



EN

OMNIPOWER GRID-TIE INVERTER

Three-Phase

CONTENTS

1. NOTES REGARDING THIS MANUAL	1
1.1 Scope of Validity.....	1
1.2 Target Group	1
1.3 Symbols Used	1
2. SAFETY	2
2.1 Appropriate Usage	2
2.2 Important Safety Instructions	3
2.3 Explanation of Symbols	4
2.4 EC Directives.....	8
3. INTRODUCTION.....	9
3.1 Basic Features	9
3.2 Terminals of PV inverter	9
3.3 Dimensions.....	10
3.4 Identification of OGT-3P	11
4. TECHNICAL DATA.....	12
4.1 DC input.....	12
4.2 AC Output.....	13
4.3 Efficiency, Safety and Protection	14
4.4 General Data	15
5. INSTALLATION	16
5.1 Unpacking	16
5.2 Check for transport damage	17
5.3 Installation precaution	17

5.4	Preparation	18
5.5	Installation steps	19
5.6	Connections of the PV power system	21
5.7	Run the inverter	34
6.	OPERATION METHOD.....	35
6.1	Control Panel.....	35
6.2	LCD Function	36
6.3	LCD Operation.....	36
7.	TROUBLESHOOTING	44
7.1	Trouble shooting	44
7.2	Routine Maintenance.....	48
8.	DECOMMISSIONING.....	49
8.1	Dismantling the inverter	49
8.2	Packaging	49
8.3	Storage	49
8.4	Disposal.....	50
9.	LIMITED PRODUCT WARRANTY.....	51

1. NOTES REGARDING THIS MANUAL

1.1 Scope of Validity

This Manual is an integral part of the inverter; it describes the assembly, installation, commissioning, maintenance and fault finding of the below inverters. Please read it carefully before operating.

OGT10-3P OGT12-3P OGT15-3P OGT17-3P OGT20-3P

Store this manual where it will be accessible at all times.

1.2 Target Group

This manual is for qualified electricians. The tasks described in this manual should only be performed by qualified electricians.

1.3 Symbols Used

The following signs of safety instructions and information appear in the document as described below:



DANGER!

“Danger” indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

“Warning” indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

“Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



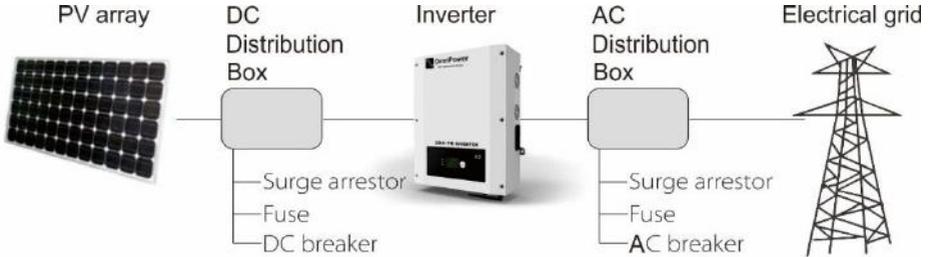
NOTE!

“Note” provides tips that are valuable for the optimal operation of your equipment.

2. SAFETY

2.1 Appropriate Usage

The OGT-3P Series is a PV inverter which converts the DC current of a PV generator into AC current and feeds it into the public grid.



Surge protection devices (SPDs) for PV installation



WARNING!

Over-voltage protection with surge arresters should be provided when the PV power system is installed. The grid connected inverter is not fitted with SPDs on either the PV input side or the MAINS side.

Lightning can cause damage either from a direct strike or from surges due to a nearby strike.

Induced surges are the more likely cause of lightning damage in the majority of installations, especially in rural areas where electricity is usually conducted by long overhead lines. Surges may be induced on both the PV array connections and/or the AC cables leading into the building.

Specialists in lightning protection should be consulted during the installation. Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.

To protect the DC system, a surge suppression device (SPD type 2) should be fitted at the inverter DC input and at the combiner box, located between the inverter and the PV

generator. If the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 is required for surge protection.

To protect the AC system, a surge suppression device (SPD type 2) should be fitted at the main incoming point of AC supply, between the inverter and the meter/ distribution system. Use an SPD (test impulse D1) for signal line according to EN 61643-21.

All DC cables should be installed to provide shortest possible runs. Positive and negative DC cables of the same string or main DC supply should be bundled together, avoiding the creation of loops in the system. This requirement for short runs and bundling includes any associated earth / building conductors.

Spark gap devices are not suitable to be used in DC circuits as once conducting, they won't stop conducting until the voltage across their terminals is typically below 30 volts.

2.2 Important Safety Instructions



Danger!

DANGER TO LIFE DUE TO HIGH VOLTAGES INSIDE THE INVERTER!

- All work on the inverter must be carried out by a qualified electrician.
- The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instructions.
- Children should be supervised to ensure that they do not play with the appliance.



CAUTION!

DANGER OF BURNING OR INJURIES DUE TO HOT ENCLOSURE PARTS!

During operation, the top cover of the enclosure and the enclosure body may become hot.

- Only touch the bottom enclosure cover during operation.



CAUTION!

POSSIBLE DAMAGE TO HEALTH AS A RESULT OF THE EFFECTS OF RADIATION!

- Do not stay closer than 20cm to the inverter for any length of time

**NOTE!**

Grounding the PV generator.

Comply with the local requirements for grounding of all the PV modules.

Sinetech recommends connecting the module frames and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of the system and persons.

2.3 Explanation of Symbols

This section gives an explanation of all the symbols shown on the inverter and on the type label.

- **Symbols on the Inverter**

Symbol	Explanation
	Operating Display
	Communication is active.
	An error has occurred, please inform your installer immediately.

- **Symbols on the Type Label**

Symbol	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	TUV certified.
	RCM remark.
	SAA certification.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact.
	Danger of high voltages. Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Observe enclosed documentation.
	The inverter can not be disposed of together with the household waste. Disposal information can be found in the enclosed documentation.
	Don't work on this inverter until it is isolated from both mains and on-site PV generation suppliers.
	Danger to life due to high voltage. There is residual voltage in the inverter which needs 45 min to discharge. • Wait 45 min before you open the upper lid or the DC lid.

- **Important Safety Instructions**

When using the product, please do remember the below information to avoid fire, lightning or other personal injury.

**WARNING**

Ensure input DC voltage \leq Max. DC voltage. Overvoltage will cause permanent damage to the inverter and other connected devices. This is **NOT** covered by warranty! This chapter contains important safety and operating instructions. Read and keep this Operation Guide for future reference.

**WARNING!**

Authorized service personal must disconnect both AC and DC power from the OGT-3P series inverter before attempting any maintenance or cleaning or working on any circuits connected to the OGT-3P series inverter.

- Read all instructions, cautionary markings on the inverter, and all appropriate sections of this manual before using this inverter.
 - Use only attachments recommended or sold by Sinetech.
 - Make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the OGT-3P series inverter with damaged or substandard wiring.
 - Do not disassemble the OGT-3P series inverter. It contains no user-serviceable parts. See warranty for instructions on obtaining service. Attempting to service the OGT-3P series inverter yourself may result in risk of electric shock or fire and will void your warranty.
 - Keep away from flammable, explosive materials to avoid risk of fire.
 - The installation location should be away from humid or corrosive substances.
 - Authorized service personnel must use insulated tools when installing or working with this equipment.
 - PV modules should have an IEC 61730 class "A" rating.
- **PE Connection and leakage current**
 - The installation shall be protected by an earth leakage device with a rated fault current of $\leq 100\text{mA}$.
 - DC leakage currents are generated (caused by insulation resistance and through capacities of the PV generator). In order to prevent nuisance triggering, the residual current of the RCD has to be $\leq 100\text{mA}$.
 - The inverter is intended to connect to a PV generator with a capacitance limit of approx 700nf.

**WARNING!**

High leakage currents!
Earth connection essential before connecting supply.

- Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic interference.
- Make sure that grounding conductors are adequately sized as required by local safety regulations.
- In case of a multiple inverter installation, do not connect the ground terminals of the units in series. This product can cause currents with a DC component, where a residual current operated protective (RCD) or monitoring (RCM) device is used for protection. In case of direct or indirect contact, only an RCD or RCM type B is allowed on the supply side of this product.

**WARNING!**

Do not work on the solar inverter while it is operating.

- Never touch either the positive or negative pole of PV connecting device.
- **And NEVER EVER touch both at the same time!**

**WARNING!**

Risk of lethal electric shock!

- The unit contains capacitors that remain charged to a potentially lethal voltage even after the MAINS and PV supply have been disconnected.
- Hazardous voltage will be present for up to 45 minutes after disconnection from power supply.
- CAUTION - RISK of electric shock from energy stored in capacitors, never work on solar inverter connectors, the MAINS cable, PV cables or the PV generator when power is applied. After switching off the PV power and MAINS, always wait for 15 minutes to let the intermediate circuit capacitors discharge before you unplug DC input and MAINS connectors.
- When access to internal circuit of solar inverter, it is very important to wait 45 minutes before working on power circuit or removing the electrolyte capacitors from inside the device. Do not open sooner since the capacitors require this long to discharge sufficiently!
- Measure the voltage between terminals UDC + and UDC - with a multimeter to ensure that the device is discharged (35VDC) before working inside the device.

2.4 EC Directives

This chapter follows the requirements of the European Low Voltage Directives, which contains the safety instructions and conditions of acceptability for the end user system, which you must follow when installing, operating and servicing the unit. If ignored, physical injury or death may follow, or damage may occur to the unit. Read all instructions before you work on the unit. If you are unable to understand the dangers, warnings, cautions or instructions, **STOP** and contact an authorized service dealer to install, commission, operate and service the unit.

The grid connected inverter meets the requirement stipulated in Low Voltage Directive (LVD) 2006/95/EC and Electromagnetic Compatibility (EMC) Directive 2004/108/EC. The unit is tested based on:

EN 50178:1997 EN 62109-1:2010 EN 62109-2:2011
VDE 0126-1-1:2006 VDE 4105:2011

For installations in PV systems, startup of the unit (i.e. start of designated operation) is prohibited until it is determined that the full system meets the requirements stipulated in ED Directive (2006/95/EC, 2004/108/EC, etc.)

The grid connected inverter leaves the factory as a complete unit, ready for connection to the mains and PV supply. The unit shall be installed in accordance with national wiring regulations. Compliance with safety regulations depends upon installing and configuring system correctly, including using the specified cables. The systems must be installed by professional installers only who are familiar with the requirements for safety and EMC. The installer is responsible for ensuring that the system complies with all the relevant laws in the country where it is to be used.

The individual subassemblies of the system shall be interconnected by means of the wiring methods outlined in national/international rules, such as National Electric code (NFPA) No.70 or VDE regulation 0107.

3. INTRODUCTION

3.1 Basic Features

Congratulations on your purchase of an OGT-3P series inverter from Sinetech. The OGT-3P inverter is one of the finest inverters on the market today, incorporating state-of-the-art technology, high reliability, and convenient control features.

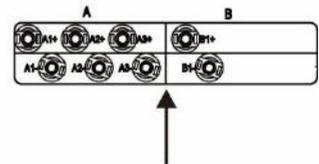
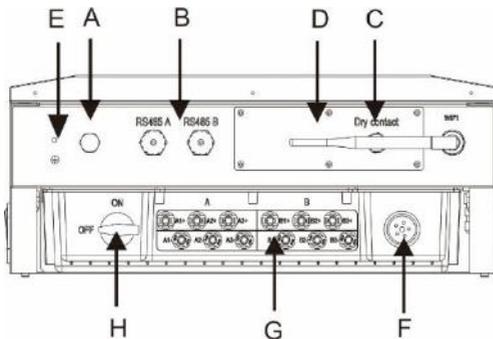
- Advanced DSP control technology.
- Utilizing the latest high-efficiency power components.
- Optimal MPPT technology.
- Two independent MPPT trackers.
- Wide MPPT input range.
- Advanced anti-islanding solutions.
- Anti – theft protection.
- IP65 protection level.
- Max efficiency up to 98.2%. EU efficiency up to 97.6%.
- THD <3%.
- Safety & Reliability: Transformerless design with software and hardware protection.
- Power factor regulation.
- Friendly HMI.
- * LED status indications

*LCD displays technical data, Human-machine interaction via push buttons.

*RS485/RS232, dry contact communication interface.

*PC remote control.

3.2 Terminals of PV inverter



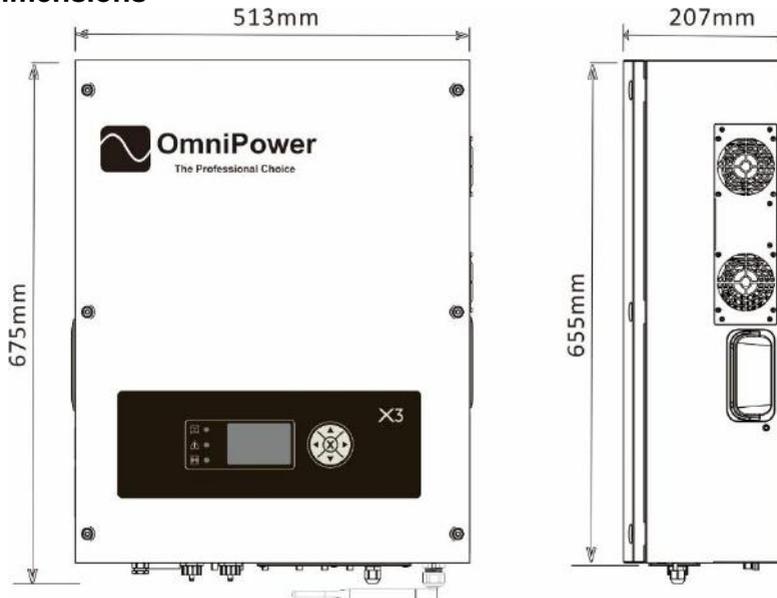
DC connector area
for OGT10-3P / OGT12-3P

Object	Description
A	Air release valve
B	Cable entry for RS485 connection
C	Cable entry for dry contact
D	Communication cover (Open the cover to set the RS232)
E	Ground terminal
F	AC connector
G	DC connector (OGT15-3P, OGT17-3P, OGT20-3P)
H	DC Switch

**WARNING!**

Only qualified electricians to carry out the connections.

3.3 Dimensions



4. TECHNICAL DATA

4.1 DC input

Model	OGT10-3P	OGT12-3P	OGT15-3P	OGT17-3P	OGT20-3P
Max. DC input power (W)	10260	12300	15370	17420	20500
Max. DC input Voltage(V)	1000	1000	1000	1000	1000
Min. DC input Voltage(V)	250	250	250	250	250
MPP voltage range(V)	320-800	380-800	350-800	400-800	480-800
Rated input voltage(V)	640	640	640	640	640
Startup input voltage (V)	220	220	220	220	220
Max. DC input current A(A)	22	22	22	22	22
Max. DC input current B(A)	11	11	22	22	22
Max. short-circuit current A	30	30	30	30	30
Max. short-circuit current B	15	15	30	30	30
No. of MPP inputs	2	2	2	2	2
Strings per MPP input A	3	3	3	3	3
Strings per MPP input B	1	1	3	3	3

4.2 AC Output

Model	OGT10-3P	OGT12-3P	OGT15-3P	OGT17-3P	OGT20-3P
Rated output power (V)	10000	12000	15000	17000	20000
Max. apparent AC power(VA)	10000	12000	15000	17000	20000
Rated grid voltage(V)	3/N/PE~230/400V				
AC voltage range(V)	160-280				
AC nominal current(A)	14.5	17.4	21.7	24.6	29
Max.output current(A)	16	20	24	25	29
Max.short-circuit current(A)	40	40	50	50	50
THD	<3%	<3%	<3%	<3%	<3%
Rated grid frequency(Hz)	50	50	50	50	50
Rated grid frequency range(Hz)	44-55				
Displacement power factor	0.9leading...0.9lagging				
Feed-in phases	3				
Connection phases	3				
Overvoltage catagory	III(MAINS),II(PV)				

4.3 Efficiency, Safety and Protection

Model	OGT10-3P	OGT12-3P	OGT15-3P	OGT17-3P	OGT20-3P
Max. Efficiency	98.2%	98.2%	98.2%	98.2%	98.2%
Euro Efficiency	97.6%	97.6%	97.6%	97.6%	97.6%
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%	99.9%
Safety & Protection					
Over/under voltage protection			YES		
DC isolation resistance protection			YES		
Ground fault protection			YES		
Grid monitoring			YES		
Ground fault current monitoring			YES		
DC injection monitoring			YES		
Back feed current monitoring			YES		
Residual current detection			YES		
Anti-island protection			YES		
Over load protection			YES		
Over temp protection			YES		

4.4 General Data

Model	OGT10-3P	OGT12-3P	OGT15-3P	OGT17-3P	OGT20-3P
Dimension (W/H/D) (mm)	513*675*207				
Weight (kg)	48	48	50.5	50.5	50.5
Dimension of packing (W/H/D)	650*750*350				
Gross weight (kg)	58	58	60.5	60.5	60.5
Cooling concept	temperature-controlled fan				
Noise emission (Hz)	<50	<50	<50	<50	<50
Operating temperature range (°C)	-20~+60 (derating at 45)				
Storage temperature (°C)	-20~+60				
Pollution degree	IP65(IP54 Fan)				
Degree of protection	II				
Topology	Transformer-less				
Internal consumption (W)	<1				
LCD display	Backlit 128*64 dots				
Communication interface	RS485/RS232/Dry contact(WIFI optional)				
Standard warranty	5 Years				

5. INSTALLATION

5.1 Unpacking

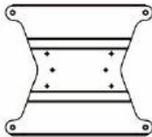
Open the package and unpack the product, check for any deformation or damage during transport. Confirm that all accessories are included; refer to the accessories list below.

The instruction manual is an integral part of the unit and should therefore be read carefully and stored for future use.

It is recommended that the packaging should not be removed until the unit is positioned at the installation site.



A



B



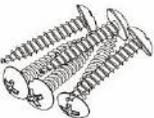
C



D



E



F



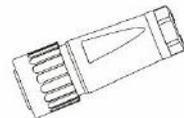
G



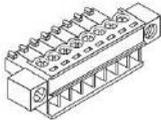
H



I



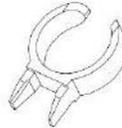
J



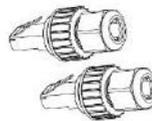
K



L



M



N



O



P

Object	Quantity	Description
A	1	OGT-3P Series inverter
B	1	Bracket
C	1	User manual
D	1	WIFI setting guide
E	6	Rawl bolts
F	6	Mounting screws
G	12	DC pin contact
H	12	DC connectors units (6* positive ,6* negative)
I	1	Earth terminal lug
J	1	AC connector
K	1	8 pin terminal block male connector for dry connector.
L	1	Steel ring
M	1	Wrench tool to separate DC connector
N	2	RS 485 sealing connector
O	4	Waterproof plug
P	5	AC pin contact

5.2 Check for transport damage

Check if the OGT-3P series inverter has some visible external damage, such as cracks in the housing or display. Please contact with your dealer if you find any damage.

5.3 Installation precaution

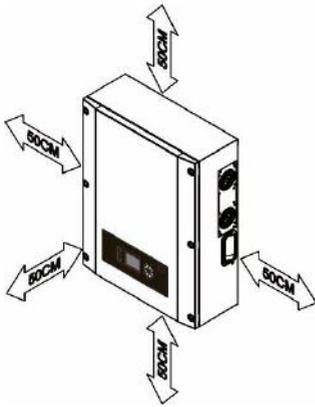
The OGT-3P series inverter is designed for outdoor installation (IP65)

Make sure the installation site does not fall into any of the following conditions:

- Do not install the inverter in direct sunlight or near any heat sources.
- Do not install the inverter near flammable material.
- Do not install the inverter in areas where highly flammable materials are stored.
- Do not install the inverter in potentially explosive areas.
- Do not install the inverter exposed to direct cold air flow.
- Do not install the inverter near a television antenna or antenna cable.
- Do not install the inverter at altitudes above 2 000 m.
- Do not expose the inverter to high humidity (>95%);

Moisture at the installation site may cause corrosion and damage to the components.

- Install the inverter in a location with an ambient air temperature below 45°C.
- The inverter should be installed in a location that is not accessible to children.
- The inverter emits a slight vibrating noise when operating, this is normal.
- The slope of the wall should be within $\pm 5^{\circ}$.
- Keep the inverter far away from seawater.
- The inverter is heavy; ensure the mounting surface is strong enough to hold the weight.
- If you install the inverter in a cabinet, closet or other small enclosed area, sufficient air circulation must be provided in order to dissipate the heat generated by the unit.



Available space size	
Position	Min.Size
Side	50cm
Top	50cm
Bottom	50cm
Front	50cm

5.4 Preparation

Below are the tools needed for this installation:

Installation tools: crimping pliers for binding post and RJ45, screwdriver, manual wrench, 8mm driller and rubber hammer.



Installation Tools

Lifting and Handling

The unit is heavy. Do not lift it alone.

- During lifting procedures ensure that the unit is firmly secured to avoid the risk of accidental tipping or dropping
- Parts used for support or securing of the unit shall be designed and manufactured so as to minimize the risk of physical injuries and of accidents by coming loose.
- Ensure that the method of lifting will not allow the unit to slip from chains and/or slings or turn-over or slide from lifting devices.
- Transportation must be carried by specialized person (Fork-lift operators), equipped with the necessary protection equipment (overalls, safety shoes, protective gloves, helmets, goggles)
- Do not walk near or stand beneath or in the proximity of the load.
- Avoid sudden movements or jolts when unloading and positioning the unit.
- Any handling procedures must be conducted with care.
- Keep the unit balanced. Protruding parts should not be supported by hand.
- The inverter should be installed so that the operating panel is easily accessible, also allowing access to the electrical power connections.
- Unit to be accessible for maintenance and repair work.
- Loading capacity and rigidity of the supporting surface, load rating of mounting bracket should be at least four times the weight of the devices according to IEC62109-1. Supporting characteristics will be impaired by wear, corrosion, material fatigue or ageing, this should be calculated by inspection of the design data of supporting material and consulting a construction engineer.

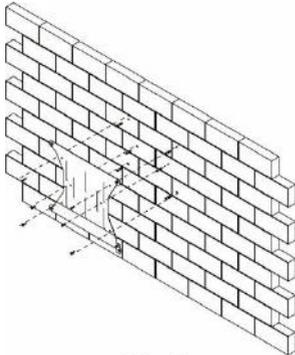
5.5 Installation steps

Step 1: Fitting the wall bracket onto the wall

- Use the wall bracket as a template to mark the position of the six holes.
- Drill 8mm holes carefully, make sure the holes are deep enough for installation and insertion of the rawl bolts. (F)
- Install the rawl bolts and mount the bracket using the screws provided.

Step 2: Install the anti – theft protection.

- Fit the steel ring into the holes of the bracket and inverter on the right side.



Step1



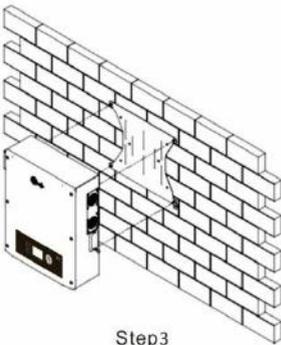
Step2

Step 3: Hang the OGT-3P inverter onto the wall bracket.

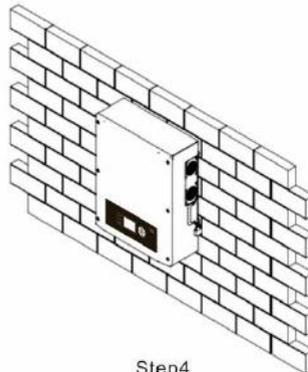
- Transport the inverter with at least 2 people, using the handles at the sides.
- Hang the OGT-3P inverter onto the bracket; make sure the support on the bracket is aligned well with the inverter.

Step 4: Install the anti –theft protection.

- Secure the inverter to the bracket using the steel ring and a padlock.



Step3



Step4



NOTE!

Store the key in a safe place so that you have access to it in future if the inverter requires attention.

5.6 Connections of the PV power system

- PV String



WARNING!

PV module voltages are very high and fall into the dangerous voltage range; comply with electric safety rules when connecting.



WARNING!

When a photovoltaic array is exposed to sunlight, it generates a DC voltage.

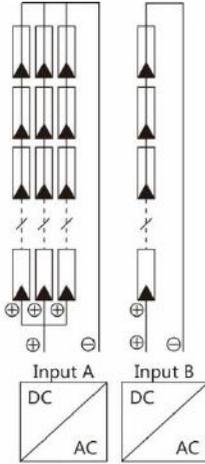


WARNING!

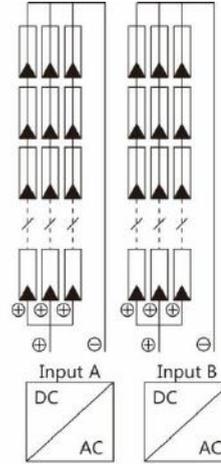
Confirm correct connection and interconnections of all PV panels. Panels can be connected to the inverter only if all panels and strings are wired correctly .

OGT-3P series inverters have two input sections, “A” and “B”, each with its own MPP Tracker. Two series connected strings of PV modules can be used. Please select only top quality and reliable PV modules. Open-circuit voltage of module arrays connected in series must be <Max DC input voltage, even in very cold conditions; operating voltage to conform to MPPT voltage range.

Model	OGT10-3P	OGT12-3P	OGT15-3P	OGT17-3P	OGT20-3P
Max.DC input voltage(V)	1000				
MPPT voltage range(V)	320-800	380-800	350-800	400-800	480-800



OGT10-3P and OGT12-3P with 2 MPP trackers area: A and B. Area A with 3 strings, area B with 1 string input.



OGT15-3P and OGT15-3P and OGT17-3P with 2 MPP trackers area: A and B. Each area 3 strings input.



NOTE!

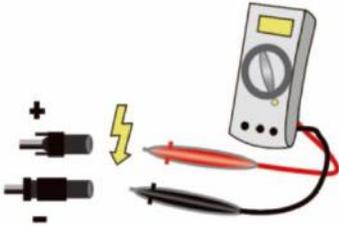
The following rules for PV modules need to be applied for each input section;
 *Same type *Same quantity *Identical horizontal and vertical alignment

Use only weather and UV resistant PV cable. From junction box to inverter, voltage drop can be 1-2%. Install the inverter close to the PV modules, in order to save cable and reduce DC cable losses. (No exceeding 30m)



NOTE!

Do not connect PV positive or negative to ground!



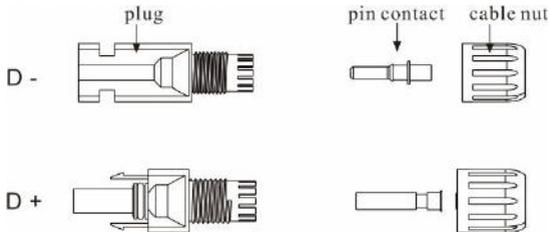
- Use multi meter to measure module array voltage
 - Check the PV+ and PV- from the PV string combiner box correctly. Make sure the PV+ and PV- are connected correctly.

• **Connection Steps**

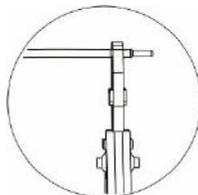
1. Disconnect the DC switch.
2. Choose the 6 mm² wire to connect the PV module.
3. Strip 6 mm of insulation from the wire end.



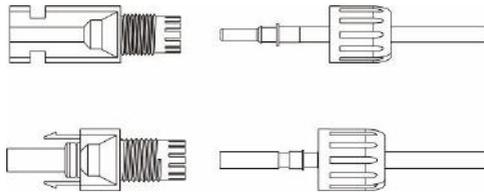
4. Separate the DC connector as below.



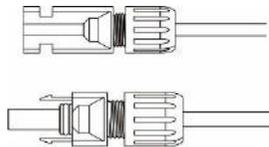
5. Insert stripped cable into pin and ensure all conductor strands are placed inside the pin.
6. Crimp the contact with crimping pliers. Put the pin with stripped cable into a suitable crimping pliers and crimp the contact.



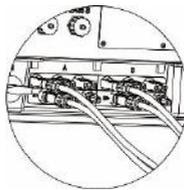
7. Feed the pin through the cable nut to assembly into the back of the male or female plug. When you feel or hear a “click”, the pin assembly is properly seated.



8. Tighten the DC connector.
 a. Move the cable nut towards the back shell.
 b. Rotate the cable nut to secure the cable.



9. After securing the cable tightly, align the 2 connector halves and connect them together.



10. To separate the DC connector
 a. Use the specified tool
 b. When separating the DC+ connector, push the tool down from the top side
 c. When separating the DC- connector, push the tool up from the bottom side
 d. Separate the connectors manually.

**WARNING!**

Before connecting or disconnecting the cables between solar generator and inverter lock the disconnect switch in the open position. Place a warning sign "Do not turn on, maintenance in progress" on the external disconnect switch while it is switched off, and ensure that the remote control is inhibited.

- **AC Output**

**WARNING!**

Must comply with the connection requirement of your local grid.

OGT-3P series inverters are designed for three phase grid. Voltage range is from 230V $\pm 20\%$, according to different countries. The typical frequency is 50Hz. Other technical requests should comply with the requirement of local grid. For the terminal and cable design please follow the below requirements.

Terminal capacity and Identification

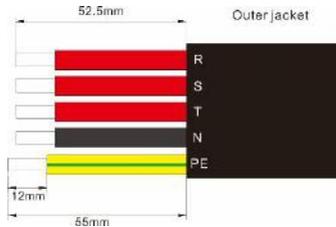
	Connection type	Rated connecting capacity and ratings	Tighting torque	Stripping length
Protective earthing connection	Torx-head Screw(m5)	-----	1.8-2Nm	11mm
DC input connection	Amphenol(MC4)	48A 1000V	1.8-2Nm	-----
ACoutput connection	Amphenol	36A 380V	1.8-2Nm	-----
RS485	Connector	-----	-----	-----

Earth conductor: PE screw terminal designed for clamping a cable lug or bar by means of a screw, nut and locking washer. Before PE connection, strip the conductor end 12mm long to fit them into a cable lug or bar. The length of conductors between the cord clamp and the terminals shall be such that the current – carrying conductors became taut before the earthing conductor does.

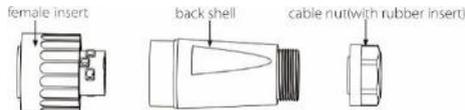
Model	ZDNY-TL 10000	ZDNY-TL 12000	ZDNY-TL 15000	ZDNY-TL 17000	ZDNY-TL 20000
Cable(Cu) (mm ²)	≥ 6				
MCB (A)	25	25	32	32	32

- **Connection Steps**

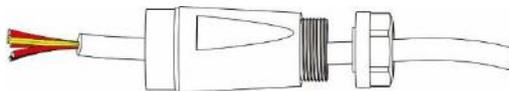
1. Check the grid voltage and compare with the permissible voltage range. (see technical data)
2. Turn off the circuit breaker of all 3 phases and secure against re-connection.
3. Strip the wires:
 - a. Strip all the wires to 52.5mm and the PE wire to 55mm
 - b. Use the crimping pliers to strip 12mm insulation from all wire ends as below.



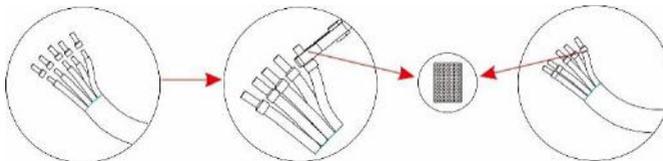
4. Separate the AC plug into three parts as below.
 - a. Hold the middle part of the female insert, rotate the back shell to loosen it, and detach it from female insert.
 - b. Remove cable nut (with rubber insert) from the back shell.



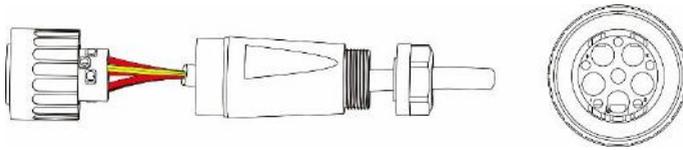
5. Slide the cable nut and the back shell over the cable.



6. Insert stripped cable in AC terminal and insure all conductor strands are captured in the AC terminal. Compress the AC terminal head by using a crimping pliers and screw down screw cap tight. Cable core section after crimping should be as the section below.

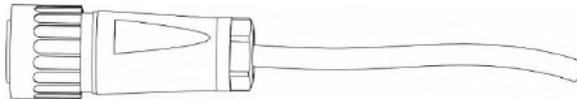


7. Insert the stripped end of all five wires into the appropriate hole in the female insert, and then tighten each screw (to hold each wire in place)

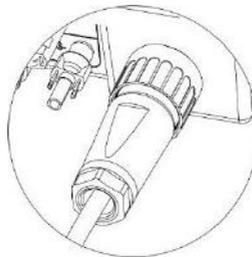


NO.of holes		1	2	3	4
Wire type	PE	N	R	S	T

8. Tighten the cable
- Slide the back shell towards the female insert.
 - Hold the middle part of the female insert, rotate the back shell to connect it to the female insert and tighten it.
 - Slide the cable towards the back shell.
 - Rotate the cable nut to secure the cable.



9. Connect the AC plug to the inverter, and then rotate the locking ring of the female insert to secure the plug to the inverter.



Selection of Fuses and Cables:

Mains cable (AC line cable) shall be short circuit and thermal overload protected. Always use the input cable with a fuse. Normal gG (US: CC or T) fuses will protect the input cable under short circuit conditions. Dimension the fuses according to local safety regulations, appropriate input voltage and the related current of the solar inverter. AC output to be protected by external fuse (gG rated current 25A/250VAC for 10KW and 12KW; 32A/250VAC for 15KW, 17KW and 20KW) providing protected connections to the AC supply.

The rated short circuit breaking capacity of the above protective device shall be at least equal to the prospective fault current at the point of installation. See section technical data of this manual for details.

AC output cable: Cu, L, N6+PE, 2*6. 0+6.0mm² @ 40^oC ambient with a max length of 5m, with operating time of the fuse to be less than 5 seconds, installation method B2 according to EN60204-1:2006, annex D: Cable in conduit cable trunking system, number of loaded circuits only one. Use H07RNF (cord designation 60245 IEC66) for an ambient temperature of 40^oC or less and use 90^oC wire for ambient temperature between 40^oC and 60^oC.

Note 1: For conditions differing from those mentioned above, dimension the cables according to local safety regulations, appropriate input voltage and the load current of the unit. (You can choose a thicker cable but the fuses must be rated according to the cable.)

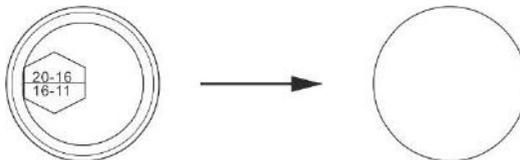
Note 2: Fuses must be approved by Certified Body

The inverter does not provide galvanic isolation from the mains to the PV array; the feedback current can be up to 20A/250VAC for 3kW and 4kW units as well as 25A/250VAC for the 5kW unit under fault conditions, based on the AC circuit breaker installed and /or earth leakage device installed.



NOTE!

If the selected AC cable is >16mm², you need to break the connection between the two rubber rings which make up the rubber insert, see below.



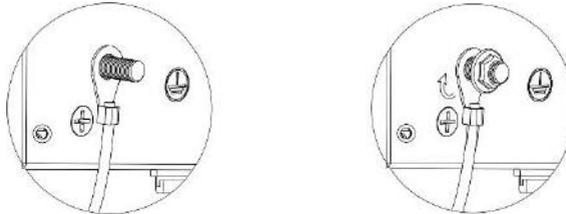
Earth connection

You can additionally earth the inverter enclosure if a second earthing or equipotential bonding is required locally. This prevents leakage current if the original protective conductor fails.

Cable size: 12AWG (4 mm²)

Connection Steps:

1. Strip the earthing cable insulation.
2. Insert the stripped cable into the ring terminal.
3. Clamp the end of the ring terminal.
4. Unscrew the nut of the earthing connector.
5. Fit the ring terminal onto the earthing connector.
6. Tighten the nut of the earthing connector.



WIFI Connection (optional)

WIFI communication interface is a standard interface; you can read the real time data in the local network by your Smartphone or check the details from the internet either from PC or Smartphone with WIFI monitoring.

Connection Steps:

1. Install the antenna on the inverter.
2. Connect the WIFI with the router. (as described in the WIFI setting guide)
3. Set the station account on the online portal. (as described in the WIFI setting guide)

- **Communication interface**

This product has a variety of communication interfaces: WIFI, RS485, RS232, dry contact and extension port for human machine communication. Operating information like output voltage, current, frequency, fault information, etc., can be sent to a PC or other monitoring equipment via these interfaces.

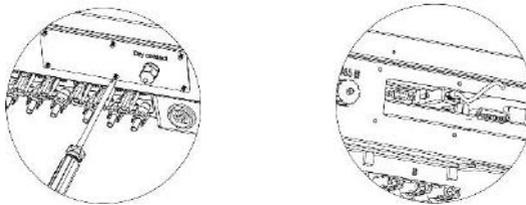
① RS232 communication

You can select which DSP needs to be updated by the DIP switch on the right side of the RS232 connector.

DIP switch No.(left to right)	1	2	Status
The position of the DIP switch	up	up	Can not update
	up	down	Main DSP update
	down	X	Subsidiary DSP update

• Connecting Steps

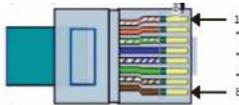
1. Open the connection cover with a screwdriver
2. Connect one side of the RS232 line to the inverter, the other to the computer.



3. Update the software on the computer.
4. After the upgrade is finished, disconnect the RS232 line, replace the communication cover.

② RS485 Communication

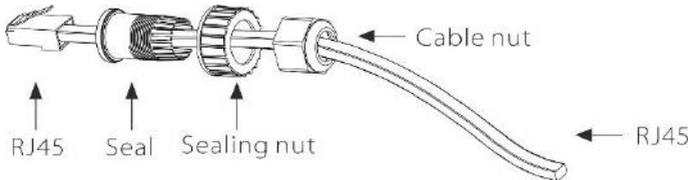
RS485 is generally for multiple inverters. Up to 32 inverters can communicate at the same time, but wire length should be $\leq 1200\text{m}$. System monitor Sunny Logger should be configured to realize one PC to communicate with multiple inverters at the same time. Through PC Sunny Logger can obtain real time operating data. For RS485 connection, use the RJ45 connection, RJ45 PIN layout as below.



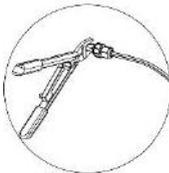
PIN	PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8
Function	NC	NC	NC	A	B	NC	NC	NC

- **Connection Steps:**

1. Separate the RS485 sealing connector.
2. Insert the communication line into these parts following the below order.



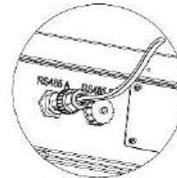
3. Strip the insulation from the communication cable ends.
4. Insert the communication cable into the RJ45 connector following the PIN definition rule.
5. Crimp the RJ45 connector with the crimping pliers.
6. Tighten the connections.
 - a. Slide the seal towards the RJ45 connector; fix the seal and the connector.
 - b. Slide the sealing nut towards the seal.
 - c. Slide the cable nut towards the seal, rotate the cable nut to secure the connector
7. Twist the RS485 screw cap on the inverter.
8. Insert the RJ45 connector and rotate the sealing nut to secure the connector to the inverter tightly.



step5



step6



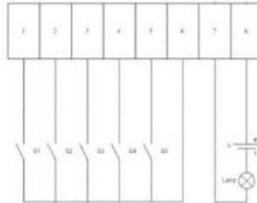
step8

③ Dry Contact

Dry contacts are provided to enable a remote monitor and remote control with the optional accessory. The remote monitor function provides an indication on the inverter's operating status. The remote control function provides a contact signal to operate the inverter. The dry contact communication uses terminal blocks. The PIN definitions and the circuit connections are as below.

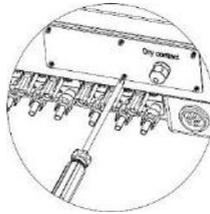
PIN	PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8
Definition	Remote control for reactive power regulation						Remote monitor	

Note: The external connection of PIN7 and PIN8 must be below 300V 2A

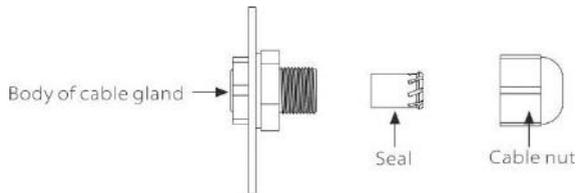


- **Connection Steps:**

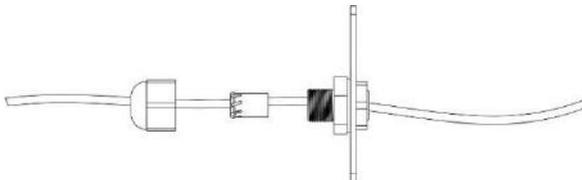
1. Open the communication cover at the back of the inverter.



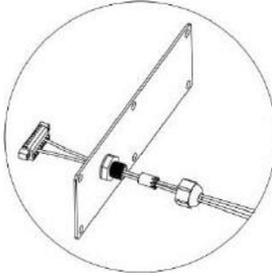
2. Separate the dry connect cable gland.



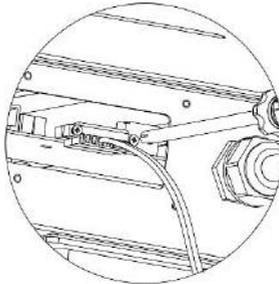
3. Use at least 1.5mm² wire; strip the insulation from the wire ends.
4. Insert the wire into the separate parts as following.



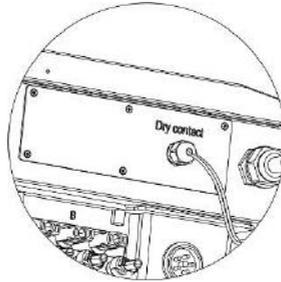
5. Feed the stripped wire through the hole of the terminal block.
6. Screw down the screw on the terminal block.



7. Connect the terminal block.
 - a. Insert the male terminal into the female terminal on the inverter.
 - b. Secure with the two screws on either side of the terminal block.



8. Install the communication cover.
9. Tight the connection of the cable gland.
 - a. Slide the seal to the body of the cable gland; insert the seal into the body of the cable gland.
 - b. Slide the cable nut to the body of the cable gland, rotate the cable nut to secure the connection.



5.7 Run the inverter

Start inverter after checking all below steps:

- Check that the device is secured well onto the wall.
- Make sure all the DC and AC wirings are completed.
- DC connectors which are not used should be covered.
- Turn on the external AC and DC connectors.
- Turn the DC switch to the "ON" position.

Start inverter

- Inverter will start automatically when PV panels generate enough energy.
- Check the status of LED and LCD screen, the LED should be green and the LCD screen should display the main interface.
- If the LED is not green, please check the following:
 - a. Are all the connections correct?
 - b. All the external disconnect switches are closed.
 - c. The DC switch of the inverter is in the "ON" position.



WARNING!

Power to the unit must be turned on only after installation work has been completed. All electrical connections must be carried out by qualified personnel in accordance with legislation in force in the country concerned.

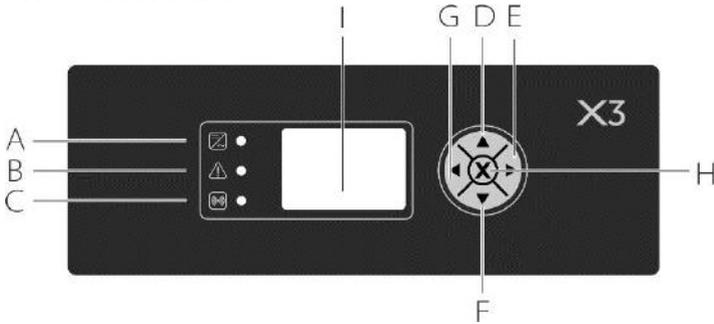


NOTE!

Please setup the inverter if this is the initial start. Above steps are for the regular start up of the inverter. If it is the first start up, you need to setup the inverter.

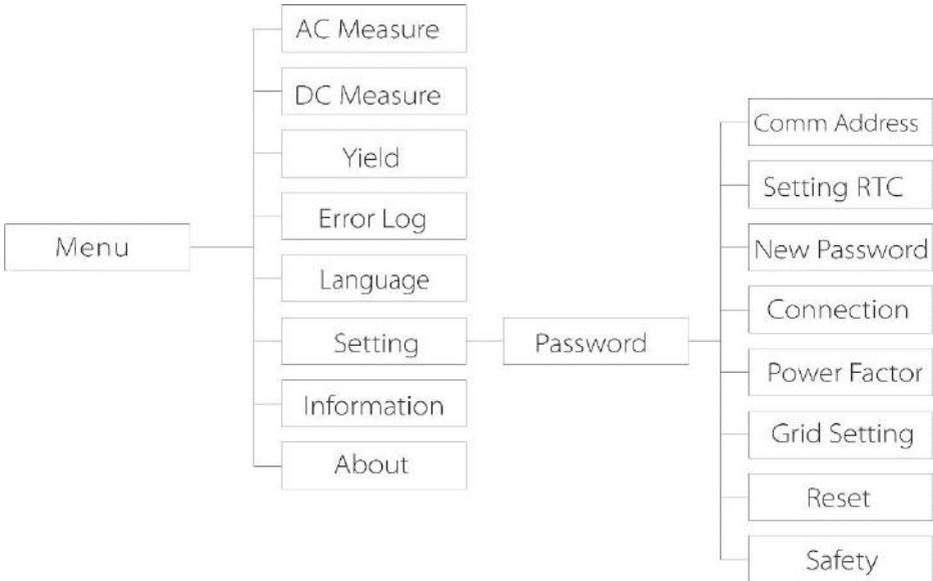
6. OPERATION METHOD

6.1 Control Panel



Object	Name	Description
A	Indicator LED	Green LED: Inverter normal
B		Red LED: Inverter fault
C		Yellow LED: Inverter is communicating
D	Function button	Up Button: Move cursor up to increase values.
E		Right button: Move cursor to right side.
F		Down Button: Move cursor down to decrease values.
G		Left button: Move cursor to left side.
H		OK: Confirm the selection.
I	LCD Screen	Display the information of the inverter in this LCD screen.

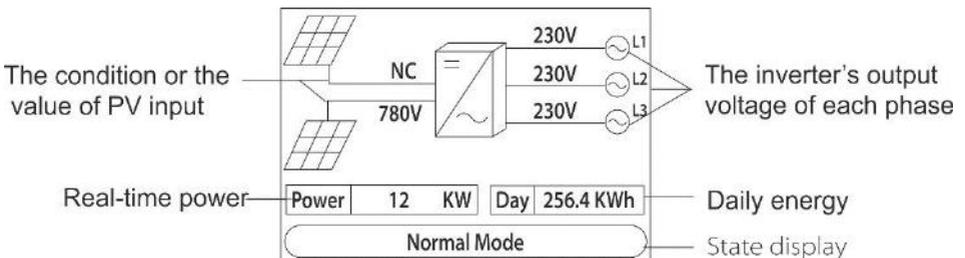
6.2 LCD Function



6.3 LCD Operation

- **LCD Graphic Display (Main interface)**

The main interface is the default interface, the inverter will automatically jump to this interface when the system started up successfully and not operated for a period of time. The information of the interface is shown below.



- **Menu interface**

The menu interface is a transfer interface for the user to get into the other interface to finish the setting or get information.

- User can get into this interface by passing the “OK” button when the LCD displays the main interface.
- User can select interface by moving the cursor with the function button, and press “OK” to confirm the selection.

Menu		Main
AC Measure	DC Measure	
Yield	Error Log	
Language	Setting	
Information	About	

- **AC measure an DC measure**

AC measure and DC measure are display interfaces to show the information of the DC input and AC output.

- User can get into the two interfaces by selecting the “AC Measure” or “DC Measure” with the cursor on the menu interface and pressing “OK” to confirm.
- Move the cursor to “Back” and press “OK” to get back to the menu interface.

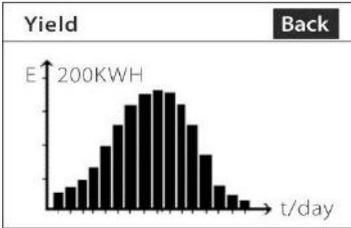
AC Measure		Back
VacR = 230.0V	IacR = 1.8A	
VacS = 230.0V	IacS = 1.8A	
VacT = 230.0V	IacT = 1.8A	
PacR = 424.3V	PacS = 424.3V	
PacT = 424.3V	Fac = 50Hz	

DC Measure		Back
Vdc1 = 0.0V	Vdc2 = 780.3V	
Idc1 = 0.0A	Idc2 = 1.8A	
Pdc1 = 0.0W	Pdc2 = 1273W	

- **Yield**

Yield interface displays the generated power with a histogram.

- User can get into the interface by selecting the “Yield” with cursor on the menu interface and pressing “OK” to confirm.
- The X-axis can be switched between “day” or “hour” by pressing left or right button.
- The Y-axis displays the total generated power.
- Move the cursor to “Back” and press “OK” to get back to the menu interface.



• Error log

The error log interface displays the error information that occurred.

It can record a max of 5 items.

- Enter the error log interface by selecting the "Error log" with cursor on the menu interface and press "OK" to confirm.
- It can display 3 items, press up and down button to see more error items.
- Move the cursor to "Back" and press "OK" to get back to the menu interface.

Error Log	Back
1:2012-02-24 13:23:24 Grid Lost Fault	
2:2012-03-24 14:14:24 SW_FANIFault	
3:2012-04-24 13:11:24 SW OCP DCI	

• Setting

User can set the safety, time, password and connection etc. here.

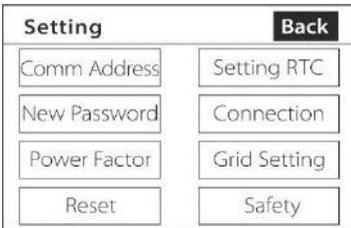
- Enter the "Setting" by selecting "Setting" with cursor on the menu interface and pressing "OK" to confirm.
- The password interface will appear for the user to enter the password.
- Enter the password, confirm with "OK".

Password	OK	Back
<input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/>		

DEFAULT FACTORY
PASSWORD:

1 2 3 4

If the password is correct it will jump into the setting interface or else it will return back to the menu interface.



A) Comm Address

- The user can set the comm address here.
- Press up or down to increase or decrease the value.
- Press OK to confirm.



B) Setting RTC

Setting RTC is used to set the current system time.

- Enter the "Setting RTC" by selecting the "Setting RTC" with cursor on the setting interface and press "OK" to confirm.
- Alternate the cursor by pressing function button, when the cursor is on the item you want to change. Press "OK" to confirm.
- Press up and down button to increase or decrease the number.
- Alternate the cursor to "OK:" on the top of the screen and press "OK" to confirm the setting, or alternate cursor to "back" and press "OK" to cancel the setting. The screen will jump to the setting interface after that.

Setting RTC	OK	Back
Year-Month-Day 2014 - 03 - 12		
Hour-Minute-Second 04 : 34 : 54		

C) New Password

User can set a user's password to protect the inverter system from being changed.

- Enter the "New Password" with the cursor on the setting interface, and press "OK" to confirm.
- Enter new password. Alternate the cursor by pressing function button, when the cursor is on the item which you want to change. Press "OK" to confirm.
- Enter the same password again in the blank below.
- Alternate the cursor to "OK" on the top of the screen and press "OK" to confirm the setting, or alternate cursor to "back" and press "Back" to cancel the setting. The screen will jump to the setting interface after that.

New Password	OK	Back
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 2px;">0</div> <div style="border: 1px solid black; padding: 5px; margin: 2px;">0</div> <div style="border: 1px solid black; padding: 5px; margin: 2px;">0</div> <div style="border: 1px solid black; padding: 5px; margin: 2px;">0</div> </div>		

DEFAULT FACTORY
PASSWORD:

1 2 3 4

D) Connection

Connection setting is used for changing the connection type of DC input.

- Enter the "Connection" with cursor on the setting interface and press "OK" to confirm.
 - Alternate the cursor by pressing up and down button. When the cursor is on the item you want to choose, press "OK" to confirm.
 - Alternate the cursor to "OK" on the top of the screen and press "OK" to confirm the setting, or alternate cursor to "Back" and press "Back" to cancel setting. The screen will jump to the setting interface after that.
- Comm – string: Both MPP trackers are connected together
Mul – string: The MPP trackers are independent.

Connection		OK	Back
Comm-String			
Mul-String			
Current:Comm-String			

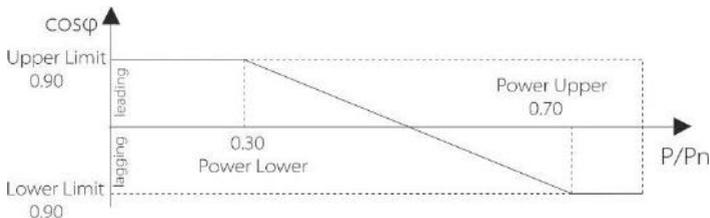
E) Power Factor

Power factor setting is to set the power factor of the inverter, it contains four modes: “off mode”, “constant cos mode”, “cos mode” and “power limit mode”.

- Enter the “power factor” with cursor on the setting interface and press “OK” to confirm.
- Enter the power factor interface, move the cursor to the mode, press up or down to choose the right mode you want to set, and press “OK” to confirm.
- Once you have selected the right mode, press up or down for the right parameter you want to set, press “OK” to confirm. When cursor is flashing, you can set the parameter by pressing up or down to increase or decrease the value. Press “OK” to confirm.
- Enter the power limit mode, the value refers to the limitation of the output power: 1.00 means 100% output power, 0.85 means 85% output power.
- Once the setting is finished, move the cursor to OK on the screen, confirm the setting by pressing “OK”.

Power Factor		OK	Back
Mode:	[cosφ(P)]		
Upper Limit:	[0.90]		
Lower Limit:	[0.80]		
Lower Power:	[0.30]		
Upper Power:	[0.70]		

Power Factor		OK	Back
Mode:	[off]		



F) Grid Setting

Grid setting is to set the limited parameter of the public grid. It has 8 parameters to set.

- Enter the “Grid setting” with cursor on the setting interface and press “OK” to confirm.
- Enter the “Grid Setting” interface. Move the cursor to the parameter you want to set by pressing up or down button. Press “OK” to confirm.
- The cursor will flash; press up or down to increase or decrease the value and press “OK” to confirm.
- Press the down button when the cursor is at the bottom of the screen, the screen will jump to the next page.

Grid Setting	OK	Back
Page - 1/2		
Vac High:	[240 V]
Vac Low:	[210 V]
Vac High Slow:	[235 V]
Vac Low Slow:	[215 V]

Grid Setting	OK	Back
Page - 2/2		
Fac High:	[55.00 Hz]
Fac Low:	[40.00 Hz]
Fac High Slow:	[50.00 Hz]
Fac Low Slow:	[45.00 Hz]

G) Reset

Reset function can reset E-today and error log.

- Enter the interface by selecting the “Reset” with the cursor on the setting interface and press “OK” to confirm.
- Select “Reset E-today” or “Reset error log” and press “OK” to confirm.
- Next enter into Reset E- today or reset error log interface. Press OK to reset.

Reset	Back
<input type="button" value="Reset E-today"/>	
<input type="button" value="Reset Error Log"/>	

H) Safety

Safety allows selecting different countries grid connection safety rules.

- Enter the safety by selecting the “Safety” on the setting interface.
- Press left and right to choose different countries, press “OK” to confirm.
- Move the cursor to “Back” and press OK to get back to the setting interface.



- **Information**

Information interface displays the main information of the inverter. Such as the total generated power, the current temperature inside the inverter and the total run time.

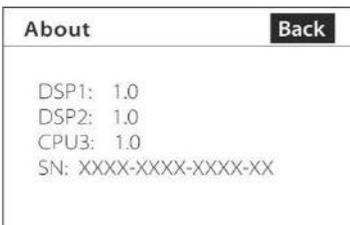
- Enter the "Information" with cursor on the menu interface and press "OK" to confirm.
- Move the cursor to "Back" and press "Back" to get back to the menu interface.



- **About**

"About" interface displays the version and serial number of the inverter.

- Enter "About" by selecting "About" with cursor on the menu interface and press "OK" to confirm.
- Move the cursor to "Back" and press "Back" to get back to the menu interface.



7. TROUBLESHOOTING

7.1 Trouble shooting

This section contains information and procedures for solving possible problems with the OGT-3P series inverter, and provides you with trouble shooting tips to identify and solve most problems that could occur with the OGT-3P series inverter.

This section will help you narrow down the source of any problem you may encounter. Please read the following troubleshooting steps.

- Check the warning or fault messages on the System Control Panel or Fault codes on the inverter information panel. If a message is displayed, record it before doing anything further.
- Attempt the solution indicated in the table below.

Faults	Diagnosis and Solution
SPI ERR	SPI communication fault <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
SCI ERR	SCI communication fault <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
Lcd CommsErr	LCD communication fault <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
HW_OCP_ACR	AC over current detected by hardware. <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
HW_OCP_ACS	
HW_OCP_ACT	
HW_OVP_BUS	BUS over voltage detected by hardware. <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
HW_OCP_Boost I	Boost over current detected by hardware. <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.
HW_OCP_Boost II	
PV ConfigSet_Wrong	PV connection fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV- , reconnect them. • Seek help from your supplier if unit does not return to normal.

Faults	Diagnosis and solution
SampleConsistentFault	Detection circuit fault <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
UnRecover_Relay Fault	Relay fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
Current_Sensor_Fault	Current sensor fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
UnRecover_FANXFault	Fan circuit fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
EEPROM_WR_Fault	EEPROM reading or writing fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
GFCI_Device_Fault	Leakage current detection device fault. <ul style="list-style-type: none"> • Disconnect PV+ and PV-, reconnect them. • Seek help from your supplier if unit does not return to normal.
SW_OCP_ACR	AC over current detection by software. <ul style="list-style-type: none"> • The grid power is not stable. • Wait for a while,the system will reconnet to the grid automatically.
SW_OCP_ACS	
SW_OCP_ACT	
SW_OCP_Boost I	Boost over current detection by software. <ul style="list-style-type: none"> • The PV input is not stable. • Wait for a while,the system will reconnet to the grid automatically.
SW_OCP_Boost II	
PLL Fault	Phase-lock over time. <ul style="list-style-type: none"> • Wait for a while,the system will reconnet to the grid automatically. • If this fault happens frequently, check the three-phase connection. • Seek help from your supplier if unit does not return to normal.
Grid_Lost_Fault	Grid voltage or frequency is out of range or not present at all <ul style="list-style-type: none"> • System will reconnect after the utility is back to normal. • Seek help from your supplier if unit does not return to normal.
SW_OVP_AC	Over voltage AC side. <ul style="list-style-type: none"> • Wait for a while,the system will reconnet to the grid automatically. • Seek help from your supplier if unit does not return to normal.

Faults	Diagnosis and solution
SW_OVP_Boost I	Boost over voltage detected by software. <ul style="list-style-type: none"> • Check the PV input, make sure the MaxDC voltage is < 950V. • Seek help from your supplier if unit does not return to normal.
SW_OVP_Boost II	
SW_OVP_Boost	
SW_OVP_ACR	Over current/voltage of each phase in AC side detected by software. <ul style="list-style-type: none"> • If one of these faults happens frequently, check with Eskom.
SW_OVP_ACS	
SW_OVP_ACT	
SW_UVP_ACR	
SW_UVP_ACS	
SW_UVP_ACT	
SW_OVP_BUS	Bus over voltage detected by software. <ul style="list-style-type: none"> • Check the PV input, make sure the MaxDC voltage is < 950V. • Seek help from your supplier if unit does not return to normal.
SW_OFF_AC	The grid frequency is out of limit. <ul style="list-style-type: none"> • If one of these faults happens frequently, check with Eskom.
SW_UFP_AC	
SW_UFP_ACR	
SW_UFP_ACS	
SW_UFP_ACT	
SW_OFF_ACR	
SW_OFF_ACS	
SW_OFF_ACT	
ISO I Fault	Isolation fault in boost circuit. <ul style="list-style-type: none"> • Please check the PV input wiring. • Seek help from your supplier if unit does not return to normal.
ISO II Fault	
RelayShortFault	The relay in the inverter is faulty. <ul style="list-style-type: none"> • Seek help from your supplier if unit does not return to normal.
RelayOpenFault	
SW_OCP_DCI	DCI current over limit. <ul style="list-style-type: none"> • Seek help from your supplier if unit does not return to normal.

Faults	Diagnosis and solution
SW_OCP_RCD	Residual current detector device fault or residual current over limit, <ul style="list-style-type: none"> • Check the resistance of DC input and AC output. • Seek help from your supplier if unit does not return to normal.
SW_OCP_RCD_Jump I	
SW_OCP_RCD_Jump II	
SW_OCP_RCD_Jump III	
SW_OCP_RCD_300mA	
SW_OVP_ACRMS	The RMS value of AC current is above limit. <ul style="list-style-type: none"> • Seek help from your supplier if unit does not return to normal.
SW_OverTemp	Temperature is above limit. <ul style="list-style-type: none"> • Check if fan is running normally. • Check if the environment temperature is above limit. • Seek help from your supplier if unit does not return to normal.
SW_IACRMS_Unbalance	The RMS value of AC current not balance.
SW_FAN I fault	Fan fault. <ul style="list-style-type: none"> • Check if fan is running normally. • Check if fan is blocked. • Seek help from your supplier if unit does not return to normal.
SW_FAN II fault	
SW_FAN III fault	
UnRecover_LN_Fault	The L and N line is not connected correctly. <ul style="list-style-type: none"> • Check the connection of L and N. • Seek help from your supplier if unit does not return to normal.
Auto_Test_Fault	Auto test failed.(For Italy)
SW_BUS_Unbalance	Bus not balance. <ul style="list-style-type: none"> • Seek help from your supplier if unit does not return to normal.
PhaseDelta Fault	Phase fault. <ul style="list-style-type: none"> • Contact Eskom if this happens frequently.
Control Loop ERR	Controller fault. <ul style="list-style-type: none"> • Seek help from your supplier if unit does not return to normal.

If your inverters information panel is not displaying a fault light, check the following list to make sure that the present state of the installation allows proper operation of the unit.

- Is the inverter located in a clean, dry, and well ventilated place?
- Are the DC input breakers open?
- Are the AC and DC cables adequately sized for applicable current rating and distance?
- Are the input and output connections and wiring in good condition?
- Are the configurations settings correct for your particular installation?
- Are the display panel and the communications cable properly connected and undamaged?

Contact Sinetech for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit.

7.2 Routine Maintenance

Inverters do not need any maintenance or correction in most conditions, but if the inverter often loses power due to overheating, this can be the following reason:

- The cooling fins on the rear of the house are covered by dust.

Only trained and authorized professional personnel who are familiar with the requirements of safety are allowed to perform servicing and maintenance work.

• Safety checks

Safety checks should be performed at least every 12 month by Sinetech's qualified person who has adequate training, knowledge, and practical experience to perform these tests. The data should be recorded in an equipment log. If the device is not functioning properly or fails any of the tests, the device has to be repaired. For safety check details, refer to this manual, section 2 Safety Instruction and EC Directives.

• Maintain periodically

Only qualified person may perform the following works.

While operating the inverter, the person in charge shall examine and maintain the machine regularly. The basic operations are as follow:

1. Check that the air inlet and outlet of the inverter are not blocked, the fans work normally, and the machine can be cleaned from dust when necessary. This work should be performed from time to time, depending on site condition.
2. Check that the indicators of the inverter are in normal state, check that the keys of the inverter are in normal state, check if the indicators of the inverter are in normal state. Check if the display of the inverter is normal. These checks should be performed at least every 6 month.
3. Check for damage on AC and DC input and output cabling. This check should be performed at least every 6 months.

4. You should get the solar panels cleaned and their mechanical fittings checked at least every 6 months.

Clean the ventilation filter

The inverter takes cooling air in via a mesh filter and blows it out again through a mesh filter using its fan. If the ventilation mesh is covered with dust it will result in reduced air flow to the inverter. Clean the ventilation meshes if they are dirty.



NOTE!

“The ventilation meshes can only be removed for short cleaning periods. The ventilation meshes protect the inverter against the ingress of insects, leaves, dust etc.

8. DECOMMISSIONING

8.1 Dismantling the inverter

- Disconnect the inverter from DC input and AC output.
- Remove all connection cables from the inverter.
- Open anti – theft lock.
- Remove the inverter from the bracket.
- Remove the bracket if necessary.

8.2 Packaging

If possible, pack the inverter into its original packaging.

If it is no longer available, you can also use an equivalent carton that meets the following requirements:

- Suitable for loads above 50kg
- With carry handle
- Can be fully closed.

8.3 Storage

Store the inverter in dry place where ambient temperatures are always between -20°C and $+60^{\circ}\text{C}$.

8.4 Disposal

When the inverter or other related components needs to be disposed of, have it carried out according to local waste handling regulations. Please be sure to deliver wasted inverters and packaging materials to relevant site.

- **The inverter is suitable for the following countries:**

State	Voltage and Frequency range
Germany	Comply with the local grid
France	Comply with the local grid
Norway	Comply with the local grid
Denmark	Comply with the local grid
Netherland	Comply with the local grid
Czech	The reconnection time can be adjusted from 20s to 20min.
Slovenia	Comply with the local grid
Greece(continent)	Comply with the local grid
Greece(island)	Comply with the local grid
England	Comply with the local grid
Australia	Comply with the local grid
Belgium	Comply with the local grid

9. LIMITED PRODUCT WARRANTY

5 Years Limited Warranty

Sinotech Pty (Ltd) warrants that the Unit will be free from defects for 5 years following the date it was purchased.

Please Note: The Limited Warranty is subject to a number of important exclusions and limitations. This Limited Warranty does not apply to any defect resulting from any of the following, each of which may result in your Limited Warranty being voided:

- Abuse, misuse or negligence.
- The removal of the Serial Number.
- Accidents or force majeure events, including but not limited to lightning, flood, earthquake, fire, extreme cold weather, or other events outside the reasonable control of Sinotech.
- Failure to operate or maintain the Unit in accordance with the User Manual.

In addition, this Limited Warranty does not cover normal wear and tear or deterioration, or superficial defects, dents or marks that do not impact the performance of the Unit, noise or vibration that is not excessive or uncharacteristic and does not impact your Unit's performance, damage or deterioration that occurs after the expiration or voiding of the warranty period or theft of the Unit or any of its components.

Limitations of Liability: To the greatest extent permitted by law, Sinotech shall not be liable for any consequential, incidental, indirect, special, and exemplary or punitive damages arising out of or related to this limited warranty, regardless of the form of action and regardless of whether Sinotech has been informed of, or otherwise might have anticipated, the possibility of such damages. To the greatest extent permitted by law, Sinotech's liability arising out of a claim under this limited warranty shall not exceed the amount you paid for the Unit. Some countries and regions do not allow, or restrict, the exclusion or limitation of damages, including incidental or consequential damages, so the above limitation or exclusion may not apply to you, or may only apply to a limited extent.

Limitation on Use: The Unit is not to be used as a primary or back-up power source for life-support systems, other medical equipment, or any other application where product failure could lead to injury to persons or loss of life or catastrophic property damage. Sinotech disclaims any and all liability arising out of any such use of the Unit. Further, Sinotech reserves the right to refuse to service any Unit used for these purposes and disclaims any and all liability arising out of Sinotech's service or refusal to service the Unit in such circumstances.