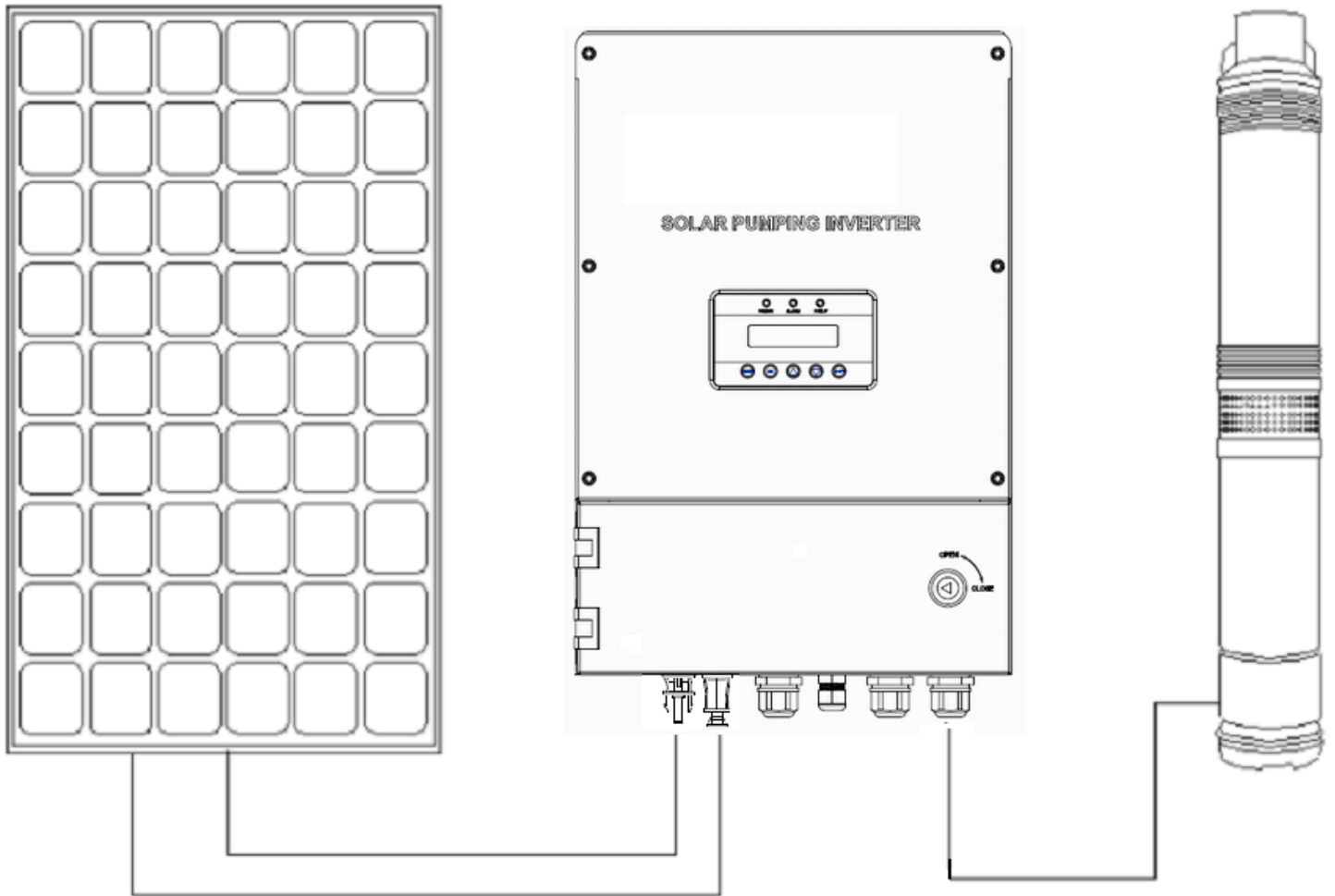


Solar Pumping Inverter

User's Manual



Preface

Thank you very much for using AQUAFLOW Series Solar Pumping Inverter.

In order to give full play to the product performance and guarantee the safety of user and equipment, before installation and use, please carefully read the manual.

In order to facilitate daily inspection and maintenance of inverter and understand abnormal reason and solutions, please keep the instruction properly.

If you have any questions or special requirements during use, please contact with our company's product dealer or directly contact with our company's technical service center.








If the manual contents change, we may not offer notice.

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Precautions


The safe operation of the product is subject to correct transportation, installation, operation, and maintenance. Before conducting these tasks, please pay attention to relevant safety instructions. The warnings related to safety in the manual are listed as follows:

	<p>Grounding Wire of Equipment</p>
	<p>AC Value</p>
	<p>DC Value</p>
	<p>Phase</p>
	<p>Before operating inverter, please read the instruction.</p>
 <p>5minutes</p>	<p>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</p>
	<p>Warning: when machine works, the temperature of metal shell may be very high.</p>

◆ Procurement Inspection

 Warning
<p>1. If the inverter is found to suffer damage or lack in component and part, do not install it, or else it may cause accident!</p>

◆ Installation

 Warning
<p>1. In order to guarantee good effect of convection cooling, the inverter shall be installed vertically. Keep at least 10cm space between upward side and downward side.</p>

2. Try to install it in the indoor place with ventilation opening or air interchanger. It is forbidden to install it directly under sunshine.
3. During installation, do not discard residue of drill hole into inverter cooling fan or fan, which may affect heat dissipation.

◆ Wiring



Danger

1. The wiring shall be conducted by qualified electric technician, or it may cause electric shock or fire disaster.
2. Before wiring, please confirm that the input power has been cut off, or else it may cause electric shock or fire disaster.
3. The grounding terminal must be grounded reliably, or else the inverter shell may have electricity.
4. The solar array, motor load, and inverter model selection shall be reasonable, or else it may damage equipment.



Warning

1. Please use specified moment of force to tighten terminal, or else it may cause fire disaster.
2. Do not connect capacitance or phase advance LC/RC noise filter in the output end of inverter. When the distance between inverter and motor load is over 100m, it is advised to use output reactor.

◆ Operation



Danger

1. Power on after confirming that the wiring is correct, or it may damage inverter or fire disaster.
2. During electricity, do not change wiring, or else it may cause electric shock.

**Warning**

1. Before the first operation, please adjust some control parameters according to operation instruction. Do not alter the control parameters of inverter at random, or else it may damage the equipment.
2. During operation, the temperature of radiator is very high. Do not touch the radiator, or else it may scald you.
3. When height above sea level exceeds 1000m, the inverter shall be used under rated power. If the height increases by 1500m, the output current shall decrease by 10%.

◆ Miscellaneous**Danger**

1. Assign qualified electric technician for maintenance and inspection.
2. During power-up state, do not remove the inverter. After outage, wait for 5 minutes at least, then conduct maintenance and inspection, so as to avoid that the residual voltage on electrolytic capacitor of major loop may cause damage to people.
3. It is forbidden to transform the inverter without authorization, or else it may damage personnel or equipment.
4. When handling scrapped inverter, please dispose the inverter as industrial waste. The inner electrolytic capacitor may explode during burning. Some components and parts may generate hazardous and harmful gas during combustion.

Chapter I Product Introduction

1.1 Introduction to Solar Pumping System

Solar Pumping System is widely applied in domestic water, agricultural irrigation, forestry watering, desert control, grassland animal husbandry, island water supply, water treatment project, etc. During recent years with the enhancement of new energy utilization, solar pumping system is widely applied in the landscape and water spray system of municipal works, urban square, garden sightseeing, tourist resort, hotel, and residential community. The system consists of solar cell array, pumping inverter, and water pump (figure 1-1). Based on the design philosophy of saving water first, the system omits energy storing device such as accumulator.

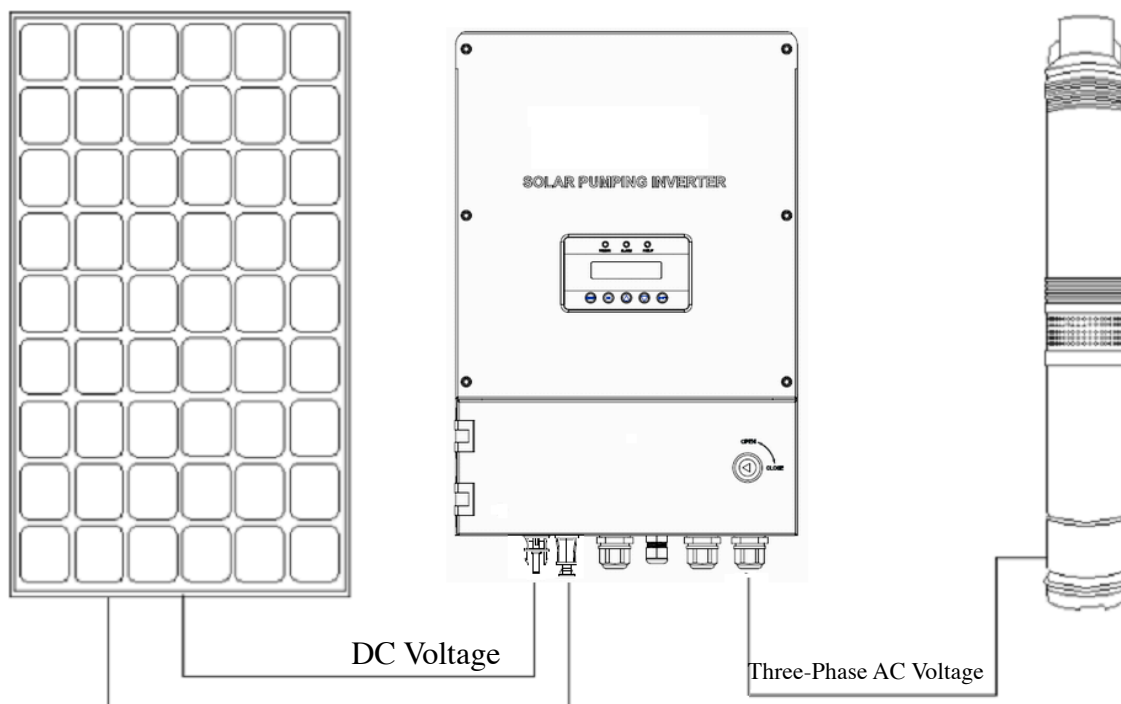


Figure 1-1 Structure of Solar Pumping System

The solar cell array is made from the series connection and parallel connection of several solar cell modules, which absorb solar radiation energy and transform it into electric energy, so as to supply electric power for the whole system. The pumping inverter controls and regulates the operation of the system, transforms the direct current of solar cell array into alternating current to drive water pump. In addition, according to the change of sunlight intensity, regulate output frequency timely, to realize MPPT (Maximum Power Point Tracking). The water pump is driven by three-phase AC motor. It pumps water from deep well, river, and lake, then inject water into water storage tank/pool, or directly connect with irrigation system or fountain system, etc. According to actual requirements of system and installation, different types of water pumps such as centrifugal pump, axial flow pump, mixed-flow pump, or deep-well pump can be used.

1.2 Product Characteristics

On the basis of many-year research, development, and experiment, the pumping inverter (Figure 1-2) independently developed and produced by our company has the following advantages:

- ◆ Use independently-developed dynamic VI MPPT (Maximum Power Point Tracking) control method. The response speed is fast. Operation is stable and reliable. It solves the following problems: tracking effect is poor when sunlight intensity rapidly; operation is not stable; water hammer damage.
- ◆ All digital control. It has complete automatic operation, data storage, and complete protection functions.
- ◆ AQUAFLOW Solar Pumping Inverter is specially designed for solar water pump. The inner structure is more reasonable and professional.
- ◆ All key parts used in AQUAFLOW solar pumping inverter are made by international famous brands. The quality is reliable, service life is long, and quality assurance period is long.

Component and Part	Manufacturer	Country
IGBT Module	Infineon	Germany
Electrolytic Capacitor	NCC	Japan
EMI Filter	VAC	Germany
DSP Control Chip	TI	America
PV Fuse	BUSSMAN	America

- ◆ The shell of AQUAFLOW solar pumping inverter is thick. The design process is improved through abrasive tool test for many times. The appearance is elegant and exquisite, model is compact, and weight is proper.
- ◆ AQUAFLOW solar pumping inverter integrates combiner box. It includes DC switch, lightning arrester, fuse, and optional components. It greatly simplifies and facilitates equipment installation and maintenance, but also effectively protects the equipment.
- ◆ Multiple communication interfaces such as RS485/CAN/GPRS(optional), etc. User can check or control the running status and running mode of the system in a remote place.
- ◆ The design of AQUAFLOW solar pumping inverter selects electric supply or diesel generator as standby inverter power supply, so as to meet the comprehensive requirements of water supply.
- ◆ AQUAFLOW solar pumping inverter has complete operation protection mechanisms, including output short circuit protection, IGBT module overcurrent protection, acceleration/deceleration/constant speed overcurrent protection, acceleration/deceleration/constant speed overvoltage protection, input

overvoltage/undervoltage protection, motor overload protection, inverter overload protection, output side phase loss protection, inverter module overheat protection, grounding short circuit protection, and underload (anti-dry pumping) protection.

- ◆ The main circuit uses power module (PIM), and the reliability is higher.
- ◆ The small-power model uses completely-new aluminum shell, LCD display operation panel, and directly-insert connection terminal. The appearance is beautiful. The heat dissipation effect and protective properties are good.
- ◆ Upper and lower water level detection and control circuit are optional.
- ◆ Protection grade IP65 (rated power is less than 22kW); temperature of service environment: -20 ~ +60°C.

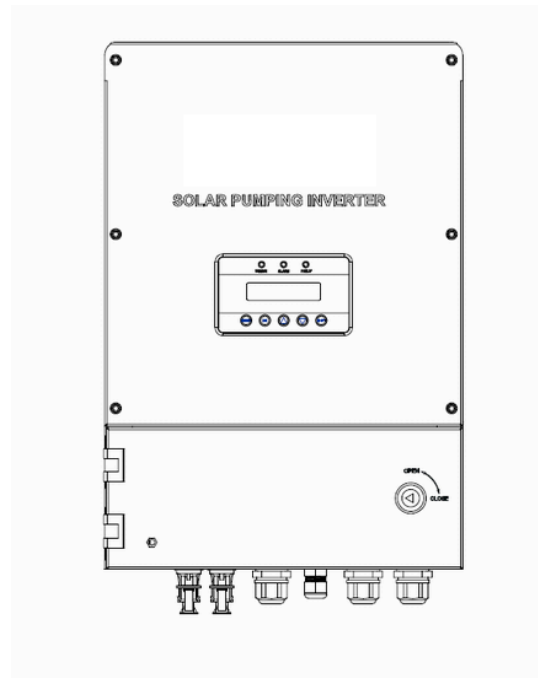
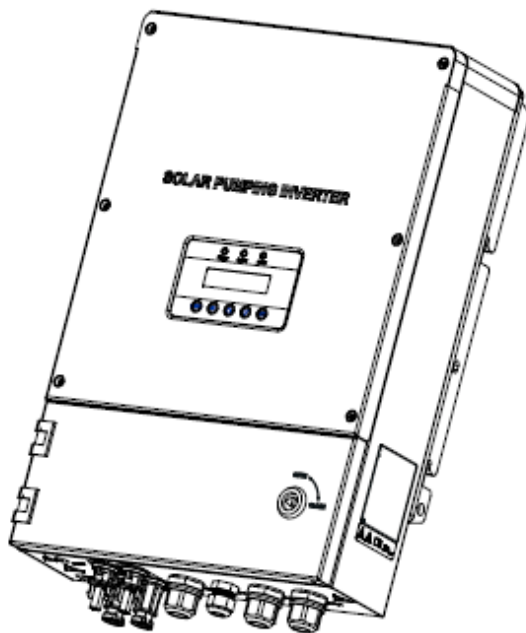


Figure 1-2 AQUAFLOW Series Pumping Inverter

1.3 Inverter Specification

1.3.1 Introduction to Nameplate and Model

The product nameplate is located at the right lower part of inverter. The nameplate includes important information such as product series, voltage, power grade, software version, and hardware version. Such information provides important basis for product application, maintenance, and after-sales service.

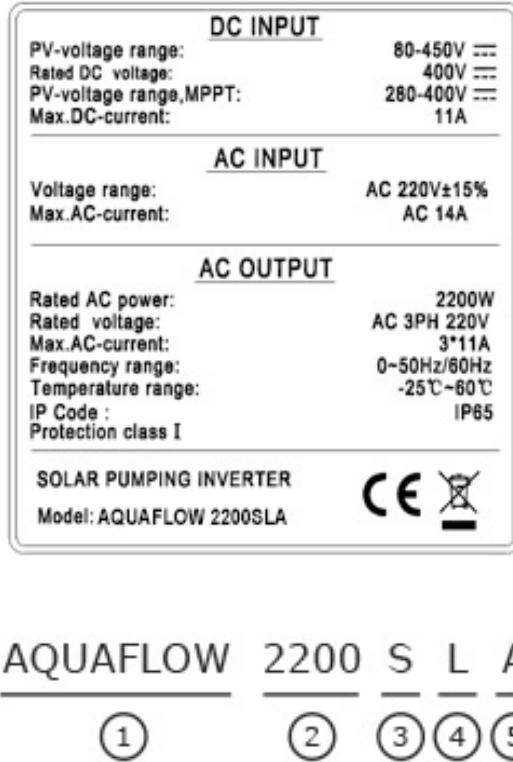


Figure 1-3 Introduction to Product Nameplate and Model

Identification	Introduction
1	Product Series
2	Rated Power (W) of Motor
3	Output Voltage (L: 220V None:380V)
4	A: with electric supply function None: without electric supply function



Warning: do not rip out product nameplate label.

1.3.2 Product Specification and Technical Index

Model	Max. DC input voltage (Vdc)	Recommen ded MPP voltage (Vdc)	Start voltage (Vdc)	Rated output power (W)	Max.AC output current(A)	Output frequency (Hz)	Rated output voltage (Vac)
AQUAFLOW 550-L	450	100-400	80	550	3	0-50/60	3PH 220V
AQUAFLOW 750-L	450	150-400	120	750	5	0-50/60	3PH 220V
AQUAFLOW 1100-L	450	150-400	120	1100	6	0-50/60	3PH 220V
AQUAFLOW 1500-L	450	200-400	120	1500	7	0-50/60	3PH 220V
AQUAFLOW 2200-L	450	280-400	200	2200	11	0-50/60	3PH 220V
AQUAFLOW 550-LA	450	100-400	80	550	3	0-50/60	3PH 220V
AQUAFLOW 750-LA	450	150-400	120	750	5	0-50/60	3PH 220V
AQUAFLOW 1100-LA	450	150-400	120	1100	6	0-50/60	3PH 220V
AQUAFLOW 1500-LA	450	200-400	120	1500	7	0-50/60	3PH 220V
AQUAFLOW 2200-LA	450	280-400	200	2200	11	0-50/60	3PH 220V
AQUAFLOW 3000	900	500-680	250	3000	8	0-50/60	3PH 380V

AQUAFLOW 4000	900	500-680	250	4000	10	0-50/60	3PH 380V
AQUAFLOW 5500	900	500-680	250	5500	13	0-50/60	3PH 380V
AQUAFLOW 7500	900	500-680	250	7500	18	0-50/60	3PH 380V
AQUAFLOW 9200	900	500-680	250	9200	21	0-50/60	3PH 380V
AQUAFLOW 11K	900	500-680	250	11000	24	0-50/60	3PH 380V
AQUAFLOW 13K	900	500-680	250	13000	28	0-50/60	3PH 380V
AQUAFLOW 15K	900	500-680	250	15000	30	0-50/60	3PH 380V
AQUAFLOW 18K5	900	500-680	250	18500	39	0-50/60	3PH 380V
AQUAFLOW 22K	900	500-680	250	22000	45	0-50/60	3PH 380V
AQUAFLOW 3000-A	900	500-680	250	3000	8	0-50/60	3PH 380V
AQUAFLOW 4000-A	900	500-680	250	4000	10	0-50/60	3PH 380V
AQUAFLOW 5500-A	900	500-680	250	5500	13	0-50/60	3PH 380V
AQUAFLOW 7500-A	900	500-680	250	7500	18	0-50/60	3PH 380V
AQUAFLOW 9200-A	900	500-680	250	9200	21	0-50/60	3PH 380V
AQUAFLOW	900	500-680	250	11000	24	0-50/60	3PH 380V

11K-A							
AQUAFLOW 13K-A	900	500-680	250	13000	28	0-50/60	3PH 380V
AQUAFLOW 15K-A	900	500-680	250	15000	30	0-50/60	3PH 380V
AQUAFLOW 18K5-A	900	500-680	250	18500	39	0-50/60	3PH 380V
AQUAFLOW 22K-A	900	500-680	250	22000	45	0-50/60	3PH 380V



Warning: please select appropriate model according to solar cell array and motor load.



Warning: The input power in the above table refers to multi-channel total input power. The maximum input DC current of each group shall not exceed 15A.

Chapter II Installation and Wiring

2.1 Procurement Inspection

Our company has strict quality assurance system in aspects of product manufacturing, packaging, etc. In case of abnormal condition, please contact with our company’s product dealer, or contact with our company’s technical service center. We will provide you with solution as soon as possible. When you get the products, please confirm the following items:

Inspection Item	Inspection Method
Whether it accords with ordered products	Inspect nameplate of product
Whether it is damaged or falls off	Check the overall appearance
Whether host computer and parts are complete	Inspect according to product checklist
Whether tightening parts such as bolt are loosened	When necessary, use screwdriver for inspection

2.2 Dimension and Weight

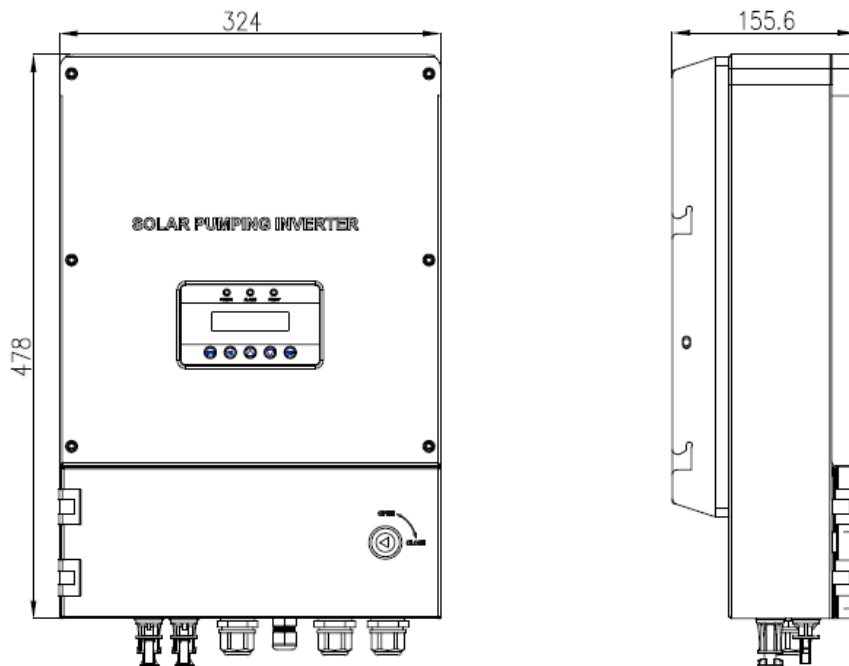


Figure 2-1 Product Appearance and Installation Dimension

Product Specification Parameter:

Model	Weight (Kg)	Appearance and installation dimension (mm)		
		L	W	H
AQUAFLOW 550-L	5	405	297	147
AQUAFLOW 750-L	8	405	297	147
AQUAFLOW 1100-L	8	405	297	147
AQUAFLOW 1500-L	10	405	297	147
AQUAFLOW 2200-L	10	405	297	147
AQUAFLOW 550-LA	5	405	297	147
AQUAFLOW 750-LA	8	405	297	147
AQUAFLOW 1100-LA	8	405	297	147
AQUAFLOW 1500-LA	10	405	297	147
AQUAFLOW 2200-LA	10	405	297	147
AQUAFLOW 3000	14	478	325	155
AQUAFLOW 4000	14	478	325	155
AQUAFLOW 5500	15	478	325	155
AQUAFLOW 7500	15	563	346	148
AQUAFLOW 9200	15	563	346	148
AQUAFLOW 11K	15	563	346	148
AQUAFLOW 13K	16	533	405	190
AQUAFLOW 15K	16	533	405	190
AQUAFLOW 18K5	22	533	405	190
AQUAFLOW 22K	22	533	405	190
AQUAFLOW 3000-A	14	478	325	155
AQUAFLOW 4000-A	14	478	325	155
AQUAFLOW 5500-A	15	478	325	155
AQUAFLOW 7500-A	15	563	346	148
AQUAFLOW 9200-A	15	563	346	148
AQUAFLOW 11K-A	15	563	346	148
AQUAFLOW 13K-A	16	533	405	190
AQUAFLOW 15K-A	16	533	405	190
AQUAFLOW 18K5-A	22	533	405	190
AQUAFLOW 22K-A	22	533	405	190



Warning: most models of AQUAFLOW series are hanging installation. Guarantee that the installation backboard can bear the weight of inverter.

2.3 Installation Diagram

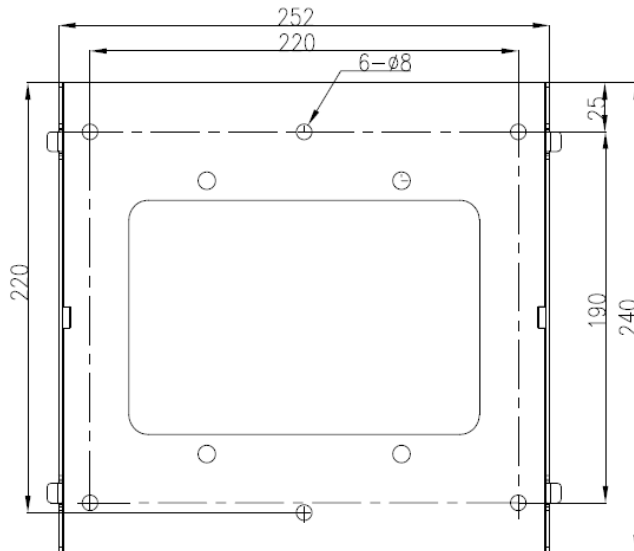


Figure 2-2 Installation Dimension Diagram of AQUAFLOW 550 to 2200

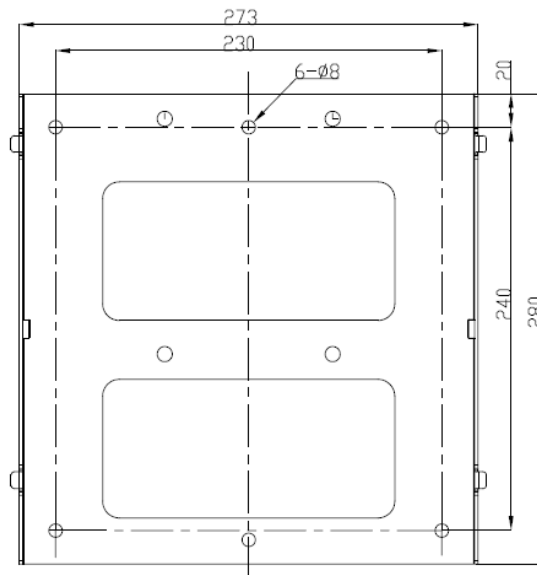


Figure 2-3 Installation Dimension Diagram of AQUAFLOW 3000 to 5500

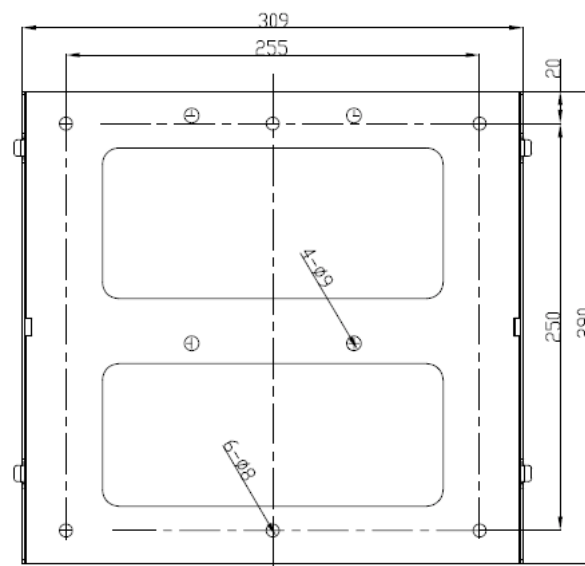


Figure 2-4 Installation Dimension Diagram of AQUAFLOW 7500 to 13K

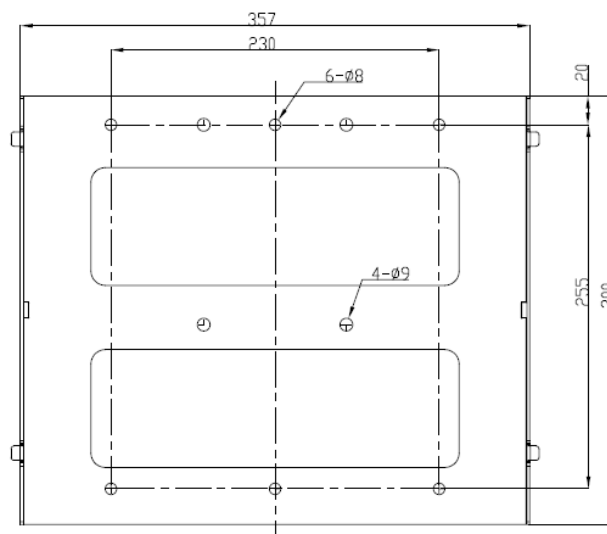


Figure 2-5 Installation Dimension Diagram of AQUAFLOW 15K to 22K

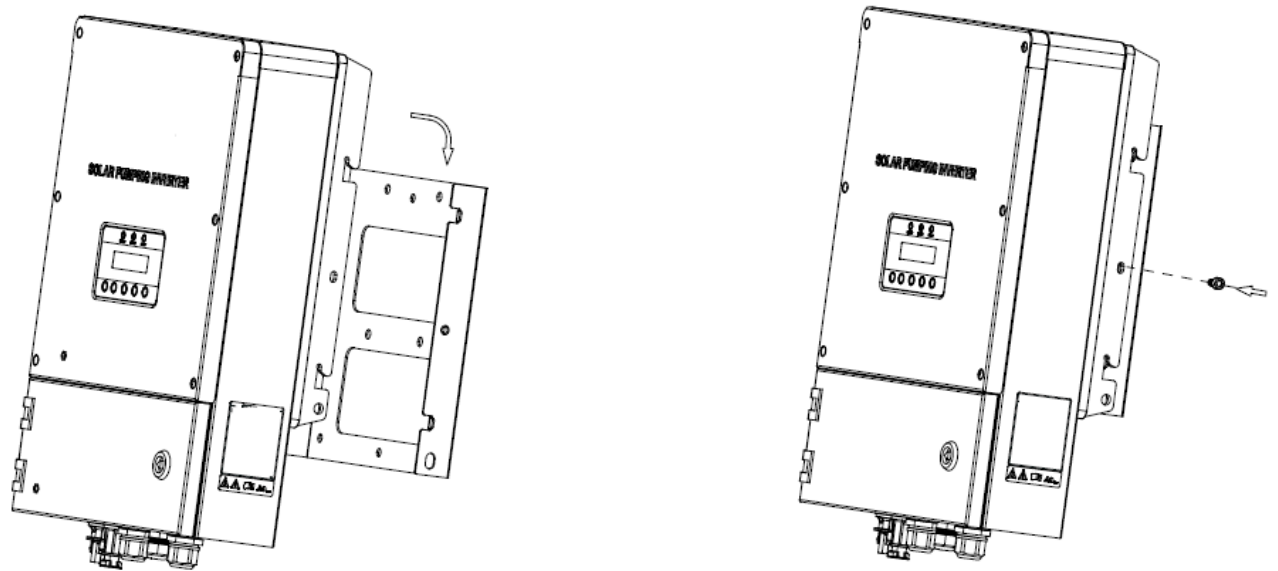


Figure 2-6 Install Safety Nut

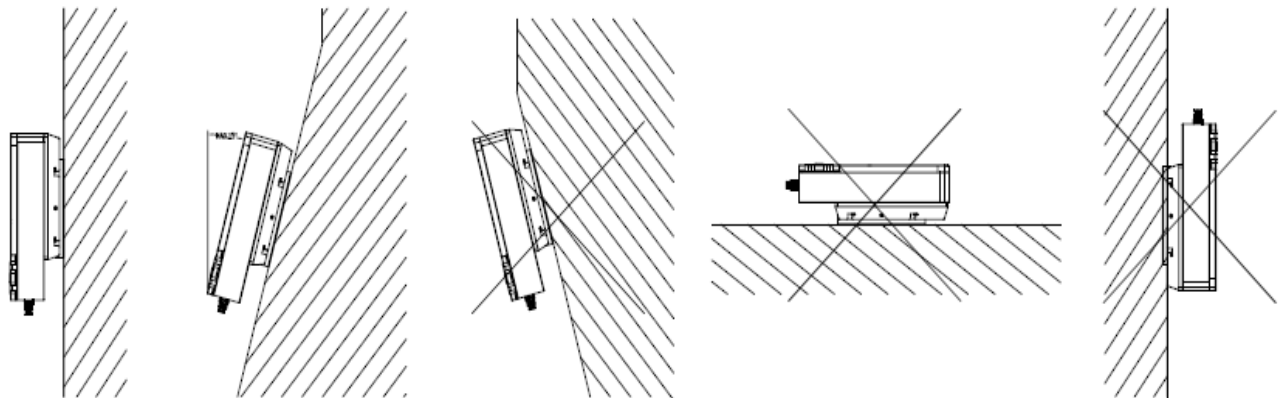


Figure 2-7 Correct Arrangement Diagram of Inverter

2.4 Wiring Diagram

2.4.1 Wiring Diagram of AQUAFLOW 550-2200

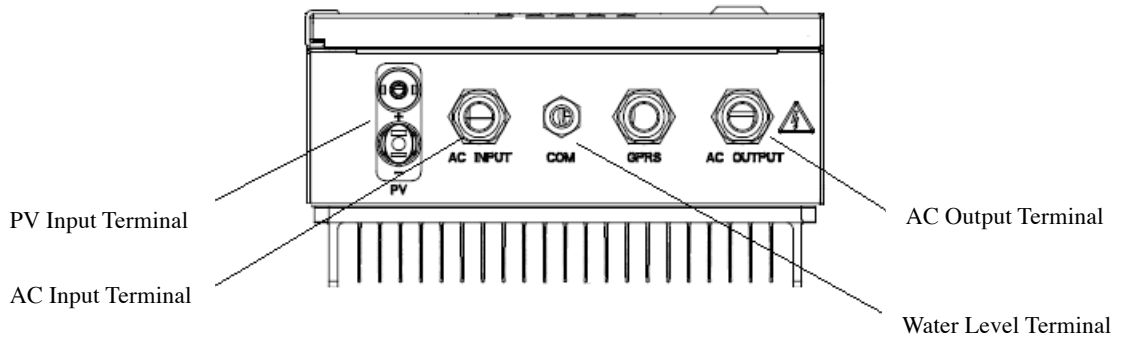


Figure 2-8 Wiring Terminal

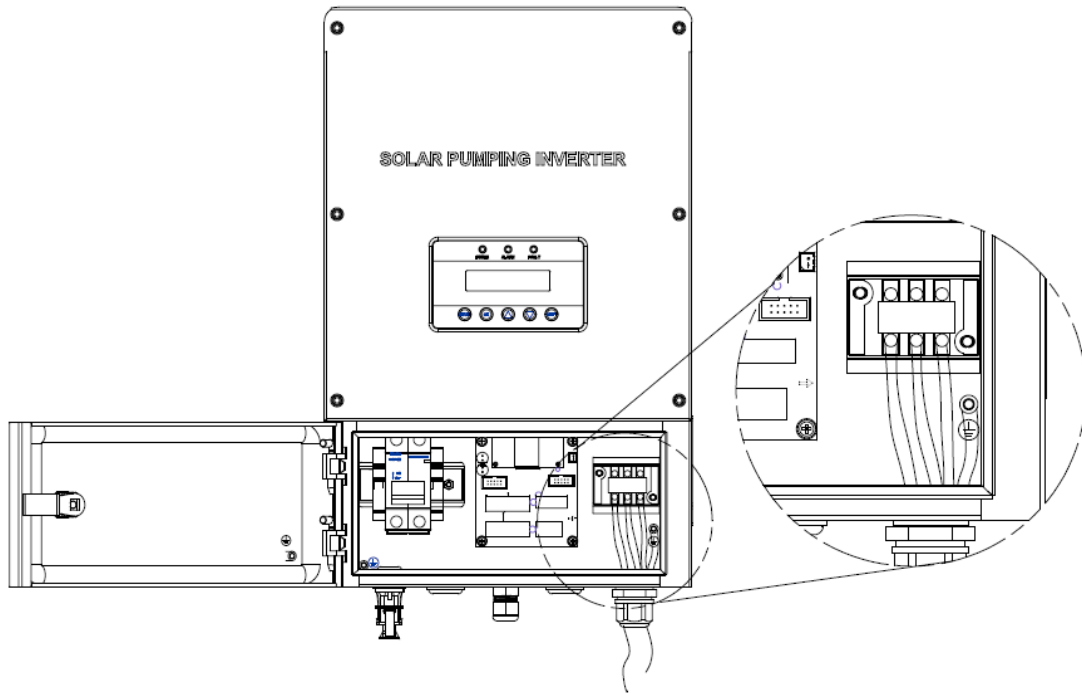


Figure 2-9 AQUAFLOW 550-L to 2200-L Wiring Diagram

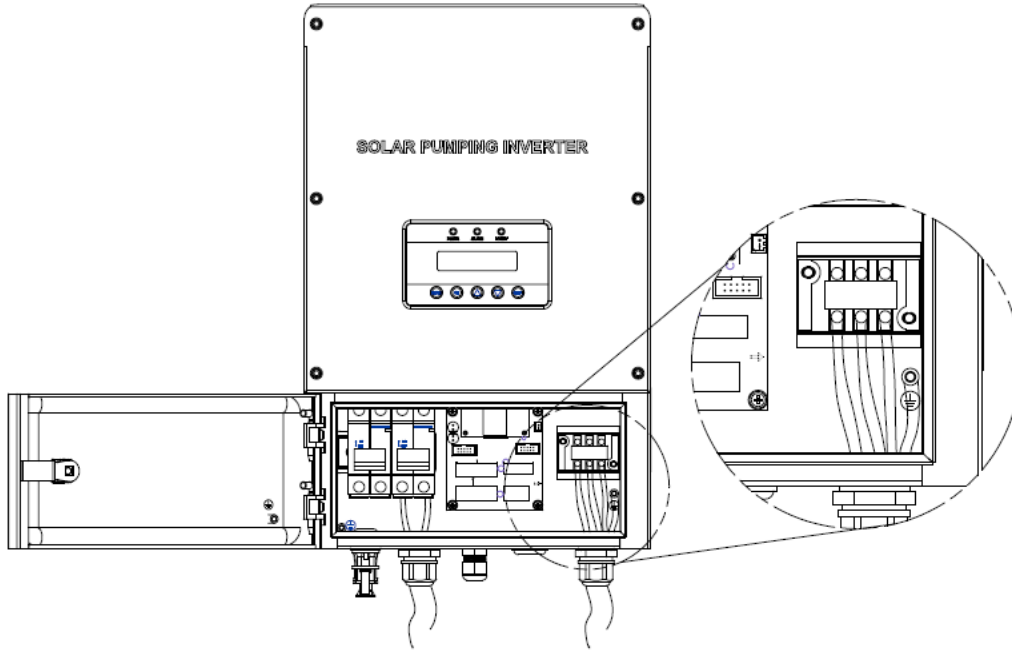


Figure 2-10 AQUAFLOW 550-LA to 2200-LA Wiring Diagram

2.4.2 Wiring Diagram of AQUAFLOW 3000 to 5500

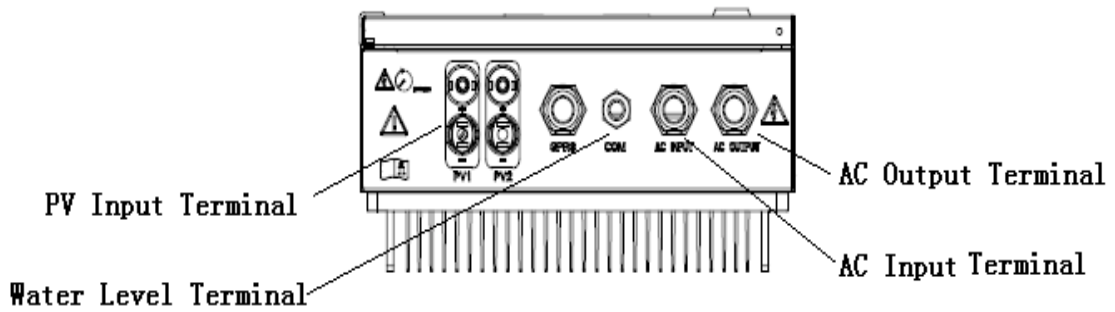


Figure 2-11 AQUAFLOW 3000 to 5500 Wiring Terminal

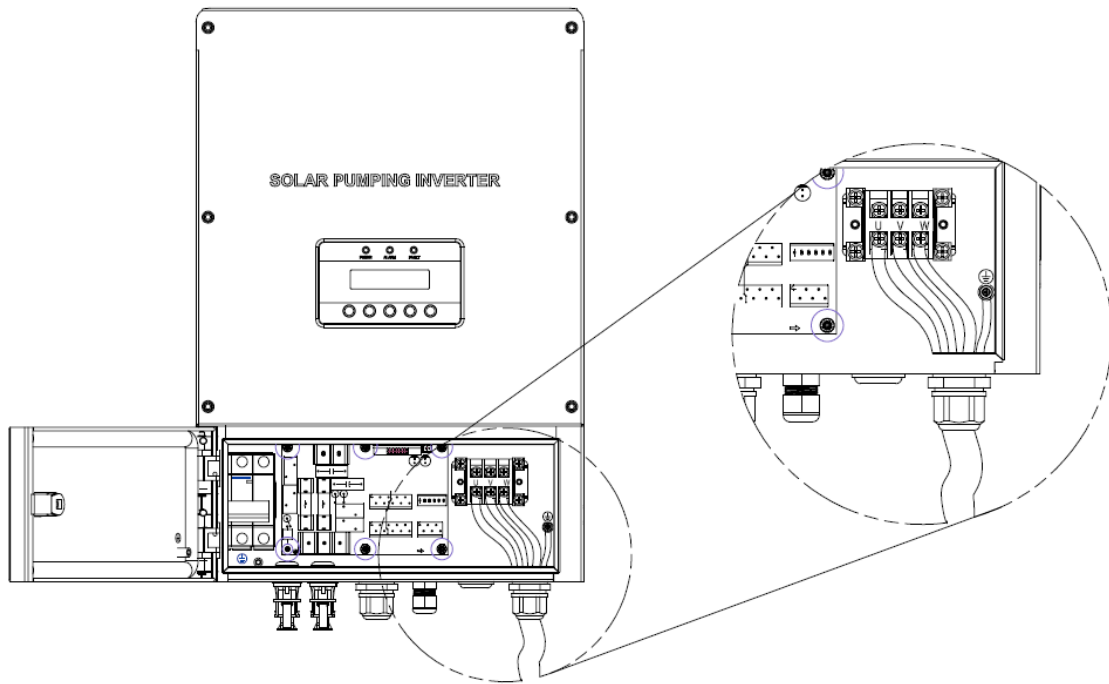


Figure 2-12 AQUAFLOW 3000 to 5500 Wiring Diagram

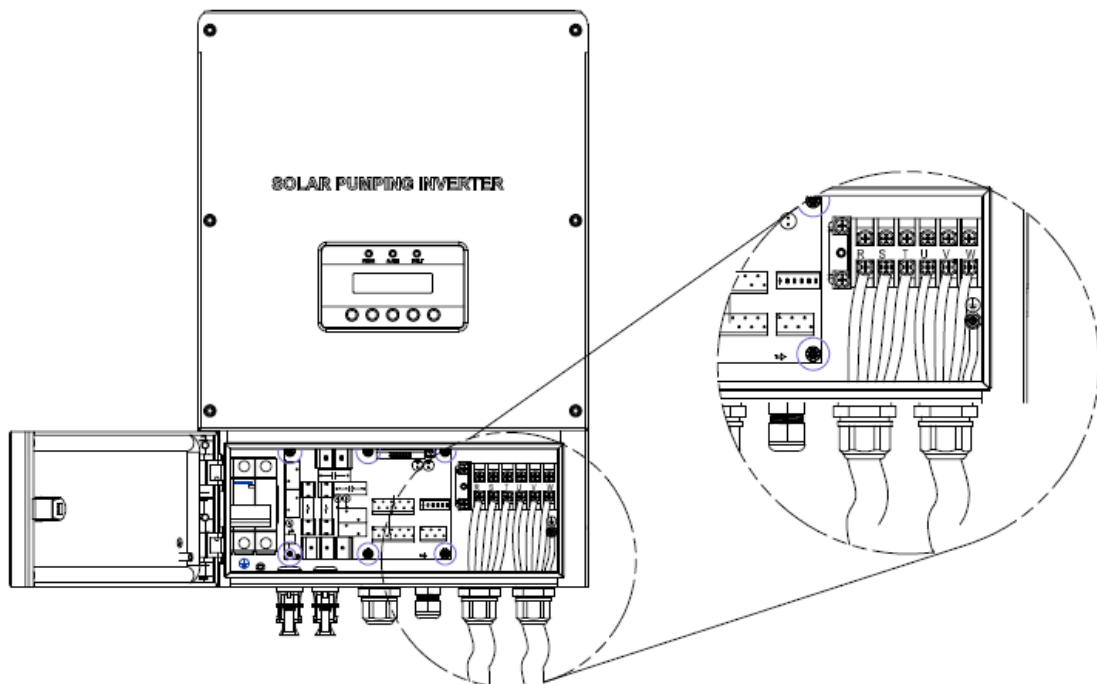


Figure 2-13 AQUAFLOW 3000-A to 5500-A Wiring Diagram

2.4.3 Wiring Diagram of AQUAFLOW 7500 to 13K

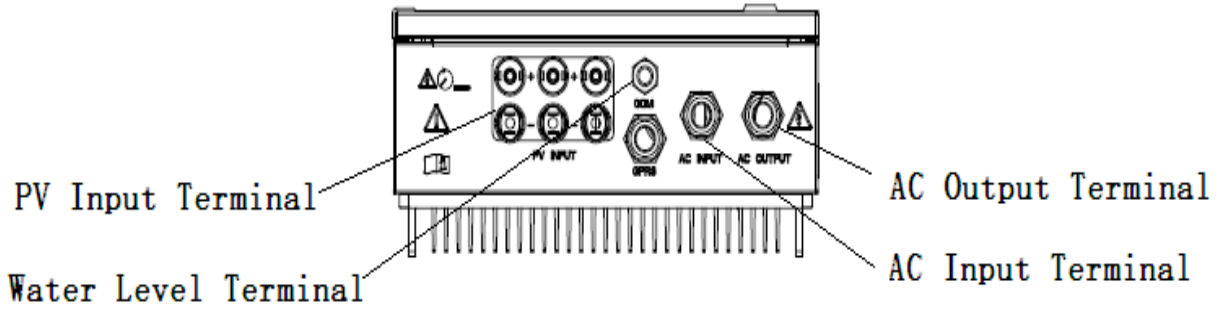


Figure 2-14 AQUAFLOW 7.5K to 13K Wiring Terminal

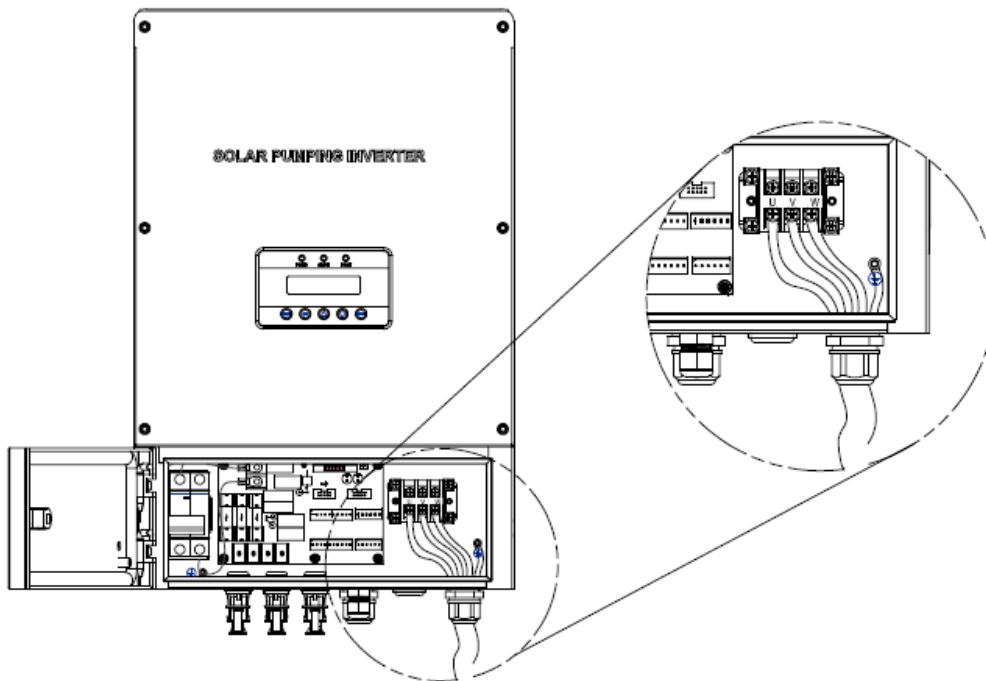


Figure 2-15 AQUAFLOW 7.5K to 13K Wiring Diagram

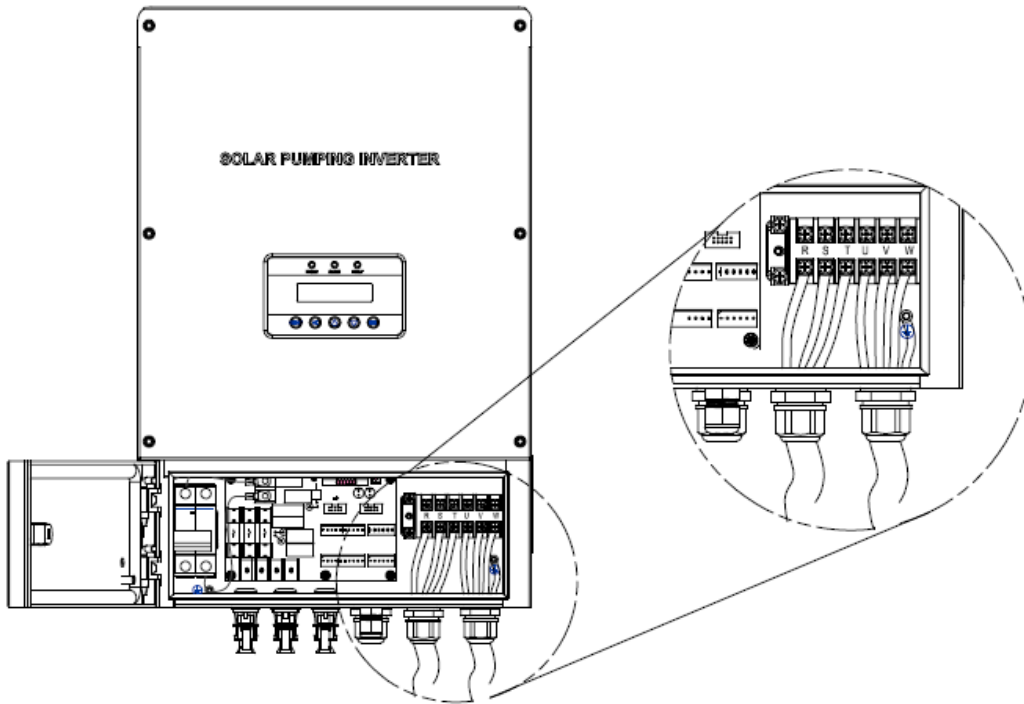


Figure 2-16 AQUAFLOW 7.5K-A to 13K-A Wiring Diagram

2.4.4 Wiring Diagram of AQUAFLOW 15K to 22K

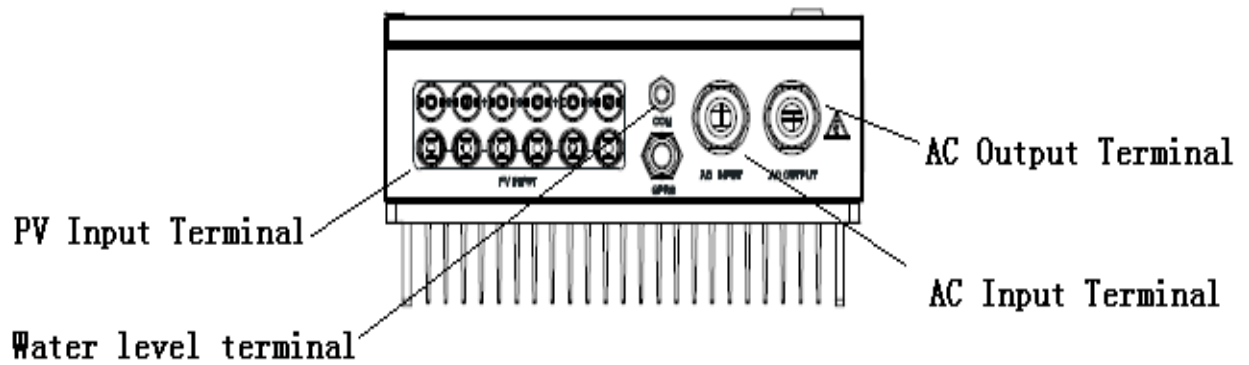


Figure 2-17 AQUAFLOW 15K to 22K Wiring Terminal

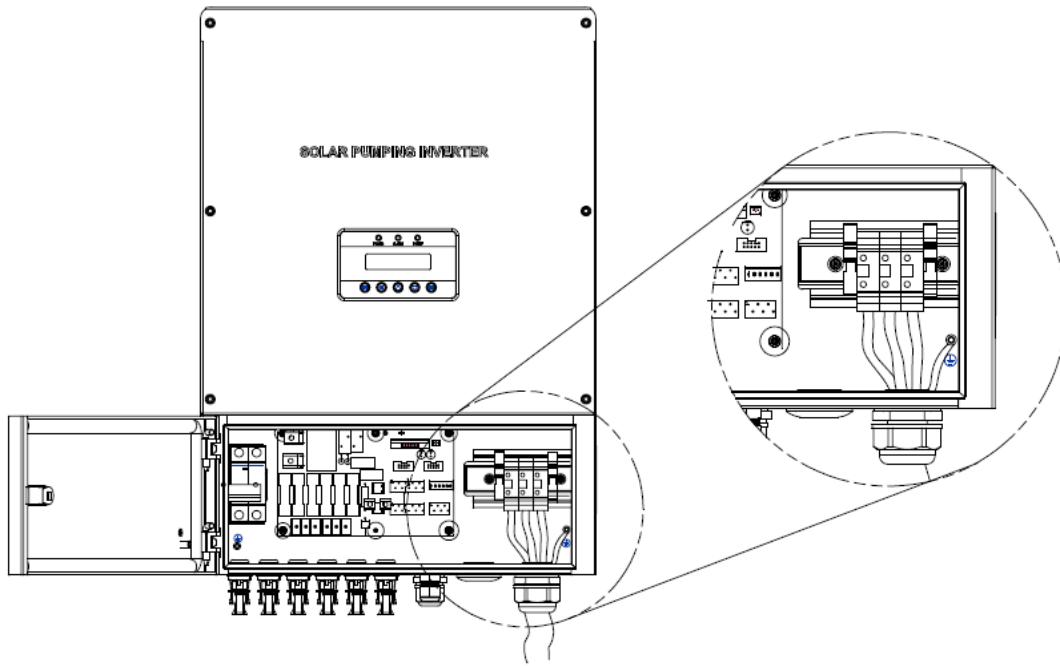


Figure 2-18 AQUAFLOW 15K to 22K Wiring Diagram

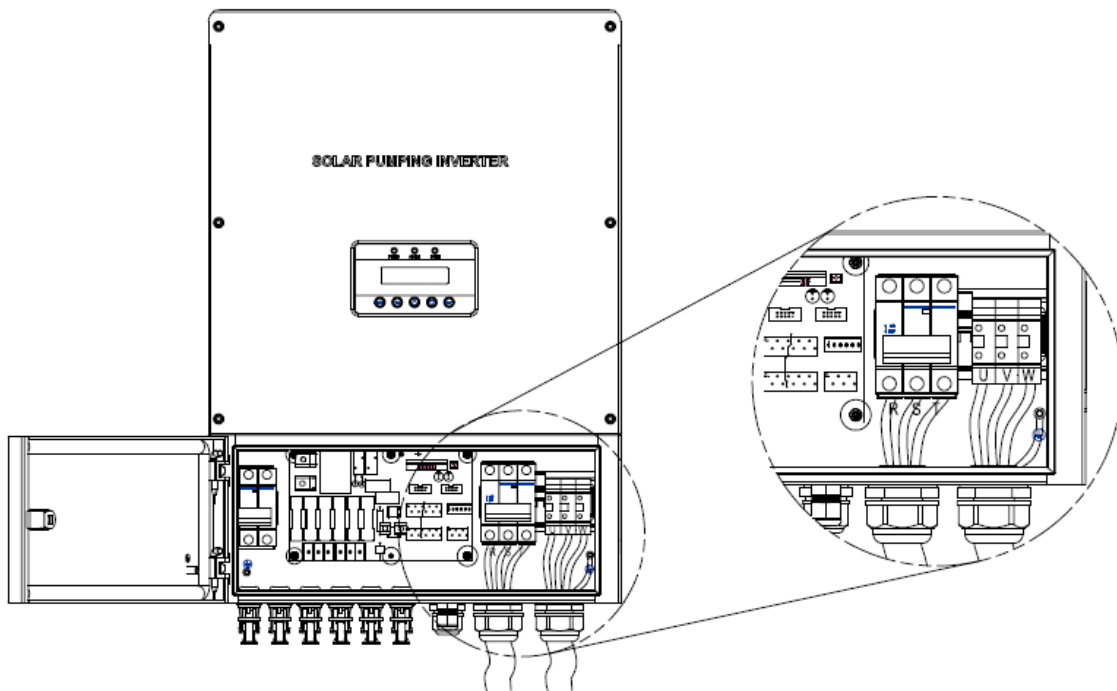


Figure 2-19 AQUAFLOW 15K- A to 22K- A Wiring Diagram

Use key to open the lower cover of crate. There is DC switch, water level sensor connection terminal, GPRS (optional), and AC output terminal.

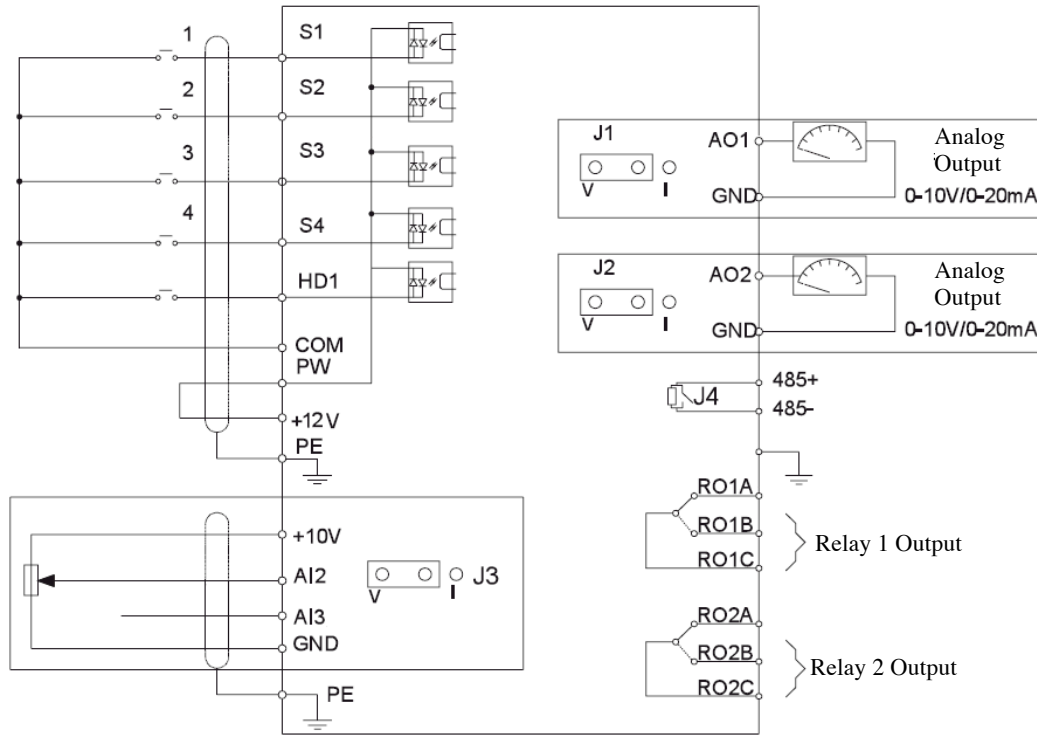


Figure 2-20 A/O Terminal Diagram

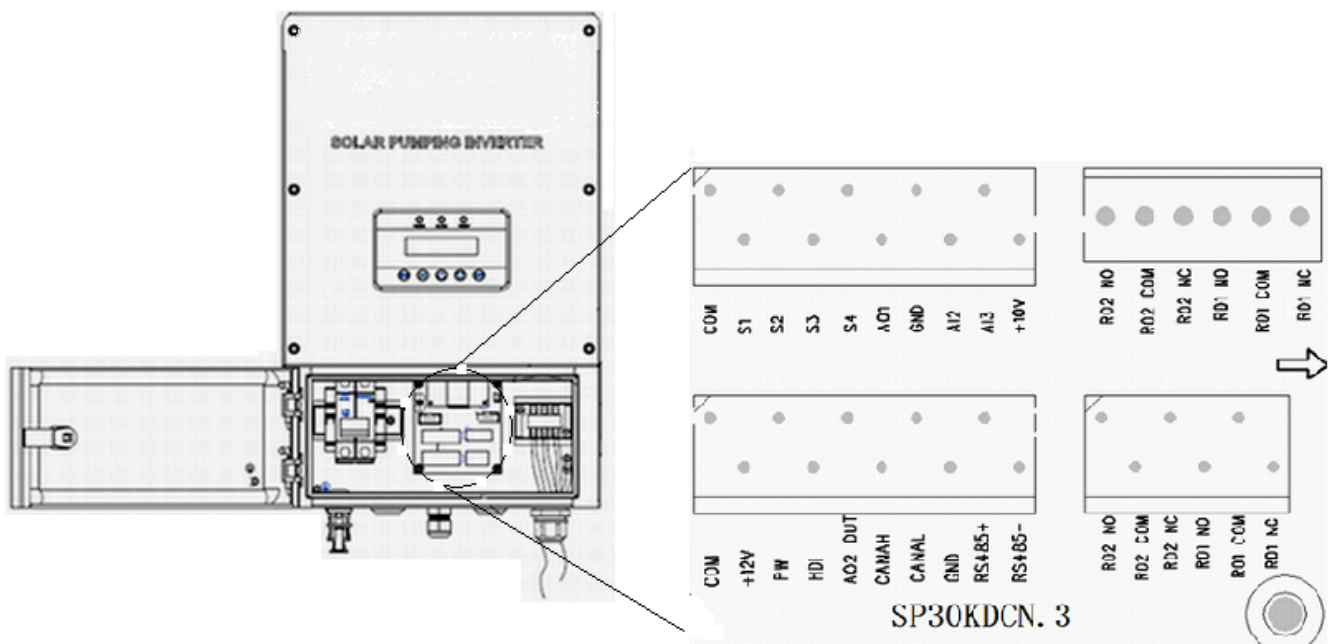


Figure 2-21 I/O Terminal Diagram

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
	W	Connect with motor W phase
Water Level Sensor Input (Switch Value)	+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. Please confirm according to plug.



Warning: the signal marshalling sequence of AC output sockets of different models are different. Please confirm according to the number on socket.





Warning: in order to guarantee that the system works normally, please select wire dimension according to the following principle.

2.4.4 Recommended Diameter of Wire (mm²)

model	Recommended output current(A)	Output voltage(V)	length≤30m	length≤60m	length≤90m	length≤120m	length≤150m	length≤180m	length≤210m
AQUAFLOW 550-L	3	1HP 230V	0.75	1	1.5	2.5	2.5	2.5	4
AQUAFLOW 750-L	5	3HP 220V	0.75	1.5	2.5	2.5	4	4	4
AQUAFLOW 1100-L	6	3HP 220V	1	1.5	2.5	4	4	4	6
AQUAFLOW 1500-L	7	3HP 220V	1	2.5	2.5	4	4	6	6
AQUAFLOW 2200-L	11	3HP 220V	1.5	2.5	2.5	6	6	6	6
AQUAFLOW 3000	8	3HP 380V	1.5	2.5	2.5	6	6	6	6
AQUAFLOW 4000	10	3HP 380V	1.5	2.5	2.5	6	6	6	6
AQUAFLOW 5500	13	3HP 380V	2.5	2.5	4	6	6	6	6
AQUAFLOW 7500	18	3HP 380V		2.5	4	6	6	10	10
AQUAFLOW 9200	21	3HP 380V		4	4	6	10	10	10
AQUAFLOW	24	3HP 380V		4	6	10	10	10	16

11K									
AQUAFLOW 13K	28	3HP 380V		6	6	10	10	10	10
AQUAFLOW 15K	30	3HP 380V		6	6	10	10	16	16
AQUAFLOW 18K5	39	3HP 380V		6	10	10	16	16	25
AQUAFLOW 22K	45	3HP 380V			10	16	16	25	25
Units: mm ²									

 Notice: the environment temperature of the above recommended wire dimension is $\leq 50^{\circ}\text{C}$.

 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.

2.5 Assemble DC Connector

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

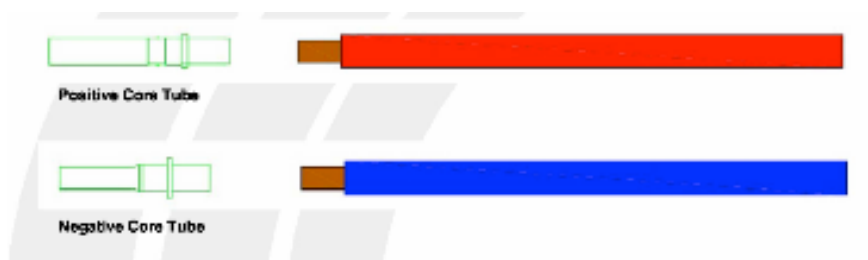


Figure 2-22 DC Line connects with wiring board

2.5.2 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 voice indicating in place.

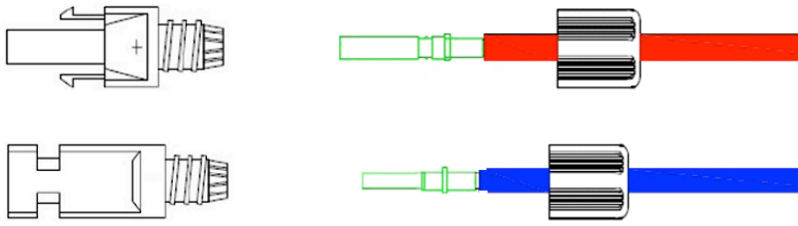


Figure 2-23

2.5.3 Insert contact cable assembly into back of the male and female connector. Tighten nuts according to the opposite direction. Now wiring is finished.

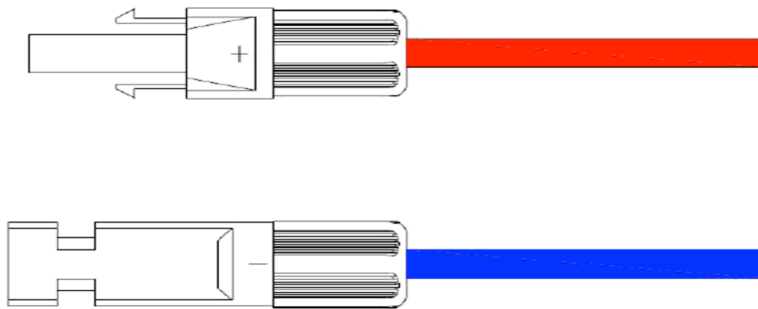


Figure 2-24

2.5.4 The PV importation that will assemble a good DC conjunction machine to make an effort to insert Inverters carries and link OK after hearing the sound of "click".



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

2.6 Introduction to the Wiring of Water Level Sensor

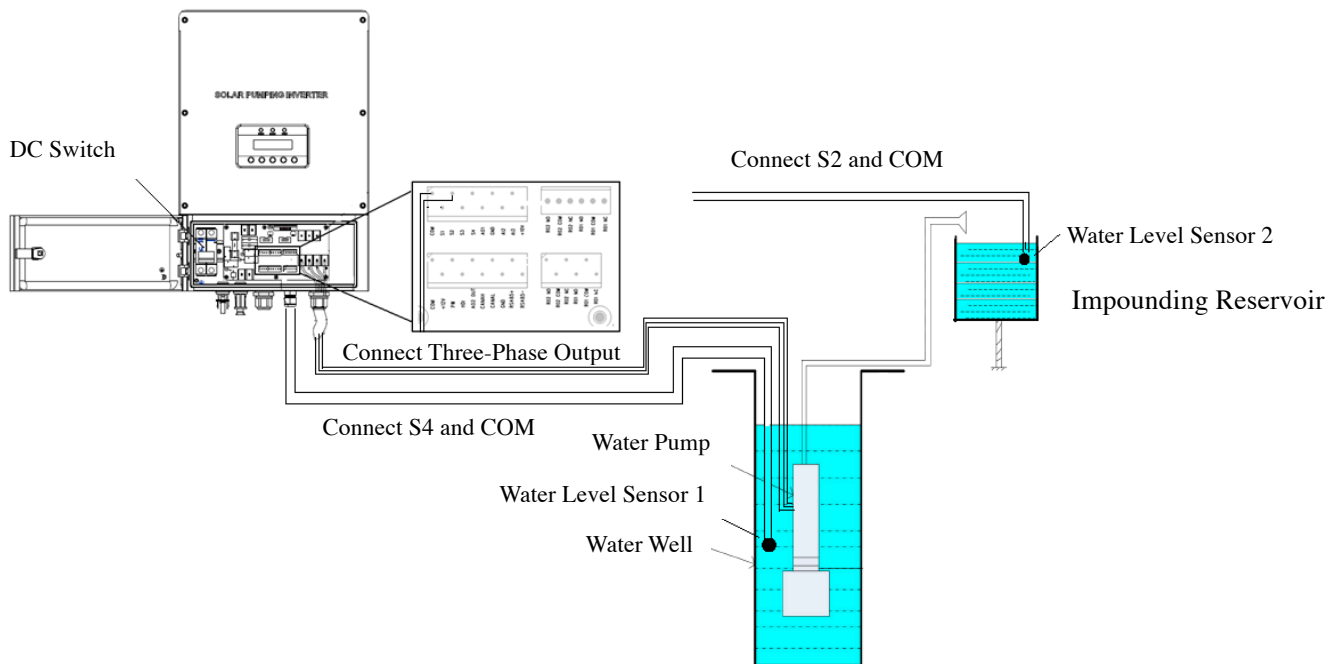


Figure 2-25 Wiring Diagram of Water Level Detector



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 pumping inverter will delay for 60s, then turn off output protection pump. The water level recovers. Wait for 600s, then the pumping inverter re-works normally.



Notice: connect water level sensor 2 to defect 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 pumping inverter delays for 60s and turns off output; when water level is lower than set level, wait for 120s, then pumping inverter re-starts to work normally.

Chapter III Operation Control

3.1 Panel Layout and Introduction

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

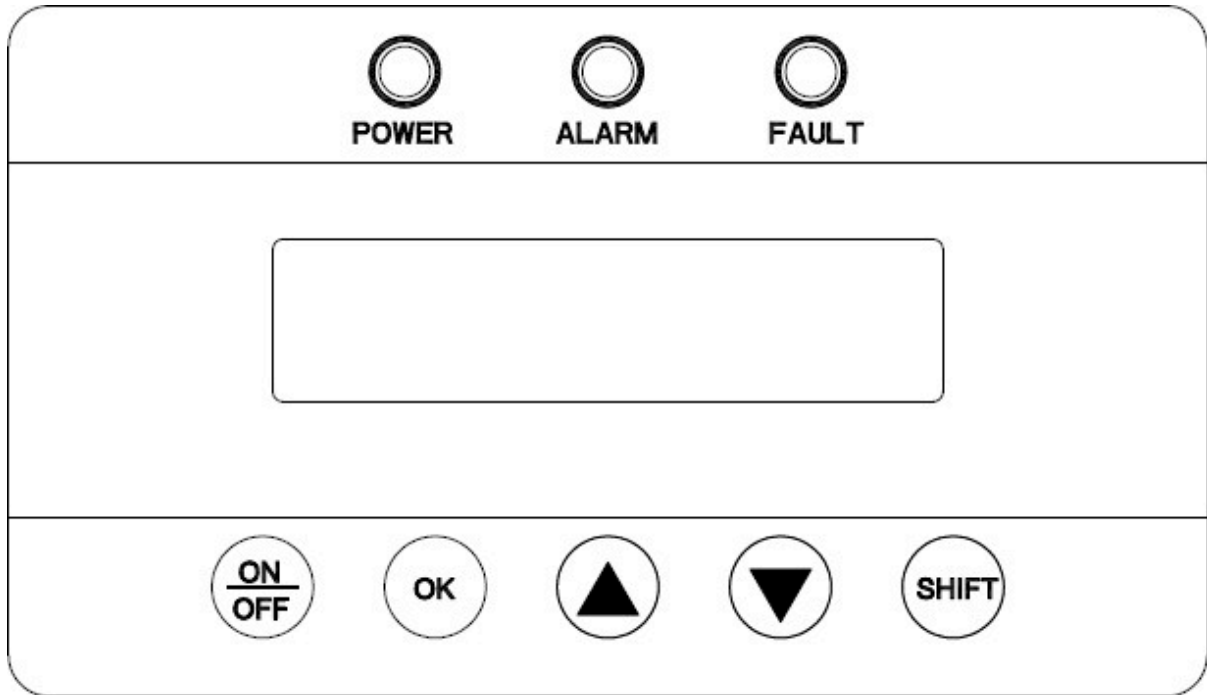








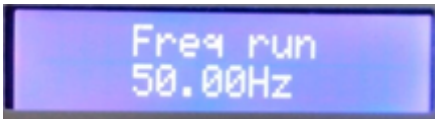


Figure 3-1 Keyboard Layout and Each Part Name










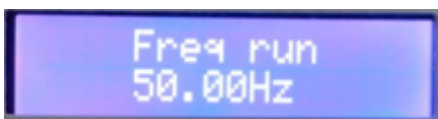
Indicator and Key	Name	Function Introduction	
POWER	Operation Indicator	Green	Bright: Inverter Operates
ALARM	Warning Indicator	Yellow	Bright: warning and terminal mode
FAULT	Failure Indicator	Red	Bright: system failure
	Operation/Stop Key	1. Press for a short time, then the inverter starts control; 2. Press for 2s, then inverter stops control.	

Indicator and Key	Name	Function Introduction
	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 return to the previous 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.
	Shift Key	1. After entering mode of parameter editing, press the key for a short time to conduct shifting; 2. When machine operates normally, press the key to see the parameter of main interface.

3.2 Panel Operation Method



The operation panel display includes three modes: operation data display, control parameter display, and historical parameter display. The default state is display state of operation data. The default state diagram is shown as follows:

Operation	Description	Display
Initial status: Current running data		
↓ 	Output frequency of the inverter	 Represent: 50.00Hz
↓ 	Set frequency of the inverter	 Represent: 50.00Hz

↓ 	Input voltage of the inverter	 Represent: 542.3V
↓ 	Output voltage of the inverter	 Represent: 379V
↓ 	Output current of the inverter	 Represent: 11.1A
↓ 	The relative value of rated power	 Represent: 79.1%
↓ 	Output frequency of the inverter	 Represent: 50.00Hz

3.3 Work Mode

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

1: Keyboard manual work mode: menu S00. Setting S00.01=0. Press  key to operate. Press  key for 2s, then the inverter stop working.

2: Fully-automatic work mode: menu S00. Setting S00.01=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 S00. Setting S00.01=2. Under such mode, bind

cellphone number. Send messages to set startup, shutdown, parameter inquiry, etc.

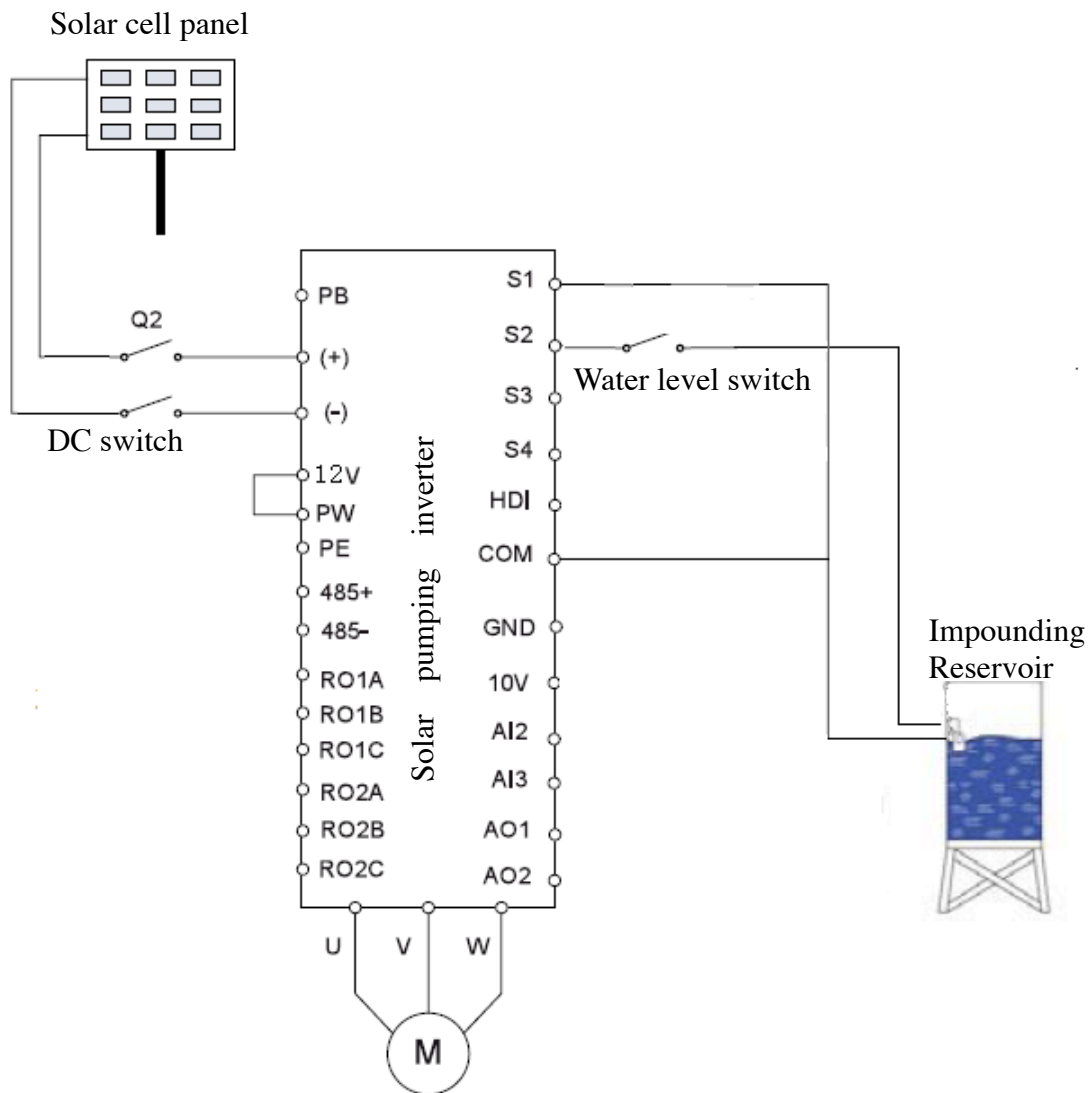


Warning: do not change menu S00 parameters. The default mode is fully-automatic work mode.

3.4 Introduction to the Procedure of Wiring and Debugging

3.4.1 Procedure of Power Supply Debugging of Solar Cell

1. Conduct wiring according to system diagram and check whether wiring is correct or not. After confirming it, turn on Q2.














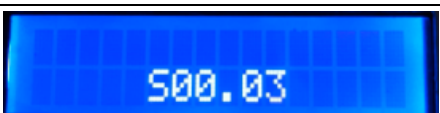
2. Conduct parameter setting for the motor









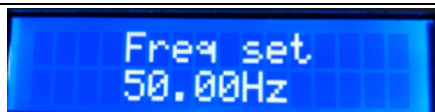















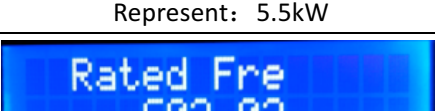


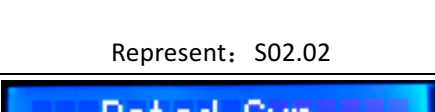
(a) Setting S00.01=0. Command code channel is keyboard manual mode instruction.





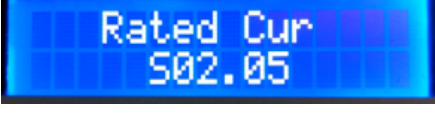





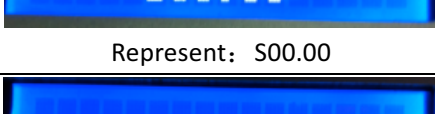


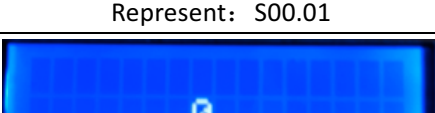



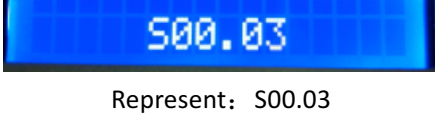

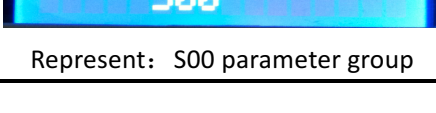


(b) Set water pump nameplate parameters: S02.01 motor rated power value; S02.02 motor rated power value; S02.04 motor rated voltage value; S02.05 motor rated current value.


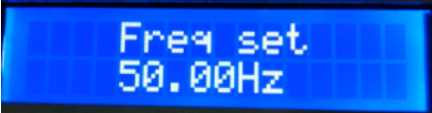
(c) After finishing parameter setting of water pump, set S00.01=1. The operation code channel is altered as original automatic mode instruction.

See the following figure. The settings of nameplate parameters of water pump are listed as follows (for example: 7.5KW inverter drives 5.5KW water pump):

Operation	Description	Display
Initial status: non-historical data display ↓		
	Enter the main parameter modification interface for long press 2s	 Represent: S00 parameter group
↓ 	Press OK key to enter the branch menu	 Represent: S00.00
↓ 	Press UP key to view the S00.01	 Represent: S00.01
↓ 	Press OK key to enter the S00.01(the factory set is 1)	 Represent: 1
↓ 	Edited it to 0(controlled by keyboard)	 Represent: 0
↓ 	Press to save the parameter value and display the next code number	 Represent: S00.03

Operation	Description	Display
 	Return the main parameter modification interface for long press 2s	 Represent: S00 parameter group
 	Long press OK for 2s to return to the initial status	 Represent: Working freq. 50.00Hz
 	Long press ON/OFF key for 2s to stop the inverter.	 Represent: Set freq. 50.00Hz
 	Enter the main parameter modification interface for long press 2s	 Represent: S00 parameter group
 	Press the UP key to S02 group	 Represent: S02 parameter group
 	Press OK key to enter the S02.01	 Represent: S02.01
  and 	Edited the rated power to 5.5kW	 Represent: 5.5kW
 	Press OK turn to S02.02	 Represent: S02.02
 	Press UP key to S02.05 and enter	 Represent: S02.05

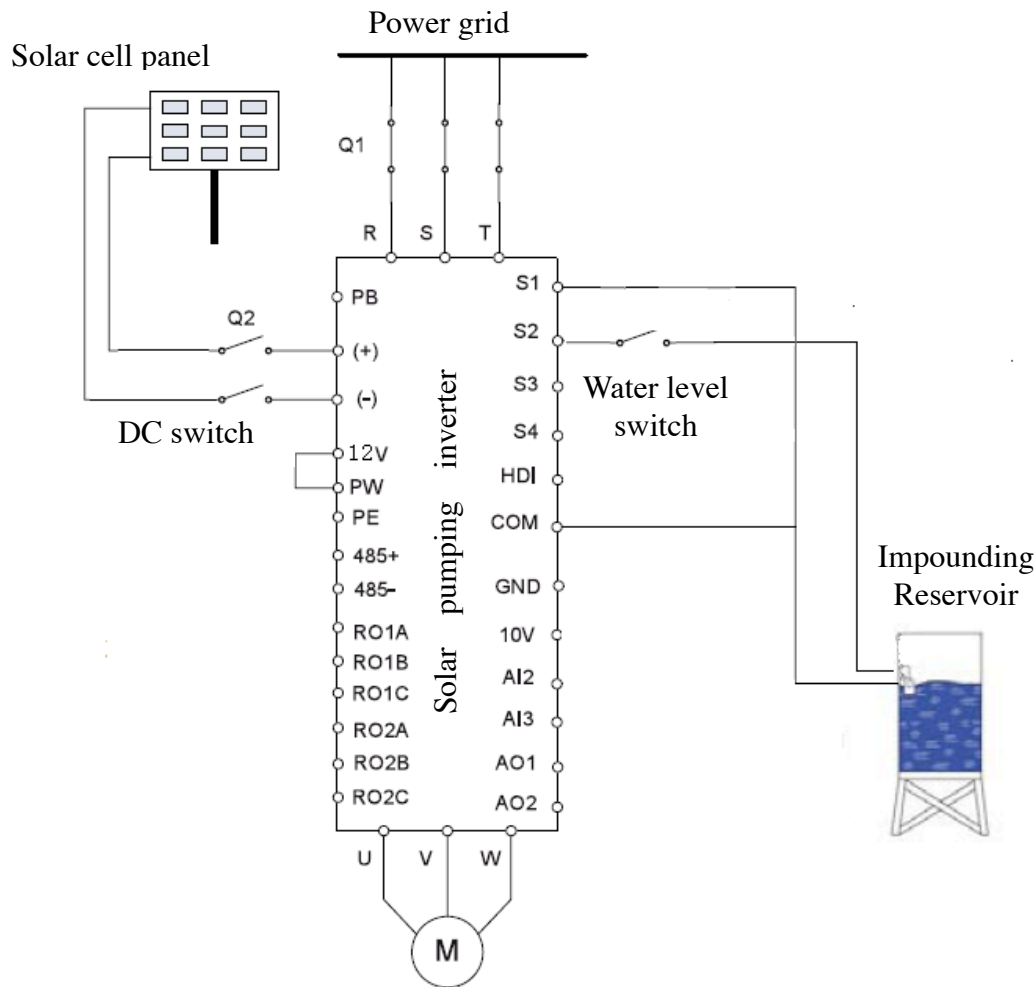
Operation	Description	Display
 and  ↓	Edited the rated current of the pump(it will write in pump) e.g.11.3A	 Represent: 11.3A
 ↓	Press to save the parameter value and return to the branch menu	 Represent: S00 parameter group
 ↓	Long press OK for 2s to return to the main menu	 Represent: S02 parameter group
 ↓	Press DOWN key to S00 parameter group.	 Represent: S00 parameter group
 ↓	Press OK key to enter the branch menu.	 Represent: S00.00
 or  ↓	Press UP or DOWN key to view the S00.01	 Represent: S00.01
 ↓	Press OK key to enter the S00.01.	 Represent: 0
 ↓	Edited it to 1 (controlled by terminals)	 Represent: 1
 ↓	Press to save the parameter value and display the next code number.	 Represent: S00.03
 ↓	Long press OK for 2s to return to the main menu.	 Represent: S00 parameter group

Operation	Description	Display
 <p style="text-align: center;">↓</p> <p>Turn off the DC switch, waiting the LCD display off, then turn on the DC switch, the inverter will auto-start to drive pump(5.5kW)</p>	<p>Long press OK for 2s to return to the initial status.</p>	 <p style="text-align: center;">Represent: 50.00Hz</p>

3. After finishing all parameter settings, turn off Q2 of DC switch. After display screen is OFF for 5 minutes, turn on AC output. Then turn on DC input switch Q2. Wait for 60s. The machine will operate automatically.

3.4.2 Procedure of Power Supply Debugging of Power Grid (Diesel Engine)

1. Conduct wiring according to systematic diagram and check whether the wiring is correct.



2. Turn off Q2 switch, then turn on Q1 switch.

3. After power-on, adjust motor parameter according to Item 2 of Article 3.4.1.

4. After finishing all parameter settings, turn off Q1 of AC input switch. After display screen is off for 5 minutes, turn on AC output switch. Then turn on Q1 of AC input switch. Wait for 60s. The equipment will operate automatically.

5. When solar power supply is used, turn off Q1 and turn on Q2 (Attention: it is forbidden to turn on Q1 and Q2 at the same time).



Warning: do not change inverter's control parameters at random, or else the system may not work normally.

3.4.3 Introduction to function parameters

SN	Name	Scope	Introduction	Factory Value
S00.01	Operation code channel	0~2	0: keyboard operation code channel (LED is off) 1: terminal operation code channel (LED flickers) 2: communication operation code channel (LED is bright)	1
S02.01	Rated power of asynchronous motor	0.1 ~ 3000.0	0.1 ~ 3000.0kW	Model confirmation
S02.02	Rated frequency of asynchronous motor	0.01 ~ S00.03	0.01 ~ S00.03	50.00Hz
S02.04	Rated voltage of asynchronous motor	0 ~ 1200	0 ~ 1200V	Model confirmation
S02.05	Rated current of asynchronous motor	0.8 ~ 6000	0.8 ~ 6000A	Model confirmation

Chapter IV: Failure Diagnosis

4.1 Explanation and Solution for Fault Code

AQUAFLOW series solar pumping inverter has complete protection. When system suffers failure, the inverter will take protective measures: the general protective measures are to stop the output of drive signal of motor and forbid to re-start within a certain period.

When failure or protection happens, the failure or protection needs to reset the inverter. Power off input power supply, then power on it. If the failure is not still settled, please contact with manufacturer to settle it.

The common failures are listed as follows:

Code	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 water pump is too large The voltage of cell array is too low The motor wiring is too long	Replace small-power water pump load Check the 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 wiring Seek services from manufacturer
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	Seek services from manufacturer
Shortcut GND 1	Grounding short circuit	The output line may be connected with ground	
Curr test Fault	Current detection failure		Seek services from manufacturer
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. If water is provided, it can recover automatically	
Water Full	Water full	When water level decreases. It can recover automatically	
Com Fault	Communication failure	Device or circuit damage	Reset Seek services from manufacturer



Warning: before resetting, completely find out failure reasons and eliminate the reasons. If it fails to reset or suffers failure again, find out the reasons. The continuous resetting will damage inverter.

Chapter V Maintenance

5.1 Daily Inspection and Maintenance

Affected by environment temperature, humidity, vibration, and inverter internal component aging, the inverter may suffer some potential problems during operation. In order to stably operate the inverter for a long term, conduct periodical inspection once each year.

5.1.1 Requirements of Inspection and Maintenance

1. The inspection shall be conducted by professional technician. When necessary, cut off the power supply of inverter.
2. Avoid leaving metal components and parts in inverter, or else it may damage the equipment.
3. The inverter has conducted electrical insulation experiment before leaving factory, so the user needn't conduct high-voltage insulation test.
4. If you intend to conduct insulation test on inverter, all input and output terminals must be short circuit reliably. It is forbidden to conduct insulation test on single terminate. Please use 500V megameter during test.
5. It is forbidden to use megameter to measure control loop.
6. When conducting insulation test on motor, remove the connecting line between motor and inverter.

5.1.2 Key Points of Inspection and Maintenance

Please use the inverter under the environment recommended in the manual and conduct inspection and maintenance according to the following table.

Inspection Frequency		Inspection Item	Inspection Content	Judgment Standard
Daily	Periodically			
√		Operating Environment	1. Temperature and humidity 2. Dust and gas	1. Temperature <50°C 2. Humidity <90%, without moisture condensation 3. No peculiar smell. No combustible or explosive gas
	√	Cooling System	1. Installation environment 2. Radiator	1. The ventilation of installation environment is good 2. The air flue of radiator is not blocked
√		Inverter Body	1. Vibration, temperature rise 2. Noise 3. Wire, terminal	1. Vibration is stable and shell temperature rise is normal 2. No abnormal noise or peculiar smell 3. Tighten the screw
√		Motor	1. Vibration, temperature rise 2. Noise	1. Operate stably. Temperature is normal. 2. No abnormal noise
√		Input and Output Parameter	1. Input Voltage 2. Output Current	1. Input voltage is in specified scope 2. Output current is under rated value

5.2 Inspection and Replacement of Quick-wear Parts

5.2.1 Filter Capacitor

The pulsating current of main loop will affect the performance of filter capacitor of aluminium electrolysis. The affected degree and environment temperature are related to service environment. Under normal conditions, the inverter shall change electrolytic capacitor once every 10 years. When electrolyte of electrolytic capacitor leaks, safety valve emits, or capacitance expands, replace it immediately.

5.2.2 Fan cooling

In AQUAFLOW series pumping inverter, the inverter above AQUAFLOW 22K has cooling fan inside. The service life of cooling fan is about 15000 hours. If fan has abnormal noise or generates vibration, replace it immediately.

5.3 Storage and Maintenance

5.3.1 Storage

After purchasing inverter, if you do not use it temporarily or decide to store it for a long time, pay attention to the following items:

1. Avoid putting inverter on the places in which temperature is high, air is humid, or places where there is vibration or metal dust. Guarantee good ventilation.
2. If the inverter is not used for a long term, the internal filter capacitor characteristic will decrease. Power on twice every two years to recover the characteristics of filter capacitor. At the same time, check the functions of inverter. During power-on, gradually increase the voltage through DC power supply. The power-on time shall not be less than 5 hours.

5.3.2 Maintenance

The warranty period of inverter is 2 years (since production date). During warranty period, if inverter suffers failure or damage under normal conditions, our company provides maintenance service free of charge. After warranty period, our company also provides paid maintenance services.

During warranty period, if the failure is caused due to the following reasons, some maintenance fees will be charged.

1. Failure caused by violation of operation manual or standards;
2. Without authorization, user repairs and transforms the inverter.
3. Failure caused by improper storage;
4. Use inverter for abnormal functions;
5. Failure caused by fire disaster, salt corrosion, gas corrosion, earthquake, windstorm, flood, lightning, abnormal voltage, or other force majeure.



Notice: the warranty scope only refers to inverter body.

Quality Assurance

Warranty Policy:

Warranty period: Our company provides series solar pumping inverter with warranty period of 24 months. The systematic components provided by our company have 12-month warranty period.

Starting date of warranty period: the date when user gets goods from our dealer.

Warranty proof: product series number and local dealer's shipment invoice.

Notice: if client does not provide shipment invoice and other documents, our company will use the date which is 2 months after delivery date, as starting date of warranty period.

Scope: during warranty period, the scope and responsibility of any damage shall be appraised by dealer and our company.

Warranty principle:

In order to provide our company final users with better services, all the dealers authorized shall reply user's warranty request. During warranty period, the dealer will replace all defective products and parts in aspects of design and production.

- (1) Warranty card is not sent to dealer or our company.
- (2) Product change, design alteration, or component replacement is not approved by our company.
- (3) Alter, change or try to repair it. The serial number is wiped out or does not have our company technician's seal.
- (4) Wrong installation and debugging
- (5) Does not abide by proper safety regulation (CQC standards, etc.)
- (6) The product is improperly stored and damaged by final user.
- (7) Transportation damage. During transportation, the paint is scratched. During unloading, if enough evidence is available, apply in insurance company as soon as possible.
- (8) Fail to abide by user's manual, installation guidance, and maintenance regulation.
- (9) Incorrect use or improper operation
- (10) Shortage of ventilating device
- (11) The product maintenance procedure does not abide by or implement an acceptable standard.
- (12) Force majeure (such as lightning, over-voltage, thunderstorm, fire disaster)

If claim exceeds the power quoted in warranty principle,our company shall not undertake legal responsibilities, including the following conditions: claim compensation due to direct or indirect damaged caused by defective equipment; claim compensation due to the damage caused by removal and installation; profit loss not specified in our company warranty scope.

Warranty and Claim Procedure:

Please send a simple failure description report to our company local dealer. If we agree to replace, we will issue an equivalent replacement device according to model and year length. The rest warranty rights will be transferred to replacing equipment. Under such condition, as your power has been filed in our company, you will not receive a new certification. The substitute goods will be delivered within 2 working days. The defective equipment is to use the transportation packaging to transport to dealer. If on-site re-installation is necessary, the end-user shall consult with dealer in advance. All maintenance services during warranty period are free of charge.

Warranty Card

Client Name		Contact Person	
Client Address		Contact Tel.	
Product Specification		Procurement Date	
Equipment Code		Warranty Date (since production date)	
Distribution Unit (Seal)			

Packing List

- (1) Main engine quantity: One set
- (2) Instruction book (including warranty card) quantity: one
- (3) Patch plug of positive pole of solar cell array quantity: one
- (4) Patch plug of negative pole of solar cell array quantity: one
- (5) Water level sensor quantity: one (optional)