

Wilo-Multivert MVISE-3G



en Installation and operating instructions

zh 安装及操作说明书

Fig. 1

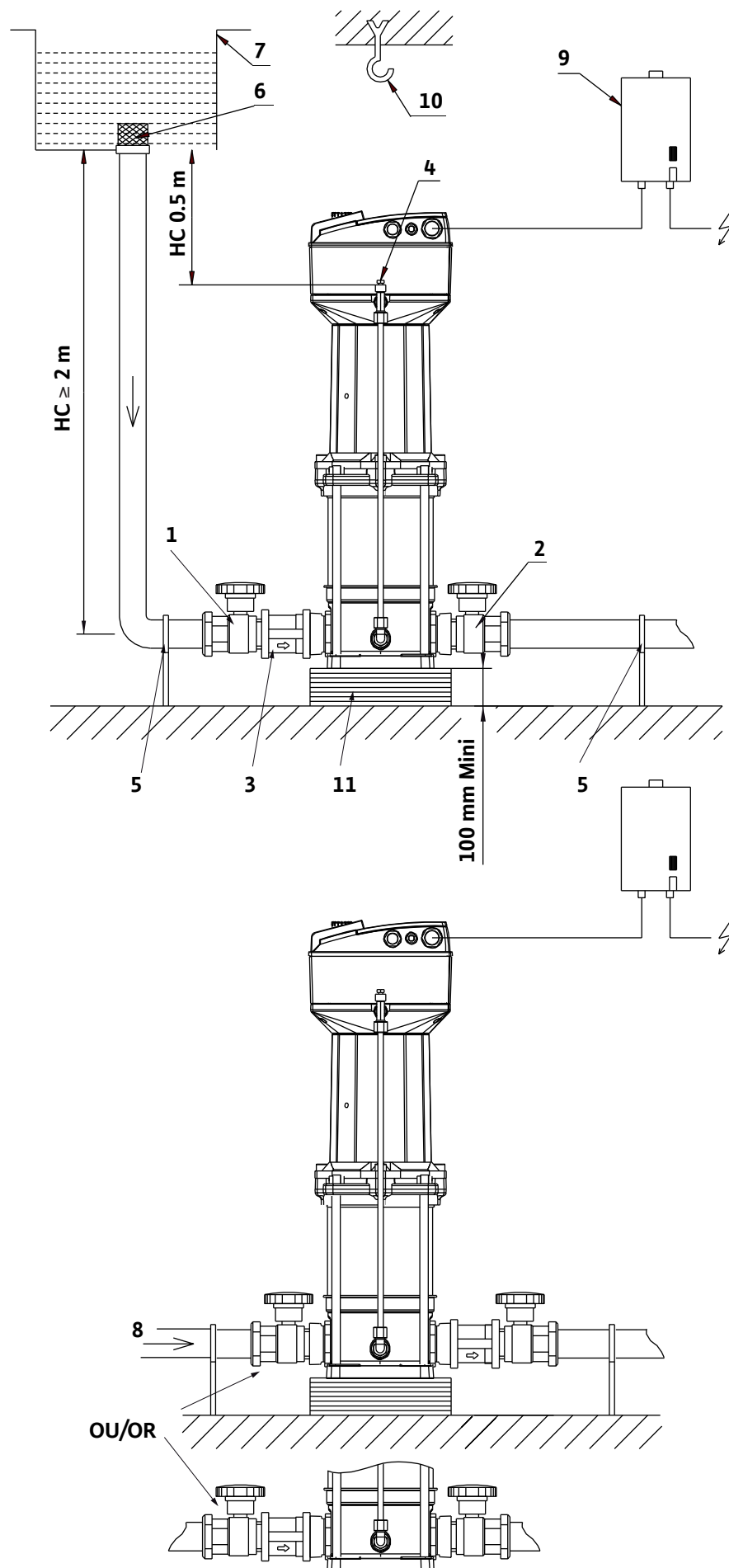


Fig. 2

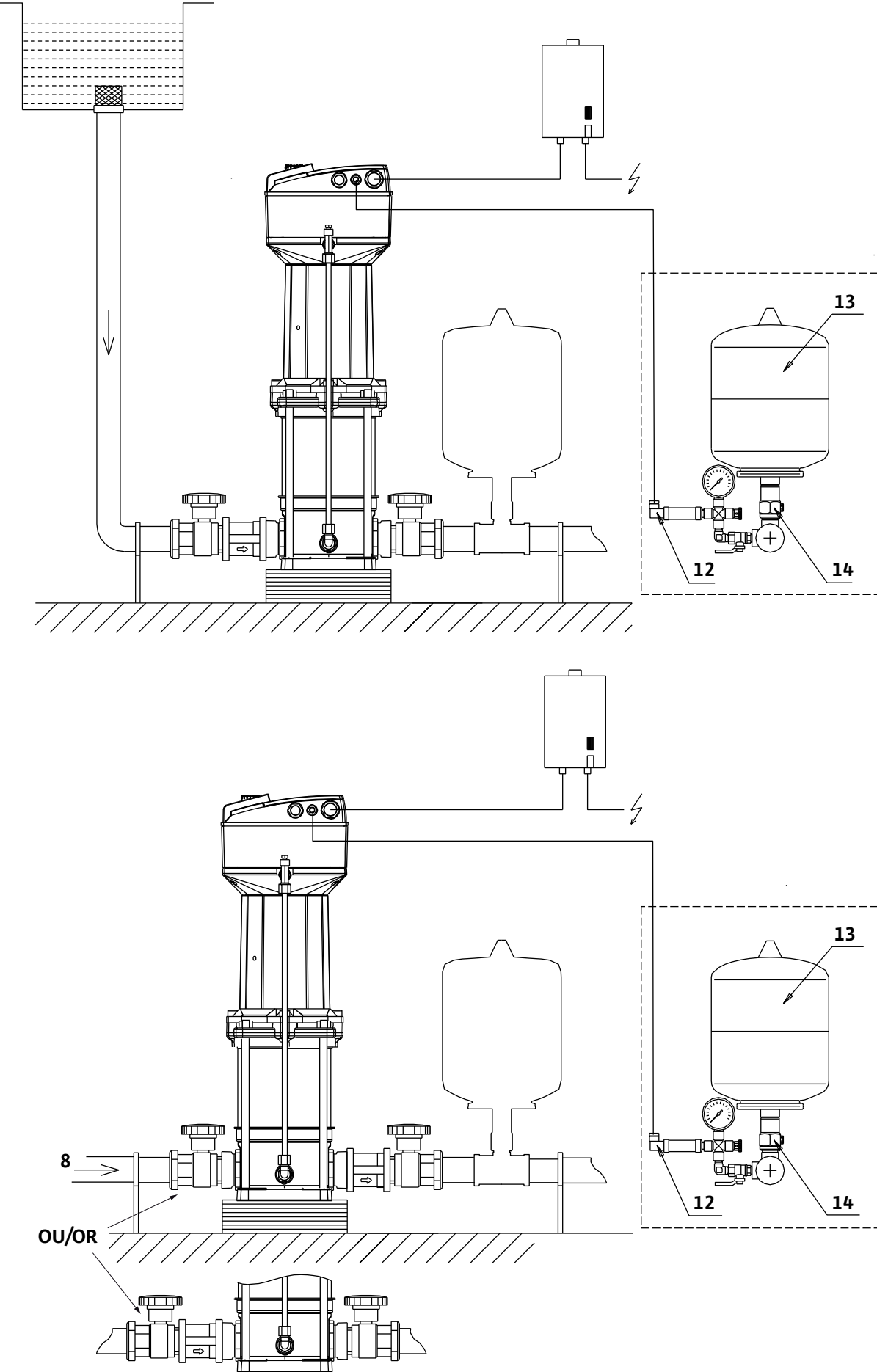


Fig. 3

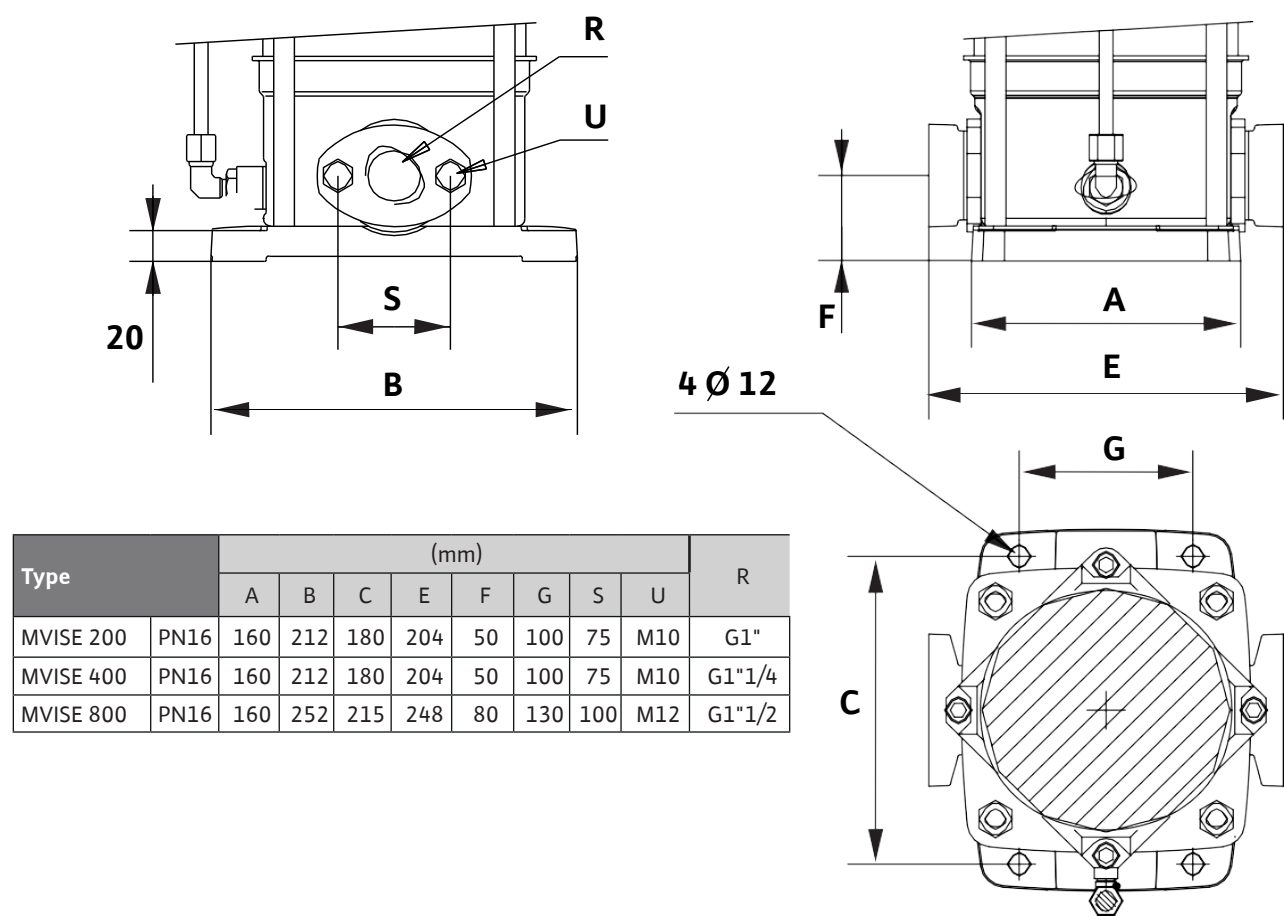


Fig. 4

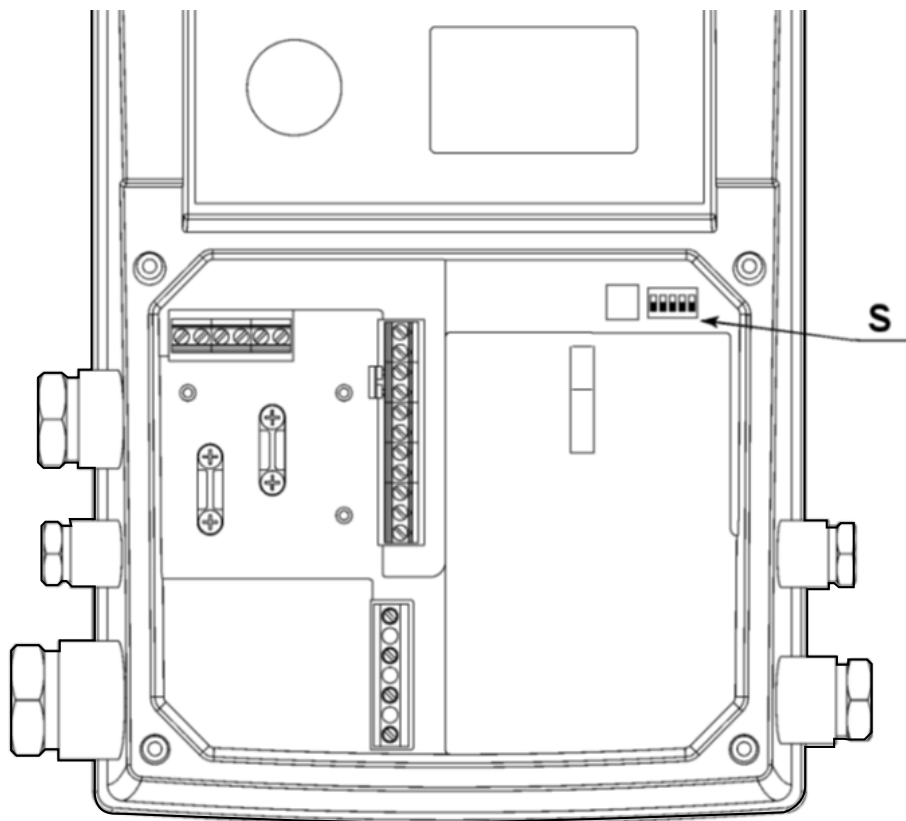


Fig. 5

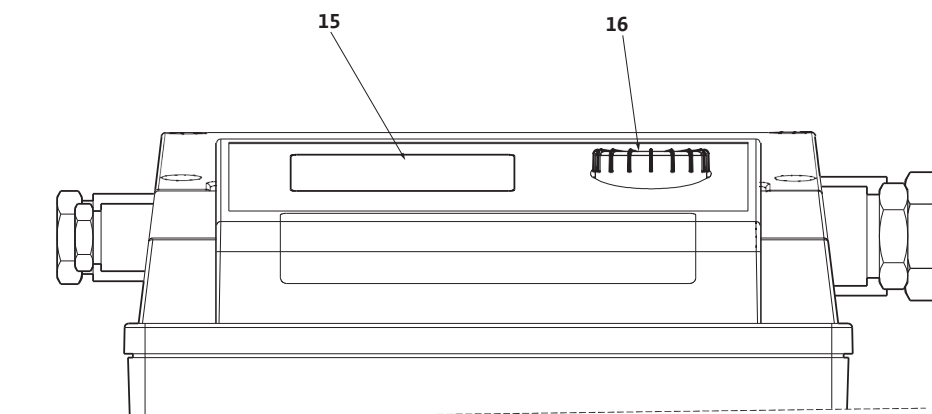
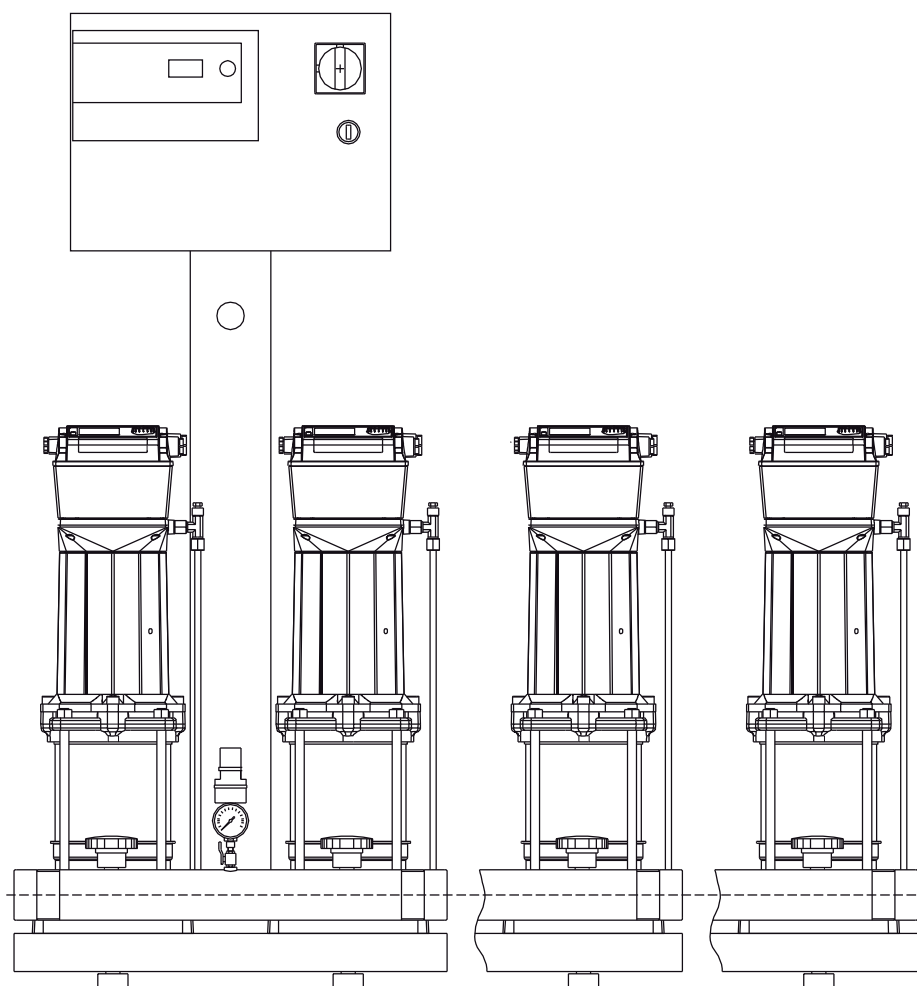


Fig. 6



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1. General

1.1 About this document

The language of the original installation and operating instructions is English. All other languages of these instructions are translations of the original installation and operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a necessary condition for the correct installation and operation of the product.

These installation and operating instructions correspond to the relevant version of the product and the underlying safety standards valid at the time of going to print.

EC-Declaration of conformity:

A copy of the EC-Declaration of conformity is an integral part of these installation and operating instructions.

If a technical modification is made on the series named here without our agreement, this declaration loses its validity.

2. Safety

These installation and operating instructions contain important information which must be adhered to during installation, operation and maintenance. For this reason, these 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 in this section that must be adhered to but also the special safety instructions with danger symbols included in the following sections.

2.1 Symbols and signal words in the operating instructions

Symbols



General danger symbol



Danger due to electrical voltage



NOTICE: ...

Signal words:

DANGER! Acutely dangerous situation. Non-observance will result in death or the most serious of injuries.

WARNING! The user may suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this information is disregarded.

CAUTION! There is a risk of damaging the product/unit. "Caution" implies that damage to the product and its operation is likely if this information is disregarded.

NOTICE: Useful information on handling the product. It draws attention to possible problems. Information that appears directly on the product, such as

- the arrows indicating the direction of rotation,
 - identifiers for connections,
 - rating plate,
 - warning stickers,
- 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 also 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 existing directives for accident prevention must be adhered to.

Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be respected.

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

2.5 Safety instructions for the operator

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

- 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 must be respected.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be respected.

2.6 Safety instructions for installation and maintenance work

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

Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification of components and use of unauthorised spare parts

Unauthorised modification of components and use of unauthorised 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 absolves the manufacturing company of any and all liability.

2.8 Improper use

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

3. Transport and temporary storage

Immediately check the product for any transit damage on arrival. If transit damage is identified, the necessary steps must be taken involving the carrier within the specified period.



CAUTION! Environmental damage can occur!

If the product is to be installed later, then it must be stored in a dry location. Protect the product from impacts/shock and other ambient effects (moisture, freezing etc.).

Temperature range for transportation and storage: -30 °C to +60 °C

Care must be taken with the pump so that it is not damaged before installation.

4. Intended use

The pump is generally intended for the pumping of cold or warm water, water-glycol mixtures or other low-viscosity media that do not contain mineral oils, solid or abrasive constituents or long-fibre materials.



CAUTION! Overheating protection for the motor!

For fluids with a higher viscosity than water, a technical consultation is necessary.



DANGER! Risk of explosion!

This pump must not be used to pump flammable or explosive fluids.

4.1 Fields of application

- Water supply and pressure-boosting systems
- Industrial circulation systems
- Cooling water circulation systems
- Irrigation and sprinkling installations

5. Product information

5.1 Type key

Example: MWISE402-1/16/E/3-2/3G	
MVIS	High-efficiency multistage in-line pump in vertical design
E	Equipped with a frequency converter
4	Rated flow rate in m ³ /h
02	Number of stages
-1	1 = pump housing in stainless steel 304 + hydraulics in stainless steel 304
16	16 = PN 16 flanges
/E	E = EPDM-O-Ringe (WRAS/KTW)
/3	3 = 3~, three-phase current
-2	Number of poles
/2G	2nd generation frequency converter

5.2 Technical data

Maximum utilisation pressure											
Pump housing	16 bar										
Maximum suction pressure	10 bar Notice: the actual input pressure (P input) + the pressure at zero delivery rate (P zero delivery rate) must always be lower than the maximum authorised operating pressure (P max). If the maximum authorised operating pressure is exceeded, the mechanical seal and the roller bearing can be damaged or their life span reduced. $P_{\text{input}} + P_{\text{zero delivery rate}} \leq P_{\text{max}}$ Refer to the pump plate for the maximum operating pressure: P max										
Temperature range											
Fluid temperature	-15 °C to +50 °C										
Ambient temperature	-15 °C to +40 °C (other temperatures on request)										
Electrical data											
Type of motor protection	See motor plate										
Insulation class see rating plate											
Frequency											
Voltage											
Power supply voltage	<table border="1"> <thead> <tr> <th colspan="2">Power (kW)</th></tr> <tr> <th>1.1</th><th>2</th></tr> </thead> <tbody> <tr> <td colspan="2">400 V (±10 %) 50 Hz</td></tr> <tr> <td colspan="2">380 V (±10 %) 60 Hz</td></tr> <tr> <td colspan="2">480V (±10 %) 60 Hz</td></tr> </tbody> </table>	Power (kW)		1.1	2	400 V (±10 %) 50 Hz		380 V (±10 %) 60 Hz		480V (±10 %) 60 Hz	
Power (kW)											
1.1	2										
400 V (±10 %) 50 Hz											
380 V (±10 %) 60 Hz											
480V (±10 %) 60 Hz											
Types of supported power supplies	TN, TT										
Sonstige Daten											
Ambient humidity	< 90 % without condensation										
Altitude	< 1000 m (> 1000 m on request)										
Noise level dB(A) 0/+3 dB(A)	≤ 55 dB(A)										
Power supply cable cross section diameter (cable equipped with 4 wires) mm ²	<table border="1"> <thead> <tr> <th colspan="2">Power (kW)</th></tr> <tr> <th>1.1</th><th>2</th></tr> </thead> <tbody> <tr> <td>1.5 - 2.5</td><td>2.5 - 4</td></tr> </tbody> </table>	Power (kW)		1.1	2	1.5 - 2.5	2.5 - 4				
Power (kW)											
1.1	2										
1.5 - 2.5	2.5 - 4										

- Electromagnetic compatibility (*)
- Residential emission –
1st environment: PN-EN 61800-3
- Industrial interference resistance –
2nd environment: PN-EN 61800-3

- Outline and connection dimensions (Fig. 3).

5.3 Scope of delivery

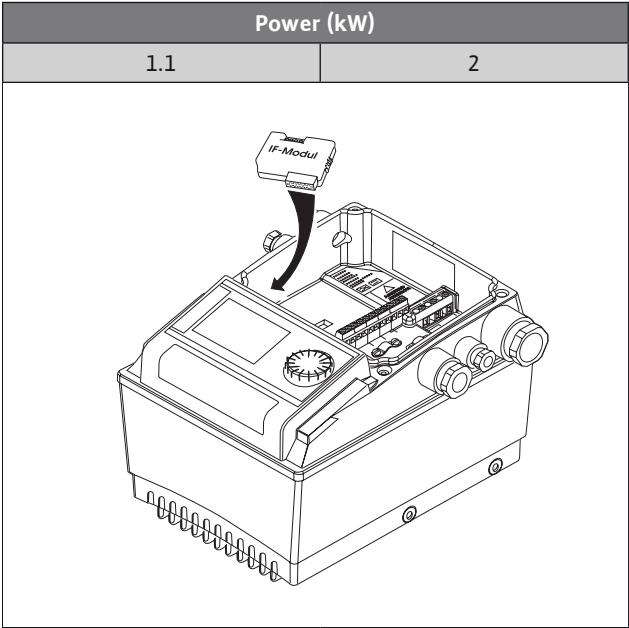
- High-pressure multistage centrifugal pump
- 2 oval flanges (counter flanges) with female thread, gaskets and screws
- Installation and operating instructions

(*) In the frequency range between 600 MHz and 1 GHz, the display or the pressure indication in the display might be disturbed in the exceptional case of the direct vicinity (<1 m from the electronic module) of radio transmission installations, transmitters or similar devices working in this frequency range. The operation of the pump is not affected at any time.

5.4 Accessories

Contact Wilo customer service for the accessory list.

- IF module PLR for connecting to PLR/interface converter
 - IF module LON for connection to LONWORKS network. These modules plug directly into the connection interfaces of the converter (see Fig. below).
 - Non-return valves (with tab or spring ring for operation at constant pressure)
 - Protection kit against dry-running
 - Pressure sensor kit for control (accuracy: $\leq 1\%$; use between 30 % and 100 % of the measurement range).
- Use only accessories that are new.



6. Description and function

6.1 Description of the product

Fig. 1, 2, 5

- 1 - Pump suction valve
 - 2 - Pump discharge valve
 - 3 - Non-return valve
 - 4 - Venting screw
 - 5 - Supports for pipe or pipe clamps
 - 6 - Strainer
 - 7 - Replenishment reservoir
 - 8 - Drinking water network
 - 9 - Motor protection switch
 - 10 - Lifting hooks
 - 11 - Pedestal
 - 12 - Pressure sensor
 - 13 - Tank
 - 14 - Insulation valve of the tank
 - 15 - Display
 - 16 - Control button
- HC = Minimal positive suction head
HP = Position of the Venting screw

6.2 Function of the product

- Vertical, multistage pump (2 to 10 stages) with glandless motor, with inline connections.
- In the glandless pump, all rotating parts are in contact with the fluid. The fluid lubricates the bearings and cools both the motor and the rotor. The pump does not require any maintenance.

7. Installation and electrical connection

Installation and electrical connection may only be performed by qualified personnel in accordance with local regulations.



WARNING! Danger of injury!

Observe the applicable accident prevention regulations.



WARNING! Danger due to electrical voltage!

Danger from electrical current must be eliminated.

7.1 Receipt

Unpack the pump and dispose of the packaging while observing environmental regulations.

7.2 Installation

Install the pump in a dry, well ventilated and frost-free location on a flat cement surface and secure it with the screws intended for the purpose.



CAUTION! Risk of wear and damage to the pump!

Foreign objects or contaminants in the pump housing can impair the function of the product.

- It is recommended that all welding or soldering work is completed before installing the pump.
 - Flush the entire circuit before installing and commissioning the pump.
- To make inspection or replacement easier, the pump must be installed in a location which is easy to access.
 - To simplify the dismantling of heavy pumps, attach a lifting hook vertically above the pump (Fig. 1, pos. 10).



WARNING! Risk of burns from hot surfaces!

The pump must be set up so that people cannot come into contact with hot surfaces during operation.



WARNING! Risk of tipping over!

The pump must be anchored securely to the ground.



CAUTION! Danger of contaminating the pump!

It is important to ensure that the pump housing covers are removed before installation.



NOTICE: As all pumps have their hydraulic output tested at the factory, there may be some residual water in the pump. For reasons of hygiene, it is recommended that the pump is flushed each time before being used for drinking water.



WARNING! Risk of tipping over!

When purchasing the pump, particular attention should be paid to the fact that, for the larger versions, a higher centre of gravity poses several risks during pump operation.

- The installation surface must be horizontal and flat. Any slanting of the pump results in premature wear.
- Place insulating material (cork or reinforced rubber) under the pump to prevent noise pollution and the transfer of vibration to the system.
- Only the provided screws may be used for the installation of the oval flange. Longer screws can damage the pump housing.

7.3 Pipe connection

- Connect the pump to the pipes using suitable counter flanges, bolts, nuts and gaskets.



CAUTION!

The nut tightening torques must not exceed the following values:

M10 = 20 Nm
M12 = 30 Nm

Do not use impact wrenches.

- The arrow on the pump housing shows the direction of flow of the fluid.
- During installation of the suction line and the pressure pipe, make sure that the pump is not under tension. The pipes must be attached so that their weight is not borne by the pump.
- The pump must be equipped with stop valves on the suction side and on the pressure side.
- The use of compensators can lessen the development of pump noise and vibration.
- The diameter of the pipe must be at least as large as the diameter of the pump's suction port.
- The pressure pipe can be equipped with a non-return valve to protect the pump from the effects of fluid hammer.
- If the pump is directly connected to a public drinking water network, the suction line must be equipped with a non-return valve and a stop valve.
- If the pump is indirectly connected to a public drinking water network via a diaphragm pressure vessel, the suction line must be equipped with a non-return valve and a suction strainer to prevent contaminants from entering the pump.

- The cables for the sensor, the external instruction, the inputs [Ext. Off] and [Aux] must be shielded.

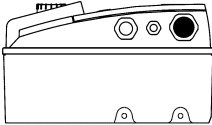
7.4 Electrical connection

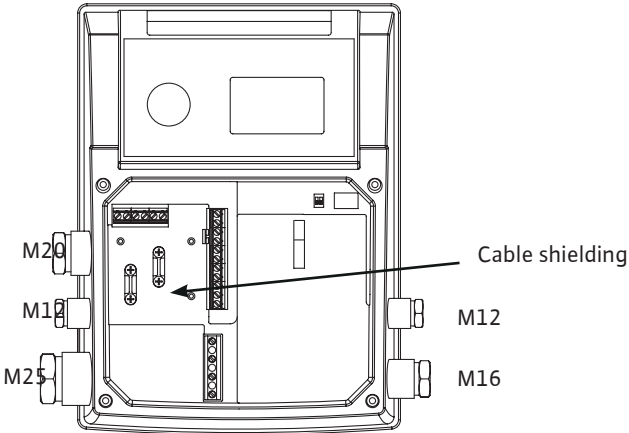


DANGER! Risk of fatal injury!

Hazardous voltage due to the discharge of the converter capacitors.



- Before any work on the converter, wait for 5 minutes after disconnecting the power supply.
- Check that all electrical connections and contacts are not live.
- Check that the pressure connection terminals have been allocated correctly.
- Make sure that the pump and the installation are properly grounded.
- The power supply cable (3phases + earth) must be inserted into the gland indicated below in black.
- The glands that aren't used must remain sealed using plugs provided by the manufacturer.

Power (kW)	
1.1	2
<p>M25</p> 	

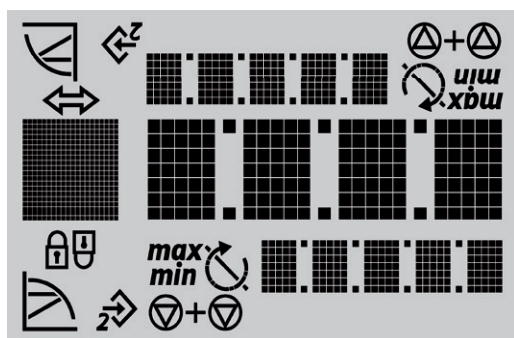
Power (kW)	
1.1	2
	

- The electric characteristics (frequency, voltage, nominal current) of the frequency converter are specified on the pump identification label. Ensure that the frequency converter complies with the power supply it will be used with.
- The electric protection of the motor is integrated into the converter. It is set up to take into account the pump characteristics and ensure the protection of pump and motor.
- In all cases, install a fused isolator (type gF) to protect the unit.

Exception: Residual-current devices that have a selective universal-current-sensitive design are permitted.

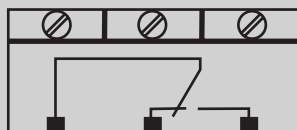
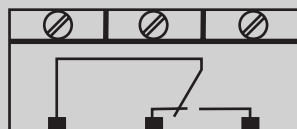
- Labelling: FI  
 - Trigger current: > 30 mA.
 - Use only power cables complying with applicable regulations.
 - Protection on mains side: max. admissible 25 A.
- Trigger characteristic of the fuses: B.

As soon as the power supply to the converter is activated, a 2-second display test is carried out during which all characters on the display are shown.



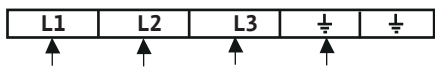
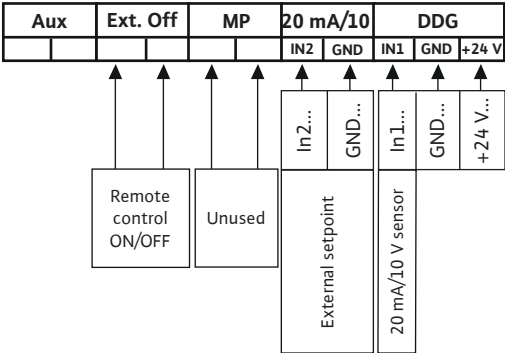
Connection terminal assignment

- Remove the screws and take off the converter cover.





Type key	Assignment	Remarks				
L1, L2, L3	Mains connection voltage	Three-phase current 3 ~ IEC38				
PE	Earth terminal	<table><tr><td>1,1</td><td>2</td></tr><tr><td colspan="2">x1</td></tr></table>	1,1	2	x1	
1,1	2					
x1						
IN1	Sensor input	Signal nature: voltage (0–10 V, 2–10 V) Input resistor: Ri ≥ 10 kΩ Signal nature: current (0–20 mA, 4–20 mA) Input resistor: Rb = 500 Ω Can be configured in the “Service” menu <5.3.0.0>				
IN2	External setpoint input	Signal nature: voltage (0–10 V, 2–10 V) Input resistor: Ri ≥ 10 kΩ Signal nature: current (0–20 mA, 4–20 mA) Input resistor: Rb = 500 Ω Can be configured in the “Service” menu <5.4.0.0>				
GND (x2)	Ground terminals	For each IN1 and IN2 input				
+24 V	Continuous power supply for sensor	Max. current: 60 mA. The power supply is protected from short-circuits.				
Ext. Off	ON/OFF control input “DEACTIVATION priority” for a potential-free external switch	The potential-free external switch is used to activate and deactivate the pump. On installations with high numbers of starts (> 20 per day), activation and deactivations should be performed via “Ext. Off”.				
SBM	“Available transfer” relay 	In normal operation, the relay is activated when the pump is running or in standby. The relay is deactivated if an initial malfunction occurs or if the main power supply is disconnected (pump switches off). Pump availability, even temporarily, can thus be signalled to the switchgear. Can be configured in the “Service” menu <5.7.6.0> Potential-free contact: minimum: 12 V DC, 10 mA maximum: 250 V AC, 1 A				
SSM	“Failures transfer” relay 	If consecutive malfunctions of the same type are detected (from 1 to 6 according to significance), the pump switches off, and this relay is activated (until manual intervention). Potential-free contact: minimum: 12 V DC, 10 mA maximum: 250 V AC, 1 A				
PLR	Connection terminals of the PLR communication interface	The optional IF module PLR can be inserted into the multiple connector placed in the converter connector area. The module is protected from polarity reversal.				
LON	Connection terminals of the LON communication interface	The optional IF module LON can be inserted into the multiple connector placed in the converter connector area. The module is protected from polarity reversal.				



NOTICE: Terminals IN1, IN2, GND and Ext. Off meet the requirements for “safe isolation” (in acc. with EN 61800-5-1) at the mains terminals as well as at SBM and SSM terminals (and vice versa).

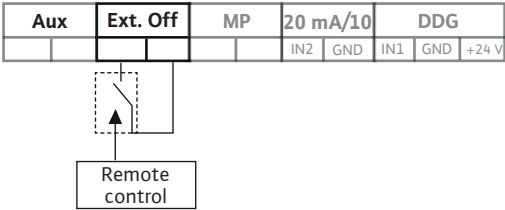
Mains connection	Power terminal block
Plug the 4-conductor cable into the power terminal block (phases + earth).	
Input/output connection	Input/output terminal block
<ul style="list-style-type: none"> The cables of the sensors, the external setpoint and the remote control (Ext. Off) must be shielded. 	
<ul style="list-style-type: none"> Remote control enables the starting or deactivation of the pump (potential-free), this function has priority over the other functions. This remote control can be removed by shunting the terminals of the remote control (Ext. Off). 	Example: float switch, low-water pressure regulator, etc.

Connections and control rules of each operating mode:

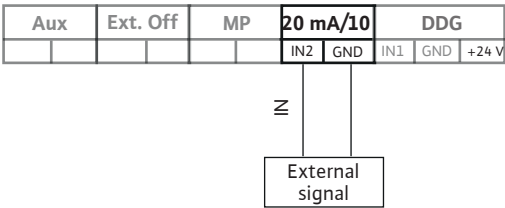
Signal connections and control rules		Connection		Signal	
Operating modes	Setting			Current	Voltage
		see the diagrams below			
<ul style="list-style-type: none">In “Speed stage control” mode 	... speed, manual	C1	/	/	/
	... speed, external control	C1	C2	S3	S4
<ul style="list-style-type: none">In “Constant pressure: p-c” modeControl with a relative pressure sensorIn “Δp-c” modeControl with a differential pressure sensor 	... of the setpoint with the rotary knob	C1	C3	S1	S2
	... by an external setpoint	C1	C2	S5	S6
			C3	S1	S2
<ul style="list-style-type: none">In the mode “Variable pressure: Δp-v”Control with a differential pressure sensor 	... of the setpoint with the rotary knob	C1	C3	S1	S2
	... by an external setpoint	C1	C2	S5	S6
			C3	S1	S2
<ul style="list-style-type: none">In “PID control” modeControl with a temperature sensor or delivery rate sensor... 	... of the setpoint with the rotary knob	C1	C3	S1	S2
	... by an external setpoint	C1	C2	S5	S6
			C3	S1	S2

Input/output connections

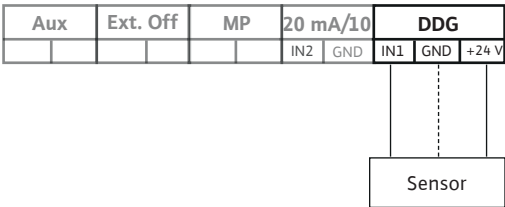
- Remote control: Position [C1]
- Converter delivered with a jumper.
 - Use of the remote control is optional



- External signal IN2: Position [C2]
- 2 wires ([20 mA/10 V] / 0 V)

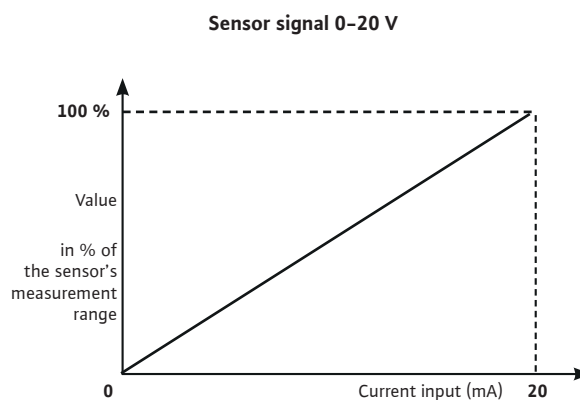
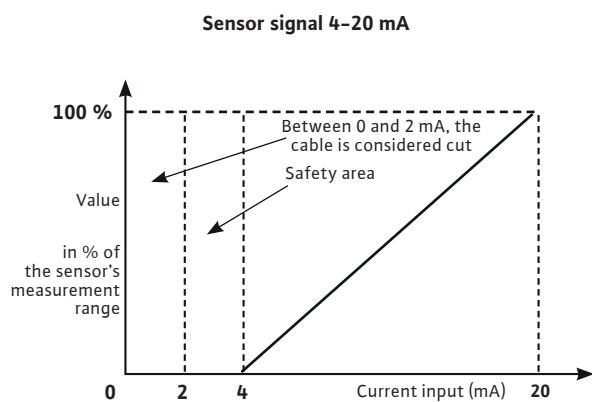


- IN1 sensor: Position [C3]
- 2 wires ([20 mA/10 V] / +24 V)
 - 3 wires ([20 mA/10 V] / 0 V / +24 V)

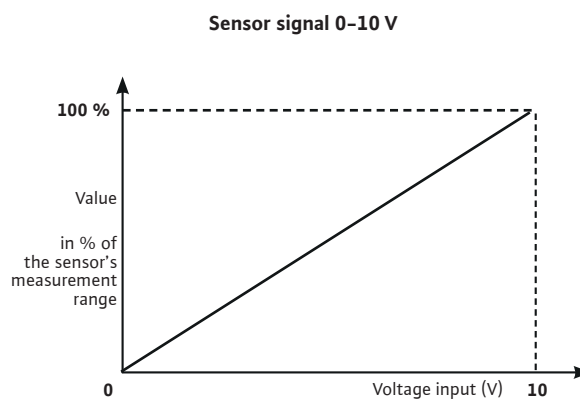
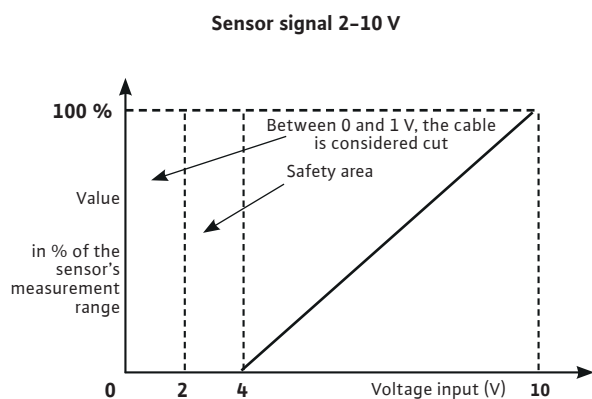


Control rules of input signals

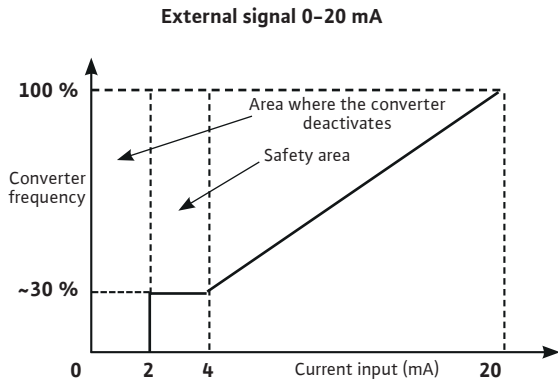
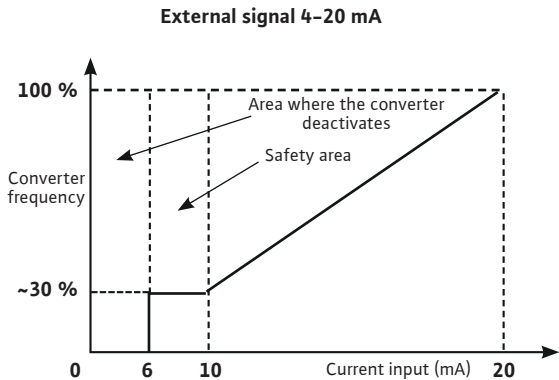
Sensor input – Current signal: Position [S1]



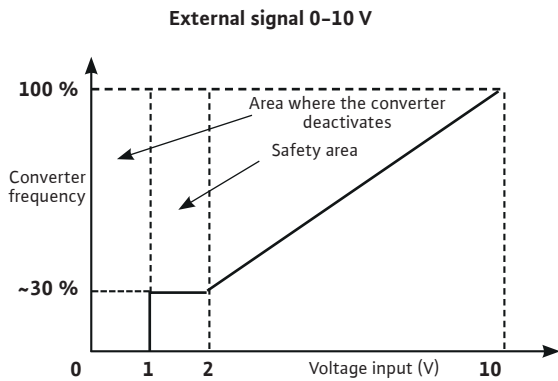
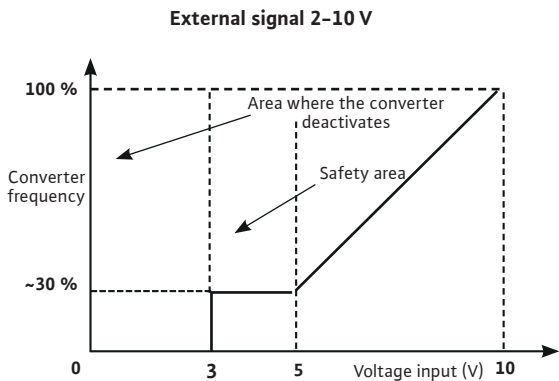
Sensor input – Voltage signal: Position [S2]



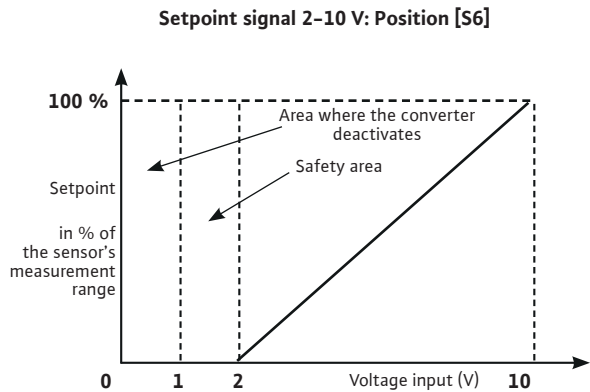
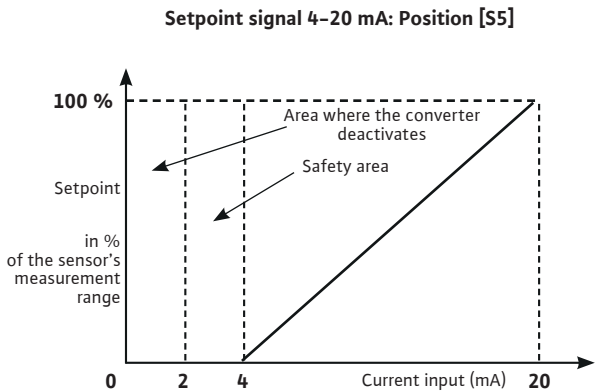
External control input of the speed stage – Current signal: Position [S3]



External control input of the speed stage – Voltage signal: Position [S4]



External setpoint input of control with a sensor (pressure, temperature, delivery rate, etc.)



8. Commissioning

8.1 Filling and venting the system



CAUTION! Danger of damage to the pump!

The pump must not be allowed to run dry. The system must be checked prior to switching on the pump.

8.1.1 Venting – inlet mode (Fig. 1)

- Close the two stop valves (1 + 2).
- Loosen the venting screw (4).
- Slowly open the stop valve (1) on the suction side.
- Close the drain cock as soon as the air has been emitted and fluid runs out of the pump (4).



WARNING! Risk of burns!

If the fluid is hot and the pressure is high, there is the danger of scalding or other injuries being caused by the stream ejected from the drain cock.

- Fully open the stop valve (1) on the suction side.
- Open the stop valve (2) on the pressure side.

8.2 Commissioning



CAUTION! Danger of material damage!

The pump must not be allowed to run at zero volume flow (stop valve closed on the pressure side).

The following flow rate must be ensured:

Pump type	Min. volume flow	Max. volume flow
MVISE 2	0.4 m³/h	5 m³/h
MVISE 4	0.5 m³/h	8 m³/h
MVISE 8	1 m³/h	16 m³/h



WARNING! Danger of injury!

Depending on the pump's or system's operating conditions (fluid temperature, volume flow), the entire pump, including the motor, can get exceedingly hot. Risk of burns if the pump is touched!



CAUTION! Check the direction of rotation!

Incorrect direction of rotation causes poor pump output and the possible overloading of the motor.

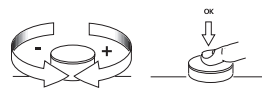
- In the terminal box there is a control lamp (Fig. 1, pos. 9), which illuminates if the direction of rotation is correct.
- If the control lamp does not illuminate, there is no supply of operating voltage or the direction of rotation is incorrect. In the last case, swap the two phases of the mains connection.

8.3 Operation of the converter

8.3.1 Control elements

The converter is controlled using the following control elements:

Rotary knob



- Selecting a new parameter only requires rotating the knob in direction “+” to the right or “-” to the left.
- A short impulse on the rotary knob confirms this new setting.

DIP switches

This converter has a block of five DIP switches (Fig. 4, pos. 5) each with two positions.

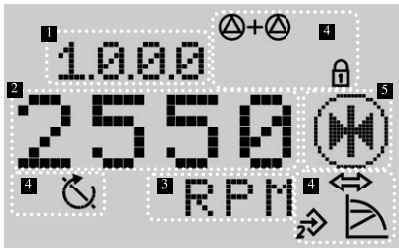


- DIP switch 1 switches from “OPERATION” mode [DIP switch 1 OFF] to “SERVICE” mode [DIP switch 1 ON] and back again. The “OPERATION” position authorises the operation of the chosen mode and stops access to the parameterisation (normal operation). The “SERVICE” position allows the user to carry out parameterisation of the different operations.
- DIP switch 2 is used to activate or deactivate the “Access lock” (see section 8.3.6.5).
- DIP switches 3 and 4 must be kept in the ON position.
- DIP switch 5 is not used and must be kept in the OFF position.

Relay

(see section 10)

8.3.2 Display structure



Pos.	Description
1	Menu number
2	Value display
3	Unit display
4	Standard symbols
5	Icon display

8.3.3 Description of standard symbols

Symbol	Description
	Operation in “Speed stage control” mode
	Operation in “Constant pressure” or “PID control” mode
	Operation in “Variable pressure” or “PID control” mode
	IN2 input activated (external setpoint)
	Access lock When this symbol appears, the settings or current measurement values cannot be modified. The information is displayed in read-only form
	BMS (Building Management System) PLR or LON is activated
	Pump in operation (if flashing, zero delivery rate detection detected)
	Pump switched off

8.3.4 Display

Display status page

- The status page appears as the default page of the display.
The currently set setpoint is displayed. Basic settings are displayed by symbols.



Example of display status page



NOTICE: In all menus, if the rotary knob is not operated within 30 seconds, the display will reappear and no change will be registered.

Navigation element

- The menu structure makes it possible to call up the functions of the converter. A number is attributed to every menu and submenu.
- Turn the rotary knob to scroll through any menu level (e.g. 4000 -> 5000).
- Blinking elements (value, menu number, symbol or icon) allow the selection of a new value, a new menu number or a new function.

Symbol	Description
	When the arrow appears: <ul style="list-style-type: none">• An impulse on the rotary knob provides access to a sub-menu (e.g. 4000 -> 4100).
	When the “return” arrow appears: <ul style="list-style-type: none">• An impulse on the rotary knob provides access to the higher menu (e.g. 4130 -> 4100).

8.3.5 Defining the application of an open or closed hydraulic loop

The product has two types of application. The type of application chosen defines the operating modes that can be accessed.

Hydraulic application	Operating mode	
Open loop	“p-c” mode	Speed stage control mode
Closed loop	“Δp-c” mode “Δp-v” mode	PID mode

Menu 5.7.8.0 of the EXPERT menu can be used to select the type of application required.



NOTICE: The product must be reinitialised when the application is changed. All the user parameters will revert to the factory settings.

8.3.6 Defining operating modes

Defining pressure sensors

- The relative pressure sensor measures the pressure in relation to atmospheric pressure.
- The absolute pressure sensor measures the pressure in relation to the zero pressure in a vacuum.
- The differential pressure sensor measures the pressure between two points.



NOTICE: All the pressures indicated by the pump are measured in relation to the atmospheric pressure, except when a differential pressure sensor is used.



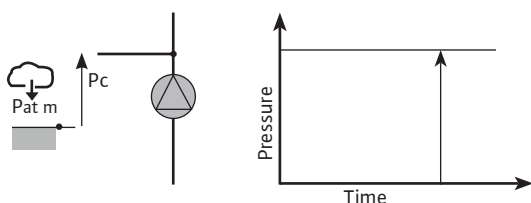
NOTICE: If the pump is provided alone, and not integrated into a system installed by us, the configuration mode upon delivery is the “speed stage control” mode.

“Speed stage control” mode (Fig. 1)

- The duty point is obtained by manually adjusting the speed stage via the menus or using an external command signal for the speed stage expressed in %.
- For entry into service, the motor speed stage should be set at 2400 rpm.

“Constant pressure: pc” mode (Fig. 2)

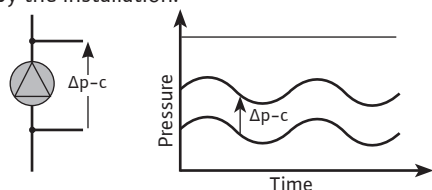
- In “p-c” mode, the converter maintains a constant pressure at the pump discharge irrespective of the delivery rate required by the installation.



- The duty point is defined manually via the menus or an external signal.
- This mode can be accessed when the open hydraulic loop parameter is selected in menu 5.7.8.0.
- A relative pressure sensor is used for control (sensor: accuracy: $\leq 1\%$; using between 30 % and 100 % of the measuring range).
- For entry into service, the set pressure should be set at 60 % of the pump's maximum pressure.

“ Δp -c” mode (Fig. 2)

- In “ Δp -c” mode, the converter maintains a constant differential pressure (generated by the pump) irrespective of the delivery rate required by the installation.



- The differential pressure is defined manually via the menus or via an external signal.
- This mode can be accessed when the closed hydraulic loop parameter is selected in menu 5.7.8.0.
- A differential pressure sensor is used for control (sensor: accuracy: $\leq 1\%$; using between 30 % and 100 % of the measuring range).
- For entry into service, the set pressure should be set at 60 % of the pump's maximum pressure.

“Variable pressure: Δp -v” mode (Fig. 2)

- In “ Δp -v” mode, the converter changes the differential pressure of the pump in a linear manner, in line with the delivery rate required by the installation.
- The duty point (Pset) is defined manually via the menus or an external signal.
- The duty point at a zero delivery rate (%Pset) is defined manually via the menus.
- This mode includes zero delivery rate detection that switches off the pump.
- A differential pressure sensor is used for control (sensor: accuracy: $\leq 1\%$; using between 30 % and 100 % of the measuring range).
- For entry into service, the set pressure should be set at 60 % of the pump's maximum pressure.
- This mode can be accessed when the closed hydraulic loop parameter is selected in menu 5.7.8.0.

“PID control” mode

- The converter enables control with another type of sensor (temperature, delivery rate, etc.) via control of the PID (proportional integral differential control).
- The duty point is expressed as a percentage of the measurement range of the sensor used. This point is defined manually via the menus or via an external control signal.

8.3.7 Menu description

List of menus (Fig. A5)

<1.0.0.0> Setpoint setting

<2.0.0.0> Operating mode setting

<3.0.0.0> On/Off pump setting

<4.0.0.0> “Information” menu
Reading the pump parameters

<5.0.0.0> “Service” menu
Access to the pump parameter settings

<6.0.0.0> Error acknowledgement
If one or more malfunctions occur, the malfunction page will appear. The letter “E” followed by a three-figure code will appear (see section 10).

<7.0.0.0> Access lock
The “Access lock” can be accessed if DIP switch 2 is in the ON position.

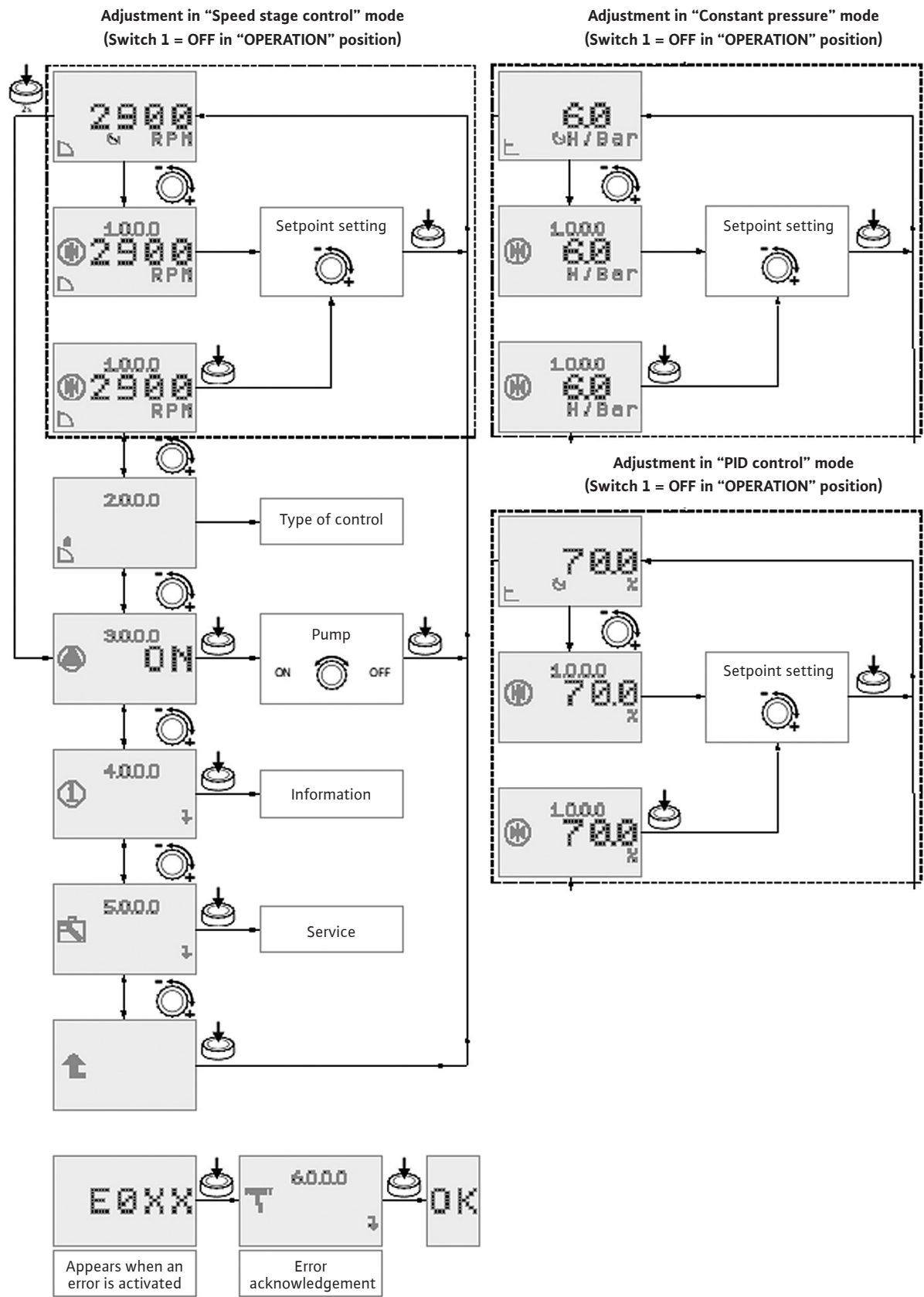


CAUTION! Risk of property damage!

Incorrect setting changes may cause pump operation faults which may lead to damage of the pump or installation.

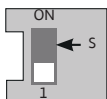
Menu navigation

Fig. A1



- Only perform adjustments in “SERVICE” mode when commissioning, which should only be performed by specialist technicians.

Navigating the “Easy” and “Expert” menus



Place DIP switch 1 in the ON position (Fig. A1, pos. 1). The “SERVICE” mode is activated.

On the display, the symbol here will flash (Fig. A7).

In the “SERVICE” mode, the parameter of menus <2.0.0.0> and <5.0.0.0> can be changed.

There are 2 adjustment modes:

Easy menu



A simplified menu that provides access to the main parameters of the operating modes.

- Press the rotary knob for two seconds. The “Easy” menu symbol is displayed (Fig. A7).
- Press the rotary knob to validate this choice. The display will switch to menu number <2.0.0.0> (Fig. A8).
- After performing the adjustments, put DIP switch 1 in the OFF position (Fig. A1, pos. 1).

Expert menu



The menu for accessing all the parameters.

- Press the rotary knob for two seconds and turn it in order to select the expert menu. The “Expert” menu symbol is displayed (Fig. A7).
- Press the rotary knob to validate this choice. The display will switch to menu <2.0.0.0> (Fig. A8).
- Select the operating mode in menu <2.0.0.0> and validate.
- Select menu <5.0.0.0> to access all the converter’s parameters (Fig. A9).
- After performing the adjustments, put DIP switch 1 in the OFF position (Fig. A1, pos. 1).

Fig. A2

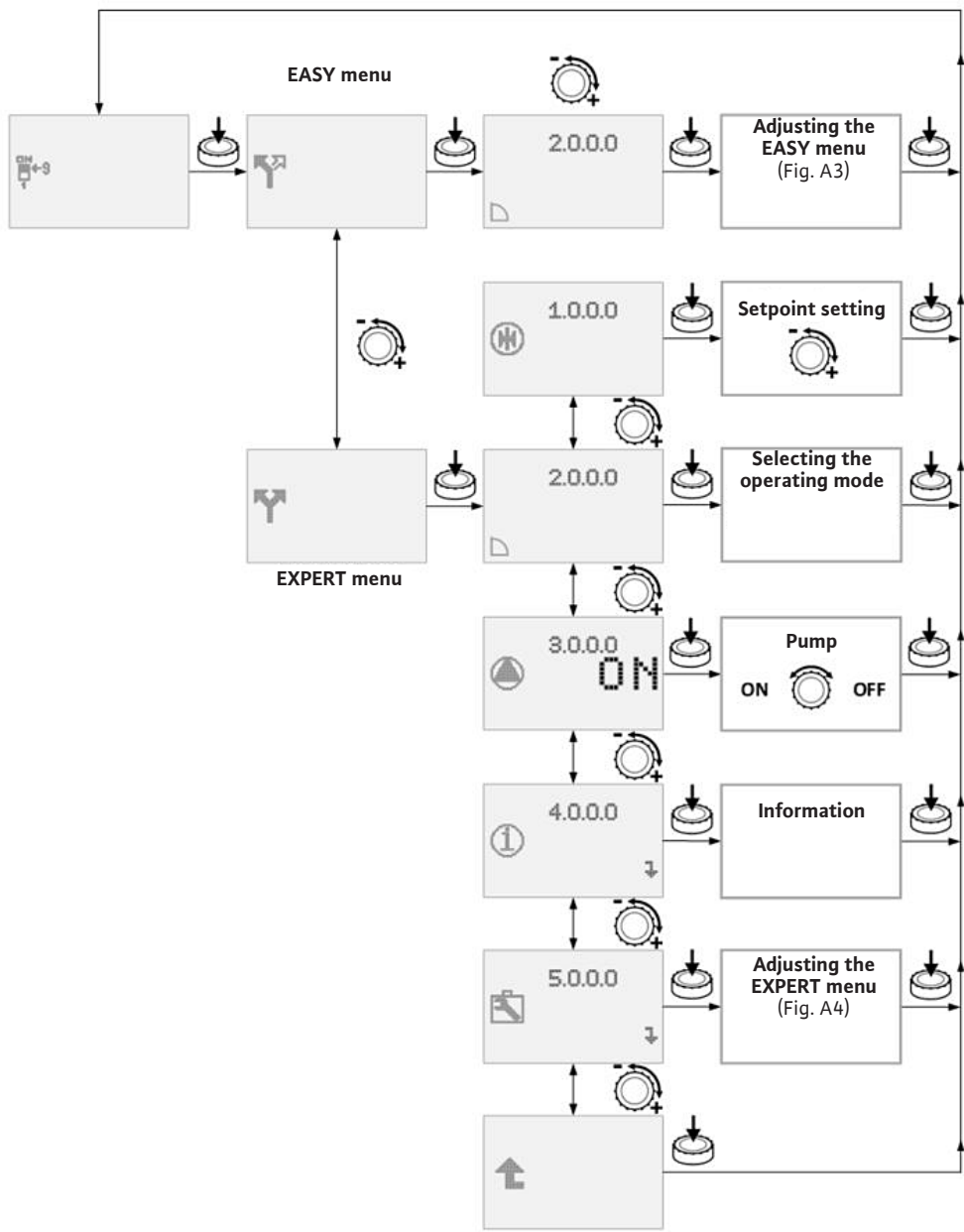


Fig. A3

ADJUSTING THE EASY MENU

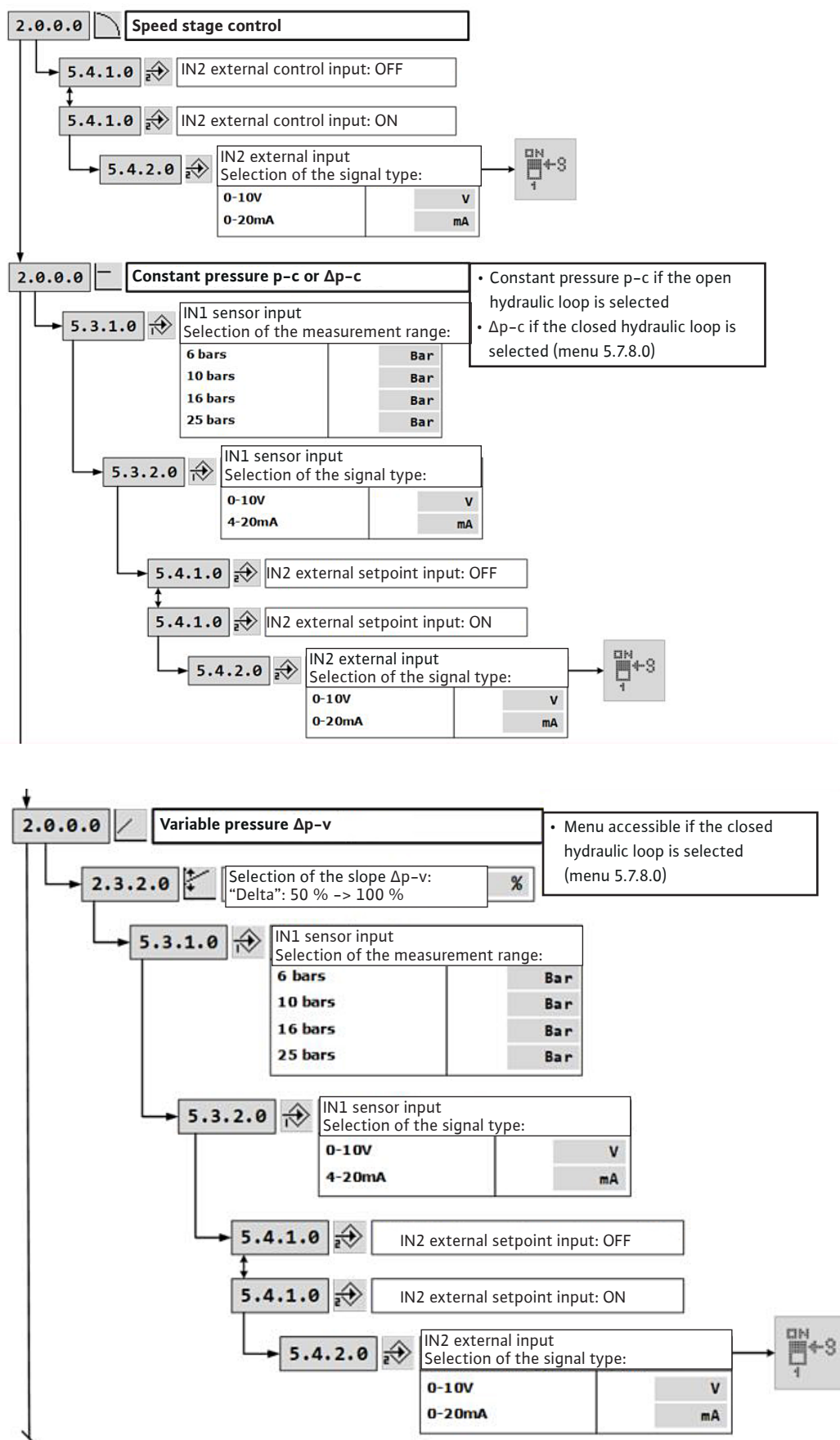


Fig. A3

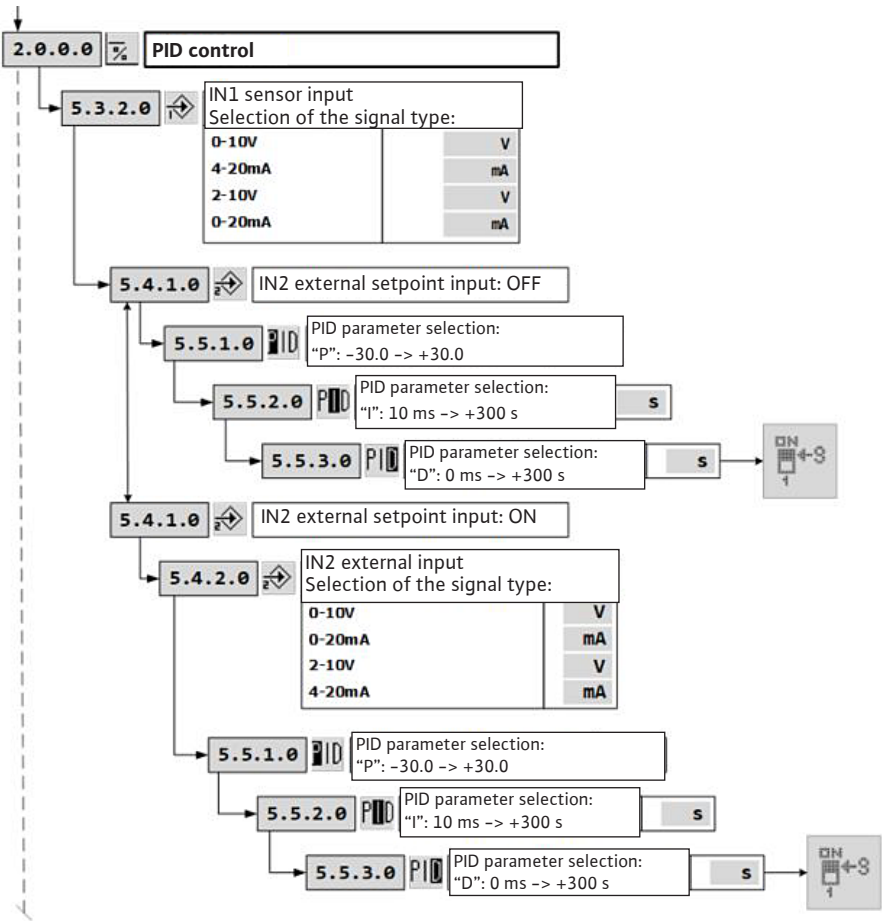


Fig. A4

ADJUSTMENT OF THE EXPERT MENU

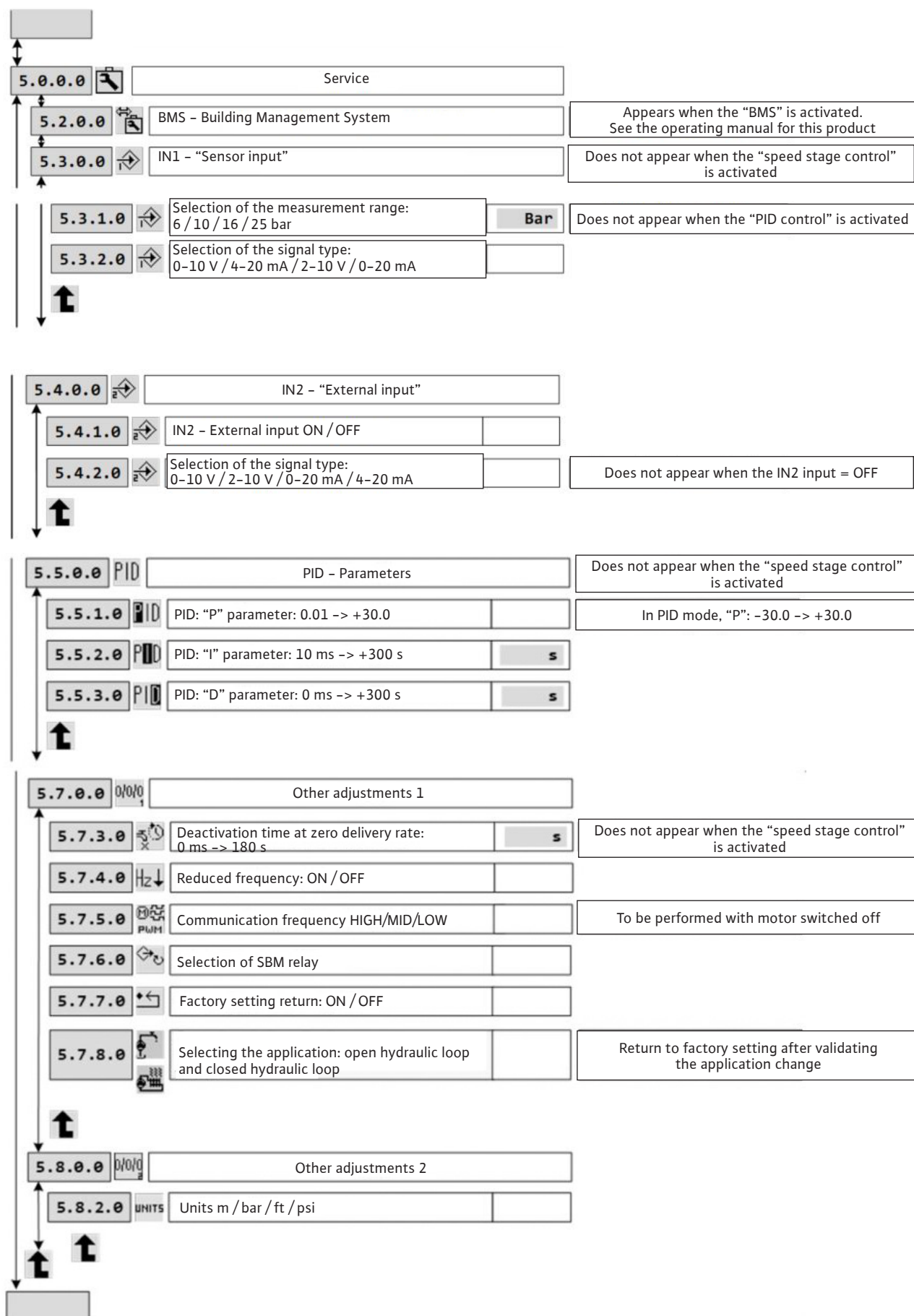
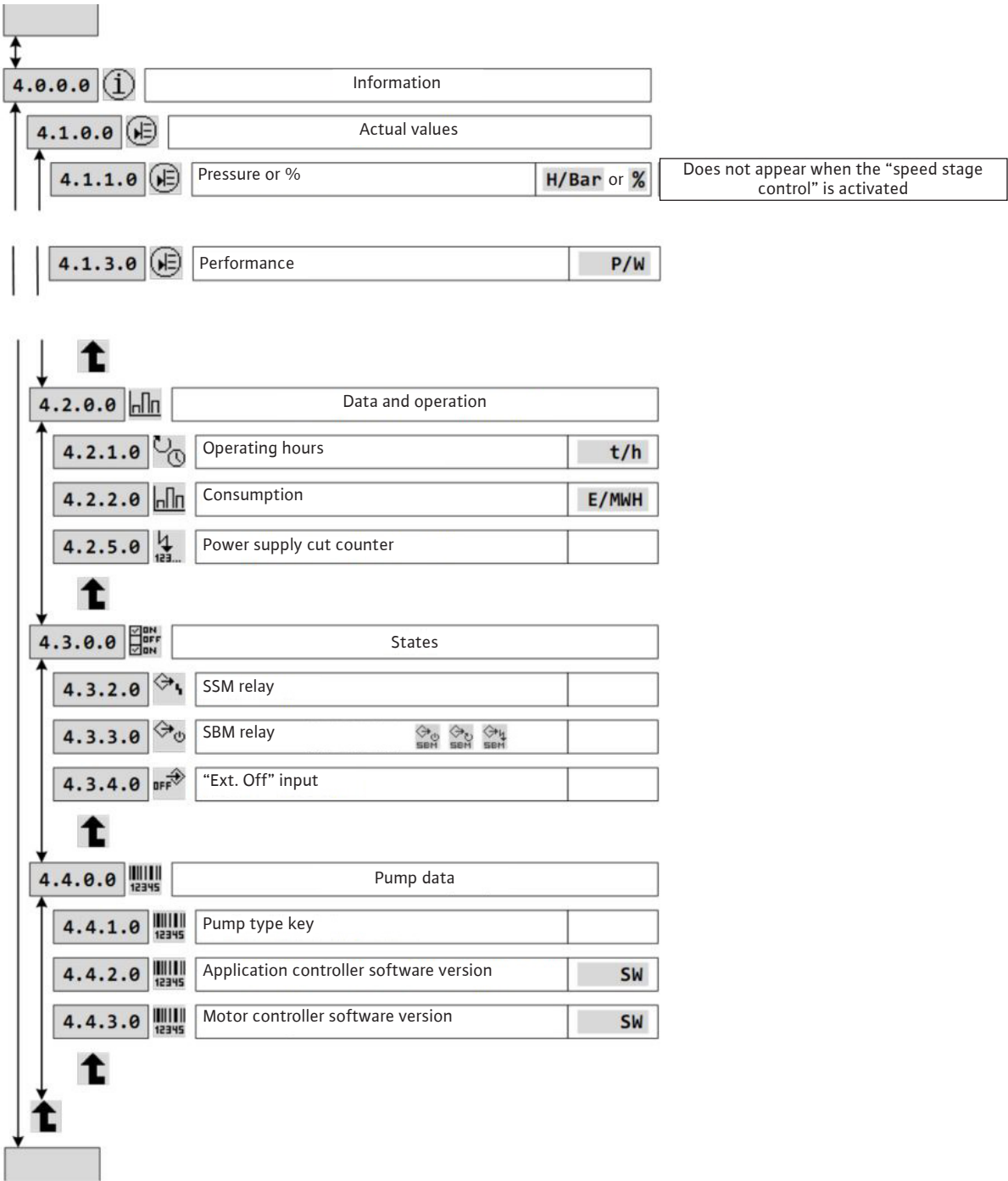


Fig. A5

NAVIGATING THE “4000” INFORMATION MENU



Access lock

The “Access lock” can be used to block all adjustments to the pump.

Proceed as follows:

- Place DIP switch 2 in the ON position.
The menu <7.0.0.0> will appear.
- Turn the rotary knob to activate or deactivate the lock. The current status of the lock is represented by the following symbols:



Lock activated: The parameters are locked and access to the menus is authorised in read-only mode.



Lock deactivated: The parameters can be changed and access to the menus to make adjustments is authorised.

- Place DIP switch 2 in the OFF position. The status setting will reappear.

9. Maintenance

All maintenance and repair work must be carried out by authorised and qualified personnel!



WARNING! Danger due to electrical voltage!

Dangers from electricity must be ruled out. The pump must be voltage-free before commencing electrical work and secured against unintended reactivation.



WARNING! Risk of burns!

If the water temperature and the system pressure are high, close the stop valve on the suction side and on the pressure side. The pump must cool down first.

- No special maintenance is necessary during operation.
- During periods of frost, stationary pumps must be cleaned to prevent damage.

10. Faults, causes and remedies



WARNING! Danger due to electrical voltage!

Dangers from electricity must be ruled out.
The pump must be voltage-free before commencing electrical work and secured against unintended reactivation.



WARNING! Risk of burns!

If the water temperature and the system pressure are high, close the stop valve on the suction side and on the pressure side.
The pump must cool down first.

Fault	Cause	Remedy
The pump is not running	No power supply	Check fuse protection, wiring and connections
	Motor protection has interrupted the power supply	Avoid overloading the motor
The pump runs but does not reach its duty point	Incorrect direction of rotation	Check the direction of rotation and correct as necessary
	Pump components are blocked by foreign objects	Check the pump and clean it
	Air inclusion in the pump	Seal the suction port
	Suction line too narrow	Install a larger suction line
	The stop valve is not sufficiently open	Fully open the stop valve
The pump does not pump evenly	Air in the pump	Vent the pump and ensure that the suction line is sealed. If necessary, start the pump for 20 to 30 s. Open the venting screw so that the air can escape. Close the venting screw and repeat the procedure as often as required
The pump vibrates or is loud	Foreign object in the pump	Remove the foreign object
	The pump is not properly attached to the ground	Tighten the anchor screws
	Bearing damaged	Contact Wilo customer service
The motor has overheated, motor protection has been activated	One phase is interrupted	Check fuse protection, wiring and connections
	Fluid temperature too high	Maximum fluid temperature
	Foreign object in the pump	Remove the foreign object
	Bearing damaged	Contact Wilo customer service
The delivery rate is inconsistent	In "Constant pressure" or "Variable pressure" mode, the pressure sensor is not adapted	Install a sensor with a compliant pressure scale and precision
In "Constant pressure" or "Variable pressure" mode, the pump does not switch off when the delivery rate is zero	The non-return valve is not impermeable	Clean or change it
	The non-return valve is not adapted	Replace it with an adapted non-return valve
	The tank does not have enough capacity for the installation	Change it or add another to the installation

If the fault cannot be resolved, please contact Wilo customer service.

Faults must be remedied by qualified personnel only!
Observe the safety instructions in section 9 Maintenance.

Relay

The converter is fitted with 2 output relays serving as interface with the centralised control, e.g.: switchgear, pump control.

SBM relay:

This relay can be configured in the “Service” menu <5.7.6.0> in 3 operating modes.



State: 1 (default setting)

“Available transfer” relay (normal operation of this pump type).

The relay is activated when the pump is running or in standby.

The relay is deactivated if an initial malfunction occurs or if the main power supply is disconnected (pump switches off). Pump availability, even temporarily, is signalled to the switchgear.



State: 2

“Run transfer” relay.

The relay is activated when the pump is running.



State: 3

“Power on transfer” relay.

The relay is activated when the pump is connected to the network.

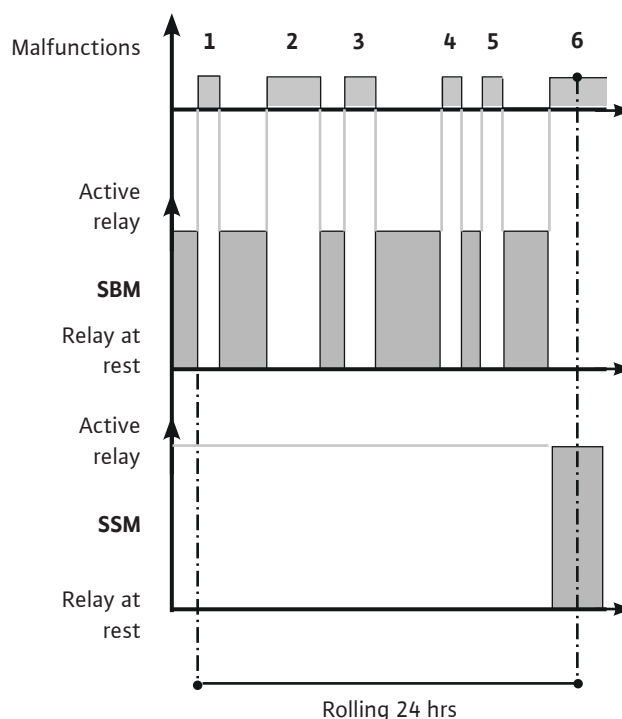
SSM relay:

“Failures transfer” relay.

If consecutive malfunctions of the same type are detected (from 1 to 6 according to significance), the pump switches off, and this relay is activated (until manual intervention).

Example: 6 defects with a variable duration within 24 hours.

The state of the SBM relay is “Available transfer”.



10.1 Faults table

All incidents mentioned hereafter will have the following effect:

- Deactivation of the SBM relay (when parameterised in “available transfer” mode).
- Activation of the SSM relay “failure transfer” when the max. quantity of one malfunction type is reached within a 24-hour period.
- Lighting of a red LED.

Error code	Ramp time before signalling of error	Time before the error is taken into account after signalling	Waiting time before automatic reactivation	Max. error in 24 h	Faults Possible causes	Remedies	Waiting time before reset
E001	60 s	0 s	60 s	6	The pump is overloaded, malfunctioning	Density and/or viscosity of the pumped fluid too high	300 s
					The pump is obstructed by foreign bodies	Dismantle the pump, replace the malfunctioning components or clean it	
E004 (E032)	~5s	(0.55 to 7.5 kW) 300 s	(0.55 to 7.5 kW) 0 s if error deleted	6	The power supply to the converter is in undervoltage	Check the voltage at the converter terminals: • malfunction if power supply > 480 V (0.55 to 7.5 kW) • malfunction if power supply > 506 V (11 to 22 kW)	(0.55 to 7.5 kW) 0 s
		(11 to 22 kW) 0 s	(11 to 22 kW) 300 s				(11 to 22 kW) 300 s
E005 (E033)	~5s	300 s	0 s if error deleted	6	The power supply to the converter is at overvoltage	Check the voltage at the converter terminals: • malfunction if power supply > 506 V	0 s
E006	~5s	300 s	0 s if error deleted	6	A power supply phase is missing	Check the power supply	0 s
E007	0 s	0 s	0 s if error deleted	Un-limited	The converter operates as a generator. Warning, no pump deactivation	The pump has switched direction, check the impermeability of the valve	0 s
E010	~5s	0 s	Unlimited	1	The pump is blocked	Dismantle pump, clean it and replace the faulty parts. Possible mechanical motor malfunction (roller bearings)	60 s
E011	15s	0 s	60 s	6	The pump is deactivated or is running dry	Re-prime by filling the pump (See § 9.3). Check the impermeability of the foot valve	300 s
E020	~5s	0 s	300 s	6	The motor is heating up	Clean the cooling ribs at the back and under the converter, as well as the fan cap	300 s
					Room temperature above product characteristics	Improve the ventilation of the premises	
E023	0 s	0 s	60 s	6	The motor is short-circuited	Remove the motor-converter from the pump and check it or replace it	60 s
E025	0 s	0 s	Unlimited	1	A phase of the motor is missing	Check the connection between the motor and the converter	60 s
E026	~5s	0 s	300 s	6	The motor's temperature sensor is faulty or has a bad connection	Remove the motor-converter from the pump and check it or replace it	300 s
E030 E031	~5s	0 s	(0.55 to 7.5 kW) 0 s if error deleted	6	The converter is heating up	Clean the cooling ribs at the back and under the converter, as well as the fan cap	300 s
			(11 to 22 kW) 300 s		Room temperature above product characteristics	Improve the ventilation of the premises	
E042	~5s	0 s	Unlimited	1	The sensor cable (IN1) is cut	Check for the correct power supply and wiring to the sensor	60 s
E050	60 s	0 s	0 s if error deleted	Un-limited	The BMS communication is faulty	Check the connection	300 s
E077	0 s	0 s	Unlimited	1	24 V power supply voltage of sensors faulty	Check the sensors and their connections	60 s
E---	0 s	0 s	Unlimited	1	Converter internal malfunction	Call customer service	60 s

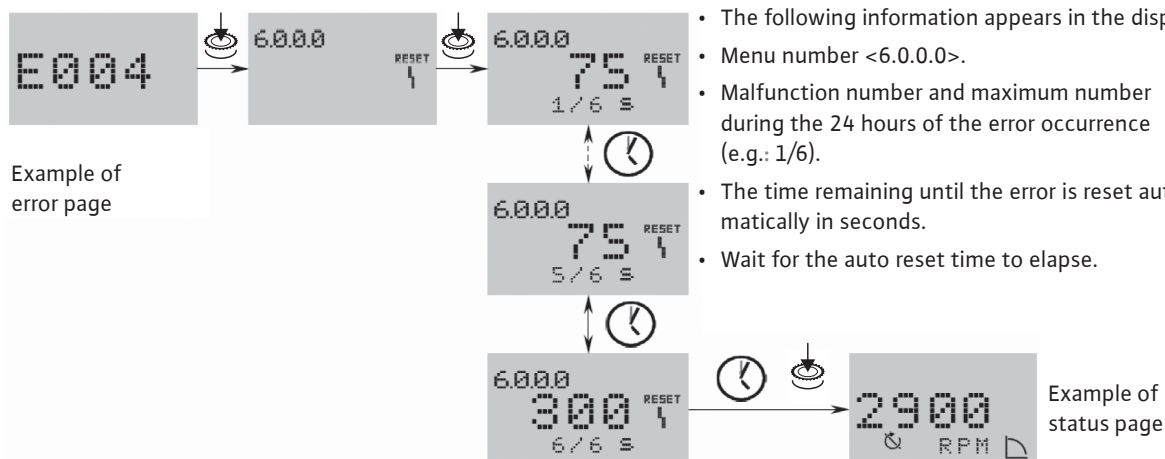
10.2 Errors acknowledgement



CAUTION! Risk of property damage!

Only acknowledge errors after they have been resolved.

- Errors may be resolved by qualified technicians only.
- When in doubt, contact the manufacturer.
- In case of a error, the malfunction page is displayed instead of the status page.
- To acknowledge a error, proceed as follows.
- Press the rotary knob.
- The following information appears in the display:
 - Menu number <6.0.0.0>.
 - Malfunction number and maximum number during the 24 hours of the error occurrence (e.g.: 1/6).
 - The time remaining until the error is reset automatically in seconds.
- Wait for the auto reset time to elapse.



A timer runs inside the system. The remaining time (in seconds) until the error is automatically acknowledged is displayed.

- When the maximum number of error is reached and the last follow-up time has elapsed, press the rotary knob to acknowledge.

The system returns to the status page.



NOTICE: If time for the resolution of the malfunction remains after the error signal (e.g.: 300 s), then the error must always be acknowledged manually.

The auto reset timer is inactive and “- - -” is displayed.

11. Spare parts

All spare parts must be ordered through local authorised technicians and/or the Wilo customer service.

Please state all data shown on the rating plate with each order to avoid queries and incorrect orders.

12. Disposal

Information on the collection of used electrical and electronic products

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



NOTICE: Disposal in domestic waste is forbidden!

In the European Union, this symbol can appear 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:

- Only hand over these products at designated, certified collecting points.
- 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. For further information on recycling, go to www.wilo-recycling.com.

Subject to change without prior notice.



1. 概述

1.1 关于本文档

原版安装及操作说明所采用的语言为英语。
本说明的所有其他语言版本均为原版安装及操作说明的译本。
本安装及操作说明是产品的组成部分。必须将其存放在产品安装处，以便随时取用。严格遵循本说明是正确安装和使用本产品的必要条件。
本安装及操作说明符合本产品的相关版本以及付诸印制时有效的基本安全标准。
欧盟符合性声明：
欧盟符合性声明的副本是本安装及操作说明不可或缺的组成部分。
如果在未经我们同意的情况下对此处指定的系列进行技术修改，则此声明将失去效力。

2. 安全

本安装及操作说明包含了安装、操作和维护过程中必需遵守的重要信息。因此，在安装及试运行之前，维修人员及负责的专业人员/操作员务必阅读本说明。
他们不仅必须遵守本节所列出的一般安全说明，还必须遵守以下各节中所包含的带有危险符号的特殊安全说明。

2.1 操作说明的危险提示标识

符号



一般危险符号



电压造成的危险



注意：

信号词：

危险！紧急危险情况。如果不遵守说明，则会导致死亡或极为严重的伤害。

警告！用户可能会受到（严重）伤害。“警告”意味着，如果忽视此信息，则可能会造成（严重）人身伤害。

小心！产品/设备有受损的风险。“小心”意味着，如果忽视此信息，则本产品及操作装置可能会受损。

注意：关于产品操作的有用信息。它提醒人们注意可能会出现的问题。

- 直接出现在产品上的信息，如
- 指示旋转方向的箭头
 - 连接标识符
 - 铭牌
 - 警告贴纸
- 必须得到严格遵循，并保持清晰可读。

2.2 工作人员资质

负责安装、操作和维护的工作人员必须具备该项工作所要求的相应资质。运营方应确保工作人员的责任范围、职责和相应监督。如果工作人员不具备必要的知识，则必须接受培训和指导。如有必要，这项工作可以根据运营方的请求由产品制造商来完成。

2.3 违反安全说明时出现的危险情况

违反安全说明可能导致人员受伤，并对环境和产品/设备造成损害。违反安全说明还会导致丧失任何损害索赔权。具体来讲，违反安全说明可能会带来以下风险，例如：

- 电气、机械和细菌等影响对人员构成的危险
- 因危险物品泄漏导致的环境破坏
- 财产损失
- 重要产品/装置功能的失效
- 所需的维护和维修过程失败

2.4 作业时的安全意识

必须遵守现有的事故防范指令。
必须消除电流方面的危险。必须遵守当地指令或通用指令 [例如 IEC、VDE 等] 以及本地能源供应公司的指令。
本设备不适合身体、感官或精神能力较弱以及缺乏经验和知识的人（包括儿童）使用，除非有人监督或指导他们如何使用设备，并负责他们的安全。应照看好儿童，确保其不会玩耍设备。

2.5 运营方安全说明

本设备不适合身体、感官或精神能力较弱以及缺乏经验和知识的人（包括儿童）使用，除非有人监督或指导他们如何使用设备，并负责他们的安全。
应照看好儿童，确保其不会玩耍设备。

- 如果产品/装置上的高温或低温部件会导致危险，则必须采取局部措施以防接触。
- 当本产品处于运行状态时，不得拆除防止接触移动部件的防护装置（例如联轴器）。

- 必须将（例如从轴封处）泄漏的（易爆、有毒或高温）有害流体导出，以免对人员或环境造成危害。必须遵守国家法律规定。
- 必须消除电流方面的危险。必须遵守当地指令或通用指令 [例如 IEC、VDE 等] 以及本地能源供应公司的指令。

2.6 有关安装和维护作业的安全指示

运营方须保证所有安装和维护作业均由经授权和具备资质的专业人员执行，且这些人员必须已经通过深入研习本安装及操作说明而掌握了充分的信息。只有在产品/设备处于休止状态时，才能对其进行操作。关闭产品/设备时，必须遵循本安装及操作说明中所述的步骤。作业结束后，必须马上将所有的安全及防护装置放回原处并/或对其进行重新调试。

2.7 擅自改装部件和使用未授权备件

擅自改装部件和使用未授权备件将会危害产品/人员的安全，并使生产商安全声明无效。只有在与制造商协商后，才能对产品进行修改。制造商授权的原装备件和附件可确保安全。使用其他部件将免除制造商的一切责任。

2.8 不当使用

对于所提供产品的常规使用，只有在遵守本安装及操作说明第 4 节的情况下才能确保操作安全。在任何情况下，极限值均不得高于或低于目录/数据表中指定的值。

3. 运输和临时存放

当本产品运抵后，请立即检查其是否发生了运输损坏。如果确定发生了运输损坏，则必须在规定期限内采取涉及承运人的必要步骤。



小心！可能会发生环境破坏！

如果本产品将于稍后安装，则必须将其存放在干燥的场所。保护本产品免受冲击/撞击和其他环境影响（湿气、结冰等）。

运输和存放温度范围：-30 °C 至 +60 °C

必须小心地处理泵，以免其在安装前损坏。

4. 预期用途

此泵通常用于泵送冷水或温水、水-乙二醇混合物或不含矿物油、固体或磨料成分或长纤维材料的低粘度介质。



小心！请对电机采取过热保护措施！

对于粘度比水更高的流体，需要进行技术咨询。



危险！小心爆炸风险！

不得将此泵用于泵送易燃或易爆流体。

4.1 应用领域

- 供水和升压系统
- 工业循环系统
- 冷却水循环系统
- 灌溉和喷洒装置

5. 产品信息

5.1 型号代码

示例：MVIS402-1/16/E/3-2/3G	
MVIS	采用立式设计的高效多级串联泵
E	配备变频器
4	额定流量，单位为 m³/h
02	级数
-1	1 = 304 不锈钢制泵壳 + 304 不锈钢制液压部件
16	16 = PN 16 法兰
/E	E = EPDM O 形圈 (WRAS/KTW)
/3	3 = 3~, 三相电流
-2	极数
/2G	第 2 代变频器

5.2 技术数据

最大利用压力											
泵壳	16 bar										
最大吸入压力	10 bar 注意：实际输入压力 (P input) + 零输送速率时的压力 (P zero delivery rate) 必须始终低于最高允许工作压力 (P max)。如果超过最高允许工作压力，则机械密封件和滚针轴承可能会损坏或者其使用寿命将会缩短。 $P_{\text{input}} + P_{\text{zero delivery rate}} \leq P_{\text{max}}$ 有关最高工作压力，请参阅泵的铭牌：P max										
温度范围											
流体温度	-15 °C 至 +50 °C										
环境温度	-15 °C 至 +40 °C (其他要求的温度)										
电气数据											
电机保护类型	请参见电机铭牌										
有关绝缘等级，请参见铭牌											
频率											
电压											
电源电压	<table border="1"> <thead> <tr> <th colspan="2">功率 (kW)</th></tr> <tr> <th>1.1</th><th>2</th></tr> </thead> <tbody> <tr> <td colspan="2">400 V (±10 %) 50 Hz</td></tr> <tr> <td colspan="2">380 V (±10 %) 60 Hz</td></tr> <tr> <td colspan="2">480 V (±10 %) 60 Hz</td></tr> </tbody> </table>	功率 (kW)		1.1	2	400 V (±10 %) 50 Hz		380 V (±10 %) 60 Hz		480 V (±10 %) 60 Hz	
功率 (kW)											
1.1	2										
400 V (±10 %) 50 Hz											
380 V (±10 %) 60 Hz											
480 V (±10 %) 60 Hz											
支持的电源类型	TN、TT										
其他数据											
环境湿度	< 90 %，无冷凝										
海拔	< 1000 m (按客户要求，> 1000 m)										
噪声级 dB(A) 0/+3 dB(A)	≤ 55 dB(A)										
电源电缆横截面直径 (电缆配有 4 根电线) mm²	<table border="1"> <thead> <tr> <th colspan="2">功率 (kW)</th></tr> <tr> <th>1.1</th><th>2</th></tr> </thead> <tbody> <tr> <td>1.5 – 2.5</td><td>2.5 – 4</td></tr> </tbody> </table>	功率 (kW)		1.1	2	1.5 – 2.5	2.5 – 4				
功率 (kW)											
1.1	2										
1.5 – 2.5	2.5 – 4										

- 电磁兼容性 (*)
- 住宅排放 –
 - 1 类环境：PN-EN 61800-3
- 工业抗干扰性 –
 - 2 类环境：PN-EN 61800-3

- 外形和连接尺寸 (Fig. 3)。

5.3 供货范围

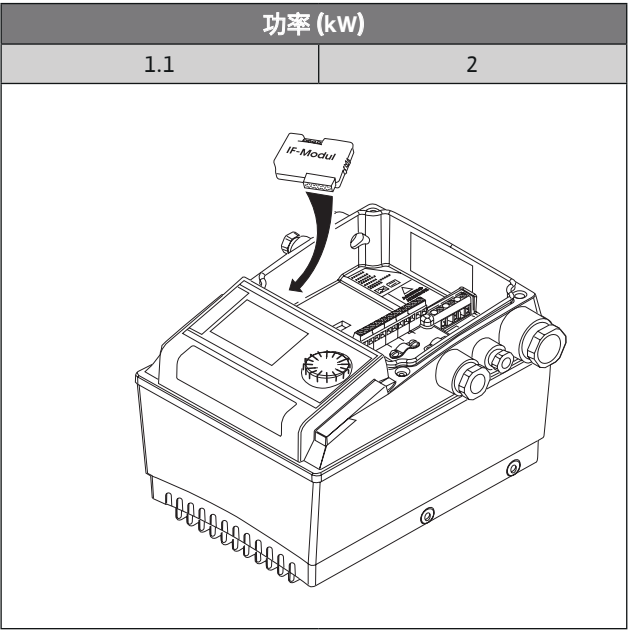
- 高压多级离心泵
- 2 个带内螺纹的椭圆法兰 (配对法兰)、密封垫、螺钉
- 安装及操作说明

(*) 当频率范围为 600 MHz 与 1 GHz 之间时，在直接靠近无线电传输装置、发射器或在此频率范围内工作的类似设备的特殊情况下 (与电子模块相距 <1 m)，显示屏中的显示或压力指示可能会受到干扰。泵的运行在任何时候都不会受到影响。

5.4 附件

有关附件列表，请联系 Wilo 客服部门。

- IF 模块 PLR，用于连接 PLR/接口转换器
- IF 模块 LON，用于连接 LONWORKS 网络。
这些模块直接插入变频器的连接接口中（请参见如下 Fig.）。
- 止回阀（带调节片或弹簧圈，适合在恒定压力下工作）
- 防干运行保护套件
- 控制用压力传感器套件（精度： $\leq 1\%$ ；在测量范围的 30 % 至 100 % 之间使用）。只能使用全新的附件。



6. 说明和功能

6.1 产品说明

Fig. 1、2、5

- 1 – 泵吸入阀
- 2 – 泵排放阀
- 3 – 止回阀
- 4 – 排气螺钉
- 5 – 管道或管夹支架
- 6 – 滤网
- 7 – 补给容器
- 8 – 饮用水网络
- 9 – 电机保护开关
- 10 – 吊钩
- 11 – 基座
- 12 – 压力传感器
- 13 – 蓄水罐
- 14 – 蓄水罐保温阀
- 15 – 显示屏
- 16 – 控制按钮
- HC = 最小正吸入压头
- HP = 排气螺钉的位置

6.2 产品功能

- 带无填料函压盖电机和串联式连接的立式多级泵（2 至 10 级）。
- 在无填料函压盖泵中，所有旋转部件均与流体接触。流体润滑轴承并冷却电机和转子。此泵无需任何维护。

7. 安装和电气连接

安装和电气连接只能由合格的工作人员按照当地法规来执行。



警告！小心受伤危险！

请遵守适用的事故预防规定。



警告！电压造成的危险！

必须消除电流方面的危险。

7.1 接收

打开泵的包装，并遵循环保规定处置包装。

7.2 安装

请将泵安装在平坦水泥表面上干燥、通风良好且无霜冻的位置，并使用安装专用的螺钉将其固定。



小心！存在损坏泵的风险！

泵壳中的异物或污染物可能会影响本产品的功能。

- 建议在完成所有焊接和熔接作业之后再安装泵。
- 安装和试运行泵之前，请冲洗整个回路。
- 为了方便检查或更换，必须将泵安装在易于触及的地方。
- 为了简化重型泵的拆卸，请将吊钩垂直附接到泵的上方（Fig. 1，位置 10）。



警告！小心高温表面造成烫伤危险！

必须妥善地设置此泵，从而使人员无法在其运行时接触到高温表面。



警告！小心倾覆危险！

必须将泵牢牢地锚固在地面上。



小心！小心污染泵的危险！

必须确保在安装之前移除所有的泵壳外罩。



注意：因为所有泵的液压输出端都在出厂前经过测试，因此泵中可能会含有一些残留的水。出于卫生的原因，建议每次将泵用于饮用水之前对其进行冲洗。



警告！小心倾覆危险！

购买泵时，应特别注意以下事实：对于更大版本的泵，较高的重心可能会在泵运行时造成某些风险。

- 安装表面必须水平且平坦。泵的任何倾斜都会导致过早磨损。
- 请将绝缘材料（软木塞或增强橡胶）放置在泵的下方，以避免噪音污染和振动传入系统。
- 只有提供的螺钉可以用于安装椭圆形法兰。更长的螺钉可能会损坏泵壳。

7.3 管道连接

- 使用合适的对接翻、螺栓、螺母和密封垫将泵连接至管道。



小心！

螺母的拧紧扭矩不得超过以下值：

M10 = 20 Nm
M12 = 30 Nm

请勿使用冲击式扳手。

- 泵壳上的箭头指明了流体的流动方向。
- 在安装吸入管和压力管时，请确保泵没有处在张力之下。必须连接管道，从而使水泵不会承受它们的重量。
- 必须为泵在吸入侧和压力侧均配备截止阀。
- 使用补偿器可以减少泵噪音和振动的产生。
- 管道的直径至少必须与泵吸入口的直径具有相同尺寸。
- 为了保护泵免受流体锤击的影响，可以向压力管配备一个止回阀。
- 如果泵直接连接到公共饮用水网络上，则必须为吸入管配备一个止回阀和一个截止阀。
- 如果泵通过薄膜压力罐间接连接到公共饮用水网络上，则必须为吸入管配备一个吸滤器，以防止污染物进入泵中。

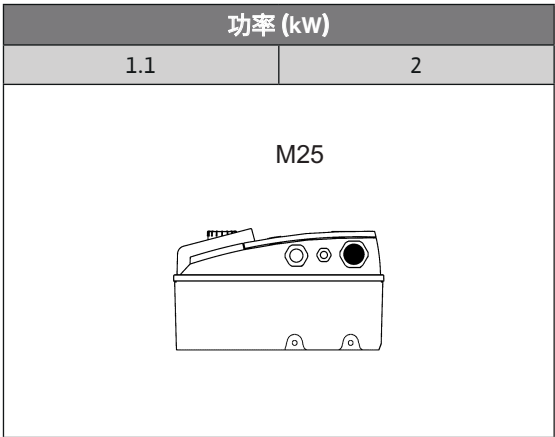
7.4 电气连接



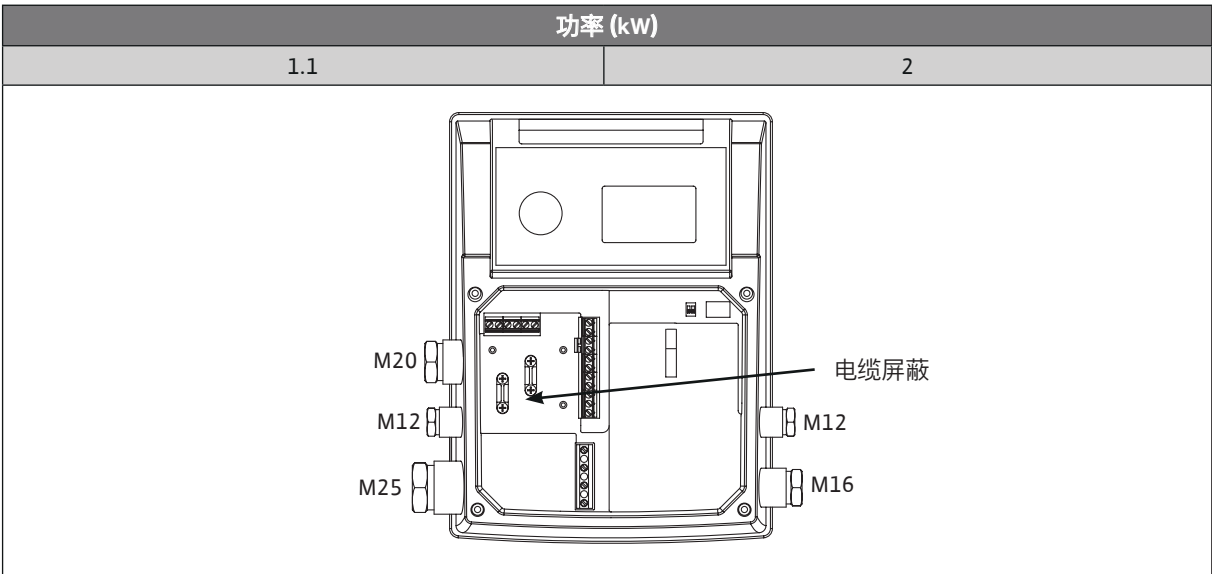
危险！小心致命危险！

变频器电容器放电会产生危险电压。

- 在对变频器进行任何作业之前，请在断开电源之后等待 5 分钟。
- 检查所有电气连接和触点是否都已不带电。
- 检查压力连接端子是否已正确分配。
- 确保泵和装置已妥善接地。
- 必须将电源线（3 根相线 + 地线）插入下图中以黑色指示的填料函压盖中。
- 不使用的填料函压盖必须使用制造商提供的堵塞进行密封。



- 必须对用于传感器、外部指令以及输入端 [Ext. Off] 和 [Aux] 的电缆进行屏蔽处理。



泵识别标签上详细列出了变频器的电气特性（频率、电压和额定电流）。请确保变频器符合将与其配合使用的电源。

- 电机的电动保护装置集成在变频器中。其设置考虑到了泵的特性，并可确保对泵和电机的保护。
- 在所有情况下，请安装熔断式隔离开关（gF 型）以保护设备。




注意：如果需要安装漏电保护器以保护用户，则该设备必须具有延迟效果。请根据泵标识贴上规定的电流调节断路器的额定值。

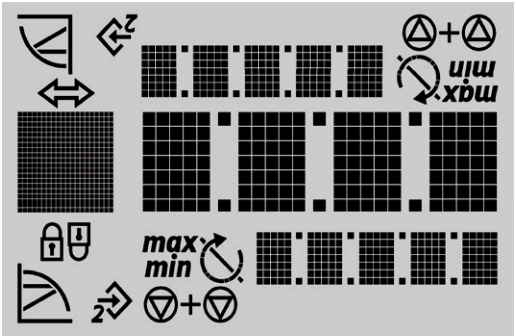


注意：此泵配备了变频器，因此不需要漏电保护器提供保护。变频器可能会影响漏电保护器的功能。

例外：允许使用具有选择性通用电流敏感设计的漏电保护器。

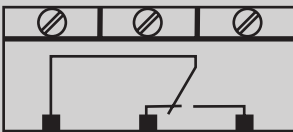
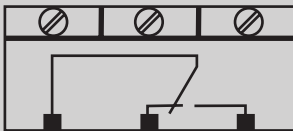
- 标签： FI 
- 触发电流： > 30 mA。
- 只能使用符合适用法规的电源线。
- 电源侧的保护装置：最大允许电流为 25 A。
熔断器触发特性：B。

激活变频器电源后，系统将立即执行为时 2 秒的显示测试，显示屏上的所有特性都会在此期间显示。



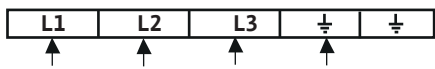
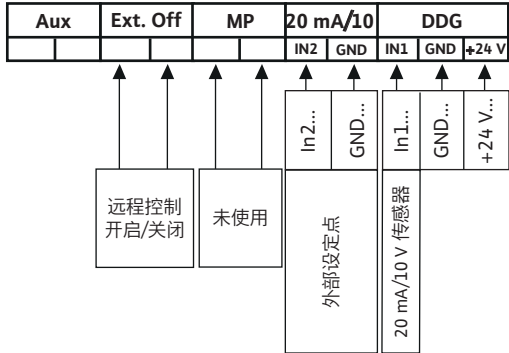
连接端子分配

- 拆下螺钉并取下变频器盖。



型号代码	分配	备注				
L1、L2、L3	电源连接电压	三相电流 3 ~ IEC38				
PE	接地端子	<table><tr><td>1,1</td><td>2</td></tr><tr><td colspan="2">x1</td></tr></table>	1,1	2	x1	
1,1	2					
x1						
IN1	传感器输入	信号性质：电压（0-10 V， 2-10 V） 输入电阻器：Ri ≥ 10 kΩ 信号性质：电流（0-20 mA， 4-20 mA） 输入电阻器：RB = 500 Ω 可以在“Service” 菜单 <5.3.0.0> 中配置				
IN2	外部设定点输入	信号性质：电压（0-10 V， 2-10 V） 输入电阻器：Ri ≥ 10 kΩ 信号性质：电流（0-20 mA， 4-20 mA） 输入电阻器：Rb = 500 Ω 可以在“Service” 菜单 <5.4.0.0> 中配置				
GND (x2)	接地端子	用于每一个 IN1 和 IN2 输入				
+24 V	传感器的连续供电	最大电流：60 mA。 电源受到短路保护。				
Ext. Off	开启/关闭控制输入 用于无电势外部开关的 “DEACTIVATION priority”	无电势外部开关用于激活和停用泵。 在起动次数较为频繁（每天超过 20次）的装置， 应通过“Ext. Off” 来执行激活和停用。				
SBM	“Available Transfer” 继电器 	在正常运行中，当泵处于运行或待机状态时， 继电器被激活。 如果发生初始故障或主电源断开（泵关闭）， 则此继电器将被停用。 因此泵的可用性（即使是暂时性的）可以通过信号发送至开关设备。 可以在“Service” 菜单 <5.7.6.0> 中配置 无电势触点： 最小值：12 V DC， 10 mA 最大值：250 V AC， 1 A				
SSM	“Failures Transfer” 继电器 	如果检测到相同类型的故障连续出现（按严重性为 1 个到 6 个）， 则泵将关闭， 且此继电器将被激活（直至手动干预）。 无电势触点： 最小值：12 V DC， 10 mA 最大值：250 V AC， 1 A				
PLR	PLR 通信接口的连接端子	可选的 IF 模块 PLR 可以插入放置在变频器连接器区域中的多个 连接器中。 模块受到防极性反转保护。				
LON	LON 通信接口的连接端子	可选的 IF 模块 LON 可以插入放置在变频器连接器区域中的多个 连接器中。 模块受到防极性反转保护。				



注意：端子 IN1、IN2、GND 和 Ext. Off 满足电源端子处以及 SBM 和 SSM 端子处“安全隔离”的要求（符合 EN 61800-5-1）（反之亦然）。

电源连接	电源端子排
将 4 导线电缆插入电源端子排（相线 + 地线）。	
输入/输出连接	输入/输出端子排
<ul style="list-style-type: none"> 必须对用于传感器、外部设定点和远程控制 (Ext. Off) 的电缆进行屏蔽处理。 	
<ul style="list-style-type: none"> 远程控制可实现泵的起动和停用（无电势），此功能优先于其他功能。 用户可以通过分流远程控制 (Ext. Off) 的端子来移除此远程控制。 	例如：浮子开关、低水压调节器等

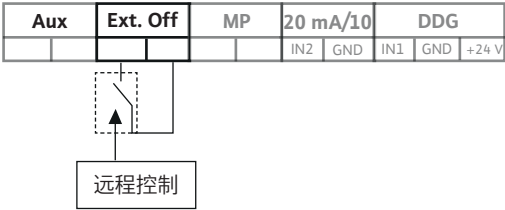
各运行模式的连接和控制规则：

信号链接和控制规则		连接		信号	
运行模式	设置	请参见下图		电流	电压
<ul style="list-style-type: none"> 在 “Speed stage control” 模式下 	...速度，手动	C1	/	/	/
	...速度，外部控制	C1	C2	S3	S4
<ul style="list-style-type: none"> 在 “Constant pressure: p-c” 模式下 使用相对压力传感器进行控制 在 “Δp-c” 模式下 使用压差传感器进行控制 	使用旋钮设置 ...的设定点	C1	C3	S1	S2
	...按照外部设定点	C1	C2	S5	S6
			C3	S1	S2
<ul style="list-style-type: none"> 在 “Variable pressure: Δp-v” 模式下 使用压差传感器进行控制 	使用旋钮设置 ...的设定点	C1	C3	S1	S2
	...按照外部设定点	C1	C2	S5	S6
			C3	S1	S2
<ul style="list-style-type: none"> 在 “PID control” 模式下 使用温度传感器或输送速率传感器...进行控制 	使用旋钮设置 ...的设定点	C1	C3	S1	S2
	...按照外部设定点	C1	C2	S5	S6
			C3	S1	S2

输入/输出连接

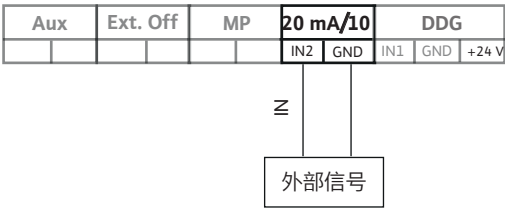
远程控制：位置 [C1]

- 变频器在交付时随附一条跳线。
- 使用远程控制为可选项



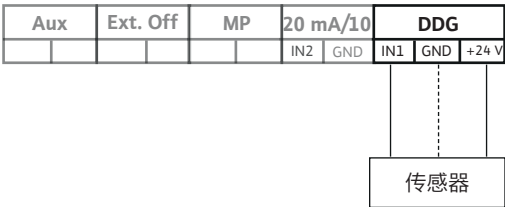
外部信号 IN2：位置 [C2]

- 2 条电线 ([20 mA/10 V] / 0 V)



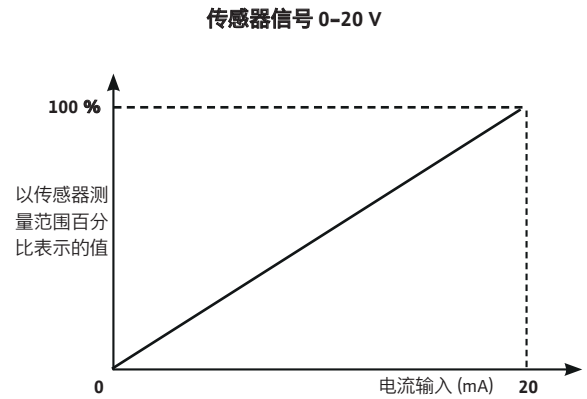
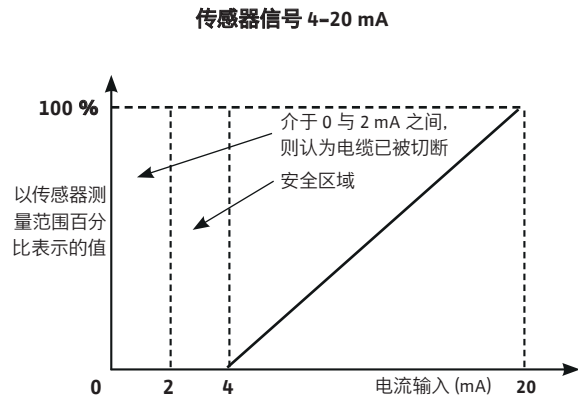
IN1 传感器：位置 [C3]

- 2 条电线 ([20 mA/10 V] / +24 V)
- 3 条电线 ([20 mA/10 V] / 0 V / +24 V)

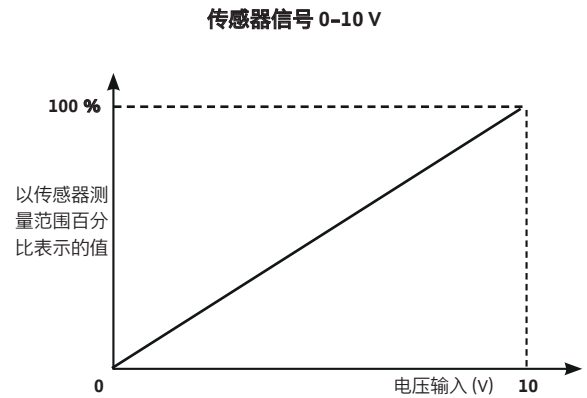
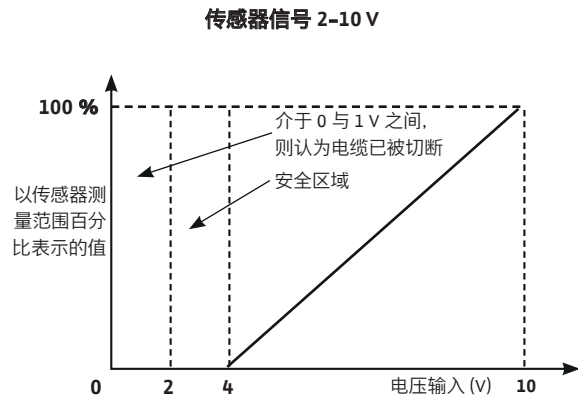


输入信号的控制规则

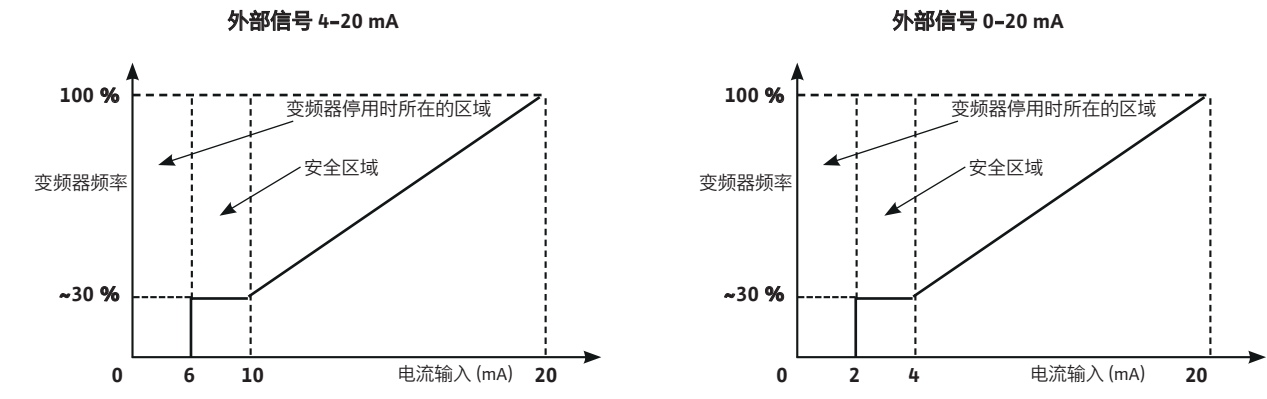
传感器输入 – 电流信号：位置 [S1]



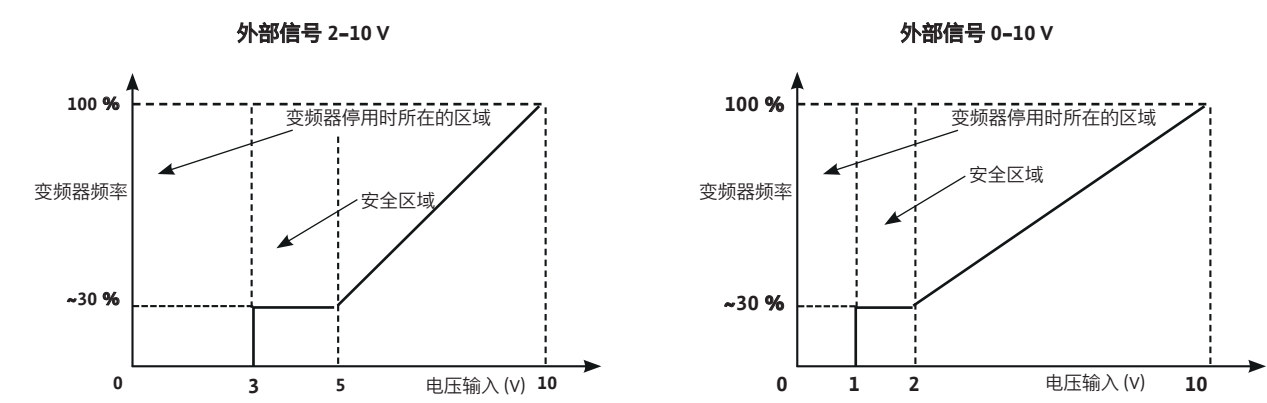
传感器输入 – 电压信号：位置 [S2]



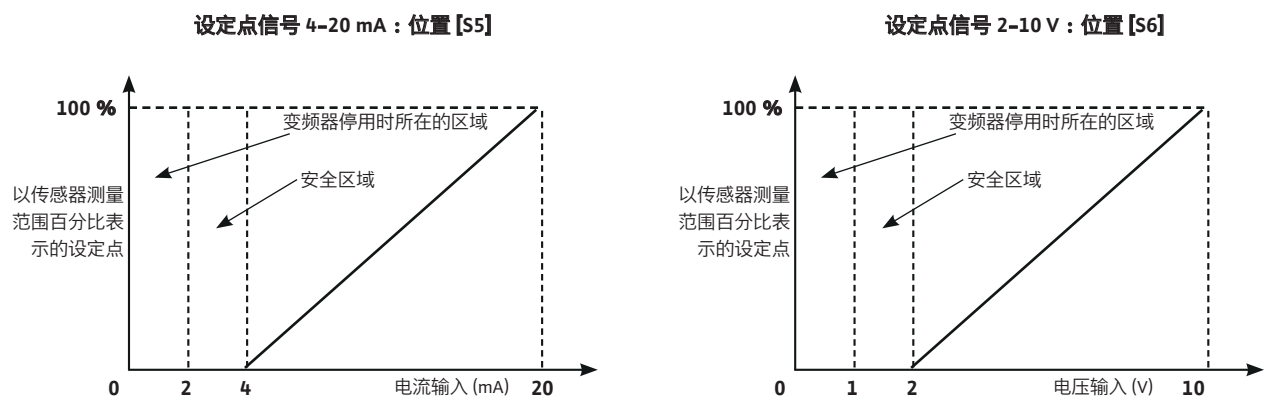
速度等级的外部控制输入 – 当前信号：位置 [S3]



速度等级的外部控制输入 – 电压信号：位置 [S4]



带传感器时控件的外部设定点输入（例如压力、温度、输送速率等）



8. 试运行

8.1 系统填充和排气



小心！存在损坏泵的风险！

禁止在无水的情况下运行泵。
在启动泵之前，必须检查系统。

8.1.1 排气 – 进气模式 (Fig. 1)

- 关闭两个截止阀 (1 + 2)。
- 松开排气螺钉 (4)。
- 缓缓打开吸入侧的截止阀 (1)。
- 一旦空气已逸出且流体从泵 (4) 中流出，则立即关闭排放旋塞。



警告！小心烫伤危险！

如果流体处于高温高压状态，则存在因从排放旋塞喷出的流体而引起烫伤或其他伤害的危险。

- 完全打开吸入侧的截止阀 (1)。
- 打开压力侧的截止阀 (2)。

8.2 试运行



小心！小心材料损坏危险！

禁止在零流量条件下（压力侧的截止阀已关闭）运行泵。
必须确保以下流量：

泵类型	最小流量	最大流量
MVISE 2	0.4 m³/h	5 m³/h
MVISE 4	0.5 m³/h	8 m³/h
MVISE 8	1 m³/h	16 m³/h



警告！小心受伤危险！

视泵或系统的运行条件（流体温度、流量）而定，整个泵（包括电机在内）可能会变得过热。小心触摸泵而被烫伤的危险！



小心！请检查旋转方向！

旋转方向不正确会导致泵输出不良和潜在的电机过载。

- 接线盒中有一个控制指示灯 (Fig. 1, 位置 9)，此灯会在旋转方向正确时亮起。
- 如果此控制指示灯没有亮起，则表明没有提供工作电压或旋转方向不正确。在最后一种情况下，请互换电源接头的两个相位。

8.3 操作变频器

8.3.1 控制元件

变频器由以下控制元件控制：

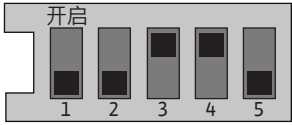
旋钮



- 只需将旋钮沿“+”方向转向右侧或“-”方向转向左侧即可选择新参数。
- 短按旋钮即可确认此新设置。

DIP 开关

此变频器具有一个由五个 DIP 开关 (Fig. 4, 位置 5) 组成的开关块，其中每个开关都有两个档位。

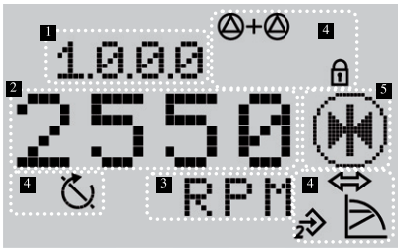


- DIP 开关 1 从“OPERATION”模式 [DIP 开关 1 关闭] 切换至“SERVICE”模式 [DIP 开关 1 开启]，然后再次切换回原状。“OPERATION”档位允许运行所选的模式并停止访问参数化（正常操作）。“SERVICE”档位允许用户对不同操作进行参数化。
- DIP 开关 2 用于激活或停用“Access Lock”（请参见第 8.3.6.5 节）。
- DIP 开关 3 和 4 必须保持在“ON”档位。
- DIP 开关 5 未使用，且必须保持在“OFF”档位。

继电器

（请参见第 10 节）

8.3.2 显示结构



位置	说明
1	菜单编号
2	数值显示
3	单位显示
4	标准符号
5	图标显示

8.3.3 标准符号说明

符号	说明
	在“Speed stage control”模式下运行
	在“Constant pressure”或“PID control”模式下运行
	在“Variable pressure”或“PID control”模式下运行
	IN2 输入已激活（外部设定点）
	访问锁 当此符号出现时，无法修改设置或当前测量值。信息以只读形式显示
	BMS（建筑管理系统） PLR 或 LON 已激活
	泵在运行中（如果闪烁，则表示检测到零输送速率）
	水泵关闭

8.3.4 显示屏

显示状态页面

- 状态页面作为显示屏的默认页面显示。它显示了当前设置的设定点。基本设置以符号显示。



显示状态页面示例



注意：在所有菜单中，如果您没有在 30 秒内操作旋钮，则显示会重新出现，且所有更改都不会被记录。

导航元素

- 此菜单结构可以调用变频器的功能。每个菜单和子菜单都有一个数字。
- 转动旋钮可浏览任何等级的菜单（例如 4000 -> 5000）。
- 闪烁元素（值、菜单编号、符号或图标）允许用户选择新值、新菜单编号或新功能。

符号	说明
	当箭头出现时： • 按下旋钮即可访问子菜单（例如 4000 -> 4100）。
	当“return”箭头出现时： • 按下旋钮即可放回上一级菜单（例如 4130 -> 4100）。

8.3.5 定义开式或闭式液压回路的应用

本产品具有两种类型的应用。所选应用的类型将决定可以使用的运行模式。

液压部件应用	运行模式	
开式回路	“p-c”模式	速度等级控制模式
闭式回路	“Δp-c”模式 “Δp-v”模式	PID 模式

“EXPERT”菜单的菜单 5.7.8.0 可以用于选择所需应用的类型。



注意：更改应用时，必须将本产品重新初始化。所有用户参数都将恢复为出厂设置。

8.3.6 定义运行模式

定义压力传感器

- 相对压力传感器测量相对于大气压力的压力。
- 绝对压力传感器测量相对于真空中零压力的压力。
- 压差传感器测量两点之间的压力。



注意：泵指示的所有压力均相对于大气压力进行测量，但使用压差传感器时除外。



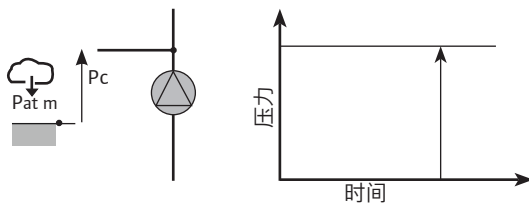
注意：如果我们只提供了泵，且没有将其集成到安装的系统中，则交付时的配置模式将为“speed stage control”模式。

“Speed stage control”模式 (Fig. 1)

- 通过菜单手动调节速度等级或使用适用于以百分比表示的速度等级的外部命令信号，即可获得工况点。
- 若要进入使用状态，应将电机速度等级设置在 2400 rpm。

“Constant pressure: pc”模式 (Fig. 2)

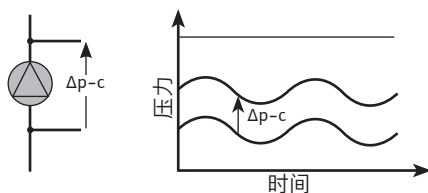
- 在“p-c”模式下，变频器将在泵排放口处保持恒定压力，而不论装置所需的输送速率如何。



- 工况点通过菜单或外部信号手动定义。
- 当您在菜单 5.7.8.0 中选择了开式液压回路参数时，可以访问此模式。
- 相对压力传感器用于控制（传感器：精度： $\leq 1\%$ ；在测量范围的 30 % 与 100 % 之间使用）。
- 若要进入使用状态，应将设定压力设置为泵最高压力的 60 %。

“ Δp -c”模式 (Fig. 2)

- 在“ Δp -c”模式下，变频器将保持恒定压差（由泵生成），而不论装置所需的输送速率如何。



- 压差通过菜单或外部信号手动定义。
- 当您在菜单 5.7.8.0 中选择了闭式液压回路参数时，可以访问此模式。
- 压差传感器用于控制（传感器：精度： $\leq 1\%$ ；在测量范围的 30 % 与 100 % 之间使用）。
- 若要进入使用状态，应将设定压力设置为泵最高压力的 60 %。

“Variable pressure: Δp -v”模式 (Fig. 2)

- 在“ Δp -v”模式下，变频器将以线性方式改变泵的压差，与装置所需的输送速率保持一致。
- 工况点 (Pset) 通过菜单或外部信号手动定义。
- 零输送速率 (%P set) 时的工况点通过菜单手动定义。
- 此模式包括可关闭泵的零输送速率检测。
- 压差传感器用于控制（传感器：精度： $\leq 1\%$ ；在测量范围的 30 % 与 100 % 之间使用）。
- 若要进入使用状态，应将设定压力设置为泵最高压力的 60 %。
- 当您在菜单 5.7.8.0 中选择了闭式液压回路参数时，可以访问此模式。

“PID control”模式

- 通过 PID 控制（比例积分微分控制），变频器可以使用其他类型的传感器（温度、输送速率等传感器）实现控制。
- 工况点表示为所用传感器测量范围的百分比。工况点通过菜单或外部控制信号手动定义。

8.3.7 菜单说明

菜单列表 (Fig. A5)

<1.0.0.0> 设定点设置

<2.0.0.0> 运行模式设置

<3.0.0.0> 开启/关闭泵设置

<4.0.0.0> “Information” 菜单
读取泵参数

<5.0.0.0> “Service” 菜单
访问泵参数设置

<6.0.0.0> 错误确认
如果发生一个或多个故障，则故障页面将出现。后面紧跟三位数代码的字母“E”将出现（请参见第 10 节）。

<7.0.0.0> 访问锁
当 DIP 开关 2 处于 ON 档位时，您可以访问“Access lock”。

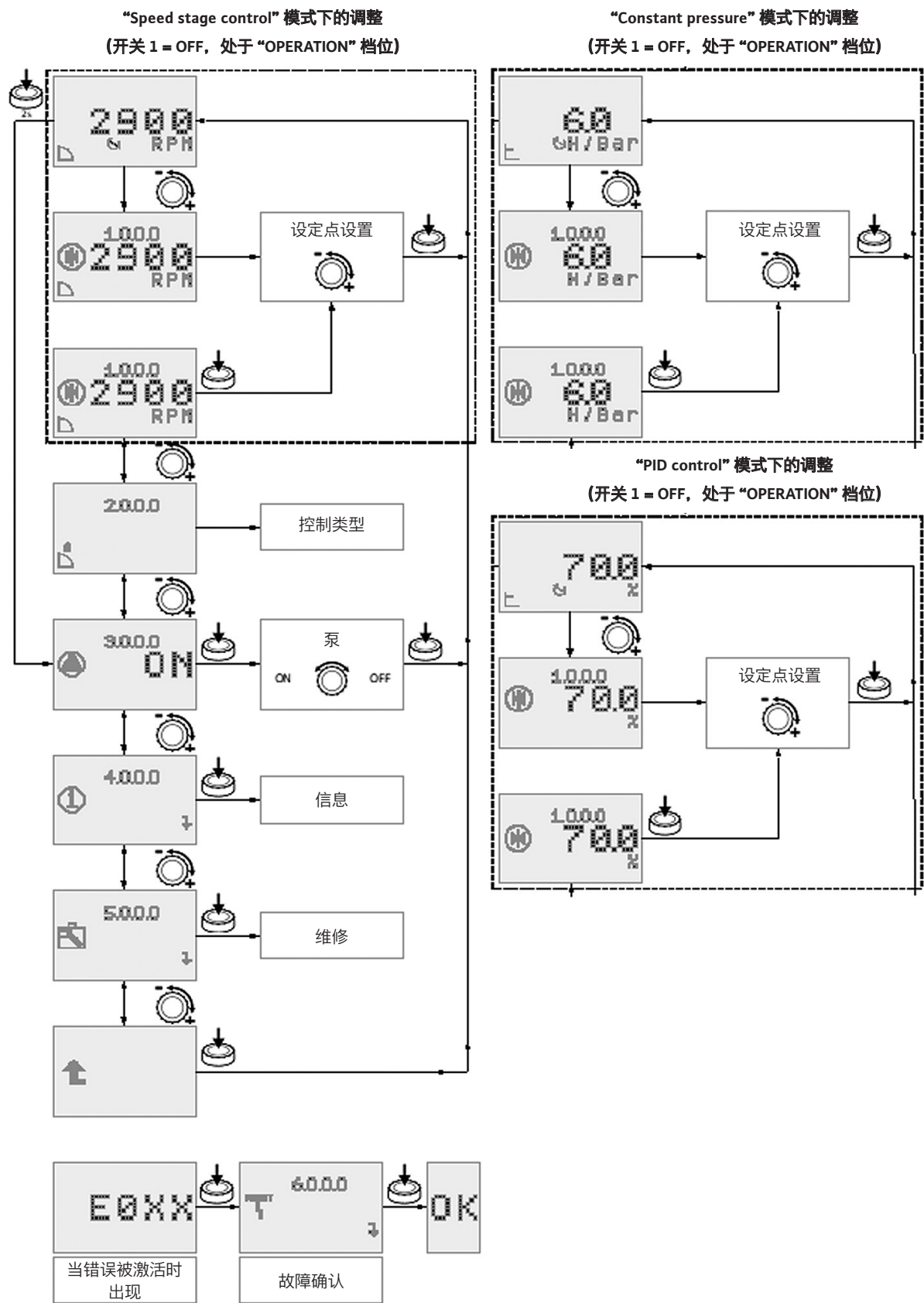


小心！小心财产损失危险！

不正确的设置更改可能会造成可能导致泵或装置损坏的泵运行故障。

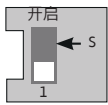
菜单导航

Fig. A1



- 试运行，只能在“SERVICE”模式下执行调节，且只能由专业技术人员来执行。

导航“Easy”和“Expert”菜单



将 DIP 开关 1 置于“ON”档位 (Fig. A1, 位置 1)。“SERVICE”模式随即被激活。在显示屏上，符号将在此处闪烁 (Fig. A7)。

在“SERVICE”模式下，用户可以更改菜单 <2.0.0.0> 和 <5.0.0.0> 的参数。

调整模式分为以下 2 种类型：

简易菜单



即可以访问运行模式主要参数的简化菜单。

- 按下旋钮两秒钟。“Easy”菜单符号随即显示 (Fig. A7)。
- 按下旋钮以确认此选择。显示屏将切换到菜单编号 <2.0.0.0> (Fig. A8)。
- 执行调整后，将 DIP 开关 1 置于“OFF”档位 (Fig. A1, 位置 1)。

专家菜单



即用于访问所有参数的菜单。

- 按下旋钮两秒钟，然后转动以选择“Expert”菜单。“Expert”菜单符号随即显示 (Fig. A7)。
- 按下旋钮以确认此选择。显示将切换至菜单 <2.0.0.0> (Fig. A8)。
- 在菜单 <2.0.0.0> 中选择运行模式并确认。
- 选择菜单 <5.0.0.0> 可访问变频器的所有参数 (Fig. A9)。
- 执行调整后，将 DIP 开关 1 置于“OFF”档位 (Fig. A1, 位置 1)。

Fig. A2

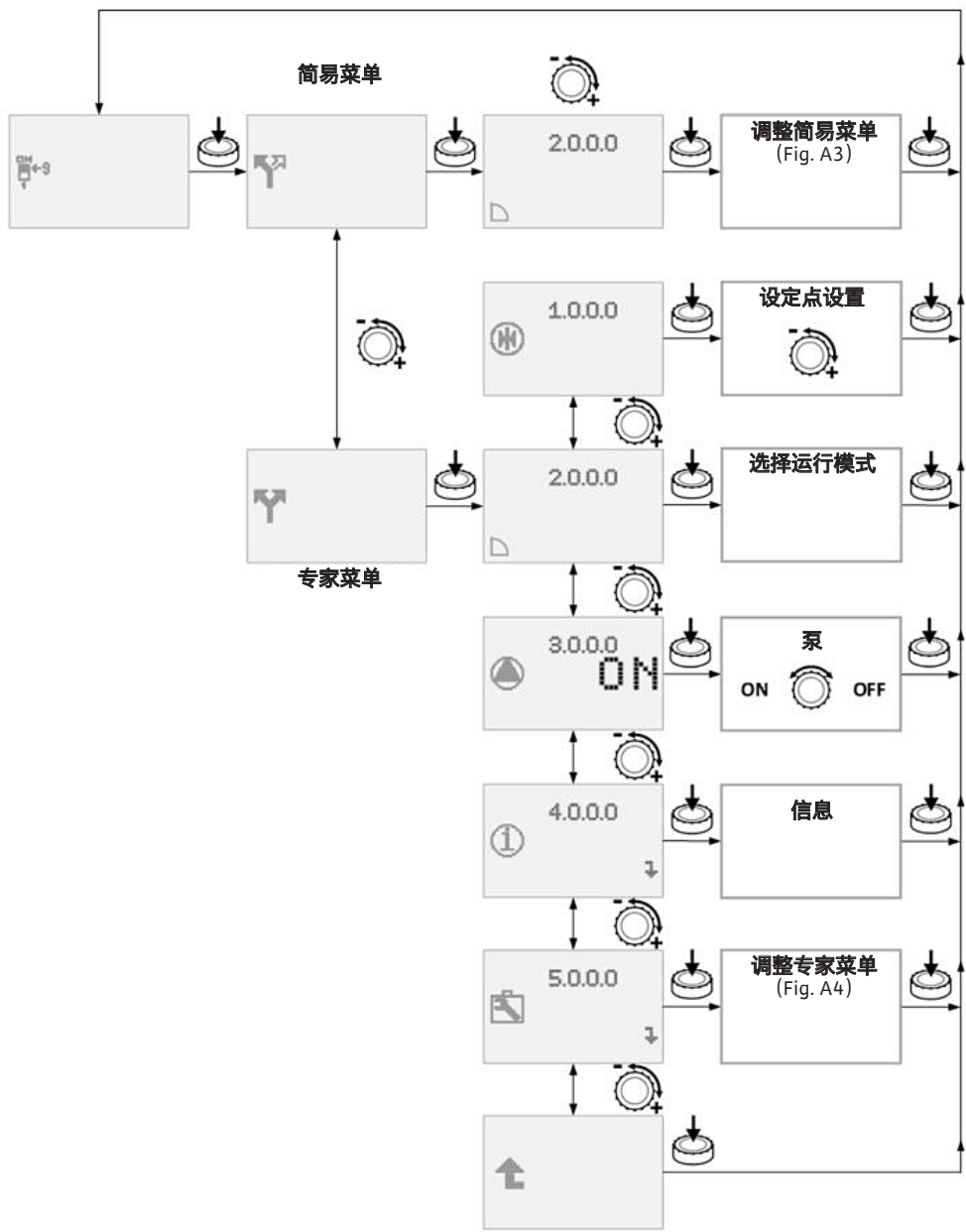


Fig. A3

调整简易菜单

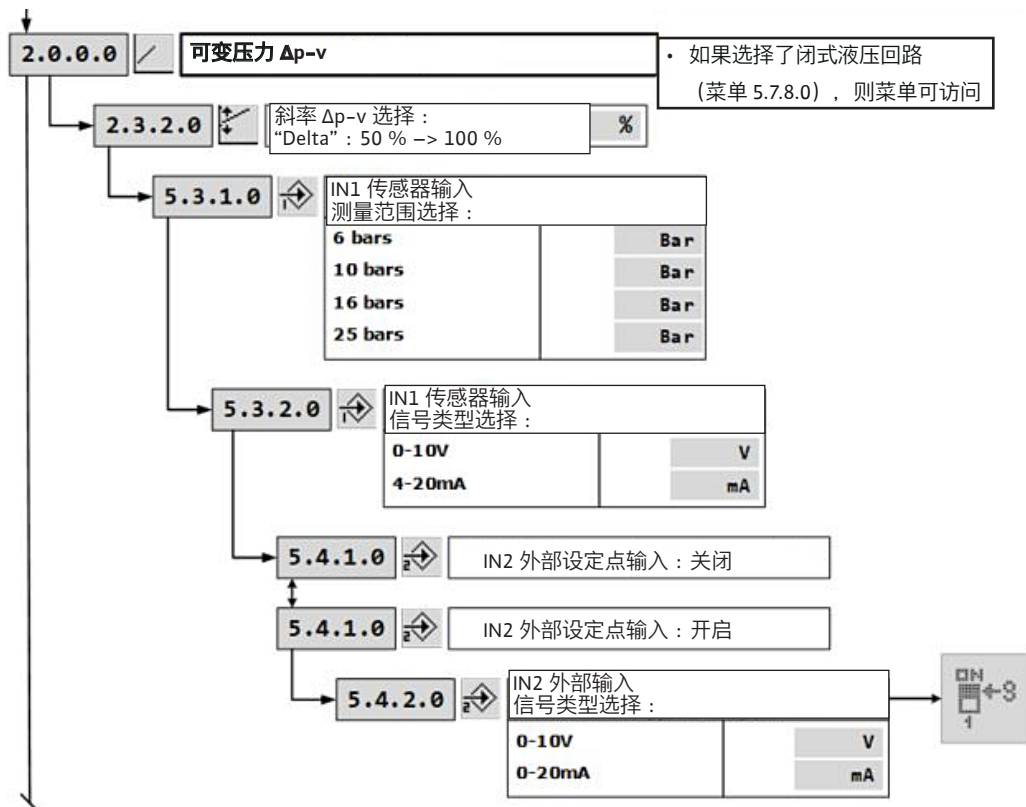
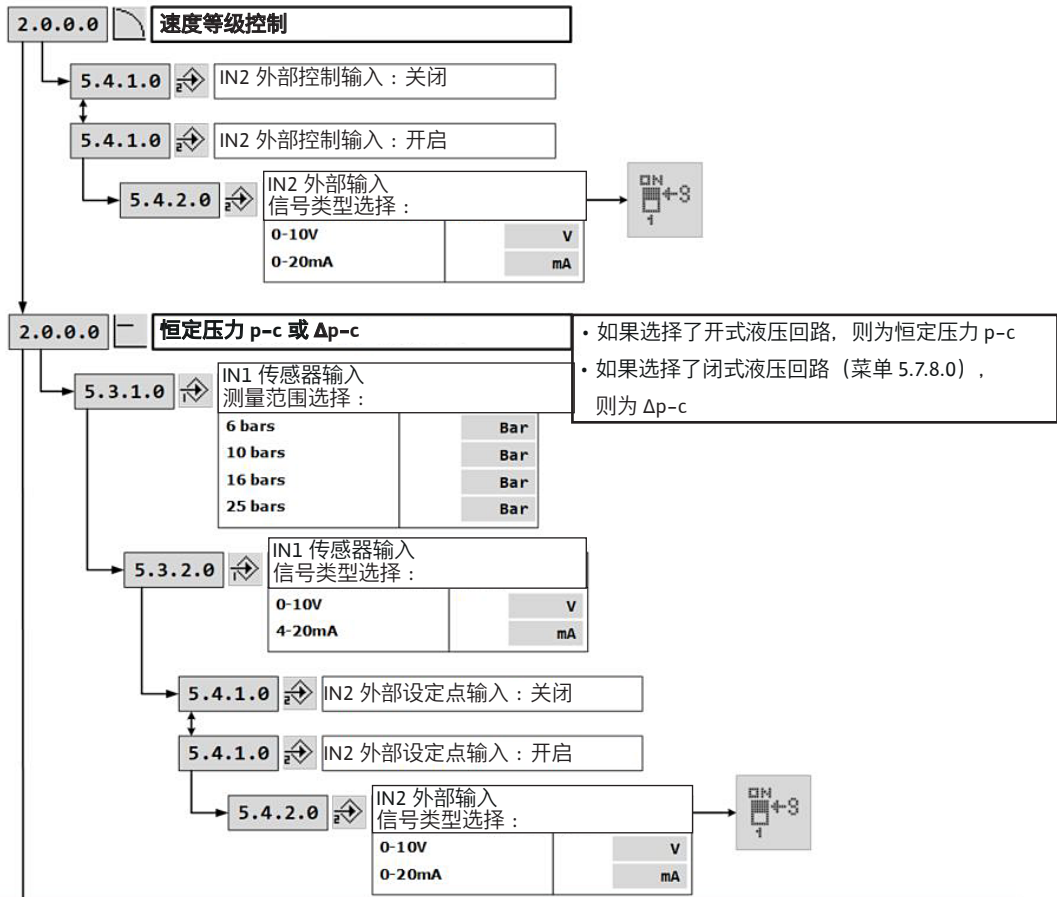


Fig. A3

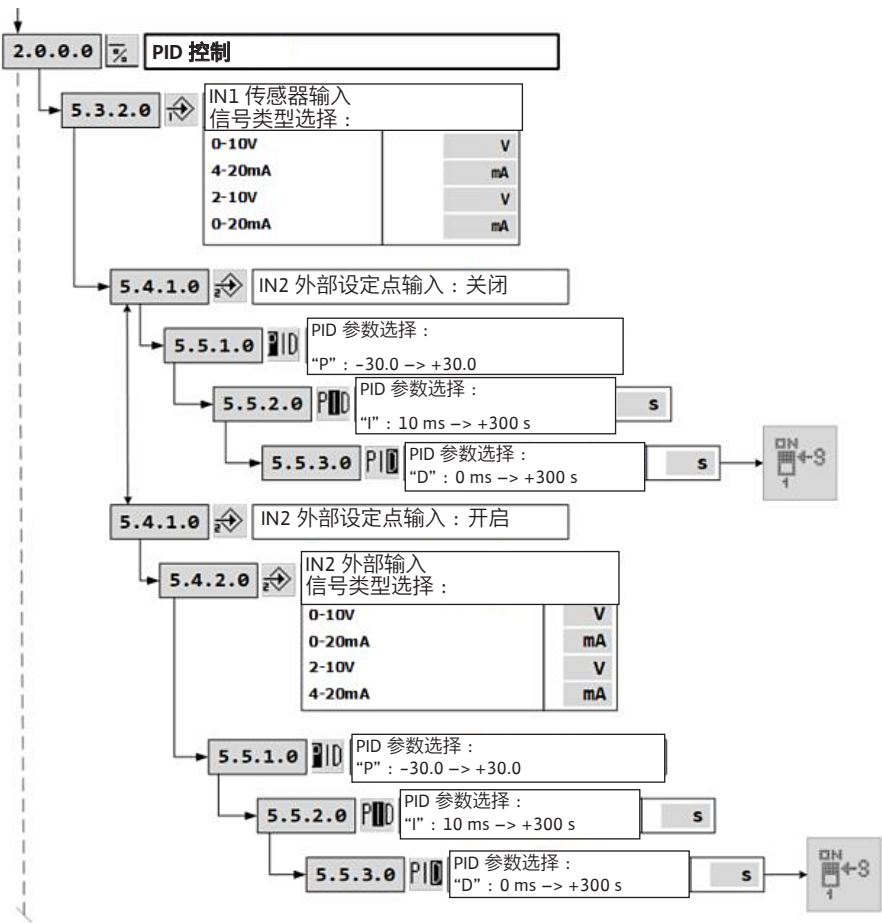


Fig. A4

调整专家菜单

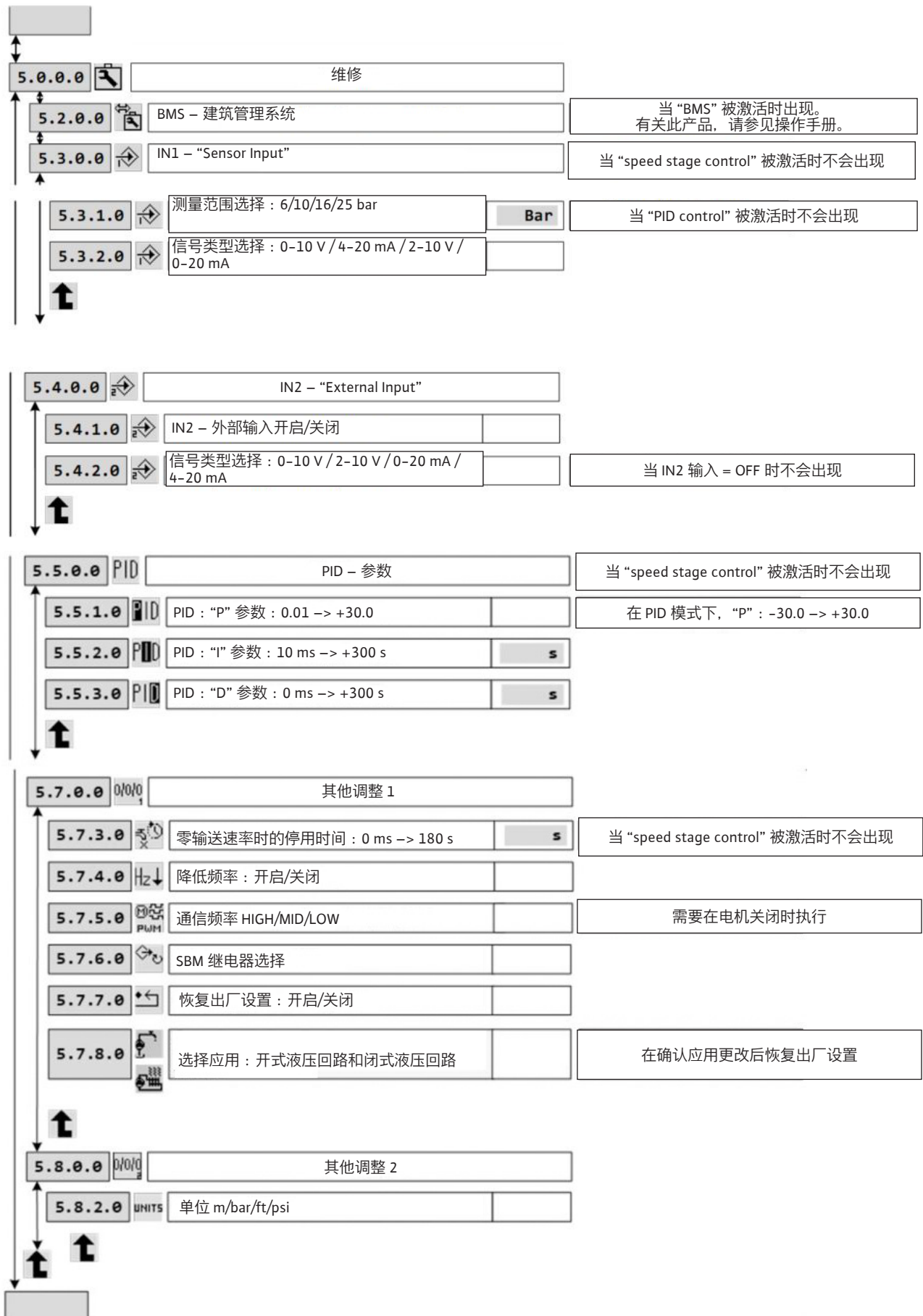
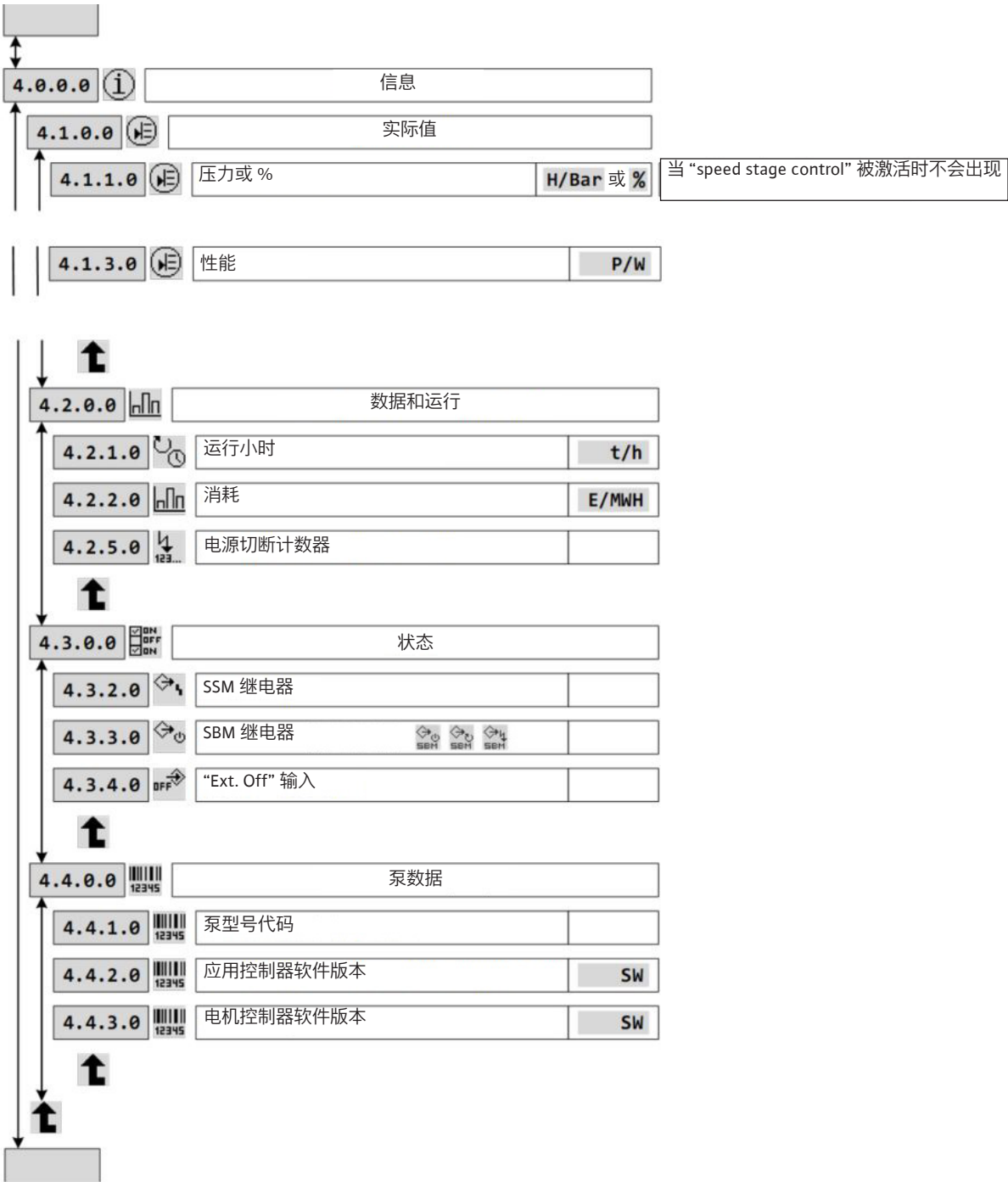


Fig. A5

导航“4000”信息菜单



访问锁

“Access Lock” 功能可用于阻止对泵的所有调整。

按照以下方式进行操作：

- 将 DIP 开关 2 置于 “ON” 档位。菜单 <7.0.0.0> 随即出现。
- 转动旋钮以激活或停用访问锁。访问锁的当前状态由以下符号表示：



访问锁已激活：参数已被锁定，且访问菜单将在只读模式下授权。



访问锁已停用：用户可以更改参数，且被授权访问菜单以进行调整。

- 将 DIP 开关 2 置于 “OFF” 档位。状态设置将随即出现。

9. 维护

所有维护和维修作业必须由经过授权的合格工作人员来执行！



警告！电压造成的危险！

必须排除电力方面的危险。

在开始电气作业之前，泵必须无电压，并受到保护以防止意外重新激活。



警告！小心烫伤危险！

如果水温和系统压力都很高，请关闭吸入侧和压力侧的截止阀。必须首先使泵冷却。

- 运行期间无须特殊维护。
- 在霜冻期间，必须清洁静止的泵，以防止损坏。

10. 故障、原因和排除方法



警告！电压造成的危险！

必须排除电力方面的危险。
在开始电气作业之前，泵必须无电压，并受到保护以防止意外重新激活。



警告！小心烫伤危险！

如果水温和系统压力都很高，请关闭吸入侧和压力侧的截止阀。
必须首先使泵冷却。

故障	原因	排除方法
泵不工作	无电源	检查保险丝保护装置、布线和连接
	电机保护装置已中断电源	避免电机过载
泵虽然运行但不能达到工况点	旋转方向不正确	检查旋转方向，并在必要时纠正
	泵部件已被异物堵塞	检查并清洁泵
	泵中有空气	密封吸入口
	吸入管太窄	安装更大的吸入管
	截止阀打开的宽度不够大	完全打开截止阀
泵送不均匀	泵中有空气	对泵排气，并确保已密封吸入管。 必要时，启动泵 20 – 30 s。打开排气螺钉，从而使空气能够逸出。关闭排气螺钉，并根据需要重复此程序
泵振动或有噪声	泵中有异物	去除异物
	泵未正确接地	拧紧锚固螺钉
	轴承损坏	联系 Wilo 客服部门
电机已过热，电机保护装置已被激活	一个相位已被中断	检查保险丝保护装置、布线和连接
	流体温度过高	流体最高温度
	泵中有异物	去除异物
	轴承损坏	联系 Wilo 客服部门
输送速率不一致	在“Constant pressure”或“Variable pressure”模式下，压力传感器不适用	安装带合规压力刻度和精度的传感器
在“Constant pressure”或“Variable pressure”模式下，泵没有在输送速率为零时关闭	止回阀并非非不透水	对其进行清洁或更换
	止回阀不适用	使用适用的止回阀进行更换
	蓄水罐没有适用于装置的足够容量	对其进行更换，或在装置上再加装一个蓄水罐

**如果故障无法解决，
请联系 WILo 客服部门。**

只能由合格的人员修复故障！
请遵循第 9 节“维护”中的安全说明。

继电器

变频器配有 2 个用作集中式控制（例如开关设备、水泵控制器）接口的输出继电器。

SBM 继电器：

此继电器可以在“Service”菜单 < 5.7.6.0 > 中配置为 3 种运行模式。



状态：1（默认设置）

“Available transfer” 继电器（此类泵正常运行）。
当泵处于运行或处于待机状态时，此继电器被激活。

如果发生初始故障或主电源断开（泵关闭），
则此继电器将被停用。泵的可用性（即使是暂时性的）将通过信号发送至开关设备。



状态：2

“Run transfer” 继电器。
当泵运行时，此继电器被激活。



状态：3

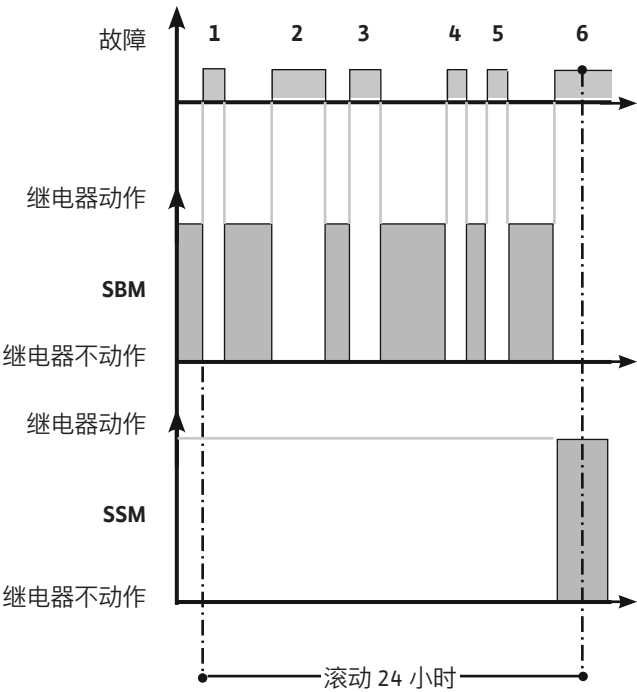
“Power on transfer” 继电器。
当泵连接到网络上时，此继电器被激活。

SSM 继电器：

“Failures transfer” 继电器。
如果检测到相同类型的故障连续出现（按严重性为 1 个到 6 个），则泵将关闭，且此继电器将被激活（直至手动干预）。

示例：24 小时内在不同时间出现的 6 个故障。

SBM 继电器状态为“Available transfer”。



10.1 故障表

以下提到的所有意外事件将具有如下影响：

- 停用 SBM 继电器（在“Available Transfer”模式下进行参数化时）。
- 在 24 小时内达到一种类型故障的数量上限时，激活 SSM 继电器“Failure Transfer”。
- 红色 LED 亮起。

错误代码	发出信号以指示错误之前的斜坡时间	在发出信号之后考虑错误之前的时间	自动重新激活之前的等待时间	24 小时之内的错误数量上限	故障可能原因	排除方法	重置之前的等待时间
E001	60 s	0 s	60 s	6	泵已过载, 发生故障	泵送流体的密度和/或粘度太高	300 s
					泵被异物阻塞	拆卸泵, 更换或清洁发生故障的部件	
E004 (E032)	~5 s	(0.55 至 7.5 kW) 300 s	(0.55 至 7.5 kW) 0 s (如果删除了错误)	6	变频器的电源处于欠压状态	检查变频器端子处的电压： • 如果电源电压 > 480 V (0.55 至 7.5 kW)，则表明发生了故障 • 如果电源电压 > 506 V (11 至 22 kW)，则表明发生了故障	(0.55 至 7.5 kW) 0 s
		(11 至 22 kW) 0 s	(11 至 22 kW) 300 s				(11 至 22 kW) 300 s
E005 (E033)	~5 s	300 s	0 s (如果删除了错误)	6	变频器的电源处于过压状态	检查变频器端子处的电压： • 如果电源电压 > 506 V，则表明发生了故障	0 s
E006	~5 s	300 s	0 s (如果删除了错误)	6	电源缺相	检查电源	0 s
E007	0 s	0 s	0 s (如果删除了错误)	无限制	变频器像发电机一样运行。警告, 没有泵停用	泵已切换方向, 请检查阀门的密封性	0 s
E010	~5 s	0 s	无限制	1	泵堵塞	拆卸泵, 对其进行清洁并更换故障部件。可能发生了电机机械故障 (滚针轴承)	60 s
E011	15 s	0 s	60 s	6	泵已停用或在无水状态下运行	通过向泵注水以重新启动 (请参见第 9.3 节)。检查底阀的密封性	300 s
E020	~5 s	0 s	300 s	6	电机发热	清洁变频器背面和下方的冷却肋片, 以及风扇盖	300 s
					室温高于产品特性温度	改善房屋的通风	
E023	0 s	0 s	60 s	6	电机存在短路	将电机变频器从泵上拆下, 然后对其进行检查或更换	60 s
E025	0 s	0 s	无限制	1	电机缺相	检查电机与变频器之间的连接	60 s
E026	~5 s	0 s	300 s	6	电机温度传感器发生故障或连接不良	将电机变频器从泵上拆下, 然后对其进行检查或更换	300 s
E030 E031	~5 s	0 s	(0.55 至 7.5 kW) 0 s (如果删除了错误) (11 至 22 kW) 300 s	6	变频器发热	清洁变频器背面和下方的冷却肋片, 以及风扇盖	300 s
					室温高于产品特性温度	改善房屋的通风	
E042	~5 s	0 s	无限制	1	传感器电缆 (IN1) 已断开	检查传感器的电源和接线是否正确	60 s
E050	60 s	0 s	0 s (如果删除了错误)	无限制	BMS 通信发生故障	检查连接	300 s
E077	0 s	0 s	无限制	1	传感器的 24 V 电源电压不正常	检查传感器及其连接	60 s
E---	0 s	0 s	无限制	1	变频器内部故障	呼叫客服部门	60 s

10.2 错误确认



小心！小心财产损失危险！

只有在解决错误之后才能进行确认。

- 错误只能由合格的技术人员来解决。
- 如有任何疑问，请联系制造商。
- 如果发生错误，则屏幕上会显示故障页面，而不是状态页面。
- 若要确认错误，请按照以下方式进行操作。
- 按下旋钮。

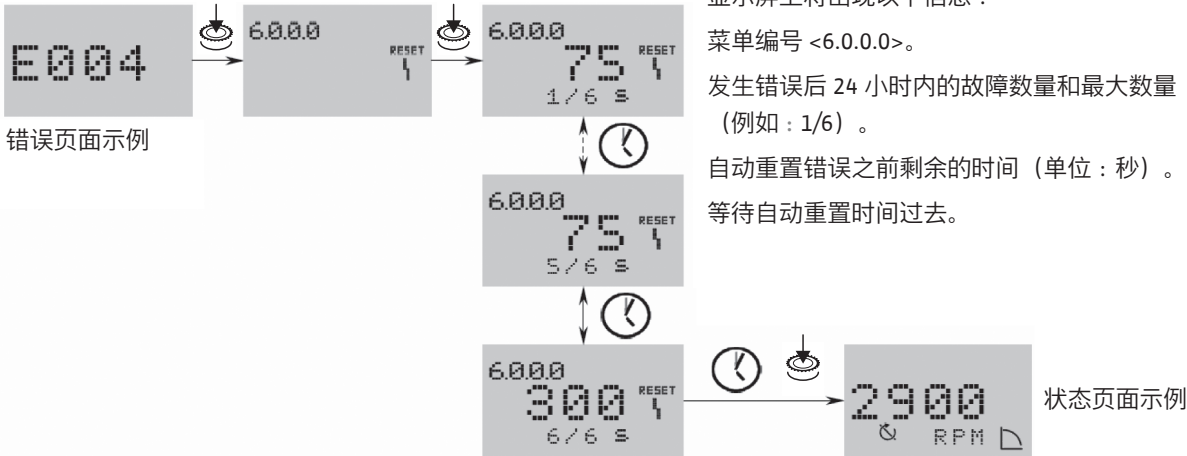
显示屏上将出现以下信息：

菜单编号 <6.0.0.0>。

发生错误后 24 小时内的故障数量和最大数量（例如：1/6）。

自动重置错误之前剩余的时间（单位：秒）。

等待自动重置时间过去。



计时器在系统内部运行。屏幕上显示已自动确认故障之前剩余的时间（单位：秒）。

- 当达到错误的数量上限且最后一次跟进时间已过去时，请按下旋钮以确认。

系统将返回状态页面。



注意：如果错误信号发出之后仍留有故障处理时间（例如：300 s），则务必手动确认错误。自动重置计时器处于不活动状态且屏幕上显示“---”。

11. 备件

所有备件都必须通过当地经授权技术人员和/或 Wilo 客服部门订购。

请在各订单上注明铭牌上显示的所有数据，以避免查询和错误订单。

12. 处置

有关旧电气和电子产品回收的信息

正确处置和恰当回收本产品可防止破坏环境或危害人身健康。



注意：禁止与生活垃圾一起处置！

在欧盟，该符号可能出现在产品上、包装上或随附文件上。它意味着，禁止将该电器或电子产品与生活垃圾一起处置。

为确保相关旧产品的妥善搬运、回收和处置，请注意以下要点：

- 只能在指定的经认证回收点移交这些产品。
- 请遵守当地适用法规！有关妥善处置的信息，请咨询当地市政厅、最近的废物处置场或向您出售产品的经销商。有关回收的更多信息，请访问 www.wilo-recycling.com。

如有更改，恕不另行通知。



EU/EG KONFORMITÄTSERKLÄRUNG
EU/EC DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE UE/CE

Als Hersteller erklären wir unter unserer alleinigen Verantwortung, daß die Pumpenbauarten der Baureihe,
We, the manufacturer, declare under our sole responsibility that the pump types of the series,
Nous, fabricant, déclarons sous notre seule responsabilité que les types de pompes de la série,

MVISE ...

(Die Seriennummer ist auf dem Typenschild des Produktes nach Punkten b) & c) von §1.7.4.2 und §1.7.3 des Anhanges I der Maschinenrichtlinie angegeben. / The serial number is marked on the product site plate according to points b) & c) of §1.7.4.2 and §1.7.3 of the annex I of the Machinery directive. / Le numéro de série est inscrit sur la plaque signalétique du produit en accord avec les points b) & c) du §1.7.4.2 et du §1.7.3 de l'annexe I de la Directive Machines.)

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entsprechen:
In their delivered state comply with the following relevant directives:
dans leur état de livraison sont conformes aux dispositions des directives suivantes :

_ **Maschinenrichtlinie 2006/42/EG**

_ **Machinery 2006/42/EC**

_ **Machines 2006/42/CE**

und gemäss Anhang 1, §1.5.1, werden die Schutzziele der Niederspannungsrichtlinie 2014/35/EU eingehalten
and according to the annex 1, §1.5.1, comply with the safety objectives of the Low Voltage Directive 2014/35/EU
et, suivant l'annexe 1, §1.5.1, respectent les objectifs de sécurité de la Directive Basse Tension 2014/35/UE

_ **Elektromagnetische Verträglichkeit - Richtlinie 2014/30/EU**

_ **Electromagnetic compatibility 2014/30/EU**

_ **Compatibilité électromagnétique 2014/30/UE**

_ **Energieverbrauchsrelevanter Produkte - Richtlinie 2009/125/EG**

_ **Energy-related products 2009/125/EC**

_ **Produits liés à l'énergie 2009/125/CE**

Nach den Ökodesign-Anforderungen der Verordnung 547/2012 für Wasserpumpen,
This applies according to eco-design requirements of the regulation 547/2012 for water pumps,
suivant les exigences d'éco-conception du règlement 547/2012 pour les pompes à eau

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

sowie auch den Bestimmungen zu folgenden harmonisierten europäischen Normen:
comply also with the following relevant harmonised European standards:
sont également conformes aux dispositions des normes européennes harmonisées suivantes :

EN 809+A1

EN 60204-1

EN 61800-5-1

EN 61800-3+A1:2012

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen ist:

Person authorized to compile the technical file is:

Personne autorisée à constituer le dossier technique est :

Dortmund,



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<p>(BG) - български език ДЕКЛАРАЦИЯ ЗА СЪОТЕТСТВИЕ ЕС/ЕО</p> <p>WILO SE декларира, че продуктите посочени в настоящата декларация съответстват на разпоредбите на следните европейски директиви и приелите ги национални законодателства:</p> <p>Машини 2006/42/ЕО ; Електромагнитна съвместимост 2014/30/ЕС ; Продукти, свързани с енергопотреблението 2009/125/ЕО</p> <p>както и на хармонизираните европейски стандарти, упоменати на предишната страница.</p>	<p>(CS) - Čeština EU/ES PROHLÁŠENÍ O SHODĚ</p> <p>WILO SE prohlašuje, že výrobky uvedené v tomto prohlášení odpovídají ustanovením níže uvedených evropských směrnic a národním právním předpisům, které je přejímají:</p> <p>Stroje 2006/42/ES ; Elektromagnetická Kompatibilita 2014/30/EU ; Výrobků spojených se spotřebou energie 2009/125/ES</p> <p>a rovněž splňují požadavky harmonizovaných evropských norem uvedených na předcházející stránce.</p>
<p>(DA) - Dansk EU/EF-OVERENSSTEMMELSESESKLÆRING</p> <p>WILO SE erklærer, at produkterne, som beskrives i denne erklæring, er i overensstemmelse med bestemmelserne i følgende europæiske direktiver, samt de nationale lovgivninger, der gennemfører dem:</p> <p>Maskiner 2006/42/EF ; Elektromagnetisk Kompatibilitet 2014/30/EU ; Energirelaterede produkter 2009/125/EF</p> <p>De er ligeledes i overensstemmelse med de harmoniserede europæiske standarder, der er anført på forrige side.</p>	<p>(EL) - Ελληνικά ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΕ/ΕΚ</p> <p>WILO SE δηλώνει ότι τα προϊόντα που ορίζονται στην παρούσα ευρωπαϊκά δήλωση είναι σύμφωνα με τις διατάξεις των παρακάτω οδηγιών και τις εθνικές νομοθεσίες στις οποίες έχει μεταφερθεί:</p> <p>Μηχανήματα 2006/42/ΕΚ ; Ηλεκτρομαγνητικής συμβατότητας 2014/30/ΕΕ ; Συνδεδεμένα με την ενέργεια προϊόντα 2009/125/ΕΚ</p> <p>και επίσης με τα εξής εναρμονισμένα ευρωπαϊκά πρότυπα που αναφέρονται στην προηγούμενη σελίδα.</p>
<p>(ES) - Español DECLARACIÓN DE CONFORMIDAD UE/CE</p> <p>WILO SE declara que los productos citados en la presenta declaración están conformes con las disposiciones de las siguientes directivas europeas y con las legislaciones nacionales que les son aplicables :</p> <p>Máquinas 2006/42/CE ; Compatibilidad Electromagnética 2014/30/UE ; Productos relacionados con la energía 2009/125/CE</p> <p>Y igualmente están conformes con las disposiciones de las normas europeas armonizadas citadas en la página anterior.</p>	<p>(ET) - Eesti keel EL/EÜ VASTAVUSDEKLARATSIOONI</p> <p>WILO SE kinnitab, et selles vastavustunnistuses kirjeldatud tooted on kooskõlas alljärgnevale Euroopa direktiivide sätetega ning riiklike seadusandlustega, mis nimetatud direktiivid üle on võtnud:</p> <p>Masinaid 2006/42/EÜ ; Elektromagnetilist Ühilduvust 2014/30/EL ; Energiatõuga toodete 2009/125/EÜ</p> <p>Samuti on tooted kooskõlas eelmisel leheküljel ära toodud harmoneeritud Euroopa standarditega.</p>
<p>(FI) - Suomen kieli EU/EY-VAATIMUSTENMUKAISUUSVAKUUTUS</p> <p>WILO SE vakuuttaa, että tässä vakuutuksessa kuvutatut tuotteet ovat seuraavien eurooppalaisten direktiivien määräysten sekä niihin sovellettavien kansallisten lakiasetusten mukaisia:</p> <p>Koneet 2006/42/EY ; Sähkömagneettinen Yhteensopivuus 2014/30/EU ; Energiaan liittyvien tuotteiden 2009/125/EY</p> <p>Lisäksi ne ovat seuraavien edellisellä sivulla mainittujen yhdenmukaistettujen eurooppalaisten normien mukaisia.</p>	<p>(GA) - Gaeilge AE/EC DEARBHÚ COMHLÍONTA</p> <p>WILO SE ndearbhaíonn an cur síos ar na táirgí atá i ráiteas seo, siad i gcomhréir leis na forálacha atá sna treoracha seo a leanas na hEorpa agus leis na dlíthe náisiúnta is infheidhme orthu:</p> <p>Innealra 2006/42/EC ; Comhoiriúnacht Leictreamaighnéadach 2014/30/AE ; Fuinneamh a bhaineann le táirgí 2009/125/EC</p> <p>Agus siad i gcomhréir le forálacha na caighdeáin chomhchuíbhithe na hEorpa dá dtagraítear sa leathanach roimhe seo.</p>
<p>(HR) - Hrvatski EU/EZ IZJAVA O SUKLADNOSTI</p> <p>WILO SE izjavlja da su proizvodi navedeni u ovoj izjavi u skladu sa sljedećim prihvaćenim europskim direktivama i nacionalnim zakonima:</p> <p>EZ smjernica o strojevima 2006/42/EZ ; Elektromagnetna kompatibilnost - smjernica 2014/30/EU ; Smjernica za proizvode relevantne u pogledu potrošnje energije 2009/125/EZ</p> <p>i usklađenim europskim normama navedenim na prethodnoj stranici.</p>	<p>(HU) - Magyar EU/EK-MEGFELELŐSÉGI NYILATKOZAT</p> <p>WILO SE kijelenti, hogy a jelen megfelelősségi nyilatkozatban megjelölt termékek megfelelnek a következő európai irányelvek előírásainak, valamint azok nemzeti jogrendbe áttültetett rendelkezéseinek:</p> <p>Gépek 2006/42/EK ; Elektromágneses összeférhetőségre 2014/30/EU ; Energiával kapcsolatos termékek 2009/125/EK</p> <p>valamint az előző oldalon szereplő, harmonizált európai szabványoknak.</p>
<p>(IT) - Italiano DICHIARAZIONE DI CONFORMITÀ UE/CE</p> <p>WILO SE dichiara che i prodotti descritti nella presente dichiarazione sono conformi alle disposizioni delle seguenti direttive europee nonché alle legislazioni nazionali che le traspongono :</p> <p>Macchine 2006/42/CE ; Compatibilità Elettromagnetica 2014/30/UE ; Prodotti connessi all'energia 2009/125/CE</p> <p>E sono pure conformi alle disposizioni delle norme europee armonizzate citate a pagina precedente.</p>	<p>(LT) - Lietuvių kalba ES/EB ATITIKTIES DEKLARACIJA</p> <p>WILO SE pareiškia, kad šioje deklaracijoje nurodyti gaminiai atitinka šių Europos direktyvų ir jas perkeliančių nacionalinių įstatymų nuostatus:</p> <p>Mašinų 2006/42/EB ; Elektromagnetinis Suderinamumas 2014/30/ES ; Energija susijusiems gaminiams 2009/125/EB</p> <p>ir taip pat harmonizuotas Europas normas, kurios buvo cituotos ankstesniame puslapyje.</p>
<p>(LV) - Latviešu valoda ES/EK ATBILSTĪBAS DEKLARĀCIJU</p> <p>WILO SEdeklarē, ka izstrādājumi, kas ir nosaukti šajā deklarācijā, atbilst šeit uzskaitīto Eiropas direktīvu nosacījumiem, kā arī atsevišķu valstu likumiem, kuros tie ir ietverti:</p> <p>Mašīnas 2006/42/EK ; Elektromagnētiskās Saderības 2014/30/ES ; Enerģiju saistītiem ražojumiem 2009/125/EK</p> <p>un saskaņotajiem Eiropas standartiem, kas minēti iepriekšējā lappusē.</p>	<p>(MT) - Malti DIKJARAZZJONI TA' KONFORMITÀ UE/KE</p> <p>WILO SE jiddikjara li l-prodotti speċifikati f'din id-dikjarazzjoni huma konformi mad-direttivi Ewropej li jseguw u mal-legislażżjonijiet nazzjonali li japplikawhom:</p> <p>Makkinarju 2006/42/KE ; Kompatibbiltà Elettromanjetika 2014/30/UE ; Prodotti relatati mal-enerġija 2009/125/KE</p> <p>kif ukoll man-normi Ewropej armonizzati li jseguw imsemmija fil-paġna preċedenti.</p>

<p align="center">(NL) - Nederlands EU/EG-VERKLARING VAN OVEREENSTEMMING</p> <p>WILO SE verklaart dat de in deze verklaring vermelde producten voldoen aan de bepalingen van de volgende Europese richtlijnen evenals aan de nationale wetgevingen waarin deze bepalingen zijn overgenomen:</p> <p>Machines 2006/42/EG ; Elektromagnetische Compatibiliteit 2014/30/EU ; Energiegeïntegreerde producten 2009/125/EG</p> <p>De producten voldoen eveneens aan de geharmoniseerde Europese normen die op de vorige pagina worden genoemd.</p>	<p align="center">(PL) - Polski DEKLARACJA ZGODNOŚCI UE/WE</p> <p>WILO SE oświadcza, że produkty wymienione w niniejszej deklaracji są zgodne z postanowieniami następujących dyrektyw europejskich i transponującymi je przepisami prawa krajowego:</p> <p>Maszyn 2006/42/WE ; Kompatybilności Elektromagnetycznej 2014/30/UE ; Produktów związanych z energią 2009/125/WE</p> <p>oraz z następującymi normami europejskich zharmonizowanymi podanymi na poprzedniej stronie.</p>
<p align="center">(PT) - Português DECLARAÇÃO DE CONFORMIDADE UE/CE</p> <p>WILO SE declara que os materiais designados na presente declaração obedecem às disposições das diretivas europeias e às legislações nacionais que as transcrevem :</p> <p>Máquinas 2006/42/CE ; Compatibilidade Electromagnética 2014/30/UE ; Produtos relacionados com o consumo de energia 2009/125/CE</p> <p>E obedecem também às normas europeias harmonizadas citadas na página precedente.</p>	<p align="center">(RO) - Română DECLARAȚIE DE CONFORMITATE UE/CE</p> <p>WILO SE declară că produsele citate în prezenta declarație sunt conforme cu dispozițiile directivelor europene următoare și cu legislațiile naționale care le transpun :</p> <p>Mașini 2006/42/CE ; Compatibilitate Electromagnetică 2014/30/UE ; Produselor cu impact energetic 2009/125/CE</p> <p>și, de asemenea, sunt conforme cu normele europene armonizate citate în pagina precedentă.</p>
<p align="center">(SK) - Slovenčina EÚ/ES VYHLÁSENIE O ZHODE</p> <p>WILO SE čestne prehlasuje, že výrobky ktoré sú predmetom tejto deklarácie, sú v súlade s požiadavkami nasledujúcich európskych direktív a odpovedajúcich národných legislatívnych predpisov:</p> <p>Strojových zariadeniach 2006/42/ES ; Elektromagnetickú Kompatibilitu 2014/30/EÚ ; Energetický významných výrobkov 2009/125/ES</p> <p>ako aj s harmonizovanými európskych normami uvedenými na predchádzajúcej strane.</p>	<p align="center">(SL) - Slovenščina EU/ES-IZJAVA O SKLADNOSTI</p> <p>WILO SE izjavlja, da so izdelki, navedeni v tej izjavi, v skladu z določili naslednjih evropskih direktiv in z nacionalnimi zakonodajami, ki jih vsebujejo:</p> <p>Stroji 2006/42/ES ; Elektromagnetno Zdržljivostjo 2014/30/EU ; Izdelkov, povezanih z energijo 2009/125/ES</p> <p>pa tudi z usklajenimi evropskih standardi, navedenimi na prejšnji strani.</p>
<p align="center">(SV) - Svenska EU/EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE</p> <p>WILO SE intygar att materialet som beskrivs i följande intyg överensstämmer med bestämmelserna i följande europeiska direktiv och nationella lagstiftningar som inför dem:</p> <p>Maskiner 2006/42/EG ; Elektromagnetisk Kompatibilitet 2014/30/EU ; Energirelaterade produkter 2009/125/EG</p> <p>Det överensstämmer även med följande harmoniserade europeiska standarder som nämnts på den föregående sidan.</p>	<p align="center">(TR) - Türkçe AB/CE UYGUNLUK TEYID BELGESİ</p> <p>WILO SEbu belgede belirtilen ürünlerin aşağıdaki Avrupa yönetmeliklerine ve ulusal kanunlara uygun olduğunu beyan etmektedir:</p> <p>Makine Yönetmeliği 2006/42/AT ; Elektromanyetik Uyumluluk Yönetmeliği 2014/30/AB ; Eko Tasarım Yönetmeliği 2009/125/AT</p> <p>ve önceki sayfada belirtilen uyumlaştırılmış Avrupa standartlarına.</p>
<p align="center">(IS) - Íslenska ESB/EB LEYFISYFIRLÝSING</p> <p>WILO SE lýsir því yfir að vörurnar sem um getur í þessari yfirlýsingu eru í samræmi við eftirfarandi tilskipunum ESB og landslögum hafa samþykkt:</p> <p>Vélartilskipun 2006/42/EB ; Rafseguls-samhæfni-tilskipun 2014/30/ESB ; Tilskipun varðandi vörur tengdar orkunotkun 2009/125/EB</p> <p>og samhæfða evrópska staðla sem nefnd eru í fyrri síðu.</p>	<p align="center">(NO) - Norsk EU/EG-OVERENSSTEMMELSESERKLÆING</p> <p>WILO SE erklærer at produktene nevnt i denne erklæringen er i samsvar med følgende europeiske direktiver og nasjonale lover:</p> <p>EG-Maskindirektiv 2006/42/EG ; EG-EMV-Elektromagnetisk kompatibilitet 2014/30/EU ; Direktiv energirelatererte produkter 2009/125/EF</p> <p>og harmoniserte europeiske standarder nevnt på forrige side.</p>
<p align="center">(RU) - русский язык Декларация о соответствии Европейским нормам</p> <p>WILO SE заявляет, что продукты, перечисленные в данной декларации о соответствии, отвечают следующим европейским директивам и национальным предписаниям:</p> <p>Директива ЕС по машинному оборудованию 2006/42/ЕС ; Директива ЕС по электромагнитной совместимости 2014/30/ЕС ; Директива о продукции, связанной с энергопотреблением 2009/125/ЕС</p> <p>и гармонизированным европейским стандартам, упомянутым на предыдущей странице.</p>	

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