



User Manual

5G PRO INVERTER

KSY-30KW/33KW/35KW/40KW/50KW60KW

3-Phase Grid-tied Solar Inverter

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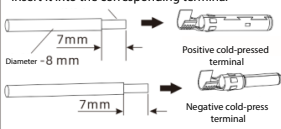
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DC Commissioning :

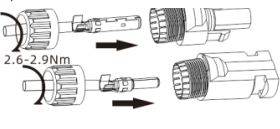
Step 1: Peel off the insulation layer of the cable & insert it into the corresponding terminal



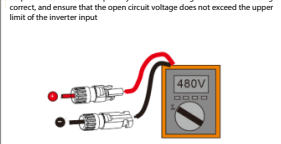
Step 2: Use a suitable crimping pliers to crimp the corresponding wire



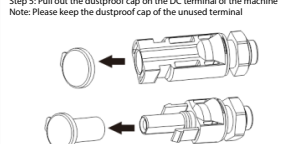
Step 3: Insert the crimped terminal into the corresponding plastic shell



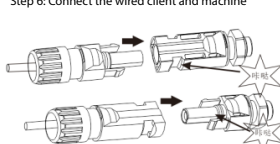
Step 4: Check whether the polarity of the connecting cables of the PV string is correct, and ensure that the open circuit voltage does not exceed the upper limit of the inverter input



Step 5: Pull out the dustproof cap on the DC terminal of the machine
Note: Please keep the dustproof cap of the unused terminal



Step 6: Connect the wired client and machine



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1. SYMBOLS ON THE LABEL

	DANGER, WARNING AND CAUTION		RECYCLABLE AND REUSABLE
	HIGH VOLTAGE AVOID CONTACT		AVOID DAMP AND MOISTURE
	HIGH TEMPERATURE AVOID CONTACT		SHIPMENT STACK LIMIT: 8
	CE MARKS		DO NOT DISPOSE WITH HOUSEHOLD WASTE
	PROCEED OPERATIONS AFTER 5 MINUTES DISCHARGE		BREAKABLE ITEM
	PLACE UPWARDS		USER MANUAL IN PACK

2. SAFETY AND WARNINGS

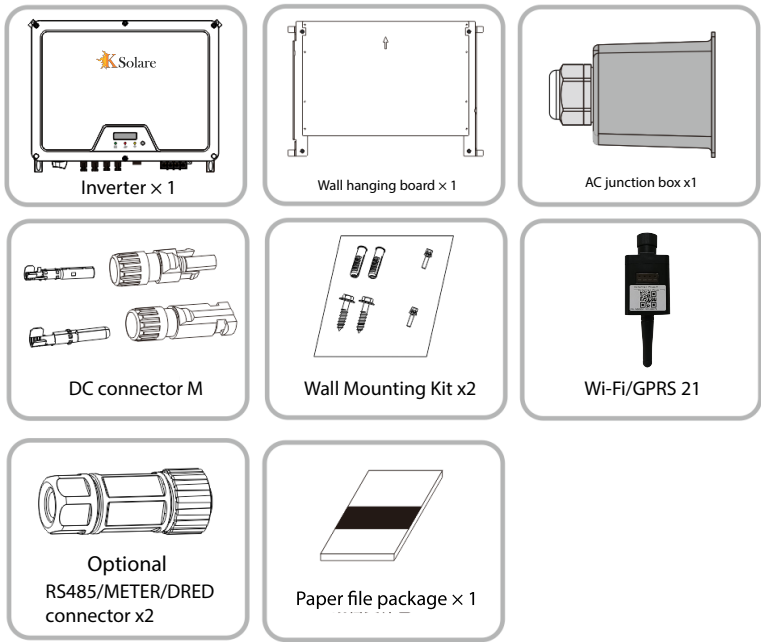
1. All persons who are responsible for mounting, installation, commissioning, maintenance, tests, and service of KSOLARE inverter products must be suitably trained and qualified for corresponding operations. They **MUST** be experienced and have knowledge of operation safety and professional methods. All installation personnel must have knowledge of all applicable safety information, standards, directives, and regulations.
2. The product must **ONLY** be connected and operated with PV arrays of protection class II, in accordance with IEC 61730 , application class A. The PV modules must also be compatible with this product. Power resources other than compatible PV arrays **MUST** not be connected and operate with the product.

3. When designing or constructing a PV system, all components MUST remain in their permitted operating ranges, and their installation requirements MUST always be fulfilled.
4. Under exposure to sunlight, the PV array may generate dangerous output in DC voltage. Contacts with the DC wires, conductors and live components in the inverter may result in lethal shocks.
5. High voltages in inverter could cause lethal electrical shocks. Before proceeding any work, including maintenance and/or service, on the inverter, fully disconnect it from all DC input, AC grid and other voltage sources. There MUST be a 5 -minute waiting time after the full disconnection.
6. The DC input voltage of the PV array MUST never exceed the maximum input voltage of the inverter.
7. DO NOT touch parts of the inverter during operation as heat will be induced and these parts will exceed 60 °C.

3. 3 UNPACKING

3.1 Scope of Delivery

Please inspect and check for completeness in the scope of delivery. Confirm with purchase order.



1. DC Connector

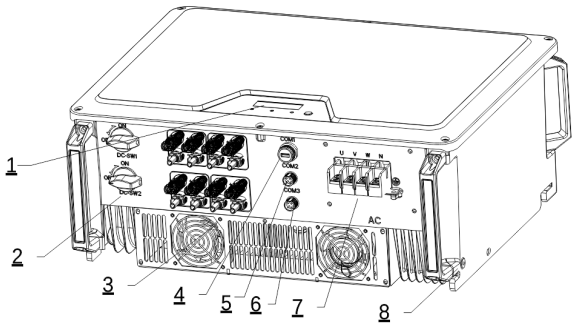
KSYS-30K/33K/36KW 6 pairs

KSYS-40K/50K/60KW 8 pairs

2. Wi-Fi/GPRS optional

3.2 Product Overview

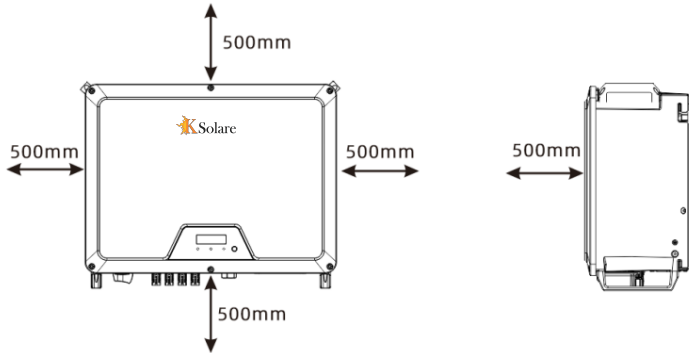
- 1. LED&LCD or LED
- 2. DC Switch
- 3. PV Terminal (s)
- 4. COM1: Wi- Fi/GPRS/RS485 port
- 5. COM2: Smart Meter port
- 6. COM3: RS485
- 7. AC Terminal
- 8. Secondary PE Terminal



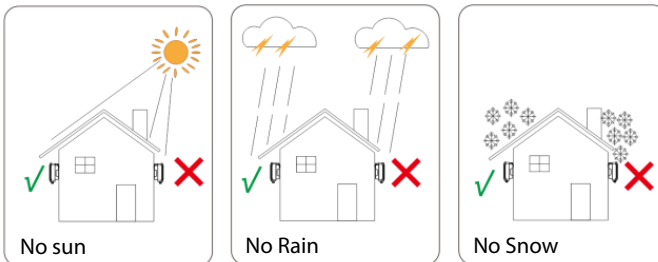
4. 4 INSTALLING

4.1 Installation Requirement

1. Please install the inverter(s) in places that can avoid inadvertent contact.
2. Installation method, location and surface must be fitting for the inverter's weight and dimensions.
3. Please install the inverter in an accessible location for operation, future maintenance and service.
4. The inverter performance peaks at ambient temperature lower than 45° .
5. When installing in residential or domestic environment, it is recommended to install and mount the inverter on a solid, concrete wall surface. Mounting the inverter on composite or plaster boards or walls with similar materials would induce noise during its operation and is therefore not recommended.
6. DO NOT cover the inverter NOR place any objects on top of the inverter.
7. To ensure sufficient room for heat dissipation and maintenance, the clearing space between inverter(s) and other surroundings is indicated below for reference:

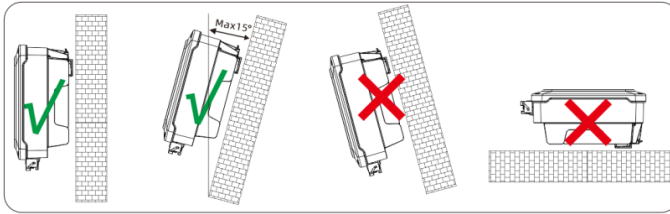


8. Avoid direct exposure to sunlight and rain and snow layup.



4.2 Mounting Location

1. DO NOT mount the inverter near any inflammable materials.
2. DO NOT mount the inverter near any explosive materials.



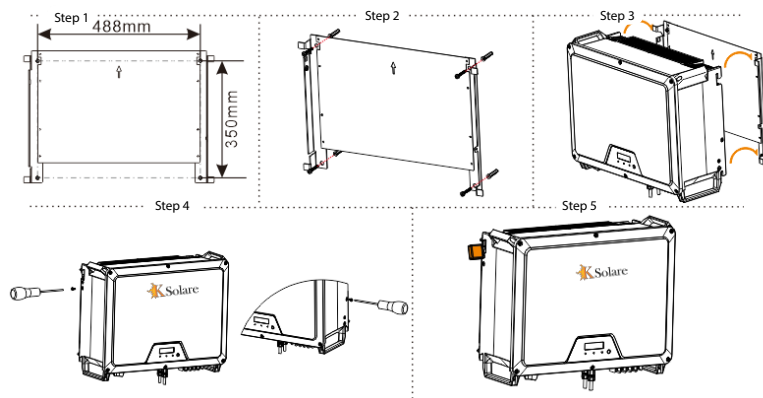
3. DO NOT mount the inverter on tilting surface over 15° backwards. Please mount the inverter on a vertical wall surface.
4. DO NOT mount the inverter on any surfaces tilting forward or to either sides.
5. DO NOT mount the inverter on a horizontal surface.
6. For easy installation and operation, please mount the inverter on a height that the display could match eye level.
7. The bottom side where all commissioning terminals are equipped MUST always point downwards.

4.3 Mounting

Wall - mounting the inverter

1. Use the mounting bracket as a template and drill holes of 10mm diameter and 70mm depth.
2. Fix the mounting bracket with the screws and expansion bolts packed in mounting accessories.
3. Hold onto the handles on the inverter and tilt it slightly forward. Hang up the inverter and attach it to the mounting bracket. Check both sides of the heat sink to ensure it is stably attached.
4. Observe from above, ensure the inverter has been securely attached to the bracket.
5. Use M5 screws (T25 screwdriver, torque 2.5 Nm) to attach the heat sink fins to the mounting bracket.

It is recommended to attach the anti-theft lock to the inverter. Lock diameter $\phi 4-5.5$ mm recommended.

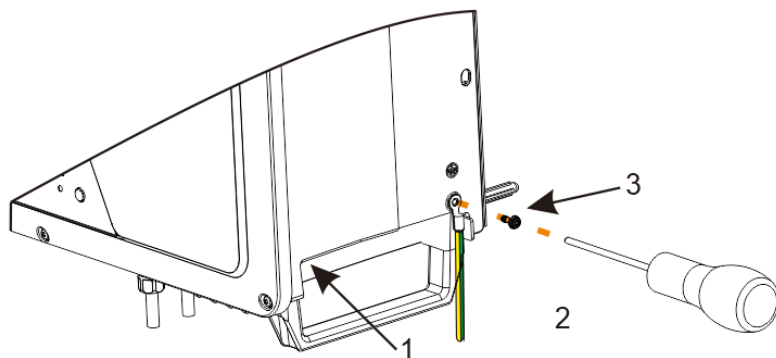


Racket - mounting the inverter:

In the same way as wall- mounting the inverter, only replace the expansion bolts and screws with M10*45 Stainless steel full thread screw assembly (The assembly incl. bolt, nut, flat washer, spring washer is not included in the package)

4. 4 Installing the secondary PE cable

1. Insert the grounding conductor into the suitable OT terminal lug and crimp the contact.
2. Align the terminal lug with the grounding conductor and the ground washer on the screw. The teeth of the ground washer must be facing the housing.
3. Tighten it firmly into the housing (M6 PE terminal, screwdriver type: Pan head, torque: 4.5Nm).



Information on grounding components:

Object	Description
1	Housing
2	M6 terminal lug with protective conductor
3	M6×12 pan head screw

Note: PE cable requirements

Diameter	Cross- section	
$16 < S \leq 35 \text{mm}^2$	16mm^2	Only suitable when the material of PE cable is aligned with other AC phase cables. In case the materials are different, please ensure the resistance is equivalent to the figure mentioned in the table.
$S > 35 \text{mm}^2$	$S/2$	



Danger

Please install the secondary PE before connect any other cables.

Secondary PE cannot replace the connection of PE terminal in AC wiring . Both PE and secondary PE should be properly installed.

KSOLARE will not take account for any consequences caused by violating the requirement.

5. 5 COMMISSIONING

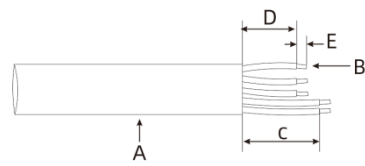
5.1 Safety Instructions

1. Measure the frequency and voltage of grid connection and make sure they follow the inverter's grid connection specifications.
2. An external circuit - breaker on the AC side (or a fuse) at 1.25*AC rated current is strongly recommended.
3. Reliability of all earth connections must be tested and valid .
4. Before commissioning, disconnect the inverter and the circuit - breaker or fuse, and prevent accidental reconnection.

5.2 AC Wire Assembly and Connection

5.2.1 AC Commissioning

Five core flexible copper recommended,& strip the cable in Such way :



	Description	Value
A	Outer Diameter	KSY-30KW/KW-33KW/35KW:22 30mm KSY-40KW/KSY-50KW-60KW:30 50mm
B	Conductor cross-section	U,V,W,N (KSY-30KW/KSY-33KW/KSY35KW): 16~35mm ² (KSY-40KW/KSY-50KW/KSY60KW): U,V,W,N (KSY-40KW/KSY-50KW/KSY60KW): Copper wire recommended 35~50mm ² 70mm ² is recommended for aluminum wire PE line: see the requirements in the table below
C	N/PE Cable insulation strip length	Approx. 90 mm
D	U/V/W Cable insulation strip length	Approx. 70 mm
E	Cable insulation strip length	Approx. 20 mm
Make sure the strip length of PE is approx. 20 mm longer than L1、 L2、 L3 and N.		

AC phase cable cross- section	PE cable cross - section	Note
$16 < S \leq 35 \text{mm}^2$	16mm^2	
$S > 35 \text{mm}^2$	$S/2$	Only suitable when the material of PE cable is aligned with other AC phase cables. In case the materials are different, please ensure the resistance is equivalent to the figure mentioned in the table.

Cable cross section depends on the model of the inverter, ambient temperature, cable routing method, cable type, cable losses and other installation requirements.

Aluminum cable requirements:

Copper aluminum transition terminal is obligated to prevent electrochemical reaction

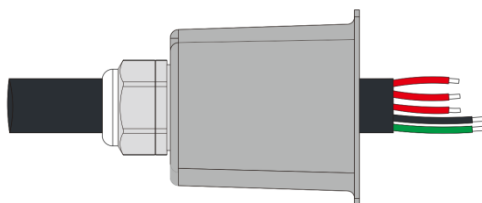
Please follow the steps:



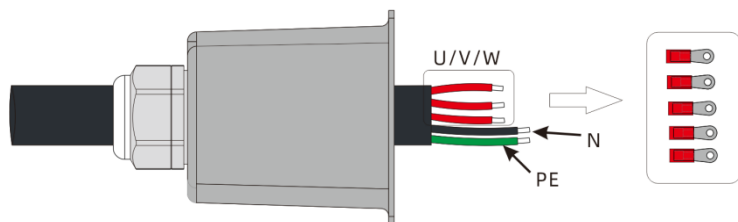
Danger

Danger due to high voltage electricity

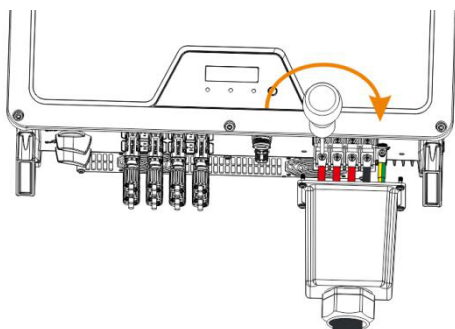
1. Disconnect AC circuit breaker and ensure it cannot be connected by accident.
2. Strip the cable as required.
3. Thread the cable through forcing nut of waterproof joint, sealing plug, waterproof joint and junction box.



4. Insert the grounding conductor into the OT terminal lug in the accessory pack and crimp the contact, ensure the insulation protection has been done properly.



5. Insert PE, N, U, V and W cable into correspondent hole. And secure with cross screwdriver (Torque: 4.5 6Nm)



Danger

False connection could damage the inverter

5. 2.2 AC Switch Types

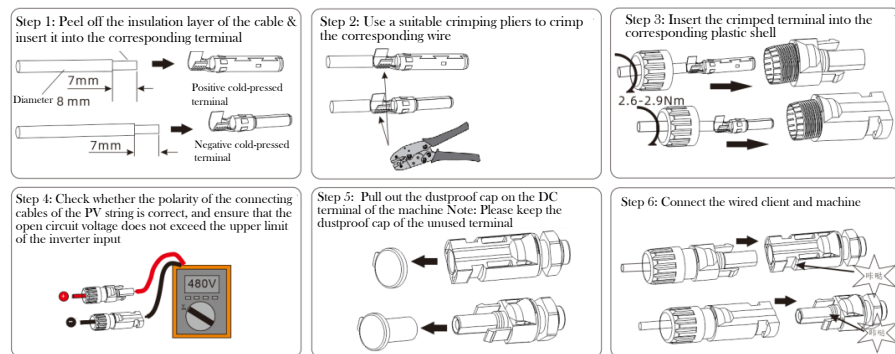
Please install an individual 2 - stage miniature circuit breaker according to the following specifications:

Model	Maximum output current (A)	AC Breaker Rated current (A)
KSY- 30KW	50A	63
KSY- 33K W	55 A	63
KSY- 35K W	60 A	80
KSY-40K W	66.7 A	80
KSY- 50K W	80 A	100
KSY-60KW	88A	108A

5.3 DC Wire Assembly and Connection

1. PV modules of the connected strings must be of: the same time, identical alignment and tilting angle.
2. Before commissioning and connecting the PV arrays, the DC switch **MUST** be open.
3. Parallel strings must have the same number of modules.
4. It is mandatory to use the DC connectors within package for the connection of PV arrays.
5. The polarity of the PV arrays **MUST** be compatible to the DC connectors of the inverter.
6. The DC input voltage **AND** DC input current of the PV array **MUST** never exceed the maximum input allowance of the inverter.

DC Commissioning :



5.4 Residual Current Protection

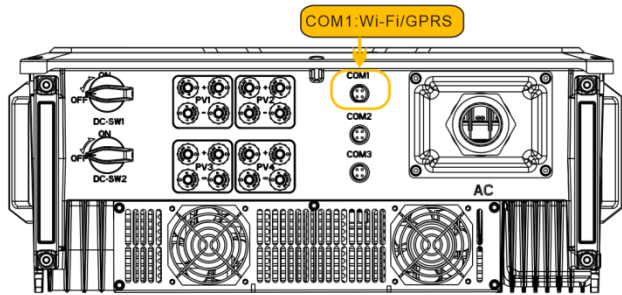
This product is equipped with residual current protection device internally, in accordance with IEC 60364 - 7- 714. An external residual current protection device is not needed.

If the local regulation demands otherwise, it is recommended to install a 30mA Type B residual current protection device.。

6. 6 COMMUNICATION

6.1 System monitoring via Datalogger - RS485/ Wi- Fi /GPRS (Optional)

Wi - Fi /GPR S Datalogger Installation



1. Unpack the Datalogger from package.
2. Unscrew the cap in COM1 port and plug the Datalogger in and tighten.
3. For user guidance and configuration of Datalogger, please refer to the corresponding KSOLARE Wi - Fi Stick Guide manual, which is available in printed form inside Documents pack, or an online manual on KSOLARE website at www.ksolare.com

RS485 Installation

location description

Step 1

Insert the wire end into the European terminal (DIN46228-4) and crimp it

Step 2

Insert the crimped conductors into the corresponding terminals, and tighten the screws with the screwdriver in the attached packaging bag.

RS485	COM1	METER - DRED	COM2
Power +	→ PIN 1	RS485 A	→ PIN2
Power -	→ PIN2	RS485 B	→ PIN3
RS485 A	→ PIN3	COM LOAD/O	→ PIN1
RS485 B	→ PIN4	REF GEN/O	→ PIN4

Step 3

The guide groove

Step 4

Insert the wired connector into the AC output port and tighten. When operating, first align the groove on the head of the terminal block with the rib on the inner ring of the output port.

7. 7 START UP AND OPERATION

7.1 Safety Check Before Start Up




Please check before switching on any voltage resources connected to the inverter and closing inverter's DC switch:

1. Grid Voltage: Check the grid voltage at point of connection at the inverter complies with permitted range of the inverter.
2. Mounting Bracket: Check if the mounting bracket is properly and securely installed.
3. Mounting of the inverter: Check if the inverter is properly mounted and attached to the mounting bracket.
4. DC Connectors: Check if the DC connectors are installed correctly on terminals.
5. AC C connectors and Wire Assembly: Check if wires are assembled correctly on the AC side and if the AC connector is properly and securely installed. Check if the AC connector is firmly plugged into AC terminal.
6. Cables: Check if all cables are reliably connected. Check if the connections are effective, while the insulations are undamaged.
7. Groundings: Check all groundings using multimeter and if all exposed metal parts of the inverter are properly grounded.
8. DC Voltage: Check if the largest open - circuit voltage of PV arrays complies with the permitted range.
9. DC Polarity: Check if the wires from DC voltage resource are connected to terminals with correct polarity.
10. Grounding Resistance: Check if the grounding resistance of PV strings $> 1\text{M}\Omega$ using a multimeter.

After all installation and checks, close the AC circuit - breaker, then the DC switch. The inverter will start to operate when DC input voltage and grid conditions meet the requirements of inverter startup.




7.2 Inverter LED Indicators

When the inverter operates, LED symbols on display have the following meanings:

 POWER	<ul style="list-style-type: none"><input checked="" type="radio"/> ON Inverter Power ON and Feeding Power to Grid<input type="radio"/> Blink Inverter Power ON. Not Feeding Power to Grid<input type="radio"/> OFF Inverter Power OFF, DC Disconnected
 FAULT	<ul style="list-style-type: none"><input checked="" type="radio"/> ON Inverter is Faulty<input type="radio"/> OFF No Fault
 COM	<ul style="list-style-type: none"><input type="radio"/> Blink Communication Device Connected<input type="radio"/> OFF Communication Device Disconnected

7.3 Fault Finding

Classifications of Fault Information

Fault Location	Fault Type	Error Message
<div> DC Side Fault</div>	Failures caused by PV side wiring	F5 - PV voltage too high F6 - Surface insulation resistance error F7 - GFCI exceeds the permissible range
<div> AC Side Fault</div>	Various faults caused by abnormal power grid or AC side wiring	F0 - 10min average voltage over the protection range F9 - No grid F10 - The grid voltage is out of range F11 - The grid frequency exceeds the range F19 - The voltage of N-PE is too high
<div> Inverter Fault</div>	Fault code caused by inverter itself	F1 - MCU fault F2 - Current sensor fault F3 - GFCI sensor fault F4 - Relay fault F12 - Dc component out of range F13 - EEPROM fault F14 - Master and slave DSP communication failure
Others	It may be caused by external installation environment, PV side and inverter itself. Further Diagnoses needed.	F8 - Temperature is out of range F15 - BUS voltage is too high F16 - BUS voltage is too low F17 - DRM S9 fault F18 - DRM S0 fault

❖ Faults & Troubleshooting

Grid (AC) Side faults

Fault code	Fault	Solution
Fault 9	No Grid	1. Check Ac (grid) Voltage In Connector 2. Phase to Neutral voltages 200V-250V 3. Phase to Phase Voltage 400V - 450V
Fault 10	The grid voltage is out of range	1. Check Grid Voltages 2. Phase to Neutral voltages 200V-250V 3. Phase to Phase Voltage 400V - 450V
Fault 19	The voltage of N-PE is too high	1. Check AC side Neutral to Ground Voltage less than 15V
Waiting	-	1. Check Connection in AC connector 2. Grid voltages in inverter 3. Check Version & make Online system

(Panel) DC Side faults

Fault code	Fault	Solution
Fault 5	PV voltage too high	1. Check DC Side Voltages 2. For single phase voltage under 500V 3. For Three phase voltage under 1000V
Fault 6	Surface insulation resistance error	1. Check DC side Positive to ground voltage & negative to Ground voltage less than 50V
Display Off	-	1. Check String polarity 2. Check DC Voltage <ul style="list-style-type: none">• For single phase 1kw - 3.3kw start up voltage 80V - 500V• For single phase 4kw - 6.2kw start up voltage 100V - 550V• For Three phase 3kw - 60kw start up voltage 200V - 1100V 3. Loose connection in string / looe crimping

Log complaint on <https://bit.ly/3eRZba9>

Contact 8530111222 / 7888009282 / 7030955507 /01

8. SYSTEM MAINTENANCE

Content	Maintenance Measures	Cycle
System Cleaning	<ul style="list-style-type: none">• Check if the heat sink is covered and dusted	Annually OR Half a year
System Status	<ul style="list-style-type: none">• Inspect the enclosure for damage/deformation• Check if the parameters are normal during operation	Half a year
Commissioning	<ul style="list-style-type: none">• Check if the cables are loose• Check if the cable insulations are damaged, especially the parts in contact with metal surfaces	Half a year after first commissioning Annually OR Half a year
Grounding	<ul style="list-style-type: none">• Check if the cables are securely grounded	Half a year after first commissioning Annually OR Half a year



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