

Wilo-Control MS-L 1x4kW



de Einbau- und Betriebsanleitung
en Installation and operating instructions
fr Notice de montage et de mise en service
es Instrucciones de instalación y funcionamiento
it Istruzioni di montaggio, uso e manutenzione
pt Manual de Instalação e funcionamento
nl Inbouw- en bedieningsvoorschriften
da Monterings- og driftsvejledning
sv Monterings- och skötselanvisning
fi Asennus- ja käyttöohje
el Οδηγίες εγκατάστασης και λειτουργίας

hr Upute za ugradnju i uporabu
sr Uputstvo za ugradnju i upotrebu
sl Navodila za vgradnjo in obratovanje
hu Beépítési és üzemeltetési utasítás
pl Instrukcja montażu i obsługi
cs Návod k montáži a obsluze
sk Návod na montáž a obsluhu
ru Инструкция по монтажу и эксплуатации
ro Instrucțiuni de montaj și exploatare
uk Інструкція з монтажу та експлуатації

Fig. 1

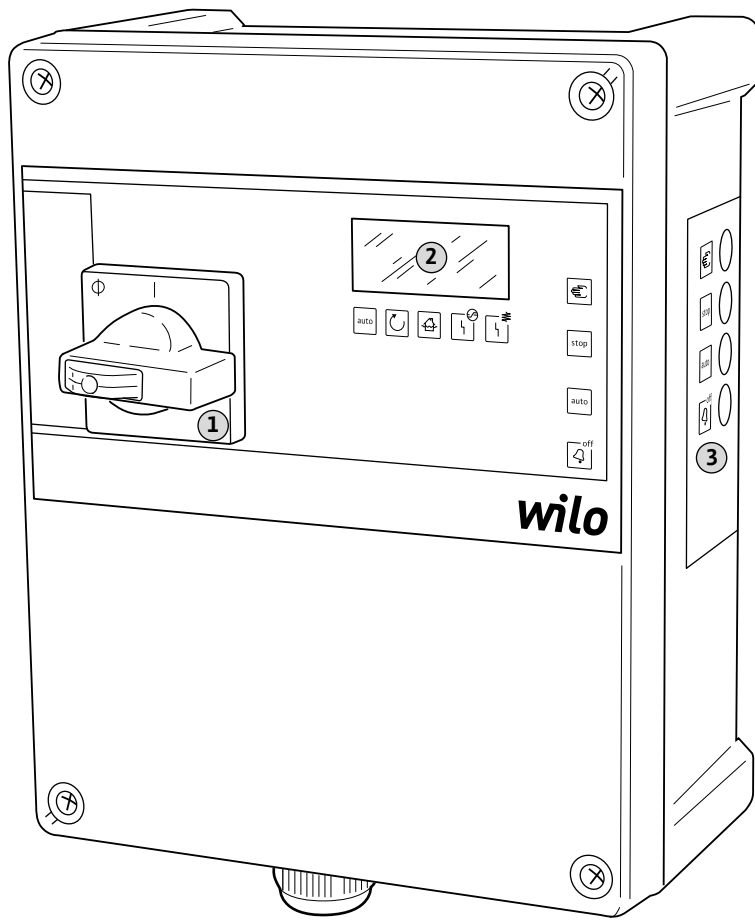


Fig. 2/A

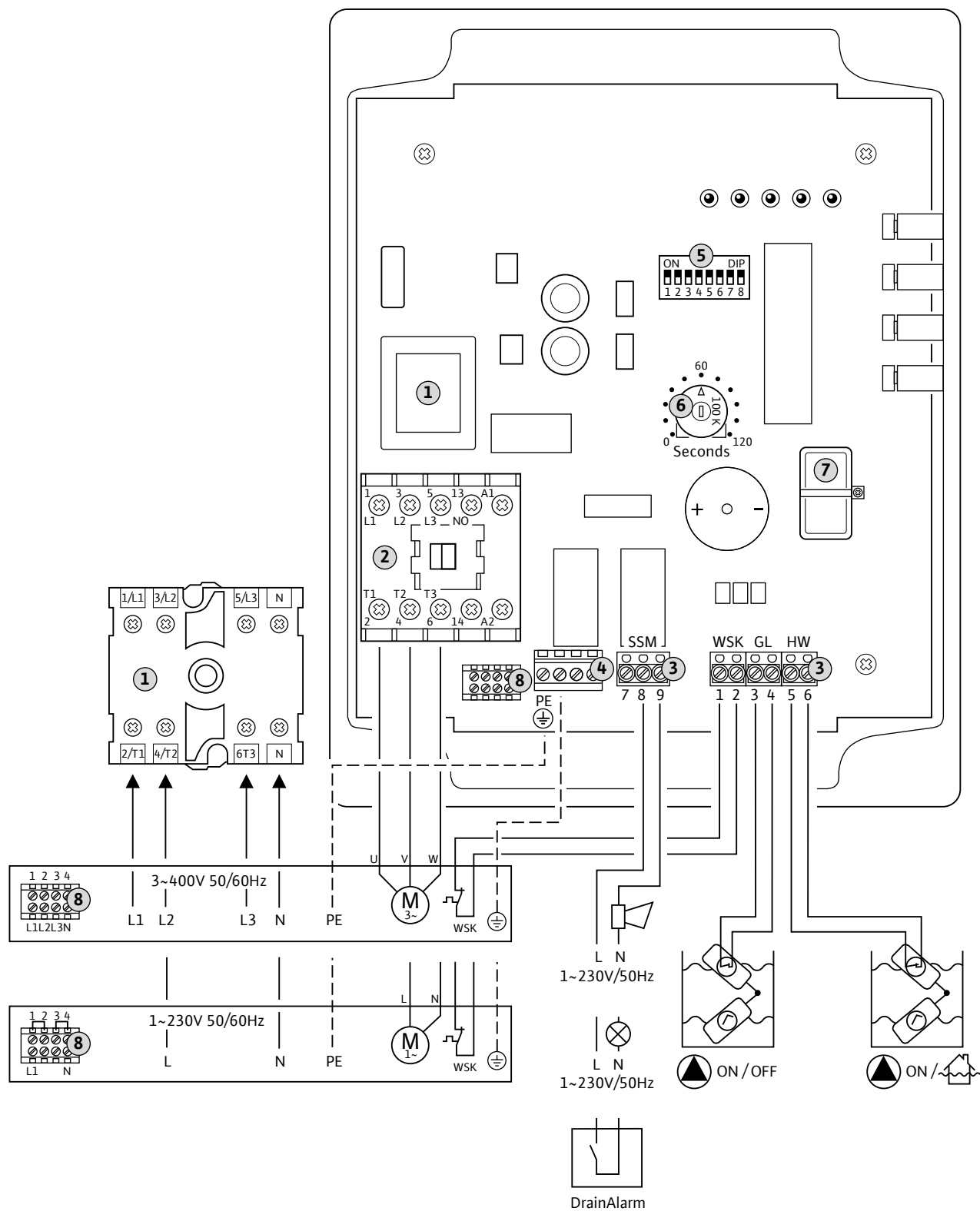
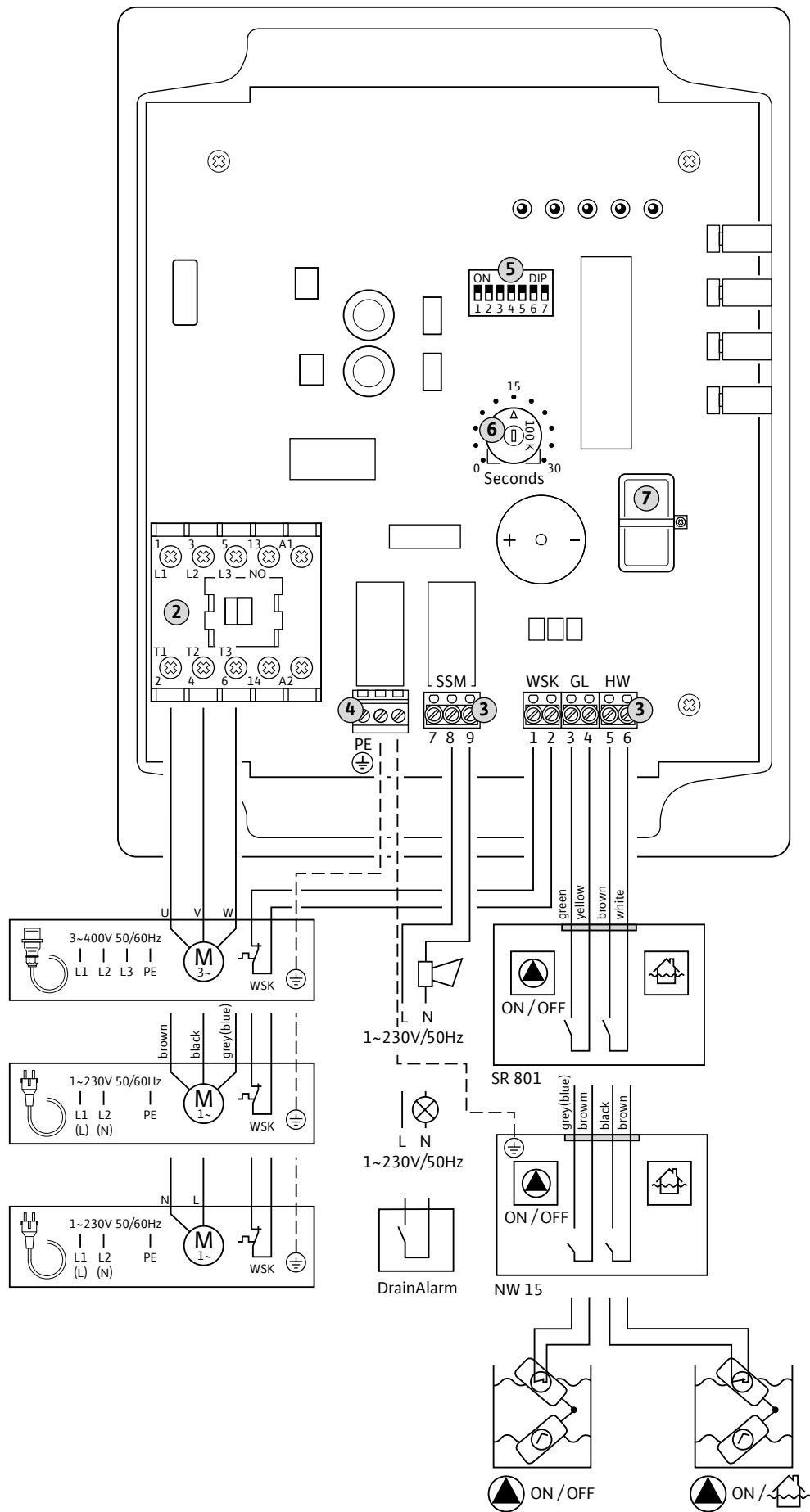
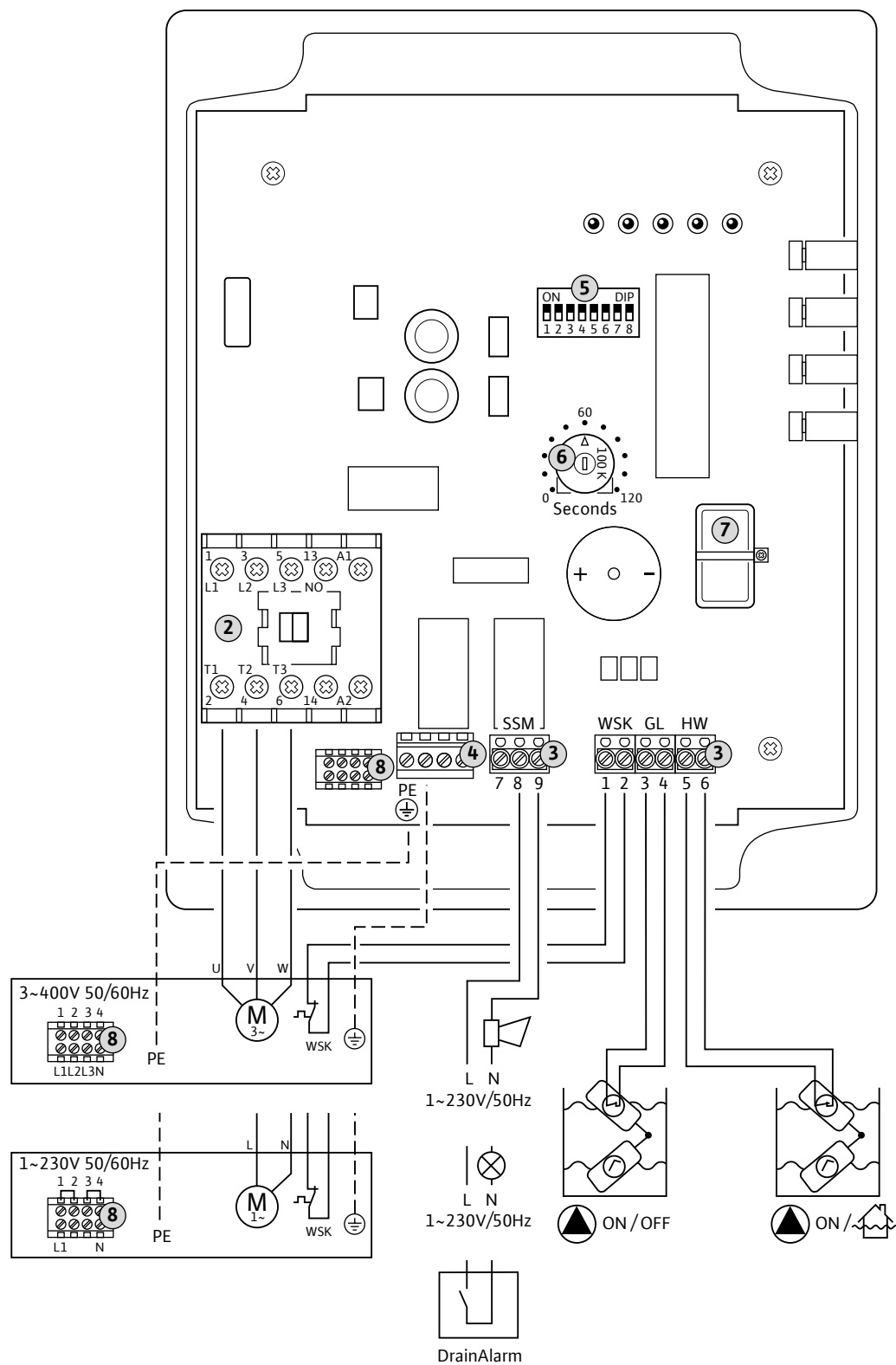


Fig. 2/B





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1. Introduction

1.1. About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

This manual is divided into individual sections, which are listed in the table of contents. Each section has a heading which clearly describes its content.

A copy of the EC declaration of conformity is a component of these operating instructions. If a technical modification is made on the designs named there without our agreement, this declaration loses its validity.

1.2. Personnel qualifications

All personnel who work on or with the switchgear must be qualified for such work; electrical work, for example, may only be carried out by a qualified electrician. All personnel must be of legal age. Operating and maintenance personnel must also observe national accident prevention regulations. It must be ensured that personnel have read and understood the instructions in this operating and maintenance handbook; if necessary, this manual must be ordered from the manufacturer in the required language.

This switchgear is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the switchgear by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the switchgear.

1.3. Copyright

This operating and maintenance manual has been copyrighted by the manufacturer. The operating and maintenance manual is intended for use by installation, operating and maintenance personnel. It contains technical regulations and drawings which may not be reproduced or distributed, either in whole or in part, used for purposes of competition or shared with third parties. Illustrations may differ from the original and serve only as example illustrations of switchgears.

1.4. Rights of modification

The manufacturer reserves the right to make technical modifications to systems or components. This operation and maintenance manual refers to the switchgear indicated on the title page.

1.5. Warranty

In general, the specifications in the current "general terms and conditions" apply for the warranty. You can find these here:

www.wilo.com/legal

Any deviations must be contractually agreed and shall then be given priority.

1.5.1. General

The manufacturer is obliged to correct any defects found in the switchgears it sells, provided that the one or more of the following is the case:

- The defects are caused by the materials used or the way the product was manufactured or designed.
- The defects were reported in writing to the manufacturer within the agreed warranty period.
- The switchgear was used only as prescribed.

1.5.2. Warranty period

The duration of the warranty period is stipulated in the "general terms and conditions".

Any deviations must be contractually agreed.

1.5.3. Spare parts, attachments and modifications

Only genuine spare parts from the manufacturer may be used for repairs, replacements, attachments and modifications. Unauthorised add-ons and modifications or the use of non-original spare parts can seriously damage the switchgear and/or injure personnel.

1.5.4. Maintenance

The prescribed maintenance and inspection work should be carried out regularly. This work may only be carried out by qualified, trained and authorised personnel.

1.5.5. Damage to the product

Damage and malfunctions that endanger safety must be eliminated immediately by trained personnel. The switchgear may only be operated if it is in proper working order.

In general, repairs should only be carried out by Wilo customer service.

1.5.6. Disclaimer

No liability will be assumed for damage to the switchgear if any of the following is the case:

- The manufacturer deems that information provided by the operator or customer is insufficient or incorrect
- Non-compliance with safety instructions and working instructions as specified in this operating and maintenance manual
- Improper use
- Incorrect storage and transport
- Improper assembly/dismantling
- Insufficient maintenance
- Incorrect repairs
- Inadequate construction site or construction work
- Chemical, electrochemical and electrical influences
- Wear

This means the manufacturer's liability excludes all liability for personal injury, material damage or financial losses.

2. Safety

This section lists all the generally applicable safety instructions and technical information.

In addition, all the other sections contain specific safety instructions and technical information. All instructions and information must be observed and followed during the various phases of the switchgear life cycle (installation, operation, maintenance, transport, etc.)! The operator is responsible for ensuring that all personnel follow these instructions and guidelines.

2.1. Instructions and safety instructions

This manual uses instructions and safety instructions for preventing injury and damage to property. To clearly identify them for personnel, the instructions and safety instructions are distinguished as follows:

- Instructions appear in bold and refer directly to the preceding text or section.
- Safety instructions are slightly indented and bold and always start with a signal word.
 - **Danger**
Serious or fatal injuries can occur!
 - **Warning**
Serious injuries can occur!
 - **Caution**
Injuries can occur!
 - **Caution** (instruction without symbol)
Substantial property damage can occur. Irreparable damage is possible!
- Safety instructions that refer to personal injury appear in black and are always accompanied by a safety symbol. Danger, prohibition or instruction symbols are used as safety symbols.
Example:



Danger symbol: General hazard



Danger symbol, for example, electrical current



Prohibition symbol, for example, Keep out!



Instruction symbol, for example, wear protective clothing

The safety symbols used conform to the generally applicable directives and regulations, such as DIN and ANSI.

- Safety instructions that only refer to material damage are printed in grey, without safety symbols.

2.2. General safety

- The electricity network must be switched off before any work is performed (installation, dismantling, maintenance). The switchgear must be disconnected from the electricity network and secured against reactivation.

- The person operating the switchgear must notify his or her supervisor immediately should any faults or irregularities occur.
- Where damage occurs to electrical components, cables and/or insulation, the switchgear must be shut down immediately by the operator.
- Tools and other objects should be kept in their designated places so that they can be found quickly.
- The switchgear may not be installed in potentially explosive areas. A risk of explosions pertains.

These instructions must be strictly observed.

Non-observance can result in injury or substantial material damage.

2.3. Electrical work



DANGER due to electrical voltage!

Improper procedures during electrical work may result in fatal injuries caused by electrical voltage! Such work may only be carried out by a qualified electrician.

BEWARE of moisture!

Ingress of moisture will result in damage to the switchgear. During installation and operation, pay attention to the permissible air humidity and ensure the switchgear is installed so it is overflow-proof.

Our switchgears are operated with alternating or three-phase current. The governing national directives, standards and regulations (e.g. VDE 0100) as well as the requirements of the local energy supply company must be observed.

The person operating the switchgear must know where it is supplied with power and how to cut off the supply. A residual-current device (RCD) must be provided by the customer.

The section entitled "Electrical connection" must be observed when connecting the product. The technical specifications must be observed strictly. The switchgear must always be grounded. To do this, connect the protective earth conductor at the earth terminal indicated (⊕). The cross section of the cable for the protective earth conductor must correspond to the local regulations.

If the switchgear has been switched off by a protective device, it must not be switched on again until the fault has been corrected.

Use of electronic devices such as soft starters or frequency converters is not possible with this switchgear. Pumps must be connected directly.

2.4. Conduct during operation

When operating the switchgear, always follow the locally applicable laws and regulations for work safety, accident prevention and handling electrical products. To help to ensure safe working practice, the responsibilities of employees should be clearly set out by the operator. All personnel are responsible for ensuring that regulations are observed.

Pushbuttons and LEDs on the housing are used to operate the switchgear, display the operating state, and signal faults. The housing cover must not be opened during operation.



DANGER due to electrical voltage!
There is a risk of fatal electric shocks occurring when performing work on the open switchgear. Only operate the switchgear with the cover closed!

2.5. Standards and guidelines used

The switchgear is subject to various European directives and harmonised standards. See the EC declaration of conformity for precise information about these.
Also, various regulations are used as a basis for operating, installation and dismantling the switchgear.

2.6. CE marking

The CE marking is attached to the rating plate.

3. Product description

The switchgear has been manufactured with great care and is subject to constant quality controls. Trouble-free operation is guaranteed if it is installed and maintained correctly.

3.1. Intended use and fields of application



DANGER – explosive atmosphere!
If the connected pump and signal transmitter are used in potentially explosive areas, there is a danger of fatal injuries from explosions! The connected pump and signal transmitter must always be used outside of potentially explosive areas. Installation must always be carried out by a qualified electrician.

The MS-Lift switchgear is designed for

- automatic control of 1 non Ex-rated pump in lifting units and sewage chambers for water/sewage conveyance.

The switchgear must **not**

- be installed in potentially explosive areas.
- be flooded.

Intended use also includes observation of these instructions. Any other use is considered to be outside the intended use.



NOTE
For automatic control, float switches must be provided by the customer.

3.2. Set-up

Fig. 1.: Overview of operating components

1	Main switch	3	Control panel with buttons
2	LED indicators		

The switchgear comprises the following main components:

- Main switch: for switching the switchgear on/off

NOTE



- The "S" version has no main switch. A plug is pre-assembled instead.
- The "O" version has no main switch and no plug. A corresponding mains disconnection facility must be provided by the customer in accordance with the local regulations.

- LEDs for displaying the current operating state (operation/fault)
 - Automatic mode
 - Pump operation
 - High water
 - Overload fault
 - Winding fault
- Control panel with buttons
 - Manual mode
 - Stop
 - Automatic mode
 - Buzzer OFF/reset
- Contactor combinations for connecting the pump for direct starting, including electronic triggering for excess current protection

3.3. Function description

The microcontroller-controlled Micro Control switchgear is designed for control of a fixed speed pump with level-dependent switching. Level measurement is carried out using two-position control with a float switch, which needs to be provided by the customer. The pump is activated/deactivated automatically depending on the fill level. If a follow-up time is required, this can be set via a potentiometer.
When the high water level is reached (detected by a separate float switch), a visual and audible signal is emitted and forced switch-on of the pump takes place. The collective fault signal (SSM) is active.
The current operating state is indicated via LEDs on the front side. Operation is via 4 pushbuttons on a control panel attached at the side.
Faults are indicated visually via LEDs and audibly via an integrated buzzer. The last error is stored in the fault memory.

3.4. Technical data

3.4.1. Inputs

- 2 digital inputs for float switches (pump on/off, high water)
- 1 input for thermal winding monitoring with bimetallic temperature sensor. Connection of PTC sensors is not possible!

3.4.2. Outputs

- 1 potential-free contact for SSM

3.4.3. Switchgear

Mains connection:	1~230 V or 3~400 V
Frequency:	50/60 Hz
Max. current:	12 A
Power consumption:	Contacteur taut: 15 VA Downtime status: 8 VA
Max. switching capacity P_2 :	4 kW, AC3
Max. fuse protection on mains side:	16 A
Activation type:	Direct start-up
Ambient/operating temperature:	-30 to +60 °C
Storage temperature:	-30 to +60 °C
Max. relative humidity:	50 %
Protection class:	IP 54
Control voltage:	24 VDC
Alarm contact switching capacity:	max. 250 V~, 1 A
Housing material:	Polycarbonate, UV-resistant
Housing dimensions (Wx-HxD):	191x240x107 mm
Electrical safety:	Degree of contamination II

3.5. Type key

Example: Wilo-Control MS-L 1x4kW-M-DOL-S	
MS	Micro Control switchgear for fixed speed pumps
L	Level-dependent control of the pump
1x	Max. number of pumps that can be connected
4kW	Max. permissible rated power (P_2) of pump
M	Mains connection: None = Choice of 1~230 V or 3~400 V M = alternating current (1~230 V) T4 = three-phase current (3~400 V)
DOL	Direct-on-line starting of pump
S	Version of switchgear: Without = standard version with main switch S = Version for lifting units without main switch, with cable and plug O = Version without main switch and without plug

3.6. Options

By inserting a rechargeable battery (available as an accessory) alarm signals can be emitted independent of the electricity network in case of a fault. An audible constant tone will be emitted as an alarm.

3.7. Scope of delivery

Standard variant and "O" variant

- Switchgear
- 2x reducing seals for threaded cable connection
- 2x assembled jumper wires for mains connection
- Installation and operating instructions

Variant "S"

- Switchgear with connected cable and plug:
 - 1~230 V: Shockproof plug
 - 3~400 V: CEE phase inverter plug with phase inverter
- Installation and operating instructions

3.8. Accessories

- Float switch WA for wastewater and sewage free of faeces
 - Float switch MS1 for abrasive sewage containing faeces
 - NiMH rechargeable battery (9 V/200 mAh) for alarm signals to indicate a power failure
 - Horn 230 V, 50 Hz
 - Flash light 230 V, 50 Hz
 - Signal lamp 230 V, 50 Hz
- Accessories have to be ordered separately.

4. Transport and storage

4.1. Delivery

On delivery, check immediately that the shipment is complete and undamaged. If any parts are damaged or missing, the transport company or the manufacturer must be notified on the day of delivery. Claims made after this date cannot be recognised. Damage to parts must be noted on the freight documentation.

4.2. Transport

Only the packaging used by the manufacturer or supplier may be used for transport. This normally precludes the possibility of damage occurring during transport and storage. The packaging should be stored in a safe place for reuse if the product is frequently used at different locations.

4.3. Storage

On delivery, switchgears may be placed into temporary storage for up to 1 year until use providing the details below are observed.

The following should be taken into consideration for storage:

- Place the packaged switchgear on a firm subsurface.
 - Our switchgears may be stored at -10 °C to +60 °C at a max. relative humidity of 50 %.
- The store room must be dry. We recommend a frost-protected room for storage with a temperature between 10 °C and 25 °C and a relative air humidity of 40 % to 50 %.

Avoid formation of condensate!

- Seal the threaded cable connections securely to prevent ingress of moisture.
- Connected power supply cables and attached plugs should be protected from kinking, damage, and moisture.

BEWARE of moisture!

Ingress of moisture will result in damage to the switchgear. During storage, pay attention to the permissible air humidity and ensure the switchgear is stored so it is overflow-proof.

- The switchgear must be protected from direct sunlight, heat and dust. Heat or dust can cause damage to electrical components!
- Following a longer period of storage, the switchgear should be cleaned of dust before commissioning. If condensate has formed, check the individual components are working properly. Defective components must be replaced immediately.

4.4. Return delivery

Switchgears which are returned to the plant must be clean and correctly packaged. The packaging must protect the switchgear from damage during transportation. If you have any questions, please contact the manufacturer.

5. Installation

In order to prevent damage to the switchgear or serious injury during installation, the following points must be observed:

- Installation work – assembly and installation of the switchgear – may only be carried out by qualified persons. The safety instructions must be followed at all times.
- The switchgear must be inspected for transport damage before carrying out any installation work.

5.1. General

For planning and operation of technical sewage systems, observe the pertinent local regulations and directives for sewage technology (such as those of the German Association for Water, Wastewater and Waste).

When adjusting level control devices, make sure that connected pumps have the minimum water coverage.

5.2. Types of installation

- Wall-mounted installation

5.3. Installation**DANGER due to explosive atmosphere!**

The switchgear is not approved for potentially explosive areas and must always be installed outside of such areas! Failure to observe this can lead to fatal injury due to explosion! Always have the connection carried out by a qualified electrician.

The following information must be observed when installing the switchgear:

- The work must be carried out by a qualified electrician.

- The installation location must be clean, dry and free of vibrations. Avoid exposing the switchgear to direct sunlight.
- The customer must provide the power supply cables. These must be of sufficient length so that connection to the switchgear is possible without any problems (no tugging on the cable, no kinking, no crushing). Check whether the cable present is long enough for its cross-section and its installation type.
- When using the "S" version, a suitable socket must be installed within a 1 m radius of the switchgear.
- Structural components and foundations must be of sufficient stability in order to allow the product to be fixed securely and functionally. The operator or the supplier is responsible for provision of the foundations and their suitability in terms of dimensions, stability and strength.
- The following ambient conditions must be observed:
 - Ambient/operating temperature: -30 ... +60 °C
 - Max. relative humidity: 50 %
 - Overflow-proof assembly
- Check the available consulting documentation (installation plans, design of installation location, wiring diagram) is complete and correct.
- Please also observe the applicable national accident prevention regulations and trade association safety provisions.

5.3.1. Basic advice on fixing the switchgear

The switchgear can be installed on various structures (concrete wall, mounting rail etc.). For this reason, the fixation materials provided by the customer must be suitable for the relevant structure.

Observe the following instructions for the fixation material:

- Ensure the proper edge clearance in order to prevent the construction material from tearing or chipping.
- The depth of the borehole depends on the length of the bolts. The borehole should be 5 mm deeper than the bolt length.
- Drilling dust impairs holding strength. Therefore: Always blow or vacuum out the borehole.
- Make sure the fixation material is not damaged during assembly.

5.3.2. Assembling the switchgear**Wall-mounted installation**

Fix the switchgear to the wall using 4 screws and 4 anchors.

1. Open the cover on the switchgear and place this on the intended assembly area.
2. Draw the four holes on the assembly area.
 - Drilling distances (WxH): 140x219 mm
 - Observe the information on the underside of the switchgear too!
3. Drill the holes according to the specifications for the fixation materials used.

4. Fix the switchgear using four screws (max. Ø: 4 mm) and appropriate anchors onto the wall.

5.3.3. Positioning of signal transmitters

For automatic control of the connected pump, a corresponding level control device must be installed. This needs to be provided by the customer.

Float switches may be used as signal transmitters. Connection of level sensors or electrodes is not possible! The corresponding signal transmitters must be installed according to the unit's installation plan.



DANGER – explosive atmosphere!

If the connected signal transmitters are used in potentially explosive areas, there is a danger of fatal injuries from explosions! The connected signal transmitters must always be used outside of potentially explosive areas. Installation must always be carried out by a qualified electrician.

Note the following:

- When using float switches, ensure that these can move freely in the operating space (pump chamber, reservoir).
- The water level of the connected pump must not fall below the minimum.
- The maximum switching frequency of the connected pump must not be exceeded.

5.4. Electrical connection



POTENTIALLY fatal danger due to electrical voltage!

Incorrect electrical connections can cause fatal electric shocks. Electrical connections may only be carried out by a qualified electrician approved by the local energy supply company, in accordance with locally applicable regulations.



DANGER – explosive atmosphere!

If the connected pump and signal transmitter are used in potentially explosive areas, there is a danger of fatal injuries from explosions! The connected pump and signal transmitter must always be used outside of potentially explosive areas. Installation must always be carried out by a qualified electrician.



NOTE

- Depending on the system's impedance and the connected consumers' max. no. of connections/hour, voltage fluctuations or voltage drops may occur. Always have the electrical connections carried out by an electrician authorised by the local energy supply company.
- Observe the installation and operating instructions for the connected pump and signal transmitters.
- The mains connection current and voltage must be as stated on the rating plate.

- All-pole disconnecting, K-type circuit breakers must be installed!
- Max. fuse protection on mains side: 16 A
- On switchgears without a power supply separation device (O version: without main switch or plug) this must be provided by the customer!
- It is recommended a residual-current-operated protection switch (RCD, type A, sinus wave-form current) be installed. Observe the local laws and regulations on this too!
- Route the power supply cable in accordance with the valid norms and regulations and according to the wiring diagram.
- Ground the system (switchgear and all electric consumers) in accordance with the regulations.

Fig. 2.: Overview of individual components

A	Switchgear with main switch		
W	Switchgear with plug		
C	Switchgear without main switch and plug		
1	Main switch	5	DIP switch
2	Motor contactor	6	Potentiometer for fol- low-up time
3	Terminal strip	7	Rechargeable battery installation location
4	Earth terminals	8	Mains terminal strip

5.4.1. Switchgear mains connection – with main switch

Insert the cable ends of the power supply cable laid on-site through the threaded cable connections and secure them accordingly.

Connect the wires **to the main switch** as follows:

- Mains connection 1~230 V:
 - Cable: 3-core
 - Terminals: 4/T2 (L), N (N)
 - The protective earth conductor (PE) is connected to the earth terminal (⊕).
 - DIP switch position "8": OFF (bottom position)

NOTE

To function correctly, 2 bridges (supplied) must be installed on the mains terminal strip:

- Terminal 1 and 2
- Terminal 3 and 4



- Mains connection 3~400 V:
 - Cable: 5-core
 - Terminals: 2/T1 (L1), 4/T2 (L2), 6/T3 (L3), N (N)
 - The protective earth conductor (PE) is connected to the earth terminal (⊕).
 - DIP switch position "8": ON (top position)
 - A **clockwise** rotating field must be present!

5.4.2. Switchgear mains connection – with plug ("S" version)

Insert the plug into the socket:

- Mains connection 1~230 V: Shock-proof socket
- Mains connection 3~400 V: CEE socket (a **clockwise** rotating field must be present)

5.4.3. Switchgear mains connection – without main switch and plug ("O" version)

Insert the cable ends of the power supply cable laid on-site through the threaded cable connections and secure them accordingly.
Connect the wires on the **mains terminal strip** as follows:

- Mains connection 1~230 V:
 - Cable: 3-core
 - Terminals: L1 (L), N (N)
 - The protective earth conductor (PE) is connected to the earth terminal (⊕).
 - DIP switch position "8": OFF (bottom position)



NOTE
To function correctly, 2 bridges (supplied) must be installed on the mains terminal strip:

- Terminal 1 and 2
- Terminal 3 and 4

- Mains connection 3~400 V:
 - Cable: 5-core
 - Terminals: L1 (L1), L2 (L2), L3 (L3), N (N)
 - The protective earth conductor (PE) is connected to the earth terminal (⊕).
 - DIP switch position "8": ON (top position)
 - A **clockwise** rotating field must be present!

5.4.4. Pump mains connection

Insert the cable ends of the pump power supply cables laid on-site through the threaded cable connections and secure accordingly.
Connect the wires **on the motor contactor** as follows:

- Pump connection 1~230 V, 3-core cable:
 - Terminals: 4/T2 (L), 6/T3 (N)
 - The protective earth conductor (PE) is connected to the earth terminal (⊕).



NOTE
With the "S" version the pump is connected at terminals 2/T1 (L), 4/T2 (N).

- Pump connection 3~400 V:
 - Terminals: 2/T1 (U), 4/T2 (V), 6/T3 (W)
 - The protective ground conductor (PE) is connected to the earth terminal (⊕).
 - A **clockwise** rotating field must be present!

Once the pump has been connected correctly, the motor protection needs to be adjusted.

Adjusting the motor protection

The electronic motor protection monitors the rated current of the connected pump during operation. Deactivation takes place immediately if the set rated current is exceeded.



NOTE
With connection of 3-phase current motors, deactivation also occurs after 10 sec. if the rated current drops below 300 mA during operation!

After each deactivation, the fault needs to be acknowledged via the "Reset" button.
The motor protection needs to be set to the rated current shown on the rating plate.
The desired rated current is set using the DIP switches 1–5. The lowest current value is 1.5 A, when all DIP switches are set to "OFF" position. Activating the individual DIP switches ("ON" position) increases the current value by the value of the relevant DIP switch.

DIP switch	1	2	3	4	5
Current value	0.5 A	1.0 A	2.0 A	3.0 A	4.0 A

Example: Required rated current 7.5 A
1.5 A + 2.0 A (DIP switch 3) + 4.0 A (DIP switch 5)
= 7.5 A

5.4.5. Winding temperature monitoring connection

Bimetallic strips may be connected for temperature monitoring.
Monitoring is self-acknowledging, meaning that after the motor has cooled down the error is reset automatically and the LED goes off.
Connect the wires at terminals 1 and 2 (WSK) on the terminal strip.



NOTE

- No external voltage may be applied!
- On connecting a winding monitoring device, the factory converter bridge must be removed!

5.4.6. Connection for level measurement signal transmitter

Level measurement is carried out using a float switch. Connection of level sensors and electrodes is not possible!
Insert the cable ends of the cable laid on-site through the threaded cable connections and secure accordingly.
Connect the wires at terminals 3 and 4 (GL) on the terminal strip.



NOTE
No external voltage may be applied!

5.4.7. High-water protection connection

A high-water alarm can be realized via a float switch. A visual (LED) and audible (buzzer) warning signal are first emitted followed by forced switch-on of the pump. The collective fault signal is also active.
Monitoring is self-acknowledging, meaning that after the water level has gone down the error is reset automatically and the LED goes off.
Insert the cable ends of the cable laid on-site through the threaded cable connections and secure accordingly.
Connect the wires at terminals 5 and 6 (HW) of the terminal strip.



NOTE

- No external voltage may be applied!
- We recommend high-water protection always be provided as additional fuse protection for the unit.

5.4.8. Collective fault signal connection

A potential-free contact is available via the corresponding terminals for external signals (e.g. horn, flash light or alarm unit).

- Contact: Changeover contact
- Terminals: 7, 8, 9
- Min. switching capacity: 12 VDC, 10 mA
- Max. switching capacity: 250 VAC, 1 A
- In case of an alarm, a drop in voltage and when the main switch is switched off, the contact between terminals 8 and 9 is closed.

Insert the cable ends of the cable laid on-site through the threaded cable connections and secure accordingly.

Connect the wires according to the required function at terminals 7, 8 and 9 of the terminal strip.


DANGER due to electrical voltage!

An external voltage is applied at the terminals for this function. This is also present at the terminals when the main switch is switched off! There is a risk of fatal injury! The power supply must be disconnected from its source before all work!

5.4.9. Switching the buzzer on/off

When the buzzer is switched on, audible warnings are also emitted in addition to the visual indicator. The internal buzzer can be switched on and off using DIP switch 7:

- "ON" position: Buzzer on
- "OFF" position: Buzzer off (factory setting)



NOTE

If the battery for alarms that are independent of the mains is installed, the buzzer cannot be switched off using the DIP switch during a power failure, when the main switch is switched off or the mains plug is disconnected. To deactivate the buzzer, the battery must always be removed in such cases!

5.4.10. Switching pump kick on/off

To prevent long shutdowns for the connected pumps, a periodic test run can be performed (pump kick function). A 2 s test run takes place after if the connected pump has been shut down for 24 h.

The function can be switched on and off using DIP switch 6:

- "ON" position: Pump kick on
- "OFF" position: Pump kick off (factory setting)

5.4.11. Adjusting the follow-up time

Follow-up time is the time between the float switch "OFF" signal and the pump being deactivated by the switchgear.

The follow-up time is continuously adjusted via the potentiometer. Setting range:

- Standard version: 0...120 s
- Version S: 0...30 s
- "O" version: 0...120 s

5.4.12. Installing the rechargeable battery

By inserting a rechargeable battery, alarm signals will be emitted independent of the electricity network on power failure. An audible, constant tone will be emitted as an alarm.

1. Place the rechargeable battery in the holder. Pay attention to the correct polarity.
2. Secure the rechargeable battery using the enclosed cable tie



NOTE

- To ensure perfect operation, the rechargeable battery must have been fully charged prior to insertion or have been charged for 24 h in the switchgear.
- The capacity of the rechargeable battery will fall if temperatures drop. This reduces the running time of the rechargeable battery.

6. Operation and function

This section contains all information on operating the switchgear and how it functions.


POTENTIALLY fatal danger due to electrical voltage!

There is a risk of fatal electric shocks occurring when performing work on the open switchgear. All work on individual components must be performed by a qualified electrician.



NOTE

Following a power supply interruption, the switchgear will automatically start up in the last operating mode set!

6.1. Controls

The switchgear is operated on the side control panel via 4 buttons. The current operating state is indicated via 4 LEDs on the front side.

6.1.1. Main switch (standard version only)

Disconnection from the mains is via a main switch on the standard version.





Position "0" = switchgear OFF






Position "1" = switchgear ON






NOTE

The main switch can be secured against unauthorised activation/deactivation using a lock!

6.1.2. Buttons	
	Manual mode Pressing the button activates the pump independently of the signal from the level control device. The pump operates as long as the button is held down. This function is intended for test mode.
	Automatic mode By pressing this button, automatic mode is activated. The pump is activated and deactivated depending on the signal from the level control device. When deactivating the pump, the pump follow-up time is taken into account.
	Stop By pressing this button, automatic mode is deactivated and the switchgear is set to stand-by mode. The pump is not controlled according to the level.
	Buzzer OFF/reset By pressing this button, the integrated buzzer is switched off during a warning and the collective fault signal relay (SSM) is deactivated. When held down for longer, the fault shown is acknowledged and control is reenabled.


6.1.3. LED indicators	
	Automatic mode (green) LED flashing: Switchgear is switched on but in stand-by mode. LED lights up: Automatic mode is activated.
	Pump operation (green) LED flashing: Pump running during the set follow-up time. LED lights up: Pump running.
	High water (red) LED lights up: High water level reached, high water alarm has been triggered
	"Excess current" fault (red) LED flashing: Switchgear is operating without any load. LED lights up: Rated current has been exceeded.
	"Winding monitoring" fault (red) LED lights up: Temperature sensor has triggered.

6.2. Button lock	
To prevent erroneous or unauthorised activation of buttons, a lock can be activated.	
	Activating/deactivating the button lock Simultaneously pressing the Manual mode, Stop and Automatic mode buttons (for approx. 1 s), activates/deactivates the button lock. All LEDs light up for approx. 2 sec by way of confirmation.
	
	


If a button is pressed when the button lock is active, all LEDs also light up for 2 sec.

NOTE
When the button lock is active, the buzzer can be switched off and the collective fault signal relay deactivated during an alarm signal with the Buzzer OFF/Reset button. Faults cannot be acknowledged nor can the control be released.

7. Commissioning



POTENTIALLY fatal danger due to electrical voltage!
Incorrect electrical connections can cause fatal electric shocks. Electrical connections may only be inspected by a qualified electrician approved by the local energy supply company, in accordance with locally applicable regulations.

NOTE

- Following a power supply interruption, the switchgear will automatically start up in the last operating mode set!
- Observe the installation and operating instructions for products provided on-site (float switches, connected pumps) as well as the system documentation!

The "Commissioning" section contains all the important instructions for operating personnel on commissioning and operating the switchgear safely.

Always keep this manual either by the switchgear or in a place specially reserved for it, where it is accessible for all operating personnel at all times. All persons working on or with the switchgear must have been provided with this operating and maintenance manual and have read and understood it.

In order to prevent damage or serious injury when commissioning the switchgear, the following points must always be observed:

- The switchgear must be installed as described in the "Installation" section and in accordance with the applicable national regulations.
- The switchgear must be properly fused and grounded.
- All unit safety devices and emergency cut-outs must be connected and inspected to ensure that they are working properly.
- The switchgear is suitable for use under the specified operating conditions.

7.1. Level control

The float switches are installed according to the specifications for the unit and the desired switching points have been set.

7.2. Operation in potentially explosive areas

The switchgear may not be installed or used in potentially explosive areas.
Connection of monitoring devices and signal transmitters used within potentially explosive areas is strictly prohibited.



DANGER due to explosive atmosphere!
If the switchgear or the connected pump and signal transmitter are used in potentially explosive areas, there is a danger of fatal injuries from explosions! The switchgear and connected pump and signal transmitter must always be used outside of potentially explosive areas.

7.3. Activating the switchgear



POTENTIALLY fatal danger due to electrical voltage!
All settings need to be made on the switchgear components. There is a risk of fatal electric shocks occurring when performing work on the open switchgear. All work must be carried out by a qualified electrician.



NOTE
Following a power supply interruption, the switchgear will automatically start up in the last operating mode set!

The following points must be checked before activation:

- Check the installation.
 - All terminals must be retightened.
 - DIP switches correctly set:
 - Motor protection (DIP switches 1–5)
 - Pump kick (DIP switch 6)
 - Buzzer (DIP switch 7)
 - Mains voltage selection (DIP switch 8)
 - Follow-up time
If corrections are necessary, proceed as in the section "Electrical connection".
1. Turn main switch to ON position. On switchgears with a plug, insert the plug into the corresponding socket.
 2. All LEDs light up for 2 sec.
 3. The switchgear is ready for operation.
 - The "auto" LED flashes: The switchgear is in stand-by mode, automatic mode is off.
 - The "auto" LED lights up: The switchgear is active, automatic mode is on. To set the switchgear to stand-by mode, press the Stop button.



NOTE
If an audible signal is sounded after activation and all LEDs flash anti-clockwise in turn (in light sequence), there is a phase fault in the mains connection. Follow the instructions under "Rotation control" for this.

7.4. Rotation control of connected three-phase AC motors

In the factory, a switchgear for a clockwise rotating field is checked for correct direction of rotation and set.
Observe the wire designations on the wiring diagram when connecting the switchgear and the connected pumps.

7.4.1. Checking the direction of rotation

The rotation control of the connected pump can be performed using a brief test run, max. 2 minutes.

1. Press the "Manual" button on the control panel.
2. The pump operates as long as the button is held down.

BEWARE of damage to the pump

A test run of the connected pump should only be performed under the permissible operating conditions. For this, observe the installation and operating instructions for the pump and ensure that the required operating conditions are complied with.

7.4.2. If the direction of rotation is not correct

After activation, an audible signal sounds and all LEDs flash in turn anti-clockwise:

The switchgear is incorrectly connected and the connected pump is not operating correctly.
2 phases/conductors of the power supply on mains side to the switchgear need to be swapped over.

Pump running incorrectly:

Connection of the switchgear is correct. Connection of the pump is incorrect. 2 phases of the mains supply to the pump supply line need to be swapped.

7.5. Activating automatic mode on the unit

Before automatic mode is switched on, check the settings for the switching level and follow-up time.

If all settings have been checked, you can switch the unit on.

1. Press the "auto" button on the control panel.
2. The "auto" LED lights up and the unit now runs in automatic mode. As soon as the float switches provide a corresponding signal, the pump is activated
 - "Pump ON" level: If the switch-on level is reached, the pump switches on and the "Pump operation" LED lights up continuously.
 - "Pump OFF" level: If the off level is reached, the follow-up time set is active. During the follow-up time, the "Pump operation" LED flashes. Once the follow-up time has elapsed, the pump is switched off and the "Pump operation" LED goes out.



NOTE

High-water protection is active in automatic mode. When the switch-on level for high-water protection is reached, the following occurs:

- a forced switch-on of the pump.
- a visual warning, the High water LED, lights up constantly.
- an audible warning is emitted via a constant tone.
- a collective fault signal contact (SSM) is activated.

7.6. Behaviour during operation

When operating the switchgear, always follow the locally applicable laws and regulations for work safety, accident prevention and handling electrical products.

To help to ensure safe working practice, the responsibilities of employees should be clearly set out by the operator. All personnel are responsible for ensuring that regulations are observed.

Check the settings at regular intervals as to whether they meet the current requirements. The settings may need to be adjusted.

8. Decommissioning/disposal

All work must be carried out with the greatest care.

8.1. Deactivating automatic mode on the unit

1. Press the "Stop" button on the control panel.
2. The "Pump operation" LED goes out.
3. The "auto" LED flashes.
4. The switchgear is in stand-by mode.



NOTE

High-water protection is **not** active in standby mode. When the switch-on level for high-water protection is reached, the following occurs:

- **no** forced switch-on of the pump.
- **a** visual and audible warning
- **The** collective fault signal contact (SSM) is activated.

8.2. Temporary decommissioning

For temporary deactivation, the control is switched off and switchgear is switched off via the main switch.

The switchgear and the unit are now ready for operation at any time. The defined settings are stored retentively in the switchgear and are not discarded.

Make sure that the ambient conditions are observed accordingly:

- Ambient/operating temperature: -30 ... +60 °C
- Air humidity: 40...50 %

Prevent formation of condensate!

BEWARE of moisture!

Ingress of moisture will result in damage to the switchgear. During standstill time, pay attention to the permissible air humidity and ensure the switchgear is stored so it is over-flow-proof.

1. Press the "Stop" button.
2. Wait until the "Pump operation" LED goes out.
3. The "auto" LED flashes.
4. Switch off the switchgear using the main switch ("OFF" position).

8.3. Final shutdown



POTENTIALLY fatal danger due to electrical voltage!

Incorrect procedures can cause fatal electric shocks. This work may only be carried out by a qualified electrician approved by the local power supplier, in accordance with locally applicable regulations.

1. Press the "Stop" button.
2. Wait until the "Pump operation" LED goes out.
3. The "auto" LED flashes.
4. Switch off the switchgear using the main switch ("OFF" position). On switchgears with a plug, remove the plug from the socket.
5. Switch off the entire unit so it is voltage-free and secure it against accidental activation.
6. If the terminal for the collective fault signal is occupied, the external voltage source present there must also be switched so it is voltage-free.
7. Disconnect all power supply cables and pull these out of the threaded cable connections.
8. Connect the ends of the power supply cables so that no moisture can enter into the cable.
9. Dismount the switchgear by undoing the screws on the substructure.

8.3.1. Return delivery/storage

For shipping purposes, the switchgear must be packaged so it is protected against knocks and waterproof.

Please also refer to the "Transport and storage" section.

8.4. Disposal

Proper disposal of this product avoids damage to the environment and risks to personal health.

- Use the services of public or private waste disposal companies, or consult them for the disposal of the product or parts thereof.
- For more information on proper disposal, please contact your local council or waste disposal office or the supplier from whom you purchased the product.

9. Maintenance and repair



POTENTIALLY fatal danger due to electrical voltage!

There is a risk of fatal electric shocks occurring when performing work on the open switchgear. During all work, the switchgear must be disconnected from the electricity network and secured against reactivation without permission. All electrical work must be carried out by a qualified electrician.

After completing maintenance or repair work, the switchgear must be connected according to the "Installation" section and activated as under "Commissioning".

Maintenance or repair work and/or constructional changes that are not listed in this operating and maintenance manual may only be carried out by the manufacturer or by authorised service centres.

9.1. Maintenance intervals

To ensure reliable operation, various maintenance tasks must be carried out regularly.



NOTE

When used in sewage lifting units inside buildings or on land plots, the maintenance intervals and work shown in DIN EN 12056-4 must be adhered to.

Before initial commissioning or after a longer period of storage:

- Clean the switchgear

Yearly

- Visual inspection of individual components

9.2. Maintenance work

Prior to maintenance work, the switchgear must be switched off as described under "Temporary shutdown". Maintenance work may only be carried out by qualified persons.

9.2.1. Clean the switchgear

Use a damp cotton cloth to clean the switchgear.
Do not use any aggressive or scouring cleaners or fluids!

9.2.2. Visual inspection of individual components

Have the individual components checked for wear by a qualified electrician or Wilo Customer Service (e.g. melting of protective contacts, deformation of plastic parts).

If severe wear is identified, have the affected components replaced by a specialist electrician or Wilo Customer Service.

9.3. Repair work

Prior to repair work, the switchgear must be switched off as described under "Final shutdown" and all power supply cables dismantled. Repair work must be carried out by an authorised service centre or Wilo Customer Service.

10. Troubleshooting and possible solutions



DANGER due to electrical voltage!

Improper procedures during electrical work may result in fatal injuries caused by electrical voltage! Such work may only be carried out by a qualified electrician.

Potential faults are indicated visually and audibly. According to the fault shown, the connected pump or signal transmitter must be checked for correct operation and replaced if necessary.

Only perform this work if suitably qualified personnel are available. Electrical work must be carried out by qualified electricians for instance. We recommend always having this work carried out by Wilo Customer Service.

Unsanctioned modifications to the switchgear are made at the operator's own risk and release the manufacturer from any warranty obligations.

10.1. Acknowledging faults



After a fault occurs, a visual and audible warning is output.

By briefly pressing the Buzzer OFF/reset button, the audible alarm is deactivated and collective fault signal relay (SSM) acknowledged.

When held down for longer (min. 1 sec), the fault is acknowledged and the control is reenabled.

A fault can only be acknowledged once it has been eliminated!

10.2. Fault signals



LED lights up red

Cause: permitted rated current has been exceeded, excess current release has been initiated

Solution: Checking the pump and the DIP switch setting



LED flashes red

Cause: Rated current below 300 mA during operation or phase L2 missing

Solution: Check mains connection of switchgear and pump connection



LED lights up red

Cause: Winding temperature monitoring has been triggered

Solution: Check pump and wiring (converter bridge may be missing); check pump operating conditions



LED lights up red

Cause: High-water alarm has been triggered.

Solution: Check pump/unit operating conditions and level settings

All LEDs light up simultaneously for 2 sec.

Cause: Button lock active

Solution: Deactivate the button lock by simultaneously pressing down the Manual Mode, Stop and Automatic Mode buttons (for approx. 1 s).

All LEDs light up from right to left.

Cause: Incorrect phase sequence in mains connection

Solution: Swap over 2 phases in the switchgear's mains connection

10.3. Fault memory

The switchgear has a fault memory. The last fault is stored retentively in the fault memory.



Opening the fault memory

By pressing down the Stop and Automatic Mode buttons simultaneously, the last fault is indicated by the corresponding LED.





Deleting the fault memory

Simultaneously pressing and holding down (for approx. 1 s) the Manual mode and Stop buttons erases the fault memory.



10.4. Further steps for troubleshooting

If the points listed here do not rectify the fault, contact Wilo Customer Service. They can help you as follows:

- Telephone and/or written support from Wilo Customer Service
- On-site support from Wilo customer service
- Inspection or repair of the switchgear at the factory

Please note that you may be charged for some services provided by our customer service.

For more details, please contact Wilo Customer Service.

11. Appendix

11.1. System impedance tables

System impedances for 1~230 V, 2-pole, direct starting

Power kW	System impedance ohms	Connections/h
1.5	0.4180	6
2.2	0.2790	6
1.5	0.3020	24
2.2	0.1650	24
1.5	0.2720	30
2.2	0.1480	30

System impedances for 3~400 V, 2-pole, direct starting

Power kW	System impedance ohms	Connections/h
2.2	0.2788	6
3.0	0.2000	6
4.0	0.1559	6
2.2	0.2126	24
3.0	0.1292	24
4.0	0.0889	24
2.2	0.1915	30
3.0	0.1164	30
4.0	0.0801	30

System impedances for 3~400 V, 4-pole, direct starting

Power kW	System impedance ohms	Connections/h
3.0	0.2090	6
4.0	0.1480	6
2.2	0.2330	24

System impedances for 3~400 V, 4-pole, direct starting

Power kW	System impedance ohms	Connections/h
3.0	0.1380	24
4.0	0.0830	24
2.2	0.2100	30
3.0	0.1240	30
4.0	0.0740	30

11.2. Spare parts

Spare parts can be ordered from Wilo Customer Service. To avoid return queries and incorrect orders, the serial and/or article number must always be supplied.

Subject to change without prior notice!

D EG – Konformitätserklärung
GB *EC – Declaration of conformity*
F *Déclaration de conformité CE*

*(gemäß 2004/108/EG Anhang IV,2 und 2006/95/EG Anhang III,B,
according 2004/108/EC annex IV,2 and 2006/95/EC annex III,B,
conforme 2004/108/CE appendice IV,2 et 2006/95/CE appendice III B)*

Hiermit erklären wir, dass die folgenden elektronischen Schaltgeräte der Baureihe :
Herewith, we declare that the types of electronic switch boxes of the series:
Par le présent, nous déclarons que les types de coffrets électroniques des séries :

Control MS-Lift
Control MP-Lift

(Die Seriennummer ist auf dem Typenschild des Produktes angegeben.
The serial number is marked on the product site plate.
Le numéro de série est inscrit sur la plaque signalétique du produit.)

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:
in its delivered state complies with the following relevant provisions:
est conforme aux dispositions suivants dont il relève:

Niederspannungsrichtlinie
Low voltage directive
Directive basse-tension

2006/95/EG

Elektromagnetische Verträglichkeit – Richtlinie
Electromagnetic compatibility – directive
Compatibilité électromagnétique– directive

2004/108/EG

und entsprechender nationaler Gesetzgebung.
and with the relevant national legislation.
et aux législations nationales les transposant.

angewendete harmonisierte europäische Normen, insbesondere:
as well as following relevant harmonized European standards:
ainsi qu'aux normes européennes harmonisées suivantes:

EN 61439-1
EN 61439-2
EN 60204-1
EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007
EN 61000-6-4:2007

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