auma®
Solutions for a world in motion

# Multi-turn gearboxes

## GK 10.2 – GK 40.2

Operation instructions

Assembly and commissioning

**Read operation instructions first.**

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

**Target group:**

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

## 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 EU 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.

**Electrostatic charging**

Highly efficient charge generating processes (processes more efficient than manual friction) on the device surface must be excluded at any time, since they will lead to propagating brush discharges and therefore to ignition of a potentially explosive atmosphere.

This also applies to fireproof coatings or covers available as an option.

**Ignition hazards**

Gearboxes were subjected to an ignition hazard assessment in compliance with the currently applicable standard according to ISO 80079-36/ -37 / -38. Hot surfaces, mechanically generated sparks as well as static electricity and stray electric currents were identified and assessed as major potential ignition sources. Protective measures to prevent the likelihood that ignition sources arise were applied to the gearboxes. This includes in particular lubrication of the gearbox, the IP protection codes and the warnings and notes contained in these operation instructions.

**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 written consent of the manufacturer.

## 1.2. Range of application

AUMA multi-turn gearboxes are designed for the operation of industrial valves, e.g. gate valves and globe 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 results 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 could result in minor or moderate injury. May also be used with property damage.**

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

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

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

## 1.4. References and symbols

The following references and symbols are used in these instructions:

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

Symbol for CLOSED (valve closed)

Symbol for OPEN (valve open)

➥ **Result of a process step**

Describes the result of a preceding process step.

## 2. Short description

AUMA bevel gearboxes are multi-turn gearboxes transmitting a rotary movement to the valve. They are driven either via electric motor (by means of a multi-turn actuator) or manually (via a handwheel).

The drive axle is perpendicular to the output axle, thus adjusting in a single stage the effective direction of the input torque by 90° onto the output drive.

## 3. Name plate

Figure 1: Arrangement of name plates


[1] Gearbox name plate
[2] Approval plate in explosion-proof version
[3] Additional plate, e.g. KKS plate (Power Plant Classification System)

### Description of gearbox name plate

Figure 2: Gearbox name plate (example of GK 10.2)


[1] Name of manufacturer
[2] Address of manufacturer
[3] **Type designation** - valve attachment (flange)
[4] **Order number**
[5] **Serial number**
[6] **Reduction ratio**
[7] **Factor**
[8] Max. output torque
[9] Type of lubricant
[10] Permissible ambient temperature
[11] **Explosion protection version** (option)
[12] Can be assigned as an option upon customer request
[13] **Data Matrix code**
[14] Enclosure protection

**Type designation**

Figure 3: Type designation (example)


1. Type and size of gearbox

2. Flange size (valve attachment)

**Type and size**

These instructions apply to the following device types and sizes:

Bevel gearboxes of **GK** type, sizes **10.1 – 40.1**

**Order number**

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

Please always state this number for any product inquiries.

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

**Serial number**

Table 1:

| **Description of serial number (example of 2621MK12345)** | | | |
|---|---|---|---|
| 26 | 21 | MK12345 | |
| 26 | Positions 1+2: Assembly in week = week 26 | | |
| | 21 | Positions 3+4: Year of manufacture = 2021 | |
| | | MK12345 | Internal number for unambiguous product identification |

**Reduction ratio**

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

**Factor**

Mechanical conversion factor for actuator size determination:

Input torque = required valve torque (output torque)/factor

## Explosion protection version (option)

The explosion protection version is either indicated on the name plate of the gearbox or on a separate approval plate.

Figure 4: Separate name plate for explosion-proof version (example)


[1] Ex symbol, CE mark

**Classification:**

[2] Gas explosion protection

[3] Dust explosion protection

**Data Matrix code**

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

Figure 5: Link to AUMA Assistant App:

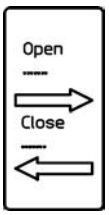
For further Service & Support, Software/Apps/... refer to www.auma.com

## Marking of special version for counterclockwise closing

In the standard version, the direction of rotation at input shaft corresponds to the direction of rotation at valve shaft (clockwise version). In order to reverse the direction

of rotation e.g. for a counterclockwise closing valve, a AUMA reversing gearbox of the GW 14.1 type can be mounted between multi-turn actuator and bevel gearbox. From size GK 30.2, the direction of rotation can be selected when ordering. For these sizes, the direction of rotation is marked on the order-related technical data sheet as "CCW" or "CW". For the "CCW" special version, a label for the direction of rotation is additionally attached to the handwheel.

Figure 6: Marking on handwheel.



# 4. Transport and storage

## 4.1. Transport

For transport to place of installation, use sturdy packaging.

Transport gearbox and actuator separately.

**DANGER**

**Suspended load!**

*Death or serious injury!*

→ Do NOT stand below suspended load.

→ Fix ropes or slings on gearbox housing, NOT to handwheel, actuator, or actuator controls.

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

→ Observe manufacturer specifications for fixing lifting straps and round slings.

→ Respect total weight of combination (gearbox, actuator, actuator controls, output drive).

→ Eyebolts are exclusively permitted for the weight of the represented arrangements of the respective sizes.

→ Secure load against falling down, sliding or tilting.

→ Perform lift trial at low height to eliminate any potential danger e.g. by tilting.

### GK 10.2 – GK 16.2

Up to size 16.2, the gearboxes are supplied mounted to the actuator and the output drive types A and AF when leaving the factory. Suspension is always performed using lifting straps /round slings wound around the gearbox mounting flange and the actuator housing.

Figure 7: Example of GK 10.2, horizontal suspension

### GK 25.2

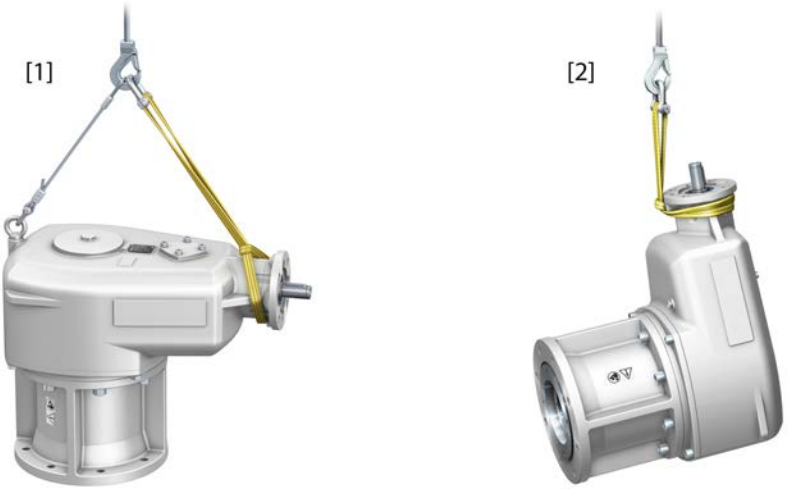
Actuators for GK 25.2 gearbox are always supplied separately when leaving the factory. Unless specified otherwise by the customer, output drive types A and AF are mounted to the gearbox. Suspension is always made via eyebolt.

Figure 8: Example of GK 25.2, horizontal suspension and mounted actuator

## GK 30.2

Actuators for the GK 30.2 gearbox are always supplied separately when leaving the factory and must be transported and lifted separately. Unless specified otherwise by the customer, output drive types A and AF are mounted to the gearbox. Size 30.2 leaves the factory with eyebolt fastened in the housing. The gearbox is either suspended horizontally via the eyebolt in combination with round slings/lifting straps or vertically via round slings/lifting straps.

Figure 9: Example of GK 30.2, horizontal and vertical suspension



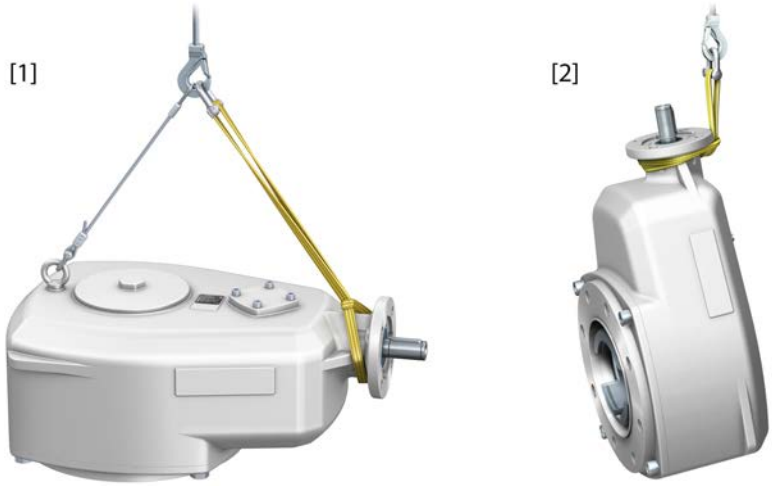

[1] Horizontal suspension

[2] Vertical suspension

## GK 35.2 – GK 40.2

Actuators for gearbox sizes GK 35.2 – GK 40.2 as well as output drive types A and AF are always supplied separately when leaving the factory and must be transported and lifted separately. Sizes 35.2– 40.2 leave the factory with eyebolt fastened in the housing. The gearbox is either suspended horizontally via the eyebolt in combination with round slings/lifting straps or vertically via round slings/lifting straps.

Figure 10: Example of GK 40.2, horizontal and vertical suspension




[1] Horizontal suspension

[2] Vertical suspension

Table 2: Gearbox weight with output drive sleeve (without bore) and grease filling in the gear housing

| Typ | Gewicht [kg] |
|---|---|
| GK 10.2 | 8,5 |
| GK 14.2 | 15 |
| GK 14.6 | 15 |
| GK 16.2 | 31 |
| GK 25.2 | 60 |
| GK 30.2 | 110 |
| GK 35.2 | 190 |
| GK 40.2 | 250 |

Table 3:

| **Weights for output drive type** | | |
|---|---|---|
| Type designation | Flange size | [kg] |
| A 10.2 | F10 | 2.8 |
| A 14.2 | F14 | 6.8 |
| A 16.2 | F16 | 11.7 |
| A 25.2 | F25 | 42 |
| A 30.2 | F30 | 69 |
| A 35.2 | F35 | 126 |
| A 40.2 | F40 | 202 |

Table 4:

| **Weights for output drive type** | | |
|---|---|---|
| Type designation | Flange size | [kg] |
| AF 07.2 | F10 | 5.2 |
| AF 07.6 | F10 | 5.2 |
| AF 10.2 | F10 | 5.5 |
| AF 14.2 | F14 | 13.7 |
| AF 16.2 | F16 | 23 |
| AF 25.2 | F25 | 61 |

| Weights for output drive type | | |
|---|---|---|
| AF 30.2 | F30 | 103 |
| AF 35.2 | F35 | 180 |
| AF 40.2 | F40 | 320 |

For the actuator and actuator controls weights, refer to the respective operation instructions.

## 4.2. 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**

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

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

# 5. Assembly

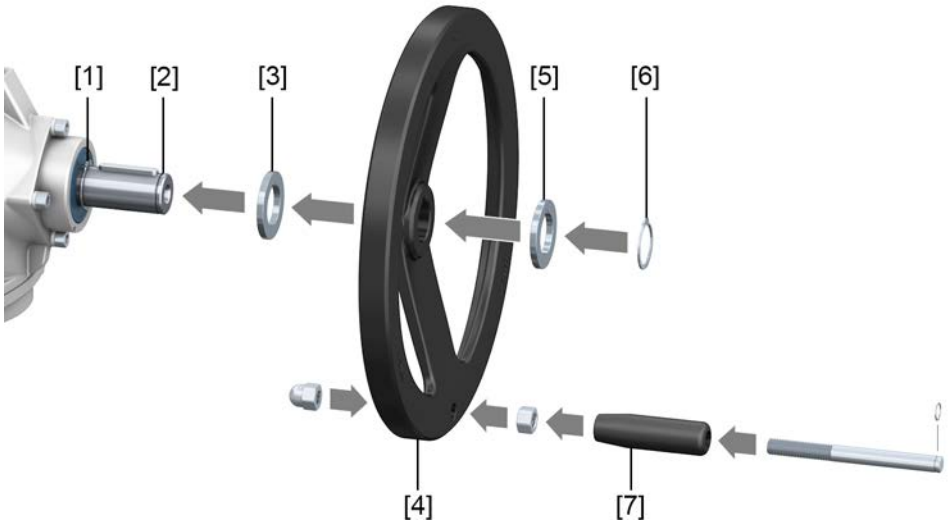
## 5.1. Mounting position

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

## 5.2. Handwheel fitting

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

Figure 11: Handwheel (example)




[1] Retaining ring for input shaft (partly required)
[2] Gear input shaft
[3] Spacer (partly required)
[4] Handwheel
[5] Spacer (partly required)
[6] Retaining ring
[7] Ball handle

**How to proceed**

1. For input shafts with keyway: Fit [2] retaining ring [1] on input shaft.
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 retaining ring [6] supplied.
6. Fit ball handle [7] to handwheel.

## 5.3. Multi-turn actuators for motor operation

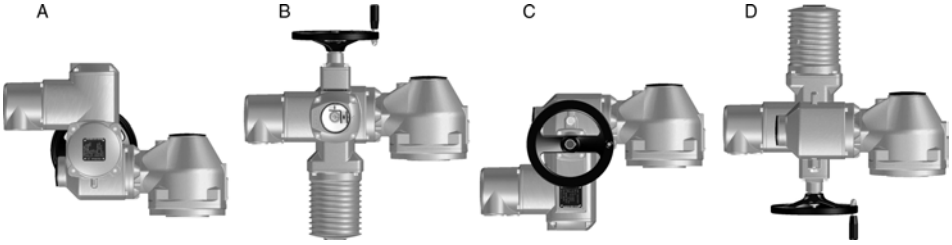
Refer to the operation instructions pertaining to the multi-turn actuator for indications on how to mount multi-turn actuators to gearboxes.

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

**Mounting positions**

When delivered with AUMA multi-turn actuators, the multi-turn actuator-gearbox combination is delivered in the ordered mounting position up to size GK 16.2. For packing reasons, multi-turn actuator and gearbox will be delivered separately from size GK 25.2.

Figure 12: Mounting positions A – D




Restriction: For rising valve stem and specific handwheel sizes, mounting position B is not possible.

## Flanges

Table 5: Suitable input mounting flanges

| Gear-boxes | Flange for mounting multi-turn actuator | | Permissible weight Multi-turn actuator | Suitable AUMA multi-turn actuator[1)] |
|---|---|---|---|---|
| | Standard EN ISO 5210 | Option DIN 3210 | max. kg | |
| GK 10.2 | F10<br>F14 | G0<br>G½ | 40/80 | SA/SAR 10.2<br>SA/SAR14.2 |
| | F10 | G0 | 40 | SA/SAR 07.6<br>SA/SAR 10.2 |
| GK 14.2 | F10<br>F14 | G0<br>G½ | 40/80 | SA/SAR 10.2<br>SA/SAR 14.2 |
| | F10 | G0 | 40 | SA/SAR 10.2 |
| GK 14.6 | F14 | G½ | 80 | SA/SAR 14.2 |
| | F10<br>F14 | G0<br>G½ | 40/80 | SA/SAR 10.2<br>SA/SAR 14.2 |
| GK 16.2 | F14 | G½ | 80 | SA/SAR 14.2<br>SA/SAR 14.6 |
| | F14 | G½ | | SA/SAR 14.2 |
| GK 25.2 | F14 | G½ | 80 | SA/SAR 14.6 |
| | F14 | G½ | | SA/SAR 14.2<br>SA/SAR 14.6 |
| GK 30.2 | F14<br>F16 | G½<br>G3 | 80/160 | SA/SAR 14.6<br>SA/SAR 16.2 |
| | F14 | G½ | 80 | SA/SAR 14.6 |
| GK 35.2 | F16 | G3 | 160 | SA 16.2 |
| | F14<br>F16 | G½<br>G3 | 80/160 | SA 14.6<br>SA 16.2 |
| GK 40.2 | F16<br>F25 | G3<br>G4 | 160/300 | SA 16.2<br>SA 25.1 |
| | F16 | G3 | 160 | SA 16.2 |

1) Standard flange according to EN ISO 5210

## Screws to multi-turn actuator

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

**WARNING**

**Risk of actuator falling off in case inappropriate screws used should shear.**

*Risk of death or serious injury!*

→ Check length of screws.

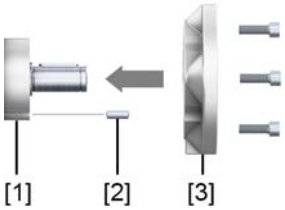
The reach of screws must be sufficient for the internal threads to ensure the supporting strength of the multi-turn actuator and to accept the lateral forces due to the applied torque.

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

**Input mounting flange: mount**

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

Figure 13: Mount flange to multi-turn gearbox




[1] Gearboxes
[2] Parallel pin
[3] Input mounting flange

**Assembly steps**

1. Clean mounting faces, thoroughly degrease uncoated mounting surfaces.
2. Mount parallel pin [2].
3. Place input mounting flange [3] and fasten with screws.
4. Tighten screws crosswise with a torque according to table <Tightening torques for screws> .
5. Place the multi-turn actuator on the bevel gearbox and mount according to the multi-turn actuator's operation instructions. Ensure that the spigot fits uniformly in the recess and that the mounting faces are in complete contact.

   **Information:** The multi-turn actuator can be positioned on the valve at every 90°.
6. Fasten screws crosswise to a torque according to table.

Table 6: Tightening torques for screws
(for mounting multi-turn actuator and input mounting flange)

| Screws<br>Threads | Tightening torque $T_A$ [Nm] |
|---|---|
| | Strength class A2-80 |
| M8 | 24 |
| M10 | 48 |
| M12 | 82 |
| M16 | 200 |
| M20 | 392 |

## 5.4. Mount gearbox to valve

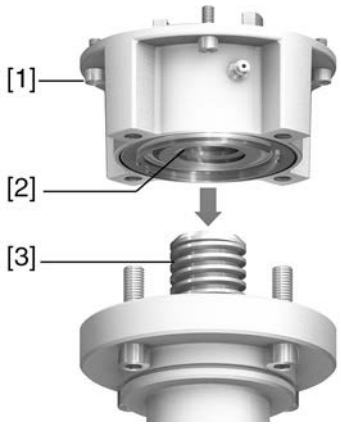
### 5.4.1. Overview of output drive types

Table 7: Overview on output drive types

| Valve attachment | Application | Description |
|---|---|---|
| A | • for rising, non-rotating valve stem<br>• capable of withstanding thrust<br>• not appropriate for radial forces | page 16, Output drive type A |
| B, B1 – B4<br>C<br>D<br>E | • for rotating, non-rising valve stem<br>• not capable of withstanding thrust | page 19, Output drive types B/C/D and E |

### 5.4.2. Output drive type A

Figure 14: Output drive type A (example of A 10.2)




[1] Output mounting flange
[2] Stem nut
[3] Valve stem

**Short description**

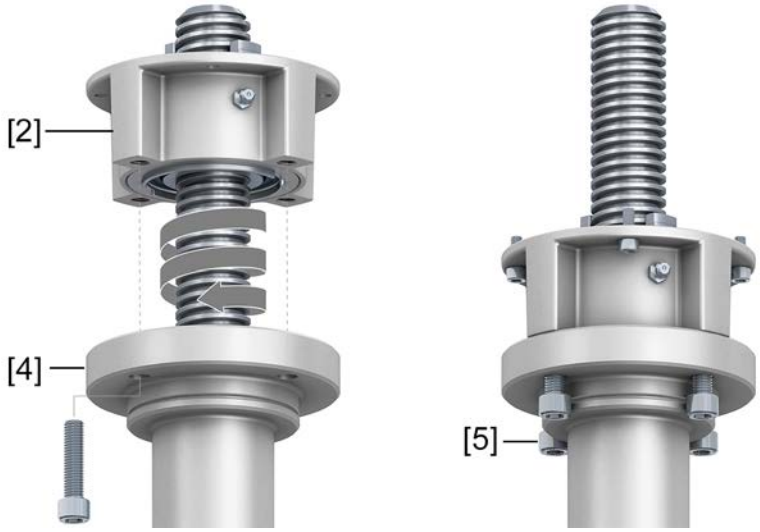
Output drive type A consisting of output mounting flange [1] with axial bearing stem nut [2]. The stem nut transmits the torque from the actuator hollow shaft to the valve stem [3]. Output drive type A can withstand thrusts.

To adapt the actuators to available output drive types A with flanges F10 and F14 (year of manufacture 2009 and earlier), an adapter is required. The adapter can be ordered from AUMA.

#### 5.4.2.1. Gearbox with output drive type A: mount to valve

1. If output drive type A is already mounted to the gearbox: Loosen screws and remove output drive type A.
2. Check if the flange of output drive type A matches the valve flange [4].
3. Apply a small quantity of grease to the valve stem.
4. Place output drive type A on valve stem and turn until it is flush on the valve flange.
5. Turn output drive type A until alignment of the fixing holes.
6. Fasten screws [5] between valve and output drive type A [2] without completely tightening them.

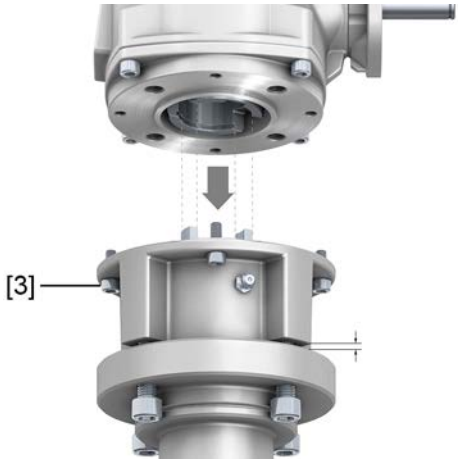
Figure 15: Example of output drive A 10.2



7. Fit gearbox on the valve stem so that the stem nut dogs engage into the output drive sleeve.

➥ The flanges are flush with each other if properly engaged.

Figure 16: Example of output drive A 10.2




8. Adjust gearbox until alignment of the fixing holes.
9. Fasten gearbox with screws [3].
10. Fasten screws [3] crosswise with a torque according to table.

Table 8: Tightening torques for screws

| Screws | Tightening torque $T_A$ [Nm] | | |
|---|---|---|---|
| Threads | Strength class | | |
| | 8.8 | A2-70/A4-70 | A2-80/A4-80 |
| M8 | 25 | 18 | 24 |
| M10 | 51 | 36 | 48 |
| M12 | 87 | 61 | 82 |
| M16 | 214 | 150 | 200 |
| M20 | 431 | 294 | 392 |
| M30 | 1,489 | 506 | 1,354 |
| M36 | 2,594 | 1,769 | 2,358 |

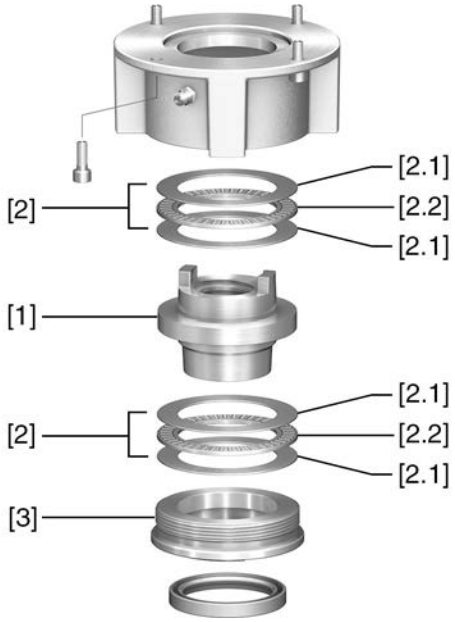
11. Turn gearbox with handwheel in direction OPEN until valve flange and output drive type A are firmly placed together.
12. Tighten fastening screws [5] between valve and output drive type A crosswise applying a torque according to table.

### 5.4.2.2. Stem nut for output drive type A: finish machining

This working step is only required if stem nut is supplied unbored or with pilot bore.

**Information** For exact product version, please refer to the order-related technical data sheet or the AUMA Assistant App.

Figure 17: Example of output drive A 10.2



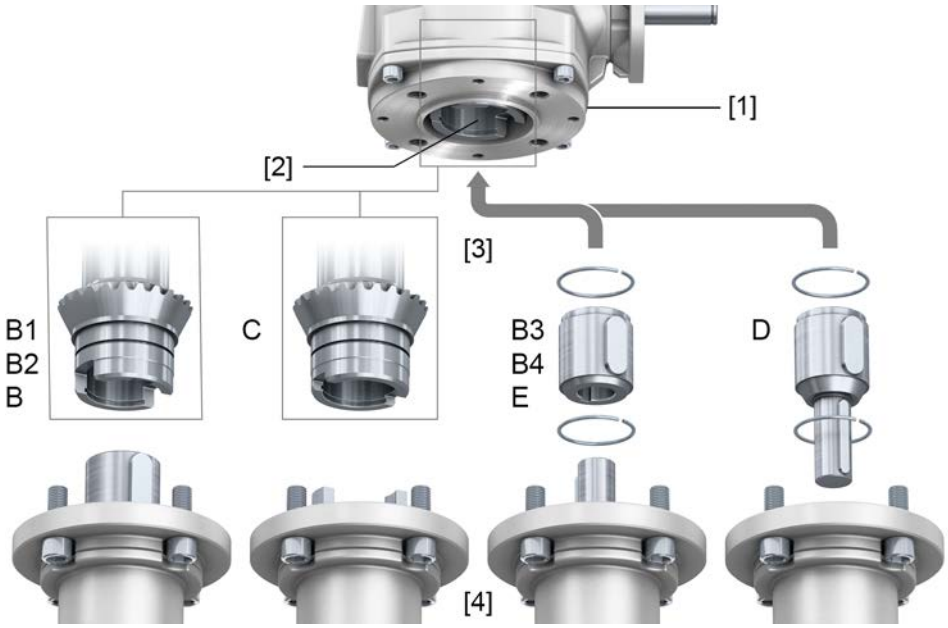

[1] Stem nut
[2] Axial needle roller bearing
[2.1] Axial bearing washer
[2.2] Axial needle roller and cage assembly
[3] Spigot ring

**How to proceed**

1. Remove spigot ring [3] from output drive.
2. Remove stem nut [1] together with axial needle roller bearing [2].
3. Remove axial bearing washers [2.1] and axial needle roller and cage assemblies [2.2] from stem nut [1].
   **Information:** For output drive types A from size 35.2 and larger: Record the order of axial bearing washers [2.1].
4. Drill and bore stem nut [1] and cut thread.
5. Clean the machined stem nut [1].
6. Apply sufficient Lithium soap EP multi-purpose grease to axial needle roller and cage assemblies [2.2] and axial bearing washers [2.1], ensuring that all hollow spaces are filled with grease.
7. Place greased axial needle roller and cage assemblies [2.2] and axial bearing washers [2.1] onto stem nut [1].
   **Information:** For output drive types A from size 35.2: Observe correct order of axial bearing washers [2.1].
8. Re-insert stem nut [1] with axial needle roller bearings [2] into output drive.
9. Screw in spigot ring [3] until firm seat against the shoulder.

### 5.4.3. Output drive types B/C/D and E

Figure 18: Mounting principle




[1] Flange/gearbox
[2] Hollow shaft
[3] Output drive sleeve (illustration examples)
[4] Valve shaft (example with key)

**Short description**

Connection between hollow shaft and valve via output drive sleeve fixed to the hollow shaft of the gearbox via retaining ring.

When exchanging the output drive sleeve, later retrofitting to a different output drive type is possible

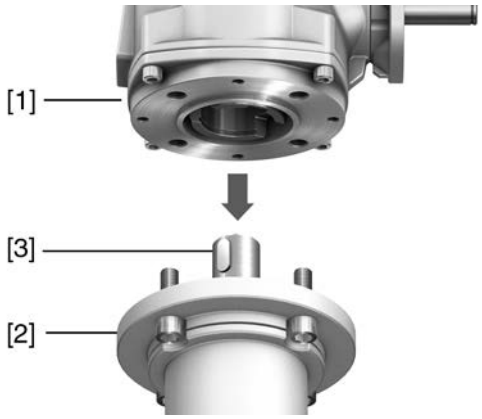
- Output drive type B/E:
  Output drive sleeve with bore according to DIN 3210
- Output drive types B1/B3:
  Output drive sleeve with bore according to EN ISO 5210
- Output drive types B2/B4:
  Output drive sleeve with bore according to customer order
  B4 including special bores like bores without keyway, square bore, hexagon bore, internal splines
- Output drive type C:
  Output drive sleeve with dog coupling according to EN ISO 5210 or DIN 3338
- Output drive type D:
  Shaft end with key according to EN ISO 5210 or DIN 3210

**Information**

Spigot at valve flanges should be loose fit.

### 5.4.3.1. Gearbox with output drive types B: mount to valve

Figure 19: Mounting output drive types B




[1] GK gearbox
[2] Valve
[3] Valve shaft

1. Check if mounting flanges fit together.
2. Check, if output drive of gearbox [2] matches the output drive of valve/valve shaft [2/3].
3. Apply a small quantity of grease to the valve shaft [3].
4. Fit gearbox [1].
   **Information:** Ensure that the spigot fits uniformly in the recess and that the mounting faces are in complete contact.
5. Fasten gearbox with screws.
   **Information:** We recommend applying liquid thread sealing material to the screws to avoid contact corrosion.
6. Fasten screws crosswise to a torque according to table.

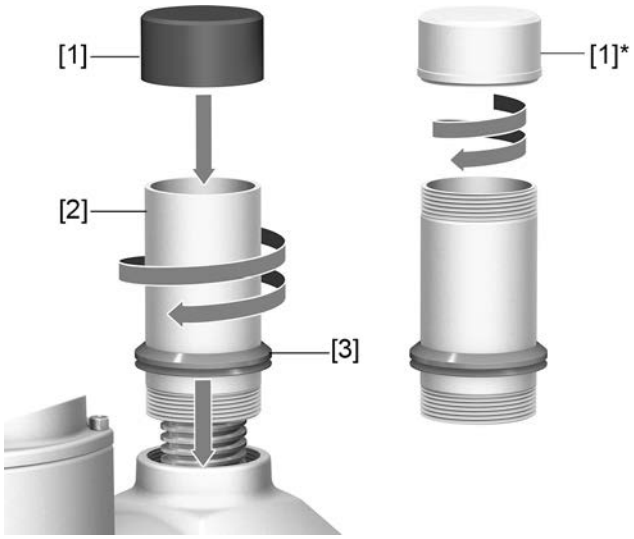
Table 9: Tightening torques for screws

| Screws | Tightening torque $T_A$ [Nm] | | |
|---|---|---|---|
| Threads | Strength class | | |
| | 8.8 | A2-70/A4-70 | A2-80/A4-80 |
| M8 | 25 | 18 | 24 |
| M10 | 51 | 36 | 48 |
| M12 | 87 | 61 | 82 |
| M16 | 214 | 150 | 200 |
| M20 | 431 | 294 | 392 |
| M30 | 1,489 | 506 | 1,354 |
| M36 | 2 594 | 1,769 | 2,358 |

## 5.5. Accessories for assembly

### 5.5.1. Stem protection tube for rising valve stem

Figure 20: Assembly of the stem protection tube

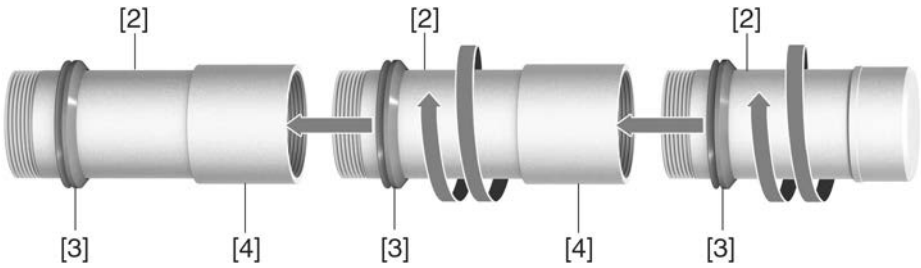



[1] Protective cap for stem protection tube (fitted)
[1]* Option: Protective cap made of steel (screwed)
[2] Stem protection tube
[3] V-seal

**How to proceed**

1. Seal all threads with hemp, Teflon tape, sealing agent or thread sealing material.
2. Screw stem protection tube [2] into thread and tighten it firmly.
   **Information:** For stem protection tubes made of two or more segments, all parts have to be thoroughly screwed together.

   Figure 21: Protection tube made of segments with threaded sleeves




   [2] Segment of stem protection tube
   [3] V-seal
   [4] Threaded sleeve
3. Push down the sealing ring [3] onto the housing.
   **Information:** For mounting segments, push down seals of segments down to the sleeve (connecting piece).
4. Check whether protective cap [1] for stem protection tube is available, in perfect condition and tightly placed on or screwed to the tube.

**NOTICE**

**Risk of bending or oscillation of protection tubes exceeding a length of 2 m!**

*Risk of damage at stem and/or protection tube.*

→ Secure protection tubes exceeding 2 m by an appropriate support.

# 6. Commissioning

## 6.1. Seating via multi-turn actuator

This chapter supplies basic information and instructions which should be heeded 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.
- End position seating must be set in compliance with the operating instructions pertaining to the multi-turn actuator.
- For limit seating, determine overrun, i.e. how much does the valve move after the motor has been switched off?
- When setting the torque switching within the multi-turn actuator, make sure that the tripping torque for both directions does not exceed the max. gearbox input torque (refer to technical data or name plate).
- Set the torque switching within the multi-turn actuator to the following value to prevent damage to the valve:
  Tripping torque = valve torque/factor (refer to name plate)

# 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 offers extensive service such as servicing and maintenance as well as customer product training. For the contact addresses, refer to our website (www.auma.com).

## 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.

After six months and then once a year: Check gearbox for damage as well as for grease and oil leakage.

## 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.

When deployed in areas where dust formation represents a potential explosion hazard, perform visual inspection for deposit of dirt or dust on a regular basis. Clean devices if required.

Check gearbox for unusual running or grinding noise or vibration which might be an indication of bearing or gear damage.

## 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.:

- Various metals
- Plastic materials
- Greases and oils

The following generally applies:

- Greases and oils are hazardous to water and must not be released into the environment.

- Arrange for controlled waste disposal of the disassembled material or for separate recycling according to materials.
- Observe the national regulations for waste disposal.

# 8. Technical data

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

## 8.1. Technical data Multi-turn gearboxes

| **Features and functions** | | |
|---|---|---|
| Type of duty | • Short-time duty S2 - 15 min (open-close duty)<br>• Intermittent duty S4 - 25 % (modulating duty) | |
| Direction of rotation | Standard: | Clockwise rotation at input shaft results in clockwise rotation at output drive |
| | Options: | • GK 10.2 – GK 25.2<br>Reversal of direction of rotation by GW 14.1 reversing gearbox<br>• GK 30.2 – GK 40.2<br>Counterclockwise rotation possible as an alternative |
| Stages | Single stage: | GK 10.2 – GK 25.2 |
| | Double stage: | GK 30.2 – GK 40.2 |
| Input shaft | Input shaft made of stainless steel | |
| | Standard: | Cylindrical with parallel key according to DIN 6885.1 |
| | Option: | Square: tapered (according to DIN 3233) or cylindrical shape |
| | | With respect to size, please contact AUMA |

| **Operation** | | |
|---|---|---|
| Motor operation | With electric multi-turn actuator (maximum permissible input speed: 240 rpm) | |
| Manual operation | Available handwheel diameters according to EN 12570, selection according to output torque: | |

| Type | GK 10.2 | | GK 14.2 | | GK 14.6 | | | GK 16.2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reduction ratio | 1 : 1 | 2 : 1 | 2 : 1 | 2.8 : 1 | 2 : 1 | 2.8 : 1 | 4 : 1 | 1 : 1 | 2.8 : 1 | 4 : 1 | 4 : 1 | 5.6 : 1 | 5.6 : 1 |
| Standard handwheel Ø [mm] | 315 | 200 | 315 | 200 | 315 | 400 | 315 | 800 | 630 | 315 | 500 | 315 | 400 |
| Special handwheel Ø [mm] | 400 | | 400 | | 400 | 800 | 400 | 800 | | 400 | 800 | | |

| Type | GK 25.2 | | GK 30.2 | | | | GK 35.2 | | | GK 40.2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reduction ratio | 5.6:1 | 8:1 | 5.6:1 | 5.6:1 | 8:1 | 11:1 | 8:1 | 11:1 | 16:1 | 16:1 | 22:1 | 22:1 |
| Standard handwheel Ø [mm] | 630 | 500 | 800 | | | | 800 | | | 800 | | |
| Special handwheel Ø [mm] | 800 | | 800 | | | | 800 | | | 800 | | |

| | | |
|---|---|---|
| | Standard: | • Handwheel made of aluminium<br>• Handwheel with ball handle |
| | Options: | • Handwheel made of GJL-200<br>• Handwheel lockable<br>• WSH limit switching device for signalling position and end positions |
| Power tool emergency operation (input shaft with square) | Maximum permissible input speed: 240 rpm | |

| **Valve attachment** | |
|---|---|
| Output drive types | A, B1, B2, B3, B4 according to EN ISO 5210<br>A, B, D, E according to DIN 3210<br>C according to DIN 3338<br>Special valve attachments: AF, AK, AG, IB1, IB3, IB4 |

| **Service conditions** | | |
|---|---|---|
| Mounting position | Any position | |
| Ambient temperature | Standard: | –40 °C to +80 °C |
| | Options: | –60 °C to +60 °C<br>0 °C to +120 °C |
| Enclosure protection in accordance with IEC 60529 | IP68 | |
| | According to AUMA definition, enclosure protection IP68 meets the following requirements:<br>• Depth of water: maximum 8 m head of water<br>• Continuous immersion in water: maximal 96 hours<br>• Up to 10 operations during immersion<br>• Modulating duty is not possible during immersion | |
| Corrosion protection | Standard: | KS: Suitable for use in areas with high salinity, almost permanent condensation, and high pollution. |
| | Option: | KX: Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution. |
| Coating | Double layer powder coating<br>Two-component iron-mica combination | |
| Colour | Standard: | AUMA silver-grey (similar to RAL 7037) |
| | Option: | Available colours on request |
| Lifetime | AUMA multi-turn gearboxes meet or exceed the lifetime requirements of EN 15714-2. Detailed information can be provided on request. | |

| **Accessories** | | |
|---|---|---|
| Reversing gearboxes | GW reversing gearbox for reversal of rotation direction for manual and motor operation | |

| **Special features for use in potentially explosive atmospheres** | | |
|---|---|---|
| Explosion protection in accordance with ATEX 2014/34/EU | Standard: | II 2G Ex h IIC T4 Gb<br>II 2D Ex h IIIC T130°C Db |
| | Options: | II 2G Ex h IIC T3 Gb<br>II 2D Ex h IIIC T190°C Db<br>I M2 Ex h I Mb |
| Type of duty | Open-close duty: | Short-time duty S2 - 15 min with the following average output torques: |

| Type | GK 10.2 | | GK 14.2 | | GK 14.6 | | GK 16.2 | |
|---|---|---|---|---|---|---|---|---|
| Reduction ratio | 1:1 | 2:1 | 2:1 | 2.8:1 | 2.8:1 | 4:1 | 4:1 | 5.6:1 |
| Average output torque in [Nm] | 40 | 60 | 125 | | 150 | 250 | 300 | 500 |

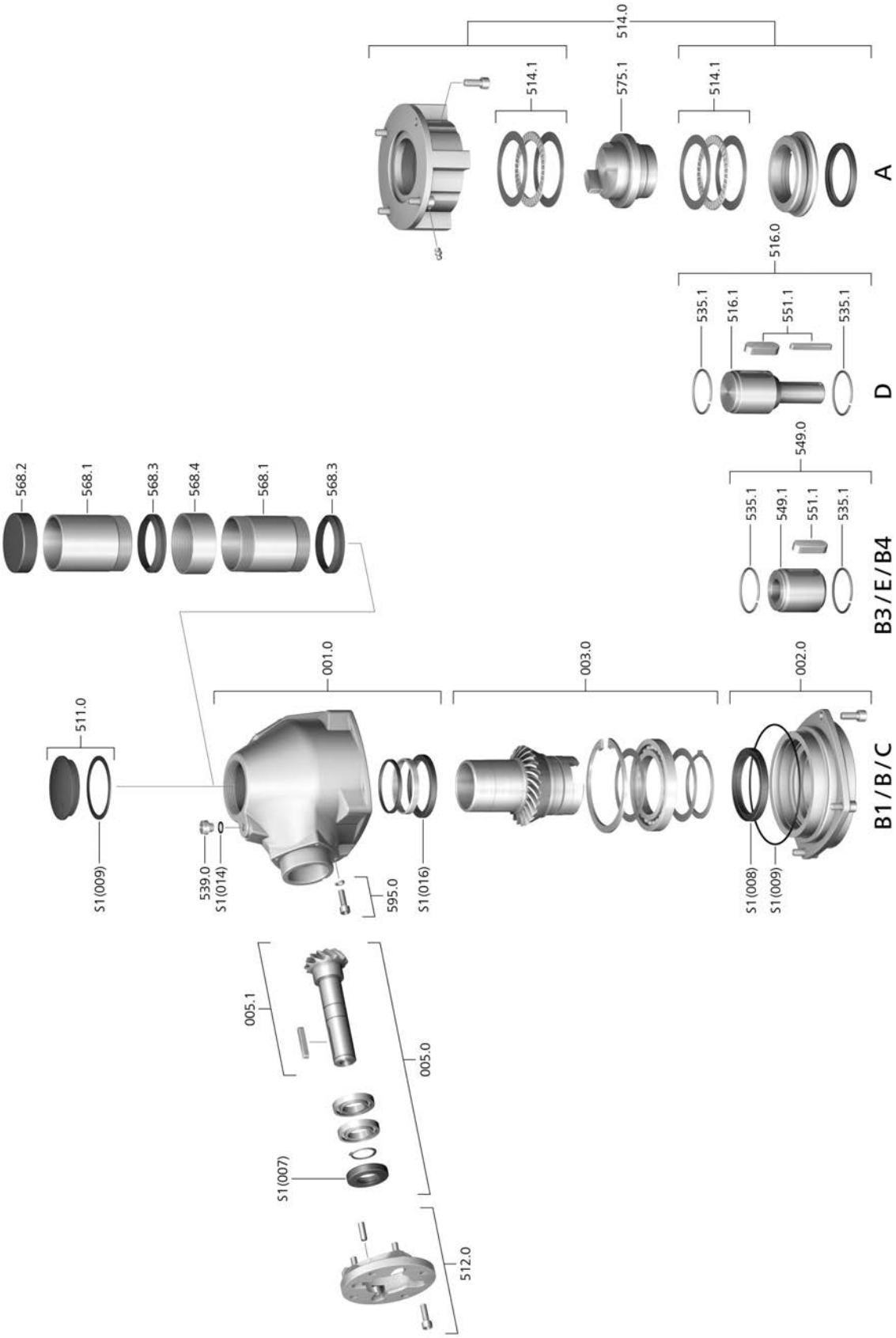
| Type | GK 25.2 | | GK 30.2 | | GK 35.6 | | GK 40.2 | |
|---|---|---|---|---|---|---|---|---|
| Reduction ratio | 5.6:1 | 8:1 | 8:1 | 11:1 | 11:1 | 16:1 | 16:1 | 22:1 |
| Average output torque in [Nm] | 600 | 1,000 | 2,000 | | 4,000 | | 8,000 | |

| | | |
|---|---|---|
| | Modulating duty: | Intermittent duty S4 – 25 % with modulating torque |
| Ambient temperature | Standard: | –40 °C to+40 °C (II 2G Ex h IIC T4 Gb; II 2D Ex h IIIC T130 °C Db)<br>–40 °C to +60 °C (II 2G Ex h IIC T4 Gb; II 2D Ex h IIIC T130 °C Db)<br>–60 °C to +60 °C (II 2G Ex h IIC T4 Gb; II 2D Ex h IIIC T130 °C Db) |
| | Option: | –40 °C to +80 °C (I 2G Ex h IIC T3 Gb; II 2D Ex h IIIC T190 °C Db)<br>0 °C to +120 °C (I 2G Ex h IIC T3 Gb; II 2D Ex h IIIC T190 °C Db)<br>–20 °C to +40 °C (I M2 Ex h I Mb) |

| **Further information** | |
|---|---|
| EU Directives | ATEX Directive 2014/34/EU<br>Machinery Directive 2006/42/EC |

# 9. Spare parts

## 9.1. Multi-turn gearboxes GK 10.2 – GK 25.2

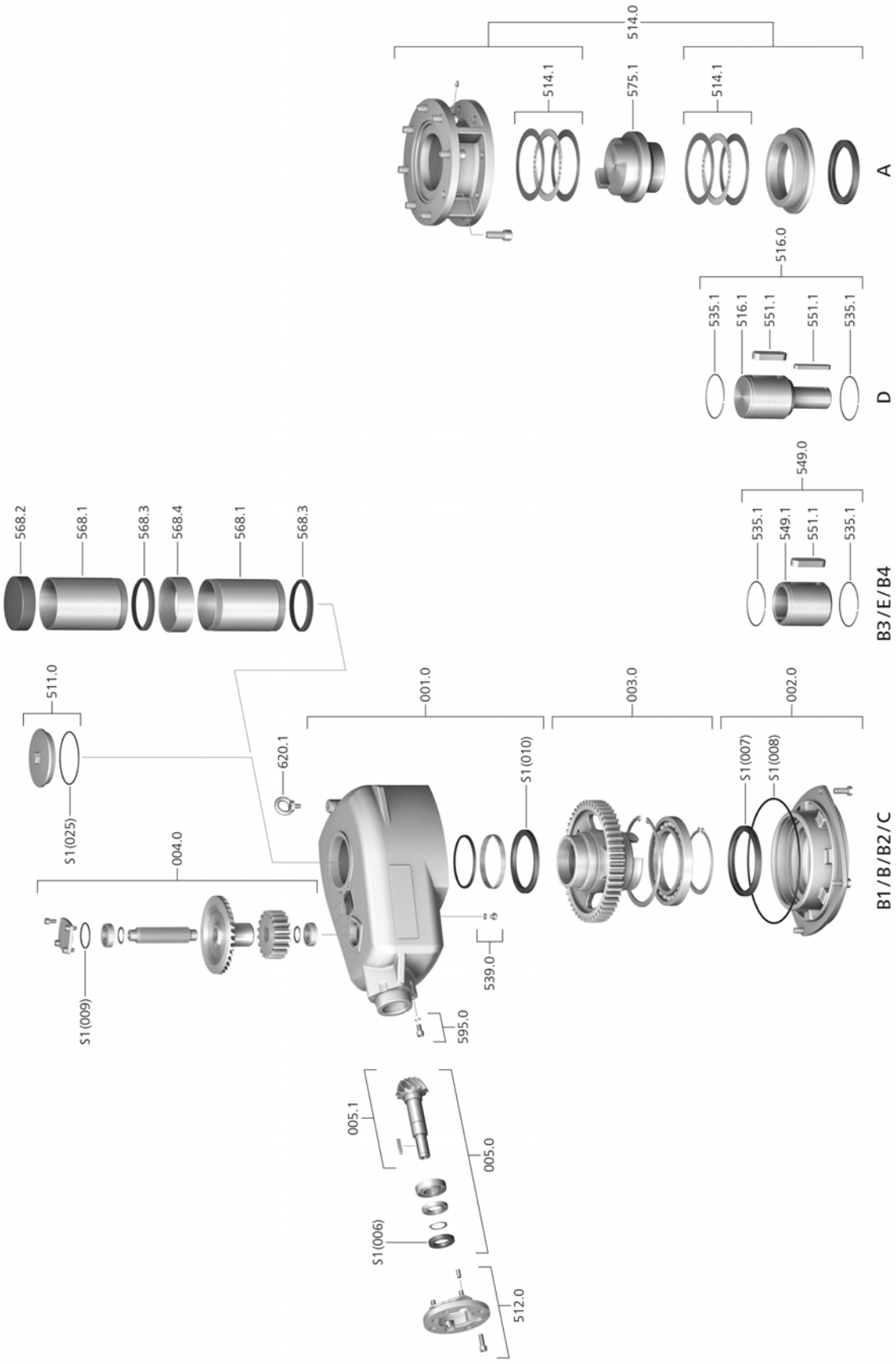


# Spare parts

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

| Ref. no. | Designation | Type |
|---|---|---|
| 001.0 | Housing | Sub-assembly |
| 002.0 | Bearing flange | Sub-assembly |
| 003.0 | Hollow shaft | Sub-assembly |
| 005.0 | Input shaft | Sub-assembly |
| 005.1 | Pinion shaft | Sub-assembly |
| 511.0 | Threaded plug | Sub-assembly |
| 512.0 | Input mounting flange | Sub-assembly |
| 514.0 | Output drive type A (without stem nut) | Sub-assembly |
| 514.1 | Axial needle roller bearing | Sub-assembly |
| 516.0 | Output drive type D | Sub-assembly |
| 516.1 | Output drive shaft D | |
| 535.1 | Snap ring | |
| 539.0 | Screw plug | Sub-assembly |
| 549.0 | Output drive type B3/E/B4 | Sub-assembly |
| 549.1 | Output drive sleeve B3/E/B4 | |
| 551.1 | Parallel key | |
| 568.1 | Stem protection tube (without cap) | |
| 568.2 | Protective cap for stem protection tube | |
| 568.3 | V-seal | |
| 568.4 | Threaded sleeve | |
| 575.1 | Stem nut (without thread) | |
| 595.0 | Screw kit for manual gearbox | Sub-assembly |
| S1 | Seal kit | Set |

## 9.2. Multi-turn gearboxes GK 30.2 – GK 40.2



# Spare parts

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

| Ref. no. | Designation | Type |
|---|---|---|
| 001.0 | Housing | Sub-assembly |
| 002.0 | Bearing flange | Sub-assembly |
| 003.0 | Hollow shaft | Sub-assembly |
| 004.0 | Intermediate stage | Sub-assembly |
| 005.0 | Input shaft | Sub-assembly |
| 005.1 | Pinion shaft | Sub-assembly |
| 511.0 | Threaded plug | Sub-assembly |
| 512.0 | Input mounting flange | Sub-assembly |
| 514.0 | Output drive type A (without stem nut) | Sub-assembly |
| 514.1 | Axial needle roller bearing | Sub-assembly |
| 516.0 | Output drive type D | Sub-assembly |
| 516.1 | Output drive shaft D | |
| 535.1 | Snap ring | |
| 539.0 | Screw plug | Sub-assembly |
| 549.0 | Output drive type B3/E/B4 | Sub-assembly |
| 549.1 | Output drive sleeve B3/E/B4 | |
| 551.1 | Parallel key | |
| 568.1 | Stem protection tube (without cap) | |
| 568.2 | Protective cap for stem protection tube | |
| 568.3 | V-seal | |
| 568.4 | Threaded sleeve | |
| 575.1 | Stem nut for output drive type A | |
| 595.0 | Screw kit for manual gearbox | Sub-assembly |
| 620.1 | Eyebolt | |
| S1 | Seal kit | Set |

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