

# Preface

Thank you for purchasing VD360 Series Inverters!

VD360 series inverter special for solar pump, is based on the core control algorithm of VD300 control frequency, combined with the application control requirements of solar water pump, developed a specifically for outdoor PV power supply inverter special for pump. With maximum power tracking, weak light sleep, wake up the intensity, high level of dormancy, underload warning, remote communication monitoring control and protection function.

When debugging this product, refer to the debugging of this manual.

## **Unpacking and Inspection:**

Every inverter has been inspected rigorously before shipping.

Please confirm carefully when unpacking the packing carton:

- Check if any damage signs of the product and its package.
- Check if the model and inverter rated values on the nameplate are the same as stated on your order and user manual.
- The box contains the inverter, manufacturer certificate, user manual.

If the product is damaged during transportation, or there is any omission or damage, please contact our company or your local supplier immediately.

First time use suggests:

The users who use this product for the first time shall read this manual carefully. For any doubt on certain functions and performances, please contact the technical support personnel of our company for help, so as to use this product properly. With commitment to the constant improvement of the inverter products, our company may change the information provided without additional notice.

VD360 series inverter is confirmed to below international standard, has passed the CE certification.

IEC/EN 61800-5-1: 2003 adjustable speed electric drive system safety regulation requirements;

IEC/EN 61800-3: 2004 adjustable speed electric drive system: part 3: product EMC standard and its specific test method;

IEC/EN61000-2-1, 2-2, 3-2, 3-3, 4-2, 4-3, 4-4, 4-5, 4-6; EMC international and EU standard .



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# Chapter 1 Safety and Precautions

## 1.1 Safety Definition

In order to ensure that your personal, equipment and property safety, before the using the frequency converter, please be sure to read this chapter carefully, and in the subsequent handling, installation, debugging, operation and maintenance process in accordance with the implementation. The users must comply with the relevant safety instructions in this manual, if any danger or loss of property caused by the uses is not related to the company. The security identify definition in this manual is divided into "danger" and "attention" two types.

### DANGER

- Danger arising due to improper operations may cause severe hurt or even death and major property damage.

### WARNING

- Danger arising due to improper operations may cause moderate damage or light hurt, and equipment damage or property damage.

## 1.2 Safety Precautions

### 1.2.1 Before Installation

#### DANGER

- Do not install the equipment if you find water seepage, component missing or damage upon unpacking.
- Do not install the equipment if the packing list does not conform to the product you received

#### DANGER

- Handle the equipment with care during transportation to prevent damage.
- Do not touch the components with your hands. Failure to comply will result in static electricity damage.

### 1.2.2 During Installation

#### DANGER

- Install the equipment on incombustible objects such as metal, and keep it away from combustible materials. Failure to comply may result in a fire.
- Install the equipment according to regulations and tighten the fastening bolts. Failure to comply may result in equipment falling.
- Do not loosen the fixed screws of the components, especially the screws with red mark.

#### WARNING

- Do not drop conductive objects as wire ends or screw into inverter. Failure to comply will result in damages.
- Install inverter in place avoid to vibration, water drops and direct sunlight.
- When two inverters are installed in the same cabinet, arrange the installation positions properly to ensure normal cooling effect, keep the cabinet with good ventilation.

### 1.2.3 At Wiring

#### DANGER

- Wiring must be performed only by qualified personnel under instructions described in this manual. Failure to comply may result in unexpected accidents.
- A circuit breaker must be used to isolate the power supply and inverter. Failure to comply may result in a fire.
- Ensure that the power supply is cut off before wiring. Failure to comply may result in electric shock.
- Connect inverter to ground properly by standard. Failure to comply may result in electric shock.
- Do not connect the input power with output terminals U, V, W, confirm the mark on terminal before connection to avoid wrong wiring. Failure to comply can damage the inverter!
- Never connect the braking resistor between the DC bus terminals P+ and P-. Failure to comply may result in a fire.
- The wire size of main circuit should conformed to standard, the wiring should comply with EMC and local safety standard. Failure to comply may result in accidents.
- Use shielded cable for input output control circuit of analog and rapid speed pulse signal, and ensure the shielding layer is reliably grounded.

### 1.2.4 Before Power-on:

#### DANGER

- Check that the following requirements are met:
- The voltage class of the power supply is consistent with the rated voltage class of the AC drive.
- The input terminals (R, S, T) and output terminals (U, V, W) are properly connected.
- No short-circuit exists in the peripheral circuit.
- The wiring is secured.
- The external units of inverter and wires are configured under the manual instructed, all matched circuit and wiring are correctly connected.
- Failure to comply will result in damage to inverter!

### 1.2.5 After Power-on

#### DANGER

- Do not open the cover after inverter power-on to prevent electric shock.
- Do not touch or operate the inverter with wet hands. Failure to comply will result in electric shock.
- Do not touch any terminal of inverter after power-on, or drag connection cable. Failure to comply will result in equipment damage or electric shock.
- Do not try to check or change the manufacturer parameter. Failure to comply may result in malfunction or damage to inverter!
- Make sure the mechanical equipment is ready to start before inverter run with loading, make sure related staff is in safety zone. Failure to comply will result in damage or personal hurt!
- Please pay attention to hiding accident which may result in personal hurt or property damage while motor is run, if it is necessary to identify the motor parameter.

### 1.2.6 During Operation

#### DANGER

- Do not touch the cooling fan or braking resistor etc, otherwise may cause personal injury!
- Do not do inspection while inverter run, except for professional technician, otherwise may cause inverter damaged or personal injury.

 **WARNING**

- Do not move inverter or the installed cabinet while it is run, keep external objects falling into the device. Failure to comply will result in damage.
- Start/Stop inverter via terminal function or other control method, try not to start inverter via directly power-on control method. Do not use contactor on inverter output terminal to control motor starting or stop.

**1.2.7 During Maintenance**
 **DANGER**

- Do not repair and maintain the equipment if power is connected. Otherwise there will be danger of electric shock!
- If the LED is still on light on control panel, it is Disabled to disassemble the body in order to avoid electric shock.
- The inverter shall be repaired and maintained only by the qualified person who has received professional training. Otherwise, it may cause personal injury or equipment damage.
- For all the standard equipped or optional accessories, must be dismantled or mounted while the inverter power is disconnected.

**1.3 General Precautions****1.3.1 Motor Insulation Inspection**

For first time usage, motor is left unused for long time or periodically inspected, insulation inspection must be done to avoid motor coils insulation failure which may result in inverter damage. Disconnect motor and inverter before inspection, 500V voltage type Meg-ohmmeter is recommended. It is up to standard if insulation resist value no less than 5MΩ.

**1.3.2 Motor Overheat Protection**

If selected motor and inverter rated capacity doesn't match, especially the inverter rated power larger than motor rated power, it is necessary to adjust the motor protect parameter of inverter into actual used motor parameter. Or a thermal relay can be installed to motor to protect motor.

**1.3.3 Run with Power Frequency (under or above)**

This inverter can provide 0.00Hz~650.00Hz output frequency, so motor is run at low frequency on long time. Take care of motor cooling or frequency converted motor could be a choice. When motor run with over-limit rate frequency, consider the bearing capacity of mechanic system with high speed, to avoid the shortening of lifespan of equipment.

**1.3.4 Vibration and Resonance of Mechanic System**

Since inherent property of mechanic system, inverter could have mechanic system resonance point while acceleration or deceleration, by setting inverter jump frequency can avoid mechanic system resonance point. If customer required run frequency is happened to be the same with mechanic resonance frequency, it is necessary to change run frequency or change the inherent resonance frequency of mechanic system.

**1.3.5 Regarding Motor Heating and Noise**

Inverter output voltage is PWM wave, with some higher harmonic, so motor temperature rising, noise and vibration should increase a little comparing with power frequency, which is normal.

**1.3.6 Pressure Sensing Device on Output Side or Improve Power Factor Capacitor**

Inverter output voltage is PWM wave, if output side installed capacitor to improve power factor or pressure sensing device to anti-thunder, it could easily result in instant over current or damage to inverter. Disassemble such devices before inverter installation.

**1.3.7 Switchover Device as Contactor Installed on Inverter Input Output Side**

If there is a contactor between power supply and inverter input terminal, it is Disabled to use it to start/stop inverter. When it is very necessary to use the contactor to start/stop inverter, the action interval time should not less than 1hr. Since frequent charge/discharge could easily shorten the

lifespan of electrolytic capacitor inside inverter. If there is a contactor between motor and inverter output terminal, make sure if motor is static and inverter is without output, then switchover the contactor, failure to comply may damage the inverter.

### **1.3.8 Applications with Non-rated Voltage**

The application voltage range used on inverter should not exceed the regulated voltage on this manual, low voltage or higher voltage can easily damage inverter.

If power is not enable, then use voltage reduction or voltage rising device to deal with voltage conversion in order to comply with inverter input voltage requirement.

### **1.3.9 Three-phase Input Change to Two Phase Input**

If inverter is 3phase input type, do not use 2phase power supply, otherwise it could result in phase loss protection error even inverter damage.

### **1.3.10 Lightning Surge Protection**

Although there is lightning overvoltage overcurrent device inside inverter, which has certain self-protection function for lightning induction. But for user located in lightning frequent zones, it is necessary to add lightning protection unit in front of inverter, this does good to extend inverter lifespan.

### **1.3.11 Altitude Level and Voltage Reduction Usage**

Place with altitude exceeding 2000M, inverter cooling effect get worse due to air condense reduced, so under-rated usage of inverter is necessary.

### **1.3.12 Common DC Bus Introduction**

In condition of several units of inverter run at the same time, then common DC bus can be adopted to save electricity. This type of inverter support common DC bus, but make sure the power specification of those inverters are very close in advance, otherwise it could damage inverter.

### **1.3.13 Precaution of Inverter Abandonment**

Inverter belongs to electric electronic device, burning disposal will result lots of harmful gas even exploding. Please refer to related national laws and regulations to dispose or abandon.

### **1.3.14 Regarding Adaptable Motor**

- ① This series inverter standard matching motor is quaternary squirrel-cage asynchronous induction motor or permanent magnet synchronous motor. When the dragging motor is not above type, please refer to motor rated current to select the suitable inverter.
- ② The cooling fan and rotor spindle of general motor are coaxial connected. While motor rotating speed reducing resulted cooling fan Deceleration proportionally and so making heat dissipation worse. As a conclusion, if motor run at low frequency stage for long time, it is necessary to add a strong exhaust fan or change the motor to variable frequency motor.
- ③ Inverter default setup has built-in standard parameter for its adaptive motor, but in actual application, it is necessary to identify motor parameter or change its original default setup of motor parameter. Otherwise it will affect operation efficiency and protection performance to motor.
- ④ Due to cable or motor internal short circuit can result in inverter alarm or even exploding. So insulation and short circuit test on wiring and motor should be done before connecting and installing motor. If the system has been idled for long time, then a retest should be done to avoid system damage or performance reduce.



## Chapter 2 Product Information

### 2.1 Designation Rules

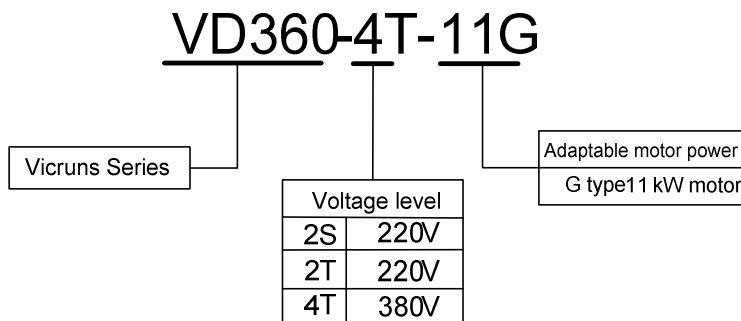


Fig 2.1-1 Designation Rules

### 2.2 Nameplate



Fig 2.2-1 Nameplate instructions

	<b>WARNING</b>
<ul style="list-style-type: none"> <li>• The bar code on inverter nameplate is the only code to recognize its identity, so the bar code is the most important basis for the after sales service.</li> </ul>	

### 2.3 Products Specifications and Technical Data

Table 2-1 Output three-phase 220V series product specifications and technical data

220V Voltage Level	
Maximum input DV voltage	400VDC
Recommended MPPT voltage range	180~350VDC
Recommended input working voltage	330VDC
MPPT efficiency	99.99%
Input group number	1

Rated output voltage	3AC 220V				
Input frequency range	0~50Hz				
Maximum efficiency of the whole machine	97%				
Cooling method	Forced air cooling				
Protection grade	IP20				
Altitude	Below 1000 m, after the altitude of more than 1000 m, please according to the scale of 100 m derating 1% drop				
Standard	CE				
Model No.	Power Capacity (kVA)	Rated Input Current (A)	Rated Output Current (A)	Adaptable Motor	
				kW	HP
Single-phase power supply: 220V, 50/60Hz					
VD360-2S-0.7G	1.5	7.2	4.0	0.75	1
VD360-2S-1.5G	3.0	14.0	6.0	1.5	2
VD360-2S-2.2G	4.0	23.0	9.6	2.2	3
VD360-2S-3.7G	5.9	35.0	16.0	3.7	5
VD360-2S-5.5G	7.9	50.0	25.0	5.5	6.5

Table 2-2 Output three-phase 380V series product specifications and technical data

380V Voltage Level	
Maximum input DV voltage	800VDC
Recommended MPPT voltage range	350~750VDC
Recommended input working voltage	540VDC
MPPT efficiency	99.99%
Input group number	1
Rated output voltage	3AC 380V
Input frequency range	0~50Hz
Maximum efficiency of the whole machine	97%
Cooling method	Forced air cooling
Protection grade	IP20
Altitude	Below 1000 m, after the altitude of more than 1000 m, please according to the scale of 100 m derating 1% drop
Standard	CE

Model No.	Power Capacity (kVA)	Rated Input Current (A)	Rated Output Current (A)	Adaptable Motor	
				kW	HP
Three phase power supply: 380V, 50/60Hz					
VD360-4T-0.7G	1.5	3.4	2.5	0.75	1
VD360-4T-1.5G	3.0	5.0	3.8	1.5	2
VD360-4T-2.2G	4.0	5.8	5.1	2.2	3
VD360-4T-3.7G	5.9	10.5	9.0	3.7	5
VD360-4T-5.5G	7.9	14.6	13.0	5.5	6.5
VD360-4T-7.5G	11.0	20.5	16.0	6.5	10
VD360-4T-11G	16.0	25.0	25.0	11.0	15
VD360-4T-15G	21.0	35.0	32.0	15.0	20

### 2.4 Physical Appearance and Main Structure Diagram

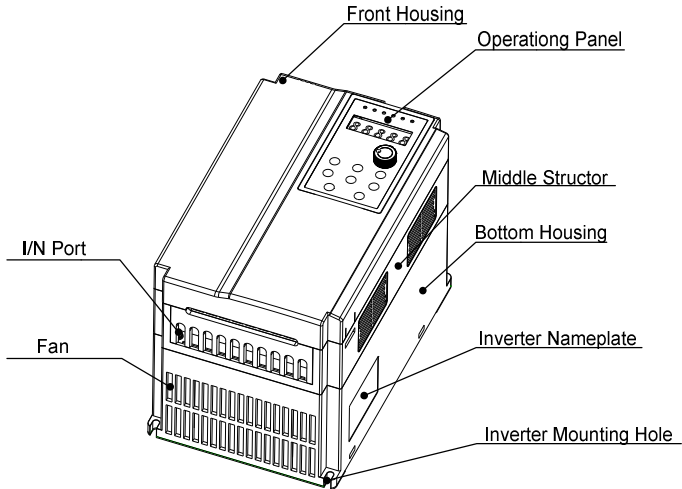


Fig 2.4-1 Physical appearance and main structure diagram

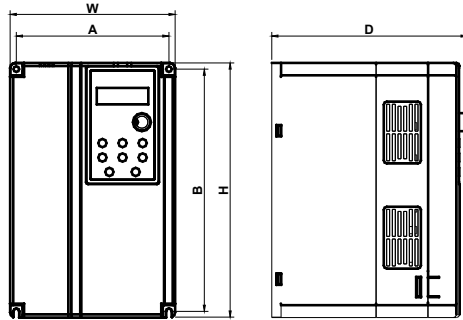


Fig 2.4-2 Schematic diagram for physical dimensions and mounting dimensions (below 7.5kW)

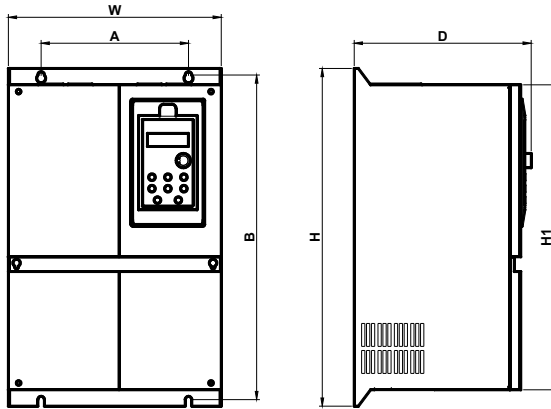


Fig 2.4-3 Schematic diagram for physical dimensions and mounting dimensions (11kW~15kW)

Table 2-3 Physical dimensions and installation hole (mm)

Model No	Mounting Hole (mm)		Physical Dimensions (mm)				Diameter of Mounting Hole (mm)	Weight (kg)
	A	B	H	H1	W	D		
VD360-2S-0.7G	105.5	175	185(H)	/	118	169	4.5	1.8
VD360-2S-1.5G								
VD360-2S-2.2G								
VD360-2S-3.7G	148	235	247(H)	/	160	191	5.5	3.0
VD360-2S-5.5G								
VD360-4T-0.7G	105.5	175	185(H)	/	118	169	4.5	1.8
VD360-4T-1.5G								
VD360-4T-2.2G								
VD360-4T-3.7G								
VD360-4T-5.5G	148	235	247(H)	/	160	191	5.5	3.0
VD360-4T-7.5G								
VD360-4T-11G	120	308	320(H)	284	190	195.5	5.5	6.5
VD360-4T-15G								

## 2.5 Routine Repair and Maintenance of Inverter

The influence of the ambient temperature, humidity, dust and vibration will cause the aging of the devices in the inverter, which may cause potential fault of the inverter or reduce the service life of the inverter. Therefore, it is necessary to carry out routine and periodical maintenance on the inverter, it must be regularly maintenance for every 3~6 months.

### 2.5.1 Daily Round Check

Daily Inspection Projects

#### WARNING

- If the heat from motor and the run inverter is higher than normal temperature
- If any abnormal noise or vibration from motor and the run inverter
- If current value of inverter loading current is as normal level
- If inverter cooling fan is run as normal, if it is stained with oil dirt and speed getting low.
- If the color of main control circuit terminal changed or rusted, if any arc discharge between input and output phases.
- If the enclosure of inverter is overheat, if inverter inside is filled with dirt or metal powder, or oil dirt on circuit board or conductive copper bar etc.
- If inverter is installed in cabinet, good ventilation is kept, cooling fan is run as normal.

### 2.5.2 Regular Maintenance

Regular maintenance item

#### WARNING

- Clear inverter cooling air duct regularly, once the speed of cooling fan inside cabinet getting low or stop, then replace it on time.
- Check if the connecting screws in main circuit and control circuit is loosed, any signs of overheat on connecting copper bar inside inverter.
- Check if the insulation performance of motor and main circuit cable, any insulation damage of main circuit and control circuit, especially the surface contacting with metal has cut.
- Non-professional staff or untrained operator cannot do maintenance or change device of the inverter, failure to comply will result in personal hurt or damage the device.
- User is required to do insulation test on inverter. While testing insulation resistor of motor and cable, make sure to disconnect inverter in advance. Otherwise the inverter can be damaged.
- If user insist to do insulation test on inverter, make sure all the input output terminal of main circuit (L, N, R, S, T, U, V, W, P1, P+, PB, P-) are reliably grounded, use a 500V Meg Ohm Meter to check.
- Do not use a 500V meg ohm meter to check on control circuit terminal, otherwise it can damage inverter.

### 2.5.3 Inverter Wearing Part Replacement

Some device inside inverter can get wearing or aged after using for a certain period, in order to ensure inverter operate reliably, it is necessary to do preventive maintenance, when necessary some device need to be replaced.

The wearing part of inverter mainly as cooling fan, filtering big capacity electrolytic capacitor. Those life is closely related with its applicant environment and maintain condition.

#### WARNING

- In general condition the inverter cooling fan need to replace for every 2-3 years.
- In general condition the big capacity electrolytic capacitor of inverter need to replace for every 4-5 years.

### 2.5.4 Inverter Storage

If inverter has to be kept for some time or long time after purchasing, should pay attention to the following:

#### WARNING

- Do not keep it in high temperature, humid or vibrated place with metal powder, and keep good ventilation.
- If inverter kept too long without run, the filter capacitor performance will reduce.
- If the inverter is not used for a long time, the characteristics of the large capacity filter capacitor should be recovered once every two years, check the inverter function at the same time. When power on the inverter, an auto-transformer should be applied to upgrade voltage, and power-on time should less than 5hr.

## 2.6 Warranty Introduction

For inverter manufactured by our factory, since the date of manufacture, under normal condition application, if inverter failed or damaged within warranty period, the manufacturer response for repair. If inverter is without in warranty period, users need to take reasonable maintenance costs.

#### WARNING

- Free warranty only refers to the frequency converter
- Please keep the machine outer packing boxes and other packaging materials, to facilitate future inverter relocation or repair and other logistics transportation

Our company will provide 18-month warranty (starting from the leave-factory date as indicated on the bar code) for the failure or damage under normal use conditions. If the equipment has been used for over 12 months, reasonable repair expenses will be charged.

### **2.6.1 In the warranty period, the following reasons lead to the failure of the inverter and damage, the user must bear part of the maintenance costs.**

- ① The machine failure caused by the user does not use the user manual or beyond the standard specifications range use;
- ② The machine failure caused by the user repair and modify;
- ③ The machine failure caused by the user custody, maintenance improper.
- ④ Damage caused when the inverter is used for abnormal function;
- ⑤ The machine failure due to fires, floods, salt corrosion, corrosive gases, earthquake, storm, lightning, abnormal voltage or other non resistance caused by damage to the machine.

**2.6.2 Relevant service charges will be calculated in accordance with the manufacturer's unified standard, if there is a contract, it is handled according to the relevant provisions of the contract.**

# Chapter 3 Debug Instruction and Control Terminal

## 3.1 Debugging Steps of Solar Board Power Supply

3.1.1 Refer to Figure 3.1, and check if the wiring is correct, and then Q2 is closed.

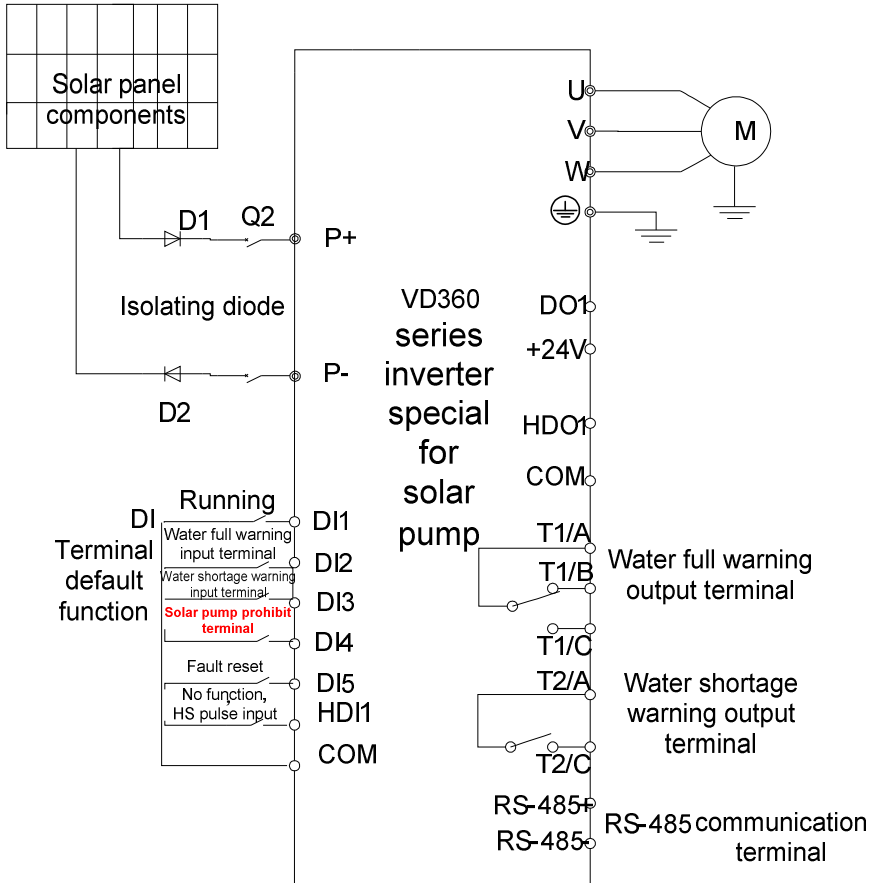


Fig 3.1 reference wiring diagram of photovoltaic panel power supply

### 3.1.2 Motor parameters setting

Set the motor nameplate parameters, respectively P02.01 rated motor power, P00.02 rated motor voltage, P02.03 rated motor current, P02.04 rated motor frequency, P02.05 rated motor speed.

### 3.1.3 Water pump yield tests

- 1) Set P29.01=6 to restore solar water pump parameters, return to the solar water pump factory parameters.
- 2) Set the P00.01=0 keyboard command channel.

3) Click run key, and then observe the frequency and the water situation, in the light of normal circumstances, if the frequency is normal but the water is less, that the motor may be connected to the counter, the need to stop the exchange of two electrical wiring.

### 3.1.4 PI adjustment of water outlet speed

If the user has a higher response to the water speed, can adjust the PI parameters (P22.06~P22.10), the stronger the PI parameters, the greater the regulation, the water response speed is also faster, but will cause the increase of the motor frequency fluctuation; whereas the weak water response speed is slower, the motor frequency is relatively stable.

### 3.1.5 MPPT tracking speed debugging

MPPT will track the maximum power tracking voltage in the range of P22.29~P22.30. Between this range is smaller, the faster the tracking. To ensure the normal work of the voltage point falls within the scope, otherwise not be able to track the maximum power point. In general:

- 1) Rated motor voltage is P22.29=180, P22.30=380, 220V
- 2) Rated motor voltage is P22.29=350, P22.30=750, 380V

The above value is only for reference P22.29 (maximum power tracking minimum voltage reference) and P22.30 (maximum power tracking maximum voltage reference) must be appropriately adjusted according to the situation.

### 3.1.6 Fault point setting and fault reset and time delay

If customers need to use dry pump warning, weak light warning, full water warning and water shortage warning can according to the need set up fault detection, reset time and delay time. The water full warning water level sensor for the low and high water tower reservoir respectively, water shortage warning water level sensor reach above and parallel to the deep well pump respectively. Water shortage warning is set up P22.15~P22.15, full water warning is set to P22.16~P22.19, dry pump warning set P22.16~P22.19, light weak warning set to P22.25~P22.27, the user can directly use the default settings.

### 3.1.7 Parameter setting after system running normally

When the water is normal, after the stable operation of the system, debugging is completed. When setting up P29.01=0, it is a common product, not in accordance with the function of PV work. When setting up P29.01=6, recovery of solar water pump factory parameters (see table 4-1), closed DI1 terminal automatic operation.

## 3.2 Debugging steps for power supply of municipal electric and solar panels

3.2.1 According to the wiring diagram wiring, first Q2 off, and then Q1 can be closed, consistent with Figure 3.2.

3.2.2 To set the parameters of the motor

Set the motor nameplate parameters, respectively for P02.01 rated motor power, P02.02 rated motor voltage, P02.03 rated motor current, P02.04 rated motor frequency, P02.05 rated motor speed. (After each setting must remember to press the ENTER button).

3.2.3 According to the 3.1 debugging steps 2, 3, 4, 5, 6, 7 debugging good system.

3.2.4 Close the DI4 terminal (or set P22.01=0).

3.2.5 To observe the size of the operation bus voltage, set the voltage reference value of P22.02, ensure that the value is less than the runtime of the bus voltage, the greater the difference, the faster the water response. Recommended setting for less than the runtime bus voltage fluctuation 20 ~ 30V.

3.2.6 In the conversion of solar power supply, only need to disconnect the Q1, terminal Q2 off, DI4 closed.



**Note: it is strictly prohibited to Q2, Q1 closing at the same time, otherwise it will damage the solar panels!**

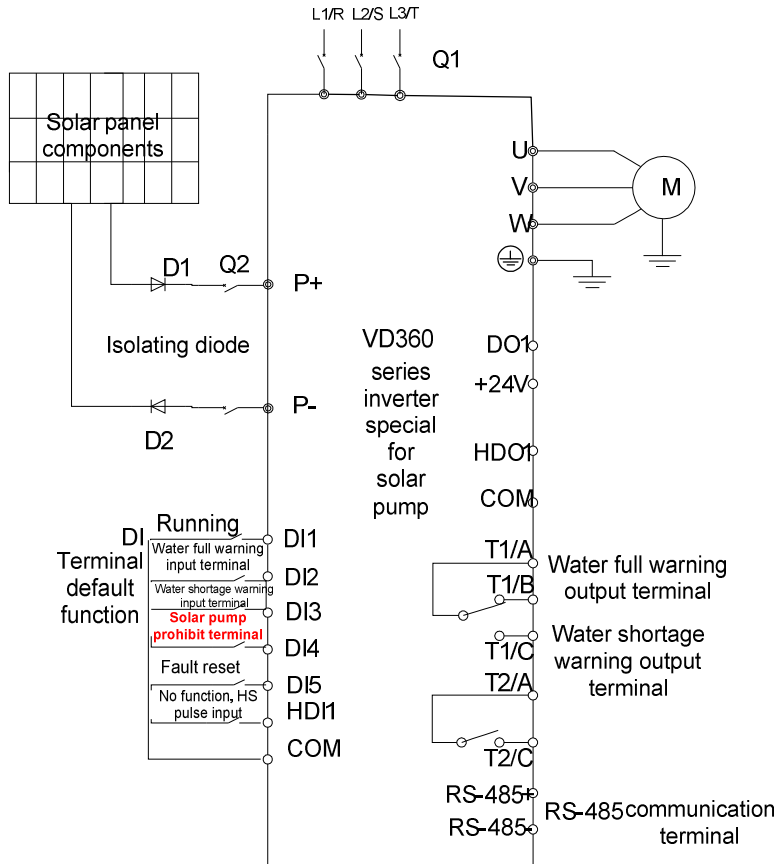
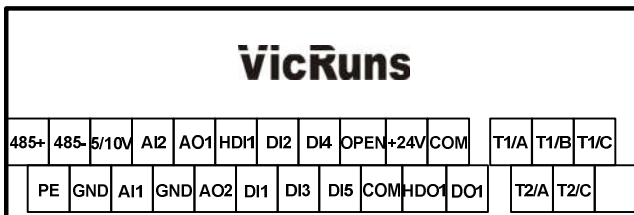


Fig 3.2 Reference wiring diagram of electric and solar panels respectively

### 3.3 Control Circuit Terminals

#### 3.3.1 Wiring Diagram of Control Circuit Terminals



### 3.3.2 Function Description of Control Circuit Terminal

Table 3-7 Function description of control circuit terminal

Type	Terminal Sign	Terminal Name	Function
Power Supply	5V/10V-GND	+5V/10V power supply	<ol style="list-style-type: none"> <li>1. Provide +5V/10V power supply for external-units, J15 jumper on main control board to select 5V or 10V power output, default is 10V.</li> <li>2. It is generally used as the operating power supply for the external potentiometer, the range of potentiometer resistance is 1kΩ~10KΩ.</li> <li>3. The Maximum output current 20mA.</li> </ol>
	+24V-COM	24V power supply	<ol style="list-style-type: none"> <li>1. Provide +24V power supply for external units. It is generally used as the operating power supply for digital input/output terminals and the external sensor.</li> <li>2. The maximum output current is 200mA.</li> </ol>
	OPEN	External power input terminal	<ol style="list-style-type: none"> <li>1. Connect to 24V by default, J14 jumper on main control board to select +24V or COM connection.</li> <li>2. When external power is used to drive DI1~DI5, HDI1, OPEN needs to connect to the external power supply and disconnect J14 (disconnecting with +24V/COM).</li> </ol>
Communication	485+-485-	RS-485 communication terminals	Standard RS-485 communication terminal, should use twisted pair cable
Analog Input	AI1-GND	Analog input terminal 1	<ol style="list-style-type: none"> <li>1. Input Voltage range : DC 0V to 10V</li> <li>2. Input resistance : 22kΩ</li> </ol>
	AI2-GND	Analog input terminal 2	<ol style="list-style-type: none"> <li>1. Input range : DC 0V to 10V or 0/4mA~20mA, can be selected by J5 jumper on main control board, default DC0V~10V signal;</li> <li>2. Input impedance: under voltage input-22 kΩ, under current input 500Ω.</li> </ol>
Digital Input	DI1-COM	Digital input terminal 1	<ol style="list-style-type: none"> <li>1. Optical coupling isolation, compatible with dual polarity input, internal resistance 3.3kΩ;</li> <li>2. Multi-function digital input, through F5-01-F5-05 to set function.</li> <li>3. The inverter default +24v power supply built-in, COM is common terminal.</li> <li>4. When using external power, JP14 should be suspended, external +24V connect to OPEN terminal, COM is common terminal (external voltage supply range is +24V±10%).</li> </ol>
	DI2-COM	Digital input terminal 2	
	DI3-COM	Digital input terminal 3	
	DI4-COM	Digital input terminal 4	
	DI5-COM	Digital input terminal 5	

	HDI1-COM	High speed pulse input terminal	<ol style="list-style-type: none"> <li>1. When used as general digit input, it is the same function as DI1~DI5;</li> <li>2. Can be combine with OPEN terminal as bipolar high speed pulse input terminals, max input frequency is 100kHz.</li> <li>3. When use external power, input voltage range <math>+24V\pm 10\%</math>;</li> <li>4. The internal impedance 1.65 k<math>\Omega</math></li> </ol>
Analog Output	AO1-GND	Analog output terminal 1	Support 0V~10V voltage or 0/4mA~20mA current output, decided by jumper J3, default 0V~10V voltage output
	AO2-GND	Analog output terminal 2	Support 0V~10V voltage or 0/4mA~20mA current output, decided by jumper J4, default 0V~10V voltage output
Digital Output	DO1-COM	Digital output 1	<ol style="list-style-type: none"> <li>1. Optical coupling isolation, dual polarity open collector output;</li> <li>2. Pull-up voltage range: 5V~24V (pull-up resistance range: 0.48k<math>\Omega</math>~10k<math>\Omega</math>);</li> <li>3. Output current range: 2mA~50mA.</li> </ol>
	HDO1-COM	Rapid pulse input terminal	<ol style="list-style-type: none"> <li>1. When used as general digital output, same function as DO1;</li> <li>2. Can be combined with the OPEN terminal as bipolar high speed pulse output terminals, max output frequency is 100kHz;</li> <li>3. Pull-up voltage range: 5V-24V(pull-up resistance range: 0.48k<math>\Omega</math>~10k<math>\Omega</math>).</li> <li>4. Output current range: 2mA~50mA</li> </ol>
Relay Output	T1/A-T1/B	Relay T1 normally closed terminal	Contact driving capacity: AC250V, 3A, DC 30V, 5A
	T1/A-T1/C	Relay T1 normally open terminal	
	T2/A-T2/C	Relay T2 normally open terminal	
Ground	PE	Shield cable ground terminal	<ol style="list-style-type: none"> <li>1. Used to control cable shield grounding, when the interference is big on site or control cable is too long, the PE should be well grounded to reduce EMC affect.</li> <li>2. PE terminal is not allowed to connect with power N line, otherwise will damaged the inverter</li> </ol>

## Chapter 4 Function Parameter Table

The symbols in the function table are described as follows:

- It indicates that the parameter setup value can be modified when the inverter is in run state;
- ◎—It indicates that the parameter setup value cannot be modified when the inverter is in the run state;
- It indicates that the numerical value of the parameter is the actually measured value, which cannot be modified;
- ☆—It indicates this parameter is “Factory default parameter” and can be set only by the manufacturer.

P00 Basic Function Parameter Group				
Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P00.01	Start stop command selection	Select the source of the running order of the inverter: 0: Keypad command channel (L/R OFF) By the keyboard panel RUN, STOP / RESET button to start, stop and other commands. 1: Terminal command channel (L/R ON) By the multi function input terminal to achieve control commands, reference P05 group function code 2: Communication command channel (L/R flashes) Run command from the host computer through a communication mode, reference P15 group function code	0	○
P00.14	Acceleration Time 0	0.0s~3600.0s Acceleration time is the time when the frequency is accelerated from 0.00Hz to the reference frequency (P00.16), used to set the slope of the frequency changes	Model dependent	○
P00.15	Deceleration Time 0	0.0s~3600.0s Deceleration time is the time when the frequency is accelerated from 0.00Hz to the reference frequency (P00.16), used to set the slope of the frequency changes	Model dependent	○
P01 Start/Stop Control Parameter Group				

Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P01.05	Stop Mode Selection	0: Decelerate to stop Deceleration to stop: deceleration to stop is motor relying on inverter braking, under set deceleration time reducing to zero. Different application can adopt different stop mode. 1: Coast stop Coast to stop: coast to stop is inverter cut off motor current after receiving stop command, motor relying its inertia reduce speed to zero.	0	○
P01.22	Power-on Terminal Running Protection Selection	0: Terminal operation command is disabled when power on 1: Terminal operation command is enabled when power on	0	○
P01.23	Restart Selection Upon Power Failure	0: Disabled restart When the inverter power failure, once again on the power, the inverter does not automatically start running 1: Allow restart When the inverter power failure, after power on again, the inverter automatically start running	0	○
P01.24	Waiting Time of Restart Upon Power Failure	0.0s~3600.0s (corresponding P01.23=1 is effective)	1.0s	○
<b>P02 Motor Parameter Group</b>				
Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P02.00	Motor 1 Type	0: Asynchronous motor	0	●
P02.01	Rated Motor 1 Power	0.4kW~1000.0kW	Model dependent	◎
P02.02	Rated Motor 1 Voltage	0V~1500V	Model dependent	◎
P02.03	Rated Motor 1 Current	0.0A~2000.0A	Model dependent	◎
P02.04	Rated Motor 1 Frequency	0.00Hz~P00.07 (Maximum output frequency)	Model dependent	◎

P02.05	Rated Motor 1 Rotation Speed	ORPM~65535RPM	Model dependent	⊙
The above set of asynchronous motor rated parameters, the user can input according to the motor nameplate.				
Note: the power of the asynchronous motor should be matched with the power level of the inverter.				
P05 Input Terminal Parameters Group				
Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P05.01	DI1 Input Function Selection	0: No function	1	⊙
P05.02	DI2 Input Function Selection	The terminals not being used can be set "no function", to avoid wrong operation;	54	⊙
P05.03	DI3 Input Function Selection	1: Forward running (FWD)	44	⊙
P05.04	DI4 Input Function Selection	Through the external terminal to control the operation of the inverter;	56	⊙
P05.05	DI5 Input Function Selection	54: Water full warning	0	⊙
P05.06	HDI1 Input Function Selection (Can select HS pulse input)	Receiving water level warning device signal;	0	⊙
		55: Water shortage warning		
		Receiving water level warning device signal;		
		56: Solar water pump is disabled		
		Prohibit solar water pump function, use external power supply;		
P06 Output Terminal Function Parameter Group				
Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P06.03	DO1 Digital Output Function Selection	See table blow	0	○
P06.04	HDO1 Digital Output Function Selection		0	○

P06.05	Relay T1 Digital Output Function Selection		0	○
P06.06	Relay T2 Digital Output Function Selection		0	○
Digital output terminal function table:				
Set Value	Function	Description		
0	Disabled	There have no function on output terminals		
1	Inverter in running	It indicate the inverter is in running state, have the output frequency (can be zero), the output ON signal.		
5	Inverter fault	When the inverter fails and downtime, output ON signal.		
7	Frequency inverter ready running	When the main circuit and control circuit of supply is stable, and the inverter not detected any failure information, the inverter in the running, output ON signal.		
34	Solar water pump total warning	Water full, dry pump, light weak, water shortage warning of the combined output signal.		
35	Water full warning	Receives the water tank will be the full signal, the output ON signal.		
36	Dry pump warning	When detect the pump idle (no load), the output signal of ON.		
37	Light weak warning	When the light intensity is not enough (weak light), the output ON signal.		
38	Water shortage warning	The water source water shortage signal is received, the output ON signal.		
P22 Solar Inverter Special Function Group				
Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P22.00	Solar Inverter Selection	0: Disabled 1: Enabled  0 indicates that the PV control is not valid and that the function group is not valid. 1 for the PV control.	0	◎
P22.01	Vmpp Voltage Given Selection	0: Voltage given 1: Maximum power tracking is given  For 0, said the use of a voltage given method, the reference voltage from the P22.02 keyboard to a given reference voltage, is a fixed value.  The 1 represents the maximum power to track a given reference voltage and the	1	◎

		reference voltage will continue to change until the system is stable.  No matter what kind of reference voltage, when the bus voltage is higher than the reference voltage, target frequency will go to the upper limit of the output frequency of the PI; when the bus voltage is lower than the reference voltage, target frequency will go to the lower limit of the output frequency of the PI.		
P22.02	Vmpp Voltage Keyboard Given	0~6553.5V In the case of P22.01 is 0, the value of the reference voltage is given by the function code.	530.0V	○
P22.03	PI Control Deviation Limit	0.0~100.0% (100.0% corresponded to P22.02)  Namely ABS (bus voltage deduction voltage) *100.0%/ reference voltage, the value is greater than P22.03 deviation limit value, the PI will be adjusted, otherwise do not carry out PI processing.  Abs: absolute value	0.0%	○
P22.04	PI Output Frequency Upper Limit	P22.05~100.0% (100.0% corresponded to P00.07)	100.0%	○
P22.05	PI Output Frequency Lower Limit	0.0%~P22.04 (100.0% corresponded to P00.07)	0.0%	○
P22.06	KP1	0.00~100.00  Target frequency ratio coefficient 1  The greater the value, the greater the role, the faster the adjustment	1.00	○
P22.07	KI1	0.00~100.00  Target frequency integral coefficient 1  The greater the value, the greater the role, the faster the adjustment	1.00	○
P22.08	KP2	0.00~100.00  Target frequency ratio coefficient 1  The greater the value, the greater the role, the faster the adjustment	4.00	○
P22.09	KI2	0.00~100.00  Target frequency integral coefficient 1  The greater the value, the greater the role, the faster the adjustment	4.00	○
P22.10	PI Switching Point	0.0~6553.5V	50.0V	○



		When the absolute value of bus voltage and the reference voltage difference is greater than the P22.10 set value, switch to KI2 and KP2; otherwise, the use of KP1 and KI1.		
P22.11	Reserved	Reserved	0	●
P22.12	Water Source Water Shortage Detection Selection	0: Disabled 1: AI1 2: AI2 3: AI3 4: DI terminal  When selection 0, the water shortage detection is disabled	0	◎
P22.13	Water Shortage Threshold	0.0%~100.0%  When the water level control analog signal of detection is greater than P22.13, and continued this state after the P22.14 delay time, reported water shortage warning (Err.84), and sleep.	75.0%	○
P22.14	Water Shortage Warning Delay	0~3600s	10s	○
P22.15	Water Shortage Reset Delay	0~3600s	300s	○
P22.16	Water Full Detection Selection	0: Disabled 1: AI1 2: AI2 3: AI3 4: DI terminal  When choose 0, the water full detection is invalid.	0	◎
P22.17	Water Full Threshold	When the water level control analog signal of detection is less than P22.17, and continued this state after the P22.18 delay time, reported water shortage warning (Err.81), and sleep.	25.0%	○
P22.18	Water Full Warning Delay	0~3600s	10s	○
P22.19	Water Full Reset Delay	0~3600s	300s	○
P22.20	Dry Pump Detection Enable	0: Disabled 1: Enabled	0	○

		After dry pump detection enables P22.21~P22.24 to be effective.		
P22.21	Dry Pump Current Threshold	0.0~100.0%	50.0%	○
P22.22	Dry Pump Frequency Threshold	0.00~50.00Hz	30.00Hz	○
P22.23	Dry Pump Warning Delay	0~3600s When the motor current is less than P22.21 and the motor running frequency is greater than P22.22, the state duration is greater than P22.23, the dry pump warning (Err.82), and sleep.	60s	○
P22.24	Dry Pump Reset Delay	0~3600s	120s	○
P22.25	Light Weak Judgment Frequency	0.00~50.00Hz	5.00Hz	○
P22.26	Light Weak Warning Delay	0~3600s When the output frequency is less than or equal to P22.25, and the duration is greater than P22.26, light weak warning (Err.83), and sleep. Note: When the bus voltage is lower than (the software under the voltage point+50.0V), the direct warning light weak, without delay waiting.	100s	○
P22.27	Light Weak Reset Delay	0~3600s	300s	○
P22.28	Reference Voltage for a Given Display	Real time display monitoring value	0	●
P22.29	Maximum Power Tracking Minimum Voltage Reference	0.0V~P22.30 When P22.01=1, for the minimum voltage in tracking. The maximum power tracking voltage will be tracked within the range of P22.29~P22.30. Be sure to ensure that the normal maximum power voltage points fall within the range.P22.29 and P22.30 must be properly adjusted according to the site conditions.	220V: 180.0V 380V: 350.0V	○
P22.30	Maximum Power Tracking Maximum Voltage Reference	P22.29~6553.5V When P22.01=1, for the maximum voltage in tracking.	220V: 380.0V 380V: 750.0V	○
P22.31	Maximum Power Tracking Control Voltage	0.1~6553.5V	1.0V	○

P22.32	Solar Pump MPPT Algorithm Computing Cycle	1~65536ms	500ms	○
P22.33	Search Initial Value	0.50~2.00	0.85	○
P22.34	Maximum Power Tracking Mode	0~1	0	○

The above parameters are the special parameters of solar pump frequency inverter

#### P28 Condition Monitoring Parameters Group

Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P28.00	Running Frequency		0.01Hz	●
P28.01	Set Frequency		0.01Hz	●
P28.02	Slope Given Frequency		0.01Hz	●
P28.03	Bus Voltage		0.1V	●
P28.04	Output Voltage		1V	●
P28.12	Motor Run Speed		1RPM	●
P28.27	Current Fault Code		1	●
P28.28	Accumulative Running Time		1h	●
P28.29	Accumulative Power-on Time		1h	●
P28.30	Current Running Time		1min	●
P28.31	Current Power-on Time		1min	●
P28.32	Module Temperature		0.1°C	●

The above parameters are used to check the inverter input, output, and other users to set the real-time display of function value. The user can view the group function code in real time, and judge the running state of the inverter.

#### P29 User Parameters Group

Function Code	Parameter Name	Setting Range	Factory Default Value	Property
P29.00	User Password	0~65535 Any non-zero number can be set, and then the password protection function will be enabled. When enter the menu next time, must input password correctly, otherwise	0	○

		can't view and modify the function parameters, please remember setup user password correctly.  Set P29.00 to 0000: clear the previous setup user password and disable the password protection function.		
P29.01	Parameter Initialization	0: No operation 1: Restore the factory parameter 2: Clear the fault record 3: Clear accumulative running and power-on time 4: Date upload (inverter to panel) 5: Date download (panel to inverter) 6: Reset solar pump parameters	0	©
When P29.01=6 is set, the solar pump factory parameters default are as follow table:				

Function Code	Setting Value	Explain
P00.01	1	Terminal control
P00.14	2.0	Acceleration time
P00.15	0.1	Deceleration time
P01.05	1	Coast to stop
P01.22	1	After the power is turned on, the terminal commands are still valid
P01.23	1	Allow power outage to start again
P05.02	54	Water full warning input terminal
P05.03	55	Water shortage warning input terminal
P05.04	56	Solar pump prohibit terminal
P06.03	37	Light weak warning output terminal
P06.05	35	Water full warning output terminal
P06.06	38	Water shortage warning output terminal
P22.00	1	Solar pump enable

# Chapter 5 Fault Shooting and Solutions

## 5.1 Fault Alarm and Countermeasures

VD360 inverter special for solar pump has warning information and fault protection function. In case of abnormal fault, the inverter error relay contactor will be in action, before user seeking for help, please do self-inspection according to this chapter to analyze causes and find out solution. If user cannot solve problem by himself, seeking for help or directly contact your local dealer or our company.

VD360 inverter special for solar pump during running process or powered on, if fault occurred, on the display of panel of inverter will show error code. At the moment inverter already have protection effectively to the fault, output terminal stopped output, the display panel has indicating current error with 2~5 code.

Inverter keypad displayer has showing error code when in error, the code content and corrective action as below table.

Code	Error Type	Possible Error Causes	Solution
Er001	Acceleration run over-current (hardware)	1: Acceleration time is too short 2: Motor parameter is not correct 3: Grid voltage is too low 4: Inverter power is too small 5: V/F curve inappropriate 6: Inverse module short circuit protection	1: Extend acceleration time 2: Self-tuning of motor parameter 3: Check grid input power 4: Select inverter with bigger power class 5: Adjust V/F curve setting, adjust manual torque boost 6: Inverter module or drive circuit damage
Er002	Deceleration run over-current (hardware)	1: Deceleration time is too short 2: load inertia torque is too big 3: Inverter power is too small 4: Inverse module short circuit protection	1: Extend deceleration time 2: Add external energy consumption braking unit 3: Choose inverter with bigger class power 4: Inverse module or drive circuit damage
Er003	Constant speed run over-current (hardware)	1: Load with jump or abnormal 2: Grid voltage is too low 3: Inverter power is too small 4: Inverse module short circuit protection	1: Check load or reduce load jumping 2: Check grid input power 3: Choose inverter with bigger class power 4: Inverse module or drive circuit damage
Er004	Acceleration run over-current (software)	1: Acceleration time is too short 2: Motor parameter is not correct 3: Grid voltage is too low 4: Inverter power is too small 5: V/F curve inappropriate	1: Extend acceleration time 2: Self-tuning of motor parameter 3: Check grid input power 4: Select inverter with bigger power class 5: Adjust V/F curve setting, adjust manual torque boost
Er005	Deceleration run over-current	1: Deceleration time is too short 2: Load inertia torque is too	1: Extend deceleration time 2: Add external energy consumption braking unit

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	(software)	big 3: Inverter power is too small	3: Choose inverter with bigger class power
Er006	Constant speed run over-current (software)	1: Load with jump or abnormal 2: Grid voltage is too low 3: Inverter power is too small	1: Check load or reduce load jumping 2: Check grid input power 3: Choose inverter with bigger class power
Er007	Acceleration run over-voltage	1: Input voltage abnormal 2: Restart motor in rotating after instant power off	1: Check grid input power 2: Avoid stop and restart
Er008	Deceleration run over-voltage	1: Deceleration time is too short 2: Load inertia torque is too big 3: Input voltage abnormal	1: Extend Deceleration time 2: Increase energy consumption braking unit 3: Check grid input power
Er009	Constant speed run over-voltage	1: Input voltage abnormal 2: Input voltage with abnormal change 3: Load inertia is too big	1: Check grid input power 2: Install input electric reactor 3: Add external energy consumption braking unit
Er010	Bus under-voltage	1: Grid voltage too low 2: Instant power off	1: Check grid input power 2: RESET operation
Er011	Motor overload	1: Grid voltage is too low 2: Motor rate current setting un-correct 3: Motor stalled for load jump is too big	1: Check grid voltage 2: Reset setting motor rate current 3: Check load, adjust torque boost quantity
Er012	Inverter overload	1: Acceleration is too quick 2: Restart motor in rotating 3: Grid voltage is too low 4: Load is too big	1: Increase acceleration time 2: Avoid stop and restart 3: Check grid voltage 4: Choose bigger power inverter
Er013	Phase loss at input side	Phase loss with input R, S, T	1: Check grid input power 2: Check installation wiring
Er014	Phase loss at output side	1: U, V, W output phase loss 2: Load 3phase seriously unbalance	1: Check output wiring 2: Check motor and cable
Er015	Inverse module overheat	1: Inverter instant over current 2: Output 3phase with interphase or short circuit to ground 3: Air channel stalled or fan damaged 4: Environment temperature high 5: Control board connection or plug in loose 6: Auxiliary power damage, drive voltage under-voltage 7: Power module with bridge arm straight 8: Control board abnormal	1: Refer to overcurrent solution 2: Re-wiring 3: Clear fan channel or change fan 4: Reduce environment temperature 5: Check and re-connect 6: Seek for help 7: Seek for help 8: Seek for help

Er016	Current over limit error in run	Setting of Current over limit value is small	Check P13.09~P13.11 setting
Er017	External error	DI external error input terminal act	Check external device input
Er018	Communication error	1: Baud rate setting inappropriate 2: Adopt serious communication error 3: Communication break up for long time	1: Set appropriate baud rate 2: Press STOP/RST key to reset, seek help 3: Check communication interface wiring
Er019	Current detecting circuit error	1: Control board connector with bad connection 2: Auxiliary power damage 3: Hall device damage 4: Amplify circuit abnormal	1: Check connector, re-wring 2: Seek for help 3: Seek for help 4: Seek for help
Er020	Motor self-learning error	1: Motor and inverter capacity is not match 2: Motor rate parameter setting inappropriate 3: Self-learning parameter and standard parameter deviation is too big 4: Self-learning overtime	1: Change inverter model 2: Set rate parameter according to motor nameplate 3: Make motor empty load, re-identify 4: Check motor wire connection, parameter setting
Er021	EEPROM write-read error	1: Write-read error of the control parameter 2: EEPROM damage	1: Press STOP/RST key to reset, seek for help 2: Seek for help
Er024	Motor short circuit to ground	One phase short circuit to ground( U, V, W)	Check output 3phase to ground conductance, eliminate error
Er081	Water full warning	1. Water tank level will be full	1. Wait for the water level to drop
Er082	Dry pump warning	1. Pump idling	1. Restart 2. Check whether the water source is short of water
Er083	Light weak warning	1. Light intensity reduction	1. Wait for the light intensity increases
Er084	Water shortage warning	1. Water is shortage	1. Check whether the water source is short of water, waiting for the water source level rise

## 5.2 Common Faults and Solutions

### 5.2.1 No Display after Power on

Use multi-meter to check inverter input power to see if it is in accordance with inverter rated voltage. If power voltage factor is eliminated, then check 3phase rectifier bridge is okay. If rectifier bridge has exploded, please ask for help.

Check the CHARGE light on. If the light is off, the fault is mainly in the rectify bridge or the buffer resistor. If the light is on, the fault may be lies in the switchover power supply. Please ask for support.

### **5.2.2 Power Supply Air Switchover Trips off when Power on**

Inspect whether the input power supply is grounded or short circuit. Please solve the problem. Inspect whether the rectify bridge has been burnt or not. If it is damaged, ask for support.

### **5.2.3 Motor doesn't Move after Inverter Run**

Inspect if there is balanced three-phase output among U, V, W. If yes, then motor could be damaged, or mechanically locked. Please solve it. If the output is unbalanced or lost, the inverter drive board or the output module may be damaged, ask for support..

### **5.2.4 Inverter Displays Normally when Power on, but Switchover at the Input Side Trips when Run**

- ① Inspect whether the output side of inverter is short circuit. If yes, ask for support.
- ② Inspect whether ground fault exists. If yes, solve it.
- ③ If trip happens occasionally and the distance between motor and inverter is too far, it is recommended to install output AC reactor.
- ④ If inverter in normal protection, after eliminating error, press STOP/RESET key to reset error, then restart inverter.
- ⑤ After eliminating error, inverter power supply shut down, wait until LED display light off, then restart inverter.
- ⑥ If above steps cannot get inverter back to normal usage, then take note of the error code displayed, and inverter specification, product number, then contact the manufacturer.



Schedule: recommended solar array configuration and pump selection table

Schedule1: Three phase 380V output level recommended for solar array configuration

Model No.	Selection of open circuit voltage level of solar cell modules						Inverter Rated Current
	Open Circuit Voltage 21±2V		Open Circuit Voltage 31±2V		Open Circuit Voltage 43±2V		
	POWER ±3WP	Number of Series	POWER± 3WP	Number of Series	POWER±3 WP	Number of Series	
VD360-4T-0.7G	30WP	30*1					2.5A
VD360-4T-1.5G	60WP	30*1	90WP	20*1			3.8A
VD360-4T-2.2G	90WP	30*1	145WP	20*1			5.1A
VD360-4T-3.7G	85WP	28*2	120WP	20*2			9.0A
VD360-4T-5.5G			180WP	20*2			13.0A
VD360-4T-7.5G			240WP	20*2	200WP	15*3	17.0A
VD360-4T-11G			180WP	20*4	240WP	15*4	25.0A
VD360-4T-15G			240WP	20*4	240WP	15*5	32.0A

Schedule 2: Three phase 220V output level recommended for solar array configuration

Model No.	Selection of open circuit voltage level of solar cell modules						Inverter Rated Current
	Open Circuit Voltage 21±2V		Open Circuit Voltage 31±2V		Open Circuit Voltage 43±2V		
	POWER± ±3WP	Number of Series	POWER± 3WP	Number of Series	POWER± 3WP	Number of Series	
VD360-2S-0.7G			40WP	11*2	60WP	8*2	4.8A
VD360-2S-1.5G			85WP	11*2	120WP	8*2	7.0A
VD360-2S-2.2G	90WP	17*2	120WP	11*2	180WP	8*2	9.6A
VD360-2S-3.7G	100WP	17*3	140WP	11*3	190WP	8*3	17.0A
VD360-2S-5.5G	120WP	17*4	150WP	11*4	210WP	8*4	25.0A

Note: the user can configure according to their own specifications of the solar panels to be, to ensure that the solar panel output voltage and power within the specified range.

Current requirements: can not exceed the maximum DC input current.

Power requirements: Recommend the input power is 1.3 times of the inverter power.

According to the power calculation of the number of the battery board, and then combined with the voltage and current requirements, the appropriate series and parallel to the battery board.

Schedule 3: Fast type selection table for photovoltaic water pump system

Pump Head (m) Power (kw) Water Yield (m <sup>3</sup> /Day)	10m	20m	30m	50m	100m	120m	150m	200m	250m	300m	350m	400m
	12m <sup>3</sup> /Day		0.37	0.55	1.1	1.5	2.2	2.2	3	4	5.5	5.5
18m <sup>3</sup> /Day		0.37	0.75	1.5	2.2	2.2	3	4	5.5	7.5	9.2	11
30m <sup>3</sup> /Day	0.37	0.75	1.1	2.2	3	4	5.5	7.5	7.5	11	11	13
42m <sup>3</sup> /Day	0.55	0.75	1.5	3	5.5	5.5	7.5	9.2	11	13	15	18.5
60m <sup>3</sup> /Day	0.75	1.5	2.2	4	5.5	7.5	9.2	11	15	18.5	22	25
84m <sup>3</sup> /Day	1.1	2.2	3	7.5	9.2	9.5	11	15	22	25	25	30
120m <sup>3</sup> /Day	1.5	3	4	9.2	11	13	15	22	25	37	37	45
180m <sup>3</sup> /Day	2.2	4	5.5	13	15	18.5	22	30	37	55	55	63
240m <sup>3</sup> /Day	3	5.5	7.5	15	18.2	22	30	45	55	63	75	90
300m <sup>3</sup> /Day	4	5.5	9.2	18.5	25	30	37	55	63	75	90	110
360m <sup>3</sup> /Day	4	7.5	11	22	30	37	45	55	75	90	110	120
480m <sup>3</sup> /Day	5.5	9.2	15	30	37	45	55	75	90	110	140	
600m <sup>3</sup> /Day	7.5	13	18.5	45	55	63	75	90	110	140	160	

※ This table is based on the submersible pump design, selection of other pumps, according to the choice of the corresponding model of the pump, and configure the corresponding battery plate components.

※ Reference to this table can quickly determine the pump configuration, according to the selection of the inverter can be recognized and solar photovoltaic panels components.

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※ Combined with the local climate conditions, the sunshine time adjust the system configuration, this table is calculated according to the effective light for 6 hours.



## Warranty Agreement

1. The warranty period of the product is 18 months from date of manufacturing. During the warranty period, if the product fails or is damaged under the condition of normal use by following the instructions, Vicruns will be responsible for free maintenance.
2. Within the warranty period, maintenance will be charged for the damages caused by the following reasons:
  - A. Improper use or repair/modification without prior permission;
  - B. Fire, flood, abnormal voltage, other disasters and secondary disaster;
  - C. Hardware damage caused by dropping or transportation after procurement;
  - D. Improper operation;
  - E. Trouble out of the equipment (for example, external device).
3. If there is any failure or damage to the product, please correctly fill out the Product Warranty Card in detail.
4. The maintenance fee is charged according to the latest Maintenance Price List of Vicruns.
5. The product Warranty Card is not re-issued. Please keep the card and present it to the maintenance personnel when asking for maintenance.
6. If there is any problem during the service, contact Vicruns's agent of Vicruns directly.
7. This agreement shall be interpreted by Hunan Vicruns Electric Technology Co., Ltd.

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Email: [oversea@vicruns.com](mailto:oversea@vicruns.com)



## Product Warranty Card

Customer Information	Address:	
	Company Name:	Contact Person:
	Postcode:	Tel of Email:
Product Information	Product Model:	
	Serial No:	
	Name of supplier who supplied you the unit:	
Failure Description (eg. Fault code)	Maintenance Personnel:	