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User Instructions

Please read user instructions before installing and using the product

NVF300M Series
Mini Inverter

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Foreword

Thank you for choosing Chint NVF300M series mini inverter!

NVF300M series mini converter uses high-quality small components and advanced DSP control technology, and it is characterized by small size, easy installation and flexible operation, etc. For the convenient use of customers. In control mode, it adopts advanced drive solutions, such as: vector control, torque control and speed torque control integration and other methods, to meet all kinds of complex high precision drive demand in industrial field. Operation functions have great value in reducing system cost and improving the system reliability through practical process closed-loop control, multi-function input and output terminals, pulse frequency setting, main and auxiliary setting control etc. Through the integral design of electromagnetic compatibility and adoption of optimized PWM control technology, the product meets the environmental requirements of low noise and low electromagnetic interference of the user to the application site.

This manual describes the functional characteristics and methods of use of the NVF300M series mini inverter, including product selection, installation and commissioning, parameter function description and other contents. Please read this manual carefully before using to ensure proper use of the inverter. After reading this guide, save for later use.

If encountering the difficulties or problems that can not be solved during use, please contact dealers or directly contact the company's professional and technical personnel to seek help.

The company reserves the right to constantly optimize and improve NVF300M series mini inverter; information is subject to change without notice.

Safety Information

1. Definition of safety

Danger	The operation not as required may result in death or serious injury.
Caution	The operation not as required may result in moderate or minor injury, or damage to the property.

2. Notes for installation

Danger

- Please mount on metal and other non-flammable objects, otherwise there is a risk of fire.
- Do not place flammable materials near inverter, otherwise there is a risk of fire.
- Do not install in an environment containing explosive gases, otherwise there is a risk of explosion.
- Wiring work must be carried out by a qualified person, otherwise there is a risk of electric shock.
- Make sure the input power is completely disconnected before wiring work, otherwise there is a risk of electric shock.
- Ground terminal of the inverter must be grounded, otherwise there is a risk of electric shock.
- Close the cover before connecting the power, otherwise there is a risk of electric shock and explosion.
- The inverter that has been stored for more than 2 years should be gradually boosted with regulator before energized, otherwise there is a risk of electric shock and explosion.
- Do not touch the terminals when the power is on, otherwise there is a risk of electric shock.
- Do not operate the inverter with wet hands, otherwise there is a risk of electric shock.
- Carry out maintenance operations after disconnecting the power supply for 10 minutes when the positive and negative bus voltage is below 25V, otherwise there is a risk of electric shock.
- Only the professional can replace the parts, and it is strictly prohibited to leave wire piece or metal objects in the machine, otherwise there is a risk of fire.
- After replacing the control board, the parameters must be set correctly before running, otherwise there is a risk of damage to the property.
- The exposed part of main circuit wiring cables must be wrapped up with the insulating tape, otherwise there is a risk of electric shock.
- If the inverter has damaged part or lack of component, do not install or operate, otherwise there is a risk of fire and injury.
- Do not install inverter in direct sunlight, otherwise there is a risk of damage to property.
- Do not short connection and B directly, otherwise there is a risk of fire and damage to property.
- Main circuit terminals and wires must be securely connected to each other, otherwise there is a risk of damage to property.
- Do not connect AC 220V signal to the control terminals except RA, RB, and RC, otherwise there is a risk of damage to property.

⚠ Notes for Use

When using NVF300M series mini inverter, please note the followings:

1. About the motor and mechanical load

1. Compared with working frequency operation
   NVF300M series inverter is voltage-type inverter, and the output voltage is PWM wave with some harmonics. Therefore, temperature rise, noise, and vibration when using the motor slightly increase compared with working frequency operation.
2. Constant torque low speed operation
   When the inverter drives general motors to run at low speed for long time, it is necessary to reduce the amount of output torque due to the worsening cooling effect of the motor. If you need to long-term operate at low speed and constant torque, variable frequency motor must be selected.
3. The value of electronic thermal protection for the motor
   When selecting adaptive motor, the inverter can implement thermal protection to the motor. If the motor does not match the rated capacity of the inverter, the protection value must be adjusted or other protective measures taken to ensure the safe operation of the motor.
4. Operation above 50Hz frequency
   If running at above 50Hz frequency, in addition to considering the vibration and noise increases of the motor, also be sure to confirm the motor bearings and mechanical devices in endure range, and check must be carried out in advance.
5. Lubrication of mechanical device
   Mechanical devices such as gear box and gear that need lubrication may be damaged in long-term low-speed operation due to the worsening lubricating effect, check must be carried out in advance.
6. Negative torque load
   For such occasions as lifting loads, negative torque often occurs, the inverter often trips due to overcurrent or overvoltage fault, then consider choosing the brake components with proper parameters.
7. Mechanical resonance point of the load device
   Inverter may encounter the mechanical resonance point of the load device within a certain range of output frequency which must be avoided by setting the jump frequency.
8. The occasion of frequent starting and stopping
   Start and stop of the inverter should be controlled via terminals. It is prohibited to directly carry out start and stop operations with switching devices such as contactors at the inverter input side, otherwise it will cause equipment damage.

9. Motor insulation checks before connecting to the inverter
   Before the first use or re-use of the motor after placed for a long time, the motor insulation should be checked to prevent damage to the inverter due to the motor winding insulation failure. Wiring is shown in Figure 1 500V megger for the test should be used to ensure that the measured insulation resistance is not less than 5MΩ.

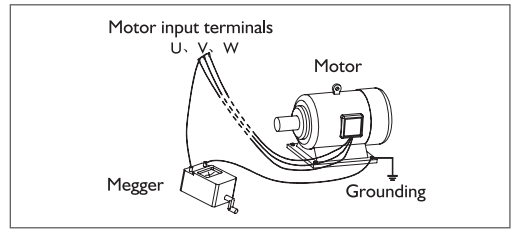

Figure 1 Motor Insulation Check

2.Installation and handling

1. During handling, do not let the operation panel and cover bear stress, otherwise there is a risk of injury or damage to property when falling.
2. During installation, install the inverter on which can withstand its weight, otherwise there is a risk of injury or damage to property when falling.
3. Do not install in the occasions such as the water pipes where it tends to produce water droplets splashing, otherwise there is a risk of damage to the property.
4. Do not let screws, washers, metal bars and other foreign matters fall inside the inverter, otherwise there is a risk of fire and damage to property.

3. About the inverter

1. Capacitor or pressure-sensitive devices to improve the power factor
   Since the inverter outputs PWM wave, the capacitors or lightning varistor installed at the output side to improve the power factor may cause the inverter fault trip or damage to device, they must be removed.
2. Use of contactor and other switching devices installed at the inverter output side
   If you need to install contactor and other switching devices between the inverter output and the motor, make sure to carry out the on-off operation before starting the inverter, otherwise it may take damage to the inverter.
3. Usage beyond the rated voltage
   Do not use NVF300M series mini inverter outside the allowable voltage range, if necessary, use the appropriate step-up or step-down device for transformation processing.

4. Lightning surge protection

The inverter is provided with built-in lightning protection devices, with a certain self-protection capability against lightning.

5. Altitude and derating use

In areas of altitude of over 1000 meters, thin air will result in the worsening cooling effect of the inverter, so it is necessary to derate before use. Figure 2 shows the curve for the relation between the rated current and altitude of the inverter.

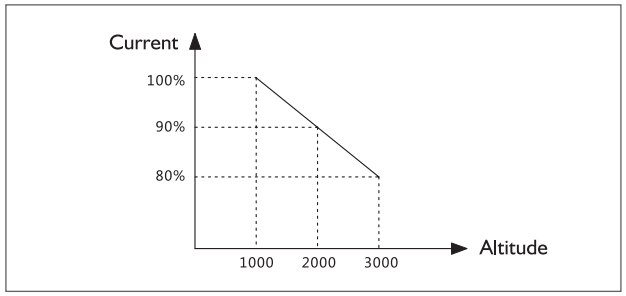

Figure 2 Curve for the Relation between the Rated Current and Altitude of the Inverter

4. Notes for scrapping

When scrapping the inverter, please note:

1. The electrolytic capacitors on the main circuit and PCB may explode when burning.
2. Toxic gases will be produced when burning panels and other plastic parts.
3. It should be treated as industrial waste.

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Chapter 1 Product Overview

1.1 Nameplate description

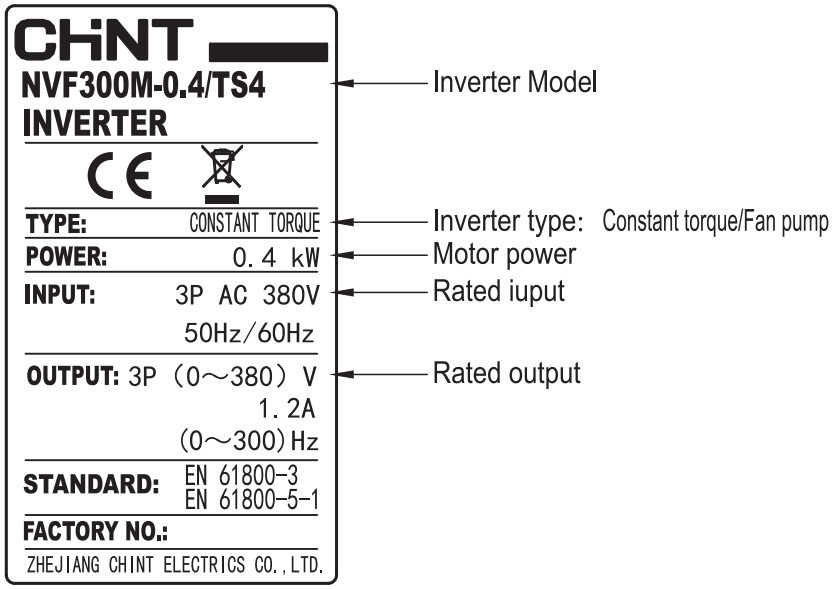
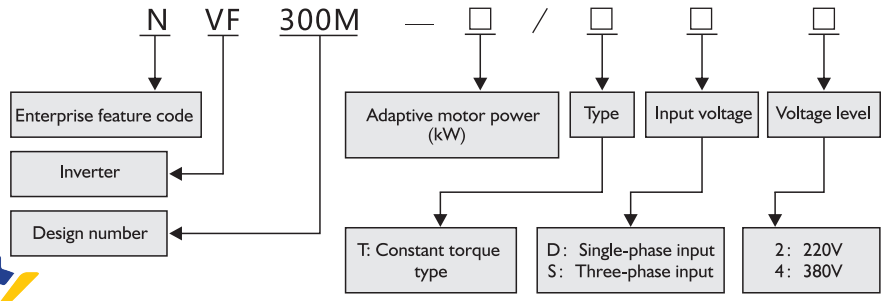


Figure 1.1 Nameplate

1.2 Model description



1.3 Model and specifications of NVF300M series mini inverter

Table 1.1 Table of Inverter Model and Specifications

Model (NVF300M-)	Maximum applicable motor (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	1.0	2.5
0.75/TS2	0.75	1.5	4.0
1.5/TS2	1.5	3.0	7.5
0.4/TS4	0.4	1	1.2
0.75/TS4	0.75	1.5	2.1
1.5/TS4	1.5	3	3.8

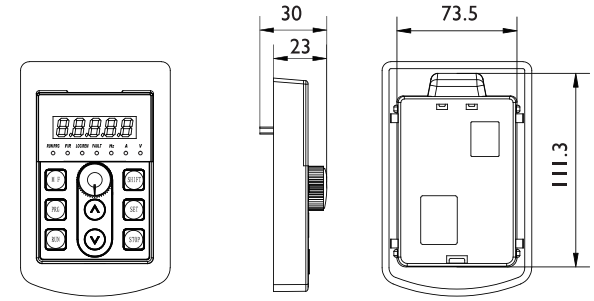
Table 1.2 Universal Technical Specifications

Item		Item Description
Intput	Rated voltage	Single-phase: 220V; three-phase: 220V/380V
	Frequency	(47~63)Hz
	Allowable voltage range	220V series: (187-253)V 380V series: (323-437)V
Output	Voltage	0~ Rated input voltage
	Frequency	(0~300)Hz
	Overload capacity	150% of rated current for 1 minute, 180% of rated current for 2 seconds
Main control performance	Control mode	V/F、SVC
	Modulation mode	Space vector PWM modulation
	Starting torque	150% of the rated torque at 0.5Hz (SVC)
	Frequency accuracy	Digital setting: maximum frequency x ± 0.01%; Analog setting: maximum frequency x ± 0.2%
	Frequency resolution	Digital setting: 0.01Hz; Analog setting: maximum frequency x 0.5%
	Torque boost	0.0%: Automatic torque boost (0.1~30.0)%: Manual torque boost
	V/F curve	6 types: linear V/F curve, three kinds of reduced torque characteristic curve method (2.0 times the power, 1.7 times the power, 1.2 times the power), multi-point V/F curve mode and V/F separated curve
	Acceleration and deceleration curve	Linear acceleration and deceleration: four types of acceleration and deceleration time

Item		Item Description
	Automatic current limiting	Automatically limit the current during operation to prevent frequent overcurrent fault trip
Customized function	Jog	Jog frequency range: (0.00~50.00)Hz; Jog acceleration and deceleration time (0.1~3600.0) s can be set Jog interval time can be set.
	Multi-speed operation	Achieve multi-speed operation through the control terminal
Operation function	Program running	Program timing running control
	Control function	Forward and reverse PID control function
	Operation command channel	Operation panel setting, control terminal setting, communication control, can be switched in a variety of ways
	Frequency setting channel	Digit setting, analog voltage setting, analog current setting, high-speed pulse setting, serial communication setting, multi-segment speed setting, PID setting etc.
	Pulse output terminal	(0~100) kHz pulse square wave signal output, enables output of setting frequency, output frequency and other physical quantities
	Analog output terminal	1-channel analog signal output, respectively optional (0~20)mA or (4~20)mA or (0~10) V, enables output of setting frequency, output frequency and other physical quantities
Operation panel	LED display	Can display more than 20 kinds of parameters of setting frequency, output frequency, output voltage, output current, etc.
	Parameter copy	Using the operation panel can achieve fast copying of the parameters
	Key lock and function option	Achieve locking of some or all of the keys, define action range of some keys to prevent misoperation
Protection function		Overcurrent protection, overvoltage protection, undervoltage protection, frequency conversion overheat protection, overload protection, open-phase protection, grounding protection, motor overheat protection etc.
Environment	Places of use	Indoors, free from direct sunlight, dust, corrosive gas, flammable gas, oil mist, steam, water dripping or salt
	Altitude	Derating use above 1000m; derated by 10% every 1000 meters rise but not exceeding 3000m
	Ambient temperature	(-10~+45)℃ (Derating use between 45 ℃ to 55 ℃, at 1 ° C per 1 ° C derating)

Item		Item Description
	Humidity	(5-95)% RH (without condensing)
	Vibration	(2~9)Hz amplitude≤0.3mm (9~200)Hz vibration acceleration≤1m/s²
	Storage temperature	(-25~+55) ℃
Structure	Protection class	IP20
	Cooling mode	Air cooling, with fan control
Installation method		Wall-mounted type
Efficiency		93%

1.4 Description of NVF300M series mini inverter dimensions



Note:73.5*111.5 is the opening size.

Figure 1.2 Operation panel Outline

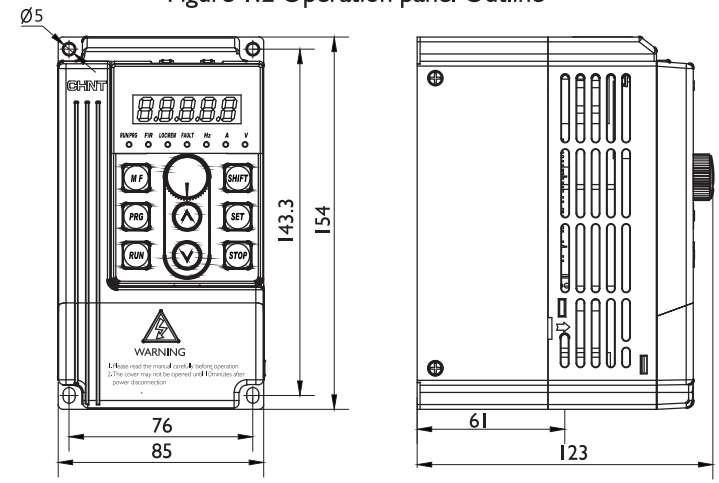


Figure 1.3 NVF300M Series Outline Drawing

Chapter 2 Installation and Wiring of Inverter

2.1 Inverter installation

The inverter is generally required to be installed indoors and in a well-ventilated place, generally should be mounted vertically. When selecting the installation environment, attention should be paid to the following:

- Ambient temperature is required to be in the range of (-10 ~+45)° C, if the temperature between 45 C and 55 C , , 1% of derating use is required every rise of 1 C ;
- Ambient temperature is required to be in the range of (5～95)%RH without condensation
- Vibration limit allowed in the inverter installation location: (2～9)Hz amplitude ≤0.3mm; (9～200)Hz vibration acceleration ≤lm/s^2;
- Avoid install inverter under direct sunlight;
- Avoid install inverter in a place with a lot of dust or metal powder;
- Do not install in a place with corrosive or explosive gas.

Mounting space and distance requirements are shown in Figure 2.1. When two inverters are installed up and down, the diversion partition should be used in the middle, as shown in Figure 2.2. For special installation requirements, please consult and confirm in advance.

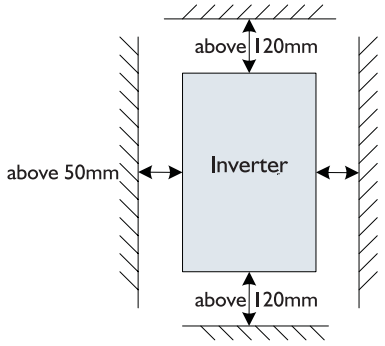


Figure 2.1 Installation Schematic

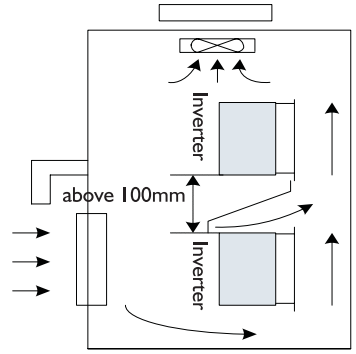


Figure 2.2 Installation of more than one Inverter

2.2 Inverter wiring

⚠ Danger

- Wait for at least 10 minutes after reliably cutting off the power supply before opening the inverter cover.
- Wait for at least 10 minutes after reliably cutting off the power supply before starting internal wiring work.
- Internal wiring work of the inverter can only be carried out by trained and licensed qualified professionals.
- When connecting the emergency stop or safety circuit, carefully check the wiring before and after the operation.
- Check the inverter voltage level before supplying power, otherwise it may result in casualties and equipment damage.

⚠ Caution

- Carefully verify whether the rated input voltage of the inverter is consistent with the voltage of the AC power supply before using.
- The inverter has gone through the voltage withstand test before leaving the factory; the user shall no longer carry out voltage withstand test on the inverter.
- When an external braking resistor or braking unit is required, see related content in Section 2.4 of Chapter 2.
- Do not connect the power cord with U, V and W.
- The grounding wire is generally copper wire of diameter more than 3.5mm, and grounding resistance is less than 10 Ω.
- There exists leakage current inside the inverter and the specific value of leakage current is determined by the conditions of use. In order to ensure safety, the inverter and the motor must be grounded, and the users are required to install leakage protector (ie RCD). RCD is recommended to be type B, and the leakage current is set as 300mA.
- To facilitate input side over-current protection and outage maintenance, the inverter should be connected with the power supply through the air breaker or fuse switch.

2.3 Main circuit terminal arrangement

1. Three-phase 380V series (NVF300M-0.4/TS4～1.5/TS4)

⊕	Ⓑ	R	S	T	⏚	U	V	W

2.Three-phase 220V series (NVF300M-0.4/TS2～1.5/TS2)

⏚	R	S	T	Ⓑ	⊕	U	V	W

3.Single-phase 220V series (NVF300M-0.4/TD2～1.5/TD2)

⏚	L	N		Ⓑ	⊕	U	V	W

Note: External braking resistor between ⊕ Ⓑ connect. Because the machine brake function is optional feature, product is not equipped with brake function, if you need brake function, please declared in order.

Table 2.1 Main Circuit Terminals Description

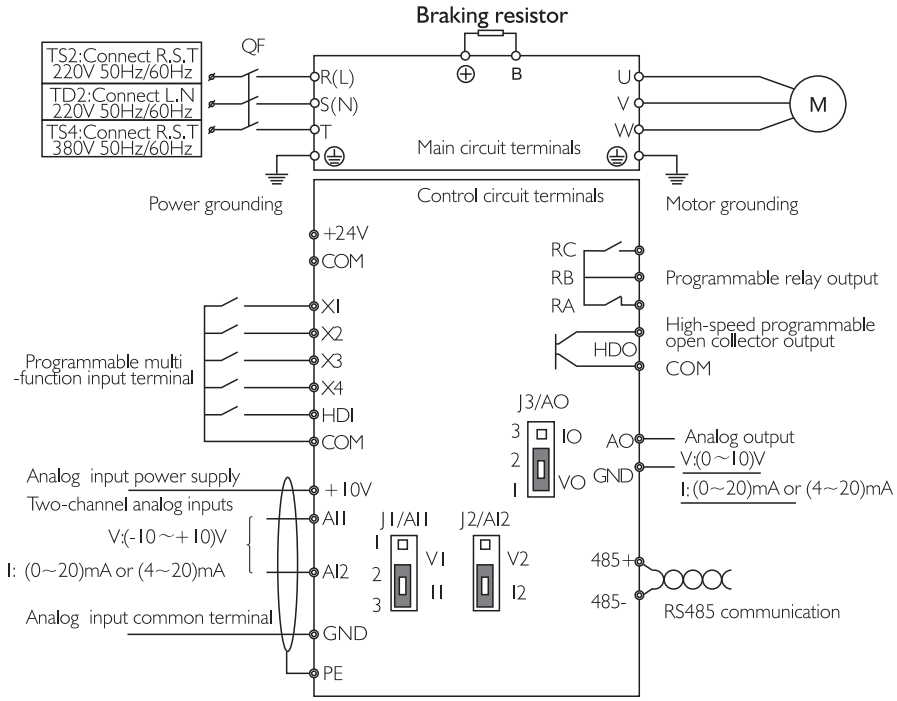
Terminal symbo	Terminal name	Function description
R、S、T	Main circuit power input	Three-phase AC input terminal, connected to the grid
L、N	Main circuit power input	Single-phase AC input terminal, connected to the grid
U、V、W	Inverter output	Three-phase AC output terminal, usually connected with the motor
⏚	Ground terminal	Safety protective grounding terminal, must be reliably grounded
⊕、Ⓑ	External braking resistor connection terminals	When applied to an external braking resistor connection terminals, connect according to the actual needs

Table 2.2 Standard of Ground Wire

Power line conductor cross-sectional area S (mm^2)	Grounding conductor cross-sectional area (mm^2)
S≤16	S

Caution	The wiring distance between the braking unit and the braking resistor must be less than 5m, and shall not exceed 10m though the twisted-pair is used.

2.4 Control circuit wiring and configuration



Note: PE shielded wire connect to CPU boards at the bottom right corner screws.

Figure 2.3 NVF300M Wiring Diagram

1. Jumper option

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

When 2 connects with 1, (-10～+10)V analog voltage input; 2 with 3, (0～20)mA or (4～20)mA analog current input

J3 position (AO analog output interface):

When 2 connects with 1, (0～10)V analog voltage output; 2 with 3, (0～20)mA or (4～20)mA analog current output

2. Control circuit terminals are arranged as shown below:

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

2.5 Control circuit terminal wiring

Table 2.3 Functions of Terminals on the Control Board

Type	Terminal silkscreen	Name	Terminal function description	Specification
Power	+10V GND	+10Vpower	Provide + 10V reference power supply to outside GND internal isolated with COM	Maximum allowable output current: 5mA
Analog input	AI1 AI2	AI1、AI2 Single-ended analog input AI1, AI2	Accept analog voltage or single-ended current input, voltage/current input selected by the control board jumpers AI1 and AI2 (reference ground: GND)	Input voltage range: (-10 ～+10)V (Input impedance: 45kΩ) (0～20) mA Resolution: 1/4000 Input current range: (0～20) mA Resolution: 1/2000 (jumper required)
Analog output	AO	Analog output	Provide analog voltage/current output, the output voltage and current selected by the control board jumper AO1; for factory default output voltage, see description of function code F6.11 (reference ground: GND).	Voltage output range: (0 ～10) V Current output range: (0～20)mA or (4～20)mA
Commu -nications	485+	communication interface	485 differential signal positive terminal	Please use twisted pair or shielded wire for standard RS485 communication interface
	485-		485 differential signal negative terminal	
Multi -function input terminals	X1 X2 X3 X4 HDI	Multi-function input terminals	The term "Programmable" is defined as the multi-functional switch input terminal; introduction to the functions of input terminals F5.01～F5.07 in switch input terminal (Group F5)	Opto-isolated input impedance: R = 3.3kΩ X1～X4 maximum input frequency: 200Hz; When HDI maximum input frequency of 100kHz uses the internal power supply, input voltage: (20 - 24)V
Multi -function output terminals	HDO	Open collector pulse output terminal	The term "Programmable" is defined as the multi-functional pulse signal output terminal;introduction to the functions of F6.02 output terminal (common end: COM) in switch input terminal (Group F6)	Output frequency range: determined by F6.18; maximum: 100kHz

Type	Terminal silkscreen	Name	Terminal function description	Specification
Power	+24V COM	+24V power	Provide + 24V power supply to outside (GND internal isolated with COM)	Maximum output current: 100mA
Relay output terminal	RA RB RC	Relay output	The term "Programmable" is defined as the multi -functional relay output terminal; introduction to the functions of F6.03 output terminal in switch output terminal (Group F6)	RA-RB: normally closed; RB-RC: normally open Contact capacity: NO 5A/NC 3A 250V (AC) See F6 instructions for the using methods Overvoltage class of input voltage of relay output terminals is II

⚠ Caution	1. When using the analog input, filter capacitor or common mode inductance can be installed between the input signal and GND. 2. Voltage of the analog input signal is recommended not to exceed 12V. 3. Analog input and output signals are vulnerable to external interference, shielded cable must be used and well grounded when wiring, and wiring length should be as short as possible. 4. Analog output terminals can withstand a maximum voltage of 12V. 5. It is recommended to use wires over 1mm^2 as connecting lines of control circuit terminals.

Chapter 3 Inverter Running and Operation

3.1 Inverter operation panel

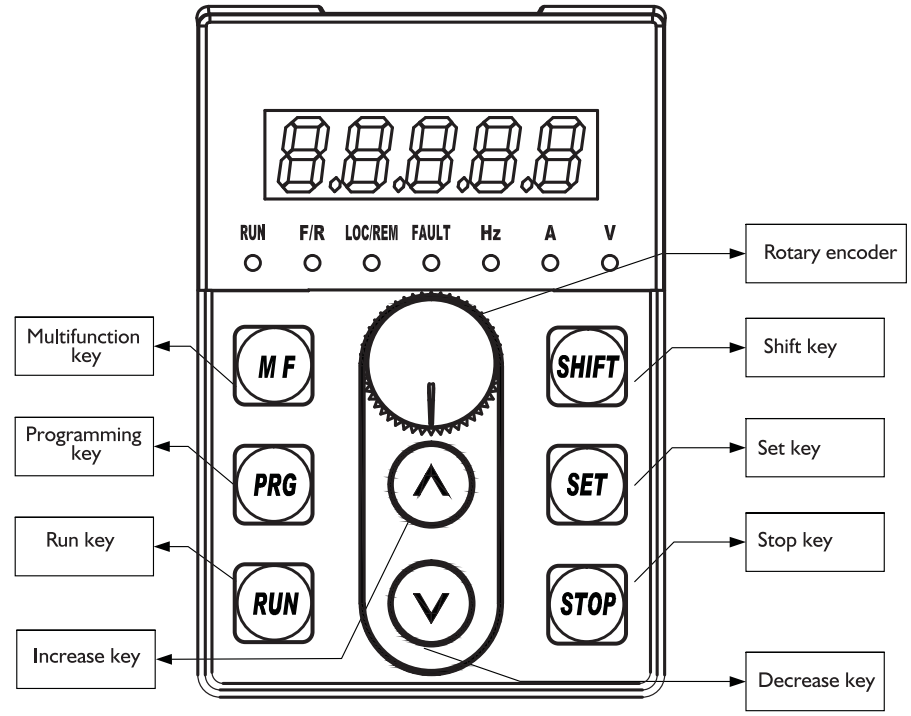


Figure 3.1 LED Operation Panel Diagram

The display panel is the main unit to accept the commands, display parameters, setting parameters of the inverter. The operation panel has eight keys and a rotary encoder, the function of each key is as shown in Table 3.1 below.

3.2 Operation panel function table

Table 3.1 Operation Panel Function Table

Key	Name	Function
PRG	Programming/Exit key	Enter or exit the programming state
SET	Set key	Enter the submenu or confirm data

Key	Name	Function
∧	Increase key	Increase data or function code
∨	Decrease key	Decrease data or function code
SHIFT	Shift key	When editing the menu, you can set the modified bit of the data; in the main interface, you can switch to display state parameters
MF	Multifunction key	Enable jog, free stop or fast stop function; the key functions are set by F7.02
RUN	Run key	In the operation panel mode, press this key to run
STOP	Stop/Reset key	Stop or fault reset
	Rotary encoder	When you modify the data, the data can be increased or decreased by rotating, you can press the rotary encoder to confirm the function

Except their own functions, Key also can realize combination keys functions, showed in table 3.2:

Table 3.2 Combination keys functions

Key	Name	Function
SET + PRG	Key Lock	Key locked according to F7.01
PRG + ∨	Lock Clear	Clear the key lock
PRG + ∧	Self-check	Self-check for operation panel

3.3 Description of LED digital tube and indicator light

There are 5-bit 8-segment LED tube, 3 unit indicators and 4 state indicator lights on the inverter LED operation panel, as shown in Figure 3.1. The digital tube can display the main interface state parameters, menu interface code, function code parameters and fault alarm codes of the inverter. Correspondence between the displaying symbols and bytes/numbers of the digital tube is shown in Table 3.3 below:

Table 3.3 Correspondence between the Displaying Symbols and Bytes/Numbers

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

3 unit indicators respectively correspond to Hz, A, V and other units instructions, as shown in Table 3.4.

Table 3.4 Description of Unit Indicator Lights

Unit indicator light	Description
○ Hz	Frequency in Hz
○ A	Current in A
○ V	Voltage in V
○ Hz +○ A	Speed in rpm
○ A +○ V	Percentage in %

4 Meanings indicated by state indicator lights are separately described in Table 3.5 below.

Table 3.5 Description of State Indicator Lights

Indicator light	Display state	Indicating current state of the inverter
Running state indicator light (RUN)	On	Running state
	Off	Stop state
Running direction indicator light (F/R)	On	Forward
	Off	Reverse
Running command channel indicator light(LOC/REM)	On	Operation panel control state
	Off	Terminal control state
	Flash	Communication control mode
Fault indication (FAULT)	On	Fault state
	Off	Normal state

3.4 Display state of operation panel

Display state of NVF300M operation panel includes stop state parameter display, running state parameter display and function code parameter editing state display.

1. Stop parameter display state
When the inverter is in stop state, the operation panel displays the stop state parameters. Pressing the SHIFT key can display the different stop state parameters in cycle. The viewable stop state parameter is defined by the function code F7.07.

2. Running parameter display state
After receiving the effective run command, the inverter enters the running state ; the operation panel displays the running state parameters; the RUN indicator light on the panel turns on; on/off of F/R light is determined by the current running direction. Unit indicator light shows the unit of this parameter. Pressing the SHIFT key displays the running state parameters in cycle. The viewable running state parameter is defined by the function codes F7.05 and F7.06.

3. Fault display state
When the inverter detects a fault signal, it enters the fault alarm display state , and then the FAULT light turns on, and fault codes are displayed. Through the STOP key on the operation panel, control terminals or communications command, fault reset operation can be carried out. If the fault persists, continue displaying the fault codes.

4. Function code editing status
In stop, operation or fault alarm state , press PRG key to enter editing mode (if there is a user password, see description in F7.00). The editing state is displayed in two-level menu mode, the order is: function code group number→function index number→function code parameters, press the SET key to enter the function parameter display state . In the function parameter display state , press the SET key to store the parameters; press PRG to return.

Chapter 4 Parameter Summary Table

1. Contents of the function table are as follows:

Item	Description	
Function code	Function parameter group and parameter numbers	
Name	Full name of the function parameter	
Parameter details	Detailed description of the function parameter	
Setting range	Range of the effective setting value of the function parameter	
Unit	V: Voltage; A: Current; ℃: Degree Celsius; Ω: Ohm; mH:millihenry; rpm: Speed;%: Percentage; bps: Baud rate; Hz, kHz: Frequency; ms, s, min, h, kh : Time; kW: Power; /: No units	
Default value	Original factory setting values of the function parameter	
Change	Modifying properties of the function parameter (i.e., whether to allow the change and change the conditions)	
	○	The setting value of this parameter can be modified when the inverter is in stop or operating status
	◎	The setting value of this parameter can not be modified when the inverter is in operating status
	●	The value of the parameter is the actual detection recording value, and can not be modified; (The inverter has carried out automatic check constraints to the modify property of each parameter to help users avoid inadvertent modification.)

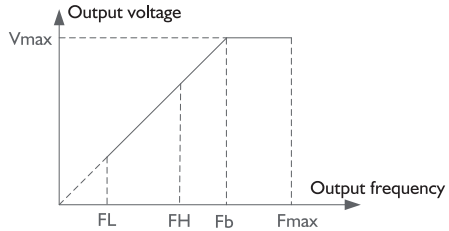
1. "Parameter Hex" is decimal system (DEC). If the parameter uses hexadecimal, when editing the parameters, each bit of data is independent of each other, and the range of some bits can be hexadecimal (0 ~F).
2. The "default value" refers to the value of the function code parameter after refreshed when conducting the factory parameters restoration operation; but the parameter value or record value actually detected will not be refreshed.
3. In order to more effectively protect the parameter, the inverter provides password protection for the function code. Setting methods are detailed in F7. 00 function description.

Function & Parameter Summary Table

Function code	Name	Detailed description of the parameter	Default value	Modification
Group F0: Basic function group				
F0.00	Control mode option	0:Vector control 1: Reserved 2: VF control 3: Reserved	2	◎

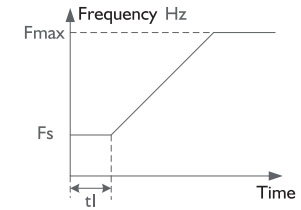
Function code	Name	Detailed description of the parameter	Default value	Modification
F0.01	Operation command channel option	For selecting the control command channels of the inverter. Inverter control commands include start, stop, forward, reverse, jog and other operations. 0: Panel Control Start and stop with the RUN, STOP, MF keys on the operation panel. 1:Terminal Control Start and stop with external control terminal Xi (function codes F5.00~F5.04 set 1 and 2), forward and reverse etc. 2: Communication Control Adopt the Mod bus protocol to operate and stop the inverter through RS485 terminal.	0	○
F0.02	Main frequency source option	0: Figure given (F0.05) Value of the function code F0.05 is taken as the current setting frequency when the inverter powers on. 1: AI1 analog given 2: AI2 analog given 3: Reserved When the analog signal input is taken as the voltage signal input, the following provisions are made: (-10~0)V segment: Reverse, the corresponding frequency can be defined in group F5. (0~10)V segment: Forward, the corresponding frequency can be defined in group F5. 4: High-speed pulse HDI given The frequency setting is determined by high-speed pulse frequency of HDI terminal. Corresponding relation between the high-speed pulse frequency and setting frequency can be defined in Group F5 function codes. 5: Reserved	0	○
F0.03	Auxiliary frequency source option	0: No auxiliary given setting frequency is only composed of the main setting frequency. Auxiliary frequency source is default ineffective. 1: AI1 analog given 2: AI2 analog given 3: Reserved 4: High-speed pulse HDI given Auxiliary frequency setting is determined by terminal pulse frequency and can only be input by HDI. 5: Process PID output frequency	0	○

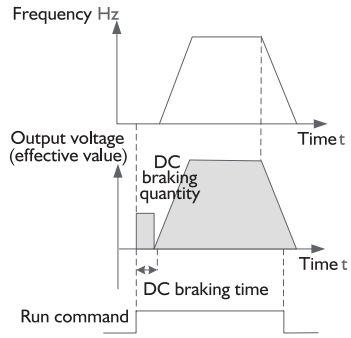
Function code	Name	Detailed description of the parameter	Default value	Modification
F0.04	Main and auxiliary frequency source computing	0:"+" Sum of the main setting frequency and auxiliary setting frequency is as the setting frequency. When the positive and negative polarity of the synthesized frequency is opposite to the main setting frequency, the setting frequency is zero. 1:"-" Difference between the main setting frequency and the auxiliary setting frequency is as the set frequency. When the positive and negative polarity of the synthesized frequency is opposite to the main setting frequency, the setting frequency is zero. 2: MAX (Main setting frequency, auxiliary setting frequency) The maximum absolute in the main setting frequency and auxiliary setting frequency is taken as the setting frequency. When the positive and negative polarity of the auxiliary setting frequency is opposite to the polarity of the main setting frequency, the setting frequency is the main setting frequency. 3: MIN (Main setting frequency, auxiliary setting frequency) The minimum absolute in the main setting frequency and auxiliary setting frequency is taken as the setting frequency. When the positive and negative polarity of the auxiliary setting frequency is opposite to the main setting frequency, the setting frequency is zero.	0	○
F0.05	Digital given	When the main setting frequency channel is defined as the digital setting (F0.02=0), this function parameter is the initial setting frequency of the main setting frequency of the inverter. **Setting range:** F0.09~F0.08	50.00Hz	○
F0.06	Running direction setting	Motor running direction can be changed by changing the value of the function. Its function is equivalent to achieving the motor rotation direction conversion by adjusting any two lines of the motor lines (U, W, V). 0: Run in default direction; inverter forward running,FWD/REV indicator light on. 1: Run in opposite direction; Inverter reverse running,FWD/REV indicator light off. **Note:** After the function parameters are restored to the default values, motor running direction will be restored to the default state. Cautiously use in occasions that are not allowed to change the motor rotation after the system is debugged. 2: Prohibit reverse running; Prohibit reverse running of inverter; suitable for application in the specific occasions where the reverse running is prohibited.	0	○

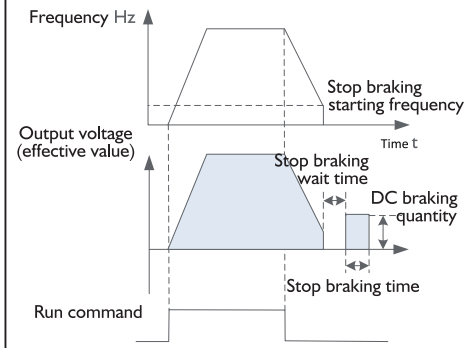
Function code	Name	Detailed description of the parameter	Default value	Modification
F0.07	Maximum output frequency	Maximum output frequency of the inverter is the basis for the frequency setting and acceleration speed. Maximum output frequency: Allowable maximum output frequency of the inverter, as Fmax shown in the figure; Higher limit of operating frequency: Maximum allowable operating frequency set by the user, as FH shown in the figure; Lower limit of operating frequency: Minimum allowable operating frequency set by the user, as FL shown in the figure; Basic operating frequency: The minimum value corresponding to the output frequency when the inverter outputs the maximum voltage in V/F mode, as Fb shown in the figure; Maximum output voltage: Allowable maximum output voltage of the inverter, as Vmax shown in the figure;  Figure 4.1 Limit frequency parameter definition schematic diagram **Setting 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:(0～380)V	50.00Hz	◎
F0.08	Higher limit of operating frequency		50.00Hz	○
F0.09	Lower limit of operating frequency		0.00Hz	○
F0.10	Basic operating frequency		50.00Hz	○
F0.11	Maximum output voltage		Inverter rated value	●

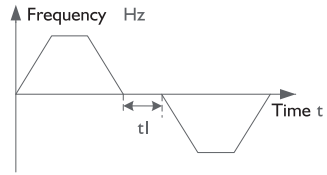
Function code	Name	Detailed description of the parameter	Default value	Modification
F0.12	UP/DN adjustment rate	For change rate when modifying the setting frequency through UP/DN terminal or panel ∧/∨. **Setting range:** (0.01～99.99)Hz/s	1.00Hz/s	○
F0.13	UP/DN adjustment control	**LEDbits:(after modifying the setting frequency for UP/DN)** 0: Frequency power down stored 1: Frequency power down not stored **LED tens: (after modifying the setting frequency for UP/DN)** 0: Stop frequency reserved 1: Stop restore to the initial frequency	0x0000	○
F0.14	Acceleration time 1	Acceleration time: Time required by the inverter from zero frequency accelerating to the maximum output frequency (F0.07). Deceleration time: Time required by the inverter from maximum output frequency decelerating to zero frequency. **Setting range:** (0.0～6000.0)s	10.0s	○
F0.15	Deceleration time1		10.0s	○
F0.16	Carrier frequency	By adjusting the carrier frequency to adjust the motor noise, avoid mechanical system resonance point, reduce the line-to-ground leakage current and interference generated against the inverter. When the carrier frequency is low, the output current higher harmonic increases, as well as the motor loss and temperature rise. When the carrier frequency is high, the motor loss is reduced as well as the motor temperature rise, but the inverter loss is increased, as well as the inverter temperature and interference rise. Carrier frequency adjustment will affect the following performances: Carrier frequency: Low → High Motor noise: Large → Small Output current waveform: Bad → Good Motor temperature rise: High→ Low Inverter temperature rise: Low → High Leakage current: Small→ Large External radiation interference: Small→ Large Carrier frequency of inverter with different powers may be different. **Note:** If the set carrier frequency is higher than the factory value, it will lead to temperature rise of inverter radiator. At this time, the user needs to use the inverter deratedly; otherwise, the inverter will have the risk of overheating alarm. **Setting range:** (0.5～15.0)kHz	Model fixed	○

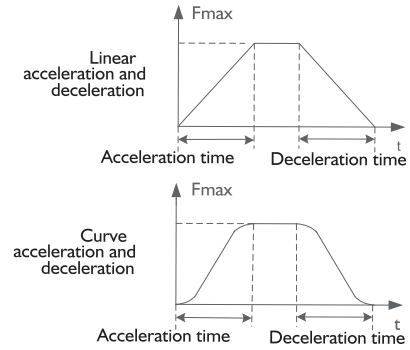
Function code	Name	Detailed description of the parameter	Default value	Modification
F0.17	Motor parameters tuning	0: No action 1: Motor static tuning Suitable for occasions where the motor can not disengage the load, motor parameters self-learning. 2: Motor dynamic tuning Suitable for occasions where control accuracy requirements are relatively high,comprehensive motor parameters self-learning. After the end of self-tuning, setpoint of F0.17 is automatically set as 0. **Note:** Before parameters self-learning, be sure to correctly input the motor parameters according to the motor nameplate; otherwise, it will lead to motor parameter learning inaccuracies.	0	◎
F0.18	Automatic voltage regulating AVR function option	0: No operation 1: Full effective 2: Only ineffective during deceleration AVR is automatic voltage regulation. When the input voltage deviates from the rated value, the output voltage can be kept constant by this function. Therefore, generally, AVR should act, especially when the input voltage is higher than the rated value. When slowing down, selecting AVR no action, deceleration time is short, but the output current is larger. Selecting AVR always action, motor decelerates smoothly and output current is small, but the deceleration time becomes longer.	2	○
F0.19	Parameters restore	0: No operation 1: Only Clear the fault record information 2: Parameters restore (Except motor parameters) **Note:** When this function is set as 2, the system starts to restore factory settings, namely to restore the settable parameters of the system to the factory values. During this period, the operation panel will prompt "-Int-"; it is recommended not to perform other operations at this time and even power failure is not allowed; otherwise, it will easily lead to incomplete recovery parameters and equipment fault upon the re-operation. When the display panel returns to the main interface, it shows that the parameter recovery completed.	0	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
Group F1: Start/Stop functions				
F1.00	Start-up mode	0: Start from the starting frequency Start according to the set starting frequency (F1.01) and starting frequency holding time (F1.02). 1: First DC brake and then start from the starting frequency DC brake (see F1.06～F1.09) and then start according to mode 0. Suitable for occasions where small inertia load may produce reverse rotation upon the starting. 2: Speed tracking (induding direction discrimination) and then start The inverter firstly detects the operating speed and direction of motor and starts running to the setting frequency at the current speed to achieve the smooth starting without impact against the rotating motor. This mode is suitable for occasions where large inertia load may produce reverse rotation upon the starting. **Note:** Start-up mode 1 is suitable for small inertia load of the motor with a positive or reverse rotation when the inverter is in the shutdown state; for high-speed running high inertia load, start-up mode 1 should not be adopted.	0	◎
F1.01	Direct starting frequency	Starting frequency refers to the initial frequency upon the inverter starting, as shown in the figure; starting frequency holding time refers to the time for the inverter to keep running at the starting frequency in the starting process, as t1 shown in the figure.  Figure 4.2 Starting frequency and time schematic diagram **Setting range:** F1.01: (0.00～60.00)Hz F1.02: (0.00～10.00)s **Note:** Starting frequency is not restricted by the operating frequency lower limit.	0.00Hz	○
F1.02	Starting frequency holding time		0.00s	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F1.03	DC braking current before starting	F1.03 and F1.04 are only effective when the starting operation mode selects the braking before starting mode (F1.00=1), as shown in the figure.  Figure 4.3 Brake before starting mode **Setting range:** F1.03: (0.0~100.0)% (Inverter rated current) F1.04: 0.00 (no action) (0.01~30.00)s	0.00%	○
F1.04	DC braking time before starting		0.00s	○
F1.05	Stop mode	0: Deceleration stop The inverter gradually reduces the output frequency according to the deceleration time after receiving the stop command and stops after the frequency is reduced to 0. 1: Free stop The inverter immediately terminates the output after receiving the stop command; and the load freely stops according to the mechanical inertia. 2: Deceleration stop+ DC braking The inverter reduces the output frequency according to the deceleration time after receiving the stop command and starts the DC braking when reaching the stop braking starting frequency. Related functions of stop DC braking are shown in the definitions of F1.06~F1.09.	0	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
F1.06	Stop DC braking starting frequency	**Stop DC braking starting frequency:** during the deceleration stop process, when reaching this frequency, start stop DC braking. **Stop DC braking wait time:** before the start of stop DC braking, the inverter seals the output and restarts the DC braking after the time delay. Used for preventing the overcurrent fault caused by the DC braking start at high speed. **Stop DC braking current:** refers to the increased DC braking quantity. The larger the current, the stronger the DC braking effect. Setting of the stop DC braking current is the percentage relative to the inverter rated current. **Stop DC braking time:** duration of the DC braking quantity. If the time is 0, DC braking will be ineffective, and the inverter will stop according to the deceleration time set.  Figure 4.4 Deceleration stop DC braking schematic diagram **Setting range:** F1.06: (0.00~60.00)Hz F1.07: (0.00~10.00)s F1.08: (0.0~100.0)% F1.09: (0~30.00)s **Note:** F1.08 is the percentage relative to the inverter rated current.	0.00Hz	○
F1.07	Stop DC braking wait time		0.00s	○
F1.08	Stop DC braking current		0.0%	○
F1.09	Stop DC braking time		0.00s	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F1.10	Forward and reverse dead time	This function is used for the transition time of the switching point set by F1.11 during the process of forward operation transition to reverse operation of the inverter (or reverse operation transition to forward operation), as t1 shown in the figure.  Figure 4.5 Forward and reversible dead time **Setting range:** (0～360.00)s	0.00s	○
F1.11	Forward and reverse switching mode	0: Operating frequency lower limit switching The inverter transits at the frequency reaching the operating frequency lower limit (F0.09) during the process of forward operation transition to reverse operation, or reverse operation transition to forward operation. 1: Starting frequency switching The inverter transits at the frequency reaching the starting frequency (F1.01) during the process of forward operation transition to reverse operation, or reverse operation transition to forward operation.	0	◎
F1.12	Reserved	---	---	●
F1.13	Acceleration and deceleration mode option	This function is used to select the frequency change mode in the starting and running processes. 0: Linear acceleration and deceleration Output frequency increases or decreases according to constant slope, as shown in the figure. 1: S-curve acceleration and deceleration Output frequency increases or decreases according to S-curve. S-curve is generally used in places that require relatively flat starting and shutdown processes, such as: elevator, conveyor belt etc.	0	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
		 Figure 4.6 Linear acceleration and deceleration diagram		
F1.14	S-curve acceleration start time	(10.0～50.0)% (acceleration time)	20.0%	◎
F1.15	S-curve acceleration end time	(10.0～80.0)% (acceleration time)	20.0%	◎
F1.16	S-curve deceleration start time	(10.0～50.0)% (deceleration time)	20.0%	◎
F1.18	Power-on terminal Run protection function option	0: Power-on terminal Run command is ineffective 1: Power-on terminal Run command is effective	0	◎
F1.19	Speed tracking search speed	1～50 Used to set the proportion of the speed tracking search speed.	20	◎
F2.00	Reserved	---	---	●
Group 2:Motor Parameter group				
F2.01	Motor rated power	Set parameters of the controlled asynchronous motor. In order to guarantee the control performance, be sure to correctly set the values of F2.01～F2.06 according to the nameplate parameters of asynchronous motor. **Setting range:** F2.01: (0.4～1000.0) kW F2.02: 0- Inverter rated voltage F2.03: (0.1～1000.0)A F2.04: (1.00～300.00)Hz	Model fixed	◎
F2.02	Motor rated voltage		Model fixed	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
F2.03	Motor rated current	F2.05: 2~24 F2.06: (0~60000)rpm **Note:** Asynchronous motor and inverter power rating should be set matchingly. Generally, only two levels smaller or one level greater than the inverter is allowed; control performance cannot be guaranteed if exceeding this range.	Model fixed	◎
F2.04	Motor rated frequency		Model fixed	◎
F2.05	Motor poles		4	◎
F2.06	Motor rated speed		1440rpm	◎
F2.07	Motor stator resistance % R1	Function code F2.08 is the sum of gustatory and leakage inductance of stator and rotor. **Setting 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	Model fixed	◎
F2.08	Motor leakage inductance % X		Model fixed	◎
F2.09	Motor rotor resistance % R2		Model fixed	◎
F2.10	Motor mutual inductance % Xm		Model fixed	◎
F2.11	Motor no-load current I		Model fixed	◎
F3: Vector control group				
F3.00	Speed / torque control mode	0: Speed control mode 1: Torque control mode	0	◎
F3.01	Speed loop proportional gain 1 (High speed ASR1-P)	Function codes F3.00~F3.07 are effective in the vector control mode. In the vector control mode, change the vector control speed response characteristic by setting the proportional gain P and integral time I of the speed regulator.	20.0	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F3.02	Speed loop integral time 1 (High speed ASR1-I)	**Setting range:** F3.01:0.1~200.0 F3.02:(0.000~10.000)s F3.03:0~8(0~2^8/10ms) F3.04:0.1~200.0 F3.05:(0.000~10.000)s F3.06:0~8(0~2^8/10ms)	0.200s	○
F3.03	ASR1 output filter		0	○
F3.04	Speed loop proportional gain 2 (Low speed ASR2-P)		20.0	○
F3.05	Speed loop integral time 2 (Low speed ASR2-I)		0.200s	○
F3.06	ASR2 output filter		0	○
F3.07	ASR low switching frequency	**Setting Range:** 0 ~ F3.24	5.00Hz	○
F3.08	Forward speed limit value with torque control	Forward speed limit with torque control is the limit value of forward speed under torque control; Reverse speed limit with torque control is the limit value of reverse speed under torque control; Driving torque limit value is the torque limit value in the motor electric state; Brake torque limit value is the torque limit value in the motor power generation state; When the setpoint is 100%, it corresponds to the inverter rated torque. **Setting range:** F3.08~ F3.09: (0.0~+100.0)% F3.10~ F3.11: (0.0~+300.0)%	100.0%	○
F3.09	Reverse speed limit value with torque control		100.0%	○
F3.10	Driving torque limit value		180.0%	○
F3.11	Braking torque limit value		180.0%	○

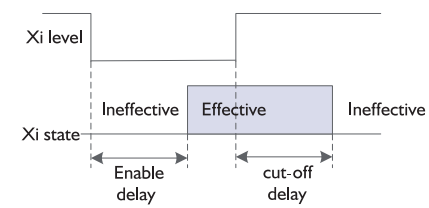
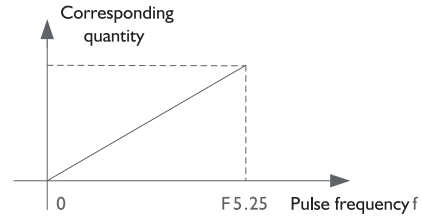
Function code	Name	Detailed description of the parameter	Default value	Modification
F3.12	Torque setting optionl	0: Keyboard set torque (F3.13) 1: AI1 2: AI2 3: Reserved 4: HDI high-speed pulse setting	0	◎
F3.13	Keyboard setting torque	Set the target torque value, percentage of motor rated current. **Setting range:** (-300.0～+300.0)%	0.0%	○
F3.14	Speed -torque switching point	Start under torque control mode; first select the speed mode; when the output torque reaches the torque switching point, switch the delay time through speed control and then switch to the torque control mode for operation. If using terminals X1～X4 and HDI for torque and speed control switching, F3.14 is ineffective; F3.15 is the switching delay time of torque and speed control modes. **Setting range:** F3.14: (0～+300.0)% (initial torque) F3.15: (0～1000)ms	100.0%	◎
F3.15	Speed -torque switching delay		0ms	◎
F3.16	Torque given filter time	Through the torque given channel, filter the external torque command via the primary delay filter. Appropriately setting filter time can prevent the sudden change of the torque command and causing motor jittering. **Setting range:** (0～65535)ms	0ms	◎
F3.17	Pre -excitation time	This function is used for motor pre-excitation upon inverter starting. Establishing magnetic field inside the motor can effectively improve the torque characteristics in the motor starting process. **Setting range:** (0.000～8.000)s	0.300s	○
F3.18	Current loop propor -tional gain (ACR-P)	F3.18 and F3.19 are PI regulator parameters of current loop. Increasing current loop KP or reducing I can speed up the dynamic response of the system torque; reducing KP or increasing I can enhance the system stability. **Setting range:** F3.18: 1～5000 F3.19: (0.5～100.0)ms	1000	○
F3.19	Current loop integral time (ACR-I)	**Note:** For most occasions, PI parameter of the current loop is not required to be adjusted, and users are recommended to change this set of parameters cautiously.	8.0ms	○
F3.20	Static Friction Compen -sation (Torque control effective)	**Setting range:** (0.0～300.0)% (Relative to the motor rated torque)	50.0%	◎
F3.21	Reserved	---	---	◎
F3.22	Reserved	---	---	◎
F3.23	Reserved	---	---	◎
F3.24	ASR high switching frequency	**Setting range:**F3.07～F0.07	10.00Hz	○
F3.25	Speed error gain	**Setting range:**(50～200)%	100%	○

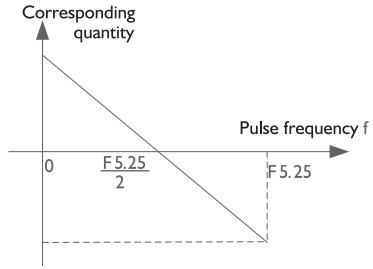
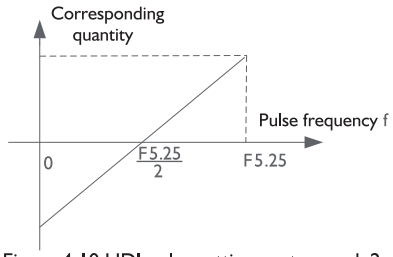
Function code	Name	Detailed description of the parameter	Default value	Modification
Group F4: V / F control group				
F4.00	V / F curve setting	Select different V/F curves to meet the needs of different load characteristics. 0: Linear V / F curve; suitable for constant torque load. 1: 2 power reduced torque V/F curve; 2.0 power reduced torque characteristic. 2: 1.7 power reduced V/F curve; 1.7 power reduced torque characteristic. 3: 1.2 power reduced V/F curve; 1.2 power reduced torque characteristic. The above curves are suitable for fan pump variable torque load; the user can adjust according to the load characteristic to achieve the best energy-saving effect. 4: Multi-point V/F curve (set by F4.01～F4.06); users can customize V/F curve through F4.01～F4.06. Adopting increasing (V1, F1), (V2, F2), (V3, F3) three-point broken-line mode to define V/F curve for special load characteristics. Factory default users customize that V/F is a straight line. 5: V/F separation curve (F4.10～F4.15 set voltage); in this mode, V and F are separated; f can be adjusted through the frequency given channel set by F0.02 to change the curve characteristic; and V can be also adjusted according to the voltage given channel set by F4.10 to change the curve characteristic.	0	◎
F4.01	V/F frequency 3	When F4.00 = 4 (multi-point V/F curve), lock V/F curve through F4.01～F4.06. V/F curve is generally set according to the load characteristic of the motor. **Setting 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. High low -frequency voltage setting may cause motor overheating and even burning; inverter may undergo overcurrent stall or 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 boost	To compensate for the low frequency torque characteristic, some boost compensation can be made to the output voltage. F4.07 is relative to the maximum output voltage Vb. F4.08 defines the percentage of basic operating frequency F0.10 relative to the manual torque boost cut-off frequency. Torque boost can improve V / F low frequency torque characteristics.	0.0%	○
F4.08	Torque boost cut-off point		10.0%	○

Function code	Name	Detailed description of the parameter	Default value	Modification
		Torque boost quantity should be appropriately selected according to the load size. Large size can increase the boost, but the boost value should not be set too large; when the torque boost is too large, the motor will run at over-excitation, the inverter output current will increase, motor heating will increase and the efficiency will be reduced. Automatic torque boost of the inverter when the torque boost is set as 0.0%. Torque boost cut-off point: At this frequency point, torque boost is effective; when exceeding this setting frequency, the torque boost is ineffective. **Setting range:** F4.07: 0.0% (automatic) (0.1~30.0)% F4.08: (0.0~50.0)%		
F4.09	Energy -saving operation option	0: No action 1: Automatic energy-saving operation When the motor operates at constant speed in the process of no load or light load, the inverter adjusts the output voltage by detecting the load current to achieve the purpose of automatic energy-saving. Tip: This function is especially effective for fan and pump load.	0	◎
F4.10	V/F output voltage channel option	When selecting V/F channel separation, output voltage set channel. 0: Keyboard setting voltage (F4.11) 1: AI1 set voltage 2: AI2 set voltage 3: Reserved **Note:** 100% corresponds to the motor rated voltage	0	○
F4.11	Keyboard set voltage value	When the motor set channel option F4.10=0 (panel set voltage), the function code value is the voltage digital setpoint. **Setting range:** (0.0~100.0)% (motor rated voltage)	100.0%	○
F4.12	Voltage increase time	Voltage increase time refers to the time required by the inverter from accelerating the minimum output voltage to the maximum output voltage. Voltage decrease time refers to the time required by the inverter from decelerating the maximum output voltage to the minimum output voltage. **Setting range:**F4.12~ F4.13: (0.1~10.0)s	5.0s	○
F4.13	Voltage decrease time		5.0s	○
F4.14	Maximum output voltage	When separating the V/F curve, set the maximum and minimum output voltage of the inverter, percentage relative to the rated output voltage of the inverter. **Setting range:** F4.14: F4.15~100.0%(Inverter rated voltage) F4.15: 0.0%~F4.14(Inverter rated voltage)	100.0%	◎
F4.15	Minimum output voltage		0.0%	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
Group F5: Input terminal parameter group				
F5.00	HDI input type option	0: HDI is the high-speed pulse input (set by F5.25~F5.27) 1: HDI is the switch input (similar to X1~X4 terminal functions)	0	◎
F5.01	X1 terminal function option	0: No function 1: Forward (FWD) 2: Reverse (REV) 3: Jog forward 4: Jog reverse 5: Three-wire operation control 6: External reset (RESET) input 7: External fault input 8: External interrupt input 9: Inverter operating disabled 10: Terminal stop 11: Terminal DC braking stop 12: Terminal free stop 13: Frequency increment instruction (UP) 14: Frequency decrease instruction (DN) 15: Command to switch to panel control 16: Command to switch to the terminal control 17: Command to switch to the communication control 18: Main frequency source switching to digital setting 19: Main frequency source switching to AI1 20: Main frequency source switching to AI2 21: Reserved 22: Main frequency source switching to HDI 23: Auxiliary frequency source is ineffective 24: Multi-frequency option 1 25: Multi-frequency option 2 26: Multi-frequency option 3 27: Multi-frequency option 4 28: Acceleration and deceleration time option 1 29: Acceleration and deceleration time option 2 30: Multi-segment closed loop setting option 1 31:Multi-segment closed loop setting option 2 32: Multi-segment closed loop setting option 3 33: Multi-segment closed loop setting option 4 34: Forward disabled 35: Reverse disabled 36: Acceleration and deceleration disabled 37:Process closed loop disabled 38: Speed control and torque control switching terminal 39: PLC pause 40: PLC disabled 41: PLC stop memory clear 42: Wobble switch in 43: Wobble status reset 44~50: Reserved	1	◎
F5.02	X2 terminal function option		2	◎
F5.03	X3 terminal function option		24	◎
F5.04	X4 terminal function option		25	◎
F5.05	Reserved		---	●
F5.06	Reserved		---	●
F5.07	HDI terminal function option		0	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
F5.08	Input terminal effective status setting (X1 ~X4, HDI)	Binary setting: 0: Normal logic, conducting effective 1: Negative logic, disconnect effective **LED bits:** **bit0~bit3:** X1~X4 **LED tens:** bit0~bit1: Reserved bit2: HDI bit3: Reserved **Note:** Factory settings of all terminals are positive logic.	00	○
F5.09	Input terminal filter time	This function code sets the filter time for input terminal detection. When the input terminal state changes and if it remains unchanged after the filter time set, it is considered that the terminal state change is effective; otherwise, it still remains the last state, so as to reduce the malfunction caused by interference. **Setting range:** (0~1000)ms	10ms	○
F5.10	Terminal control mode option	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: Reserved	0	◎
F5.11	X1 terminal close delay	Delay time corresponding to the level changes when the programmable input terminal is connected and disconnected is shown in the figure below:	0.000s	○
F5.12	X1 terminal cut-off delay time		0.000s	○
F5.13	X2 terminal close delay time		0.000s	○
F5.14	X2 terminal cut-off delay time		0.000s	○
F5.15	X3 terminal close delay time		0.000s	○
F5.16	X3 terminal cut-off delay time		0.000s	○

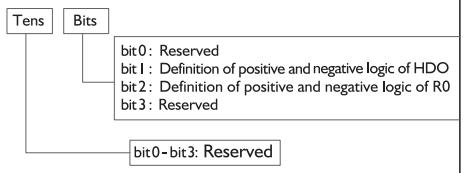
Function code	Name	Detailed description of the parameter	Default value	Modification
F5.17	X4 terminal close delay time	 Figure4.7 Programmable input terminal open-delay schematic diagram **Setting range:** F5.11~F5.24:(0.000~50.000)s	0.000s	○
F5.18	X4 terminal cut-off delay time		0.000s	○
F5.19	Reserved		---	●
F5.20	Reserved		---	●
F5.21	Reserved		---	●
F5.22	Reserved		---	●
F5.23	HDI terminal close delay time		0.000s	○
F5.24	HDI terminal cut-off delay time		0.000s	○
F5.25	HDI maximum input pulse frequency	**Setting range:** (0.1~100.0)kHz **Note:** Only effective when HDI terminal selects the high-speed pulse input, namely that F5.00 is 0.	10.0 kHz	○
F5.26	HDI pulse output center point option	0: No center point. As shown in the figure below  Figure 4.8 HDI pulse setting no-center point mode	0	○

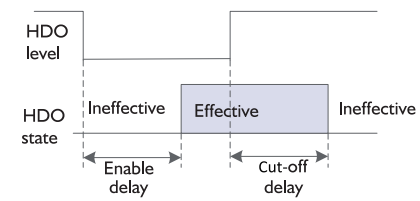
Function code	Name	Detailed description of the parameter	Default value	Modification
		Quantities corresponding to the pulse input frequency are positive. 1: Center point mode 1  Figure 4.9 HDI pulse setting center mode 1 Pulse input has a center point; the center point is the half of the maximum pulse input frequency F5.25. The corresponding quantity is positive when the input pulse frequency is less than the midpoint frequency. 2: Center point mode 2 Pulse input has a center point; the center point is the half of the maximum pulse input frequency F5.25. The corresponding quantity is positive when the input pulse frequency is greater than the midpoint frequency.  Figure 4.10 HDI pulse setting center mode2		
F5.27	Set pulse filter time	This function code defines the filter time of input pulse. The longer the filter time, the slower the change rate of the given pulse frequency. **Setting range:** (0.00~10.00)s	0.05s	○
F5.28	Reserved		---	●

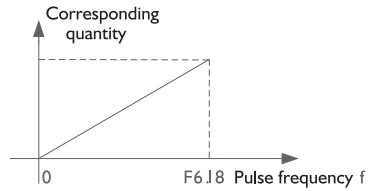
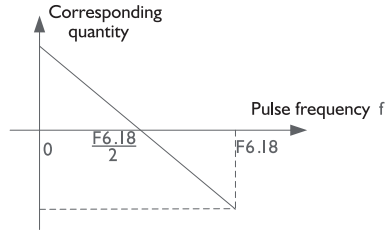
Function code	Name	Detailed description of the parameter	Default value	Modification
F5.29	AI1 filter	F5.29~F5.30 defines the AI channel filter time constant and carries out filter processing against the input signal. The longer the filter time, the stronger the anti-disturbance ability, but the slower the response; the shorter the filter time, the faster the response, but the weaker the anti-disturbance ability. **Setting range:** (0.00~10.00)s	0.05s	○
F5.30	AI2 filter		0.05s	○
F5.31	Reserved		---	●
F5.32	Curve option	**LED bits: AI1 curve option** 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4 **LED tens: AI2 curve option** 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4 **LED hundreds: Reserved** **LED thousands: HDI-speed pulse input curve option** 0: Curve 1 1: Curve 2 2: Curve 3 3: Curve 4	0x0000	○
F5.33	Curve 1 maximum setting	F5.35~110.00%	100.00%	○
F5.34	The actual corres-ponding quantity of curve 1 maximum setting	Frequency setting: (0.0~100.00)%Fmax; (or the amount of torque: (0.0~300.00)% Te;)	100.00%	○
F5.35	Curve 1 minimum setting	0.00%~ F5.33	0.00%	○
F5.36	The actual corres-ponding quantity of curve 1 minimum setting	The same with F5. 34	0.00%	○
F5.37	Curve 2 maximum setting	F5.39~110.00%	100.00%	○

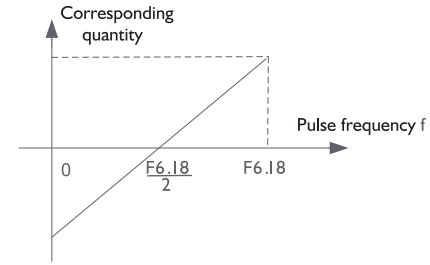
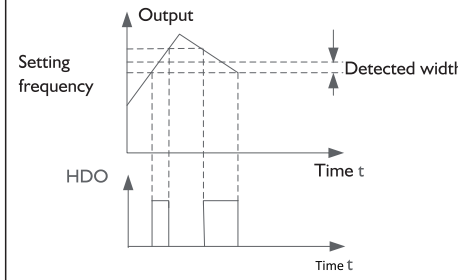
Function code	Name	Detailed description of the parameter	Default value	Modification
F5.38	The actual corresponding quantity of curve 2 maximum setting	The same with F5. 34	100.00%	○
F5.39	Curve 2 minimum setting	0.0%～F5.37	0.00%	○
F5.40	The actual corresponding quantity of curve 2 minimum setting	The same with F5. 34	0.00%	○
F5.41	Curve 3 minimum setting	F5.43～110.00%	100.00%	○
F5.42	The actual corresponding quantity of curve 3 maximum setting	The same with F5. 34	100.00%	○
F5.43	Curve 3 minimum setting	0.0%～F5.41	0.00%	○
F5.44	The actual corresponding quantity of curve 3 minimum setting	The same with F5. 34	0.00%	○
F5.45	Curve 4 minimum setting	F5.47～110.00%	100.00%	○
F5.46	The actual corresponding quantity of curve 4 maximum setting	The same with F5. 34	100.00%	○

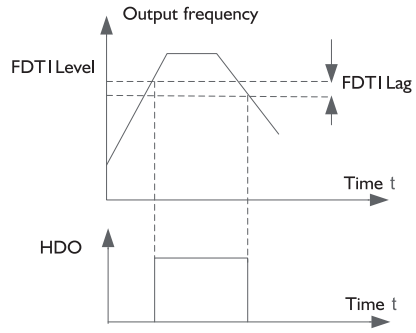
Function code	Name	Detailed description of the parameter	Default value	Modification
F5.47	Curve 4 inflection point 2 settingg	F5.49～F5.45	100.00%	○
F5.48	The actual corresponding quantity of curve 4 inflection point 2 setting	The same with F5. 34	100.00%	○
F5.49	Curve 4 inflection point 1 settingg	F5.51～F5.47	0.00%	○
F5.50	The actual corresponding quantity of curve 4 inflection point 1 setting	The same with F5. 34	0.00%	○
F5.51	Curve 4 minimum setting	0.0%～F5.49	0.00%	○
F5.52	The actual corresponding quantity of curve 4 minimum setting	The same with F5. 34	0.00%	○
Group F6: Output terminal parameter group				
F6.00	HDO output type option	0: High-speed pulse open collector output. HDO terminal is as the high-speed pulse output function; the maximum pulse frequency is 100.0kHz; see the description of F6.18～F6.19 function codes for related functions. 1: Open collector output. See the description of F6.02 function code for related functions.	0	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
F6.01	Reserved	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 stop (LU) 6: External fault stop (EXT) 7: Frequency higher limit (FHL) 8: Frequency lower limit (FLL) 9: Inverter zero-speed operation 10: X1 terminal (reserved) 11: X2 terminal (reserved) 12: Simple PLC operation complete instructions 13: PLC cycle completion indication 14: Wobble higher and lower limit 15: Inverter ready for operation (RDY) 16: Inverter fault 17: Reserved 18: Reserved 19: Torque limited 20: Inverter forward and reverse indication terminal 21:PFC 22~50: Reserved	---	●
F6.02	HDO(as Y terminal) output option		0	◎
F6.03	Relay RO output option		16	◎
F6.04	Output terminal valid state setting (HDO, R0)	Setting of valid state of output terminal:  Figure4.11 Output terminal hexadecimal setting map Positive logic: HDO (as Y terminal); high level with output; low level without output; RB-RC pickup when R0 has output and RA-RB pickup when R0 has no output; Negative logic: HDO (as Y terminal); low level with output; high level without output; RA-RB pickup when R0 has output and RB-RC pickup when R0 has no output; Binary setting 0:Conducting effective 1: Disconnect effective	00	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F6.05	Reserved	When the programmable output terminal is connected and disconnected, the delay time corresponding to the level changes is shown in the figure (HDO terminal as an example):  Figure 4.12 HDO signal opening and cut-off delay schematic diagram **Setting range:** F6.05~F6.10: (0.000~50.000)s	---	●
F6.06	Reserved		---	●
F6.07	HDO (as Y terminal) opening delay time		0.000s	○
F6.08	HDO (as Y terminal) cut-off delay time		0.000s	○
F6.09	Relay RO opening delay time		0.000s	○
F6.10	Relay RO cut-off delay time		0.000s	○
F6.11	AO output function option	0: No function 1: Output frequency (0~ maximum frequency) 2: Setting frequency (0~ maximum frequency) 3: Setting rate (after acceleration and deceleration) (0~ maximum frequency) 4: Motor speed (0~ maximum speed) 5: Output current (0~2)times the Inverter rated current 6: Output current (0~2)times the Motor rated current 7: Output torque (0~3)times the Motor rated torque 8: Output power (0~2)times the rated power 9: Output voltage (0~1.2)times the rated voltage 10: Bus voltage (0~800)V 11: AI1 12: AI2 13: Reserved 14: HDI 15~36: Reserved **Note:** When AO output option is current signal, the external equivalent resistance is recommended not to exceed 250 Ohm.	0	○
F6.12	Reserved		---	●
F6.13	HDO high speed pulse output function option		0	○
F6.14	AO gain	For AO analog output, if the user needs to change the display range or correct the header error, it can be achieved by adjusting the gain. **Setting range:** F6.14: (0.0~200.0)% F6.15: (-100.0~+100.0)%	100.0%	○
F6.15	AO bias correction		0.0%	○
F6.16	Reserved		---	●
F6.17	Reserved		---	●

Function code	Name	Detailed description of the parameter	Default value	Modification
F6.18	HDO maximum output pulse frequency	(0.1～100.0) kHz	10.0kHz	○
F6.19	HDO pulse output center point option	0: No center point, as shown below.  Figure 4.13 HDO set no center mode Quantity corresponding to the pulse output frequency is positive. 1:Center point mode 1. As shown below.  Figure4.14 HDO pulse set center mode 1 The pulse output has a center point; and the center point is half of the maximum pulse output frequency F6.18. When the output pulse frequency is less than the center point frequency, the corresponding quantity is positive. 2: Center point mode 2 The pulse output has a center point; and the center point is half of the maximum pulse output frequency F6.18. When the output pulse frequency is greater than the center point frequency, the corresponding quantity is positive.	0	○

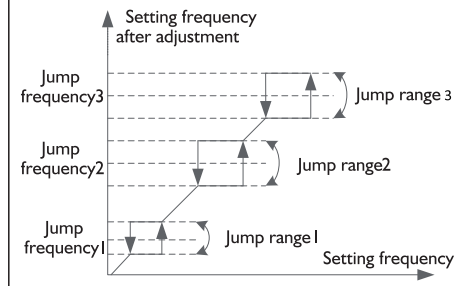
Function code	Name	Detailed description of the parameter	Default value	Modification
		 Figure 4.15 HDO pulse set center mode 2		
F6.20	Frequency arrival detection width	 Figure 4.16 Frequency arrival signal output schematic diagram As shown in the figure, when the inverter output frequency is within the positive and negative detected width, output the pulse signals. (HDO terminal output as an example): **Setting range:** (0.00～300.00)Hz	2.50Hz	○
F6.21	FDT1 level	When the output frequency exceeds this setting frequency (FDT1 level), output the indication signal until the output frequency drops below a certain frequency of FDT1 level (FDT1 level-FDT1 lag). As shown below.	50.00 Hz	○
F6.22	FDT1 lag		1.00 Hz	○
F6.23	FDT2 level		25.00 Hz	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F6.24	FDT2 lag	 Figure 4.17 Frequency level detection schematic diagram Setting range: F6.21～F6.24:(0.00～300.00)Hz	1.00Hz	○
Group F7: Human-machine interface parameter group				
F7.00	User password	To protect the parameters, the converter provides password protection function. When F7.00 is set non-zero values, it is the user password; when exiting function code edit state, password protection becomes effective; when pressing PRG key again and entering into function code edit state, "0000" will be displayed; the user must enter user password before entering the function code editing state.	0000	○
F7.01	Keyboard lock function	0: No lock 1: Full lock 2: Full lock except the multi-function key 3: Full lock except the SHIFT key 4: Full lock except the RUN, STOP keys Press and hold the SET key; press the PRG key, and then lock the key. When the control panel keys are locked, unlock through the following operations: Press and hold the PRG key, and then press the key. ▼	0	○
F7.02	MF (multi-function) key function option	0: Jog 1: Free stop 2: Fast stop 3: Forward and reverse switching 4: UP/DN set value cleared	0	○
F7.03	Parameter protection setting	0: All data is allowed to be rewritten; 1: Rewriting is not allowed except F0.05 and this function code 2: All is not allowed to be rewritten except this function code	0	○

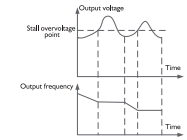
Function code	Name	Detailed description of the parameter	Default value	Modification
F7.04	Parameter copy	0: No action 1: Parameter upload 2: Parameter download 3: Parameter download (except motor parameters)	0	◎
F7.05	Parameters option 1 displayed by the operating status	Setting range: 0x0007～0x3FFF bit00: Output frequency (Hz on) bit01: Setting frequency (Hz flash) bit02: Bus voltage (V on) bit03: Output voltage (V on) bit04: Output current (A on) bit05: Operating speed (rpm on) bit06: Output power (% on) bit07: Output torque (% on) bit08: PID setting (% flash) bit09: PID feedback (% on) bit10: Input terminal status bit11: Output terminal status bit12: Torque setpoint (% on) bit13: PLC current number of segment bit14:Setting Speed bit15: reserved	0x0017	○
F7.06	Parameters option 2 displayed by the operating status	Setting range: 0x0000～0x000F bit00: Analog AI1 value (V on) bit01: Analog AI2 value (V on) bit02: Reserved bit03: HDI high-speed pulse frequency bit04～bit15: Reserved	0x0000	○
F7.07	Parameters option displayed by the stop status	Setting range: 0x0003～ 0x00FF bit00: Setting frequency (Hz on, frequency slowly flash) bit01: Bus voltage (V on) bit02: Input terminal status bit03: Output terminal status bit04: PID setpoint value (% flash) bit05: PID feedback value (% on) bit06: Torque setpoint value (% on) bit07: Analog AI1 value (V on) bit08: Analog AI2 value (V on) bit09: Reserved bit10: HDI high-speed pulse frequency bit11: PLC current number of segments bit12: Speed Set bit13 ～bit15: Reserved	0x0003	○
F7.08	Stop key effective choice	0: Effective only for the panel control 1: Effective for the panel and terminal control function simultaneously 2: Effective for the panel and communication control function simultaneously 3: Effective for all control modes	0	○

Chapter 4 Parameter Summary Table

Function code	Name	Detailed description of the parameter	Default value	Modification
Group F8: Enhancements group				
F8.00	Acceleration time 2	The inverter defines a total of 4 kinds of acceleration and deceleration time, and selects the acceleration and deceleration time 1-4 during the operation of the inverter by controlling different combinations of terminals; refer to definition of acceleration and deceleration time terminal function in F5.01～F5.07. **Setting 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	Jog run frequency	Under the operation panel control conditions, the jog running can be achieved through MF key on the panel (F7.02 = 0). Jog runs by pressing the MF key and stops by releasing the MF key. Under the terminal control conditions, the jog running can be achieved by setting the terminal functions and through jog forward terminal or jog reverse terminal. Jog interval is the interval that must be waited from the moment of canceling the last jog command to the next jog command effective. The jog command will not make the inverter operate in the interval, and the inverter operates in zero-frequency state without output. If the jog command has been existing, start to execute the jog command after the end of the interval; immediately execute the jog command after the jog interval. **Setting range:** F8.06: (0.10～50.00)Hz F8.07: (0.0～100.0)s	5.00Hz	○
F8.07	Jog interval		0.0s	○
F8.08	Jump frequency1	To let the inverter output frequency avoid the resonance frequency of mechanical load, setting frequency of the inverter can be set according to the method shown in the figure. The inverter makes jump operation near some frequency points and can define 3 jump ranges at most.	0.00Hz	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
		 Figure 4.18 Jump frequency and range schematic diagram		
F8.09	Range of jump frequency1	Although the inverter setting frequency is in the mechanical resonance frequency band of the drive system after setting the jump frequency parameters, output frequency of the inverter will also be automatically adjusted outside the mechanical resonance band to avoid operation on the resonance frequency. **Setting 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	0.00Hz	◎
F8.10	Jump frequency2		0.00Hz	◎
F8.11	Range of jump frequency2		0.00Hz	◎
F8.12	Jump frequency3		0.00Hz	◎
F8.13	Range of jump frequency3		0.00Hz	◎
F8.14	Power outage restart function	In the different operating command channel, the inverter power down and then power up, waiting for a period of time after the automatic operation . **Note**: If the function is "action", the inverter power on again after the restart tracking speed for a period of time. **Setting range:** F8.14: 0: No action 1: Action F8.15: (0.0～10.0)s	0	◎
F8.15	Power outage restart wait time		0.0s	○
F8.16	Brake unit operating voltage	(650 ～750)V (380V series) (340 ～380)V (220V series)	720(380V series) 360(220V series)	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
F8.17	Dynamic braking option	0: No action 1: Action **Note:** Be sure to correctly set the function parameter according to the actual use; otherwise, the control performance will be affected.	0	◎
F8.18	Dynamic braking usage	Effective for brake unit built-in models. **Note:** Brake resistor resistance and power should be considered when setting this function. **Setting range:**(0.0～100.0)%	80.0%	○
F8.19	Carrier frequency automatic adjustment option	0: No automatic adjustment 1: Automatic adjustment	1	○
F8.20	Voltage regulation option	**LED bits: Overvoltage stall option** 0: Disable (when braking resistor is installed) 1: Allow **LED tens: Instantaneous stop and non-stop functions option** 0: No action 1: Action (Low voltage compensation) **LED hundreds: Overmodulation enable** 0: Ineffective 1: Effective LED hundreds determine whether to start over-modulation function controlled by V/F. Vector control over-modulation has been always enabled. Over-modulation means that when the grid voltage is chronically low (below 15% of the rated voltage) or under long-term overloaded work, the inverter will improve the bus voltage utilization itself to improve the output voltage.	0x0001	◎
F8.21	Stall over -voltage point	During the decelerated operation of inverter, due to the load inertia effect, actual decline rate of the motor speed may be lower than the decline rate of the output frequency. At this time, the motor will give back the power to the inverter and cause inverter DC bus voltage rise. If no measures are taken, overvoltage trip will occur.	120.0% (380V series) 115.0% (220V series)	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
		The overvoltage stall protection function detects the bus voltage and compares with the stall overvoltage point defined by F8.21 (relative to the standard bus voltage)during the decelerated operation of inverter; if the bus voltage exceeds the stall overvoltage point, the inverter output frequency stops falling. When the bus voltage is detected lower that the stall overvoltage point again, implement the decelerated operation, as shown in the figure.  Figure 4.19 Overvoltage stall function schematic diagram **Setting range:**(110.0～150.0)% Udc		
F8.22	Droop control	Droop control is generally used for the load distribution when multiple motors drive the same load. Droop control means that the inverter output frequency falls with the increase of load, so that when multiple motors drive the same load, motor output frequency in the load will decrease more, thus reducing the motor load and achieving the load uniformity of multiple motors. This parameter refers to the output frequency decrease value when the inverter is outputting the rated load. **Setting range:** 0.00 Hz (ineffective) ～10.00 Hz	0.00Hz	○
F8.23	Automatic current limiting level	Automatic current-limiting function automatically limits that the current will not exceed the set automatic current-limiting level (F8.23) through the real-time control of the load current to prevent the fault trip caused by current overshoot. For some load occasions with large inertia or dramatic changes, this function is especially useful. Automatic current-limiting level (F8.23) defines the current threshold of automatic current-limiting action. The Setting range is the percentage relative to the inverter rated current. Frequency decreasing rate upon current limiting (F8.24) defines the rate adjusted for the output frequency at the automatic current limiting action. If the frequency decreasing rate (F8.24) at the automatic current limiting action is too small, it is not easy to get rid of automatic current limiting state and may eventually lead to overload failure. If the frequency decreasing rate (F8.24) is too large, the frequency adjustment level will be increased, and the inverter will be in power for a long time, thus causing over-voltage protection.	160.0%	●
F8.24	Current -limiting frequency decrease rate		5.00Hz/s	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F8.25	Automatic current limiting action option	The current limit protection function detects the output current during the inverter operation and compares it with the current limit defined by F8.23. If the current limit level is exceeded, the inverter will run at steady frequency during acceleration operation ; If the inverter is running at constant speed, the inverter will run down. If the current exceeds the current limit continuously, the output frequency of the inverter will continue to decrease until the lower limit frequency. When the output current is again detected below the current limit level, the acceleration operation continues. **Setting range:** F8.23: (20.0%~200.0%)le F8.24: (0.0 0~99.99)Hz/s F8.25: 0: Current limit ineffective 1: Current limit always effective 2: Constant speed ineffective, other status effective	0	◎
F8.26	Slip compen -sation gain	Slip compensation can compensate for motor speed changes generated with load to increase the motor mechanical characteristics hardness. F8.26 determines the sensitivity and speed of compensation and F8.27 determines the size of the compensation. **Setting 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 compen -sation limit		200.0%	○
F8.28	Slip compen -sation time constant		2.0s	○
F8.29	Frequency decrease rate at voltage compen -sation		10.00 Hz/s	○
F8.30	Zero frequency operation threshold	This function code is used together with No. 9 function of switch output terminal. **Setting range:** (0.00~300.00)Hz	0.50 Hz	○
F8.31	Reserved	---	---	●

Function code	Name	Detailed description of the parameter	Default value	Modification
F8.32	Suppre -ssion shock factor	When controlled by V/F, adjusting this parameter can suppress the motor shock. **Setting range:** 0~255	2(380V Series) 20(220V Series)	○
F8.33	Fan control	0: Automatic operation The inverter automatically starts the internal temperature detection program in operation, and determines the operation and stop of the fan according to the module temperature. If the fan runs before the shutdown, the fan continues to run 3 minutes upon the shutdown and then starts the internal temperature detection program. 1: Operation effective; continue to run 3 minutes after the shutdown 2: Fans have been turning in energizing	1	◎
F8.34	Textile function option	0: Not select the textile function 1: Select the textile function Wobble function is applicable to textile, chemical fiber and other industry, and other occasions needing traversing and winding functions. It refers to the inverter output frequency and swings up and down with the setting frequency as the center.	0	◎
F8.35	Wobble operation mode	**LED bits: Starting mode** 0: Automatic 1: Terminal manual **LED tens: Swing control** 0:Relative central frequency 1: Relative maximum frequency **LED hundreds: Wobble state memory** 0: Stop memory 1: Stop no memory **LED thousands: Wobble state power down storage** 0: Stored 1: Not stored	0x0000	◎
F8.36	Wobble preset frequency	Define the inverter preset frequency before entering into the wobble operation state. **Setting range:** 0.00 Hz~operating frequency higher limit (F0.08)	0.00 Hz	○
F8.37	Wobble preset frequency waiting time	Before entering into the wobble state, set the duration of the preset wobble frequency operation. **Setting range:** (0.0~3600.0)s	0.0s	○
F8.38	Wobble amplitude	Swing Aw=F8.38* (Center frequency or maximum operating frequency) **Note:** Swing value is related to LED ten value of F8.35. **Setting range:** (0.0~50.0)%	0.0%	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F8.39	Sudden jump frequency	Sudden jump frequency=Swing Aw* F8.39, Set as 0, showing no sudden jump frequency. **Setting range:** (0.0~50.0)%	0.0%	○
F8.40	Wobble cycle	Define the time of a complete cycle of wobble rise and fall process. **Setting range:** (0.1~999.9)s	10.0s	○
F8.41	Triangle wave rise time	Define the running time of wobble rise phase = F8.40* F8.41 (s); running time of the decline phase =F8.40* (1-F8.41) (s) **Setting range:** (0.0~50.0)% (refer to wobble cycle)	50.0%	○
F8.42	Detection enabling of overload pre-alarm of the inverter	This function is used for detecting the overload pre-alarm of the inverter. **Set range:** F8.42: 0: Not detected 1. Always detected 2. Detected only at constant F8.43: (20.0~200.0)% F8.44: (0.1~60.0)s **Notes:** When the multifunctional output terminal HDO (as Y terminal) or relay Ro is set as "4: Overload detection signal (OL)", this group of functions are effective.	0	○
F8.43	Detection level of overload pre-alarm		130.0%	○
F8.44	Detection time of overload pre-alarm		5.0s	○
F8.45	Torque accelera-tion time	The acceleration time of set torque from the start (0%)to the motor rated torque(100%). **Setting range:** (0.00~120.00)s	0.10s	○
F8.46	Torque decelera-tion time	The deceleration time of set torque from the motor rated torque(100%) to stop(0%). **Setting range:** (0.00~120.00)s	0.10s	○
Group F9: Process PID control group				
F9.00	Closed-loop function option	0: Closed-loop operation control ineffective 1: Closed-loop operation control effective	0	◎
F9.01	Setting channel option	0: Given by the digital 1: Given by AI1 analog 2: Given by AI2 analog 3: Reserved	1	○
F9.02	Feedback channel option	0: Given by AI1 analog 1: Given by AI2 analog 2: AI1 + AI2 3: AI1 - AI2 4: Min{ AI1, AI2} 5: Max{ AI1, AI2} 6: High-speed pulse HDI	1	○
F9.03	Quantita-tive digital setting	This function achieves the quantitative digital setting of operation panel or serial port. **Setting range:** (-10.00 ~+10.00) V	0.00V	○
F9.04	Speed closed-loop given	This function is used to set the given speed when HDI is as the feedback channel (F9.02 is 6), and the given channel is set as digital given (F9.01 is 0).This function is used to set the given speed. **Setting range:** (0~39000)rpm	0 rpm	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F9.05	The minimum given quantity	F9.05: Percentage of the minimum given quantity and the reference value 10V (or 20mA); F9.06: Percentage of feedback quantity corresponding to the minimum given quantity and the reference value 10V (or 20mA); F9.07: Percentage of the maximum given quantity and the reference value 10V (or 20mA); F9.08: Percentage of feedback quantity corresponding to the maximum given quantity and the reference value 10V (or 20mA). **Setting range:** F9.05: 0.0%~(F9.07) F9.06: (0.0~100.0)% F9.07: (F9.05)~100.0% F9.08: (0.0~100.0)%	0.0%	○
F9.06	The minimum given quantity correspon-ding feedback		0.0%	○
F9.07	The maximum given quantity		100.0%	○
F9.08	The maximum given quantity correspon-ding feedback		100.0%	○
F9.09	Propor-tional gain KP	The greater the proportional gain KP the faster the response, but too large gain will be prone to oscillations. Regulation only by proportional gain KP can not completely eliminate the deviation. In order to eliminate residual deviation, integral gain Ki can be used to constitute closed loop control. The greater the Ki, the faster the deviation response to the change; but too large Ki will be prone to oscillations. **Setting range:** F9.09~F9.11: 0.000~10.000	4.400	○
F9.10	Integral gain Ki		3.740	○
F9.11	Differential gain Kd		0.000	○
F9.12	Sampling period	Sampling period T is that of the feedback quantity. At each sampling period, the closed-loop regulator computes once. The greater the sampling period, the slower the response. **Setting range:** (0.01~50.00)s	0.50s	○
F9.13	Output filter time	Output filter time is the filter time of the closed-loop output (frequency or torque). The greater the output filter time, the slower the output response. **Setting range:** (0.01~10.00)s	0.05s	○
F9.14	Deviation limit	The maximum allowable deviation of the system output value relative to the closed-loop setpoint is shown in the figure. When the feedback amount is within this range, the closed-loop regulator stops adjustment. Proper setting of this function can be helpful to the accuracy and stability of the system output. **Setting range:** (0.0~20.0)% (corresponding to the closed-loop setpoint)	2.0%	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F9.15	Closed-loop regulation characte-ristics	0: Positive action 1:Reaction	0	◎
F9.16	Integral adjustment option	0: Stop integral adjustment when frequency reaches the higher and lower limits 1: Continue the integral adjustment when frequency reaches the higher and lower limits Recommend to disable the integral adjustment for system for quick response	0	◎
F9.17	Closed-loop preset frequency	The function code can make the closed-loop control fast into the stable phase.Closed-loop preset frequency (F9.17) shall be less than or equal to the given frequency; otherwise, the preset frequency function will be invalid. After the closed-loop operation starts, the frequency should be first accelerated to the closed-loop preset frequency F9.17, and continuously operate for some time F9.18 at the point of the frequency, then operate according to the closed-loop characteristic. **Setting range:** F9.17: 0.00Hz～F0.08 F9.18: (0.0～3600.0)s	0.00 Hz	○
F9.18	Preset holding time		0.0s	◎
F9.19	Multi-segment closed-loop setting 1	In the closed-loop given channel, in addition to 4 kinds of channel defined in F9.01, voltage value given by the multi-segment closed-loop defined in F9.19～F9.33 can be also used as the closed-loop setting. Voltage selection of multi-segment closed-loop setting 1～15 segments can achieve flexible switching through external terminals; refer to F5.01～F5.07 terminal functions 30～33. Multi-segment closed-loop setting control priority is higher than the given channel defined in F9.01. **Setting range:** F9.19～F9.33:(-10.00～+10.00)V	0.00V	○
F9.20	Multi-segment closed-loop setting 2		0.00V	○
F9.21	Multi-segment closed-loop setting 3		0.00V	○
F9.22	Multi-segment closed-loop setting 4		0.00V	○
F9.23	Multi-segment closed-loop setting 5		0.00V	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F9.24	Multi-segment closed-loop setting 6		0.00V	○
F9.25	Multi-segment closed-loop setting 7		0.00V	○
F9.26	Multi-segment closed-loop setting 8		0.00V	○
F9.27	Multi-segment closed-loop setting 9		0.00V	○
F9.28	Multi-segment closed-loop setting 10		0.00V	○
F9.29	Multi-segment closed-loop setting 11		0.00V	○
F9.30	Multi-segment closed-loop setting 12		0.00V	○
F9.31	Multi-segment closed-loop setting 13		0.00V	○
F9.32	Multi-segment closed-loop setting 14		0.00V	○
F9.33	Multi-segment closed-loop setting 15		0.00V	○

Function code	Name	Detailed description of the parameter	Default value	Modification
F9.34	Closed-loop output reverse option	0: If the closed-loop output is negative, the inverter will operate at zero frequency. 1: If the closed-loop output is negative, the inverter will operate at reverse; but if the anti-reverse selects "Prohibit reverse running", the inverter will operate at zero frequency.	0	○
F9.35	Sleep function	This function is mainly used in pump water supply, air supply control and other occasions requiring automatic sleep. When F9.35 is set as "1", open the sleep function; when it set as "0", the sleep function is ineffective. **Setting range:** F9.35: (Sleep function) 0: Ineffective 1: Enable F9.36: 0.00~F0.08 F9.37: (0~6000)s F9.38: (0.0~100.0)% (full range) F9.39: (0~6000)s F9.40: (0~6000)s	0	○
F9.36	Sleep frequency		0.00Hz	◎
F9.37	Sleep delay		30s	○
F9.38	Arousal deviation		0.0%	◎
F9.39	Arousal delay time		30s	
F9.40	Pump switching judgment time		30s	
Group FA: Simple PLC and multi-segment speed control group				
FA.00	Simple PLC operation mode option	**LED bits: PLC operation mode** 0: No action 1: Stop after single cycle 2: Keep the final value after single cycle 3: Continuous cycle **LED tens: Starting mode** 0: Re-run from the beginning of the first segment 1: Continue to run from the stage of stop (or fault) time 2: Continue to run from the stage and at the frequency of stop (or fault) time **LED hundreds: Outage storage** 0: Not store 1: Store the stage and frequency of the stop time **LED thousands: Unit option at the stage time** 0: sec 1: min	0x0000	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
FA.01	Stage 1 setting	**LED bits:Frequency source** 0: Multi-segment frequency N (N: corresponds to the current stage) 1: Determined by F0.02 function code 2: Multi-segment closed-loop setting N (N: corresponds to the current stage) 3: Closed-loop control (the setpoint is determined by F9.01 function code) **LED tens: Running direction** 0: Forward 1: Reverse 2: Determined by the operating command **LED hundreds:Acceleration and deceleration time** 0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	0x0000	○
FA.02	Stage 1 operating time	0.0~6500.0	20.0	○
FA.03	Stage 2 setting	The same with FA.01	0x0000	○
FA.04	Stage 2 operating time	0.0~6500.0	20.0	○
FA.05	Stage 3 setting	The same with FA.01	0x0000	○
FA.06	Stage 3 operating time	0.0~6500.0	20.0	○
FA.07	Stage 4 setting	The same with FA.01	0x0000	○
FA.08	Stage 4 operating time	0.0~6500.0	20.0	○
FA.09	Stage 5 setting	The same with FA.01	0x0000	○
FA.10	Stage 5 operating time	0.0~6500.0	20.0	○
FA.11	Stage 6 setting	The same with FA.01	0x0000	○
FA.12	Stage 6 operating time	0.0~6500.0	20.0	○

Function code	Name	Detailed description of the parameter	Default value	Modification
FA.13	Stage 7 operating time	The same with FA.01	0x0000	○
FA.14	Stage 7 setting	0.0~6500.0	20.0	○
FA.15	Stage 8 operating time	The same with FA.01	0x0000	○
FA.16	Stage 8 setting	0.0~6500.0	20.0	○
FA.17	Stage 9 operating time	The same with FA.01	0x0000	○
FA.18	Stage 9 setting	0.0~6500.0	20.0	○
FA.19	Stage 10 operating time	The same with FA.01	0x0000	○
FA.20	Stage 10 setting	0.0~6500.0	20.0	○
FA.21	Stage 11 operating time	The same with FA.01	0x0000	○
FA.22	Stage 11 setting	0.0~6500.0	20.0	○
FA.23	Stage 12 operating time	The same with FA.01	0x0000	○
FA.24	Stage 12 setting	0.0~6500.0	20.0	○
FA.25	Stage 13 operating time	The same with FA.01	0x0000	○
FA.26	Stage 13 setting	0.0~6500.0	20.0	○
FA.27	Stage 14 operating time	The same with FA.01	0x0000	○
FA.28	Stage 14 setting	0.0~6500.0	20.0	○
FA.29	Stage 15 operating time	The same with FA.01	0x0000	○
FA.30	Stage 15 setting	0.0~6500.0	20.0	○

Function code	Name	Detailed description of the parameter	Default value	Modification
FA.31	Multi-segment frequency1	These frequencies will be used in the multi-segment speed operation mode. Refer to multi-segment speed running terminal functions "24", "25", "26" and "27" in F5.01~F5.07. **Setting range:** FA.31~FA.45: F0.09 (Operating frequency lower limit)~F0.08 (Operating frequency higher limit)	5.00 Hz	○
FA.32	Multi-segment frequency2		10.00 Hz	○
FA.33	Multi-segment frequency3		15.00 Hz	○
FA.34	Multi-segment frequency4		20.00 Hz	○
FA.35	Multi-segment frequency5		25.00 Hz	○
FA.36	Multi-segment frequency6		30.00 Hz	○
FA.37	Multi-segment frequency7		35.00 Hz	○
FA.38	Multi-segment frequency8		40.00 Hz	○
FA.39	Multi-segment frequency9		45.00 Hz	○
FA.40	Multi-segment frequency10		50.00 Hz	○
FA.41	Multi-segment frequency11		10.00 Hz	○
FA.42	Multi-segment frequency12		20.00 Hz	○
FA.43	Multi-segment frequency13		30.00 Hz	○
FA.44	Multi-segment frequency14		40.00 Hz	○
FA.45	Multi-segment frequency15		50.00 Hz	○

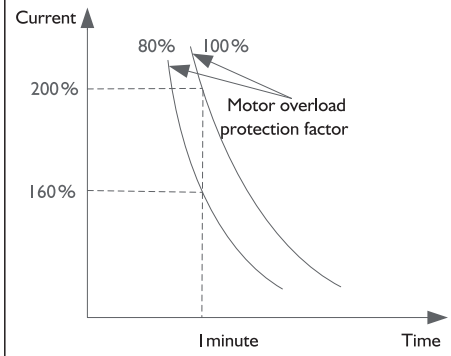
Function code	Name	Detailed description of the parameter	Default value	Modification
Group Fb: Serial communication parameters group				
Fb.00	Communication address of the machine	This function code is used for accessing the inverter into the MODBUS configuration network; and the inverter is used as the address value of the slave station. **Setting range:** 1～247	1	○
Fb.01	Communication baud rate setting	This parameter is used to set the data transmission rate between the PC and inverter. **Note:** Data formats set by PC and inverter must be consistent; otherwise, the communication can not be carried out. The greater the baud rate, the faster the communication speed. 0：2400bps 1：4800bps 2：9600bps 3：19200bps 4：38400bps 5：115200bps	2	○
Fb.02	Data bits parity setting	Data formats set by PC and inverter must be consistent; otherwise, the communication can not be carried out. 0: No parity (8-N-2) for RTU 1: Odd parity (8-O-1) for RTU 2: Even parity (8-E-1) for RTU 3: No parity (7-N-2) for RTU 4: Odd parity (7-O-1) for RTU 5: Even parity (7-E-1) for RTU 6: No parity (8-N-2) for ASCII 7: Odd parity (8-O-1) for ASCII 8: Even parity (8-E-1) for ASCII 9: No parity (7-N-2) for ASCII 10: Odd parity (7-O-1) for ASCII 11: Even parity (7-E-1) for ASCII	0	○
Fb.03	Communication response delay	It refers to the intermediate interval from the end of receiving data by the inverter to sending the response data to the PC. If the response delay is less than the system processing time, the response delay subjects to the system time; if the response delay is longer than the system processing time, the system shall delay in waiting after processing the data, and shall not send data to PC until the response delay time is up. **Setting range:** (0～200)ms	5ms	○
Fb.04	Communication timeout fault time	When the function is set to non-zero, if the interval between the first communication and the next communication exceeds the communication timeout, the system will report "485 communication fault". Usually this parameter is set to invalid. If this parameter is set in the continuous communication system, the communication state can be monitored. **Setting range:** 0.0 s (Ineffective) (0.1～100.0)s	0.0s	○

Function code	Name	Detailed description of the parameter	Default value	Modification
Fb.05	Transmission error handling	0: Alarm and free parking 1: No alarm and continue to operate 2: No alarm and stop in stopping mode (communication control mode only) 3: No alarm and stop in stopping mode (all control modes)	1	○
Fb.06	Communication processing operation option	0: Write operation with response (inverter responds to PC write command) 1: Write operation without response (inverter responds only to PC read command, instead of the write command, in this way to improve communication efficiency)	0	○
Group FC: Reserved				
Group Fd: Status display parameter group				
Fd.00	Main given setting frequency	Monitor the main setting frequency under normal operation mode. **Setting range:** (-300.00～300.00)Hz	0.00 Hz	●
Fd.01	Auxiliary given setting frequency	Monitor the auxiliary setting frequency under normal operation mode. **Setting range:** (-300.00～300.00)Hz	0.00 Hz	●
Fd.02	Setting frequency	Monitor the final frequency after primary and secondary synthesis; positive value represents the forward and the negative value represents the reverse. **Setting range:** (-300.00～300.00)Hz	0.00 Hz	●
Fd.03	Ramp setting frequency	Monitor the output frequency of the inverter after acceleration and deceleration, including the frequency direction. **Setting range:** (-300.00～300.00)Hz	0.00 Hz	●
Fd.04	Torque given	Monitor the given value of the torque in the torque control mode, including the torque direction. **Setting range:** (-300.0～+300.0)%	0.0 %	●
Fd.05	Output frequency	Monitor the output frequency of the inverter, including the frequency direction. **Setting range:** (-300.00～300.00)Hz	0.00 Hz	●
Fd.06	Output voltage	Monitor the output voltage of the inverter. **Setting range:** (0～380)V	0V	●
Fd.07	Output current	Monitor the output current of the inverter. **Setting range:** (0.0～3000.0)A	0.0A	●
Fd.08	Operating speed	Monitor the motor operating speed. **Setting range:** (0～60000) rpm	0rpm	●
Fd.09	Output torque	Monitor the output torque of the inverter relative to the rated torque of the motor. **Setting range:** (-300.0～+300.0)%	0.0 %	●

Function code	Name	Detailed description of the parameter	Default value	Modification
Fd.10	ASR controller output	Display the output value of closed-loop speed controller **Setting range:** (-300.0～+300.0)%	0.0 %	●
Fd.11	Torque current	Monitor the percentage of torque current of the inverter relative to the rated current of the motor. **Setting range:** (-300.0～+300.0) %	0.0 %	●
Fd.12	Flux current	Monitor the percentage of flux current relative to the rated current of the motor. **Setting range:** (0～+100.0)%	0.0 %	●
Fd.13	Motor power	Monitor the percentage of output power of the inverter relative to the rated power of the motor. **Setting range:** (0.0～200.0)% (Relative to motor rated power)	0.0 %	●
Fd.14	Motor estimate frequency	Estimated motor rotor frequency under open-loop vector condition. **Setting range:** (-300.00～+300.00)Hz	0.00Hz	●
Fd.15	Motor measured frequency	Motor rotor frequency measured according to the encoder in the closed-loop vector condition. **Setting range:** (-300.00～+300.00)Hz	0.00Hz	●
Fd.16	Bus voltage	Monitor the inverter bus voltage. **Setting range:** (0～800)V	0V	●
Fd.17	Operating status of the inverter	**Setting range:** 0x0000～0xFFFF bit0: Run / Stop (0 Stop, 1 Run) Bit 1: Reverse / Forward (0 forward, 1 reverse) bit2: Zero-speed operation (1 effective) bit3: Under acceleration (1 effective) bit4: Under deceleration (1 effective) bit5: Operation at constant speed (1 effective) bit6: Under pre-excitation (1 effective) bit7: Tuning (1 effective) bit8: Overcurrent limited (1 effective) bit9: DC overvoltage limited (1 effective) bit10: Torque limited (1 effective) bit11: Speed limited (1 effective) bit12: inverter fault (1 effective) bit13: Speed control (1 effective) bit14: Torque control (1 effective) bit15: Undervoltage (0 undervoltage)	0x0000	●
Fd.18	Switch input terminal status	**Setting range:** 0x0000～0x00FF 0: Disconnect; 1: Connect **LED bits:** BIT0～BIT3: X1～X4 **LED tens:** BIT0～BIT1: Reserved BIT2: HDI BIT3: Reserved	0x0000	●

Function code	Name	Detailed description of the parameter	Default value	Modification
Fd.19	Switch output terminal status	**Setting range:** 0x0000～0x001F 0: Disconnect; 1: Connect **LED bits:** BIT0～BIT3: Y、HDO、RO **LED tens:** Reserved.	0x0000	●
Fd.20	AI1 input voltage	Display the analog input signal before adjustment. **Setting range:** Fd.20～Fd.21:(-10.00～+10.00)V	0.00V	●
Fd.21	AI2 input voltage		0.00V	●
Fd.22	Reserved		---	●
Fd.23	Percentage of AI1 after adjustment	Display the percentage after curve adjustment. **Setting range:** Fd.23～Fd.24:(-100.00～+110.00)%	0.00%	●
Fd.24	Percentage of AI2 after adjustment		0.00%	●
Fd.25	Reserved	---	---	●
Fd.26	AO output	Display the percentage of the relative full range of analog output. **Setting range:** Fd.26: (0.0～100.0)% (percentage of the relative full range)	0.0%	●
Fd.27	Reserved	---	---	●
Fd.28	Process closed-loop given	Display the percentage of the relative full range of feedback,given and input signals in the process closed loop. **Setting range:** Fd.28～Fd.31: (-100.0～+100.0)% (percentage of the relative full range)	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 HDI frequency	Display the high-speed pulse frequency of input port HDI. **Setting range:** (0.1～100.0) kHz	0.0kHz	●
Fd.33	PLC current speed	Display the number of PLC segments of the inverter currently running when the inverter runs PLC program. **Setting range:** 0～16	0	●

Function code	Name	Detailed description of the parameter	Default value	Modification
Fd.34	Radiator 1 temperature	Monitor temperature of the inverter module; over-temperature protection values of different models of inverter module may be different. Temperature display range: 0～150℃; accuracy: 5% **Setting range:** (0.0～150.0)℃	0.0 ℃	●
Fd.35	Radiator 2 temperature	Monitor temperature of the rectifier module; do not detect the temperature of rectifier bridge of the model below 30kW. **Setting range:** (0.0～150.0)℃	0.0 ℃	●
Fd.36	Cumulative power-on time	Display the cumulative power-on time, operating time and fan operating time of the inverter from factory to date. **Setting range:** Fd.36～Fd.38:(0～65535)h	0h	●
Fd.37	Cumulative operating time		0h	●
Fd.38	Cumulative fan operating time		0h	●
Fd.39	Rated capacity	(0 ～999. 9)KVA (Automatically set by models)	Set by manufacturers	●
Fd.40	Rated Voltage	(0～999)V(Automatically set by models)	Set by manufacturers	●
Fd.41	Rated Current	(0～999.9)A (Automatically set by models)	Set by manufacturers	●
Fd.42	Product serial number	0～FFFF	300	●
Fd.43	Software version number	0.00～99.99	5.00	●
Fd.44	Customized version number	0～99.99	1.00	●
Fd.45	Year of compiling source code	It is used for recording to the date of compiling the source code: Fd.45 records the year of compiling and Fd.46 records the date of compiling; for example: 101 represents " January 1", 1231 refers to "December 31", and so on. Set range: Fd.45: 2014～9999 Fd.46: 101～1231	2016	●
Fd.46	Date of compiling source code		101	●
Fd.47	Sped Set	(0～60000)rpm	0	●
Fd.48	Reserved	—	—	●
Fd.49	Reserved	—	—	●
Group FE: Fault and protection parameters group				
FE.00	Relay output action option in case of fault	**LED bits: Undervoltage fault indication action option** 0: No action 1: Action (undervoltage as a fault) **LED tens: Auto reset interval fault indication action option** 0: No action 1: Action **LED hundreds: Fault lock function option** 0: No action 1: Action **LED thousands: Reserved**	0x0000	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
FE.01	Motor overload protection mode option	0: No action Without the motor overload protection feature (used carefully), the inverter has no overload protection for the load motor; 1: General motors (with low speed compensation) Because the heat dissipation effect of ordinary motor in low speed condition is poor, the corresponding electronic thermal protection value is also adjusted accordingly. With low speed compensation characteristics here is to lower the motor overload protection threshold with the operating frequency of less than 30Hz. 2: Variable frequency motor (without low speed compensation) Because the heat dissipation of special frequency conversion motor is not affected by the speed, protection value at low speed shall not be adjusted.	1	◎
FE.02	Motor overload protection coefficient setting	In order to carry out effective overload protection for different types of load motor, it is necessary to adjust the maximum value of the allowable output current of the inverter. As shown in figure.  Figure 4.20 Motor overload protection coefficient setting The adjustment value can be set according to the user demand. Under the same conditions, if the motor overload fast protection is needed, FE.02 value will be set smaller, or vice versa. **Setting range:** (20.0～110.0)% **Note:** When the rated current value of the load motor does not match with that of the inverter, motor overload protection can be realized by setting the FE.02 function code parameter values.	100.0%	◎

Function code	Name	Detailed description of the parameter	Default value	Modification
FE.03	Automatic reset times	0: No function 1～100: Automatic reset times **Note:** The module protection, external equipment failure without self-reset function	0	◎
FE.04	Auto reset interval	Automatic fault reset function can automatically reset the running faults according to the set times and intervals. When the automatic reset time is set as 0, it means that automatic reset is not allowed and the fault protection shall be done immediately. **Setting range:** (2.0～200.0)s	5.0s	◎
FE.05	Fault lock function selection	0: Fault lock disabled 1: Fault lock enabled	0	◎
FE.06	Fault record 1	0: No abnormality record 1: The inverter accelerated operating over-current (E.OC1) 2: The inverter decelerated operating over-current (E.OC2) 3: The inverter constant speed operating over-current (E.OC3) 4: The inverter accelerated operating over-voltage (E.OV1) 5: The inverter decelerated operating over-voltage (E.OV2) 6: The inverter constant speed operating over-voltage (E.OV3) 7: Control voltage over-voltage (E.OV) 8: Input side lack of phase (E.SPI) 9: Output side lack of phase (E.SPO) 10: Power module protection (E.FO) 11: Radiator 1 overheating (E.OH1) 12: Radiator 2 overheating (E.OH2) 13: inverter overload (E.OL2) 14: Motor overload (E.OL1) 15: External fault (E.EF) 16: EEPROM read and write error (E.EEP) 17: Serial port communication error (E.CE) 18: Contactor abnormal (E.SHt) 19: Current detection circuit abnormal (E. ItE) hall or amplification circuit 20: Interference fault (E. SIE) 21: Reserved 22: Reserved 23: Keyboard parameter copy error (E.PCE) 24: Auto-tuning bad (E.tE) 25: PG fault (E.PG) 26: Reserved 27: Braking unit fault (E. bCE) **Note:** ①. Reset 10 seconds after E.FO fault; ②. If an overcurrent fault occurs, delay for six seconds to reset;	0	●

Function code	Name	Detailed description of the parameter	Default value	Modification
FE.07	Bus voltage at fault	(0～999)V	0V	●
FE.08	Actual current at fault	(0.0～999.9)A	0.0A	●
FE.09	Operating frequency at fault	(0.00～300.00)Hz	0.00 Hz	●
FE.10	Inverter operating status at fault	0x0000～0xFFFF	0x0000	●
FE.11	Fault record 2	The inverter has nearly 30 kinds of abnormal protection alarm and memorize the most recent three abnormal fault types(FE.06, FE.11,FE.12) and the bus voltage, current, frequency and running state of the inverter at the last fault time for user query. And the latest fault record is fault record 1. Detailed description of the protection alarm and fault handling methods are described in Chapter 5 of this manual. **Setting range:** 0～55	0	●
FE.12	Fault record 3		0	●

Chapter 5
Fault, Alarm Countermeasures and Exception Handling

All fault types of NVF300M series universal inverter that may occur are summarized in the table below. Before seeking service, users can check by themselves according to this table and keep records of the symptoms in detail, and contact the dealer when needing to seek services.

5.1 Fault report content and countermeasures

Fault code	Fault type	Possible reasons for fault	Countermeasures
E.OC1	Inverter acceleration running overcurrent	1. Too short acceleration time 2. Inaccurate motor parameters 3.Too small inverter power 4. Unsuitable V / F curve	1. Extend the acceleration time 2.Conduct parameter self-tuning of the motor 3. Select the inverter of large power ratings 4. Adjust V / F curve setting, and adjust the manual torque boost
E.OC2	Inverter deceleration running overcurrent	1. Too short deceleration time 2. With potential load or large load inertia torque 3.Too small inverter power	1. Extend the deceleration time 2. Add the appropriate dynamic braking components 3. Select the inverter of large power ratings
E.OC3	Inverter constant speed running overcurrent	1.Too short acceleration and deceleration time 2. Load mutation or anomaly 3.Low grid voltage 4. Too small inverter power	1. Appropriately extend acceleration and deceleration time 2. Conduct load inspection 3. Check the input power 4. Select the inverter of large power ratings
E.OV1	Inverter acceleration running overvoltage	1. Abnormal input voltage 2. Too short acceleration time	1. Check the input power 2. Appropriately extend the acceleration time
E.OV2	Inverter deceleration running overvoltage	1. Too short deceleration time 2.With potential load or large load inertia torque	1. Extend the deceleration time 2. Select the appropriate dynamic braking components
E.OV3	Inverter constant speed running overvoltage	1. Incorrect setting of ASR parameters in vector control operation 2.Too short acceleration and deceleration time 3. Abnormal input voltage 4. Abnormal fluctuations in input voltage 5.Large load inertia	1. See Group F3 ASR parameter settings 2. Appropriately extend the acceleration and deceleration time 3. Check the input power 4. Install the input reactor 5. Consider using dynamic braking components

Fault code	Fault type	Possible reasons for fault	Countermeasures
E.OV	Inverter control power overvoltage	Abnormal input voltage	Check input power or seek services
E.SP1	Input side open-phase	Open phase exists in input R. S. T(L、N)	1. Check the installation wiring 2. Check the input voltage
E.SPO	Output side open-phase	Open phase exists in output U. V. W	1. Check the output wiring 2. Check the motor and cables
E.FO	Power module protection	1. The output three-phase with interphase short circuit or ground short circuit 2. Inverter instantaneous overcurrent 3. Fan duct blockage or fan damage 4.Too high ambient temperature 5. Loose control panel wiring or plug 6.Current waveform anomaly due to output open-phase and other reasons 7. Auxiliary power supply damage, drive voltage undervoltage 8. Straight inverter module bridge arm 9. Control panel anomaly	1. Re-wire, confirm whether the insulation of the motor is good 2. See overcurrent countermeasures 3. Clear the fan duct or replace the fan 4. Lower ambient temperature 5. Check and re-wire 6. Check wiring 7. Seek services 8. Seek services 9. Seek services
E.OH1	Inverter module radiator overheating	1. Too high ambient temperature 2. Duct blockage 3. Fan damage 4. Inverter module anomaly	1. Lower the ambient temperature 2. Clean the air duct 3. Replace the fan 4. Seek services
E.OH2	Rectifier module radiator overheating	1. Too high ambient temperature 2. Duct blockage 3. Fan damage	1. Lower the ambient temperature 2. Clean the air duct 3. Replace the fan
E.OL2	Inverter overload	1. Inaccurate motor parameters 2. Too large load 3. Too large DC braking quantity 4. Too short acceleration time 5. Too low grid voltage 6. Unsuitable V / F curve	1. Conduct self-tuning of the motor parameter again 2. Select the inverter of larger power 3. Reduce the DC braking current, prolong the braking time 4. Extend the acceleration time 5. Check the grid voltage 6. Adjust the V / F curve and torque boost

Faultcode	Fault type	Possible reasons for fault	Countermeasures
E.OL1	Motor overload	1. Incorrect motor overload protection factor settings 2. Motor stall or too large load mutation 3. Universal motor long-term operation with large load at low-speed 4. Too low grid voltage 5. Unsuitable V / F curve	1. Properly set the motor overload protection factor 2. Check the load 3. Select dedicated motor for long-term operation at low speed 4. Check the grid voltage 5. Correctly set V / F curve and torque boost amount
E.EF	External equipment fault	External fault emergency stop terminal effective	After the external fault is revoked, release the external fault terminal
E.EEP	EEPROM read-write fault	Control parameter read-write error	Reset STOP key and seek services
E.CE	RS485 communi -cation error	1. Irregular working of the host computer 2. Abnormal communication line 3. Incorrect communication parameters setting	1. Check the host computer wiring 2. Check the communication cable 3. Correctly set the communication parameters
E.ItE	Current detection circuit anomaly	1. Loose control board wiring or plug 2. Auxiliary power supply damage 3. Hall devices damage 4. Amplification circuit anomaly	1. Check and rewire 2. Seek services 3. Seek services 4. Seek services
E.PCE	Operation panel parameter copy error	1. Incomplete operation panel parameters or inconsistency between the operation panel version or the main control board version 2. Operation panel EEPROM damage	1. Refresh the operation panel data and version; first use F7.04 = 1 to upload the parameters and then use 7.04 = 2 or 3 to download. 2. Seek services
E.tE	Bad self-tuning	1. Motor nameplate parameters setting error 2. Reverse rotation self-tuning is prohibited in reverse running 3. Poor contact of motor connecting line 4. Setting timeout	1. Correctly set parameters according to the motor nameplate 2. Cancel the reverse disabled 3. Check the motor connections 4. Check F0.08 (upper limit frequency); check whether F0.08 setpoint is lower than the rated frequency
E.bCE	Braking unit fault	Brake pipe damage	Seek services

⚠ Caution	Short circuit of the inverter braking resistor may cause damage to the inverter brake unit.

5.2 Running anomalies and countermeasures

Phenomenon	Condition of occurrence	Possible reason	Countermeasures
Operation panel does not respond	Individual keys or all keys do not respond	Operation panel lock function takes effect	In stop or running parameter state , first press the PRG key and hold it, then continuously press V to unlock
			Energize the inverter after complete power outage
		Poor contact of the operation panel connecting line	Check the connecting line and replug
		Operation panel keys are damaged	Replace the operation panel or seek services
Function code Not modified	Not modified in the running state	The function code Not modified in the running state	Modify in the stop state
	Part of the function codes Not modified	Function code F7. 03 is set as 1 or 2	Set F7.03 to 0
		The function code is the actually detected value	Users can not modify the actual parameter
	No response when pressing MF	The operation panel lock function takes effect or others	See solutions for "Operation panel does not respond "
	Can not enter when pressing the PRG; function code displays state 0000	Set with the user password	Correctly enter the user password
			Seek services
The inverter stops accidentally during operation	Stop command is not given; the inverter automatically shuts down, and the running indicator light off	With fault alarm	Find the fault cause, reset the fault
		Power interruption	Check the power supply
		Running command channel switching	Check the operation and running command channel-related function code settings
		Changes in the positive and negative logic of the control terminal	Check whether F5.08 setting meets the requirements
	Stop command is not given; the motor automatically stops; the inverter running indicator light is on and the inverterruns at zero frequency	Automatic fault reset	Check the automatic fault reset settings and fault cause
		External interrupt	Check external interrupt settings and fault source
		Setting frequency is 0	Check the setting frequency

Phenomenon	Condition of occurrence	Possible reason	Countermeasures
		Starting frequency is higher than the setting frequency	Check the starting frequency
		Jump frequency setting problem	Check the jump frequency setting
		Enable "No forward running" terminal during forward running	Check the terminal function setting
		Enable "No reverse running" terminal during reverse running	Check the terminal function setting
Inverter can not run	The inverter does not work after pressing the Run key, and the running indicator light is off.	Free stop terminal is enabled	Check the free stop terminal
		No running terminal of the inverter is effective	Check no running terminal of the inverter
		External stop function terminal is effective	Check the external stop function terminal
		Under the three-wire control mode, three-wire operation control function terminal is not closed	Set up and close the three-wire operation control terminal
		With fault alarm	Troubleshooting
		Positive and negative logic of input terminal is set incorrectly	Check F5.08 settings
Inverter immediately runs and reports P.oFF when energized	Thyristor or contactor disconnects and the inverter load is large	Because the thyristor or contactor is not closed, the main circuit DC bus voltage will be reduced when the inverter is running with a large load, the inverter will display P.oFF, but no longer display E. SHt fault	Run the inverter after thyristor or contactor is fully closed

Chapter 6 Care and Maintenance

Due to the influence of temperature, humidity, dust and vibration in the environment, internal component aging and wear of the inverter and many other reasons will lead to the potential faults; therefore, it is necessary to carry out routine and periodic care and maintenance for the inverter.

Note: Before the inspection and maintenance, the following items should be confirmed, otherwise there is a risk of electric shock.

1. The inverter is powered off;
2. After the cover is open, the charge indicator light turns off;
3. The power is off for 10 minutes.

6.1 Routine care and maintenance

The inverter must run in the environment as required in Chapter 3. In addition, some unexpected situations may also occur during operation; the user should follow the instructions in the table below to do routine maintenance work. A good way to extend the life of the inverter is to maintain a good running environment, record the daily operation data, and early detect the causes of exception.

Table 6.1 Tips for Daily Inspection

Object of inspection	Inspection essentials			Discriminant criteria
	Content of inspection	Cycle	Means of inspection	
Control mode option	1. Temperature, humidity	Any time	1. Thermometer, hygrometer	1. (-10 ~ +45)℃, (45~55)℃ deratin g use
	2. Dust, water and dripping		2. Visual inspection	2. No water leakage imprint
	3. Gas		3. Smell	3. No bad smell
Inverter	1. Vibration, heat	Any time	1. Shell touch	1.Stable vibration,reason -able fan temperature
	2. Noise		2. Auditory sense	2. No abnormal sound
Motor	1. Heat	Any time	1. Hand touch	1. No abnormal heat
	2. Noise		2. Auditory sense	2. Uniform noise
Running state parameters	1.Output current	Any time	1. Ammeter	1. Within the range of ratings
	2.Output voltage		2. Voltmeter	2. Within the range of ratings
	3.Internal temperature		3. Thermometer	3. Temperature Rise less than 35 K

6.2 Regular maintenance

According to the environment, the user can conduct a regular inspection on the inverter every three months or six months.

> ⚠ Caution
>
> - Only the professionally trained person can do the parts disassembly, maintenance and parts replacement.
> - Do not leave screws and washers and other metal pieces in the machine, otherwise there is the risk of damage to the equipment.

General contents of inspection:

1. Whether screws of the control terminal are loose, tighten with a screwdriver;
2. Whether the main circuit terminals are in poor contact, whether copper bar connections are with overheating signs;
3. Whether the power cables, control cables are damaged, especially the casing in contact with the metal surface is with cut marks;
4. Whether the insulation binders for the power cables have fallen off;
5. Comprehensively clean dust on the circuit board and air duct, best to use a vacuum cleaner;
6. The inverters which have been stored for a long time must go through energizing experiment once within two years. When energized, the regulator is used to slowly increase the voltage to the rated value for nearly five hours, and it may not bring a load;
7. For insulation testing of the inverter, all the input and output terminals (R, S, T, U, V and W) of the inverter main circuit must be shorted with a wire, and then ground testing should be carried out. It is prohibited to conduct the ground testing with a single terminal, which may cause damage to the inverter. A 500V megger should be used.
8. To conduct insulation test of the motor, the motor input terminals U, V, W must be removed from the inverter. The test should be conducted on the motor alone, otherwise it will damage the inverter.

> ⚠ Caution
>
> - It has passed the voltage withstand test before leaving the factory; the users no longer have to conduct the test again, otherwise the improper test could damage the device.
> - Replacement of the original components in the inverter with those of different models and electrical parameters may result in damage to the inverter.

6.3 Replacement of the wearing parts of inverter

Wearing parts of the inverter mainly include cooling fan and electrolytic capacitor for filtering; its service life and operational environment are closely related to maintenance. The following table shows the general service life.

Table 6.2 Component Service Life

Component name	Service life
Fan	(30~40) thousand hours
Electrolytic capacitor	(40~50) thousand hours
Relay	About 100,000 times

Users can determine the replacement according to the running time.

1. Cooling fan

Possible causes of damage: Bearing wearing, leaf aging.

Discriminant criteria: Whether the fan blades have cracks, whether there is abnormal vibration sound at startup.

2. Filtering electrolytic capacitor

Possible causes of damage: High ambient temperature, frequent load jump resulting in ripple current increase, electrolyte aging.

Discriminant criteria: Whether there is liquid leakage, whether the safety valve has projected, measurement of the electrostatic capacitance and insulation resistance.

3.Relay

Possible causes of damage: Corrosion, frequent action.

Discriminant criteria: Opening and closing failure.

6.4 Inverter storage

After purchase of the inverter, attention must be paid to the following for temporary and long-term storage:

1. Avoid storing in the hot, humid environment with much dust, metal powder; ensure good ventilation.
2. The inverters which have been stored for a long time must go through energizing experiment once within two years. When energized, the regulator is used to slowly increase the voltage to the rated value for nearly five hours, and it may not bring a load.

Appendix
RS485-MODBUS Communication Description

A.1 Content of this chapter

This chapter describes the RS485-MODBUS communication functions related to the inverter. The inverter provides RS485 communication interface and adopts the international standard Modbus communication protocol for master-slave communication. Users can achieve centralized control (set the control command and running frequency of inverter, modification of the related function code parameters, monitoring of inverter operative mode and fault information etc.) through PC/PLC, host computer monitoring software etc., to adapt to the specific application requirements.

A.2 Networking mode

As shown in figure A-2-1, networking modes of the inverter (as the slave station) include single master/ multiple slaves mode and single master/ single slave mode.

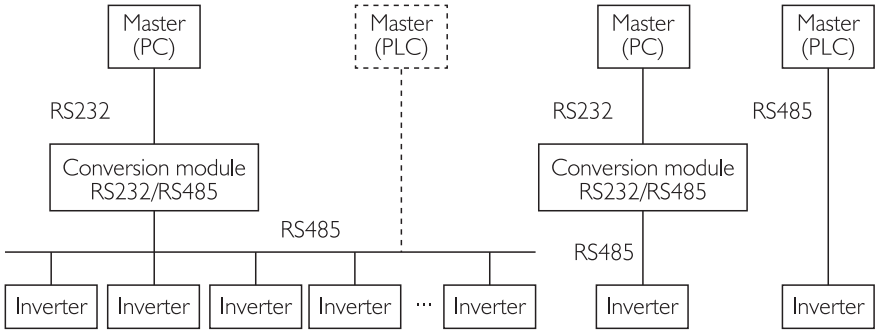


Figure A-2-1 Inverter Networking Mode Schematic

A.3 Interface mode

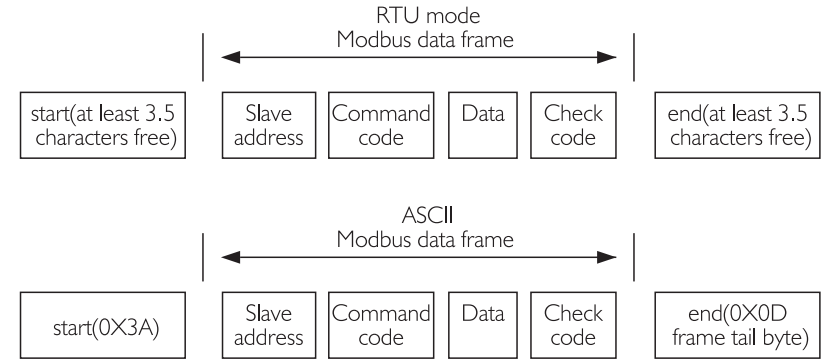
RS485 interface: Asynchronous, half-duplex. Default: 1-8-N-2 (Bit 1-start bit; bit 8-data bit, no check, bit 2-stop bit, 9600bps, RTU, slave address: 0x01. For parameter settings, see description of Group Fb function codes.

A.4 Communication mode

1. Inverter communication protocol is Modbus protocol, and supports RTU and ASCII protocols.
2. The inverter is the slave and adopts master-slave point-to-point communication. When the master uses the broadcast address to send commands, the slave will not respond.
3. In the case of multi-machine communication or long-distance, connecting resistors of 100 to 120 ohm on the positive and negative terminals of the signal line of master station communication can improve the communication immunity.
4. The inverter only provides one interface of RS485. If the communication port for external equipment is RS232, RS232/RS485 conversion equipment should be added.

A.5 Protocol format

Modbus protocol supports both RTU and ASCII. The corresponding frame format is shown below.



Modbus adopts "Big Endian" encoded mode, and sends the upper byte and then the lower byte.

A.5.1 RTU mode

In RTU mode, the greater one between the function code setting and Modbus internal convention value is taken for the floor time between frames. The minimum floor time between frames internally agreed by Modbus is as follows: floor time of frame head and tail is not less than 3.5-byte time to define the frame. Data check adopts CRC-16; the whole information participates in the check; upper and lower bytes of the checksum should be sent after exchange. Refer to the examples following the reference protocol for the specific CRC check. Notably, at least 3.5-character bus floor should be kept among frames; bus floor among frames does not need to accumulate the start and end floor.

The following examples are used to read the parameters of the internal register 0x0101 (F1.01) of slave 5 in RTU mode.

Request frame:

Slave address	Command code	Data				Check code	
		Register address		Read word number			
0x05	0x03	0x01	0x01	0x00	0x01	0xD5	0xB2

Response frame:

Slave address	Command code	Data			Check code	
		Response byte	Register content			
0x05	0x03	0x02	0x13	0x88	0x44	0xD2

Where, the check code is CRC check value.

A.5.2 ASCII mode

In ASCII mode, the frame head is"0x3A", the frame tail default is "0x0D, 0x0A", and the frame tail can be configured and set by the user. In this mode, in addition to the frame head and tail, the remaining data bytes are all sent in ASCII code; upper 4-bit byte is sent first, followed by lower 4-bit byte. Data in ASCII mode is 7-bit long. For "A"~"F", their ASCII codes in capital are used. At this time, the data adopts LRC check, and the check covers the information part from the slave address to data. Checksum is equal to the complement of sum (carry bits are abandoned) of all characters participating in the data check.
The following examples are used to write the internal register 0201 (A2.01) from 4000 (0xFA0) to slave 5 in ASCII mode.

Request frame:

	Frame head	Slave address		Command code		Data								Check code		Frame tail	
						Register address				Written content							
Char-acter	:	0	5	0	6	0	2	0	1	0	F	A	0	4	3	CR	LF
ASCII	3A	30	35	30	36	30	32	30	31	30	46	41	30	34	33	0D	0A

Where, the check code is LRC checksum; its value is equal to the complement of (05+06 02+01+0x0F+0xA0) .

Response frame:

	Frame head	Slave address		Command code		Data								Check code		Frame tail	
						Register address				Written content							
Char-acter	:	0	5	0	6	0	2	0	1	0	F	A	0	4	3	CR	LF
ASCII	3A	30	35	30	36	30	32	30	31	30	46	41	30	34	33	0D	0A

The inverter can set different response delay through the function codes to adapt to the specific application needs of various master stations. For RTU model, the actual response delay is not less than 3.5 characters; for ASCII model, the actual response delay is not less than 1ms.

A.6 Protocol application

A.6.1 Modbus command code

Main function of Modbus is to read/write the function parameters of inverter; different command codes determine different operation requests. Inverter Modbus protocol supports the operation in the table below.

Table A.1 Modbus Command Code and Use

	Use
0x03	Read inverter parameters, including function code parameter, control parameter and state parameter
0x06	Rewrite single 16-bit inverter function code parameters or control parameters
0x10	Rewrite multiple inverter function codes or control parameters.
0x04	Read inverter parameter attribute value

A.6.2 Address mapping rule for function parameter of inverter

Group number mapping of the inverter function parameter is the upper byte of modbus register address (0~F corresponding values are 0x00~0x0F); group index (parameter number in the group) mapping is the lower byte of modbus register address (00~99 corresponding values are 0x00~0x63). When data is only required to be stored in RAM (i.e., power-down data not stored), the highest position of the address is "1".

For example:
Corresponding register address of the function parameter "F5.27" is "0x051B":

1) When data only saves RAM, the corresponding address is "0x851B".
2) When data is required to be stored to EEPROM (power-down save data), the corresponding address is "0x051B".

A.6.3 Obtain the parameter attribute of the inverter function code

Parameter attribute corresponding to the inverter function code can be obtained by 0x04 command code. Attribute definition format is shown in Table A.2.

Table A.2 Data Format Definition when Reading Parameter Attribute

Data byte number	Meaning
1	Maximum value (upper byte)
2	Maximum value (lower byte)
3	Minimum value (upper byte)
4	Minimum value (lower byte)
5	Current value (upper byte)
6	Current value (lower byte)
7	Parameter attribute value (upper byte); refer to Table A.3
8	Parameter attribute value (lower byte); refer to Table A.3

Table A.3 Definitions of Parameter Attribute Value Bits

Bit definition	Bit value	Decimal value	Meaning
15~14bit: Display type	00	0	Decimal system
	01	1	Hexadecimal display
	10	2	Binary display
13~11bit: Modify attribute	000	0	Writable and readable at any time
	001	1	Modifiable in the stop state
	010	2	Read-only parameter
	011	3	Writable and readable with an enterprise password

Bit definition	Bit value	Decimal value	Meaning
13~11bit: Modify attribute	100	4	Readable with an enterprise password
	101	5	Writable and readable with an user password
10~8bit: Data type	000	0	8-bit unsigned bit data type
	001	1	16-bit unsigned bit data type
	010	2	32-bit unsigned bit data type
	011	3	8-bit signed bit data type
	100	4	16-bit signed bit data type
	101	5	32-bit signed bit data type
7~5bit: Magnification	000	0	No magnification factor
	001	1	1X magnification
	010	2	2X magnification
	011	3	3X magnification
	100	4	4X magnification
	101	5	5X magnification
4~0bit: Unit	00000	0	No unit
	00001	1	Voltage
	00010	2	Current
	00011	3	Power kW
	00100	4	Frequency Hz
	00101	5	Frequency kHz
	00110	6	Torque Nm
	00111	7	Speed rpm
	01000	8	Time second s
	01001	9	Time millisecond ms
	01010	10	Time microsecond us
	01011	11	Time minute Min
	01100	12	Time hour Hr

Bit definition	Bit value	Decimal value	Meaning
4~0bit: Unit	01101	13	percentage
	01110	14	Weight kg
	01111	15	Resistor resistance
	10000	16	Inductance value
	10001	17	Temperature
	10010	18	Pressure value Mp
	10011	19	Length meter m
	10100	20	Centimeter cm
	10101	21	Millimeter mm
	10110	22	Capacity kVA
	10111	23	Line speed m/min
	11000	24	Mp/s
	11001	25	Frequency change rate Hz/s

⚠ Caution

Parameter property contains 4 16-bit data values. The number of register should be the integer multiple of 4; otherwise, communication feedback illegal register value error occurs.

A.7 Control command, state information and fault information

Modbus master station can start and stop the inverter controlled, set the running frequency through the control command. It can retrieve the state parameter state information (such as: running frequency, output current, output torque, etc.) through the corresponding command, and can monitor the fault information of the inverter controlled.

Table A.4 Control Parameters Description

Function description	Address definition	Data significance	Power -down save	Read-write property
Communication control command (F0.01 = 2 comm -unication control	0x3200	0x00: No command	No	W
		0x01: Forward running		
		0x02: Reverse running		
		0x03: Run stop		
		0x04: Forward jog		
		0x05: Reverse jog		
		0x06: Jog stop		
		0x07: Free stop		
		0x08: Fault reset		
Inverter state	0x3300	bit00: Run / Stop (0 Stop, 1 Run)	/	R
		Bit01: Reverse / Forward (0 forward, 1 reverse)		
		bit02: Zero-speed operation (1 effective)		
		bit03: Under acceleration (1 effective)		
		bit04: Under deceleration (1 effective)		
		bit05: Operation at constant speed (1 effective)		
		bit06: Under pre-excitation (1 effective)		
		bit07: Tuning (1 effective)		
		bit08: Overcurrent limited (1 effective)		
		bit09: DC overvoltage limited (1 effective)		
		bit10: Torque limited (1 effective)		
		bit11: Speed limited (1 effective)		
		bit12: Inverter fault (1 effective)		

Function description	Address definition	Data significance	Power -down save	Read-write property
Inverter state	0x3300	bit13: Speed control (1 effective)	/	R
		bit14: Torque control (1 effective)		
		bit15: Undervoltage (0 undervoltage)		
Inverter running state displays parameter address	0x3400	Output frequency	/	R
	0x3401	Setting frequency		
	0x3402	Bus voltage		
	0x3403	Output voltage		
	0x3404	Output current		
	0x3405	Running speed		
	0x3406	Output power		
	0x3407	Output torque		
	0x3408	PID given		
	0x3409	PID feedback		
	0x340A	Input terminal state		
	0x340B	Output terminal state		
	0x340C	Torque setpoint		
	0x340D	Analog AI1 value		
	0x340E	Analog AI2 value		
	0x340F	Reserved		
	0x3410	High-speed pulse HDI frequency		
	0x3411	PLC current speed		
Inverter stop state displays parameter address	0x3500	Setting frequency	/	R
	0x3501	Bus voltage		
	0x3502	Input terminal state		
	0x3503	Output terminal state		
	0x3504	PID setpoint		
	0x3505	PID feedback value		
	0x3506	Torque setpoint		
	0x3507	Analog AI1 value		

Table A.5 Control Parameters Description

Function description	Address definition	Data significance	Power -down save	Read-write property
Inverter stop state displays parameter address	0x3508	Analog AI2 value	/	R
	0x3509	Rerserved		
	0x350A	High-speed pulse HDI frequency		
Inverter fault	0x3600	Fault information is consistent with the fault type number in the function code. Information feed back to the host computer is the dexadecimal data instead of fault symbol.	/	R

A.8 Parameter management

Modbus master station can obtain the group number of the system parameters and group number from the CPU board through the corresponding command, as well as the internal number of the corresponding group. The communication function code is provided as "0x03", and the communication address is defined in Table A.6.

Table A.6 Description of Parameter Management Function

Function description	Communication address description	Data significance	Remark
Obtain the group number	0x4200	Group number value of the parameters contained in the system	Paramter group number value contained in the inverter
Obtain Group 1 number value	0x4201	Group number value of Group 1	Group number value is consistent with the value obtained by 0x4200
Obtain Group 2 number value	0x4202	Group number value of Group 2	
Obtain Group 3 number value	0x4203	Group number value of Group 3	
……	……	……	
Obtain Group Max number value	0x42xx (xx =Max)	Group number value of Group Max	

Function description	Communication address description	Data significance	Remark
Obtain the numb -er of parameters in Group 1 parameters	0x4300	Obtain the number of parameters in Group 1	Group number value is consistent with the value obtained by 0x4200
Obtain the numb -er of parameters in Group 2 parameters	0x4301	Obtain the number of parameters in Group 2	
Obtain the numb -er of parameters in Group 3 parameters	0x4302	Obtain the number of parameters in Group 3	
……	……	……	
Obtain the numb -er of parameters in Group Max parameters	0x43xx (xx= Max-1)		

A.9 Wiring description

A.9.1 Topology structure

Repeater RS-485-Modbu is not configured. There is a trunk cable which is directly connected with all devices (daisy type) or connected through short branch cable.
Trunk cable, also known as Bus, may be very long. Its ends must be connected to the line terminal. Also the repeater can be used among multiple RS-485 Modbus. And each slave address in the network is unique, which is the basis for guaranteeing Modbus serial communications.

A.9.2 Length

End-to-end length of the trunk cable must be limited. Maximum length is related to Baud rate, load quantity on the cable (specification, capacitance, or characteristic impedance) and daisy chain and network configuration (2-wire or 4-wire system).
For cable with the high-speed baud rate at 9600bps and AWG26 (or thicker), its maximum length is 1000m.
Branches must be short and cannot exceed 20m. If multi-port splitter with n branches, the

maximum length of each branch must be restricted to 40m divided by n.

A.9.3 Grounding form

"Common end" circuit (common end of the signal and optional power supply) must be directly connected to the protected ground. Preferably, the whole bus is grounded in a single point. Usually, this point is optional on the master or its splitter.

A.9.4 Cable

Modbus cable on the serial link must be shielded. At each end of the cable, its shielding must be connected to the protected ground. If the connector is used in this end, the connector housing should be connected to the cable shielding layer. RS485-Modbus must use a pair of balanced lines and the third line (for common end).
For RS485-Modbus, cable of diameter wide enough must be selected to allow the use of maximum length (1000m). AWG24 can meet the needs of Modbus data transmission.

A.10 Definition of communication exception code

When the corresponding error message is detected in the communication process, the lower machine (i.e., CPU board) will high position "1" of the function code, feedback corresponding error code (exception code), to recognize the current error cause for the host computer. The corresponding definitions are shown in Table A.7.

Table A.7 Definition of Communication Exception Code

No.	Error code (exception code)	Detailed description
0	0x00	No error information
1	0x01	Illegal function number
2	0x02	Illegal data address
3	0x03	Illegal data value
4	0x04	Slave equipment fault
5	0x05	Confirm
6	0x06	Slave equipment busy
7	0x07	Memory parity error
8	0x08	Gateway path is not available
9	0x09	Gateway target device failed to respond

No.	Error code (exception code)	Detailed description
10	0x10	CRC check code error
11	0x11	Parameters are read only
12	0x12	Data value is out of range
13	0x13	EEPROM error
14	0x14	Readable and writable with an user password
15	0x15	Readable and writable with an enterprise password
16	0x16	Reciprocal error in multi-functional input terminals (Multi-functional input terminal setpoint cannot be repeated)
17	0x17	Illegal control command
18	0x18	Odd-even check error
19	0x19	Not modified in the running state
20	0x1A	Data frame error
21	0x1B	Data overflow error
22	0x1C	Break error

Appendix B Quality commitment

The commitment of our product quality regulations are as follows:
1. Warrantee range: The frequency converter itself
2. Warranty period: 12 months from the date of purchase by the self - employed or 18 months from the date of production. Take the time as the first.
3. Repair service is charged even in warrantee period if the failure is caused by the following reasons:
1) Improper operation, repair or alternation without our permission;
2) Use the frequency converter exceeding the specification;
3) Broken after purchase or improperly place (such as water, etc.);
4) The work environment does not comply with the requirement on the user's manual;
5) Wrong wring;
6) Earth quake, fire, flood, lightning strike, abnormal voltage or nature disaster.
4. We have the right not to provide warranty service in the following occasion:
1) The barcode, nameplate and other identifications of product are damaged or unable to indentify.
2) The user has not paid according to "purchase and sale contract";
3) User hide the improper operation appeared in process of the installation, wiring, operation, maintenance, etc.
5. We are entitled to ask the third party to repair the defective frequency converter. Associated service charges based on actual costs, subject to agreement to the agreement priority principle.
6. After-sale service can be provided by our company's sales, agents all over the country.