

**VEICHI**



# Manual

## **SI21 Solar Pump Inverter**

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## Chapter 1 Safety Requirement and Cautions

To ensure safety of your health, equipment and property, please read this chapter carefully before using the frequency inverter and act in compliance with the instructions when installing, debugging, running and overhauling the frequency inverter.

### 1.1 Safety Definition

**Danger:** it will cause danger of serious injuries and even death while operating against the rules.

**Caution:** it will cause danger of light injuries or equipment destruction while operating against the rules.

**Note:** some information is useful while operating and use frequency inverter.

### 1.2 Safety Requirements and Cautions

#### ●Before Installation

<b>Danger</b>
1. Only qualified personnel can operate the equipment. Before operating, be sure to carefully read the manual about safety, installation, operation and maintenance. The safe operation depends on the proper processes of choosing models, carrying, installation, operation and maintenance.

<b>Danger</b>
1. Don't use the damaged or incomplete frequency inverters; Otherwise, there is risk of injury.

#### ●Installation

<b>Danger</b>
1. Please install the frequency inverter on metal or other nonflammable material, and keep it away from the combustible material. Otherwise there is danger of fire;
2. No unauthorized modification to the frequency inverter; Otherwise there is danger of damaged.
3. Normal frequency inverter, which is not explosion-proof, can not be installed where with explosive gas or dust; Otherwise there is danger of explosion.

<b>Attention</b>
1. When two frequency inverters are installed in the same control cabinet, please pay attention to the installing place to guarantee the effective heat dissipation.
2. When carrying the frequency inverter, please support its bottom.

#### ●Wiring

<b>Danger</b>
1. Wire is connected only when the main circuit is cut off, otherwise there is a danger of shock.
2. Wire is connected by professional person only. Otherwise there is a danger of shock.
3. Earth must be reliable. Otherwise there is a danger of shock.
4. AC power supply should not be connected with output ports U, V, W, otherwise there is a danger of damage to frequency inverter.
5. No drop of bolt, spacer, metal stick, conducting wire or other things into the inner of frequency inverter; Otherwise there is a danger of fire or damage to frequency inverter.

**Attention**

1. If the damage to frequency inverter or other equipment is caused by improper wiring and utilization or unauthorized alteration, the user should shoulder all responsibilities.
2. Please make sure all wirings meet EMC requirement and satisfy safety standard in the local area; Please refer to recommendations in this manual or national standards of wire diameter to avoid accidents.
3. Static electricity on human body would seriously damage internal MOS transistor, etc. No touch the printed circuit boards, IGBT or other internal devices without anti-static measure, otherwise it will cause the malfunction of frequency inverter.
4. Please don't connect phase shifter capacitance or LC/RC noise filter to the output circuit of frequency inverter; Otherwise it will damage the frequency inverter.
5. Please don't connect the magnetic switch or magnetic contactor to the output circuit of frequency inverter; When frequency inverter is in the operation with load, magnetic switch or magnetic contactor can make inverter over-current protection function act. It will damage frequency inverter seriously.
6. Please don't disassemble the panel cover, it only needs to disassemble the terminal cover when wiring.
7. It is forbidden to do any pressure test on frequency inverter, otherwise it will damage the frequency inverter.

**●Before Electrification****Danger**

1. Please make sure that voltage grade of power supply is consistent with frequency inverter's voltage and then check whether the wiring is correct and firm, and whether there is short circuit in peripheral equipment's circuit. Otherwise it will damage frequency inverter and other equipment.
2. Before the frequency inverter is connected to the input power supply, make sure that the cover has been well fixed. Otherwise it will cause electric shock.
3. For the frequency inverters whose storage time is over 1 year, when electrification, the voltage should be raised by booster from low to high. Otherwise it will damage the frequency inverter.

**Attention**

1. Check if all periphery fittings are wired properly according to the handbook; Otherwise it will cause accidents.

**●After Electrification****Danger**

1. After electrified, it is forbidden to open the cover, make wiring, and check up; Otherwise, it will cause the danger of electric shock.
2. After electrified, it is forbidden to contact internal wiring board and its parts. Otherwise it will cause the danger of electric shock.
3. Do not operate or touch frequency inverter with wet hand. Otherwise there is danger of damage to frequency inverter and electric shock.

**Attention**

1. Please set the parameter of frequency inverter cautiously; Otherwise it will damage equipment.

## ●Operation

### Danger

1. Before running, please check and confirm the application range of the machine and equipment once more; Otherwise it will cause accidents.
2. Please don't touch the cooling fan and braking resistance to check the temperature; Otherwise there is a danger of getting burn.
3. Unprofessional workers are banned to check the signals in the running stage; Otherwise it will cause injuries and damage the equipment.

### Attention

1. Please don't turn off the equipment by switching off power; Please cut off the power supply after the electric machine stops running; Otherwise it will damage the frequency inverter.
2. Please avoid anything dropping into the equipment when the frequency inverter is running; Otherwise it will cause electric shock.

## ●Maintenance

### Danger

1. Please don't maintain and repair the equipment with electric; Otherwise it will cause electric shock.
2. Before maintaining and repairing the frequency inverter, please make sure the indicator lights of power supply have completely turned off; Otherwise it may cause electric shock and damage the frequency inverter.
3. Persons who have not passed specialized train are not allowed to conduct the frequency inverter maintenance; Otherwise it may cause electric shock and damage the frequency inverter.

## 1.3 Cautions in Using

1. In application of this series frequency inverter, you have to confirm all machine insulation to prevent damage to the equipment. Moreover, when the motor working in tough environment, please periodic inspect the electrical insulation to ensure the safety of the system work.
2. If the motor adapter is not consistent with frequency inverter's rating current (The rating current of the motor is far smaller than that of frequency inverter), please adjust the protective value to ensure safe running.
3. In occasions such as load raises, usually there is negative torque and frequency inverter breaks off for over-current or over-voltage. In this case, you should consider choosing the matching brake unit.
4. Frequency inverter, in a certain output frequency range, can meet the mechanical resonance of the load equipment. To avoid it, you can set up jumping frequency.
5. As output voltage of the inverter is pulse-wave type, if there is capacity which can improve power factor or pressure-sensitive resistance which used for thunder-proof in the voltage output side, the frequency inverter will break off or its parts will be damaged, so it is necessary to dismantle them. Moreover, it is proposed not install switch parts like air switch and contactor (if it is necessary to install switch on output side, please make sure the output electricity of frequency inverter is zero when the switch is working)

6. At over 1,000 meters altitude, the inverter's heat dissipation function worsened due to the thin air, it is necessary to use less.
7. The inverter output voltage is pulse wave type. If using digital multi-meter measurement, deviation of the reading will be great. And the deviation is different by using different type of digital multi-meter. Under normal circumstances, while RMS 380V, digital multi-meter reading is around 450V.
8. Solar panel can be connected in the series or parallel. For rated voltage 380V controller, we suggest working voltage between 480V and 560V while MPPT. What means the solar panel open circuit voltage should be between 600V and 700V.

## 1.4 Technical Specification

Solar pump inverter power(kW)	Pump		Max solar power input (kW)	Max DC input voltage V	Recommend Voc voltage (V)	Rated output current (A)	Output frequency (Hz)
	Rated power (kW)	Rated voltage (V)					
<b>SI21-D1 series, 60VDC~400VDC input, 3 phase 110VAC~230VAC output</b>							
0.75	0.75	110	1.0	400	175~380	7A	0~600
1.5	1.5	110	1.95	400	175~380	10A	0~600
<b>SI21-D3 series, 150VDC~450VDC input, 3 phase 220VAC~240VAC output</b>							
0.75	0.75	220	1.0	450	360~430	4A	0~600
1.5	1.5	220	1.95	450	360~430	7A	0~600
2.2	2.2	220	2.86	450	360~430	10A	0~600
<b>SI21-D5 series, 250VDC~780VDC input, 3 phase 380VAC~460VAC output</b>							
0.75	0.75	380	1.0	780	620~750	3.0	0~600
1.5	1.5	380	2.2	780	620~750	4.0	0~600
2.2	2.2	380	3.3	780	620~750	5.0	0~600
4	4	380	5.6	780	620~750	9.5	0~600
5.5	5.5	380	8	780	620~750	13	0~600

## 1.5 Cautions in Disposal

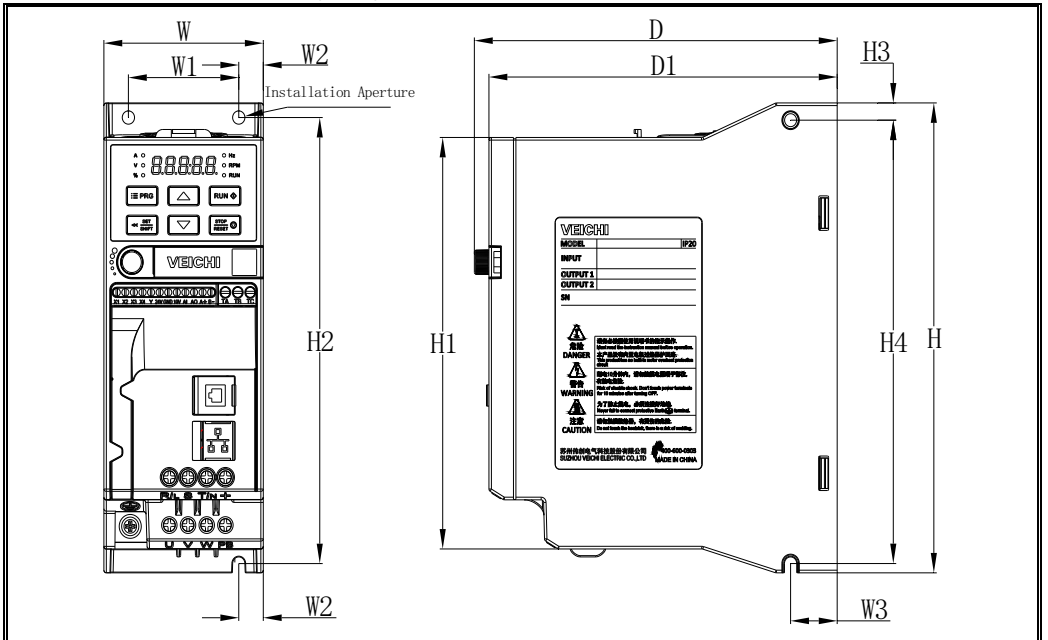
When you dispose frequency inverter, please pay attention to:

1. Electrolytic capacitor: the electrolytic capacitor of main circuit or the printing plate may explode when they are burned.
2. Plastic: plastic incineration may generate toxic gases.
3. Dispose method: please dispose as industrial waste.

## Chapter 2 Installation and Wiring

### 2.1 Dimension of Inverter

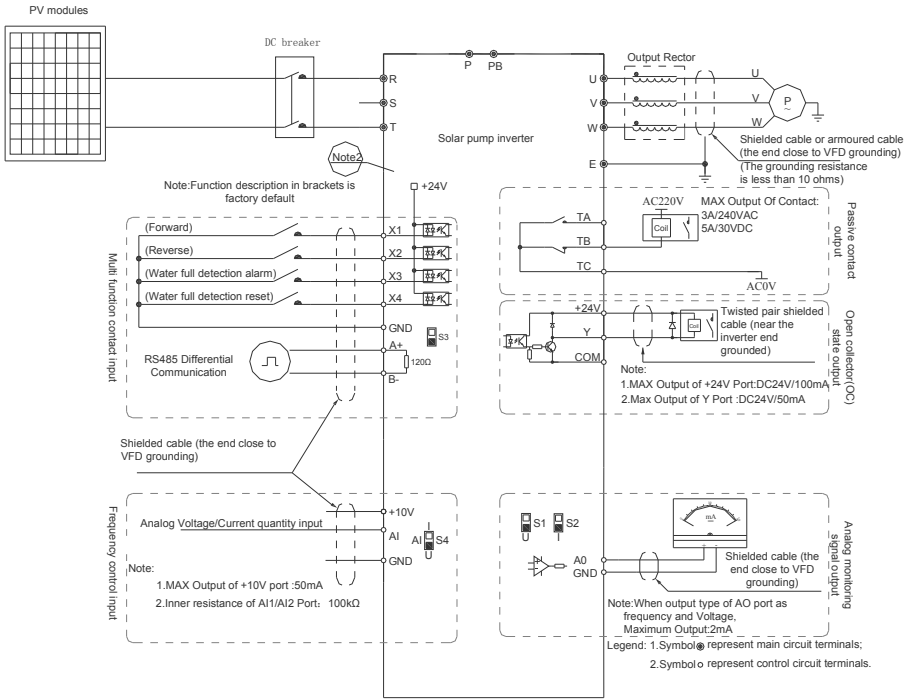
#### ● Overall Dimension of Inverter (Plastic)



MODEL	Overall Dimension(mm)					Forward mounting size(mm)			Side mounting size (mm)			Mounting aperture
	W	H	H1	D	D1	W1	W2	H2	W3	H3	H4	
SI21-D1-R75G-A	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
SI21-D1-1R5G-A												
SI21-D3-R75G-A	65	177	155	148	142	45	10	168	19	6.5	167	3-M4
SI21-D3-1R5G-A	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
SI21-D3-2R2G-A												
SI21-D5-R75G-A	65	177	155	148	142	45	10	168	19	6.5	167	3-M4
SI21-D5-1R5G-A												
SI21-D5-2R2G-A												
SI21-D5-004G-A	75	202	180	163	157	55	10	193	19	6.5	192	3-M4
SI21-D5-5R5G-A												

## 2.2 Solar Pump Controller Wiring

### ● Standard Connection Diagram



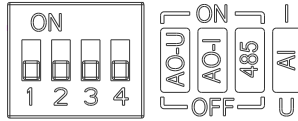
Note: When connect solar panel, please select R/T terminals.

### ● Auxiliary Terminal Output Capacity

Terminal	Function Definition	Max Output
+10V	10V auxiliary power supply output, constitutes loop with GND.	50mA
AO	Analog monitor output, constitutes loop with GND.	Max output 2mA as frequency, voltage signal
+24V	24V auxiliary power supply output, constitutes loop with GND.	100mA
Y	Collector open circuit output; can set the action-object by program.	DC24V/50mA
TA/TB/TC	Passive connector output; can set the action-object by program.	3A/240VAC 5A/30VDC



● Function Specification of Switch Terminals



Bit	Select location	Function Description
S1	ON	Enable AO output 0V~10V
	OFF	Disabling AO voltage output
S2	ON	Enable AO output 0mA~20mA or 4mA~20mA
	OFF	Disabling AO current output
S3	ON	RS485 communication access 120Ω termination resistor
	OFF	RS485 communication disconnects 120Ω termination resistor
S4	I	AI input 0mA~20mA or 4mA~20mA
	U	AI input 0V~10V

## Chapter 3 Keyboard layout and functions specification

### ● Keyboard operator appearance



### ● Key function








Symbol	Defination	Function Description
	Menu	Enter the function menu interface during standby or running; press this button to exit the modification when the parameter is modified; press the button (1 second) during
	Set/shift	Set function: After modifying the value, press this key to confirm the modified value. Shift function: long press this button (1 second) to move the operation bit, long press is
	Up/Down	The up key increases the operation value and the down key decreases the operation value.
	Run	When the run/stop is controlled by the keyboard, press this button to turn the inverter forward. The status indicator is always on during forward run, and the status indicator
	Stop/Reset	When the command given channel is keyboard control, press this key to stop the inverter; the parameter [F04.08] can be used to define whether other command




### ● Indicator Defination





Name		Status	Defination
Unit indicator	Hz	Flash/Light on	Indicates the frequency unit
	A	Light on	Represents current unit
	V	Light on	Represents voltage unit
	RPM	Light on	Express unit of speed
	%	Flash/Light on	Indicates the percentage unit
Status Indicator	RUN	Light on	The inverter is running forward
	RUN	Flash	The inverter is running reverse
	RUN	Light off	Inverter is shutdown











## Chapter 4 Fault Diagnosis and Solution

This chapter describes the inverter fault, alerts, and operation of the failure on the inverter, the display information on inverter and countermeasures.

Keypad display	Fault code	Fault type	Possibility reason	Troubleshooting
	ELU2	Under voltage at runs	<ul style="list-style-type: none"> <li>●Power voltage too low</li> <li>●DC main contactor don't close</li> </ul>	<ul style="list-style-type: none"> <li>●Check input power to solve</li> <li>●Ask support</li> </ul>
	EOU1	Over voltage at acceleration	<ul style="list-style-type: none"> <li>●Power voltage fluctuation over limit</li> <li>●Too start rotating motor</li> </ul>	<ul style="list-style-type: none"> <li>●Check power grid</li> <li>●Restart until motor is stop completely, or set [F1.00] set for 1 or 2</li> </ul>
	EOU2	Over voltage during deceleration	<ul style="list-style-type: none"> <li>●Deceleration time too small</li> <li>●The driving load too heavy</li> <li>●Power voltage fluctuation over limit</li> </ul>	<ul style="list-style-type: none"> <li>●Prolong deceleration time</li> <li>●Reduce the load, or select bigger capacitor drive, or connect braking unit</li> <li>●Check input power</li> </ul>
	EOU3	Overvoltage at constant speed	<ul style="list-style-type: none"> <li>●The input voltage is too high.</li> <li>●An external force drives the motor during deceleration</li> </ul>	<ul style="list-style-type: none"> <li>●Adjust the voltage to normal range.</li> <li>●Cancel the external force or install the braking resistor.</li> </ul>
	EOU4	Over voltage at stop	<ul style="list-style-type: none"> <li>●Voltage fluctuate above limit</li> </ul>	<ul style="list-style-type: none"> <li>●Check the input voltage</li> </ul>
	EOC1	Over current during acceleration	<ul style="list-style-type: none"> <li>●Acceleration time is too short</li> <li>●To start rotating motor</li> <li>●V/F setting not correct or torque boost setting too big</li> <li>●Solar drive capacitor is too small</li> </ul>	<ul style="list-style-type: none"> <li>●Prolong acceleration time</li> <li>●Restart motor when it on still, or set F1.00 for 1 or 2.</li> <li>●Reset V/f curve or torque boost setting</li> </ul>
	EOC2	Over current during deceleration	<ul style="list-style-type: none"> <li>●The output circuit is grounded or short circuited.</li> <li>●Motor auto-tuning is not performed.</li> <li>●The acceleration time is too short.</li> <li>●Manual torque boost or V/F curve is not</li> </ul>	<ul style="list-style-type: none"> <li>●Eliminate external faults.</li> <li>●Perform the motor auto tuning.</li> <li>●Increase the acceleration time.</li> <li>●Adjust the manual torque boost or V/F curve.</li> <li>●Adjust the voltage to normal range.</li> <li>●Select rotational speed tracking restart or start the motor after it</li> </ul>

			<p>appropriate.</p> <ul style="list-style-type: none"> <li>●The voltage is too low.</li> <li>●The startup operation is performed on the rotating motor.</li> <li>●A sudden load is added during acceleration.</li> <li>●The AC drive model is of too small power class.</li> </ul>	<p>stops.</p> <ul style="list-style-type: none"> <li>●Remove the added load.</li> <li>●Select an AC drive of higher power class.</li> </ul>
	E.oC3	Over current at constant speed	<ul style="list-style-type: none"> <li>●The output circuit is grounded or short circuited.</li> <li>●Motor auto-tuning is not performed.</li> <li>●The voltage is too low.</li> <li>●A sudden load is added during operation.</li> <li>●The AC drive model is of too small power class</li> </ul>	<ul style="list-style-type: none"> <li>●Eliminate external faults.</li> <li>●Perform the motor auto tuning.</li> <li>●Adjust the voltage to normal range.</li> <li>●Remove the added load.</li> <li>●Select an AC drive of higher power class.</li> </ul>
	E.oL1	Motor overload	<ul style="list-style-type: none"> <li>●Boost torque is too big under VF control</li> <li>●ACC. and DEC. time is too short</li> <li>●Motor parameters setting is improperly</li> <li>●Restart motor which in counter rotate</li> <li>●The grid voltage is too lower</li> <li>●Load is too big or motor block load</li> <li>●AC drive selected is too load</li> </ul>	<ul style="list-style-type: none"> <li>●Reduce boost torque</li> <li>●Increase the ACC./DEC. time</li> <li>●Reset motor parameters</li> <li>●Reduce current limit and adopt speed tracking</li> <li>●Check grid voltage</li> <li>●Check load condition</li> <li>●Change bigger power AC drive</li> </ul>
	E.oL2	AC drive overload	<ul style="list-style-type: none"> <li>●Boost torque is too big under VF control</li> <li>●ACC. and DEC. time is too short</li> <li>●Motor parameters setting is improperly</li> <li>●Restart motor which in counter rotate</li> <li>●The grid voltage is too</li> </ul>	<ul style="list-style-type: none"> <li>●Reduce boost torque</li> <li>●increase the ACC./DEC. time</li> <li>●reset motor parameters</li> <li>●Reduce current limit and adopt speed tracking</li> <li>●Too check grid voltage</li> <li>●Too check load</li> <li>●change bigger power AC drive</li> </ul>

			<p>lower</p> <ul style="list-style-type: none"> <li>● Load is too big or motor block load</li> <li>● AC drive selected is too load</li> </ul>	
	E.SC	System abnormal	<ul style="list-style-type: none"> <li>● Deceleration is too short</li> <li>● Short circuit of solar drive output or phase output short circuit to ground</li> <li>● Module damage</li> <li>● EMC interface</li> </ul>	<ul style="list-style-type: none"> <li>● Prolong acceleration time</li> <li>● To check peripheral equipment</li> <li>● Ask to support</li> <li>● Check the wiring layout, cable ground</li> </ul>
	E.oH1	Inverter over-heat	<ul style="list-style-type: none"> <li>● Temperature is too high.</li> <li>● Air channel is blocked.</li> <li>● Fan connection parts is loose.</li> <li>● Fan is damaged.</li> <li>● Temperature detection circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>● Make the environment meet the requirement.</li> <li>● Clear the air channel.</li> <li>● Check and reconnect the wire</li> <li>● Change the same new fan.</li> <li>● Seek support from factory.</li> </ul>
	E.oH2	Rectifier over-heat	<ul style="list-style-type: none"> <li>● Temperature is too high.</li> <li>● Air channel is blocked.</li> <li>● Fan connection parts is loose.</li> <li>● Fan is damaged.</li> <li>● Temperature detection circuit fault</li> </ul>	<ul style="list-style-type: none"> <li>● Make the environment meeting the requirement.</li> <li>● Clear the air channel.</li> <li>● Check and reconnect the wire.</li> <li>● Change the same new fan.</li> <li>● Seek support from factory.</li> </ul>
	E.FE1	Motor static detection fault	<ul style="list-style-type: none"> <li>● Detection overtime</li> <li>● Start static detection while motor is running.</li> <li>● Capacitance difference is too big between motor and inverter.</li> <li>● Motor parameter setting mistake.</li> </ul>	<ul style="list-style-type: none"> <li>● Check motor connection wire.</li> <li>● Detect after motor stopping totally.</li> <li>● Change inverter model.</li> <li>● Reset parameter according to nameplate.</li> </ul>

	EFE2	Motor rotation detection fault	<ul style="list-style-type: none"> <li>●Detect while motor is running.</li> <li>●Detect with load.</li> <li>●Detection overtime</li> <li>●Capacitance difference is too big between motor and inverter.</li> <li>●Motor parameter setting mistake.</li> </ul>	<ul style="list-style-type: none"> <li>●Detect after motor stop totally.</li> <li>●Re-detect without load.</li> <li>●Check motor connection wire.</li> <li>●Change inverter model.</li> <li>●Reset parameter according to nameplate.</li> </ul>
	EEEP	Memory fault	<ul style="list-style-type: none"> <li>●Electromagnetic disturb in memory period.</li> <li>●EEPROM damage.</li> </ul>	<ul style="list-style-type: none"> <li>●Resume load and save.</li> <li>●Seek support from factory.</li> </ul>
	LIFE	Reserved		
	E <sub>i</sub> LF	Input phase loss	<ul style="list-style-type: none"> <li>●3-phase input power open phase.</li> </ul>	<ul style="list-style-type: none"> <li>●Check 3-phase power supply and the phase.</li> <li>●Check 3-phase power supply wiring.</li> </ul>
	E <sub>o</sub> LF	Output phase loss	<ul style="list-style-type: none"> <li>●3-phase output power open phase</li> </ul>	<ul style="list-style-type: none"> <li>●Check 3-phase output voltage and current.</li> <li>●Check wiring.</li> </ul>
	E <sub>Gnd</sub>	Output earth terminal short circuit.	<ul style="list-style-type: none"> <li>●Check wiring and insulation.</li> </ul>	<ul style="list-style-type: none"> <li>●Output earth</li> </ul>
	E <sub>XAL</sub>	Current detection fault	<ul style="list-style-type: none"> <li>●Detect circuit fault.</li> <li>●Phase imbalance</li> </ul>	<ul style="list-style-type: none"> <li>●Seek support from factory</li> <li>●Check motor and wiring.</li> </ul>
	E <sub>PAn</sub>	Keyboard connect fault	<ul style="list-style-type: none"> <li>●Keyboard wire fault.</li> <li>●Keyboard component damage.</li> </ul>	<ul style="list-style-type: none"> <li>●Check keyboard wire.</li> <li>●Seek support from factory.</li> </ul>
	Rs485com munication fault	<ul style="list-style-type: none"> <li>● Unsuitable baud rate setting.</li> <li>●Communication wire breaks.</li> <li>●Communication format does not match upper machine.</li> </ul>	<ul style="list-style-type: none"> <li>●Set suitable baud rate setting.</li> <li>●Check communication wire.</li> <li>●Make sure right communication format.</li> </ul>	<ul style="list-style-type: none"> <li>●RS485communication fault</li> </ul>
	E <sub>CPE</sub>	Parameter copy fault	<ul style="list-style-type: none"> <li>●Parameter copy communication is fault.</li> <li>●Copy keyboard does not match the inverter.</li> </ul>	<ul style="list-style-type: none"> <li>●Check wire.</li> <li>●Select the specified external keyboard model.</li> </ul>

## Chapter 5 Parameters List

This chapter just provides function parameter table. Specifications refer to AC10 technical manual.

### ● Environment setting

Parameter (address)	Function Description	Range of settings and definition	Factory default	Notes
F00.00(0x0000)	Parameter access level	V/F SVC Set the parameter access level based on the case of restricted parameter access. 0: Standard parameter 1: Common parameters (F00.00, Pxx.yy) 2: Monitoring parameters (F00.00, Cxx.yy) 3: The parameter has been changed (F00.00, Hxx.yy)	0 (0~3)	
F00.03(0x0003)	Initialization	V/F SVC Set the inverter initialization method. 0: Not initialized 11: Select the set value according to the purpose to carry out the parameters (excluding the motor parameters) 22: All parameters are initialized 33: Clear the fault record	0 (0~33)	
F00.04(0x0004)	Keyboard parameter copy	V/F SVC 0: No function 11: Upload parameters to the keyboard 22: Download parameters to the inverter	0 (0~9999)	
F00.05(0x0005)	User password	V/F SVC Used to set the user password.	0 (0~65355)	
F00.06(0x0006)	LCD keyboard language selection	V/F SVC Select the language displayed on the LCD operator. 0: Chinese 1: English	0 (0~1)	
F00.07(0x0007)	Free parameter 1	V/F SVC When using multiple machines, it is used as the machine number. When using multiple machines, the mode number is used for each purpose.	0 (0~65535)	
F00.08(0x0008)	Free parameter 2	V/F SVC When using multiple machines, it is used as the machine number. When using multiple machines, the mode number is used for each purpose.	0 (0~65535)	

## ● Basic parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F01.00(0x0100)	Motor 1 control mode	V/F SVC The way the motor is controlled. 0: AM-VF; VF control 1: AM-SVC; Open loop vector control, current closed loop control	0 (0~1)	S/T2 models only support VF control
F01.01(0x0101)	Run command channel	V/F SVC Used to select the channel that the drive accepts the run and stop commands and the direction of travel. 0: Keyboard control (external keyboard priority) 1: Terminal control 2: RS485 communication control 3: Reserved	0 (0~3)	
F01.02(0x0102)	Frequency reference source channel A	V/F SVC The frequency converter sets the given source of the frequency. 0: Keyboard digital given frequency 1: Keyboard analog potentiometer given 2: Current/voltage analog AI given 3: Reserved 4: Reserved 5: Terminal pulse PUL given 6: RS485 communication given 7: Terminal UP/DW control 8: PID control given 9: Program Control (PLC) given 10: Option card 11: Multi-speed speed given	0 (0~11)	
F01.03(0x0103)	Frequency reference source channel A gain	V/F SVC The frequency gives the gain of source channel A.	100.0% (0.0%~500.0%)	



F01.09(0x0109)	Keyboard digital given frequency	V/F SVC Used to set and modify the keyboard digital setting frequency.	50.00Hz (0.00Hz~upper limit frequency setting)	
F01.10(0x010A)	Maximum frequency	V/F SVC The maximum frequency that the frequency converter can set.	50.00Hz (upper limit frequency~600.00Hz)	
F01.11(0x010B)	Upper frequency source selection	V/F SVC Select a given source for the upper limit frequency of the drive. 0: Upper limit frequency number given 1: Keyboard analog potentiometer given 2: Current/voltage analog AI given 3: Reserved 4: Reserved 5: Terminal pulse PUL given 6: RS485 communication given 7: Reserved	0 (0~7)	
F01.12(0x010C)	Upper limit frequency digital setting	V/F SVC The upper line frequency is given when F01.11 is set to 0.	0.00Hz (0.00Hz~upper limit frequency digital setting)	
F01.13(0x010D)	Lower limit frequency	V/F SVC Given a lower frequency limit, the given frequency is limited.	0.00Hz (0.00Hz~upper limit frequency digital setting)	
F01.20(0x0114)	Acceleration/deceleration time reference frequency	V/F SVC Set the reference frequency to calculate the acceleration/deceleration time. 0: Maximum frequency 1: Fixed frequency 50Hz 2: Set the frequency	0 (0~2)	
F01.21(0x0115)	Acceleration time unit	V/F SVC The unit of acceleration time setting. 0: 1s 1: 0.1s 2: 0.01s	2 (0~2)	

F01.22(0x0116)	Acceleration time 1	V/F SVC The time required for the output frequency to accelerate from 0.00 Hz to the time reference frequency. 1s~65000s(F01.21 = 0) 0.1s~6500.0s(F01.21 = 1) 0.01s~ 650.00s(F01.21 = 2)	Model setting (0.01s~ 650.00s)	
F01.23(0x0117)	Deceleration time 1	V/F SVC The time it takes for the output frequency to decelerate from the time reference frequency to 0.00 Hz.	Model setting (0.01s~ 650.00s)	
F01.30(0x011E)	S curve acceleration and deceleration selection	V/F SVC S curve acceleration and deceleration selection is valid 0: Invalid 1: Valid	1 (0~1)	
F01.31(0x011F)	Acceleration start S curve time	V/F SVC Set the acceleration start S curve time.	0.20s (0.00s~10.00s)	
F01.32(0x0120)	Accelerated end S curve time	V/F SVC Set the acceleration end S curve time.	0.20s (0.00s~10.00s)	
F01.33(0x0121)	Deceleration start S curve time	V/F SVC Set the deceleration start S curve time.	0.20s (0.00s~10.00s)	
F01.34(0x0122)	Deceleration end S curve time	V/F SVC Set the deceleration end S curve time.	0.20s (0.00s~10.00s)	
F01.40(0x0128)	Carrier frequency	V/F SVC Used to set the switching frequency of the inverter IGBT.	4.0 kHz (1.0kHz~ 16.0kHz)	
F01.41(0x0129)	PWM control mode	V/F SVC LED "0" digit: Carrier and temperature 0: Independent of temperature 1: Related to temperature LED "00" digit: Carrier and output frequency correlation 0: Independent of the output frequency 1: Related to the output frequency LED "000" digit: Random PWM Enable 0: Forbidden 1: Enable LED "0000" digit: PWM modulation method 0: Only three-phase modulation is used 1: Two-phase three-phase modulation automatically switches	1111 (0000~1111)	

F01.42(0x012A)	Reserved			
F01.43(0x012B)	Dead zone compensation gain	V/F SVC Dead zone compensation gain	306 (0~512)	

● Motor Parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F02.00(0x0200)	Motor type	V/F SVC Set the type of motor 0: Asynchronous motor (AM) 1: Reserved	0 (0~1)	
F02.01(0x0201)	Pole number	V/F SVC Set the number of motor stages.	4 (2~98)	
F02.02(0x0202)	Motor rated power	V/F SVC Set the rated power of the motor.	Model setting (0.1kW~ 1000.0kW)	
F02.03(0x0203)	Motor rated frequency	V/F SVC Set the rated frequency of the motor.	Model setting (0.01Hz~ Maximum frequency)	
F02.04(0x0204)	Motor rated speed	V/F SVC Set the rated speed of the motor.	Model setting (0rpm~6500rpm)	
F02.05(0x0205)	Motor rated voltage	V/F SVC Set the rated voltage of the motor.	Model setting (0V~1500V)	
F02.06(0x0206)	Motor rated current	V/F SVC Set the rated current of the motor.	Model setting (0.1A~3000.0A)	
F02.07(0x0207)	Motor parameter auto-tuning selection	V/F SVC After the parameter auto-tuning is completed, the set value of [F02.07] will be automatically set to "0". 0: No operation	0 (0~3)	S/T2 models do not support parameter auto-tuning
F02.10(0x020A)	Asynchronous motor no-load current	V/F SVC Set the size of the no-load current of the asynchronous motor.	Model setting (0.1A~3000.0A)	
F02.11(0x020B)	Asynchronous motor stator resistance	V/F SVC Set the size of the asynchronous motor stator resistance.	Model setting (0.01mΩ ~ 60000.00mΩ)	

F02.12(0x020C)	Asynchronous motor rotor resistance	V/F SVC Set the size of the asynchronous motor rotor resistance.	Model setting (0.01mΩ ~ 60000.00mΩ)	
F02.13(0x020D)	Asynchronous motor stator leakage inductance	V/F SVC Set the stator leakage inductance of the asynchronous motor.	Model setting (0.01mH ~ 65535.00mH)	
F02.14(0x020E)	Asynchronous motor stator inductance	V/F SVC Set the stator inductance of the asynchronous motor.	Model setting (0.01mH ~ 65535.00mH)	
F02.15(0x020F)	Stator resistance standard value	V/F SVC Set the stator resistance value.	Model setting (0.01% ~ 50.00%)	
F02.16(0x0210)	Rotor resistance standard value	V/F SVC Set the rotor resistance value.	Model setting (0.01% ~ 50.00%)	
F02.17(0x0211)	Stator leakage inductance	V/F SVC Set the stator leakage inductance value.	Model setting (0.01% ~ 50.00%)	
F02.18(0x0212)	Stator inductance value	V/F SVC Set the stator inductance value.	Model setting (0.1% ~ 999.0%)	
F02.19(0x0213)	F02.11 ~ F02.14 decimal point selection	V/F SVC Set the decimal point of the four parameters F02.11 ~ F02.14.	0x0000 (0x0000 ~ 0x2222)	
F02.50(0x0232)	Motor online learning function selection	V/F SVC 0: Invalid 1: Power-on self-learning 2: Run the initial segment self-learning 3: Self-learning in operation	0 (0 ~ 3)	S/T2 models do not support motor online learning

● Vector Control

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F03.00(0x0300)	ASR speed rigidity level	SVC The rigidity level is set, and the higher the level, the better the speed rigidity.	10 (1 ~ 25)	
F03.01(0x0301)	ASR speed rigid mode	SVC The rigidity level is set, and the higher the level, the better the speed rigidity.	0x0000 (0x0000 ~ 0x1111)	
F03.02(0x0302)	ASR (speed loop) proportional gain 1	SVC Set the ASR (speed loop) proportional gain 1.	10.00 (0.01 ~ 100.00)	

F03.03(0x0303)	ASR (speed loop) integration time 1	SVC Set the ASR (speed loop) integration time 1.	0.100s (0.000s~6.000s)	
F03.04(0x0304)	ASR filtering time 1	SVC Set the ASR filter time 1.	0.0ms (0.0ms~100.0ms)	
F03.05(0x0305)	ASR switching frequency 1	SVC Set the ASR switching frequency to 1.	0.00Hz (0.00Hz~Maximum frequency)	
F03.06(0x0306)	ASR (speed loop) proportional gain	SVC Set the ASR (speed loop) proportional gain 2.	10 (0.01~100.00)	
F03.07(0x0307)	ASR (speed loop) integration time 2	SVC Set the ASR (speed loop) integration time 2.	0.100s (0.000s~6.000s)	
F03.08(0x0308)	ASR filtering time 2	SVC Set the ASR filter time 2.	0.0ms (0.0ms~100.0ms)	
F03.09(0x0309)	ASR switching frequency 2	SVC Set the ASR switching frequency 2.	0.00Hz (0.00Hz~Max frequency)	
F03.10(0x030A)	Current loop D-axis proportional gain	SVC Set the current loop D-axis proportional gain.	1.000 (0.001~4.000)	
F03.11(0x030B)	Current loop D-axis integral gain	SVC Set the current loop D-axis integral gain.	1.000 (0.001~4.000)	
F03.12(0x030C)	Current loop Q-axis proportional gain	SVC Set the current loop Q-axis proportional gain.	1.000 (0.001~4.000)	
F03.13(0x030D)	Current loop Q-axis integral gain	SVC Set the current loop Q-axis integral gain.	1.000 (0.001~4.000)	
F03.15(0x030E)	Electric state torque limit	SVC Set the motor state torque limit.	180.0% (0.0%~400.0%)	
F03.16(0x030F)	Power generation torque limit	SVC Set the generator state torque limit.	180.0% (0.0%~400.0%)	
F03.17(0x0312)	Regenerative torque limit at low speed	SVC Set the regenerative torque limit value at low speed.	50.0% (0.0%~400.0%)	
F03.18(0x0313)	Torque limit action frequency amplitude at low speed	SVC Set the torque limit action frequency range at low speed.	6.00s (0.00s~30.00s)	

F03.23(0x0314)	Asynchronous motor slip compensation	SVC Set the asynchronous motor slip compensation.	100.0% (0.0%~250.0%)	
F03.24(0x0315)	Starting torque initial value	SVC Set the initial value of the starting torque.	0.0% (0.0%~250.0%)	
F03.30(0x031E)	Weak magnetic feedforward coefficient	SVC Set the weak magnetic feed forward coefficient.	10.0% (0.0%~200.0%)	
F03.31(0x031F)	Weak magnetic control gain	SVC Set the field weakening control gain.	10.0% (0.0%~500.0%)	
F03.32(0x0320)	Weak magnetic current upper limit	SVC Set the upper limit of the field weakening current.	60.0% (0.0%~250.0%)	
F03.33(0x0321)	Weak magnetic voltage coefficient	SVC Set the weak magnetic voltage coefficient.	97.0% (0.0%~120.0%)	
F03.34(0x0322)	Output power limit	SVC Set the output power limit.	250.0% (0.0%~400.0%)	
F03.35(0x0323)	Overexcitation braking gain	SVC Set the overexcitation braking gain.	100.0% (0.0%~500.0%)	
F03.36(0x0324)	Overexcitation braking limit	SVC Set the overexcitation brake limiter.	10.0% (0.0%~250.0%)	
F03.37(0x0325)	Energy efficient operation	SVC 0: off 1: on	0 (0~1)	
F03.38(0x0326)	Energy-saving operation excitation lower limit	SVC Set the lower limit of excitation for energy saving operation.	50.0% (0.0%~80.0%)	
F03.39(0x0327)	Energy-saving operating filter coefficient	SVC Set the energy saving operation filter coefficient.	0.010s (0.000s~6.000s)	

## ● V/F Control

Parameter (address) adjustable	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F04.00(0x0400)	Linear V/F curve selection	V/F Used to select the type of V/F curve to meet different load features. 0: Straight line V/F curve; 1-9: Respectively, a power V/F curve of 1.1-1.9; 10: Square V/F curve; 11: Custom V/F curve;	0 (0~11)	
F04.01(0x0401)	Torque boost	V/F 0.0%: automatic torque boost 0.1%~30.0%: manual torque boost	0.0% (0.0%~30.0%)	
F04.02(0x0402)	Torque boost cutoff frequency	V/F Set the effective range of the torque boost function. When the output frequency exceeds this value, the torque boost function is cut off.	100.0% (0.0%~100.0%)	
F04.03(0x0403)	Slip compensation gain	V/F Set the slip compensation gain.	0.0% (0.0%~200.0%)	
F04.04(0x0404)	Slip compensation limit	V/F Set the slip compensation limit value.	100.0% (0.0%~300.0%)	
F04.05(0x0405)	Slip compensation filter time	V/F The slip compensation function needs to correctly input the motor nameplate parameters and learn the parameters to achieve the best results.	0.200 (0.000~6.000)	
F04.06(0x0406)	Oscillation suppression gain	V/F By adjusting this value, low frequency resonance can be suppressed, but not too large; otherwise it will cause additional stability problems.	100.0% (0.0%~900.0%)	
F04.07(0x0407)	Oscillation suppression filter time	V/F Set the oscillation suppression filter time.	1.0s (0.0s~100.0s)	
F04.08(0x0408)	Output voltage percentage	V/F Set the output voltage percentage.	100.0% (25.0%~120.0%)	
F04.10(0x040A)	Self-setting voltage V1	V/F Self-setting voltage V1	3.0% (0.0%~100.0%)	

F04.11(0x040B)	Self-set frequency F1	V/F Self-set frequency F1	1.00Hz (0.00Hz~Maximum frequency)	
F04.12(0x040C)	Self-setting voltage V2	V/F Self-setting voltage V2	28.0% (0.0%~100.0%)	
F04.13(0x040D)	Self-set frequency F2	V/F Self-set frequency F2	10.00Hz (0.00Hz~Maximum frequency)	
F04.14(0x040E)	Self-setting voltage V3	V/F Self-setting voltage V3	55.0% (0.0%~100.0%)	
F04.15(0x040F)	Self-set frequency F3	V/F Self-set frequency F3	25.00Hz (0.00Hz~Maximum frequency)	
F04.16(0x0410)	Self-setting voltage V4	V/F Self-setting voltage V4	78.0% (0.0%~900.0%)	
F04.17(0x0411)	Self-set frequency F4	V/F Self-set frequency F4	37.5Hz (0.0Hz~Maximum frequency)	
F04.18(0x0412)	Self-setting voltage V5	V/F Self-setting voltage V5	100.0% (0.0%~100.0%)	
F04.19(0x0413)	Self-set frequency F5	V/F Self-set frequency F5	50.00Hz (0.00Hz~Maximum frequency)	
F04.30(0x041E)	Automatic energy saving control	V/F 0: Off 1: On	0 (0~1)	
F04.31(0x041F)	Energy saving step frequency lower limit	V/F Set the lower limit of the energy saving buck frequency.	15.0Hz (0.0Hz~50.0Hz)	
F04.32(0x0420)	Energy-saving step-down voltage lower limit	V/F Set the lower limit of the energy-saving step-down voltage.	50.0% (20.0%~100.0%)	
F04.33(0x0421)	Energy-saving step-down voltage regulation rate	V/F Set the energy-saving step-down voltage regulation rate.	0.010V/MS (0.000V/MS~0.200V/MS)	
F04.34(0x0422)	Energy-saving voltage and voltage recovery rate	V/F Set the energy saving voltage and voltage recovery rate.	0.20V/MS (0.00V/MS~2.00V/MS)	



## ● I/O Terminals

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F05.00(0x0500)	Terminal X1 function selection	V/F SVC See the function of terminal X for details.	1 (0~63)	
F05.01(0x0501)	Terminal X2 function selection	V/F SVC See the function of terminal X for details.	2 (0~63)	
F05.02(0x0502)	Terminal X3 function selection	V/F SVC See the function of terminal X for details.	4 (0~63)	
F05.03(0x0503)	Terminal X4 function selection	V/F SVC See the function of terminal X for details.	8 (0~63)	
F05.40(0x0528)	AI input signal type selection method	V/F SVC 0: DIP switch 1: Reserved	0 (0~1)	
F05.43(0x052B)	Analog input curve selection	V/F SVC 0: Straight line (default) 1: Curve 1 2: Curve 2 LED "0" digit: AI LED "00" digit: Reserved LED "000" digit: Reserved LED "0000" digit: Reserved	0000 (0000~2222)	
F05.50(0x0532)	AI lower limit	V/F SVC Define the signal received by the terminal. The voltage signal below this value is processed by the limit value.	0.0% (0.0%~100.0%)	
F05.51(0x0533)	AI lower limit corresponding setting	V/F SVC Set the percentage of the corresponding set value	0.0% (-100.0%~100.0%)	
F05.52(0x0534)	AI upper limit	V/F SVC Define the signal received by the terminal. The voltage signal above this value is processed according to the upper limit value.	100.00% (0.00%~100.00%)	
F05.53(0x0535)	AI upper limit corresponding setting	V/F SVC Set the percentage of the corresponding set value	100.00% (0.00%~100.00%)	
F05.54(0x0536)	AI filter time	V/F SVC Defines the size of the analog signal to be used to eliminate interfering signals.	0.010s (0.000s~6.000s)	

F05.80(0x0550)	AI port to do digital input terminal feature selection	V/F SVC 0: Active low 1: Active high LED "0" digit: AI LED "00" digit: Reserved LED "000" digit: Reserved LED "0000" digit: Reserved	0000 (0000~1111)	
F05.81(0x0551)	AI terminal function selection (as X)	V/F SVC See X terminal function	0 (0~63)	
F05.82(0x0552)	AI high level setting	V/F SVC The input setting is greater than the high level setting, which is the input high level.	70.00% (0.00%~100.00%)	
F05.83(0x0553)	AI low level setting	V/F SVC Less than the low level setting is low.	30.00% (0.00%~100.00%)	
F06.00(0x0600)	AO output mode selection	V/F SVC 0: 0V~10V 1: 4.00mA~20.00mA 2: 0.00mA~20.00mA 3: Reserved 4: Reserved	0 (0~4)	
F06.01(0x0601)	AO output selection	V/F SVC 0: Given frequency 1: Output frequency 2: Output current 3: Input voltage 4: Output voltage 5: Mechanical speed 6: Given torque 7: Output torque 8: PID given 9: PID feedback amount 10: Output power 11: Bus voltage 12: VS input value 13: AI input value 14: AS input value 15: PUL input value 16: Module temperature 1 17: Module temperature 2 18: 485 communication given 19: Virtual terminal vY1	0 (0~19)	

F06.02(0x0602)	AO output gain	V/F SVC Adjust the value of the analog output of the terminal.	100.0% (0.0%~200.0%)	
F06.003(0x0603)	AO output bias	V/F SVC Set the AO output offset. Used to adjust the zero point of the terminal output.	0.0% (-10.0%~10.0%)	
F06.04(0x0604)	AO output filtering	V/F SVC Defined as the size of the analog signal filtering used to eliminate interfering signals.	0.01s (0.00s~6.00s)	
F06.20(0x0614)	Output terminal polarity selection	V/F SVC 0: Positive polarity 1: Negative polarity LED "0" digit: Y terminal LED "00" digit: Relay output terminal 1 LED "000" digit: Reserved LED "0000" digit: Reserved	0000 (0000~1111)	
F06.21(0x0615)	Output terminal Y	V/F SVC See terminal Y function	1 (0~63)	
F06.22(0x0616)	Relay 1 output (TA-TB-TC)	V/F SVC See terminal Y function	4 (0~63)	
F06.25(0x0619)	Y output ON delay time	V/F SVC Set the Y output ON delay time.	0.010s (0.000s~60.000s)	
F06.26(0x061A)	Relay 1 output ON delay time	V/F SVC Set relay 1 to output the ON delay time.	0.010s (0.000s~60.000s)	
F06.29(0x061D)	Y output OFF delay time	V/F SVC Set the Y output OFF delay time.	0.010s (0.000s~60.000s)	
F06.30(0x061E)	Relay 1 output OFF delay time	V/F SVC Set relay 1 output OFF delay time.	0.010s (0.000s~60.000s)	

● Start/Stop Control

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F07.00(0x0700)	Start mode	V/F SVC 0: Started by the start frequency 1: DC braking first starts again from the starting frequency 2: Start after the speed tracking and direction judgment	0 (0~2)	S/T2 models do not support speed tracking

F07.01(0x0701)	Start pre-excitation time	V/F SVC Just asynchronous machine vector control (no PG) supports pre-excitation, others would be ignored	0.00s (0.00s~60.00s)	S/T2 models do not support starting pre-excitation
F07.02(0x0702)	Starting frequency	V/F SVC When the given frequency is less than this value, it does not start and is in standby state.	0.50Hz (0.00Hz~Upper limit frequency digital setting)	
F07.03(0x0703)	Start protection selection	V/F SVC 0: Off 1: On LED "0" digit: Terminal start protection when exiting abnormal LED "00" digit: Jog terminal start protection when exiting abnormal LED "000" digit: Terminal start protection when the command channel is switched to the terminal LED "0000" digit: Reserved <b>Note: The terminal start protection is enabled by default when the free stop, emergency stop and forced stop commands are valid.</b>	0111 (0000~1111)	
F07.05(0x0705)	Direction of rotation	V/F SVC LED "0" digit: Reverse the running direction 0: The direction is unchanged 1: Direction reversal LED "00" digit: No direction of operation 0: Allow forward and reverse commands 1: Only forward commands are allowed 2: Only reverse command is allowed LED "000" digit: Frequency Control Command Direction 0: The frequency control direction is invalid. 1: Frequency control direction is valid LED "0000" digit: Reserved	0000 (0000~1111)	
F07.06(0x0706)	Power failure restart action selection	V/F SVC 0: Invalid 1: Valid	0 (0~1)	
F07.07(0x0707)	Power failure restart waiting time	V/F SVC	0.50s (0.00s~60.00s)	

F07.10(0x070A)	Stop mode	V/F SVC 0: Deceleration stop 1: Free stop	0 (0~1)	
F07.11(0x070B)	Shutdown detection frequency	V/F SVC When decelerating to stop, when the inverter output frequency is less than this value, it will enter the stop state.	0.50Hz (0.00Hz~ Upperlimit frequency digital	
F07.12(0x070C)	Stop and restart limit time	V/F SVC Waiting time after restarting after shutdown	0.00s (0.00s~60.00s)	
F07.15(0x070F)	Insufficient lower limit frequency action selection	V/F SVC 0 : Run according to frequency command 1 : Free running stops, enters the pause	0 (0~3)	
F07.16(0x0710)	Zero speed torque retention factor	V/F SVC	60.0% (0.0%~ 150.0%)	
F07.17(0x0711)	Zero speed torque holding time	V/F SVC	0.0s (0.0s~6000.0s)	
F07.18(0x0712)	Positive reversal dead time	V/F SVC Positive and negative switching, zero frequency maintenance time	0.0s (0.0s~120.0s)	

● Protection Parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F10.00(0x0A00)	Overcurrent suppression	V/F SVC The automatic limiting output current does not exceed the set overcurrent suppression point to prevent overcurrent faults from being triggered by excessive current. 0: Inhibition is always valid 1: Acceleration/deceleration is valid, constant speed is invalid	0 (0~1)	
F10.01(0x0A01)	Overcurrent suppression point	V/F SVC Set the load current limit level, 100% corresponds to the rated motor current.	160.0% (0.0%~ 300.0%)	
F10.02(0x0A02)	Overcurrent suppression gain	V/F SVC Set the response effect of overcurrent suppression.	100.0% (0.0%~ 500.0%)	
F10.03(0x0A03)	Current protection setting 1	V/F SVC Set whether current-related protection is enabled	0001 (0000~0221)	

		<p>LED "0" digit: wave-by-wave current limit (CBC) 0: Off 1: On</p> <p>LED "00" digit: OC protection interference suppression 0: Normal 1: Primary interference suppression 2: Secondary interference suppression</p> <p>LED "000" digit: SC Protection Interference Suppression 0: Normal 1: Primary interference suppression 2: Secondary interference suppression</p> <p>LED "0000" digit: Reserved</p>		
F10.04(0x0A04)	Current protection setting 2	<p>V/F SVC</p> <p>LED unit: reserved 0: Off 1: On</p>	0001 (0000~0001)	
F10.10(0x0A0A)	Bus overvoltage hardware protection	<p>V/F SVC</p> <p>Set whether the bus overvoltage hardware protection function is enabled. 0: Off 1: On</p>	0 (0~1)	
F10.11(0x0A0B)	Bus overvoltage suppression	<p>V/F SVC</p> <p>When the bus voltage is greater than the overvoltage suppression point, it will slow down or stop the acceleration and deceleration to prevent overvoltage faults.</p> <p>LED "0" digit: Overvoltage suppression function 0: Off 1: Only open when decelerating 2: Both open and decelerate</p> <p>LED "00" digit: Overexcitation function 0: Off 1: On</p>	0012 (0000~0012)	
F10.12(0x0A0C)	Bus overvoltage suppression point	<p>V/F SVC</p> <p>Set bus voltage value for trigger overvoltage suppression function</p>	<p>T3: 780 S2: 370 (T3: 650~760 S2: 340~380)</p> <p>Also subject to overvoltage limit</p>	<p>T3 overvoltage point: 820V (750~840) S2 overvoltage point: 400V (360~410)</p>

F10.13(0x0A0D)	Bus overvoltage suppression gain	V/F SVC Set the response of overvoltage suppression	100.0% (0.0% ~ 500.0%)	
F10.14(0x0A0E)	Energy brake enable	V/F SVC Set whether the energy brake function is on 0: off 1: Turn on, but turn off the overvoltage suppression function 2: Turn on, and turn on the overvoltage suppression function.	2 (0~2)	
F10.15(0x0A0F)	Energy consumption braking action voltage	V/F SVC Set the energy consumption braking action voltage, when the bus voltage is greater than this value, the energy consumption brake starts to act.	T3: 740 S2: 360 (T3: 650~800 S2: 350~390) Also subject to overvoltage limit	T3 overvoltagepoint: 820V (750~840) S2 overvoltagepoint: 400V (360~410)
F10.16(0x0A10)	Bus undervoltage suppression	V/F SVC When the bus voltage is lower than the undervoltage suppression point, the operating frequency is automatically adjusted to suppress the bus voltage from decreasing, preventing the undervoltage fault. 0: Off 1: On	0 (0~1)	
F10.17(0x0A11)	Bus undervoltage suppression point	V/F SVC Set bus voltage value for trigger undervoltage suppression function	T3: 430 S2: 240 (T3: 350~450 S2: 180~260) Also subject to overvoltage limit	T3 overvoltagepoint: 820V (750~840) S2 overvoltagepoint: 400V (360~410)
F10.18(0x0A12)	Bus undervoltage suppression gain	V/F SVC Set the response effect of undervoltage suppression	100.0% (0.0% ~ 500.0%)	

F10.19(0x0A13)	Bus undervoltage protection point	V/F SVC The lower limit voltage allowed by the set bus voltage. Below this value, the inverter reports an undervoltage fault.	T3: 320 S2: 190 (T3: 300~400 S2: 160~240) Also subject to overvoltage limit	T3 overvoltagepoint: 820V (750~840) S2 overvoltagepoint 400V (360~410)
F10.20(0x0A14)	Input and output phase loss protection options	V/F SVC Set whether the input and output phase loss protection functions are enabled. LED "0" digit: Output phase loss protection 0: Off 1: On LED "00" digit: Input phase loss protection 0: Off 1: On, detected the input missing phase report warning A.ILF, continue to run 2: Turn on, detect input missing phase report fault E.ILF, free stop	021 (000~121)	
F10.21(0x0A15)	Input phase loss threshold	V/F SVC Set the percentage of voltage detection of the input phase loss detection function, 100% corresponds to the rated bus voltage	10% (0%~30%)	
F10.22(0x0A16)	Ground short circuit protection option	V/F SVC Set whether the inverter output and the inverter cooling fan ground short circuit protection function are enabled. LED "0" digit: Output short circuit protection 0: Off 1: On LED "00" digit: Fan to ground short circuit protection 0: Off 1: On	11 (00~12)	
F10.23(0x0A17)	Fan ON/OFF control selection	Set the inverter cooling fan operation mode 0: The fan runs after the inverter is powered on. 1: After the shutdown, the fan operation is related to temperature, and the operation is running. 2: After the shutdown, the fan stops after F10.24, and the operation is related to temperature.	1 (0~2)	



F10.24(0x0A18)	Fan control delay time	V/F SVC Set the time from when the run command is canceled to when the cooling fan stops running.	30.00s (0.00s~ 600.00s)	
F10.25(0x0A19)	Inverter overheating oH1 detection level	V/F SVC Set the temperature value of the inverter overheat warning, which is greater than the value to report the overheat warning.	80.0°C (0.0°C~ 100.0°C)	
F10.30(0x0A1E)	Motor overload protection curve coefficient	V/F SVC Set the coefficient of overload protection for the load motor. Increasing this value can increase the overload capacity of the motor.	100.0% (0.0%~ 250.0%)	
F10.31(0x0A1F)	Selection of inverter overload characteristics at low speed	V/F SVC When the low speed (less than 5Hz) is set, the overload protection function of the inverter is valid. 0: Invalid 1: Valid	0 (0~1)	
F10.32(0x0A20)	Load warning checkout setting	V/F SVC Set the inverter load warning detection mode and the early warning mode at this time LED "0" digit: Load warning detection 1 setting 0: no detection 1: Detection load is too large 2: Excessive load detection only at constant speed 3: Insufficient detection load 4: Insufficient load detection only at constant speed LED "00" digit: Alarm setting when the alarm is detected 0: Continue to run, report A.LD1 1: Free stop, reported to E.LD1 LED "000" digit: Load Warning Checkout 2 Settings 0: no detection 1: Detection load is too large 2: Excessive load detection only at constant speed 3: Insufficient detection load 4: Insufficient load detection only at constant speed	0000 (0000~1414)	

		LED "0000" digit: Early warning set when load warning is detected 2 0: Continue to run, report A.LD1 1: Free stop, reported to E.LD1		
F10.33(0x0A21)	Load warning detection level 1	V/F SVC Set the detection value of load warning 1 When VF is controlled, this value is 100% corresponding to the rated current of the motor. When vector control, this value corresponds to 100% of the rated output torque of the motor.	130.0% (0.0% ~ 200.0%)	
F10.34(0x0A22)	Load warning detection time 1	V/F SVC Set the duration of the detected load warning 1 and the load is greater than the load warning detection level for the duration, and the load warning is detected.	5.0s (0.0s ~ 60.0s)	
F10.35(0x0A23)	Load warning detection level 2	V/F SVC Set the detection value of load warning 2 When VF is controlled, this value is 100% corresponding to the rated current of the motor. When vector control, this value corresponds to 100% of the rated output torque of the motor.	130.0% (0.0% ~ 200.0%)	
F10.36(0x0A24)	Load warning detection time 2	V/F SVC Set the duration of the detected load warning 2, the load is greater than the load warning detection level and continue for that time, and the load warning is detected 2	5.0s (0.0s ~ 60.0s)	
F10.40(0x0A28)	Too large speed deviation protection action	V/F SVC Set the warning detection mode selection and alarm mode selection when the motor reference speed and feedback speed deviation are too large LED "0" digit: Check out options 0: No detection 1: Only at constant speed detection 2: Always testing LED "00" digit: Alarm selection 0: Free stop and report failure 1: Alarm and continue to run	00 (00 ~ 12)	

F10.41(0x0A29)	Speed deviation excessive detection threshold	V/F SVC Set the detected value whose speed deviation is too large. This value corresponds to F01.10 [maximum frequency].	10.0% (0.0%~60.0%)	
F10.42(0x0A2A)	Speed deviation too large detection time	V/F SVC Set the duration of the detection speed deviation too large, the deviation of the given speed and feedback speed is greater than F10.41 and continues to be like that, an early warning of excessive speed deviation is detected.	2s (0s~60s)	
F10.43(0x0A2B)	Speed protection action	V/F SVC Set the alarm detection mode selection and alarm mode selection when the motor is rotating too fast LED "0" digit: check out options 0: No detection 1: Only at constant speed detection 2: Always testing LED "00" digit: Alarm selection 0: Free stop and report failure 1: Alarm and continue to run	00 (00~12)	
F10.44(0x0A2C)	Rapid detection threshold	V/F SVC Set the detection value of the fast warning, which corresponds to F01.10 [maximum frequency]	110.0% (0.0%~150.0%)	
F10.45(0x0A2D)	Rapid speed detection time	V/F SVC Set the duration of the detection of the rotating speed, the feedback speed is greater than F10.44 and continues like that, and the speed warning is detected.	0.01s (0.00s~2.00s)	
F10.50(0x0A32)	Failure self-recovery	V/F SVC Set the number of fault self-recovery that is allowed to be performed. Note: A value of 0 indicates that the fault self-recovery function is turned off; otherwise it indicates that the function is enabled.	0 (0~10)	
F10.51(0x0A33)	Failure self-recovery interval	V/F SVC Set the waiting time before the inverter resets to the time before each reset.	1.0s (0.0s~100.0s)	

F10.52(0x0A34)	Numbers of failures recovered	V/F SVC Indicates the number of self-recovery faults that have been performed. This parameter is a read-only parameter.	0	
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● Operation Parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F11.00(0x0B00)	Key lock selection	V/F SVC 0: Not locked 1: Keyboard function parameter modification lock 2: Function parameters and non-start stop button lock 3: Function parameters and button full lock	0 (0~3)	
F11.01(0x0B01)	Key lock password	V/F SVC	0 (0~65535)	
F11.02(0x0B02)	Keyboard multi-function key selection	V/F SVC 0: Invalid 1: Reverse run key 2: Forward jog operation key 3: Reverse jog run key 4: Keyboard command channel and terminal naming channel switch 5: Keyboard command channel and communication naming channel switch 6: Terminal command channel and communication naming channel switch 7: Keyboard, terminal, communication command channel cycle switching	1 (0~7)	
F11.03(0x0B03)	Keyboard STOP button settings	V/F SVC 0: Non-keyboard control mode is invalid 1: Non-keyboard control mode stops according to stop mode 2: Non-keyboard control mode stops in free mode	0 (0~2)	

F11.04(0x0B04)	Status interface up and down keys (knob) function selection	V/F SVC LED "0" digit: Keyboard up and down keys to modify the selection 0: Invalid 1: Used to adjust the frequency keyboard given F01.09 2: Used to adjust the PID keyboard given F13.01 3: Keyboard up and down keys to modify the parameter number setting LED "00" digit: Power-down storage 0: Frequency is not stored when power is off 1: Frequency power down storage LED "000" digit: Action Limit 0: Adjustable operation stop 1: Adjustable only during operation, stop and keep 2: Adjustable during operation, stop and clear LED "0000" digit: Reserved	0011 (0000~0213)	
F11.05(0x0B05)	Up and down keys to quickly change the parameter code setting	V/F SVC LED "0" and "00" digit: yy setting in function parameter number Fxx.yy 00~99 LED "000" and "0000" digit: xx setting in function parameter number Fxx.yy 00~15	0109 (0000~1563)	

F11.06(0x0B06)	Keyboard command key selection	<p>V/F SVC</p> <p>LED "0" digit: Built-in, external keyboard button commands (run command, stop/reset command)</p> <p>0: External priority, when the external is valid, the built-in is invalid.</p> <p>1: Built-in priority, when the built-in is valid, the external is invalid</p> <p>2: Internal and external are valid, the stop/reset command takes precedence; when both forward and reverse are active, and the command is invalid.</p> <p>LED "00" digit: Keyboard communication options</p> <p>0: Both internal and external keyboards are valid</p> <p>1: Only the built-in keyboard is valid</p> <p>2: Only external keyboard is valid</p>	0000 (0000~1122)	
F11.10(0x0B0A)	Status interface left shift, right shift key function selection	<p>V/F SVC</p> <p>LED "0" digit: Left shift key to adjust the first line of monitoring</p> <p>0: Invalid, 1: Valid</p> <p>LED "00" digit: Right shift key to adjust the second line of monitoring</p> <p>0: Invalid, 1: Valid</p>	0011 (0000~0011)	
F11.11(0x0B0B)	Parameter 1 showed up on first line of the keyboard	<p>V/F SVC</p> <p>LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy</p> <p>00~63</p> <p>LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting</p> <p>00~07</p>	0000 (0000~0763)	
F11.12(0x0B0C)	Parameter 2 showed up on first line of the keyboard	<p>V/F SVC</p> <p>LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy</p> <p>00~63</p> <p>LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting</p> <p>00~07</p>	0001 (0000~0763)	

F11.13(0x0B0D)	Parameter 3 showed up on first line of the keyboard	V/F SVC LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting 00~07	0002 (0000~0763)	
F11.14(0x0B0E)	Parameter 4 showed up on first line of the keyboard	V / F SVC LED "0" and "00" digit: Monitor parameter number Cxx.yy YY setting 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy XX setting 00~07	0011 (0000~0763)	
F11.15(0x0B0F)	Parameter 1 showed up on second line of the keyboard	V/F SVC LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting 00~07	0002 (0000~0763)	
F11.16(0x0B10)	Parameter 2 showed up on second line of the keyboard	V / F SVC LED "0" and "00" digit: Monitor parameter number Cxx.yy YY setting 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy XX setting 00~07	0004 (0000~0763)	
F11.17(0x0B11)	Parameter 3 showed up on second line of the keyboard	V/F SVC LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting 00~07	0010 (0000~0763)	
F11.18(0x0B12)	Parameter 4 showed up on second line of the keyboard	V/F SVC LED "0" and "00" digit: Setting yy setting in monitoring parameter number Cxx.yy 00~63 LED "000" and "0000" digit: Monitoring parameter number Cxx.yy xx setting 00~07	0012 (0000~0763)	

F11.20(0x0B14)	Keyboard display item settings	<p>V/F SVC</p> <p>LED "0" digit: Output frequency display selection</p> <p>0: Target frequency</p> <p>1: Operating frequency</p> <p>LED "00" digit: Reserved</p> <p>0: Invalid</p> <p>1: Active power to remove stator resistance loss</p> <p>LED "000" digit: Power Display Dimensions</p> <p>0: Power display percentage (%)</p> <p>1: Power display kilowatt (kW)</p> <p>LED "0000" digit: Reserved</p>	0000 (0000~1111)	
F11.21(0x0B15) RUN	Speed display factor	V/F SVC	100.0% (0.0%~ 500.0%)	
F11.22(0x0B16)	Power display factor	V/F SVC	100.0% (0.0%~ 500.0%)	
F11.23(0x0B17)	Monitoring parameter group display selection	<p>V/F SVC</p> <p>LED "0" digit: Reserved</p> <p>0: Invalid</p> <p>1: Valid</p> <p>LED "00" digit: C05 display selection</p> <p>0: Automatically switch according to the control mode</p> <p>1:VF mode related parameters</p> <p>2: VC mode related parameters</p> <p>LED "000" digit: C00.40~C00.63 display selection</p> <p>0: Not displayed</p> <p>1: Display</p> <p>LED "0000" digit: Reserved</p>	0000 (0000~FFFF)	
F11.24(0x0B18)	Reserved			
F11.25(0x0B19)	Display selection when the motor is self-tuning	<p>V/F SVC</p> <p>0: Display the status of the self-learning process</p> <p>1: Do not display the status of the self-learning process</p>	0 (0~1)	S/T2 models do not support this parameter.



● Communication Parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F12.00(0x0C00)	Master-slave choice	V/F SVC 0: Slave 1: Host	0 (0~1)	
F12.01(0x0C01)	Modbus communication address	V/F SVC	1 (1~247)	
F12.03(0x0C03)	Modbus data format	V/F SVC 0: (N, 8, 1) no parity, Data bits: 8, Stop position: 1 1: (E, 8, 1) even parity, Data bits: 8, Stop position: 1 2: (O, 8, 1) odd parity, Data bits: 8, Stop position: 1 3: (N, 8, 2) no parity, Data bits: 8, Stop position: 2 4: (E, 8, 2) even parity, Data bits: 8, Stop position: 2 5: (O, 8, 2) odd parity, Data bits: 8, Stop position: 2	0 (0~5)	
F12.04(0x0C04)	Modbus transmission response processing	V/F SVC 0: The writing operation has a response 1: The writeing operation has no response	0 (0~1)	
F12.05(0x0C05)	Modbus communication response delay	V/F SVC	0ms (0ms~500ms)	
F12.06(0x0C06)	Modbus communication timeout failure time	V/F SVC	1.0s (0.1s~100.0s)	

F12.07(0x0C07)	Communication disconnection processing	V/F SVC 0: Do not detect timeout failure 1: Fault and free parking 2: Warning and continue to run	0 (0~3)	
F12.08(0x0C08)	Receive data (address 0x3000) zero bias	V/F SVC	0.00 (-100.00~ 100.00)	
F12.09(0x0C09)	Receive data (address 0x3000) gain	V/F SVC	100.0% (0.0%~ 500.0%)	

● Monitoring parameters

Parameter code (address)	Function Description	Content	Signal level of multi-function analog output	Notes
C00.00 (0x2100)	Given frequency	V/F SVC	10V corresponds to the maximum frequency	
C00.01 (0x2101)	Output frequency	V/F SVC	10V corresponds to the maximum frequency	
C00.02(0x2102)	Output current	V/F SVC	10V corresponds to the rated current of the double motor (5A)	
C00.03 (0x2103)	Input voltage	V/F SVC	10V corresponds to 380V	
C00.04 (0x2104)	The output voltage	V/F SVC	10V corresponds to the rated voltage of the motor 360V	
C00.05 (0x2105)	Mechanical speed	V/F SVC	10V corresponds to the maximum frequency of mechanical speed	
C00.06 (0x2106)	Given torque	V/F SVC	10V corresponds to +/-200%	
C00.07 (0x2107)	Output torque	V/F SVC	10V corresponds to +/-200%	
C00.08 (0x2108)	PID given	V/F SVC	10V corresponds to 100%	
C00.09 (0x2109)	PID feedback	V/F SVC	10V corresponds to 100%	
C00.10 (0x210A)	Output Power	V/F SVC		
C00.11 (0x210B)	bus voltage	V/F SVC	5V corresponding rated bus voltage	
C00.12 (0x210C)	Module temperature 1	V/F SVC	10V corresponds to 100℃	
C00.13 (0x210D)	Module temperature 2	V/F SVC	10V corresponds to 100℃	
C00.14 (0x210E)	Input terminal X is on	V/F SVC		
C00.15 (0x210F)	Output terminal Y is on	V/F SVC		
C00.16(0x2110)	Analog AI input value	V/F SVC	10V corresponds to 10V	
C00.17 (0x2111)	Reserved	V/F SVC		
C00.18 (0x2112)	Keyboard potentiometer	V/F SVC	10V corresponds to 10V	
C00.19 (0x2113)	Pulse signal PUL input	V/F SVC		
C00.20 (0x2114)	Analog output AO	V/F SVC		

C00.21 (0x2115)	Reserved	V/F SVC		
C00.22 (0x2116)	Counter count value	V/F SVC		
C00.23 (0x2117)	Power-on running time	V/F SVC		
C00.24 (0x2118)	Accumulated running time of the machine	V/F SVC		
C00.25 (0x2119)	Inverter power level	V/F SVC		
C00.26 (0x211A)	Inverter rated voltage	V/F SVC		
C00.27 (0x211B)	Inverter rated current	V/F SVC		
C00.28 (0x211C)	Software version	V/F SVC		
C00.29 (0x211D)	PG feedback frequency	V/F SVC		
C00.30 (0x211E)	Timer timing	V/F SVC		
C00.31 (0x211F)	PID output value	V/F SVC		
C00.32 (0x2120)	Inverter software	V/F SVC		
C00.33(0x2121)	Encoder feedback angle	V/F SVC		
C00.34 (0x2122)	Z pulse cumulative error	V/F SVC		
C00.35 (0x2123)	Z pulse count	V/F SVC		
C00.36 (0x2124)	Failure warning code	V/F SVC		
C00.37 (0x2125)	Cumulative power consumption (low level)	V/F SVC		
C00.38 (0x2126)	Cumulative power consumption (high)	V/F SVC		
C00.39 (0x2127)	Power factor angle	V/F SVC		

● **Fault Monitor**

Parameter code (address)	Function Description	Content	Signal level of multi-function analog output	Notes
C01.00 (0x2200)	Fault type diagnostic information	V/F SVC		
C01.01 (0x2201)	Troubleshooting information	V/F SVC		
C01.02 (0x2202)	Fault operating frequency	V/F SVC		
C01.03 (0x2203)	Fault output voltage	V/F SVC		
C01.04 (0x2204)	Fault output current	V/F SVC		
C01.05 (0x2205)	Fault bus voltage	V/F SVC		
C01.06 (0x2206)	Faulty module temperature	V/F SVC		
C01.07 (0x2207)	Faulty inverter status	V/F SVC		
C01.08 (0x2208)	Fault input terminal status	V/F SVC		
C01.09 (0x2209)	Fault output terminal status	V/F SVC		

C01.10 (0x220A)	Previous failure type	V/F SVC		
C01.11 (0x220B)	Previous troubleshooting information	V/F SVC		
C01.12 (0x220C)	The first fault operation frequency	V/F SVC		
C01.13 (0x220D)	Last fault output voltage	V/F SVC		
C01.14 (0x220E)	Last fault output current	V/F SVC		
C01.15 (0x220F)	The first fault bus voltage	V/F SVC		
C01.16 (0x2210)	The first fault module temperature	V/F SVC		
C01.17 (0x2211)	The first faulty inverter status	V/F SVC		
C01.18 (0x2212)	The first fault input terminal status	V/F SVC		
C01.19 (0x2213)	The first fault output terminal status	V/F SVC		
C01.20 (0x2214)	First 2 fault types	V/F SVC		
C01.21 (0x2215)	The first 2 troubleshooting information	V/F SVC		
C01.22 (0x2216)	Top 3 fault types	V/F SVC		
C01.23 (0x2217)	The first 3 troubleshooting information	V/F SVC		

● I/O Terminals Function Table

X	Functional interpretation	X	Functional interpretation	X	Functional interpretation
0	No function	21	PID control pause	42	Counter clock input terminal
1	Forward running	22	PID characteristic switching	43	Counter clear terminal
2	Reverse run	23	PID parameter switching	44	DC brake command
3	Three-wire operation control (Xi)	24	PID given switch 1	45	Pre-excitation command
4	Forward turn	25	PID given switch 2	46	Reserved
5	Reverse jog	26	PID given switch 3	47	Reserved
6	Free parking	27	PID feedback switching 1	48	Command channel switch to
7	Emergency pull over	28	PID feedback switching 2	49	Command channel switch to
8	Fault reset	29	PID feedback switching 3	50	Command channel switch to
9	External fault input	30	Program run (PLC) pause	51	Command channel switch to
10	Frequency increment (UP)	31	Program run (PLC) restart	52	Run prohibition
11	Frequency decrement (DW)	32	Acceleration/deceleration time	53	Forward prohibition
12	Frequency increment decrement	33	Acceleration/deceleration time	54	Reverse prohibition
13	Channel A switches to channel B	34	Suspension acceleration	55	Reserved
14	Switch the frequency channel combination to A	35	Swing frequency input	56	Reserved
15	Switch the frequency channel combination to B	36	Swing frequency pause	57	Zero servo command
16	Multi-speed terminal 1	37	Swing frequency reset	58	Run output blocking
17	Multi-speed terminal 2	38	Keyboard button and display	59	Reserved

18	Multi-speed terminal 3	39	X4 frequency measurement	60	Speed torque control
19	Multi-speed terminal 4	40	Timer trigger terminal	61	Reserved
20	PID control canceled	41	Timer clear terminal	62	Reserved
<b>Y</b>	<b>Functional interpretation</b>	<b>Y</b>	<b>Functional interpretation</b>	<b>Y</b>	<b>Functional interpretation</b>
0	No output	14	Lower limit frequency is reached	28	Underload pre-alarm output 2
1	The inverter is running	15	Program run cycle is completed	29	Inverter is warning
2	Inverter running in reverse	16	The running phase of the program is	30	Communication address
3	The inverter is running in	17	PID feedback exceeds the upper	31	Inverter overheat warning
4	Fault trip alarm 2 (no alarm)	18	PID feedback is below the lower limit	32	Motor overheat alarm output
5	Fault trip alarm 2 (no alarm)	19	PID feedback sensor disconnection	33	Frequency (speed) is
6	External downtime	20	Meter length arrives	34	Any frequency (speed) is
7	Inverter is under-voltage	21	Timer time is up	35	Frequency detection 1
8	The inverter is ready for	22	Counter reaches maximum	36	Frequency detection 2
9	Output frequency level detection	23	Counter reaches the set value	37	Frequency (speed) is
10	Output frequency level detection	24	Energy consumption braking	38	Any frequency (speed) is
11	Arrived at a given frequency	25	PG feedback disconnection	39	Frequency detection 3
12	Zero speed operation	26	Emergency stop	40	Frequency detection 4
13	Upper limit frequency is reached	27	Overload pre-alarm output 1		

● Photovoltaic Pump Special Parameters

Parameter (address)	Function Description	Range of settings and definition	Factory default (setting range)	Notes
F21.00(0x5500)	Solar pump drive control mode	LED0 Mode selection 0:Variable frequency control mode 1:CVT mode for solar 2:MPPT mode for solar LED00 Operation selection 0: Continuous Operation 1:Intermittent Operation 2: Pump Clear LED000 Reserved LED0000 Motor selection 0:Three-phase Motor 1:Single-phase Motor	0002	
F21.01(0x5501)	Running control mode	0:Stop 1:Running 2:Sleep 3:Low speed protection 4:Dry run protection 5:Over current protection	Read Only	

		6:Minimum power protection 7:Water fulfilled protection		
F21.02(0x5502)	VOC voltage (display)	0.0V~999.9V	Read only	
F21.03(0x5503)	CVT target voltage	70.0%~95.0%	81.0%	
F21.04(0x5504)	MPPT upper limit voltage	20.0%~200.0%	100.0%	
F21.05(0x5505)	MPPT lower limit voltage	20.0%~200.0%	50.0%	
F21.06(0x5506)	Frequency adjusting gain	0.1%~500.0%	10.0% (AM) 40.0% (PMSM)	
F21.07(0x5507)	MPPT search interval	0.1s~100.0s	1.0s	
F21.08(0x5508)	MPPT regulating gain	0~9999	100	
F21.09(0x5509)	Quick-drop frequency gain	0~20	2	
F21.10(0x550A)	Frequency adjusting filter time	0.001s~2.000s	0.001	
F21.11(0x550B)	Go to sleep mode voltage	0V~1000V	0V	
F21.12(0x550C)	Wake up restore voltage	0V~1000V	400V	
F21.13(0x550D)	Sleeping stop restore waiting time	0.0s~3000.0s	10.0s	
F21.14(0x550E)	Low speed protection detect frequency	0.00Hz~300.00Hz	10.00Hz	
F21.15(0x550F)	Low speed protection detect time	0.0s~3000.0s	10.0s	
F21.16(0x5510)	Low speed protection restore working time	0.0s~3000.0s	10.0s	
F21.17(0x5511)	Dry run protection detect current	0.0A~999.9A	0.0A	
F21.18(0x5512)	Dry run protection detect time	0.0s~3000.0s	10.0s	
F21.19(0x5513)	Dry run auto restore working time	0.0s~3000.0s	10.0s	

F21.20(0x5514)	Over current point setting	0.0A~999.9A	0.0A	
F21.21(0x5515)	Over current protection detect time	0.0s~3000.0s	10.0s	
F21.22(0x5516)	Over current protection auto restore working time	0.0s~3000.0s	10.0s	
F21.23(0x5517)	Input minimum power protection power point setting	0.00kW~650.00kW	0.00kW	
F21.24(0x5518)	Minimum power protection detect time	0.0s~3000.0s	10.0s	
F21.25(0x5519)	Minimum power protection auto restore working time	0.0s~3000.0s	10.0s	
F21.26(0x551A)	Fault alarm restore mode	0:Auto reset;1:Reset by manual LED0:Low speed protection LED1:Dry run LED2:Over current protection LED3: Minimum power protection	0000	
F21.27(0x551B)	Water fulfilled detect time	0.0s~3000.0s	10.0s	
F21.28(0x551C)	Water fulfilled restore time	0.0s~3000.0s	10.0s	
F21.29(0x551D)	reserve			
F21.30(0x551E)	DC current revise offset	0.00A~99.99A	0.01A	
F21.31(0x551F)	DC current revise proportion gain	0.0%~999.9%	100.0%	
F21.32(0x5520)	Power curve point 0	0.00kW~99.99kW	0.50kW	
F21.33(0x5521)	Power curve point 1	0.00kW~99.99kW	1.00kW	
F21.34(0x5522)	Power curve point 2	0.00kW~99.99kW	1.50kW	
F21.35(0x5523)	Power curve point 3	0.00kW~99.99kW	2.00kW	
F21.36(0x5524)	Power curve point 4	0.00kW~99.99kW	2.50kW	
F21.37(0x5525)	Flow curve point 0	0.0m <sup>3</sup> /h~999.9m <sup>3</sup> /h	0.0m <sup>3</sup> /h	
F21.38(0x5526)	Flow curve point 1	0.0m <sup>3</sup> /h~999.9m <sup>3</sup> /h	5.0m <sup>3</sup> /h	
F21.39(0x5527)	Flow curve point 2	0.0m <sup>3</sup> /h~999.9m <sup>3</sup> /h	10.0m <sup>3</sup> /h	
F21.40(0x5528)	Flow curve point 3	0.0m <sup>3</sup> /h~999.9m <sup>3</sup> /h	15.0m <sup>3</sup> /h	

F21.41(0x5529)	Flow curve point 4	0.0m <sup>3</sup> /h~999.9m <sup>3</sup> /h	20.0m <sup>3</sup> /h	
F21.42(0x552A)	Flow calculating revise offset	0.0m <sup>3</sup> ~999.9m <sup>3</sup>	0.0m <sup>3</sup>	
F21.43(0x552B)	Flow calculating revise gain	0.0%~999.9%	100.0%	
F21.44(0x552C)	Power per day/ generated power per day reset period	0.0h~24.0h	7.0h	
F21.45(0x552D)	Reserved			
F21.46(0x552E)	Photovoltaic pump function selection 1	0:Invalid 1:Valid LED0:Constant torque frequency limit selection LED1:Reserved LED2:Voltage rising update Voc voltage LED3: Fast frequency falling function	1100H	
F21.47(0x552F)	Fast frequency falling threshold	3.0%~15.0%	5.0%	
F21.48(0x5530)	Constant torque frequency limit coefficient	80.0%~150.0%	100.0%	
F21.49(0x5531)	Sudden voltage increase threshold	0.0%~20.0%	5.0%	
F21.50(0x5532)	Reserved			
F21.51(0x5533)	Reserved			
F21.52(0x5534)	Reserved			
F21.53(0x5535)	Functional selection	LED0: Inermittent Operation Storage 0:None; 1:Stored LED00:Stop Mode When Alarm 0:Slow down 1:Free stop LED000:Reserved LED0000:Reserved	0000	
F21.54(0x5536)	Times of Inermittent Operation	0~1000	0	
F21.55(0x5537)	Start time of Inermittent Operation	0min~3000min	0	
F21.56(0x5538)	Stop time of Inermittent Operation	0min~3000min	0	
F21.57(0x5539)	Pump Clear Frequency	0.00Hz~300.00Hz	25.00Hz	



F21.58(0x553A)	FWD Running Time	0s~3000s	30s	
F21.59(0x553B)	REV Running Time	0s~3000s	30s	
F21.60(0x553C)	Cycle Times	0~60	5	
F21.61(0x553D)	Power Limitation	0.0~1000.0	0.0	
F21.62(0x553E)	Power Limitation Kp	0.0~100.0	1.0	
F21.63(0x553F)	Power Limitation Ki	0.0~100.0	1.0	

● Photovoltaic Pump Special Monitor Parameters

Function code	Function name	Setting range and definition	Default setting
C04.00(0x2500)	Frequency reference	0.01Hz	Read only
C04.01(0x2501)	Output frequency	0.01Hz	Read only
C04.02(0x2502)	Output current	0.1A	Read only
C04.03(0x2503)	Cycle Times 1		Read only
C04.04(0x2504)	Cycle Times 2		Read only
C04.05(0x2505)	Reserved		Read only
C04.06(0x2506)	Operation Time	1min	Read only
C04.07(0x2507)	Stop Time	1min	Read only
C04.08(0x2508)	Reserved		Read only
C04.09(0x2509)	Reserved		Read only
C04.10(0x250A)	Output power	0.01kW	Read only
C04.11(0x250B)	DC bus voltage	0.1V	Read only
C04.12(0x250C)	Module temperature 1	0.1°C	Read only
C04.13(0x250D)	Status of MPPT		Read only
C04.14(0x250E)	Solar Panel Operation Point	0.1%	Read only
C04.15(0x250F)	Solar Panel Voc	0.1V	Read only
C04.16(0x2510)	Frequency Searching Period		Read only
C04.17(0x2511)	Solar Target Frequency	0.10Hz	Read only
C04.30(0x251E)	DC current	0.01A	Read only
C04.31(0x251F)	Flow speed	0.1m³/h	Read only
C04.32(0x2520)	Voc voltage	0.1V	Read only
C04.33(0x2521)	Flow per day	0.1m³	Read only
C02.34(0x2522)	Cumulative total flow(low position)	0.1m³	Read only
C02.35(0x2523)	Cumulative total flow(high position)	0.1km³	Read only
C02.36(0x2524)	Generated power per day	0.01kWh	Read only
C02.37(0x2525)	Cumulative total generated power (low position)	0.01kWh	Read only
C02.38(0x2526)	Cumulative total generated power (high position)	0.1MWh	Read only

## Chapter 6 Operation Guidance

### 6.1 Asynchronous Motor Pump Drive Operation Guidance

#### 1) Wiring:

- a. Confirmed the solar pump drive if matching with motor.
- b. Correctly connecting "+""-" of solar panel to R, T wiring terminals. Otherwise it will cause inverter damage.
- c. Connect motor wire and ground wire to corresponding U, V, W, E terminals.

#### 2) Parameters setting and trial run:

- a. Set F01.00 to 0, F01.02 for 0, and F01.22, F01.23 parameters setting according to application site.
- b. Set motor(pump) parameters according to nameplate of pump.
- c. Set solar pump MPPT mode F21.00 for 1 or 2.
- d. Press FWD button for trail running, and confirm the motor running direction.

#### 3) Common problems

- a. Q:Well-lit conditions, the pump is running, but the water is very small.  
A:Check if the pump motor direction is reversed.
- b. Q:Well-lit conditions, the drive is in standby mode 0.00Hz.  
A:Check F21.01, observe what protection status is the drive in currently, check whether the parameters set is reasonable.
- c. Q:DC current is incorrectly displayed.  
A:Adjust F21.30, F21.31 for calibration.
- d. Q:Well-lit conditions, frequency severe beating during operation.  
A:Reasonably adjust F21.06 value, the adjustment is recommended to be in the vicinity of the default, too big or too small will cause frequency oscillation.

### 6.2 Synchronous Motor Pump Drive Operation Guidance

#### 1) Wiring:

- a. Confirm if the solar pump drive matches with the motor.
- b. Connecting "+""-" of solar panel to R, T wiring terminals. Otherwise it will cause inverter damage.
- c. Connect motor wire and ground wire to corresponding U, V, W, E terminals.

#### 2) Parameters setting and trial run:

- a. Set F01.00 to 0, F01.02 for 0, and F01.22, F01.23 can be set according to demand.
- b. Set motor (pump) parameters according to nameplate of pump. Then Set F02.07 for 1, the keypad will show T-00, press START to start motor auto tuning. This process takes about three minutes;

Note: 1. If you can disconnect the motor and load, self-learning would be better;

2. The self-learning need to be done with enough sunshine and when the solar panels can provide enough energy.

- c. Set solar pump MPPT mode F21.00 for 1 or 2.
- d. Press FWD button for trail running, and confirm the motor running direction.

#### 3) Common problems and solutions

- a. Q:Well-lit conditions, the pump is running, but the water is very small.

- A: Check if the pump motor direction is reversed.
- b. Q: Well-lit conditions, the drive is in standby mode 0.00Hz.  
A: Check F21.01, observe what protection status is the drive in currently, check whether the parameters set is reasonable.
- c. Q: DC current is incorrectly displayed.  
A: Adjust F21.30, F21.31 for calibration.
- d. Q: Well-lit conditions, frequency severe beating during operation.  
A: Reasonably adjust F21.06 value, the adjustment is recommended to be in the vicinity of the default, too big or too small will cause frequency oscillation.

## 6.3 PV Water Pump Features

### 1) Sleep Function

During the photovoltaic pump operation, the inverter will go into sleep state when the DC voltage provided by solar panels is lower than F21.11 (sleep voltage threshold) due to objective factors, while the keyboard warning "A.LPn"; when DC voltage provided by solar panels rises back to F21.12 (sleep recovery voltage) point, start timing and after F21.13 (sleep shutdown waiting time), the drive starts running.

### 2) Low-frequency Protection Function

During the operation of the photovoltaic pump, for some reason, the output frequency is lower than F21.14 (low frequency detection frequency), and after F21.15 (under frequency detection time) time, enters into the standby protection state, while the keyboard warning "A.LFr"; after entering into the standby protection state and after F21.16 (frequency protection automatic recovery) time, automatically resume to running state.

### 3) Dry Run Protection

During the operation of the photovoltaic pump, for some reason, the output current is less than F21.17 (dry protection current detection), and after F21.18 (dry protection detection time) time, enters into standby protection state, while the keyboard warning "A.LuT"; after entering into the standby protection state and after F21.19 (dry protection automatic recovery)time, automatically resume to running state.

### 4) Over-current Protection

During the operation of the photovoltaic pump, for some reason, the output current is greater than F21.20(over current point setting), and after F21.21 (over current protection detect) time, enters into standby protection state, while the keyboard warning "A.oLd "; after entering into the standby protection state and after F21.22 (over current protection auto restore working )time, automatically resume to running state.

### 5) Minimum Power Protection

During the operation of the photovoltaic pump, for some reason, the output power is less than F21.23(minimum power protection value), and after F21.24 (minimum power protection detection time) time, enters into standby protection state, while the keyboard warning "ALPr"; after entering into the standby protection state and after F21.25 (minimum power automatic recovery)time, automatically resume to running state.

### 6) Full Water Protection

Detect the water full alarm and low water level through two X terminals, realizing automatic level control. Wherein F21.27

is the water overflow protection detection time and F21.28 is full water protection exit time, and X3 terminal is defined as full solar water detection alarm, and X4 terminal is defined as full solar water detection alarm reset, the warning signal is shown as "A.Ful".

### **7) Alarm Recovery Mode: 0: automatic recovery; 1: manual recovery**

This option is for low frequency protection, dry protection, over-current protection, minimum power function; you can select the alarm restoration by F21.26. When you select 0 for automatic recovery, during fault warning displaying, you can also press the "RESET" button to stop operation; during fault warning displaying, you can press the "RESET" button to manually clear, you can also press "RESET" button to achieve stop operation.

### **8) PQ Curve Function**

This model provides a self-defined PQ curve for users to set up five groups of PQ corresponding points according to the pump cases, to achieve real-time traffic speed, daily flow, cumulative flow, generating capacity, cumulative electricity consumption; of which by default, daily flow and generating capacity are calculated based on 7h in a day.

### **9) Status Check**

When the photovoltaic pump is running, you can check F21.01 to confirm the current operating status.

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