# CMBE

Installation and operating instructions


GRUNDFOS

# CMBE

**Original installation and operating instructions**

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# 1. General information

Appliances can be used by persons with reduced physical, sensory, or mental capabilities, as well as persons with a lack of experience and knowledge. This requires that they are given supervision or instruction concerning the use of the appliance in a safe way and that they understand the hazards involved. Cleaning and user maintenance shall not be carried out by children without supervision.

Read this document before you install the product. Installation and operation must comply with local regulations and accepted codes of good practice.

## 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.

## 2. Intended use

This product has been evaluated for use with clean water only.

Only use the product according to the specifications stated in these installation and operating instructions.

### 2.1 Pumped liquids

The product is suitable for pumping clean, thin, non-aggressive, non-toxic and non-explosive liquids without solid particles or fibres.

If the water contains sand, gravel or other debris, there is a risk of pump blockage and pump damage.

Please install a filter on the inlet side or apply a floating strainer to protect the pump.

### 2.2 Cybersecurity

The product must only be connected to protected network subnets with strict access control.

According to the standard EN 18031-1:2024, the RJ45 connector used for connecting to IP networks is considered an exposed network interface, along with the GENIbus TCP protocol used on it, which is considered an exposed service.

#### 2.2.1 Network interfaces and services

In the factory default state, the product exposes the following network interfaces:

| Interface | Description |
|---|---|
| RJ45 | Wired Ethernet / IP connectivity |

The following services are exposed by the product over its network interfaces in the factory default state.

| Interface | Service | Description |
|---|---|---|
| RJ45 | GENIpro TCP | It is used for connecting the product to a service tool on an engineering workstation.<br>Pairing is required before communication can take place.<br>The GENIpro TCP pairing state is persistent. |

## 3. System sizing

The system in which the CME Booster is incorporated must be designed for the maximum pump pressure.

The pump is by default set to not stop until it reaches its maximum pressure.

## 4. Receiving the product

### 4.1 Transporting the product

Do not stack the product.

**WARNING**
**Falling objects**
Death or serious personal injury
- Secure the product during transport to prevent it from tilting or falling down.

**CAUTION**
**Back injury**
Minor or moderate personal injury
- Use lifting equipment.

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

### 4.2 Inspecting the product

Before installing the product, do the following:

1. Check that the product is as ordered.
   If the product is not as ordered, contact the supplier.
2. Check that no visible parts have been damaged.
   If any visible parts have been damaged, contact the transport company.

## 5. Mechanical installation

**DANGER**
**Electric shock**
Death or serious personal injury
- In case of an insulation fault, the fault current may be a DC or pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the product.

**WARNING**
**Electric shock**
Death or serious personal injury
- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.

**WARNING**
**Hot liquid**
Death or serious personal injury
- To avoid leakage do not overtighten the pipe connections.

**CAUTION**
**Sharp element**
Minor or moderate personal injury
- Wear personal protective equipment.

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

**CAUTION**
**Back injury**
Minor or moderate personal injury
- Use lifting equipment.

The product must be installed in a location with access control to prevent unauthorized access to the product.

### 5.1 Lifting the product

Observe local regulations concerning limits for manual lifting or handling. The weight of the product is stated on the nameplate.

**CAUTION**
**Sharp element**
Minor or moderate personal injury
- Wear personal protective equipment.

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

**CAUTION**
**Back injury**
Minor or moderate personal injury
- Use lifting equipment.

Do not lift the product by the terminal box.

To protect components such as pressure gauge, sensor and tank, Grundfos recommends lifting the product in the same packing it was delivered in.

- Always lift the product by means of a forklift if the pump is fixed on a pallet.
- The product must remain in the packaging until installation.
- Mind the weight of the product. The weight is stated on the nameplate.
- Mind the unbalanced load when you lift the product. Most of the weight is on the motor side of the product.

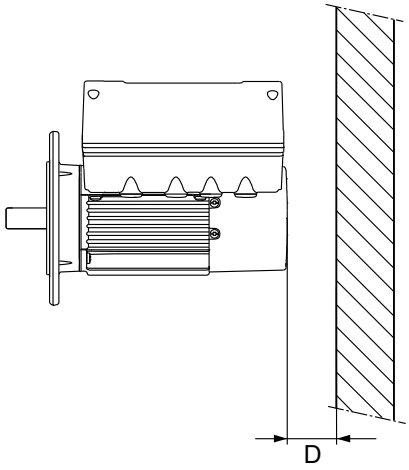
### 5.2 Installing the product

Installation must be carried out by specially trained persons and according to local regulations.

1. Fasten the pump to a solid horizontal foundation by means of screws through the holes in the base plate.
2. Seal the pipe fittings with thread sealing tape.
3. Carefully screw the inlet and outlet connections to the pipe fittings using a pipe wrench or similar tool.
4. Unscrew the drain plug, and pour water into the pump.
5. Screw the drain plug back on again.
6. Check the precharge pressure in the diaphragm tank. The correct precharge pressure is 0.7 times the required outlet pressure (setpoint).
7. Adjust the precharge pressure. We recommend that you use nitrogen gas to refill the tanks.
8. Insert the power plug into the socket, and start the pump.

### 5.3 Cooling the motor

- Install the motor allowing a distance of minimum 50 mm (D) between the end of the fan cover and the wall or another fixed object.

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- Position the product with sufficient space around.
- Make sure that the temperature of the cooling air does not exceed 50 °C.
- Keep cooling fins and fan blades clean.

### 5.4 Installing the product in moist surroundings

If you install the motor in moist surroundings or areas with high humidity, ensure that the bottom drain hole is open. As a result, the motor becomes self-venting, allowing water and humid air to escape.

### 5.5 Installing the product outdoors or in areas with high humidity

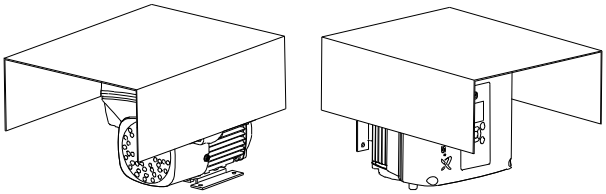
If you install the product outdoors or in areas with high humidity, take the following action to avoid condensation on the electronic components.

To maintain the UL mark, additional requirements apply to the equipment. See the appendix concerning installation in the USA and Canada.

- Provide the product with a suitable cover.

  The cover must be large enough to ensure that the product is not exposed to direct sunlight, rain or snow. Grundfos does not supply covers.

When fitting a cover to the product, observe the instructions for adequate cooling.



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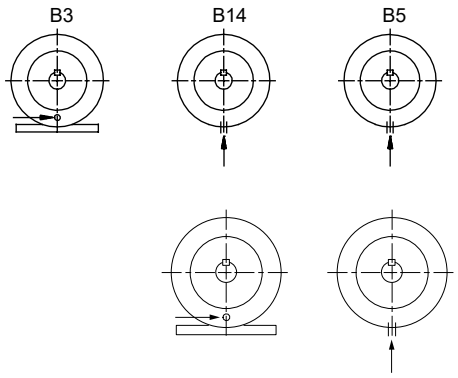
- Open the drain holes in the product.
- Connect the product permanently to the mains supply and activate the built-in standstill heating function.

### 5.6 Drain holes

The motor has a plugged drain hole on the drive side. The drain hole is placed in the flange on the drive side. You can turn the flange 90° to both sides or 180°.

With the drain hole open, the motor becomes self-venting, allowing water and humid air to escape.

When you open the drain hole, the enclosure class of the motor is lower than standard.

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*Drain hole positions*

The image on the left shows the drain hole position for motors with feet.

The image on the right shows the drain hole position for motors with the following flange sizes: 56C, 182TC, 213TC, 254TC, 256TC, 284TSC, 286TSC.

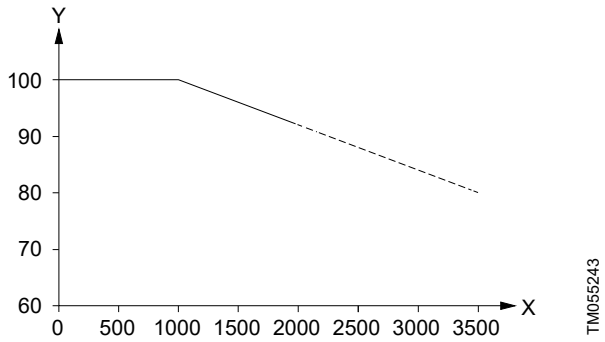
### 5.7 Installation altitude

The installation altitude is the height above sea level of the installation site.

- Products installed up to 1000 m above sea level can be loaded 100 %.
- The motors can be installed up to 3500 m above sea level.

Motors installed more than 1000 m above sea level must not be fully loaded due to the low density and consequent low cooling effect of the air.

The motor output power (P2) in relation to the altitude above sea level is shown in the graph below.




*Derating of motor output (P2) in relation to altitude above sea level*

| Pos. | Description |
|---|---|
| x | Altitude [m] |

## 6. Electrical connection

**DANGER**
**Electric shock**
Death or serious personal injury
- In case of an insulation fault, the fault current may be a DC or pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the product.

**WARNING**
**Electric shock**
Death or serious personal injury
- Carry out the electrical connection in accordance with local regulations.

**WARNING**
**Electric shock**
Death or serious personal injury
- Check that the power plug delivered with the product is in compliance with local regulations.
- The protective earth of the power outlet must be connected to the protective earth of the product. The plug must therefore have the same PE connection system as the power outlet. If not, use a suitable adapter if allowed by local regulations.
- Provide protection against indirect contact in accordance with local regulations.
- Make sure all earth connections are established correctly before switching on the power supply.
- The user or the installer is responsible for correct earthing and protection according to local regulations.
- The installer is responsible for potential compensation.
- Work must be carried out according to IEC 60204-1:2016.

**WARNING**
**Electric shock**
Death or serious personal injury
- Power cables without a plug must be connected to a supply disconnecting device incorporated in the fixed wiring according to local regulations.

**WARNING**
**Electric shock**
Death or serious personal injury
- A supply disconnecting device made according to EN 60204-1 5.3.2 must be provided with means permitting it to be locked in the OFF (isolated) position. This device must also be installed in a position according to EN 60204-1, 5.3.4.

Check that the supply voltage and frequency correspond to the values stated on the nameplate.

### 6.1 Protection against electric shock, indirect contact

**WARNING**
**Electric shock**
Death or serious personal injury
- Connect the product to protective earth and provide protection against indirect contact in accordance with local regulations.

Protective-earth conductors must have a yellow and green (PE) or yellow, green and blue (PEN) colour marking.

### 6.2 Cable requirements

**WARNING**
**Electric shock**
Death or serious personal injury
- Comply with local regulations as to cable cross-sections.

**Related information**

*13.6 Cable requirements*

## 6.3 Protection against mains voltage transients

The pump is protected against voltage transients by built-in varistors between the phases and between phases and earth.

## 6.4 Motor protection

The pump requires no external motor protection. The motor incorporates thermal protection against slow overloading and blocking, TP 211 according to IEC 34-11.

## 6.5 Residual-current circuit breakers

**DANGER**
**Electric shock**
Death or serious personal injury

- In case of an insulation fault, the fault current may be a DC or pulsating DC. Observe national legislation about requirements for and selection of Residual Current Device (RCD) when installing the product.

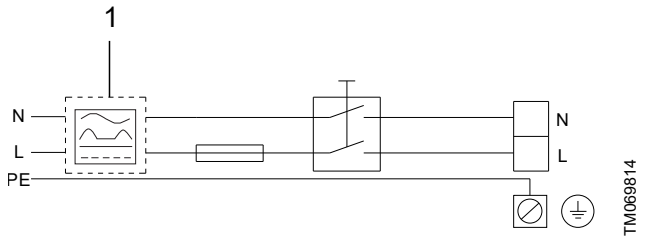
The residual-current circuit breaker must be marked.

Take into account the total leakage current of all the electrical equipment in the installation.

This product may cause a direct current in the protective-earth conductor.

### Connection example for single-phase supply

The drawing shows an example of a mains-connected single-phase motor with a main switch, a backup fuse and a residual-current circuit breaker, type B.




| Pos. | Description |
|---|---|
| 1 | Residual-current circuit breaker, type B |
| N | Neutral |
| L | Phase |
| PE | Protective earth |

## 6.6 Standard functional module, FM 200

### 6.6.1 Inputs and outputs

The module has these connections:

- two analog inputs
- two digital inputs or one digital input and one open-collector output
- Grundfos Digital Sensor input and output
- two signal relay outputs
- GENIbus connection.

All inputs and outputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits. All control terminals are supplied with protective extra-low voltage (PELV), ensuring protection against electric shock.

### 6.6.2 Signal relay 1

LIVE: You can connect supply voltages up to 250 VAC to the output.

PELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or protective extra-low voltage to the output as desired.

### 6.6.3 Signal relay 2

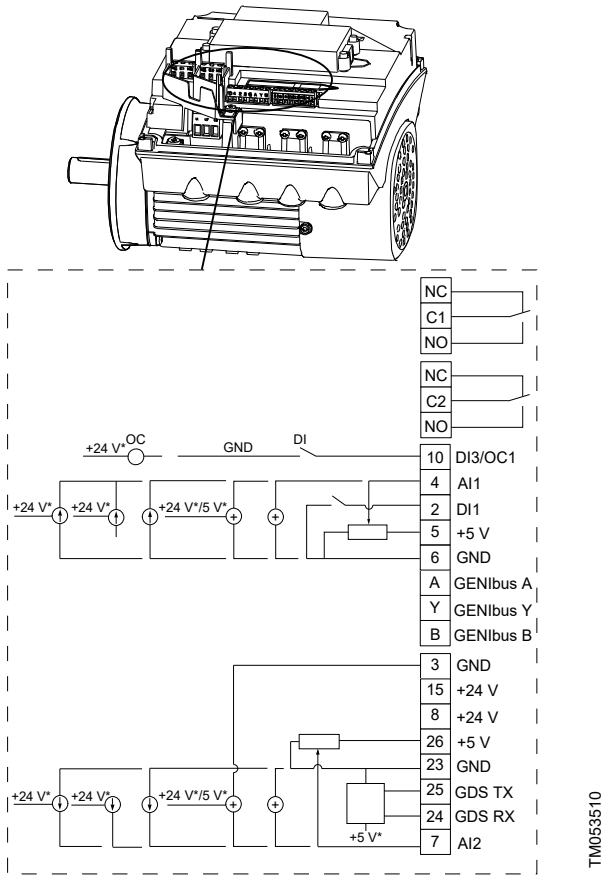
PELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or protective extra-low voltage to the output as desired.

### 6.6.4 Connection terminals for the mains supply

| Phases | Terminals |
|---|---|
| Single-phase | N, PE, L |

### 6.6.5 Connection terminals for inputs and outputs

**DANGER**
**Electric shock**
Death or serious personal injury
- Make sure that the wires to be connected to the connection groups below are separated from each other by reinforced insulation in their entire lengths.




*Connection terminals, FM 200*

* If you use an external supply source, there must be a connection to GND.

Connection terminals for inputs and outputs, FM 200. See the figure above.

| Terminal | Type | Function |
|---|---|---|
| NC | Normally closed contact | Signal relay 1 (LIVE or PELV) |
| C1 | Common | |
| NO | Normally open contact | |
| NC | Normally closed contact | Signal relay 2 (PELV only) |
| C2 | Common | |
| NO | Normally open contact | |
| 10 | DI3/OC1 | Digital input/output, configurable.<br>Open collector: Maximum 24 V resistive or inductive. |
| 4 | AI1 | External sensor.<br>Pressure sensor: Pressure signal, 0.5 to 3.5 V. Connect the white wire to this terminal. |
| 2 | DI1 | Digital input, configurable.<br>Digital input 1 is factory-set to be start or stop input where an open circuit results in stop. A jumper has been factory-fitted between terminals 2 and 6. Remove the jumper if digital input 1 is to be used as external start or stop or any other external function. |
| 5 | +5 V | Power supply to a potentiometer or sensor |
| 6 | GND | Protective earth |
| A | GENIbus, A | GENIbus, A (+) |
| Y | GENIbus, Y | GENIbus, Y (GND) |
| B | GENIbus, B | GENIbus, B (-) |
| 3 | GND | Protective earth |
| 15 | +24 V | Power supply |
| 8 | +24 V | Power supply |
| 26 | +5 V | Power supply to a potentiometer or sensor.<br>Pressure sensor: Voltage supply, +5 VDC, PELV. Connect the brown wire to this terminal. |
| 23 | GND | Protective earth.<br>Pressure sensor: GND, 0 V. Connect the green wire to this terminal. |
| 25 | GDS TX | Grundfos Digital Sensor output |
| 24 | GDS RX | Grundfos Digital Sensor input |
| 7 | AI2 | External sensor.<br>Pressure sensor: Temperature signal, 0.5 to 3.5 V. Connect the yellow wire to this terminal. |

# 7. Startup

**WARNING**
**Hot liquid**
Death or serious personal injury
- If the temperature is higher than 50 °C, use gloves and glasses when venting the pump to avoid risk of scalding.

**WARNING**
**Biological hazard**
Death or serious personal injury
- Flush the pump with clean water before first use.

Do not start the pump until it has been filled with liquid.

Do not start the booster system until all pumps have been properly primed.

After starting up the pump, check the system for leakages.

## 7.1 Flushing the system

**DANGER**
**Contaminated drinking water**
Death or serious personal injury
- Flush the system before starting it or after a standstill period.

**Drinking water systems**

**Hygiene**

Grundfos pressure booster systems are functionally tested by running water through the system. During the test, Grundfos continuously surveys the quality of the test water. Since it is not possible to completely drain and dry the system after the test, the system must be rinsed or flushed thoroughly before being taken into use in a drinking water sector due to risk of bacteria growth. This also applies if the system has been shut down for a long period of time. Rinsing and flushing must always be done in accordance with local regulations.

Contaminated drinking water endangers health.

## 7.2 Supplement to quick guide

These instructions are a supplement to the quick guide for CMBE and CMBE TWIN.

QR98388184

http://net.grundfos.com/qr/i/98388184

## 7.3 Priming and venting the product

1. Close the isolating valve on the outlet side.
2. Open the isolating valve on the inlet side.
3. Remove the priming plug.
4. Fill the pump with water until a steady stream of liquid runs out of the filling hole.
5. Let all air out of the system.
6. Fit and tighten the priming plug.

## 7.4 Adjusting the diaphragm tank pressure

1. Check the precharge pressure in the diaphragm tank. The correct precharge pressure is 0.7 times the required outlet pressure (setpoint).

   Measure the precharge pressure while the system is pressureless.

2. Adjust the precharge pressure. Always use nitrogen gas to refill the tanks.

## 7.5 Shaft seal run-in

The shaft seal faces are lubricated by the pumped liquid. A slight leakage from the shaft seal of up to 10 ml per day or 8 to 10 drops per hour may occur. Under normal conditions, the leaking liquid will evaporate. As a result, no leakage will be detected.

When the pump is started for the first time, or when the shaft seal has been replaced, a certain run-in period is required before the leakage is reduced to an acceptable level. The time required for this depends on the operating conditions, that is, every time the operating conditions change, a new run-in period will be started.

Leaking liquid will drain through the drain holes in the motor flange.

Install the product in such a way that leakage cannot cause undesirable collateral damage.

## 8. Control functions

### 8.1 Dry-running protection

Dry-running protection automatically stops the pump in case of dry running to prevent damage to the pump.

To build up pressure, the motor will run at maximum speed. When the motor runs at maximum speed, the power consumption will be measured and compared to the expected values for power consumption when the pump is filled with water. In case the measured value is below the expected value, the pump will stop with dry-running alarm.

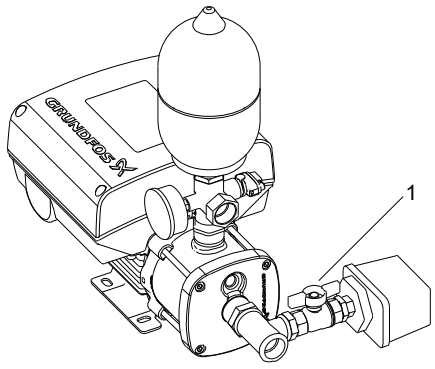
In case of a dry-running alarm, the pump will do the following:

1. The pump stops.
2. The pump will restart 5 times every 10 seconds. If the measured power consumption is still below the expected value, the pump will stop.
3. After 5 minutes, the pump will try to restart again.
4. When water returns, you can either reset the pump manually or wait for the pump to automatically restart after 5 minutes.

### 8.2 Inlet pressure protection

Some models of the pump are fitted with an adjustable pressure switch as inlet pressure protection. The pressure switch is fitted to the inlet manifold.

The inlet pressure setting may have to be adjusted according to local regulations.

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| Pos. | Description |
|---|---|
| 1 | Pressure switch valve |

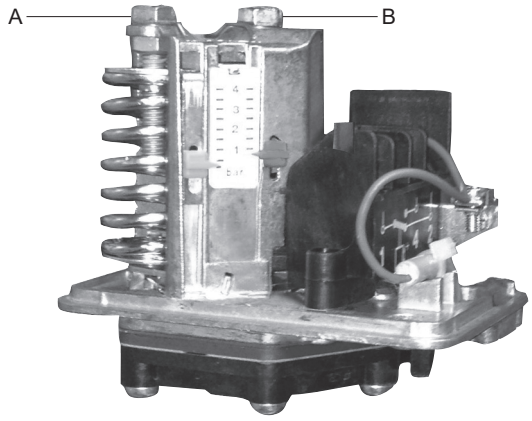
Before starting up the system, make sure that the pressure switch valve is open.

If the inlet pressure is below the lower switching point, the system cannot start.

If the pressure switch has stopped the system during operation due to the inlet pressure being too low, the inlet pressure must increase to a pressure that is higher than the setting of the upper switching point before the system can restart.

If necessary, adjust the lower switching point by turning screw A and adjust the upper switching point to a value higher than the lower switching point by turning screw B. See the figure below.

Do not set the lower switching point to a value below the minimum inlet pressure.

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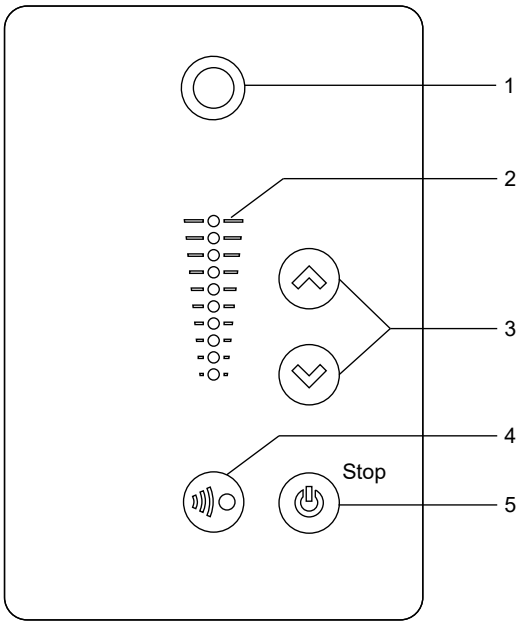
*Adjustment of switching points*

| Pos. | Description |
|---|---|
| A | Low-pressure switching point |
| B | High-pressure switching point |

# 9. Setting the product

## 9.1 Standard operating panel

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| Pos. | Symbol | Description |
|---|---|---|
| 1 | | **Grundfos Eye:** The indicator light shows the operating status of the product. |
| 2 | - | Light fields for indication of the setpoint |
| 3 | | **Up**/**Down**: The buttons change the setpoint. |
| 4 | | **Radio communication**: The button enables radio communication with the Grundfos GO and other products of the same type. |
| 5 | | **Start/Stop**: Press the button to make the product ready for operation or to start and stop the product.<br>**Start**: If you press the button when the product is stopped, the product starts if no other functions with higher priority have been enabled.<br>**Stop**: If you press the button when the product is running, the product always stops. When you press the button, the stop icon appears at the bottom of the display. |

**Related information**

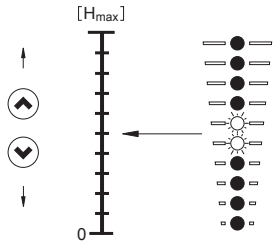
*14. Further product information*

## 9.2 Setpoint setting

The setpoint must not be set higher than the pressure which the pump can deliver.

If you change the outlet pressure, you must adjust the precharge pressure in the diaphragm tank accordingly.

Set the desired setpoint of the pump by pressing ⌃ or ⌄.
The light fields on the operating panel will indicate the setpoint set.
$H_{max}$: maximum head (see pump nameplate).

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## 9.3 Start/stop of pump

Start the pump by pressing ⏻ or by continuously pressing ⌃ until the desired setpoint is indicated.

Stop the pump by pressing ⏻. When the pump is stopped, the "Stop" text next to the button will be on. The pump can also be stopped by continuously pressing ⌄ until none of the light fields are on.

If the pump has been stopped by pressing ⏻, it can only be given free to operation by pressing ⏻ again.

If the pump has been stopped by pressing ⌄, it can only be restarted by pressing ⌃.

## 9.4 Resetting of fault indications

A fault indication can be reset in one of the following ways:

- Briefly press ⌃ or ⌄ on the pump. This will not change the setting of the pump. A fault indication cannot be reset by pressing ⌃ or ⌄ if the buttons have been locked.
- Switch off the power supply until the indicator lights are off.
- With Grundfos GO.

## 10. Servicing the product

**WARNING**
**Electric shock**
Death or serious personal injury

- Switch off the power supply before you start any work on the product.
- Make sure that the power supply cannot be switched on accidentally.

**WARNING**
**Pressurised system**
Death or serious personal injury

- Depressurise the system before you start any work on the product. The pumped liquid may be scalding hot and under high pressure.
- Drain the system or close the isolating valves on either side of the pump.

**WARNING**
**Biological hazard**
Death or serious personal injury

- When servicing the product, only use Grundfos original spare parts.

### 10.1 Maintaining the product

To ensure optimal performance and long pump life, check the precharge pressure in the built-in pressure tank once a year and adjust to the correct value, if required.

### 10.2 Cable requirements

**WARNING**
**Electric shock**
Death or serious personal injury

- Comply with local regulations as to cable cross-sections.

**Related information**

*13.6 Cable requirements*

### 10.3 Megging

Megging of an installation incorporating MGE motors is not allowed, as the built-in electronics may be damaged.

### 10.4 Refilling the diaphragm tank

We recommend that you refill the tanks with nitrogen gas once a year.

## 11. Taking the product out of operation

**WARNING**
**Electric shock**
Death or serious personal injury

- Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be switched on accidentally.

**WARNING**
**Pressurised system**
Death or serious personal injury

- Depressurise the system before you start any work on the product. The pumped liquid may be scalding hot and under high pressure.
- Drain the system or close the isolating valves on either side of the pump.

## 12. Fault finding

**WARNING**
**Electric shock**
Death or serious personal injury

- Switch off the power supply before you start any work on the product.
- Make sure that the power supply cannot be switched on accidentally.

**WARNING**
**Pressurised system**
Death or serious personal injury

- Depressurise the system before you start any work on the product. The pumped liquid may be scalding hot and under high pressure.
- Drain the system or close the isolating valves on either side of the pump.

**WARNING**
**Biological hazard**
Death or serious personal injury

- When servicing the product, only use Grundfos original spare parts.

| Fault | Grundfos Eye | Cause | Remedy |
|---|---|---|---|
| Pump does not run. | No lights on. | Power supply failure. | Switch on power supply.<br>Check cables and cable connections for defects and loose connections. |
| | | Fuses blown. | Check cables and cable connections for defects, and replace the fuses. |
| | Alarm.<br>Motor stopped.<br>Two opposite red indicator lights flashing simultaneously. | Sensor is defective. | Replace sensor. |
| Pump performance is unstable. | No lights on. | Pump inlet pressure too low. | Check the inlet conditions of the pump. |
| | | Inlet pipe is partly blocked by impurities. | Remove and clean inlet pipe. |
| | | Leakage in inlet pipe. | Remove and repair inlet pipe. |
| | | Air in inlet pipe or pump. | Vent the inlet pipe or pump.<br>Check the inlet conditions of the pump. |
| Pump has tried to restart five times and is now stopped. | Alarm.<br>Motor stopped.<br>Two opposite red indicator lights flashing simultaneously. | Pump inlet pressure too low. | Check the inlet conditions of the pump. |
| | | Inlet pipe is partly blocked by impurities. | Remove and clean inlet pipe. |
| | | The foot or non-return valve is blocked in closed position. | Remove and clean, repair or replace valve. |
| | | Leakage in inlet pipe. | Remove and repair the inlet pipe. |
| | | Air in inlet pipe or pump. | Vent the inlet pipe or pump.<br>Check the inlet conditions of the pump. |
| Pump runs backwards when switched off. | No lights on. | Leakage in inlet pipe. | Remove and repair inlet pipe. |
| | | Foot or non-return valve defective. | Remove and clean, repair or replace valve. |
| | | Foot valve is blocked in completely or partly open position. | Remove and clean, repair or replace valve. |

# 13. Technical data

## 13.1 Operating conditions

| | |
|---|---|
| Min./max. operating temperature | -20/+50 °C [1] |
| Min./max. storage temperature | -30/+60 °C |
| Liquid temperature | 0-60 °C |
| Sound pressure level | ≤ 55 dB(A) [2] |
| Start/stop frequency | Max. 100/h |

1) The motor can operate with the rated power output (P2) at 50 °C, but continuous operation at higher temperatures reduces the expected product life. If the motor is to operate at ambient temperatures between 50 and 60 °C, an oversized motor must be selected. Contact Grundfos for further information.

2) For CMBE TWIN, the sound pressure level may be higher.

**Miscellaneous data**

| | |
|---|---|
| Enclosure class | Pump: IP55<br>Sensor: IP44 |
| Insulation class | F |

## 13.2 Maximum total head

| Pump type | Max. head [m] |
|---|---|
| CMBE 1-44 | 44 |
| CMBE 3-62 | 62 |
| CMBE 3-93 | 93 |
| CMBE 5-62 | 62 |
| CMBE 10-54 | 54 |
| CMBE TWIN 3-62 | 62 |
| CMBE TWIN 3-93 | 93 |
| CMBE TWIN 5-62 | 62 |

## 13.3 Pressure

| | [bar] | [MPa] |
|---|---|---|
| Min. inlet pressure (relative) without pressure sensor | Observe local regulations. | |
| Min. inlet pressure with pressure sensor | Observe local regulations. | |
| Max. outlet pressure | 10 | 1 |
| Max. operating pressure | 10 | 1 |

## 13.4 Electrical data

| | |
|---|---|
| Supply voltage | 1 × 200-240 V -10 % / +10 %, PE |
| Frequency | 50/60 Hz -2 % / +2 % |

## 13.5 Overload protection

The overload protection of the E-motor has the same characteristic as an ordinary motor-protective circuit breaker. As an example, the E-motor can stand an overload of 110 % of rated current for 1 minute.

## 13.6 Cable requirements

**DANGER**
**Electric shock**
Death or serious personal injury

- Comply with local regulations as to cable cross-sections.
- Use the recommended fuse size.

**1 × 200-240 V**

| Power [kW] | Cross-section | |
|---|---|---|
| | [mm$^2$] | [AWG] |
| 0.25 - 2.2 | 1.5 - 2.5 | 16-12 |

**Conductor types**

Stranded or solid copper conductors.

**Conductor temperature ratings**

Temperature rating for conductor insulation: 60 °C (140 °F).

Temperature rating for outer cable sheath: -30 °C to 60 °C (-22 to 140 °F).

## 13.7 Accessories

The following are the communication interface modules intended for use with the product:

| Protocol | Communication interface module |
|---|---|
| GENIbus | CIM 050 |
| LonWorks (Single) | CIM 100 |
| PROFIBUS DP | CIM 150 |
| Modbus RTU | CIM 200 |
| BACnet MS/TP | CIM 300 |
| Modbus TCP, BACnet IP, PROFINET, GiC/GRM IP, EtherNet IP | CIM 500 |
| LonWorks (Multi) | CIM 110 |

Installing a communication interface module not listed above might affect the compliance level of the product.

## 14. Further product information

Use either the QR code or the web address below to access the complete installation and operating instructions for the relevant product.

**CRE, CRIE, CRNE, SPKE, MTRE and CME pumps**

TM056174

*http://net.grundfos.com/qr/i/98358864*

## 15. 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.

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*.

## 16. Document quality feedback

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**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

**Colombia**
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

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