VARIASOL

Operation manual

VFD500-PV/VFD500M-PV

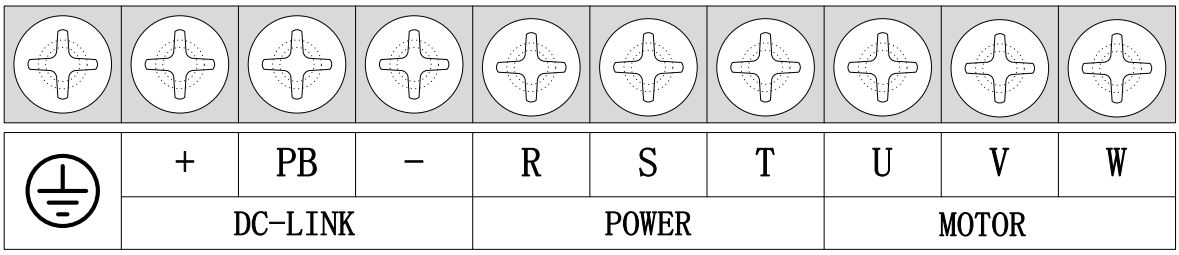
Solar pump Inverter



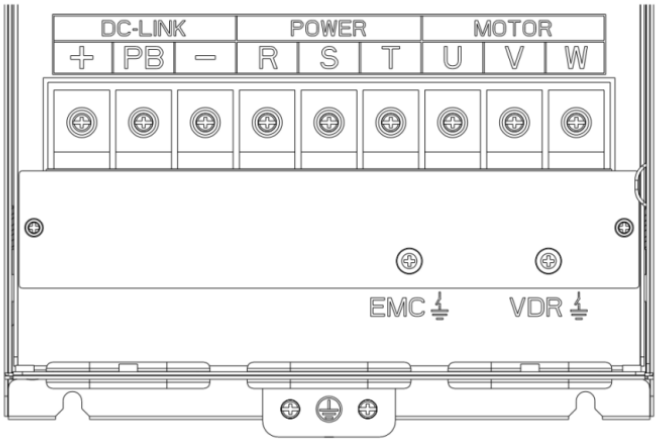
Solar pumping inverter user manual

1、VFD500-PV Electrical cable Connection

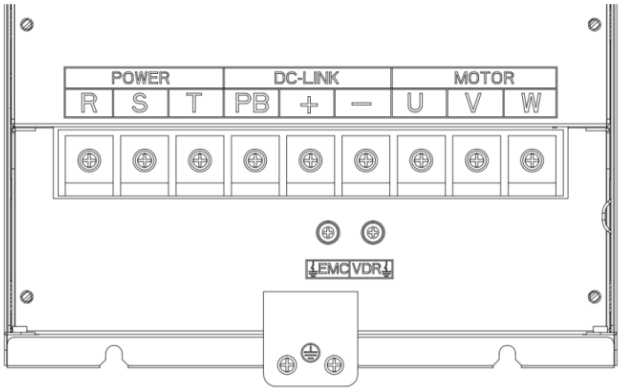
Please follow the diagram below for wiring. And pay attention to the following issues：
Please follow the diagram below for wiring. And pay attention to the following issues：



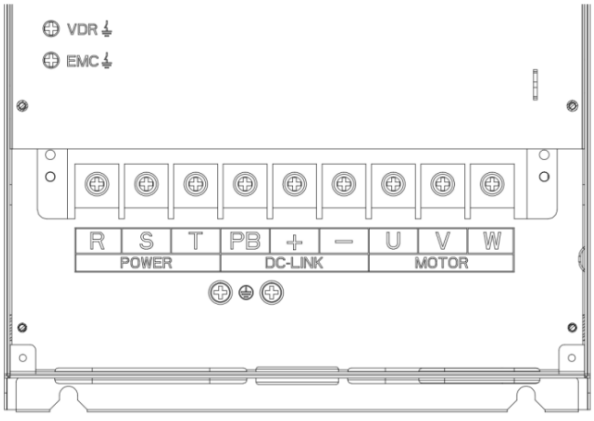
1 **Figure 1-1 SIZE A~SIZE C 0.75kw-15kw Main Circuit Terminal**



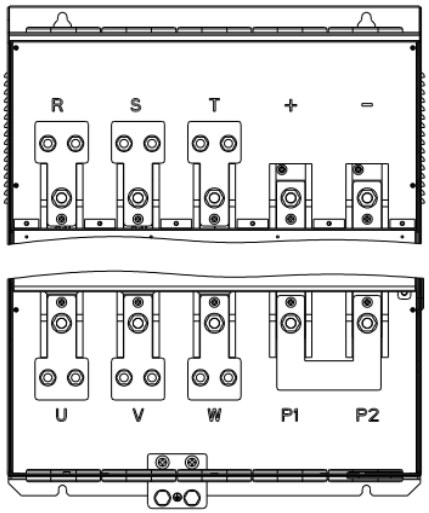
2 Figure 1-2 SIZE D 18.5kw-22kw main circuit terminal block diagram



3 Figure 1-3 SIZE E 30-37kw



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



5 Figure 1-5 110kw-250kw Main Circuit Terminal Blocks

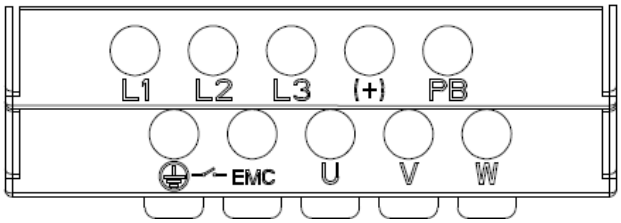
5 Table 1-6 Function description of the main circuit terminal of the inverter

Terminal	Function instruction
R、S、T	AC power input terminal, connect three-phase AC power or Solar+ -
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
P1、P2	P1 and P2 are terminal to Connect DC reactor, short P1 to P2 when DC reactor is not used (P2 is equivalent to "+" of 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”.
- **If customer use PV solar only ,it is recommended to connect PV cable to any of R T terminal,no polarity request**

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 1-7 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”。
- **If customer use PV solar only ,it is recommended to connect PV cable to any of R T terminal,no polarity request**
-

1.1 Electrical Specifications

Table 1-1 Electrical Specifications

	220V	380V
Max input DC voltage(VOC)	**450V**	**800V**
DC voltage range	**160~450VDC**	**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(maximum 600hz)**	
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,l 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
220V Single phase/Three phase level			
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

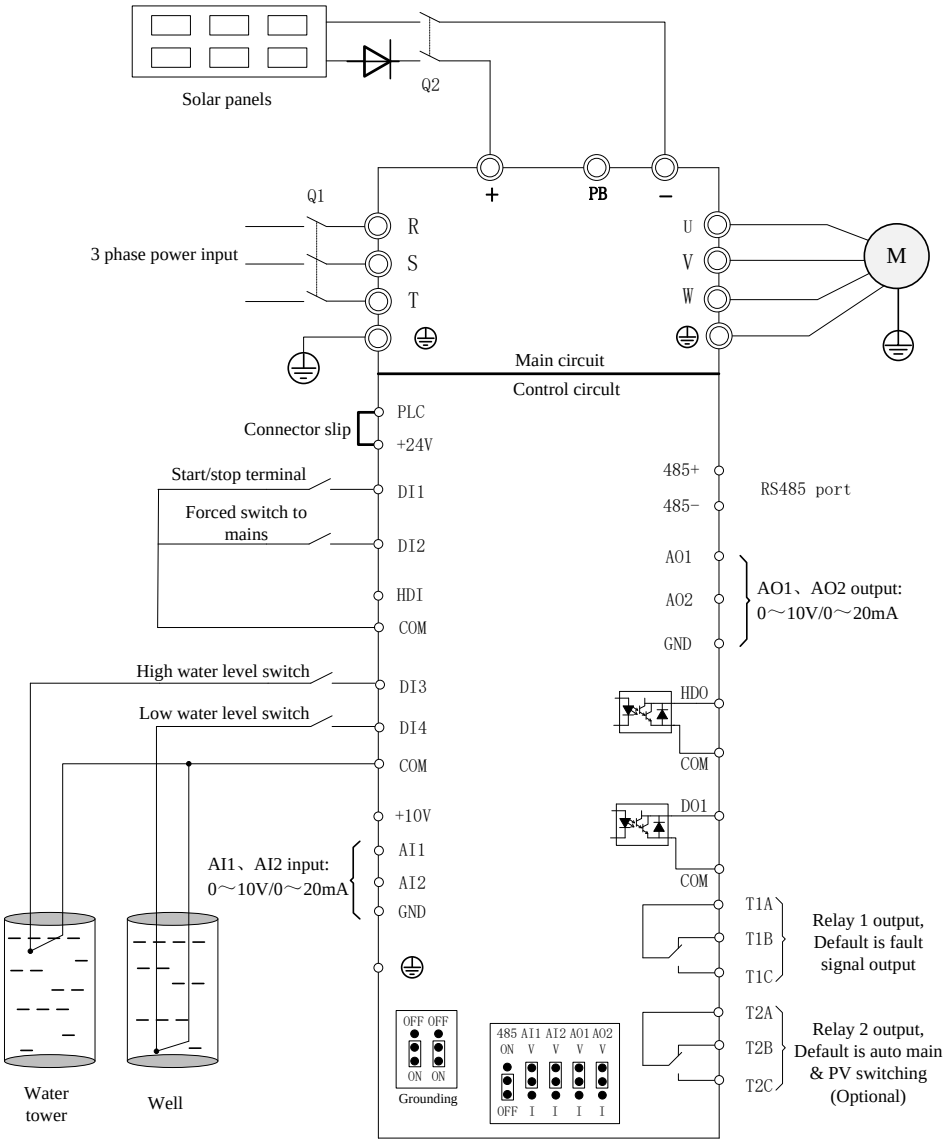
VFD500-20T00750-PV	40	32	7.5
VFD500-20T01100-PV	60	45	11
VFD500-20T01500-PV	81	60	15
VFD500-20T01850-PV	90	75	18.5
VFD500-20T02200-PV	130	90	22
VFD500-20T03000-PV	150	112	30
VFD500-20T03700-PV	200	152	37
VFD500M-20T00150-PV	9.9	7	1.5
VFD500M-20T00220-PV	14.1	10.6	2.2

Table 1-2 380V-480V rating data

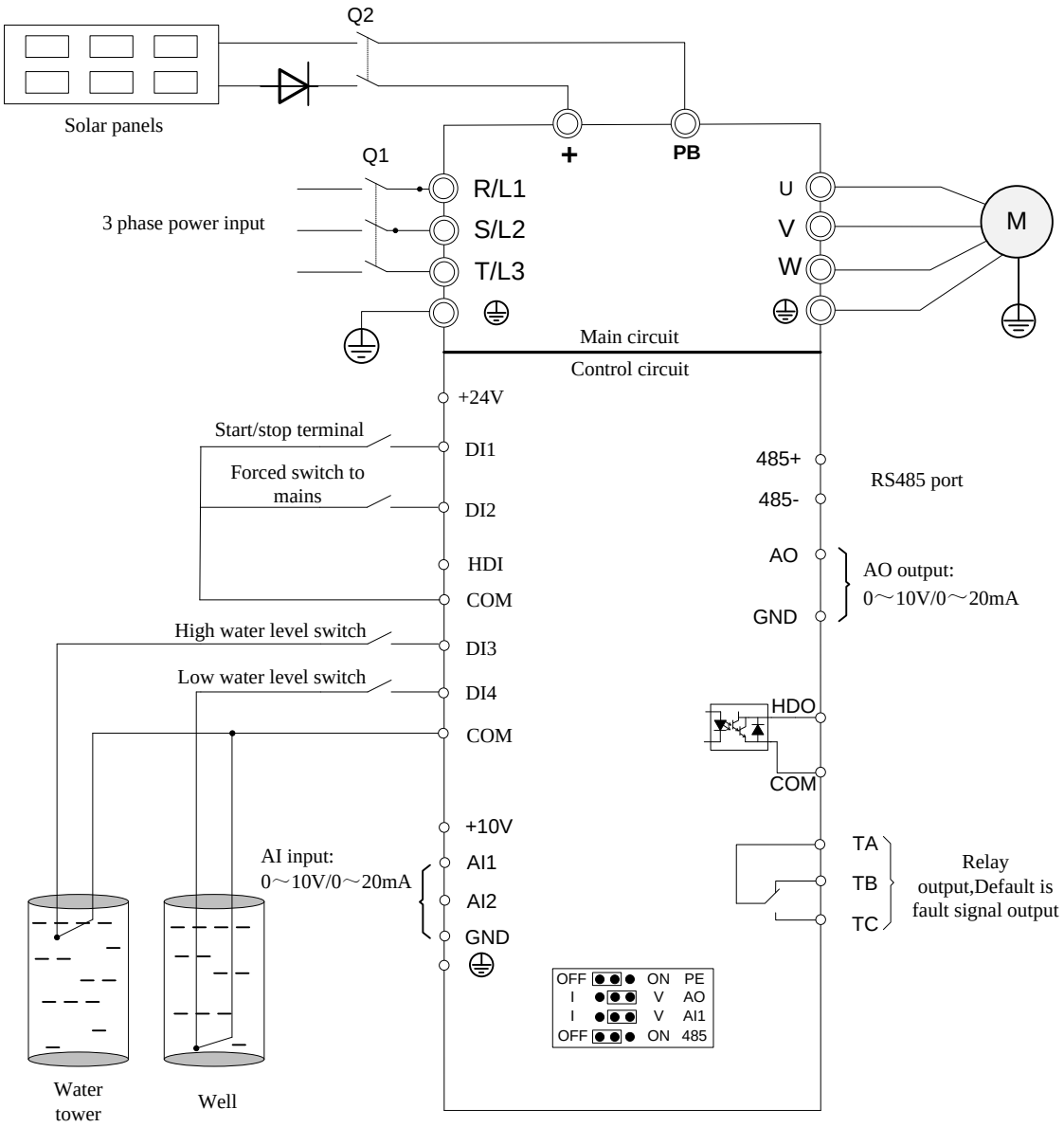
Noted 1: when the output voltage is 380V, the output current will be rated value; when the output voltage is 400V、415 V or 440V,the output current will be calculated according to power.

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 or DVDT filter or Sine wave filter .

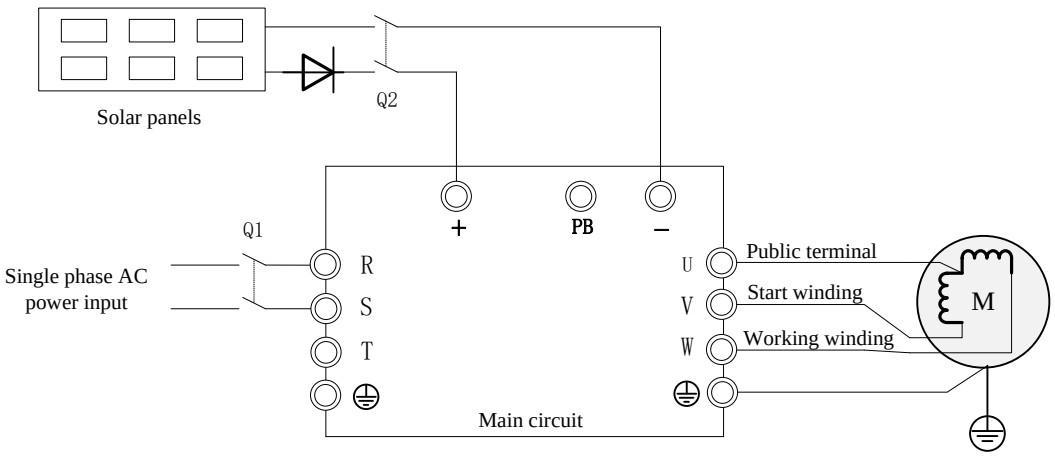
For 220V single phase motor connection

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

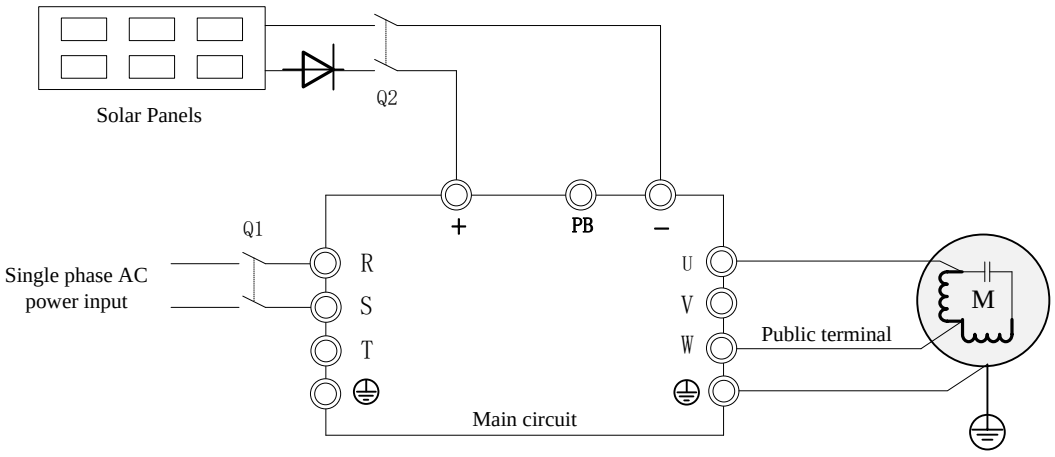
Notice: U is connected to the common end of the starting winding and the working winding, V is connected to the starting winding, and W is connected to the working winding;

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)

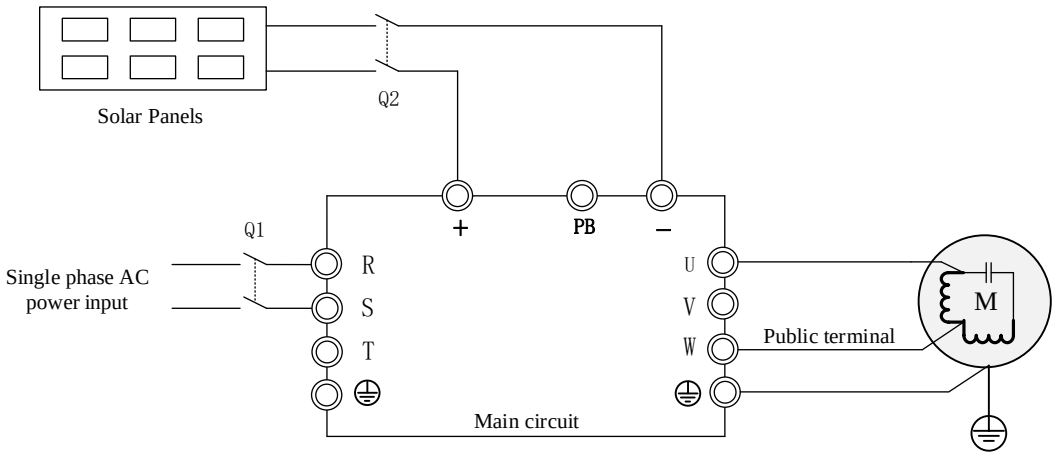


VFD500M-PV Wire Diagram of solar pump inverter (single phase pump without capacitor)

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

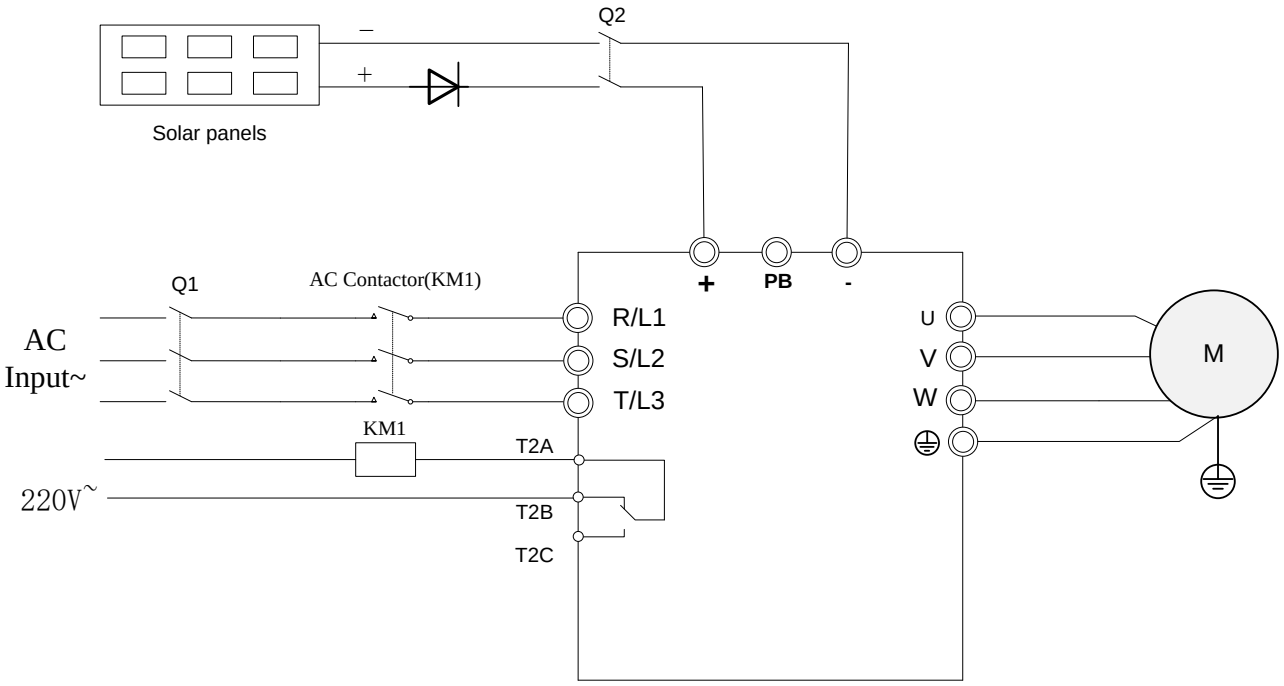


VFD500-PV Wire Diagram of solar pump inverter (single phase pump with capacitor)

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

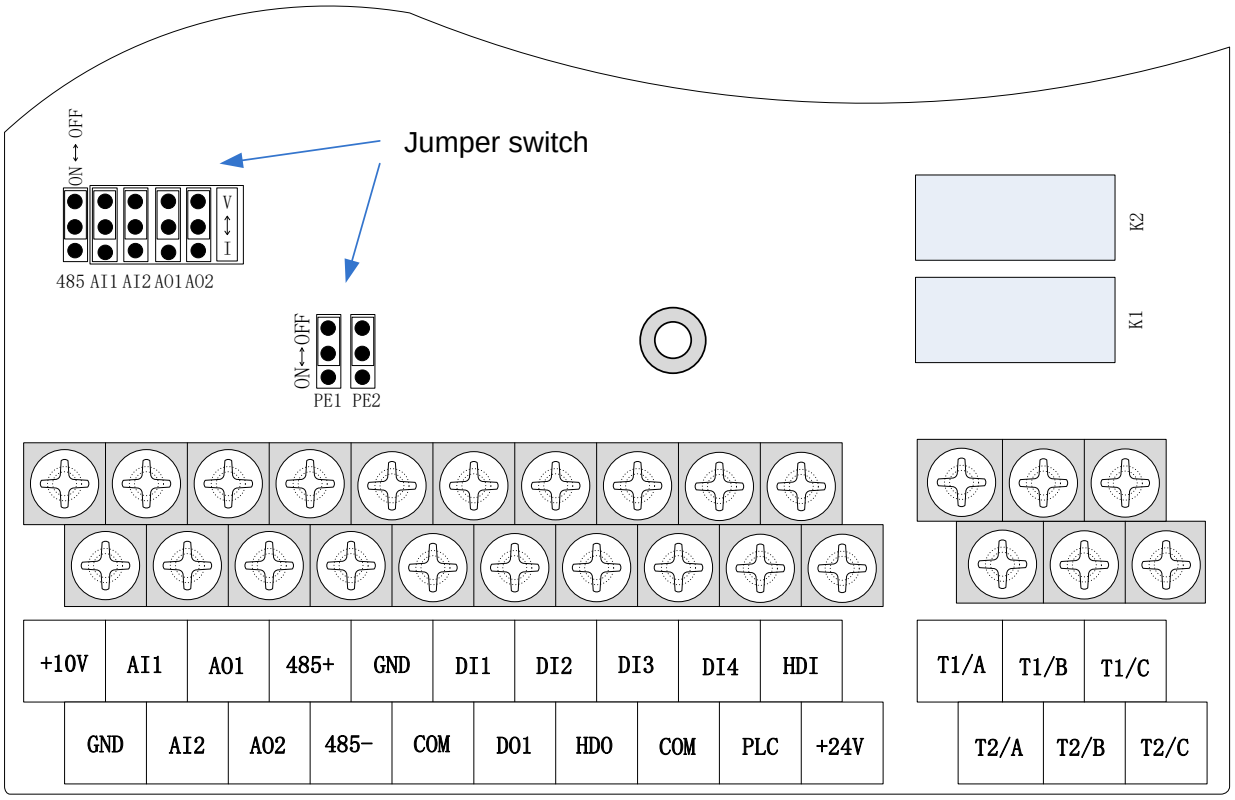


Diagram VFD500-PV control circuit terminal

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 ≥10KΩ
			Output current:0~20mA：Impedance 200Ω~500Ω
			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 ≥10KΩ
			Output current:0~20mA：Impedance 200Ω~500Ω
			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±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
			When using the external signal to drive DI1~DI5, it will disconnect the connector slip of PLC with the +24V
	COM	+24V ground	Internal isolation from GND
	DI1~DI4	Digital input terminal 1~4	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： 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(see details in user manual chapter for dry run function) If dry run protection not required then miss this step and go to step 2.

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.

PMSM pump

Synchronous motor must be self-learning of motor parameters, otherwise there will be a risk of flying,
P11.00=1 set to synchronous motor(special software)
P11.02=motor nameplate power
P11.03=Motor nameplate voltage
P11.04=Motor nameplate current
P11.05=motor nameplate frequency
P11.06=Motor nameplate speed
P11.22=Back EMF on the motor nameplate
If there is no such parameter on the nameplate, you can try to set 300V 350V for self-learning (try self-learning for 380v level)
The difference between the back-EMF setting value and the actual value should be less than 20%, otherwise the self-learning will be abnormal
After the parameter setting is completed, set P11.10=2, press RUN then the keyboard appears Tune for self-learning.

Technical Questions and solutions

1. How to achieve Automatic start after stop?

If it is controlled by keyboard,so there is no need to set any parameter(P47.03 waiting time)If you want to control by external switch,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

1st solution: See self learning of dry run(For LED display)

2nd 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

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

4th 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 out 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 r26.08 r26.09 r26.10 r26.11

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

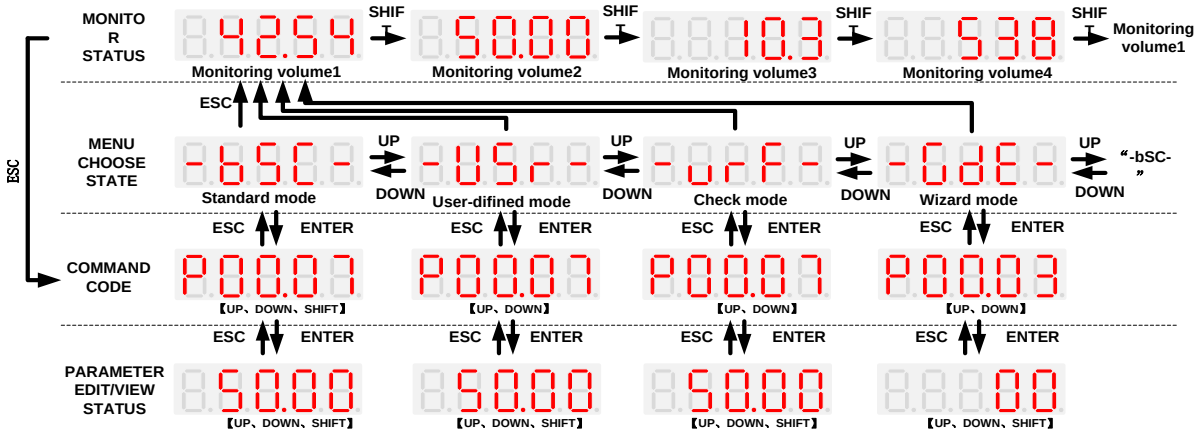
Table 3-2 The name and function of each part of the keyboard

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

8		Stop/Reset	• During operation, press to stop the operation (restricted by parameter 21.03). • In fault status, press this key to reset the fault.
9		Indicator light:Hz	·Indicate the digital display unit, all three lights off menas 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	• Off: indicates a stop condition. • On: indicates inverter is running.· Blinking: Deceleration stopped.
15		Direction indicator	• Used to indicate the sign of the variable when the LED is displaying one of the variables listed in 27.02; • In other cases the sign of the output frequency is indicated.
16		Command source indicator	• Off: The command source is the keyboard. • On: The command source is terminal. • Blinking: The command source is communication.
17		Fault indicator	• When it is on, the drive is faulty.

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 -USr-. When the keyboard is displayed -bSC-, press the key ENT 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 SLEEP	Light weak fault, please refer to function code P47.05~P47.07
A.FULL AFULL	Full water protection P47.18-47.21
A.PoL APoL	Low power protection P47.22-47.24
A.oC AoC	Overcurrent protection P47.25-47.27
A.Lor ALor	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
47 Group solar pumping special group				
P00.03	RESET	0：NO ACTION 11：Restore default parameter except for motor parameter and auto-tune related parameter and factory parameter 12:Restore default to factory parameter 13：Clear tripping record	0	★
P00.06	**Source of the Operation Command**	0：keypad 1：terminal 2：communication ➢ 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 00002:Output three phase 60hz	00000	★

Function code	Name	Description	Default	Property
		00021:Output single phase with capacitor 50hz 00022:Output single phase with capacitor 60hz 00031:Output single phase without capacitor 50hz 00032:Output single phase without capacitor 60hz 00100:Grid and solar hybrid mode (default 50HZ) 00101：MPPT mode +PID mode		
When P00.11=100, it will execute the following macro modification 1. P47.01=211 (auto start, enable MPPT, enable auto switch) 2. P07.03=47 (Mains action relay, normally closed for mains (when the automatic switching mode is 2) 3. P07.16=1.000 Relay 1 action delay 1s 4. P07.17=1.000 Relay 1 reset delay 1s 5. P47.06=600s Mains switching judgment 10min 6. P47.07=3600s Mains use time 60min. When P00.11=101, it will execute the following macro modification 1. P01.07=8 enable PID function 2. P40.06=50.00 The default setting is the midpoint 3. P40.39=1 PID shutdown operation				
P01.06	**Maximum frequency**	10.00～600.00Hz	50.00Hz	★
P01.08	**Upper limit frequency**	Lower limit frequency-maximum frequency	50.00Hz	☆
P07.03	Relay 1 Output terminal function group(T1A T1B T1C)	0:No function 1:READY 2:RUN 3:Error1（stop fault） 4:Error2（same as Error1 except undervoltage） 5:Warning output(fault but in running)	3	☆
P11.01	AC asynchronous motor TYPE	0：Three phase AC asynchronous motor 1：Single phase AC asynchronous motor without starting capacitor	0	★
P11.02	**Motor rated power**	0.1kW～710.0kW ➢ when power is less than 1kw ,0.75kw set to 0.8 as per round up principle ,0.55kw motor set 0.6 ➢ when change motor rated power,AC drive will automatically set other parameter of	Depend	★

Function code	Name	Description	Default	Property
		motor name plate and motor model parameter **be careful to use**		
P11.03	**Motor rated voltage**	10V～2000V	Depend	★
P11.04	**Motor rated current**	P11.02<30kW：0.01A P11.02>=30kW：0.1A	Depend	★
P11.05	**Motor rated frequency**	1.00Hz～600.00Hz	50.00Hz	★
P11.06	**Motor rated RPM**	1～60000rpm	Depend	★
R16.02				
P21.00	**Monitoring display**	**0：Standard mode (display frequency only)** **1：Automatic scrolling display（Check 3.1 in detail ）it show hz,current,power and voltage**	**0**	★
P23.02	**Undervoltage threshold**	220V level: 160V～300V 380V level: 350V～520V	**220/380**	★
P23.05	**Undervoltage trip threshold**	220V Level:160V～300V 380V Level:350V～520V	**200/300**	★
P23.15	**Output phase loss function**	0.0-25%, 0% means output phase detections shielded	25%	☆
r27.15	**Accumulative running time**	Unit:hour		●
P47.00	Solar pump Mppt function enable	0: invalid The parameters behind the 47 group cannot be changed! 1: Enable, to enable the special mppt function of the PV pump inverter	1	★
P47.01	Solar pump control mode	Units digit's: Startup mode 0: Manual start, the start mode is determined by P00.06; 1: automatic start, When P00.06 change, the association changes here. P00.06=0, when inverter starts and stops by keypad control, it is automatically modified to 1-automatic start P00.06=1, when inverter starts and stops by terminal control.it is automatically changed to 0-manual start Ten digit's: MPPT function 0: MPPT is disabled; CVT control is used	011	★

Function code	Name	Description	Default	Property
		(voltage is given as P47.04). 1: Enable MPPT. Hundred's unit automatic switching function 0: Disabled (Can be forced to switch ac grid through terminal function 62, invalid when enabled) 1: Automatically switch to Photovoltaic priority 2: Automatically switch to GRID power priority When Automatic switching is enabled, and the light is weak, it will automatically switch to the electric supply, and the MPPT function is disabled at this time		
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. 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 If automatic switching is enabled, it will switch to ac grid operation, and the MPPT function will be disabled	20Hz	☆
P47.06	Light detection time	See P47.05 for explanation.	120s	☆
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 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.	600s	☆
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	☆

Function code	Name	Description	Default	Property
P47.10	Regulator integral gain	0.001~1.00 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 0：Disable 1：Enable Ten digit：Fast mppt tracking 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
47 Group solar pumping special group				
P47.00	Solar pump Mppt function enable	0: invalid The parameters behind the 47 group cannot be changed! 1: Enable, to enable the special mppt function of the PV pump inverter	1	★
P47.01	Solar pump control mode	Units digit’s: Startup mode 0: Manual start, the start mode is determined by P00.06; 1: automatic start, When P00.06 change, the association changes here. P00.06=0, when inverter starts and stops by keypad control, it is automatically modified to 1-automatic start P00.06=1, when inverter starts and stops by terminal control.it is automatically changed to 0-manual start Ten digit’s: MPPT function 0: MPPT is disabled; CVT control is used (voltage is given as P47.04).	011	★

Function code	Name	Description	Default	Property
		1: Enable MPPT. Hundred's unit automatic switching function 0: Disabled (Can be forced to switch ac grid through terminal function 62, invalid when enabled) 1: Automatically switch to Photovoltaic priority 2: Automatically switch to GRID power priority When Automatic switching is enabled, and the light is weak, it will automatically switch to the electric supply, and the MPPT function is disabled at this time		
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				
r47.02	Remaining time for starting	The remaining time of the starting is displayed In auto start mode,Unit: second	--	●
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	★
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 are 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				
P47.04	MPPT starting voltage	Set the starting voltage of the MPPT algorithm. 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				
P47.05	Light detection threshold	If the output frequency is lower than this value and exceeds P47.06, it will be reported	20Hz	☆

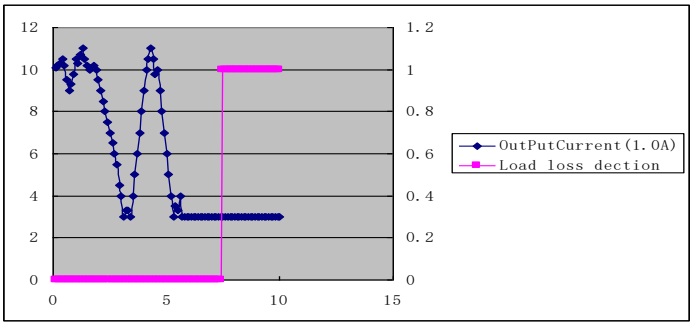
Function code	Name	Description	Default	Property
		to Sleep and stop If automatic switching is enabled, it will switch to ac grid operation, and the MPPT function will be disabled		
This is light detection threshold to measure solar radiation and solar power in a setting time (P47.06 Detection time),if 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				
P47.06	Light detection time	See P47.05 for explanation.	120s	☆
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), **default 120s(Automatically modify to 600s when P00.11=100**				
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 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.	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.**(default value Automatically modify to 3600s when P00.11=100)**				
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	☆
P47.08 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				
P47.09	Regulator proportional gain	0.001~1.00	0.05	☆
P47.10	Regulator integral gain	0.001~1.00	0.05	☆
r47.11	Today’s Pumping flow	0.1 m3 It shows the flow of water pumping today, it will be cleared after power off	0.0 m^3	●
r47.12	Cumulative pumping	1 m3, 32 digits	0 m^3	●

Function code	Name	Description	Default	Property
	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.		
P47.14	Cumulative pumping reset	Set 1 to clear zero for r47.12. This function code automatically changes to 0 after the reset is completed.	0	☆
r47.15	Current water flow	0.1 m3/h	0.0 m³/h	●
P47.16	Pump rated flow	0.1 m3/h	0.0 m³/h	☆
P47.17	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	☆
P47.18	Full water level detection channel	Units: Water level monitoring channel 0: invalid 1:AI1 2:AI2 3:AI3 4: AI4 Note: DI terminal 60-full water detection is independent of the local setting Ten'unit: analog water level logic 0: positive logic 0.00%-empty water 100.0%-full water 1: Inverse logic 0.00%-full water 100.0%-empty water	00	★
P47.19	Full water level detection value	0.0～100.0%	0.0%	☆
P47.20	Full water level detection time	0.0～3000.0s 1. When DI-60 is valid 2. The analog detection channel is greater than P47.19 (positive logic) or the analog detection channel is less than P47.19 (inverse logic) When 1 or 2 conditions are met and P47.20 is maintained, the system reports A.Full and shuts down	10.0s	☆
P47.21	Full water recovery time	0.0～3000.0s When the condition described in P47.20	10.0s	☆

Function code	Name	Description	Default	Property
		does not meet full water level detection requirement ,it will be returned to normal state after delay		
Conditions for full water detection to take effect: 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. 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 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 4. After 1, 2 or 3 conditions are met, the system will report A.FULL for the set time on P47.20 Full water recovery conditions: 5. The system enters the full water detection stage and displays A.FULL 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.				
P47.22	Low power detection value	0.0～6000.0kW 0.0-ineffective	0.0kW	☆
P47.23	Low power detection time	0～1000s 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	☆
P47.24	Low power recovery time	0～1000s 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	☆
P47.25	Overcurrent detection value	0.0～999.9A	0.0A	☆
P47.26	Overcurrent detection time	0.0～3000.0s 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	☆
P47.27	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	☆
P47.28	Starting coefficient	0.000～1.000	0.850	☆
Photovoltaic panel working coefficient = rated mppt voltage / open circuit voltage Characteristics of photovoltaic panels for example 30.7/37.9 = 0.81				
P47.29	Starting adjustment	10～100V	40V	☆

Function code	Name	Description	Default	Property
P47.30	Fast speed function	Unit digit：fast starting 0：Disable 1：Enable Ten digit：Fast mppt tracking 0：Disable 1：Enable	11	☆
P47.31	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				
P47.33	Low water level detection channel	Units: Water level monitoring channel 0: invalid 1:AI1 2: AI2 3: AI3 4: AI4 Note: DI terminal 61-water shortage detection is independent of the local setting Ten's unit: analog water level logic 0: positive logic 0.00%-empty water 100.0%-full water 1: Inverse logic 0.00%-full water 100.0%-empty water	00	★
P47.34	Low water level detection value	0.0～100.0%	0.0%	☆
P47.35	Low water level detection time	0.0～3000.0s 1. When DI-61 is valid 2. The analog detection channel is less than P47.34 (positive logic) or the analog detection channel is greater than P47.34 (inverse logic) When 1 or 2 conditions are met and P47.35 is maintained, the system reports A.Lor and shuts down	10.0s	☆
P47.36	Low water recovery time	0.0～3000.0s 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: 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. 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				

Function code	Name	Description	Default	Property
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 4. After 1, 2 or 3 conditions are met, the system will report A.Lor for the set time of P47.35 Water shortage recovery conditions: 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** **When the automatic switching is completed, the inverter will delay this time and wait for the power supply to stabilize before running** **Be sure to be greater than the effective and invalid delay of the output terminal**	5.000s	☆
r47.39	**Input power type**	**0:AC Electric power** **(DO function No47 is the mains switching function, when P47.01 hundreds place is 2, No.47 function will be activated when the photovoltaic is switched in)** **1:Solar power**	**-**	●
24 Group Pump dry run protection/unload detection parameter				
P24.03	Lower limit frequency of self-learning	0.00Hz~600.00Hz 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; 1: Enable dry run detection	1	☆
P24.13	Dry run/Unload detection level	0.0 to 200.0% 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 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 1000:Fast stop 3000:Continue to run	0000	☆

Function code	Name	Description	Default	Property
1. Set P47.00=0, P00.07=20.00-30.00, P00.06=0, and then press RUN 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 RUN and >> simultaneously for more than 2 seconds,, and if the value changes, the load-off self-learning is completed(LCD display not support)** **4. Press STOP to stop running, set P47.00=1, P00.06=1, In this process, the pump no need to take out from water** **Saying P24.12 = 1, P24.13 = 40.0%, P24.14 = 3.0s, then the diagram is shown below.**  **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	Unit'digit: Sleep source selection 0: No sleep function 2: AI1 sleep 3: AI2 sleep Ten's digit: Wake-up source selection 1: AI1 wake up 2: AI2 wake up Hundred's digit: Sleep wake-up direction selection 0: positive direction Sleep source (AI1～AI2)>P41.03, inverter sleeps Wake-up source (AI1～AI2) <P41.04, the inverter wakes up 1: reverse direction	010	☆

Function code	Name	Description	Default	Property
		Sleep source (AI1～AI2)<P41.03, inverter sleeps Wake-up source (AI1～AI2)>P41.04, the inverter wakes up 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.		
P41.03	Dormant level	0～100.0% Note: The liquid level is higher than this value and the duration exceeds P41.05, and the pump sleeps.	0.0%	☆
P41.04	Wake up level	0～100.0% 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	☆
Basic function parameter				
P00.00	User password	0 ~ 65535 ➢ No user password status (P00.01 = 1 after power-on): Entering the same non-zero value twice in succession sets a user password and enters lockout. ➢ password lock state: Enter the password to enter the unlock state. ➢ unlocked state: 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 11：Restore default parameter except for motor parameter and auto-tune related parameter and factory parameter 12:Restore default to factory parameter 13：Clear tripping record	0	★

Function code	Name	Description	Default	Property
P00.06	**Source of the Operation Command**	0：keypad 1：terminal 2：communication ➢ 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 **1：AI1** 2：AI2 3：AI3(reserved) 4：AI4（reserved） 5：HDI 6：multi-step speed 7：communication 8：PID 9：Internal PLC Notice:DI terminal function code 26-32 superior than this function code	0	★
P01.06	**Maximum frequency**	**10.00～600.00Hz**	**50.00Hz**	★
P01.07	**Upper limit frequency source**	**0: Digital setting (P01.08)** **1:AI1** **2: AI2** **3~4: reserved** **5: HDI** **6: reserved** **7: Communication** **8: PID**	**0**	★
P01.08	**Upper limit frequency**	Lower limit frequency-maximum frequency	50.00Hz	☆
P01.09	**Lower limit frequency**	0.00hz-upper limit frequency	00.00Hz	☆
P02.08	**Stop method**	0：ramp to stop (Deceleration to stop) 1：free coast to stop	0	☆
P02.15	**Minimum blocking time after free stop**	0.010s-30.000s	Depend on	★
P03.01	**Acceleration time 1**	Setting value depend on P03.16 P03.16 = 2, 0.00～600.00s; P03.16 = 1, 0.0s～6000.0s; P03.16 = 0, 0s～60000s	Depend on model	☆
P03.02	**Deceleration time 1**	Setting value depend on P03.16 P03.16 = 2, 0.00～600.00s; P03.16 = 1, 0.0s～6000.0s;	5.00S	☆

Function code	Name	Description	Default	Property
		P03.16 = 0, 0s～60000s		
P07.01	**DO1 function**	0:No function 1:READY 2:RUN 3:Error1（stop fault） 4:Error2（same as Error1 except undervoltage） 5:Warning output(fault but in running)	0	☆
P07.02	**DO2 function**	0:No function 1:READY 2:RUN 3:Error1（stop fault） 4:Error2（same as Error1 except undervoltage） 5:Warning output(fault but in running)	0	☆
P07.03	Relay 1 Output terminal function group(T1A T1B T1C)	0:No function 1:READY 2:RUN 3:Error1（stop fault） 4:Error2（same as Error1 except undervoltage） 5:Warning output(fault but in running)	3	☆
P07.04	Relay 2 Output terminal function group(T2A T2B T2C) **optional**	0:No function 1:READY 2:RUN 3:Error1（stop fault） 4:Error2（same as Error1 except undervoltage） 47:Warning output(fault but in running) auto main & PV switching	47	☆
P07.12	DO1 effective delay time	0.000s～30.000s	0.000s	☆
P07.13	DO1 ineffective delay time	0.000s～30.000s	0.000s	☆
P07.14	DO2 effective delay time	0.000s～30.000s	0.000s	☆
P07.15	DO2 ineffective delay time	0.000s～30.000s	0.000s	☆
P07.16	Relay 1 effective delay	Delay time from relay effective to actual action	0.000s	☆
P07.17	Relay 1 invalid delay	The delay time from the deactivation of the relay to the actual action	0.000s	☆

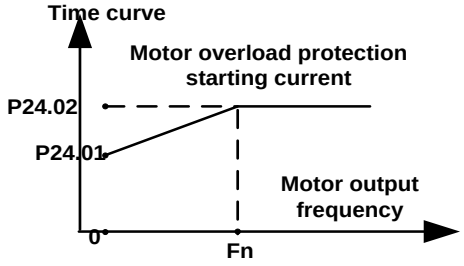
Function code	Name	Description	Default	Property
P12.11	Slip compensation gain	0～200% It is used to compensate the speed drop of the asynchronous motor VF control with load, and improve the speed control accuracy. Please adjust according to the following principles: ● Increase the setting when the motor speed is lower than the target value with loading. ● Reduce this setting when the motor speed is higher than the target value with loading,	0%	☆
P21.00	**Monitoring display**	**0：Standard mode (display frequency only)** **1：Automatic scrolling display（Check 3.1 in detail ）it show hz,current,power and voltage**	**0**	★
P22.00	**Carrier/swithcing frequency**	Depend on drives power ≤7.5kW: 1kHz～12.0kHz 11kW～45kW: 1kHz～8kHz ≥55kw: 1kHz～4kHz The carrier frequency can be reduced when it came like following phenomenon: 1 The leakage current generated by the inverter is large 2 The interference generated by the inverter has an impact on peripheral devices 3 Long wiring distance between inverter and motor The carrier frequency can be increased when it came like following phenomenon: 1 The electromagnetic noise generated by the motor is large	Depend	☆
P22.14	Cooling method (fan control)	0:effective when running 1:Forced control(effective when power on) 2:adjustable as per drive temperature	2	☆
r22.16	Drive rated power	Read only Unit:0.1kw	-	●
r22.17	Drive rated Voltage	Read only Unit:V	-	●
r22.18	Drive rated current	Read only Unit:0.1A	-	●
P22.20	Trial time setting	After this time, the inverter will stop and report Er.TTA fault; if set to 0, it will be cancelled. Note: This parameter needs agency authority to be able to see	0	☆
P22.13	Output phase switch	0:No Operation 1:Output phase switch	0	★

Function code	Name	Description	Default	Property
		(equal to change Phase between V and W and UV and UW		
P23.00	**DC Bus voltage control option**	➢ Unit'digit :Overvoltage stall control 0:overvoltage stall disabled **1:overvoltage stall enabled** 2:overvoltage stall enabled self-adjustable ➢ The over-voltage stall function limits the amount of power generated by the motor by extending the deceleration time or even increasing the speed, avoiding over-voltage on the DC side and reporting over-voltage faults Ten'unit:Undervoltage stall control 0:undervoltage stall disabled **1:Undervoltage stall(decelerate to zero speed and be in standby mode,after power restoring ,it will run again automatically)** 2: Undervoltage stall deceleration(decelerate to zero and stop) ➢ **The undervoltage stall function reduces the motor power consumption or reduces the power consumption of the motor or turns it into a power generation operation to avoid the undervoltage fault on the DC side.** The undervoltage stall function is used when the input power supply quality is poor (the power supply voltage fluctuates downward or the sporadic short power is suspended), and it is necessary to keep the inverter running as much as possible.	10	★
P23.02	**Undervoltage threshold**	220V level: 160V～300V 380V level: 350V～520V 480V level: 400V～650V	Depend	★
P23.04	**Undervoltage stall ratio**	0～20.0	4.0s	☆
P23.05	**Undervoltage trip threshold**	220V Level:160V～300V 380V Level:350V～520V 480V Level:400V～650V	Depend	★
P23.06	Undervoltage fault detecting time	0.0s～30.0s	1.0s	☆
P23.15	**Output phase loss function**	0.0-25%, 0% means output phase detections shielded	25%	☆
P23.24	Fault reset	Define as per bit:	0	☆

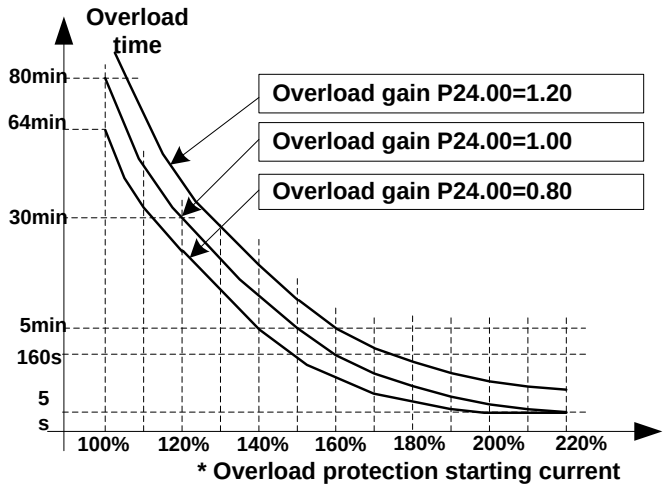
Function code	Name	Description	Default	Property
		bit0-undervoltage;bit1- inverter overload bit2-inverter overheat ;bit3-motor overload bit4-motor overheat;bit5-user'fault 1 bit6- user'fault 2; bit7～15 reserved		
P23.25	Fault source for auto reset	Define as per bit: bit0-overcurrent during acceleration;bit1-overcurrent during deceleration bit2-overcurrent during constant speed;bit3-over voltage during acceleration bit4-overvoltage during deceleratoin;bit5-overvoltage during bit6-inverter undervoltage;bit7-input phase loss bit8-inverter overload;bit9-inverter overheat bit10-motor overload;bit11-motor overheat bit12-user'fault 1;bit13-user'fault 2 bit14-Reserved;bit15-Reserved	0	☆
P23.26	Fault auto Reset times	0～99	10	☆
P23.28	Fault reset internal time	0.1s-300.0s	60	
P23.29	Fault auto reset times clearing time	0.1s～3600.0s	600.0s	☆
11 Group Motor 1 Parameter				
P11.00	Motor type	0：AC asynchronous motor 1：Synchronous motor(Special software) See appendix parameter	0	●
P11.01	AC asynchronous motor TYPE	0：Three phase AC asynchronous motor 1：Single phase AC asynchronous motor without starting capacitor	0	★
P11.02	**Motor rated power**	0.1kW～800.0kW ➢ when power is less than 1kw ,0.75kw set to 0.8 as per round up principle ,0.55kw motor set 0.6 ➢ when change motor rated power,AC drive will automatically set other parameter of motor name plate and motor model parameter **be careful to use**	Depend	★
P11.03	**Motor rated voltage**	10V～2000V	Depend	★
P11.04	**Motor rated current**	P11.02<30kW：0.01A P11.02>=30kW：0.1A	Depend	★
P11.05	**Motor rated frequency**	1.00Hz～600.00Hz	50.00Hz	★
P11.06	**Motor rated RPM**	1～60000rpm	Depend	★

Function code	Name	Description	Default	Property
P11.10	**Auto-tune/self-learning**	0：no auto tuning 1：Stationary auto tuning of Asynchronous motor 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. 2：dynamic or Rotational auto tuning of Asynchronous motor Comprehensive motor parameter auto tune It is recommended to use rotation auto tuning when high control accuracy is needed.	0	★
P11.12	Synchronous motor back electromotive force BEMF	0.0V ~ 2000.0V Induced electromotive force at rated speed	Depend	★
24 Group motor protection				
P24.00	Motor overload protection gain	0.20～10.00 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 adn 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



Function code	Name	Description	Default	Property



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

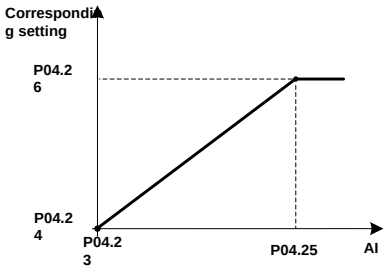
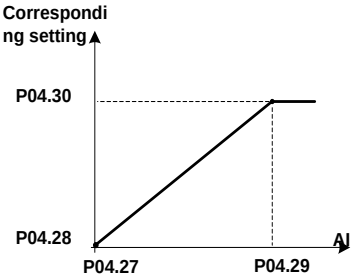
27 Group Monitoring parameter

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 bit1：direction of setting frequencybit2：direction of main frequency bit3：direction of auxiliary frequency bit4：direction of Up Down offset 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 ℃	-	●

Function code	Name	Description	Default	Property
r21.16	Load speed display	Load speed =P27.00*P21.10 Decimal point digit defined by P21.11	-	●
P21.17	Speed display unit	0：0.01Hz；1: 1Rpm ➢ 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 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	-	-	●
26 Group Fault recording parameter				
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 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		-	●

Function code	Name	Description	Default	Property
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 faul	Unit:0.1A	-	●
r26.19	Bus voltage at fault	Unit:V	-	●
P40 PID Group				
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%	-	●
P40.04	**PID reference source**	Unit's digit:**PID main reference source(ref1)** 0：Digtital setting 1：AI1 2：AI2 3：AI3(IO expansion board) 4：AI4(IO expansion board) 5：HDI high frequency pulse 6：Communication Ten'digit: **PID Auxilary reference source(ref2)** **Same as Unit's digit**	00	☆
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	**PID feedback source1**	Unit's digit 0：PID feedback source1(fdb1) 0:AI1 1:AI2 2:AI3(option card) 3:AI4(option card) 4: PLUSE(HDI) 5: Communication 6: Motor rated output current 7: Motor rated output frequency 8: Motor rated output torque 9: Motor rated output frequency Ten's digit : PID feedback source2 (fdb2) **Same as Unit's digit**	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 TI1	0.01s～20.00s	1.00s	☆

Function code	Name	Description	Default	Property
P40.19	Differential time TD1	0.000s～0.100s	0.000s	☆
P40.39	PID operation at stop	0:No PID operation at stop 1:PID operation at stop	0	☆
04 Group Analog input				
P04.07	AI 1 Curve setting	Unit's：AI curve selection 0：curve A 1：curve B 2：Curve C 3：Curve D Ten'unit：when input signal lower than minimum input 0：equal to minimum input 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 0：curve A 1：curve B 2：Curve C 3：Curve D Ten'unit：when input signal lower than minimum input 0：equal to minimum input 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)	-	●

Function code	Name	Description		Default	Property
P04.23	Curve A horizontal axis 1	0.00V～P04.25		0.00V	☆
P04.24	Curve A vertical axis 1	-100.0%～100.0%	Note: Input less than P04.23, output decided by curve ten's digit	0.0%	☆
P04.25	Curve A horizontal axis 2	P04.23～10.00V	Setting method mode for AI1 4~20mA form 1. Switch the corresponding AI1 jumper on the IO board to current; 2. Set the function code: P04.07 Unit's place=0 (default), P04.23=2.00.	10.00V	☆
P04.26	Curve A vertical axis 2	-100.0%～100.0%		100.0%	☆
P04.27	Curve B horizontal axis 1	0.00V～P04.29		0.00V	☆
P04.28	Curve B vertical axis 1	-100.0%～100.0%		0.0%	☆
P04.29	Curve B horizontal axis 2	P04.27～10.00V	Note: Input less than P04.27, output decide by curve ten's digit	10.00V	☆
P04.30	Curve B vertical axis 2	-100.0%～100.0%	Setting method mode for AI2 4~20mA form 1. Switch the corresponding AI2 jumper on the IO board to current; 2. Set the function code: P04.11 one place=1 (default), P04.27=2.00	100.0%	☆

Function code	Name	Description	Default	Property
06 Group Digital input(Terminal function)				
P06.01	DI1 Numeric input function	0：No function 1：Run terminal 2：Reverse/Forward and reverse switchover 3：Three wire control 4：Forward jog command 5：Reverse jog command 6：Terminal UP 7：Terminal DOWN 8：Clear up UP/DOWN offset 9：Coast to stop/free stop 10：Fault reset 11：Reverse forbidden 12：Switching run command to Keypad 13：Switching run command to Communication 14：fast stop 15：external stop 16：Switch between motor 1 and motor 2 17：Pause operatoin 18：DC braking 19：Switch between torque and speed Control 20：torque control disabled 21：Multi-step speed terminal 1 22：Multi-step speed terminal 2 23：Multi-step speed terminal 3 24：Multi-step speed terminal 4 25：frequency source switchover 26：Switch main frequency source to Numeric frequency setting 27：Switch main frequency source to AI1 28：Switch main frequency source to AI2 31：Switch main frequency source to high-frequency pulse input 32：Switch main frequency source to communication setting 33：Switch auxiliary frequency source to numeric frequency setting 60:full water level detection 61:Low water level detection 62:forced switching to ac power	1	★
P06.02	DI2 Numeric input function		62	★
P06.03	DI3 Numeric input function		60	★
P06.04	DI4 Numeric input function		61	★
P06.05	DI5(HDI) Numeric input function		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	1: Motor insulation aging 2: The cable is damaged and contact, short circuit 3:The distance between motor and inverter are too long. 4: Output transistor breakdown 5: The internal wiring of the inverter is loose, or the hardware is bad. 6:Brake transistor short circuit	1. Confirm the insulation resistance of the motor. If it is turned on, replace the motor. 2. Check the power cable of the motor 3. Install reactor or output filter 4, seeking technical support 5, seeking technical support 6. Check if the braking resistor is damaged and the wiring is correct.
Over current during acceleration	2	Er.OC1	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The frequency inverter model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto-Tuning in cold state 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select a frequency inverter Of higher power class.

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

Fault Name	Fault code	Display	Possible Causes	Solutions
Low voltage	8	Er.Lv1 Er.Lu 1	1: Instantaneous power failure occurs on the input power supply or input phase loss 2: The frequency inverter's input voltage is not within the allowable range. 3: Cut off the power during operation 4:the internal wiring of the inverter is loose, or the hardware is bad.	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. 2:adjust the voltage to the normal range 3:Power off after the inverter stops 4:seeking technical support 5: For the unstable power supply, if the performance requirements are low, try to enable the undervoltage stall function (P23.00).
Contactor open	9	Er.Lv2 Er.Lu2	1: Instantaneous power failure occurs on the input power supply 2: The frequency inverter's input voltage is not within the allowable range. 3: Cut off the power during operation 4:the internal wiring of the inverter is loose, or the hardware is bad.	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. 2:adjust the voltage to the normal range 3:Power off after the inverter stops 4:seeking technical support 5: For the unstable power supply, if the performance requirements are low, try to enable the undervoltage stall function (P23.00).
Frequency inverter overload	10	Er. OI Er. oL	1:The load is too large or the motor is blocked. 2:The large inertia load acceleration and deceleration time is too short 3: When the VF is controlled, the torque boost or V/F curve is not suitable. 4:The frequency converter selection is too small 5:Overload at low speed operation	1. Reduce the load and check the motor and mechanical conditions. 2, increase the acceleration and deceleration time 3. Adjust the torque boost or V/F curve 4, select the inverter with a larger power level 5. Perform motor self-learning in cold state and reduce carrier frequency at low speed

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

Fault Name	Fault code	Display	Possible Causes	Solutions
IGBT Module overheat	14	Er. oH	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the IGBT module is damaged. 5: The inverter IGBT module is damaged	1:Lower the ambient temperature. 2: Clean the air filter. 3: Replace thedamaged fan. 4:Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
Motor overheat	16	Er. oH3	1:The temperature sensor wiring is loose 2:The motor temperature is too high 3:Themotor temperature sensor detects that the temperature is greater than the set threshold.	1:check the temperature sensor wiring 2:Improve the carrier frequency, strengthen the heat dissipation of the motor, reduce the load, and select a motor with higher power. 3:Check if the set threshold is reasonable.
By wave current limitingfault	17	Er.CbC	1: The load is too heavy or locked-rotor occurs on the motor. 2: The frequency inverter model is of too small power class	1: Reduce the load and check the motor and mechanical condition. 2: Select a frequency inverter of higher power class.
Ground short circuit	18	Er.GF	1. Motor burnout or insulation aging 2, The cable is damaged and contact, short circuit 3. The distributed capacitance of the ⏚ terminal and motor cable is larger motor cable 4, Hardware is damaged	1. Confirm the insulation resistance of the motor. If it is turned on, replace the motor. 2. Check the power cable of the motor to eliminate the fault point. 3, reduce the carrier frequency, install the output reactor 4, seeking technical support
module temperature detection fault	20	Er.tCK	1, Temperature detection line broken 2, Drive board is faulty 3. Main control board is faulty 4, The environmental temperature is too low	1. Check the thermistor wiring 2. Ask for technical support 3. Ask for technical support 4, manual intervention to drive the temperature rise

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

Fault Name	Fault code	Display	Possible Causes	Solutions
Running time arrival	33	Er.TTA	Inverter trial time arrival	1:Contact agent or distributor
485Communication fault	34	Er.485	1, The work of the host computer is not normal 2, The communication line is not normal 3, The communication parameter set is incorrect	1. Check the connection of upper computer 2. Check the communication connection line 3. Set communication parameters correctly
PID feedback lost during running	36	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 2、 P40.35 and P40.37 set correct parameter
User-defined fault 1	37	Er.Ud1	1: The signal of user-defined fault 1 is input via DI. 2:The signal of user-defined fault 1 is input via virtual I/O.	1: Reset the operation. 2: Reset the operation
User-defined fault 2	38	Er.Ud2	1: The signal of user-defined fault 2 is input via DI. 2:The signal of user-defined fault 2 is input via virtual I/O.	1: Reset the operation. 2: Reset the operation
Light weak warning	39	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.FULL	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	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	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.

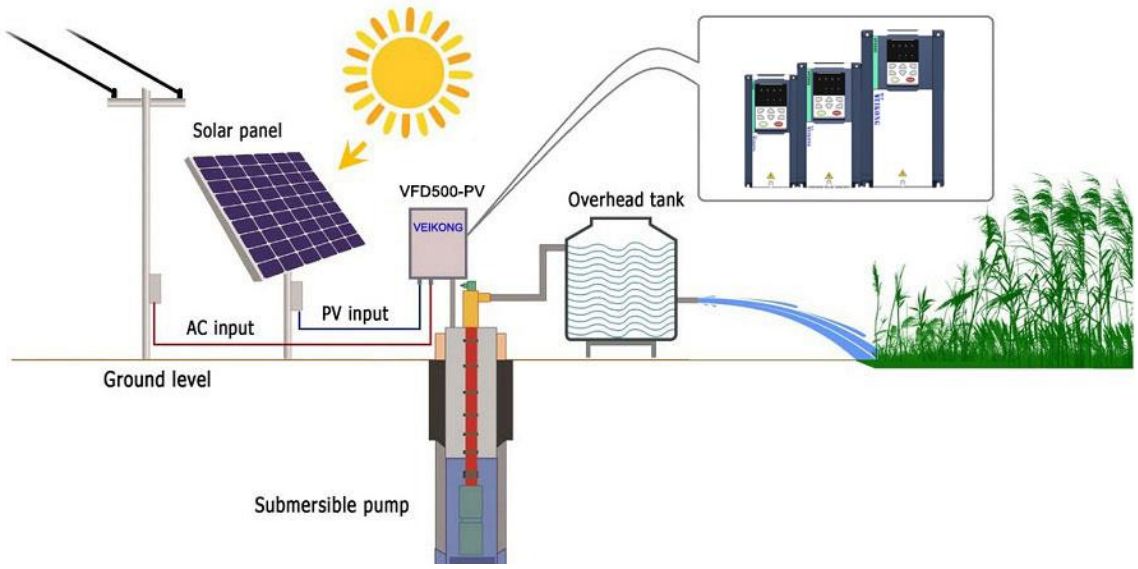
4. Technical support hotline:+86- 075589587650

Solar pump inverter maintenance warranty card

<table>
<tr><td rowspan="4"></td><td colspan="2">User corporation:</td></tr>
<tr><td colspan="2">Address:</td></tr>
<tr><td>Post code:</td><td>Contractor:</td></tr>
<tr><td>Tel. no.:</td><td>Fax no.:</td></tr>
<tr><td rowspan="3">Product information</td><td colspan="2">Solar pump inverter type:</td></tr>
<tr><td>Power size(kW):</td><td>S.N.:</td></tr>
<tr><td>Contract no.:</td><td>Purchase date:</td></tr>
<tr><td rowspan="3">Repair record</td><td>Service engineer:</td><td>Tel. no.:</td></tr>
<tr><td>Fixed date:</td><td></td></tr>
<tr><td colspan="2">Fault information:</td></tr>
<tr><td colspan="3">Complaints and demanding on our products:

User signature: year month date</td></tr>
<tr><td colspan="3">Return visit record:

Service signature: year month date</td></tr>
</table>











VARIASOL

Distribuidor autorizado:

Powertek SAS
Cra 32 # 9 - 71 B5, Arroyohondo.
Yumbo, Valle del Cauca.

Línea de soporte técnico: +57 318 535 8381

Sitio Web: www.powerteksolar.com