1. Safety

The inverters are single-phase grid-connected PV string inverters without transformer, which can convert the DC power from the photovoltaic (PV) strings into alternating current (AC) power, and feed the power into the power grid.

This document involves the following product models:
CSE SW-60003-E, CSE SW-90003-E

1. This document provides important safety information on relating to the installation of single phase PV inverters, both users and professional installers must read these guidelines carefully and strictly follow these instructions. Failure to follow these instructions may result in death, serious injury or property damage.
2. Only qualified professional and service personnel can do the installation and operation (refer to QR code). Installers must inform end-users (consumers) about the important information accordingly.
3. A warning describes a hazard to equipment or personnel. It calls attention to procedure or practice.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Danger</td>
<td>!</td>
<td>Observe the documentation</td>
</tr>
<tr>
<td>!</td>
<td>Hot surface</td>
<td>!</td>
<td>Time need to discharge stored energy in the equipment</td>
</tr>
<tr>
<td>!</td>
<td>Hazardous voltage</td>
<td>!</td>
<td>Warning designation</td>
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2. Unpacking and Inspection

1. Before unpacking the inverter, check the package appearance thoroughly, such as any holes and cracks, and check the inverter model accordingly. If you discover any damage to the packaging which indicates the inverter has been damaged, or the inverter model is not what you requested, do not unpack the product and contact your dealer immediately.
2. After opening the package, check all of the accessories carefully in the carton. If any damage is found or any component is missing, contact your dealer.

3. Installation Requirements

1. Do not install the inverter on the structures constructed of flammable or thermolabile materials.
2. The installation surface must be strong enough to bear the inverter's weight for a long period time.
3. The Inverter is protected to IP65, can be installed indoors and outdoors.
4. The humidity of the installation location should be below 100% without condensation.
5. The ambient temperature should be between -25°C to 60°C.
6. Install at eye-level for easy operation.
7. Do not install the inverter near television antenna or any other antennas and antenna cables.
8. Ensure the inverter is out of children's reach.
9. Install Inverter at the locations with some cover or protection, to ensure the optimum operation.
10. Do not install in small closed cabinet where air cannot circulate freely. Do not put any other objects on the inverter.
11. Comply with the Min. clearance to walls, other inverters, or objects to ensure the installation and maintenance, meanwhile for the good heat dissipation.

<table>
<thead>
<tr>
<th>Direction</th>
<th>Above</th>
<th>Below</th>
<th>Sides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. clearance</td>
<td>50cm</td>
<td>50cm</td>
<td>30cm</td>
</tr>
</tbody>
</table>

12. Install the inverter vertically or at a maximum backward tilt angle of 15 degrees to facilitate heat dissipation.

4. Installation

1. Use the wall-mounting bracket as a template and mark the positions of the drill holes, then drill 4 holes (Ø11mm) to a depth about 55mm.

5. Wiring AC Output and Protective Ground

1. Before performing any work on the inverter, must disconnect both the AC and DC sides.
2. Take appropriate ESD precautions when replacing and installing the inverter.
3. Must be placed an independent single-phase earth-leakage protection unit and a single-phase earth-leakage protection device for each inverter.
4. The required cable cross-sectional area range is 4.0-6.0mm², the required external diameter range is 10-14mm.

AC connections procedure steps:
1. Strip the cable's jacket, and then adjust the relative length of L, N and PE cables, to make the length of PE cable is at least 5mm longer than L and N ones.
2. Insert the conductor into the suitable ferrule and tighten them firmly, and then assemble all parts together.
3. Insert the plug assembled into the socket which installed on Inverter.

Note: The PE point at the AC output point is used only as a PE equipotential point, and cannot substitute for the PE point on the end device.

Protective cover installation procedure steps:
1. Put the upper and lower covers on the AC connector.
2. Use two self-locking screws to lock the protective cover firmly. Torque: 0.4 Nm.

6. Wiring CT/Meter (Optional)

1. CT and Meter sensors are accessories for optional functions.
2. Please refer to Inverter user manual, CT installation guide or meter installation guide for more details.

7. Wiring DRM

1. Route the network cable through threaded sleeve;
2. Prepare the RJ45 plug according to the line sequence:

8. Wiring DC Input

Requirements for PV modules string:
1. The power voltage (startup and open-circuit voltage) and operating current of each PV strings must meet the allowable value of the Inverter.
2. DC connectors have two types — 1/4 or M6, procedure stages:
   1. Strip the insulation jacket of cable to about 7.5mm. Please note do not damage the conductor when the stripping.
   2. Crimp the contact pin to the conductor of the cable.
   3. Plug the crimped contact pin into the connector housing back until one sound click audibly.
   4. Pull lightly on the wire to ensure the contact pins of the connectors are engaged.
   5. Pay attention to the polarities when assembling.
   6. Tighten the nut with a special wrench, the required torque range is 2.5-2.9N.m.
3. Insert the assembled connector into the DC connector of the inverter until one sound click audibly.

9. Communication

Multi communication protocols for your option. RS485, GPRS, and WiFi, with the communication interface M16 port.

10. Start up

Checking Electrical and Mechanical:
1. Check PV connections with multi-meter: To make sure all the bare metal surfaces of the Inverter grounded;
2. Check DC voltage value: Check if the DC voltage of the PV string exceeds the allowable range.
3. Check the polarities of the DC voltage: To make sure the DC polarities are correct.
4. Check the ground insulation of PV array with multi-meter:
   - Ensure the impedance value of ground insulation is more than 1MΩ.
5. Ensure the Inverter is installed properly, fixed with a Wall-mounting bracket firmly, and the upper cover is installed correctly.
6. Ensure the AC connectors are installed properly and fixed firmly.
7. Ensure the dust covers are sealed reliably which are used for the empty DC connectors.
8. Ensure all the cables are connected effectively, fixed firmly, and no visible damages to the insulation layer.

Start-up Inverters:
After electrical and mechanical inspections, first turn on the AC main switch/breaker, then turn on the DC switch. The Inverter will start automatically when the DC input voltage meets the performance requirement of the utility grid. Normally there will be three statuses during the operation (refer to the LED Indications):

1. Warning:
   - Conditions: The initial DC voltage of the PV strings is greater than the Min. DC input voltage, but is lower than the DC start-up input voltage.
   - Inverter cannot start-up normally and cannot feed power into utility grid either.
2. Checking:
   - Conditions: The initial voltage of the PV strings exceeds the start-up DC input voltage of the Inverter. Meanwhile both the voltage and frequency of the utility grid are normal, Inverter will check the feeding conditions immediately.
   - If anything wrong during checking, Inverter will switch to the "Fault" mode.
3. Normal:

11. Panel Operation

LED Indications:

<table>
<thead>
<tr>
<th>NO.</th>
<th>Operate states</th>
<th>LED Indicators</th>
<th>Flicker frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Watt</td>
<td>Green LED blinks</td>
<td>1s On, 1s Off</td>
</tr>
<tr>
<td>2</td>
<td>Normal</td>
<td>Green LED always on</td>
<td>/</td>
</tr>
<tr>
<td>3</td>
<td>Error</td>
<td>Red LED always on</td>
<td>/</td>
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