

User Manual

Solar Pump Inverter 550W-22000W



Table Of Contents

Information on this Manual.....	1
Validity.....	1
Scope.....	1
Target Group.....	1
Safety Instructions.....	1
Inspection.....	1
Installation.....	1
Operation.....	2
Maintenance.....	2
Symbols.....	2
Introduction.....	3
Features.....	3
Product Overview.....	4
INSTALLATION.....	5
Unpacking and Inspection.....	5
Mounting the Unit.....	5
Wiring Introduction.....	7
Terminal Introduction.....	7
Recommended Diameter of Wire.....	8
Assemble DC Connector.....	9
Wiring of Water Level Sensor.....	9
OPERATION.....	10
Display Panel.....	10
LCD Display Information.....	11
Parameters Setting.....	11
Work Mode Setting.....	11
Rated Parameters Setting for Pump.....	12
Manually Turn On/Off the System.....	13
Troubleshooting.....	15
Specifications.....	16

Information on this Manual

Validity

This manual is valid for the following devices:

- ▶ Three phase 380V solar pump inverter, 3KW~22KW

Scope

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations.

Target Group

This document is intended for qualified persons and end users. Tasks that do not require any particular qualification can also be performed by end users. Qualified persons must have the following skills:

- ▶ Knowledge of how a pump inverter works and is operated
- ▶ Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations
- ▶ Training in the installation and commissioning of electrical devices and installations
- ▶ Knowledge of the applicable standards and directives
- ▶ Knowledge of and compliance with this document and all safety information

Safety Instructions

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

Inspection



If missing components or damaged inverter is found after receiving, please do NOT install or operate it. Otherwise, it may cause human injury or equipment damage.

Installation



1. Before installation, please make sure if the voltage range of PV panel meets the requirement.
2. Check if all wires are firmly connected without short circuit. Otherwise, it will cause equipment damage.
3. Do NOT install this inverter under direct sunlight because high temperature may cause equipment damage.
4. Please install the inverter away from inflammable and explosive objectives. Please ensure no liquid can enter the inverter.
5. Please install the inverter on metal non-combustible surface.



1. **CAUTION!!** Only qualified personnel can install and operate this inverter.
2. To reduce risk of electric shock, disconnect power source before making wire connection. Otherwise, it may

cause electrical shock.

- To reduce risk of electric shock, NEVER touch any terminals on electric circuits.
- If connection cable between inverter and water pump is more than 50m, please be sure to install a three-phase AC reactor. Inductance value for each phase is about 1mH. Otherwise, water pump would be easily to be damaged.

Operation



- Only after wire connection is complete and put cover back to the inverter, it's Enter to do commissioning. Otherwise, it will cause electric shock
- If sunlight is sufficient but little water is pumped, maybe the wires on motor connection are reversely connected. Please reverse any two wires of them.
- When testing water pump, be sure to install water pump at appropriate water level. Never allow water pump in dry running. Otherwise, the inverter will activate protection.

Maintenance

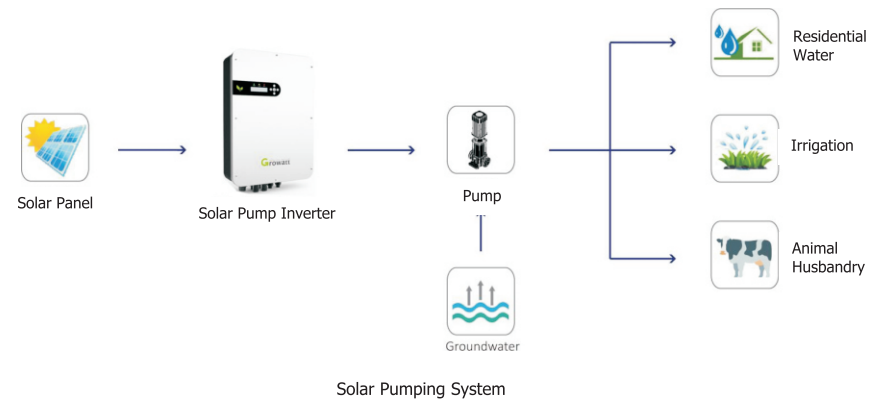


- Only qualified personnel can maintain, repair, inspect the inverter and replace any components.
- It may still contain energy after disconnecting power source within 5 minutes. Only service after the bus voltage is within safe range.

Symbols

	Grounding Wire of Equipment
	AC Value
	DC Value
	Phase
	Before operating inverter, please read the instruction.
	In order to avoid electric shock, break off machine with PV terminal and AC terminal for at least 5 minutes, then contact the wire of machine output terminal and input terminal
	Warning: when machine works, the temperature of metal shell may be very high.

Introduction



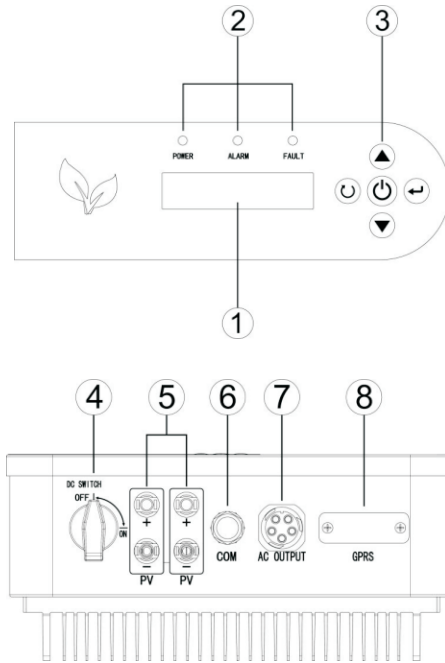
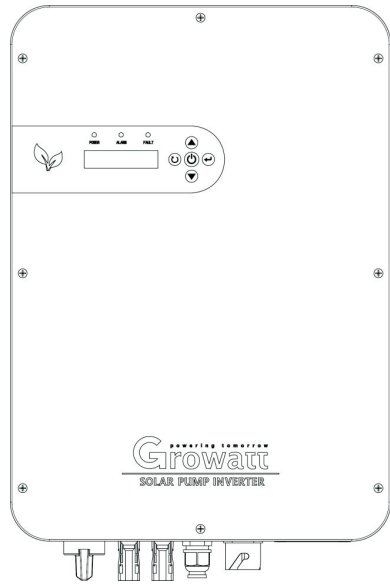
This is a solar pump inverter which allows power to be switched from the DC power obtained from solar panels to the AC power needed to control the pump.

This series solar pump inverters are built-in with MPPT solar charger to maximize solar power. The inverter is suitable for submersible pumps, ground pumps, swimming pool pumps and other pumps using three phase asynchronous motors.

Features

- ▶ Rated power 3KW to 22KW
- ▶ Inbuilt MPPT solar controller
- ▶ IP65 protection level
- ▶ Built-in full protection and self-diagnosis
- ▶ Soft start function
- ▶ Comprehensive LCD and LEDs display real-time system status
- ▶ Remote monitoring through RS-232/CAN/GPRS (optional)

Product Overview



1. LCD display
2. LED indicators
3. Function buttons
4. DC switch
5. PV input
6. Water level sensor port (optional)
7. AC output
8. GPRS communication port

INSTALLATION

Unpacking and Inspection

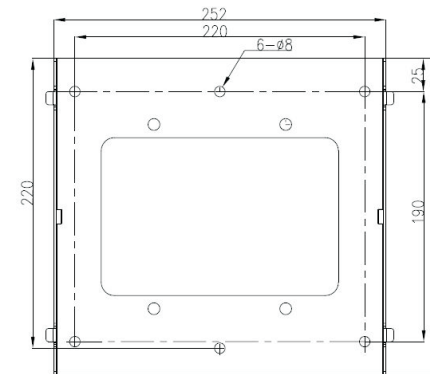
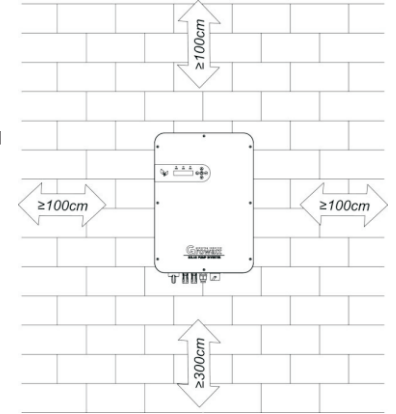
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- ☑ The unit x 1
- ☑ User manual x 1

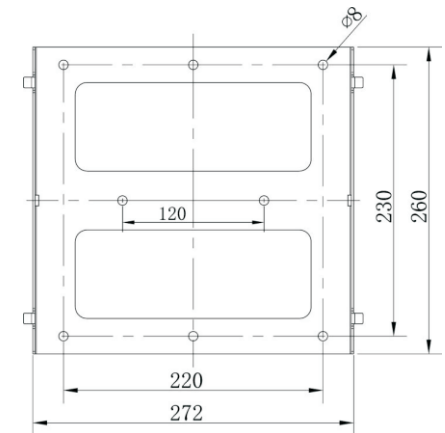
Mounting the Unit

Consider the following points before selecting where to install:

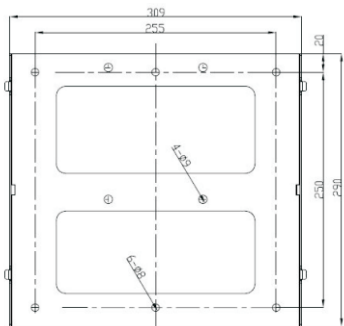
- ⚠ Do not mount the inverter on flammable construction materials.
- ⚠ Mount on a solid metal surface.
- ⚠ Avoid direct sunlight. Be sure the environment is shady and cool.
- ⚠ Be sure to install the inverter into a box with waterproof and dustproof.
- ⚠ Install this inverter at eye level in order to allow the LCD display to be read at all times.
- ⚠ The recommended installation position is to be adhered to the wall vertically.
- ⚠ Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



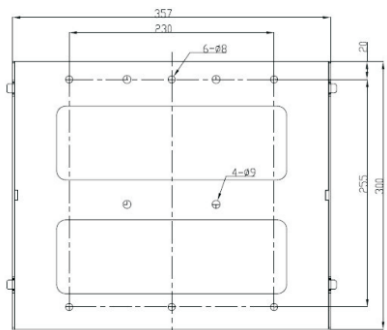
3 phase 220V 550w-2.2kw



3 phase 380V 3kw-5.5kw



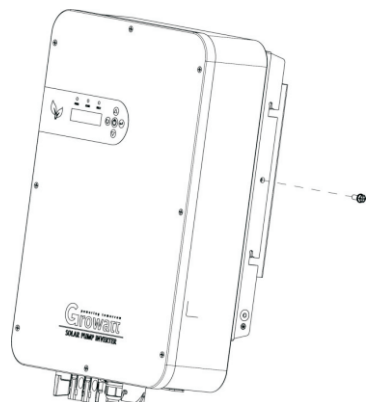
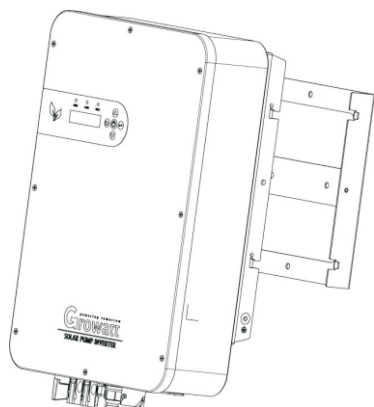
3 phase 380V 7.5kw-13kw



3 phase 380V 15kw-22kw

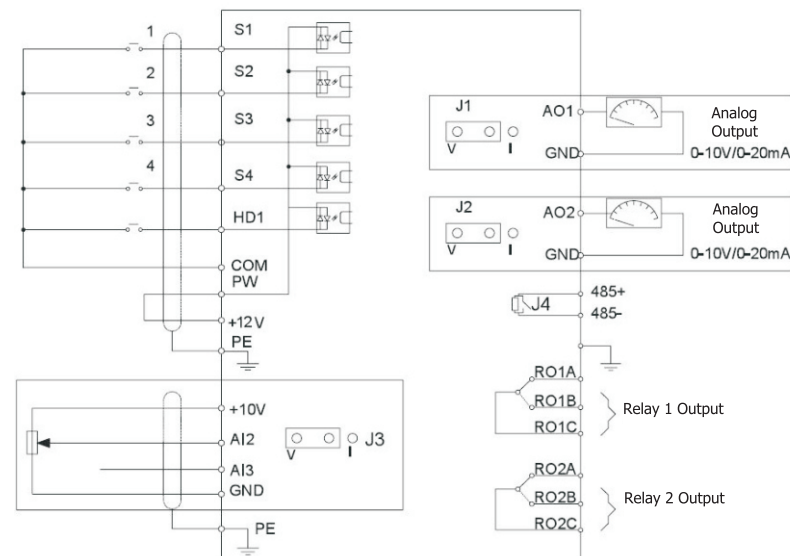
 SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

Install Safety Nut



Wiring Introduction

There is DC switch, water level sensor connection terminal, GPRS (optional), and AC output terminal.



Terminal Introduction

Socket	Terminal Introduction	Wiring Introduction
DC Input	PV+	Connect with the positive pole of solar array
	PV-	Connect with the negative pole of solar array
AC Output	PE	Connect with protective ground wire
	U	Connect with motor U phase
	V	Connect with motor V phase
Water Level Sensor Input (Switch Value)	W	Connect with motor W phase
	+12V	Power supply of water level sensor
	COM	Common signal grounding
	S1	Auto power signal (factory settings have been set)
	S2	Water-full signal of water tower (switching value)
	S4	Water shortage signal of water tower (switching value)

Water Level Sensor Input (Analog Quantity)	+10V	Power supply of water level sensor
	GND	Common signal ground wire
	AI2	Water-full signal of water tower (analog quantity)
	AI3	Water shortage signal of water tower (analog quantity)
	RS485+	485 communication
	RS485-	485 communication
	CANAH	CAN communication
CANAL	CAN communication	

⚠ Warning: The places of input sockets of DC positive pole and negative pole of different models are different.

⚠ Warning: The signal marshalling sequence of AC output sockets of different models are different.

⚠ Warning: To make sure the system works normally, please use proper size of wires.

Recommended Diameter of Wire

Model	Recommended output current(A)	Output voltage(V)	length≤ 30m	length≤ 60m	length≤ 90m	length≤ 120m	length≤ 150m	length≤ 180m	length≤ 210m
SPI 550T2	3	1HP 230V	0.75	1	1.5	2.5	2.5	2.5	4
SPI 750T2	5	3HP 220V	0.75	1.5	2.5	2.5	4	4	4
SPI 1100T2	6	3HP 220V	1	1.5	2.5	4	4	4	6
SPI 1500T2	7	3HP 220V	1	2.5	2.5	4	4	6	6
SPI 2200T2	11	3HP 220V	1.5	2.5	2.5	6	6	6	6
SPI 3000T3	8	3HP 380V	1.5	2.5	2.5	6	6	6	6
SPI 4000T3	10	3HP 380V	1.5	2.5	2.5	6	6	6	6
SPI 5500T3	13	3HP 380V	2.5	2.5	4	6	6	6	6
SPI 7500T3	18	3HP 380V	2.5	2.5	4	6	6	10	10
SPI 9200T3	21	3HP 380V	4	4	4	6	10	10	10
SPI 11000T3	24	3HP 380V	4	4	6	10	10	10	16
SPI 13000T3	28	3HP 380V	6	6	6	10	10	10	10
SPI 15000T3	30	3HP 380V	6	6	6	10	10	16	16
SPI 18000T3	39	3HP 380V	6	6	10	10	16	16	25
SPI 22000T3	45	3HP 380V	10	10	10	16	16	25	25

Units: mm²

👉 Notice: The environment temperature for the above recommended wire dimension should ≤50°C.

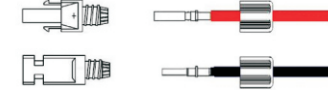
👉 Notice: Large-power wall-mounted model uses multiple-channel DC input. The dimension of DC wire of each channel shall be selected according to the above table.

Assemble DC Connector

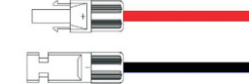
Strip the cable 6-8mm, then connect the bare wire core into core tube of connector.



Crimp contact barrel by using a hex crimping die. Put the contact barrel with striped cable in the corresponding crimping notch and crimp the contact. Insert the core tube into slot of connection until hear the sound indicating fit in place.

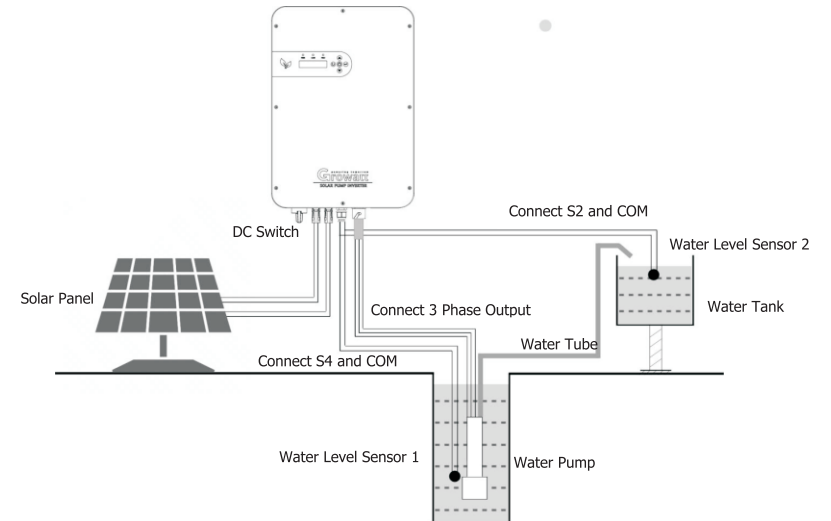


Tighten the nuts to finish the wiring.



⚠ Warning: Risk of electric shock! Before shifting solar panel, disconnect the pump inverter AC and DC. Besides, allow 5-minute internal capacitance discharging.

Wiring of Water Level Sensor



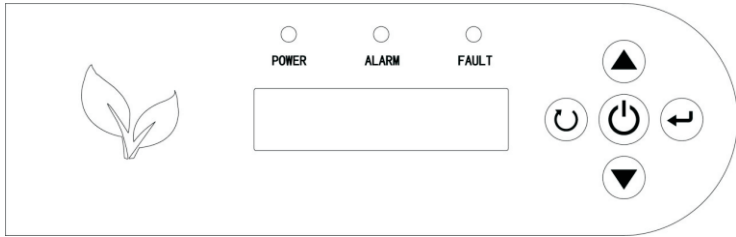
⚠ Notice: connect water level sensor 1 and detect water shortage. Respectively connect two signal lines of sensor with S4 and COM of I/O circuit board. When water level sensor 1 detects that the water level of well is lower than the level set by sensor, the pump inverter will delay for 60s, then turn off output protection pump. The water level recovers. Wait for 600s, then the pump inverter re-works normally.

⚠ Notice: connect water level sensor 2 to detect whether water is full. Connect two signal lines of sensor with S2 and COM. When water level sensor 2 detects that the water level of water tank exceeds the level set by sensor, the pump inverter delays for 60s and turns off output; when water level is lower than set level, wait for 120s, then pump inverter re-starts to work normally.

OPERATION

Display Panel

Solar pump inverter uses LCD operation panel. The operation panel is shown in the figure, including 3 LED lights, LCD display and 5 keys.



Indicator and Key	Name	Function Introduction	
POWER	System running indicator	Green	LED on, inverter is running
ALARM	Warning indicator	Yellow	LED on, warning or in terminal mode
FAULT	Failure indicator	Red	LED on, system failure
	Operation / Stop Key	1. Press for a short time, then the inverter starts control; 2. Press for 2s, then inverter stops control.	
	Confirm / Programming Key	1. Press for a short time to enter programming mode. After altering parameter, "press for a short time" to confirm the alteration 2. Press for 2s to enter the programming menu.	
	Increment Key	1. When control parameter displays state, increase parameter number or parameter value; 2. When operation displays data state, according to operation mode, increase output frequency or display current operation data.	
	Decrement Key	1. When control parameter displays state, press for a short time to decrease parameter number or parameter value. 2. When operation shows data state, according to operation mode, decrease output frequency or display current operation data.	
	Return Key	Return the initial display	

LCD Display Information

The LCD display information includes operation data, control parameters, and historical parameters. The information on the display will be switched in turns by pressing UP/DOWN key. The selectable information will be switched as below.





Description	Display
Output frequency of the inverter	Running Frequency=50.00Hz Freq Run 50.00Hz
Set frequency of the inverter	Set Frequency=50.00Hz Freq Set 50.00Hz
Input voltage of the inverter	Input PV voltage=548V PV Volt. 548 V
Output voltage of the inverter	Output voltage=379V Output Volt. 379 V
Output current of the inverter	Output current=0.7A Output Curr. 0.7 A
The relative value of rated power	Power capacity=79.1% Capacity +79.1%

Parameters Setting

Work Mode Setting

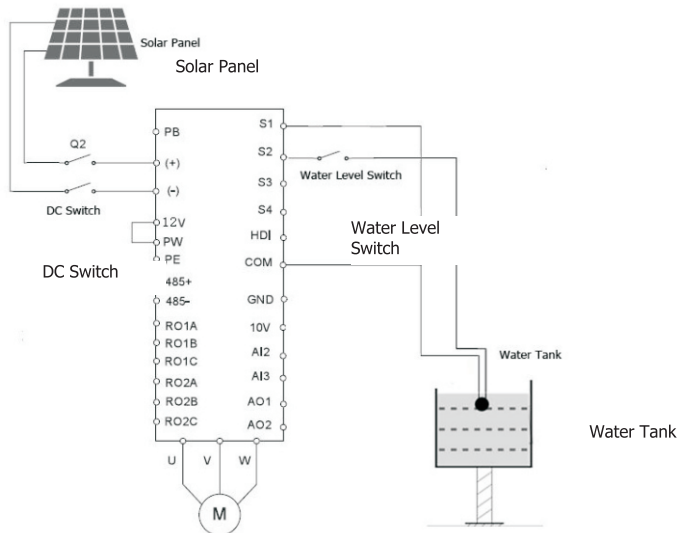
The inverter includes three work modes: manual work mode, fully-automatic terminal work mode, GPRS work mode (optional). The default mode is fully-automatic terminal work mode.

1. Manual work mode: menu P00. Setting P00.01=0. Press key to operate. Press key for 2s, then the inverter stop working.
2. Fully-automatic terminal work mode: menu P00. Setting P00.01=1. When sunlight is strong enough, the inverter will automatically trace maximum power point. Under such mode, refer to inverter's operation parameter and DC switch to turn on/off the machine.
3. GPRS work mode (optional): menu P00. Setting P00.01=2. Under this mode, combined with cellphone number, send messages to set startup, shutdown, parameter inquiry, etc.

Description	Display
Enter the main parameter modification interface for long press 2s for Enter key 	P00 parameter group, Work Mode group Work Mode P00
Press Enter key  , to enter the sub menu	P00.00 sub parameter group Work Mode P00.00
Press UP key  , to the P00.01	P00.01 operation code channel Work Mode P00.01
Press Enter key  , to enter the P00.01 setting Edited code value of the work mode	P00.01, value =1 (Default), terminal work mode Work Mode 1
	P00.01, value =0, manual work mode Work Mode 0
	P00.01, value =2, GPRS work mode Work Mode 2









Rated Parameters Setting for Pump

Before setting the parameters, please make sure all the wiring is correct.




- Setting P00.01=0. Command code channel is keyboard manual mode instruction.
- Set water pump nameplate parameters: P02.01 motor rated power value; P02.02 motor rated power value; P02.04 motor rated voltage value; P02.05 motor rated current value.
- After finishing parameter setting of water pump, set P00.01=1. The operation code channel is altered as original automatic mode instruction.

See as the following figures. (e.g. 7.5KW inverter drives 5.5KW water pump)

Description	Display
Enter the main parameter modification interface for long press 2s on Enter key 	P00 parameter group, Work Mode group Work Mode P00
Press the UP key  , to P02 group	P02 parameter group, Rated Parameters group Rating Par. P02
Press Enter key  , to enter the P02.01	P02.01 code channel, Rated Power setting Rating Pwr. P02.01
Press Enter key  , to enter the P02.01 setting Edited value of the rated power	Rated power=5.5KW Rating Pwr. 5.5kW
Press Enter key  , turn to P02.02	P02.02 code channel, Rated Frequency setting Rating Freq P02.02
Press Enter key  , to enter the P02.02 setting Edited value of the rated frequency	Rated Frequency=50Hz Rating Freq 50.00Hz
Press UP key  , turn to P02.05	P02.05 code channel, Rated Current setting Rating Curr P02.05
Press Enter key  , to enter the P02.05 setting Edited value of the rated current	Rated Current=11.2A Rating Curr 11.2A

After finishing all parameter settings, turn off DC switch. After display screen is OFF for 5 minutes, turn on AC output. Then turn on DC switch. Wait for 60s, the machine will operate automatically.

Manually Turn On/Off the System

Description	Display
After choosing Manual Work Mode, long press the ON/OFF key  for 2 seconds	Power off

 Warning: Do not change parameters at random, otherwise the system might not work normally.

Function Parameters

SN	Name	Scope	Introduction	Default Value
P00.01	Operation code channel	0~2	0: keyboard operation code channel (LED is off) 1: terminal operation code channel (LED flashes) 2: communication operation code channel (LED is solid on)	1
P02.01	Rated power of asynchronous motor	0.1 ~ 3000.0	0.1 ~ 3000.0kW	Model confirmation
P02.02	Rated frequency of asynchronous motor	0.01 ~ P00.03	0.01 ~ P00.03	50.00Hz
P02.04	Rated voltage of asynchronous motor	0 ~ 1200	0 ~ 1200V	Model confirmation
P02.05	Rated current of asynchronous motor	0.8 ~ 6000	0.8 ~ 6000A	Model confirmation

Troubleshooting

The inverter has complete protection. When a failure occurs, the inverter will take protective measures. The general protection is to stop the motor from running and forbid it to restart within a certain period.

Code	Description	Possible Reasons	Countermeasures
Power off	No failure	\	\
Inc over Volt Dec over Volt Con over Volt	Overvoltage	Input voltage is too high	Check the voltage of solar array
Vbus low	Undervoltage	Input voltage is too low; Illumination intensity is too weak	Check the voltage of solar array
In cover Current Dec over Current con over Current	Overcurrent	The load of pump is too large; The voltage of solar array is too low; The motor wiring is too long	Replace for a smaller pump; Check voltage of solar array; Shorten the wiring between inverter and motor
Overload Tel	Water pump is overload	Load is too large	Decrease maximum operation frequency
Overload VVVF	Inverter is overload	The inverter load is too large	Decrease power grade of water pump
IGBT shortcut	Module overcurrent	Output short circuit or grounding module damage	Check the wiring Get after-sells support
Inv Overtemp	Module is over-temperature	Air flue is blocked Environment temperature is too high	Clean air flue or improve ventilation
Scarce Phase Out	Output default phase	Equipment or circuit damage	Get after-sells support
Shortcut GND 1	Grounding short circuit	The output line may be connected with ground	Check the wiring
Curr Test Fault	Current detection failure	\	Get after-sells support
Lack load	Water pump conducts "dry-operation"	Water pump's connection wires are all open circuit. Water pump does not match inverter	Check water level. Check whether the water pump wiring condition and water pump power meet the requirements of inverter capacity
No Water	Water shortage	Water shortage warning	When water is provided, it can recover automatically
Water Full	Water full	Water full warning	When water level decreases, it can recover automatically
Com Fault	Communication failure	Device or circuit damage	Reset Get after-sells support



Warning: Try to find out the failure reason before your try reset. If it can't reset or suffers failure again after reset, please try find out the reason first. Continuously resetting could damage the inverter.

Specifications

Model	Max. DC input voltage (Vdc)	Recommended MPP voltage (Vdc)	Start voltage (Vdc)	Rated output power (W)	Max.AC output current (A)	Output frequency (Hz)	Rated output voltage (Vac)	Dimension (mm)	Weight (kg)
SPI 550T2	450	100-400	80	550	3	0-50/60	3PH 220V	405 x 297 x 147	6
SPI 750T2	450	150-400	120	750	5	0-50/60	3PH 220V	405 x 297 x 147	9
SPI 1100T2	450	150-400	120	1100	6	0-50/60	3PH 220V	405 x 297 x 147	9
SPI 1500T2	450	200-400	120	1500	7	0-50/60	3PH 220V	405 x 297 x 147	11
SPI 2200T2	450	280-400	200	2200	11	0-50/60	3PH 220V	405 x 297 x 147	11
SPI 3000T3	900	500-680	250	3000	8	0-50/60	3PH 380V	480 x 340 x 155	6
SPI 4000T3	900	500-680	250	4000	10	0-50/60	3PH 380V	480 x 340 x 155	9
SPI 5500T3	900	500-680	250	5500	13	0-50/60	3PH 380V	480 x 340 x 155	9
SPI 7500T3	900	500-680	250	7500	18	0-50/60	3PH 380V	563 x 346 x 148	11
SPI 9200T3	900	500-680	250	9200	21	0-50/60	3PH 380V	563 x 346 x 148	11
SPI 11000T3	900	500-680	250	11000	24	0-50/60	3PH 380V	563 x 346 x 148	15
SPI 13000T3	900	500-680	250	13000	28	0-50/60	3PH 380V	533 x 405 x 190	15
SPI 15000T3	900	500-680	250	15000	30	0-50/60	3PH 380V	533 x 405 x 190	16
SPI 18000T3	900	500-680	250	18500	39	0-50/60	3PH 380V	533 x 405 x 190	16
SPI 22000T3	900	500-680	250	22000	45	0-50/60	3PH 380V	533 x 405 x 190	16