auma®
Solutions for a world in motion

Part-turn gearboxes

GS 630.3

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.

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1. Safety instructions

1.1 Basic information on safety

Standards/directives

Our 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.

Work performed in potentially explosive atmospheres is subject to special regulations which have to be observed. The end user or contractor of the plant are responsible for respect and control of these regulations, standards, and laws.

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 device warms up and increased surface temperature 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 gearboxes 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
- 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.

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).

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.

1.4 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)

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

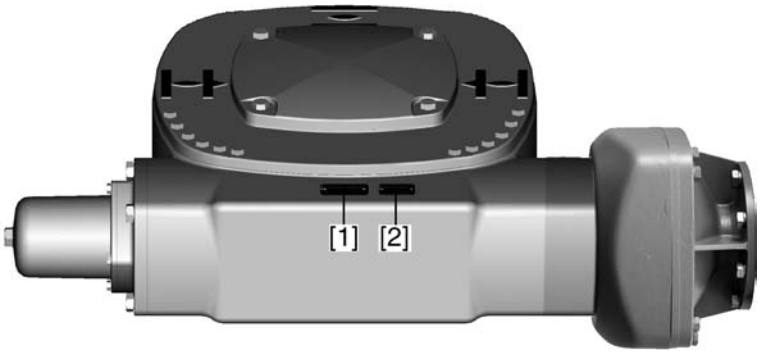
< > **Reference to other sections**

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

Figure 1: Arrangement of name plates

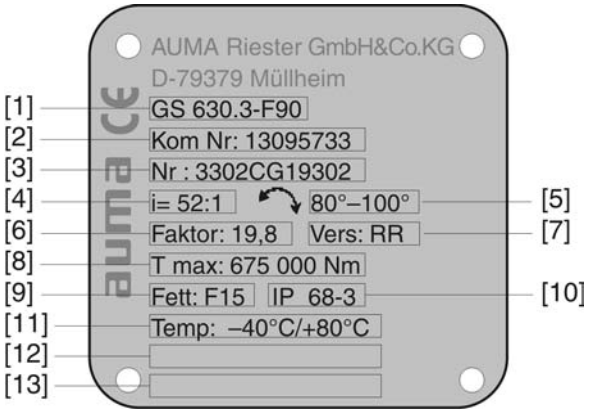


[1] Gearbox name plate

[2] Additional plate, e.g. KKS plate (Power Plant Classification System)

Data for identification

Figure 2: Gearbox name plate (example)



[1] Type and size - valve attachment (flange)

[2] Commission number

[3] Works number

[4] Reduction ratio — [5] swing angle

[6] Factor — [7] version

[8] Max. output torque (depending on flange size)

[9] Lubricant — [10] enclosure protection

[11] Ambient temperature

[12] Explosion-proof version (option)

[13] Customer information (option)

Type and size

These instructions apply to the following devices:

Part-turn gearboxes: GS 630.3

Primary reduction gearing: GZ 630.3

Commission number

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

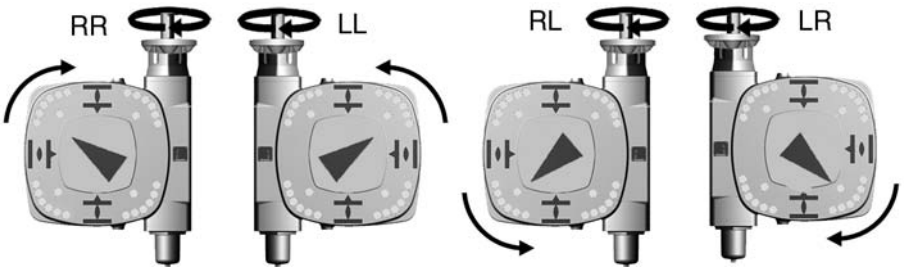
Reduction ratio

The reduction ratio within the gearing and primary reduction gearing reduces the required input torques and increases the operating time.

Factor

Mechanical gearbox factor to determine the actuator size: Input torque = required output torque/factor

Version Figure 3: Version



For clockwise rotation of the input shaft (view on pointer cover/protection cover), the first character of the **version** indicates the worm shaft position with reference to the worm wheel, the second character indicates the valve shaft rotary direction.

Table 1: Version (with view on point cover)

Version	Rotary direction at input shaft	Position of worm shaft	Rotary direction of valve shaft
RR	clockwise	right	clockwise
LL	clockwise	left	counterclockwise
RL	clockwise	right	counterclockwise
LR	clockwise	left	clockwise

2.2 Short description

AUMA worm gearboxes are part-turn gearboxes converting a rotary movement at the input shaft into a part-turn movement at the output drive. They are driven either via electric motor (by means of a multi-turn actuator) or manually (via a handwheel). The required input torques are reduced due to high reduction ratios. In standard version, internal end stops limit the swing angle to 100°.

Worm gearboxes are available in different versions to implement various mounting conditions and rotary directions.

3. Transport, storage and packaging

3.1 Transport

For transport to place of installation, use sturdy packaging.

Transport gearbox and actuator separately.

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.

→ Check available eyebolt for tight seat in housing (verify reach of the screw).

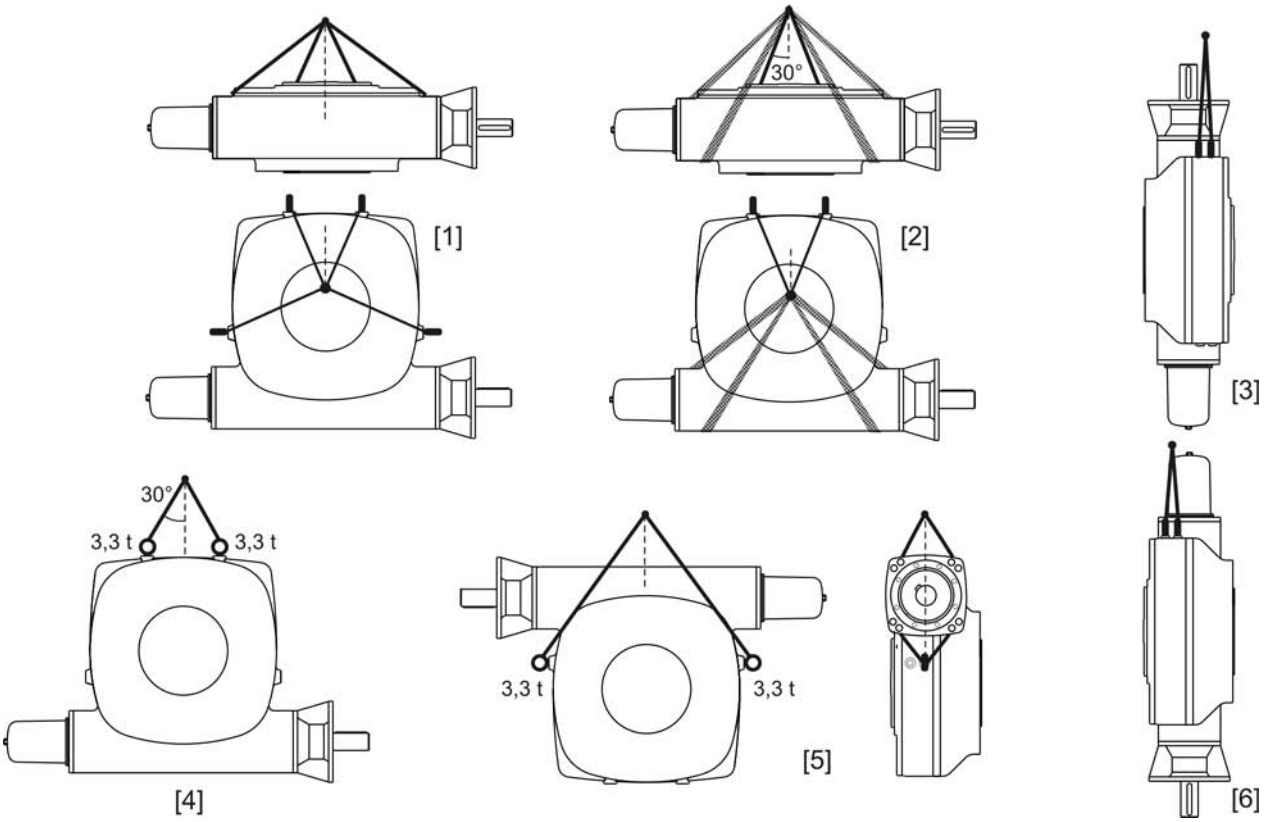
→ Fix ropes or hooks to gearbox using available eyebolts only.

→ Respect total weight of combination (gearbox, primary reduction gearing, actuator).

Unpacking

To lift the combination out of the transport box, follow illustrations [1] or [2]. Arrange straps to ensure that the suspension point is perpendicular to the centre of gravity of the combination.

Figure 4: Lift the gearbox using eyebolts (retention force max. 6.6 t for 2 eyebolts)



[1] Lifting with 4 eyebolts (out of the transport box)

[2] Lifting with 2 eyebolts and additional rope or sling

[3-6] Lifting with 2 eyebolts

CAUTION

For [3] and [6]: Danger of bending parts when lifting!

Pinching and damage at end stop or at actuator.

→ For illustration [3] and for illustration [6] with mounted actuator: Shim gearbox with appropriate material and support to ensure that end stop or actuator is not loaded with the total gearbox weight.

Table 2:Weights with coupling (with pilot bore) and grease filling in the gear housing

Type	Weight [kg]
GS 630.3	4,800
GS 630.3 with primary reduction gearing GZ 630.3 (4:1/8:1)	5,300
GS 630.3 with primary reduction gearing GZ 630.3 (16:1/32:1)	5,500
GS 630.3 with primary reduction gearing GZ 630.3 (64:1/133:1)	5,600

3.2 Storage

NOTICE

Danger of corrosion due to inappropriate storage!

→ Store in a well-ventilated, dry room (maximum humidity 70 %).

→ 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

The gearboxes described here can operated without restriction in any mounting position.

4.2 Multi-turn actuators for motor operation

Refer to the operation instructions pertaining to the multi-turn actuator for indications on mounting multi-turn actuators to gearboxes.

This chapter supplies basic information and notes which should be considered in addition to the operation instructions of the multi-turn actuator.

Multi-turn actuators and flanges

Table 3: Possible combinations and suitable flanges for actuators

Gearing	Primary reduction gearing	AUMA multi-turn actuator	Flange for mounting	
			EN ISO 5210	DIN 3210
GS 630.3		SA 48.1	F48	–
GS 630.3	GZ 630.3 (4:1)	SA 40.1	F40	–
		SA 35.1	F35	–
GS 630.3	GZ 630.3 (8:1)	SA 35.1	F35	–
		SA 30.1	F30	–
GS 630.3	GZ 630.3 (16:1)	SA 30.1	F30	–
		SA 25.1	F25	–
GS 630.3	GZ 630.3 (32:1)	SA 25.1	F25	–
		SA 16.1	F16	G3
GS 630.3	GZ 630.3 (64:1)	SA 16.1	F16	G3
GS 630.3	GZ 630.3 (133:1)	SA 16.1	F16	G3
		SA 14.5	F14	G1/2

Screws to actuator

Screws are included in the scope of delivery of the gearbox for mounting AUMA multi-turn actuators. When mounting other actuators, the screws might be either too long or too short (insufficient reach of screws)

⚠ WARNING

Danger of falling device due to fracturing when using inappropriate screws!

Risk of death or serious injury.

→ Check length of screws.

The reach of screws must be sufficient for the internal threads to ensure the supporting strength of the device and to accept the lateral forces due to the applied torque.

Screws which are too long could make contact with the housing parts. This causes a risk that the device could shift radially with respect to the gearbox. This can lead to shearing off the screws.

Mount flange for actuator

A flange for actuator is required for mounting a multi-turn actuator. Depending on the version, the flange for mounting the multi-turn actuator is already mounted in the factory.

Figure 5: Mounting flange for actuator to GS 630.3 with primary reduction gearing (133:1 and 64:1)

[1] Gearbox with primary reduction gearing
[2] Grub screw
[3] Flange for actuator

1. Clean mounting faces (mounting faces at gearbox bearing flange or at housing cover of primary reduction gearing and at flange for actuator), thouroghly degrease uncoated surfaces.
2. Fasten grub screw [2].
3. Place flange for actuator [3] and fasten with screws/lock washers.
4. Fasten screws crosswise at a torque of 85 Nm.
5. Mount AUMA actuator in compliance with the operation instructions pertaining to the multi-turn actuator.
6. Fasten screws crosswise to a torque according to table.

Table 4: Fastening torques for screws (for mounting multi-turn actuator)

Screws	**Fastening torque T_A [Nm]**	
Threads	**Strength class 8.8**	**Strength class A2-80/A-40**
M16	–	200
M20	–	392
M30	1,489	–
M36	2,595	–

4.3 Mount gearbox to valve

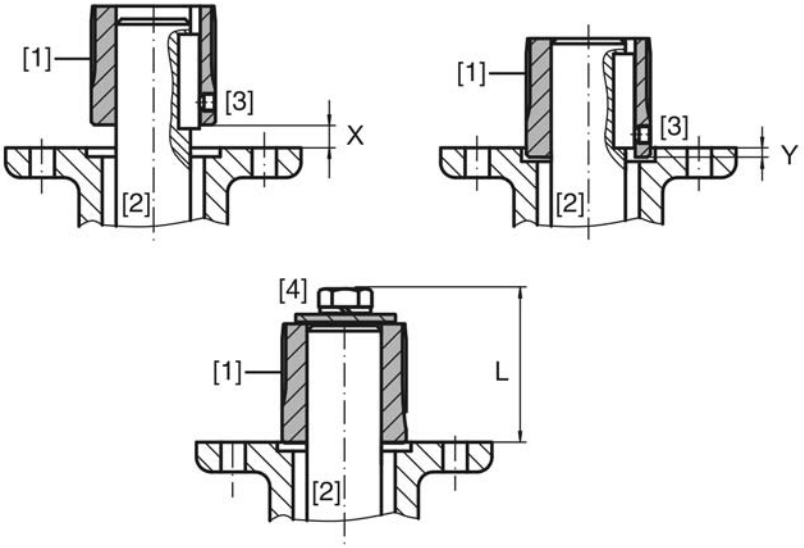
Coupling

For gearbox mounting to the valve, a plug-in coupling is included in the scope of delivery.

The coupling is mounted to the worm wheel and thus adapted to the gearbox. Assignment is made by means of a 4 digit number. This number is embossed into a base at the gearbox housing, at the mounting flange and the coupling. When mounting the gearbox to the valve, ensure that the numbers at gearbox and coupling match.

When supplied in basic version, the coupling is generally provided with a pilot bore. Prior to mounting the gearbox to the valve, finish machining the coupling to match the valve shaft (e.g. with bore and keyway, two-flats or square bore).

Figure 6: Coupling fitting dimensions



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

Table 5: Coupling fitting dimensions

Type, size - mounting flange	X max [mm]	Y max [mm]	L max [mm]
GS 630.3-F90	40	28	560

DANGER

Hovering load!

→ For lifting, respect transport instructions.

Information

Assemble valve and gearbox in the same end position. As a standard, the gearbox is supplied in end position CLOSED.

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

1. If required, move gearbox 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].
4. Place coupling [1] onto valve shaft [2] and secure against axial slipping by using a grub screw [3] or a washer and a screw [4]. Thereby, ensure that dimensions X, Y or L are observed (refer to figure and table <Coupling fitting dimensions>).
5. Apply non-acidic grease at splines of coupling (e.g. Gleitmo by Fuchs).
6. Experience showed that it is very difficult to fasten screws or nuts of size M36 or larger at defined torques. The worm gearbox may be moved radially against the valve flange. To improve adhesion between valve and gearbox, we recommend to apply Loctite 243 (or similar adhesive products) to the mounting faces.
7. Fit gearbox. If required, turn gearbox slightly until the toothing of the coupling gets engaged.

   Information: Ensure that the spigot (if provided) fits uniformly in the recess and that the flanges are in complete contact.
8. If flange bores do not match thread: Slightly rotate gearbox until bores line up.
9. Fasten gearbox with M36 screws (strength class min. 8.8).

   Information: We recommend applying liquid thread sealing material to the screws to avoid contact corrosion.

10. Fasten screws crosswise to a torque according to table.

Table 6: Tightening torques for screws

Screws Threads	**Tightening torque T_A [Nm]**	
	Strength class	
	8.8	**10.9**
M36	2,595	3,695

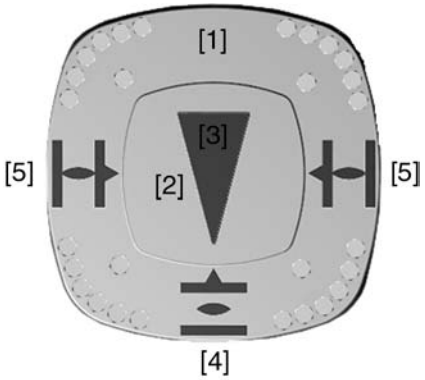
5. Indications

5.1 Mechanical position indicator/running indication

Mechanical position indicator:

- continuously indicates the valve position
  (pointer cover [2] follows the valve movement)
- indicates whether the actuator is moving (running indication)
- indicates that end positions have been reached
  (mark on pointer cover [3] points to symbols OPEN [4] or CLOSED [5])

Figure 7: Mechanical position indicator



[1] Housing cover
[2] Pointer cover
[3] Indicator mark
[4] Symbol for position OPEN
[5] Symbol for position CLOSED

6. Commissioning

6.1 End stops in gearbox

The internal end stops limit the swing angle and protect the valve against overload.

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 at the valve.

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

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

Information

The setting sequence depends on the valve:

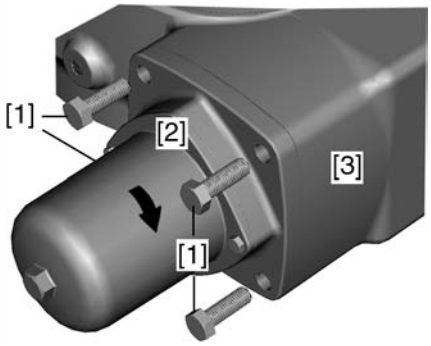
- Recommendation for **butterfly valves**: Set end stop CLOSED first.
- Recommendation for **ball valves**: Set end stop OPEN first.

Information

In general, only one end stop (either OPEN or CLOSED) must be set, due to fact that the swing angle was already set in the factory.

6.1.1 End stop CLOSED: set

Figure 8: End stop



[1] Screws
[2] End stop
[3] Housing

1. Remove the four screws [1] at end stop [2].

NOTICE

No overload protection at valve for unfastened end stop!

→ In motor operation: Stop travel on time before reaching the valve end position (consider overrun).

→ The last part of the travel must be completed in manual operation mode.

2. Turn valve via handwheel to position CLOSED. Check whether end stop [2] rotates simultaneously.
   → Otherwise: Turn end stop [2] **clockwise** to the stop.
3. Turn end stop [2] counterclockwise by 1/4 turn.

➥ This ensures that the gearbox end stop cannot be approached during motor operation if a multi-turn actuator is mounted and that the valve can close tightly for torque seating.

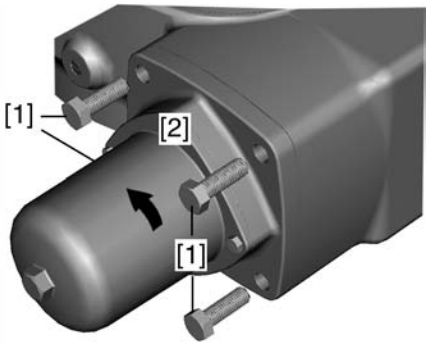
4. In case the four holes of the end stop [2] do not match the four threaded bores within the housing [3]: Remove end stop [2] until it disengages from the toothing and replace in correct position.
5. Fasten screws [1] (M24) crosswise at a torque of 730 Nm.

Further settings hereafter:

- If the gearbox is equipped with a pointer cover: Check whether the mark aligns with the symbol CLOSED. Refer to <Mechanical position indicator: set>.
- If the gearbox is mounted to a multi-turn actuator, set the seating in end position CLOSED straight after completion of the current setting position: <Seating in end positions via multi-turn actuator>.

6.1.2 End stop OPEN: set

Figure 9: End stop



[1] Screws
[2] End stop
[3] Housing

1. Remove the four screws [1] at end stop [2].

NOTICE

No overload protection at valve for unfastened end stop!

→ In motor operation: Stop travel on time before reaching the valve end position (consider overrun).

→ The last part of the travel must be in manual operation mode.

2. Turn valve via handwheel in position OPEN. Check whether end stop [2] rotates simultaneously.
   → Otherwise: Turn end stop [2] **counterclockwise** to the stop.
3. Turn end stop [2] clockwise by 1/4 turn.

➥ This ensures that the gearbox end stop cannot be approached during motor operation if a multi-turn actuator is mounted and that the valve can close tightly for torque seating.

4. In case the four holes of the end stop [2] do not match the four threaded bores within the housing [3]: Remove end stop [2] until it disengages from the toothing and replace in correct position.
5. Fasten screws [1] (M24) crosswise at a torque of 730 Nm.

Further settings hereafter:

- If the gearbox is equipped with a pointer cover: Check whether the mark aligns with the symbol OPEN. Refer to <Mechanical position indicator: set>.
- If the gearbox is mounted to a multi-turn actuator, set the seating in end position OPEN straight after completion of the current setting position: <Seating in end positions via multi-turn actuator>.

6.2 Seating in end positions via multi-turn actuator

Important information regarding setting:

End position seating must be set in compliance with the operating instructions pertaining to the multi-turn actuator.

This chapter supplies basic information and notes which should be considered in addition to the operation instructions of the multi-turn actuator.

- The valve manufacturer has to determine whether the valve is limit or torque seated.
- For limit seating, determine overrun, i.e. how much does the valve move after the motor has been switched off?
- For torque seating, the maximum permissible input torque of the gearbox must not be exceeded for neither direction. Set the torque switching within the multi-turn actuator to the following value to prevent damage to the valve:
  T torque switch = T valve/factor (refer to name plate)
- If the swing angle set in the factory for opening and closing the valve is not sufficient: refer to <Swing angle>.

6.2.1 Seating in the end position CLOSED: set

1. Move valve to end position CLOSED.
   Information: The last part of the travel must be in manual operation mode!
2. For **limit** seating in end position CLOSED:
   2.1 Turn back the valve from the valve end position by an amount equal to the overrun.
   2.2 Set limit switching for the end position CLOSED according to the operation instructions for the multi-turn actuator.
3. For **torque** seating in end position CLOSED:
   3.1 Gearbox without primary reduction gearing: Turn handwheel in the opposite direction of the valve end position by approx. 40 turns.
   3.2 Gearbox with primary reduction gearing GZ: Turn handwheel in the opposite direction of the valve end position by approx. 70 turns.
   3.3 Check torque switching for end position CLOSED according to operation instructions for multi-turn actuator and, if necessary, set to required value.
   3.4 Set limit switching for signalling end position CLOSED according to operation instructions for multi-turn actuator.

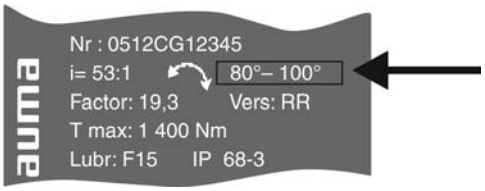
6.2.2 Seating in end position OPEN: set

1. Move valve to end position OPEN.
   Information: The last part of the travel must be in manual operation mode!
2. For **limit** seating in end position OPEN:
   2.1 Turn back the valve from the valve end position by an amount equal to the overrun.
   2.2 Set limit switching for end position OPEN according to the operation instructions for the multi-turn actuator.
3. For **torque** seating in end position OPEN:
   3.1 Gearbox without primary reduction gearing: Turn handwheel in the opposite direction of the valve end position by approx. 40 turns.
   3.2 Gearbox with primary reduction gearing GZ: Turn handwheel in the opposite direction of the valve end position by approx. 70 turns.
   3.3 Check torque switching for end position OPEN according to operation instructions for multi-turn actuator and, if necessary, set to required value.
   3.4 Set limit switching for signalling end position OPEN according to operation instructions for multi-turn actuator.

6.3 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.



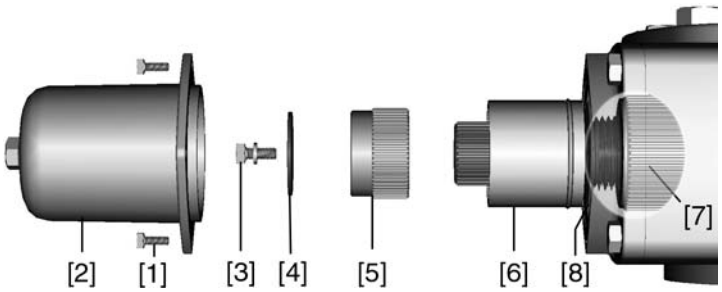
In the standard version, the swing angle can be adjusted within the range of 80° to 100° at an accuracy of 0.057°.

Option: multi-turn, without end stop, thus no protective function available for the gearbox.

6.3.1 Swing angle: modify

The adjustment is made in end position OPEN.

Figure 11: End stop (illustration shows size GS 200.3)



[1] Screws
[2] Protective cap
[3] Screw with lock washer
[4] Clamping washer
[5] Setting ring
[6] End stop nut
[7] Travelling nut

1. Remove all four screws [1] and pull off protective cap [2].
2. Remove the screw with the lock washer [3] and clamping washer [4].
3. Pull off setting ring [5]
4. **Swing angle increase:**
   - 4.1 Turn end stop nut [6] **counterclockwise**.
   - 4.2 Move valve manually to the desired end position OPEN.
   - 4.3 Turn end stop nut [6] **clockwise** until it is tight to the travelling nut [7].
5. **Swing angle reduction:**
   - 5.1 Move valve manually to the desired end position OPEN.
   - 5.2 Turn end stop nut [6] **clockwise** until it is tight to the travelling nut [7].
6. Fit setting ring [5], secure with clamping washer [4], lock washer [5] and screw [3].
7. Check whether O-ring at protective cap is in good condition, replace if damaged.
8. Fit protective cap [2] and fasten screws [1] (M12) crosswise at a torque of 61 Nm.

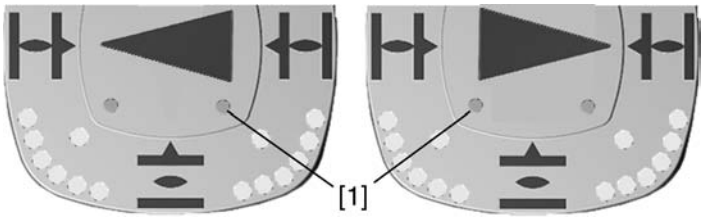
Information If the gearbox is mounted to a multi-turn actuator, the limit swiching for the end position OPEN must be set first in compliance with the operation instructions of the multi-turn actuator.

6.4 Mechanical position indicator: set

End position CLOSED

1. Move valve to end position CLOSED and check setting.

➥ The setting is correct if the mark aligns with the symbol CLOSED.



2. If the mark position is not correct:
   - 2.1 Slightly loosen four screws [1] at pointer cover.
   - 2.2 Turn pointer cover to symbol for position CLOSED [5].
   - 2.3 Fasten screws again.

End position OPEN

3. Move valve to end position OPEN and check setting.

➥ The setting is correct if the mark aligns with the symbol OPEN.

7. 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).

7.1 Preventive measures for servicing and safe operation

The following measures are required to ensure safe device operation:

These measures are based on the assumption that the unit is operated on an average less than 10 times per year.

Every 6 months after commissioning and then once a year

- Perform visual inspection for grease leakage and paint damage (corrosion).
- 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.

Every 5 years after commissioning

Test gearbox function in detail. Record the results for future reference.

For enclosure protection IP 68 (option)

After continuous immersion:

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

7.2 Maintenance intervals

Recommendation for grease change and seal replacement:

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

NOTICE

Gearing damage due to inappropriate grease!

→ Only use original lubricants.

→ The lubricant type is marked on the name plate.

→ Do not mix lubricants.

Instructions for use in potentially explosive atmospheres of categories M2, 2G, 3G, 2D and 3D

- The technical data as well as the ambient temperatures, type of duty and running times indicated on the name plate must imperatively be observed.
- In hazardous areas where combustible dust is present in particular, perform visual inspection for deposit of dirt or dust on a regular basis. Clean devices if required.
- The pointer cover with indicator glass (option) is only approved for use in potentially explosive atmospheres according to ATEX II2G c IIB T4 or T3.

- When using mechanical microswitches (option), additionally observe the mounting and wiring instructions of the manufacturer.

7.3 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.

8. 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).

8.1 Features and functions

Version	Standard: clockwise rotation RR, counterclockwise rotation LL Option: RL or LR
Housing material	Standard: Cast iron (GJL-250)
Self-locking	The gearboxes are self-locking when at standstill under normal service conditions; strong vibration may cancel the self-locking effect. While in motion, safe breaking is not guaranteed. If this is required, a separate brake must be used.
End stops	Positive for both end positions by travelling nut, sensitive adjustment
Swing angle	Standard: Adjustable 80° - 100°; set in the factory to 92° unless ordered otherwise.
Mechanical position indicator	Standard: Pointer cover with sealing for continuous position indication. Appropriate for horizontal outdoor installation (for gas applications with sealed pointer cover, an air vent in the pointer cover or venting grooves in the valve mounting flange must be provided) Option: Protection cover instead of pointer cover, e.g. for buried service
Mechanical limit switches (option)	Single switches (1 NC and 1 NO) for each end position, switches not galvanically isolated, please contact us
Input shaft	Cylindrical with parallel key according to DIN 6885.1

Operation	
Motor operation	With electric multi-turn actuator, directly or through primary reduction gearing
Type of duty	Short-time duty S2 - 15 min or S2 – 30 min (open-close duty) Push-to-run operation permissible, max. 10 steps in one direction and max. of 30 starts per hour

Primary reduction gearing	
Primary reduction gearing	Type VZ as planetary gear with various reduction ratios for reducing the input torques

Valve attachment	
Valve attachment	Dimensions according to EN ISO 5211 Standard: F90/AUMA with spigot, dimensions according to dimension drawing U3.2592 Option: F90/AUMA without spigot
Coupling	Splined coupling for connection to the valve shaft Standard: With pilot bore 100 mm Option: Finish machining with bore and keyway, bore diameter max. 400 mm

8.2 Einsatzbereich

Mounting position	Any position
Enclosure protection according to EN 60529	Refer to name plate Standard: • IP 68-3 dust-tight, submersible in water up to 3 m head of water Options:[1)] • IP 68-6 dust-tight, submersible in water up to 6 m head of water
Corrosion protection	Standard: • KN: Suitable for installation in industrial units, in water or power plants with a low pollutant concentration Options: • KS: Suitable for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. in wastewater treatment plants, chemical industry) • KX: Suitable for installation in extremely aggressive atmospheres with high humidity and high pollutant concentration
Paint	Standard: Primer coated Option: Two-component iron-mica combination
Colour	Standard: AUMA silver-grey (similar to RAL 7037) if finish painting is applied Option: Other colours on request
Ambient temperature	Refer to name plate Standard: –40 °C to +80 °C Option: 0 °C to + 120 °C, version H

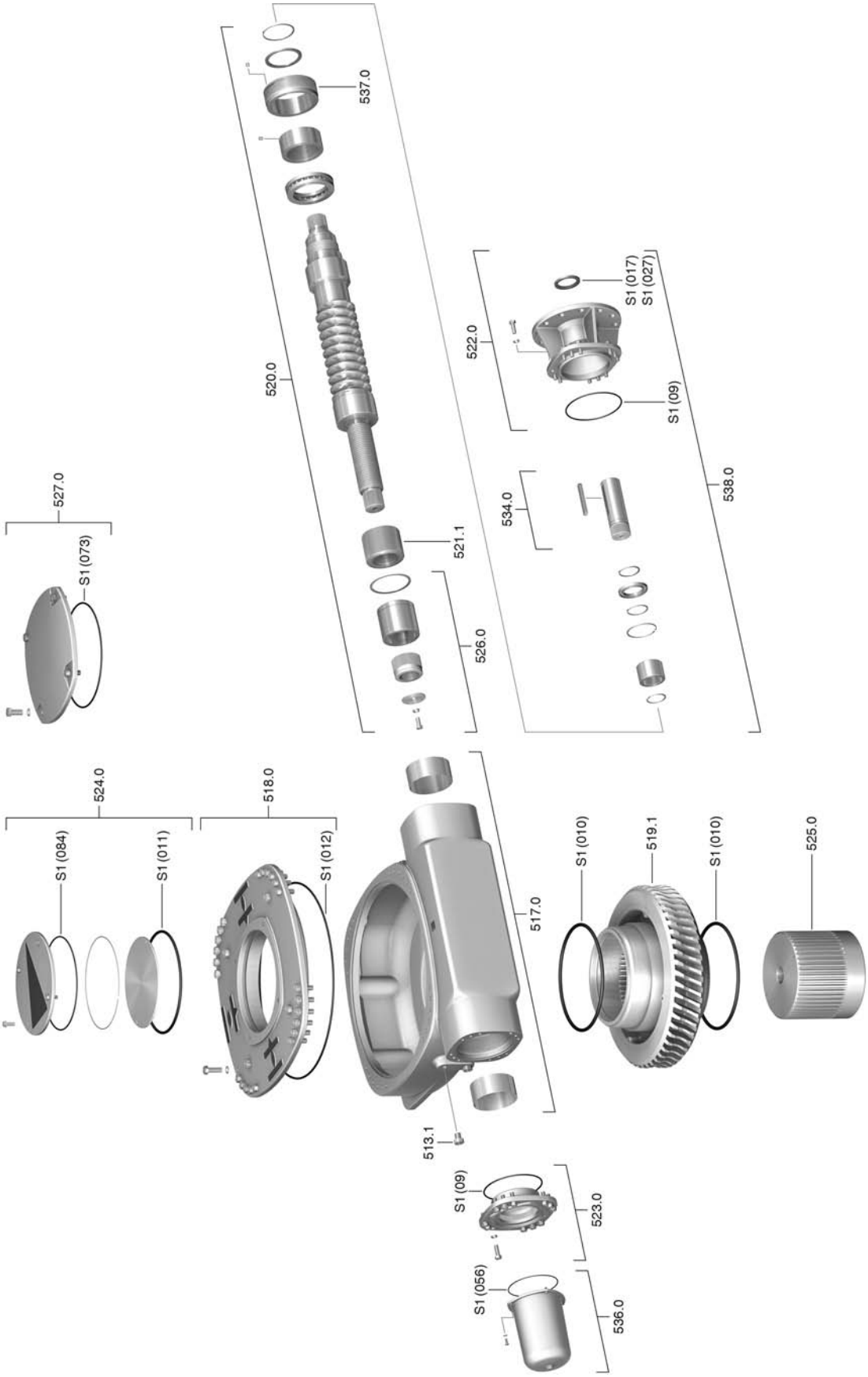
1) Not for size GS 50.3

8.3 Further information

EU Directives	• Machinery Directive: (2006/42/EC)

9. Spare parts

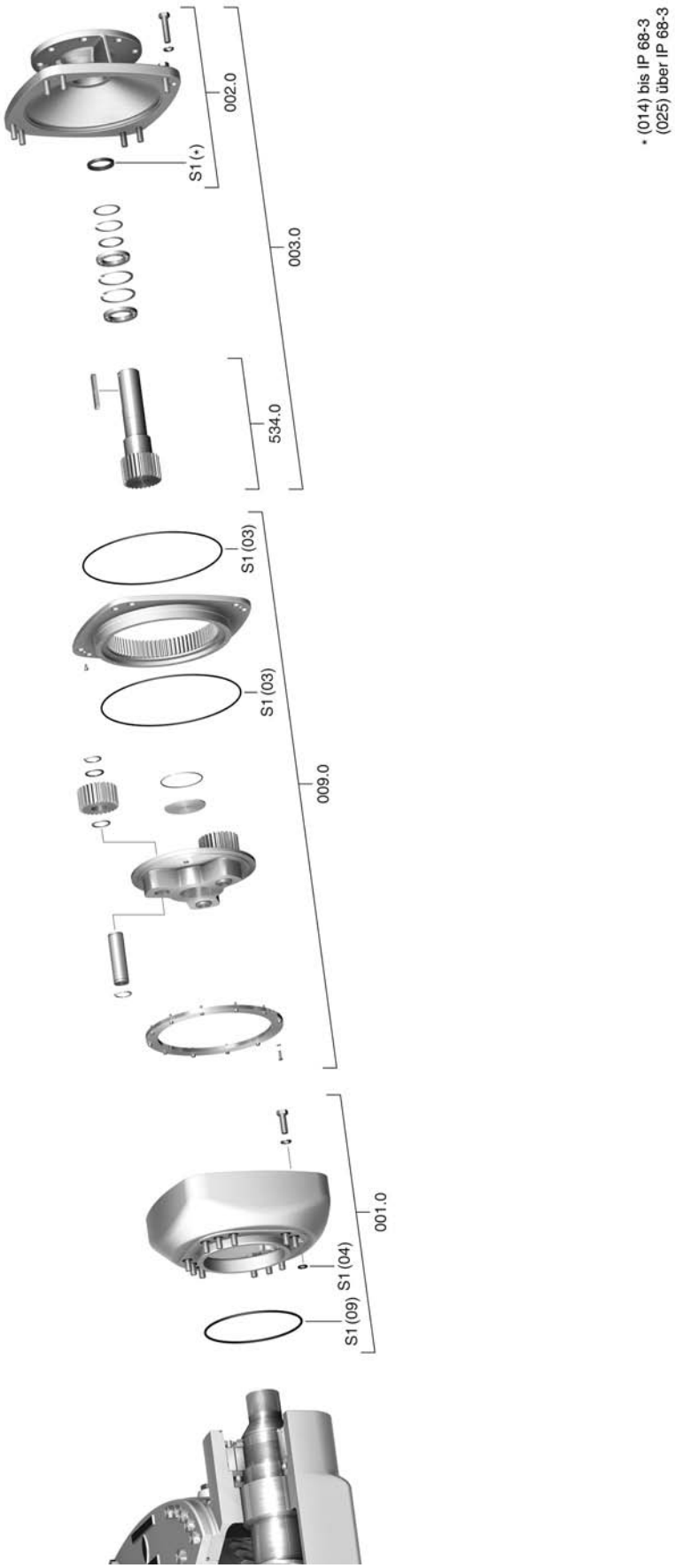
9.1 Part-turn gearboxes GS 630.3



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
513.1	Grub screw	
517.0	Housing	Sub-assembly
518.0	Housing cover	Sub-assembly
519.1	Worm wheel	
520.0	Worm shaft	Sub-assembly
521.1	Travelling nut	
522.0	Bearing cover with flange for actuator	Sub-assembly
523.0	End stop	Sub-assembly
524.0	Pointer cover	Sub-assembly
525.0	Coupling	Sub-assembly
526.0	End stop nut	Sub-assembly
527.0	Protection cover	Sub-assembly
534.0	Drive shaft	Sub-assembly
536.0	Protective cap	Sub-assembly
537.0	Lock nut	Sub-assembly
538.0	Bearing cover with flange for actuator and drive shaft	Sub-assembly
S1	Seal kit	Set

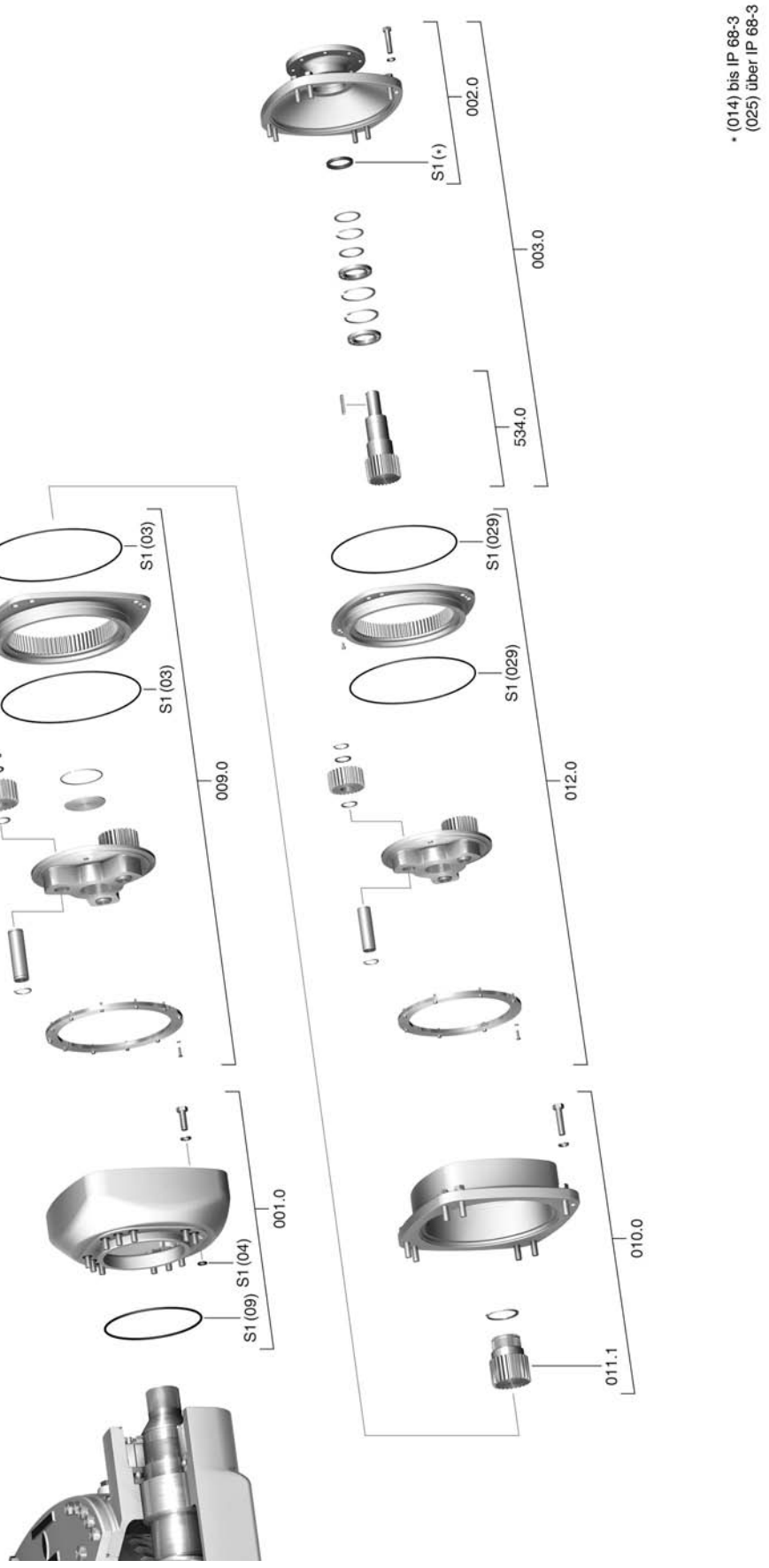
9.2 Primary reduction gearing GZ 630.3 (4:1 and 8:1)



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	Sub-assembly
002.0	Housing cover with flange for actuator	Sub-assembly
003.0	Housing cover with drive shaft	Sub-assembly
009.0	Planetary gearing, first stage (GZ 630.3)	Sub-assembly
534.0	Drive shaft	Sub-assembly
S1	Seal kit	Set

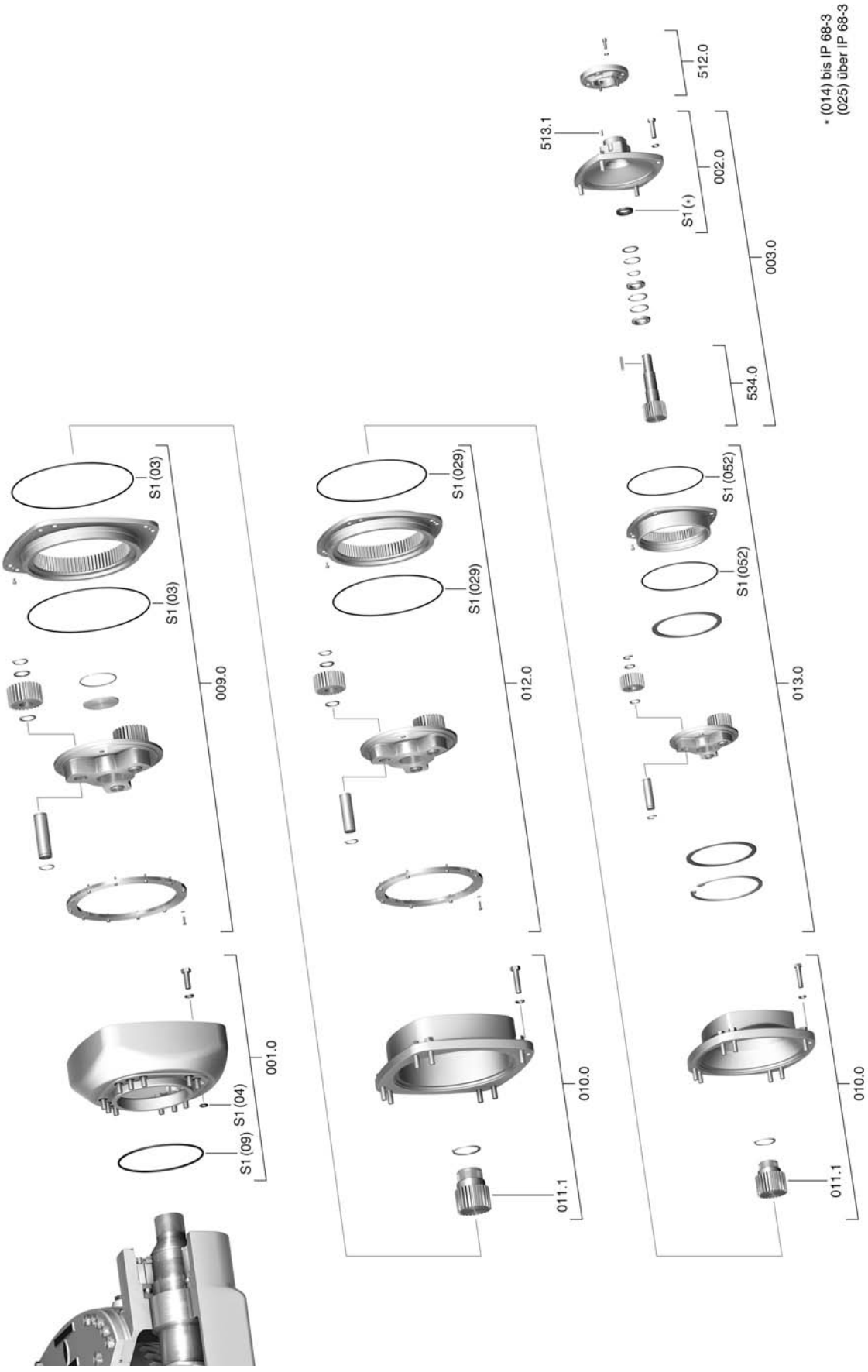
9.3 Primary reduction gearing GZ 630.3 (16:1 and 32:1)



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	Sub-assembly
002.0	Housing cover with flange for actuator	Sub-assembly
003.0	Housing cover with drive shaft	Sub-assembly
009.0	Planetary gearing, second stage (GZ 630.3)	Sub-assembly
010.0	Housing frame	Sub-assembly
011.1	Pinion	
012.0	Planetary gearing, first stage (GZ 500.3)	Sub-assembly
534.0	Drive shaft	Sub-assembly
S1	Seal kit	Set

9.4 Primary reduction gearing GZ 630.3 (64:1 and 133:1)



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	Sub-assembly
002.0	Housing cover	Sub-assembly
003.0	Housing cover with drive shaft	Sub-assembly
009.0	Planetary gearing, third stage (GZ 630.3)	Sub-assembly
010.0	Housing frame	Sub-assembly
011.1	Pinion	
012.0	Planetary gearing, second stage (GZ 500.3)	Sub-assembly
013.0	Planetary gearing, first stage (GZ 315.3)	Sub-assembly
512.0	Flange for actuator	Sub-assembly
513.1	Grub screw	
534.0	Drive shaft	Sub-assembly
S1	Seal kit	Set

10. Certificates

10.1 Declaration of Incorporation and EC Declaration of Conformity

AUMA Riester GmbH & Co. KG
Aumastr. 1
79379 Müllheim, Germany
www.auma.com

Tel +49 7631 809-0
Fax +49 7631 809-1250
Riester@auma.com

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 Directive on Explosion Protection

for AUMA gearboxes of the type ranges

Worm gearboxes	**GS 50.3 – GS 125.3 with reduction gearing VZ 2.3 – VZ 4.3**
	GS 160.3 – GS 250.3 with reduction gearing GZ 160.3 – GZ 250.3
	GS 630.3 with reduction gearing GZ 630.3
	GS 315 – GS 500 with reduction gearing GZ 16.1 – GZ 40.1
Lever gearboxes	**GF 50.3 – GF 125.3 with reduction gearing VZ 2.3 – VZ 4.3**
	GF 160.3 – GF 250.3 with reduction gearing GZ 160.3 – GZ 250.3
Bevel gearboxes	**GK 10.2 – GK 40.2**
Spur gearboxes	**GST 10.1 – GST 40.1**

AUMA Riester GmbH & Co. KG as manufacturer declares herewith, that the above mentioned gearboxes 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, 1.3.1, 1.3.7, 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	ISO 5210: 1996
EN 12100-2: 2003	ISO 5211: 2001

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 gearboxes are designed to be installed on industrial valves. AUMA gearboxes must not be put 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 gearboxes 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) Equipment and protective systems intended for use in potentially explosive atmospheres (94/9/EC)

EN 1127-1: 2007
EN 1127-2: 2002 + A1: 2008
EN 13463-1: 2009
EN 13463-5: 2003

The above mentioned AUMA gearboxes in "ATEX" and "Mining" version are marked as follows:

II2G c IIC T4 oder T3
II2D IP6X T130°C oder T190°C
IM2 c I

In order to meet the requirements for use of AUMA gearboxes in potentially explosive atmospheres, the relevant information in the operation instructions must imperatively be observed.

Muellheim, 2012-03-01

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.

Y004.932/002/en

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Europe

AUMA Riester GmbH & Co. KG

Plant Müllheim
DE 79373 Müllheim
Tel +49 7631 809 - 0
Fax +49 7631 809 - 1250
riester@auma.com
www.auma.com

Plant Ostfildern - Nellingen
DE 73747 Ostfildern
Tel +49 711 34803 - 0
Fax +49 711 34803 - 3034
riester@wof.auma.com

Service-Center Köln
DE 50858 Köln
Tel +49 2234 2037 - 900
Fax +49 2234 2037 - 9099
service@sck.auma.com

Service-Center Magdeburg
DE 39167 Niederndodeleben
Tel +49 39204 759 - 0
Fax +49 39204 759 - 9429
Service@scm.auma.com

Service-Center Bayern
DE 85386 Eching
Tel +49 81 65 9017- 0
Fax +49 81 65 9017- 2018
Riester@scb.auma.com

AUMA Armaturenantriebe GmbH
AT 2512 Tribuswinkel
Tel +43 2252 82540
Fax +43 2252 8254050
office@auma.at
www.auma.at

AUMA (Schweiz) AG
CH 8965 Berikon
Tel +41 566 400945
Fax +41 566 400948
RettichP.ch@auma.com

AUMA Servopohony spol. s.r.o.
CZ 250 01 Brandýs n.L.-St.Boleslav
Tel +420 326 396 993
Fax +420 326 303 251
auma-s@auma.cz
www.auma.cz

OY AUMATOR AB
FI 02230 Espoo
Tel +358 9 5840 22
Fax +358 9 5840 2300
auma@aumator.fi
www.aumator.fi

AUMA France S.A.R.L.
FR 95157 Taverny Cedex
Tel +33 1 39327272
Fax +33 1 39321755
info@auma.fr
www.auma.fr

AUMA ACTUATORS Ltd.
UK Clevedon, North Somerset BS21 6TH
Tel +44 1275 871141
Fax +44 1275 875492
mail@auma.co.uk
www.auma.co.uk

AUMA ITALIANA S.r.l. a socio unico
IT 20023 Cerro Maggiore (MI)
Tel +39 0331 51351
Fax +39 0331 517606
info@auma.it
www.auma.it

AUMA BENELUX B.V.
NL 2314 XT Leiden
Tel +31 71 581 40 40
Fax +31 71 581 40 49
office@auma.nl
www.auma.nl

AUMA Polska Sp. z o.o.
PL 41-219 Sosnowiec
Tel +48 32 783 52 00
Fax +48 32 783 52 08
biuro@auma.com.pl
www.auma.com.pl

OOO Priwody AUMA
RU 124365 Moscow a/ya 11
Tel +7 495 221 64 28
Fax +7 495 221 64 38
aumarussia@auma.ru
www.auma.ru

ERICHS ARMATUR AB
SE 20039 Malmö
Tel +46 40 311550
Fax +46 40 945515
info@erichsarmatur.se
www.erichsarmatur.se

GRØNBECH & SØNNER A/S
DK 2450 København SV
Tel+45 33 26 63 00
Fax+45 33 26 63 21
GS@g-s.dk
www.g-s.dk

IBEROPLAN S.A.
ES 28027 Madrid
Tel+34 91 3717130
Fax+34 91 7427126
iberoplan@iberoplan.com

D. G. Bellos & Co. O.E.
GR 13671 Acharnai Athens
Tel+30 210 2409485
Fax+30 210 2409486
info@dgbellos.gr

SIGURD SØRUM AS
NO 1300 Sandvika
Tel+47 67572600
Fax+47 67572610
post@sigum.no

INDUSTRA
PT 2710-297 Sintra
Tel+351 2 1910 95 00
Fax+351 2 1910 95 99
industra@talis-group.com

Auma Endüstri Kontrol Sistemleri Limited irketi
TR 06810 Ankara
Tel+90 312 217 32 88
Fax+90 312 217 33 88
Servis@auma.com.tr
www.megaendustri.com.tr

AUMA Technology utomations Ltd.
UA 02099 Kiyiv
Tel+38 044 586-53-03
Fax+38 044 586-53-03
auma-tech@aumatech.com.ua

Africa

AUMA South Africa (Pty) Ltd.
ZA 1560 Springs
Tel +27 11 3632880
Fax +27 11 8185248
aumasa@mweb.co.za

A.T.E.C.
EG Cairo
Tel +20 2 23599680 - 23590861
Fax +20 2 23586621
atec@intouch.com

CMR Contrôle Maintenance Régulation
TN 1002 Tunis
Tel +216 71 903 577
Fax +216 71 903 575
instrum@cmr.com.tn
www.cmr-tunisie.net

MANZ INCORPORATED LTD.
NG Port Harcourt
Tel +234-84-462741
Fax +234-84-462741
mail@manzincorporated.com
www.manzincorporated.com

America

AUMA ACTUATORS INC.
US PA 15317 Canonsburg
Tel +1 724-743-AUMA (2862)
Fax +1 724-743-4711
mailbox@auma-usa.com
www.auma-usa.com

AUMA Argentina Representative Office
AR 1609 Boulogne
Tel/Fax +54 232 246 2283
contacto@aumaargentina.com.ar

AUMA Automação do Brasil Ltda.
BR São Paulo
Tel +55 11 4612-3477
contato@auma-br.com

AUMA Chile Representative Office
CL 9500414 Buin
Tel +56 2 821 4108
Fax +56 2 281 9252
aumachile@adsl.tie.cl

TROY-ONTOR Inc.
CA L4N 8X1 Barrie Ontario
Tel +1 705 721-8246
Fax +1 705 721-5851
troy-ontor@troy-ontor.ca

Ferrostaal de Colombia Ltda.
CO Bogotá D.C.
Tel +57 1 401 1300
Fax+57 1 416 5489
dorian.hernandez@ferrostaal.com
www.ferrostaal.com

PROCONTIC Procesos y Control Automático
EC Quito
Tel +593 2 292 0431
Fax +593 2 292 2343
info@procontic.com.ec

Corsusa International S.A.C.
PE Miraflores - Lima
Tel +511444-1200 / 0044 / 2321
Fax +511444-3664
corsusa@corsusa.com
www.corsusa.com

PASSCO Inc.
PR 00936-4153 San Juan
Tel +18 09 78 77 20 87 85
Fax +18 09 78 77 31 72 77
Passco@prtc.net

Suplibarca
VE Maracaibo Estado, Zulia
Tel +58 261 7 555 667
Fax +58 261 7 532 259
suplibarca@intercable.net.ve

Asia

AUMA Actuators (Tianjin) Co., Ltd.
CN 300457 Tianjin
Tel +86 22 6625 1310
Fax +86 22 6625 1320
mailbox@auma-china.com
www.auma-china.com

AUMA INDIA PRIVATE LIMITED
IN 560 058 Bangalore
Tel +91 80 2839 4656
Fax +91 80 2839 2809
info@auma.co.in
www.auma.co.in

AUMA JAPAN Co., Ltd.
JP 211–0016 Nakaharaku, Kawasaki-shi Kanagawa
Tel +81 44 863 8371
Fax +81 44 863 8372
mailbox@auma.co.jp
www.auma.co.jp

AUMA ACTUATORS (Singapore) Pte Ltd.
SG 569551 Singapore
Tel +65 6 4818750
Fax +65 6 4818269
sales@auma.com.sg
www.auma.com.sg

AUMA Actuators Middle East W.L.L.
AE 15268 Salmabad 704
Tel +973 17877377
Fax +973 17877355
Naveen.Shetty@auma.com

PERFECT CONTROLS Ltd.
HK Tsuen Wan, Kowloon
Tel +852 2493 7726
Fax +852 2416 3763
joeip@perfectcontrols.com.hk

DW Controls Co., Ltd.
KR 153-702 Seoul
Tel +82 2 2624 3400
Fax +82 2 2624 3401
sichoi@actuatorbank.com
www.actuatorbank.com

Sunny Valves and Intertrade Corp. Ltd.
TH 10120 Yannawa Bangkok
Tel +66 2 2400656
Fax +66 2 2401095
sunnyvalves@inet.co.th
www.sunnyvalves.co.th/

Top Advance Enterprises Ltd.
TW Jhonghe City Taipei Hsien (235)
Tel +886 2 2225 1718
Fax +886 2 8228 1975
support@auma-taiwan.com.tw
www.auma-taiwan.com.tw

Australia

BARRON GJM Pty. Ltd.
AU NSW 1570 Artarmon
Tel +61 294361088
Fax +61 294393413
info@barron.com.au
www.barron.com.au

AUMA Riester GmbH & Co. KG
P.O.Box 1362
D 79373 Muellheim
Tel +49 7631 809 - 0
Fax +49 7631 809 - 1250
riester@auma.com
www.auma.com

Certificate Registration No.
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