SOLAR PUMPING INVERTER

Apply to Water Pumping & Irrigation

User Manual

(Hybrid Solar and AC Input LCD Type)

(Variable Frequency Drive from 1Hz ~50/60Hz)

VERSION	V5.28.20
DATE	05 / 28 / 2020
PRODUCER	LEO

To ensure your personal and property safety, please read the manual carefully before use the solar pumping inverter and operate in compliance with below instructions.

1. SAFETY DEFINITION:

Danger: It will cause serious injuries even death while operate against the rules

Storage Conditions:

Temperature	Humidity
Temperature -20 ℃ to +60 ℃.	5% to 90%, no condensation
Store in dry, dust-free conditions. Do not store in the conditions with corrosive gas or liquid.	

Installation:

Danger
Forbidden to connect breaker between the inverter AC output and the pump.
Wiring by qualified person only.
All wires to the device must be wrapped with electrical tapes for safety.
Forbidden installation location: **direct sunlight, thick dust, corrosive gas or oil mist, flammable gas, liquid.**

Attention
To ensure good convection cooling effect, the device must be installed **Vertically**
The installation height of the device should be over 1.1m. Please set up the risk identification beside the device.
The ambient temperature -20 ℃ -+60 ℃. **If Over 45 ℃,** please make sure **well ventilated** and the inverter backside should be covered to make sure the air of fan output from **TOP** of inverter.
Relative humidity 15%-+95%RH
The device used to control the three-phase AC asynchronous **Pump, Resistor Heater, Aerator and Fan.**

Attention
If the output flow is small, please exchange the any two wires of U.V.W
The environmental temperature influence the durability and reliability of the device directly, please make sure the conditions meet above requirements to extend the device service life.

Maintenance:

Danger
Under any conditions, without professional guidance, do not disassemble the device or touch the internal parts.
No maintenance when the device is Power-on.

2. DESCRIPTION

2.1 NAMING RULES

HSPH 2200 H/L B

B: Build In Booster

H/L : AC Output Voltage. H: 380/400/440V L: 220/240V

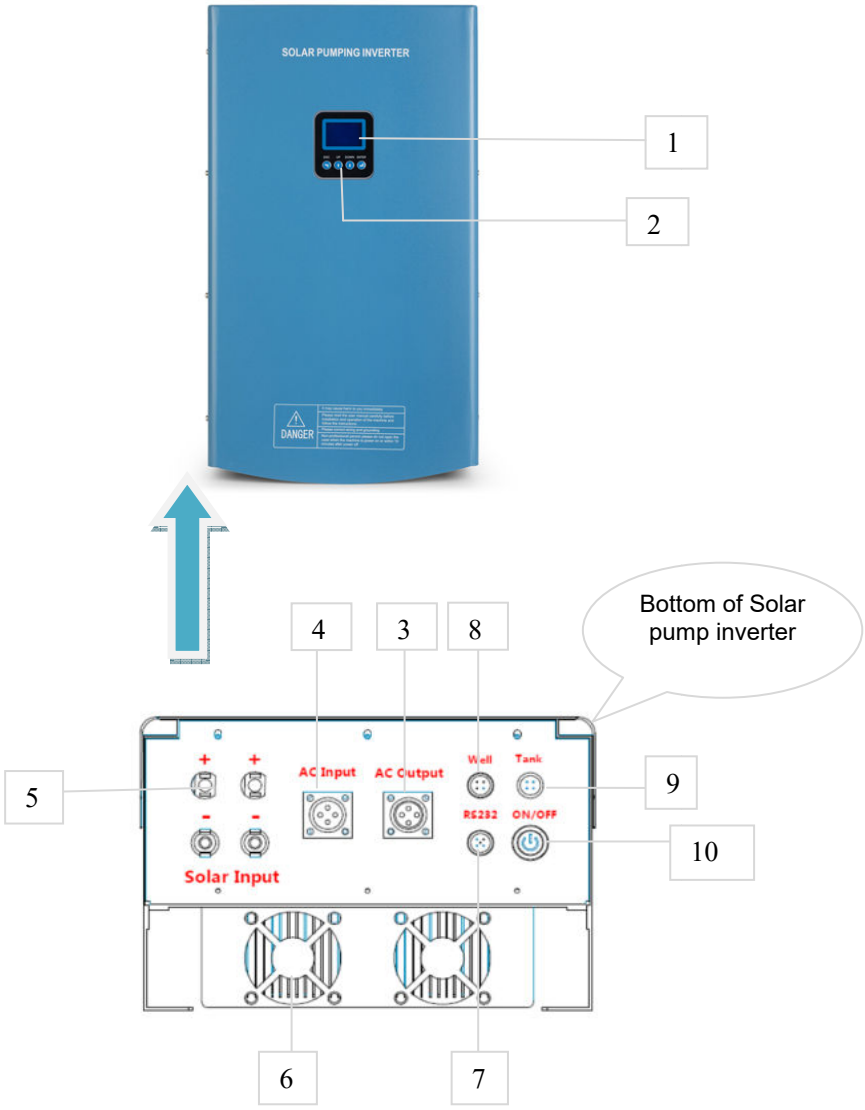
2200: Rated Power of Inverter 2200W.

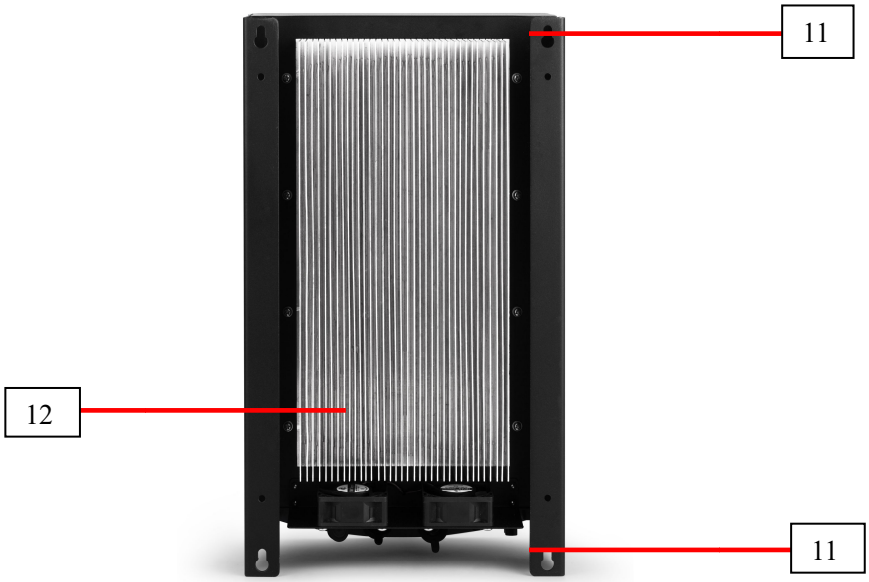
HSPL/H: Manufacturer product code: Solar Pumping Inverter.

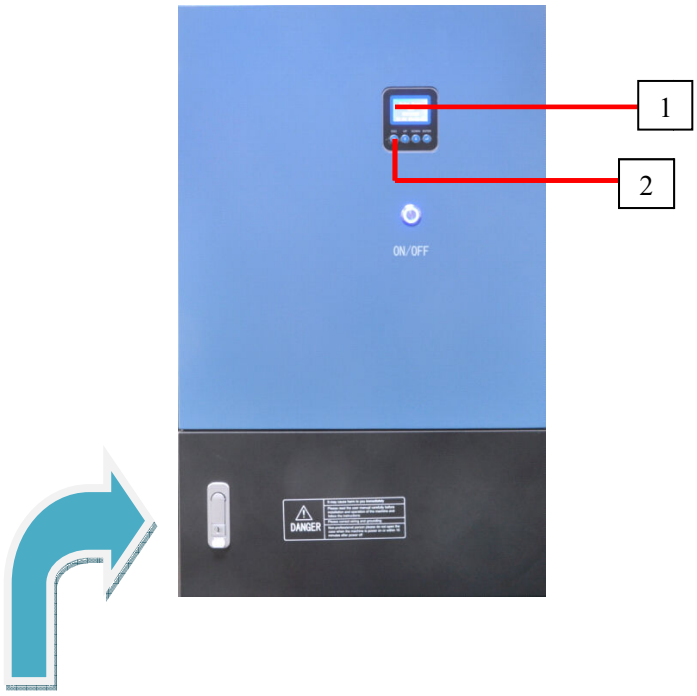
L: Only Solar Power H: Hybrid AC/Battery/Solar Power

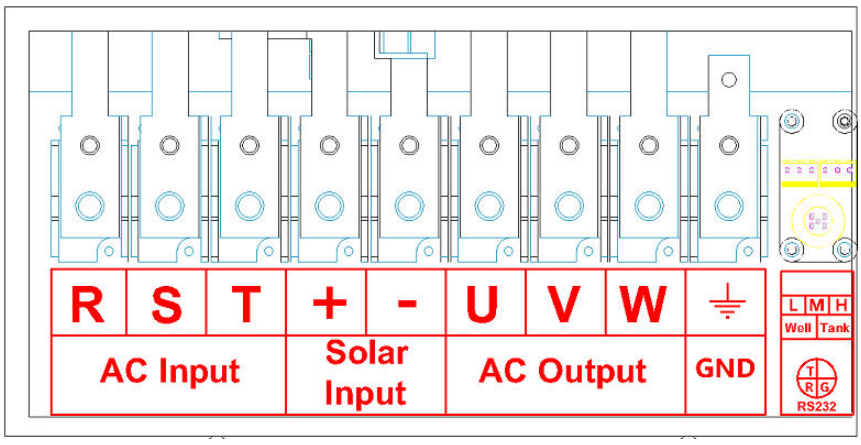
3. INSTRUCTIONS.

3.1 Socket




11
12
11


1
2
ON/OFF
DANGER


R
S
T
+
-
U
V
W
L M H
Well Tank
AC Input
Solar Input
AC Output
GND
RS232

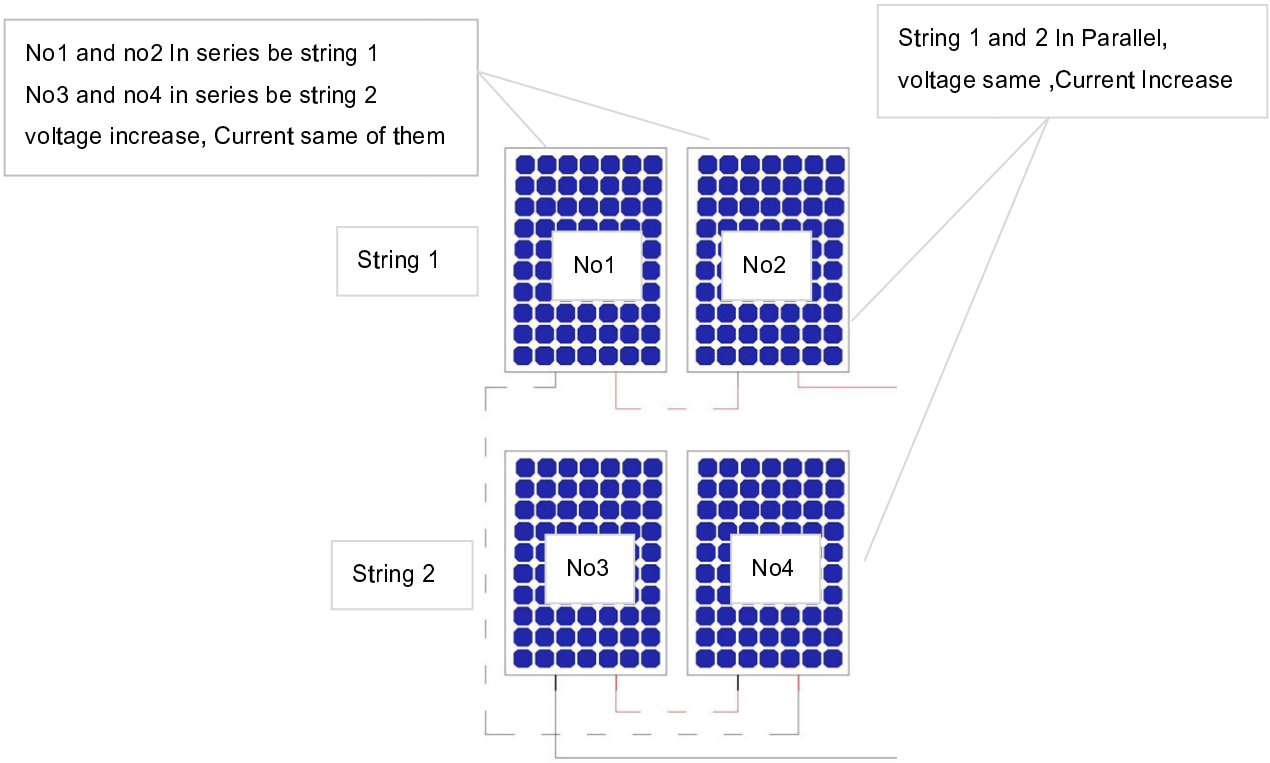
Number	Description	Parameters
1	LCD Screen Display with Cover	128*64px 16*4 Characters
2	Keyboard	Esc, Up, Down, Enter
3	AC Output	Four Lines (3Phase and Ground Line) Red/Yellow/Blue/Yellow_ Green Color IP65
4	AC/Battery Input	Four Line(3Phase and Ground Line) Red/Yellow/Blue/Yellow_ Green Color IP65
5	DC Input	Negative and Positive MC4 /IP68
6	Fan for Wind Cooling	IP68
7	Communication	RS485 /RS232 IP65
8	Well /Borehole Sensor	IP65
9	Tank Sensor	IP65
10	Power On/ Off Control	Inverter Startup: The LED On Stop: The LED Off IP65
11	The Hole for Installation	8-10mm
12	The slide plate to keep cooling wind be vertically	

3.2 Solar Input

a. Please refer to below picture and check if the Solar Arrays voltage within the required DC input range. Can measure the DC input voltage by multi-meter.

b. From PV Panels to Solar pumping inverter input can connect PV combiner box or breakers.

c. Please make sure solar power input positive(+) and negative(-) wires connect correctly.



Solar panel connection

NOTE:

1. Connect solar panel in series and in parallel, then add DC breaker between solar panel cables and solar pump inverter DC input connectors.
2. Solar Panel's Power configure to 1.2 ~ 2 times of pump's power, it depends on the pump's efficiency and sunlight of system installation location.

3.3 AC Input/Output

Forbidden to connect the breaker between inverter AC output connector with pump.

3.3.1 AC Output to 3 Phase Pump Connection:

AC Output to 3Phase Pump			
Red Color	**Yellow Color**	**Blue Color**	**Yellow_Green**
Pump-U Phase	Pump-V Phase	Pump-W Phase	Ground

NOTE: If the pump water flow is too small, please try to exchange any 2 wires of 3 phase for change to forward or reverse running direction.

3.3.2 AC Output to Single Phase Pump Connection:

Please refer to the page 17-19.

3.3.3 AC Input connection:

AC Input to Solar Pumping Inverter			
Red Color	**Yellow Color**	**Blue Color**	**Yellow_Green**
AC-U Phase	AC-V Phase	AC-W Phase	Ground

3.4 Well and Tank Sensor

Wire length of well/tank sensor is 0.5m, each sensor 3 wires. High /Middle /Low Water Level detect.

Well sensor wiring method as below (Tank sensor wiring is same) :

1) The longest length of reserved wire is for well /tank low water level detect
2) The middle length of reserved wire is for well /tank middle water level detect
3) The shortest length of reserved wire is for well /tank high water level detect

Remarks: The connection not base on line colors, it according to the length of reserved line.

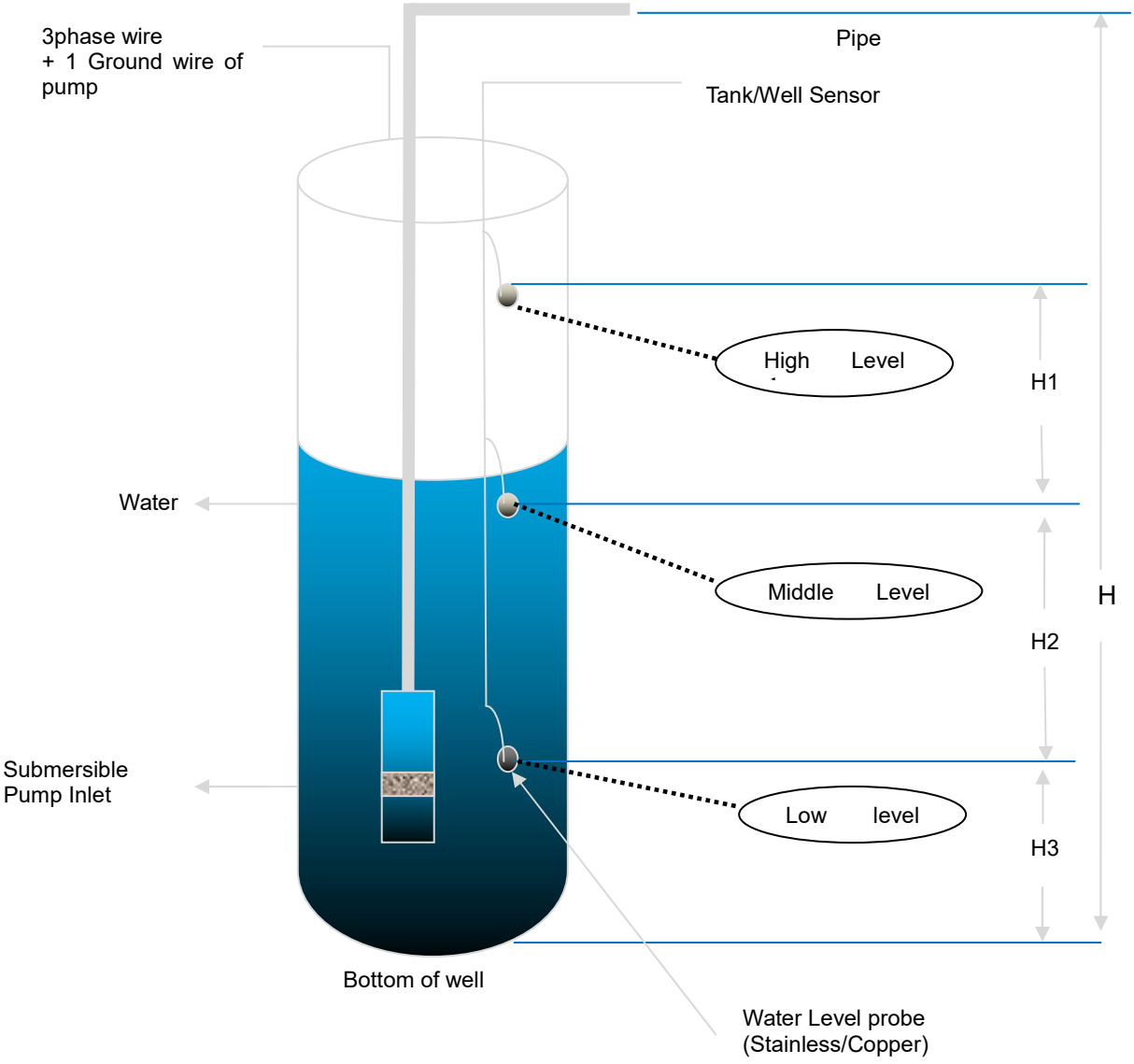
Example:

Total Height (H) of Well is 100m, water depth (H1+H2+H3) is 90m.

H3: Bottom of well to the pump inlet is 10m.

H2: 40m.

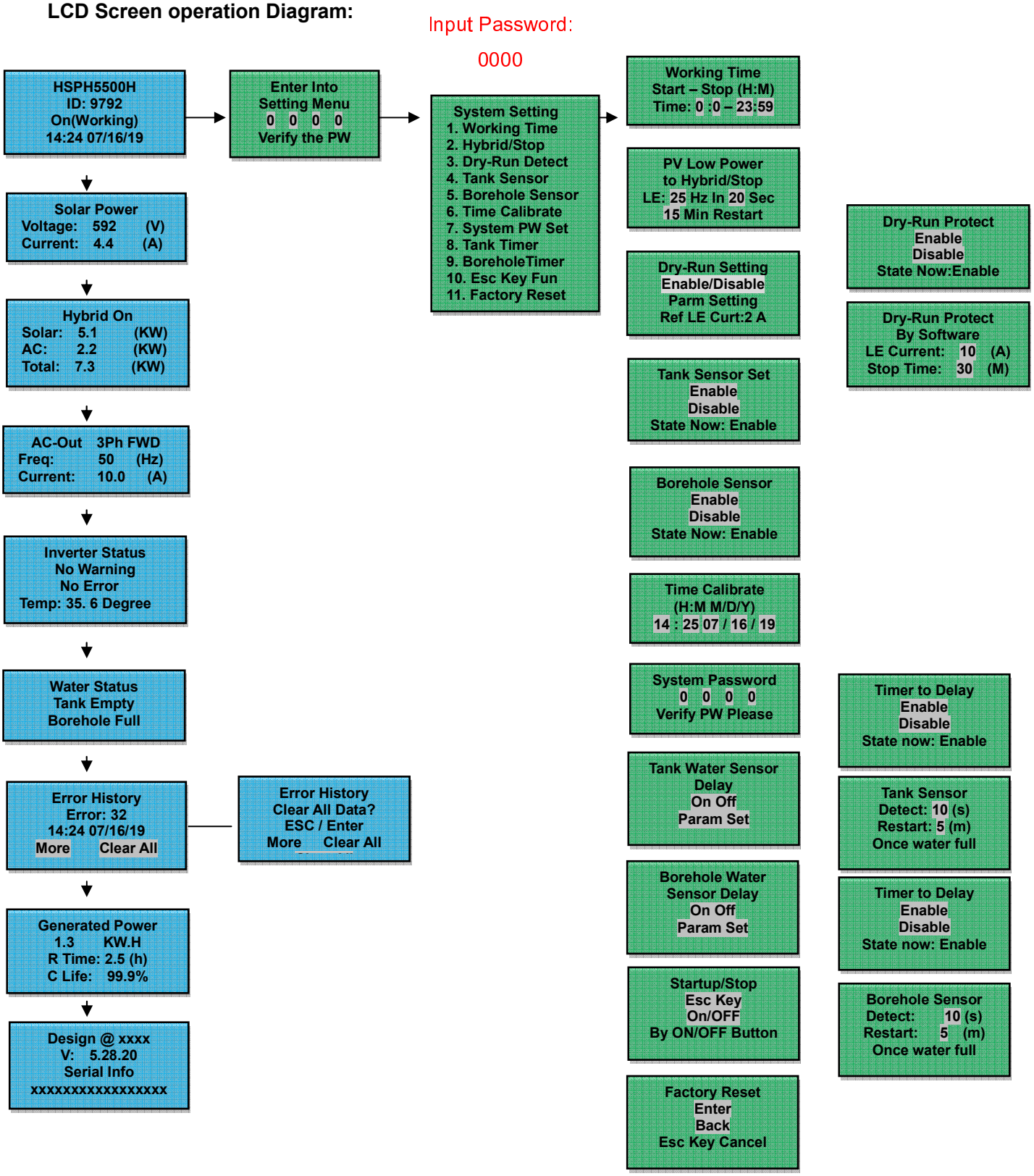
H1: 40m.



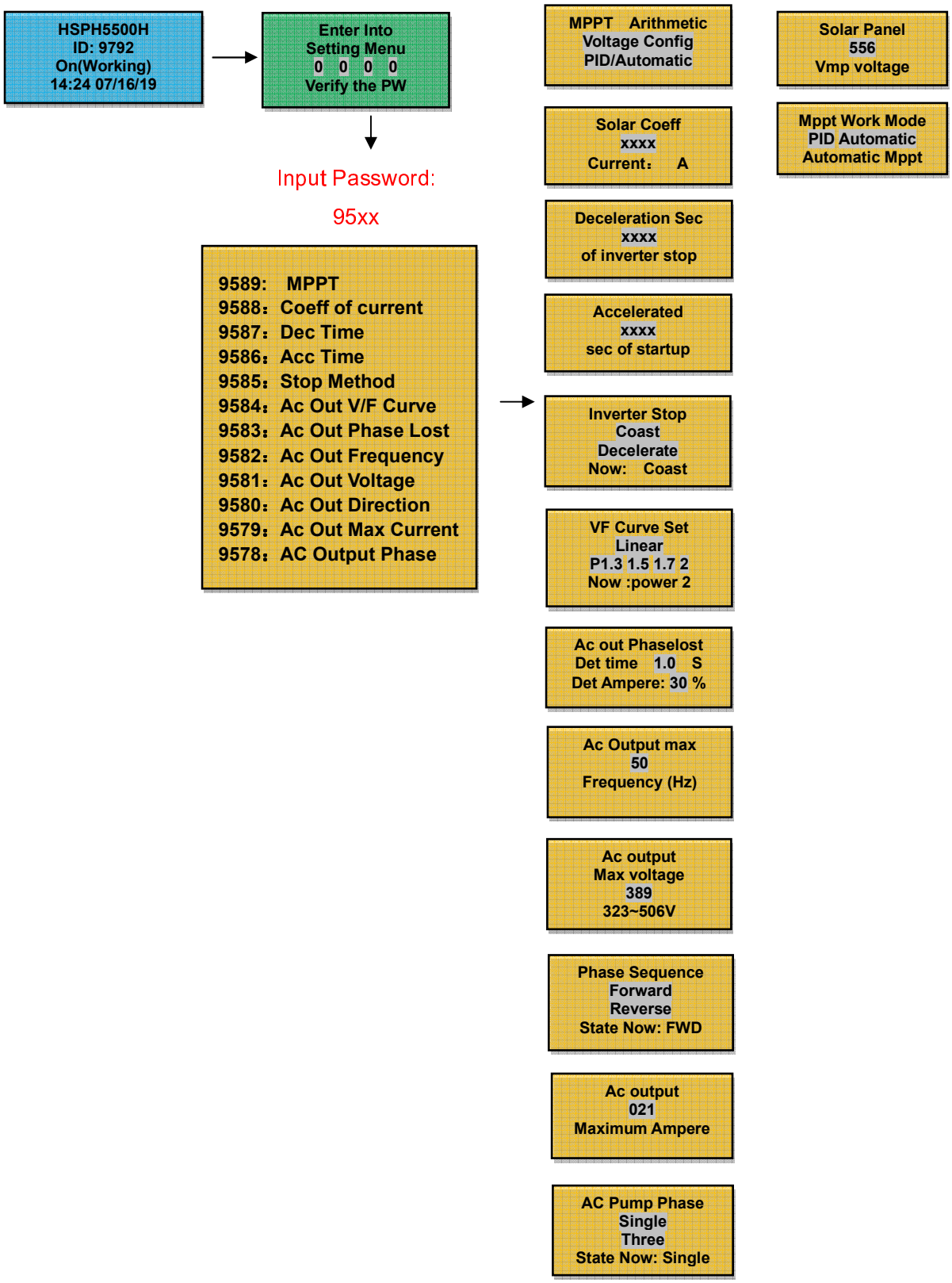
Well/Tank Sensor Wiring Method

3.5 LCD Type

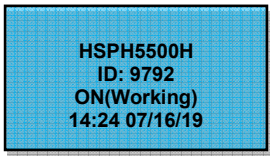
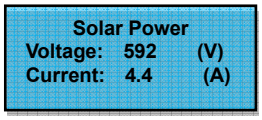
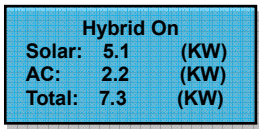
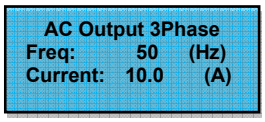
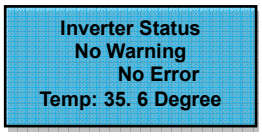
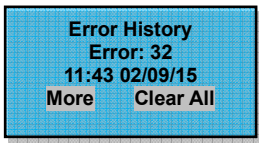
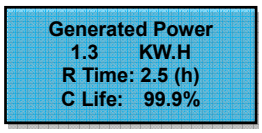
LCD Screen operation Diagram:

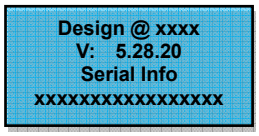
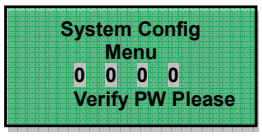
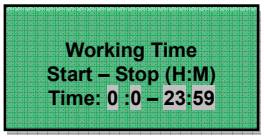
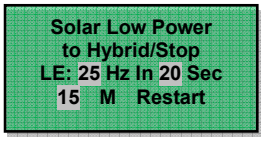
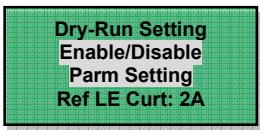
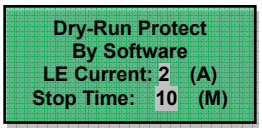


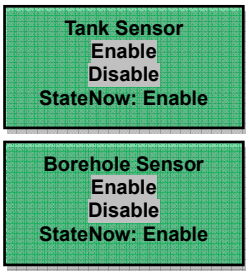
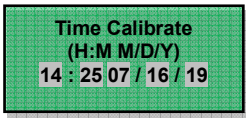
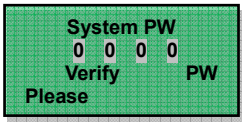
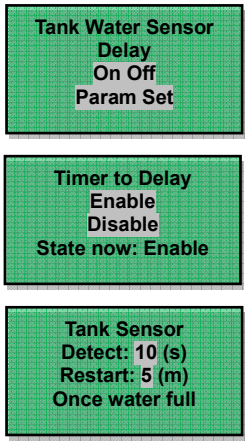
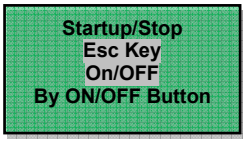
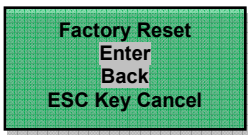
Please pay attention to when modify the following parameters, could lead to machine operation efficiency is reduced, or can't run

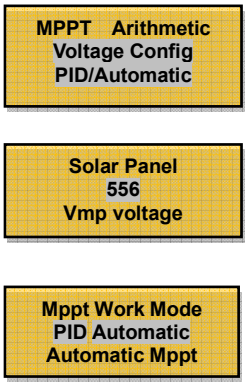
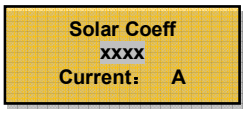
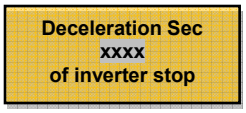
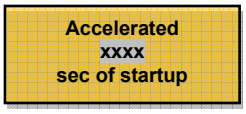
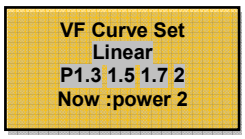


NOTE： AC Pump Phase setting only valid at 220V inverter.

	**Main Menu** “UP”, ”Down” Key for Change Menu “Enter” Key for enter Setting Menu Line 1: Model Line2: Serial ID Line3: Show System is Running or Stop(and stop reason) Line 4: System Time NOTE: System time is important. It relates to the inverter working time. Please correct it with local time.
	**Solar/ AC Input State** Show the Input Voltage, Current, Power of Solar Panel
	**Hybrid On/Off** Hybrid Power is On/Off, show the power of Solar or AC
	**AC Output State** Show the AC Output frequency, Current of AC to the pump
	**Inverter State** Show the Warning, Error and Temperature of Solar Pumping inverter
	**Tank /Well’s Water Status** Show the water Tank and Well status. If the water tank is full or well is empty , inverter stop running automatic and show the status
	**Error History** For inquiry the Error flag history Press the “Enter” key to enter the menu, press “UP”/ ”Down” to select the command for inquiry more records or clear the history. Note: If current cursor is on “More”, press “Enter” key to view more records, then “UP”/”Down” key to change the records.
	**Generated Power** Solar generated total power, running time and capacitor lifetime percent

	**Inverter Information** Manufacture and Software Version
	Verify the Password to Enter the Setting Menu Initial Password: 0000
	**System Setting** "UP"/"Down" to change Menu Item
	**Working Time** Inverter Working Time. If the system time within inverter working time, inverter working, otherwise inverter stop working, and shows " OFF(Time)".
	**Solar Low Power to Hybrid/Stop** Please refer to the page 20-23.
  	**Dry-Run Detect** Pump Dry-Run (Well Water level) detected by software. When the inverter run to 45Hz or over 45Hz, it detect the pump current. Inverter Automatic Stop once the pump current less than the LE Current, inverter will restart after 10 minutes. NOTE: If connect well sensor and Enable Well sensor, the dry run function will disable automatic. Ref LE Curt: Current value is 1/3 times of pump rated current. Also the inverter will give the reference current value when the pump running to 45Hz or over 45Hz with load, then you can according the **Ref LE Curt** A to set.

	**Tank /Well Sensor Setting** Enable/Disable the Sensor.
	**System Time** System Time Calibrate.
	**System Password** Password to enter the setting menu.
	**Tank & Borehole Sensor Detect Filter** On Off: enable the filter or not Detect time(seconds): Tank water full or borehole water empty continue 10s and inverter stop Restart time (minutes): Tank water goes to empty or borehole water come to full , and continue 5 minutes , inverter automatic restart
	**ESC Key for Startup/Stop** Inverter startup and stop can use On/OFF button or by esc key (press it for 3 seconds or more)
	**Factory Reset** Reset all settings to default value.

	**MPPT Arithmetic Setting** Input Password: 9589 PID/Automatic: choose the MPPT Arithmetic PID MPPT: need to configure the Vmp voltage according to the solar panel Automatic: inverter will automatic track the maximum power point of solar panel, the Vmp config parameter is useless
	**Coeff of Current** The coeff of solar input , ac input and ac output current
	**Deceleration Second of inverter stop** Frequency decrease time while the stop command valid
	**Accelerated Second of inverter startup** Frequency Increase time while the startup command valid
	**Stop Type** Coast: Inverter stop output immediately while the stop command is valid Decelerate: Inverter output frequency decrease by Deceleration time while the stop command is valid
	**V/F Curve** Linear P1.3: Power 1.3 1.5 : Power 1.5 1.7: Power 1.7 2: Power 2.0

Ac out Phaselost Det time 1.0 S Det Ampere: 30 %	**Phase Lost Detect Setting** Det time: detect time Det Ampere: 30% , if one of ac output phase's current is below the other phase 30%, and continue the detect time, inverter stop
Ac Output max 50 Frequency (Hz)	**AC Max Output Frequency** Set the Max output Frequency, Range from 15 to 60Hz NOTE: Please check your pump parameters. If the pump is 50Hz, but you set inverter AC output Max 60Hz, the pump will be damaged!
Ac output Max voltage 389 323~506V	**AC Max Output Voltage** Set the Max output Voltage. Invalid for 220V inverter. NOTE: Please check your pump parameters. If the pump is 380V, but you set inverter AC output voltage Max 440V, the pump will be damaged!
Phase Sequence Forward Reverse State Now: FWD	**AC Output Phase** Adjust the Phase sequence to make the pump reverse or forward running .
Ac output 021 Maximum Ampere	**AC OUTPUT MAXIMUM CURRENT** Maximum setting value is 2 times of rated current . default value is 1.5 times of rated current
AC Pump Phase Single Three State Now: Single	**AC Pump Phase** The configuration for 0.75KW-2.2KW inverter only. Single: the AC pump is Single phase Three: the AC pump is Three phase

3.6 ON/OFF Button

Startup: Press Down The light On.	
Shut Down : Press Up The light Off.	

4. PACKAGING

- Inverter: 1 piece
- DC Input Connector: 750~30KW, 1-3 pairs.
- AC/Battery Input connector: 1 piece
- Tank Sensor: 1 piece
- Well Sensor: 1 piece
- AC Output Connector: 1 piece
- User Manual: 1 piece

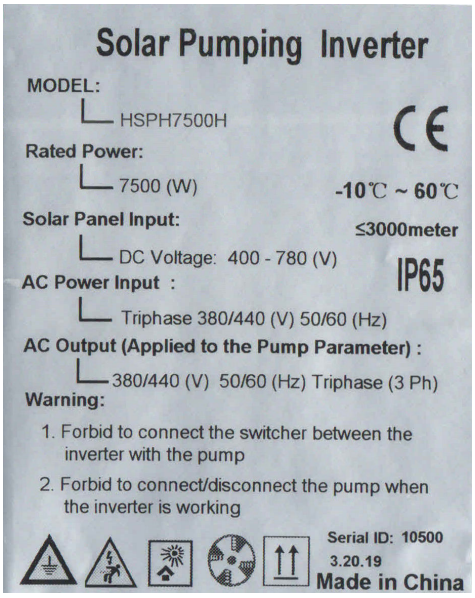
NOTE: From 37KW to 132KW, the solar input, AC input , AC output is directly connect to solar pump inverter.

5. QUALITY WARRANTY

In order to protect your interests, to solve any menace from the "rear"!

The manufacturer provides 2 YEARS quality warranty.

Please provide the inverter failure photos , videos and the Serial ID to the distributor.



Machine Label

- The following situations out of the quality warranty condition:
  Alter the inverter serial ID, quality warranty label tag.
  Operation environment out of the required conditions.
  Repairing or disassembling without manufacturer authorization.

- The following situations will be charged material cost: Irresistible natural forces such as earthquake, fire, flood both in and out of warranty period. Damages caused by improper use.

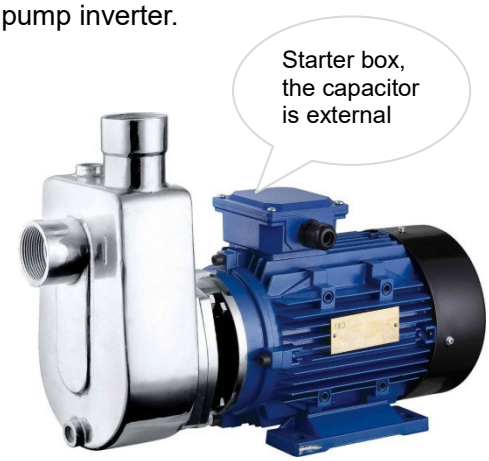
Single Phase Pump Connection Guide

Version4.0

Suitable pump specifications

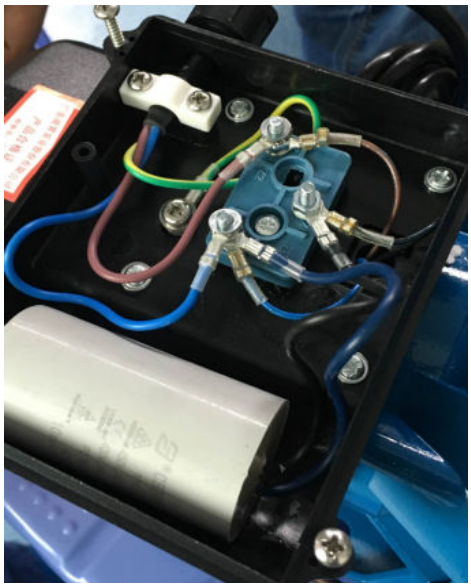
a. Single phase 220v submersible pump and surface pump.

b. The capacitors of pump must be external, it can be removed it. The internal capacitor's pump does not work with the single phase solar pump inverter.

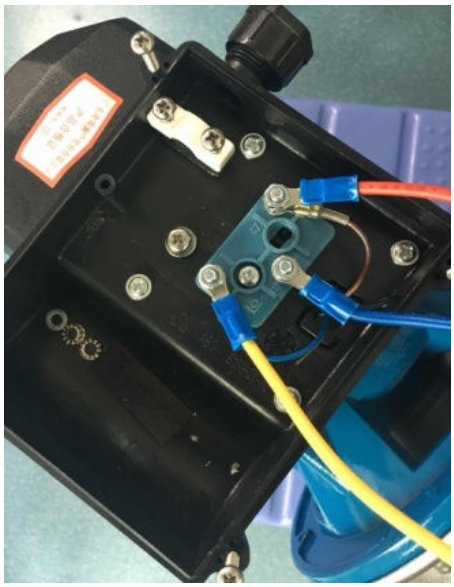


1. Single phase solar pump connect with single phase solar pump inverter steps:

1.1 Remove the capacitor of the pump



Original pump's starter box



Removed capacitor from the starter box

1.2 Use multi meter to measure the pump 3 cables each 2 of them Ohm, then confirm the pump's common, start and running wire.

For example: the pump's cables are brown, blue and black.

Take the measured Ohm record:

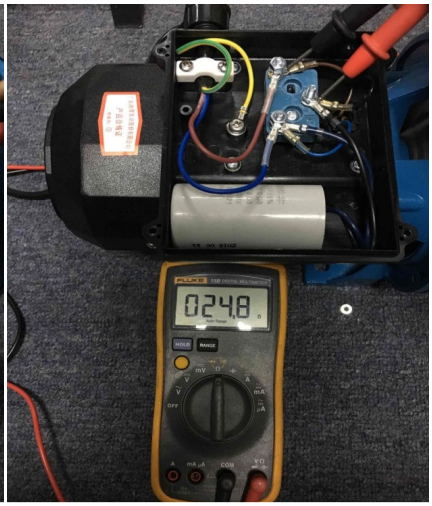
R1: between blue and black 39.3Ω

R2: between brown and black 24.8Ω

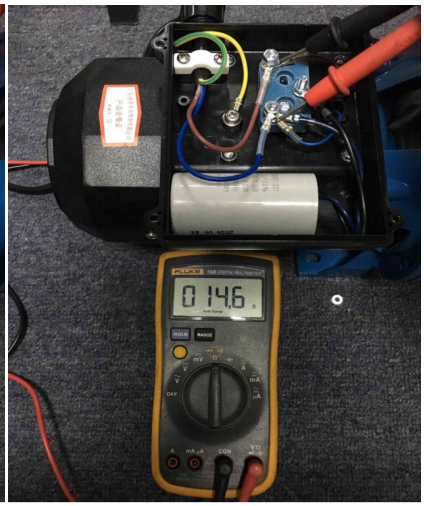
R3: between blue and brown 14.6Ω

The measure picture as follows:

R1 Ohm



R2 Ohm



R3 Ohm

And testing result

R1 = R2 + R3 and R2 > R3

The biggest ohm is between start wire and running wire

The middle ohm is between start wire and common wire

The smallest ohm is between running wire and common wire

1.3 Conclusion:

a. Motor's Brown wire is common wire, and connects with the solar pump inverter AC output red wire.
b. Motor's Black wire is the start wire, and connects with the solar pump inverter AC output blue wire.
c. Motor's Blue wire is the running wire, and connects with the solar pump inverter AC output yellow wire.

Remark: The pump cables from different factories may different, please do the ohm measurement correctly.

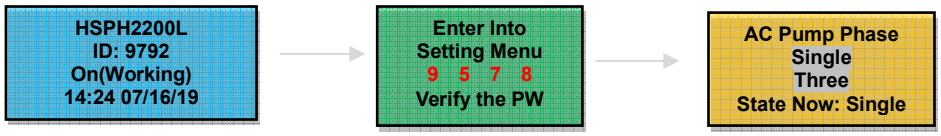
2. Solar Pump Inverter single phase or three phase 220v selection setting.

2.1 check the solar pump inverter ac output phase whether is single phase. If yes, continually do the wiring.

If no, need go to setting Menu to set the inverter AC output phase to single phase 220V. After finished setting, need switch off power, so the setting can be saved.

If the solar pump inverter AC output is 3 phase 220v, and it connect with the single phase 220v pump, it will show “phase lost”.

The solar pump inverter single phase and three phase AC output steps as follows,



Remark:

1. If the solar pump inverter common wire is connected to the single-phase pump common wire incorrectly, there are 3 situations happens, please check the follows,

a. Pump will run, but it will be over the rated current.

b. pump is heat, and it will stop running or burned after 15~30 minutes.

c. water flow is small.

2. The solar water pump inverter and the single-phase pump common wire are connected correctly, but the running wire and the starting wire are connected incorrectly, there are 1 situation, please check as follows:

a. Pump reverse running, and the water flow is small.

Hybrid Function Guide

Version1.0

Hybrid function: Solar power and AC power hybrid input at the same time , and the solar power is priority. When the solar power insufficient, AC power will be supplement rest power automatically , and inverter shows hybrid on; when the solar power recovery, the inverter will automatically only take power from solar power, and LCD screen shows hybrid off..

The hybrid function is to solve the situations that solar power insufficient or no output in the early morning, evening and rainy days, but required the pump output rated water.

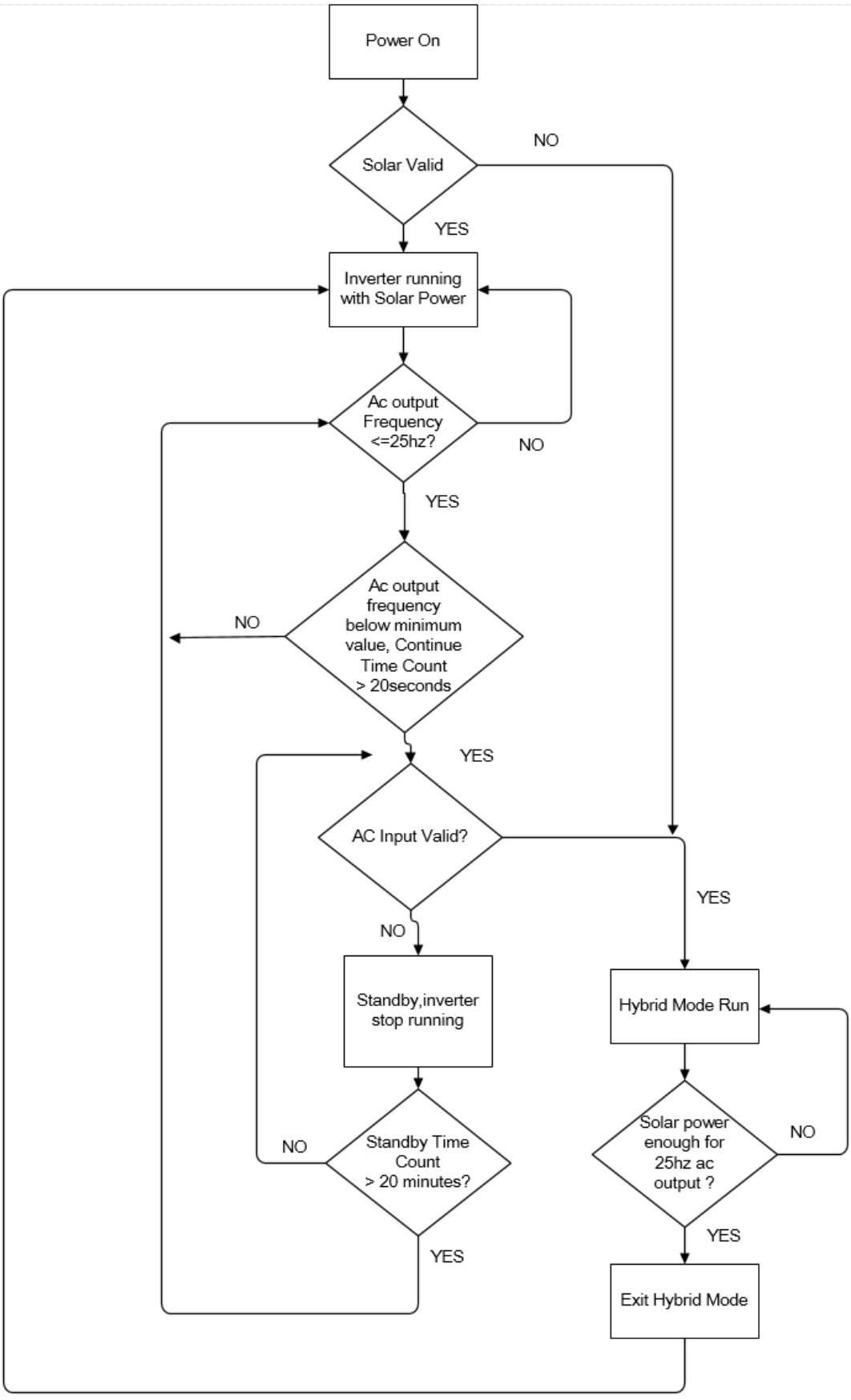
HYBRID/STOP SETTING parameters setting for example :

LE：25Hz In 20S 20 M to Restart

25Hz: Inverter minimum working frequency

20S: Detecting time (seconds)

20M: Stopping time (Minutes)


Power On
Solar Valid
NO
YES
Inverter running with Solar Power
Ac output Frequency <=25hz?
NO
YES
Ac output frequency below minimum value, Continue Time Count > 20seconds
NO
YES
AC Input Valid?
YES
NO
Standby,inverter stop running
Hybrid Mode Run
Standby Time Count > 20 minutes?
NO
YES
Solar power enough for 25hz ac output ?
NO
YES
Exit Hybrid Mode

There are 3 hybrid working situations as below:

1. Solar Input, No AC Input

HYBRID/STOP SETTING

LE：25Hz In 20S 20 M to Restart

25Hz: Inverter minimum working frequency

20S: Detecting time (seconds)

20M: Stopping time (Minutes)

LE：25Hz In 20S 20 M to Restart means when the inverter output frequency less than 25Hz in 20 seconds, inverter stop working(Standby) and restart automatic after 20 minutes.

Remark:

If input AC power when the inverter standby, the inverter will start the hybrid mode automatic in real time.

2. AC Input, No Solar Input

HYBRID/STOP SETTING

LE: 25Hz In 20S 20 M to Restart

25Hz: Inverter minimum working frequency

20S: Detecting time (seconds)

20M: Sleep time (Minutes)

All above parameters invalid, inverter work with AC power only.

Remark:

If input solar power, once the solar power output frequency over 25Hz, AC power exit and hybrid on automatic.

3. Solar & AC Dual Input

HYBRID/STOP SETTING

LE: 25Hz In 20S 20 M to Restart

25Hz: Inverter minimum working frequency

20S: Detecting time (seconds)

20M: Sleep time (Minutes)

a. Solar power is first priority, when solar output frequency over 25Hz, the inverter work with solar only.

b. When solar output frequency less than 25Hz in 20 seconds, AC power supplement automatic and hybrid on. The inverter checking solar power real time, once the solar output frequency recovery to 25Hz or over 25Hz, AC power exit and hybrid off automatic.

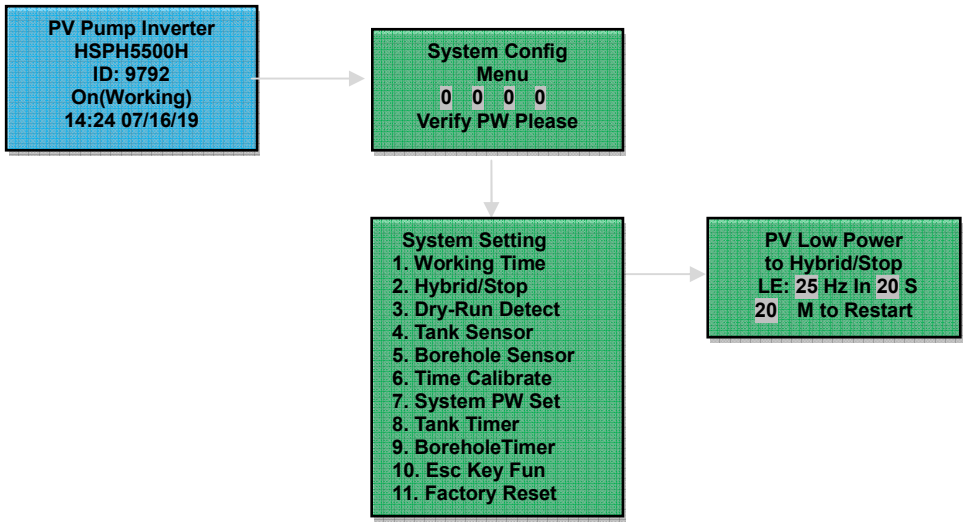
Remark:

Regarding the hybrid frequency 25Hz, why choose 25Hz?

Customer need to set the hybrid frequency according to actual situations.

Setting the frequency (Output freq) from small to large to check the frequency which can pump water to destination.

For example, when inverter output frequency 35Hz can pump water to the destination, the Hybrid/Stop Setting is 35Hz.



Display / Troubleshooting guide of Solar Pumping Inverter

THIS IS PRIVATE FILE DO NOT PUBLIC TO THE THIRD PARTY WITHOUT AUTHORIZATION

Feedback with Pictures or Videos will be much appreciated.

Display	NOTE
" ON(Working) "	Inverter is working and ac output normal
" OFF (On/Off) "	On/Off button release
" OFF (SPMCS) "	Remote SPMCS control to Stop
" OFF (Timer) "	Inverter is out of working time
"OFF (PV Low Pow)"	Solar intput low power to stop, for protect the pump working useless
" OFF (Hybrid) "	Ac input Error, hybrid mode switch failed
" OFF (Tank) "	The water of tank is full
" OFF (Borehole) "	The pump is dry run and no water input to the pump, detected by water sensor
"OFF(DryRun Soft)"	Pump dry run, no water input to the pump, detected by software
"OFF (AC Out S-C)"	Ac output over the max current of IGBT
"OFF (Sensor Err)"	Ac output current sensor error
" OFF(Mft Drive) "	Software error
"OFF (AC Out O-A)"	Ac output over load
" OFF(Over Load) "	Solar input power over maximum power of inverter
"OFF(DC Over Vol)"	Solar input over voltage
"OFF (Over Temp)"	Inverter over temperature
"OFF (Ic Voltage)"	Power supply error
"OFF (Phase Lost)"	Ac output phase lost
"OFF (Low Voltag)"	Solar input low voltage
" OFF (Locked) "	Remote SPMCS control locked the inverter

"OFF (Ac P-G S-C)"	Ac output phase to ground short circuit .
" OFF(Capacitor) "	Lifetime of capacitor is out , need to replace
" AC-Out 3Ph FWD "	Ac output 3phase forward
" AC-Out 3Ph REV "	Ac output 3phase reverse
" AC-Out 1Ph FWD "	Ac output 1phase forward
" AC-Out 1Ph REV "	Ac output 1phase reverse
" W:System Time "	System time is not working warning
Waring	*Inverter continue working and ignore the Warning*
"W:System E2PROM"	E2prom is not working warning
"W:Hybrid Low Vol"	No Ac input warning
"W:AC O Unbalance"	Ac output 3phase is unbalance warning
"W: Ac Phase Lost"	Ac 3phase input phase lost warning
"W:Solar C-Sensor"	Solar current issue warning
" W: AC C-Sensor "	Ac Input current sensor issue warning
"W:Capacitor Life"	Replace the capacitor warning
"W: U-Ph C-Sensor"	Ac output U phase current sensor issue warning
"W: V-Ph C-Sensor"	Ac output V phase current sensor issue warning
"W: W-Ph C-Sensor"	Ac output W phase current sensor issue warning
" E:Over Voltage "	Solar input over voltage error
" E:AC Out O-A "	Ac output over load error
"E:AC Out Short-C"	Ac output over max current of IGBT or ac output phase short circuit error
" E: Over Temp "	Inverter over max temperature error

" E:Power Supply "	Hardware power supply error
" E: Over Load "	Solar input power over max power of inverter error
"E:Out Phase Lost"	Ac output 3phase phase lost error
" E: Low Voltage "	Solar input low voltage
"E:AC Out P_G S-C"	Ac output phase to ground short circuit

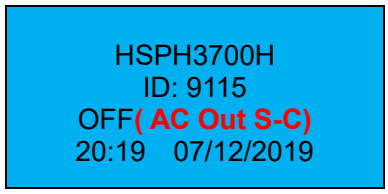
Error Code	Beep Alarm times	Reason
E1	1	Solar input power over max power of inverter error
E2	2	Solar input over voltage error
E4	3	Ac output over max current of IGBT or ac output phase short circuit error
E8	4	Ac output over load error
E16	5	Inverter over max temperature error
E32	6	Hardware power supply error
E64	7	Ac output 3phase phase lost error
E128	8	Software error
E256	9	Voltage booster error
E512	X	X
E1024	10	Ac output phase to ground short circuit
E2048	11	Ac output current sensor error
E4096	12	Capacitor over life time error

1. Inverter Off. ON/OFF Key button failure, pump is not working.

Message on the main page show **"OFF (AC Out S-C)".** Inverter Status Page show **"E: AC Out Short-C"**.

ErrorCode :**E4**

The buzzer sounds 3 times and stops .



Checking steps:

1.1. Forbidden to connect breaker between the inverter AC output and pump.

Please remove the breaker If there is breaker between the inverter ac output connector with pump, otherwise goes to 1.2 and 1.3

1.2. Checking pump and pump's wiring.

Measuring pump resistance (Ohm) to check if the pump is normal.

Step 1: Turn off the inverter.

Step 2: Plug out the AC output, disconnect the pump and inverter.

Step 3: Measuring the pump resistance (Ohm) by Multimeter.

1.2.1 Three-phase pump measurement method

There are 4 wires of pump, take the Red (U Phase), Blue (V Phase), Yellow (W Phase), Yellow-Green (Ground) as example:

Check and Record the resistance (ohm) of U-V, V-W, U-W.

For three phase pump, if the 3 data of resistances are the same, then pump is ok and goes to 1.3 .Otherwise, please check pump and pump's wiring.

1.2.2 Single-phase pump measurement method :

Ohm (U-V, V-W and U-W) is not same (not zero), and pump is single phase (Ohm of U-V = Ohm V-W + Ohm U-W or Ohm of V-W = Ohm of U-V + Ohm of U-W , or Ohm of U-W = Ohm of U-V + Ohm V-W)

If the 2 of them total resistance = one of the resistance, then pump is ok and goes to 1.3. Otherwise, please check pump and pump wiring.

Single phase pump measurement method as below(R1=R2+R3):

R1 Ohm

R2 Ohm

R3 Ohm

1.3. Inverter running without load.

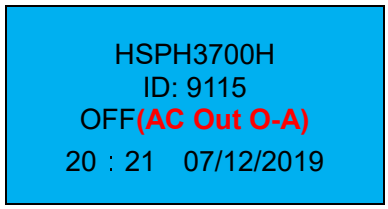
Step 1: Power off the inverter.

Step 2: Plug out AC output connector, disconnect the pump wires.

Step 3: Power on the inverter and check the AC OUTPUT STATUS.

Step 4: Check the output frequency, if output frequency is 0, inverter is failure, please contact us.

2. **Message on the main page show "OFF (AC Out O-A)", alarming 4 times, ON/OFF BUTTON, inverter can be powered on/off repeat. (Error Code : E8**) AC output over current protection, alarming 4 times and stop, repeat..

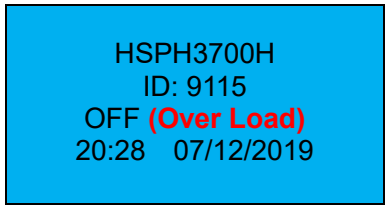


2.1 Please check If the inverter rated power >= pump rated power. Otherwise goes to 2.2

2.2 Please check pump resistance normal or not. Please follow the guide of 1.2

NOTE: Forbidden Inverter rated power < pump rated power

3. **Message on the main page show "OFF(Over Load)", alarming 1 time. (Error Code :E1)**



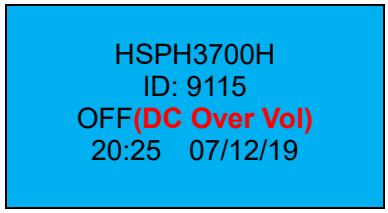
Inverter overload.

3.1. Please check If inverter rated power >= pump rated power.

3.2. Please check if the pump resistance is normal. Please follow the guide of 1.2

NOTE: Forbidden Inverter rated power < pump rated power

4. Message on the main page show "OFF(DC Over Vol)", alarming 2 times. (E2)



DC input voltage > inverter maximum Voc input voltage. Please check the solar panel connection

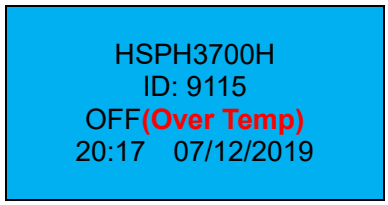
NOTE: For 220V inverter, max Voc DC input is 450V. 380V inverter：max Voc DC input is 780V or 900V.

4.1. Disconnect solar input and check the Solar Voltage.

Over 450V Voc (220V pump): please reduce the solar panels.

Over 780/780V Voc (380V pump): please reduce the solar panels.

5. Message on the main page show "OFF (Over Temp)", alarming 5 times. (ErrorCode : E16)



Over temperature. Inverter Fan working condition:

If temperature >45 ℃, fan will work, if temperature <40 ℃, fan will stop working. If temperature >70 ℃ in 10s, inverter will stop working, and LCD screen shows 'OFF(Over Temp)'

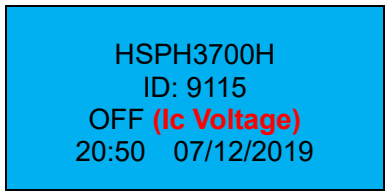
5.1. If Inverter internal temperature >45 ℃, all fans working, please check installation conditions.

5.2. If some fans are stop working , and some fans are working, please check if any foreign matters in the fans , and make it not working. If not, please replace the fan.

5.3. Check the Temperature ("Temp: ? Degree").

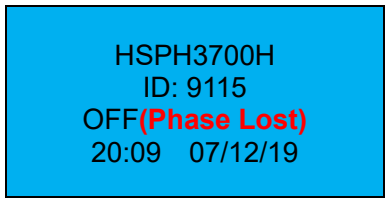
If the temperature > 65 ℃, please contact us with installation pictures.

6. Message on the main page show "OFF (Ic Voltage)", alarming 6 times. (ErrorCode :E32)



Hardware circuit failure, Please replace PCB.

7.Message on the main page show “OFF (Phase Lost)”, alarming 7 times. (ErrorCode : E64)



Phase lost protection.

7.1. Please check if the inverter output phase match pump phase.

Forbidden 3phase inverter connected to single phase pump.

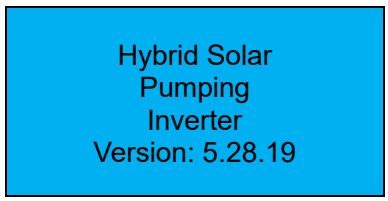
Step 1. Disconnecting pump and inverter.

Step 2. Checking and record pump’s resistance (Ohm of U-V, U-W, V-W). Please follow the guide of 1.2

Step 3. After confirming pump is normal, power off, restart the inverter and run the inverter without load.

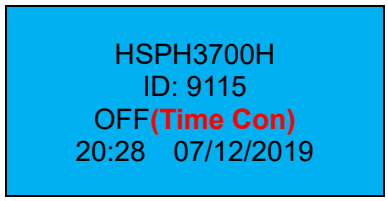
If same problem without load operation, it means inverter is failure, please contact us.

8. Stay in the boot LOGO interface, can not enter the system menu, no Error code



Solar power input voltage lower than Minimum DC input voltage, Please check DC input voltage.

9. Message on the main page show “OFF (Time Con)”, no Error code, no alarming

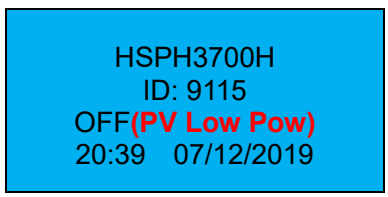


There is a problem on working time settings or time calibrate.

9.1. please check the Working Time Setting

9.2. Calibrating the system timer with local time

10. Message on the main page show “OFF (PV Low Pow)”

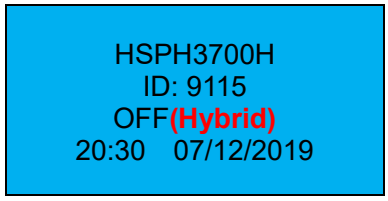


Please check Hybrid/Stop settings.

Setting the hybrid frequency to 25Hz, restart the inverter when sunlight is good enough and test again.

If there is still a problem, check if the pump is normal.

11. Message on the main page show “OFF (Hybrid)”, no Error, no alarming

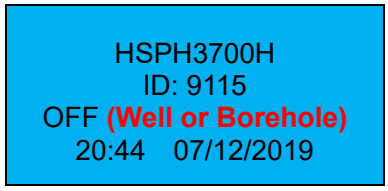


Hybrid On/Off switch, AC input voltage, phase lost.

Restart inverter with ON/OFF key.

Please check the AC input voltage and wiring.

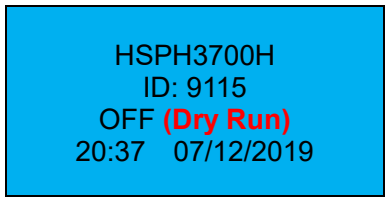
12. Message on the main page show “OFF (Well)”



Well/Borehole water empty, pump is dry run protection

Note: The well sensor can not support pure water detection.

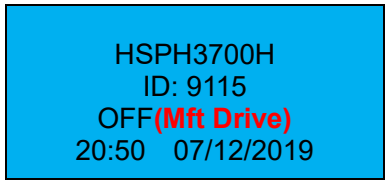
13. Message on the main page show “OFF (Dry Run)”



Dry-run protection by Software.

Please check dry-run settings, setting value= 1/3 pump rated current.

14. Message on the main page show “OFF (Mft Drive)”



Software error, restart and test. If same issues, please contact us.

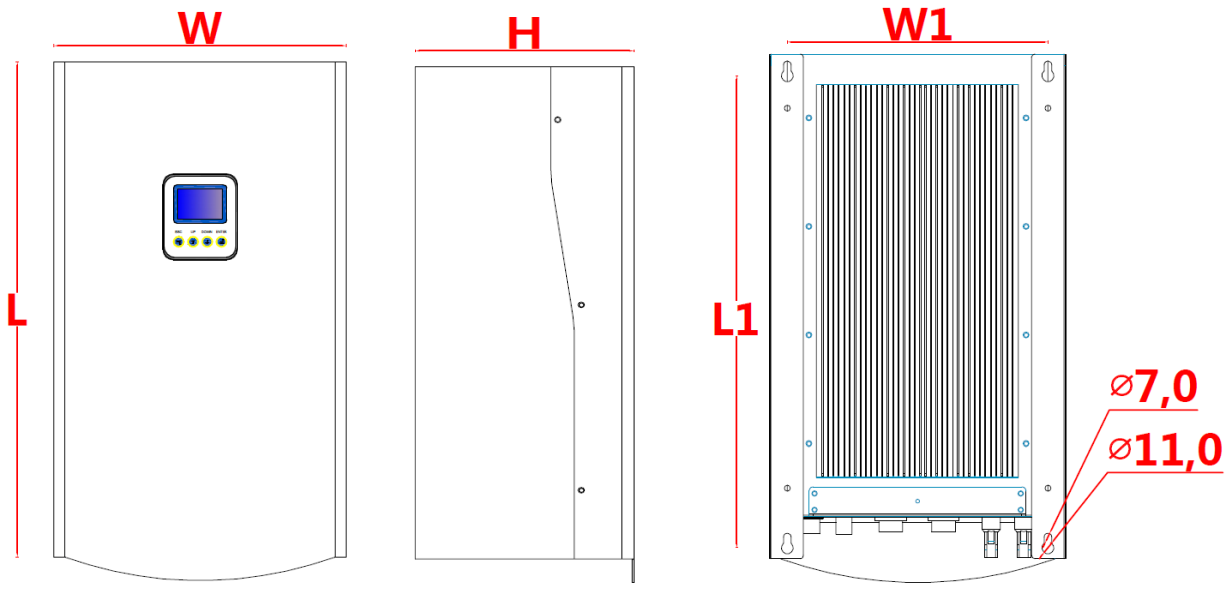
15. AC Input to inverter is OK, but can not drive the pump :

Pump or the wire is electric leakage, change the wire or replace the pump .

INSTALLATION INSTRUCTION

1. Solar Pump Inverter Graph

1.1 Power Range: 0.75-30kw



0.75-30kw solar pumping inverter box structure

Dimensions:

Power	L(mm)	W(mm)	H(mm)	Fix Hole L1(mm)	Fix Hole W1(mm)
0.75kw	420	240	152	390	207
1.5-15kw	465	274	185	435	240
18.5-30kw	420	240	150	390	207

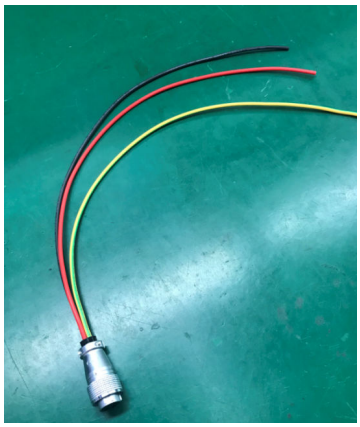
Accessories:

Power	DC Input Connector	Ac Input Connector	AC Output Connector	Tank Sensor Connector	Well Sensor Connector
0.75kw-2.2kw	1 pair + -	1	1	1	1
3.7-15kw	2 pairs + -	1	1	1	1
18.5-30kw	3 pairs + -	1	1	1	1

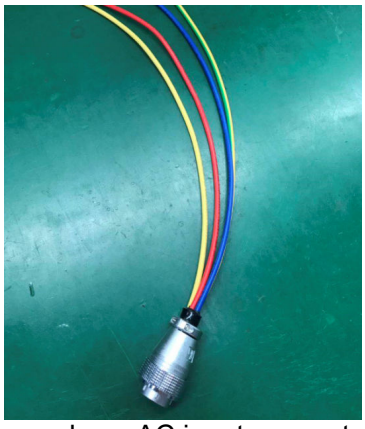
a. AC Input Connector (0.75~30KW)

U,V,W 3-Phase, U(red), V(yellow) , W(blue)

L,N single phase 220v input, L(red), N(black), Ground wire(yellow-green)



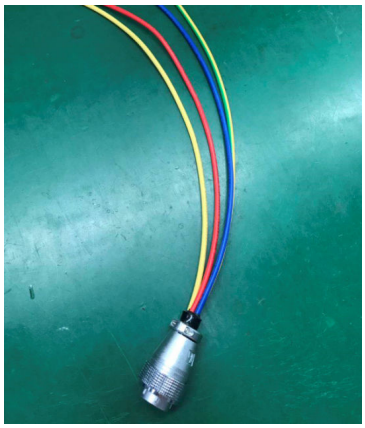
Single phase AC input connector



Three phase AC input connector

b. AC Output Connector (0.75~30KW)

U,V,W 3-Phase, U(red), V(yellow) , W(blue) Ground wire(yellow- green)



AC Output Connector

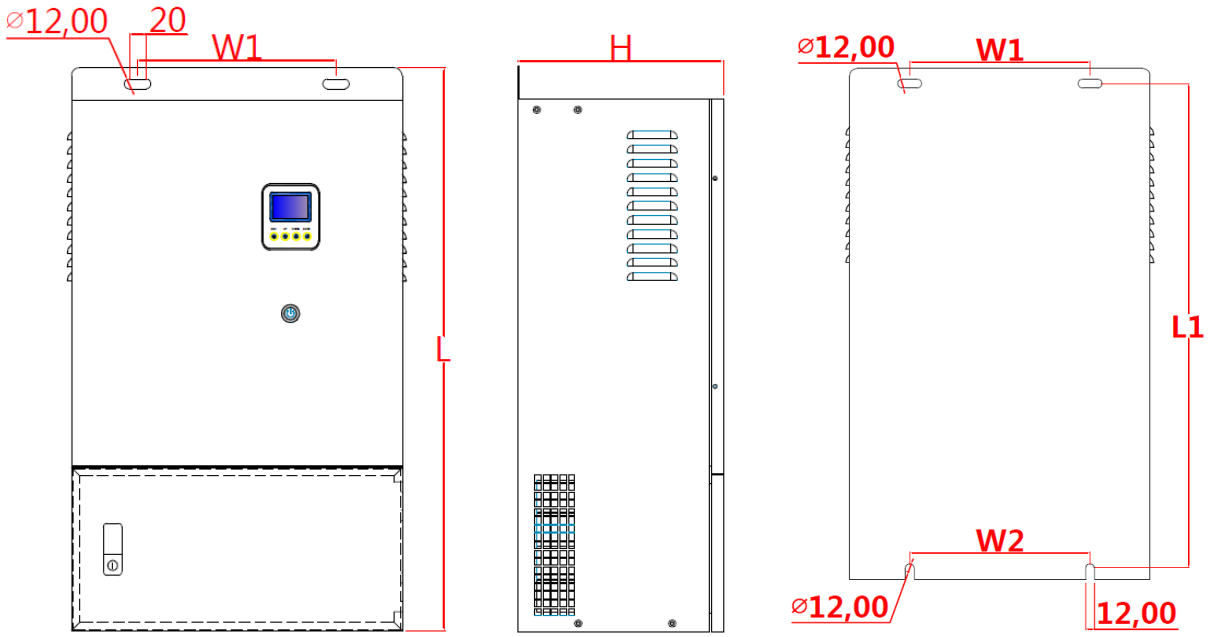
c. DC Input Connector

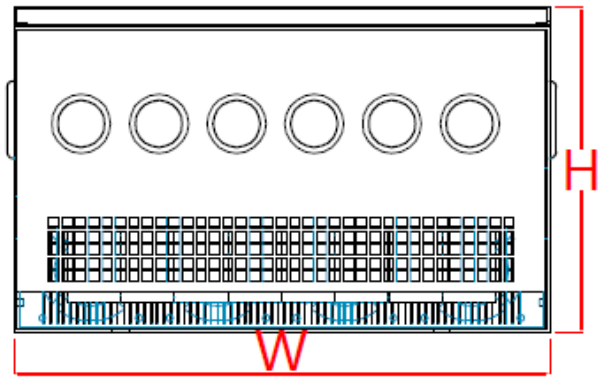
Red (positive), Black(negative)

d. Tank / Well Senor Connector

Tank/well sensor connector

1.2 Power Range: 37-75KW





37-100kw solar pumping inverter box structure

Dimensions:

Power	L(mm)	W(mm)	H(mm)	Fix Hole L1(mm)	Fix Hole W1(mm)
37-45KW	680	400	244	645	240
55-75KW	773	460	290	740	300

Remarks:

37-75KW wires connected to the solar pump inverter directly, it is different from 0.75-30KW.

2. Solar Pump Inverter Wires Specifications.

DC Input (Solar Input)				
Model	**Voltage (Min Vmp-Max Voc)**	**Current (A)**	**Wire Diameter (mm^2)**	**DC Breaker (A)**
HSPH750LB	80-450	10A	2.5 mm^2	16A
HSPH1500LB	140-450	15A	2.5 mm^2	25A
HSPH1500L	200-450	7A	2.5 mm^2	10A
HSPH2200L	200-450	10A	2.5 mm^2	16A
HSPH2200L	200-500	10A	2.5 mm^2	16A
HSPH3700L	200-450	18A	2 x 2.5 mm^2	25A
HSPH3700L	200-500	18A	2 x 2.5 mm^2	25A
HSPH5500L	200-500	26A	2 x 4 mm^2	32A
HSPH7500L	200-500	35A	2 x 4 mm^2	40A
HSPH11KL	200-500	48A	3x 4 mm^2	63A
HSPH15KL	200-500	65A	3x 4 mm^2	100A
HSPH2200H	400-900	7A	2 x 2.5 mm^2	10A
HSPH3700H	400-900	11A	2 x 2.5 mm^2	16A
HSPH5500H	400-900	15A	2 x 2.5 mm^2	32A
HSPH7500H	400-900	21A	2 x 2.5 mm^2	32A
HSPH11KH	400-900	27A	2 x 4 mm^2	32A
HSPH15KH	400-900	37A	2 x 4 mm^2	40A
HSPH18.5KH	400-900	44A	3 x 4 mm^2	63A
HSPH22KH	400-900	53A	3 x 4 mm^2	63A
HSPH30KH	400-900	70A	3 x 4 mm^2	100A
HSPH37KH	400-780	85A	25 mm^2	100A
HSPH45KH	400-780	108A	35 mm^2	160A
HSPH55KH	400-780	130A	35 mm^2	160A
HSPH75KH	400-780	170A	50 mm^2	200A
HSPH100KH	400-780	240A	70 mm^2	350A

NOTE: If the wire length exceeds 100 meters, please make diameter to 1.5 times of the standard parameter

AC Input				
Model	**Current (A)**	**AC Breaker (A)**	**Wire Diameter(mm^2)**	**1 or 3 Phase**
HSPH750LB	7A	16A	2 x 2.5 mm^2	1 Phase
HSPH1500LB	12A	16A	2 x 2.5 mm^2	1 Phase
HSPH1500L	12A	16A	2 x 2.5 mm^2	1 Phase
HSPH2200L	17A	25A	2 x 2.5 mm^2	1 Phase
HSPH2200L	17A	25A	2 x 2.5 mm^2	1 Phase
HSPH3700L	24A	32A	2 x 4 mm^2	1 Phase
HSPH3700L	24A	32A	2 x 4 mm^2	1 Phase
HSPH5500L	18A	32A	3 x 4 mm^2	3 Phase
HSPH7500L	24A	32A	3 x 4 mm^2	3 Phase
HSPH11KL	35A	63A	3 x 10 mm^2	3 Phase
HSPH15KL	48A	63A	3 x 10 mm^2	3 Phase
HSPH2200H	6A	16A	3 x 2.5 mm^2	3 Phase
HSPH3700H	9A	16A	3 x 2.5 mm^2	3 Phase
HSPH5500H	13A	16A	3 x 2.5 mm^2	3 Phase
HSPH7500H	18A	25A	3 x 2.5 mm^2	3 Phase
HSPH11KH	24A	32A	3 x 4 mm^2	3 Phase
HSPH15KH	30A	40A	3 x 4 mm^2	3 Phase
HSPH18.5KH	40A	63A	3 x 10 mm^2	3 Phase
HSPH22KH	45A	63A	3 x 10 mm^2	3 Phase
HSPH30KH	60A	63A	3 x 10 mm^2	3 Phase
HSPH37KH	75A	100A	3 x 25 mm^2	3 Phase
HSPH45KH	91A	100A	3 x 35 mm^2	3 Phase
HSPH55KH	112A	160A	3 x 50 mm^2	3 Phase
HSPH75KH	150A	200A	3 x 50 mm^2	3 Phase
HSPH100KH	176A	200A	3 x 70 mm^2	3 Phase

NOTE: If the wire length exceeds 100 meters, please make diameter to 1.5 times of the standard parameter

AC Output			
Model	**Voltage**	**Current (A)**	**Wire Diameter(mm^2)**
HSPH750LB	220V	6A	3 x 2.5 mm^2
HSPH1500LB	220V	12A	3 x 2.5 mm^2
HSPH1500L	220V	12A	3 x 2.5 mm^2
HSPH2200L	220V	14A	3 x 2.5 mm^2
HSPH2200L	220V	14A	3 x 2.5 mm^2
HSPH3700L	220V	20A	3 x 4 mm^2
HSPH3700L	220V	20A	3 x 4 mm^2
HSPH5500L	220V	17A	3 x 6 mm^2
HSPH7500L	220V	23A	3 x 6 mm^2
HSPH11KL	220V	33A	3 x 10 mm^2
HSPH15KL	220V	46A	3 x 10 mm^2
HSPH2200H	380V	6A	3 x 2.5 mm^2
HSPH3700H	380V	9A	3 x 2.5 mm^2
HSPH5500H	380V	13A	3 x 4 mm^2
HSPH7500H	380V	18A	3 x 4 mm^2
HSPH11KH	380V	24A	3 x 6 mm^2
HSPH15KH	380V	29A	3 x 6 mm^2
HSPH18.5KH	380V	39A	3 x 10 mm^2
HSPH22KH	380V	44A	3 x 10 mm^2
HSPH30KH	380V	59A	3 x 16 mm^2
HSPH37KH	380V	74A	3 x 16 mm^2
HSPH45KH	380V	90A	3 x 25 mm^2
HSPH55KH	380V	110A	3 x 25 mm^2
HSPH75KH	380V	148A	3 x 35 mm^2
HSPH100KH	380V	175A	3 x 50 mm^2

NOTE: If the wire length exceeds 100 meters, please make diameter to 1.5 times of the standard parameter

NOTE:

3. Solar Pump Inverter Wire Connection Steps.

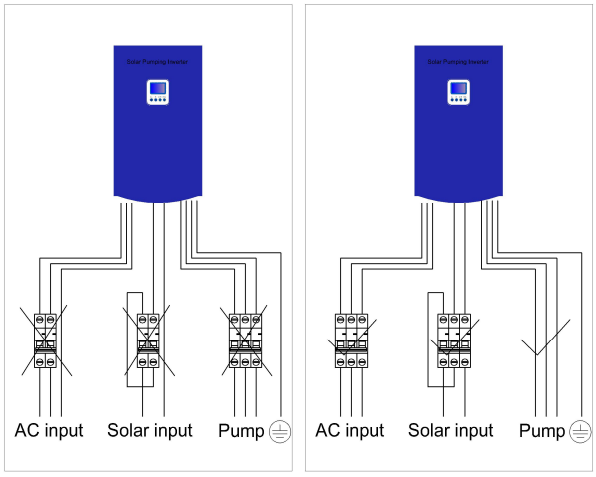
3.1 Fix the solar pump inverter on the wall or suppoter, 0.75-30KW solar pump inverter use 6mm screw, 37-75kw solar pump inverter use 10mm screw.

3.2 Connect the DC input, AC input, ACouput wires to the solar pump inverter

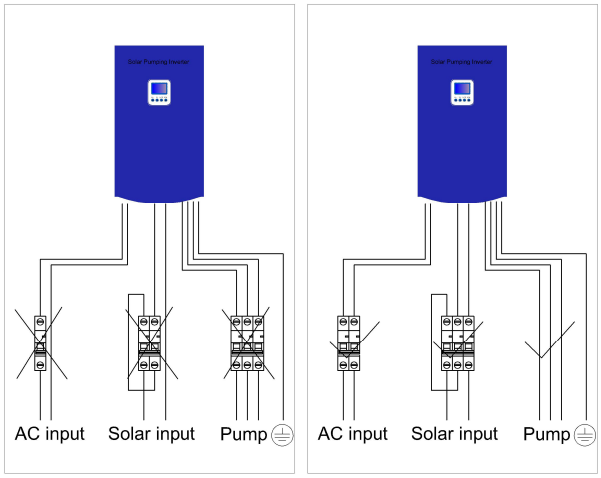
3.3 Measure the DC/AC input voltage, then switch on the DC/AC breaker.

3.4 Power on solar pump inverter.

4．Wiring Input & Output



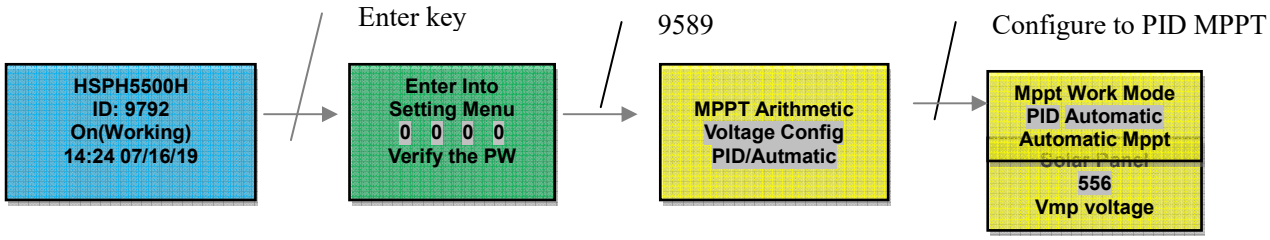
3phase 380v pump



single phase 220v pump

***5*．*SURFACE PUMP* configuration as below, *SUBMERSIBLE PUMP* please use default Automatic MPPT arithmetic**

5.1 configure the solar pumping inverter mppt arithmetic to PID MPPT



Example:

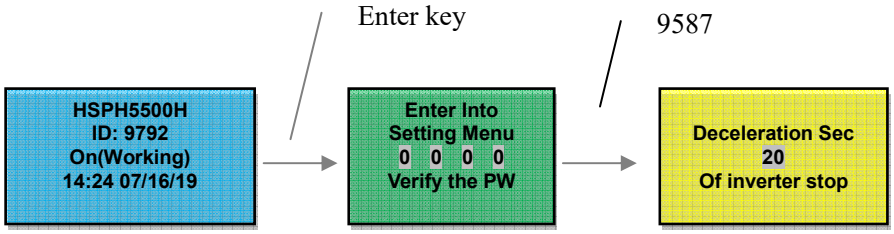
Solar panel parameters:

Open Circuit Voltage (Voc) : 46.9V

Maximum Power Voltage(Vmp): 37.6V

Solar panel connection is 15pcs in series, then total Vmp is : 37.6*15 = 564V , and PID MPPT -> Solar panel Vmp voltage config to 564V

5.2 configure deceleration Sec of inverter stop to 20



Remark:

1. **All the wires for solar pump system need to do regular checking every year, make sure the wires functional and fixed with solar pump inverter well.**
2. **Forbidden to connect any breaker between the inverter and the pump. Must connect breaker to inverter's DC input and AC input.**
3. **Solar panels in one system must be same specifications.**
4. **Before power on solar pump inverter, please check if the DC input and AC input voltage within the inverter allowed voltage range, then connect it to the solar pump inverter.**

   DC Input Voltage Range:

   0.75KW (Min Vmp 80V, Max Voc 450V)

   1.5-2.2KW single phase (Min Vmp 200v, Max Voc 450V)

   3.7-100KW 3phase 380V (Min Vmp 400v, Max Voc 780/900V)

   AC Input Voltage Range:

   1 phase 220V AC input ±15%

   3 phase 380V AC input ±15%
5. **Before you open the solar pump inverter box, please turn off the inverter and waiting for 5 minuites, until the inverter run out of electricity.**