B1100 Series
Intelligent VFD Controlled Pump
User Manual

GUANGZHOU BEDFORD ELECTRIC EQUIPMENT CO.,LTD.

V1.0.9

Preface

Thanks for your purchasing the B1100 Series product. Our motto is to provide best produce and service to client.

Please read this operation manual carefully before installation, operation, maintenance or inspection. B1100 Series with superior performance and rich function, can meet the requirement of water supply in different occasions and improve the quality of water supply system to achieve the effect of energy saving and environmental protection.

And you will be provided the features and operations' illustration of the B1100 through this user manual. Please read and have thorough knowledge about this manual before operating and make sure to operate B1100 Series product.

Contents

1 Warning and Caution for Safety

1.1 Warning

In order to operate B1100 in safety, there are symbols such as "WARNING", "CAUTION" in the instructions to remind you during handling, transport, inspection, installation and operation for the sake of safety precautions.

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

 WARNING: Wrong using may result in death, serious personal injury or other accidents.

CAUTION

- When using improperly, it may cause damage to the controller or system;
- 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 expose the controller in the environment with direct sunlight, rain, frost or snow in case of deformation or damage.

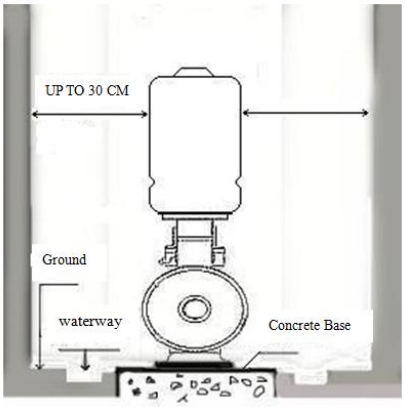
WARNING

- 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;
- Please don't splash water or other liquid over the controller;
- Layout operations should be carried out by a qualified electrical professional, and construct in accordance with the electrical code.

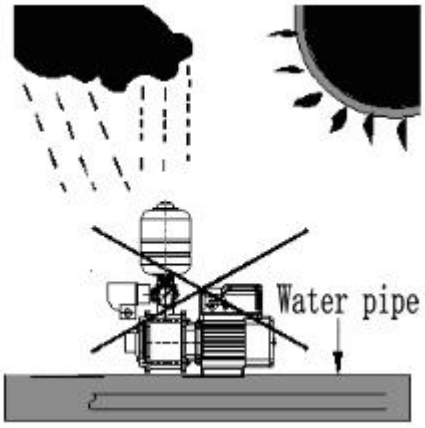
1.2 Safety Precautions

Precautions

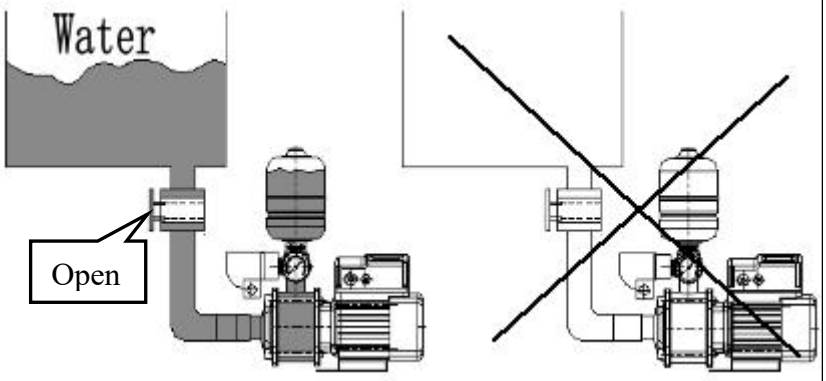
As shown in the picture on the right. When installing the motor, for a convenient repair/checkup, do not install in confined areas. Minimum space described in the picture is required. Perform ground concrete work to make sure the pump doesn't tilt over time. When the pump is directly installed on ground, 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.



As shown in the picture on the right is wrong. Do not place the product on outdoor areas directly exposed to rain or sunlight. Deformation of parts or electric shock might occur. The controller and motor should be away from water and humidity, or it will cause electric leakage or breakdown. Do not press the water pipe underground in case of conduit blowout.



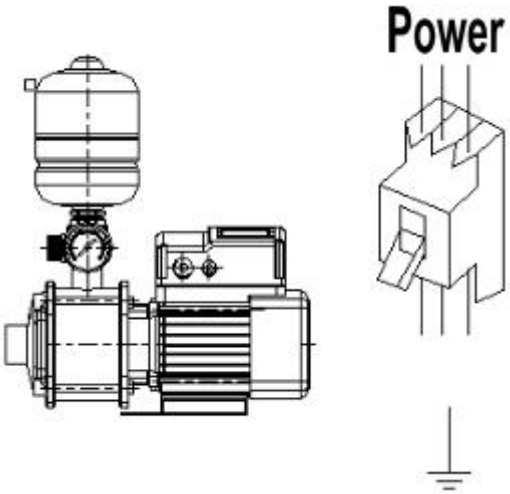
As shown in the picture on the right. Never operate when there is no water in the tank/pump (idling), or when the outlet valve is closed.



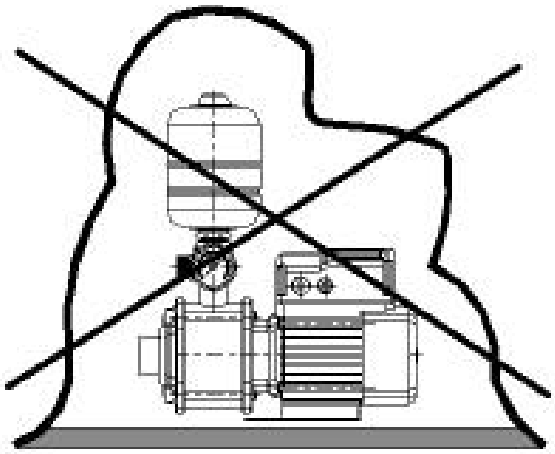
As shown in the picture on the right. Do not use alcohol, gasoline and oil to clean the pump. Use clear water only.

Warning and Caution for Safety

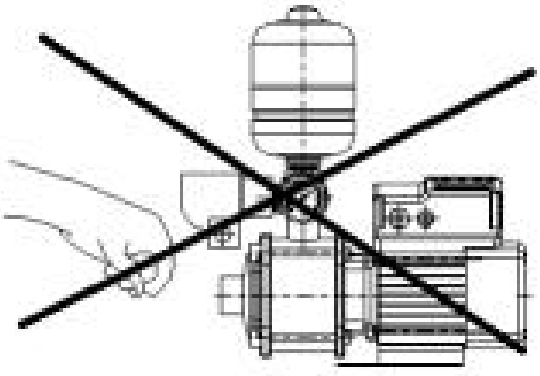
Voltage for power shall be within ± 10% of the rated voltage (220V). Make sure to exclusively use a grounded outlet. When extending the power cord, make sure that the copper wire is not damaged. Wrap the connecting part with adhesive rubber tape, and finish with electric tape; To prevent electric shock, leakage circuit breakers should be installed less than 30mA, when the motor is installed, moved, repaired and not in use for a long time, cut off the motor power.



Do not cover the pump with clothing, vinyl, wrapper etc. to protect the pump against the cold. Fire may be caused due to overheat.



Don’t touch the pump with bare hands during operation. The heat of the pump may cause burns.



2 Specification & Performance

2.1 Description of Name Plate

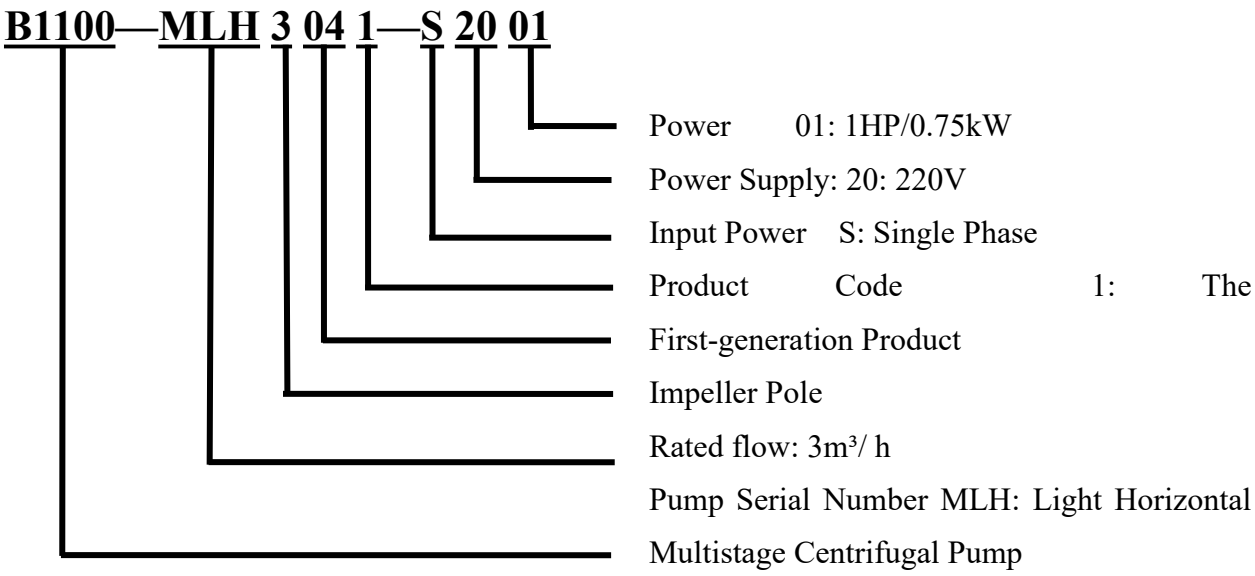


Figure 2-1 Product Specification

2.2 Product Specification

Table 2-1 Product Specification Parameter

Model	Input Voltage	Output Power (kW)	Current (A)	Head (m)	Flow (m^3/h)	Threaded Bore (Inlet/Outlet)
B1100-MLH2031 -S20007	Single Phase 220V 50/60Hz	0.55	3.2	37	2	G1/G1
B1100-MLH3041 -S2001	Single Phase 220V 50/60Hz	0.75	4.0	42	3	G1/G1
B1100-MLH8201 -S20025	Single Phase 220V 50/60Hz	1.85	9.6	36	8	$G1\frac{1}{2}/G1\frac{1}{2}$

2.3 Performance Curve

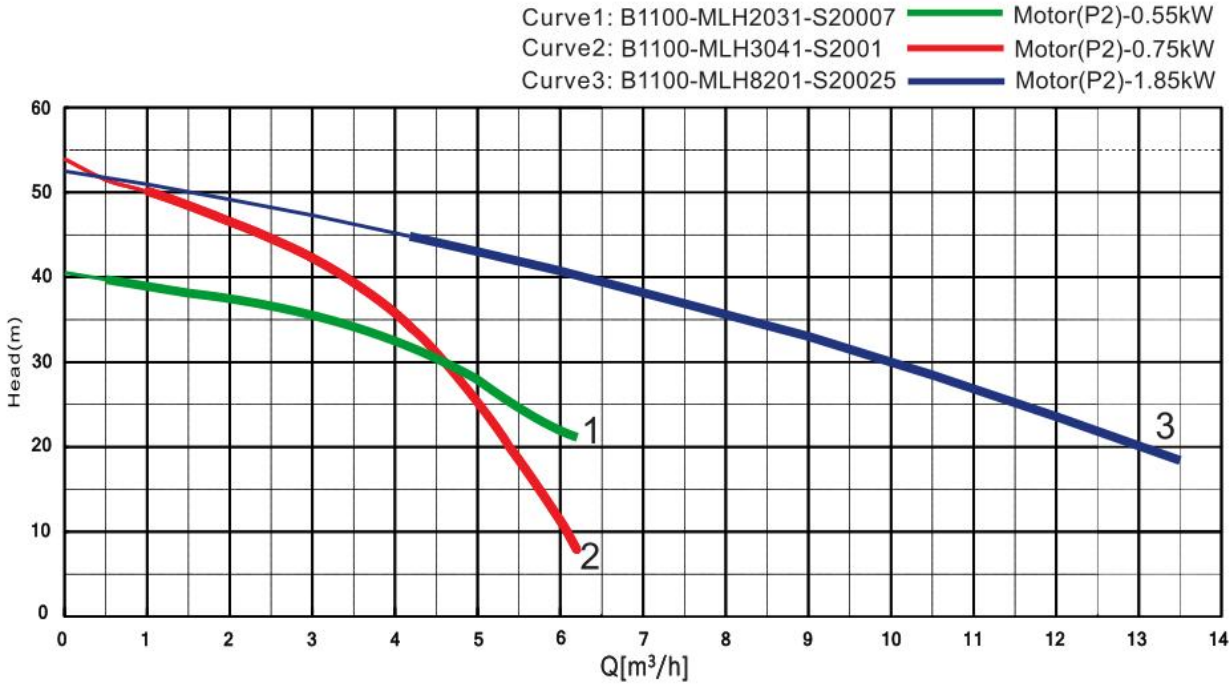


Figure 2-2 Performance Curve

2.4 Line Connection

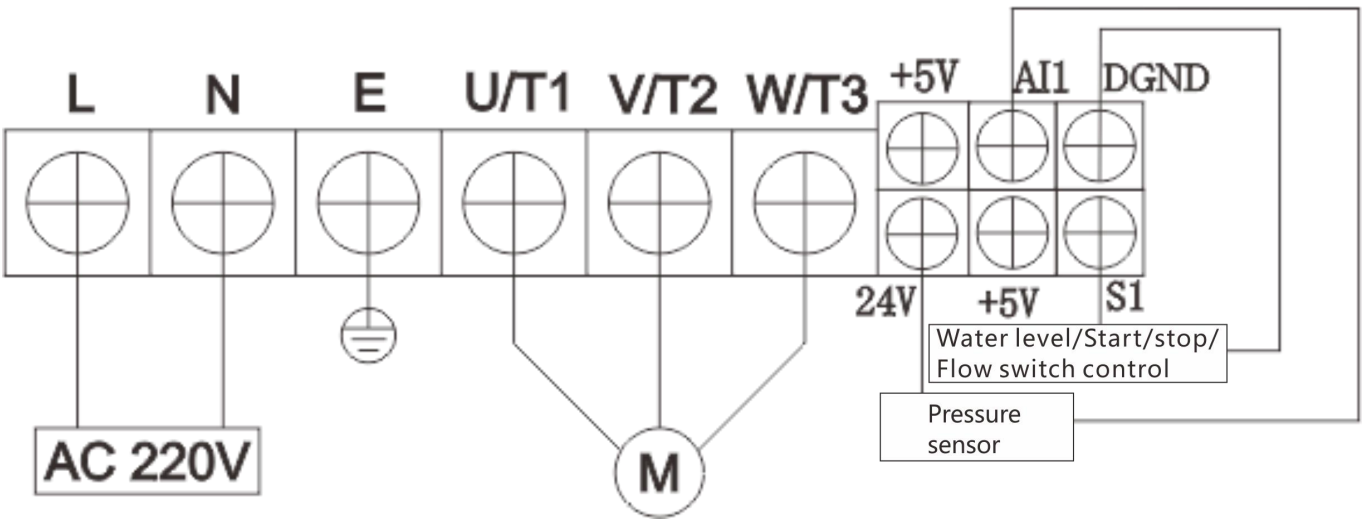


Figure 2-3 Line Connection

2.5 Outline Dimension

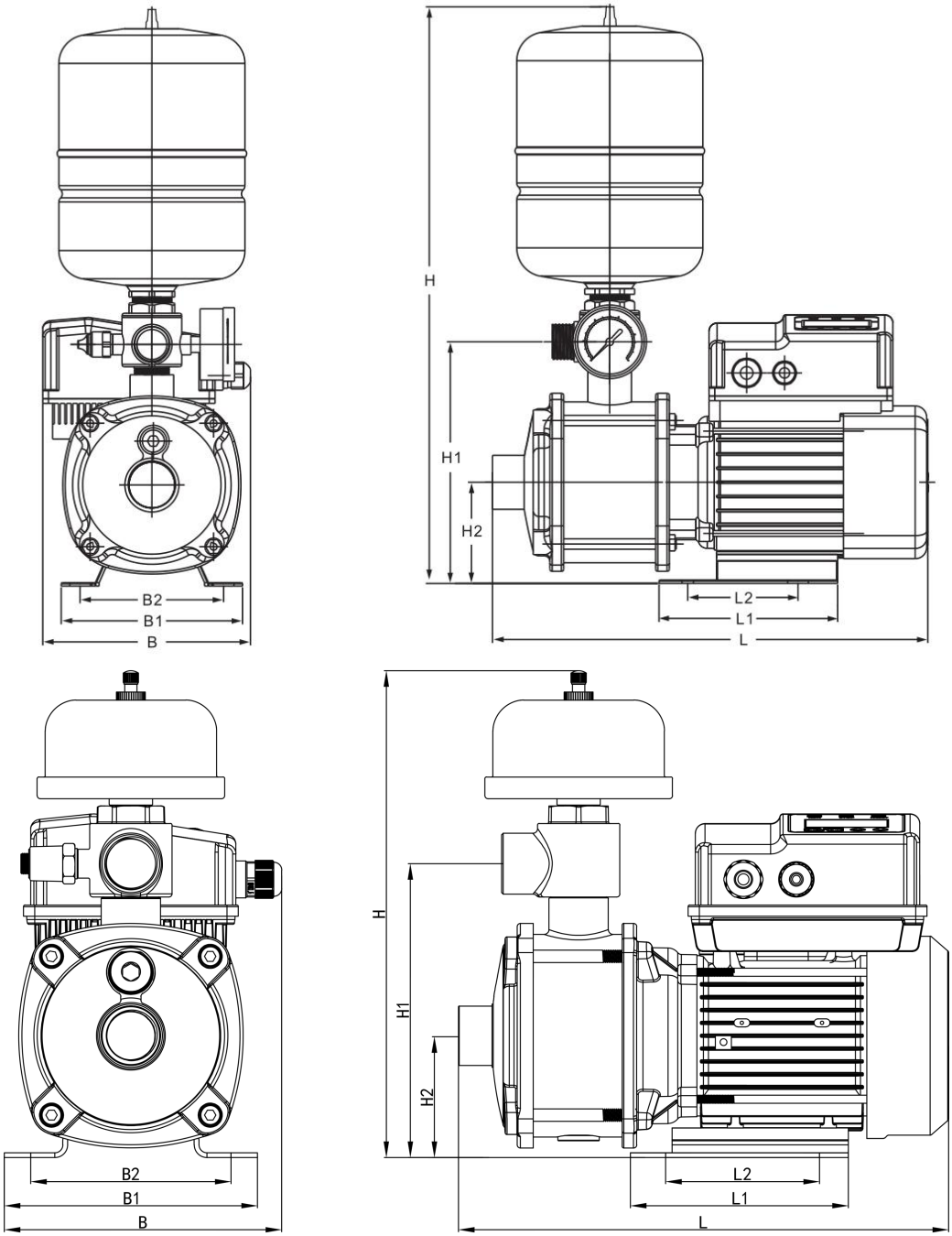


Table 2-1 B1100-MLH Outline Dimension

Model	Outline Dimension（㎜）								
	B	B1	B2	H	H1	H2	L	L1	L2
B1100-MLH2031-S20007	174	158	125	304	184	75	309	136	96
B1100-MLH3041-S2001	181	158	125	475	190	75	350	156	96
B1100-MLH8201-S20025	206	199	160	585	245	100	408	138	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.

3.2 Installation Requirements

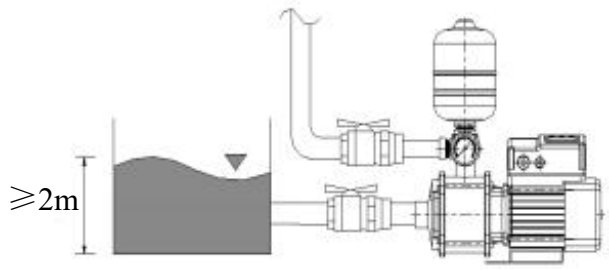


Figure 3-1

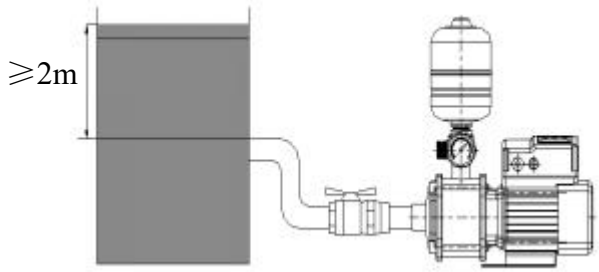


Figure 3-2

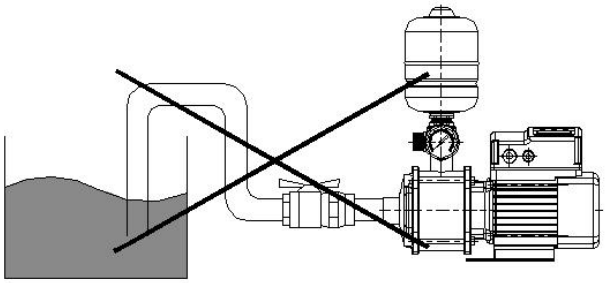


Figure 3-3

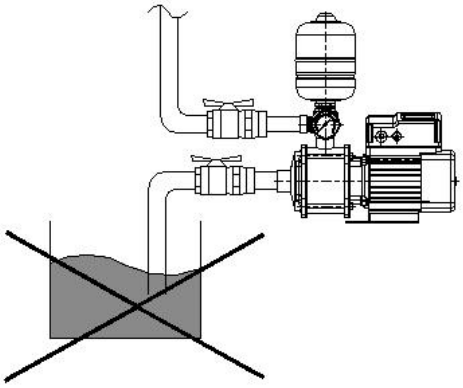


Figure 3-4

As shown in Figure 3-1, Figure 3-2, after installing and cleaning the pools, make sure to extract air. If the inside of the pump is filled with air, the pump may overheat by friction during operation to damage the internal parts.

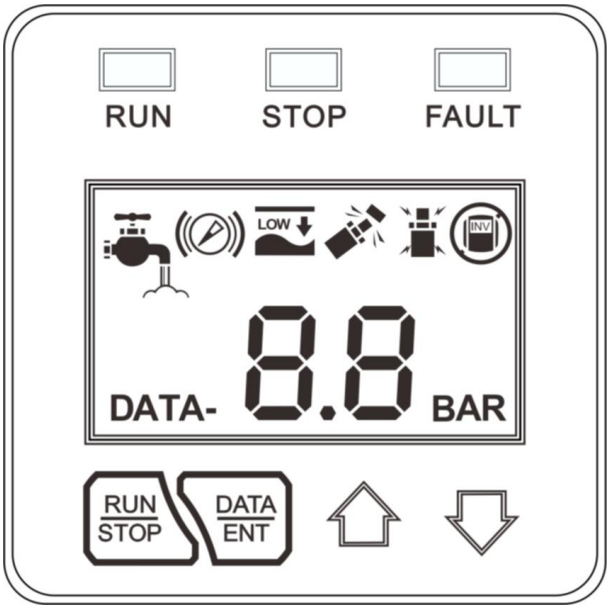
The diameter of inlet pipe must be the same or large than the diameter of the pump inlet.

The inlet water level shall be higher than 2m from the center of the pump, as shown in Figure 3-1 and Figure 3-2.

The inlet water level as shown in Figure 3-3 and Figure 3-4 is wrong.

4 Controller and Display Screen

4.1 Keypad Description



1. Status LED
Shows the operation status of the pump.

2. LCD display
Briefly displays information related to the system.

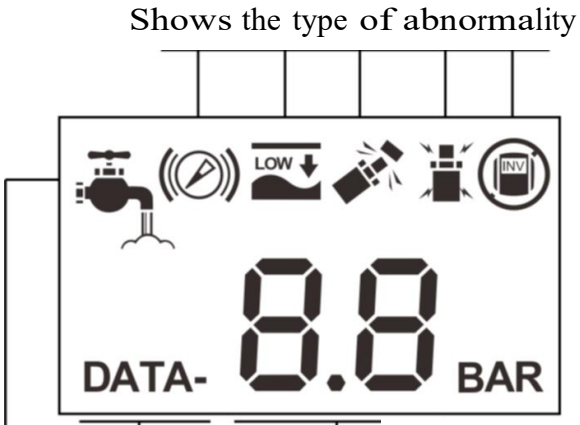
3. Control keyboard
Used when setting/checking information related to the system.

Figure 4-1 Keypad Description

4.2 Operation Indicating

RUN	Shows whether that the pump is operating. When the LED indicator light is on, the pump is in a standby mode. When the LED indicator light is blinks, the pump is currently operating.
STOP	When the LED indicator light is on, the system stops running.
FAULT	When the LED indicator light is on, the product is in abnormal condition and please refer to the fault and trouble shooting.

4.3 LCD



Display the current pressure and parameter.

Shows the setup mode for parameters.

Diagram the state of pump running (the tap running water) or stop running (the tap no water running).

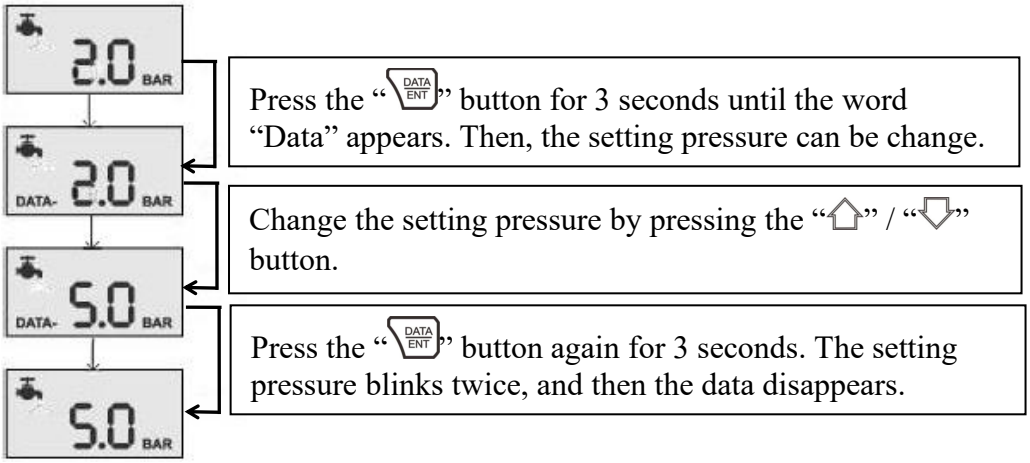
4.4 Keys

RUN STOP	Used when starting/stopping the operation of the pump; Used when exiting the parameter.
DATA ENT	Used when changing the setup pressure; Used when setting the data in parameter setup.
⇧ ⇩	Used when entering the parameter; Used when changing the data value of parameter.
DATA ENT ⇩	Press it long for 3 seconds switch button for Manual mode or Automatic mode.

4.5 Pressure/Parameter Setting

How to set pressure

Example 1: Change the setting pressure from 3.0 bar to 5.0 bar.



★ Caution

1. Pressure shall be set lower than the segment pressure of the pump. When pressure is set higher than the segment pressure of the pump, the pump continues to operate even though the user doesn't use water, causing damage to the pump.
2. Pressure shall be set lower than the high-pressure alarm and higher than the low-pressure alarm.

5 Contents of parameter function

01 Base Frequency

- Base frequency is the frequency that the rated voltage of the Controller can output.
- Set according to the rated frequency of the motor.

02 Maximum Output Frequency

- Maximum output frequency is the maximum frequency that the Controller can operate.
- Setting value shall not exceed the frequency allowed by the motor.

03 Minimum Output Frequency

- When the setting pressure reaches and the pump stops, the pump operates under the minimum output frequency for a certain time and then stops. When the stoppage frequency is too high, the stoppage frequency will elevate. On the other hand, when the stoppage frequency is too low, operation might continue. Initial value is recommended for this setup.

04 Rotating Direction

- 00: Forward rotation 01: Reverse rotation.
- When the wire connection of the motor is improper, the pump rotates reversely. Reverse rotation may lower pressure, stop water pumping and cause noise/vibration. In such case, change the setup for the rotating direction instead of changing the wire connection.

05 Sensor Range

- To detect the pipe pressure, a pressure sensor is installed on the outlet part. This parameter is set as the usage pressure for the sensor. The pressure sensor must have an output option of 4~20mA.

06 Sensor Adjustment

- In case pressure deviation occurs in the sensor, or the pressure of the gauge is different from the pressure on the screen, this parameter adjusts such difference. Before changing this parameter, check the condition of the pressure gauge.

07 Operation Deviation

- When the pipe pressure falls lower than the setting pressure, the pump operates. This parameter sets such pressure of operation. If the operation deviation is set too small, the frequency of repeated operation increases. On the other hand, if the operation deviation is set too high, the pressure deviation increases to cause inconvenience.

08 High-Pressure Alarm

- If the current pressure is higher than the high-pressure alarm, an icon () is shown on screen and the pump stops immediately. If the current pressure drops lower than the high-pressure alarm, the icon disappears, and the pump operates normally again.

09 Low Pressure Alarm

- If operation lasts for more than 30 seconds with the current pressure lower than the low-pressure alarm set, the pump stops and a (

) icon appears on the screen. Pumps will automatically restart after 5, 10 and 30 minutes. If there are more than four low-pressure alerts, system will be considered to have a problem and pump will not restart, requiring a manual reset.

10 Anti-Frost Damage

- Anti-frost damage function protects the pump against the cold weather during winter. When the setting time is elapsed, the pump operates under the maximum frequency for 5 seconds, and then stops.

11 Program Initialization

- This function locks/initializes the program

  0: Change of parameters is available.

  1: Change of parameters is not available.

  2: Initializes the parameters to their default value.

12 Manufacturer Reserves Parameters

13 Alarm Information

The history of 10 recent alarms is recorded and saved. Check the alarm information by using the "  " / "  " button.

14 Automatic restarts after power recovery

0: Off 1: On

15 Terminal start/stop selection

0: Ineffective

1: Start/stop control

2: Water level switch control (normally open)

3: Water level switch control (normally closed)

4: Flow switch control (normally open)

5: Flow switch control (normally closed)

16 Terminal delay restart time

Valid only for function code 15 set values 2and3. Delayed recovery time after the system reports a malfunction.

17 Water shortage protection factor

Judgment of water shortage fault detection reference value, the larger the value, the more likely to water shortage protection occur, 0% means no water shortage protection detection, set according to the minimum flow restriction needs of a reasonable site.

18 Water shortage protection detection Time

When the motor reaches a certain frequency, the feedback current is less than the value of the water shortage detection for the duration of the function code, report C5 fault (water shortage protection fault).

19 Low water pressure delay time

Delay in system recovery after a low water pressure failure LP occurs.

20 Sensor upper limit deviation

This parameter will adjust the upper limit of the sensor deviation when a pressure deviation happens, or when the gauge value does not match the pressure value in the display.

21 Manual mode run-time

Valid only in manual mode, after starting the pump, the pump will stop running when the continuous running time exceeds this setting, when set to 0, it will keep running.

22 Self-priming pump start time

The maximum time allowed for the self-priming pump to start, if it exceeds this time and does not finish starting, it will report "LP fault". Please set to 0 if you are using Common variable frequency pump.

23 Software version

24 Models

Models for the Controllers

25 Reserved

26 Sleep mode deviation

Pressure fluctuations that allow for sleep mode, turn up the value when it is difficult to enter sleep mode.

27 Sleep mode rate

Turn this value up for frequent starting and stopping of small water requirement and down for difficult to enter sleep mode.

28 Reserved

6 Causes of malfunctioning / Troubleshooting

Countermeasures for errors

LCD display	Abnormal fault content	description	solution

 HP	High water pressure alarms	High water pressure alarm malfunction	-Is the pressure too high? -Inspection system
 LP	Low water pressure alarm	Low water pressure alarm malfunction	-Is the pressure low? -Inspection system
 C2	Sensor Disconnect	The sensor is not connected.	-Please check that the pressure sensor is properly installed.
 C3	Sensor short circuit	Sensor short circuit	-Please check that the pressure sensor is properly installed.
 C4	controller error	Controller failure	-The controller has malfunctioned. Turn off the power and contact the manufacturer.
C5	Water Shortage Fault	Water shortage is detected by the system	Check whether water is deficient
C6	Controller unit failure	1. Acceleration too fast. 2. Damage to electrical and electronic components. 3. Interference causing unintended action. 4. poor grounding	● Extended acceleration time. ● Check the perimeter for strong interference. ● Contact supplier
C7	Running overcurrent	1. Low grid voltage. 2. Impurities in the water pump. 3. Water pump blockage	● Checking the main power supply. ● Checking water quality and the water intake environment. ● Check motors and pumps
C8	Running overvoltage	1. Abnormal changes in input voltage.	● Installation of input reactors.
C9	Bus under voltage	1. Low grid voltage	● Check grid input voltage
E1	Controller overload	1. Acceleration too fast. 2. Low grid voltage. 3. Start again before the pump stops.	● Extended acceleration time. ● Checking grid voltage. ● Avoid restarting during downtime
E2	Motor overload	1. Low grid voltage. 2. Wrong motor parameter settings. 3. Motor blocked or foreign body in pump	● Checking grid voltage. ● Resetting the motor current rating. ● Inspection of motors and pumps.
E3	Output side phase loss	1. U, V, W out of phase (or severe asymmetry of the three phases of the load)	● Check the output wiring. ● Check motors and cables

E4	Current sense circuit failure	1. Poor contact of the control board connection cable. 2. Current detection circuit anomaly	● Check connections, rewire ● Contacting suppliers for services
E5	EEPROM Read/Write Failures	1. Errors in the reading and writing of control parameters. 2. EEPROM damage	● Press the stop button to reset and seek service. ● Seek service.
LL	Low water level failure	1. The water level in the pool is too low. 2. Abnormal water level switch wiring. 3、Water level switch type setting error	● Inspection of water intake systems. ● Check the wiring of the water level switch to terminal S1. ● Check that the value group 15 settings to match the type of level switch

⊙The system stores up to 20 information related to the detection of abnormalities.

⊙To initialize the information of abnormalities saved, press the "DATA ENT" button for more than 1 second.

If any other problems, please contact with the agent.

Intelligent VFD Controlled Pump

Agent:

http://www.bedford.com.cn