SEC-ENGLISH-Gefahrenhinweise-V1.00-20210701

Hazard Warnings

Hazard warnings in this manual indicate potential harm to the user or the product. For the person interacting with the product, the level of risk includes consequences ranging from slight, up to lethal injuries. As for the product, disobeying the warnings may cause damage to the equipment and/or void the warranty. Therefore, said warnings are made apparent to instruct and warn the user, which precautions have to be made prior to performing any actions described in this manual. The user must read and be familiar with the manual, before performing any tasks as described in this manual.

Hazard warnings in this manual are presented in these three forms:

WARNING: These warning notices refer to personal safety. Failure to obey these notices could result in personal injury or death.

CAUTION: General precautions must be made. Failure to obey these notices could result in personal injury and/or equipment damage.

NOTE: Directs the user's attention to essential information.

SEC-DS-ENGLISH-GETRIEBE-QT-V1.02-2023.08.01

Operating manual for QT-Gearboxes

1 General

A gearbox of type QT is a coaxial quarter turn (90°) gear. The axis of rotation of the gear output shaft is equal to the axis of rotation of the actuator. It is assembled with electric open/close or control actuators of the manufacturer Schiebel on valves that require a pivoting movement.

The gear units are designed that the end positions can not be exceeded when the actuator is operated manually. In electrical operation, it is not allowed to move the actuator against the stops. The end positions must be set accordingly. See chapter "Commissioning" in the standard operating manual.

In Table 1 the available types and technical data of QT-Gearboxes are listed.

Type	Actuator	Output flange	Travel	max. 'Torque S2/S4 [Nm]	Ratio	Factor	Weight [kg]
QT3	AB3, CM03	F05 / F07 / F10	90°	30 / 15	1	1	2,3
QT6	AB5, CM06	F05 / F07 / F10	90°	60 / 30	1	1	2,3
QT12	AB3, CM03	F05 / F07 / F10	90°	120 / 60	4,88	4,16	3,2
QT25	AB3, CM03	F07 / F10	90°	250 / 125	9	7,92	4,8
QT50	AB5, CM06	F10 / F12	90°	500 / 250	9	7,92	8,9

Table 1: *Technical data QT-Gearboxes*

2 Structure

The types QT3 and QT6 are an adapter that restricts rotation to 90°. These consists of an output flange with stops and a drive sleeve with stops. The output torque and the output speed correspond to those of the actuator.

The types QT12, QT25 and QT50 are basically a planetary gear with metallic gears, limited to a 90° movement. The input shaft is compound of a actuator-specific drive sleeve connection. The ring gear is made of steel and the output flange is made of aluminum. For the output, a multi-geared steel drive sleeve without orientation is used. It can be machined according to customer requirements.

The rotation range is limited by the pin in the planet carrier, which can only move between the end stops in the output flange.

Figure 1 and Figure 2 show the exploded images of QT12, QT25 and QT50 gears. Apart from the technical data, the two types of gears differ in the way that the QT25 and QT50 gearbox uses an additional adapter. Figure 3 shows the exploded image for gears of type QT3/QT6.

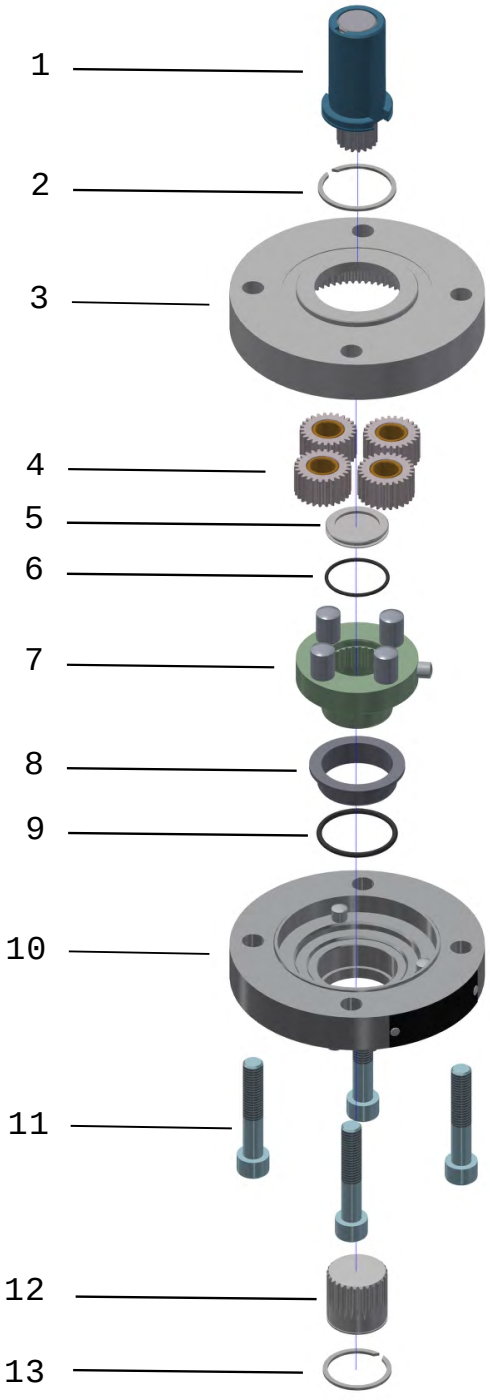

Figure 1: *Exploded view QT12*
1... input shaft, 2... lock ring, 3... gear ring, 4... planet gears, 5... sealing plate, 6... o-ring, 7... planetary carrier, 8... friction bearing, 9... o-ring, 10... output flange, 11... flange srews, 12... drive sleeve, 13... lock ring

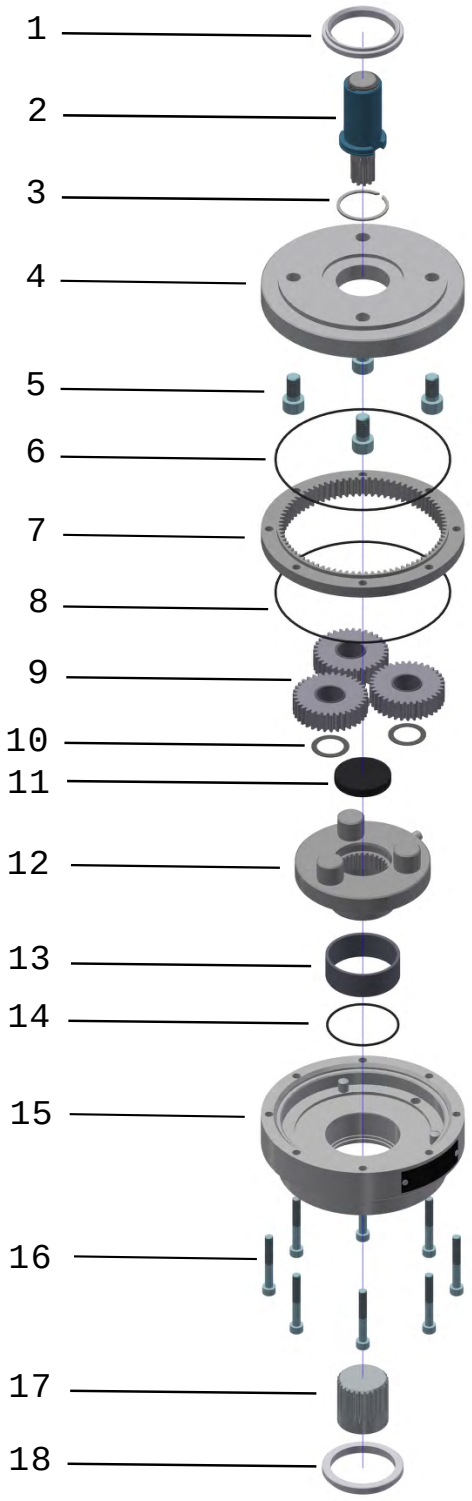

Figure 2: *Exploded view QT25, QT50*
1. . . centering ring, 2. . . input shaft, 3. . . lock ring, 4. . . actuator adapter, 5. . . adapter srews, 6. . . o-ring, 7. . . gear ring, 8. . . o-ring, 9. . . planet gears, 10. . . thrust washer, 11. . . closing cap, 12. . . planetary carrier, 13. . . friction bearing, 14. . . o-ring, 15. . . output flange, 16. . . flange srews, 17. . . drive sleeve, 18. . . lock ring

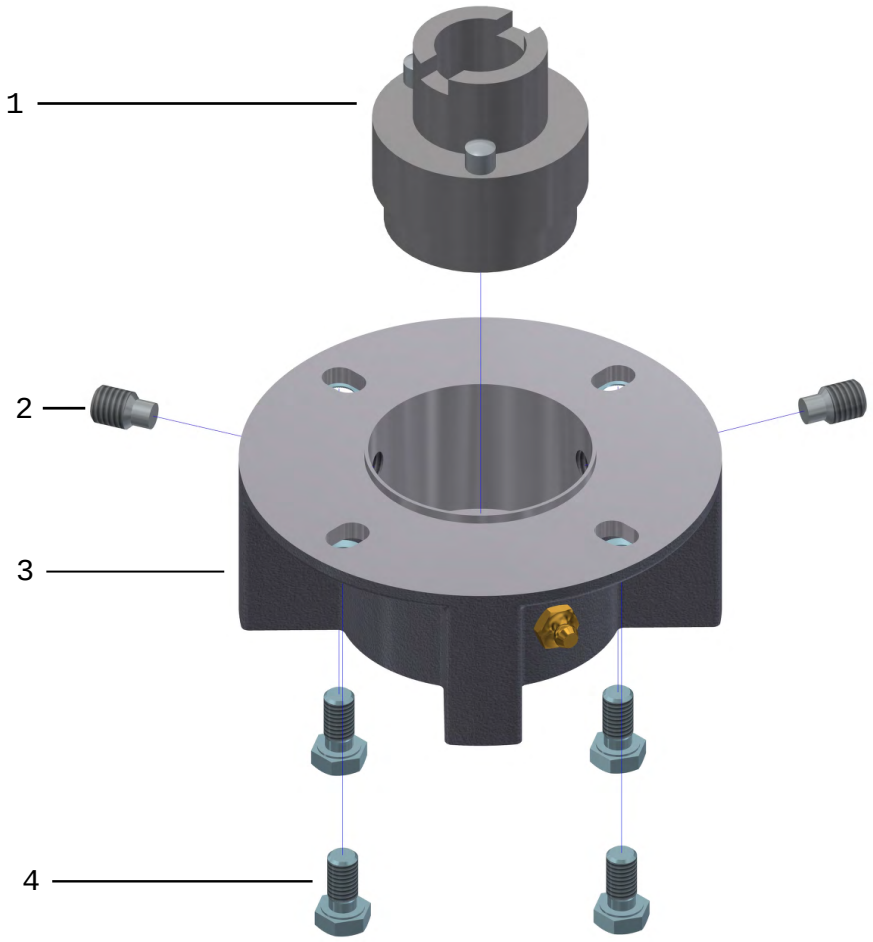

Figure 3: *Exploded view QT3/QT6*
1. . . drive sleeve with stops, 2. . . flange stops, 3. . . output flange, 4. . . flange srews

3 Packaging, transport and storage

See chapter „Packaging, transport and storage“ in der standard user manual.

4 Assembly and disassembly of QT-Gearboxes

In the following subsections, the procedures for the assembly and disassembly of QT-gears to actuators are explained step by step.

4.1 Security and assembly instructions

WARNING: For assembly and disassembly of the actuator, the pipes where the valve is installed on have to be depressurised!

WARNING: The device may only be mounted and commissioned by qualified personnel!
Qualified personnel within the meaning of this operating manual are persons who are familiar, with assembly, commissioning and operation of this product, and have the required appropriate qualifications for this activity.

WARNING: The rotational range is limited to 90° by the QT-Gearbox.
In electrical operation, it is not allowed to move against the end stop! The end positions of the actuator must be configured accordingly!

4.2 Assembly QT3/QT6

1. Unscrew the flange stops from the output flange.
2. Insert the drive sleeve according Figure 3 in the output flange. If necessary, rotate it that one of the drive sleeve stops is between the 90° offset of the holes for the flange stops.

   NOTE: To determine which of the two drive sleeve stops has to be selected, consider the required position of the drive sleeve machining. The choice of the respective other drive sleeve stop turns the position of the drive sleeve machining in the end stops (open/closed) by 45°. This adjustment option is especially relevant for square machining.
3. Screw the flange stops into the output flange.

   NOTE: The ends of the mounted flange stops must not touch the driving shaft!

   NOTE: Now a 90° movement of the drive sleeve must be possible, otherwise there is none of the drive sleeve stops between the 90° range of the flange stops.
4. Mount the gear on the output flange of the actuator. Make sure that the claws of the output shaft of the actuator and those of the drive sleeve engage.
5. Fix the gear with the flange screws.
6. Assemble the actuator and the gear on the valve.

4.3 Disassembly QT3/QT6

1. Disassemble the actuator with the gear from the valve.
2. Loosen the screws on the output flange of the gear and remove it from the actuator.

4.4 Assembly QT12/QT25/QT50

1. Insert the input shaft into the hollow shaft of the rotary actuator so that the claws engage.
2. Apply the lock ring to the input shaft and secure it against moving out of the hollow shaft.
3. **Only for QT25 and QT50:** Mount the adapter on the output flange of the actuator using the four screws.
4. Place the gear correctly assembled according to the exploded view on the drive and ensure that the input shaft engages the planetary gears.

   NOTE: The pin in the planetary carrier must be located between the 90° offset of the two end stops!
5. Mount the gear to the actuator (QT12, 4 screws) or drive adapter (QT25/QT50, 8 screws) using the flange screws.
6. Turn the handwheel to the position in which the valve is located.
7. Put the drive sleeve with the lock ring on the valve.
8. Mount the actuator on the valve.

4.5 Disassembly QT12/QT25/QT50

1. Disassemble the actuator with the gear from the valve.
2. Loosen the screws on the output flange of the gear and remove it from the actuator.
3. **Only for QT25/QT50:** Remove the adapter by opening the four screws.
4. Remove the lock ring that secures the input shaft in the hollow shaft of the actuator.
5. Pull the input shaft of the gear out of the hollow shaft of the actuator.

5 Commissioning

See chapter „Commissioning“ in the standard user manual.

6 Maintenance

Check regularly the fixing screws between the actuator, gear and valve for tightness and, if necessary, tighten them with the torques specified in chapter „Installation instructions “.

Pay attention to increased running noise an make a service of the QT-Gearbox if they occur.

6.1 Service QT-Gearbox

The QT-Gearbox should be maintaeined at least every 5 years.

The following procedure has to be observed, the assignment of the components can be found in the Figures 1 and 2:

1. If necessary, disassemble the actuator from the valve.
2. Dismount the gear from the actuator as described in section 4.5.
3. Remove old grease and clean all components.
4. Grease all components
5. Assemble the gearbox according to the explosion picture.
6. Reassemble the gearbox to the actuator and valve as described in section 4.4.

6.2 Moving interval

The gear should be actuated at least every 6 months.

7 Lubricant recommendation

Grease DIN 51825-K(P) R -40
i.e. Water-repellent complex grease based on Al-soap with high resistance to acids and alkalis:

Ambient temperature:	-40 to +85 °C
Worked penetration 0,1 mm:	310-340
Dripping point:	approximately 260 °C
NLGI-Class:	1

acid-free, not or only slightly reactive with water