HYBRID DC/AC INVERTER
TGP SOLAR INVERTER

Description

The DC/AC Hybird 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% efficicency
- Integrate multiple protection functions to extend service life
- Support AC & PV input together, AC bypass function.
- Support 220V,3phase AC pump, 220V 1PH, 220V 3PH & BLDC Motors
- BLDC special voltage pump(110V,150V,220V,300V)
- Wide working voltage:AC input:single phase 85-300V,DC input:80-430V
- Long distance pump automatice stop/start without float swicth-wirelessly

Features

Before installation

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.
2. When handling, it should be lifted with care, otherwise there is a danger of damage to the equipment.
3. Please do not use a damaged controller or an inverter with missing parts, as there is a risk of injury.
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.

During installation

1. Do not twist the fixing bolts of the components, especially the bolts with red marks.
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.
3. Needs to be installed by a qualified Electrician.
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.

During installation

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.
2. The contact current of the controller is greater than 3.5mA, please ensure that the controller is well grounded.
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.
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.
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.
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.
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.
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.
9. When using multiple controllers, be careful not to make the grounding wire looped. Otherwise, it will cause malfunction of the controller or machine.
10. If the machine is visibly damaged or has parts missing, do not connect or operate it.
11. Please leave wiring, inspection, etc. to qualified Electricians.

After power on

1. Do not touch any input and output terminals after power is turned on, otherwise there will be danger of electric shock.
2. Do not remove the cover of the controller or touch the printed circuit board when the power is on.
3. Please do not change the controller manufacturer parameters.It may cause damage to the equipment.

During working

1. Non-professional technical personnel are not allowed to detect signals during operation. Otherwise, personal injury or equipment damage may result.
2. Do not touch the cooling fan and discharge resistor to test the temperature. Failure to do so may cause burns.
3. When the controller is running, avoid anything falling into the device. Otherwise it will cause equipment damage.
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.

HYBRID DC/AC INVERTER
SOLAR INVERTER INSTALLATION

SOLAR CONTROLLER:



OPERATION PANEL

MOUNTING HOLE

SENSOR CABLE ENTRANCE

PUMP ELECTRIC CABLE ENTRANCE

AC ELECTRIC CABLE ENTRANCE

DC ELECTRIC CABLE ENTRANCE

HYBRID DC/AC INVERTER
TECHNICAL DATA

Model	TGP-3-0.75	TGP-3-2.2
Input (DC)		
Max DC Voltage (VOC)	450	450
Min DC Working Voltage(V)	80	80
MPPT Working Voltage (V)	320	320
Max DC input Current (A)	17	17
Input (AC)		
Max AC Voltage(VAC)	1xPhase ≤ 300V	1xPhase ≤ 300V
Min AC Working Voltage(V)	85	85
Max AC current input(A)	15	15
Input Frequency(Hz)	47-63	
Performance		
Control mode	Motor control technology	
Type of motor	Asynchronous machine & Brushless DC motor	
Efficiency	99%	
Enclosure class	IP65	
Installation	Wall mounting	
Other Parameters		
Dimensions (L X W X H)mm	420X310X210	420X310X210
Weight (kg)	6.5	6.5
Cooling	Fan Cooling	
HMI	LCD Display	
Working environment		
Ambient temperature	(- 25°C ~ 60°C)	
Working altitude	3000m	

HYBRID DC/AC INVERTER
MINIMUM VOLTAGE REQUIREMENT

HYBRID/AUTO Mode

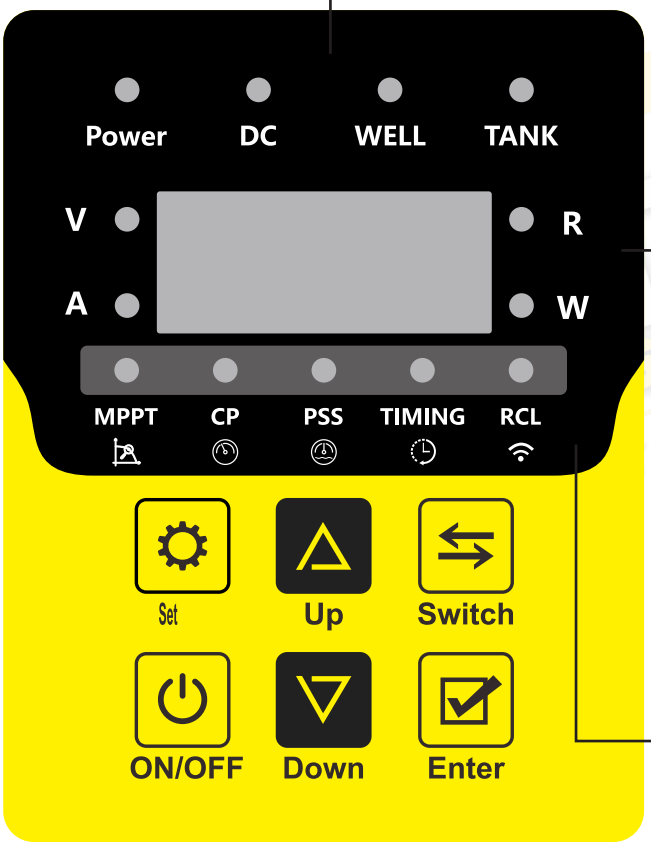
Motor	Motor Input	Inverter	Max DC	Max DC	Minimum DC	Minimum
Type	Voltage	kW:	VOC	Isc	Vmpp	Imp
1 Phase	220	0.75	430	17	340	6.2
1 Phase	220	1.1	430	17	340	8
1 Phase	220	1.5	430	17	340	11
3 Phase	220	0.75	430	17	340	4
3 Phase	220	1.1	430	17	340	5.9
3 Phase	220	1.5	430	17	340	7.8
3 Phase	220	2.2	430	17	340	11.6
DC Brush-less	110	0.75	430	17	340	10
DC Brush-less	150	1.1	430	17	340	10
DC Brush-less	200	1.5	430	17	340	10
DC Brush-less	300	2.2	430	17	340	10

DC and Auto Mode

Motor	Motor Input	Inverter	Max DC	Max DC	Minimum DC	Minimum
Type	Voltage	kW:	VOC	Isc	Vmpp	Imp
1 Phase	220	0.75	430	17	310	6.2
1 Phase	220	1.1	430	17	310	8
1 Phase	220	1.5	430	17	310	11
3 Phase	220	0.75	430	17	310	4
3 Phase	220	1.1	430	17	310	5.9
3 Phase	220	1.5	430	17	310	7.8
3 Phase	220	2.2	430	17	310	11.6
DC Brush-less	110	0.75	430	17	110	10
DC Brush-less	150	1.1	430	17	150	10
DC Brush-less	200	1.5	430	17	200	10
DC Brush-less	300	2.2	430	17	300	10

HYBRID DC/AC INVERTER
OPERATION

INDICATOR LIGHT DESCRIPTION





POWER	AC/DC power on
DC	DC power on
WELL	Well water level is below pump inlet
TANK	Water tank is full



V	Display input voltage
A	Display input current
R	Display input power
W	Display working speed



MPPT	Based on using solar energy
CP	Constant pressure mode
PSS	Pressure start&stop mode
TIMING	Timing mode
RCL	Remote control

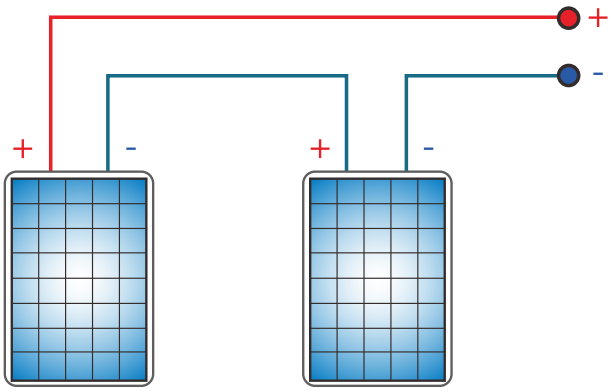
HYBRID DC/AC INVERTER
OPERATION

KEY DESCRIPTION

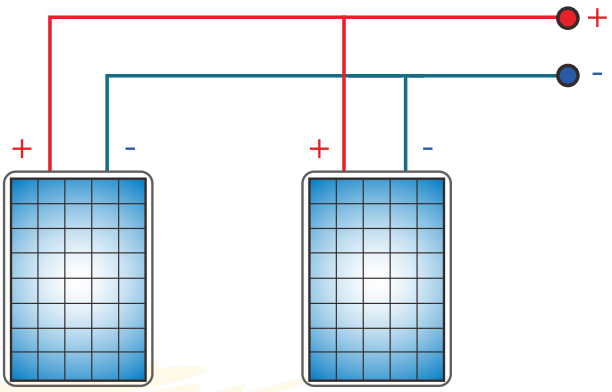
Button Name	Function Description
Set	1.Long press for 2 seconds to enter the menu setting 2.Short press to exit the menu
Enter	Short press this button to enter the menu screen level by level and confirm the set parameters.
Up	Short press the button to increase the setting value of the corresponding parameter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

HYBRID DC/AC INVERTER
SOLAR PANEL WIRING

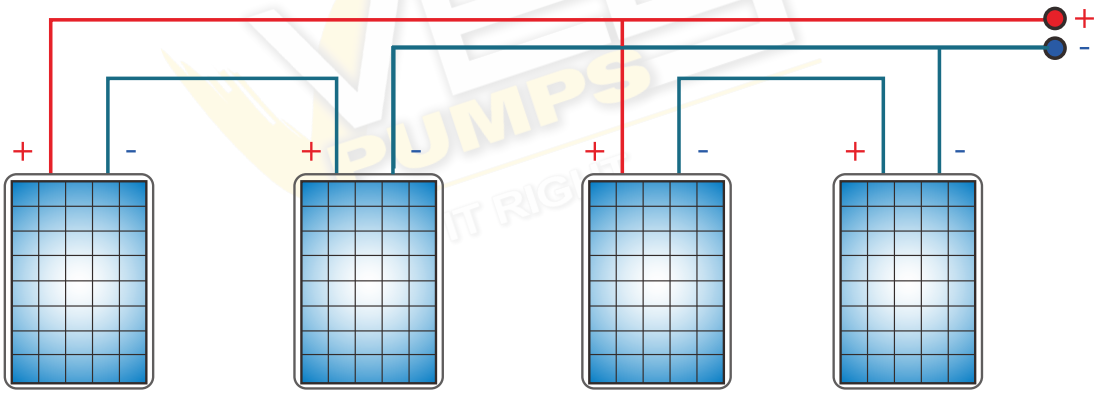
Series



Parallel



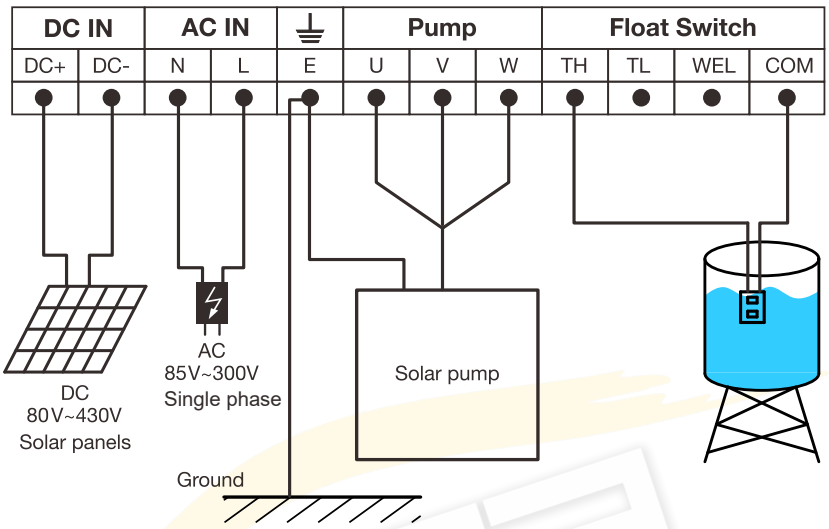
Series And Parallel

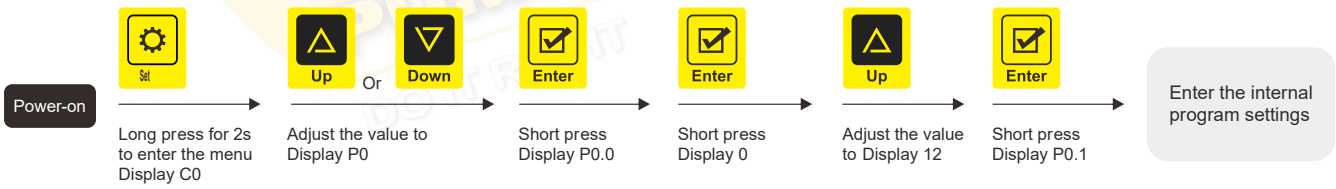


Notice: Solar panel power = Pump power ×1.3
1.3 is a factor,considering the solar strength is not enough in the morning, afternoon or cloudy day.The factor between(1.2 - 1.5) according different area or actual usage status

HYBRID DC/AC INVERTER
SOLAR INVERTER WIRING

BLDC PUMP WIRING

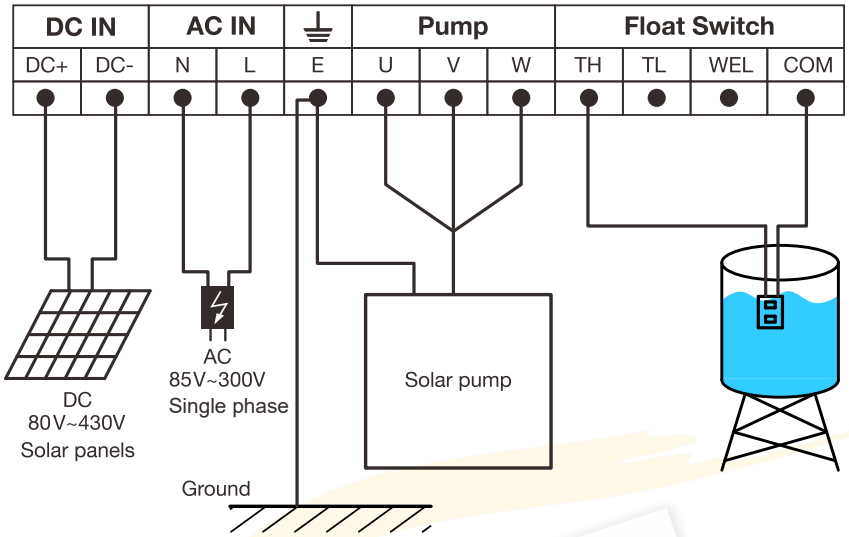


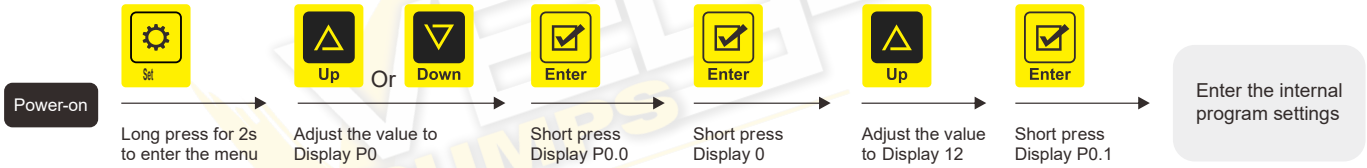


Code	Name	Default	Description
P0.0	Edit permission	0	12:Enter the internal program settings ✔ 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump ✔ 1:AC 3 phase pump 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor

HYBRID DC/AC INVERTER
SOLAR INVERTER WIRING

AC 110V/220V three phase pump

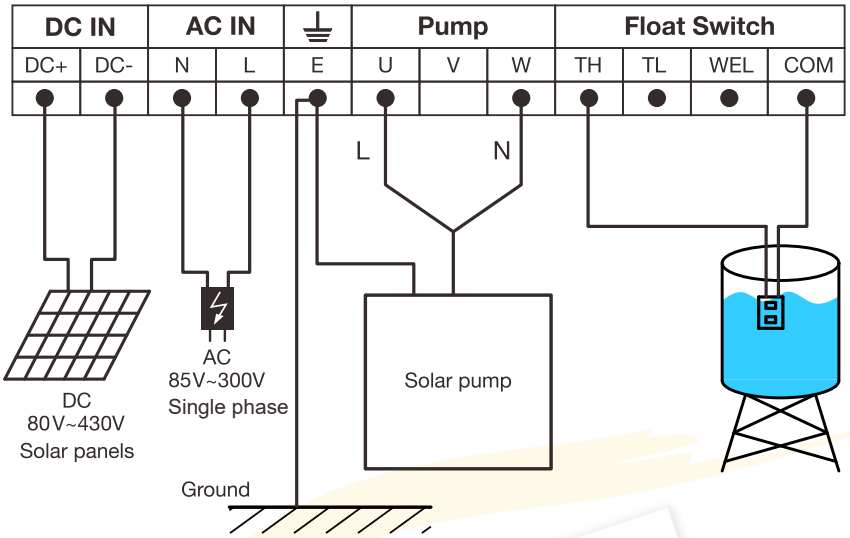


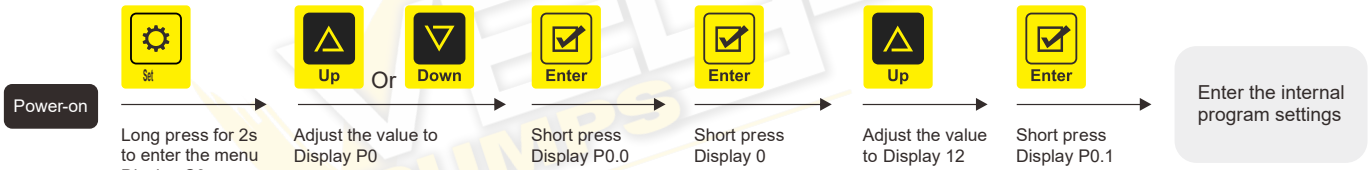


Code	Name	Default	Description
P0.0	Edit permission	0	**12:Enter the internal program settings** ☑ 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump **1:AC 3 phase pump** ☑ 2:AC 1 phase pump with capacitor 3:AC 1 phase pump without capacitor
P7.3	Rated power setting of AC motor	/	Unit:kW
P7.4	Rated voltage 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

HYBRID DC/AC INVERTER
SOLAR INVERTER WIRING

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

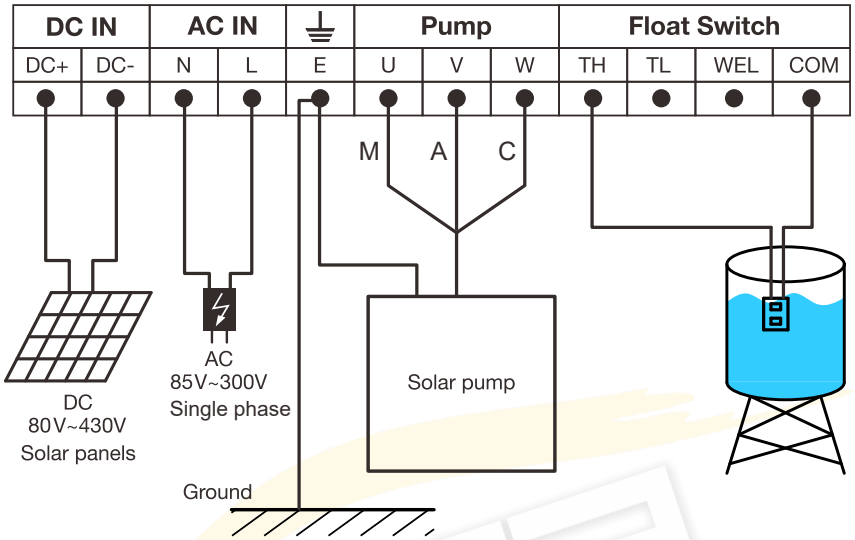


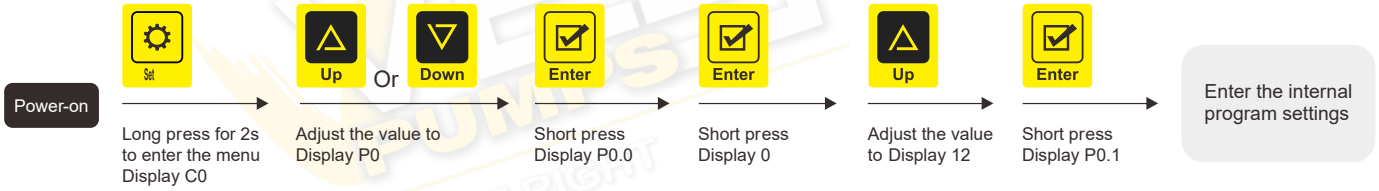


Code	Name	Default	Description
P0.0	Edit permission	0	**12:Enter the internal program settings** ✓ 21:Factory reset
P7.0	Motor Type	0	0:BLDC pump 1:AC 3 phase pump **2:AC 1 phase pump with capacitor** ✓ 3:AC 1 phase pump without capacitor
P7.3	Rated power setting of AC motor	/	Unit:kW
P7.4	Rated voltage 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

HYBRID DC/AC INVERTER
SOLAR INVERTER WIRING

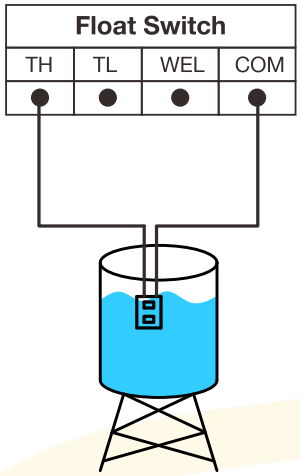
AC 110V/220 single phase pump-without capacitor (≤1.5KW)





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

HYBRID DC/AC INVERTER
FLOAT SWITCH SETTINGS



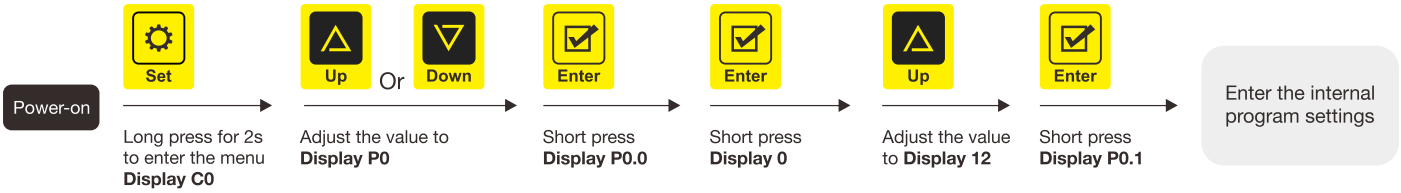


Code	Name	Default	Description
P0.0	Edit permission	0	**12:Enter the internal program settings** ☑ 21:Factory reset
P3.5	TH protection fault recovery time	0.25	Unit:h

Pumps On Line - www.pumps.co.za

1. Timing mode

Enter internal program settings

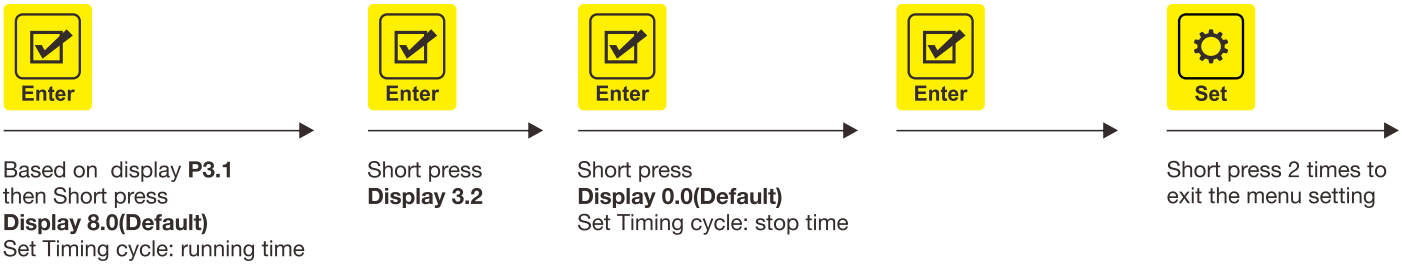


Turn on timing mode



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

2. Setting timing parameters



Based on display **P3.1**
then Short press
Display 8.0(Default)
Set Timing cycle: running time

Short press
Display 3.2

Short press
Display 0.0(Default)
Set Timing cycle: stop time

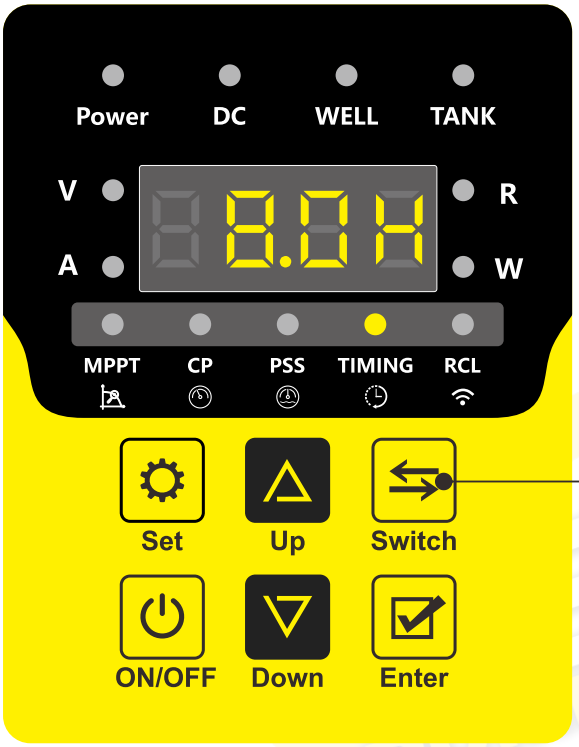
Short press 2 times to
exit the menu setting

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

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.

Pumps On Line - www.pumps.co.za

3. Shortcut keys and display attention points



Short press display



V,A,R,W light is off -
Display Timing cycle-remaining running time (Unit:h) Digital tube always on

Display Timing cycle remaining stop time (Unit:h) Digital tube flashing



V light is on - Display input voltage



A light is on - Display input current



W light is on - Display input power



R light is on - Display working speed

Button Name	Function Description
Set + Switch	Long press for 2S the (Set + Switch) buttons at the same time to switch the function mode: Speed -> CP -> PSS -> TIMING

Function parameter table

Terminal	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: °C
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 (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
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: %
P4.7	Starting pressure value logic:(1-10%)×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%×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	/

Function parameter table

Code	Name	Default	Description
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	
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 with-out 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	1. There is a short circuit in the controller output ircuit 2. The controller drive module is abnormal 3. The rotating motor is being started 4. Check whether the UVW threephase is open circuit, reconnect after power off, and ensure that the UVW is installed normally 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	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 ensures 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	1. Program mismatch 2. Pump extension cable is too long, shorten the extension cable 3.Pump bearing is stuck, clean the pump bearing	
PL	low voltage protection / Not enough input power	1. Voltage input is too low 2. Wrong solar panel selection	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	1. Voltage input is too high 2. Wrong solar panel selection	When the voltage returns to normal, clear it immediately
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.

Fault type parameter table

Fault type			
Error code	**Fault description**	**Causes and solutions**	**Recovery Process**
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.

HYBRID DC/AC INVERTER
CABLE SIZE CHART

BRUSHLESS DC									
mm²	Cable Size (mm²)								
	1.5	2.5	4	6	10	16	25	35	50
0.75kW (110V)	27	45	71	106	177	283	442	618	883
1.1kW (150V)	37	61	97	145	241	386	602	843	1204
1.5kW (200V)	49	81	81	193	321	514	803	1123	1605
2.2kW (300V)	73	121	193	289	482	771	1204	1685	2407

220V SINGLE PHASE									
mm²	Cable Size (mm²)								
	1.5	2.5	4	6	10	16	25	35	50
0.37kW	120	200	320	480	810	1260	1900	2590	3580
0.55kW	80	130	220	320	550	850	1290	1760	2430
0.75kW	60	100	170	250	430	670	1010	1380	1910
1.1kW	40	70	120	180	300	470	710	960	1360
1.5kW	30	60	90	130	230	360	550	760	1060

220V THREE PHASE									
mm²	Cable Size (mm²)								
	1.5	2.5	4	6	10	16	25	35	50
0.37kW	470	783	1253	1879	3190	4947	-	-	-
0.55kW	319	534	858	1293	2192	3399	5156	-	-
0.75kW	238	394	632	951	1612	2511	3811	5226	-
1.1kW	174	290	470	702	1195	1856	2813	3851	9220
1.5kW	128	215	342	510	870	1357	2065	2836	3700
2.2kW	87	145	232	348	597	928	1415	1415	2714