

WEEE Number: 80133970

# INSTRUCTION MANUAL

50 - 60Kw GRID TIED SOLAR INVERTER



SKU	MODEL
11521	VT-6607150
11631	VT-61060



**MULTI-LANGUAGE MANUAL QR CODE** Please scan the QR code to access the manual in multiple languages.

IN CASE OF ANY QUERY/ISSUE WITH THE PRODUCT, PLEASE REACH OUT TO US AT: SUPPORT@V-TAC.EU FOR MORE PRODUCTS RANGE, INQUIRY PLEASE CONTACT OUR DISTRIBUTOR OR NEAREST DEALERS. V-TAC EUROPE LTD. BULGARIA, PLOVDIV 4000, BUL.L.KARAVELOW 9B

#### Preface

The manual is intended to provide detailed information of product information, installation, application, trouble shooting, precautions and maintenance of iMars series grid-tied solar inverters. The manual does not contain all the information of photovoltaic system. Please read this manual carefully and follow all safety precautions seriously before any moving, installation, operation and maintenance to ensure correct use and high performance of operation on the inverter.

The use of the iMars series grid-tied solar inverters must comply with local laws and regulations on grid-tied power generation.

The manual needs to be kept well and be available at all times.

All rights reserved. The contents in this document are subject to change without notice.

There might be some deviations on actual inverter and data due to product updating, please refer to the actual product.

## Content

Preface
1. Safety precautions
1.1 Warning marks
1.2 Safety guidance
1.2.1 Transport and installation
1.2.2 Grid-connected operation
1.2.3 Maintenance and inspection
1.2.4 Waste disposal
2 Product overview
2.1 PV grid-connected power generation system
2.1.1 Supported grid connection structure
2.2 Product appearance
2.3 Nameplate description
2.4 Product model
2.5 Outline dimension and weight
2.6 The LED light panel
2.6.1 LED light panel
2.6.2 LCD operation panel10
2.7 Bottom of the chassis
3 Inverter storage
4 Installation13
4.1 Unpacking confirmation13
4.2 Prepare before installation15
4.2.1 Installation tool15
4.2.2 Installation environment15
4.3 Space requirements
4.4 Mounting board size17
4.5 Wall installation
4.6 Install the inverter
5 Electrical connection

5.1 Overview of electrical connections	20
5.2 Connect the protective ground wire	20
5.3 Connection of photovoltaic string	21
5.4 Three-phase inverter grid access	23
5.4.1 Connection terminal grid access	23
5.4.2 Parallel requirements for multiple inverters	24
5.4.3 Grid voltage requirements	24
6 Running	25
6.1 Inspection before running	25
6.2 Inverter grid-connected running	25
6.3 Inverter stop	26
6.4 Daily maintenance and inspection	26
6.4.1 Periodic maintenance on the inverter	26
6.4.2 Maintenance guidance	
7 Troubleshooting	29
8 Contact information	33
9 Appendix	

### 1. Safety precautions

iMars series grid-tied solar inverters are designed and tested strictly in accordance with relevant international safety standards. As an electrical and electronic device, all relevant safety regulations must be strictly complied during installation, operation, and maintenance. Incorrect use or misuse may result in:

• Injury to the life and personal safety of the operator or other people.

• Damage to the inverter or other property belonging to the operator or other people.

In order to avoid personal injury, damage to the inverter or other devices, please strictly observe the following safety precautions.

This chapter mainly describes various warning symbols in operation manual and provides safety instructions for the installation, operation, maintenance and use of the iMars series grid-tied solar inverters.

## 1.1 Warning marks

Warning marks is alerting users to conditions which may cause serious physical injury or death, or damage to the device. They also tell users how to prevent the dangers. The warning marks used in this operation manual are shown below:

Mark	Name	Instruction	Abbreviation
Danger	Danger	Serious physical injury or even death may occur if not follow relevant requirements.	A
	Warning	Physical injury or damage to the device ing may occur if not follow relevant requirements.	
Forbid	Electrostatic sensitive	Damage may occur if relevant requirements are not followed.	
Hot	High temperature	Do not touch the base of the inverter as it will become hot.	
Note	Note	The procedures taken for ensuring proper operation.	Note

## 1.2 Safety guidance

• After receiving this product, first please confirm the product package is intact. If

any question, please contact the logistic company or local distributor immediately.

• The installation and operation of PV inverter must be carried out by professional

	technicians who have received professional trainings and thoroughly familiar with			
	all the contents in this manual and the safety requirements of the electrical			
	system.			
	• Do not carry out cable connection/disconnection, cover open for inspection and			
	unit replacement operations on the inverter when power is connected. Before			
	wiring and inspection, users must confirm the			
	breakers on DC and AC side are disconnected and wait for at least 5 minutes.			
	• Ensure there is no strong electromagnetic interference caused by other electronic			
	or electrical devices around the installation site.			
	<ul> <li>Do not refit the inverter unless authorized.</li> </ul>			
	• All the electrical installation must conform to local and national electrical			
	standards.			
	• Do not touch the housing of the inverter or the radiator to avoid scald as they			
	may become hot during operation			
^				
	<ul> <li>Must be reliably grounded before operation.</li> </ul>			
	• Do not open the surface cover of the inverter unless authorized. The electronic			
	components inside the inverter are electrostatic sensitive. Do take proper			
	anti-electrostatic measures during authorized operation.			
	<ul> <li>Grounding mark. The inverter must be reliably grounded.</li> </ul>			
2				
$\langle \mathcal{F} \rangle$	• Discharging mark. Ensure that DC and AC side circuit breakers have been			
5min	disconnected and wait at least 5 minutes before wiring and checking.			
Note:	Technical personnel who can perform installation, wiring, commissioning,			
mainte	nance, troubleshooting and replacement of the iMars series grid-tied solar inverters			
must r	neet the following requirements:			
<ul> <li>Opera</li> </ul>	ators need professional training.			
• Operators must read this manual completely and master the related safety precautions.				
• Operators need to be familiar with the relevant safety regulations for electrical systems.				
Opera	ators need to be fully familiar with the composition and operating principle of the entire			
grid-tie	d photovoltaic power generation system and related standards of the			
countri	es/regions in which the project is located.			
Opera	Operators must wear personal protective equipment.			

#### 1.2.1 Transport and installation

• During storage or transport, ensure the inverter package and the chassis is intact,
dry and clean.
• The movement and installation of the inverter require at least two persons due to
its heavy weight.
• Select proper tools for movement and installation to ensure the inverter can
operate normally and avoid physical injury. The installation personnel must take
mechanical protective measures such as wearing anti-drop shoes or working
clothes to protect physical security.
• The inverter must be installed by professional technicians.
• Do not store or install the inverter on or close to flammable and explosive objects;
• Do not install the inverter in the place where children and other public can easily
touch
<ul> <li>Remove the metal accessories in hands eg ring or bracelet before device</li> </ul>
installation and electrical connection to avoid electric shock.
• The solar cell module exposed to the sunlight may generate dangerous voltage.
Users must cover the solar cell with fully-lightproof materials before electrical
connection
• The inverter input voltage cannot exceed the max input voltage, otherwise the
inverter may be damaged.
• PV grid-connected inverter is not applicable to the positive or negative ground
system of solar cell panel.
• Ensure inverter PE is grounded properly, otherwise the inverter cannot run
normally.
• Ensure the inverter is installed firmly and electrical wiring is reliable.

Note: PV grid-connected inverter is only suitable for crystalline silicon-type solar battery component.

#### 1.2.2 Grid-connected operation

	• Permissions by local electric power agency must be obtained and the inverter
	grid-connected power generation operation must be done by professional technicians.
	• All electrical connections must meet the electrical standards of the countries/regions in
4	which the project is located.
	• Ensure the inverter is installed firmly and electrical wiring is reliable before operating on
	the inverter.
	<ul> <li>Do not open the inverter when it is running or connecting power</li> </ul>

#### 1.2.3 Maintenance and inspection

- The maintenance, inspection and repair of the inverter must be done by well trained and qualified professional technicians.
- Contact distributor or manufacture for inverter repairing.

## In order to avoid irrelevant personnel entering the maintenance area during maintenance, temporary warning labels must be placed to warn non-professionals to enter or please isolate with fences.

• Before carrying out any maintenance operations, users must disconnect the breaker on grid side, then disconnect the breaker connected to the PV module and wait-at least 5 minutes until the internal parts of the inverter are fully discharged.



- Do not use components provided by other companies when repairing the inverter.
- The inverter can be started again for grid-connected power generation only after confirming there is no fault that may impact the safety performance of the inverter.
- Do not get close to or touch the grid or any metal conductive parts in the PV power generation system during operation, otherwise electric shock or fire may occur. Take note of any safety marks and instructions such as "Danger, electric shock risk".

#### 1.2.4 Waste disposal



 Do not dispose of the inverter together with household waste. The user has the responsibility and obligation to send it to the designated organization for recycling and disposal.

#### 2 Product overview

This chapter mainly introduces the appearance, package accessories, nameplate, technical

parameters of the grid-connected inverter.

## 2.1 PV grid-connected power generation system

PV grid-connected power generation system is comprised of solar battery component, grid-connected inverter, power energy gauging device and public grid.



Fig 2.1 Application of PV grid-connected inverter

The PV grid-connected inverter is the core part of solar PV grid-connected power generation system. The sunlight can be converted through PV panel to DC power, which further converted by grid-tied inverter to the sine AC current with the same frequency and phase position as the public grid, then feedback the AC power to the grid.



• It is recommended that the PV array to be installed conforms to IEC 61730 class A standards.

#### 2.1.1 Supported grid connection structure

iMars series grid-tied solar inverters support TN-S, TN-C, TN-C-S, TT and IT grid connection. When applied to the TT connection, the N-to-PE voltage should be less than 30V.



Fig 2.2 Type of grid

## **2.2 Product appearance**



Figure 2.3 Appearance of the three-phase PV inverter

Table 2-1 Descrip	ntion of key ex	terior compon	ents of three-	hase PV inverters
	рион ог кеу ел	tenor compon		

Serial number	Name	Description
1	DC switch	Connect DC input
2	DC input interface	Inverter DC input terminal, connected to the PV array
3	Communication interface	RS485 communication interface and its extension port EXT
4	AC terminal	Inverter AC output port, connect to public grid
5	LED pilot lamp	Instructions inverter current working condition
6	Fan Installation components	Air inlet, for fixing the fan
7	Nameplate	Mark the inverter rating parameter
8	Ground terminals /4	Two nos, at least one was selected for connection
9	Base handle	Two left and right for handling of inverter

Figure 2.4 shows the inverter nameplate..

Grid-tied Solar Inverter		
VT-6	1060	٦
DC Input		
Vmax. PV	1100V	
MPPT Range	200V-1000V	
Max. Current	39A/39A/39A/39A	
Isc PV	48A/48A/48A/48A	
AC Output		
Nominal Voltage	3/N/PE,230/400V	
Max. Current	95.6A	
Rated Power	60000W	
Max. Output Power	66000VA	
Frequency	50Hz/60Hz	
Power factor range	0.80un ~ 0.80ov	
Environment		
Temperature	-30℃ ~ +60℃	
Protective Class	I	
Inverter topology	Non-isolated	
Ingress protection	IP66	J
	CE	- 3

Fig 2.4 Inverter nameplate

- (1) Trademarks and product types
- (2) Model and important technical parameters
- (3) Certification system of the inverter confirming, serial number, company name and country of origin

Icons	Instruction			
	<ul> <li>TUV certification mark. The inverter is certified by TUV</li> </ul>			
CE	• CE certification mark. The inverter complies with the CE directive			
Cec	CQC certification mark. The inverter passed CQC certification			
X	• EU WEEE mark. The inverter cannot be disposed of as domestic waste			

## 2.4 Product model

Product name	Model	Rated output power (W)	
three-phase (L1、L2、L3、N、PE)			
Three-phase PV grid-connected inverter	XG50KTR	50000(400Vac system)	
Three-phase PV grid-connected inverter	XG60KTR	60000(400Vac system)	
Three-phase PV grid-connected inverter	XG66KTRL	66000(480Vac system)	
Three-phase PV grid-connected inverter	XG70KTRL	70000(480Vac system)	

Table 2-2 Models of three-phase PV grid-connected inverters

Note: Technical parameters of PV grid-connected inverter refer to the appendix.

## 2.5 Outline dimension and weight



Figure 2.5 Outline dimensions of the inverter

Model	Height(mm)	Width(mm)	Depth(mm))	Net weight(kg)
XG50KTR	500	650	260	42.5
XG60KTR	500	650	260	45.3
XG70KTRL	500	650	260	45.3

Table 2-3 Dimensions and net weight of the inverter



Fig 2.6 Dimension of paper package

Table 2-4 Package dimension and gross weight

Model	Height(mm)	Width(mm)	Depth(mm)	Weight(kg)	Package material
XG50KTR	785	640	385	47.2	Corrugated case
XG60KTR	785	640	385	51	Corrugated case
XG70KTRL	785	640	385	51	Corrugated case

## 2.6 The LED light panel

The LED indicator panel as the human-computer interaction interface, may indicate the working state of the inverter.

#### 2.6.1 LED light panel



#### LED indicator status description:

>	Steady blue	Normal, grid-tied and generating power	
	Blinking blue at short interval (0.2s)	Bluetooth connected and with communication. And inverter has no error	
	Blinking blue at long interval (2s)	DC or AC connected, inverter in standby or starting (no power generation)	
	Steady red	Error occurs.( The inverter fail to connect to the grid)	
×	Blinking red Bluetooth connected and in communicating but inverter h error		
	Red light off	AC and DC have been powered off.	

#### 2.6.2 LCD operation panel



#### Definition of LCD operation panel:

1 "Run", running status, shows green light;	•
2 "Alarm", fault alert, shows yellow light;	
3 "Fault", the PV string is disconnected, shows red light;	
4 Select upwards, short press to move upwards, long press to confirm;	
5 Select downward, short press to move	(5)
down, long press to return.	

Indicator	Instruction	State	Description	
light	Instruction	State	Description	
	Crid connect	Green light on	connected to grid	
Run	ed indicator	Green light off	Not connected to grid	
. ton	light	Green light flashes 0.5s	The inverter is in maintenance	
		On, 0.5s Off)	status	
		Yellow light-on	The inverter is in fault state	
	Alarm	Yellow light flashes slowly	The Inverter is in alarm state	
Alarm	indicator	1s On, 4S Off		
		Yellow light flashes (0.5s on,	The inverter is under	
		0.5s off)	maintenance	
			The power-on indicator light	
			indicates that at least one of the	
		Red light on	photovoltaic strings is connected	
	The PV		normally and the input voltage is	
Fault	connection		≥200V	
	indicator light		The inverter is disconnected from	
		Pod light off	all PV strings, or the DC input	
		red light on	voltage of all MPPT circuits is	
			less than 200V	

#### LED light display status description:

## 2.7 Bottom of the chassis

XG40-70KTR is equipped with a DC switch, which connects or disconnects all PV inputs.



XG50KTR Bottom view

### 3 Inverter storage

If the inverter is not put into use immediately, the storage of inverter should meet the following requirements:

- Do not remove the inverter outer package.
- The inverter needs to be stored in a clean and dry place, and to prevent the erosion of dust and moisture.
- The storage temperature should be kept at -30°C~+70°C, and the relative humidity should be kept at 5%RH~95%RH.
- If multiple inverters to be stacked, it is recommended to place them according to the original stacking layer number at the time of delivery. When stacking, please place the inverter carefully to avoid personal injury or equipment damage caused by equipment tipping.
- Avoid chemical corrosive substances, otherwise it may corrode the inverter.
- During storage, regular inspections are required. If insect bites or packaging damage are found, the
  packaging materials must be replaced in time. After long-term storage, the inverter needs to be
  inspected and tested by professionals before it can be put into use.

#### **4 Installation**

This chapter introduces the installation of the inverter and the connection of the inverter to the PV power generation system. Connecting inverters to PV power generation systems mainly involves the PV strings and public grids connect to the inverter.

Please read this chapter carefully before installation, and ensure that all installation conditions are met by professional technicians to complete the inverter installation.

#### 4.1 Unpacking confirmation

The inverter has been thoroughly tested and rigorously checked before delivery, but damage may still occur during transportation. Before unpacking, check carefully whether the product information in the order is consistent with that on the nameplate of the package box and whether the product package is intact. If any damage is detected, please contact the shipping company or the supplier directly. Please also provide photos of the damage to get our fastest and best service.

When the inverter is left unused, please put it in the original packing box and take measures to prevent moisture and dust.

Take out the inverter after unpacking, please check the following items:

(1) Confirm that the inverter host is complete and not damaged;

(2) Confirm that there are manuals, interface accessories and installation accessories in the packing box;

(3) Confirm that there is no damage or shortage in the delivery content in the packing box;

(4) Check whether the order is consistent with the product information on the nameplate of the inverter host;

(5) The standard delivery list is as follows.

Standard deliverables of three-phase inverter:



Fig4.1 Delivery content of three-phase inverter 50-70kW

Number	Name	Quantity
1	Inverter	1
2	Mounting bracket	1
3	AC output waterproof cover	1
4	485 communication cable	1
5	DC connector (pair)	12
6	File	1
7	Expansion bolt M8*60	5
8	M8 combination bolt	5
9	M4 combination screw	1
10	AC terminal	5

Table 4-1 delivery contents of three-phase inverter

Please check the above carefully. If you have any questions, please contact the supplier in time.

#### 4.2 Prepare before installation

#### 4.2.1 Installation tool

Table 4-2 List of installation tools

Number	Installation tools	instruction
1	Marker pen	Mark the mounting holes
2	Electric drill	Drill holes in the bracket or wall
3	Hand hammer	Knock the expansion bolt
4	Adjustable wrench	For fixed mounting bracket
5	Hexagon screwdriver	For locking anti-theft screws and for disassembling and disassembling AC junction box
6	"Flat" or "Cross" screwdriver	For AC wiring
7	Meg ohmmeter	Measure insulation performance and impedance to ground
8	Multi-meter	Detect circuit and measure AC and DC voltage
9	Electric soldering iron	Welding communication cable
10	Wire crimper	Crimp DC terminal
11	Hydraulic clamp	Crimp ring terminal for AC wiring

#### 4.2.2 Installation environment

- (1) The inverter can be installed in indoor and outdoor environment.
- (2) During the operation of the inverter, the temperature of the chassis and heat sink will be relatively high. Please do not install the inverter in the easily touched position.
- (3) Do not install inverters in areas where flammable and explosive materials are stored.
- (4) The inverter shall be installed in a well-ventilated environment to ensure inverter heat dissipation
- (5) It is recommended to choose the installation site with shelter or build



Fig 4.2 Sunshade

- (6) The installation environment temperature is 25  $^{\circ}$ C ~ 60  $^{\circ}$ C;
- (7) The installation site should be far away from the electronic equipment with strong electromagnetic interference;
- (8) The installation site should be fixed and solid object surface, such as wall, metal support, etc;
- (9) The installation position shall ensure the reliable grounding of the inverter, and the grounding metal conductor material shall be consistent with the reserved grounding metal material of the inverter.

#### 4.3 Space requirements

(1) The height of installation position shall ensure that the line of sight and LED display light are on the same horizontal plane, so as to check the inverter status conveniently.



Fig 4.3 Optimum installation height area

(2) There is enough reserved space around the installation site to facilitate the disassembly and assembly of inverter and air convection. As shown in Fig 4.3.



Fig 4.4 Installation spacing of inverter

(3) When installing multiple inverters, a certain distance shall be reserved between the inverters, as shown in Figure 4.4. At the same time, sufficient distance shall be reserved between the upper and lower parts of the inverter to ensure good heat dissipation.



Fig 4.5 Size requirements for side-by-side installation

(4) The installation surface should be perpendicular to the horizontal line, as shown in Figure 4.5. Please install the inverter vertically or backward ≤15° to facilitate the heat dissipation of the machine. Do not tilt the inverter forward, horizontally, upside down, leaning too far, or tilting to the side.



Fig 4.6 Installation position of inverter

#### 4.4 Mounting board size



Fig 4.7 Dimensions of the mounting plate

#### 4.5 Wall installation

Step 1: Place the hanging board on the wall mounting point, use a level to adjust the angle, and mark with a marker.



**Step 2:** Use a hammer drill to drill holes and install expansion bolts. Users need to prepare expansion bolts by themselves. It is recommended to use M8×60 stainless steel pressure explosion expansion bolts.



**Step 3:** Fix the hanging board. Clean the holes, use a rubber hammer to drive the expansion bolt into the hole, use a wrench to tighten the nut to fix the end of the bolt, then remove the nut, spring washer and flat washer, and then fix the wall mount plate to the wall and lock it with a tightening torque of  $13N^*m_\circ$ .



#### 4.6 Install the inverter

Step 1: Take the inverter out of the packaging box.

**Step 2:** If the installation location is high, you need to lift the inverter to the hanging plate, use the lifting equipment to lift the inverter 100mm off the ground and then pause, check the tightness of the hoisting ring and rope. After confirming that the connection is secure, lift the inverter to the destination.



Step 3: After lifting the inverter, buckle the bracket plate on the back of the machine into the wall-mounting plate, and make sure that the machine bracket plate fits well with the groove of the hanging plate.



**Step 4:** Use an M4×1 2 screw to fix the inverter with the hole on the left side of the chassis and the wall mount, and the tightening torque is 2.5N\*m



## **5 Electrical connection**

## 5.1 Overview of electrical connections

This section will introduce the electrical connection related content and related safety precautions in detail.



Fig 5.1 Schematic diagram of PV grid-connected system connection

	• Electrical connections must be completed by professional worker. Wrong
	operation may cause equipment damage during system operation, and even
	personal injury.
•	All electrical installations must comply with national/regional electrical safety
<u>/!</u>	regulations.
	• Ensure that all cables are installed tightly, without any damage, and meet the
	specified safety requirements.
	• It is not allowed to turn on the AC and DC circuit breakers before the inverter
	completes the electrical connection and check.
	• Read this section carefully and operate strictly according to the requirements.
Note	• Pay attention to the rated voltage and current values specified in this manual, and
	do not exceed the limit values specified in this manual.

## 5.2 Connect the protective ground wire

Step 1: Crimp the OT terminal to the ground wire

**Step 2:** Remove the screw at the grounding position on the side of the chassis, fix the ground wire with the screw and tighten the tightening torque 7-9N•m.



## 5.3 Connection of photovoltaic string

**Step 1:** Connect the outlet line of the PV panel to the MC4 terminal delivered by the machine The MC4 terminal crimping method is as follows:

(1) As shown in Fig 5.2, connect the output wire of the PV string to the DC connector of the inverter. Loosen the fastening nut of the connector; strip off the 15mm insulation layer of the DC cable, and use crimping pliers to press the standard metal terminal tightly. The tightening torque of the waterproof part at the tail is 2.5-3Nm. The wiring method of the positive and negative connectors is the same. Confirm that the positive and negative poles of the PV string correspond correctly to the positive and negative connectors, then connect them firmly;



Fig 5.2 Connection between MC4 DC connector and PV string

(2) After the DC connector is connected, use a multi-meter to measure the voltage of the DC input string, verify the polarity of the DC input cable, and ensure that the voltage of each string is within the allowable range of the inverter, as shown in Fig 5.3.



Fig 5.3 Measuring DC input voltage

The PV string connected to iMars series inverter must adopt the DC connector configured especially for the inverter, do not use other connection devices without authorization from our company, otherwise damage to the device, unstable operation or fire may occur and our company will not undertake quality assurance or assume any direct or joint liability thereof.

**Step 2:** After the DC terminal is connected, it is directly connected to the MC4 terminal of the machine.

(1) Connect the positive and negative connectors of the PV strings that have been connected to the corresponding positions of the inverter DC interface, and confirm the tight connection, as shown in Fig 5.4;

(2) When disassembling the DC connector from the inverter, insert the tip of a slotted screwdriver into the raised hole in the middle of the connector, and force the movable end of the connector to withdraw.



Fig 5.4 PV DC string connected to the inverter

### 5.4 Three-phase inverter grid access

Inverter AC connector interface	Three-phase grid	Remarks
L1	L1 (A)	No phase sequence
L2	L2 (B)	No phase sequence
L3	L3 (C)	No phase sequence
Ν	N(Neutral line)	Support N-wire and non-N-wire connection
	PE ground wire (grounding point on the outside of the chassis)	Must be connected

Table 5-1 Three-phase photovoltaic inverter AC connector interface description

#### 5.4.1 Connection terminal grid access

(1) Connect the four wires of the three-phase public power grid L1, L2, L3 and N to the AC connector interface according to Table 5-1, and connect the grounding wire to the grounding point on the outside of the chassis, and ensure that the conductors are crimped firmly without exposure , As shown in Fig 5.6;



Fig 5.6 Crimp cable terminal

(2) Then tighten the L1, L2, L3, N, crimped terminals according to Fig 5.7 to a torque of 7-9N•m, and the PE grounding torque of the outer side of the chassis to a torque of 7-9N•m; then tighten the AC Tighten the waterproof cap.



Fig 5.7 Three-phase inverter grid connection

#### 5.4.2 Parallel requirements for multiple inverters

Use multiple inverters to directly connect to the low-voltage three-phase grid solution. If the total capacity of the inverters is greater than 1MVA, please contact our after-sales service personnel.



Use multiple inverters to connect the low-voltage side of the medium-voltage transformer, and the high-voltage side directly connects to the medium-voltage grid. If the total capacity of the inverter is greater than 1MVA, please contact our service personnel. At the same time, the transformer must meet the total output of the inverter. Power requirements, and there is a neutral point or an external neutral conductor.



#### 5.4.3 Grid voltage requirements

Before installing the PV inverter, you need to confirm the working voltage of the AC side of the product. There are two rated voltages of 400Vac and 480Vac;



## 6 Running

This chapter introduces the related operations during the use of the inverter, which mainly involves pre-operation inspections, grid-connected operation of the inverter, inverter shutdown, and precautions for daily maintenance and repair of the inverter.

## 6.1 Inspection before running

The following items must be checked strictly before running the PV grid-connected inverter (including but not limited to the following items):

(1) Confirm the installation site of the inverter meet requirements of section 4.2.2 to ensure convenient installation, disassemble, operation and inspection on the inverter;

(2) Confirm the mechanical installation of the inverter meet requirements of section 5.3;

- (3) Confirm the electrical connection of the inverter meet the requirements of section 4.4;
- (4) Confirm all the switches are in "OFF" state;

(5) Confirm the open-circuit voltage of PV module conforms to the parameter requirements of inverter DC side in appendix;

(6) Confirm the electrical safety marks on the installation site is clear enough.



 In order to ensure a safe, normal and stable operation of the PV power generation system, all the newly installed, renovated and repaired PV grid-connected power generation system and its grid-connected inverter must undergo inspection before running.

## 6.2 Inverter grid-connected running

Please strictly follow the steps below to turn on the inverter and complete the grid-connected operation of the inverter::

	• For the first operation of the inverter, a country must be selected to set
	grid-connected standards.
Note	• Please keep the inverter powered on for at least 30 minutes, and complete the
	charging of the built-in clock battery of the inverter to ensure the normal operation
	of the clock!

- (1) Make sure that the inspection items in Section 6.1 meet the requirements;
- (2) Turn on the AC side circuit breaker of the inverter public grid;
- (3) Turn on the DC switch integrated in the inverter;
- (4) Turn on the switch on the DC input side of the photovoltaic string;
- (5) Observe the status of the inverter's LED lights or the information displayed on the LCD

screen (refer to section 2.6 for LED status lights and LCD display information);

(6) Wait for the inverter to connect to the grid successfully.

### 6.3 Inverter stop

When it is necessary to perform power failure maintenance, overhaul, and troubleshooting of the inverter, please strictly follows the steps below to shut down the inverter:

(1) Disconnect the AC side circuit breaker of the inverter public grid;

(2) Disconnect the DC switch integrated in the inverter;

(3) Disconnect the line switch on the DC input side of the photovoltaic string;

(4) Wait at least 3 minutes until the internal components of the inverter are discharged, and the inverter shutdown operation is completed.

## 6.4 Daily maintenance and inspection

In the PV grid-connected system, even if the day and night change and the season changes, the PV grid-connected inverter can automatically complete grid-connected power generation, shutdown and start-up operations without human control. In order to ensure and prolong the service life of the inverter, in addition to using the inverter in strict accordance with the content specified in this manual, it is also necessary to carry out the necessary daily maintenance and inspection of the inverter.

Check Item	Inspection Method	Maintenance Cycle
Save inverter operating data	The monitoring software is used to read the data of the inverter in real time, and the data recorded by the monitoring software is regularly backed up. Save the inverter's operating data, parameters and logs recorded in the monitoring software to a file. Check the monitoring software and check the inverter parameter settings through the handheld	Once per quarter
Inverter running status	Observe whether the inverter is installed firmly and whether it is damaged or deformed. To listen whether there's any abnormal sound during inverter running. When the system is connected to the grid, check various variables. Check whether the heating of the inverter shell is normal, and use a thermal imager to monitor the heating of the system.	Once per half a year
Clean the inverter	Check the RH and dust around the inverter, and clean the inverter when necessary. Refer to section 6.4.2.	Once per half a year

#### 6.4.1 Periodic maintenance on the inverter

Check Item	Inspection Method	Maintenance Cycle
	Check whether the system cable connection is	
	loose, whether the inverter wiring terminal is	
Electrical	loose, and then tighten it according to the method	Once per helf a veer
connections	specified in section 4. Check whether the cable is	Once per nall a year
	damaged, especially whether the rubber skin in	
	contact with the metal surface has cut marks.	
	For three-phase inverter products, observe	
O a a line of fam	whether the air inlet and outlet are normal, and	
Cooling fan	check whether there are cracks in the fan blades.	
maintenance	Listen for abnormal vibration when the fan is	Once per half a year
and	running. If necessary, clean the air inlet and	
replacement	outlet; if the fan is abnormal, it needs to be	
	replaced in time, see section 6.4.2.	
	Check the inverter LCD and the shutdown	
Security	function of the system. Simulate stop and check	Ones non half a second
function	the stop signal communication. Check the	Once per nait a year
	warning labels and replace them if necessary.	

#### 6.4.2 Maintenance guidance

#### Inverter cleaning

The cleaning steps are as follows:

- (1) Disconnect the input and output connections.
- (2) Wait ten minutes.
- (3) Use a soft brush or vacuum cleaner to clean the surface of the inverter and the air inlet and

outlet.

- (4) Repeat the operation content in section 6.1.
- (5) Restart the inverter.

#### Fan maintenance

	• Stop the inverter before maintenance work, and all power inputs of the inverter
	must be disconnected.
	• Wait at least 3 minutes for the capacitors inside the inverter to fully discharge
77	before starting maintenance work.
	Only professional electricians can perform maintenance and replacement of the
	fan.

Step 1: Stop the inverter and disconnect the electrical connection.

(1) Disconnect the input and output connections.

- (2) Turn the DC switch to the "OFF" position.
- (3) Wait ten minutes.
- (4) Disconnect all electrical connections at the bottom of the inverter.

Step 2: Disconnect the fan power plug and remove the fan cover at the bottom of the chassis.



Step 3: Use a soft brush or vacuum cleaner to clean the fan. If the fan is damaged, follow step 4.

Step 4: If the fan is damaged, remove the damaged fan and install the good fan to its original position.



Step 5: Re-install the fan tray to the inverter in the reverse order and restart the inverter...

	• Once the inverter stops due to an alarm, it is prohibited to start the inverter
Nete	immediately. You should find out the cause and confirm that all faults have been
Note	eliminated before starting the inverter. The inspection should be carried out strictly
	in accordance with the steps in section 6.1.

## 7 Troubleshooting

This chapter introduces fault alarms and codes, which are used to quickly find inverter faults.

Number	Fault types	Fault main code	Fault subcode	Fault information	Display information			
4		01	01	PV electricity down	01-01			
1	PV voltage fault	01	02	PV voltage high	01-02			
			01	Low voltage BUS	03-01			
2	BUS voltage error	03	02	BUS voltage high	03-02			
			03	BUS voltage imbalance	03-03			
			01	Inverter hardware flow	05-01			
			02	Inverter software flow	05-02			
3	Flow failures	05	03	The BOOST hardware flow	05-03			
			04	The BOOST software flow	05-04			
	Thermal failure	06	06	01	The inverter temperature thermal	06-01		
4				00		06	02	The BOOST thermal
4			03	The radiator thermal	06-03			
			04	The environmental thermal	06-04			
5	Insulation detection fault	07	01	Insulation detection fault	07-01			
6	Drive failure	08	01	Drive failure	08-01			
				01	DSP1 and ARM SCI failure	09-01		
								02
7	failure	09	03	DSP1 SPI fault	09-03			
			04	DSP2 SPI fault	09-04			
			05	SCI failure DSP1 and MCU	09-05			
8	Leakage current fault	10	01	The static leakage current is high	10-01			

Number	Fault types	Fault main code	Fault subcode	Fault information	Display information		
			02	30 ma mutation of failure	10-02		
			03	60 ma mutation of failure	10-03		
			04	150 ma mutation of failure	10-04		
0		44	01	Relay open	11-01		
9	Relay failure	11	02	Relay short circuit	11-02		
			01	DCI R phase failure	14-01		
10	DCI fault	14	02	DCI S phase failure	14-02		
			03	T the DCI fault	14-03		
			01	AC voltage test	19-01		
	Consistency of failure	19	02	BUS voltage detecting inconsistencies	19-02		
11			03	ISO voltage detecting inconsistencies	19-03		
			04	PV voltage detecting inconsistencies	19-04		
			05	GFCI inconsistent	19-05		
40	Mains voltage	04	01	Low mains voltage	31-01		
12	fault	51	02	Mains voltage high	31-02		
40	Mains	Mains	Mains	22	01	Mains frequency is low	33-01
13	frequency fault	33	02	Mains frequency is high	33-02		
14	Remote shutdown	37	01	Remote shutdown instructions	37-01		
15	Leakage current self-checking of failure	43	01	Leakage current sensor fault	43-01		
16	Auxiliary power failure	45	01	Auxiliary power off	45-01		

Number	Alarm types	Alarm master code	alarm subcode	alarm information	Display information	
			01	Fan1	01-01	
	Fan speed		02	Fan2	01-02	
1	is low	01	03	Fan3	01-03	
			04	Fan4	01-04	
2	Lightning protector	02	01	Lightning protector	02-01	
	String current		01	String 1	03-01	
			02	String 2	03-02	
			03	String 3	03-03	
0		String 03 current	00	04	String 4	03-04
3			05	String 5	03-05	
			06	String 6	03-06	
			07	String 7	03-07	
			08	String 8	03-08	

#### Table 8-2 Inverter alarm codes

If any problem, please contact with the supplier and provide following information:

•	Model of the inverter:	;
•	Serial No. of the inverter:	;
•	System version:	
	-version 1:	;
	-version 2:	
	-MCU software version:	_,
•	Fault code:	;
•	Fault description	

## 8 Contact information

IN CASE OF ANY QUERY/ISSUE WITH THE PRODUCT FOR MORE PRODUCTS RANGE INQUIRY PLEASE CONTACT OUR DISTRIBUTOR OR NEAREST DEALERS. V-TAC EUROPE LTD. BULGARIA, PLOVDIV 4000 BULL.KARAVELOW 9B support@v-tac.eu

## 9 Appendix

Table 9-1 Technical	parameters of three-	phase PV of	arid-connected	inverter
	paramotoro or anoo		gina cominocioa	

Model		VT-6607150 VT-61060			
	Maximum input power	80000W	96000W		
	Maximum DC voltage (V)	1100	1100		
	Starting voltage (V)	180	180		
	MPPT voltage range (V)	200-1000	200-1000		
DC side	Full load MPPT voltage range (V)	520-850	520-850		
	Number of MPPT channels	4	4		
	Maximum number of strings per MPPT	3/2/3/2	3/3/3/3		
	Maximum input current per MPPT (A)	39/26/39/26	39/39/39		
	Maximum short-circuit current of each MPPT (A)	48/32/48/32	48/48/48		
	Rated output power (W)	50000	60000		
	Rated output voltage (Vac)	230/400	230V/400		
	Rated output voltage frequency	50/60	50/60		
	Maximum output current (A)	79.7	95.6		
AC side	Short circuit current (A)	150	160		
	Output voltage frequency range	45~55,	′55~65		
	Power factor				
	Harmonic distortion	<3% (rated power)			
	cooling method Air-cooled				
	Maximum efficiency 98.70%		70%		
	European efficiency	98.6	60%		
	MPPT efficiency	99.6	90%		
	Protection level	P	66		
	Power consumption at night	<1	W		
	Security Level				
	Overvoltage protection level AC: III, PV: II				
	Inverter topology	non-isolated			
System	Pollution level	3			
	Operating environment temperature	-30°C~+60°C (automatic de	erating after exceeding 45°C)		
	Relative humidity	0~1	00%		
	Maximum allowable altitude (m)	≤2000, derating is require	ed after more than 2000m		
	show	LED/LCD (optional)			
	System language	English, Chinese	, German, Dutch		
	communication method	RS485 (standard); Ett	nernet, WiFi (optional)		
	DC terminal	MC4 DC wate	rproof terminal		
	Noise dB(A)	< <u></u>	55		
	Installation method	Wall-m	ounted		
Protection function	Input overvoltage protection, input o grid monitoring, islanding protection,	vercurrent protection, DC insulation monitoring, I short circuit protection and overheating protection	DC monitoring, ground fault current monitoring, n, etc.		



WEEE Number: 80133970

# **INSTRUCTION MANUAL** WIFI MODULE FOR SOLAR INVERTER



# INTRODUCTION

Thank you for selecting and buying V-TAC Product. V-TAC will serve you the best. Please read these instructions carefully & keep this user manual handy for future reference. If you have any another query, please contact our dealer or local vendor from whom you have purchased the product. They are trained and ready to serve you at the best.



# **User Manual QR CODE**

Please scan the QR code to access the manual in multiple languages.

# WARNING

- 1. Please make sure to turn off the power before starting the installation.
- 2. Installation must be performed by a gualified electrician.



This marking indicates that this product should not be disposed of with other household wastes.



Caution, risk of electric shock.







## NOTICE:

Please read this manual carefully before using products and keep it in the place where O&M providers can easily find.

Due to product upgrade and other factors, the content of this manual might change from time to time. Please take actual product as standard and get latest manual from www.vtacexports.com or sales. Unless otherwise agreed herein, this manual will only be used as guidance. Any statement, information or suggestion in this manual will not take any form of responsibility.

Without written permission, any content of this document (partly or entirely) cannot be extracted, copied or transmitted in any form by any company or individual.

## DOWNLOAD APP



SOI ARMAN Smart Energy Assistant Around you



SOLARMAN Business One-Stop O&M, After Service Management Software

IOS: Search "Solarman Smart" or "Solarman Business" in Apple Store. Android: Search "Solarman Smart" or "Solarman Business" in Google Play.

# **1. WIFI MODULE INSTALLATION**

Type 1

Step1: Assemble WIFI Module to the inverter communication interface as shown in the diagram.





# 2. WIFI MODULE STATUS

## Check Indicator light

Lights	Implication	Status Description(All lights are single green lights.)
• NET	Communication with router	<ol> <li>Light off: Connection to the router failed.</li> <li>On 1s/Off 1s(Slow flash): Connection to the router succeeded.</li> <li>Light keeps on: Connection to the server succeeded.</li> <li>On 100ms/Off 100ms(Fast flash): Distributing network fast.</li> </ol>
COM	Communication with inverter	<ol> <li>Light keeps on: WIFI Module connected to the inverter.</li> <li>Light off: Connection to the inverter failed.</li> <li>On 1s/Off 1s(Slow flash): Communicating with inverter.</li> </ol>
READY	WIFI Module running status	1.Light off: Running abnormally. 2.On 1s/Off 1s (Slow flash): Running normally. 3.On 100ms/Off 100ms(Fast flash): Restore factory settings.

The normal operation status of the WIFI Module, when router connected to the network normally:

1.Connection to the server succeeded: NET light keeps on after the WIFI Module powered on. 2.WIFI Module running normally: READY light flashes.

3.Connection to the inverter succeeded: COM light keeps on.

#### ABNORMAL STATE PROCESSING

If the data on platform is abnormal when the WIFI Module is running, please check the table below and according to the status of indicator lights to complete a simple troubleshooting. If it still can not be resolved or indicator lights status do not show in the table below, please contact Customer Support.

(Note: Please using the following table query after power-on for 2mins at least.)

NET	COM	READY			
• NET	СОМ	READY	Fault Description	Fault Cause	Solution
Any state	OFF	Slow flash	Communication with inverter abnormal	1.Connection betw- een WIFI Module and inverter loosen. 2.Inverter does not match with WIFI Module's communication rate.	1.Check the connection between WIFI Module and inverter. Remove the WIFI Module and install again. 2.Check inverter's communication rate to see if it matches with WIFI Module's. 3.Long press Reset button for 5s, reboot WIFI Module.
OFF	ON	Slow flash	Connection between logger and router abnormal	1.WIFI Module does not have a network. 2.Antenna abnormal 3.Router WiFi signal strength weak.	<ol> <li>Check if the wireless network configured.</li> <li>Check the antenna, if there is any damage or loose.</li> <li>Enhance router WiFi signal strength.</li> <li>Long press Reset button for 10s, reboot WIFI Module and networking again.</li> </ol>
Slow flash	ON	Slow flash	Connection between WIFI Module and router normal, connection between logger and remote server abnormal.	1.Router networking abnormal. 2.The server point WIFI of Module is modified. 3.Network limitation, server cannot be connected.	1.Check if the router has access to the network. 2.Check the router's setting, if the connection is limited. 3.Contact our customer service.
OFF	OFF	OFF	Power supply abnormal	1.Connection betw- een WIFI Module & inverter loosen or abnormal. 2.Inverter power - insufficient. 3.WIFI Module - abnormal.	<ol> <li>Check the connection, remove the WIFI Module and install again.</li> <li>Check inverter output power.</li> <li>Contact our customer service.</li> </ol>
Fast flash	Any state	Any state	SMARTLINK networking status	Normal	<ol> <li>1.Exit automatically after 5mins.</li> <li>2.Long press Reset button for 5s, reboot WIFI Module.</li> <li>3.Long press Reset button for 10s, restore factory settings.</li> </ol>
Any state	Any state	Fast flash	Restore factory settings	Normal	1.Exit automatically after 1mins. 2.Long press Reset button for 5s, reboot WIFI Module. 3.Long press Reset button for 10s, restore factory settings.

#### USAGE METHODS AND NOTICES FOR RESET BUTTON

Usage methods and key-press descriptions for Reset button



Key-press	Status Description	Light Status
Short press 1s	SMARTLINK rapid networking status.	NET light flashes fast for 100ms.
Long press 5s	Rebooting the WIFI Module.	All lights are extinguished immediately.
	Desetting the MITI Medule	1.All lights are extinguished after 4s.
Long press tos	Resetting the WIFI Module.	2.READY light flashes fast for 100ms.

#### NOTICES FOR RESET BUTTON



Notice: Do not remove waterproof plug.



#### USER MANUAL FOR SOLARMAN SMART APP

1.Registration Go to Solarman Smart App and register. Click "Register" and create your account here.



2.Create a Plant Click "Add Now" to create your plant. Please fill in plant basic info and other info here. 3.Add a Logger Method 1: Enter logger SN manually.

Method 2: Click the icon in the right and scan to enter logger SN You can find logger SN in the external packaging or on the logger body.



Go to "Plant Details"-"Device List", find the target SN and click "Networking".





Step 1:Confirm Wi-Fi Info Please make sure your phone has connected to the right WiFi network. And click "Start".

Notice: 5G WiFi is not supported .

Shi Kai     Image and the second of the second				
SN:2312423	10:14 AM			
Password  App_only Change network  App_only Change network	$\leftarrow$	SN:2312423	3	$\rightleftharpoons$
App_only     Change network     App_only     Change network     Start to configure eminder Pressente the signal strength of WI-Fil Is good During the configuration, same Android phones will	Password			
	App_only		Change ne	twork
.50 frequency band is not susported. Rease convect to 2.40 frequence band. Start to configure eminder Please make sure the signal strength of WI-FI is good. During the configuration, some Android phones will	£ *******			-
50 frequency band is not supported. Reade convect to 2.45 frequency band. Start to configure eminder Please make sure the signal strength of WI-FI is good. During the configuration, some Android phones will				
BG frequency band is not associated. Peake connect to 2-45 frequence band. Start to configure eminder 				
50 frequency band is not supported. Result connect to 2.45 frequence band. Start to configure aminder Please must be signal strength of WI-FI is good. During the configuration, some Android phones will				
But Industry and the Ale first assorted that the assorted that and the assorted that assorted that and the assorted that as a sorted that assorted that as a sorted that a				
Start to configure eminder Please make sure the signal strength of Wi-Fi is good During the configuration, some Android phones will	5G frequ Please co	uency band is not su nnect to 2.4G freque	pported. anci band.	
eminder . Please make sure the signal strength of WI-FI is good .During the configuration, some Android phones will	5	Start to configu	ıre	
. Please make sure the signal strength of Wi-Fi is good .During the configuration, some Android phones will	Reminder			
	1. Please make sur 2.During the confi	e the signal streng quration, some	gth of Wi-Fi Android pho	is good nes will
rompt that the current network is not available. Please	prompt that the cu	rrent network is i	not available	. Please

Step 2:Connect to AP network Click "Go to connect" and find the right "AP\_XXXXX" network (XXXXX Refers to logger SN).

If the password is required, you can find the password on the logger body. Go back to Solarman Smart App, after connecting to AP network.

Step 3: Auto Configuration Please wait for a while to complete the configuration. Then system will switch to the following page.

Click "Done" to check plant data. (Usually, the data will be updated in 10 mins)



If configuration failure occurs, please check the following reason and try it again.

- (1) Make sure WLAN is ON.
- (2) Make sure WiFi is normal.
- (3) Make sure wireless router does not implement the white-black list.
- (4) Remove the special characters in Wi-Fi network.
- (5) Shorten the distance between the phone and device.
- (6) Try to connect to other Wi-Fi.

Warning:

Please make sure the WIFI Module is working properly before you leave the site. If there is anything abnormal, please do not leave the site and contact customer service: support@v-tac. eu.