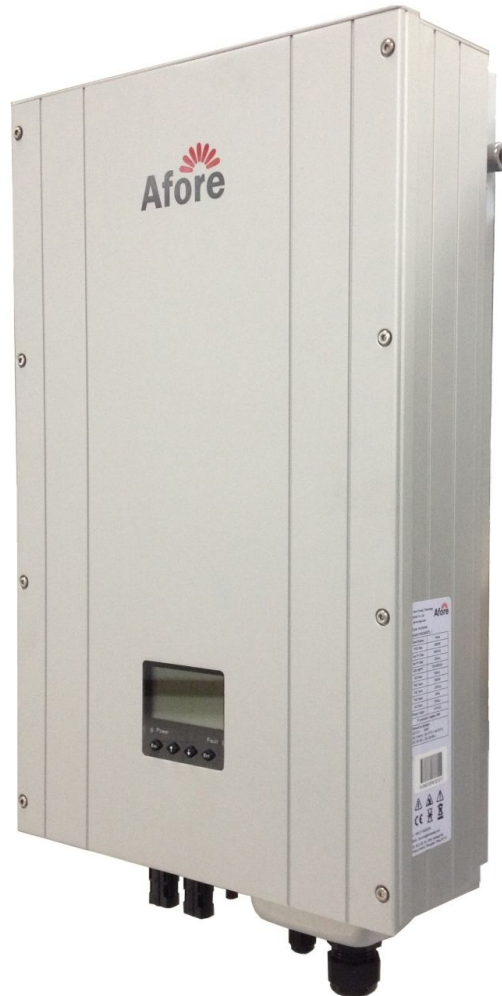




**USER MANUAL –
INSTALLATION AND OPERATION**



PV Inverter

HNSxxxxTL-1(xxxx=1000,1500,2000,2500,3000,3600,4000,4500,5000,5500,6000)

HNSxxxxTL(xxxx=3000,3600,4000,4500,5000,5500,6000)

Version: UM0106EN-150707(WIFI)

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1 About This Manual

1.1 Scope of Validity

This manual describes the assembly, installation, commissioning, operation and maintenance of the following ANYHOME series grid-connected PV inverters produced by Afore New Energy:

Single MPPT

HNS1000TL-1	HNS1500TL-1	HNS2000TL-1	HNS2500TL-1
HNS3000TL-1	HNS3600TL-1	HNS4000TL-1	HNS4500TL-1
HNS5000TL-1	HNS5500TL-1	HNS6000TL-1	

Double MPPT

HNS3000TL	HNS3600TL	HNS4000TL	HNS4500TL
HNS5000TL	HNS5500TL	HNS6000TL	

Please keep this manual all time available in case of emergency.

1.2 Target Group

This manual is for qualified personnel. The tasks described in this manual must only be performed by qualified personnel.

1.3 Additional Information

Further information on special topics, such as description of parameters and measurement readings, can be downloaded in the download area at www.aforeenergy.com.








2 Safety Instructions




2.1 Safety Precautions

1. All work on the inverter must be carried out by skilled electricians. And ensure that children do not play with the equipment.
2. The device may only be operated with PV generators. Do not connect any other sources of energy to the device.

3. The PV generator and inverter must be connected to the ground in order to reach maximum protection for property and persons.
4. Do not remove cover until 3 minutes after disconnecting all sources of supply. This is because the charge stored in capacitors may result a risk of electric shock or a risk of electrical energy-high current level.
5. The enclosure of Inverter can become hot during operation. To reduce the risk of injury, do not touch the cover, heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.
6. Do not use the equipment for purposes other than those described in this manual.
7. Both the inverter and associated transport packaging are mainly made of recyclable raw materials. Please ensure that the used device and any relevant accessories are disposed of in accordance with applicable regulations.
8. Packed with damping EPE and carton, Afore inverter should be placed upwards and handled with care in delivery. No more than 4 units in one pile and pay attention to waterproof.
9. Alternative uses, modifications to the inverter or the installation of components not expressly recommended or sold by Afore New Energy void the warranty claims and operation permission.

2.2 Explanations of Symbols

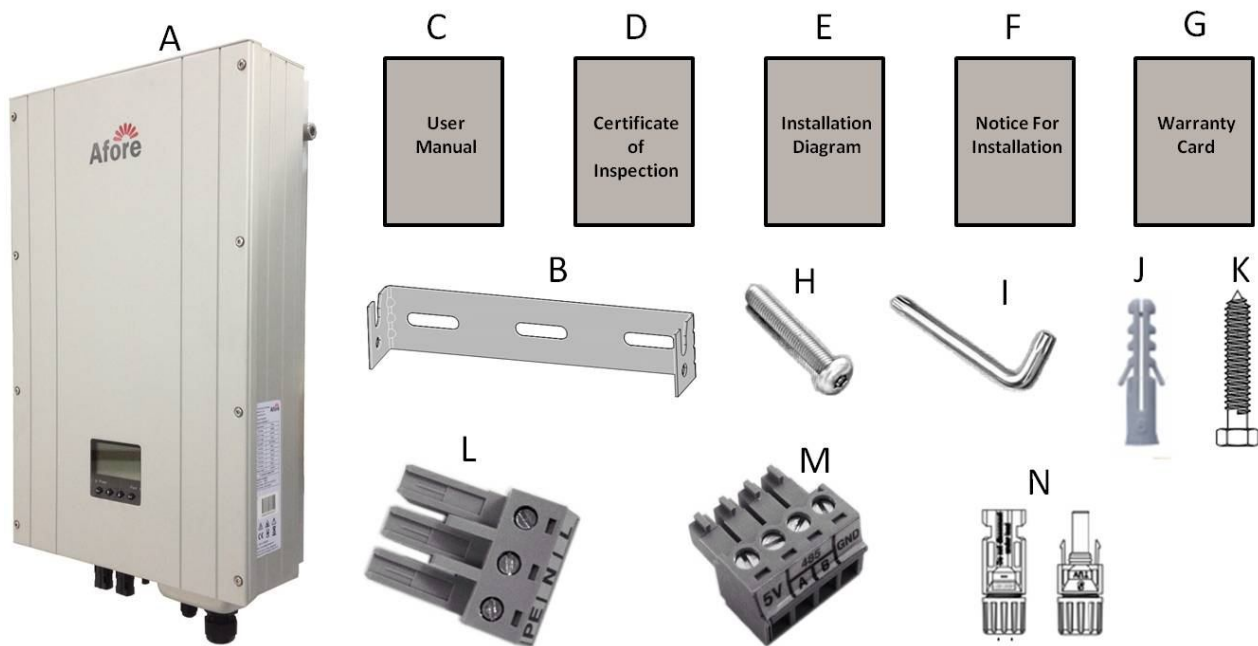
Symbol	Explanation
	Danger of Electric Shock. The inverter is directly connected with the public grid. All work on the inverter must be carried out by qualified personnel only.
	Beware of hot surface. The inverter can become hot during operation. Do not contact the device during operation.
	Caution, risk of electric shock Energy storage timed discharge, time to be indicated adjacent to the symbol.
	Caution, Danger. This device directly connected with electricity generators and public grid.
	Do not dispose of this device with the normal domestic waste.
	Without Transformer. This inverter does not use transformer for the isolation function.
	CE mark. The inverter complies with the requirements of the applicable EC guidelines.

	Regulatory compliance mark. The inverter complies with the requirements of Australian Communications Authority guidelines, safety and EMC guidelines.
	Notes, Important. Non-adherence to these instructions may adversely affect the operating convenience or functionality of the device.
	Refer to manual before service.

3 Unpacking

3.1 Assembly Parts

Please check the delivery for completeness and any visible external damage. Contact your dealer at once if anything is damaged or missing.



Object	Quantity	Description	Object	Quantity	Description
A	1	Solar inverter	H	2	Security screw
B	1	Wall mounting bracket	I	1	Screwdriver for security screw
C	1	User manual	J	3	Plastic Expansion Tube
D	1	Certificate of inspection	K	3	Tapping screw
E	1	Installation diagram	L	1	AC connector
F	1	Notice for installation ^①	M	1	Communication connector
G	1	warranty card	N	1 set/ 2 sets ^②	DC plug connector

① Only for HNSxxxxTL (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000)

② 1 set applies to HNSxxxxTL-1 (xxxx=1000, 1500, 2000, 2500);

2 sets apply to HNSxxxxTL-1 / HNSxxxxTL (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000);

3.2 Identifying the Inverter

You can identify the inverter using the type label. Information such as serial number (Serial No.) and type of the inverter, as well as device-specific characteristics are specified on the type label. The type label is on the right side of the enclosure.

4 Mounting



DANGER!

Danger to life due to potential fire or electric shock.

Do not install the inverter near any inflammable or explosive items. The inverter will be directly connected with high voltage power generation device. The installation must be performed by qualified personnel only in compliance with national and local standards and regulations.



CAUTION!

Danger of burn injuries due to hot enclosure parts.

- Install the inverter so that it cannot be touched inadvertently.

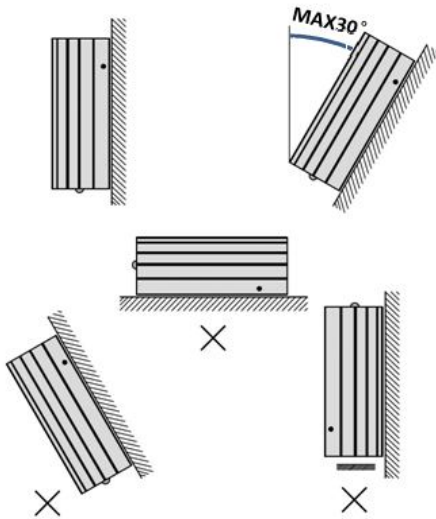
Risk of injury due to the heavy weight of the inverter.

- Take the inverter's weight into account for mounting. (Weight of inverter refers to chapter 9.)

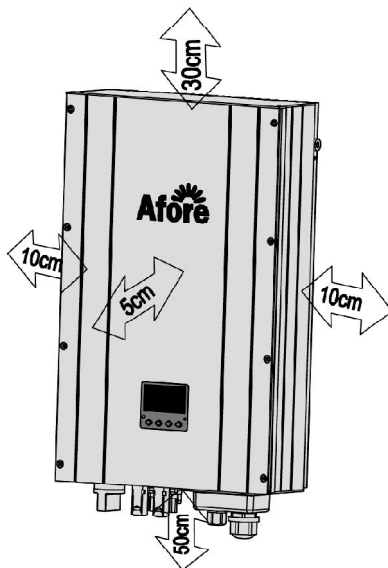
4.1 Selecting the Appropriate Mounting Location

Consider the following points when selecting where to install:

- The mounting method and location must be suitable for the inverter's weight and dimensions.
- Mount the equipment on a solid brick or concrete surface. But do not mount it on plasterboard walls or similar in order to avoid audible vibrations for the inverter can make noises in operation.
- Vertical installation or tilted backward by max. 30 degree is allowed.
- Never mount the device with a forward tilt, horizontally or even upside down.



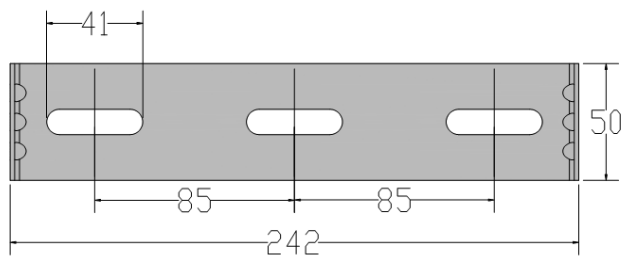
- For the convenience of checking the LCD display and possible maintenance activities, please install the inverter at eye level.
- The ambient temperature of installation site should be between -20 °C and +55 °C (between -4 °F and 131 °F).
- Provide better ventilation for the inverter to ensure that the heat is dissipated adequately.



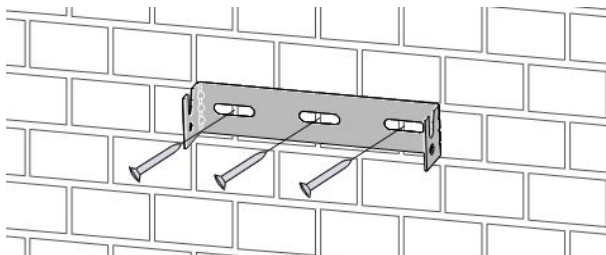
- The site altitude of installation should be below 1000m above sea level; more than 1000m above the sea level will cause derating.
- Install the inverter directly exposing to strong sunshine is not recommended, the excess heating might lead to power reduction.

4.2 Mounting the Inverter with Wall Mounting Bracket

1. Use the wall mounting bracket as a drilling template and drill the holes for the screws.

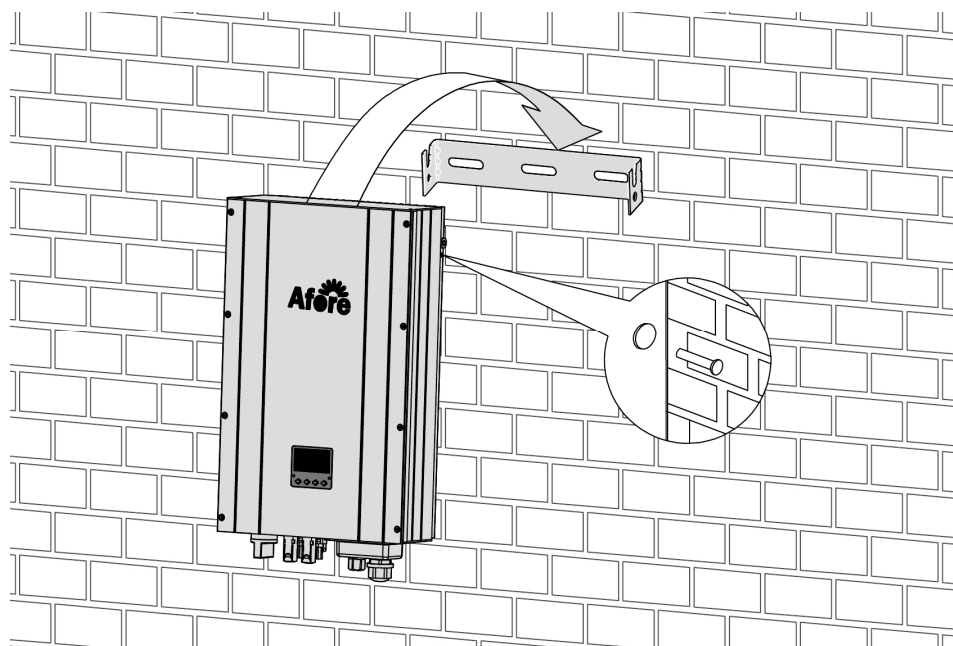


2. Fix the wall mounting bracket to the wall using appropriate screws (diameter min. 6 mm, max. 8 mm) and washers (outer diameter min. 12 mm, max. 24 mm).



3. Hang the inverter to the mounting bracket and ensure the slot is fitted on the bracket.

4. Check to ensure the inverter is correctly seated. Make sure to lock it with the security screws on both sides to ensure the inverters. (See the figure below.)



5 Electrical Connection



Notes:

1. After the inverter has been installed in its fixed position, the electrical connection to the unit can be established.
2. Make sure Max. Open Voltage and short-circuit current of the each PV strings accord with the Spec.
3. Choose the appropriate cable width for AC/DC wire.
4. To connect the inverter, the AC and DC sides must be disconnected from all power sources and secured against being inadvertently switched back on.
5. Before connecting the inverter to PV arrays and public grid, make sure the polarity is correct.

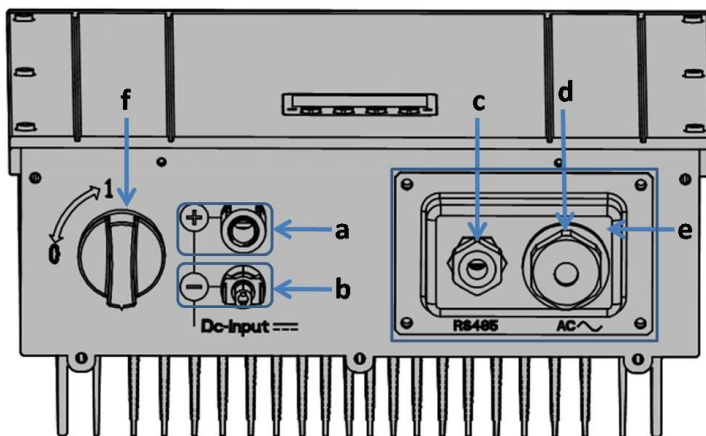


Notes:

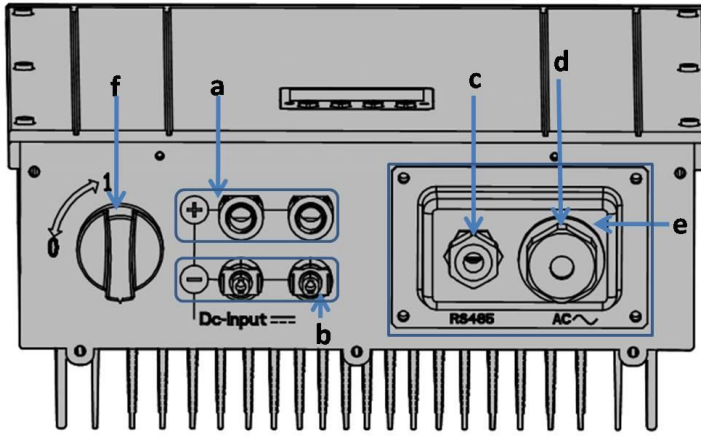
Electrical installation & maintenance shall be conducted by licensed electrician and shall comply with local Wiring Rules.

5.1 Overview of the Connection Area

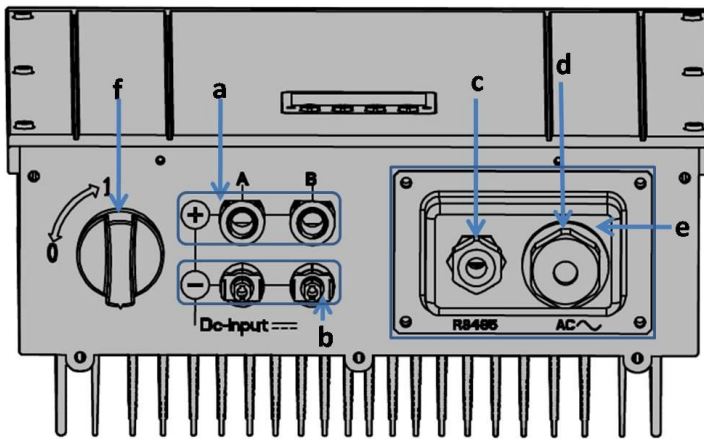
The following figures show the assignment of the individual connection areas on the bottom of the inverter.



Apply to HNSxxxxTL-1 (xxxx=1000, 1500, 2000, 2500)



Apply to HNSxxxxTL-1 (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000)



Apply to HNSxxxxTL (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000)

Object	Description
a	DC connectors (+) for connecting the PV strings
b	DC connectors (-) for connecting the PV strings
c	Waterproof connector for the communication connection (RS485 Quick Module)
d	Waterproof connector for the AC connection
e	waterproof outlet box for RS485 connection and AC connection
f	Switch(optional)

5.2 Connection to the RS485 and Public Grid (AC)

5.2.1 Conditions for Connection



CAUTION!

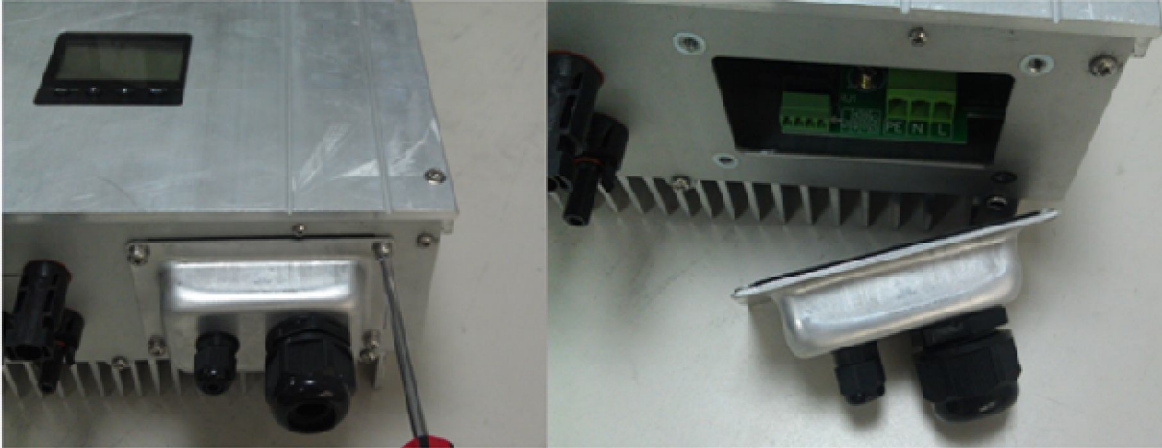
Load Disconnection Unit

An individual circuit breaker should be equipped for each inverter in order that the inverter can be safely disconnected under load.

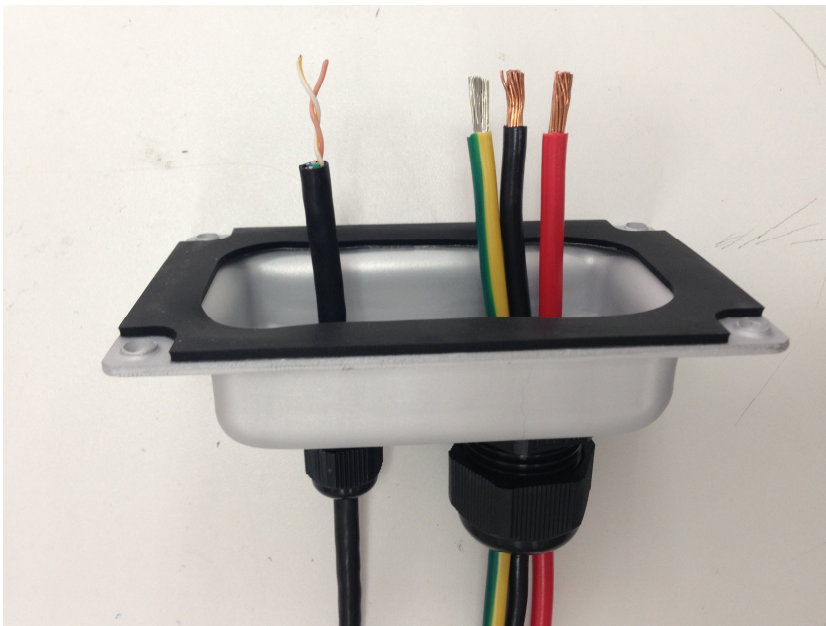
5.2.2 Connection to the RS485 and Public Grid (AC)

Measure the grid voltage within the permissible range. Disconnect the circuit breaker between the inverter and the grid.

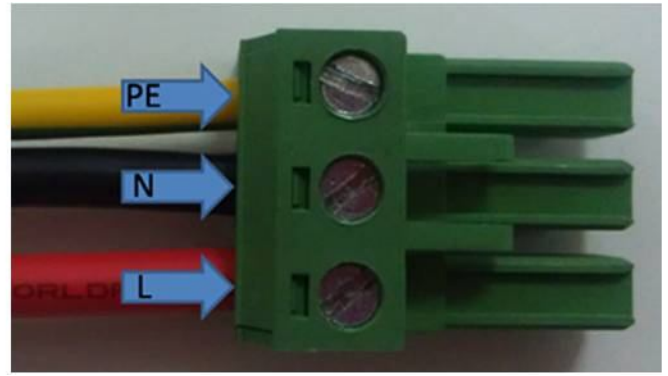
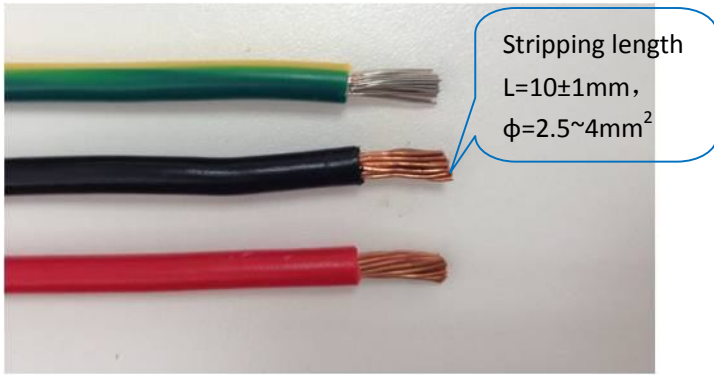
1. Loosen the screws and waterproof connectors, and take off the waterproof cover.



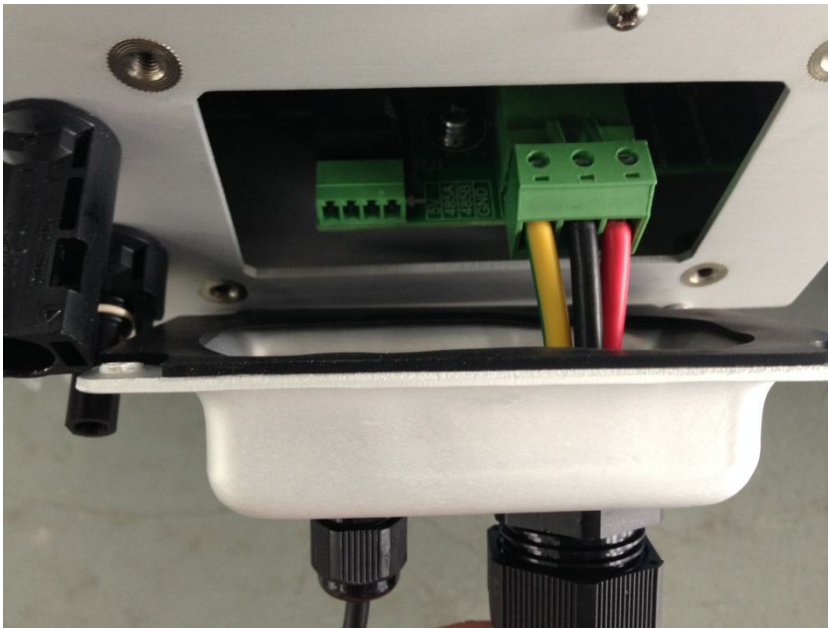
2. Loosen the two waterproof connectors and let the holes exposed. Pass through the AC and communication cables separately as below:



3. Assemble AC connection terminals according to the polarity. Connect ground line with terminal instructed PE; connect neutral wire with N; live wire with L. Loosen screws on the terminals by clockwise rotation, insert the wire and then tighten the screws by anticlockwise rotation to ensure secure installation.



4. Insert the assembled AC connectors to the corresponding slots.

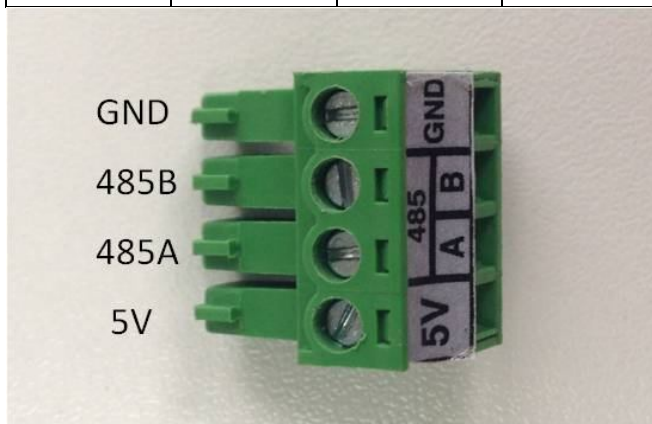


5. Communication Connection

One RS485 communication terminal is on inverter for monitoring. Users can monitor the generation and operation status on smart devices by connecting them with inverter through RS485. RS485 can satisfy wired and wireless monitoring.

Four pins on RS485 by definition as bellows:

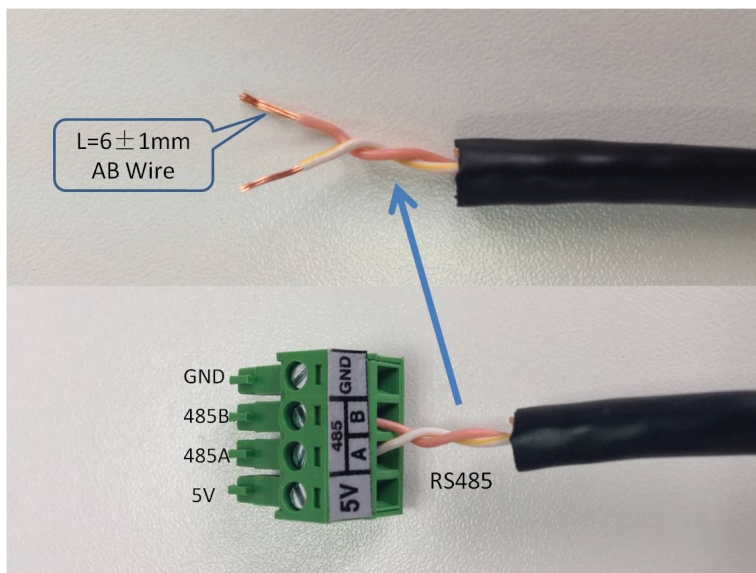
Pin1	Pin2	Pin3	Pin4
5V	485A	485B	GND



4.1 Wired Monitor Connection

Connect RS485 and smart devices by reticle. 485A and 485B of RS485 need to adopt twisted-pair (or AB wire) as below.

Assemble the RS485 as shown in the following figures. Loosen the screws to end in counter-clockwise, insert the cables into the socket, and then tighten the screws to end in clockwise. Make sure the wires are securely connected.

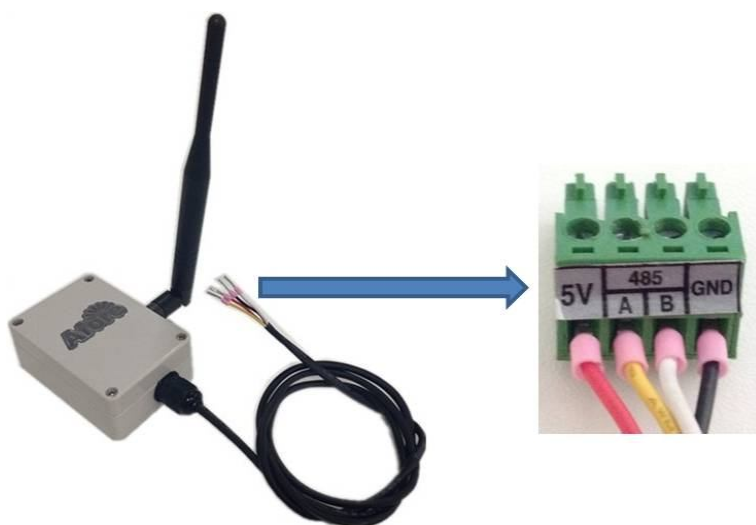


4.2 Wireless Monitor Connection (optional)

Inverter can be wirelessly monitored with module HMI-901.

Connect the wires one by one according to the wire colors and the definition chart, and tighten the screws.

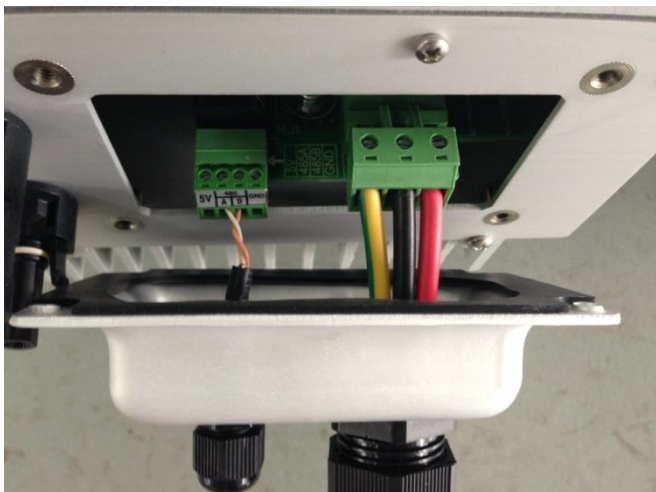
Colour	Red	Yellow	White	Black
Definition	+5V	485A	485B	GND



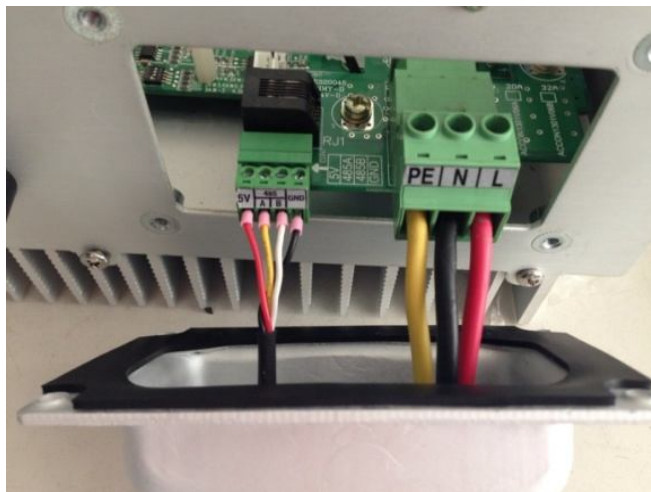
The operation of HMI-901 refers to annex 1.

6. Insert the assembled communication connectors to the corresponding slots.

Wired monitor Connection



Wireless monitor Connection



7. Close the junction box and tighten the waterproof connectors and screws.



5.3 Connection to the PV Generator (DC)



CAUTION!

Load Disconnection Unit

On the DC side out of inverter there is a circuit breaker (optional), in order that the inverter can be safely installed, the circuit breaker must be switched off.

5.3.1 Conditions for the DC Connection

- The connected PV modules must meet following requirements
 - Same type

- Same number
- Identical alignment
- Identical tilt
- The following limit values at the DC input of the inverter must not be exceeded (connecting to a higher voltage will destroy the device):

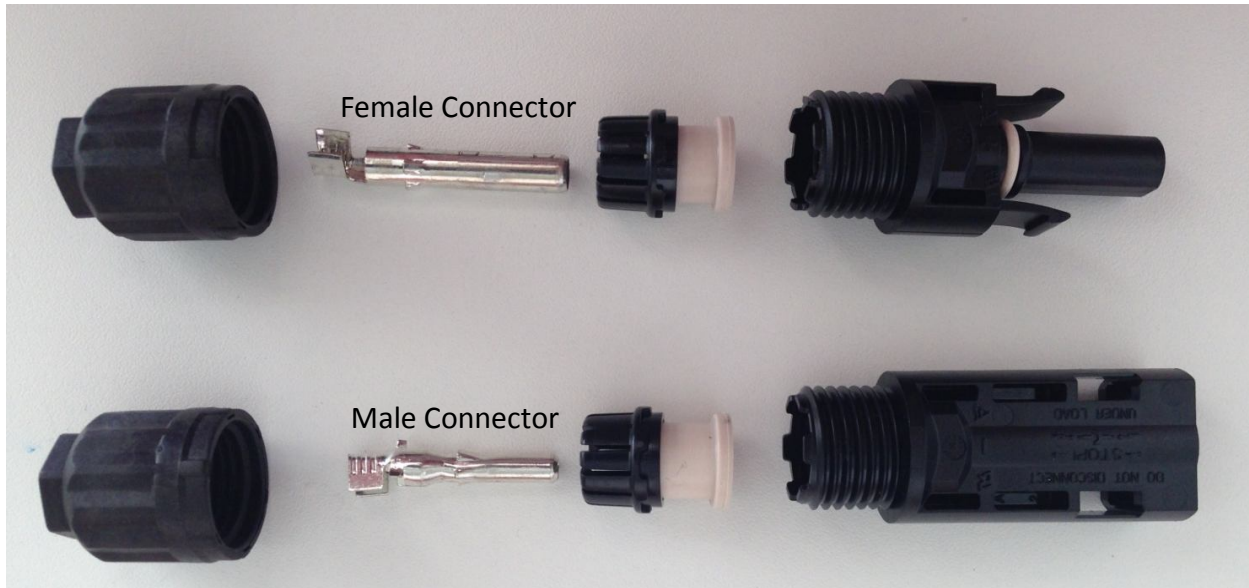
Anyhome	Maximum input voltage	Maximum input current
Single MPPT		
HNS1000TL-1	450V	6A
HNS1500TL-1	450V	8A
HNS2000TL-1	500V	12A
HNS2500TL-1	500V	14A
HNS3000TL-1	550V	17A
HNS3600TL-1	550V	18A
HNS4000TL-1	550V	20A
HNS4500TL-1	550V	23A
HNS5000TL-1	550V	25A
HNS5500TL-1	550V	26A
HNS6000TL-1	550V	27A
Double MPPT		
HNS3000TL	550V	10 Ad.c*2
HNS3600TL	550V	12 Ad.c*2
HNS4000TL	550V	13 Ad.c*2
HNS4500TL	550V	14 Ad.c*2
HNS5000TL	550V	15 Ad.c*2
HNS5500TL	550V	15.5 Ad.c*2
HNS6000TL	550V	16 Ad.c*2

5.3.2 Assembling the DC Plug Connector

In order to connect to the inverter, all connection cables of the PV modules must be equipped with the DC plug connectors provided. You will find the necessary DC plug connector for DC connection in the delivery. To assemble the DC plug connectors, proceed as detailed below. Ensure the plug connectors have the correct polarity.

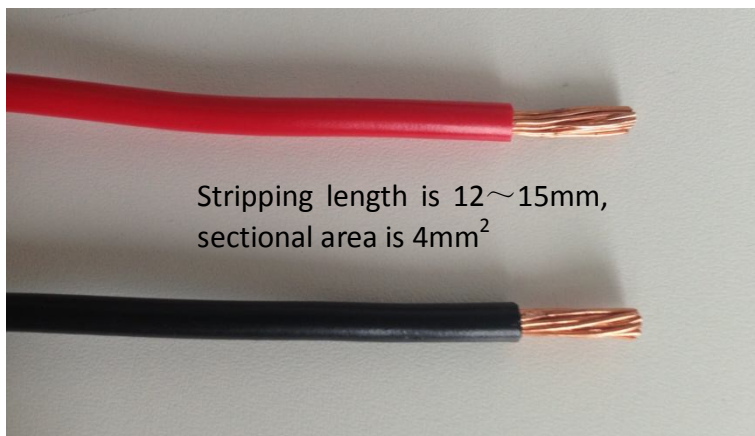
The plug connector in DC side includes male and female as blow.

Note that the sizes of metal connecting tubes are different. Big one is for female connector and small one is for male connector.

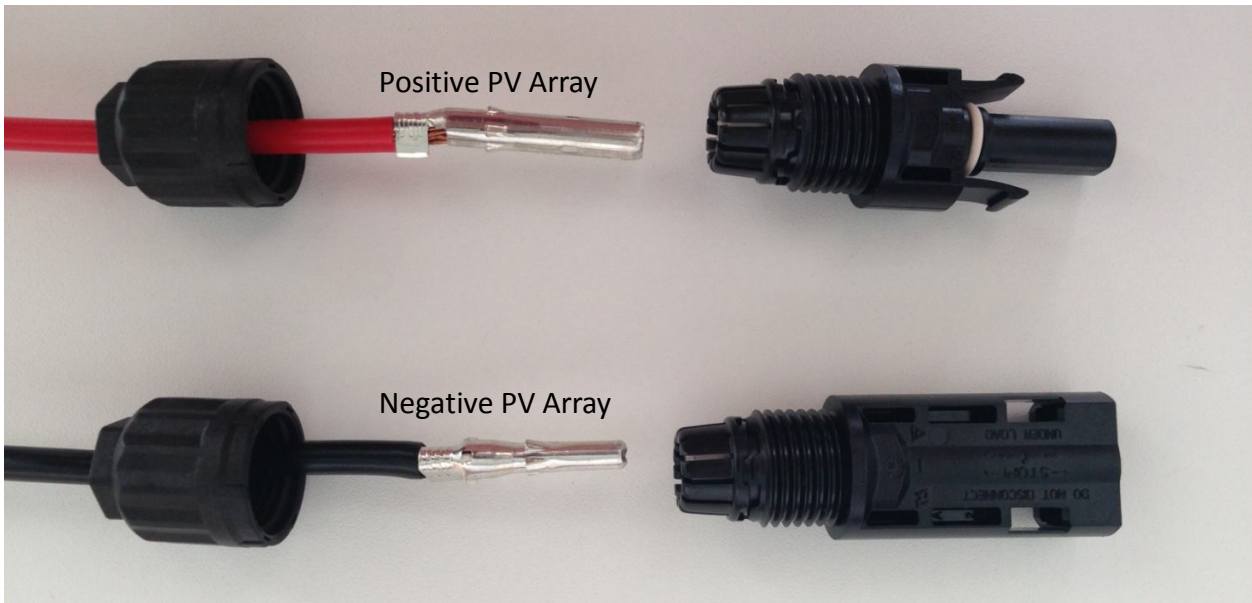


Assembly Instructions:

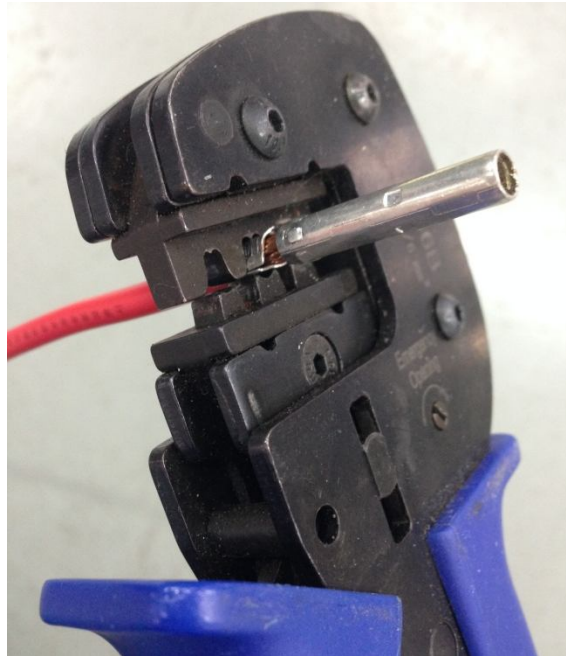
◆ Prepare the PV wire to connect the positive and negative PV arrays. Stripping length is 12~15mm, sectional area is 4 mm² as below.



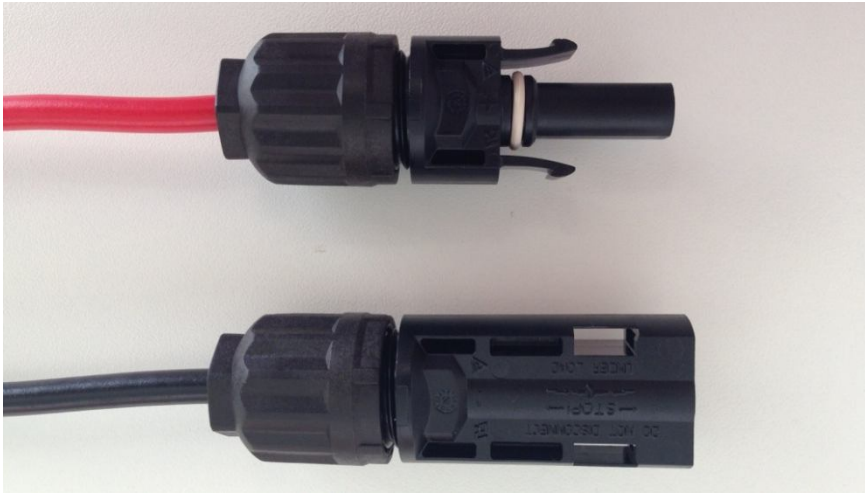
◆ Insert the PV wire to metal connecting tube. Make sure all line heads are in the connecting tube as picture blow.



◆ Use crimping pliers to fasten the metal connecting tube and copper wire. Make sure the harness will not fall off as picture below.



◆ Insert the assembled cable into male/ female connector. A “chick” sound can be heard when connecting correctly. Then tighten the cap. Refer to the picture below.



5.3.3 Connecting the PV Generator (DC)



DANGER!

Danger to life due to high voltage in the inverter.

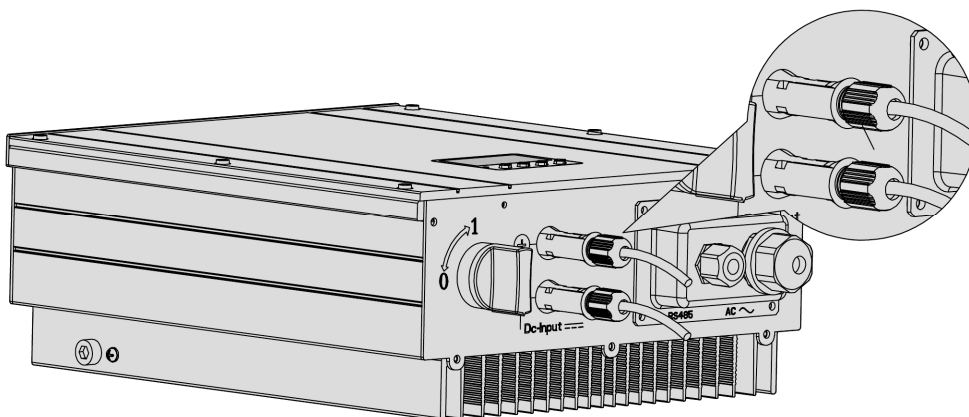
- Before connecting the PV generator, ensure that the AC&DC circuit breaker is switched off and that it cannot be reactivated.



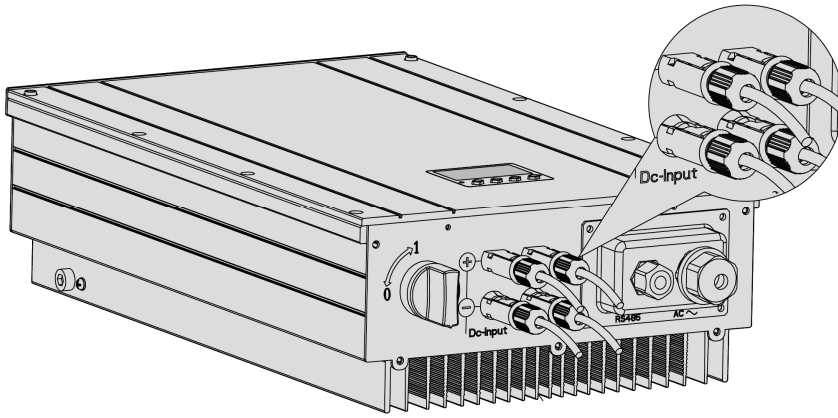
Notes:

1. Disconnect the circuit breaker.
2. Check the connection cables of the PV modules for correct polarity and that the maximum input voltage of the inverter is not exceeded.
3. Check the DC plug connector for correct polarity and connect it.

Plug the DC plug connectors into DC terminals on inverter.



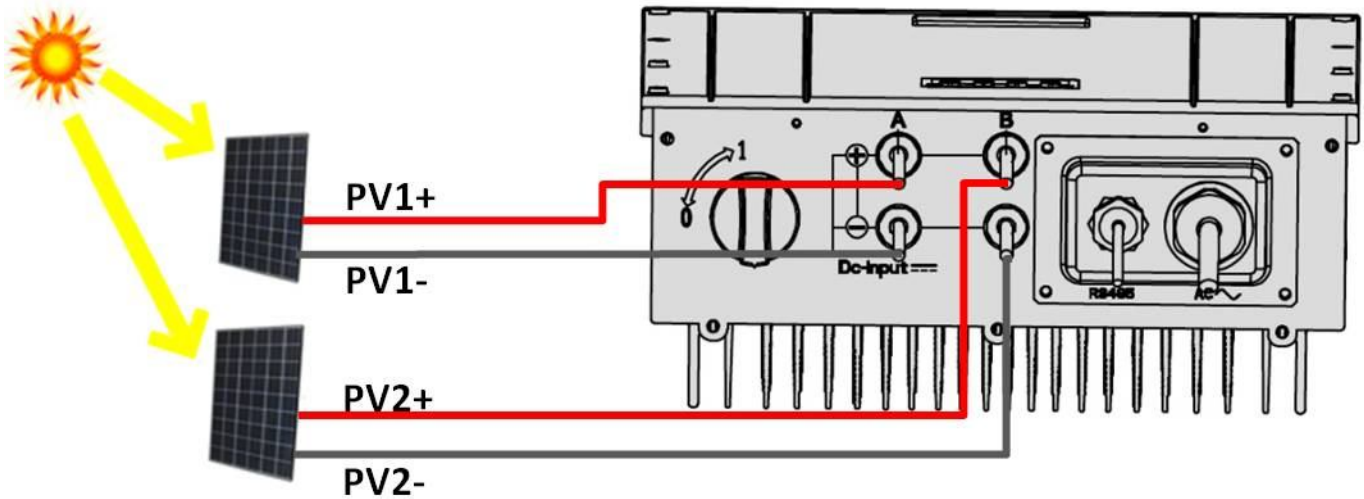
Apply to HNSxxxxTL-1(xxxx=1000, 1500, 2000, 2500)



Apply to HNSxxxxTL-1 / HNSxxxxTL (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000)

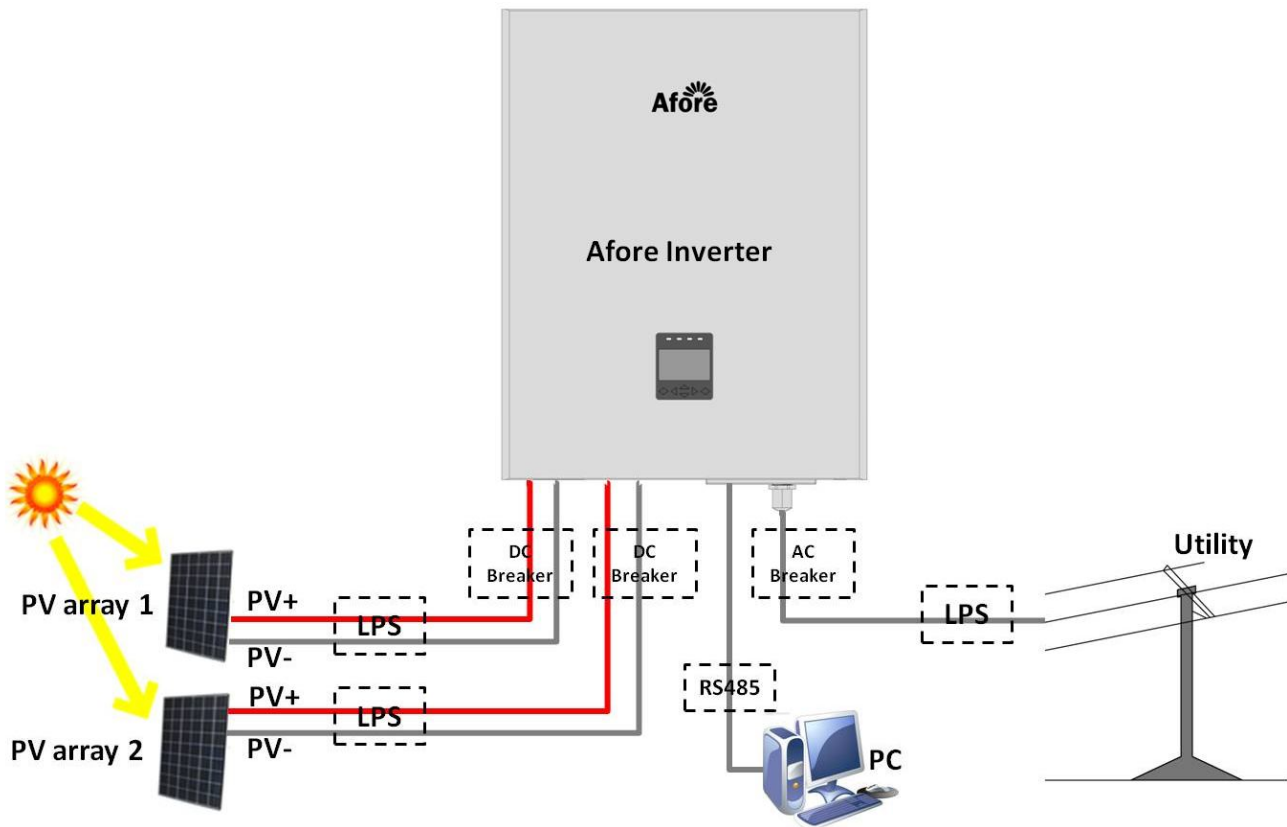
HNSxxxxTL (xxxx=3000, 3600, 4000, 4500, 5000, 5500, 6000) is equipped with 2 groups (A and B) of connecting sockets for PV input, and each group contains a pair of connecting sockets (PV+ and PV-).

Group A and B are respectively connected to two PV arrays as picture below. Connect PV1+ and PV1- in PV Array 1 to the positive and negative poles of A and PV2+ and PV2- of PV Array 2 to those of B.



6 System Diagram

The typical connection diagram for the entire PV system is shown in the following figure.



1. PV array: Provide DC power to inverter
2. Inverters: Converts DC (Direct Current) power from PV panel(s) to AC (Alternating Current) power. Because Inverter is grid-connected, it controls the current amplitude according to the PV Panel power supply. Inverter always tries to convert the maximum power from your PV array.
3. DC Breaker: The current per DC string does not exceed 25A.
4. AC Breaker: Refer to the following table to choose the AC breaker.

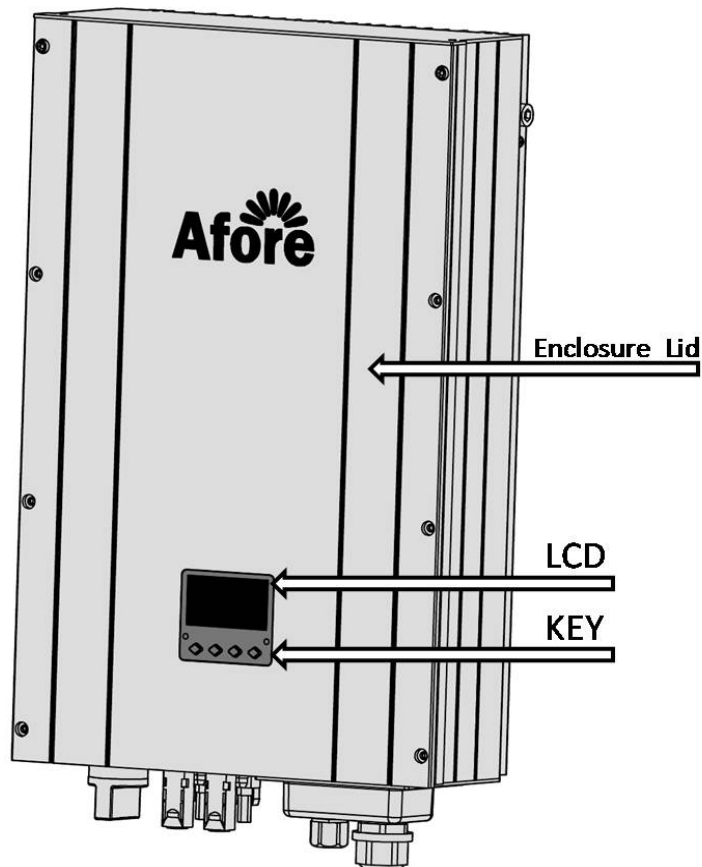
Single MPPT	Double MPPT	Nominal AC Current [A]	Rate current of AC breaker[A]
HNS1000TL-1	—	6	9
HNS1500TL-1	—	8	16
HNS2000TL-1	—	10	16
HNS2500TL-1	—	12	20
HNS3000TL-1	HNS3000TL	14	25
HNS3600TL-1	HNS3600TL	16	25
HNS4000TL-1	HNS4000TL	18	32
HNS4500TL-1	HNS4500TL	20	32
HNS5000TL-1	HNS5000TL	22	40
HNS5500TL-1	HNS5500TL	24	40
HNS6000TL-1	HNS6000TL	26	40

5. LPS: Lightning protection system.

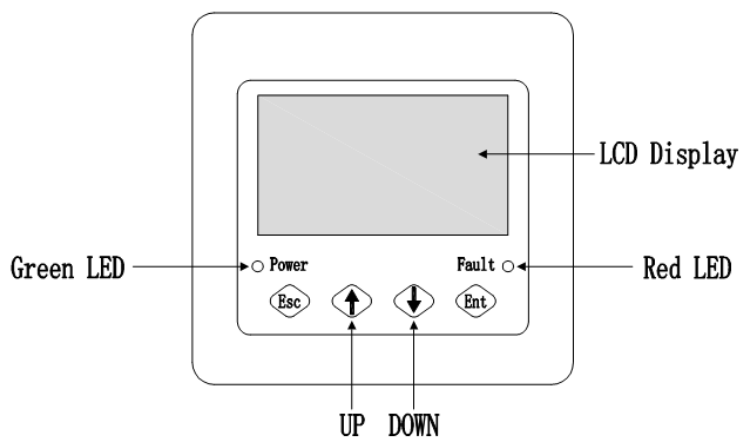
6. Utility: Referred to as “grid” in this manual, i.e. the way your electric power company provides power to your place. Please note that Inverter can only be connected to low-voltage systems (namely, 230Vac, 50Hz).

7 Operation

Product Overview



7.1 Overview of Controls and Displays



There are four function keys on the front panel (from left to right): Esc, Up, Down, Ent.

The keypad is used for:

- Scrolling the displayed parameter (Up and Down keys);
- Accessing and modifying the adjustable parameters (Esc and Ent keys).

7.2 Commissioning

After completing the mechanical and electrical installation, the inverter is put into operation.

1. Switch on the DC breaker.

The inverter starts up automatically when the power from PV generator is sufficient.

2. Check whether the display and LEDs are indicating a normal operating state.

A	Green	Glowing, operation
B	Red & LCD backlight	Flashing, contact installer

7.3 LED Display

The inverters are equipped with two LEDs including “green” and “red” which provide information about various operating states in the following ways. They are marked with “Power” and “Fault”, respectively. When the inverter is power on from the generator and operates correctly, the green LED is on. The red light flashing during the inverter is operating correctly indicates a fault in the system or inverter, and the LCD display provides the exact information.

LED DC Power in (green):

The green LED is illuminated from a generator voltage of approx. 120V onward and extinguishes as soon as the generator voltage falls below 100V. The DC Power in LED signals that the inverter is in its active state and the inverter controls are enabled. If this LED is not lit up which means the inverter will not be able to start grid feeding. Under normal operating conditions the LED is illuminated in the morning when there is enough daylight, and extinguishes again when it gets dark.

Under normal operating conditions the inverter starts grid feeding in the morning and terminates this process as it becomes dark. This process might be repeated several times throughout the day, especially in the morning and evening. This is not a sign of faulty operation but normal operating behavior.

Fault LED (red):

This LED indicates that the grid-feeding process has been terminated as a result of a malfunction.

Please wait for about 10 minutes to verify if the malfunction is only temporarily. If not, please contact your authorized electrician. On elimination of the error the grid feeding process is re-started after about 5

minutes.

In the event of a fuse failure please contact your authorized electrician. In case of a general power grid failure please wait until the problem has been resolved. The inverter will restart automatically.

7.4 LCD Display

A backlight LCD display is integrated into the inverter so that it can be easily visible.

Inverter starts up automatically when DC-power from the PV panel is sufficient. During startup (the green led is illuminated), the LCD shows logo of company and version of inverter.



The LCD will be initialized for 3 seconds. In the normal operation status, the display will show the default menu as follow:

Power: 1.5KW	
Ipva: 3.5A	
Vpva: 202V	
Ipvb: 3.9A	
MPPT	
01-01-2014	13:53

Power: 1.5KW	
EToday: 0.75KWH	
ETotal: 0.75KWH	
Run Time: 30Min	
MPPT	
01-01-2014	13:53

7.4.1 LCD Display

All content shows in the LCD by default:

Power	The current output power (W)
Ipva	The present input current in PVA channel
Vpva	The present input voltage in PVA channel
Ipvb^③	The present input current in PVB channel
Vpvb	The present input voltage in PVB channel
Iac	The present grid current (A)
Vac	The grid voltage (V)

EToday	The energy generated today in kilo watt hours (KWh)
ETotal	The energy generated since starting up the inverter (KWh)
RunTim	The time since the energy generated today (minutes)
SumTim	The total time since starting up the inverter (hours)

③Character 'a' and 'b' represent two MPPT connected with two solar panels respectively. PVb is only for double MPPT series: HNSxxxxTL(3000,3600,4000,4500,5000,5500,6000).

The current system date and time shows below the default content.

Ipva, Vpva, Ipvb, Vpvb, Iac, Vac, EToday, Etotal, RunTim, SumTim in the block diagram will be shown one by one with default 3s interval. Screens can be scrolled manually by pressing the 'Up' key.

Along with the different working states of the inverter, the line of current information will display different state information as follow:

Display	Description
Wait	Initialization & Waiting
MPPT	Max power point tracking
EEPROM Failure	Internal device fault
Para Over Range	Internal parameter over range
Ref Voltage Error	Reference voltage error
Vac Sensor Fail	Grid voltage sensor failure
Iac Sensor Fail	Grid current sensor failure
Ipva (Ipvb) Sensor Fail	A fault has occurred in PVa (or PVb) current sensor of the inverter.
GFCI Failure	GFCI sensor failure
AC Fuse-Check Fail	Fuse of the grid-side melted
AC Relay-Check Fail	Relay of the grid-side failure
PVa (PVb) Over Voltage	PVa (or PVb) voltage exceeds permitted values.
Busbar Over Voltage	The Bus voltage of PV strings exceeds permitted values.
Utility Loss	No utility or power off
Vac Over Voltage	Grid voltage high
Vac Under Voltage	Grid voltage low
Fac Over Range	Grid Frequency over limited
Grid Islanding	Grid voltage Islanding
Fault PDP	Internal device (PDP module) fault
DC INJ High	The alternative component of the DC current is out of the permitted range.
AC Over Current	Grid current is over range.
PVa (PVb) Over Current	PVa (PVb) current exceeds permitted values.
Over Temperature	The temperature of inverter is over 85°C.
RS485 Failure	RS485 represent communication module.

Internal Error B	Grounding abnormal
Isolation Fail	PV low impedance or AC ground

In the state of Fault, the red LED will flash. In most situations, the inverter requires very little service. However, if inverter is not able to work perfectly, you can check more details in the chapter '10 Trouble shooting'.

7.4.2 Main Menu

Press the 'Esc' key to enter the main menu. The main menu contains 6 submenus as follow:

Press the '↑' & '↓' keys to select the submenu. When chosen item is selected, press 'Ent' key to open the submenu. Pressing the 'Esc' key calls back the Main menu.

MENU ▲	
Display	Info
Device	Info
History	Info
Advance	Info

MENU ▲	
History	Info
Advance	Info
Date/Day	Info
language	Set

Display Info

The interface of 'Display Info' shows all the parameters when the inverter in the normal operation status. The pattern of the interface is as same as the default menu after the LCD is initialized. As the follow figure:

Power: 1.5KW	
Ipva: 3.5A	
Vpva: 202V	
Ipvb: 3.9A	
MPPT	
01-01-2014	13:53

Device Info

Press 'Ent' to open the submenu 'Device Info'. This submenu contains these follow information: Rated power, Rated current, Rated voltage, Rated frequency, Busbar voltage, Cooler Temperature, Case temperature. Screens can be scrolled manually by pressing the '↑' & '↓' keys.

Device state ▲	
Standard	: 2
Rated P	: 3.6kw
Rated I	: 16.0A
Rated V	: 230V
Rated F	: 50Hz

History Info

Press 'Ent' to open the submenu 'History Info'. 'History Info' records the fault information group and it records the fault parameter in detail. Screens can be scrolled manually by pressing the '↑' & '↓' keys.

Fault Record: ▲	
Fault Group	: 01
F Type	: 23
F VPn	: 376V
F Vpv1	: 294V
F Vpv2	: 1V

Advanced Info

'Advanced Info' refers to the password. Type in the correct password (The password can be altered manually by pressing the '↑' & '↓' keys, then press the 'Ent' key to confirm).

For safety usage and do not affect the efficiency of the inverter, this submenu should be operated by the authorized electrician only. Pressing 'Esc' calls back the main menu.

<table border="1"> <tr> <td>INPUT:</td> </tr> <tr> <td>00000</td> </tr> </table>	INPUT:	00000
INPUT:		
00000		

Date/Day Info (Date & Time Adj:)

To ensure the correct statistical results of 'day power', please make sure the system time is set to local time.

Press 'Ent' to get access to the 'Date/Day Info'. Set the time by the procedure below.

Pressing '↓' to choose the option, and then use '↑' key to set the number. After adjusting the time and date, pressing 'Ent' to confirm and save, the interface will show the figure as below. Press 'Ent' again the interface will return to the previous main menu. Pressing 'Esc' if cancel.

Day & time Adj:
Year:2014
Month: 01
Day:01
Hour:13
Minute:54

Language Set

Use '↑' and '↓' key to select language and press 'Ent' to confirm and save.

中文
English

8 Auto Test (For Italy only)

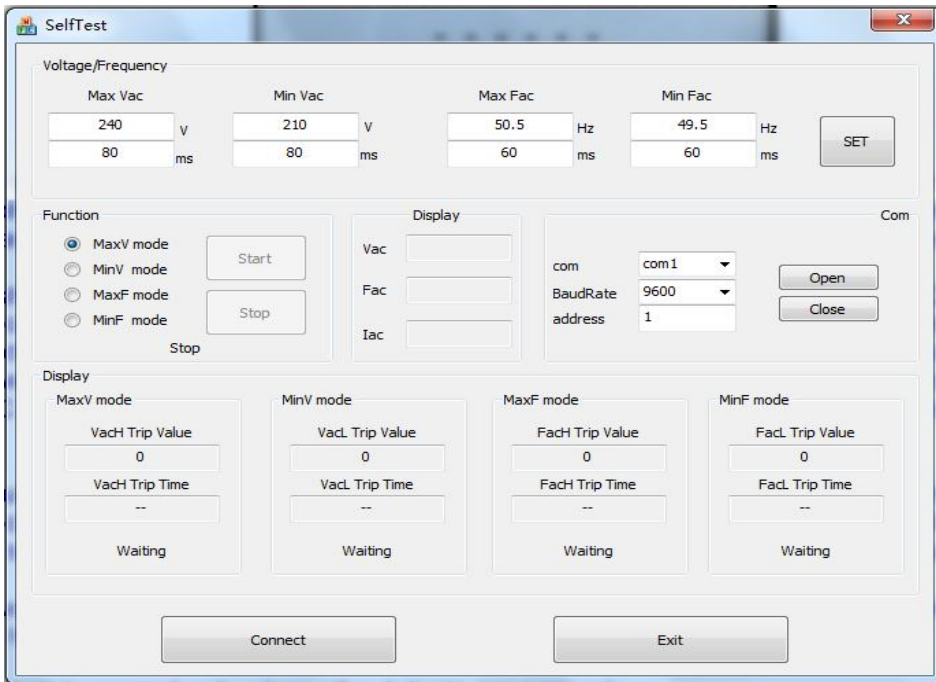
The 'Auto test' can be download from Afore company' website www.aforeenergy.com.

The auto-test function is stipulated in accordance with the Italian Standard CEI 0-21. It will enable verification of the voltage and frequency monitoring function.

8.1 The auto-test can be started by any user.

8.2 The auto-test software shall be installed in a PC that will communicate to the PV grid-connected inverter through the "485 port". For the overall duration of the auto-test, the grid-connected inverter doesn't export power to the AC grid. And meanwhile make sure the inverter was connected to the PV arrays, and the inverter was generating.

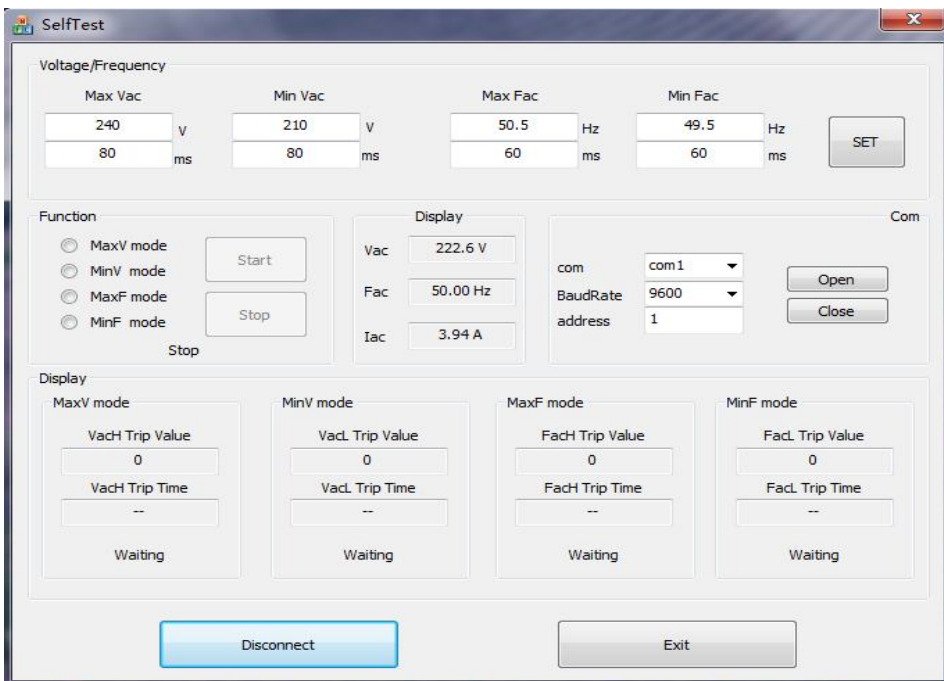
8.3 After clicking the icon  , the interface will be displayed on the PC screen.



8.4 Clicking the “Open” button, it will communicate to the PV grid-connected inverter through the “485 port”.

8.5 Then clicking the “Connect” button, the interface will be displayed as followings if successfully connecting (connected). And meanwhile you should ensure the inverter is safely connected to the utility.

8.6 And the AC grid voltage, the AC grid frequency and the AC current of the grid-connected inverter will be shown in the PC screen.



8.7 If the connecting is failed, repeat the step 4 to the step 5 until successfully connected.

8.8 The values of the thresholds and software trip time for the grid voltage and the grid frequency related to the auto test can be set. The default parameters are as follows:

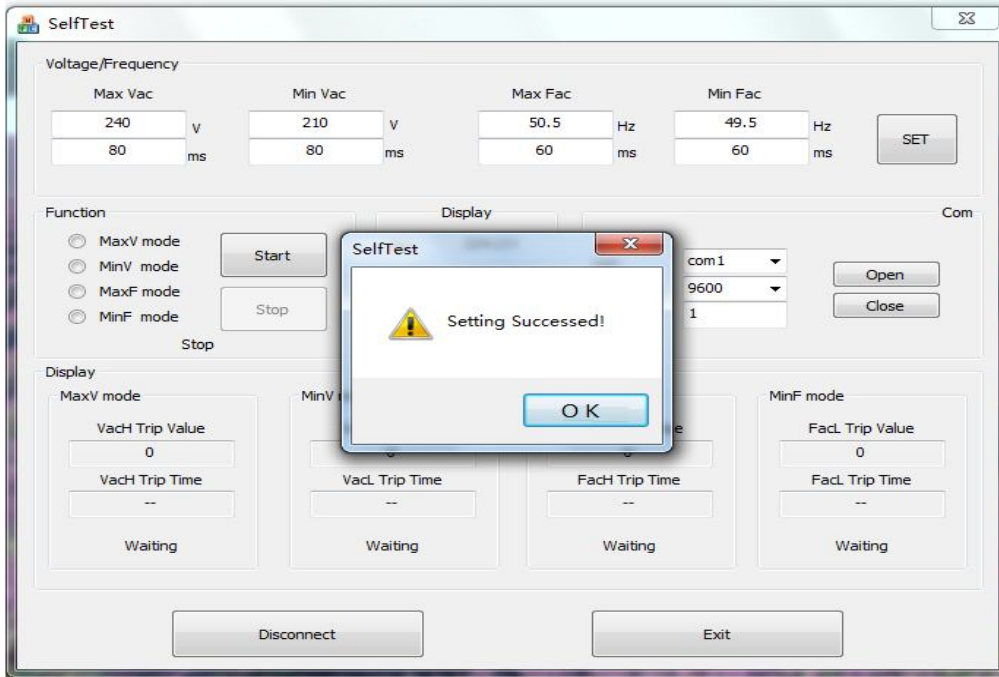
Max Vac (Maximum AC voltage threshold): 264.5V; $\leq 0.2s$

Min Vac (Minimum AC voltage threshold): 92V; $\leq 0.2s$

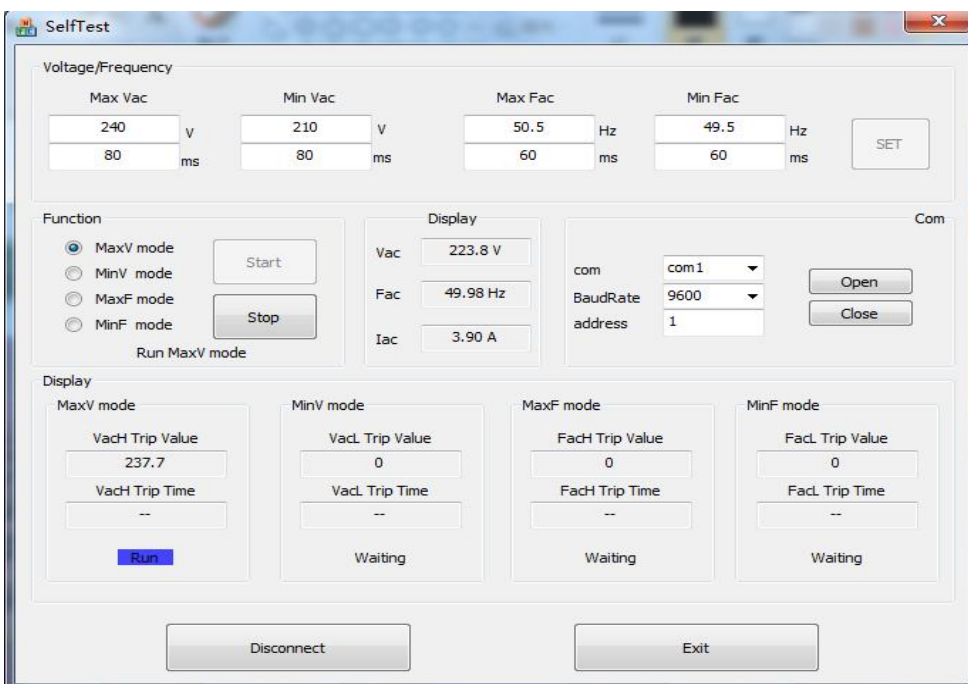
Max Fac (Maximum AC frequency threshold): 51.5Hz; $< 0.1s$

Min Fac (Minimum AC frequency threshold): 47.5Hz; $< 0.1s$

8.9 If all values are correct then the user can (would) be able to click the "SET" button on the PC screen to set the auto-test parameters. The interface will be displayed on the PC screen as followings if successfully set.

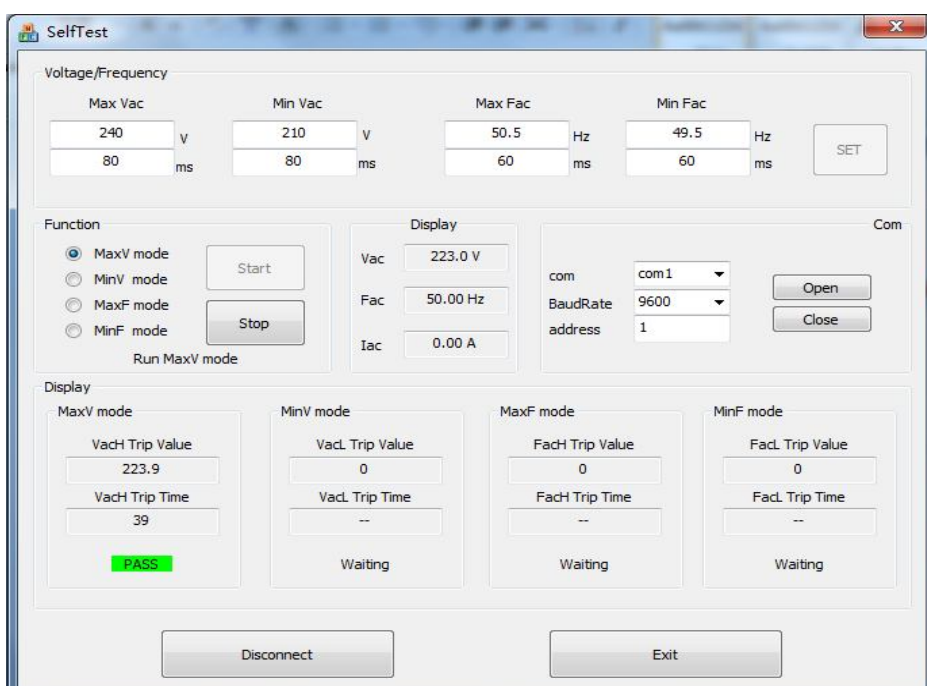


8.10 After setting the values of the auto-test, there are four mode selections to test the auto-test and the user can only select one mode every time. After selecting the mode, the user can click the button "Start" to start the auto-test. And if clicking the "stop" button, the auto-test will stop. For example, if the user selects the MaxV mode and clicks the button "Start", the following will be shown on the PC screen.



8.11 The slew rate of the threshold values , either increase or decrease, is equal or less than 0.05Hz/s for AC grid frequency and equal or less than 1V/s for AC grid voltage starting from the maximum (or minimum) threshold value. During the auto-test, the threshold value changes linearly and the measured values of the grid will be displayed on the PC screen in real time. The threshold will move from the maximum (or minimum) threshold value toward the measured value of the AC grid. While the two value matching occurs, the PV grid-connected inverter will disconnect the AC grid through the AC relays.

8.12 The matched value between the threshold and the AC grid and the software trip time between the matching is (being) recognized and the AC relays is (being) open will be displayed on the PC screen. The status of the each auto-test, Pass or Fail, will also be displayed on the PC screen as well. The following will be shown on the PC screen if selecting the MaxV mode.



8.13 If firstly click the “Disconnect” button and then click the “Exit” button, the auto-test will stop and the interface on the PC screen will exit.

Note: The results will be saved as an Access file after the auto-test process is completed.

9 Technical Data

The Afore inverters are available for outdoor using and wet location. PV modules connecting to inverter should comply with the requirement of IEC61730 class A, and PV arrays are not earthed.

Single MPPT

Electrical Specifications	HNS1000TL-1	HNS1500TL-1	HNS2000TL-1	HNS2500TL-1
Input				
Max. DC Power [W]	1100	1600	2200	2700
Max. DC Voltage [V]	450	450	500	500
MPPT Voltage Range [V]	120 - 360	120 - 360	120 - 400	120 - 400
Max. DC Current [A]	6	8	12	14
Isc PV [A]	8	10	15	17
Max backfeed current	<0.1mA	<0.1mA	<0.1mA	<0.1mA
Number of MPPT Trackers/ Strings Per MPP Tracker	1/1	1/1	1/1	1/1
Output				
Power Connector	Single Phase	Single Phase	Single Phase	Single Phase
Nominal AC Power [W]	1000	1500	2000	2500
Nominal AC Phase Voltage [V]	230	230	230	230
Nominal AC Frequency [Hz]	50	50	50	50
Nominal AC Current [A]	6	8	10	12
Max AC inrush current [A]	6	8	10	12
Max AC fault current [A]	9	12	15	18
Max AC protect current [A]	9	12	15	18
Power Factor	-0.9 ~ +0.9			
Output Current THD	<3%			
Power efficiency				
Max. Efficiency/400Vdc	96.83%	96.38%	97.02%	96.97%
Euro Efficiency/400Vdc	93.96%	94.81%	95.83%	95.90%
MPPT Efficiency	>99%	>99%	>99%	>99%
Compliance				
Electromagnetic Compatibility	EN61000-6-1/6-3			
Anti-Islanding Protection	Internal			
General information				
Dimensions (H×W×D) [mm]	394x300x130			
Overvoltage Category	III[Main], II [PV]			
Enclosure	IP65			
Pollution degree	3			
UV protection	Metal enclosure			
RCD	Internal			
Weight [kg]	11			
Ambient Temperature Range	-20 °C ~ +55 °C			
Humidity range	4% ~ 100%			
Topology	Transformerless			
Communication Interface	RS485			
Night Consumption [W]	<1			
Cooling Concept	Convection			
Noise Emission [dB]	<25			
Elevation	Up to 1000m without derating above sea level.			

Electrical Specifications	HNS3000TL-1	HNS3600TL-1	HNS4000TL-1	HNS4500TL-1	HNS5000TL-1	HNS5500TL-1	HNS6000TL-1
Input							
Max. DC Power [W]	3200	3800	4200	4700	5200	5800	6200
Max. DC Voltage [V]	550	550	550	550	550	550	550
MPPT Voltage Range [V]	120-450	120-450	120-450	120 - 450	120 - 450	120 - 450	120 - 450
Max. DC Current [A]	17	18	20	23	25	26	27
Isc PV [A]	21	22	24	28	30	32	33
Max backfeed current	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA
Number of MPPT Trackers/ Strings Per MPPT Tracker	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Output							
Power Connector	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Nominal AC Power [W]	3000	3600	4000	4500	5000	5500	6000
Nominal AC Phase Voltage [V]	230	230	230	230	230	230	230
Nominal AC Frequency [Hz]	50	50	50	50	50	50	50
Nominal AC Current [A]	14	16	18	20	22	24	26
Max AC inrush current [A]	14	16	18	20	22	24	26
Max AC fault current [A]	21	24	27	30	33	36	39
Max AC protect current [A]	21	24	27	30	33	36	39
Power Factor range	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9
Output Current THD	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Power efficiency							
Max. Efficiency/400Vdc	96.90%	96.96%	97.00%	96.90%	97.11%	97.31%	97.47%
Euro Efficiency/400Vdc	96.18%	96.33%	96.43%	95.96%	96.24%	96.42%	96.53%
MPPT Efficiency	>99%	>99%	>99%	>99%	>99%	>99%	>99%
Compliance							
Electromagnetic Compatibility	EN61000-6-1/6-3						
Anti-Islanding Protection	Internal	Internal	Internal	Internal	Internal	Internal	Internal
General information							
Dimensions (H×W×D) [mm]	526x300x130	526x300x130	526x300x130	634x300x130	634x300x130	634x300x130	634x300x130

Electrical Specifications	HNS3000TL-1	HNS3600TL-1	HNS4000TL-1	HNS4500TL-1	HNS5000TL-1	HNS5500TL-1	HNS6000TL-1
Overvoltage Category	III[Main], II [PV]						
Enclosure	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Pollution degree	3	3	3	3	3	3	3
UV protection	Metal enclosure						
RCD	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Weight [kg]	16	16	16	19	19	19	19
Ambient Temperature Range	-20 °C ~ +55 °C						
Humidity range	4% ~ 100%						
Topology	Transformerless						
Communication Interface	RS485	RS485	RS485	RS485	RS485	RS485	RS485
Night Consumption [W]	<1	<1	<1	<1	<1	<1	<1
Cooling Concept	Convection	Convection	Convection	Convection	Convection	Convection	Convection
Noise Emission [dB]	<28	<28	<28	<30	<30	<30	<30
Elevation							

Double MPPT

Electrical Specifications	HNS3000TL	HNS3600TL	HNS4000TL	HNS4500TL	HNS5000TL	HNS5500TL	HNS6000TL
Input							
Max. DC Power [W]	3200	3800	4200	4700	5200	5800	6200
Max. DC Voltage [V]	550	550	550	550	550	550	550
MPPT Voltage Range [V]	120-450	120-450	120-450	120-450	120-450	120-450	120-450
Max. DC Current [A]	10*2	12*2	13*2	14*2	15*2	15.5*2	16*2
Isc PV [A]	12	15	16	17	18	19	20
Max backfeed current	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA	<0.1mA
Number of MPPT Trackers/ Strings Per MPPT Tracker	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Output							
Power Connector	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Nominal AC Power [W]	3000	3600	4000	4500	5000	5500	6000

Electrical Specifications	HNS3000TL	HNS3600TL	HNS4000TL	HNS4500TL	HNS5000TL	HNS5500TL	HNS6000TL
Nominal AC Phase Voltage [V]	230	230	230	230	230	230	230
Nominal AC Frequency [Hz]	50	50	50	50	50	50	50
Nominal AC Current [A]	14	16	18	20	22	24	26
Max AC inrush current [A]	14	16	18	20	22	24	26
Max AC fault current [A]	21	24	27	30	33	36	39
Max AC protect current [A]	21	24	27	30	33	36	39
Power Factor range	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9	-0.9 ~ +0.9
Output Current THD	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Power efficiency							
Max. Efficiency/400Vdc	96.90%	96.96%	97.00%	96.90%	97.11%	97.31%	97.47%
Euro Efficiency/400Vdc	96.18%	96.33%	96.43%	95.96%	96.24%	96.42%	96.53%
MPPT Efficiency	>99%	>99%	>99%	>99%	>99%	>99%	>99%
Compliance							
Electromagnetic Compatibility	EN61000-6-1/6-3						
Anti-Islanding Protection	Internal	Internal	Internal	Internal	Internal	Internal	Internal
General information							
Dimensions (H×W×D) [mm]	584x300x130	584x300x130	584x300x130	634x300x130	634x300x130	634x300x130	634x300x130
Overvoltage Category	III[Main], II [PV]						
Enclosure	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Pollution degree	3	3	3	3	3	3	3
UV protection	Metal enclosure						
RCD	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Weight [kg]	18.5	18.5	18.5	18.5	19.5	19.5	19.5
Ambient Temperature Range	-20 °C ~ +55 °C						
Humidity range	4% ~ 100%						
Topology	Transformerless						
Communication Interface	RS485	RS485	RS485	RS485	RS485	RS485	RS485
Night Consumption [W]	<1	<1	<1	<1	<1	<1	<1
Cooling Concept	Convection	Convection	Convection	Convection	Convection	Convection	Convection

Noise Emission [dB]	<28	<28	<28	<30	<30	<30	<30
Elevation	Up to 1000m without derating above sea level.						

10 Trouble Shooting

In most situations, the inverter requires very little service. However, if inverter is not able to work perfectly, we recommend the following solutions for quick troubleshooting.

Fault No.	Definition	Error Message	Possible Causes	Corrective Measure
1	PVA over voltage	PVa Over Voltage	1. The open-circuit voltage of PV panels exceeds permitted values.	Adjust the PV panel configuration
			2. Inverter fault	Restart the inverter*
2	PVB over voltage	PVb Over Voltage	1. The open-circuit voltage of PV panels exceeds permitted values.	Adjust the PV panel configuration
			2. Inverter fault.	Restart the inverter
3	PN over voltage	Busbar Over Voltage	Inverter fault	Restart the inverter
4	Ground-fault current protection	Active GFCI	1. The connection of grounding wires of PV panels is incorrect.	Check the wire connection
			2. The connection of AC grounding wires of PV panels is incorrect.	Check the wire connection
			3. Inverter fault	Restart the inverter
5	EEPROM error	EEPROM Failure	Inverter fault	Restart the inverter
6	Parameter error	Para Over Range	Inverter fault	Restart the inverter
7	Reference voltage error	Ref Voltage Error	Inverter fault	Restart the inverter
8	AC voltage sensor failure	Vac Sensor Fail	Inverter fault	Restart the inverter
9	AC current sensor failure	Iac Sensor Fail	Inverter fault	Restart the inverter
10	PVA current sensor failure	Ipva Sensor Fail	Inverter fault	Restart the inverter
11	PVB current sensor failure	Ipvb Sensor Fail	Inverter fault	Restart the inverter
12	Ground-fault current interrupter failure	GFCI Failure	Inverter fault	Restart the inverter

17	AC fuse blew out	AC Fuse-Check Fail	Inverter fault	Restart the inverter
18	AC relay failure	AC Relay-Check Fail	Inverter fault	Restart the inverter
19	Isolation failure	Isolation failure	1.PV(+) or PV(-) is earthed	Check the impedance between PV(+)& PV(-)
			2.PV-inverter isn't earthed	Make sure the PV-Inverter is earthed
			3. Inverter fault	Restart the inverter
22	DC current protection	DC INJ High	1. The grid fluctuates too sharply.	When the grid returns to normal, the inverter restores automatically.
			2. Inverter fault	Restart the inverter
23	AC over current	AC Over Current	1. The grid fluctuates too sharply.	The inverter restores automatically.
			2. Inverter fault	Restart the inverter
24	PVA over current	PVa Over Current	1. The external conditions, such as the PV voltage and the sunlight, change too sharply.	The inverter restores automatically.
			2. Inverter fault	Restart the inverter
25	PVB over current	PVb Over Current	1. The external conditions, such as PV voltage and sunlight, change too sharply.	The inverter restores automatically.
			2. Inverter fault	Restart the inverter
26	Over temperature protection	Over Temperature	1. The external conditions, such as the PV voltage and the sunlight, change too sharply.	The inverter restores automatically.
			2. Inverter fault	Restart the inverter
27	Islanding protection	Grid Islanding	1. The grid is abnormal.	When the grid returns to normal, the inverter restores automatically.
			2. Ratings of the grid-side switch do not meet the grid requirements so that the switch has tripped.	Replace the switch.
			3. AC connectors are in poor connect.	Reconnect the connectors again.
			4. Inverter fault	Restart the inverter
28	Grid loss	Utility Loss	1. The grid is abnormal.	When the grid returns to normal, the inverter restores automatically.
			2. Ratings of the grid-side switch do not meet grid requirements so that the switch has tripped.	Replace the switch.
			3. AC connectors are in poor connect.	Reconnect the connectors again.

			4. Inverter fault	Restart the inverter
29	Grid over voltage	Vac Over Voltage	1. The grid is abnormal.	When the grid returns to normal, the inverter restores automatically.
			2. Inverter fault	When the grid returns to normal, restart the inverter
30	Grid under voltage	Vac Under Voltage	1. The grid is abnormal.	When the grid returns to normal, the inverter restores automatically.
			2. Inverter fault	When the grid returns to normal, restart the inverter
31	Grid frequency error	Fac Over Range	1. The grid is abnormal.	When the grid returns to normal, the inverter restores automatically.
			2. Inverter fault	When the grid returns to normal, restart the inverter
N/A	LCD screen do not light up/ Green LED glows.	NC	Inverter fault	When the grid returns to normal, restart the inverter
N/A	Output power is half of the Max. Power.	NC	1. All the PV panels are connected to the inverter as one input string.	Change the installation.
			2. Inverter fault	When the grid returns to normal, restart the inverter
N/A	GFCI tripped	NC	1. The connection of grounding wires of PV panels is incorrect.	Check the installation
			2. The connection of AC grounding wires of the inverter is incorrect.	Check the installation
			3. GFCI is shared by both the inverter and other equipments.	Check the installation
			4. GFCI failure	Replace the switch
			5. Inverter fault	Restart the inverter
* Restart the inverter: Disconnect all the input and output switches, wait until the LCD screen and all the indicating lights go off, and then reconnect all the switches again.If the error still remains after repeated restarting, please contact our after-sales.				

- If there is a fault, the red LED will flash. Please refer to the following table for a list of potential problems and their solutions.
- If there is no display on the panel, please check PV-input connections.

- If the voltage is higher than 120 V, and the inverter doesn't work, please call local service.
- If it is intended to replace the cable or open the enclosure lid, please call our service.
- During periods of little or no sunlight, the inverter may continuously start up and shut down. It is due to insufficient power generated to operate the control circuits.

Annex 1 Web Monitor HMI-901 Operation (Optional)

Users can decide to choose web monitor according to own demands, which can be bought from Afore.

1 Wireless portal configuration

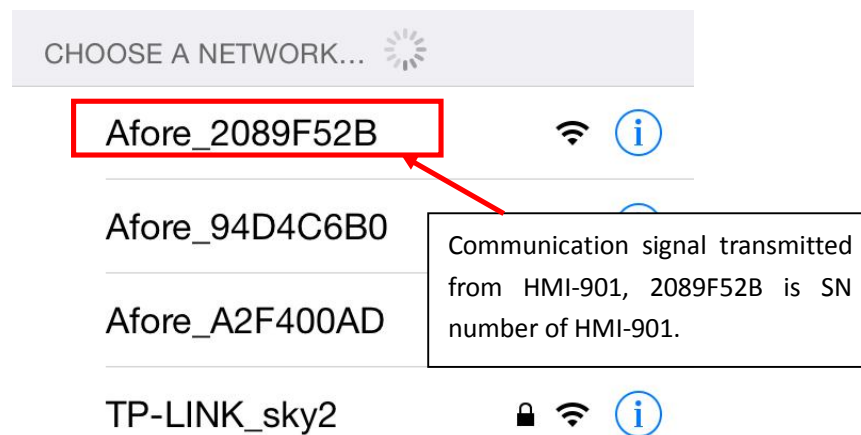
1.1 Make sure the inverter is properly working.

1.2 Search Wi-Fi signal "Afore_xxxxxxx" of HMI-901 by smart devices such as laptop, mobile phone or pad.

The password is empty, xxxxxxxx is SN number of web monitor. Please record it for registering on website.

(Picture 1-1)

"Afore_xxxxxxx" is the communication signal transmitted from HMI-901, but not the Wi-Fi signal to surf on Internet.



1-1

1.3 Connect the Afore_xxxxxx WIFI signal

Visit the site 11.11.11.1 with your PC's web browser, below interface displays (Picture1-2), both the user's name and password are "admin".



1-2

1.4 Click “ok” and move into next interface.

Afore Professional Solar PV Inverter Manufacture

Basic **Monitor** System

SN: 2089F52B

MAC: C8-93-46-42-E0-Da [IP Address](#)

Inverter type: AF-1P-2nd

SSID: Afore_wireless [Find AP](#)

Key:

[Save&Reboot](#) [Factory Default](#)

1-3

1.5 Click “Find AP” (Picture 1-3), open the scan interface, in which it could automatically search the WIFI router signal in the neighbourhood, choose your home/office WIFI signal in the interface, and input the password in the Key column. Please make sure the signal strength is at least 30% (Picture 1-4); otherwise the communication will be affected.

Afore Professional Solar PV Inverter Manufacture

[Return](#) Available Wireless Network

SSID	Signal
Afore_5E22B1FC	100%
Afore_94D4C6B0	100%
Afore_wireless	95%
Afore_A2F400AD	95%
AP1201	40%
TP-LINK_1C74	25%
bee	20%
TP-LINK_790BD8	15%

[Refresh](#)

1-4

1.6 Click “Save&Reboot” to save this configuration and wait for 5 seconds to complete the process.

1.7 Retype 11.11.11.1 in the web browser and enter, then click “IP Address” and check (Picture1-5).

Afore Professional Solar PV Inverter Manufacture	
Return	IP Address Setting
Current Local IP:	192.168.1.100
Current Netmask:	255.255.255.0
Current Gateway IP:	192.168.1.1
Current DNS Server:	192.168.1.1
DHCP Select:	Enable <input type="button" value="v"/>
Set Local IP:	<input type="text" value="192.168.1.1"/>
Set Netmask:	<input type="text" value="255.255.255.0"/>
Set Gateway IP:	<input type="text" value="192.168.1.1"/>
Set DNS Server:	<input type="text"/>
<input type="button" value="Save"/>	

1-5

1.8 If Current Local IP, Current Netmask, Current Gateway IP, and Current DNS Server) all display specific data rather than “0”, it means the monitor device has successfully get IP address and can work normally.

1.9 If the interface shows as Picture 1-6, it means the monitor device failed to connect with router or the internet connection is not normal. When this happens, user should check if the password of the router is correct or if the WIFI signal is too weak.

Afore Professional Solar PV Inverter Manufacture	
Return	IP Address Setting
Current Local IP:	0.0.0.0
Current Netmask:	0.0.0.0
Current Gateway IP:	0.0.0.0
Current DNS Server:	0.0.0.0
DHCP Select:	Enable <input type="button" value="v"/>
Set Local IP:	<input type="text" value="192.168.1.1"/>
Set Netmask:	<input type="text" value="255.255.255.0"/>
Set Gateway IP:	<input type="text" value="192.168.1.1"/>
Set DNS Server:	<input type="text"/>
<input type="button" value="Save"/>	

1-6

It is also possible that the user’s router is Static IP address, then user can use the similar method to set up by clicking “IP Address”, enter the “IP address setting” interface, close DHCP Select by choosing “Disable” then input the Static IP address, net mask, gateway IP and DNS. Then save the settings. Wait for 2 minutes and retype 11.11.11.1 in the web browser and enter, then click IP Address and check. If Current Local IP, Current Netmask, Current Gateway IP, and Current DNS Server all display specific data rather than “0”, it means the setting is successful. If not, please confirm if the router allows wireless device to be connected.

If the router needs MAC address, please get it from the interface of picture 1-3.

2 Account register

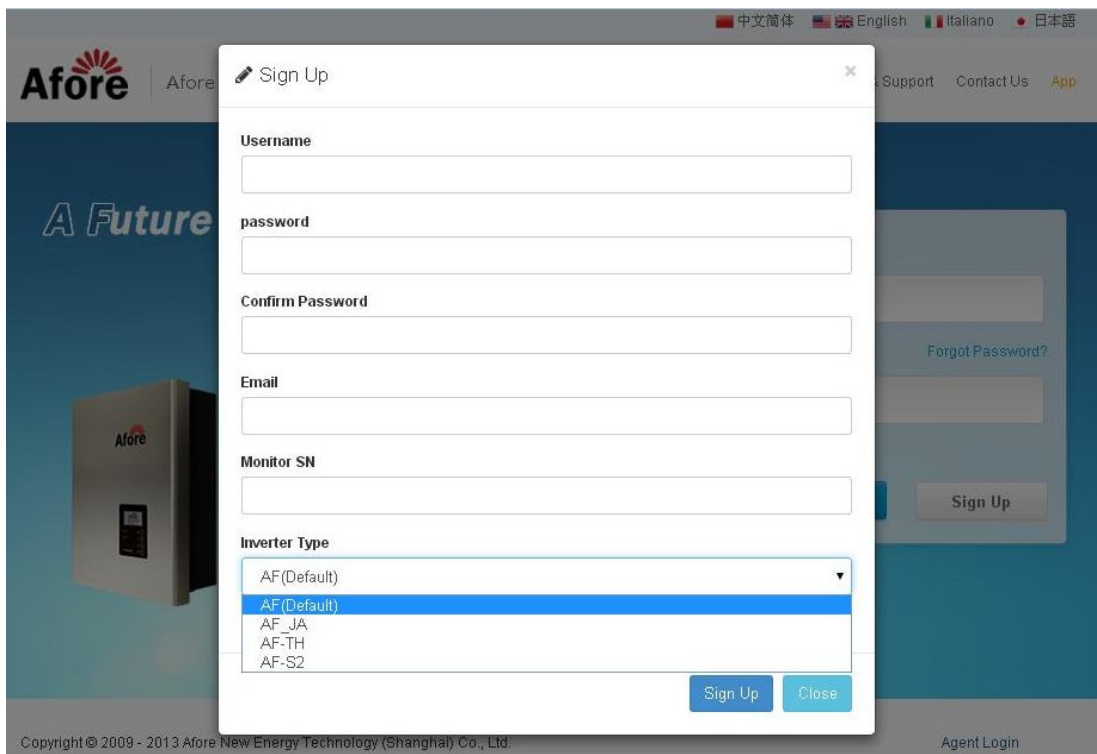
2.1 Use the laptop or PC connected with Internet. Enter www.aforeenergy.com in IE to Afore's home page. Click "Register" under the "Monitoring System User Login" in the middle of right side of home page and it shows the login interface of Afore's monitoring system as picture 2-1. Select language on the top right corner and click APP to download the intelligent monitoring system for telephone.



2-1

2.2 Click register and it shows the register window as picture 2-2. Input user name, password, register email, and SN number of web monitor. Choose the corresponding type of inverter (AF: One Phase of Generation Two, AF-JA: Japanese Type, AF-TH: Three Phase, AF-S2: One Phase inverter of Generation Three). Click "Sign Up" and finish the registration.

Attention: The type of inverter related in this manual is AF.



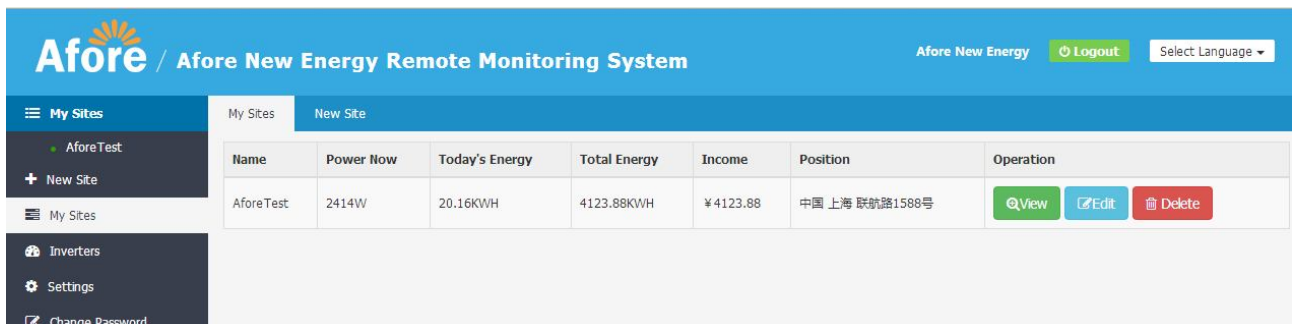
2-2

2.3 After register completes, login with user's name and password, select your own language in the upper right corner if necessary. This setting will be saved to this account number, when log in next time, no need to set up again.

3 User's instructions

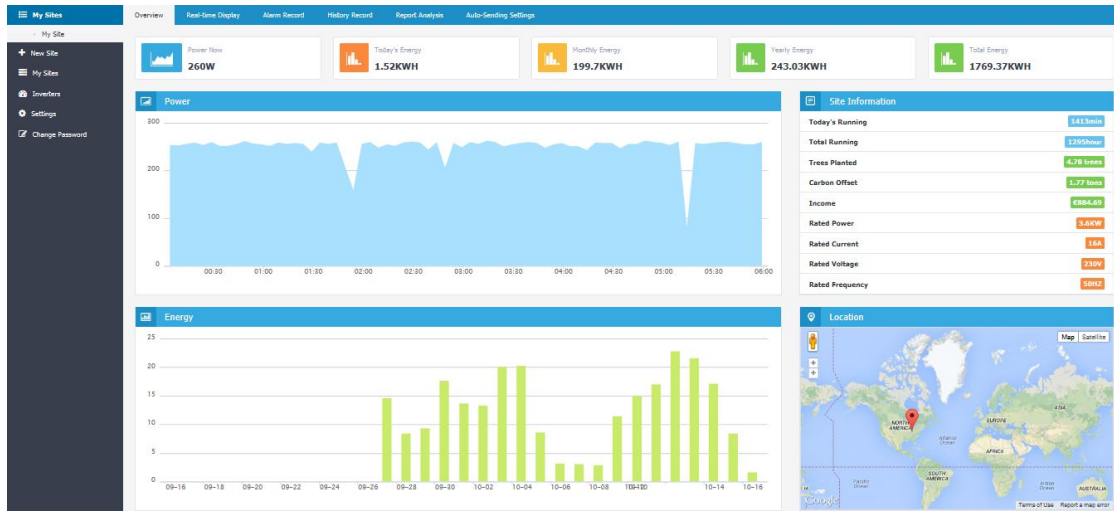
3.1 Log in

Log into the monitoring system with registered user's name and password, the system will automatically generate PV system monitoring site, called "my sites" (Picture 3-1).



3-1

Click "view", the PV system's operational data could be viewed and displayed now. (Picture 3-2)



3-2

3.2 Edit, add sites and add inverters by users

In Afore Energy Remote Monitoring System, users not only can view their own sites, but can also edit. Click “Edit”, move to the interface shown as Picture 3-3, users could edit content such as PV system name, location, local feed-in tariff, PV system introduction, and can also select PV system location on the map.

The “Sort No.” in the bottom shows the current PV systems position sequence, the smaller number ranks higher position of the list. Input the relevant information and save the settings to complete the PV system new site adding.

The 'Edit Site' form contains the following fields:

- Name: AforeTest
- Country: China
- Province: [Empty]
- City: Shanghai
- Address: 1588 Lianhang Rd
- Power Tariff: 1.00 RMB
- Remark: [Empty text area]
- Location: [Map showing Shanghai area]
- Sort No.: 1

Buttons: Save, Cancel

3-3

If users need to monitor multiple sites, add new sites in the system by clicking the “+ New Sites” in the menu on left side. Then it shows the similar interface with editing site. Input same name, address and other information. Choose corresponding time zone.

Input the SN number corresponding to the inverter in “Add A New Inverter” on the bottom of the page and choose the type of inverter (AF: One Phase, AF-JA: Japanese Type, AF-TH: Three Phase, AF-S2: One Phase inverter of Generation Three) (Picture 3-4).

3-4

If users need to add more than one inverter in the monitoring system, click “Inverters” in the left column, interface will show as Picture 3-5. Users could edit current inverter or add new inverters with similar steps. Here we will introduce “Add New Inverter” as an example. All the inverters in the list can be monitored by other sites only when they are deleted.

Inverters						
Add New Inverter						
Site Name:AforeTest						
SN	Name	Rated Power	Rated Current	Rated Voltage	Rated Frequency	Operation
33643e0bf0ef42dfbde66a9a98885e15	Afore-Inverter1	3.6KW	16A	230V	50HZ	Edit Delete
c6084b9b085b4a0e91b03aa8d12a7df3	test2-Inverter2	2KW	9A	230V	50HZ	Edit Delete

3-5

Click “Add New Inverter”, type in relevant information and click “save” to complete the adding. (Picture 3-6)

The screenshot shows the 'Add New Inverter' form. The left sidebar contains 'My Sites' with sub-items 'AforeTest', 'New Site', 'My Sites', 'Inverters', 'Settings', and 'Change Password'. The main form area has a blue header 'Inverters' and a sub-header 'Add New Inverter'. The form fields are: Inverter Name (dropdown menu with 'AforeTest' selected), SN (text input), Name (text input), Rated Power (text input with 'KW' unit), Rated Current (text input with 'A' unit), Rated Voltage (text input with 'V' unit), Rated Frequency (text input with 'HZ' unit), Remark (text area), and Sort No. (text input). At the bottom right, there are 'Save' and 'Cancel' buttons.

3-6

3.3 User's information setting

Users can edit own account information, click “Settings” in the left column (Picture 3-7).

The screenshot shows the 'Settings' form. The left sidebar is the same as in the previous image. The main form area has a blue header 'Settings'. The form fields are: Username (text input with 'afore' value), Fullname (text input with 'Afore New Energy' value), Telephone (text input), Email (text input), Address (text input), Remark (text area), and 'Save' and 'Reset' buttons at the bottom right.

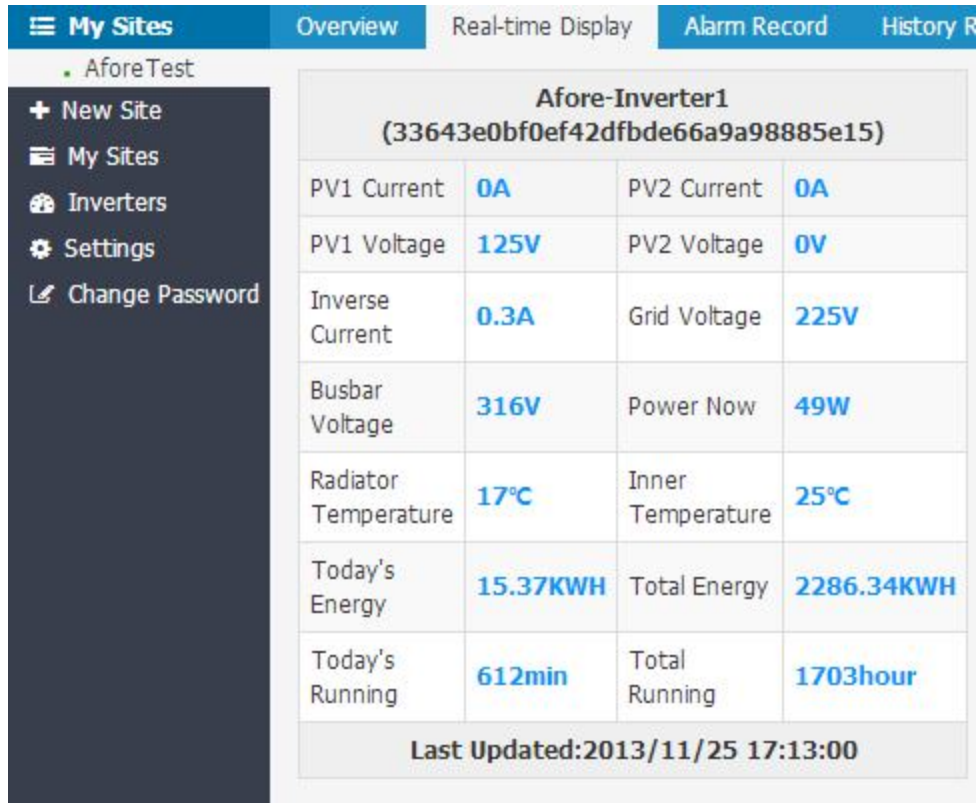
3-7

3.4 PV system management

Afore Energy Remote Monitoring System provides abundant functions of PV system monitoring and management.

3.4.1 Real-time Display

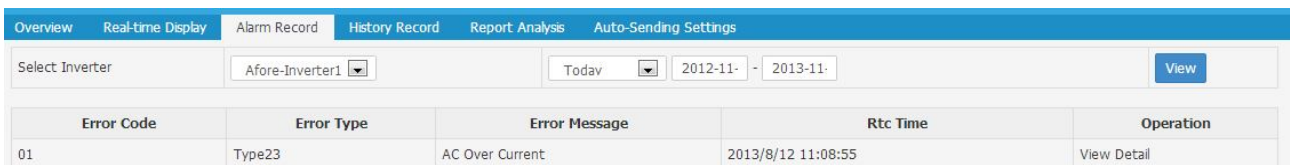
Real-time display provides users with basic real-time working data information of the PV system, and enables the users quickly to view his own PV system working status. Select a site, click “view”, and choose “Real-time display” (Picture 3-8).



3-8

3.4.2 Alarm Record

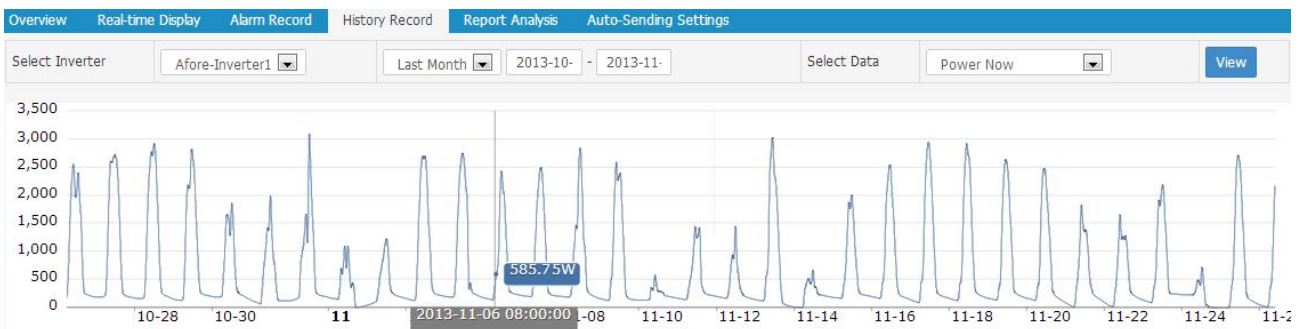
In the Alarm Record page, users could check the relevant Alarm Record under different inverters and the fault happening time (Picture 3-9)



3-9

3.4.3 History Record

In History Record page, users could check the curves of historical data and could also check specified time period of certain operation parameters, such as "Power now" (Picture 3-10)



3-10

3.4.4 Report Analysis

In the Report Analysis page, users could check the PV system daily, monthly, and yearly report. (Picture 3-11)

Date	Energy
2013-11-01	22.33KWH
2013-11-02	9.14KWH
2013-11-03	9.69KWH
2013-11-04	27.22KWH
2013-11-05	25.55KWH

3-11

3.4.5 Auto-sending Settings

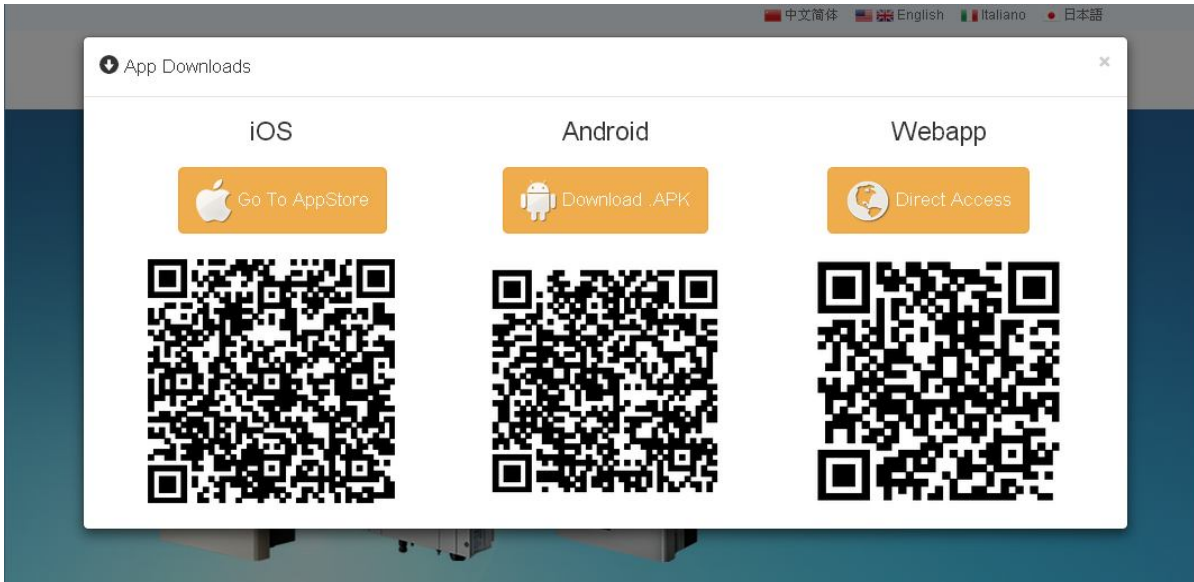
In this page, users could set faulty report automatic sending by day, week and month (Picture 3-12). Select the “on” option of the specific report, and type in the email address that needs receiving this report, then save the setting, then users could receive the report regularly.

3-12

4 APP Web Monitor on Mobile Devices

4.1 Installation APP Web Monitor

Click “APP” on the right corner in the login interface of “Afore’s Monitoring System” and then it shows as Picture 4-1. Users down and install the corresponding APP as demands.



4-1

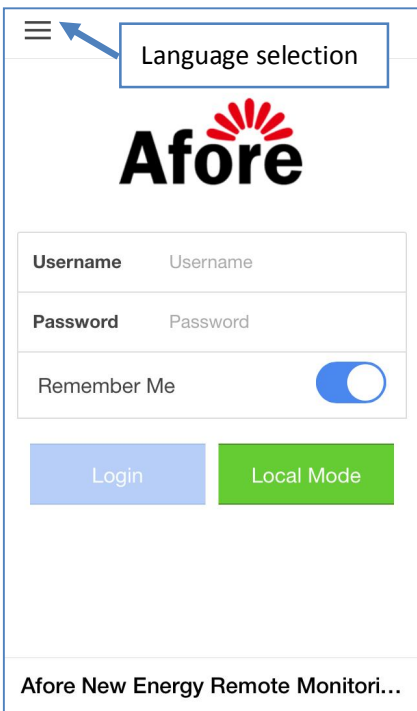
Users with IOS system can also open APP Store, search “afore web monitor” to install this APP.

4.2 Monitor Use Instructions

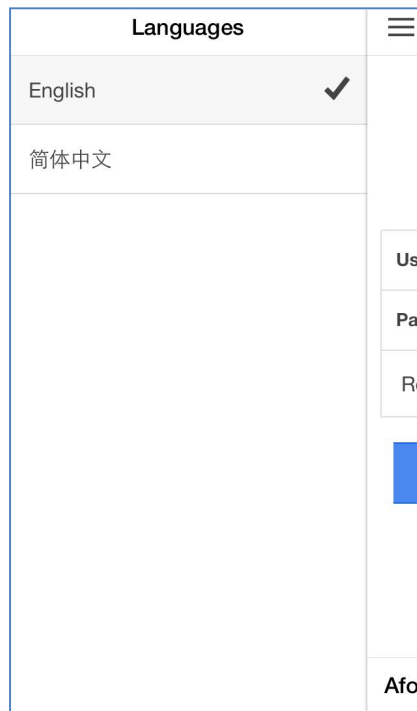
4.2.1 Click the APP icon on your device and get into the login interface of the monitor app (Picture 4-2).

Select the language by touching the Dialog box in the upper left corner (Picture 4-3).

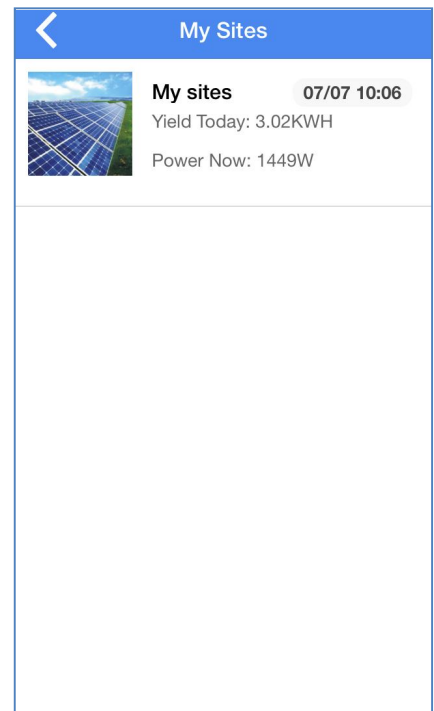
4.2.2 Input the “Username” and “Password” and click “Login” to get into the main interface (Picture 4-4).



4-2




4-3





4-4

4.2.3 Touching the icon (Picture 4-4) to enter ‘my sites’.


4.2.4 Click the different icon at the bottom to view the power generation information (Picture 4-5).

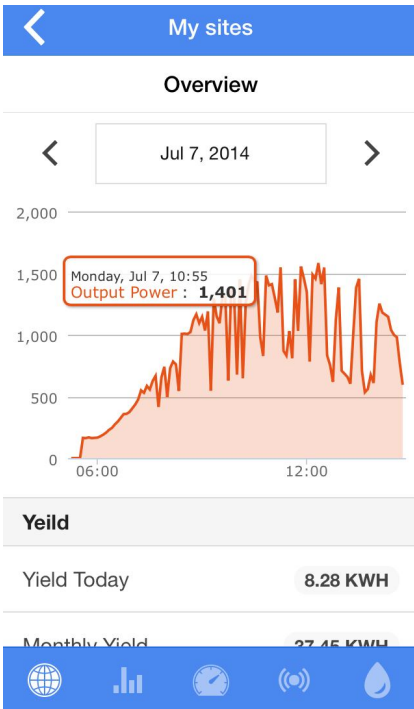
 : Day power (Picture 4-5) and site information (Picture 4-6)

 : Day energy/month, month energy/year, year energy/total (Picture 4-7)

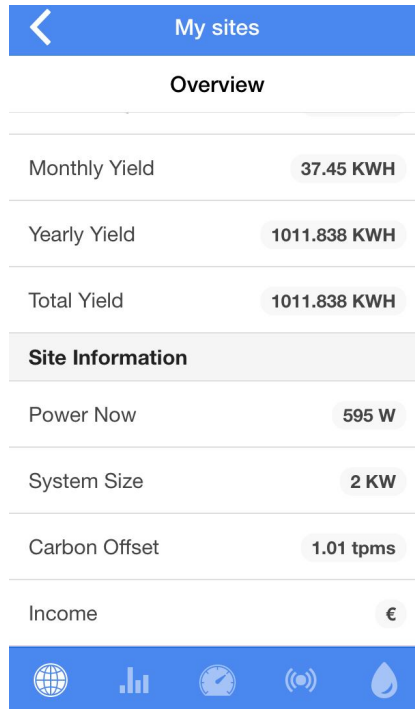
 : Device (Picture 4-8), click the picture of inverter, current information display (Picture 4-9).

 : Error message

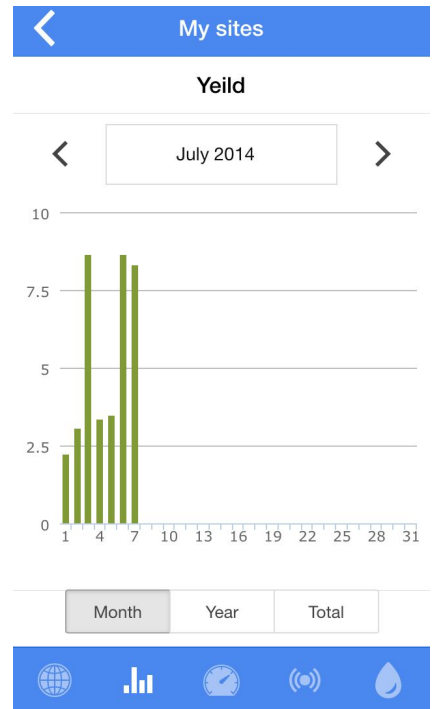
 : The recent 4-day local weather (Picture 4-10)



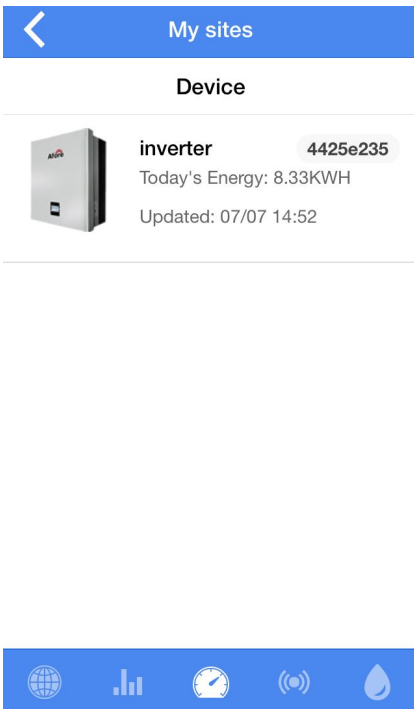
4-5



4-6



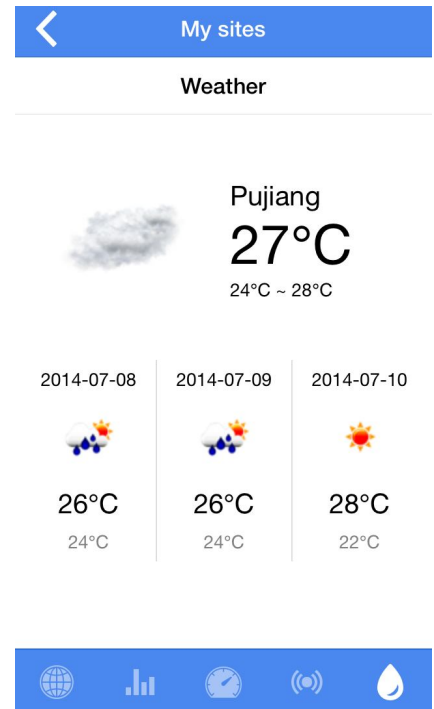
4-7



4-8



4-9



4-10

Annex 2 Contact

Please do not hesitate to contact us for any technical problems you have. Please be sure to provide the following information in order to obtain necessary assistance:

- Inverter type
- Inverter serial number

Afore New Energy Technology Co., Ltd.

www.aforeenergy.com

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TEL: +86-21-54326236

FAX: +86-21-54326136

E-MAIL: info@aforeenergy.com



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