



NVF3M Series  
Inverter

---

# User Instruction

---



# Safety Warnings

---

## Before Installation

- 1 Check the product nameplate against your order, do not install the product if there is any inconsistency;
- 2 Do not install and operate the product if there is any damage in appearance or missing of any parts, otherwise it may cause fire or injury;
- 3 To avoid dangerous accidents, the product must be installed and wired strictly according to the instructions;
- 4 Do not install the product in inflammable, explosive, humid and condensing environment;

## Product Installation and Commissioning

- 1 Do not install the product in places where there is direct sunshine or water leakage, otherwise the equipment can be damaged;
- 2 Do not use your hands to touch main circuit terminals, control circuit terminals, electric components and internal parts of the inverter directly;
- 3 The inverter must be installed by qualified person, otherwise electric shock can occur;
- 4 The inverter must be isolated from power supply through circuit breaker, otherwise there will be a risk of fire;
- 5 The power and load connected to the inverter should comply with the requirements for inverter input power and its matching motor;
- 6 If the length of motor cable exceeds 100 meters, user should use stranded wire and install an AC output reactor to suppress high frequency oscillation, so as to prevent motor insulation damage or too much leak current;
- 7 Do not start and stop the inverter frequently by connecting and disconnecting the power supply, otherwise the equipment damage may occur;
- 8 In civil applications, the product may cause radio interference. In such cases, user may have to take control measures such as installing reactor or filter;
- 9 When installing external live conductor, the exposed parts of the conductor should be insulated to avoid electric shock.

## Product Maintenance and Service

- 1 It is prohibited to touch live parts of the product during operation; do not operate the inverter with wet hands;
- 2 Before installing, maintaining and servicing the inverter, turn off the power and wait for 10 minutes first;
- 3 The inverter has gone through dielectric withstand voltage test before delivery. It is prohibited to conduct such test on the inverter again, otherwise the equipment can be damaged;
- 4 Non-professional person is prohibited to conduct signal testing during operation, otherwise personal injury or equipment damage may occur;
- 5 The electrolytic capacitors in the main circuit and those on the printed board may explode and the plastic components (such as panel) may generate poisonous gas during the disposal process, therefore they should be disposed as industrial waste;
- 6 Only professional person is allowed to maintain, service, check the product or replace parts, otherwise electric shock may occur;
- 7 It is prohibited to conduct maintenance, service and inspection on live products, otherwise electric shock may occur.

# Preface

---

Thank you for choosing CHINT NVF3M series inverter.

NVF3M series mini inverter is made of high performance materials and equipped with advanced components and DSP control technology. The product is compact and easy for installation and operation.

NVF3M offers modular scalable solutions which not only meet the general needs of customers but also can be customized to specific industrial demands. With multiple practical functions such as process closed-loop control, multi-function input and output terminals, pulse frequency setting, and main and auxiliary setting control, NVF3M is suitable for various complex transmission applications and can help customers reduce system cost and improve system reliability.

With overall EMC design and optimized PWM control technology, NVF3M meets the requirements for low noise and low electromagnetic interference operation.

This manual introduces the functions and operations of NVF3M series inverter. Before using the inverter, please read this manual carefully to ensure correct operations. After reading this manual, please keep it properly for later use. If you run into any difficulties or problems that you cannot handle during operation, please contact our local dealer or our professional technicians for help.

We reserve the right to continuously optimizing and improving the NVF3M series inverter. The information in this manual is subject to change without prior notice.

# Contents

---

<b>1</b>	<b>Main Usage and Range of Applications</b>	01
<b>2</b>	<b>Type Key Explanation</b>	02
<b>3</b>	<b>Conditions for Normal Use, Installation and Transportation and Storage</b>	03
<b>4</b>	<b>Key Technical Parameters and Performance</b>	04
<b>5</b>	<b>Working Principles</b>	05
<b>6</b>	<b>Outline and Installation Dimensions and Weight</b>	07
<b>7</b>	<b>Use Instructions of Operation Panel</b>	09
<b>8</b>	<b>Notes for Maintenance, Care and Storage</b>	11
<b>9</b>	<b>Fault Analysis and Troubleshooting</b>	13
<b>10</b>	<b>Environmental Protection</b>	17
<b>11</b>	<b>Parameter Summary Table</b>	17

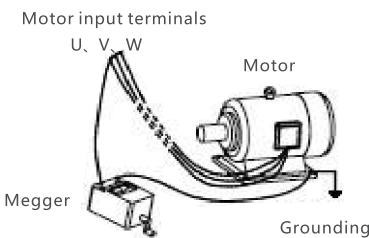


## 1 Main Usage and Range of Applications

### 1.1 Main Usage and Range of Applications

NVF3M adopts advanced integrated drive solution for the integration of asynchronous motor drive, torque control and speed control, with industrial leading drive indicators that meet the needs of various complex applications. NVF3M also provides perfect anti-trip control and resistance to harsh power grid environment, extreme temperature, humidity and dust, which greatly improves its reliability and adaptability.

### 1.2 Precautions

Precautions	Explanations
Comparison with frequency type operation	This is a voltage type inverter with output voltage of PWM wave which includes a certain proportion of harmonic. Therefore, the temperature rise, noise and vibration during operation might be a little stronger than those in frequency type operation.
Constant torque low speed operation	When the inverter is used to drive normal motor for long term low speed operation, user should decrease the output torque limit due to the poor heat dissipation of the motor. If you need to use the inverter for long term low speed constant torque operation, please choose a variable frequency motor.
Electronic thermal protection value of motor	If a matching motor is selected, the inverter can provide thermal protection for the motor. If the rated capacity of the selected motor does not match with that of the inverter, make sure to setup a proper protection value or take other protective measures to guarantee the safe operation of the motor.
Operating above 50Hz	If you need to run the product above 50Hz, please pay attention to the increase in motor vibration and noise; remember to check the speed range of motor bearings and mechanical devices first.
Lubrication of mechanical devices	The lubrication effect of mechanical devices such as reduction gearbox and gear will decrease over long term low speed operation, which may lead to equipment damage, please check the lubrication in advance.
Negative torque load	Negative torque often occurs in applications where load increase is needed, which makes inverter to trip due to overcurrent or overvoltage. In such cases, user should use braking components with proper parameters.
Mechanical resonance point of load bearing device	The input frequency range of the inverter may include the mechanical resonance point of load bearing device. In this case, user must setup a hopping frequency to bypass the mechanical resonance point.
Frequent start and stop	Use terminals to control the start and stop of inverter. It is prohibited to use switching devices such as contactor for frequent start and stop operations at the input side of the inverter, otherwise the equipment can be damaged.
Motor insulation check before connecting the inverter	<p>Before using the motor for the first time or after long-term idle, check the insulation of the motor so that the inverter will not be damaged due to invalid insulation of motor winding. See the figure for wiring. Use 500V voltage type megameter for measuring, the insulation resistance should not be smaller than 5MΩ.</p>  <p>The diagram illustrates the procedure for checking motor insulation. A Megger (insulation tester) is connected to the three motor input terminals labeled U, V, and W. The other end of the Megger is connected to the motor's ground terminal. The motor is shown as a cylindrical unit with a terminal box on top.</p>

Precautions	Explanations
Capacitors or pressure sensitive components with improved power factor	Since the inverter outputs PWM wave, if any capacitors or pressure sensitive components for lightning protection with improved power factor are installed at input side, they may cause inverter to trip or lead to component damage. Please remove these devices.
Use of switching devices such as inverter output terminal installation contactor	If user needs to install switching devices such as contactor between inverter output and motor, please make sure the inverter can make and break smoothly when there is no output, otherwise the inverter can be damaged.
Applications beyond rated voltage	The inverter is not suitable for applications beyond permissible operating voltage. If needed, please use corresponding voltage increase or decrease devices for voltage transformation.

## 2 Type Key Explanation

The model on product nameplate uses combination of numbers and letters to indicate the series of the product, as shown in Figure 2-1-1.

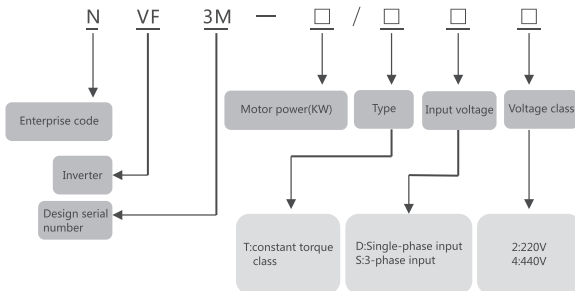
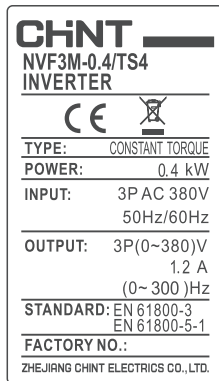


Figure 2-1-1 Nameplate and type key explanations

### 2.1 Product Specifications

**Table 2.1 Inverter specification table**

Model (NVF3M-)	Max. motor power (kW)	Rated capacity(kVA)	Rated output current (A)
0.4/TD2	0.4	1.0	2.5
0.75/TD2	0.75	1.5	4.0
1.5/TD2	1.5	3.0	7.5
0.4/TS2	0.4	1.5	2.5
0.75/TS2	0.75	3.0	4.0
1.5/TS2	1.5	4.0	7.5
0.4/TS4	0.4	1	1.2
0.75/TS4	0.75	1.5	2.5
1.5/TS4	1.5	3	3.7

### 3 Conditions for Normal Use, Installation and Transportation, and Storage

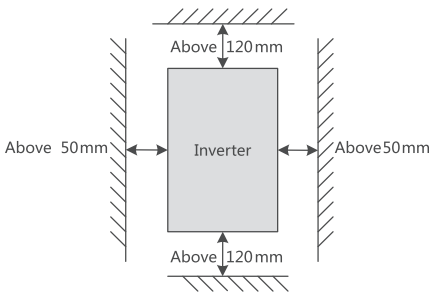
#### 3.1 Conditions for Use, Transportation and Storage

- a) Ambient temperature for storage:  $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$ ;
- b) Ambient temperature for operation:  $(-10 \sim +50)^{\circ}\text{C}$ , derate between  $40^{\circ}\text{C} \sim 50^{\circ}\text{C}$  (derate 1% with every  $1^{\circ}\text{C}$  temperature rise);
- c) Relative humidity  $(5 \sim 95)\% \text{RH}$ ;
- d) The product should be used under 1000m altitude, derate 1% for every 100m altitude rise, but do not use above 3000m altitude;
- e) Allowable vibration limit of installation site:  $(2 \sim 9)\text{Hz}$ , amplitude  $\leq 0.3\text{mm}$ ,  $(9 \sim 200)\text{Hz}$  vibration acceleration  $\leq 5.8\text{m/s}^2$ ;

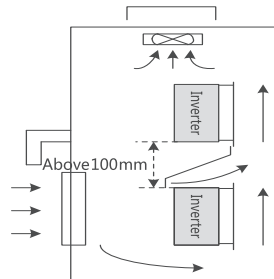
Note: For long-term idled inverters, user must power it on at least once every 2 years. Use voltage regulator to raise the voltage to rated value gradually, run the inverter for 1 hour without load, otherwise electric shock or explosion may occur.

#### 3.2 Installation Conditions

- a) The inverter should be installed indoor, with good ventilation. Usually, we recommend vertical installation;
- b) The inverter should be installed indoor and protected from direct sunshine, dust, corrosive gas, inflammable gas, oil spray, steam, water drop and salt;
- c) Pay attention to installation interval and distance when using the inverter. See Figures below for parallel and vertical installation of multiple inverters respectively.



**Figure 3-2-1 Inverter installation diagram**



**Figure 3-2-2 Vertical installation of multiple inverters**

## 4 Key Technical Parameters and Performance

**Table 4.1 Universal technical parameters and performance**

Item	Description	
Input	Rate voltage	Single phase: 220V; 3-phase: 220V/380V
	Frequency	47Hz~63Hz
	Allowable operating voltage range	220V series: 200V-240V 380V series: 380V-460V
Output	Voltage	0~input voltage
	Frequency	0Hz~300Hz
	Overload capacity	150% rated current for 60 seconds, 180% rated current for 10 seconds
Main control performance	Control method	V/F, SVC
	Regulation method	Space vector PWM regulation
	Starting torque	150% rated torque at 0.5Hz (SVC)
	Frequency precision	Digital setting: max. frequency $\times\pm 0.01\%$ ; Analog setting: max. frequency $\times\pm 0.2\%$
	Frequency resolution	Digital setting: 0.01Hz; Analog setting: max. frequency $\times 0.5\%$
	Torque increase	Manual torque increase 0%~30.0% (only for V/F mode)
	V/F curve	For methods: 1 method for user setting V/F curve and 3 methods for decreased torque characteristics curve (2.0, 1.7, 1.2 multiple points)
	Acceleration and deceleration curve	Linear acceleration and deceleration; 4 types of acceleration and deceleration time
Customizable functions	Automatic current limiting	Automatic current limiting during operation, preventing frequent fault trips due to overcurrent.
	Inching	Inching frequency: 0.00Hz~50.00Hz; inching acceleration and deceleration time 0.1~3600.0 seconds, inching interval is programmable
	Multi-speed operation	Use control terminal to achieve multi-speed operation
	Programmed operation	Use program timer to control operation
Operation functions	Control function	Forward and reverse PID control
	Operation command channel	User can switch between multiple methods: operation panel setting, control terminal setting, communication control
	Frequency setting channel	Digital setting, analog voltage setting, analog current setting, pulse setting
	Pulse output terminal	0~100kHz pulse square-wave signal output, for setup of physical variables such as frequency, output frequency
Operation panel	Analog output terminal	2 way analog signal output, 0/4~20mA or 0/2~10V available, for physical variables such as frequency, output frequency
	LED display	Displays more than 20 parameters including set frequency, output frequency, output voltage and output current.
	Parameter copy	Use operation panel for easy copy of parameters.
Protective functions	Key lock and function selection	Achieve part or full lockup of keys to define the control scope of the keys and prevent misoperation.
		Provides overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, phase loss protection, ground protection, and motor over-temperature protection.
Environment	Application site	The product should be installed indoor and protected from direct sunshine, dust, corrosive gas, inflammable gas, oil spray, steam, water drop and salt.
	Altitude	The product should be derated when used above 1000m altitude (derate 10% for every 1000m altitude rise); do not use the product above 3000m altitude.
	Ambient	-10°C~ + 50°C (closed parallel installation is allowed at +40°C)
	Humidity	Below 90%RH (no condensation)

Item		Description
Environment	Vibration	Below 20Hz: 9.80665m/s <sup>2</sup> (1G) 20Hz~50Hz: 5.88m/s <sup>2</sup> (0.6G)
	Storage temperature	-40°C~ +70°C
Structure	Protection class	IP20
	Cooling method	Fan cool, with fan control
Installation method		Wall mounting
Efficiency		≥93%

## 5 Working Principles

### 5.1 Working Principle Diagram

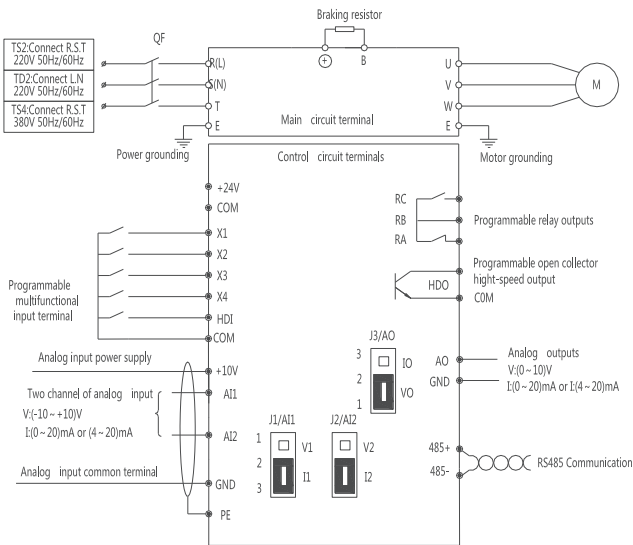


Figure 5-1-1 NVF3M wiring diagram

#### 1) Jumper selection

J1, J2 position (AI1, AI2 analog input interface):

-10V~10V analog voltage input when 2 is connected to 3; 0/4mA~20mA analog current input when 2 is connected to 1

J3 position (AO analog output interface):

0V~10V analog voltage input when 2 is connected to 1; 0/4mA~20mA analog current input when 2 is connected to 3

#### 2) The arrangement of control circuit terminals is shown below:

RA	RB	HDI	X1	X2	X3	X4	AI1	AI2
RC	HDO	+24V	COM	485+	485-	GND	+10V	AO

**5.2 Wiring Symbols of Main Circuit Terminals**

a) 3-phase 380V series (NVF3M-0.4TS4~1.5TS4)



b) 3-phase 220V series (NVF3M-0.4TS2~1.5TS2)



c) Single phase 220V series (NVF3M-0.4/TD2~1.5/TD2)



Note: An external braking resistor is connected between ⊕ ⊗. Since the product uses internal braking function as default, please specify in your order if external braking function is required.

**Table 5.1 Explanation of main circuit terminals**

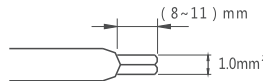
Terminal symbol	Terminal name	Function description
R, S, T	Main circuit power input	3-phase AC input terminals, to be connected with power grid.
L, N	Main circuit power input	Single phase AC input terminals, to be connected with power grid.
U, V, W	Inverter output	3-phase AC output terminals, typically connected with motor.
⊕	Grounding terminal	Safe protection grounding terminal, must be grounded securely.
⊕ ⊗	External braking resistor terminal	Connected based on actual needs when used as external braking resistor terminal.

**5.3 Instruction for Control Terminal Wiring**

Use conductor with cross-sectional area of 1 mm<sup>2</sup> as control wire.

The strip length of control terminal should be (8~11) mm (as shown in Figure 5-4-1).

The core of the wire must fully contact with the terminal, the exposed wire should be kept within the terminal, otherwise short circuit may occur.



**Figure 5-3-1 Strip length of control terminal**

**Table 5.2 Function table of control panel terminals**

Item	Terminal symbol	Name	Terminal function	Specifications
Power	+10V GND	+10V power	Provide +10V reference power, GND is internally isolated from COM	Max. allowable output current 5mA
Analog input	AI1 AI2	Analog single-ended input AI1, AI2	Receive analog voltage or current single-ended input, the voltage/current input is selected by control panel jumper AI1, AI2 (reference ground: GND)	Input voltage range: -10V~10V (input impedance: 45 kΩ) Resolution: 1/4000 Input current range: 0mA~20 mA Resolution: 1/2000 (jumper required) See Figure 2.3 for details.

Item	Terminal symbol	Name	Terminal function	Specifications
Analog output	AO	Analog output	Provide analog voltage/ current output, the output voltage/current is selected by control panel jumper AO1; the default setting is output voltage. See function code F6.11 for description (reference ground: GND)	Voltage output range: (0~10)V Current output range: (0/4~20)mA
Communication	485+	Rs485 communication interface	Positive end of 485 differential signal	Standard RS485 communication interface Please use twisted-pair or shielded wire.
	485-		Negative end of 485 differential signal	
Multi-function input terminals	X1 X2 X3 X4 HDI	Multi-function input terminal 1	Switch input terminals that can be programmed with different functions. See Switch Input Terminals (Group F5) for the function description of input terminal F5.01~F5.07	Optical coupler isolated input impedance: R = 3.3kΩ; X1~X4 maximum input frequency: 200Hz; If internal power supply is used at maximum HDI input frequency of 100kHz, the input voltage is: 20~24V;
Multi-function output terminal	HDO	Open collector pulse output terminal	A switch output terminal that can be programmed with different functions. See Switch Output Terminal (Group F6) for the function description of output terminal F6.02 (Common terminal: COM)	Output frequency range: Determined by F6.18, 100kHz maximum.
Power	+24V COM	+24V power	Provide +24V power supply (COM and GND are internally isolated)	Maximum output current: 100mA
Relay output terminals	RA RB RC	Relay output	Relay output terminals that can be programmed with different functions. See Switch Output Terminal (Group F6) for the function description of output terminal F6.03.	RA-RB: NC; RB-RC: NO Contact capacity: NO 5A /NC 3A 250V(AC) See F6 for use instructions. The overvoltage level of the input voltage of relay output terminal is II.
 <b>Note</b>	1. When analog input is used, user can install a filter capacitor or common mode inductor between the input signal and GND. 2. We do not recommend using a voltage higher than 12V for analog input signal. 3. Analog input and output signals are vulnerable to external interference, therefore user must use shielded wires for these signals. The wires should be as short as possible and should be grounded properly. 4. The maximum withstand voltage of analog output terminal is 12V. 5. We recommend using wire with cross-sectional area bigger than 1mm <sup>2</sup> for the connection of control circuit terminals.			

## 6 Outline and Installation Dimensions and Weight

Product outline and installation dimensions and weight

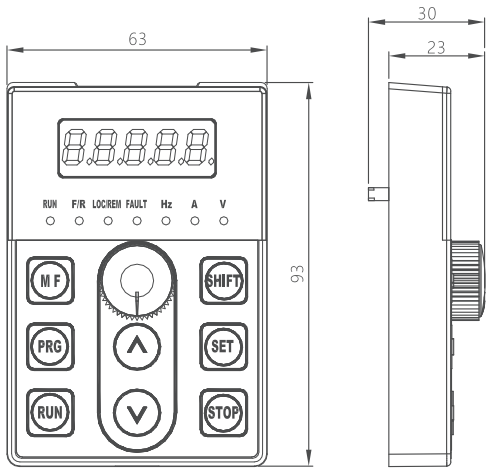


Figure 6-1-1 Outline drawing of NVF3M

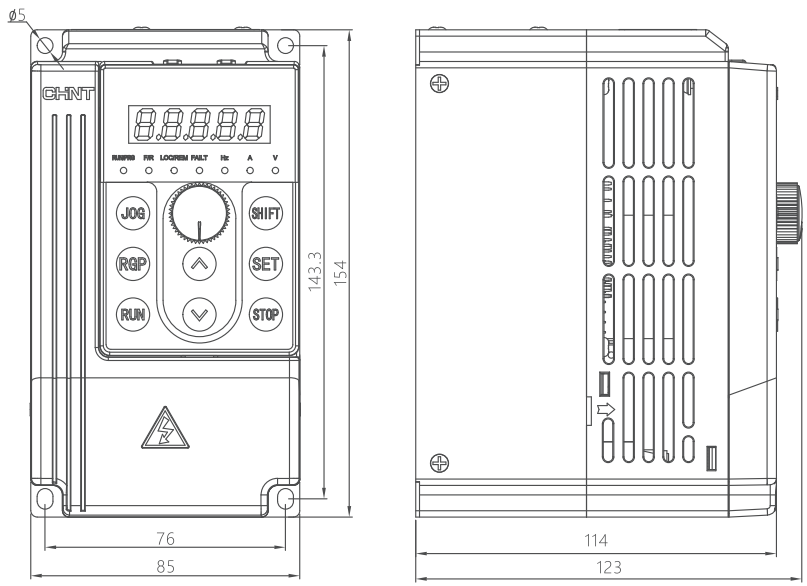


Figure 6-1-2 Outline dimensions of NVF3M



## 7 Use Instructions of Operation Panel

### 7.1 Panel Key Introductions

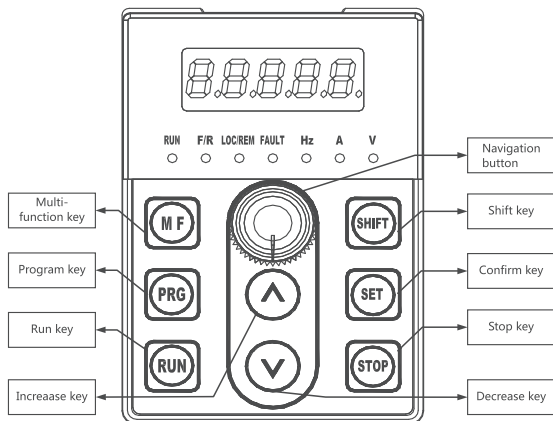


Figure 7-1-1 LED operation panel drawing

The display panel is the main unit for the inverter to receive orders, display parameters and for users to set up parameters. There are 8 keys and a navigation button on the panel, please refer to Table 7.1 for the functions of each key.

Table 7.1 Function list of operation panel

Key	Name	Function
	Program/exit key	Enter or exit program status
	Confirm key	Enter next level menu or confirm data
	Increase key	Increase data or function code
	Decrease key	Decrease data or function code
	Shift key	In editing interface, you can use the key to select the digit to be changed; in main interface, you can use the key to switch between the displayed parameters.
	Multi-function key	You can use the key for inching, free stop or fast stop function, the function of the key is set by F7.02.
	Run key	Press the key under operation panel mode to run the product.
	Stop/reset key	Stop the product or fault reset.
	Navigation button	When changing data, rotate the button to increase or decrease the value, press the button to confirm.

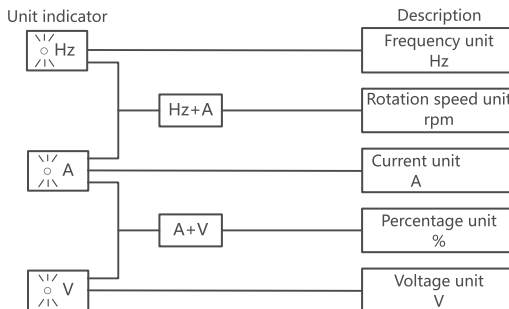
**7.2 Display Explanation of LED Digital Tube and Indicator**

The LED operation panel of the inverter has a 5-digit and 8-segment LED displays, 3 unit indicators, and 4 status indicators, as shown in Figure 7-1-1. The digital tube can display main interface status parameter, menu interface code, function code and fault code. Please refer to Table 7.2 for the relationship between the displayed symbol and character/number.

**Table 7.2 Relationship between the displayed symbol and character/number**

LED display	Meaning	LED display	Meaning	LED display	Meaning	LED display	Meaning
	0		A		I		S
	1		b		J		T
	2		C		L		t
	3		c		N		U
	4		d		n		v
	5		E		O		y
	6		F		o		-
	7		G		P		8.
	8		H		q		.
	9		h		r		

The 3 unit indicators show Hz, A and V respectively, as shown in Figure 7-3-2.



**Figure 7-3-2 Description of unit indicators**

4 status indicators: See Table 7.3 for their meanings.

**Table 7.3 Description of status indicators**

Indicator	Status	Indication of inverter status
Operation status indicator (RUN)	On	Operating
	Off	Stop
Operation direction indicator (F/R)	On	Forward
	Off	Reverse
Operation command channel indicator (LOC/REM)	On	Operation panel control
	Off	Terminal control
	Flash	Communication control
Fault indicator (FAULT)	On	Fault
	Off	Normal

### 7.3 Status Displayed by Operation Panel

The NVF3M operation panel can display parameters of different status including stop status parameters, operation status parameters and function code parameter editing status.

#### 1) Stop status parameters

When the inverter is stopped, the operation panel will display stop status parameters. Press SHIFT key to show various stop status parameters in cycle. The available stop status parameters are defined by function code F7.07.

#### 2) Operation status parameters

After receiving an effective operation order, the inverter will start to run, and the operation panel will display operation status parameters. In this case, the RUN indicator on the panel is on, and the status of the F/R light is determined by current operation direction. The unit indicator will show the unit of corresponding parameter. Press SHIFT key to show various operation status parameters in cycle. The available operation status parameters are defined by function code F7.05 and F7.06.

#### 3) Fault status

When a fault signal is detected by the inverter, the operation panel will display corresponding fault warning and fault code and the FAULT indicator will light on. User can reset the inverter by pressing the STOP key or by using control terminal or communication command. If the fault still exists, the panel will continue to show the fault code.

#### 4) Function code editing status

Under stop, operation or fault warning status, press PRG key to enter editing status (refer to F7.00 if user password is required). The editing status is displayed in two levels of menu in the order of: function code group number→function index number→function code parameter. Press SET key to enter function parameter display status. Under function parameter display status, press SET key to save parameters; press PRG key to return.

## 8 Notes for Maintenance, Care and Storage

### 8.1 Daily Maintenance and Care

The inverter must run within specified conditions. Unexpected situations may occur during the operation. User should conduct daily maintenance according to Table 8.1. Keeping a good operation environment, recording all the daily operation data and identifying abnormalities in early stage would help to prolong the service life of the inverter.

**Table 8.1 Daily inspection list**

Target	Key points		Standard	
	Content	Cycle		
Operation conditions	1. Temperature, humidity	Any time	1. Thermometer, hygrometer	1. (-10~ +45)°C 2. Derate at (45~50)°C
	2. Dust, water and leakage		2. Visual	2. No sign of leakage
	3. Gas		3. Smell	3. No odor
Inverter	1. Vibration, heat generation	Any time	1. Touch enclosure	1. Stable vibration; the temperature of the fan is within reasonable range
	2. Noise		2. Hear	
Motor	1. Heat generation	Any time	1. Touch by hand	1. No abnormal heat generation
	2. Noise		2. Hear	2. Noise is even
Operation parameters	1. Output current	Any time	1. Amperemeter	1. Within rated value range
	2. Output voltage		2. Voltmeter	2. Within rated value range
	3. Internal temperature		3. Thermometer	3. Temperature rise is smaller than 35K

### 8.2 Maintenance and Care during Operation

- a) If the motor runs according to settings;
- b) If there are any abnormalities in the environment where the equipment is installed;
- c) If there are any abnormalities in the cooling system;
- 4) If there is any abnormal vibration noise;
- d) If there is any overheat or color change;
- e) Use multimeter to measure the input voltage of the inverter during operation.

### 8.3 Inspection and Repair Cycle

Based on application environment, user should conduct an inspection the inverter every 3 or 6 months. General inspections:

- a) Check if the screws of control terminals are loose. If yes, use screwdriver to tighten them;
- b) Check the contact status of main circuit terminals. Check if there is any sign of overheat at the connections of copper bar;
- c) Check if the power cables and control cables are damaged, especially any scratching on the cable sheath that contact with metal surface;
- d) Check the status of the insulation tapes of power cables;
- e) Clean up the dust on circuit board and air duct (it is preferred to use a vacuum cleaner);
- f) Conduct insulation test on the inverter. All the input and output terminals (R, S, T, U, V, W, etc.) in the main circuit must be short-circuited by using conductors before conducting ground test. It is prohibited to conduct ground test on single terminal, otherwise the inverter can be damaged. Please use 500V megameter for the test;
- g) When conducting insulation test on the motor, user must remove the input terminals U, V and W from the inverter first, then test the motor separately, otherwise the inverter can be damaged.

### 8.4 Maintenance and Care for Long-Term Idle

User must follow the instructions below for short-term and long-term storage of the inverter:

- a) The inverter must be kept in a well-ventilated environment that is free from high temperature, high humidity, dust and metal dust;
- b) For long-term idled inverters, user must power it on at least once every 2 years. Use voltage regulator to raise the voltage to rated value slowly. Run the inverter for about 5 hours (without load is allowed).

### 8.5 Regular Inspection

User must cut off the power before conducting regular inspection and service on the inverter. Wait until there is no display of the monitor (keypad) and the indicator of the main circuit power has gone off for 10 minutes. Switch the multimeter to DC and test P/P+ and P-. User should not start inspection before the DC bus voltage is below 25V, otherwise the residual voltage in the capacitors of the inverter may cause injury.

- a) Cooling system: Please clean up the air filter and check the status of cooling fan.
- b) Screws and bolts: Fixing parts such as screws and bolts may get loose due to vibration and temperature change, check their status and tighten them according to tightening torque if needed.
- c) Check if the conductors and insulators are corroded or damaged.
- d) Measure insulation resistance.
- e) Check if there is any color change, odor, plumping and leakage in the filter capacitor.

**8.6 Replacement of Wearing Parts**

The wearing parts of the inverter mainly include cooling fan and electrolytic capacitor whose service life is closely related to application environment and maintenance. The service life of these parts under normal conditions is shown in Table 8.2.

**Table 8.2 Parts service life**

Parts	Service life
Fans	(30000~40000) hours
Electrolytic capacitors	(40000~50000) hours

User can determine the time for replacement of these parts according to their operation hours.

a) Cooling fan

Possible cause of damage: Bearing wear, blade aging.

Measuring criteria: Cracking on fan blades, abnormal vibration sound upon starting.

b) Electrolytic capacitors

Possible cause of damage: High ambient temperature, frequent load change that causes increase in pulsating current, electrolyte aging;

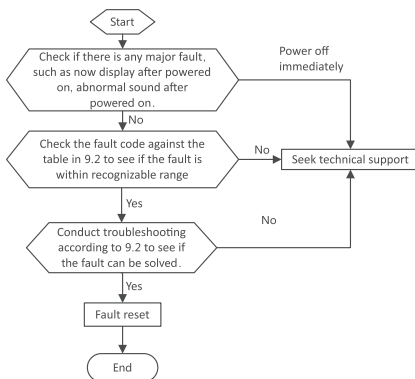
Measuring criteria: liquid leakage, bulge in safety valve, measuring of static capacitor, measuring of insulation resistance.

User should not replace the wearing parts listed by itself, please contact manufacturer to replace these parts.

**9 Fault Analysis and Troubleshooting**

**9.1 Fault Analysis**

See figure below for fault diagnosis process.



**Figure 9-1-1 Fault diagnosis process**

## 9.2 Troubleshooting


If the inverter shows the following fault codes, user can conduct troubleshooting based on the table below before seeking technical support. User should record the fault in detail and contact dealer if service is needed.

**Table 9.1 Fault Codes**

Fault codes	Fault types	Possible reasons	Troubleshooting measures
E.OC1	Overcurrent during inverter acceleration	<ol style="list-style-type: none"> <li>1. Acceleration time is too short</li> <li>2. Incorrect motor parameters</li> <li>3. Code disc fault when PG is running</li> <li>4. Inverter power is too small</li> <li>5. Inappropriate V/F curve</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend acceleration time</li> <li>2. Conduct parameter self-tuning for the motor</li> <li>3. Check the code disc and its wiring</li> <li>4. Choose an inverter with larger power</li> <li>5. Adjust V/F curve setup, adjust the increment of manual torque</li> </ol>
E.OC2	Overcurrent during inverter deceleration	<ol style="list-style-type: none"> <li>1. Deceleration time is too short</li> <li>2. Potential energy load exists or load inertia torque is too big</li> <li>3. Encoder fault when PG is running</li> <li>4. Inverter power is too small</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend deceleration time</li> <li>2. Add suitable dynamic braking components</li> <li>3. Check the encoder and its wiring</li> <li>4. Choose an inverter with larger power</li> </ol>
E.OC3	Overcurrent during constant speed operation of the inverter	<ol style="list-style-type: none"> <li>1. The set time for acceleration and deceleration is too short</li> <li>2. Sudden change or abnormality in load</li> <li>3. Low voltage in grid</li> <li>4. Encoder fault when PG is running</li> <li>5. Inverter power is too small</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend acceleration and deceleration time appropriately</li> <li>2. Conduct load check</li> <li>3. Check input power</li> <li>4. Check the encoder and its wiring</li> <li>5. Choose an inverter with larger power</li> </ol>
E.OV1	Overvoltage during inverter acceleration	<ol style="list-style-type: none"> <li>1. Abnormal input voltage</li> <li>2. The set time for acceleration is too short</li> </ol>	<ol style="list-style-type: none"> <li>1. Check input power</li> <li>2. Extend acceleration time appropriately</li> </ol>
E.OV2	Overvoltage during inverter deceleration	<ol style="list-style-type: none"> <li>1. Deceleration time is too short</li> <li>2. Potential energy load exists or load inertia torque is too big</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend deceleration time</li> <li>2. Choose suitable dynamic braking components</li> </ol>
E.OV3	Overvoltage during constant speed operation of the inverter	<ol style="list-style-type: none"> <li>1. Inappropriate ASR parameter setup in vector control operation mode</li> <li>2. The set time for acceleration and deceleration is too short</li> <li>3. Abnormal input voltage</li> <li>4. Abnormal fluctuation of input voltage</li> <li>5. Load inertia is too big</li> </ol>	<ol style="list-style-type: none"> <li>1. See ASR parameter setup in Group F3</li> <li>2. Extend acceleration and deceleration time appropriately</li> <li>3. Check input power</li> <li>4. Install input reactor</li> <li>5. Consider using dynamic braking components</li> </ol>
E.OV	Overvoltage of inverter control power	Abnormal input voltage	Check input power or seek service
E.SPI	Phase missing at input side	Phase missing at input R,S,T	<ol style="list-style-type: none"> <li>1. Check wiring</li> <li>2. Check input voltage</li> </ol>
E.SPO	Phase missing at output side	Phase missing at output U,V,W	<ol style="list-style-type: none"> <li>1. Check wiring</li> <li>2. Check motor and cables</li> </ol>
E.FO	Power module protection	<ol style="list-style-type: none"> <li>1. Interphase short circuit or ground short circuit at output 3 phases</li> <li>2. Instantaneous overcurrent of inverter</li> <li>3. Air duct is blocked or fan is damaged</li> <li>4. Ambient temperature is too high</li> <li>5. Loose in control panel wiring or plug-in</li> <li>6. Abnormal current waveform due to output phase missing</li> <li>7. Auxiliary power broken, undervoltage in driving voltage</li> <li>8. Inverter module shoot through</li> <li>9. Abnormality in control panel</li> </ol>	<ol style="list-style-type: none"> <li>1. Rewire, confirm the insulation of the motor is intact</li> <li>2. See solutions for overcurrent</li> <li>3. De-block the air duct or replace the fan</li> <li>4. Lower ambient temperature</li> <li>5. Check and rewire</li> <li>6. Check wiring</li> <li>7. Seek service</li> <li>8. Seek service</li> <li>9. Seek service</li> </ol>

Fault codes	Fault types	Possible reasons	Troubleshooting measures
E.OH1	Inverter module radiator overheat	<ol style="list-style-type: none"> <li>1. Ambient temperature is too high</li> <li>2. Air duct is blocked</li> <li>3. Fan is broken</li> <li>4. Abnormality in inverter module</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower ambient temperature</li> <li>2. Clean up the air duct</li> <li>3. Replace the fan</li> <li>4. Seek service</li> </ol>
E.OH2	Rectifier module radiator overheat	<ol style="list-style-type: none"> <li>1. Ambient temperature is too high</li> <li>2. Air duct is blocked</li> <li>3. Fan is broken</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower ambient temperature</li> <li>2. Clean up the air duct</li> <li>3. Replace the fan</li> </ol>
E.OL2	Inverter overload	<ol style="list-style-type: none"> <li>1. Inaccurate motor parameters</li> <li>2. Load is too big</li> <li>3. DC braking capacity is too big</li> <li>4. Acceleration time is too short</li> <li>5. Grid voltage is too low</li> <li>6. Inappropriate V/F curve</li> </ol>	<ol style="list-style-type: none"> <li>1. Conduct motor parameter self-tuning again</li> <li>2. Choose an inverter with larger power</li> <li>3. Reduce DC braking current, extend braking time</li> <li>4. Extend acceleration time</li> <li>5. Check grid voltage</li> <li>6. Adjust V/F curve setup, adjust the increment of manual torque</li> </ol>
E.OL1	Motor overload	<ol style="list-style-type: none"> <li>1. Incorrect setup of motor overload protection coefficient</li> <li>2. Motor stalling or sudden load change is too big</li> <li>3. Long term low speed high load operation for universal motor</li> <li>4. Grid voltage is too low</li> <li>5. Inappropriate V/F curve</li> </ol>	<ol style="list-style-type: none"> <li>1. Set the motor overload protection coefficient correctly</li> <li>2. Check load</li> <li>3. Use dedicated motor for long term low speed operation</li> <li>4. Check grid voltage</li> <li>5. Adjust V/F curve setup, adjust the increment of manual torque</li> </ol>
E.EF	External fault	The external fault emergency stop terminal is valid	Release the external fault terminal after the fault is eliminated
E.EEP	EEPROM read/write error	Read/write error of control parameters	Press STOP key to reset or seek service
E.CE	Rs485 abnormal communication	<ol style="list-style-type: none"> <li>1. Abnormality in upstream machine</li> <li>2. Abnormality in communication line</li> <li>3. Incorrect setup of communication parameters</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the wiring of upstream machine</li> <li>2. Check communication wiring</li> <li>3. Setup the communication parameters correctly</li> </ol>
E.Sht	Abnormal contactor	<ol style="list-style-type: none"> <li>1. Grid voltage is too low</li> <li>2. Contactor is broken</li> <li>3. Power on buffer resistance is broken</li> <li>4. Control circuit is broken</li> <li>5. Input phase failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check grid voltage</li> <li>2. Replace the contactor of main circuit, or seek service</li> <li>3. Replace the buffer resistance, or seek service</li> <li>4. Seek service</li> <li>5. Check input R.S.T wiring</li> </ol>
E.ItE	Abnormality in current inspection circuit	<ol style="list-style-type: none"> <li>1. Loose in control panel wiring or plug-in</li> <li>2. Auxiliary power is broken</li> <li>3. Hall device is broken</li> <li>4. Abnormality in amplification circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Check and rewire</li> <li>2. Seek service</li> <li>3. Seek service</li> <li>4. Seek service</li> </ol>
E.PCE	Operation panel data copy error	<ol style="list-style-type: none"> <li>1. The operation panel parameters are incomplete or the version of the operation panel is inconsistent with that of main control board.</li> <li>2. The EEPROM of the operation panel is broken</li> </ol>	<ol style="list-style-type: none"> <li>1. Refresh the data and the version of the operation panel, use F7.04 = 1 to upload parameters then use 7.04 = 2 or 3 to download.</li> <li>2. Seek service</li> </ol>
E.tE	Poor self-tuning	<ol style="list-style-type: none"> <li>1. Incorrect setup of motor nameplate parameters</li> <li>2. Conduct reserve rotation self-tuning when reserve rotation is prohibited</li> <li>3. Poor motor wiring</li> <li>4. Self-tuning overtime</li> </ol>	<ol style="list-style-type: none"> <li>1. Set the parameters correctly according to motor nameplate</li> <li>2. Cancel prohibition on reserve rotation</li> <li>3. Check motor wiring</li> <li>4. Check F0.08 (operating frequency upper limit) to see if the set value of F0.08 is lower than rated frequency</li> </ol>
E.PG	PG fault	With PG vector control, the encoder signal line is disconnected.	Check the connection and reconnect the encoder.
E.bCE	Braking unit fault	Braking pipe is broken	Seek service

### 9.3 Abnormality Handling

Phenomenon	Conditions	Possible reasons	Troubleshooting methods
No response from operation panel	Part or all of the keys have no response.	The operation panel is locked.	Press and hold PRG/S key under stop or operation parameter status, then press  to unlock.
		The keys are damaged.	Fully disconnect the inverter before power it on again. Replace the operation panel or seek service.
Cannot change function code	Cannot change under operation status.	User is not allowed to change function codes under operation status	Change under stop status.
	Cannot change part of the function codes.	Function code F7.03 is set to 1 or 2 The function code is an actual measured value.	Change F7.03 to 0 User is not allowed to change actual parameters.
	Cannot enter by pressing PRG/S ; the displayed function code is 0000.	Need user password	Enter the correct user password. Seek service.
The inverter stops unexpectedly during operation.	The inverter stops without receiving any stop command and the operation indicator goes off.	There is a fault alarm.	Identity fault reasons and reset fault.
		Power is disconnected.	Check power supply.
		Operation command channel is changed.	Check the corresponding function code setting of operation and running command channels.
		The positive and negative logic of control terminal is changed.	Check if F5.06 is set as required.
	The motor stops automatically without receiving any stop order; the inverter runs at zero frequency and the operation indicator is on.	Automatic fault reset.	Check fault reset setup and fault reason.
		External disconnection.	Check external disconnection setup and fault source.
		The set frequency is 0.	Check set frequency
		The starting frequency is bigger than set frequency.	Check starting frequency
		The jump frequency setting is not correct.	Check jump frequency setting
The "Prohibit forward rotation operation" terminal is enabled during forward rotation operation.		Check terminal function setup.	
	The "Prohibit reverse rotation operation" terminal is enabled during reverse rotation operation.	Check terminal function setup.	
The inverter does not operate.	After pressing the Run key, the inverter does not operate and the operation indicator is off.	The free stop terminal is enabled.	Check the free stop terminal.
		The operation prohibition terminal is enabled.	Check the operation prohibition terminal.
		The external stop terminal is enabled..	Check the external stop terminal.
		Under three-wire control mode, the three-wire control terminal is not closed.	Set and close the three-wire control terminal.
		Fault alarm exists.	Eliminate the fault.
		The positive and negative logic of input terminal is not set properly.	Check F5.06 setting
The inverter displays P.oFF immediately after being powered on.	The thyristor or contactor is disconnected and the load is relatively high.	Since the thyristor or contactor is disconnected, the DC bus voltage of main circuit will decrease when the inverter runs with relatively high load, therefore the inverter will display P.oFF instead of E.SHt fault.	Wait until the thyristor or contactor is fully closed before starting the inverter.



## 10 Environmental Protection

In order to protect the environment, the product or product parts should be disposed of according to the industrial waste treatment process, or be sent to the recycling station for assortment, dismantling and recycling according to local regulations.

## 11 Parameter Summary Table

Item	Explanation																																										
Function code	Number of function parameter groups and parameters																																										
Name	Full name of function parameter																																										
Parameter explanation	Detailed description of function parameter																																										
Units	Unit explanation:																																										
	<table border="1"> <thead> <tr> <th>Unit</th> <th>Name</th> <th>Unit</th> <th>Name</th> <th>Unit</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>V</td> <td>Voltage</td> <td>A</td> <td>Current</td> <td>°C</td> <td>Centigrade</td> </tr> <tr> <td>mH</td> <td>Millihenry</td> <td>rpm</td> <td>Rotation speed</td> <td>Ω</td> <td>Ohm</td> </tr> <tr> <td>%</td> <td>Percentage</td> <td>Hz</td> <td>Hertz</td> <td>kHz</td> <td>Kilohertz</td> </tr> <tr> <td>kW</td> <td>Kilowatt</td> <td>ms</td> <td>Millisecond</td> <td>s</td> <td>Second</td> </tr> <tr> <td>min</td> <td>Minute</td> <td>H</td> <td>Hour</td> <td>kh</td> <td>Kilohour</td> </tr> <tr> <td>bps</td> <td>Baud rate</td> <td>/</td> <td>None</td> <td></td> <td></td> </tr> </tbody> </table>	Unit	Name	Unit	Name	Unit	Name	V	Voltage	A	Current	°C	Centigrade	mH	Millihenry	rpm	Rotation speed	Ω	Ohm	%	Percentage	Hz	Hertz	kHz	Kilohertz	kW	Kilowatt	ms	Millisecond	s	Second	min	Minute	H	Hour	kh	Kilohour	bps	Baud rate	/	None		
	Unit	Name	Unit	Name	Unit	Name																																					
	V	Voltage	A	Current	°C	Centigrade																																					
	mH	Millihenry	rpm	Rotation speed	Ω	Ohm																																					
	%	Percentage	Hz	Hertz	kHz	Kilohertz																																					
	kW	Kilowatt	ms	Millisecond	s	Second																																					
min	Minute	H	Hour	kh	Kilohour																																						
bps	Baud rate	/	None																																								
Default value	Factory set value of function parameter.																																										
Alteration	The alteration attribute of function parameters (whether the parameter is allowed to be altered and the conditions for alteration)																																										
	<input type="radio"/> Means the value of the parameter can be altered no matter the inverter is on or off.																																										
	<input checked="" type="radio"/> Means the value of the parameter can only be altered in standby status.																																										
	<input type="radio"/> Means the value of the parameter is actual measured value which cannot be altered; (the inverter will automatically check the alteration attribute of each parameter to prevent user from misoperation.)																																										

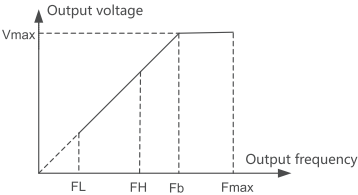
2. Most parameters use decimal system (DEC), if the parameter starts with "0x" , it means the parameter uses hexadecimal system (such as 0x0000). When editing parameters, user can use hexadecimal system (0~F) for the value range of some digits.

3. "Default value" is the value of a function code parameter when it is restored to factory set value; however, the actual measured parameters or recorded values cannot be restored to factory set value.

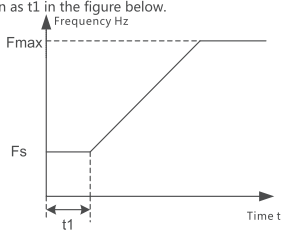
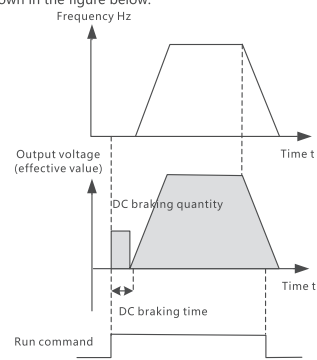
4. The inverter offers password protection function to effectively protect parameters. See F7.00 for setup method.

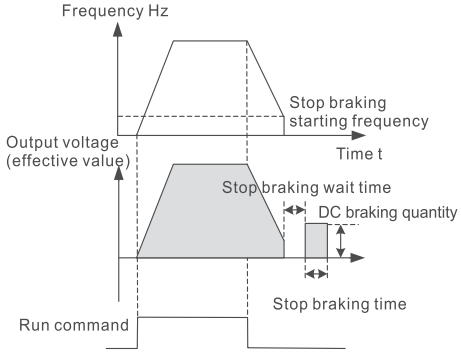
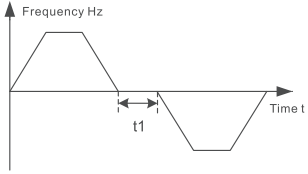
Function code	Name	Value range	Default value	Alteration
<b>F0 group: Basic functions</b>				
F0.00	Control method selection	0: control without PG vector (open-loop vector) 1: control with PG vector 2: control without PG-V/F 3: control with PG-VF	0	<input checked="" type="radio"/>
F0.01	Select operation command channel	Used to select inverter control command channel. Inverter control commands include: start, stop, forward rotation, reverse rotation and inching. 0: Operation panel control Use the RUN, STOP, MF keys on the operation panel to start and stop the inverter. 1: Terminal control Use the external control terminal Xi (Function code F5.00 ~ F5.06, set 1 and 2) and forward and reverse rotation command to start and stop the inverter. 2: Communication control Use RS485 terminal and Modbus protocol to start and stop the inverter.	0	<input type="radio"/>

Function code	Name	Value range	Default value	Alteration
F0.02	Select main frequency source	0: Digital setting (F0.05) When connecting the inverter to power, use the value of function code F0.05 as current set frequency. 1: AI1 analog setting 2: AI2 analog setting 3: Reserve When analog signal input is used as voltage signal input, the following rules shall apply: -10V~0V: Reverse rotation, the corresponding frequency can be defined in Group F5. 0V~10V: Forward rotation, the corresponding frequency can be defined in Group F5. 4: High speed pulse HDI setting The frequency setting is determined by HDI terminal high speed pulse frequency; the relation between high speed pulse frequency and set frequency can be defined in Group F5. 5: Reserve	0	○
F0.03	Auxiliary frequency source setting	0: Non-auxiliary setting The set frequency consists main set frequency only, the auxiliary frequency source is invalid by default. 1: AI1 analog setting 2: AI2 analog setting 3: Reserve 4: High speed pulse HDI setting Auxiliary frequency setting is determined by terminal pulse frequency and can only input through HDI. 5: Process PID output frequency	0	○
F0.04	Calculation of main and auxiliary frequency source	0: "+" Use the sum of main set frequency and auxiliary set frequency as set frequency. When the polarity of the combined frequency is opposite from that of the main set frequency, the set frequency will be zero. 1: "-" Use the difference between main set frequency and auxiliary set frequency as set frequency. When the polarity of the combined frequency is opposite from that of the main set frequency, the set frequency will be zero. 2: MAX (Main set frequency, auxiliary set frequency) Use main set frequency or auxiliary set frequency (the one with bigger absolute value) as set frequency. When the polarity of the auxiliary frequency is opposite from that of the main set frequency, the set frequency will be the main set frequency. 3: MIN (Main set frequency, auxiliary set frequency) Use main set frequency or auxiliary set frequency (the one with smaller absolute value) as set frequency. When the polarity of the auxiliary frequency is opposite from that of the main set frequency, the set frequency will be zero.	0	○
F0.05	Keypad digital setting	When digital setting is used as main set frequency channel (F0.02=0), the parameter of this function is the initial set frequency of the main set frequency of the inverter. Setup range: F0.09~F0.08	50.00Hz	○
F0.06	Operation direction setup	User can change the operation direction of the motor by changing the value of this function. It works the same as adjusting any two motor lines (U, V, W) to change the operation direction of the motor. 0: Default direction; Forward: the FWD/REV indicator is on. 1: Reverse direction; Reverse: the FWD/REV indicator is off. Note: If the parameter is restored to default value, the motor will run in the default direction. For applications that prohibit change of motor operation direction after system commissioning is completed, this function should be used with caution. 2: Run in reserve direction prohibited; the inverter is prohibited to run in reverse direction, which is suitable for applications that do not allow reverse operation direction.	0	○

Function code	Name	Value range	Default value	Alteration
F0.07	Max. output frequency	The maximum output frequency of the inverter is the foundation for frequency setup and acceleration.	50.00Hz	☉
F0.08	Operation frequency upper limit	Max. output frequency: The biggest frequency allowed to be output by the inverter, shown as Fmax in the figure below; Operation frequency upper limit: The biggest allowed frequency set by user, shown as FH in the figure below;	50.00Hz	○
F0.09	Operation frequency lower limit	Operation frequency lower limit: The smallest allowed frequency set by user, shown as FL in the figure below;	0.00Hz	○
F0.10	Basic operation frequency	Basic operation frequency: The smallest value of corresponding output frequency when the inverter outputs highest voltage with V/F method shown as Fb in the figure below;	50.00Hz	○
F0.11	Max. output voltage	Max. output voltage: The highest voltage allowed to be output by the inverter, shown as Vmax in the figure below.   <p>Figure 6-3-1 Definitions for frequency limits                      Setup range: F0.07: F0.08~300.00Hz                      F0.08: F0.09~F0.07                      F0.09: 0.00Hz~F0.08                      F0.10: 0.00Hz~F0.07                      F0.11: 0~480V</p>	Rated value of inverter	●
F0.12	UP/DN speed adjustment	Used to define the increment for changing set frequency by using UP/DN terminal or $\wedge/\vee$ keys. Setup range: (0.01~99.99)Hz/s	1.00Hz	○
F0.13	UP/DN adjustment control	LED ones digit: (after changing frequency by using UP/DN) 0: save the frequency upon power off 1: do not save the frequency upon power off LED tens digit: (after changing frequency by using UP/DN) 0: maintain the frequency upon shut down 1: restore to initial frequency upon shut down	00	○
F0.14	Acceleration time 1	The factory settings of acceleration and deceleration time are: 5.5kW and below: 10.0s 7.5kW~55kW: 20.0s 75kW and above: 30.0s	Depends on model	○
F0.15	Deceleration time 1	Acceleration time: The time needed for the inverter to accelerate from zero to maximum output frequency (F0.07). Deceleration time: The time needed for the inverter to decelerate from maximum output frequency to zero. Setup range: (0.0~6000.0)s	Depends on model	○
F0.16	Carrier frequency	Adjust motor noise through carrier frequency, avoiding the resonance point of the mechanical system, reducing earth leakage current and the interference on the inverter. When the carrier frequency is relatively low, there will be more higher harmonic in output current, which leads to bigger motor wear and temperature rise; When the carrier frequency is relatively high, there will be less motor wear and temperature rise, but more inverter wear and interference. By adjusting carrier frequency, user can achieve following influences:	Depends on model	○

Function code	Name	Value range	Default value	Alteration														
F0.16	Carrier frequency	<table border="1"> <thead> <tr> <th>Carrier frequency</th> <th>Low → High</th> </tr> </thead> <tbody> <tr> <td>Motor noise</td> <td>High → Low</td> </tr> <tr> <td>Output current waveform</td> <td>Poor → Good</td> </tr> <tr> <td>Motor temperature rise</td> <td>High → Low</td> </tr> <tr> <td>Inverter temperature rise</td> <td>Low → High</td> </tr> <tr> <td>Leakage current</td> <td>Small → Big</td> </tr> <tr> <td>External radiation interference</td> <td>Small → Big</td> </tr> </tbody> </table> <p>Inverters with different power may have different carrier frequency.            Note: If the set carrier frequency is higher than factory setting, the temperature rise of inverter radiator will increase. In this case, user should derate the inverter, otherwise the system may send overheat alarm.            Setup range: (0.5–15.0)kHz</p>	Carrier frequency	Low → High	Motor noise	High → Low	Output current waveform	Poor → Good	Motor temperature rise	High → Low	Inverter temperature rise	Low → High	Leakage current	Small → Big	External radiation interference	Small → Big	Depends on model	○
Carrier frequency	Low → High																	
Motor noise	High → Low																	
Output current waveform	Poor → Good																	
Motor temperature rise	High → Low																	
Inverter temperature rise	Low → High																	
Leakage current	Small → Big																	
External radiation interference	Small → Big																	
F0.17	Motor parameter self-learning	<p>0: Do not operation            1: Operate (asynchronous motor is static)            Suitable to applications where motor cannot release load, for motor parameter self-learning.            2: Operate (asynchronous motor runs)            Suitable to applications demand high control precision, for complete motor parameter self-learning.            After self-tuning, the set value of F0.17 will be changed to 0.            Note: Before parameter self-learning, user must input motor parameters according to motor nameplate correctly, otherwise the motor parameter self-learning can be inaccurate.</p>	0	⊙														
F0.18	Automatic voltage regulation (AVR) function	<p>0: Do not operation            1: Valid all time            2: Only invalid during deceleration            AVR refers to Automatic voltage regulation. When the input voltage deviates from rated value, this function can maintain a constant output voltage. Therefore, AVR function is usually activated, especially when input voltage is higher than rated value.            If the AVR function is deactivated during deceleration, the deceleration time can be shortened but the operation current will be bigger.            If the AVR function is activated all time, the motor will decelerate smoothly, with smaller operation current but longer deceleration time.</p>	2	○														
F0.19	Parameter initialization	<p>0: Do not operation            1: Clear fault records            2: Restore factory setting            Note: If the function is set to 2, the system will start to restore all the programmable parameters to factory setting. The operation panel will display "Int-" , and we do not suggest any other operations or disconnect power during this process, otherwise the restoration may be incomplete which can lead to fault when the equipment is put into operation again. The restoration is completed when the panel shows main interface again.</p>	0	⊙														
<b>Group F1: Start and stop control group</b>																		
F1.00	Start methods	<p>0: Start from initial frequency            Start according to the set initial frequency (F1.01) and the maintain time of initial frequency (F1.02).            1: Brake first before starting from initial frequency            First conduct DC braking (Refer to F1.06–F1.09), then start according to Method 0. This method is suitable to applications where small inertia load can cause reverse rotation during startup.            2: Rotation speed tracking (including direction identification) and restart            The inverter will inspect the rotation speed and direction of the motor first, then it will start to operate at current speed to set frequency, achieving smooth and impact-free startup of rotating motor. This method is suitable for applications where large inertia load can cause reverse rotation during startup.            Note: Start method 1 is suitable for small inertia load can cause forward or reverse rotation of motor when the inverter is not operating. It is not suitable for large inertia load during high speed rotation.</p>	0	⊙														

Function code	Name	Value range	Default value	Alteration
F1.01	Starting frequency for direct start	Starting frequency refers to the initial frequency when the inverter starts, shown as $F_s$ in the figure below; the maintain time of starting frequency refers to the time that the inverter operates at starting frequency during startup, shown as $t_1$ in the figure below.	0.00Hz	○
F1.02	Maintain time of starting frequency	 <p>Figure 6-3-2 Starting frequency and startup time                      Setup range: F1.01: (0.00~60.00)Hz                      F1.02: (0.00~10.00)s                      Note: The operation frequency lower limit is not applicable to the starting frequency.</p>	0.00s	○
F1.03	DC braking current before starting	F1.03 and F1.04 are only valid when start after braking is selected (F1.00 = 1), as shown in the figure below.	0.0%	○
F1.04	DC braking time before starting	 <p>Figure 6-3-3 Start after braking                      Setup range: F1.03: 0.0%~100.0% (rated current of inverter)                      F1.04: 0.00 (Do no operate)                      (0.01~30.00)s</p>	0.00s	○
F1.05	Stop methods	0: Decelerated stop After receiving stop command, the inverter will decrease the output frequency gradually according to deceleration time. The inverter stops when the frequency is decreased to zero. 1: Free stop After receiving stop command, the inverter will cut off the output immediately and stops freely based on mechanical inertia. 2: Decelerated stop + DC braking After receiving stop command, the inverter will decrease the output frequency gradually according to deceleration time. When the starting frequency for braking is reached, the inverter will conduct DC braking. See F1.06~F1.09 for the definition of DC braking.	0	◎

Function code	Name	Value range	Default value	Alteration
F1.06	Starting frequency for DC braking	Starting frequency for DC braking: During the process of decelerated stop, the inverter will conduct DC braking when this frequency is reached.	0.00Hz	○
F1.07	Delay time for DC braking	Delay time for DC braking: Before conducting DC braking, the inverter will lockout output first. The purpose of such delay is to prevent overcurrent due to DC braking at high operation speed.	0.00s	○
F1.08	DC braking current	DC braking current: Refers to the applied DC braking capacity. The braking effect increases with the current. The DC braking current is set as a percentage of the rated current of the inverter.	0.0%	○
F1.09	DC braking time	DC braking time: The duration of DC braking. DC braking is invalid if the time is 0. The inverter will stop according to the deceleration time.   <p>Figure 6-3-4 Decelerated DC braking                      Setup range: F1.06: (0.00~60.00)Hz                      F1.07: (0.01~10.00)s                      F1.08: 0.0%~100.0%                      F1.09: (0~30.00)s                      Note: F1.08 is a percentage of the rated current of the inverter.</p>	0.00s	○
F1.10	Dead time for forward and reverse rotation	This is the transition time for the inverter to transfer from forward rotation to reverse rotation (or vice versa), which can be set in F1.11, shown as t1 in the figure below.   <p>Figure 6-3-5 Dead time for forward and reverse rotation                      Setup range: (0~360.00)s</p>	0.00s	○
F1.11	Switch modes for forward and reverse rotation	0: Switch at the lower limit of operation frequency The inverter will transfer from forward rotation to reverse rotation (or vice versa) when the lower limit of operation frequency (F0.09) is reached. 1: Switch at starting frequency The inverter will transfer from forward rotation to reverse rotation (or vice versa) when the starting frequency (F1.01) is reached.	0	⊙
F1.12	Reserve	---	---	●

Function code	Name	Value range	Default value	Alteration
F1.13	Select acceleration and deceleration method	<p>This function is used to select the frequency change method during acceleration and deceleration.</p> <p>0: Linear acceleration and deceleration The output frequency will increase or decrease according to constant slope, as shown in the figure below.</p> <p>1: S curve acceleration and deceleration The output frequency will increase or decrease according to S curve, which is typically used in applications that require smooth start and stop process, such as elevator or conveyor.</p> <p>Figure 6-3-6 Linear acceleration and deceleration</p>	0	⊙
F1.14	Start period of S curve acceleration	10.0%~50.0% (Acceleration time)	20%	⊙
F1.15	End period of S curve acceleration	10.0%~80.0% (Acceleration time)	20%	⊙
F1.16	Start period of S curve deceleration	10.0%~50.0% (Deceleration time)	20%	⊙
F1.17	End period of S curve deceleration	10.0%~80.0% (Deceleration time)	20%	⊙
<b>Group F2: Motor parameters</b>				
F2.00	Model display	0: CT model (Constant torque) 1: VT model (Fan-pump)	0	●
F2.01	Motor rated power	<p>Set the parameters of controlled asynchronous motor.</p> <p>To guarantee the proper control of performance, please set F2.01~F2.06 correctly according to the nameplate of the asynchronous motor.</p> <p>Setup range: F2.01: (0.4~999.9) kW F2.02: 0~rated voltage of inverter F2.03: (0.1~999.9)A F2.04: (1.00~300.00)Hz F2.05: 2~24 F2.06: (0~60000)rpm</p> <p>Note: The power of the asynchronous motor should match with that of the inverter. Typically, the power of the asynchronous motor is only allowed to be two class smaller or one class bigger than the power of the inverter, otherwise the performance cannot be guaranteed.</p>	Depends on model	⊙
F2.02	Motor rated voltage		Depends on model	⊙
F2.03	Motor rated current		Depends on model	⊙
F2.04	Motor rated frequency		Depends on model	⊙
F2.05	Motor pole number		4	⊙
F2.06	Motor rated rotation speed		1440rpm	⊙
F2.07	Motor stator resistance %R1			Depends on model

Function code	Name	Value range	Default value	Alteration
F2.08	Motor leakage inductive reactance %X	Function code F2.08 is the sum of stator leakage inductive reactance and rotor leakage inductive reactance. Setup range: F2.07: 0.00%~50.00% F2.08: 0.00%~50.00% F2.09: 0.00%~50.00% F2.10: 0.0%~2000.0% F2.11: (0.1~999.9)A	Depends on model	⊙
F2.09	Motor rotor resistance %R2		Depends on model	⊙
F2.10	Motor mutual inductive reactance % X <sub>m</sub>		Depends on model	⊙
F2.11	Motor empty load current I		Depends on model	⊙
<b>F3: Vector control</b>				
F3.00	Speed/torque control method	0: speed control method 1: torque control method	0	⊙
F3.01	Speed loop proportional gain 1 (low speed ASR1-P)	Function codes F3.00~F3.07 are valid under vector control mode. Under vector control mode, user can change the speed response characteristics of vector control by adjusting the proportional gain P and integral time I. Setup range: F3.01: 0.1~200.0 F3.02: (0.000~10.000)s F3.03: 0~8 (correspond to 0~28/10ms) F3.04: 0.1~200.0 F3.05: (0.000~10.000)s F3.06: 0~8 (correspond to 0~28/10ms)	20.0	○
F3.02	Speed loop integral time 1 (low speed ASR1-I)		0.200s	○
F3.03	ASR1 output filter		0	○
F3.04	Speed loop proportional gain 2 (high speed ASR2-P)		20.0	○
F3.05	Speed loop integral time 2 (high speed ASR2-I)		0.200 s	○
F3.06	ASR2 output filter		0	○
F3.07	ASR1/2 switch frequency		10.0%	○
F3.08	Forward rotation speed limit under torque control	Driving torque limit is the torque limit under motoring condition; Braking torque limit is the torque limit under generating condition; 100% set value corresponds to the rated torque of the inverter. Setup range: F3.07~ F3.09: 0.0%~+100.0% F3.10~ F3.11: 0.0%~+300.0%	100.0%	○
F3.09	Reverse rotation speed limit under torque control		100.0%	○
F3.10	Driving torque limit		180.0%	○
F3.11	Braking torque limit		180.0%	○
F3.12	Select torque setting		0: Keypad set torque (F3.13) 1: AI1 2: AI2 3: Reserve 4: HDI high speed pulse setting	0
F3.13	Keypad set torque	Set the target torque as a percentage of the rated current of the motor. Setup range: -300.0%~+300.0%	0.0%	○
F3.14	Speed→torque switching point	To start under torque control mode, select speed mode first. When the output torque reaches the switching point, the system will switch to torque control mode after the switching delay time is over. F3.14 will be invalid if terminal X1~X6 and HDI are used for switching. In this case, F3.15 is the delay time for speed-torque switching. Setup range: F3.14: 0%~+300.0% (initial torque) F3.15: (0~1000)ms	100.0%	⊙
F3.15	Delay time for speed-torque switching		0 ms	⊙



Function code	Name	Value range	Default value	Alteration
F3.16	Torque setting filtering time	Use the delay filter to filtrate the external torque command once through torque setting channel. Set filtering time properly to prevent sudden change of torque command which can cause motor shaking. Setup range: (0~65535)ms	0 ms	⊙
F3.17	Pre-excitation time	This function is used for motor pre-excitation during inverter startup. It creates a magnetic field inside the motor which can improve the torque characteristics during motor startup effectively. Setup range: (0.000~8.000)s	0.300 s	○
F3.18	Current loop proportional gain (ACR-P)	F3.18 and F3.19 are the parameters of PI regulator in the current loop. By increasing current loop KP or decreasing I, user can speed up the dynamic response of system torque; by decreasing KP or increasing I, user can enhance the stability of the system. Setup range: F3.18: 1~5000 F3.19: (0.5~100.0)ms	1000	○
F3.19	Current loop integral time (ACR-I)	Note: For most applications, there is no need to adjust the PI of current loop, we suggest user to change this group of parameters with caution.	8.0 ms	○
<b>Group F4: V/F control</b>				
F4.00	V/F curve setup	Select different V/F curves for different torque requirements. 0: Linear V/F curve; applicable to constant torque load. 1: 2 power reduced torque V/F curve; as 2.0 power reduced torque characteristics. 2: 1.7 power torque V/F curve; as 1.7 power reduced torque characteristics. 3: 1.2 power torque V/F curve; as 1.2 power reduced torque characteristics. The above curves are applicable to variable torque loads such as fans and pumps. Use can make adjustments based on load characteristics to achieve maximum energy saving. 4: Multi-point V/F curve (set in F4.01~F4.06); user can use F4.01~F4.06 to customize V/F curve. User can (V1, F1), (V2, F2), (V3, F3) to customize V/F curve for special load characteristics. The default user customized V/F curve is a straight line. 5: V/F separated curve (set voltage in F4.10~F4.15); in this mode, V and f are separated. User can use the frequency setting channel set in F0.02 to adjust f so as to change curve characteristics, or use the voltage setting channel set in F4.10 to adjust V so as to change curve characteristics.	0	⊙
F4.01	V/F frequency 3	When F4.00 = 4 (multi-point V/F curve), use can use F4.01~F4.06 to lockup the V/F curve. Usually, the V/F curve is set based on the load characteristics of motor. Setup range: F4.01: F4.03~maximum output frequency (F0.07) F4.02: F4.04~100.0% F4.03: F4.05~F4.01 F4.04: F4.06~F4.02 F4.05: 0.00 Hz~ F4.03 F4.06: 0~ F4.04 Note: V1 < V2 < V3, f1 < f2 < f3. Overheat or burnout may occur if the set low frequency voltage is too high which can cause overcurrent stall or initiate overcurrent protection.	0.00Hz	⊙
F4.02	V/F voltage 3		0.0%	⊙
F4.03	V/F frequency 2		0.00Hz	⊙
F4.04	V/F voltage 2		0.0%	⊙
F4.05	V/F frequency 1		0.00Hz	⊙
F4.06	V/F voltage 1		0.0%	⊙
F4.07	Torque increase		User can compensate low frequency torque by increasing output voltage. F4.07 corresponds to the maximum output voltage Vb. F4.08 defines the cut-off frequency for manual torque increase (as a percentage of basic operation frequency F0.10). By increasing torque, user can improve the V/F low frequency torque characteristics. User should increase the torque according to load. However, increasing too much torque can cause motor over-excitation and increase inverter output current which may lead to increased heat generation and reduced efficiency. If the torque increase is set to 0.0%, the inverter will increase torque automatically. Cut-off point for torque increase: Torque increase is only valid when the frequency is below this point. Setup range: F4.07: 0.0% (auto) 0.1%~30.0% F4.08: 0.0%~50.0%	0.0%
F4.08	Cut-off point for torque increase		10.0%	○

Function code	Name	Value range	Default value	Alteration
F4.09	Select energy saving operation	0: Do not operate 1: Automatic energy saving operation When the motor runs at constant speed with empty load or light load, the inverter will detect load current and adjust output voltage to achieve energy saving automatically. Note: This function is especially effective for fans and pumps.	0	⊙
F4.10	Select V/F output voltage channel	The channel for output voltage when separated V/F curve is selected. 0: Keypad set voltage (F4.11) 1: AI1 set voltage 2: AI2 set voltage 3: Reserve Note: 100% corresponds to the rated voltage of the motor.	0	○
F4.11	Keypad set voltage	If F4.10=0 (panel set voltage) is selected as motor setup channel, the value of the function code is the set value of voltage. Setup range: 0.0%~100.0% (rated voltage of motor)	100.0%	○
F4.12	Voltage increase time	Voltage increase time: Refers to the time needed for the inverter to accelerate from minimum output voltage to maximum output voltage. Voltage decrease time: Refers to the time needed for the inverter to decelerate from maximum output voltage to minimum output voltage. Setup range: F4.12~ F4.13: (0.1~10.0)s	5.0 s	○
F4.13	Voltage decrease time		5.0 s	○
F4.14	Maximum output voltage	If separated V/F curve is selected, user should set the maximum and minimum values of the output voltage of inverter, which should be percentage of the rated output voltage of inverter. Setup range: F4.14: F4.15~100.0% (rated voltage of inverter) F4.15: 0.0%~F4.14 (rated voltage of inverter)	100.0%	⊙
F4.15	Minimum output voltage		0.0%	⊙
<b>Group F5: Input terminal parameters</b>				
F5.00	Select HDI input type	0: HDI is high speed impulse input (set by F5.25~F5.27) 1: HDI is switch input (similar to the function of terminal X1~X6)	0	⊙
F5.01	Select X1 terminal function	0: None 1: Forward rotation (FWD) 2: Reverse rotation (REV) 3: Inching forward rotation 4: Inching reverse rotation 5: Three-wire operation control 6: External reset (RESET) input 7: External fault input 8: External interrupt input 9: Inverter operation prohibited 10: Stop by terminal 11: Stop by terminal DC braking 12: Free stop by terminal 13: Frequency up command (UP) 14: Frequency down command (DN) 15: Command switches to keypad control 16: Command switches to terminal control 17: Command switches to communication control 18: Main frequency source switches to digital setting 19: Main frequency source switches to AI1 20: Main frequency source switches to AI2 21: Reserve 22: Main frequency source switches to HDI 23: Invalid auxiliary frequency source 24: Multistage frequency option 1 25: Multistage frequency option 2 26: Multistage frequency option 3 27: Multistage frequency option 4 28: Acceleration and deceleration time option 1 29: Acceleration and deceleration time option 2 30: Multistage closed loop setting option 1 31: Multistage closed loop setting option 2 32: Multistage closed loop setting option 3 33: Multistage closed loop setting option 4	1	⊙
F5.02	Select X2 terminal function		2	⊙
F5.03	Select X3 terminal function		24	⊙
F5.04	Select X4 terminal function		25	⊙
F5.05	Reserve		---	●
F5.06	Reserve		---	●
F5.07	Select HDI terminal function		0	⊙

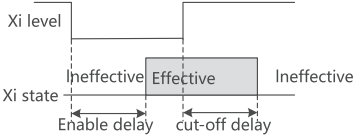
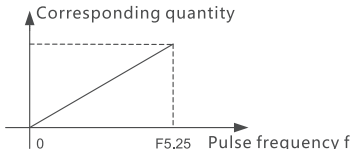
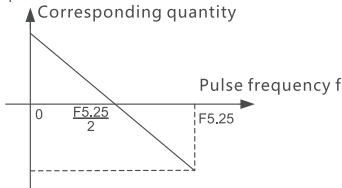
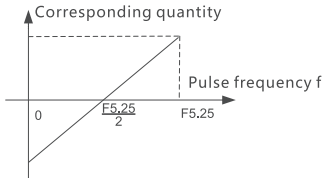
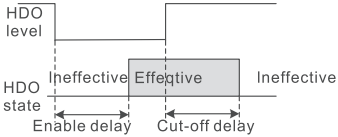
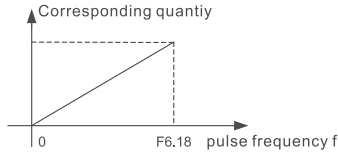
Function code	Name	Value range	Default value	Alteration
F5.07	Select HDI terminal function	34: Forward rotation prohibited 35: Reverse rotation prohibited 36: Acceleration and deceleration prohibited 37: Process closed loop prohibited 38: Speed control and torque control switching terminal 39: PLC pause 40: PLC prohibited 41: Erase PLC shut-down memory 42: Frequency wobbling 43: Wobbling reset 44~50: Reserve	0	⊙
F5.08	Input terminal valid status setup of (X1~X6, HDI)	Binary system setup: 0: Normal logic, connection valid 1: Reverse logic, disconnection valid LED ones digit: BIT0~BIT3: X1~X4 LED tens digit: BIT0~BIT1: Reserve BIT2: HDI BIT3: Reserve Note: All the terminals are set to positive logic upon delivery.	00	○
F5.09	Filtering time of input terminal	This function code is used to define the filtering time of input terminal. When the status of input terminal is changed, the changed status is only deemed valid if it remains the same after the set filtering time is over, otherwise the latest status will be restored. This function is used to prevent misoperation due to interference. Setup range: (0~1000)ms	10 ms	○
F5.10	Select terminal control mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2 4: Reserve	0	⊙
F5.11	Delay time for X1 terminal connection	See the figure below for the delay time for the level changes during the connection and disconnection of programmable input terminals:  	0.000 s	○
F5.12	Delay time for X1 terminal disconnection		0.000 s	○
F5.13	Delay time for X2 terminal connection		0.000 s	○
F5.14	Delay time for X2 terminal disconnection		0.000 s	○
F5.15	Delay time for X3 terminal connection		0.000 s	○
F5.16	Delay time for X3 terminal disconnection		0.000 s	○
F5.17	Delay time for X4 terminal connection		0.000 s	○
F5.18	Delay time for X4 terminal disconnection		0.000 s	○
F5.19	Reserve		---	●
F5.20	Reserve		---	●
F5.21	Reserve		---	●
F5.22	Reserve		---	●

Figure 6-3-7 Connection and disconnection delay of programmable input terminals  
Setup range: F5.11~F5.24: 0.000~50.000s

Function code	Name	Value range	Default value	Alteration
F5.23	HDI terminal closing delay time		0.000 s	○
F5.24	HDI terminal breaking delay time		0.000 s	○
F5.25	HDI maximum input pulse frequency	Setup range: (0.1~100.0)kHz Note: Only valid when high speed pulse input is selected for HDI terminal, i.e. F5.00 is 0.	10.0 kHz	○
F5.26	Select HDI pulse setting center point	<p>0: No center point, as shown below.</p>  <p>Figure 6-3-8 No center point mode for HDI pulse setting The corresponding values of pulse input frequency are positive. 1: Center point mode 1</p>  <p>Figure 6-3-9 Center point mode 1 for HDI pulse setting Pulse input has a center point which is half of the maximum pulse input frequency F5.25. The corresponding value is positive when the pulse input frequency is smaller than the center point frequency. 2: Center point mode 2</p>  <p>Figure 6-3-10 Center point mode 2 for HDI pulse setting</p>	0	○
F5.27	Pulse setting filtering time	This function code is used to define the filtering time for input pulse. The longer the time, the slower the set pulse frequency changes. Setup range: (0.00~10.00)s	0.05 s	○
F5.28	Reserve	---	---	●
F5.29	AI1 filtering	F5.29~F5.31 defines the filtering time constant of AI channel for the filtering of input signal. The longer the time, the stronger the anti-interference capability and the slower the response; the shorter the time, the faster the response and the weaker the anti-interference capability. Setup range: F5.2~F5.31: (0.01~10.00)s	0.05 s	○
F5.30	AI2 filtering		0.05 s	○
F5.31	Reserve		---	●

Function code	Name	Value range	Default value	Alteration
F5.32	Curve selection	LED ones digit: Select AI1 curve 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4 LED tens digit: Select AI2 curve 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4 LED hundreds digit: Reserve LED thousands digit: Select HDI high speed input curve 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4	0000	○
F5.33	Maximum setting of curve 1	F5.35~110.00%	100.00%	○
F5.34	Actual value corresponds to the maximum setting of curve 1	Frequency setting: (0.0~100.00)%Fmax; (or torque: (0.0~300.00)%Te);	100.00%	○
F5.35	Minimum setting of curve 1	0.00%~ F5.33	0.00%	○
F5.36	Actual value corresponds to the minimum setting of curve 1	Same as F5.34	0.00%	○
F5.37	Maximum setting of curve 2	F5.39~110.00%	100.00%	○
F5.38	Actual value corresponds to the maximum setting of curve 2	Same as F5.34	100.00%	○
F5.39	Minimum setting of curve 2	0.0%~ F5.37	0.00%	○
F5.40	Actual value corresponds to the minimum setting of curve 2	Same as F5.34	0.00%	○
F5.41	Maximum setting of curve 3	F5.43~110.00%	100.00%	○
F5.42	Actual value corresponds to the maximum setting of curve 3	Same as F5.34	100.00%	○
F5.43	Minimum setting of curve 3	0.0%~ F5.41	0.00%	○
F5.44	Actual value corresponds to the minimum setting of curve 3	Same as F5.34	0.00%	○
F5.45	Maximum setting of curve 4	F5.47~110.00%	100.00%	○

Function code	Name	Value range	Default value	Alteration
F5.46	Actual value corresponds to the maximum setting of curve 4	Same as F5.34	100.00%	○
F5.47	Setting of curve 4 inflection point 2	F5.49~ F5.45	100.00%	○
F5.48	Actual value corresponds to the setting of curve 4 inflection point 2	Same as F5.34	100.00%	○
F5.49	Setting of curve 4 inflection point 1	F5.51~ F5.47	0.00%	○
F5.50	Actual value corresponds to the setting of curve 4 inflection point 1	Same as F5.34	0.00%	○
F5.51	Minimum setting of curve 4	0.0%~ F5.49	0.00%	○
F5.52	Actual value corresponds to the minimum setting of curve 4	Same as F5.34	0.00%	○
<b>Group F6: Output terminal parameters</b>				
F6.00	Select HDO output type	0: Open collector high speed pulse output, the HDO terminal is used for high speed pulse output, with maximum pulse frequency of 100.0kHz. See F6.18~F6.19 for detailed function description. 1: Open collector output, see F6.02 for detailed function description.	0	⊙
F6.01	Select Y output function	0: Inverter operating signal (RUN) 1: Frequency arrival signal (FAR) 2: Frequency level detection signal (FDT1) 3: Frequency level detection signal (FDT2) 4: Overload detection signal (OL) 5: Undervoltage lockout (LU) 6: External fault shutdown (EXT) 7: Frequency upper limit (FHL) 8: Frequency lower limit (FLL) 9: Inverter operating at zero speed 10: X1 terminal (reserve) 11: X2 terminal (reserve) 12: Simplified PLC operation phase completed indication 13: PLC cycle completed indication 14: Upper and lower limit of frequency wobbling 15: Inverter is ready (RDY) 16: Inverter fault 17: Reserve 18: Reserve 19: Torque limited 20: Forward and reverse rotation indication terminal of inverter 21~50: Reserve	0	⊙
F6.02	HDO output selection		0	⊙
F6.03	Select relay output (RO)		16	⊙
F6.04	Output terminal valid status setup (Y, HDO, RO)	Output terminal valid status setup: 	00	○

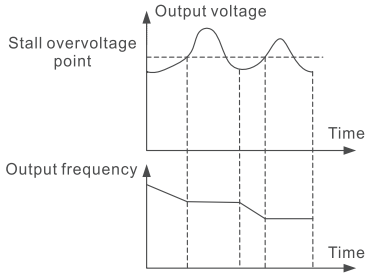
Function code	Name	Value range	Default value	Alteration
F6.04	Output terminal valid status setup (Y, HDO, R0)	Figure 6-3-11 Hexadecimal system setup for output terminal Positive logic: Valid when Xi terminal is connected to corresponding common terminal, invalid when disconnected; Negative logic: Invalid when Xi terminal is connected to corresponding common terminal, valid when disconnected. Binary system setup: 0: Valid when connected 1: Valid when disconnected	00	○
F6.05	Delay time for Y connection	 <p>See the figure below for the delay time for the level changes during the connection and disconnection of programmable output terminals (take terminal Y as example):</p>	0.000 s	○
F6.06	Delay time for Y disconnection		0.000 s	○
F6.07	Delay time for HDO connection		0.000 s	○
F6.08	Delay time for HDO disconnection		0.000 s	○
F6.09	Delay time for relay R0 connection		0.000 s	○
F6.10	Delay time for relay R0 disconnection		Figure 6-3-12 Connection and disconnection delay of Y signal Setup range: F6.05~F6.10: 0.000~50.000s	0.000 s
F6.11	Select AO1 output function	0: None 1: Output frequency (0~maximum frequency) 2: Set frequency (0~maximum frequency) 3: Set rate (after acceleration and deceleration) (0~maximum frequency) 4: Motor rotation speed (0~maximum) 5: Output current (0~2*I <sub>el</sub> ) 6: Output current (0~2*I <sub>lem</sub> ) 7: Output torque (0~3*I <sub>tem</sub> ) 8: Output power (0~2*P <sub>e</sub> ) 9: Output voltage (0~1.2*V <sub>e</sub> ) 10: Bus voltage (0~800V) 11: AI1 12: AI2 13: Reserve 14: HDI 15~36: Reserve	00	○
F6.12	Select AO2 output function	Note: If current signal is selected for AO1 or AO2 output, we suggest connecting an external equivalent resistance not bigger than 250 Ohm.	00	○
F6.13	Select HDO high speed pulse output function	10: Bus voltage (0~800V) 11: AI1 12: AI2 13: Reserve 14: HDI 15~36: Reserve	00	○
F6.14	AO1 gain	For AO1 and AO2 analog outputs, user can change the displayed range or correct meter error through gain adjustment.	100.0%	○
F6.15	AO1 bias correction	Setup range: F6.14: 0.0%~200.0%	0.0%	○
F6.16	AO2 gain	F6.15: -100.0%~100.0%	100.0%	○
F6.17	AO2 bias correction	F6.16: 0.0%~200.0% F6.17: -100.0%~100.0%	0.0%	○
F6.18	HDO maximum output pulse frequency	0.1 kHz~100.0 kHz	10.0 kHz	○
F6.19	Select center point for HDO pulse output	0: No center point, as shown below.  Figure 6-3-13 No center mode of HDO pulse setting The corresponding values of pulse output frequency are positive. 1: Center point mode 1, as shown below.	0	○

Function code	Name	Value range	Default value	Alteration
F6.19	Select center point for HDO pulse output	<p>Figure 6-3-14 Center point mode 1 of HDO pulse setting Pulse output has a center point which is half of the maximum pulse output frequency F6.18. The corresponding value is positive when the pulse output frequency is smaller than the center point frequency. 2. Center point mode 2 Pulse output has a center point which is half of the maximum pulse output frequency F6.18. The corresponding value is positive when the pulse output frequency is bigger than the center point frequency.</p> <p>Figure 6-3-15 Center point mode 2 of HDO pulse setting</p>	0	○
F6.20	Frequency arrival (FAR) detection width	<p>Figure 6-3-16 Output of frequency arrival signal As shown in the figure, pulse signal is sent when the output frequency of the inverter is within the positive and negative detection width of the set frequency. (Take output of terminal Y as example): Setup range: (0.00~300.00)Hz</p>	2.50 Hz	○
F6.21	FDT1 level	When the output frequency exceeds this set frequency (FDT1 level), an output indication signal will be sent, until the output frequency falls below the FDT1 level (FDT1 level - FDT1 lag), as shown in the figure below.	50.00 Hz	○
F6.22	FDT1 lag		1.00 Hz	○
F6.23	FDT2 level		25.00 Hz	○
F6.24	FDT2 lag	<p>Figure 6-3-17 Frequency level detection Setup range: F6.21~F6.24: (0.00~300.00)Hz</p>	1.00 Hz	○



Function code	Name	Value range	Default value	Alteration
<b>Group F7: Human-computer interface parameters</b>				
F7.00	Use password	0: No password Others: Password protection, see user password service in the panel operation instructions in 4.3.	0000	○
F7.01	Keypad lockout function	0: No lockout 1: Full lockout 2: Full lockout except multi-function key 3: Full lockout except ◀▶ key 4: Full lockout except RUN and STOP key Press and hold OK key, then press PRG to lock the keypad; when the keypad is locked, user can press and hold PRG key then press ▼ key to unlock.	0	○
F7.02	Select MF (multi-function) key functions	0: Inching 1: Free stop 2: Fast stop	0	○
F7.03	Parameter protection setup	0: All data is allowed to be changed 1: Data change prohibited except F0.05 and this function code 2: Data change prohibited except this function code	0	○
F7.04	Parameter copy (Note: Please contact manufacturer if needed)	0: None 1: Parameter upload 2: Parameter download 3: Parameter download (except motor parameters) Note: No upload/download of inverter parameters	0	⊙
F7.05	Select displayed parameters under operation status 1	Setup range: 0x0017~0x3FFF Bit00: Output frequency (Hz is on) Bit01: Set frequency (Hz flashes) Bit02: Bus voltage (V is on) Bit03: Output voltage (V is on) Bit04: Output current (A is on) Bit05: Rotation speed (rpm is on) Bit06: Output power (%is on) Bit07: Output (%is on) Bit08: PID setting (% flashes) Bit09: PID feedback (% is on) Bit10: Input terminal status Bit11: Output terminal status Bit12: Torque setting (% is on) Bit13: Current PLC segments Bit14~Bit15: Reserve	0x0017	○
F7.06	Select displayed parameters under operation status 2	Setup range: 0x0000~0x000F Bit00: Analog quantity AI1 (V is on) Bit01: Analog quantity AI2 (V is on) Bit02: Reserve Bit03: High speed pulse HDI frequency Bit04~Bit15: Reserve	0x0000	○
F7.07	Select displayed parameters under stop status	Setup range: 0x0003~0x0FFF Bit00: Set frequency (Hz is on, the frequency flashes slowly) Bit01: Bus voltage (V is on) Bit02: Input terminal status Bit03: Output terminal status Bit04: PID setting (% flashes) Bit05: PID feedback (% is on) Bit06: Torque setting (% is on) Bit07: Analog quantity AI1 (V is on) Bit08: Analog quantity AI1 (V is on) Bit09: Reserve Bit10: High speed pulse HDI frequency Bit11: Current PLC segments Bit12~Bit15: Reserve	0x0003	○

Func-tion code	Name	Value range	Default value	Alteration	
F7.08	Select STOP key function	0: Only valid to panel control mode 1: Valid to both panel and terminal control modes 2: Valid to both panel and communication control modes 3: Valid to all control modes	0	○	
<b>Group F8: Enhanced functions</b>					
F8.00	Acceleration time 2	The inverter has four acceleration and deceleration time options which can be selected through different combination of control terminals, see F5.01~F5.07 for the functions of these terminals. Setup range: F8.00~F8.05: (0.0~6000.0)s	10.0s	○	
F8.01	Deceleration time 2		10.0s	○	
F8.02	Acceleration time 3		10.0s	○	
F8.03	Deceleration time 3		10.0s	○	
F8.04	Acceleration time 4		10.0s	○	
F8.05	Deceleration time 4		10.0s	○	
F8.06	Inching operation frequency	Under operation panel control mode, user can press the MF key (F7.02 = 0) to achieve inching operation and release the MF key for inching stop. Under terminal control mode, user can set the terminals to achieve forward or reverse inching operation. Inching interval is the time from the end of last inching order to the start of next inching order. Any inching order sent during the interval will not activate the inverter, and the inverter will run at zero frequency (no output). If the inching order continues to exist, it will be executed after the interval is over; inching order sent after the interval will be executed immediately. Setup range: F8.06: (0.10~50.00)Hz F8.07: (0.0~100.0)s	5.00 Hz	○	
F8.07	Inching interval		0.0 s	○	
F8.08	Jump frequency 1	<p>Figure 6-3-18 Jump frequency and jump range After setting the jump frequency, the output frequency of the inverter will be adjusted automatically when the set frequency falls within the mechanical resonance frequency band of the driving system, so as to avoid operation at resonance frequency. Setup range: F8.08: (0.00~300.00)Hz F8.09: (0.00~30.00)Hz F8.10: (0.00~300.00)Hz F8.11: (0.00~30.00)Hz F8.12: (0.00~300.00)Hz F8.13: (0.00~30.00)Hz</p>	0.00 Hz	⊙	
F8.09	Range of jump frequency 1		0.00 Hz	⊙	
F8.10	Jump frequency 2		0.00 Hz	⊙	
F8.11	Range of jump frequency 2		0.00 Hz	⊙	
F8.12	Jump frequency 3		0.00 Hz	⊙	
F8.13	Range of jump frequency 3		0.00 Hz	⊙	
F8.14	Select restart after power failure		This function is used to define whether the inverter will restart automatically when reconnected to power after power failure and the wait time before automatic restart. Setup range: F8.13: 0: Do not operate 1: Operate F8.14: (0.0~10.0)s	0	⊙
F8.15	Wait time before restart after power failure			0.0 s	○
F8.16	Braking unit operating voltage		650 V~750 V(380V series) 340 V~380 V(220V series)	720 (380V series) 360 (220V series)	⊙

Function code	Name	Value range	Default value	Alteration
F8.17	Select dynamic braking	0: Do not operate 1: Operate Note: Please set this parameter according to actual usage, otherwise the control performance can be affected.	0	☉
F8.18	Use rate of dynamic braking	Setup range: (0.0~100.0)% Valid to the built-in model of the braking unit. Note: The resistance value and power of the braking resistor should be considered when setting this function.	80.0%	○
F8.19	Select carrier frequency adjustment	0: Do not adjust automatically 1: Automatic adjustment	1	○
F8.20	Select voltage adjustment	LED ones digit: Select overvoltage stall 0: Prohibited (when braking resistor is installed) 1: Allowed LED tens digit: Select 'Do not stop upon instantaneous stop' function 0: Do not operate 1: Operate (low voltage compensation) LED hundreds: Enable over-modulation 0: Invalid 1: Valid	001	☉
F8.21	Stall overvoltage point	 <p>Figure 6-3-19 Overvoltage stall function During decelerated operation, the actual decreasing rate of motor rotation speed can be smaller than that of the output frequency due to influence of load inertia, in which case the motor will feedback energy to the inverter and cause DC bus voltage increase, which can lead to overvoltage trip if not precautions are taken. The overvoltage stall protection function can measure bus voltage during deceleration and compare the voltage with the stall overvoltage point defined in F8.21 (with respect to standard bus voltage). If the voltage is bigger than the stall overvoltage point, the inverter output frequency will stop to decrease until the measured bus voltage is smaller than the stall overvoltage point, as shown in the figure. The LED hundreds digit is used to define whether the over-modulation function controlled by V/F is enabled. If the vector controlled over-modulation is enabled, the inverter will increase the use rate of bus voltage to enhance output voltage if the grid voltage is low (below 15% of rated voltage) or the system is running with heavy load for a long time.</p>	120.0% (380V series) 115.0% (220V series)	☉
F8.22	Drop control	Drop control is usually used for load distribution when multiple motors are used to drive one load. It will decrease the output frequency of the inverter when the load increases, so that the output frequency of the motor in load will decrease more when multiple motors are driving the same load. In this way, the load can be evenly distributed among all the motors. This parameter is the decrease value of the output frequency when the inverter outputs rated load. Setup range: 0.00 Hz (invalid)~10.00 Hz	0.00 Hz	○

Function code	Name	Value range	Default value	Alteration
F8.23	Automatic current limit level	Automatic current limit function provides real-time control of load current so that the current does not exceed the set automatic current limit level (F8.23), so as to prevent fault trip caused by current overshoot. This function is ideal for applications with large inertia or load changes. Automatic current limit level (F8.23) defines the current threshold for automatic current limit, as a percentage of the rated current of inverter. Frequency drop rate during current limit (F8.24) defines the adjustment rate of output frequency during automatic current limiting process. If the frequency drop rate during current limit F8.24 is too small, the automatic current limiting process will be too long which can cause overload; if the drop rate F8.24 is too big, the inverter will stay in generating status for too long, which can trigger overvoltage protection.	CT model: 160.0% VT model: 120.0%	⊙
F8.24	Frequency drop rate during current limit	The automatic current limit function is always valid during acceleration and deceleration. As for constant speed operation, the validity of automatic current limit function is defined by automatic current limit action (F8.25). If F8.25 = 0, the automatic current limit function is invalid during constant speed operation; if F8.25 = 1 the automatic current limit function is valid during constant speed operation. The output frequency may change during the automatic current limit action, therefore this function should not be used for application where stable output frequency during constant speed operation is required. If the function is activated and the current limit level is set too low, the overload capacity of the inverter can be affected. Setup range: F8.23: 20.0%~200.0% F8.24: (0.0~99.99)Hz/s F8.25: (always valid during acceleration and deceleration) 0: Invalid during constant speed operation 1: Valid during constant speed operation	5.00Hz/s	○
F8.25	Select automatic current limit action		0	⊙
F8.26	Slip compensation gain	Slip compensation is used to compensate the change in motor rotation speed due to load driving, so as to improve the strength of motor mechanical characteristics. F8.26 defines the sensitivity and speed for compensation, and F8.27 defines the amount of compensation. Setup range: F8.26: 0.0%~300.0% F8.27: 0.0%~250.0% F8.28: (0.1~25.0)s F8.29: (0.00~99.99)Hz/s	100.0%	○
F8.27	Slip compensation limit		200.0%	○
F8.28	Slip compensation time constant		2.0 s	○
F8.29	Frequency drop rate during voltage compensation		10.00 Hz/s	○
F8.30	Threshold for zero frequency operation		This function should be used with switch output terminal 9. Setup range: (0.00~300.00)Hz	0.50 Hz
F8.31	Reserve	---	---	●
F8.32	Oscillation suppression factor	Under V/F control mode, user can adjust this parameter to suppress motor oscillation. Setup range: 0~255	2	○
F8.33	Fan control	0: Automatic The internal temperature detection program will be activated automatically during operation. The program will start and stop the fan based on module temperature. If the fan is running before the inverter is stopped, it will continue to run for 3 minutes after inverter is stopped, then the internal temperature detection program will be activated. 1: Valid during operation, continue running for 3 minutes after inverter is stopped 2: The fan keeps running when the power is on	1	⊙
F8.34	Select textile function	0: Do not select textile function 1: Select textile function Frequency wobbling function is applicable to textile and chemical fiber industries as well as applications require horizontal motion and winding, where the output frequency of inverter will wobble up and down around the set frequency.	0	⊙
F8.35	Wobble method	LED ones digit: Starting method 0: Automatic 1: Manual by terminal LED tens digit: Wobble amplitude control	0000	⊙

Function code	Name	Value range	Default value	Alteration
F8.35	Wobble method	0: Relative center frequency 1: Relative maximum frequency LED hundreds digit: Memory of wobble status 0: Shutdown memory 1: Do not memorize upon shutdown LED thousands digit: Save wobble status upon power failure 0: Save 1: Do not save	0000	⊙
F8.36	Pre-wobbling frequency	The inverter will start to enter frequency wobbling operation mode when this frequency is reached. Setup range: 0.00 Hz~upper limit of operation frequency (F0.08)	0.00 Hz	○
F8.37	Wait time of pre-wobbling frequency	The time that inverter runs at pre-wobbling frequency before entering the wobbling operation mode. Setup range: (0.0~3600.0)s	0.0 s	○
F8.38	Wobble amplitude	Wobble amplitude $A_w = F8.38^*$ (center frequency or maximum operation frequency) Note: The value of wobble amplitude is relevant to the value of LED tens digit in F8.35. Setup range: 0.0%~50.0%	0.0%	○
F8.39	Hopping frequency	Hopping frequency = Wobble amplitude $A_w^* F8.39$ , No sudden frequency if set to 0. Setup range: 0.0%~50.0%	0.0%	○
F8.40	Wobbling cycle	This function defines the time of the complete cycle for frequency wobbling. Setup range: (0.1~999.9)s	10.0 s	○
F8.41	Triangular wave rise time	This function defines the time for upward wobbling = $F8.40^* F8.41$ (second), and the time for downward wobbling = $F8.40^* (1-F8.41)$ (second). Setup range: 0.0%~100.0% (refers to wobbling cycle)	50.0%	○
<b>Group F9: Process PID control</b>				
F9.00	Select closed-loop function	0: Closed-loop operation control invalid 1: Closed-loop operation control valid	0	⊙
F9.01	Select setting channel	0: Digital setting 1: AI1 analog setting 2: AI2 analog setting 3: Reserve	1	○
F9.02	Select feedback channel	0: AI1 analog setting 1: AI2 analog setting 2: AI1 + AI2 3: AI1 - AI2 4: Min(AI1, AI2) 5: Max(AI1, AI2) 6: High speed pulse HDI	1	○
F9.03	Digital setup of setting	This function is used for digital setup of the setting of operation panel or serial port. Setup range: -10.00 V~10.00 V	0.00 V	○
F9.04	Speed closed-loop setting	This function is used to set rotation speed setting when HDI is used as feedback channel (F9.02 is 6) and the setting channel is set to digital setting (F9.01 is 0). Setup range: (0~39000)rpm	0 rpm	○
F9.05	Minimum setting	F9.05: Minimum setting, as a percentage of base value 10V (or 20mA); F9.06: Feedback quantity corresponds to minimum setting, as a percentage of base value 10V (or 20mA);	0.0%	○
F9.06	Feedback quantity corresponds to minimum setting	F9.07: Maximum setting, as a percentage of base value 10V (or 20mA); F9.08: Feedback quantity corresponds to maximum setting, as a percentage	0.0%	○

Function code	Name	Value range	Default value	Alteration
F9.07	Maximum setting	of base value 10V (or 20mA) Setup range: F9.05: 0.0%~(F9.07)	100.0%	○
F9.08	Feedback quantity corresponds to maximum setting	F9.06: 0.0~100.0% F9.07: (F9.05)~100.0% F9.08: 0.0~100%	100.0%	○
F9.09	Proportional gain KP	The bigger the proportional gain KP, the faster the response. However, if the proportional gain KP is too big, oscillation may occur. It is impossible to fully eliminate the deviation only by adjusting proportional gain KP. User can use integral gain Ki to achieve closed-loop control so as to eliminate the residual deviation. The bigger the Ki, the faster the response to deviation. However, if the Ki is too big, oscillation may occur.	2.000	○
F9.10	Integral gain Ki	Setup range: F9.09~F9.11: 0.000~10.000	0.100	○
F9.11	Differential gain Kd		0.100	○
F9.12	Sampling cycle	Sampling cycle T refers to the sampling cycle of feedback quantity. For each sampling cycle, the closed-loop regulator will conduct calculation once. The longer the sampling cycle, the slower the response. Setup range: (0.01~50.00)s	0.50 s	○
F9.13	Output filtering time	Output filtering time refers to the filtering time of closed-loop output (frequency or torque). The longer the filtering time, the slower the response. Setup range: (0.01~10.00)s	0.05 S	○
F9.14	Deviation limit	This is the maximum allowable deviation of system output with respect to closed-loop setting, as shown in the figure. When the feedback is within this range, the closed-loop regulator will stop regulation. This function can help improving the precision and stability of system output if set properly. Setup range: 0.0%~20.0% (with respect to closed-loop setting)	2.0%	○
F9.15	Closed-loop regulation characteristics	0: Positive effect 1: Negative effect	0	⊙
F9.16	Select integral regulation	0: The integral regulation will be stopped when the upper and lower frequency limit is reached. 1: The integral regulation will continue when the upper and lower frequency limit is reached. For systems require fast response, continued integral regulation is not suggested.	0	⊙
F9.17	Preset closed-loop frequency	This function code is used to quickly stable the closed-loop regulation. The preset closed-loop frequency (F9.17) should be smaller than the set frequency, otherwise it will be invalid.	0.00 Hz	○
F9.18	Maintain time of preset frequency	After the close-loop operation is initiated, the frequency will be increased to preset closed-loop frequency F9.17 according to the acceleration time; before running with closed-loop characteristics, the system will run at this preset frequency for a period of time first F9.18. Setup range: F9.17: (0.00~300.00)Hz F9.18: (0.0~3600.0)s	0.0 s	⊙
F9.19	Multistage closed-loop setting 1	In addition to the four channels defined in F9.01, user can also use the voltages defined in F9.19~F9.33 closed-loop setting. The selection of voltages from 1~15 can be switched by external terminals, see F5.01~F5.07 Terminal Function 30~33. The control priority of multistage closed-loop setting is higher than the setting channel defined in F9.01. Setup range: F9.19~F9.33: (-10.00~10.00)V	0.00 V	○
F9.20	Multistage closed-loop setting 2		0.00 V	○
F9.21	Multistage closed-loop setting 3		0.00 V	○
F9.22	Multistage closed-loop setting 4		0.00 V	○
F9.23	Multistage closed-loop setting 5		0.00 V	○
F9.24	Multistage closed-loop setting 6		0.00 V	○

Function code	Name	Value range	Default value	Alteration
F9.25	Multistage closed-loop setting 7		0.00 V	○
F9.26	Multistage closed-loop setting 8		0.00 V	○
F9.27	Multistage closed-loop setting 9		0.00 V	○
F9.28	Multistage closed-loop setting 10		0.00 V	○
F9.29	Multistage closed-loop setting 11		0.00 V	○
F9.30	Multistage closed-loop setting 12		0.00 V	○
F9.31	Multistage closed-loop setting 13		0.00 V	○
F9.32	Multistage closed-loop setting 14		0.00 V	○
F9.33	Multistage closed-loop setting 15		0.00 V	○
F9.34	Select closed-loop output reverse rotation	0: The closed-loop output is negative, the inverter runs at zero frequency. 1: The closed-loop output is negative, the inverter runs with reverse direction. However, if the reverse rotation is prohibited, the inverter will run at zero frequency.	0	○
F9.35	Sleep function	This function is mainly used in applications require automatic sleep function, such as water and air supply by pump. If F9.35 is set to "1", the sleep function is activated, if it is set to "0", the sleep function is deactivated.	0	○
F9.36	Sleep level	Setup range: F9.35: (sleep function)	50.0%	⊙
F9.37	Sleep delay	0: Invalid 1: Enabled F9.36: 0.0%~100.0%(Full scale)	30.0 s	○
F9.38	Wake up level	F9.37: (0.0~6000.0)s F9.38: 0.0%~100.0%(Full scale)	50.0%	⊙
<b>Group FA: Simplified PLC and multistage speed control</b>				
FA.00	Select simplified PLC operation mode	LED ones digit: PLC operation method 0: Do not operate 1: Stop after single cycle 2: Maintain final value after single cycle 3: Continuous cycle LED tens digit: Starting method 0: Restart from first stage 1: Continue from the stage where the system stopped (or fault occurred) 2: Continue from the stage and the frequency where the system stopped (or fault occurred) LED hundreds digit: Save upon power failure 0: Do not save 1: Save the stage and the frequency upon power failure LED thousands digit: Select stage time unit 0: Second 1: Minute	0000	⊙
FA.01	Stage 1 setup	LED ones digit: 0: Multistage frequency N (N: correspond to current stage) 1: Determined by function code F0.02 2: Multistage closed-loop setting N (N: correspond to current stage) 3: Closed-loop control (The setting is determined by function code F9.01) LED tens digit: 0: Forward rotation 1: Reverse rotation	000	○

Function code	Name	Value range	Default value	Alteration
FA.01	Stage 1 setup	2: Determined by operation command LED hundreds digit. 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	000	<input type="radio"/>
FA.02	Stage 1 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.03	Stage 2 setup	Same as FA.01	000	<input type="radio"/>
FA.04	Stage 2 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.05	Stage 3 setup	Same as FA.01	000	<input type="radio"/>
FA.06	Stage 3 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.07	Stage 4 setup	Same as FA.01	000	<input type="radio"/>
FA.08	Stage 4 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.09	Stage 5 setup	Same as FA.01	000	<input type="radio"/>
FA.10	Stage 5 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.11	Stage 6 setup	Same as FA.01	000	<input type="radio"/>
FA.12	Stage 6 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.13	Stage 7 setup	Same as FA.01	000	<input type="radio"/>
FA.14	Stage 7 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.15	Stage 8 setup	Same as FA.01	000	<input type="radio"/>
FA.16	Stage 8 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.17	Stage 9 setup	Same as FA.01	000	<input type="radio"/>
FA.18	Stage 9 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.19	Stage 10 setup	Same as FA.01	000	<input type="radio"/>
FA.20	Stage 10 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.21	Stage 11 setup	Same as FA.01	000	<input type="radio"/>
FA.22	Stage 11 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.23	Stage 12 setup	Same as FA.01	000	<input type="radio"/>
FA.24	Stage 12 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.25	Stage 13 setup	Same as FA.01	000	<input type="radio"/>
FA.26	Stage 13 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.27	Stage 14 setup	Same as FA.01	000	<input type="radio"/>
FA.28	Stage 14 operation time	0.0~6500.0	20.0	<input type="radio"/>
FA.29	Stage 15 setup	Same as FA.01	000	<input type="radio"/>
FA.30	Stage 15 operation time	0.0~6500.0	20.0	<input type="radio"/>

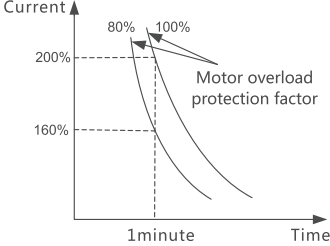


Function code	Name	Value range	Default value	Alteration
FA.31	Multistage frequency 1	These frequencies are used in multistage speed operation method, see multistage speed operation terminal function "24", "25", "26", "27" in F5.01~F5.07. Setup range: FA.31~FA.45: F0.09 (lower limit of operation frequency)~F0.08 (upper limit of operation frequency)	5.00 Hz ○	<input type="radio"/>
FA.32	Multistage frequency 2		10.00 Hz	<input type="radio"/>
FA.33	Multistage frequency 3		15.00 Hz	<input type="radio"/>
FA.34	Multistage frequency 4		20.00 Hz	<input type="radio"/>
FA.35	Multistage frequency 5		25.00 Hz	<input type="radio"/>
FA.36	Multistage frequency 6		30.00 Hz	<input type="radio"/>
FA.37	Multistage frequency 7		35.00 Hz	<input type="radio"/>
FA.38	Multistage frequency 8		40.00 Hz	<input type="radio"/>
FA.39	Multistage frequency 9		45.00 Hz	<input type="radio"/>
FA.40	Multistage frequency 10		50.00 Hz	<input type="radio"/>
FA.41	Multistage frequency 11		10.00 Hz	<input type="radio"/>
FA.42	Multistage frequency 12		20.00 Hz	<input type="radio"/>
FA.43	Multistage frequency 13		30.00 Hz	<input type="radio"/>
FA.44	Multistage frequency 14		40.00 Hz	<input type="radio"/>
FA.45	Multistage frequency 15		50.00 Hz	<input type="radio"/>
<b>Group Fb: Serial communication parameters</b>				
Fb.00	Local communication address	This function code is used for the inverter to connect with MODBUS configuration network. It is the station address of the inverter as a slave station. Setup range: 1~247	1	<input type="radio"/>
Fb.01	Communication baud rate setup	This parameter is used to set the data transmission rate between the upstream machine and the inverter. Remember that the baud rate of the upstream machine must consistent with that of the inverter. The bigger the baud rate, the faster the transmission speed. 0: 2400bps 1: 4800bps 2: 9600bps 3: 19200bps 4: 38400bps 5: 115200bps	2	<input type="radio"/>
Fb.02	Data bit parity check setup	The data format of the upstream machine must be consistent with that of the inverter, otherwise the communication will be invalid. 0: No parity check (8-N-2) for RTU 1: Odd parity check (8-O-1) for RTU 2: Even parity check (8-E-1) for RTU 3: No parity check (7-N-2) for RTU 4: Odd parity check (7-O-1) for RTU 5: Even parity check (7-E-1) for RTU 6: No parity check (8-N-2) for ASCII 7: Odd parity check (8-O-1) for ASCII	0	<input type="radio"/>

Function code	Name	Value range	Default value	Alteration
Fb.02	Data bit parity check setup	8: Even parity check (8-E-1) for ASCII 9: No parity check (7-N-2) for ASCII 10: Odd parity check (7-O-1) for ASCII 11: Even parity check (7-E-1) for ASCII	0	○
Fb.03	Communication response delay	This refers to the interval after the inverter finishes data receiving and before it sends response data to the upstream machine. If the response delay is shorter than the system processing time, the system time will be used. If the response delay is longer than the system processing time, the inverter will not send data to the upstream machine until the response delay is over. Setup range: (0~200)ms	5 ms	○
Fb.04	Communication timeout fault time	If this parameter is set to any value other than zero, the system will send "485 communication fault" alarm when the interval between two communications exceeds the set value. Usually, this parameter is set to invalid. However, it can be used to monitor communication status in systems require continuous communication. Setup range: 0.0 s (invalid) (0.1~100.0)s	0.0 s	○
Fb.05	Handling of transmission error	0: Send alarm and stop freely 1: No alarm and continue to run 2: No alarm and stop according to stop method (only communication control mode) 3: No alarm and stop according to stop method (all control modes)	1	○
Fb.06	Select communication processing action	0: Write operation with response (the inverter respond to the write command of upstream machine) 1: Write operation without response (the inverter only respond to the read command of upstream machine, which can improve communication efficiency)	0	○
<b>Group FC: Reserve</b>				
<b>Group Fd: Status display parameters</b>				
Fd.00	Set frequency of main setting	Monitor main set frequency under normal operation mode. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.01	Set frequency of auxiliary setting	Monitor auxiliary set frequency under normal operation mode. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.02	Set frequency	Monitor the final frequency that combines main and auxiliary frequencies. Positive value means forward rotation, negative value means reverse rotation. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.03	Slope set frequency	Monitor the output frequency of inverter after acceleration or deceleration process, including frequency direction. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.04	Torque setting	Monitor the torque setting under torque control mode, including torque direction. Setup range: (-300.0~300.0)%	0.00%	●
Fd.05	Output frequency	Monitor the output frequency of inverter, including frequency direction. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.06	Output voltage	Monitor the output voltage of inverter. Setup range: (0~480)V	0 V	●
Fd.07	Output current	Monitor the output current of inverter. Setup range: (0.0~3.0)Ie	0.0 A	●
Fd.08	Rotation speed	Monitor the rotation speed of motor. Setup range: (0~60000)rpm	0rpm	●
Fd.09	Output torque	Monitor the output torque of inverter (with respect to the rated torque of motor). Setup range: (-300.0~300.0)%	0.0%	●

Function code	Name	Value range	Default value	Alteration
Fd.10	ASR controller output	Display the output value of speed closed-loop regulator. Setup range: (-300.0~300.0)%	0.0%	●
Fd.11	Torque current	Monitor the torque current of inverter (as a percentage of the rated current of motor). Setup range: (-300.0~+300.0)%	0.0%	●
Fd.12	Flux current	Monitor the flux current (as a percentage of the rated current of motor). Setup range: (0~+100.0)%	0.0%	●
Fd.13	Motor power	Monitor the output power of inverter (as a percentage of the rated power of motor). Setup range: 0.0%~200.0%(with respect to the rated power of motor)	0.0%	●
Fd.14	Estimated motor frequency	The motor rotor frequency estimated under open-loop vector condition. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.15	Measured motor frequency	The motor rotor frequency measured by encoder under closed-loop vector condition. Setup range: (-300.00~300.00)Hz	0.00 Hz	●
Fd.16	Bus voltage	Monitor the bus voltage of inverter. Setup range: (0~800)V	0 V	●
Fd.17	Inverter operation status	Setup range: 0~FFFF bit0: Operating/stop (0 stop, 1 operating) bit1: Reverse/forward (0 reverse, 1 forward) bit2: Operating at zero speed (1 valid) bit3: Accelerating (1 valid) bit4: Decelerating (1 valid) bit5: Operating at constant speed (1 valid) bit6: Pre-excitation (1 valid) bit7: Tuning (1 valid) bit8: Overcurrent limit (1 valid) bit9: DC overvoltage limit (1 valid) bit10: Torque limit (1 valid) bit11: Speed limit (1 valid) bit12: Inverter fault (1 valid) bit13: Speed control (1 valid) bit14: Torque control (1 valid) bit15: Undervoltage (0 undervoltage)	0	●
Fd.18	Switch input terminal status	Setup range: 0~FFH 0: Disconnect; 1: Connect Display the disconnect status of terminal X1~X6 and HDI, "0" means the terminal is disconnected, "1" means the terminal is connected.	00	●
Fd.19	Switch output terminal status	Setup range: 0~1FH 0: Disconnect; 1: Connect Function code Fd.19 can display the output status of switch terminal Y, HDO and relay R0. When there is signal output, the position of Fd.19 will be switched to 1.	00	●
Fd.20	AI1 input voltage	Display the analog input signal before adjustment. Setup range: Fd.20~Fd.22: (-10.00~10.00)V	0.00 V	●
Fd.21	AI2 input voltage		0.00 V	●
Fd.22	Reserve		---	●
Fd.23	AI1 percentage after adjustment	Display the percentage after curve adjustment. Setup range: Fd.23~Fd.25: -100.00%~110.00%	0.00%	●
Fd.24	AI2 percentage after adjustment		0.00%	●
Fd.25	Reserve		---	●

Function code	Name	Value range	Default value	Alteration
Fd.26	AO1 output	Display the percentage of analog output with respect to full scale. Setup range: Fd.26~Fd.27: 0.0%~100.0% (percentage with respect to full scale)	0.0%	●
Fd.27	AO2 output		0.0%	●
Fd.28	Process closed-loop setting	Display the percentage of the process closed-loop feedback, setting and output signal with respect to full scale. Setup range: Fd.28~Fd.30: -100.0%~100.0%(percentage with respect to full scale)	0.0%	●
Fd.29	Process closed-loop feedback		0.0%	●
Fd.30	Process closed-loop error		0.0%	●
Fd.31	Process closed-loop output		0.0%	●
Fd.32	High speed pulse HD1 frequency	Display the high speed pulse frequency of input port HD1. Setup range: (0.1~100.0)kHz	0.0kHz	●
Fd.33	Current PLC speed stage	Display the current PLC stage of inverter when the PLC program is running. Setup range: 0~16	0	●
Fd.34	Radiator 1 temperature	Monitor the temperature of inverter module. Different model may have different overheat protection value for inverter module. Temperature display range: 0~150°C, precision: 5% Setup range: (0.0~150.0)°C	0.0 °C	●
Fd.35	Radiator 2 temperature	Monitor the temperature of rectifier module, not applicable to model with power under 30kW. Setup range: 0.0~150.0°C	0.0 °C	●
Fd.36	Total power-on hours	Display the total power-on hours, operation hours and fan operation hours of the inverter by far. Setup range: Fd.36~Fd.38: (0~65535)h	0h	●
Fd.37	Total operation hours		0h	●
Fd.38	Total fan operation hours		0h	●
Fd.39	Rated capacity	(0~999.9)KVA (automatically set based on model)	Factory set	●
Fd.40	Rated voltage	(0~999)V (automatically set based on model)	Factory set	●
Fd.41	Rated current	(0~999.9)A (automatically set based on model)	Factory set	●
Fd.42	Product serial number	0~FFFF	300	●
Fd.43	Software version	0.00~99.99	3.00	●
Fd.44	Customized version	0~99.99	1.00	●
<b>Group FE: Fault and protection parameters</b>				
FE.00	Select the output action of relay and Y terminal in case of fault	LED ones digit: Select undervoltage fault indicating action 0: Do not act 1: Act (undervoltage is considered as fault) LED tens digit: Select auto reset interval fault indicating action 0: Do not act 1: Act LED hundreds digit: Select fault lockout function 0: Do not act 1: Act LED thousands digit: Reserve	0000	⊙
FE.01	Select motor overload protection method	0: Do not act No motor overload protective characteristics (use with caution). In this case, the inverter will not provide overload protection to the load carrying motor; 1: Normal motor (with low speed compensation)	1	⊙

Function code	Name	Value range	Default value	Alteration
FE.01	Select motor overload protection method	Due to the poor heat dissipation effect of normal motor under low speed operation, user should set the electronic thermal protection value properly. The low speed compensation here means decreasing the overload protection threshold of motors with operation frequency below 30Hz. 2: Variable frequency motor (without low speed compensation) The heat dissipation of variable frequency motor is not affected by rotation speed, therefore there is no need to adjust the protection value during low speed operation.	1	⊙
FE.02	Motor overload protection factor setup	To provide effective overload protection for motors with different models, it is necessary to adjust the maximum allowable output current of the inverter, as shown in the figure below.  <p>Figure 6-3-20 Motor overload protection factor setup</p> This value can be set according to specific needs. The value of FE.02 determines the speed for motor overload protection. The smaller the value, the faster the protection and vice versa. Setup range: 20.0%~110.0% Note: If the rated current of the motor is not consistent with the rated current of the inverter, user can use FE.02 to achieve motor overload protection.	100.0%	⊙
FE.03	Number of automatic reset	0: Invalid 1~100: Number of automatic reset Note: Automatic reset is not applicable to module protection and external equipment fault.	0	⊙
FE.04	Automatic reset interval	This function enables automatic fault reset based on set reset number and interval. If the number is set to 0, the function is deactivated, in which case the fault protection will be triggered immediately. Setup range: (2.0~200.0)s	5.0 s	⊙
FE.05	Select fault lockout function	0: Fault lockout prohibited 1: Fault lockout allowed	0	⊙
FE.06	Fault record 1	0: No abnormality record 1: Overcurrent during acceleration (E.OC1) 2: Overcurrent during deceleration (E.OC2) 3: Overcurrent during constant speed operation (E.OC3) 4: Overvoltage during acceleration (E.OV1) 5: Overvoltage during deceleration (E.OV2) 6: Overvoltage during constant speed operation (E.OV3) 7: Control voltage overvoltage (E.OV) 8: Phase failure at input side (E.SPI) 9: Phase failure at output side (E.SPO) 10: Power module protection (E.FO) 11: Radiator 1 overheat (E.OH1) 12: Radiator 2 overheat (E.OH2) 13: Inverter overload (E.OL2) 14: Motor overload (E.OL1) 15: External fault (E.EF)	0	●

Function code	Name	Value range	Default value	Alteration
FE.06	Fault record 1	16: EEPROM read/write error (E.EEP) 17: Abnormal serial port communication (E.CE) 18: Abnormal contactor (E.SHT) 19: Abnormal current detection circuit (E.tE ) Hall or amplification circuit 20: Interference fault (E.SIE) 21: Reserve 22: Reserve 23: Keypad parameter copy error (E.PCE) 24: Poor self-tuning (E.tE) 25: PG fault (E.PG) 26: Reserve 27: Braking unit fault (E.bCE) Note: ① No detection when E.OV is below 18.5G/22G, others will be detected all the time after stop; ② Reset 10 seconds after E.FO fault; ③ Reset after a 6 seconds delay if overcurrent occurs;	0	●
FE.07	Bus voltage upon fault	(0~999)V	0 V	●
FE.08	Actual current upon fault	(0.0~999.9)A	0.0 A	●
FE.09	Operating frequency upon fault	(0.00~300.00)Hz	0.00 Hz	●
FE.10	Operation status of the inverter upon fault	0~FFFFH	0000	●
FE.11	Fault record 2	The inverter provides nearly 30 fault alarms and records the last three fault types (FE.06, FE.11, FE.12) as well as the bus voltage, current, frequency and operation status of the inverter upon the latest fault for user's inquiry. The latest fault will be recorded as fault 1. See Chapter 7 of this manual for details introductions of protection alarms and troubleshooting methods. Setup range: 0~55	0	●
FE.12	Fault record 3		0	●

**CHNT**

# QC PASS

NVF3M Series  
Inverter  
User Instruction  
IEC 61800-2

**Check 05**

---

Test date: Please see the packing

---

**ZHEJIANG CHINT ELECTRICS CO., LTD.**

**CHINT**

CHINT ELECTRICS

# NVF3M Series Inverter User Instruction

## **Zhejiang Chint Electrics Co., Ltd.**

Add: No.1, CHINT Road, CHINT Industrial Zone, North Baixiang,  
Yueqing, Zhejiang 325603, P.R.China

E-mail: [global-sales@chint.com](mailto:global-sales@chint.com)

Website: <http://en.chint.com>

