AC Motors
**DRN71 – 315**
with Encoder AK8Y
1 Revision

INFORMATION

This revision describes amendments made to the "AC Motors DR..71 – 315, DRN63 – 315, DR2..56 – 80" operating instructions (edition 06/2019). The following chapters of the operating instructions have been amended/revised:

- Chapter "Inspection and maintenance" > "Motor and brake maintenance – preliminary work" > "Removing and mounting conical encoder on DRN71 – 132S, DR2..71 – 80 motors"
1.1 Removing and mounting the conical encoder AK8Y on DRN71 – 132S, DR2..71 – 80 motors

1.1.1 Removing the AK8Y encoder

1. Unscrew the screws [E].
2. Remove the connection cover [619] from the connection adapter [1164].
3. Loosen the screws [D] in the lower part [C].
   ⇒ Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the safety cover [361].
4. Unscrew the screws [34].
5. Remove the safety cover [361] from the motor. When doing this, slide the connection adapter [1164] out of the recess.
6. Unscrew the screws [232].
7. Unscrew the screws [22].
8. Remove the fan guard [35] over the encoder [220]. Guide the connection adapter [1164] with the signal cable through the cutout of the fan guard [35].
9. To break the conical connection, turn the encoder shaft in the conical bore of the rotor [1]. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
10. Remove the encoder [220] from the rotor [1].

1.1.2 Mounting the AK8Y encoder
1. Clean the cone of the encoder [220] and the rotor [1].
2. Insert the encoder [220] into the conical bore of the rotor [1].
3. To fasten the encoder [220], screw the encoder shaft into the conical bore. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
   ➔ Tightening torque 9 Nm.
4. Mount the fan guard [35] over the encoder [220]. When doing this, guide the connection adapter [1164] with the signal line through the central grille cutout of the fan guard [35].
5. Use the screws [22] to secure the fan guard [35] to the rear endshield or brake endshield [42] of the motor.
   ➔ Tightening torque 3.3 Nm.
6. Screw the screws [232] through the grille of the fan guard [35] and into the nuts of the torque arm [1889].
   ➔ If you need to turn the encoder [220] in order for the screws to reach the nuts of the torque arm, turn the encoder [220] clockwise.
   ➔ Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the safety cover [361].
   ➔ Tightening torque 3.3 Nm.
7. Push the connection adapter [1164] into the cutout on the safety cover [361] as far as the end of the cutout on the forced cooling fan [170] that faces away from the motor.
8. Place the safety cover [361] onto the fan guard [35].
   ➔ The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].
   ➔ If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.
9. Fasten the safety cover [361] with the screws [34] and washers [33].
   ➔ Tightening torque 2 Nm.
10. Turn the connection adapter [1164] clockwise up to the stop.
11. Secure the connection adapter [1164] in place by tightening the screws [D].
   ➔ Tightening torque 2 Nm.
12. Place the connection cover [619] onto the connection adapter [1164].
13. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].
   ⇒ Tightening torque 2.5 Nm.

1.1.3 Removing the encoder AK8Y with the forced cooling fan option

1. Unscrew the screws [E].
2. Remove the connection cover [619] from the connection adapter [1164].
3. Loosen the screws [D] in the lower part [C].
   ⇒ Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the forced cooling fan [170].
4. Loosen the screws [22].
5. Unscrew the screws [34].
6. Remove the forced cooling fan [170] from the motor. When doing this, slide the connection adapter [1164] out of the recess.
7. Unscrew the screws [232].
8. Remove the signal cable from the slot of the cable retainer [1900].
9. Unscrew the screws [22].
10. Remove the fan guard [35] over the encoder [220]. Guide the connection adapter [1164] with the signal cable through the cutout of the fan guard [35].
11. To break the conical connection, turn the encoder shaft in the conical bore of the rotor [1]. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
12. Remove the encoder [220] from the rotor [1].

1.1.4 Mounting the encoder AK8Y with the forced cooling fan option

1. Clean the cone of the encoder [220] and the rotor [1].
2. Insert the encoder [220] into the conical bore of the rotor [1].
3. To fasten the encoder [220], screw the encoder shaft into the conical bore. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
   ⇒ Tightening torque 9 Nm.
4. Mount the fan guard [35] over the encoder [220]. When doing this, guide the connection adapter [1164] with the signal line through the central grille cutout of the fan guard [35].
6. Screw the screws [232] through the grille of the fan guard [35] and into the nuts of the torque arm [1889].
   ⇒ If you need to turn the encoder [220] in order for the screws to reach the nuts of the torque arm, turn the encoder [220] clockwise.
   ⇒ Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the forced cooling fan [170].
   ⇒ Tightening torque 3.3 Nm.
Removing and mounting the conical encoder AK8Y on DRN71 – 132S, DR2..71 – 80 motors

7. **CAUTION!**
   Improper mounting can cause damage to the equipment. Damage to the signal cable.
   Insert the signal cable of the encoder [220] into the curve of the cable support [1900] so that the signal cable does not touch the rotating forced cooling fan.

   ⇒ The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].

   ⇒ If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.

8. To turn the cable retainer [1900], loosen the set screw [1927].

9. To secure the cable retainer [1900] in place, tighten the set screw [1927].

   ⇒ Tightening torque 1.8 Nm.

10. Place the forced cooling fan [170] onto the fan guard [35].

11. Insert the connection adapter [1164] into the recess of the forced cooling fan [170]. The standard alignment of the recess points towards the terminal box.

12. Use the screws [22] to secure the fan guard [35] to the rear endshield or brake endshield [42] of the motor.

   ⇒ Tightening torque 3.3 Nm.

13. Fasten the forced cooling fan with the screws [34] and washers [33].

   ⇒ Tightening torque 2 Nm.

14. Push the connection adapter [1164] into the cutout on the safety cover [361] as far as the end of the cutout on the forced cooling fan [170] that faces away from the motor.

15. Turn the connection adapter [1164] clockwise up to the stop.

16. Secure the connection adapter [1164] in place by tightening the screws [D].

   ⇒ Tightening torque 2 Nm.

17. Place the connection cover [619] onto the connection adapter [1164].

18. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].

   ⇒ Tightening torque 2.5 Nm.
1.2 Removing and mounting the conical encoder AK8Y on DRN132M – 315 motors

[Diagram with parts labeled]

- [1] Rotor
- [22] Screw (hexagonal)
- [33] Washer
- [34] Screw (Phillips head)
- [35] Fan guard
- [42] Rear endshield
- [220] Encoder
- [232] Screw (hexalobular)
- [361] Safety cover
- [619] Connection cover
- [1164] Connection adapter
- [1889] Insulation coupling
- [1895] Support ring/spacer ring
- [1896] Screw (hexalobular)
- [1897] Screw (hexagon socket head)

- [1898] Clamp
- [1899] Cage nut
- [1900] Cable support
- [1902] Threaded sleeve
- [1901] Accessory bag
- [1902] Threaded sleeve
- [1927] Set screw
- [1929] Accessory bag
- [B] T-slot nut
- [C] Lower part
- [D] Screw
- [E] Screw

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1.2.1 Removing the AK8Y encoder

1. Unscrew the screws [E].

2. Remove the connection cover [619] from the connection adapter [1164].

3. Loosen the screws [D] in the lower part [C].

→ Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the safety cover [361].

4. Unscrew the screws [34].

5. Remove the safety cover [361] from the motor. When doing this, slide the connection adapter [1164] out of the recess.

6. Unscrew the screws [232].

7. Unscrew the screws [22].
8. Remove the fan guard [35] over the encoder [220]. Guide the connection adapter [1164] with the signal cable through the cutout of the fan guard [35].

9. To break the conical connection, turn the encoder shaft in the conical bore of the rotor [1]. Apply the necessary force at the wrench flat SW10 on the encoder shaft. Counter at the rotor.

10. In the case of the insulation coupling option: Counter at the wrench flat SW30 of the insulation coupling.

11. Remove the encoder [220] from the rotor [1].

12. For optional insulation coupling: Remove the encoder [220] from the insulation coupling [1891].

### 1.2.2 Mounting the AK8Y encoder

1. Clean the cone of the encoder [220] and the rotor [1].

2. For optional insulation coupling: Clean the cones of the insulation coupling [1891].

3. For optional insulation coupling: The insulation coupling [1891] must be mounted before the encoder is mounted. Insert the insulation coupling [1891] into the conical bore of the rotor [1]. To secure the insulation coupling in place, tighten the central retaining screw.
   - Tightening torque 3.3 Nm.

4. Insert the encoder [220] into the conical bore of the rotor [1].

5. In the case of the insulation coupling option: Insert the encoder [220] into the conical bore of the insulation coupling [1891].

6. To fasten the encoder [220], screw the encoder shaft into the conical bore. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
   - Tightening torque 9 Nm.

7. In the case of the insulation coupling option: To fasten the encoder [220], screw the encoder shaft into the conical bore of the insulation coupling [1891].
   - Counter at the wrench flat SW30 of the insulation coupling.
   - Tightening torque 9 Nm.

8. Mount the fan guard [35] over the encoder [220]. When doing this, guide the connection adapter [1164] with the signal line through the central grille cutout of the fan guard [35].

9. Use the screws [22] to secure the fan guard [35] to the rear endshield or brake endshield [42] of the motor.
   - DRN132M – L: Tightening torque 11.3 Nm.
   - DRN160 – 280: Tightening torque 27.3 Nm.
   - DRN315: Secure the screws [22] in place with medium-strength thread locker. Tightening torque 5 Nm.

10. Screw the screws [232] through the support ring/spacer ring [1895] or the grille on the fan guard [35] into the nuts on the torque arm [1889].
   - Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the safety cover [361].
   - Tightening torque 3.3 Nm.

11. Place the safety cover [361] onto the fan guard [35].
   - The standard alignment of the recess points towards the terminal box.
The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].

If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.

12. Fasten the safety cover [361] with the screws [34] and washers [33].
   - Tightening torque 4.5 Nm.

13. Push the connection adapter [1164] into the cutout on the safety cover [361] as far as the end of the cutout on the forced cooling fan [170] that faces away from the motor.

14. Turn the connection adapter [1164] clockwise up to the stop.

15. Secure the connection adapter [1164] in place by tightening the screws [D].
   - Tightening torque 2 Nm.

16. Place the connection cover [619] onto the connection adapter [1164].
17. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].
   - Tightening torque 2.5 Nm.

1.2.3 Removing the encoder AK8Y with the forced cooling fan option

1. In motors of sizes 250 – 315: If the screws [1893] are available, unscrew the screws. Remove the supporting plate [1892]. Push the sealing profile [1310]/[1965] out of the cutout.

2. Unscrew the screws [E].

3. Remove the connection cover [619] from the connection adapter [1164].

4. Loosen the screws [D] in the lower part [C].
   - Only unscrew the screws [D] to such an extent that the connection adapter [1164] can be moved in the recess of the forced cooling fan [170].

5. Unscrew the screws [22].

6. Remove the forced cooling fan [170] from the motor. When doing this, slide the connection adapter [1164] out of the recess.

7. Unscrew the screws [232].

8. Remove the signal cable from the slot of the cable retainer [1900].

9. To remove the torque arm [935], loosen the screw [936]/hex nut [937]. Guide the connection adapter [1164] with the signal cable through the cutout of the torque arm [935].

10. To break the conical connection, turn the encoder shaft in the conical bore of the rotor [1]. Apply the necessary force at the wrench flat SW10 on the encoder shaft.

11. In the case of the insulation coupling option: Counter at the wrench flat SW30 of the insulation coupling.

12. Remove the encoder [220] from the rotor [1].

13. For optional insulation coupling: Remove the encoder [220] from the insulation coupling [1891].
1.2.4 Mounting the encoder AK8Y with the forced cooling fan option

1. Clean the cone of the encoder [220] and the rotor [1].

2. For optional insulation coupling: Clean the cones of the insulation coupling [1891].

3. For optional insulation coupling: The insulation coupling [1891] must be mounted before the encoder is mounted. Insert the insulation coupling [1891] into the conical bore of the rotor [1]. To secure the insulation coupling in place, tighten the central retaining screw.
   ⇒ Tightening torque 3.3 Nm.

4. Insert the encoder [220] into the conical bore of the rotor [1].

5. In the case of the insulation coupling option: Insert the encoder [220] into the conical bore of the insulation coupling [1891].

6. To fasten the encoder [220], screw the encoder shaft into the conical bore. Apply the necessary force at the wrench flat SW10 on the encoder shaft.
   ⇒ Tightening torque 9 Nm.

7. In the case of the insulation coupling option: To fasten the encoder [220], screw the encoder shaft into the conical bore of the insulation coupling [1891].
   ⇒ Counter at the wrench flat SW30 of the insulation coupling.
   ⇒ Tightening torque 9 Nm.

8. Guide the torque arm [935] over the connection adapter [1164] and the encoder [220].

9. For optional insulation coupling: Mount the spacer bolt [1625].
   ⇒ M6 screw: Tightening torque 11.3 Nm.
   ⇒ M8 screw: Tightening torque 27.3 Nm.

10. When mounting the torque arm [935], make sure it is aligned centrally to the encoder [220]. Screw in the screw [936]/hex nut [937] with the spacer bushings [934].
    ⇒ M6 screw: Tightening torque 11.3 Nm.
    ⇒ M8 screw: Tightening torque 27.3 Nm.

11. **CAUTION!**
    Improper mounting can cause damage to the equipment. Damage to the signal cable. Insert the signal cable of the encoder [220] into the curve of the cable support [1900] so that the signal cable does not touch the rotating forced cooling fan.

12. To turn the cable retainer [1900], loosen the set screw [1927].

13. To secure the cable retainer [1900] in place, tighten the set screw [1927].
    ⇒ Tightening torque 1.8 Nm.

14. To secure the torque arm [1889] of the encoder in place, screw the screws [232] into the bores of the torque arm [935].
    ⇒ Make sure the signal cable is of a sufficient length so that the connection adapter [1164] can be inserted into the recess of the forced cooling fan [170].

15. Insert the connection adapter [1164] into the recess of the forced cooling fan [170]. The standard alignment of the recess points towards the terminal box.
    ⇒ The arrow that is cast in the lower part [C] of the connection adapter [1164] indicates the direction of the subsequent cable outlet for the connection cover [619].
If you wish to change the direction of the cable outlet: Unscrew the screws [D]. Twist the lower part [C] against the T-slot nut [B]. Screw in the screws [D]. When doing so, only tighten the screws [D] lightly.

16. Place the forced cooling fan [170] onto the rear endshield or brake endshield [42].

17. Fasten the forced cooling fan [170] with the screws [22] on the rear or brake endshield [42] of the motor.

- DRN132M – L: Tightening torque 11.3 Nm.
- DRN160 – 280: Tightening torque 27.3 Nm.
- DRN315: Secure the screws [22] in place with medium-strength thread locker. Tightening torque 5 Nm.

18. Push the connection adapter [1164] into the cutout on the safety cover [361] as far as the end of the cutout on the forced cooling fan [170] that faces away from the motor.

19. Turn the connection adapter [1164] clockwise as far as the stop.

20. In motors of sizes 250 – 315: To fasten the supporting plate [1892], screw in the screws [1893]. Push the sealing profile [1310]/[1965] into the cutout.

21. Secure the connection adapter [1164] in place by tightening the screws [D].

- Tightening torque 2 Nm.

22. Place the connection cover [619] onto the connection adapter [1164].

23. Screw the screws [E] through the bores on the connection cover [619] into the bores on the connection adapter [1164].

- Tightening torque 2.5 Nm.