Wilo-VR-System

D Einbau- und Betriebsanleitung

GB Installation and operating instructions

F Notice de montage et de mise en service

NL Inbouw- en bedieningsvoorschriften

2 040 503-Ed. 02 / 2011-08-Wilo

Fig. 1:

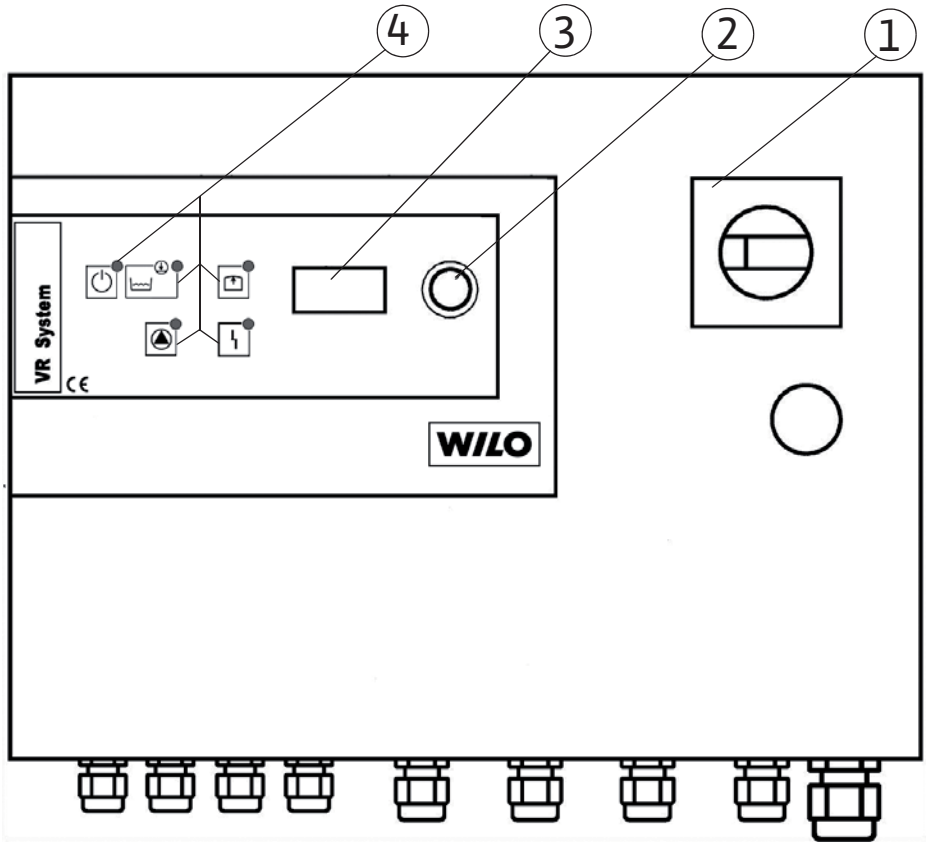


Fig. 2:

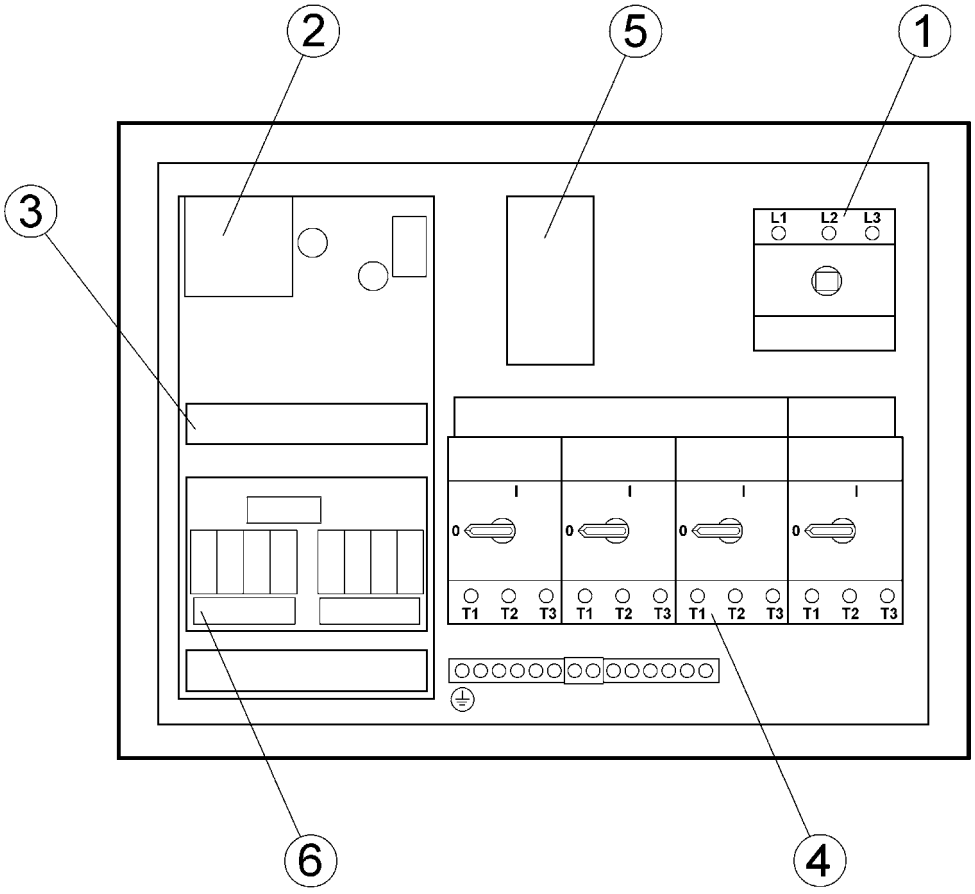


Fig. 3:

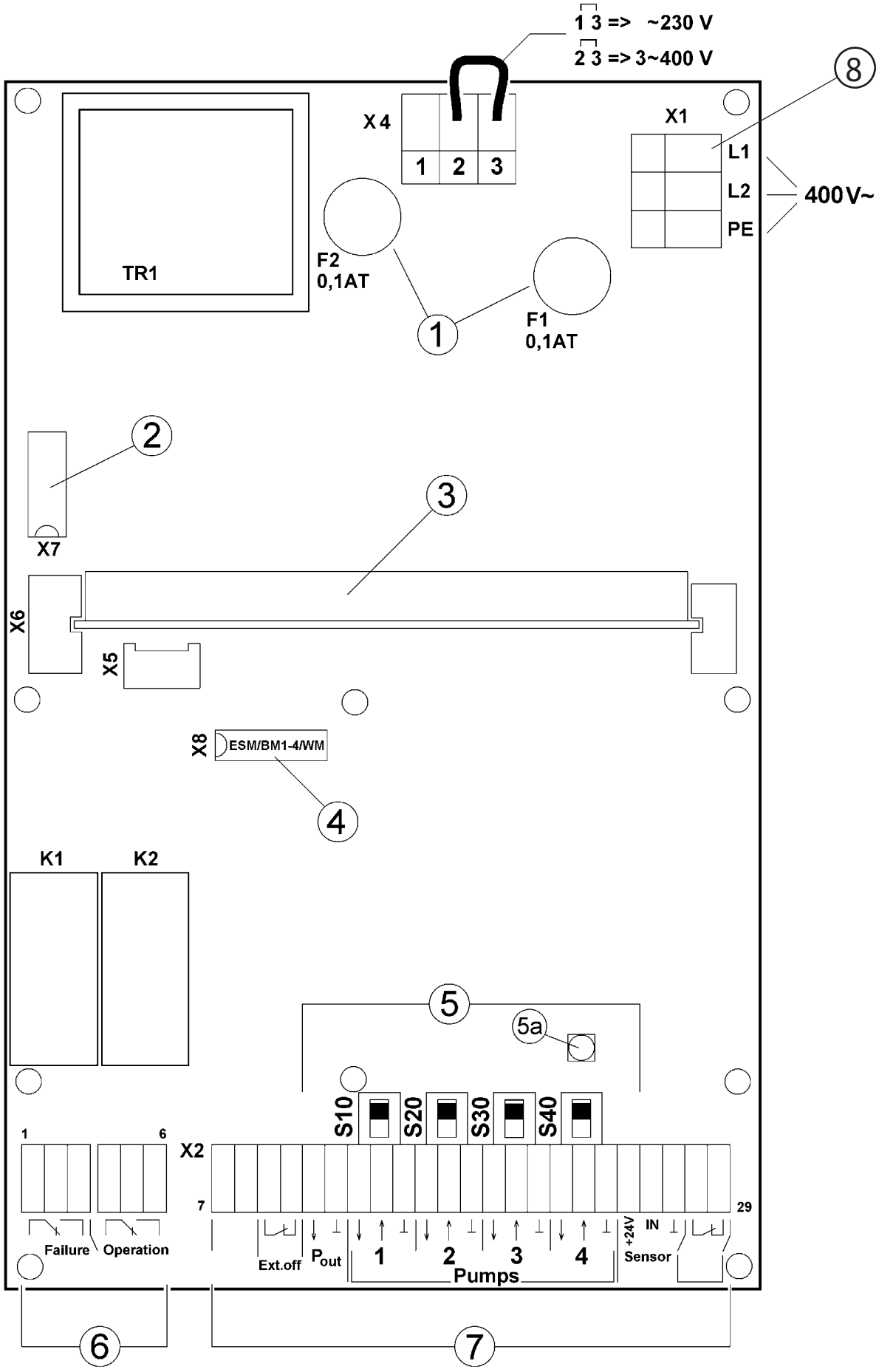

1 3 => ~230 V
2 3 => 3~400 V
8
X4
1 2 3
X1
L1
L2
PE
400V~
TR1
F2
0,1AT
F1
0,1AT
1
2
X7
3
X6
X5
X8
ESM/BM1-4/WM
4
K1
K2
5
5a
S10
S20
S30
S40
1
6
X2
7
29
Failure
Operation
Ext.off
Pout
1
2
3
4
Pumps
+24V
IN
Sensor
6
7

Fig. 4:

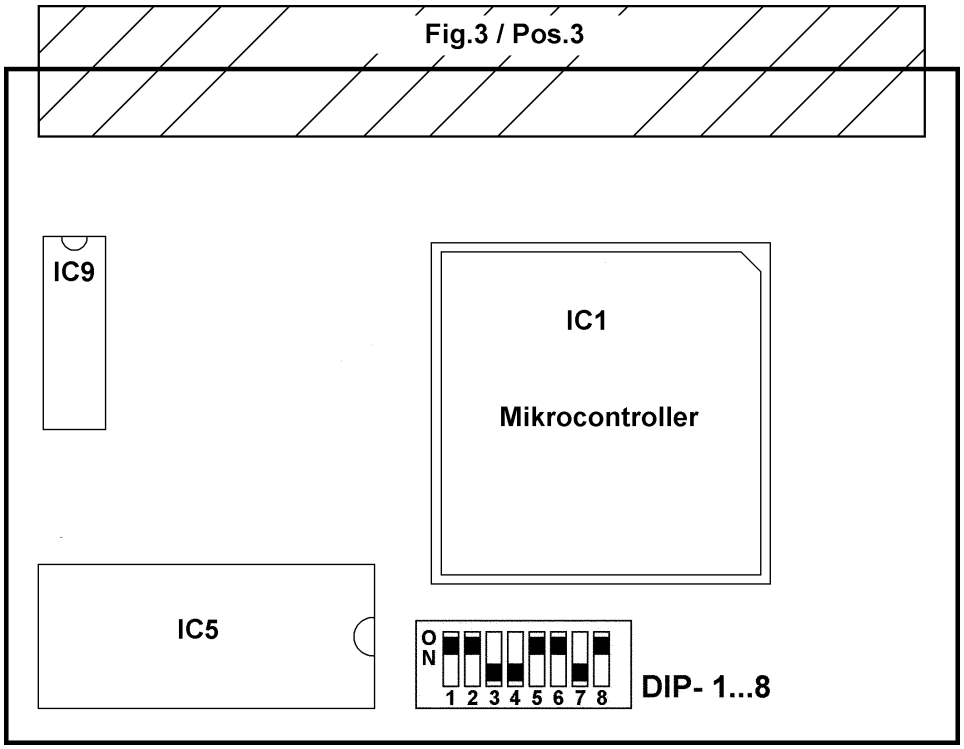
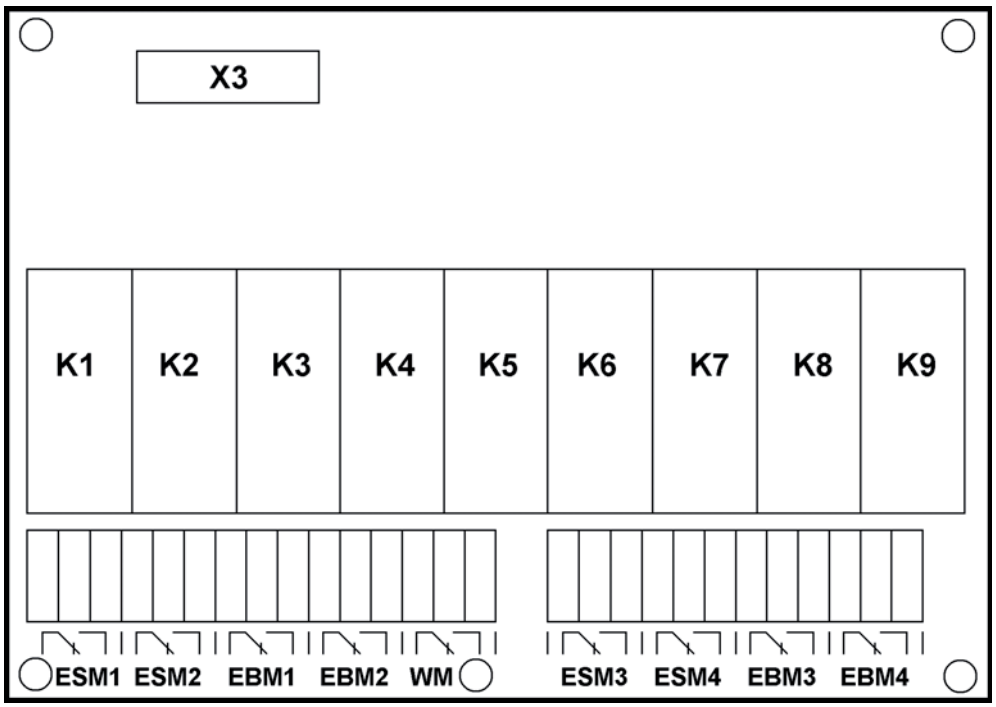


Fig.3 / Pos.3
IC9
IC1
Mikrocontroller
IC5
ON
1 2 3 4 5 6 7 8
DIP- 1...8

Fig. 5:


X3
K1
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EBM1
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Fig. 6:

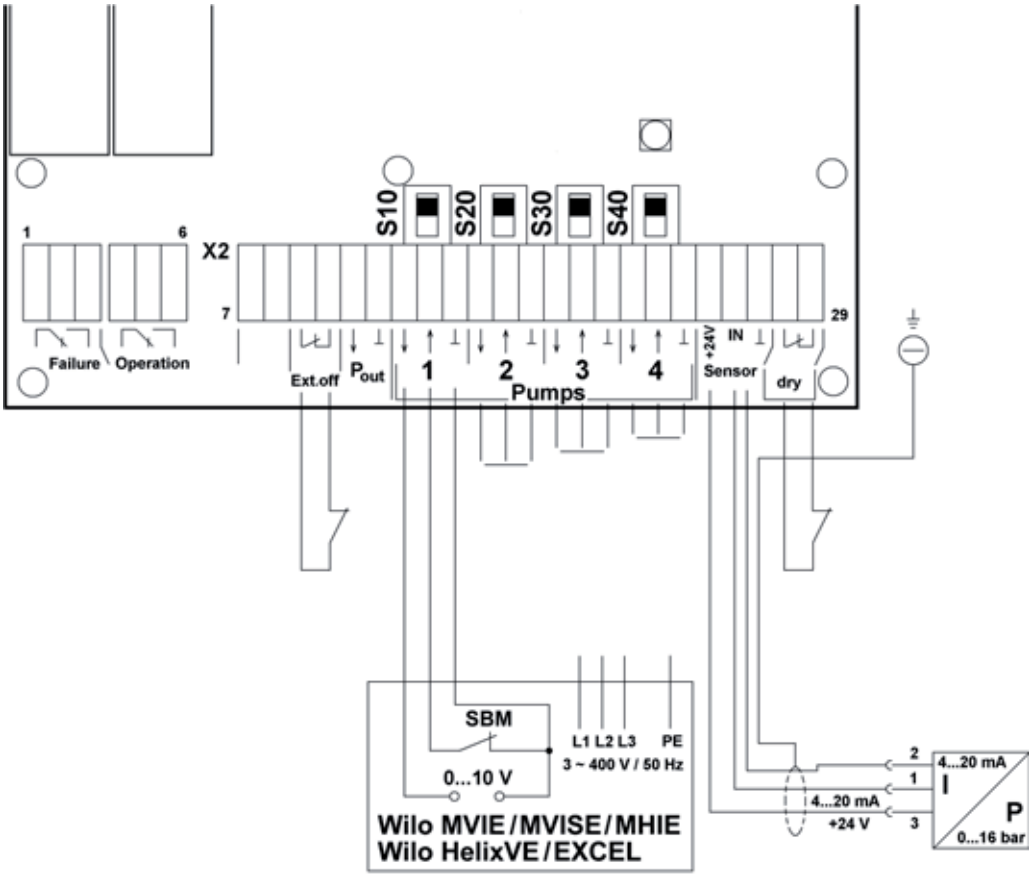
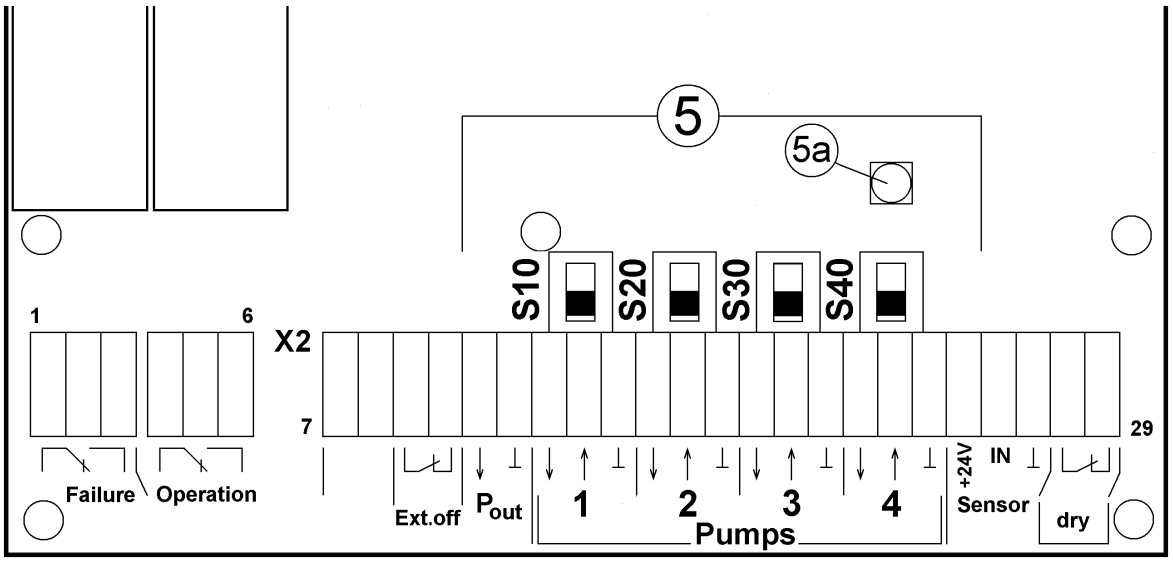

S10
S20
S30
S40
1
6
X2
7
29
Failure
Operation
Ext.off
Pout
1
2
3
4
Pumps
+24V
IN
Sensor
dry
SBM
0...10 V
L1 L2 L3
PE
3 ~ 400 V / 50 Hz
2
1
3
4...20 mA
+24 V
4...20 mA
I
P
0...16 bar
Wilo MVIE/MVISE/MHIE
Wilo HelixVE/EXCEL

Fig. 7:


5
5a
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S20
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X2
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Failure
Operation
Ext.off
Pout
1
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3
4
Pumps
+24V
IN
Sensor
dry

1 General

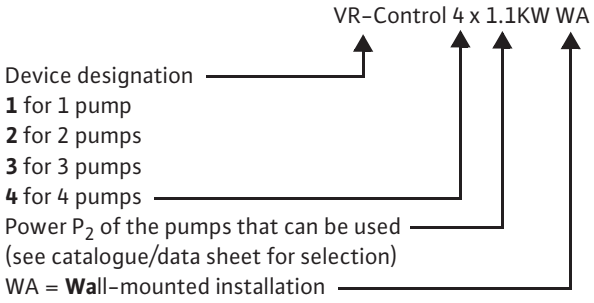
Installation and commissioning by qualified personnel only!

1.1 Intended use

The VR control device is for automatically controlling pressure boosting systems consisting of 1 to 4 pumps with integrated frequency converters of the WILO- MVIE, MVISE, MHIE and HELIX VE series or external frequency converters. These operating instructions only apply to operation with WILO pumps with integrated frequency converters.
If external frequency converters are used, the corresponding installation and operating instructions are to be taken into account.
Water supply and pressure boosting in residential, commercial and public buildings, hotels, hospitals, department stores and for industrial systems are the fields of application.
When used in conjunction with suitable signal transmitters, the pumps offer low-noise and energy-saving operation. The performance of the pumps is adapted to the constantly changing requirements in the pressure boosting system.

1.2 Product information

1.2.1 Type key



1.2.2 Connection and technical data	
Operating voltages:	1~230 V (L1, N, PE)
	3~400 V (L1, L2, L3, PE)
Frequency:	50/60 Hz
Protection class:	IP 54
Degree of contamination	3
Maximum ambient temperature:	40 °C
Pressure sensor:	P: 0 – 6 bar, 0 – 10 bar, 0 – 16 bar, 0 –25 bar
	I: 4 – 20 mA
Mains-side fuse protection:	according to wiring diagram included

Further electrical technical data can be found on the technical data sheet or rating plate.
Please state all the information on the system rating plate when ordering spare parts.

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 note is disregarded.
CAUTION!
There is a risk of damaging the product/unit. 'Caution' concerns possible damage to the product that could occur if this note is disregarded.
NOTE:
Useful information on handling the product. It draws attention to possible problems.
Information that appears directly on the product, such as

- Direction of rotation arrow
- Identification for connections
- Rating plate
- 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:

- Danger to persons from electrical, mechanical and bacteriological influences
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- 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

The existing directives for accident prevention must be adhered to.

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/the unit lead to hazards, 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 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 due to their own detailed study of the operating instructions.

Work to 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

CAUTION! Risk of damage to the product!
The control device must be protected against moisture and mechanical damage caused by blows/impact. The control device must not be exposed to temperatures outside the range between 10 °C and +50 °C.

4 Description of the product and accessories

4.1 Description of the control device

4.1.1 Function description

The control device is for controlling and regulating pressure boosting systems consisting of pumps with integrated frequency converters or external frequency converters. The pressure of a system is controlled load-sensitively with appropriate signal transmitters. The controller affects the frequency converter which has an effect on the pump speed. A change in speed changes the volume flow and thus the rated motor power of the single pumps. Depending on load requirements, pumps and associated frequency converters are started or stopped. The control device can control up to 4 pumps or frequency converters.

4.1.2 Design of the control device

The standard control device consists of the following individual components (Fig. 2):

NOTE!
Fig. 2 merely shows an example.
The actual design may vary
according to the plant configuration.

The installations are in a sheet metal housing, painted in RAL 7035 (textured):

- **Main switch** (item 1):
  Disconnects the power supply and is for connecting the mains supply.
- **Base board** (item 2, design according to Fig. 3):
  Power supply unit for the control device's low-voltage part, fuses 6.3x32 (item 1), connector strip for the display board, microcontroller board (item 3) and individual run and fault message board (item 4). In addition, connection terminals for the power supply (Fig. 3, item 8) and for the external signals (items 6+7), and slide switch (item 5) for every pump for the system's emergency operation function and a potentiometer (item 5a) for setting the speed.
- **Microcontroller board** (item 3):
  Microprocessor and plug connections for the base board and display board and DIP switches 1...8.
- **Display board:**
  For LCD display, rotary knob and LEDs.
- **Circuit breaker** (item 5):
  Fuse protection for the power supply of electronic modules.
- **Circuit breaker** (item 4):
  Fuse protection and connection of the single pumps with frequency converter drives.
- **Individual run and fault message board** (item 6):
  Optional, for the provision of changeover contacts for the run and fault signals of each pump and for low water protection (see also Fig. 5).

Chapter 5 provides more information.

4.1.3 Operating modes of the system

Normal operation
An electronic pressure transducer provides the actual system pressure value as 4 – 20 mA current signal. Then the controller maintains the system pressure constantly at the setpoint by means of the comparison of the setpoint/actual value.
If there is no “External Off” signal and no fault, a pump starts if required. The pump speed depends on consumption.
If the required output cannot be covered by this pump, another pump is started, the speed of which is then controlled according to the reduction to the pressure setpoint. Pumps, which are already running, keep running at maximum speed. A zero-flow test prevents the activation of a further pump, provided there is no pressure drop.
If demand decreases to such an extent that the controlling pump runs in its lowest performance range and is not needed to cover demand, this pump will be deactivated and the control function is assigned to another pump which has previously been working at maximum speed.
When the supply voltage is re-established after deactivation or a power failure, the control device is automatically switched to the previously set operating mode.

Zero-flow cut-off
If only one pump is operated, whether a reduction still applies is checked every 60 seconds. For this, the pressure setpoint is increased slightly for a short while and then reset again. If the actual system pressure then remains at the higher level, there is zero flow. The pump is then switched off after an adjustable follow-up time, T2. If the pressure falls below the setpoint, the system restarts. If T2 = 0 is set, zero-flow detection and deactivation are no longer active.

Pump cycling
Two mechanisms are applied in order to ensure that the loads on all pumps are distributed as evenly as possible and to adjust the running times of the pumps.
On the one hand, pump cycling is enforced after a running time of 6 hours, including during normal operation. For this, during peak-load operation, the pump previously operated as peak-load pump assumes the control function, which follows the pump previously operated as base load (control) pump. On the other hand, when the system is restarted (e.g. after zero flow, “External Off”), the pump that follows the pump last switched off is started (provided there is no pump fault).

Pump kick
If the system is switched off for 6 hours due to a zero-flow cut-off, one pump of the unit is switched on for approx. 10 seconds. Pump cycling is performed in the repeated case, meaning that e.g. for a 4-pump system, every pump set to "Auto" starts once every 24 hours.
The pump kick is for avoiding any blocking of a pump after a long standstill.

Standby pump
Setting the system parameters via DIP switches allows a pump to be defined as standby pump. During standby operation, operation of the pump is disabled. It is only switched on if a pump fails due to a fault and a corresponding demand exists. Pump cycling ensures that every pump becomes a standby pump.

Fault-actuated switchover of multi-pump system
If a pump indicates a fault, it is switched off immediately. This is done by reducing the analogue control voltage to 0 V.
If a pump fails, the control task is assigned to a pump previously not in operation. If a pump running at maximum speed fails, the control increases the pump output of the control pump according to requirements and, if necessary, a further pump is started.

Low water
A low-water signal can be fed to the control system via a potential-free contact by means of a signal from a suction-side pressure switch, float switch or level relay. The pumps are switched off after an adjustable time T1. Low water below the time T1 does not result in the system being deactivated. The system is restarted immediately if there is no low-water signal.
Low water activates the collective fault signal once T1 has passed and the low water LED lights up immediately. If the low water is corrected before the time T1 passes, the LED goes out. If T1 is exceeded, the LED stays on until acknowledgement is given. The LED flashes during the time between the correction of the low water and the acknowledgement.
Turning the rotary knob acknowledges the error message and the collective fault signal is reset. Acknowledgement is only possible if the fault no longer applies.

Overpressure
An overpressure threshold can be set to protect the building installation. If the system pressure rises above this threshold for a period of three seconds, the pumps in operation are switched off without delay and the collective fault signal and the overpressure LED are activated.
If the system pressure has fallen back below the overpressure threshold, the fault is indicated by the flashing overpressure LED. The system is restarted one second after the system pressure has fallen below this pressure threshold. After acknowledging the fault, the overpressure LED and the collective fault signal are reset.

Emergency operation
In the event of a fault of the microcontroller board or of the sensor, the operator has the option of specifying a fixed, analogue voltage (0 ... 10 V) and thus a fixed speed for the pumps (see Section 8.4). The voltage can be specified via a potentiometer. The slide switch can be used to start or stop the pumps according to requirements.

CAUTION! Risk of damage to property!
During emergency operation, all control and monitoring functions are disabled. However, electrical line and motor protection are still ensured.
It is essential that the system is monitored by a specialist.

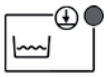
4.2 Operation of the control device

4.2.1 Controls (Fig. 1)

- **Main switch** (item 1)
  On/Off function of the control system and disconnection from the electrical power supply
- **LC display** (item 3)
  The setting parameters and system messages are indicated on the display by symbols and numerical values.
  The display's illumination is switched on permanently.
- **Rotary knob** (item 2)
  The rotary knob is used for the user-specific input of values or for acknowledging faults.
  Briefly pressing the knob takes you from the standard display to the Operating modes menu (see 4.2.2 Menu structure) of the pumps. Pressing it for more than 2 seconds opens the System settings menu (see 4.2.2 Menu structure).
  The parameters or settings on the display can be changed accordingly in the individual menu items by turning the rotary knob to the left or right and then pressing the button.

- **Signal lamps/LEDs**
  (layout Fig. 1, item 4)

Green LED run signal indicates the system's operational readiness. It lights up even if no pump is running.



Red LED for **low water** indicates by going on continuously whether the system has shut down after the detection of a low water level. Flashing indicates that a low-water signal applied; however, there is currently no fault. Flashing stops when the fault is acknowledged by turning the rotary knob.

Red LED for **overpressure** indicates a fault if the system has shut down due to a system pressure being too high. If this light flashes, that indicates a previous overpressure fault that no longer applies. Flashing stops when the fault is acknowledged by turning the rotary knob.

Green LED for **run signal of pumps** (pump status) indicates that at least one pump is being controlled

Red LED for **pump malfunction** (pump status) indicates that a fault is indicated by at least one pump. This LED does not light up in the event of a sensor fault or controller fault.

4.2.2 Menu structure

The complete menu structure consists of the following elements:

- Standard display
- Operating modes menu
- Controller setting menu (with operation indicator and error memory)

The current system pressure is displayed on the **standard display**. In addition, the symbol indicates whether standby pump mode was set. A flashing symbol indicates that no standby pump is available (e.g. due to a pump fault).

(1) By briefly pressing (< 2 seconds) the red rotary knob, the standard display switches to the **Operating modes menu**. In this menu, the corresponding pump (P1, P2, P3, P4) is selected by turning the rotary knob. Only the number of pumps that were configured via the DIP switches appears on the display (see Section 4.2.3). After selecting the pump, this selection must be confirmed by briefly pressing the rotary knob. Then, the current operating mode of the pump is displayed:

auto	Automatic mode	(speed, activation and deactivation of the pump is controlled by the controller)
on	Manual mode	(maximum pump speed)
off	Off	(pump stopped)

(The key symbol indicates any error message of the pump. It also indicates the “Ext.Off” status or a sensor fault.)
The operating mode of the pump can be set by turning the rotary knob to the left or right. Then, pressing it briefly takes you back to the standard display.

(2) By continuously pressing (> 2 seconds) the red rotary knob, the standard display switches back to the **Controller setting menu**. A menu item (Tab. 1) can be selected by turning the knob. To be able to change the values, the rotary knob needs to be pressed briefly at the corresponding point of the menu. That displays the previously set parameter on the display and it can be adjusted by turning the rotary knob. Pressing the rotary knob briefly takes you back to the selection of menu items and pressing it continuously takes you back to the standard display.

Display	Description	Adjustment range	Factory setting
P – –	Pressure setpoint	1.0 bar ... max. sensor value	3 bar
H I –	Overpressure threshold	1.0 bar ... max. sensor value	10 bar
P –	Controller P – parameter	10 ... 100 (%)	50 (%)
I –	Controller I – parameter	1 ... 100 (%)	50 (%)
d –	Controller D – parameter	0 ... 100 (%)	0 (%)
T 1	Follow-up time Low water	0 ... 180 s	180 s
t 2	Follow-up time Zero-flow test	0 ... 180 s	10 s
O P	Operation menu	Operating hours, switch-on frequency	
E r r	Error memory menu	Error history	

Tab. 1: Controller setting menu

(3) Additional system data, such as e.g. operating hours and the switch-on frequency of the control device can be displayed in the **Operation menu**.
Briefly press the rotary knob in the "O P" menu item to open the "OPeration" menu. Here, you have the option of selecting one of the following menu items:

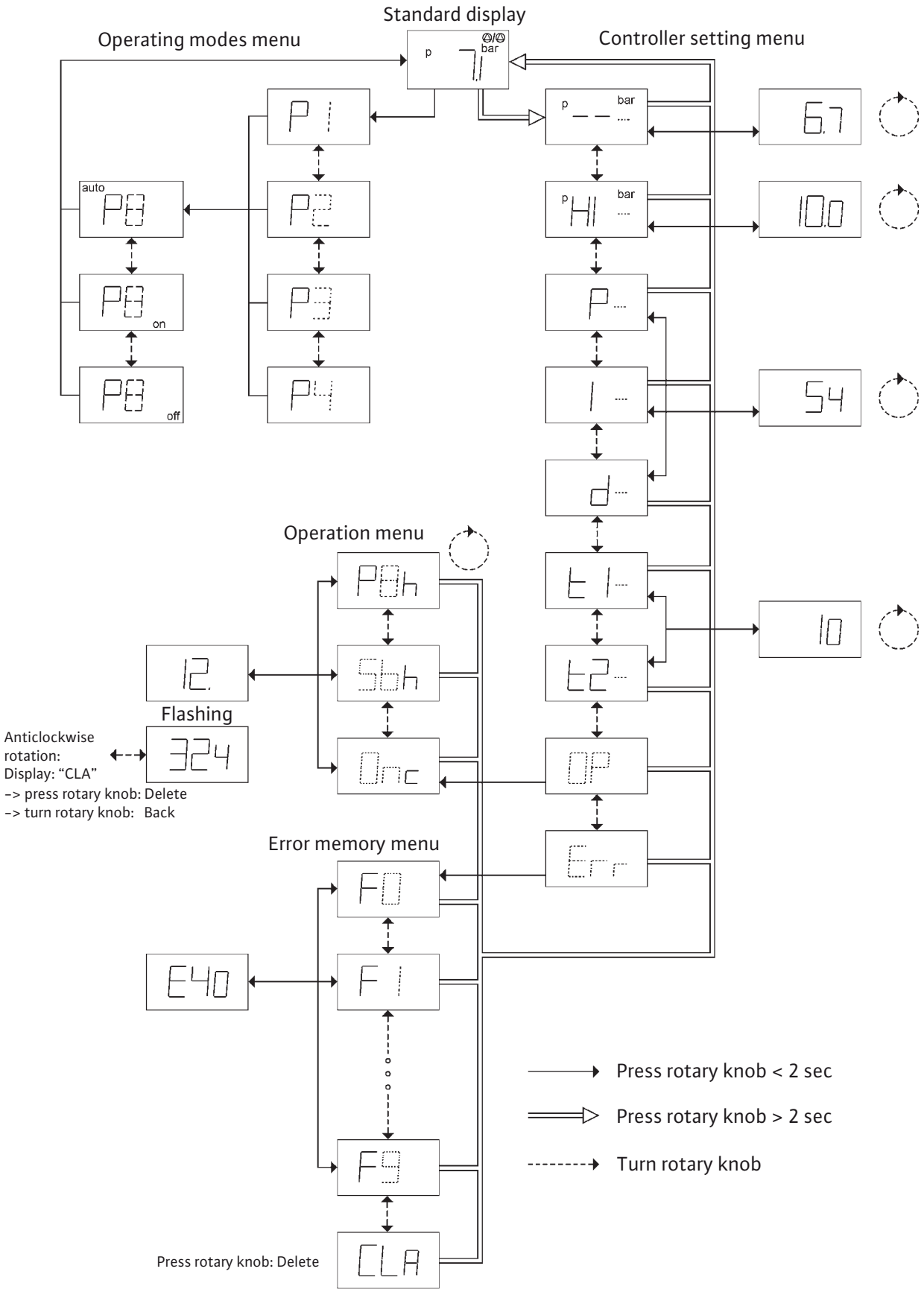
O n c	Mains On/Off counter
S b h	Operating hours of the control device
P 1 h	Operating hours of pump 1
P 2 h	Operating hours of pump 2 (at least 2 pump systems)
P 3 h	Operating hours of pump 3 (at least 3 pump systems)
P 4 h	Operating hours of pump 4 (at least 4 pump systems)

The selection is made by turning the knob to the left or right and displaying the corresponding values by pressing the rotary knob. For indicated values exceeding 1000, the thousands and then the remaining places are indicated in alternation and flashing. The internally saved values for the operating hours of the pumps and the Mains On/Off counter can be deleted, if required. However, that only makes sense if pumps need to be replaced. For this, the rotary knob must be turned to the left until "CLA" is displayed and then confirmed by pressing the rotary knob. Pressing the rotary knob continuously takes you back to the standard display.

(4) The **Error memory menu** "E r r" is described in more detail in Section 8.3 "Error memory for faults".

NOTE!
It is only possible to change parameters and reset system data if no user lock applies (DIP switch 8, Fig. 4).

Overview of the menu structure



4.2.3 DIP switch setting

- **Overview** (Fig. 4, DIP switch)

DIP switch	Function
1	Number of pumps (bit 0)
2	Number of pumps (bit 1)
3	Number of pumps (bit 2)
4	Standby pump
5	Pressure sensor type (bit 0)
6	Pressure sensor type (bit 1)
7	SSM inverted
8	Lock parameter

- **Setting the number of pumps**

Quantity	DIP – 1	DIP – 2	DIP – 3
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON

Factory setting: according to system type

- **Standby pump**

Standby	DIP – 4
yes	ON
no	OFF

Factory setting: according to system type

- **Pressure sensor type: (measurement range)**

Sensor	DIP – 5	DIP – 6
6 bar	OFF	OFF
10 bar	ON	OFF
16 bar	OFF	ON
25 bar	ON	ON

Factory setting: according to system type

- **Logic reversal of collective fault signal**

Reversal	DIP – 7	Relay active
yes	ON	No fault
no	OFF	Fault

Factory setting: DIP – 7: OFF, no logic reversal

- **Setting the locking of parameter changes**

Locking	DIP – 8
yes	ON
no	OFF

Factory setting: DIP – 8: ON, lock

CAUTION! Risk of malfunctions!
Before making adjustments to the DIP switches, switch off the device! The modified settings are only applied when the power supply is restored.

4.3 Scope of delivery

- Wilo VR-Control control device
- Installation and operating instructions
- Wiring diagram
- Double bit switch cabinet key

5 Installation

5.1 Installation

The VR/Control control device is delivered as a completely assembled unit. The wall-mounted installation of the devices is performed using 4 screws ∅ 8 mm, e.g. on a base frame or the wall. Install the control device in a dry, vibration- (acceleration < 2g in all directions) and frost-free place that is protected from direct sunlight.
Devices for higher capacities are delivered as floor models.

5.2 Electrical connection

DANGER! Risk of fatal injury!
The electrical connection must be made according to the local regulations (VDE regulations) by an electrical installation engineer approved by local energy supply companies.

- **The type of current, system type and voltage of the mains connection must correspond to the specifications on the rating plate**
- **Observe the rating plate data of the pump motors to be controlled**
- **Observe the fuse protection on the mains side according to the system's rating plate**
- **If residual-current-operated protection switches are used, the corresponding regulations and the operating instructions for the pump(s) to be connected are to be observed.**
- **Wiring is to be performed in accordance with the wiring diagram enclosed**
- **Earth the pump/installation in accordance with the regulations**
- **The connection lines are to be installed in such a way that there is no contact with the pipes and the pump and motor housings under any circumstances. At ambient temperatures > 30 °C, please take the corresponding reduction factors into account!**

Mains connection 1~230 V:
The 3-wire cable (L1, N, PE) is to be provided onsite. The connection is established at the main switch (Fig. 2, item 1), the PE is connected to the earth bar.

Mains connection 3~400 V:
The 4-wire cable (L1, L2, L3, PE) is to be provided onsite. The connection is established at the main switch (Fig. 2, item 1) or for systems of higher power at the terminal strips in accordance with the wiring diagram, the PE is connected to the earth bar.

Pump mains connections:
CAUTION! Risk of damage to the product!
Observe the installation and operating instructions for the pumps!
The connection of the pumps with integrated frequency converter is to be established directly at the circuit breakers (2, 4, 6), or for systems of higher power at the terminal strips in accordance with the wiring diagram enclosed (Fig. 2, item 4). The PE is to be connected to the earth bar. If external frequency converters are used, shielded cables must always be used. To achieve the best shielding effect, fit the shield on both sides!

Pump control signals:
CAUTION! Risk of damage to the product!
Observe the installation and operating instructions for the pumps!
Connect them to the base board at terminal **"Pumps 1...4"** (Fig. 6) and to the terminal strips of the pumps.
Use a shielded cable, place the shield on one side in the control device.
If a three-wire cable is used (as shown in Fig. 6) an "SBM" terminal must be bridged with the earth terminal of the 0...10 V input in the pump terminal box.
If a four-wire cable is used, this bridging may also be performed in the control device.
CAUTION! Risk of damage to the product!
Do not connect any external voltage to the terminals!

Pressure sensor 4...20 mA:
Connect the sensor according to the installation and operating instructions correctly to the base board at the **"Sensor"** terminal (Fig. 6).
Use a shielded cable, place the shield on one side in the control device.
CAUTION! Risk of damage to the product!
Do not connect any external voltage to the terminals!

External On/Off switching:
Remote On/Off switching by means of a potential-free contact (NC contact) can be connected via the **"Ext. Off"** terminals of the base board (Fig. 3) after removing the jumper (premounted at the factory). That gives you the option of switching the system on and off (Fig. 6).

Contact closed:	Automatic On
Contact open:	Automatic Off, "OFF" signal on the display
Contact load:	24 V DC/10 mA

CAUTION! Risk of damage to the product!
Do not connect any external voltage to the terminals!

Protection against low water level:
Protection function against low water level by means of a potential-free contact (NC contact) can be connected via the **"dry"** terminals of the base board (Fig. 3) after removing the jumper (premounted at the factory). (Fig. 6).

Contact closed:	No low water
Contact open:	Low water
Contact load:	24 V DC/10 mA

CAUTION! Risk of damage to the product!
Do not connect any external voltage to the terminals!

Collective run/collective fault signals SBM/SSM:
Potential-free contacts (changeover contacts) for external signals are available via the **"Failure"** (collective fault signal) and **"Operation"** (collective run signal) terminals.
Potential-free contacts, max. contact load (see Fig. 6)
- 250 V ~/1 A ohmic load,
- 30 V-/1 A ohmic load

Actual pressure indication:
A 0 ... 10 V voltage signal for an external display option of the current actual pressure is available via the **"Pout"** terminal. 0 ... 10 V corresponds to the pressure sensor signal 0 ... pressure sensor limit value.

For example:	Sensor	Display range	Voltage/ pressure
	16 bar	0 ... 16 bar	1 V = 1.6 bar

CAUTION! Risk of damage to the product!
Do not connect any external voltage to the terminals!

Optional individual run and fault signals of the pumps and low water protection system:
EBM 1 ... EBM 4, ESM 1 ... ESM 4, WM
Potential-free contacts (changeover contacts), max. contact load (see Fig. 5)
- 250 V ~/1 A ohmic load,
- 30 V-/1 A ohmic load

6 Commissioning

We recommend that you have the system commissioned by Wilo customer service.
Before switching it on for the first time, the onsite wiring must be checked, in particular the earthing and potential equalisation.
Before initial commissioning, the pumps and the pipe system must be flushed completely, filled and bled, if necessary.

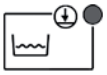
DANGER! Risk of fatal injury!
Tighten all connection terminals prior to commissioning!

7 Maintenance

DANGER! Risk of fatal injury!
Before all maintenance and repair work, disconnect the system from the power supply and secure it so that it cannot be switched on by unauthorised persons.
We recommend that you conclude a maintenance agreement to guarantee the highest operational reliability at the lowest possible operating costs.

8 Faults, causes and remedies

8.1 Fault indication and acknowledgement at the control device

Indication	Reaction	Cause and remedy
Mains On/Off LED 	Is not on	Check position of main switch. Check the power supply for the electronic modules, the mains voltage and the fuses
Low water LED 	Is on, At least one pump is running	Low-water signal is applied; however, period of time below the delay time T1
	Is on, Pumps off	Low-water signal active, pumps stopped once the delay time T1 passed.
	Flashing	Low-water signal is no longer active, acknowledgement by turning the rotary knob
Overpressure LED 	Is on	System pressure above the overpressure threshold, system shuts down after 3 seconds
	Flashing	System pressure OK again after overpressure fault, acknowledgement by turning the rotary knob
Pump green LED 	Is on	At least one pump is running
Pump red LED 	Is on	At least one pump with error message; faulty pump is indicated in the Operating modes menu by a key symbol
LC display	"O F F" indicator flashing with current system pressure	External On/Off inputs not closed, system switched off externally
LC display	"S F" indicator	Sensor fault, no electrical connection to the sensor
LC display	"E r r" indicator	Current fault in the error memory (extended menu function was selected)
LC display symbol 	Is on	Operating mode with standby pump selected
	Flashing	Standby pump is not available, i.e. at least one pump is faulty or "External Off" switched or dry-running protection activated
LC display "Key" symbol 	Is on	Pump not available (pump malfunction, Ext.Off, sensor fault)

8.2 Fault matrix

Fault / Cause	Pumps do not start	Pumps do not stop	No pump cycling	Switching frequency too high	Pumps running unsteadily	Motor or pump get too warm	Electrical motor protection triggers	Pumps do not perform	Dry-running protection system switches off, although water is present	Dry-running protection does not switch off, despite lack of water	Severely fluctuating final pressure	Run signal light does not light up
Low water protection system did not react	•							•				
External Off	•											
Intake pressure above pressure setpoint	•											
Controller fuse faulty	•											•
Motor protection switch for the pumps has triggered	•											
No mains voltage	•											•
Main switch “OFF”	•											•
Operating mode of the pumps “OFF”	•											
Non-return valve leaking		•										
Operating mode of the pumps “Manual”		•	•			•						
Pressure setpoint set too high		•				•						
Gate valve to pressure transducer closed	•											
Gate valve in the system closed		•				•		•				
Insufficient bleeding of the pumps		•			•	•		•				
Error message pumps/frequency converter faulty	•		•				•					
Intake pressure fluctuates severely				•	•				•			
Diaphragm vessel closed or filled incorrectly				•							•	
Volume flow too high		•			•				•			
Suction-side pressure switch faulty or connected incorrectly	•								•	•		
Check controller parameters					•							
Check dry-running protection follow-up time T1		•										
Check zero-flow follow-up time T2		•										

8.3 Error memory for faults

The last 9 faults that occurred and the current fault are displayed in the form of fault numbers (code numbers) in the Error memory menu (see Menu structure).

The error memory is designed in such a way that the oldest fault (fault F9) is lost when a new fault applies and is saved.
If F0 is displayed in the first menu item, a fault currently applies, which is characterised by its fault number.

Code no.	Cause	Remedy
E00	Low water/dry running	Check intake pressure/water level of break tank
E40	Sensor faulty	Replace sensor
E42	Sensor cable faulty	Replace/repair sensor cable
E60	Overpressure	Consult Wilo Service
E70	Software stack low	Consult Wilo Service
E73	Internal electronic supply voltage too low	Check mains connection, consult Wilo Service
E75	Hardware analogue output faulty	Consult Wilo Service
E81…84	Pump malfunction, pumps 1…4	Observe EBA of the pumps
E90	Impermissible combinatorics	Check DIP switches 1…3

It is possible to erase the complete error memory via the last menu item "CLA".
In the event of a sensor fault or broken sensor cable, the pumps are no longer started. In such a case, it might be necessary to run the system in emergency operation (see 8.4).

8.4 Emergency operation

In the event of faults of the microcontroller board or of the control functions of the control device, an emergency operation function is available (Fig. 7). Switches S10, S20, S30 and S40 (item 5) can be used to control the pumps directly with an analogue voltage between 0 ... 10 V, that is set via the potentiometer (item 5a).

DANGER! Risk of fatal injury!
Use suitably insulated screwdrivers in accordance with VDE specifications!
The terminals of motor protection, line protection and main switch may be live!
For this purpose, the switch for the corresponding pump must be pushed towards the terminal strip. The switch setting in the direction away from the terminal strip corresponds to the factory setting. In this case, the pumps are controlled by the controller.
If you can't fix the malfunction, contact your specialist or Wilo customer service.

Technical information subject to change without prior notice!

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

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

Hiermit erklären wir, dass die Bauarten der Baureihe : **Wilo-Control VR-Booster**
Herewith, we declare that this product:
Par le présent, nous déclarons que cet agrégat :

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

Elektromagnetische Verträglichkeit – Richtlinie **Electromagnetic compatibility – directive** **Compatibilité électromagnétique– directive**	**2004/108/EG**
Niederspannungsrichtlinie **Low voltage directive** **Directive basse-tension**	**2006/95/EG**

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

Angewendete harmonisierte Normen, insbesondere: *Applied harmonized standards, in particular:* *Normes harmonisées, notamment:*	**EN 61000-6-2, EN 61000-6-3,** **EN 60204-1, EN 60439-1,** **EN 50178, EN 60335-1**

Bei einer mit uns nicht abgestimmten technischen Änderung der oben genannten Bauarten, verliert diese Erklärung ihre Gültigkeit.
If the above mentioned series are technically modified without our approval, this declaration shall no longer be applicable.
Si les gammes mentionnées ci-dessus sont modifiées sans notre approbation, cette déclaration perdra sa validité.

Dortmund, 21.01.2011

i. V.
Erwin Prieß
Quality Manager

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Germany

Document: 2109749.1

NL

EG-verklaring van overeenstemming

Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen:

Elektromagnetische compatibiliteit 2004/108/EG

EG-laagspanningsrichtlijn 2006/95/EG

en overeenkomstige nationale wetgeving
gebruikte geharmoniseerde normen, in het bijzonder:
zie vorige pagina

I

Dichiarazione di conformità CE

Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti:

Compatibilità elettromagnetica 2004/108/EG

Direttiva bassa tensione 2006/95/EG

e le normative nazionali vigenti
norme armonizzate applicate, in particolare:
vedi pagina precedente

E

Declaración de conformidad CE

Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes:

Directiva sobre compatibilidad electromagnética 2004/108/EG

Directiva sobre equipos de baja tensión 2006/95/EG

y la legislación nacional vigente
normas armonizadas adoptadas, especialmente:
véase página anterior

P

Declaração de Conformidade CE

Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos:

Compatibilidade electromagnética 2004/108/EG

Directiva de baixa voltagem 2006/95/EG

e respectiva legislação nacional
normas harmonizadas aplicadas, especialmente:
ver página anterior

S

CE- försäkran

Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser:

EG–Elektromagnetisk kompatibilitet – riktlinje 2004/108/EG

EG–Lågspänningsdirektiv 2006/95/EG

och gällande nationell lagstiftning
tillämpade harmoniserade normer, i synnerhet:
se föregående sida

N

EU-Overensstemmelseserklæring

Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser:

EG–EMV–Elektromagnetisk kompatibilitet 2004/108/EG

EG–Lavspenningsdirektiv 2006/95/EG

og tilsvarende nasjonal lovgivning
anvendte harmoniserte standarder, særlig:
se forrige side

FIN

CE-standardinmukaisuusseloste

Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä:

Sähkömagneettinen soveltuvuus 2004/108/EG

Matalajännite direktiivit: 2006/95/EG

ja vastaavaa kansallista lainsäädäntöä
käytetyt yhteensovitetut standardit, erityisesti:
katso edellinen sivu.

DK

EF-overensstemmelseserklæring

Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser:

Elektromagnetisk kompatibilitet: 2004/108/EG

Lavvolts-direktiv 2006/95/EG

og gældende national lovgivning
anvendte harmoniserede standarder, særligt:
se forrige side

H

EK-megfelelőségi nyilatkozat

Ezennel kijelentjük, hogy az berendezés megfelel az alábbi irányelveknek:

Elektromágneses összeférhetőség irányelv: 2004/108/EK

Kisfeszültségű berendezések irányelv: 2006/95/EK

valamint a vonatkozó nemzeti törvényeknek és
alkalmazott harmonizált szabványoknak, különösen:
lásd az előző oldalt

CZ

Prohlášení o shodě ES

Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením:

Směrnice o elektromagnetické kompatibilitě 2004/108/ES

Směrnice pro nízké napětí 2006/95/ES

a příslušným národním předpisům
použité harmonizační normy, zejména:
viz předchozí strana

PL

Deklaracja Zgodności WE

Niniejszym deklarujemy z pełną odpowiedzialnością, że dostarczony wyrób jest zgodny z następującymi dokumentami:

dyrektywą dot. kompatybilności elektromagnetycznej 2004/108/WE

dyrektywą niskonapięciową 2006/95/WE

oraz odpowiednimi przepisami ustawodawstwa krajowego
stosowanymi normami zharmonizowanymi, a w szczególności:
patrz poprzednia strona

RUS

Декларация о соответствии Европейским нормам

Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам:

Электромагнитная устойчивость 2004/108/EG

Директивы по низковольтному напряжению 2006/95/EG

в соответствии с национальным законодательством
Используемые согласованные стандарты и нормы, в частности:
см. предыдущую страницу

GR

Δήλωση συμμόρφωσης της ΕΕ

Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις :

Ηλεκτρομαγνητική συμβατότητα ΕΚ-2004/108/ΕΚ

Οδηγία χαμηλής τάσης ΕΚ–2006/95/ΕΚ

καθώς και την αντίστοιχη κρατική νομοθεσία
Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα:
Βλέπε προηγούμενη σελίδα

TR

CE Uygunluk Teyid Belgesi

Bu cihazın teslim edildiği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz:

Elektromanyetik Uyumluluk 2004/108/EG

Alçak gerilim yönetmeliği 2006/95/EG

ve söz konusu ulusal yasalara.
kısmen kullanılan standartlar için:
bkz. bir önceki sayfa

RO

EC-Declarație de conformitate

Prin prezenta declarăm că acest produs aşa cum este livrat, corespunde cu următoarele prevederi aplicabile:

Compatibilitatea electromagnetică – directiva 2004/108/EG

Directiva privind tensiunea joasă 2006/95/EG

şi legislația națională respectivă
standarde armonizate aplicate, îndeosebi:
vezi pagina precedentă

EST

EÜ vastavusdeklaratsioon

Käesolevaga tõendame, et see toode vastab järgmistele asjakohastele direktiividele:

Elektromagnetilise ühilduvuse direktiiv 2004/108/EÜ

Madalpinge direktiiv 2006/95/EÜ

ja vastavalt asjaomastele siseriiklikele õigusaktidele
kohaldatud harmoneeritud standardid, eriti:
vt eelmist lk

LV

EC - atbilstības deklarācija

Ar šo mēs apliecinām, ka šis izstrādājums atbilst sekojošiem noteikumiem:

Elektromagnētiskās savietojamības direktīva 2004/108/EK

Zemsprieguma direktīva 2006/95/EK

un atbilstošai nacionālajai likumdošanai
piemēroti harmonizēti standarti, tai skaitā:
skatīt iepriekšējo lappusi

LT

EB atitikties deklaracija

Šiuo pažymima, kad šis gaminys atitinka šias normas ir direktyvas:

Elektromagnetinio suderinamumo direktyvą 2004/108/EB

Žemos įtampos direktyvą 2006/95/EB

bei atitinkamamiems šalies įstatymams
pritaikytus vieningus standartus, o būtent:
žr. ankstesniame puslapyje

SK

ES vyhlásenie o zhode

Týmto vyhlasujeme, že konštrukcie tejto konštrukčnej série v dodanom vyhotovení vyhovujú nasledujúcim príslušným ustanoveniam:

Elektromagnetická zhoda - smernica 2004/108/ES

Nízkonapäťové zariadenia - smernica 2006/95/ES

a zodpovedajúca vnútroštátna legislatíva
používané harmonizované normy, najmä:
pozri predchádzajúcu stranu

SLO

ES – izjava o skladnosti

Izjavljamo, da dobavljene vrste izvedbe te serije ustrezajo sledečim zadevnim določilom:

Direktiva o elektromagnetni združljivosti 2004/108/ES

Direktiva o nizki napetosti 2006/95/ES

in ustrezno nacionalnim zakonom
uporabljeni harmonizirani standardi, predvsem:
glejte prejšnjo stran

BG

ЕО-Декларация за съответствие

Декларираме, че продуктът отговаря на следните изисквания:

Електромагнитна съвместимост – директива 2004/108/ЕО

Директива ниско напрежение 2006/95/ЕО

и съответното национално законодателство
Хармонизирани стандарти:
вж. предната страница

M

Dikjarazzjoni ta' konformità KE

B'dan il-mezz, niddikjaraw li l-prodotti tas-serje jissodisfaw id-dispożizzjonijiet relevanti li ġejjin:

Kompatibbiltà elettromanjetika - Direttiva 2004/108/KE

Vultaġġ baxx - Direttiva 2006/95/KE

kif ukoll standards armonizzati adottati fil-leġiżlazzjoni nazzjonali b'mod partikolari:

ara l-paġna ta' qabel

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