



# *Operation manual*

VFD500-PV/VFD500M-PV

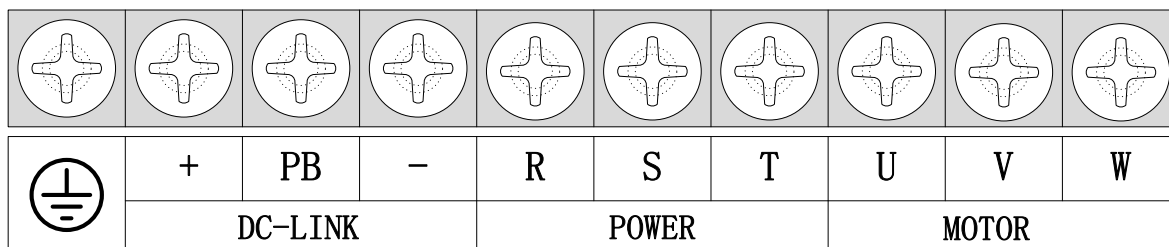
Solar pump Inverter



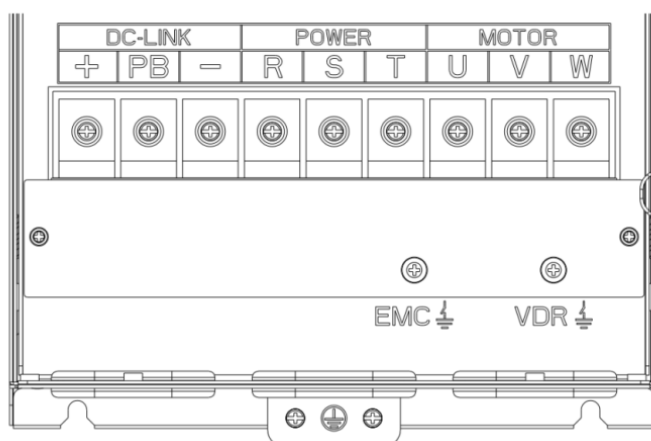
# Solar pumping inverter user manual

## 1、VFD500-PV Electrical cable Connection

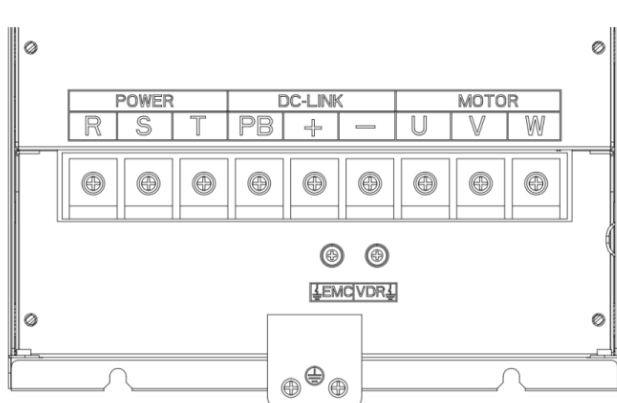
Please follow the diagram below for wiring. And pay attention to the following issues:  
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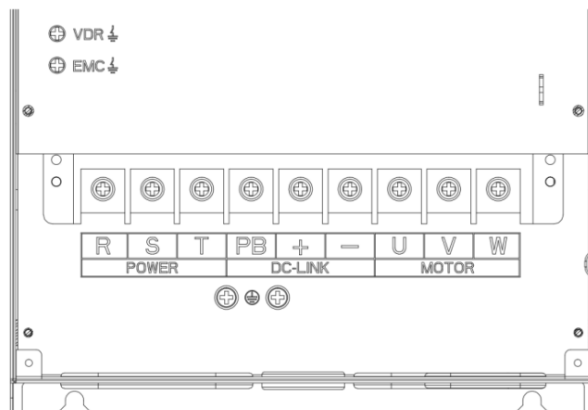
1 Figure 1-1 SIZE A~SIZE C 0.75kw-15kw Main Circuit Terminal



2 Figure 1-2 SIZE D 18.5kw-22kw main circuit terminal block diagram



3 Figure 1-3 SIZE E 30-37kw



4 Figure 1-4 SIZE F~G 45-90kw

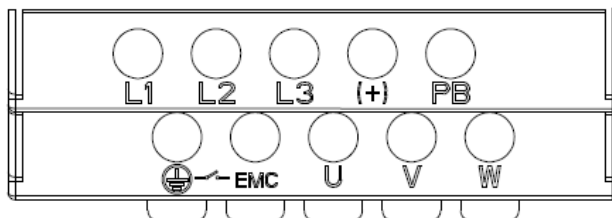
5 Table 1-5 Function description of the main circuit terminal of the inverter

| Terminal | Function instruction   |
|----------|--|
| R、S、T    | AC power input terminal, connect three-phase AC power  |
| U、V、W    | Inverter AC output terminal, connect three-phase AC motor  |
| +、-      | The positive and negative terminals of the internal DC bus are connected to the external brake unit or For common DC bus |
| +、PB     | Braking resistor connection terminal when built-in brake unit  |
| ⊕        | Ground terminal, ground  |
| EMC、VDR  | Safety capacitor and varistor grounding selection screw (SIZE A~SIZE C EMC screw on the left side of the fuselage)       |

- The power output of the PV panel is connected to the “+” and “-” terminals. Please note that the polarity is not reversed.
- Make sure that the inverter input AC voltage level is consistent with AC grid voltage before connecting with Input “R”, “S” and “T” terminals
- If Grid is single-phase power supply, you can connect to R T or any two terminals of “R”, “S” and “T”。

## 2、VFD500M-PV Electrical cable Connection

Please follow the diagram below for wiring. And pay attention to the following issues:  
Please follow the diagram below for wiring. And pay attention to the following issues:



5 Table 1-6 Function description of the main circuit terminal of the inverter

| Terminal | Function instruction   |
|----------|--|
| L1、L2、L3 | AC power input terminal, or solar DC supply terminal   |
| U、V、W    | Inverter AC output terminal, connect three-phase AC motor  |
| +、PB     | + for solar positive and PB for solar negative   |
| ⊕        | Ground terminal, ground  |
| EMC、VDR  | Safety capacitor and varistor grounding selection screw (SIZE A~SIZE C EMC screw on the left side of the fuselage) |

- The power output of the PV panel is connected to the any two terminal of L1 L2 L3 on priority Or if L1 L2 L3 are connected for AC grid ,+ terminal is for solar positive and PB for solar negative.
- Make sure that the inverter input AC voltage level is consistent with AC grid voltage before connecting with Input “L1”, “L2” and “L3” terminals
- If Grid is single-phase power supply, you can connect to L1 L2 or any two terminals of “L1”, “L2” and “L3”。

## 1.1 Electrical Specifications

Table 1-1 Electrical Specifications

|   | 220V   | 380V               |
|---|--|--------------------|
| Max input DC voltage(VOC)                 | 450V   | 800V               |
| DC voltage range                          | 200~450VDC   | 350~800VDC         |
| Recommended DC input voltage range (Vmpp) | 250V-400V  | 450V-600V          |
| Recommended Input Operation Voltage       | 305V(Vmpp)   | 530V(Vmpp)         |
| MPPT efficiency                           | >99%   |                    |
| Rated output voltage                      | 1/3-phase 220VAC   | 3-phase 380-480VAC |
| Output frequency range                    | 50/60Hz  |                    |
| Max efficiency of the machine             | 99%  |                    |
| Ambient temperature range                 | -10 °C~50 °C, derating if the temperature is above 40 °C |                    |
| Cooling method                            | Air cooling  |                    |
| Protection degree                         | IP20/IP21  |                    |
| Altitude                                  | Below 1000m; above 1% for every additional 100m.         |                    |
| Standard                                  | CE/ROHS  |                    |

Noted: We suggest solar panel power should be 1.4-1.5 times higher than solar pump power ,and solar pump inverter power should be higher level than solar pump. When solar pump distance to inverter higher than 100m,it should be equipped with Output reactor or higher level power inverter .for Solar panel,I total VOC less than Maximum DC voltage of inverter and Solar panel vmp is recommend 530V for 380V pump and 305V for 220V pump

## 1.2 Power degree AND Technical SPECIFICATION

Power size of VFD500-PV refers to the standard 4 poles induction motor at rated voltage.

Overload: 150% rated output current, 1 minute

| Drive model                                | Max DC input current (A) | Rated output current (A) | Applicable water pump (kW) |
|--|--------------------------|--------------------------|----------------------------|
| VFD500M-40T00150-PV                        | 9                        | 3.7                      | 1.5                        |
| VFD500M-40T00220-PV                        | 12                       | 5                        | 2.2                        |
| VFD500M-40T00400-PV                        | 16.5                     | 9.4                      | 4                          |
| VFD500M-40T00550-PV                        | 23.9                     | 13                       | 5.5                        |
| VFD500M-40T00750-PV                        | 30.6                     | 17                       | 7.5                        |
| VFD500-40T00150-PV                         | 9                        | 4.2                      | 1.5                        |
| VFD500-40T00220-PV                         | 12                       | 5.6                      | 2.2                        |
| VFD500-40T00400-PV                         | 16.5                     | 9.4                      | 4                          |
| VFD500-40T00550-PV                         | 23.9                     | 13                       | 5.5                        |
| VFD500-40T00750-PV                         | 30.6                     | 17                       | 7.5                        |
| VFD50040T01100-PV                          | 39.2                     | 25                       | 11                         |
| VFD500-40T01500-PV                         | 49.0                     | 32                       | 15                         |
| VFD500-40T01850-PV                         | 50                       | 37                       | 18.5                       |
| VFD500-40T02200-PV                         | 60                       | 45                       | 22                         |
| VFD500-40T03000-PV                         | 81                       | 60                       | 30                         |
| VFD500-40T03700-PV                         | 90                       | 75                       | 37                         |
| VFD500-40T04500-PV                         | 130                      | 90                       | 45                         |
| VFD500-40T05500-PV                         | 150                      | 112                      | 55                         |
| VFD500-40T07500-PV                         | 200                      | 152                      | 75                         |
| VFD500-40T09000-PV                         | 250                      | 176                      | 90                         |
| VFD500-40T11000-PV                         | 300                      | 210                      | 110                        |
| VFD500-40T13200-PV                         | 360                      | 253                      | 132                        |
| VFD500-40T16000-PV                         | 430                      | 304                      | 160                        |
| VFD500-40T18500-PV                         | 500                      | 360                      | 185                        |
| VFD500-40T20000-PV                         | 550                      | 380                      | 200                        |
| VFD500-40T22000-PV                         | 620                      | 426                      | 220                        |
| VFD500-40T25000-PV                         | 680                      | 465                      | 250                        |
| <b>220V single phase/three phase level</b> |                          |                          |                            |
| VFD500-20T00075-PV                         | 6.7                      | 4.5                      | 0.75                       |
| VFD500-20T00150-PV                         | 9.9                      | 7                        | 1.5                        |
| VFD500-20T00220-PV                         | 14.1                     | 10.6                     | 2.2                        |
| VFD500-20T00400-PV                         | 22.6                     | 17                       | 4                          |
| VFD500-20T00550-PV                         | 30                       | 25                       | 5.5                        |

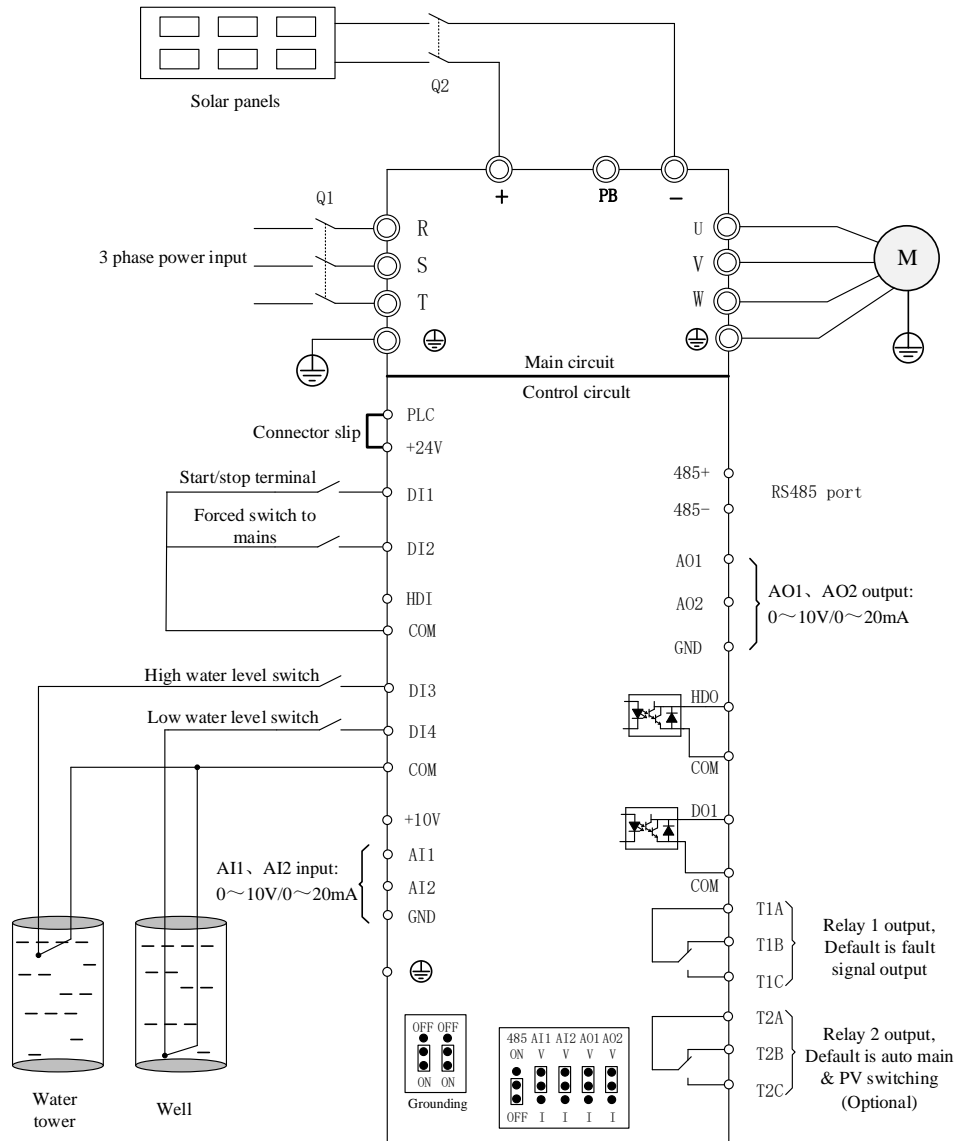
|                     |      |      |      |
|---------------------|------|------|------|
| VFD500-20T00750-PV  | 40   | 32   | 7.5  |
| VFD500-20T01100-PV  | 60   | 45   | 11   |
| VFD500-20T01500-PV  | 81   | 60   | 15   |
| VFD500-20T01850-PV  | 90   | 75   | 18.5 |
| VFD500-20T02200-PV  | 130  | 90   | 22   |
| VFD500-20T03000-PV  | 150  | 112  | 30   |
| VFD500-20T03700-PV  | 200  | 152  | 37   |
| VFD500M-20T00150-PV | 9.9  | 7    | 1.5  |
| VFD500M-20T00220-PV | 14.1 | 10.6 | 2.2  |

**Table 1-2 380V-480V rating data**

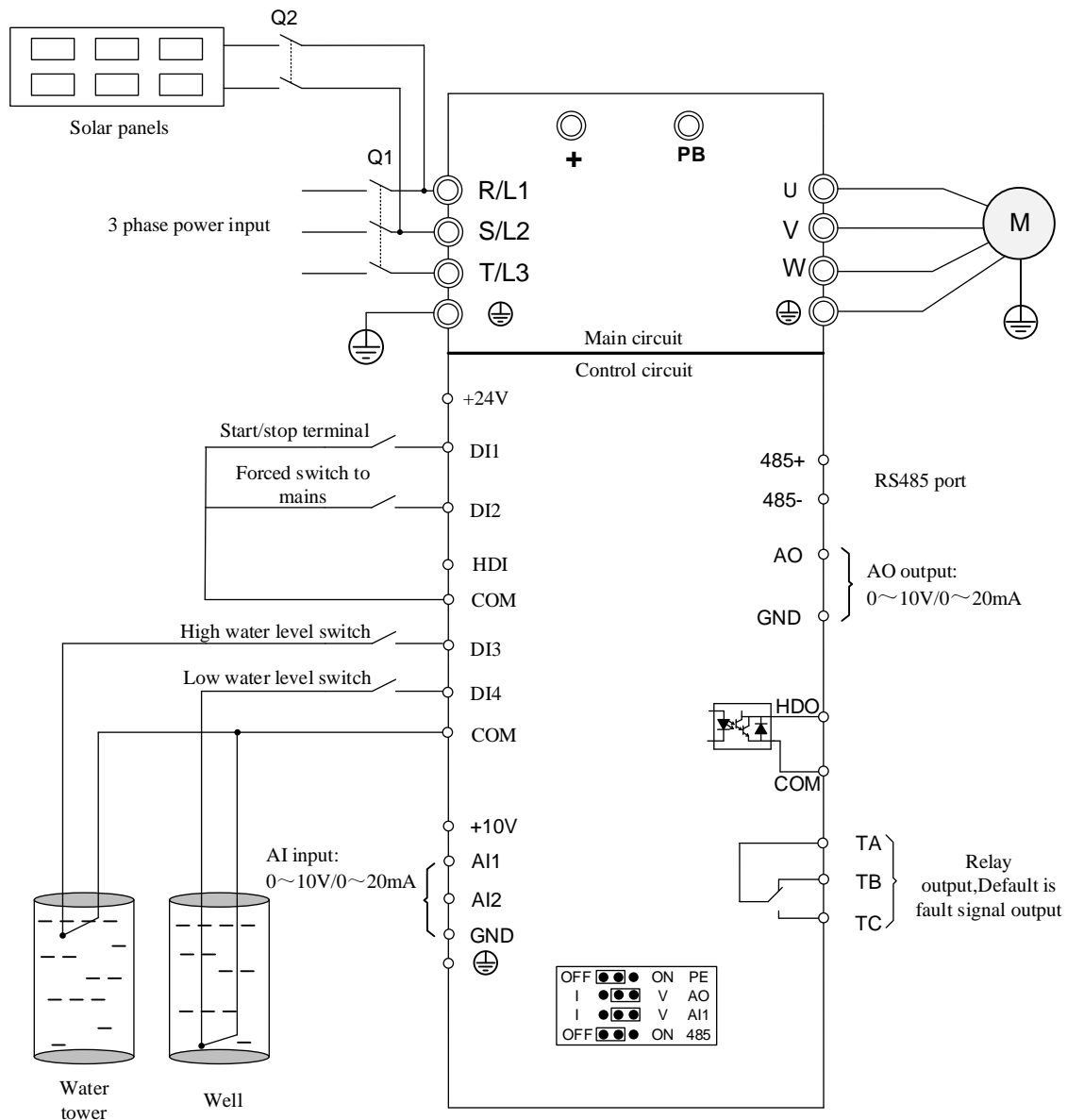
**Noted 1:** when the output voltage is 380V, the output current will be rated value; when the output voltage is 400V、415 V or 440V,the output current will be calculated according to power.

**Noted 2:** when the output voltage is 220V, the output current will be rated value

# For 380V OR 220V or 110V Three phase motor Pump connection



1.3 VFD500-PV Wire Diagram of solar pump inverter (three phase pump)



#### 1.4 VFD500M-PV Wire Diagram of solar pump inverter (three phase pump)

NOTE:

- 1: VFD500-PV Solar array output should be connected to the terminal ( +DC、 -DC) of the drive, please pay attention to the polarity of the solar array or you can connect solar array to R and T but VFD500M-PV Solar array output should be connected to L1 L3 OR L1 L2 OR L2 L3
- 2: For control wire, recommend using shielded cable or shielded twisted pair.
- 3: Do not suggest using the power contactor to control the RUN/STOP of the drive.
- 4: In default carrier frequency, the maximum motor cable length is 100 meters. When the motor cable is longer than 100m, it is recommended to use output reactor.



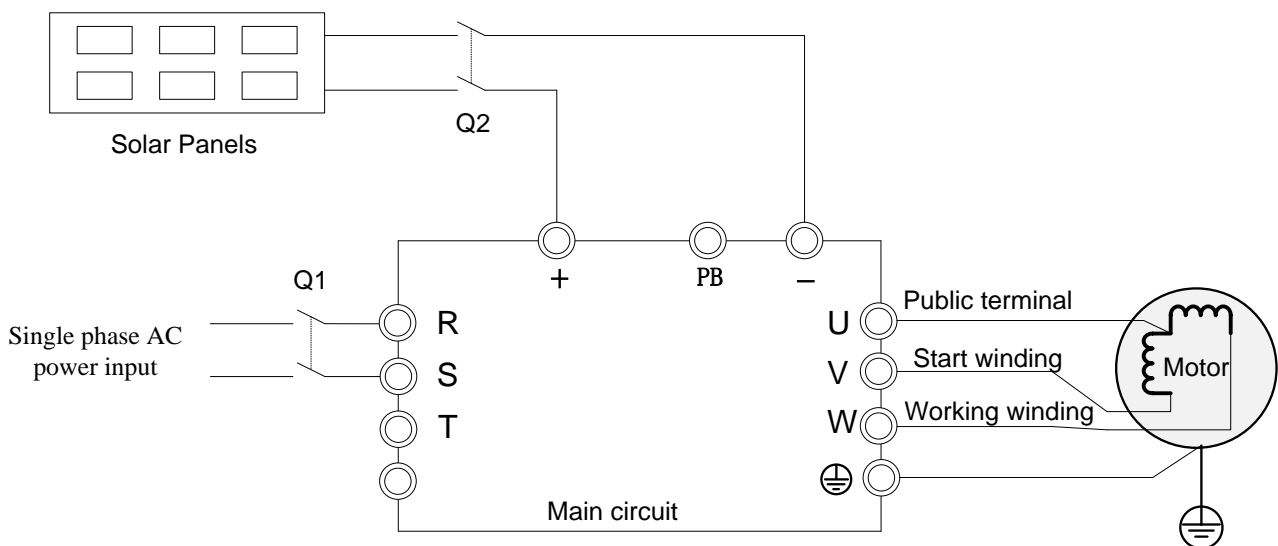
# For 220V single phase motor connection

## 1: Single phase asynchronous motor wiring method (without starting capacitor):

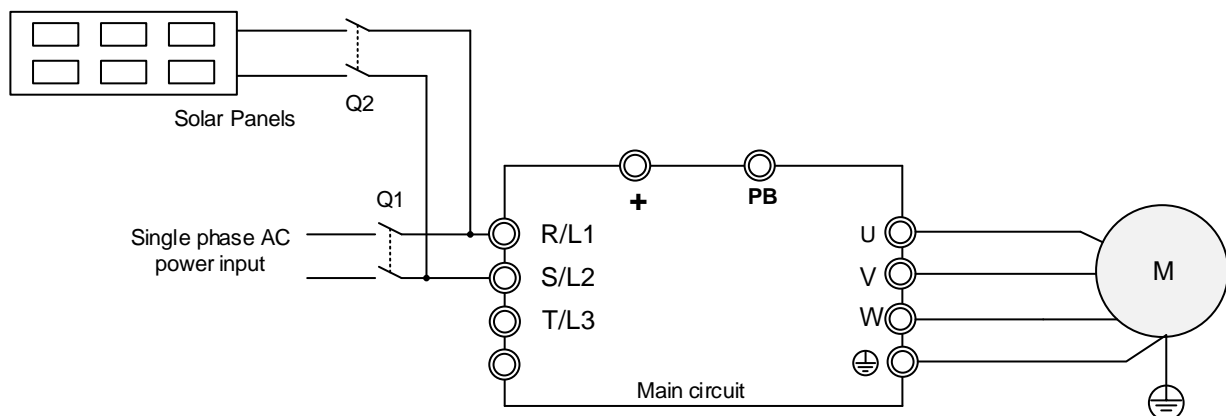
Notice: U is connected to the common end of the starting winding and the working winding, V is connected to the starting winding, and W is connected to the working winding;

Single-phase asynchronous motor if the rotary steering is not correct, you can change the V and W wiring or set P22.13=1.

First solution: Set parameter P11.01=1 (Single phase motor type without capacitor) or second solution: set P00.11=00031 if your motor frequency is 50 hz or set P00.11=32 if your motor frequency is 60HZ



VFD500-PV Wire Diagram of solar pump inverter (single phase pump without capacitor)

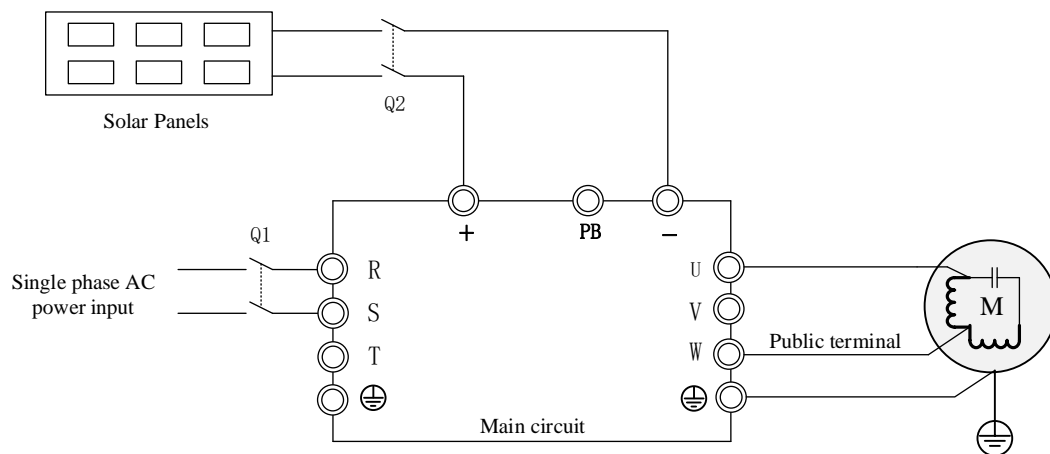


VFD500M-PV Wire Diagram of solar pump inverter (single phase pump without capacitor)

# For 220V single phase motor connection

## 2:Single-phase asynchronous motor wiring method (with capacitor)

**Notice1:First solution: Connect motor cable to power terminal U and V and enter BSC mode to Set parameter P23.15=0(output phase loss shielding protection) or second solution: set macro P00.11=00021 if your motor frequency is 50HZ or set P00.11=22 if your motor frequency is 60HZ**

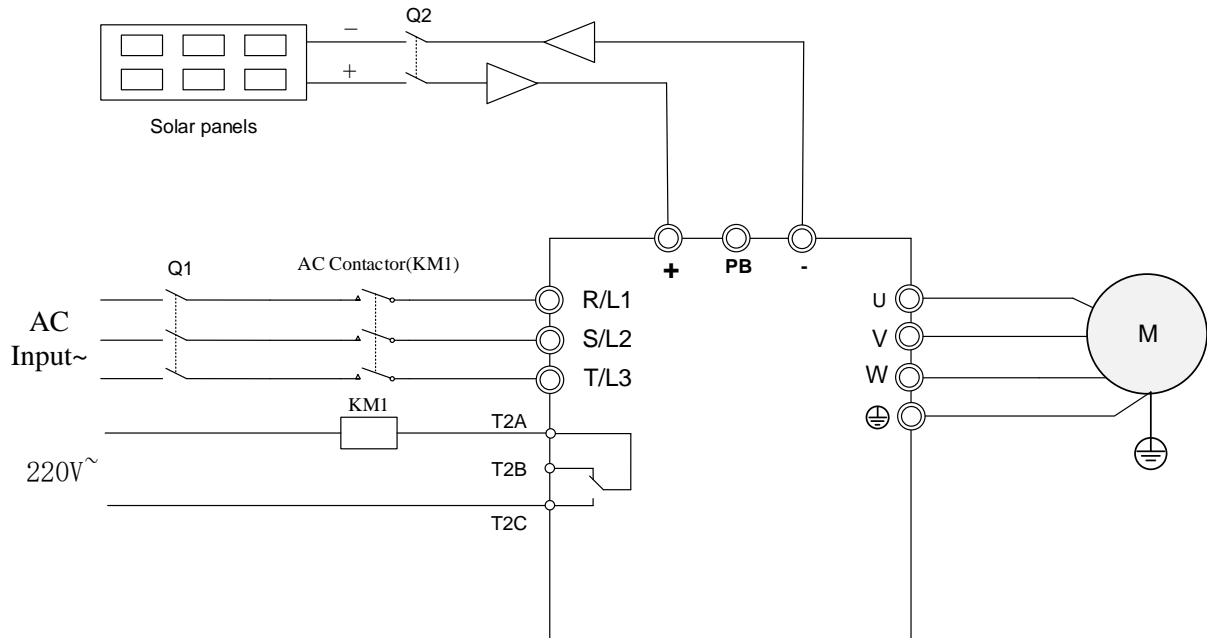


**VFD500-PV Wire Diagram of solar pump inverter (single phase pump with capacitor)**

**Notes: Single phase motor has three lines, first use the universal meter to check the three lines resistor, the biggest value two lines parallel the start capacitor (recommend the capacitor volume is 150UF/250V), the other line(common-coil) connect the power terminal. Then use the universal meter to check the common coil with the other two lines resistor, the lower one connects another power terminal**

## Wiring method for Compensation of Grid and Solar DC supply

The back of the photovoltaic panel must be connected with anti-reverse diodes, and the photovoltaic panel will be damaged after the current is recharged



Wiring diagram of main circuit for simultaneous photovoltaic and power supply

## 1.4 Control Circuit Terminal

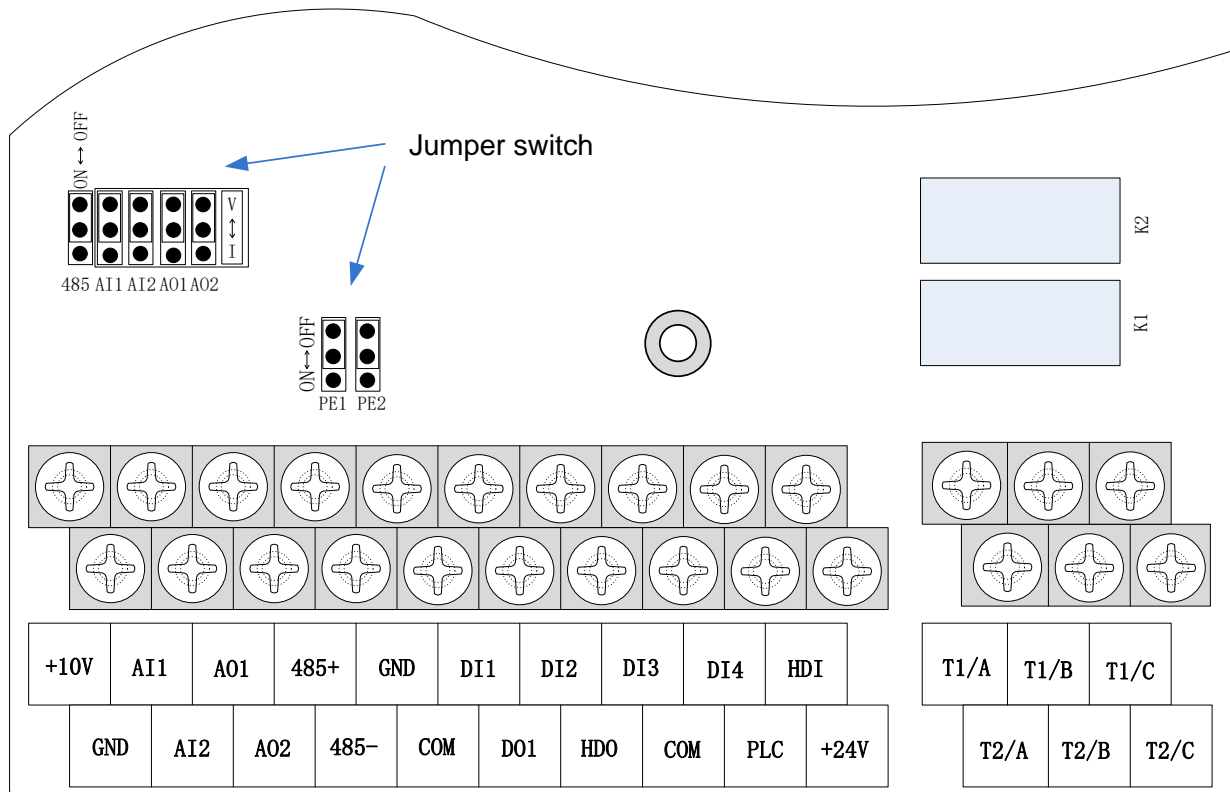


Diagram VFD500-PV control circuit terminal

**Table VFD500-PV control circuit terminal instruction**

| Type                 | Terminal Symbol | Terminal Name  | Terminal function description  |
|----------------------|-----------------|----------------|--|
| Analog input voltage | +10V            | Input voltage  | 10.10V±1%  |
|                      |                 |                | Maximum output current:10mA, it provides power supply to external potentiometer with resistance range of: 1KΩ~51KΩ |
|                      | GND             | Analog ground  | Internal isolation from COM  |
|                      | AI1             | Analog input1  | Input voltage:0~10V: Impedance 22KΩ, Maximum input voltage   |
|                      |                 |                | Input current:0~20mA: Impedance 500Ω, Maximum input current  |
|                      |                 |                | Through the jumper switch AI1 0 ~ 10V and 0 ~ 20mA analog input switch, the factory default voltage input.         |
|                      | AI2             | Analog input 2 | Input voltage:0~10V: Impedance 22KΩ, Maximum input voltage   |
|                      |                 |                | Input current:0~20mA: Impedance 500Ω, Maximum input current  |
|                      |                 |                | Through the jumper switch AI2 0 ~ 10V and 0 ~ 20mA   |





| Type   | Terminal Symbol | Terminal Name                    | Terminal function description   |
|--|-----------------|----------------------------------|---|
|  |                 |                                  | analog input switch, the factory default voltage input.   |
| Analog output  | AO1             | Analog output 1                  | Output voltage:0~10V: Impedance $\geq 10K\Omega$  |
|  |                 |                                  | Output current:0~20mA: Impedance $200\Omega\sim 500\Omega$  |
|  |                 |                                  | Through the jumper switch AO1 0 ~ 10V and 0 ~ 20mA analog output switching, the factory default voltage output.           |
|  | AO2             | Analog output 2                  | Output voltage:0~10V: Impedance $\geq 10K\Omega$  |
|  |                 |                                  | Output current:0~20mA: Impedance $200\Omega\sim 500\Omega$  |
|  |                 |                                  | Through the jumper switch AO2 0 ~ 10V and 0 ~ 20mA analog output switching, the factory default voltage output.           |
| GND  | Analog ground   | Internal isolation from COM      |   |
| Switch input   | +24V            | +24V current                     | 24V $\pm 10\%$ , Internal isolation from GND  |
|  |                 |                                  | Maximum output current: 200mA   |
|  |                 |                                  | To provide 24V power supply, generally used as a digital input and output terminal power supply and external sensor power |
|  | PLC             | Digital input terminal common    | The factory default setting is connected PLC with +24V  |
|  |                 |                                  | Terminal for on-off input high and low level switch   |
|  | COM             | +24V ground                      | When using the external signal to drive DI1~DI5, it will disconnect the connector slip of PLC with the +24V               |
|  | DI1~DI4         | Digital input terminal 1~4       | Internal isolation from GND   |
| Optocoupler isolation, compatible with bipolar input |                 |                                  |   |
| Frequency range: 0~200Hz                             |                 |                                  |   |
|  |                 |                                  | Voltage range: 10V~30V  |
| Switch output  | DO1             | Open collector output            | Optocoupler isolation   |
|  |                 |                                  | Voltage range: 0V~24V   |
|  |                 |                                  | Current range: 0mA ~50mA  |
| Relay output 1                                       | TA/TB/TC        | Relay output                     | T1A-T1B: normal close   |
|  |                 |                                  | T1A-T1C: normal open  |
|  |                 |                                  | Contact rating: AC 250V, 3A; DC 30V, 1A   |
| Relay output2 (optional)                             | T2A/T2BT2C      | Relay output                     | T2A-T2B: normal close   |
|  |                 |                                  | T2A-T2C: normal open  |
|  |                 |                                  | Contact rating: AC 250V, 3A; DC 30V, 1A   |
| 485 port   | 485+            | 485 Positive differential signal | Baud rate:<br>1200/2400/4800/9600/19200/38400/57600/115200bps   |
|  | 485-            | 485 Negative differential signal |   |

## 2、 Trial run(How to start solar pump inverter)

Make sure all cables connections of solar panel and pump motor correct and no need to set any parameter, if you want to set parameter, you can do as follows.

**Step 1: (Keypad control):**Set motor parameter P11.02- P11.06 as per motor pump name plate If dry run protection is required, measure the unload protection current according to the following method. If dry run protection not required then miss this step and go to step 2.

**Notice” Unload detection current self-learning:**

1. Set P47.00=0, P00.07=20.00-30.00, P00.06=0, and then press  to run the drive
2. Check the function code P27.00, wait until its value becomes 20.00, and then enter the function code P24.13,
3. press the keyboard  and  simultaneously for more than 2 seconds,, and if the value changes, the load-off self-learning is completed
4. Press  to stop running, set P47.00=1, P00.06=1, In this process, the pump no need to take out from water

### PMSM pump

If your pump is Permanent magnetic Synchronous motor pump, please set P11.00=1 and set P11.02 and P11.03 and P11.04 and P11.06 and P11.05(Set RPM first then frequency) and set P01.08 and P11.10=1 or 2 for Auto tuning

**Step 2:** Set other related special solar pump parameters for optimization if needed.

**Step 3:** After trial run finishing, if motor pump still not output water when inverter is running more than 40 Hz. Please disconnect the power supply and replace any two-phase wiring of the motor.

### Technical Questions and solutions

#### 1. How to achieve Automatic start after stop?

If it is controlled by keyboard no need to set any parameter. If you want to control by external switch As the default control mode is keypad control, First set P00.06=1 and use a wire or switch to connect com and DI1, When the switch is closed, the drive run, when the switch is open, the drive stop

#### 2. How to use a float in the water tank to stop the pump if the tank is full?

If your float signal is digital signal Use float switch to short DI 3 and com ,see diagram 1.3

### **3. Use level probe in the well for protection against dry running**

1<sup>st</sup> solution: See self learning of dry run

2<sup>nd</sup> solution: do it manually Set P24.13=30%-60%(as per real empty load current percentage based on rated current) and P24.14 P24.16 and P23.21

3<sup>rd</sup> solution: If your sensor is digital switch ,just short D4 and com

4<sup>th</sup> solution: If your float signal is Analog signal, Connect Ai2 and 10V and GND and set P41.00=23 and P41.03-P41.06

### **4. How to set minimum frequency ( for example) 30hz and maximum 50HZ**

Set P47.05=30HZ and 47.06 to some time and 47.07 to some time. Please refer to details of P47.05-47.07

### **5. If pump is 60HZ frequency, how to set max frequency?**

Notice: If your motor rated frequency is 60HZ First solution for you, P01.06=P01.08=P11.05=60HZ.

Quick setting and easier way: you should set P00.11=02 If your motor is three phase; if your motor is single phase with capacitor ,set P00.11=22; If your motor is single phase without capacitor ,set P00.11=32

### **6. Does the product need to set a lot of parameters?**

No, it doesn't. The inverter has a self-adaptive and self-learning function. It is automatic start and stop, you can press Run key to start, or you just wait for P47.03=600S(Default) then it will automatically start

### **7. Could it replace my previous PV pumping inverter?**

Yes, of course. Selecting inverter model according to the rated voltage, current and power of the water pump. A bit more is better. Then take off the old one and put ours on, the system will work.

### **8. How to design solar PV water pump system?**

Key point: the rated VOC and VMP and power of the PV Array need to match the input range of the inverter. If needed, we will provide technical support online.

### **9. How to make the water pump system work without sunshine?**

Usually, solar PV water pump system can meet the needs of pumping water.

If there is no sunshine, the system will not work. But our inverter could also support AC input. So, connect the power grid or diesel power generation to the inverter, the pumping system will work. If necessary, keep switch and interface locations during the system design

### **10. How to check and solve basic problem of inverter trips and error**

- a: Check the total vmp and voc of solar panels ,solar panel technical data
- b: Check motor pump power and rated current
- c: Check the distance between motor and inverter
- d: Check trip record r25.00 r25.01 25.02 25.03 r26.00 r26.01 r26.02 r26.03
- e: Check troubleshooting fault and find relevant solutions
- f: Check if motor insulation has been damaged or motor is blocked

# 3、Keypad display

## 3.1 LED Instruction of operation and display

LED keyboard consists of 5 digital tubes, 7 lights, 8 keys and a potentiometer; can be used to set the parameters, status monitoring and operation control, LED keyboard shape as shown in Figure 4-1:







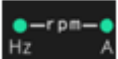
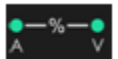




Figure 3-1 Operating panel

### Description of indicator

Table 3-2 The name and function of each part of the keyboard

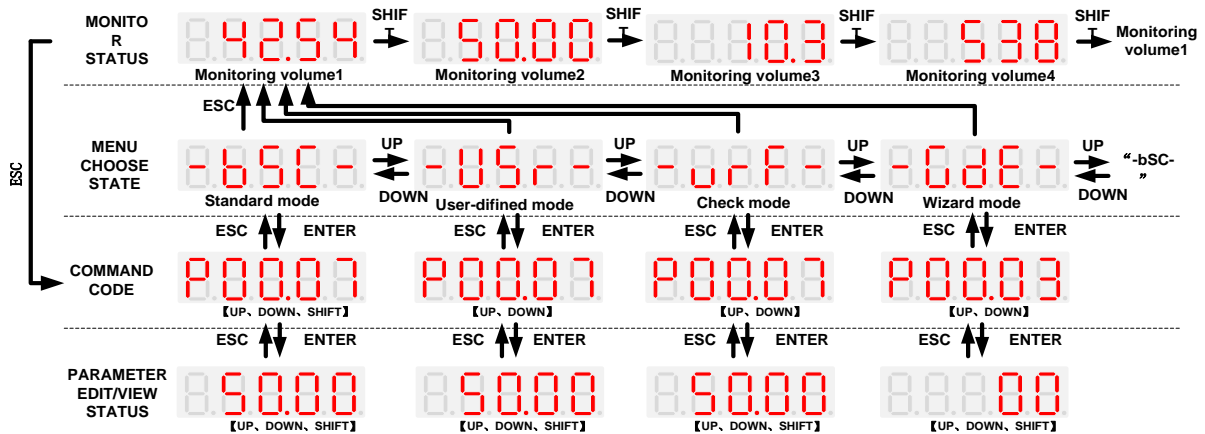
| No. | Part | Name                  | Function   |
|-----|------|-----------------------|--|
| 1   |      | Exit                  | • exit menu level  |
| 2   |      | Confirmation          | • Enter the menu interfaces level by level,<br>• confirm the parameter setting and save to EEPROM  |
| 3   |      | <b>Increment/Up</b>   | • The number indicated by the cursor increases by one.<br>• Next function code.<br>• Used to switch the left and right screens while in monitor mode |
| 4   |      | <b>Decrement/Down</b> | • The number indicated by the cursor minus one.<br>• The previous function code.   |
| 5   |      | Multi-function        | • Perform function switchover according to the setting of 21.02  |
| 6   |      | Shift                 | • Cursor shift.<br>• Monitor Status Displays the next monitor volume.<br>• Switch left and right screens.  |
| 7   |      | Run                   | Start the frequency inverter in the operation panel control mode   |



|    |   |                                  |   |
|----|---|----------------------------------|---|
| 8  |    | Stop/Reset                       | <ul style="list-style-type: none"> <li>• During operation, press to stop the operation (restricted by parameter 21.03).</li> <li>• In fault status, press this key to reset the fault.</li> </ul>                                       |
| 9  |    | Indicator light:Hz               | Indicate the digital display unit, all three lights off means other units   |
| 10 |    | Indicator light:A                |   |
| 11 |    | Indicator light:V                |   |
| 12 |    | Indicator light:Hz+A(rpm/minute) | When Hz" and "A" are lit at the same time, the unit of the currently displayed parameter is "RPM PER MINUTE"  |
| 13 |    | Indicator light:A+V(%)           | When "A" and "V" are lit at the same time, the unit of the currently displayed parameter is "percent".  |
| 14 |    | Running lights                   | <ul style="list-style-type: none"> <li>• Off: indicates a stop condition.</li> <li>• On: indicates inverter is running.</li> <li>Blinking: Deceleration stopped.</li> </ul>   |
| 15 |  | Direction indicator              | <ul style="list-style-type: none"> <li>• Used to indicate the sign of the variable when the LED is displaying one of the variables listed in 27.02;</li> <li>• In other cases the sign of the output frequency is indicated.</li> </ul> |
| 16 |  | Command source indicator         | <ul style="list-style-type: none"> <li>• Off: The command source is the keyboard.</li> <li>• On: The command source is terminal.</li> <li>• Blinking: The command source is communication.</li> </ul>                                   |
| 17 |  | Fault indicator                  | <ul style="list-style-type: none"> <li>• When it is on, the drive is faulty.</li> </ul>   |


## 3.2 Display hierarchy and menu mode

VFD500-PV digital keyboard display is divided into four layers, from top to bottom are: monitoring status, menu mode selection status, function code selection status, parameter editing / viewing status, as shown in Figure 4-2. In the menu mode selection status, press **【UP】** or **【DOWN】** key to select menu mode, press **【ENTER】** to enter the selected menu mode, the following describes several menu modes:





3-3 Keyboard operation diagram

### 3.3 Monitor display(P21.00=1)

According to the running status of the inverter, the digital tube displays different contents in turn. If the button has no operation, the next monitoring amount is automatically displayed every few seconds; of course, you can also switch  to the next monitoring indicator

- When the inverter is in the stop state, the digital tube is cyclically scrolling to display:  
“00000”→DC bus voltage (r27.03) →given frequency (r27.01) →“00000”
- When the inverter is in running state, the digital tube is cyclically scrolling to display.:  
“00000”→DC bus voltage (r27.03) →output frequency (r27.00) →output current (r27.06) →output ac output voltage (r27.05) →“00000”

### 3.4 Menu mode

After the solar pump inverter is power on, the keyboard menu mode is user-defined mode. Most of users only need to pay attention to the parameters displayed in this mode. To check the complete inverter parameters, press the  and 

keys while the keyboard is displayed  . When the keyboard is displayed

 , press the key  to enter the basic menu mode.

**3.5 Error code:** For other alarm codes, please refer to Chapter 5 of the manual.

| alarm code             | meaning   |
|------------------------|---|
| Sleep <b>SLEEP</b>     | Light weak fault, please refer to function code P47.05~P47.07 |
| A.FULL<br><b>AFULL</b> | Full water protection P47.18-47.21                            |
| A.PoL<br><b>APoL</b>   | Low power protection P47.22-47.24                             |
| A.oC <b>AoC</b>        | Overcurrent protection P47.25-47.27                           |
| A.Lor <b>ALor</b>      | Low water protection P47.33-47.36                             |
| Dry                    | Dry dun protection see P24.12-24.14                           |

After the above warning occurs, the solar pump inverter will decelerate to stop and cannot be started again until the warning condition is not released. When the warning is released, the system will start automatically.

During the warning, the digital tube will flash the alarm code, and after 2s, it will display the other interface for 2s.

## 4、Solar pump special parameter User mode fast quick start

| Function code                               | Name                            | Description   | Default | Property |
|---|---------------------------------|---|---------|----------|
| <b>47 Group solar pumping special group</b> |                                 |   |         |          |
| P00.03                                      | RESET                           | 0: NO ACTION<br>11: Restore default parameter except for motor parameter and auto-tune related parameter and factory parameter<br>12: Restore default to factory parameter<br>13: Clear tripping record | 0       | ★        |
| P00.06                                      | Source of the Operation Command | 0: keypad<br>1: terminal<br>2: communication<br>➤ Command source: run、stop、forward、reverse、jog、fast brake stop.etc  | 0       | ★        |
| P00.07                                      | Numeric frequency setting       | 00.00Hz~maximum frequency   | 50.00Hz | ☆        |
| P00.11                                      | Application Macro               | 00001: Output three phase 50HZ<br>00002: Output three phase 60hz  | 00000   | ★        |

|        |   |   |         |   |
|--------|---|---|---------|---|
|        |   | 00021:Output single phase with capacitor 50hz<br>00022:Output single phase with capacitor 60hz<br>00031:Output single phase without capacitor 50hz<br>00032:Output single phase without capacitor 60hz  |         |   |
| P01.06 | <b>Maximum frequency</b>                            | 10.00~600.00Hz  | 50.00Hz | ★ |
| P01.08 | <b>Upper limit frequency</b>                        | Lower limit frequency-maximum frequency   | 50.00Hz | ☆ |
| P07.03 | Relay 1 Output terminal function group(T1A T1B T1C) | 0:No function<br>1:READY<br>2:RUN<br>3:Error1 ( stop fault )<br>4:Error2 ( same as Error1 except undervoltage )<br>5:Warning output(fault but in running)   | 3       | ☆ |
| P11.01 | AC asynchronous motor TYPE                          | 0: Three phase AC asynchronous motor<br>1: Single phase AC asynchronous motor without starting capacitor  | 0       | ★ |
| P11.02 | <b>Motor rated power</b>                            | 0.1kW~710.0kW<br>➤ when power is less than 1kw ,0.75kw set to 0.8 as per round up principle ,0.55kw motor set 0.6<br>➤ when change motor rated power,AC drive will automatically set other parameter of motor name plate and motor model parameter <b>be careful to use</b> | Depend  | ★ |
| P11.03 | <b>Motor rated voltage</b>                          | 10V~2000V   | Depend  | ★ |
| P11.04 | <b>Motor rated current</b>                          | P11.02<30kW: 0.01A<br>P11.02>=30kW: 0.1A  | Depend  | ★ |
| P11.05 | <b>Motor rated frequency</b>                        | 1.00Hz~600.00Hz   | 50.00Hz | ★ |
| P11.06 | <b>Motor rated RPM</b>                              | 1~60000rpm  | Depend  | ★ |
| P21.00 | <b>Monitoring display</b>                           | <b>0: Standard mode (display frequency only)</b><br><b>1: Automatic scrolling display (Check 3.1 in detail ) it show hz,current,power and voltage</b>   | 0       | ★ |
| P23.15 | <b>Output phase loss function</b>                   | 0.0-30%, 0% means output phase detections shielded  | 30%     | ☆ |
| r27.15 | <b>Accumulative running time</b>                    | Unit:hour   |         | • |
| P47.00 | Solar pump Mppt function enable                     | 0: invalid<br>The parameters behind the 47 group cannot be changed!   | 1       | ★ |

|        |                           |   |            |   |
|--------|---------------------------|---|------------|---|
|        |                           | 1: Enable, to enable the special mppt function of the PV pump inverter  |            |   |
| P47.01 | Solar pump control mode   | <p>Units digit's: Startup mode</p> <p>0: Manual start, the start mode is determined by P00.06;</p> <p>1: automatic start,</p> <p>When P00.06 change, the association changes here.</p> <p>P00.06=0, when inverter starts and stops by keypad control, it is automatically modified to 1-automatic start</p> <p>P00.06=1, when inverter starts and stops by terminal control.it is automatically changed to 0-manual start</p> <p>Ten digit's: MPPT function</p> <p>0: MPPT is disabled; CVT control is used (voltage is given as P47.04).</p> <p>1: Enable MPPT.</p> <p>Hundred's unit automatic switching function</p> <p>0: prohibited</p> <p>1: enable</p> <p>Automatic switching is enabled, when the light is weak, it will automatically switch to the electric supply, and the MPPT function is disabled at this time.</p> | 011        | ★ |
| P47.03 | Automatic start timing    | In auto start mode, set the time from power on to start. It is also waiting time to start   | 600        | ★ |
| P47.04 | MPPT starting voltage     | Set the starting voltage of the MPPT algorithm.<br>When the MPPT function is disabled, this value is the reference voltage.   | 305V(530V) | ★ |
| P47.05 | Light detection threshold | If the output frequency is lower than this value and exceeds P47.06, it will be reported to Sleep and stop<br>If automatic switching is enabled, it will switch to ac grid operation, and the MPPT function will be disabled  | 0Hz        | ☆ |
| P47.06 | Light detection time      | See P47.05 for explanation.   | 60s        | ☆ |
| P47.07 | Light weak wake up time   | After the sleep fault is reported, if the time when Vdc is higher than the undervoltage point is greater than the set value, the fault  | 600s       | ☆ |

|        |                             |  |       |   |
|--------|-----------------------------|--|-------|---|
|        |                             | state is exited and the operation continues. When the automatic switching is enabled, after switching into the electric supply operation for this time, it will try to switch into the photovoltaic operation. |       |   |
| P47.08 | MPPT tracking step length   | The amount of change in the bus voltage during an MPPT cycle. The larger the value, the faster the maximum power point is found, but the lower the accuracy of the maximum power point.                        | 2V    | ☆ |
| P47.09 | Regulator proportional gain | 0.001~1.00 It is for immediate response speed, it is not recommended to change   | 0.05  | ☆ |
| P47.10 | Regulator integral gain     | 0.001~0.100 tracking response.it is not recommended to change  | 0.05  | ☆ |
| P47.28 | Starting coefficient        | 0.000~1.000  | 0.850 | ☆ |
| P47.30 | Fast speed function         | Unit digit: fast starting<br>0: Disable                    1: Enable<br>Ten digit: Fast mppt tracking<br>0: Disable                    1: Enable   | 11    | ☆ |

## 5、Detailed Parameter list

Symbol Description:

“☆” means that the set value of this parameter can be changed no matter the inverter is in the stop state or in running state.

“★” indicates that the set value of this parameter cannot be changed while the inverter is running.

“●” indicates that the value of this parameter is the actual detected record value and cannot be changed.

### 47 Group solar pumping special group

| Function code                               | Name                            | Description   | Default | Property |
|---|---------------------------------|---|---------|----------|
| <b>47 Group solar pumping special group</b> |                                 |   |         |          |
| <b>P47.00</b>                               | Solar pump Mppt function enable | 0: invalid<br>The parameters behind the 47 group cannot be changed!<br>1: Enable, to enable the special mppt function of the PV pump inverter         | 1       | ★        |
| <b>P47.01</b>                               | Solar pump control mode         | Units digit's: Startup mode<br>0: Manual start, the start mode is determined by P00.06;<br>1: automatic start,<br>When P00.06 change, the association | 011     | ★        |

|  |  |   |  |  |
|--|--|---|--|--|
|  |  | <p>changes here.</p> <p>P00.06=0, when inverter starts and stops by keypad control, it is automatically modified to 1-automatic start</p> <p>P00.06=1, when inverter starts and stops by terminal control.it is automatically changed to 0-manual start</p> <p>Ten digit's: MPPT function</p> <p>0: MPPT is disabled; CVT control is used (voltage is given as P47.04).</p> <p>1: Enable MPPT.</p> <p>Hundred's unit automatic switching function</p> <p>0: prohibited</p> <p>1: enable</p> <p>Automatic switching is enabled, when the light is weak, it will automatically switch to the electric supply, and the MPPT function is disabled at this time.</p> |  |  |
|--|--|---|--|--|

Remarks:

Inbuilt auto mppt software and algorithm which measure and detect every 2ms to adjust current and voltage to find the best working maximum power The input of solar energy determines the frequency corresponding to the maximum power point, because the actual pump power is positively related to the frequency. The maximum power tracking is the power of the photovoltaic panel, which provides the input power to the inverter. The power outside this point is less than the optimal working point.In other words, below this point, the frequency of the pump driven by the inverter will drop. The specific operating point is determined by the characteristics of the photovoltaic panel, not where we want to work. The high voltage is only for sufficient output under low light conditions. If you do not consider such a demand, the configuration can be freely

|               |                             |  |     |   |
|---------------|-----------------------------|--|-----|---|
| <b>r47.02</b> | Remaining time for starting | The remaining time of the starting is displayed In auto start mode,Unit: second          | --  | • |
| <b>P47.03</b> | Automatic start timing      | In auto start mode, set the time from power on to start.It is also waiting time to start | 600 | ★ |

47.03 is waiting time to start solar pump inverter without press start button, Our solar pump inverter Is purely automatic start ,no setting software and simple and smart

Make sure solar panels cables and motor cables well connected ,it will automatically start after 600S,10 Minutes is a threshold ,if you want to test this function ,you can set P47.03=10s,so power off and power on ,it will start after 10s

|               |                       |   |            |   |
|---------------|-----------------------|---|------------|---|
| <b>P47.04</b> | MPPT starting voltage | Set the starting voltage of the MPPT algorithm.<br>When the MPPT function is disabled, this value is the reference voltage. | 305V(530V) | ★ |
|---------------|-----------------------|---|------------|---|

This is Manual mppt threshold voltage ,when you want to use manual mppt mode ,first you need to set mppt function disable P47.01=00 (Unit digit 0 is means manual control ,ten'digit 0 is means CVT enables also manual mppt function ,you can check solar panel configuration and calculate VOC and VMP and set P47.04=VMP





|  |                             |  |                    |   |
|--|-----------------------------|--|--------------------|---|
| <b>P47.05</b>  | Light detection threshold   | If the output frequency is lower than this value and exceeds P47.06, it will be reported to Sleep and stop<br>If automatic switching is enabled, it will switch to ac grid operation, and the MPPT function will be disabled   | 0Hz                | ☆ |
| This is light detection threshold to measure solar radiation and solar power in a setting time (P47.06 Detection time),if customer do not want to keep pump running below this frequency so it can make pump sleep below this frequency ,for example ,if pump can not run to 20hz in a setting time ,inverter will sleep and stop. if solar power is enough in detection time ,then it will not report sleep alarming and return to normal |                             |  |                    |   |
| <b>P47.06</b>  | Light detection time        | See P47.05 for explanation.  | 60s                | ☆ |
| For example :if customer want to keep pump sleep below 25HZ,so customer need to set minimum frequency to 25HZ P47.05=25HZ, if inverter can not run to 25hz in a time(it is set by P47.06),it will report "Sleep" alarming (previous software show CCC)   |                             |  |                    |   |
| <b>P47.07</b>  | Light weak wake up time     | After the sleep fault is reported, if the time when Vdc is higher than the undervoltage point is greater than the set value, the fault state is exited and the operation continues.<br>When the automatic switching is enabled, after switching into the electric supply operation for this time, it will try to switch into the photovoltaic operation. | 600s               | ☆ |
| P47.07 is wake up time to make inverter restart again. If solar power is enough ,it will detect again after 600s(default value),so inverter will automatically try to start after 600s and try to run to this frequency in set time(P47.06),if it can run to this frequency ,sleep alarm will disappear and inverter return to normal.   |                             |  |                    |   |
| <b>P47.08</b>  | MPPT tracking step length   | The amount of change in the bus voltage during an MPPT cycle. The larger the value, the faster the maximum power point is found, but the lower the accuracy of the maximum power point.  | 2V                 | ☆ |
| P47.08 is mppt tracking step ,our solar pump inverter detect and adjust voltage and current every 2ms to search the best working maximum power to drive the pump ,we recommend the user understand this parameter and do not set and change without factory guidance ,the large in the value ,the faster the maximum power point is found ,but the accuracy of the maximum power is lower  |                             |  |                    |   |
| <b>P47.09</b>  | Regulator proportional gain | 0.001~1.00   | 0.05               | ☆ |
| <b>P47.10</b>  | Regulator integral gain     | 0.001~0.100  | 0.05               | ☆ |
| <b>r47.11</b>  | Today's Pumping flow        | 0.1 m <sup>3</sup><br>It shows the flow of water pumping today, it will be cleared after power off   | 0.0 m <sup>3</sup> | ● |
| <b>r47.12</b>  | Cumulative pumping          | 1 m <sup>3</sup> , 32 digits   | 0 m <sup>3</sup>   | ● |

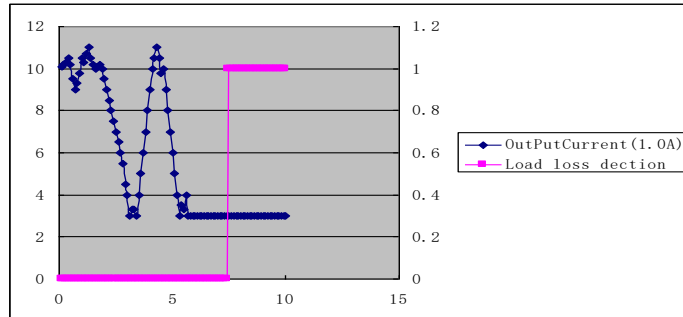


|               |                                    |  |          |   |
|---------------|------------------------------------|--|----------|---|
|               | flow volume                        | It shows the pumping flow volume accumulated by the pump. The power can be saved automatically after power-on, and continue to accumulate on the original basis after re-powering. It Can be cleared to zero by P47.14.  |          |   |
| <b>P47.14</b> | Cumulative pumping reset           | Set 1 to clear zero for r47.12. This function code automatically changes to 0 after the reset is completed.  | 0        | ☆ |
| <b>r47.15</b> | Current water flow                 | 0.1 m3/h   | 0.0 m³/h | ● |
| <b>P47.16</b> | Pump rated flow                    | 0.1 m3/h   | 0.0 m³/h | ☆ |
| <b>P47.17</b> | pump water frequency reference     | This parameter is only related with r47.15.Set the output frequency of the inverter when the pump can pump water which can help to calculate water flow  | 20.00Hz  | ☆ |
| <b>P47.18</b> | Full water level detection channel | Units: Water level monitoring channel<br>0: invalid<br>1:AI1<br>2:AI2<br>3:AI3<br>4: AI4<br>Note: DI terminal 60-full water detection is independent of the local setting<br>Ten'unit: analog water level logic<br>0: positive logic 0.00%-empty water 100.0%-full water<br>1: Inverse logic 0.00%-full water 100.0%-empty water | 00       | ★ |
| <b>P47.19</b> | Full water level detection value   | 0.0~100.0%   | 0.0%     | ☆ |
| <b>P47.20</b> | Full water level detection time    | 0.0~3000.0s<br>1. When DI-60 is valid<br>2. The analog detection channel is greater than P47.19 (positive logic) or the analog detection channel is less than P47.19 (inverse logic)<br>When 1 or 2 conditions are met and P47.20 is maintained, the system reports A.Full and shuts down  | 10.0s    | ☆ |
| <b>P47.21</b> | Full water recovery time           | 0.0~3000.0s<br>When the condition described in P47.20 does not meet full water level detection requirement ,it will be returned to normal  | 10.0s    | ☆ |

|  |                             |   |       |   |
|--|-----------------------------|---|-------|---|
|  |                             | state after delay   |       |   |
| <p>Conditions for full water detection to take effect:</p> <ol style="list-style-type: none"> <li>1. The DI terminal arbitrarily set to function No. 60 receives the input switch close signal. For example, when P06.03 is set to 60, DI3 is closed.</li> <li>2. When the ten's digit of P47.18 is 0 and the analog input is greater than the detection value, for example: set P47.18=01, P47.19=50%, at this time AI1 input is greater than 5V or 10mA</li> <li>3. When the tens place of P47.18 is 1 and the analog input is less than the detection value, for example: set P47.18=11, P47.19=50%, at this time AI1 input is less than 5V or 10mA</li> <li>4. After 1, 2 or 3 conditions are met, the system will report A.FULL for the set time on P47.20</li> </ol> <p>Full water recovery conditions:</p> <ol style="list-style-type: none"> <li>5. The system enters the full water detection stage and displays A.FULL</li> </ol> <p>When conditions 1, 2 and 3 are not met, and the maintenance time is greater than the time set in P47.21, the system recovers.</p> |                             |   |       |   |
| <b>P47.22</b>  | Low power detection value   | 0.0~6000.0kW<br>0.0-ineffective   | 0.0kW | ☆ |
| <b>P47.23</b>  | Low power detection time    | 0~1000s<br>During operation, when the actual output power (r16.02) is less than P47.22 and the time of P47.23 is maintained, the system reports A.Pol and stops.    | 10.0s | ☆ |
| <b>P47.24</b>  | Low power recovery time     | 0~1000s<br>When the condition described in P47.23 does not meet Low power protection requirement ,it will be returned to normal state after delay                   | 10.0s | ☆ |
| <b>P47.25</b>  | Overcurrent detection value | 0.0~999.9A  | 0.0A  | ☆ |
| <b>P47.26</b>  | Overcurrent detection time  | 0.0~3000.0s<br>During operation, when the actual output current (r27.06) is more than P47.25 and the P47.26 time is maintained, the system reports A.Pol and stops. | 10.0s | ☆ |
| <b>P47.27</b>  | Overcurrent recovery time   | 0.0~3000.0s When condition described in P47.26 does not meet Over current protection requirement ,it will be returned to normal state after delay                   | 10.0s | ☆ |
| <b>P47.28</b>  | Starting coefficient        | 0.000~1.000   | 0.850 | ☆ |
| <p><b>Photovoltaic panel working coefficient = rated mppt voltage / open circuit voltage</b><br/> <b>Characteristics of photovoltaic panels for example 30.7/37.9 = 0.81</b></p>   |                             |   |       |   |
| <b>P47.29</b>  | Starting adjustment         | 10~100V   | 40V   | ☆ |
| <b>P47.30</b>  | Fast speed function         | Unit digit: fast starting<br>0: Disable                      1: Enable<br>Ten digit: Fast mppt tracking   | 11    | ☆ |

|   |                                   | 0: Disable  | 1: Enable |        |   |
|---|-----------------------------------|---|-----------|--------|---|
| <b>P47.31</b>   | Fault automatic reset time        | 0.00~600.00   |           | 60.00s | ☆ |
| Function faults include: undervoltage fault Er.Lu1, soft start fault Er.Lu2, inverter overload Er.oL, motor overload Er.oL1, inverter overheat Er.oH, motor overheat Er.oH1, motor overheat Er.oH1, user-defined fault 1 Er.Ud1, user-defined fault 2 Er.Ud2  |                                   |   |           |        |   |
| <b>P47.33</b>   | Low water level detection channel | Units: Water level monitoring channel<br>0: invalid<br>1: AI1<br>2: AI2<br>3: AI3<br>4: AI4<br>Note: DI terminal 61-water shortage detection is independent of the local setting<br>Ten's unit: analog water level logic<br>0: positive logic 0.00%-empty water 100.0%-full water<br>1: Inverse logic 0.00%-full water 100.0%-empty water |           | 00     | ★ |
| <b>P47.34</b>   | Low water level detection value   | 0.0~100.0%  |           | 0.0%   | ☆ |
| <b>P47.35</b>   | Low water level detection time    | 0.0~3000.0s<br>1. When DI-61 is valid<br>2. The analog detection channel is less than P47.34 (positive logic) or the analog detection channel is greater than P47.34 (inverse logic)<br>When 1 or 2 conditions are met and P47.35 is maintained, the system reports A.Lor and shuts down  |           | 10.0s  | ☆ |
| <b>P47.36</b>   | Low water recovery time           | 0.0~3000.0s<br>When the conditions described in P47.35 are not met, it will be restored after a delay   |           | 10.0s  | ☆ |
| Conditions for the water shortage test to take effect:<br>1. The DI terminal arbitrarily set to function No. 61 receives the input switch close signal. For example, after P06.04 is set to 61, DI4 is closed.<br>2. When the ten's digit of P47.33 is 0 and the analog input is less than the detection value, for example: set P47.33=01, P47.34=50%, at this time AI1 input is less than 5V or 10mA<br>3. When the ten's digit of P47.33 is 1 and the analog input is greater than the detection value, for example: set P47.33=11, P47.34=50%, at this time AI1 input is greater than 5V or 10mA<br>4. After 1, 2 or 3 conditions are met, the system will report A.Lor for the set time of P47.35<br>Water shortage recovery conditions:<br>5. The system enters the water shortage detection stage and displays A.Lor |                                   |   |           |        |   |

|   |  |  |         |   |
|---|--|--|---------|---|
| 6. When the conditions 1, 2 or 3 are not met, and the maintenance time is greater than the time set in P47.36, the system will recover.   |  |  |         |   |
| P47.37  | Reserved                               |  |         |   |
| P47.38  | Automatic switching delay start time   | 0.000s~30.000s<br>When the automatic switching is completed, the inverter will delay this time and wait for the power supply to stabilize before running | 5.000s  | ☆ |
| r47.39  | Input power type                       | 0:AC Electric power<br>1:Solar power   | -       | ● |
| <b>24 Group Pump dry run protection/unload detection parameter</b>  |  |  |         |   |
| P24.03  | Lower limit frequency of self-learning | 0.00Hz~600.00Hz<br>When the operating frequency is greater than or equal to this frequency, the load-off self-learning can be performed                  | 20.00HZ | ☆ |
| P24.12  | Dry run/Unload protection option       | 0: No offload detection is performed;<br>1: Enable dry run detection   | 1       | ☆ |
| P24.13  | Dry run/Unload detection level         | 0.0 to 200.0%<br>The percentage of motor rated current.  | 0.0%    | ☆ |
| P24.14  | Dry run Unload detection time          | 0.000s~60.000s   | 30.000s | ☆ |
| P24.15  | Unload detection offset frequency      | 0.00Hz~Fmax<br>Detection frequency=Fmax-P24.15   | 5.00Hz  | ☆ |
| P24.16  | Reset time of dry run protection       | 0.0~6000.0   | 240.0s  | ☆ |
| P23.21  | Dry run detection mode                 | 0000:Coast stop<br>1000:Fast stop<br>3000:Continue to run  | 0000    | ☆ |
| <p><b>1. Set P47.00=0, P00.07=20.00-30.00, P00.06=0, and then press  to run the drive</b></p> <p><b>2. Check the function code P27.00, wait until its value becomes 20.00, and then enter the function code P24.13,</b></p> <p><b>3. press the keyboard  and  simultaneously for more than 2 seconds,, and if the value changes, the load-off self-learning is completed</b></p> <p><b>4. Press  to stop running, set P47.00=1, P00.06=1, In this process, the pump no need to take out from water</b></p> <p><b>Saying P24.12 = 1, P24.13 = 40.0%, P24.14 = 3.0s, then the diagram is shown below.</b></p> |  |  |         |   |



Dry run logic curve

Seen from the diagram shown above, if the output current is fall down to 40.0% of the max output current and the status last for P24.14 then the drive will set the alarm dry. If with P23.21 is not set, then the drive will coast stop while if P23.21 is set to value 3000, then the drive will keep on running with dry alarm.

**41 Group Pump sleep and wake-up parameters:**

|        |                             |   |      |   |
|--------|-----------------------------|---|------|---|
| P41.00 | Sleep/wake source selection | <p>Unit'digit: Sleep source selection<br/>           0: No sleep function<br/>           2: AI1 sleep<br/>           3: AI2 sleep<br/>           Ten's digit: Wake-up source selection<br/>           1: AI1 wake up<br/>           2: AI2 wake up<br/>           Hundred's digit: Sleep wake-up direction selection<br/>           0: positive direction<br/>           Sleep source (AI1 ~ AI2)&gt;P41.03, inverter sleeps<br/>           Wake-up source (AI1 ~ AI2) &lt;P41.04, the inverter wakes up<br/>           1: reverse direction<br/>           Sleep source (AI1 ~ AI2)&lt;P41.03, inverter sleeps<br/>           Wake-up source (AI1 ~ AI2)&gt;P41.04, the inverter wakes up</p> <p>Note: If AI2 is connected to the liquid level detection signal, please set this value to "23". If there is no sleep source (the ones place is 0), the wake-up function is automatically invalid, and P41.03~P41.06 are invalid.</p> | 010  | ☆ |
| P41.03 | Dormant level               | <p>0~100.0%<br/>           Note: The liquid level is higher than this value and the duration exceeds P41.05, and</p>  | 0.0% | ☆ |

|                                 |                                     |   |         |   |
|---------------------------------|-------------------------------------|---|---------|---|
|                                 |                                     | the pump sleeps.  |         |   |
| P41.04                          | Wake up level                       | 0~100.0%<br>Note: The liquid level is lower than this value and the duration exceeds P41.06, the pump wakes up.   | 0.0%    | ☆ |
| P41.05                          | Enter sleep delay                   | 0.0s~6000.0s  | 0.0s    | ☆ |
| P41.06                          | Wake-up delay                       | 0.0s~6000.0s  | 0.0s    | ☆ |
| <b>Basic function parameter</b> |                                     |   |         |   |
| P00.00                          | User password                       | 0 ~ 65535<br>➤ No user password status (P00.01 = 1 after power-on):<br>Entering the same non-zero value twice in succession sets a user password and enters lockout.<br>➤ password lock state:<br>Enter the password to enter the unlock state.<br>➤ unlocked state:<br>Enter the original password to enter the lock state; enter the same value twice in a row to change the password (clear the password if you enter 0 twice in a row). | 0       | ☆ |
| P00.03                          | RESET                               | 0: NO ACTION<br>11: Restore default parameter except for motor parameter and auto-tune related parameter and factory parameter<br>12: Restore default to factory parameter<br>13: Clear tripping record   | 0       | ★ |
| P00.06                          | Source of the Operation Command     | 0: keypad<br>1: terminal<br>2: communication<br>➤ Command source: run、stop、forward、reverse、jog、fast brake stop.etc  | 0       | ★ |
| P00.07                          | Numeric frequency setting           | 00.00Hz~maximum frequency   | 50.00Hz | ☆ |
| P01.00                          | Main frequency source selection (A) | 0: Digital setting<br><b>1: AI1</b><br>2: AI2<br>3: AI3(reserved)<br>4: AI4 (reserved)<br>5: HDI<br>6: multi-step speed<br>7: communication<br>8: PID   | 10      | ★ |

|               |  |   |                 |          |
|---------------|--|---|-----------------|----------|
|               |  | 9: Internal PLC<br>Notice:DI terminal function code 26-32 superior than this function code  |                 |          |
| <b>P01.06</b> | <b>Maximum frequency</b>                     | <b>10.00~600.00Hz</b>   | <b>50.00Hz</b>  | <b>★</b> |
| <b>P01.07</b> | <b>Upper limit frequency source</b>          | <b>0: Digital setting (P01.08)</b><br><b>1: AI1</b><br><b>2: AI2</b><br><b>3~4: reserved</b><br><b>5: HDI</b><br><b>6: reserved</b><br><b>7: Communication</b><br><b>8: PID</b> | <b>0</b>        | <b>★</b> |
| <b>P01.08</b> | <b>Upper limit frequency</b>                 | Lower limit frequency-maximum frequency   | 50.00Hz         | ☆        |
| <b>P01.09</b> | <b>Lower limit frequency</b>                 | 0.00hz-upper limit frequency  | 00.00Hz         | ☆        |
| <b>P02.08</b> | <b>Stop method</b>                           | 0: ramp to stop (Deceleration to stop)<br>1: free coast to stop   | 0               | ☆        |
| <b>P02.15</b> | <b>Minimum blocking time after free stop</b> | 0.010s-30.000s  | Depend on       | <b>★</b> |
| <b>P03.01</b> | <b>Acceleration time 1</b>                   | Setting value depend on P03.16<br>P03.16 = 2, 0.00~600.00s;<br>P03.16 = 1, 0.0s~6000.0s;<br>P03.16 = 0, 0s~60000s   | Depend on model | ☆        |
| <b>P03.02</b> | <b>Deceleration time 1</b>                   | Setting value depend on P03.16<br>P03.16 = 2, 0.00~600.00s;<br>P03.16 = 1, 0.0s~6000.0s;<br>P03.16 = 0, 0s~60000s   | 5.00S           | ☆        |
| <b>P07.01</b> | <b>DO1 function</b>                          | 0:No function<br>1:READY<br>2:RUN<br>3:Error1 (stop fault)<br>4:Error2 (same as Error1 except undervoltage)<br>5:Warning output(fault but in running)                           | 0               | ☆        |
| <b>P07.02</b> | <b>DO2 function</b>                          | 0:No function<br>1:READY<br>2:RUN<br>3:Error1 (stop fault)<br>4:Error2 (same as Error1 except undervoltage)<br>5:Warning output(fault but in running)                           | 0               | ☆        |

|               |  |  |             |          |
|---------------|--|--|-------------|----------|
| <b>P07.03</b> | Relay 1 Output terminal function group(T1A T1B T1C)          | 0:No function<br>1:READY<br>2:RUN<br>3:Error1 (stop fault)<br>4:Error2 (same as Error1 except undervoltage)<br>5:Warning output(fault but in running)  | 3           | ☆        |
| <b>P07.04</b> | Relay 2 Output terminal function group(T2A T2B T2C) optional | 0:No function<br>1:READY<br>2:RUN<br>3:Error1 (stop fault)<br>4:Error2 (same as Error1 except undervoltage)<br>47:Warning output(fault but in running)<br>auto main & PV switching   | 47          | ☆        |
| <b>P12.11</b> | Slip compensation gain                                       | 0~200%<br>It is used to compensate the speed drop of the asynchronous motor VF control with load, and improve the speed control accuracy. Please adjust according to the following principles:<br>● Increase the setting when the motor speed is lower than the target value with loading.<br>● Reduce this setting when the motor speed is higher than the target value with loading, | 100%        | ☆        |
| <b>P21.00</b> | <b>Monitoring display</b>                                    | <b>0: Standard mode (display frequency only)</b><br><b>1: Automatic scrolling display (Check 3.1 in detail ) it show hz,current,power and voltage</b>  | <b>0</b>    | <b>★</b> |
| <b>P21.11</b> | <b>Monitoring display &gt;&gt;</b>                           | If you use shift button >> ,you will monitor running frequency, set frequency, DC bus voltage and output current, if you change this value to 5341,It will show running frequency, ac output voltage and DC bus voltage and output current   | <b>5341</b> | ☆        |
| <b>P22.00</b> | <b>Carrier/swithcing frequency</b>                           | Depend on drives power<br>≤7.5kW: 1kHz~12.0kHz<br>11kW~45kW: 1kHz~8kHz<br>≥55kw: 1kHz~4kHz<br>The carrier frequency can be reduced when it came like following phenomenon:<br>1 The leakage current generated by the inverter is large<br>2 The interference generated by the inverter has an impact on peripheral devices<br>3 Long wiring distance between inverter and motor        | Depend      | ☆        |



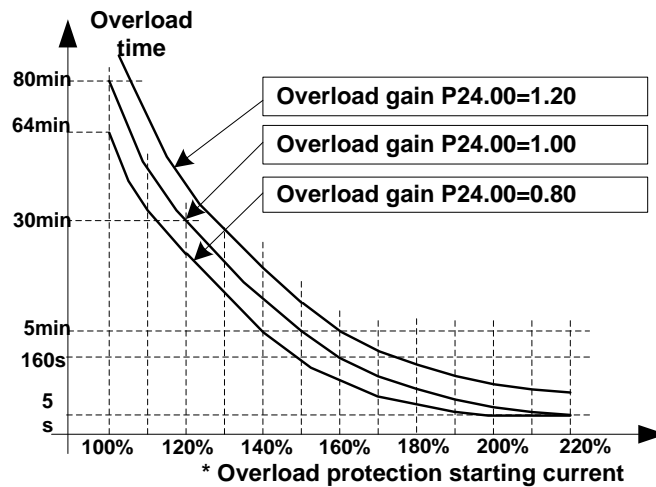
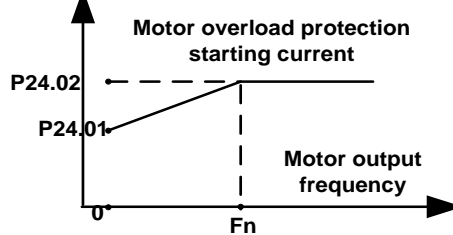
|                                   |                                      |   |         |   |
|-----------------------------------|--------------------------------------|---|---------|---|
|                                   |                                      | The carrier frequency can be increased when it came like following phenomenon:<br>1 The electromagnetic noise generated by the motor is large   |         |   |
| P22.14                            | Cooling method (fan control)         | 0:effective when running<br>1:Forced control( effective when power on)<br>2:adjustable as per drive temperature   | 2       | ☆ |
| <b>P23.15</b>                     | <b>Output phase loss function</b>    | 0.0-30%, 0% means output phase detections shielded  | 30%     | ☆ |
| P23.26                            | Fault auto Reset times               | 0~99  | 10      | ☆ |
| P23.28                            | Fault reset internal time            | 0.1s-300.0s   | 10      |   |
| P23.29                            | Fault auto reset times clearing time | 0.1s~3600.0s  | 600.0s  | ☆ |
| <b>11 Group Motor 1 Parameter</b> |                                      |   |         |   |
| P11.00                            | Motor type                           | 0: AC asynchronous motor<br>1: Synchronous motor(Special software)<br>See appendix parameter  | 0       | • |
| P11.01                            | AC asynchronous motor TYPE           | 0: Three phase AC asynchronous motor<br>1: Single phase AC asynchronous motor without starting capacitor  | 0       | ★ |
| <b>P11.02</b>                     | <b>Motor rated power</b>             | 0.1kW~800.0kW<br>➤ when power is less than 1kw ,0.75kw set to 0.8 as per round up principle ,0.55kw motor set 0.6<br>➤ when change motor rated power,AC drive will automatically set other parameter of motor name plate and motor model parameter <b>be careful to use</b> | Depend  | ★ |
| <b>P11.03</b>                     | <b>Motor rated voltage</b>           | 10V~2000V   | Depend  | ★ |
| <b>P11.04</b>                     | <b>Motor rated current</b>           | P11.02<30kW: 0.01A<br>P11.02>=30kW: 0.1A  | Depend  | ★ |
| <b>P11.05</b>                     | <b>Motor rated frequency</b>         | 1.00Hz~600.00Hz   | 50.00Hz | ★ |
| <b>P11.06</b>                     | <b>Motor rated RPM</b>               | 1~60000rpm  | Depend  | ★ |
| <b>P11.10</b>                     | <b>Auto-tune/self-learning</b>       | 0: no auto tuning<br>1: Stationary auto tuning of Asynchronous motor<br>It is suitable in the cases when the motor can not de-couple form the load. The auto tuning for the motor parameter will impact the control accuracy.   | 0       | ★ |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  | 2: dynamic or Rotational auto tuning of Asynchronous motor<br>Comprehensive motor parameter auto tune<br>It is recommended to use rotation auto tuning when high control accuracy is needed. |  |  |
|--|--|--|--|--|

**24 Group motor protection**

|        |  |   |        |   |
|--------|--|---|--------|---|
| P24.00 | Motor overload protection gain                 | 0.20~10.00<br>The larger the value, the longer the allowable overload operation, and the higher the risk of motor overheating damage. | 1.00   | ☆ |
| P24.01 | Motor overload starting current at zero speed  | 50.0%~150.0%  | 100.0% | ☆ |
| P24.02 | Motor overload starting current at Rated speed | 50.0%~150.0%  | 115.0% | ☆ |

**Motor in self cooling mode, heat dissipation is poor when in low frequency but good in condition of high frequency . P24.01 and P24.02 is used to set the starting point of zero and rated speed overload current in order to obtain a more reasonable under different speed overload protection Time curve**



First graph: Motor overload protection starting current

Second graph: Motor Overload Protection Curve with Different Overload Protection Gains

Motor overload only protects the motor from overload when P24.04 is enabled. P24.00 is used to adjust the overload inverse time curve time, as shown in the right figure above, the minimum motor overload time is 5.0s.  
 Note: Users need to correctly set the three parameters of P24.00, P24.01 and P24.02 according to the actual overload capacity of the motor. If set unreasonable, prone to motor overheating damage and the inverter is not timely warning of the danger of protection

### 27 Group Monitoring parameter

|        |                           |  |   |   |
|--------|---------------------------|--|---|---|
| r27.00 | Output frequency          | It can set unit as per Parameter P21.07  | - | ● |
| r27.01 | Setting frequency         | It can set unit as per Parameter P21.07  | - | ● |
| r27.02 | Direction indicator       | bit0: direction of running frequency<br>bit1: direction of setting frequency<br>bit2: direction of main frequency<br>bit3: direction of auxiliary frequency<br>bit4: direction of Up Down offset<br>bit5: reserved | - | ● |
| r27.03 | DC Bus voltage            | Unit: 1V   | - | ● |
| r27.04 | VF separation setting     | unit: 0.1%   | - | ● |
| r27.05 | Output AC voltage         | unit: 0.1V   | - | ● |
| r27.06 | Output AC current         | unit: 0.1A   | - | ● |
| r27.07 | Output current percentage | unit: 0.1%(100% of motor rated current)  | - | ● |
| r27.14 | Accumulated power on time | Unit:hour  | - | ● |
| r27.15 | Accumulated running time  | Unit:hour  | - | ● |
| r27.18 | Heat sink temperature     | Unit:0.1 °C  | - | ● |
| r21.16 | Load speed display        | Load speed =P27.00*P21.10<br>Decimal point digit defined by P21.11   | - | ● |
| P21.17 | Speed display unit        | 0: 0.01Hz; 1: 1Rpm<br>➤ r10.12, r27.00, r27.01 displaying unit selection   | 0 | ★ |

### 25 Group Fault tracking parameter

|        |                                   |  |   |   |
|--------|-----------------------------------|--|---|---|
| r25.00 | Current fault type                | See detail chapter 5 fault diagnosis and solution                        | - | ● |
| r25.01 | Output frequency at fault         | Unit:0.01Hz  | - | ● |
| r25.02 | Output current at fault           | Unit:0.1A  | - | ● |
| r25.03 | Bus voltage at fault              | Unit:V   | - | ● |
| r25.04 | Running mode status 1st fault     | See Parameter r27.10 in detail   | - | ● |
| r25.05 | Input terminal status at fault    | Bit0~Bit6 corresponds to DI1~DI7<br>Bit12~Bit15 corresponds to VDI1~VDI4 | - | ● |
| r25.06 | Working time at fault             | Unit:0.01S   | - | ● |
| r25.07 | Accumulated working time at fault | Unit:hour  | - | ● |

|   |                                   |   |    |   |
|---|-----------------------------------|---|----|---|
| r25.08                                    | Frequency source at fault         | Unit:0.01hz   | -  | ● |
| r25.14                                    | Heat sink temperature at fault    | Unit: 0.1° C  | -  | ● |
| r25.15                                    | Low-level fault                   | -   | -  | ● |
| <b>26 Group Fault recording parameter</b> |                                   |   |    |   |
| r26.00                                    | Last fault 1trip type             | SEE DETAILS IN CHAPTER 5  | -  | ● |
| r26.01                                    | Output frequency at fault         | Unit:0.01Hz   | -  | ● |
| r26.02                                    | Output current at fault           | Unit:0.1A   | -  | ● |
| r26.03                                    | Bus voltage at fault              | Unit:V  | -  | ● |
| r26.04                                    | Running mode status 1at fault     | See Parameter r27.10  | -  | ● |
| r26.05                                    | Input terminal status at fault    | Bit0~Bit6 corresponds to DI1~DI7<br>Bit12~Bit15 corresponds to VDI1~VDI4  | -  | ● |
| r26.06                                    | Working time at fault             | Unit:0.01S  | -  | ● |
| r26.07                                    | Accumulated Working time at fault | Unit:hour   | -  | ● |
| r26.08                                    | Last fault 2 trip type            | Same as last fault description  | -  | ● |
| r26.09                                    | Output frequency at fault         | Unit:0.01Hz   | -  | ● |
| r26.10                                    | Output current at fault           | Unit:0.1A   | -  | ● |
| r26.11                                    | Bus voltage at fault              | Unit:V  | -  | ● |
| r26.12                                    | Running mode status 1at fault     |   | -  | ● |
| r26.16                                    | Last fault 3 trip type            | Same as last fault description  | -  | ● |
| r26.17                                    | Output frequency at fault         | Unit:0.01Hz   | -  | ● |
| r26.18                                    | Output current at fault           | Unit:0.1A   | -  | ● |
| r26.19                                    | Bus voltage at fault              | Unit:V  | -  | ● |
| <b>P40 PID Group</b>                      |                                   |   |    |   |
| r40.00                                    | PID final output value            | Read only unit:0.1%   | -  | ● |
| r40.01                                    | PID final set value               | Read only:0.01%   | -  | ● |
| r40.02                                    | PID final feedback value          | Read only:0.01%   | -  | ● |
| r40.03                                    | PID deviation value               | Read only unit:0.01%  | -  | ● |
| <b>P40.04</b>                             | <b>PID reference source</b>       | Unit's digit: <b>PID main reference source(ref1)</b><br>0: Digital setting<br>1: AI1<br>2: AI2<br>3: AI3(IO expansion board)<br>4: AI4(IO expansion board)<br>5: HDI high frequency pulse<br>6: Communication | 00 | ☆ |

|                              |                             | Ten's digit:PID Auxiliary reference source(ref2)Same as Unit's digit   |        |   |
|------------------------------|-----------------------------|--|--------|---|
| P40.05                       | PID given feedback range    | 0.01~655.35  | 100.00 | ☆ |
| P40.06                       | PID digital setting 0       | 0.0~P40.05   | 0.00   | ☆ |
| P40.11                       | <b>PID feedback source1</b> | Unit's digit 0: PID feedback source1(fdb1)<br>0:AI1<br>1:AI2<br>2:AI3(option card)<br>3:AI4(option card)<br>4: PLUSE(HDI)<br>5: Communication<br>6: Motor rated output current<br>7: Motor rated output frequency<br>8: Motor rated output torque<br>9: Motor rated output frequency<br>Ten's digit : PID feedback source2 (fdb2)<br><b>Same as Unit's digit</b> | 00     | ☆ |
| P40.15                       | Upper limit of PID output   | -100.0%~100.0%   | 100.0% | ☆ |
| P40.16                       | lower limit of PID output   | -100.0%~100.0%   | 0.0%   | ☆ |
| P40.17                       | Proportional gain KP1       | 0.00~200.0%  | 5.0%   | ☆ |
| P40.18                       | Integral time T11           | 0.01s~20.00s   | 1.00s  | ☆ |
| P40.19                       | Differential time TD1       | 0.000s~0.100s  | 0.000s | ☆ |
| <b>04 Group Analog input</b> |                             |  |        |   |
| P04.07                       | AI 1 Curve setting          | Unit's: AI curve selection<br>0: curve A<br>1: curve B<br>2: Curve C<br>3: Curve D<br>Ten'unit: when input signal lower than minimum input<br>0: equal to minimum input<br>1: equal to 0.0%  | 00     | ★ |
| P04.08                       | AI1 filter time             | 0.000s~10.000s   | 0.100s | ☆ |
| r04.09                       | AI 1 actual value           | 0.00V~10.00V ( it is used to view the port voltage of AI1. When AI1 is a current type (0~20mA) input, multiplying this value by 2 is the input current (mA) of the AI1 port.)  | -      | ● |
| r04.10                       | AI 1 Conversion value       | -100.0%~100.0%(It is used to view the output of the AI1 mapped curve)  | -      | ● |

|        |                           |   |   |        |   |
|--------|---------------------------|---|---|--------|---|
| P04.11 | AI 2 Curve setting        | Unit's: AI curve selection<br>0: curve A<br>1: curve B<br>2: Curve C<br>3: Curve D<br>Ten'unit: when input signal lower than minimum input<br>0: equal to minimum input<br>1: equal to 0.0% |   | 01     | ★ |
| P04.12 | AI2 filter time           | 0.000s~10.000s  |   | 0.100s | ☆ |
| r04.13 | AI 2 actual value         | 0.00V~10.00V ( it is used to view the port voltage of AI2. When AI2 is a current type (0~20mA) input, multiplying this value by 2 is the input current (mA) of the AI2 port.)               |   | -      | ● |
| r04.14 | AI 2 Conversion value     | -100.0%~100.0%(It is used to view the output of the AI2 mapped curve)   |   | -      | ● |
| P04.23 | Curve A horizontal axis 1 | 0.00V~<br>P04.25  | <p>Note: Input less than P04.23, output decided by curve ten's digit</p> <p>Setting method mode for AI1 4~20mA form</p> <ol style="list-style-type: none"> <li>1. Switch the corresponding AI1 jumper on the IO board to current;</li> <li>2. Set the function code: P04.07 Unit's place=0 (default), P04.23=2.00.</li> </ol> | 0.00V  | ☆ |
| P04.24 | Curve A vertical axis 1   | -<br>100.0%<br>~<br>100.0%  |   | 0.0%   | ☆ |
| P04.25 | Curve A horizontal axis 2 | P04.23<br>~<br>10.00V   |   | 10.00V | ☆ |
| P04.26 | Curve A vertical axis 2   | -<br>100.0%<br>~<br>100.0%  |   | 100.0% | ☆ |

|        |                           |                            |  |        |   |
|--------|---------------------------|----------------------------|--|--------|---|
| P04.27 | Curve B horizontal axis 1 | 0.00V~<br>P04.29           | <p>Note: Input less than P04.27, output decide by curve ten's digit</p> <p>Setting method mode for AI1 4~20mA form</p> <ol style="list-style-type: none"> <li>1. Switch the corresponding AI1 jumper on the IO board to current;</li> <li>2. Set the function code: P04.11 one place=1 (default), P04.27=2.00</li> </ol> | 0.00V  | ☆ |
| P04.28 | Curve B vertical axis 1   | -<br>100.0%<br>~<br>100.0% |  | 0.0%   | ☆ |
| P04.29 | Curve B horizontal axis 2 | P04.27<br>~<br>10.00V      |  | 10.00V | ☆ |
| P04.30 | Curve B vertical axis 2   | -<br>100.0%<br>~<br>100.0% |  | 100.0% | ☆ |

### 06 Group Digital input(Terminal function)

|        |                            |   |    |   |
|--------|----------------------------|---|----|---|
| P06.01 | D11 Numeric input function | 0: No function<br>1: Run terminal<br>2: Reverse/Forward and reverse switchover<br>3: Three wire control<br>4: Forward jog command<br>5: Reverse jog command<br>6: Terminal UP<br>7: Terminal DOWN<br>8: Clear up UP/DOWN offset<br>9: Coast to stop/free stop<br>10: Fault reset<br>11: Reverse forbidden<br>12: Switching run command to Keypad<br>13: Switching run command to Communication<br>14: fast stop | 1  | ★ |
| P06.02 | D12 Numeric input function |   | 62 | ★ |
| P06.03 | D13 Numeric input function |   | 60 | ★ |

|        |                                 |  |    |   |
|--------|---------------------------------|--|----|---|
| P06.04 | DI4 Numeric input function      | 15: external stop<br>16: Switch between motor 1 and motor 2<br>17: Pause operatoin<br>18: DC braking<br>19: Switch between torque and speed Control<br>20: torque control disabled<br>21: Multi-step speed terminal 1  | 61 | ★ |
| P06.05 | DI5(HDI) Numeric input function | 22: Multi-step speed terminal 2<br>23: Multi-step speed terminal 3<br>24: Multi-step speed terminal 4<br>25: frequency source switchover<br>26: Switch main frequency source to Numeric frequency setting<br>27: Switch main frequency source to AI1<br>28: Switch main frequency source to AI2<br>31: Switch main frequency source to high-frequency pulse input<br>32: Switch main frequency source to communication setting<br>33: Switch auxiliary frequency source to numeric frequency setting<br>60:full water level detection<br>61:Low water level detection<br>62:forced switching to ac power | 0  | ★ |



## Chapter 5 Fault Diagnosis and Solution

VFD500-PV inverter has 24 types of warning information and protection function. In case of abnormal fault, the protection function will be invoked, the inverter will stop output, and the faulty relay contact of the inverter will start, and the fault code will be displayed on the display panel of the inverter. Before consulting the service department, the user can perform self-check according to the prompts of this chapter, analyze the fault cause and find out solution. If the fault is caused by the reasons as described in the dotted frame, please consult the agents of inverter or factory directly.

| Fault Name                       | Fault code | Display            | Possible Causes  | Solutions  |
|----------------------------------|------------|--------------------|--|--|
| Inverter unit protection         | 1          | Er. SC<br>Er. SC   | 1: Motor insulation aging<br>2: The cable is damaged and contact, short circuit<br>3: The distance between motor and inverter are too long.<br>4: Output transistor breakdown<br>5: The internal wiring of the inverter is loose, or the hardware is bad.<br>6: Brake transistor short circuit   | 1. Confirm the insulation resistance of the motor. If it is turned on, replace the motor.<br>2. Check the power cable of the motor<br>3. Install reactor or output filter<br>4, seeking technical support<br>5, seeking technical support<br>6. Check if the braking resistor is damaged and the wiring is correct.  |
| Over current during acceleration | 2          | Er. OC1<br>Er. OC1 | 1: The output circuit is grounded or short circuited.<br>2: Motor auto-tuning is not performed.<br>3: The acceleration time is too short.<br>4: Manual torque boost or V/F curve is not appropriate.<br>5: The voltage is too low.<br>6: The startup operation is performed on the rotating motor.<br>7: A sudden load is added during acceleration.<br>8: The frequency inverter model is of too small power class. | 1: Eliminate external faults.<br>2: Perform the motor auto-Tuning in cold state<br>3: Increase the acceleration time.<br>4: Adjust the manual torque boost or V/F curve.<br>5: Adjust the voltage to normal range.<br>6: Select rotational speed tracking restart or start the motor after it stops.<br>7: Remove the added load.<br>8: Select a frequency inverter Of higher power class. |

| Fault Name                       | Fault code | Display          | Possible Causes  | Solutions  |
|----------------------------------|------------|------------------|--|--|
| Over current during deceleration | 3          | Er.OC2<br>Er.oC2 | 1: The output circuit is grounded or short circuited.<br>2: Motor auto-tuning is not performed.<br>3: The deceleration time is too short.<br>4: The voltage is too low.<br>5: A sudden load is added during deceleration.<br>6: The braking unit and braking resistor are not installed    | 1: Eliminate external faults.<br>2: Perform the motor auto-tuning.<br>3: Increase the deceleration time.<br>4: Adjust the voltage to normal range.<br>5: Remove the added load.<br>6: Install the braking unit And braking resistor.                             |
| Over current at constant speed   | 4          | Er.OC3<br>Er.oC3 | 1: The output circuit is grounded or short circuited.<br>2: Motor auto-tuning is not performed.<br>3: The voltage is too low.<br>4: A sudden load is added during operation.<br>5: The frequency inverter model is of too small power class.   | 1: Eliminate external faults.<br>2: Perform the motor auto-tuning.<br>3: Adjust The voltage to normal range.<br>4: Remove the added load.<br>5: Select a frequency Inverter of higher power class.   |
| Overvoltage during acceleration  | 5          | Er.OU1<br>Er.oU1 | 1: The input voltage is too high<br>2: The surge voltage is mixed in the input power supply.<br>3: There is an external force to drive the motor to run, or the brake type load is too heavy<br>4: The acceleration time is too short<br>5: The motor is shorted to ground                 | 1: The power supply voltage is reduced to the normal range<br>2: Install DC reactor<br>3: Cancel the external force of the draggable motor or install the brake unit<br>4: Increase the acceleration time  |
| Overvoltage during deceleration  | 6          | Er.OU2<br>Er.oU2 | 1: The input voltage is too high<br>2: The surge voltage is mixed in the input power supply.<br>3: there is an external force to drive the motor to run, or the brake type load is too heavy<br>4: the deceleration time is too short<br>5: the motor is shorted to ground                 | 1: the power supply voltage is reduced to the normal range<br>2: install DC reactor<br>3: Cancel the external force of the draggable motor or install the brake unit<br>4: increase the deceleration time<br>5: eliminate the part of the ground                 |
| Overvoltage at constant speed    | 7          | Er.OU3<br>Er.oU3 | 1: The input voltage is too high<br>2: The surge voltage is mixed in the input power supply.<br>3: There is an external force to drive the motor to run, or the brake type load is too heavy<br>4: The acceleration or deceleration time is too short<br>5: The motor is shorted to ground | 1: the power supply voltage is reduced to the normal range<br>2: install DC reactor<br>3: Cancel the external force of the draggable motor or install the brake unit<br>4: increase the acceleration or deceleration time<br>5: eliminate the part of the ground |

| Fault Name                  | Fault code | Display          | Possible Causes  | Solutions  |
|-----------------------------|------------|------------------|--|--|
| Low voltage                 | 8          | Er.Lv1<br>Er.Lv1 | <p>1: Instantaneous power failure occurs on the input power supply or input phase loss</p> <p>2: The frequency inverter's input voltage is not within the allowable range.</p> <p>3: Cut off the power during operation</p> <p>4:the internal wiring of the inverter is loose, or the hardware is bad.</p>                   | <p>1:Check if the input power supply is abnormal, whether the input power terminal is loose, whether the input contactor or the air switch is abnormal.</p> <p>2:adjust the voltage to the normal range</p> <p>3:Power off after the inverter stops</p> <p>4:seeking technical support</p> <p>5: For the unstable power supply, if the performance requirements are low, try to enable the undervoltage stall function (P23.00).</p> |
| Contactor open              | 9          | Er.Lv2<br>Er.Lv2 | <p>1: Instantaneous power failure occurs on the input power supply</p> <p>2: The frequency inverter's input voltage is not within the allowable range.</p> <p>3: Cut off the power during operation</p> <p>4:the internal wiring of the inverter is loose, or the hardware is bad.</p>                                       | <p>1:Check if the input power supply is abnormal, whether the input power terminal is loose, whether the input contactor or the air switch is abnormal.</p> <p>2:adjust the voltage to the normal range</p> <p>3:Power off after the inverter stops</p> <p>4:seeking technical support</p> <p>5: For the unstable power supply, if the performance requirements are low, try to enable the undervoltage stall function (P23.00).</p> |
| Frequency inverter overload | 10         | Er. Ol<br>Er. ol | <p>1:The load is too large or the motor is blocked.</p> <p>2:The large inertia load acceleration and deceleration time is too short</p> <p>3: When the VF is controlled, the torque boost or V/F curve is not suitable.</p> <p>4:The frequency converter selection is too small</p> <p>5:Overload at low speed operation</p> | <p>1. Reduce the load and check the motor and mechanical conditions.</p> <p>2, increase the acceleration and deceleration time</p> <p>3. Adjust the torque boost or V/F curve</p> <p>4, select the inverter with a larger power level</p> <p>5. Perform motor self-learning in cold state and reduce carrier frequency at low speed</p>  |

| Fault Name              | Fault code | Display          | Possible Causes   | Solutions   |
|-------------------------|------------|------------------|---|---|
| Motor overload          | 11         | Er.oL1<br>Er.oL1 | <p>1:The load is too large or the motor is blocked.</p> <p>2:The large inertia load acceleration and deceleration time is too short</p> <p>3:When the VF is controlled, the torque boost or V/F curve is not suitable.</p> <p>4:The motor selection is too small</p> <p>5:overload at low speed operation</p> <p>6:Improper setting of motor parameters and motor protection parameters</p> | <p>1. Reduce the load and check the motor and mechanical conditions. Correctly set the motor parameters and motor protection parameters.</p> <p>2, increase the acceleration and deceleration time</p> <p>3. Adjust the torque boost or V/F curve</p> <p>4, select a motor with a higher power level</p> <p>5. Perform motor self-learning in cold state and reduce carrier frequency at low speed</p> <p>6, check the settings of related parameters</p> |
| Power input phase loss  | 12         | Er.iLP<br>Er.iLP | <p>1: The three-phase power input is abnormal.</p> <p>2: The drive board is faulty.</p> <p>3: Thelightning proof board is faulty.</p> <p>4: The main control board is faulty.</p>   | <p>1:Eliminate external faults.</p> <p>2: Ask for technical support.</p> <p>3: Ask for technical support.</p> <p>4: Ask for technical support.</p>  |
| Power output phase loss | 13         | Er.oLP<br>Er.oLP | <p>1: The cable connecting the frequency inverter and the motor is faulty.</p> <p>2: The frequency inverter's three-phase outputs are unbalanced when the motor is running.</p> <p>3: The drive board is faulty.</p> <p>4: The IGBT module is faulty.</p>   | <p>1:Eliminate external faults.</p> <p>2: Check whether the Motor three phase winding is normal.</p> <p>3: Ask for technical support.</p> <p>4: Ask for technical support.</p>  |

| Fault Name                               | Fault code | Display            | Possible Causes  | Solutions   |
|--|------------|--------------------|--|---|
| IGBT Module<br>overheat                  | 14         | Er. oH<br>Er. oH   | <ol style="list-style-type: none"> <li>1: The ambient temperature is too high.</li> <li>2: The air filter is blocked.</li> <li>3: The fan is damaged.</li> <li>4: The thermally sensitive resistor of the IGBT module is damaged.</li> <li>5: The inverter IGBT module is damaged</li> </ol>         | <ol style="list-style-type: none"> <li>1: Lower the ambient temperature.</li> <li>2: Clean the air filter.</li> <li>3: Replace the damaged fan.</li> <li>4: Replace the damaged thermally sensitive resistor.</li> <li>5: Replace the inverter module.</li> </ol>   |
| Motor<br>overheat                        | 16         | Er. oH3<br>Er. oH3 | <ol style="list-style-type: none"> <li>1: The temperature sensor wiring is loose</li> <li>2: The motor temperature is too high</li> <li>3: The motor temperature sensor detects that the temperature is greater than the set threshold.</li> </ol>   | <ol style="list-style-type: none"> <li>1: check the temperature sensor wiring</li> <li>2: Improve the carrier frequency, strengthen the heat dissipation of the motor, reduce the load, and select a motor with higher power.</li> <li>3: Check if the set threshold is reasonable.</li> </ol>                                      |
| By wave<br>current<br>limiting fault     | 17         | Er. CbC<br>Er. CbC | <ol style="list-style-type: none"> <li>1: The load is too heavy or locked-rotor occurs on the motor.</li> <li>2: The frequency inverter model is of too small power class</li> </ol>   | <ol style="list-style-type: none"> <li>1: Reduce the load and check the motor and mechanical condition.</li> <li>2: Select a frequency inverter of higher power class.</li> </ol>   |
| Ground short<br>circuit                  | 18         | Er. GF<br>Er. GF   | <ol style="list-style-type: none"> <li>1. Motor burnout or insulation aging</li> <li>2, The cable is damaged and contact, short circuit</li> <li>3. The distributed capacitance of the terminal and motor cable is larger <math>\oplus</math> motor cable</li> <li>4, Hardware is damaged</li> </ol> | <ol style="list-style-type: none"> <li>1. Confirm the insulation resistance of the motor. If it is turned on, replace the motor.</li> <li>2. Check the power cable of the motor to eliminate the fault point.</li> <li>3, reduce the carrier frequency, install the output reactor</li> <li>4, seeking technical support</li> </ol> |
| module<br>temperature<br>detection fault | 20         | Er. tCK<br>Er. tCK | <ol style="list-style-type: none"> <li>1, Temperature detection line broken</li> <li>2, Drive board is faulty</li> <li>3. Main control board is faulty</li> <li>4, The environmental temperature is too low</li> </ol>   | <ol style="list-style-type: none"> <li>1. Check the thermistor wiring</li> <li>2. Ask for technical support</li> <li>3. Ask for technical support</li> <li>4, manual intervention to drive the temperature rise</li> </ol>  |

| Fault Name                | Fault code | Display          | Possible Causes   | Solutions  |
|---------------------------|------------|------------------|---|--|
| Current detection fault   | 21         | Er.Cur<br>Er.CUR | 1: The HALL device is faulty.<br>2: The drive board is faulty.<br>3: The control board is faulty  | 1: Replace the faulty HALL device.<br>2: Replace the faulty drive board.<br>3: Ask for technical support.  |
| Encoder offline           | 22         | Er.PGL<br>Er.PGL | 1. Motor locked<br>2. Encoder pulse setting wrong<br>3. Encoder offline   | 1 check motor and mechanical condition<br>2 set correct parameter for encoder<br>3 check encoder connecting line   |
| Motor over-speed          | 25         | Er.oS<br>Er.oS   | 1: The encoder parameters are set incorrectly.<br>2: The motor auto-tuning is not performed.<br>3: The over-speed detection parameters are set incorrectly                    | 1: Set the encoder parameters properly.<br>2: Perform the motor auto-tuning.<br>3: Set the over-speed detection parameter correctly based on the actual situation. |
| Too large speed deviation | 26         | Er.DEV<br>Er.dEv | 1: The encoder parameters are set incorrectly.<br>2: The motor auto-tuning is not performed.<br>3: The detection parameters of too large speed deviation are set incorrectly. | 1: Set the encoder parameters properly.<br>2: Perform the motor auto-tuning.<br>3: Set the detection parameters correctly based on the actual situation.           |
| Motor auto-tuning fault 1 | 27         | Er.tU1<br>Er.tU1 | 1: The motor parameters are not set according to the nameplate.<br>2: The motor auto-tuning times out.  | 1: Set the motor parameters according to the nameplate properly.<br>2: Check the cable connecting between the Frequency inverter and the motor.                    |
| Motor auto-tuning fault 3 | 28         | Er.tU3<br>Er.tU3 | 1: The motor parameters are not set according to the nameplate.<br>2: The motor auto-tuning times out.  | 1: Set the motor parameters according to the nameplate properly.<br>2: Check the cable connecting between the Frequency  |
| Off load                  | 31         | Er.LL<br>Er.LL   | 1、 The frequency inverter running current is lower than the setting value.  | 1、 Confirm whether the load is off<br>2、 Check that the load is disconnected or the parameter setting is correct   |
| EEPROM read- write fault  | 32         | Er.EEP<br>Er.EEP | 1、 Eeprom Operate too frequent<br>2、 The EEPROM chip is damaged.  | 1、 Operate Eeprom suitable<br>2、 Replace the main control board  |

| Fault Name                       | Fault code | Display          | Possible Causes   | Solutions  |
|----------------------------------|------------|------------------|---|--|
| Running time arrival             | 33         | Er.TTA<br>Er.ttA | Inverter trial time arrival   | 1:Contact agent or distributor   |
| 485Communication fault           | 34         | Er.485<br>Er.485 | 1, The work of the host computer is not normal<br>2, The communication line is not normal<br>3, The communication parameter set is incorrect        | 1. Check the connection of upper computer<br>2. Check the communication connection line<br>3. Set communication parameters correctly |
| PID feedback lost during running | 36         | Er.FbL<br>Er.FbL | 1、PID feedback<P40.35 setting value and P40.36 not zero,PID feedback>P40.37 setting value and P40.38 not zero                                       | 1、 Check PID feedback signal<br>2、 P40.35 and P40.37 set correct parameter   |
| User-defined fault 1             | 37         | Er.Ud1<br>Er.Ud1 | 1: The signal of user-defined fault 1 is input via DI.<br>2:The signal of user-defined fault 1 is input via virtual I/O.                            | 1: Reset the operation.<br>2: Reset the operation  |
| User-defined fault 2             | 38         | Er.Ud2<br>Er.Ud2 | 1: The signal of user-defined fault 2 is input via DI.<br>2:The signal of user-defined fault 2 is input via virtual I/O.                            | 1: Reset the operation.<br>2: Reset the operation  |
| Light weak warning               | 39         | Sleep<br>SLEEP   | If output frequency is lower than light detection threshold and Solar radiation is too weak   | Check P47.05 and 47.07   |
| Full water protection            | 40         | A.FU<br>AFUL     | Detect the water full alarm and low water level through DI terminals, realizing automatic level control   | Check P47.18 to 47.21  |
| Lower power protection           | 41         | A.PLo<br>APoL    | During the operation of the photovoltaic pump, for some reason, the output power is less than P47.22(minimum power protection value)                | Check P47.22 to 47.24  |
| Over current protection          | 42         | A.oC<br>RoC      | During operation, when the actual output current (r27.06) is less than P47.25 and the P47.26 time is maintained, the system reports A.oC and stops. | Check P47.25 to 47.27  |

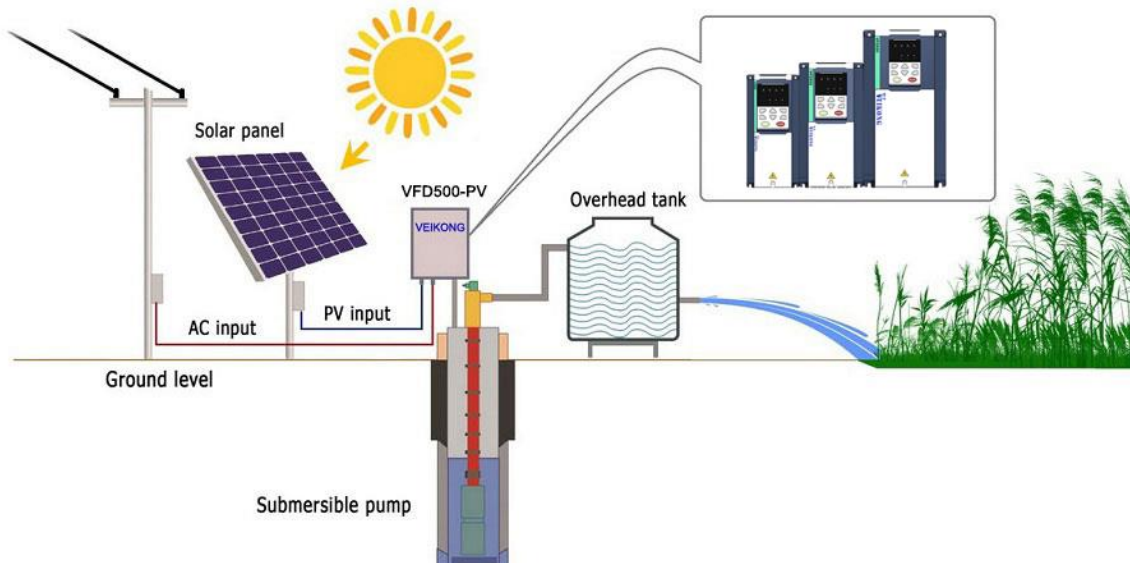
## Chapter 6 Service Agreement

1. Guarantee Free-service period is 18 Month valid since delivery date from factory which was subjected to the serial number on the drive rating label.
2. Service free for Failure or trouble caused by our product quality issue.
3. For the service that Exceeding Guarantee time or failure not caused by drive quality issues is out of the free range:
  - From inappropriate, negligent or incorrect installation or adjustment of the optional operating parameters of the equipment or from mismatching the drive with the motor;
  - Not permitted by the factory supplier, modified the drive devices;
  - Out of the VFD500-PV product specification application;
  - Failure consequences by fire, flooding, earthquake etc., un-foresee natural disasters;
  - Without drive's serial number or the S.N. can not be identified clearly.
4. Technical support hotline:+86- 075589587650



# Solar pump inverter maintenance warranty card

|  |                           |                |
|--|---------------------------|----------------|
|  | User corporation:         |                |
|  | Address:                  |                |
|  | Post code:                | Contractor:    |
|  | Tel. no.:                 | Fax no.:       |
| Product information                                | Solar pump inverter type: |                |
|  | Power size(kW):           | S.N.:          |
|  | Contract no.:             | Purchase date: |
| Repair record                                      | Service engineer:         | Tel. no.:      |
|  | Fixed date:               |                |
|  | Fault information:        |                |
| Complaints and demanding on our products:          |                           |                |
| <p>User signature:    year    month    date</p>    |                           |                |
| Return visit record:                               |                           |                |
| <p>Service signature:    year    month    date</p> |                           |                |



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