LC 221

Installation and operating instructions

Original installation and operating instructions.

CONTENTS

Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

Warning

The use of this product requires experience with and knowledge of the product.
Persons with reduced physical, sensory or mental capabilities must not use this product, unless they are under supervision or have been instructed in the use of the product by a person responsible for their safety.
Children must not use or play with this product.

Note

As the LC 221 controller is part of either a Multilift, Unolift or Duolift system, there is no separate EC declaration of conformity for LC 221. Please see declaration of conformity in the installation and operating instructions for the lifting station.

1. Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury.

Caution

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

Note

Notes or instructions that make the job easier and ensure safe operation.

2. Scope of delivery

Grundfos LC 221 controllers can be ordered together with wastewater lifting stations, such as Multilift, Unolift or Duolift. The controller is delivered with mains cable and appropriate plug.

An accessories bag containing the following items is also included:

- 1 x installation and operating instructions
- 1 x quick guide for controller menu.

3. Transportation and storage

For long periods of storage, the LC 221 controller must be protected against moisture and heat.

Storage temperature, see chapter *10. Technical data*.

4. Product description

LC 221 is a level controller designed for controlling and monitoring the Grundfos lifting stations, Multilift, Unolift and Duolift. The control is based on a signal received continuously from the piezoresistive level sensor.

The level controller switches the pumps on and off according to the liquid level measured by the level sensor.

An alarm will be indicated in case of high water level in the tank, pump failure, etc.

Furthermore, the level controller has many more functions as described below.

TM05 1368 3811 - TM05 1370 3811

Fig. 1 LC 221 level controllers for one and two pumps

TM05 4022 1912

Fig. 2 LC 221 level controller, Y/D (star-delta) version

Functions

The LC 221 controller has the following functions:

- on/off control of two wastewater pumps based on a continuous signal from a piezoresistive level sensor with alternating operation and automatic changeover in case of pump failure
- motor protection with motor-protective circuit breaker and/or current measurement as well as connection of thermal switches
- motor protection via operating-time limitation with subsequent emergency operation. Normal operating times are max. 25 seconds (Duolift 270) and 55 seconds (Duolift 540), and the operating time is limited to three minutes (see section *7.4 Description of fault indications*, fault code F011).
- automatic test runs for two seconds during long periods of inactivity (24 hours after last operation)
- re-starting delay up to 45 seconds after returning from power cut-off to mains operation (in order to even out the mains load when several appliances are started up at the same time)
- setting of delay times:
  – stopping delay (time from the stop level is reached till the pump is stopped) - reduces water hammer if pipes are long
  – starting delay (time from the start level is reached till the pump is started)
  – alarm delay (time from a fault appears till an alarm is indicated). This prevents short-time high-level alarm in case of temporary high inflow to the tank.
- automatic current measurement for alarm indications
- setting of current values:
  – overcurrent (preset)
  – rated current (preset)
  – dry running current (preset).
- operating indication:
  – operating mode (auto, manual)
  – operating hours
  – number of starts
  – highest measured motor current.
- alarm indication:
  – pump status (running, fault)
  – phase sequence failure and missing phase
  – thermal-switch failure
  – high-water alarm
  – service/maintenance (selectable).
- selection of automatic alarm resetting
- fault log of up to 20 alarms
- selection between different start levels
- selection of maintenance interval (0, 3, 6 or 12 months).

As standard, the LC 221 has four potential-free outputs for:

  – pump running
  – pump failure
  – high water level alarm
  – common fault.

Furthermore, LC 221 has inputs for the following functions:

  – additional float switch parallel to the existing level sensor
  – separate level switch to be used for flood detection outside the lifting station (e.g. in a sump in the basement)
  – external alarm reset
  – external alarm
  – common fault
  – thermal switch of the motor.

For further adjustments, a PC Tool (PC Tool LC22x) can be connected. See service instructions.

If a warning is required in case of local power supply failure, a battery (accessory) can be installed which activates an acoustic alarm (buzzer). The buzzer is activated as long as the fault exists. It cannot be reset.

If a warning is required in case of sectional power failure, the common alarm output which is a potential-free changeover contact can be used to forward the alarm signal to a control room by means of an external power source.

Double pump operation:

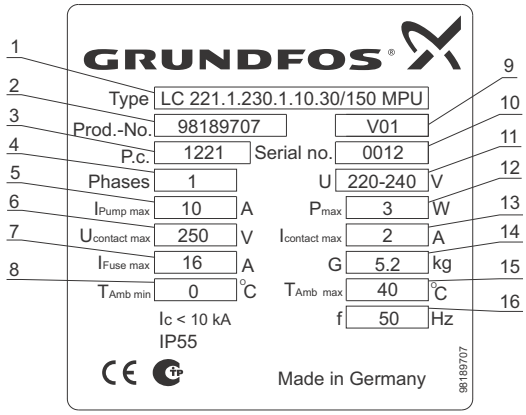
- When the first start level is reached, the first pump will start, and when the liquid level has been lowered to the stop level, the pump will be stopped by the controller. If the liquid level rises up to the second start level, the second pump will also start, and when the liquid level has been lowered to the stop level, the pumps will be stopped by the controller.
- Starts alternate between the two pumps.
- In case of pump failure in one pump, the other pump will take over (automatic pump changeover).

Type key, LC 221 controller

Example	**LC 221**	**.2**	**.230**	**.1**	**.10**	**.30**
LC 221 = controller type						
1 = one-pump controller 2 = two-pump controller						
Voltage [V]						
1 = single-phase 3 = three-phase						
Max. operating current [A]						
Capacitors [µF]						
Starting method: [ ] = DOL SD = Star-delta						

Nameplate

The controller type, voltage variant, etc. are stated in the type designation on the nameplate situated on the side of the control cabinet.



TM05 1870 3311

Fig. 3 Example of an LC 221 nameplate

Pos.	Description
1	Type designation
2	Product number
3	Production code (year, week)
4	Number of phases
5	Maximum pump input current
6	Maximum voltage at potential-free contact
7	Maximum backup fuse
8	Minimum ambient temperature
9	Version
10	Serial number
11	Rated voltage
12	Power consumption
13	Maximum current at potential-free contact
14	Weight
15	Maximum ambient temperature
16	Frequency

4.1 Design

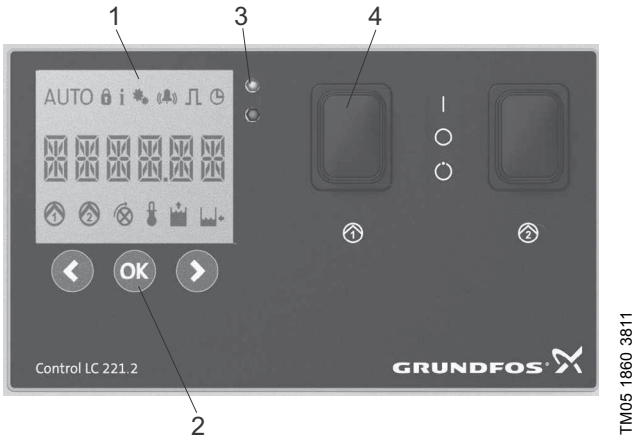
The LC 221 level controller incorporates the necessary components to control and protect the pumps, such as relays and capacitors for single-phase motors, contactors for three-phase motors and additional motor-protective circuit breaker.

The operating panel offers a user interface with operating buttons and a display for indication of operating conditions and fault indications.

The controller has an integrated piezoresistive level sensor which is activated by compressed air directly via the pressure tube inside the collecting tank and terminals for power supply, connection to the pump and the inputs and outputs mentioned in section *4. Product description*.

The front cover is closed by four bayonet fastenings with quarter turn locks. On the left side, the locks are extended and connected to the cabinet bottom with hinge strings. The cabinet can be mounted on a wall without opening it (this does not apply to the Y/D version).

Operating panel



TM05 1860 3811

Fig. 4 Operating panel

Pos.	Description
1	Display
2	Operating buttons
3	Status LEDs
4	ON-OFF-AUTO selector switch

Display (pos. 1)

The display shows all relevant operating data and fault indications. The operation and fault indications are described in section *7.1 Description of display*.

Operating buttons (pos. 2)

The level controller is operated by the operating buttons placed under the display. The functions of the operating buttons are described in the table below:

Operating button	Description
	• go left in the main menu. • go up in the submenus. • decrease values in the submenus.
	• confirm a selection. • activate the submenus. • reset the buzzer.
	• go right in the main menu. • go down in the submenus. • increase values in the submenus.

Status LEDs (pos. 3)

The upper LED (green) is on when the power supply is on.
The lower LED flashes (red) in case of fault to make the fault visible from a long distance and is thus an addition to the display symbols and fault codes.

Selector switch (pos. 4)

Switch	Description of function
	The operating mode is selected by the ON-OFF-AUTO selector switch which has three different positions: POS I: Starts the pump manually. The operating time protection is active and indicates alarm after three minutes. Normal operating times are up to max. 25 seconds (MD) and 55 seconds (MLD). POS O: • Stops the pump when running and cuts off the power supply to the pump. The three symbols "Settings locked", "Information" and "Setup" will be visible. • Resets fault indications. POS AUTO: Automatic operation. The pump will start and stop according to the signal from the level sensor.

4.2 Level sensor

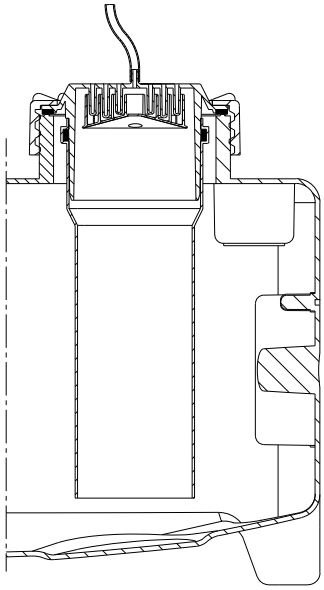
The piezoresistive level sensor placed in the controller is connected via a pressure hose to a pressure tube in the tank. The screw cap where the pressure hose is connected includes a condensate trap and a connection for a DN 100 tube. This tube, the pressure tube, extends down into the tank. The rising liquid level compresses the air inside the pressure tube and pressure hose, and the piezoresistive sensor transforms the changing pressure into an analogue signal. The controller uses the analogue signal to start and stop the pump and to indicate high water level alarm. The pressure tube is fixed underneath the screw cap and can be taken out for maintenance, service and for cleaning the inside of the tube. An O-ring ensures tightness.

Please note that the display cannot show 0 mm, even if the tank has been completely emptied. This fact is related to the measuring principles of the sensor.

As long as the pressure tube is not immersed in water, the configured value for the distance (e.g. 84 mm) between the bottom of the tank and the bottom edge of the tube is displayed. The sensor starts working correctly when it is immersed in water.

When the pressure tube is immersed, the liquid will enter the tube just a few mm (as long as there is no air leakage). The water level in the tube will not follow the level in the tank because of the pressure ratio inside the tube.

The sensor usually does not require any calibration in the field, as it has already been calibrated by the factory.



TM05 0332 1011

Fig. 5 Pressure tube with pressure hose

Please note that the pressure tubes look differently in Multilift and Uno-/Duolift. Multilift lifting stations have a DN 100 tube with a screw cap, whereas Uno-/Duolift come with a DN 50 tube with a cap to be inserted.

5. Installation

Warning

Before making any connections in LC 221 or working on pump, pit, etc., make sure that the power supply has been switched off and that it cannot be accidentally switched on.

The installation must be carried out by authorised personnel in accordance with local regulations.

5.1 Location

Warning

Do not install the LC 221 controller in explosion hazard areas.

Install the controller as close as possible to the lifting station.

When installed outdoors, LC 221 must be placed in a protective shed or enclosure. LC 221 must not be exposed to direct sunlight.

5.2 Mechanical installation

Warning

When drilling the holes, take care not to damage any cables or water and gas pipes. Ensure a safe installation.

Note ***LC 221 can be mounted without removing the front cover.***

Proceed as follows:

- Mount LC 221 on a plane wall surface.
- Mount LC 221 with the cable entries pointing downwards (additional cable entries, if required, must be fitted in the bottom plate of the cabinet).
- Mount LC 221 with four screws through the mounting holes in the back plate of the cabinet. Drill the mounting holes with a 6 mm drill using the drilling template supplied with the controller. Fit the screws into the mounting holes and tighten securely. Fit plastic caps if provided.

5.3 Electrical connection

Warning

LC 221 must be connected in accordance with the rules and standards in force for the application in question.

Warning

Before opening the cabinet, switch off the mains supply.

The operating voltage and frequency are marked on the controller nameplate. Make sure that the controller is suitable for the electricity supply on which it will be used.

All cables/wires must be fitted through the cable entries and gaskets.

The power supply socket must be placed near the cabinet as the controller is supplied with a 1.5 m cable, a Schuko plug for single-phase and a CEE plug for three-phase pumps.

Maximum backup fuse is stated on the controller nameplate.

If required according to local regulations, install an external mains switch.

5.3.1 Battery

The LC 221 controller can be equipped with a battery. However, the battery does not buffer any data. Its only function is to activate the buzzer in case of a power failure. Depending on the charging level of the battery, the buzzer can run on battery power for a couple of days.

If the customer requires this function, connect a non-rechargeable battery to connector 21 shown in fig. 6.

Note ***Use non-rechargeable batteries only. The controller is not equipped with a charging device.***

Note ***If present, the battery should be replaced as part of annual maintenance.***

5.3.2 Internal layout of LC 221

Figure 6 shows the connectors and the internal layout of LC 221.

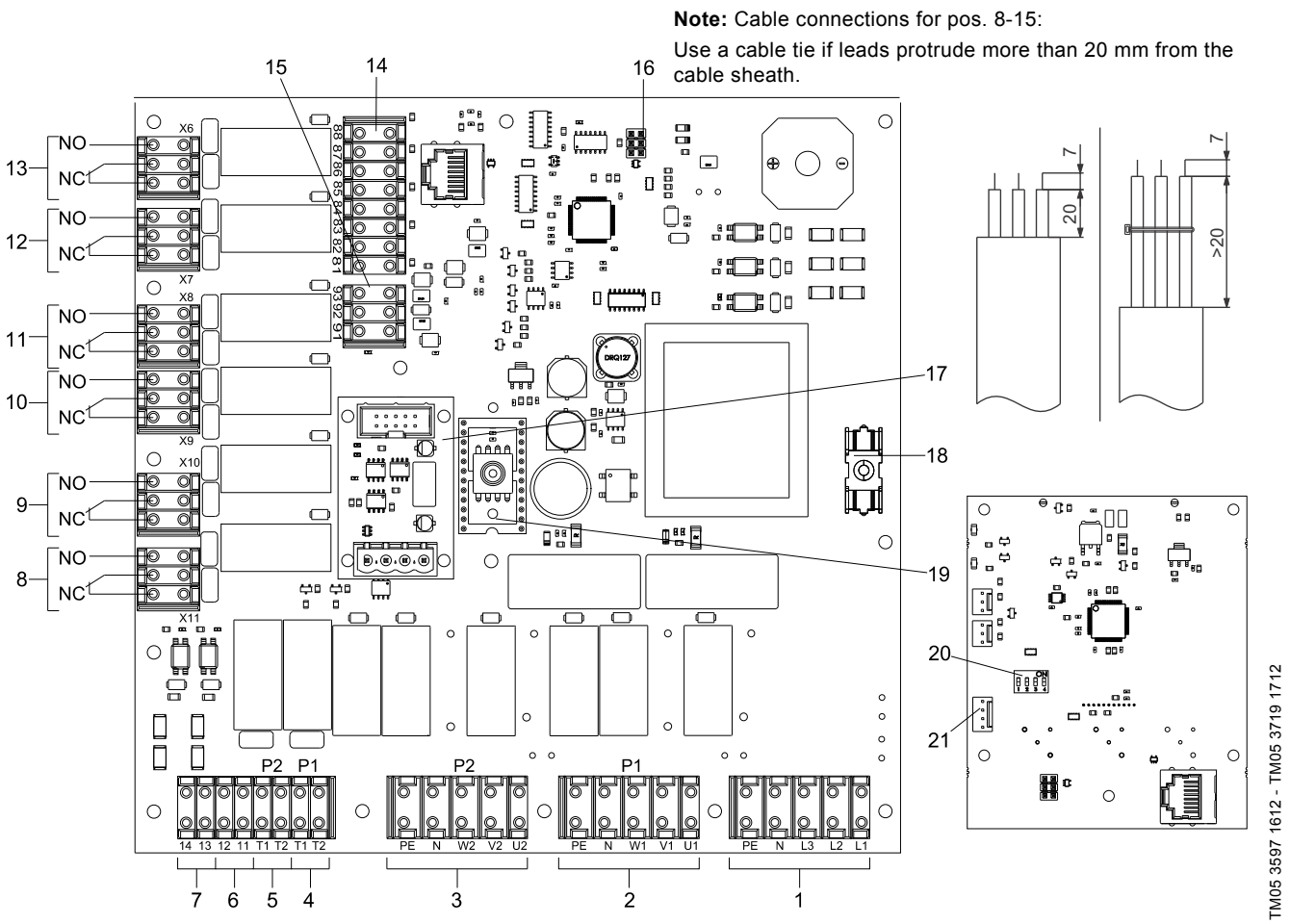
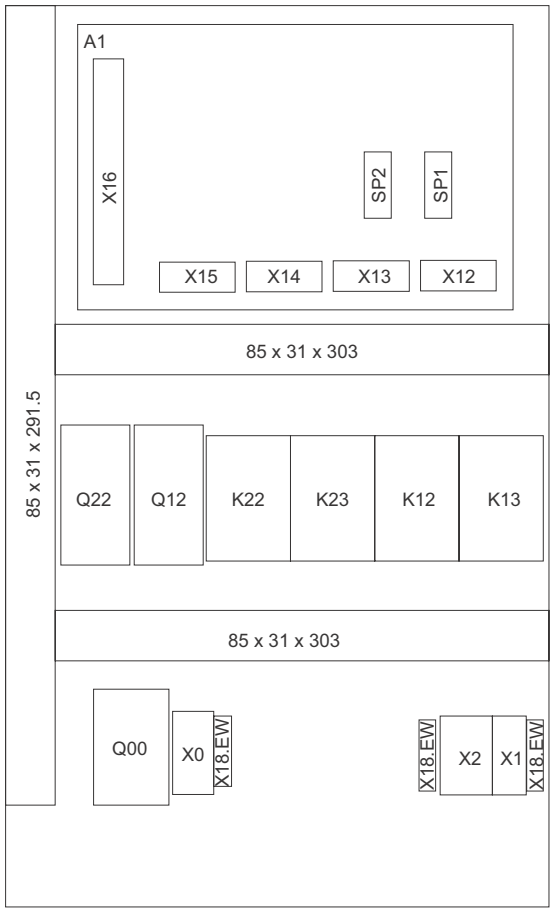


Fig. 6 Internal layout LC 221 (three-phase main board as example)

Pos.	Description	Comments	Terminal designation
1	Terminals for power supply (do not use for Y/D version).		PE, N, L3, L2, L1
2	Terminals for connecting pump 1 (for Y/D version, use X1, see fig. 7)		PE, N, W1, V1, U1
3	Terminals for connecting pump 2 (for Y/D version, use X2, see fig. 7)		PE, N, W2, V2, U2
4	Terminals for thermal switch, pump 1		T1, T2
5	Terminals for thermal switch, pump 2		T1, T2
6	Terminals for external reset	230 V	11, 12
7	Terminals for external alarm	230 V	13, 14
8	Terminals for common fault	Potential-free changeover NO/NC contacts with max. 250 V / 2 A. **Attention**: Connect these terminals to supply network potential or low voltage but do not mix the two.	X11
9	Terminals for high water level alarm		X10
10	Terminals for failure, pump 2		X9
11	Terminals for failure, pump 1		X8
12	Terminals for operation, pump 2		X7
13	Terminals for operation, pump 1		X6
14	Terminals for level switches	Potential-free NO contacts	81-88
	Terminals for additional high water level alarm (inside the tank)	Potential-free NO contacts	81, 82
15	Not used		-
16	Service connector to PC Tool		-
17	Not used		-
18	Control circuit fuse	Fine-wire fuse: 100 mA / 20 mm x ∅5	-
19	Piezoresistive pressure sensor module		-
20	DIP switches	Not in use for this application	-
21	Connector for battery, 9 V (accessory)	Non-rechargeable batteries only. The controller is not equipped with a charging device.	-

5.3.3 Internal layout of LC 221, Y/D version

Figure 7 shows the connectors and the internal layout of LC 221, Y/D version.



TM06 0022 4213

Fig. 7 Internal layout, LC 221 Y/D version

Pos.	Description	Comments	Terminal designation
Q00	Terminals for power supply		L1, L2, L3
X0			N, PE
X1	Terminals for connecting pump 1		1, 2, U1, V1, W1, PE, V2, W2, U2
X2	Terminals for connecting pump 2		1, 2, U1, V1, W1, PE, V2, W2, U2

5.4 Connecting the level sensor

Connect the pressure hose between the pressure tube located in the tank and the bulkhead fitting of the control cabinet. At the cabinet, the pressure hose must be inserted up to the stop. Insert approximately 15 mm. Otherwise there is a risk of leakage resulting in pressure loss, inaccurate level detection and malfunction of the system.

5.5 Setting

You only need to set the start level so that it is equal to the inlet level of the collecting tank. All other values are preset but can be adjusted, if required.

The following values can be changed, if necessary:

Start level

The start level must be equal to the inlet pipe height above floor level (180, 250 and 315 mm or 416 mm for MLD). Stop and alarm levels are preset.

Rated current

Preset value corresponding to the rated current of the pump. The protection against blockage is a preset value for overcurrent.

Stop delay

The stop delay increases the effective volume and reduces the quantity of residual water in the tank. It also prevents water hammer. The non-return valve closes more softly. The preset value is 0.

Start delay

Normally, there is no need to make adjustments for lifting stations except on a houseboat or pontoon boat. The preset value is 0.

Alarm delay

High temporary inflow can cause short-time high-level alarm. This situation may arise when a backwash filter of a swimming pool is connected. Preset value is 0.

Calibration and offset

The level sensor is calibrated at the factory. Calibrating the sensor is only required when it is replaced. For more information, see service instructions.

Maintenance interval

The maintenance/service interval can be set to 0, 3, 6 or 12 months and is indicated in the "SERVICE" display (no acoustic signal).

Reset alarm

It is possible to set the controller to reset alarms automatically when the fault disappears; however, most alarms must be reset manually. See section *7.4 Description of fault indications*. Preset value is AUTO.

Reset to factory settings

The controller will reboot, and startup settings will have to be made again. See section *7.2 Setup menu*.

5.5.1 External alarm

Lifting stations are often installed in sumps below the basement of buildings. That is the deepest point in the building, and an additional alarm level switch can be placed outside the lifting station to detect flooding caused by leakages, pipe bursts or groundwater inflow.

The external alarm can be connected to a level switch (230 V / 2 A) at terminals 11, 12.

6. Startup

Prior to startup, the connection and settings must have been carried out according to sections *5.3 Electrical connection* and *5.5 Setting*.

Please double-check that the pressure hose is properly and airtightly connected to the pressure tube in the tank and the bulkhead fitting of the control cabinet.

Startup must be carried out by authorised personnel.

Proceed as follows:

1. Check all connections.
2. Connect mains power supply to the controller and switch it on.

Note

There is a re-starting delay of up to 45 seconds. This delay is to even out the mains load when several appliances are started up at the same time when recovering from a power failure. This time can be reduced to 5 seconds by pressing the [OK] button.

3. When the power supply is connected for the first time, three values for the start level can be chosen. When L_01 is displayed press [OK].
4. Select the height of the inlet pipe, 180, 250 and 315 mm or 416 mm (for MLD) above floor level, using the buttons [>] and [<], then press [OK] to save the desired value. If the height of the inlet pipe is between two values, e.g. 220 mm above the floor, choose the nearest lower value (180 mm).
   Now the controller is ready for automatic mode.
5. Open the isolating valves in discharge and inlet lines.
6. Activate a sanitary appliance connected to the inflow of the lifting station and monitor the increasing liquid level in the tank up to the start level.

Note

Please note that the level shown in the display of the LC 221 is not 0 mm even though the tank may be completely empty. As long as the pressure tube is not immersed in water, the configured value for the distance (e.g. 84 mm) between the bottom of the tank and the bottom edge of the pipe is displayed. The value will change as soon as the pressure tube starts to be immersed in water.

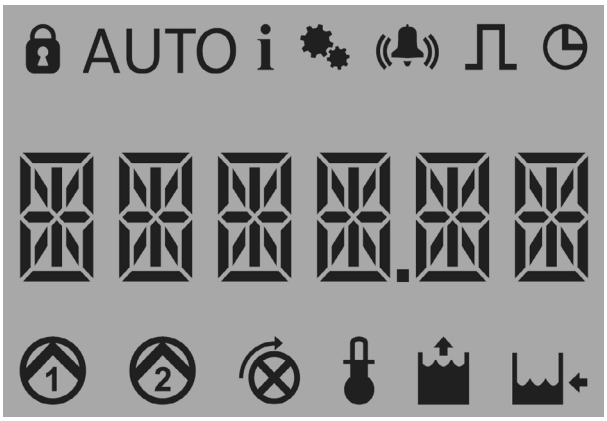
Caution

Check the start and stop function several times.

7. Operating

7.1 Description of display

The display of the LC 221 level controller is shown in fig. 8.



TM05 1861 3811

Fig. 8 LC 221 display

The table below describes the symbols shown in the display as well as the corresponding functions and indications.

Symbol	Function	Description
	Settings locked	The symbol is visible when the setup menu is locked. This prevents unauthorised persons from making changes to the settings. To unlock the buttons, enter the code 1234.
AUTO	Automatic operating mode	The symbol is visible when the level controller is in automatic mode, i.e. when the selector switch is in position AUTO.
	Information	The symbol is visible when there is information about faults, operating hours, number of starts, max. current of pump. The symbol will be visible if the level controller detects a fault. The fault will be written into the fault log. After you have entered the fault log, the symbol will disappear. See section *7.3 Information menu*.
	Setup	The setup menu holds information about setup for start level, rated current, the stop-, start- and alarm delay, selection of maintenance interval, reset (automatic or manual) and reset back to factory settings. For the procedure and a description of the settings, see section *7.2 Setup menu*.
	Alarm	The symbol is visible if an alarm situation occurs. The type of alarm can be displayed at the information menu. The symbol disappears when the fault has disappeared.
	Impulse counter	The symbol is visible when the number of starts in the information menu is shown in the display.
	Settable times and fault indication	The symbol is visible when the operating hours in the information menu and the delays set in the setup menu are shown in the display. The symbol flashes when max. operating time has been exceeded.

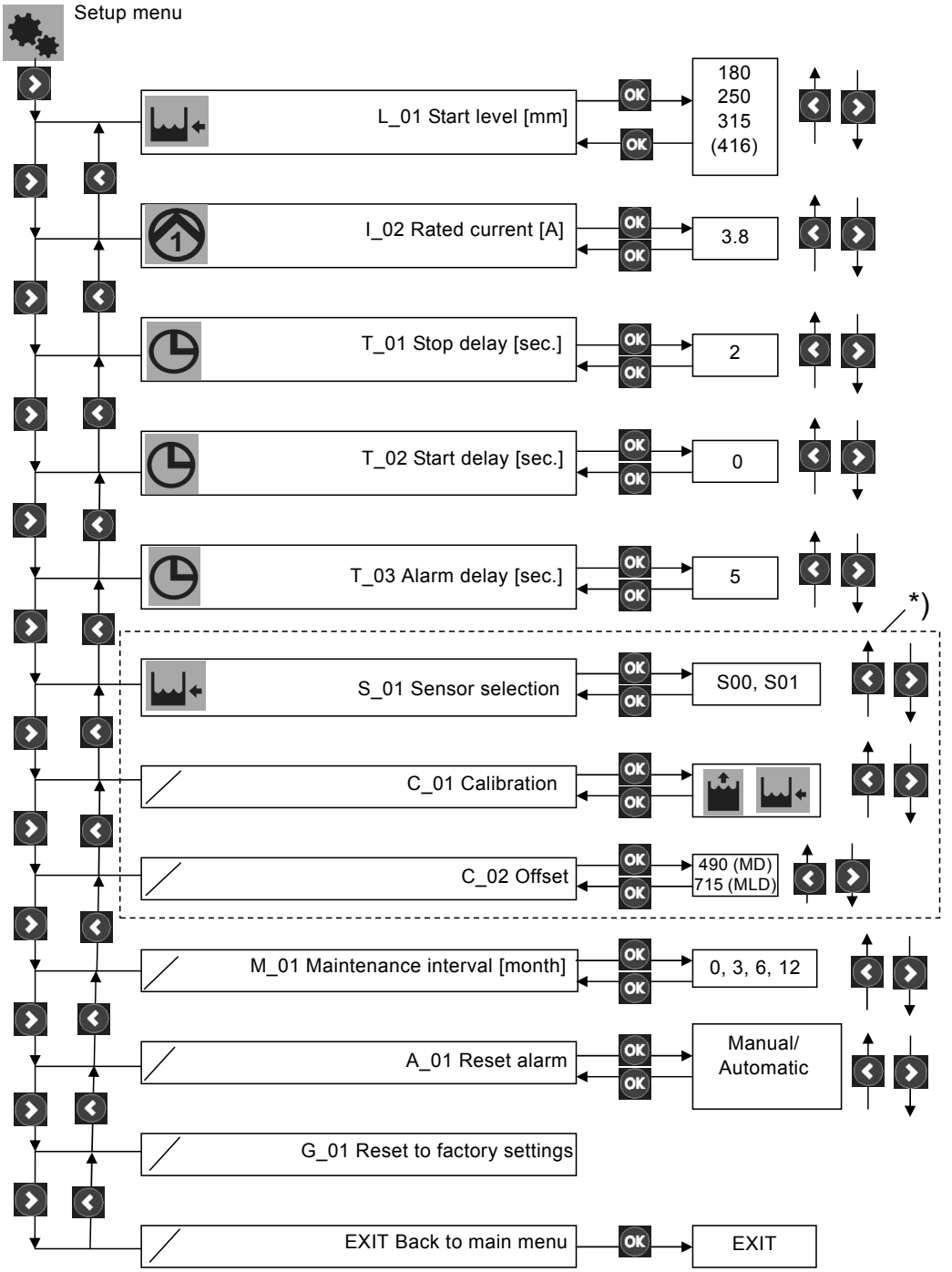
Symbol	Function	Description
	Values in the form of digits	In automatic mode, faults are indicated by means of a code, and in normal operation these two values are shown: • the liquid level in the tank, if the pump is not running • the current consumption, if the pump is running. If both pumps are running, the current consumption shown is the value for both pumps. In the information menu, the following information is indicated: • fault codes • operating hours • impulses • max. measured motor current. In the setup menu, the following information is indicated: • set start level • set delays • set currents • sensor calibration (presettings for piezoresistive level sensor) • service intervals • total reset to factory settings.
	Pump operation and pump fault in pump 1	The symbol is visible when pump 1 is running and flashes when pump 1 has a fault. In case of fault, it can be combined with other symbols or fault codes in the display.
	Pump operation and pump fault in pump 2	The symbol is visible when pump 2 is running and flashes when pump 2 has a fault. In case of fault, it can be combined with other symbols or fault codes in the display.
	Phase-sequence fault	(Only three-phase pumps) The symbol flashes in case of a phase-sequence fault and missing phase. See section *7.4 Description of fault indications*.
	Thermal-switch failure	The symbol is visible if the motor temperature exceeds the permissible value and the thermal switch cuts out the pump.
	High-water alarm	The symbol is visible if the liquid level in the tank reaches max. level.
	Liquid level	The symbol is visible when the current liquid level is indicated in the middle of the display.

7.2 Setup menu

All settings are preset except for the start level. The start level depends on the inlet height and must be set during the startup phase. See section *5.4 Connecting the level sensor*. However, in case adjustments are required, settings can be made via the setup menu. To open the setup menu, mark the symbol using the button [>] and press [OK]. Navigate through the menu by means of the buttons [>] and [<]. Select the desired menu item by pressing [OK]. Enter values or select settings from a list by means of the buttons [>] and [<]. Save the settings by pressing [OK]. See also fig. 9.

The following settings can be made:

- start level
- rated current
- stop delay
- start delay
- alarm delay
- sensor selection
- sensor calibration
- sensor offset
- time for maintenance
- alarm reset (manually or automatically)
- reset to factory settings.



TM05 1808 3811

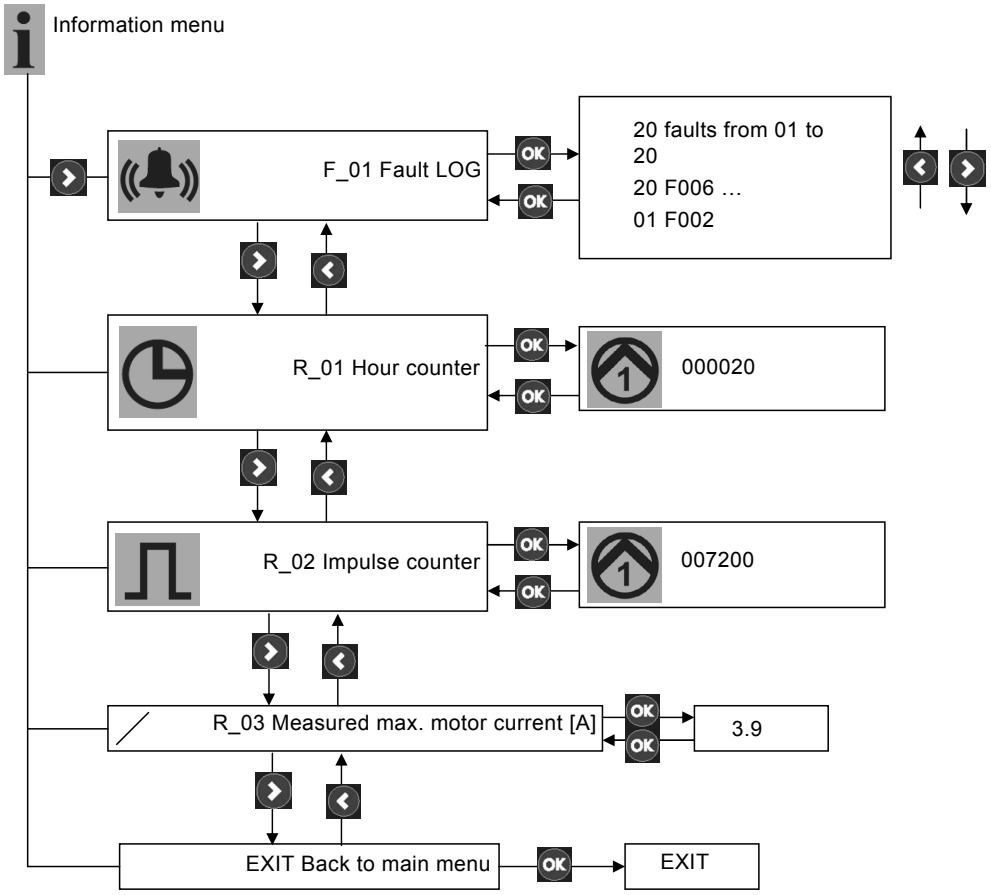
Fig. 9 Menu structure for setup menu

7.3 Information menu

All status data and fault indications can be seen in the information menu. The information menu can be seen in all operating modes (ON-OFF-AUTO). To open the information menu, mark the symbol i using the button [>] and press [OK]. Navigate through the menu by means of the buttons [>] and [<]. Select the desired menu item by pressing [OK]. See also fig. 10.

In the information menu the following data can be read:

- fault indications
- operating hours
- number of starts
- max. measured motor current.



TM05 1809 3811

Fig. 10 Menu structure for information menu

7.4 Description of fault indications

If a fault occurs, the symbol i will be visible, an audible alarm will be given by the buzzer and the fault code will be written by means of the 14-segment characters in the display. To see the kind of fault, if it is automatically reset and the code is not longer visible, open the fault log (see fig. 10). When you leave the fault log, the symbol i will disappear.

The last 20 faults are stored in the fault log as fault codes. The meaning of the fault codes are described in the table below:

Fault code	Meaning	Displayed text	Flashing symbols	Reset of fault indications		Description
				Auto	Man	
F001	Phase sequence failure	F001			•	(Only three-phase pumps) The phase sequence between control board and power supply is wrong.
F002	One phase missing	F002		•	•	(Only three-phase pumps) One phase is missing.
F003	High liquid level	F003		•	•	The liquid level is high in relation to preset value.
F004	Level measurement failure	SENSOR	-	•	•	Sensor signal out of range or lost.
F005	Overtemperature, pump 1	TEMP		•	•	Motor thermal switches connected to the controller will stop pump 1 in case of overheating.
F006	Overtemperature, pump 2	TEMP		•	•	Motor thermal switches connected to the controller will stop pump 2 in case of overheating.
F007	Overcurrent, pump 1	F007			•	Pump 1 is stopped if an overcurrent is measured for a certain period of time (blockage protection).
F008	Overcurrent, pump 2	F008			•	Pump 2 is stopped if an overcurrent is measured for a certain period of time (blockage protection).
F011	Operating time exceeded, pump 1	F011		•	•	Pump 1 is stopped if normal operating time of the pump is exceeded, e.g. due to venting problems of pump housing, closed discharge valve (forgotten to open it after service/maintenance), forgotten to switch back to automatic mode, if ON-OFF-AUTO switch is set to "ON" for service/maintenance. A subsequent emergency operation starts and stops the pump automatically until the controller gets a regular stop signal from the sensor. The controller then switches back to normal operation.
F012	Operating time exceeded, pump 2	F012		•	•	Pump 2 is stopped if normal operating time of the pump is exceeded, e.g. due to venting problems of pump housing, closed discharge valve (forgotten to open it after service/maintenance), forgotten to switch back to automatic mode, if ON-OFF-AUTO switch is set to "ON" for service/maintenance. A subsequent emergency operation starts and stops the pump automatically until the controller gets a regular stop signal from the sensor. The controller then switches back to normal operation.
F013	External fault	EXTERN	-		•	An external level switch can be connected to the controller to give an alarm when basement outside the lifting station is flooded by groundwater or water from burst water pipe.
F014	Battery failure	BAT	-	•	•	The battery is empty and must be replaced.
F015	Relay or contactor does not open, pump 1	RELAY			•	Pump 1 receives a signal to stop, but does not react. This situation is detected by current measurement.
F016	Relay or contactor does not close, pump 1	RELAY				Pump 1 receives a signal to start, but does not react. This situation is detected by current measurement.
F017	Relay or contactor does not open, pump 2	RELAY			•	Pump 2 receives a signal to stop, but does not react. This situation is detected by current measurement.
F018	Relay or contactor does not close, pump 2	RELAY				Pump 2 receives a signal to start, but does not react. This situation is detected by current measurement.
F019	Communication failure	-	-			The main board has detected a bad connection to the display. Call service.
F020	Internal float switch high level	F020				The optional float switch inside the tank is switched. The tank is probably flooded.
F117	Communication failure	F117	-			The display cannot communicate with the main board. Call service.

If a fault occurs, the red LED will flash, the symbol will be visible and the fault will be added to the fault log. Furthermore, the buzzer will be activated, the symbol will be visible, the corresponding symbols will flash and the fault code will be displayed. When the fault has disappeared or has been removed, the controller will automatically switch to normal operation again. However, the controller enables resetting of the fault indication (visible and acoustic alarms) either manually (Man) or automatically (Auto).

If manual resetting was selected in setup menu, the acoustic alarm and red LED can be reset by pressing [OK]. The fault indication will be reset when the fault has disappeared, has been removed or the ON-OFF-AUTO switch has been set to OFF position.

You can get an overview of faults in the fault log in information menu.

The symbol will be visible as long as the fault log is open.

If automatic resetting was selected in menu setup, the red LED and the symbol will disappear, and the buzzer will be deactivated again after the fault has disappeared, has been removed or the ON-OFF-AUTO switch has been set to OFF position. However, even if automatic resetting was selected, some of the fault indications have to be reset manually. See the table above.

Every 30 minutes the fault indication will be written from the short-term memory into the long-term memory.

8. Maintenance

8.1 Electrical maintenance

- Check the gasket of the LC 221 cabinet front cover and of the cable entries.
- Check the cable connections.
- Check the controller functions.
- Replace the 9 V battery, if fitted, in connection with annual service.

Note

The above list is not complete. LC 221 may be installed in environments which require thorough and frequent maintenance.

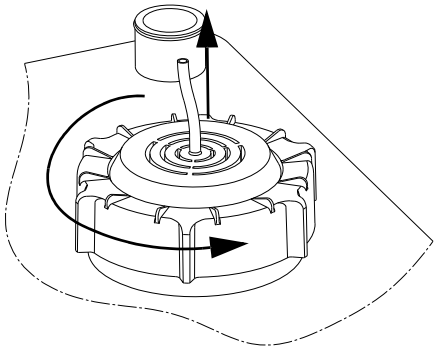
8.2 Checking the level sensor

Check for possible leaks between the pressure hose and the bulkhead fitting of the control cabinet. The pressure hose must be inserted to the stop (approx. 15 mm).

The sensor calibration is factory set and does not need any re-calibration.

8.3 Cleaning the pressure tube for the sensor

1. Push the ON-OFF-AUTO selector switch to position OFF (○).
2. Loosen the screw cap by turning it counterclockwise. See fig. 11.
3. Lift the pressure tube carefully out of the collecting tank. Do not lift it by means of the pressure hose.
4. Check for possible deposits on or in the pressure tube and the condensate trap underneath the screw cap.
5. Scrape off any deposits. If necessary, remove the pressure hose from the controller, and rinse the pressure tube and pressure hose with clean water at low pressure.
6. Refit the pressure tube by screwing the screw cap on to the tank. Reconnect the pressure hose to the controller.
7. Check the sensor by test running the lifting station.



TM05 0545 1011

Fig. 11 Removing the level sensor

9. Fault finding

Warning

Before carrying out any work on lifting stations used for pumping liquids which might be hazardous to health, make sure that the lifting station has been thoroughly flushed with clean water and that the discharge pipe has been drained. Rinse the parts in water after dismantling. Make sure that the isolating valves have been closed. The work must be carried out in accordance with local regulations.

Before making any connections in the LC 221 or work on lifting stations, etc., make sure that the power supply has been switched off and that it cannot be accidentally switched on.

Fault	Cause	Remedy
1. The pump(s) does/do not run.	a) No power supply. None of the indicator lights are on. **With battery backup:** See section *4. Product description*.	Switch on the power supply or wait until the power cut is over. During the power cut, drain the collecting tank with diaphragm pump.
	b) The ON-OFF-AUTO selector switch is in position OFF (○).	Push the ON-OFF-AUTO selector switch into position ON (|) or AUTO (◌).
	c) Control circuit fuses are blown.	Check and eliminate the cause. Replace the control circuit fuses.
	d) The motor-protective circuit breaker has cut out the pump (only relevant if a motor-protective circuit breaker has been installed). The pump symbol in the display is flashing and the red indicator light for fault is flashing. The fault indication in the display is RELAY and the fault code is F018.	Check the pump and tank as well as the setting of the motor-protective circuit breaker. If the pump is blocked, remove the blockage. If the setting of the motor-protective circuit breaker is wrong, readjust it (compare the setting with the nameplate).
	e) Motor/supply cable is defective or the connections have become loose.	Check motor and supply cable. Replace cable or retighten connections if necessary.
	f) The fault indication in the display is SENSOR and in the fault code is F005 and/or F006.	Clean the level sensor (see section *8.2 Checking the level sensor*), and start up again. Check the cable and the connection on the controller board. If the signal is still wrong, please call Grundfos service.
	g) The main board or the LCD board is defective.	Replace the main board or the LCD board.
2. The pump(s) is/are starting/stopping too frequently and even if there is no inflow.	a) The level measurement fails. The sensor gives wrong signal.	Check for possible leaks between pressure hose and bulkhead fitting at the control cabinet. The pressure hose must be inserted to the stop (approx. 15 mm). Clean the level sensor (see section *8.2 Checking the level sensor*).
	b) The operating time protection is activated, the pump and time symbols are flashing, the red LED is flashing and the display indicates fault code F011 and/or F012. If the pump runs longer than 3 minutes, a protection program of the controller will stop the pump for 3 minutes and the other pump will take over. At the next start impulse, the first pump will be activated again. If the venting problem persists, the pump will be stopped after 3 minutes and so on. **Note:** Normal operating times are up to 60 seconds depending on duty point and effective tank volume.	Check that the discharge valve is open. Check the venting of the pump housing. Clean the vent hole if it is blocked.
	c) The thermal switch has cut out the pump. The pump and thermal switch symbols on the display are flashing, and the red indicator light for fault is permanently on. The fault indication in the display is TEMP and in the fault code is F005 and/or F006.	Allow the pump to cool down. After cooling down, the pump will restart automatically unless the LC 221 has been set to manual restarting. See section *5.4 Connecting the level sensor*. If so, the ON-OFF-AUTO selector switch must be pushed into position OFF (○) for a short period. Check the inflow parameters and the non-return valve. The risk is low, but if the non-return valve flap is leaky, liquid in the discharge pipe can flow back. A high number of starts without cooling time in between over a longer period can cause thermal cut-out. Consider S3 duty. See section *10. Technical data*. See also section *8.2 Checking the level sensor*.
3. One pump starts sometimes without visible reason.	a) Test run 24 hours after last operation.	No action necessary. It is a safety function that prevents the shaft sealing from seizing up.
4. The tank is empty but the displayed water level is greater than 0 mm.	a) This is related to the measuring principles of the sensor.	No action necessary. See chapter *4.2 Level sensor*.

10. Technical data

10.1 LC 221 controller

Controller	
Voltage variants, rated voltages:	1 x 230 V, 3 x 230 V, 3 x 400 V
Voltage tolerances for LC 221:	- 10 %/+ 6 % of rated voltage
Mains frequency for LC 221:	50 Hz
Supply system earthing:	For TN systems
Controller power consumption:	6 W
Control circuit fuse:	Fine-wire fuse: 100 mA / 250 V / 20 mm x ∅5
Ambient temperature:	
During operation:	0 to +40 °C (must not be exposed to direct sunlight)
In stock and during transportation:	-30 - +60 °C
Enclosure class:	IP54
Potential-free contacts:	NO/NC, max. 250 VAC / 2 A
Input external reset:	230 V
Cabinet of LC 221	
External dimensions:	Height = 390 mm Width = 262 mm Depth = 142 mm
Material:	ABS (acrylonitrile butadiene styrene)
Weight:	Depending on variant. See nameplate
Cabinet of LC 221 Y/D version	
External dimensions:	Height = 600 mm Width = 380 mm Depth = 210 mm
Material:	Steel sheet
Weight:	Depending on variant.

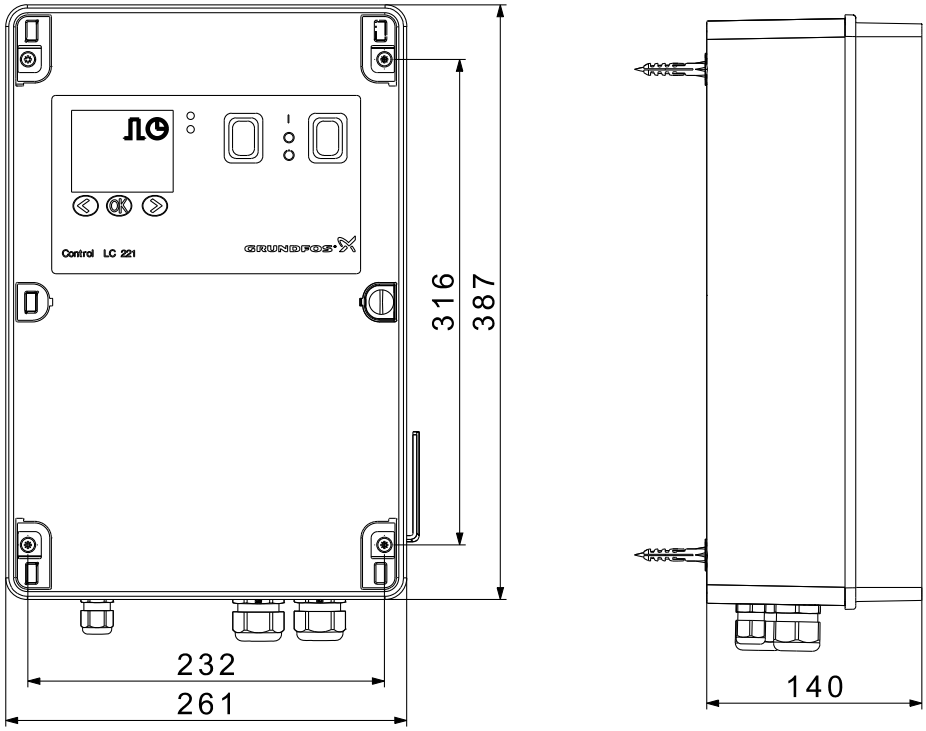
11. Disposal

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.

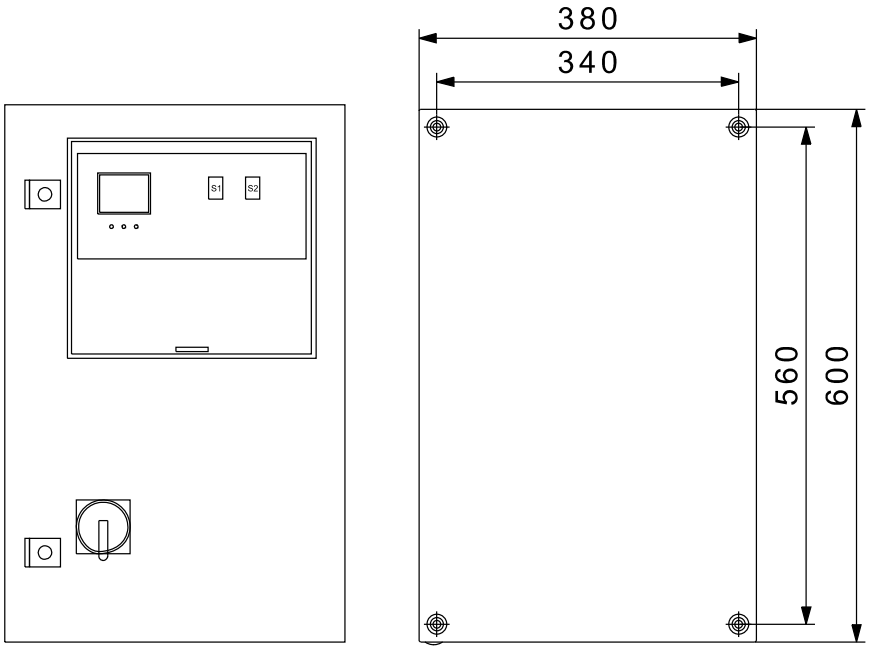
Subject to alterations.

Dimensional drawings



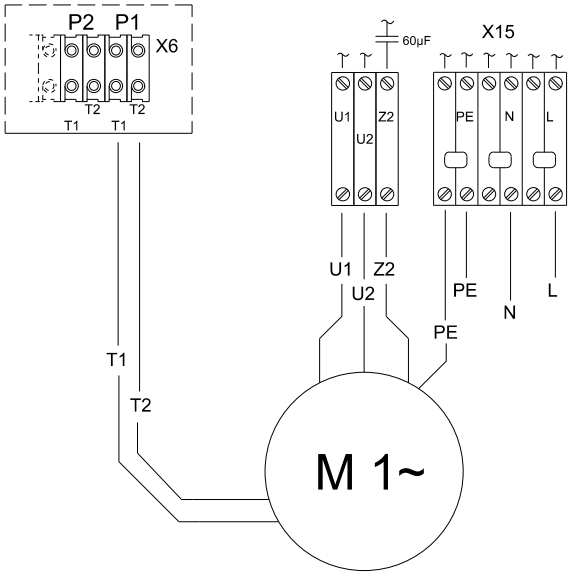
TM05 8749 2613

Fig. 1 LC 221



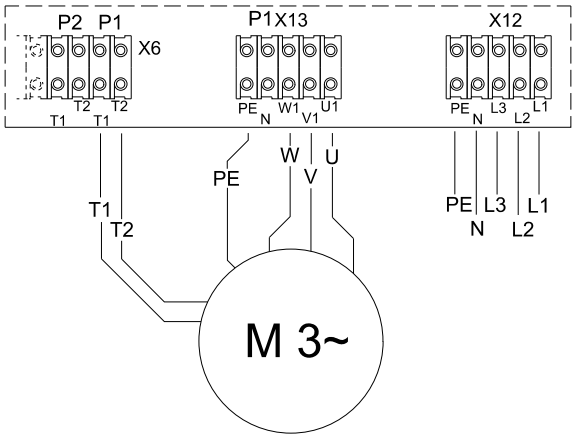
TM05 4042 2613

Fig. 2 LC 221, Y/D version



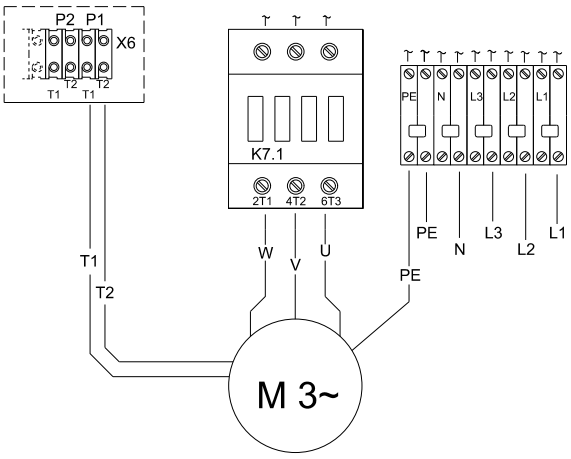
TM05 1941 4011

Fig. 3 Multilift M.12.1.4 and M.15.1.4



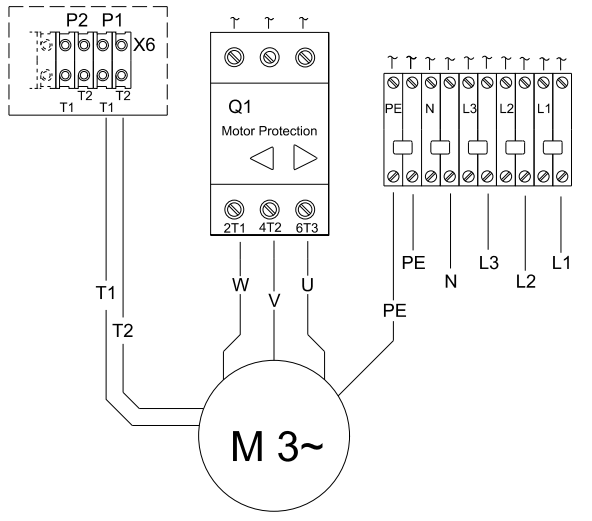
TM05 3456 1512

Fig. 4 Multilift M.12.3.4 and M.15.3.4



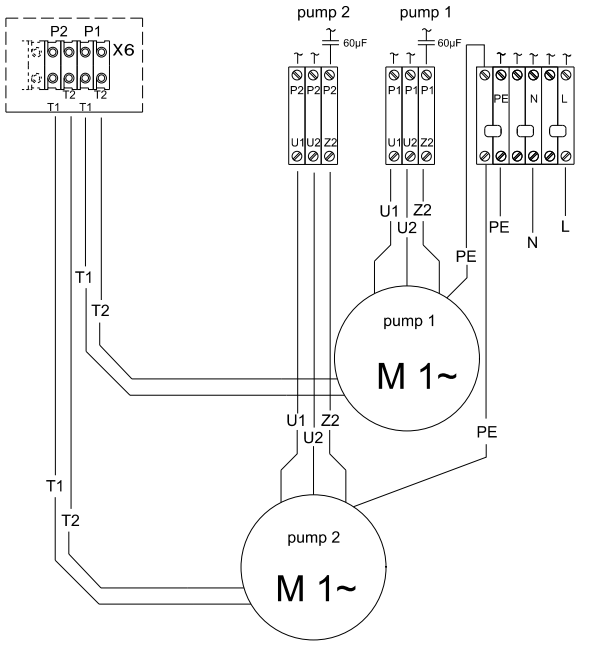
TM05 1942 4011

Fig. 5 Multilift M.22.3.4



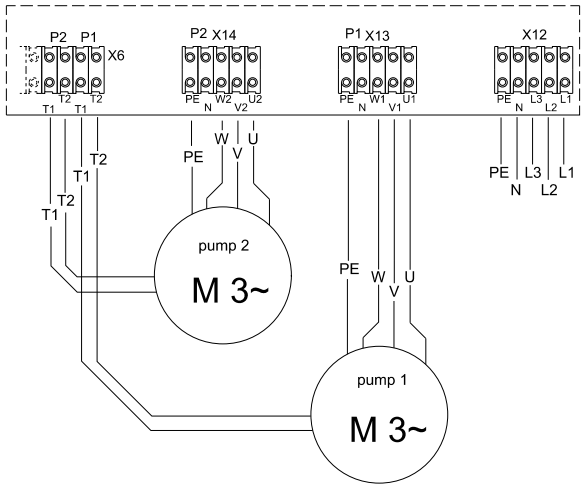
TM05 1943 4011

Fig. 6 Multilift M.22.3.4, M.24.3.2, M.32.3.2 and M.38.3.2



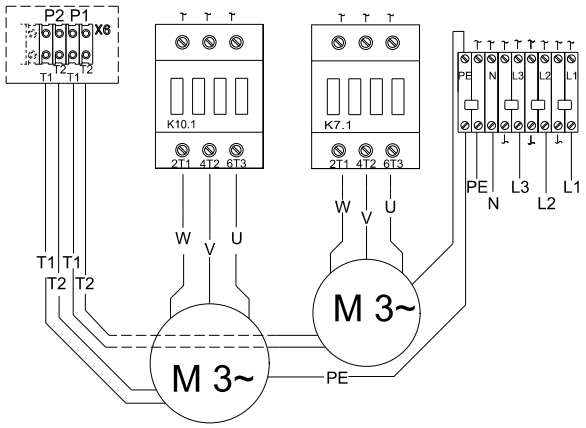
TM05 3593 1612

Fig. 7 Multilift MD/MLD.12.1.4 and MD/MLD.15.1.4



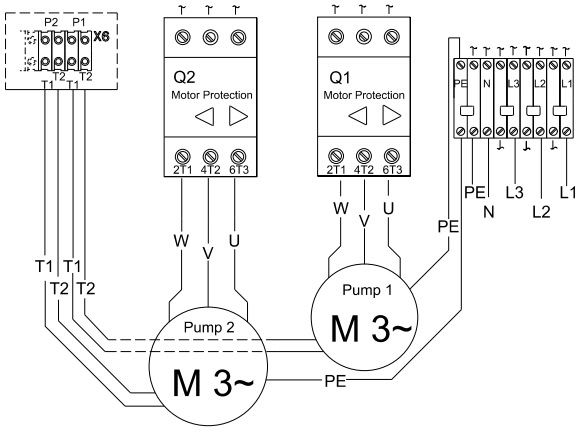
TM05 3594 1612

Fig. 8 Multilift MD/MLD.12.3.4 and MD/MLD.15.3.4



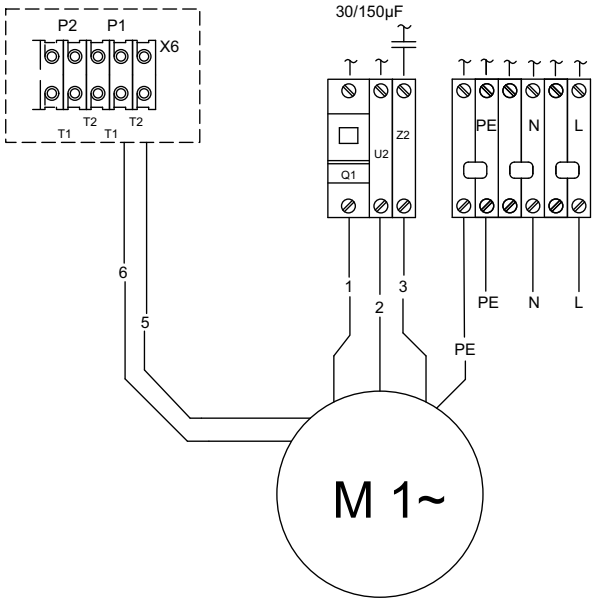
TM05 3595 1612

Fig. 9 Multilift MD/MLD.22.3.4



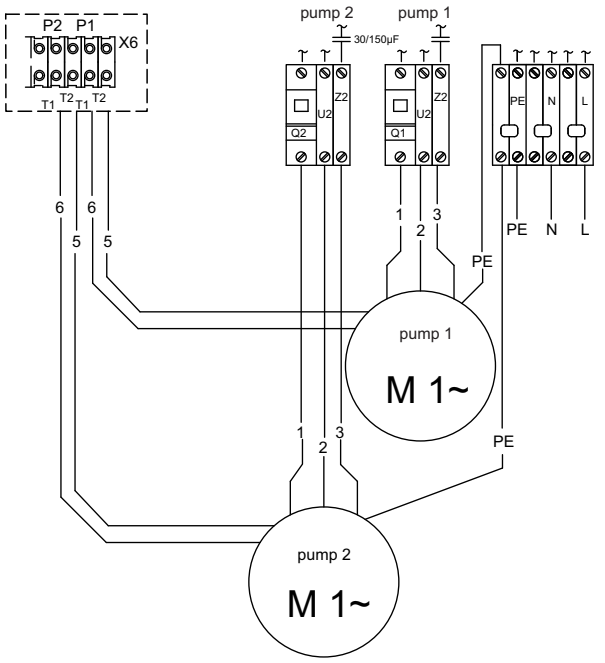
TM05 3596 1612

Fig. 10 Multilift MD/MLD.24.3.2, MD/MLD.32.3.2 and MD/MLD.38.3.2



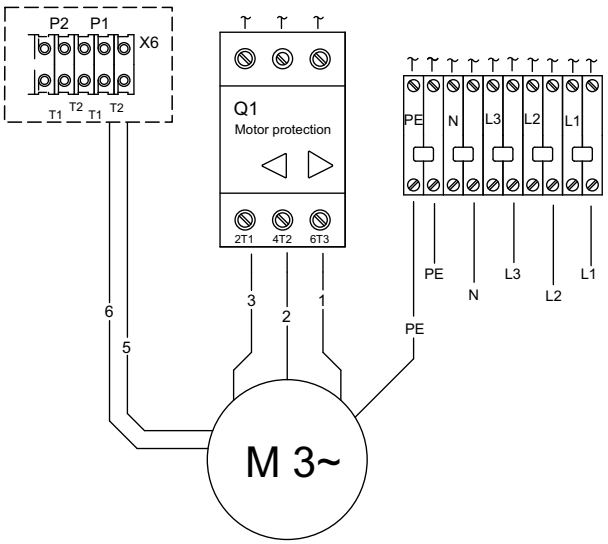
TM05 3819 1612

Fig. 11 Multilift MOG



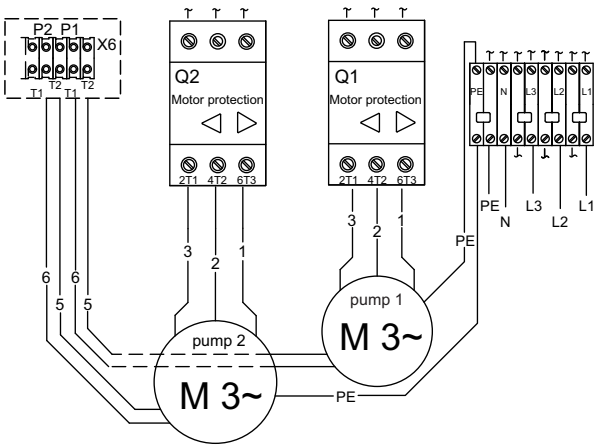
TM05 3816 1612

Fig. 12 Multilift MDG



TM05 3818 1612

Fig. 13 Multilift MOG



TM05 3817 1621

Fig. 14 Multilift MDG

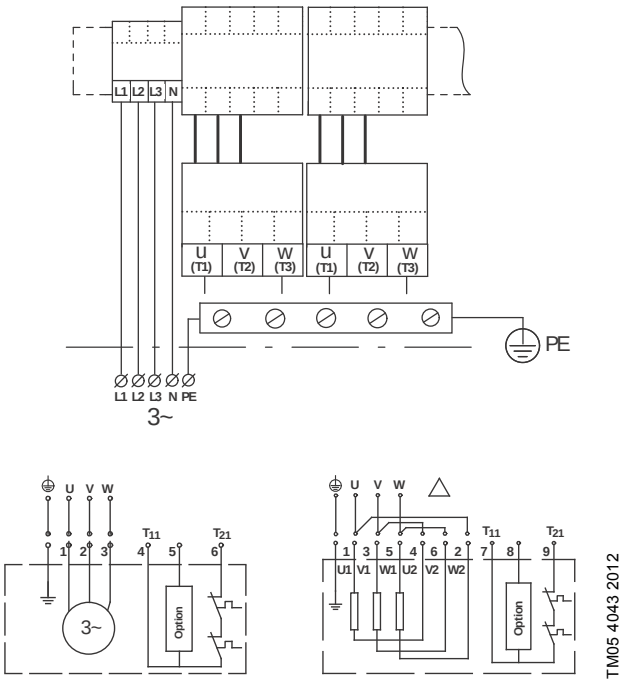


Fig. 15 DOL (< 5 kW) for Multilift MD1 and MDV

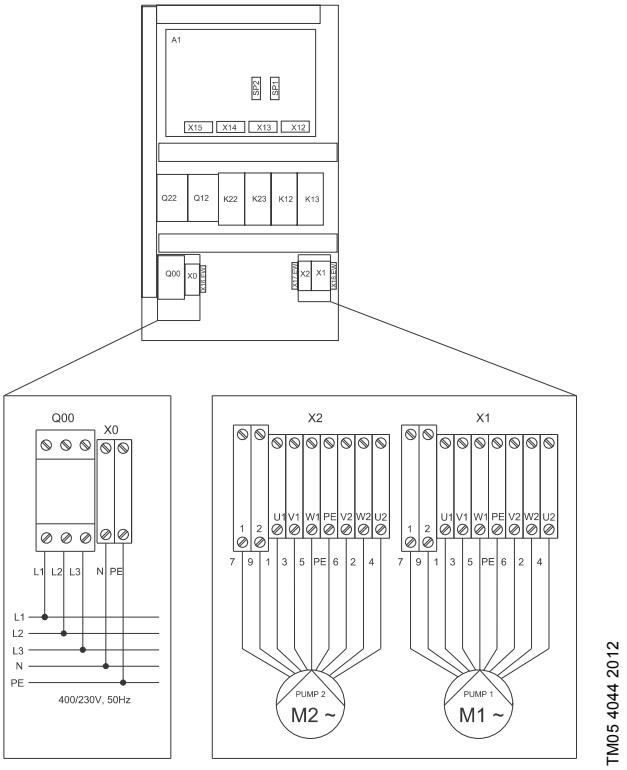


Fig. 16 Y/D (> 5 kW) for Multilift MD1 and MDV

Declaration of conformity

GB: EC declaration of conformity
The LC 221 controller is part of a Multilift, Unolift or Duolift system. For EC declaration of conformity, please see installation and operating instructions for the relevant system.

CZ: ES prohlášení o shodě
Řídicí jednotka LC 221 je součástí systému Multilift, Unolift nebo Duolift. Seznamte se s prohlášením o shodě ES uvedeným v montážním a provozním návodu příslušného systému.

DE: EG-Konformitätserklärung
Die Steuerung LC 221 ist Teil einer Multilift-, Unolift- oder Duolift-Anlage. Die EG-Konformitätserklärung finden Sie in der Montage- und Betriebsanleitung der entsprechenden Anlage.

GR: Δήλωση συμμόρφωσης ΕC
Ο ελεγκτής LC 221 αποτελεί τμήμα ενός συστήματος Multilift, Unolift ή Duolift. Για τη δήλωση συμμόρφωσης ΕΚ, παρακαλούμε δείτε τις οδηγίες εγκατάστασης και λειτουργίας του σχετικού συστήματος.

FR: Déclaration de conformité CE
Le coffret de commande LC 221 fait partie d'un système Multilift, Unolift ou Duolift. Pour consulter la déclaration de conformité, se reporter à la notice d'installation et de fonctionnement du système concerné.

IT: Dichiarazione di conformità CE
Il regolatore LC 221 fa parte di un sistema Multilift, Unolift o Duolift. Per la dichiarazione di conformità CE, consultare le istruzioni di installazione e funzionamento del relativo sistema.

LV: EK atbilstības deklarācija
LC 221 regulators ietilpst MULTILIFT, UNOLIFT vai DUOLIFT sistēmā. Paziņojumu par atbilstību prasībām skatīt attiecīgās sistēmas uzstādīšanas un ekspluatācijas instrukcijā.

HU: EK megfelelőségi nyilatkozat
Az LC 221 vezérlő egy Multilift, Unolift vagy Duolift rendszer része. Az EU megfelelőségi nyilatkozatot lásd a vonatkozó rendszer telepítési és üzemeltetési utasításában.

UA: Декларація відповідності ЄС
Контролер LC 221 входить до складу системи Multilift, Unolift або Duolift. Декларація з відповідності нормам ЄС входить до складу інструкції з монтажу та експлуатації відповідної системи.

PT: Declaração de conformidade CE
O controlador LC 221 faz parte de um sistema Multilift, Unolift ou Duolift. Consulte a declaração de conformidade CE nas instruções de instalação e funcionamento do respectivo sistema.

RO: Declaraţie de conformitate CE
Controlerul LC 221 face parte dintr-un sistem Multilift, Unolift sau Duolift. Pentru declaraţia de conformitate CE, consultaţi instrucţiunile de instalare şi exploatare pentru sistemul relevant.

SI: ES izjava o skladnosti
Krmilnik LC 221 je del sistema Multilift ali Unilift. Izjavo o skladnosti ES si oglejte v navodilih za montažo in obratovanje ustreznega sistema.

FI: EY-vaatimustenmukaisuusvakuutus
LC 221 -säädin on osa Multilift-, Unolift- tai Duolift-järjestelmää. EY:n vaatimustenmukaisuusvakuutus on luettavissa käytettävän järjestelmän asennus- ja käyttöohjeista.

TR: EC uygunluk bildirgesi
LC 221 kontrolörü, bir Multilift, Unolift veya Duolift sisteminin bir parçasıdır. AT uygunluk beyanı için lütfen ilgili sistemin kurulum ve kullanım talimatlarına bakınız.

BG: ЕС декларация за съответствие
Контролерът LC 221 е част от системата Multilift, Unolift или Duolift. За декларацията за съответствие на ЕС моля, вижте инструкциите за монтаж и експлоатация за съответната система.

DK: EF-overensstemmelseserklæring
LC 221-styringen er en del af et Multilift-, Unolift- eller Duolift-anlæg. EF-overensstemmelseserklæringen fremgår af monterings- og driftsinstruktionen for det relevante anlæg.

EE: EL vastavusdeklaratsioon
LC 221 juhtplokk on osa Multilift, Unolift või Duolift süsteemist. Palun vaadake EÜ vastavusdeklaratsiooni vastava seadme paigaldus- ja kasutusjuhendist.

ES: Declaración CE de conformidad
El controlador LC 221 forma parte de un sistema Multilift, Unolift o Duolift. Encontrará la declaración de conformidad de la CE en las instrucciones de instalación y funcionamiento del sistema correspondiente.

HR: EZ izjava o usklađenosti
Regulator LC221 dio je sustava Multilift, Unolift ili Duolift. Za EC izjavu o sukladnosti, molimo pogledajte upute za ugradnju i rad za odgovarajući sustav.

KZ: ЕО сәйкестік туралы мәлімдеме
LC 221 контроллері — Multilift, Unolift немесе Duolift жүйесінің бөлігі. Тиісті жүйеге арналған орнату және пайдалану нұсқаулықтарынан ЕО сәйкестік туралы декларациясын қараңыз.

LT: EB atitikties deklaracija
LC 221 valdiklis yra „Multilift“, „Unolift“ arba „Duolift“ sistemos dalis. EC atitikties deklaracija pateikta atitinkamos sistemos įrengimo ir naudojimo instrukcijoje.

NL: EC overeenkomstigheidsverklaring
De LC 221 regelaar maakt onderdeel uit van een Multilift, Unolift of Duolift systeem. Voor de EG-overeenkomstigheidsverklaring raadpleegt u de installatie- en bedrijfsinstructies voor het relevante systeem.

PL: Deklaracja zgodności WE
Sterownik LC 221 stanowi część systemu Multilift, Unolift lub Duolift. Patrz: deklaracja zgodności WE w instrukcji montażu i eksploatacji odpowiedniego systemu.

RU: Декларация о соответствии ЕС
Шкаф управления LC 221 является частью установок Multilift, Unolift или Duolift. Декларация о соответствии ЕС включена в состав руководства по монтажу и эксплуатации насосной установки.

SK: Prehlásenie o konformite ES
Riadiaca jednotka LC 221 je súčasťou sústavy Multilift, Unolift alebo Duolift. Vyhlásenie o súlade si, prosím, pozrite v montážnom a prevádzkovom návode pre príslušnú sústavu.

RS: EC deklaracija o usaglašenosti
Regulator LC 221 je deo Multilift, Unolift ili Duolift sistema. Za EC deklaraciju o usklađenosti molimo pogledajte uputstvo za instalaciju i rad odgovarajućeg sistema.

SE: EG-försäkran om överensstämmelse
Styrenheten LC 221 är en del av ett Multilift-, Unolift- eller Duolift-system. EG-försäkran om överensstämmelse finns i monterings- och driftsinstruktionen för tillämpligt system.

CN: EC 产品合格声明书
LC 221 控制器是 Multilift、Unolift 或 Duolift 系统的一部分。关于 EC 合规性声明，请参阅相关系统的安装和操作说明书。

Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro Industrial Garin
1619 Garín Pcia. de B.A.
Phone: +54-3327 414 444
Telefax: +54-3327 45 3190

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

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

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

Belarus
Представительство ГРУНДФОС в Минске
220125, Минск
ул. Шафарнянская, 11, оф. 56, БЦ «Порт»
Тел.: +7 (375 17) 286 39 72/73
Факс: +7 (375 17) 286 39 71
E-mail: minsk@grundfos.com

Bosna and Herzegovina
GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A,
BH-71000 Sarajevo
Phone: +387 33 592 480
Telefax: +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
Phone: +55-11 4393 5533
Telefax: +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
email: bulgaria@grundfos.bg

Canada
GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
50/F Maxdo Center No. 8 XingYi Rd.
Hongqiao development Zone
Shanghai 200336
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

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

Czech Republic
GRUNDFOS s.r.o.
Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111
Telefax: +420-585-716 299

Denmark
GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +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
Mestarintie 11
FIN-01730 Vantaa
Phone: +358-(0)207 889 900
Telefax: +358-(0)207 889 550

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

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

HILGE GmbH & Co. KG
Hilgestrasse 37-47
55292 Bodenheim/Rhein
Germany
Tel.: +49 6135 75-0
Telefax: +49 6135 1737
e-mail: hilge@hilge.de

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +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
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary
GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India
GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia
PT GRUNDFOS Pompa
Jl. Rawa Sumur III, Blok III / CC-1
Kawasan Industri, Pulogadung
Jakarta 13930
Phone: +62-21-460 6909
Telefax: +62-21-460 6910 / 460 6901

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

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

Japan
GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg., 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

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

Latvia
SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Fakss: + 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
Phone: +60-3-5569 2922
Telefax: +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
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands
GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +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
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway
GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +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
Telefax: +351-21-440 76 90

Romania
GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ilfov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia
ООО Грундфос Россия
109544, г. Москва, ул. Школьная, 39-41, стр. 1
Тел. (+7) 495 564-88-00 (495) 737-30-00
Факс (+7) 495 564 88 11
E-mail grundfos.moscow@grundfos.com

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

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

Slovenia
GRUNDFOS d.o.o.
Šlandrova 8b, SI-1231 Ljubljana-Črnuče
Phone: +386 31 718 808
Telefax: +386 (0)1 5680 619
E-mail: slovenia@grundfos.si

South Africa
GRUNDFOS (PTY) LTD
Corner Mountjoy and George Allen Roads
Wilbart Ext. 2
Bedfordview 2008
Phone: (+27) 11 579 4800
Fax: (+27) 11 455 6066
E-mail: lsmart@grundfos.com

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

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

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

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

Thailand
GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +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
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine
Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Телефон: (+38 044) 237 04 00
Факс.: (+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
Phone: +971 4 8815 166
Telefax: +971 4 8815 136

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

U.S.A.
GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

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

Addresses Revised 11.03.2014

98503253 0214
ECM: 1115365