ZIEHL-ABEGG

Die Königsklasse

The Royal League

Die Königsklasse in Lufttechnik, Regeltechnik und **Antriebstechnik** | The Royal League in ventilation, control and **drive technology**

ZAtop

SM250.60B
SM250.80D
SM250.100C

Replacement of the brake

Assembly instructions

Store for future use!

Content

1 General information

1.1 Structure of the assembly instructions

▷ The assembly instruction does not replace the original operating instructions of the motor or frequency inverter!
▷ The original operating instructions has to be always available!

1.2 Target group

The assembly instructions address persons entrusted with planning, installation, commissioning and maintenance and servicing and who have the corresponding qualifications and skills for their job.

1.3 Exclusion of liability

ZIEHL-ABEGG SE is not liable for damage due to misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

1.4 Copyright

2 Safety instructions

2.1 General

ZIEHL-ABEGG SE spare parts are not ready-to-use products and may only be operated when they have been installed on an elevator machine and their safety has been assured using guard grilles, barriers, structural attachments or other appropriate measures, depending on the application (see also DIN EN ISO 13857)!

2.2 Pictographs

Safety instructions are highlighted with warning triangles and are depicted according to the degree of hazard as follows.

	**Danger!** General hazardous area. Death or severe injury or significant property damage can occur if the corresponding precautions are not taken!
	**Information** Important additional information and advice for user.

2.3 Requirements placed on the personnel / due diligence

Danger!
▷ Installation, connection to the power supply and commissioning may only be performed by qualified service personnel! The relevant regulations must be observed!
▷ Persons entrusted with the planning, installation, commissioning and maintenance and servicing in connection with the elevator machine must have the corresponding qualifications and skills for these jobs. Based on their training, knowledge and experience as well as knowledge of the relevant standards, they must be able to judge the work transferred to them and be able to recognize possible hazards.
▷ In addition, they must be knowledgeable about the safety regulations, EU directives, rules for the prevention of accidents and the corresponding national as well as regional and in-house regulations. Personnel undergoing training, instruction, or on apprenticeship may only work on the elevator machine under the supervision of an experienced person. This also applies to personnel in general training.
▷ Comply with the legal minimum age.

2.4 General safety instructions

Danger!
▷ The elevator machine has attachment points: integrally cast eyelets or screwed-on eye bolts, eye plates or steel cable loops. The attachment points are designed exclusively for transporting the elevator machine including brake and traction sheave. Do not lift other loads such as bolted on components, ropes lying on top, etc. with the attachment points. Suitable lifting gear must be used.

Danger!
Warning of hand injuries!

▷ Risk of injury from reaching into the rope guard.
▷ Do not carry out any activities during operation.
▷ Only perform maintenance work on the drive when stopped!

▷ If the elevator machine is not energised, no electric torque is available. Releasing the brakes can cause uncontrolled acceleration of the elevator.
We recommend short-circuiting the windings of the de-energised elevator machine to generate a brake torque dependent on the speed.
In the event of a short-circuit, a short-circuit current of at least the level of the rated current is flowing.
The windings may not be short-circuited when the elevator machine is energised.

3 Safety precautions

Danger!
In case safety precautions are not taken:
✓ Can it lead to death or severe injury or significant property damage!
✓ Brake malfunction may result!

On installed drives, before replacement of the brake, following safety measures have to be taken:
▷ Counterweight has to rest on the buffer.
▷ Cabin has to be suspended.
✓ Thereby the ropes are unburdened!

4 Versions of the brake

RSO 1300 - ZAtop SM250.60B

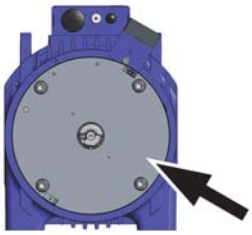

Figure 4-01

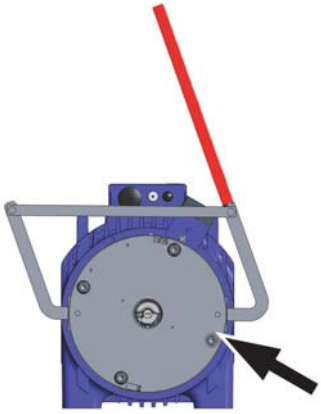

Figure 4-02 - Brake with a mechanical hand release system

RSO 1800 - ZAtop SM250.80D/SM250.100C

Figure 4-03

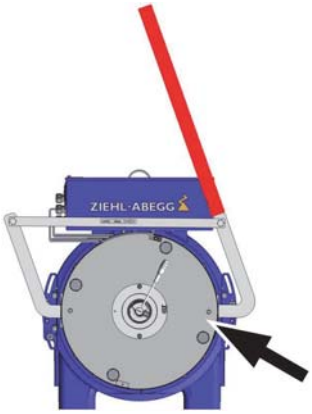

Figure 4-04 - Brake with a mechanical hand release system

Brake type	Elevator machine type
RSO 1300	ZAtop SM250.60B
RSO 1800	ZAtop SM250.80D
RSO 1800	ZAtop SM250.100C

A brake with a mechanical hand release system is available optionally. The hand release system cannot be fitted later. The complete brake must be replaced to retrofit the hand release system.

5 Scope of delivery

- Brake
- Assembly kit brake - article number 70029992 (optionally available)

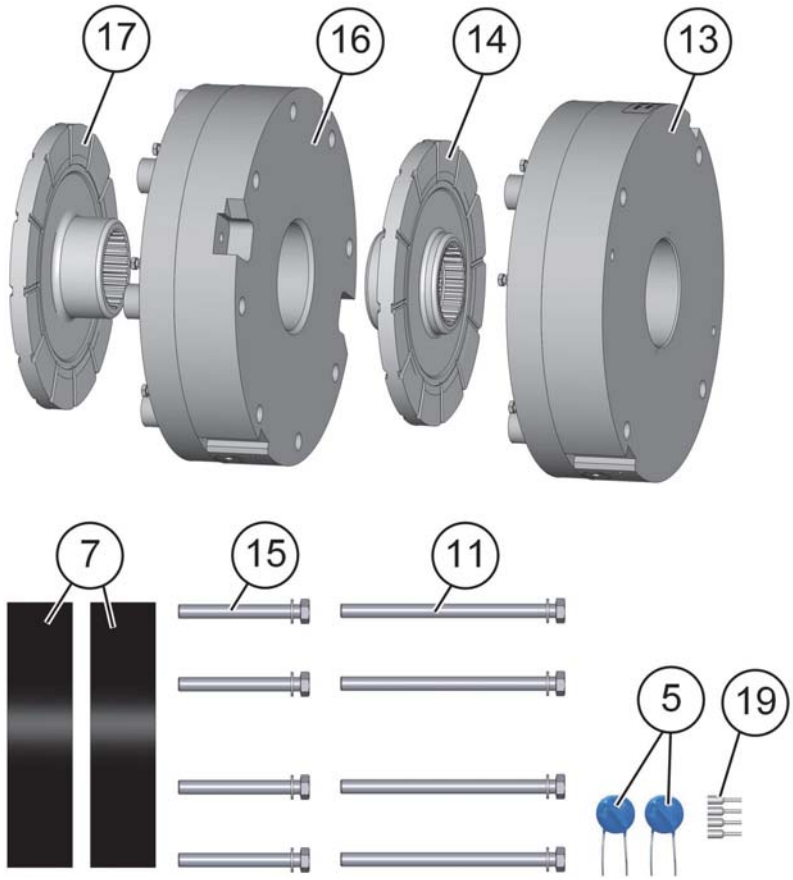

Figure 5-01

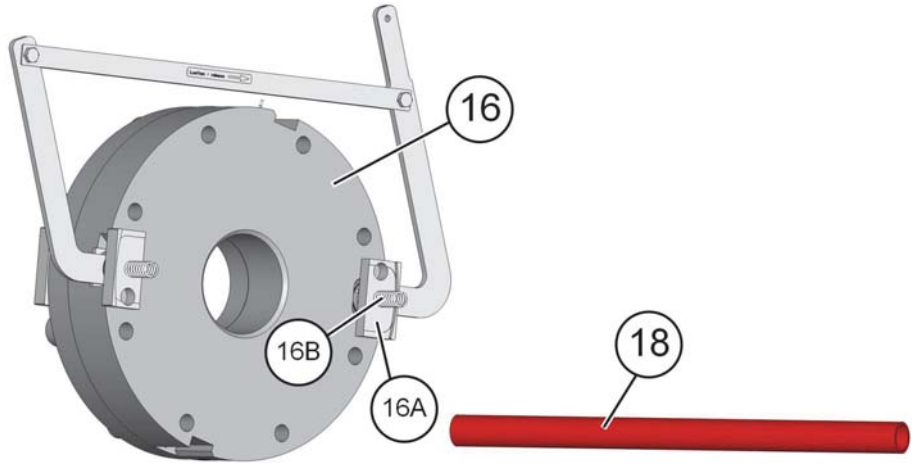

Figure 5-02 - Brake bodies 1 in version with hand release

Pos.	Count	Designation
5	2	varistor
7	2	Cover
11	4	RSO 1300 - ZAtop SM250.60B Socket cap screw M16 x 250 with washer RSO 1800 - ZAtop SM250.80D/100C Hexagon head bolt M20 x 300 with washer
13	1	Brake body 2
14	1	Brake rotor 2 14A - O-ring
15	4	RSO 1300 - ZAtop SM250.60B Socket cap screw M16 x 150 with washer RSO 1800 - ZAtop SM250.80D/100C Hexagon head bolt M20 x 170 with washer
16	1	Brake body 1 **In version with levers for hand release:**(see Figure 5-02) 16A - 2 x Tensile block 16B - 2 x Thrust spring
17	1	Brake rotor 1 18A - O-ring
18	1	Pipe
19	4	Wire-end sleeves
20	1	Micro-active cloth
21	1	Feeler gauges, 13-part
22	1	Anti tamper paint 20 ml
23	1	Technical vaseline 50 g
24	1	Quick cleaner LOCTITE® 7063 400 ml

The assembly kit brake (article number 70029992), including pos. 5 and pos. 19 to pos. 24 is optionally available and supplied in a separate folding box.

6 Tools required

6.1 General

- ZIEHL-ABEGG tool set article 70027450
- Wire cutter
- Cable stripper
- Crimper
- Slotted screwdriver 0.6 x 3.5
- Lifting eye bolt M12

6.2 RSO 1300 - ZAtop SM250.60B

- Allen wrench size 14
- Torque wrench for a tightening torque of 300 Nm with allen wrench size 14

6.3 RSO 1800 - ZAtop SM250.80D/100C

- Allen wrench size 4
- Allen wrench size 5
- Screw wrench size 30
- Torque wrench for a tightening torque of 5.5 Nm with allen wrench size 4
- Torque wrench for a tightening torque of 9.5 Nm with allen wrench size 5
- Torque wrench for tightening torque 410 Nm, size 30

7 Dismounting the brake

During the mounting as well as the dismounting also the operating manual of the brake has to be observed.

Risk of death!
When dismounting the brake make sure that the cabin and the counterweight are mechanically secured against movement!

Attention!
- ▷ Due the electrostatic discharge the absolute encoder can be destroyed! Do not touch the pins of the encoder cable as well as the electronics of the absolute encoder!
- ▷ You must discharge your own body before touching. This can be done, for example, by touching a conductive, earthed object (for example bare metal switch cabinet parts) immediately before.

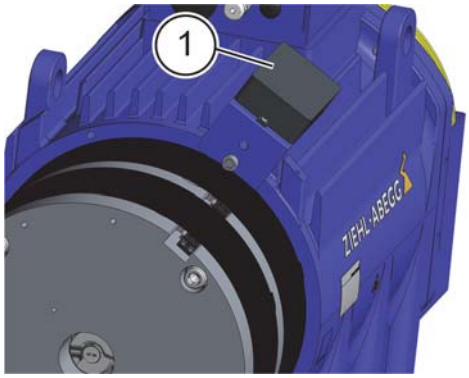

Figure 7-01A - ZAtop SM250.60B

Figure 7-01B - ZAtop SM250.80D/100C

1. **ZAtop SM250.80D/100C:**
   Unscrew the 4 socket cap screws M5 x 10 - 8.8 (2) with a size 4 allen wrench.
2. **ZAtop SM250.60B - 100C:**
   Remove the cover (1) from the junction box.

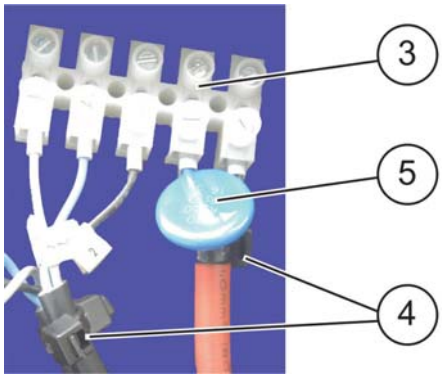

Figure 7-02

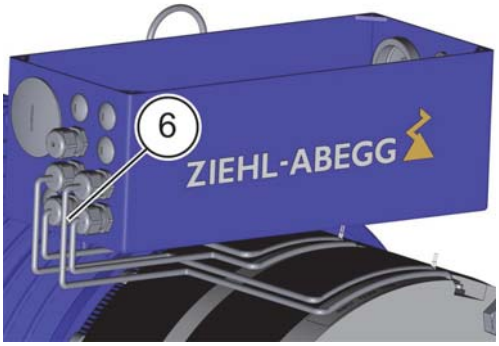

Figure 7-03

3. Disconnect the electrical connection (3) of both brake bodies.
4. Carefully remove strain reliefs (4) of all connecting cables with wire cutters.
5. Cut off varistors (5).
6. Feed all connecting cables (6) out of the terminal box.
7. Remove the cable ties at the brake cables.

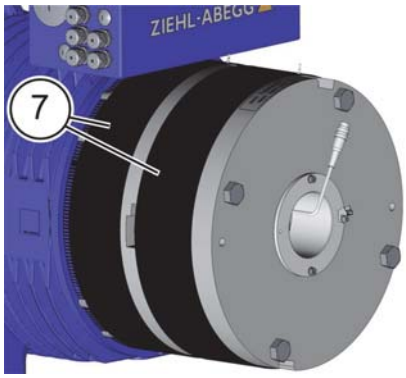

Figure 7-04

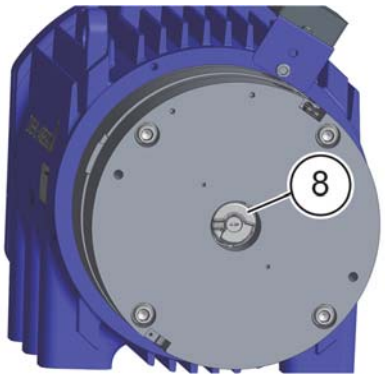

Figure 7-05A - ZAtop SM250.60B

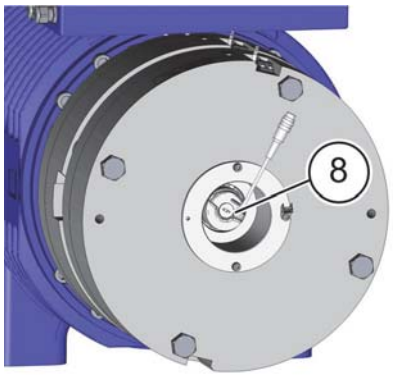

Figure 7-05B - ZAtop SM250.80D/100C

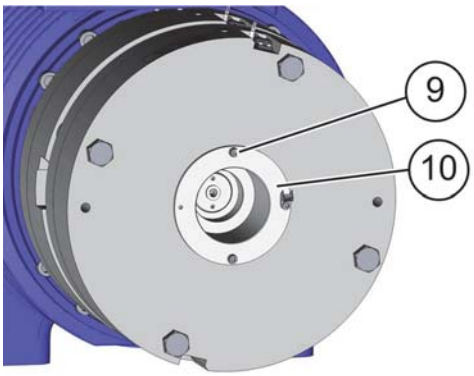

Figure 7-06

8. Remove the covers (7).
9. Dismounting absolute encoder (8), see "Replacement of the absolute encoder A-TIA17_02-..."
10. **ZAtop SM250.80D/100C:**
    Unscrew the two socket cap screws M6 x 16 - 8.8 (9) with a size 5 allen wrench.
11. **ZAtop SM250.80D/100C:**
    Remove the encoder flange (10) with the fastening lug.

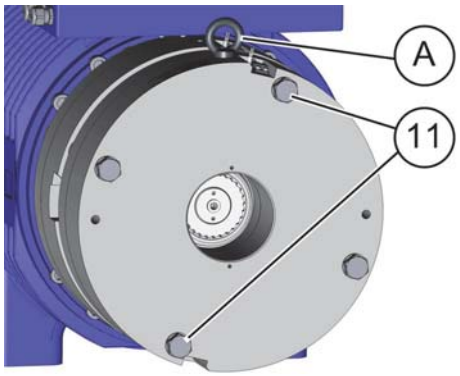

Figure 7-07

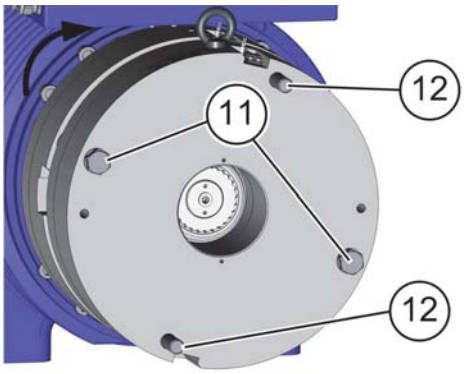

Figure 7-08

12. **Caution:** Due to the great weight of the brake body, we recommend you to secure and change the brake body by using an eye bolt M12 (A) and appropriate lifting gear.
13. Completely unscrew two of the fixing screws (11) diagonally in turn:
    RSO 1300 - Socket cap screw M16 x 250 (11) with a size 14 allen wrench
    RSO 1800 - Hexagon head bolts M20 x 300 (11) with a size 30 screw wrench
14. Replace the two fixing screws (11) with threaded bolts (12) from the ZIEHL-ABEGG tool set, item number 70027450:
    RSO 1300 - Threaded bolt M16 (12)
    RSO 1800 - Threaded bolt M20 (12)
15. Fasten the two threaded bolts (12) hand tight.
16. Gradually unscrew the two remaining fixing screws (11) diagonally in turn:
    RSO 1300 - Socket cap screw M16 x 250 (11) with a size 14 allen wrench
    RSO 1800 - Hexagon head bolts M20 x 300 (11) with a size 30 screw wrench

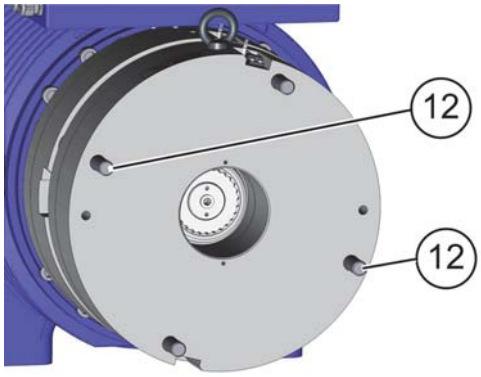

Figure 7-09

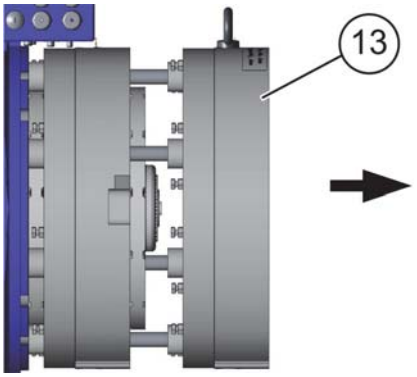

Figure 7-10

17. Replace the two fixing screws (11) with threaded bolts (12) from the ZIEHL-ABEGG tool set, item number 70027450:
    RSO 1300 - Threaded bolt M16 (12)
    RSO 1800 - Threaded bolt M20 (12)
18. Fasten the two threaded bolts (12) hand tight.
19. Attach brake body 2 (13) to suitable lifting gear using the eye bolt (A) and remove.
    ATTENTION! Note the weight of the brake body.
    RSO 1300 - Approx. 75 kg.
    RSO 1800 - Approx. 100 kg.

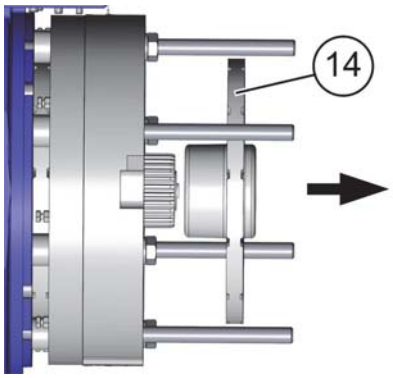

Figure 7-11

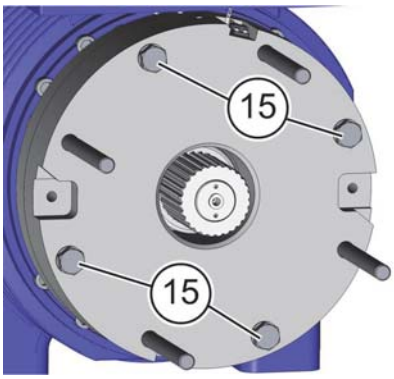

Figure 7-12

20. Detach the brake rotor 2 (14) from the toothed hub. The brake rotor may only be detached by hand.
    ATTENTION! Do not use screwdrivers to release the brake rotor.
    The screwdrivers damage the friction lining. Damaged friction linings may not be re-fitted!
21. Completely unscrew the 4 fixing screws (15) gradually diagonally in turn:
    RSO 1300 - Socket cap screw M16 x 150 (15) with a size 14 allen wrench
    RSO 1800 - Hexagon head bolts M20 x 170 (15) with a size 30 screw wrench

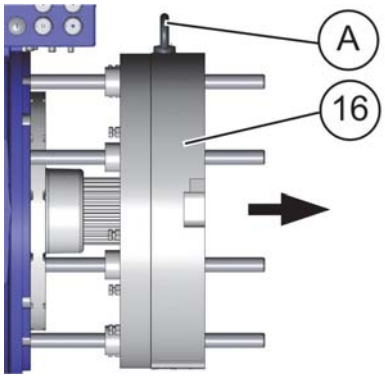

Figure 7-13

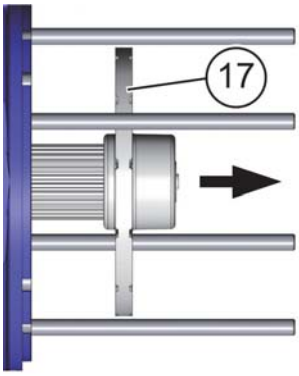

Figure 7-14

22. **RSO 1300:** Screw in the eye bolt (A).
    RSO 1800 - Pull out brake body 1 (16) slightly until the eye bolt (A) can be screwed in.
23. Attach brake body 1 (16) to suitable lifting gear using the eye bolt (A) and remove.
    ATTENTION! Note the weight of the brake body.
    RSO 1300 - Approx. 75 kg.
    RSO 1800 - Approx. 100 kg.
24. Detach the brake rotor 1 (17) from the toothed hub. The brake rotor may only be detached by hand.
    ATTENTION! Do not use screwdrivers to release the brake rotor.
    The screwdrivers damage the friction lining. Damaged friction linings may not be re-fitted!

8 Mounting the brake

During the mounting as well as the dismounting also the operating manual of the brake has to be observed.

Risk of death!
Incorrect mounting can have a detrimental impact on the braking action.

Attention!
▷ Never touch the connection contacts on the position absolute encoder or on the cable! The electronics can be destroyed by static electricity.
▷ You must discharge your own body before touching. This can be done, for example, by touching a conductive, earthed object (for example bare metal switch cabinet parts) immediately before.

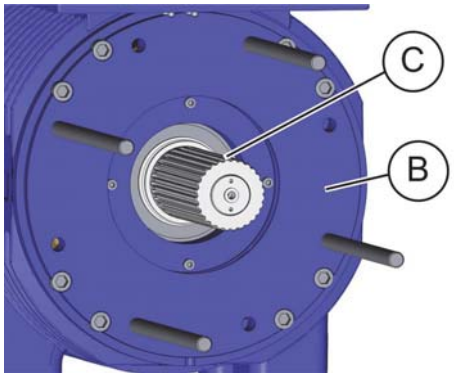

Figure 8-01

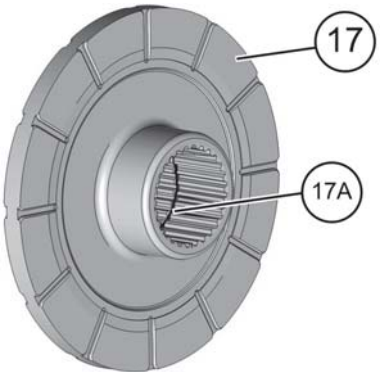

Figure 8-02

1. Make sure that the brake surface (B) on the motor housing and the toothed hub (C) on the drive shaft are free of dirt and grease. Clean with a micro active cloth (20) and LOCTITE® 7063 (24) rapid cleaner from the “Brake assembly kit” (article number 70029992).
2. Check that the o-ring (17A) is correctly inserted in the recess in brake rotor 1 (17).

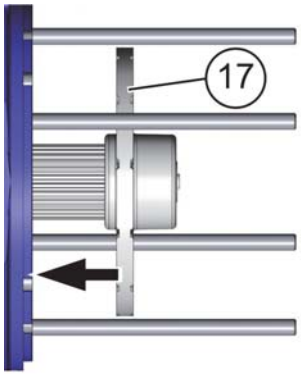

Figure 8-03

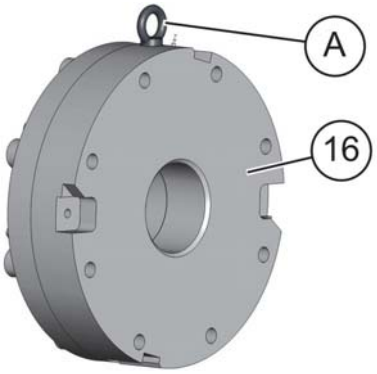

Figure 8-04

3. Make sure that the friction lining of brake rotor 1 (17) is free of dirt and grease. Clean with a micro active cloth (20) and LOCTITE® 7063 (24) rapid cleaner from the “Brake assembly kit” (article number 70029992).
4. Slide the brake rotor 1 (17) with the O-ring (17A) onto the toothed hub by hand by exerting light pressure.
   ATTENTION! Make sure that the shorter rotor collar is facing towards the machine wall.
5. Make sure that the gear teeth engage easily.
6. O-ring may not be damaged.
7. **Caution:** Due to the great weight of the brake body, we recommend you to secure and change the brake body by using an eye bolt M12 (A) and appropriate lifting gear.

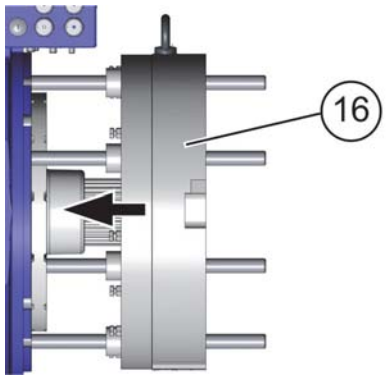

Figure 8-05

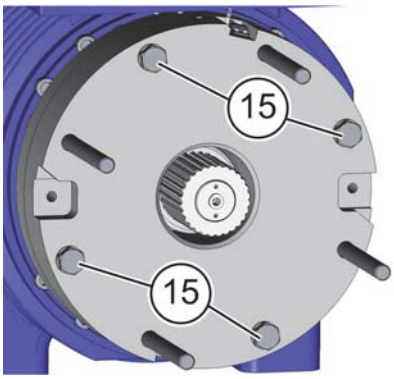

Figure 8-06

8. Slide brake body 1 (16) slightly over the threaded bolts
   Attention! Note the weight of the brake body.
   RSO 1300 - Approx. 75 kg.
   RSO 1800 - Approx. 100 kg.
9. Unscrew12the lifting eye bolt (A).
10. Slide on the brake body 1 (16) as far as the bearing bracket.
11. Tighten brake body 1 (16) by hand using the hexagon head screws (15)
    Do not forget the washers.
    RSO 1300 - Socket head screw M16 x 150 (15)
    RSO 1800 - Hexagon head bolts M20 x 170 (15)
12. Gradually tighten the 4 fixing screws (15) evenly crosswise using a torque wrench:
    RSO 1300 - Torque wrench with size 14 allen wrench - Tightening torque: 300 Nm
    RSO 1800 - Torque wrench with Size 30 - Tightening torque: 410 Nm
13. Endue the fixing screws with anti tamper paint (22).

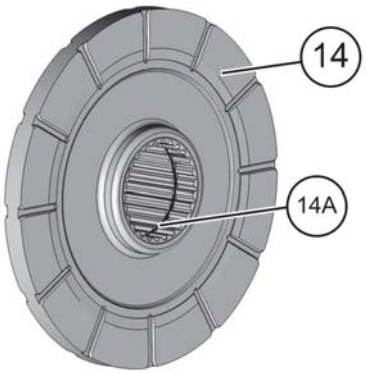

Figure 8-07

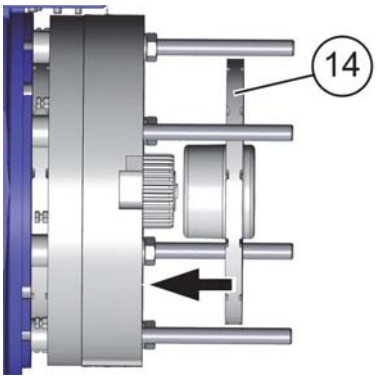

Figure 8-08

14. Check that the o-ring (14A) is correctly inserted in the recess in brake rotor 1 (14).
15. Make sure that the friction lining of brake rotor 2 (14) is free of dirt and grease. Clean with a micro active cloth (20) and LOCTITE® 7063 (24) rapid cleaner from the “Brake assembly kit” (article number 70029992).
16. Slide the brake rotor 2 (14) with the O-ring (14A) onto the toothed hub by hand by exerting light pressure.
    ATTENTION! Make sure that the longer rotor collar is facing towards the brake body 1.
17. Make sure that the gear teeth engage easily.
18. O-ring may not be damaged.

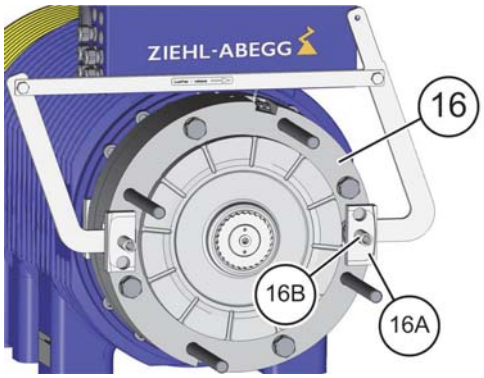

Figure 8-09

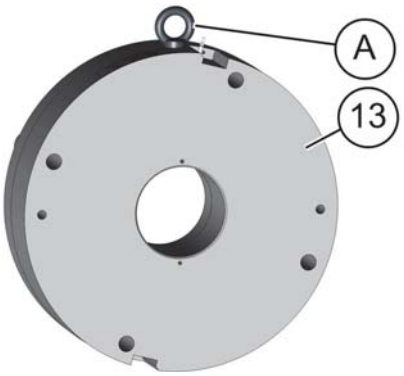

Figure 8-10

19. **On the design with levers for hand release only:**
    Slide the 2 tension blocks (16A) for brake body 2 (13) onto the 2 hexagon head bolts on the levers for hand release with the projection pointing towards the outer diameter of the brake and towards brake body 2 (13).
20. **On design with lever for hand release only:**
    Fit the 2 compression springs (16B) in brake body 2 (13).
21. **Caution:** Due to the great weight of the brake body, we recommend you to secure and change the brake body by using an eye bolt M12 (A) and appropriate lifting gear.

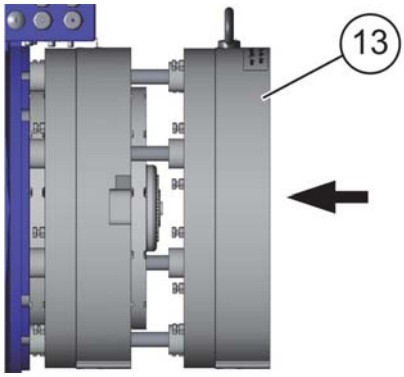

Figure 8-11

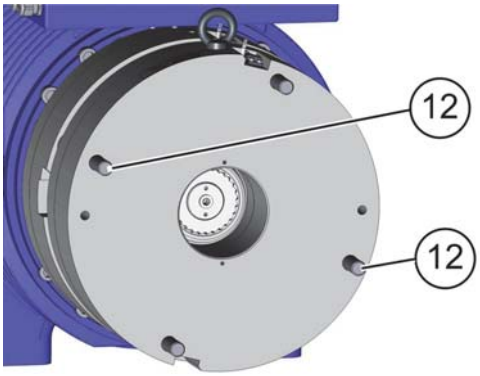

Figure 8-12

22. Slide on the brake body 2 (13).
23. Unscrew two of the threaded bolts (12).

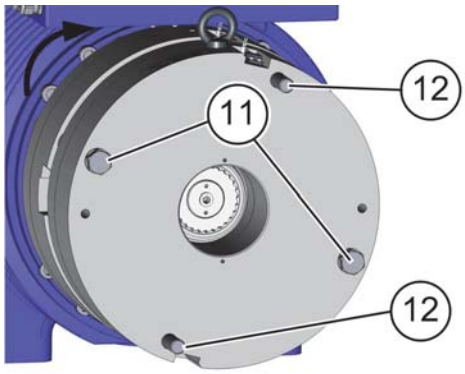

Figure 8-13

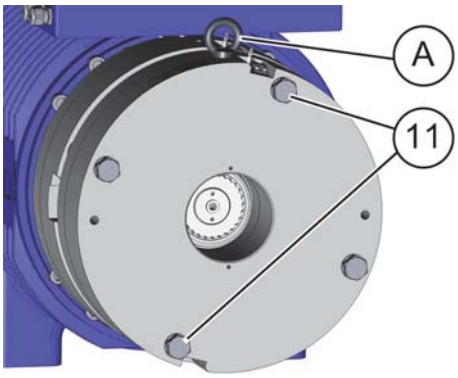

Figure 8-14

24. Replace the two threaded bolts (12) with fixing screws (11):
    RSO 1300 - Socket cap screw M16 x 250 (11)
    RSO 1800 - Hexagon head bolts M20 x 300 (11)
25. Tighten the brake body 2 (13) hand tight with the hexagon head bolts (11).
    Do not forget the washers!
26. Unscrew the two remaining threaded bolts (12).
27. Replace the two threaded bolts (12) with fixing screws (11):
    RSO 1300 - Socket cap screw M16 x 250 (11)
    RSO 1800 - Hexagon head bolts M20 x 300 (11)
28. Tighten the brake body 2 (13) hand tight with the fixing screws (11).
    Do not forget the washers!
29. Gradually tighten the 4 fixing screws (11) evenly crosswise using a torque wrench:
    RSO 1300 - Torque wrench with size 14 allen wrench - Tightening torque: 300 Nm
    RSO 1800 - Torque wrench with size 30 - Tightening torque: 410 Nm
30. Endue the fixing screws with anti tamper paint (22).
31. Unscrew12the lifting eye bolt (A).

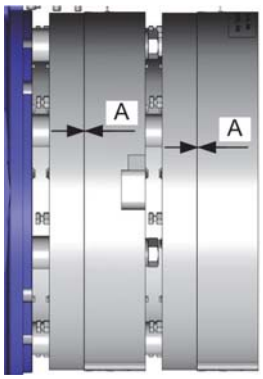

Figure 8-15

Figure 8-16

32. **Check the air gap “A” between the coil carrier and the armature disk when de-energised:**
    RSO 1300 - Air gap: 0.40 mm ≤ "A" ≤ 0.60 mm
    RSO 1800 - Air gap: 0.44 mm ≤ "A" ≤ 0.60 mm
    See brake operating instructions in the appendix to the original operating instructions.
    ✓ **If the air gaps are outside the tolerance, please contact our customer service.**
33. **Check the function of the hand release system:**
    Fit the pipe (18) on the hand release and operate.
    Required hand release force:
    RSO 1300 - Approx. 360 N
    RSO 1800 - Approx. 380 N
34. The shaft must now rotate freely.

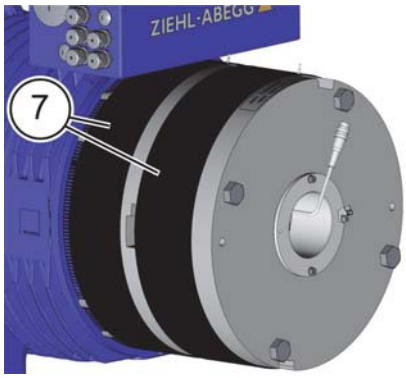

Figure 8-17

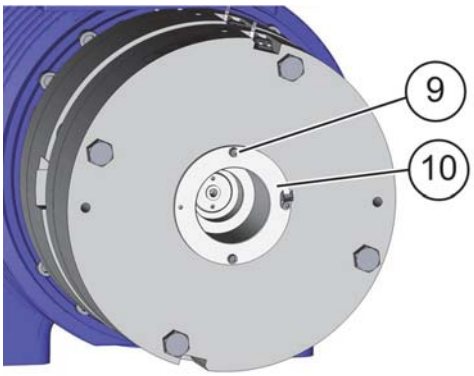

Figure 8-18

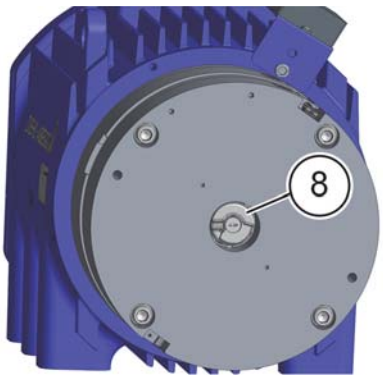

Figure 8-19A - ZAtop SM250.60B

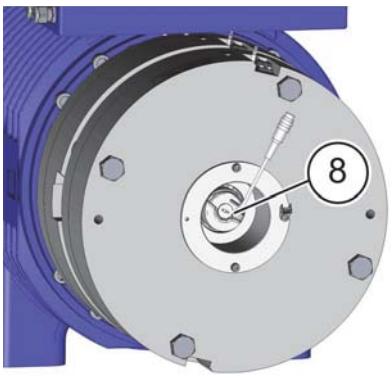

Figure 8-19B - ZAtop SM250.80D/100C

35. Tighten the cover hoods (7).
36. **ZAtop SM250.80D/100C:**
    Attach the encoder flange (10) with the fastening lug.
37. **ZAtop SM250.80D/100C:**
    Screw in the two socket cap screws M6 x 16 - 8.8 (9) and tighten with a torque wrench size 5 allen wrench.
    Tightening torque: 9.5 Nm
38. Mounting absolute encoder (8), see "Replacement of the absolute encoder A-TIA17_02-..."

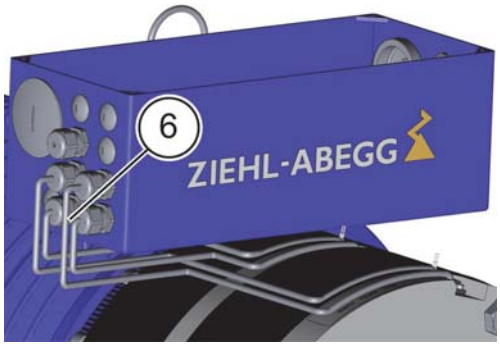

Figure 8-20

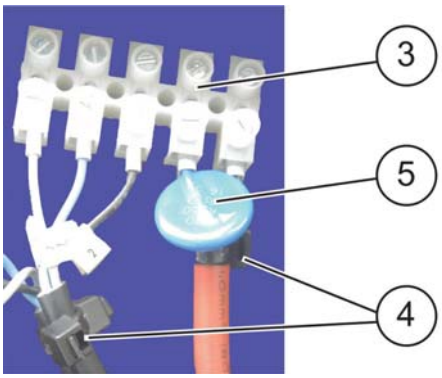

Figure 8-21

Brake wiring diagram with micro switch

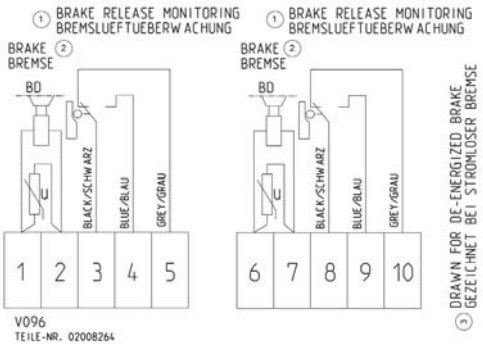

Figure 8-22
1 Brake release monitoring
2 Brake
3 Shown with currentless brake

Brake wiring diagram with inductive proximity switch

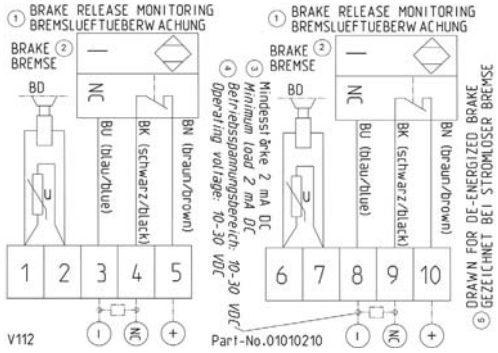

Figure 8-23
1 Brake release monitoring
2 Brake
3 Minimum strength 2 mA DC
4 Operating voltage range 10 - 30 V DC
5 Shown with currentless brake

39. Lead the connection cables (6) of the magnet coils and the release monitoring into the terminal box.
40. Connect the solenoids, release monitoring and varistors (5) as shown in the wiring diagram (see Figure 8-22 and Figure 8-23) inside the cover of the junction box (1).
41. Fit strain reliefs (4).

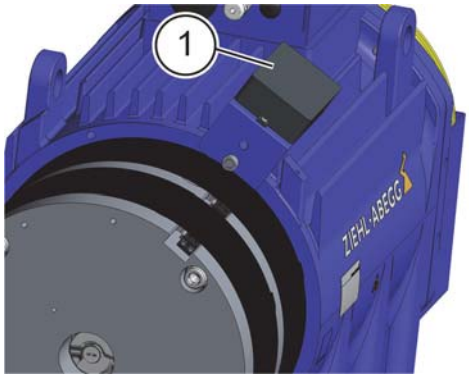

Figure 8-24A - ZAtop SM250.60B

Figure 8-24B - ZAtop SM250.80D/100C

42. Close the cover (1) of the junction box.
43. **ZAtop SM250.80D/100C:**
    Screw on the cover (1) with the 4 socket cap screws M5 x 10 - 8.8 (2) with a torque wrench for tightening torque 5.5 Nm with a size 4 allen wrench.
    Tightening torque: 5.5 Nm
44. Perform brake test (see chapter "Brake operating instructions - brake test" in the appendix at the original operating instructions).
45. Carry out the alignment of the absolute encoder (8) corresponding to the original operation instructions of the frequency inverter.

9 Functional test on microswitch/inductive proximity switch for release monitor

After mounting of the brake, a functional test must be performed on the micro switches/inductive proximity switches (see chapter "Brake operating instructions - release monitor" at the original operating instructions).
If the function is not available, please check the causes that may prevent the actuation of the micro switches/inductive proximity switches (see chapter "Brake operating instructions - release monitor" in the appendix). The micro switches/inductive proximity switches will otherwise have to be readjusted (see the chapter "Assembly and adjustment of release monitor with micro switches or inductive proximity switches" in the appendix at the original operating instructions).

10 Adjustment of the microswitch/inductive proximity switch for release monitor

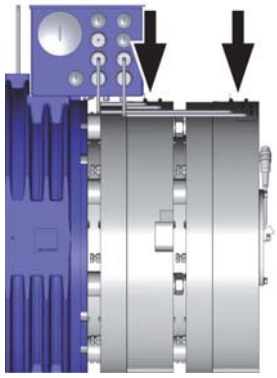

Figure 10-01

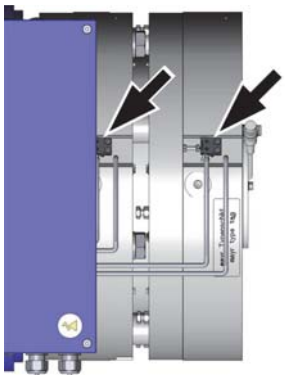

Figure 10-02

Adjustment of the microswitches/inductive proximity switches is only necessary if they are not working correctly.
The microswitches/inductive proximity switches are located on top of the brake (see arrow).
ATTENTION! It must be ensured that the appropriate microswitches/inductive proximity switches are selected for the magnet to be adjusted.
Adjustment of the release monitor with microswitches/inductive proximity switches, see “Assembly and adjustment of release monitor with microswitches or inductive proximity switches” chapter in the appendix at the original operating instructions.

11 Disposal / recycling

Disposal must be carried out professionally and environmentally friendly in accordance with the legal stipulations.

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