



AC/DC Hybrid Pump

v1.2 2025

Operating Safety Instructions

Installation Guidelines

- Do not install equipment in areas prone to flammable materials, explosions, water exposure, or corrosion.
- Avoid installation in locations subject to vibration, shock, or electromagnetic interference. Mount on flame-retardant materials (e.g., metal) and away from heat sources and flammable objects.
- Ensure no debris (e.g., sawdust, metal filings) is present in the frequency converter or radiator to prevent fire hazards.

Wiring Safety

- All wiring must be done by a qualified electrician to prevent electric shock or equipment damage.
- Ensure the power supply is disconnected before wiring to avoid electric shock or fire risks.
- The grounding terminal (PE) must be properly grounded to prevent the inverter casing from becoming charged.
- Avoid contact with main circuit terminals or housing to prevent electric shock.
- Do not touch or manipulate power or motor wires while the controller is operational. Any installation or maintenance must only occur after disconnecting all power for at least one minute.

Earth Leakage Protection Precautions

- High-frequency leakage currents can cause malfunction of the leakage protector. Shorten the lead between the controller and motor and install the leakage protector correctly.
- Install the leakage protector on the input side of the inverter, ideally after the air switch.

Precautions for High-Altitude Areas

In altitudes over 2000 meters, thin air reduces the frequency converter's heat dissipation, leading to higher temperatures and shorter lifespan. Where possible, add external cooling inside the controller distribution cabinet to mitigate this effect.

Use with Unstable Power Sources (e.g. Generators)

Unstable power sources, such as generators, can cause fluctuations in input voltage, triggering undervoltage or overvoltage protection in the controller. To prevent this, install a voltage regulator capacitor board module of the appropriate model (contact us for technical support).

Leakage Protectors

Choose leakage protectors not sensitive to higher harmonics or designed specifically for frequency converters (30mA sensitivity or higher). If using standard protectors, opt for a sensitivity of 200mA or higher, with an operating time of at least 0.1 seconds.

Pump Installation Guidelines

- Ensure proper grounding is completed before operating the water pump.
- Install earth leakage protection and overload or over-current protection devices on the pump.
- Do not allow the electric pump to run dry.
- The water surface must not come into contact with the pump during operation.
- To prevent electrical shock, always disconnect the power source before performing maintenance or cleaning.

Introduction

The deep-well pump is a water-lifting tool that directly connects the electric motor to the pump, suitable for extracting underground water from deep wells, rivers, reservoirs, and canals. It is primarily used for farmland irrigation and drinking water supply in mountainous areas but can also be applied in cities, factories, railways, mines, and construction sites.

Operating Conditions

1. Voltage fluctuation range: $\pm 10\%$ of the rated values.
2. Maximum submersion depth: 120 meters.
3. Maximum water temperature: 35°C.
4. Water pH: between 6.5 and 8.5.
5. Solid content in water: less than 0.25%, with particles not exceeding 2.3mm in diameter.

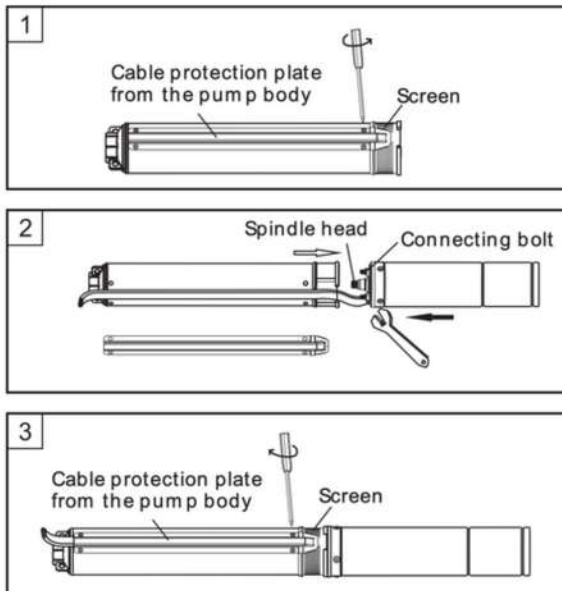
Installation and Precautions

- Ensure the well's diameter is compatible with the pump before installation. For new wells, use an air compressor or old pump to clean debris. Confirm water quality and temperature meet operating conditions before installation.

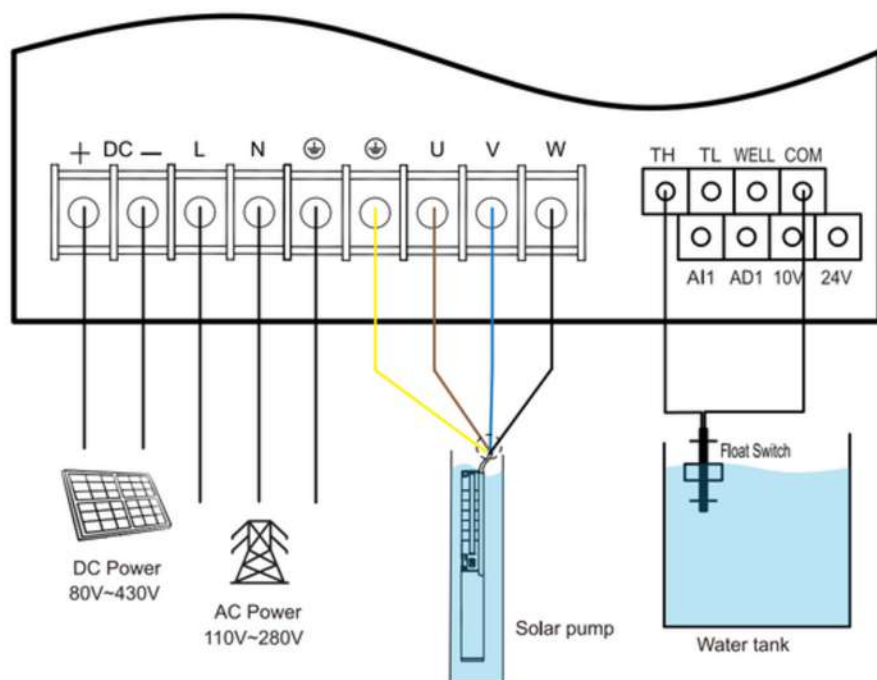
- After unpacking, inspect the pump for any damage caused during transportation or storage. Check if the cable, plug, and joints are intact and secure. Contact a professional for repairs or replacements if needed.
- Secure the pump during installation, and correctly install earth leakage protection, as well as overhear or over-current protection devices. The pump must be properly grounded.

Motor and Pump Body Assembly

When the pump reaches a certain length, the motor and pump body must be packed separately. For separate packing, first remove the filter screen and cable protection plate from the pump body. Place the pump body on the motor, ensuring the spindle head of the rotor slides smoothly into the coupling. Manually rotate the coupling to ensure smooth operation, then tighten the connecting bolt (Figure 2). Finally, reinstall the filter screen and cable protection plate (Figure 3).



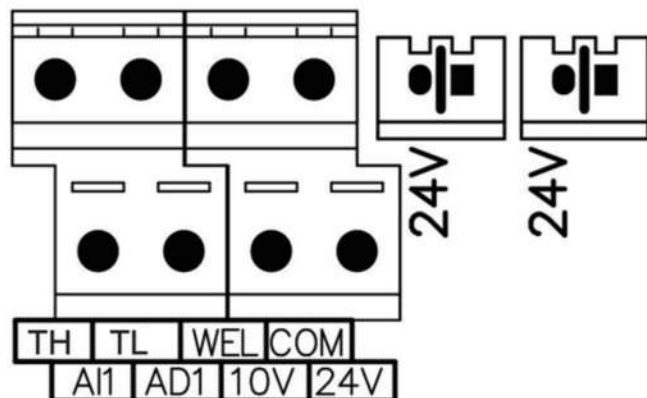
Controller wiring diagram



AC:110~280V DC:80~430V

Terminal type	Terminal identification	Name	Explanation
Input	L、N	Single-phase AC power input terminal	AC220V power connection terminal
	DC+、DC-	DC bus positive and negative input terminals	DC bus power connection terminal
Output	U、V、W	Controller output terminal	Connect three-phase motor
Earth	E	Grounding terminal	Connect ground terminal

Schematic diagram of sensor/signal wiring



Terminal type	Terminal identification	Name	Explanation
Power supply	+10V - COM	+ 10V power supply	Provide + 10V power supply to the outside, maximum output current: 10mA Generally used as an external potentiometer working power supply, potentiometer resistance range: 1K Ω ~ 5K Ω
	+24V - COM	+ 24V power supply	Provide + 24V power supply to the outside, generally used as a working power supply for digital input and output terminals And external sensor power supply, maximum output current: 200mA
Analog input	AD1	Voltage type pressure sensor signal input	Connect 10V, 5V pressure sensor signal input
	AI1	Current type pressure sensor signal input	Connect 4 -20mA pressure sensor signal input
Digital input	TH - COM	Water tank full float interface	1. Input impedance: 2.4K Ω 2. Voltage range when level input: 0V~ 10V
	TL - COM	Tank low float signal	
	WEL - COM	Well position water shortage	

Controller technical parameter specification

Controller model	Input voltage range (V)	Rated input power (kW)	Maximum input current (A)	Solar panel open circuit voltage recommended input range VOC (V)
Multiflow Smart Controller	DC: 80~430 AC: 110~280	2.8	DC: 17A AC: 15A	150-390

Note: Before powering on, be sure to use an instrument to detect the open circuit voltage of the solar panel, or use a series connection to calculate the open circuit voltage of the solar panel. The open circuit voltage of the solar panel must not exceed the maximum input voltage of the controller, otherwise it will cause irreversible damage.







Operation and Display Interface Overview

The operation panel serves as the human-machine interface for the frequency converter. Through this panel, users can modify functional parameters, control operations (start, stop), and monitor the working status of the converter. The layout and functions are illustrated in the accompanying figure.



Display Instructions

Indicator light	On	Flicker	Off
POWER	When there is a power connection	/	No access
DC	When there is photovoltaic access	The controller is working with photovoltaics	No access
WELL	Well water shortage protection	/	Well status is normal
TANK	Water tower full water protection	/	The water tower is in normal condition
V	Current interface display voltage	/	/
R	The current interface displays the speed	/	/
A	Current interface display current	/	/
W	Current interface display power	/	/
MPPT	System enters MPPT.	/	Non-solar mode operation
PID	The system switches to constant voltage mode	/	/
MPA	The system switches to pressure start	/	/
T	The system switches to timing mode	/	/
IOT	Internet signal is full	Flash quickly when the signal is full, and flash slowly when the signal is less than 3 bars	No signal

Button	Name	Function description
	MODE button	Long press the button 2S to enter the menu (PX. X) settings After setting is complete, press this key to exit the menu
	ENTER button	Short press this key in the advanced menu settings to enter the menu screen step by step and confirm the setting parameters
	UP button	Short press the button to increase the setting value of the corresponding parameter
	DOWN button	Short pressing the button can reduce the set value of the corresponding parameter
	SWITCH button	Short press this button to switch the display content, which will be switched in the following order: Input voltage > Input current > Input power > Operating speed
	ON/OFF button	Short pressing the button can control the start and stop of the equipment, and short pressing can reset the fault in the fault state

Operation Modes

This series of frequency converters provides four control modes: *speed control mode*, *constant pressure control mode*, *pressure start-stop*, and *timing mode*. The control mode can be switched directly by pressing the (set + switch) button at the same time. The basic panel operation is as follows:

Control the operation and shutdown of the frequency converter through the power button. Adjust the operating speed or target pressure setting value through up and down buttons. Press the Settings button and the Up button simultaneously to switch between AC mode, DC mode, Auto mode, and Hybrid mode.

Fault reset: When a fault occurs, press the power button to reset the fault.

Operation Mode Description

Speed Control Mode

Device Startup

- Press the button to start: When the water pump is in the shutdown state, briefly press the power button to start the motor.
- Fault self-recovery startup: When the controller is in a fault state, if the fault recovery time has passed, the controller will clear the fault and restart the motor.

Equipment Shutdown

- Button stop: Press the power button to stop the motor.
- Fault shutdown: If the controller detects a fault while running, it will immediately shut down the equipment.

Speed Setting

- Target speed setting: In speed control mode, use the up and down buttons to quickly adjust the target speed.

Speed Mode Display Status Switch List

- Short press the switch key to toggle between different displays in the following order: input voltage → input current → input power → operating speed.

Constant Voltage Control Mode (only effective in AC power mode)

Device Startup

- Constant pressure start: Short press the power button to put the water pump in standby mode. If the pressure is lower than the starting pressure, the water pump will start automatically.
- Fault self-recovery start: When the controller is in a fault state, once the fault recovery time is reached, the water pump enters standby mode and starts automatically if the pressure is lower than the starting threshold.

Equipment Shutdown

- Button stop: Press the power button briefly to generate a stop command, and the motor will slow down and stop.

- Constant pressure shutdown: In constant pressure control mode, the pump will automatically shut down when the return pressure reaches the shutdown pressure or the outlet valve is closed.
- Fault shutdown: If a fault is detected during operation, the controller will immediately shut down the equipment.

Constant Pressure Setting

Target pressure setting: When the controller is in constant pressure control mode, short press and up and down buttons can quickly adjust the target pressure (Unit: Bar)

Constant Voltage Control Function Parameter Setting Instructions

- Target Pressure Setting: When in constant pressure control mode, use the up and down buttons to quickly adjust the target pressure (Unit: Bar).
- Display Switch: Press the button to switch the display content in the following order:
 - Current pressure (Unit: Bar) → Input voltage → Input current → Input power → Operating speed.

Constant voltage control function parameter table			
Function code	Parameter	Default value	Remarks
P2.0	Operation mode setting	0	0: Speed control mode 1: Constant pressure control mode 2: Cycle timing mode 3: Pressure start -stop mode
P2.1	Sensor model setting	4	0:4 -20mA range 10Bar; 1:0 -10V range 10Bar; 3:4 -20mA range 16Bar; 4:0 -10V range 16Bar; 6:4 -20mA range 25Bar; 7:0 -10V range 25Bar;
P2.9	Target pressure setting	3.0	Unit: Bar
P4.0	Lower limit of sensor input	0	Current type unit: mA; Voltage type unit: V Please enter the pressure sensor nameplate information
P4.1	Sensor input limit	10.00	Current type unit: mA; Voltage type unit: V Please enter the pressure sensor nameplate information
P4.2	Pressure correction factor percentage	100	Unit:%

Note: P2.0 and P2.1 are required settings. P2.0 must be set to 1, and P2.1 must be set according to the actual sensor model used.

Mode Example:

- Step 1: When the controller is powered off, connect the pressure sensor correctly, then power on the controller.
- Step 2: Enter the function code parameter settings. First, press the confirm key to enter P0.0 and set the parameter value to 12 to obtain modification permission. Then, set P2.0 to constant pressure control mode. Check if the parameters in P2.1, P4.0, and P4.1 match the pressure sensor nameplate information. If they do not match, adjust them according to the nameplate.
- Step 3: After setup, return to the monitoring interface. The display will show the current pressure value. Compare the displayed pressure with the reading on the pressure gauge. If they do not match, fine-tune the parameters in the P4.2 function code.
- Step 4: Use the up/down buttons to set the target pressure value for constant pressure.
- Step 5: Press the power button to start the pump. Wait for the pressure on the display to rise to the target value, then compare it with the pressure gauge reading. If they are inconsistent, fine-tune the parameters in P4.2.
- Step 6: Once set, press the switch key to view other running status variables while in operation.

Constant voltage sleep function parameter table			
Function code	Parameter	Default value	Remarks
P4.3	Constant pressure sleep enable	1	0: not enabled 1: enabled
P4.4	Sleep speed	2000	Unit: r/min
P4.5	Sleep detection cycle time	60	Unit: seconds
P4.6	Percentage of dormancy deviation pressure	2.0	Unit: %
P4.7	Wake-up deviation pressure percentage	10.0	Unit: %
P5.0	Sleep low -speed hold time	30	Unit: seconds
P5.1	Sleep judgment pressure percentage	5.0	Unit: %

Brief Description of Constant Pressure Sleep Process:

(1) **Sleep Shutdown**

When the constant pressure sleep function (P4.3) is activated, after detecting that the current operating speed is below the set sleep speed (P4.4), the system waits for the sleep detection time (P4.5) for n seconds to assess the sleep pressure. If the deviation between the current pressure and the set pressure is less than the sleep deviation percentage (P4.6), the system will initiate the sleep process, reducing the pump's operating speed to 1000 rpm. After maintaining this low-speed for the low-speed holding time (P5.0) for n seconds, if the percentage change in the current pressure value is less than the sleep threshold percentage, the controller will completely enter sleep mode and stop.

(2) **Sleep Start**

In the sleep state, if the user starts using water and the current pressure value drops by more than the wake-up deviation pressure percentage (P4.7), the controller will exit the sleep shutdown state and restart.

Constant pressure overpressure protection threshold setting instructions

Over-Pressure protection threshold parameter table			
Function Code	Parameter	Default Value	Remarks
P4.8	Over-Pressure protection threshold	3.0	Unit: Bar

Overpressure Protection Process Summary:

If no pressure tank is installed, or the tank capacity is too small, closing the valve quickly at the water end can lead to output overpressure and overshoot. When the current pressure exceeds the target pressure by more than the overpressure protection threshold (P4.8), the controller will automatically stop the machine to protect it.

Pressure Switch Mode (only effective in AC power mode)

Device Start-up

- Loading Pressure Start: Briefly press the power button to put the water pump in standby mode. If the current pressure falls below the set loading pressure, the pump will automatically start.
- Fault Self-Recovery Start: When the controller is in a fault state, and the fault recovery time is reached, the pump enters standby mode. If the pressure is detected to be lower than the set loading pressure, the pump will automatically restart.

Equipment Shutdown

Button Stop:

- While the controller is running, briefly pressing the power button will issue a stop command, and the motor will gradually slow down and stop.

Unloading Shutdown:

- In pressure switch mode, if the detected pressure exceeds the set unloading pressure, the water pump will automatically shut down.

Fault Shutdown:

- If a fault is detected while the controller is running, the system will immediately shut down the water pump.

Unloading Pressure Setting:

- When the controller is in pressure switch mode, press the up and down buttons briefly to quickly adjust the unloading pressure. (Unit: Bar)

Timing Control Mode (only effective in AC power mode)

- This mode allows for automatic cyclic start-stop of the electric pump, with the timing unit set in hours.

Device Startup

Timed Start:

- To initiate the water pump in standby mode, briefly press the power button. If the timing cycle's shutdown period has ended and the pump has been running for less than the set operating time, the water pump will automatically start.

Fault Self-Recovery Start:

- If the controller is in a fault state, but the fault recovery time has been reached, the pump will enter standby mode. If the pump has not yet completed its set operating time for the timing cycle, it will automatically start again.

Equipment Shutdown

Button Stop:

- While the controller is running, briefly pressing the power button will issue a stop command, and the motor will gradually slow down and stop.

Scheduled Shutdown:

- When the controller is in timing control mode and the current running time exceeds the set timing period, the water pump will automatically shut down. During the scheduled shutdown time, the pump will remain off.

Fault Shutdown:

- If a fault is detected while the controller is running, the system will immediately shut down the water pump.

Timing Cycle Settings

1. P3.1: Defines the running time for the cycle (continuous operation).
2. P3.2: Defines the stop time for the cycle (continuous stop period).

Timing function parameter table			
Function code	Parameter	Default value	Remarks
P3.1	Timing period: running time	8.0	Unit: hour
P3.2	Timing period: stop time	0.0	Unit: hour

Power Supply Mode Overview

Independent Solar Power Operation

When running on solar power, the pump's speed varies depending on the power available from the solar panels. The system tracks the solar panel's maximum power (MPPT). If sunlight increases, the pump's speed increases. If sunlight decreases, the pump's speed drops. However, the pump's speed will not exceed the set target speed.

If the solar power supply becomes too weak to start or run the system, the voltage will drop quickly. If it stays below the system's minimum voltage for 10 seconds, the system will show a low power fault ("PL"). The system will attempt to restart five times, with a 10-second interval between each attempt, and then every 10 minutes thereafter.

Display and Control Features

Press the button briefly to cycle through the following display options:

- Remaining time (hours) for timed mode
- Input voltage
- Input current
- Input power
- Operating speed

Timing Mode Indicator

- Power indicator always on: When displaying the remaining time for the running cycle in timed mode.
- Power indicator flashing: When displaying the downtime during the timing cycle.

When using AC power as the independent supply, the system operates without reliance on other power sources.

Switching from Solar to AC Power

When the controller is set to solar mode but detects an AC power supply at the AC port, it monitors the solar input. If the solar input power falls below a set threshold for 60 seconds, the system will automatically switch to AC power.

Switching from AC to Solar Power

When the controller is in AC mode and detects a solar power supply at the DC port, it monitors the solar input voltage. If the solar voltage exceeds the set threshold and the waiting time surpasses the switching time, the system will switch to solar power operation.

AC/DC Switching Parameters Table

To operate correctly, the power supply input must be connected to both the solar and AC power sources.

In AC mode, the pump can work in three modes:

- **Speed Control Mode:** The pump speed is directly controlled by the target speed set by the controller.
- **Constant Pressure Control Mode:** The pump's speed is adjusted based on the target pressure.
- **Timing Control Mode:** The speed is controlled by a timer.

When operating in solar mode, if AC power is available, the controller monitors the solar input power. If the solar power drops below a set value (for more than 60 seconds), the system switches to AC power mode.

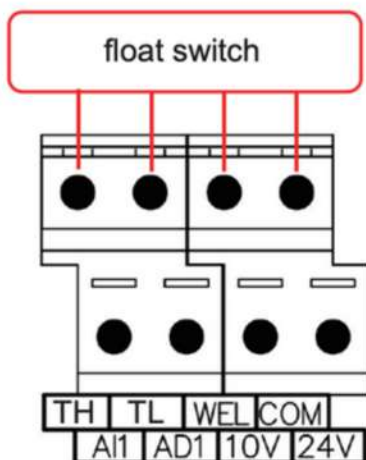
Similarly, when operating in AC mode, if solar power is available, the controller will check the solar voltage. If it is higher than the set threshold and the waiting time exceeds the switching time, it will switch to solar mode.

AC/DC Switching Parameters

- **Model:** Multiflow Smart Controller (Intelligent Controller)
- **Switching Voltage to Solar Power:** 80V
- **AC Power Switching:** 200W
- **Switch to Solar Power Waiting Time:** 15 minutes

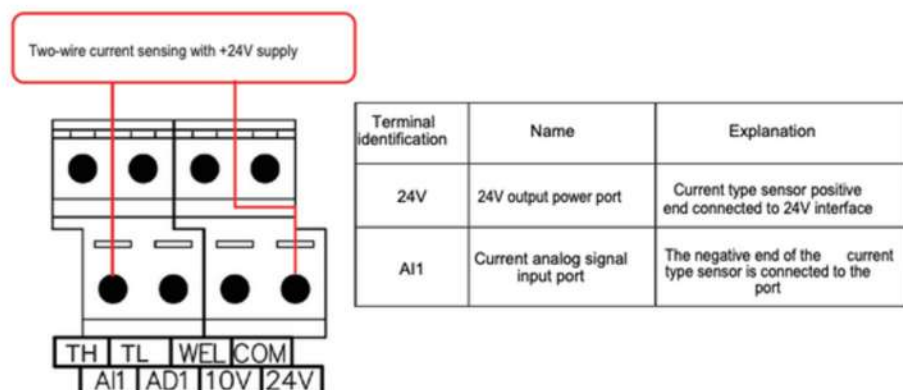
Low-Light Protection

When the controller is in solar (DC) mode, the low-light sleep speed (P6.1) is enabled. If the pump's speed drops below 600 rpm, the pump will enter low-light protection mode, reducing or stopping operation to prevent damage.

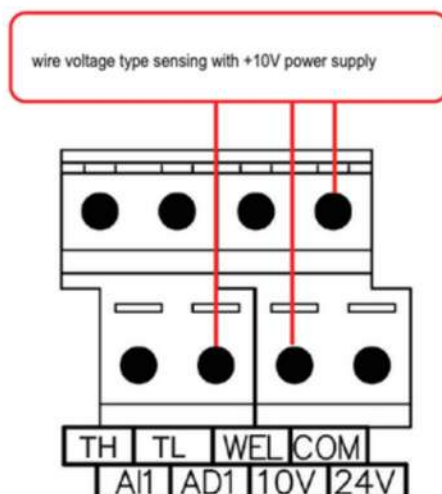


Terminal identification	Name	Explanation
TH (H)	High-water float	TH is connected to one end of the switch, and COM is connected to the other end of the switch. When the switch is closed, the motor stops and the system enters a high water level protection state. When the switch is OFF, the high water level protection state is eliminated.
TL (L1)	Low-water float	TL is connected to one end of the switch, and COM is connected to the other end of the switch. When the switch is closed, the system will jump from other water level states to low water level states and immediately start the motor. When the switch is OFF, the low water level state is eliminated.
WEL	Well -site water - deficient float	WEL is connected to one end of the switch, and COM is connected to the other end of the switch. When the switch is closed, the motor stops and the system enters the well water shortage protection state. When the switch is off, the water shortage state of the well is eliminated.

Schematic diagram of constant voltage control wiring using 20mA current type pressure sensor



Schematic diagram of constant voltage control wiring of voltage-type pressure sensor with 10V power supply



Terminal identification	Name	Explanation
10V	10V output power port	The positive end of the voltage sensor is connected to the 10V interface
AD1	Current analog signal input port	Voltage type sensor output connected to AD1 port
COM	Weak signal GND port	Voltage type sensor GND port to COM port

Controller Function Parameter Summary

Group C Parameters

function code	name (of a thing)	factory value	
C0.0	Display RPM	/	Unit: V
C0.1	Display output current	/	Unit: A
C0.2	Display Input AC Voltage	/	Unit: V
C0.3	Display of input PV voltage	/	Unit: V
C0.4	Display busbar DC voltage	/	Unit: V
C0.5	Display input power	/	Unit: kW
C0.6	Display output voltage	/	Unit: V
C0.7	Displays an estimate of the input current	/	Unit: A
C0.8	Display IPM temperature	/	Unit: °C
C0.9	Cumulative PV runtime	/	Unit: hour
C1.0	Cumulative utility runtime	/	Unit: hour
C1.1	Cumulative photovoltaic power generation	/	Unit: kWh
C1.2	Cumulative photovoltaic power generation	/	Unit: mWh
C1.3	Cumulative fault enquiry	/	The last 5 fault codes can be queried by pressing the up and down buttons, NULL means no fault occurs. NULL means no fault occurred. In this screen, long press SWITCH to clear the fault record.

Controller Function Parameter Summary

Group P Parameters

Function code	Name	Factory Value	Clarification
P0.0	User Modification Purposes	0	12: getting permission to modify 21: Reset to default settings
P0.1	Software Dry Rotation Protection	1	0: Disabled 1: Enable
P0.2	Power Supply Mode	0	0: Auto Identification 2: Solar Power 3: AC Power Supply 4: Mixed Mode
P0.3	Voltage protection return value	5	2-40V
P0.4	DC undervoltage protection value	80	Unit: V
P0.5	Dry Run Power Point 1	Model Specific	600 RPM
P0.6	Dry Run Power Point 2	Model Specific	1800 RPM
P0.7	Dry Run Power Point 3	Model Specific	2400 RPM
P0.8	Dry Run Power Point 4	Model Specific	5000 RPM Unit: W
P0.9	Setting the operating speed	4000	Unit: Rpm
P1.0	Motor operation status after power on	2	0: Default motor stop 1: Default motor start 2: Perform according to state before power failure
P1.1	Setting maximum power	Model Specific	Unit: KW
P1.2	Motor steering setting	1	0: Default steering 1: Opposite to default steering
P1.3	DC switching voltage threshold	Model Specific	Unit: V
P1.4	DC switching AC Power Threshold	Model Specific	Ac220 Unit: W
P1.5	Time between switching from AC to DC mode	15	Unit: Minute
P1.8	Maximum power setting in AC power mode	Model Specific	AC2.2 Unit: kW
P1.9	Dry pumping protection. Failure recovery time	0.25	Unit: Hour
P2.0	Operation mode setting	0	0: Speed control mode 1: Constant pressure control mode 2: Cycle timing mode 3: Pressure start-stop mode
P2.1	Sensor model setting	4	0: 4-20mA range 10Bar; 1: 0-10V range 10Bar; 3: 4-20mA range 16Bar; 4: 0-10V range 16Bar; 6: 4-20mA range 25Bar; 7: 0-10V range 25Bar

Function code	Name	Factory Value	Clarification
P2.9	Target pressure setting	3	Unit: Bar
P3.1	Timing cycle: running time	8	Unit: hour
P3.2	Timing cycle: stopping time	0	Unit: hour
P3.3	Number of automatic recovery from overcurrent faults	0	Unit: times (setting range 0-5)
P3.5	TH Protection Failure Recovery Time	0.25	Unit: hour
P3.6	TH Protection Failure Recovery Temp	80	Unit: °C
P3.7	Driver module temperature protection enable	1	0: not enabled, 1: enabled
P4.0	Sensor input lower limit	0	Please input according to the sensor's nameplate (Unit: mA; V)
P4.1	Sensor input limit	10	Please input according to the sensor's nameplate (Unit: mA; V)
P4.2	Percentage pressure correction factor	100	Adjust according to the sensor's nameplate (Unit: %)
P4.3	Constant Voltage Sleep Enable	1	0: not enabled, 1: enabled
P4.4	Dormant RPM	2000	Unit: r/min
P4.5	Dormant detection cycle time	60	Unit: seconds
P4.6	Hibernation Deviation Pressure Percentage	2	Unit: %
P4.7	Wake-up deviation pressure percentage	10	Unit: %
P4.8	Overpressure protection threshold	3	0: not enabled, 1: enabled (Unit: Bar)
P4.9	Sensor disconnection protection enable	1	Unit: seconds, 0: not enabled, 1: enabled
P5.0	Hibernation low hold time	30	Unit: seconds
P5.1	Hibernation judgement pressure percentage	5	Unit: seconds
P5.2	Constant pressure mode acceleration time	5	Unit: seconds
P5.3	Constant pressure mode deceleration time	20	Unit: seconds
P5.4	Constant pressure ring KP proportional gain	0.6	
P5.5	Constant pressure ring KI proportional gain	0.6	
P5.6	TH logic level	0	0: Default logic, 1: Opposite to default logic
P5.7	TL logic level	0	0: Default logic, 1: Opposite to default logic
P5.8	WEL logic level	0	0: Default logic, 1: Opposite to default logic
P5.9	Backwater protection enable	1	0: not enabled, 1: enabled
P6.0	Minimum system operating speed	1000	Unit: RPM

P7.0	Synchronous motor type selection	Default Model	0: Synchronous motor, 1: Asynchronous motor
P7.2	Frequency converter carrier frequency	6	Unit: KHz
P7.8	Maximum adjustable speed setting of synchronous machine	Determined by model	Unit: RPM
P7.9	IoT communication options	1	0: Domestic version, 1: Foreign version

Fault alarm and troubleshooting instructions

Type of failure			
Fault code	Fault description	Failure causes and solutions	Recovery process
P0	Hardware overcurrent	<ol style="list-style-type: none"> 1. Short circuit in controller output loop 2. Controller drive module exception 3. Starting the rotating motor 4. Check whether there is an open circuit in the UVW three phase, and repeat it after power failure New wiring to ensure UVW installation is normal 5. After power failure, remove the motor wire and restart the control <p>If the P0 fault is still reported, the controller hardware is damaged</p>	Automatically cleared after the first 5 30s. Try again in 30 minutes Start
P43	Output phase loss protection	<ol style="list-style-type: none"> 1. There is a short circuit in the UVW three -phase of the motor, reconnect after power failure Line to ensure reliable UVW contact 	Automatically cleared after the first 5 30s. Try again in 30 minutes Start
P44	Startup failed	<ol style="list-style-type: none"> 1. Check the pump body impeller for foreign matter, the motor load is No exception 	
P45/P47	Out-of-step protection/ overspeed protection	<p>Motor model does not match, choose the matching water pump The extension cord of the water pump is too long, reduce the extension cord The water pump bearing is stuck, clean the water pump bearing</p>	

PL	Low voltage protection/insufficient power	<p>1. The voltage input is too low, refer to the electrical characteristics of the corresponding model Normal distribution</p> <p>2. Solar panel selection error, refer to the recommendation and proceed correctly Optional</p>	<p>Automatically cleared after the first 5 30s. Try again in 30 minutes Start</p>
P51	High voltage protection	<p>1. If the voltage input is too high, refer to the electrical characteristics of the corresponding model Normal distribution</p>	<p>Voltage returns to normal, clear immediately Except</p>
P48	Dry turn protection/off load protection	<p>1. If the air in the water pump is not completely drained, cut off the power supply, turn on the power again after 30 seconds, and start the water pump drainage</p> <p>2. The operating power of the motor is lower than the set dry rotation protection power value. Adjustable menu P0.5~ P0.8 setting power value</p>	<p>The first three times will be automatically cleared after 60s, and then determined by the time set by P1.9. After the time is up, the fault will be cleared and restarted</p>
P60	High temperature protection	<p>1. The MCU temperature in the controller exceeds 85 °C</p>	<p>Automatically clear after normal temperature</p>
P46	Stall protection	<p>1. Motor model does not match, choose the matching water pump</p> <p>2. The extension cord of the water pump is too long, reduce the extension cord</p> <p>3. Low power supply, increase power supply</p> <p>4. The water pump bearing is stuck, clean the water pump bearing</p>	<p>Automatically cleared after the first 5 30s. Try again in 10 minutes Start</p>

P59	Power supply mode selection exception	<p>1. When the controller selects the power supply mode set by P0.2, it cannot</p> <p>If the corresponding power input is detected, the fault code will be reported. Please</p> <p>Confirm whether the power supply mode selection matches the controller wiring</p>	Automatically clear after fault recovery
P1	Backwater protection	<p>1. The motor pump body is in the process of backwater reversal, please wait for the return</p> <p>Water ends and restarts.</p> <p>2. If the pipeline is not in the return water state, or the return water time exceeds</p> <p>If the fault is still reported after 10 minutes, please check the motor output UVW.</p> <p>Whether there is leakage or short circuit with the earth.</p>	<p>The first 5 faults are continuously displayed</p> <p>After 90S, it automatically clears and duplicates</p> <p>Start, then try every 30 minutes</p> <p>Restart</p>
P63	Pressure sensing overpressure protection	<p>1. Check whether the constant pressure setting pressure is set normally</p> <p>2. Check if the pressure sensor circuit is connected abnormally</p>	After the pressure is restored, the fault is eliminated
P64	Pressure sensing disconnection protection	<p>1. Check if the pressure sensor model selection is correct</p> <p>2. Check if the pressure sensor circuit is connected abnormally</p>	After the pressure feedback returns to normal,

Notes:

[illegible]

