

## Chapter 1 Safety and Precautions

### Safety definition:

In this manual, safety precautions are classified as follows:



**Danger:** Operations which are not performed according to requirements may cause serious equipment loss or personnel injury.





**Caution:** Operations which are not performed according to requirements may cause medium hurt or light hurt or material loss.



During the installation, commissioning and maintenance of the system, please make sure to follow the safety and precautions of this chapter. In case of a result of illegal operations, caused any harm and losses is nothing to do with the company.

### 1.1 Safety Precautions



#### 1.1.1 Before Installation:

 Danger	<ul style="list-style-type: none"> <li>Do not use the water-logged inverter, damaged inverter or inverter with missing parts. Otherwise, there may be risk of injury.</li> <li>Use the motor with Class B or above insulation. Otherwise, there may be risk of electric shock.</li> </ul>
 Caution	<ul style="list-style-type: none"> <li>Carefully handled when loading, otherwise it may damage the inverter.</li> <li>Please don't use the damaged driver or inverter with missing parts, there may be risk of injury.</li> <li>Do not touch the electronic parts and components; otherwise it will cause static electricity.</li> </ul>



#### 1.1.2 During Installation:

 Danger	<ul style="list-style-type: none"> <li>Install the inverter on incombustible surface such as metal, and keep away from flammable substances. Otherwise it may cause fire.</li> <li>Do not loose the set screw of the equipment, especially the screws marked in RED.</li> </ul>
 Caution	<ul style="list-style-type: none"> <li>Do not drop the cable residual or screw in the inverter. Otherwise it may damage the inverter.</li> <li>Please install the driver in the place where there is no direct sunlight or less vibratory.</li> <li>When more than two inverters are to be installed in one cabinet, due attention should be paid to the installation locations (refer to Chapter 3 Mechanical and Electrical Installation) to ensure the heat sinking effect.</li> </ul>



**1.1.3 During Wiring:**

 <b>Danger</b>	<ul style="list-style-type: none"> <li>● Operation should be performed by the professional engineering technician. Otherwise there will be danger of electric shock!</li> <li>● There should be circuit breaker between the inverter and power supply. Otherwise, there may cause fire!</li> <li>● Make sure the power is disconnected prior to the connection. Otherwise there will be danger of electric shock!</li> <li>● The ground terminal should be earthed reliably. Otherwise there may be danger of electric shock.</li> </ul>
 <b>Caution</b>	<ul style="list-style-type: none"> <li>● Never connect AC power to output U, V, W terminals. Please note the remark of the wiring terminals, connect them correctly. Otherwise it will cause inverter be damaged.</li> </ul> <div data-bbox="295 533 916 772" data-label="Diagram"> <p>The diagram illustrates the correct wiring for the VFD. It shows a power supply (1AC/3AC) connected to the input terminals R, S, and T. The output terminals U, V, and W are shown as open. A red circle with a slash and the word 'Forbidden' indicates that connecting the power supply to the output terminals is incorrect. A green checkmark indicates that connecting the power supply to the input terminals is correct.</p> </div> <ul style="list-style-type: none"> <li>● Ensure the wiring circuit can meet the requirement of EMC and the area safety standard. Please follow the instructions in the manual before wiring. Otherwise may cause injury or electric shock.</li> <li>● Never connect the braking resistor between DC Bus (+), (-) terminals. Otherwise may cause fire.</li> <li>● Encoder must be used together with shielded wire, and ensure the single terminal of the shielded lay is connected with ground well.</li> </ul>



**1.1.4 Before Power-on:**

 <b>Danger</b>	<ul style="list-style-type: none"> <li>● Please confirm whether the power voltage class is consistent with the rated voltage of the inverter and whether the I/O cable connecting positions are correct, and check whether the external circuit is short circuited and whether the connecting line is firm. Otherwise it may damage the inverter. The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused.</li> <li>● The inverter is free from dielectric test because this test is performed prior to the delivery. Otherwise accident may occur.</li> </ul>
 <b>Caution</b>	<ul style="list-style-type: none"> <li>● The cover must be well closed prior to the inverter power-on. Otherwise electric shock may be caused!</li> <li>● Whether all the external fittings are connected correctly in accordance with the circuit provided in this manual. Otherwise accident may occur!</li> </ul>


**1.1.5 After Power-on:**

 Danger	<ul style="list-style-type: none"> <li>Do not open the cover of the inverter upon power-on. Otherwise there will be danger of electric shock!</li> <li>Do not touch the inverter and its surrounding circuit with wet hand. Otherwise there will be danger of electric shock!</li> <li>Do not touch the inverter terminals (including control terminal). Otherwise there will be danger of electric shock!</li> <li>At power-on, the inverter will perform the security check of the external heavy-current circuit automatically. Thus, at the moment please do not touch the terminals U, V and W, or the terminals of motor, otherwise there will be danger of electric shock.</li> </ul>
 Caution	<ul style="list-style-type: none"> <li>If parameter identification is required, due attention should be paid to the danger of injury arising from the rotating motor. Otherwise accident may occur!</li> <li>Do not change the factory settings at will. Otherwise it may damage the equipment!</li> </ul>

**1.1.6 During Operation:**

 Danger	<ul style="list-style-type: none"> <li>Do not touch the fan or discharge resistor to sense the temperature. Otherwise, you may get burnt!</li> <li>Detection of signals during the operation should only be conducted by qualified technician. Otherwise, personal injury or equipment damage may be caused!</li> </ul>
 Caution	<ul style="list-style-type: none"> <li>During the operation of the inverter, keep items from falling into the equipment. Otherwise, it may damage the equipment!</li> <li>Do not start and shut down the inverter by connecting and disconnecting the contactor. Otherwise, it may damage the equipment!</li> </ul>

**1.1.7 During Maintain:**

 Danger	<ul style="list-style-type: none"> <li>Do not repair and maintain the equipment with power connection. Otherwise there will be danger of electric shock!</li> <li>Be sure to conduct repair and maintenance after the charge LED indicator of the inverter is OFF. Otherwise, the residual charge on the capacitor may cause personal injury!</li> <li>The inverter should be repaired and maintained only by the qualified person who has received professional training. Otherwise, it may cause personal injury or equipment damage!</li> <li>Carry out parameter setting after replacing the inverter, all the plug-ins must be plug and play when power outage.</li> </ul>
---	---

## **1.2 Precautions**

### **1.2.1 Motor Insulation Inspection**

When the motor is used for the first time, or when the motor is reused after being kept, or when periodical inspection is performed, it should conduct motor insulation inspection so as to avoid damaging the inverter because of the insulation failure of the motor windings. The motor wires must be disconnected from the inverter during the insulation inspection. It is recommended to use the 500V megameter, and the insulating resistance measured should be at least 5MΩ.

### **1.2.2 Thermal Protection of the Motor**

If the ratings of the motor does not match those of the inverter, especially when the rated power of the inverter is higher than the rated power of the motor, the relevant motor protection parameters in the in the inverter should be adjusted, or thermal relay should be mounted to protect the motor.

### **1.2.3 Running with Frequency higher than Standard Frequency**

This inverter can provide output frequency of 0Hz to 600Hz. If the user needs to run the inverter with frequency of more than 50Hz, please take the resistant pressure of the mechanical devices into consideration.

### **1.2.4 Vibration of Mechanical Device**

The inverter may encounter the mechanical resonance point at certain output frequencies, which can be avoided by setting the skip frequency parameters in the inverter.

### **1.2.5 Motor Heat and Noise**

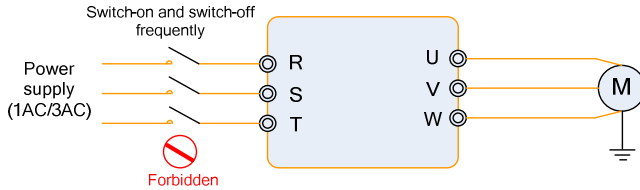
Since the output voltage of inverter is PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will be higher than those at power frequency.

### **1.2.6 Voltage-sensitive Device or Capacitor Improving Power Factor at the Output Side**

Since the inverter output is PWM wave, if the capacitor for improving the power factor or voltage-sensitive resistor for lightning protection is mounted at the output side, it is easy to cause instantaneous over current in the inverter, which may damage the inverter. It is recommended that such devices not be used.

### **1.2.7 Switching Devices like Contactors Used at the Input and Output terminal**

If a contactor is installed between the power supply and the input terminal of the inverter, it is not allowed to use the contactor to control the startup/stop of the inverter. If such contactor is unavoidable, it should be used with interval of at least one hour. Frequent charge and discharge will reduce the service life of the capacitor inside the inverter. If switching devices like contactor are installed between the output end of the inverter and the motor, it should ensure that the on/off operation is conducted when the inverter has no output. Otherwise the modules in the inverter may be damaged.



### 1.2.8 Use under voltage rather than rated voltage

If the inverter is used outside the allowable working voltage range as specified in this manual, it is easy to damage the devices in the inverter. When necessary, use the corresponding step-up or step-down instruments to change the voltage.

### 1.2.9 Change Three-phase Input to Two-phase Input

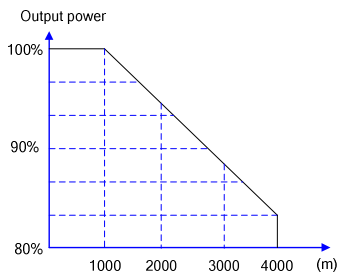
It is not allowed to change the three-phase inverter into two-phase one. Otherwise, it may cause fault or damage to the inverter.

### 1.2.10 Lightning Impulse Protection

The series inverter has lightning over current protection device, and has certain self-protection capacity against the lightning. In applications where lightning occurs frequently, the user should install additional protection devices at the front-end of the inverter.

### 1.2.11 Altitude and Derating

In areas with altitude of more than 1,000 meters, the heat sinking effect of the inverter may turn poorer due to rare air. Therefore, it needs to derate the inverter for using. Please make selection as the below derating diagram.



### 1.2.12 Certain Special Use

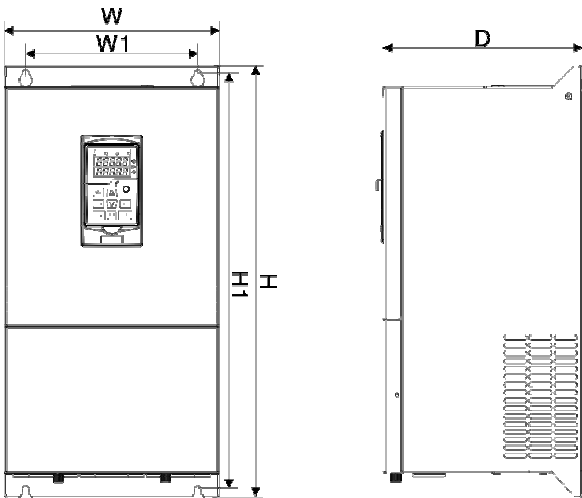
If the user needs to use the inverter with the methods other than the recommended wiring diagram in this manual, such as shared DC Bus, please consult our company.

### 1.2.13 Note of Inverter Disposal

The electrolytic capacitors on the main circuit and the PCB may explode when they are burnt. Emission of toxic gas may be generated when the plastic parts are burnt. Please dispose the inverter as industrial wastes.

## Chapter 2 Product Information

### 2.1 Dimensions and selection guide



Rated power (kW)	Rated current (A)	H (mm)	W (mm)	D (mm)	H1 (mm)	W1 (mm)	Installation hole size (mm)
7.5	17	247	130	162	236.5	115	5
11	25	272	160	201	259	146	5.2
15	32						
18.5	37	313	211	205	299	196	6.5
22	45						
30	60	418	252	206.9	399	201	9
37	75						
45	90	603	299	276.7	581	240	9

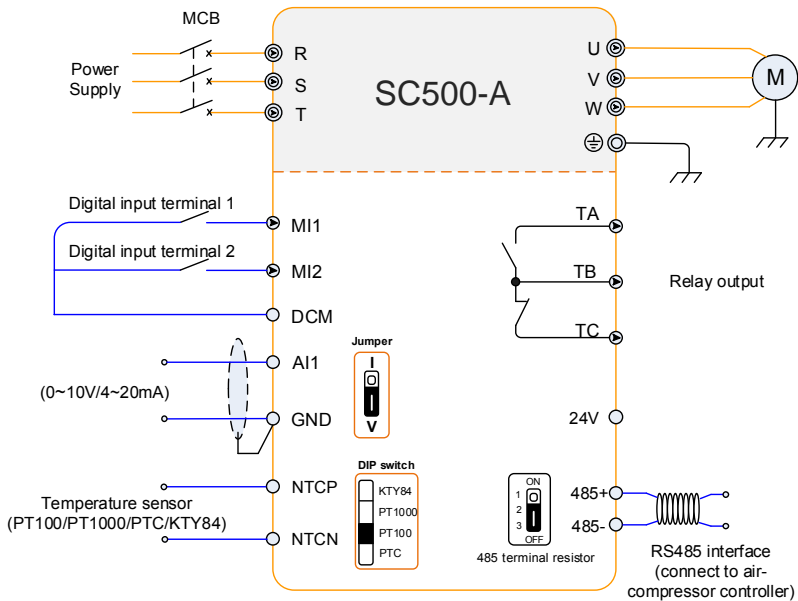
55	110							
75	152							
90	176		643	338	312	619	280	11
110	210							
132	253							
160	304							
185	340		1126	410	383.7	776	320	12
200	380							
220	426							
250	465		1472	650	430.2	1046.8	520	13
280	520							

## 2.2 Technical Specifications

Technical Index	Specification
Input voltage	3AC 220~240V±15%, 3AC 380~460V±15%
Input frequency	50/60Hz±5%
Output voltage	0~rated input voltage
Output frequency	0~600Hz
Control mode	V/f control Sensorless vector control Close-loop vector control
Overload capacity	150%/120s, 160%/60s, 180%/10s, 200%/1s.
Communication terminals	Standard RS485 communication interface, support MODBUS-RTU communication protocol
LED display	Display frequency setting, output frequency, output voltage, output current, etc. Two lines display

Multifunction key	REV/JOG key, can be used as multifunction key
Ambient temperature	-10°C~50°C, without direct sunshine.
Humidity	90%RH or less (non-condensing)
Altitude	≤1000M: output rated power, >1000M: output derated
Storage temperature	-20°C~60°C

## 2.3 Wiring diagram




### Note:

Terminal © refers to the main circuit terminal, terminal O refers to the control circuit terminal.

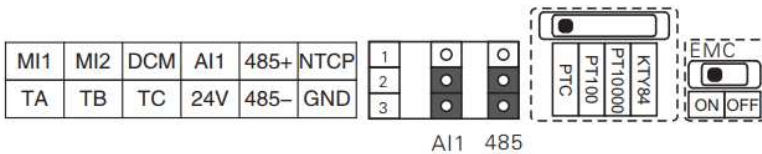


### 2.3.1 Instructions of main circuit terminals

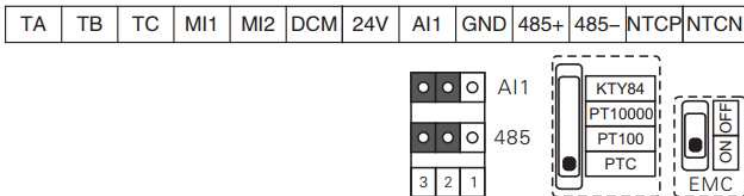
Terminal	Description
R, S, T	Connect to three-phase AC power
U, V, W	Connect to three phase motor
	Ground connection terminal

### 2.3.2 Control terminals and connections

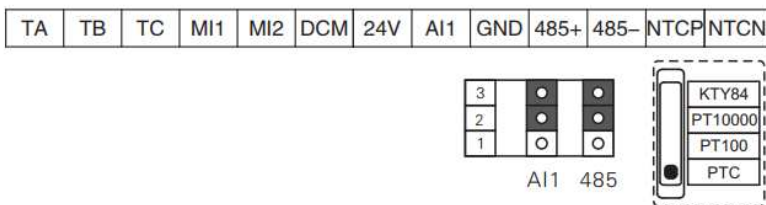
(1)  $\leq 7.5\text{kW}$ :



(2) 11~15kW:

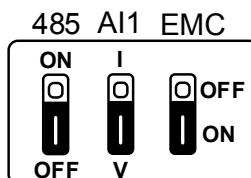


(3)  $\geq 18.5\text{kW}$



### 2.3.3 Description of jumpers on control board

(1) Jumper default position



## (2) Detailed description

Jumper	connection	Description
<b>AI1</b>	Short connect 1 & 2	Input 4~20mA
	Short connect 2 & 3	Input 0~10V (Default)
<b>485</b>	Short connect 1 & 2	Connect RS485 terminal resistor
	Short connect 2 & 3	Disconnect RS485 terminal resistor (Default)
<b>EMC</b>	ON	Better Anti-interference performance
	OFF	-----

## 2.3.4 Description of Control Terminals Function

Type	Terminal Symbol	Terminal Name	Function Description
Power Supply	24V	+24V power supply	1. Provide +24V power supply for external units. 2. It is generally used as the operating power supply for digital input/output terminals and the external sensor. The maximum output current is 150mA.
Analog Input	AI1~GND	Analog input terminal 1	1. Input range: DC 0~10V/4~20mA, determined by jumper AI1 on the control board. 2. Current input impedance: 500Ω. 3. Voltage input impedance: 22kΩ.
Digital Input	MI1	Digital input 1	1. Optical coupling isolation, compatible with both PNP and NPN input 2. Input impedance: 2.4kΩ
	MI2	Digital input 2	3. Voltage range for level input: 9V~30V
Relay Output	TB-TC	Normally close output	Driving capacity: AC 250V/3A, DC 30V/1A
	TB-TA	Normally open output	
RS485	485+	Modbus terminals	Communication interface of Modbus, it is suggested to use twisted-pair cable or shielded cable.
	485-		
Sensor	NTCN	Motor temperature sensor	Input terminal of motor temperature sensor, J4 is used to switch the different sensor type.
	NTCP		

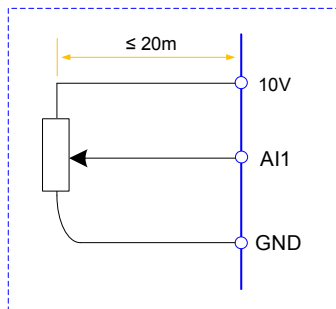
### 2.3.5 Principle of wiring connection

#### (1) Power cables

- ◆ Please select the cables size (diameter) properly based on the power rating, current and electrician standard.
- ◆ It is suggested to install a MCB (Main Circuit Breaker) between power supply and R, S, T terminals, and the MCB should not be interfered by high frequency signals.
- ◆ The power cables must keep safe distance with control cables, don't put them in one wire casing.
- ◆ Never connect the power supply to U, V, W terminals.
- ◆ The output power cables cannot touch any point of frequency inverter's metal case, otherwise it will cause grounding short-circuited.
- ◆ The power cables must keep safe distance with other devices.
- ◆ If the cables' length between motor and frequency inverter is longer than 50 meters (220V inverter) or 100 meters (380V inverter), it must install an additional output reactor in the system.
- ◆ If the cables' length between motor and frequency inverter is long, please reduce the carrier frequency, if the carrier frequency is bigger, the leakage current of higher harmonic on the cable will be bigger, which will bring bad effect to frequency inverter and other devices.

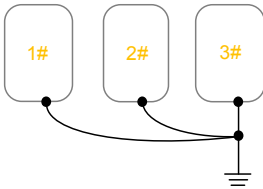
#### (2) Control cables

- ◆ Don't put the power cables and control cables in one wire casing, otherwise it will cause interferences.
- ◆ Please use shield cables for control circuit, and it is suggested to use  $1\text{mm}^2$  shield cables.
- ◆ Don't make the analog signal cables' length longer than 20 meters.

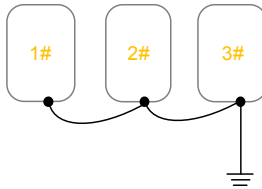


### (3) Ground connection

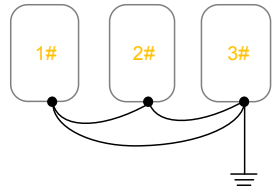
- ◆ The grounding resistor should be less than 100.
- ◆ The grounding cables length is the shorter the better.
- ◆ Please don't make frequency inverters' grounding point separated with other big power equipment (like electric welder and other large-scale mechanical devices)
- ◆ Please make correct grounding as below diagram



A: Correct



B: Wrong



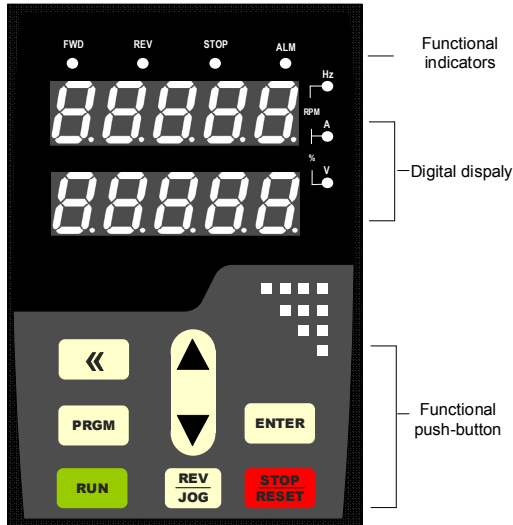
C: Wrong



## Chapter 3 Operation and Display

### 3.1 Keypad Description

With the operation keypad, it can perform such operations on the inverter as function parameter modification, working status monitor and running control (start and stop).



#### 1) Function keys description

Functional indicator	Description
<b>FWD</b>	Indication of inverter forward running
<b>REW</b>	Indication of inverter reverse running
<b>STOP</b>	Inverter is stopping
<b>ALM</b>	Inverter with fault



#### 2) Digital display zone

Five-number digit LED display, can display setting frequency, output frequency, various monitoring data and alarm code.

The first line LED display of two lines keypad is operated and displayed the same like single line LED keypad. The second line LED displays the parameters of F7-08, the default value is 04, displays the output

current. If customers need to display other parameters, just change F7-08.

### 3) Keypad push-button description

Button	Name	Function
<b>PRGM</b>	Programming key	Entry and exit of primary menu
<b>ENTER</b>	Confirmation key	Progressively enter menu, and confirm parameters
	Increment key	Progressively increase of data or function codes
	Decrement key	Progressively decrease of data or function codes
<b>«</b>	Shift key	Select the displayed parameters in turn on the stop display interface and running display interface, and select the modification bit of parameters when modifying parameters.
<b>RUN</b>	Run key	Start to run inverter under keyboard control mode
<b>STOP RESET</b>	Stop / Reset	Stop inverter in running status and reset operation in fault alarm status. The reactions are controlled by F7-02.
<b>REV JOG</b>	Multi-function selection key	The corresponding functions are defined by F7-01.

## 3.2 Function Code Checking and Modification Methods Description

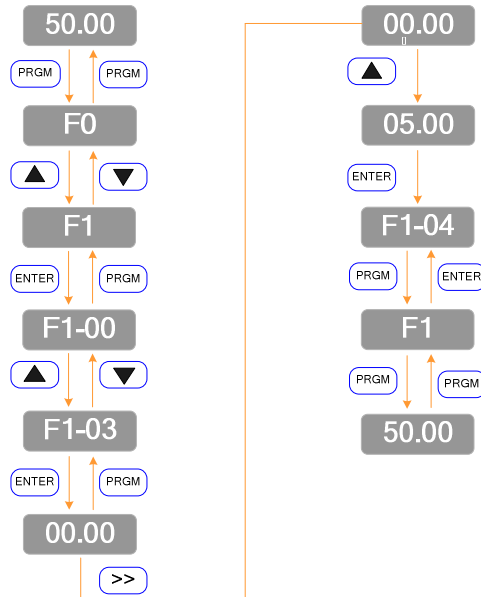
The operation keypad of the Inverter adopts three-level menu structure to carry out operations such as parameter setting.

- 1) Function parameter group (level 1 menu)
- 2) Function code (level 2 menu)
- 3) Function code setting value (level 3 menu)

Description: When operating on level 3 menu, press **PRGM** key or **ENTER** key to return to level 2 menu. The difference between **PRGM** key and **ENTER** key is described as follows:

- 1) Pressing **ENTER** key will save the setup parameter and return to the level 2 menu and then automatically shift to the next function code.
- 2) Pressing **PRGM** key will directly return to level 2 menu without saving the parameter, and it will return to the current function code.

**Example:** Modify the function code F1-03 from 00.00Hz to 05.00Hz.



In level 3 menu, if there is no flashing bit, it means this function code cannot be modified. The possible reasons are:

- 1) The function code is an unchangeable parameter, such as actual detection parameter, running record parameter, etc.
- 2) The function code cannot be modified in running status. It can be modified only when the inverter is stopped.

### 3.3 Power-on Initialization

Firstly the system initializes during the inverter power-on, and LED displays “8.8.8.8.8.8”. After initialization, the inverter is in fault protection status if a fault happens, or the inverter is in stand-by status

### 3.4 Fault Protection

In fault status, inverter will display fault code & record output current, output voltage, etc. For details, please refer to FA (fault and protection) parameter group. Fault can be reset via STOP/RESET key or external terminals.

### 3.5 Running

In running status, there are thirty two parameters can be chosen to display or not through function code F7-04~F7-08 (running status display parameter) according to binary bits.

The displaying of the chosen parameters can be switched in sequence by pressing >> button.

### 3.6 Password Setting

The inverter provides user password protection function. When F7-00 is set to non-zero value, it indicates the user password, and the password protection turns valid after exiting the function code editing status. When pressing **PRGM** key again, "-----" will be displayed, and common menu cannot be entered until user password is input correctly.

To cancel the password protection function, enter with password and set F7-00 to "0".

### 3.7 Motor Parameters Auto-tuning

To select the vector control running mode, it must input the nameplate parameter of the motor accurately prior to the running of the inverter. The Inverter will select standard motor parameters matching the nameplate parameter. Since the vector control mode relies highly on the motor parameters, it must acquire the accurate parameters of the controlled motor to ensure the good control performance.

The procedures for the automatic tuning of motor parameters are described below:

First, select the command source (F0-02) as the command channel of the operation keypad. Second, input the following parameters in accordance with the actual motor parameters:

F2-01: Rated motor power

F2-02: Rated motor voltage

F2-03: Rated motor current

F2-04: Rated motor frequency

F2-05: Rated rotation speed of motor

If the motor is completely disconnected from the load, set F2.33 to "1" (PM motor static auto-tuning), and press **RUN** key on the keypad, it will display "TUNE", the motor will be in static auto-tuning processing, after auto-tuning, the keypad will display "END". After auto-tuning the following parameters will be updated:

F2-19: PM motor d axis inductance

F2-20: PM motor q axis inductance

F2-21: PM motor counter electromotive force

F2-22: PM motor stator resistance



## Chapter 4 Function Parameter List

The detailed functional parameters are listed in below table.

The instruction of the symbols in function parameter list is as following:

“○” Means the parameter can be modified at stop and running status.

“◎” Means the parameter cannot be modified at the running status.

“●” Means the parameter is the real detection value which cannot be modified.

### 4.1 Basic Function Parameter Table

Function code	Name	Detailed instruction	Factory default	Modify
<b>F0 Group: Basic Function</b>				
F0-01	Control mode	0: Sensorless Vector Control (SVC) 1: Close-loop vector control	0	◎
F0-02	Running command source	0: Keypad 1: Terminal 2: Communication (Modbus)	0	○
F0-03	Main frequency source A selection	0: Keypad (F0-08, UP and DOWN Adjustable, non-recorded after power off) 1: Keypad potentiometer 2: AI1 3: AI2 4: AI3 5: HDI (High speed pulse) 6: Multi-step speed 7: Simple PLC 8: PID 9: Communication (percentage %) 10: Communication (direct frequency)	1	◎
F0-04	Auxiliary frequency source B selection	Same as F0-03	0	◎
F0-05	Reference of Frequency source B	0: Relative to maximum frequency 1: Relative to frequency source A	0	○
F0-06	Range of Auxiliary Frequency source B	0%~300%	100%	○
F0-07	Frequency source selection	Units place: frequency source selection 0: Main frequency source A 1: Auxiliary frequency source B	00	○

Function code	Name	Detailed instruction	Factory default	Modify
		2: Calculation result of frequency A and B (determined by tens place) 3: Switching between A and B 4: Switching between A and calculation result 5: Switching between B and calculation result Tens place: calculation relationship between frequency A and B 0: A + B 1: A - B 2: Max (A, B) 3: Min (A, B)		
F0-08	Keypad reference frequency	0.00Hz ~ maximum frequency (F0-10)	50.00Hz	○
F0-09	Running direction selection	0: Same direction 1: Reverse direction	0	○
F0-10	Maximum frequency	1.00Hz ~ 600.00Hz	50.00Hz	◎
F0-11	Frequency source of upper limit	0: F0-12 1: AI1 2: AI2 3: AI3 4: HDI (High speed pulse) 5: Communication (percentage %) 6: Communication (direct frequency)	0	◎
F0-12	Frequency upper limit	F0-14 (frequency lower limit) ~ F0-10 (max. frequency)	50.00Hz	○
F0-13	Frequency upper limit offset	0.00Hz ~ F0-10 (max. frequency)	0.00Hz	○
F0-14	Frequency lower limit	0.00Hz ~ F0-12 (frequency upper limit)	0.00Hz	○
F0-15	Carrier frequency	1.0kHz ~ 16.0kHz	Model depend	○
F0-16	Carrier frequency adjusting according to temperature	0: No 1: Yes	1	○
F0-17	Acceleration time 1	0.00s ~ 65000s	Model depend	○
F0-18	Deceleration time 1	0.00s ~ 65000s	Model depend	○
F0-19	ACC/DEC time unit	0: 0.01s 1: 0.1s 2: 1s	1	◎
F0-20	Acceleration reference frequency	0: max. frequency 1: setting frequency	0	◎

Function code	Name	Detailed instruction	Factory default	Modify
		2:100 Hz		
F0-21	Main frequency source gain	0.0%~300.0%	100.0%	○
F0-22	Main & auxiliary frequency source combine gain	0.0%~300.0%	100.0%	○
F0-23	Combined frequency regulated by analog signal	0: Main & auxiliary channel combined frequency; 1: A11 * Main & auxiliary channel combined frequency; 2~5: Reserved	0	◎
F0-24	Terminal UP/DOWN change rate	0.00Hz/s ~ 500.00Hz/s	5.0Hz/s	◎
F0-25	UP/DOWN changed frequency clear selection	0: Don't clear 1: Clear it at not running status 2: Clear it while UP/DOWN invalid	2	◎
F0-26	UP/DOWN changed frequency storage selection when stop	0: Not store 1: store	0	◎
F0-30	Parameters initialization	0: No action 1: Initialize factory parameters (Not includes motor parameters, running and power-on time record) 2: Initialize motor parameters (Only initialize parameters of F2-00~F2-33 and A1-00~A1~33)	0	◎
<b>F1 Group: Start and Stop control</b>				
F1-00	Start mode	0: Direct start 1: Speed tracking and restart	0	○
F1-01	Speed tracking mode	0: Begin from stop frequency 1: Begin from input power frequency 2: Begin from maximum frequency	0	◎
F1-02	Speed tracking deceleration time	0.1s ~ 20.0s	2.0s	◎
F1-03	Speed tracking current	30.0% ~ 150.0%	60.0%	◎
F1-04	Speed tracking compensation gain	1.00 ~ 1.30	1.05	◎
F1-05	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	◎
F1-06	Start frequency holding time	0.0s ~ 60.0s	0.0s	◎

Function code	Name	Detailed instruction	Factory default	Modify
F1-07	Pre-excitation current	50.0% ~ 500.0%	100.0%	☉
F1-08	Pre-excitation time	0.0s ~ 100.0s	0.10s	☉
F1-09	DC braking current before start	0.0% ~ 100.0%	100.0%	☉
F1-10	DC braking time before start	0.00s ~ 30.00s	0.00s	☉
F1-11	DC braking demagnetization time before start	0.00s ~ 30.00s	0.50s	☉
F1-12	ACC/DEC mode	0: Linear ACC/DEC 1: S-curve ACC/DEC	0	☉
F1-13	S curve's start part during acceleration	0.00s ~ ACC time /2s	1.00s	○
F1-14	curve's end part during acceleration	0.00s ~ ACC time /2s	1.00s	○
F1-15	S curve's start part during deceleration	0.00s ~ DEC time /2s	1.00s	○
F1-16	curve's end part during deceleration	0.00s ~ DEC time /2s	1.00s	○
F1-17	Stop mode	0: Deceleration to stop 1: Coast to stop 2: Reserved	0	☉
F1-18	DC braking start frequency while stopping	0.00Hz ~ F0-10 (maximum frequency)	0.00Hz	☉
F1-19	DC braking delay time while stopping	0.00s ~ 30.00s	0.50s	☉
F1-20	DC braking current while stopping	0% ~ 150%	100.0%	☉
F1-21	DC braking time while stopping	0.00s ~ 30.00s	0.00s	☉
F1-22	Braking usage ratio	20% ~ 100% (100% means duty cycle is 1)	100%	○
F1-23	Flux brake gain	100 ~ 150	100	☉
F1-24	Dynamic braking function selection	0: Valid 1: Invalid	0	☉
F1-25	Dynamic braking voltage	100.0% ~ 150.0%	100%	○
F1-26	Restart mode selection after fault / coast to stop	0: Restart by the setting of F1-00 1: Speed tracking and restart	0	☉

Function code	Name	Detailed instruction	Factory default	Modify
F1-27	0 speed correspond frequency	0.00 ~ 5.00Hz	0.25Hz	○
<b>F2 Group: Motor Parameters</b>				
F2-00	Motor type	0: Common asynchronous motor 1: Variable frequency asynchronous motor 2: Synchronous motor (PM motor)	0	◎
F2-01	Motor rated power	0.1kW ~ 650.00kW	Model depend	◎
F2-02	Motor rated voltage	50V ~ 2000V	Model depend	◎
F2-03	Motor rated current	0.01A ~ 600.00A (Inverter power ≤ 75kW) 0.1A ~ 6000.0A (Inverter power > 75kW)	Model depend	◎
F2-04	Motor rated frequency	0.01Hz ~ F0-10 (max. frequency)	Model depend	◎
F2-05	Motor rated speed	1 ~ 60000RPM	Model depend	◎
F2-06	Motor wires connection mode	0: Y 1: Δ	Model depend	◎
F2-07	Motor rated power factor	0.600 ~ 1.000	Model depend	◎
F2-08	Motor efficiency	30.0% ~ 100.0%	Model depend	◎
F2-09	Asynchronous motor stator resistance	1mΩ ~ 60000mΩ (Inverter power ≤ 75kW) 1mΩ ~ 6000.0mΩ (Inverter power > 75kW)	Motor parameter	◎
F2-10	Asynchronous motor rotor resistance	1mΩ ~ 60000mΩ (Inverter power ≤ 75kW) 1mΩ ~ 6000.0mΩ (Inverter power > 75kW)	Motor parameter	◎
F2-11	Asynchronous motor leakage inductance	0.01mΩ ~ 600.00mΩ (Inverter power ≤ 75kW) 0.001mΩ ~ 60.000mΩ (Inverter power > 75kW)	Motor parameter	◎
F2-12	Asynchronous motor mutual inductance	1mΩ ~ 6000.0mΩ (Inverter power ≤ 75kW) 0.01mΩ ~ 600.00mΩ (Inverter power > 75kW)	Motor parameter	◎
F2-13	Asynchronous motor no-load current	0.01A ~ 600.00A (Inverter power ≤ 75kW)	Motor parameter	◎

Function code	Name	Detailed instruction	Factory default	Modify
		0.01A ~ 600.00A (Inverter power > 75kW)		
F2-14	Asynchronous motor magnetic saturation coefficient 1	10.00% ~ 100.00%	87.00%	⊙
F2-15	Asynchronous motor magnetic saturation coefficient 2	10.00% ~ 100.00%	80.00%	⊙
F2-16	Asynchronous motor magnetic saturation coefficient 3	10.00% ~ 100.00%	75.00%	⊙
F2-17	Asynchronous motor magnetic saturation coefficient 4	10.00% ~ 100.00%	72.00%	⊙
F2-18	Asynchronous motor magnetic saturation coefficient 5	10.00% ~ 100.00%	70.00%	⊙
F2-19	PM motor d axis inductance	0.01mH ~ 600.00mH	Motor parameter	⊙
F2-20	PM motor q axis inductance	0.01mH ~ 600.00mH	Motor parameter	⊙
F2-21	PM motor counter electromotive force	10.0 ~ 2000.0V	Motor parameter	⊙
F2-22	PM motor stator resistance	1mΩ ~ 60000mΩ	Motor parameter	⊙
F2-23	Encoder resolution	1 ~ 65535	1024	⊙
F2-24	Encoder type	0: ABZ incremental encoder 1: UVW incremental encoder 2: Reserved 3: Reserved 4: Rotary encoder	0	⊙
F2-25	Encoder installation angle	0.0~359.9°	0.0	⊙
F2-26	ABZ incremental encoder AB phase sequence	0: Forward direction 1: Reverse direction	0	⊙
F2-27	UVW encoder UVW phase sequence	0: Forward direction 1: Reverse direction	0	⊙
F2-28	UVW encoder offset angle	0.0~359.9°	0.0	⊙
F2-29	Pole-pairs number of rotary encoder	1~65535	1	⊙

Function code	Name	Detailed instruction	Factory default	Modify
F2-30	PM motor initial electrical degree	0.0~359.0°	0.0	☉
F2-31	Encoder wires disconnection detection time	0.0~10.0	0.0	☉
F2-32	Encoder feedback filter time	0.000s~0.100s	0.002s	☉
F2-33	Auto-tuning	0: No action 1: PM motor static auto-tuning 2: PM motor rotary auto-tuning 3: PM motor encoder auto-tuning	0	☉
<b>F3 Group: Vector Control Parameters</b>				
F3-00	Speed loop proportional gain 1	0.00 ~ 100.00	12.00	○
F3-01	Speed loop integration time 1	0.000s ~ 30.000s	0.200s	○
F3-02	Switching frequency 1	0.00 ~ F3-05	5.00Hz	○
F3-03	Speed loop proportional gain 2	0.00 ~ 100.00	8.00	○
F3-04	Speed loop integration time 2	0.000s ~ 30.000s	0.300s	○
F3-05	Switching frequency 2	F3-02 ~ F0-10 (max. frequency)	10.00Hz	○
F3-06	Vector control slip compensation coefficient	50% ~ 200%	100%	○
F3-07	Speed loop filter time	0.000s ~ 0.100s	0.001s	○
F3-08	Torque upper limit source selection in speed control mode	0: F3-09 1: AI1 2~4: Reserved	0	☉
F3-09	Torque upper limit digital setting during running	0.0% ~ 250.0%	165.0%	○
F3-10	Torque upper limit digital setting during braking	0.0% ~ 250.0%	165.0%	○
F3-11	Excitation regulation proportion	0.00 ~ 100.00	0.50	○
F3-12	Excitation regulation integration	0.00ms ~ 600.00ms	10.00ms	○

Function code	Name	Detailed instruction	Factory default	Modify
F3-13	Torque regulation proportion	0.00 ~ 100.00	0.50	○
F3-14	Torque regulation integration	0.00ms ~ 600.00ms	10.00ms	○
F3-15	0 speed reaction under SVC control mode	0: Brake 1: No reaction 2: Block the inverter output	2	◎
F3-16	0 speed brake current	50.0% ~ 400.0% (100% is the motor no-load current)	100%	○
F3-17	Voltage front-feed gain	0% ~ 100%	0%	○
F3-18	Weak magnetic control	0: Invalid 1: Direct calculation 2: Auto regulation	2	◎
F3-19	Weak magnetic voltage	70.00% ~ 100.00%	95.00%	○
F3-20	PM motor max. weak magnetic current	0.0% ~ 150.0% (100% is the motor rated current)	100%	○
F3-21	Weak magnetic regulator proportion gain	0.00 ~10.00	0.50	○
F3-22	Weak magnetic regulator integration time	0.01s ~ 60.00s	2.00s	○
F3-23	PM motor MTPA (Maximum Ratio of Torque to Current) control selection	0: Invalid 1: Valid	0	◎
F3-24	Initial position auto-tuning gain	0% ~ 150%	100%	○
F4-17	PM motor flux compensation coefficient	0.00% ~ 500.00%	100.00%	○
F4-18	PM motor flux compensation filter time	0.00s ~ 10.00s	0.50s	○
F5 Group: Input Terminals				
F5-00	MI1 terminal function	0: No function 1: Run command 2: Run direction (Forward/Reverse) 3: Three-line stop control 4: Forward Jog (FJOG) 5: Reverse Jog (RJOG)	1	◎
F5-01	MI2 terminal function		2	◎
			0	◎
			0	◎
			0	◎



Function code	Name	Detailed instruction	Factory default	Modify
		6: Terminal UP	0	⊙
		7: Terminal DOWN		
		8: UP and DOWN setting clear (terminal and keypad)		
		9: Coast to stop		
		10: Fault reset (RESET)		
		11: Multi-step speed terminal 1		
		12: Multi-step speed terminal 2		
		13: Multi-step speed terminal 3		
		14: Multi-step speed terminal 4		
		15: Multi-step PID terminal 1		
		16: Multi-step PID terminal 2		
		17: Multi-step torque terminal 1		
		18: Multi-step torque terminal 2		
		19: ACC/DEC selection terminal 1		
		20: ACC/DEC selection terminal 2		
		21: ACC/DEC invalid		
		22: PID pause		
		23: External fault input		
		24: Running command switching to keypad		
		25: Running command switching to communication		
		26: Frequency source switching		
		27: Reset the time of timing control		
		28: Speed control / torque control switching		
		29: Torque control invalid		
		30: Motor 1 / Motor 2 switch		
		31: PLC status reset (start from 1 <sup>st</sup> step speed)		
		32: PLC running time reset (keep at present step)		
		33: 0 speed command		
		34: Counter input ( $\leq 250\text{Hz}$ )		
		35: High speed counting input ( $\leq 100\text{kHz}$ , valid for HDI)		
		36: Counter reset		
		37: Length counting input ( $\leq 250\text{Hz}$ )		
		38: High speed length counting input ( $\leq 100\text{kHz}$ , valid for HDI)		
		39: Length reset		
		40: Pulse input ( $\leq 100\text{kHz}$ , valid for HDI)		

Function code	Name	Detailed instruction	Factory default	Modify
		41: PID pause 42: PID integration pause 43: PID parameters switching 44: PID action direction reverse 45: Stop and DC braking 46: DC brake while stopping 47: DC brake immediately 48: Fastest deceleration to stop 49: Wobble frequency pause 50: External stop 51: Main frequency source switching to keypad setting 52: Main frequency source switching to AI1 53: Main frequency source switching to AI2 54: Main frequency source switching to AI3 55: Main frequency source switching to HDI 56: Main frequency source switching to communication 47: Servo drive enable 58~68: Reserved 69: Reverse forbidden		
F5-02 ~ F5-17	Reserved			
F5-18	Terminal command mode	0: Two-line mode 1 1: Two-line mode 2 2: Three-line mode 1 3: Three-line mode 2	0	☉
F5-19	AI curve 1 minimum input	0.00V ~ F5-21	0.10V	○
F5-20	AI curve 1 minimum input corresponding setting	-100.0% ~ +100.0%	0.0%	○
F5-21	AI curve 1 maximum input	F5-19 ~ 10.00V	9.90V	○
F5-22	AI curve 1 maximum input corresponding setting	-100.0% ~ +100.0%	100.0%	○
F5-23 ~ F5-42	Reserved			
F5-43	AI1 input filter time	0.00s ~ 10.00s	0.10s	○
F5-51	AI curve selection	Unit bit: AI1 select Tens bit: AI2 select	321D	☉

Function code	Name	Detailed instruction	Factory default	Modify
		Hundred bit: AI3 select Ten hundred bit: Reserved 0: AI curve 1 1: AI curve 2 2: AI curve 3 3: AI curve 4		
F5-52	MI1 valid delay time	0.0s ~ 30.0s	0.000s	○
F5-53	MI1 invalid delay time	0.0s ~ 30.0s	0.000s	○
F5-54 ~ F5-76	Reserved			
<b>F6 Group: Output Terminal</b>				
F6-03	Relay output selection (TA, TB, TC)	0: No output 1: Inverter is running 2: Fault output (fault stop) 3: FDT1 output 4: Frequency arrival 5: Zero-speed running (no output when stop) 6: Motor overload pre-alarm 7: Inverter overload pre-alarm 8: Setting count value arrival 9: Designated count value arrival 10: Length arrival 11: Simple PLC circulate running completed 12: Accumulated running time arrival 13: Frequency limiting 14: Torque limiting 15: Ready for running 16: AI1>AI2 17: Frequency upper limit arrival 18: Frequency lower limit arrival 19: Under voltage status output 20: Communication setting 21: Position fixed (reserved) 22: Position approach (reserved) 23: Zero-speed running 2 (output when stop) 24: Accumulated power-on time arrival 25: FDT2 output 26: Frequency 1 arrival output 27: Frequency 2 arrival output 28: Current 1 arrival output 29: Current 2 arrival output	0	○
			2	○
			0	
			0	○
			0	○

Function code	Name	Detailed instruction	Factory default	Modify								
		30: Timing arrival output 31: AI1 input over limit 32: Off load 33: Reverse running 34: Zero-current status 35: Module temperature arrival 36: Output current over limit 37: Lower limit frequency arrival (output when stop) 38: Warning output (keep running) 39: Motor over temperature pre-alarm 40: This running time arrival										
F6-27	Relay valid output delay time	0.000s ~ 30.000s	0.000s	○								
F6-28	Relay invalid output delay time	0.000s ~ 30.000s	0.000s	○								
F6-29 ~ F6-48	Reserved											
F7 Group: Keypad and Display												
F7-00	User password	0 ~ 65535	0	○								
F7-01	REV/JOG key function selection	0: No function 1: Reverse run 2: Forward jog 3: Reverse jog 4: FDW/REV switching 5: Deceleration to stop 6: Coast to stop 7: The change bit moves left 8: Switching between keypad command and remote command (terminal command or communication command)	1	◎								
F7-02	STOP/RESET operation selection	0: Valid when keypad control 1: Always valid	1	○								
F7-03	Reserved											
F7-04	The upper LED display parameters 1	<table border="1"><tr><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr></table> Bit0: Running frequency 1 (Hz) Bit1: Setting frequency (Hz) Bit2: DC Bus voltage (V) Bit3: Output voltage (V) Bit4: Output current (A)	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	00011111	○
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0					

Function code	Name	Detailed instruction	Factory default	Modify								
		Bit5: Output power (kW) Bit6: Output torque (%) Bit7: MI input status										
F7-05	The upper LED display parameters 2	<table><tr><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr></table> Bit0: DO output status Bit1: AI1 voltage (V) Bit2: AI2 voltage (V) Bit3: AI3 voltage (V) Bit4: Count value Bit5: Length value Bit6: Load speed display Bit7: PID setting	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	00000000	○
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0					
F7-06	The upper LED display parameters 3	<table><tr><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr></table> Bit0: PID feedback Bit1: PLC step Bit2: HDI input pulse (kHz) Bit3: Reserved Bit4: Remain running time Bit5: PG card detected frequency Bit6: Estimated feedback frequency Bit7: Torque setting	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	00000000	○
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0					
F7-07	The upper LED display parameters 4	<table><tr><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr></table> Bit0: Output current percentage Bit1: Simple PLC running cycles No. Bit2: Present step PLC running time Bit3: UP/DOWN changed frequency Bit4: Power consumption: MWh Bit5: Power consumption: kWh Bit6: Output power factor Bit7: Reserved	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	00000000	○
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0					
F7-08	The upper LED display parameters 5	<table><tr><td>Bit7</td><td>Bit6</td><td>Bit5</td><td>Bit4</td><td>Bit3</td><td>Bit2</td><td>Bit1</td><td>Bit0</td></tr></table> Bit0: Communication setting frequency Bit1: PM motor rotor's position Bit2: Rotary encoder position Bit3: Motor temperature Bit4: V/f separate setting voltage Bit5: V/f separate output voltage Bit6: 0 speed position deviation Bit7: PID output value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	00000000	○
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0					

Function code	Name	Detailed instruction	Factory default	Modify
F7-09	Reserved			
F7-10	Load speed display coefficient	0.01 ~ 600.00	30.00	○
F7-11	The lower LED display values	00: Running frequency (Hz) 01: Setting frequency (Hz) 02: DC Bus voltage (V) 03: Output voltage (V) 04: Output current (A) 05: Output power (kW) 06: Output torque (%) 07: MI input status 08: DO output status 09: AI1 voltage (V) 10: AI2 voltage (V) 11: AI3 voltage (V) 12: HDI input frequency (kHz) 13: Inverter temperature 14: Count value 15: Length value 16: Load speed display 17: PID setting 18: PID feedback 19: PLC step 20: Communication setting frequency 21: Main frequency A display (Hz) 22: Auxiliary frequency B display (Hz) 23: Current power-on time (Hour) 24: Current running time (Min) 25: Accumulated running time 26: Remain running time	04	○
F7-12	Inverter radiator temperature	0.0 ~ 100.0°C	-	●
F7-13	Accumulated running time (h)	0h ~ 65535h	-	●
F7-14	Accumulated Power-on time (h)	0h ~ 65535h	-	●
F7-15	Parameters upload & download	0: No action 1: Upload parameters to keypad 2: Download parameters to inverter	0	◎
F7-16	Function codes modification authority	0: Enable 1: Disable	0	○
F7-17	Clear the power consumption	0: Don't clear 1: Clear	0	○

Function code	Name	Detailed instruction	Factory default	Modify
F7-18	Inverter's rated power	0.40KW ~ 650.0KW	Model depend	●
F7-19	Inverter's rated voltage	60V ~ 690V	Model depend	●
F7-20	Inverter's rated power	0.01A ~ 1500.0A	Model depend	●
F7-21	Software version No.	-	-	●
F7-22 ~ F7-38	Reserved			
F7-39	UP/DOWN zero crossing selection	0: Disable 1: Enable	0	◎
<b>F8 Group: Enhanced Function</b>				
F8-00	Jog running frequency	0.00Hz ~ F0-10 (max. frequency)	5.00Hz	○
F8-01	Jog acceleration time	0.0s ~ 6500.0s	5.0s	○
F8-02	Jog deceleration time	0.0s ~ 6500.0s	5.0s	○
F8-03	Acceleration time 2	0.0s ~ 6500.0s	15.0s	○
F8-04	Deceleration time 2	0.0s ~ 6500.0s	15.0s	○
F8-05	Acceleration time 3	0.0s ~ 6500.0s	15.0s	○
F8-06	Deceleration time 3	0.0s ~ 6500.0s	15.0s	○
F8-07	Acceleration time 4	0.0s ~ 6500.0s	15.0s	○
F8-08	Deceleration time 4	0.0s ~ 6500.0s	15.0s	○
F8-09	Jump frequency 1	0.00Hz ~ 600.00Hz	0.00Hz	○
F8-10	Jump frequency amplitude 1	0.00Hz ~ 20.00Hz	0.00Hz	○
F8-11	Jump frequency 2	0.00Hz ~ 600.00Hz	0.00Hz	○
F8-12	Jump frequency amplitude 2	0.00Hz ~ 20.00Hz	0.00Hz	○
F8-13	Jump frequency 3	0.00Hz ~ 600.00Hz	0.00Hz	○
F8-14	Jump frequency amplitude 3	0.00Hz ~ 20.00Hz	0.00Hz	○

Function code	Name	Detailed instruction	Factory default	Modify
F8-15	FWD/REV dead time	0.0s ~ 3000.0s	0.0s	○
F8-16	Reverse run selection	0: Enable 1: Disable	0	◎
F8-17	Action when setting frequency lower than frequency lower limit	0: Running at frequency lower limit 1: Stop 2: Zero-speed running	0	◎
F8-18	Droop control	0.00Hz ~ 10.00Hz	0.00Hz	○
F8-19	Set accumulated power-on arrival time	0h ~ 65000h	0h	◎
F8-20	Set accumulated running arrival time	0h ~ 65000h	0h	◎
F8-21	Auto restart selection after power recovering	0: Auto restart 1: No action	0	◎
F8-22	Reserved			
F8-23	Frequency detection value (FDT1)	0.00Hz ~ F0-10 (maximum frequency)	30.00Hz	◎
F8-24	Frequency detection lagging value (FDT1)	-(Fmax-F8-23) ~ F8-23	2.00Hz	◎
F8-25	Frequency arrival detection amplitude	0.0Hz ~ 50.00Hz	0.00Hz	◎
F8-26	ACC/DEC time switching selection	0: Valid 1: Invalid	0	◎
F8-27	Acceleration time 1 and acceleration time 2 switching frequency point	0.00 ~ F0-10 (maximum frequency)	0.00Hz	○
F8-28	Deceleration time 1 and deceleration time 2 switching frequency point	0.00 ~ F0-10 (maximum frequency)	0.00Hz	○
F8-29	Terminal jog priority	0: Invalid 1: Valid	0	◎
F8-30	Frequency detection value (FDT2)	0.00Hz ~ F0-10 (maximum frequency)	20.00Hz	◎
F8-31	Frequency detection lagging value (FDT2)	-(Fmax-F8-30) ~ F8-30	2.00Hz	◎
F8-32	Timing running lock password	0~65535	0	◎
F8-33	Timing running duration	0.0Min ~ 6500.0Min	0.0Min	○



Function code	Name	Detailed instruction	Factory default	Modify
F8-34	Cooling fan running control	0: Run while switch on the power 1: Run while start the inverter 2: Smart run according to temperature	1	☉
F8-35~ F8-42	Reserved			
F8-53	Fast stop deceleration time	0.00~650.00s (F0-19=0) 0.0~6500.0s (F0-19=1) 0~65000s (F0-19=2)	0.0Min	○
<b>F9 Group: PID Function</b>				
F9-00	PID given source	0: F9-01 1: AI1 2~4: Reserved 5: Communication (Modbus) 6: Multi-step command	0	○
F9-01	PID given through keypad	0.0%~100%	50.0%	○
F9-02	PID feedback source	0: AI1 1~4: Reserved 5: Communication (Modbus) 6~8: Reserved	0	○
F9-03	PID action direction	0: Positive 1: Negative	0	○
F9-04	PID given feedback range	0~65535	1000	○
F9-05	Proportional gain Kp1	0.0 ~ 100.0	20.0	○
F9-06	Integration time Ti1	0.01s ~ 10.00s	2.00s	○
F9-07	Differential time Td1	0.000s ~ 10.000s	0.000s	○
F9-08	PID upper limit	F9-09 ~ 100%	100.0%	○
F9-09	PID lower limit	-100.0% ~ F9-08	0.0%	○
F9-10	PID deviation limit	0.0% ~ 100.0%	0.0%	○
F9-11	PID differential amplitude	0.00% ~ 100.00%	5.00%	○
F9-12	PID given filter time	0.000 ~ 30.000s	0.00s	○
F9-13	PID feedback filter time	0.000 ~ 30.000s	0.00s	○

Function code	Name	Detailed instruction	Factory default	Modify
F9-14	PID output filter time	0.000 ~ 30.000s	0.00s	○
F9-15	Proportional gain Kp2	0.0 ~ 100.0	0.40	○
F9-16	Integration time Ti2	0.000s ~ 30.000s	10.00s	○
F9-17	Differential time Td2	0.000s ~ 30.000s	0.000s	○
F9-18	PID parameter switching condition	0: No switching 1: Switching via MI <sub>n</sub> terminals 2: Automatic switching according to the deviation	0	○
F9-19	PID parameter switching deviation 1	0.0% ~F9-20	20.0%	○
F9-20	PID parameter switching deviation 2	F9-19 ~ 100.0%	80.0%	○
F9-21	PID initial value	0.0% ~ 100.0%	0.0%	○
F9-22	PID initial value holding time	0.00 ~ 650.00s	0.00s	○
F9-23	PID Integral separation Threshold	0.00% ~ 100.00%	100.00%	○
F9-24	PID feedback lost detection upper value	0.00% ~ 100.00%	100.00%	○
F9-25	PID feedback lost detection lower value	0.00% ~ 100.00%	0.00%	○
F9-26	PID feedback lost detection time	0.000s ~ 30.000s	0.0s	○
F9-27	PID dormancy control	0: Invalid 1: Dormancy at zero speed	0	○
F9-28	Dormancy setting value	0.00% ~ 100.00% (100.00% is the sensor measure range )	0.00%	○
F9-29	Dormancy delay time	0.0~6500.0s	0.0s	○
F9-30	Wake up setting time	0.00% ~ 100.00% (100.00% is the sensor measure range )	0.00%	○
F9-31	Wake up delay time	0.0~6500.0s	0.0s	○
F9-32	Multi-step PID given 1	0~F9-04	0.0	○
F9-33	Multi-step PID given 2	0~F9-04	0.0	○

Function code	Name	Detailed instruction	Factory default	Modify
F9-34	Multi-step PID given 3	0~F9-04	0.0	○
<b>FA Group: Fault and Protection</b>				
FA-00	Protection function enable	0: Enable 1: Disable	1	○
FA-01	Motor overload protection gain	0.20 ~ 10.00	1.00	○
FA-02	Motor overload pre-alarm coefficient	50% ~ 100%	80%	○
FA-03	Motor temperature sensor type	0: No sensor 1: PT100 2: PT1000 3: PTC 4: KTY84	0	○
FA-04	Motor over-heat protection threshold	0~200℃	130℃	○
FA-05	Motor over-heat pre-alarm threshold	0~200℃	100℃	○
FA-06	DC Bus voltage control selection	1: invalid 2: valid under stall under-voltage 3: valid under stall over-voltage 4: valid under both stall over-voltage and under-voltage	2	◎
FA-07	Stall over-voltage point / Braking threshold	110% ~ 150%	128.5%	○
FA-08	Stall under-voltage control voltage	60.0~power off judgments voltage (100.0=standard DC Bus voltage)	76	○
FA-09	Instantaneous power failure judgment voltage	FA-08~100.0%	86%	○
FA-10	Power failure judgment delay time	0.00~100.00s	5.00s	○
FA-11	AVR (Automatic Voltage Regulation) function	0: Invalid 1: Valid	1	◎
FA-12	Current limit function	0: Invalid 1: Limit method 1 2: Limit method 2	2	◎
FA-13	Current limit level	20.0~180.0%	150.0%	○
FA-14	Over current restrain function	0: Disable 1: Enable	0	◎
FA-15	Fault auto-reset times	0 ~ 20	0	◎

Function code	Name	Detailed instruction	Factory default	Modify
FA-16	Reserved			
FA-17	Fault auto-reset interval	0.01s ~ 30.00s	0.50s	○
FA-18	Fault auto-reset control	<div>Err07 Err03 Err02 Err06 Err05 Err04</div> 0: allow fault auto-reset 1: forbidden fault auto-reset	000000	◎
FA-19	Fault repeat recover time	0.01s ~ 30.00s	10.00s	○
FA-20	Action select 1 when fault happen	<div>Err21 Err16 Err15 Err14 Err13 Err12 Err08 Err07</div> 0: coast to stop 1: stop according to the set of F1-17	00000000	◎
FA-21	Action select 2 when fault happen	<div>Err28 Err27 Err25 Err23</div> 0: coast to stop 1: stop according to the set of F1-17	0000	◎
FA-22	Input phase failure protection selection	0: Disable 1: Enable	1	○
FA-23	Output phase failure protection selection	0: Disable 1: Enable	1	○
FA-24	Off-load protection selection	0: Disable 1: Enable	0	○
FA-25	Off-load detection level	0.0 ~ 100.0%	10.0%	○
FA-26	Off-load detection time	0.0 ~ 60.0s	1.0s	○
FA-27	Action select when off-load happen	0: coast to stop 1: stop according to the set of F1-17	1	◎
FA-28	Motor over-speed detection value	0.0%~50.0% (F0-10)	20.0%	○
FA-29	Motor over-speed detection time	0.0~60.0s (0.0s means without over-speed protection)	1.0s	○
FA-30	Motor stall fault detection time	0.0~60.0s (0.0s means without stall protection)	60.0s	○
FA-31	The first fault type	Please refer to fault code	0	●
FA-32	The second fault type		0	●
FA-33	The third (latest) fault type		0	●
FA-34	Frequency at the latest fault	—	—	●

Function code	Name	Detailed instruction	Factory default	Modify
FA-35	Current at the latest fault	—	—	●
FA-36	DC Bus voltage at the latest fault	—	—	●
FA-37	The inverter status at the latest fault	0: Stop 1: Forward ACC 2: Reverse ACC 3: Forward DEC 4: Reverse DEC 5: Forward running at constant speed 6: Reverse running at constant speed	0	●
FA-38	Running time at the latest fault	—	—	●
<b>FC Group: Communication Parameters</b>				
FC-00	Baud rate	0: 4800BPS 1: 9600BPS 2: 19200BPS 3: 38400BPS 4: 57600BPS 5: 115200BPS	1	○
FC-01	Data format	0: 1-8-N-1 (1 start bit + 8 data bit + 1 stop bit) 1: 1-8-E-1 (1 start bit + 8 data bit + 1 Even parity + 1 stop bit) 2: 1-8-O-1 (1 start bit + 8 data bit + 1 Odd parity + 1 stop bit) 3: 1-8-N-2 (1 start bit + 8 data bit + 2 stop bit) 4: 1-8-E-2 (1 start bit + 8 data bit + 1 Even parity + 12 stop bit) 5: 1-8-O-2 (1 start bit + 8 data bit + 1 Odd parity + 2 stop bit)	3	○
FC-02	Inverter address	1 ~ 249, 0 is broadcast address	1	○
FC-03	Communication delay time	0ms ~ 20ms	2ms	○
FC-04	Communication timeout time	0.0 (invalid) 0.1s ~ 60.0s	0.0	○
FC-05	Communication read current resolution	0: 0.01A 1: 0.1A	0	○
<b>FD Group: Multi-step Command and Simple PLC</b>				
FD-00	Multi-step speed 0	0.00Hz~F0-10	0.00Hz	○

Function code	Name	Detailed instruction	Factory default	Modify
FD-01	Multi-step speed 1	0.00Hz~F0-10	0.00Hz	○
FD-02	Multi-step speed 2	0.00Hz~F0-10	0.00Hz	○
FD-03	Multi-step speed 3	0.00Hz~F0-10	0.00Hz	○
FD-04	Multi-step speed 4	0.00Hz~F0-10	0.00Hz	○
FD-05	Multi-step speed 5	0.00Hz~F0-10	0.00Hz	○
FD-06	Multi-step speed 6	0.00Hz~F0-10	0.00Hz	○
FD-07	Multi-step speed 7	0.00Hz~F0-10	0.00Hz	○
FD-08	Multi-step speed 8	0.00Hz~F0-10	0.00Hz	○
FD-09	Multi-step speed 9	0.00Hz~F0-10	0.00Hz	○
FD-10	Multi-step speed 10	0.00Hz~F0-10	0.00Hz	○
FD-11	Multi-step speed 11	0.00Hz~F0-10	0.00Hz	○
FD-12	Multi-step speed 12	0.00Hz~F0-10	0.00Hz	○
FD-13	Multi-step speed 13	0.00Hz~F0-10	0.00Hz	○
FD-14	Multi-step speed 14	0.00Hz~F0-10	0.00Hz	○
FD-15	Multi-step speed 15	0.00Hz~F0-10	0.00Hz	○
FD-16	Simple PLC running mode	0: Stop after one cycle 1: Stop after a limited number of cycles 2: Keep the last speed after a limited number of cycles 4: Circular running	0	○
FD-17	Limited number of cycles	1~10000	1	○
FD-18	Simple PLC status memory selection	Units place: Memory selection when stop 0: Not memory (start from step 1) 1: Memory (from the stop moment)  Tens place: Memory selection when power-off	00	○

Function code	Name	Detailed instruction	Factory default	Modify
		0: Not memory (start from step 1) 1: Memory (from the stop moment)		
FD-19	0 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-20	0 <sup>th</sup> step set	Units place: Running direction set 0: Forward 1: Reverse  Tens place: ACC/DEC set 0: ACC/DEC time 1 1: ACC/DEC time 2 2: ACC/DEC time 3 3: ACC/DEC time 4	00	○
FD-21	1 <sup>st</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-22	1 <sup>st</sup> step set	Same as FD-20	00	○
FD-23	2 <sup>nd</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-24	2 <sup>nd</sup> step set	Same as FD-20	00	○
FD-25	3 <sup>rd</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-26	3 <sup>rd</sup> step set	Same as FD-20	00	○
FD-27	4 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-28	4 <sup>th</sup> step set	Same as FD-20	00	○
FD-29	5 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-30	5 <sup>th</sup> step set	Same as FD-20	00	○
FD-31	6 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-32	6 <sup>th</sup> step set	Same as FD-20	00	○
FD-33	7 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-34	7 <sup>th</sup> step set	Same as FD-20	00	○

Function code	Name	Detailed instruction	Factory default	Modify
FD-35	8 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-36	8 <sup>th</sup> step set	Same as FD-20	00	○
FD-37	9 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-38	9 <sup>th</sup> step set	Same as FD-20	00	○
FD-39	10 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-40	10 <sup>th</sup> step set	Same as FD-20	00	○
FD-41	11 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-42	11 <sup>th</sup> step set	Same as FD-20	00	○
FD-43	12 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-44	12 <sup>th</sup> step set	Same as FD-20	00	○
FD-45	13 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-46	13 <sup>th</sup> step set	Same as FD-20	00	○
FD-47	14 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-48	14 <sup>th</sup> step set	Same as FD-20	00	○
FD-49	15 <sup>th</sup> step running time	0.0s (h) ~ 6500.0s (h)	0.0s (h)	○
FD-50	15 <sup>th</sup> step set	Same as FD-20	00	○
FD-51	Multi-step speed 0 given channel	0: FD-00 1: Reserved 2: AI1 3~5: Reserved 6: Simple PLC 7: PID 8: By communication (set as percentage) 9: By communication (direct frequency set) 10: Keypad setting frequency (F0-08), can be modified via UP/DOWN	0	○
FE-16	Coefficient of phase failure protection	1~1000	250	◎



Function code	Name	Detailed instruction	Factory default	Modify
<b>FE Group: Torque Control &amp; Optimized Parameters</b>				
FE-00	Speed/torque control mode selection	0: Speed control 1: Torque control	0	☉
FE-01	Torque setting source selection in torque control mode	0: FE-03 1: AI1 2: AI2 3: AI3 4: HDI (High speed pulse) 5: Communication 6: Min (AI1, AI2) 7: Max (AI1, AI2)	0	☉
FE-02	Reserved			
FE-03	Torque setting through keypad in torque control mode	-200.0% ~ 200.0%	150.0%	○
FE-04	0Hz PWM output control mode	0: Invalid 1: Valid	0	○
FE-05	Forward maximum frequency in torque control mode	0.00Hz ~ F0-10 (maximum frequency)	50.00Hz	○
FE-06	Reverse maximum frequency in torque control mode	0.00Hz ~ F0-10 (maximum frequency)	50.00Hz	○
FE-07	ACC time in torque control mode	0.00s ~ 65000s	0.00s	○
FE-08	DEC time in torque control mode	0.00s ~ 65000s	0.00s	○
FE-09	Static friction compensation	0.0%~200.0%	0.0%	○
FE-10	Static friction compensation cutoff frequency	0.00Hz~F0-10 (max. frequency)	10.00Hz	○
FE-11	Sliding friction compensation	0.0%~200.0%	0.0%	○
FE-12	Rotary inertia compensation	0.0%~200.0%	0.0%	○
FE-13	ACC time of rotary inertia compensation activate	0.00s~65000s	0s	○
FE-14	DEC time of rotary inertia compensation activate	0.00s~65000s	0s	○

Function code	Name	Detailed instruction	Factory default	Modify
FE-15	DPWM switching upper limit frequency	0.00Hz ~ 15.00Hz	12.00Hz	○
FE-16	PWM regulation mode	0: Asynchronous mode 1: Synchronous mode	0	○
FE-17	Dead zone compensation mode selection	0: no compensation 1: compensation mode 1 2: compensation mode 2	1	○
FE-18	Depth of random PWM	0: Random PWM invalid 1~10: depth of random PWM	0	○
FE-19	Fast current limitation enable	0: Disable 1: Enable	1	○
FE-20	Current detection compensation	0~100	5	○
FE-21	SVC optimized mode selection	0: No optimized 1: Optimized mode 1 2: Optimized mode 2	1	○
FE-22	Under voltage level setting	60% ~ 140%	80%	○

## 4.2 Monitoring Parameter Table (U0 group)

Function code	Name	Minimum unit
U0-00	Running frequency (Hz)	0.01Hz
U0-01	Setting frequency (Hz)	0.01Hz
U0-02	DC Bus voltage (V)	0.1V
U0-03	Output voltage (V)	1V
U0-04	Output current (A)	0.01A
U0-05	Output power (kW)	0.1kW
U0-06	Output torque (%)	0.10%
U0-07	MI input status	00
U0-09	AI1 voltage (V)	0.01V
U0-15	Load speed	1
U0-16	PID setting	1
U0-17	PID feedback	1
U0-18	PLC step	1
U0-21	Remain running time	0.1Min
U0-22	Main frequency display (Hz)	0.01
U0-23	Auxiliary frequency display (Hz)	0.01
U0-24	Current power-on time (Hour)	1Hour
U0-25	Current running time (Min)	1Min
U0-26	Cumulative running time (Hour)	1Hour
U0-27	PG card detection frequency	0.01
U0-28	Estimated feedback frequency	0.01
U0-30	Percentage of output current	0.1
U0-36	Output power factor	0.001
U0-37	Communication setting	0.1
U0-38	Motor rotor position of PM motor	0.1
U0-39	Rotary encoder position	1
U0-40	Motor temperature	1

### 4.3 Fault code list

Fault code	Fault type
Err01	Short circuit / EMC fault
Err02	Instantaneous over-current
Err03	Constant speed over-current
Err04	Instantaneous over-voltage
Err05	Constant speed over-voltage
Err06	Constant speed under-voltage
Err07	Input phase failure
Err08	Output phase failure
Err09	Inverter overload
Err10	Inverter over-heat
Err11	Parameters setting error
Err12	Motor over-heat
Err13	Motor overload
Err14	External fault
Err15	Inverter memory failure
Err16	Communication abnormal
Err17	Inverter temperature sensor abnormal
Err18	Buffer relay is not closed
Err19	Current detection circuit abnormal
Err20	Stall fault
Err21	PID feedback lost
Err22	Encoder fault
Err23	Keypad memory fault
Err24	Motor auto-tuning fault
Err25	Motor over-speed protection
Err26	Off-load protection
Err27	Accumulated power-on time arrival
Err28	Accumulated running time arrival
Err29	Internal communication fault