User Manual for 500kW Photovoltaic Grid-connected Inverter
SOLARTEC CENTRAL 500
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1 • General

1.1 Foreword

Dear users,
Thank you for using the photovoltaic grid-connected inverter Solartec Central 500 produced by Beijing Kinglong New Energy Technology Co., Ltd. We sincerely hope that the product meets your demand. Please do not hesitate to contact us if you have any suggestions.

1.2 How to Use this Manual

This manual provides the users detailed product information, and installation and operation instructions for Solartec Central 500 photovoltaic grid-connected inverter from Beijing Kinglong New Energy Technology Co., Ltd.

Please read this manual carefully before using the product.

2 • Safety Information

2.1 Symbol Description

The following symbols are used in this manual. To use the product correctly, please read the symbol description carefully.

This symbol represents high hazard, which may cause personal casualty or serious accidents if not observed.

This symbol represents medium hazard, which may cause personal injury or equipment damage if not observed.

This symbol represents low hazard, which may cause the product unable to operate properly if not observed.

2.2 Safety Instructions

- Please read this manual carefully before installation. We do not provide any warranty for equipment damages caused by installation not in accordance with the instructions contained in this manual.
- All operations and connections must be carried out by professional electrical or mechanical engineers.
- During installation, do not touch any parts in the cabinet other than the terminals. All electrical installations must comply with local electrical installation standards.
- Solartec Central 500 does not include user self-maintenance module. When maintenance is required, please contact designated local system installation and maintenance personnel.
- Using Solartec Central 500 grid-connected power generation requires the permission of local power supply department and relevant operations carried out by professionals.
- When photovoltaic array is installed in the daytime, it should be covered by an opaque material; otherwise, a high voltage will be generated at the array terminal in the sunlight.

Make sure that the DC input voltage does not exceed 900V d.c. Higher input voltages may cause permanent damage of Solartec Central 500 and other losses. We do not provide any warranty or bear any responsibility for this.
3 • Product Introduction

3.1 Photovoltaic Grid-connected Power Generation System

Solar module → Grid-connected inverter → MV transformer → Public power grid

Figure 3-1 Schematic diagram of photovoltaic grid-connected power generation system

The Photovoltaic grid-connected power generation system consists of solar module, grid-connected inverter and distribution system (as shown in Figure 3-1). Solar energy is converted into direct current via the photovoltaic module, then converted into an alternating current having the same frequency and phase as the grid voltage via the grid-connected inverter, and finally incorporated into the power grid after being boosted and isolated by the medium voltage transformer.

Requirements on medium-voltage transformer:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated capacity</td>
<td>1MVA</td>
</tr>
<tr>
<td>Rated voltage (primary/secondary)</td>
<td>400V/300V</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50Hz</td>
</tr>
<tr>
<td>Connection mode</td>
<td>Yd11</td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>＞1500V</td>
</tr>
<tr>
<td>Short-circuit voltage (%)</td>
<td>＞6%</td>
</tr>
</tbody>
</table>

Requirements on power distribution box:

The distribution box is to be set up on both DC and AC side of the inverter. The nominal voltage and nominal current of the breaker on the distribution box should be higher than those of the inverter and the breaking capacity should be more than 50kA.

3.2 Circuit Structure

As shown in Figure 3-2, the schematic diagram of the main circuit of Solartec Central 500, the inverter converts direct current into alternating current via the three-phase bridge converter (DC/AC inverter module) and then into a sine wave voltage via the AC filter.

Figure 3-2 Schematic diagram of the main circuit of Solartec Central 500

3.3 Appearance Description

- **LCD Touch screen**
  The touch screen provides the user an easily operated and user-friendly human-machine interface. Its functions include operation data display, start/stop control, alarm processing (display, recording and inquiry) and historical fault report.

- **LED indicators**
  They are used to indicate the operating state of the system.
### 3.5 Technical Characteristics

Some critical technical characteristics of Solartec Central 500 grid-connected inverters are listed below:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High efficiency</strong></td>
<td>The maximum efficiency is up to 96.3%, the European weighted efficiency is 97.9%.</td>
</tr>
<tr>
<td><strong>Maximum Power Point Tracking (MPPT)</strong></td>
<td>The inverter executes Maximum Power Point Tracking (MPPT) algorithms to track the PV array maximum peak power point at any ambient temperatures and under any lighting conditions.</td>
</tr>
<tr>
<td><strong>Anti-islanding protection</strong></td>
<td>The inverter uses active and passive detection methods to detect the occurrence of islanding and stops automatically. It makes a reconnection when the line voltage returns to the specified range.</td>
</tr>
<tr>
<td><strong>Low Voltage Ride Through (LVRT)</strong></td>
<td>The inverter provides low voltage ride through function. The system includes an additional component, which enables quick response to the voltage dips in the power grid and restoration of grid-connected power generation after fault clearance.</td>
</tr>
<tr>
<td><strong>Reactive and power factor control</strong></td>
<td>The inverter supports reactive power output, with the power factor fully controllable within 0.9 (lagging) ~ 0.9 (leading).</td>
</tr>
<tr>
<td><strong>Low standby power consumption</strong></td>
<td>The nighttime power consumption is less than 40W.</td>
</tr>
<tr>
<td><strong>PV array ground fault monitoring</strong></td>
<td>The inverter can be equipped with a PV array ground fault monitoring device to monitor the PV array and the positive and negative DC buses of the inverter for ground faults.</td>
</tr>
<tr>
<td><strong>Very low Current Total Harmonic Distortion (THD)</strong></td>
<td>The current total harmonic distortion produced by the inverter is less than 3% (full load).</td>
</tr>
<tr>
<td><strong>Automatic identification of phase sequence of the power grid</strong></td>
<td>The inverter can automatically identify the phase sequence of the AC power grid. It has no phase sequence requirements when connected to the power grid.</td>
</tr>
<tr>
<td><strong>Remote monitoring</strong></td>
<td>The inverter can be equipped with various types of communication interfaces, such as optical fiber interface, to support remote monitoring of the inverter.</td>
</tr>
</tbody>
</table>

### 3.4 Internal Component Description

- **K1** - main DC contactor
- **K2** - precharge contactor
- **K3** - main AC contactor
- **Q1** - main AC circuit breaker
- **Q2** - control power circuit breaker
- **Q3** - UPS circuit breaker
- **UPS** - uninterruptible power supply
- **AIM** - filter module
- **ALM** - inverter module
- **J1** - supply terminal
- **J2-220Vac socket**
- **ISO** - insulation monitor
4. Product installation

4.1 General

- Check for Transportation Damages
  Solaris Centra 500 has been tested and inspected before delivery. However, damage may occur during transportation. Please check it carefully before installation. In case of any damage, please contact the transportation company or Beijing Kinglong New Energy Technology Co. Ltd. Please provide the photo of the damaged location, so that we can provide you with fast and quality service.

- Basic Installation Requirements
  Solaris Centra 500 is electronic equipment with the waterproof level of IP20. Do not place it in humid places. The following are the basic requirements:
  - It should be installed indoors and protected from sunlight and rain.
  - The equipment may produce noises (+65dB) during operation, it should preferably be installed far away from residential areas.
  - The mounting floor shall be firm and level.
  - The ambient temperature shall be within a specified range (-25°C to +50°C).
  - There must be a sufficient distance between the cabinet and the walls (-40cm) in order to ensure ventilation and heat dissipation.
  - The installation environment shall be well ventilated.
  - The equipment may generate heat during operation, do not place it near inflammable and explosive substances.
  - The installation environment shall be clean and dust-free.
  - The working elevation of the unit should not exceed 2000 meters. If it is installed at a place higher than 2000 meters, then the AC output current of the inverter must be de-rated. For details, please contact KLNE after-sales department for consultation.

4.2 Mechanical Installation

4.2.1 Safety Instructions

As an electronic product with a DC side voltage of up to 800V d.c. and an AC side voltage of up to 300V a.c., it is dangerous to touch its live parts.

4.2.2 Installation Method

Crane Lifting
- The lifting sling or rope must have a sufficient rated load capacity, i.e., for four-point lifting, the lifting capacity of each point must be greater than half the weight of the cabinet.
- The lifting sling or rope must have a sufficient length to ensure that the angle between the sling and the top edge of the cabinet is greater than 45° in accordance with DIN 580, as shown in Figure 4.1. Using a too short sling may apply too much pressure on the lifting ring and damage it.
- Before lifting, check to see if the crane is located correctly above the center of the cabinet in order to ensure that the cabinet will not swing on the rope during lifting.
- The paint on the top edge of the cabinet shall be protected from wear, as shown in Figure 4.2.

Forklift Lifting
Crane lifting is the first choice. Forklift lifting is used only when very necessary.
- Make sure that the floor is enough to withstand the total weight of the cabinet and the forkift.
- Make sure that the forkift has sufficient lifting capacity.
- Provide the fork arm with a pad made of rubber or other suitable materials to prevent damages.
- Keep the center of gravity steady. Do not lift the cabinet during lifting.
- Lower the product slowly.

Note: The angle of the cable or rope must be greater than 45°.
4.3 Electrical Installation

4.3.1 Safety Instructions

Before operation, make sure that both the AC and DC sides are voltage-free and that the capacitor of the DC bus has been discharged to the safe voltage range.

4.3.2 Input and Output Requirements

- **Photovoltaic Array**
  For SOLARAC 500, the recommended photovoltaic array maximum power can be up to 550kW. The maximum array open circuit voltage shall not exceed 900V d.c.; otherwise, the equipment may be damaged.

  **Recommended photovoltaic array maximum power: 550kW**
  **Maximum photovoltaic array open circuit voltage: 900V d.c.**

- **Three-phase Power Grid**
  SOLARAC 500 outputs a 300V a.c. three-phase AC voltage, which is connected to the secondary side of the medium voltage transformer and then incorporated into the power grid after being boosted and isolated by the medium voltage transformer. The secondary side of the medium voltage transformer shall be a three-phase IT system with a voltage fluctuation of -10% to +10% and a frequency of 49.5-50.5Hz.

  Permission shall be obtained from local electric power department before the installation of the grid-connected inverter.

  **Grid voltage: 3- 255.330V.**
  **Grid frequency: 49.5-50.5Hz.**
  The phase sequence of the power grid must be such that the phase A voltage precedes the phase B voltage by 120°.

4.3.3 Cable Requirements

<table>
<thead>
<tr>
<th>Cable</th>
<th>Size requirements (mm²)</th>
<th>Screw size</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photovoltaic array DC+</td>
<td>≥50 mm², 10 lines</td>
<td>M10</td>
<td>34</td>
</tr>
<tr>
<td>Photovoltaic array DC-</td>
<td>≥50 mm², 10 lines</td>
<td>M10</td>
<td>34</td>
</tr>
<tr>
<td>Ground wire PE</td>
<td>≥330mm²</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Phase A of the power grid</td>
<td>≥185mm²×3</td>
<td>M10</td>
<td>34</td>
</tr>
<tr>
<td>Phase B of the power grid</td>
<td>≥185mm²×3</td>
<td>M10</td>
<td>34</td>
</tr>
<tr>
<td>Phase C of the power grid</td>
<td>≥185mm²×3</td>
<td>M10</td>
<td>34</td>
</tr>
</tbody>
</table>

4.3.4 Connection Mode of the DC Side

- **Warning:**
  The photovoltaic array open circuit voltage shall not exceed 900V d.c., otherwise the equipment may be damaged.

- **Caution:**
  Make sure that the positive and negative polarities of the photovoltaic array are correct.

DC+ and DC- connector bars: the inverter provides 10 lines of photovoltaic array input, which are connected respectively to the positive and negative poles of the photovoltaic array. (The two front rows are DC+, the rear row is DC-)
4.3.5 Connection Mode of the AC Side

Connect the AC power grid:

- Open the AC side distribution circuit breaker and measure with a multimeter to make sure that the AC line connected to the terminal is voltage-free.
- Connect the three phases of the AC output to the three phases of the secondary side of the medium voltage transformer;
- Make sure that the wires are connected securely.

Before connecting the AC power grid, make sure that the AC incoming line is voltage-free.

4.3.6 Connection Mode of the Ground Wire

The ground line MUST be wired correctly according to our instructions, and must be permanent wiring.

In the cabinet of Solartec Central 500, a ground bar is reserved for the user to connect the special ground cable securely to the ground terminal in Solartec Central 500.
5. Functions and Operating Method

5.1 Operating Mode

SolarEdge Central 500 photovoltaic grid-connected inverter has four states, stopped state, standby state, running state, and fault state. SolarEdge Central 500 can automatically switch between these four operating states by judging the photovoltaic array voltage and other external conditions. The description and switching conditions of these four operating states are given below:

Stopped State
In the stopped state, the inverter is disconnected from the photovoltaic array and the power grid, the AC contactor, DC contactor and precharge contactor in the inverter are open.

Standby State
In the standby state, the AC contactor and DC contactor of the inverter are closed, the inverter can start operating once the external conditions are met.

Running State
In the running state, the inverter enables the output of PVM signal and operates in the grid-connection power generation mode and uses the maximum power point tracking (MPPT) technology to convert the direct current produced by the photovoltaic array into alternating current and incorporate it into the power grid to the maximum extent.

Fault State
In the fault state, the inverter blocks the PVM signal to stop power generation. Whether to start automatically or to wait for manual reset is decided according to the nature of the fault and the external conditions.

5.2 Switching Relationship

![Switching relationship diagram]

Note:
- The dashed lines represent automatic execution.
- The solid lines represent manual operation.
- "&" means that it is necessary to meet multiple conditions at the same time.
- "I" means that only one of these conditions needs to be met.
- Upv is the DC voltage of the component.
- Ppv is the power of the component.

5.3 Touch Screen Operation

<table>
<thead>
<tr>
<th>Level</th>
<th>Picture</th>
<th>Content Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td><img src="image" alt="Home" /></td>
<td>Display the main data and state parameters of the equipment.</td>
</tr>
<tr>
<td>Second level page</td>
<td><img src="image" alt="Second level page" /></td>
<td>View the detailed parameters of the equipment and change the relevant parameters.</td>
</tr>
<tr>
<td>Generated power histogram</td>
<td><img src="image" alt="Generated power histogram" /></td>
<td>Based on time sequence.</td>
</tr>
<tr>
<td>Realtime params</td>
<td><img src="image" alt="Realtime params" /></td>
<td>View the realtime values of the detailed parameters of the equipment.</td>
</tr>
<tr>
<td>Latest fault</td>
<td><img src="image" alt="Latest fault" /></td>
<td>View the latest fault.</td>
</tr>
<tr>
<td>Fault history</td>
<td><img src="image" alt="Fault history" /></td>
<td>View and inquire the historical faults.</td>
</tr>
<tr>
<td>Historical data</td>
<td><img src="image" alt="Historical data" /></td>
<td>Browse, search and export historical data.</td>
</tr>
<tr>
<td>Historical state</td>
<td><img src="image" alt="Historical state" /></td>
<td>Browse, search and export historical states.</td>
</tr>
<tr>
<td>Languages</td>
<td><img src="image" alt="Languages" /></td>
<td>Set the language of the operating picture (Chinese, English, Italian).</td>
</tr>
<tr>
<td>Network settings</td>
<td><img src="image" alt="Network settings" /></td>
<td>Set IP address on touch screen.</td>
</tr>
<tr>
<td>Time settings</td>
<td><img src="image" alt="Time settings" /></td>
<td>Set time on touch screen.</td>
</tr>
<tr>
<td>Protection parameters</td>
<td><img src="image" alt="Protection parameters" /></td>
<td>Examine and modify protection parameters and advanced parameters.</td>
</tr>
<tr>
<td>Parameter correction</td>
<td><img src="image" alt="Parameter correction" /></td>
<td>Correct DC voltage, current and daily generated power.</td>
</tr>
<tr>
<td>Parameter initialization</td>
<td><img src="image" alt="Parameter initialization" /></td>
<td>Initialize system parameters to the default values.</td>
</tr>
<tr>
<td>Version</td>
<td><img src="image" alt="Version" /></td>
<td>Display the versions of software and hardware.</td>
</tr>
<tr>
<td>Start/Stop</td>
<td><img src="image" alt="Start/Stop" /></td>
<td>Control the start/stop of the inverter.</td>
</tr>
</tbody>
</table>

Note:
To provide faster operation, each function picture includes navigation menu and state indication (with the same meaning). You can go from the function pictures at any level to the pictures at the other level.
5.3.1 Default Main Picture

Main operation data and state indication. This picture includes a structure diagram of photovoltaic grid-connected power generation system, DC voltage value, DC current value, AC line voltage value and AC line current value, output power, daily electricity generation and total electricity generation, system time, manual/automatic state, equipment state, etc.

Note:
- DC side voltage and current;
- AC side line AB voltage, line BC voltage and line CA voltage;
- AC side phase A current, phase B current, phase C current;
- Manual/automatic state. After startup, the inverter operates automatically and automatically switches between "Running", "Standby" and other states according to the conditions of the AC and DC sides. When it is stopped manually or due to a non-recoverable fault, the system switches to the manual state and needs to be operated manually;
- Equipment state. The standby state of the equipment is indicated by a blue icon. The running state is indicated by a green icon, and the fault state is indicated by a flashing red icon;
- Navigation menu. You can go from any picture to other function pictures rapidly and conveniently.
- Network state, namely the state of communication between touch screen and inverter;
- Energy saving and emission reduction, namely the reduction of CO2, SO2, Nox and smoke dust;
- Today's gen. time, namely the accumulated power generation time.

5.3.2 Start/Stop Operation

1. Start operation.
In any function picture, click the button on the navigation menu, a dialog box will pop up, as shown in the figure. Click the "Start" button.
If you do not want to start the equipment now, click the "×" icon on the top right corner of the dialog box to close the dialog box.

2. Stop operation.
In any function picture, click the button on the navigation menu, and a dialog box will pop up as shown in the figure. Click the "Stop" button.
If you do not want to stop the equipment now, click the "×" icon on the top right corner of the dialog box to close the dialog box.

Note: You can open this picture to execute the "Start/Stop" operation from any picture.

5.3.3 Switching Languages

1. Click the button to enter the equipment parameters picture, then click the "Languages" button.

2. Choose the language by clicking on the button "中文" "English" or "Italiano".

Note: The current version supports three languages --- Chinese, English and Italian.

5.3.4 View the Real-time Data

Beijing Kinglong New Energy Technology Co. Ltd.
5.3.5 Protection Parameters

1. Click the button to enter the equipment parameters picture, then click the “Protection parameters” button.

2. This interface shows grid overvoltage, grid undervoltage, grid freq exceeded, grid freq undershot, grid fault retry, power increase rate etc.

3. Parameter modification: Click the “Data frame”, an input box will pop up, as shown in the figure. Enter the parameter, and then click “OK”. If you do not want to change the parameter, click “Cancel”.

Note: Each parameter has an effective range. If the input value is out of the range, the system will change it to the upper or lower limit automatically.

5.3.6 View the Manufacturer Parameters

1. Click the button to enter the equipment parameters picture, then click the “Mfr. params” button.

2. Restore factory parameters: Click “Restore factory parameters”, and a prompt will pop up. Click “OK” or “Cancel” to start or cancel restoring.

Note: Standby first and then start restoring operation; otherwise, it cannot be done; After the factory parameters are restored, the key parameters will be restored to factory parameters and the generated power will come back to zero so users please be prudent before restoring it.

5.3.7 View the Version

1. Click on the button to enter the second level page. Click “Version”.

2. This interface shows model, serial number, manufacture date and software version.
5.3.8 View Fault History

1. Click on the button [File] to enter the second level page. Click "Fault history".

2. The system will record fault data automatically. Users can search for fault data by inputting the starting and ending time.

5.3.9 View the Latest Fault

1. Click on the button [File] to enter the second level page. Click "Latest fault".

2. When the network state icon becomes red and the word "fault" appears, the system can recover from the recoverable faults automatically; the irrecoverable fault can only be recovered manually and click "Clear".

5.3.10 View the Historical Data

1. Click on the button [File] to enter the second level page. Click "Historical data".

2. Every ten seconds, the system automatically stores the values of Vdc, Idc, Vac, Iac, power and today's gen. energy.

3. Historical Data Searching:
   Click "setting" and set the time range. Click "OK" or "Cancel" to proceed or cancel the search.

4. Historical data exportation:
   Click "Export data" and the interface of "Historical data" will pop up. Insert a flash disk. Set the starting and stopping time. Click "OK" or "Cancel" to export it or cancel the operation.

Note: The space for historical data storage is 500M. If the historical data exceeds it, the system will delete the earliest data. The USB port is in the back of the touch screen. It supports the flash disk with a capacity smaller than 4G.
5.3.11 View the Historical Event

1. Click on the button to enter the second level page. Click "Historical event".

2. The system stores the data of equipment’s state.

3. Historical event searching
   Click “Setting”. Set the time range and click “OK”.
   Then the historical data will be shown. Click "Cancel" to cancel searching.

4. Export historical event
   Click “Export data”. The prompt of "Save parameters" will pop up. Insert a flash disk. Set the starting and stopping time. Click "OK" or "Cancel" to export it or cancel the operation.

Note: ① The space for historical data storage is 50M. If the historical data exceeds it, the system will delete the earliest data. ② The USB port is in the back of the touch screen. It supports the flash disk with a capacity smaller than 4G.

5.3.12 View the Daily Electricity Generation

1. Click on the button to enter the second level page. Click "Power gen. histogram".

2. This interface shows the daily generated power.

Note: ① If the current time is not on the hour, the electricity generation from 0 minute 0 second of the hour to the current time is displayed;
② At 23:00 of each day, the value of daily generated power will be cleared to zero.

5.3.13 Network Setting

1. Click on the button to enter the second level page. Click "Network Setting".

2. Click the last digit of IP address and input the number. The number should be between 3 and 254.
5.3.14 Set the Time on Touch Screen

1. Click on the button to enter the second level page. Click “Time setting”.
2. Set the time and click “OK”.

5.3.15 Parameter Correction

1. Click on the button to enter the second level page. Click “Parameter correction”.
2. Set Volts d.c. compensation, DC compensation and power compensation.

5.4 Data Upload Interface

Solartec Central 500 is equipped with an optical switchboard and furnished with a multi-mode or single-mode fiber port (SC) to support remote monitoring of the inverter.

<table>
<thead>
<tr>
<th>Communication interface</th>
<th>Optical fiber (SC, multi-mode or single-mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default IP</td>
<td>192.168.1.0 (default)</td>
</tr>
<tr>
<td>Port</td>
<td>502</td>
</tr>
<tr>
<td>Communication protocol</td>
<td>Modbus TCP</td>
</tr>
<tr>
<td>Parameters</td>
<td>Voltage, current, power, electricity generation and other parameters</td>
</tr>
</tbody>
</table>

If you want to upload detailed parameters, please contact the manufacturer to obtain relevant information.
6. On-grid Power Generation

6.1 Pre-operation Inspection
- Check to see if the AC and DC sides have been connected correctly and securely.
- Check to see if the ground connection has been connected to the ground correctly and securely.
- Check to see if the environmental conditions are within the normal operation range of the equipment.
- Check to see if the emergency stop switch is popped up.
- Make sure that no one operates the inverter circuit.

6.2 Start
- After the above inspections have been completed, close the AC side circuit breaker.
- Observe whether the displays of the indicators and the human-machine interface are normal.

6.4 Disconnect from the Power Grid
Solarvec Central 500 grid-connected inverter performs the grid-connected power generation process automatically. When all conditions are met, it enters the grid-connected power generation mode. Equipment stop is classified as normal stop or abnormal stop. When the equipment is stopped, the AC contactor and DC contactor are open.
- Normal stop. Click the "Stop" button on the touch screen and click "OK".
- Abnormal stop. In some special situations, the inverter disconnects from the power grid and enters the stopped state.

6.3 Running
Click the "Start" button on the touch screen and click OK. The equipment starts to judge the external conditions and operate automatically.

In the first trial operation, observe whether the inverter operates normally, including noise, temperature, grid-connected voltage and current parameters, touch screen display, etc. In case of abnormalities, please make adjustments according to the error type and corresponding corrective method displayed on the screen. If you still have any questions, please contact the customer service personnel of the company.
7 · Fault Diagnosis

Faults are classified as recoverable faults or serious non-recoverable faults.

Fault list

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Fault description</th>
<th>Handling method</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC side overvoltage</td>
<td>The DC side voltage exceeds the upper limit</td>
<td>Decrease the panel’s open circuit voltage</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>2</td>
<td>DC side overcurrent</td>
<td>The DC side current exceeds the upper limit</td>
<td>Decrease the panel power</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>3</td>
<td>Reverse flow of DC current</td>
<td>The DC current is less than -10A</td>
<td>Contact the after-sales service personnel</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>4</td>
<td>Reverse polarity of the panel</td>
<td>The DC voltage is less than 1V</td>
<td>Check the positive and negative polarities of the panel</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>5</td>
<td>DC side surge</td>
<td>The DC lightning protector has a fault</td>
<td>Replace the lightning protector module</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>6</td>
<td>AC side overvoltage</td>
<td>The AC side voltage is too high</td>
<td>Check the power grid</td>
<td>Recoverable</td>
</tr>
<tr>
<td>7</td>
<td>AC side overcurrent</td>
<td>The AC side current is too high</td>
<td>Decrease the panel power</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>8</td>
<td>AC side overfrequency</td>
<td>The AC side frequency exceeds the upper limit</td>
<td>Check the power grid</td>
<td>Recoverable</td>
</tr>
<tr>
<td>9</td>
<td>AC side underfrequency</td>
<td>The AC side frequency is lower than the upper limit</td>
<td>Check the power grid</td>
<td>Recoverable</td>
</tr>
<tr>
<td>10</td>
<td>AC side surge</td>
<td>The AC lightning protector has a fault</td>
<td>Replace the lightning protector module</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>11</td>
<td>Fuse failure</td>
<td>Fuse failure</td>
<td>Replace the fuse</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>12</td>
<td>Level 1 alarm of insulation monitoring</td>
<td>Level 1 fault of insulation monitoring</td>
<td>Contact the after-sales service personnel</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>13</td>
<td>Level 2 alarm of insulation monitoring</td>
<td>Level 2 fault of insulation monitoring</td>
<td>Contact the after-sales service personnel</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>14</td>
<td>Low voltage Ride through fault</td>
<td>Overline of AC side low voltage</td>
<td>Check the power grid</td>
<td>Non-recoverable</td>
</tr>
<tr>
<td>15</td>
<td>System fault</td>
<td>System fault</td>
<td>Contact the after-sales service personnel and provide the fault code</td>
<td>Non-recoverable</td>
</tr>
</tbody>
</table>

※ System fault includes the faults of the equipment itself and all types of external faults which may cause system shutdown. Please check the fault values and confirm the fault detail.

Note:
- For recoverable faults, the equipment will try again after the failure retry interval without manual intervention. When the fault has been recovered and the operating conditions are met, the equipment will switch to the running state automatically;
- For non-recoverable faults, handle the fault according to its type. If the fault cannot be cleared, please contact the after-sales service personnel and provide the name or code of the fault.
### 8. Technical Data

<table>
<thead>
<tr>
<th>DC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended photovoltaic array power</td>
<td>509 kWp</td>
</tr>
<tr>
<td>Max. DC voltage</td>
<td>DC 600 V</td>
</tr>
<tr>
<td>MPPT voltage range</td>
<td>DC 450 - 620 V (adjustable)</td>
</tr>
<tr>
<td>Max. input current</td>
<td>1000 A</td>
</tr>
<tr>
<td>Max. number of strings</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid parameter</td>
<td>IT, 3~300V, 50Hz (optional 60Hz)</td>
</tr>
<tr>
<td>Nominal AC output power</td>
<td>500kW</td>
</tr>
<tr>
<td>Nominal AC output current</td>
<td>962A</td>
</tr>
<tr>
<td>THD of AC current (full-load)</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Power factor</td>
<td>0.9 (lagging) - 0.9 (leading)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Euro. efficiency</td>
<td>97.9%</td>
</tr>
<tr>
<td>Max. efficiency</td>
<td>99.3%</td>
</tr>
<tr>
<td>Max. output overcurrent protection</td>
<td>1443A (60s)</td>
</tr>
<tr>
<td>Max. inverter backflow current</td>
<td>0 A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating noise</td>
<td>&lt;65dB</td>
</tr>
<tr>
<td>Power consumption at night</td>
<td>&lt;40W</td>
</tr>
<tr>
<td>Insulation monitoring value</td>
<td>30kΩ</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25°C ~ +55°C</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>5% - 95% (non-condensing)</td>
</tr>
<tr>
<td>Working altitude</td>
<td>2000m (operation with derating above 2000m)</td>
</tr>
<tr>
<td>Cooling</td>
<td>Fan</td>
</tr>
<tr>
<td>IP protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Protective class</td>
<td>I</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>III</td>
</tr>
<tr>
<td>Overvoltage class</td>
<td>III</td>
</tr>
<tr>
<td>Insulating strength</td>
<td>50Hz, AC 2kV/1min</td>
</tr>
<tr>
<td>Lightning protection level</td>
<td>Level C (B)</td>
</tr>
<tr>
<td>Display/operation</td>
<td>LCD touch screen</td>
</tr>
<tr>
<td>Communication port</td>
<td>Standard: optical fiber, Optional: RS485, RJ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(width * height * depth)</td>
<td>2600<em>2100</em>800 (mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>1815 kg</td>
</tr>
</tbody>
</table>
9.1 Warranty

- **Warranty Period**
  
The warranty period of the product is 5 years. If it is otherwise specified in the contract, the provisions of the contract shall prevail.

- **Evidence**
  
Beijing Kinglong New Energy Technology Co. Ltd. will ask the customer to provide the purchasing invoice and date of the product. The trademark on the product shall be clearly visible; otherwise the company will not provide any warranty.

- **Conditions**
  
If the product has a fault during the warranty period, Beijing Kinglong New Energy Technology Co. Ltd. will repair or replace it free of charge.

The replaced product shall be returned to Beijing Kinglong New Energy Technology Co. Ltd.

The customer shall reserve a proper time for Beijing Kinglong New Energy Technology Co. Ltd. to repair the faulty equipment.

- The company will not provide any warranty in the following cases:
  
- Transportation damage
- Incorrect installation
- Incorrect retrofitting
- Incorrect use
- Operation in severe environments that do not meet the requirements of this manual.
- Any exceeding of the installation and operation ranges specified in relevant international standards.
- Damages caused by abnormal natural environment.

The product dimensions and parameters may be subject to change. The company's latest information shall prevail. Please pay attention to our website.

9.2 About Kinglong

Beijing Kinglong New Energy Technology Co. Ltd. is an internationalized photovoltaic enterprise situated in Beijing Information Industry Base. We are committed to the research & development, production and marketing of high quality inverters and providing the customers with perfect photovoltaic inverter products. As an increasingly powerful Sino-American joint venture, we build up our strength to meet the increasing demand of our customers all around the world. Nowadays, we have become the leader of Chinese photovoltaic inverter industry.

9.3 Contact Us

If you have any problems concerning Solartec Central 500 photovoltaic grid-connected inverter, please contact us. We will try our best to solve your problem. Please remember the following contact information:

3rd Floor, Caihong South Building, No.11 Xinxi Road, Haidian District, Beijing, China.

Tel: +86 - (0) 10-62985751
Fax: +86 - (0) 10-62983711-808
Sales hotline: +86 - (0) 10-62988159
Technical service: +86 - (0) 10-62985751-221
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France: france.sales@kinglongpower.com
Italy: italy.sales@kinglongpower.com
Australia: australia.sales@kinglongpower.com
Spain: spain.sales@kinglongpower.com
USA: usa.sales@kinglongpower.com
Canada: canada.sales@kinglongpower.com