User Manual

-Installation
-Operation

Z10I1K
Z10I1K5
Z10I2K
Z10I2K5
Z10I3K

Zeus Appollo Solar

Catalogue

1. Notes on this manual

1.1 Scope of Validation

The main purpose of this User Manual is to provide instructions and detailed procedures for installing, operating, maintaining, and troubleshooting the following five types of Z10 series inverters:

- Z10I1K
- Z10I1K5
- Z10I2K
- Z10I2K5
- Z10I3K

Please keep this user manual available at all times in case of emergency.

1.2 Symbols Used

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, can result in death or serious injury or moderate injury.

CAUTION

CAUTION indicates a hazardous condition which, if not avoided, can result in minor or moderate injury.

NOTICE

NOTICE indicates a situation that can result in property damage, if not avoided.

1.3 Target Group

- Chapter 1, 2, 3, 4, 7, 8, 9, 10 and chapter 11 are provided for anyone who is intending to use a Z10 Series Grid-tied Solar Inverter. Before any further action is taken, the operators must first read all safety regulations and be aware of the potential danger when operating high-voltage devices. Operators must also have a complete understanding of this device's features and functions.

WARNING

Do not use this product unless it has been successfully installed by qualified personnel in accordance with the instructions in Chapter 5. "Installation"

- Chapter 5 and chapter 6 are only for qualified personnel who are intending to install or uninstall the Z10 Series Grid-tied Solar Inverter.

NOTICE

Qualified personnel means he/she has a valid license from the local authority in:

- Installing electrical equipment and PV power systems (up to 1000 V).
- Applying all relevant installation codes.
- Analyzing and reducing the hazards involved in performing electrical work.
- Selecting and using Personal Protective Equipment (PPE).

2. Preparation

2.1 Safety Instructions

DANGER

DANGER due to electrical shock and high voltage

DO NOT touch the operating component of the inverter, it might result in burning or death.

TO prevent risk of electric shock during installation and maintenance, please make sure that all AC and DC terminals are unplugged.

DO NOT remain close to the equipment while there are severe weather conditions including storms, lightning etc.

WARNING

The installation, recycling and disposal of the inverters must be performed by qualified personnel who must comply with national and local standards and regulations. Please contact your dealer to obtain–details about an authorized repair facility if the inverter requires maintenance or repair. Any unauthorized activities including the modification of product functionality of any kind will affect the extent of the warranty; such actions may result in Zeus Appollo Solar not accepting any responsibility or that warranty.

NOTICE

Public utility only

The PV inverter is designed to feed AC power directly into the public utility power grid; do not connect the AC output of the device to any private AC equipment.

CAUTION

The PV inverter will become hot during operation; please don't touch the heat sink or adjacent surface during or shortly after operation.

Risk of damage due to modifications. Never modify or manipulate the inverter or other components of the system.

2.2 Explanations of Symbols on Inverter

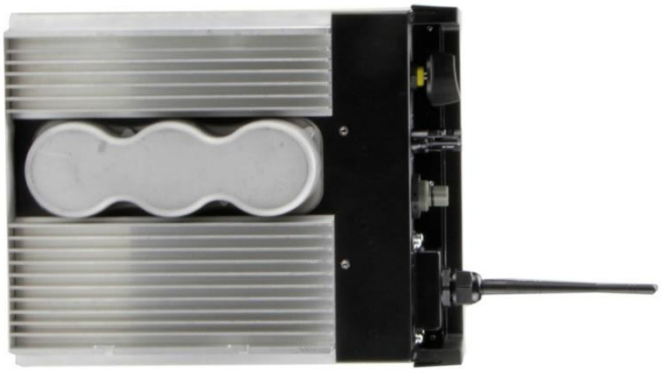
Symbol	Description
	**Dangerous electrical voltage** This device is directly connected to public grid, consequently all work on the inverter shall only be carried out by qualified personnel.
	**DANGER to life due to high electrical voltage!** There might be residual currents present within the inverter because of large capacitors. Wait **10 MINUTES** before you remove the front lid.
	**NOTICE, danger!** This device directly connected with electricity generators and the public grid.
	**Danger of hot surface** The components inside the inverter will generate heat during operation, **DO NOT** touch aluminum housing during operation.
	**An error has occurred** Please go to Part 9 “Trouble Shooting” to remedy the error.
	**This device SHALL NOT be disposed of in residential waste** Please go to Part 8 “Recycling and Disposal” for proper treatments.
	**Without Transformer** This inverter does not use a transformer for the isolation function.
	**Standards Association of Australian** The inverter complies with the requirement of the AS4777.
	**CE Mark** Equipment with the CE mark fulfils the basic requirements of the Guideline Governing Low-Voltage and Electromagnetic Compatibility.
	**No unauthorized perforations or modifications** Any unauthorized perforations or modifications are strictly forbidden, if any defect or damage (device/person) occurs, Zeus Appollo Solar will not accept any responsibility for it. Electrical Installation & Maintenance shall be conducted by licensed electrician and shall comply with Australia National Wiring Rules.

3. Product Information

3.1 Overview

- Industrial Layout

- Excellent Heat Elimination



- Effective Shield For DC/AC/Communication Connections

3.2 Major Characteristics

The Z10 series inverter has following characteristics, which ensure that the Z10 series inverter delivers “High Efficiency, High Reliability, and a High Cost Effective Ratio”

- An extensive DC input voltage and current range, enables more PV panels to be connected.
- A wide MPP voltage range will ensure a high yield under various weather conditions.
- A high MPP tracking accuracy ensures minimum power losses during conversion.
- A complete set of protection methods.

In addition, following protection methods are integrated into the Z10 series inverter:

- Internal overvoltage
- DC insulation monitoring
- Ground fault protection
- Grid monitoring
- Ground fault current monitoring
- DC current monitoring
- Integrated DC switch (Optional)

3.3 Datasheet

Type	Z10I1K	Z10I1K5	Z10I2K
Input (DC)			
Max. PV Power	1300W	1750W	2300W
Max DC Voltage	500V	500V	500V
Nominal DC Voltage	360V	360V	360V
Operating MPPT Voltage Range	80-360V	120-450V	120-450V
MPPT Voltage Range at Nominal Power	150-360V	150-450V	150-450V
Startup DC Voltage	90V	150V	150V
Turn off DC Voltage	80V	120V	120V
Max. DC Current	16A	18A	18A
Max. Short Circuit Current for each MPPT	20A	20A	20A
Number of MPP trackers	1	1	1
Number of DC Connection for each MPPT	1	1	1
Max. inverter back feed current to the array	0	0	0
DC Connection Type	MC4 Connector	MC4 Connector	MC4 Connector
Output (AC)			
Max. AC Apparent Power	1100VA	1650VA	2200VA
Nominal AC Power (cos phi = 1)	1000W	1500W	2000W
Nominal Grid Voltage	220V/230V/240V	220V/230V/240V	220V/230V/240V
Nominal Grid Frequency	50Hz/60Hz	50Hz/60Hz	50Hz/60Hz
Max. AC Current	5.8A	9.0A	11.0A
Maximum output fault current	8A	12A	14A
Maximum output protection current	10A	14A	16A
Grid Voltage Range*	185-276V	185-276V	185-276V
Grid Frequency Range*	45-55Hz/55-65Hz	45-55Hz/55-65Hz	45-55Hz/55-65Hz
Power Factor	0.9i…1…0.9c	0.9i…1…0.9c	0.9i…1…0.9c
Total Harmonic Distortion (THD)	<2%	<2%	<2%
Feed in Starting Power	30W	30W	30W
Night time Power Consumption	<1W	<1W	<1W
Standby Consumption	6W	6W	6W
AC Connection Type	Plug-in connector	Plug-in connector	Plug-in connector
Efficiency			
Max. Efficiency (at 360Vdc)	97.5%	97.5%	97.5%

Euro Efficiency (at 360Vdc)	96.3%	96.5%	96.6%
MPPT Efficiency	99.9%	99.9%	99.9%
Safety and Protection			
DC Insulation Monitoring	Yes		
DC Switch	Optional		
Residual Current Monitoring Unit (RCMU)	Integrated		
Grid Monitoring with Anti-islanding	Yes		
Protection Class	I (According to IEC 62103)		
Overvoltage Category	PV II / Mains III (According to IEC 62109-1)		
Reference Standard			
Safety Standard	EN 62109, AS/NZS 3100		
EMC Standard	EN 61000-6-1, EN 61000-6-3, EN 61000-6-2, EN 61000-6-4, EN61000-3-2, EN61000-3-3, EN61000-3-11, EN61000-3-12		
Grid Standard	AS4777		
Physical Structure			
Dimensions (WxHxD)	343x281x130mm		
Weight	11kg		
Environmental Protection Rating	IP 65 (According to IEC 60529)		
Cooling Concept	Natural convection		
Mounting Information	Wall bracket		
General Data			
Operating Temperature Range	-20°C to +60°C(derating above 45°C)		
Relative Humidity	0% to 98%, no condensation		
Max. Altitude (above sea level)	2000m		
Noise Level	< 40dB		
Isolation Type	Transformerless		
Islanding protection	Initiative, Frequency disturbance		
DRM command	DRM0, DRM5, DRM6, DRM7, DRM8		
Display	3 LED, Backlight, 4 x 20 Character LCD		
Data Communication Interfaces	RS485(Wi-Fi, GPRS integrated)		
Computer Communication	USB		
Standard Warranty	5 Years (10 years optional)		

*The AC voltage and frequency range may vary depending on the specific country grid

Type	Z10I2K5	Z10I3K
Input (DC)		
Max. PV Power	2800W	3250W
Max DC Voltage	500V	500V
Nominal DC Voltage	360V	360V
Operating MPPT Voltage Range	120-450V	120-450V
MPPT Voltage Range at Nominal Power	150-450V	150-450V
Startup DC Voltage	150V	150V
Turn off DC Voltage	120V	120V
Max. DC Current	18A	18A
Max. Short Circuit Current for each MPPT	20A	20A
Number of MPP trackers	1	1
Number of DC Connection for each MPPT	1	1
Max. inverter back feed current to the array	0	0
DC Connection Type	MC4 Connector	MC4 Connector
Output (AC)		
Max. AC Apparent Power	2750VA	3000VA
Nominal AC Power(cos phi = 1)	2500W	3000W
Nominal Grid Voltage	220V/230V/240V	220V/230V/240V
Nominal Grid Frequency	50Hz/60Hz	50Hz/60Hz
Max. AC Current	12.5A	14.0A
Maximum output fault current	15A	17A
Maximum output protection current	18A	20A
Grid Voltage Range*	185-276V	185-276V
Grid Frequency Range*	45-55Hz/55-65Hz	45-55Hz/55-65Hz
Power Factor	0.9 capacitive…0.9 inductive	0.9 capacitive…0.9 inductive
Total Harmonic Distortion (THD)	<2%	<2%
Feed in Starting Power	30W	30W
Night time Power Consumption	<1W	<1W
Standby Consumption	6W	6W
AC Connection Type	Plug-in connector	Plug-in connector
Efficiency		
Max. Efficiency (at 360Vdc)	97.7%	97.7%
Euro Efficiency (at 360Vdc)	96.9%	97.0%
MPPT Efficiency	99.9%	99.9%
Safety and Protection		
DC Insulation Monitoring	Yes	
DC Switch	Optional	
Residual Current Monitoring Unit (RCMU)	Integrated	
Grid Monitoring with Anti-islanding	Yes	
Protection Class	I (According to IEC 62103)	

Overvoltage Category	PV II / Mains III (According to IEC 62109-1)
Reference Standard	
Safety Standard	EN 62109, AS/NZS 3100
EMC Standard	EN 61000-6-1, EN 61000-6-3, EN 61000-6-2, EN 61000-6-4, EN61000-3-2, EN61000-3-3, EN61000-3-11, EN61000-3-12
Grid Standard	AS4777
Physical Structure	
Dimensions (WxHxD)	343x281x150mm
Weight	13kg
Environmental Protection Rating	IP 65 (According to IEC 60529)
Cooling Concept	Natural convection
Mounting Information	Wall bracket
General Data	
Operating Temperature Range	-20°C to +60°C(derating above 45℃)
Relative Humidity	0% to 98%, no condensation
Max. Altitude (above sea level)	2000m
Noise Level	< 40dB
Isolation Type	Transformerless
Islanding protection	Initiative, Frequency disturbance
DRM command	DRM0, DRM5, DRM6, DRM7, DRM8
Display	3 LED, Backlight, 4 x 20 Character LCD
Data Communication Interfaces	RS485(Wi-Fi, GPRS integrated)
Computer Communication	USB
Standard Warranty	5 Years (10 years optional)

*The AC voltage and frequency range may vary depending on specific country grid

4. Packing checklist

4.1 Assembly parts

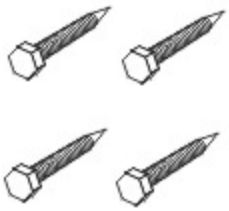
After you receive the Z10 series inverter, please check to see if there is any damage to the carton, and then examine the inverter and accessories for any visible external damage. Contact your dealer if anything is damaged or missing.

A

B

C

D



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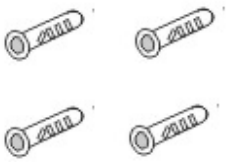

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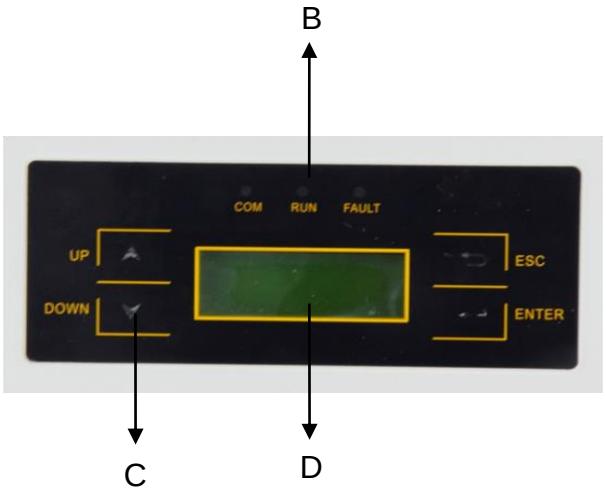
G

Object	Quantity	Description
A	1	Z10 series inverter
B	2 pairs	DC connectors
C	1	AC connector
D	1	Wall mounting bracket
E	4	Screws (ST6×50)
F	4	Expansion tubes
G	1	Installation and operating instructions

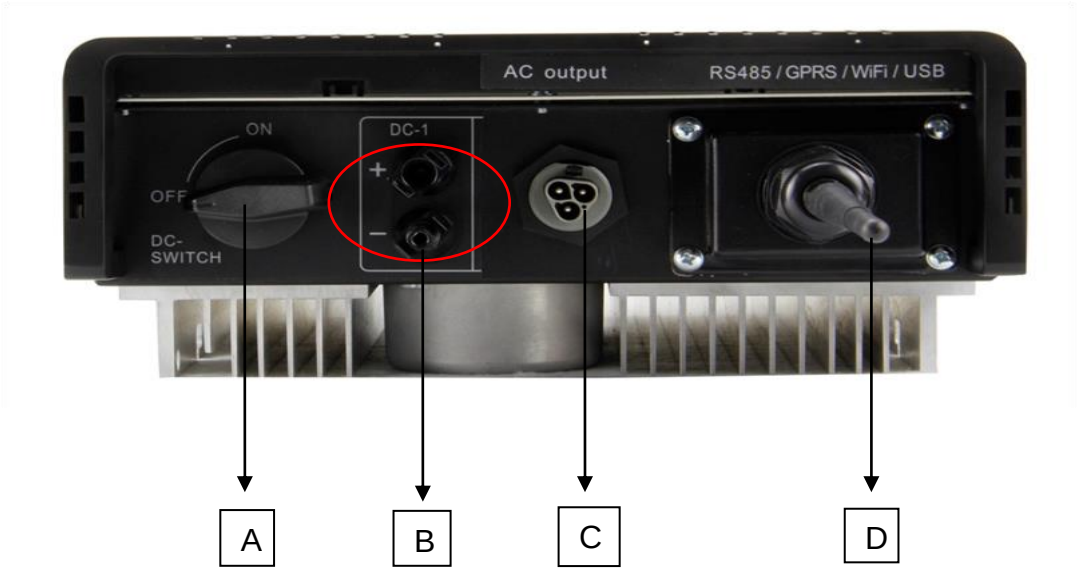
4.2 Product Appearance

- Front



Object	Description
A	Removable front shield
B	LED light (3 pcs)
C	Function keys for displays and setting(4 pcs)
D	Monitoring LCD with backlighting

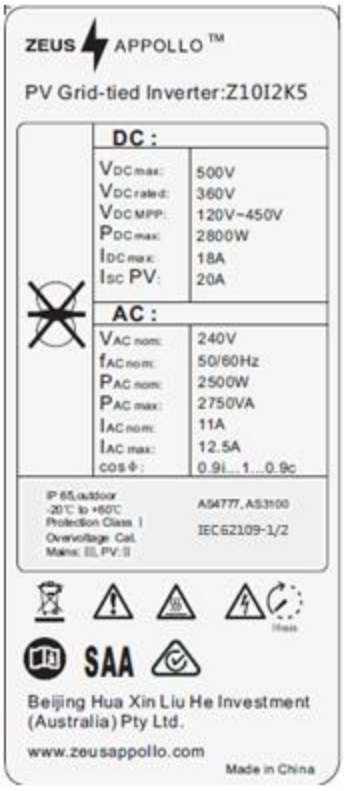
- Bottom



Object	Description
A	DC switch (optional)
B	Plug connectors for DC input
C	Terminal for grid connection (AC output)
D	Communication interface(RS485/GPRS/Wi-Fi/USB)

4.3 Product Identification

You can identify the inverter by the side nameplate. Information such as the type of inverter, as well as the inverter specifications are contained on the side nameplate. The nameplate is on the middle part of the right hand side of the inverter housing. The following figure is an example of the side nameplate on the **Z10I2K5**.



4.4 Further Information

If you have any further questions concerning the type of accessories or installation, please check our website www.zeusappollo.com or contact your nearest Zeus Appollo office.

5. Installation

5.1 Safety

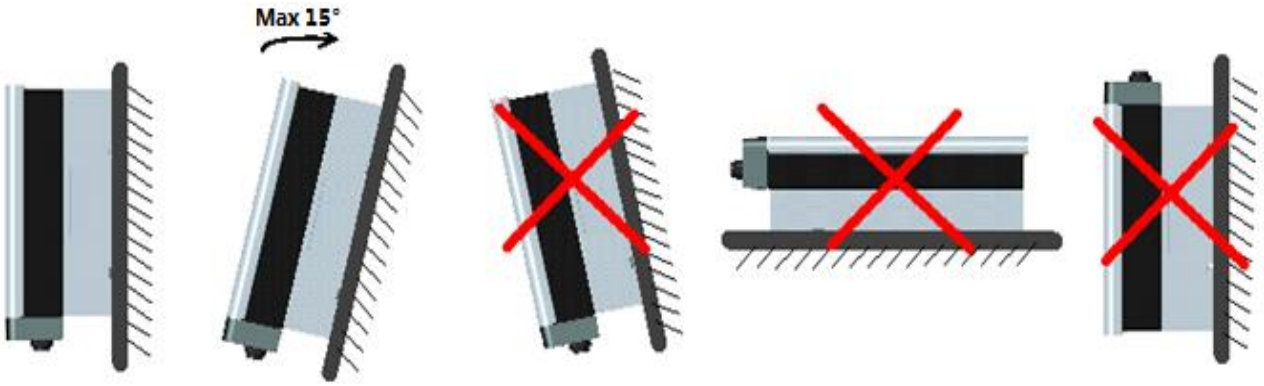
DANGER

DANGER to life due to potential fire or electricity shock.
DO NOT install the inverter near any flammable or explosive items.
This inverter will be directly connected with a **HIGH VOLTAGE** power generation device; the installation must be performed by qualified personnel only in compliance with national and local standards and regulations.

NOTICE

NOTICE An inadequate or incorrect installation may impact on the published lifespan of the inverter.
Do **NOT** expose to **direct sunlight** to avoid power reduction due to an increase in the internal temperature of the inverter.
Do **NOT** expose to **rain and snow cover** to enhance inverter life time.
The installation site **MUST** have good ventilation condition.

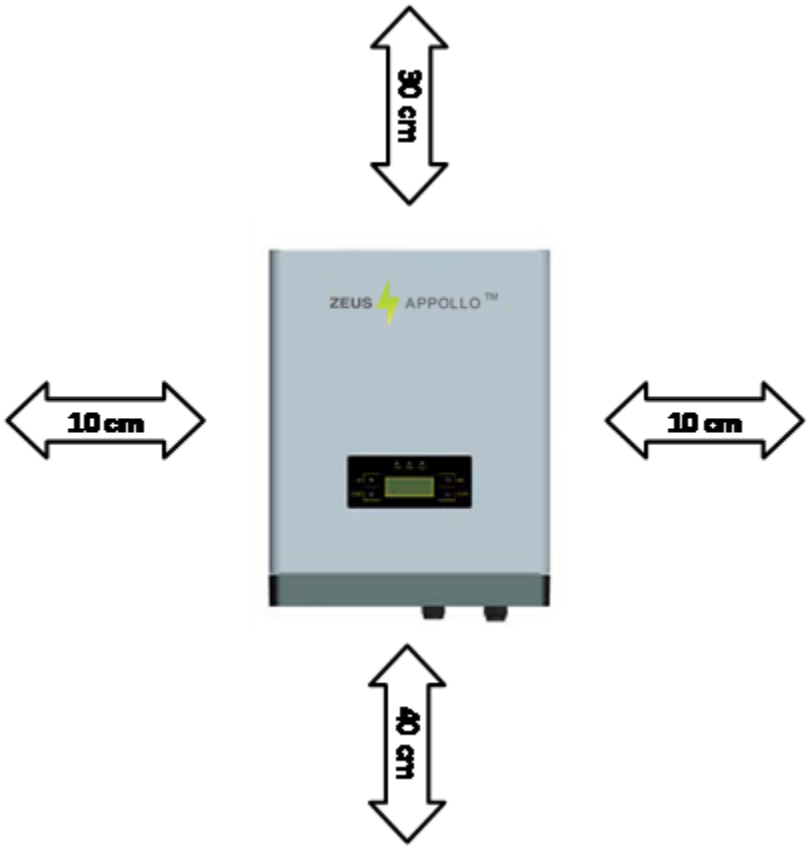
5.2 Mounting Instructions



- Z10 series inverter is designed for indoor and outdoor installation, Zeus Appollo Solar suggests installing the inverter in a basement or garage where there's no directly sunlight or rain.
- Do not install in rooms where people live or where the prolonged presence of people or animals is expected because of the noise that the inverter makes during operation.
- Please mount the inverter in the direction as illustrated above.
- Installing the inverter in the vertical direction is recommended, with a max.15 degrees backwards tilt.
- For the convenience of checking the LCD display and possible maintenance activities, please install the inverter at eye level.
- Make sure the wall you have selected is strong enough to handle the screws and bear the weight of the inverter.
- Ensure the device is properly fixed to the wall.
- It is not recommended that the inverter be exposed to strong sunshine, because the excess heat might lead to a power reduction.
- The ambient temperature of the installation site should be between -20 °C and +60 °C (between -4 °F and 140 °F).
- Make sure the installation location is well ventilated insufficient ventilation may reduce the performance of the electronic components inside the inverter and shorten the life of the inverter.

5.3 Safety Clearance

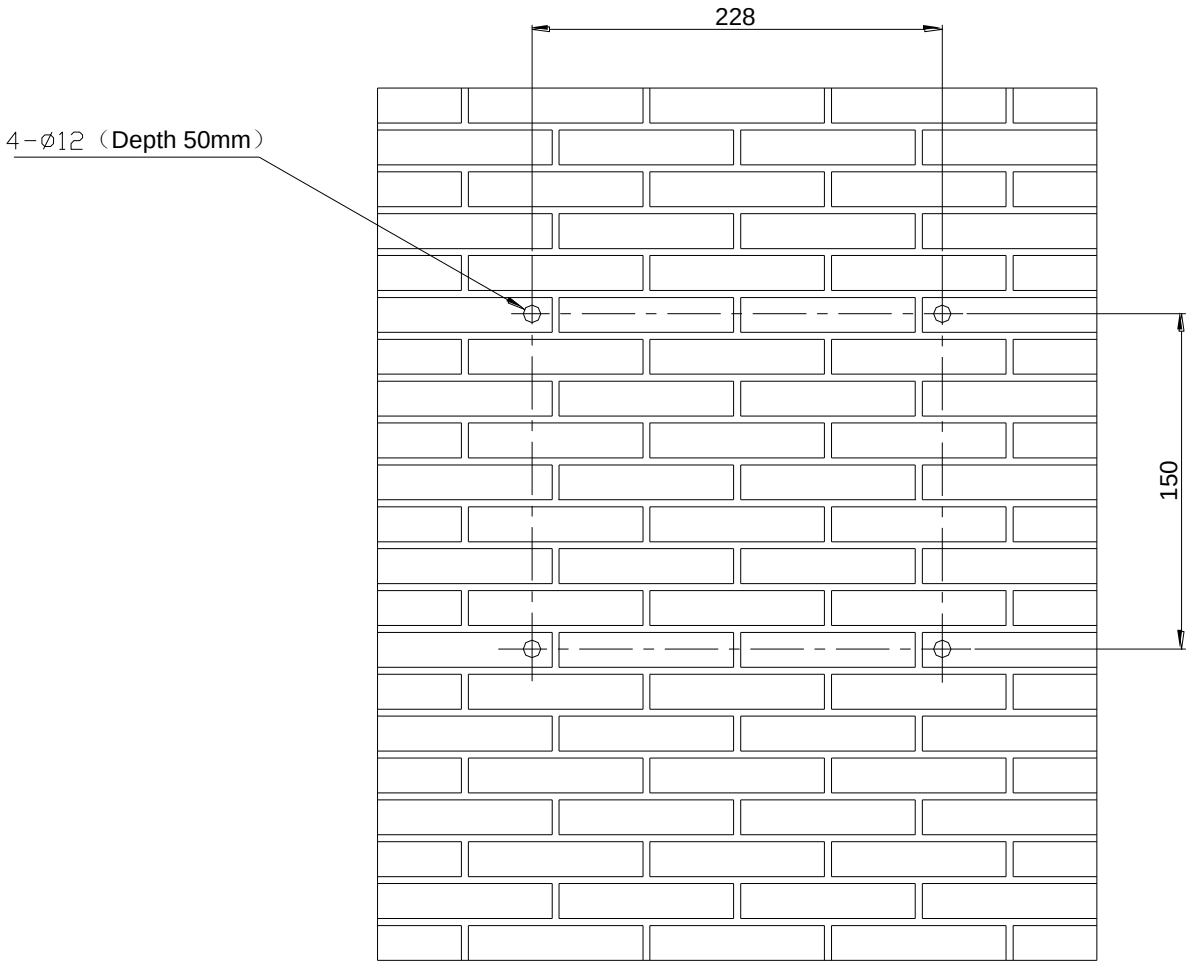
Observe the following minimum clearances to walls, other devices or objects to guarantee sufficient heat dissipation and enough space for pulling the electronic solar switch handle.



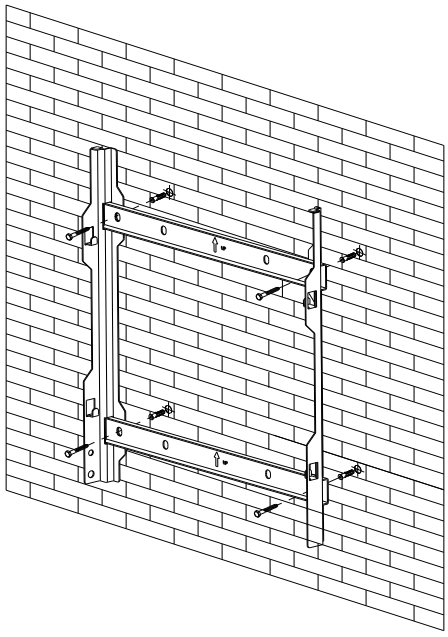
Direction	Minimum clearance
Above	30 cm
Below	40 cm
Sides	10 cm

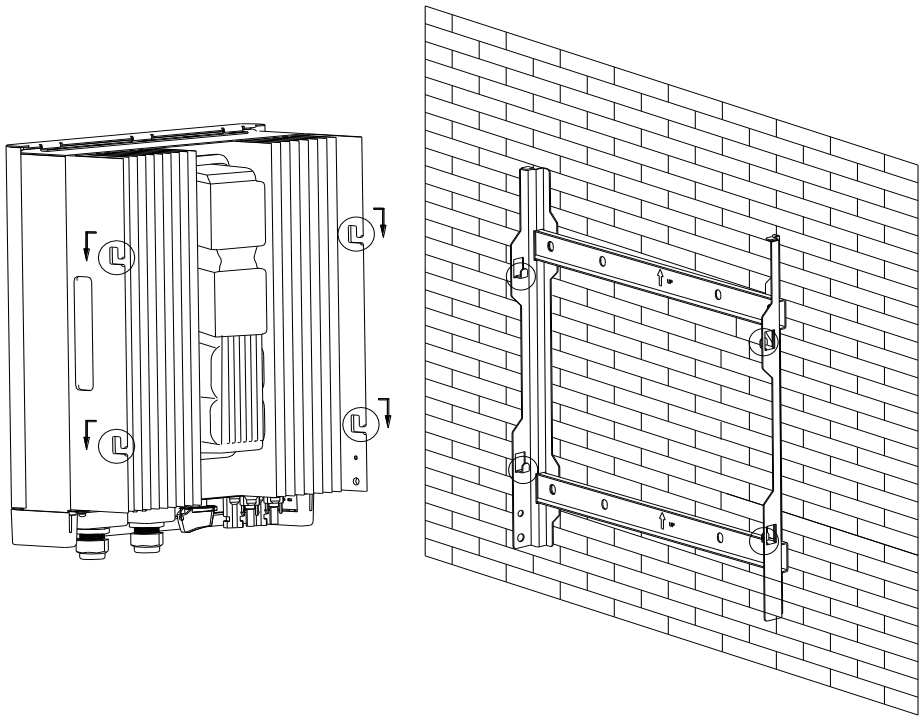
5.4 Mounting Procedure

1. Mark the four (4) positions of the drill holes on the wall corresponding with the wall mounting bracket in the carton.

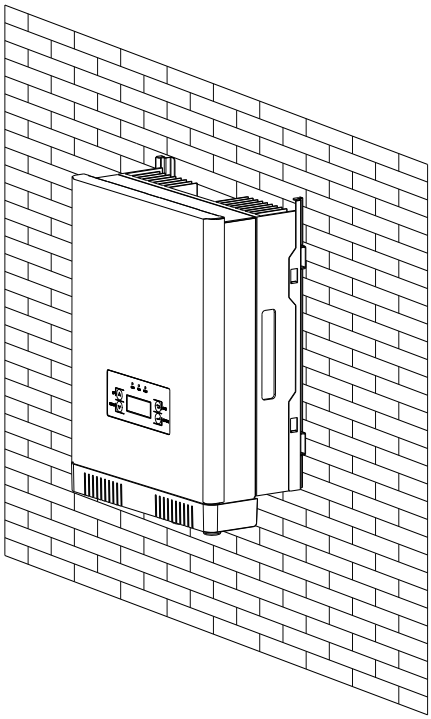


2. Then where the wall is marked, drill 4 holes. Then insert four expansion tubes into the holes using a rubber hammer. Next insert the 4 screws through the mounting holes in the bracket, and then tighten the screws into the expansion tubes. The bracket is now installed.





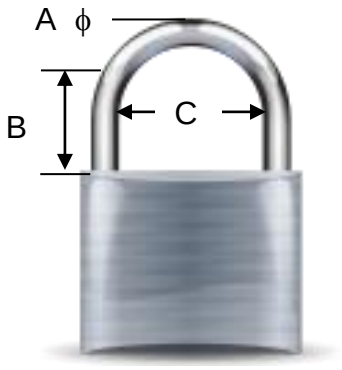
3. Check the 4 holes at the rear of the inverter. Then lift the inverter carefully, aligning the 4 holes in the inverter and the 4 hooks on the bracket, and finally lightly attach the inverter to the hooks.



5.5 Safety lock

After the inverter is hanging up on the bracket, lock up the device and the bracket together at the Lower Left Corner of the inverter (as per the picture below).

Recommended padlock dimension:



A. Shackle Diameter	5~7 mm
B. Vertical Clearance	8~15 mm
C. Horizontal Clearance	12~20 mm
Stainless, solid hanger and secured lock cylinder	

NOTICE

For further maintenance and possible repair, please keep the key of the padlock in a safe place.

6. Electrical Connection

6.1 Safety

DANGER

DANGER to life due to potential fire or electricity shock.
When the inverter is powered up, comply with all applicable national regulations and legislation concerning accident prevention.
This inverter will be directly connected to a **HIGH VOLTAGE** power generation device; the installation must be performed by qualified personnel only in compliance with national and local standards, regulations and legislation.

NOTICE

Electrical connections must be carried out in accordance with the applicable regulations, such as conductor sections, fuses, and PE connections.

6.2 AC Side Connection

DANGER

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

1. Integrated RCD and RCM

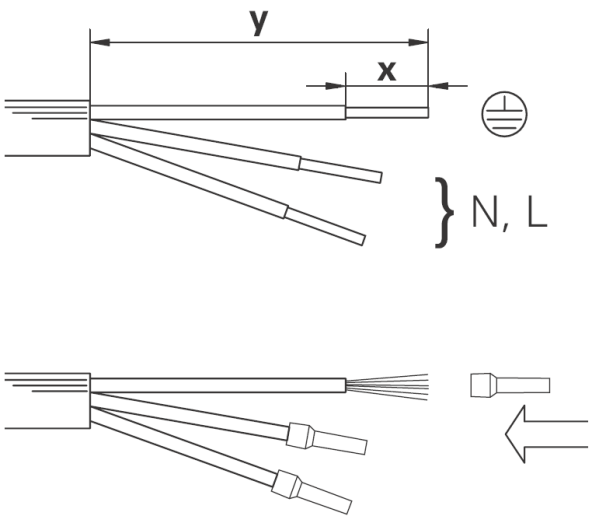
The Z10 series inverter is equipped with an integrated RCD (Residual Current Protective Device) and RCM (Residual Current Operated Monitor). The current sensor will detect the volume of the leakage current and compare it with the pre-set value, if the leakage current exceeds the permitted range, the RCD will disconnect the inverter from the AC load.

2. Assembly Instructions

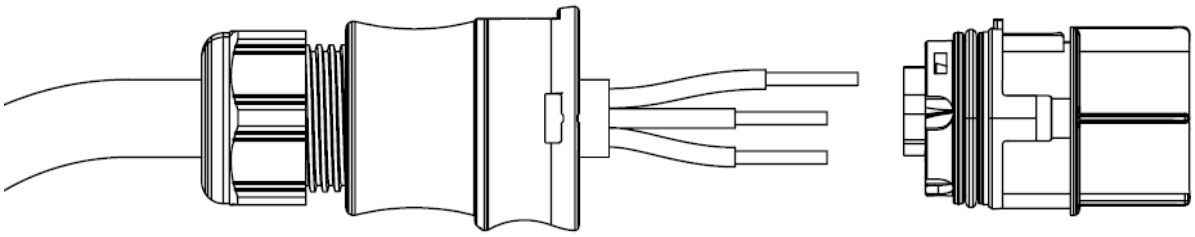
NOTICE

Use **16-12AWG (1.5-4mm²)** copper wire for all AC wiring connections to the Z10 series inverter. Use only solid wire or stranded wire.

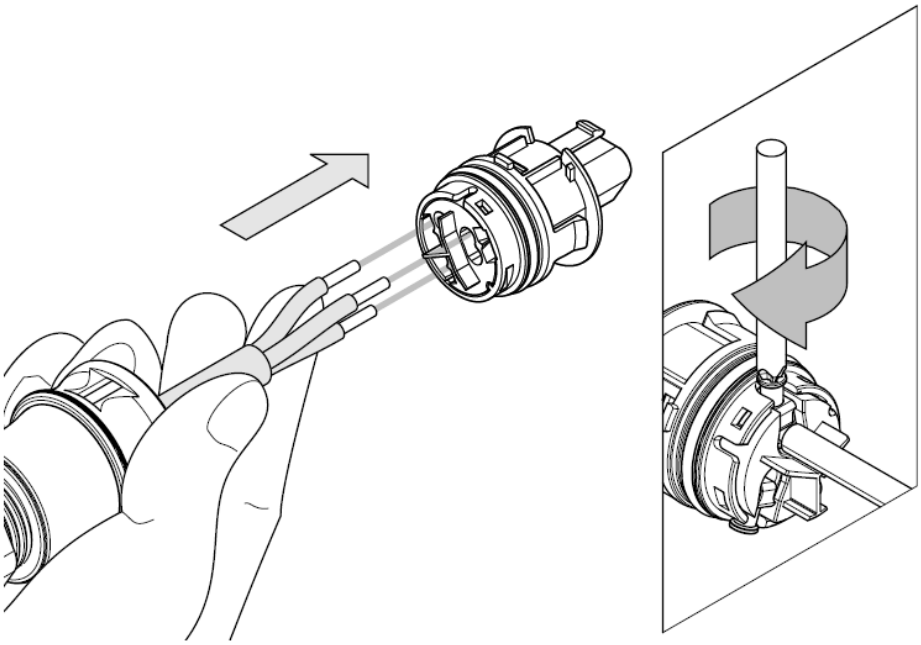
1) Remove length y of **N, L** conductor 35mm (1.38'')/**PE** conductor 40mm (1.57'') sheath of AC cable terminal, length x about 14mm (0.55'') of the inner wrapper, then dress the conductor terminals with ferrules or tin soldering.



Check that all parts of the AC connector are present. Then slide the hex nut onto the cable and insert the cable end through clamp ring.



1) Insert the **stripped N, L and PE conductor terminals** into the appropriate holes, using a cross screwdriver to tighten it applying a tightening torque of 1Nm.



2) Insert the connector into clamp ring with two click sounds and then tighten the hex nut with tightening torque of 4Nm.

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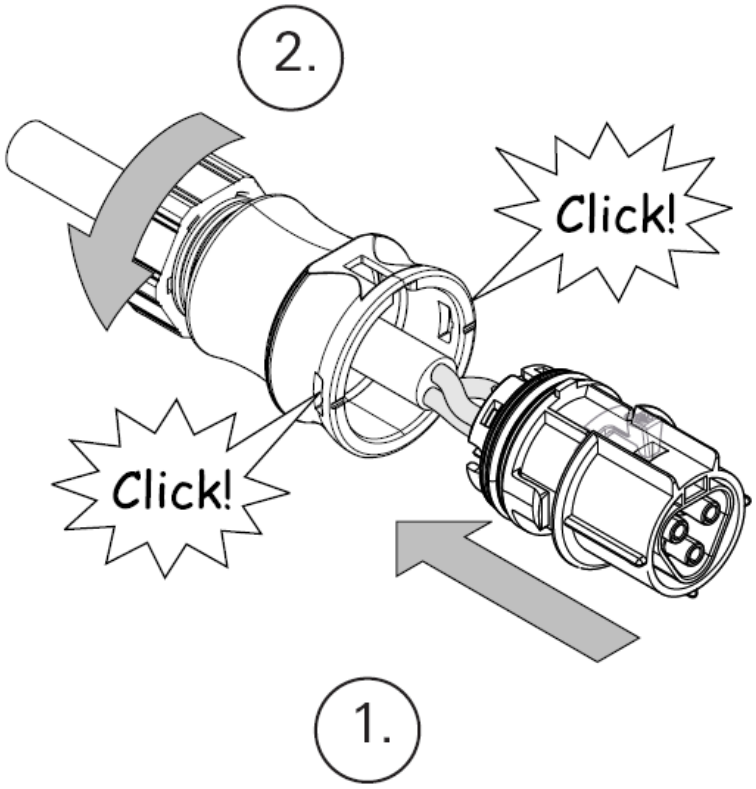
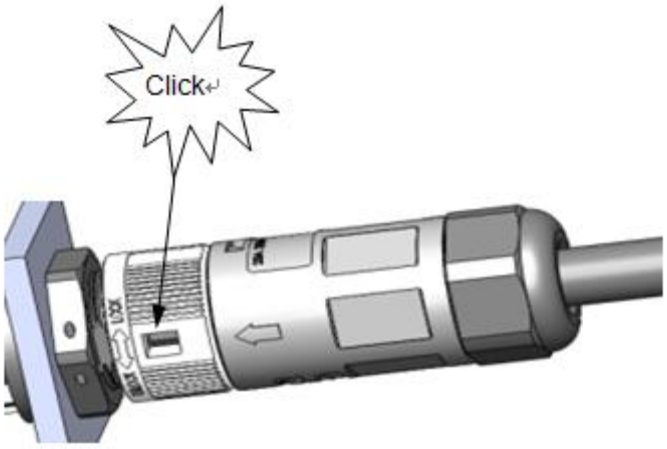
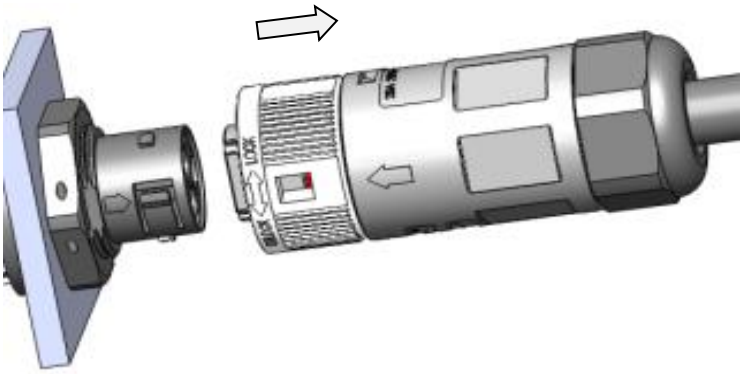


3) Finally push the straight plug to the AC terminal on the inverter，then rotate the locker according to the direction instructed by the marks on the locker.



4) If you need to separate the connectors, please use a screwdriver to press the lock tongue, rotate the locker according to the direction instructed by the marks on the locker, and then pull down the plug.



6.3 DC Side Connection

DANGER

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

NOTICE

The DC Switch (**Optional**) may be integrated or external to Inverter, and it can be used to connect or disconnect the DC source from the Inverter.

For Z10I1K, Z10I1K5, Z10I2K, Z10I2K5 and Z10I3K, there is one MPP Tracker, and the DC characteristics of them are illustrated as the following table.

Inverter Type	MPP Tracker	Max. DC Power	Max. DC Voltage	Max. DC Current
Z10I1K	1	1300W	500V	16A
Z10I1K5		1750W		18A
Z10I2K		2300W		18A
Z10I2K5		2800W		18A
Z10I3K		3250w		18A

MC4 Assembly instructions

☞ If, during self-assembly, parts and tools other than those stated by MC are used or if the preparation and assembly instructions described here are disregarded then neither safety nor compliance with the technical data can be guaranteed.

⚠ For protection against electric shock, PV-connectors must be isolated from the power supply while being assembled or disassembled.

⚠ The end product must provide protection from electric shock.

☞ The use of PVC cables is not recommended.

☞ Unplugging under load: PV plug connections must not be unplugged while under load. They can be placed in a no load state by switching off the DC/AC converter or breaking the DC circuit interrupter. Plugging and unplugging while under voltage is permitted.

☞ It is inadvisable to use non-tinned cables of type H07RN-F, since with oxidized copper wires the contact resistances of the crimp connection may exceed the permitted limits.

☞ Disconnected connectors should be protected from dirt and water with sealing caps.

☞ Plugged parts are watertight IP67. They cannot be used permanently under water. Do not lay the MC-PV connectors on the roof surface.

☞ See the MC catalogue 2 solar lines for technical data and assembled parts.

PV-Female cable coupler **PV-Male cable coupler** **Optional**

PV-KBT4

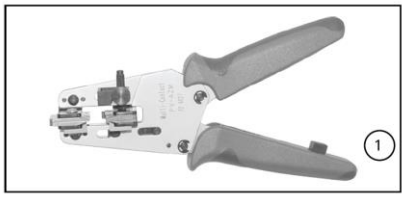
PV-KST4

PV-SSH4

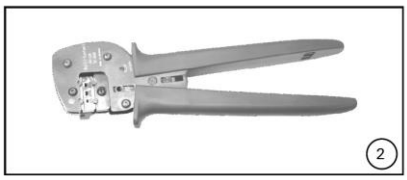
Touch protection, mated/unmated	IP67/IP2X	**Rated current**	17A(1,5mm²/16AWG) 22A(2,5mm²/14AWG) 30A(4mm²,6mm²/10AWG)
Ambient temperature range	-40° to 90°C (IEC/CEI) -40° to 75°C(UL) -40° ...70°C (UL:14AWG)	**Rated voltage**	1000V (IEC/CEI) 600V (UL)
Upper limiting temperature	105°C (IEC/CEI)	**Safety class**	II

Note: The DC connector is MC4 type; you can order the specified tools at MC website: http://www.multi-contact.com.

Tools required



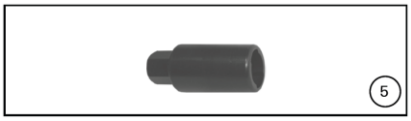
(ill. 1)
Stripping pliers PV-AZM... incl. built-in blade as well as hexagonal screwdriver A/F 2,5mm.
Cable cross section: 1,5 / 2,5 / 4 / 6 mm²
Type: PV-AZM-1.5/6
Order No. 32.6029-156



(ill. 2)
Crimping pliers PV-CZM... incl. locator and built-in crimping insert.
Crimping range: 2,5 / 4 / 6 mm² (12 / 10 AWG)
Type: PV-CZM-19100
Order No. 32.6020-19100

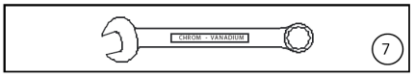
(ill. 3)
Open-end spanner PV-MS,
1 Set = 2 pieces
Order No.: 32.6024

(ill. 4)
PV-WZ-AD/GWD socket wrench insert to tighten
Order No. 32.6006



(ill. 5)
PV-SSE-AD4 socket wrench insert to secure
Order No. 32.6026

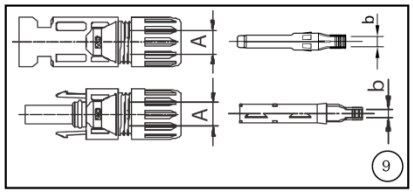
(ill. 6)
Test plug PV-PST
Order No. 32.6028



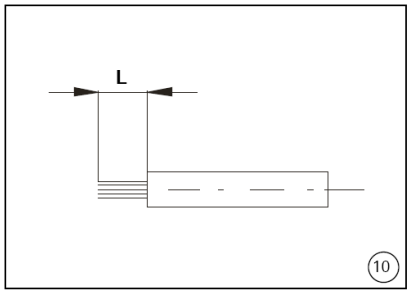
(ill. 7)
Open-end spanner A/F 15 mm

(ill. 8)
Torque screwdriver A/F 12 mm

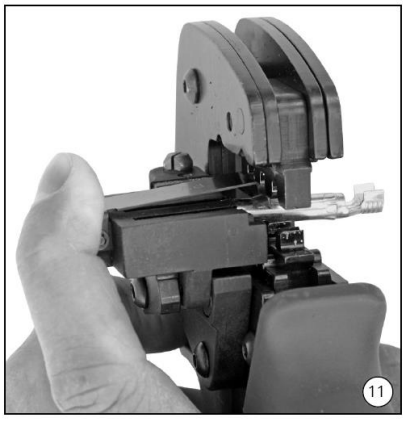
Cable preparation



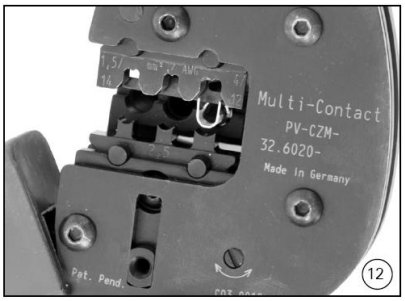
(ill. 9)
Use 14-10AWG (2.5-6mm^2) conductor as DC cable. Dimension **A**3-6mm, **b**2.5-6mm^2



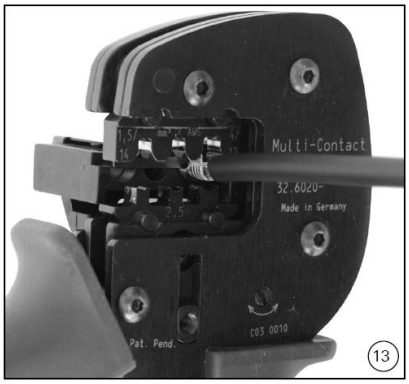
(ill. 10)
Strip the cable end **L** with 6 mm to 7.5 mm of insulation.



(ill. 11)
Open the clamp (K) and hold. Place the contact in the appropriate cross section range.
Turn the crimp lugs upwards. Release the clamp (K). The contact is fixed.

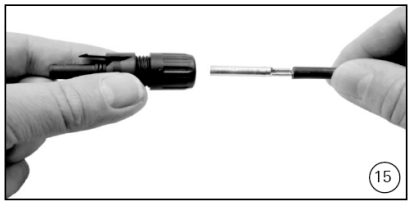


(ill. 12)
Press the pliers gently together until the crimp lugs are properly located within the crimping die.



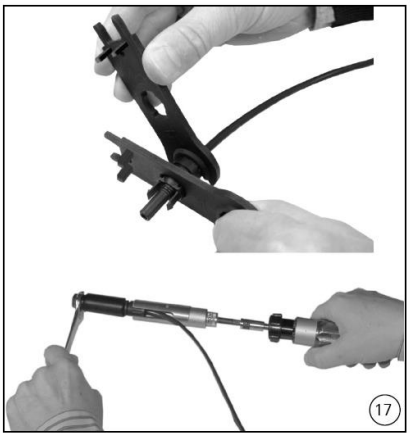
(ill. 13)
Insert the stripped cable end until the insulation comes up against the crimp insert. Completely close the crimping pliers.

(ill. 14)
Visually check the crimp.

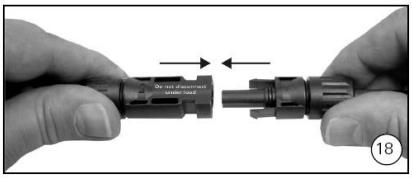


(ill. 15)
Insert the crimped-on contact into the insulator of the male or female coupler until it clicks into place. Pull gently on the lead to check that the metal part is correctly engaged.

(ill. 16)
Insert the appropriate end of the test pin into the male or female coupler as far as it will go. If the contact is correctly located, the white mark on the test pin must still be visible.



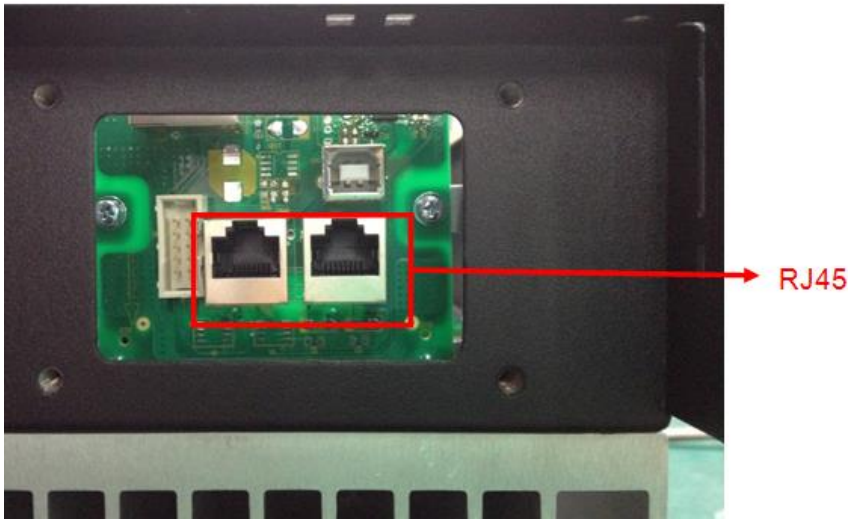
(ill. 17)
Screw up the cable gland hand-tight with the tools PV-MS or tighten the cable gland with the tools PV-WZ-AD/GWD and PV-SSE-AD4.
In both cases: The tightening torque must be appropriate for the solar cables used. Typical values are between 2,5 Nm and 3 Nm.



(ill. 18)
Plug the parts of the cable coupler together until they click in place. Check that they have engaged properly by pulling on the cable coupler.

6.4 Communication and Monitoring Device

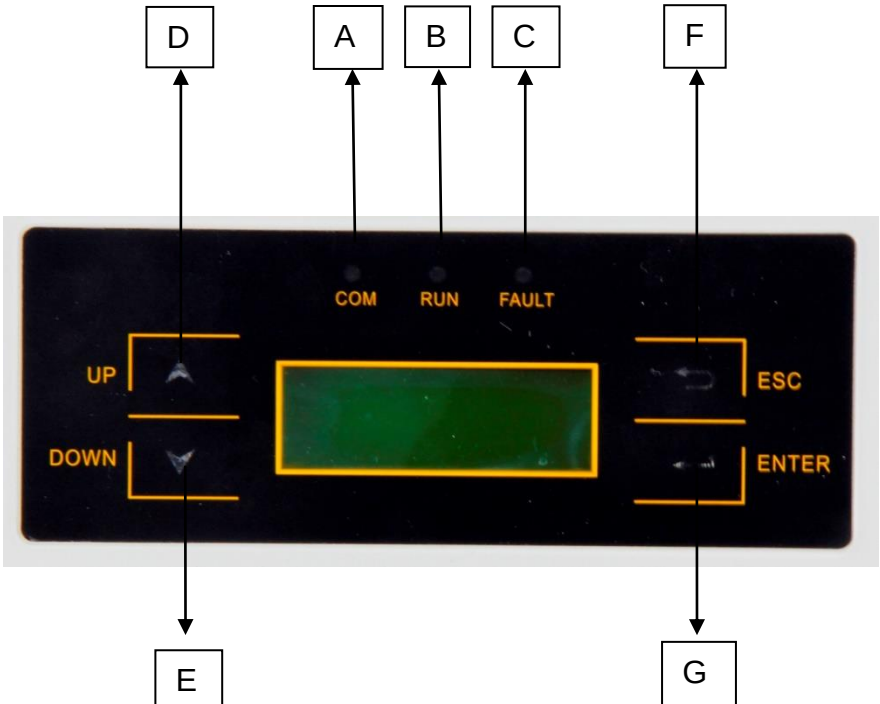
There are 2 RJ45 plugs in the bottom side of the Z10 series inverter as shown in the following figure:



These 2 RJ45 plugs are used for multipoint communications, that is, up to 50 Z10 series inverters can be connected one by one through these 2 plugs and the cables, the upper computer can communicate with these inverters via a single signal cable at the same time, and maximum length of the cable is 1000m. Through these plugs, the user can get the data from these inverters, and can also configure the parameters of them.

7. Display and Operation

7.1 LCD Panel



Object	Description
A	LED light(Yellow) – COM
B	LED light(Green) – RUN
C	LED light(Red) – FAULT
D	**UP** key
E	**DOWN** key
F	**ESC** key
G	**ENTER** key

The LCD panel is integrated in the front lid of the inverter, so it is easy for the user to check and set the data. In addition, the user can press the function key to illuminate the LCD screen.

NOTICE

Z10 series inverter is not an aligned measuring instrument for current, voltage or power consumption.
A slight deviation of a few percent points is inherent to the system; the results from the inverter cannot be used for grid balance calculations. An aligned meter will be required to make calculations for the utility company.

7.2 Commissioning

NOTICE

The power supply of the display module is accessed through the AC grid, so the screen will not be available until AC is connected.

A minimum available voltage of 150Vdc and a DC power of >10Wdc is required before the inverter starts feeding power to the grid.

AC side: Turn on the AC circuit breaker and the display module will works.
DC side: Turn on the DC switch.
When the inverter is started for the first time, a menu is displayed to choose the language and the country where the inverter installed, English, Dutch and German are available for display.

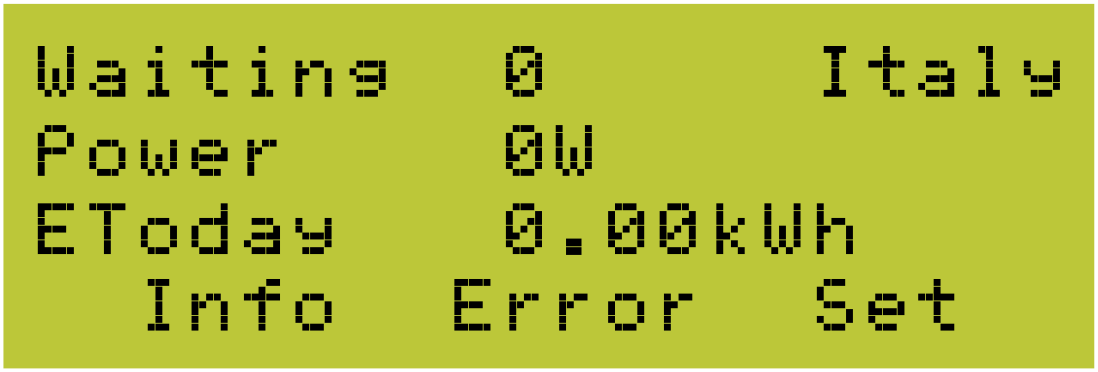
NOTICE

You need to ensure that you have selected the correct country so that local safety compliance is maintained.

7.3 Operation

7.3.1 System operation interface

System operation interface 1:



In this interface, the displayed "**Waiting 0**" part will switch along with the system operation status.

The system will have the following status:

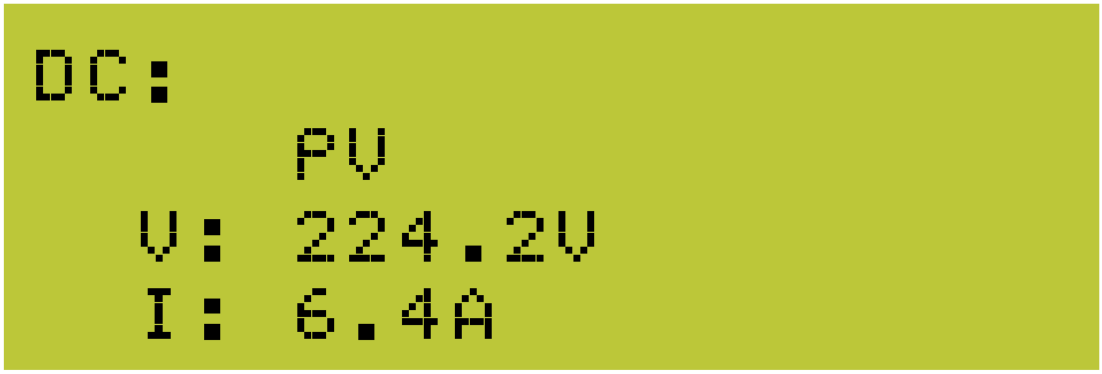
1. Waiting status: Display as Waiting XXX, XXX refers to the countdown time, will display 1~3 numbers.
2. Flash status: Display as Flash
3. Fault status: Display as Fault XX, XX refers to error code, will display 1~2 numbers.

Power and **EToday** in this interface will change along with the change of number after system operation.

System operation interface 2:

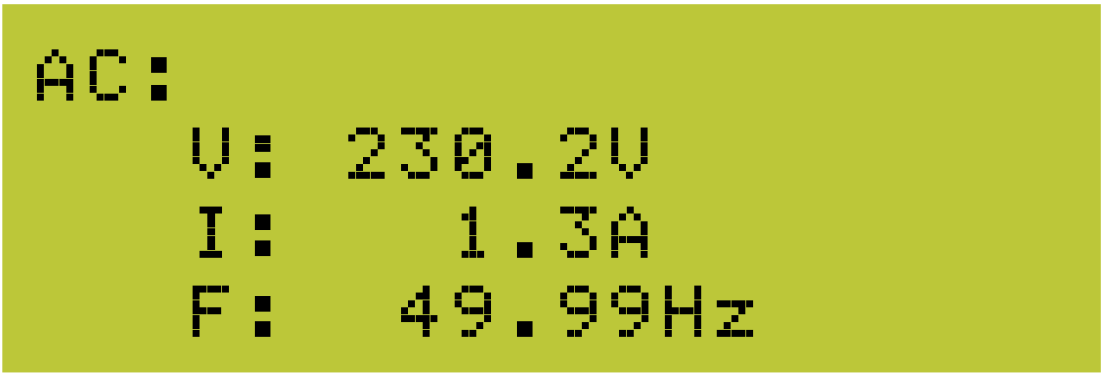
Power and **ETotal** in this interface will change along with the change of number after system operation.

System operation interface 3:



This interface displays the input voltage and current of the 2 input PV panel.

System operation interface 4:



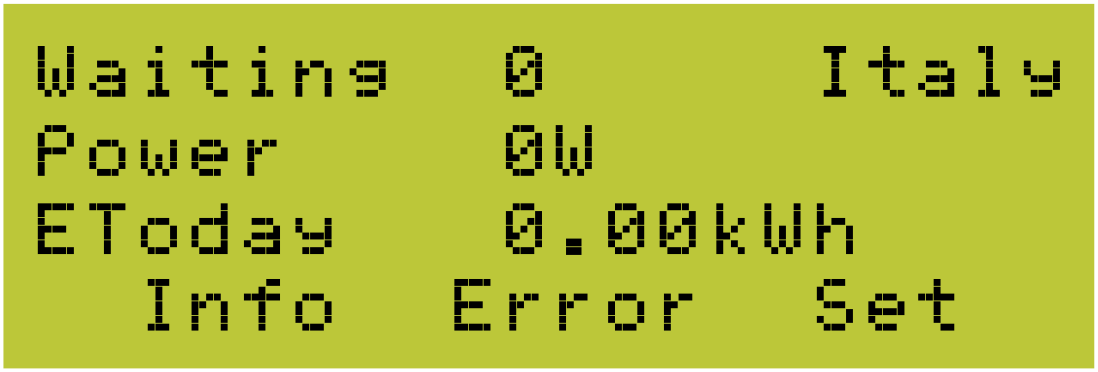
This interface displays the voltage and frequency of grid and the current which inverter outputs to the grid.

System operation interface 5:

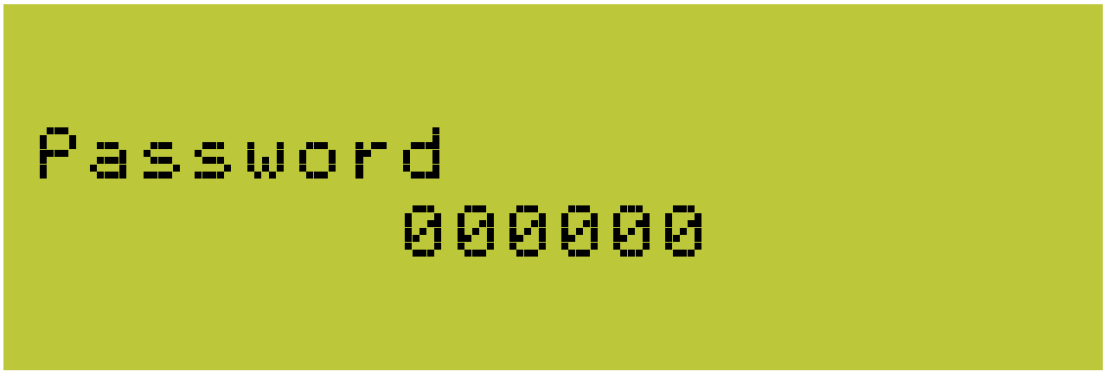
This interface displays the Wi-Fi information of the inverter, including Wi-Fi SN and IP address.

7.3.2 Interface introduction

Safety Interface: When choose **“Safety”** by pressing compound key (**ESC+ENTER**) in system operation interface 1 for 3 seconds

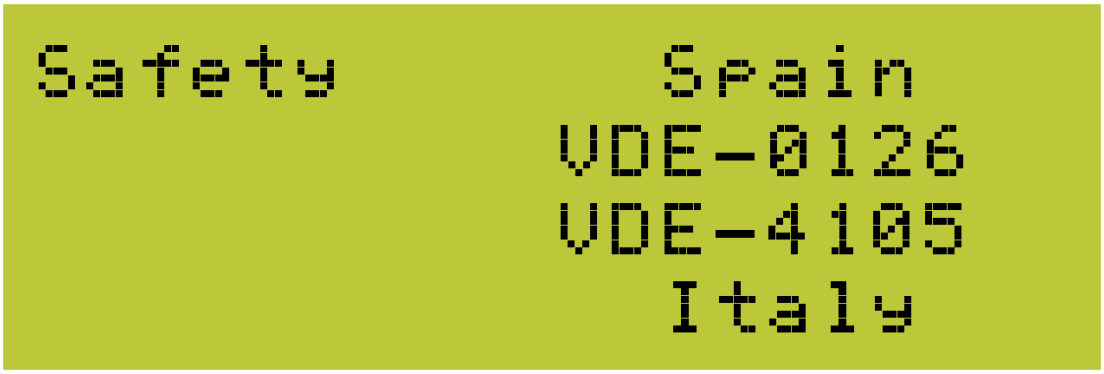


Safety **“Italy”** in the screen flickers. After confirm to enter, password dialog box appears. The default password is **“654321”**.



After entering the password, system will get to the safety selection interface.

Safety selection interface:



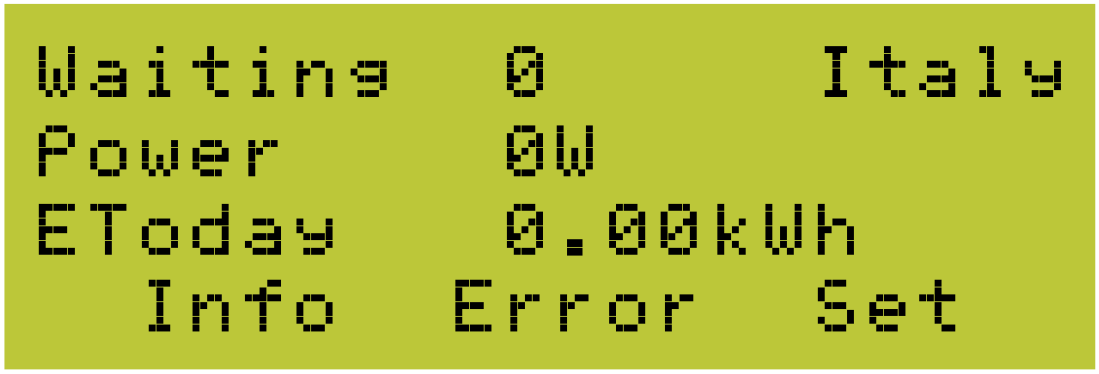
The selected safety information flickers. The selectable safety information as following:

Italy	VDE-4105	VDE-0126	Spain	GREMAIN
Portugal	Belgium	Italy_S	EnglG83	EnglG59
Austral	China	GerBDEW	Danmark	GreIsla
Czech	Slovak	Holland	Sweden	Bulgari
France	Brazil	EngG592	Holl16A	SAfrica

This safety information will be arranged in 4 lines, i.e. there will be 4 safety information displayed in the same interface.

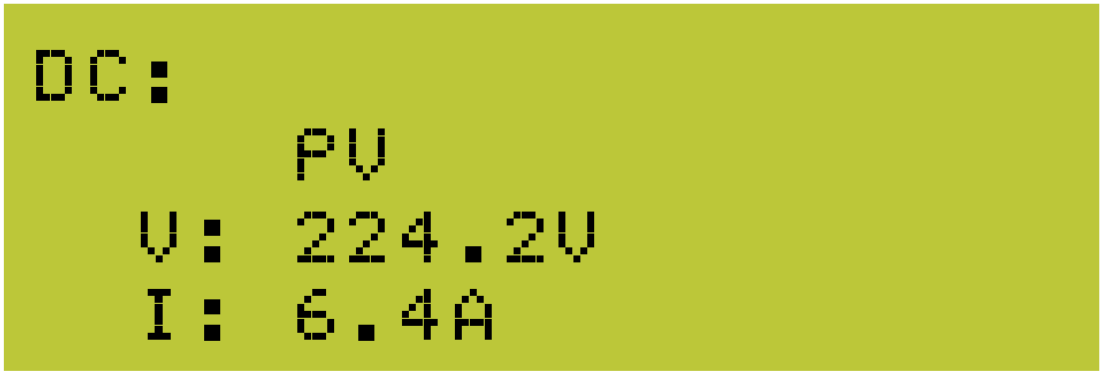
Info Interface:

You can choose **"Info"** by **UP** and **DOWN** key in system operation interface 1

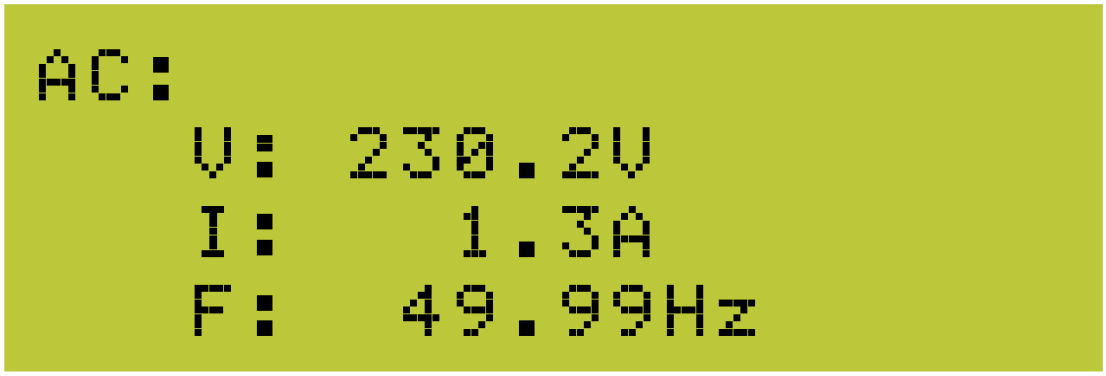


While **"Info"** flickers. Confirm to enter Info mode. There will be 7 interfaces in the Info mode.

1. PV panel information:

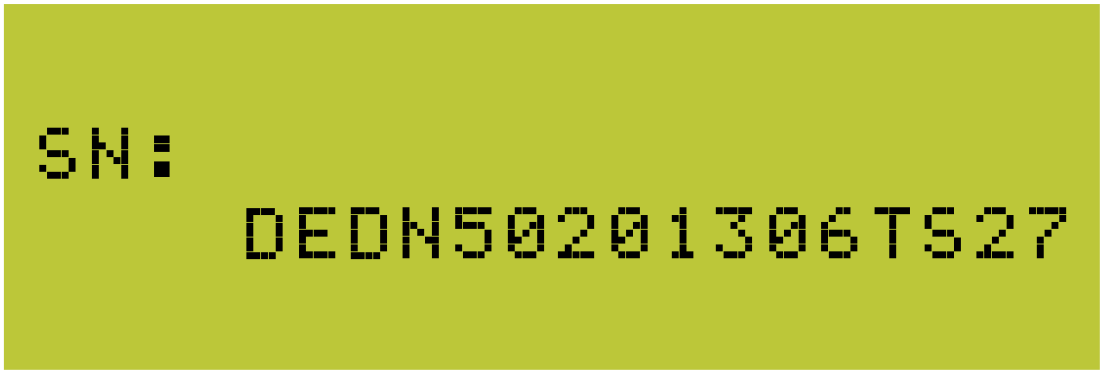


2. AC grid information:

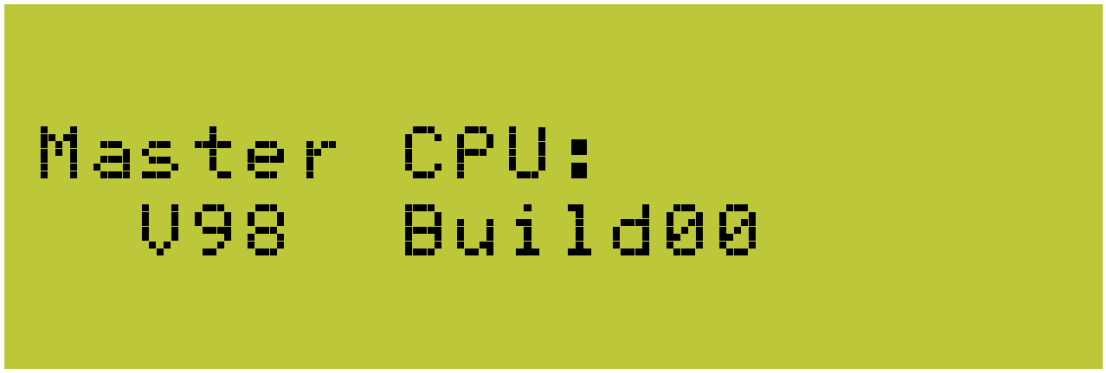


3. Inverter’s model information:

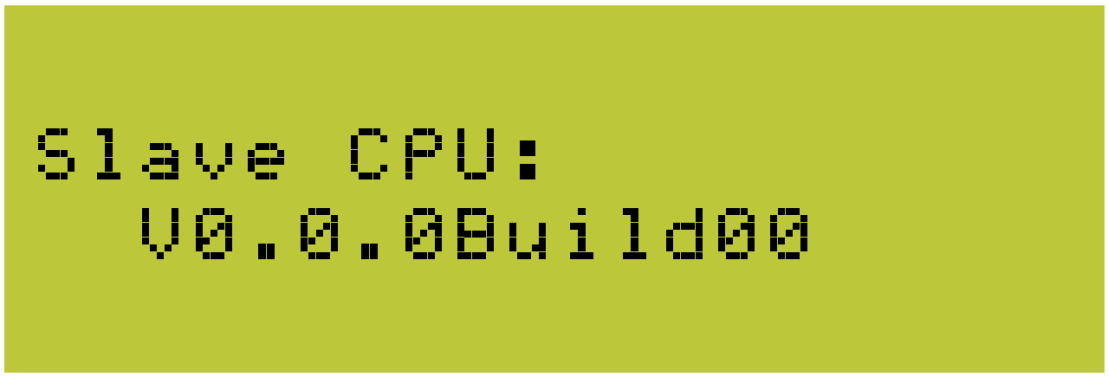
4. Inverter’s SN information:



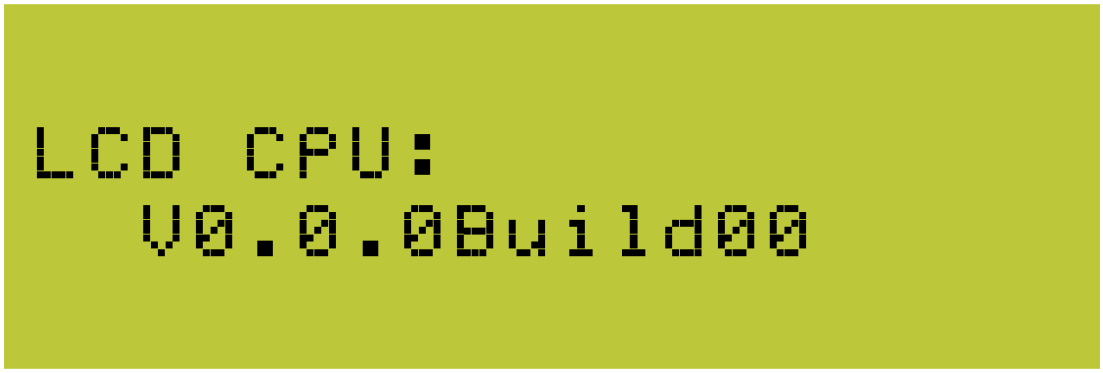
5. Inverter’s master CPU information:



6. Inverter’s slave CPU information:



7. Inverter’s display module version information:



Error record display interface:

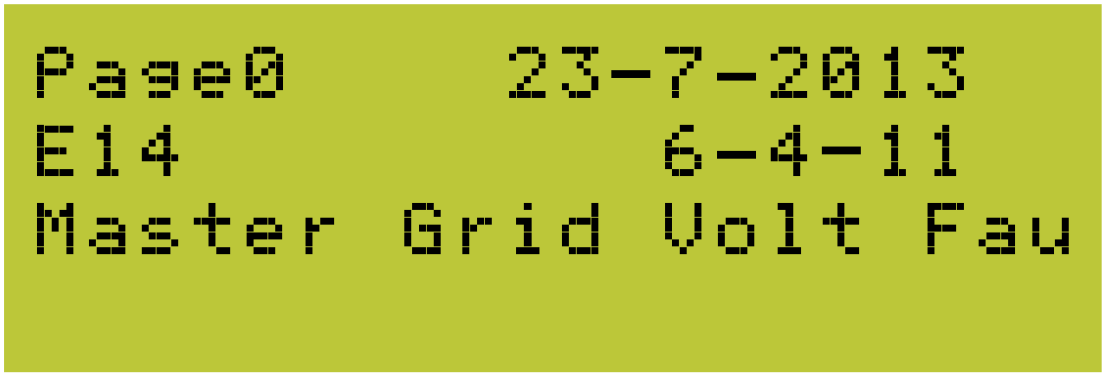
You can choose **"Error"** by **UP** and **DOWN** key in system operation interface 1

While **"Error"** flickers, confirm to enter the Error record mode.

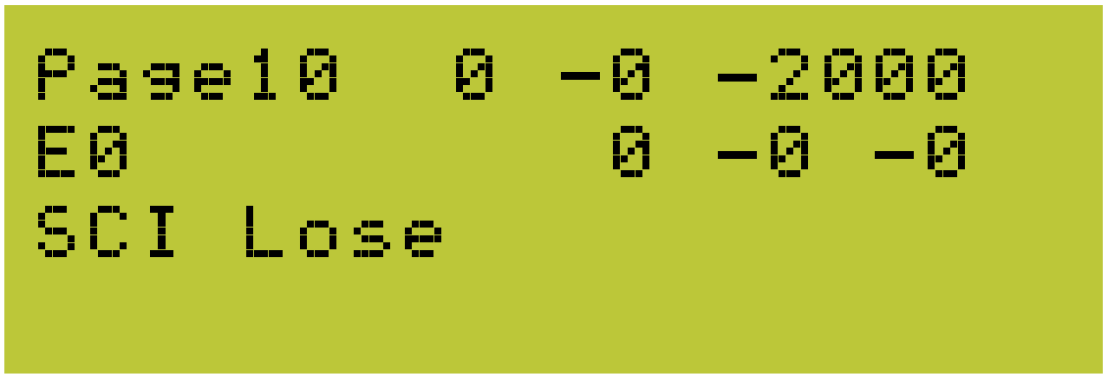
Interface number of the Error record mode is unfixed; it ranges from 0 to 9 interfaces.

No error record interface:

Recent error record interface:

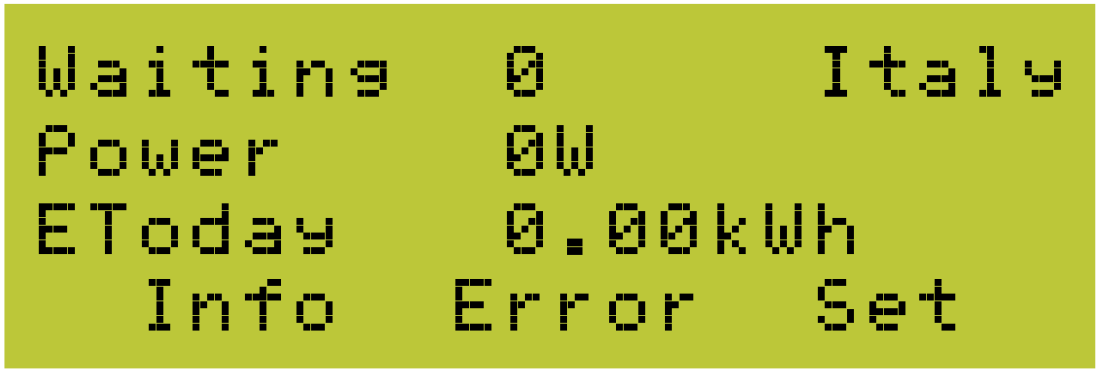


Earliest error record interface:

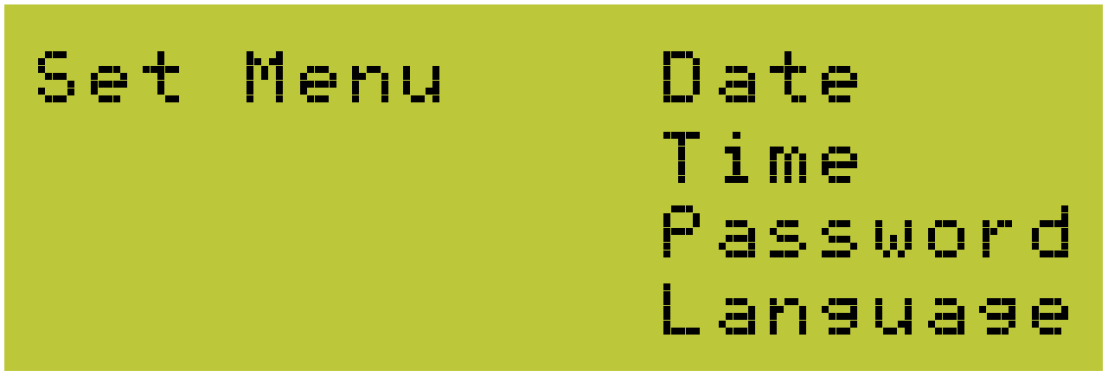


Set mode:

You can choose **"Set"** by **UP** and **DOWN** key in system operation interface 1



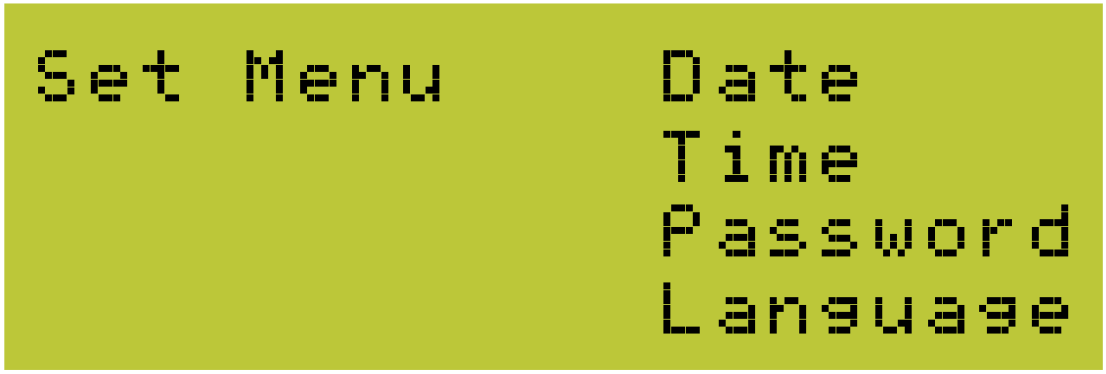
While **"Set"** flickers, confirm to enter the Set mode.
The Set mode is operated with 2 levels of menu. There are five items in the sub-menu, Time, Data, Password, Language and Wi-Fi. The items are shown as following picture.



Choose the item which needs adjustment by **UP** and **DOWN** key in the sub-menu. The flickering one is the selected item.

Setting Language:

In the Set mode, choose Language by Up and Down key (as shown in the picture)

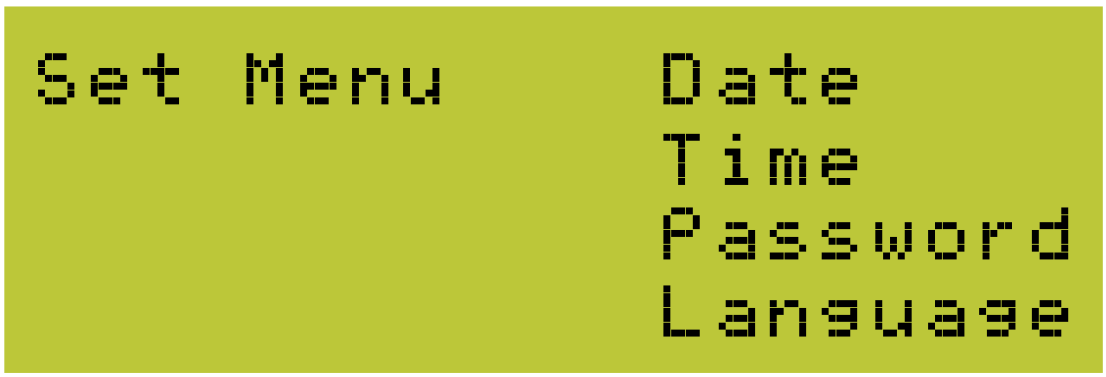


While **"Language"** flickers, confirm to enter the language option list.

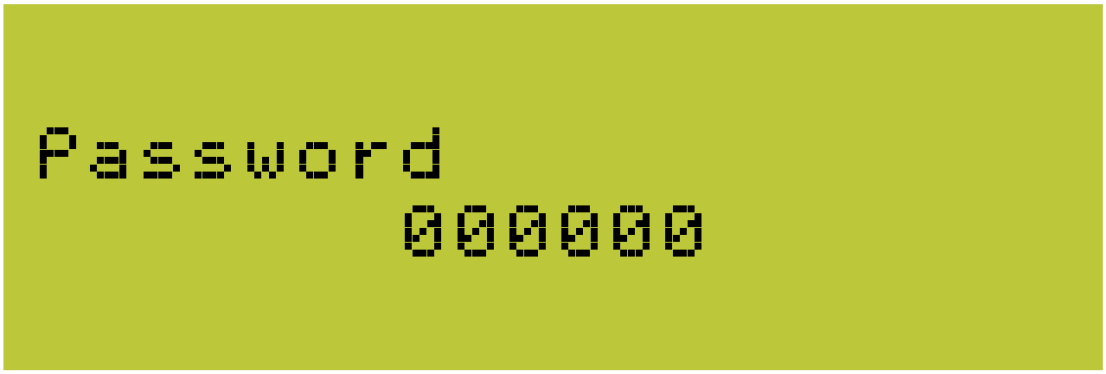
Choose the target language, the corresponding language flickers. English, Dutch and German are available for displaying. Click **ENTER** to save data and back to prior menu.

Changing Password:

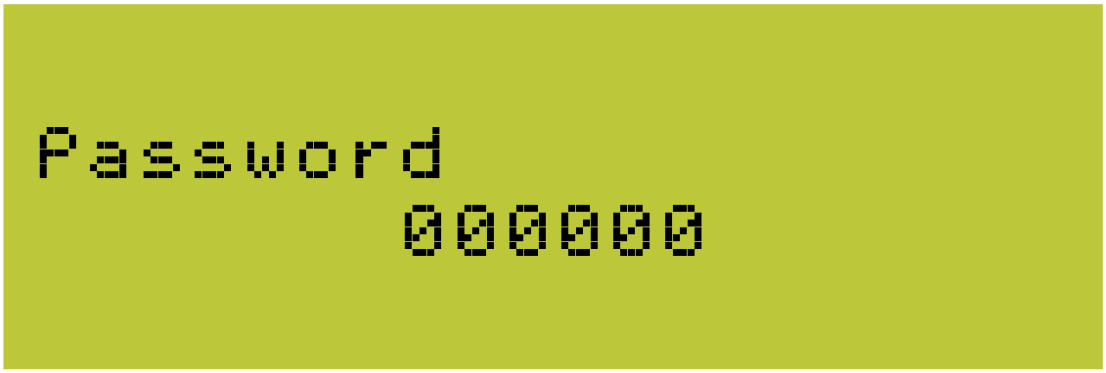
In the Set mode, choose "**Password**" by **UP** and **DOWN** key as shown in the picture.



While **“Password”** flickers, confirm to enter the password modified interface.



Input 6 figure passwords, check correctness and enter the modified mode

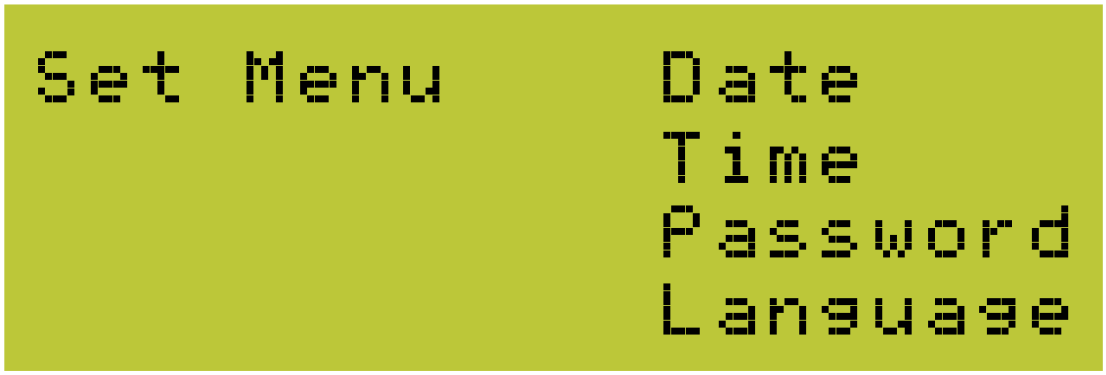


Save password after the end of input

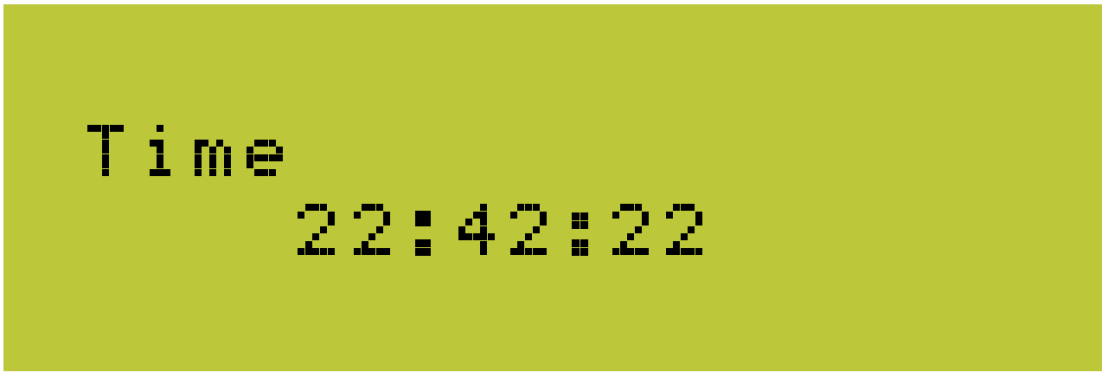
Back to two-level menu mode after saving the password

Setting Time:

In the Set mode, choose **“Time”** by **UP** and **DOWN** key as shown in the picture.



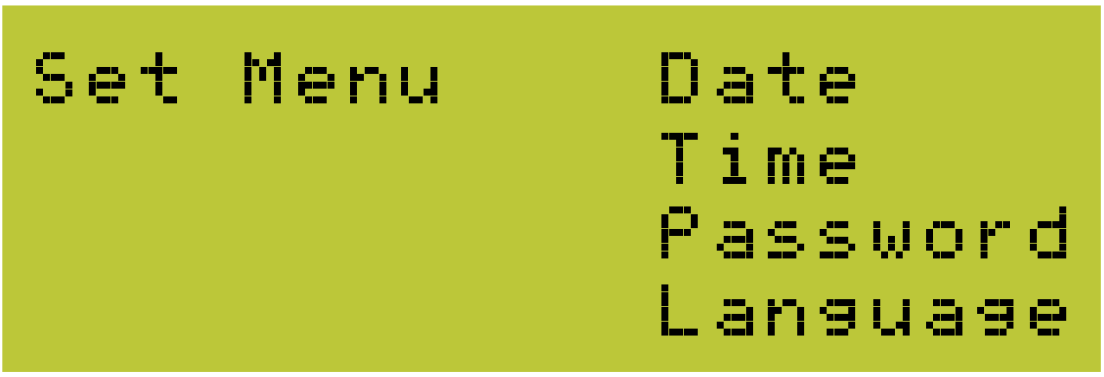
While **“Time”** flickers, confirm to enter the inverter time setting mode.



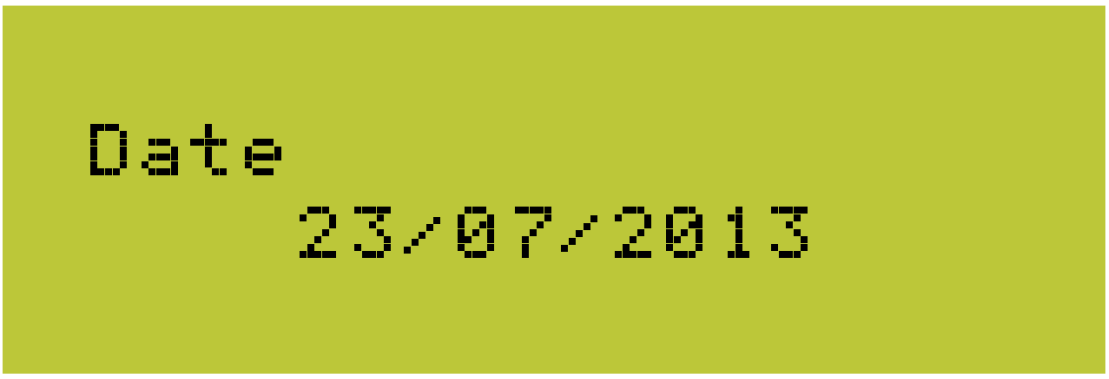
There are hour, minute and second displayed in the time setting mode. Use ENTER key to choose the one you want to modify and **UP/DOWN** key to change the value.

Setting Date:

In the Set mode, choose **“Date”** by **UP** and **DOWN** key as shown in the picture.



While **“Date”** field flickers, confirm to enter the inverter Date Setting mode



There are day, month and year displayed in the date setting mode, set date by **Up/Down** key. Confirm to enter the next setting data, the sequence is day/month/year. After setting year, return to the two-level menu mode.

7.4 State Information

State	Display	State information
Wait	Waiting	Initialization & waiting
	Reconnects	Reconnect
	Checking's	Checking
Normal	Normal	Normal state
Fault	Current Fault	GFCI failure oversized leakage current
	Master Grid Freq Fault	Grid frequency failure
	Master Grid Freq Fault	Grid voltage failure
	PV Voltage Fault	Input voltage too high
	Over Temp Fault	Temperature abnormal
	Isolation Fault	Isolation failure
	Relay1 Fault Relay2 Fault	Output relay failure
	Current DC Offset	Output DC injection too high
	Eeprom Fault	EEPROM problem
	SCI Lose	Serial communication interface failure
	Hole Sense Device Fault	Output AC sensor abnormal
	GFCI Failure	GFCI testing device abnormal
Flash	F/W Updating	Update

About the further information for each fault, please reference to chapter **"8.Troubleshooting"**.

8. Troubleshooting

	LCD display	Possible actions
Correctable Fault	Isolation Fault	1. Check the impedance between PV (+) & PV (-) and the inverter is earthed. The impedance must be greater than 2MΩ. 2. Check whether the AC-side has contacts with earth.
	Current Fault	1. The ground current is too high. 2. After cut off the AC side connection, unplug the inputs from the PV generator and check the peripheral AC system. 3. After the cause is cleared, re-plug the PV panel and AC connection, and check PV-Inverter status.
	Master Grid Freq Fault Master Grid Volt Fault	1. Wait for a moment, if the grid returns to normal, PV-Inverter automatically restarts. 2. Make sure grid voltage and frequency meet the specifications.
	No Utility	1. Grid is not connected. 2. Check grid connection cables. 3. Check grid usability. 4. If grid is ok, and the problem persists, maybe the fuse in the inverter is open, please call service.
	Over Temp Fault	1. The internal temperature is higher than specified normal value. 2. Find a way to reduce the ambient temperature. 3. Or move the inverter to a cooler environment.
	PV Voltage Fault	1. Check the open PV voltage; see if it is greater than or too close to 500VDC (for Z10I1K, Z10I1K5, Z10I2K, Z10I2K5 or Z10I3K). 2. If PV voltage is less than 500VDC, and the problem still occurs, please call local service.
Permanent Fault	ENS Grid Voltage Fault ENS Grid Freq Fault	Disconnect PV (+) or PV (-) from the input, restart the inverter.
	Relay1 Fault Relay2 Fault	1. Disconnect ALL PV (+) or PV (-). 2. Wait for a few seconds. 3. After the LCD switches off, reconnect and check again. 4. If the problems remain please call local service.
	Current DC Offset	
	Eeprom Fault	
	SCI Lose	
	Hole Sense Device Fault	
	GFCI Device Fault	

Error code list：

ERROR CODE	Description
0	GFCI Device Fault
1	Hole Sense Device Fault
2	Reference Device Fault
3	DCI ENS Fault
4	GFCI ENS Fault
5	Less Bus Low Voltage Fault
6	Over Bus High Voltage Fault
7	Master Device Fault
8	Master Delta Grid Z Fault
9	No Utility
10	Current Fault
11	Bus Voltage Fault
12	B12
13	Over Temp Fault
14	Auto Test fail
15	PV Voltage Fault
16	Fan Fault
17	Master Grid Volt Fault
18	Isolation Fault
19	Current DC Offset
20	ENS Grid VFZ Fault
21	ENS Grid Z Fault
22	ENS Grid Freq Fault
23	ENS Grid Voltage Fault
24	Relay2 Fault
25	Relay1 Fault
26	Slave Grid Z Fault
27	Master Grid Z Fault
28	Slave Grid Freq Fault
29	Master Grid Freq Fault
30	Eeprom Fault
31	SCI Lose

9. Abbreviation

LCD	Liquid Crystal Display
LED	Light Emitting Diode
MPPT	Maximum Power Point Tracking
PV	Photovoltaic
Vdc	Voltage at the DC side
Vac	Voltage at the AC side
Vmpp	Voltage at the Maximum Power Point
Impp	Amperage at Maximum Power Point
AC	Alternating Current (Form of electricity supplied by Utility Company)
DC	Direct Current (Form of electricity generated by PV modules)
DC Switch	Switch in the DC Circuit. Disconnects DC source from Inverter. May be integrated or external to Inverter

10. Contact

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