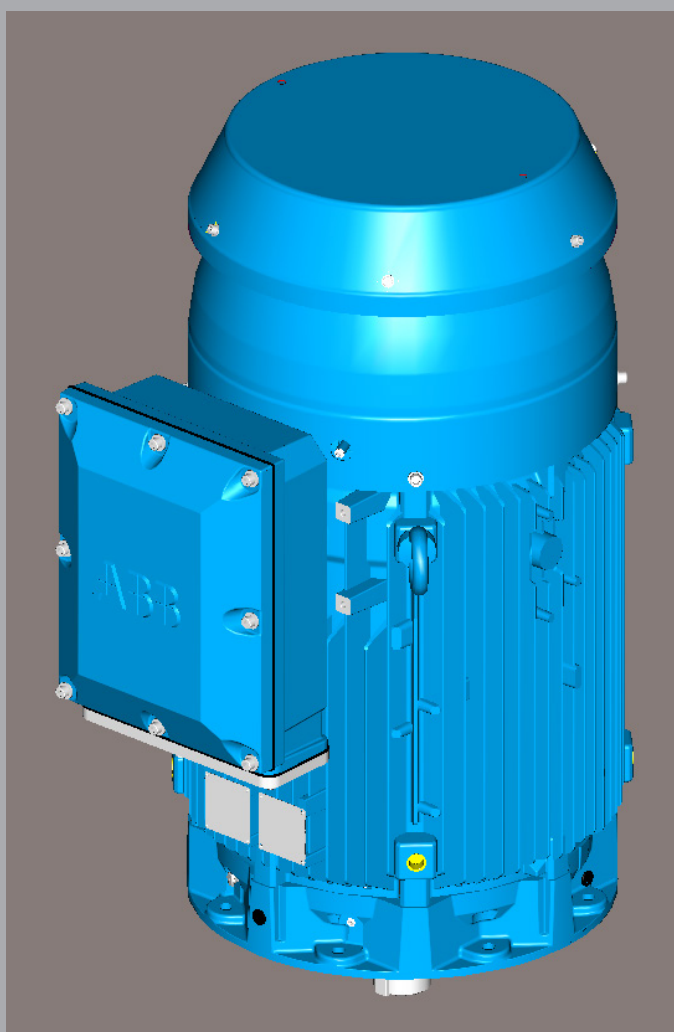


Marine motors

Additional manual for open deck marine motors

Cast iron motors IEC 160 - 450



Additional manual for open deck marine motors

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NOTE!

This document is supplementary to the manual for standard low voltage motors that is provided with the motor. When the same issues are addressed in both documents, instructions given in this document will prevail.

1. General

These instructions apply to motors in marine applications with IP 56 protection class, mounted on the open deck of ships or offshore units.

In addition to these instructions, the rules issued by marine classification societies must be followed when installing and using the motor.

The motor's condensation heaters should always be charged when the motor is at a standstill.

All screws should be tightened to the torque given in Table 1. A thread locker compound (low or medium strength) should be used to lock and seal the screws mentioned in this manual.

Table 1.

Screw	Torque [Nm]
M6	10
M8 CS *	13
M8	23
M10 CS *	26
M10	46
M12	79

* Terminal box cover screw (thinned, partly threaded)

2. Terminal box

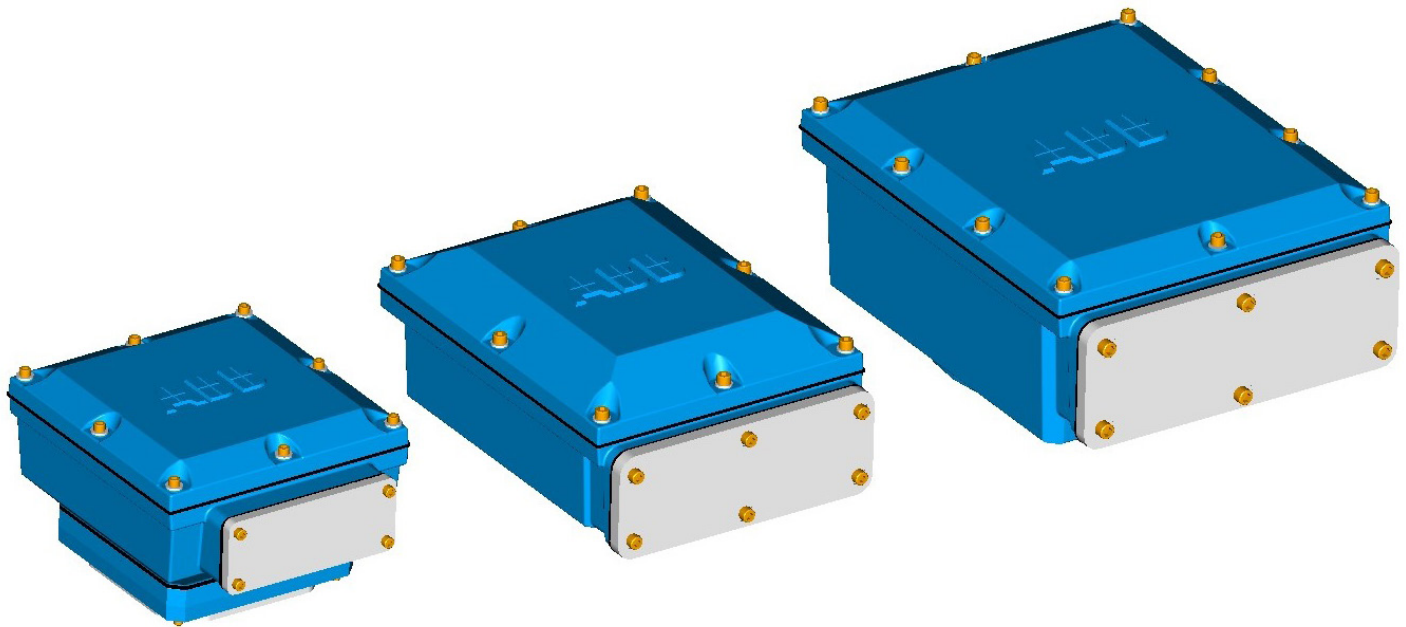


Figure 1. Examples of terminal boxes in open deck motors (except for M3JP Ex d motors)

ABB cannot guarantee the tightness of the terminal box if the instructions given in this manual are not followed. (The warranty is valid only for terminal boxes that have been assembled in the correct order.) Use only original parts supplied with the motor or by ABB, together with high quality cable glands for offshore use, of the appropriate size and protection class.

The M3 motor terminal box can be turned by 90 degrees four times. For vertically mounted motors, the terminal box must be turned so that the main cables point downward.

The plugs on the terminal box should be removed only if they are replaced by a cable gland.

Terminal box seals are glued to the terminal box frame. At the beginning of assembly, confirm through visual inspection that the terminal box cover seal, gland plate seal and terminal box frame seal (if the frame is removed) are properly in place, and that they are in good condition (Figure 2). Make sure that the inside surfaces and especially the sealing surfaces are clear of any foreign substances.

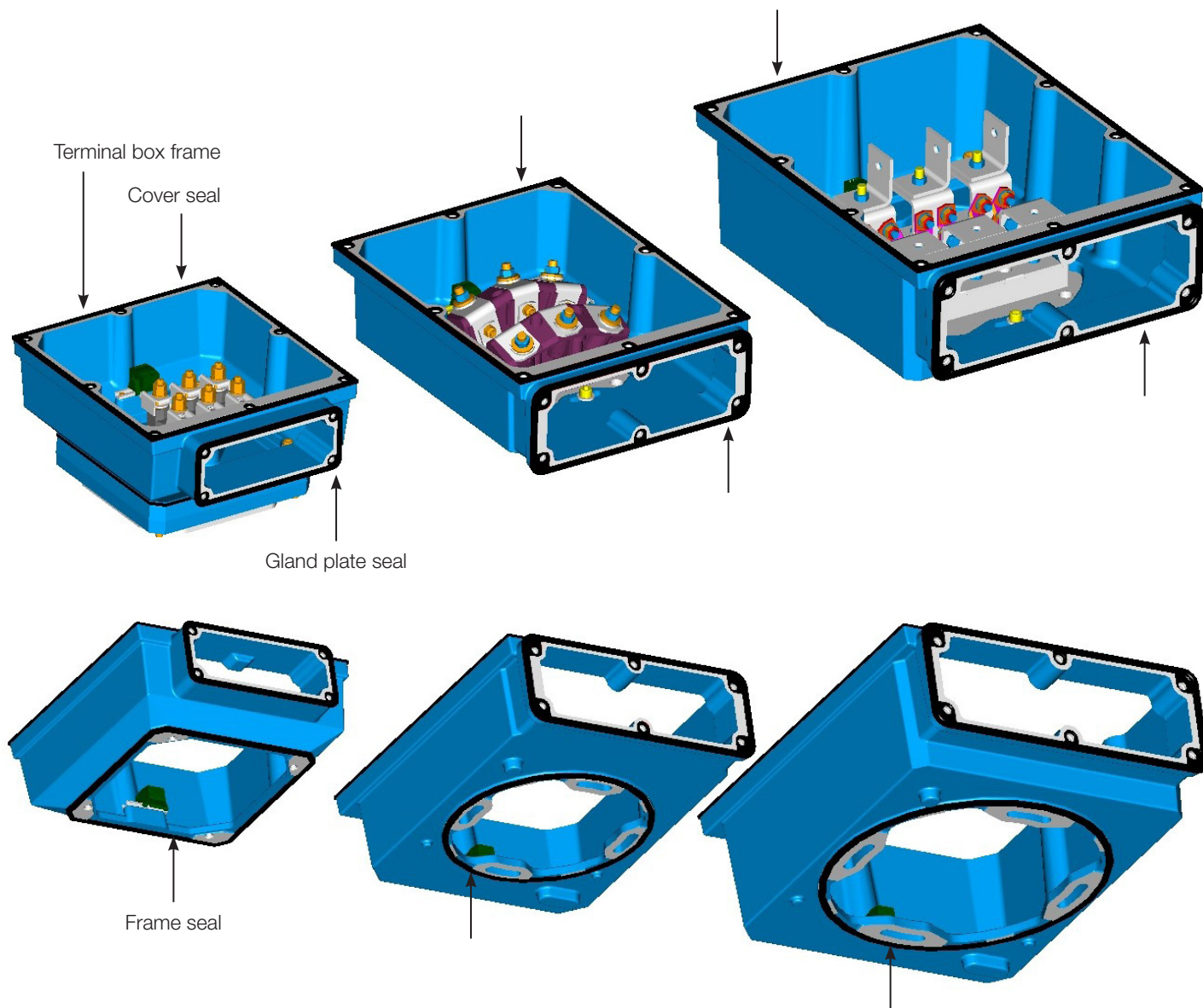


Figure 2. Terminal box seals

3. Assembly instructions for terminal box

Note!

Instructions given in this section apply to the terminal box type where the cable entrance is in the terminal box frame and not split between frame and terminal box cover.

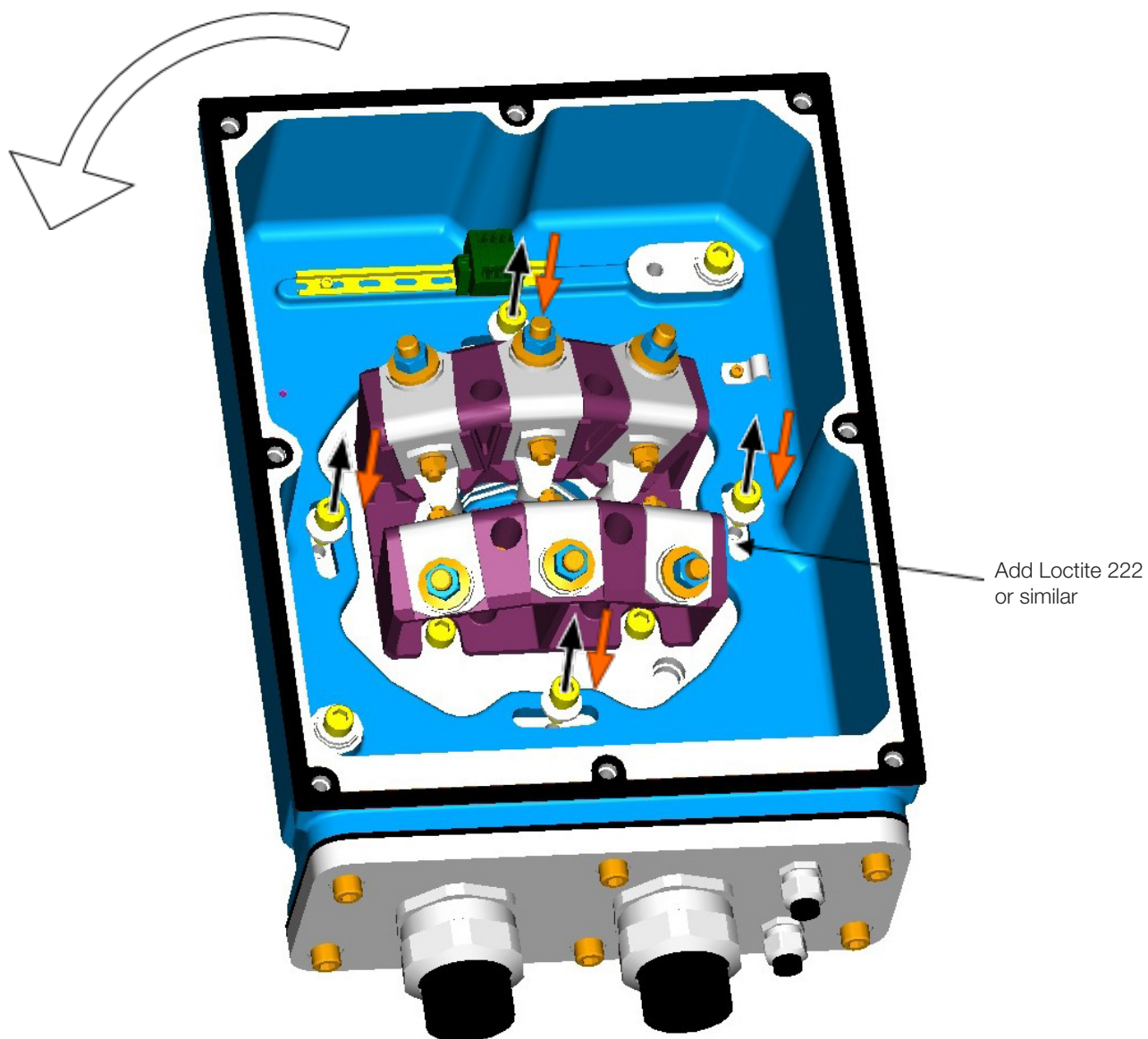
Note!

Before opening the terminal box, read and follow all warning and instruction labels attached to the motor.

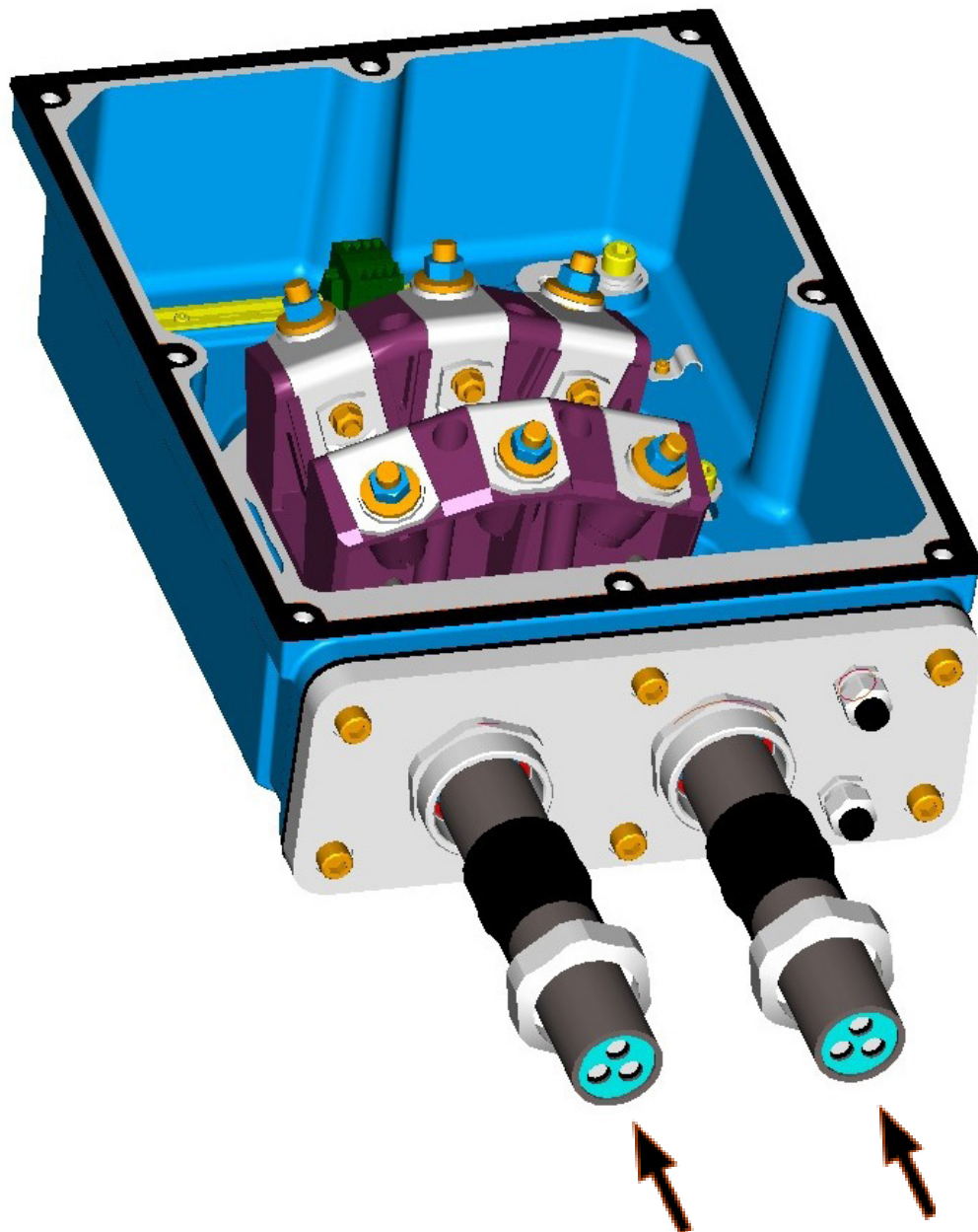
1. If you want to replace the gland plate:
Remove old plate and mount a new gland plate delivered by ABB.
2. Unscrew the terminal box cover screws until screws rotate completely freely (do not detach screws from the cover) and remove the terminal box cover.
3. If you want to rotate the terminal box frame:
Unscrew the screws on terminal box frame. Turn the terminal box into a desired position. In case of vertically mounted motors, turn the terminal box so that the main cables are pointing downward. Add thread locking compound, (Loctite 222 or similar) to the terminal box frame screws and tighten them to the proper torque (see Table 1).

Note!

Prevent the terminal box frame from falling when removing the screws on the terminal box.



4. Prepare the cable and cable gland according to the assembly instructions for the cable gland. Gland plate can be removed to make installation easier. Push the cable(s) through the glands and gland plate and connect to the terminals. Follow the connection diagram inside the terminal box cover and the mounting instructions following the connection parts. Connect accessories such as anti-condensation heaters or temperature detectors in the same way as with the main cables.



5. Re-assemble the cable gland(s) according to the assembly instructions for the cable gland.
6. Visually inspect the terminal box cover seal and gland plate seal to confirm that they are intact. Mount the terminal box cover. Tighten the terminal box cover screws until the cover seal is squeezed by all four corners of the terminal box cover. Tighten the terminal box cover screws to proper torque (see Table 1).

4. Maintenance

WARNING!

Disconnect the motor before working near rotating motor parts.

4.1 General

While washing or defrosting the motor, do not direct water or steam jet at the terminal box or bearing parts.

4.2 Protection

Motors may have unused holes in the flange endshield at drive end. These holes must be plugged.

4.3 Lubrication

Note!

Instructions for emptying grease collectors only apply to vertically mounted (V1) motors. Horizontally mounted motors do not have grease collectors or grease collection chambers as standard.

Only for motors with regreasing nipples

Motors are equipped with a lubrication plate. For more information, see the lubrication section in the 'Installation, operation, maintenance and safety manual' for low voltage motors.

The motors with regreasing nipples should be lubricated at least, once a year even if the duty hours given on the lubrication plate have not been exceeded.

Place the cap back on the grease nipples and SPM-nipples after lubrication.

Motor sizes IEC 160 to 250

As standard, motors with permanently greased bearings do not have a grease collector chamber, but the ones that have grease nipples also have a grease collector chamber next to the shaft both at the drive end (next to the shaft) and non drive end (see Figure 3).

The motor must be relubricated and the grease collector chambers emptied as often as instructed in the lubrication plate or in the labels (see figure 3) attached to the motor, however every 10 years at the minimum (every second docking).

Use medium strength thread locking compound to secure screw connections after removing grease.

Reassemble motor parts in reverse order after lubrication.

Motor sizes IEC 280 to 450

Motors of this size usually have a grease collection chamber at the drive and non-drive end, or only at the non-drive end.

If the motor does not have a grease outlet lever pointing out from the fan cover or from the end shield at the D-end, then it has a grease collection chamber (see Figure 4).

The motor must be relubricated and the grease chamber emptied as often as instructed on the lubrication plate or in the labels (see figure 4) attached to the motor, however every 5 years at the minimum (every docking). Reassemble motor parts in reverse order after lubrication.

Use medium strength thread locking compound to secure screw connections after removing grease.

4.4 Rotary shaft seal

Inspect the condition of the rotary shaft seals (such as gamma seal or radial seal) and, if necessary, change the seals every 5 to 10 years.

The wear of the radial seal and the counterfacing surface of the bearing cover depend on rotation speed. If the motor is typically run at over 1000 rpm, due to centrifugal force it begins to wear less as the contact pressure of seal lip decreases. The higher the rotation speed, the less the wear. The seals can be inspected when the grease collectors are emptied.

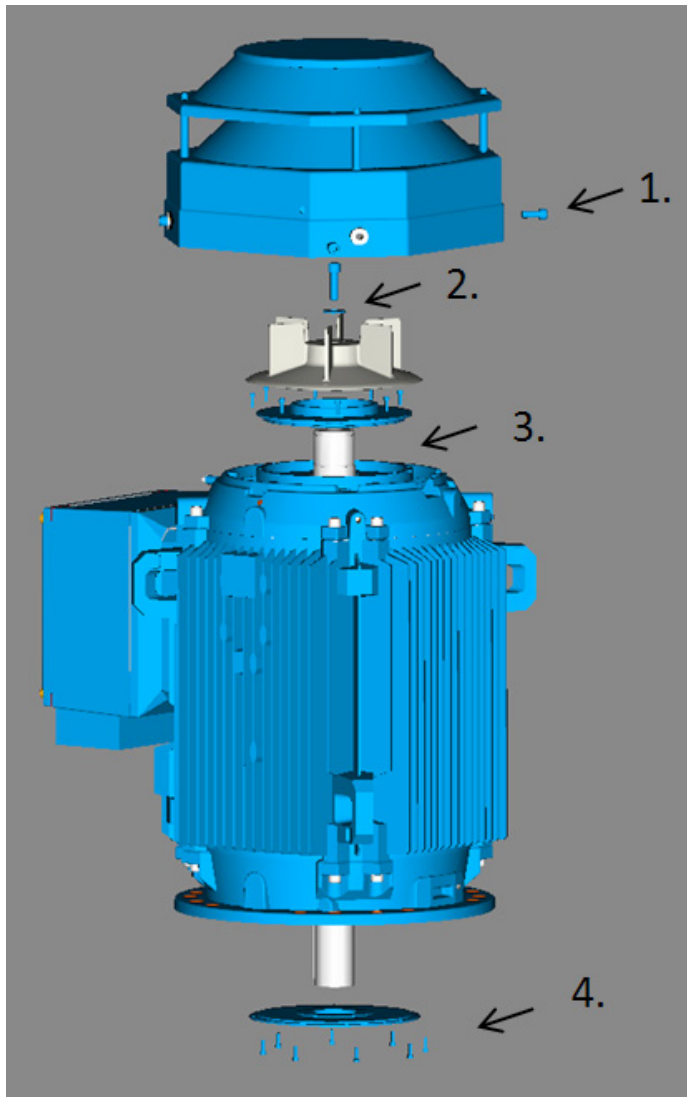
When inspecting and (or) changing the seals or bearing cover etc., see dismantling and re-assembly section in the "Installation, operation, maintenance and safety manual".

4.5 Spare parts

See the spare parts section in the 'Installation, operation, maintenance and safety manual'.

WARNING!

Disconnect the motor before working near rotating motor parts.



1. Remove fan cover screws and fan cover.
2. N-end: Unscrew fan bolt and washer and pull out the fan.
3. Unscrew and remove grease collector cover. Remove waste grease by scraping the collector empty.
4. D-end: Dismount the motor and remove coupling to remove grease as in the N-end.

Note!

Use medium strength thread locking compound to secure screw connections.

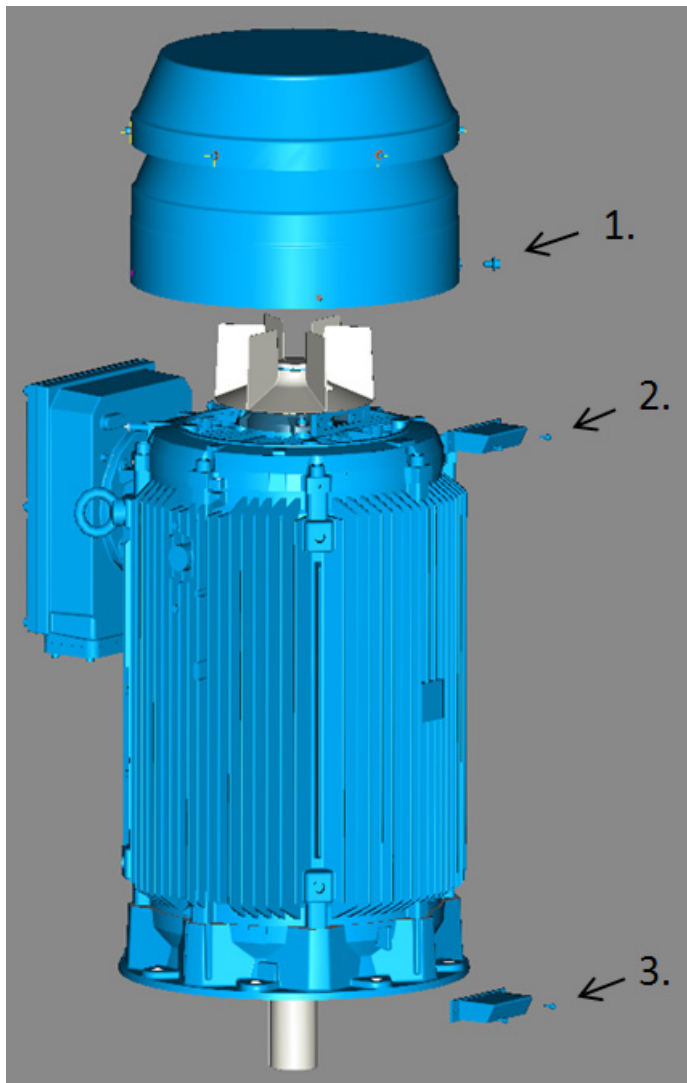
Figure 3. Removing waste grease, motor sizes 160 – 250



NOTE! Motor is equipped with grease collection boxes under the fan cover and at DE. Empty the grease boxes every 12th lubrication time or every 10 year. See manual 3GZF5000930-93. Ensure motor is disconnected during the procedure.

WARNING!

Disconnect the motor before working near rotating motor parts.



1. Remove fan cover screws and fan cover.
2. ND-end: Unscrew and remove grease collection box. Remove waste grease from the box.
3. The motor may have grease collection box at D-end. Usually it can be emptied through a hatch or by other means. If not possible, dismount the motor and empty grease collection box as in the ND-end.

Note!

Use medium strength thread locking compound to secure screw connections.

Figure 4. Removing waste grease, motor sizes 280 – 450

<p>NOTE! MOTOR IS EQUIPPED WITH A GREASE COLLECTION BOX UNDER THE FAN COVER. EMPTY THE GREASE BOX EVERY 6:TH LUBRICATION TIME OR EVERY 5 YEAR.</p>	<p>ACHTUNG! DER MOTOR IST MIT EINER FETTBLASSKAMMER UNTER DER LÜFTERHAUBE AUSGERÜSTET. DIE KAMMER NACH JEDER 6. NACHSCHMIERUNG ODER JEDES 5. JAHR ENTLEREEN.</p>	<p>AVERTISSEMENT! MOTEUR ÉQUIPÉ AVEC RÉCUPÉRATEUR DE GRAISSE SITUÉ SOUS LE CAPOT DU VENTILATEUR. IL DOIT ÊTRE VIDÉ TOUS LES 6 REGRAISSAGES OU TOUS LES 5 ANS.</p>
<p>MAKE SURE THAT MOTOR IS DISCONNECTED DURING THE PROCEDURE!</p>	<p>SICH VERGEWISSERN, DASS DER MOTOR WÄHREN DER ENTLERUNG VOM NETZ GETRENNT IST!</p>	<p>VERIFIER QUE LE MOTEUR EST COUPÉ DU RÉSEAU ÉLECTRIQUE PENDANT CETTE OPÉRATION!</p>

4.6 Yearly maintenance

- Regrease the motor while it is running. See section “Lubrication”.
- Disassemble and clean the inside surfaces of the fan cover, if needed, to ensure free air flow.

Note!

The motor must be disconnected during this procedure.

- Check the paint on the motor and touch up with new paint if required.
- Make sure plastic and rubber plugs on the motor are properly in place.
- Corrosion protection treatment should be applied to the shaft ends. Tectyl 8721 or similar can be used for corrosion protection.

4.7 Maintenance every 5 or 10 years (or as instructed by labels on the motor)

- Follow the instructions given in section Yearly Maintenance.
- Empty the D- and ND-end grease collection chambers. For details see section Lubrication.
- Inspect and if needed replace the rotary shaft seals (such as gamma seal or radial seal). For more information, see the section Rotary shaft seal.

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