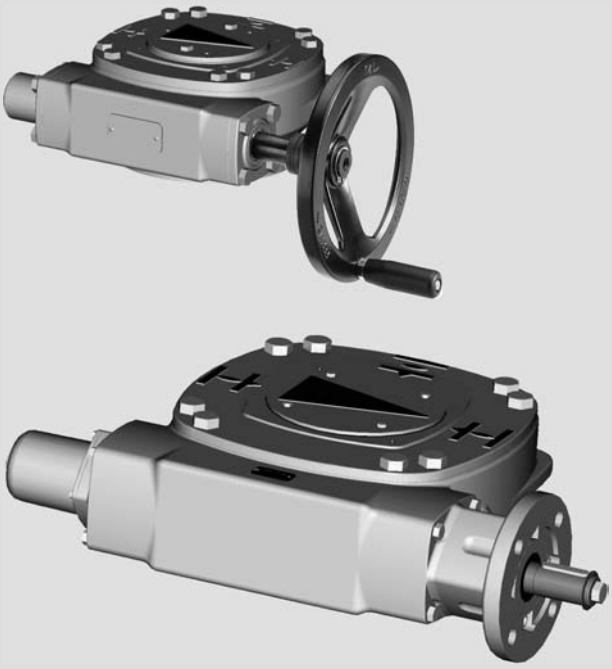
auma®
Solutions for a world in motion

Part-turn gearboxes

GS 50.3 – GS 250.3



Operation instructions Assembly, operation, commissioning

Read operation instructions first.

- Observe safety instructions.
- These operation instructions are part of the product.
- Retain 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

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.

The devices described herein are also approved for use in the potentially explosive atmospheres of zones 1, 2, 21, and 22 and for use in mining (category M2). For use in potentially explosive atmospheres, special conditions such as explosion protection, output torque, type of duty and ambient temperatures indicated in the technical data must imperatively be observed.

Deviating versions are recorded in the order acknowledgement or may be request in the factory indicating the commission number (refer to name plate). Before using the product check the service conditions against the version indicated in the order acknowledgement.

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.

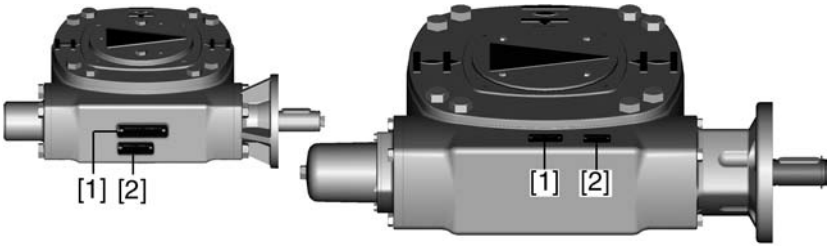
< > Reference to other sections

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

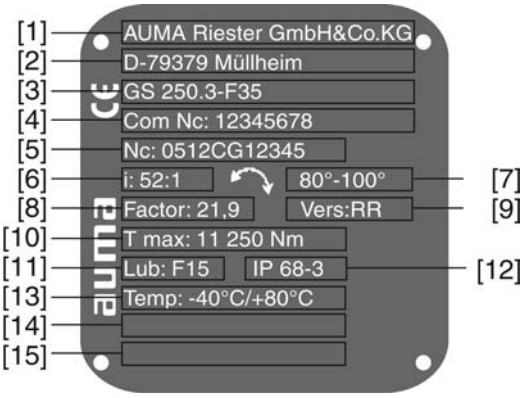
Figure1: Arrangement of name plates



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

Description of gearbox name plate

Figure2: Gearbox name plate (example GS 250.3)



[1] Name of manufacturer
[2] Address of manufacturer
[3] Type and size - valve attachment (flange)
[4] Commission number
[5] Gearbox serial number
[6] Reduction ratio — [7] swing angle
[8] Factor — [9] version
[10] Max. output torque (depending on flange size)
[11] Lubricant type – [12] enclosure protection
[13] Permissible ambient temperature
[14] Explosion-proof version (option)
[15] Can be assigned as an option upon customer request

Type and size

These instructions apply to the following devices types and sizes:

Part-turn gearboxes: GS 50.3 – GS 250.3

Primary reduction gearings: VZ 2.3 – VZ 4.3

Primary reduction gearings: GZ 160.3 – GZ 250.3

Commission number

An order-relevant commission number (order number) is assigned to each device. This commission number can be used to directly download inspection records and further information regarding the device from the Internet: **http://www.auma.com**. For some details, the customer number might be required.

Gearbox works number

Table 1: Description of series number (with example)

05	**12**	**C G 12345**	
1st + 2nd position: Assembly in week			
05	In our example: Week 05		
3rd + 4th position: Year of manufacture			
	12	In our example: Year of manufacture: 2012	
All other positions			
		C G 12345	Internal works number for unambiguous product identification

Reduction ratio

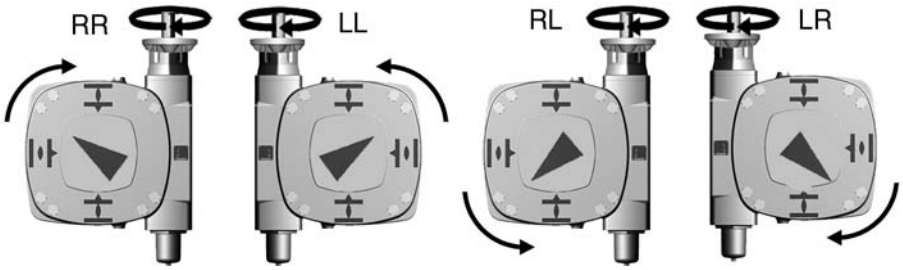
The reduction ratio within the gearing and primary reduction gearing reduces the required input torques and increases the operating time.

Factor

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

Version

Figure3: Version (worm shaft position and direction of rotation)



The first letter of the version indicates the **position of the worm shaft** in relation to the worm wheel (view on input shaft).

The second letter indicates the **direction of rotation** of the valve shaft (view on housing cover) for clockwise rotation at the input shaft.

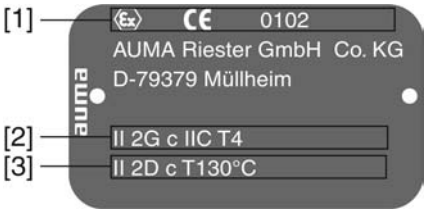
Table 2: Version

Version	Position of worm shaft	Rotation direction of valve shaft
RR	right	clockwise
LL	left	counterclockwise
RL	right	counterclockwise
LR	left	clockwise

Explosion-proof version (option)

For larger sizes (GS 80.3 – GS 250.3), explosion-proof version is directly indicated on the gearbox name plate. For smaller sizes GS 50.3 and GS 63.3, explosion-proof version is indicated on a separate name plate.

Figure4: Separate name plate for explosion-proof version (example)



[1] Ex symbol, CE mark, number of test authority
Classification:
[2] Gas explosion protection
[3] Dust explosion protection

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. The worm gearboxes are driven either via electric motor (by means of a multi-turn actuator) or manually (e.g. 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).

Table 3: Weight with coupling (without bore) and grease filling in the gear housing

Type	Weight [kg]
GS 50.3	7
GS 63.3	12
GS 80.3	16
GS 100.3	33
GS 100.3 with primary reduction gearing VZ	39
GS 125.3	40
GS 125.3 with primary reduction gearing VZ	46
GS 160.3	80
GS 160.3 with primary reduction gearing GZ 160.3 (4:1/8:1)	91
GS 200.3	140
GS 200.3 with primary reduction gearing GZ 200.3 (4:1/8:1)	160
GS 200.3 with primary reduction gearing GZ 200.3 (16:1)	170
GS 250.3	273
GS 250.3 with primary reduction gearing GZ 250.3 (4:1/8:1)	296
GS 250.3 with primary reduction gearing GZ 250.3 (16:1)	308

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

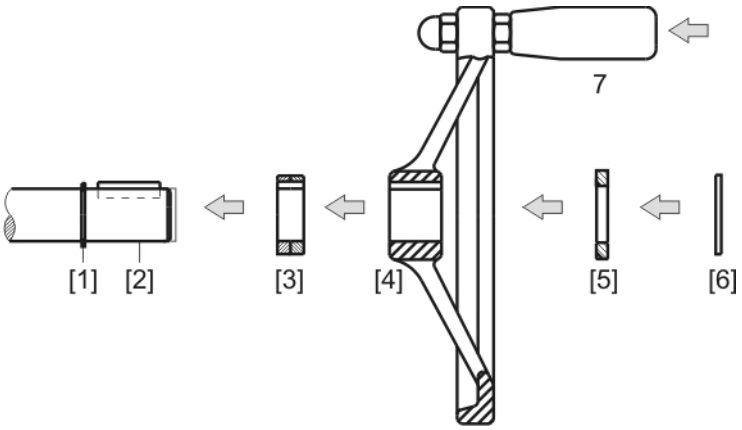
4.1. Mounting position

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

4.2. Handwheel fitting

Gearboxes designed for manual operation are supplied with a separate handwheel. Fitting is performed on site according to the description below.

Figure5: Handwheel



[1] Circlip of gear input shaft
[2] Gear input shaft
[3] Spacer (partly required)
[4] Handwheel
[5] Spacer (partly required)
[6] Circlip
[7] Ball handle (option)

1. Place circlip [1] onto input shaft [2].
2. If required, fit spacer [3].
3. Slip handwheel [4] onto input shaft.
4. If required, fit spacer [5].
5. Secure handwheel [4] using the circlip [6] supplied.
6. Fit ball handle [7] to handwheel.

4.3. Multi-turn actuators for motor operation

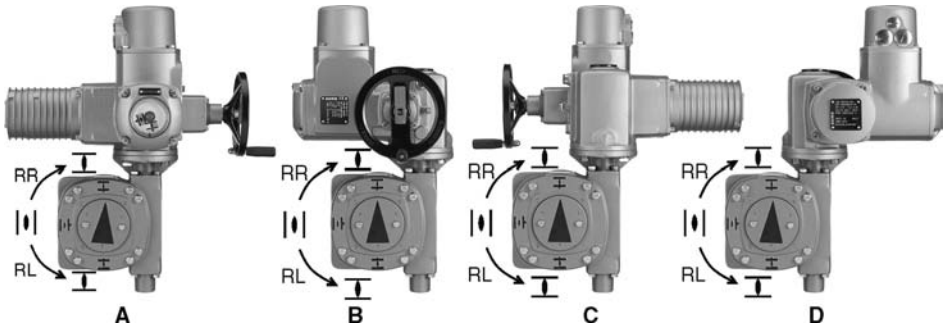
Refer to the operation instructions pertaining to the multi-turn actuator for indications on mounting multi-turn actuators to gearboxes.

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

Mounting positions

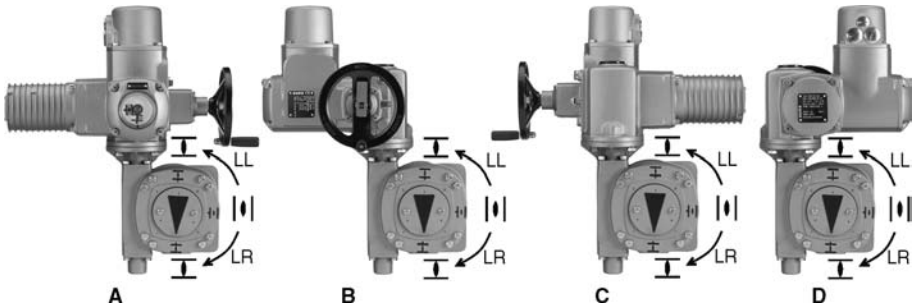
Up to size GS 125.3, the actuator-gearbox combination is delivered in the ordered mounting position. For packing reasons, actuator and gearbox will be delivered separately from size GS 160.3.

Figure6: Versions RR and RL



Limitation: For SA/SAR 14.1/14.5 with GS 125.3, mounting position “C” in versions RR/RL is only possible for a handwheel diameter up to 315 mm.

Figure7: Versions LL and LR



Limitation: For SA/SAR 14.1/14.5 with GS 125.3, mounting position “A” in versions LL/LR is only possible for a handwheel diameter up to 315 mm.

Flanges

Table 4: Suitable input mounting flanges

Gearing	Primary reduction gearing	Flange for mounting of multi-turn actuator	
		EN ISO 5210	DIN 3210
GS 50.3	—	F07, F10	G0
GS 63.3	—	F07, F10	G0
GS 80.3	—	F07, F10	G0
GS 100.3	—	F10, F14	G0, G1/2
GS 100.3	VZ 2.3/3.3/4.3	F10	G0
GS 125.3	—	F14	G1/2
GS 125.3	VZ 2.3	F10, F14	G0
GS 125.3	VZ 3.3/VZ 4.3	F10	G0
GS 160.3	—	F14, F16	G1/2, G3
GS 160.3	GZ 160.3 (4:1)	F10, F14	G0, G1/2
GS 160.3	GZ 160.3 (8:1)	F10	G0
GS 200.3	—	F16, F25	G3
GS 200.3	GZ 200.3 (4:1)	F14	G1/2
GS 200.3	GZ 200.3 (8:1)	F10, F14	G0, G1/2
GS 200.3	GZ 200.3 (16:1)	F10	G0
GS 250.3	—	F25, F30	–
GS 250.3	GZ 250.3 (4:1)	F14, F16	G1/2, G3
GS 250.3	GZ 250.3 (8:1)	F14	G1/2
GS 250.3	GZ 250.3 (16:1)	F10, F14	G0, G1/2

Screws to actuator

For mounting AUMA multi-turn actuators, screws are supplied together with the gearboxes. When mounting other actuators, the screws might be either too long or too short (insufficient reach of screws).

⚠ WARNING

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

Risk of death or serious injury.

→ Check length of screws.

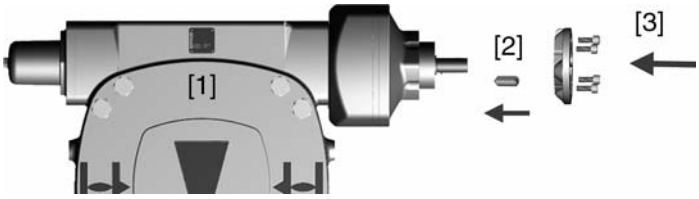
The reach of screws must be sufficient for the internal threads to ensure the supporting strength of the device and to accept the lateral forces due to the applied torque.

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

Mount input mounting flange

An input mounting flange 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.

Figure8: Mounting input mounting flange to gearbox with primary reduction gearing



[1] Gearbox with primary reduction gearing
[2] Parallel pin
[3] Input mounting flange

1. Clean mounting faces (mounting faces at gearbox bearing flange or at housing cover of primary reduction gearing and at input mounting flange), thoroughly degrease uncoated surfaces.
2. Fit parallel pin [2].
3. Place input mounting flange [3] and fasten with screws/lock washers.
4. Fasten screws crosswise to a torque according to table <Fastening torques for screws>.
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 5: Fastening torques for screws

(for mounting of multi-turn actuator and input mounting flange)

Screws Threads	**Tightening torque T_A [Nm]**
	Strength class A2-80
M8	24
M10	48
M12	82
M16	200
M20	392

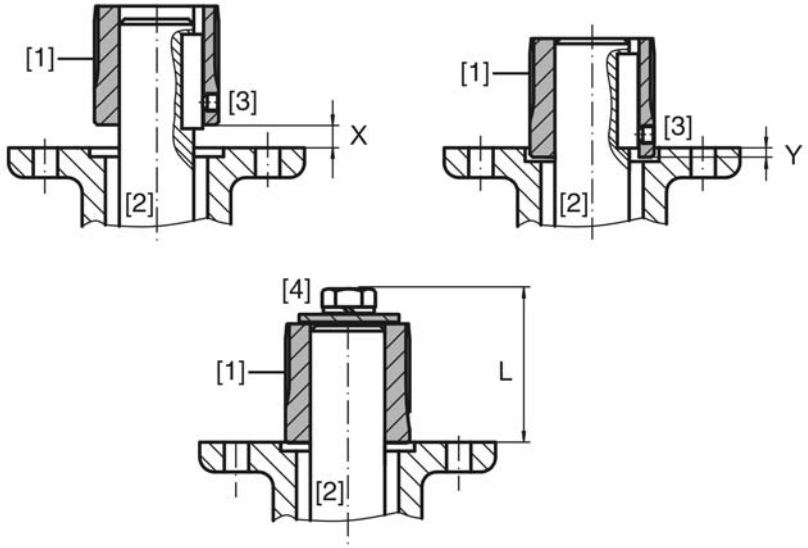
4.4. Mount gearbox to valve

Coupling

A plug-in coupling for mounting the gearbox to the valve is included in the scope of delivery.

When supplied in basic version, the coupling is provided with a pilot bore from size GS 160.3. Prior to mounting the gearbox to the valve, finish machine the coupling to match the valve shaft (e.g. with bore and keyway, two-flats or square bore).

Figure9: Coupling fitting dimensions



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

Table 6: Coupling fitting dimensions

Type, size - mounting flange	X max [mm]	Y max [mm]	L max [mm]
GS 50.3-F05	6	5	65
GS 50.3-F07	14	5	61
GS 50.3-F10	14	5	61
GS 63.3-F10	7	18	73
GS 63.3-F12	10	13	76
GS 80.3-F12	13	18	78
GS 80.3-F14	23	5	88
GS 100.3-F14	22	13	123
GS 100.3-F16	22	8	123
GS 125.3-F16	17	35	126
GS 125.3-F25	17	27	126
GS 160.3-F25	15	11	130
GS 160.3-F30	30	0	140
GS 200.3-F30	19	19	160
GS 200.3-F35	44	0	190
GS 250.3-F35	8	8	220
GS 250.3-F40	13	0	230

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 M30 or larger at defined torques. There is a risk that the worm gearbox might shift radially with regard to the valve mounting flange. To improve adhesion between valve and gearbox, we recommend to apply Loctite 243 (or similar) for screws and nuts from size M30 (or similar adhesive products) to the mounting faces.
7. Fit gearbox. If required, slightly turn gearbox until splines of coupling engage.

   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:

   8.1 Slightly rotate handwheel until bores line up.

   8.2 If required, shift gearbox position by one tooth on the coupling.
9. Fasten gearbox with 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 7: Tightening torques for screws

Screws Threads	**Tightening torque T_A [Nm]**		
	Strength class		
	8.8	**A2-70/A4-70**	**A2-80/A4-80**
M6	11	8	10
M8	25	18	24
M10	51	36	48
M12	87	61	82
M16	214	150	200
M20	431	294	392
M30	1,489	564	–
M36	2,595	–	–

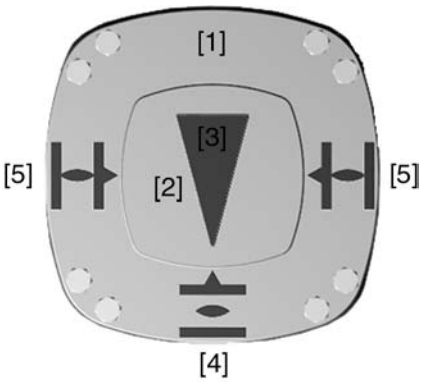
5. Indications

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])

Figure10: 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:

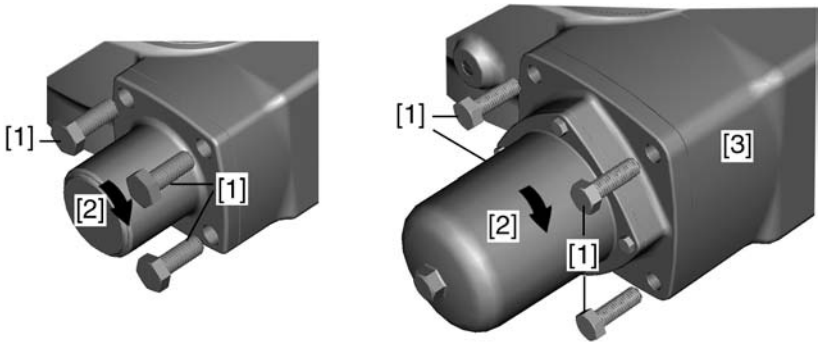
- Recommendation for **butterfly valves**: Set end stop CLOSED first.
- Recommendation for **ball valves**: Set end stop OPEN first.

Information

- In general, gearboxes with a swing angle > 190° are multi-turn (without end stops). Consequently, end position setting is not possible. Thus, no protective function is available for the valve.
- 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

Figure11: End stop (left: up to size 125.3, right: from size 160.3)



[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. With mounted multi-turn actuator (not required for manual operation): 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] crosswise with a torque according to table <Tightening torques for screws at end stop>.

Table 8: Tightening torques for screws at end stop

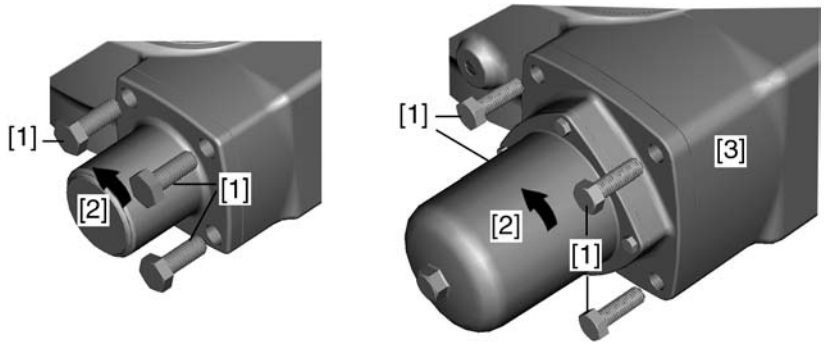
Gearing	Screws [1]	Tightening torque T_A [Nm]
GS 50.3	M6	10
GS 50.3 – GS 80.3	M8	24
GS 100.3 – GS 125.3	M12	82
GS 160.3	M10	48
GS 200.3	M12	82
GS 250.3	M16	200

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

Figure12: End stop (left: up to size 125.3, right: from size 160.3)



[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. With mounted multi-turn actuator (not required for manual operation): 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] crosswise with a torque according to table <Tightening torques for screws at end stop>.

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 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. 4 – 6 turns.
   3.2 Gearbox with primary reduction gearing VZ/GZ: Turn handwheel in the opposite direction of the valve end position by approx. 10 – 15 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.

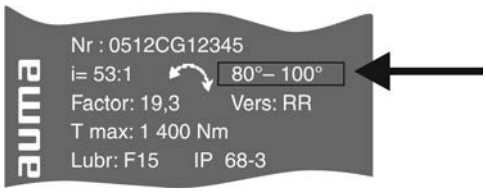
6.2.2. Seating in end position OPEN: set

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. 4 – 6 turns.
   - 3.2 Gearbox with primary reduction gearing VZ/GZ: Turn handwheel in the opposite direction of the valve end position by approx. 10 – 15 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.

Figure13: Name plate indicating the swing angle



Versions Sizes GS 50.3 – GS 125.3 = adjustable swing angle - option

Sizes GS 160.3 – GS 250.3 = adjustable swing angle - standard

Accuracy Sizes GS 50.3 – GS 125.3 = 0.6°

Sizes GS 160.3 – GS 250.3 = 0.11° up to 0.14°

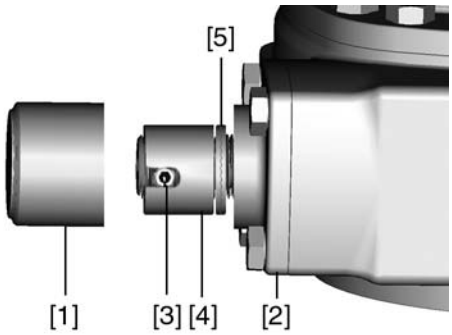
6.3.1. Swing angle: modify at gearboxes up to size 125.3

The adjustment is made in end position OPEN.

Special tools: Pin drive for roll pin

- for GS 50.3 (AUMA art. no. V001.367-Pos.003)
- for GS 63.3 – GS 80.3 (AUMA art. no. V001.367-Pos.002)
- for GS 100.3 – GS 125.3 (AUMA art. no. V001.367-Pos.001)

Figure14: End stop (figure shows size 80.3)



[1] Protective cap
[2] End stop
[3] Roll pin
[4] End stop nut
[5] Pair of safety wedge discs (for OPEN and CLOSE)

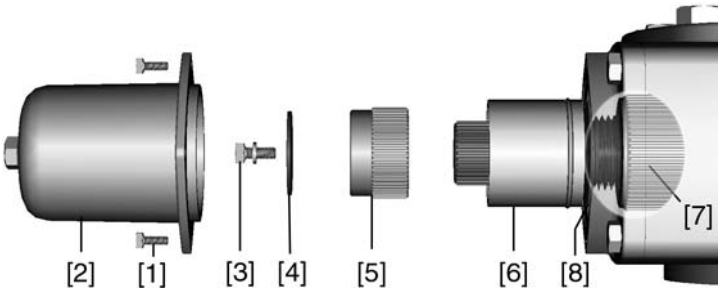
1. Unscrew protective cap [1] at end stop [2].
2. Remove roll pin [3] with suitable pin drive (special tool).
3. **Swing angle increase:**
   - 3.1 Turn end stop nut [4] **counterclockwise**.
     Information: When turning back the end stop nut [4] make sure that the roll pin [3] can still be tapped within the oblong hole.
   - 3.2 Move valve manually to the desired end position OPEN.
   - 3.3 Turn end stop nut [4] **clockwise** until it is tight to the travelling nut.
4. **Swing angle reduction:**
   - 4.1 Move valve manually to the desired end position OPEN.
   - 4.2 Turn end stop nut [4] **clockwise** until it is tight to the travelling nut.
     Information: Roll pin [3] must remain completely covered by end nut [4].
5. Drive in the roll pin [3] using the appropriate tool.
   → If the slot provided in the end stop nut [4] does not align with the bore of the worm shaft: Turn end stop nut [4] slighty counterclockwise until the hole is aligned; then drive in roll pin [3].
6. Check whether O-ring at protective cap is in good condition, replace if damaged.
7. Fasten protective cap [1].

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

6.3.2. Swing angle: modify at gearboxes from size 160.3

Adjustments are generally made in end position OPEN.

Figure15: End stop (figure shows size 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
[8] Pair of safety wedge discs (for OPEN and CLOSE)

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. Place protective cap [2] and fasten screws [1] crosswise with a torque according to table <Tightening torques for screws at end stop>.

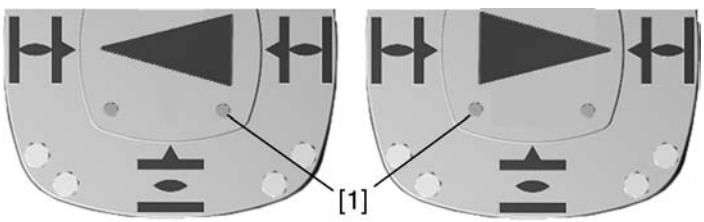
Information If the gearbox is mounted to a multi-turn actuator, the limit switching for the end position OPEN must be set first in compliance with the operation instructions of the multi-turn actuator.

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 screws [1] at pointer cover [two screws up to size 125.3, four screws as from size 160.3).
   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

- Before commissioning, perform visual inspection for grease leakage and paint damage (corrosion).
- Thoroughly touch up any possible damage to paint. Original paint in small quantities can be supplied by AUMA.

7.2. Maintenance intervals

Recommendation for plants subject to strong vibration

- For plants subject to strong vibration, 6 months after commissioning and then once a year: Check fastening screws between actuator and gearbox/valve for tightness. If required, fasten screws while applying the tightening torques as indicated in chapter <Assembly>. For screws sealed and secured with e.g. thread sealing material, this action is not required.

Recommendation for grease change and seal replacement:

- If rarely operated (typically in buried service), the gearboxes are maintenance-free. Grease change or re-lubrication is not necessary.
- If operated frequently (typically in modulating duty), we recommend changing both grease and seals after 4 – 6 years.

NOTICE

Gearing damage due to using inappropriate grease!

→ Only use original lubricants supplied by AUMA.

→ Do not mix lubricants.

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

- Imperatively heed the technical data, as well as the ambient temperatures, type of duty and running times indicated on the name plate are observed.
- In potentially explosive atmospheres, in particular where combustible dust is present, 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) Option: Spheroidal cast iron (GJS-400-15)
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
Strength of end stop	Guaranteed strength of end stop (in Nm) for input side operation according to AWWA • GS 50.3 = 250 Nm (not qualified in accordance with AWWA) • GS 63.3 = 450 Nm • GS 80.3 = 450 Nm • GS 100.3 with VZ 2.3/3.3 = 500 Nm • GS 100.3 with VZ 4.3 = 250 Nm (not qualified in accordance with AWWA) • GS 125.3 with VZ 2.3/3.3 = 500 Nm • GS 125.3 with VZ 4.3 = 250 Nm (not qualified in accordance with AWWA) • GS 160.3 with VZ 160.3 (4:1) = 500 Nm • GS 160.3 with VZ 160.3 (8:1) = 450 Nm • GS 200.3 with VZ 200.3 (4:1/8:1/16:1) = 500 Nm • GS 250.3 with VZ 250.3 (4:1/8:1/16:1) = 500 Nm
Swing angle GS 50.3 – GS 125.3	Standard: Fixed swing angle between 10° and max. 100°; set in the factory to 92° unless ordered otherwise. Options: • Adjustable in steps of: 10° – 35°, 35° – 60°, 60° – 80°, 80° – 100°, 100° – 125°, 125° – 150°, 150° – 170°, 170° – 190° • Swing angle > 190°, multi-turn version without end stops, worm wheel made of bronze required, GSD version, special sizing necessary
Swing angle GS 160.3 – GS 250.3	Standard: Adjustable 80° – 100°; set in the factory to 92° unless ordered otherwise. Options: • Adjustable in steps of: 0° – 20°, 20° – 40°, 40° – 60°, 60° – 80°, 90° – 110°, 11° – 130°, 130° – 150°, 150° – 170°, 170° – 190° • Swing angle > 190°, multi-turn version without end stops, worm wheel made of bronze required, GSD version, special sizing necessary
Mechanical position indicator	Standard: Pointer cover for continuous position indication Options: • Pointer cover sealed 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) • 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

Operation	
Type of duty	For version with worm wheel made of spheroidal cast iron: • Short-time duty S2 - 15 min (open-close duty) • Push-to-run operation permissible, max. 10 steps in one direction and max. of 30 starts per hour For version with worm wheel made of bronze: • Intermittent duty S4 - 25 % (modulating duty)
Manual operation	Via handwheel in aluminium, directly or through primary reduction gearing VZ/GZ Available handwheel diameters, selection according to the max. output torque: • GS 50.3 = 160, 200, 250 mm • GS 63.3 = 250, 315 mm • GS 80.3 = 315, 400mm • GS 100.3 = 400, 500 mm • GS 100.3 with VZ 2.3/3.3 = 315, 400 mm • GS 100.3 with VZ 4.3 = 250, 315 mm • GS 125.3 = 500, 630, 800 mm • GS 125.3 with VZ 2.3/3.3 = 400, 500 mm • GS 125.3 with VZ 4.3 = 315, 400 mm • GS 160.3 = 630, 800 mm • GS 160.3 with GZ 160.3 (4:1) 400 mm, (8:1) = 315 mm • GS 200.3 with GZ 200.3 (4.1) = 500/630 mm, (8:1) = 400 mm, (16:1) = 315 mm • GS 250.3 with GZ 250.3 (4:1) = 800 mm, (8:1) = 500/630 mm, (16:1) = 400 mm Option: Material GJL-200

Primary reduction gearing	
Primary reduction gearing	• Types VZ and GZ as planetary gears with various reduction ratios for reducing the input torques • Combination with GK bevel gearbox directly on GS or on GS with VZ/GZ possible

Valve attachment	
Valve attachment	Dimensions according to EN ISO 5211 Standard: • GS 50.3 – GS 125.3: without spigot • GS 160.3 – GS 250.3: with spigot Options: • GS 50.3 – GS 125.3: with spigot • GS 160.3 – GS 250.3: without spigot
Coupling	Splined coupling for connection to the valve shaft Standard: Without bore or pilot bore from GS 160.3 Options: • Finish machining with bore and keyway • Square bore or two-flats with grub screw to secure on valve shaft

8.2. Service conditions

Mounting position	Any position
Enclosure protection according to EN 60529	Refer to name plate Standard: • IP68-8 dust-tight, submersible in water up to 8 m head of water Options:[1)] • IP68-10 dust-tight, submersible in water up to 10 m head of water • IP68-20 dust-tight, submersible in water up to 20 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
Finish coating	Standard: • GS 50.3 – GS 125.3: Two-component iron-mica combination • GS 160.3 – GS 250.3: Primer coated Option: • GS 160.3 – GS 250.3: 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 Options: • –60 °C to +60 °C, version EL • 0 °C to + 120 °C, version H Note: When using mechanical microswitches, the temperature ranges indicated here are reduced to –30 °C up to max. +90 °C.
Lifetime	Open-close duty (number of cycles according to standard EN 15714-2 for max. torque and 90° rotary movement): GS 50.3/GS 63.3: 10 000 GS 80.3/GS100.3/VZ: 5,000 GS 125.3/VZ, GS 200.3/GZ: 2,500 GS 250.3/GZ: 1,000 Modulating duty:[2)] 2.5 million modulating steps

1) Not for size GS 50.3
2) 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.

Special features for use in potentially explosive atmospheres	
Explosion protection according to ATEX 94/9/EC	Standard: • II2G c IIC T4 • II2D c T130°C Options: • II2G c IIC T3 • II2D c T190°C • IM2 c

Special features for use in potentially explosive atmospheres	
Type of duty	For version with worm wheel made of spheroidal cast iron: Short-time duty S2 – 15 min., max. 3 cycles (OPEN-CLOSE-OPEN) 90°; on following average output torques (then cool-down to ambient temperature) • GS 50.3 = 250 Nm • GS 63.3 = 500 Nm • GS 80.3 = 1,000 Nm • GS 100.3 = 2,000 Nm • GS 125.3 = 4,000 Nm • GS 160.3 = 8,000 Nm • GS 200.3 = 16,000 Nm • GS 250.3 = 32,000 Nm For version with worm wheel made of bronze: Intermittent duty S4 – 25 % with modulating torque, exception: GS 200.3 with modulating torque up to 4,800 Nm Max. input speed: Standard: 45 rpm, exception: GS 200.3 and GS 250.3 up to 11 rpm The type of duty must not be exceeded. • For special reduction ratios, refer to separate technical data sheets.
Ambient temperature	(Temperature range depending on application and worm wheel material) Standard: • –40 °C to +40 °C (II2G c IIC T4; II2D c T130°C) bronze • –40 °C to +60 °C (II2G c IIC T4; II2D c T130°C) bronze/spheroidal cast iron • –50 °C to +60 °C (II2G c IIC T4; II2D c T130°C) bronze • –60 °C to +60 °C (II2G c IIC T4; II2D c T130°C) bronze Options: • –50 °C to +60 °C (II2G c IIC T4; II2D c T130°C) spheroidal cast iron • –60 °C to +60 °C (II2G c IIC T4; II2D c T130°C) spheroidal cast iron • –40 °C to +40 °C (II2G c IIC T4; II2D c T130°C) spheroidal cast iron • –40 °C to +80 °C (II2G c IIC T3; II2D c T190°C) bronze/spheroidal cast iron • 0 °C to +120 °C (II2G c IIC T3; II2D c T190°C) bronze/spheroidal cast iron • –20 °C to +40 °C (IM2 c) bronze/spheroidal cast iron
Mechanical position indicator	Pointer cover with indicator glass (option) only approved for IIG c IIB T4 or T3
Mechanical microswitches (option)	Explosion-proof switches with external test certificate PTB 03 ATEX 1068 X Temperature ranges for ambient temperatures: • –20 °C to +60 °C (II2G c IIC T4; II2D c T130°C) • –20 °C to +80 °C (II2G c IIC T3; II2D c T190°C)

8.3. Accessories

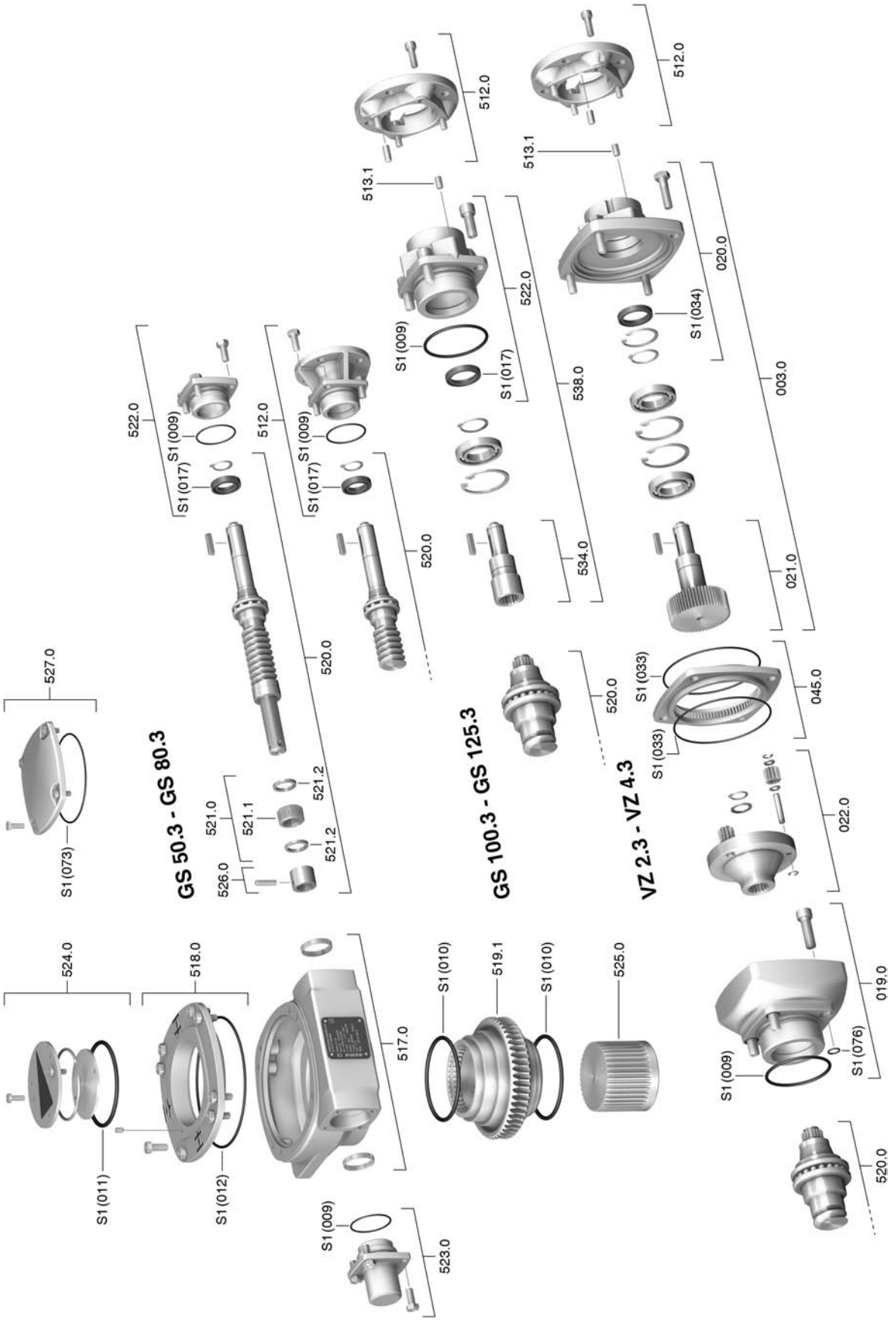
Valve position indicators	WSG valve position indicator for signalling intermediate and end positions to ensure precise and low-backlash feedback for swing angles ranging from 82° – 98°
Limit switching device	WSH limit switching device for manually operated valves. For signalling intermediate and end positions

8.4. Further information

EU Directives	• ATEX Directive: (94/9/EC) • Machinery Directive: (2006/42/EC)

9. Spare parts

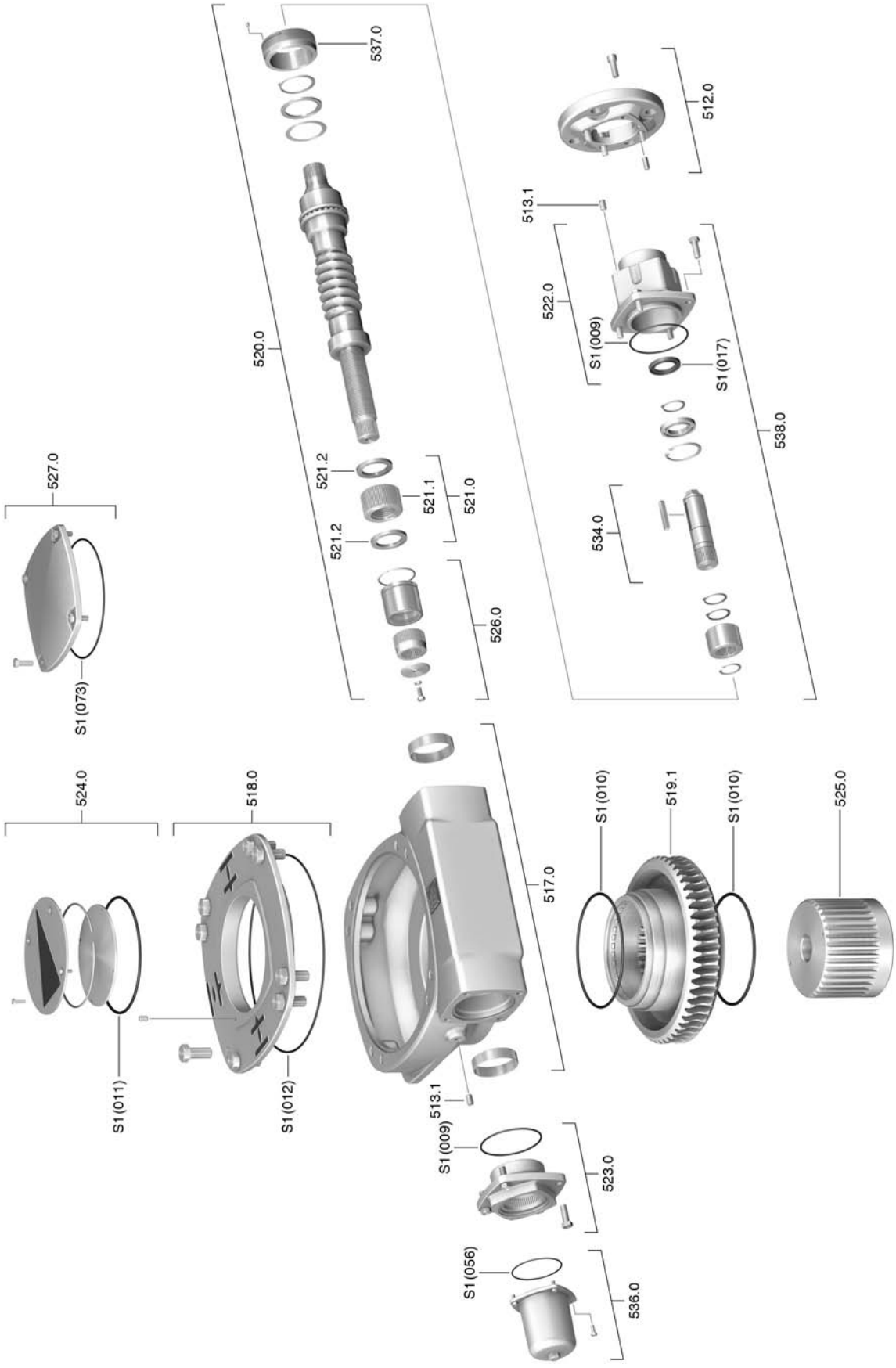
9.1. Part-turn gearboxes GS 50.3 – GS 125.3 and primary reduction gearings VZ 2.3 – VZ 4.3



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 in these instructions.

No.	Designation	Type
003.0	Housing cover with drive shaft VZ	Sub-assembly
019.0	Housing VZ	Sub-assembly
020.0	Housing cover VZ	Sub-assembly
021.0	Drive shaft VZ	Sub-assembly
022.0	Planet carrier VZ	Sub-assembly
045.0	Internal geared wheel VZ	Sub-assembly
512.0	Input mounting flange	Sub-assembly
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
521.0	Travelling nut with two pairs of safety wedge discs	Sub-assembly
521.1	Travelling nut	
521.12	Pair of safety wedge discs	
522.0	Bearing cover	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
538.0	Bearing cover with drive shaft	Sub-assembly
S1	Seal kit	Set

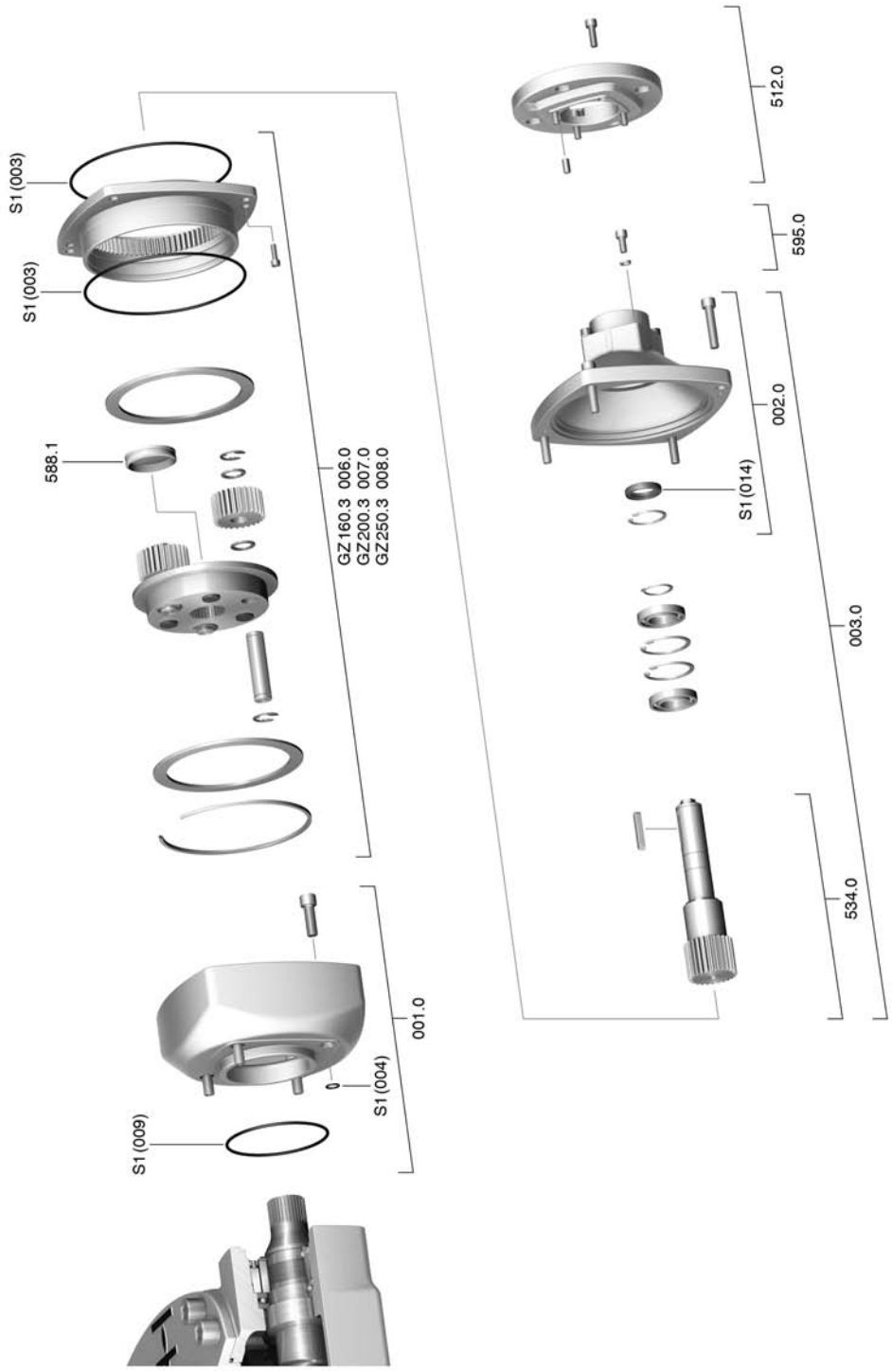
9.2. Part-turn gearboxes GS 160.3 – GS 250.3



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 in these instructions.

No.	Designation	Type
512.0	Input mounting flange	Sub-assembly
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
521.0	Travelling nut with two pairs of safety wedge discs	Sub-assembly
521.1	Travelling nut	
521.2	Pair of safety wedge discs	
522.0	Bearing cover	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 drive shaft	Sub-assembly
S1	Seal kit	Set

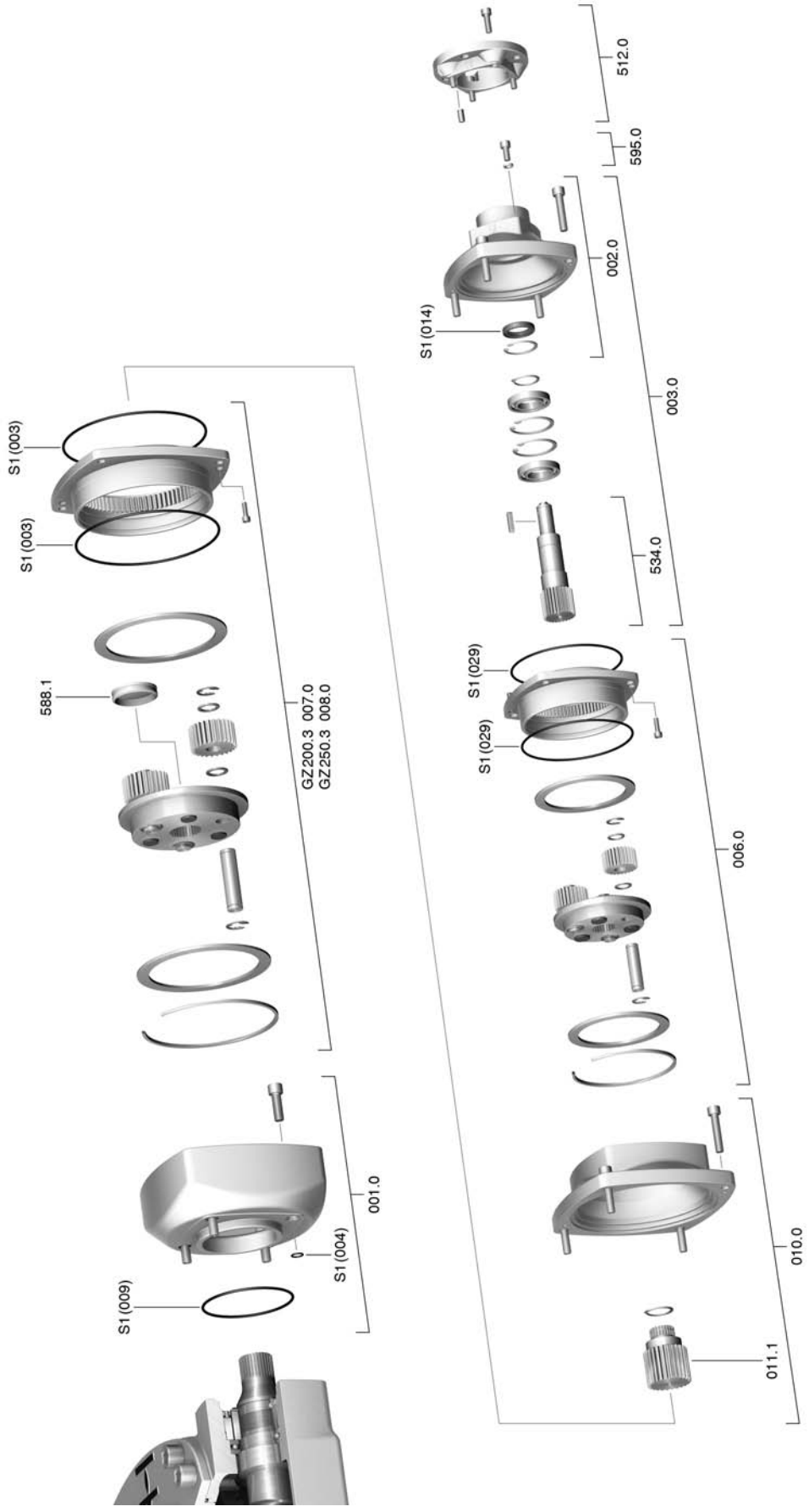
9.3. Primary reduction gearings GZ 160.3 – GZ 250.3 (4:1/8:1)



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 in these instructions.

No.	Designation	Type
001.0	Housing	Sub-assembly
002.0	Housing cover	Sub-assembly
003.0	Housing cover with drive shaft	Sub-assembly
006.0	Planetary gearing, first stage (GZ 160.3)	Sub-assembly
007.0	Planetary gearing, first stage (GZ 200.3)	Sub-assembly
008.0	Planetary gearing, first stage (GZ 250.3)	Sub-assembly
512.0	Input mounting flange	Sub-assembly
513.1	Grub screw	
534.0	Drive shaft	Sub-assembly
588.1	Blanking plug	
595.0	Screw with polyamide washer (PA)	Sub-assembly
S1	Seal kit	Set

9.4. Primary reduction gearings GZ 200.3 – GZ 250.3 (16:1)



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 in these instructions.

No.	Designation	Type
001.0	Housing	Sub-assembly
002.0	Housing cover	Sub-assembly
003.0	Housing cover with drive shaft	Sub-assembly
006.0	Planetary gearing, first stage	Sub-assembly
007.0	Planetary gearing, second stage (GZ 200.3)	Sub-assembly
008.0	Planetary gearing, second stage (GZ 250.3)	Sub-assembly
010.0	Housing frame	Sub-assembly
011.1	Pinion	
512.0	Input mounting flange	Sub-assembly
513.1	Grub screw	
534.0	Drive shaft	Sub-assembly
588.1	Blanking plug	
595.0	Screw with polyamide washer (PA)	Sub-assembly
S1	Seal kit	Set

10. Certificates

10.1. 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 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: 2011
EN 1127-2: 2002 + A1: 2008
EN 13463-1: 2009
EN 13463-5: 2011

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

II2G c IIC T4 or T3
II2D IP6X T130°C or 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, 2013-05-01

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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