

# Multilift MD, MLD

## Installation and operating instructions



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**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.

## 1. Symbols used in this document

**Warning**

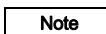
If these safety instructions are not observed, it may result in personal injury.

**Warning**

These instructions must be observed for explosion-proof pumps.

**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

## 2.1 MD

Grundfos Multilift MD lifting stations are supplied complete with collecting tank, butterfly-non-return valves, a sensor unit with cable and two pumps with cable, both connected to the LC 221 controller. The controller includes a power supply cable with plug.

An accessories bag containing the following items is also included:

- 1 x installation and operating instructions
- 1 x Quick guide for controller menu
- 1 x discharge adapter flange, DN 80, with connection piece, DN 100 (outer diameter, 110 mm)
- 1 x flexible hose, DN 100, and two clamps to connect the discharge pipe
- 1 x flexible hose, DN 70, and two clamps to connect the venting pipe
- 2 x screw and expansion anchor for tank fixation
- 3 x screw and washer for fastening a pipe plug in the inlet disk, if required
- 1 x socket seal, DN 100
- 1 x socket seal, DN 50, for diaphragm pump connection or inlet, DN 50
- 1 x gasket kit, DN 80, 4 bolts M16, nuts and washers (galvanised).

## 2.2 MLD

Grundfos Multilift MLD lifting stations are supplied complete with collecting tank, butterfly-non-return valves, a sensor unit with cable and two pumps with cable, both connected to the LC 221 controller. The controller includes a power supply cable with plug.

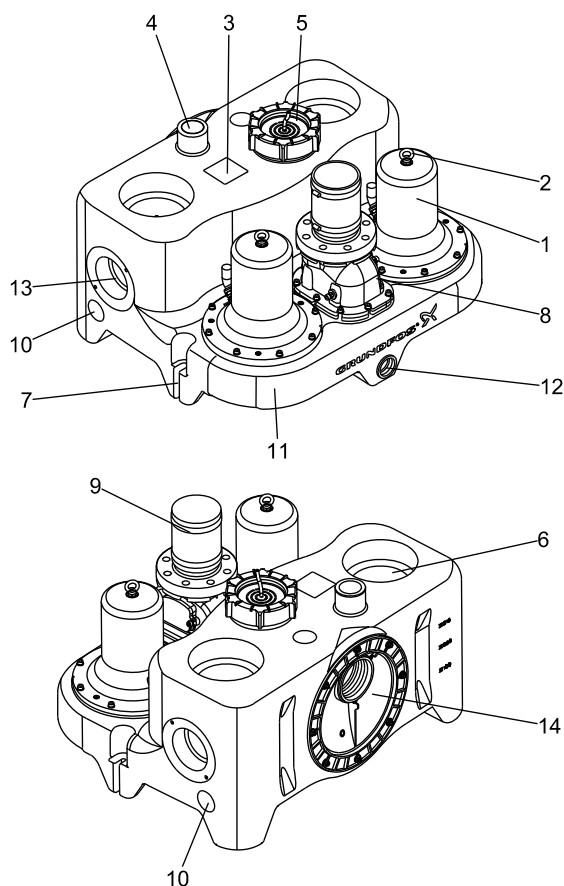
An accessories bag containing the following items is also included:

- 1 x installation and operating instructions
- 1 x Quick guide for controller menu
- 1 x discharge adapter flange, DN 80, with connection piece, DN 100 (outer diameter, 110 mm)
- 1 x flexible hose, DN 100, and two clamps to connect discharge pipe
- 1 x flexible hose, DN 70, and two clamps to connect venting pipe
- 4 x screw and expansion anchor for tank fixation
- 1 x socket seal, DN 150
- 1 x flexible hose connection with two clamps, DN 50, for diaphragm pump connection or inlet, DN 50
- 1 x gasket kit, DN 80, 4 bolts M16, nuts and washers (galvanized).

### 3. General description

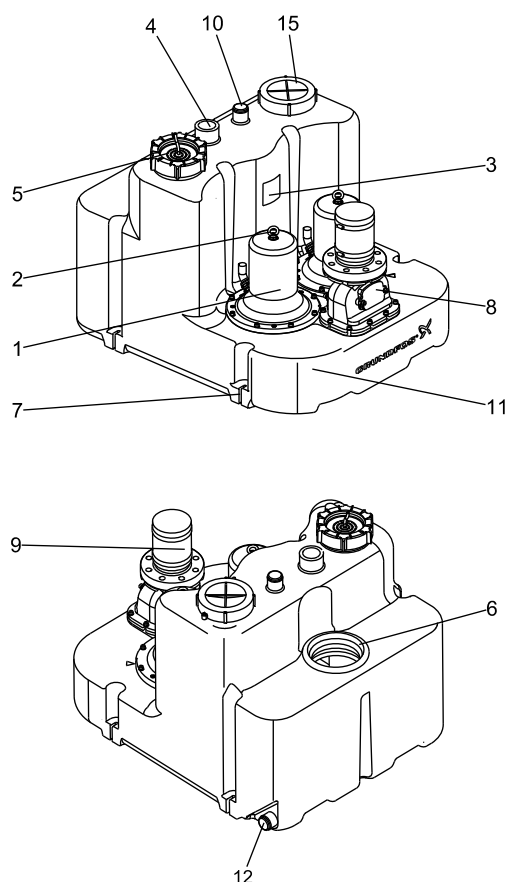
Grundfos Multilift MD and MLD lifting stations are supplied complete with collecting tank, pumps, level sensor, LC 221 controller and connection accessories.

The following gives a description of the components.



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**Fig. 1** Multilift MD front and rear view



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**Fig. 2** Multilift MLD front and rear view

Pos.	Description
1	Pump
2	Lifting eye for pumps
3	Nameplate
4	Venting port, DN 70 (outer diameter, 75 mm), open
5	Screw cap for pressure tube and tank inspection opening
6	Vertical inlet, DN 150 (seal is accessory)
7	Fixing point
8	Non-return butterfly valve, DN 80, with inspection cover and drain screw to lift up the valve flap
9	Discharge adapter flange, DN 80, to pipe Ø110 with flexible connection piece and 2 clamps
10	Side or top inlet, DN 50 (seals are accessory). Socket for MD; connecting piece for MLD
11	Collecting tank with carrying handle moulded into tank body
12	Port for manually operated diaphragm pump, 1 1/2". Socket with seal for MD; connecting piece with flexible connection hose and clamps for MLD
13	Horizontal inlet, DN 100 (seal is accessory)
14	Adjustable inlet disk, DN 100 (DN 150 optional as accessory)
15	Separate inspection cover

### 3.1 Applications

Grundfos Multilift MD and MLD lifting stations are designed for the collection and pumping of domestic wastewater with no free flow to sewer level. Grundfos Multilift MD and MLD lifting stations are designed for the collection and pumping of the following liquids:

- domestic wastewater, including grey wastewater without faeces, black wastewater with faeces (discharge from water closets)
- sludge-containing water.

The lifting stations are capable of pumping liquids containing fibres, textiles, faeces, etc., below sewer level from multi-family houses, offices, schools, hotels, restaurants, public areas and other commercial buildings and similar industrial applications.

Do not pump rainwater with the Multilift MD and MLD lifting stations for these two reasons:

- The motors of the lifting stations are not designed for continuous operation which may be necessary in case of heavy rainfall.
- Rainwater must not be discharged into a lifting station inside a building according to EN 12056-4.

If in doubt, please contact Grundfos for advice.

Do not discharge the following substances/types of wastewater via a lifting station:

- solid matter, tar, high content of sand, cement, ash, cardboard, debris, garbage etc.
- wastewater from sanitary installations situated above the flood level (this must be drained away via a free-flow drainage system according to EN 12056-1).
- wastewater containing hazardous substances such as greasy wastewater from large-scale catering establishments. For drainage of greasy wastewater, use a grease separator according to EN 1825-2 between a canteen or commercial kitchen and the Multilift MD or MLD.

### 4. Transportation and storage



#### Warning

The motor lifting eye is only intended for lifting the pump. Never lift or lower the lifting station by means of the lifting eye.

#### Note

Lift the lifting station by the collecting tank.

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

After a long period of storage, the pumps must be inspected before they are started up again. Make sure that the impellers can rotate freely.

### 5. Product description

The MD and MLD Multilift lifting stations are described in the following sections:

- section [5.1 Lifting station](#) describing the lifting station with collecting tank, pumps, non-return valve and level sensor
- section [5.2 LC 221 controller](#) describing the controller as well as the functions and operation of the controller.

In section [7. Installation of lifting station](#) and the following sections, the above components are described as one unit.

### 5.1 Lifting station

The Grundfos Multilift MD and MLD lifting stations are supplied complete with two single- or three-phase submersible pumps connected to the LC 221 controller incorporating a level sensor.

#### Type key, lifting station

Example	M	L	D	.22	.3	.4
Multilift lifting station						
L = large tank						
D = 2 pumps						
Output power, $P_2$ / 100 (W)						
1 = single-phase motor						
3 = three-phase motor						
2 = 2-pole motor						
4 = 4-pole motor						

#### Nameplate, lifting station

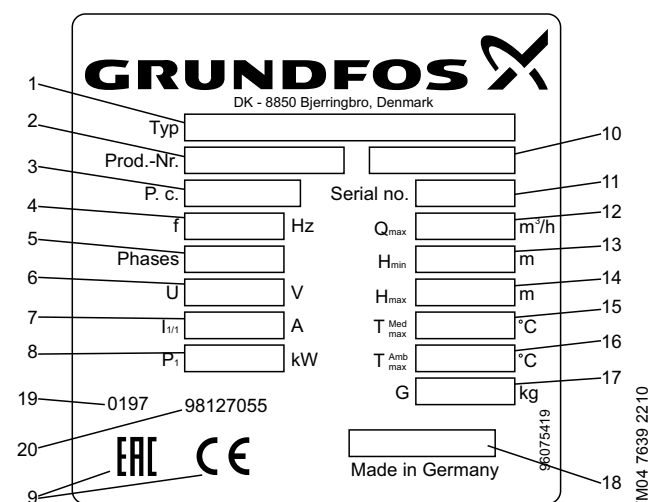


Fig. 3 Nameplate, lifting station

Pos.	Description
1	Type designation
2	Product number
3	Production code (year/week)
4	Frequency [Hz]
5	Number of phases + voltage [V]
6	Voltage [V]
7	Full-load current [A]
8	Motor input power $P_1$ [kW]
9	EAC and CE mark
10	Duty type
11	Serial number
12	Maximum flow rate [m <sup>3</sup> /h]
13	Minimum head [m]
14	Maximum head [m]
15	Maximum liquid temperature [°C]
16	Maximum ambient temperature [°C]
17	Weight [kg]
18	European norm identification code
19	Notified Body
20	Reference number for the Declaration of Performance

### 5.1.1 Collecting tank

The gas-, odour- and pressure-tight collecting tank is made of wastewater resistant polyethylene (PE) and has all necessary ports for the connection of inlet pipes, discharge pipe, venting pipe and a manually operated diaphragm pump, which is available as an accessory.

The **MD collecting tank** has a turnable, eccentric disk in the back allowing adjustment of the inlet to any height between 180 and 315 mm above the floor. The most common heights are marked beside the inlet. See section [7.3 Procedure for installation of lifting station](#).

Furthermore, the MD collecting tank offers four horizontal inlets in the sides (2 x DN 100 and 2 x DN 50) and three vertical inlets at the top of the tank (2 x DN 150 and 1 x DN 50). The centres of the horizontal inlets are 120 mm (DN 50) and 250 mm (DN 150) above the floor.

The side and back inlets 180 and 250 mm above the floor are for direct connection to wall-hung or floor-standing toilet according to EN 33 and EN 37. Further sanitary appliances can be connected to the other ports.

The **MLD collecting tank** offers one vertical inlet, DN 50, at the top of the tank and one vertical inlet, DN 150, in the stepped part of the tank.

The tank volume and effective volume (volume between start and stop) for Multilift MD and MLD lifting stations appear from the following table:

MD			
Inlet level [mm]	180	250	315
Total tank volume [l]	130		
Effective tank volume [l]	49	69	86
MLD			
Inlet level [mm]	560		
Total tank volume [l]	270		
Effective tank volume [l]	190		

Setting to the relevant start inlet level must be made during the start-up phase via the setup menu. See section [6.2 Setup menu](#). The first step after power supply connection is a start-up phase with level setting.

To minimise sedimentation, the tank bottom is chamfered to lead the wastewater to the pump.

### 5.1.2 Pumps

The pump impellers are designed as free-flow vortex impellers, ensuring almost unchanged performance throughout the entire life of the pump. The stator housing of the motor is made of cast iron. The pump has a mechanical shaft seal.

See more technical data in section [12. Technical data](#).

Single-phase motors are protected by a thermal switch in the windings and run via a capacitor inside the controller cabinet.

Three-phase motors are protected by a thermal switch in the windings and an additional thermal circuit breaker in the cabinet of Multilift MD/MLD22, 24, 32 and 38 to cut out the motor in case of overload.

If the phase sequence for three-phase pumps is wrong, the controller will indicate fault and prevent the pump(s) from starting. For correction of phase sequence, see fig. [14](#). For direction of rotation, see section [10.2 Motor](#).

If the motor is overloaded, it will stop automatically.

**Note** When it has cooled to normal temperature, it will restart automatically.

Performance curves are available in the databooklet, which you can download via the QR code or link below:



<http://net.grundfos.com/qr/i/98288126>

### 5.1.3 Shaft seal

The pumps have three shaft seals, the oil chambers in between are filled for life and therefore require no maintenance.

For replacement in case of service, please see service instructions.

### 5.1.4 Motor cable

The motor cable is fitted to the motor via a cable entry. The enclosure class is IP68. The length of the cable is either 4 m or 10 m.

### Nameplate, motor

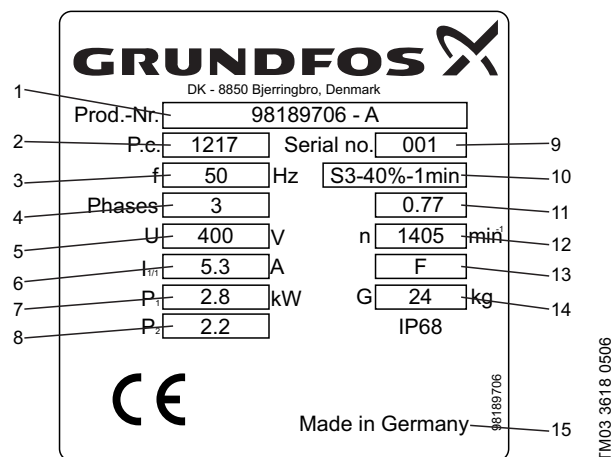


Fig. 4 Nameplate, motor

Pos.	Description
1	Product number and model
2	Production code (year/week)
3	Frequency
4	Number of phases
5	Rated voltage
6	Rated current
7	Input power
8	Shaft power
9	Serial number
10	Operating mode
11	Power factor
12	Rated speed
13	Insulation class
14	Weight
15	Production country

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### 5.1.5 Non-return valve

The DN 80 non-return valve includes a drain screw to lift up the internal flap in order to drain the discharge pipe in case of maintenance or service. The valve is designed and tested according to EN12050-4. See fig. 5.

**Note** Loosen the lock nut a little before turning the drain screw.



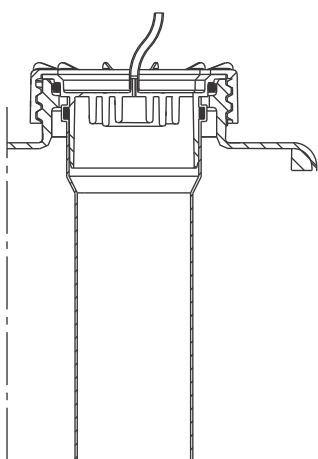
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**Fig. 5** Butterfly (double) non-return valve, DN 80

### 5.1.6 Level sensor

The piezoresistive pressure sensor placed in the controller is connected via a hose to a pressure tube in the tank. The screw cap where the hose is connected includes 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 hose, and the piezoresistive sensor transforms the changing pressure into an analogue signal. The control box 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.

The hose is supplied in lengths of 4 or 10 m. The hose must be connected to the controller.



**Fig. 6** Screw cap with hose, DN 100 tube

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### 5.2 LC 221 controller

The LC 221 is a level controller specially designed for controlling and monitoring the Grundfos lifting stations, Multilift MD and MLD. The basis for the control is the signal received continuously from the piezoresistive, analogue level sensor.

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

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.



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**Fig. 7** LC 221 level controller for Multilift MD and MLD

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 (MD) and 55 seconds (MLD), and the operating time is limited to three minutes (see section 6.4 [Description of fault indications](#), fault code F011).
- automatic test runs (2 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 of:
  - operating mode (auto, manual)
  - operating hours
  - impulses (number of starts)
  - highest measured motor current.
- alarm indication of:
  - pump status (running, fault)
  - phase sequence failure and missing phase
  - thermal-switch failure
  - high-water alarm (5 seconds delay)
  - time for 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 six digital inputs for the following functions:

- connecting an analogue sensor (4-20 mA or 0-5 V)
- connecting up to four level switches and pressure sensors instead of analogue sensor. An additional float switch can be connected to the alarm input as backup for the analogue sensor.
- connecting a separate level switch to be used for flood detection outside Multilift MD or MLD. Lifting stations are often installed in a sump inside the basement - the lowest point in the building. In case of e.g. groundwater inflow or water pipe burst, an alarm will be indicated by the controller.
- connecting a piezoresistive pressure sensor PCB (pre-assembled)
- connecting an external alarm reset
- connecting the thermal switch of the motor.

For updates and further adjustments, a PC Tool can be connected. See service instructions.

To allow for the situation that the normal power supply should fail, 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.

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.

### 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, LC 221 controller

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

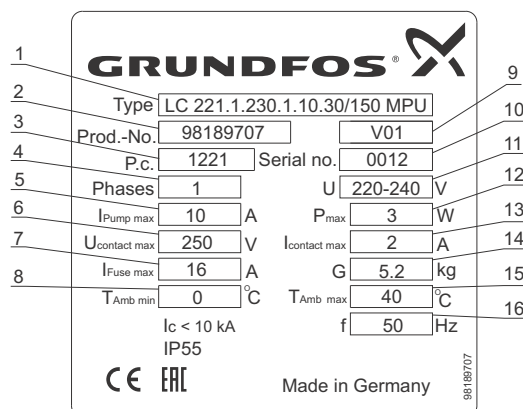


Fig. 8 Example of an LC 221 nameplate

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

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### 5.2.1 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 (> Multilift MD22 or MLD22).

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

Furthermore, it has an integrated piezoresistive pressure sensor which is activated by compressed air directly via the pressure tube inside the collecting tank. Finally, it has terminals for power supply, connection to the pump and the inputs and outputs mentioned in section [5.2 LC 221 controller](#).

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 offers the possibility of being mounted on a wall without opening it first. A drilling template and six screws with rubber guides are enclosed.

### 5.2.2 Control panel

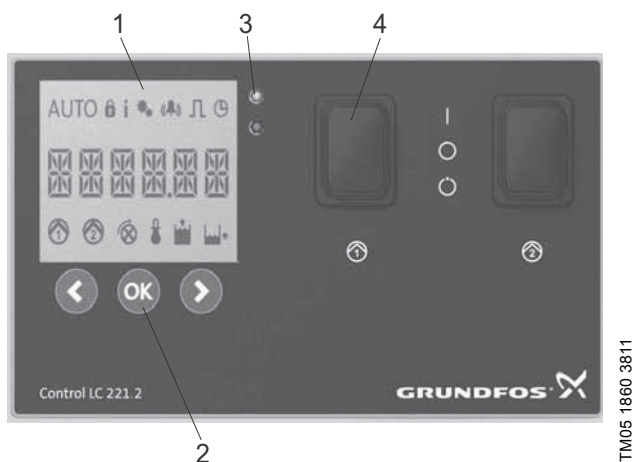


Fig. 9 Control panel

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 [6.1 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
	<ul style="list-style-type: none"> <li>go left in the main menu.</li> <li>go up in the submenus.</li> <li>decrease values in the submenus.</li> </ul>
	<ul style="list-style-type: none"> <li>confirm a selection.</li> <li>activate the submenus.</li> <li>reset the buzzer.</li> </ul>
	<ul style="list-style-type: none"> <li>go right in the main menu.</li> <li>go down in the submenus.</li> <li>increase values in the submenus.</li> </ul>

### 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
	<p>The operating mode is selected by the ON-OFF-AUTO selector switch which has three different positions:</p> <p>POS I:</p> <p>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).</p>
	<p>POS O:</p> <ul style="list-style-type: none"> <li>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.</li> <li>Resets fault indications.</li> </ul>
	<p>POS AUTO:</p> <p>Automatic operation. The pump will start and stop according to the signal from the level sensor.</p>

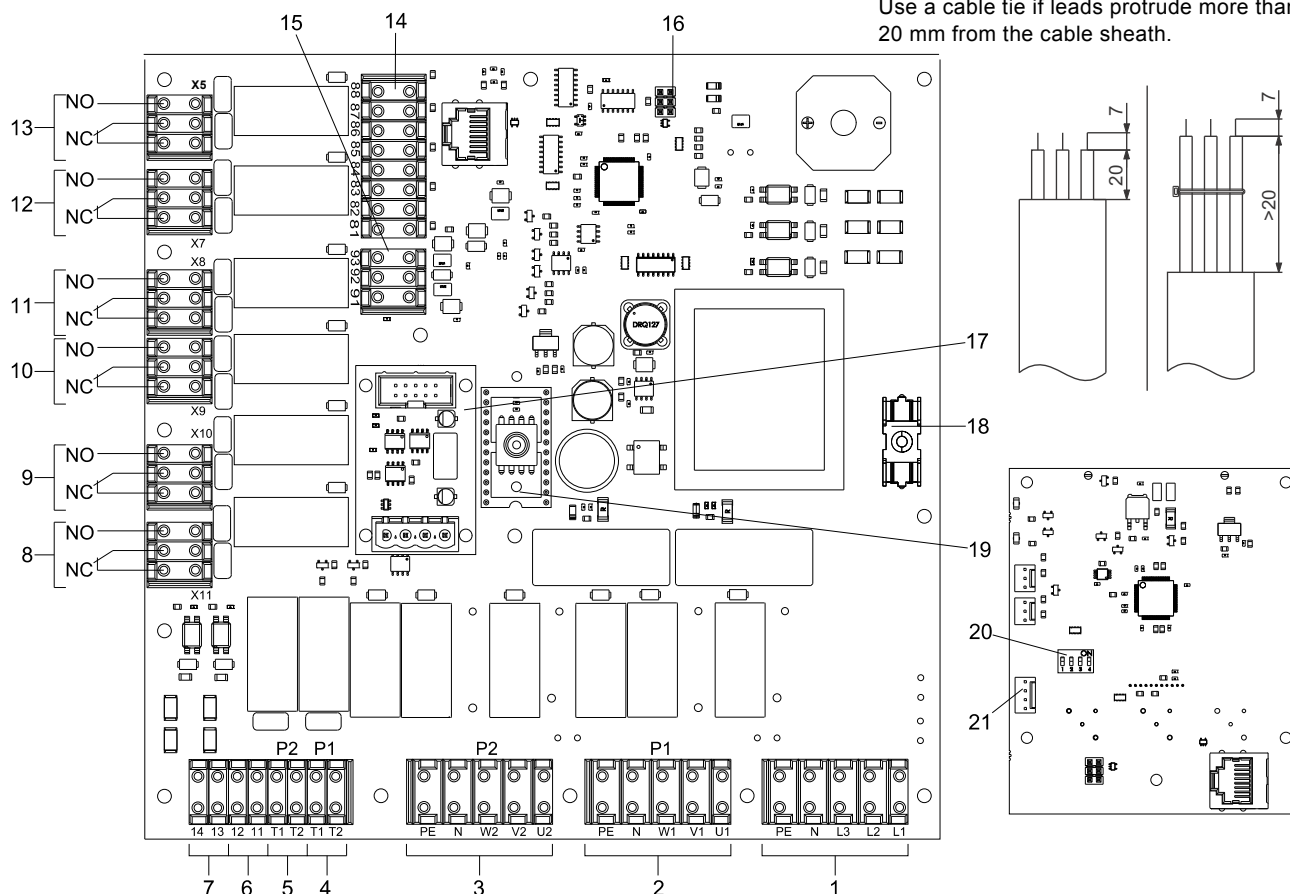


### 5.2.3 Internal layout of LC 221

Figure 10 shows the internal layout of LC 221.

**Note:** Cable connections for pos. 8-15:

Use a cable tie if leads protrude more than 20 mm from the cable sheath.



**Fig. 10** Internal layout LC 221 (three-phase PCB as example)

Pos.	Description	Comments	Terminal designation
1	Terminals for power supply		PE, N, L3, L2, L1
2	Terminals for connecting pump 1		PE, N, W1, V1, U1
3	Terminals for connecting pump 2		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 (outside the tank)	230 V	13, 14
8	Terminals for common fault		X11
9	Terminals for high water-level alarm	Potential-free changeover NO/NC contacts with max. 250 V / 2 A. <b>Attention:</b> Connect these terminals to supply network potential or low voltage but do not mix the two.	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
	Terminals for level switches	Digital	81-88
14	Terminals for additional high water-level alarm (inside the tank)	Digital	81, 82
15	Terminals for analogue sensor	0-5 V or 4-20 mA	91 (GND), 92 (Signal), 93 (12 V)
16	Service connector to PC Tool		-
17	Connector for GENibus interface module	Not in use for this application	-
18	Control circuit fuse	Fine-wire fuse: 100 mA / 20 mm x Ø5	-
19	Piezoresistive pressure sensor module	0-5 V	-
20	DIP switches	Not in use for this application	-
21	Connector for battery, 9 V	Non-rechargeable batteries only. The controller is not equipped with a charging device.	-

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## 6. Operating LC 221 controller








### 6.1 Description of display








The display of the LC 221 level controller is shown in fig. 11.












Fig. 11 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.
	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 and the fault will be written into the fault log. After you have entered the fault log, the symbol will switch off. See section <a href="#">6.3 Information menu</a> .
	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 <a href="#">6.2 Setup menu</a> .
	Alarm	The symbol is visible if an alarm situation occurs. The type of alarm will appear from 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	<p>In automatic mode, faults are indicated by means of a code, and in normal operation these two values are shown:</p> <ul style="list-style-type: none"> <li>the liquid level in the tank, if the pump is not running</li> <li>the current consumption, if the pump is running. If both pumps are running, the current consumption shown is the value for both pumps.</li> </ul> <p>In the information menu, the following information is indicated:</p> <ul style="list-style-type: none"> <li>fault codes</li> <li>operating hours</li> <li>impulses</li> <li>max. measured motor current.</li> </ul> <p>In the setup menu, the following information is indicated:</p> <ul style="list-style-type: none"> <li>set start level</li> <li>set delays</li> <li>set currents</li> <li>sensor calibration (presettings for piezoresistive level sensor)</li> <li>service intervals</li> <li>total reset to factory settings.</li> </ul>
	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	<p>(Only three-phase pumps)</p> <p>The symbol flashes in case of a phase-sequence fault and missing phase. See section <a href="#">6.4 Description of fault indications</a>.</p>
	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.

## 6.2 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 start-up phase. See section 8.4 *Setting of LC 221*. 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 the button . Navigate through the menu by means of the buttons  and . Select the desired menu item by pressing the button . Enter values or select settings from a list by means of the buttons  and . Save the settings by pressing the button . See also fig. 12.

The following settings can be made:

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

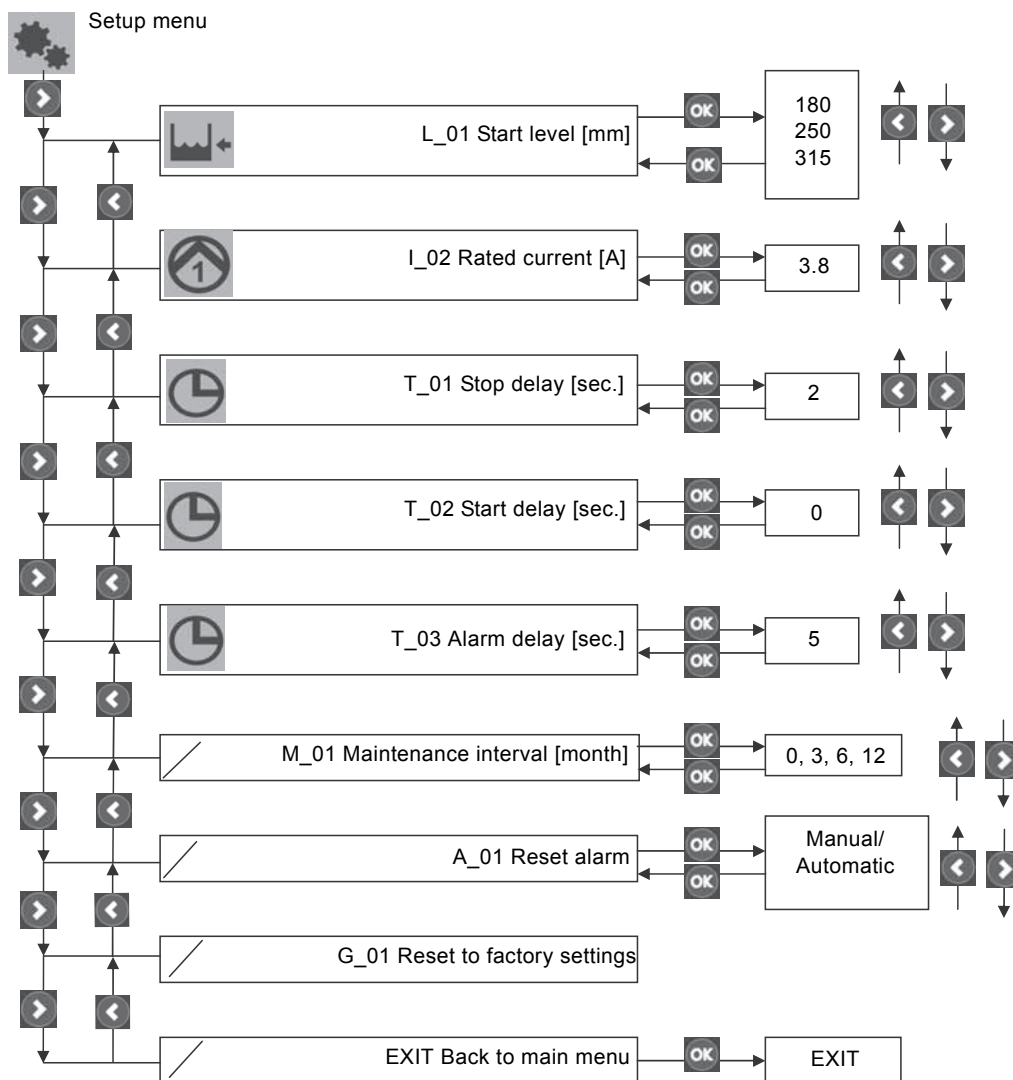


Fig. 12 Menu structure for setup menu

### 6.3 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 the button **OK**. Navigate through the menu by means of the buttons **>** and **<**. Select the desired menu item by pressing the button **OK**. See also fig. 13.

In the information menu the following data can be read:

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

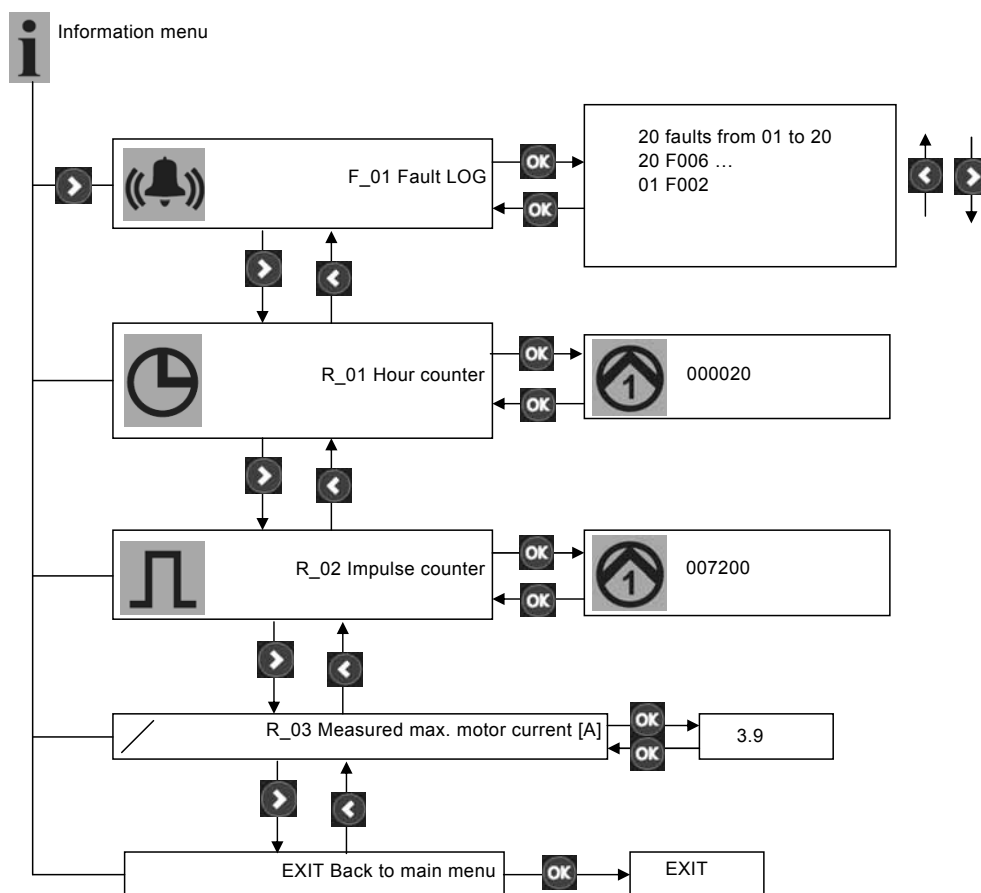

















Fig. 13 Menu structure for information menu

## 6.4 Description of fault indications

If a fault occurs, the symbol  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. 13). When you leave the fault log, the symbol  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. See fig. 14.
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	Sensor 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		•	•	The pump has run for more than the allowed operating time and the controller has stopped the pump for a defined cool-down period in order to prevent overheating. The operating time and cool down period depends on the pump. See duty type on nameplate. Check that the outlet isolating valve is open. Check that the non-return valve is functioning. A leaky non-return valve can allow liquid in the outlet pipe to flow back in to the collecting tank. Remove any blockage from the venting system, see fig. 33.
F012	Operating time exceeded, pump 2	F012		•	•	
F013	External fault	EXT	-		•	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	Display communication failure	Display is off.		•		Communication failure between the main board and the display. As the display is off, the fault code can be found via PC tool only. Check the patch cable RJ45 between the main board and the display.
F117		F117		•		Communication failure between the main board and the display. The display is still on and is displaying the fault code F117. Check the patch cable RJ45 between the main board and the display.
F020	High level alarm in tank	F020		•		Alarm triggered by the additional float switch inside the tank. The piezoresistive sensor has failed to detect the start level. The float switch is triggered and starts a pump for 20 seconds (preset value, changeable via PC tool). • Check the tank, the level sensor hose and the hose connections for any air leakage. The level sensor hose is connected correctly to the pneumatic coupling underneath the controller when you cannot pull it out without pressing the locking mechanism.



If a fault occurs, the red LED will flash, the symbol **i** will be visible and the fault will be added to the fault log. Furthermore, the buzzer will be activated, the symbol **A** 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).

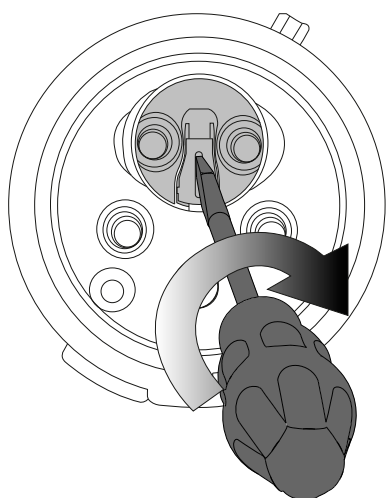
If manual resetting was selected in setup menu, the acoustic alarm and red LED can be reset by pressing the button **OK**. The fault indication will be reset when the fault has disappeared, has been removed or the ON-OFF-AUTO switch has been set to OFF position.

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

The symbol **i** 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 **A** 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.



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**Fig. 14** Changing phases of a three-phase controller with phase inverter

## 7. Installation of lifting station

### 7.1 General description

When installing the Multilift MD or MLD lifting station, make sure that all local regulations covering venting, access to the stations, etc. are observed.

#### 7.1.1 Installation sketches

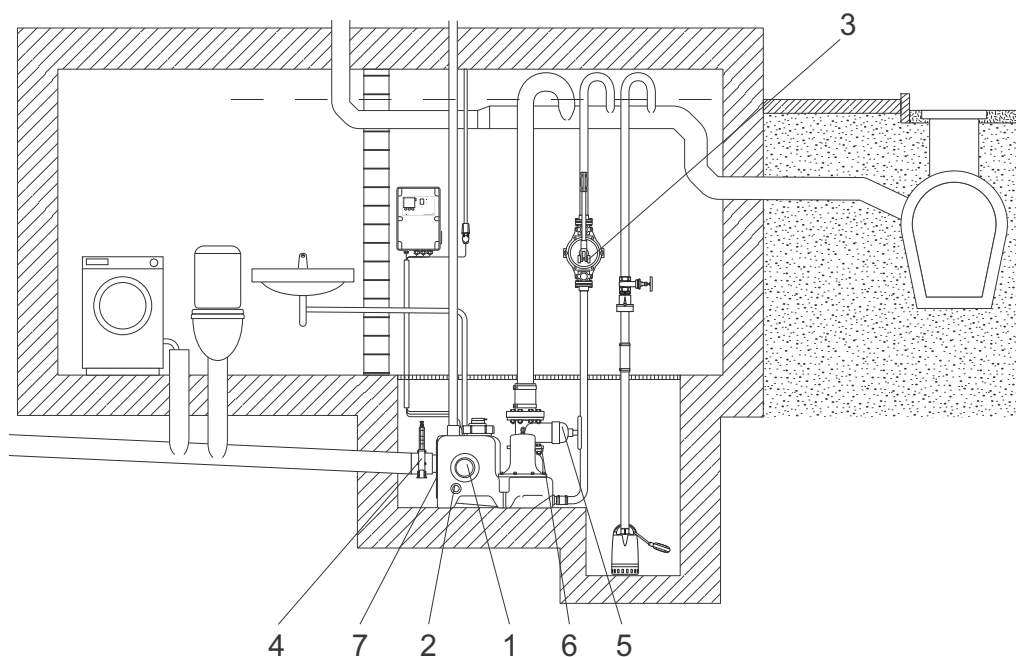


Fig. 15 Installation sketch, Multilift MD

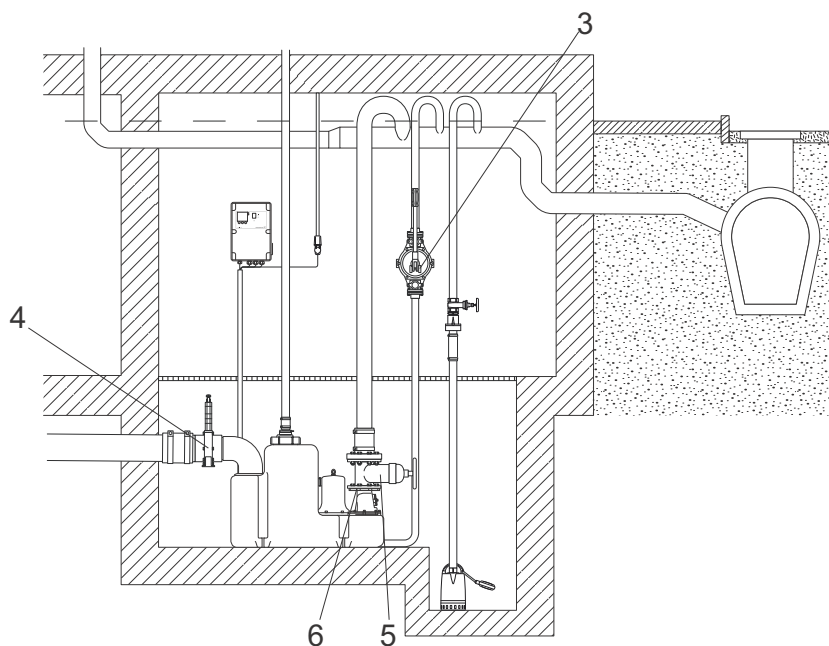


Fig. 16 Installation sketch, Multilift MLD

Pos.	Accessories	Product number
1	Socket seal, DN 100	97726942
2	Socket seal, DN 50	98079669
3	Diaphragm pump, 1 1/2"	96003721
4	PVC isolating valve, DN 100	96615831
5	Cast iron isolating valve, DN 80	96002011
6	Gasket kit, DN 80, with bolts, nuts and washers	96001999
7	Inlet disk with socket seal, DN 150, for replacement	98079681

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## 7.2 Guidelines for installation of lifting station

The guidelines for correct mechanical installation of lifting station are according to EN 12056-4.

See section 7.1.1 *Installation sketches*.

- Install the lifting station in a properly lit and vented room with 60 cm free space around all parts to be serviced and operated.
- Provide a pump sump below the floor level. If a lifting station is installed in a basement with the risk of penetrating groundwater, it is advisable (in certain countries required) to install a drainage pump in a separate pump sump below floor level in order to drain the room. See figures 15 and 16.

### Note

The collecting tank, pump and cables may be flooded (max. 2 m for 7 days).

### Caution

The controller must be installed in a dry and well ventilated place.

- All pipe connections must be flexible to reduce resonance.
- Lifting stations must be secured against uplift and twist.
- All discharge pipes from lifting station, diaphragm pump and drainage pump must have a bend above the local backwater level. The highest point of the bend/reversed water seal must be above street level. See figures 15 and 16.
- For discharge pipes, DN 80 and upwards, install an isolating valve in the discharge pipe. Also provide an isolating valve in the inlet line.
- Surface water must not be discharged into the lifting station inside the building. It must have its own pumping station outside the building.
- Lifting stations must be provided with an approved non-return valve according to EN 12050-4.
- The volume of the discharge pipe above the non-return-valve up to the backwater level must be smaller than the effective tank volume.
- In general, a lifting station for black wastewater must be vented above roof level. However, it is permitted to lead the ventilation, as a secondary ventilation, into the main building ventilation system. Special venting valves (accessory) must be placed outside the building.
- If the wastewater is discharged into a collecting line, this collecting line must have a filling ratio of at least  $h/d = 0.7$ . The collecting line must be at least one nominal diameter bigger after the discharge pipe connection.
- The controller must be placed in a flood safe place and be equipped with an alarm.
- Use a diaphragm pump for simple, manual draining of the collecting tank in case of pump failure (not obligatory).

## 7.3 Procedure for installation of lifting station

### 7.3.1 Inlet pipe connections, Multilift MD

1. Check the scope of delivery.  
For scope of delivery see section 2. *Scope of delivery*.
2. Prepare the adjustable inlet on the back of Multilift MD.  
The turnable inlet disk has a DN 100 inlet and allows the inlet height to be adjusted to any height between 180 and 315 mm above floor level. The most common heights, 180, 250 and 315 mm, are marked beside the inlet. See fig. 17. An inlet disk with a DN 150 inlet is available as an accessory. See fig. 18. The screws around the outer ring of the inlet disk are not fully tightened allowing the inlet disk to be turned. This will allow the inlet to be adjusted to the desired inlet height. When the desired inlet height has been set, tighten all screws. All screws must be tightened to max. 9 Nm.

### Note

Before connecting Multilift MD, consider that when turning the inlet disk to fit to the height of the inlet pipe, the lifting station and the discharge will move sideways accordingly (max. 72.5 mm). See fig. 17.

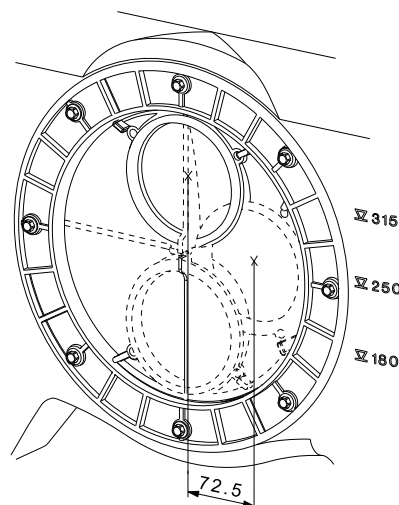


Fig. 17 DN 100 inlet disk, adjustable from 180 to 315 mm above the floor to the middle of the inlet pipe

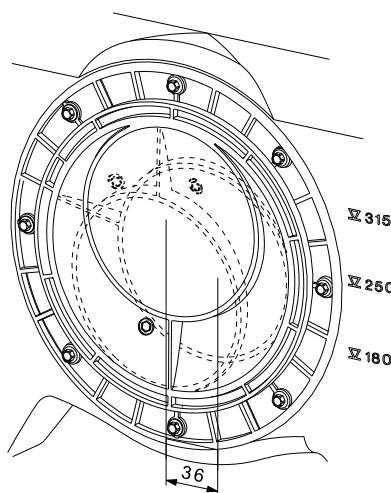
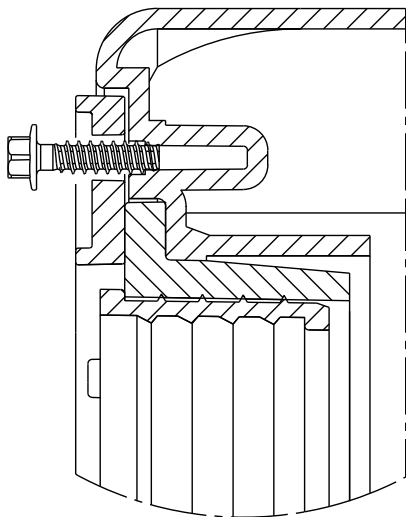


Fig. 18 Optional DN 150 inlet disk, adjustable from 207 to 279 mm above the floor to the middle of the inlet pipe

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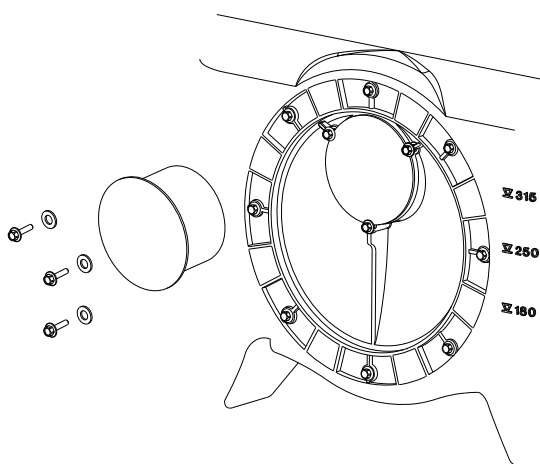
**Fig. 19** Untightened screw in outer ring

**Caution**

Multilift MD lifting stations are supplied with loose screws in the outer ring of the turnable inlet disk. See fig. 19. Check and tighten all screws to max. tightening torque of 9 Nm before connecting the inlet pipe.

**Note**

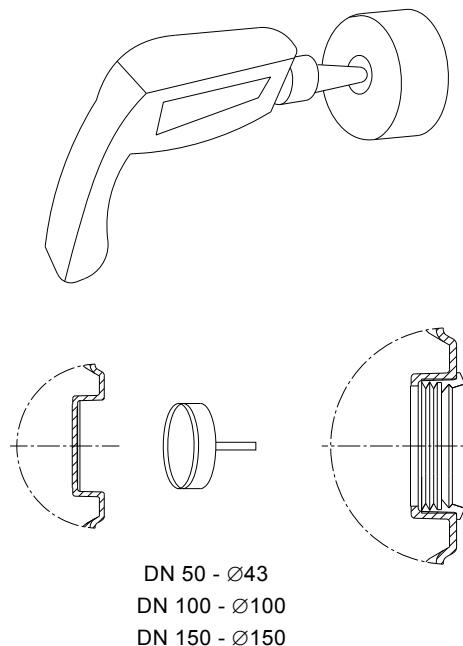
If the main inlet is not to be used it can easily be plugged using a standard DN 100 pipe plug fastened with three screws and washers. See fig. 20.



**Fig. 20** Plugging the main inlet

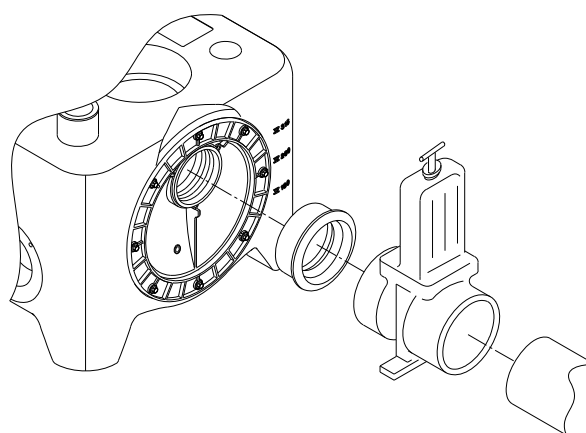
3. Prepare optional inlets by cutting out the desired one. Use cup drills  $\varnothing 150$  for DN 150,  $\varnothing 100$  for DN 100 and  $\varnothing 43$  for DN 50 inlets. The cutting line is recessed. To avoid sharp cutting edges, the holes must be deburred. The socket seals are provided with collars.

4. Prepare the connection for diaphragm pump (optional). Use cup drill,  $\varnothing 43$ , for DN 50 connection socket. To avoid sharp cutting edges, the hole must be deburred.



**Fig. 21** Cutting or drilling of optional connection holes

5. Connect the inlet pipe to the tank. Install an isolating valve between inlet pipe and lifting station to avoid inflow during maintenance and service. We recommend an easy-to-handle PVC isolating valve.



**Fig. 22** Installation of isolating valve

**Caution**

Make sure that weight from inlet, discharge and vent pipes does not rest on the tank. Long pipe sections, valves, etc. must be supported.



Warning  
Never step on the lifting station.

### 7.3.2 Inlet pipe connections, Multilift MLD

1. Check the scope of delivery.  
For scope of delivery, see section 2. [Scope of delivery](#).
2. Prepare the  $\varnothing 150$  inlet.  
Use a cup drill  $\varnothing 150$  to drill out the hole along the recessed line. See fig. 21. The tank minimum inlet level for MLD is approximately 560 mm. See fig. 23.
3. Prepare the additional  $\varnothing 50$  inlet.  
Cut along the stepped line of the  $\varnothing 50$  inlet port on top of the tank.

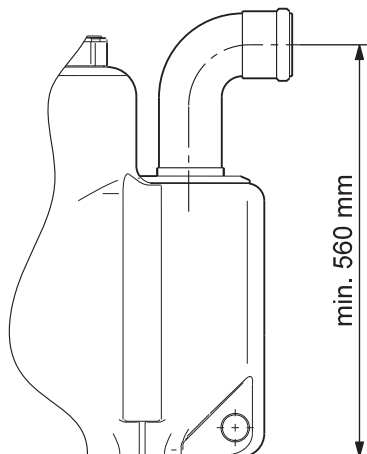


Fig. 23 Minimum inlet level for MLD

### 7.3.3 Further connections for Multilift MD and MLD

1. Connect the discharge pipe.  
Install an isolating valve between the non-return valve and the supplied flexible connection hose, DN 100 (internal diameter 110 mm). A flexible connection can be ensured if a distance of approx. 3 cm is left between the pipe ends of the connection piece and the discharge pipes.

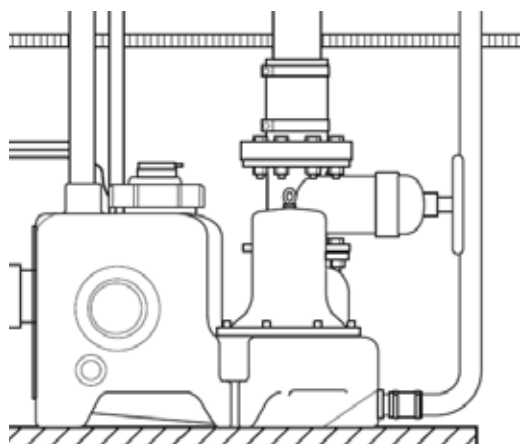


Fig. 24 Isolating valve on top of non-return valve

2. Connect the venting pipe.  
The DN 70 venting port on top of the tank is open. Connect the venting pipe to the venting port via a flexible connection piece. The venting pipe must be led out above the roof into the open air in accordance with local regulations. Check the use of venting valves (accessory) according to local regulations if venting above the roof is impossible. A flexible connection can be ensured if a distance of approx. 3 cm is left between the venting pipe end and the venting port.
3. Connect the diaphragm pump (optional).  
Fit the diaphragm pump on the discharge side. To facilitate servicing of the diaphragm pump, we recommend fitting a 1 1/2" isolating valve to the tank port.

4. Fix the tank to the floor.

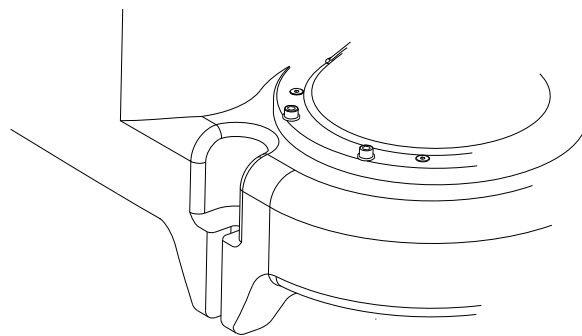


Fig. 25 Fixing point for fixation of tank to the floor

## 8. Installation of LC 221 controller



#### 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.

### 8.1 Location



#### Warning

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

LC 221 can be installed at ambient temperatures ranging from 0 °C to +40 °C.

Enclosure class: IP55.

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.

### 8.2 Mechanical installation



#### Warning

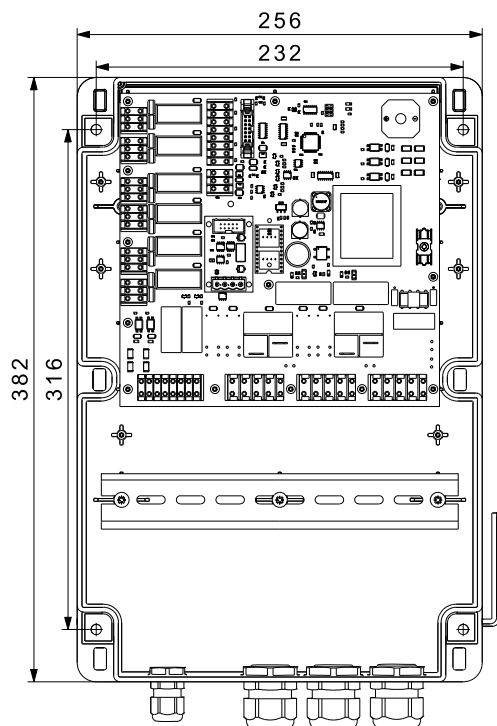
When drilling the holes, take care not to damage any cables or water and gas pipes. Ensure a safe installation.

#### 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 the plastic caps.



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Fig. 26 Mounting of controller to the wall

### 8.3 Electrical connection



#### Warning

The protective earth (PE) of the power outlet must be connected to the protective earth of the product. The plug must have the same PE connection system as the power outlet.



#### Warning

The installation must be fitted with a residual current device (RCD) with a tripping current less than 30 mA.



#### Warning

The product must be connected to an external main switch with a minimum contact gap of 3 mm (0.12 inch) in all poles.



#### 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 power supply.

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

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

The power outlet must be placed near the cabinet as the controller is supplied with a 1.5 m cable.

Maximum back-up fuse is stated on the controller nameplate.

### 8.4 Setting of LC 221

Only the start level corresponding to the inlet level to the collecting tank needs to be set. All other values are preset but can be adjusted if required.

Select the height of the inlet pipe, 180, 250 or 315 mm above floor level, using the buttons and , and press the button 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.

The following values can be changed, if necessary:

#### Start level

The start level must be set according to the inlet pipe height above floor level (180, 250 and 315 mm). Stop and alarm levels are preset.

#### Rated current

Preset value from factory according to the rated current of the motor. The protection against pump 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 to Multilift MD. Preset value is 5 seconds.

#### 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 some alarms automatically when the fault disappears; however, most alarms must be reset manually. See section [6.4 Description of fault indications](#). Preset value is AUTO.

#### Reset to factory settings

The controller will reboot, and start-up settings will have to be made again. See section [6.2 Setup menu](#).

#### 8.4.1 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 13, 14.



## 8.5 Wiring diagrams

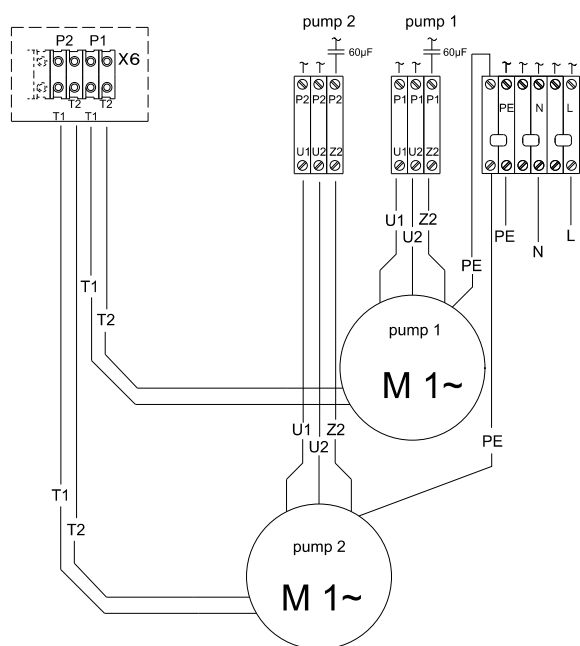


Fig. 27 Wiring diagram, single-phase Multilift MD/MLD.12.1.4 and MD/MLD.15.1.4

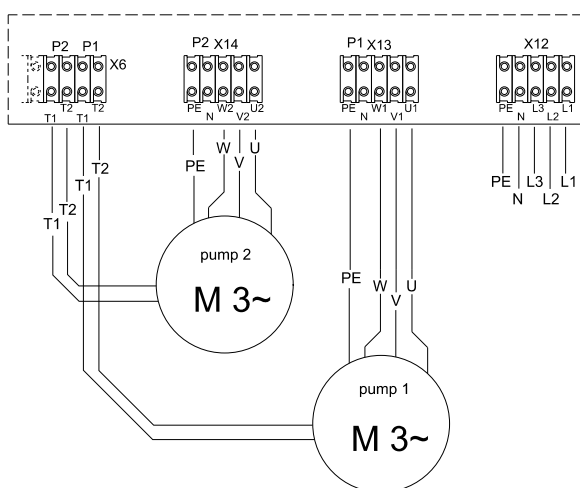


Fig. 28 Wiring diagram, three-phase Multilift MD/MLD.12.3.4 and MD/MLD.15.3.4

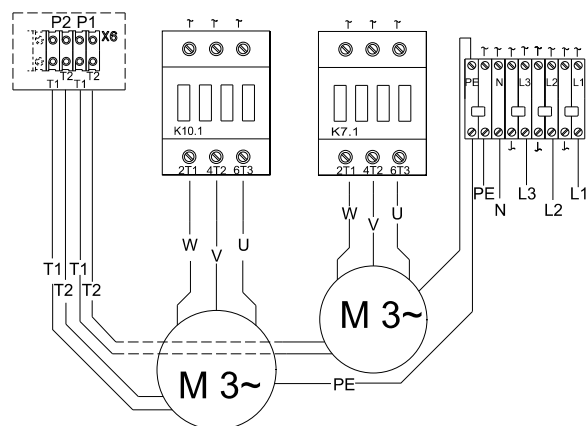


Fig. 29 Wiring diagram, three-phase Multilift MD/MLD.22.3.4 with contactors

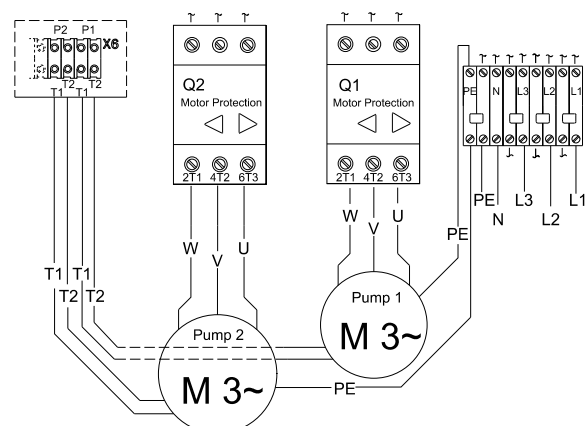


Fig. 30 Wiring diagram, three-phase Multilift MD/MLD.24.3.2, MD/MLD.32.3.2 and MD/MLD.38.3.2 with motor-protective circuit breaker

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TM05 3596 1612

TM05 3593 1612

TM05 3594 1612

## 9. Startup



### Warning

Before starting any work on a pump used for pumping liquids which could be hazardous to health, clean and vent the pump, pit, etc., thoroughly according to local regulations.



### 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.

Prior to start-up, the connection and settings must have been carried out according to sections [8.3 Electrical connection](#) and [8.4 Setting of LC 221](#).

Start-up must be carried out by authorised personnel.

Proceed as follows:

1. Check all connections.
2. Connect the plug to the power supply and follow the controller start-up sequence.

**Note:** It will take up to 45 seconds to boot the controller.

This time can be reduced to 5 seconds by pressing the OK button. When the power supply is connected for the first time, three values for the start level can be chosen (180, 250 or 315 mm above floor level) according to the inlet height to the collecting tank. If the inlet height is between two levels, choose the lower level for start in the display. All other settings are preset. Some settings can be changed.

See section [8.4 Setting of LC 221](#). Now the controller is ready for automatic mode (selector switch in pos. AUTO).

3. Open the isolating valves in discharge and inlet lines.
4. Activate a sanitary appliance connected to the inflow of the Multilift MD or MLD and monitor the increasing liquid level in the tank up to the start level. Check the starts and stops at least twice.

If the pump cable was disconnected from the controller, for instance to lead the cable through an empty cable conduit, check the direction of rotation of the pump. See section [10.2 Motor](#).

**Note**

## 10. Maintenance and service

The Multilift MD and MLD require a minimum of maintenance.



### Warning

Before carrying out maintenance and service 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.



### Warning

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

According to EN 12056-4 lifting stations must be checked at the following regular intervals:

- every 12 months in single-family houses
- every 6 months in multi-family dwellings
- every 3 months in commercial and industrial applications.

During the check, local regulations must be observed.

The periodic checks of the lifting station must be carried out by authorised personnel and must comprise electrical and mechanical maintenance.

Check the following points:

- **Discharge and inlet connections**  
Check all connections to the lifting station for tightness and leakages. Make sure that weight from the inlet, discharge and venting pipes does not rest on the tank. Long pipe sections, valves, etc. must be supported.
- **Power consumption**  
See nameplate.
- **Cable entry**  
Make sure that the cable entry is watertight and that the cables are not bent sharply and/or pinched.
- **Pump parts**  
Remove eight screws and dismantle the pump from the tank and check that the vent hole of the pump housing is clear. When the pumps is mounted again, we recommend to replace the O-ring between pump and tank. Make a test run with clean water. In case of noise, vibration or abnormal running, contact Grundfos.
- **Ball bearings**  
Check the shaft for noisy or heavy operation. Replace defective ball bearings. A general overhaul of the pump is usually required in case of defective ball bearings or poor motor function. This work must be carried out by the manufacturer or an authorised service workshop.

### Cleaning the non-return valve (if required)

Proceed as follows:

1. Close the isolating valves in the discharge pipe and in the inlet pipe (if fitted) or drain the discharge pipe by tightening the drain screw on the side of the non-return valve. See fig. [5](#).
2. Clean the non-return valve via its inspection cover. Replace the gasket of the inspection cover when reassembling the non-return valve.

## 10.1 Mechanical maintenance

- Remove possible deposits and/or sludge build-up in the collecting tank.
- Remove any blockages on the inlet side of the lifting station. A blockage will typically be a large solid object.
- Check and replace the gaskets of connections at valves, etc., if necessary.
- Check the tank for cracks and deformations. These may occur in case of faulty assembly and therefore excessive stress on the tank.

**Note:** The above list is not complete. The lifting station may be installed in environments which require thorough and frequent maintenance.

## 10.2 Motor

Check the direction of rotation of the pump in the following way:

- Turn off the power.
- Unscrew the lifting eye on top of motor. See fig. 31.
- The top of the motor shaft is now visible. See fig. 32. Check that rotor and impeller can be turned freely by turning the shaft with a large slotted screwdriver.

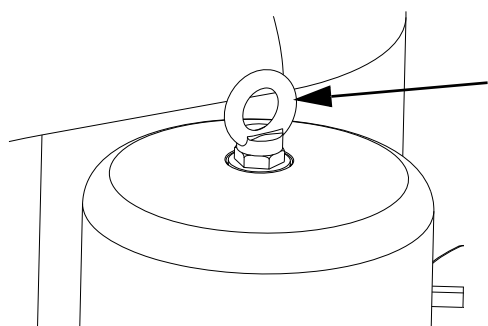


Fig. 31 Lifting eye

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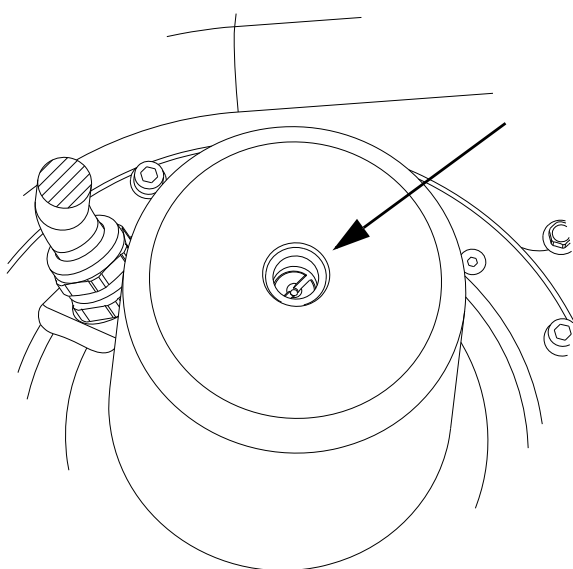


Fig. 32 Top of slotted motor shaft

TM05 0339 1011

If the pump has been disassembled, remember to align the vent hole in the pump with the vent hole in the tank when remounting the pump to the tank. See figures 33 and 34.

**Caution**

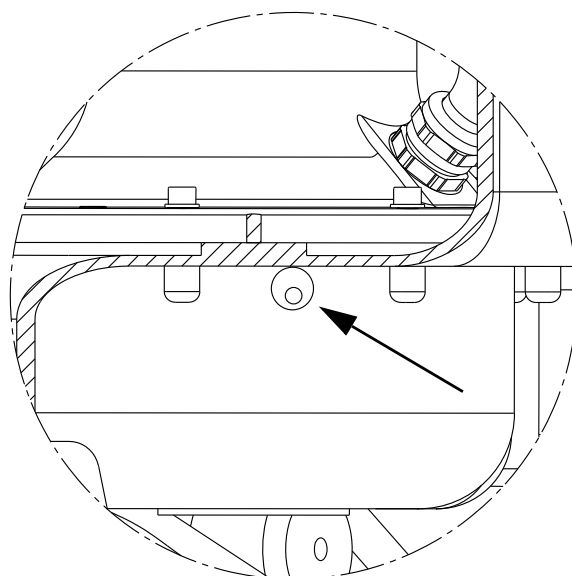


Fig. 33 Vent holes in pump housing and collecting tank

TM05 0344 1011

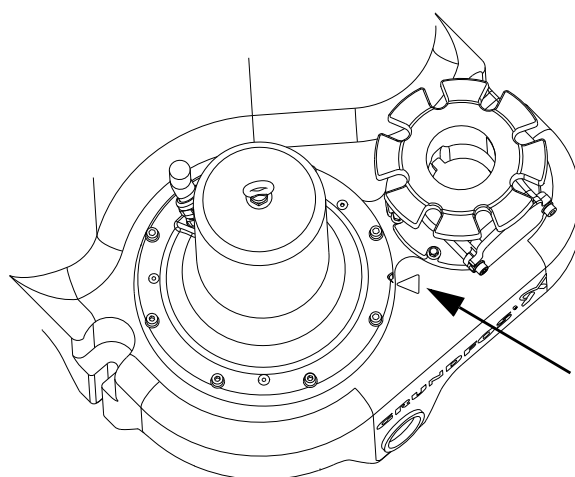


Fig. 34 Alignment marks on tank and pump flange

TM05 0330 1011

## 10.3 Electrical maintenance

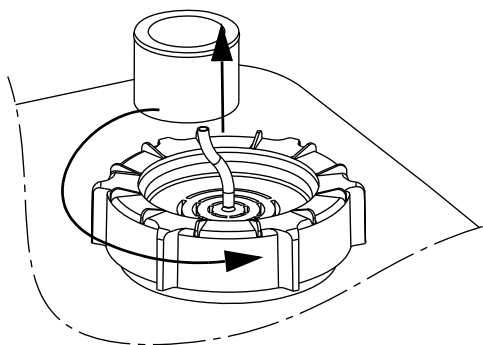
- Check the gasket of the LC 221 cabinet front cover and of the cable entries.
- Check the cable connections.
- Check the controller functions.
- Check and clean the level sensor. See section [10.4 Cleaning the level sensor](#).
- If LC 221 is installed in a particularly moist environment in a basement, we recommend checking the terminals on the PCB in order to identify possible corrosion. In typical installations, the contacts will work for several years and do not require any inspection.
- 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.

## 10.4 Cleaning the level sensor

1. Push the ON-OFF-AUTO selector switch to position OFF (○).  
See section 5.2.2 *Control panel*.
2. Loosen the screw cap by turning it counterclockwise.  
See fig. 35.
3. Lift the pressure tube carefully out of the collecting tank.  
Do not lift it by means of the hose.
4. Check for possible deposits on or in the pressure tube. See section 5.1.6 *Level sensor*.
5. Scrape off any deposits. If necessary, remove the hose from the controller, and rinse the tube and hose with clean water at low pressure. Make sure no water remains in the hose.
6. Refit the pressure tube by screwing the screw cap on to the tank. Reconnect the hose to the controller.
7. Check the sensor by test running Multilift MD, MLD.



TM05 0545 1011

Fig. 35 Removing the level sensor

## 10.5 Contaminated lifting station or components



### Warning

If a Multilift lifting station has been used for a liquid which is injurious to health or toxic, it will be classified as contaminated.

If Grundfos is requested to service the lifting station, Grundfos must be contacted with details about the pumped liquid, etc. before the lifting station is returned for service. Otherwise Grundfos can refuse to accept the lifting station for service.

Lifting stations which have been in contact with the pumped liquid must be thoroughly cleaned before they are returned to Grundfos.

Any costs of returning the lifting station are to be paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the lifting station has been used for liquids which are injurious to health or toxic.

## 11. 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., it must be ensured 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. <b>With battery back-up:</b> See section <a href="#">5.2 LC 221 controller</a> .	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 (○), see section <a href="#">6. Operating LC 221 controller</a> .	Push the ON-OFF-AUTO selector switch into position ON (I) 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 <a href="#">10.4 Cleaning the level sensor</a> ), 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 module power circuit board or the LCD board is defective.	Replace the PCB or LCD board.
2. The sensor signal is out of range. All pumps are started and high level alarm is on.	a) Discharge valves are not all opened.	Open all discharge isolating valves.
	b) There is a blockage in the tank or pump.	Remove blockage.
	c) The pump venting is not working, which means that the pump cannot built pressure.	Remove blockage from the pump venting hole, located above the impeller.
	d) The lifting station is undersized.	Recalculate the inflow parameters and compare with the size and pumping volume of the lifting station. Contact the nearest Grundfos sales company for ordering a new product if needed.
3. The pump(s) is/are starting/stopping too frequently and even if there is no inflow.	a) The level sensor fails. The sensor gives wrong signal.	Clean the level sensor (see section <a href="#">10.4 Cleaning the level sensor</a> ).
	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. <b>Note:</b> 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. If blocked clean the vent hole. See fig. <a href="#">33</a> .
	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. After cooling, the pump will restart automatically unless the LC 221 has been set to manual restarting. See section <a href="#">8.4 Setting of LC 221</a> . 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 <a href="#">12. Technical data</a> . See also section <a href="#">10.4 Cleaning the level sensor</a> .
4. 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.

## 12. Technical data

### 12.1 Lifting station

Weight:	Depending on variant. See nameplates
Temperature range:	0-40 °C For short periods up to 60 °C (max. 5 minutes per hour)
Flood conditions:	Max. 2 m for 7 days
Sound pressure level:	< 70 dB(A) according to EN 12050-1 and the Machinery Directive

### 12.2 Collecting tank

Material:	PE (polyethylene)
-----------	-------------------

### 12.3 Pump

<b>Motor</b>	
Mains frequency:	50 Hz
Isolation class:	F (155 °C)
Impeller type:	Vortex
Enclosure class:	IP68
pH-range:	4-10
Starts per hour:	Max. 60
Max density of liquid:	1100 kg/m <sup>3</sup>

Component	Material
Pump housing	Cast iron
Impeller	PPE+PS
Pump shaft	Stainless steel, DIN W.-Nr. 1.4301
Motor cable	Polychloroprene
O-rings	NBR rubber

### 12.4 LC 221 controller

<b>Controller</b>	
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:	50/60 Hz
Supply system earthing:	For TN systems
Controller power consumption:	6 W
Control circuit fuse:	Fine-wire fuse: 100 mA T / 250 V / 20 mm x Ø5
Ambient temperature:	
During operation:	0 to +40 °C (must not be exposed to direct sunlight)
In stock:	-30 to +60 °C
Enclosure class:	IP55
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

Multilift MD Multilift MLD	Duty	Voltage [V]	Power P1 / P2 [kW]	I <sub>1/1</sub> / I <sub>start</sub> [A]	RPM [min <sup>-1</sup> ]	Number of poles	Plug type
MD/MLD.12.1.4	S3 -50 %, 1 min.	1 x 230 V	1.9 / 1.4	9 / 39	1430	4	E/F, I -
MD/MLD.12.3.4		3 x 400 V	1.8 / 1.5	3.7 / 19			CEE 3P+N+E, 16 A
MD/MLD.15.1.4		1 x 230 V	2.3 / 1.7	10.1 / 39	1410	4	E/F, I -
MD/MLD.15.3.4		3 x 400 V	2.3 / 1.8	4 / 19			CEE 3P+N+E, 16 A
MD/MLD.22.3.4	S3 -50 %, 1 min.	3 x 230 V	2.8 / 2.3	10.2 / 51.5	1430	4	CEE 3P+E 16 A
MD/MLD.22.3.4		3 x 400 V		5.5 / 29.7			CEE 3P+N+E, 16 A
MD/MLD.24.3.2		3 x 230 V	3.1 / 2.6	9.7 / 88.7	2920	2	CEE 3P+E 16 A
MD/MLD.24.3.2		3 x 400 V		5.5 / 39			CEE 3P+N+E, 16 A
MD/MLD.32.3.2		3 x 230 V	4.0 / 3.4	88.7	2920	2	CEE 3P+E 16 A
MD/MLD.32.3.2		3 x 400 V		6.7 / 39			CEE 3P+N+E, 16 A
MD/MLD.38.3.2		3 x 230 V	4.6 / 3.9	13 / 88.7	2880	2	CEE 3P+E 16 A
MD/MLD.38.3.2		3 x 400 V		7.5 / 39			CEE 3P+N+E, 16 A

## 13. Disposal

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

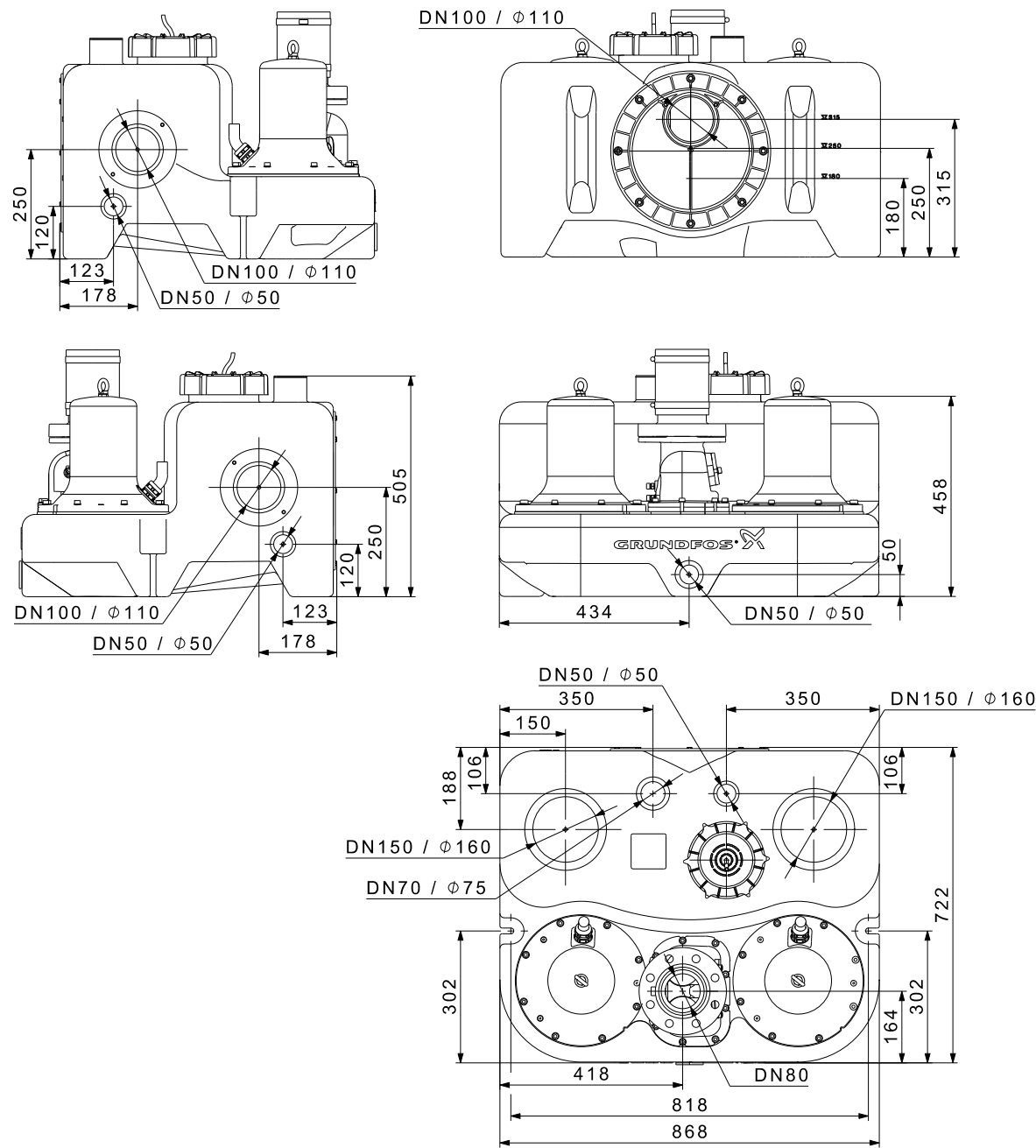
1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



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

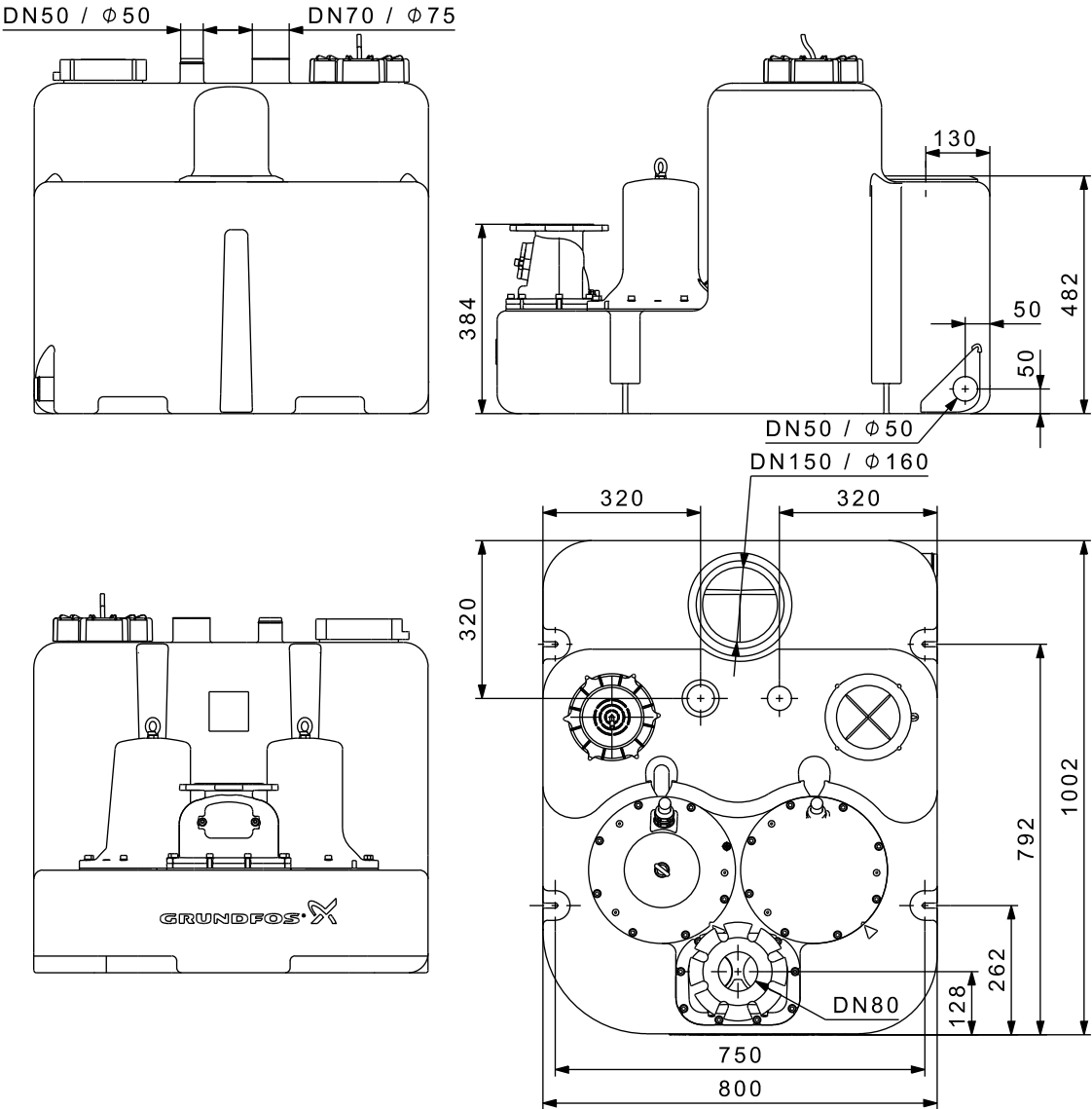


Fig. A - Dimensional sketches - MD



TM05 0441 1011

Fig. B - Dimensional sketches - MLD



TM05 0442 1011

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