auma®
Solutions for a world in motion

Part-turn actuators

SG 05.1 – SG 12.1/SGR 05.1 – SGR 12.1

AUMA NORM (without controls)

Operation instructions Assembly, operation, commissioning

Read operation instructions first.

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

Purpose of the document:

This document contains information for installation, commissioning, operation and maintenance staff. It is intended to support device installation and commissioning.

Table of contents

1. Safety instructions

1.1 Basic information on safety

Standards/directives

AUMA products are designed and manufactured in compliance with recognised standards and directives. This is certified in a Declaration of Incorporation and an EC Declaration of Conformity.

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.

Safety instructions/warnings

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.

Qualification of staff

Assembly, electrical connection, commissioning, operation, and maintenance must be carried out exclusively by suitably qualified personnel having been authorised by the end user or contractor of the plant only.

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.

Commissioning

Prior to commissioning, it is important to 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.

Operation

Prerequisites for safe and smooth operation:

- Correct transport, proper storage, mounting and installation, as well as careful commissioning.
- Only operate the device if it is in perfect condition while observing these instructions.
- Immediately report any faults and damage and allow for corrective measures.
- Observe recognised rules for occupational health and safety.
- Observe the national regulations.
- During operation, the housing warms up and surface temperatures > 60 °C may occur. To prevent possible burns, we recommend checking the surface temperature using an appropriate thermometer and wearing protective gloves, if required, prior to working on the device.

Protective measures

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.

Maintenance

To ensure safe device operation, the maintenance instructions included in this manual must be observed.

Any device modification requires prior consent of the manufacturer.

1.2 Range of application

AUMA part-turn actuators are designed for the operation of industrial 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
- Permanent submersion (observe enclosure protection)
- Potentially explosive areas, with the exception of zone 22
- 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 Applications in Ex zone 22 (option)

Actuators of the indicated series basically meet the requirements for applications in dust hazardous locations of ZONE 22 in compliance with the ATEX directive 94/9/EC.

The actuators are designed to meet enclosure protection IP 67 or IP 68 and fulfil the requirements of EN 50281-1-1:1998 section 6 - Electrical apparatus for use in presence of combustible dust, requirements for category 3 electrical equipment - protected by enclosures.

To comply with all requirements of EN 50281-1-1:1998, it is imperative that the following points are observed:

- In compliance with the ATEX directive 94/9/EC, the actuators must be equipped with an additional identification – II3D IP6X T150 °C.
- The maximum surface temperature of the actuators, based on an ambient temperature of +40 °C in accordance with EN 50281-1-1 section 10.4, is +150 °C. In accordance with section 10.4, an increased dust deposit on the equipment was not considered for the determination of the maximum surface temperature.
- The correct connection of the thermoswitches or the PTC thermistors as well as fulfilling the requirements of the duty type and the technical data are prerequisites for compliance with the maximum surface temperature of devices.
- The connection plug may only be plugged in or pulled out when device is disconnected from the mains.
- The cable glands used also have to meet the requirements of category II3 D and must at least comply with enclosure protection IP 67.
- The actuators must be connected by means of an external ground connection (accessory part) to the potential compensation or integrated into an earthed piping system.
- As a general rule, the requirements of EN 50281-1-1 must be respected in dust hazardous locations. During commissioning, service, and maintenance, special care as well as qualified and trained personnel are required for the safe operation of actuators.

1.4 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).

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION	**Indicates a potentially hazardous situation with a low level of risk. Failure to observe this warning may result in minor or moderate injury. May also be used with property damage.**
NOTICE	**Potentially hazardous situation. Failure to observe this warning may result in property damage. Is not used for personal injury.**

Arrangement and typographic structure of the warnings

⚠ DANGER	**Type of hazard and respective source!** *Potential consequence(s) in case of non-observance (option)* → Measures to avoid the danger → Further measure(s)

Safety alert symbol ⚠ warns of a potential personal injury hazard.

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

1.5 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)

✓ Important information before the next step. This symbol indicates what is required for the next step or what has to be prepared or observed.

< > **Reference to other sections**

Terms in brackets shown above refer to other sections of the document which provide further information on this topic. These terms are either listed in the index, a heading or in the table of contents and may quickly be found.

2. Identification

2.1 Name plate

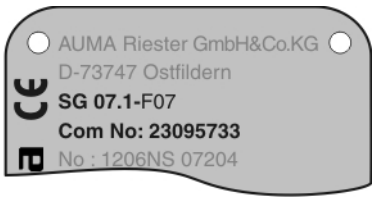
Each device component (actuator, motor) is equipped with a name plate.

Figure 1: Arrangement of name plates

[1] Motor name plate
[2] Actuator name plate
[3] Additional plate, e.g. KKS plate (Power Plant Classification System) (Power Plant Classification System)

Data for identification

Figure 2: Actuator name plate



[1] Type and size of actuator
[2] Commission number

Type and size

These instructions apply to the following devices:

Part-turn actuators for open-close duty: SG 05.1, 07.1, 10.1, 12.1

Part-turn actuators for modulating duty: SG**R** 05.1, 07.1, 10.1, 12.1

Version: NORM (without actuator controls)

Commission number

An order-specific commission number is assigned to each device. This commission number can be used to directly download the terminal plan, inspection records and further information regarding the device from the Internet: **http://www.auma.com.**

2.2 Short description

Part-turn actuator

Definition in compliance with 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 actuators are driven by an electric motor. A handwheel is provided for manual operation. Switching off in end positions may be either by limit or torque seating. Controls are required to operate or process the actuator signals.

Actuators without controls can be equipped with AUMA controls at a later date. The local controls are included in the AUMA controls. For enquiries and more information, please state our commission no. (refer to actuator name plate).

3. Transport, storage and packaging

3.1 Transport

For transport to place of installation, use sturdy packaging.

DANGER

Hovering load!

Risk of death or serious injury.

→ Do NOT stand below hovering 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.

→ Actuators mounted to gearboxes: Attach ropes or hooks for the purpose of lifting by hoist only to the gearbox using eyebolts and NOT to the actuator.

→ Actuators mounted to controls: Attach ropes or hooks for the purpose of lifting by hoist only to the actuator and NOT to the controls.

3.2 Storage

NOTICE

Danger 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

If the device must be stored for a long period (more than 6 months) the following points must be observed in addition:

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.

3.3 Packaging

Our products are protected by special packaging for transport when leaving the factory. The packaging consists of environmentally friendly materials which can easily be separated and recycled. We use the following packaging materials: wood, cardboard, paper, and PE foil. For the disposal of the packaging material, we recommend recycling and collection centres.

4. Assembly

4.1 Mounting position

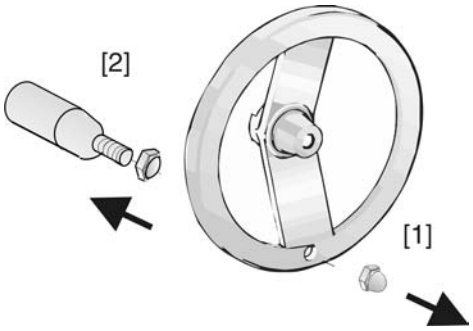
AUMA actuators can be operated without restriction in any mounting position.

4.2 Ball handle: fit to handwheel

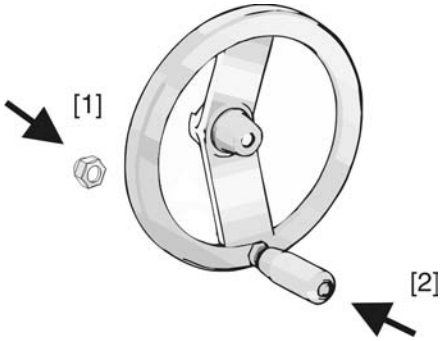
To avoid damage during transport, the ball handle is fitted at the rear of the handwheel.

Prior to commissioning, mount the ball handle into correct position:

1. Remove cap nut [1] and pull out ball handle [2].



2. Insert ball handle [2] in correct position and fasten with cap nut [1].



3. After ball handle fitting, remove label from handwheel.

4.3 Part-turn actuator to valve: mount

NOTICE

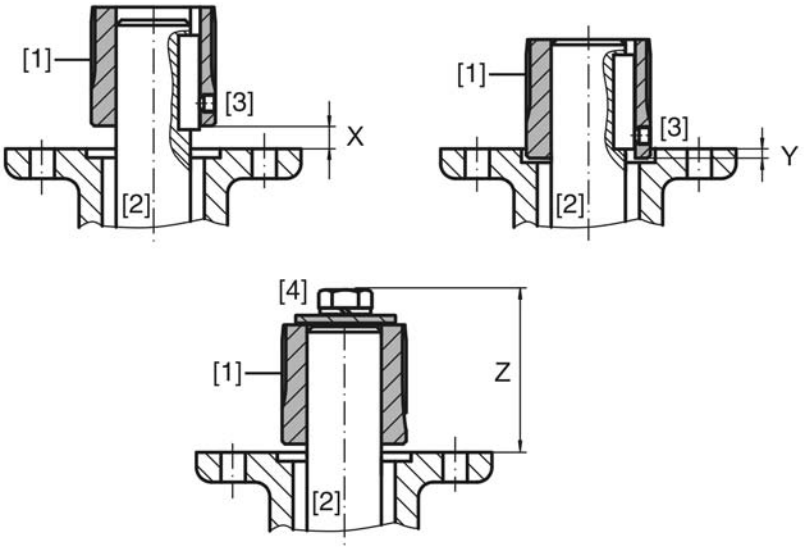
Danger of corrosion due to damage to paint finish and condensation!

→ Touch up damage to paint finish after work on the device.

→ After mounting, connect the device immediately to electrical mains to ensure that heater prevents condensation.

4.3.1 Coupling

Figure 5: Coupling fitting dimensions



[1] Coupling
[2] Valve shaft
[3] Grub screw
[4] Screw

Table 1: Coupling fitting dimensions

Type, size - mounting flange	X max [mm]	Y max [mm]	Z max [mm]
SG/SGR 05.1-F05	9	–	60
SG/SGR 05.1-F07	9	–	60
SG/SGR 07.1-F07	9	–	60
SG/SGR 07.1-F10	24	–	75
SG/SGR 10.1-F10	15	9	77
SG/SGR 10.1-F12	32	–	97
SG/SGR 12.1-F12	25	–	100
SG/SGR 12.1-F14	45	–	120
SG/SGR 12.1-F16	57	–	132

1. Use handwheel to drive actuator to mechanical end stop.

   Information: Assemble valve and actuator in the same end position.
   - With butterfly valves: recommended mounting position is end position CLOSED.
   - With ball valves: recommended mounting position is end position OPEN.
2. Thoroughly degrease mounting faces of the mounting flange.
3. Apply a small quantity of grease to the valve shaft [2].
4. Place coupling [1] onto valve shaft [2] and secure against axial slipping by using a grub screw, a circlip or a screw. Thereby, ensure that dimensions X, Y or Z are observed (refer to figure and table <Coupling fitting dimensions>).
5. Apply non-acidic grease at splines of coupling.
6. Fit actuator.

   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 position by one tooth on the coupling.

8. Fasten actuator with screws [4].
   Information: We recommend glueing the screws using sealing material to avoid contact corrosion.

   → Fasten screws [4] crosswise with a torque according to table:

   Table 2: Tightening torques for screws

Screws Thread	**Tightening torque T_A [Nm]**
	Strength class 8.8
M6	11
M8	25
M10	51
M12	87

5. Electrical connection

5.1 Basic information

WARNING

Danger due to incorrect electrical connection

Failure to observe this warning can result in death, serious injury, or property damage.

→ The electrical connection must be carried out exclusively by suitably qualified personnel.

→ Prior to connection, observe basic information contained in this chapter.

→ After connection but prior to applying the voltage, observe the <Commissioning> and <Test run> chapters.

Wiring diagram/terminal plan

The pertaining wiring diagram/terminal plan (in German and English language) is attached to the device in a weather-proof bag, together with these operation instructions. It can also be obtained from AUMA (state commission no., refer to name plate) or downloaded directly from the Internet (www.auma.com).

NOTICE

Valve damage for connection without controls!

→ NORM actuators require controls: Connect motor via controls only (reversing contactor circuit).

→ Observe the type of seating specified by the valve manufacturer.

→ Observe wiring diagram.

Delay time

The delay time is the time from the tripping of the limit or torque switches to the motor power being switched off. To protect the valve and the actuator, we recommend a delay time < 50 ms. Longer delay times are possible provided the operating time, output drive type, valve type, and the type of installation are considered. We recommend switching off the corresponding contactor directly by limit or torque switch.

Protection 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 respective sizing is derived from the current consumption of the motor (refer to electrical data sheet).

Limit and torque switches

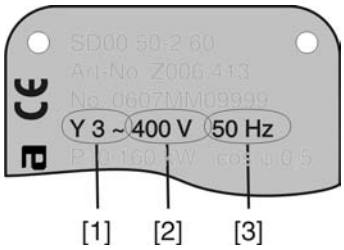
Limit and torque switches can be provided as single, tandem, or triple switches. Only the same potential can be switched on the two circuits (NC/NO contact) of each single switch. If different potentials are to be switched simultaneously, tandem switches or triple switches are required. When using tandem/triple switches:

- For signalling use the leading contacts TSC1, TSO1, LSC1, LSO1.
- For switching off use the lagging contacts TSC, TSO, LSC, LSO.

Type of current, mains voltage and mains frequency

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

Figure 6: Motor name plate (example)



[1] Type of current
[2] Mains voltage
[3] Mains frequency (for 3-ph and 1-ph AC motors)

Connecting cables

- For device insulation, appropriate (voltage-proof) cables must be used. Specify cables for the highest occurring rated voltage.
- Use connecting cable with appropriate minimum rated temperature.
- For connecting cables exposed to UV radiation (outdoor installation), use UV resistant cables.

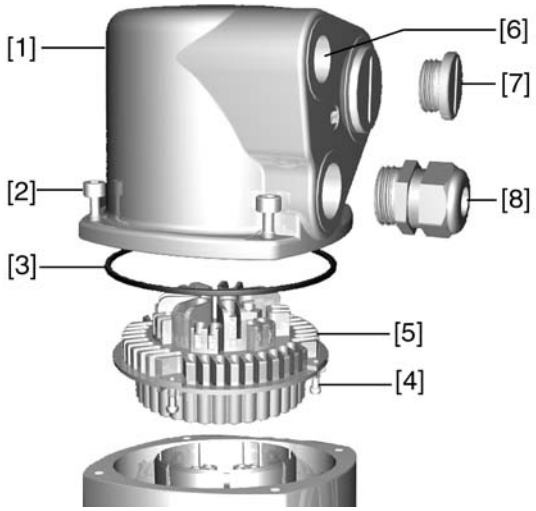
5.2 Connection with AUMA plug/socket connector

Cross sections AUMA plug/socket connector:

- Power terminals (U1, V1, W1, U2, V2, W2): max. 6 mm² flexible/10 mm² solid
- PE connection ⏚: max. 6 mm² flexible/10 mm² solid
- Control contacts (1 to 50): max. 2.5 mm²

5.2.1 Terminal compartment: open

Figure 7: Connection AUMA plug/socket connector, version S



[1] Cover
[2] Screws for cover
[3] O-ring
[4] Screws for socket carrier
[5] Socket carrier
[6] Cable entry
[7] Blanking plug
[8] Cable gland (not included in delivery)

DANGER

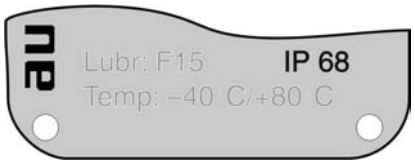
Hazardous voltage!

Risk of electric shock.

→ Disconnect device from the mains before opening.

1. Loosen screws [2] and remove cover [1].
2. Loosen screws [4] and remove socket carrier [5] from cover [1].
3. Insert cable glands [8] suitable for connecting cables.

➥ The enclosure protection IP... stated on the name plate is only ensured if suitable cable glands are used. Example: Name plate shows enclosure protection IP 68.



4. Seal unused cable entries [6] with suitable blanking plugs [7].
5. Insert the cables into the cable glands [8].

5.2.2 Cable connection

✔ Observe permissible cross sections.

1. Remove cable sheathing.
2. Strip wires.
3. For flexible cables: Use end sleeves according to DIN 46228.
4. Connect cables according to order-related wiring diagram.

⚠ WARNING

In case of a fault: Hazardous voltage while protective earth conductor is NOT connected!

Risk of electric shock.

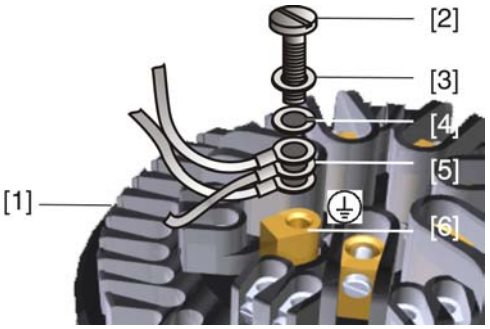
→ Connect all protective earth conductors.

→ Connect PE connection to external protective earth conductor of connecting cables.

→ Start running the device only after having connected the protective earth conductor.

5. Tighten PE conductors firmly to PE connection using ring lugs (flexible cables) or loops (rigid cables).

Figure 9: PE connection



[1] Socket carrier
[2] Screw
[3] Washer
[4] Lock washer
[5] Protective earth with ring lugs/loops
[6] PE connection, symbol: ⏚

NOTICE

Danger of motor damage if PTC thermistors or thermoswitches are not connected!

Our warranty for the motor will lapse if the motor protection is not connected.

→ Connect PTC thermistors or thermoswitches to external controls.

NOTICE

Danger of corrosion: Damage due to condensation!

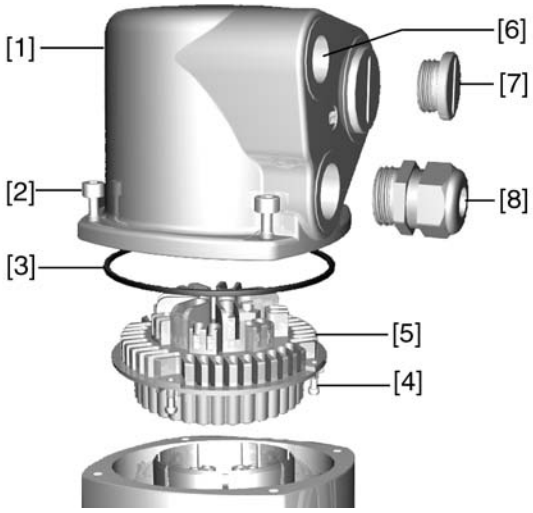
→ After mounting, commission the device immediately to ensure that heater minimises condensation.

Information

Some actuators are equipped with an additional motor heater. The motor heater minimises condensation within the motor and improves the start-up behaviour for extremely low temperatures.

5.2.3 Terminal compartment: close

Figure 10: Example: Version S



[1] Cover
[2] Screws for cover
[3] O-ring
[4] Screws for socket carrier
[5] Socket carrier
[6] Cable entry
[7] Blanking plug
[8] Cable gland (not included in delivery)

⚠ WARNING

Short-circuit due to pinching of cables!

Risk of electric shock and functional failures.

→ Carefully fit socket carrier to avoid pinching the cables.

1. Insert the socket carrier [5] into the cover [1] and fasten with screws [4].
2. Clean sealing faces of cover [1] and housing.
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. Fit cover [1] and fasten screws [2] evenly crosswise.
6. Fasten cable glands [8] applying the specified torque to ensure the required enclosure protection.

5.3 Accessories for electrical connection

— Option —

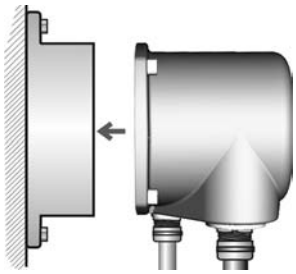
5.3.1 Parking frame

Application

Parking frame for safe storage of a disconnected plug.

For protection against touching the bare contacts and against environmental influences.

Figure 11: Parking frame



5.3.2 Protection cover

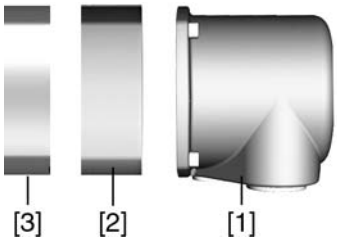
Protection cover for plug compartment when plug is removed.

The open terminal compartment can be closed using a protective cover (not illustrated).

5.3.3 Double sealed intermediate frame

When removing the electrical connection or due to leaky cable glands, ingress of dust and water into the housing may occur. This is prevented effectively by inserting the double sealed intermediate frame [2] between the plug/socket connector [1] and the housing of the device. The enclosure protection of the device (IP 68) will not be affected, even if the electrical connection [1] is removed.

Figure 12: Electrical connection with double sealed intermediate frame



[1] Electrical connection

[2] Double sealed intermediate frame

[3] Actuator housing

6. Operation

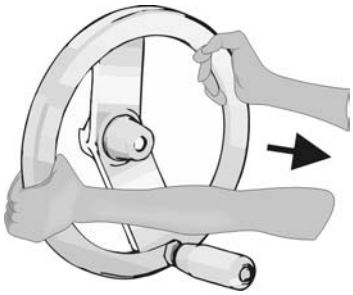
6.1 Manual operation

For purposes of setting and commissioning, in case of motor failure 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.

6.1.1 Manual operation: engage

→ Engage manual operation by pulling the handwheel.



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

6.1.2 Manual operation: disengage

→ Release handwheel.

➥ A spring pulls back the handwheel into the initial position.

Information Handwheel must engage, assist by turning manually, if required.

6.2 Motor operation

NOTICE

Valve damage due to incorrect setting!

→ Perform all commissioning settings and the test run prior to motor operation.

Controls are required to operate an actuator during motor operation. If the actuator is to be operated locally, additional local controls are required.

1. Switch on power supply.
2. To close the valve, switch on motor operation in direction CLOSE.

➥ Valve shaft turns clockwise in direction CLOSE.

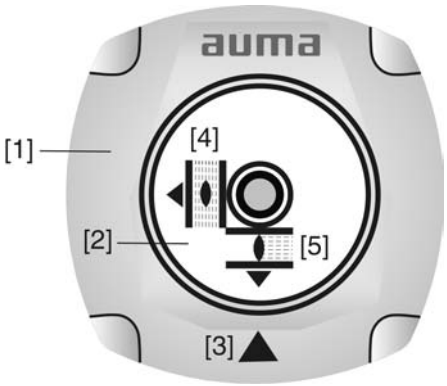
7. Indications

7.1 Mechanical position indicator/running indication

Mechanical position indicator:

- Continuously indicates the valve position
  (For a swing angle of 90°, the indicator disc [2] rotates by approximately 180°.)
- Indicates whether the actuator is running (running indication)
- Indicates that the end positions are reached (via indicator mark [3])

Figure 14: Mechanical position indicator



[1] Cover
[2] Indicator disc
[3] Mark
[4] Symbol for position OPEN
[5] Symbol for position CLOSED

8. Signals

8.1 Feedback signals from actuator

Information The switches can be provided as single switches (1NC and 1 NO), as tandem switches (2 NC and 2 NO) or as triple switches (3 NC and 3 NO). The precise version is indicated in the terminal plan or on the order-related technical data sheet.

Feedback signal	Type and designation in terminal plan	
End position OPEN/CLOSED reached	Setting via limit switching Switches: 1 NC and 1 NO (standard)	
	LSC	Limit switch, closing, clockwise rotation
	LSO	Limit switch, opening, counterclockwise rotation
Intermediate position reached	Setting via DUO limit switching Switches: 1 NC and 1 NO (standard)	
	LSA	Limit switch, DUO, clockwise rotation
	LSB	Limit switch, DUO, counterclockwise rotation
Torque OPEN/CLOSED reached	Setting via torque switching Switches: 1 NC and 1 NO (standard)	
	TSC	Torque switch, closing, clockwise rotation
	TSO	Torque switch, opening, counterclockwise rotation
Motor protection tripped	Thermoswitches or PTC thermistors, depending on version	
	F1, Th	Thermoswitches
	R3	PTC thermistors
Running indication	Switches: 1 NC (standard)	
	S5, BL	Blinker transmitter
Valve position	Via potentiometer or electronic position transmitter RWG, depending on version	
	R2	Potentiometer
	R2/2	Potentiometer in tandem arrangement (option)
	B1/B2, RWG	3- or 4-wire system (0/4 – 20 mA)
	B3/B4, RWG	2-wire system (4 – 20 mA)

9. Commissioning

9.1 End stops in part-turn actuator

The internal end stops limit the swing angle. They protect the valve in the event of limit switching failure.

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

⚠ CAUTION

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

Pinching and damage by valve or actuator.

→ End stops may be set by suitably qualified personnel only.

→ Set end stops to ensure that they are NOT reached during normal operation.

Information

The setting sequence depends on the valve:

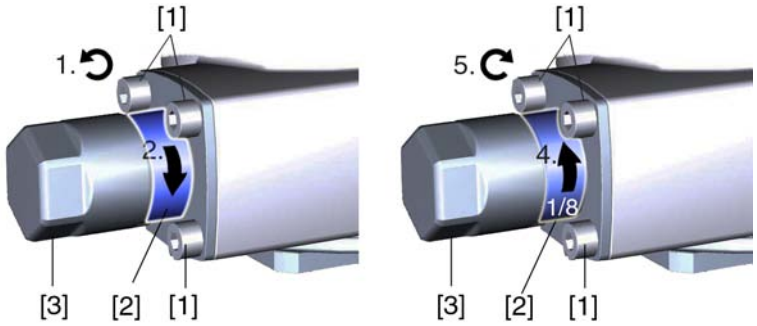
- Recommendations for **butterfly valves**: Set end position CLOSED first.
- Recommendations for **ball valves**: Set end position OPEN first.

Information

When leaving the factory (without valve), the screws [1] are not fastened, i.e. the end stops must be set. If the actuator is mounted onto the valve with the screws [1] fastened, the valve manufacturer has already performed the end stop setting. In this case, the end stops must only be checked (use the handwheel to drive valve into end positions).

9.1.1 End stop CLOSED: set

Figure 15: End stop



[1] Screws

[2] End stop nut

[3] Protective cap

1. If the four screws [1] are fastened: Unfasten the screws [1] with approx. 3 turns.
2. Move valve to end position CLOSED with handwheel. Check whether end stop nut [2] rotates simultaneously.
   → Otherwise: Turn end stop nut [2] **clockwise** until end stop is reached.
3. In case end position CLOSED has been passed: Turn back the handwheel by several turns and approach end position CLOSED again.
4. Turn end stop nut [2] counterclockwise by 1/8th turn.
   Information: In this process, the protective cap [3] must not be unfastened.

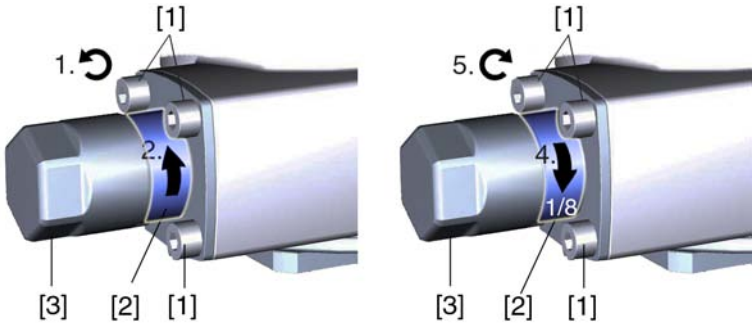
➥ Thus, the end stop CLOSED within the part-turn actuator is set to a slightly higher swing angle (approx. 1°) than the valve end position.

5. Fasten screws [1] crosswise at 25 Nm.

- Following end stop setting, the limit switching for end position CLOSED can be set (refer to <Limit switching: set> chapter). For this, the switch compartment must be opened and the indicator disc removed (refer to <Switch compartment: open> chapter).
- In general, the end stop OPEN does not require setting due to fact that the swing angle was already set in the factory.

9.1.2 End stop OPEN: set

Figure 16: End stop



[1] Screws
[2] End stop nut
[3] Protective cap

1. If the four screws [1] are fastened: Unfasten the screws [1] with approx. 3 turns.
2. Move valve to end position OPEN with handwheel. Check whether end stop nut [2] rotates simultaneously.
   → Otherwise: Turn end stop nut [2] **counterclockwise** until end stop.
3. In case end position OPEN has been passed: Turn back the handwheel by several turns and approach end position OPEN again.
4. Turn end stop nut [2] clockwise by 1/8th turn.
   Information: In this process, the protective cap [3] must not be unfastened.

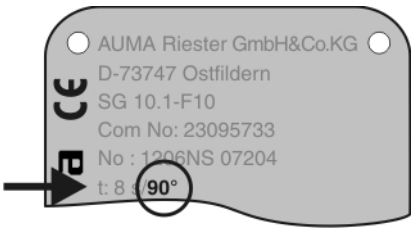
➥ Thus, the end stop OPEN within the part-turn actuator is set to a slightly higher swing angle (approx. 1°) than the valve end position.

5. Fasten screws [1] crosswise at 25 Nm.
   - Subsequent to this setting, the limit switching for end position OPEN can be set (refer to <Limit switching: set> chapter). For this, the switch compartment must be opened and the indicator disc removed (refer to <Switch compartment: open> chapter).
   - In general, the end stop CLOSED does not require setting due to the fact that the swing angle was already set in the factory.

9.2 Swing angle

The swing angle must only be changed if the swivel range for end stop setting is not sufficient.

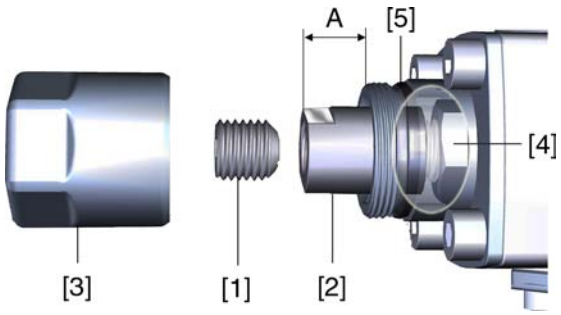
The swing angle set in the factory is indicated on the name plate.



In the standard version the swing angle can be adjusted within the range of 80° to 110°. Optional swivel ranges: refer to technical data pertaining to the order.

9.2.1 Swing angle: modify

Figure 18: End stop



[1] Grub screw
[2] End stop nut
[3] Protective cap
[4] Travelling nut
[5] Sealing ring

1. Unfasten protective cap [3].
2. While holding end stop nut [2] in position with open end spanner, unfasten grub screw [1].
3. **Swing angle increase:**
   3.1 Turn end stop nut [2] **counterclockwise**. Do not exceed dimension A max.

Type	A max. [mm]
SG 05.1/ SGR 05.1	22
SG 07.1/ SGR 07.1	22
SG 10.1/ SGR 10.1	17
SG 12.1/ SGR 12.1	23

   3.2 Move valve manually to the desired end position OPEN.
   3.3 Turn end stop nut [2] clockwise until it is tight up to the travelling nut [4].
4. **Swing angle reduction:**
   4.1 Move valve manually to the desired end position OPEN.
   4.2 Turn end stop nut [2] **clockwise** until it is tight up to the travelling nut [4]. Do not fall below dimension A min.

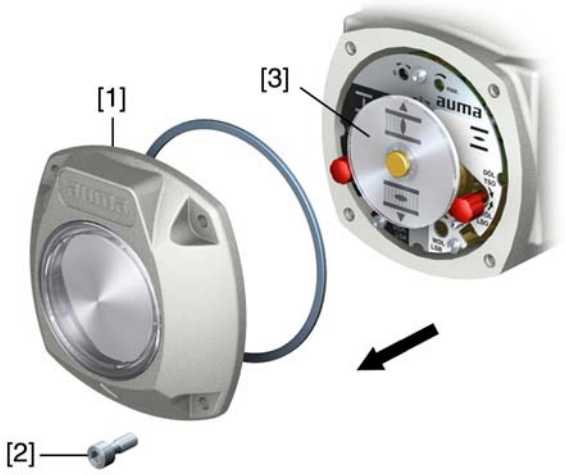
Type	A min. [mm]
SG 05.1/ SGR 05.1	10
SG 07.1/ SGR 07.1	10
SG 10.1/ SGR 10.1	08
SG 12.1/ SGR 12.1	12

5. Degrease mounting face of grub screw [1].
6. While holding end stop nut [2] in position with open end spanner fasten grub screw [1] at 85 Nm.
7. Check O-ring [5] and replace if damaged.
8. Fasten protective cap [3].

9.3 Switch compartment: open

The switch compartment must be opened to perform the following settings (options).

1. Loosen screws [2] and remove cover [1] from the switch compartment.
   Figure 19:



2. If indicator disc [3] is available:
   Remove indicator disc [3] using a spanner (as lever).
   Information: To avoid damage to paint finish, use spanner in combination with soft object, e.g. fabric.
   Figure 20:

9.4 Torque switching: set

Once the set torque is reached, the torque switches will be tripped (overload protection of the valve).

Information The torque switches may also trip during manual operation.

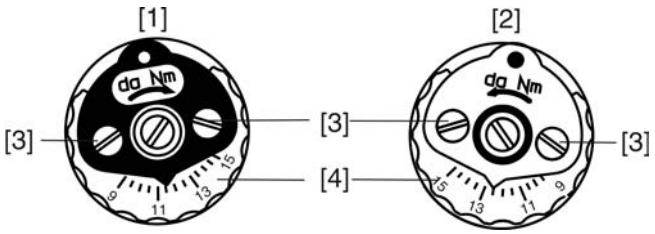
NOTICE

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.

Figure 21: Torque switching heads



[1] Torque switching head black in direction CLOSE
[2] Torque switching head white in direction OPEN
[3] Lock screws
[4] Torque dials

1. Loosen both lock screws [3] at the indicator disc.
2. Turn torque dial [4] to set the required torque (1 da Nm = 10 Nm).
3. Fasten lock screws [3] again.
   Information: Maximum tightening torque: 0.3 – 0.4 Nm

➥ The torque switch setting is complete.

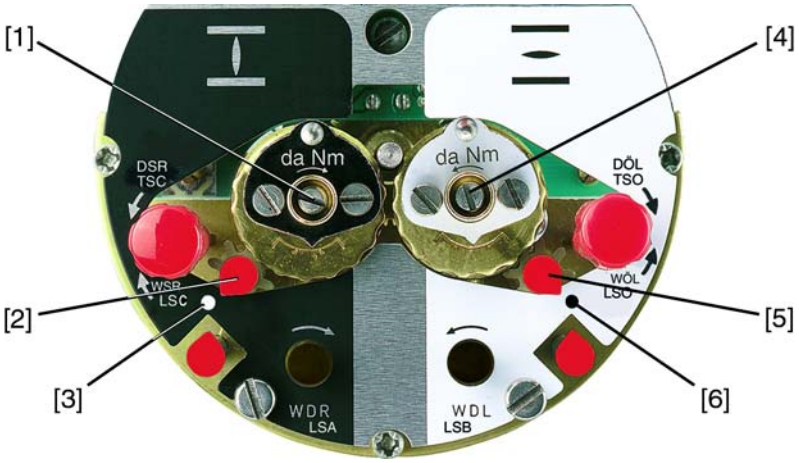
Example: The figure above shows the following settings:

- 11.5 da Nm = 115 Nm for direction CLOSE
- 12.5 da Nm = 125 Nm for direction OPEN

9.5 Limit switching: set

The limit switching records the travel. When reaching the preset position, switches are operated.

Figure 22: Setting elements for limit switching



Black section:

[1] Setting spindle: End position CLOSED
[2] Pointer: End position CLOSED
[3] Mark: End position CLOSED is set

White section:

[4] Setting spindle: End position OPEN
[5] Pointer: End position OPEN
[6] Mark: End position OPEN is set

9.5.1 End position CLOSED (black section): set

1. Engage manual operation.
2. Turn handwheel clockwise until valve is closed.

3. To prevent that the end stop is reached (due to overrun) before the limit switch has tripped, turn handwheel 4 turns (overrun) in the opposite direction.
4. **Press down** and turn setting spindle [1] with screw driver in direction of the arrow and observe the pointer [2]: While a ratchet click is felt and heard, the pointer [2] moves 90° every time.
5. If the pointer [2] is 90° from mark [3]: Continue turning slowly.
6. If the pointer [2] moves to mark [3]: Stop turning and release setting spindle.

➥ The end position CLOSED setting is complete.

7. If you override the tripping point inadvertently (ratchet click is heard after the pointer has snapped): Continue turning the setting spindle in the same direction and repeat setting process.

9.5.2 End position OPEN (white section): set

1. Engage manual operation.
2. Turn handwheel counterclockwise until valve is open.
3. To prevent that the end stop is reached (due to overrun) before the limit switch has tripped, turn handwheel 4 turns (overrun) in the opposite direction.
4. **Press down** and turn setting spindle [4] with screw driver in direction of the arrow and observe the pointer [5]: While a ratchet click is felt and heard, the pointer [5] moves 90° every time.
5. If the pointer [5] is 90° from mark [6]: Continue turning slowly.
6. If the pointer [5] moves to mark [6]: Stop turning and release setting spindle.

➥ The end position OPEN setting is complete.

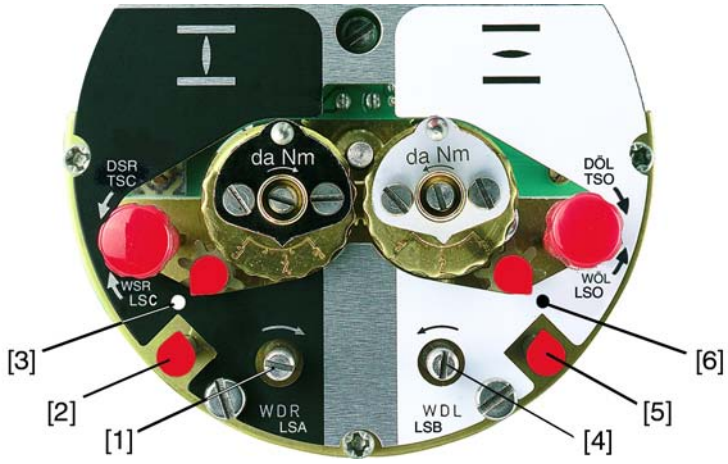
7. If you override the tripping point inadvertently (ratchet click is heard after the pointer has snapped): Continue turning the setting spindle in the same direction and repeat setting process.

9.6 Intermediate positions: set

— Option —

Actuators equipped with DUO limit switching contain two intermediate position switches. One intermediate position may be set for each running direction.

Figure 23: Setting elements for limit switching



Black section:

[1] Setting spindle: Running direction CLOSE
[2] Pointer: Running direction CLOSE
[3] Mark: Intermediate position CLOSED is set

White section:

[4] Setting spindle: Running direction OPEN
[5] Pointer: Running direction OPEN
[6] Mark: Intermediate position OPEN is set

9.6.1 Running direction CLOSE (black section): set

1. Move valve in direction CLOSE to desired intermediate position.
2. If you override the tripping point inadvertently: Turn valve in opposite direction and approach intermediate position again in direction CLOSE.

   Information: Always approach the intermediate position in the same direction as in later electrical operation.
3. **Press down** and turn setting spindle [1] with screw driver in direction of the arrow and observe the pointer [2]: While a ratchet click is felt and heard, the pointer [2] moves 90° every time.
4. If the pointer [2] is 90° from mark [3]: Continue turning slowly.
5. If the pointer [2] moves to mark [3]: Stop turning and release setting spindle.

➥ The intermediate position setting in running direction CLOSE is complete.

6. If you override the tripping point inadvertently (ratchet click is heard after the pointer has snapped): Continue turning the setting spindle in the same direction and repeat setting process.

9.6.2 Running direction OPEN (white section): set

1. Move valve in direction OPEN to desired intermediate position.
2. If you override the tripping point inadvertently: Move valve in opposite direction and approach intermediate position again in direction OPEN (always approach the intermediate position in the same direction as in later electrical operation).
3. **Press down** and turn setting spindle [4] with screw driver in direction of the arrow and observe the pointer [5]: While a ratchet click is felt and heard, the pointer [5] moves 90° every time.
4. If the pointer [5] is 90° from mark [6]: Continue turning slowly.
5. If the pointer [5] moves to mark [6]: Stop turning and release setting spindle.

➥ The intermediate position setting in running direction OPEN is complete.

6. If you override the tripping point inadvertently (ratchet click is heard after the pointer has snapped): Continue turning the setting spindle in the same direction and repeat setting process.

9.7 Test run

Perform test run only once all settings previously described have been performed.

9.7.1 Direction of rotation: check

NOTICE

Valve damage due to incorrect direction of rotation!

→ If the direction of rotation is wrong, switch off immediately.

→ Correct phase sequence.

→ Repeat test run.

1. Move actuator manually to intermediate position or to sufficient distance from end position.

2. Switch on actuator in direction CLOSE and observe the direction of rotation on the indicator disc.
   → Switch off before reaching the end position.

➥ The direction of rotation is correct, if **actuator runs in direction CLOSE** and **indicator disc turns clockwise**.

9.7.2 Limit switching: check

1. Move actuator manually into both end positions of the valve.

➥ The limit switching is set correctly if:

- LSC switch trips in end position CLOSED
- LSO switch trips in end position OPEN
- the switches release the contacts after turning back the handwheel

2. If the end position setting is incorrect: Reset limit switching.
3. If the end position setting is correct and no options (e.g. potentiometer, position transmitter) are available: Close switch compartment.

9.8 Potentiometer setting

— Option —

The potentiometer as travel sensor records the valve position.

Information Due to the ratio of the reduction gearing the complete resistance range/stroke is not always passed. Therefore, external adjustment (setting potentiometer) must be provided.

Figure 25: View of control unit

[1] Potentiometer

1. Move valve to end position CLOSED.
2. Turn potentiometer [1] counterclockwise until stop is felt.

➥ End position CLOSED corresponds to 0 %

➥ End position OPEN corresponds to 100 %

3. Turn potentiometer [1] slightly in opposite direction.

4. Perform fine-tuning of the zero point at external setting potentiometer (for remote indication).

9.9 Electronic position transmitter RWG: set

— Option —

The electronic position transmitter RWG records the valve position. On the basis of the actual position value measured by the potentiometer (travel sensor), it generates a current signal between 0 – 20 mA or 4 – 20 mA.

Table 3: Technical data RWG 4020

Wiring		**3- or 4-wire system**	**2-wire system**
Terminal plan	KMS	TP_ _4/ _ _ _	TP_ 4 _/ _ _ _ TP_ 5 _/ _ _ _
Output current	I_A	0 – 20 mA, 4 – 20 mA	4 – 20 mA
Power supply	U_V	24 V DC, ±15 % smoothed	14 V DC +(I x R_B), max. 30 V
Max. current consumption	I	24 mA at 20 mA output current	20 mA
Max. load	R_B	600 Ω	(U_V – 14 V) /20 mA

Figure 26: View of control unit

[1] Potentiometer (travel sensor)
[2] Potentiometer min. (0/4 mA)
[3] Potentiometer max. (20 mA)
[4] Measuring point (+) 0/4 – 20 mA
[5] Measuring point (–) 0/4 – 20 mA

1. Connect voltage to electronic position transmitter.
2. Move valve to end position CLOSED.
3. Connect ammeter for 0 – 20 mA to measuring points [4 and 5]. If no value can be measured:
   3.1 Check, whether external load is connected to customer connection XK (terminals 23/24) (observe max. load R_B), or
   3.2 Connect terminals 23/24 across customer connection XK (terminals 23/24).
4. Turn potentiometer [1] counterclockwise to the stop.
5. Turn potentiometer [1] slightly in opposite direction.
6. Turn potentiometer [2] clockwise until output current starts to increase.
7. Turn potentiometer [2] in opposite direction until the following value is reached:

- for 0 – 20 mA approx. 0.1 mA
- for 4 – 20 mA approx. 4.1 mA

➥ This ensures that the signal remains above the dead and live zero point.

8. Move valve to end position OPEN.
9. Set potentiometer [3] to end value 20 mA.
10. Approach end position CLOSED again and check minimum value (0.1 mA or 4.1 mA). If necessary, correct the setting.

9.10 Mechanical position indicator: set

— Option —

1. Place indicator disc on shaft.
2. Move valve to end position CLOSED.
3. Turn lower indicator disc until symbol (CLOSED) is in alignment with the mark ▲ on the cover.

4. Move actuator to end position OPEN.
5. Hold lower indicator disc in position and turn upper disc with symbol (OPEN) until it is in alignment with the mark ▲ on the cover.

6. Move valve to end position CLOSED again.
7. Check settings:

   If the symbol (CLOSED) is no longer in alignment with mark ▲ on the cover:
   → Repeat setting procedure.

9.11 Switch compartment: close

NOTICE

Danger of corrosion due to damage to paint finish!

→ Touch up damage to paint finish after work on the device.

1. Clean sealing faces of housing and cover.
2. Check whether O-ring [3] is in good condition, replace if damaged.
3. Apply a thin film of non-acidic grease (e.g. petroleum jelly) to the O-ring and insert it correctly.

4. Place cover [1] on switch compartment.
5. Fasten screws [2] evenly crosswise.

9.12 Operating time: set

For part-turn actuators with 1-phase AC motors, the operating time can be adjusted.

Table 4: Operating time setting for 90°

Size	Operating times
SG 05.1/SGR 05.1	5.6 to 45 seconds
SG 07.1/SGR 07.1	11 to 90 seconds
SG 10.1/SGR 10.1	11 to 90 seconds
SG 12.1/SGR 12.1	22 to 180 seconds

Figure 30: Part-turn actuator with 1-ph AC motor

[1] Motor cover
[2] Potentiometer

DANGER

Hazardous voltage!

Risk of electric shock.

→ Disconnect device from the mains before opening.

NOTICE

Danger of corrosion due to damage to paint finish!

→ Touch up damage to paint finish after work on the device.

1. Unfasten motor cover [1].
2. Set required operating time via potentiometer [2].
3. Clean sealing faces of motor cover and housing.
4. Apply a thin film of non-acidic grease (e.g. petroleum jelly) to the sealing faces.
5. Check whether O-ring is in good condition, correctly insert O-ring.
6. Fit motor cover [1] and fasten with screws (tightening torque approx. 50 Nm).
   Information: For enclosure protection IP 68, the motor cover is additionally sealed with thread sealing material.

10. Corrective action

10.1 Faults during commissioning

Table 5: Faults during commissioning

Fault description	Possible causes	Remedy
Fault in end position Actuator runs to end stop although the limit switches work properly.	The overrun was not considered when setting the limit switching. The overrun is generated by the inertia of both the actuator and the valve and the delay time of the controls.	Determine overrun: Overrun = travel covered from switching off until complete standstill. Set limit switching again considering the overrun (turn handwheel back by the amount of the overrun).
Position transmitter RWG No value can be measured at measuring points.	Current loop via RWG is open. (Position feedback 0/4 – 20 mA only functions if the current loop is closed across the RWG.)	Connect terminals 23/24 to XK across RWG. Connect external load to XK, e.g. remote indication. Consider maximum load R_B.
Limit and/or torque switches do not trip.	Switch is defective or switch setting is incorrect.	Check setting, if required, reset end positions. → **Check switches** and replace them, if required.

Switch check

The red test buttons [1] and [2] are used for manual operation of the switches:

1. Turn test button [1] in direction of the TSC arrow: Torque switch CLOSED trips.
2. Turn test button [2] in direction of the TSO arrow: Torque switch OPEN trips.

If the actuator is equipped with a DUO limit switching (option), the intermediate position switches (LSA and LSB) will be operated at the same time as the torque switches.

1. Turn test button [1] in direction of the LSC arrow: Limit switch CLOSED trips.
2. Turn test button [2] in direction of the LSO arrow: Limit switch OPEN trips.

10.2 Motor protection (thermal monitoring)

In order to protect against overheating and impermissibly high temperatures at the actuator, PTC thermistors or thermoswitches are embedded in the motor winding. They trip as soon as the max. permissible winding temperature has been reached.

Behaviour during failure

If the signals are correctly wired within the controls, the actuator is stopped and can only resume its operation once the motor has cooled down.

Possible causes

Overload, running time exceeded, max. number of starts exceeded, ambient temperature is too high.

Remedy

Check cause, eliminate if possible.

11. Servicing and maintenance

CAUTION

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 offer extensive service such as servicing and maintenance as well as customer product training. For the relevant contact addresses, please refer to <Addresses> in this document or to the Internet (www.auma.com) .

11.1 Preventive measures for servicing and safe operation

The following measures are required to ensure safe device operation:

6 months after commissioning and then every year

- Carry out visual inspection:
  Cable entries, cable glands, blanking plugs, etc. have to be checked for correct tightness and sealing.
  Respect torques according to manufacturer's details.
- 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.

For enclosure protection IP 68

After continuous immersion:

- Check actuator.
- In case of ingress of water, locate leaks and repair, dry device correctly and check for proper function.

11.2 Maintenance

Lubrication

- In the factory, the gear housing is filled with grease.
- Change of grease or re-lubrication will be required in case of lubrication loss only.

11.3 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
- plastics
- 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.

12. Technical data

Information The following technical data includes standard and optional features. For detailed information on the customer-specific version, refer to the order-relevant data sheet. This data sheet can be downloaded from the Internet at **http://www.auma.com** in German and English (indication of commission number required).

12.1 Features and functions of actuator

Type of duty[1)]	SG: Short-time duty S2 - 15 min SGR: Intermittent duty S4 - 25 %
Torque range	Refer to actuator name plate
Operating time for 90°	Refer to actuator name plate
Motor	Standard: 3-ph AC asynchronous motor, type IM B9 according to IEC 60034
Insulation class	Standard: F, tropicalized Option: H, tropicalized
Motor protection	Standard: Thermoswitches (NC) Option: PTC thermistors (according to DIN 44082)[2)]
Self-locking	Yes
Swing angle	Standard: 80° to 110° adjustable between min. and max. values Option: 30° – 40°, 40° – 55°, 55° – 80°, 110° – 160°, 160° – 230° or 230° – 320°
Limit switching	Counter gear mechanism for end positions CLOSED and OPEN Standard: • Single switches (1 NC and 1 NO; not galvanically isolated) for each end position Options: • Tandem switches (2 NC and 2 NO) for each end position, switches galvanically isolated • Triple switches (3 NC and 3 NO) for each end position, switches galvanically isolated • Intermediate position switches (DUO limit switching), adjustable for any position
Torque switching	Torque switching adjustable for directions OPEN and CLOSE Standard: Single switch (1 NC and 1 NO; not galvanically isolated) for each direction Option: Tandem switches (2 NC and 2 NO) for each direction, switches galvanically isolated
Position feedback signal, analogue (option)	Potentiometer or 0/4 – 20 mA (RWG)
Mechanical position indicator	Continuous indication, adjustable indicator disc with symbols OPEN and CLOSED
Running indication	Blinker transmitter
Heater in switch compartment	Standard: Self-regulating PTC heater, 5 – 20 W, 110 – 250 V AC/DC Option: 24 – 48 V AC/DC or 380 – 400 V AC
Motor heater (option)	Voltages: 110 – 220 V AC, 220 – 240 V AC or 400 V AC Power: 12.5 W
Manual operation	Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation. Option: Handwheel lockable
Electrical connection	Standard: AUMA plug/socket connector with screw-type connection Options: Screw-type terminals or crimp connection
Threads for cable entries	Standard: Metric threads Options: Pg-threads, NPT-threads, G-threads
Terminal plan	Terminal plan according to commission number attached with delivery
Coupling	Standard: Coupling without bore Options: Machined coupling with bore and keyway, square bore or bore with two-flats according to EN ISO 5211
Valve attachment	Dimensions according to EN ISO 5211

1) For nominal voltage and 20 °C ambient temperature and an average load with running torque or modulating torque according to separate technical data. The type of duty must not be exceeded.
2) PTC thermistors require additionally a suitable tripping device in the controls

Technical data for limit and torque switches	
Mechanical lifetime	2 x 10^6 starts
Silver plated contacts:	
U min.	30 V AC/DC
U max.	250 V AC/DC
I min.	20 mA
I max. AC current	5 A at 250 V (resistive load) 3 A at 250 V (inductive load, cos phi = 0.6)
I max. DC current	0.4 A at 250 V (resistive load) 0.03 A at 250 V (inductive load, L/R = 3 µs) 7 A at 30 V (resistive load) 5 A at 30 V (inductive load, L/R = 3 µs)
Gold plated contacts:	
U min.	5 V
U max.	30 V
I min.	4 mA
I max.	400 mA

Technical data for blinker transmitter	
Mechanical lifetime	10^7 starts
Silver plated contacts:	
U min.	10 V AC/DC
U max.	250 V AC/DC
I max. AC current	3 A at 250 V (resistive load) 2 A at 250 V (inductive load, cos phi ≈ 0.8)
I max. DC current	0.25 A at 250 V (resistive load)

12.2 Service conditions

Mounting position	Any position
Use	Approved for indoor and outdoor installation
Enclosure protection according to EN 60529	Refer to name plate Standard: • IP 67 Options: • IP 68 • IP 68-DS • IP 67-DS According to AUMA definition, enclosure protection IP 68 meets the following requirements: • Water depth: Maximum 6 m head of water • Duration of continuous immersion in water: maximum of 72 hours • Up to 10 operations during flooding • Modulating duty is not possible during continuous immersion. (DS = Double Sealed = terminal compartment additional sealed against interior)
Corrosion protection	Standard: KS: Suitable for installation in industrial units, in water or power plants with a low pollutant concentration as well as for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. in wastewater treatment plants, chemical industry) Option: • KX: Suitable for installation in extremely aggressive atmospheres with high humidity and high pollutant concentration • KX-G: same as KX, however aluminium-free version (outer parts)
Installation altitude	Standard: ≤ 2 000 m above sea level Option: > 2 000 m above sea level, please contact AUMA
Finish coating	Standard: Two-component iron-mica coating
Colour	Standard: AUMA silver-grey (similar to RAL 7037)

Ambient temperature	Refer to name plate Standard: • Open-close duty: –40 °C to +80 °C • Modulating duty: –40 °C to +60 °C Options: • Open-close duty: –50 °C to +60 °C • Open-close duty: –60 °C to +60 °C • Open-close duty: 0 °C to +120 °C
Lifetime	Open-close duty (operating cycles OPEN - CLOSE - OPEN): SG 05.1 – SG 07.1: 20,000 SG 10.1: SG 15,000 SG 12.1: 10, 000 Modulating duty:[1)] SGR 05.1 – SGR 12.1: 2.5 million modulating steps
Weight	Refer to separate technical data

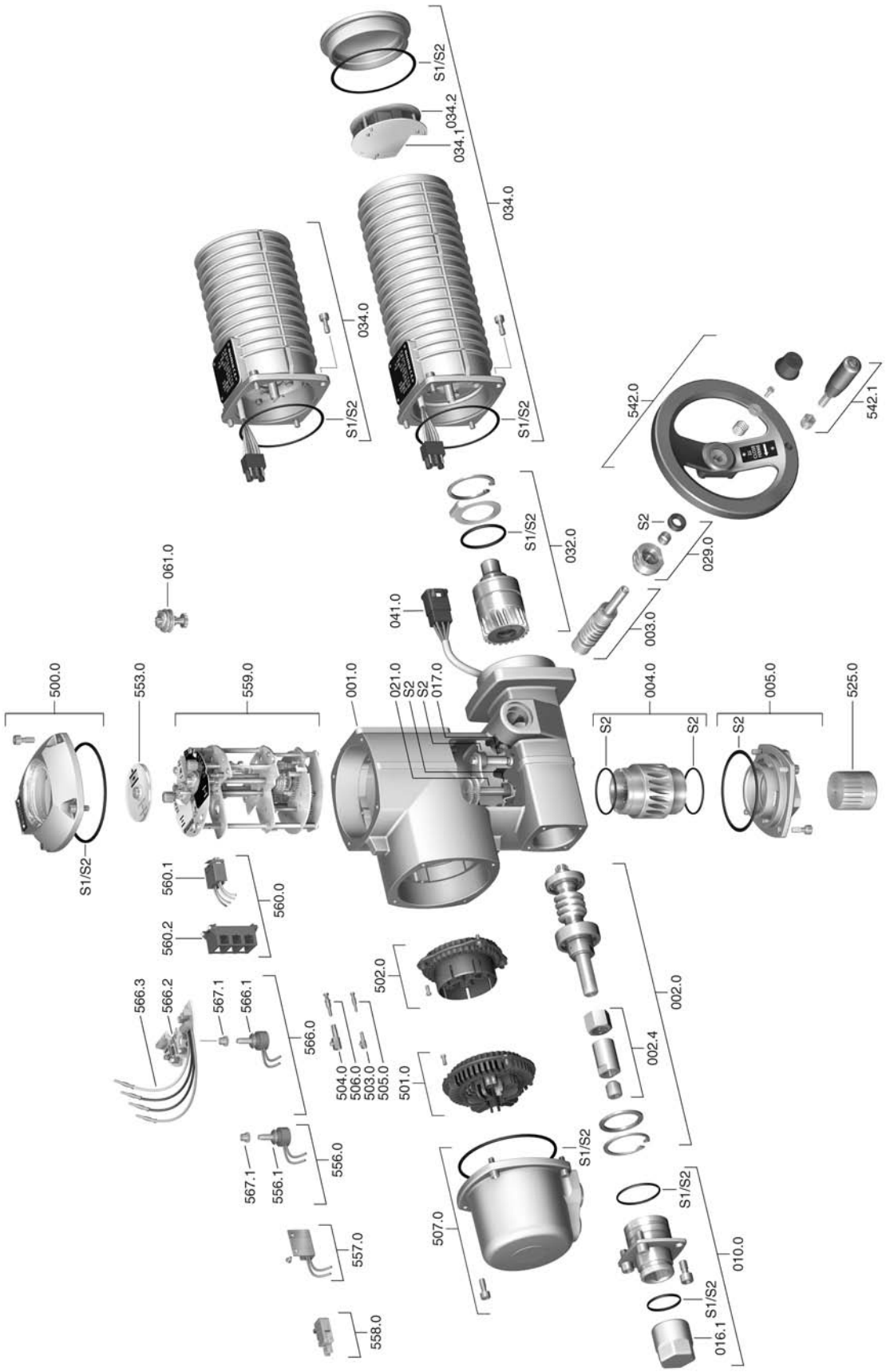
1) The lifetime depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as permissible for the process

12.3 Further information

EU Directives	• Electromagnetic Compatibility (EMC): (2004/108/EC) • Low Voltage Directive: (2006/95/EC) • Machinery Directive: (2006/42/EC)

13. Spare parts

13.1 Part-turn actuators SG 05.1 – SG 12.1/SGR 05.1 – SGR 12.1



Information: Please state type and commission no. of the device (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. Delivered spare parts may slightly vary from the representation.

No.	Designation	Type
001.0	Housing	
002.0	Worm shaft	Sub-assembly
002.4	End stop nut (included in sub-assembly 002.0)	
003.0	Manual drive worm	Sub-assembly
004.0	Worm wheel	Sub-assembly
005.0	Mounting flange	Sub-assembly
010.0	End stop	Sub-assembly
016.1	Protective cap	
017.0	Torque finger	Sub-assembly
021.0	Limit drive finger	Sub-assembly
029.0	Manual drive bearing	Sub-assembly
032.0	Planetary gearing	Sub-assembly
034.0	Motor	Sub-assembly
034.1	Motor brake	Sub-assembly
034.2	Cover plate	Sub-assembly
041.0	Socket carrier with motor cable harness	Sub-assembly
061.0	Torque switching head	Sub-assembly
500.0	Cover	Sub-assembly
501.0	Socket carrier (complete with sockets)	Sub-assembly
502.0	Pin carrier without pins	Sub-assembly
503.0	Socket for controls	Sub-assembly
504.0	Socket for motor	Sub-assembly
505.0	Pin for controls	Sub-assembly
506.0	Pin for motor	Sub-assembly
507.0	Plug cover	Sub-assembly
525.0	Coupling	
542.0	Handwheel	Sub-assembly
542.1	Ball handle	Sub-assembly
553.0	Mechanical position indicator	Sub-assembly
556.0	Potentiometer for position transmitter	Sub-assembly
556.1	Potentiometer without slip clutch	
557.0	Heater	Sub-assembly
558.0	Blinker transmitter including pins at wires (without impulse disc and insulation plate)	Sub-assembly
559.0-1	Control unit with torque switching heads and switches	Sub-assembly
559.0-2	Control unit with magnetic limit and torque transmitter (MWG) for Non-intrusive version in combination with AUMATIC integral controls	Sub-assembly
560.0-1	Switch stack for direction OPEN	Sub-assembly
560.0-2	Switch stack for direction CLOSE	Sub-assembly
560.1	Switch for limit/torque switching	
560.2	Switch case	
566.0	Position transmitter RWG	Sub-assembly
566.1	Potentiometer for RWG without slip clutch	Sub-assembly
566.2	Electronic board RWG	Sub-assembly
566.3	Wire harness for RWG	Sub-assembly
567.1	Slip clutch for potentiometer	Sub-assembly
S1	Seal kit, small	Set
S2	Seal kit, large	Set

14. Certificates

14.1 Declaration of Incorporation and EC Declaration of Conformity

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auma®
Solutions for a world in motion

Original Declaration of Incorporation of Partly Completed Machinery (EC Directive 2006/42/EC) and EC Declaration of Conformity in compliance with the Directives on EMC and Low Voltage

for electric AUMA multi-turn actuators of the type ranges **SG 05.1 – SG 12.1** and **SGR 05.1 – SGR 12.1** in versions **AUMA NORM**, **AUMA SEMIPACT**, **AUMA MATIC** or **AUMATIC**.

AUMA Riester GmbH & Co. KG as manufacturer declares herewith, that the above mentioned part-turn actuators meet the following basic requirements of the EC Machinery Directive 2006/42/EC: Annex I, articles 1.1.2, 1.1.3, 1.1.5, 1.2.1; 1.2.6, 1.3.1, 1.3.7, 1.5.1, 1.6.3, 1.7.1, 1.7.3, 1.7.4

The following harmonised standards within the meaning of the Machinery Directive have been applied:

EN 12100-1: 2003
EN 12100-2: 2003
ISO 5211: 2001
EN 60204-1: 2006

With regard to the partly completed machinery, the manufacturer commits to submitting the documents to the competent national authority via electronic transmission upon request. The relevant technical documentation pertaining to the machinery described in Annex VII, part B has been prepared.

AUMA part-turn actuators are designed to be installed on industrial valves. AUMA part-turn actuators must not be put into service until the final machinery into which they are to be incorporated has been declared in conformity with the provisions of the EC Directive 2006/42/EC.

Authorised person for documentation: Peter Malus, Aumastrasse 1, D-79379 Muellheim

As partly completed machinery, the part-turn actuators further comply with the requirements of the following directives and the respective approximation of national laws as well as the respective harmonised standards as listed below:

(1) Directive relating to Electromagnetic Compability (EMC) (2004/108/EC)

EN 61000-6-4: 2007
EN 61000-6-2: 2005
EN 61800-3: 2004

(2) Low Voltage Directive (2006/95/EC)

EN 60204-1: 2006
EN 50178: 1997
EN 60034-1: 2004
EN 61010-1: 2001

Year of affixing of the CE marking: 2010

Muellheim, 2009-12-29

H. Newerla, General Management

This declaration does not contain any guarantees. The safety instructions in product documentation supplied with the devices must be observed. Non-concerted modification of the devices voids this declaration.

Y004.930/002/en

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