MGE and MLE model K

Service instructions



GRUNDFOS

MGE and MLE model K

English (GB)

Service instructions 4

Original service instructions

Table of contents

1. General information 5
1.1 Hazard statements 5
1.2 Notes 5
1.3 Safety information for working on the product 5

2. Torques 6

3. Secondary materials 7

4. Tightening sequences 7

5. Service tools 8

6. Megging of the motor 9

7. High voltage test of electronics 9

8. Lifting the product 10
8.1 Lifting the terminal box 10
8.2 Lifting the complete motor unit 11

9. Replacing hardware 12
9.1 Replacing the terminal box cover 12
9.2 Replacing the operating panel 12
9.3 Replacing the CIM module 13
9.4 Replacing the cover for stator cables 13
9.5 Replacing the cover for mains cables 14
9.6 Replacing the isolation cover 14
9.7 Replacing the functional module 14
9.8 Replacing the busbar 15
9.9 Replacing the filter board 16
9.10 Replacing the power board 17
9.11 Replacing the lower part complete 18
9.12 Replacing the terminal box 19
9.13 Replacing the fan 20
9.14 Replacing the bearings 20
9.15 Replacing the seal rings or gamma rings 22

10. Configuring the drive 24
10.1 Connection to the drive by means of Grundfos GO Link using Ethernet connection 24
10.2 Connection to the drive by means of Grundfos GO Link using PC-Tool Link 24
10.3 Connection to the drive by means of Grundfos GO Link using MI301 24
10.4 Connection to the drive by means of Grundfos GO via Bluetooth (BLE) 24
10.5 Configuring the drive using Grundfos GO Link 25

11. Lubricating the bearings 25
11.1 Motor bearing monitoring 25

12. Fault finding 26
12.1 General information 26
12.2 Fault and warning signals 27
12.3 Functional module 30
12.4 Power board 33
12.5 Winding resistance 34

13. Exploded view 36

14. Disposing of the product 37

1. General information

Read this document before you start service work on the product. Service work must comply with local regulations and accepted codes of good practice.

Observe the safety instructions for the product.

1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

SIGNAL WORD

Description of the hazard

Consequence of ignoring the warning

- Action to avoid the hazard.

1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

Observe these instructions for explosion-proof products.

A blue or grey circle with a white graphical symbol indicates that an action must be taken.

A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.

If these instructions are not observed, it may result in malfunction or damage to the equipment.

Tips and advice that make the work easier.

1.3 Safety information for working on the product

These service instructions apply to MGE and MLE model K motors.

The safety instructions for this product and for the system which it is part of must be available during service of the product.

Position numbers of parts (digits) refer to drawings and parts lists; position numbers of tools (letters) refer to the section about service tools.

Electrical parts must only be serviced by Grundfos or an authorised service workshop.

WARNING

Biological hazard

Death or serious personal injury

- Use personal protective equipment if there is a risk of getting into contact with the pumped liquid.
- Observe local regulations.

WARNING

Hot surface

Death or serious personal injury

- Do not touch the product while it is running. Allow surfaces to cool before servicing.

CAUTION

Sharp element

Minor or moderate personal injury

- When servicing the product, wear protective gloves to avoid cutting your hands on sharp edges.

CAUTION

Cold surface

Minor or moderate personal injury

- Make sure that no one can accidentally come into contact with cold surfaces. Wear protective gloves.

Before dismantling

DANGER

Electric shock

Death or serious personal injury

- Switch off the power supply and make sure that it cannot be accidentally switched on. The power supply must be switched off for at least five minutes before you start working on the motor.
- Check that other pumps or sources do not force flow through the pump even if the pump is stopped. This will cause the motor to act like a generator, resulting in voltage on the terminals.
- Tighten the cable glands to the recommended torques.
- Connect the product to protective earth and provide protection against indirect contact in accordance with local regulations.

- Close the isolating valves, if fitted, and make sure that they cannot be accidentally opened.
- Before starting work on the product, let the product and pumped liquid cool off.

During assembly

- Lubricate and tighten screws and nuts according to the sections about torques and secondary materials.

After assembly

- If analog or digital inputs, the relay output or the CIM module has been removed from the functional module, check the communication with external units after service.

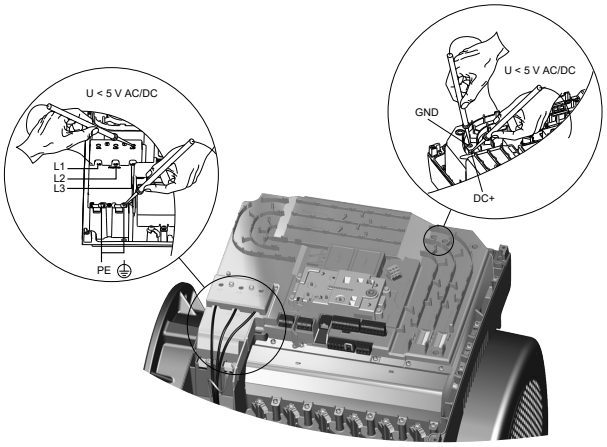
Related information

2. *Torques*
3. *Secondary materials*
5. *Service tools*
10. *Configuring the drive*

1.3.1 Safety check of discharged circuits

Wait at least 5 minutes after disconnecting power, before starting the measurement process.

1. Perform a voltage test between the three measuring points found on the cover for mains and earth.
   Perform the measurement on all three terminals (L1, L2, L3).
2. Perform a voltage test using the two measuring points found on the isolation cover.



TM085115

Related information

9.6 Replacing the isolation cover
9.7 Replacing the functional module
9.8 Replacing the busbar
9.9 Replacing the filter board
9.10 Replacing the power board
9.11 Replacing the lower part complete
9.12 Replacing the terminal box

2. Torques

Pos.	Designation	Type	Dimensions [mm]	Torque [Nm]
152	Torx screw	Tx30	M6 x 14	7.5 - 9.5
166	Torx screw	Tx25	M5 x 14	3.5 - 4
178	Hex screw	Hex 8	M10 x 65	25 - 27
185	Hex screw	Hex 8	M10 x 30 or M10 x 65	24.5 - 27
189b	Hex screw	Hex 10	M12 x 25	25 - 27
192	Hex screw	Hex 8	M10 x 35	25 - 27
206	Hex screw	Hex 8	M10 x 30	24.5 - 27
207	Hex screw	Hex 4	M5 x 40	4.5 - 5
208	Hex screw	Hex 4	M5 x 40	4.5 - 5
251d	Torx screw	Tx25	M5 x 50	4.5 - 5 [1)]
268	Torx screw	Tx25	M5 x 35	4.5 - 5
273a	Torx screw	Tx20	M4 x 35	1 - 1.3
274b	Torx screw	Tx20	M4 x 6	1 - 1.15
274c	Torx screw	Tx25	M5 x 16	2.5 - 3
274d	Torx screw	Tx20	M4 x 12	1 - 1.3
274e	Torx screw	Tx25	M5 x 10	0.9 - 1.6
275c	Torx screw	Tx25	M5 x 16	0.8 - 1.2 and 2.5 - 3.5
275d	Torx screw	Tx20	M4 x 12	1 - 1.3
276a	Hex nut	Hex 8	M5	1.8 - 2
277a	Torx screw	Tx20	M4 x 35	1 - 1.3
277c	Torx screw	Tx20	M4 x 6	1 - 1.3
284a	Torx screw	Tx20	PT40 x 18.5	1.0 - 1.3
285b	Torx screw	Tx20	M4 x 6	1 - 1.3
285c	Hex nut	Hex	M5	2.0 - 2.4
286	Hex spacer	Hex 8	M8 x 19.5	2.2 - 2.7
286a	Hex spacer	Hex 8	M7 x 20	2.2 - 2.7
287a	Torx screw	Tx20	M4 x 35	1 - 1.3
289a	Torx screw	Tx25	M5 x 14	3.5 - 4

1) Screws of new terminal box lower parts must be tightened to 6.5 - 7 Nm.

Torques for terminals

Terminal	Thread size	Maximum torque [Nm]
L1, L2, L3, L, N	M4	2.2
PE	M5	6
NC, C1, C2, NO	M3	0.5
DI1, DI2, DI3, DI4, AI1, AI2, AI3, AO1, PT1, PT2, LT1, LT2, GND, 24V, 5V, TX, RX, A, Y, B, S24, ST1, ST2	M3	0.5

Related information

1.3 Safety information for working on the product

3. Secondary materials

Pos.	Designation	Quantity [g]
156c,d 159d,e	Castrol LMX grease	5
153, 154	Mobil Unirex N3 grease	28
156a,b	SKF anti-fretting agent LGAF 3E	5
201c	Loctite 454	0.3

Related information

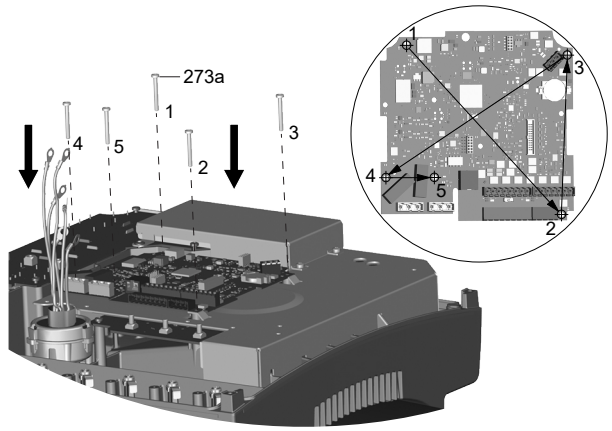
1.3 Safety information for working on the product

4. Tightening sequences

Follow the tightening sequences when installing the functional module, filter board or power board.

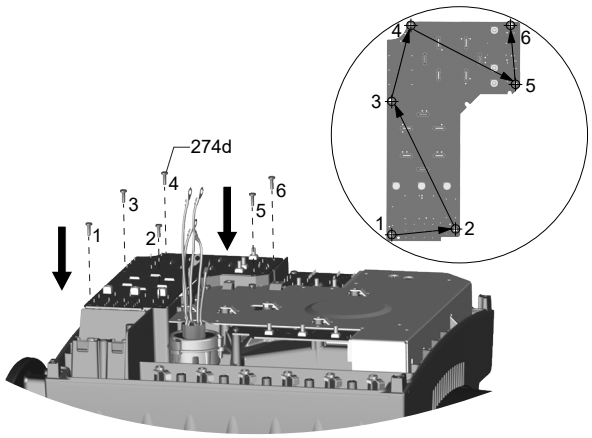
The tightening sequences are also written directly on the printed circuit boards.

Functional module



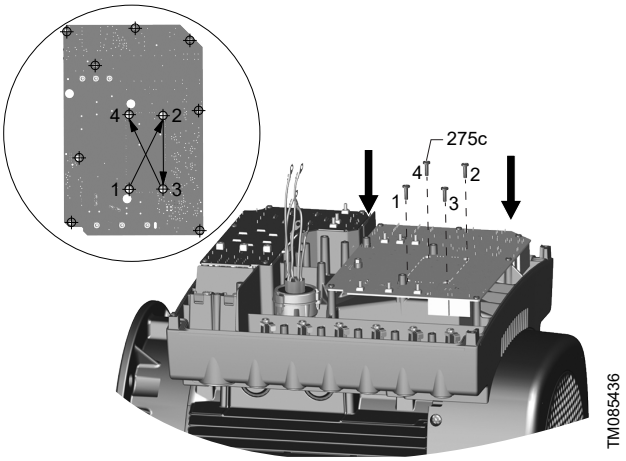
TM085300

Filter board

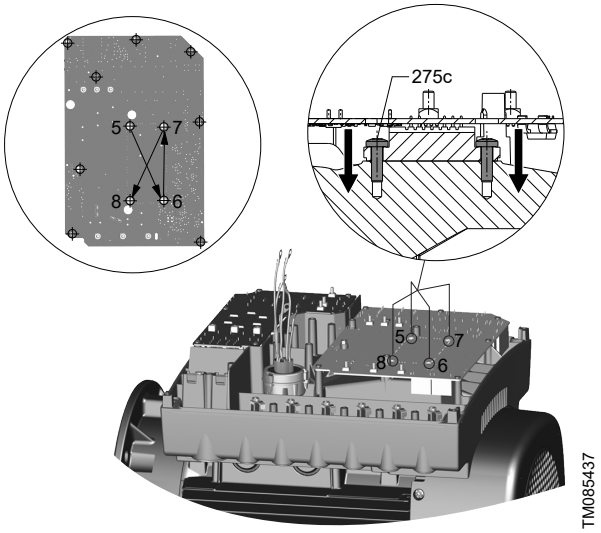


TM085301

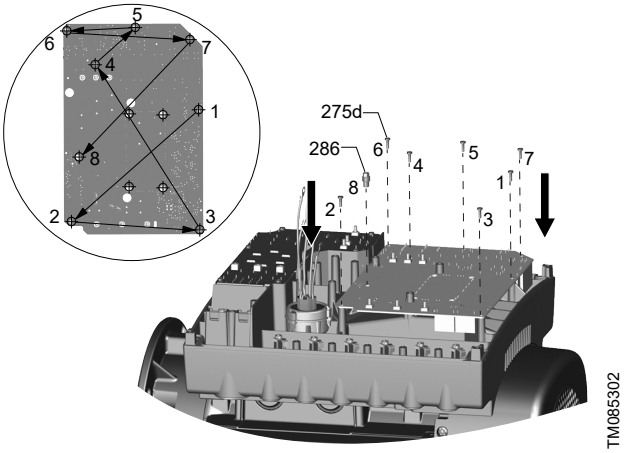
Power board



TM085436



TM085437

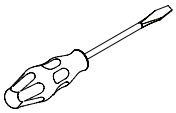


TM085302

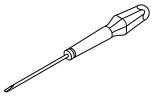
5. Service tools

Standard tools

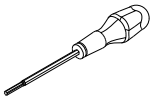
A


TM003421

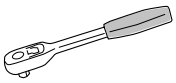
B


TM054808

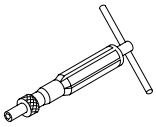
C


TM054807

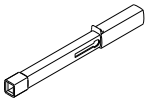
D


TM039143

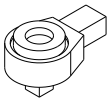
E


TM024335

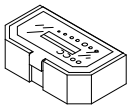
F


TM001396

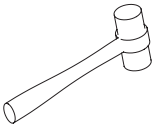
G


TM009125

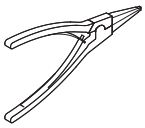
H


TM020844

I


TM027581

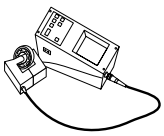
J


TM021058

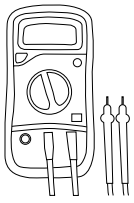
K


TM051590

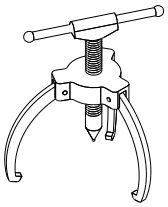
L


TM036177

M

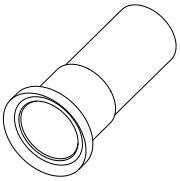

TM037785

O

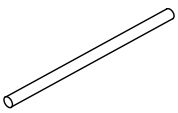

TM062035

Special tools

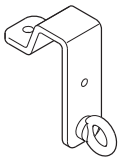
N


TM083673

P


TM024385

Q


TM083236

Lifting equipment

R


TM039613

Pos.	Designation	For pos.	Further information
Standard tools			
A	Screwdriver	156, 252b	Straight slot, 8 mm
B	Screwdriver	273b, 502	Straight slot, 3 mm
C	Screwdriver	273a, 277a, 288a	Torx20
		152,181, 268, 251d	Torx25 Torx27
		178, 185, 192, 289a	Torx30
		286	Torx40
D	Ratchet spanner with socket	J, K	17 mm
E	Torque screwdriver	-	0.5 - 4 Nm
F+G	Torque wrench	-	0-30 Nm
H	Bits kit	152, 178,181, 185, 251d, 268, 273a, 277a, 286, 287a, 288a, 289a	Tx20, Tx25, Tx27, Tx30, Tx40
I	Plastic hammer or press	156	1300 N (axial force)
J	Locking-ring pliers	156c	D40
		188	D42, D48
K	Antistatic service kit	-	96884939
L	Bearing heater	153, 154	
M	Digital scope meter	-	CAT III / 1000 V 96770121
O	Puller for bearing	153, 154	
Special tools			
N	Punch D45	159e, d	99124643
	Punch D50	159e, d	
P	Rod	155	⌀10
Q	Lifting bracket	251a	92996474
Lifting equipment			
R	Eye bolt	251a	M8

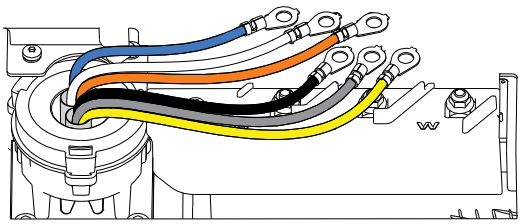
Related information

1.3 Safety information for working on the product

6. Megging of the motor

Never measure between two terminals.

1. Switch off the power and remove the supply leads from the mains terminal.
2. Disconnect the stator wires from the motor terminals.



TM083108

Stator wires disconnected from the motor terminals

3. Measure between each stator wire and earth. As windings are star connected, fault in a winding will show when measuring all terminals.
4. Replace the entire motor unit in case of fault. See also measurement of winding resistances in the section on the power board.
5. Mount the stator wires to the motor terminal.
6. Switch on the power supply.
7. Start the pump.

Max. test voltage	Max. leakage current [mA]
1000 VAC/1500 VDC	35

Related information

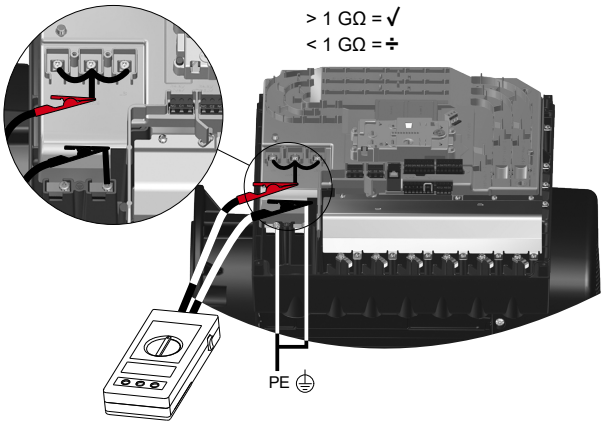
9.10 Replacing the power board
9.12 Replacing the terminal box

7. High voltage test of electronics

WARNING
Electric shock
Death or serious personal injury
- A high-voltage insulation test is required if the power board or filter board has been replaced or re-installed.

The test must only be carried out by service technicians who have received specific training in high-voltage testing.

Never measure between two terminals.



TM085114

Connecting the megger/high voltage tester

1. Switch off the power and remove the supply leads from the mains terminal.
2. Measure between terminals L1, L2, L3 and earth as shown above.
3. Replace the terminal box in case of fault.
4. Connect the power supply.
5. Switch on the power supply.
6. Start the pump.

Max. test voltage	Min. isolation resistance [Gigaohm]
1000 VDC	1

Related information

9.9 Replacing the filter board
9.10 Replacing the power board
9.11 Replacing the lower part complete

8. Lifting the product

WARNING
Back injury
Death or serious personal injury
- Use lifting equipment and follow local regulations when lifting the product.

WARNING
Falling objects
Death or serious personal injury
- Use lifting equipment rated for the weight of the product.

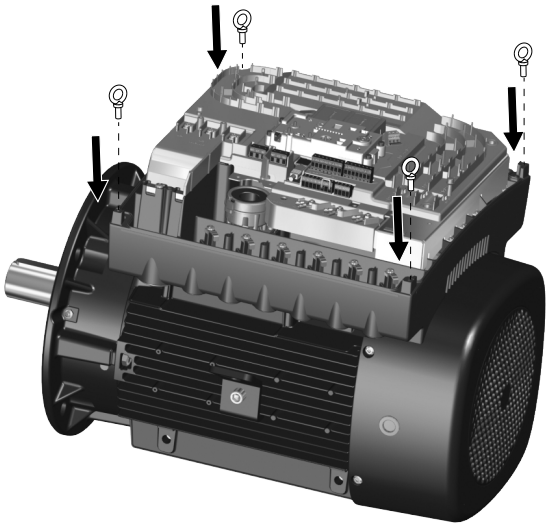
CAUTION
Crushing of feet
Minor or moderate personal injury
- Wear safety shoes when moving the product.

The lifting brackets and/or eyebolts on the terminal box must only be used to lift the terminal box alone.

8.1 Lifting the terminal box

Terminal box in horizontal position

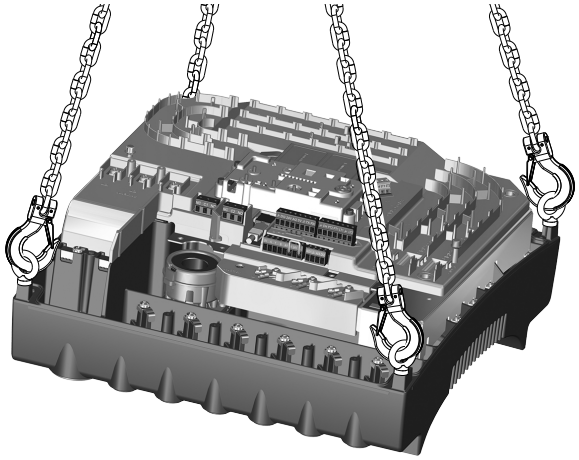
1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the cover for mains cables (284) and the cover for stator cables (285), and disconnect the cables.
4. Fit 4 eye bolts (R) to the terminal box.



TM083192

Fitting eye bolts to the terminal box

5. Attach a hook from a crane or similar lifting equipment to the eye bolts.
6. Remove the screws (178) from the terminal box (251a) and gently lift the terminal box off the motor.

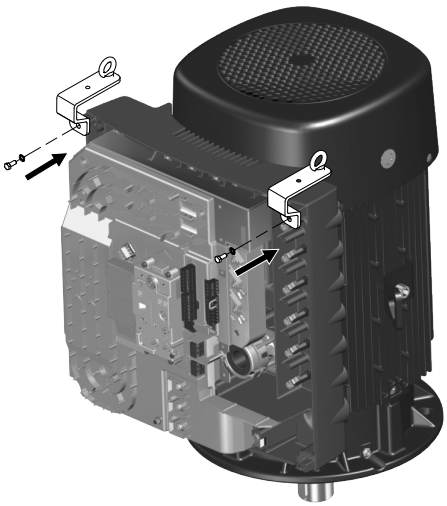


TM083193

Lifting the terminal box (horizontal position)

Terminal box in vertical position

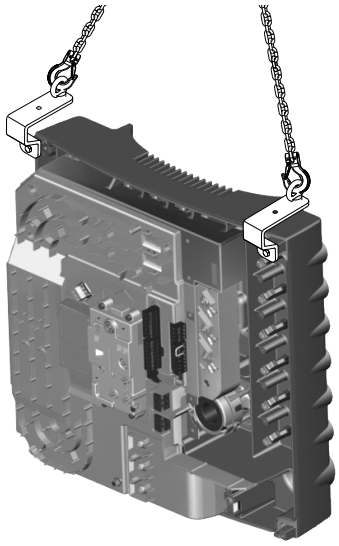
1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the cover for mains cables (284) and the cover for stator cables (285), and disconnect the cables.
4. Fit 2 lifting brackets (Q) to the terminal box, and fasten them with the screws supplied.



TM083194

Fitting lifting brackets to the terminal box

5. Attach a hook from a crane or similar lifting equipment to the eye bolts of the lifting bracket.
6. Remove the screws (178) from the terminal box (251a) and gently lift the terminal box off the motor.



TM083195

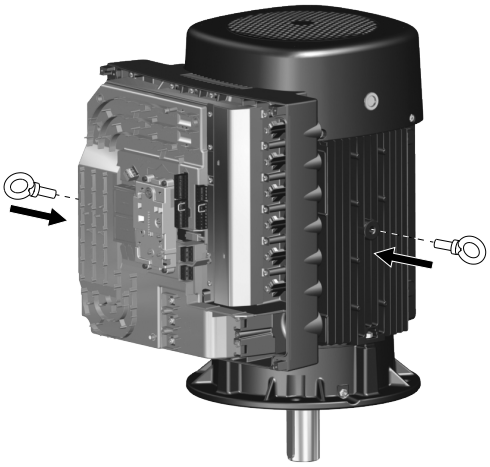
Lifting the terminal box (vertical position)

Related information

9.12 Replacing the terminal box

8.2 Lifting the complete motor unit

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the cover for mains cables (284), and disconnect the cables.
4. Fit 2 eye bolts (R) to the motor.



TM083196

Fitting eye bolts to the motor

5. Attach a hook from a crane or similar lifting equipment to the eye bolts, and gently lift the complete motor unit.



TM083197

Lifting the complete motor unit

9. Replacing hardware

Always use an antistatic service kit when handling electronic components. This prevents static electricity from damaging components.

When unprotected, the component must be placed on the antistatic cloth.



TM051590

Antistatic service kit

9.1 Replacing the terminal box cover

1. Loosen the four screws (251d) and remove the terminal box cover (251b).
2. Clean the sealing faces of the terminal box (251a) and the terminal box cover.
3. Fit the terminal box cover and cross-tighten the screws. Make sure that the position of the terminal box cover is correct in relation to the operating panel (290).

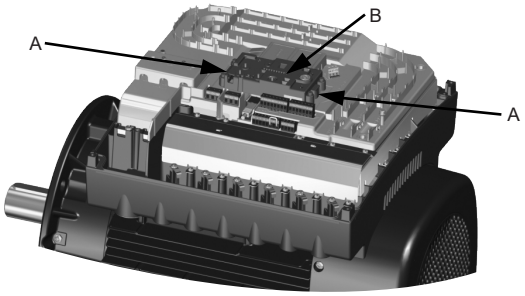
The operating panel can be turned 180°.

Related information

9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.4 Replacing the cover for stator cables
9.5 Replacing the cover for mains cables
9.6 Replacing the isolation cover
9.7 Replacing the functional module
9.8 Replacing the busbar
9.9 Replacing the filter board
9.10 Replacing the power board
9.11 Replacing the lower part complete
9.12 Replacing the terminal box
10.1 Connection to the drive by means of Grundfos GO Link using Ethernet connection
10.2 Connection to the drive by means of Grundfos GO Link using PC-Tool Link
12.3.1 Checking inputs and outputs

9.2 Replacing the operating panel

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Press and hold in the two locking tabs (A) while gently lifting the operating panel (B, pos. no. 290).



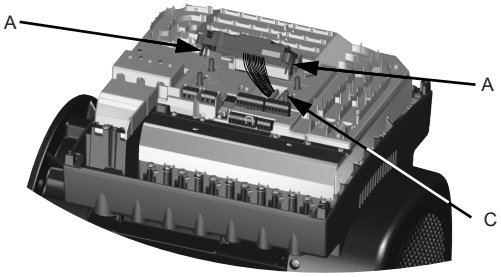
TM083392

Removing the operating panel

4. Gently remove the plug for the operating panel from the functional module (273).
5. Connect the plug for the new operating panel to the functional module.
6. Turn the operating panel to the desired position (0° / 180°).

Do not twist the flat cable by more than 90°.

7. Position the operating panel correctly on the four rubber pins (C). Make sure that the locking tabs (A) are placed correctly.



TM083393

Fitting the operating panel

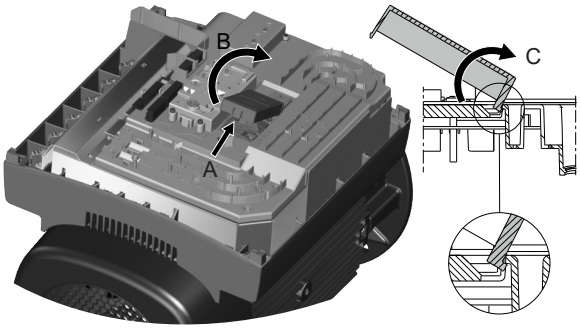
8. Fit the terminal box cover.

Related information

9.1 Replacing the terminal box cover
9.6 Replacing the isolation cover
9.7 Replacing the functional module
9.8 Replacing the busbar
9.9 Replacing the filter board
9.10 Replacing the power board
9.11 Replacing the lower part complete
12.3 Functional module
12.3.1 Checking inputs and outputs

9.3 Replacing the CIM module

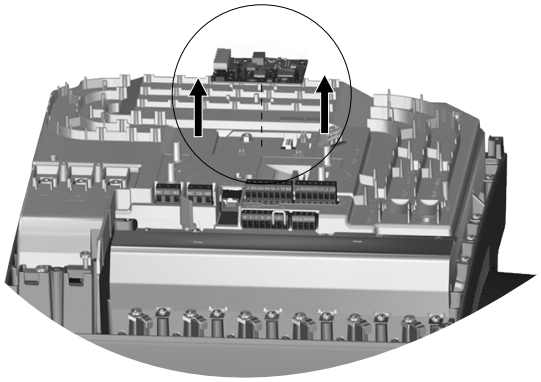
1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the plug connection for the CIM module (502).
4. Remove the cover of the CIM module (287) by pressing the locking tab (A) and lifting the end of the cover (B). Then lift the cover off the hooks (C).



TM082969

Removing the cover of the CIM module

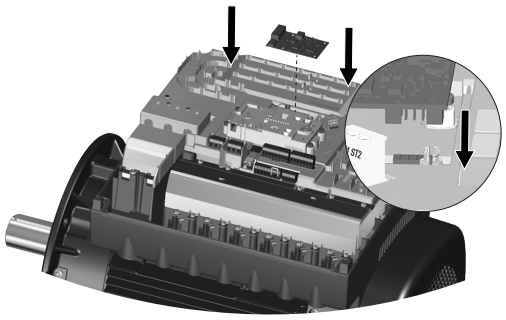
5. Remove the screw (287a) connecting the frame connection of the CIM module to the functional module (273).
6. Insert a screwdriver at the three plastic holders and loosen the CIM module from the isolation cover (277).
7. Gently lift the CIM module away from the isolation cover so that the connecting plug is not damaged.



TM084727

Removing the CIM module

8. Fit the new CIM module by aligning it with the plastic holders and the connecting plug. Press home the module using your fingers.



TM082971

Aligning the CIM module with the connecting plug

9. Fit the frame screw in the CIM module.
10. Fit the cover by leading the slits into the end with the plug connection and clicking the locking tabs onto the isolation cover.
11. Press down the module using your fingers. Check that the plug has been pressed home.
12. If the module is supplied with an FCC label, fix the label on the terminal box.



TM083394

Position of FCC label

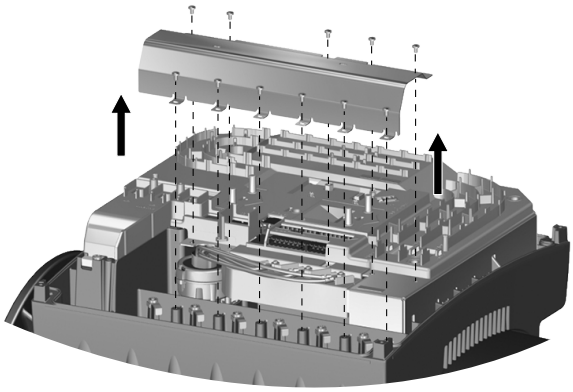
13. Fit the terminal box cover.

Related information

- *9.1 Replacing the terminal box cover*
- *9.6 Replacing the isolation cover*
- *9.7 Replacing the functional module*
- *9.8 Replacing the busbar*
- *9.9 Replacing the filter board*
- *9.10 Replacing the power board*
- *9.11 Replacing the lower part complete*

9.4 Replacing the cover for stator cables

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the screws (285b) from the cover for stator cables (285) and lift the cover away.



TM084711

Removing the cover for stator cables

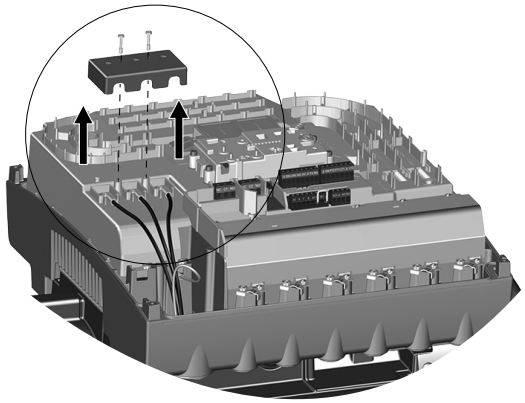
4. Fit the new cover for stator cables and fasten it with the screws.
5. Fit the terminal box cover.

Related information

- *9.1 Replacing the terminal box cover*
- *9.8 Replacing the busbar*
- *9.9 Replacing the filter board*
- *9.10 Replacing the power board*
- *9.11 Replacing the lower part complete*
- *9.12 Replacing the terminal box*

9.5 Replacing the cover for mains cables

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Remove the screws (284a) from the cover for mains cables (284) and lift the cover away.



TM084709

Removing the cover for mains cables

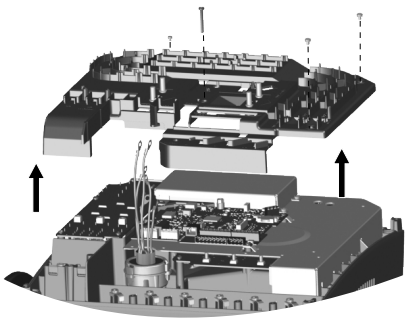
4. Fit the new cover for mains cables and fasten it with the screws.
5. Fit the terminal box cover.

Related information

9.1 Replacing the terminal box cover
9.8 Replacing the busbar
9.9 Replacing the filter board
9.10 Replacing the power board
9.12 Replacing the terminal box

9.6 Replacing the isolation cover

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover for stator cables (285).
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the screws (277a and 277c) from the isolation cover (277).



TM084729

Removing the isolation cover

12. You can now remove the isolation cover from the terminal box.
13. Fit the new isolation cover on the terminal box.
14. Secure the isolation cover to the terminal box with the screws.
15. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
16. Connect the stator cables and fasten them by tightening the nuts.
17. Fit the cover for stator cables.
18. Fit the CIM module.
19. Fit the operating panel.
20. Connect the mains cables and fasten them by tightening the screws.
21. Fit the cover for mains cables.
22. Fit the terminal box cover.

Related information

1.3.1 Safety check of discharged circuits
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.7 Replacing the functional module
9.8 Replacing the busbar
9.9 Replacing the filter board
9.10 Replacing the power board
9.11 Replacing the lower part complete

9.7 Replacing the functional module

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover for stator cables (285).
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the isolation cover.
12. Remove the spacer (286) and screws (273a).
13. Gently lift the functional module (273) up so that the connecting plug (275a) is not damaged.
14. Insert the connecting plug into the new functional module with the long end towards the module. Lead it through the module and home.
15. Fit the new functional module with the screws. See the order of the tightening sequence for screws on the functional module.
16. Fit the spacer on the module.
17. Gently push the connecting plug home.
18. Fit the isolation cover.

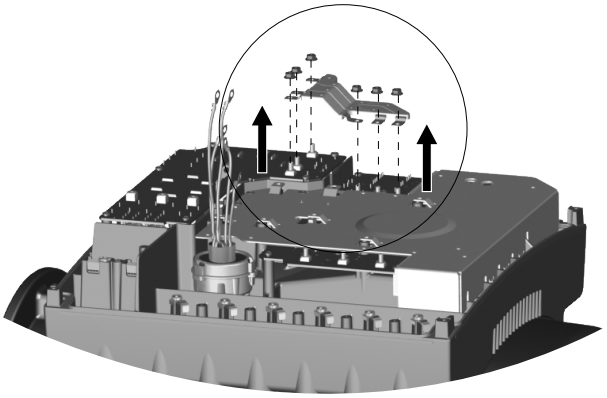
19. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
20. Connect the stator cables and fasten them by tightening the nuts.
21. Fit the cover for stator cables.
22. Fit the CIM module.
23. Fit the operating panel.
24. Connect the mains cables and fasten them by tightening the screws.
25. Fit the cover for mains cables.
26. Fit the terminal box cover.

Related information

1.3.1 Safety check of discharged circuits
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.6 Replacing the isolation cover
9.10 Replacing the power board
9.11 Replacing the lower part complete
12.3 Functional module

9.8 Replacing the busbar

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover for stator cables (285).
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the isolation cover.
12. Remove the spacer (286) and screws (273a).
13. Gently lift the functional module (273) up so that the connecting plug (275a) is not damaged.
14. Remove the screws (274b and 274c) from the box for EMC filter board (274a) and lift the box away.
15. Remove the nuts (276a) from the busbar (276) and lift the busbar away.



Removing the busbar

16. Fit the new busbar and fasten it with the nuts.
17. Fit the box for EMC filter board.
18. Fit the functional module with the screws. See the order of the tightening sequence for screws on the functional module.
19. Fit the spacer on the module.
20. Gently push the connecting plug home.
21. Fit the isolation cover.
22. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
23. Connect the stator cables and fasten them by tightening the nuts.
24. Fit the cover for stator cables.
25. Fit the CIM module.
26. Fit the operating panel.
27. Connect the mains cables and fasten them by tightening the screws.
28. Fit the cover for mains cables.
29. Fit the terminal box cover.

Related information

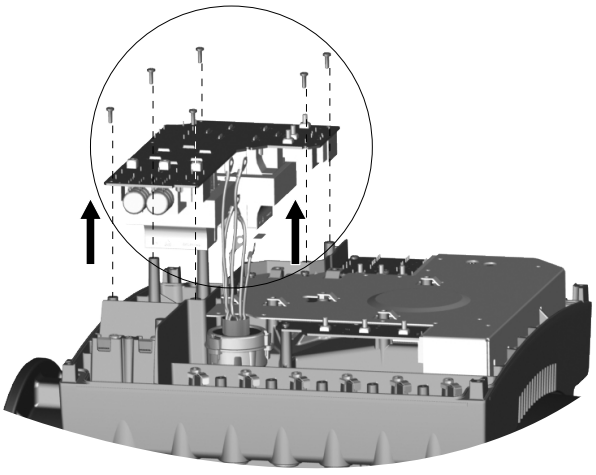
1.3.1 Safety check of discharged circuits
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.4 Replacing the cover for stator cables
9.5 Replacing the cover for mains cables
9.6 Replacing the isolation cover
9.9 Replacing the filter board
9.10 Replacing the power board

9.9 Replacing the filter board

- A high-voltage insulation test is required if the power board or filter board has been replaced or re-installed.
- The replacement and high voltage testing of the filter board must only be carried out by service technicians trained in the respective tasks.

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover (285) for stator cables.
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the isolation cover.
12. Remove the spacer (286) and screws (273a).
13. Gently lift the functional module (273) up so that the connecting plug (275a) is not damaged.
14. Remove the screws (274b and 274c) from the box for EMC filter board (274a) and lift away the box.
15. Remove the busbar (276).
16. Remove the screws (274d) from the filter board (274) and lift the filter board away.

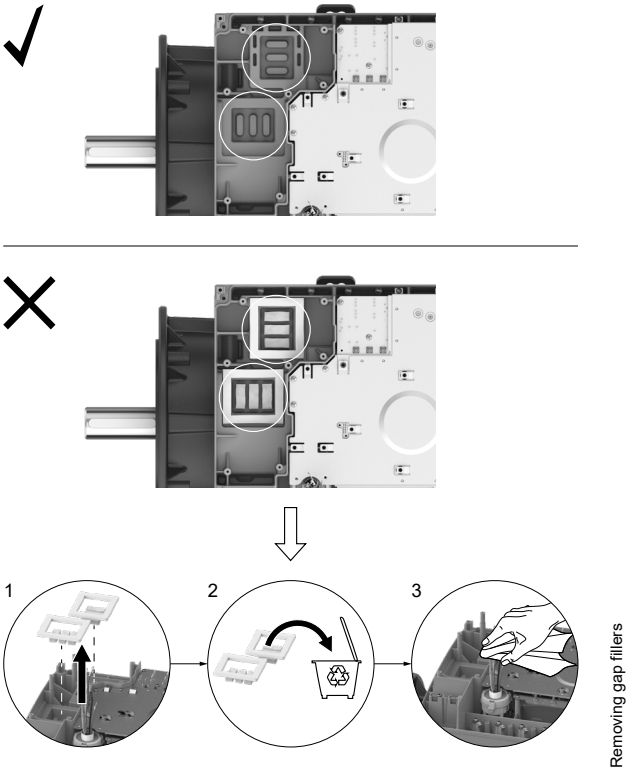
Ensure that the cooling pads remain fitted on the filter board.



TM084735

Removing the filter board

17. Check that no pieces from the gap fillers remain stuck on the control box lower part and remove any residue from the gap fillers with a clean cloth.

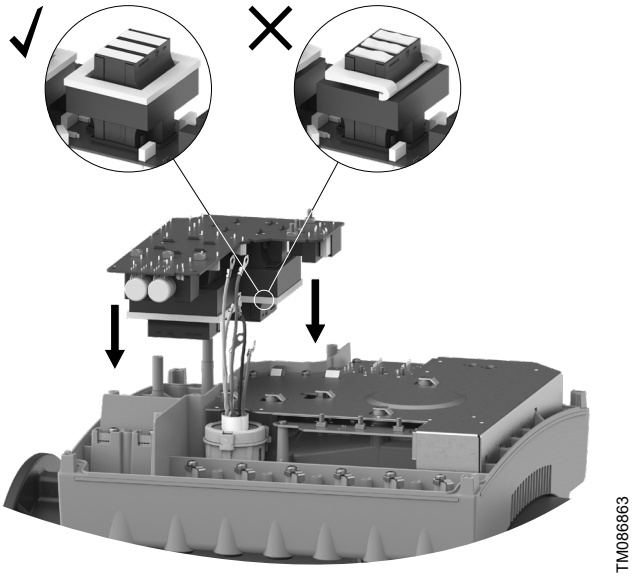


Removing gap fillers

Removing the gap fillers

18. Fit the new filter board and fasten it with the screws. See the order of the tightening sequence for screws on the filter board.

Make sure that the gap fillers on the new filter board are properly aligned and not bent.



TM086863

Alignment of gap fillers

19. Fit the busbar.
20. Fit the box for EMC filter board.
21. Fit the functional module with the screws. See the order of the tightening sequence for screws on the functional module.
22. Fit the spacer on the module.
23. Gently push the connecting plug home.
24. Fit the isolation cover.

25. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
26. Connect the stator cables and fasten them by tightening the nuts.
27. Fit the cover for stator cables.
28. Fit the CIM module.
29. Fit the operating panel.
30. Perform a high voltage test between the three mains terminals (L1, L2, L3) and earth.
31. Connect the mains cables and fasten them by tightening the screws.
32. Fit the cover for mains cables.
33. Fit the terminal box cover.

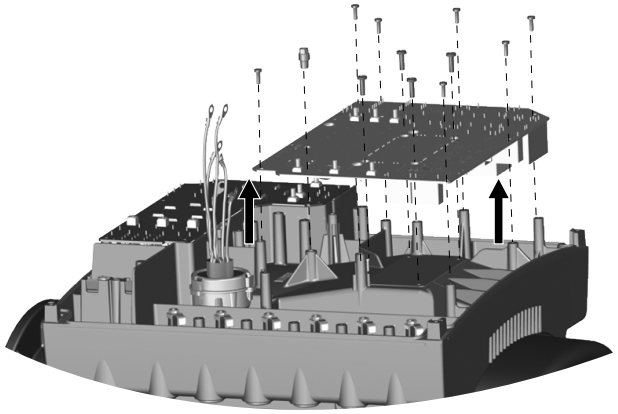
Related information

1.3.1 Safety check of discharged circuits
7. High voltage test of electronics
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.4 Replacing the cover for stator cables
9.5 Replacing the cover for mains cables
9.6 Replacing the isolation cover
9.8 Replacing the busbar

9.10 Replacing the power board

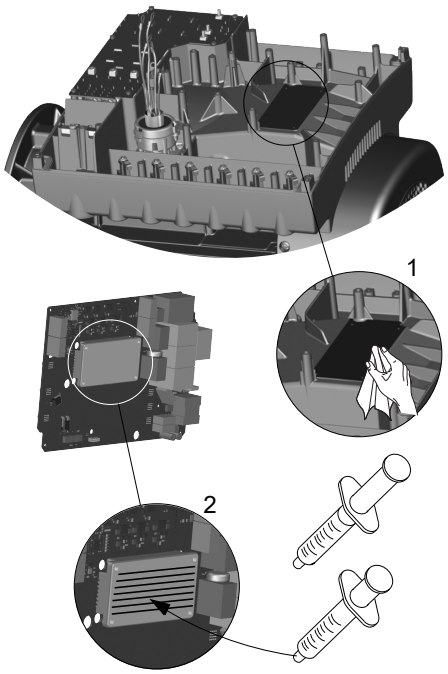
- A high-voltage insulation test is required if the power board or filter board has been replaced or re-installed.
- The replacement and high voltage testing of the power board must only be carried out by service technicians trained in the respective tasks.

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover for stator cables (285).
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the isolation cover.
12. Remove the spacer (286) and screws (273a).
13. Gently lift the functional module (273) up so that the connecting plug (275a) is not damaged.
14. Remove the box for EMC filter board (274a).
15. Remove the busbar (276).
16. Remove the box for EMC power board (275b).
17. Remove the spacer (286) and screws (275c and 275d) from the power board (275) and lift the power board away.



Removing the power board

18. Remove the used heat paste with a clean cloth and apply a new layer as shown.



TM084757

Removing and applying heat paste

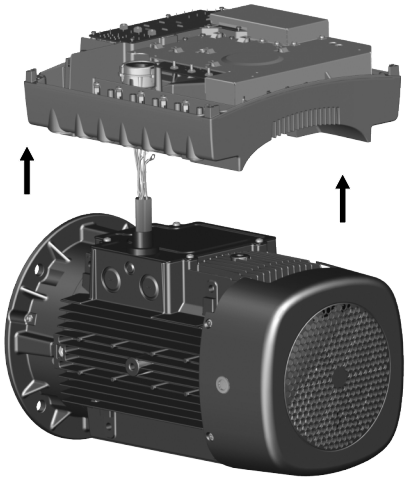
19. Fit the new power board with the screws. See the order of the tightening sequence for screws on the power board.
20. Fit the spacer on the power board.
21. Fit the box for EMC power board.
22. Fit the busbar.
23. Fit the box for EMC filter board.
24. Fit the functional module. See the order of the tightening sequence for screws on the functional module.
25. Fit the spacer on the module.
26. Gently push the connecting plug home.
27. Fit the isolation cover.
28. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
29. Connect the stator cables and fasten them by tightening the nuts.
30. Fit the cover for stator cables.
31. Fit the CIM module.
32. Fit the operating panel.
33. Perform a high voltage test between the three mains terminals (L1, L2, L3) and earth.
34. Connect the mains cables and fasten them by tightening the screws.
35. Fit the cover for mains cables.
36. Fit the terminal box cover.

Related information

1.3.1 Safety check of discharged circuits
6. Megging of the motor
7. High voltage test of electronics
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.4 Replacing the cover for stator cables
9.5 Replacing the cover for mains cables
9.6 Replacing the isolation cover
9.7 Replacing the functional module
9.8 Replacing the busbar
12.4 Power board

9.11 Replacing the lower part complete

1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (274e) holding the cables.
6. Remove the operating panel (290) from the isolation cover (277).
7. Remove the CIM module (502) from the isolation cover.
8. Pull out the plug connections (266) using your fingers.
9. Remove the cover for stator cables (285).
10. Disconnect the stator cables by removing the nuts (285c) holding the cables.
11. Remove the isolation cover.
12. Remove the spacer (286) and screws (273a).
13. Gently lift the functional module (273) up so that the connecting plug (275a) is not damaged.
14. Remove the screws (178) from the terminal box lower part (251a) and gently lift it off the motor (150).

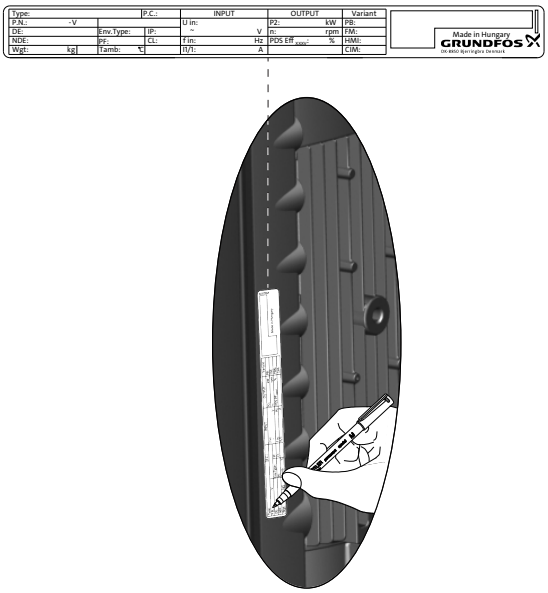


TM084868

Removing the terminal box lower part

15. Fit the new terminal box lower part on the motor.
16. Cross-tighten the screws of the terminal box.
17. Fit the functional module. See the order of the tightening sequence for screws on the functional module.
18. Fit the spacer on the module.

19. Gently push the connecting plug home.
20. Fit the isolation cover.
21. Push the plug connections into the relevant terminals. They are marked so that they only fit in the right socket of the functional module.
22. Connect the stator cables and fasten them by tightening the nuts.
23. Fit the cover for stator cables.
24. Fit the CIM module.
25. Fit the operating panel.
26. Perform a high voltage test between the three mains terminals (L1, L2, L3) and earth.
27. Connect the mains cables and fasten them by tightening the screws.
28. Fit the cover for mains cables.
29. Fit the terminal box cover.
30. Transfer data from the nameplate of the old terminal box to the nameplate of the new one.



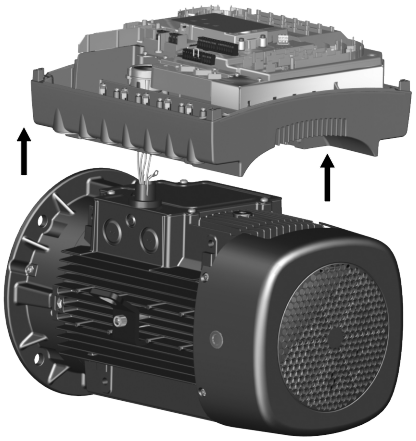
TM082979

Related information

1.3.1 Safety check of discharged circuits
7. High voltage test of electronics
9.1 Replacing the terminal box cover
9.2 Replacing the operating panel
9.3 Replacing the CIM module
9.4 Replacing the cover for stator cables
9.6 Replacing the isolation cover
9.7 Replacing the functional module
10. Configuring the drive

9.12 Replacing the terminal box

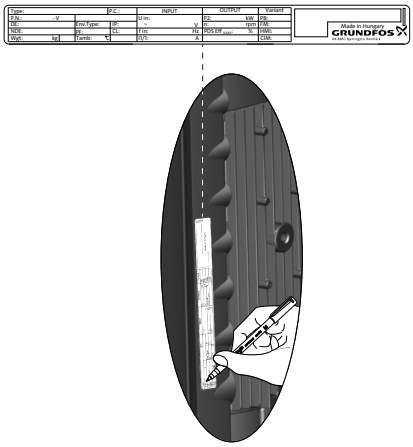
1. Disconnect the power supply.
2. Remove the terminal box cover (251b).
3. Perform the below safety measurements:
   a. Perform a voltage test between the three measuring points (L1, L2, L3) on the cover for mains and earth.
   b. Perform a voltage test using the two measuring points found on the isolation cover.
4. Remove the cover for mains cables (284).
5. Disconnect the mains cables by removing the screws (284a) holding the cables.
6. Remove the cover for stator cables (285).
7. Disconnect the stator cables by removing the nuts (285b) holding the cables.
8. Remove the screws (178) from the terminal box (251a) and gently lift the terminal box off the motor (150).



TM084718

Removing the terminal box

9. Fit the new terminal box on the motor.
10. Cross-tighten the screws of the terminal box.
11. Move relevant modules to the new terminal box according to the sections above.
12. Connect the stator cables and fasten them by tightening the nuts.
13. Fit the cover for stator cables.
14. Connect the mains cables and fasten them by tightening the screws.
15. Fit the cover for mains cables.
16. Fit the terminal box cover.
17. Transfer data from the nameplate of the old terminal box to the nameplate of the new one.



TM082979

Transferring data to new nameplate

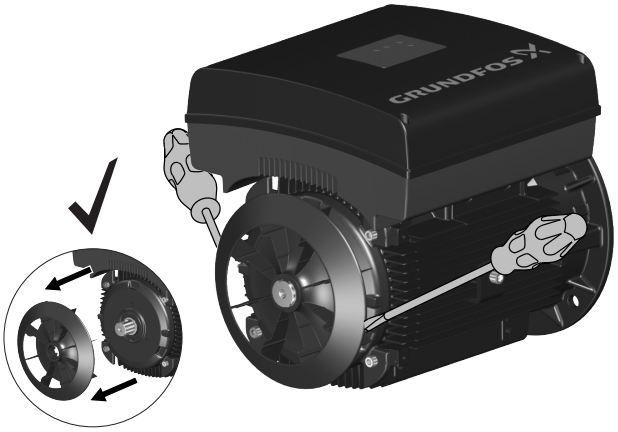
Related information

1.3.1 Safety check of discharged circuits
6. Megging of the motor
8.1 Lifting the terminal box
9.1 Replacing the terminal box cover
9.4 Replacing the cover for stator cables
9.5 Replacing the cover for mains cables

9.13 Replacing the fan

WARNING
Crushing of hands
Death or serious personal injury
- The product must only be serviced by qualified service persons.
- Wear protective gloves when servicing the product.

1. Disconnect the power supply.
2. Remove the screws (152) and lift off the fan cover (151).
3. Remove the locking ring (156e) from the shaft with pliers.
4. Insert two screwdrivers close to the shaft (172) and remove the fan (156).



TM085079

Removing the fan

5. Push the new fan on the shaft. Alternatively, gently knock the fan onto the shaft (172) with a plastic hammer while holding the drive end of the shaft against a solid surface.
6. Fit the locking ring on the shaft with pliers.
7. Fit the fan cover on the stator housing (150) and tighten the screws (152).

Related information

9.14.1 Replacing the bearing on the non-drive end
9.15 Replacing the seal rings or gamma rings

9.14 Replacing the bearings

DANGER
Magnetic field
Death or serious personal injury
- Do not handle the motor or rotor if you have a pacemaker.

WARNING
Crushing of hands
Death or serious personal injury
- The product must only be serviced by qualified service persons.
- Wear protective gloves when servicing the product.
- Be careful when handling magnetised parts to avoid personal injury.

CAUTION
Sharp element
Minor or moderate personal injury
- When servicing the product, wear protective gloves to avoid cutting your hands on sharp edges.

Do not remove the rotor from the motor.

The bearings can be replaced without removing the terminal box from the stator housing.

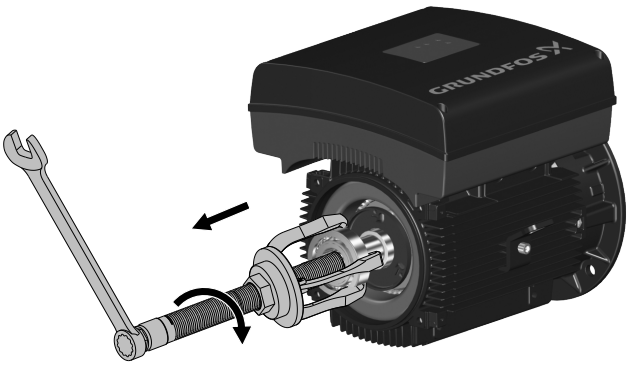
9.14.1 Replacing the bearing on the non-drive end

Dismantling

1. Disconnect the power supply.
2. Remove the screws (152) and lift off the fan cover (151).
3. Remove the locking ring (156e) from the shaft with pliers.
4. Remove the fan (156).
5. Remove the seal ring (156d) or the gamma ring (159e) from the shaft.
6. Remove the screws (206 and 207) from the end-shield (156a).
7. Remove the end-shield (156a) together with the corrugated spring (158).

- In the case of motors for CRE high-pressure pumps, the corrugated spring is placed on the drive end.
- In the case of angular contact bearings, two corrugated springs are used.

8. Remove the O-ring (157) (only applies to aluminium end-shields).
9. Remove the bearing (154) with a puller (O).



TM082981

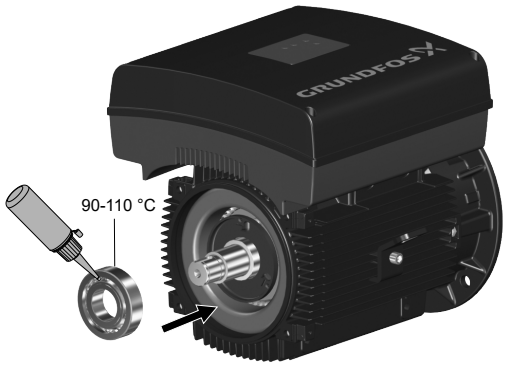
Removing the bearing with a puller

10. Remove the bearing plate (155a).
11. Remove the O-ring (150b).

Assembly

1. Clean the bearing seat with a clean cloth.
2. Fit the O-ring.
3. Fit the bearing plate.
4. Lubricate the new bearing.
5. Heat the new bearing (154) to a temperature between 90 and 110 °C. Follow the instructions for the bearing and bearing heater.
6. Fit the heated bearing (154) on the shaft (172).

CAUTION
Hot surface
Minor or moderate personal injury
- Use heat-resistant gloves.



TM082982

Lubricating, heating and fitting the bearing

7. • Fit the O-ring (157) (only applies to aluminium end-shields).
   • Lubricate the end-shield (only applies to cast iron flanges).
8. Place the end-shield (156a) together with the corrugated spring (158) on the shaft. An M5 steel rod can be used to align the holes of the bearing cover (155a) with the holes of the end-shield (156a).

Do not mount the end-shield until the bearing has cooled down.

- In the case of motors for CRE high-pressure pumps, the corrugated spring is placed on the drive end.
- In the case of angular contact bearings, two corrugated springs are used.

9. Fit the screws (206 and 207) and cross-tighten them.
10. Lubricate the sealing surface of the end-shield.
11. Lubricate and fit the seal ring (156d) or the gamma ring (159e). Use a punch for fitting the gamma ring.
12. Check that the shaft can rotate freely.
13. Fit the fan.
14. Fit the locking ring.
15. Fit the fan cover.

Related information

9.13 Replacing the fan

9.15 Replacing the seal rings or gamma rings

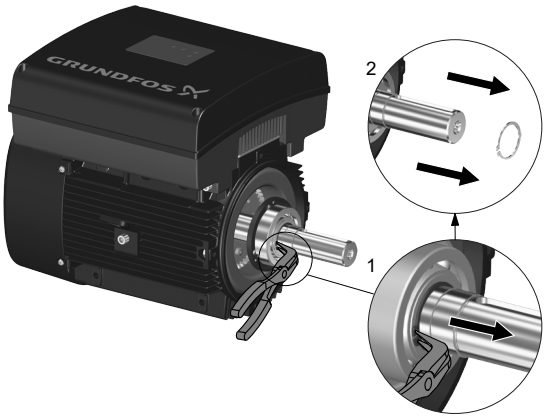
9.14.2 Replacing the bearing on the drive end

Dismantling

1. Disconnect the power supply.
2. Remove the parallel key (172a), if any, from the shaft.
3. Remove the seal ring (156c) or the gamma ring (159d) from the shaft.
4. Remove the screws (185 and 208) from the flange (156b).
5. Remove the flange (156b) by gently knocking it with a plastic hammer.
6. Remove the corrugated spring (158), if any.

- In the case of motors for CRE high-pressure pumps, the corrugated spring is placed on the drive end.
- In the case of angular contact bearings, two corrugated springs are used.

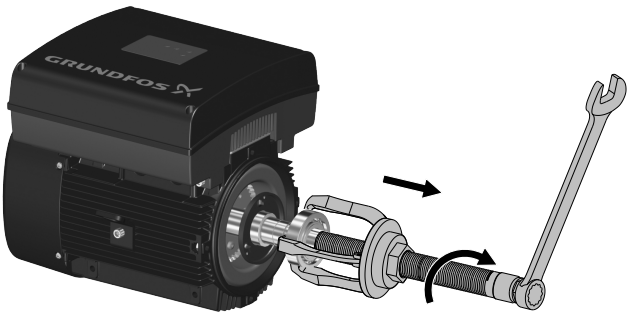
7. Remove the locking ring (188), if any, from the shaft with pliers.



TM085074

Removing the locking ring

8. Remove the bearing (153) with a puller (O).



TM085075

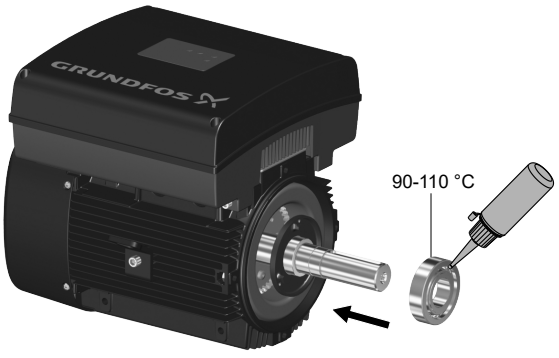
Removing the bearing with a puller

9. Remove the bearing plate (155a).
10. Remove the O-ring (150b).

Assembly

1. Clean the bearing seat with a clean cloth.
2. Fit the O-ring.
3. Fit the bearing plate.
4. Lubricate the new bearing.
5. Heat the new bearing (153) to a temperature between 90 and 110 °C.
6. Fit the heated bearing (153) on the shaft.

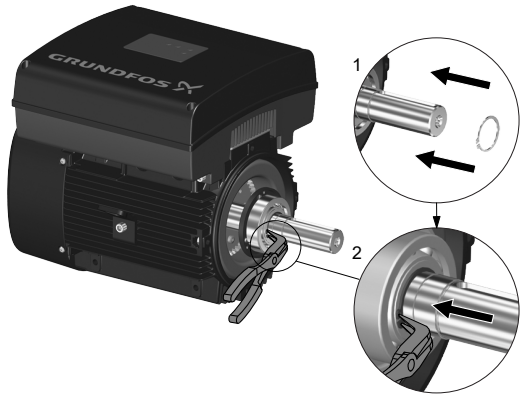
CAUTION
Hot surface
Minor or moderate personal injury
- Use heat-resistant gloves.



TM082985

Lubricating, heating and fitting the bearing

7. Fit the locking ring (188), if any, on the shaft with pliers.



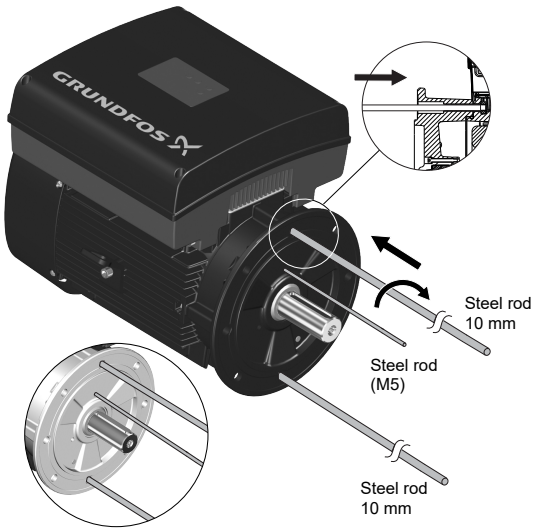
TM085091

Fitting the locking ring

8. Lubricate the flange (only applies to cast iron flanges).
9. Place the flange (156b) together with the corrugated spring (158). Use a thin pin to align the holes of the bearing cover (155a) with the holes of the flange (156b), and use two Ø10 rods to align the holes of the flange with the stator housing.

Do not mount the flange until the bearing has cooled down.

- In the case of motors for CRE high-pressure pumps, the corrugated spring is placed on the drive end.
- In the case of angular contact bearings, two corrugated springs are used.



TM082987

Aligning flange, bearing cover and stator housing

10. Fit the flange in position by gently knocking it with a plastic hammer. The flange should stay in place.
11. Fit the screws (185 and 208) in the available holes of the flange and cross-tighten them.
12. Remove the pins and fit the remaining screws (185 and 208).
13. Lubricate the sealing surface of the flange.
14. Lubricate and fit the seal ring (156c) or the gamma ring (159d). Use a punch for fitting the gamma ring.
15. Fit the parallel key (172a), if any, on the shaft.
16. Check that the shaft can rotate freely.

Related information

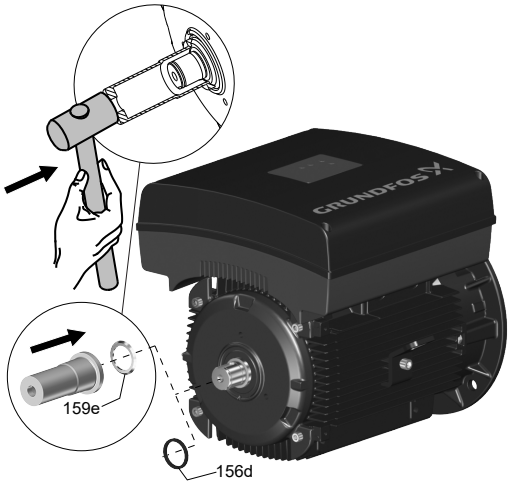
9.15 Replacing the seal rings or gamma rings

9.15 Replacing the seal rings or gamma rings

Gamma rings are only fitted on motors with enclosure class IP66.

Replacement on the non-drive end

1. Disconnect the power supply.
2. Remove the screws (152) and lift off the fan cover (151).
3. Remove the locking ring (156e) from the shaft with pliers.
4. Remove the fan (156).
5. Remove the seal ring (156d) or gamma ring (159e) from the shaft (172).
6. Lubricate the new seal ring (156d) or gamma ring (159e) and fit it on the non-drive end of the shaft.
7. Fit the seal ring in position by hand or fit the gamma ring in position by gently knocking it with the relevant punch.



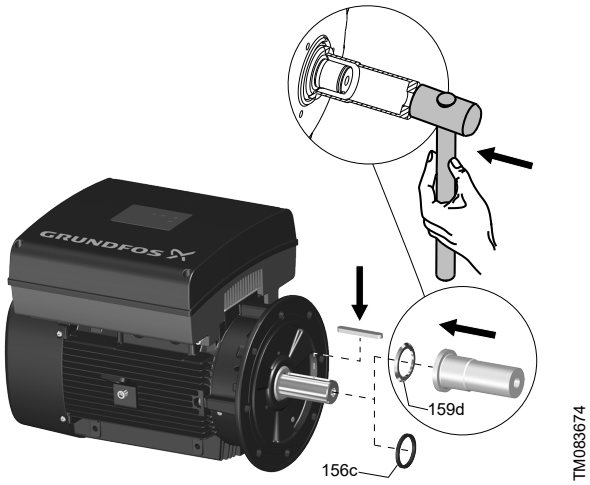
TM083675

Fitting the gamma ring on the non-drive end of the shaft

8. Fit the fan.
9. Fit the locking ring.
10. Fit the fan cover.

Replacement on the drive end

1. Disconnect the power supply.
2. Remove the parallel key (172a), if any, from the shaft.
3. Remove the seal ring (156c) or gamma ring (159d) from the shaft (172).
4. Lubricate the new seal ring (156c) or gamma ring (159d) and fit it on drive end of the shaft.
5. Fit the gamma ring in position by gently knocking it with the relevant punch.



Fitting the gamma ring on the drive end of the shaft

6. Fit the parallel key (172a), if any, on the shaft.

Related information

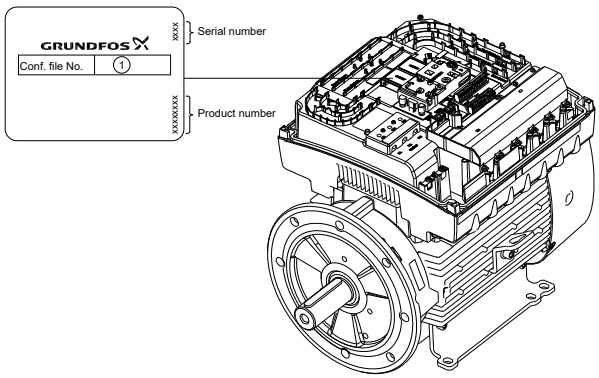
9.13 Replacing the fan

9.14.1 Replacing the bearing on the non-drive end

9.14.2 Replacing the bearing on the drive end

10. Configuring the drive

The drive is configured from factory for the intended application and pump type. The configuration file number can be found on the drive configuration label which is placed inside the drive. See the below figure.



Position of the configuration label

If the drive, functional module or power board is replaced or mounted on another motor, it must be reconfigured.

Use Grundfos GO Link or Grundfos GO for that purpose. To establish connection to the motor, use Bluetooth, Ethernet, PC-Tool Link or Grundfos MI301.

Related information

1.3 Safety information for working on the product

9.11 Replacing the lower part complete

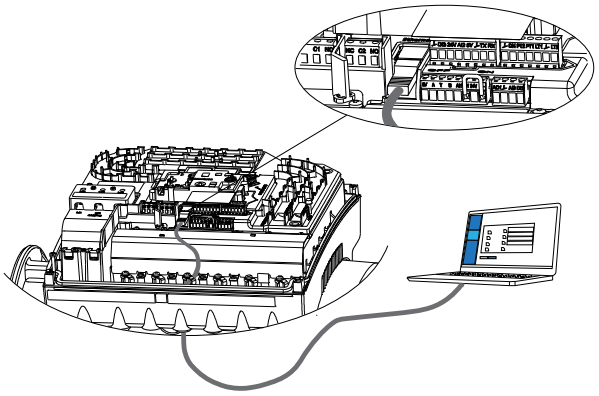
10.1 Connection to the drive by means of Grundfos GO Link using Ethernet connection

Equipment

- Grundfos GO Link, version 01.02.00 or newer
- Cat. 5 Ethernet cable

Procedure

1. Remove the terminal box cover.
   See the section about replacing the terminal box cover.
2. Connect a laptop to the Ethernet connector in the terminal box by means of the Ethernet cable.



Connecting the Ethernet cable

3. Open Grundfos GO Link and connect to the pump.

Related information

9.1 Replacing the terminal box cover

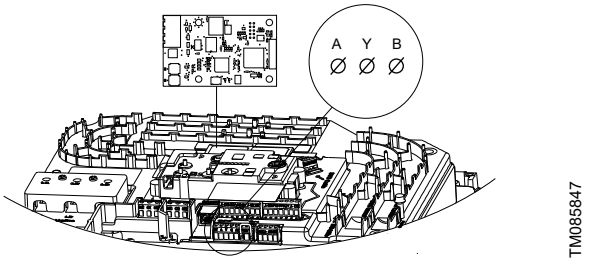
10.2 Connection to the drive by means of Grundfos GO Link using PC-Tool Link

Equipment

- Grundfos GO Link, version 01.02.00 or newer
- Grundfos PC Tool Link
- GENIbus cable (RS-485).

Procedure

1. Remove the terminal box cover.
   See the section about removing the terminal box cover.
2. Connect PC Tool Link to the GENIbus terminals on the motor by means of the GENIbus cable. Connect directly to AYB terminals (ensure that AYB terminals are set to GENI and not Modbus) or AYB terminals on a CIM50 card (Multi-E/Multi pump systems).



Connection of GENIbus

3. Open Grundfos GO Link and connect to the pump.

Related information

9.1 Replacing the terminal box cover

10.3 Connection to the drive by means of Grundfos GO Link using MI301

Equipment

- Grundfos GO Link, version 01.02.00 or newer
- Grundfos MI301

Procedure

1. Turn on the MI301.
2. Open Grundfos GO Link and connect to the pump using either **Direct connect** or **Radio scan**.

10.4 Connection to the drive by means of Grundfos GO via Bluetooth (BLE)

Equipment

- Grundfos GO app
- iOS or Android device

Procedure

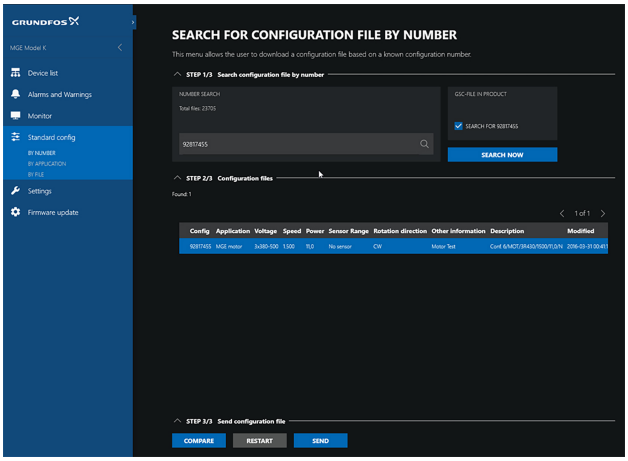
1. Open the Grundfos GO app and connect to the pump using Bluetooth.

10.5 Configuring the drive using Grundfos GO Link

The GO Link configuration must only be carried out by service technicians trained in the task and possessing at least Service Engineer level access.

1. Select **Standard config** > **By number**
2. Fill in the number from the sticker inside the drive and select Search.
3. Select the file in the list and click **Send**.

The drive is now configured with default data and is now ready to be set up for the specific installation.



TM085845

11. Lubricating the bearings

Lubricate the bearings through the grease nipples with a grease dispenser and high-temperature grease as specified on the bearing nameplate.

The display indicates the number of bearing relubrications that has been done since the last bearing replacement. For more information about the display, see the section on "Motor bearing monitoring".

The factory-set interval between relubrications is stated on the bearing nameplate placed on the motor. The relubrication interval can be changed by a Grundfos service technician.

It is possible to relubricate the bearings five times according to the preset interval. When the preset interval has been reached after the fifth relubrication, a warning will be given to replace the bearings.

In the case of seasonal operation (motor is idle for more than six months of the year), we recommend that you lubricate the motor bearings when you take it out of operation.

It is important to relubricate the bearings as specified on the motor nameplate with mechanical data. If this interval is not observed, the bearing life will be reduced.

Reduced lubricating interval

The lubricating interval must be reduced in these situations:

- Dirty and dusty environments. Reduce the lubricating interval by a factor 0.75.
- Very moist environments. Reduce the lubricating interval by a factor 0.9.

If the environments are both dusty and moist, multiply the factors.

Grease type and quantity

See the bearing nameplate.

Never mix grease with thickeners, such as lithium-based grease with polycarbamide-based grease.

11.1 Motor bearing monitoring

Use this function to select whether or not you want to monitor the motor bearings.

You can make the following settings:

- **Active**
- **Not active**

When the function is set to **Active**, a counter in the controller starts counting the running hours of the bearings. The running hours are calculated on the basis of the motor speed. When a predefined limit is reached, a warning indicates that the bearings must be replaced or relubricated.

If you change the function to **Not active**, the counter continues to count. However, no warning is given when it is time to replace the bearings. If you change the function to **Active** again, the accumulated running hours are used to recalculate the replacement time.

12. Fault finding

12.1 General information

1. Check the mains supply to the pump.
2. Read fault messages by means of Grundfos Eye, Grundfos GO, Grundfos GO Link or the graphical operating panel (if fitted).

Make a copy of motor settings.

3. If possible, test if the motor can run without load. Remove the coupling to the pump (if possible) and set the operating signal to maximum by means of Grundfos GO Link, Grundfos GO or the operating panel.

You can reset a fault indication in the following ways:

- When the fault cause has been eliminated and the pump is switched on, the pump will revert to normal duty.
- If the fault disappears by itself, the fault indication will automatically be reset.

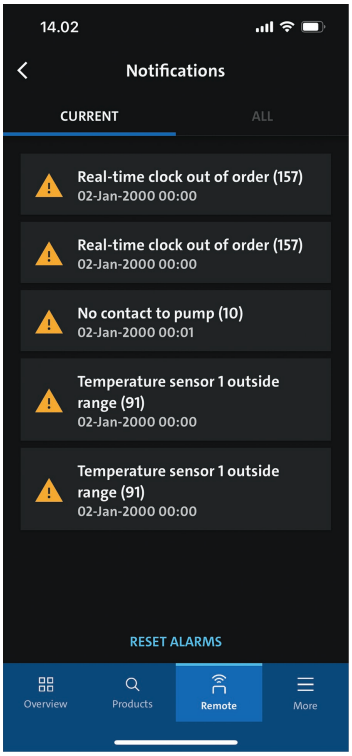
The fault cause will be stored in the pump alarm or warning log.

Fault indications via Grundfos Eye

See the indication of motor status by means of Grundfos Eye and the contact positions of signal relays in the installation and operating instructions for the MGE, MLE motor.

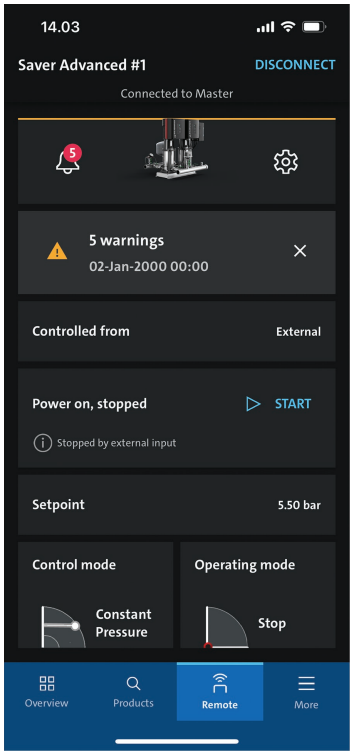
Fault indications via Grundfos GO

See the description of the Grundfos GO operating panel and possibilities of communication in the installation and operating instructions for the MGE, MLE motor.



TM086061

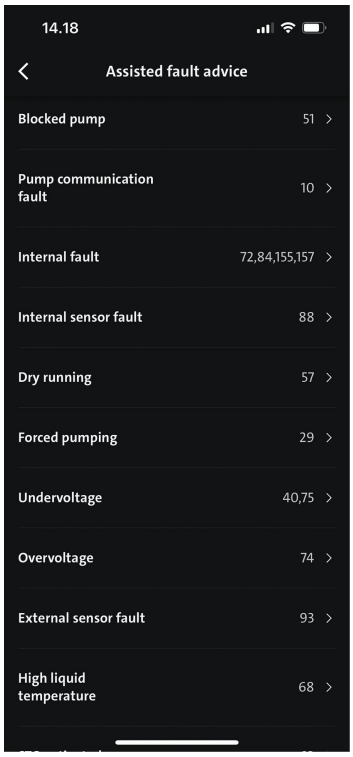
Alarms and warnings shown in Grundfos GO



TM086060

Alarm and warning log of Grundfos GO

For a detailed description of the fault, see display "Assisted fault advice".

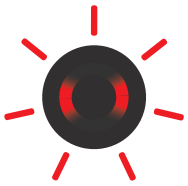


TM086062

Detailed fault description

12.2 Fault and warning signals

The fault indication below can be read by means of the number in brackets, as text or as status indications on the operating panel, depending on the equipment available.

Grundfos Eye	Cause	Remedy
 TM053839 Two opposite red indicator lights flashing simultaneously. (Alarm indication)	**External fault (3)**	
	An external signal has reported an external fault to the digital input set for this function.	• Check the parameter or the unit reporting the external fault. • Correct the fault.
	Too many restarts (4)	
	The pump has restarted too many times in connection with a fault that forced the pump to stop and restart automatically.	• Check the warning and alarm log for faults that caused too many restarts. • Replace the pump if the fault cannot be found.
	Overvoltage (32)	
	The supply voltage to the pump is too high.	• Make sure that the power supply is within the specified range.
	Undervoltage (40)	
	The supply voltage to the pump is too low.	• Make sure that the power supply is within the specified range.
	Undervoltage transient from mains supply (41)	
	The supply voltage to the pump shows signs of voltage drops.	• Make sure that the power supply is within the specified range and check power quality.
	Overload (49)	
	The motor is overloaded and has automatically reduced the speed and thus the pump performance.	• Check that the viscosity and temperature of the pump liquid is within the limits for the pump. If not, change the properties of the liquid. • Dismantle the pump, and remove any foreign matter or impurities preventing the pump from rotating. • If none of the above causes are present, replace the pump.
	Blocked pump (51)	
	The pump is blocked.	• Dismantle the pump, and remove any foreign matter or impurities preventing the pump from rotating.
	STO Active Indication (62)	
	The Safe Torque Off (STO) function has been activated by an external device.	• This might not be an alarm situation, the pump might be stopped on purpose due to STO being activated by external device. • Verify STO functionality according to the STO manual.

Grundfos Eye	Cause	Remedy
 TM053835 One yellow indicator light permanently on. (Warning indication)	**Pump communication fault (10)**	
	There is a communication fault between this pump and the other pumps of the multipump system.	• Make sure that all pumps of the multipump system have been correctly set.
	Forced pumping (29)	
	Other pumps or sources force flow through the pump even if the pump is stopped.	• Check the system for defective non-return valves and replace, if necessary. • Check the system for correct position of, for example, non-return valves.
	Dry running (56, 57)	
	There is no water at the pump inlet, or the water contains too much air.	• Prime and vent the pump before a new startup. • Check that the pump is operating correctly. If not, replace the pump.
	Internal fault (72, 83, 85, 155, 157, 163)	
	There is an internal fault in the pump electronics.	• Replace the functional module, power board or terminal box.
	High motor temperature (65, 66)	
	The motor temperature is too high.	• Make sure that the ambient temperature is within the specified range. • Make sure that the pump is not covered by dust, dirt or other foreign matter which reduces the air cooling of the pump. • If none of the above causes are present, replace the motor.
	Internal communication fault (76)	
	There is a communication fault between different parts of the electronics.	• Replace the terminal box.
	Soft pressure buildup, timeout (215)	
	The system has been in the mode "soft pressure buildup" longer than the set time limit.	• Check the system for leakages.

Grundfos Eye	Cause	Remedy
	Replace the motor bearings (30)	
	The bearings are worn.	• The bearings must be replaced. Follow the instructions for the pump. See the relevant section about bearing replacement in the service instructions.
	Internal sensor fault (88)	
	The pump is receiving a signal from the internal sensor which is outside the normal range.	• Check that the plug and cable are connected correctly to the sensor. The sensor is on the back of the pump housing. • Replace the sensor.
	Pt100/1000 sensor 1 (91) and 2 (175)	
	Pt100/1000 input 1 is receiving a signal which is outside the normal range.	• Check that the sensor resistance corresponds to approximately 100 or 1000 ohm. If not, replace the sensor. • Check the sensor cable for damage. • Check the cable connection at the pump and at the sensor. Correct the connection, if required. • Replace the sensor.
 TM053833 One yellow indicator light rotating in the direction of rotation of the motor when seen from the non-drive end. (Warning indication)	**Supply fault, 5 V (161)**	
	Fault in the output voltage to sensor or potentiometer.	• Check the output voltage and wire to sensor or potentiometer.
	Supply fault, 24 V (162)	
	Fault in the output voltage.	• Check the output voltage and wire.
	Signal fault, LiqTec-sensor (164)	
	The pump is receiving a signal from the LiqTec sensor which is outside the normal range.	• Check that the plug and cable are connected correctly to the sensor. • Replace the sensor.
	Signal fault, sensor 1 (165), 2 (166) and 3 (167)	
	Analog input 1, 2 or 3 is receiving a signal which is outside the normal range.	• Check that the setup of the analog input corresponds to the sensor output as regards electrical characteristics (0.5 - 3.5 V, 0-5 V, 0-10 V, 0-20 mA or 4-20 mA). If not, change the setting, or replace the sensor with one that matches the setup. • Check the sensor cable for damage. • Check the cable connection at the pump and at the sensor. Correct the connection, if required. • Check if the sensor has been removed, but the input was not deactivated. • Replace the sensor.
	Limit 1 exceeded (190) and limit 2 exceeded (191)	
	Limit 1 or 2 has reached the limit for warning or alarm.	• Identify and remove the fault cause.

12.3 Functional module

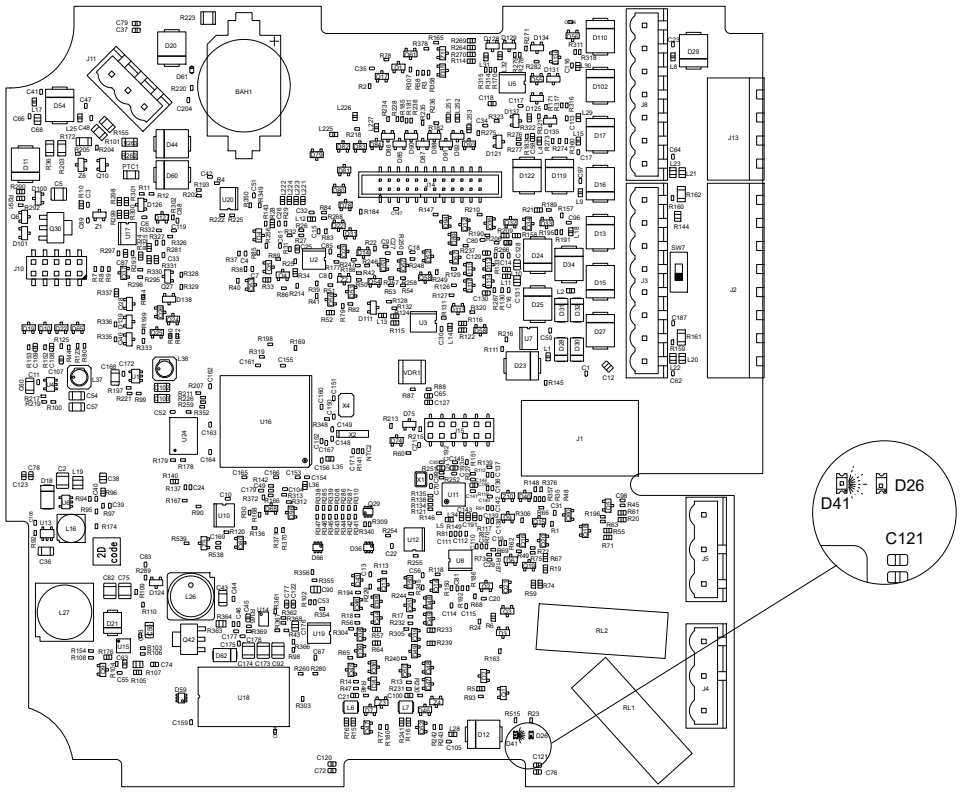
WARNING
Electric shock
Death or serious personal injury

- Do not touch the terminals of the power board as they are still live.
- Do not touch the relay RL1 as it may still be live.

Measuring equipment must be free of static electricity or have same potential as the motor before being used for measurement without isolation cover.

The status diode of the functional module flashes 150 times/minute when the software is running correctly. See the figure below. The functional module can only function if the power board is in operation, as the power board supplies voltage to the functional module.

Status	Fault
Permanently on.	The microprocessor is frozen. The functional module is defective.
Light off.	The functional module is defective.
Flashing 150 times/minute.	The processor of the functional module is functional

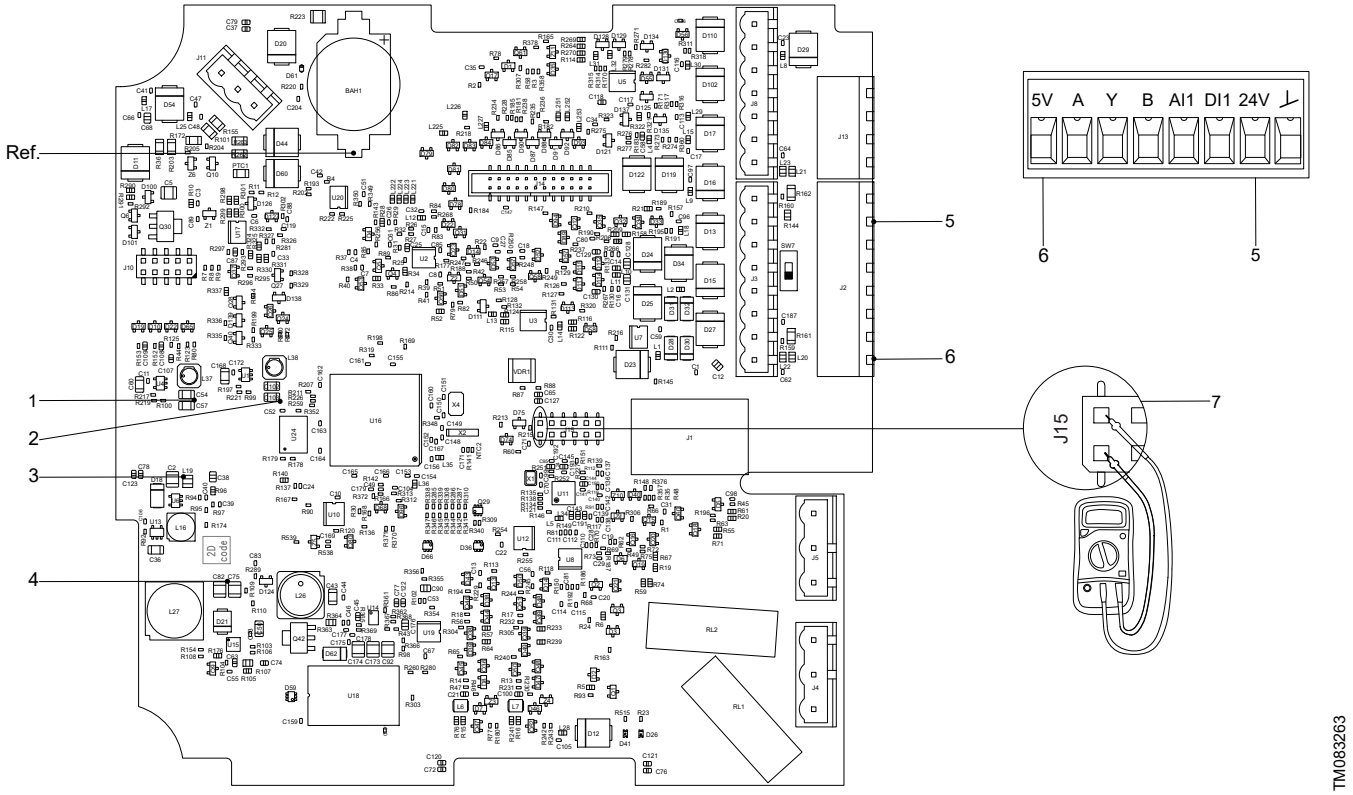


Status diode of functional module

If the light diode is flashing, the functional module is working correctly. The fault may then be in the operating panel.

If the status diode of the functional module is off, check if the power board supplies voltage by measuring 8.5 VDC on the VFE plug connection between the functional module and the power board (J15). If no voltage is measured, the connection between the modules or the power board is defective.

If the VFE voltage to the functional module is okay, check if the voltage between the reference point and the other measuring points is okay. The voltage values apply to an operating motor.



Measuring voltage on the functional module

Use a correctly calibrated measuring instrument.

To measure the voltage listed in the table below, you must use the same reference point (Ref.) seen on the figure above.

Measure the DC voltage from, for example, "Ref." to "3". The measure should be between 14.5 and 15.7 V.

Pos.	Control voltage [VDC]		
	Minimum	Nominal	Maximum
VFE (J15)		8.5	
1	4.8	5	5.2
2	3.2	3.3	3.4
3	14.5	15.1	15.7
4	4.8	5	5.2
5	23	23.9	24.9
6	4.8	5	5.2
7		VFE	
Ref.		GND	

Replace the functional module if the voltage is not correct.

Related information

9.2 Replacing the operating panel

9.7 Replacing the functional module

12.3.1 Checking inputs and outputs

Make a copy of the motor settings.

Pt100/1000

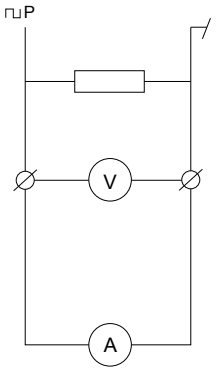
Use a 100 Ω resistance and decide on the basis of the motor settings which value this resistance will show in the display when connected to the terminals instead of the Pt100/1000 sensor.

Analog input, AI

It is possible to measure on the analog input to determine if its function is correct.

During current state, a 292 Ω resistance in the input converts a current signal (e.g. 0-20 mA) from the sensor to a voltage signal for the processor.

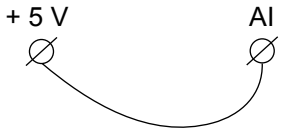
Measure the voltage across the input and read the current in the circuit by means of Grundfos GO or PC Tool. The current value must be equal to voltage divided with resistance. Alternatively, a milliammeter can be connected in series with the circuit.



TM057115

Measuring on analog input

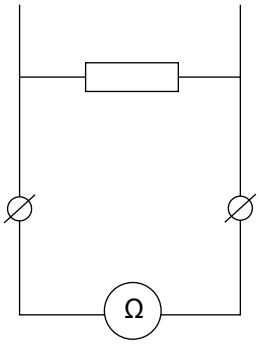
Next step is to test the input in voltage state. Change the setup of the input to voltage state (0-10 V). Fit a jumper between terminal 5 (+5 V) and the analog input. 5 V must now be read by means of the PC Tool.



TM057116

Testing the input during voltage state

Change the setup of the input to current state and measure on the input using an ohmmeter. The resistance must be 292 Ω. In voltage state, the resistance is 122 kΩ.



TM057117

Measuring resistance in current and voltage state

Analog output, AO

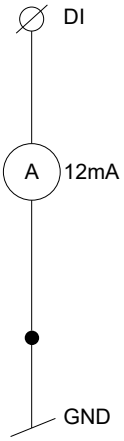
The analog input is protected against short circuit and will shut down the signal in case of short circuit. If you suspect a short circuit, remove the load and compare the value read via PC Tool with the value measured by means of the measuring instrument.

If the values are not identical, the module is defective.

Digital input, DI

See the settings of the input in PC Tool.

Connect the digital input to frame (GND) by means of an ammeter. The value measured must now be approximately 12 mA. Check that PC Tool shows a corresponding value.



TM080068

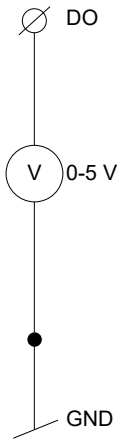
Testing the digital input

Digital output, DO/open collector, OC

See the settings of the output in PC Tool.

Measure the output. If the value in PC Tool differs from the value measured with the measuring instrument, remove the load. If the values still differ, the module is defective.

The voltage of an active output is approximately 5 V.



TM080069

Measuring voltage on the digital output

LiqTec sensor

Connect a new LiqTec sensor to check the input. Immerse the sensor into water and take it up. The motor must now report fault within 20 seconds.

Signal relay

See the settings of the output in PC Tool.

Check if the relay reacts to the signals of the controller according to the configuration of the controller.

CIM

Test the CIM module according to its manual.

Radio

If there are problems in the radio connection between Grundfos GO and the motor, remove the terminal box cover. See the section on replacing the terminal box cover. Replace the operating panel if there is still no connection.

Battery

Switch off power to the motor for a short period. When you switch on the power to the pump again, adjust the clock.

Operating panel (HMI)

Check the flat cable to the functional module. Replace the operating panel if the connection is correct, and it did not solve the problem.

Related information

9.1 Replacing the terminal box cover

9.2 Replacing the operating panel

12.4 Power board

WARNING
Electric shock
Death or serious personal injury
- Do not touch the terminals of the power board as they are still live.

Measuring equipment must be free of static electricity or have same potential as the motor before being used for measurement without isolation cover.

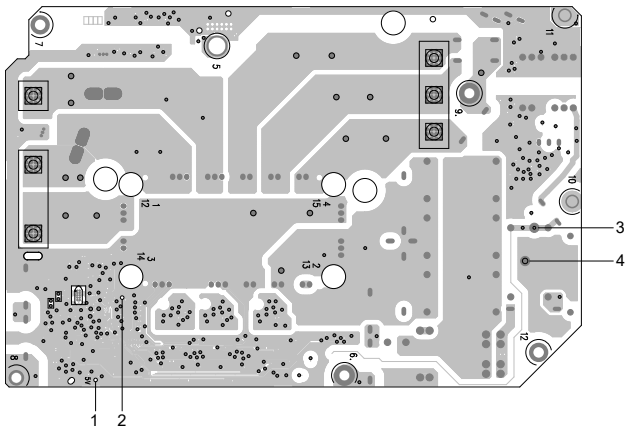
If reading of fault codes does not provide a clear answer as to whether the power board is functioning correctly, you can proceed as described below.

1. Check that the voltage to the power board is within the limit values stated on the nameplate. Check all phases of a three-phase motor.
2. If there are signs of moisture in the terminal box, take necessary precautions to prevent similar faults.
3. Check the two status diodes of the power board by looking through dedicated holes in the PCB. Status diode "LED 5V" must be permanently on when connected to mains. Status diode "LED Micro Controller" flashes when the functionality is correct. See the tables below.

   It may be necessary to dim the light as the diode light is weak.

Status, three-phase	Fault
The LED Micro Controller is permanently on.	• The microprocessor is frozen. • No initialising message from the functional module. Switch the power supply off and on. If this does not solve the problem, replace the power board.
The LED Micro Controller is off.	The power board is defective.
The LED Micro Controller is flashing 1 time per second.	The processor of the power board is functional.
LED 5V is permanently on.	The processor of the power board is functional.
LED 5V is off.	The power board is defective.
LED 5V and LED Micro Controller are flashing simultaneously.	• Short circuit in the connection to the functional module. • Short circuit in the functional module. • The functional module is disconnected. • The power board is defective.

4. Measure the DC voltage across the capacitors (GND and DC+) to ensure that the capacitors are not short-circuited. If the function is correct, the voltage must be ≥ 566 V (at a mains voltage of 400 V). See figures Status diode of functional module and Status diodes of power board, three-phase. If not, the power board is defective.



Status diodes of power board, three-phase

Pos.	Description
1	LED 5V
2	LED Micro Controller
3	DC+
4	GND

Related information

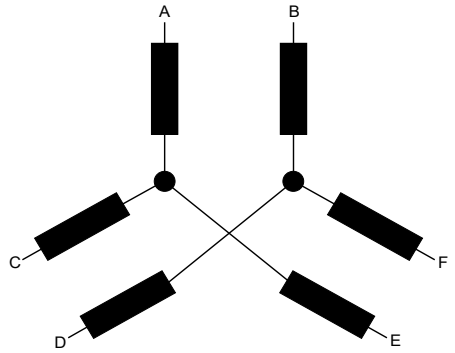
9.10 Replacing the power board

12.5 Winding resistance

As the motor is star-connected, the easiest way to measure the winding resistance is to measure across two phases. Measure at the coil temperatures stated in the table below. It may be necessary to let the motor cool off if it has been running or if it was stopped because of short circuit or overload.

The stator cables must be disconnected from the motor terminals, and all 6 resistance values must be measured as described in the table below.

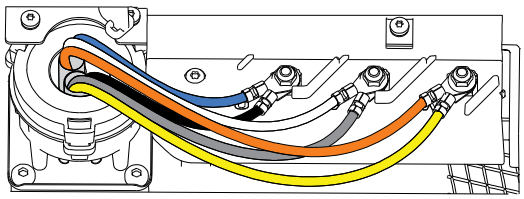
Measurement number	Pair of cables
1.	Blue #1 – White #2
2.	White #2 – Orange #3
3.	Orange #3 – Blue #1
4.	Yellow #4 – Black #5
5.	Black #5 – Grey #9
6.	Grey #9 – Yellow #4



TM083106

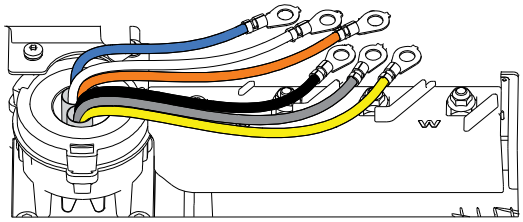
Schematic drawing of star connections

Pos.	Description
A	Blue #1
B	Black #5
C	Orange #3
D	Yellow #4
E	White #2
F	Grey #9



TM083107

Stator cables connected to the motor terminals

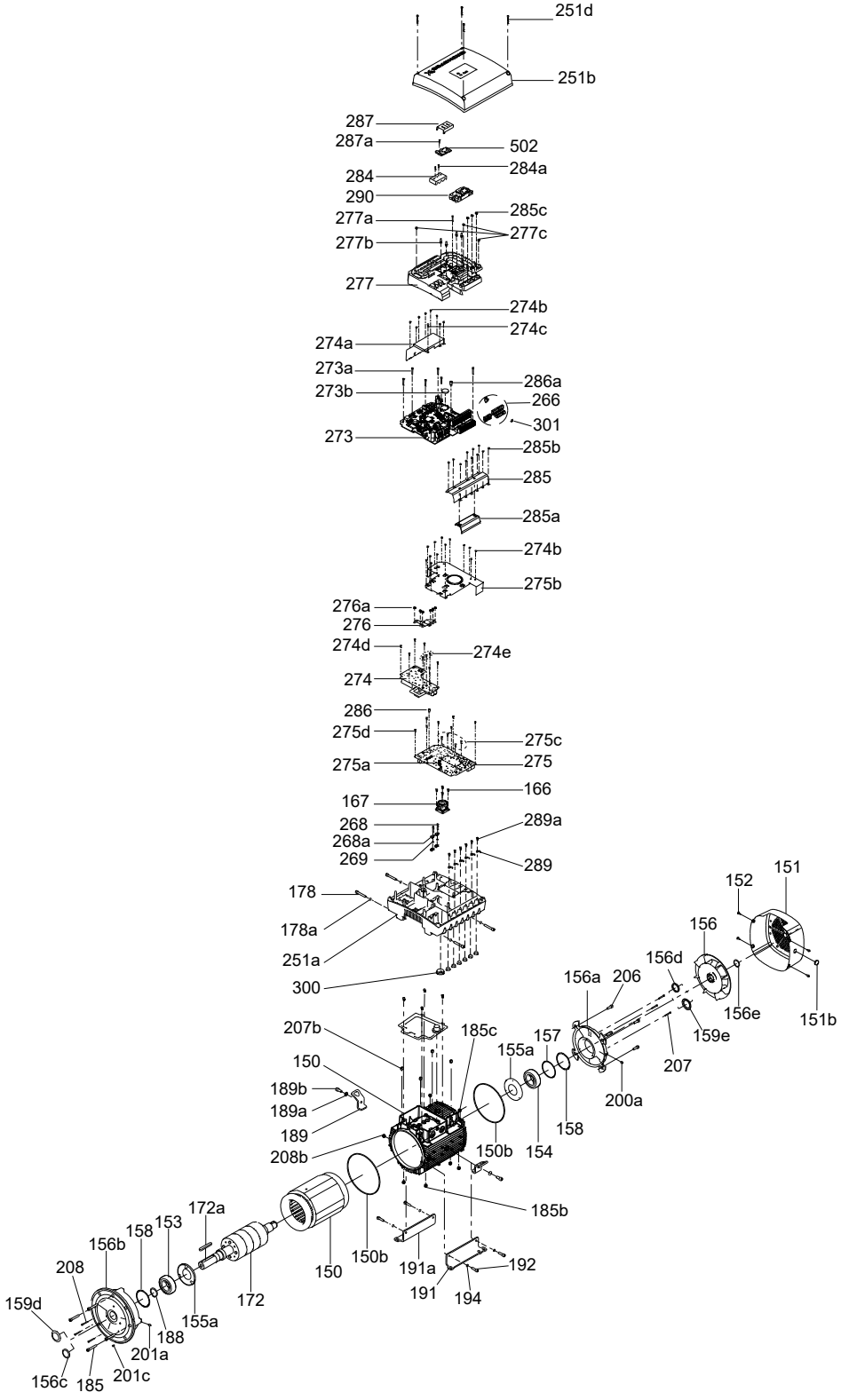


TM083108

Stator cables disconnected from the motor terminals

Type				Min./max. resistance across two phases [Ω]		
Motor	**Max. Speed [Min^{-1}]**	**Voltage [VAC]**	**Power [kW/hp]**	**20 °C**	**60 °C**	**80 °C**
MGE 160, MLE 160	2200	3 x 380-480	11.0 / 15.0	1.12 / 1.31	1.29 / 1.51	1.38 / 1.62
		3 x 440-480				
MGE 160, MLE 160	2200	3 x 380-480	15.0 / 20.0	0.74 / 0.86	0.85 / 1.00	0.91 / 1.07
		3 x 440-480				
MGE 180, MLE 180	2200	3 x 380-480	18.5 / 25.0	0.54 / 0.63	0.62 / 0.73	0.66 / 0.78
		3 x 440-480				
MGE 180, MLE 180	2200	3 x 380-480	22.0 / 30.0	0.44 / 0.51	0.51 / 0.60	0.54 / 0.64
		3 x 440-480				
MGE 160, MLE 160	4000	3 x 380-480	15.0 / 20.0	0.58 / 0.68	0.67 / 0.78	0.71 / 0.84
		3 x 440-480				
MGE 160, MLE 160	4000	3 x 380-480	18.5 / 25.0	0.42 / 0.49	0.48 / 0.56	0.51 / 0.60
		3 x 440-480				
MGE 180, MLE 180	4000	3 x 380-480	22.0 / 30.0	0.34 / 0.40	0.40 / 0.46	0.42 / 0.50
		3 x 440-480				
MGE 180, MLE 180	4000	3 x 400-480	26.0 / -	0.34 / 0.40	0.40 / 0.46	0.42 / 0.50
		3 x 440-480				
MGE 160, MLE 160	5200	3 x 380-480	15.0 / 20.0	0.33 / 0.39	0.38 / 0.45	0.41 / 0.48
		3 x 440-480				
MGE 160, MLE 160	5200	3 x 380-480	18.5 / 25.0	0.23 / 0.27	0.27 / 0.32	0.29 / 0.34
		3 x 440-480				
MGE 180, MLE 180	5200	3 x 380-480	22.0 / 30.0	0.20 / 0.23	0.23 / 0.26	0.24 / 0.28
		3 x 440-480				
MGE 180, MLE 180	5200	3 x 400-480	26.0 / -	0.20 / 0.23	0.23 / 0.26	0.24 / 0.28
		3 x 440-480				
MGE 160	4000	3 x 200-240	7.5 / 10.0	0.14 / 0.17	0.16 / 0.19	0.18 / 0.21
MLE 160		3 x 200-240				
MGE 160	4000	3 x 200-240	11.0 / 15.0	0.14 / 0.17	0.16 / 0.19	0.18 / 0.21
MLE 160		3 x 200-240				

13. Exploded view



MGE, MLE model K

14. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way.

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.
3. Dispose of the waste battery through the national collective schemes. If in doubt, contact your local Grundfos company.



The crossed-out wheelie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

See also end-of-life information at *www.grundfos.com/product-recycling*.

Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500industin
1619 - Garín Pcia. de B.A.
Tel.: +54-3327 414 444
Fax: +54-3327 45 3190

Australia
GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Tel.: +61-8-8461-4611
Fax: +61-8-8340-0155

Austria
GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Fax: +43-6246-883-30

Belgium
N.V. GRUNDFOS Bellux S.A.
Boomsesteenweg 81-83
B-2630 Aartselaar
Tel.: +32-3-870 7300
Fax: +32-3-870 7301

Bosnia and Herzegovina
GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A
BiH-71000 Sarajevo
Tel.: +387 33 592 480
Fax: +387 33 590 465
www.ba.grundfos.com
E-mail: grundfos@bih.net.ba

Brazil
BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo Branco, 630
CEP 09850 - 300
São Bernardo do Campo - SP
Tel.: +55-11 4393 5533
Fax: +55-11 4343 5015

Bulgaria
Grundfos Bulgaria EOOD
Slatina District
Iztochna Tangenta street no. 100
BG - 1592 Sofia
Tel.: +359 2 49 22 200
Fax: +359 2 49 22 201
E-mail: bulgaria@grundfos.bg

Canada
GRUNDFOS Canada inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Tel.: +1-905 829 9533
Fax: +1-905 829 9512

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106 PRC
Tel.: +86 21 612 252 22
Fax: +86 21 612 253 33

Columbia
GRUNDFOS Colombia S.A.S.
Km 1.5 vía Siberia-Cota Conj. Potrero Chico,
Parque Empresarial Arcos de Cota Bod. 1A.
Cota, Cundinamarca
Tel.: +57(1)-2913444
Fax: +57(1)-8764586

Croatia
GRUNDFOS CROATIA d.o.o.
Buzinski prilaz 38, Buzin
HR-10010 Zagreb
Tel.: +385 1 6595 400
Fax: +385 1 6595 499
www.hr.grundfos.com

Czech Republic
GRUNDFOS Sales Czechia and Slovakia s.r.o.
Čajkovského 21
779 00 Olomouc
Tel.: +420-585-716 111

Denmark
GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tel.: +45-87 50 50 50
Fax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Estonia
GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel.: + 372 606 1690
Fax: + 372 606 1691

Finland
OY GRUNDFOS Pumput AB
Trukkikuja 1
FI-01360 Vantaa
Tel.: +358-(0) 207 889 500

France
Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tel.: +33-4 74 82 15 15
Fax: +33-4 74 94 10 51

Germany
GRUNDFOS GMBH
Schlüterstr. 33
40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Fax: +49-(0) 211 929 69-3799
E-mail: infoservice@grundfos.de
Service in Deutschland:
kundendienst@grundfos.de

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Tel.: +0030-210-66 83 400
Fax: +0030-210-66 46 273

Hong Kong
GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor, Siu Wai industrial Centre
29-33 Wing Hong Street & 68 King Lam Street, Cheung Sha Wan
Kowloon
Tel.: +852-27861706 / 27861741
Fax: +852-27858664

Hungary
GRUNDFOS South East Europe Kft.
Tópark u. 8
H-2045 Törökbálint
Tel.: +36-23 511 110
Fax: +36-23 511 111

India
GRUNDFOS Pumps india Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 097
Tel.: +91-44 2496 6800

Indonesia
PT GRUNDFOS Pompa
Graha intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Tel.: +62 21-469-51900
Fax: +62 21-460 6910 / 460 6901

Ireland
GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Tel.: +353-1-4089 800
Fax: +353-1-4089 830

Italy
GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Fax: +39-02-95309290 / 95838461

Japan
GRUNDFOS Pumps K.K.
1-2-3, Shin-Miyakoda, Kita-ku
Hamamatsu
431-2103 Japan
Tel.: +81 53 428 4760
Fax: +81 53 428 5005

Kazakhstan
Grundfos Kazakhstan LLP
7' Kyz-Zhibek Str., Kok-Tobe micr.
KZ-050020 Almaty Kazakhstan
Tel.: +7 (727) 227-98-55/56

Korea
GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Tel.: +82-2-5317 600
Fax: +82-2-5633 725

Latvia
SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60
LV-1035, Rīga,
Tel.: + 371 714 9640, 7 149 641
Fax: + 371 914 9646

Lithuania
GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel.: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia
GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie industrial Park
40150 Shah Alam, Selangor
Tel.: +60-3-5569 2922
Fax: +60-3-5569 2866

Mexico
Bombas GRUNDFOS de México
S.A. de C.V.
Boulevard TLC No. 15
Parque industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Tel.: +52-81-8144 4000
Fax: +52-81-8144 4010

Netherlands
GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Fax: +31-88-478 6332
E-mail: info_gnl@grundfos.com

New Zealand
GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Tel.: +64-9-415 3240
Fax: +64-9-415 3250

Norway
GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tel.: +47-22 90 47 00
Fax: +47-22 32 21 50

Poland
GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel.: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal
Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Fax: +351-21-440 76 90

Romania
GRUNDFOS Pompe România SRL
S-PARK BUSINESS CENTER, Clădirea A2, etaj 2
Str. Tipografilor, Nr. 11-15, Sector 1, Cod 013714
Bucuresti, Romania
Tel.: 004 021 2004 100
E-mail: romania@grundfos.ro

Serbia
Grundfos Srbija d.o.o.
Omladinskih brigada 90b
11070 Novi Beograd
Tel.: +381 11 2258 740
Fax: +381 11 2281 769
www.rs.grundfos.com

Singapore
GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Tel.: +65-6681 9688
Faxax: +65-6681 9689

Slovakia
GRUNDFOS s.r.o.
Prievozská 4D 821 09 BRATISLAVA
Tel.: +421 2 5020 1426
sk.grundfos.com

Slovenia
GRUNDFOS LJUBLJANA, d.o.o.
Leskoškova 9e, 1122 Ljubljana
Tel.: +386 (0) 1 568 06 10
Fax: +386 (0)1 568 06 19
E-mail: tehnika-si@grundfos.com

South Africa
GRUNDFOS (PTY) LTD
16 Lascelles Drive, Meadowbrook Estate
1609 Germiston, Johannesburg
Tel.: (+27) 10 248 6000
Fax: (+27) 10 248 6002
E-mail: lgradidge@grundfos.com

Spain
Bombas GRUNDFOS España S.A.
Camino de la Fuentecilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Fax: +34-91-628 0465

Sweden
GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46 31 332 23 000
Fax: +46 31 331 94 60

Switzerland
GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Fax: +41-44-806 8115

Taiwan
GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Tel.: +886-4-2305 0868
Fax: +886-4-2305 0878

Thailand
GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road
Dokmai, Pravej, Bangkok 10250
Tel.: +66-2-725 8999
Fax: +66-2-725 8998

Turkey
GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bölgesi
Ihsan dede Caddesi
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Tel.: +90 - 262-679 7979
Fax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine
ТОВ "ГРУНДФОС УКРАЇНА"
Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Tel.: (+38 044) 237 04 00
Fax: (+38 044) 237 04 01
E-mail: ukraine@grundfos.com

United Arab Emirates
GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone, Dubai
Tel.: +971 4 8815 166
Fax: +971 4 8815 136

United Kingdom
GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 4TL
Tel.: +44-1525-850000
Fax: +44-1525-850011

U.S.A.
Global Headquarters for WU
856 Koomey Road
Brookshire, Texas 77423 USA
Phone: +1-630-236-5500

Uzbekistan
Grundfos Tashkent, Uzbekistan
The Representative Office of Grundfos Kazakhstan in Uzbekistan
38a, Oybek street, Tashkent
Tel.: (+998) 71 150 3290 / 71 150 3291
Fax: (+998) 71 150 3292

Trademarks displayed in this material, including but not limited to Grundfos and the Grundfos logo, are registered trademarks owned by The Grundfos Group. © 2024 Grundfos Holding A/S, all rights reserved.

92786579 **05.2024**
ECM: 1394503

www.grundfos.com

GRUNDFOS