

20kVA Off-Grid DC to AC Power Inverter User Instruction Manual

Model: battery charger

**The user must have the manual read it and keep it for
aftermath consultation**

- Please read carefully and understand safety precautions before start
- Save the manual at hand for reference

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1、Preface

1.2、Safety Caution

Please read the manual carefully before installing and operating. If not according to the instructions in this manual for installation and equipment damage, the company shall have the right to not be warranty.

1.3、Notes

- ☆ Proper transport, storage, installation, operation and maintenance of security in order to ensure the normal operation of the inverter.
- ☆ The equipment must be installed by professionals and ensure that all electrical installation meet electrical installation standard.
- ☆ Ensure that the equipment in a safe condition in order to carry out inspection and maintenance.
- ☆ When doing maintenance, there must be two or more staff to work until the equipment has been safely discharged off.
- ☆ Wear an antistatic bracelet to avoid unnecessary contact with the circuit board.
- ☆ Comply with the safety precautions in this manual and related documents.

2、 General Introduction

Battery intelligent charger is a new generation of intelligent high efficiency charger. This charger adopts high frequency switching power supply technology, charging speed is fast, charging efficiency is high, can realize the functions of uniform charging/floating charging, constant current/constant voltage automatic switching, short circuit protection, overload protection, fault self-diagnosis and so on. It can set, control and display voltage, current, time, charging amount and other parameters, and automatically save charging data for easy maintenance and data query

3. Performance characteristics

- ✓ True color 7 "LCD touch screen control, good man-machine interface
- ✓ Different charging modes can be set according to different battery types
- ✓ The system is controlled by digital microcomputer
- ✓ Automatic identification of charging status, equal-charge floating charge automatic conversion
- ✓ Adopt unique air duct design, internal heat dissipation effect is good, dust does not diffuse
- ✓ Optional CAN and computer RS485 communication remote control
- ✓ Multiple protection functions(input under voltage/input overvoltage/overvoltage/overheat, etc.)

- ✓ Adopt the structure design of anti-corrosion material to ensure the anti-rust of structural parts in high temperature, high humidity and high salt area
- ✓ The charger automatically follows the charging curve of the battery pack, as shown in the figure below:

3.1、Technical Parameter

battery charger		
GRID	Allow input voltage range	Single phase120VAC60Hz
Battery	Battery side voltage range	120-130VDC
	maximum charging current	80A
Display mode	Touch Sreen	
Working Environment	Dielectric strength	1500VAC,1minute
	Noise (1m)	<65dB
	Ambient temperature	-10℃~+45℃
	Humidity	0~95%, No condensation
	Altitude	<2000m Higher than 2000m rated power should be reduced
Communication interface	RS485	

4. Equipment Installation

4.1、Installation Requirements

4.1.1 Unpacking inspection

Please check the package if it is damaged, and if there is obvious distortion, please immediately contact us. Please check

the sign of the equipment to confirm the device type, capacity, input voltage, output voltage whether it is your purchase requirements, you can confirm it depending on the appearance and the model specification in the manual. If missing or damaged during transport, please promptly contact us, please retain the packaging materials for the transportation in future.

4.1.2 Installation conditions

In order to ensure good performance and long-term working life, choose the installation location of the system should pay attention to the following conditions to protect the system from damage:

- (1) Corrosive gas or liquid
- (2) salt /oil mist
- (3) mechanical shock, vibration
- (4) high humidity
- (5) extreme cold and heat (which can be used in the appropriate ambient temperature range: -10 °C ~ 45 °C)
- (6) electromagnetic noise (such as: welding machine, high power equipment)
- (7) radioactive material
- (8) flammable items

4.1.3 Installation position

- (1)Mounted on the flat ground surface which is fire-retardant or channel steel structure, removing surface depression or sloping ground situation, to ensure a solid foundation, safety and reliability, do not put uneven or sloping place.
- (2) Placed in a well-ventilated place,keep the back and side at least 50cm away from the wall to keep the airway open
- (3)Keep away from sources of ignition or high temperature to prevent overheating
- (4) Avoid contact with corrosive gases
- (5) There must have enough operation space in front of the power supply for installation
ambient humidity 15%-95%

4.2、 Safety Instructions

- (1)The DC side voltage is up to 384V,and the AC side side voltage is up to 220V. Please be sure that both side without charge.
- (2)Inverter adopts integral transportation mode, users can use forklift to lift it from the bottom , or use hoist and crane to move it.

(3)When moving, you cannot make the inverter tilt, shaking, suddenly put down or up, so as not to damage the inverter or affect the security of person.

The internal terminals are shown in the figure below:

5.LCD Touch Screen

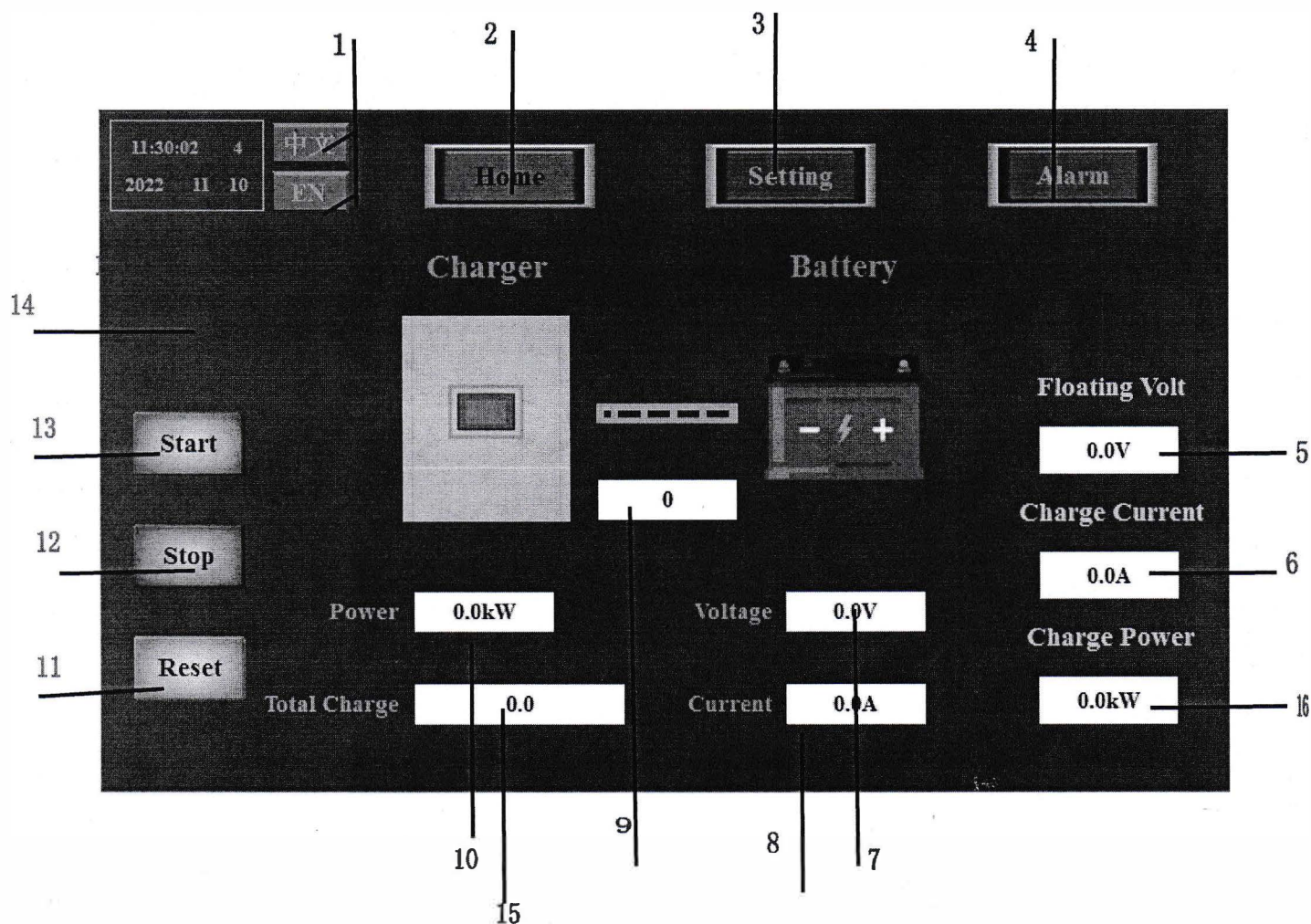
- Please read carefully and understand safety precautions before start
- Save the manual at hand for reference

This page displays the operation data, error status, and power curve.This page allows you to view your work status and stop or start the device.When starting the device, press the reset or stop button to clear the error.Then press the start button.

Press the button below to enter the interface.

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◆ Operate the main interface



No.	Name	Explain	Function
1	Chinese/English interface selection		Click to change the page display to Chinese/English
2	Home page window		Click back to the main page to display the main information
3	Parameter setting window		Click to set the working mode, as detailed below
4	Fault information window		Click here to query for specific failures
5	Floating voltage display window		Displays the floating voltage of the current power supply
6	Charge current display window		Displays the charge current of the current power supply
7	Dc voltage display window		Displays the dc output voltage of the current power supply

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8	Current display window		Displays the dc output current of the current power supply
9	Working mode		Displays the current power mode
10	Power display window		Display the power of the current power supply
11	Reset button		Click to reset an existing error
12	Stop button		Click to stop the power
13	Start button		Click to start the power
14	Indicator light		When the indicator light is green, it indicates that it is running When the indicator light is red, it is not started
15	Total charge		
16	Charging power		

◆ Parameter Settings

11:30:21 4 中文
2022-11-10 EN

Home Setting Alarm

☐ CC Charge ☐ CP Charge

☐ Enable Time Control

User:

Factory:

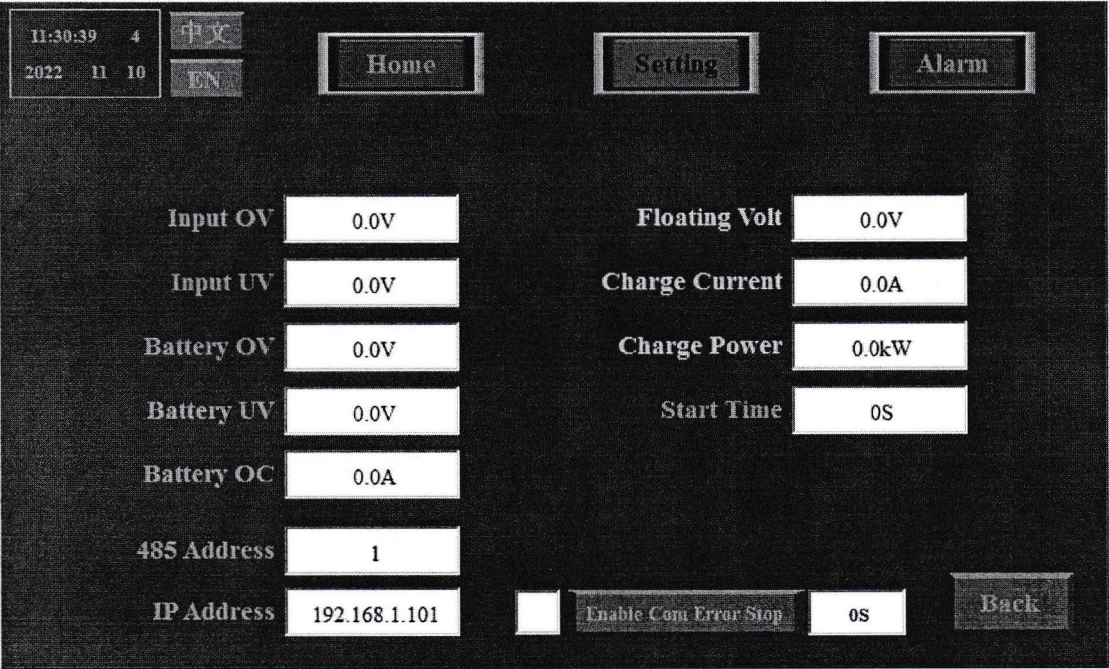
Charging Period

Start Time: Stop Time:

0H : 0M 0H : 0M

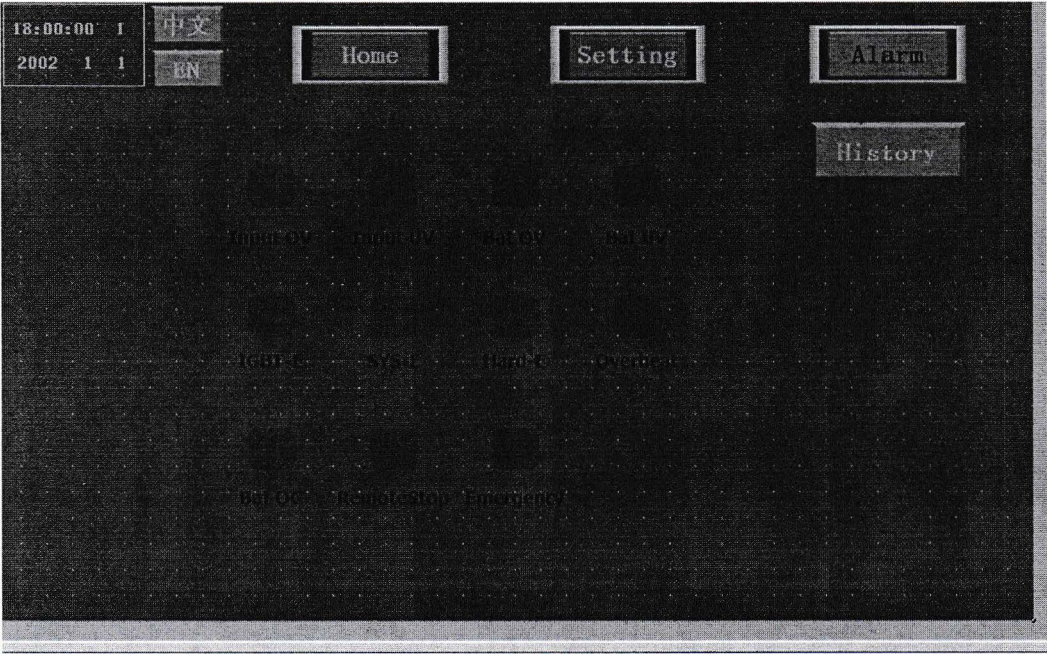
Power curve setting: click the white input box on the right of user setting, enter the password: "1", and click

"ok"to enter the setting page.



Displays setting parameters of power supply

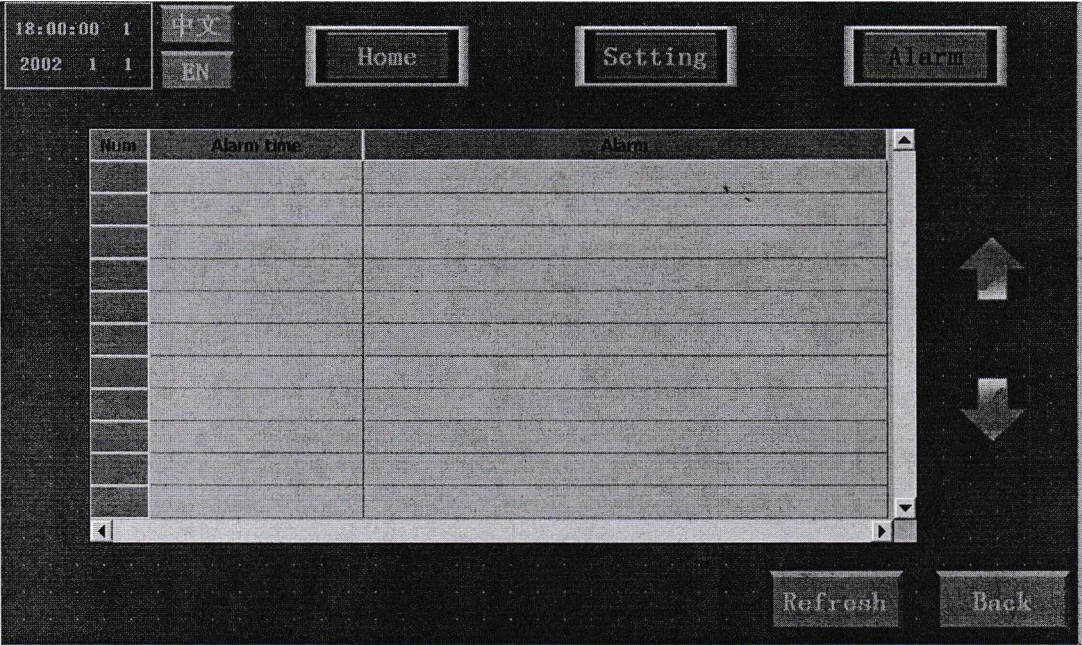
◆ warning page view



Battery charger operation manual

When the corresponding fault occurs, the corresponding indicator box changes from green to red.

History failure: Click to view history alarm record.The interface is as follows:



Refresh: Click to update history.

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I : Introduction

Our pure sine wave inverter is a dedicated power supply of a new generation of electric power and communication systems, we design and manufacture the inverter power supply according to the characteristics and requirements of the electric system, suitable for power system of power supply equipment high quality, high reliability requirements, are widely used in power system communication, carrier, monitoring, relay protection and emergency lighting. The power supply uses advanced sinusoidal pulse width modulation (SPWM) technology, the main circuit of Germany's Siemens IGBT module drive protection for Japan's Mitsubishi thick film circuit, with the advantages of high reliability, protection and full-featured, small waveform distortion, larger power and so on.

Our inverter power supply input DC voltage is 120Vdc, Output is 220Vac, has the following main features:

- (1) The main circuit adopts the United States INTEL microprocessor, Germany Siemens IGBT module, drive protection adopts Japan Mitsubishi movement, output partial adopts isolation transformer, safe and reliable
- (2) SPWM pulse width modulation technology, the output is inverter, pure sine wave of low distortion
- (3) Full-bridge circuit structure, applicable to any load

(4) DC input uses state-of-the-art anti-filling noise suppression technology, the AC input of multiple filtering to eliminate the interference of the electricity grid, communication equipment and other common DC panel without disturbing each other

(5) With a full range of power protection solutions and perfect self-detection and protection. DC input voltage is too low alarm, overload alarm, overheating alarm and short-circuit, the power will turn off the inverter output, troubleshooting, manually reset the power to work properly; Input under-voltage protection fault is cleared after the output will automatically resume

(6) Compact circuit structure, high efficiency, strong function

(7) Group-screen installation, elegant appearance

II. Select the capacity method:

Purely resistive load power capacity= $1.1 \times \text{load power}$

Rectifier load power capacity= $(\text{Load current crest factor}/1.5) * \text{Load power}$

Pure inductive load power capacity= $(\text{Load starting current}/1.5 * \text{Rated current}) * \text{Load power}$

Pure capacitive load= $3 \times \text{load power}$

Mixed load: Follow the comprehensive selection of different proportion of the load

III. Installation Notes:

1. Inverter power supply unit models whether fit ordered model and capacity.
2. Inverter power supply whether accidentally damaged because of shipping. If so, do not connect the power supply.
3. Before use the power supply, should first determine the power supply specifications to avoid the inverter power supply is damaged.
4. Inverter power supply due to the different of capacity size and input voltage, have different standards for the installation, please follow the capacity size and the input voltage, select the appropriate wiring methods, when wiring, please refer to "electrical regulations," provides choice, pay attention to its diameter is in compliance with specifications
5. Note that the inverter power supply input, should be avoided with other devices sharing the same switch, and as close to the utility source.
6. Please use the O-terminal terminal construction, disk input and output wiring terminals, be sure the power cord connected, and pay attention to tighten the screws to avoid poor contact and prevent the occurrence of electric shock
7. Turn off the power when wiring, non-line work, attention to safety.
8. Note that all terminals plugs when wiring, whether sockets loose, to avoid dangerous electrical conductivity.

IV. Operate steps:

1. Confirm the input power is within specifications (see the machine technical parameters)

2. Starting up

(1) First open DC air switch, press the START key, built-in inverter work.

If power for the first time to use, please use external voltmeter check output terminal voltage and voltmeter display value is consistent, confirmation add load.

(2) Load from the DC power supply is plugged into an AC bypass, the power is automatically switched to the DC power supply; switch automatically after loss of DC power to AC power supply; exchange bypass after power is restored, automatically switches to DC power state.

(3) During operation, the machine may be issued by a slight high-frequency sound is normal.

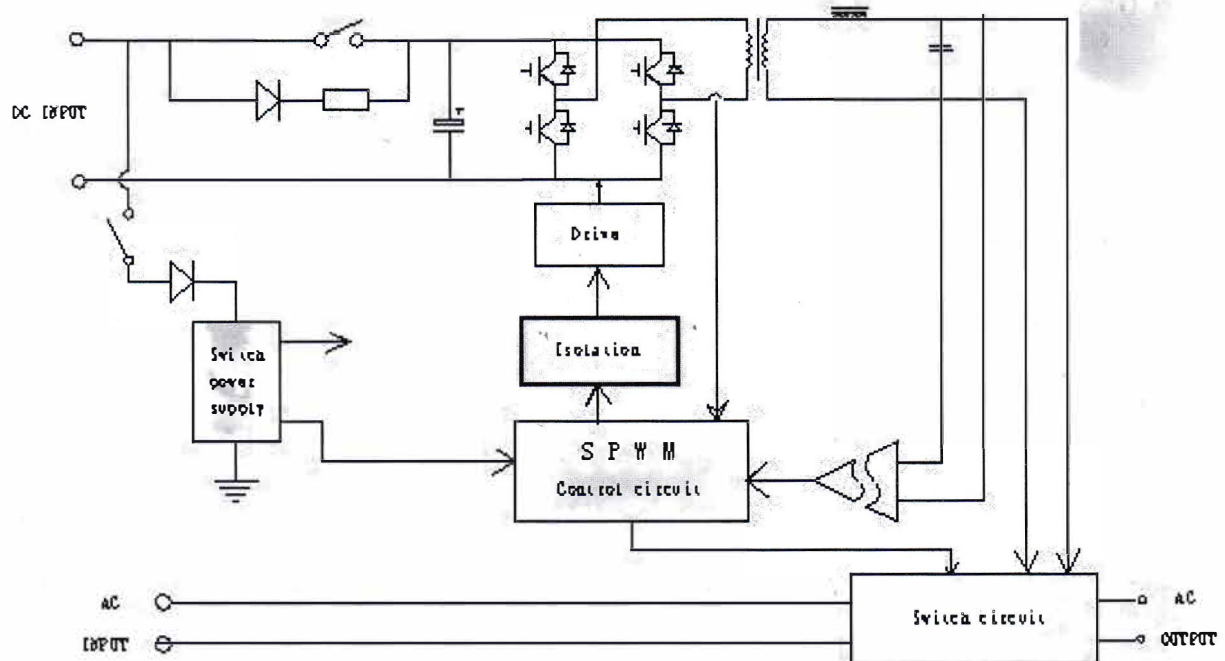
3. Stop

(1) Bounce STOP button, the inverter is stopped, at the same time, cut the AC bypass power, the machine stop output. During operation, if a failure occurs, the protection circuit in the machine will automatically shut down to protect the inverter circuit and stop the output, audible and visual alarm.

(2) Such as downtime not use, please stop the invert and turn off all of the switches .

Note: When you turn off the power first bounce to start / stop button (START / STAP), and then turn off the input breaker.

V. Inverter power supply system drawing:



VI. Troubleshooting:

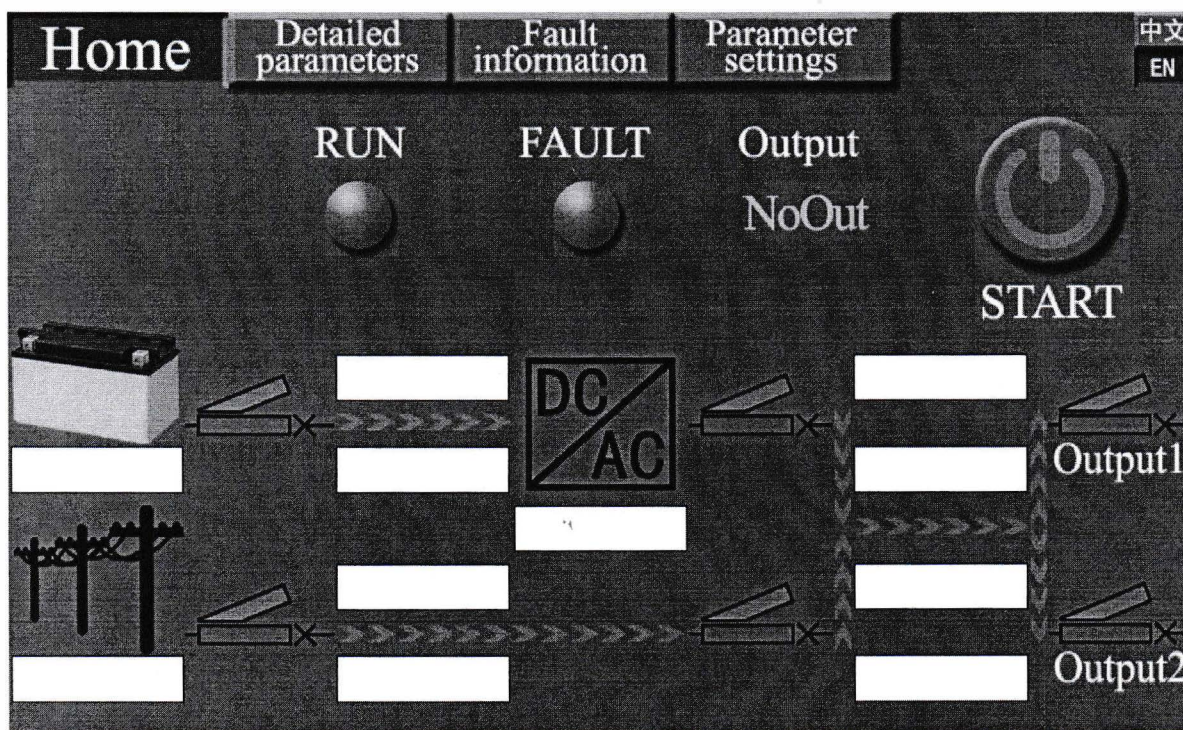
The machine is limited to electrical maintenance professionals. Please note that the internal high-pressure, non-professionals are not allowed to open the door repair. When the smooth operation of the machine can not, turn it off and check the following steps:

Off Grid Inverter User Manual

Phenomenon	Inspection methods	trouble clearing
No input power	1. Mains input switch is open? 2. Input power is plugged in? Lock? 3. Input voltage is within specifications? 4. Check the circuit breaker is off?	1. Open the mains input switch. 2. Re-plug the input power is good, locking. 3. Modify or re-install the correct voltage specification. 4. Check the circuit breaker.
Output power failure	1. Is there a power failure or momentary power failure? 2. Is there overload phenomenon?	1. Press the start switch reboot. 2. If because overloading and tripping, please reduce the load, restart your computer.
No output voltage	1. Circuit breaker is tripped? 2. Check overload?	1. Please check with the specifications of the machine and for protection Fuse. 2. Greater capacity for static variable frequency power supply.
Output frequency, voltage, current, watt table shows "0" and the buzzer alarm will sound.		1. Check and reduce the load current. 2. Press the start switch reboot. 3. Restart the operation, as well as the alarm sound, please contact the manufacturer
Temperature	1. Overloaded? 2. Fan speed slows down or not to switch?	1. Reduce the load. 2. Replace the fan.
Emergency repair call		Please advise: 1 machine model and serial number. 2 the date and time of failure. 3 load types. 4 Detailed description of symptoms.

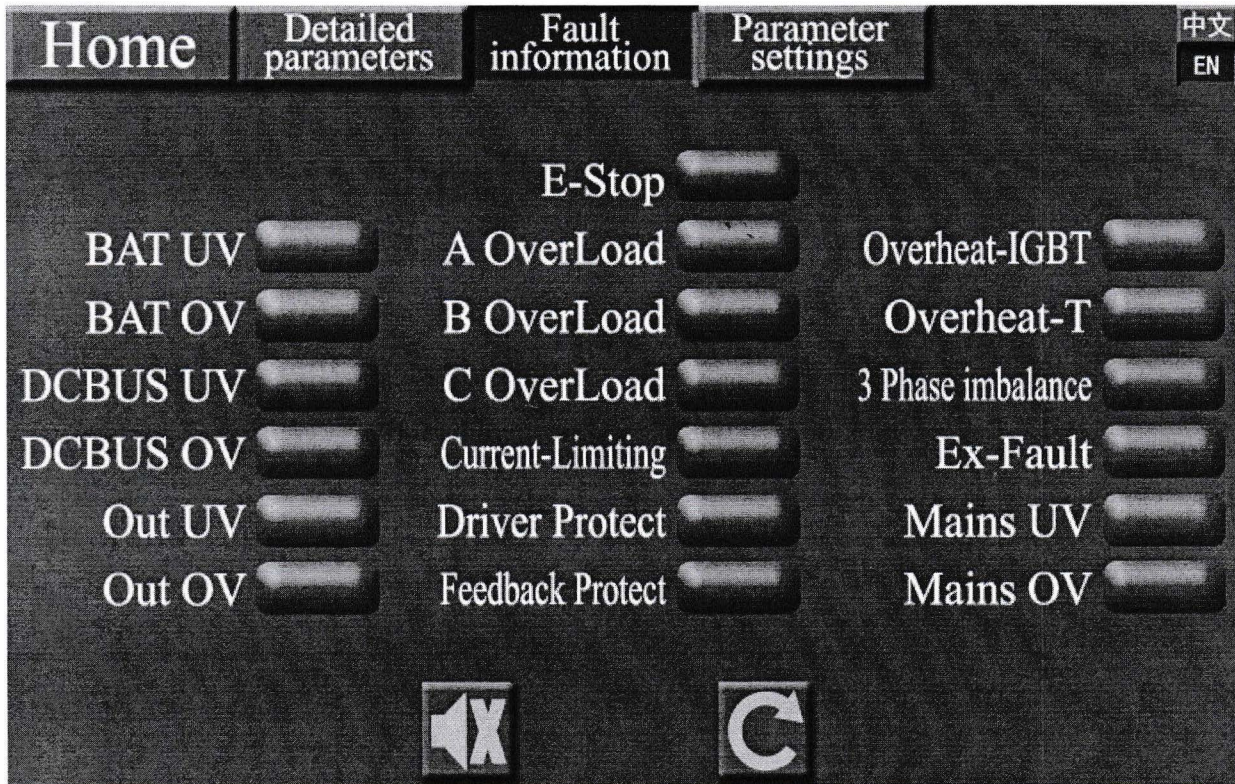
VII. The appearance of the product structure:

1. Operation main interface



Name	Explain	Function
Home		Click to enter the main interface
detailed parameters		Click to enter the parameters interface
fault information		Click on Fault Information
parameter settings		Click to enter Parameter Settings
language		Click to switch between Chinese and English
Operating status of equipment		Shows whether the device is currently running (running or stopped), running status (contravariant, bypass, no-output) power supply.
Device output data		Display device output data in real time
Start / stop		Click to start or stop the device
The temperature		Displays the current device temperature
Three inputs of data		Real-time display of three input data

2. the fault view page



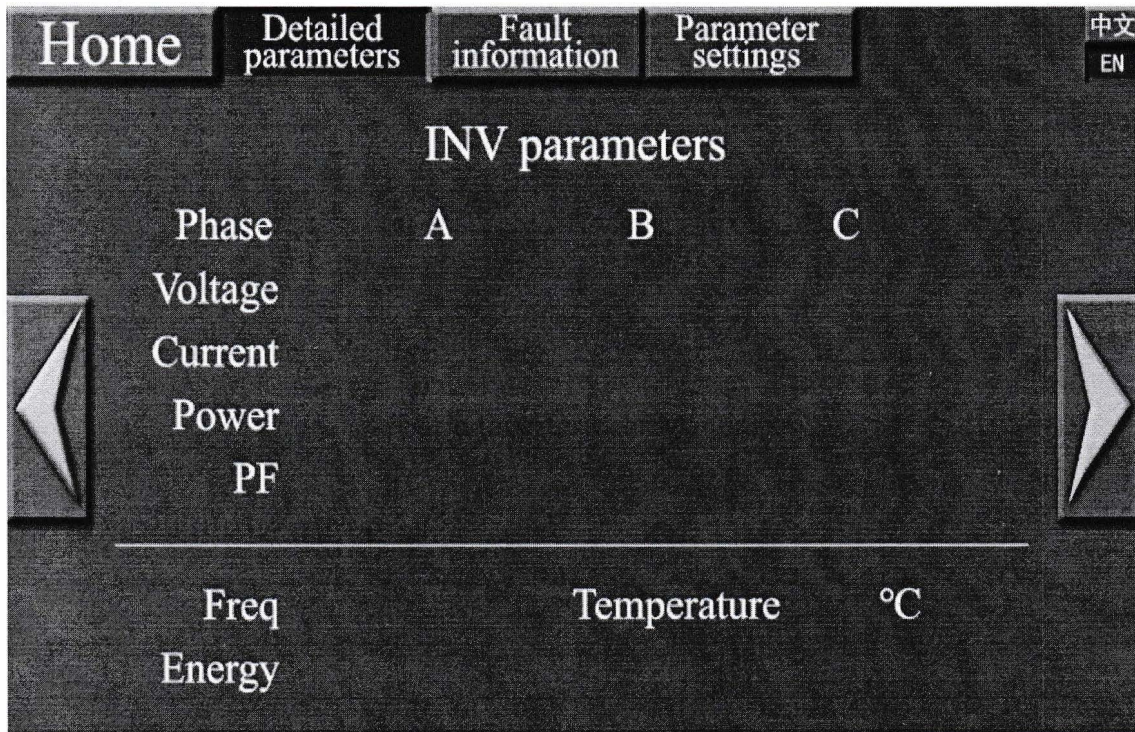
Protect the view child page: When the fault alarm stops, the green strip at the back end of the corresponding fault item will.

SILENCE: Press this button to cancel the alarm.

RESET: After troubleshooting, press this button to eliminate the fault that has occurred.

RETURN: Press this button to return to the main page.

3. Data display subpages



This page can display the following information in detail:

1. Ac input phase voltage、frequency.
2. Ac output phase voltage、frequency.
3. Real-time temperature display of power supply internal environment.

Press the RETURN key to return to the main operation interface.

Wiring according to the following chart:

DC INPUT			AC INPUT			AC OUTPUT		
+		-	L	N	⏏	L	N	⏏



Warning: The input and output can't be connected reversely.



Warning:

After correct wiring and correct DC input voltage, then turn on the air switch.

At first, Turn on DC INPUT air switch;

Secondly, Turn on AC INPUT air switch.

You can't make them in reverse!!!

Or else the electrical damage will be caused.

VIII. Main technology data.

Model		LNS125-D-20K
DC Input	Input rated voltage	125Vdc $\pm$ 15 %
AC Output	Rated capacity	20KW
	Output rated voltage and frequency	120Vac 60Hz
	Switching frequency	20KHz
	Output rating	20KVA/16KW
	Output voltage accuracy	120 Vac $\pm$ 2%
	Output frequency accuracy	60Hz $\pm$ 0.05%
	Wave	Pure sine wave (Isolation transformer)
	THD.	$\leq$ 3% (Linear load)
	Power factor (PF)	1
	Overload capacity	120%,10 minutes, 150%,3 second
	Crest factor (CF)	3:1
	Inverter efficiency	$>$ 92%
Working Environment	Protect grade	IP20
	Noise (1m)	$\leq$ 50dB
	Ambient temperature	-10℃~+40℃
	Humidity	0~90%, No condensation
	Altitude	$<$ 2000m Higher than 2000m rated power should be reduced
	Recommended battery capacity	$>$ 850Ah
Production function		Input reverse protection, input under-voltage protection, output overload protection, output short circuit protection, thermal protection

Ground Rules

- All RS485 communication loops should follow master/slave mode
- The master station will initialize and control all the information passed on the RS485 communication circuit
- Each communication must be initiated by the master station
- All communication on the RS485 communication circuit is delivered in an "information frame" manner
- If the master or sub-station receives an information frame for an unknown command, it does not respond

Type and format of communication data

- Information is transmitted asynchronously and in bytes. The communication between the master and slave stations is in 10-bit word format : 1 start bit, 8 data bit, no check bit, and 1 stop bit
- Communication data (information frame) format

Data format:	Address code	Function code	Data area	Error checking
Data length:	1 byte	1 byte	N bytes	16-bit CRC code (redundant cycle code)

Communication information transmission process

When the communication command is sent from the sending device (host) to the receiving device (slave), the slave machine that meets the corresponding address code receives the communication command, and reads the information according to the function code and related requirements. If the CRC check is correct, the corresponding task is executed, and then the execution result (data) is returned to the host. The returned information includes address code, function code, data after execution and CRC check code. If the CRC check fails, no information is returned.

- Address Code
-

The address code is the first byte (8 bits) of each communication frame, ranging from 0 to 255. This byte indicates that the slave whose address is set by the user will receive the message sent by the host. Each slave must have a unique address code, and only the slave that matches the address code can respond to the echo message. When a slave sends a callback message, the callback data all starts with the respective address code. The address code sent by the host indicates the address of the slave to be sent, while the address code returned by the slave indicates the address of the slave to be sent back. The corresponding address code indicates where the information is coming from.

- Function code

Is the second byte transmitted in each communication frame. The function codes defined by the ModBus protocol range from 1 to 127. Frequency conversion series power supply only uses part of the function code. Sent as a host request, the function code tells the slave what action to perform. As a slave response, the function code returned by the slave is the same as the function code sent from the host, and indicates that the slave has responded to the host and the related action has been performed.

MODBUS partial function code

Function code	Definition	Operation (binary)
01	Read switch output	Read one or more switch output status data
02	Read the switch quantity input	Read one or more switches status input data
03	Read register data	Read the data of one or more registers
05	Write the switch output	Control one relay "on/off" output
06	Write single-way registers	Write a set of binary data to a single register
10	Write multiplexed registers	Write multiple sets of binary data to multiple registers

- Data area

The data area includes what information needs to be sent back from the slave or what actions need to be performed. This information can be data (e.g., switching input/output, analog input/output, registers, etc.), reference addresses, etc. For example, the host tells the slave the value of the return register through the function code 03 (including the starting address of the register to be read and the length of the register to be read), then the returned data includes the data length and data content of the register. For different slave machines, the address and data information are not the same (should give the communication information table).

- Error check code (CRC check) :

The host or slave can use the check code to determine whether the received information is correct. Due to electronic noise or some other interference, information in the transmission process sometimes occur errors, error check code (CRC) can check whether the host or slave in the communication data transmission process information is wrong, wrong data can be abandoned (whether it is sent or received), which increases the security and efficiency of the system.

The CRC (Redundant cyclic code) of MODBUS communication protocol contains 2 bytes, that is, 16 bits of binary number. The CRC code is calculated by the sending device (host) and is placed at the end of the sending message frame, with the low byte before the high byte after. The receiving device (slave) then recalculates the CRC of the received information and compares whether the calculated CRC matches the received CRC. If the two do not match, it indicates an error.

Only 8 data bits are used in CRC calculation, and the start bit and stop bit are not involved in CRC calculation.

- CRC code is calculated as follows:

- 1) Preset 1 16-bit register to hexadecimal FFFF (i.e. all 1s); Call this register a CRC register;
 - 2) The first 8-bit binary data (that is, the first byte of the communication frame) is different from the lower 8-bit of the 16-bit CRC register or put the result in the CRC register;
 - 3) Move the contents of the CRC register one bit to the right (towards the low), fill the highest bit with 0, and check the moved bits after the right shift;
 - 4) If the move out bit is 0: repeat step 3 (move one bit right again); If the removed bit is 1: the CRC register XOR with polynomial A001 (1010 0000 0000 0001);
-

- 5) Repeat steps 3 and 4 until you have moved to the right 8 times so that the entire 8-bit data is all processed;
- 6) Repeat steps 2 through 5 for the next byte of the communication frame;
- 7) After calculating all the bytes of the communication information frame according to the above steps, the high and low words of the 16-bit CRC register are obtained

The section is exchanged;

- 8) The resulting CRC register content is the CRC code.

Introduction to MODBUS function code

- Function code 01: Read the output status of one or multiple modbus switches

For example, the host wants to read the output status of the address is 01, the switch quantity DO1, DO2.

Start bit address	DO register data (hexadecimal)	Reserve Note
00	02	DO2 output status "1", DO1 output status "0"

Format of the packet sent by the host:

Host sent	Number of bytes	Messages sent	Prepared Note
Slave address	1	01	Send to slave with address 01
Function code	1	01	Read the switch output status
Starting BIT	2	0000	The start BIT address is 0000
Read data length	2	0002	Read the 2-way relay output status bit
CRC code	2	BDCB	The CRC code is calculated by the host

Format of the message returned by the slave:

Slave response	Number of bytes	Information returned	Backup note
Slave address	1	01	From slave machine 01
Function CODE	1	01	Read the switch output status
Data length	1	01	1 byte (8 BIT bits)
DO status data	1	02	DO register contents
CRC code	2	D049	CRC code computed by slave machine

- Function code "02" : read 1 or multiple switch quantity status input

For example: the host to read address 01, switch quantity DI1-DI4 input status.

The address and data of the slave data register are:

Start bit address	DI register data (hexadecimal)	Reserve Note
0000	0B	DI1/DI2/DI4 in "1" status and DI3 in "0" status

Format of the packet sent by the host:

Host sent	Number of bytes	Messages sent	Prepared Note
Slave address	1	01	Send to slave with address 01
Function code	1	02	Read the switch input status
Starting BIT	2	0000	The start BIT address is 0000
Read data	2	0004	Read the 4-way switch

length			quantity input status bits
CRC code	2	79C9	Calculated by the host to get the CRC code

Format of the message returned by the slave:

Slave response	Number of bytes	Messages sent	Prepared Note
Slave address	1	01	From slave machine 01
Function CODE	1	02	Read the switch input status
Data length	1	01	1 byte (8 BIT bits)
DI status data	1	0B	DI register contents
CRC code	2	79C9	CRC code computed by slave machine

- Function code "03" : read multiple register input

For example, the host wants to read the data of 3 slave registers at address 01 and start address 0116.

The address and data of the slave data register are:

Register address	Register data (hexadecimal)	Remarks
0116	1784	
0117	1780	
0118	178A	

Format of the message sent by the host:

Host sent	Number of bytes	Messages sent	Prepared Note
Slave address	1	01	Send to slave with address 01
Function	1	03	Read registers

code			
Origin address	2	0116	Start at 0116
Data length	3	0003	Read 3 registers (total of 6 bytes)
CRC code	2	E5F3	CRC code calculated by the host

Format of the message returned by the slave:

Slave response	Number of bytes	Messages sent	Reserve injection
Slave address	1	01	From slave machine 01
Function CODE	1	03	Read registers
Read word	1	06	3 registers total 6 bytes
Register data 1	2	1784	The address is 0116 memory contents
Register Data 2	2	1780	The contents of memory at address 0117
Register data 3	2	178A	The contents of memory at address 0118
CRC code	2	5847	CRC code computed by slave machine

- Function code "05" : write 1 switch quantity output (" remote control ")

The control command is:

"FF00" is the control relay "in";

"0000" is the control relay "points";

Switch quantity output point DO1, its current state is "minutes", the host to control the relay "close".

Format of the packet sent by the host:

Host sent	Number of bytes	Messages sent	Prepared Note
Slave address	1	01	Send to slave with address 01
Function code	1	05	Write the switch output status
Output BIT	2	0000	Corresponding output relay BIT (DO1)
Control command	2	FF00	Control this relay output to the "on" status bit
CRC code	2	8C3A	The CRC code is calculated by the host

Format of the packet returned by the slave: the format and data content of the packet sent by the host are identical.

Switch output point DO2, its current status is "on", the host to control the relay "off".

Format of the packet sent by the host:

Host sent	Number of bytes	Sent information	Prepared Note
Slave address	1	01	Send to slave with address 01
Function code	1	05	Write the switch output status
Output BIT	2	0001	Corresponding output relay BIT (DO2)
Control	2	0000	Control this relay output to "ON"

command			status bit
CRC code	2	9C0A	Calculated by the host to get the CRC code

Format of the packet returned by the slave: the format and data content of the packet sent by the host are identical.

- Function code 06: write to a single-channel register

For example, the host wants to save the data 07D0 to the slave register of address 002C (slave address code is 01).

The format of the packet sent by the host:

Host sent	Number of bytes	Messages sent	Remarks
Slave address	1	01	Send to slave with address 01
Function code	1	06	Write single-way registers
Starting address	2	002C	Register address to write to
Write data	2	07D0	Corresponding new data
CRC code	2	4BAF	CRC code calculated by the host

Format of the packet returned by the slave: The format and data content of the packet sent by the host are identical.

- Function code "10" : write multiple register

For example, the host wants to save 0064,0010 to the slave register at address 002C, 002D (slave address code is 01).

The format of the packet sent by the host:

Host sent	Number of bytes	Messages sent	Remarks
Slave address	1	01	Send to slave 01
Function code	1	10	Write multiplexed registers
Starting address	2	002C	The starting address of the register to be written to
Save the data word length	2	0002	Word length to save data (total 2 words)
Save data byte length	1	04	Length of bytes to save data (total 4 bytes)
Save the data 1	2	04B0	Data address 002C
Save Data 2	2	1388	Data address 002D
CRC Code	2	FC63	CRC code calculated by the host

The format of the message returned by the slave (PDM) response:

Slave response	Number of bytes	Number of bytes	Remarks
Slave address	1	01	From slave machine 01
Function CODE	1	10	Write multiplexed registers
Starting address	2	002C	Start at 002C
Save the data word length	2	0002	Save 2 word length of data
CRC code	2	8001	CRC code calculated by slave machine

Communication error messages and data processing

If the data received from the machine has CRC check error, it will be ignored by the inverter power supply.

The sub-machine returns the error code in the following format:

Address code	1 byte
Function code	1 byte (highest bit is 1)
Error code	1 byte
CRC code	2 bytes

The child returns the error code information as follows:

01	Illegal function code The received function code is not supported by the single-phase power UPS
02	Illegal data location The specified data location is outside the address range of the module
04	CRC check error The CRC check of the packet sent by the received host is incorrect

Inverter data and address table

#	Register address	Available function code	Content	Instructions
1	0x0000	0x06	Start-stop control	0x0001= Start, 0x0005= Stop, 0x0007= reset
2	0x0001	0x06 0, 0 x03	Inverter set frequency	Integer variable, fixed point one decimal, unit (Hz)
3	0x0002	0x06 0, 0 x03	Inverter set voltage	Integer variable, fixed point one decimal, unit (V)
4	0x0003	0x06	High and low Settings	0x0000= High, 0x00FF= Low
5	0x0004	0x06	Reserved	
6	0x0005	0x06	Reserved	
7	0x0006	0x06	Reserved	
8	0x0007	0x06	Reserved	
9	0x0008	0x03	Run Status word	run_flag
10	0x0009	0x03	Fault status word	fault_flag

11	0x000A	0x03	Ambient temperature	Integer variable, fixed point without decimal place, unit (°C)
12	0x000B	0x03	Output frequency	Integer variable, fixed point one decimal, unit (Hz)
13	0x000C	0x03	Output voltage	Integer variable, fixed point one decimal, unit (V)
14	0x000D	0x03	Output current	Integer variable, fixed point one decimal, unit (A)
15	0x000E	0x03	Output power	Integer variable, fixed point one decimal, unit (KW)
16	0x000F	0x03	Output power factor	Integer variable, fixed three decimal places
17	0x0010	0x03	Photovoltaic voltage	Integer variable, fixed point one decimal, unit (V)
18	0x0011	0x03	Photovoltaic current	Integer variable, fixed point one decimal, unit (A)
19	0x0012	0x03	Pv power	Integer variable, fixed point one decimal, unit (KW)
20	0x0013	0x03	Battery voltage	Integer variable, fixed point one decimal, unit (V)
21	0x0014	0x03	Battery current	Integer variable, fixed point one decimal, unit (A)
22	0x0015	0x03	Battery power	Integer variable, fixed point one decimal, unit (KW)
23	0x0016	0x03	Bus voltage	Integer variable, fixed point one decimal, unit (V)
24	0x0017	0x03	Reserved	
25	0x0018	0x03	Reserved	
26	0x0019	0x03	Reserved	
27	0x001A	0x03	Reserved	
28	0x001B	0x03	Reserved	
29	0x001C	0x03	Reserved	
30	0x001D	0x03	Reserved	
31	0x001E	0x03	Reserved	
32	0x001F	0x03	Reserved	
33	0x0020	0x03	Inverter frequency	Integer variable, fixed point one decimal, unit (Hz)
34	0x0021	0x03	Inverter A voltage	Integer variable, fixed point one decimal, unit (V)
35	0x0022	0x03	Inverter A current	Integer variable, fixed point one decimal, unit (A)
36	0x0023	0x03	Inverter A power	Integer variable, fixed point one decimal, unit (KW)
37	0x0024	0x03	Invert A power factor	Integer variable, fixed point three decimal
38	0x0025	0x03	Inverter B voltage	Integer variable, fixed point one decimal, unit (V)

39	0x0026	0x03	Inverter B Current	Integer variable, fixed point one decimal, unit (A)
40	0x0027	0x03	Inverter B Power	Integer variable, fixed point one decimal, unit (KW)
41	0x0028	0x03	Inverter B power factor	Integer variable, fixed three decimal
42	0x0029	0x03	Inverter C voltage	Integer variable, fixed point one decimal, unit (V)
43	0x002A	0x03	Inverter C Current	Integer variable, fixed point one decimal, unit (A)
44	0x002B	0x03	Inverter C Power	Integer variable, fixed point one decimal, unit (KW)
45	0x002C	0x03	Invert C power factor	Integer variable, fixed three decimal
46	0x002D	0x03	Mains frequency	Integer variable, fixed point one decimal, unit (Hz)
47	0x002E	0x03	Mains A voltage	Integer variable, fixed point one decimal, unit (V)
48	0x002F	0x03	Mains A current	Integer variable, fixed point one decimal, unit (A)
49	0x0030	0x03	Mains A power	Integer variable, fixed point one decimal, unit (KW)
50	0x0031	0x03	Mains A power factor	Integer variable, fixed three decimal
51	0x0032	0x03	Mains B voltage	Integer variable, fixed point one decimal, unit (V)
52	0x0033	0x03	Mains B current	Integer variable, fixed point one decimal, unit (A)
53	0x0034	0x03	Mains B power	Integer variable, fixed point one decimal, unit (KW)
54	0x0035	0x03	Mains B power factor	Integer variable, fixed three decimal
55	0x0036	0x03	Mains C voltage	Integer variable, fixed point one decimal, unit (V)
56	0x0037	0x03	Mains C current	Integer variable, fixed point one decimal, unit (A)
57	0x0038	0x03	Mains C power	Integer variable, fixed point one decimal, unit (KW)
58	0x0039	0x03	Mains C power factor	Integer variable, fixed three decimal
59	0x003A	0x03	Reserved	
60	0x003B	0x03	Reserved	
61	0x003C	0x03	Reserved	
62	0x003D	0x03	Reserved	
63	0x003E	0x03	Reserved	
64	0x003F	0x03	Reserved	
65	0x0040	0x03	Pv cumulative power (high 16 bits)	Long shaping variable, fixed point two decimal places, unit (KWh)
66	0x0041	0x03	Pv cumulative power (low 16 bits)	

67	0x0042	0x03	Accumulated battery charge (high 16 bits)	Long shaping variable, fixed point two decimal places, unit (KWh)
68	0x0043	0x03	Accumulated battery charge (low 16 bits)	
69	0x0044	0x03	Total mains power (high 16 bits)	Long shaping variable, fixed point two decimal places, unit (KWh)
70	0x0045	0x03	Mains accumulated power (low 16 bits)	
71	0x0046	0x03	Inverter accumulated power (high 16 bits)	Long shaping variable, fixed point two decimal places, unit (KWh)
72	0x0047	0x03	Inverter accumulated power (low 16 bits)	
73	0x0048	0x03	Output accumulated power (high 16 bits)	Long shaping variable, fixed point two decimal places, unit (KWh)
74	0x0049	0x03	Output accumulated power (low 16 bits)	
75	0x004A	0x03	Reserved	
76	0x004B	0x03	Reserved	
77	0x004C	0x03	Reserved	
78	0x004D	0x03	Reserved	
79	0x004E	0x03	Reserved	
80	0x004F	0x03	Reserved	

Note: Single-phase power supply only needs to read the A-phase data, other data is invalid.

Two-phase power supply only needs to read phase AB data, other data is invalid.

The definition of each bit of the power supply fault sign is shown in Table 1 below: (1 indicates fault)

0 bit	Battery undervoltage	1 bit	Battery overvoltage
2 bits	Bus undervoltage protection	3-bit	Bus overvoltage protection
4-bit	Output undervoltage protection	5-bit	Output overvoltage protection
6-bit	Phase A overload protection	7-bit	Phase B overload protection
8-bit	Phase C overload protection	9-bit	Current Limiting protection
10-bit	IGBT fault	Eleven bit	Feedback Exception Protection
12-bit	IGBT overheat protection	13 bit	Transformer overheat protection
14 bit	Three phase unbalance protection	15-bit	External faults

Power status flags, each bit defined as shown in Table 2 below:

0 bit	Inverted state (0 not inverted 1 inverted)	1 bit	Output state (0 inverter no output 1 inverter output)
2-bit	Output status (0 Bypass no output 1 inverter output)	3-bit	Power status (0 PV unpowered 1 powered)

	1 Bypass output)		PV powered)
4-bit	Power status (0 battery unpowered 1 Battery powered)	5-bit	Power status (0 AC unpowered 1 AC powered)
6-bit	NC	7-bit	NC
8-bit	Undervoltage mains	9 bit	Mains overvoltage
10-bit	Battery undervoltage	11 bit	NC
12 bits	NC	13 bits	NC
14 bits	NC	15 bits	NC

Standard Modbus Communication Protocol

1. RS485

Communication Protocol: Modbus RTU

Serial Port Settings:

Baud Rate: 9600 bps

Check Bit: NONE

Data Bit: 8 bits

Stop Bit: 1 bit

2. TCP/IP

Communication Protocol: Modbus TCP/IP

The touchscreen is in Modbus Server mode

Local Port Number: 3000

Remote Port Number: 3000

Communication Checklist:

R: Read 03 Read Instruction

W: Write 06 Write Instruction

Address	Read-write Type	Register Content	Description	Remark
00				
01				
02	R	Output Power	kW, one decimal	
03	R	Battery Voltage	V, one decimal	
04	R	Battery Current	A, one decimal	
05	R	Fault Code		See Appendix for the code
06	R	Start-Stop Sign	1= Activate 0= Stop	
07	R	Constant Pressure Floating State	0= Non-constant Voltage 1= Constant Pressure Floating Charge	
08	R	Reserve		
09	R	Total Charge	kWh, one decimal	
10	R/W	Start-Stop	0x00FF= Activate 0xFF00= Stop	
11	R/W	Work Mode Setting	1= Constant Current 2= Constant Power	
12	R/W	Constant Current Value Setting	A, one decimal	Charging Current Setting
13	R/W	Constant Power Setting	kW, one decimal	Charging Power Setting
14	R/W	Constant Pressure Setting	V, one decimal	Floating Charge Voltage Setting

Serial Number	Fault Code	Fault Definition	Remark
1	01	Input Overvoltage	Check whether the actual value of the internal bus voltage is consistent with the displayed value; Check whether the internal bus overvoltage is set correctly.
2	02	Input Undervoltage	Check whether the actual value of the internal bus voltage is consistent with the displayed value; Check whether the internal bus undervoltage is set correctly.
3	03	Output Overvoltage	Check whether the actual battery voltage value is consistent with the displayed value; Check whether the battery overvoltage is set correctly.
4	04	Output Undervoltage	Check whether the actual battery voltage value is consistent with the displayed value; Check whether the battery undervoltage is set correctly.
5	05	Output Overcurrent	Check whether the charging settings are set correctly, and not too high; Check whether the overcurrent value is set correctly.
6	13	Scram	Check whether the emergency stop button is in the emergency stop position.
7	14	Superheating	Check whether site ventilation conditions are normal; Check whether cooling fan is operating normally; Check that cooling settings are correct.
8	15	Current Limiting Protection	Check that current settings are correct.
9	16	IGBT Module is faulty	Check that settings are correct; Check whether the IGBT module is damaged.
10	17	Programmed Shutdown	Check whether the host computer issued a stop instruction; Click "ON" on the touchscreen to start the device.
11	18	System Error	Check whether the motherboard is operating normally.
12	19	Hardware Error	Check whether the main control board is operating normally.
13	20	Float Error	Check whether the floating charging voltage is set correctly; Check whether battery is normal.

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-877-348-9680 FOR FURTHER ASSISTANCE.

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