Table of Contents

1 About this instruction 4

1.1 Validity 4

1.2 Target group 4

1.3 Retention of the instructions 4

1.4 Index of installation and startup 4

1.5 Regulations 5

1.6 Safety rules 5

2 Safety instructions and regulations 6

2.1 Technical rules 6

2.2 Intended use 6

2.3 Accident prevention regulations 6

2.4 Symbols on the type label 7

3 Unpacking 8

3.1 Scope of delivery 8

3.2 Check for transport damage 8

4 Installation 9

4.1 Select an appropriate place 9

4.2 Ambient conditions 9

4.3 Mounting position 11

4.4 Installation procedure 11

4.5 Electrical connection 15

4.5.1 Connection to the grid (AC output) 16

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4.5.2 Connection of the PV generator (DC input) 18
5 Startup 22
5.1 Startup procedure 22
5.2 Set key parameters 23
5.3 Automatic shutdown / startup 23
6 Communication 24
6.1 Communication through RS232 24
6.2 Communication through RS485 26
6.3 Ethernet 29
6.4 Wireless 29
6.5 USB 30
7 Safety protection 31
8 Technical data 32
8.1 DC input data 32
8.2 AC output data ..... 错误！未定义书签。
8.3 Efficiency and parameters of safety protection ..... 错误！未定义书签。
8.4 General data ..... 错误！未定义书签。
8.5 Cable Requirement ..... 错误！未定义书签。
9 Operating 37
9.1 Overview 37
9.2 LEDs 38
9.3 Display 40
9.4 Function keys 42
9.4.1 Check parameters of the generated energy 43
9.4.2 Check parameters at AC and DC side 44

ever-solar

9.4.3 Parameter setting.....46
9.4.4 Device and Error Info.....50
9.5 Display of Fault 52
10 FAQ(Frequently asked questions) 53
11 Service and maintenance.....55
12 Recycling and disposal 55
13 Contact 56

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1 About this instruction

General notes

Thank you for choosing an Ever-Solar inverter!

Ever-Solar inverter converts the direct current from your solar system into grid-compliant alternating current.

When you choose Ever-Solar inverter, you opt for reliable and powerful technology.

1.1 Validity

This instruction describes the installation , startup and operating of Eversol-TLC 10K/ 12K/15K/17K.

1.2 Target group

The inverter can only be installed by qualified electricians who will register you with the power supply company and have your photovoltaic installation approved by the supply grid operator. If you encounter any problems, read this instruction at first before calling the service.

1.3 Retention of the instructions

All documentation and accessories must be kept and available at all times.

1.4 Index of installation and startup

1. Safety instructions and regulations: see 1.1, 1.2, 2.1, 2.2, 2.3
2. All the included accessories: see 3.1
3. Inspection of transport damage: see 3.2
4. Installation preparation: see 4.1, 4.2, 4.3
5. Installing procedure: see 4.4
6. Connection to the grid: see 4.5.1
7. Connection to PV generator: see 4.5.2
8. Startup: see 5.1
9. Key parameter setting: see 5.2
10. Communication by RS485, Ethernet, Wireless: see 6.2, 6.3,6.4

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1.5 Regulations

Type	Normative reference
TLC 10K/ 12K/15K/17K	CE, EN62109, VDE0126-1-1, G59/2, G83/1，RD1663, ENEL Guide, EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN61000-3-11, EN61000-3-12

1.6 Safety rules

The safety precautions and general information as follows are used in this instruction:



DANGER!

Failure to observe a warning indicated in this instruction will result in serious injury or death.



WARNING!

Failure to observe a warning indicated in this instruction may result in serious injury or death.



CAUTION!

Failure to observe a warning indicated in this instruction may result in minor or moderate injury.



NOTICE!

Failure to observe a warning indicated in this instruction may result in property damage.



Information

Information provides tips which are valuable for the optimal installation and operation of the inverter.

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2 Safety instructions and regulations

2.1 Technical rules

Installation must be suited to the on-site conditions and comply with local regulations and technical rules.

2.2 Intended use

The inverter is designed according to the safety rules. However, improper use, move , personal maintenance or modification may cause lethal hazard for the operator, third parties , the unit or the other property. Ever-Solar is not responsible for the loss and invalidate these warranty claims.

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2.3 Accident prevention regulations

1. Only qualified electricians who have read and fully understood all safety information contained in the instructions, can install, maintenance and repair Eversol.
2. The inverter must only be operated with PV generator. Do not connect any other source of energy to it.
3. Be sure that the PV modules and inverter connect to the ground in order to protect property and personal safety.
4. Before opening the housing, the inverter must be disconnected with the grid and PV generator; while you must wait at least five minutes to let the energy storage capacitors are fully discharged.

2.4 Symbols on the type label

Icon	Explanation
	Beware of high electrical voltage and high operating current. The inverter operates at high voltage and current. All work on the inverter may only be carried out by skilled and authorized electricians.
	Beware of hot housing. The housing of the inverter may become hot. Avoid contact with it during operation.
	Do not dispose of this inverter together with household waste. For more information on disposal, please see chapter 9 “Recycling and disposal” (page 54).
	CE mark The inverter complies with the fundamental requirements of the Guideline Governing Low-Voltage and Electromagnetic Compatibility.
	Certified safety The inverter fulfills the requirements of the Equipment and Product Safety Act in Europe.
	Capacitor discharge. Do not disconnect DC input or AC output connectors until 5 minutes after disconnecting with all power sources.

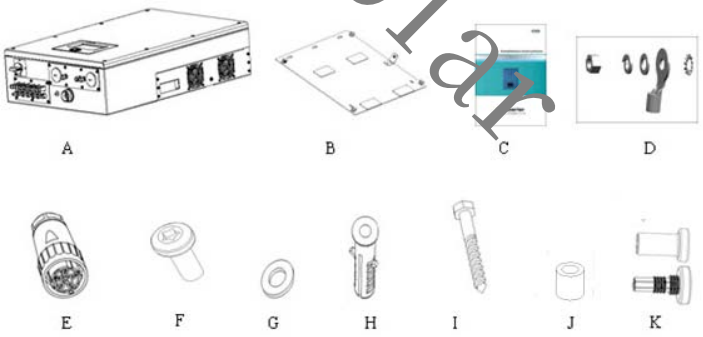
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3 Unpacking

3.1 Scope of delivery

Fittings List of Eversol-TLC 10K/12K/15K/17K		
Object	Description	Quantity
A	Eversol	1 pcs
B	Mounting rail	1 pcs
C	Installation and operation instructions	1 pcs
D	Earthing parts	1 Set
E	AC female connector	1 pcs
F	Screw M5×12	1 pcs
G	Washer φ6	6 pcs
H	Wall plug	5 pcs
I	Screw ST6×50	5 pcs
J	Sealing insert	3 pcs
K	Sealing caps	3 pairs for TLC 10K/12K
		4 pairs for TLC 15K/17K

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3.2 Check for transport damage

Thoroughly inspect the packaging upon received, if you detect any damage to the packaging which indicates the inverter may be damaged, inform the responsible transport company immediately. We will be glad to assist you if required.

4 Installation

4.1 Select an appropriate place

DANGER!
Danger to life due to fire or explosion.

Despite careful construction, electrical equipment may cause fire.

Do not mount the inverter on flammable materials.

Do not install the inverter in areas where there store highly flammable materials.

Do not install the inverter in areas where there is a risk of explosion.

Caution!

The housing may become hot during operation. Risk of burns!

Mount the inverter in areas where it cannot be touched unintentional.

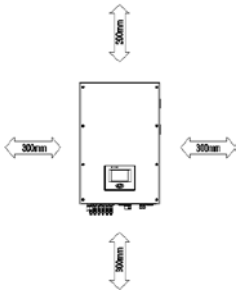
Wait approx. 30 minutes before disassembling until the housing has cooled down.

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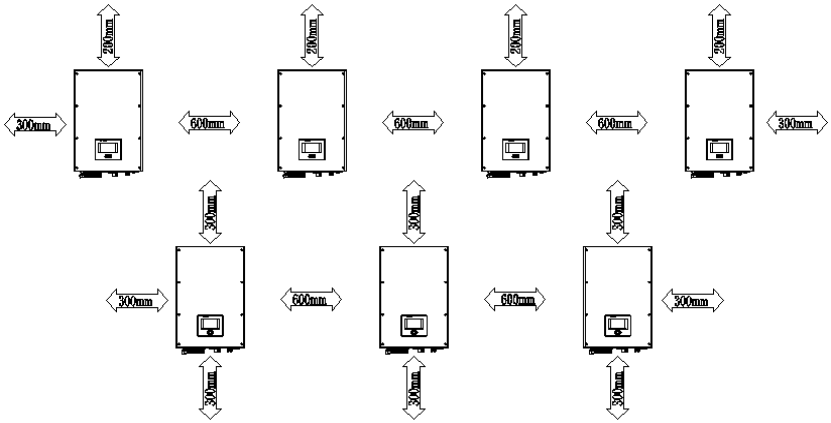
4.2 Ambient conditions

1. The area where the inverter mounted is as dry as possible.
2. Ensure good access to the inverter for installation and possible service purposes.
3. Be sure that inverter is out of the children's reach.
4. Provide better ventilation for the inverter to ensure that heat is dissipated quickly.
5. Ensure the following minimum clearance around it:

Direction	Minimum clearance（mm）
above	200
below	300
sides	300



ambient dimensions of one inverter

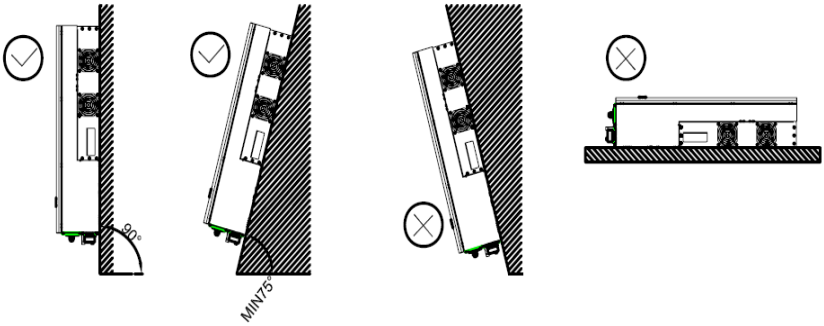


ambient dimensions of a series of inverters

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6. When installing the inverter at residential area, please fix it on the concrete wall, while it's not recommended to fix it on wooden wall. If have to, please add the heat insulation material between the inverter and the wooden wall.
7. If you have to install the inverter on the wooden wall, we don't recommend self-tapping screws and wall plugs; instead, please use the M6 bolt, nut, spring washer each 5pcs. The bolt should be 10mm longer than thickness of wooden board for nut fixing. The wooden board should be above 15mm and of log material to meet the strength requirement when hanging.
8. Do not expose the inverter to direct sunlight, in order to avoid power reduction caused by excessive heating. The ambient temperature keeps below 45℃ will guarantee the inverter working in optimal status.
9. Don't put any things on the inverter.
10. Before cleaning, disconnect the inverter separately with the grid by cutting off the AC breaker and with the PV generator by cutting off the DC breaker in order to exclude the danger of electric shock. Using a soft, dry cloth to clean it. Never use corrosive, solvent-containing or abrasive cleaners or polishes.

4.3 Mounting position

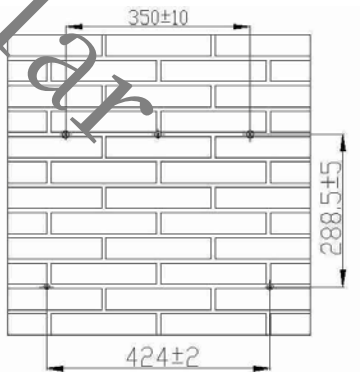


1. Mount the inverter vertically or tilted backward by max. 15°.
2. Never mount the inverter forwards.
3. Never mount the inverter horizontally.
4. Never install the inverter with a sideways tilt.
5. Mount at eye level to make it easier to operate and read the display.
6. The electrical connection area must point downwards.

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4.4 Installation procedure

a) **Drilling holes**



Take out installing template (A2 paper) from carton and paste it on the wall; drill five holes (φ10) at the selected installation position as the template indicated. Head of percussion drill should be kept vertical with wall when operating; hold firmly and do not shake to avoid damaging the wall or deviating the holes etc. The space between every two holes is shown as figure on the right. The depth of the holes must be the same and in the range of 55 ~ 60 mm. After removing dust in the five holes, measure the net depth. If one of the holes are not conformed to requirement, relocate and drill.

WARNING!

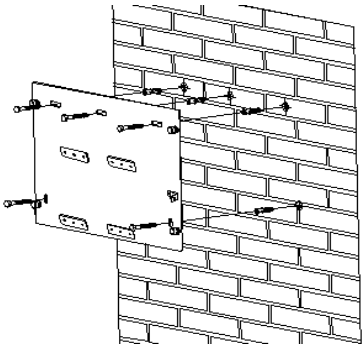
Risk of injury due to the undesirable mounting holes.

Before inserting wall plugs, measure the depth and distance of the three holes.

If the measure values don't meet the installation requirement, re-drill the holes.

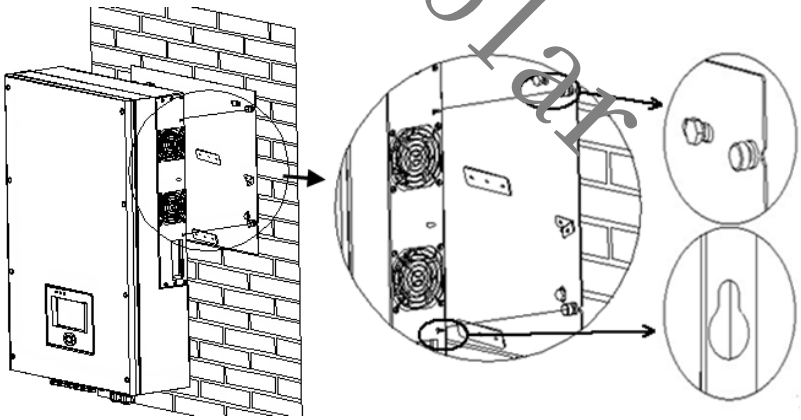
b) **Mounting bracket**

After drilling holes in the wall, place five wall plugs into the holes vertically. Put washers through the self tapping screws present with inverter, and then attach the mounting rail to the wall.



c) **Hanging the inverter**

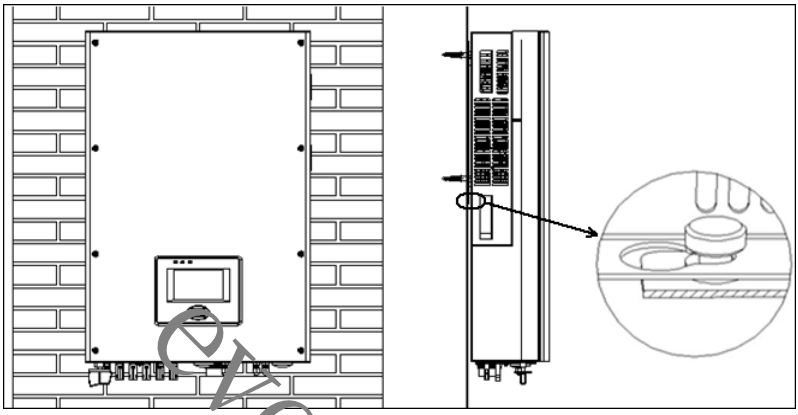
Hang the four holes of the inverter onto the four hooks of the mounting rail downwards slightly as following figure.



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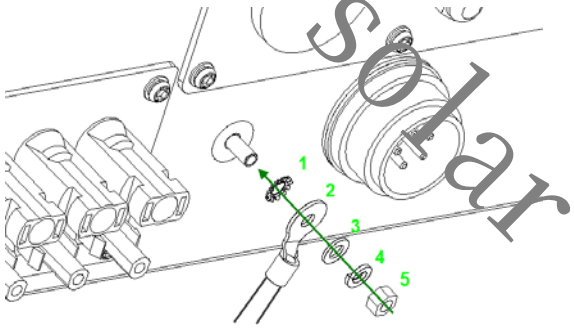
d) **Checking the positioning**

After the inverter is hung on the mounting rail, check whether the four holes of the inverter match the four hooks of the mounting rail reliably. If there is anything wrong, please disboard the inverter and relocate.



e) **Earthing**

Take out earthing parts from the package and connect the wire to the earthing terminal, then tighten them as following figure.



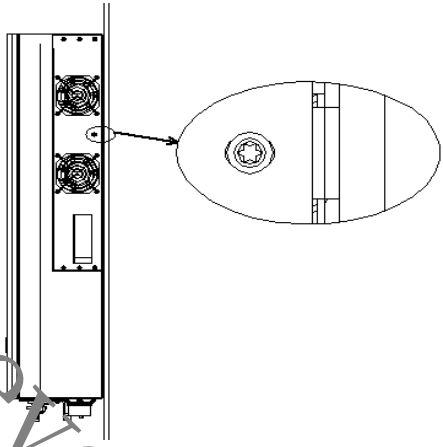
Earthing parts information：

No	Description	Quantity(pcs)
1	Serrated lock washer	1
2	Cable socket M5	1
3	Washer φ5	1
4	Lock washer M5	1
5	Nut M5	1

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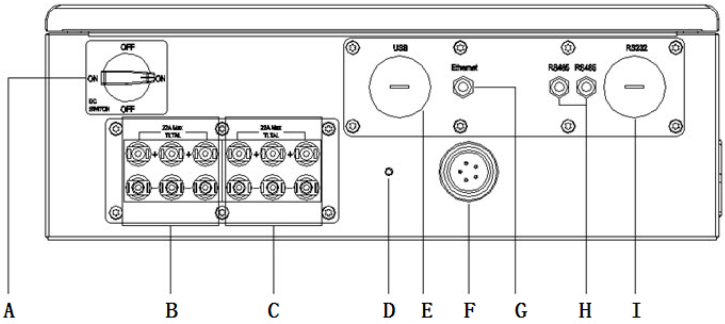
f) **Anti-theft device**

After confirming the inverter is fixed reliably, put M5 screw with φ6 washer and tighten it firmly with screw-driver Torx 25.



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4.5 Electrical connection



component	Description
A	DC-switch（optional）
B	DC input terminal of route A
C	DC Input terminal of route B
D	Earthing
E	USB interface （only for updating PCU firmware）
F	Grid connection interface
G	Ethernet interface
H	RS485 interface
I	RS232 interface （only for updating MCU firmware）

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Information:

1. After the inverter has been mounted firmly, the electrical connection can begin.
2. Make sure Max. open circuit voltage and short circuit current of the PV modules accord with input spec of the inverter.
3. Choose the appropriate cable model, see “8.5 Cable requirement”.
4. Before doing the electrical connection, both AC and DC end must be disconnected with all power sources.

4.5.1 Connection to the grid (AC output)

DANGER!

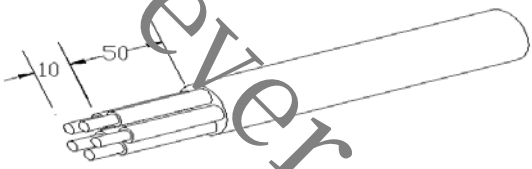
Danger to life due to high voltages in the inverter.

You must safeguard each inverter with an individual AC breaker in order that the inverter can be disconnected safely.

Connection Procedure:

1. Switch off the AC breaker secure against being switched back on inadvertently.

2. Strip the cable as the following figure：



3. AC female connector includes the following components:



terminals adapter body screw cap

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4. Put the wires through screw cap, adapter body of the AC female connector.



Keep the wire N, R,S, T, PE corresponding to 1、2、3、4、⏚ of the AC female connector correctly.

Match table of wire & hole:

1 ⟺ N	Wire N
2 ⟺ R	Wire R
3 ⟺ S	Wire S
4 ⟺ T	Wire T
⏚ ⟺ PE	Wire PE



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Caution!

Please ensure the corresponding relationship between the polarity of the wire and the hole of the terminal is correct.

5. Screw these components tightly after connecting the wires.



Finally, connect AC female connector to AC male connector on Eversol and then screw them together.



Residual current protection

Residual current detection and monitoring unit inside, it's not necessary to install a RCD or RCM outside

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4.5.2 Connection of the PV generator (DC input)

DANGER!

Danger to life due to high voltages in the inverter.

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

Do not disconnect the DC connectors under load.

NOTICE!

The inverter can be destroyed by overvoltage.

If the voltage of the PV modules exceeds the maximum input voltage of the inverter, it can be destroyed due to overvoltage. All warranty claims become void.

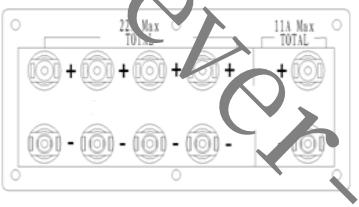
Do not connect strings with an open circuit voltage higher than the maximum input voltage of the inverter.

Check the design of the PV plant.

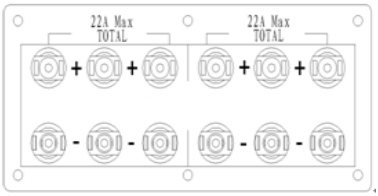
There are two MPPT trackers (A & B route) provided by the TLC 10K/12K/15K/17K, and each MPPT tracker provides multiple DC input interface. Numbers of DC input connector for each route are shown as below.

	TLC 10K/12K		TLC 15K/17K	
	Route A	Route B	Route A	Route B
Maximum input current	22A	11A	22A	22A
Numbers of DC input connecter	4	1	3	3

Before connecting PV modules to Eversol, please make sure the polarity of the DC input connectors is correct.



TLC 10K/12K

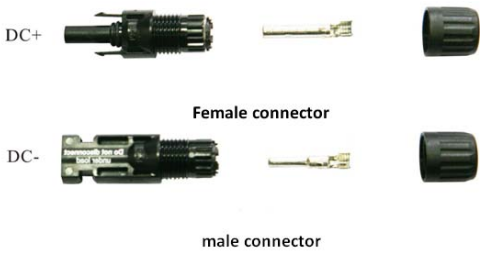


TLC 15K/17K

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Connection procedure by MC4:

Connect the PV modules and Eversol using MC4 connectors as shown below. Connect the positive and negative terminals from the PV modules to positive (+) terminals and negative (-) terminals on Eversol.



Connection Procedure:

1. Switch off the DC breaker and secure against being switched back on inadvertently.
2. Strip the cable 7 mm.



3. Insert striped cable into contact barrel and insure all conductor strands are captured in the contact barrel.
4. Crimp contact barrel by using a hex crimping die. Put the contact barrel with striped cable in the corresponding crimping notch and crimp the contact.

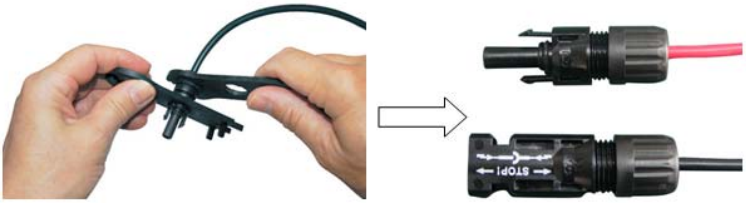


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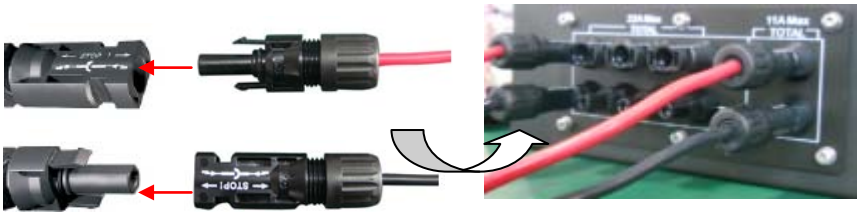
5. Insert contact cable assembly into back of the male and female connector. A "click" should be heard or felt when the contact cable assembly is seated correctly.



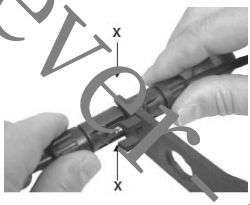
6. Wrest the cap by using the torque of 2.6~2.9N.m.



7. After wrest the cap tightly, align the 2 half connectors and mate them together by hand until a “click” is heared or felt.



8. When the separation of the DC connector is necessary, please use the specified wrench tool to separate.Please make sure the wedge side of the fingers face the male connector and push the tool down.Then separate the connector by hand. See below figure



9. If input connector is not enough, adopt “Y”connector (optional) just as below:



10. Please use sealing caps for tight sealing of unplugged PV connectors.

If using H4 connector, the operating procedure is similar as that of MC4 connector.

DANGER!

DANGER to life due to potential fire or electric shock.
NEVER connect or disconnect the DC connectors under load.

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5 Startup

After finishing mechanical and electrical installation, you can startup Eversol.

5.1 Startup procedure

Switch on the DC and AC breakers. Then, the inverter starts up automatically when DC power from the PV generator is sufficient.

There are three normal states during operation:
Waiting: When DC voltage of the PV modules is greater than 250V (Min. input voltage) but lower than 300V (initial input voltage), the inverter waits for sufficient power. At this time, the inverter doesn't work and feed power into the grid.

Checking: When DC voltage of the PV modules exceeds 300V, the inverter will check feeding conditions at once. The checking process needs 30 seconds. If there is anything wrong during checking, the inverter will turn into the "Fault" state.

Normal: After checking, the inverter will operate normally and the green LED will light up at the same time. Meanwhile, it feeds power into the grid and shows present power on the display.

As long as the inverter working, it tracks the maximum power point from the PV generator.

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5.2 Set key parameters

Set language and safety regulations

The default language of Eversol is “English”. Please set the language and safety regulations when you start Eversol for the first time and you will find how to set the parameters in the ninth chapter.

Set date and time

When you start Eversol for the first time or Eversol doesn’t work for more than one week or longer, please reset the date and time to ensure right records.

5.3 Automatic shutdown / startup

When sunlight weakens gradually, power decreases below startup power or PV voltage is less than shutdown voltage(220V), Eversol itself will stop working and won’t feed power into the grid; when sunlight strengthens gradually, power and PV voltage are up to startup value, Eversol will automatically start up with following steps “waiting, checking, normal”.

Normally, Eversol will start in the morning and shut down at evening.

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Information:

If the inverter is in “**Fault**” state, refer to the FAQ part in the tenth chapter.

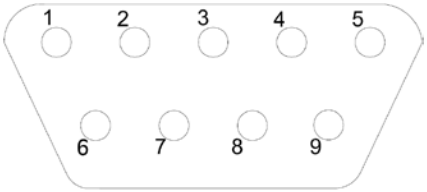
6 Communication

The inverter can be monitored with different ways, including RJ45, Ethernet and wireless.

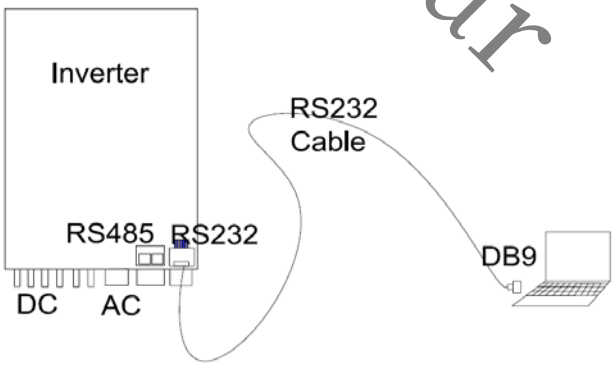
6.1 Communication through RS232

The RS232 interface of the TLC 10K/12K/15K/17K is only for maintenance engineer when updating the MCU firmware. The maximum length of RS232 cable is 10m.

Definition of the pins of RS232:

Pin1--------NC	
Pin2--------TX	
Pin3--------RX	
Pin4--------NC	
Pin5--------GND	
Pin6--------NC	Pin8--------NC
Pin7--------NC	Pin9--------NC

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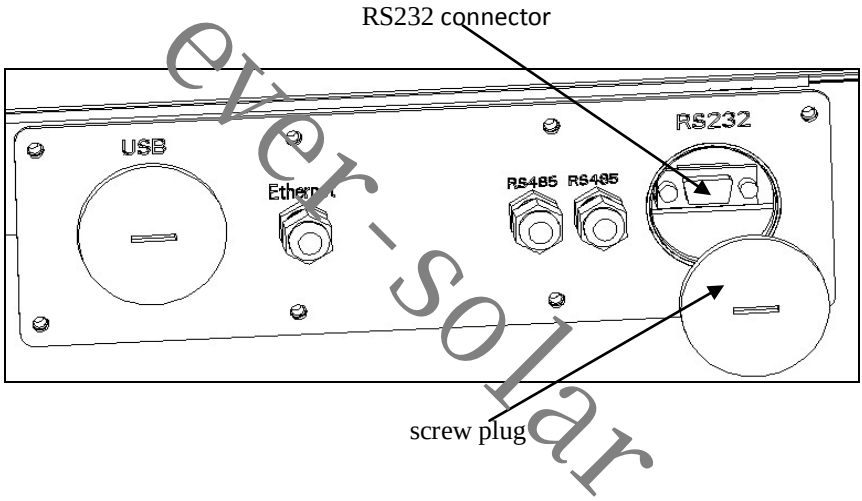


Connection graph of RS232 communication

Information：
If your computer doesn't have DB9 communication interface, you can use RS232-USB cable to realize this function.

Procedure of using RS232 communication as below:

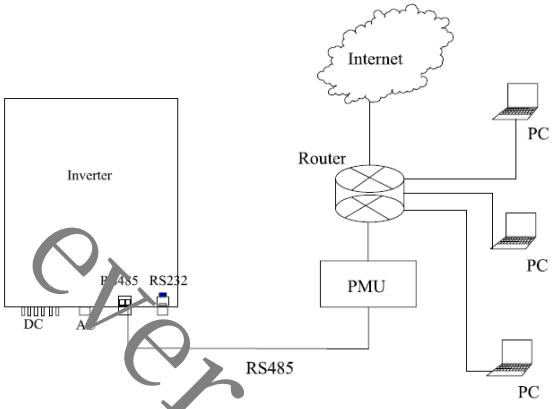
1. Screw off the screw plug as following figure and RS232 interface will show up;
2. Connect the corresponding RS232 wire to it and then start to update the MCU firmware; after finishing, take off RS232 wire and screw the screw plug;



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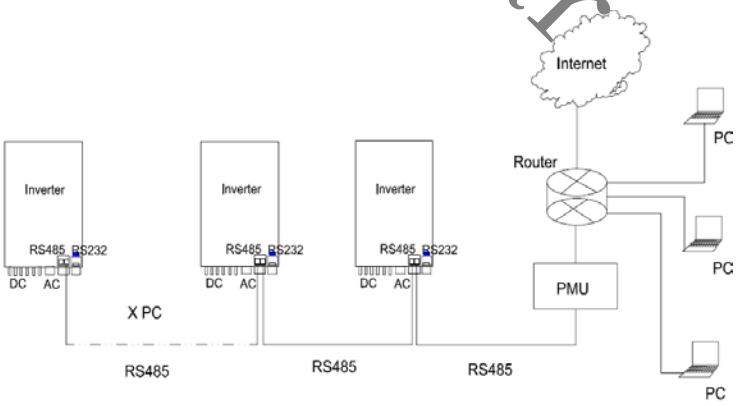
6.2 Communication through RS485

RS485 is used for multipoint communication. A PMU can communicate with and monitor 50 units inverters at the same time. But the maximum length of RS485 cable should not surpass 1000m. The connected graph of RS485 for one inverter is shown below.



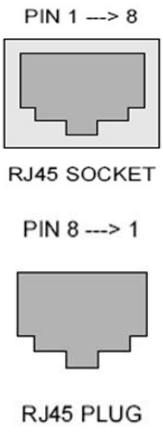
Connection graph of RS485 communication

The connected graph of the monitoring system in which the multipoint communication can be realized through RS485 interface, is shown below. The software "AS Control" in the PC can handle real-time monitoring of max 16 PMU at the same time.



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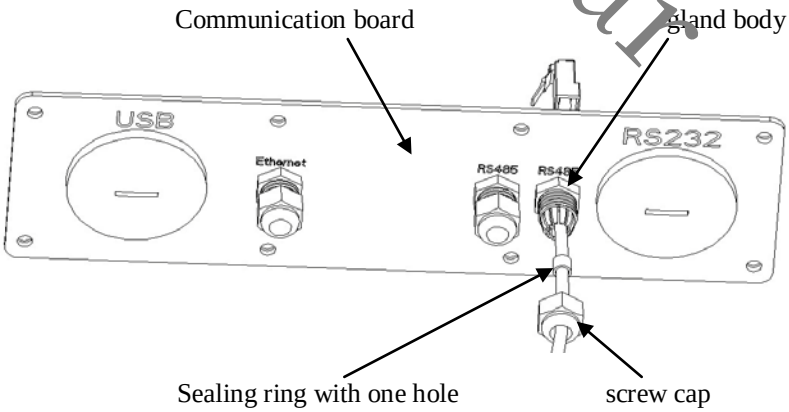
The pins definition of RS485 as below:

Pin1------- TX_RS485A	
Pin2-------TX_RS485B	
Pin3-------RX_RS485A	
Pin4-------GND	
Pin5-------GND	
Pin6-------RX_RS485B	
Pin7-------+7V	
Pin8-------+7V	

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Connection procedure of RS485 cable:

a. Take off 8pcs screws on the communication board with screw driver Torx 20;
b. Twist off the screw cap of the M12 cable gland;
c. Eject out the sealing ring without hole, and insert the sealing ring with one hole;
d. Put RS485 cable through the components as sequence: screw cap, sealing ring with one hole, gland body, communication board; compress the crystal head on the site and insert crystal head into the according interface;

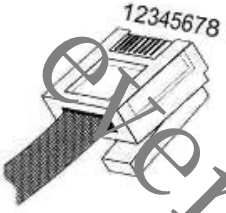


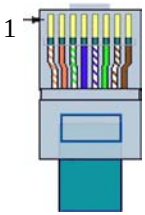
e. Cover the communication board, tighten 8pcs screws and screw the cap by hand;

Notes: there're two kinds of sealing ring, one has no hole, the other has one hole; if no communication required, there's no need to operate as above procedures; instead, just keep the original state.

Operating procedure of RS485 crystal head as shown below:

1. A RS485 cable is composed by eight wires with different color. Cut off outside envelope to reveal the eight wires. Then make the end of every wire straight, and put them in order.





2. The connection between crystal connectors and RS485 wires is one-to-one correspondence, one pin of crystal connector to one specific color wire, as shown in the following table.

The number of the pins of crystal connector	Color of the RS485 wires
1	Orange and white
2	Orange
3	Green and white
4	Blue
5	Blue and white
6	Green
7	Brown and white
8	Brown



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3. Insert the eight wires to corresponding slots of the crystal connector at the same time, and then press them together by a professional tool.





4. Connect the other end of RS485 cable to crystal connector by repeating the procedure 3 and 4.
5. Eversol can connect with a PMU by a RS485 cable. After the PMU connects with PC by Ethernet or USB, Eversol can communicate with PC.

6.3 Ethernet

The inverter has the Ethernet interface. You can use this interface to connect your inverter with Ethernet, and PC can realize real-time communication with the inverter through IP address.

6.4 Wireless

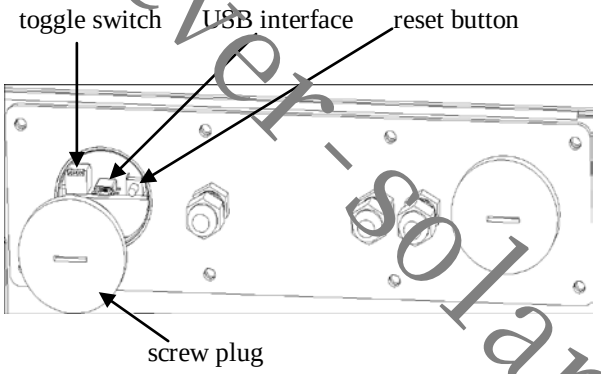
The inverter can communicate through wireless. Ever-Solar can customize the solution for customers to realize wireless communication.

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6.5 USB

USB interface is specially designed for maintenance engineer to burn and update of PCU firmware. Operation procedure is as below:

1 Twist off the screw plug;
2 Connect USB cable;
3 Dial switch downwards;
4 Press reset button;
5 Dial switch upwards;
6 Start to update the PCU firmware;
7 Pull out USB cable;
8 Re-press reset button;
9 Twist on the screw plug;



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7 Safety protection

We provide the following safety protection for you:

1) Overvoltage, low-voltage protection;
2) Overfrquency, low-frequency protection;
3) Over temperature monitoring;
4) Ground fault current interruption (GFCI);
5) Isolation fault detection;
6) Earthing fault monitoring;
7) Active anti-islanding protection;
8) DC current injection monitoring;
9) DC reverse polarity protection.

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8 Technical data

8.1 DC input data

Type	TLC 10K	TLC 12K	TLC 15K	TLC 17K
Max. PV-generator power [W]	10400	12500	15600	17600
Max. DC Voltage [V]	900	900	900	900
MPPT voltage range [V]	270-800	270-800	270-800	270-800
Turn off DC voltage [V]	220	220	220	220
Max. DC current(A/B) [A]	22/11	22/11	22/22	22/22
Numbers of DC connector(A/B)	4/1	4/1	3/3	3/3
Numbers of MPP tracker	2	2	2	2
DC-connector	MC4			
DC-switch	Optional			

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8.2 AC output data

Type	TLC 10K
Power connection	3/N/PE, 230/400Vac
Rated AC power [W]	10000
Max. AC Power [W]	10000
Grid voltage/frequency range	According to G59/2,G83/1 RD1663, ENEL Guide
Max. current [A]	16
Power factor	>0.97 at 20% load >0.99 at 100% load
Harmonic distortion (THD) at rated output	<3%
Power consumption at night [W]	<0.6
Power consumption at standby [W]	<12

Type	TLC 12K	TLC 15K	TLC 17K
Power connection	3/N/PE, 230/400Vac		
Rated AC power [W]	12000	15000	17000
Max. AC Power [W]	12000	15000	17000
Grid voltage/frequency range	According to VDE0126-1-1, G59/2, RD1663, ENEL Guide		
Max. current [A]	19.2	24	25.8
Power factor	>0.97 at 20% load >0.99 at 100% load		
Harmonic distortion (THD) at rated output	<3%		
Power consumption at night [W]	<0.6		
Power consumption at standby [W]	<12		

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8.3 Efficiency and parameters of safety protection

Type	TLC 10K/12K/15K/17K
Efficiency	
Max. efficiency	98.2%
Euro efficiency (at 360VDC)	97.5%
MPPT adaptation efficiency	99.5%
Safety equipment	
Internal DC voltage surge protection	Type 3 Integrated
DC insulation monitoring	Integrated
Earth fault protection	Integrated
Mains monitoring	According to G59/2,G83/1，VDE0126-1-1, RD1663, ENEL Guide
Earth fault current monitoring	According toVDE0126-1-1
DC current monitoring	According to G59/2,G83/1，VDE0126-1-1, RD1663, ENEL Guide
Islanding protection	AFD(According to VDE0126-1-1, RD1663, ENEL Guide, G59/2,G83/1)
EMC immunity	EN61000-6-1, EN61000-6-2
EMC emission	EN61000-6-3, EN61000-6-4
Utility interference	EN61000-3-11, EN 61000-3-12

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8.4 General data

Type	TLC 10K/12K/15K/17K
Weight	50 Kg
Dimension (L×W×D)	720×500×175mm
Installation environment	Indoor/Outdoor
Mounting information	Wall bracket
Operating temperature range	-20°C to +60°C（up 45°C derating）
Relative humidity	0% to 98%, no condensation
Site altitude	Up to 2000m without power derating
IP protection type	IP65 according to IEC60529
Environment category	4K4H
Overvoltage category	AC output：Ⅲ DC input：Ⅱ
Isolation type	Transformerless
Cooling concept	Fan cooling
Noise level	< 50 dB(A)
LED display	3
Display	800*480 Pixel TFT LCD
Data logger Data communication interfaces	RS485 / Wireless (optional)
Standard warranty	5 years

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8.5 Cable requirement

AC Cable (5-core cable)	Cable model	Max. recommended cable length (cables power loss of 1% rated output power)
TLC 10K Wire(R, S, T, N)	4 mm^2	27.4m
	6 mm^2	38.4m
TLC 12K Wire(R, S, T, N)	4 mm^2	22.8m
	6 mm^2	32m
TLC 15K Wire(R, S, T, N)	4 mm^2	18.3m
	6 mm^2	25.6m
TLC 17K Wire(R, S, T, N)	4 mm^2	17.9m
	6 mm^2	25.1m
PE	at least as phase cables	

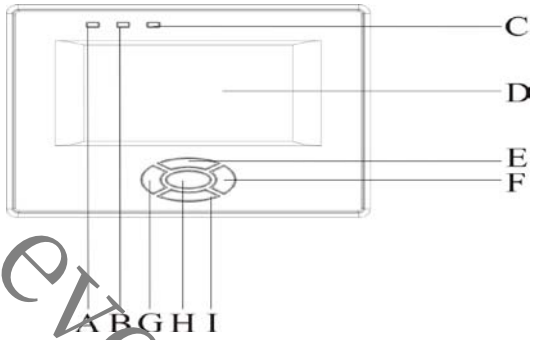
Avoiding too much power loss due to inappropriate cable model of DC input, please Choose AWG12 (4mm^2, 4.75Ω/km) or AWG10 (6mm^2, 3.39Ω/km). MC4 connector is compatible with 4mm^2/6mm^2 wires.

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9 Operating

Info provided here mainly includes LEDs, display ,function keys and display fault etc.

9.1 Overview



Object	Description
A	Working normally (Green LED)
B	Fault (Red LED)
C	Communication (Yellow LED)
D	LCD display
E	Up (Function key)
F	Right (Function key)
G	Left (Function key)
H	ENTER (Function key)
I	Down (Function key)

All function including parameter review, setting, and malfunction info etc can be realized at this interface.

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9.2 LEDs

The inverter is equipped with three LEDs including “green”, “yellow” and “red” which provide information about various operating status.

Green LED:

The green LED lighting indicates that the inverter is active and working normally. Normally, this LED begins to light up in the morning when the sunshine intensity is enough and goes out when it gets dark.

Yellow LED:

The yellow LED blinks during the inverter communicating with other devices including PMU and PC etc through RJ45 and goes out after the communication finishes. The yellow LED keeps on lighting during updating the firmware.

Red LED:

The red LED lighting indicates the inverter has stopped feeding power into the grid because of fault, and the corresponding faulty information will be shown on the display at the same time. The faults in the following table will activate the red LED.

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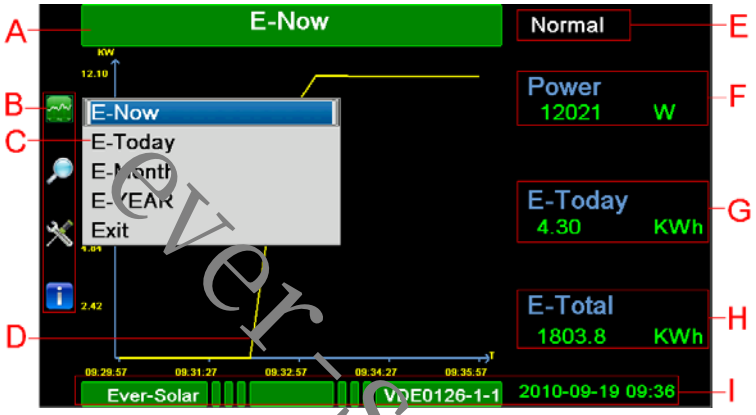
LED	Display messages	Detailed message
Red	GFCI Failure	The GFCI detection circuit is abnormal.
	AC HCT Failure	The AC output sensor is abnormal.
	Consistent Fault： DC inj. differs for M-S	Different measurements between Master and Slave for DC output current
	Consistent Fault： Ground I differs for M-S	Different measurements between Master and Slave for GFCI
	High DC Bus	DC Bus voltage is too High
	Utility Loss	No grid voltage detected
	Ground I Fault	Residual current too high

Red	Over Temperature in Inverter	The temperature inside exceeds the spec of the inverter.
	PV Over Voltage	The voltage of the PV modules exceeds the Max. input voltage of the inverter.
	Fan Lock	Fan malfunction
	AC Voltage Out of Range	The voltage of the grid is out of range.
	Isolation Fault	The resistance of PV generator to earth is too low.
	DC Injection High	The DC injection to the grid is too high
	Consistent Fault： Fac differs for M-S	Different measurements between Master and Slave for grid frequency
	Consistent Fault： Vac differs for M-S	Different measurements between Master and Slave for grid voltage
	AC Relay-Check Fail	AC relay malfunction
	M-S Version Unmatched	Different CPU firmware version
	Fac Failure Fac Out of Range	The frequency of the grid is out of range.
	EEPROM R/W Fail	EEPROM reading or writing error
	SPI Failure： Communication Fails between M-S	Communication between microcontrollers fails

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9.3 Display

The parameters showed on the display can be set through function key. There are four menu icons on the left of the display, showing parameters of power, input & output parameters, parameter setting, device and malfunction info. The middle area is for showing parameter info or oscillogram etc under each menu. On the right, it always shows working state, current output power, E-today, and E-total from top down. At the bottom of the display, brand, certificate, date and time will be shown.



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Object	Description
A	The current menu
B	Main menu: generated power parameters, input & output parameters, parameter setting, device & malfunction info
C	Pull-down menu under main menu
D	Display area of specific parameters, curve
E	Working state of the inverter
F	Current output power
G	The energy generated today (kWh)
H	The energy generated since the inverter started (kWh)
I	Display field of the brand, certificate, date & time

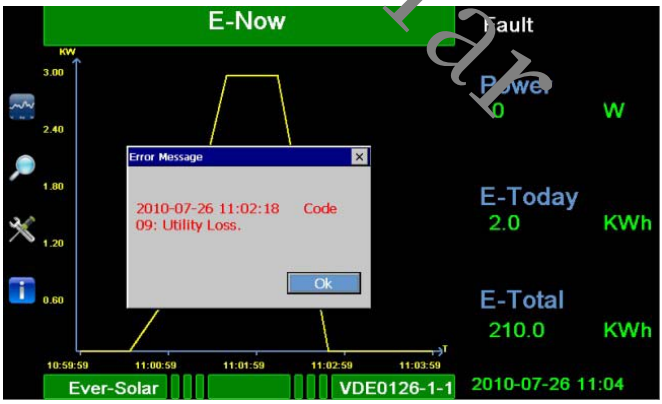
Content of menu

Menu icons	Function	Content
	Generated power parameters	E-Now
		E-Today
		E-Month
		E-Year
		Exit
	Input & output parameters	AC Parameter
		DC Parameter
		Exit
	Parameter setting	Language and Time
		Safety Parameters
		Clear Data
		Exit
	Device & malfunction info	Device Info
		Error Info
		Exit

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Fault display:

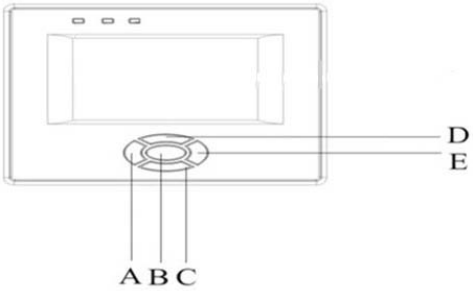
When fault happens, the specific faulty information will show in a floating window on the display. At the same time, the red LED lights up and the green LED goes out. The following figure indicates that the fault “Utility Loss” happened.



After you click “OK”, the floating window disappears. If you enter into , faulty information of the latest 20 pieces can be reviewed.

9.4 Function keys

There are five function keys, by which users can choose menus on the display and realize parameter reviewing & setting etc.



“Left” Key (A):

You can move the cursor to the left or to the last parameter by pressing the “Left” key.

“ENTER” key (B):

The key is for confirming the menu or the parameters you selected.

“Down” Key (C):

You can move the cursor downwards or to the next parameter or to do numberical subtraction by pressing the “Down” key.

“Up” key (D):

You can move the cursor upwards or to the last parameter or to do numberical increase by pressing the “Up” key.

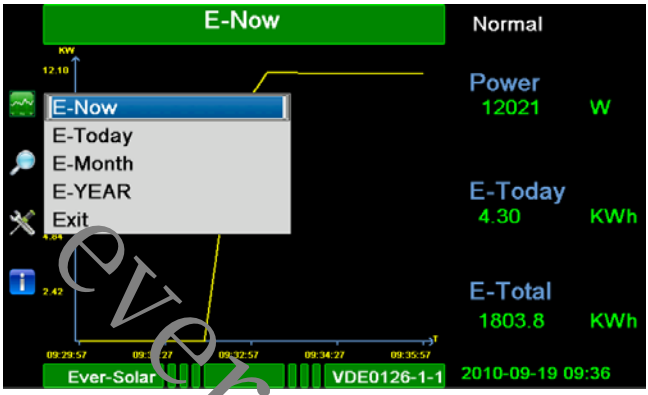
“Right” key (E):

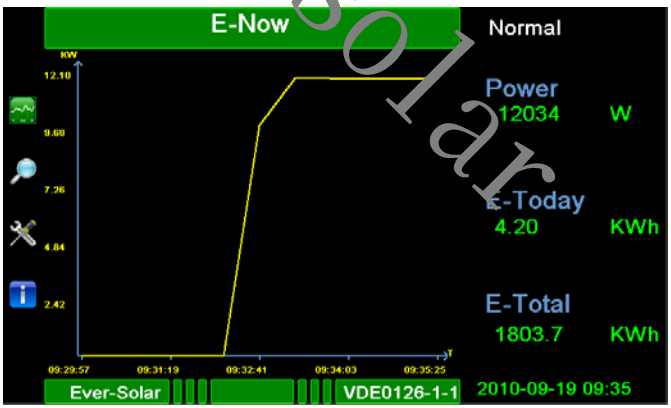
You can move the cursor to the right or to the next parameter by pressing the “Right” key.

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9.4.1 Check parameters of the generated energy

Move the cursor to  by pressing the “up” or “down” key; press the “ENTER” key, and then you will find a pull-down menu. Please move the cursor to “E-Now” by pressing the “up” or “down” key, then press “ENTER”, the relevant information will be shown. (E-Now is default state)



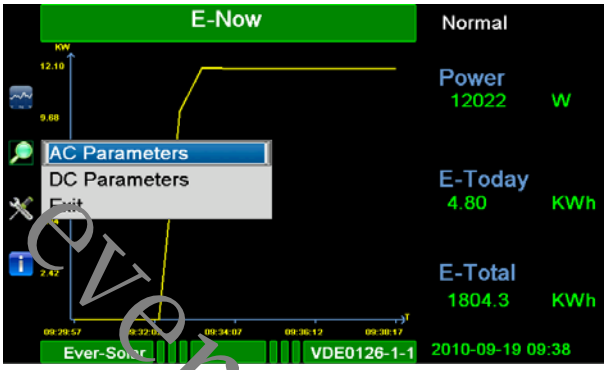


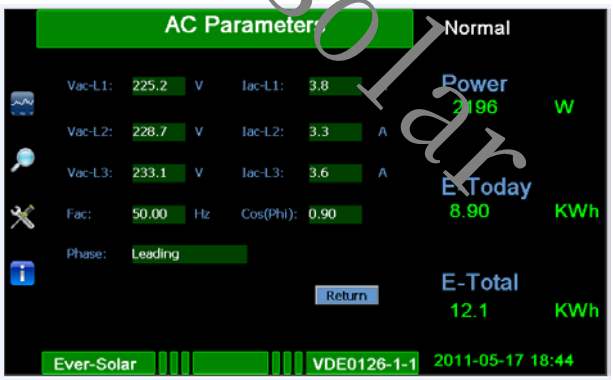
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Using the same operating procedures, you can check “E-today”, “E-Month”, “E-Year” and so on. You can also choose “Exit” in the pull-down menu, and you will exit this interface.

9.4.2 Check parameters at AC and DC side

Move the cursor to by pressing the “up” or “down” key; press the “ENTER” key, and then you will find a pull-down menu. Please move the cursor to “AC Parameters” by pressing the “up” or “down” key, and then press “ENTER”, the related information at AC side will be shown. If you press “ENTER” once more, you can exit this interface.





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Both “phase” and “Cos(phi)” indicate the corresponding value if “BDEW” was selected as the installation location.

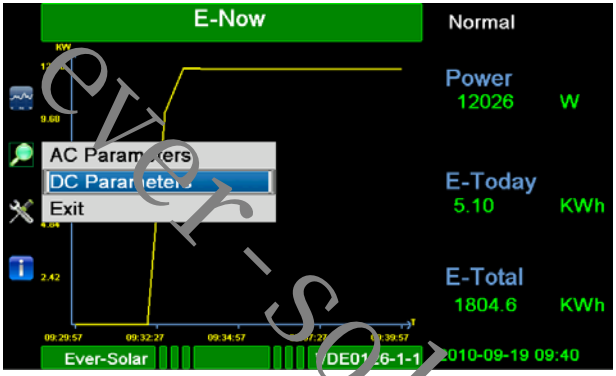
“Cos(phi)” indicates power factor, “phase” indicates the phase difference between voltage and current.

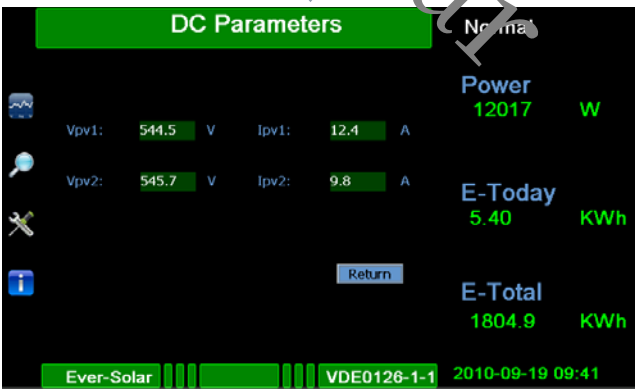
While failing to meet BDEW regulation, “Cos(phi)” shows 1.00, and “phase” value is unavailable

TLC 10K/12K/15K/17K comply with regulations of BDEW and EEG.

Its function of adjustable power can be realized together with PMU Pro of Ever-Solar.

Move the cursor to  by pressing the “up” or “down” key, press the “ENTER” key, and then you will find a pull-down menu. Please move the cursor to “DC Parameters” by pressing the “up” or “down” key, and then press “ENTER”, the relevant information at DC side will be shown, including input voltage & current of route A and B. If you press “ENTER” once more, you can exit this interface.



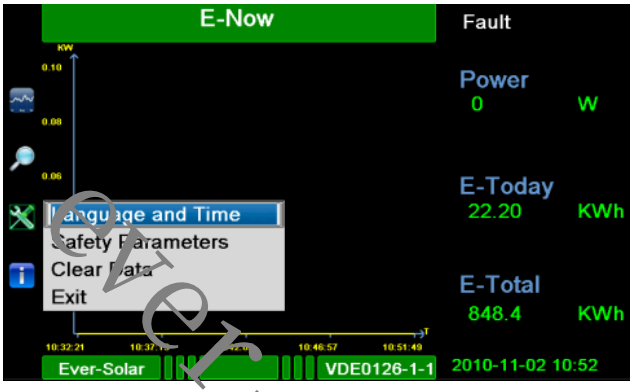


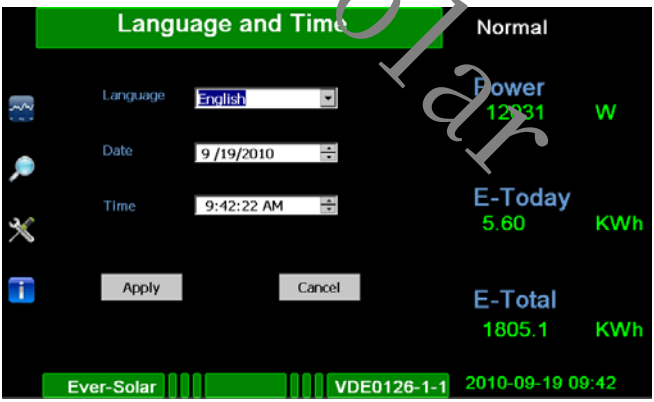
If you want to exit “input & output parameter” menu, please choose “Exit” in pull-down menu.

9.4.3 Parameter setting

9.4.3.1 Language and Time

Move the cursor to by pressing the “up” or “down” key; press the “ENTER” key, and then you will find a pull-down menu. Please move the cursor to “Language and Time” by pressing the “up” or “down” key, and then press “ENTER”, you can set the language, date and time.





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Language setting

When the cursor is at the “Language” column, you can choose “Chinese”, “English” or “German” etc. Then press “ENTER”, you come to set the next parameter ---- “Date”.

Date setting

When the cursor is at the “Date”, at first you can set the “Year” by pressing the “up” and “down” keys. After finishing setting “Year”, please press the “right” key and set “Month” and “Date”. Then, press “ENTER”, you come to set the next parameter ---- “Time”.

Time setting

When the cursor is at the “Time”, at first you can set “Hour” by pressing the “up” and “down” keys. After finishing setting “Hour”, please press the “right” key to “Minute” and “second”. Finally, please press “ENTER” and the window “Apply” will appear.

Information:

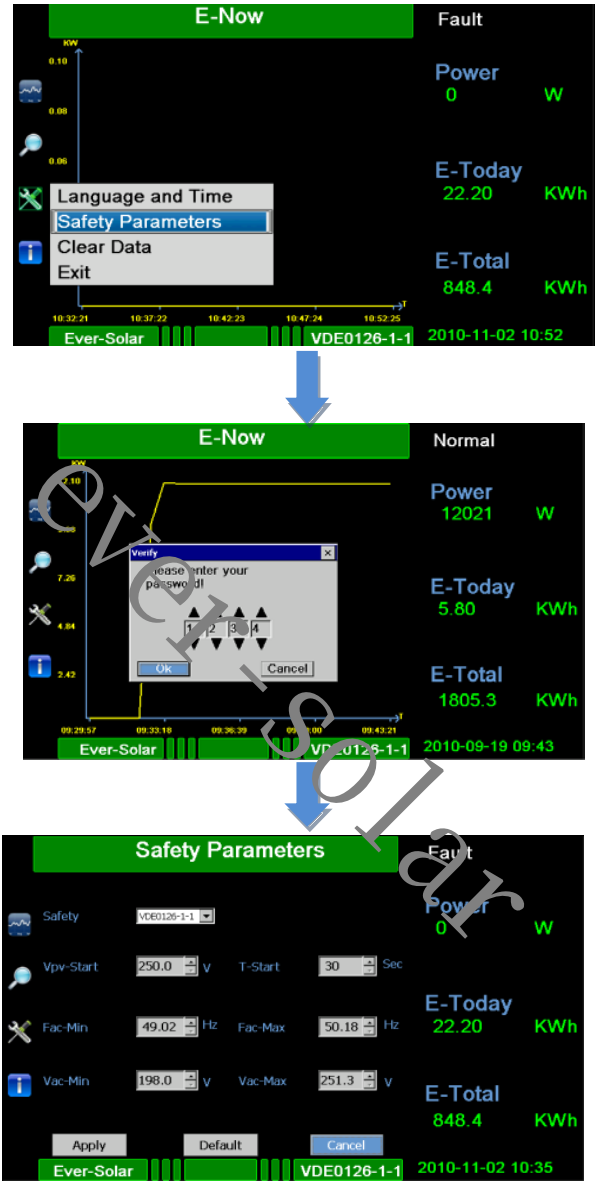
After setting the “Language”, “Date” and “Time”, the window “Apply” will appear and you can choose the “Apply” or “Cancel” by pressing the “left” and “right” keys. If you choose “Apply”, the parameters just selected will be saved; if you choose “Cancel”, the parameters will not be changed and remain the original status.

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9.4.3.2 Safety Parameters Setting

Move the cursor to  by pressing the “up” or “down” key; when pressing the “ENTER” key, you will find a pull-down menu. Please move the cursor to “Safety Parameters” menu by pressing the “up” or down” key, and then press “ENTER”, you will come to the interface for “Device Parameter setting”. At this interface, you can choose the last or the next parameter, and do numberical subtraction or increase. These parameters contain “Safety Type”, “Vpv-start”, “T-start”, “Fac-Min”, “Fac-Max”, “Vac-Min”, “Vac-Max” and so on. Among the parameters, Safety Type contain “VDE0126-1-1”, “CQC”, “RD1663”, “ENEL Guide”, “BDEW”, “G59/2”, “G83/1” etc. You can choose any one by pressing the “up” or “down” key, taking “VDE126-1-1” for example。

Notes: This operation requires password (default value: 1234).



After that, you can choose “Apply”, “Default” or “Cancel” to confirm parameter change, restore original data or cancel the setting. Press “ENTER” and exit this interface to enter main menu.

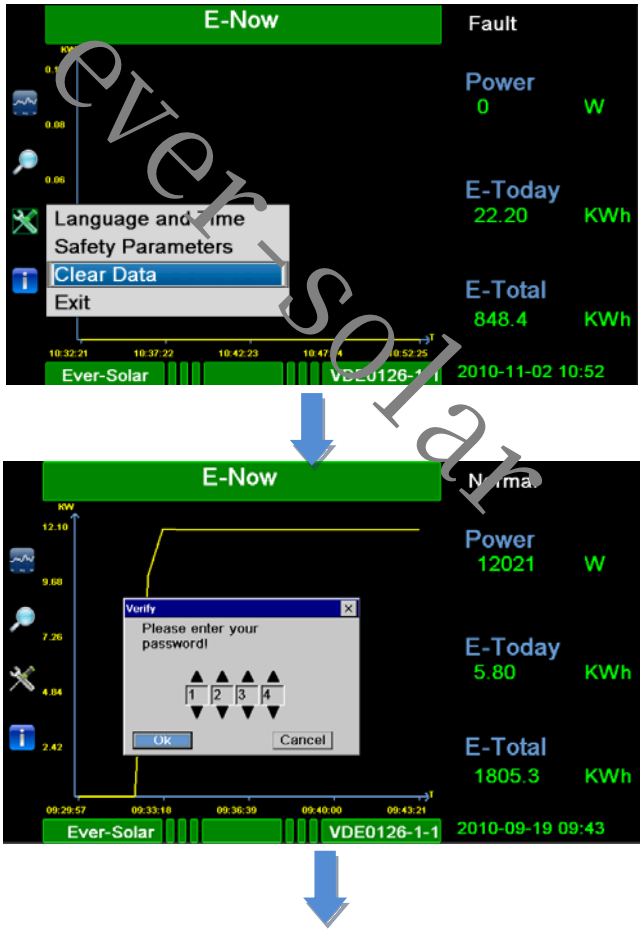
9.4.3.3 Clear Data menu

Move the cursor to  by pressing the “up” or “down” key; after pressing the “ENTER” key, you will find a pull-down menu. Choose “Clear Data” and press “ENTER” to get into data clearing state. In this menu, pressing “ENTER” to clear all the data in the memory, and if choosing “Cancel”, exit this interface.

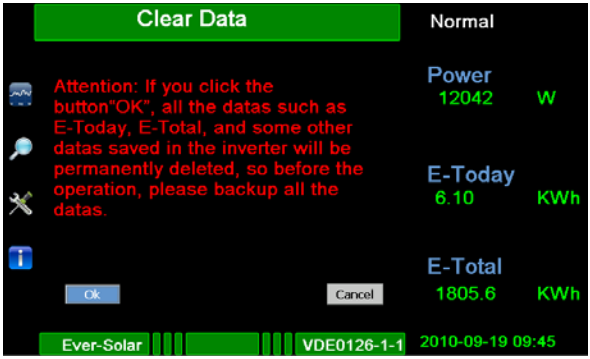
Notes:

①This operation requires password (default value: 1234).

②If this operation is done, all the data in the memory will be cleared, so backup of all the data before clear is recommended.



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9.4.3.4 Exit key

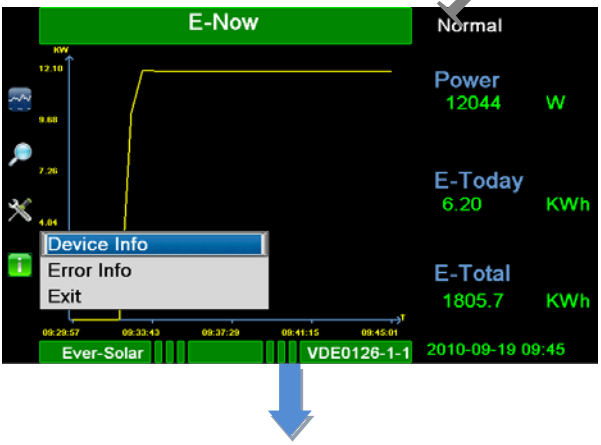
If you are at the pull-down menu of “parameter setting” and don’t want to do any settings, please choose “Exit” and press “ENTER” to enter main menu.

9.4.4 Device and Error Info

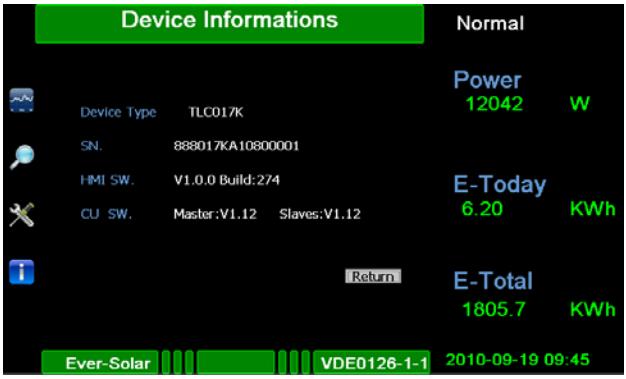
Move the cursor to by pressing the “up” or “down” key, press the “ENTER” key and you will find a pull-down menu. Please move the cursor to the parameters which you want to check by pressing the “up” or down” key, and then press “ENTER”, you will find all information of the selected parameter.

Device Info

Move the cursor to “Device Info” by pressing the “up” or “down” key, and then press the “ENTER” key, you will find the information of “Device Type”, “SN”, “HMI/SW”, “CU/SW” etc. Press the “ENTER” key once more and exit this interface.



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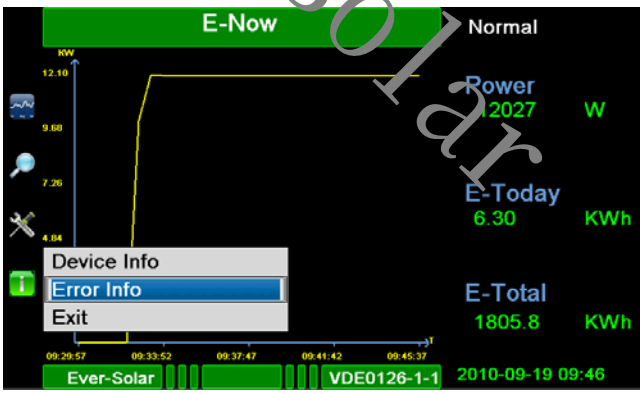


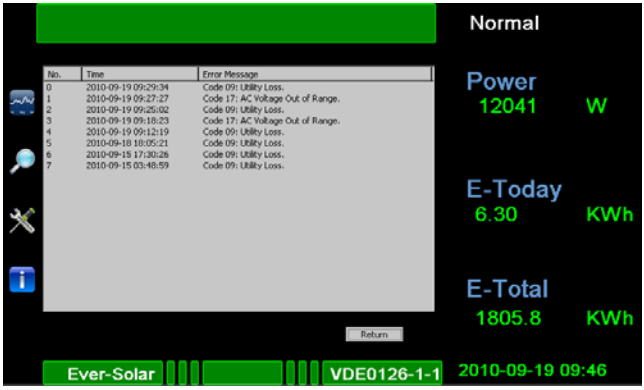
Error Info

Move the cursor to “Error Info” by pressing the “up” or “down” key, then press the “ENTER” key, you will find the Error information column, including the time when fault happened and fault info. Press the “ENTER” key once more and exit this interface.

“Error Info” contains Error information of the latest 20 times; if you need more information, please derive from PMU.

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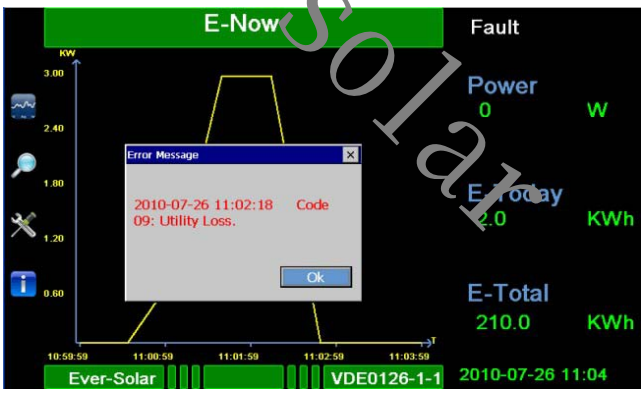




9.5 Display of Fault

When the inverter cannot work normally and the fault has not been solved, the specific fault information will show in a floating window on the display, showing when the fault happened and the error information. At the same time, the red LED lights up and the green LED goes out. The following figure indicates that the fault "Utility Loss" happened.

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Under "Fault"state, when you click "ENTER", the floating window disappears; while the red LED will keep on lighting until the trouble has been solved. Now if you want to review the fault info, you can find "Error Info" under  menu.

10 FAQ(Frequently asked questions)

When the PV plant doesn't work normally, we recommend the following solutions for quick troubleshooting. If there is a fault, the red LED will light up.
Following info can help the technician to understand the problem and take action.

	Display messages	Possible actions
Resumable Fault	Isolation Fault	1. Check the resistance of the PV generator's PV (+) terminals & PV (-) terminals with the ground, both of them must be greater than 2MΩ. 2. Check whether the ground wire of AC output cable has been grounded reliably.
	Ground I Fault	The residual current is too high. 1. After cutting off the AC end connection, and unplug the inputs from the PV generator, then check the connection of AC side. 2. After the cause is cleared, replug the PV inputs and AC connector, and check the inverter state.
	Grid Fault Fac Over Range Vac Over Range	1. Wait for 5 minutes, if the grid returns to normal, Eversol restarts automatically. 2. Make sure grid voltage and frequency meet the local specifications.
	Utility Loss	1. Grid is not connected. 2. Check grid connection cables. 3. Check grid usability. 4. If the grid is ok and the problem persists, maybe the fuse in the inverter is open, please call the service.
	Over Temperature	The temperature inside exceeds the spec of the inverter. 1. Find a way to reduce the ambient temperature. 2. Move the inverter to the cooler environment.

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	PV over Voltage	1. Check the open circuit voltage of the PV modules, see if it is greater than or too close to the Max input voltage of the inverter. 2. If the open circuit voltage of the PV modules is less than the Max input voltage of the inverter, and the problem still occurs, please call the service.
Permanent Fault	Consistent Fault	Firstly, disconnect the PV modules with the inverter; secondly, reconnect them after a while. If the problems remain, please call the service.
	Relay-Check Fail	
	DC INJ High	
	EEPROM R/W Fail	
	SCI Failure	
	AC HCT Fault	
	GFCI Failure	

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The safety information in this instruction must be fully observed in doing so.

During periods of little or no sunlight, the inverter may continuously startup and Shut down. This is due to insufficient power generated by the PV generator. If the problem remains, please call the service.

Except the frequent problems as above, if you still have any problems which cannot be solved, please call the service.

11 Service and maintenance

Ever-Solar grants a warranty of 60 months as standard, starting from the date of the purchase invoice date marked. Ever-Solar will only perform warranty services when the faulty unit is returned back together with a copy of the invoice and warranty card which were issued by the dealer to the user. And the unit should be returned in its original or equivalent packaging, please preserve the original packaging. The cost for new packaging and shipment is paid by the customer. In addition, the S/N label on the unit must be fully legible. If these requirements are not fulfilled, Ever-Solar reserves the right to deny warranty services.

Warranty claims are excluded for direct or indirect damages due to:

1. Beyond warranty date, without warranty card or serial number;
2. Improper use, operation and refitting;
3. Transport damage;
4. Non-observance to the relevant safety instruction and work in the severe environment out of the recommended ones in this instruction;
5. Beyond installation and use areas of the relevant international standards;
6. Influence of abnormal environment disaster and force majeure (earthquake, fire, flood etc).

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12 Recycling and disposal

Both the inverter and its transport packaging are predominantly made of recyclable raw materials.

Do not dispose of the defective inverter and its accessories with household waste.

Ensure the defective inverter, its accessories and transport packaging are disposed of appropriately.

13 Contact

If you have any technical problems about our product, you can contact us via:

WEB: www. ever-solar.com

ADD: Building 9 No. 198 Xiangyang Road, CN-215011 Suzhou, China

Tel.: +86 512 6937 0998

Fax: +86 512 6937 0630

Email: service@ever-solar.com

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