

CPS Series Photovoltaic Grid Connection Inverter

**CPS SC1.5KTL, CPS SC2KTL, CPS SC2.8KTL,
CPS SC4KTL, CPS SC4KTL-O**

Installation and Operation Manual

Version 3.0E 2011.05



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Before you start...

Congratulations on choosing CHINT Grid PV-Inverter (referred to in this manual as “PV-Inverter”, or simply “Inverter”). CHINT Grid PV-Inverter is a highly reliable product due to its innovative design and perfect quality control. Such an inverter is used in high demand, grid-linked PV systems.

This manual contains important information regarding installation and safe operation of this unit. Be sure to read this manual carefully before using.



If you encounter any problems during installation or operation of this unit, first check this manual before contacting your local dealer or representative. Instructions inside this manual will help you solve most installation and operation difficulties.

Thank you once again that our product is chosen, and wishes you enjoy CHINT PV-Inverter.

Safety instructions



Risk of Electric Shock

1. Do not remove the casing. The Inverter contains no user serviceable parts. Refer servicing to qualified service personnel.
2. Both AC and DC voltage sources are terminated inside the PV-Inverter. Please disconnect these circuits before servicing.
3. When a photovoltaic panel is exposed to light, it generates a DC voltage. When connected to this equipment, a photovoltaic panel will charge the DC link capacitors.
4. Energy stored in this equipment's DC link capacitors presents a risk of electric shock. Even after the unit is disconnected from the grid and photovoltaic panels, high voltages may still exist inside the PV-Inverter. Do not remove the casing until at least 30 minutes after disconnecting all power sources.
5. This unit is designed to feed power to the public power grid (utility) only. Do not connect this unit to an AC source or generator. Connecting the Inverter to external devices could result in serious damage to your equipment.
6. Carefully remove the unit from its packaging and inspect for external damage. If you find any imperfections, please contact your local dealer.



Hot surfaces

Although designed to meet all safety requirements, some parts and surfaces of the PV-Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the Inverter or nearby surfaces while it is operating.

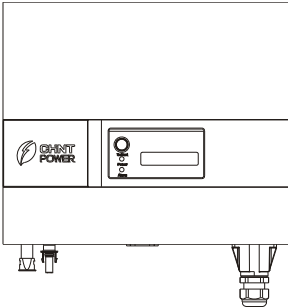
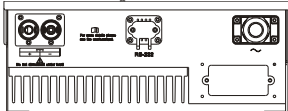
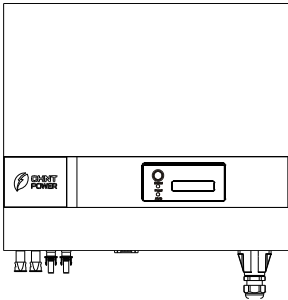
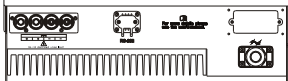
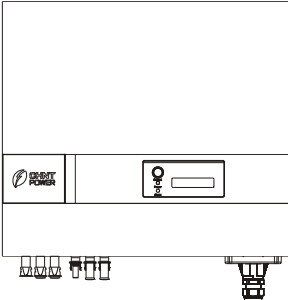
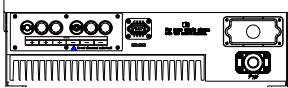
Limited Warranty

The Inverter comes with a standard **5-year warranty**. An optional extended warranty is available for purchase before the unit is delivered to the end user. This warranty includes all defects of design, components and manufacturing. Excluded from warranty are damages due to:

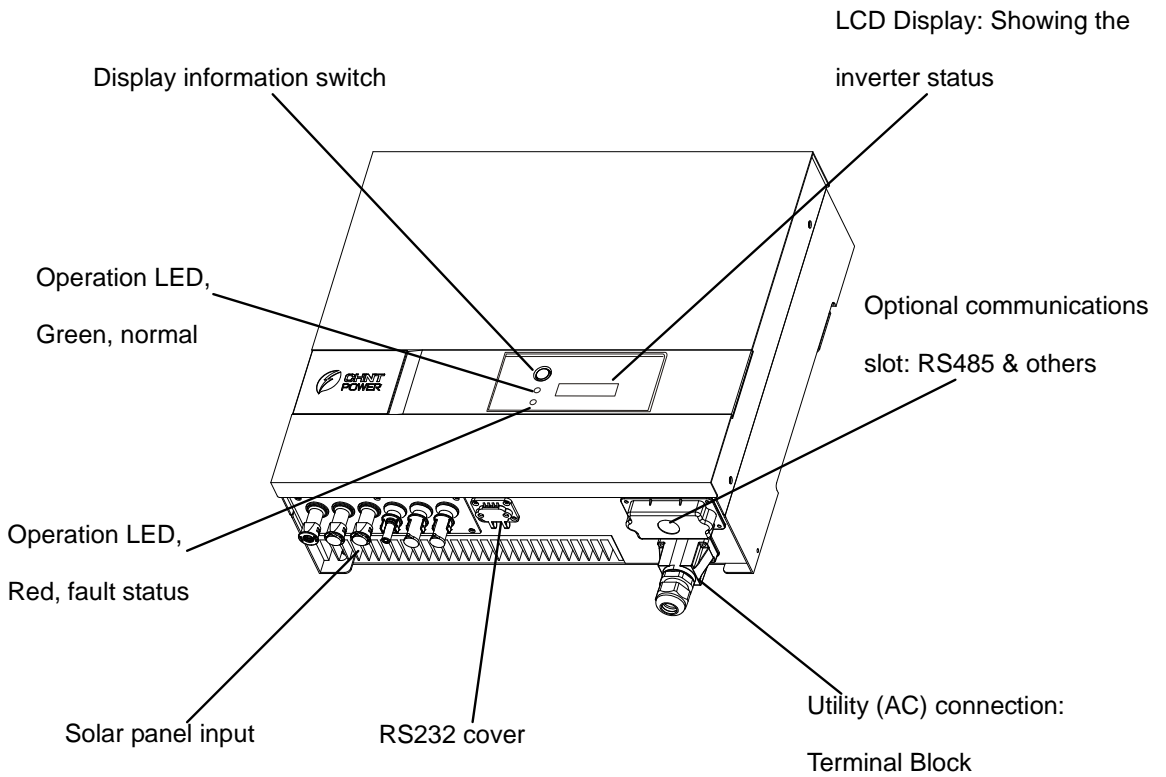
- Breaking the product seal (opening the casing)
- Improper transportation and delivery
- Unqualified persons opening the unit
- Improper installation
- Unauthorized modification, testing or repairing
- Use and application beyond the definition in this manual
- Application beyond the scope of safety standards (VDE, UL etc.)
- Acts of nature such as lightning, fire, storm etc.

The right to repair and/or replace the unit is at the manufacturers' discretion. Any damages discovered during installation should be submitted via a written damage report within **5 working days** of receiving the PV-Inverter. Manufacturer are not responsible for damages beyond the Scope of this warranty.

1. Overview

Model	Front View	Bottom View
<p>CPS SC1.5KTL CPS SC2KTL CPS SC2.8KTL</p>		
<p>CPS SC4KTL</p>		
<p>CPS SC4KTL-O</p>		

Parts Description



2. Features

- Very high conversion efficiency
- Automatic MPPT (Maximum Power Point Tracking)
- Higher power capacity than similar products of the same size.
- Embedded LCD display showing complete status information
- Natural convection cooling. Quiet, fan-less design
- Stylish, modern casing
- Compact, small profile
- High reliability
- Easy installation
- Maintenance free
- Standard RS-232, optional RS-485 and others
- Embedded ENS meets VDE 0126-1-1
- No external GFCI breaker is required

3. Installation instructions

Opening the package

After opening the package, please check the contents of the box. It should contain the following:

1. One CHINT inverter
2. Instruction manual
3. One mounting frame
4. 4 mounting screws
5. 2 safety-lock screws
6. One cable gland (PG21) for AC cable in CPS SC4KTL and SC4KTL-O
7. One AC socket assembly in CPS SC1.5KTL, SC2KTL and SC2.8KTL

Before installation

Before starting installation please consider the following items:

CPS SC1.5KTL~SC4KTL are designed for indoor usage (IP43). Do not expose the unit to wet, or moist conditions.



Although the CPS SC4KTL-O is designed for outdoor application (IP65), however we recommend not exposing the PV-Inverter to moist or wet environments.

For optimal usage do not expose the PV-Inverter to direct sunlight. Direct sunlight increases the internal temperature that may reduce conversion efficiency.



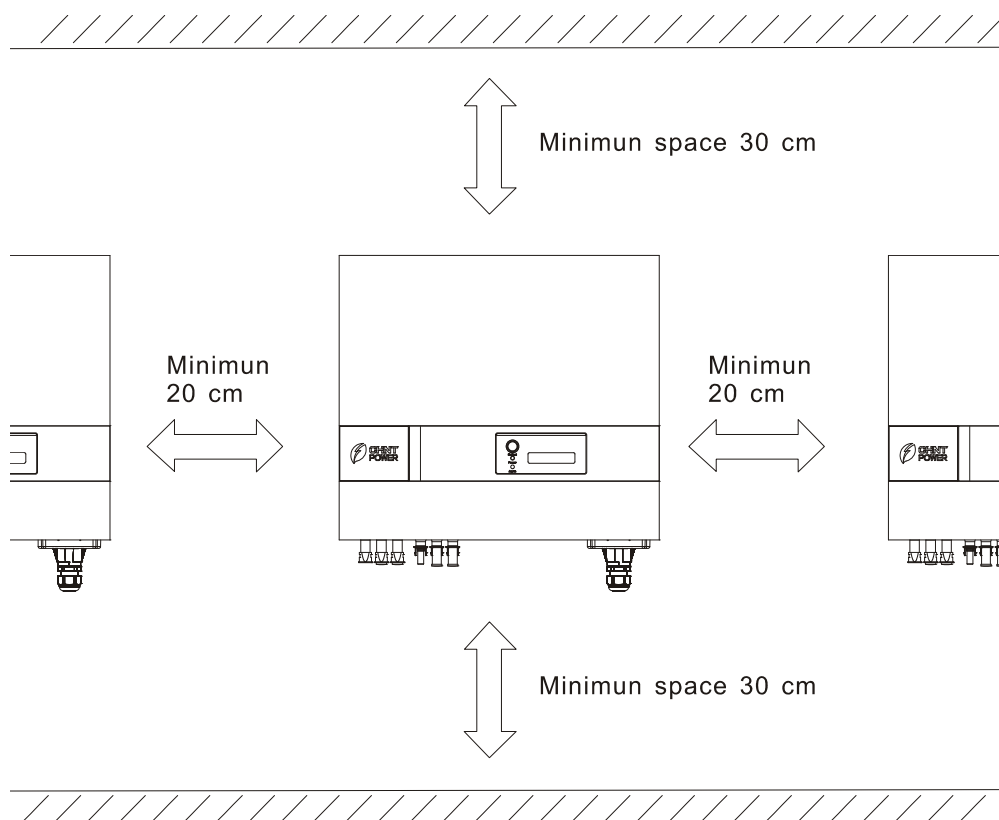
- ✓ Check the ambient temperature of installation is within specified range $-20 \sim +55^{\circ}\text{C}$.
- ✓ The AC grid voltage is 230VAC, 50Hz.
- ✓ Electric utility company has approved the grid connection.
- ✓ Qualified personnel are performing the installation.
- ✓ Adequate convection space surrounds the inverter.
- ✓ Inverter is being installed away from explosive vapors.
- ✓ No flammable items are near the inverter.



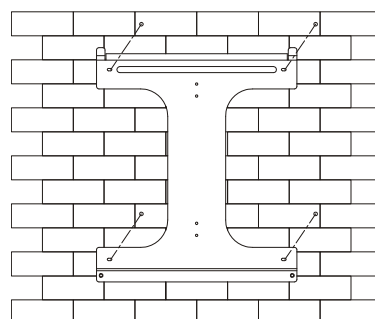
The PV-Inverter can be installed and operated at locations where the ambient temperature is up to 55°C . However, for optimal operation, it is recommended that the PV-Inverter is installed where the ambient temperature is between $0\sim 40^{\circ}\text{C}$.

Mounting PV-Inverter to the wall

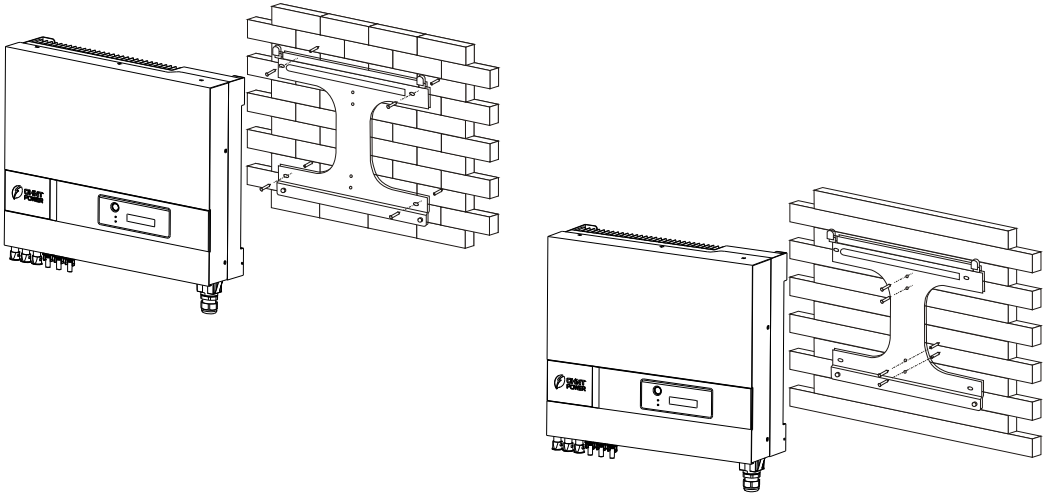
1. Select a wall or solid vertical surface that can support the PV-Inverter.
2. PV-Inverter requires adequate cooling space. Allow at least 30cm space above and below the inverter.



3. Using the mounting frame as a template, drill 4 holes as illustrated in the following figures.
4. Fix the mounting frame as the figure shows.

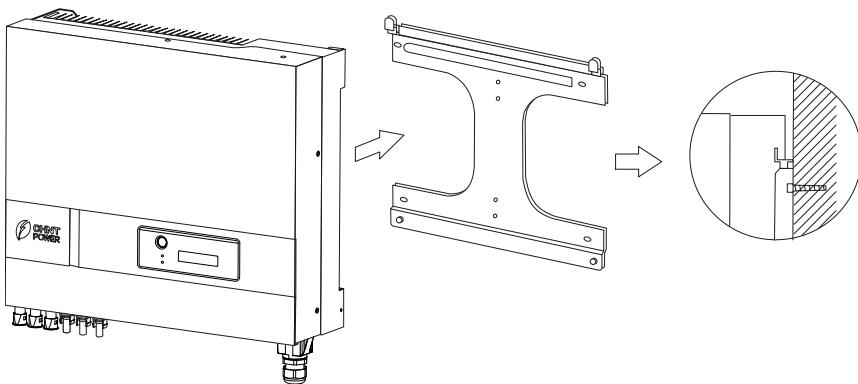
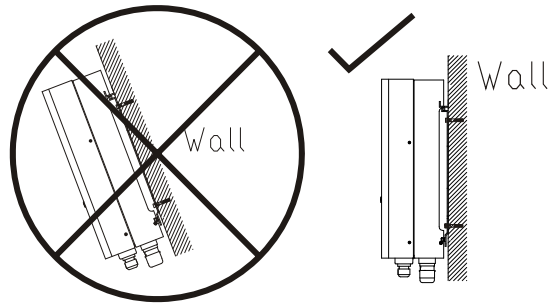


5. Hang PV-Inverter on the mounting frame.

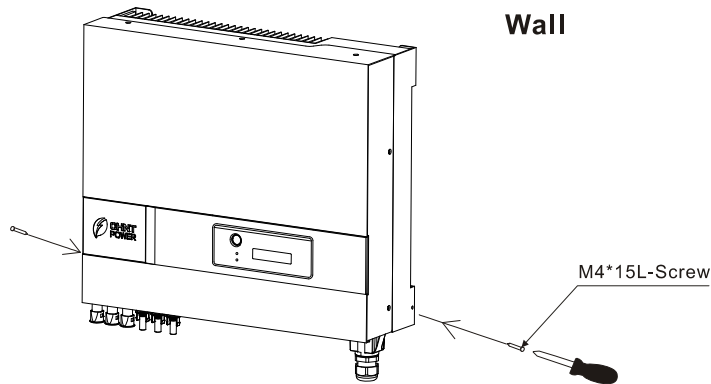


6. Check the installation conditions.

- a) Do not install the PV-Inverter on a slanted surface.
- b) Check the upper straps of PV-Inverter and ensure it fits on to the bracket.



c) Insert safety-lock screws to the bottom leg to secure the inverter.




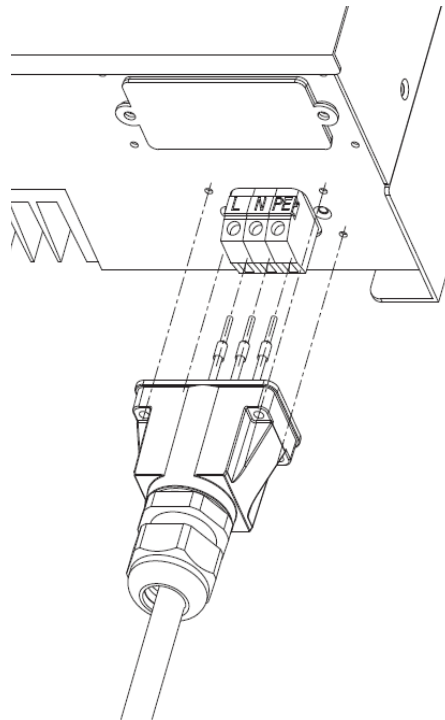
Check the secure mounting of the PV-Inverter by trying to raise it from the bottom. The PV-Inverter should remain firmly attached.



Select the installation location so that the status display can be easily viewed. Choose a strong mounting wall to prevent vibrations while PV-Inverter is operating.

Connecting to the grid (AC utility)

1. Measure grid (utility) voltage and frequency. It should be 230VAC, 50Hz, and single phase.
2. Open the breaker or fuse between PV-Inverter and utility.
3. For CPS SC1.5KTL, SC2.8KTL, SC2KTL, SC4KTL and SC4KTL-O, connect AC wires as follows:
 - Insert utility wires through cable gland. Connect wires according to polarities indicated on terminal block. L → LINE (brown or black), N → Neutral (blue) and → system ground (yellow-green).
 - Fasten the gland plate with attached screws.
 - Twist the gland so that the cable is firmly fixed.
 - Refer to left figure. 



To prevent risk of electric shock, ensure the ground wire is properly earthed before operating the PV-Inverter.

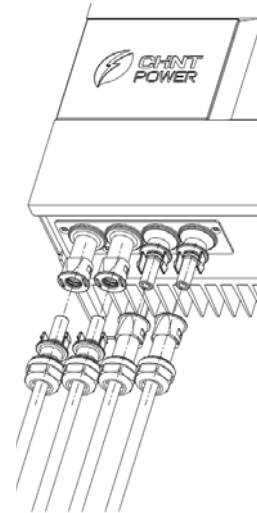


4. Suggested cable width for AC wire

Model	Diameter ϕ (mm)	Area (mm ²)	AWG no.
CPS SC1.5KTL / CPS SC2KTL	≥ 1.29	≥ 1.5	≤ 16
CPS SC2.8KTL	≥ 1.63	≥ 2.0	≤ 14
CPS SC4KTL / CPS SC4KTL-O	≥ 2.05	≥ 2.5	≤ 12

Connect to PV Panel (DC input)

1. Make sure the maximum open circuit voltage (V_{oc}) of each PV string is less than $500V_{DC}$ (or $450V_{DC}$ for CPS SC1.5KTL) UNDER ANY CONDITION. We recommend use the solar modules, whose total U_{MPP} at STC in the string between $250V_{DC}$ and $350V_{DC}$ ($200V_{DC}$ and $320V_{DC}$ for CPS SC1.5KTL) with ambient temperature $25^{\circ}C$.
2. Use **Wieland** connectors for PV array terminals.
3. Connect the positive and negative terminals from the PV panel to positive (+) terminals and negative (-) terminals on the PV-Inverter.



Before connecting PV panels to DC terminals, please make sure the polarity is correct. Incorrect polarity connection could

permanently damage the unit.

Check short-circuited current of the PV string. The total short-circuit current of the PV string should be less than the inverter's maximum DC current.



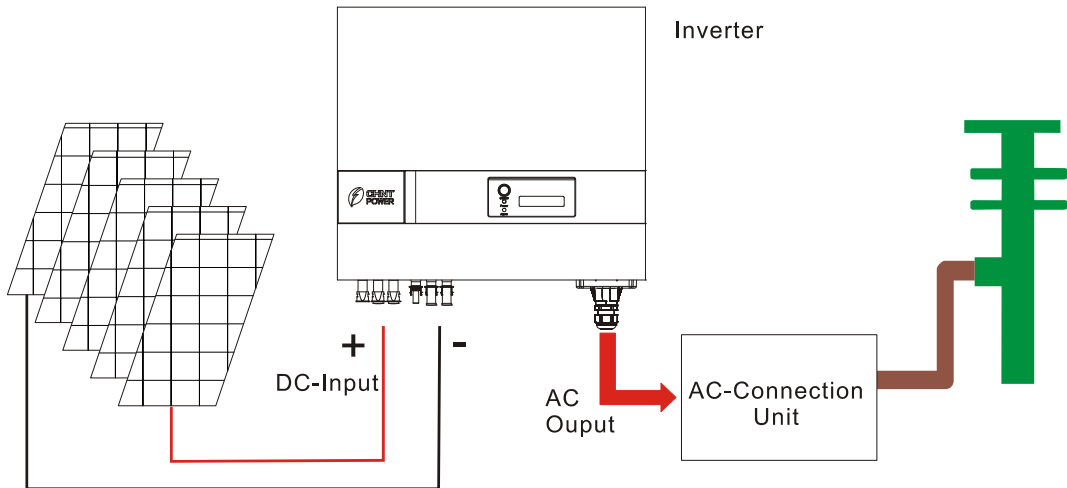
High voltages exist when the PV panel is exposed to the sun. To reduce risk of electric shock, avoid touching live components and treat connection terminals carefully.

Checking

1. When the PV panels are connected and their output voltage is greater than $100 V_{DC}$ but the AC grid is not yet connected, the message on the LCD display produce the following messages in order: "MODEL= CPS SCxxKTL-x" -> "Waiting" -> "No Utility". The display repeats "No Utility" and the RED "fault LED" turns on.
2. Close the AC breaker or fuse between PV-Inverter and grid. The normal operating sequence begins.
3. Under normal operating conditions the LCD displays "Watt=xxxx.xW". That is the power fed to the grid. The green LED turns lights-up.
4. This completes the check.

4. System Diagram

The typical connection diagram for the entire PV system is shown in the following figure.



1. **PV Panel:** Provide DC power to inverter
2. **PV-Inverter:** Converts DC (Direct Current) power from PV panel(s) to AC (Alternating Current) power. Because the PV-Inverter is grid-connected it controls the current amplitude according to the PV Panel power supply. The inverter always tries to convert the maximum power from your PV panel(s).
3. **Connection system:** This “interface” between Utility and PV-Inverter may consist of electrical breaker, fuse and connecting terminals. To comply with local safety standards and codes, the connection system should be designed and implemented by a qualified technician.
4. **Utility:** Referred to as “grid” in this manual, is the way your electric power company provides power to your place. Please note that the PV-Inverter can only connect to low-voltage systems (namely, [230VAC/50Hz](#)).

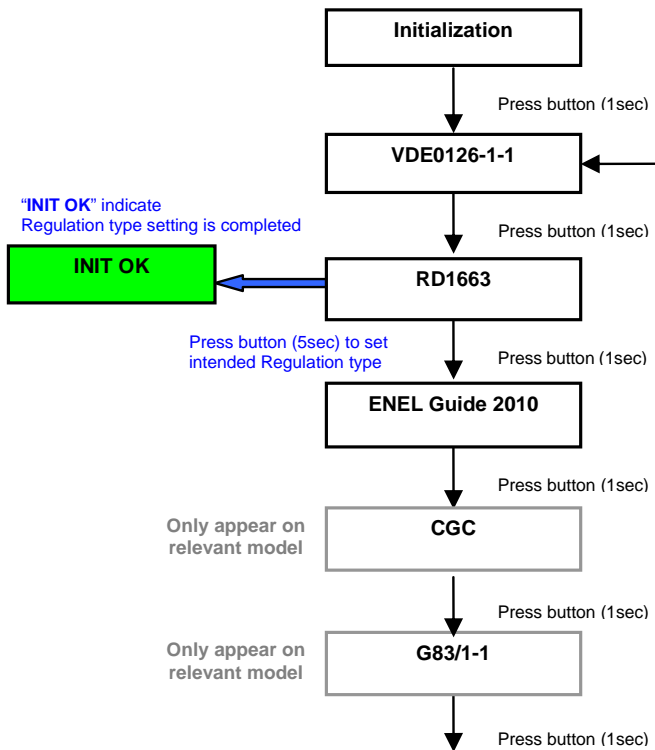
5. Operation of PV-Inverter

Initialization for Regulation Setting

1. The Inverter provides a “Initialization” function at the first time start-up as an process in which user is able to select the intended regulation type before normal operation.
2. The inverter will not able to operate normally before regulation setting is completed even though it is connected correctly at both DC input and AC output.
3. The follwing figure illustrates the process of “Initialization”, and the display sequence of regulation available.
4. For example, if user need to set regulation type to RD1663, user have to power on the inverter to start the “Initialization” and change the menu by button control until RD1663 present, hold on to this regulation page and then press the button for 5 more seconds untl “**INIT OK**” message appeared, the regulation setting is completed.



Note: Incorrect regulation type setting would cause inverter to non-operation, please consult with your dealer if you are not familiar with regulation type setting.



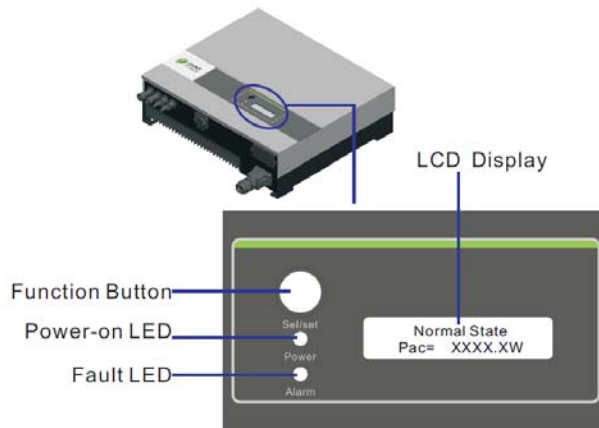
Modes of operation

There are 3 different modes of operation.

1. **Normal mode:** In this mode, the inverter works normally. Whenever the supplied power from PV panel is sufficient (voltage>150VDC), inverter converts power to the grid as generated by the PV panel. If the power is insufficient (voltage<120VDC), inverter enters a “waiting” state. Whilst “waiting” inverter uses just enough power from the PV panel monitor internal system status. In normal mode the green LED is on.
2. **Fault mode:** The internal intelligent controller can continuously monitor and adjust the system status. If inverter finds any unexpected conditions such as grid problems or internal failure, it will display the information on its LCD and light up the red “Fault” LED.

3. **Shutdown mode:** During periods of little or no sunlight, inverter automatically stops running. In this mode, inverter does not take any power from the grid. The display and LED's on the front panel do not work.

Front Panel arrangement



Front Panel

Operating PV-Inverter is quite easy. During normal operation, the inverter runs automatically. However, to achieve maximum conversion efficiency of inverter please read the following information:

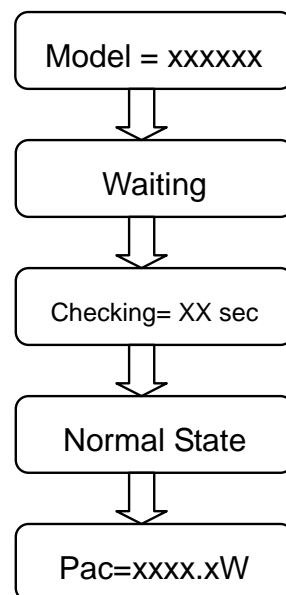
1. Automatic ON-OFF: PV-Inverter starts up automatically when DC-power from the PV panel is sufficient. Once the PV-Inverter starts it enters one of the following 3 states:

- **Standby:** The PV string can only provide just enough voltage to minimum requirements of the controller.
- **Waiting:** When the PV string DC voltage is greater than 100V, the inverter enters a “waiting” state and attempts to connect to the grid.
- **Normal operation:** When PV string DC voltage is greater than 150V, the inverter operates in the normal state. In this state, it feeds power to the grid.

The inverter automatically stops when the PV power is not enough.

2. Starting-up display sequence: Once the PV power is sufficient, inverter displays information as shown in the flow chart to the right.

3. Change display information: During normal operation, inverter can show details about its operation status. The display is setup to automatically indicate the supplying power to the grid. Press the “Function” button on the front panel and release it immediately to see additional

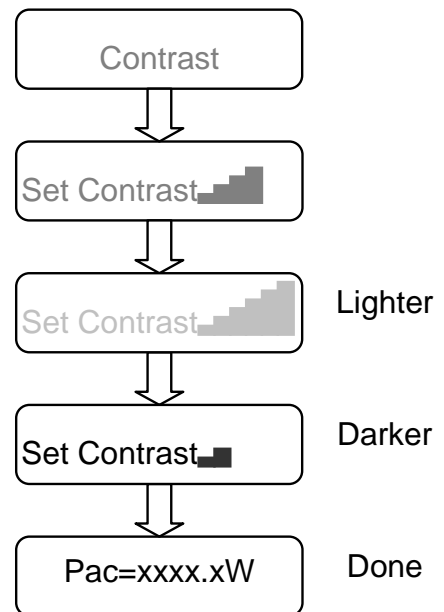


Information during start-up

information. Each subsequent press changes the display. The display sequence is shown in panel LCD display sequence figure on next page.

4. Hold display: If you want to hold a specific display. Repeatedly press the function key until the desired display is reached. Release the key and press again for more than 1 second until you see “Lock”, release the key; the information remains on the display. To change the display again, please press the key as indicated in 3
5. LCD backlight control: To save power, the LCD display’s backlight automatically turns off after 30 seconds. To enable it, press the “Function” key again.
6. Contrast control: A natural phenomenon of LCD displays is the background color is darker at higher temperatures. At higher temperatures, the characters may not be easily identified. In this case, the adjust the contrast as follows:

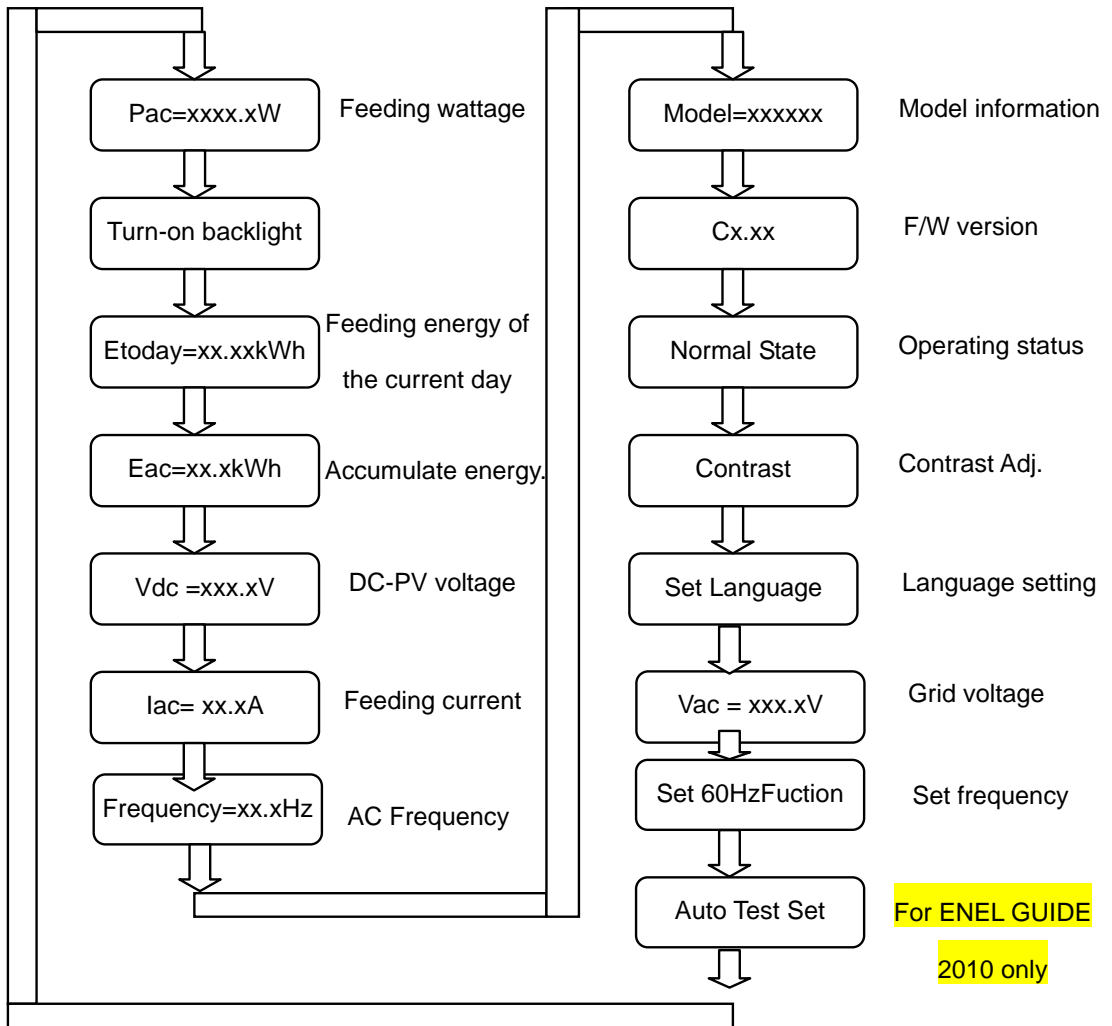
- a. Press the “Function” key repeatedly until “Contrast” shows in the display.
- b. Hold the “Function” key down for more than 2 seconds, until display shows “Set contrast” and a bar graph on the right.
- c. Press the “Function” key repeatedly until the display’s contrast is acceptable.
- d. Release the key for more than 10 seconds, the display will show “Watt=xxxx.xW”.
- e. Setting completed



Contrast setup

LCD Display Sequence

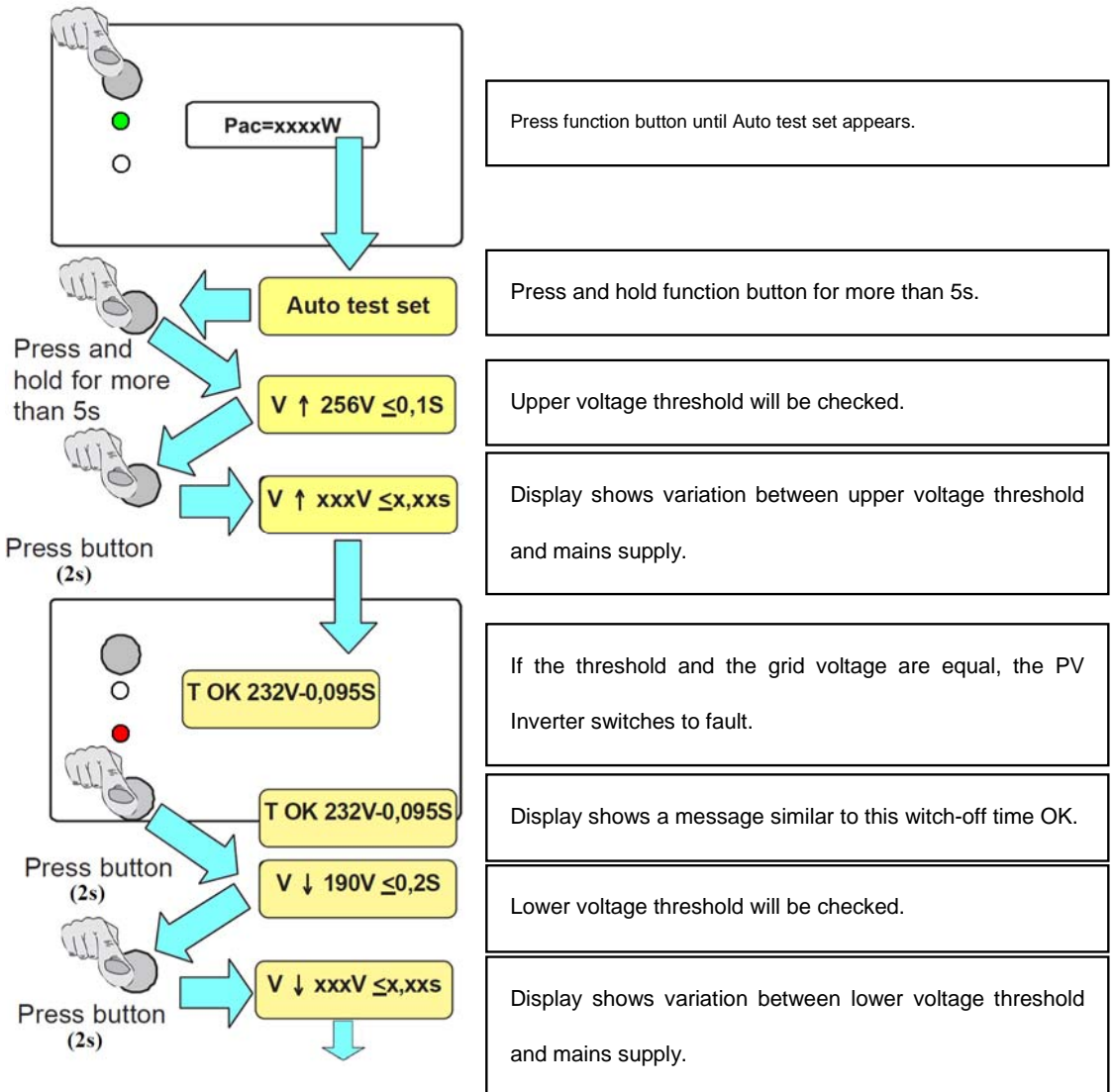
LCD display sequence



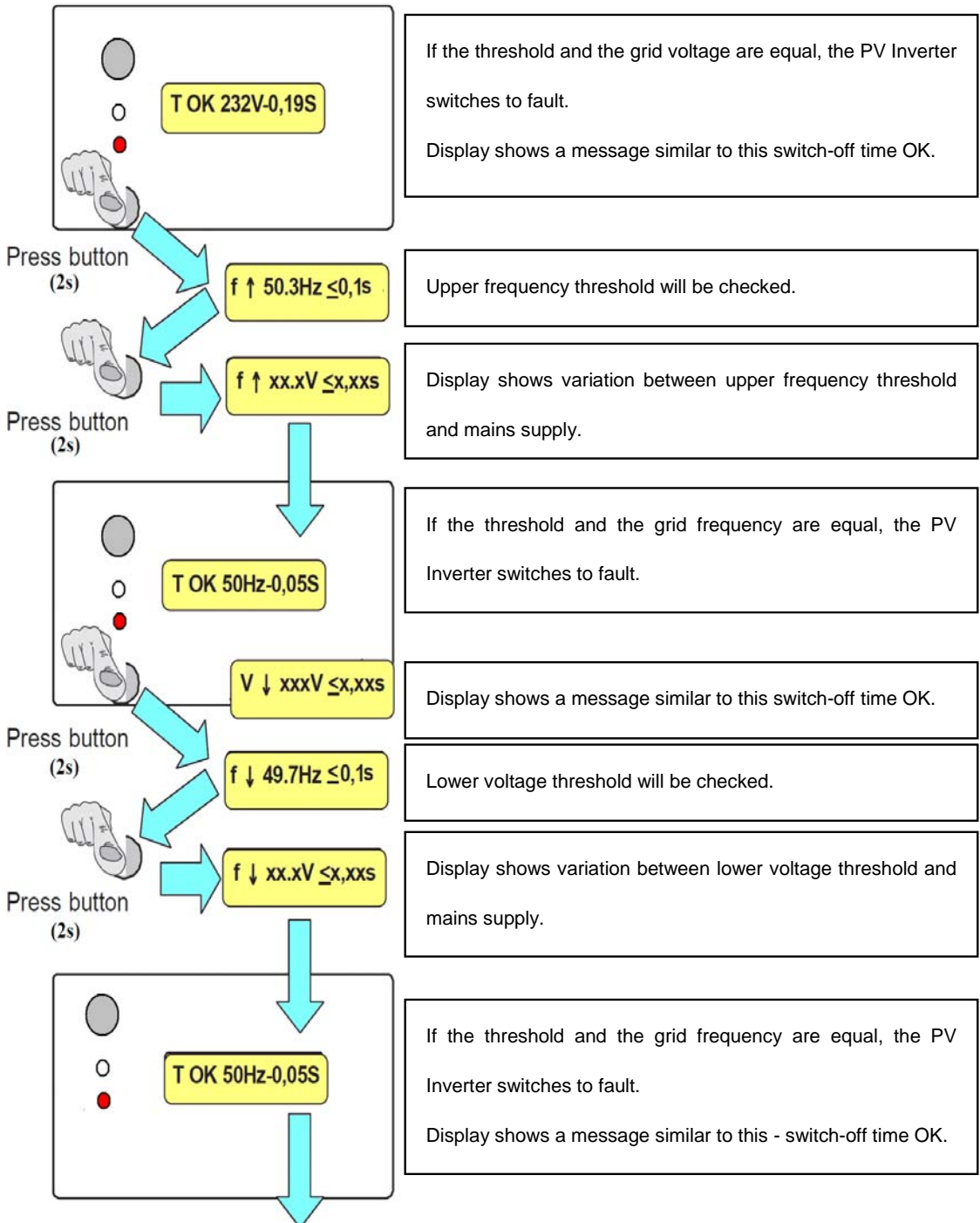
LCD display sequence

Auto Test Setting (Only for ENEL GUIDE 2010 model)

The Inverter is supplied with an auto test function which enables the user to check that the protection interface is operating correctly. In order to select this function, press the function button until the message "AUTO TEST SET" appears on the display panel. Press and hold the same button for at least 5 seconds to initiate the auto test procedure.



Auto Test



If the threshold and the grid voltage are equal, the PV Inverter switches to fault.

Display shows a message similar to this switch-off time OK.

Upper frequency threshold will be checked.

Display shows variation between upper frequency threshold and mains supply.

If the threshold and the grid frequency are equal, the PV Inverter switches to fault.

Display shows a message similar to this switch-off time OK.

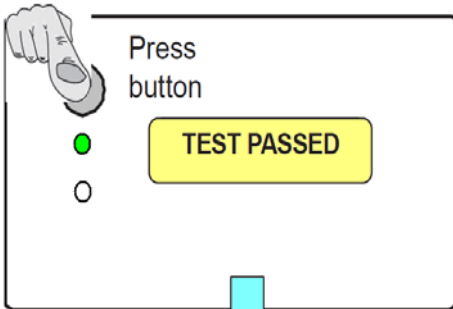
Lower voltage threshold will be checked.

Display shows variation between lower voltage threshold and mains supply.

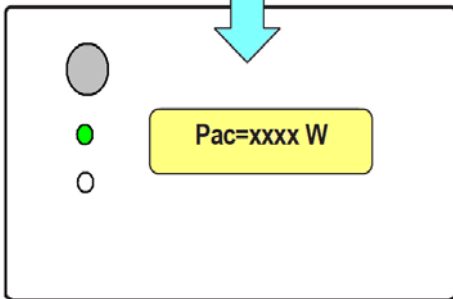
If the threshold and the grid frequency are equal, the PV Inverter switches to fault.

Display shows a message similar to this - switch-off time OK.

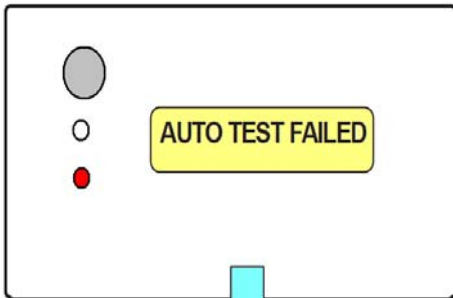
Auto Test



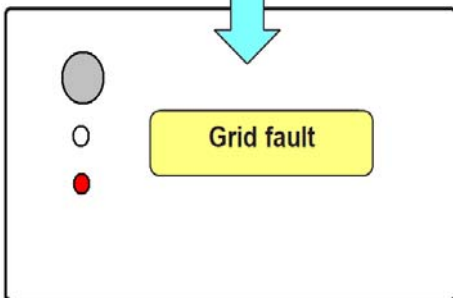
If all the above tests have been performed, the display shows the message TEST PASSED.



PV Inverter switches to normal operation mode.



If one of the above tests failed, the display shows the message AUTO TEST FAILED.

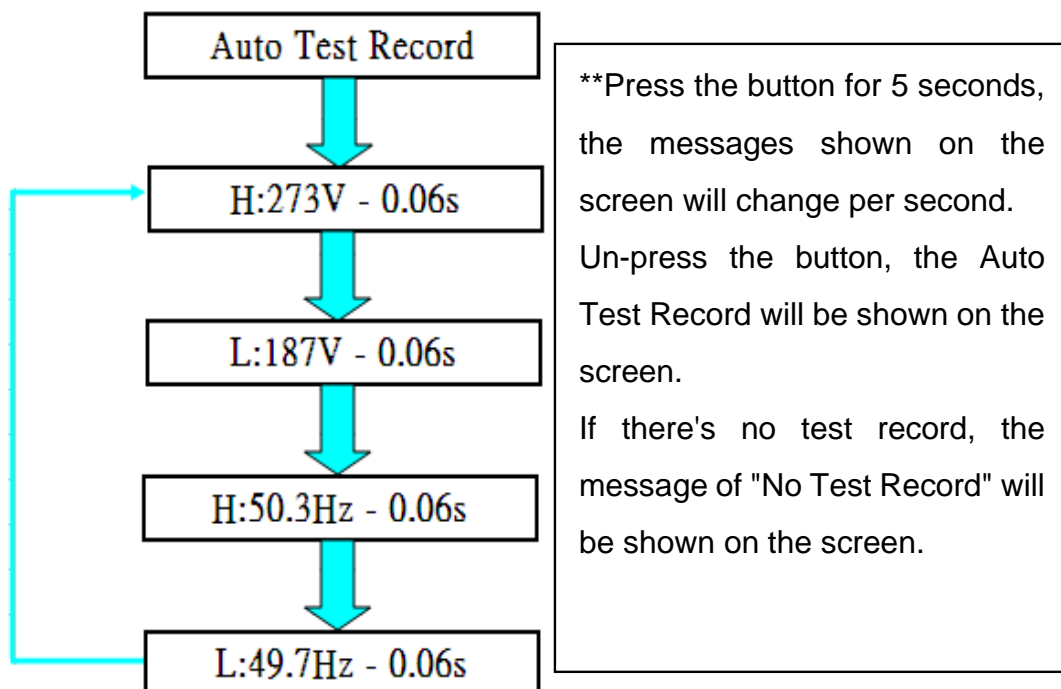


PV Inverter switches automatically and permanently to fault status.

Contact the installer.

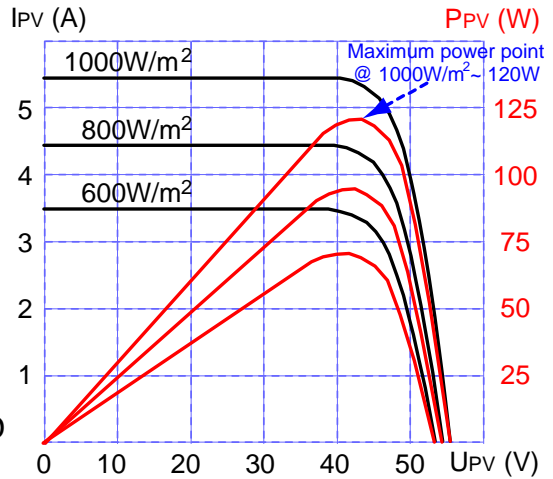
Auto Test Record (Only for ENEL GUIDE 2010 model)

After the Auto test setting, inverter will record the test result values, as shown in below.



Maximum Power Point Tracking (MPPT)

A good PV inverter must be able to convert the maximum power from any PV panel. Due to its advanced design, this PV-Inverter can track the maximum power from your PV panel in any condition. When the displayed power on the LCD output does not change



dramatically, the inverter is converting the maximum power from panels. When the LCD power reading is significantly changes, the inverter is tracking the power according to the varied sunlight.

When the PV panel's output is low, the feeding DC-power may drift slowly as does the AC power. It is because PV-Inverter is tracking maximum DC-power continuously.



Accuracy of the reading

The reading on the LCD is just for reference. We do not recommend using the data for checking or testing of the system. Normally, its accuracy is around $\pm 2\%$. In all ranges of operation, the accuracy is up to $\pm 5\%$.

6. Inverter Status

This inverter is designed to be user-friendly; therefore, the status of the Inverter can be easily understood by reading the information shown on the front panel display. All possible messages are shown in the following table.

Display information

Operating conditions	In English	In German	In Italian	Description
Normal Working Status				
Power off	–	–	–	PV inverter is totally shutdown, $V_{PV} < 70V$
Standby	Standby	Standby	Standby	$70V < \text{Input voltage} < 120V$
Initialization & waiting	Waiting	Warten	Attendere..	Input voltage range 120~150V during start-up. After PV voltage is higher than 120V, inverter is waiting for feeding to grid
Check grid	Checking xxxS	Netzprüfung xxxS	Verifica... xxxS	When PV voltage > 150V, inverter is checking feeding conditions
Feeding grid, MPPT	Normal	Normalbetrieb	Stato Normale	Inverter is feeding power. After 10 seconds of this display, LCD will show wattage.

Operating conditions	In English	In German	In Italian	Description
FLASH	FLASH	FLASH	FLASH	FLASH firmware
Monitoring Parameters				
Instantaneous Output power	Pac=xxxx.xW	Pac=xxxx.xW	Pac = xxxx.xW	The real time output power in xxxx W
Accumulated energy information	Eac = xxxxxxkWh	Eac = xxxxxxkWh	E = xxxxxxkWh	Total energy to has been fed to grid since inverter was installed
Grid voltage	Vac=xxx.xV	Uac=xxx.xV	Vac = xxx.xV	Grid voltage in xxx.x VAC
Grid frequency	Frequency=xx.xHz	Frequenz = xx.xHz	Freq = xx.xHz	Grid frequency in xx.x Hz
Feeding current	Iac=xx.xA	Iac=xx.xA	Iac = xx.xA	Feeding current amount in xx.x A
PV array voltage	Vdc= xxx.x V	Udc= xxx.x V	Vdc=xxx/xxx/xxxV	Input voltage from PV array, xxx.x VDC
Daily Energy	Etoday=xxx.xxKWh	Etoday=xxx.xxKWh	Etoday=xxx.xkWh	The accumulated kWh of that day

Operating conditions	In English	In German	In Italian	Description
System Fault				
Isolation failure	Isolation fault	Isolationsfehler	Err.Isolamento	Earth fault of the PV-panels or failure of surge voltage protection
GFCI active	Ground I fault	Fehlerstrom	I dispers.Alta	Leakage current on ground conductor is too high
Grid failure	Grid fault	Netzfehler	Err.Rete	Grid measured data is beyond the specification (voltage & frequency)
No utility	No Utility	Kein Netz	Non disponibile	Utility is not available
Input voltage too high	PV over voltage	DC-Überspg.	Vdc alta	Input voltage higher than the maximum input voltage
Inverter Fault				
Consistent failure	Consistent Fault	Konsistenzfehler	Err.interno 01	The readings of 2 microprocessors are not consistent. It could be caused by CPU and/or other circuit do not function well.
Temperature too high	Over temperature	Übertemperatur	Sovratemperatura	The internal temperature is higher than normal value

Operating conditions	In English	In German	In Italian	Description
Output relay failure	Relay Failure	Relaisfehler	Err.rele`	The relay between inverter and grid is not functional
Output DC injection too high	DC INJ High	DC INJ zu hoch	Idc uscita alta	Output DC injection too high
EEPROM problem	EEPROM Failure	EEPROM Fehler	Err.interno 02	EEPROM inside has data access problem
Communication failure between microprocessors	SCI Failure	CPU Fehlfunktion	Err.interno 03	The communication between MCU inside is abnormal
DC bus voltage is too high	High DC Bus	Udc bus zu hoch	Err.interno 04	The DC BUS inside is higher than expected
DC bus voltage is too low	Low DC Bus	Udc bus zu klein	Err.interno 05	The DC BUS inside is lower than expected
2.5V reference voltage inside prolem	Ref 2.5V Fault	Uref fehlfunkt.	Err.interno 06	The 2.5V reference inside are abnormal
Output DC sensor abnormal	DC Sensor Fault	DC Sensor Fehler	Err.interno 07	The DC output sensor is abnormal
GFCI detection problem	GFCI Failure	FI-Fehler	Anomalia GFCI	The GFCI detection circuit is abnormal

Operating conditions	In English	In German	In Italian	Description
System Information				
Model display	CPS SC1.5KTL / CPS SC2KTL / ...	CPS SC1.5KTL / CPS SC2KTL / ...	CPS SC1.5KTL / CPS SC2KTL / ...	Inverter model name
LCD contrast	Contrast	Kontrast	Contrasto	The top menu of LCD contrast setting
LCD contrast setting	Set Contrast	Kontrast	Regola contrasto	Setting the contrast of LCD
LCD display lock	Lock	Lock	Bloccato	Hold the present display message
Waiting for reconnect to grid	Reconnect xxxS	Kontakt in xxx S	Connessione xxx S	The time for reconnect to grid
Firmware version	Ver xx.xx	Ver xx.xx	Ver xx.xx	F/W version information
Setting Language	Set Language	Sprache	Imposta lingua	Set up of the display language

LED

There are 2 LED's on the inverter, one is **green** and the other is **red**. Normally, only the green LED switches on during operation. Their indicated status is explained as follows:

1. Power on (green LED): It lights to indicate that the inverter is running.
2. Fault (red LED): Illuminates during a "fault" or "failure". Details of possible faults and their solutions can be found in the previous table.

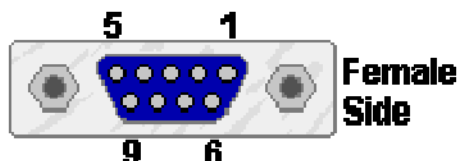
7. Communications

This inverter is equipped with a powerful communications interface and options. Use “Pro Control” to monitor the status of your PV-Inverter. Also, qualified personnel can upgrade the firmware using the RS232 port.

1. RS232: To use the RS232 port, remove the RS232 cover on the bottom side of the inverter. It is a DB9 socket. The pin definition is

Pin	Functional Description
1	N.C.
2	TxD
3	RxD
4	N.C.
5	Common
6	N.C.
7	N.C.
8	N.C.
9	N.C.

N.C. means “No Connection”



2. Optional communications port: This port is a very powerful extension. The inverter can accept a special card designed for the port only. The RS485 card is used to work with EZ logger and in multiple monitoring applications. For information of card details, please refer to the user manual of each individual card. To get the latest information, please contact with your local dealer or visit our website.
3. Firmware upgrade: To keep the firmware up to-date, use the RS232 port and supplied program to upgrade firmware. To do this, please contact your local service



To prevent risk of damage it is recommended that only authorized personnel perform firmware upgrades.

8. Trouble shooting

In most situations, the inverter requires very little service. However, if inverter is not able to work perfectly, please refer to the following instructions before calling your local dealer.

- Should any problems arise, the red (Fault) LED on the front panel turns on and the LCD displays the relevant information. Please refer to the following table for a list of potential problems and their solutions.

	Display	Possible actions
System Fault	Isolation fault	<ol style="list-style-type: none"> 1. Check the impedance is between PV (+) & PV (-) and the PV-Inverter is earthed. The impedance must be greater than $2M\Omega$ 2. If the problem persists please call service
	Ground I fault	<ol style="list-style-type: none"> 1. The ground current is too high. 2. Unplug the inputs from the PV generator and check the peripheral AC system 3. After the cause is cleared, re-plug the PV panel and check PV-Inverter status. 4. If the problem persists please call service.
	Grid fault	<ol style="list-style-type: none"> 1. Wait for 30 seconds, if the grid returns to normal, PV-Inverter automatically restarts. 2. Make sure grid voltage and frequency meet the specifications 3. If the problem persists please call service
	No Utility	<ol style="list-style-type: none"> 1. Grid is not connected. 2. Check grid connection cables. 3. Check grid usability.
Inverter Failure	PV over Voltage	<ol style="list-style-type: none"> 1. Check the open PV voltage, see if it is greater than or too close to 500V (450V for CPS SC1.5KTL). 2. If PV voltage is less than $500 V_{DC}$ ($450 V_{DC}$), and the problem still occurs, please call local service
	Consistent Fault	<ol style="list-style-type: none"> 1. Disconnect PV (+) or PV (-) from the input, restart the PV-Inverter 2. If it does not work, call service

	Over temperature	<ol style="list-style-type: none"> 1. The internal temperature is higher than specified normal value 2. Find a way to reduce the ambient temperature. 3. Or move the inverter to a cooler environment 4. If it is not effective, call local service
	Relay Failure	<ol style="list-style-type: none"> 1. Disconnect ALL PV (+) or PV (-) 2. Wait for few seconds 3. After the LCD switches off, reconnect and check again 4. If the message reappears call your local service
	DC INJ High	
	EEPROM Failure	
	SCI Failure	
	High DC Bus	
	Low DC Bus	
	Ref 2.5V Fault	
	DC Sensor Fault	
GFCI Failure		

- If there is no display on the panel, please check PV-input connections. If the voltage is higher than 150V, call your local service.
- During periods of little or no sunlight, the PV-Inverter may continuously start up and shut down. This is due to insufficient power generated to operate the control circuits.

9. Specifications

Model		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
Market	Germany (DE)	V	V	V	V	V
	Italy (IT)	V	V	V	V	V
	United Kingdom (UK)	V	V	V	V	-
	China (CN)	-	-	V	-	-
Input (DC)						
Nominal DC voltage		360 V	400 V			
Max. PV open voltage		450V	500V			
System start-up voltage		Typical 120 V				
Initial feeding voltage		150 V				
Shutdown voltage		Typical 70V				
Working voltage range ¹		100 ~ 450 V	100 ~ 500 V			
Full rating voltage range		200 ~ 405 V	250 ~ 450 V			
MPPT voltage range		150 ~ 405 V	150 ~ 450 V			
MPPT efficiency		> 99%				
Number of MPP tracker(s)		1				
Max. DC current		8.9A	10A	13A	20A	20A
DC voltage ripple		< 10%				

¹ Which is the DC voltage range that inverter can feed power to grid.

Model		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
DC insulation resistance ²		> 5MΩ				
Output (AC)						
Nominal AC power		1500W	2000W	2800W	4000W	4000W
Max. AC power (in 10 minutes)		1650W	2200W	3000W	4400W	4400W
Nominal AC current		6.6 A	8.7 A	12.2 A	17.4 A	17.4 A
Max. AC current		7.9 A	10.5 A	14.3 A	20 A	20 A
O/P current distortion (THD i)		< 3%				
Power Factor		> 0.99				
for Germany (DE)	Operational voltage range ³ (F/W Setting)	190 ~ 256V				
	Disconnection time of excess operational voltage range	≤ 0.2 sec.				
	Operational frequency range ⁴ (F/W Setting)	47.55 ~ 50.15 Hz				

² The DC resistance requirement for positive or negative terminal to chassis ground

³ Regulation voltage range is 184~264.5 V_{AC} according to VDE0126-1-1

⁴ Regulation frequency range is 47.5~50.2Hz according to VDE0126-1-1.

Model		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
	Disconnection time of excess operational frequency range	≤ 0.2 sec.				
	Re-connecting time after disconnection	30 sec				
for Italy (IT)	Operational voltage range ⁵ (F/W Setting)	190~267V				
	Disconnection time of excess operational voltage range	Min Voltage protection 0.2 s; Max voltage protection 0.1s				
	Operational frequency range ⁶ (F/W Setting)	49.75 ~ 50.25 Hz				
	Disconnection time of excess operational frequency range	≤ 0.1 sec.				
	Re-connecting time after disconnection	60 sec				

⁵ Regulation voltage range is 184~267 V_{AC} according to ENEL Guide 2010

⁶ Regulation frequency range is 49.7~50.3Hz according to ENEL Guide 2010.

Model		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
for United Kingdom (UK)	Operational voltage range ⁷ (F/W Setting)	212~256V			Step1 : 207~246V Step2 : 189~256V	-
	Disconnection time of excess operational voltage range	≤ 1.5 sec.			U/V st1 200.1V(87%), 2.5s O/V st1 253V(110%), 1s U/V st2 184V(80%), 0.5s O/V st2 264.5V(115%), 0.5s	-
	Operational frequency range ⁸ (F/W Setting)	47.05~50.45Hz			St1 47.55~51.45Hz St2 47.05~51.95Hz	-
	Disconnection time of excess operational frequency range	≤ 0.5 sec.			U/F st1 47.5Hz, 20s O/F st1 51.5Hz, 90s U/F st2 47Hz, 0.5s O/F st2 52Hz, 0.5s	-

⁷ Regulation voltage range is 207~264 VAC according to G83/1-1

Regulation voltage range is 184V-264.5VAC according to G59 Issue 2

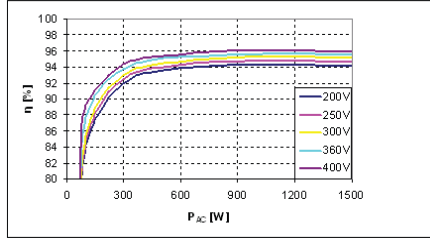
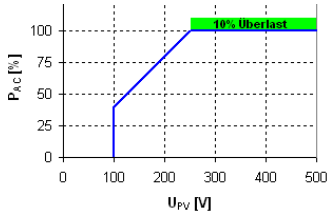
⁸ Regulation frequency range is 47~50.5Hz according to G83/1-1.

Regulation frequency range is 47~52Hz according to G59 Issue 2

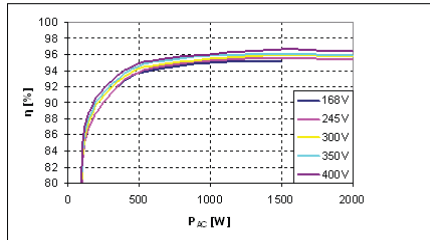
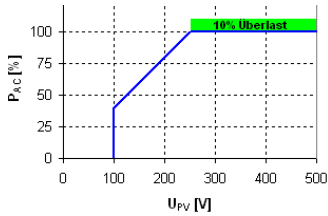
Model		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
	Re-connecting time after disconnection	180 sec			180 sec	-
Efficiency						
	Max. conversion efficiency	95%	96%	96%	96%	96%
	European efficiency	94%	95%	95%	95%	95%

Typical Efficiency Charts vs. Load

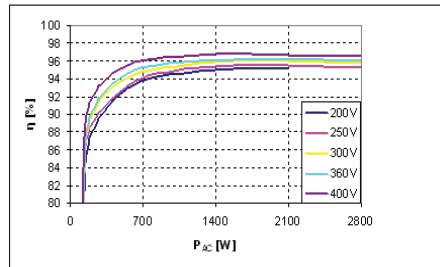
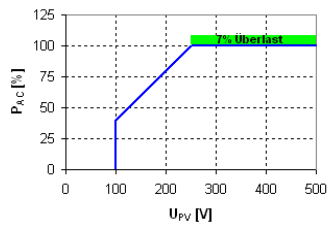
CPS SC1.5KTL



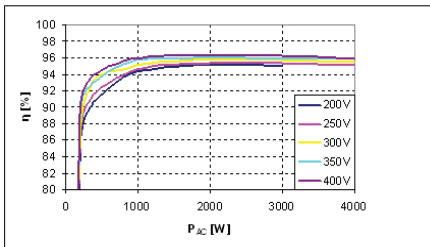
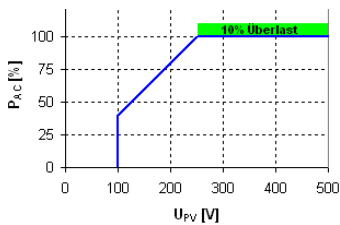
CPS SC2KTL



CPS SC2.8KTL



CPS SC4KTL / CPS SC4KTL-O



Note: Test equipment tolerances, environmental conditions and model specifications may cause actual results to differ.

10. Disposal

The dealer or installers should remove the PV Inverter from the array and contact the supplier for disposal instructions



The inverter must not be disposed of with the household waste.

Dispose of the PV Inverter at the end of its service life should be done in accordance with the disposal regulations for electronic waste which apply at the installation site at that time.

Please contact supplier for disposal instruction, the contact information could be found in Chapter 11. Contact Information.

11. Contact Information

Should you have technical problems concerning this product, please contact our Service line.

We require the following information in order to provide you with the necessary assistance:

- Inverter type
- Serial number of the PV Inverter
- Type and number of PV panel connected
- Fault message
- Communication method

SHANGHAI CHINT POWER SYSTEMS CO., LTD.

Add: Building 4, No.855 Wenhe Road, Songjiang District, Shanghai,
201614, China

Tel :+86 - 21 - 3779 1222

Fax:+86 - 21 - 3779 1222 - 6016

Service Hotline : +86 - 21 - 3779 1222 - 6300

Mail:service.cps@chint.com

Web:www.chintpower.com

12. Regulation & Certificate

Regulatory Type		CPS SC1.5KTL	CPS SC2KTL	CPS SC2.8KTL	CPS SC4KTL	CPS SC4KTL-O
Grid Monitoring	VDE0126-1-1	V	V	V	V	V
	ENEL Guide 2010	V	V	V	V	V
	G83/1-1; G59 Issue 2	G83/1-1	G83/1-1	G83/1-1	G59 issue2	-
Safety		DIN EN 50178 (4.98) (VDE0160) (IEC62103)				
EMC: EMS / EMI		EN 61000-6-2 EN 61000-6-3				
CE		LVD: 2006/95/EC EMC: 2004/108/EC				

VDE Certificate (European models)

VDE Prüf- und Zertifizierungsinstitut

ZEICHENGENEHMIGUNG MARKS APPROVAL

Shanghai Chint Power
Systems Co., Ltd.
#4 Building, No. 855 Wenhe Rd.
201614 SONGJIANG DISTRICT, SHANGHAI
Shanghai
CHINA

ist berechtigt, für ihr Produkt /
is authorized to use for their product

PV-Wechselrichter mit selbsttätiger Freischaltstelle
Power converter for photovoltaic with interactive fail safe interface
PV-Wechselrichter mit selbsttätiger Freischaltstelle (ENS)
PV-Inverter with automatic disconnecting facility

die hier abgebildeten markenrechtlich geschützten Zeichen
für die ab Blatt 2 aufgeführten Typen zu benutzen /
the legally protected Marks as shown below for the types referred to on page 2 ff.



Geprüft und zertifiziert nach /
Tested and certified according to

DIN EN 50178 (VDE 0160):1998-04; EN 50178:1997
IEC 62103(ed.1)
DIN VDE V 0126-1-1 (VDE V 0126-1-1):2006-02

Das Produkt entspricht den Anforderungen des deutschen Geräte- und Produktsicherheitsgesetzes (GPSG) hinsichtlich der Gewährleistung von Sicherheit und Gesundheit.
The product covers the requirements of the German Act "Geräte- und Produktsicherheitsgesetz (GPSG)" regarding the ensurance of safety and health.

Befristet zum / valid until: 2014-11-30

Aktenzeichen: 5012648-3971-0001 / 135846
File ref.:

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VDE Testing and Certification Institute
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further conditions see overleaf and following pages

Offenbach, 2010-06-21

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