PUMP CONTROLLER

INTELLIGENT WATER PUMP CONTROLLER

Product Introduction

Single phase pump controller.

This controller boasts powerful functionality and offers simple, convenient installation. It enhances the reliability of your pumping system by detecting dry-run through the monitoring of the pump's current.

The 20Y 1-phase LCD display pump controller for single pump is designed with built-in start capacitor, facilitates the startup of deep well submersible pumps, and protects them from abnormalities, keeping the well pumping system up and running. Unique non-contact induction technology mitigates the need for probes to achieve shutdown protection when the pump is running dry due to lack of water, thus realizing fully intelligent and unmanned operation.

Product size: 275mm x 205mm x 75mm

Application:
Ideal for water supply in high-rise buildings and the control and protection of sewage transfer and deep well pumping, this versatile controller meets these diverse needs.

Its compatibility extends to various pump types, including centrifugal pumps, submersible pumps, multi-stage pumps, deep well pumps, sewage pumps and booster pumps.

Multiple Protections

Dry run alarm and protection	Under-voltage alarm and protection
Overload alarm and protection	Pump stalled alarm and protection
No load alarm and protection	Anti-seizing protection
Water shortage alarm and protection	Short circuit alarm and protection
Over-voltage alarm and protection	Phase loss alarm and protection

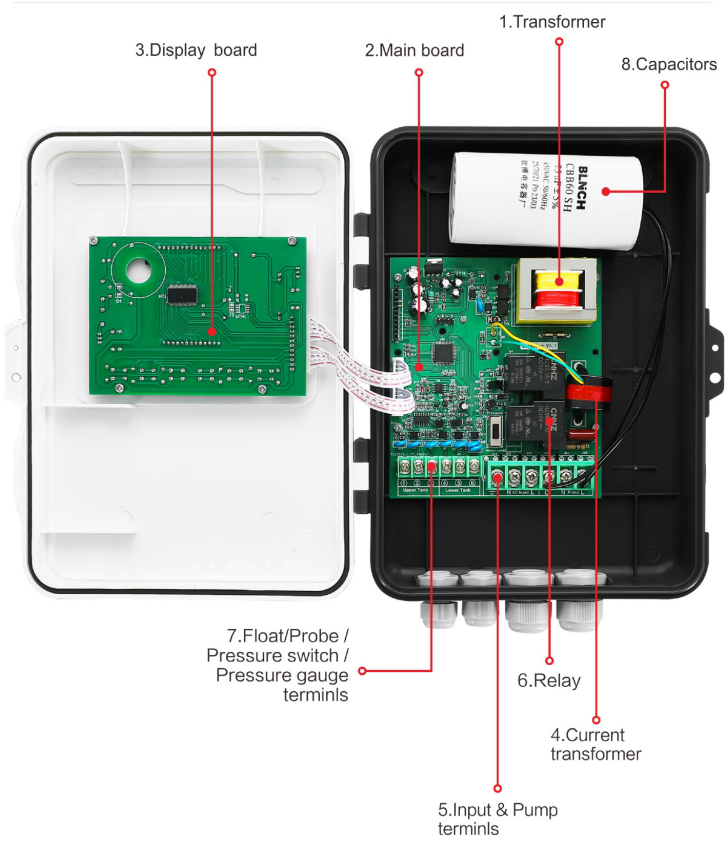
Main Parameters

Rated voltage:	AC220V±10% (50Hz-60Hz)
Rated power	0.37KW-2.2KW
Static consumption power:	<3W
P03: Time setting ON:	0-99 hours adjustable
P04: Time setting OFF:	0-999 minutes adjustable
P05: Automatic restart time from dry run	0-720 minutes adjustable
P07: Over-voltage setting, adjustable, default	264VAC
P08: Under-voltage setting, adjustable, default	176VAC
P09: Screen backlight OFF time	0-120 minutes adjustable, default 30 minute
P12: No load trip delay time	0-600 seconds adjustable
P13: Overload trip delay time	0-600 seconds adjustable
Max. control distance:	≤2000m without strong electric and electromagnetic fields
Over-voltage/under-voltage trip time:	≤3 seconds
Phase loss trip time:	<2 seconds

Main Function

- **Pressure Control Options**: Choose between a two-wire pressure switch or a three-wire electric contact pressure gauge, providing versatile options to suit your specific pressure control needs.
- **Liquid Level Control Options:** Opt for either electrode probe or float switch detection for versatile and effective liquid level control.
- **Display:** Voltage display, current display, upper/lower reservoir water level display.
- **Control Mode:** Easily switch between automatic and manual mode.
- **Intuitive Fault Identification:** Receive word-based fault finding indications on the monitor screen accompanied by an audible beep.
- **Comprehensive Protection Features**: Ensure reliable operation with a robust suite of protections, including locked-rotor overload protection, safeguards against water shortage, no-load conditions, short circuit protection, and over/under voltage protection.
- **Current Monitoring:** Independently set parameters for overload and no-load protection, with adjustable no-load delay start for enhanced control.
- **Automatic Restart Feature:** Following over/under-voltage protection, the system will initiate an automatic restart once the voltage returns to normal levels.
- **Effortless Configuration:** Enables easy setup with a one-key setting for overload and idling current protection.
- **Versatile Control Options:** Choose between manual and automatic start-stop modes, implement regular start-stop cycles, and enable automatic restart after power failure for flexible operational control.
- **Multi-Functional Control:** Efficiently manage liquid levels, pressure, and seamlessly switch between controls.
- **Factory Settings Restoration:** Simply press and hold the overload and no-load buttons simultaneously for three seconds to restore the controller to its factory settings.
- **Failure History:** Access the last 10 recorded fault events.
- **No-Load Restart Customization:** Tailor the no-load restart feature to your preferences with an adjustable range spanning from 0 to 999 minutes.
- **User interface:** a user-friendly interface for configuring settings, monitoring operation, and accessing diagnostic information.
- **Anti-rust protection:** Long-term non-use of these pumps will automatically start the pump for 3 seconds after 15 days.

Inner Compoments



LCD Screen

MAIN KEY			
FAULT QUERY	Continuous press 3 times to check the latest 10 failures	+ OVERLOAD	Overload current setting, Key increase
TIME SETTING	Time setting key, protection setting selection	NO LOAD −	NO-load current setting Key decrease
AUTO / MANUAL	AUTO / Manual Key	START / STOP	Start or stop pump in manual, Save key
Reset: Press + OVERLOAD NO LOAD − for 3 seconds			

The pump controller utilizes advanced microcomputer single-chip technology, offering powerful functions and easy, convenient installation. Its unique non-contact sensing technology provides automatic shutdown protection in the event of a dry run, without the need for a deep well probe. This enables fully intelligent and automated management of water pumps.

1. Host Installation: Mount the controller securely on the wall. Open the wiring box and connect the power lines, pump lines, pressure control lines, or probes following the wiring diagram.
2. Signal Line Connection: Ensure that no two probe lines are short-circuited. Avoid contact with the pool wall, stay away from areas with strong interference or electrical appliances, and keep the signal lines separate from power supply lines.
3. ON: After connecting the power supply, turn on the circuit breaker. The display screen will indicate the actual water level and operation status. Press the START/STOP key to turn the water pump on or off immediately. Ensure that the pump's current is within the correct operating range after starting.

Protection display icon and normal operation

1.Basic display
1.1. A: Displays the actual operating current of the water pump, showing "0.0" when there is no current.
1.2. V: Displays the actual operating voltage.
1.3. AUTO/Manual: When the "AUTO" light is on, all functions are operating in automatic mode. When the "Manual" light is on, automatic operation is disabled, and the functions are controlled only by pressing the "START/STOP" keys.
1.4. Water Level: Display the actual water level in the upper and lower tank.
1.5. Pressure: The upper tank level indicator shows the actual pressure status. When the lower limit is reached, the "Low" light turns on. The "Middle" light illuminates when at the mid-level, and the "High" light turns on when the upper limit is reached.

2.Protection Function and Fault Record Display
2.1.No—load protection: When the water pump's operating current falls below the set no-load parameter, the pump stops. The "No-Load" light turns on, and the current display screen shows the stopped parameter, blinking to indicate the status.

2.2.Overload protection: When the water pump's operating current exceeds the set overload parameter, the pump stops. The "OVERLOAD" light turns on, and the current display screen displays the stopped parameter, blinking to indicate the status.

2.3.Overvoltage/undervoltage protection: During pump operation, if the voltage goes beyond the set protection range, the "Over-V" or "Under-V" light will turn on. The voltage display screen will show the stopped voltage parameter and blink to indicate the status.

MAIN KEY			
FAULT QUERY	Continuous press 3 times to check the latest 10 failures	+ OVERLOAD	Overload current setting, Key increase
TIME SETTING	Time setting key, protection setting selection	NO LOAD −	NO-load current setting Key decrease
AUTO MANUAL	AUTO / Manual Key	START STOP	Start or stop pump in manual, Save key
Reset: Press + OVERLOAD NO LOAD − for 3 seconds			

1.Fault Record

Fault record display: While in the OFF state, continuously press three times to display E01. Then press the and to display the last 10 faults. Press to return to the home display.

2.Time Setting ON/OFF

Press and hold for 3 seconds, then release when a beep sounds.Upon entering the setting mode, “P03” will appear on the voltage display screen for setting the ON time (Adjust using “+” and “-” in hours).
Press again and “P04” will be displayed for setting the OFF time (adjust using “+” and “-” in minutes).
Press again to display “P05” for setting the no-load delay restart time, default 30 minutes (adjust using and).
Press again to display “P07” for setting overvoltage protection, with a default voltage of 264V.
Press again to display “P08 for setting undervoltage protection, with a default voltage of 176V.
Press again to display P09 for setting the LCD screen backlight OFF time, default 30 minutes (adjust using and)
After completing the settings, press to save.

Press again to display ‘P12’ will be displayed on the voltage screen, allowing you to set the no-load trip delay time in seconds (1–600 seconds adjustable). Use to increase and to decrease the value, then press to save the setting.
Press again to display “P13” on the voltage screen, allowing you to set the overload trip delay time in seconds (1—600 seconds adjustable). Use to increase and to decrease the value, then press to save the setting.

A. Time Setting 'ON': After setting the ON time, the controller will automatically switch on the pump according to the set time. The time setting is in hours and operates in a cyclic starting mode.

Press the TIME SETTING key for 3 seconds and release it upon a beep sound. Upon entering the time setting mode, "P03" will appear on the voltage display screen, and the current display screen will show the latest setting. Press OVERLOAD to increase and press NO LOAD to decrease the value. Press START STOP to save the setting.

For example:
If P03 is set to "02", the pump controller will automatically start the water pump every 2 hours.
If P03 is set to "06", the pump controller will automatically start the water pump every 6 hours.

B. Time Setting 'OFF' : If the water pump starts and the water tank is not filled to the desired level or pressure within the set time range, it will automatically stop the pump after the set duration. The Time Setting OFF is in minutes and determines the maximum run time after startup.

Press the key TIME SETTING for 3 seconds,and release upon a beep sound to enter the setting mode.Then press TIME SETTING again, and "P04" will be displayed on the voltage display screen. The current display screen will show the latest setting. Press OVERLOAD to increase and NO LOAD to decrease the value.
Press START STOP to save the setting.

If P04 is set to "60", the pump controller will automatically stop after 60 minutes.

C.No—load Delay Restart

Press the key TIME SETTING for 3 seconds, and release it upon hearing a beep sound to enter the setting mode.
Press TIME SETTING again and "P04" will appear on the voltage display screen.
Press TIME SETTING again **and "**P05" will be displayed on the voltage display screen. The current display screen will show the latest setting. Use OVERLOAD to increase and NO LOAD to decrease the value. Press START STOP to save the setting.

For example:
If P05 is set to "60," the pump controller will automatically restart after 60 minutes following a no-load protection event.
If P05 is set to "120," the pump controller will automatically restart after 120 minutes following a no-load protection event.

3. AUTO/Manual Mode (to switch by pressing the AUTO/MANUAL key)
A. Under AUTO: In this mode, all functions of the pump controller, such as water supply, drainage, constant water supply, and time setting ON, operate fully automatically.
B. Under Manual: In this mode, the pump controller is not controlled by water level or pressure; it is only controlled by pressing the START/STOP key.

4. Overload OVERLOAD
When the working current of the water pump exceeds the set overload current, the pump stops. Overload protection follows an inverse time limit principle: the more the current exceeds the set limit, the quicker the overload protection activates.

Overload protection current setting:
This function can efficiently control and protect the pump when it has stalled, rusted or overloaded. Press OVERLOAD for 3 seconds and release it upon hearing a beep sound to enter the P01 overload current setting mode.The “OVERLOAD” light will turn on, and the current display screen will show the latest setting. Use OVERLOAD to increase and NO LOAD to decrease the value The setting will automatically save after 15 seconds, or you can press the START/STOP key to save instantly.

For example, when setting the overload protection parameter, if the water pump is operating normally, the overload protection current should be set slightly higher than the displayed operating current.

Parameter Setting:
Normal operation current: Set the overload protection current parameter slightly above the pump’s normal operating current.

5. No-Load Protection

When the working current of the water pump falls below the set no-load current, the pump automatically stops. No-load protection follows an inverse time limit principle: the lower the current compared to the set value, the faster the no-load protection will activate.

No—load protection current setting:

This function helps control and protect the water pump in cases of water shortage, dry runs, or impeller damage.

To set the no-load protection current, press for 3 seconds and release upon hearing a beep sound to enter the P02 water shortage protection setting mode. The “NO—LOAD” light is on, will turn on, and the current display screen will show the latest P02 setting.

Press to increase and to decrease the value.

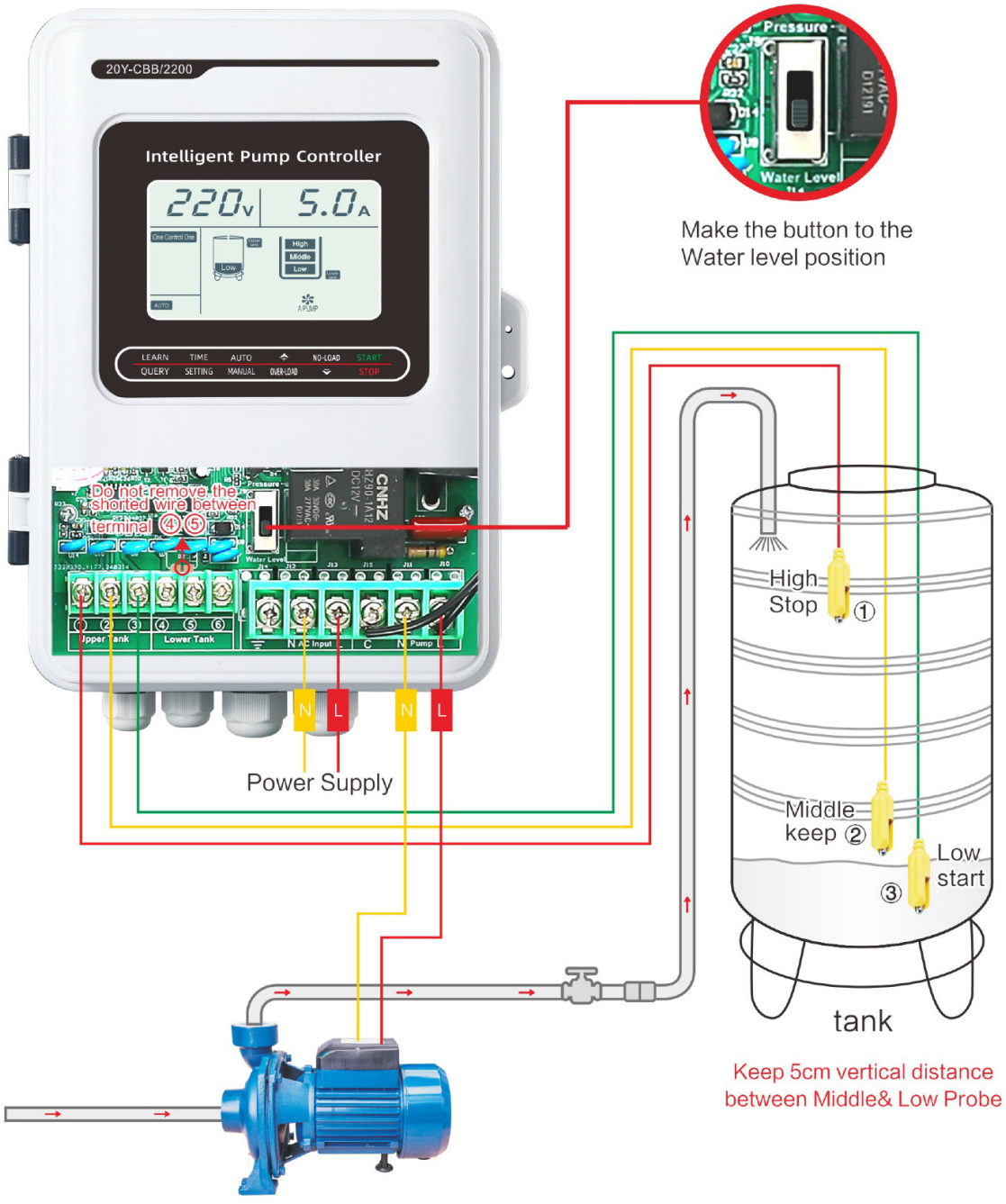
The setting will automatically save after 15 seconds, or press the key to save instantly.

For example, when turning on the water pump during a water shortage, the current displayed is the no-load current of the pump. The no-load protection parameter should be set slightly higher than the water shortage current or slightly lower than the normal operating current.

Parameter Setting Guideline:

Pipeline water shortage current < No-load current < Normal operating current.

Water Supply Probe

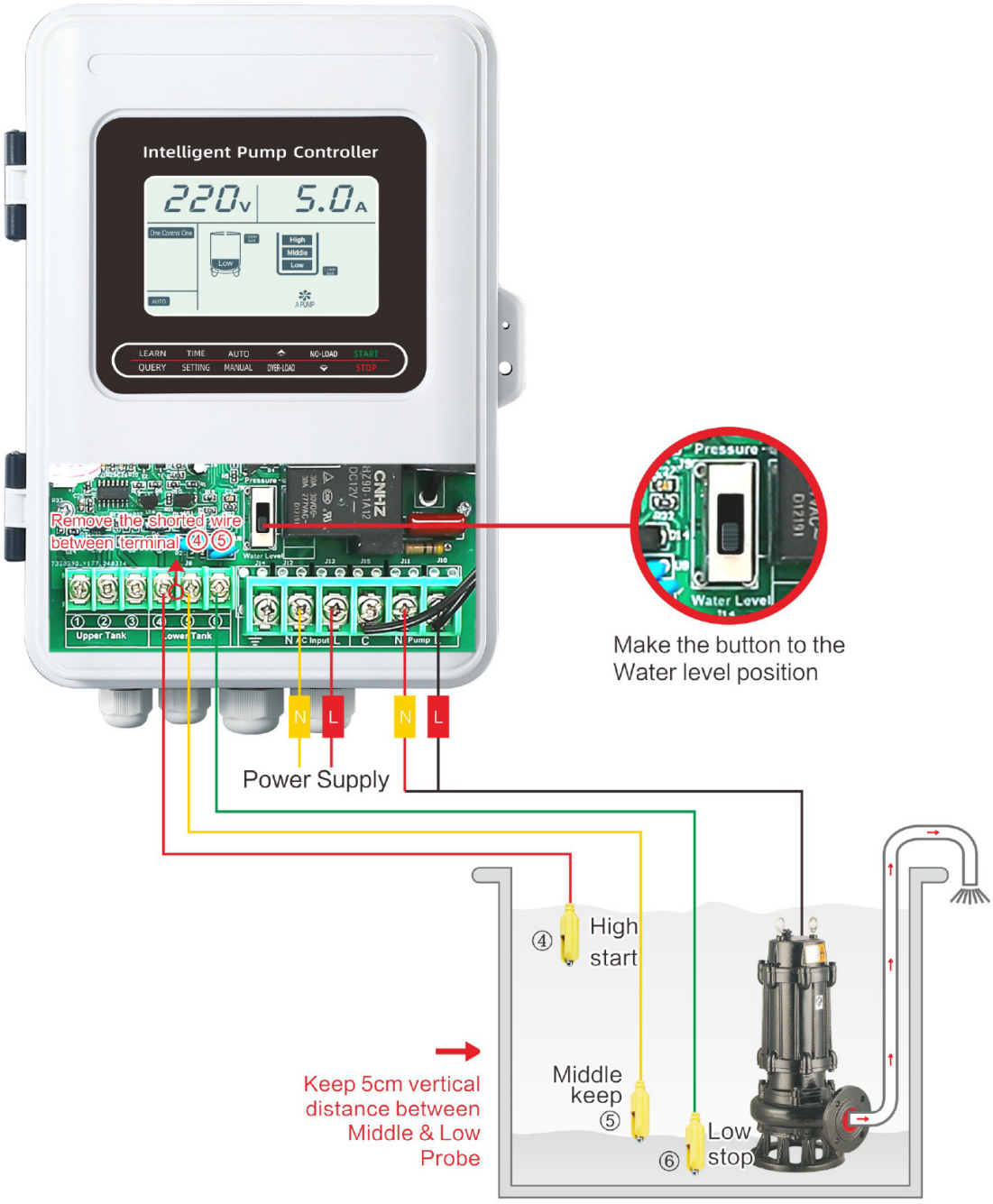


ATTENTION

a. Position the probes at the High, Middle, and Low levels, then connect it to terminals 1, 2, and 3.

b. Low Water Level — START, High Water Level — STOP.

Drainage Probe

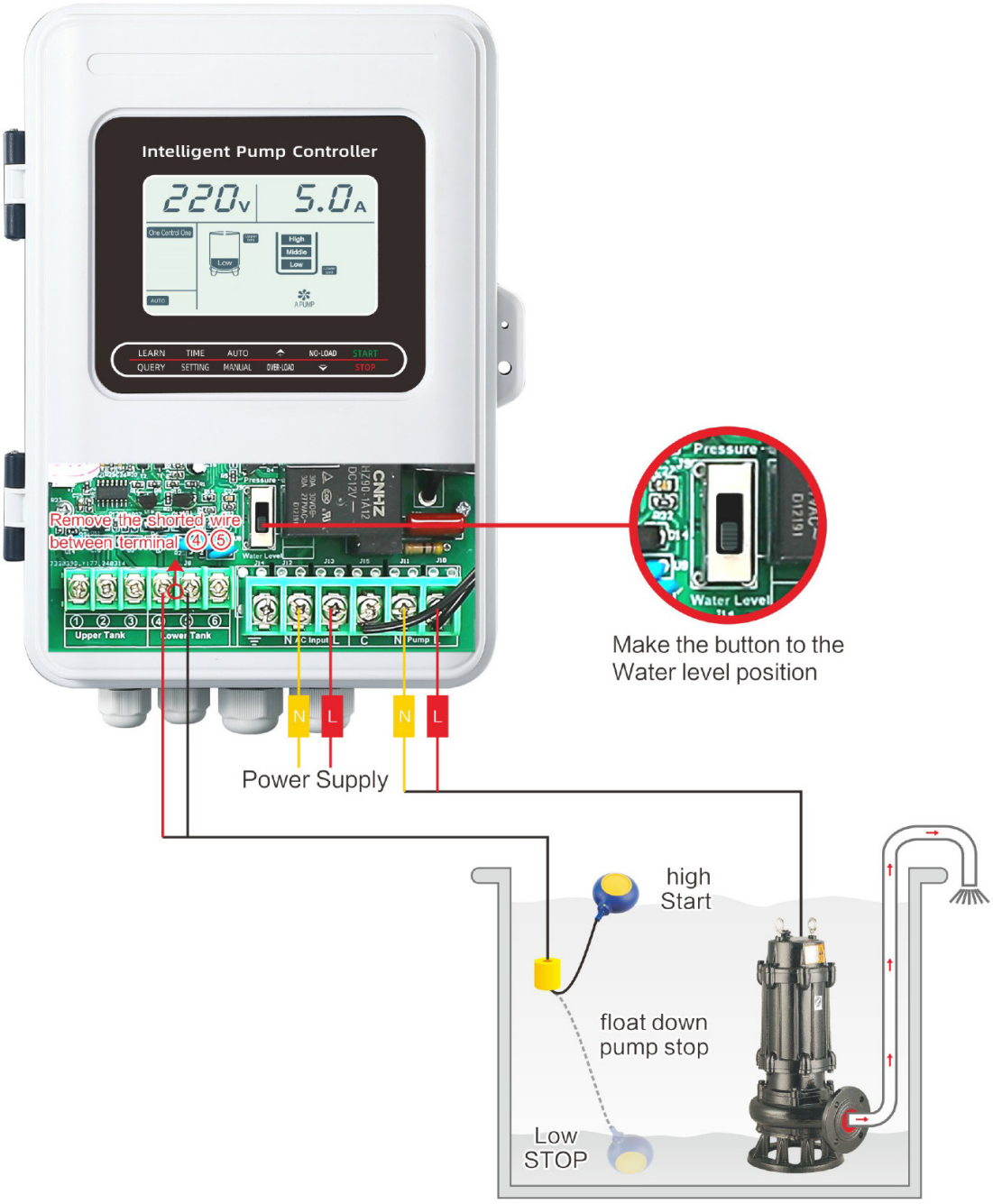


ATTENTION

a. Place the probes at the High, Middle, and Low positions, then connect to terminals 4, 5, and 6.

b. High Water Level — START, Low Water Level — STOP.

Drainage Float Switch

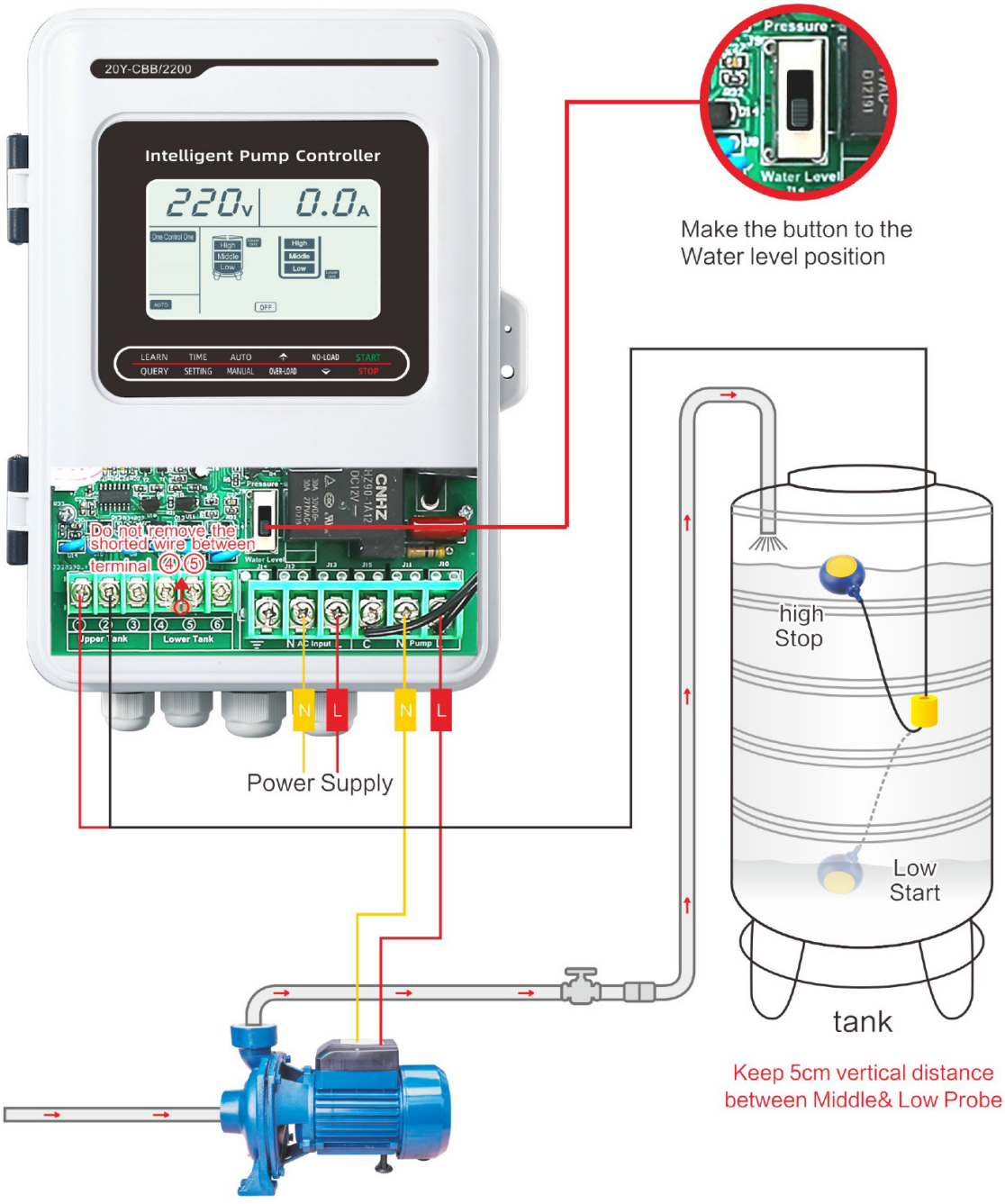


ATTENTION

a. Connect the float wires to terminals 4 and 5 (Red wire to terminal 4, Black wire to terminal 5).

b. When the float is up, the pump starts. When the float is down, the pump stops.

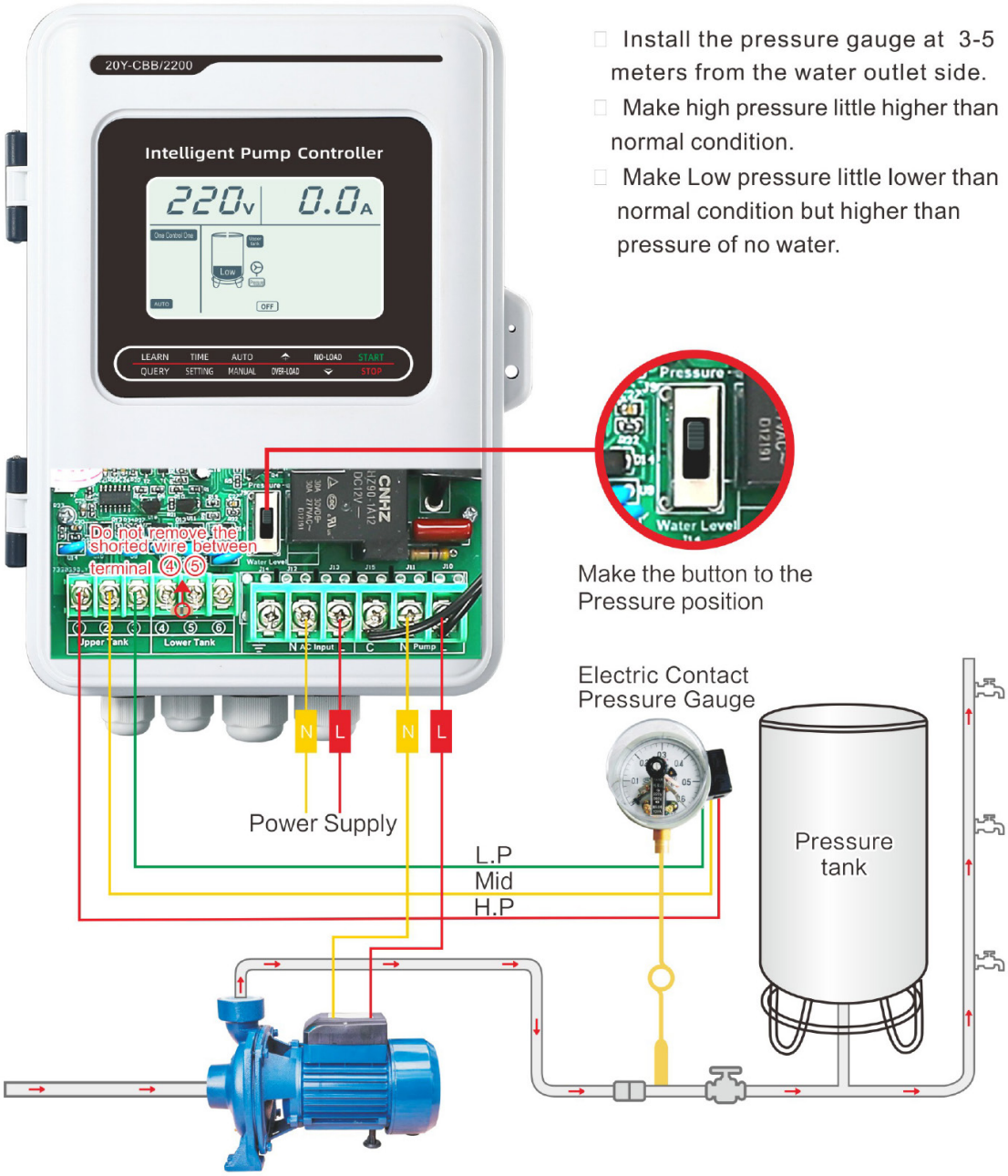
Water Supply Float Switch



ATTENTION

a. Connect the float wires to terminals 1 and 2 (Red wire to terminal 1, Black wire to terminal 2).

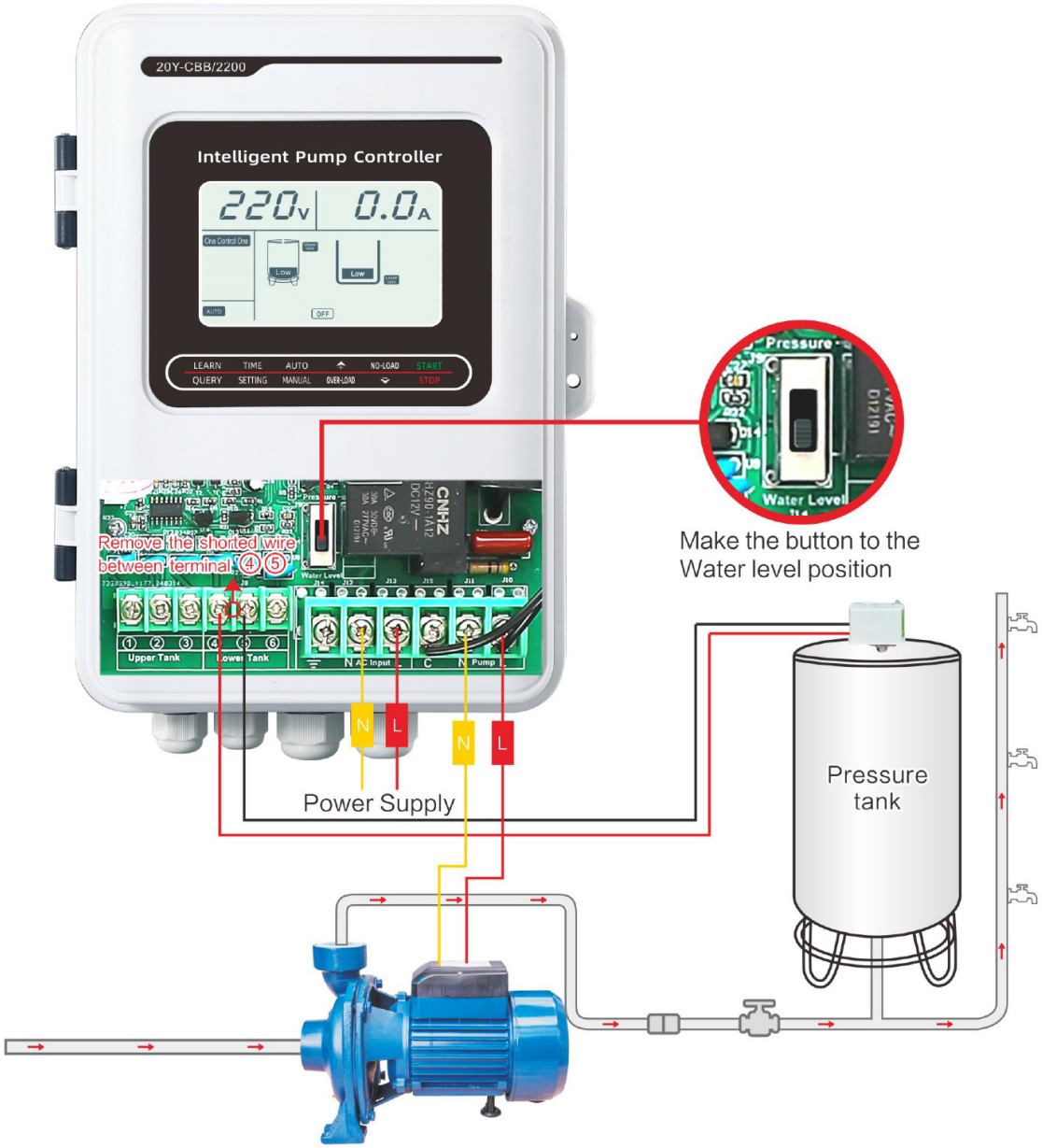
b. When the float is down, the pump starts. When the float is up, the pump stops.



- Install the pressure gauge at 3-5 meters from the water outlet side.
- Make high pressure little higher than normal condition.
- Make Low pressure little lower than normal condition but higher than pressure of no water.

ATTENTION

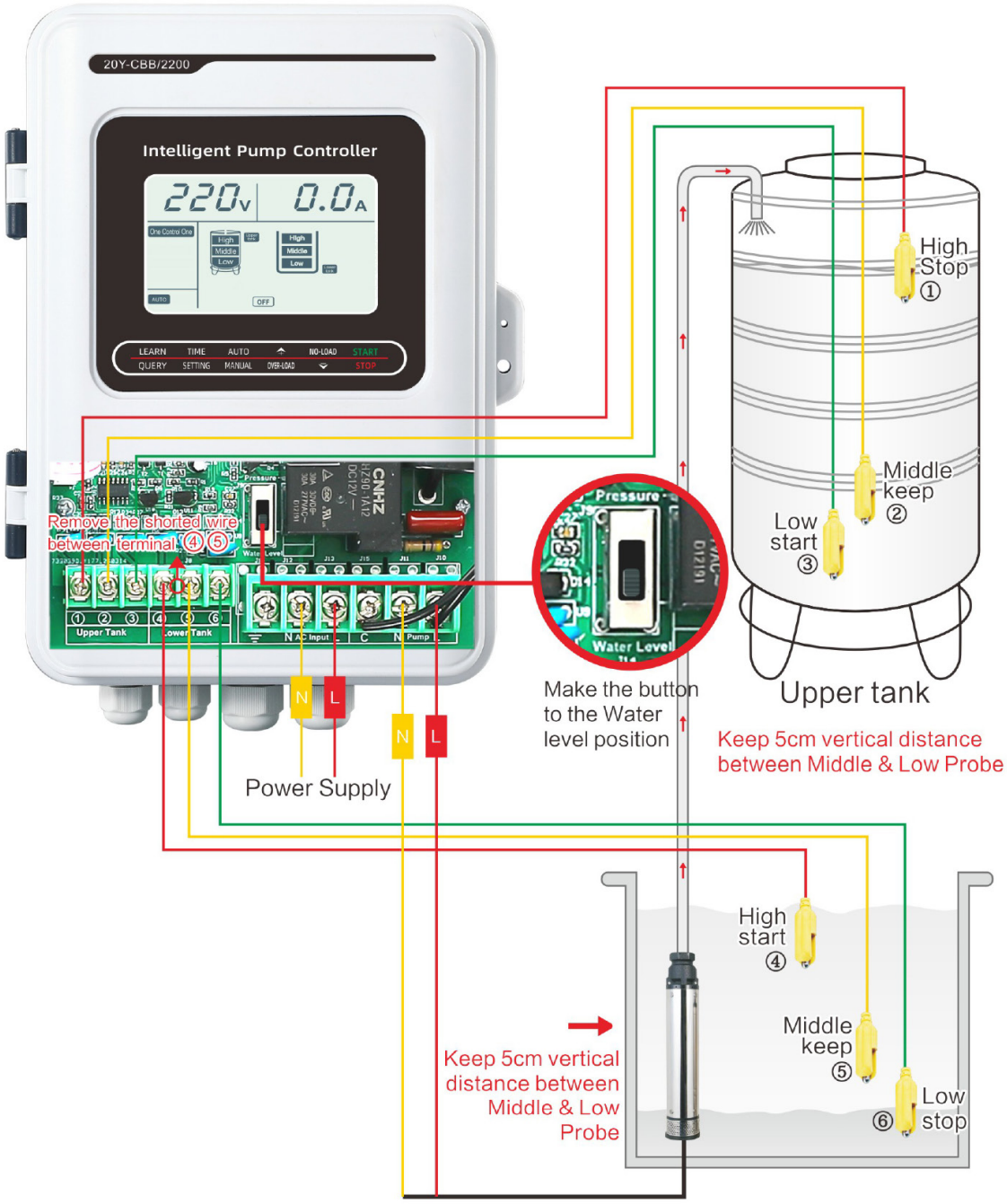
a. Connect the pressure gauge wire to the terminal 1, 2 and 3.
b. Indicator “Middle” - gauge not connected or wrong connection.
c. Indicator “High” - exchange the terminal wire 1 with 3.
d. Indicator “Low” - exchange the terminal wire 2 with 3



ATTENTION

a. If the pressure switch is set to disconnect, the pump will stop. Connect the input and output wires of the pressure switch to terminals 4 and 5.

b. If the pressure switch is set to disconnect, the pump will start. Connect the input and output wires of the pressure switch to terminals 1 and 2.



ATTENTION

a. Position the probe at the High, Middle, and Low levels. Connect the upper tank probe to terminals 1, 2, and 4, and the lower tank probe to terminals 4, 5, and 6.

b. Upper Tank: Starts at low level, stops at high level.
Lower Tank: Stops at low level.

Trouble Shooting

Fault	Possible Cause	Solutions
Pump stops after starting (No-Load light ON)	1. Water shortage 2. Impeller damage 3. Water shortage current parameter set too high relative to pump's operating current.	1. Check water supply. 2. Inspect the water pump. 3. Set the water shortage current lower than the pump's operating current.
Pump stops after starting (Over-Load light ON)	1. The water pump is stalled or blocked. 2. Poor contact on one phase line, or overcurrent set too low relative to pump's operating current.	1. Check the water pump 2. Check the wiring or the controller. 3. Set the overcurrent higher than the pump's normal operating current.
The display screen is not on	1. No power supply or poor wire contact. 2. Controller burnout. 3. Phase loss	1. Check power supply and wiring. 2. Replace controller. 3. Inspect the circuit.
Upper tank water level drops but pump doesn't start automatically	1. Probe/float wire is disconnected, 2. System under protection, 3. Terminal 4, 5, 6 not shorted 4. Controller is in "Manual" mode.	1. Check the probe/float wire. 2. Press the start key to resume automatic operation and verify protection settings. 3. Short terminals 4, 5, 6. 4. Switch the controller to "Auto" mode.
Pump stops under protection (Over/ Under Voltage light ON)	1. The input voltage is too high or too low. 2. Poor contact between input wires and controller.	1. Check the input power. 2. Inspect the input wiring or controller.
Constant alarm, fault flashing	Overload, no-load, overvoltage, or undervoltage protection activated.	Check the set parameters, voltages, circuits, and related components.