Pioneering for You



# **Wilo-Control Fire D VdS**



en Installation and operating instructions

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W-CTRL Fire VdS https://qr.wilo.com/1340

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#### 1 General

-	General	
1.1	About these instructions	These instructions form part of the product. Compliance with the instructions is essential for correct handling and use:
		Read the instructions carefully before all activities.
		Keep the instructions in an accessible place at all times.
		Observe all product specifications.     Observe the markings on the product
		The language of the original operating instructions is German. All other languages of these
		instructions are translations of the original operating instructions.
1.2	Copyright	WILO SE © 2023
		The reproduction, distribution and utilisation of this document in addition to communica- tion of its contents to others without express consent is prohibited. Offenders will be held liable for payment of damages. All rights reserved.
1.3	Subject to change	Wilo shall reserve the right to change the listed data without notice and shall not be liable for technical inaccuracies and/or omissions. The illustrations used may differ from the ori- ginal and are intended as an exemplary representation of the product.
1.4	Exclusion from warranty and liabil-	Wilo shall specifically not assume any warranty or liability in the following cases:
	ity	<ul> <li>Inadequate configuration due to inadequate or incorrect instructions by the operator or the client</li> </ul>
		Non-compliance with these instructions
		Improper use
		Incorrect storage or transport
		Incorrect installation or dismantling     Insufficient maintenance
		Unauthorised repairs
		Inadequate construction site
		<ul> <li>Chemical, electrical or electrochemical influences</li> <li>Wear</li> </ul>
1.5	VdS certification	These instructions are for switchgears with VdS certification for firefighting systems with a diesel motor.
		If the switchgear is used in firefighting systems in the purview of the VdS (VdS Schadenver– hütung GmbH), the VdS regulations for installation, operation and maintenance must be observed and adhered to.
		Please observe VdS CEA 4001.
2	Safetv	This section contains basic information about the individual
		stages in the life cycle of the pump. Failure to observe this in-
		formation carries the following risks:
		<ul> <li>Danger to persons from electrical mechanical and bacteriolo-</li> </ul>
		gical effects as well as electromagnetic fields
		<ul> <li>Environmental damage from discharge of hazardous sub- stances</li> </ul>
		Damage to property
		Failure of important functions
		Failure to observe the information contained herein will render
		any claims for damages void.

# The directions and safety instructions in the other sections must also be observed!

# 2.1 Identification of safety instructions

These installation and operating instructions set out safety instructions for preventing personal injury and damage to property, which are displayed in different ways:

en

- Safety instructions relating to personal injury start with a signal word and are **preceded by a corresponding symbol**.
- Safety instructions relating to property damage start with a signal word and are displayed **without** a symbol.

# Signal words

• Danger!

Failure to observe safety instructions will result in serious injury or death!

- Warning! Failure to follow instructions can lead to (serious) injury!
- **Caution!** Failure to follow instructions can lead to property damage and possible total loss.
- Notice! Useful information on handling the product

# Markups

- Prerequisite
- 1. Work step/list
  - $\Rightarrow$  Notice/instructions
  - Result

# Notices on the product

Comply with all notices and marks on the product and keep them in legible condition.

- Symbol for direction of rotation/flow
- Mark for connections
- Rating plate
- Warning stickers

# Symbols

These instructions use the following symbols:



General danger symbol

Danger caused by electric voltage



# 2.2 Personnel qualifications

- Personnel have been instructed on locally applicable regulations governing accident prevention.
- Personnel have read and understood the installation and operating instructions.
- Electrical work: qualified electrician
   Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.

- Installation/dismantling work: qualified fire protection expert according to the state of the art.
   Correct installation and connection of the system to the supply line.
- Operation/control: Operating personnel, instructed in the functioning of the complete system
- Setting/operating the switchgear: trained expert for fire protection according to the state of the art.
   Specialised linguistic knowledge in the areas of fire protection and motor technology.
- Maintenance work: trained fire protection expert according to the state of the art

Correct installation and connection of the system to the supply line.

Specialised linguistic knowledge in the areas of fire protection and motor technology.

# 2.3 Electrical work



# NOTICE

Carry out electrical connection according to VdS CEA 4001.

- Electrical work must be carried out by a qualified electrician.
- Observe applicable local fire protection regulations when connecting to the mains power supply.
- Earth the device.
- Before commencing work, disconnect the product from the mains and secure it against being switched on again without authorisation.



# WARNING

**Risk of electric shock for systems with diesel motors.** Systems with diesel motors contain batteries.

• Disconnect the batteries before carrying out any work on the switchgear.

- Train personnel on how to make electrical connections.
- Train personnel on the options for switching off the device.
- Wear the following protective equipment:
  - Safety footwear
  - Safety gloves for protection against cuts
  - Safety helmet (when using lifting equipment)
- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Demarcate and cordon off the working area.
- Keep unauthorised persons away from the working area.
- Only use legally prescribed and approved lifting gears and lifting devices.

# 2.4 Transport

- Select the lifting gear based on the prevailing conditions (weather, attachment point, load, etc.).
- Always attach the lifting gear to the attachment points.
- Standing under suspended loads is not permitted. Do **not** move suspended loads over workplaces where people are present.

# 2.5 Installing/dismantling



# NOTICE

Carry out installation according to VdS CEA 4001.

- Wear the following protective equipment:
  - Safety footwear
  - Safety gloves for protection against cuts
  - Safety helmet (when using lifting equipment)
- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Demarcate and cordon off the working area.
- Keep working area free from ice.
- Keep the working area free of any objects lying around.
- Keep unauthorised persons away from the working area.
- Work must always be carried out by two persons.
- Disconnect the product from the mains and secure it against being switched on again.



#### WARNING

Risk of electric shock for systems with diesel motors.

Systems with diesel motors contain batteries.

- Disconnect the batteries before carrying out any work on the switchgear.
- Cover open wells and water tanks or attach a safety harness.
- Only use legally prescribed and approved lifting gears and lifting devices.
- Stay outside the swivel range of the lifting device.

Systems with diesel motors use the following operating fluids:

- Diesel fuel
- Motor oil
- Battery acid

The operating fluids are harmful to the environment and must not be released into the soil or waters.

• Wipe up drips immediately!

#### Diesel fuel

- R 40: suspected carcinogenic effect
- R 65: hazardous to health; may cause lung damage if swallowed.

#### 2.6 Operating fluids

- R 66: repeated exposure may cause skin roughness or cracking.
- R 51/53: toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

#### **Battery acid**

• R 35: causes severe burns.

# 2.7 Operator responsibilities

- Provide installation and operating instructions in a language which the personnel can understand.
- Make sure that the personnel have received the required training for the specified work.
- Provide protective equipment. Ensure that the protective equipment is worn by personnel.
- Ensure that safety and information signs mounted on the device are always legible.
- Train the personnel on the function of the system.
- Eliminate any risk from electrical current.
- Equip hazardous components inside the entire system with an on-site guard.
- Demarcate and cordon off the working area.
- Define personnel responsibilities to ensure safe working practice.

Children and persons younger than 16 years or with reduced physical, sensory or mental capacities or limited experience are prohibited from handling the product! A technician must supervise persons younger than 18 years!

#### 3 Transport and storage

3.1 Delivery

Transport

3.2

• After delivery, check product and packaging for defects (damage, completeness).

• The transport company or the manufacturer must be notified of any defects the day the shipment is received, and the damage noted on the freight documentation.

Claims cannot be asserted if the notification of defects takes place at a later date.

The product may already be pre-assembled on a system on delivery. If the product is not pre-assembled, it is delivered separately on a pallet or in a box. The product is packed in plastic wrap to protect it from humidity and dirt.



#### WARNING

**Risk of injury from falling parts!** 

Never allow anyone to stand under suspended loads!

• Do not move the load over workplaces where persons are present.



#### WARNING

#### Risk of injury from a lack of protective equipment!

Danger of (serious) injuries during work. Wear the following protective equipment:

- · Safety gloves for protection against cuts
- Safety shoes
- · Safety helmet must be worn if lifting accessories are used!

# CAUTION

#### Damage to property due to wet packaging!

Wet packaging may tear. If unprotected, the product may fall on the ground and be irreparably damaged.

• Carefully lift wet packaging and replace it immediately!

1.	Only transport	the product in t	the packaging provided.
	- /		

- 2. If the outer packaging is damaged or no longer present, apply suitable protection from humidity and dirt.
- 3. Remove the outer packaging only once the system is on site.
- 4. Demarcate and cordon off the working area.
- 5. Keep unauthorised persons away from the working area.
- 6. Use approved lifting gear, such as sling chains or transport straps.
- 7. Only use proper and suitable lifting equipment.
- Place the product on a firm and level surface.
- Pack the product in dustproof and watertight packaging.
- Protect the product from direct sunlight and heat.
- Storage temperature between 0...+40 °C with a max. relative humidity of 95 %, noncondensing.
- All open threaded cable glands must be sealed to prevent water ingress into the housing.
- Attached cables should be protected against kinking, damage and ingress of moisture.

charged via the mains supply. Each battery is charged via its own charger. If the power sup-

ply fails, the two batteries take over the power supply of the switchgear.

4	intended use	
4.1	Intended use	The switchgear is designed for the automatic operation of firefighting systems with diesel motors. The switchgear is used:
		<ul> <li>to automatically start the pump,</li> <li>to manually start the pump during start-up and maintenance work, and</li> <li>to monitor the diesel motor.</li> </ul>
4.2	Improper use	Intended use includes compliance with this manual. Any other use is regarded as non–in– tended use.
5	Product description	The switchgear is designed for professional use as part of a pump group. The switchgear is located in a switch cabinet with fixing holes at the rear and bottom for installation. The switch cabinet can be installed directly on a pump group or on a wall.
		The switchgear is supplied with power via the mains. The switchgear supplies the motor with the necessary power for starting and operation. As well as this, two batteries are

3.3

Storage

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#### 5.1 Switchgear



Fig. 1: Switchgear overview

5.2 Control panel

All instruments, indicators and operating elements are located on the switchgear door. The main switch is located inside the switchgear.

	Description	Function
1	Control panel	Control panel with buttons, indicators and touchscreen display
2	Acoustic alarm	Buzzer for acoustic alarm
3	Emergency stop	If the pump has been started via the emergency start button, it can be stopped using the emergency stop.
		If the switchgear has a fault, the pump can be stopped.
4	Battery B emergency start	If the automatic start procedure fails or the switchgear has a fault, the pump can be started manually.
5	Battery A emergency start	If the automatic start procedure fails or the switchgear has a fault, the pump can be started manually.

The control panel contains the following:

- Instruments for monitoring and operating the pump and all subassemblies
- Graphical user interface with a touchscreen display



Fig. 2: Control panel overview

	Element	Description	Colour	As per VdS 2100-2 2en
1	Display	Touchscreen display, see: Display overview [▶ 14]		
2	Pump operation	Pump is in operation (automatic start via pressure switch or manual start)	White	4.2.11.1
		Time recording starts when 700 rpm is exceeded.		
3	False start (after 6 failed attempts)	Motor start failure after six 10-second failed attempts with waiting time of 10 seconds	Yellow	4.2.11.1
4	Float switch operating	Water level in the inlet tank of the pump has dropped to $2/3$ of the normal fill level.	Yellow	4.2.11.1
5	Excessive speed	Speed is too high.	Yellow	4.2.11.1
		Time recording starts when 3100 rpm is exceeded.		
6	Float switch fault	Fault of the float switch in case of a short-circuit or interrup- tion of the cable.	Yellow	4.2.11.1
7	Motor overheating	Cooling water temperature is too high; monitoring is continu- ously active.	Yellow	4.2.11.1
8	Pump disabled	Pump was in automatic mode and was stopped.	Blue	4.2.11.1
		A request from a pressure switch is still present.		
		LED turns off when pressure is restored (no request from pres- sure switch) and the system is back in automatic mode.		
9	Low oil pressure	Oil pressure is too low.	Yellow	4.2.11.1
		Monitoring is only active when the motor is running.		
10	Fuel low	Fuel level is below setpoint; factory setting: 90%	Yellow	4.2.11.1
11	Motor preheater fault	Motor preheater faulty. If the temperature of the motor pre- heater falls below the set value (standard value: 45°C), then the fault is displayed.	Yellow	
12	General message indicator	LED lights up when an alarm or message is shown on the dis– play.	Yellow	
		<ul> <li>Press the reset button to acknowledge the message and the fault.</li> </ul>		
13	Room ventilation fault	Malfunction of the ventilators or lamellae.	Yellow	
		LED lights up, if:		
		• during pump operation, the lamellae opening check is neg-		
		<ul> <li>ative.</li> <li>the check of relays QF11 and QF12 does not give a positive result.</li> </ul>		
14	Room ventilation operating	Operation of ventilators and lamellae after an automatic or manual start.	White	
		Ventilators in operation and lamellae open if pump is in opera- tion or the "Manual subassembly start" button is pressed.		
23	Fault of pressure switch 1	Fault of pressure switch 1 in case of a short-circuit or interrup- tion of the cable.	Yellow	4.2.11.1
24	Fault of pressure switch 2	Fault of pressure switch 2 on account of a short-circuit or in- terruption of the cable.	Yellow	4.2.11.1
25	Operation of pressure switch 1	Operation of pressure switch 1	White	4.2.11.1
26	Operation of pressure switch 2	Operation of pressure switch 2	White	4.2.11.1
27	Fault of contactor battery A	Fault at battery contactor A (relay QF4 or QF6 fault)	Yellow	4.2.11.1
28	Fault of contactor battery B	Fault at battery contactor B (fault relay QF5 or QF7)	Yellow	4.2.11.1

	Element	Description	Colour	As per VdS 2100-2 2en
29	Fault of battery A	LED is associated with a display message and lights up when one of the following faults occurs at battery A:	Yellow	4.2.11.1
		<ul> <li>Alarm 3: reversed polarity</li> <li>Alarm 4: battery not connected</li> <li>Alarm 5: internal cell short-circuited</li> <li>Alarm 6: battery sulphation</li> <li>Alarm 7: quick charge function</li> <li>Alarm 8: battery temperature too high</li> <li>Alarm 9: incorrect battery type</li> <li>Alarm 10: corroded cables or connections</li> <li>Alarm 13: internal fault 0</li> <li>Alarm 14: internal fault 1</li> <li>Alarm 15: internal fault 2</li> <li>Alarm 16: service life test not possible</li> <li>Alarm 17: short-circuit or overload on the battery terminals</li> <li>Error also occurs with incorrect commissioning: without mains connection, there is no communication between batteries and batteries</li> </ul>		
30	Fault of battery B	LED is associated with a display message and lights up when a fault occurs (see: "Fault of battery A").	Yellow	4.2.11.1
31	Pre-alarm fault of battery A	<ul> <li>LED is associated with a display message and lights up when one of the following faults occurs with battery A:</li> <li>Alarm 1: high input AC voltage</li> <li>Alarm 2: low input AC voltage</li> <li>Alarm 11: high battery voltage</li> <li>Alarm 12: low battery voltage</li> <li>Alarm 18: power supply not connected</li> </ul>	Yellow	4.2.11.1
32	Pre-alarm fault of battery B	LED is associated with a display message and lights up when a fault occurs (see: "Pre-alarm fault of battery A").	Yellow	4.2.11.1
33	Switchgear fault	LED lights up in the event of a fault or communication error of the slave circuit boards with the main printed circuit board. In the event of a general malfunction of the control, all LEDs light up.	Yellow	4.2.11.1
34	Fuel valve closed	Fuel valve is closed	Yellow	4.2.11.1
35	Power supply ON	Mains voltage is normal, power supply is switched on	White	4.2.11.1
36	Fault of power supply	<ul> <li>No power supply or mains voltage</li> <li>In the event of a mains failure, check the power supply line and the condition of the fuses FU 1, FU 2.</li> </ul>	Yellow	4.2.11.1

#### Buttons

	Button	Function	Colour	As per VdS 2100-2 2en
15	Manual subassembly stop	Stop of the ventilators and optional lamellae after a manual start. LED lights up if the button is pressed. Room ventilation cannot be stopped during automatic mode.	Red	4.2.10
16	Manual subassembly start	When the motor is running, the room ventilation is started au- tomatically. Manual start of the ventilation and optional lamel- lae also possible.	White	
17	Manual stop	Stop the pump manually after an automatic or manual start- up. LED lights up if the button is pressed.	Red	4.2.10

	Button	Function	Colour	As per VdS 2100-2 2en
18	Manual battery B start	Can be activated if LED lights up.	White	
		LED lights up if the switchgear is powered for the first time or after 6 failed start-up attempts.		
		LED goes out when the button is pressed and the start proced- ure is carried out (test start function).		
19	Manual start	Start pump manually.	White	4.2.10
		The start cycle is carried out and the pressure switch message is simulated.		
		LED lights up if the manual start cycle is active.		
20	Manual battery A start	Can be activated if LED lights up.	White	
		LED lights up if the switchgear is powered for the first time or after 6 failed start-up attempts.		
		LED goes out when the button is pressed and the start proced- ure is carried out (test start function).		
21	Buzzer "OFF"	Deactivate acoustic alarm in case of fault.	White	4.2.10
		LED lights up when mute is activated.		
		Mute is deactivated if another alarm occurs.		
22	Lamp test	Test LED indicators.	White	
		LED lights up if the button is pressed.		

#### 5.3 Electrical components



Fig. 3: Overview of electrical components

	Description
1	Circuit breaker 10A (QF1)
2	Circuit breaker 10A (QF2)
3	Circuit breaker (QF3 – QF15)
4	Battery A charging device (GD1)
5	Battery B charging device (GD2)
6	Relay (KA5 – KA9)
7	Main switch (QS1)
8	Terminal strip (M1 – M3)
9	Battery B power contactor (KM2)
10	Battery A power contactor (KM1)
11	Fuse protection (Frequency converter 1 – Frequency converter 2)
12	Auxiliary relay (KA1–KA4)

# 5.4 Display



#### Fig. 4: Display overview

	Description
1	Battery B voltage and current
2	Power supply of battery B charging device
3	Ambient temperature
4	Cooling water temperature
5	Scroll menu
	Press to access the system menu and scroll through menu pages.
6	Reset alarms
	Press to reset alarms.
	The LEDs are also reset, if possible. The Buzzer "OFF" LED is reset.
7	General alarm indicator
	Lights up yellow if an alarm is present.
	• Press to display the alarm type and the alarm record.
8	Fuel fill level
9	Motor oil temperature
10	Motor oil pressure
11	Power supply of battery A charging device
12	Battery A voltage and current
13	Motor speed
• For	more menu displays, see menu [▶ 18]

5.6

Switchgear material	Steel, red
Ambient temperature	+10 +40°C
Mains voltage	1~ 230 V +/- 10%
Mains frequency	50 Hz
Max. relative humidity	50% at max. 40°C
Switchgear protection class	IP54
Max. installation height	300 m above SL
Min. air pressure	1 bar
Rated current	See rating plate
EMC noise emission	According to EN 61000-6-3
EMC noise insensitivity	According to EN 61000-6-2
Display type	TFT colour display
Display size	4.3"
Resolution	480 x 272 pixels
Colours	65,536 colours
Backlight	White LED
Service life of backlight	50,000 hours
Brightness setting	16 stages

#### 5.7 Analogue and digital inputs

Technical data display

The switchgear has digital and analogue inputs.

Designation	(Digital) input (Slave 10)	Terminal
IN1	Pressure switch diesel motor	M1 -1
IN2	High-temperature sensor of the diesel motor	M1 -2
IN3	Low temperature sensor of the diesel motor	M1-3
IN4	Low fill level of fuel tank	M1-4
IN5	Valve on fuel circuit partially closed	M1-5
IN6	Fuel loss in the fuel tank	M1-6
IN7	Room ventilation	M1 -7
IN8	Valve on heat exchanger circuit partially closed	M1-8
Designation	Input (analogue) (slave 12)	Terminal
IN1	Pump 1 pressure switch	M1 -11
IN2	Pump 2 pressure switch	M1 -12
IN3	Float switch inlet tank	M1 -13
IN4	Oil temperature sensor	M1-14
IN5	Water temperature sensor	M1 -15
IN6	Heat temperature sensor	M1-16
IN7	Fill level sensor for fuel tank 420 mA	M1 -17
IN8	Room temperature sensor	M1-18
IN9	Oil pressure sensor	M1-19
IN10	Fuel fill level sensor, 0-330 Ohm	M1-20

#### 5.8 Analogue and digital outputs

The switchgear has digital outputs distributed on different printed circuit board. Some outputs are dependent on the optionally selected potential-free changeover contacts.

Printed circuit board C0610A_1.1	Output (slave 10)	Terminal
OUT3	Pump stop, automatic mode excluded	M2.16-18
OUT4	General error	M2.13-15

Printed circuit board C0610A_1.1	Output (slave 10)	Terminal
OUT5	Mains voltage OK	M2.10-12
OUT6	Power supply fault	M2. 7-9
	<ul><li>High/low voltage battery</li><li>High/low voltage AC voltage</li></ul>	
OUT7	No bus communication	M2.19-21
OUT8	Empty	/
Printed circuit board C0610A_1.2	Output (slave 11)	Terminal
OUT6	<ul><li>Signal path fault</li><li>Pressure switch 1 and 2</li><li>Float switch, break tank</li></ul>	M2. 28-30
OUT7	Start request <ul> <li>Float switch, break tank</li> </ul>	M2. 25-27
OUT8	Start request	M2. 22-24
	Pressure switch 1 and 2	
Printed circuit board C0610A	Output (slave 11)	Terminal
OUT1	Fuel tank not completely filled	M2. 4-6
OUT2	Fuel tank alarm	M2.1-3
OUT3	Pump in operation 2 (PCB)	M2. 34-36

5.9 Type key

#### Example: W-CTRL-F-BC10A-12V-N37-M2-D150

Pump in operation 1 (PCB)

W-CTRL	Wilo switchgear
F	Firefighting system
BC10A	Battery charging device rated current (A)
12 V	Battery charging device rated voltage (V)
N37	Coding for product tested by VdS
M2	M: Single-phase
	2: Rated voltage of 230 V power supply
D150	D: Diesel pump
	150: Protective electric current (A)

M2.31-33

5.10 Scope of delivery

5.11 Accessories

#### • Switchgear

OUT4

- Ready for connection
- Pre-assembled and set at the factory
- Including function test
- Installation and operating instructions
- Accessories, depending on order
- Pressure switch with pre-assembled resistors
- Float switch with pre-assembled resistors

For more information on the installation, calibration and adjustment of the accessories supplied, refer to the manufacturer's instructions.

• Order accessories separately.

6 Installation and electrical connection



# DANGER

#### Risk of explosion due to sparks!

Sparking at the poles of the batteries can cause an explosion in a potentially explosive environment.

- Do not install the switchgear in an explosive environment.
- Ensure adequate aeration in the installation room.



# WARNING

#### Danger due to improper installation!

- Have the switchgear connected in accordance with local regulations and by qualified personnel.
- If the switchgear is installed in fire pump systems within the scope of VdS, observe VdS regulations for installation, operation and maintenance.
- Please observe VdS CEA 4001.

# CAUTION

#### Risk of material damage due to escaping water.

Escaping water can damage the components of the switchgear.

• Install the switchgear in such a way that water escaping from the pump or pipework cannot damage the switchgear.

- 6.1 Requirements at the installation location
- Install the switchgear in a dry, well-ventilated, frost-free room.
- Avoid direct sun exposure.
- Place the switchgear as close as possible to the pump and within sight of the pump unit.
- Maintain maximum distance between the switchgear and the batteries (5 metres).
- Maintain sufficient distance for installation and later access to the switchgear.
- Ensure that the switchgear is installed at the correct height.
- Ensure sufficient air circulation for cooling.

#### 6.2 Electrical connection



# DANGER

#### Risk of fatal injury due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Electrical work must be carried out by a qualified electrician in accordance with the locally applicable regulations.
- If the product is disconnected from the mains, secure it against being switched on again.



# CAUTION

#### Risk of damage to property.

An incorrect electrical connection will damage the product.

- Carry out the electrical connection according to the circuit diagram in the switchgear.
- The mains connection current and voltage must be as stated on the rating plate.

If the switchgear is part of a fire-fighting system, the wiring is pre-assembled at the factory.

If the switchgear is supplied as a component, carry out the following work:

• The mains connection cable must be dimensioned in accordance with the relevant standards.

- Use safety switches that match the cable cross-sections.
- Connect the mains connection cable to the main switch.

The following connections are necessary for the proper operation of the switchgear:

- Power supply
- Batteries
- Diesel motor starter at terminal M1, 22–23
- Alternator for diesel motors, according to circuit diagram
- Electric stop system for diesel motors at terminal M3, 8–9
- Pressure switch 1 to terminal M1-11 (pressure switches from the accessories are ready for connection with pre-assembled resistors.)
- Pressure switch 2 to terminal M1-12 (pressure switches from the accessories are ready for connection with pre-assembled resistors.)
- Float switch for break tank at terminal M1–13. If you do not use a break tank to prefill the pump, the corresponding terminal for the float switch is bridged. Float switches from the accessories are ready for connection with pre-assembled resistors.
- Speed sensor at terminal M1, 25-26
- Oil pressure switch, according to circuit diagram
- Motor thermostat, according to circuit diagram
- Fuel filling level sensor, according to circuit diagram
- Fuel valve

The following connections are to be connected optionally:

- When status and alarm signals are passed on to a building services system, the signals can be sent via free contacts. Each alarm has a free contact in the commutation.
- If a motor heater is required, connect the power supply (230 V) for the motor heater to terminal M0, 3-4. It is possible to connect a thermostatic valve to control the motor heating to terminal M3, 6-7. The terminal M3, 6-7 is bridged as standard.
- If lamellae and ventilators are used to supply fresh air, the motors of the lamellae and ventilators must be supplied with power separately in order to be functional in case of malfunction of the main power supply. The control and fuse protection of the electric circuit (QF11 for lamellae, 4 A, curve C; QF12 for ventilators, 6 A, curve C) can be connected to terminal M3.
- Connect electrical valve for cooling water heat exchanger (if heat exchanger is present) to terminal M3, 10–11.

- 7 Operation
- 7.1 Menu

The menus can be called up using the 🗲 and 📂 buttons.

If no action is performed on the display for 30 seconds, the main menu is displayed again.

Page	View		Description
Page 2	View 9 Last starting time 0 Total operating hours 0 7 SET fuel level probe 1.0 6 SET fuel level alarm 90 % 5 SET heater alarm 45 / 0 9 View 4 Mout 3	: 0 : 0 SET 1 0 ° C 1 2)	Description         Displayed values:         • Total number of operating hours (8)         • Duration of the last start (9)         Change values (see menu 2.1)         1. Press Set (1).         2. Enter password (9456).         3. Select value.         4. Enter new value.         Changeable values:
		-	<ul> <li>Commissioning test</li> <li>Fuel fill level sensor conversion factor (7)</li> <li>Fuel fill level alarm (min. 80%, max. 95%) (6)</li> <li>Motor heater temperature (default value/current value) (5)</li> <li>Date and time (4)</li> <li>The language can be changed by pressing the corresponding flag at the bottom (3).</li> </ul>





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The switchgear can work in the following operating modes:

- Automatic mode
- Manual mode
- Emergency start/emergency stop
- Additional operating functions

The switchgear is in automatic mode as standard.

Automatic mode

Manual mode

7.2.1

7.2.2

- Control lamp "Power supply ON" lights up.
- All fault and status messages do not light up or are reset.

The pump can be started manually for manual mode with the "Manual start" button. The pressure switch on the discharge side is bypassed and the start cycle of automatic mode is activated.

When the pump is in operation, the "Pump operation" control lamp lights up. When the pump is stopped with the "Manual stop" button and the pressure is above the pressure set on the pressure switches, the control device returns to automatic mode. If the pressure is not sufficient, the control device switches the pump off (automatic deactivation).

The pump can also be started manually from the batteries using the corresponding buttons on the control panel ("Manual battery A start" or "Manual battery B start"):

- The control lamp "Manual battery A start" or "Manual battery B start" lights up depending on which battery was used for the manual mode test. When the LEDs light up, the buttons are functional.
- When the control device is powered for the first time, the LEDs light up.
- When the pump has stopped, the LEDs light up.
- When the button is pressed and the start is carried out, the LED goes out.



# NOTICE

After each manual start, the pump must be stopped manually. To carry out another test, wait until the red LED for the manual stop has gone out.



# NOTICE

Pressing the "Manual battery A start" or "Manual battery B start" button also checks the connection of the respective emergency start button on the switchgear.

#### Start pump

- 1. Open the switchgear.
- 2. Check that all circuit breakers are switched on.
- 3. Activate switchgear at the main switch.
- 4. Close switchgear.
  - ⇒ If the electrical connection is correct, the control lamp "Power supply ON" lights up. Possible notifications are shown on the display and by the general message indicator.
- 5. Reset alarms with the reset button in the display.
- If the LEDs "Manual battery A start" and "Manual battery B start" (white LEDs) light up, a manual mode test must be carried out.
- 7. Press the "Manual battery A start" button.
- 8. Press the "Manual stop" button and wait until the red LED goes out.
- 9. Press the "Manual battery B start" button.
- 10. Press the "Manual stop" button.
  - $\Rightarrow$  After the manual mode test, the system will be in automatic mode.



# CAUTION

The manual mode test locks the "Manual battery A start" and "Manual battery B start" buttons. The automatic mode of the system is still active according to the valid VdS regulation.

- 11. Press the "Manual start" button.
- 12. If the pump does not start, check fault indications and instructions in the display.
  - ► The system is in manual mode.

#### Stop pump

- 1. Press the "Manual stop" button on the control panel.
  - $\Rightarrow$  When the pressure is restored, the system goes into automatic mode.

7.2.3 Emergency start – emergency stop The switchg

**p** The switchgear is equipped with emergency start buttons including cover and an emergency stop button on the front door.

The emergency start and emergency stop buttons are always active, even if the switchgear has an error.

If the control lamps "Test, emergency start 1" and "Test, emergency start 2" do not light up, the electrical connection of the emergency start device can be tested.

In the event of a control device fault ("Switchgear fault" control lamp), or if all LEDs light up in the event of a general control device fault, the motor can be started manually with the "Battery A emergency start" or "Battery B emergency start" buttons.

- Break glass pane.
- Carry out start attempts alternately with the "Battery A emergency start" and "Battery B Emergency start" buttons.
- Press the button (maximum 15 seconds) until the motor starts.

#### 7.2.4 Additional operating functions

Operating functions	Description
Calibration	To ensure the hydraulic output of the system, the throttle valve and therefore the speed of the pump must be adjusted. Check parameters continuously to calibrate the throttle lever to the pump curve.
Test control lamps	To test the function of the control device's control lamp, press the "Lamp test" button on the control panel.
Motor heating	All pump units are equipped with a motor heater. The control device contains the necessary ter- minals for the power supply to the motor heater.

#### 7.3 Monitoring functions

Function	Description	
Power supply	The power supply is monitored.	
	If the power supply is insufficient, the control lamp "Fault of power supply" lights up and the con- trol lamp "Power supply on" goes out. The display shows the fault indication. If the fault no longer exists, the fault indicator is automatically reset.	
	<ul> <li>In the event of a mains failure, check the power supply line and the condition of the fuses FU1, FU2.</li> </ul>	

Function	Description
Battery voltage	<ul> <li>The voltage of batteries A and B are monitored. If there is a fault, the fault indication "Battery A voltage fault" or "Battery B voltage fault" lights up.</li> <li>Alarm 3: reversed polarity</li> <li>Alarm 4: battery not connected</li> <li>Alarm 5: internal cell short-circuited</li> <li>Alarm 6: battery sulphation</li> <li>Alarm 7: quick charge function</li> <li>Alarm 8: battery temperature too high</li> <li>Alarm 10: corroded cables or connections</li> <li>Alarm 14: internal fault 1</li> <li>Alarm 15: internal fault 2</li> <li>Alarm 16: service life test not possible</li> <li>Alarm 17: short-circuit or overload on the battery terminals</li> <li>Reset the error by pressing the reset button on the display.</li> </ul>
Charging voltage	The battery chargers for battery A and battery B are monitored. If there is a fault, the "Pre-alarm fault of battery A" or "Pre-alarm fault of battery B" control lamp comes on. If the fault no longer exists, the fault indicator is automatically reset. • Alarm 1: high input AC voltage • Alarm 2: low input AC voltage • Alarm 11: high battery voltage • Alarm 12: low battery voltage • Alarm 18: power supply not connected
Battery contactor	<ul> <li>The battery contactors for battery A and battery B are monitored. If a contactor is not working properly, the control lamp "Fault of contactor battery A" or "Fault of contactor battery B" lights up. If the fault no longer exists, the fault indicator is automatically reset.</li> <li>Battery A: battery contactor QF4, QF6</li> <li>Battery B: battery contactor QF5, QF7</li> </ul>
Main printed circuit board	The main printed circuit board is monitored. "Switchgear fault" lights up in the event of a mal- function or communication fault of the secondary printed circuit boards with the main printed circuit board. In the event of a general malfunction of the control, all LEDs light up.
Signal path (pressure switch, float switch break tank)	The pressure switch and the float switch in the break tank are monitored with a separate cable to detect wire breakage and short-circuit. Each pressure switch is connected to a monitoring and start command line. In case of wire breakage or short-circuit, the "Fault of pressure switch (1)" or "Fault of pressure switch (2)" control lamp or, if present, the "Float switch fault" control lamp lights up. If the fault no longer exists, the fault indicator is automatically reset.
Oil pressure	<ul> <li>The oil pressure is monitored via a pressure sensor on the motor. If the oil pressure is too low, the "Low oil pressure" control lamp comes on.</li> <li>If the oil pressure is too low, the motor will not stop.</li> <li>Reset the error by pressing the reset button on the display.</li> </ul>
Temperature	<ul> <li>The temperature is monitored via a temperature sensor on the motor. If the motor temperature becomes too high, the "Motor overheating" control lamp comes on.</li> <li>If the temperature is too high, the motor will not stop.</li> <li>Reset the error by pressing the reset button on the display.</li> </ul>
Excessive speed	<ul><li>The motor speed is monitored via a speed sensor on the motor. If the speed is above 3100 rpm, the "Excessive speed" control lamp comes on.</li><li>Reset the error by pressing the reset button on the display.</li></ul>
Fill level of the fuel tank	<ul><li>The fill level in the fuel tank is monitored. If the fuel fill level in the fuel tank falls below 90% fill, the "Fuel low" control lamp comes on.</li><li>Reset the error by pressing the reset button on the display.</li></ul>
Fuel valve position	The position of the fuel valve is monitored. When the fuel valve is closed, the "Fuel valve closed" control lamp lights up. If the fault no longer exists, the error display is automatically reset

en

#### 7.4 Additional functions

Function	Description
Room ventilation control	The ventilation of the installation room must ensure a sufficient supply of fresh air and heat dis- sipation. If lamellae and ventilators are installed, they can be controlled via the switchgear.
	The lamellae and ventilators are to be provided by the customer. The power supply must also be guaranteed in an emergency. Connect control and fuse protection (safety switch QF11 for lamel- lae, C-curve, 4 A; safety switch QF12 for ventilators, C-curve, 6 A) to terminal strip M3.
	When the room ventilation is in operation, the control lamp "Room ventilation operating" lights up. If the lamellae check is faulty or the relay control QF11 and QF12 is faulty, the "Room ventila-tion fault" control lamp lights up.
	<ul><li>Start room ventilation manually by pressing the "Manual subassembly start" button.</li><li>Stop room ventilation manually by pressing the "Manual subassembly stop" button.</li></ul>
Inlet tank fill level	The fill level in the inlet tank can be monitored by a float switch. When the fill level drops below 2/3 of the tank capacity, the motor starts automatically and the "Operation of floating switch" in- dicator lights up. In the event of a float switch error, the "Fault of floating switch" indicator lights up. If the fault no longer exists, the fault indicator is automatically reset.
Fuel leakage	A leakage sensor can be connected to the switchgear to detect leaking fuel.
	The system must be installed on a surface suitable for collecting oil and fuel leaks. A float switch is installed in the collector tank.

#### 7.5 Running the operating modes



# WARNING

#### Risk of injury due to improper operation!

• Observe safety instructions in the installation and operating instructions for the diesel motor and the pump.



# CAUTION

#### **Risk of damage to property!**

Insufficient ventilation can cause damage to the switchgear.

Ensure sufficient ventilation of the switchgear

The most important operating parameters, notifications and alarm signals appear on the display and are indicated via control lamps in the control panel.

• Reset alarm signals that do not reset automatically by pressing the reset button on the display.

#### 7.5.1 Automatic mode

- 1. After activating the switchgear, test the manual mode using the "Manual battery A start" and "Manual battery B start" buttons, seeManual mode [▶ 21].
  - The system is in automatic mode. The control lamp "Power supply ON" lights up. No further operation is required.

#### **Operation via pressure switch**

- During a fire, when the sprinklers are activated and water is expended, the pressure in the discharge pipeline is reduced.
- If the pressure drops below the set value, the pump starts automatically.
- When the pump is running, the control lamps "Pump operation" and "Operation of pressure switch" as well as the control lamp "Operation of pressure switch 1" or "Operation of pressure switch 2" are lit.

#### **Operation via float switch**

The pump also starts when the fill level of the inlet tank (if present) falls below 2/3 of the filling volume.*It is necessary to keep the pump supplied with water on the suction side.* 

- Check the system pipework for leakage.
- Check the suction line and valve of the pump.

A start-up attempt takes 10 seconds. If the motor does not start, another start attempt is made after 10 seconds. The battery is changed with every start attempt. A total of six start-up attempts are made.

After six start-up attempts, automatic mode is blocked and the "False start" control lamp comes on. When the fault has been corrected, automatic mode can be restored by pressing the "Reset" button in the display.

After six unsuccessful start-up attempts, an additional test of manual mode must be performed, see Manual operation [▶ 21] (from action instruction 7).



#### NOTICE

The system is not stopped if warnings arise. To stop the pump, press "Manual stop" on the control panel.

#### Execute emergency stop

If an emergency shutdown is required, carry out one of the following actions:

- Press the emergency stop button on the front of the switchgear.
- Pull the stop lever (if present) of the injection pump on the diesel motor.
- Close fuel valve. Motor keeps running.

#### 7.5.2 Perform test runs



# CAUTION

#### Risk of property damage during test run.

If a fault occurs during the test run, the product may be damaged.

- Do not leave the installation room during the test run.
- Observe all operating and fault indications, as the product does not stop automatically in the event of a fault (e.g. no cooling water or no oil).

A test run can be carried out to test the manual mode and the electrical connection of the emergency starting device.

A test run is requested after the first switch-on and after a deactivated pump/automatic shutdown.

- 1. Start the pump by pressing the "Manual start battery A" button.
- 2. Stop the pump by pressing the "Manual stop" button.
- 3. Start the pump by pressing the "Manual start battery B" button.
- 4. Stop the pump by pressing the "Manual stop" button.
  - $\Rightarrow$  The pump group goes back into automatic mode.

#### **Check automatic start function**

- 1. Keep the "Manual stop" button pressed.
- Open the stop valve of the test line for the necessary time to perform six start-up attempts.
  - ⇒ After six failed start-up attempts, the control lamp "False start" lights up on the control panel.
- 3. Release the "Manual stop" button until the LED goes out.
- 4. Reset alarm, by pressing the "Reset alarms" button on the control panel.
- 5. Stop the pump by pressing the "Manual stop" button.

 $\Rightarrow$  When the pressure is restored, the pump group goes back into automatic mode.

6. Close the stop valve of the test line.

#### Battery test

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All battery types can be used. With the help of jumpers, it is possible to set predefined characteristic curves for batteries with open lead acid, sealed lead acid, gel, Ni–Cd and Ni–Mh (option).

The battery chargers are equipped with a real-time auto-diagnostic system that monitors, detects and reports battery faults (e.g. short-circuit, incorrect connection or disconnection of the battery).

The battery test is carried out automatically. The battery connections are checked every 60 seconds. Every 220 minutes, the battery efficiency is checked during trickle charging.

#### 8 Commissioning

#### 8.1 Preparatory work



#### DANGER

#### Risk of fatal injury due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Electrical work must be carried out by a qualified electrician in accordance with the locally applicable regulations.
- If the product is disconnected from the mains, secure it against being switched on again.



#### DANGER

#### Risk of fatal injury due to electrical current!

There is a risk of fatal injury when performing work on the open switchgear! The components carry current!

- Have work carried out by a qualified electrician.
- Avoid contact with earthed metal parts (pipes, frames etc.).



# WARNING

#### Risk of injury due to improper commissioning!

• Observe the commissioning of the installation and operating instructions for the diesel motor and the pump.

#### **Preliminary work**

- Switchgear and pump group are properly installed and connected.
- 1. Set the pressure switch to the required values.
- 2. Check the tight fit of the screw terminals of the controllers and signal transmitters before commissioning.

After installation, a test run must be carried out for commissioning on site in accordance with VdS CEA 4001 Point 9.9.13.2:

- 1. Open the switchgear.
- 2. Check that all circuit breakers are switched on.
- 3. Connect the switchgear to the power supply.
- Connect the batteries. First connect the positive terminal, then connect the negative terminal.
- 5. Activate switchgear at the main switch.
- 6. Close switchgear.
  - ⇒ If the electrical connection is correct, the switchgear starts. When the switchgear is ready, the "Power supply ON" control lamp lights up.
- 7. Prevent motor start by:
  - ⇒ Close fuel valve. Due to remaining fuel, the motor can still start, or
  - $\Rightarrow$  Pull and block the locking lever of the injection pump, if present, or
  - $\Rightarrow$  Press and hold the emergency stop.
- 8. Open page 2 in the display and press "Set" (password: 9456).

8.2

Carry out commissioning



Select commissioning test

10. Press the arrow at the bottom keeleft.



The main screen is displayed. "Commission-

- ing test mode" is displayed at the top of the screen.
- 11. To perform the commissioning test, press the "Manual start" button on the control panel.
  - ⇒ The system performs 6 start attempts (duration 15 seconds) with a 10-second pause, according to VdS CEA 4001 9.9.13.2.
- 12. After 6 start attempts, the fault is displayed and the acoustic alarm sounds. Reset the alarm by pressing the reset button on the display.
- 13. Make motor start feasible by:
  - ⇒ Open fuel valve, or
  - $\Rightarrow$  Release the locking lever of the injection pump again, if present, or
  - $\Rightarrow$  Release the emergency stop button again.



The system ends the commissioning test. "Make manual start test batteries A and B" is displayed at the top of the screen.

- ⇒ The LEDs light up for the "Manual battery A start" and "Manual battery B start" buttons.
- 14. End commissioning test by pressing the "Manual battery A start" and then "Manual battery B start" button.
  - ⇒ The LEDs for the "Manual battery A start" and "Manual battery B start" buttons no longer light up.
- 15. If the "Manual battery A start" and "Manual battery B start" control lamps are on, start the diesel motor manually using the "Manual battery A start" or "Manual battery B start" button.
  - > The system is ready for operation and is in automatic mode.



#### NOTICE

In case of a false start after the six unsuccessful start attempts, a test must be performed in manual mode  $[\triangleright 21]$ .

Commissioning is complete when the system is pressurised after a start-up and the switchgear is in automatic mode.

- 9 Shut-down
- 9.1 Decommissioning

The pumps must first be stopped before decommissioning.



# NOTICE

Observe the regulations of VdS CEA 4001 (safety measures and procedure in the event of a non-functional system).

- 1. Open the switchgear.
- 2. Set the main switch to "OFF".
- 3. Open circuit breakers QF4, QF5 QF8.
- 4. Close switchgear.
- 5. Remove the cable connection at the negative terminals of the batteries.
- 6. Remove the cable connection at the positive terminals of the batteries.
  - The unit is switched off and cannot be started.

#### 10 Maintenance



# DANGER

#### Risk of fatal injury due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Electrical work must be carried out by a qualified electrician in accordance with the locally applicable regulations.
- If the product is disconnected from the mains, secure it against being switched on again.



# NOTICE

#### **Observe regulations!**

• Observe the maintenance instructions of the VdS.



# NOTICE

#### **Professional maintenance!**

The operator must ensure that all maintenance, inspection and installation work is carried out by qualified personnel. A regular maintenance schedule helps to avoid expensive repairs and contributes to troublefree, reliable operation.

10.1 Maintenance intervals

#### Weekly

- Test control lamps.
- 1. Press the "Lamp test" button. If a control lamp is defective, contact Wilo customer service.

#### Monthly

• Check optional fuel leakage sensor, see product instructions.

#### Annually

- Check cable and cable connections.
- Check terminals.
- Check earthing.
- 1. Tighten loose connections.
- 2. Replace damaged cables.



# WARNING

#### Injuries due to sparking at the battery terminal!

When connecting or disconnecting the battery, sparking may occur.Only connect or disconnect the battery when the motor is not run-

ning.

The batteries are maintenance-free.

Repeated buffer charges lead to wear and tear of the batteries. Wilo recommends regularly replacing the batteries.

- Check the charge of the batteries during the starting procedures.
- Keep batteries clean and dry.
- Clean the container and plastic components of the batteries with clean water only.

#### **Replace** batteries

- 1. Remove the cable from the negative terminal (black).
- 2. Remove the cable from the positive terminal (red).

#### 11 Faults, causes and remedies



#### WARNING

#### Risk of fatal injury due to insufficient qualification!

- Faults should only be remedied by qualified personnel!
- Carefully read and understand the instructions in this manual.
- Do not repair materials or equipment unless you understand how they function.

Contact Wilo for regular maintenance if:

- The personnel do not have sufficient knowledge about the product.
- The personnel do not have sufficient knowledge of the operating logic required by the specific standards for fire-fighting systems.
- The personnel do not have the necessary technical skills.

#### Switchgear

Fault	Cause	Remedies
Switchgear without power	No power supply	Check power supply
		Check condition of fuses FU1, FU2

#### Main pump with diesel motor

Fault	Cause	Remedies
The motor does not start or stops when trying to start.	Batteries discharged	Check batteries and chargers. Charge the batteries or re- place them if necessary.
	Fuel shortage	If LED on switchgear is not lit up, check the fuel tank and float. Replace. Fill fuel tank.
	Air in the fuel circuit	Vent the circuit by venting the injectors and the fuel fil- ter.
	Diesel filter clogged	Replace filter.
	Air filter clogged	Replace filter.
	Fuel circuit malfunction	Contact customer service.
	Injection nozzle clogged	
	Injection pump malfunction	
	Temperature too low	Ensure that the ambient temperature is above 10 °C. Check that the oil/water preheater is working properly. Replace oil/water preheater.

Fault	Cause	Remedies
	Battery/starter/servo relay connec- tions loosened or corroded	Check cables and terminals. Rewire. Tighten properly. Replace component.
	Pump control unit in the switchgear defective	Check and replace if necessary.
	Starter malfunction	Contact customer service.
Pinion of starter motor does not dis- engage after starting the motor.	Fault control unit on control device	Contact customer service.
Pump does not deliver water or has a very low volume flow or delivery head	Negative suction head is too high. Pump cavitation	Check calculations according to the NPSHr value of the pump.
	Incorrect diameters of suction pipe and valves. Pump cavitation	Check calculations according to the NPSHr value of the pump
	Air entering the suction line	Make sure that there are no leakages in the suction line. Check the distance between the suction units if more than one pump is installed. Install anti-vortex plates.
	Partially/fully closed stop valves	Open the suction and pressure valves.
	Wear and tear on pump	Check and repair.
	Pump impeller blocked	Check and repair.
	Suction strainer/clogged filters	Check and repair.
	Wear and tear on pump/motor joint	Check and repair.
	Motor does not reach rated speed or pendulum speed	Check the speed on the display of the switchgear. See next point.
Motor does not reach rated speed or speed fluctuates.	Throttle lever in wrong position	Check, adjust speed and secure lever.
	Fuel filter blocked	Replace.
	Injector/pump fault	Contact customer service.
	Overload with partially blocked pump	Remove and check the pump.
	Joint not in axle	Align correctly.
Unusual heating – high water/oil temperature	Ambient temperature higher than 40 °C	Air-condition the environment.
	Insufficient ventilation	Check filter and ventilation screen, clean or change size.
	Contaminated or clogged chiller/heat exchanger	Dismantle and clean.
	Water shortage in chiller/heat ex- changer	After cooling, top up with water and check for leakages.
	Heat exchanger circuit valve closed or insufficiently open	Check whether the pump is delivering water and open the valve.
	Water circulation pump fault	Contact customer service.
	Fan belt fault (air-cooled motors)	Check tension and replace fan belt if necessary.
	Malfunction of the corresponding alarm	Check probe, connections and switchgear. Replace if ne- cessary.
Sudden drop in speed	Momentary overload/foreign body in the pump	Stop the motor, disassemble and repair the pump.
	Air filter/dirt trap clogged	Replace filter.
Black smoke	Oil level too high	Remove excess oil.
	Malfunction of injectors, fuel pump, etc.	Contact customer service.
	Loosened screws	Check and tighten the screwed connection.
	Loosened screws on the joint cover	Check and tighten the screwed connection.
Unusual mechanical noises	Slip between fan and contact guard, between joint and cover, etc.	Establish the correct distance and reassemble.
	Foreign object in the pump	Dismantle and remove.

Fault	Cause	Remedies
	Unaligned joint	Newly align.
	Bearings poorly lubricated or worn/ broken	Lubricate with grease or replace.
	Damaged bearings	Replace bearings.
Overheating of pump bearings	Insufficient lubrication	Relubrication.
	Misalignment between pump and mo- tor	Newly align.
	Absence of vibration absorber on the unit	Repair.
	Pump cavitation	Check the configuration of the system.
Unusual vibrations	Water with high air content	Make sure that there are no leakages in the suction line. Check the distance between the suction units if more than one pump is installed. Install anti-vortex plates.
	Closure on bearings, pump shaft	Replace bearings.
	Wear and tear on the pump/rubber plug motor coupling	Replace the rubber plug.
	Misalignment between pump and mo- tor	Newly align.
The motor does not stop after pressing the STOP button.	Normal if pressure in the system is not restored	End the automatic mode with the selection switch set to "AUTOMATIC OFF" and press the "Manual stop" button.
	Breakdown of the electromagnet/fail- ure of the control unit	Manually operate the fuel valve on which the solenoid acts.

#### 12 Spare parts

Spare parts are ordered via customer service. To avoid return queries and incorrect orders, the serial or article number must always be supplied. **Subject to change without prior no-tice!** 

# 12.1 Recommended spare parts inventory

To ensure that interventions can be made and the system can be restored quickly, maintaining a stock of the spare parts is recommended.

- For additional information, see spare parts list.
- Contact customer service.

#### 13 Disposal

Proper disposal and appropriate recycling of this product prevents damage to the environment and danger to your personal health.



#### NOTICE

#### Disposal in domestic waste is prohibited!

In the European Union this symbol may be included on the product, the packaging or the accompanying documentation. It means that the electrical and electronic products in question must not be disposed of along with domestic waste.

To ensure proper handling, recycling and disposal of the used products in question, please note the following points:

- Hand over these products at designated, certified collection points only.
- Observe the locally applicable regulations!

Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal. See www.wilo-recycling.com for more information about recycling.

13.2 Oils and lubricants

Operating fluids must be collected in suitable containers and disposed of in accordance with the locally applicable guidelines. Wipe up drips immediately!

Batteries and rechargeable batteries must not be disposed of with domestic waste and they must be removed before product disposal. End consumers are legally obliged to return all used batteries and rechargeable batteries. For this purpose, you can return used batteries and rechargeable batteries free of charge at municipal collection points or specialist retailers.



#### NOTICE

#### Disposal in domestic waste is prohibited!

Batteries and rechargeable batteries affected are marked with this symbol. The identifier for the heavy metal they contain is displayed beneath the graphic:

- Hg (mercury)
- Pb (lead)
- Cd (cadmium)







# wilo



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