WLD160 Series
Intelligent VFD Controlled Pump
User Manual

GUANGZHOU BEDFORD ELECTRIC EQUIPMENT CO.,LTD.

V1.0.1

Preface

Thanks for choosing our product, we will supply you with considerate service as well as ever.

- Professional design based on users' needs, simplicity of operation and suitable for all kinds of applications;
- According to the water condition to supply constant pressure water without manual operation after parameters were set correctly;
- Stop running automatically when no water consumption;
- Alarm automatically when faults occurred;

Contents

1. Warning and Caution for Safety

1.1 Warning

WLD160 is a new power electronic product, please read the operation manual carefully before using to keep your safety and make sure proper operation.

In this manual, the safety precautions were sorted to **"WARNING"** and **"CAUTION"**.

⚡ **WARNING:** Wrong using may result in death or serious personal injury.

⚠ **CAUTION:** Wrong using may result in the damage of controller or system.

⚡ WARNING
● Please don't dismantle, change the product, or may cause electric shock, fire hazard and personal injury;
● Please don't open the cover during the running of controller;
● Please don't put wire, bar of metal, filaments etc. into the controller so as not to cause a short circuit or get an electric shock;
● After controller powered on, its cannot be touched even if in down state as the terminals of the controller are still live, otherwise, there is a risk of electric shock
● Please don't splash water or other liquid over the controller.
● Wiring work is performed by qualified electricians, and construct is performed in accordance with electrical code.

⚠ CAUTION
● Please don't make withstand voltage testing for the controller;
● Never connect AC power to output U,V,W terminals;
● If the internal components of the controller were influenced or damaged by static, please do not to touch;
● The motor, controller and power specifications should be matching, otherwise it could cause abnormal operation even burn out the device;
● If the controller appears serious vibration, noise, heat or peculiar smell in the first operation, please cut off the power immediately and contact suppliers or service center later;
● Please don't install the controller in the environment with direct sunlight, rain, frost or snow in case of deformation or damage.

1.2 Safety Precautions

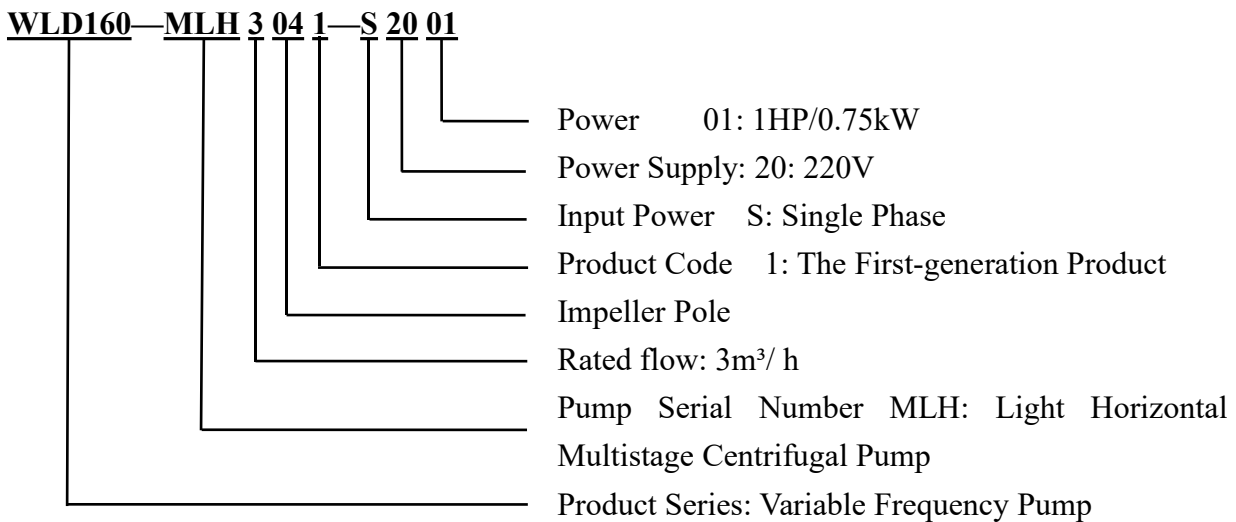| ⚠ **PRECAUTIONS** |
| --- |
| ● When installing the motor, for a convenient repair/checkup, do not install in confined areas. Perform ground concrete work to make sure the pump doesn't tilt over time. When the pump is directly installed on ground, the rotation of the pump may cause vibration. Install anti-vibration devices. Drainage facility must be secured to prevent damages caused by leakage during installation，exchange and repair.
 ● Do not use alcohol, gasoline and oil to clean the pump. Use clear water only.
 ● Don't touch the pump with bare hands during operation. The heat of the pump may cause burns. |

2. Product specification

2.1 Model Specification

WLD160—MLH 3 04 1—S 20 01

Power   01: 1HP/0.75kW
Power Supply: 20: 220V
Input Power   S: Single Phase
Product Code   1: The First-generation Product
Impeller Pole
Rated flow: 3m³/ h
Pump Serial Number MLH: Light Horizontal Multistage Centrifugal Pump
Product Series: Variable Frequency Pump

Figure 2-1 Product Specification

2.2 Product Specification

Table 2-1 Product Specification Parameter

Model	Input Voltage	Output Power (kW)	Current (A)	Head (m)	Flow (m3/h)	Threaded Bore (Inlet/Outlet)
WLD160-MLH3041-S2001	Single Phase 220V 50/60Hz	0.75	3.2	42	3	G1/G1

2.3 Performance Curve

WLD160-MLH3041-S2001——Motor(P2)0.75kW
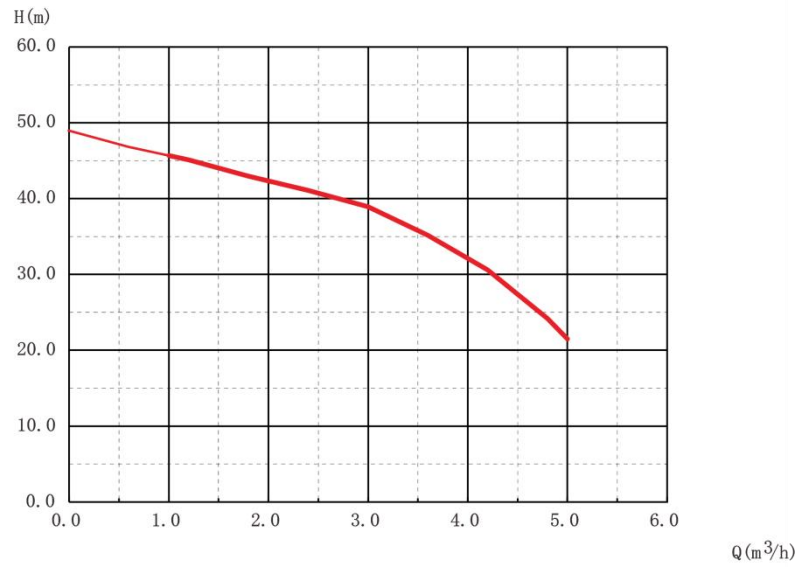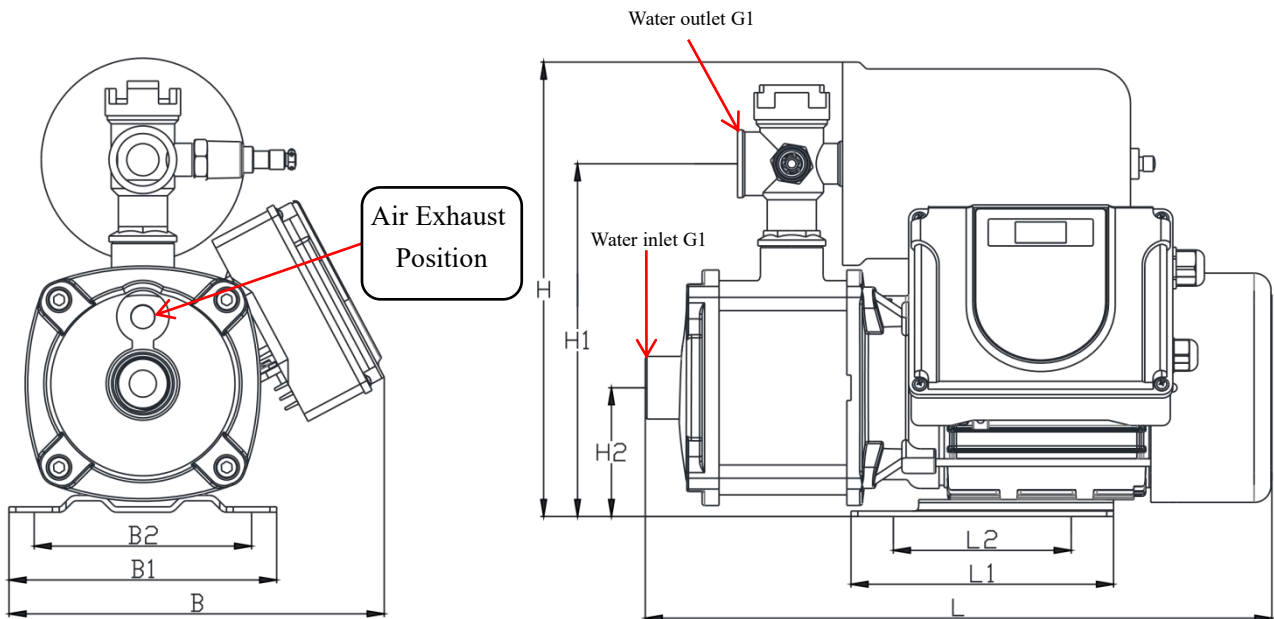

Figure 2-2 Performance Curve

2.4 External Dimension

Table 2-3 WLD160-MLH   Outline Dimension

Model	Outline Dimension(mm)								
	B	B1	B2	H	H1	H2	L	L1	L2
WLD160-MLH3041-S2001	220	158	125	266	133.5	75	362	155	96

3. Installation /Test-Operation of the Product

3.1 Environmental Conditions

● This product is designed for indoor use. If you want to install the product on outdoor areas, prepare facilities that can provide the product with protection against rain, wind and low temperature.

● Medium: Clear Water, Temperature: 15~99℃.

3.2 Installation Requirements

● After installing and cleaning the pools, make sure to extract air. Air exhaust position as shown in Figure 2-3. If the inside of the pump is filled with air, the pump may overheat by friction during operation to damage the internal parts.

● The diameter of inlet pipe must be the same or large than the diameter of the pump inlet.

● The inlet water level shall be higher than 2m from the center of the pump
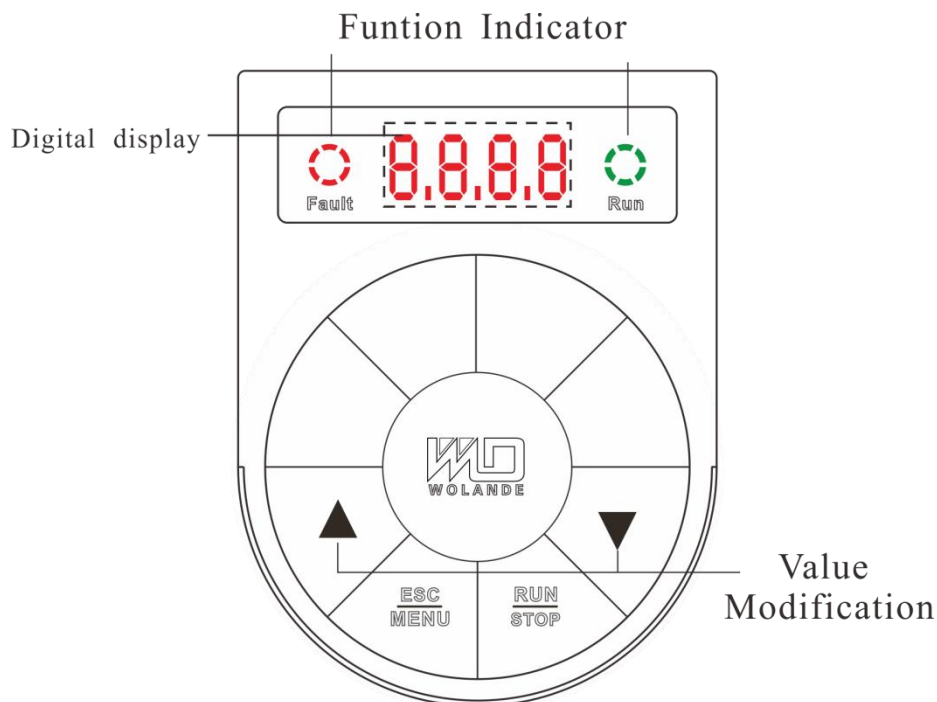
4. Operation

4.1 Operation Panel

Figure4-1 Operation Panel

4.2 Keypad Description

1. **▲/▼ Key**: Digital modification key, used to set the pressure value, parameter modification. ① The set pressure can be modified when in the stop state; ②In the running state, press ▲or▼key to increase or decrease the pressure value; press the ▲/▼ key simultaneously to switch the display state parameter.

2. **ESC/MENU Key**: Menu/Exit Key, pressing more than 1 second can change the status display to the parameter setting mode.

3. **RUN/STOP Key**：Run / Stop Key.

4.3 Prefix Letter of Display interface definition

H: Operating Frequency

P: The Actual Pressure of Pump Outlet

L: The Setting Pressure of Pump Outlet

4.4 Parameter Setting

The parameters are divided into three levels of menu: 1. Function code group (first-level); 2. Function code (second-level); 3. Function value (third-level).
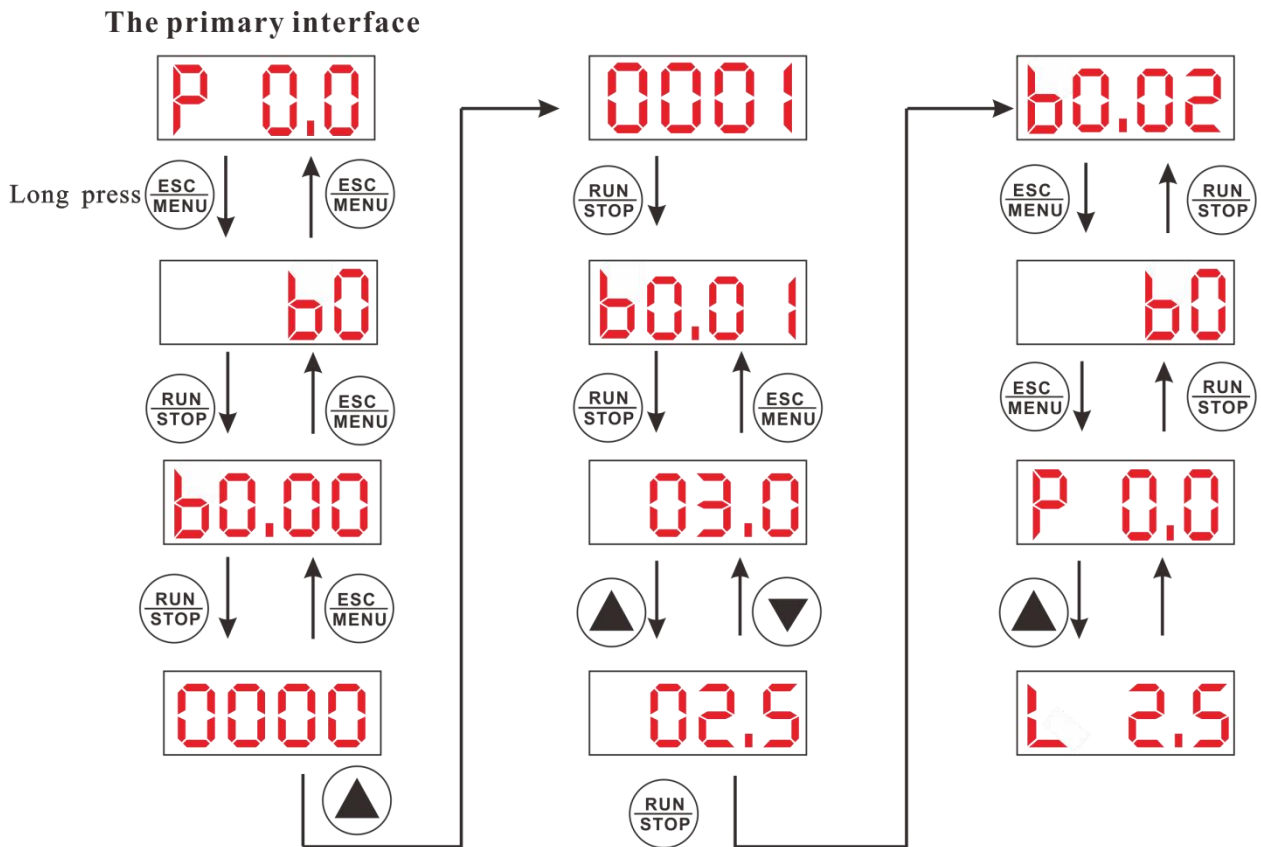
● At the primary interface, press ▲or▼ will switchover display running/stop status monitoring parameters;

● At the primary interface, long press **ESC/MENU Key** will enter the first-level menu, then short press **ESC/MENU Key** will return to the primary interface;

● At the first-level menu, press **RUN/STOP Key** will enter the second-level menu. In second-level menu, press **RUN/STOP Key** will enter the third-level, while press **ESC/MENU Key** will return to first-level menu;

● At third-level menu, press both **ESC/MENU Key** and **RUN/STOP Key** can return to the second-level menu, difference is: pressing **RUN/STOP Key** will save the parameters into the controller and return to the second-level menu with shifting to the next function code automatically; while pressing **ESC/MENU Key** will directly return to the second-level menu without saving the parameters, and keep staying at the current function code.

Under the third-level menu, if the data bit flashes, it can be modified, otherwise it cannot be modified. When there are multiple modifiable data bits, flashing indicator automatically shift to the right and loop back and forth.

Example 1: Change default pressure setting 3.0 bar to 2.5 bar

Method 1: Enter parameter setting

Operation Step:

The primary interface

Figure4-2 Operation Steps

Method 2: Directly setting at the primary interface

Press▲or▼at primary interface when the controller is in stop or run status, the system will switch-over automatically to display setting pressure, press ▲or▼again, the setting pressure increase/decrease. In the adjustment process, the controller will automatically track to operate and automatically saves the pressure value.

5. Instructions of parameters group

Function Code	Name	Setting Range	Factory Setting	Description
b0.00	Debugging Password	0~9999	0001	
b0.01	Pressure Setting Value	1.0~b0.09-1	3.0	Set according to the actual requirements of user
b0.02	Upper limit of Output Frequency	b0.03~60.00	60.00	Maximum running frequency
b0.03	Lower Limit of Output Frequency	0.0~b0.02	30.00	The minimum running frequency of pump

b0.04	Motor Rotating Direction	0~1	0	0: Forward 1: Reverse
b0.05	AI1 Lower Limit	0.00~b0.06	4.0	
b0.06	AI1 Higher Limit	b0.05~20.00	20.00	
b0.07	Wake-up Pressure Bias	0.0~b0.01	0.5	During sleeping the wake-up pressure bias, e.g. the setting value (L)=3.0bar, Bias (b0.7)=0.3bar, practical pressure (P)<L-0.3=2.7bar, the pump will restart again.
b0.08	Sleeping Bias	0.0~b0.01bar	0.12	The pressure fluctuation which allows sleeping
b0.09	High Water Pressure Alarm Value	0~10.0	6.0	When pressure is higher than this preset value, the controller halts and alarms
b0.10	Low Water Pressure Alarm Value	0~b0.09	0.5	When pressure is lower than the preset value for a low-pressure running time, the controller halts and alarms. It is null and void when set to 0
b0.11	Sleep detection coefficient	0.0~10.0	2.5	If it is difficult to sleep, please decrease the setting value.
b0.12	Motor Rated Frequency	0.01~60.00Hz	60.00	Depend on model, setting parameters according to nameplate of motor
b0.13	Motor Rated Voltage	0~280V	Model Set	
b0.14	Software Version			
b0.15	Reserved			

6. Fast Debugging Instructions

6.1 Parameter Setting

For example, it needs 2.5 bar pressure valve. The parameters are set as follow:

Function Code	Factory Setting	Setting Value	Description
b0.01	3.0	2.5	The pressure of water supply

Start the controller after setting the parameters to confirm whether the pump steering is rotating forward. If the pump rotates reversely, it can be modified by the following two methods:

(1) Stop the controller and switch off the power supply, exchange any two wires of the motor output wires U, V, W.

(2) Stop the controller and modify parameter b0.04.

7. Fault and Trouble Shooting

7.1 Controller Running Fault and Trouble Shooting

Fault Code	Fault Type	Reason	Solution
LP	Low Water Level	1. Sensor fault; 2. Motor rotates in reverse direction; 3. Insufficient water inflow; 4. There is air in pump	● Check the pressure transmitter whether is normal; ● Check the motor's direction of rotation is correct or not; ● Check the parameter b0.10(setting value too big)
HP	High Water Pressure	1. Abnormal sensor; 2. The parameter b0.03 setting value is too small	● Check the installation of pressure transmitter; ● Check the parameter b0.09(setting value too small)
LL	Water Shortage	1. Water pressure/level abnormal; 2. Pressure transmitter disconnected or loose contact, no feedback signal; 3. Short water detection alarm time; 4. Low shortage water protection detection frequency; 5. High shortage water protection detection current;	● Check pump's inlet pressure whether is normal ● Check the pressure transmitter installation and wiring ● Check related parameter
E022	Sensor Fault	1. Pressure transmitter disconnected; 2. Wrong pressure transmitter wiring; 3. Pressure transmitter short circuit; 4. Pressure transmitter break down	● Check the cable between pressure transmitter and controller; ● Check the sensor whether is normal
OUT	IGBT Fault	1. Acc./Dec. time is too short; 2. IGBT module fault; 3. Malfunction caused by interference; 4. Grounding is not properly	● Increase Acc./Dec. time; ● Check external equipment and eliminate interference; ● Ask supplier for support
OC1	Over-current When Acceleration	1. Acc. time is too short; 2. Low input voltage; 3. The power of controller is small	● Increase Acc. time; ● Check the power supply; ● Select bigger power controller
OC2	Over-current When Deceleration	1. Dec. time is too short; 2. Load is too heavy; 3. The power of controller is small	● Increase Dec. time; ● Increase braking unit; ● Select bigger power controller

OC3	Over-current When Constant Speed Running	1. Sudden change of load; 2. Low input voltage; 3. The power of controller is small	● Check the load; ● Check the power supply; ● Select bigger power controller
OV1	Over-voltage When Acceleration	1. High input voltage; 2. Regenerative energy from the motor is too large	● Check the power supply; ● Avoid restarting the motor until it stops running completely
OV2	Over-voltage When Deceleration	1. Dec. time is too short; 2. Load is too heavy; 3. High input voltage	● Increase Dec. time; ● Increase braking unit; ● Check the power supply
OV3	Over-voltage When Constant Speed Running	1. High input voltage; 2. Load is too heavy	● Install input reactor; ● Increase braking unit
OV	Hardware over-voltage	1. Input voltage abnormal. 2. Dec. time is too short; 3. Load is too heavy	● Check the power supply ● Increase Dec. time; ● Increase braking unit
UV	DC Bus Under-voltage	1. Low input voltage	● Check the grid's input power supply
OL1	Controller Overload	1. Acc. time is too short; 2. Restart the motor when it is decelerating; 3. Low input voltage; 4. Load is too heavy	● Increase Acc. time; ● Avoid restarting the motor until it stops running completely; ● Check the power supply; ● Select bigger power controller
OL2	Motor Overload	1. Low input voltage; 2. Wrong setting of motor parameter; 3. Motor locked-rotor or sudden big change of load to small load; 4. The power of motor is too small	● Check the power supply; ● Set the rated current of motor properly; ● Check the load, adjust the value of torque boost; ● Select proper power motor
OL3	Over-torque	1. Acc. time is too short; 2. Restart the motor when it is decelerating; 3. Low input voltage; 4. Load is too heavy	● Increase Acc time; ● Avoid restarting the motor until it stops running completely; ● Check the power supply; ● Select bigger power controller
SPO	Output Phase Failure (SPO)	1. Open-phase occurred at output side of main circuit	● Check the output wiring connecting, cable and motor

OH	IGBT Overheat	1. Sudden over-current; 2. Input/output side has short circuit; 3. Ambient temperature is too high; 4. Wires or connectors of control board are loose; 5. Auxiliary power supply unit is damaged or low driving voltage for IGBT; 6. Power module bridge is damaged; 7. Control board is abnormal	● Refer to measures of over-current; ● Check the wiring; ● Decrease the ambient temperature; ● Check and reconnect; ● Ask supplier for support
ITE	Current Detection Fault	1. Wires or connectors of control board are loose; 2. Auxiliary power supply unit is damaged; 3. Current detector is damaged or amplifying circuit is abnormal	● Check the wiring and connectors; ● Ask supplier for support
ERR	EEPROM Fault	1. R/W fault of control parameters	● Press **RUN/STOP** to reset; ● Ask for support

7.2 System Running Fault and Trouble Shooting

Abnormal Function	Reason	Solution
Can't Sleep	1. Outlet pipe leakage; 2. Check valve leakage; 3. Pressure tank damage; 4. High environment EMI; 5. Wrong parameter	● Check outlet pipe, or to set b0.08; ● Inspect check valve; ● Change pressure tank; ● Transducer adopt shielded wires, shielded layer connects to PE;
Full-Frequency Running	1. Lose pressure feedback; 2. Wrong parameter; 3. Pump under power	● Check transducer and wires;
Motor Noise	1. Motor abnormal; 2. Motor installation is not stable; 3. Low carry-frequency	● Check motor

WOLANDE

Intelligent VFD Controlled Pump

Agent: