

M, MD Multilift

Installation and operating instructions

GB D F I E P GR NL S
DK PL RU HR RO BG CZ SK



GB Declaration of Conformity

We **Grundfos** declare under our sole responsibility that the products **M** and **MD**, to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EC Member States relating to

- Machinery (98/37/EC).
Standard used: EN ISO 12100.
- Electromagnetic compatibility (89/336/EEC).
Standards used: EN 61000-6-2 and EN 61000-6-3.
- Electrical equipment designed for use within certain voltage limits (73/23/EEC) [95].
Standards used: EN 60335-1: 2002, EN 60335-2-41: 2003 and EN 60439-1.
- Construction products (89/106/EEC).
Standard used: EN 12050-1/-2.

F Déclaration de Conformité

Nous **Grundfos** déclarons sous notre seule responsabilité que les produits **M** et **MD** auxquels se réfère cette déclaration sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives à

- Machines (98/37/CE).
Standard utilisé: EN ISO 12100.
- Compatibilité électromagnétique (89/336/CEE).
Standards utilisés: EN 61000-6-2 et EN 61000-6-3.
- Matériel électrique destiné à employer dans certaines limites de tension (73/23/CEE) [95].
Standards utilisés: EN 60335-1: 2002, EN 60335-2-41: 2003 et EN 60439-1.
- Produits de construction (89/106/CEE).
Standard utilisé: EN 12050-1/-2.

E Declaración de Conformidad

Nosotros **Grundfos** declaramos bajo nuestra única responsabilidad que los productos **M** y **MD** a los cuales se refiere esta declaración son conformes con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CE sobre

- Máquinas (98/37/CE).
Norma aplicada: EN ISO 12100.
- Compatibilidad electromagnética (89/336/CEE).
Normas aplicadas: EN 61000-6-2 y EN 61000-6-3.
- Material eléctrico destinado a utilizarse con determinadas límites de tensión (73/23/CEE) [95].
Normas aplicadas: EN 60335-1: 2002, EN 60335-2-41: 2003 y EN 60439-1.
- Productos de construcción (89/106/CEE).
Norma aplicada: EN 12050-1/-2.

GR Δήλωση Συμμόρφωσης

Εμείς η **Grundfos** δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα **M** και **MD** συμμορφώνονται με την Οδηγία του Συμβουλίου επί της σύγκλισης των νόμων των Κρατών Μελών της Ευρωπαϊκής Ένωσης σε σχέση με τα

- Μηχανήματα (98/37/ΕΚ).
Πρότυπο που χρησιμοποιήθηκε: EN ISO 12100.
- Ηλεκτρομαγνητική συμβατότητα (89/336/ΕΕΚ).
Πρότυπα που χρησιμοποιήθηκαν: EN 61000-6-2 και EN 61000-6-3.
- Ηλεκτρικές συσκευές σχεδιασμένες για χρήση εντός ορισμένων ορίων ηλεκτρικής τάσης (73/23/ΕΕΚ) [95].
Πρότυπα που χρησιμοποιήθηκαν: EN 60335-1: 2002, EN 60335-2-41: 2003 και EN 60439-1.
- Προϊόντα κατασκευών (89/106/ΕΕΚ).
Πρότυπο που χρησιμοποιήθηκε: EN 12050-1/-2.

S Försäkran om överensstämmelse

Vi **Grundfos** försäkrar under ansvar, att produkterna **M** och **MD**, som omfattas av denna försäkran, är i överensstämmelse med Rådets Direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende

- Maskinell utrustning (98/37/EC).
Använd standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EEC).
Använda standarder: EN 61000-6-2 och EN 61000-6-3.
- Elektrisk material avsedd för användning inom vissa spänningsgränser (73/23/EC) [95].
Använda standarder: EN 60335-1: 2002, EN 60335-2-41: 2003 och EN 60439-1.
- Produkter för bygg och anläggning (89/106/EC).
Använd standard: EN 12050-1/-2.

D Konformitätserklärung

Wir **Grundfos** erklären in alleiniger Verantwortung, dass die Produkte **M** und **MD**, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedstaaten übereinstimmen:

- Maschinen (98/37/EG).
Norm, die verwendet wurde: EN ISO 12100.
- Elektromagnetische Verträglichkeit (89/336/EWG).
Normen, die verwendet wurden: EN 61000-6-2 und EN 61000-6-3.
- Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (73/23/EWG) [95].
Normen, die verwendet wurden: EN 60335-1: 2002, EN 60335-2-41: 2003 und EN 60439-1.
- Bauprodukte (89/106/EWG).
Norm, die verwendet wurde: EN 12050-1/-2.

I Dichiarazione di Conformità

Noi **Grundfos** dichiariamo sotto la nostra esclusiva responsabilità che i prodotti **M** e **MD** ai quali questa dichiarazione se riferisce sono conformi alle Direttive del Consiglio concernente il ravvicinamento delle legislazioni degli Stati membri CE relative a

- Macchine (98/37/CE).
Standard usato: EN ISO 12100.
- Compatibilità elettromagnetica (89/336/CEE).
Standard usati: EN 61000-6-2 e EN 61000-6-3.
- Materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione (73/23/CEE) [95].
Standard usati: EN 60335-1: 2002, EN 60335-2-41: 2003 e EN 60439-1.
- Prodotti da costruzione (89/106/CEE).
Standard usato: EN 12050-1/-2.

P Declaração de Conformidade

Nós **Grundfos** declaramos sob nossa única responsabilidade que os produtos **M** e **MD** aos quais se refere esta declaração estão em conformidade com as Directivas do Conselho das Comunidades Europeias relativas à aproximação das legislações dos Estados Membros respeitantes à

- Máquinas (98/37/CE).
Norma utilizada: EN ISO 12100.
- Compatibilidade electromagnética (89/336/CEE).
Normas utilizadas: EN 61000-6-2 e EN 61000-6-3.
- Material eléctrico destinado a ser utilizado dentro de certos limites de tensão (73/23/CEE) [95].
Normas utilizadas: EN 60335-1: 2002, EN 60335-2-41: 2003 e EN 60439-1.
- Produtos de construção (89/106/CEE).
Norma utilizada: EN 12050-1/-2.

NL Overeenkomstigheidsverklaring

Wij **Grundfos** verklaren geheel onder eigen verantwoordelijkheid dat de producten **M** en **MD** waarop deze verklaring betrekking heeft in overeenstemming zijn met de Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgevingen van de Lid-Staten betreffende

- Machines (98/37/EG).
Norm: EN ISO 12100.
- Elektromagnetische compatibiliteit (89/336/EEG).
Normen: EN 61000-6-2 en EN 61000-6-3.
- Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen (73/23/EEG) [95].
Normen: EN 60335-1: 2002, EN 60335-2-41: 2003 en EN 60439-1.
- Bouwproducten (89/106/EEG).
Norm: EN 12050-1/-2.

DK Overensstemmelseserklæring

Vi **Grundfos** erklærer under ansvar, at produkterne **M** og **MD**, som denne erklæring omhandler, er i overensstemmelse med Rådets direktiver om indbyrdes tilnærmelse til EF medlemsstaternes lovgivning om

- Maskiner (98/37/EF).
Anvendt standard: EN ISO 12100.
- Elektromagnetisk kompatibilitet (89/336/EØF).
Anvendte standarder: EN 61000-6-2 og EN 61000-6-3.
- Elektrisk materiel bestemt til anvendelse inden for visse spændingsgrænser (73/23/EØF) [95].
Anvendte standarder: EN 60335-1: 2002, EN 60335-2-41: 2003 og EN 60439-1.
- Byggevarer (89/106/EØF).
Anvendt standard: EN 12050-1/-2.

PL Deklaracja zgodności

My, **Grundfos**, oświadczamy z pełną odpowiedzialnością, że nasze wyroby **M** oraz **MD**, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich EG:

- maszyny (98/37/EG),
zastosowana norma: EN ISO 12100.
- zgodność elektromagnetyczna (89/336/EWG),
zastosowane normy: EN 61000-6-2 i EN 61000-6-3.
- wyposażenie elektryczne do stosowania w określonym zakresie napięć (73/23/EWG) [95],
zastosowane normy: EN 60335-1: 2002, EN 60335-2-41: 2003 i EN 60439-1.
- Budowa wyrobu (89/106/EEC).
zastosowana norma: EN 12050-1/-2.

HR Izjava o usklađenosti

Mi, **Grundfos**, izjavljujemo uz punu odgovornost, da su proizvodi **M** i **MD**, na koje se ova izjava odnosi, sukladni smjernicama Savjeta za prilagodbu propisa država-članica EZ:

- Strojevi (98/37/EZ).
Korištena norma: EN ISO 12100.
- Elektromagnetska kompatibilnost (89/336/EEZ).
Korištene norme: EN 61000-6-2 i EN 61000-6-3.
- Električni pogonski uređaji za korištenje unutar određenih granica napona (73/23/EEZ) [95].
Korištene norme: EN 60335-1: 2002, EN 60335-2-41: 2003 i EN 60439-1.
- Građevni proizvodi (89/106/EEZ).
Korištena norma: EN 12050-1/-2.

BG Декларация за съответствие

— Ние, фирма **Grundfos** заявяваме с пълна отговорност, че продуктите **M**, **MD**, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕО:

- Машины (98/37/ЕО).
Приложена норма: EN ISO 12100.
- Електромагнетична поносимост (89/336/ЕИО).
Приложени норми: EN 61000-6-2 и EN 61000-6-3.
- Електрически машини и съоръжения за употреба в рамките на определени граници на напрежение на електрическия ток (73/23/ЕИО) [95].
- Приложени норми: EN 60335-1: 2002, EN 60335-2-41: 2003 и EN 60439-1.
- Конструктивни продукти (89/106/ЕИО)
- Приложена норма: EN 12050-1/-2.

SK Prehlásenie o konformite

My firma **Grundfos**, na svoju plnú zodpovednosť prehlasujeme, že výrobky **M**, **MD**, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s nasledovnými smernicami Rady pro zblíženie právnych predpisov členských zemí Európskej únie:

- Stroje (98/37/EG),
Použitá norma: EN ISO 12100.
- Elektromagnetická kompatibilita (89/336/EWG),
Použité normy: EN 61000-6-2 a EN 61000-6-3.
- Elektrické prevádzkové prostriedky, použité v určitom napäťovom rozsahu (73/23/EWG) [95],
Použité normy: EN 60335-1: 2002, EN 60335-2-41: 2003 a EN 60439-1.
- Konštrukčné výrobky (89/106/EWG),
Použitá norma: EN 12050-1/-2.

RU Свидетельство о соответствии требованиям

Мы, фирма **Grundfos**, со всей ответственностью заявляем, что изделия **M** и **MD**, к которым и относится данное свидетельство, отвечают требованиям следующих указаний Совета ЕС об унификации законодательных предписаний стран-членов ЕС:

- Машиностроение (98/37/ЕС).
Применявшиеся стандарты: Евростандарт EN ISO 12100.
- Электромагнитная совместимость (89/336/ЕЭС).
Применявшиеся стандарты: Евростандарт EN 61000-6-2 и EN 61000-6-3.
- Электрические машины для эксплуатации в пределах определенного диапазона значений напряжения (73/23/ЕЭС) [95].
Применявшиеся стандарты: Евростандарт EN 60335-1: 2002, EN 60335-2-41: 2003 и EN 60439-1.
- Требования к безопасности и эксплуатационным качествам конструктивных материалов (89/106/ЕЭС).
Применявшиеся стандарты: EN 12050-1/-2.

RO Declarație de conformitate

Noi, **Grundfos**, declarăm asumându-ne întreaga responsabilitate că produsele **M**, **MD** la care se referă această declarație sunt în conformitate cu Directivele Consiliului în ceea ce privește alinierea legislațiilor Statelor Membre ale CE, referitoare la:

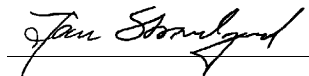
- Utilaje (98/37/CE).
Standard aplicat: EN ISO 12100.
- Compatibilitate electromagnetică (89/336/CEE).
Standarde aplicate: EN 61000-6-2 și EN 61000-6-3.
- Echipamente electrice destinate utilizării între limite exacte de tensiune (73/23/CEE) [95].
Standarde aplicate: EN 60335-1: 2002, EN 60335-2-41: 2003 și EN 60439-1.
- Produse pentru construcții (89/106/EEC).
Standard aplicat: EN 12050-1/-2.

CZ Prohlášení o konformitě

My firma **Grundfos** prohlašujeme na svou plnou odpovědnost, že výrobky **M** a **MD** na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sblížení právních předpisů členských států Evropského společenství v oblastech:

- strojřemství (98/37/EG),
použitá norma: EN ISO 12100.
- elektromagnetická kompatibilita (89/336/EWG),
použité normy: EN 61000-6-2 a EN 61000-6-3.
- provozování spotřebičů v toleranci napětí (73/23/EWG) [95],
použité normy: EN 60335-1: 2002, EN 60335-2-41: 2003 a EN 60439-1.
- Konstrukční výrobky (89/106/EEC),
použitá norma: EN 12050-1/-2.

Bjerringbro, 1st June 2006



Jan Strandgaard
Technical Director

M, MD Multilift

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

1. General description

Grundfos M and MD Multilift lifting stations are designed for the collection and pumping of wastewater with no free flow to sewer level. The lifting stations are supplied complete with controller LC 109 or LCD 109.

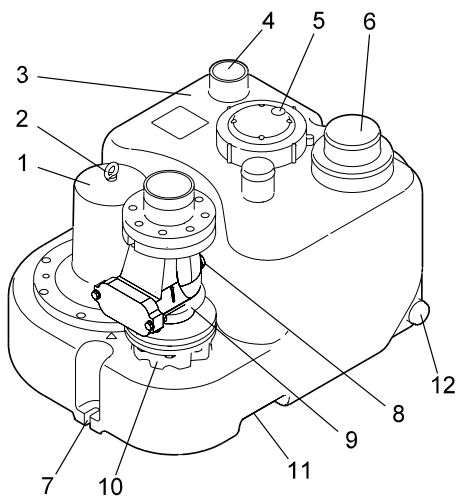


Fig. 1

TM022331 2108

Pos.	Description
1	Pump
2	Lifting eye
3	Nameplate
4	Vent port
5	Cover with level sensor
6	Vertical inlet
7	Fixing points
8	Drain screw for forced opening of non-return valve
9	Cleaning cover
10	Non-return valve
11	Carrying handle
12	ø50 mm port for manually operated diaphragm pump

1.1 Applications

Grundfos M and MD Multilift lifting stations are designed for the collection and pumping of:

- wastewater,
- sludge-containing water and
- domestic wastewater with discharge from water closets.

The lifting stations are capable of pumping liquids containing fibres, textiles, faeces, etc. This makes them ideal for the collection and pumping of wastewater below sewer level from minor buildings such as private dwellings, blocks of flats, hotels, restaurants, schools, etc.

Note:

Do not pump rainwater with the M and MD Multilift 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.

Note:

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

- solid matter, tar, sand, cement, ash, coarse paper, paper towels, cardboard, debris, garbage, grease, oil
- wastewater from sanitary installations situated above the flood level (EN 12 056-1)
- wastewater containing hazardous substances (DIN 1986-100), such as greasy wastewater from large-scale catering establishments.

For drainage of greasy wastewater, use a grease separator to DIN 4040-1.

The lifting stations are supplied complete with one or two pumps and a controller.

Lifting station	Controller
M, one-pump lifting station	LC 109
MD, two-pump lifting station	LCD 109

2. Transportation and storage

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

Note: The lifting station must be lifted by the carrying handles cast in the bottom of the collecting tank, see pos. 11 in fig. 1.

For long periods of storage, the pumps and controllers must be protected against moisture and heat.

After a long period of storage, the pumps should be inspected before they are put into operation. Make sure that the impeller can rotate freely.

3. Product description

The description of the M and MD Multilift lifting stations is divided into the following sections:

- Section 4. describes the lifting station with collecting tank, pump and level sensor.
- Section 5. describes the controllers LC 109 and LCD 109 as well as the functions of these controllers.

In section 6. *Installation* and the following sections, these components have been described as one unit as required.

4. Lifting station

Smell-tight and watertight lifting station complete with one or two pumps. The lifting station includes a collecting tank with all necessary ports for the connection of inlet pipe, discharge pipe, vent pipe and a manually operated diaphragm pump, which is available as an accessory.

The M and MD Multilift lifting stations are supplied complete with single- or three-phase submersible pumps connected to the LC 109 or LCD 109 controller incorporating a pneumatically/electrically operated level switch.

The lifting stations have one vertical and two horizontal inlet ports. The centre of the horizontal inlet ports is positioned 180 mm and 250 mm, respectively, above floor level.

- The vertical inlet port can be connected to 110 mm and 160 mm PVC pipes.
- The horizontal inlet port positioned 180 mm above floor level is connected to Euro-standardized water closets.
- The horizontal inlet port positioned 250 mm above floor level is connected to wall-mounted water closets.

See fig. 4 on page 11.

The lifting station can be connected to a piping system with several water closets:

M: Max. four water closets.

MD: Max. five water closets.

Type key, M and MD Multilift lifting stations:

Example	M	D	.22	.3	.4
Lifting station					
Blank = one pump					
D = two pumps					
Output power, $P_2 / 100$ (W)					
1 = single-phase					
3 = three-phase					
2 = 2-pole motor					
4 = 4-pole motor					

4.1 Collecting tank

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

	M lifting station		MD lifting station	
Inlet level [mm]	180	250	180	250
Tank volume [l]	100	100	120	120
Effective volume [l]	54	74	72	92

MD Multilift lifting stations have two pumps, thus providing a standby pump in case of pump failure or additional pump performance if the inlet exceeds the performance of one pump.

MD Multilift lifting stations must always be used if the wastewater flow must not be interrupted.

4.2 Pump

The pump impeller is designed as a free-flow impeller, which ensures almost unchanged performance throughout the entire life of the pump, see the pump curve in section 10.1.

The stator housing of the motor is made of painted aluminium.

Three-phase pumps: If the phase sequence is wrong, the controller indicates a fault and prevents the pump(s) from starting. For direction of rotation, see 5.4.1 *Control panel* and 7.1 *Direction of rotation*.

4.2.1 Shaft seal

The shaft seal is lubricated for life and therefore requires no maintenance.

4.2.2 Motor cable

The cable is fitted to the motor part via a cable entry. Enclosure class IP 68.

4.3 Level sensor

The level sensor incorporates four pressure sensors. The level sensor also functions as cover at the top of the collecting tank. For selection of inlet level, see 7.2 *DIP switch setting*.

5. Controllers LC 109 and LCD 109

The LC 109 and LCD 109 controllers are designed for the control of M and MD Multilift lifting stations.

The controllers incorporate the necessary components such as contactors, control board with indicator lights for indication of operating condition as well as a level input which, via a cable, is activated directly by the sensors in the collecting tank.

The controller functions are described in section 5.4 *Functions*.

The actual controller type, voltage variant, etc., appear from the type key on the nameplate placed on the side of the controller cabinet.

The LC 109 and LCD 109 controllers are designed for direct-on-line starting (DOL).

Type key, LC 109 and LCD 109 controllers:

Example	LC	109	.230	.1	.7	.35
LC = one-pump controller						
LCD = two-pump controller						
109 = type designation						
Supply voltage [V]						
1 = single-phase						
3 = three-phase						
Maximum operating current per pump [A]						
Run capacitor:						
35 = 35 μ F						
50 = 50 μ F						

5.1 Applications

The LC 109 and LCD 109 allow

- control of one or two pumps based on signals from the level sensor in the tank
- automatic pump changeover (even distribution of operating hours on both pumps)
- deselection of automatic test run during long periods of inactivity (every 24 hours)
- battery back-up in case of mains supply failure
- starting delay within the range from 0 to 255 sec. (random) after returning from battery operation to mains operation (resulting in an even mains load when several lifting stations are started up at the same time; only in the case of battery operation)
- selection of automatic alarm resetting
- selection of automatic restarting
- setting of stop delays matching the actual operating conditions
- indication of liquid level

- alarm indication of:
 - inadmissibly high liquid level, which triggers a high-level alarm
 - too high motor temperature (temperature sensor)
 - wrong phase sequence 1
 - mains supply failure
 - defective level sensor.

As standard, the LC 109 and LCD 109 controllers have two alarm outputs for:

- common alarm and
- separate high-level alarm.

Common alarm and high-level alarm are signalled acoustically via a built-in buzzer.

Note: Each fault signal output has an NO and an NC contact. See fig. 8 and fig. 10 on page 13.

5.2 Accessories

Accessories for the controllers are described in the following sections.

5.2.1 Accumulator

An accumulator maintaining the alarm signal in case of supply failure is available as an accessory. Fitted inside the controller via a plug, the accumulator ensures that an alarm can be given within 9 hours after the electricity supply has been switched off.

The accumulator is partly charged on delivery. It will be fully charged after 24 hours under voltage. After discharge, the charging time is approx. 24 hours. The accumulator is automatically charged when the electricity supply is switched on.

Note: Used up NiMH accumulators must be disposed of in accordance with local regulations.

5.2.2 Hour and start counters

Hour and/or start counters are available as accessories. They are also available as a combined unit.

5.3 Mode of operation

5.3.1 M - LC 109

- When the liquid level in the collecting tank reaches the pump starting level, the pump will start.
- After the stop signal has been given, the pump will run for approx. 8 seconds (stop delay). The stop delay is adapted to the tank capacity and the pump type. The factory settings should only be changed if the tank is not sufficiently drained in the actual application. For example, if a high head is required, the tank cannot be sufficiently drained during the stop delay, see "Switch 5, 6 and 7" in section 7.2 *DIP switch setting*.
- If the liquid level rises to alarm level, the pump will start and an alarm is given until the liquid level is below alarm level. Then the alarm indication is automatically reset by the controller. If required, manual resetting of the alarm indication can be selected, see "Switch 9" in section 7.2 *DIP switch setting*.

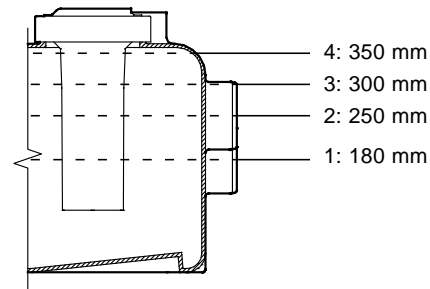
5.3.2 MD - LCD 109

The two-pump controller ensures alternating operation of the pumps.

- When the liquid level in the collecting tank reaches the pump starting level, the first pump will start.
- If the liquid level rises further to the next starting level, the second pump will start.
- A further rise in the liquid level after both pumps have started will cause an alarm until the liquid level is below alarm level.
- After the stop signal has been given, the second pump will run for approx. 8 seconds (stop delay). The stop delay is adapted to the tank capacity and the pump type. The factory settings should only be changed if the tank is not sufficiently drained in the actual application. For example, if a high head is required, the tank cannot be sufficiently drained during the stop delay, see "Switch 5, 6 and 7" in section 7.2 *DIP switch setting*.
- After the stop signal has been given, the first pump will run for approx. 13 seconds (stop delay).
- When the pump starting level is reached again, an automatic pump changeover will take place (alternating operation).

- If the liquid level rises to alarm level, both pumps will start. Different stop times ensure an even load on the mains supply and thus water hammer is prevented.

5.3.3 Tank level above floor



TM02 2345 4101

M one-pump lifting station

Level	Inlet level 180 mm	Inlet level 250 mm
1	Start	–
2	–	Start
3	–	–
4	Alarm	Alarm

MD two-pump lifting station

Level	Inlet level 180 mm	Inlet level 250 mm
1	Start - first pump	–
2	Start - second pump	Start - first pump
3	–	Start - second pump
4	Alarm	Alarm

5.3.4 Automatic test run

The controller is factory-set to "automatic test run", switch 4 in position ON. When the function is active, a test run of 2 seconds will be carried out if the pump/pumps have not been running for 24 hours.

The function can be deselected, see "Switch 4" in section 7.2 *DIP switch setting*.

5.4 Functions



Before making any connections in the LC 109 or LCD 109 or work on lifting stations, etc., it must be ensured that the electricity supply has been switched off and that it cannot be accidentally switched on.

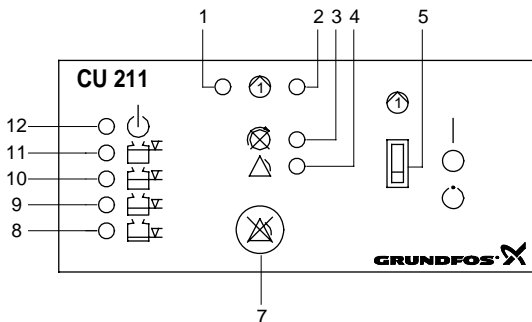
The functions of the LC 109 and LCD 109 controllers are described in the following sections.

5.4.1 Control panel

The LC 109 one-pump controller has a CU 211 module.

The LCD 109 two-pump controller has a CU 212 module.

Fig. 2 shows the control panel of the **CU 211 module**.



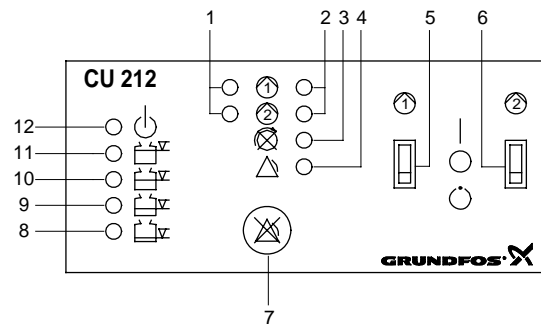
TM01 6-425 3902

Fig. 2

Key to the symbols in fig. 2:

Pos.	Description
1	Green indicator light, indicating starting delay (flashing) and pump operation (permanently on).
2	Red indicator light, indicating pump fault, flashing or permanently on, see section 7.5.
3	Red indicator light, indicating wrong phase sequence (three-phase pumps only).
4	Red indicator light, indicating common alarm.
5	ON-OFF-AUTO selector switch, three positions, see section 7.3.
7	Reset button, push-button for manual resetting of alarm signals to <i>external</i> alarm devices and the built-in buzzer, see section 7.3.
8, 9, 10 and 11	Four orange indicator lights, which are activated by the pressure sensors in the tank. In case of high-level alarm, the top indicator light is flashing and the three other indicator lights are permanently on.
12	Green indicator light, indicating that the electricity supply has been switched on.

Fig. 3 shows the control panel of the **CU 212 module**.



TM01 6397 3902

Fig. 3

Key to the symbols in fig. 3

Pos.	Description
1	Green indicator light for pump 1 and 2, indicating starting delay (flashing) and pump operation (permanently on).
2	Red indicator light for pump 1 and 2, indicating pump fault, flashing or permanently on, see section 7.5.
3	Red indicator light, indicating wrong phase sequence (three-phase pumps only).
4	Red indicator light, indicating common alarm.
5	ON-OFF-AUTO selector switch for pump 1, three positions, see section 7.3.
6	ON-OFF-AUTO selector switch for pump 2, three positions, see section 7.3.
7	Reset button, push-button for manual resetting of alarm signals to <i>external</i> alarm devices and the built-in buzzer, see section 7.3.
8	Orange indicator light, which is activated by the pressure sensor for start of the first pump/common stop.
9	Orange indicator light, which is activated by the pressure sensor for start of the second pump.
10 and 11	Two orange indicator lights, which are activated by the pressure sensor for high-level alarm. In case of high-level alarm, the top indicator light is flashing and the other is permanently on.
12	Green indicator light, indicating that the electricity supply has been switched on.

5.4.2 Battery back-up functions

If a back-up battery for module CU 211 or CU 212 is installed, the following functions will be carried out if the normal electricity supply to the LC 109 or LCD 109 fails (see also the illustrations below):

- The common alarm is active, the **red** indicator light is on – *cannot* be reset!
- If the *external* alarm device for common alarm is supplied from an external power source, this device will be active – *cannot* be reset by means of the reset button!
- The built-in buzzer is activated – can be reset by means of the reset button!
- If the liquid level rises above the level for high-level alarm, the top **orange** indicator light will be **flashing** and the second **orange** indicator light from the top will be permanently on.
- If the starting delay function and automatic test run were selected (switch 4 of the DIP switch) (factory setting), the start-up will be delayed after the electricity supply has been switched on when the liquid level is sufficiently high, see 7.2 DIP switch setting.

The table below shows the situations which may occur if the normal electricity supply to the LC 109 or LCD 109 fails and a back-up battery is connected:

- = the indicator light is off.
- ⊗ = the indicator light is on.
- ⊛ = the indicator light is flashing.

CU 211

Mains supply failure:

- The common alarm is active. The **red** indicator light is on.
- The green indicator light (electricity supply switched on) is *off*.

CU 211

Mains supply failure *and* high-level alarm:

- The common alarm is active. The **red** indicator light is on.
- The top **orange** indicator light is **flashing**.
- The three other **orange** indicator lights are on.
- The green indicator light (electricity supply switched on) is *off*.

6. Installation

6.1 General description

Before installing the M and MD Multilift lifting stations, ensure that all local regulations covering venting, access to the stations, etc. are observed.

Note: The lifting station must not be covered.

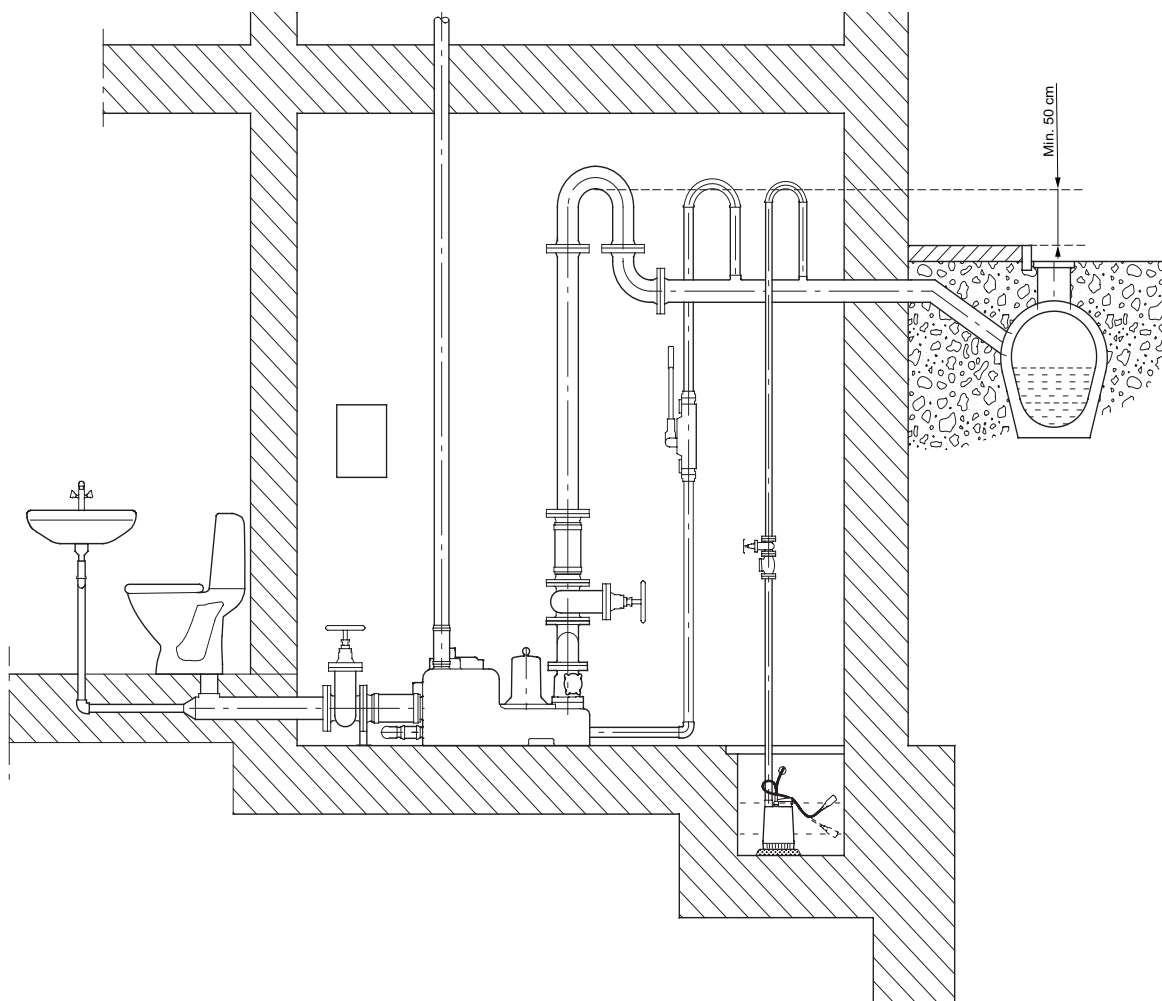
A minimum space of 60 cm around the lifting station is required in order to facilitate installation and service.

Ensure that no back-flow can occur in case of a high water level in the sewage pipe buried in the street outside the building.

Back-flow can be prevented by fitting a goose neck or reversed water seal. The highest point of the goose neck/reversed water seal must be above street level.

The discharge pipe from the pump as well as the discharge pipe from the manually operated diaphragm pump, if any, and the drainage pump, if any, installed below floor level must also be fitted with a goose neck or reversed water seal.

See fig. 4.



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Fig. 4

6.2 Mounting of collecting tank

Fasten the collecting tank to an even floor with the rawplugs, rubber washers and screws supplied with the tank.

To facilitate service, it is advisable to fit isolating valves on the inlet and discharge sides of the tank.

Inlet side: DN 100/DN 150.

Discharge side: DN 80/DN 100.

To avoid sediment build-up in the discharge pipe, the pipe - and the lifting station - should be sized for a flow velocity of minimum 0.7 m/s. For vertical pipes, however, not lower than 1.0 m/s.

For PN 6 PVC pipes, for example, the following flows are required to meet these requirements:

Nominal diameter of pipe	80 mm	100 mm
Flow velocity of 0.7 m/s	14.2 m ³ /h	21.2 m ³ /h
Flow velocity of 1.0 m/s	20.2 m ³ /h	30.3 m ³ /h

Note: When installing the pipes, it must be ensured that the lifting station is not stressed by the pipework.

Flexible connecting pieces supplied:

2 connecting pieces ø110 (inlet and outlet).

1 connecting piece ø75 (venting).

1 connecting piece ø50 (connection for wash basin).

Fit the flexible connecting piece (DN 110) supplied with the lifting station on the inlet side of the lifting station and connect it to the inlet pipe.

As the lifting station offers several connections, cut off the ends of the desired connections, see fig. 5, and connect the pipes as required by means of a pipe collar or similar device.

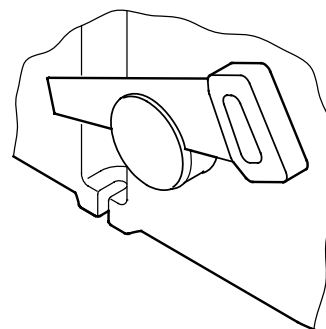


Fig. 5

Note: The internal diameter of the inlet pipe should be the same as the internal diameter of the station inlet port.

The lifting stations also have a vertical DN 50 inlet port at the top of the tank for inflow from wash basin, shower, etc.

Cut off the blanked-off end of the vent port and connect a DN 70 vent pipe to the tank by means of the flexible connection supplied. The vent pipe must be led out into the open air in accordance with local regulations.

Note: Make sure that no weight from the inlet, discharge and vent pipes rests on the tank. Long pipe sections, valves, etc. must be supported.

Note: Never stand on the lifting station.

A flexible connection can be ensured if a distance of approx. 5 cm is left between the pipe ends of the inlet, discharge and vent pipes and the ports of the lifting station.

6.2.1 Diaphragm pump

The optional, manually operated diaphragm pump is used for draining the tank in the event of pump failure. The diaphragm pump **must** be fitted with a non-return valve on the discharge side. To facilitate servicing of the diaphragm pump, it is advisable to fit a $\varnothing 50$ mm isolating valve to the tank port.

6.2.2 Blanking flange

If a pump has to be removed for service, the tank can be provided with a blanking flange in order to close it hermetically. The blanking flange is available as an accessory. Fitted to MD Multilift lifting stations, the blanking flange also allows continued operation by means of the remaining pump.

6.2.3 Drainage pump

If an M or MD Multilift lifting station is installed in a cellar 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. The installation sketch in fig. 4 shows a lifting station installed in accordance with the regulations in force for this type of lifting station.

Note: The collecting tank, pumps and cables may be flooded by the pumped liquid. The controller must be installed in a dry and well ventilated place.

6.3 Electrical connection

The electrical connection must be carried out in accordance with local regulations.



Before making any connections in the LC 109 or LCD 109 or work on lifting stations, etc., it must be ensured that the electricity supply has been switched off and that it cannot be accidentally switched on.

The cable length between motor and controller is 3 metres. The controller can be placed within the length of the cable.

The supply cable for the controller is approx. 0.8 metres.

The controller connected to the pump is to be mounted on a wall in accordance with local regulations and section 6.4 *Location and mounting of controller*.

The operating voltage and frequency are marked on the pump and controller nameplates. The voltage tolerance must be within $-10\%/+6\%$ of the rated voltage. Make sure that the lifting station is suitable for the voltage and frequency available at the installation site.

Three-phase connection: Make sure that the phase sequence is correct, see pos. 3 in section 5.4.1 *Control panel*.

All cables/wires must be fitted through the Pg cable entries and gaskets (IP 55).

Maximum back-up fuse is stated on the controller nameplate and in the table in section 10. *Technical data*.

If required according to local regulations, an external mains switch must be installed.

Pump motors for M and MD Multilift lifting stations have a thermal switch incorporated in the motor windings. Via the controller, the thermal switch disconnects the electricity supply to the pump in case of excessive winding temperature.

The motor-protective circuit breaker, if installed, must be set to the rated motor current, see pump nameplate.

Controllers for single-phase pumps also incorporate the necessary run capacitors.

Pump type	Run capacitor	
	[μ F]	[VAC]
1.1 kW	35	400
1.5 kW	50	400

The lifting stations require no further motor protection.

The electrical connection must be carried out in accordance with the marking on the supply cable to the controller.

- Cables for single-phase MSS.12.1.4, M.12.1.4, and M.15.1.4 have Schuko plug.

Note: In countries, where the Schuko plug is not used as standard, this plug **must** be replaced according to local regulations.

- Cables for single-phase MD.15.1.4 and MLD.15.1.4 have no plug.
- Cables for three-phase motors have a CEE plug (3x230 V = Blue plug, 3x400 V = Red plug).

If the cables between pump and controller as well as the supply cable have been disconnected, the electrical connection must be carried out as shown in the wiring diagram, section 6.5.

An external fault indication device can be connected to one of the two potential-free fault signal outputs of the controller. Maximum load: 250 VAC, 5 A, AC1.

Note: Each fault signal output has an NO and an NC contact. See fig. 8 and fig. 10 on page 13.

6.4 Location and mounting of controller

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

When installed outdoors, the LC 109 and LCD 109 controllers must be placed in a protective shed or cupboard.

The LC 109 and LCD 109 must not be exposed to direct sunlight.

Before mounting the controller, remove the transport protectors, if any, from inside the cabinet.

Mount the LC 109 and LCD 109:

- on a plane wall surface,
- with the Pg cable entries pointing downwards (additional Pg cable entries, if required, must be fitted in the bottom plate of the cabinet),
- with four screws through the mounting holes in the back plate of the cabinet, see fig. 6. The mounting holes must be bored with a 4 mm bore. Fit the screws into the mounting holes and tighten securely. Fit the plastic caps supplied with the controller on the screws (IP 55).

Fig. 6 shows the dimensions of the controller cabinet for wall-mounting.

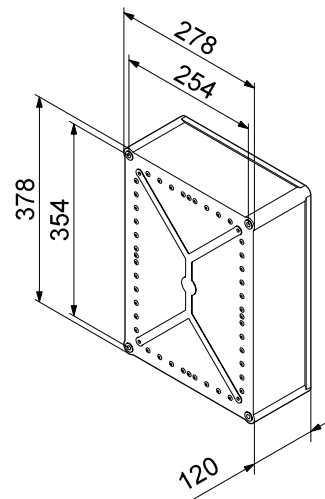


Fig. 6

Fig. 7 shows the *internal* construction of the **LC 109**.

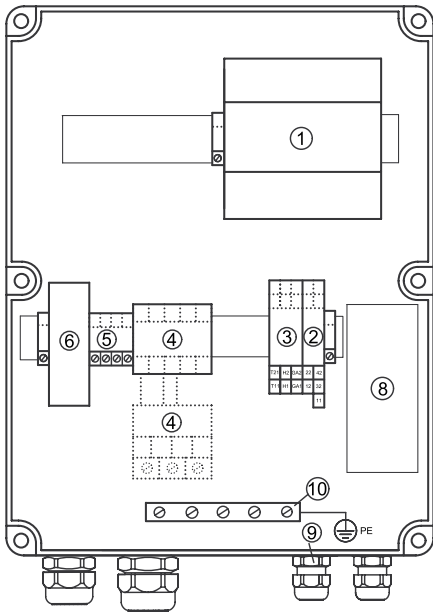


Fig. 7

Fig. 8 shows the terminals listed under positions 2 and 3.

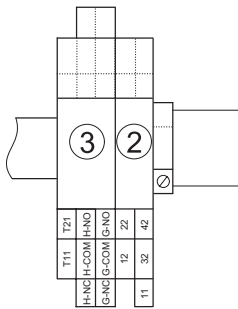


Fig. 8

Key to the symbols in figs. 7 and 8:

Pos.	Description
1	Module CU 211.
2	Terminal block for level inputs (11-12, 22, 32, 42).
3	Terminal block with: <ul style="list-style-type: none"> input for the motor thermal switch (T11-T21), output for external alarm device for high-level alarm (H-NC, H-COM, H-NO). output for external alarm device for common alarm (G-NC, G-COM, G-NO).
4	Motor starter (only if a motor-protective circuit breaker has been installed).
5	Terminal block for electricity supply (a three-phase variant is illustrated above).
6	Fuse holders for control circuit fuses (1 to 3 depending on voltage/current variant).
8	Run capacitor (single-phase pumps only).
9	Pg cable entries.
10	Earth bar (\oplus PE).

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Fig. 9 shows the *internal* construction of the **LCD 109**.

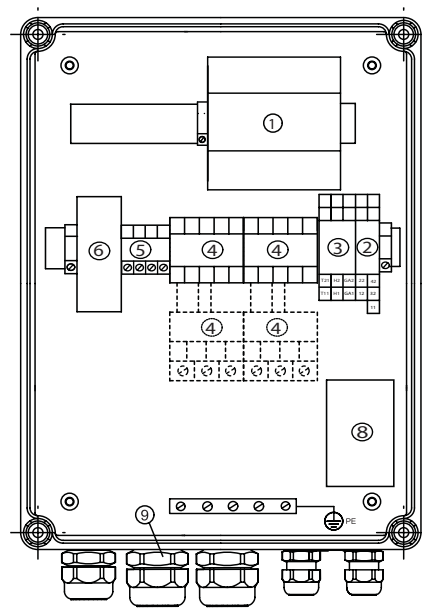


Fig. 9

Fig. 10 shows the terminals listed under positions 2 and 3.

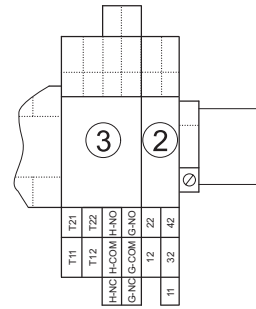


Fig. 10

Key to the symbols in figs. 9 and 10:

Pos.	Description
1	Module CU 212.
2	Terminal block for level inputs (11-12, 22, 32, 42).
3	Terminal block with: <ul style="list-style-type: none"> inputs for the motor thermal switches (T11-T21, T12-T22), output for external alarm device for high-level alarm (H-NC, H-COM, H-NO), output for external alarm device for common alarm (G-NC, G-COM, G-NO).
4	Motor starters, pumps 1 and 2 (only if motor-protective circuit breakers have been installed).
5	Terminal block for electricity supply (a three-phase variant is illustrated above).
6	Fuse holders for control circuit fuses (1 to 3 depending on voltage/current variant).
7	Isolating transformer.
8	Run capacitor (single-phase pumps only).
9	Pg cable entries.
10	Earth bar (\oplus PE).

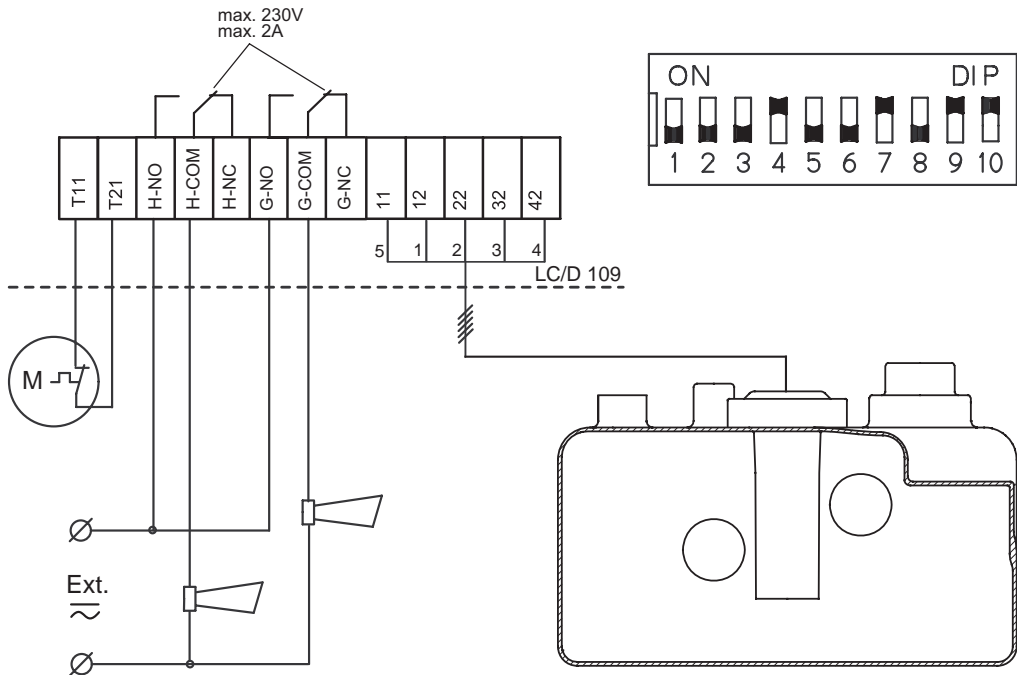
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6.5 Wiring diagram

GB



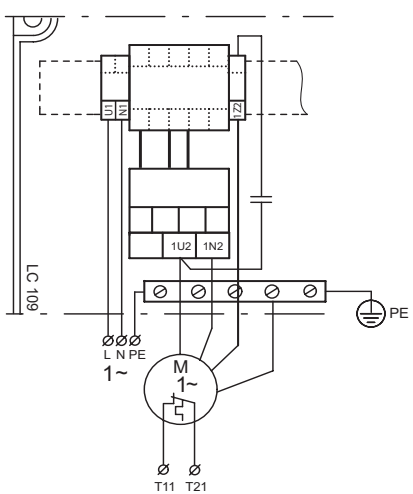
Description	Terminal number
Connection of level sensor. See also section 5.3.3.	11-42

Single-phase connection

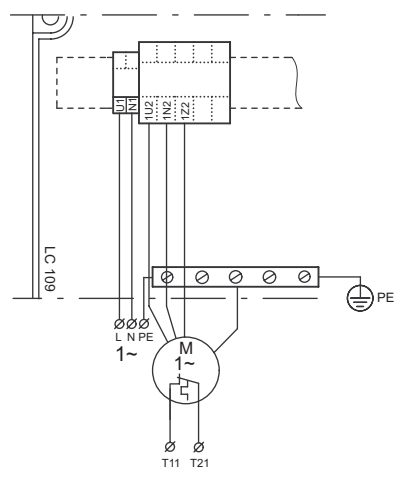
with motor-protective circuit breaker

without motor-protective circuit breaker

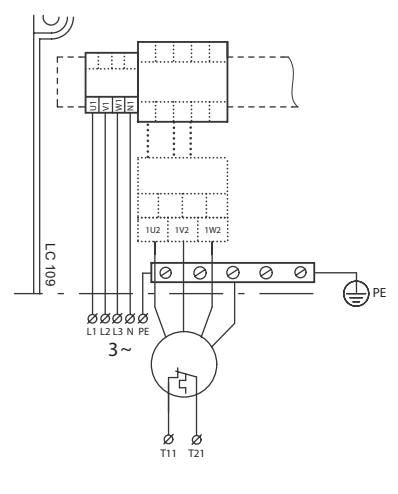
Three-phase connection



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TM02 4466 1002



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Fig. 11

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7. Start-up

When the Multilift lifting station has been installed correctly and connected in accordance with local regulations and the controller settings have been made, the lifting station can be started up.



Before starting any work on pumps used for pumping liquids which might be hazardous to health, thorough cleaning/venting of pumps, tank, etc. must be carried out according to local regulations.

Before making any connections in the LC 109 or LCD 109 or work on lifting stations, etc., it must be ensured that the electricity supply has been switched off and that it cannot be accidentally switched on.

Start-up must be carried out by authorized personnel.

Proceed as follows:

1. If, during installation of the lifting station, it has been necessary to disconnect the LC 109 or LCD 109 from the station, make sure that the terminals are connected as before the disconnection.
See also section 6.5 *Wiring diagram*.
2. If a motor-protective circuit breaker has been installed, check that the settings are correct.
3. Check that the correct inlet level, 180 or 250 mm, has been selected, see "Switch 1" in section 7.2 *DIP switch setting*.
4. Switch on the electricity supply.
Three-phase lifting stations only: If a wrong phase sequence is indicated on the controller control panel, interchange two phases in the CEE plug.
5. Open all isolating valves.
6. Test-run the pump for **maximum 1 minute** by pushing the ON-OFF-AUTO selector switch into position ON (|), see section 7.3.
7. Push the ON-OFF-AUTO selector switch into position AUTO (○), see section 7.3.
8. Supply liquid (clean water) to the tank until the pump starts. Stop the liquid supply and check that the tank is empty/the liquid level has fallen to stop level.

If high heads are required, the stop delay can be changed, see 7.2 *DIP switch setting*.

Note: The drain screw on the side of the non-return valve is used for emptying the discharge pipe between the non-return valve and the isolating valve, if fitted.

During normal operation, the screw must be left untightened. When the drain screw is tightened, see fig. 12, the non-return valve will be forced open and the contents of the discharge pipe will be emptied into the collecting tank.

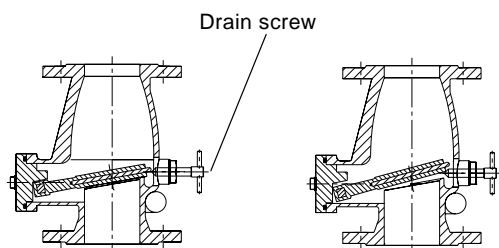


Fig. 12

7.1 Direction of rotation

When the lifting station is delivered from factory, the direction of rotation of the pumps is correct.

Three-phase lifting stations only: If the cables between controller and pumps have been disconnected, point 1. in section 7. *Start-up* must be observed.

If a wrong phase sequence is indicated on the controller control panel, interchange two phases in the CEE plug.

7.2 DIP switch setting

In the controllers LC 109 and LCD 109, the modules CU 211 and CU 212 have a 10-pole DIP switch in the bottom right corner, see fig. 13.

Note: During setting, the controller must be off circuit for at least 1 minute to ensure the correct configuration during start-up after change of the DIP switch setting.

The DIP switch setting offers the following possibilities:

- setting of inlet level (switch 1)
- deselection of starting delay and automatic test run (switch 4)
- setting of stop delay (switches 5, 6 and 7)
- selection of automatic alarm resetting (switch 9)
- selection of automatic restarting (switch 10).

See explanations of the settings below.

Fig. 13 shows the factory setting of the DIP switch.

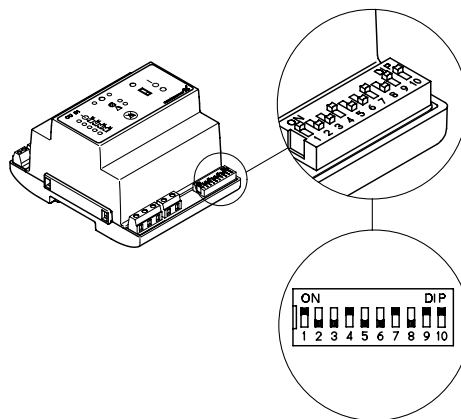


Fig. 13

Each individual switch (1 to 10) of the DIP switch can be set to position OFF or ON.

Note: The DIP switch *must not* be set to other switch combinations than those described in this section.

Set the switches 1 to 10 as follows:

- Switch 1, inlet level:

When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!



This setting determines the inlet level of the lifting station. OFF corresponds to a 180 mm inlet level and ON corresponds to a 250 mm inlet level.

- Switches 2 and 3:

When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!




Switches 2 and 3 have no function in connection with the actual application, but this setting *must* be maintained.


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- Switch 4, starting delay and automatic test run (only in connection with battery backup):

When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!

 At this setting, the start-up is delayed within the range from 0 to 255 sec. (random) after the electricity supply has been switched on *when* the liquid level is sufficiently high.
Automatic test run every 24 hours.









 After the electricity has been switched on, the pump will start immediately *when* the liquid level is sufficiently high.
No automatic test run.

- Switch 5, 6 and 7, stop delay:

When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!


The **stop delay** is the time from the stop signal is given until the pump is stopped.

The stop delay is adapted to the tank capacity and the pump type. The setting should only be changed if the tank is not sufficiently emptied in the application in question.

0 sec.		8 sec.	
2 sec.		10 sec.	
4 sec.		12 sec.	
6 sec.		14 sec.	


- Switch 8:


When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!

 Switch 8 has no function in connection with the actual application, but this setting *must* be maintained!

- Switch 9, automatic alarm resetting:


When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!

 This setting ensures automatic resetting of alarm signals to external alarm devices and the built-in buzzer. However, an alarm signal will only be reset if the cause of the fault no longer exists.

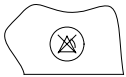
 At this setting, the alarm signal must be reset manually by means of the reset button (the reset button is described in section 7.3 *Reset button and ON-OFF-AUTO selector switch*).

- Switch 10, automatic restarting:

When the DIP switch setting is changed, the controller must be switched off for at least 1 minute!

 This setting must not be changed. It ensures automatic restarting of the motor after it has been cut out on account of too high temperature.

7.3 Reset button and ON-OFF-AUTO selector switch



The **reset button** is a push-button for manual resetting of alarm signals to *external* alarm devices and the built-in buzzer (i.e. *not* for resetting of the alarm memory as this is reset by means of the ON-OFF-AUTO selector switch, see position OFF (○)).

Even if the fault condition still exists, the *external* alarm devices and the built-in buzzer will be reset when the reset button is pressed.

The **ON-OFF-AUTO selector switch** has three different positions:

ON (|), top position:

- The pump will start when the selector switch is pushed into this position (unless a motor-protective circuit breaker, if any, has cut out the pump).
- If the thermal switch of the motor registers overtemperature, the pump will *not* be switched off.

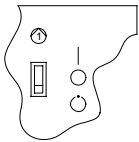
Note: It is the user's responsibility to decide how long the pump is to run with this fault indication. Over a long period, the pump will be damaged!

OFF (○), middle position:

- The pump *cannot* start when the selector switch has been set to this position.
- The alarm memory is reset by pushing the selector switch into position OFF (○). The alarm memory is the light indication of a fault condition which has disappeared. If a fault condition still exists when the selector switch is pushed into position ON (|) or AUTO (○), the alarm indication will be repeated immediately.

AUTO (○), bottom position:

- The pump is controlled by the input signals from the level sensor and the pump(s) according to the selected DIP switch setting.
- Alarm signals will automatically be reset. Switch 9 of the DIP switch can, however, be set to manual resetting which is carried out by means of the reset button, see 7.2 *DIP switch setting*.
- The pump will restart automatically when a given fault condition disappears.
- When the pump starts automatically after a fault condition which has disappeared, the indicator light will continue to show the fault condition (alarm memory) and the indication can only be removed by resetting the alarm memory, see position OFF (○).



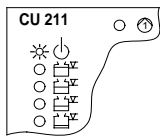
7.4 Normal operating conditions

- = the indicator light is off.
- * = the indicator light is on.
- * = the indicator light is flashing.

The following applies to the indications shown below:

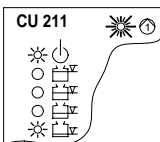
Where the indications of CU 211 and CU 212 are identical, only a CU 211 will be shown and described.

Where the indications of CU 211 and CU 212 are different, both CU 211 and CU 212 will be shown and described.



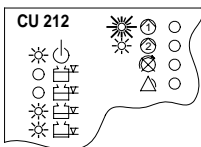
The liquid level in the collecting tank is *lower than* the starting level of the pump:

- Electricity supply switched on. The **green** indicator light is on.



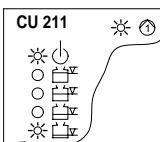
The liquid level in the collecting tank is *higher than* the starting level of the pump:

- Starting delay of the pump (this only applies to starting after interruption of electricity supply and if a back-up battery has been fitted). The **green** indicator light is **flashing**.
- The bottom **orange** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.



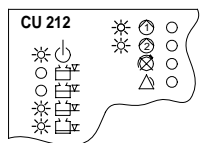
The liquid level in the collecting tank is *higher than* the starting level of the second pump:

- Starting delay of the pump (this only applies to starting after interruption of electricity supply and if a back-up battery has been fitted). The **green** indicator light is **flashing**.
- The first pump is running. The **green** indicator light is **on**.
- The two bottom **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.



The liquid level in the collecting tank is *higher than* the starting level of the pump:

- The pump is running. The **green** indicator light is **on**.
- The bottom **orange** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.



The liquid level in the collecting tank is *higher than* the starting level of the second pump:

- The pumps are running. Two **green** indicator lights are **on**.
- The two bottom **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.

7.5 Alarm conditions

Common alarm activates:

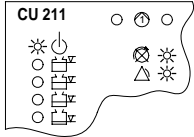
- red indicator light
- built-in buzzer and
- external alarm device for common alarm.

High-level alarm activates:

- common alarm (see above)
- external alarm device for high-level alarm
- the top orange indicator light (flashing) and
- the other orange indicator lights (permanently on).

- = the indicator light is off.
- ⊗ = the indicator light is on.
- ⊗* = the indicator light is flashing.

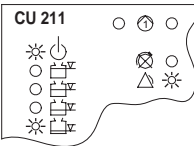
The table below shows examples of typical alarm conditions.



Wrong phase sequence (only three-phase variants):

- The **red** indicator light for wrong phase sequence is on.
- The common alarm is active. The **red** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.

The pump *cannot* be started in this condition. Interchange two phases in the CEE plug.



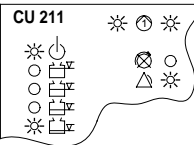
The level sensor is dirty or defective:

- The **orange** indicator light for the defective sensor is on.
- The common alarm is active. The **red** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.

During pumping, various combinations of orange indicator lights may be on. After pumping, the fault is indicated as illustrated in the figure.

Applies only if a motor-protective circuit breaker (accessory) has been installed.

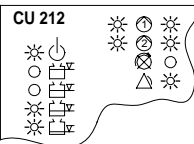
The motor-protective circuit breaker *has* cooled and has been reset manually after a cutout. The pump is running again:



- The pump is running. The **green** indicator light is **on**.
- The **red** indicator light for pump fault is **on**.
- The common alarm is active. The **red** indicator light is on.
- The bottom **orange** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.

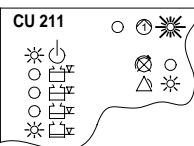
This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.

The motor-protective circuit breakers *have* cooled and have been reset manually after a cutout. The pumps are running again:



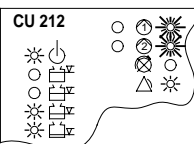
- The pumps are running. The two **green** indicator lights are **on**.
- The two **red** indicator lights for pump fault are **on**.
- The common alarm is active. The **red** indicator light is on.
- The two bottom **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.

This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.



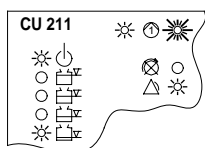
The motor thermal switch has cut out the pump. The motor has not yet cooled sufficiently:

- The **red** indicator light for pump fault is **flashing**.
- The common alarm is active. The **red** indicator light is on.
- The bottom **orange** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.



The motor thermal switches have cut out the pumps. The motors have not yet cooled sufficiently:

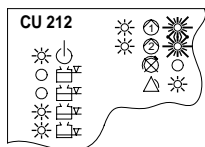
- The two **red** indicator lights for pump fault are **flashing**.
- The common alarm is active. The **red** indicator light is on.
- The two bottom **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.



The pump *has* cooled after the thermal switch has caused a cutout. The pump is running again:

- The pump is running. The **green** indicator light is **on**.
- The **red** indicator light for pump fault is **flashing**.
- The common alarm is active. The **red** indicator light is on.
- The bottom **orange** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.

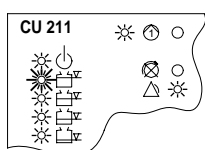
This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.



The pumps *have* cooled after the thermal switch has caused a cutout. The pumps are running again:

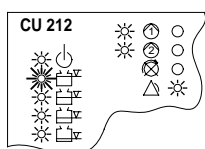
- The pumps are running. The two **green** indicator lights are **on**.
- The two **red** indicator lights for pump fault are **flashing**.
- The common alarm is active. The **red** indicator light is on.
- The two bottom **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.

This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.



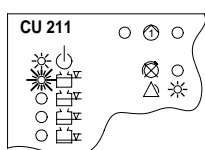
High-level alarm. The pump is running:

- The pump is running. The **green** indicator light is **on**.
- The common alarm is active. The **red** indicator light is on.
- The top **orange** indicator light is **flashing**.
- The other **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.



High-level alarm. The pumps are running:

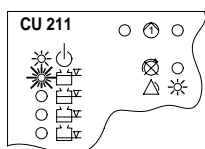
- The pumps are running. The two **green** indicator lights are **on**.
- The common alarm is active. The **red** indicator light is on.
- The top **orange** indicator light is **flashing**.
- The other **orange** indicator lights are on.
- Electricity supply switched on. The **green** indicator light is on.



There *has been* a high-level situation and the liquid level in the collecting tank is now *lower than* the starting level of the pump:

- The common alarm is active. The **red** indicator light is on.
- The top **orange** indicator light is **flashing**.
- Electricity supply switched on. The **green** indicator light is on.

This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.



The level sensor is dirty or defective or the quantity of liquid at the inlet is too big:

- The common alarm is active. The **red** indicator light is on.
- Electricity supply switched on. The **green** indicator light is on.

This alarm indication can be reset by resetting the alarm memory, see ON-OFF-AUTO selector switch, section 7.3.

8. Maintenance and service

With normal usage, the M and MD Multilift lifting stations require a minimum of maintenance.



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.

Before making any connections in the LC 109 or LCD 109 or work on lifting stations, etc., it must be ensured that the electricity supply has been switched off and that it cannot be accidentally switched on.

Pumps in normal operation should be checked at least once a year. Local regulations must be observed.

These periodical checks of the lifting station should be carried out by authorized personnel and must among other things comprise electrical and mechanical maintenance. The following points should be checked:

- **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 the impeller, shaft seal, etc. for possible wear. Replace defective parts.

- **Ball bearings**

Check the shaft for noisy or heavy operation (turn the shaft by hand). 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 authorized service workshop.

Cleaning the non-return valve (if required):

Proceed as follows:

1. Close the isolating valve 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 7. *Start-up*.
2. Clean the non-return valve via the cleaning cover on the side of the discharge pipe. If cleaning of the attachment of the flap is required, it might be necessary to remove the valve casing from the bottom part of the discharge pipe.

8.1 Electrical maintenance

- Check the gaskets of the LC 109 and LCD 109 cabinet front and those of the Pg cable entries.
- Check the cable entries.
- Check the controller functions.
- Check and clean the level sensor. Check its functions, for instance in a bucket of water. See "Cleaning the level sensor" below.
- If the LC 109 or LCD 109 has been installed in a particularly aggressive environment, it is advisable to check the contacts of the motor-protective circuit breaker, if installed, in order to identify possible chemical attack resulting in corrosion. In typical installations, the motor-protective circuit breaker contacts will work for several years and do not require any inspection.

Note: The above list is *not* complete. The LC 109 or LCD 109 may be installed in environments which require thorough and regular maintenance.

Cleaning the level sensor:

Proceed as follows:

1. Push the ON-OFF-AUTO selector switch into position OFF (○), see section 7.3.
2. Loosen the cover with level sensor by turning the union nut counter-clockwise.
3. Lift the sensor carefully out of the tank. Do not lift it by means of the cable.
Note: The cover must always point upwards.
4. Check for possible deposits on or in the sensor tube and whether the vent hole on the side of the sensor tube is clean.
5. Scrape off any deposits. If necessary, rinse the sensor with clean water at low pressure, but do not flush the sensor tube.
6. Check the sensor by lowering it slowly into a bucket of water.
Note: The controller must be under voltage, but the motor must be disconnected.
7. Check that the orange indicator lights for indication of liquid level illuminate in the order 1, 2, 3 and 4. When the orange indicator light 4 illuminates, the buzzer and the alarm signal relay are activated.
See 5.4.1 *Control panel* and 5.3.3 *Tank level above floor*.
8. When the indicator lights illuminate in the correct order, the sensor operates correctly and can be fitted again.

If the discharge pipe needs to be drained, see 7. *Start-up*.

8.2 Mechanical maintenance

- Check for possible deposits and/or sludge build-up in the collecting tank.
- Check for possible blockage on the inlet side of the lifting station. A blockage will typically be a large solid object.
- Check the gaskets of connections to the stationary system (at valves, etc.).
- 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 regular maintenance.

8.3 Contaminated lifting station or components

Note: 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. Possible costs of returning the lifting station are 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.

9. Fault finding chart



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 109 or LCD 109 or work on lifting stations, etc., it must be ensured that the electricity supply has been switched off and that it cannot be accidentally switched on.

Fault	Cause	Remedy
1. The pump does not run.	a) No electricity supply. Without battery back-up: None of the indicator lights are on. With battery back-up (accessory): See section 5.4.2.	Switch on the electricity supply.
	b) The ON-OFF-AUTO selector switch is in position OFF (○), see section 7.3.	Push the ON-OFF-AUTO selector switch into position ON () or AUTO (◐).
	c) Connection not in accordance with these installation and operating instructions.	Connect the lifting station correctly, see 6.5 <i>Wiring diagram</i> .
	d) Control circuit fuses are blown.	Check and eliminate the cause. Replace the control circuit fuses (see pos. 6, fig. 7 or 9).
	e) The motor-protective circuit breaker has cut out the pump (only relevant if a motor-protective circuit breaker has been installed). The red indicator light for pump fault is permanently on, see section 7.5.	Check the pump and tank as well as the setting of the motor-protective circuit breaker.
	f) The thermal switch in the motor has cut out the pump. The red indicator light for pump fault is flashing, see section 7.5.	Allow the pump to cool. After cooling, the pump will restart automatically unless the LC 109 or LCD 109 has been set to manual restarting, see section 7.2. If so, the ON-OFF-AUTO selector switch must be pushed into position OFF (○) for a short period. If the cutout is due to impurities in tank or system, send for a sludge exhauster. If the level sensor is dirty, lift out the cover with sensor and clean the sensor.
	g) The control circuit for the motor-protective circuit breaker has been broken or fails (only relevant if a motor-protective circuit breaker has been installed). The green indicator light indicating pump operation is permanently on, see section 5.4.1.	Check control circuit.
	h) Motor/supply cable is defective.	Check motor and cable.
	i) Level sensor is dirty or defective.	Check cables. Clean or replace the level sensor.
	j) Pump is blocked or defective.	Clean, repair or replace the pump.
	k) Liquid level in collecting tank is too low.	Supply liquid (clean water) to the tank.
	l) Controller is defective.	Check the controller and replace possible defective components.
	m) The new DIP switch setting does not work correctly.	Switch off the electricity supply to the controller for 1 minute and switch it on again (normal procedure), see section 7.2.
2. The pump is starting/stopping frequently or runs constantly.	a) Level sensor is dirty or defective.	Check cables. Clean or replace the level sensor.
	b) Contactor in controller is defective.	Replace the contactor.
	c) Controller is defective.	Check the controller and replace possible defective components.
	d) Non-return valve is blocked or leaking.	Clean the non-return valve, see 8. <i>Maintenance and service</i> .

9.1 Fuses

The LC 109 and LCD 109 controllers are provided with a fine-wire fuse for protection of the electronics. If the fuse is defective, replace it by a fuse of the same type. A spare fuse is positioned inside the controller.

10. Technical data

Supply voltage

- 1 x 230 V -10/+6%, 50 Hz, PE.
- 3 x 230 V -10/+6%, 50 Hz, PE.
- 3 x 400 V -10/+6%/N, 50 Hz, PE.

See nameplate.

Supply system earthing

For TN systems and TT systems.

Rated insulation voltage, U_i

4 kV.

Rated impulse withstand voltage, U_{imp}

4 kV.

Back-up fuse

Controller	Back-up fuse
LC 109.230.1.7.35	16
LC 109.230.1.9.50	16
LC 109.230.3.6,5	16
LC 109.230.3.12	16
LC 109.400.3.4	16
LC 109.400.3.7	16
LCD 109.230.1.9.50	25
LCD 109.230.3.6,5 (4-pole)	16
LCD 109.230.3.12 (2-pole)	35
LCD 109.400.3.4 (4-pole)	16
LCD 109.400.3.7 (2-pole)	25

Output voltage for pump

- 1 x 230 V, 50 Hz.
- 3 x 230 V, 50 Hz.
- 3 x 400 V, 50 Hz.

Depending on the supply voltage.

Outputs for alarm devices

Max. 230 VAC / max. 2 A / min. 10 mA / AC1.

Controller power consumption

8-12 W.

Control circuit fuse

Fine-wire fuse: 250 mA / F / 32 mm x ø6 mm.

Ambient temperature

- During operation: 0°C to +40°C.
- In stock: -30°C to +50°C.

The controller must not be exposed to direct sunlight.

Liquid temperature

- 0°C to +40°C.
- For short periods up to +60°C (maximum 5 minutes per hour).

pH-value

4 to 10.

Maximum density of liquid

1100 kg/m³.

Operating mode

Max. 20 starts per hour.

Note that the pumps are only designed for intermittent operation.

Type	Operating mode
M.12.1.4	S3-13% 3 min.
M.15.1.4/MD.15.1.4	S3-13% 3 min.
M.12.3.4	S3-40% 1 min.
M.15.3.4/MD.15.3.4	S3-40% 1 min.
M.22.3.4/MD.22.3.4	S3-40% 1 min.
M.24.3.2/MD.24.3.2	S3-20% 1 min.
M.32.3.2/MD.32.3.2	S3-20% 1 min.

Performance

Type	$Q_{max.}$	$H_{min.}$	$H_{max.}$
	[m ³]	[m]	[m]
M.12.1.4	39.6	5.0	8.5
M.15.1.4	54.0	3.5	9.1
M.12.3.4	39.6	3.4	7.7
M.15.3.4	57.6	3.3	9.0
M.22.3.4	45.0	6.2	10.2
M.24.3.2	29.9	7.9	15.8
M.32.3.2	25.2	12.4	19.5

Motor protection

Thermal switch incorporated in motor windings.

Enclosure class

- Motor: IP 68.
- Controller: IP 55.

Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

EMC (electromagnetic compatibility)

According to EN 61000-6-2 and EN 61000-6-3.

Dimensions

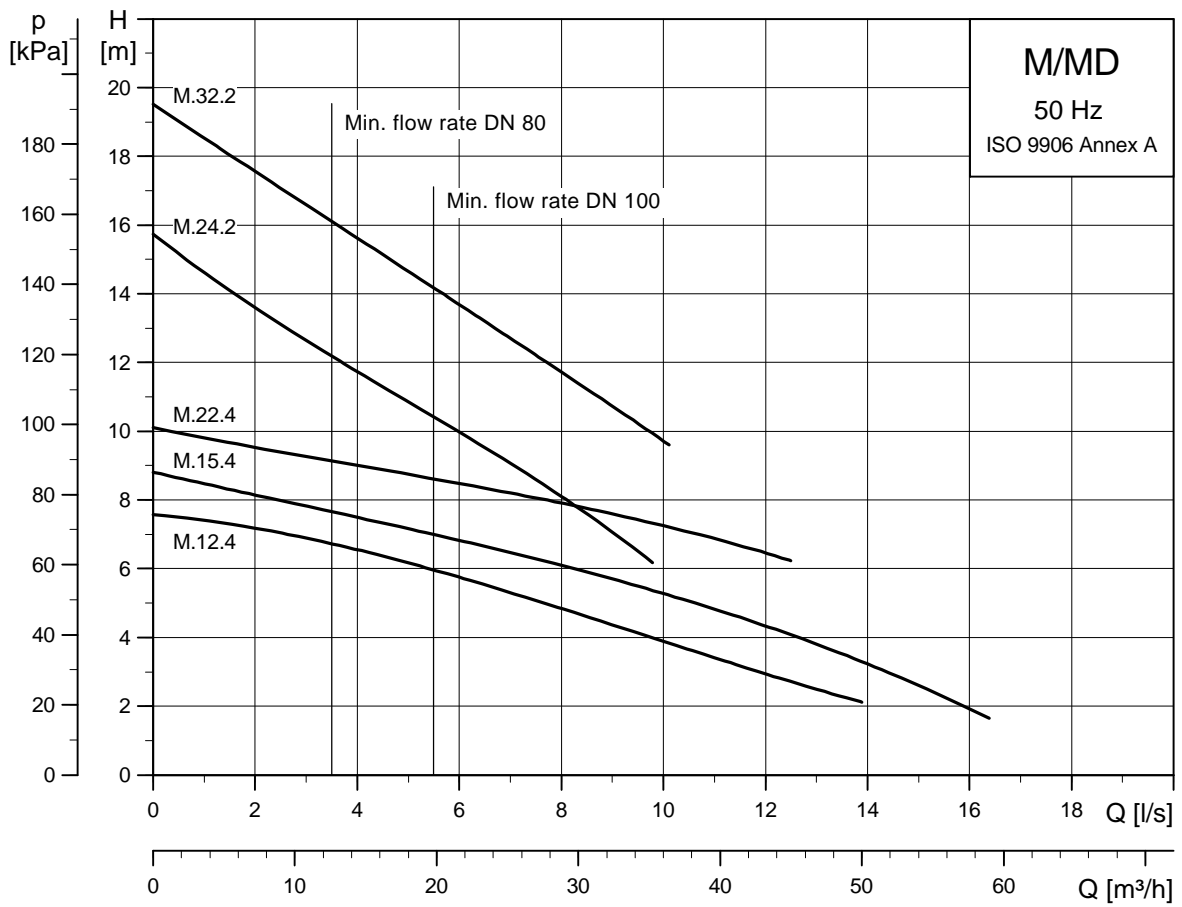
See dimensional sketches at the end of these instructions.

Controller cabinet

- **External dimensions:**
Height = 378 mm, bredde = 278 mm, dybde = 130 mm.
- **Material:** ABS (Acrylonitril butadien styren).
- **Weight:** Approx. 3 kg, see nameplate.

10.1 Pump curve

The curve is only intended as a guide and must *not* be used as a guarantee curve. Tolerances are according to ISO 9906 Annex A.



TM02 4079 0102

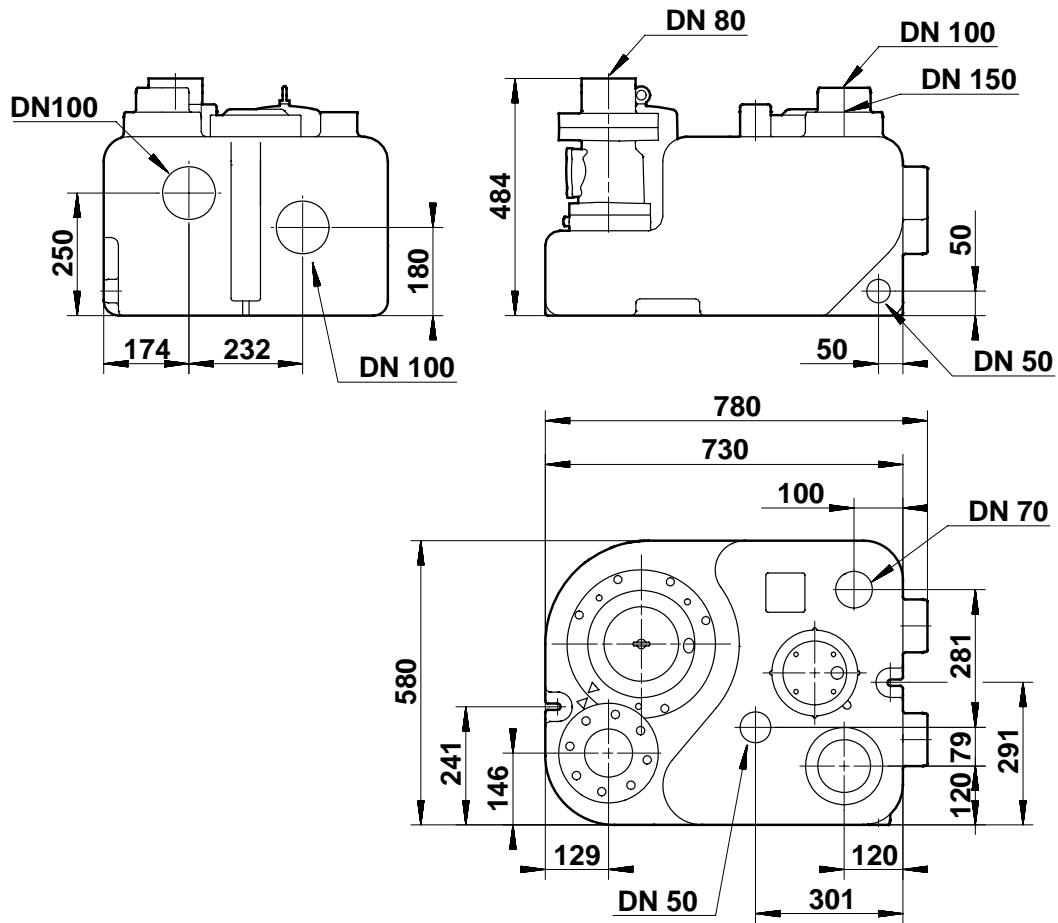
Fig. 14

11. Disposal

Disposal of this product or parts of it must be carried out according to the following guidelines:

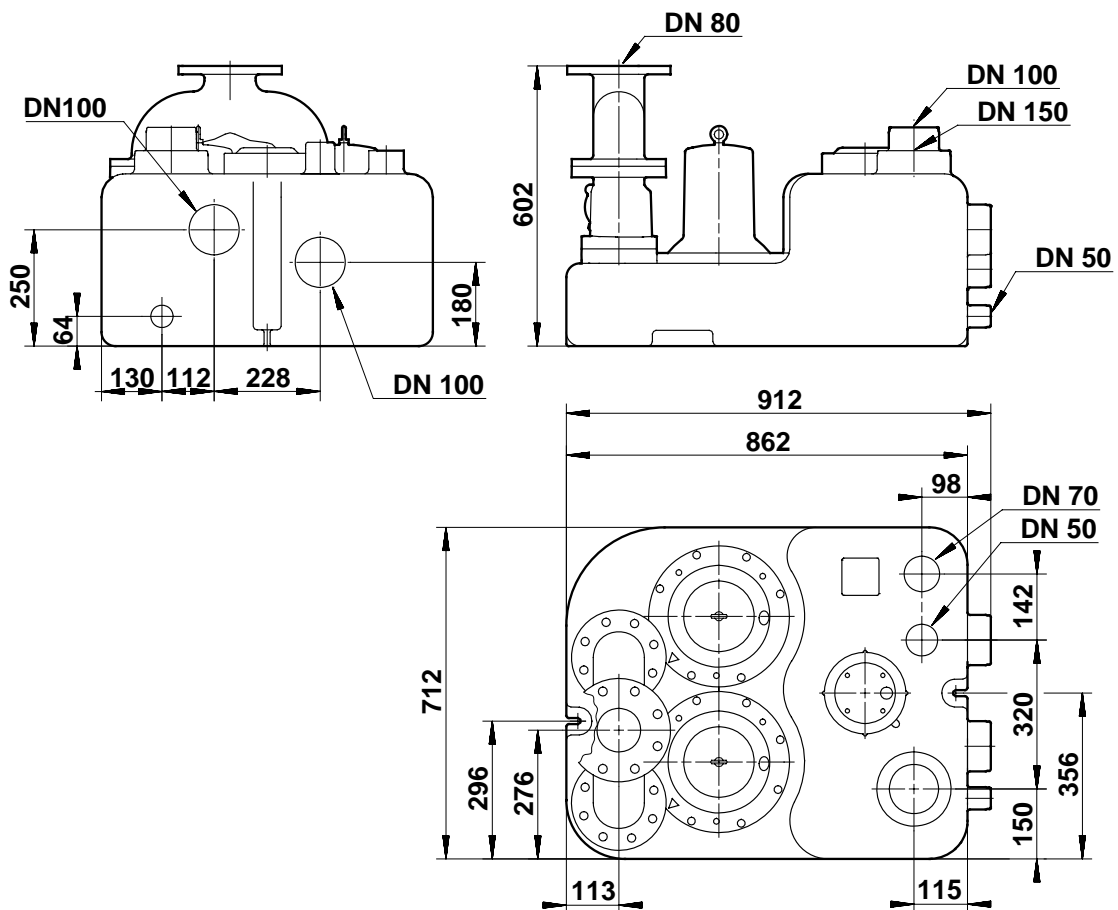
1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.

Fig. A - Dimensional sketch - M



TM02 4211 0202

Fig. B - Dimensional sketch - MD



TM02 4212 0202

Pos. no.	Description			
	GB	D	F	I
6	Collecting tank	Sammelbehälter	Réservoir	Serbatoio di raccolta
12	Discharge flange	Druckflansch	Bride de refoulement	Flangia di scarico
13	Breeches pipe	Hosenrohr	Bifurcations tuyau	Tubo di raccordo
18	Cleaning cover	Reinigungsdeckel	Couvercle de nettoyage	Coperchio di pulizia
18c	Hexagon socket head screw	Innensechskantschraube	Vis à tête hexagonale	Brugola esagonale
25a	Cover plate	Deckplatte	Plaque de couverture	Piastra di copertura
25b	Screw	Schraube	Vis	Vite
25c	Set screw	Gewindestift mit Innensechskant	Jeu de vis	Vite di regolazione
35	Hexagon socket head screw	Innensechskantschraube	Vis à tête hexagonale	Brugola esagonale
35b	Washer	Unterlegscheibe	Rondelle	Rondella
35c	Nut	Mutter	Ecrou	Dado
39	Gasket	Dichtung	Bague d'étanchéité	Guarnizione
49	Impeller	Lauftrad	Roue	Girante
55	Stator housing with stator	Statorgehäuse mit Stator	Chemise du stator avec stator	Alloggiamento statore con statore
55b	Hexagon socket head screw	Innensechskantschraube	Vis à tête hexagonale	Brugola esagonale
100	O-ring	O-Ring	Joint torique	O-ring
103	Lip seal ring	Lippendichtung	Joint d'étanchéité à lèvres	Guarnizione circolare a labbro
104	Lip seal ring	Lippendichtung	Joint d'étanchéité à lèvres	Guarnizione circolare a labbro
153	Ball bearing	Kugellager	Roulement à billes	Cuscinetto a sfere
154	Ball bearing	Kugellager	Roulement à billes	Cuscinetto a sfere
155	Bearing cover	Lagerdeckel	Couvercle de palier	Copricuscinetto
158	Corrugated spring	Gewellte Feder	Ressort ondulé	Molla ondulata
159a	O-ring	O-Ring	Joint torique	O-ring
167	Cable entry	Kabeleinführung	Entrée de câble	Pressacavo
172	Rotor with pump shaft	Rotor mit Pumpenwelle	Rotor avec arbre de pompe	Rotore con albero motore
181	Motor cable	Motorkabel	Câble moteur	Cavo motore
182	Level sensor	Niveausensor	Capteur de niveau	Sensore di livello
187	O-ring	O-Ring	Joint torique	O-ring
190	Lifting eye	Transportöse	Crochet de levage	Anello di sollevamento
210	Valve casing	Ventilgehäuse	Revêtement vanne	Alloggiamento valvola
211	Hexagon socket head screw	Innensechskantschraube	Vis à tête hexagonale	Brugola esagonale
211a	Washer	Unterlegscheibe	Rondelle	Rondella
212	Gasket	Dichtung	Bague	Guarnizione
215	Retainer for valve flap	Halter für Ventilklappe	Retenue pour soupape à clapet	Fermo per valvola a farfalla
217	Valve flap	Ventilklappe	Soupape à clapet	Valvola a farfalla
217a	O-ring	O-Ring	Joint torique	O-ring
220	Flange	Flansch	Bride	Flangia
220b	O-ring	O-Ring	Joint torique	O-ring

Pos. no.	Description			
	(E)	(P)	(GR)	(NL)
6	Tanque colector	Reservatório de recolha	Δεξαμενή περισυλλογής	Verzameltank
12	Brida de descarga	Flange de descarga	Φλάντζα κατάθλιψης	Afvoerflens
13	Tubo en Y	Tubo bifurcado	Εύκαμπτος σωλήνας	Broekstuk
18	Tapa de limpieza	Tampa de limpeza	Καπάκι καθαρισμού	Klep deksel
18c	Tornillo hexagonal	Parafuso sextavado interior	Άλλεν	Inbusbout
25a	Cubierta	Chapa de cobertura	Έλασμα καπακιού	Afdekplaat
25b	Tornillo	Parafuso	Βίδα	Schroef
25c	Tornillo de sujeción	Parafuso de pressão	Ρυθμιστικός κοχλίας	Stelbout
35	Tornillo hexagonal	Parafuso sextavado interior	Άλλεν	Inbusbout
35b	Arandela	Anilha	Ροδέλα	Ring
35c	Tuerca	Porca	Περικόχλιο	Moer
39	Junta	Junta	Παρέμβυσμα	Pakking ring
49	Impulsor	Impulsor	Πτερωτή	Waaier
55	Carcasa de estator con estator	Voluta do estator com estator	Περίβλημα στάτη με στάτη	Motorhuis met stator
55b	Tornillo hexagonal	Parafuso sextavado interior	Άλλεν	Inbusbout
100	Junta tórica	O-ring	Δακτύλιος-O	O-ring
103	Anillo de cierre labiado	Empanque vedante	Δακτύλιος στεγανοποιητικού χείλους	Keer ring
104	Anillo de cierre labiado	Empanque vedante	Δακτύλιος στεγανοποιητικού χείλους	Keer ring
153	Rodamiento de bolas	Rolamento	Σφαιρικό έδρανο	Kogellager
154	Rodamiento de bolas	Rolamento	Σφαιρικό έδρανο	Kogellager
155	Tapa del rodamiento	Tampa de chumaceira	Καπάκι εδράνου	Lager dichtingshuis
158	Muelle ondulado	Mola	Έλασμα ελατήριου	Golf ring
159a	Junta tórica	O-ring	Δακτύλιος-O	O-ring
167	Entrada de cable	Entrada do cabo	Είσοδος καλωδίου	Kabeldoorvoer
172	Rotor con eje de bomba	Rotor com veio de bomba	Ρότορας με άξονα αντλίας	Rotor
181	Cable de motor	Cabo do motor	Καλώδιο κινητήρα	Motorkabel
182	Sensor de nivel	Sensor de nível	Αισθητήρας στάθμης	Niveauschakelaar
187	Junta tórica	O-ring	Δακτύλιος-O	O-ring
190	Cáncamo	Olhal de elevação	Λαβή ανύψωσης	Hijsoog
210	Alojamiento de válvula	Voluta da válvula	Περίβλημα βαλβίδας	Klephuis
211	Tornillo hexagonal	Parafuso sextavado interior	Άλλεν	Inbus bout
211a	Arandela	Anilha	Ροδέλα	Ring
212	Junta	Junta	Παρέμβυσμα	Pakking ring
215	Retén para aleta de válvula	Anel de retenção da válvula de borboleta	Διάταξη συγκράτησης για πτερύγιο βαλβίδας	Klepveer
217	Aleta de válvula	Válvula de borboleta	Πτερύγιο βαλβίδας	Terugslagklep
217a	Junta tórica	O-ring	Δακτύλιος-O	O-ring
220	Brida	Flange	Φλάντζα	Flens
220b	Junta tórica	O-ring	Δακτύλιος-O	O-ring

Pos. no.	Description			
	(S)	(DK)	(PL)	(RU)
6	Uppsamlingsstank	Opsamlingsbeholder	Zbiornik	Сборный резервуар
12	Utloppsfläns	Afgangsflange	Króciec kołnierzowy	Фланец напорного патрубка
13	Grenrör	Bukserør	Trójnik	Y-образный симметричный тройник
18	Renslucka	Rengøringsdæksel	Pokrywa zaworu	Крышка окна для удаления загрязнений
18c	Insexskruv	Cylinderskrue med indvendig sekskant	Śruby imbusowe	Винт с внутренним шестигранником
25a	Täckplatta	Dækplade	Podkładka	Крышка
25b	Skruv	Skruer	Śruba	Винт
25c	Skruvstift	Gevindtap med indvendig sekskant	Śruba regulacyjna	Установочный винт
35	Insexskruv	Cylinderskrue med indvendig sekskant	Śruba imbusowa	Винт с внутренним шестигранником
35b	Bricka	Spændeskive	Podkładka	Шайба
35c	Mutter	Møtrik	Nakrętka	Гайка
39	Packning	Pakning	Uszczelka	Уплотнительная прокладка
49	Pumphjul	Løber	Wirnik	Рабочее колесо
55	Statorhus med stator	Statorhus med stator	Obudowa silnika ze statorem	Корпус со статором
55b	Insexskruv	Cylinderskrue med indvendig sekskant	Śruba imbusowa	Винт с внутренним шестигранником
100	O-ring	O-ring	Uszczelka O-ring	Уплотнительное кольцо круглого сечения
103	Läpptätning	Læbetætning	Uszczelnienie wargowe	Манжетное уплотнение
104	Läpptätning	Læbetætning	Uszczelnienie wargowe	Манжетное уплотнение
153	Kullager	Kugleleje	Łożysko kulkowe	Шарикоподшипник
154	Kullager	Kugleleje	Łożysko kulkowe	Шарикоподшипник
155	Lagerkåpa	Lejedæksel	Pokrywa łożyska	Крышка подшипника
158	Fjäder	Bølgefjeder	Pierścień sprężynujący	Гофрированная пружина
159a	O-ring	O-ring	Uszczelka O-ring	Уплотнительное кольцо круглого сечения
167	Kabelgenomföring	Kabelgennemføring	Dławik kablowy	Кабельный ввод
172	Rotor med pumpaxel	Rotor med pumpeaksel	Rotor z wałem pompy	Ротор с валом насоса
181	Motorkabel	Motorkabel	Kabel silnika	Кабель электродвигателя
182	Nivåsensor	Niveausensor	Czujnik poziomu	Датчик контроля уровня
187	O-ring	O-ring	Uszczelka O-ring	Уплотнительное кольцо круглого сечения
190	Lyftögla	Løfteøje	Zaczerp z uchem	Рым-болт
210	Ventilhus	Ventilhus	Obudowa zaworu	Корпус клапана
211	Insexskruv	Cylinderskrue med indvendig sekskant	Śruba imbusowa	Винт с внутренним шестигранником
211a	Bricka	Spændeskive	Podkładka	Шайба
212	Packning	Pakning	Uszczelka	Уплотнительная прокладка
215	Hållare för ventilklafter	Holder for ventilklap	Zacisk dla kłapy zaworu	Держатель заслонки клапана
217	Ventilklafter	Ventilklap	Kłapa zaworu	Заслонка клапана
217a	O-ring	O-ring	Uszczelka O-ring	Уплотнительное кольцо круглого сечения
220	Fläns	Flange	Kołnierz	Фланец
220b	O-ring	O-ring	Uszczelka O-ring	Уплотнительное кольцо круглого сечения

Pos. no.	Description			
	(HR)	(RO)	(BG)	(CZ)
6	sabirni spremnik	Rezervor de colectare	Колекторен резервоар	Akumulační nádrž
12	tlačna priрубnica	Flaşa de refulare	Нагнетателен фланец	Výtlačná příruba
13	rašljasta cijev	Racord în furcă	Тройник	Kalhotový trubní kus
18	poklopac za čišćenje	Capac de curăţare	Капак за почистване	Kryt čistícího otvoru
18c	nutarnji vijak sa šesterostranom glavom	Şurub cu cap cu locaş hexagonal	Винт с шестостенна глава	Šroub s vnitřním šestihranem
25a	pokrovna pločica	Placă de acoperire	Капак	Krycí deska
25b	vijak	Şurub	Винт	Šroub
25c	zatic s navojem	Şurub de reglare	Комплект винтове	Stavěcí šroub
35	nutarnji vijak sa šesterostranom glavom	Şurub cu cap cu locaş hexagonal	Винт с шестостенна глава	Šroub s vnitřním šestihranem
35b	podložna pločica	Şaibă	Шайба	Podložka
35c	matica	Piuliţă	Гайка	Matice
39	brtva	Garnitură	Гарнитура	Těsnicí kroužek
49	rotor	Rotor	Работно колело	Oběžné kolo
55	kućište statora sa statorom	Carcasa statorului cu stator	Статорен кожух със статор	Těleso statoru se statorem
55b	nutarnji vijak sa šesterostranom glavom	Şurub cu cap cu locaş hexagonal	Винт с шестостенна глава	Šroub s vnitřním šestihranem
100	O-prsten	Inel O	O-пръстен	O-kroužek
103	klinasta brtva	Inel muchie de etanşare	Уплътнителен пръстен - маншетен тип	Těsnicí kroužek (simmering)
104	klinasta brtva	Inel muchie de etanşare	Уплътнителен пръстен - маншетен тип	Těsnicí kroužek (simmering)
153	kuglični ležaj	Rulment	Съчмен лагер	Kuličkové ložisko
154	kuglični ležaj	Rulment	Съчмен лагер	Kuličkové ložisko
155	poklopac ležaja	Capac lagăr	Лагерен капак	Kryt ložiska
158	valovita opruga	Arc ondulat	Гофрирана пружина	Pružina
159a	O-prsten	Inel O	O-пръстен	O-kroužek
167	kabelska uvodnica	Intrarea cablului	Кабелен вход	Kabelová průchodka
172	rotor s vratilom crpke	Rotor cu arborele pompei	Ротор с вал	Rotor s hřídelem čerpadla
181	kabel motora	Cablul motorului	Кабел на двигателя	Motorový kabel
182	senzor razine	Senzorul de nivel	Сензор за ниво	Snímač hladiny
187	O-prsten	Inel O	O-пръстен	O-kroužek
190	transportna ušica	Urechea de ridicare	Халка за повдигане	Zvedací oko
210	kućište ventila	Carcasa vanei	Вентил	Těleso ventilu
211	nutarnji vijak sa šesterostranom glavom	Şurub cu cap cu locaş hexagonal	Винт с шестостенна глава	Šroub s vnitřním šestihranem
211a	brtveni prsten	Şaibă	Шайба	Podložka
212	brtva	Garnitură	Гарнитура	Těsnicí kroužek
215	držač zaklopke ventila	Dispozitiv de blocare pentru clapa vanei	Фиксатор на клапата	Držák klapky ventilu
217	zaklopka ventila	Clapa vanei	Клапа	Klapka ventilu
217a	O-prsten	Inel O	O-пръстен	O-kroužek
220	priрубnica	Flaşă	Стандартен фланец	Příruba
220b	O-prsten	Inel O	O-пръстен	O-kroužek

Pos. no.	Description
	(SK)
6	Akumulačná nádrž
12	Výtlačná príruha
13	Nohavicový potrubný kus
18	Kryt čistiaceho otvoru
18c	Skrutka s vnútorným šesťhranom
25a	Krycia doska
25b	Skrutka
25c	Nastavovacia skrutka
35	Skrutka s vnútorným šesťhranom
35b	Podložka
35c	Matica
39	Tesniaci krúžok
49	Obežné koleso
55	Teleso statora so statorom
55b	Skrutka s vnútorným šesťhranom
100	O-krúžok
103	Tesniaci krúžok (simmering)
104	Tesniaci krúžok (simmering)
153	Guličkové ložisko
154	Guličkové ložisko
155	Kryt ložiska
158	Pružina
159a	O-krúžok
167	Káblová priechodka
172	Rotor s hriadeľom čerpadla
181	Motorový kábel
182	Snímač hladiny
187	O-krúžok
190	Zdvíhacie oko
210	Teleso ventilu
211	Skrutka s vnútorným šesťhranom
211a	Podložka
212	Tesniaci krúžok
215	Držiak klapky ventilu
217	Klapka ventilu
217a	O-krúžok
220	Príruba
220b	O-krúžok

Fig. C - Exploded view - M

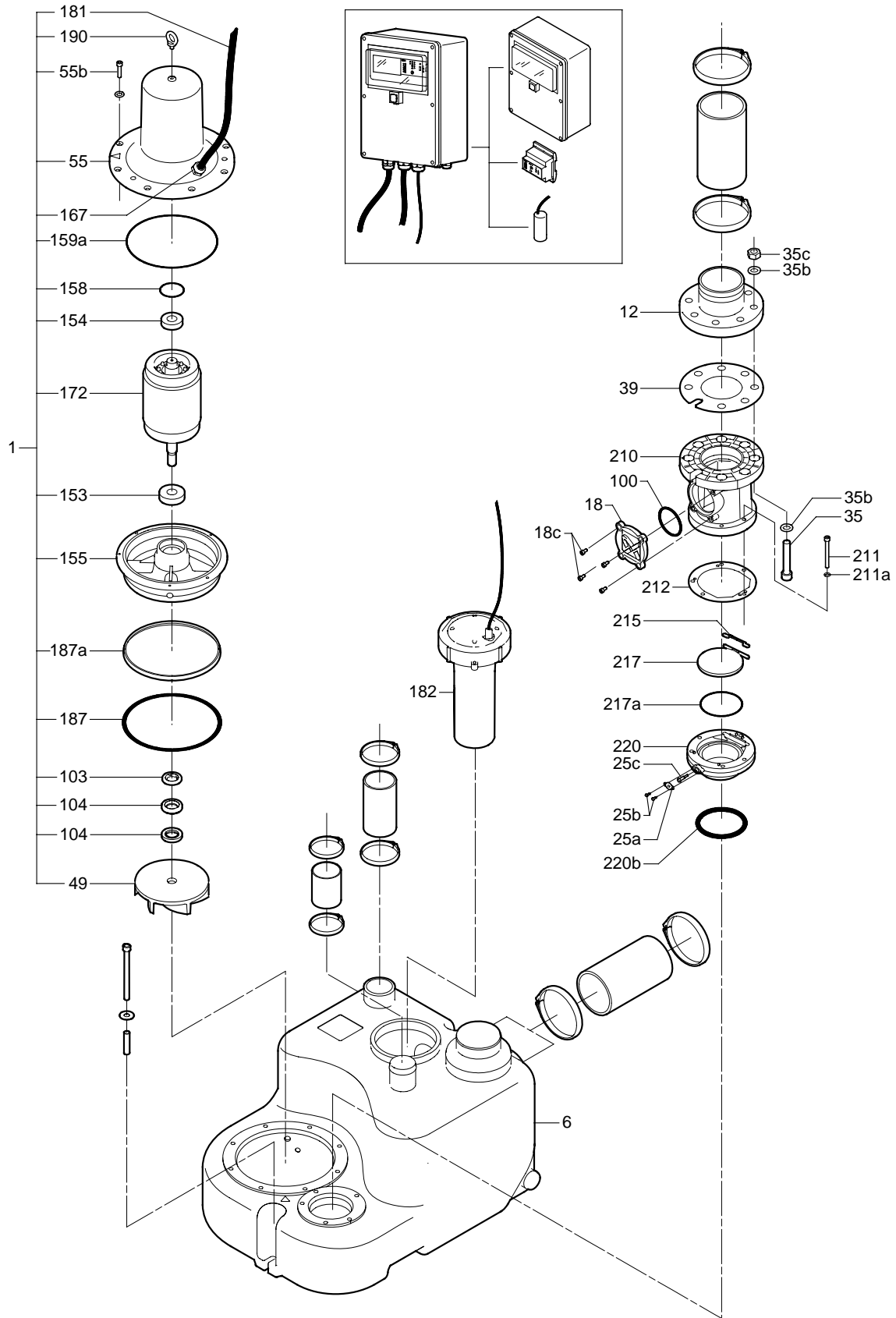
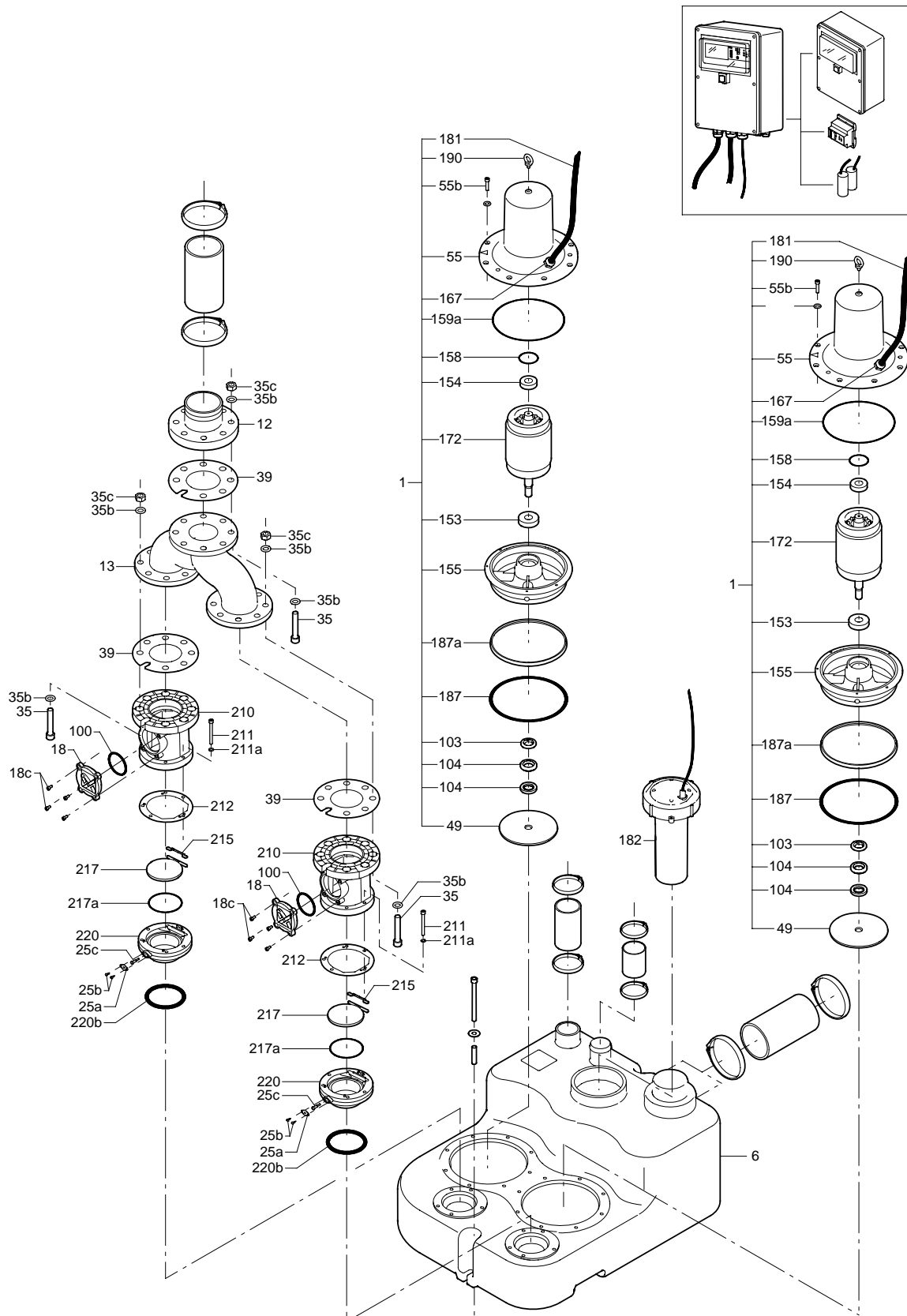


Fig. D - Exploded view - MD



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