Pioneering for You

Wilo-Control SC-Fire Diesel DK

en Installation and operating instructions

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Fig. 1:

BATTERY A
AUTOMATIC MODE

BATTERY B
AUTOMATIC MODE

BATTERY C
MANUAL MODE

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Smart Control

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**

SPRINKLER PUMP MOTOR SUPPLY.
NOT TO BE SWICHED OFF
IN THE EVENT OF FIRE

I ON

0 OFF

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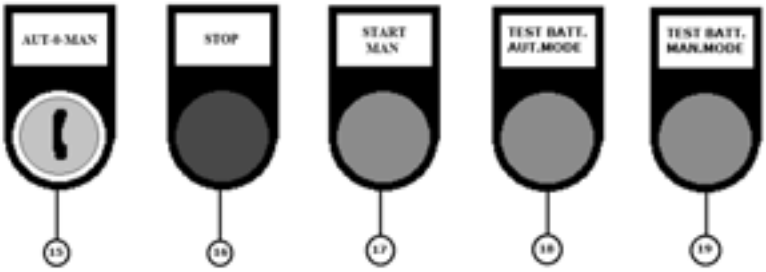

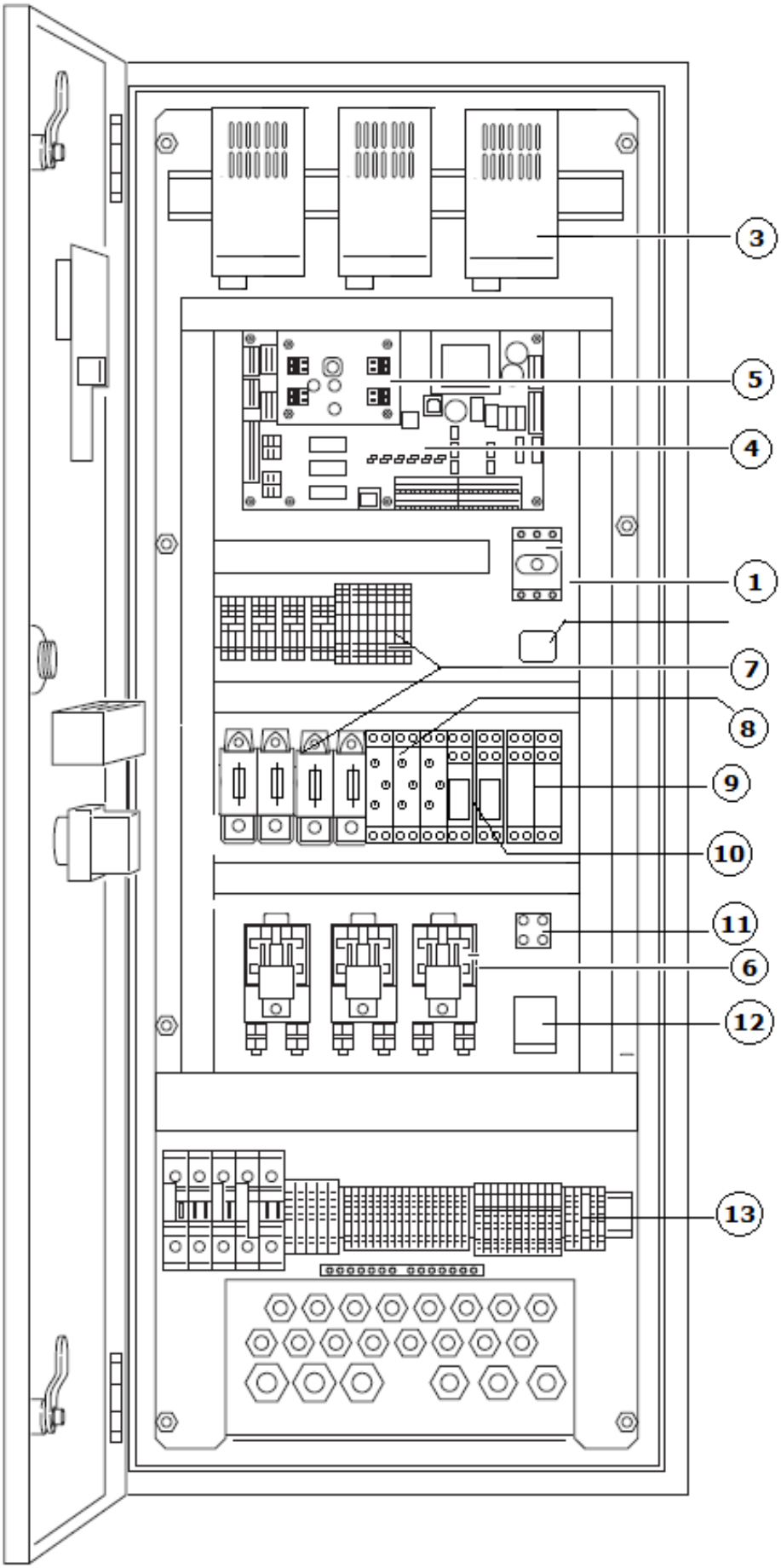
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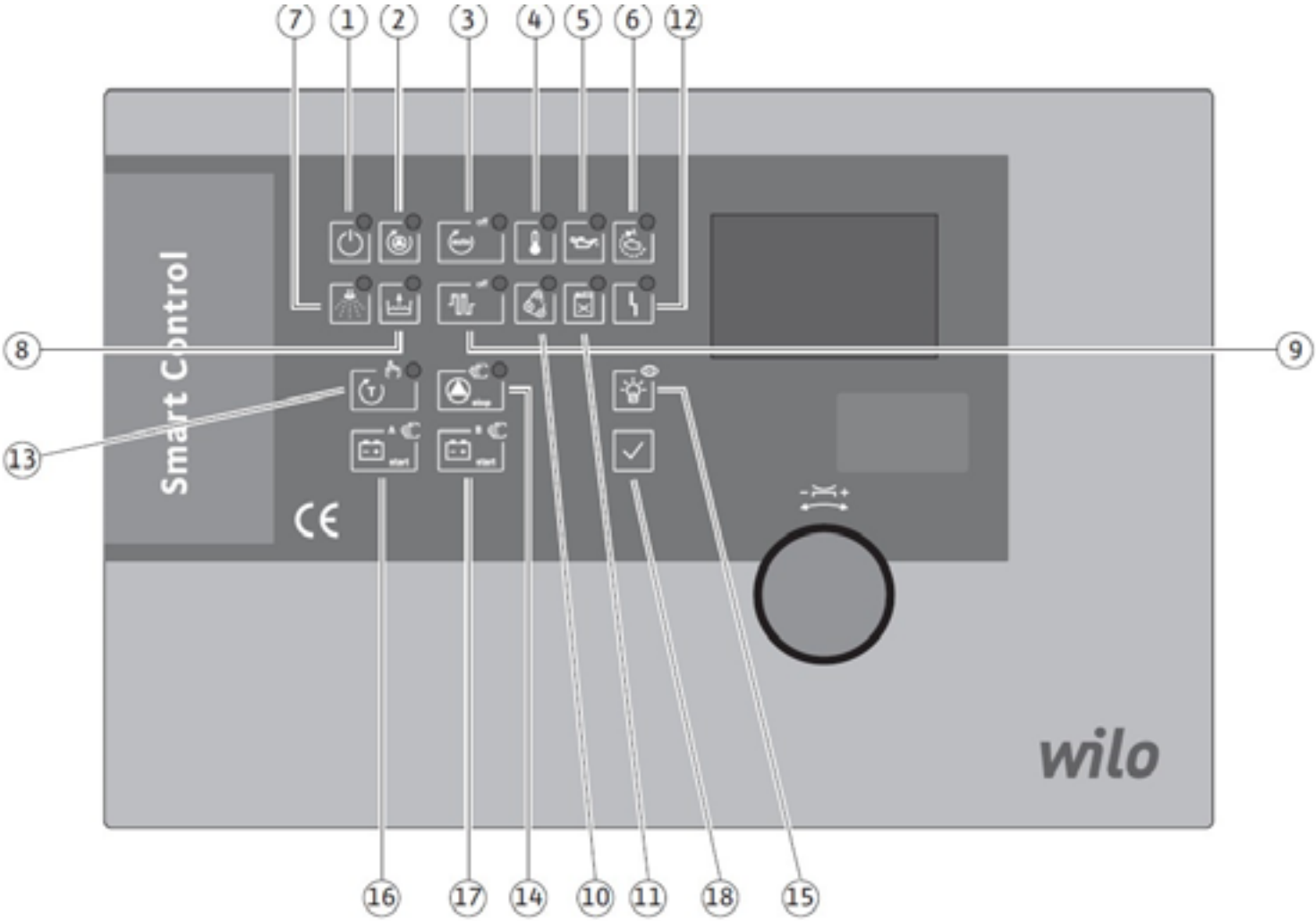
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Smart Control
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Captions

Fig. 1	Switchgear set-up
1	Main switch: for switching the switchgear on/off
2	Menu selection and parameter input
3	Chargers for automatic charging of the start-er batteries
4	Base board: printed circuit board with micro controller
5	Converter rpm board
6	Contactors/relay for connecting the battery for motor starter switch
7	Fusible cut-outs
8	Timer relay for batteries test on manual and automatic start
9	Control relay batteries voltage for manual and automatic start
10	Auxiliary relays
11	Diode bridge
12	Electric stop control relay
13	Terminal strip
14	EMC filter
15	Mode selector AUT-0-MAN
16	Stop button
17	Manual start button
18	Test button “battery automatic start”
19	Test button “battery manual start”
20	Voltmeter for batteries
**	Note regarding the main switch: Power supply for the sprinkler pump motor DO NOT SWITCH OFF IN THE EVENT

Fig. 2	Switchgear display elements
1	LED (green): Operational standby
2	LED (green): Pump operation
3	LED (yellow): Automatic mode
4	LED (yellow): Excess motor tempera-ture (cooling water)
5	LED (yellow): Oil pressure fault
6	LED (yellow): False start
7	LED (white): Sprinkler request
8	LED (white): Float switch request (pump priming tank) A and B batteries active test
9	LED (yellow): Heating fault

10	LED (yellow): Belt break
11	LED (yellow): Lack of fuel
12	LED (yellow): Collective fault
13	LED (yellow) and button: Test device for manual starter device
14	LED (red) and button: Manual pump stop
15	Button: Lamp test
16	Button: Manual start of battery A
17	Button: Manual start of battery B
18	Button: Acknowledgement of error messages

1 General

1.1 About this document

The language of the original operating instructions is Italian. All other languages of these instructions are translations of the original operating instructions.
These Installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.
These Installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

EC-Declaration of conformity:
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 or the declarations made in the Installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail, be read by the service technician and the responsible specialist/operator before installation and commissioning.
It is not only the general safety instructions listed under the main point "safety" that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Indication of instructions in the operating instructions

Symbols:
General danger symbol

Danger due to electrical voltage

NOTE

Signal words: DANGER!
Acutely dangerous situation.
Non-observance results in death or the most serious of injuries.
WARNING!
The user can suffer (serious) injuries. "Warning" implies that (serious) injury to persons is probable if this information is disregarded.
CAUTION!
There is a risk of damaging the pump unit.
"Caution" implies that damage to the product is likely if this information is disregarded.
NOTE:
Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as:

2.1.1 Direction of rotation arrow,

2.1.2 Identification for connections,

2.1.3 Rating plate,

2.1.4 Warning sticker,

must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages.
In detail, non-observance can, for example, result in the following risks:

2.3.1 Danger to persons from electrical, mechanical and bacteriological influences

2.3.2 Damage to the environment due to leakage of hazardous materials

2.3.3 Property damage

2.3.4 Failure of important product/unit functions

2.3.5 Failure of required maintenance and repair procedures

2.4 Safety consciousness on the job

The safety instructions included in these Installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

2.5 Safety instructions for the operator

This appliance 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 appliance

by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/unit lead to hazards, then local measures must be taken to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from the shaft seals) of hazardous fluids (which are explosive, toxic or hot) must be led away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Highly flammable materials are always to be kept at a safe distance from the product.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions.
Work on the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the Installation and operating instructions for shutting down the product/unit be complied with.
Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/ personnel and will make void the manufacturer's declarations regarding safety.
Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and interim storage

Immediately after receiving the product:

- Check product for transport damage.
- In the event of damage in transit, take the necessary steps with the forwarding agent within the respective time limits.

⚠ **CAUTION! Risk of property damage! Incorrect transport and interim storage can cause property damage.**

- **The switchgear is to be protected against moisture and mechanical damage.**
- **It must not be exposed to temperatures outside the series of -10 °C to +50 °C.**

4 Application (intended use)

The SC Fire switchgear is used to control an individual diesel pump in automatic sprinkler systems, in accordance with EN 12845.
The device is used in residential and office buildings, hospitals, hotels, administrative and industrial buildings.
The pump is used in conjunction with suitable signal transmitters and it is switched on according to the pressure or on and off according to the level.
The intended use includes complying with these instructions.
Any other use is considered to be outside the intended use.

5 Product information

5.1 Type key

Example:	W-CTRL-SC-F-1x4.25-47.7KW-M- FM- ND4-D
W	W = WILO
CTRL	Control
SC	Smart Control = control unit
F	F = fire fighting purposes
1x	Number of pumps
47.7 kW	Rated power of diesel engine [kW]
M	1~230 V, 50 Hz
FM	Frame mounted (on a base frame)
ND4	New Design switchgear 400 x 950 x 250 mm
D	Switchgear for diesel pump
DK	Denmark or Danish version

5.2 Technical data (standard version)

Mains supply voltage [V]:	1~230 V (L, N, PE)
Frequency [Hz]:	50/60 Hz
Control voltage [V]:	12/24 V DC
Max. current consumption [A]:	See rating plate
Protection class:	IP54
Max. fuse protection on mains side [A]:	See wiring diagram
Ambient temperature [°C]:	0 to +40 °C
Electrical safety:	Degree of contamination II
Alarm/signalling contact	250 VAC, 1 A

5.3 Scope of delivery

- Switchgear
- Wiring diagram
- Installation and operating instructions
- Test report acc. to EN 60204-1

6 Description and function

6.1 Description of the product (Fig. 1)

6.1.1 Function description

The switchgear is used to control a diesel pump in sprinkler systems, in accordance with EN 12845. The control panel has two starting circuits, an automatic one and an emergency manual one, the two circuits are independent of each other. The automatic starter circuit is powered by two batteries, which are not interconnected thanks to a diode bridge, and it is controlled and operated by PCB (Fig. 1, items 4 and 5) and control panel. The diesel engine starts automatically via pressure switch (Fig. 2, item 7) or float switch (Fig. 2, item 8). Six start attempts are performed at most (three for battery A and B). Once it gets started it can only be stopped manually using the stop button (Fig. 2 item 14) if the starting conditions have been restored; in case the pressure should not be reestablished or the level of the priming tank should not have been reached, it can only be stopped in automatic mode (via the key switch "AUT-0-MAN" Fig. 1, item 15) and one has to use the key switch first and then push the stop button (Fig. 2, item 14). The control panel has two control buttons (Fig. 2, items 16 and 17) to start the engine manually with the A and B batteries.
Warning: the A and B manual start (Fig. 2, items 16 and 17) are always enabled even if the automatic mode is switched off. (Fig. 1, item 15). The manual starting circuit is an emergency starting circuit that allows you to start the engine by pressing button (Fig. 1, item 17) via its battery and dedicated remote control switch. This action can still be executed if the automatic circuit is not working. There are no sensors for controlling the motor, so if the PCB does not function, it will not be possible to retrieve any information about the state of the engine (rpm, engine temperature, oil pressure, etc.). Potential-free contacts are available for forwarding run or fault signals messages to the building management system.

6.1.2 Set-up of the switchgear (Fig. 1)

The set-up of the switchgear depends on the capacity of the pump to be connected. It consists of the following main components:

- Main switch: Switches the switchgear On/Off (Fig. 1, item 1)
- Human-machine interface (HMI): LCD for displaying operating data (see menus), LEDs for displaying the operating status (operation/fault), operating knob for menu selection and parameter input (Fig. 1, item 2)
- Base board: printed circuit board with microcontroller (Fig. 1, item 4)
- Converter board: conversion of the voltage from 12 V DC to 24 V DC, conversion of the speed signal (Fig. 1, item 5)
- Fuse protection for components: fuse protection for control and connected components using fusible cut-outs (Fig. 1, item 7)
- Contactors/relay: contactors/relay for connecting the starter (Fig. 1, item 6)
- Chargers: chargers for automatic charging of the starter batteries (Fig. 1, item 3)
- Control timers of the function "test batteries" (Fig. 1, item 8)
- Relay for limit control of the battery minimum voltage (Fig. 1, item 9). The limit is monitored on the automatic starter circuit at the output of the diode bridge. The alarm is detected only if both batteries (A and B) are too low.
- Voltmeters for checking the individual A, B and C battery voltages (Fig. 1, item 20)

6.2 Function and operation DANGER!

Risk of fatal injury!
When working on the open switchgear, there is a danger of electric shock from touching the live com-ponents.
This work must only be carried out by qualified personnel!

NOTE:
After connecting the switchgear to the supply voltage, as well as after every power interruption, the switchgear returns to the operating mode set before the power interruption.

6.2.1 Switchgear operating modes in automatic mode (Fig. 2) – Switching the switchgear On/Off

Before connecting the battery to the unit, place the key switch (Fig. 1, item 15) in position 0 to prevent accidental starting. After the batteries have been connected to the switchgear and the power supply has been connected, the control is ready for operation after a few seconds (the start phase). The green standby LED (Fig. 2, item 1) lights up. The LC display alternately displays the battery voltage of the connected batteries and the charging current. To ensure a constant engine oil temperature, the chargers and the heating system can be switched on and off using the main switch. To switch the control off, disconnect the batteries.

Pump request

A white LED (Fig. 2, item 7) indicates if the pressure drops below the set target pressure at one or both of the pressure switches. If the LED flashes, this indicates that the set delay time has expired (see menu 1.2.5.1). After the set delay time has expired, the LED lights up continuously for as long as the pressure switch remains tripped. The automatic start cycle for the diesel engine takes place, with a maximum of 6 start attempts. The starting time (menu 1.2.2.1) and the pause time (menu 1.2.2.2) can be set using the software.

After each start attempt, the system switches to a different battery. A non-engaged pinion in the motor's gear rim is detected. Additional attempts are carried out to engage the pinion.
The green LED (Fig. 2, item 2) indicates that the diesel engine has started. The LED lights up if the measured speed exceeds the set switching threshold for “motor in operation” (menu 1.2.1.3). The LC display shows the current speed when the motor is running. The engaged starting pinion is automatically disengaged. The diesel engine can only be stopped manually be pressing the “stop” button (Fig. 2, item 14). The green LED (Fig. 2, item 2) goes out when the speed drops below the switching threshold for “motor in operation” and the LC display shows the battery voltage and charging current again.

Priming device
If the level of the pump priming tank falls below 2/3, the float switch closes and this is indicated by a white LED (Fig. 2, item 8). If the LED flashes, this indicates that the set delay time has expired (see menu 1.2.5.2). After the set delay time has expired, the LED lights up continuously for as long as the float switch remains tripped. The automatic start cycle for the diesel engine takes place, with a maximum of 6 start attempts. The starting time (menu 1.2.2.1) and the pause time (menu 1.2.2.2) can be set using the software. After each start attempt, the system switches to a different battery. A non-engaged pinion in the motor's gear rim is detected. Additional attempts are carried out to engage the pinion.
The green LED (Fig. 2, item 2) indicates that the diesel engine has started. The LED lights up if the measured speed exceeds the set switching threshold for “motor in operation” (menu 1.2.1.3). The LC display shows the current speed when the motor is running. The engaged starting pinion is automatically disengaged. The diesel engine can be stopped manually by pressing the “stop” button (Fig. 2, item 14). The green LED (Fig. 2, item 2) goes out when the speed drops below the switching threshold for “motor in operation” and the LC display shows the battery voltage and charging current again.

Voltage monitoring of A and B batteries (Fig. 1, item 2)
To improve operational reliability, the batteries and the mains power supply to the chargers are monitored continuously. The chargers report any faults to the control, such as a wire break, short-circuit, battery fault or mains supply fault. The control evaluates the faults and displays them in the fault menu.
In addition, a minimum battery voltage can be set in menu 5.4.1.0. If the voltage in one of the connected batteries falls below this value, an error message appears on the display.

Monitoring the motor start
After the pressure or float switch trips, the motor's automatic start cycle takes place. The motor start is monitored for malfunctions by the control, such as the pinion engaging in the motor's gear rim and false motor starts. If no confirmation is received during starter activation indicating that the pinion is engaged, the system will perform an additional activation to attempt to throw the pinion into gear. An error message is shown on the display. After each start attempt, the system switches to a different battery. After 6 unsuccessful start attempts, the system interrupts the process, the yellow LED (Fig. 2, item 13) lights up, an error message is shown on the display and the allocated fault signal contacts are active.

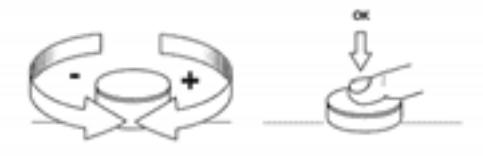
A and B batteries test in automatic mode
To perform the test, you have to select the automatic mode via the key switch and there should not be any start requests present from the pressure switch or float of the priming tank. Press and hold the stop button (Fig. 1, item 16) during the entire test and push the battery test button to start the test by using the battery test button in automatic mode (Fig. 1, item 18). The test begins by activating the LED (Figure 2, item 8) and performs a cycle of six alternating starts between the A and B batteries, according to the times set in parameters 1.2.2.1 for the starting time, and the parameters 1.2.2.2 for the break time. The total duration of the test depends on the time set on the relay “3kT” (the relay 3kT must be set with function “E” and the total time of six starting cycles with six breaks, is two minutes.). After the starting cycle has completed, the “fail to start” LED (Figure 2 item 6) and the “manual start test” LED (figure 2 item 13) will turn on. Activate the latter after releasing the stop button, and it will start the motor pump for checking the proper functioning.

Battery C test in manual mode
It is possible to test the status of the C battery used for the emergency manual start of the fire group. To perform the test, select manual mode via the key switch, press and hold the stop button (Fig. 1, item 16) during the entire test and push the battery test button to start the test by using the battery test button in manual mode (Fig. 1, item 19). A test loop consists of three start-ups, and the time for each start-up is set on the relay “2KT” (default: function “D” 10 s). The total duration of the test depends on the time set on the relay “1KT” (default: function “E” 54 s).

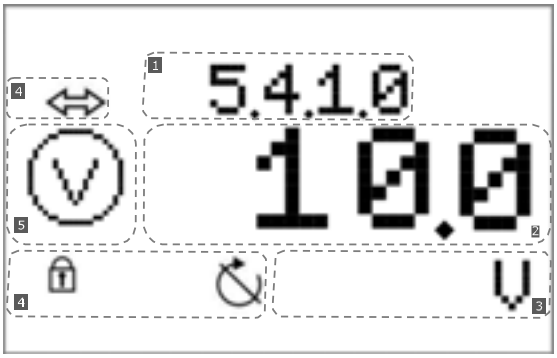
Logic reversal of the collective fault signal (SSM)
The required logic of the SSM can be set in menu 5.5.2.0. In this case, it is possible to select between negative logic (falling edge in case of a fault = “fall”) or positive logic (rising edge in case of a fault = “raise”).

6.2.2 Operation of the switchgear operating elements

- **Main switch** On/Off (lockable in “Off” position)
- The **LCD** shows the operating statuses of the pump and the settings menu. The menu selection and parameter input are performed using the **operating knob**. Turn the knob to change values or to scroll through a menu level; press it in order to select and confirm:



Information appears on the display as shown in the sample illustration below:



Item	Description
1	Menu number
2	Value display
3	Units display
4	Standard symbols
5	Graphic symbols

The following graphic symbols are used:

Symbol	Function/description	Availability
	Go back (press briefly: one menu level; press and hold: main screen)	All
	EASY menu	All
	EXPERT menu	All
	1st meaning: Service not logged in 2nd meaning: Display value – no entry possible	All
	Service menu	All
0/0/0	Parameter	All
	Information	All
	Fault	All
reset	Reset fault	All

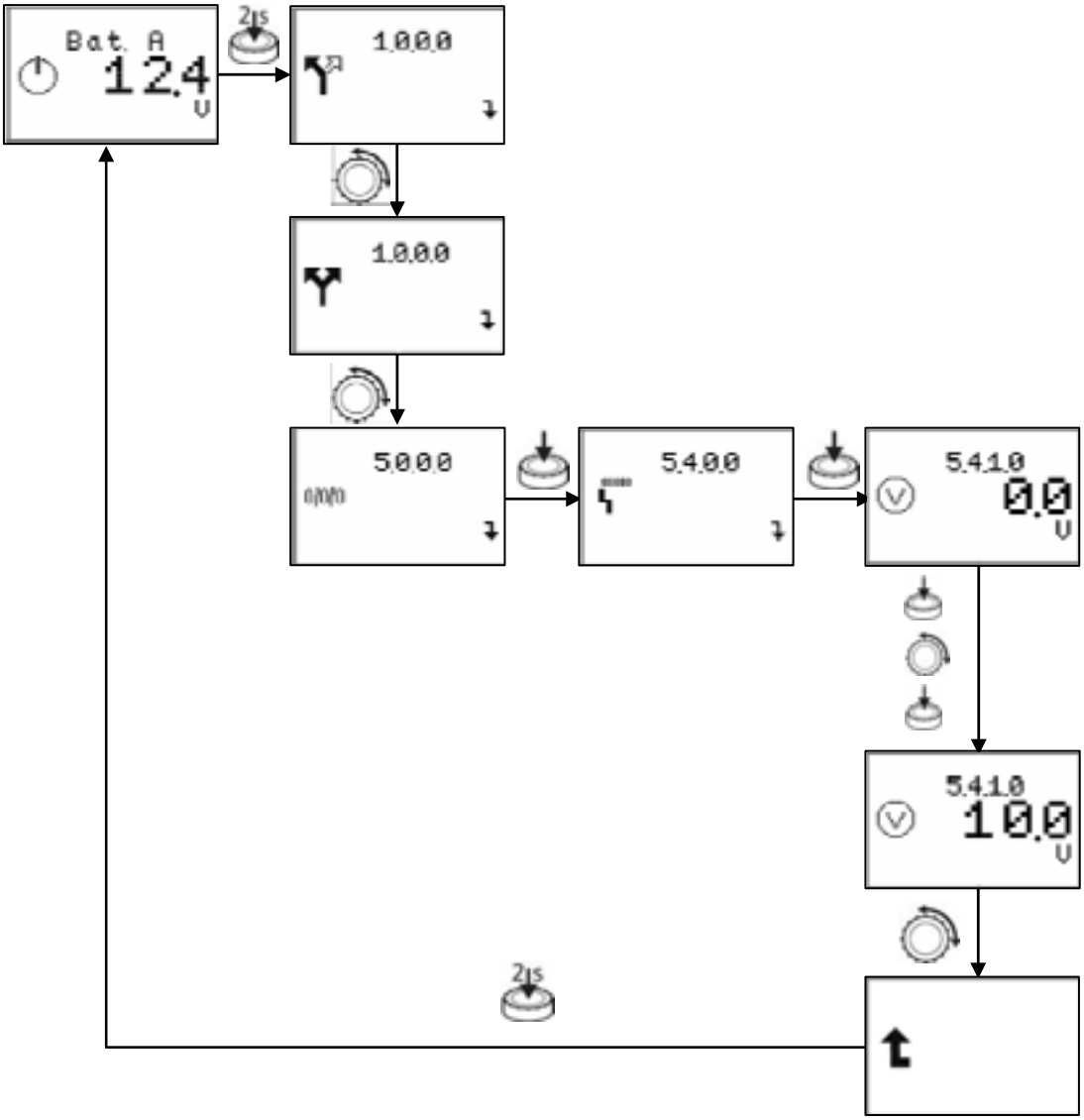
Symbol	Function/description	Availability
	Alarm settings	All
	Pump	All
	Setpoints	All
	Actual value	All
	Sensor signal	All
	Sensor measurement range	Electrical equipment
	Delay time	All
	Operating mode/application	All
	Standby	All
	Operating data	All
	Switchgear data: Controller type; ID number; software/firmware	All
	Operating hours	All
	Pump's operating hours	All
	Switchgear's switching cycles	All
	Pump's switching cycles	All
	Communication	All
	Output parameters	All

Symbol	Function/description	Availability
	SSM parameter	All
	Set motor speed	Diesel
	Starting time per start attempt	Diesel
	Pause between start attempts	Diesel
	Fuel	Diesel
	Battery	Diesel
	Battery	Diesel
	Sprinkler (pressure switch)	All
	Pump priming tank (float switch)	All
	Heating	Diesel
	Engine	Diesel
	Motor temperature thermostatic valve	Diesel
	Cooling water (temperature)	Diesel
	Belt break	Diesel
	False start	Electrical equipment
	Pressure	Electrical equipment
	Mains power supply	Electrical equipment

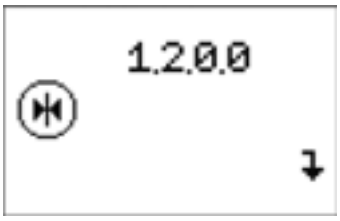
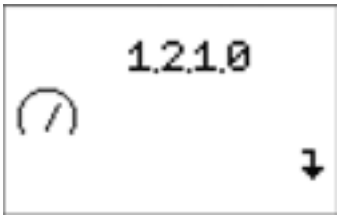
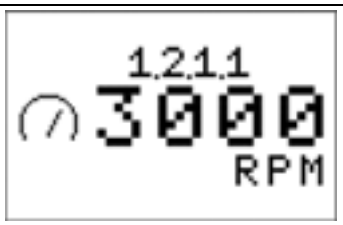
Symbol	Function/description	Availability
	Voltmeter	All
	Ampere meter	All
	Star-delta switching	Electrical equipment
	Freely configurable fault signal	All
	Fault input	All
	Start attempts counter	Diesel
	Duration	All
	Power meter	Electrical equipment
	Communication parameters	All
	Modbus	All
	BACnet	All
	Factory setting	All
	Resetting the settings to the factory settings	All
	Alarm counter	All
	Maintenance interval	All
	Reset	All
	Motor speed	Diesel

Symbol	Function/description	Availability
	Set motor speed	Diesel
	Minimum speed for “motor in operation”	Diesel
	Reset starting counter	Diesel

Menu structure:
The menu structure of the control system has 4 levels.
Navigation in the individual menus as well as the parameter input are described in the following example (change of minimum battery voltage):



Refer to the following table for a description of the individual menu items:

Menu no. /	Display	Description	Parameter range factory setting
		The main screen shows the status of the system. The display continuously switches between the voltage and charging current for the connected batteries.	
		When the motor is running, the current speed is shown on the display.	
		The EASY menu makes it possible to adjust the motor speed and set the speed for “motor in operation”.	
		The EXPERT menu contains other settings that can be used for a detailed setting of the switchgear.	
		The parameter menu for all settings that influence operation.	
		The setting menu for the speed parameters	
		Setting the speed for speed adjustment.	100 ... **3000** ... 4000

Menu no. /	Display	Description	Parameter range factory setting
	1.2.1.2 set Finished	Starts speed adjustment.	Finished Start
	1.2.1.3 min 600 RPM	Speed for “motor in operation” signal	200 … **600** … 3000
	1.2.2.0	The parameter menu for all settings that influence operation.	
	1.2.2.1 5 s	Starting time: duration of start attempt	5 … **10**
	1.2.2.2 10 s	Pause time: pause between start attempts	5 … **10**
	1.2.5.0	Delays	
	1.2.5.1 1 s	Start delay when pressure switch trips	**1** … 10
	1.2.5.2 1 s	Start delay when float switch trips	**1** … 10

Menu no. /	Display	Description	Parameter range factory setting
	1.2.5.3 3 s	Delay for “out of fuel” signal	0 … **3** … 5
	2.0.0.0	Communication	
	2.1.0.0 No bus	Display of currently activated fieldbus	**None** Modbus BACnet GSM
	3.0.0.0	Pump menu	
	3.1.0.0 mode OFF Drive	Drives On/Off	**OFF** ON
	4.0.0.0	Information	
	4.1.0.0	Operating values	
	4.1.1.0	Current battery voltages	

Menu no. /	Display	Description	Parameter range factory setting
	4.1.1.1 12.3 V	Voltage of battery A	
	4.1.1.2 12.3 V	Voltage of battery B	
	4.1.2.0 A	Current charging currents	
	4.1.2.1 3.4 A	Charging current of battery A	
	4.1.2.2 3.4 A	Charging current of battery B	
	4.1.3.0 CTR	Start attempts counter	
	4.1.3.1 15 0->1	Start attempts for battery A	
	4.1.3.2 14 0->1	Start attempts for battery B	

Menu no. /	Display	Description	Parameter range factory setting
	4.1.4.0	Status (switch status) of connected sensors	
	4.1.4.1 P-Sw close	Status of pressure switch	
	4.1.4.2 F-Sw oPen	Status of float switch	
	4.1.4.3 Fuel oPen	Status of fuel float switch	
	4.1.4.4 Heat oPen	Status of heating temperature switch	
	4.1.4.5 Oil oPen	Status of oil temperature switch	
	4.1.4.6 TemP oPen	Status of cooling water temperature switch	
	4.1.5.0	Sensor values	

Menu no. /	Display	Description	Parameter range factory setting
	4.1.5.1 3.5 bar	Oil pressure	
	4.1.5.2 32 °C	Oil temperature	
	4.1.5.3 25 °C	Cooling water temperature	
	4.1.6.0	Speed	
	4.1.6.1 2995 RPM	Motor speed	
	4.1.6.2 min 600 RPM	Speed for “motor in operation” signal	
	4.2.0.0	Operating data	
	4.2.1.0 5 h	Total running time of the system	

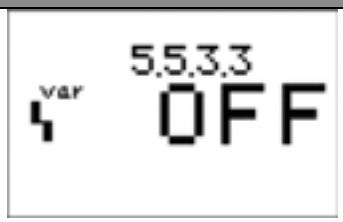
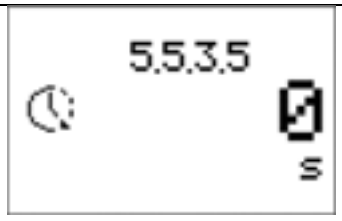
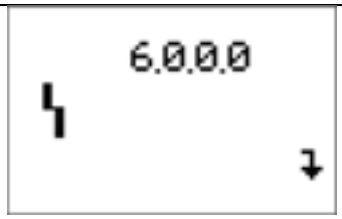
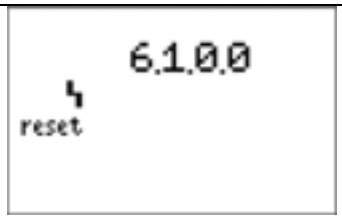
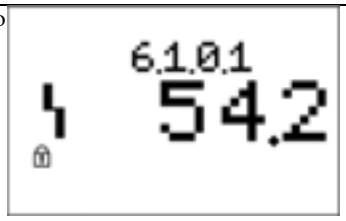
Menu no. /	Display	Description	Parameter range factory setting
	4.2.2.0 2 min	Total running time of pump	
	4.2.3.0 1 min	Running time of pump during last start	
	4.2.4.0 CTR 3 0->1	System's switching cycles	
	4.2.5.0 CTR1 1 0->1	Pump's switching cycles	
	4.3.0.0 12345	System data	
	4.3.1.0 12345 SC D Type	System type	SC diesel
	4.3.2.0 12345 5020 Id-No	Serial number as ticker format	
	4.3.3.0 12345 4.020 Softw	Software version	

Menu no. /	Display	Description	Parameter range factory setting
	4.3.4.0 1.27 Firmw	Firmware version	
	5.0.0.0 0/0/0	Settings	
	5.1.0.0 01010	Communication	
	5.1.1.0 M	Modbus	
	5.1.1.1 M 19.2 kBaud	Baud rate	9.6 **19.2** 38.4 76.8
	5.1.1.2 M 10 Adres	Slave address	1 … **10** … 247
	5.1.1.3 M even Parit	Parity	**even** none odd
	5.1.1.4 M 1 StBit	Stop bits	**1** 2

Menu no. /	Display	Description	Parameter range factory setting
	5.1.2.0	BACnet	
	5.1.2.1 19.2 kBaud	Baud rate	9.6 **19.2** 38.4 76.8
	5.1.2.2 128 Adres	Slave address	1 … **128** … 255
	5.1.2.3 even Parit	Parity	**even** none odd
	5.1.2.4 1 StBit	Stop bits	**1** 2
	5.1.2.5 128 Id.	BACnet device instance ID	0 … **128** … 9999
	5.2.0.0	Sensor settings	
	5.2.3.0 OFF	Activation of oil pressure sensor	**OFF** ON

Menu no. /	Display	Description	Parameter range factory setting
	5.2.4.0	Correspondence values for oil pressure sensor	
5.2.4.1 to 5.2.4.9	5.2.4.1 270 0 bar	Drag coefficients input	0 … 3000
	5.2.5.0 OFF	Activation of oil temperature sensor	**OFF** ON
	5.2.6.0	Correspondence values for oil temperature sensor	
5.2.6.1 to 5.2.6.9	5.2.6.1 1095 10 C	Drag coefficients input	0 … 3000
	5.2.7.0 OFF	Activation of cooling water temperature sensor	**OFF** ON
	5.2.8.0	Correspondence values for cooling water temperature sensor	
5.2.8.1 to 5.2.8.9	5.2.8.1 1095 10 C	Drag coefficients input	0 … 3000

Menu no. /	Display	Description	Parameter range factory setting
	5.2.9.0 OFF	Activation of belt break monitoring	**OFF** ON
	5.4.0.0	Limit values	
	5.4.1.0 0.0 V	Minimum battery voltage	**0** … 30
	5.5.0.0	Signal output parameters	
	5.5.2.0 Raise	SSM	Fall **Raise**
	5.5.3.0 var	Freely configurable fault signal	
	5.5.3.1 Not store	Acknowledgement process for fault signal	**Not store** ON store
	5.5.3.2 Raise	Logic reversal of input signal	Fall **Raise**

Menu no. /	Display	Description	Parameter range factory setting
		Activation of configurable fault signal	**OFF** ON
		Active: Always Only when pump is in operation	**Ever** Pump
		Response delay	**0** … 60
		Fault signals	
		Reset for fault signals	
6.1.0.1 to 6.1.1.6		Fault signals 1 to 16	

Operation levels:
The parameterisation of the switchgear is divided into the menu areas EASY and EXPERT.
For rapid commissioning using the factory presets, it suffices to set the speed values and the speed adjustment in the EASY area.

The EXPERT area is provided in case other parameters need to be changed, or for reading out data from the device.
Menu level 7.0.0.0 is reserved for Wilo customer service.

- **Manual start of battery A and battery B (Fig. 2, items 16 and 17)**
  Pressing the button starts the diesel engine manually via battery A or battery B. The starter is active as long as the button is pressed. Once the motor has started, it can only be stopped by pressing the “stop” button.

- **Manual stop (Fig. 2, item 14)**
  This button is used to stop the motor. If the relevant signal lamp (Fig. 2, item 14) lights up red when the motor is running, the motor can be stopped. The motor can only be stopped if there is no request from the pressure switch present (sprinkler request). Once the motor has stopped, the signal lamps for “pump in operation” and “stop” go out (Fig. 2, items 2 and 14).

- **Test device for manual starter device (Fig. 2, item 13)**
  Test button and signal lamp for regular inspection of the manual electric starter device. The button becomes functional if an automatic motor start was followed by a manual switch off, or if six consecutive automatic start attempts are unsuccessful. In both operating statuses, the signal lamp lights up and the button has to be pushed.

- **Lamp test (Fig. 2, item 15)**
  Pushing the button switches on all the signal lamps for as long as the button is pushed, allowing you to check that the lamps function. When you release the button, the signal lamps go out again and only light up according to their regular operation.

- **Acknowledgement (Fig. 2, item 18)**
  Pressing the button resets all the error messages or signal lamps provided that the cause of the error no longer exists.

6.2.3 Switchgear display elements

Operational standby (Fig. 2, item 1)
The signal lamp lights up green when the power supply is connected.

Pump operation (Fig. 2, item 2)
The signal lamp lights up green when the diesel engine has started and the speed recorded by the Speed transmitter has reached or exceeded the value set for “motor in operation” (menu 1.2.1.3).

Automatic mode (Fig. 2, item 3)
The signal lamp flashes yellow when automatic mode is switched off (menu 3.1.0.0).

Excess motor temperature (cooling water) (Fig. 2, item 4)
The signal lamp lights up yellow when a connected thermostatic valve is triggered.

Oil pressure fault (Fig. 2, item 5)
The signal lamp lights up yellow when a connected oil pressure monitor is triggered.

False start (Fig. 2, item 6)
The signal lamp lights up yellow after six consecutive unsuccessful automatic start attempts.

Sprinkler request (Fig. 2, item 7)
The signal lamp lights up white if the pressure in the system falls below the set/requested pressure and at least one of the two pressure switches is triggered. Once the start delay has expired (menu 1.2.5.1), the signal lamp lights up continuously. If the pressure rises accordingly, the signal lamp goes out.

Float switch request (Fig. 2, item 8)
The signal lamp flashes white when the level in the pump priming tank falls to 2/3 and the float switch is triggered. Once the start delay has expired (menu 1.2.5.2), the signal lamp lights up continuously. If the level rises accordingly, the signal lamp goes out.

Heating fault (Fig. 2, item 9)
The signal lamp lights up yellow when a connected thermostatic valve is triggered.

Belt break (Fig. 2, item 10)
The signal lamp lights up yellow when a belt break is detected.

Belt break (Fig. 2, item 11)
The signal lamp lights up yellow when the fuel float switch is triggered.

Collective fault (Fig. 2, item 12)
The signal lamp lights up red when a fault occurs. The fault must be acknowledged when its cause has been rectified.

Test device for manual starter device (Fig. 2, item 13)
The signal lamp lights up if an automatic motor start was followed by a manual switch off, or if six consecutive automatic start attempts are unsuccessful.

Manual pump stop (Fig. 2, item 14)
The signal lamp lights up red as soon as the stop function for the stop button is enabled when the motor is running. The stop function is not enabled when the pressure switch (sprinkler request) has been triggered.

7 Installation and electrical connection

Installation and electrical connection must be carried out in accordance with local regulations and only by qualified personnel!

WARNING! Risk of injury!
The existing directives for accident prevention must be adhered to.

Warning! Danger of electric shock!
Danger from electrical current must be eliminated.
Local directives or general directives [e.g. IEC] and instructions from local energy supply companies must be adhered to.

7.1 Installation

Install the switchgear/system at a dry location. Protect the place of installation from direct exposure to sunlight.

7.2 Electrical connection

DANGER! Risk of fatal injury!
Improper electrical connections can lead to fatal electric shocks.

- **Have the electrical connection established by an electrician approved by the local electricity supplier only and in accordance with local regulations.**
- **Observe the Installation and operating instructions for the pumps and accessories!**
- **Disconnect the power supply before any work.**

Warning! Danger of electric shock!
There is a potentially fatal voltage on the supply side, even when the main switch is turned off.

- The type of mains, current and voltage of the mains connection must match the details on the rating plate of the control device.

NOTE:

- Fuse on mains side in accordance with the information in the wiring diagram
- Feed the ends of the mains cable through the threaded cable connections and cable inlets and wire them according to the markings on the terminal strips.
- Earth the pump/installation in accordance with the regulations.

7.2.2 Power supply connection

Connect the on-site 3-wire cable (L, N, PE) for the supplying network to the main switch, in accordance with the wiring diagram.

7.2.3 Battery connection

Connect the batteries using the cables provided. Firmly tighten the screws on the fixation clips.

7.2.4 Fault signal/run signals connection

A signal can be taken from the terminal strip for the fault signal/run signal via a potential-free contact in order to indicate a fault/operation (see wiring diagram).
Potential-free contacts, max. contact load
250 V~/1 A

Warning! Danger of electric shock!
There is a potentially fatal voltage on these terminals, even when the main switch is turned off.

8 Commissioning

WARNING! Risk of fatal injury! Commissioning by qualified personnel only! Improper commissioning poses a risk of fatal injury. Have commissioning performed by qualified personnel only.

DANGER! Risk of fatal injury!
When working on the open switchgear, there is a danger of electric shock from touching the live components.
This work must only be carried out by qualified personnel!

We recommend that you have the switchgear commissioned by Wilo customer service.
Before switching on for the first time, the on-site wiring must be checked, in particular the earthing.

Tighten all terminals prior to commissioning!

8.1 Factory setting

The control is factory preset.
The factory settings can be restored by Wilo customer service.

8.2 Checking the speed adjustment

The motor speed is adjusted in the factory. To check the speed adjustment, start the motor manually. Once the motor has started, record the speed with a portable rev counter and compare it to the speed on the display. If the two values match, no correction is necessary.
If the difference is large, readjustment is necessary. Proceed as follows. Set the motor to a constant, known speed. Enter and confirm this value in menu 1.2.1.1. Go to the next menu item. In menu 1.2.1.2, change the setting to “Start” and confirm. After the adjustment, “Finished” appears on the display. The speed adjustment is complete and saved. The motor can be stopped by pressing the “stop” button (Fig. 2, item 14).

9 Maintenance

Have maintenance and repair work carried out by qualified skilled personnel only!
DANGER! Risk of fatal injury!
There is a risk of fatal injury from electric shock when working on electrical equipment.

- **The switchgear should be electrically isolated and secured against any unauthorised activation during any maintenance or repair work.**
- **Any damage to the connection cable should only ever be eradicated by a qualified electrician.**

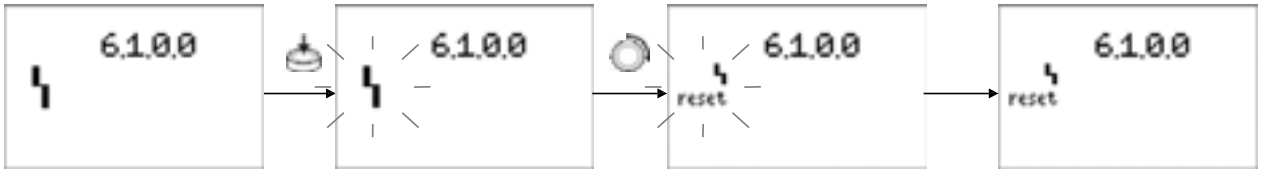
- The switchgear must be kept clean.
- Visual inspection of the electric system parts in the switchgear

10 Faults, causes and remedies

DANGER! Risk of fatal injury!
There is a risk of fatal injury from electric shock when working on electrical equipment. Have faults remedied by qualified skilled personnel only! Follow the safety instructions in Section "2 Safety".
Before all work to remedy faults, disconnect the unit from the power supply, and make sure it cannot be switched back on by unauthorised persons.

10.1 Fault indication

If a fault occurs, the relevant fault signal LED lights up, the collective fault signal and associated individual fault contact are activated and the fault is displayed on the LCD (fault code number).
The fault can be acknowledged by pressing the acknowledgement button (Fig. 2, item 18) or in menu 6.1.0.0 by proceeding as follows:



10.2 History memory for faults

A history memory has been set up for the switchgear and operates according to the FIFO principle (first-IN, first-OUT).
The memory is configured for 16 faults. The fault memory can be called up using menus 6.1.0.1 to 6.1.1.6.

Code	Fault description	Causes	Remedy
E04.1	No supply voltage to charger A	Main switch switched off	Switch on the main switch.
		Fuse defective	Check fuse and replace, if necessary.
E04.2	No supply voltage to charger B	Main switch switched off	Switch on the main switch.
		Fuse defective	Check fuse and replace, if necessary.
E04.3	No supply voltage to battery A	Connection to battery A interrupted	Check connection.
		Fuse defective	Check fuse and replace, if necessary.
E04.4	No supply voltage to battery B	Connection to battery B interrupted	Check connection.
		Fuse defective	Check fuse and replace, if necessary.
E04.5	Undervoltage in battery A	Voltage has fallen below value set in menu 5.4.1.0	Check battery A and replace, if necessary.
			Check charger.
			Check setting in 5.4.1.0 and correct, if necessary.
E04.6	Undervoltage in battery B	Voltage has fallen below value set in menu 5.4.1.0	Check battery B and replace, if necessary.
			Check charger.

Code	Fault description	Causes	Remedy
			Check setting in 5.4.1.0 and correct, if necessary.
E54.0	No bus communication to HMI board	Connection to HMI board interrupted	Check connection. Request customer service.
E54.1	No bus communication to charger for battery A	Connection to charger for battery A interrupted	Check connection. Request customer service.
E54.2	No bus communication to charger for battery B	Connection to charger for battery B interrupted	Check connection. Request customer service.
E54.3	Faulty data transfer from charger for battery	Faults on the data cable	Request customer service.
E54.4	Faulty data transfer from charger for battery	Faults on the data cable	Request customer service.
E100.1	Battery fault in battery A	Battery A defective	Check battery A and replace, if necessary. Request customer service.
E100.2	Battery fault in battery B	Battery B defective	Check battery B and replace, if necessary. Request customer service.
E105.1	Short-circuit in battery A	Battery A defective	Check battery A and replace, if necessary. Request customer service.
E105.2	Short-circuit in battery B	Battery B defective	Check battery B and replace, if necessary.
E106.1	Cable break in battery A	Connection to battery A interrupted	Check connection to battery A. Request customer service.
E106.2	Cable break in battery B	Connection to battery B interrupted	Check connection to battery B. Request customer service.
E109.0	Freely configurable fault	Depending on the fault configuration	Depending on the fault configuration
E130.0	Lack of fuel	Fuel below minimum level	Refuel.
E131.0	Heating fault	Thermostatic valve for the heating has triggered	Check heating.
E132.0	Low oil pressure	Oil pressure switch has triggered	Check oil level and refill, if necessary. Request customer service.
E133.0	Excess motor temperature	Thermostatic valve for the motor has triggered	Check cooling water level. Request customer service.
E134.0	Starting pinion not engaged	Confirmation from starting pinion missing	Check starter. Check fuse. Request customer service.
E135.0	Pinion rim interrupted	Confirmation from starting pinion missing	Check fuse. Request customer service.
E136.0	Failed start attempts	6 unsuccessful start attempts performed	Request customer service.
E137.0	Belt break	No tension for generator	Check V-belt and replace, if necessary. Request customer service.

If the fault cannot be remedied, please contact your nearest Wilo customer service point or representative.

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Pioneering for You

WILO SE
Nortkirchenstraße 100
D-44263 Dortmund
Germany
T +49(0)231 4102-0
F +49(0)231 4102-7363
wilo@wilo.com
www.wilo.com