

Multilift MSS

Installation and operating instructions



Other languages

<http://net.grundfos.com/qr/i/98042530>

be
think
innovate

GRUNDFOS 

Original installation and operating instructions

CONTENTS

	Page
1. Symbols used in this document	2
2. Scope of delivery	2
3. General description	3
3.1 Applications	3
4. Transportation and storage	3
5. Product description	3
5.1 Lifting station	4
5.2 LC 220 controller	6
6. Installation of lifting station	9
6.1 General description	9
6.2 Guidelines for installation of lifting station	10
6.3 Recommended steps for mechanical installation of lifting station	10
7. Installation of LC 220 controller	11
7.1 Location	11
7.2 Mechanical installation	11
7.3 Electrical connection	12
7.4 Setting of LC 220	12
7.5 Wiring diagrams	13
8. Startup	13
9. Maintenance and service	14
9.1 Electrical maintenance	14
9.2 Cleaning the level sensor	14
9.3 Contaminated lifting station or components	14
10. Fault finding	15
11. Technical data	16
11.1 Lifting station	16
11.2 LC 220 controller	16
12. Disposal	16

**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**

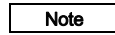
If these safety instructions are not observed, it may result in personal injury.

**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

Grundfos Multilift MSS lifting stations are supplied complete with collecting tank, pump, level sensor, non-return valve (depending on type) and LC 220 controller. Both sensor and pump are connected to the controller with 4 or 10 m hose and cable.

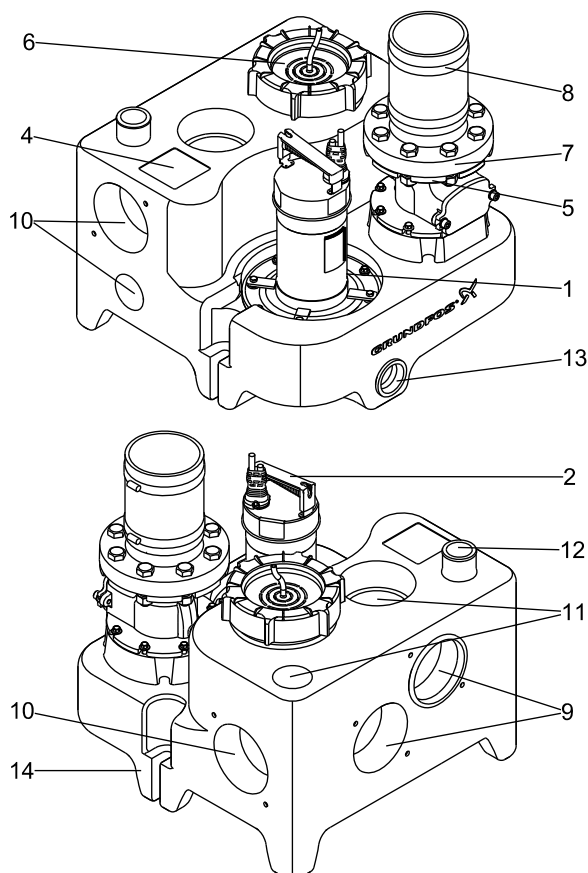
An accessories bag containing the following items is also included:

- 1 x installation and operating instructions
- 1 x outlet 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 outlet pipe
- 1 x flexible hose, DN 50, and two clamps to connect the venting pipe
- 2 x screw and expansion anchor for tank fixation
- 1 x socket seal, DN 100
- 1 x socket seal, DN 50, for diaphragm pump, 1 1/2" connection or inlet, DN 50
- 1 x gasket kit, DN 80, 4 bolts M16, nuts and washers (galvanised).

3. General description

Grundfos Multilift MSS lifting stations are supplied complete with collecting tank, pump, level sensor, LC 220 controller and connection accessories. Depending on the variant, a non-return valve is included.

The following gives a description of the components.



TMD05 1331 2611

Fig. 1 Multilift MSS, front and rear view

Pos.	Description
1	Pump with vortex impeller
2	Carrying handle for the pump
3	Collecting tank (44 litres)
4	Nameplate
5	Non-return valve with inspection cover and drain screw to lift up the valve flap. See fig. 4. NOTE: MSS is also available with adapter flange only for connection to an external standard non-return valve.
6	Screw cap for pressure tube and tank inspection opening
7	Outlet adapter flange, DN 80, with connection piece, DN 100 (outer diameter, 110 mm)
8	Flexible connection hose, DN 100 (internal diameter, 110 mm) with two clamps
9	Horizontal inlets in the back, DN 100, 180 or 250 mm above the floor
10	Horizontal inlets from the side, DN 50/DN 100
11	Vertical inlets, DN 50/DN 100
12	Vent port, DN 50 (outer diameter, 52 mm), open
13	Port for manually operated diaphragm pump, DN 50 (internal diameter, 50 mm)
14	Fixing point

3.1 Applications

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

- domestic wastewater
- grey wastewater without faeces
- black water with faeces and discharge from water closets
- sludge-containing water.

The lifting stations are capable of pumping liquids containing fibres, textiles, faeces, etc., below sewer level from minor buildings such as private dwellings, flats, holiday homes etc.

Do not pump rainwater with the Multilift MSS 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 substances such as large amounts of greasy wastewater from deep fryers or similar appliances.

4. Transportation and storage



Warning

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

Note

Lift the lifting station by the collecting tank.

For long periods of storage, the LC 220 controller must be protected against moisture and heat.

After a long period of storage, the pump must be inspected before it is started up again. Make sure that the impeller can rotate freely.

5. Product description

The MSS Multilift lifting stations are described in the following sections:

- section [5.1 Lifting station](#) describing lifting station, collecting tank, pump, non-return valve and level sensor
- section [5.2 LC 220 controller](#) describing the controller as well as the functions of the controller.

In section [6. Installation of lifting station](#) and the following sections, the above components are described as one unit.

5.1 Lifting station

The Grundfos Multilift MSS lifting stations are supplied complete with single- or three-phase submersible pumps connected to the LC 220 controller incorporating a level sensor.

Type key, lifting station

Example	M	SS	.11	.3	.2
Multilift lifting station					
SS = one pump					
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

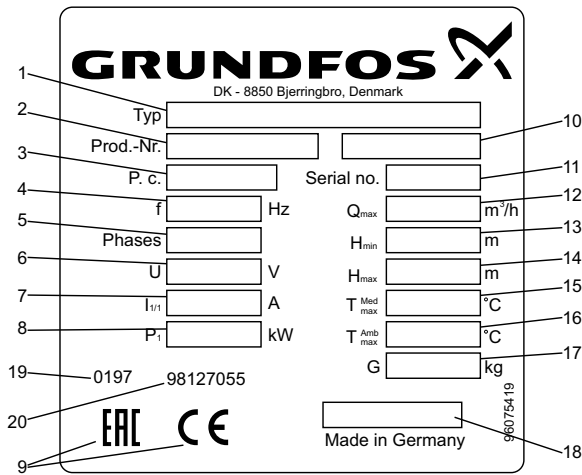


Fig. 2 Nameplate, lifting station

Pos.	Description
1	Type designation
2	Product number
3	Production code, year and week
4	Frequency [Hz]
5	Number of phases + voltage [V]
6	Voltage [V]
7	Full-load current [A]
8	Motor input power P1 [kW]
9	EAC and CE marks
10	Duty type
11	Serial number
12	Maximum flow rate [m ³ /h]
13	Minimum head [m]
14	Maximum head [m]
15	Maximum liquid temperature [°C]
16	Maximum ambient temperature [°C]
17	Weight [kg]
18	Identification code of the European standard
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, outlet pipe, venting pipe and a manually operated diaphragm pump, which is available as an accessory.

Thus the collecting tank offers five horizontal inlets from the back and the sides of the tank (4 x DN 100, 1 x DN 50) and two vertical inlet connections at the top of the tank (1 x DN 100, 1 x DN 50). The side and back inlets are 180 and 250 mm above the floor for connection to direct wall-hung or floor-standing toilet according to EN 33 and EN 37. Further sanitary appliances can be connected to the other ports.

The tank volume and effective volume (volume between start and stop) of the collecting tank appear from the following table:

Inlet level [mm]	180	250
Total tank volume [l]	44	44
Effective tank volume [l]	20	28

Setting to the relevant inlet level can be made via a DIP switch on the control panel of the controller. See section 7.4 *Setting of LC 220*.

The factory-set inlet level is 250 mm above the floor.

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

5.1.2 Pump

The pump impeller is designed as a free-flow vortex impeller, ensuring almost unchanged performance throughout the entire life of the pump. All parts in contact with the pumped liquid are made of stainless steel. The pump has a mechanical shaft seal.

See more technical data in section 11. *Technical data*.

Single-phase motors have run capacitors.

Single- and three-phase motors are protected by a thermal switch in the windings and an additional thermal circuit breaker to cut out the motor in case of overload.

Three-phase motors:

If the phase sequence is wrong, the controller indicates fault and prevents the pump from starting. For correction of phase sequence, see section 5.2.2 *Control elements and indicator lights* and fig. 8.

If the motor is overloaded, it will stop automatically.

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

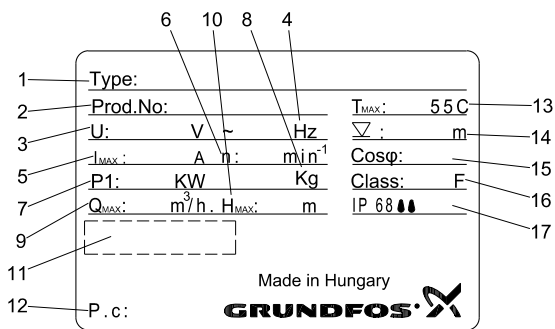
Performance curves are available in the databooklet, which you can download via the QR code or link below:



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

Nameplate, pump

The nameplate is printed on the pump.



TM05 1194 2411

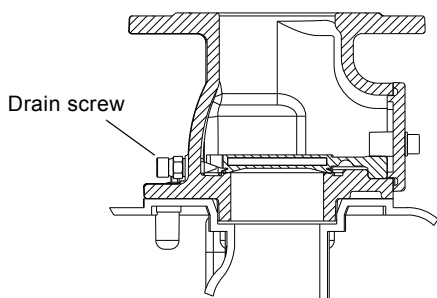
Fig. 3 Nameplate, pump

Pos.	Description
1	Type designation
2	Product number
3	Rated voltage
4	Frequency
5	Rated current
6	Rated speed
7	Rated power input
8	Weight
9	Maximum flow rate
10	Maximum head
11	Approvals
12	Production week, year and day
13	Maximum liquid temperature
14	Maximum installation depth
15	Power factor
16	Insulation class
17	Enclosure class

5.1.3 Non-return valve

The DN 80 non-return valve includes a drain screw to lift up the internal flap in order to drain the outlet pipe in case of maintenance or service. The valve is designed and tested according to EN 12050-4. See fig. 4.

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



TM05 0340 1011

Fig. 4 Non-return valve

5.1.4 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.

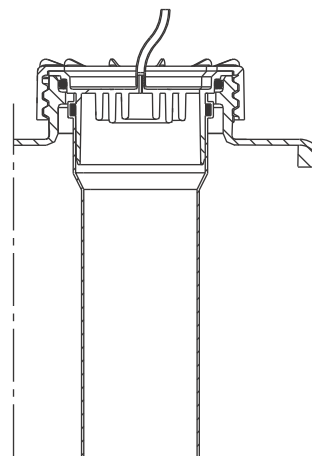


Fig. 5 Screw cap with hose, DN 100 tube

TM05 0332 1011

5.2 LC 220 controller

The level controller switches the MSS Multilift pump on and off according to the liquid level measured by the piezoresistive, analogue level sensor. When the start level is reached, the pump will start, and when the liquid level has been lowered to the stop level, the pump will be stopped by the controller. An alarm will be indicated in case of high water level in the tank, sensor failure etc.



Fig. 6 LC 220 level controller for Multilift MSS

The LC 220 controller has the following functions:

- on/off control of one wastewater pump based on a continuous signal from a piezoresistive, analogue level sensor
- automatic test runs during long periods of inactivity (24 hours after last operation)
- battery backup in case of mains supply failure (accessory)
- selection of automatic alarm resetting (via DIP switch)
- selection between two inlet levels (via DIP switch)
- operating indication of:
 - power on
 - pump running
 - time for service/maintenance (selectable via DIP switch).
- alarm indication of:
 - too high liquid level, which triggers a high-level alarm
 - wrong phase or phase sequence detection for three-phase pumps
 - sensor failure
 - external level alarm
 - runtime monitoring.

As standard, the LC 220 controller has one alarm signal output for common alarm and three signal inputs for connecting the piezoresistive sensor, an additional float switch functioning as backup for the analogue sensors and an additional level switch for flood detection outside the Multilift MSS. 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. If the liquid level in the sump rises above the high-level alarm level, the corresponding alarm LED will be on and the built-in buzzer will be activated.

A battery (accessory) can be installed to activate an acoustic alarm (buzzer). The buzzer will be activated as long as the fault exists as it cannot be reset.

In case of power failure, the common alarm output, which is a potential-free changeover contact, can forward the alarm signal to a control room by means of an external power source.

A PC Tool can be connected in order to implement updates and further adjustments.

Furthermore, a log of the last 20 faults can be read out, as well as the number of starts and operating hours (accessory).

Type key, LC 220 controller

Example	LC 220	.1	.230	.1	.8
LC 220 = controller type					
1 = one-pump controller					
2 = two-pump controller					
Voltage [V]					
1 = single-phase					
3 = three-phase					
Maximum operating current per pump [A]					

Nameplate, LC 220 controller

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

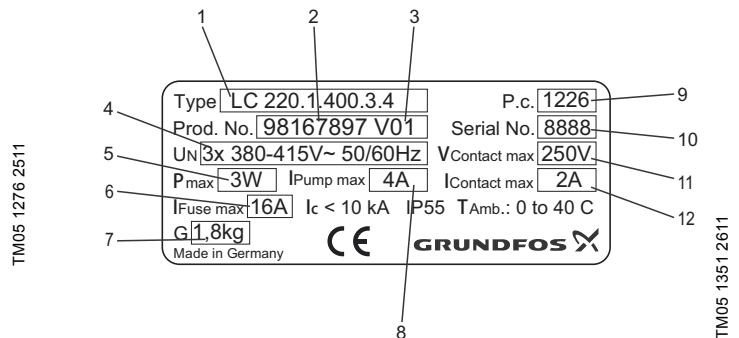


Fig. 7 Example of an LC 220 nameplate

Pos.	Description
1	Type designation
2	Product number
3	Version number
4	Rated voltage
5	Power consumption
6	Maximum backup fuse
7	Weight
8	Maximum pump input current
9	Production year and week
10	Serial number
11	Maximum voltage at contactor
12	Maximum current at contactor









5.2.1 Design

The LC 220 level controller incorporates the necessary components such as relays and a control panel with indicator lights for indication of operating conditions and fault indications. Furthermore, it has a level input which is activated directly via the pressure tube inside the collecting tank. Finally, it has terminals for power supply, connection to the pump and an alarm signal output for common alarm.

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.

5.2.2 Control elements and indicator lights

The table below gives a description of the function of the various control elements and indicator lights:

Element	Function	Description
	Selection of operating mode	The operating mode is selected by the ON-OFF-AUTO selector switch which has three different positions: POS I: Starts the pump manually. POS O: <ul style="list-style-type: none"> Stops the pump manually Resets alarm indications. POS AUTO: Automatic operation. The pump will start and stop according to the signal from the level sensor.
	Indication of power supply status	Green indicator light, indicating that the power supply is on.
	Indication of pump status	Red and green indicator lights, indicating pump status: Green: Pump is running. Red: Pump fault.
	High-level alarm	Red indicator light, indicating high water level. The LED lights up if the level sensor measures a certain level in the collecting tank during automatic mode.
	Phase-sequence fault	Red indicator light, indicating wrong phase sequence (three-phase pumps). Change phase sequence by following the instruction in fig. 8.
	Sensor failure alarm	Red indicator light, indicating that the signal is the out of the measuring range of around 1000 mm. The pump has been started and a high-level alarm is activated.
	External level alarm	Red indicator light, indicating an alarm from an external level switch.
	Indication of time for service	Yellow indicator light, indicating that it is time for service. This function can be switched on and off by the DIP switch. The factory setting is one year according to EN 12056-4.

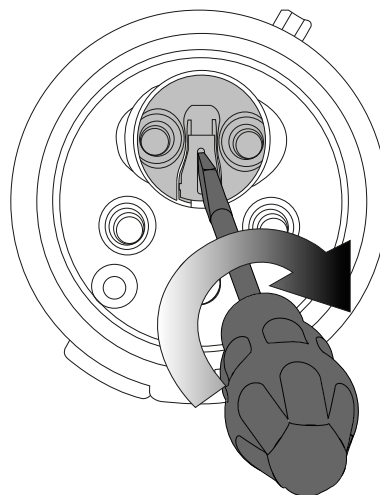


Fig. 8 Changing phases of a three-phase controller with phase inverter

TM05 3455 0616

5.2.3 Internal layout of LC 220

Figure 9 shows the internal layout of LC 220.

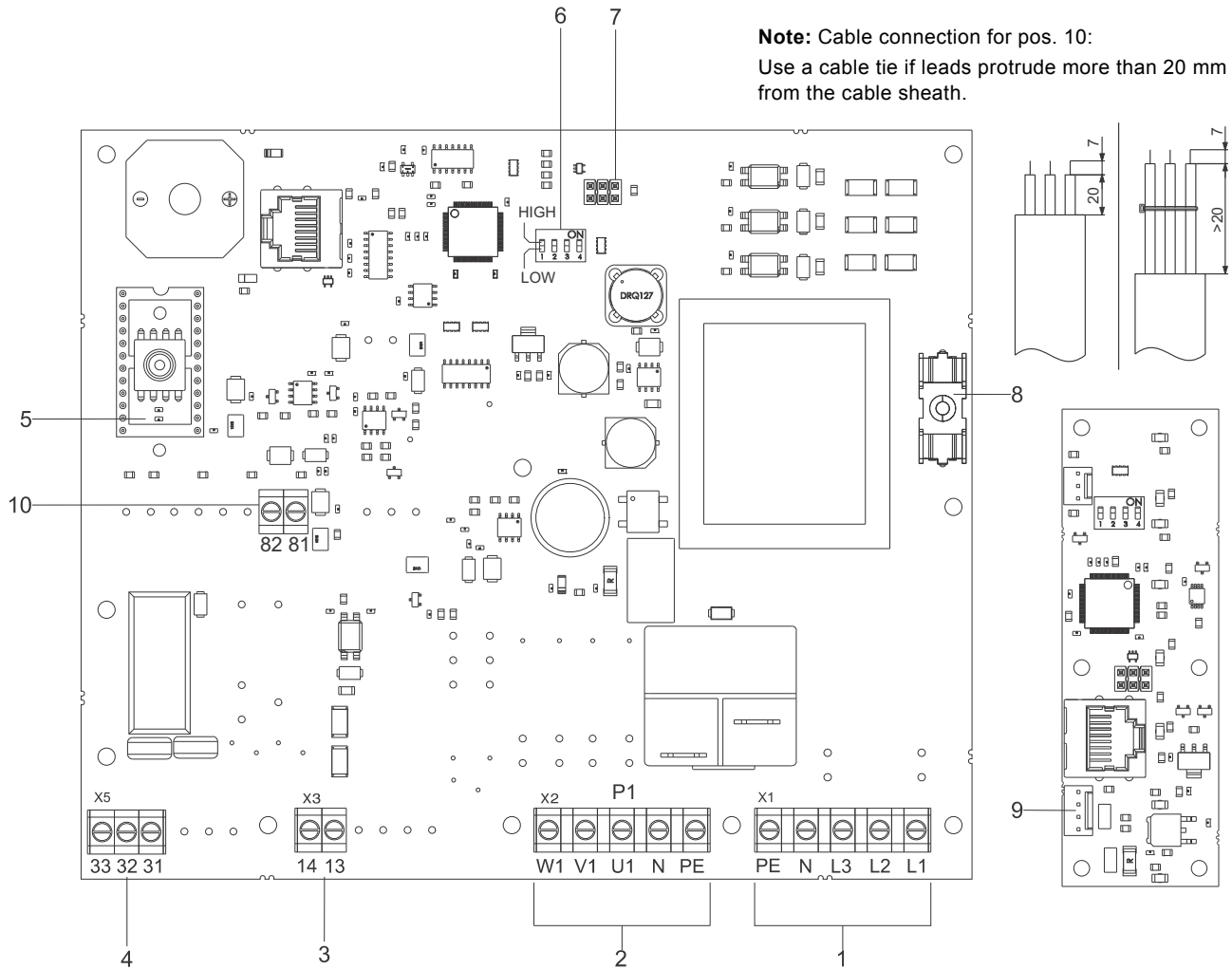


Fig. 9 Internal layout of LC 220

Pos.	Description	Terminal numbers
1	Terminals for power supply	PE, N, L3, L2, L1
2	Terminals for connecting the pump	W1, V1, U1, N, PE
3	Terminals for connecting an external level switch	230 V, NO 13, 14
4	Terminals for "common alarm" output signal	Potential-free changeover contacts NO/NC with max. 250 V / 2 A 31, 32, 33
5	PCB with piezoresistive analogue pressure sensor	0-5 V
6	DIP switch	<ol style="list-style-type: none"> Inlet height: ON = HIGH = 250 mm (factory setting) OFF = LOW = 180 mm Reset setting: ON = Automatic (factory setting) OFF = Manual Service interval: ON = 1 year OFF = None (factory setting) Reset setting (only in case of sensor replacement) ON = Safe (normal position, factory setting) OFF = Switch briefly to OFF for the sensor to adjust to the ambient pressure. See service instructions.
7	Software service connector (PC Tool)	6-pole connector
8	Control circuit fuse, fine-wire fuse	100 mA/20 mm x Ø5
9	Battery (non-rechargeable)	9 V
10	Terminals for additional high water-level alarm (inside the tank), digital	81, 82

6. Installation of lifting station

6.1 General description

Before installing the Multilift MSS lifting station, make sure that all local regulations covering venting, access to the stations, etc. are observed.

6.1.1 Installation sketch

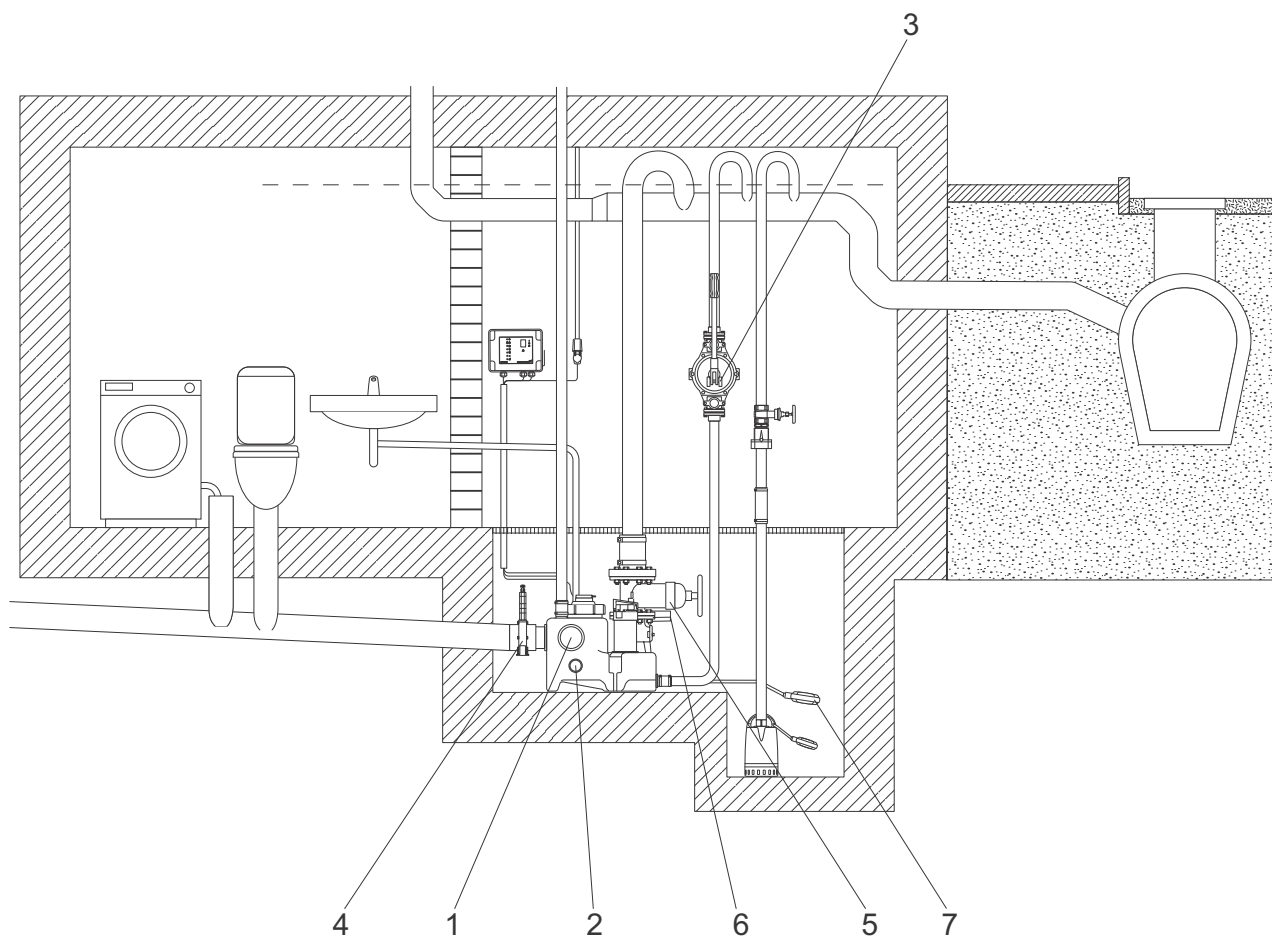


Fig. 10 Installation sketch

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	External float switch	00ID7805

TM05 1346 2611

6.2 Guidelines for installation of lifting station

Guidelines for correct mechanical installation of lifting station according to EN 12056-4

See section 6.1.1 *Installation sketch*.

- 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 fig. 10.

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 outlet pipes (lifting station, diaphragm pump and drainage pump) must have a loop above the local backwater level. The highest point of the goose neck/reversed water seal must be above street level.
- For outlet pipes, DN 80 and upwards, install an isolating valve in the outlet 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 outlet 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.
- 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 outlet pipe connection.
- Use a diaphragm pump for simple, manual draining of the collecting tank in case of pump failure (not obligatory).

6.3 Recommended steps for mechanical installation of lifting station

1. Checking the scope of delivery. For scope of delivery, see section 2. *Scope of delivery*.
2. Preparing the inlets by cutting out the required holes. Use cup drills $\varnothing 100$ 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.
3. Preparing 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.

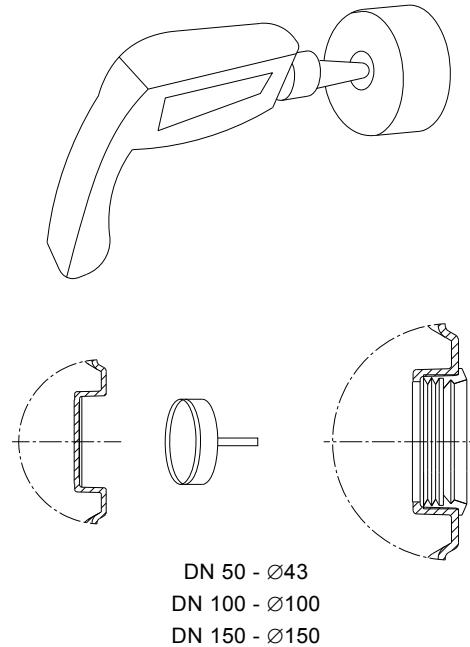


Fig. 11 Cutting or drilling of connection holes

4. Connecting 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.

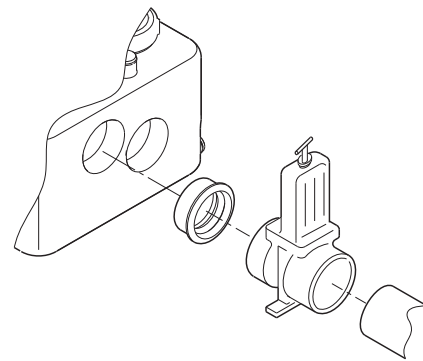


Fig. 12 Installation of isolating valve

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



Warning
 Never step on the lifting station.

TM05 1242 2511

TM03 3614 0406

5. Connecting the outlet 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. 5 cm is left between the pipe ends of the inlet, outlet and vent pipes and the ports of the lifting station.

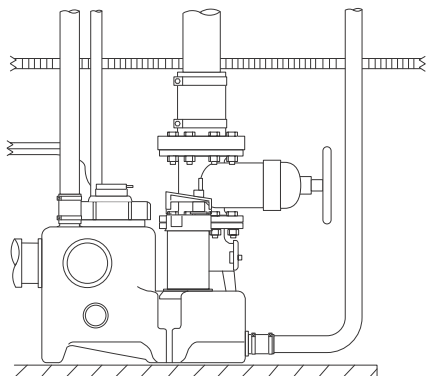


Fig. 13 Isolating valve on top of non-return valve

TM05 1347 2611

6. Connecting the venting pipe.
The DN 50 vent port on top of the tank is open. Connect the venting pipe to the vent 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. A flexible connection can be ensured if a distance of approx. 3 cm is left between the venting pipe end and the vent port.
7. Connecting the diaphragm pump (optional).
Fit the diaphragm pump on the outlet side. To facilitate servicing of the diaphragm pump, we recommend fitting a 1 1/2" isolating port.
8. Fixing the tank to the floor.

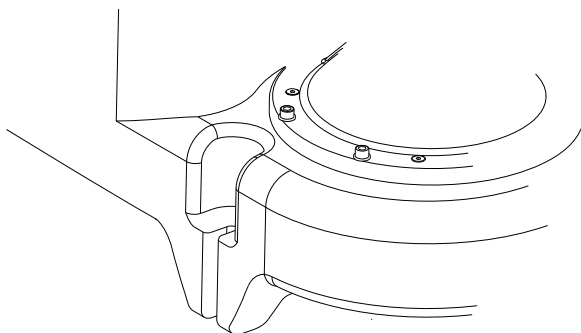


Fig. 14 Fixing point for fixation of tank to the floor

TM05 0334 1011

7. Installation of LC 220 controller



Warning

Before making any connections in LC 220 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.

7.1 Location



Warning

Do not install the LC 220 controller in explosion hazard areas.

LC 220 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 220 must be placed in a protective shed or enclosure. LC 220 must not be exposed to direct sunlight.

7.2 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 220 can be mounted without removing the front cover.

Proceed as follows:

- Mount LC 220 on a plane wall surface.
- Mount LC 220 with the cable entries pointing downwards (additional cable entries, if required, must be fitted in the bottom plate of the cabinet).
- Mount LC 220 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.

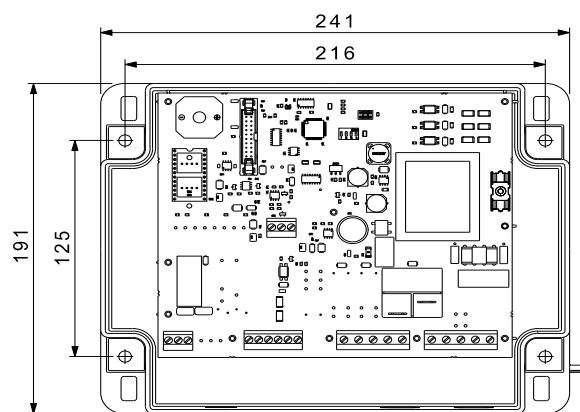


Fig. 15 Mounting of controller on the wall

TM05 1405 2711

7.3 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 220 must be connected in accordance with the rules and standards in force for the application in question.



Warning

Before opening the cover, 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 backup fuse is stated on the controller nameplate.

7.4 Setting of LC 220

LC 220 has a 4-contact DIP switch. See fig. 16.

To make the settings, open the cabinet cover by means of the bayonet fastener locks. The locks on the left side have hinge strings.

Note

During setting, the controller must be off circuit for at least 10 seconds to ensure the correct configuration during startup after change of the DIP-switch setting.

The DIP switch has the following functions:

- setting of start level (switch 1). The factory setting is set to inlet 250 mm above the floor to get the highest effective tank volume. For floor standing toilets, the setting must be changed to 180 mm. Starts and stops will be adjusted automatically.
- selection of automatic alarm resetting (switch 2)
- selection of service interval (switch 3)
- selection of sensor (switch 4).

The DIP-switch factory setting is shown in fig. 16.

Each individual switch (1 to 4) of the DIP switch can be set to position OFF or ON.

When the DIP-switch setting is changed, the controller must be switched off for at least 10 seconds!

Set the switches 1 to 4 as follows:

- **Switch 1** (start level):

Pos.	Description
ON	The pump starts when the level in the collecting tank reaches 250 mm.
OFF	The pump starts when the level in the collecting tank reaches 180 mm.

- **Switch 2** (automatic alarm reset):

Pos.	Description
ON	The fault indication will be reset after the fault has disappeared, meaning the indicator lights will be turned to off and the alarm signals to external alarm devices and the built-in buzzer will be deactivated.
OFF	The alarm signal must be reset manually by switching the selector switch to position "0".

- **Switch 3** (service interval):

Pos.	Description
ON	The function for reminding that it is time for maintenance is activated. The yellow indication light will be on when it is time for maintenance work. The maintenance interval is 1 year (fixed value).
OFF	The function for reminding that it is time for maintenance is deactivated.

- **Switch 4** (sensor resetting):

Pos.	Description
ON	Safe (normal position, factory default)
OFF	Switch briefly to OFF for the sensor to adjust to the ambient pressure. See service instructions.

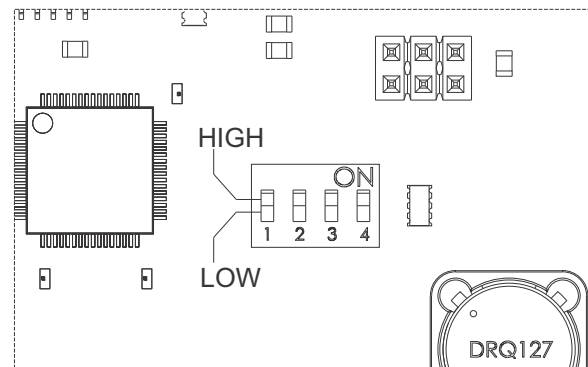


Fig. 16 DIP switch

TM05 1404 2711

7.5 Wiring diagrams

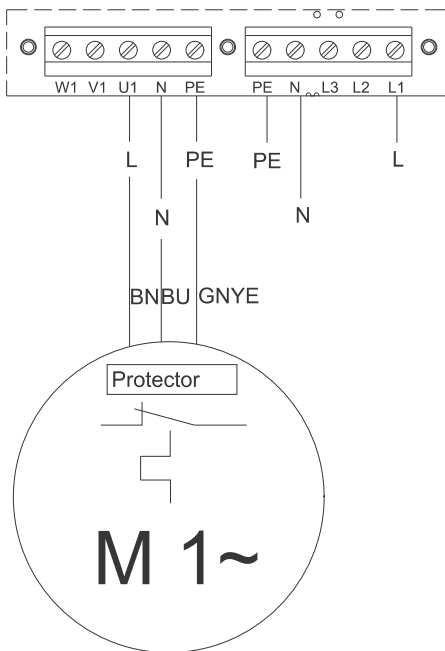


Fig. 17 Wiring diagram for Multilift MSS, single-phase

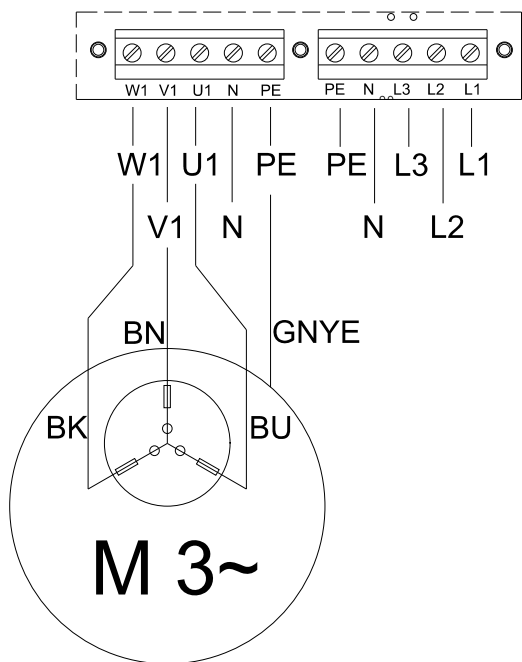


Fig. 18 Wiring diagram for Multilift MSS, three-phase

8. 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 220 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 startup, the connection and DIP-switch setting must have been carried out according to sections 7.3 *Electrical connection* and 7.4 *Setting of LC 220*.

Startup must be carried out by authorised personnel.

Proceed as follows:

1. Check all connections.
2. Open the isolating valves in outlet and inlet lines.
3. Switch on the power supply.
4. Activate a sanitary appliance connected to the inflow of the Multilift MSS and monitor the increasing water level in the tank up to the start level. Check the starts and stops at least twice, and then change the ON-OFF-AUTO selector switch to automatic mode.

TM05 1402 2711

TM05 1403 2711

9. Maintenance and service

The Multilift MSS requires 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 outlet 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 220 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 in single-family houses must be checked once a year. 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:

- **Outlet and inlet connections**

Check all connections to the lifting station for tightness and leakages. Make sure that weight from the inlet, outlet 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**

Check that the vent hole of the pump housing is clear by dismantling the pump from the support flange.

Do not loosen the support flange. It is screwed and sealed to the collecting tank. Loosen the four stainless steel clamps instead.

We recommend replacing the O-ring sealing between pump and support flange.

Make a test run with clean water. In case of noise, vibration or abnormal running, contact Grundfos.

- **Shaft seal**

Check the shaft seal, O-ring and oil. The oil chamber contains 60 ml non-poisonous oil. Used oil must be disposed of in accordance with local regulations. This work must be carried out by the manufacturer or an authorised service workshop. See service instructions.

Cleaning the non-return valve (if required)

Proceed as follows:

1. Close the isolating valves in the outlet pipe and in the inlet pipe (if fitted) or drain the outlet pipe by tightening the drain screw on the side of the non-return valve.
See section [5.1.3 Non-return valve](#).
2. Clean the non-return valve via its inspection cover.
Replace the gasket of the inspection cover when reassembling the non-return valve.

9.1 Electrical maintenance

- Check the gaskets of the LC 220 cabinet front cover and of the cable entries.
- Check the cable connections.
- Check the controller functions.
- Check and clean the pressure tube. See section [9.2 Cleaning the level sensor](#).
- If LC 220 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 many 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 220 may be installed in environments which require thorough and frequent maintenance.

9.2 Cleaning the level sensor

1. Push the ON-OFF-AUTO selector switch to position OFF (○).
See section [5.2.2 Control elements and indicator lights](#).
2. Loosen the screw cap by turning it counterclockwise.
See fig. [19](#).
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 [5.1.4 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 MSS.

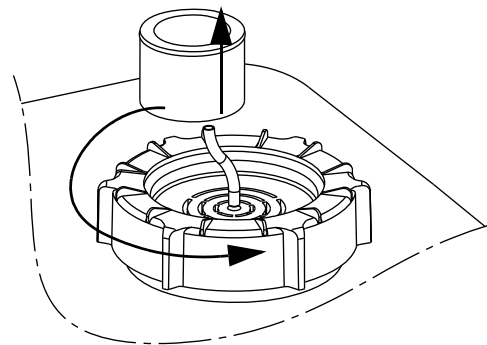


Fig. 19 Removing the pressure tube

9.3 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.

10. 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 outlet 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 LC 220 or working 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 does not run.	a) No power supply. Without battery backup: None of the indicator lights are on. With battery backup: See section 5.2 LC 220 controller .	Switch on the power supply.
	b) The ON-OFF-AUTO selector switch is in position OFF (○). See section 5.2.2 Control elements and indicator lights .	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 thermal switch has cut out the pump.	Allow the pump to cool. After cooling, the pump will restart automatically unless LC 220 has been set to manual restarting (see section 7.4 Setting of LC 220). If so, push the ON-OFF-AUTO selector switch into position OFF (○) for a short period.
	e) Motor/supply cable is defective.	Check and replace motor and cable, if necessary.
	f) The power circuit board or the LED board is defective.	Replace the power circuit board or LED board.
	g) The new DIP-switch setting does not work correctly.	Switch off the power supply to the controller for 1 minute and switch it on again (normal procedure). See section 7.4 Setting of LC 220 .
2. The sensor signal is out of range. All pumps are started and high-level alarm is on.	a) Not all outlet valves are open.	Open all outlet valves.
	b) There is a blockage in the tank or pump.	Remove the blockage.
	c) The pump is not vented correctly. The pump cannot build up pressure.	Remove any blockage from the vent hole underneath the pump.
	d) The lifting station is undersized.	Recalculate the inflow parameters and compare the result with the tank volume and pump performance. If you need a new product, contact the nearest Grundfos sales company.
3. The pump starts and stops too frequently even if there is no inflow.	a) The level sensor is blocked.	Clean the level sensor (see section 9.2 Cleaning the level sensor).
	b) The ventilation of the inner pump housing is blocked and the pump cannot build up pressure.	Check the pump housing and remove any impurities.
4. The 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 seal from seizing up.

11. Technical data

11.1 Lifting station

Weight:	Depending on variant. See nameplate
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

11.1.1 Collecting tank

Material:	Polyethylene (PE)
-----------	-------------------

11.1.2 Pump

Motor:	
Mains supply:	1 x 230 V, 50 Hz
Insulation 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 ³

Component	Material	DIN W.-Nr.	AISI
Pump housing	Stainless steel	1.4301	304
Impeller	Stainless steel	1.4301	304
Motor unit complete	Parts in contact with liquid: Stainless steel	1.4401	316
Pump shaft - wet end	Stainless steel	1.4301	304
Motor cable	Polychloroprene		
O-rings	NBR rubber		
Oil	Shell Ondina 15, non-toxic		

11.2 LC 220 controller

Controller	
Voltage variants, rated voltages:	1 x 230 V, 3 x 400 V
Voltage tolerances for LC 220:	- 15 %/+ 10 % of rated voltage
Mains frequency for LC 220:	50/60 Hz
Supply system earthing:	For TN systems
Controller power consumption:	7 W

Backup fuse:	Depending on variant. See nameplate
Control circuit fuse:	Fine-wire fuse: 100 mA / 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

Cabinet of LC 220

External dimensions:	Height = 195 mm Width = 250 mm Depth = 110 mm
Material:	ABS (acrylonitrile butadiene styrene)
Weight:	Depending on variant. See nameplate
Outputs for alarm devices:	Max. 250 VAC / max. 2 A / min. 10 mA / AC1

Multilift MSS	Duty	Voltage [V]	Power P1 / P2 [kW]	I _{1/1} / I _{start} [A]	RPM [min ⁻¹]	Number of poles	Plug type
MSS.11.1.2	S3 -10 %, 1 min.	1 x 230 V	1.8 / 1.1	8 / 22.5	2760	2	E/F, I
MSS.11.3.2		3 x 400 V		3.2 / 16			CEE 3P+N+E, 16 A

12. 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.

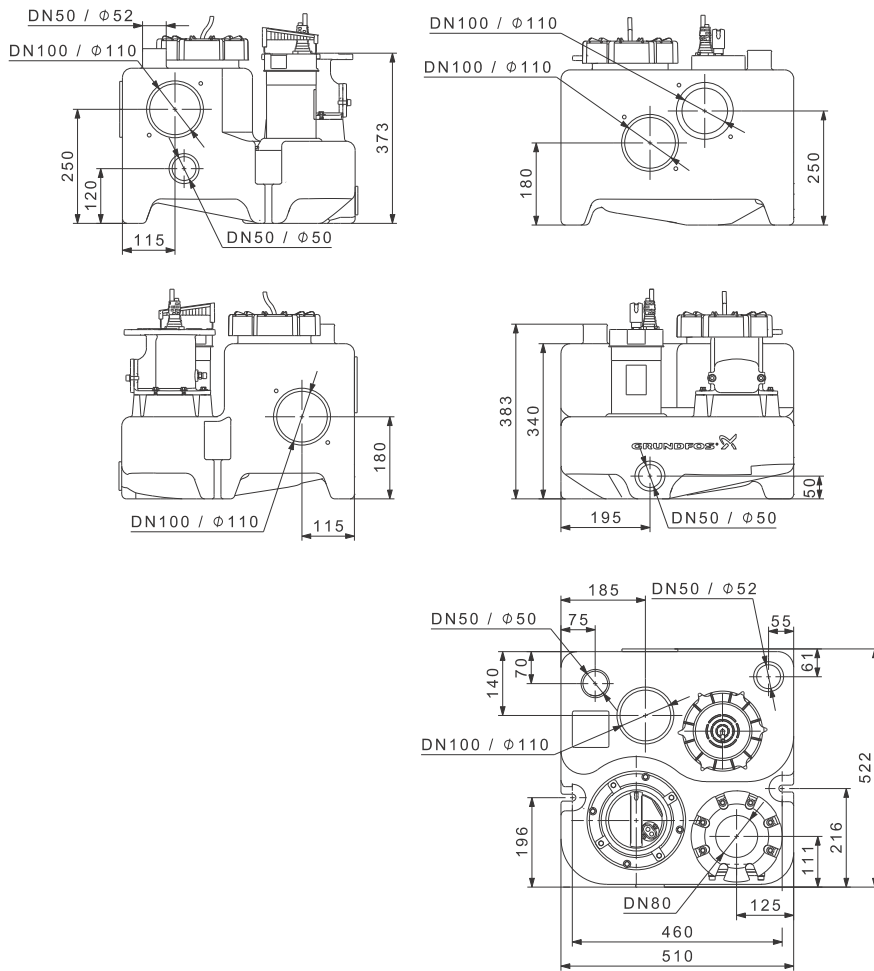


The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal

authorities. The separate collection and recycling of such products will help protect the environment and human health.

1. Dimensional drawings

1.1 Multilift MSS, with non-return valve



TM05 0439 2011

Argentina

Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro Industrial Garin
1619 Garin 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.
Boomssesteenweg 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

Bosnia 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.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

COLOMBIA

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

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

GRUNDFOS Sales Czechia and Slovakia s.r.o.

Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111

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 Pumpat AB
Trukkikuja 1
FI-01360 Vantaa
Phone: +358-(0) 207 889 500

France

Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
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

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.
Tópark 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
Thoraiakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia

PT. GRUNDFOS POMPA
Graha Intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Phone: +62 21-469-51900
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.
1-2-3, Shin-Miyakoda, Kita-ku,
Hamamatsu
431-2103 Japan
Phone: +81 53 428 4760
Telefax: +81 53 428 5005

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
ул. Школьная, 39-41
Москва, RU-109544, Russia
Тел. (+7) 495 564-88-00 (495) 737-30-00
Факс (+7) 495 564 8811
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

Slovakia

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

Slovenia

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

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: Ismart@grundfos.com

Spain

Bombas GRUNDFOS España S.A.
Camino de la Fuentequilla, 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 Chaloen 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
İhsan 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
9300 Loiret Blvd.
Lenexa, Kansas 66219
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 14.03.2018

98042530 1218

ECM: 1217058

Trademarks displayed in this material, including but not limited to Grundfos, the Grundfos logo and "be think innovate" are registered trademarks owned by The Grundfos Group. All rights reserved. © 2018 Grundfos Holding A/S, all rights reserved.