For professional use only

- Professional installer must read these guidelines carefully and strictly follow these instructions. Failure to follow these instructions may result in death, injury or property damage.

The installation and handling of Inverters requires professional skills and should only be performed by qualified professionals. The installers must inform end-users (consumers) the aforesaid information accordingly.

- Product specifications are subject to change without notice. Every attempt has been made to make this document complete, accurate and up-to-date. Individuals reviewing this document and installers or service personnel are cautioned, however, that Canadian Solar reserves the right to make changes without notice and shall not be responsible for any damages, including indirect, incidental or consequential damages caused by reliance on the material presented including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the material provided in this document.

- Canadian Solar accepts no liability for customers’ failure to comply with the instructions for correct installation and will not be held responsible for upstream or downstream systems Canadian’s equipment has supplied.

- The customer is fully liable for any modifications made to the system; therefore, any hardware or software modification, manipulation, or alteration not expressly agreed with the manufacturer shall result in the immediate cancellation of the warranty.

- Given the countless possible system configurations and installation environments, it is essential to verify adherence to the following:
  - There is sufficient space suitable for housing the equipment.
  - Airborne noise produced depending on the environment.
  - Potential flammability hazards.

- Canadian Solar will not be held liable for defects or malfunctions arising from:
  - Improper use of the equipment.
  - Deterioration resulting from transportation or particular environmental conditions.
  - Performing maintenance incorrectly or not at all.
  - Tampering or unsafe repairs.
  - Use or installation by unqualified persons.

- This product contains lethal voltages and should be installed by qualified electrical or service personnel having experience with lethal voltages.
1. Introduction

1.1 Product Description

Canadian Solar single phase inverters integrate DRM and backflow power control function, that could suitable for smart grid requirement. Single phase series inverter contain 4 models which are listed below:

CSI-7KTL1P-GI-FL, CSI-8KTL1P-GI-FL, CSI-9KTL1P-GI-FL, CSI-10KTL1P-GI-FL
1. Introduction

1.2 Packaging

When you receive the inverter, ensure that all the parts listed below are included:

![Image of inverter components]

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PV grid tie inverter</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Wall/pole bracket</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Locking screws</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>DC connector</td>
<td>3 pairs</td>
</tr>
<tr>
<td>5</td>
<td>Manual</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1.1 Parts list

2. Safety Instructions

2.1 Safety Symbols

Safety symbols used in this manual, which highlight potential safety risks and important safety information, are listed as follows:

**WARNING:**

WARNING symbol indicates important safety instructions, which if not correctly followed, could result in serious injury or death.

**NOTE:**

NOTE symbol indicates important safety instructions, which if not correctly followed, could result in some damage or the destruction of the inverter.

**CAUTION:**

CAUTION, RISK OF ELECTRIC SHOCK symbol indicates important safety instructions, which if not correctly followed, could result in electric shock.

CAUTION, HOT SURFACE symbol indicates safety instructions, which if not correctly followed, could result in burns.

2.2 General Safety Instructions

Improper use may result in potential electric shock hazards or burns. This manual contains important instructions that should be followed during installation and maintenance. Please read these instructions carefully before use and keep them for future reference.

**WARNING:**

Please don’t connect PV array positive(+) or negative(-) to ground, it could cause serious damage to the inverter.

**WARNING:**

Electrical installations must be done in accordance with the local and national electrical safety standards.
2. Safety Instructions

2.3 Notice For Use

The inverter has been constructed according to the applicable safety and technical guidelines. Use the inverter in installations that meet the following specifications ONLY:

1. Permanent installation is required.
2. The electrical installation must meet all the applicable regulations and standards.
3. The inverter must be installed according to the instructions stated in this manual.
4. The inverter must be installed according to the correct technical specifications.
5. To startup the inverter, the Grid Supply Main Switch (AC) must be switched on, before the solar panel's DC isolator shall be switched on. To stop the inverter, the Grid Supply Main Switch (AC) must be switched off before the solar panel's DC isolator shall be switched off.

3. Overview

3.1 Front Panel Display

Figure 3.1 Front Panel Display

3.2 LED Status Indicator Lights

There are three LED status indicator lights in the front panel of the inverter. Left LED: POWER LED (red) indicates the power status of the inverter. Middle LED: OPERATION LED (green) indicates the operation status. Right LED: ALARM LED (yellow) indicates the alarm status. Please see Table 3.1 for details.

<table>
<thead>
<tr>
<th>Light</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>ON</td>
<td>The inverter can detect DC power</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>No DC power or low DC power</td>
</tr>
<tr>
<td>OPERATION</td>
<td>ON</td>
<td>The inverter is operating properly.</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>The inverter has stopped to supply power.</td>
</tr>
<tr>
<td></td>
<td>FLASHING</td>
<td>The inverter is initializing.</td>
</tr>
<tr>
<td>ALARM</td>
<td>ON</td>
<td>Alarm or fault condition is detected.</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>The inverter is operating properly.</td>
</tr>
</tbody>
</table>
3. Overview

3.3 Keypad

There are four keys in the front panel of the Inverter (from left to right): ESC, UP, DOWN and ENTER keys. The keypad is used for:

- Scrolling through the displayed options (the UP and DOWN keys);
- Access to modify the adjustable settings (the ESC and ENTER keys).

3.4 LCD

The two-line Liquid Crystal Display (LCD) is located on the front panel of the Inverter, which shows the following information:

- Inverter operation status and data;
- Service messages for operator;
- Alarm messages and fault indications.

4. Installation

4.1 Select a Location for the Inverter

To select a location for the inverter, the following criteria should be considered:

- Do not install in small closed spaces where air cannot circulate freely. To avoid overheating, always make sure the flow of air around the inverter is not blocked.
- Exposure to direct sunlight will increase the operational temperature of the inverter and may cause output power limiting. Canadian Solar recommends inverter installed to avoid direct sunlight or raining.
- To avoid overheating ambient air temperature MUST be considered when choosing the inverter installation location. Canadian Solar recommends using a sun shade minimizing direct sunlight when the ambient air temperature around the unit exceeds 104°F/40°C.

▲ Figure 4.1 Recommended Installation locations
4. Installation

- Install on a wall or strong structure capable of bearing the weight.
- Install vertically with a maximum incline of +/- 5°. If the mounted inverter is tilted to an angle greater than the maximum noted, heat dissipation can be inhibited, and may result in less than expected output power.
- When 1 or more inverters are installed in one location, a minimum 12 inches clearance should be kept between each inverter or other object. The bottom of the inverter should be 20 inches clearance to the ground.

Visibility of the LED status indicator lights and the LCD located at the front panel of the inverter should be considered.

Adequate ventilation must be provided if the inverter is to be installed in a confined space.

**NOTE:**
Nothing should be stored on or placed against the inverter.

4.2 Mounting the Inverter

Dimensions of mounting bracket:

![Figure 4.4 Inverter wall mounting](image)

Please see Figure 4.4 and Figure 4.5 for instruction on mounting the inverter to a wall or pillar. The inverter shall be mounted vertically. The steps to mount the inverter are listed below:

1. According to the figure 4.2, select the mounting height of the bracket and mark the mounting holes. For brick walls, the position of the holes should be suitable for the expansion bolts.
4. Installation

4.3 Electrical Connections

4.3.1 Connect PV side of inverter

The electrical connection of the inverter must follow the steps listed below:

1. Switch the Grid Supply Main Switch (AC) OFF.
2. Switch the DC Isolator OFF.
3. Assemble PV input connector to the Inverter.

Before connecting inverter, please make sure the PV array open circuit voltage is within the limit of the inverter.

Figure 4.5 Inverter pillar mounting

Figure 4.6 Wall Mount Bracket

Copyright © 1999-2012 Solarenergy International, Inc. All Rights Reserved.
4. Installation

The steps to assemble the DC connectors are listed as follows:

i) Strip off the DC wire for about 7mm, Disassemble the connector cap nut.

Please don’t connect PV array positive or negative pole to the ground, it could cause serious damages to the inverter.

Before connection, please make sure the polarity of the output voltage of PV array matches the “DC+” and “DC-” symbols.

Please use approved DC cable for PV system.

Maximum 600Voc for
CSI-7KTL1P-GI-FL  CSI-8KTL1P-GI-FL
CSI-9KTL1P-GI-FL  CSI-10KTL1P-GI-FL

### Table 4.1 DC cable

<table>
<thead>
<tr>
<th>Cable type</th>
<th>Cross section</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry generic PV cable</td>
<td>4.0~6.0</td>
<td>(12~10AWG)</td>
</tr>
<tr>
<td>(model: PV1-F)</td>
<td></td>
<td>4.0 (12AWG)</td>
</tr>
</tbody>
</table>

Please note:

- Maximum 600Voc for CSI-7KTL1P-GI-FL  CSI-8KTL1P-GI-FL
- CSI-9KTL1P-GI-FL  CSI-10KTL1P-GI-FL

Before connection, please make sure the polarity of the output voltage of PV array matches the “DC+” and “DC-” symbols.

Please use approved DC cable for PV system.

### Table 4.1 DC cable

<table>
<thead>
<tr>
<th>Cable type</th>
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</tr>
<tr>
<td>(model: PV1-F)</td>
<td></td>
<td>4.0 (12AWG)</td>
</tr>
</tbody>
</table>

The steps to assemble the DC connectors are listed as follows:

i) Strip off the DC wire for about 7mm, Disassemble the connector cap nut.

ii) Insert the wire into the connector cap nut and contact pin.

iii) Crimp the contact pin to the wire using a proper wire crimper.

iv) Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector.

Please connect PV array positive or negative pole to the ground, it could cause serious damages to the inverter.
4. Installation

v) Then connect the DC connectors to the inverter. Small click will confirm connection.

4.3.2 Connect grid side of inverter

For all AC connections, 10-25mm² cable is required to be used. Please make sure the resistance of cable is lower than 1.5ohm. If the wire is longer than 20m, it's recommended to use 16-25mm² cable.

The steps to assemble the AC grid terminals are listed as follows:
A) Strip the end of AC cable outer insulating jacket about 60mm then strip the end of each wire about 10mm. (as shown in figure 4.15)

Additional explanation:
If the diameter of the protective layer of the AC cable is less than the recommended (18-25mm) it should be spirally wounded the protective.

B) Disassemble the 4 screws on the AC terminal cover and take out the cover. Disassemble the screw under terminal rack and Pull out the terminal (as shown in figure 4.16)

C) Insert the 3 cables into AC terminal and use the slotted screwdriver to tight the screws. The torque is 2-2.5Nm. (as shown in figure 4.17)

D) Push the AC terminals along the rail to the inside of the inverter then tighten the screw under rack. Lock the 4 screws of AC terminal and tighten the cap nut of AC terminal. (as shown in figure 4.18)

WARNING:
Please do not put the insulating layer of the cable in to the terminal when tight the screws, otherwise it will cause poor contact.

v Figure 4.14 Connect the DC Connectors to the Inverter

Figure 4.16 Disassemble AC terminal cover

Figure 4.17 Connect cable to AC terminal

Figure 4.18 Tighten the AC terminal
4. Installation

### 4.3.3 Max. over current protection device (OCPD)

To protect the inverter's AC grid connection conductors, Canadian Solar recommends installing breakers that will protect against overcurrent. The following table defines OCPD ratings for the Canadian Solar 7-10kW single phase inverters.

<table>
<thead>
<tr>
<th>Inverter</th>
<th>Rated voltage (V)</th>
<th>Rated output current (A)</th>
<th>Current for protection device (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI-7KTL1P-GI-FL</td>
<td>220/230</td>
<td>31.8/30.4</td>
<td>40</td>
</tr>
<tr>
<td>CSI-8KTL1P-GI-FL</td>
<td>220/230</td>
<td>36.4/34.8</td>
<td>60</td>
</tr>
<tr>
<td>CSI-9KTL1P-GI-FL</td>
<td>220/230</td>
<td>40.9/39.1</td>
<td>60</td>
</tr>
<tr>
<td>CSI-10KTL1P-GI-FL</td>
<td>220/230</td>
<td>45.5/43.5</td>
<td>60</td>
</tr>
</tbody>
</table>

▲ Table 4.3 Rating of grid OCPD

### 4.3.4 Inverter monitoring connection

The inverter can be monitored via Wi-Fi or GPRS. All Canadian Solar communication devices are optional (Figure 4.18). For connection instructions, please refer to the Canadian Solar Monitoring Device installation manuals.

5. Start & Stop

### 5.1 Start the Inverter

To start up the Inverter, it is important that the following steps are strictly followed:

1. Switch the grid supply main switch (AC) ON first.
2. Switch the DC switch ON. If the voltage of PV arrays are higher than start up voltage, the inverter will turn on. The red LED power will light.
3. When both the DC and the AC sides supply to the inverter, it will be ready to generate power. Initially, the inverter will check both its internal parameters and the parameters of the AC grid, to ensure that they are within the acceptable limits. At the same time, the green LED will flash and the LCD displays the information of INITIALIZING.
4. After 30-300 seconds (depending on local requirement), the inverter will start to generate power. The green LED will be on continually and the LCD displays GENERATING.

⚠️ WARNING: Do not touch the surface when the inverter is operating. It may be hot and cause burns.

### 5.2 Stop the Inverter

To stop the Inverter, the following steps must be strictly followed:

1. Switch the Supply Main Switch (AC) OFF.
2. Wait 30 seconds. Switch the DC Switch OFF. All the LEDs of the inverter will be off in one minute.

▲ Figure 4.18 Wi-Fi communication function
6. Operation

During normal operation, the display alternately shows the power and the operation status with each screen lasting for 10 seconds (see Figure 6.1). Screens can also be scrolled manually by pressing the UP and DOWN keys. Press the ENTER key to access to the Main Menu.

### 6.1 Main Menu

There are four submenus in the Main Menu (see Figure 6.1):

1. Information
2. Settings
3. Advanced Info.
4. Advanced Settings

### 6.2 Information

The Canadian Solar Single Phase 4G Inverter main menu provides access to operational data and information. The information is displayed by selecting “Information” from the menu and then by scrolling up or down.

#### 6.2.1 Lock screen

Pressing the ESC key returns to the Main Menu. Pressing the ENTER key locks (Figure 6.2(a)) or unlocks (Figure 6.2 (b)) the screen.

![Figure 6.2 Locks and Unlocks the Screen of LCD](image)

<table>
<thead>
<tr>
<th>Display</th>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_DC1 350.8V</td>
<td>10 sec</td>
<td>V_DC1: Shows input 01 voltage value.</td>
</tr>
<tr>
<td>I_DC1 5.1A</td>
<td>10 sec</td>
<td>I_DC1: Shows input 01 current value.</td>
</tr>
<tr>
<td>V_DC3 350.8V</td>
<td>10 sec</td>
<td>V_DC3: Shows input 03 voltage value.</td>
</tr>
<tr>
<td>I_DC3 5.1A</td>
<td>10 sec</td>
<td>I_DC3: Shows input 03 current value.</td>
</tr>
<tr>
<td>V_Grid 230.4V</td>
<td>10 sec</td>
<td>V_Grid: Shows the grid’s voltage value</td>
</tr>
<tr>
<td>I_Grid 8.1A</td>
<td>10 sec</td>
<td>I_Grid: Shows the grid’s current value.</td>
</tr>
<tr>
<td>Status: Generating</td>
<td>10 sec</td>
<td>Status: Shows instant status of the Inverter.</td>
</tr>
<tr>
<td>Power: 1488W</td>
<td>10 sec</td>
<td>Power: Shows instant output power value.</td>
</tr>
<tr>
<td>Grid Frequency F_Grid: 60.06Hz</td>
<td>10 sec</td>
<td>F_Grid: Shows the grid’s frequency value.</td>
</tr>
<tr>
<td>Total Energy 0258458 kwh</td>
<td>10 sec</td>
<td>Total generated energy value.</td>
</tr>
<tr>
<td>This Month: 0123kwh Last Month: 0123kwh</td>
<td>10 sec</td>
<td>This Month: Total energy generated this month.</td>
</tr>
<tr>
<td>Last Month: 0123kwh</td>
<td>10 sec</td>
<td>Last Month: Total energy generated last month.</td>
</tr>
<tr>
<td>Today: 15.1kwh Yesterday: 13.3kwh</td>
<td>10 sec</td>
<td>Today: Total energy generated today.</td>
</tr>
<tr>
<td>Yesterday: 13.3kwh</td>
<td>10 sec</td>
<td>Yesterday: Total energy generated yesterday.</td>
</tr>
<tr>
<td>Inverter: SN 0000000000000</td>
<td>10 sec</td>
<td>Display series number of the inverter</td>
</tr>
</tbody>
</table>

![Table 6.1 Information list](image)
6. Operation

6.3 Settings

The following submenus are displayed when the Settings menu is selected:
1. Set Time
2. Set Address

6.3.1 Set Time

This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in Figure 6.3.

![Figure 6.3 Set Time](image)

Press the UP/DOWN keys to set time and data. Press the ENTER key to move from one digit to the next (from left to right). Press the ESC key to save the settings and return to the previous menu.

6.3.2 Set Address

This function is used to set the address when multi inverters are connected to single monitor. The address number can be assigned from "01" to "99" (see Figure 6.4). The default address number of Canadian Solar Single Phase Inverter is "01".

![Figure 6.4 Set Address](image)

Press the UP/DOWN keys to set the address. Press the ENTER key to save the settings. Press the ESC key to cancel the change and return to the previous menu.

6.4 Advanced Info - Technicians Only

NOTE:
To access to this area is for fully qualified and accredited technicians only. Enter menu "Advanced Info." and "Advanced settings" (need password).

Select "Advanced Info." from the Main Menu. The screen will require the password as below.

![Figure 6.5 Enter password](image)

The default password is "0010". Please press "down" to move the cursor, press "up" to select the number.

After enter the correct password the Main Menu will display a screen and be able to access to the following information.

1. Alarm Message
2. Running message
3. Version
4. Daily Energy
5. Monthly Energy
6. Yearly Energy
7. Daily Record
8. Communication Data

The screen can be scrolled manually by pressing the UP/DOWN keys. Pressing the ENTER key gives access to a submenu. Press the ESC key to return to the Main Menu.

6.4.1 Alarm Message

The display shows the 100 latest alarm messages (see Figure 6.6). Screens can be scrolled manually by pressing the UP/DOWN keys. Press the ESC key to return to the previous menu.

![Figure 6.6 Alarm Message](image)
6. Operation

6.4.2 Running Message
This function is for maintenance person to get running message such as internal temperature, Standard NO. etc.
Screens can be scrolled manually by pressing the UP/DOWN keys.

6.4.3 Version
The screen shows the model version and the software version of the Inverter (see Figure 6.7).

```
Model: 08
Software Version: D20001
```

▲ Figure 6.7 Model Version and Software Version

6.4.4 Daily Energy
The function is for checking the energy generation for selected day.

```
YES=<ENT> NO=<ESC>
Select: 2015-02-22
```

▲ Figure 6.8 Select date for daily energy
Press DOWN key to move the cursor to day, month and year, press UP key to change the digit. Press Enter after the date is fixed.

```
2015-02-22: 051.3kWh
2015-02-23: 061.5kWh
```

▲ Figure 6.9 Daily energy
Press UP/DOWN key to move one date from another.

6.4.5 Monthly Energy and Yearly Energy
The two functions are for checking the energy generation for selected month and Year.

```
YES=<ENT> NO=<ESC>
Select: 2015-02
```

▲ Figure 6.10 Select month for monthly energy

```
2015-02: 0510kWh 2015-01: 0610kWh
```

▲ Figure 6.12 Monthly energy

```
01-05: 01 25 E4 9D AA
06-10: C2 B5 E4 9D 55
```

▲ Figure 6.14 Communication Data
Press DOWN key to move the cursor, press UP key to change the digit. Press Enter after the month/year is fixed.

```
2015-02: 0510kWh
2015-01: 0610kWh
```

▲ Figure 6.13 Yearly energy
Press UP/DOWN key to move one date from another.

6.4.6 Daily record
The screen shows history of changing settings. Only for maintenance personnel.

```
YES=<ENT> NO=<ESC>
Select: 2015-02
```

▲ Figure 6.11 Daily record

6.4.7 Communication Data
The screen shows the internal data of the Inverter (see Figure 6.14), which is for service technicians only.

```
01-05: 01 25 E4 9D AA
06-10: C2 B5 E4 9D 55
```

▲ Figure 6.14 Communication Data

6.5 Advanced Settings - Technicians Only

NOTE: To access to this area is for fully qualified and accredited technicians only. Please follow 6.4 to enter password to access this menu.

Select Advanced Settings from the Main Menu to access the following options:

6.5.1 Selecting Standard
This function is used to select the grid’s reference standard (see Figure 6.11).

```
YES=<ENT> NO=<ESC>
Standard: AUS-Q-0.8
```

▲ Figure 6.15
6. Operation

Press the UP/DOWN keys to select the standard (AS4777, VDE4105, VDE0126, UL-240V-A, UL-208V-A, UL-240V, UL-208V, MEX-CFE, G83/2 (for 1-3.6kW models), G59/3 (for 4-5kW models), EN50438 DK, EN50438 IE, EN50438 NL and “User-Def” function). Press the ENTER key to confirm the setting. Press the ESC key to cancel changes and returns to previous menu.

**NOTE:**
This function is for technicians use only.

Selecting the "User-Def" menu will access to the following submenu (see Figure 6.16).

![Figure 6.16](image)

**NOTE:**
The "User-Def" function can be only used by the service engineer and must be allowed by the local energy supplier.

Below is the setting range for "User-Def". Using this function, the limits can be changed manually.

```
OV-G-V1: 220---290V
OV-G-V1-T: 0.1---9S
OV-G-V2: 220---290V
OV-G-V2-T: 0.1---1S
UN-G-V1: 90---210V
UN-G-V1-T: 0.1---9S
UN-G-V2: 90---210V
UN-G-V2-T: 0.1---1S
Startup-T: 10-600S
```

**NOTE:**
This inverter including two level protections for voltage and frequency under user-def mode: please set the same value both level one and level two if the gird only have one level requirment, eg. Brazil...etc.

Press the UP/DOWN keys to scroll through items. Press the ENTER key to edit the highlighted item. Press the UP/DOWN keys again to change the setting. Press the ENTER key to save the setting. Press the ESC key to cancel changes and returns to the previous menu.

---

6.5.2 Grid ON/OFF

This function is used to start up or stop the power generation of Canadian Solar Single Phase Inverter (see Figure 6.17).

![Figure 6.17](image)

Screens can be scrolled manually by pressing the UP/DOWN keys. Press the ENTER key to save the setting. Press the ESC key to return to the previous menu.

6.5.3 Clear Energy

Clear Energy can reset the history yield of inverter

These two functions are applicable by maintenance personnel only, wrong operation will prevent the inverter from working properly.

6.5.4 New Password

This function is used to set the new password for menu "Advanced info." and "Advanced information" (see Figure 6.18).

![Figure 6.18](image)

Enter the right password before set new password. Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

6.5.5 Power control

Active and reactive power can be set through power setting button.

There are 5 item for this sub menu:

This function is applicable by maintenance personnel only, wrong operation will prevent the inverter from reaching maximum power.
6. Operation

6.5.6 Calibrate Energy

Maintenance or replacement could clear or cause a different value of total energy. Use this function could allow user to revise the value of total energy to the same value as before. If the monitoring website is used the data will be synchronous with this setting automatically. (see Figure 6.19).

Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

6.5.7 AUS STD. Settings

This sub menu is enabled when the grid standard is set to AS4777. To comply with New AUS/ NZ 4777.2, Canadian Solar inverter could set different work mode to work with different grid requirement.

There are 5 work mode in working mode submenu.


The parameter in each model could be set as below:

1. Fixed PF
Set PF (-0.8, +0.8), Default 1, Resolution 0.01

2. Reac. Power
Set reactive power (0, 60%), Default 0, Resolution 1%

7. Maintenance

Canadian Solar Single Phase Inverter does not require any regular maintenance. However, cleaning the dust on heat-sink will help the inverter to dissipate the heat and increase its life time.

The dust can be removed with a soft brush.

CAUTION:
Do not touch the inverter’s surface when it is operating. Some parts of the inverter may be hot and cause burns. Turn off the inverter (refer to Section 5.2) and wait for a cool-down period before before any maintenance or cleaning operation.

The LCD and the LED status indicator lights can be cleaned with a damp cloth if they are too dirty to be read.

NOTE:
Never use any solvents, abrasives or corrosive materials to clean the inverter.

8. Troubleshooting

The inverter is designed in accordance with the most important international grid-tied standards and safety and electromagnetic compatibility requirements. Before delivering to the customer, the inverter has been subjected to several tests to ensure its optimal operation and reliability.

In case of failure, the LCD screen will display an alarm message. In this case, the inverter may stop feeding into the grid. The failure descriptions and their corresponding alarm messages are listed in Table 8.1:
8. Trouble Shooting

**NOTE:**
If the inverter displays any alarm message as listed in Table 8.1; please turn off the inverter (refer to Section 5.2 to stop your inverter) and wait for 5 minutes before restarting it (refer to Section 5.1 to start your inverter). If the failure persists, please contact your local distributor or the service center. Please keep ready with you the following information before contacting us.

1. Serial number of Canadian Solar Single Phase Inverter;
2. The distributor/dealer of Canadian Solar Single Phase Inverter (if available);
3. Installation date.
4. The description of problem (i.e. the alarm message displayed on the LCD and the status of the LED status indicator lights. Other readings obtained from the Information submenu (refer to Section 6.2) will also be helpful.);
5. The PV array configuration (e.g. number of panels, capacity of panels, number of strings, etc.);
6. Your contact details.

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Failure description</th>
<th>Solution</th>
</tr>
</thead>
</table>
| No power        | Inverter no power on LCD                  | 1. Check PV input connections  
2. Check DC input voltage  
(single phase >120V, three phase >350V)  
3. Check if PV+/- is reversed |
| LCD show initializing all the time | can not start-up                           | 1. Check if the connector on main board or power board are fixed.  
2. Check if the DSP connector to power board are fixed. |
| OV-G-V01/02/03/04 | Over grid voltage                          | 1. Resistant of AC cable is too high.  
2. Adjust the protection limit if it’s allowed by electrical company. |
| UN-G-V01/02     | Under grid voltage                         | 1. Use user define function to adjust the protection limit if it’s allowed by electrical company. |
| UN-G-F01/02     | Under grid frequency                       | 1. Check connections and grid switch.  
2. Check the grid voltage inside inverter terminal. |
| G-IMP           | High grid impedance                        | 1. Reduce the module number in series                                      |
| NO-GRID         | No grid voltage                            | 1. Check inverter inductor connection  
2. Check driver connection |
| OV-DC01/02/03/04 | Over DC voltage                            | 1. Check inverter inductor connection  
2. Change power board |
| OV-BUS          | Over DC bus voltage                        | 1. Check inverter inductor connection  
2. Check driver connection |
| UN-BUS01/02     | Under DC bus voltage                       | 1. Restart inverter  
2. Change power board |
| GRID-INTF01/02  | Grid interference                          | 1. Restart inverter  
2. Change power board |
| OV-G-I          | Over grid current                          | 1. Restart inverter  
2. Change power board |
| IGBT-OV-I       | Over IGBT current                          | 1. Restart inverter  
2. Identify and remove the string to the fault MPPT  
3. Change power board |
| DC-INTF         | DC input overcurrent                       | 1. Restart inverter  
2. Identify and remove the string to the fault MPPT  
3. Change power board |
| OV-DCA-I        | Grid current tracking failure              | 1. Restart inverter or contact installer.                                  |
| IG-FOL-F        | Grid current sampling fail                 | 1. Restart inverter or contact installer.                                  |
| INI-TEM         | Over Temperature                           | 1. Check inverter surrounding ventilation.  
2. Check if there’s sunshine direct on inverter in hot weather. |
| INI-FAULT       | Initialization system fault                | 1. Restart inverter or contact installer.                                  |
| DSP-B-FAULT     | Comm. failure between main and slave DSP   | 1. Restart inverter or contact installer.                                  |
| 12Power-FAULT   | 12V power supply fault                     | 1. Restart inverter or contact installer.                                  |

**Table 8.1 Fault message and description**

**Alarm Message**  
**Failure description**  
**Solution**

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Failure description</th>
<th>Solution</th>
</tr>
</thead>
</table>
| PV ISO-PRO 01/02 | PV isolation protection | 1. Remove all DC input, reconnect and restart inverter one by one.  
2. Identify which string cause the fault and check the isolation of the string. |
| IL-Leak-PRO 01/02 | Leakage current protection | 1. Check AC and DC connection  
2. Check inverter inside cable connection. |
| RelayChk-FAIL | Relay check fail | 1. Restart inverter or contact installer. |
| DCinj-FAULT | High DC injection current | 1. Restart inverter or contact installer. |

**NOTE:**
8. Trouble Shooting
### 9. Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>CSI-7KTL1P-GI-FL</th>
<th>CSI-8KTL1P-GI-FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. DC input power (Watts)</td>
<td>8000</td>
<td>9200</td>
</tr>
<tr>
<td>Max. DC input voltage (Volts)</td>
<td>600</td>
<td>800</td>
</tr>
<tr>
<td>Rated DC voltage (Volts)</td>
<td>330</td>
<td>330</td>
</tr>
<tr>
<td>Startup voltage (Volts)</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>MPPT voltage range (Volts)</td>
<td>100...500</td>
<td>100...500</td>
</tr>
<tr>
<td>Max. input current (Amps)</td>
<td>10+10</td>
<td>10+10</td>
</tr>
<tr>
<td>Max short circuit input current (Amps)</td>
<td>15.6+15.6+15.6</td>
<td>15.6+15.6+15.6</td>
</tr>
<tr>
<td>MPPT number/Max input strings number</td>
<td>3/3</td>
<td>3/3</td>
</tr>
<tr>
<td>Rated output power (Watts)</td>
<td>7000</td>
<td>8000</td>
</tr>
<tr>
<td>Max. output power (Watts)</td>
<td>7700</td>
<td>8800</td>
</tr>
<tr>
<td>Max. apparent output power (VA)</td>
<td>7700</td>
<td>8800</td>
</tr>
<tr>
<td>Rated grid voltage (Volts)</td>
<td>220/230</td>
<td>220/230</td>
</tr>
<tr>
<td>Grid voltage range (Volts)</td>
<td>160...285</td>
<td>160...285</td>
</tr>
<tr>
<td>Rated output current (Amps)</td>
<td>31.8/30.4</td>
<td>36.4/34.8</td>
</tr>
<tr>
<td>Power Factor (at rated output power)</td>
<td>0.8leading~0.8lagging [1]</td>
<td>0.8leading~0.8lagging [1]</td>
</tr>
<tr>
<td>THDI (at rated output power)</td>
<td>&lt;1.5%</td>
<td>&lt;1.5%</td>
</tr>
<tr>
<td>Rated grid frequency (Hertz)</td>
<td>50/60</td>
<td>50/60</td>
</tr>
<tr>
<td>Operating frequency range (Hertz)</td>
<td>47...52 or 57...62</td>
<td>47...52 or 57...62</td>
</tr>
<tr>
<td>Max. efficiency</td>
<td>98.1%</td>
<td>98.1%</td>
</tr>
<tr>
<td>EU efficiency</td>
<td>97.6%</td>
<td>97.6%</td>
</tr>
<tr>
<td>MPPT efficiency</td>
<td>&gt;99.5%</td>
<td>&gt;99.5%</td>
</tr>
<tr>
<td>Dimensions</td>
<td>333W<em>573H</em>249D (mm)</td>
<td>333W<em>573H</em>249D (mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>18kg</td>
<td>18kg</td>
</tr>
<tr>
<td>Topology</td>
<td>Transformerless</td>
<td>Transformerless</td>
</tr>
<tr>
<td>Operating ambient temperature range</td>
<td>-25°C...60°C</td>
<td>-25°C...60°C</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td>Noise emission (typical)</td>
<td>&lt;30 dBA</td>
<td>&lt;30 dBA</td>
</tr>
<tr>
<td>Cooling concept</td>
<td>Natural convection</td>
<td>Natural convection</td>
</tr>
<tr>
<td>Max. operation altitude</td>
<td>4000m</td>
<td>4000m</td>
</tr>
<tr>
<td>Designed lifetime</td>
<td>&gt;20 years</td>
<td>&gt;20 years</td>
</tr>
<tr>
<td>Grid connection standard</td>
<td>EN50438, G83/2, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105</td>
<td>EN50438, G83/2, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105</td>
</tr>
<tr>
<td>Operating surroundings humidity</td>
<td>0...100% Condensing</td>
<td>0...100% Condensing</td>
</tr>
<tr>
<td>Connetion</td>
<td>Mc4 connector and Ip67 rated plug</td>
<td>Mc4 connector and Ip67 rated plug</td>
</tr>
<tr>
<td>Display</td>
<td>LCD, 2x20 Z.</td>
<td>LCD, 2x20 Z.</td>
</tr>
<tr>
<td>Communication connections</td>
<td>4 pins RS485 connector</td>
<td>4 pins RS485 connector</td>
</tr>
<tr>
<td>Monitoring</td>
<td>WiFi or GPRS</td>
<td>WiFi or GPRS</td>
</tr>
<tr>
<td>Warranty Terms</td>
<td>5 Years STD (Extendable to 20 Years)</td>
<td>5 Years STD (Extendable to 20 Years)</td>
</tr>
</tbody>
</table>
### 9. Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>CSI-9KTL1P-GI-FL</th>
<th>CSI-10KTL1P-GI-FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. DC input power (Watts)</td>
<td>10800</td>
<td>11500</td>
</tr>
<tr>
<td>Max. DC input voltage (Volts)</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Rated DC voltage (Volts)</td>
<td>330</td>
<td>330</td>
</tr>
<tr>
<td>Startup voltage (Volts)</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>MPPT voltage range (Volts)</td>
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</tr>
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<td>10+10+10</td>
<td>10+10+10</td>
</tr>
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</tr>
<tr>
<td>MPPT number/Max input strings number</td>
<td>3/3</td>
<td>3/3</td>
</tr>
<tr>
<td>Rated output power (Watts)</td>
<td>9000</td>
<td>10000</td>
</tr>
<tr>
<td>Max. output power (Watts)</td>
<td>9900</td>
<td>10000</td>
</tr>
<tr>
<td>Max. apparent output power (VA)</td>
<td>9900</td>
<td>10000</td>
</tr>
<tr>
<td>Rated grid voltage (Volts)</td>
<td>220/230</td>
<td>220/230</td>
</tr>
<tr>
<td>Grid voltage range (Volts)</td>
<td>160...285</td>
<td>160...285</td>
</tr>
<tr>
<td>Rated output current (Amps)</td>
<td>40.9/39.1</td>
<td>45.5/43.5</td>
</tr>
<tr>
<td>Power Factor (at rated output power)</td>
<td>0.8 leading~0.8 lagging [1]</td>
<td>0.8 leading~0.8 lagging [1]</td>
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<td>Natural convection</td>
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</tr>
<tr>
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<td>4000m</td>
<td>4000m</td>
</tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Operating surroundings humidity</td>
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<td>0...100% Condensing</td>
</tr>
<tr>
<td>Connection</td>
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<tr>
<td>Warranty Terms</td>
<td>5 Years STD (Extendable to 20 Years)</td>
<td>5 Years STD (Extendable to 20 Years)</td>
</tr>
</tbody>
</table>

[1]: For Brazil products, the certificated PF range is 0.9 leading~0.9 lagging, but the actual range is 0.8 leading~0.8 lagging.
# Installation and Commissioning Checklist

**3 Phase String Inverters (KTL Series)**

Warning: This checklist is not a replacement for the user manual. Please read the user manual prior to inverter site selection and installation.

<table>
<thead>
<tr>
<th>Step</th>
<th>No.</th>
<th>Content</th>
<th>Details</th>
<th>Values / Notes</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Installation environment</td>
<td>Ensure installation site meets environmental and physical constraints.</td>
<td></td>
<td></td>
<td>[ ] Good [ ] Poor</td>
</tr>
<tr>
<td>2</td>
<td>Unpacking</td>
<td>Check inverter condition after unpacking.</td>
<td></td>
<td></td>
<td>[ ] Good [ ] Poor</td>
</tr>
<tr>
<td>3</td>
<td>Mounting bracket installation</td>
<td>Install inverter mounting bracket according to installation instructions in user manual. For allowable tilt angle refer to the installation manual.</td>
<td></td>
<td></td>
<td>[ ] Completed Record Tilt Angle in Notes</td>
</tr>
<tr>
<td>4</td>
<td>Inverter installation</td>
<td>Carefully install the inverter to the mounting bracket and ensure it is firmly attached. Ensure the inverter has proper clearances and are properly ventilated.</td>
<td></td>
<td></td>
<td>[ ] Completed</td>
</tr>
<tr>
<td>5</td>
<td>Serial number</td>
<td>Record the product serial numbers located on the side label.</td>
<td></td>
<td>Serial Numbers; attached list</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Solar modules</td>
<td>Confirm PV module installation completion. Record the total power of the PV modules.</td>
<td></td>
<td>[ ] Completed Record kWp in Notes</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>DC input and AC output connection</td>
<td>Switch off the DC and AC distribution unit, connect DC to PV terminals of inverter, and connect AC to AC terminals of inverter. Ensure proper polarity and cable size. Torque to specifications.</td>
<td></td>
<td>[ ] Completed Record Torque in Notes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PV voltage</td>
<td>Measure and record DC voltage. Ensure voltage and polarities are correct. Confirm the voltages are within 5% tolerance to what was tested.</td>
<td></td>
<td>[ ] Completed Record $V_{DC}$ in Notes</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>AC grid</td>
<td>Measure and record AC voltage and frequency. Confirm the $V_{AC}$ voltages are within 5% tolerance to what was tested.</td>
<td></td>
<td>[ ] Completed Record $V_{AC}$ in Notes</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Grounding cable</td>
<td>Ensure ground cable is firmly attached to grounding lug.</td>
<td></td>
<td></td>
<td>[ ] Good [ ] Poor</td>
</tr>
</tbody>
</table>

Please return completed form to inverter.register@canadiansolar.com

www.canadiansolar.com
# INSTALLATION AND COMMISSIONING CHECKLIST

**Warning:** This checklist is not a replacement for the user manual. Please read the user manual prior to inverter site selection and installation.

<table>
<thead>
<tr>
<th>Step</th>
<th>No.</th>
<th>Content</th>
<th>Details</th>
<th>Values / Notes</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Communication cable (if function is used)</td>
<td>Connect the RS485 cable to the communication port.</td>
<td></td>
<td>[ ] Completed</td>
</tr>
</tbody>
</table>
| 2    |     | Supply DC / AC power | CSI-xx-KTL-Gi:  
1. Switch the grid supply main Switch (AC) ON first.  
2. Switch the DC switch ON. If the voltages of PV arrays are higher than start up voltage, the inverter will turn on. The red LED power will be continuously lit.  
3. When both the DC and the AC sides supply to the inverter, it will be ready to generate power. Initially, the inverter will check both its internal parameters and the parameters of the AC grid, to ensure that they are within the acceptable limits. At the same time, the green LED will flash and the LCD displays the information of INITIALIZING. |       | [ ] Completed  
Record LEDs status in Notes |
### INSTALLATION AND COMMISSIONING CHECKLIST

#### 3 PHASE STRING INVERTERS (KTL SERIES)

Warning: This checklist is not a replacement for the user manual. Please read the user manual prior to inverter site selection and installation.

<table>
<thead>
<tr>
<th>Step</th>
<th>No.</th>
<th>Content</th>
<th>Details</th>
<th>Values / Notes</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>Waiting time</td>
<td>CSI-xx-KTL-6: After 60-300 seconds (depending on local requirement), the inverter will start to generate power. The green LED will be on continuously and the LCD displays the information of GENERATING.</td>
<td>[ ] Completed</td>
<td>Record LEDs status in Notes</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Power generation</td>
<td>After grid connection, record power output of inverter.</td>
<td>[ ] Completed</td>
<td>Record power in Notes</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Date &amp; Time setting</td>
<td>Set the current date and time using the front panel interface.</td>
<td>[ ] Completed</td>
<td>Record current date/time in Notes</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Communication setting (if avail.)</td>
<td>Set communication with a unique address for each inverter.</td>
<td>[ ] Completed</td>
<td>Record address in Notes</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Machine version</td>
<td>For maintenance and reference, please record the firmware revisions if applicable.</td>
<td>[ ] Completed</td>
<td>Record with serial numbers</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Operating parameter</td>
<td>Record operating parameters of the inverter. Verify IEC62109 or the corresponding On-grid setting is selected. De-rate inverter and attach de-rate sticker as required.</td>
<td>[ ] Completed</td>
<td>Record operating parameters in Notes</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Testing</td>
<td>Open and close the DC breaker to confirm whether the inverter reboots and shuts down automatically.</td>
<td>[ ] Reboot successful / [ ] Not rebooting</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Completion</td>
<td>Installation and commissioning is complete if no abnormality.</td>
<td>[ ] Good / [ ] Issues detected</td>
<td></td>
</tr>
</tbody>
</table>

Please return completed form to inverter.register@canadiansolar.com
INSTALLATION AND COMMISSIONING CHECKLIST

3 PHASE STRING INVERTERS (KTL SERIES)

Warning: This checklist is not a replacement for the user manual. Please read the user manual prior to inverter site selection and installation.

System Owner: __________________________

Address / Location: __________________________

Inverter model: __________________________

Number of inverters: ____________ Inverter mounting tilt: ____________

Output power*: ____________ Input DC voltage: ____________

Grid: V Max: ____________ V Min: ____________ Frequency Max: ____________ Min: ____________

Configuration: MPPT Individual ______ MPPT Parallel ________________________

Monitoring: RS485: ____________ Ethernet: ____________

PV module manufacturer: ____________ PV model: ____________

DC cable size: ____________ AC cable size: ____________

Transformer ratings, supplier: __________________________

Number of series connected modules in PV strings: __________________________

Number of PV strings in parallel per MPPT: __________________________

Total System size (DC Watts): __________________________

*Specify de-rated power and add nameplate power in parenthesis

GENERAL COMMENTS / OBSERVATIONS:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
3 PHASE STRING INVERTERS
(KTL SERIES)

Warning: This checklist is not a replacement for the user manual.
Please read the user manual prior to inverter site selection and installation.

Inverter serial numbers:

1
2
3
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41
42

INSTALLER’S NAME

INSTALLER’S SIGNATURE

COMPANY

DATE

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