INSTALLATION
AND
OPERATIONS
MANUAL
IGSI - 3 Phase Output Series
(IGSI-5000DJ/3, IGSI-6000DJ/3, IGSI-8000DJ/3, IGSI-10000DJ, IGSI-12000DJ, IGSI-xxxxDJ/3)

REVISION TABLE

Document Revision	Author	Date	Change Description
0	KL Tan	01/06/2012	First release
			-

SAVE THESE INSTRUCTIONS !

IMPORTANT SAFETY INSTRUCTIONS

GENERAL PRECAUTIONS

For your own safety and that of the unit, you must read and understand the instructions contained in this document before starting to work.

Keep these instructions in a place accessible to all the personnel who work with the unit so that these may be consulted.

Only professional technician may install and operate our units.

WARNING:

To avoid risk of electric shock from energy stored in capacitor, please wait for at least 5 minutes to access the conductor part of input or output terminals of the inverter after it is disconnected from the output of PV panel and AC grid.

There is a fuse in our units. For continued protection against risk of fire, replace only with same type and ratings of fuse. The replacement should be done by qualified service personnel.

- The installation of inverter must be performed in full compliance with the National Wiring Rules of Standard AS/NZS 3000 and other relative local standards and regulations.
- There are no spare parts in package box. To avoid risk of electric shock, Do not remove machine cover. No user serviceable parts inside. Refer servicing to qualified service personnel. Please contact your reseller if you need to know the nearest authorized repair center or qualified service personnel.
- As a qualified service personnel, you should know both ac and dc voltage sources are terminated inside this units. Each circuit must be individually disconnected before servicing.
- Read and understand all the instructions contained in this manual and become familiar with the safety symbols in the relevant paragraphs before you install and commission the equipment.
- The connection to the AC grid must be done only after receiving approval from the administering authority as required by national and state interconnection regulations, and can be done only by qualified personnel.
- Keep the whole surface of the photovoltaic panel covered with material opaque to solar radiation before connecting panel to equipment; this will ensure that no dangerous high voltage is present at the connection cables.
- 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 Inverter to external devices could result in serious damage to your equipment.
- Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the solar inverter or nearby surfaces while Inverter is operating. Keep it away from any flammable objects.
- This version of IGSI “J” series inverters shall be used with panels connected in a “floating” way, i.e. with positive and negative terminal not connected to the ground.

The equipment is provided with several labels, some of them with a yellow background, and these are related to safety issues.

Make sure to read the labels and fully understand them before installing the equipment.

The symbols are:

	Equipment grounding conductor (Main grounding protective earth, PE)
	Alternate Current (AC) value
	Direct Current (DC) value
	Phase
 5minutes	To avoid risk of electric shock from energy stored in capacitor, please wait for at least 5 minutes to access the conductor part of input or output terminals of the inverter after it is disconnected from the output of PV panel and AC grid.
	Caution: The temperature of metal enclosure may be high during operation.

Disposal: Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact you local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

CONTENT

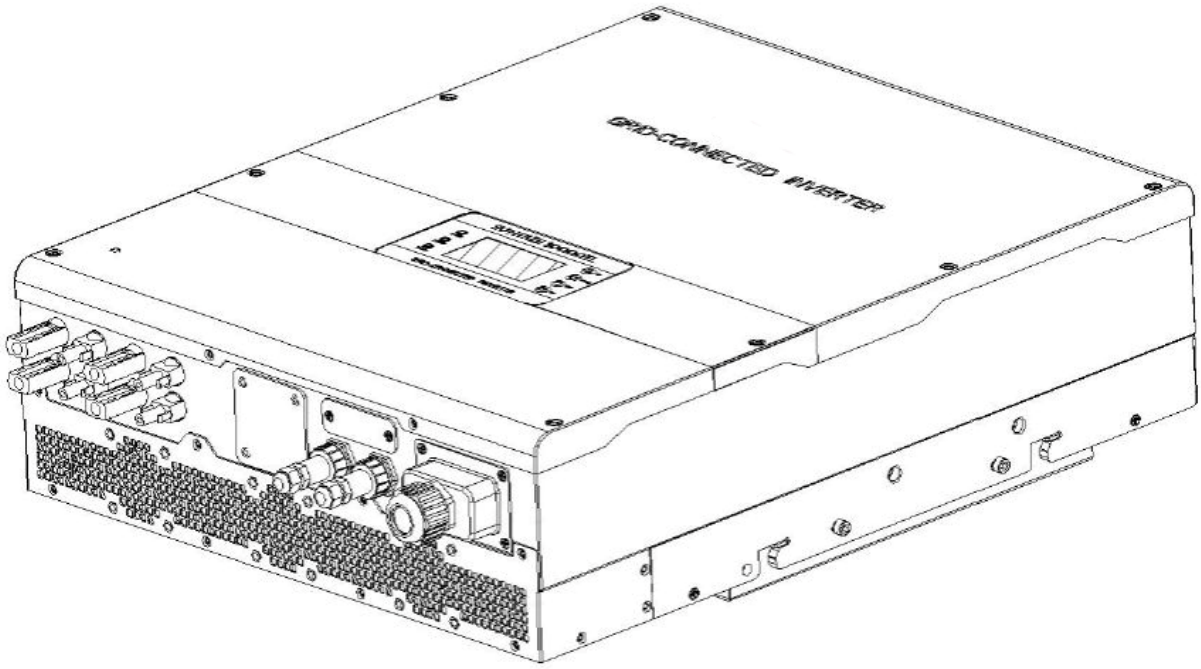
1. OVERVIEW

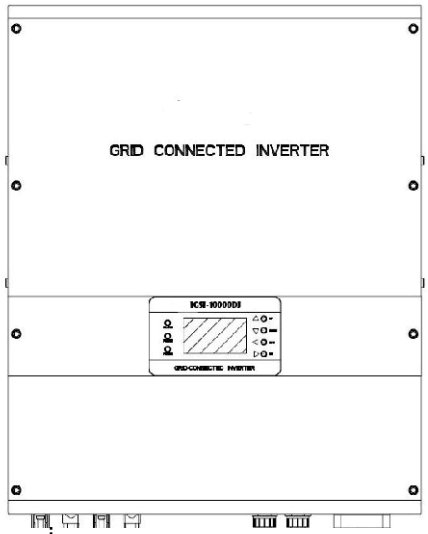
1.1 Basic Features

The IGSI – 3 Phase Output Series of string PV inverter is one of the optimum designed inverter on the market today, incorporating state-of-the-art technology, high reliability, and convenient control features.

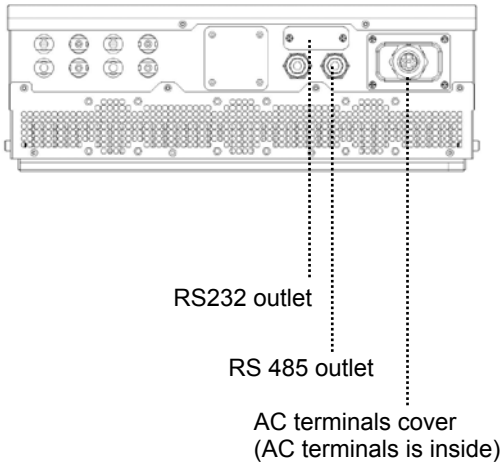
- Advanced DSP control technology.
- Utilize the latest high-efficiency power component.
- Optimal MPPT technology.
- 2 independent MPP trackers.
- Advanced anti-islanding solutions.
- Maximum efficiency up to 98%, EU efficiency up to 97.6%.
- THD~3%.
- Power factor adjustable arrange:+/-0.9.
- Safety & Reliability: Transformerless design with software and hardware protection.
- IP65 protection.
- Friendly HMI.
- LED status indications.
- Multi language LCD display, Human-Machine interaction through button.
- RS485/RS232 communication interface.
- PC remote control.

1.1 Machine Overview





Front View



Bottom View

Fig.1 Overview of inverter

Opening the package

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

Item	Name	Quantity
1.	Solar inverter	1 pc
2.	Mounting frame	1 pc
3.	Mounting screws and blocks	6 pcs
4.	Safety-lock screws	2 pcs
5.	Socket head wrench	1 pc
6.	DC socket assembly	1 set
7.	Special RS-232 cable	1 pc
8.	Instruction manual	1 pc
9.	Monitor software(CD)	1 pc
10.	Warranty sheet	1 pc

IGSI-xxxxDJ/3 series include:
IGSI-5000DJ/3, IGSI-6000DJ/3, IGSI-8000DJ/3, IGSI-10000DJ, IGSI-12000DJ

2. INSTALLATION

WARNING: The electrical installation of the IGSI "J" series inverter must be performed in compliance with applicable local and national standards and laws.

WARNING: The connection of IGSI "J" series inverter to the AC grid must be performed only after receiving authorization from the utility that operates the grid.

2.1 Package Inspection

The customer is encouraged to perform the following checks:

- Inspect the package box for apparent damage, such as holes, cracking or any sign of possible damage to its contents.
- Describe any damage or shortage on the receiving documents and have the carrier sign his/her full name.
- Open the package box and inspect the contents for internal damage. While unpacking, be careful not to discard any equipment, parts or manuals. If any damage is detected, call the delivering carrier to determine the appropriate action. Save all shipping material for the event the carrier sends an inspector to verify damage!
- If the inspection reveals damage to the inverter, please call your local supplier or the authorized distributor. They will determine if the equipment should be returned for repair. They will also provide instructions on how to get the equipment repaired;
- It is the customer's responsibility to file a claim with the carrier. Failure to file a claim with the carrier may void all warranty service rights for any damage;
- Carefully store the original packaging of IGSI "J" series inverter since it shall be used in case it is necessary to ship it for repair.

2.2 Selecting the place of installation

Place of installation should be selected based on the following considerations:

- IGSI "J" series inverters shall be set at a suitable height from the ground to enable easy readout view of the display and the LEDs.
- Select a well ventilated place sheltered from direct sun radiation. Choose a place that allows fluent air flow around the unit.
- Allow sufficient room around the unit to enable easy installation and removal of the object from its mounting surface.

The following figure shows the recommended minimum clearances around the inverter:

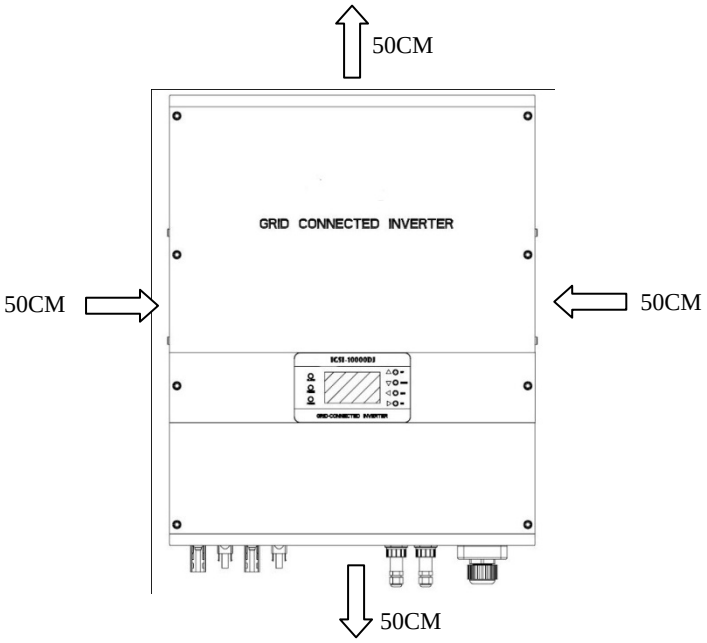


Fig.2 Minimum clearance around inverter

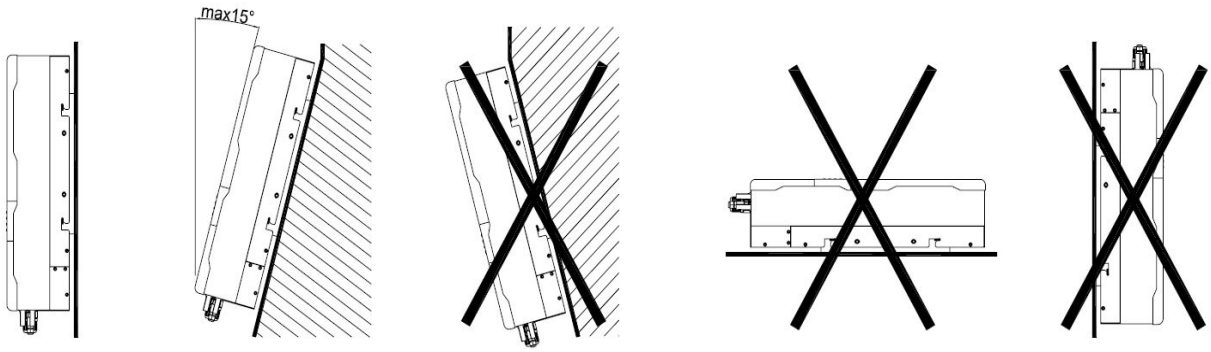


Fig.3 Recommended installed position of the inverter

2.3 Fixed on the wall

Step1: Drill 6 or 9 holes as illustrated in the Fig.4

Step2: Fix the mounting frame as illustrated in the Fig.5 by the screws, and then hang the inverter on the mounting frame.

Step3: Fix safety-lock screws at left side and right side as illustrated in Fig.6 with the attached socket head wench.

Step4: Check the installation conditions.

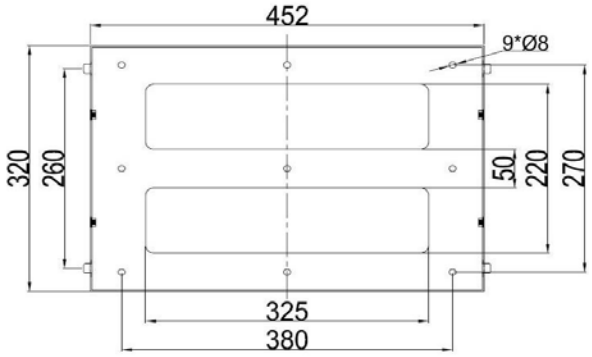


Fig.4 The size of mounting frame for IGSI-xxxxDJ/3, IGSI-10000DJ, IGSI-12000DJ

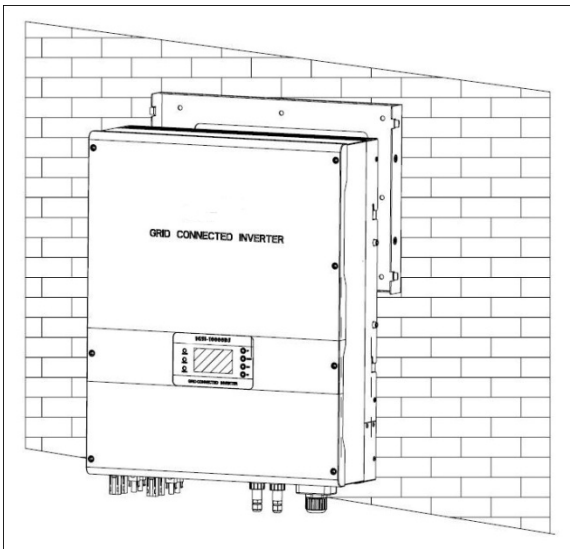


Fig.5 Hang inverter to mounting frame

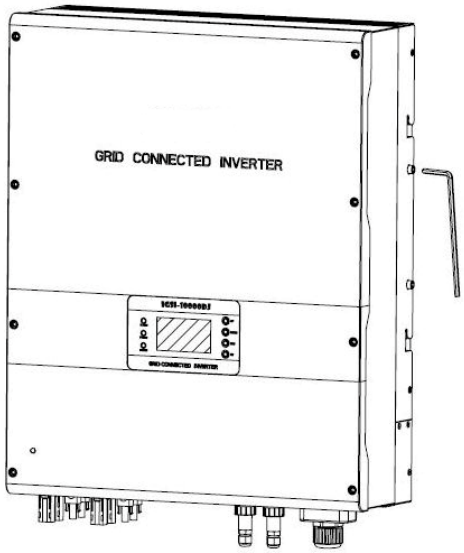


Fig.6 Fix safety-lock screws

The customer is encouraged to perform the following checks:

- Do not install the solar inverter on a gradient surface.
- Check the upper straps of solar inverter and ensure it to fit on to the bracket.
- Ensure safety-lock screws (M5 socket head cap screws) to insert into the mounting frame through inverter's heat-sink.
- Check the secure mounting of the solar inverter by trying to raise it from the bottom. The solar inverter should remain firmly attached.
- Choose a strong mounting wall to prevent vibrations while inverter is operating.

2.4 System Diagram and Connection Label

The IGSI "DJ/3" series are three-phase solar inverters **with two independent channels of MPPT input**. They are designed to convert the direct current generated by PV panels into three-phase 400Vac 50Hz alternating current for delivery into the AC grid.

The IGSI "DJ/3" series can be used in an on-grid PV system to produce electricity.
The installation of the IGSI "DJ/3" series and their connection to the AC grid shall be done in accordance with local regulations and may require the installation of adequate electricity consumption measuring devices.

The IGSI "DJ/3" series only operates when it is connected to the AC grid and cannot operate as a stand-alone unit.

The simplified connection diagrams of the inverter are as figures 7 & 8 below.

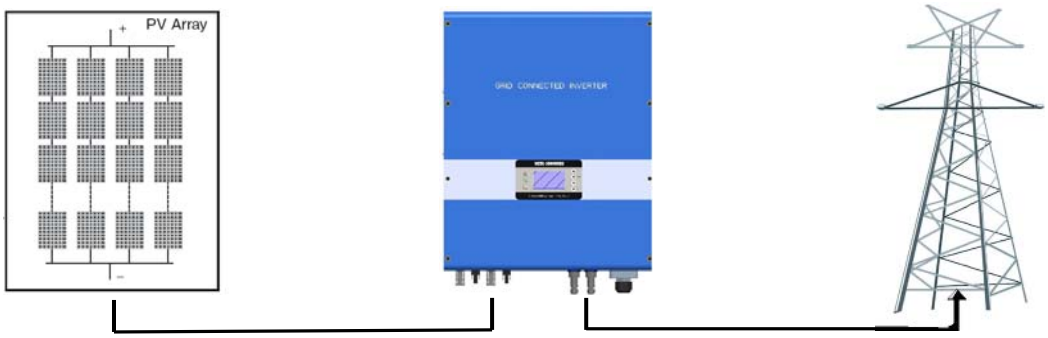


Fig.7 The PV system diagram 1

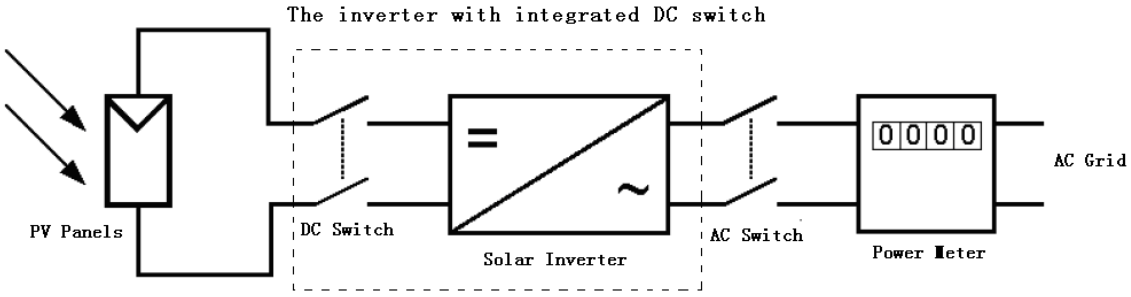


Fig.8 The PV system diagram 2

NOTE: Ensure that the IGSI-xxxxDL/3 inverter is not exposed to direct sun radiation or other external heat sources, including heat from units below it (see fig.6). At times, the heat generated by the inverters installed at the bottom rows could increase the ambient temperature and this may be detrimental to the inverters located in the top rows. At temperature above 50°C, output power of the top row units could be derated. Derating is more significant in case of high output power and high ambient temperature. For proper cooling, do make sure to allow unobstructed air flow at installed location (for instance, never with the front panel facing a solid surface).

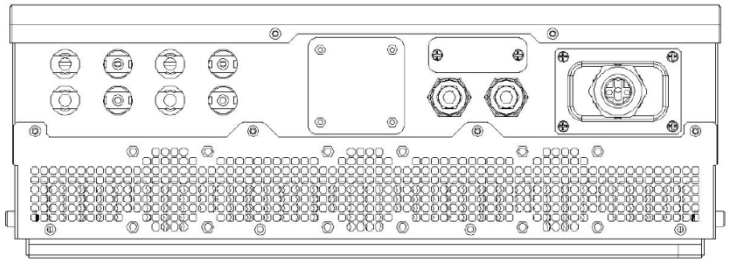


Fig. 9 Connections on the bottom of the inverter

A. PV Panels: Provide DC power to inverter.
B. Solar inverter: Converts DC (Direct Current) power from PV panel(s) to AC (Alternating Current) power. As the Inverter is grid-connected, it controls the current amplitude according to the PV Panel power supply. The PV inverter always tries to convert the maximum power from your PV panel(s).
C. DC Switch and AC Switch: "DC switch" is located between PV Panels and solar inverter while "AC Switch" located is between AC Grid (Utility) and solar Inverter. They are simplified in this diagram. Usually, they may consist of electrical breaker, fuse and/or connecting terminals. To comply with local safety standards and codes, the connection system should be designed and implemented by a qualified technician. The solar inverter also has an option of an integrated DC switch demonstrated in dashed border in Fig.6. –S suffix indicates the inverter is integrated a DC switch in PV input side.
D. AC Grid (Utility): Referred to as "grid" in this manual, is the way your electric power company provides power to your place. Please note that Inverter can only connect to low-voltage systems (namely, 400Vac, 50Hz).
E. PV INPUT: Connected to PV Panels by the attached terminals.
F. RS232: Connected to monitoring computer by special RS232 cable provided.
G. RS485: daisy-chain communication for one or more inverters.
H. AC TERMINAL (three blocks in right hand): Connected to AC Grid.

Note: There is an option of an integrated switch box that includes DC switch, AC switch, DC fuse, AC fuse, DC SPD and AC SPD devices as an option. Such a product is also readily available from your local market.

2.5 Connecting to the AC Grid (Utility)

A. Measure AC grid (utility) voltage and frequency. It should be 400VAC, 50Hz, three-phase.
B. Open AC Switch between solar inverter and AC Grid (Utility).
C. Open AC terminals cover and connect AC wires on AC terminals as follows. It is recommended that the tightening torque for the terminals be 0.56Nm. It is necessary to terminate the PE terminal with the main grounding protecting earth by a suitably sized cable.

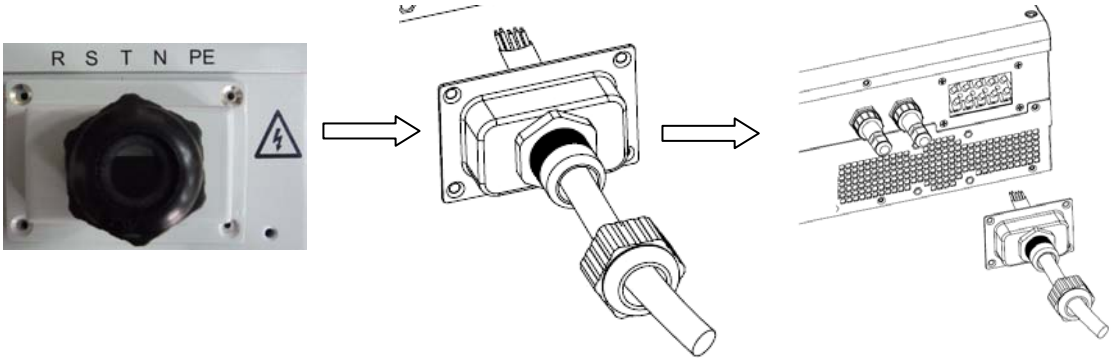


Fig. 10 AC terminals under AC terminals cover

Model	IGSI-5000DJ/3	IGSI-6000DJ/3	IGSI-8000DJ/3	IGSI-10000DJ	IGSI-12000DJ
Cable(Cu)	≧4mm^2	≧4mm^2	≧4mm^2	≧4mm^2	≧4mm^2
Micro-Breaker	25A	25A	25A	25A	25A

WARNING: When making the electrical connections adhere strictly to the procedures to avoid exposure to dangerous voltages.

WARNING: Use suitable low-impedance cables to connect the inverter to AC disconnect.

WARNING: IGSI "DJ" 3-phase series inverter shall be connected to AC disconnect by means of a five-wire cable: three phase cables, one neutral cable and a yellow-green cable for ground (PE).

Connect the 5-wire cables as follows:

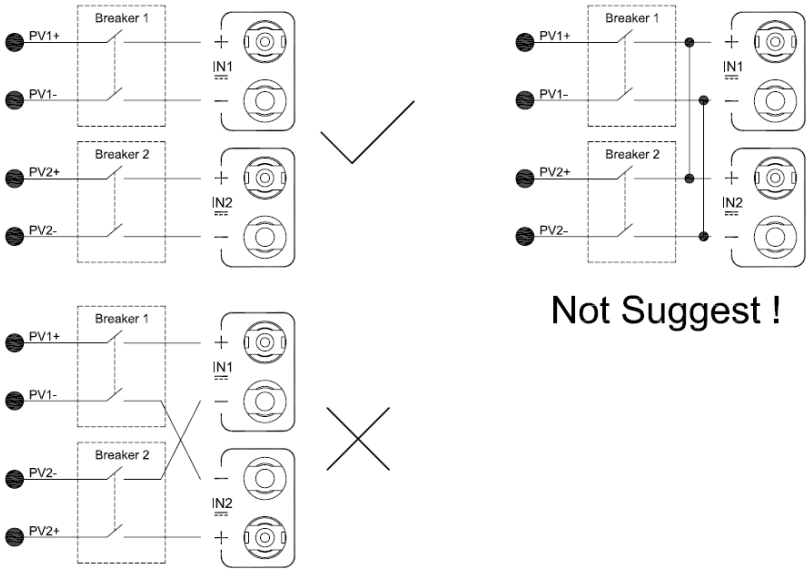
- Terminal ⏚ for Protective Earth PE
- Terminal R for Line R,
- Terminal S for Line S.
- Terminal T for Line T.
- Terminal N for neutral.

Fig.11 - Terminations for AC cables connections

WARNING: Do not reverse any phase and neutral as this may make the system unsafe to run and cause malfunctioning.

2.6 Connecting to PV Panel (DC input)

A. **Under any condition!** Make sure the maximum open circuit voltage (Voc) of each PV string is less than 900VDC for the IGSI-xxxxDJ/3, IGSI-10000DJ & IGSI-12000DJ. The length of input cable must be less than 30m. Generally, at the lowest ambient temperature, the Voc of PV string is the highest.
B. Use the attached connectors for the PV array termination.
C. Open the DC Switch and connect the positive and negative terminals from the PV panel to the DC switch, and then to the positive (+) terminals and negative (-) terminals on the solar inverter. Each DC terminal on the inverter can withstand up to 40Adc.
D. When connecting the PV panels to the DC Switch, and the DC Switch to the terminals of the inverter, please ensure that the polarity is correct.
   Incorrect polarity connection could permanently damage the unit. Please confirm the short-circuit current of the PV string. The total short-circuit current of the PV string should be less than the inverter's maximum DC input current.
E. High voltages exist when the PV panel is exposed to the sun. To reduce risk of electrical shock, avoid touching live components and treat all connecting terminals with proper care.
F. To avoid the Electro Magnetic Interference of inverter to the surrounding equipment, please see below the recommended connections.



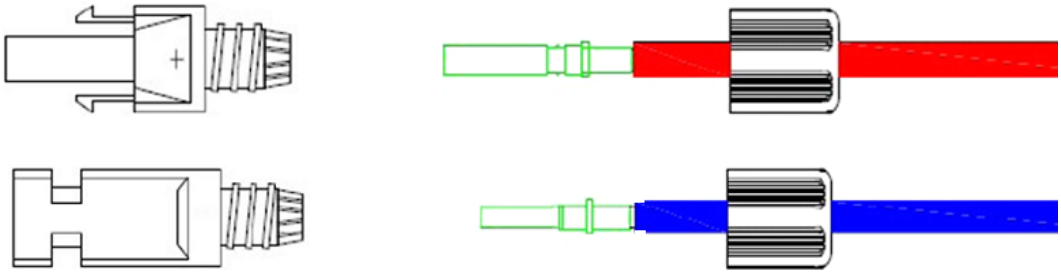
Note: Ensure that photovoltaic field voltage polarity matches the "+" and "-" symbols. Before connecting the IGSI "DJ" series inverters with the photovoltaic field, it is recommended to check, using a proper gauge, that the polarity value and the voltage allowed value between positive and negative contacts are correct.

2.6.1 Assemble the DC connector

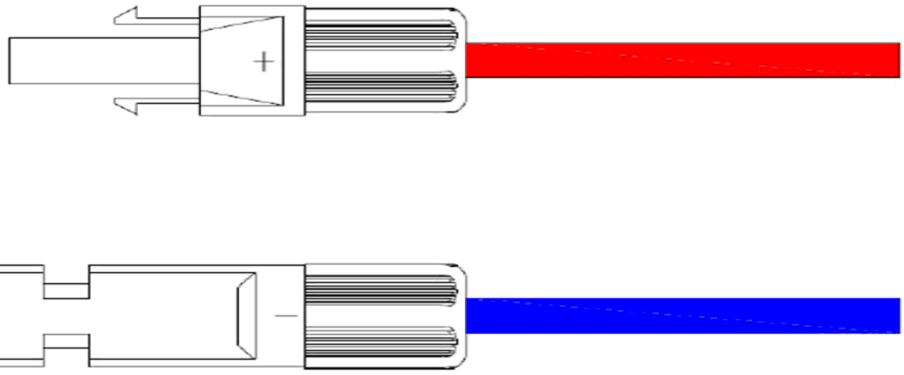
2.6.1.1 Strip the cable 6-8mm,then connect the bare wire core into the core tube of connector.

2.6.1.2 Crimp the contact barrel by using a hex crimping die. Put the contact barrel with the stripped cable in the corresponding crimping notch and crimp the contact.

2.6.1.3 Insert the core tube into the slot of the connection until you hear the locking sound, indicating in connection is in place.



2.6.1.4 Insert contact cable assembly into back of the male and female connector. Tighted the nuts accordingly towards the opposite direction. The assembly is complete.



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WARNING: Shock hazard! Before removing the panel, disconnect the inverter at both the AC and DC side and allow at least 5 minutes for the internal capacitors to discharge.

3. OPERATION METHOD

3.1 Control Panel

There is a LCD screen, three LEDs and four function keys on the front panel of the solar inverter. The LCD and LED provide the status of your Inverter. You also can use the function key as a simple control for scrolling and viewing data.

Fig. 12 Control panel

A. LCD Screen: Display the operating data and conditions, warning/error codes and relevant inverter information.
B. The model of inverter (for example,IGSI-1000SJ)
C. ALARM LED: Indicates the alarm of the inverter.
D. POWER LED: Indicates the inverter is running normally.
E. Fault LED: Indicates the fault of the inverter.
F. Function Key: Shall be used to set different parameters and display language for the inverter.
G. Description of inverter

Note: To save power, the LCD display's backlight automatically turns off after 10 seconds.

There are 4 buttons on the panel's function keys: UP, DOWN, ESC ,OK

- UP button: Move cursor to up or increase the values
- DOWN button: Move cursor to down or decrease the values.
- ESC button: Exit current screen or selection
- OK button: Confirm the selection.

LED indicators

Information List	Green LED	Yellow LED	Red LED
Wait State	FLASH	OFF	OFF
Fault Revover	OFF	ON	OFF
Normal State	ON	OFF	OFF
Fault State	OFF	OFF	ON
Permanent State	ON	OFF	OFF

Wait State: Inverter is waiting to check state for the period of the reconnection time. In this state, the PV voltage is more than 250V and the grid voltage value is between the max and min limit. If out of range, the inverter will go to Fault State or Permanent State.

Fault Recover: Inverter is on the process of circulating in take place mistake or breakdown, break down Inverter to re- combine a net after the relief

Normal State: Inverter feeds to grid energy from PV panel as much as possible according MPP trackers. Inverter will go to Fault State or Permernent State if any error or fault occurs.

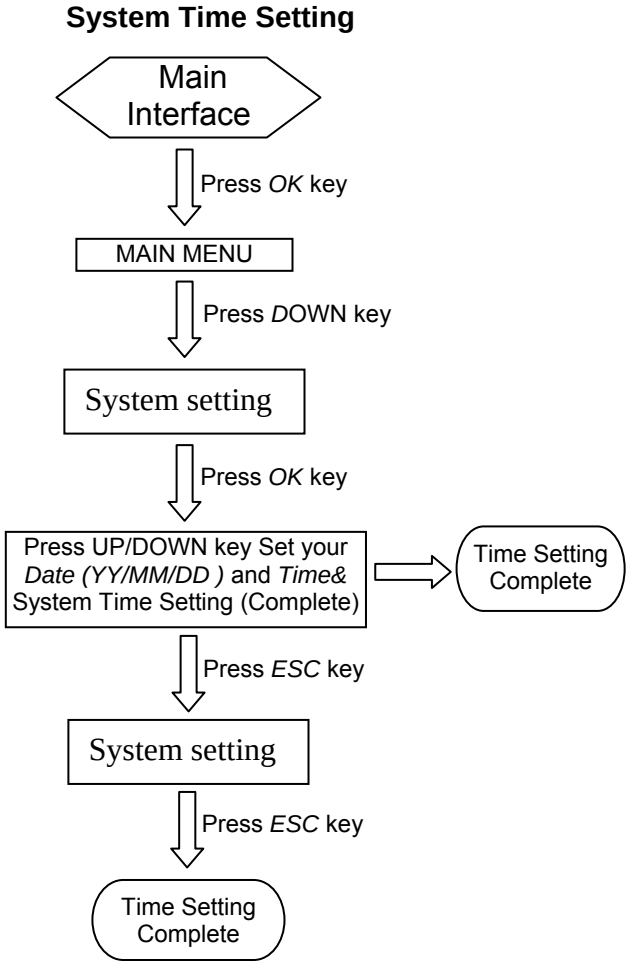
Fault State: Inverter has occurred some recoverable error

Permanent State: Inverter has occurred some unrecoverable error. It will stay in Permenent State. You should take some measure according the error code.

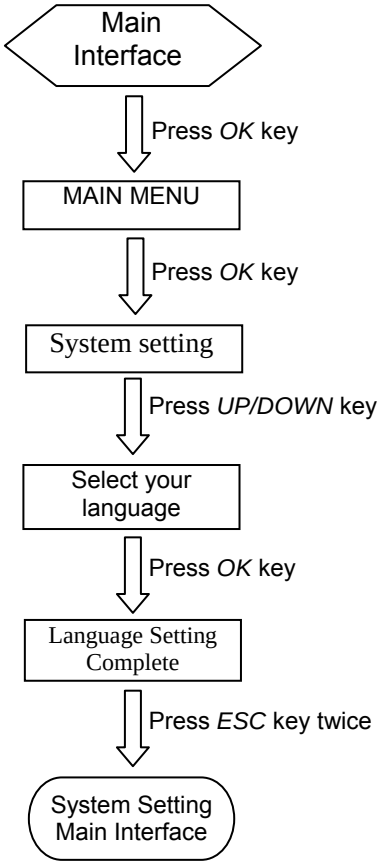
3.2 Operate the Function Key

To view the operating data of the inverter, you can press the Function Key. Of course, the data also will automatically and periodically display. To set different display contrast and display language for the inverter, please carefully refert to the following chart.

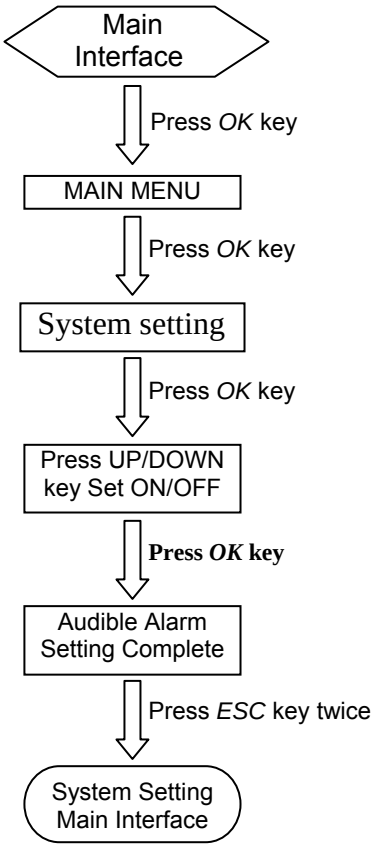
3.2.1 LCD Commissioning setup operation steps



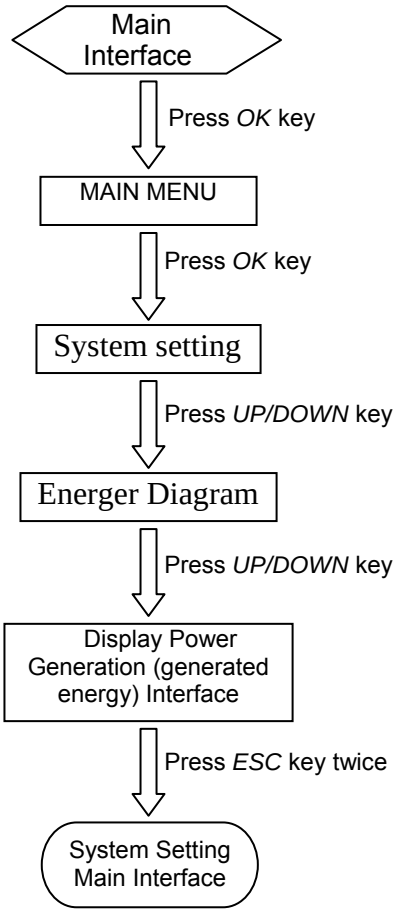
System Language Setting



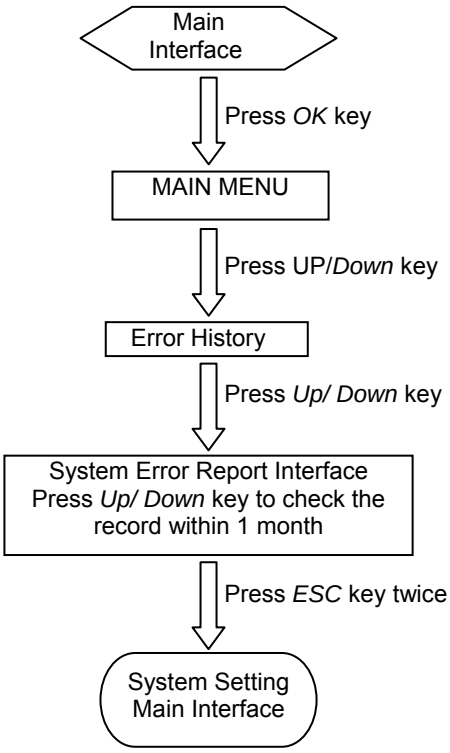
Audible Alarm Setting



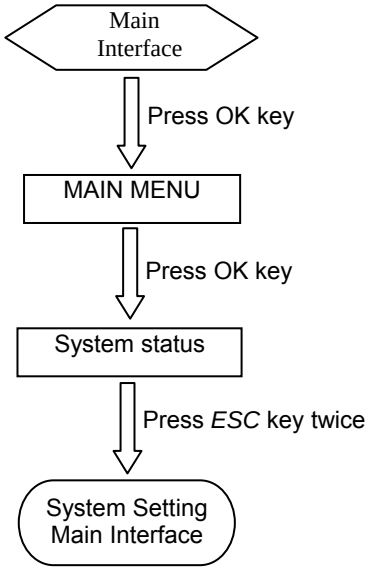
Power Generation(generated energy) Checking



Checking System Error Code



System Parameters Checking



3.2.2 Autotest (**Only for Italy model**)

During turn on time, the inverter will test all the electrical parameters. If the test failed, the inverter will not work

Note: The error messages of the inverter testing will be specified in section 7 with the respective troubleshooting solution.

3.2.2.1 PV voltage testing

The inverter will test the PV input voltage at the first time before connecting to the grid. If the voltage is below 250V, the inverter will be stay in a standby state. If the voltage is between 250V to 900V/1000V, the inverter will pass the test. If the voltage is above 900V/1000V, PV over-voltage error will be reported.

Note: It will cause unpredictable damage to the inverter if it continues in the PV over-voltage state. Turn off the PV input switch immediately and check the solar panel's connection. Turn on the PV input switch after the problems are isolated and resolved.

3.2.2.2 Grid voltage / frequency testing (**Only for Italy model**)

The inverter will test the grid voltage,frequency and phase before connecting to the grid. For the IGSI-xxxxDJ/3 and IGSI-10000/120000DJ series, the operating voltage range is 190V to 260V(L-N), and the frequency range is 49.71Hz to 50.29 Hz.

3.2.2.3 PV input ISO testing

The inverter will test the PV input ISO number before connecting to the grid. If the number is small than the system setting number, the inverter will not operate.

Note: If the ISO test error occurs, the inverter will test repeatedly. Please troubleshoot according to Section 7.4 when the ISO error reported before restarting the inverter.

3.2.2.4 GFCI testing

The inverter will test the GFCI number before connecting to the grid and during grid-tied operating period. If there is any issue, the GFCI error will be reported and the inverter output will be turned off.

Note: If the GFCI error is reported repeatedly, please turn-off the inverter and check the grid connection. Switch on the inverter only after problems are resolved.

Note: In addition to each inverter state being highlighted through the relevant LED that lights up or flashes, the LCD also displays a message that identifies the operation in progress or the detected fault/failure.

3.3 General LCD Display Information

Start	
Time Setting	

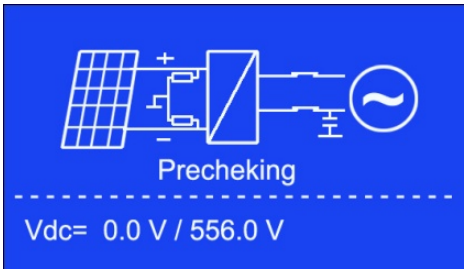
System Setting	
System Status	
Main Menu	

Auto Test Menu (for Italy)	
Auto Test Submenu (for Italy)	
Default Display	

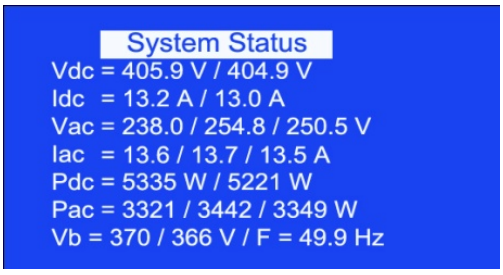
History Record	
Power Data Reset	
Energy Diagram Menu	

Energy Diagram	

3.4 **State Message In LCD**

State Message In LCD		
STATE	**DISPLAY CONTENT**	**COMMENTS**
Wait State		While PV Voltage > 250V, Inverter Checking , Relay Off
PreChecking State		While checking to 0 second, Relay On
Inverter connection State		Connect to Grid

Fault State		While Error happen, Inverter Alarm and display error message
Auto Test State(only for Italy)		Protection auto test

Main Operating Messages In LCD		
STATE	DISPLAY CONTENT	COMMENTS
		Normal display: Display power, Etoday,Etotal
		System Status: Display all Crital paremeters
		System Setting: Display Serial number, Model Name, Date, Time, Buzzer Status, Language Type
Note:		

4. INVERTER START-UP AND OPERATION

WARNING:
Do not place any items on the inverter during operation. When the inverter is operating, do not touch the heat sink as some of the parts may become very hot.

Step 1: Ensure that the AC cable and DC cable are connected correctly and the unused DC plugs and AC terminal cover are sealed.

Step 2: Connect the DC and AC switches. The inverter starts up automatically when DC-power from the PV strings is sufficient.

Once the solar inverter starts, it enters one of the following 3 states in turn:

Standby: The PV string can only provide just enough voltage to minimum requirements of the internal controller unit.

Waiting: When the PV string DC voltage is greater than 200V, the inverter enters a “waiting” state and attempts to connect to the grid.

Normal: When PV string DC voltage is greater than 300V, Inverter operates in the normal state.

The inverter will ensure the MPPT function and deliver power to AC Grid when it is in normal operation. At low input DC-power, the inverter may stop operation. However, it will automatically restart again when DC-power from the PV string is within the operating range again.

Error or Warning status

The inverter is designed to be user-friendly. Therefore, the error or warning 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	COMMENTS
	System fault	
1	Auto Test Failed	Auto Test does not pass
2	No Utility	No Grid Connect
3	PV Over Voltage	PV panel voltage is too high
4	Isolation Fault	Insulation problem of PV panel
5	GFCI Fault	leakage current is too high
6	Grid Freq. Fault	Grid frequency is out of range
7	Grid Volt. Fault	Grid voltage is out of range
	Inverter fault	
1	Consistent Fault	Consistent fault
2	Over Temp. Fault	Internal temperature is abnormal
3	Relay Fault	Output relay fault
4	DCI Out Range	Output current DC Offset is too high
5	REEPROM Fail	EEPROM fault
6	Comm. Lost	Communication fault
7	Bus Over Voltage	DC Bus over-voltage
8	Bus Low Voltage	DC Bus under-voltage
9	Boost Fault	Boost current or voltage fault
10	GFCI Device Fault	GFCI device is damaged
11	Inv. Curr. Over	Inverter output current is too high
12	Fan Lock	Fan Lock
13	RTC Fail	Real Time Clock IC fault
14	SCI Fault	Communication fault

5. COMMUNICATIONS

5.1 Data communication with RS232

Fig. 10 RS232 serial port and special RS232 cable

Open the cover of RS232 serial port and connect the solar Inverter to the computer using the special RS232 cable. Please limit the communication distance to less than 10m.

NOTE: Please use only the special RS232 cable. If the length is not insufficient, extend it using the “extended RS232 cable” from the local market.

5.2 Data communication with RS485 (optional)

5.2.1 RS485 Serial Port

The RS485 is used for the purpose of communicaiton between several inverters. Ethernet cable is connetced to each inverter. Only three lines of communications are applied: two for signals and one for ground connection.

Fig. 11 The waterproof RJ45 socket and connectors for RS485 port

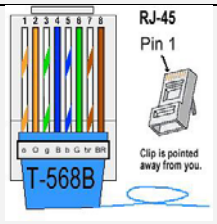
To help installation, the inverter features two RJ45 sockets to separate input ethernet cable from output ethernet cable.

5.2.2 RJ45 Connectors

The RS485 serial connection, whether as a single unit or several inverters as daisy chain, can be performed by means of the RJ45 connectors.

It makes no difference if the sockets are in connector 1 or 2 since they are connected in parallel, and signals are thus the same. One socket is for input ethernet cable with RJ45 connector, another socket is for output ethernet cable with RJ45 connector. The output ethernet cable will be connected to the next unit.

The RS485 pin definition is as follows:

RJ45 connectors			
	**Pin #**	**Signal Name**	**Description**
	1		Not Used
	2		Not Used
	3	**RTN**	***Signal Return*** Common reference for logical signals.
	4		Not Used
	5		Not Used
	6		Not Used
	7	**-TR**	***- Data Line*** Required for RS485 communication.
	8	**+TR**	***+ Data Line*** Required for RS485 communication.

NOTE: You can buy T-568B standard Straight-Through ethernet cable to connect two adjacent inverters in local market.

5.2.3 RS485 Daisy Chain

RJ45 connectors may be used to connect a single IGSI "DJ" series inverter or multiple IGSI "DJ" series inverters daisy chained together. Up to 31 inverters can be daisy chained. The recommended maximum daisy chain length is 1000m.

With multiple daisy-chained inverters, each unit will be automatically be assigned to a RS485 address within the monitoring software.

The RJ45 socket with120Ω terminal resistor should be installed at the last inverter in the chain. A special RJ45 socket with terminal resistor and a vacant RJ45 socket are provided in the attached accessories. If the inverter is not the last one in the chain, please remove the terminal resistor and use it as a vacant RJ45 socket.

In order to ensure that the communication on the RS485 line is safe, it is recommended to connect an isolating RS232-485 adapter between the first inverter in the daisy chain system and the PC. Non-isolating RS232-485 adapter may also be used.

The following diagram shows how to connect multiple inverters in a daisy chain configuration.

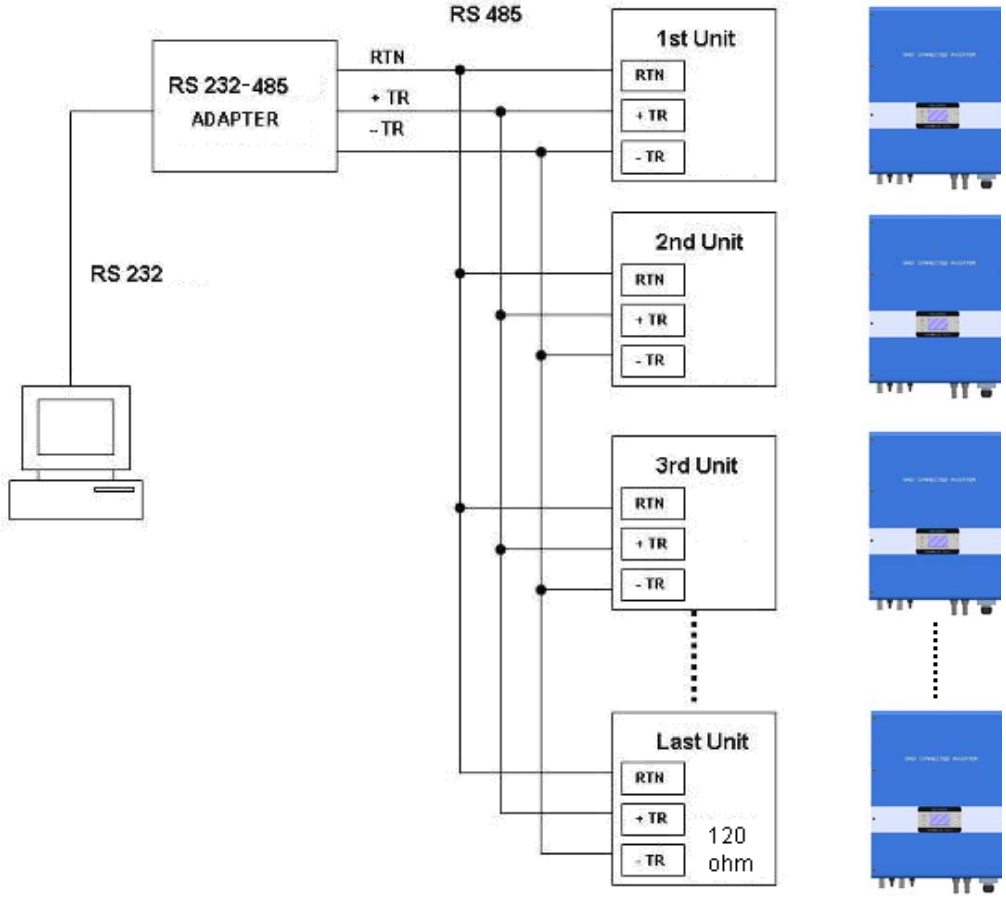


Fig.12 Multiple daisy-chain connection

NOTE: The RS485 link supports up to 31 inverters.
NOTE: The RJ45 socket with120Ω terminal resistor should be installed at the last inverter in the chain. Even if there is only one inverter, the 120Ω terminal resistor is also required.

5.3 Monitor the inverter

After the RS232 or RS485 link is connected correctly, initiate the monitoring software that is installed from the attached CD. The user will be able to monitor the parameters of the inverters. Detailed information of the inverter is displayed on the right-hand side of the main interface. As for the more detailed setting methods and other functions, please refer to the communicator's user manual in the CD.

6. INTERFACE PROTECTION AND SETTING POINTS

The interface protection is designed according to VDE 0126-1-1, and it is insensitive to normal voltage and frequency variations in the AC grid.

The interface protection ensures that the inverter ceases to energize the AC grid when any parameters listed as below exceed the operating set points. Disconnection is provided in case of any hardware malfunctioning.

The solar inverter will cease to energize the AC grid in response to an interface protection and it is achieved by the simple isolation of two internal AC relays connected in series.

See below the default interface protection settings for the IGSI-xxxxDJ/3, IGSI-10000DJ and IGSI-120000DJ.

Parameters	Setting trip time	Setting protection point
Over voltage	60ms	264Vac
Under voltage	60ms	206Vac
Over frequency	60ms	50.75Hz
Under frequency	60ms	49.25Hz
Loss of the Mains	120ms	---
DC injection current	120ms	500mA
PV array Insulation resistance	100ms	1Mohm
Reconnection time	60s	---
Sudden change of residual current	240ms	25mA
	60ms	45mA
	20ms	120mA
Continuous change of residual current	170ms	240mA

⚠ **WARNING:** This product can cause current with a DC component. Where a residual current-operated protective device (RCD) or monitoring device (RCM) is used for protection in case of direct or indirect contact, only a RCD or RDM of Type B is allowed on the supply side of this product.

7. TROUBLESHOOTING

In most circumstances, the inverter requires very little servicing. However, if the inverter is not able to operate in accordance to its function, please refer to the following troubleshooting instructions before calling your local dealer or service personnel.

If any problems arise, the “Alarm” LED on the front panel will be red and the LCD displays the relevant information. Please refer to the following table for a list of potential problems and their solution.

	DISPLAY	HOW TO DO?
1	No display in LCD or LED	Check PV-input connections
2	No Utility	Check grid connection cables.
3	PV over-voltage	Check the Voc of the PV string and see if it is greater than or too close to the max. input DC voltage of respective inverter type.
4	Isolation Fault	Check the impedence between PV (+) & PV (-) and that the PV-Inverter is earthed. The impedance must be greater than 2MΩ.
5	GFCI Fault	The leakage current is too high.Unplug the inputs from the PV string and check the peripheral AC system.
6	Grid Volt. Fault	Make sure grid voltage meet the specifications
7	Grid Freq. Fault	Make sure grid frequency meet the specifications

NOTE: During periods of little or no sunlight, the solar inverter may continuously start up and shut down. This is due to insufficient power generated to operate the control circuits.

If you are not able to resolve the issues through the above troubleshooting procedures, please contact your local dealer or service personnel. Before contacting the authorized local dealer or service personnel, please have the following information:

Information of IGSI series inverter

1. Inverter Model
2. Serial Number
3. Week of manufacture
4. Which LED is red?
5. Which warning/error is displayed?
6. Do you notice whether warning/error can be repeated?

Information of the PV array

1. The model and manufacturer of the PV panels
2. Number of strings in the PV array and number of panels per string

8. SPECIFICATIONS

Model	IGSI-5000DJ/3	IGSI-6000DJ/3	IGSI-8000DJ/3
DC-Input Parameters			
Max. Input Power (W)	5180	6200	8300
Max. Input Voltage (Vdc)	900		
MPPT Operating Range (Vdc)	250 to 800		
Max. Input Current per channel (A)	10	12	16
Numbers of Input	2		
MPPT Channel	2		
AC-Output Parameters			
Max. Output Power (W)	5000	6000	8000
Rated Output Power (W)	5000	6000	8000
Output Voltage Range (Vac)*	330 to 480		
Max. Output Current per phase (A)	7.9	9.5	12.7
Rated Output Voltage (Vac)	400		
Rated Output Current per phase (A)	7.3	8.7	11.6
Output Frequency Range (Hz)*	50 ± 5		
Power Factor	0.9 (leading) to 0.9 (lagging)		
Current Harmonic Distortion (THDi)	< 3%		
Max. Efficiency	97.6%	97.8%	98.1%
European Efficiency	96.7%	96.9%	97.3%
MPPT Efficiency	99.6%		
Environment Parameters			
Protective Level	IP65		
Working Temperature Range (^{o}C)	-25 to +60		
Humidity	0 to 95%, no condensation		
Ventilation	Forced fan cooling (IP54 fan)		
Consumption During Night Time (W)	0		
Noise(dB) - typical	<= 45		
Communication			
LCD	4 lines character display, controls are manipulated through the buttons		
Communication Interface	RS232 & RS485		
Mechanical Parameters			
Dimensions (W×D×H) mm	470 x 165 x 560		
Weight (kg)	32		
Others			
Certifications	VDE4105, ENEL, AS4777, IEC 62109-1, IEC62109-2, EN50178, EN61000, G59/2, CE certification.		

* Output AC voltage and frequency range will be dependent on the local requirements

Model	IGSI-10000DJ	IGSI-12000DJ
DC-Input Parameters		
Max. Input Power (W)	11200	13300
Max. Input Voltage (Vdc)	900	
MPPT Operating Range (Vdc)	200 to 800	
Max. Input Current per channel (A)	18	24
Numbers of Input	4	
MPPT Channel	2	
AC-Output Parameters		
Max. Output Power (W)	10000	12000
Rated Output Power (W)	10000	12000
Output Voltage Range (Vac)*	330 to 480	
Max. Output Current per phase (A)	16	19
Rated Output Voltage (Vac)	400	
Rated Output Current per phase (A)	14.5	17.4
Output Frequency Range (Hz)*	50 ± 5	
Power Factor	0.9 (leading) to 0.9 (lagging)	
Current Harmonic Distortion (THDi)	< 3%	
Max. Efficiency	98.2%	98.3%
European Efficiency	97.6%	97.6%
MPPT Efficiency	99.6%	
Environment Parameters		
Protective Level	IP65	
Working Temperature Range (^{o}C)	-25 to +60	
Humidity	0 to 95%, no condensation	
Ventilation	Forced fan cooling (IP54 fan)	
Consumption During Night Time (W)	0	
Noise (dB)	< 25	
Communication		

LCD	4 lines character display, controls are manipulated through the buttons
Communication Interface	RS232 & RS485
Mechanical Parameters	
Dimensions (W×D×H) mm	470 × 165 × 585
Weight (Kg)	35
Others	
Certifications	VDE0126-1-1, DK5940, AS4777, IEC 62109-1, IEC62109-2, EN50178, EN61000, G59/1, CE certification.

* Output AC voltage and frequency range will be dependent on the local requirements