Hydro Multi-E

Multi-pump systems CRE and CME

Service instructions

GRUNDFOS

Hydro Multi-E

English (GB)

Service instructions 4

Original service instructions

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1. General information

Read this document before you start service work on the system. Service work must comply with local regulations and accepted codes of good practice. Observe the safety instructions in the installation and operating instructions for the system.

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. Maintenance

2.1 Yearly maintenance and checks

2.1.1 Pumps

- Air vent the pumps to remove the air and prevent the valve from being clogged.
- Check gaskets for any leakage.
- Check shaft seals for leakage.
- Check for abnormal noise. If you hear any, disassemble and check the pump according to the service instructions of the pump.
- Check the function of the isolation valves by opening or closing the valve. This is to prevent the valve from getting stuck.
- Check the function of the non-return valve.

Stop the pump and observe if the pump runs backwards.

2.1.2 Motor

- Check the motor and signal cables for any damages. Replace the cable if necessary.
- Check the motor bearings for any abnormal noise. Replace the motor bearings if necessary.

2.1.3 Sensors and switches

- Check if the sensor shows the same value as the pressure gauge or other measurement equipment. Replace the sensor if necessary.
- Check the function of the pressure switch, if any. Replace the pressure switch if necessary.

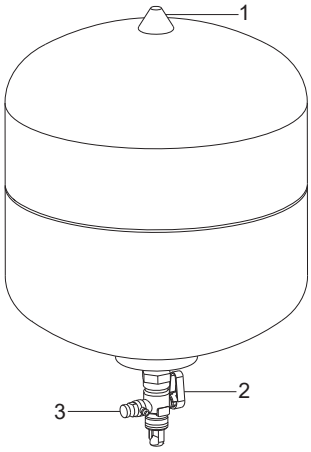
2.1.4 Diaphragm tank

Check the pre-pressure of the diaphragm tank.

Measure the tank precharge pressure when there is no water pressure in the system.

WARNING
Pressurised system
Death or serious personal injury
- The diaphragm tank can be loaded with pressurised water. When replacing the diaphragm tank, release the water from the tank first.

1. Close the inlet valve.
2. Slowly open the drain valve to release the water from the diaphragm tank.
3. Adjust the pressure to 70 % of the setpoint.
4. If the diaphragm tank is defective, replace the diaphragm tank and repeat step 3.



Releasing the water from the diaphragm tank

Pos.	Description
1	Air valve
2	Inlet valve
3	Drain valve

2.1.5 General

Check for physical damages. Replace any damaged parts if necessary.

3. Replacing electrical options

The numbers in the following diagrams refer to the connection terminals shown in section FM300 and FM310 connections.

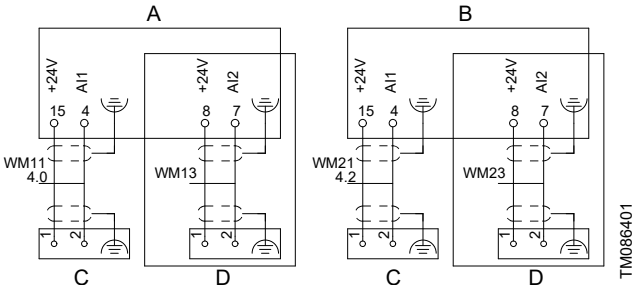
Related information

8.1 FM300 and FM310 connections

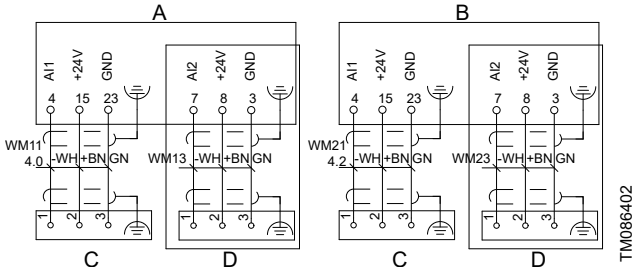
3.1 Replacing an outlet sensor

When replacing an outlet sensor or an inlet sensor for dry-running protection, follow the wiring diagram below.

Make sure that the pressure range is the same as the old sensor. If not, change the range with Grundfos GO, GO Link or HMI 300.



Connecting sensors, 2-wire sensor

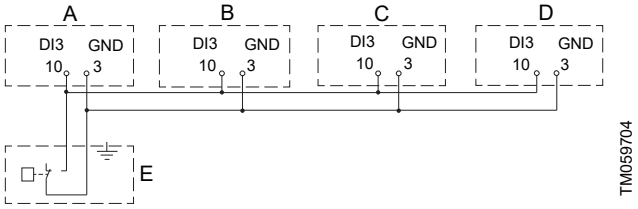


Connecting sensors, 3-wire sensor

Pos.	Description
A	Motor 1
B	Motor 2
C	Outlet sensor
D	Dry-running protection sensor

3.2 Replacing a pressure switch

When replacing a pressure switch for dry-running protection, follow the wiring diagram below.

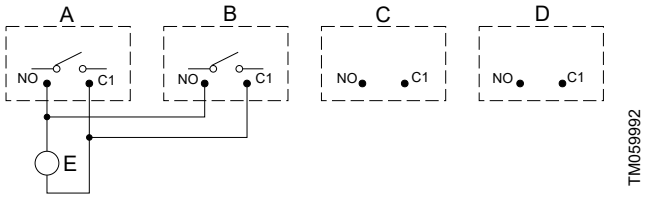


Connecting a pressure switch

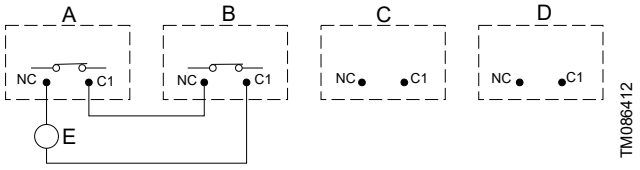
Pos.	Description
A	Motor 1
B	Motor 2
C	Motor 3
D	Motor 4
E	Dry-running protection pressure switch

3.3 Connecting digital outputs

The digital outputs of all the pumps equipped with an outlet sensor must be connected together, so that any devices linked to the digital outputs continue to work normally, even if the control pump changes. Depending on the device and the need, the digital outputs can be connected either normally open (NO) or normally closed (NC). In the wiring diagram below, motors 1 and 2 are equipped with an outlet sensor.



Connecting digital outputs, NO



Connecting digital outputs, NC

Pos.	Description
A	Motor 1
B	Motor 2
C	Motor 3
D	Motor 4
E	Device (for example, LED)

3.4 Replacing the CIM module

A CIM module in the system is always installed in pump 1 (master pump).

For detailed instructions on the replacement of a CIM module, see the service instructions for the MGE motor in the section Replacing the CIM module.

4. Reconfiguring the system (FM200, FM300)

When adding or replacing a pump, the system needs to be reconfigured to integrate the new pump in the system. To configure the new system, the previous system must be disabled, and the new motor must be unlocked.

4.1 Disabling the system with Grundfos GO

To add a new pump to an existing system, the system must be disabled and configured again.

1. Connect the power supply for the complete system.
2. Open the Grundfos GO app, select **Remote**, press **Connect**, and select **MI 301**.
3. The app will search for nearby pumps and create a list. Click on the pump in the list, and Grundfos Eye on the pump will flash. Press the **Connect** button (HMI 200) or the **OK** (HMI 300) button.
4. Go to **Setup**.
5. Select **Multi-pump setup**.
6. Mark **Disable Multi-pump** and press **Next**.
7. Press **Finish setup**.

4.2 Disabling the system with the HMI 300 operating panel

1. Go to **Assist**.
2. Select **Setup of multi-pump system**.

3. Press the **Right** button to continue.
4. Press **OK** to confirm **Disable**.
5. Press the **Right** button to continue.
6. Press **OK** to confirm.

4.3 Unlocking a new motor with PC Tool GO Link

To configure the system, the **assisted cascade setup** function in Grundfos GO needs to be accessible. To unlock this function, use the PC Tool GO Link. Find the correct configuration (GSC) file number in the below table that matches the sensor type for the master pumps and dry-running protection for the slave pumps.

Connect the PC Tool to the motor using either of these:

- Grundfos MI 301
- PC Tool Link box.

Follow these instructions to find the GSC file in the PC Tool:

1. Start the PC Tool.
2. Select **Standard configuration**.
3. If the electronic unit or the complete motor is changed, start downloading the standard pump GSC file.
4. Select **By Number**.
5. In the search field, type the desired GSC file and click **Search now**.
6. Select the GSC file in the list of search results, and click **Send**.

	Sensor range	Inlet protection	GSC file
Master pumps	0-10 bar	Switch	98523060
	0-16 bar	Switch	98523071
	0-10 bar	0-1 bar	98523074
	0-10 bar	0-6 bar	98523075
	0-16 bar	0-1 bar	98523076
	0-16 bar	0-6 bar	98523077
	0-145 psi	Switch	98523072
	0-232 psi	Switch	98523073
	0-145 psi	0-14.5 psi	98523078
	0-232 psi	0-14.5 psi	98523079
	0-145 psi	0-87 psi	98523080
	0-232 psi	0-87 psi	98523081
Slave pumps	No sensor	Switch	98523082
	No sensor	No switch	98523083

Depending on the GSC file loaded in the MGE motor, the master pump can be set to have an outlet sensor and a switch or inlet sensor for dry-running protection.

The files also set the sensor range and the inlet protection. Any pump connected with an outlet sensor must be configured with a master pump file, other pumps with a slave pump file.

A motor loaded with a GSC file for slave pumps can always be configured as a master pump later using Grundfos GO.

Note that the above files is hided in the motor and cannot be seen with Grundfos GO or PC Tool.

4.4 Setting up a new system with Grundfos GO

1. Connect the power supply for the complete system.
2. Open the Grundfos GO app, select **Remote**, press **Connect**, and select **MI 301**.
3. The app will search for nearby pumps and create a list. Connect to one pump by pressing **Connect**, Grundfos Eye on the pump will flash. Press the **Connect** button (HMI 200) or the **OK** button (HMI 300). Set the individual pump unit address (1, 2, 3, 4).
4. Reconnect to pump 1.
5. Go to **Setup**.
6. Select **Multi-pump setup**.
7. Mark **Bus cable** and press **Next**.
8. Mark **Cascade** and press **Next**.
9. The search will start and the connected pump will be listed. (If not listed, check the cabling and unit addresses, and start the search again.)
10. Press **Next**.
11. Press **Finish setup**.

4.5 Setting up a new system with the HMI 300 operating panel

1. Set the individual pump unit address (1, 2, 3, 4).
2. Go to **Assist** on pump 1.
3. Select **Setup of Multi-pump setup**.
4. Press the **Right** button to continue.
5. Select **Wired GENIbus**.
6. Press the **Right** button twice to continue.
7. Select **Cascade**.
8. Press **OK** to search for connected pumps.
9. The connected pumps will be listed.
10. Press **OK** to confirm the system. The master/slave icon will now appear on the HMI 300 operating panel.

Related information

8.2 Identifying the master or slave pump

5. Reconfiguring the system (FM310)

When adding or replacing a pump, the system needs to be reconfigured to integrate the new pump in the system. To configure the new system, the previous system must be disabled, and the new motor must be configured.

You can build a system with both FM300 and FM310.

5.1 Disabling the system with Grundfos GO

To add a new pump to an existing system, the system must be disabled and configured again.

1. Connect the power supply for the complete system.
2. Open the Grundfos GO app, select **Remote**, and press **Connect**.
3. The app will search for nearby pumps and create a list. Meanwhile Grundfos Eye will flash on all pumps. Press the **Connect** button (HMI 200) or the **OK** button (HMI 300) on the first pump in the system.

   The app will prompt if you want to connect to the pump or the system, select system.
4. Go to **Setup**.
5. Select **Multi-pump setup**.
6. Mark **Disable Multi pump** and press **Next**.
7. Press **Finish setup**.

5.2 Disabling the system with the HMI 300 operating panel

1. Go to **Assist**.
2. Select **Setup of multi-pump system**.
3. Press the **Right** button to continue.
4. Press **OK** to confirm **Disable**.
5. Press the **Right** button to continue.

6. Press **OK** to confirm.

5.3 Unlocking a new motor with PC Tool GO Link

To configure the system, the **assisted cascade setup** function in Grundfos GO needs to be accessible. To unlock this function, use the PC Tool GO Link. Find the correct configuration (GSC) file number in the below table that matches the sensor type for the master pumps and dry-running protection for the slave pumps.

Connect the PC Tool to the motor using either of these:

- Grundfos MI 301
- PC Tool Link box
- Ethernet connection.

Follow these instructions to find the GSC file in the PC Tool:

1. Start the PC Tool.
2. Select **Standard configuration**.
3. If the electronic unit or the complete motor is changed, start downloading the standard pump GSC file.
4. Select **By Number**.
5. In the search field, type the desired GSC file and click **Search now**.
6. Select the GSC file in the list of search results, and click **Send**.

	Sensor range	Inlet protection	GSC file
Master pumps	0-10 bar	Switch	93186058
	0-16 bar	Switch	93186059
	0-10 bar	None	93236090
	0-16 bar	None	93236091
	0-10 bar	0-1 bar	93186060
	0-10 bar	0-6 bar	93186061
	0-16 bar	0-1 bar	93186062
	0-16 bar	0-6 bar	93186063
	0-145 psi	Switch	93186064
	0-232 psi	Switch	93186065
	0-145 psi	None	93236092
	0-232 psi	None	93236093
	0-145 psi	0 - 14.5 psi	93186066
	0-232 psi	0 - 14.5 psi	93186067
	0-145 psi	0-87 psi	93186068
	0-232 psi	0-87 psi	93186069
	0-232 psi	0-145 psi	93236094
Slave pumps	No sensor	Switch	93186070
	No sensor	No switch	93186071

Depending on the GSC file loaded in the MGE motor, the master pump can be set to have an outlet sensor and a switch or inlet sensor for dry-running protection.

The files also set the sensor range and the inlet protection. Any pump connected with an outlet sensor must be configured with a master pump file, other pumps with a slave pump file.

A motor loaded with a GSC file for slave pumps can always be configured as a master pump later using Grundfos GO.

Note that the above files is hided in the motor and cannot be seen with Grundfos GO or PC Tool.

5.4 Setting up a new system with Grundfos GO

1. Connect the power supply for the complete system.
2. Open the Grundfos GO app, select **Remote**, press **Connect**, and select **MI 301**.
3. The app will search for nearby pumps and create a list. Meanwhile the Grundfos Eye will flash on all pumps. Press the **Connect** button (HMI 200) or the **OK** button (HMI 300) to connect to one pump. Set the individual pump unit address (1, 2, 3, 4).
4. Reconnect to pump 1.
5. Go to **Setup**.
6. Select **Multi-pump setup**.
7. Mark **Bus cable** and press **Next**.
8. Mark **Cascade** and press **Next**.
9. The search will start and the connected pump will be listed. (If not listed, check the cabling and unit addresses, and start the search again.)
10. Press **Next**.
11. Press **Finish setup**.

5.5 Setting up a new system with the HMI 300 operating panel

1. Set the individual pump unit address (1, 2, 3, 4).
2. Go to **Assist** on pump 1.
3. Select **Setup of Multi-pump setup**.
4. Press the **Right** button to continue.
5. Select **Wired GENIbus**.
6. Press the **Right** button twice to continue.
7. Select **Cascade**.
8. Press **OK** to search for connected pumps.
9. The connected pumps will be listed.
10. Press **OK** to confirm the system. The master/slave icon will now appear on the HMI 300 operating panel.

Related information

8.2 Identifying the master or slave pump

6. Fault finding

DANGER
Electric shock
Death or serious personal injury

- Switch off the power supply and wait at least five minutes before you make any connections in the breaker cabinet or control cabinet.
- Make sure that the power supply is disconnected and cannot be accidentally switched on.

6.1 The system does not run when started

The system does not run when started.

Cause	Remedy
The actual pressure is higher than or equal to the setpoint.	Wait until the pressure drops, or decrease the pressure on the outlet side of the system, and check if the system starts.
The power supply is disconnected.	Connect the power supply.
The circuit breakers have cut out.	Correct the fault and cut in the circuit breakers.
The internal motor protection is activated.	Contact Grundfos.
The circuit breaker is defective.	Replace the circuit breaker.
The motor is defective.	Repair or replace the motor.
Outlet-pressure sensor fault. • The outlet-pressure sensor is defective. • The cable is broken or short-circuited.	• Replace the outlet-pressure sensor. • Repair or replace the cable.

6.2 The system starts but stops immediately afterwards

The system starts but stops immediately afterwards. The operating pressure is not reached.

Cause	Remedy
Dry running or no inlet pressure.	Check the water supply to the system. When the inlet pressure is re-established, the pumps will restart after 15 seconds.

6.3 The system stops and cannot restart

The system stops and cannot restart.

Cause	Remedy
Outlet-pressure sensor fault. • The outlet-pressure sensor is defective. • The cable is broken or short-circuited.	• Replace the outlet-pressure sensor. Outlet-pressure sensors with 0-20 mA or 4-20 mA output signals are monitored by the system. • Repair or replace the cable.
Terminal box unit fault. • The power supply is disconnected on pump 1. • The terminal box is defective.	• Connect the power supply. • Replace the terminal box of pump 1. • Contact Grundfos.

6.4 Unstable water supply from the system

The water supply from the system is unstable (only applies to very low consumption).

Cause	Remedy
The inlet pressure is too low.	Check the inlet pipe and possible inlet strainer.
The inlet pipe or pumps are partly blocked by impurities.	Clean the inlet pipe or pumps.
The pumps suck air.	Check the inlet pipe for leakages.
The outlet-pressure sensor is defective.	Replace the outlet-pressure sensor.

6.5 Pumps are running but deliver no water

Pumps are running but deliver no water.

Cause	Remedy
The inlet pipe or pumps are blocked by impurities.	Clean the inlet pipe or pumps.
The non-return valve is blocked in the closed position.	Clean the non-return valve. The non-return valve must move freely.
The inlet pipe is leaky.	Check the inlet pipe for leakages.
Air in the inlet pipe or pumps.	Vent the pumps. Check the inlet pipe for leakages.

6.6 The system cannot reach the setpoint

The system cannot reach the setpoint.

Cause	Remedy
The cable is broken or short-circuited (GENIbus communication between pump 1 and pump 2 or 3).	Repair or replace the cable.
Pump 2 or 3 does not operate.	Connect the power supply to the pump and check the pump condition.

6.7 Leakage from a shaft seal

The shaft seal has leakage.

Cause	Remedy
The shaft seal is defective.	Replace the shaft seal.
The height adjustment of the pump shaft is inaccurate.	Re-adjust the shaft height.

6.8 There is noise when the pumps are operating

There is noise when the pumps are operating.

Cause	Remedy
The pumps are cavitating.	Clean the inlet pipe or pumps, and if necessary, the inlet strainer.
The pumps do not rotate freely (frictional resistance) due to inaccurate height of the pump shaft.	Re-adjust the shaft height. See the installation and operating instructions of the pump supplied with the system.

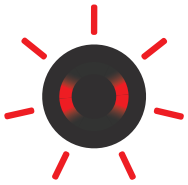
6.9 Very frequent starts and stops

The starts and stops of pumps are frequent.

Cause	Remedy
Wrong diaphragm tank precharge pressure.	Check the precharge pressure.
The difference between start and stop pressures is too small. This situation only occurs in systems with emergency operation.	Increase the differential pressure setting on each pressure switch.

7. Fault and warning signals

The fault indication below can be read by the number in brackets, text or 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 reports 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 restarts too many times due to a fault that forces 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 the power quality.
	Overload (49)	
	The motor is overloaded and has automatically reduced the speed, thereby reducing the pump performance.	• Check if the viscosity and temperature of the pump liquid is within the limits for the pump. If not, change the properties of the liquid. • Disassemble the pump, and remove any foreign objects 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.	• Disassemble the pump, and remove any foreign objects or impurities preventing the pump from rotating.
	STO Active Indication (62)	
	The Safe Torque Off (STO) function are activated by an external device.	• This might not be an alarm situation. The pump might be stopped on purpose due to the activation of STO by an 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 multi-pump system.	• Make sure that all pumps of the multi-pump system are 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 if the pump operates 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 objects which reduce 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 is in the mode "soft pressure buildup" longer than the set time limit.	• Check the system for leakages.

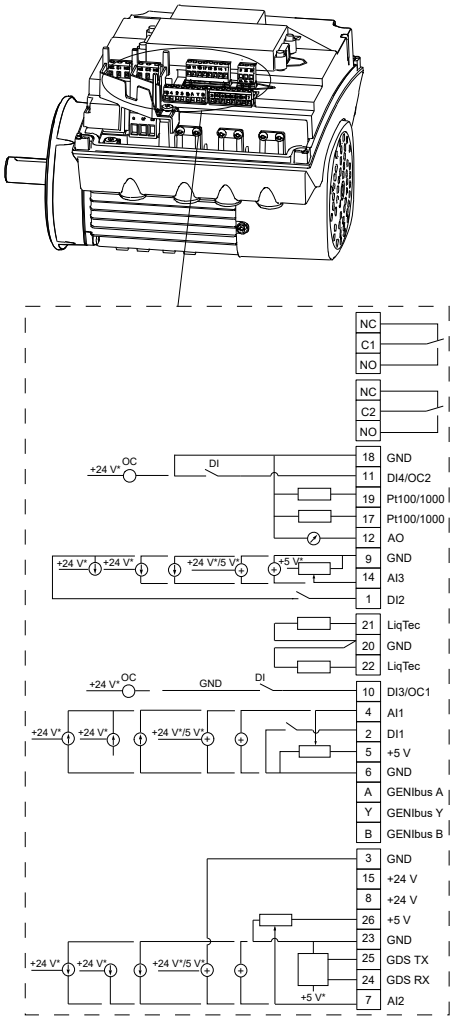
Grundfos Eye	Cause	Remedy
	Replace the motor bearings (30)	
	The bearings are worn.	• Replace the bearings. Follow the instructions for the pump. See the relevant section on bearing replacement in the service instructions.
	Internal sensor fault (88)	
	The pump receives a signal from the internal sensor which is out of 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 receives a signal which is out of the normal range.	• Check if the sensor resistance is approximately 100 or 1000 ohm. If not, replace the sensor. • Check the sensor cable for damage. • Check the cable connection of the pump and 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 the sensor or potentiometer.	• Check the output voltage and wire to the 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 receives a signal from the LiqTec sensor which is out of the normal range.	• Check if 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 receives a signal which is out of the normal range.	• Check if 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 of the pump and the sensor. Correct the connection, if required. • Check if the sensor is removed, but the input is not deactivated. • Replace the sensor.
	Limit 1 exceeded (190) and limit 2 exceeded (191)	
	Limit 1 or 2 reaches the limit for warning or alarm.	• Identify and remove the fault cause.

8. References

8.1 FM300 and FM310 connections

The motor used in the system is equipped with FM300 or FM310 as standard.

FM300 connections



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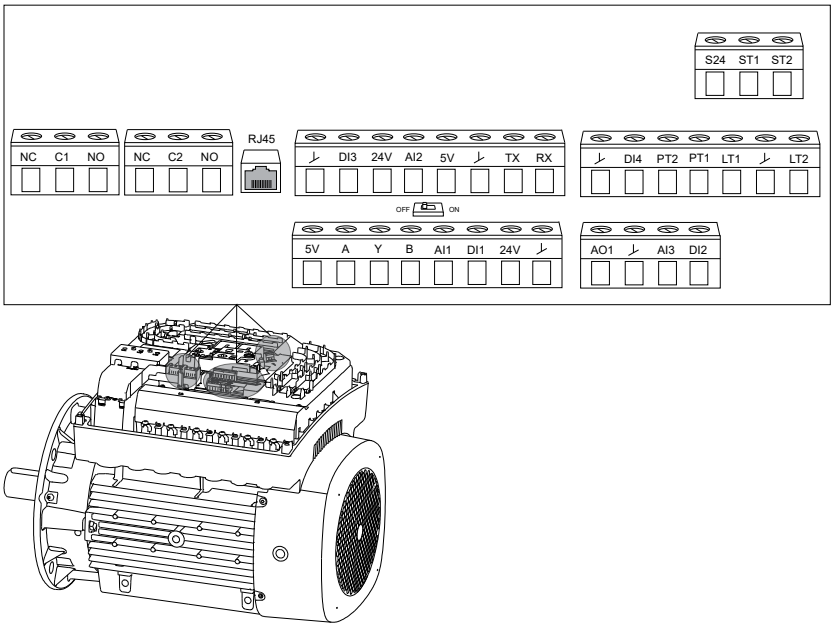
* If you use an external supply source, it must be connected to GND.

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	
18	GND	Signal ground
11	DI4/OC2	Digital input/output, configurable Open collector: Maximum 24 V resistive or inductive
19	Pt100/1000 input 2	Pt100/1000 sensor input
17	Pt100/1000 input 1	Pt100/1000 sensor input
12	AO	Analog output: • 0-20 mA or 4-20 mA • 0-10 V.
9	GND	Signal ground

Terminal	Type	Function
14	AI3	Analog input: • 0-20 mA or 4-20 mA • 0-10 V
1	DI2	Digital input, configurable
21	LiqTec sensor input 1	LiqTec sensor input (white conductor)
20	GND	Signal ground (brown and black conductors)
22	LiqTec sensor input 2	LiqTec sensor input (blue conductor)
10	DI3/OC1	Digital input/output, configurable Open collector: Maximum 24 V resistive or inductive
4	AI1	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
2	DI1	Digital input, configurable Digital input 1 is factory-set to be the start-stop input for the situation when an open circuit results in a stop. A jumper is factory-fitted between terminals 2 and 6. Remove the jumper if you want to use digital input 1 for external start-stop or any other external function.
5	+5 V	Supply to potentiometer and sensor
6	GND	Signal ground
A	GENIbus, A	GENIbus, A (+)
Y	GENIbus, Y	GENIbus, GND
B	GENIbus, B	GENIbus, B (-)
3	GND	Signal ground
15	+24 V	Supply
8	+24 V	Supply
26	+5 V	Supply to potentiometer and sensor
23	GND	Signal ground
25	GDS TX	Grundfos Digital Sensor output
24	GDS RX	Grundfos Digital Sensor input
7	AI2	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.

FM310 connections



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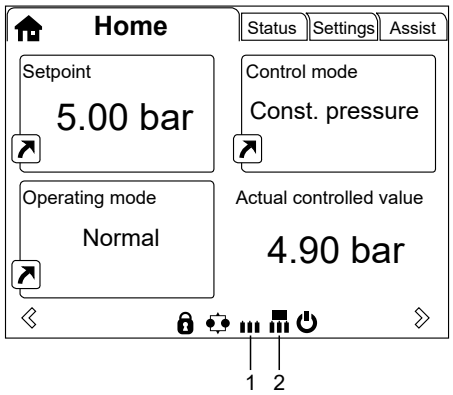
Terminal	Type	Function
NC	Normally closed contact	Signal relay 1: LIVE or SELV
C1	Common	
NO	Normally open contact	
NC	Normally closed contact	Signal relay 2: SELV only
C2	Common	
NO	Normally open contact	
RJ45	Ethernet	Ethernet communication
GND	GND	Signal ground
DI3	DI3/OC1	Digital input/output, configurable Open collector: Maximum 24 V resistive or inductive
24V	+24 V	Power supply
AI2	AI2	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
5V	+5 V	Power supply to a potentiometer or sensor
GND	GND	Signal ground
TX	GDS TX	Grundfos Digital Sensor output
RX	GDS RX	Grundfos Digital Sensor input
GND	GND	Signal ground
DI4	DI4/OC2	Digital input/output, configurable Open collector: Maximum 24 V resistive or inductive
PT2	Pt100/1000 input 2	Pt100/1000 sensor input 2
PT1	Pt100/1000 input 1	Pt100/1000 sensor input 1
LT1	LiqTec sensor input 1	LiqTec sensor input 1 White conductor
GND	GND	Signal ground Brown and black conductors
LT2	LiqTec sensor input 2	LiqTec sensor input 2 Blue conductor
5V	+5 V	Power supply to a potentiometer or sensor
A	GENIbus, A	GENIbus, A (+) / Modbus, D1 (+)
Y	GENIbus, Y	GENIbus, GND / Modbus, GND
B	GENIbus, B	GENIbus, B (-) / Modbus, D0 (-)

Terminal	Type	Function
AI1	AI1	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
DI1	DI1	Digital input, configurable Digital input 1 is factory-set to be start-stop input for the situation when an open circuit results in a stop. A jumper is factory-fitted between terminals DI1 and GND. Remove the jumper if you want to use digital input 1 for external start-stop or any other external function.
24V	+24 V	Power supply
GND	GND	Signal ground
AO1	AO	Analog output: • 0-20 mA or 4-20 mA • 0-10 V.
GND	GND	Signal ground
AI3	AI3	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
DI2	DI2	Digital input, configurable
S24	+24 V (STO)	Power supply to the Safe Torque Off inputs
ST1	STO1	Safe Torque Off - Input 1
ST2	STO2	Safe Torque Off - Input 2

8.2 Identifying the master or slave pump

The master or slave status of the pumps can be identified in two ways:

- With HMI 200, the status of the pump can be identified with Grundfos GO.
- With HMI 300, the status of the pump can be identified from the home display.



Identifying the master/slave pump

Pos.	Description
1	Indicates that the pump is functioning as a slave pump in a multi-pump system
2	Indicates that the pump is functioning as a master pump in a multi-pump system

8.3 Accessories

The following are the communication interface modules for use with the system.

Protocol	Communication interface module
GENIbus	CIM 50
LonWorks (Single)	CIM 100
LonWorks (Multi)	CIM 110
PROFIBUS DP	CIM 150
Modbus RTU	CIM 200 [1)]
BACnet MS/TP	CIM 300
Modbus TCP, BACnet IP, PROFINET, GiC/GRM IP, EtherNet IP	CIM 500
Ethernet connection to Grundfos iSOLUTIONS Cloud (GiC)	CIM 550

1) Soft CIM built-in motor with FM310 and FM311.

Installing a communication interface module that is not listed above might affect the compliance level of the system.

8.4 Product manuals

You can find further product information about the system in the following documents.
The documents are available in Grundfos Product Center on www.grundfos.com.

Title	Document type	QR code	Link	Publication number
CRE, CRIE, CRNE, SPKE, MTRE, CME, BMS E-pumps with MGE Model J, K motor	Installation and operating instructions		*http://net.grundfos.com/qr/i/92898118*	92898118
CRE, CRIE, CRNE, CRKE, SPKE, MTRE, CME MLE Model J, K permanent-magnet motors	Installation and operating instructions		*http://net.grundfos.com/qr/i/92898117*	92898117
CM, CME	Service instructions		*http://net.grundfos.com/qr/i/99698874*	99698874
MGE and MLE model J	Service instructions		*http://net.grundfos.com/qr/i/99137804*	99137804

9. Disposal

9.1 Precautions for disposal

DANGER
Electric shock
Death or serious personal injury

- Before you dismantle the system, make sure that the power supply is disconnected and cannot be accidentally switch on.

WARNING
Crushing of feet
Death or serious personal injury

- Before you lift, make sure that the lifting equipment can lift this load, which is listed on the nameplate and on the packaging label.

WARNING
Hot surface
Death or serious personal injury

- Before you dismantle the system, make sure that the system cools down.

CAUTION
Overhead load
Minor or moderate personal injury

- Use safety equipment when dismantling the system.

CAUTION
Sharp element
Minor or moderate personal injury

- Wear safety gloves.

9.2 Disposing of the system

This system 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.

10. Document quality feedback

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