage.
- Observe dimension  $T_{min}$ .

#### Information

- The swing angle set in the factory (e.g. 90°) as well as the setting range (e.g. 82° to 98°) is indicated in the order-related technical data sheet. The swing angle can be freely adjusted within the indicated setting range.
- The setting sequence depends on the valve:
  - Recommendation for **butterfly valves**: Set end stop CLOSED first.
  - Recommendation for **ball valves**: Set end stop OPEN first.

Figure 17: End stops



- [1] Screw plug for end stop OPEN
- [2] Setting screw for end stop OPEN
- [3] Screw plug for end stop CLOSED
- [4] Setting screw for end stop CLOSED

Table 5:

Dimensions/sizes	04.2	05.2	07.2	10.2
T (for 90°) [mm]	13.5	13	16	19
$T_{min}$ . [mm]	9	8	9	9

#### 7.1.1. End stop CLOSED: set

1. Remove screw plug [3].
2. Move valve to end position CLOSED with crank handle/handwheel.

3. If the valve end position is not reached:
  - Slightly turn setting screw [4] counterclockwise until valve end position CLOSED can be correctly set.
  - ➔ Turning the setting screw [4] clockwise decreases the swing angle.
  - ➔ Turning the setting screw [4] counterclockwise increases the swing angle.



4. Turn setting screw [4] clockwise to the stop.
  - ➔ This completes the setting of end stop CLOSED.
5. Check O-ring in screw plug [3] and replace if damaged.
6. Fasten and tighten screw plug [3].

Once this procedure is complete, the end position detection for end position CLOSED can be set immediately.

### 7.1.2. End stop OPEN: set

**Information** In general, the end stop OPEN does not have to be set.

1. Remove screw plug [1].
2. Move valve to end position OPEN with crank handle/handwheel.
3. If the valve end position is not reached:
  - Slightly turn setting screw [2] counterclockwise until valve end position OPEN can be correctly set.
  - ➔ Turning the setting screw [2] clockwise decreases the swing angle.
  - ➔ Turning the setting screw [2] counterclockwise increases the swing angle.

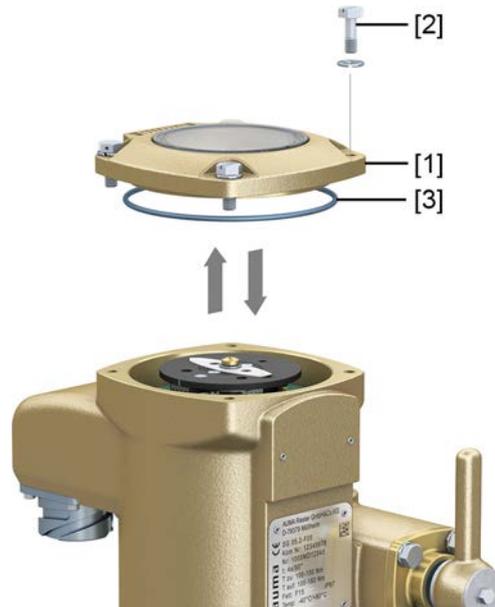


4. Turn setting screw [2] clockwise to the stop.
  - ➔ This completes the setting of end stop OPEN.
5. Check O-ring in screw plug [1] and replace if damaged.
6. Fasten and tighten screw plug [1].

Once this procedure is complete, the end position detection for end position OPEN can be set immediately.

**7.2. Switch compartment: open/close**

Figure 18:



The following sub-assemblies are located within the switch compartment:

- End position detection
- RWG electronic position transmitter (option)
- Mechanical position indicator

The switch compartment must be opened to perform the setting of these sub-assemblies.

- |              |   |
|--------------|---|
| <b>Open</b>  | 1. Loosen screws [2] and remove cover [1] from the switch compartment.                                  |
| <b>Close</b> | 2. Clean sealing faces of housing and cover.  |
|              | 3. Check whether O-ring [3] is in good condition, replace if damaged.                                   |
|              | 4. Apply a thin film of non-acidic grease (e.g. petroleum jelly) to the O-ring and insert it correctly. |
|              | 5. Place cover [1] on switch compartment.   |
|              | 6. Fasten screws [2] evenly crosswise.  |

**7.3. End position detection: verify/set**

Figure 19: Verify/set end position detection using LEDs



- [1] Screws for setting CLOSED
- [2] Setting disc
- [3] Screw
- [L1] Green LED, signals end position OPEN
- [L2] Yellow LED, signals end position CLOSED

The end position detection signals that end positions OPEN and CLOSED have been reached. The “End position OPEN/CLOSED reached” signals are available as output signals. ⇒ [page 39, Status signals \(digital outputs\)](#)

For limit seating, the signals of the end position detection are used for end position tripping.

On delivery, the end position detection is adjusted to swing angle factory setting of the mechanical end stops. ⇒ [page 19, Mechanical end stop setting](#)

Once the mechanical end stops have been changed, the end position detection has to be readjusted. Two LEDs are available for setting.

**7.3.1. Setting for clockwise closing**

The following description is only valid for “clockwise closing”, i.e. driven shaft turns clockwise to close the valve. Designation in the wiring diagram: TPC ... AI M ... for “clockwise”

**Check end position  
CLOSED**

1. Switch on the power supply.
2. Operate valve exactly to end position CLOSED and do not change position irrespective of the type of seating, i.e. limit or torque seating.
  - If the yellow LED is illuminated, end position detection CLOSED has been correctly set. Continue with step “Check end position OPEN”.
  - If the yellow LED is not illuminated or only flickering, end position detection CLOSED has to be set again. Proceed as follows:

**Set end position  
CLOSED**

3. Loosen both screws [1] so that the setting disc [2] can be turned.

4. Set switching point (yellow LED is brightly illuminated) by turning clockwise. Figure 20:



**Verify end position OPEN**

- ➔ If the LED is only dimly illuminated, the switching point has not yet been reached.
  - ➔ Once you have turned too far, the yellow LED goes out again.
  - ➔ The setting disc should be positioned in the middle between illumination and going out of the yellow LED.
5. After setting end position CLOSED: Hold setting disc tight and tighten both screws [1].
  6. Operate valve from end position.
  7. Approach end position CLOSED once again and check setting (yellow LED must be illuminated).
  8. Operate valve exactly to end position OPEN.

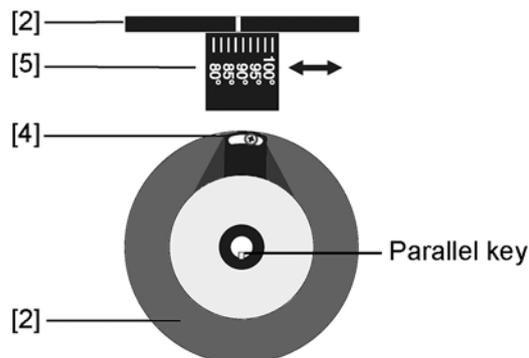
**Set end position OPEN**

- ➔ If the green LED is illuminated, end position detection OPEN has been correctly set.
  - ➔ If the green LED is not illuminated or only flickering, end position detection has to be set again. Proceed as follows:
9. Loosen screw [3] and remove setting disc [2].



**Do not lose parallel key.**

10. Loosen screw [4] at the bottom of the setting disc. Figure 21: Bottom of the setting disc with lateral dial



11. Adjust dial to different swing angle: approx. 3 – 4° smaller than actual end position.
12. Tighten screw [4] again.
13. Fit setting disc [2] and secure with screw [3].
14. Approach end position CLOSED once again and check setting (LED must be illuminated).

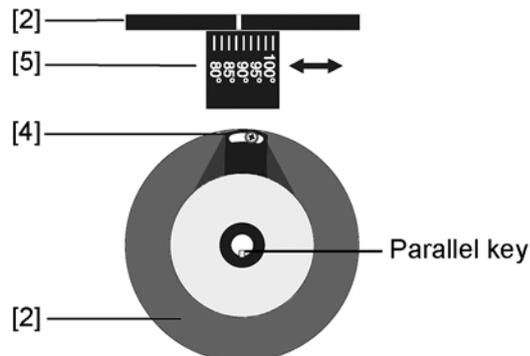
**7.3.2. Setting for counterclockwise closing**

The following description is only valid for “counterclockwise closing”, i.e. driven shaft turns counterclockwise to close the valve. Designation in the wiring diagram: TPC ... AIB ... for “clockwise”

- |                                      |   |
|--------------------------------------|---|
| <b>Check end position<br/>CLOSED</b> | <ol style="list-style-type: none"> <li>1. Switch on the power supply.</li> <li>2. Operate valve exactly to end position CLOSED and do not change position. <ul style="list-style-type: none"> <li>➤ If the green LED is illuminated, end position detection CLOSED has been correctly set. Continue with step “Check end position OPEN”.</li> <li>➤ If the green LED is not illuminated or only flickering, end position detection CLOSED has to be set again. Proceed as follows:</li> </ul> </li> </ol>   |
| <b>Set end position<br/>CLOSED</b>   | <ol style="list-style-type: none"> <li>3. Loosen both screws [1] so that the setting disc [2] can be turned.</li> <li>4. Set switching point (green LED is brightly illuminated) by turning clockwise. <ul style="list-style-type: none"> <li>➤ If the LED is only dimly illuminated, the switching point has not yet been reached.</li> <li>➤ Once you have turned too far, the green LED goes out again.</li> <li>➤ The setting disc should be positioned in the middle between illumination and going out of the green LED.</li> </ul> </li> <li>5. After setting end position CLOSED: Hold setting disc tight and tighten both screws [1].</li> <li>6. Operate valve from end position.</li> <li>7. Approach end position CLOSED once again and check setting (green LED must be illuminated).</li> </ol> |
| <b>Verify end position<br/>OPEN</b>  | <ol style="list-style-type: none"> <li>8. Operate valve exactly to end position OPEN. <ul style="list-style-type: none"> <li>➤ If the yellow LED is illuminated, end position detection OPEN has been correctly set.</li> <li>➤ If the yellow LED is not illuminated or only flickering, end position detection OPEN has to be set again. Proceed as follows:</li> </ul> </li> </ol>  |
| <b>Set end position OPEN</b>         | <ol style="list-style-type: none"> <li>9. Loosen screw [3] and remove setting disc [2].</li> </ol>  |

**Do not lose parallel key.**

10. Loosen screw [4] at the bottom of the setting disc.  
Figure 22: Bottom of the setting disc with lateral dial



11. Adjust dial to different swing angle: approx. 3 – 4° smaller than actual end position.
12. Tighten screw [4] again.
13. Fit setting disc [2] and secure with screw [3].
14. Approach end position OPEN once again and check setting (yellow LED must be illuminated).

## 7.4. RWG electronic position transmitter

RWG electronic position transmitter records the valve position. On the basis of the actual position value measured by the potentiometer (travel sensor), it generates a current signal between 4 – 20 mA. The signal will be automatically synchronised to end positions OPEN and CLOSED within MEC 03.1 actuator controls.

### Technical data

Table 6: RWG

Data	2-wire system
Output current $I_a$	4 – 20 mA
Power supply $U_V$	14 V DC + $(I \times R_B)$ , max. 30 V
Max. current consumption	20 mA
Max. load $R_B$	$(U_V - 14 \text{ V})/20 \text{ mA}$

### Delivery state

RWG electronic position transmitter is already set on delivery. In the factory, the 4 – 20 mA signal has been adjusted to the complete swing angle range between the mechanical end stops OPEN and CLOSED.

### 7.4.1. Set measuring range



**The measuring range only needs to be readjusted if the factory-set swing angle has been increased.**

### Setting elements

The RWG is housed in the actuator switch compartment. The switch compartment must be opened to perform any settings. ⇒ [page 21, Switch compartment: open/close](#)  
Setting is made via three potentiometers [1], [2] and [3].

Figure 23: View on the open switch compartment



- [1] Trimmer potentiometer max. (20 mA)
- [2] Trimmer potentiometer min. (4 mA)
- [3] Potentiometer (travel sensor)

For measuring range setting, voltage must be applied at the position transmitter.

1. Move valve in direction CLOSE to the mechanical end stop.
2. Connect measuring equipment for 4 – 20 mA to XG2.



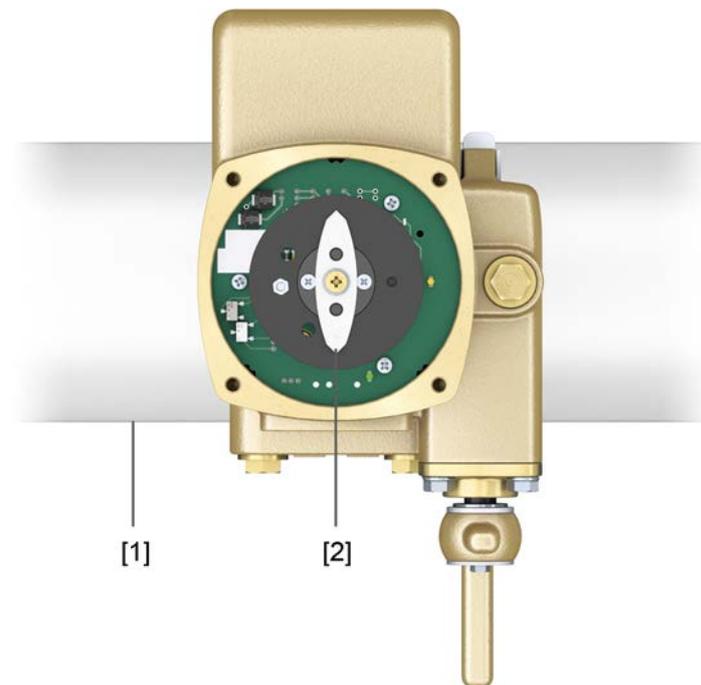
**The electric circuit (external load) must be closed (consider maximum load  $R_B$ ), otherwise no value can be measured.**

3. Turn potentiometer [3] clockwise to the stop.
4. Turn potentiometer [3] slightly in opposite direction.

5. Turn trimmer potentiometer [2] clockwise until output current starts to increase.
  6. Turn back trimmer potentiometer [2] until a value of approx. 4.1 mA has been reached.
- ➔ This ensures that the signal remains above the dead and live zero point.
7. Move valve in direction OPEN to the mechanical end stop.
  8. Set trimmer potentiometer [1] to end value 20 mA.
  9. Approach end position CLOSED anew and check minimum value (4.1 mA). If necessary, correct the setting.

### 7.5. Mechanical position indicator: set

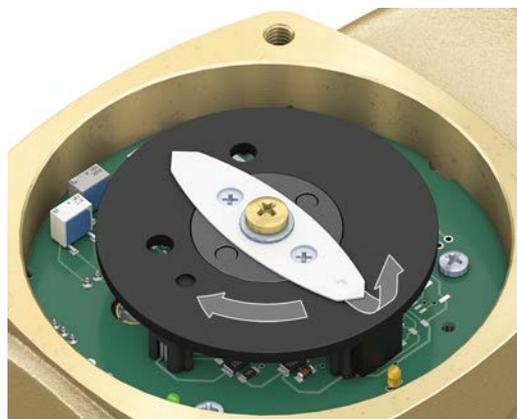
Figure 24: Position indication in end position CLOSED/pointer perpendicular to the pipeline



- [1] Pipeline  
[2] White pointer

1. Move valve to end position CLOSED.
2. Slightly lift white pointer [2] on the side with groove so that the pointer is perpendicular to the pipeline [1].

Figure 25:



- ➔ For valve with 90° part-turn movements, the pointer will engage into the provided groove.

Further information on indication: ⇒ [page 37, Mechanical position indicator](#)

## 8. Basic settings for the actuator controls

To prevent valve damage and failures during commissioning, the basic settings of actuator controls must be verified prior to electrical actuator operation (motor operation) and adapted in compliance with the requirements of both valve and application.

Basic settings of the actuator controls include:

- Setting hardware (switches) or software mode
- Setting the type of seating
- Setting the torque switching
- Setting the operating time

To perform basic settings, proceed as follows:

1. via **switches** (directly at the device when not live);  
For switch setting, open actuator controls cover.
2. via **AUMA CDT software** (with computer/notebook, tablet);  
⇒ [page 6, Software](#) (For available software version, refer to [www.auma.com](http://www.auma.com)).  
For this, the cover of actuator controls may not be opened. For communication with the AUMA CDT software, the actuator must be connected to mains voltage.

### 8.1. Actuator controls: open/close

For changing switch settings, open actuator controls cover.

open

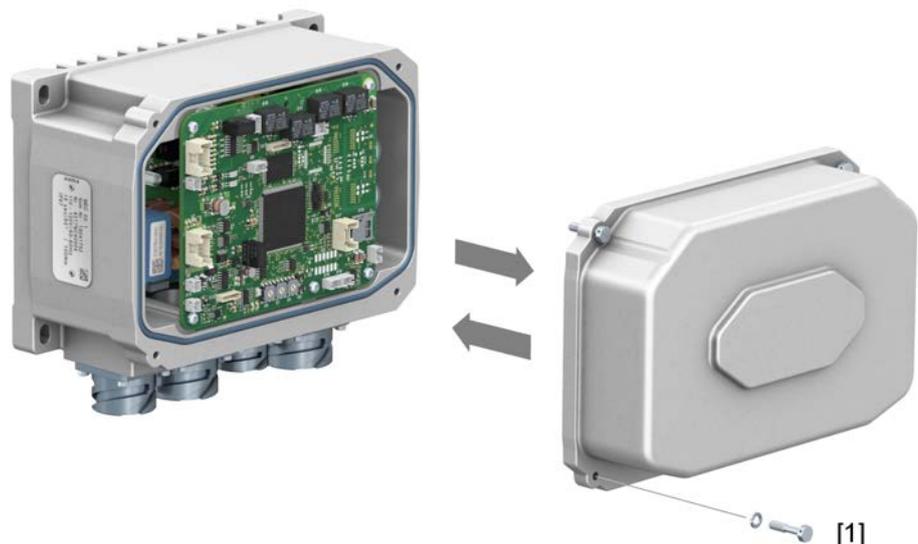


**Electric shock due to presence of hazardous voltage!**

*Death or serious injury.*

- Disconnect device from the mains before opening.
- Wait for 60 seconds after power cut-off prior to opening the housing.

1. Loosen 4 screws and remove cover [1] to actuator controls.  
Figure 26:



2. Clean sealing faces of housing and cover.
3. Apply a thin film of non-acidic grease (e.g. petroleum jelly) to the sealing faces.
4. Check whether seal is in good condition, replace seal if damaged.
5. Apply a thin film of non-acidic grease (e.g. petroleum jelly) to the seal and insert correctly.
6. Place cover [1].
7. Fasten screws evenly crosswise.

**8.2. Setting via hardware (switches) or via software**

The switch [S5] position determines whether the hardware settings (switches) or the software settings (via AUMA CDT software) are currently active.

Figure 27: Switch [S5] = Hardware/software mode

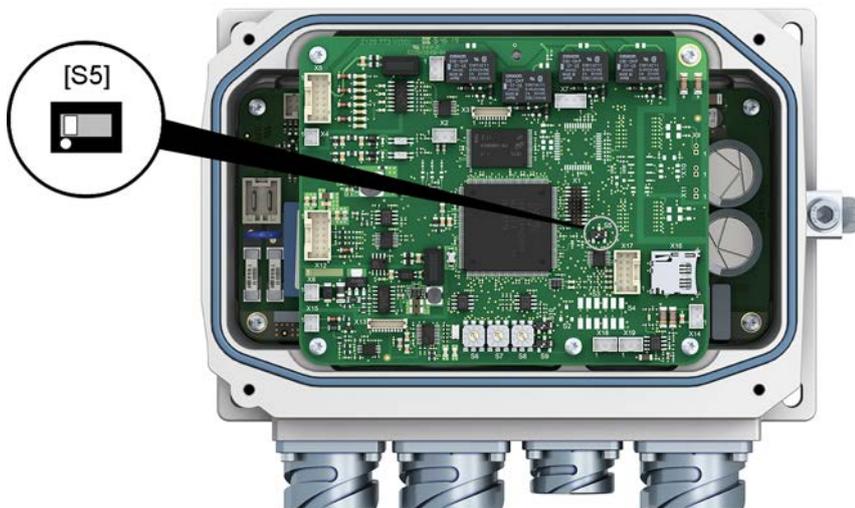


Table 7:

Switch [S5] functions		
OFF (1)		<b>Hardware mode</b> (factory setting on delivery) Settings of switches [S2] through [S4] and [S6] through [S10] are valid. The values cannot be changed via AUMA CDT software.
ON (0)		<b>Software mode</b> (sliding switch at white dot) Settings of switches [S2] through [S4] and [S6] through [S10] are NOT relevant. Settings are defined via software parameters.

**8.3. Type of seating: set**

**NOTICE**

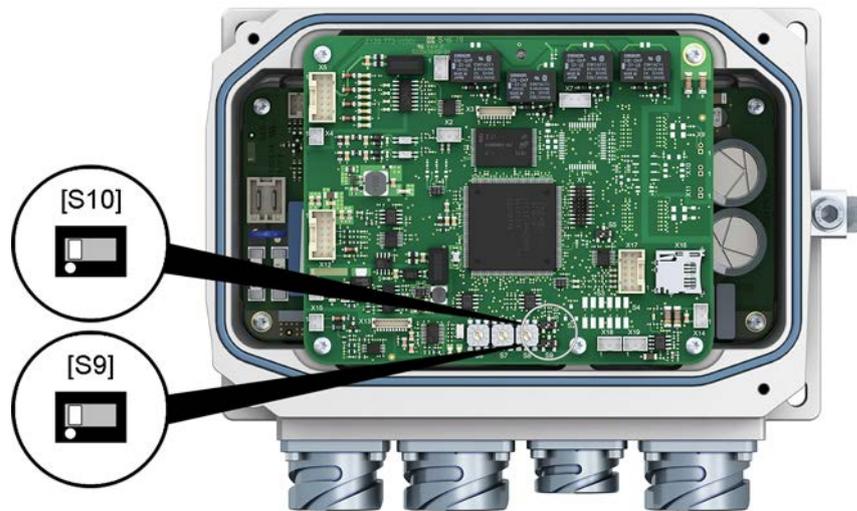
**Valve damage due to incorrect setting!**

- The type of seating setting (limit or torque seating) must match the selection for the valve.
- Only change the setting with prior consent of the valve manufacturer.

**Setting via switches**

Condition: Switch [S5] is in position OFF (hardware mode).

Figure 28: Switches for type of seating



[S9] End position OPEN  
[S10] End position CLOSED

Table 8:

Function of switches [S9], [S10]		
ON		Limit seating, sliding switch at white dot
OFF		Torque seating

**Setting via software parameters (AUMA CDT)**

Condition: Switch [S5] is in position ON (software mode).

**Setting parameters**

**Customer settings**

- Type of seating
- End position CLOSED
- End position OPEN

**Default value:** Limit

**Setting values:**

- Limit** Limit seating in end positions.
- Torque** Torque seating in end positions.

**8.4. Torque switching: set**

**NOTICE**

**Valve damage due to excessive tripping torque limit setting!**

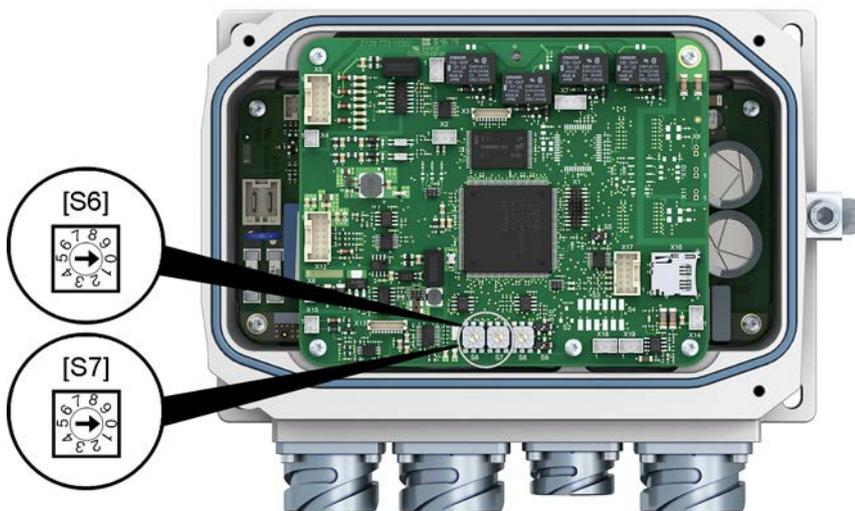
- The tripping torque must suit the valve.
- Only change the setting with the consent of the valve manufacturer.

Once the set tripping torque is reached, the controls automatically switch off the actuator (overload protection of the valve).

**Setting via switches**

Condition: Switch [S5] is in position OFF (hardware mode).

Figure 29: Switches for tripping torque



[S6] Tripping torque in direction OPEN  
[S7] Tripping torque in direction CLOSE

**Default value:** depending on the order

**Setting range:** in 8 steps (refer to tables), linear from 40 – 100 % of the maximum tripping torque.

Table 9:

Switch steps	Tripping torques [Nm]			
	SG 04.2	SG 05.2	SG 07.2	SG 10.2
0	25	50	100	200
1	25	50	100	200
2	30	60	120	240
3	35	70	140	280
4	40	80	160	320
5	45	90	180	360
6	50	100	200	400
7	55	110	220	440
8	63	125	250	500
9	63	150 <sup>1)</sup>	250	700 <sup>1)</sup>

1) When operating the actuator using these settings, the lifetime will be reduced. The lifetime is indicated in the Technical data. The “excessive torque” function is not effective for these settings.

**Setting via software parameters (AUMA CDT)**

Condition: Switch [S5] is in position ON (software mode).

**Setting parameters**

**Customer settings**

**Torque switching**

Tripping torque CLOSE (S7)

Tripping torque OPEN (S6)

**Default value:** depending on the order

**Setting ranges:** adjustable between 40 – 100 % of the maximum tripping torque

**8.5. Operating time: set**

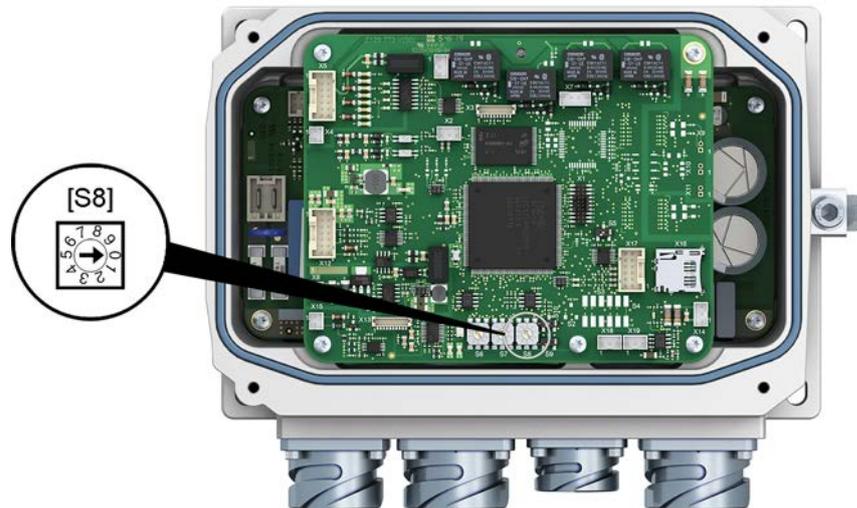
Operating time is defined by the motor speed.

### Setting via switches

Switch [S8] is used to change the motor speed and thus the actuator operating time. The preset operating time is valid for both operation modes (Local **and** Remote).

Condition: Switch [S5] is in position OFF (hardware mode).

Figure 30: Switch for operating time



[S8] Operating time

**Default value:** depending on the order

**Setting range:** 9 steps (refer to table)

Table 10:

Switch [S8] Step	Operating times for 90° in [s]	
	SG 04.2/05.2/07.2	SG 10.2
1	63 <sup>1)</sup>	90 <sup>1)</sup>
2	45 <sup>1)</sup>	63 <sup>1)</sup>
3	32 <sup>1)</sup>	45 <sup>1)</sup>
4	22	32
5	16	22
6	11	16
7	8	11
8	5.6	8
9	4	5.6
0	impermissible switch position	

1) Motor is operating in stepping mode

### Setting via software parameters (AUMA CDT)

Motor speed and thus actuator operating time can be modified by means of the software parameters described below. Contrary to operating time setting using switch [S8], setting via software parameters offers the following additional possibilities:

- Different motor speeds for operation modes Local and Remote
- Adjustable motor speed setting (operating times)
- Setting the motor speed setting (target speed) for operation mode Remote by an external signal (4 – 20 mA) or via the analogue input AIN 1

#### Setting parameters

Condition: Switch [S5] is in position ON (software mode).

#### Device configuration

**Motor speed**  
Speed LOCAL  
Speed REMOTE  
Speed I/O interface

**Description of parameters:**

**Speed LOCAL** Output speed for operation via local controls (operation mode Local); Setting range: linear between 0 – 100 % of max. motor speed; Default value = 50.0 %

**Speed REMOTE** Output speed in operation mode Remote for setting the parameter **Speed I/O interface** = **Internal** ; Setting range: linear between 0 – 100 % (0 % = min. motor speed, 100 % = max. motor speed); Default value = 50.0 %

**Speed I/O interface** = **External**

In operation mode Remote, the output speed is defined via analogue input AIN 1 (4 – 20 mA).

= **Internal**

In operation mode Remote, the output speed is not defined via analogue input AIN 1 but via the **Speed REMOTE** software parameter.

Table 11:

**Beispielwerte zur Einstellung für Baugrößen SG 04.2/05.2/07.2**

Output speed via parameter: Speed LOCAL Speed REMOTE	Output speed via AIN1 (Speed I/O interface = External) <b>4 – 20 mA</b>	Speed Motor [rpm]	Operating time Output drive [s]
0.0 %	4.0	133	52
9.0 %	5.4	314	22
14.0 %	6.3	431	16
23.0 %	7.7	627	11
34.0 %	9.5	863	8
52.0 %	12.3	1,232	5.6
75.0 %	16.0	1,725	4
100.0 %	20.0	2,250	3.1

Table 12:

**Example values for SG 10.2 size setting**

Output speed via parameter: Speed LOCAL Speed REMOTE	Output speed via AIN1 (Speed I/O interface = External) <b>4 – 20 mA</b>	Speed Motor [rpm]	Operating time Output drive [s]
0.0 %	4.0	133	81
10.0 %	5.5	338	32
17.0 %	6.7	491	22
26.0 %	8.1	675	16
40.0 %	10.4	928	11
57.0 %	13.2	1,350	8
85.0 %	17.6	1,929	5.6
100.0 %	20.0	2,250	4.8

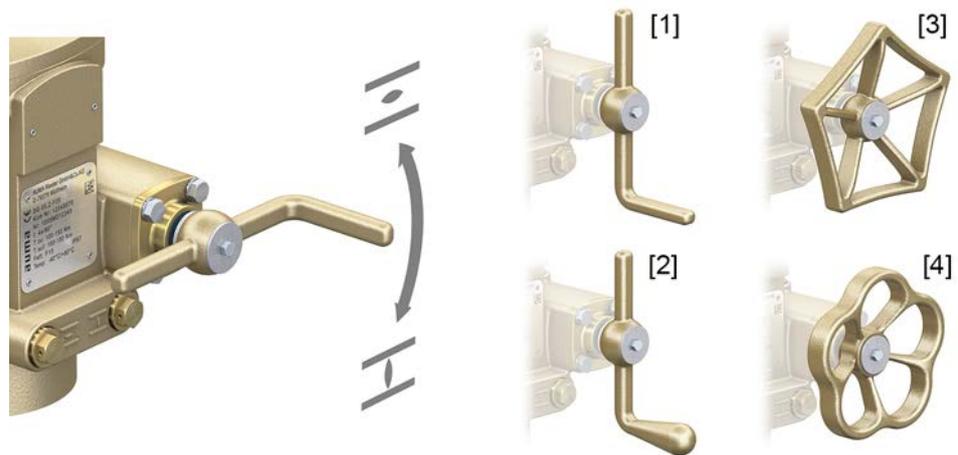
## 9. Operation and control of actuator

### 9.1. Manual operation

For purposes of setting and commissioning, in case of motor or power failure, the actuator may be operated manually.

The handwheel does not rotate during motor operation. Change-over from motor operation to manual operation is not required.

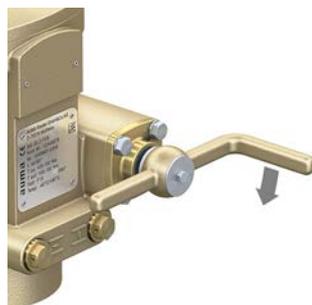
Figure 31: Manual operation



**Handwheel versions:**

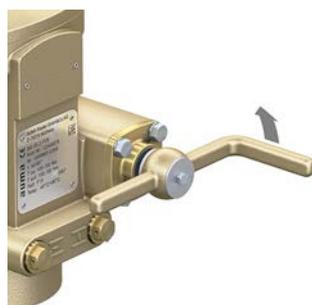
- [1] Crank handle with cylindrical grip (standard)
- [2] Crank handle with conical grip
- [3] Handwheel with five-edge ring
- [4] Handwheel with five-ripple ring

1. Close valve: Turn crank handle/handwheel clockwise.



➔ Drive shaft (valve) turns clockwise in direction CLOSE.

2. Open valve: Turn crank handle/handwheel counterclockwise.



➔ Drive shaft (valve) turns counterclockwise in direction OPEN.

**Information** Turning the handwheel during motor operation extends or reduces the operating time, depending on the direction of rotation.

## 9.2. Motor operation

### 9.2.1. Actuator control from Remote

For operation commands from Remote, up to four digital inputs within the MEC 03.1 actuator controls are available. Wiring diagram designations: REMOTE OPEN, STOP, REMOTE CLOSE (Default)

Actuator without local controls (standard version) can only be controlled from Remote.

For actuators with local controls, operation mode Remote must be activated at local controls.

Figure 32: Local controls (option)



[2] Operation mode LOCAL/REMOTE

[4] Indication light for operation mode LOCAL (blue)

#### Activate operation mode Remote by means of local controls:

- If indication light [4] is blinking in blue: Hold down push button [2] for approx. 3 seconds until the blue indication light goes out.
- ➔ Now, it is possible to operate the actuator via remote control, via operation commands (OPEN, STOP, CLOSE) or analogue setpoints (e.g. 0/4 – 20 mA).

#### Change-over between OPEN - CLOSE control and setpoint control:

For actuators equipped with positioner, it is possible to select between **OPEN - CLOSE control** (REMOTE OPEN-CLOSE) and **setpoint control** (REMOTE SETPOINT).

Selection is made via MODE input, e.g. based on a 24 V DC signal (refer to wiring diagram).

- MODE input: + 24 V DC = REMOTE OPEN-CLOSE  
Control is made via digital operation commands OPEN, STOP, CLOSE.
- MODE input: 0 V (or input open-circuit) = REMOTE SETPOINT  
Control takes place via an analogue signal (e.g. 0/4 – 20 mA).

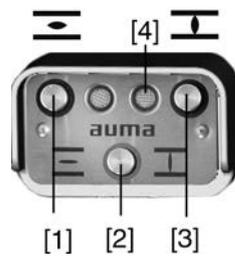
#### EMERGENCY operation:

- An EMERGENCY operation is initiated by a signal at the EMERGENCY input.
- The actuator moves to a predefined EMERGENCY position (i.e. end position OPEN or end position CLOSED).
- During EMERGENCY operation, the actuator does not perform any operation commands.

### 9.2.2. Operation commands from Local

If local controls are provided, the actuator can be operated via the push buttons at local controls.

Figure 33: Local controls



- [1] Push button OPEN
- [2] Push button STOP - operation mode LOCAL/REMOTE
- [3] Push button CLOSE
- [4] Indication light for operation mode LOCAL (blue)



**Hot surfaces, e.g. possibly caused by high ambient temperatures or strong direct sunlight!**

*Risk of burns*

→ Verify surface temperature and wear protective gloves.

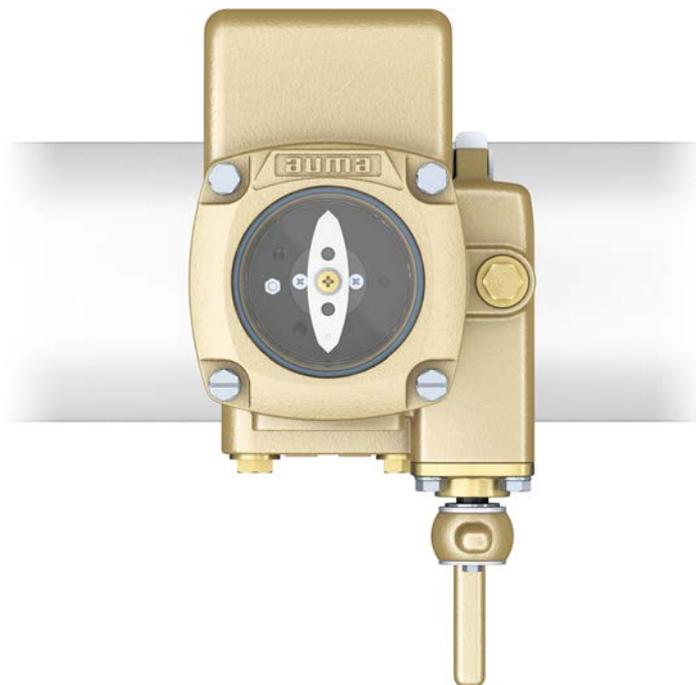
#### **Activate operation mode LOCAL:**

- Hold down push button [2] for approx. 3 seconds until the indication light [4] is blinking in blue.
- ➔ If the right indication light is blinking in blue, the actuator can be operated via push buttons [1 – 3]:
  - Run actuator in direction OPEN: Press push button OPEN [1].
  - Stop actuator: Press push button STOP [2].
  - Run actuator in direction CLOSE: Press push button CLOSE [3].

**10. Indications**

**10.1. Mechanical position indicator**

Figure 34: Mechanical position indicator



The mechanical position indicator shows by means of a white rotating pointer both the valve position and whether the actuator is running (running indication). If set correctly, the position indicator shows that end position OPEN or CLOSE has been reached.



**Perform the position indicator setting to match the valve!**

→ Refer to [page 26, Mechanical position indicator: set](#)

Table 13: Valve position setting with regard to the pipeline.

White pointer Position with regard to the pipeline	Description
	The valve is closed. The actuator is in end position CLOSED.
	The valve is open. The actuator is in end position OPEN.
	Valve and actuator are in an intermediate position.

**10.2. Indication lights on local controls of MEC 03.1**

Figure 35: Indication lights on local controls of MEC 03.1(option)



- [1] Indication light OPEN/fault (green/red)
- [2] Indication light CLOSE/LOCAL (yellow/blue)

Table 14:

Indication light [1] (default setting)		
Colour/state	Signification	Description
illuminated in green	OPEN	The actuator is in end position OPEN.
blinking in red	Fault	The number of blinking signals indicates the number of fault signal. Refer to <Corrective action> chapter.

Table 15:

Indication light [2] (default setting)		
Colour/state	Signification	Description
illuminated in yellow	CLOSE	The actuator is in end position CLOSED.
blinking in blue (1 Hz)	LOCAL	Operation mode LOCAL is active. The actuator can be operated using the push buttons of local controls.

## 11. Output signals

### 11.1. Status signals (digital outputs)

Up to 4 programmable semi-conductors (switching capacity max. 30 V DC/2A) or relay outputs (switching capacity max. 30 V DC/1 A) are available as binary signals.

Table 16:

Exemplary assignment of 4 outputs	
Designation of output contacts in wiring diagram	Designation of output contact in AUMA CDT software
K 1 = End position OPEN	Signal DOUT 2 = End position OPEN
K 2 = End position CLOSED	Signal DOUT 1 = End position CLOSED
K 3 = Fault	Signal DOUT 3 = Fault
K 4 = REMOTE (only for version with local controls)	Signal DOUT 4 = Selector sw. REMOTE

### 11.2. Analogue signals

#### — Option —

**Valve position** Signal: E2 = 4 – 20 mA (galvanically isolated)

Designation in the wiring diagram:

ANOUT1 (position)

**Information** If the output issues 2 mA, the setting of the end positions at the actuator has not yet been performed, i.e. the mA signal does not yet refer to the position. The mA signal is automatically adjusted to the end positions when setting the end positions.

## 12. AUMA CDT software (accessories)

The AUMA CDT software (accessories) can be used to establish a connection to a computer (notebook or tablet).

AUMA CDT software can be downloaded free of charge from our website [www.auma.com](http://www.auma.com). For the supported actuator ranges, refer to our website.

For connecting the computer to the actuator controls, a service cable is required.

### Read/perform basic settings via AUMA CDT software

Basic settings at the device (in actuator controls) made via switches are read only via AUMA CDT on delivery and cannot be modified. To be able to change these parameters via software, set switch [S5] in actuator controls to "Software mode." ⇒ [page 29, Setting via hardware \(switches\) or via software](#)

Switches and software parameters are set to the same values upon delivery (factory settings).

### 13. Corrective action

#### 13.1. Fault indications and warning indications

**Faults** interrupt or prevent the electrical actuator operation.

Faults and warnings can be signalled via the two output contacts and/or via the local controls.

Should local controls be available, the fault and warning signals are indicated by the left indication light [1].

Figure 36: Fault indications and RESET



[1] Red indication light: Fault, yellow: Warning

[2] Push button RESET

In operation mode LOCAL (right indication light is blinking in blue), stored faults (cause does no longer exist), may be reset using the push button RESET [2] (hold it down for more than 1 second).

The tables below show the fault signalling via the indication lights of the local controls.

Table 17:

Fault signalling via the red indication light		
Indication	Message	Signification (default)
1 blinks	Fault indication 1	Torque fault → Press push buttons OPEN or CLOSE to reset the fault (indication light) by operating the device in the opposite direction.
3 blinks	Fault indication 3	Signal loss of analogue input (4 – 20 mA)
4 blinks	Fault indication 4	Operation mode DISABLED: Operation via the local controls is disabled (Enable local controls function).
5 blinks	Fault indication 5	Fault E2 (actual value of positioner) → Check wiring (for possible loss of signal) of E2. → Read detailed fault indication via AUMA CDT software (accessories).
7 blinks	Fault indication 7	Fault of controls temperature
8 blinks	Fault indication 8	Collective signal: Internal error has occurred. → Read detailed fault indication via AUMA CDT software (accessories) and contact AUMA service.
9 blinks	Fault indication 9	Collective signal for all other faults

If there are several faults, only the fault with the highest priority will be signalled. Fault signal 1 has the highest priority, fault signal 9 the lowest.

#### 13.2. Fuses

##### 13.2.1. Fuses within the actuator controls



#### Electric shock due to presence of hazardous voltage!

*Death or serious injury.*

- Disconnect device from the mains before opening.
- Wait for 60 seconds after power cut-off prior to opening the housing.

F1 and F2 primary fuses (device protection fuses are located on the power board (below the logic board). The fuses become visible when removing the cover to the actuator controls. ⇒ [page 28, Actuator controls: open/close](#) If a fuse is defective, the power board has to be replaced.

Figure 37: Primary fuses on power board



## 14. Servicing and maintenance



### Damage caused by inappropriate maintenance!

- Servicing and maintenance must be carried out exclusively by suitably qualified personnel having been authorised by the end user or the contractor of the plant. Therefore, we recommend contacting our service.
- Only perform servicing and maintenance tasks when the device is switched off.

### AUMA Service & Support

AUMA offers extensive service such as servicing and maintenance as well as customer product training. For the contact addresses, refer to our website ([www.auma.com](http://www.auma.com)).

### 14.1. Preventive measures for servicing and safe operation

The following actions are required to ensure safe device operation:

#### 6 months after commissioning and then once a year

- Carry out visual inspection:  
Cable entries, cable glands, blanking plugs, etc. have to be checked for correct tightness and sealing. If required, tighten cable glands and blanking plugs with torque in compliance with the manufacturer's specifications.  
Check actuator for damage as well as for grease or oil leakage.
- Check fastening screws between actuator and gearbox/valve for tightness. If required, fasten screws while applying the tightening torques as indicated in chapter <Assembly>.
- When rarely operated: Perform test run.

### 14.2. Maintenance

#### Maintenance intervals

The maintenance intervals depend on load and application conditions having a major influence on the lubricating characteristics of the oil. Maintenance (incl. oil change/seal replacement) may only be carried out by the AUMA service.

#### Recommendation for the maintenance of actuators:

- Generally after 4 to 6 years for modulating duty.
- Generally after 6 to 8 years if operated frequently (open-close duty).
- Generally after 10 to 12 years if operated rarely (open-close duty).

No additional lubrication of the gear housing is required during operation.

### 14.3. Disposal and recycling

Our devices have a long lifetime. However, they have to be replaced at one point in time. The devices have a modular design and may, therefore, easily be separated and sorted according to materials used, i.e.:

- Electronic scrap
- Various metals
- Plastic materials
- Greases and oils

The following generally applies:

- Greases and oils are hazardous to water and must not be released into the environment.
- Arrange for controlled waste disposal of the disassembled material or for separate recycling according to materials.
- Observe the national regulations for waste disposal.

## 15. Technical data

**Information** The following tables include standard and optional features. For detailed information on the customer-specific version, refer to the order-related data sheet. The technical data sheet can be downloaded from the Internet in both German and English at <http://www.auma.com> (please state the order number).

Type	Operating time for 90° in seconds (adjustable in 9 steps)	Torque range (Unseating torque) <sup>1)</sup>	Run torque <sup>2)/</sup> Modulating torque <sup>3)</sup>	Valve attachment	Valve shaft			Handwheel/crank handle according to VG 85081 <sup>4)</sup>		Weight actuator (bronze) <sup>5)</sup>	MEC weight
					Standard EN ISO 5211	Cylindrical Max. [mm]	Square Max. [mm]	Two-flat Max. [mm]	Ø [mm]		
SG 04.2	4 – 63	25 – 63	32	F07	20	17	17	125	13.5	7.0	3.5
SG 05.2	4 – 63	50 – 125	63	F07	20	17	17	125	13.5	9.0	3.5
SG 07.2	4 – 63	100 – 250	125	F07	25.4	22	22	125	13.5	14	3.5
SG 10.2	5.6 – 90	200 – 500	250	F10	38	30	27	150	13.5	22	3.5

- 1) The "Torque by-pass" function (can be activated) allows increasing the pre-set torque to 130 % (unseating torque). This increase only applies during actuator start for an adjustable time period, allowing to unseat blocked valves.
- 2) Permissible average torque in open-close duty S2 - 15 min
- 3) Torque in modulating duty S4 - 40 %
- 4) Hub does not correspond to VG 85081; other versions on request
- 5) Indicated weight includes part-turn actuator with electrical connection in standard version, unbored coupling and handwheel/crank handle.

### Features and functions of actuator

Type of duty	Open-close duty:	Short-time duty S2 - 15 min
	Modulating duty:	Intermittent duty S4 - 40 % with maximum number of starts of 1,800 cycles per hour (option)
	For nominal voltage and 40 °C ambient temperature and at average running or modulating torque load. The type of duty must not be exceeded.	
Motor	Variable speed, brushless motor	
Insulation class	F, tropicalized	
Housing material	Actuator:	Bronze
	Actuator controls:	Aluminium
Self-locking	Yes	
Swing angle	82° – 98° adjustable between min. and max. values	
Limit switching	Contactless limit switches (Hall sensors) for end positions OPEN and CLOSED	
Torque switching	Via electronic current measurement, status signals for directions OPEN and CLOSE, adjustable in 8 steps	
Mechanical position indicator	Continuous indication, adjustable indicator disc with symbols OPEN and CLOSED	
Manual operation	Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation	
Coupling	Standard:	Coupling unbored
	Options:	<ul style="list-style-type: none"> <li>• Coupling unbored extended</li> <li>• Finish machining of coupling (standard or extended)                             <ul style="list-style-type: none"> <li>- Bore according to EN ISO 5211 with 1 keyway according to DIN 6885-1</li> <li>- Square bore according to EN ISO 5211</li> <li>- Two-flat according to EN ISO 5211</li> </ul> </li> </ul>
Valve attachment	Dimensions according to EN ISO 5211	

Features and functions of actuator controls			
Mains voltage, mains frequency	Standard voltages:		
	<b>1-phase AC current</b> Voltages/frequencies		
	Volt	115	230
	Hz	50/60	50/60
	Permissible variation of mains voltage: $\pm 10\%$ Permissible variation of mains frequency: $\pm 5\%$ For current consumption, current type, mains voltage and frequency, refer to the name plate		
External supply of the electronics (option)	24 V DC +20 %/-15 % Current consumption: With options up to 200 mA		
Overvoltage category	Category III according to IEC 60364-4-443		
Power electronics	Power electronics with integral motor controller		
Control (input signals)	<ul style="list-style-type: none"> <li>• Maximum 4 digital inputs (via opto-isolator)                             <ul style="list-style-type: none"> <li>- Control voltage 24 V DC, current consumption: approx. 15 mA per input</li> <li>- Minimum pulse duration for shortest operation pulse: 100 ms.</li> <li>- 3 inputs on the same potential</li> <li>- 1 input galvanically isolated</li> </ul> </li> <li>Assignment for open-close actuators:                             <ul style="list-style-type: none"> <li>- OPEN, STOP, CLOSE (standard)</li> <li>- OPEN, STOP, CLOSE, EMERGENCY (option)</li> <li>- OPEN, STOP, CLOSE, MODE in combination with positioner (option)</li> </ul> </li> <li>Assignment for modulating actuators with positioner:                             <ul style="list-style-type: none"> <li>- OPEN, STOP, CLOSE, MODE (standard)</li> <li>- OPEN, EMERGENCY, CLOSE, MODE (option)</li> </ul> </li> </ul>		
	Option:	<ul style="list-style-type: none"> <li>• Analogue input 4 – 20 mA (not available for SG 04.2)                             <ul style="list-style-type: none"> <li>- Used as input signal for E1 position setpoint (in combination with positioner) or as input signal for E3 motor speed.</li> <li>- The analogue input as E1 position setpoint requires that the connected actuator is equipped with an RWG module.</li> </ul> </li> </ul>	

Features and functions of actuator controls	
Status signals (output signals)	Up to 4 programmable semi-conductors (switching capacity max. 24 V DC/2A) or relay outputs (switching capacity max. 30 V DC/2A) are available. They are preassigned with the signals as indicated below.
	Variants of semi-conductor output type:
	Standard: <ul style="list-style-type: none"> <li>4 outputs as NO with 19-pole signal connector:                             <ul style="list-style-type: none"> <li>-&gt; comparable to SGM/SVM actuators</li> <li>- 1 and 2 at one common, 3 and 4 respectively galvanically isolated</li> <li>Assignment: CLOSE, OPEN, fault, REMOTE</li> </ul> </li> </ul>
	Variant: <ul style="list-style-type: none"> <li>4 outputs as NO with 19-pole signal connector:                             <ul style="list-style-type: none"> <li>-&gt; comparable to SGM/SVM actuators</li> <li>- 1, 2 and 3 at one common, 4 galvanically isolated</li> <li>Assignment: CLOSE, OPEN, fault, REMOTE</li> </ul> </li> </ul>
	Variants of relay output type:
	Standard: <ul style="list-style-type: none"> <li>3 outputs as NO/NC (change-over contact) with 17-pole signal connector:                             <ul style="list-style-type: none"> <li>-&gt; compatible for replacing MEC 02.1</li> <li>- All on the same potential</li> <li>Assignment: OPEN, CLOSE, fault</li> </ul> </li> </ul>
Variants: <ul style="list-style-type: none"> <li>3 outputs as NO with 19-pole signal connector:                             <ul style="list-style-type: none"> <li>- All on the same potential</li> <li>Assignment: OPEN, CLOSE, fault</li> <li>Assignment (option): OPEN, CLOSE, system OK</li> </ul> </li> <li>4 outputs as NO with 19-pole signal connector:                             <ul style="list-style-type: none"> <li>- 1, 2 and 3 at one common, 4 galvanically isolated</li> <li>Assignment: CLOSE, OPEN, fault, REMOTE</li> </ul> </li> <li>4 outputs as NC with 19-pole signal connector:                             <ul style="list-style-type: none"> <li>- 1, 2 and 3 at one common, 4 galvanically isolated</li> <li>Assignment: CLOSE, OPEN, fault, REMOTE</li> </ul> </li> </ul>	
An analogue output can be selected as option for position feedback.	
Option:	<ul style="list-style-type: none"> <li>Analogue output (passive) (not available for SG 04.2)                             <ul style="list-style-type: none"> <li>- Galvanically isolated position feedback 4 – 20 mA (load 500 Ω)</li> <li>- The output must be supplied with 24 V DC.</li> <li>- The analogue input requires that the connected actuator is equipped with an RWG module.</li> </ul> </li> </ul>
Voltage output	Auxiliary voltage 24 V DC, max. 100 mA for supply of the control inputs, galvanically isolated from internal voltage supply (not available for version with 17-pole signal connector for connection to DCS). Not available for “external electronics supply” option.
Local controls (option)	<ul style="list-style-type: none"> <li>Push buttons OPEN, STOP (LOCAL - REMOTE), CLOSE</li> <li>2 multi-colour indication lights:                             <ul style="list-style-type: none"> <li>- End position CLOSED (yellow), fault/failure (red), end position OPEN (green), operation mode LOCAL (blue)</li> </ul> </li> </ul>
Functions	<ul style="list-style-type: none"> <li>Switch-off mode adjustable:                             <ul style="list-style-type: none"> <li>- Limit or torque seating for end positions OPEN and CLOSED</li> </ul> </li> <li>Torque monitoring across the whole travel</li> <li>Torque by-pass</li> <li>EMERGENCY behaviour programmable:                             <ul style="list-style-type: none"> <li>- Digital input low active</li> <li>- Reaction can be selected: Stop, run to end position CLOSED, run to end position OPEN</li> </ul> </li> <li>Positioner (option):                             <ul style="list-style-type: none"> <li>- Position setpoint via analogue input E1 = 4 – 20 mA</li> <li>- Programmable behaviour on loss of signal</li> <li>- Automatic adaptation of dead band (adaptive behaviour selectable)</li> <li>- Selection between open-close duty and modulating duty via digital MODE input</li> </ul> </li> </ul>
Electrical connection	Plug/socket connector with crimp connection

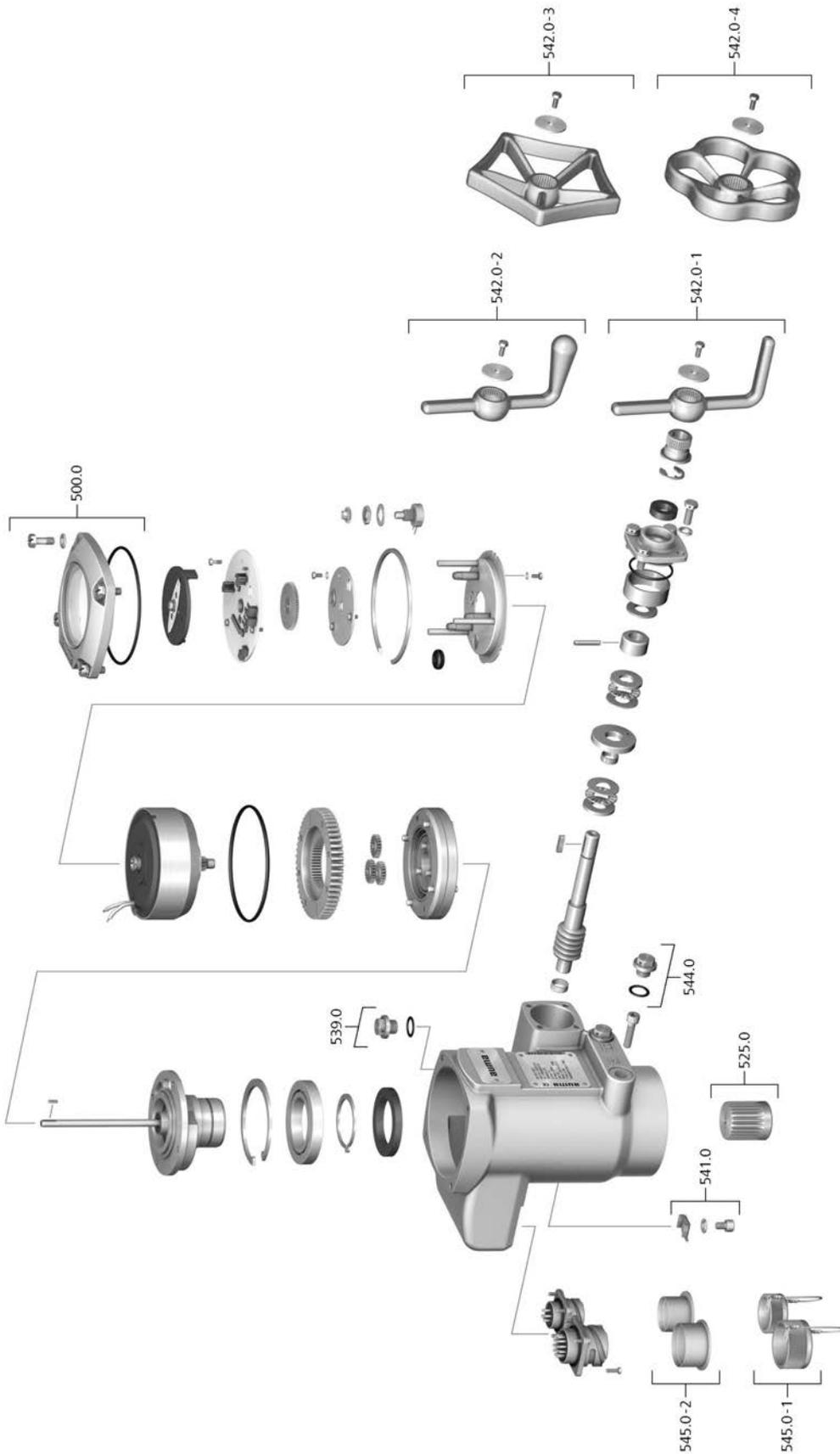
Features and functions of actuator controls		
Wiring diagram (basic version)	For version with 3 inputs, 4 semi-conductor outputs, 19-pole signal connector for connection to DCS.	
	Open-close duty:	TPCM-AA4--C70-510 AIM110-000
	Modulating duty:	TPCM-CC4--C70-510 AIM110-000

Service conditions		
Mounting position	Any position	
Ambient temperature	-25 °C to +70 °C	
Humidity	Up to 100 % relative humidity across the entire permissible temperature range	
Enclosure protection according to EN 60529	Standard:	IP67
	Option:	IP68 According to AUMA definition, enclosure protection IP68 meets the following requirements: <ul style="list-style-type: none"> <li>• Depth of water: maximum 8 m head of water</li> <li>• Duration of continuous immersion in water: Max. 96 hours</li> <li>• Up to 10 operations during immersion</li> <li>• Modulating duty is not possible during immersion</li> </ul>
Pollution degree according to IEC 60664-1	Pollution degree 4 (when closed), pollution degree 2 (internal)	
Vibration resistance according to IEC 60068-2-6	2 g, from 10 to 200 Hz Resistant to vibration during start-up or for failures of the plant. However, a fatigue strength may not be derived from this. Not valid in combination with gearboxes.	
Shock resistance	Standard:	Without
	Options:	<ul style="list-style-type: none"> <li>• WTD: in accordance with BV 0430[2] for surface vessels (180 g)</li> <li>• WTD: in accordance with BV 0430[2] for submarines (400 g)</li> <li>• Shock load up to 70 g</li> </ul>
Corrosion protection Actuator (bronze)	Sea water resistant bronze housing. All external screws and shafts are made of stainless steel.	
Corrosion protection Actuator controls	Suitable for use in areas with high salinity, almost permanent condensation, and high pollution due to double layer powder coating.	
Colour	Actuator:	Bronze
	Actuator controls:	AUMA silver-grey (similar to RAL 7037)
Lifetime	Open-close duty:	20,000 operating cycles OPEN - CLOSE - OPEN An operating cycle is based on an operation from CLOSED to OPEN and back to CLOSED, at a respective rotary movement of 90°.
	Modulating duty:	5 million modulating steps
The lifetime depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as permissible for the process.		

Further information	
EU Directives	Machinery Directive 2006/42/EC Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU RoHS Directive 2011/65/EU

**16. Spare parts**

**16.1. Part-turn actuator SG 04.2 – SG 10.2**



Please state device type and our order number (see name plate) when ordering spare parts. Only original AUMA spare parts should be used. Failure to use original spare parts voids the warranty and exempts AUMA from any liability. Representation of spare parts may slightly vary from actual delivery.

Ref. no.	Designation	Type
500.0	Cover	Sub-assembly
525.0	Coupling	Sub-assembly
539.0	Screw plug	
541.0	Protective earthing	Sub-assembly
542.0-1	Crank handle with cylindrical grip	Sub-assembly
542.0-2	Crank handle with conical grip	Sub-assembly
542.0-3	Handwheel with five-edge ring	Sub-assembly
542.0-4	Handwheel with five-ripple ring	Sub-assembly
544.0	Screw plug	Sub-assembly
545.0-1	Protective cap with cord	Sub-assembly
545.0-2	Protective cap without cord	Sub-assembly

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Y009.142/003/en/1.22