

**VEICHI**

# **SOLAR PUMP**

## INSTRUCTION BOOK



**Solar Water Pumping System  
Hybrid AC/DC Manual**

### Description



The DC/AC Hybrid solar inverter is an off-grid solar inverter which support AC & PV input together. It can be connected to the grid or a generator as complementary or back-up power during solar panel power weakness.


It is designed for continuous as well as intermittent operation. The system is suitable for various water supply systems including irrigation.



### Features

- IP65 designed for outdoor solar pumping system.
- MPPT software up to 99% efficiency
- Integrate multiple protection functions to extend service life
- Support AC & PV input together, AC bypass function.
- Support 220V, 3-phase AC pump
- BLDC special voltage pump (110V, 150V, 220V, 300V)
- Wide working voltage: AC input: single phase 85-300V, DC input: 80-430V
- Long distance pump automatic stop/start without float switch-wirelessly
- GPRS remote control pump stop/start by web/phone

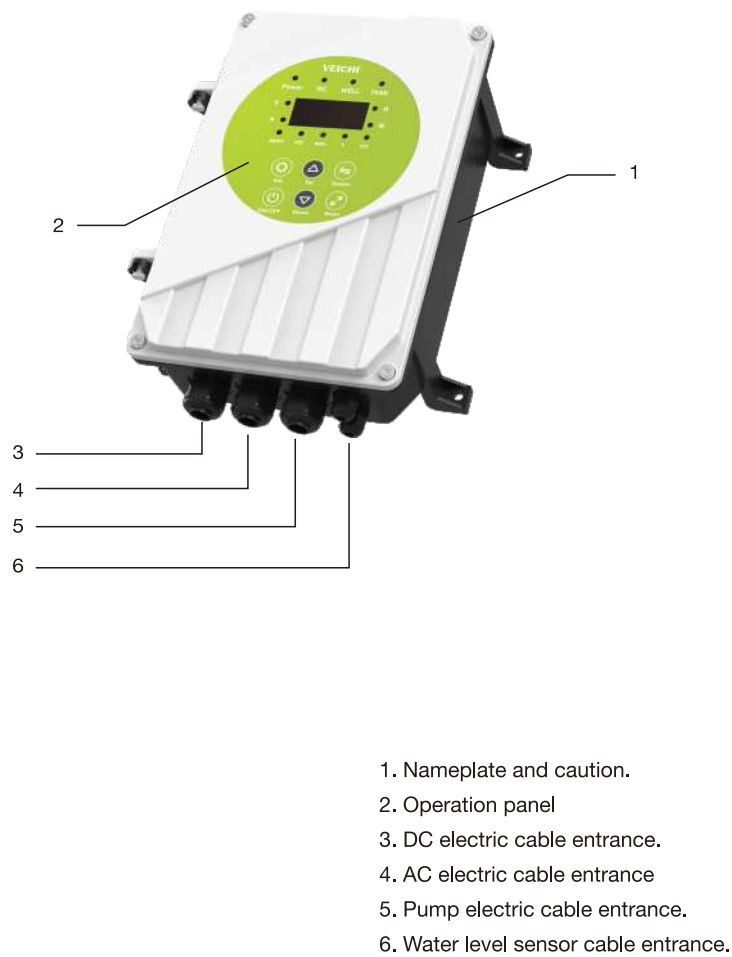
### Controller installation

Before installation	
 Note	<ol style="list-style-type: none"><li>1. If you find that water has entered the control system, parts are missing or parts are damaged when unpacking, please do not install it!</li><li>2. When handling, it should be lifted with care, otherwise there is a danger of damage to the equipment!</li><li>3. Please do not use a damaged controller or an inverter with missing parts, as there is a risk of injury!</li><li>4. This device has been tested to withstand voltage before leaving the factory. No withstand voltage test can be performed on any part of the controller, and high voltage may cause damage to the insulation and internal components of the controller!</li></ol>
During installation	
 Note	<ol style="list-style-type: none"><li>1. Do not twist the fixing bolts of the components at will, especially the bolts with red marks!</li><li>2. It is strictly forbidden to modify the controller. The modified controller may cause electric shock. If the product is modified without authorization, the company will not take any responsibility!</li><li>3. Non-electrical construction professionals are not allowed to perform installation, maintenance, inspection or component replacement, otherwise there is a risk of electric shock!</li><li>4. Do not install transformers and other devices that generate electromagnetic waves or interference around the controller, otherwise it will cause malfunction of the controller. If such equipment is to be installed, a shielding plate should be installed between it and the controller!</li></ol>

During installation	
 Note	<ol style="list-style-type: none"><li>1. Do not perform wiring work when the power is turned on, otherwise there will be a risk of electric shock. Disconnect power to all equipment before performing inspections. Even if the power is cut off, there is residual voltage in the internal capacitor. After cutting off the power, please wait at least 10 minutes!</li><li>2. The contact current of the controller is greater than 3.5mA, please ensure that the controller is well grounded, otherwise there will be a risk of electric shock!</li><li>3. Please connect the output terminals U, V, W of the controller to the input terminals U, V, W of the pump respectively. At this time, be sure to make the phase sequence of the electric pump terminal and the controller terminal consistent. If the phase sequence is inconsistent, it will cause the motor to rotate in reverse!</li><li>4. Do not connect the power supply to the output terminals of the controller. Otherwise, it will cause damage to the controller, or even cause a fire!</li><li>5. Before turning on the power supply of the controller, please confirm whether the voltage of the control cabinet is consistent with the power supply voltage!</li><li>6. It is strictly forbidden to connect the input power to the output terminals (U, V, W) of the inverter. Otherwise, the controller may be damaged!</li><li>7. Please comply with local standards and take certain protection measures for branch circuits and short circuit circuits. Inadequate protective measures may result in damage to the controller!</li><li>8. Do not share the ground wire with welding machines or power machines that require high current, otherwise it will cause malfunction of the controller or machine!</li><li>9. When using multiple controllers, be careful not to make the grounding wire looped. Otherwise, it will cause malfunction of the controller or machine!</li><li>10. If the machine is visibly damaged or has parts missing, do not connect or operate it!</li><li>11. Please leave wiring, inspection, etc. to professionals!</li></ol>

After power on	
 Note	<ol style="list-style-type: none"><li>1. Do not touch any input and output terminals at will after power on, otherwise there will be danger of electric shock!</li><li>2. Do not remove the cover of the controller or touch the printed circuit board when the power is on, otherwise there will be a risk of electric shock!</li><li>3. Please do not change the controller manufacturer parameters at will. Otherwise it may cause damage to the equipment!</li></ol>
During working	
 Note	<ol style="list-style-type: none"><li>1. Non-professional technical personnel are not allowed to detect signals during operation. Otherwise, personal injury or equipment damage may result!</li><li>2. Do not touch the cooling fan and discharge resistor to test the temperature. Failure to do so may cause burns!</li><li>3. When the controller is running, avoid anything falling into the device. Otherwise it will cause equipment damage!</li><li>4. Do not use the contactor on and off method to control the start and stop of the controller. Failure to do so may cause equipment damage!</li></ol>

Solar Controller



Technical data

Model		AC/DC 110V	AC/DC 150V	AC/DC 200V	AC/DC 300V
Suitable PMSM / BLDC pumps	Pump's Voltage	DC-110V	DC-150V	DC-200V	DC-300V
	Pump's Frequency	According to the manufacturer's design			
	Pump's Phase	1xPhase / 3xPhase			
Suitable AC pumps	Pump's Voltage	100V~130V 220V~240V	220V~240V	220V~240V	220V~240V
	Pump's Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Pump's Phase	1xPhase 3xPhase	1xPhase 3xPhase	1xPhase 3xPhase	3xPhase
Inverter Power		0.75KW	1.3KW	1.5KW	2.2KW
Inverter rated output current		10A	10A	10A	10A
Input AC power requirements - Grid or generator		(L,N)1xPhase 85~300V / 50/60Hz			
Input DC power requirements - PV panel or battery	Max input DC Voltage(VOC)	450	450	450	450
	Min DC Working Voltage(V)	80	80	80	80
	MPPT Working Voltage(V)	80-450	80-450	80-450	80-450
Performance					
Control mode		Motorcontrol technology			
Type of motor		Permanent magnet synchronous motor and asynchronous motor			
Efficiency		99%			
Enclosure class		IP65			
Installation		Wall mounting			
Other Parameters					
Cooling		Fan Cooling			
HMI		LCD screen			
Working environment					
Ambient temperature		(- 25℃ ~ 60℃)			
Working altitude		3000m			
Warranty		18 months			



Indicator Light Description

<b>Power</b>	AC/DC power on
<b>DC</b>	DC power on
<b>WELL</b>	Well water level is below pump inlet
<b>TANK</b>	Water tank is full

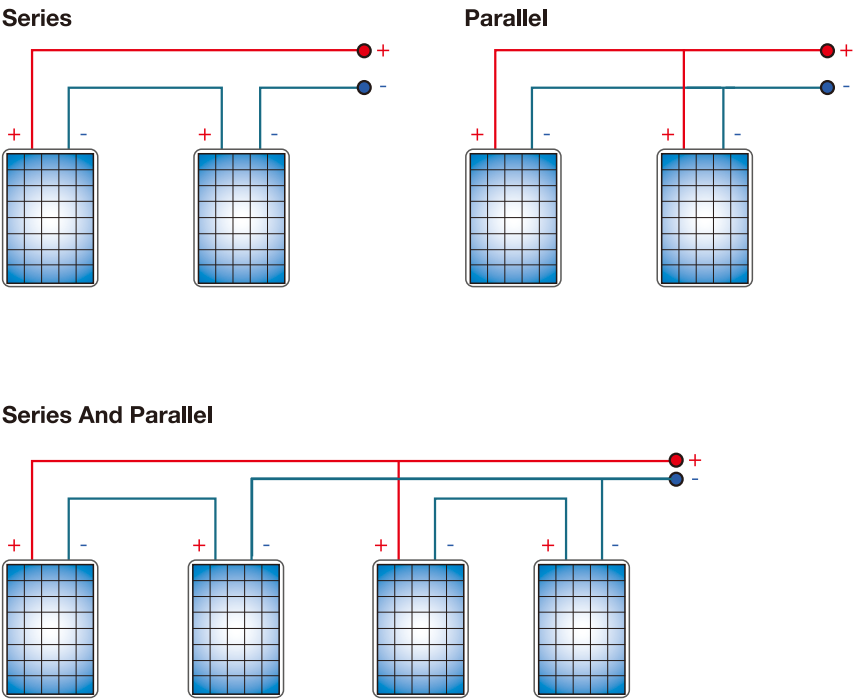
<b>V</b>	Display input voltage
<b>A</b>	Display input current
<b>R</b>	Display input power
<b>W</b>	Display working speed

<b>MPPT</b>	Based on using solar energy
<b>PID</b>	Constant pressure mode
<b>MPA</b>	Pressure start&stop mode
<b>T</b>	Timing mode
<b>IOT</b>	Remote control

Key Description

Button Name	Function Description
	1.Long press for 2s to enter the menu setting 2.Short press to exit the menu
	Short press this button to enter the menu screen level by level and confirm the set parameters.
	Short press the button to increase the setting value of the corresponding parameter
	Short press the button to decrease the setting value of the corresponding parameter
	Short press this button to switch the display: Input voltage->Input current->Input power->Working speed
	Short press this button to control the pump start and stop. In the fault state, short press to reset the fault.
	Long press for 2S the (Set + Switch) buttons at the same time to switch the function mode: Speed -> PID -> MPA -> T
	Short press the (Set + Up) buttons at the same time to switch the power mode: AC->DC->Auto->Hybrid

# Solar Panel Wiring

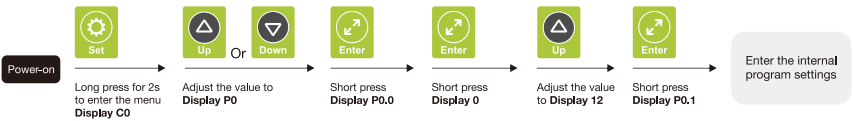
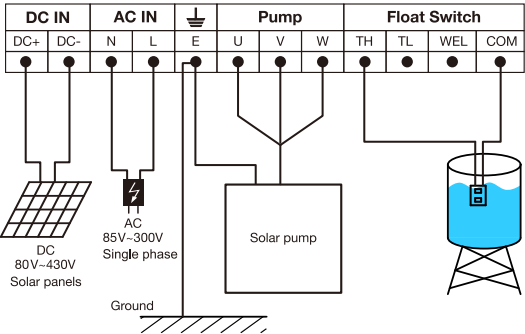


**Notice:** Solar panel power = Pump power × 1.3

1.3 is a factor, considering the solar strength is not enough in the morning, afternoon or cloudy day. The factor between (1.2 - 1.5) according to different area or actual usage status

# Solar Inverter Wiring

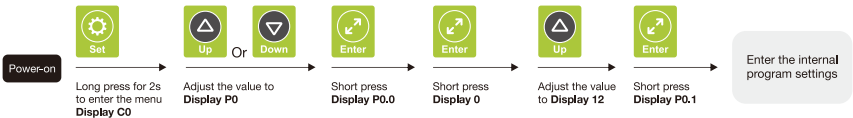
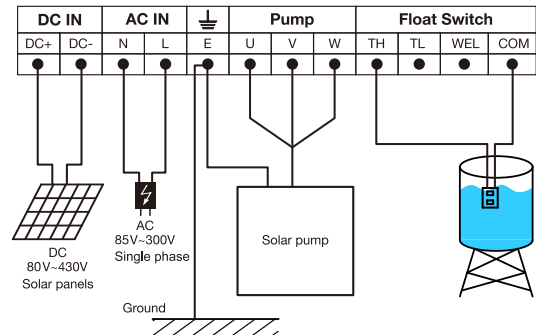
## BLDC Pump wiring



Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings☑ 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump☑ 1:AC 3 phase pump 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor

# Solar Inverter Wiring

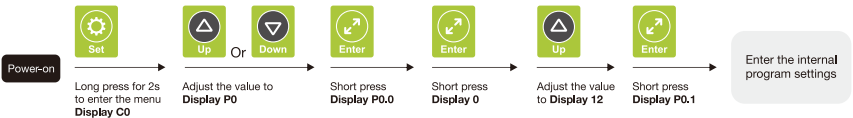
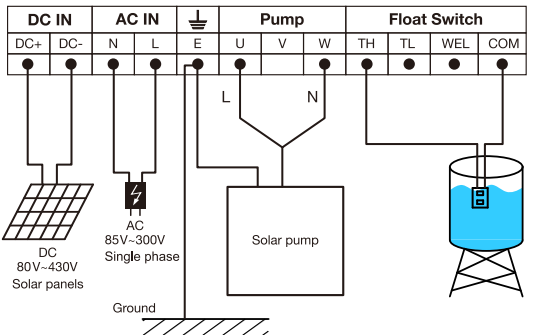
## AC 110V/220V three phase pump



Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump 1:AC 3 phase pump 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor
P7.3	Rated power setting of AC motor	/	Unit:KW
P7.4	Rated voltage setting of AC motor	220	Unit:V
P7.5	Rated current setting of AC motor	10	Unit:A
P7.6	Rated Hz setting of AC motor	50	Unit:Hz
P7.7	Running Hz setting of AC motor	50	Unit:Hz
P8.0	Max working HZ setting of AC motor	50	Unit:Hz

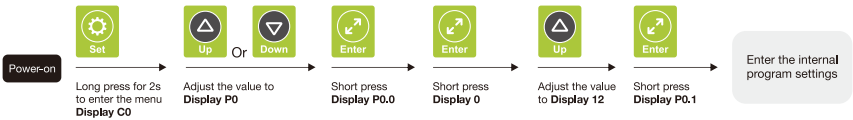
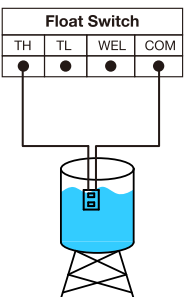
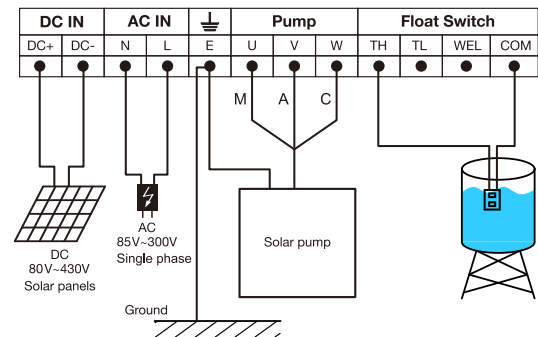
# Solar Inverter Wiring

## AC 110V/220 single phase pump-with capacitor (≤1.5KW)

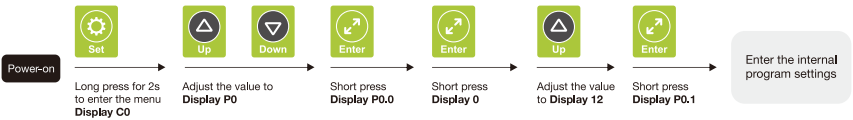


Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump 1:AC 3 phase pump 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor
P7.3	Rated power setting of AC motor	/	Unit:KW
P7.4	Rated voltage setting of AC motor	220	Unit:V
P7.5	Rated current setting of AC motor	10	Unit:A
P7.6	Rated Hz setting of AC motor	50	Unit:Hz
P7.7	Running Hz setting of AC motor	50	Unit:Hz
P8.0	Max working HZ setting of AC motor	50	Unit:Hz

AC 110V/220 single phase pump-without capacitor (≤1.5KW)

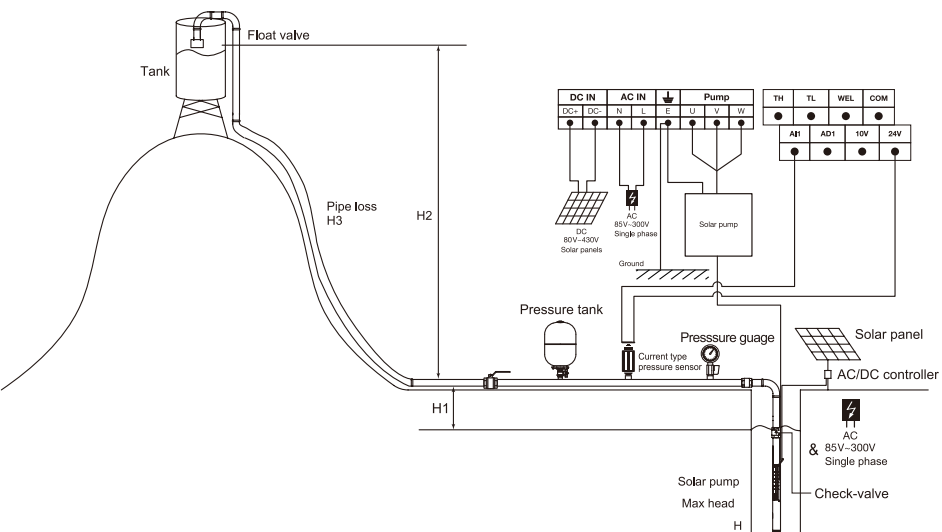


Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump 1:AC 3 phase pump 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor
P7.3	Rated power setting of AC motor	/	Unit:KW
P7.4	Rated voltage setting of AC motor	220	Unit:V
P7.5	Rated current setting of AC motor	10	Unit:A
P7.6	Rated Hz setting of AC motor	50	Unit:Hz
P7.7	Running Hz setting of AC motor	50	Unit:Hz
P8.0	Max working HZ setting of AC motor	50	Unit:Hz



Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings 21:Factory reset
P3.5	TH protection fault recovery time	0.25	Unit:h

① Constant pressure mode-Scenario diagram

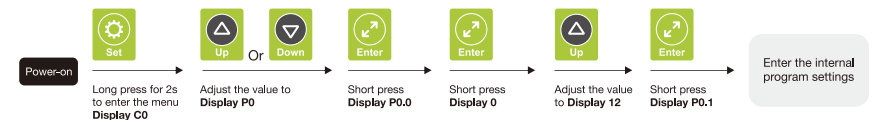


P1:Starting pressure value  
Logic:(1-10%)×P2.9(Target pressure value)  
P2:Target pressure value  
H:Pump max head  
H1:Height from well liquid to ground  
H2:Height from ground to water tank  
H3:Pipe loss

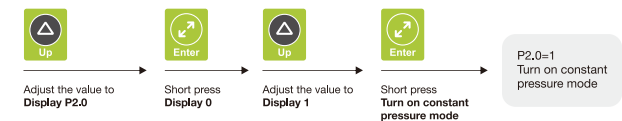
$P1 > H2$   
 $H - H1 - H3 > P2 > H2 + H3$

② Turn on constant pressure mode

Enter internal program settings



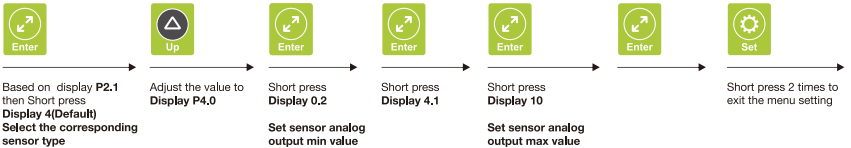
Turn on constant pressure mode



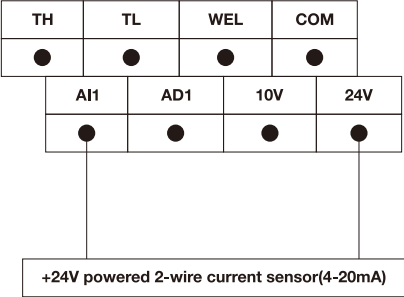
Code	Name	Default	Description
P0.0	Edit permission	0	<b>12:Enter the internal program settings</b> 21:Factory reset
P2.0	Working mode setting	0	0: Speed control mode <b>1: Constant pressure mode</b> 2: Timing mode 3: Pressure start-stop mode

③ Setting pressure sensor parameters

③ -1 Current type pressure sensor wiring

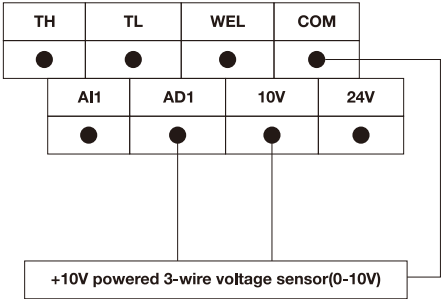


Code	Name	Default	Description
P2.1	Select the corresponding sensor type	4	0: 4-20mA range 10Bar; 1: 0-10V range 10Bar; 3: 4-20mA range 16Bar; 4: 0-10V range 16Bar; 6: 4-20mA range 25Bar; 7: 0-10V range 25Bar
P4.0	Set sensor analog output min value	0.2	Current type Unit: mA; Voltage type Unit: V  Please set according to the pressure sensor nameplate information.
P4.1	Set Set sensor analog output max value	10	



Terminal	Name	Description
+24V	24V output power port	The positive terminal of the current sensor is connected to the 24V interface
AI1	Current analog signal input port	The negative terminal of the current sensor is connected to this port.

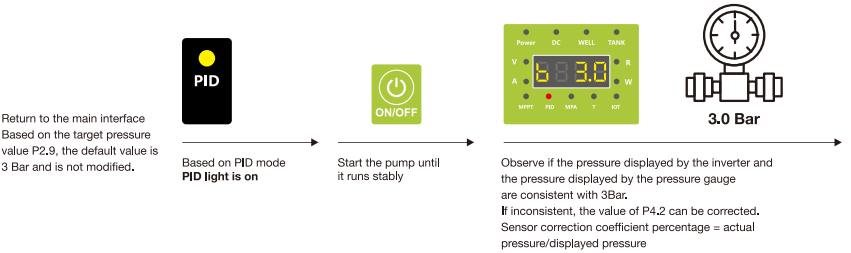
③ -2 Voltage type pressure sensor wiring



Terminal	Name	Description
10V	10V output power port	The positive terminal of the voltage sensor is connected to the 10V interface
AD1	Current analog signal input port	Voltage sensor output connected to AD1 port
COM	Weak current signal GND port	The voltage sensor GND port is connected to the COM port

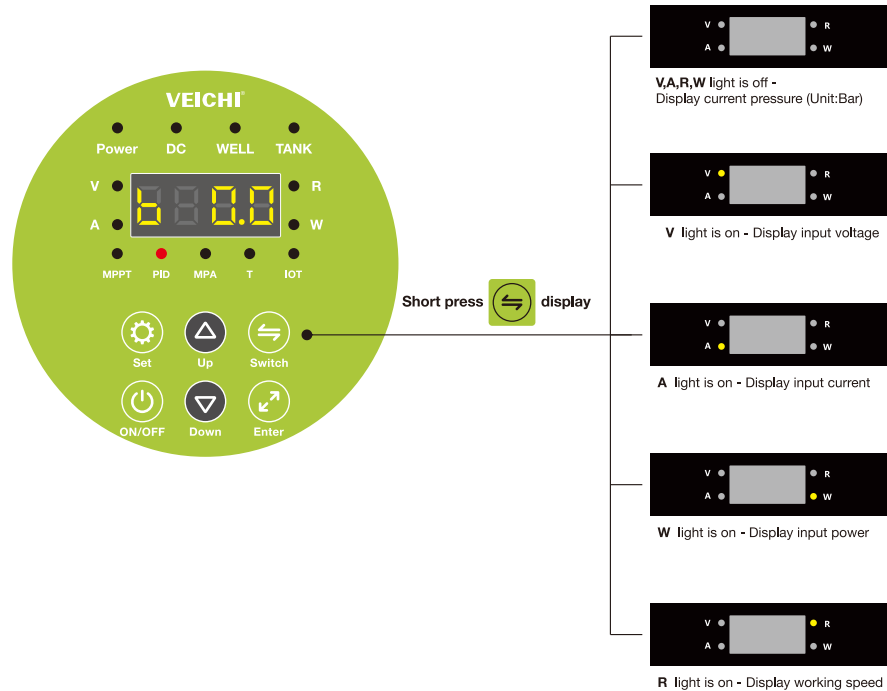
④ Calibrate the displayed pressure value

Sensor correction factor percentage



Code	Name	Default	Description
P4.2	<b>Sensor correction factor percentage</b> (When the pressure displayed by the inverter is inconsistent with the pressure displayed by the pressure gauge, then modify this factor) Sensor correction factor percentage= Actual pressure / Display pressure	100	Unit: %

## ④ -1 Shortcut keys and display attention points



Button Name	Description
	Long press for 2S the (Set + Switch) buttons at the same time to switch the function mode: Speed -> PID -> MPA -> T
or	Based on constant pressure mode In the main interface  P2.9(Target pressure value) can be adjusted quickly By pressing the Up and Down Button

## ⑤ Constant pressure mode & Sleep mode -parameter setting

Code	Name	Default	Description
P4.3	<b>Sleep mode-constant pressure energy saving</b>  After selecting the constant pressure control mode (P.20=1), after reaching the set target pressure and without water usage, the water pump enters a sleep state to achieve energy saving.	1	0:turn off 1:turn on <input checked="" type="checkbox"/>
Need to set area			
P2.9	Target pressure value	3.0	Unit: Bar
P4.7	Starting pressure value <b>logic:(1-10%)×P2.9 (Target pressure value)</b>	10	Unit: %
No need to set area			
P4.4	Sleep mode - speed	2000	Unit: r/min
P4.5	Sleep mode - Sleep detection cycle time	60	Unit: S
P4.6	Sleep mode - Sleep deviation pressure percentage <b>logic:2%×P2.9 (Target pressure value)</b>	2	Unit: %
P5.0	Sleep Low Speed Hold Time	30	Unit: S
P5.1	Sleep judgment pressure percentage <b>logic:5%×P2.9(Target pressure value)</b>	5	Unit: %



## ⑤ -1 Sleep mode logic

### Sleep mode-Automatic stop

Based on P4.3=1

Sleep mode-constant pressure energy saving function turn on ☒

If 1:The current running speed < P4.4 (2000 r/min)

If 2:Sleep detection cycle time=P4.5 (60s)

If 3:(P2.9-Current Pressure)<P4.6(2%×P2.9)

#### Based on If 1,2,3

Action 1:The pump working speed drops to1000r/min

Action 2:keep working time = P5.0(30s)

If (P2.9-Current Pressure)<P5.1(5%×P2.9)

Action:Sleep mode-Pump Automatic stop

### Sleep mode-Automatic start

Based on Sleep mode-Pump Automatic stop

If 1:Users start using water

Current Pressure < P4.7 (Starting pressure value)

Action1:Pump Automatic start

## ⑥ Overpressure protection setting

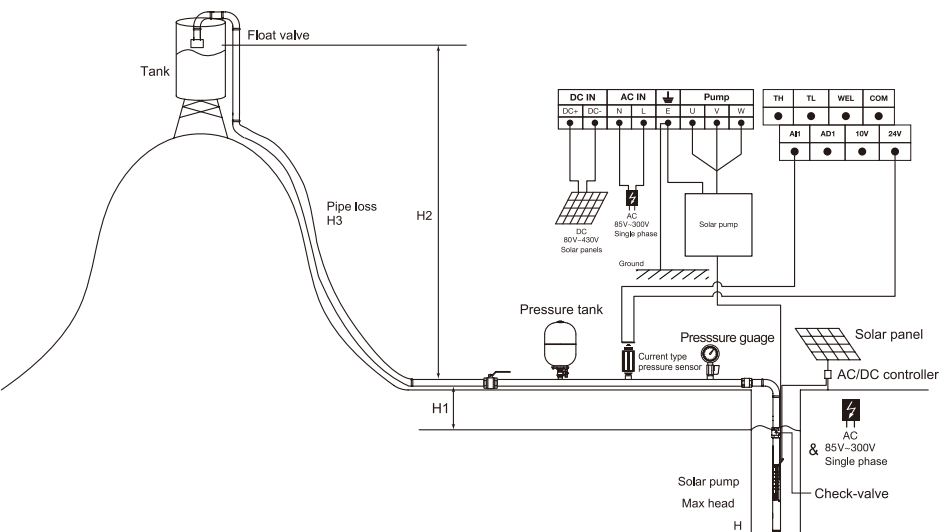
Code	Name	Default	Description
P4.8	Overpressure protection value logic 3+P2.9 Target pressure value	3.0	Unit: Bar

If the pressure tank is not installed or the pressure tank capacity is too small, the output pressure will be over-pressured when the user quickly closes the valve.

If Current Pressure > P4.8 (Overpressure protection value) +P2.9 Target pressure value

Action:Pump Automatic stop and display P63

① Pressure start-stop mode-Scenario diagram

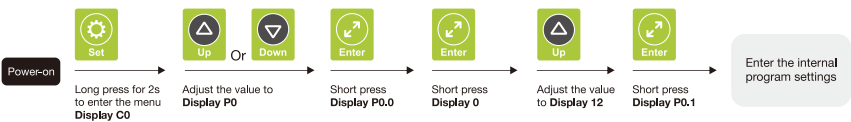


P1:Starting pressure value  
Logic:(1-10%)×P2.9(Target pressure value)  
P2:Target pressure value  
H:Pump max head  
H1:Height from well liquid to ground  
H2:Height from ground to water tank  
H3:Pipe loss

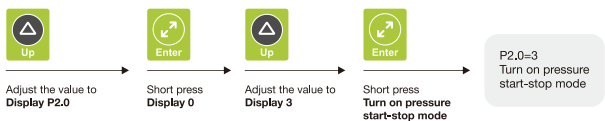
$P1 > H2$   
 $H - H1 - H3 > P2 > H2 + H3$

② Turn on pressure start-stop mode

Enter internal program settings

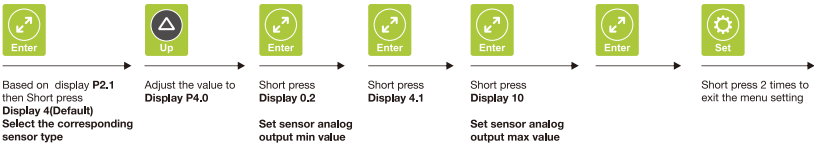


Turn on pressure start-stop mode



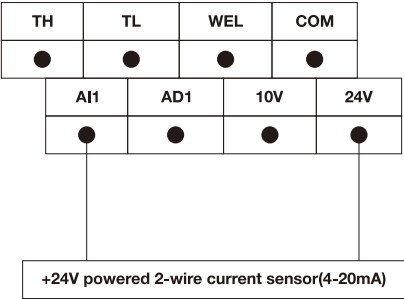
Code	Name	Default	Description
P0.0	Edit permission	0	<b>12:Enter the internal program settings</b> 21:Factory reset
P2.0	Working mode setting	0	0: Speed control mode 1: Constant pressure mode 2: Timing mode <b>3: Pressure start-stop mode</b>

③ Setting pressure sensor parameters



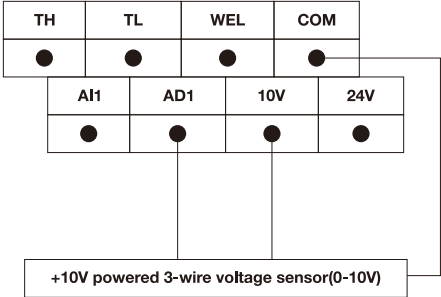
Code	Name	Default	Description
P2.1	Select the corresponding sensor type	4	0: 4-20mA range 10Bar; 1: 0-10V range 10Bar; 3: 4-20mA range 16Bar; 4: 0-10V range 16Bar; 6: 4-20mA range 25Bar; 7: 0-10V range 25Bar
P4.0	Set sensor analog output min value	0.2	Current type Unit: mA; Voltage type Unit: V
P4.1	Set Set sensor analog output max value	10	Please set according to the pressure sensor nameplate information.

③ -1 Current type pressure sensor wiring



Terminal	Name	Description
+24V	24V output power port	The positive terminal of the current sensor is connected to the 24V interface
AI1	Current analog signal input port	The negative terminal of the current sensor is connected to this port.

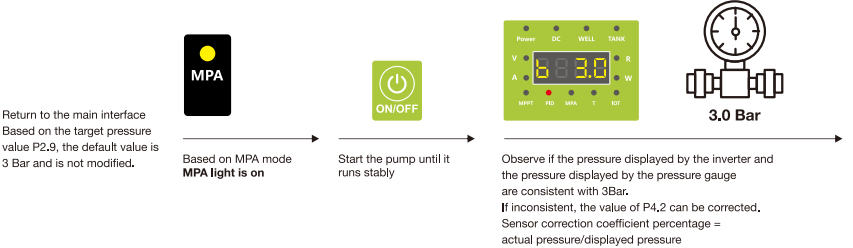
③ -2 Voltage type pressure sensor wiring



Terminal	Name	Description
10V	10V output power port	The positive terminal of the voltage sensor is connected to the 10V interface
AD1	Current analog signal input port	Voltage sensor output connected to AD1 port
COM	Weak current signal GND port	The voltage sensor GND port is connected to the COM port

④ Calibrate the displayed pressure value

Sensor correction factor percentage

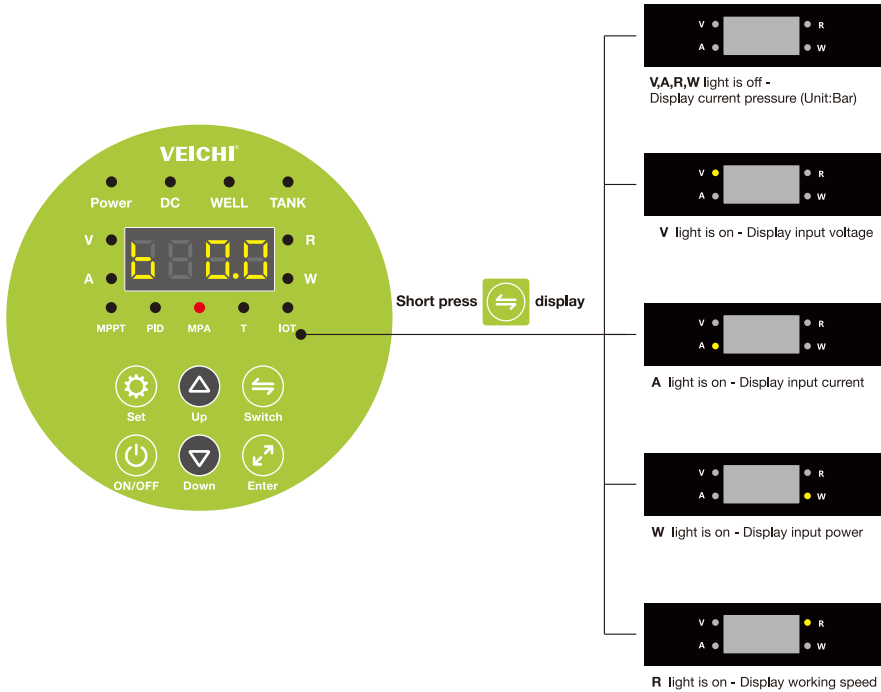






Code	Name	Default	Description
P4.2	<b>Sensor correction factor percentage</b> (When the pressure displayed by the inverter is inconsistent with the pressure displayed by the pressure gauge, then modify this factor) Sensor correction factor percentage= Actual pressure / Display pressure	100	Unit: %

Pressure start-stop mode-parameter setting

Code	Name	Default	Description
P2.9	Target pressure value	3.0	Unit: Bar
P4.7	Starting pressure value <b>logic:(1-10%)×P2.9(Target pressure value)</b>	10	Unit: %

④ -1 Shortcut keys and display attention points



Button Name	Description
 	Long press for 2S the (Set + Switch) buttons at the same time to switch the function mode: Speed -> PID -> MPA -> T
 or 	Based on pressure start-stop mode In the main interface  P2.9(Target pressure value) can be adjusted quickly By pressing the Up and Down Button

⑤ Overpressure protection setting

Code	Name	Default	Description
P4.8	Starting pressure value logic: 3+P2.9(Target pressure value)	3.0	Unit: Bar

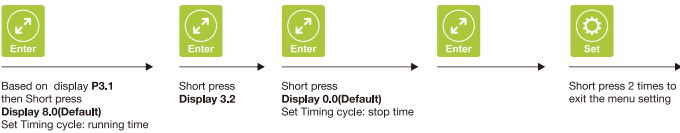
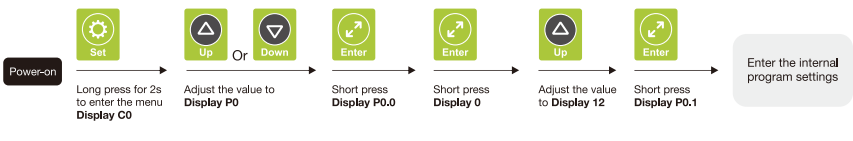
If the pressure tank is not installed or the pressure tank capacity is too small, the output pressure will be over-pressured when the user quickly closes the valve.

If Current Pressure > P4.8 (Overpressure protection value)+P2.9 Target pressure value  
Action: Pump Automatic stop and display P63

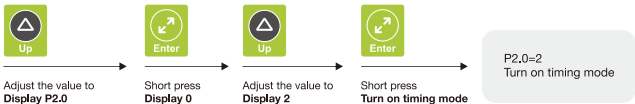
① Timing mode

② Setting timing parameters

Enter internal program settings



Turn on timing mode

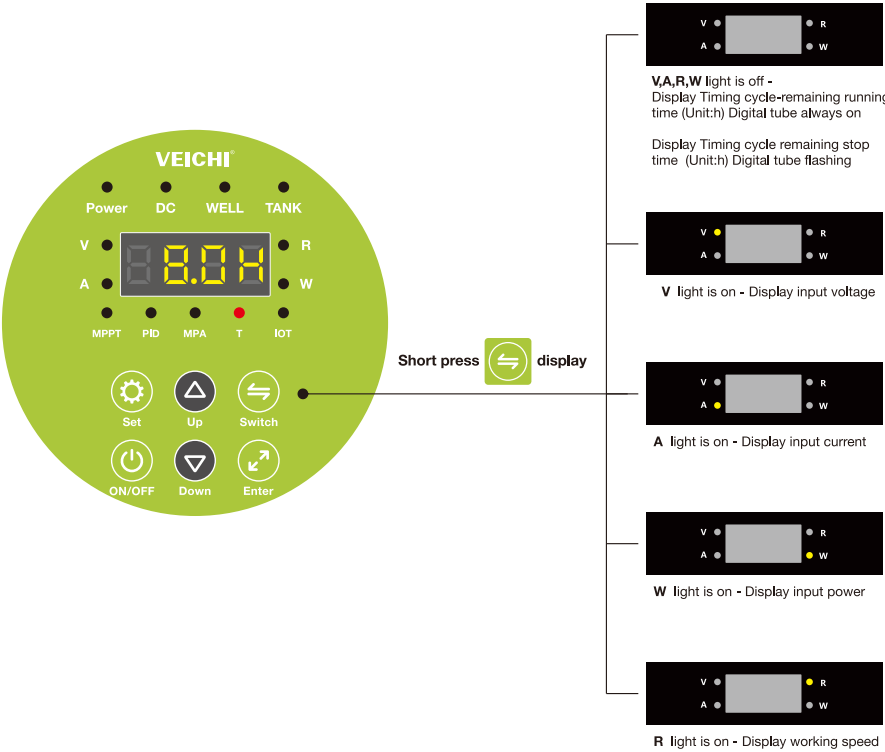




Code	Name	Default	Description
P3.1	Timing cycle: running time	8.0	Unit: h
P3.2	Timing cycle: stop time	0.0	

Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings☑ 21:Factory reset
P2.0	Working mode setting	0	0: Speed control mode 1: Constant pressure mode 2: Timing mode ☑ 3: Pressure start-stop mode

If P3.1=8 , P3.2=4  
Then the pump will work continuously for 8 hours and then stop,  
and restart after stopping for 4 hours, and repeat this process.

③ Shortcut keys and display attention points



Button Name	Description
 	Long press for 2S the (Set + Switch) buttons at the same time to switch the function mode: Speed -> PID -> MPA -> T

Function parameter table

Code	Name	Description
C0.0	Display working speed	Rpm
C0.1	Display output current	Unit:A
C0.2	Displays the input AC voltage	Unit:V
C0.3	Display input PV voltage	Unit:V
C0.4	Display bus DC voltage	Unit:V
C0.5	Display input power	Unit:Kw
C0.6	Display output voltage	Unit:V
C0.7	Display input current	Unit:A
C0.8	Display IPM temperature	Unit:℃
C0.9	Total PV operation time	Unit:h
C1.0	Total mains electricity operation time	Unit:h
C1.1	Total PV power generation	Unit:KwH
C1.2	Total PV power generation	Unit:MwH
C1.3	Fault Query	Use the up and down keys to query the last five fault codes. NULL means no fault has occurred. In this interface, long press SWITCH to clear the fault record.

## Function parameter table

Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings 21:Factory reset
P0.1	Dry-running protection	1	0:Turn off 1:Turn on
P0.2	Power supply mode	0	0:Auto 2:DC 3:AC 4:Hybrid
P0.3	Based on battery power supply Restart value=(P0.3+P0.4)	5	Setting range: 2-40 Unit: V
P0.4	Based on battery power supply DC undervoltage protection value (Less than 80V,Pump stops)	80	Unit: V
P0.5	Dry-running protection point 1 If the well is short of water,the pump does not stop,and the working speed is between 0-2000 rpm,Increase the default value	According to the manufacturer's settings	0 - 2000 Rpm
P0.6	Dry-running protection point 2 If the well is short of water,the pump does not stop,and the working speed is between 2000 - 3000 rpm,Increase the default value	According to the manufacturer's settings	2000 - 3000 Rpm
P0.7	Dry-running protection point 3 If the well is short of water,the pump does not stop,and the working speed is between 3000 - 4000 rpm,Increase the default value	According to the manufacturer's settings	3000 - 4000 Rpm
P0.8	Dry-running protection point 4 If the well is short of water,the pump does not stop,and the working speed is between 4000 - 5000 rpm,Increase the default value	According to the manufacturer's settings	4000 - 5000 Rpm
P0.9	Design speed of BLDC motor	According to the manufacturer's settings	Unit :Rpm

## Function parameter table

Code	Name	Default	Description
P1.0	Motor operating status after power-on	2	0: Default motor stop 1: Default motor start 2: Execute according to the last command status
P1.1	Set maximum power	According to the manufacturer's settings	Unit :KW
P1.2	Motor rotation direction setting	1	0: Default direction 1: Opposite to the default direction
P1.3	DC switching voltage value	According to the manufacturer's settings	Unit: V
P1.4	DC switching AC power value	According to the manufacturer's settings	AC220Unit: W
P1.5	Interval time from AC mode to DC mode	15	Unit: minutes
P1.8	Maximum power setting in AC power mode	According to the manufacturer's settings	AC220Unit: W
P1.9	Dry-pump protection fault recovery time	0.25	Unit :h
P2.0	Working mode setting	0	0: Speed control mode 1: Constant pressure mode 2: Timing mode 3: Pressure start-stop mode
P2.1	Select the corresponding sensor type	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 parameter table

Code	Name	Default	Description
P2.9	Target pressure value	3	Unit: Bar
P3.1	Timing cycle: running time	8	Unit: h
P3.2	Timing cycle: stop time	0	Unit: h
P3.3	Overcurrent fault automatic recovery times	0	Setting range 0-5
P3.5	TH protection fault recovery time	0.25	Unit: h
P3.6	Driver module temperature protection	80	Unit: °C
P3.7	Driver module temperature protection	1	0: Turn off 1: Turn on
P4.0	Set sensor analog output min value	0.2	Current type Unit: mA; Voltage type Unit: V Please set according to the pressure sensor nameplate information.
P4.1	Set sensor analog output max value	10	
P4.2	Sensor correction factor percentage (When the pressure displayed by the inverter is inconsistent with the pressure displayed by the pressure gauge, then modify this factor) Sensor correction factor percentage= Actual pressure / Display pressure	100	Unit: %
P4.3	Sleep mode-constant pressure energy saving  After selecting the constant pressure control mode (P20=1), after reaching the set target pressure and without water usage, the water pump enters a sleep state to achieve energy saving.	1	0: Turn off 1: Turn on
P4.4	Sleep mode - speed	2000	Unit: r/min
P4.5	Sleep mode - Sleep detection cycle time	60	Unit: seconds
P4.6	Sleep mode - Sleep deviation pressure percentage	2	Unit: %

## Function parameter table

Code	Name	Default	Description
P4.7	Starting pressure value logic: $(1-10\%) \times P2.9$ (Target pressure value)	10	Unit: %
P4.8	Overpressure protection value logic: $3 + P2.9$ (Target pressure value)	3	Unit: Bar
P4.9	Sensor disconnection protection	1	0: Turn off 1: Turn on
P5.0	Sleep Low Speed Hold Time	30	Unit: seconds
P5.1	Sleep judgment pressure percentage logic: $5\% \times P2.9$ (Target pressure value)	5	Unit: %
P5.2	Acceleration time in constant pressure mode After pressing the On button to start the pump, Acceleration time from 0 -Set speed	5	Unit: seconds
P5.3	Deceleration time in constant pressure mode Trigger-based sleep mode(P4.4 / P4.5 / P4.6) Acceleration time from P4.4 to 1000 rpm	20	Unit: seconds
P5.4	Constant pressure loop KP proportional gain KP and KI values should increase or decrease synchronously The higher the value, the faster the pipeline pressure increases and the easier it is to damage the pipeline.	0.6	/
P5.5	Constant pressure loop KI proportional gain KP and KI values should increase or decrease synchronously The higher the value, the faster the pipeline pressure increases and the easier it is to damage the pipeline.	0.6	/
P5.6	TH Logic	0	0: Default logic 1: Opposite to default logic
P5.7	TL Logic	0	
P5.8	WEL Logic	0	

## Function parameter table

Code	Name	Default	Description
P5.9	High and low liquid level difference-backflow reverse protection	1	0: Turn off 1: Turn on
P6.0	System min working speed	1000	Unit: rpm
P7.0	Motor Type	0	0: BLDC pump 1: AC 3 phase pump 2: AC 1 phase pump with capacitor 3: AC 1 phase pump without capacitor
P7.1	BLDC motor model selection	According to the manufacturer's settings	According to the manufacturer's settings
P7.2	Inverter carrier frequency	6	Unit: KHz
P7.3	Rated power setting of AC motor	According to the manufacturer's settings	Unit: KW
P7.4	Rated voltage setting of AC motor	220	Unit: V
P7.5	Rated current setting of AC motor	12	Unit: A
P7.6	Rated Hz setting of AC motor	50	Unit: Hz
P7.7	Running Hz setting of AC motor	50	Unit: Hz
P7.8	Max working speed setting of BLDC motor	According to the manufacturer's settings	Unit: Rpm
P7.9	IoT Communication Options	1	1: 485 Communications
P8.0	Max working HZ setting of AC motor	50	Unit: Hz
P8.1	Main-to-auxiliary turns ratio (For AC 1 phase without capacitor, If it fails to start, adjust this value)	1.3	Scale factor
P8.2	Asynchronous motor stall detection time	5	Unit: seconds 0: Turn off

## Fault type parameter table

Fault type			
Error code	Fault description	Causes and solutions	Recovery Process
P0	Hardware overcurrent	<ol style="list-style-type: none"> <li>1. There is a short circuit in the controller output circuit</li> <li>2. The controller drive module is abnormal</li> <li>3. The rotating motor is being started</li> <li>4. Check whether the UVW three-phase is open circuit, reconnect after power off, and ensure that the UVW is installed normally</li> <li>5. Remove the motor wire after power off, then power on and restart the controller. If the P0 fault is still reported, the controller hardware is damaged</li> </ol>	The fault code will be cleared automatically after 30 seconds for the first five times. Starting from the sixth time, it will start again after 30 minutes.
P43	Output phase loss protection	There is an open circuit in the three phases of UVW of the motor. Rewiring after power off to ensure reliable UVW contact.	The fault code will be cleared automatically after 30 seconds for the first five times. Starting from the sixth time, it will start again after 30 minutes.
P44	Startup failed	Check if there are foreign objects in the impeller of the pump body and whether the motor load is abnormal.	
P45/P47	Out-of-step protection/ Overspeed protection	<ol style="list-style-type: none"> <li>1. Program mismatch</li> <li>2. Pump extension cable is too long, shorten the extension cable</li> <li>3. Pump bearing is stuck, clean the pump bearing</li> </ol>	
PL	low voltage protection / Not enough input power	<ol style="list-style-type: none"> <li>1. Voltage input is too low</li> <li>2. Wrong solar panel selection</li> </ol>	The fault code will be cleared automatically after 30 seconds for the first five times. Starting from the sixth time, it will start again after 30 minutes.
P51	High voltage protection	<ol style="list-style-type: none"> <li>1. Voltage input is too high</li> <li>2. Wrong solar panel selection</li> </ol>	When the voltage returns to normal, clear it immediately

## Fault type parameter table

Fault type			
Error code	Fault description	Causes and solutions	Recovery Process
P48	Dry running protection	1.Lack of water at the pump inlet 2. The air in the water pump has not been completely exhausted. Cut off the power supply, then turn it on again after 30 seconds and start the water pump to drain the water.	The first three times will be automatically cleared after 60 seconds. Starting from the fourth time, it is determined by the time set by P1.9(0.25 h)
P60	MCU high temperature protection	The MCU temperature in the controller exceeds 85°C	Automatically clear after the temperature returns to normal
P46	Stall protection	1. Program mismatch 2. Pump extension cable is too long, shorten the extension cable 3.The power supply is too low, increase the power supply 4.Pump bearing is stuck, clean the pump bearing	The fault code will be cleared automatically after 30 seconds for the first five times. Starting from the sixth time, It will start again after 10 minutes.
P59	Abnormal selection of power supply mode	When the controller selects the power supply mode set by P0.2, if the corresponding power input cannot be detected, this fault code will be reported. Please confirm whether the power supply mode selection matches the controller wiring.	Automatically cleared after fault recovery
P1	Backflow reverse protection	1. The pump is in the process of backflow reversal. Please wait for the water return to be completed before restarting. 2.If the pipeline is not in the backflow state, or the fault is still reported when the backflow time exceeds 10 minutes, please check if there is a leakage or short circuit between the motor output UVW and the ground.	The first 5 faults are displayed continuously for 90 seconds and then automatically cleared and restarted, and then restarted every 30 minutes
P63	Pressure sensor overpressure protection	1. Check if the constant pressure setting pressure is set normally 2. Check if the pressure sensor line is connected abnormally	After the pressure is restored, the fault is eliminated
P64	Pressure sensor disconnection protection	1. Check if the pressure sensor model is correct 2. Check if the pressure sensor line is abnormally connected	After the pressure feedback returns to normal, the fault is eliminated.