High Performance Vector AC Drive

English Manual

Version: V1.0

Filling date: 2024-05-21

Contents

Chapter 1 Safety and Notes

1.1 Safety Notes

1. The AC drive should be installed and adjusted by professional electrical technicians, otherwise there is a danger of electric shock!

2. Make sure the power is off before wiring, otherwise there is a danger of electric shock!

3. Ground terminal must be reliably grounded, ground resistance should be less than 0.1Ω!

4. Do not connect the input power to the output U, V, W, otherwise the AC drive will be damaged!

5. Make sure wires diameter be accord with technical standards, otherwise fault will happen.

6. No voltage test is required for AC drive, this item has been tested when leave the factory.

7. Do not touch the AC drive terminal (Includes control terminal) after power on, otherwise there is a danger of electric shock!

8. If you want to do parameter self-learning, please be aware of the risk of injury during motor rotation, otherwise it may cause an accident!

9. Do not control the start and stop of the ac drive by the contactor on or off, otherwise the equipment will be damaged!

10. AC drive cannot be repaired or maintained immediately because there is still high voltage on the filter capacity after the power off. It needs to wait for more than 5 minutes before using a multimeter to measure the bus voltage (the voltage between (+) and (-)) should not exceed 36V.

11. Do not share the ground terminal PE with the power line terminal N!

1.2 Notes

1. Insulation checking of motors

Make sure to separate the motor connection from the AC drive during insulation test(checking), It is recommended to use 500V voltage megohm meter and should guarantee the measured insulation resistance is not less than 5 m Ω.

2. About motor thermal and noise

The output voltage of the AC drive is PWM wave, which contains certain harmonics, so the temperature rise, noise and vibration of the motor will increase slightly compared with the operation of power frequency.

3. The output side cannot connect to the pressure sensitive device or improved the power factor of capacity.

4. Protection against lightning strike

This series AC drive is equipped with lightning overcurrent protection device, which has certain self-protection ability for inductive lightning. For frequent lightning, users should also install lightning protection at the front of the AC drive.

5. Disposing unwanted drive

The electrolytic capacitor of the main circuit and the electrolytic capacitor on the printed board may

explode during incineration. The incineration of plastic will produce poisonous gas, please deal with it as industrial waste.

6. Pay attention when the cable length is too long

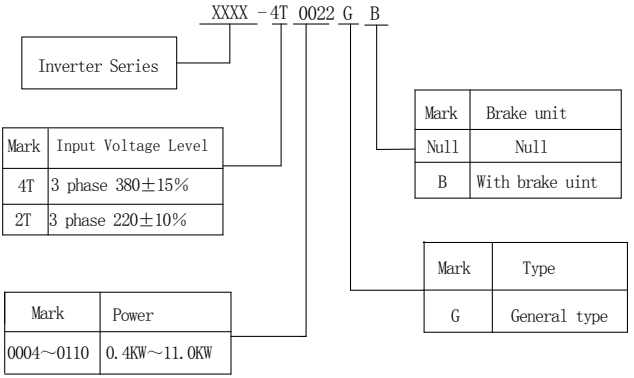
When the motor cable length is longer than 50m, it is recommended to install an output reactor or output filter. If the motor cable length exceeds 100m,An output reactor or output filter must be installed, otherwise the motor insulation is easily damaged.

7. The drive should be used in an environment that meets the design specifications, otherwise it may cause failure.

Abnormal function or component damage caused by non-compliance with relevant regulations are not within the scope of warranty , for example: the products can not be used in special occasions such as damp, conductive dust or corrosive gas.

Chapter 2 Product Information

2.1 Naming Rule



2.2 Electric Data

Model	Power capacity KVA	Input current A	Output current A	Adaptive motor KW
XXXX-2S0004GB	1.0	3.4	2.1	0.4
XXXX-2S0007GB	1.5	5.0	3.8	0.7
XXXX-2S0015GB	3.0	8.0	7.0	1.5
XXXX-2S0022GB	4.0	10.0	9.0	2.2
XXXX-4T0007GB	1.5	3.4	2.1	0.75
XXXX-4T0015GB	3.0	5.0	3.8	1.5
XXXX-4T0022GB	4.0	5.8	5.1	2.2
XXXX-4T0030GB	5.9	8.0	7.0	3.0

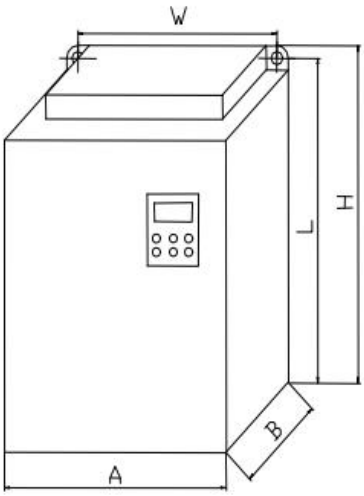
2.3 Technology Specifications

Item		Specifications
Input	Voltage Range	three phase 380V±15% three phase 220V±10%
	Frequency	50/60Hz ±5%
Output	Voltage	three phase 0～380V three phase 0～220V
	Frequency	0～3000Hz
	Overload capacity	G type: 150% rated current 1 minute;180 rated current 3s; P type: 120% rated current 1 minute;150% rated current 3s.
Control perform	Control mode	Open loop vector control、V/F control、torque control
	Start torque	Open loop vector control: 0.5Hz 180%,VF control: 0.5Hz 150%

	Speed adjustable range	Open loop vector control: 1:200,VF control: 1:100
	Speed control accuracy	Open loop vector control: ±0.2%,VF control: ±0.5%
Protection performance	25 protection functions	Including over voltage, over current, over heat, over load, under voltage, short circuit, ground fault, input and output lack of equal, all-directional protection AC drive reliable operation.
Installation environment requirements	Working storage environment temperature	Working temperature:-10 ～ 40℃(Ambient temperature 40℃ ～ 50℃,please derating for usage),free from the direct sunlight. Storage temperature:-20～60℃
	Ambient environment	Humidity within 90% (no condensation), vibration less than 0.6G
		Non (corrosive, flammable, explosive, water-absorbent dust material), all kinds of lint cannot be accumulated.
	Altitude	0～1000m. each rises 1000 m, derating 10% for usage.

2.4 Product Outline and Installation Hole Sizes

2.4.1 High performance Vector AC Drive Outline

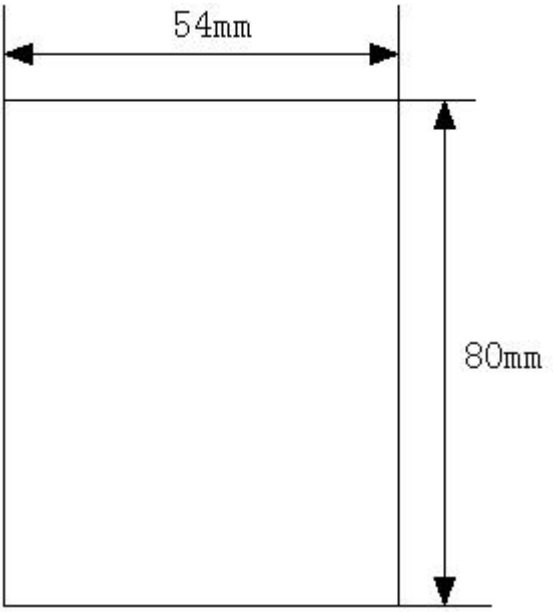


2.4.2 The Dimension and Installation Hole Size

Model	Mounting hole mm		External dimension mm			Mounting aperture mm	Weight kg
	L	W	H	A	B		
Three phase 380V							
XXXX-2S0004GB	148	81	152	85	113		
XXXX-2S0007GB	148	81	152	85	113		
XXXX-2S0015GB	148	81	152	85	113		
XXXX-2S0022GB	148	81	152	85	113		
XXXX-4T0007GB	148	81	152	85	113		
XXXX-4T0015GB	148	81	152	85	113		
XXXX-4T0022GB	148	81	152	85	113		
XXXX-4T0030GB	148	81	152	85	113		
XXXX-4T0037GB							
XXXX-4T0055GB							
XXXX-4T0075GB							
XXXX-4T00110GB							

2.4.3 Keyboard Tray Outline and Size

When you need pull out operation panel and fixed on the door or platform, please choose operation panel tray and extend wire group, and the aperture size is as follows;



Aperture size of keyboard tray

2.5 Brake Optional Parts of AC Drive

Power (KW)	Recommended Braking Resistor Power(KW)	Recommended Braking Resistor Resistance(Ω)	Brake Unit
0.4KW～0.75KW	0.2KW	≥300Ω	Standard build-in
1.5KW～2.2KW	0.5KW	≥220Ω	
3.0KW～3.7KW	1.0KW	≥130Ω	
5.5KW	1.0KW	≥90Ω	
7.5KW	1.5KW	≥65Ω	
11KW	2	≥43Ω	

Chapter 3 Mechanical and Electrical Installation

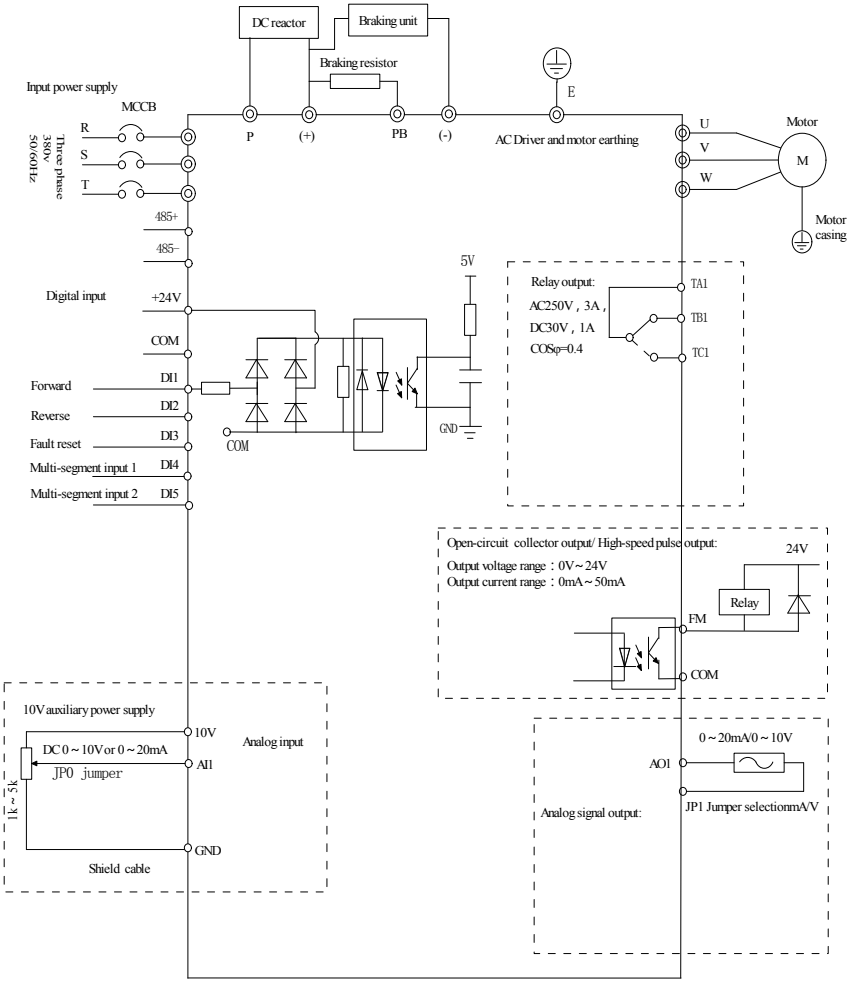
3.1 Selection Guidance of Peripheral Electrical Components

The wire selection is for reference only. If the copper nose cannot be assembled with air switch, please choose the corresponding air switch coupling plate by yourself.

Power (KW)	Air Switch (MCCB)	Recommend Contactor(A)	Recommend input main circuit wire (mm^2)	Recommend output main circuit wire (mm^2)	Recommend control circuit wire (mm^2)
0.4	6	9	0.75	0.75	0.5
0.75	6	9	0.75	0.75	0.5
1.5	10	9	0.75	0.75	0.5
2.2	10	9	0.75	0.75	0.5
3.0	16	12	1.5	1.5	0.5
3.7	16	12	1.5	1.5	0.5
5.5	20	18	2.5	2.5	0.75
7.5	32	25	4.0	4.0	0.75
11	40	32	4.0	4.0	0.75
15	50	38	6.0	6.0	0.75
18.5	50	40	10	10	1.0
22	63	50	10	10	1.0
30	100	65	16	16	1.0
37	100	80	25	25	1.0
45	123	95	35	35	1.0
55	160	115	50	50	1.0
75	225	170	70	70	1.0
93	250	205	95	95	1.0
110	315	245	120	120	1.0
132	350	300	120	120	1.0
160	400	300	150	150	1.0
185	500	410	150	150	1.0
200	500	410	185	185	1.0
220	630	475	240	240	1.0
250	630	475	2*120	2*120	1.0
280	700	620	2*120	2*120	1.0
315	800	800	2*150	2*150	1.0
350	1000	800	2*185	2*185	1.0
400	1250	1000	2*240	2*240	1.0
450	1250	1000	2*240	2*240	1.0

500	1250	1000	4*150	2*240	1.0
550	1250	1000	4*150	2*240	1.0
630	1250	1250	2*240	2*240	1.0
720	1500	1500	2*240	2*240	1.0

3.2 Main Circuit Terminals and Wiring



1. Three-phase ac drive main circuit terminal instructions

Symbol	Name	Description
R、S、T	Three-phase power input	AC input three phase power connection point
(+)、(-)	DC bus positive and negative terminal	Common dc bus input point

(+)、PB	Brake resistance connecting terminal	G30kW and below brake resistance connection points;
P、(+)	External reactor connection terminal	G75KW and above ac drive external reactor connection point
U、V、W	Output terminal	Connect the three-phase motor
⏚	Grounding terminal PE	The ground terminal cannot be connected with the neutral wire of the power supply

2. Control Terminals and Wiring

1) The terminal layout of CPU control loop is shown as follows:

10V	AI1	DI1	DI2	DI3	DI4	COM
GND	AO1	485+	485-	DI5	FM	24V

TA1	TB1	TC1

2) Control terminal function description

Item	Symbol	Name	Description
Power supply	10V-GND	10V power supply	Provides 10V power supply, maximum output current: 10 mA. Generally used as power of external potentiometer, potentiometer resistance range:1kΩ～5kΩ
	24V-COM	24V power supply	Provide 24V power supply, generally used as power supply of digital input and output terminal and external sensor, maximum output current: 200mA.
Analog input	AI1-GND	Analog input terminal 1	1.Input range: DC 0V～10V/4mA～20mA,etermined by the JP0 jumper on the control board 2.Input impedance: voltage input: 22 kΩ, current input: 500Ω.
Digital input	DI1-COM	Digital input 1	1.Optocoupler isolation 2.Input impedance:2.4kΩ 3.The DI5 can also be used as high speed pulse input and the factory default supports maximum 20.00KHz.The maximum input frequency is 100 KHz, but it needs to change the U20 as the high-speed optical coupling, at the same time, the RDI5 resistance was re-welded to the RDI.
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	
	DI5-COM	Digital input 5	
Analog output	AO1-GND	Analog output 1	The JP1 jumper on the control board determines the voltage or current output. Output voltage range:0V～10V Output current range:0mA～20mA

Digital output	FM-COM	Digital output	When the open collector output/high speed pulse output, it is constrained by the function code B5-00; As high speed pulse output, the factory default supports maximum 100.00KHz.The maximum output frequency is 100KHz, but it needs to change the U12 as the high-speed optical coupling, at the same time, the RSP resistance was re-welded to the RFM. Output voltage range: DC 0V～24V Maximum output current:50mA
Relay output	TA1-TB1-TC1	Normal closed TA1-TB1 Normal open TA1-TC1	Contact drive capability: AC 250V,3A,COSø=0.4 DC 30V,1A,
Auxiliary interface	J10	Display keyboard interface	RJ45 interface, external connection is possible
Communication terminal	485- 485+	RS485 hardware circuit	Support the standard MODBUS communication

3) Control board jumper description

Jumper no.	Position	Description
JP0	Short connect 1. 2 pin V (factory setting)	AI2 analog input selection-voltage V
	Short connect 2, 3 pin mA	AI2 Analog input selection - current mA
JP1	Short connect 1.2 pin V(factory setting)	AO1output selection - voltage V
	Short connect 2、3 pin mA	AO1 output selection - current mA

Chapter 4 Operation and Display

4.1 Introduction of Operation and Display Interface

When the panel is operated by a keyboard, the function parameters of ac drives, the ac drive working condition monitoring and operation control (such as start, stop) can be modified, its appearance and function as shown below:

Keyboard

4.2 Function Indicator Light Description

RUN: When light off, the ac drive is in stop status, when light on, the drive is in running status.

LOCAL: Keyboard operation, terminal operation and remote operations (communication control) indicator lights, light-off indicates keyboard control, light-on indicates terminal operation control , lights flash is in a state of remote communication control

REV: Forward and reverse indicator, light-on means the reverse state.

HZ: Frequency unit

A: Current unit

V: Voltage unit

RMP(Hz+A): Speed unit

%(A+V): Percentage

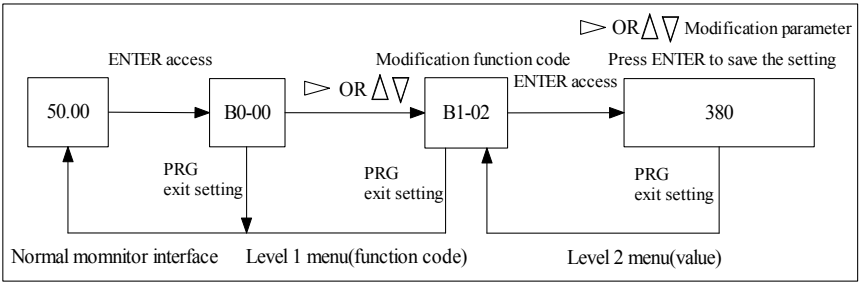
4.3 Key instructions

Key	Name	Function
PRG	programming key	Main menu entry or exit
ENTER	Confirmation key	Step into the menu screen, confirm set parameter
▲	Increment key	Increment of data or function code
▼	Decrement key	Decrement of data or functional codes
SHIFT	Right shift key	When the parameters are modified, the modification bit of the parameters can be selected, and the display parameters can be cyclically selected on the stop display and the running display.
RUN	Running key	In keyboard mode, used to run operations.
STOP/RST	Stop / Reset	When drive is running, pressing this key can be used to stop the operation; in the fault alarm state, the key is used to reset the fault, the characteristic of the key is restricted by the function code B7-02.
QUICK	Multifunction selection key	Function switching selection based on B7-01, which can be defined as a command source, or a fast direction switch.
RUN+ STOP	Free stop key	When the drive is in operation and the two keys are pressed at the same time, the free stop is realized.
	Analog potentiometer	Set the digital frequency or PID object setting.

4.4 Basic Function Code Inspection and Modification Method Description

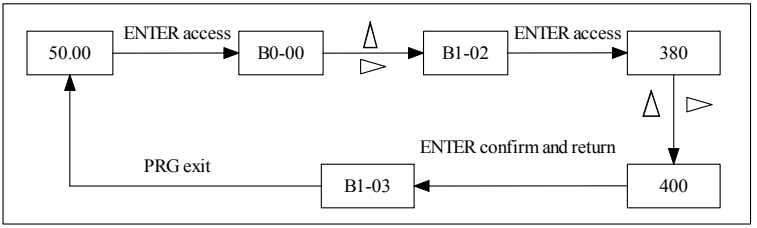
The basic function code group is the whole function code of the ac drive, Enter to access the Level 1 menu. And press the ENTER again then access to the Level 2 menu.

The operation process is shown in figure.



Note: When performing parameter modification operations in the -level 2 menu, it needs to press ENTER to save the setting parameters; if press PRG to return to level 1 menu directly, the current modified parameters are not saved.

For example: An example of modifying the function code B1-02 from 380V to 400V.



In the level 2 menu state, if the parameter has no flashing bit, it means that the function code cannot be modified. The possible reasons are as below:

1. The function code is not modifiable such as the actual detected parameters, operation record parameters, etc.

2. The function code cannot be modified in the running state and can be modified after stop.

Chapter 5 Functional Parameters Table

B7-11 is set to a non-zero value, that is, the user password is set. Please remember the password in order to enter the parameter setting. After setting the password, press the ENTER key on the normal interface, and display 0.0.0.0.0. It prompts to enter the correct password for parameter setting; if it needs to cancel the password, please set B7-11 to 0 after enter the correct password.

Group B0-PL is the basic function parameter, and group PU is the monitoring function parameter. The symbol description in the function table is as follows:

"√": Indicates that the set value of this parameter can be changed when the ac drive stop or operate;

"×"; Indicates that the set value of this parameter cannot be changed when the ac drive is in operation;

"○": Indicates that the parameter is the actual value and cannot be changed.

Basic function parameters:

Function Code	Name	Setting Range	Factory Setting	Modification
B0 Basic Function Group				
B0-00	GP Type selection	1:G type (constant torque load model) 2:P type (fan, water pump type load model)	1	×
B0-01	Motor control mode	0:Speed sensorless vector control(SVC1) (Rapid acceleration and deceleration) 1:Reserve 2:VF control 3:Speed sensorless vector control(SVC2) (High torque)	2	×
B0-02	Command source selection	0: Operation panel command channel (LOCAL Lamp off) 1: Terminal command channel (LOCAL Lamp light) 2: Communication command channel (LOCAL Lamp flashing)	0	√
B0-03	Main frequency source A selection	0: Digital set (preset frequency B0-08, UP/DOWN can be modified, no memory can be lost.) 1: Digital set (preset frequency B0-08, UP/DOWN can be modified, lost memory) 2: AI1 3: Reserver 4: Keyboard potentiometer 5: Reserver 6: Multiple instructions 7: Simple PLC 8: PID 9:Communication given	4	×
B0-04	Auxiliary frequency source B selection	B0-03 (main frequency source A)	0	×

B0-05	Auxiliary frequency source B range selection at superposition	0: Relative to the maximum frequency 1: Relative to frequency source A	0	√
B0-06	Auxiliary frequency source B range selection at superposition	0%～150%	100%	√
B0-07	Frequency source superposition selection	Ones: Frequency source selection 0:Main frequency source A 1: Main and auxiliary operation results (The operation relationship is determined by the ten units.) 2:Switch between main frequency source A and auxiliary frequency source B 3:Switch between main frequency source A and main auxiliary operation 4: Switching between auxiliary frequency source B and main auxiliary operation Ten units: Frequency source main and auxiliary operation relation. 0:A+B 1:A-B 2:Max(A,B) 3:Min(A,B)	02	√
B0-08	Preset frequency	0.00Hz～Maximum frequency(B0-10)	50.00Hz	√
B0-09	Running direction	0: Same direction 1: Opposite direction	0	√
B0-10	Maximum frequency	50.00Hz～3000Hz	50.00Hz	×
B0-11	Upper limit frequency source	0:B0-12 setting 1:AI1 2:Reserver 3:Keyboard potentiometer 4:HDI pulse setting	0	×
B0-12	Upper limit frequency	Lower limit frequency B0-14～Maximum frequency B0-10	50.00Hz	√
B0-13	Upper limit frequency offset	0.00Hz～Maximum frequency B0-10	0.00Hz	√
B0-14	Lower limit frequency	0.00Hz～Upper limit frequency B0-12	0.00Hz	√
B0-15	Carrier frequency	0.5kHz～15.0kHz	Depends on mode	√
B0-16	Carrier frequency is adjusted with temperature	0: No 1: Yes	1	√

B0-17	Acceleration time 1	0.00s～32000s	Depends on mode	√
B0-18	Deceleration time 1	0.00s～32000s	Depends on mode	√
B0-19	Acceleration/Deceleration time unit	1:0.1S 2:0.01s	1	×
B0-21	Auxiliary frequency source bias frequency at superposition	0.00Hz～Maximum frequency B0-10	0.00Hz	√
B0-22	Frequency command resolution	1:0.1Hz 2:0.01Hz	2	×
B0-23	Stop memory selection at digital setting frequency	0:without memory 1:with memory	1	√
B0-25	Acceleration/Deceleration time reference frequency	0:Maximum frequency(B0-10) 1:Setting frequency 2:100Hz	0	×
B0-26	Operation frequency instruction UP/ DOWN benchmark	0: Operation frequency 1: Setting frequency	0	×
B0-27	Command source binding frequency source	Ones: Selection of operation panel command binding frequency source 0:No binding 1:Digital setting frequency 2:AI2 3:Reserver 4:Keyboard potentiomer 5: Reserversetting(DI5) 6: Multi-speed 7:Simple PLC 8:PID 9:Communication given Tens: Selection of the terminal command binding frequency source Hundreds : Selection of the communication command binding frequency source Thousands: Selection of automatic running binding frequency source	0000	√

B1 Group Motor parameters				
B1-00	Motor type selection	0: Ordinary asynchronous motor. 1: Variable frequency asynchronous motor. 2: Permanent magnet synchronous motor	0	×
B1-01	Motor rated power	0.1kW～1000.0kW	Model depends	×
B1-02	Motor rated voltage	1V～1000V	Model depends	×
B1-03	Motor rated current	0.01A～320.00A(ac drive power<=55kW) 0.1A～3200.0A(ac drive power>55kW)	Model depends	×
B1-04	Motor rated frequency	1.00Hz～Maximum frequency	Model depends	×
B1-05	Motor rated speed rotation	1rpm～32000rpm	Model depends	×
B1-06	Asynchronous motor stator resistance	0.001Ω～32.000Ω(ac drive power<=55kW) 0.0001Ω～3.2000Ω(ac drive power>55kW)	Tuning parameters	×
B1-07	Asynchronous motor rotor resistance	0.001Ω～32.000Ω(ac drive power<=55kW) 0.0001Ω～3.2000Ω(ac drive power>55kW)	Tuning parameters	×
B1-08	Asynchronous motor leakage inductance reactance	0.01mH～320.00mH(ac drive power<=55kW) 0.001mH～32.000mH(ac drive power>55kW)	Tuning parameters	×
B1-09	Asynchronous motor mutual inductance resistance	0.1mH～3200.0mH(ac drive power<=55kW) 0.01mH～320.00mH(ac drive power>55kW)	Tuning parameters	×
B1-10	Asynchronous motor no-load current.	0.01A～B1-03(ac drive power<=55kW) 0.1A～B1-03(ac drive power>55kW)	Tuning parameters	×
B1-16	Stator resistance of PM synchronous motor	0.001Ω～32.000 Ω（ac drive power <=55kW） 0.0001 Ω～3.2000 Ω（ac drive power>55kW	Tuning parameter	×
B1-17	PM Synchronous motor D-axis inductance	0.01mH～320.00mH（ac drive power<=55kW） 0.001mH～32.000mH（ac drive power>55kW	Tuning parameter	×
B1-18	PM Synchronous motor Q-axis inductance	0.01mH～320.00mH（ac drive power<=55kW） 0.001mH～32.000mH（ac drive power>55kW）	Tuning parameter	×
B1-20	Back-EMF coefficient of PM synchronous motor	2.0～1000.0V	Tuning parameter	×
B1-26	Zero frequency stop delay	0.00s～30.00s Note: When B0-14=3,The automatic delay performed only in high level vector control	5.00s	×
B1-37	Tuning(motor parameters auto-learning)	0: No operation 1: Motor static tuning(Motor not work) 2: Motor complete tuned (The motor static	0	×

	selection	auto-learning first, then auto-learns in rotating)		
B2 Group Motor vector control parameters				
B2-00	Speed loop proportional gain 1	1～100	20	√
B2-01	Speed loop integral time 1	0.01s～10.00s	0.50s	√
B2-02	Switching frequency 1	0.00～B2-05	5.00Hz	√
B2-03	Speed loop proportional gain 2	1～100	15	√
B2-04	Speed loop integral time 2	0.01s～10.00s	1.00s	√
B2-05	Switching frequency 2	B2-02～Maximum frequency	10.00Hz	√
B2-06	Vector control slip gain	50%～200%	100%	√
B2-07	Speed loop filter coefficient	2～100	50	√
B2-08	VC low frequency excitation boost	80.0%～150.0%	105.0%	√
B2-09	Torque upper limit source in speed control mode	0: Function code B2-10 setting 1: AI2 2: AI2	0	√
B2-10	Digital setting of electric torque upper limit	50.0%～300.0%(Relative to motor rated torque)	165.0%	√
B2-11	Digital setting of generator torque upper limit	50.0%～300.0%(Relative to motor rated torque)	150.0%	√
B2-13	Excitation adjustment proportional gain	1～32000	2000	√
B2-14	Excitation adjustment integral gain	1～32000	1300	√
B2-15	Torque adjustment proportional gain	1～32000	2000	√
B2-16	Torque adjustment integral gain	1～32000	1300	√
B3 Group V/F Control Parameters				
B3-00	VF curve setting	0: Line V/F 1: Multi-point V/F 2:Square V/F 10:VF complete separation Mode	0	×
B3-01	Torque boost	0.1%～30.0%	Depends on motor	√
B3-02	Torque boost cutoff	0.00Hz～Maximum frequency	50.00Hz	×

	frequency			
B3-03	Multipoint VF frequency point 1	0.00Hz～B3-05	5.00Hz	×
B3-04	Multipoint VF voltage point 1	0.0%～100.0%	15.0%	×
B3-05	Multipoint VF frequency point 2	B3-03～B3-07	17.50Hz	×
B3-06	Multipoint VF voltage point 2	0.0%～100.0%	45.0%	×
B3-07	Multipoint VF frequency point 3	B3-05～motor rated frequency(B1-04)	35.00Hz	×
B3-08	Multipoint VF voltage point 3	0.0%～100.0%	80.0%	×
B3-09	VF slip compensation gain	0.0%～200.0%	0.0%	√
B3-10	VF overexcitation gain	0～200	32	√
B3-11	VF oscillation suppression gain	0～100	0	√
B3-13	VF Separation voltage source	0:Digital setting(B3-15) 1:AI1 2:Reserver 3:Keyboard potentiometer 4:HDI pulse setting(DI5) 5:Multi-segment instruction 6:Simple PLC 7:PID 8:Communication given Note: 100.0% corresponding motor rated voltage B3-15.	0	√
B3-14	AVR Automatic voltage regulator	0: Disable 1: Enable 2: Only invalid when slowing down.	0	√
B3-15	VF Separation voltage digital settings	0V～Motor rated voltage	0V	√
B3-16	VF Separation voltage Acceleration time	0.0s～3200.0s	10.0s	√
B3-17	VF Separation voltage Deceleration time	0.0s～3200.0s	10.0s	√
B4 Group Input terminals				
B4-00	DI1 Terminal function selection	0: No function 1: Forward running(FWD)	1	×

B4-01	DI2 Terminal function selection	2: Reverse running(REV) (setting 1,2cooperates with B0-13 for use) 3: Three-wire operation control 4: Forward Jog(FJOG) 5: Reverse Jog(RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free stop for all the channels 9: Faulty Reset(RESET)for all the channels 10: Operation Pause (Valid for all the channels) 11: External fault normal open input (E015) 12: Multi-segment instruction terminal 1 13: Multi-segment instruction terminal 2 14: Multi-segment instruction terminal 3 15: Multi-segment instruction terminal 4 16: Acceleration/deceleration time selection terminal 1 17: Acceleration/deceleration time selection terminal 2 18: Frequency source combination switching (2、3、4 is valid during B0-04 is digit unit) 19: UP/DOWN setting clear(terminal、keyboard) 20: Control command switch terminal 1 (B0-12 is terminal or communication channel, switch to keyboard control during closed) 21: Acceleration/deceleration forbidden 22: PID pause 23: PLC status reset 24: Swing frequency Pause 25: Counter input 26: Counter reset 27: Length count input 28: Length reset 29: Torque control forbidden 30: HDI(pulse)frequency input(only valid for DI5,More than 20.00KH, it needs to change the high-speed optical coupling) 31: Reserved 32: Immediate DC braking. 33: External faulty normal closed input(E015 emergency stop) 34: Frequency modify enabled 35: PID negative direction action 36: External stop terminal 1(Only the keyboard control is valid, the terminal is closed to stop, which is equivalent to the function of the STOP	2	×
B4-02	DI3 Terminal function selection		9	×
B4-03	DI4 Terminal function selection		0	×
B4-04	DI5 Terminal function selection		0	×
B4-05	DI6 Terminal function selection		0	×
B4-06	Reserved			
B4-07	Reserved			

		key on the keyboard) 37: Control command switch terminal 2(When B0-12 is terminal control, the terminal is closed and switched to communication control; When B0-12 is communication control, the terminal is closed and switched to terminal control. When B7-09 = 1, the terminal is closed invalid) 39: Frequency source A and digital frequency switch 40: Frequency source B and digital frequency switch 44: User-defined fault 1(E027) 45: User-defined fault 2(E028) 46: Speed control /torque control switch 48: External stop terminal2 49: Deceleration DC braking (first decelerate to the braking frequency and then DC brake. 50: Running time clear		
B4-11	Terminal command mode	0: Two-wire 1 (Forward terminal forward start and stop , reverse terminal reverse start and stop) 1: Two-wire 2 (The forward rotation terminal starts and stops, the reverse terminal changes direction) 2: Three-wire 1 (Forward terminal pulse start and stop, reverse terminal pulse start and stop, three-wire terminal normally closed (stop when disconnected) 3: Three-wire 2 (Three-wire control 2, forward terminal pulse start and stop, reverse terminal selects direction, three-wire terminal normally closed (stop when disconnected) 4: Three-wire 3 (Three-wire control 3, forward terminal pulse starts and stops forward rotation, reverse terminal pulse starts and stops reverse rotation, three-wire terminal normally open (stop when closed)	0	×
B4-12	Terminal UP/DOWN change rate	0.01Hz/s～100.0Hz/s	2.00Hz/s	√
B4-13	AI1 minimum input	0.00V～B4-15	0.02V	√
B4-14	AI1 minimum input corresponding setting	-100.0%～+100.0%	0.0%	√
B4-15	AI1 maximum input	B4-13～+10.00V	9.98V	√
B4-16	AI1 maximuminput corresponding setting	-100.0%～+100.0%	100.0%	√
B4-17	AI1 Input filter	0～20(When PID pressure is unstable, increase	3	√

	coefficient	appropriately; when CNC machine tool requires rapid response, decrease appropriately)		
B4-18	AI2 minimum input	0.00V～B4-20	0.02V	√
B4-19	AI2 minimum input corresponding setting	-100.0%～+100.0%	0.0%	√
B4-20	AI2 maximum input	B4-18～+10.00V	9.98V	√
B4-21	AI2 maximum input corresponding setting	-100.0%～+100.0%	100.0%	√
B4-22	AI2 Input filter coefficient	0～20(When PID pressure is unstable, increase appropriately; when CNC machine tool requires rapid response, decrease appropriately)	3	√
B4-23	Input terminal logic negate	0: Positive logic 1: Antilogic Unit: DI1 Negate; Decade: DI2 Negate; Hundred: DI3 Negate; Thousand:DI4 Negate;	00000	×
B4-24	Input terminal logic negate	0: Positive logic 1: Antilogic Unit: DI5 Negate; Decade: DI6 Negate;	00000	×
B4-28	HDI minimum input	0.00kHz～B4-30	0.00kHz	√
B4-29	HDI minimum input corresponding setting	-99.99%～100.00%	0.00%	√
B4-30	HDI maximum input	B4-28～100.00kHz	20.00kHz	√
B4-31	HDI maximum input corresponding setting	-99.99%～100.00%	100.00%	√
B4-32	HDI Filter time	0～20	3	√
B4-34	AI1,AI2,HDI lower than minimum input setting selection	0: Corresponding minimum input setting 1: 0.0%	0	√
B4-35	DI1 closed delay time	0.000s～32.000s	0.000s	×
B4-36	DI1 disconnect delay time	0.000s～32.000s	0.000s	×
B4-37	DI2 closed delay time	0.000s～32.000s	0.000s	×
B4-38	DI2 disconnect delay time	0.000s～32.000s	0.000s	×
B4-39	DI3 closed delay time	0.000s～32.000s	0.000s	×
B4-40	DI3 disconnect delay time	0.000s～32.000s	0.000s	×
B4-41	DI4 closed delay time	0.000s～32.000s	0.000s	×
B4-42	DI4 disconnect delay time	0.000s～32.000s	0.000s	×
B4-43	DI5 closed delay time	0.000s～32.000s	0.000s	×
B4-44	DI5 disconnect delay time	0.000s～32.000s	0.000s	×

B4-45	DI6 closed delay time	0.000s～32.000s	0.000s	×
B4-46	DI6 disconnect delay time	0.000s～32.000s	0.000s	×
B5 Group Output terminal				
B5-00	FM terminal output mode selection	0: Pulse output(HDO,B5-09～B5-12 setting) 1: Open collector output(FM,B5-01 setting)	1	√
B5-01	Control board FM open collector output function selection.	0: No output 1: Ac drive operation 2: Faulty output (Faulty stop)	0	√
B5-02	Relay output function selection (TA1-TB1-TC1)	3: FDT1 output of frequency level detection (B8-19、B8-20) 4: Frequency reached (B8-21)	2	√
B5-03	Relay output function selection (TA2-TB2-TC2)	5: Zero speed operation (No output during stop) 6: Motor overload pre-alarm(B9-02) 7: Ac drive overload pre-alarm(B9-51)	1	√
B5-04	Reserved	8: Set count value reached.(B8-11) 9: Specified count value reached(B8-12) 10: Length reached(B8-08～B8-10) 11: PLC cycle is completed. 13: Frequency limitation 15: Running preparation ready 16: AI1>AI2 17: Upper limit frequency reached 18: Lower limit frequency reached (operation related) 19: Under voltage state output. 20: Communication setting(Address2001H) 23: Zero speed operation 2(also output when stop) 24: Cumulative power-on time reached (B7-06>=B8-16) 25: FDT2 output of frequency level detection(B8-28、B8-29) 26: Frequency 1 reached output (B8-30、B8-31) 27: Frequency 2 reached output(B8-32、B8-33) 28: Current 1 reached output(B8-38、B8-39) 29: Torque level detection FDT output(B8-40、B8-41) 30: Timing reaches output.(B8-42～B8-44) 31: AI1 input over limit (B8-45、B8-46) 33: Reverse running 34: Zero current state(B8-34、B8-35) 35: Module temperature reached(B8-47) 36: The output current exceeds the limit(B8-36、	0	√

		B8-37) 37: Lower frequency limit (even output when stop) 40: Present running time reach(B8-53) 41: Faulty output(no output when undervoltag) 42: Multi-speed frequency reached output(No operation in Zero speed) 45: Output finish in PLC stage 46: Digital output specified value(B5-22) 47: At least one multi-speed terminal is closed 48: In forward running (Jog forward running not included) 49: In reverse running(Jog reverse running not include) 50: Jog running 51: In running(Not jog running) 52: Output current reached (B6-13、B6-14 control) 53: Input terminal DI1 state 54: Input terminal DI2 state 55: Input terminal DI3 state 56: Input terminal DI4 state 57: Input terminal DI5 state 58: Input terminal DI6 state		
B5-06	HDO high speed pulse output function selection	0: Operation frequency (10Vcorresponding to the maximum frequency) 1: Set frequency (10Vcorresponding to maximum frequency) 2: Output current (10V corresponding to 2 times motor rated current) 3: Output torque (10V corresponding to 2 times motor rated torque) 4: Output power(10Vcorresponding to 2 times motor power) 5: Output voltage (10V corresponding to 1.2 times drive rated voltage) 6: HDI high speed pulse (10V corresponding to 20.0kHz) 7: AI1 8: Reserver 9: DC bus voltage (0-10V corresponding to 0-1000V) 10: Length(0～Maximum set length) 11: Count value(0～Maximum count value) 12: Communication set (Address2004H、2002H、2003H) 13: Motor rotation(0～Rotation speed	0	√
B5-07	AO1 analog output function selection		0	√
B5-08	Reserver		1	√

		corresponding to maximum output frequency) 14: Output current(100.0% corresponding to 1000.0A) 15: Output voltage(100.0% corresponding to 1000.0V) 16: Output torque (-2 times motor rated torque~ 2 times motor rated torque) 17: Output percentage specified value(B5-23)		
B5-09	Reserver			
B5-10	Reserver			
B5-11	Reserver			
B5-12	Reserver			
B5-13	AO1maximum output	0.00V～10.00V	10.00V	√
B5-14	AO1upper limit percentage	0.0%～100.0%	100.0%	√
B5-15	AO1 minimum output	0.00V～10.00V	0.00V	√
B5-16	AO1 lower limit percentage	0.0%～100.0%	0.0%	√
B5-17	Reserver			
B5-18	Reserver			
B5-19	Reserver			
B5-20	Reserver			
B5-21	Below lower limit output selection	0: Output 0V 1: Output lower limit	1	√
B5-22	Digital output specified value	0: Closed 1: Disconnect	1	√
B5-23	AO1 output percentage specified value	0.0%～100.0%	0.0%	√
B5-24	FM closed delay	0.0s～3200.0s	0.0s	√
B5-25	FMdisconnect delay	0.0s～3200.0s	0.0s	√
B5-26	T1 closed delay	0.0s～3200.0s	0.0s	√
B5-27	T1 disconnect delay	0.0s～3200.0s	0.0s	√
B5-28	Reserver			

B5-29	Reserver			
B5-32	Digital output logic inversion	0: Positive logic 1: Antilogic Digit: FM logic negation Ten digit: TA1 output logic negation	0000	√
B5-33	AO output calibration	0.0%～100.0%	97.0%	√
B6 Group Start-Stop Control				
B6-00	Start-up mode	0:Direct start 1: Speed tracking restart 2:Pre-excitation start (ac asynchronous motor)	0	√
B6-02	Speed tracking frequency	0.00Hz～100.00Hz	20.00Hz	√
B6-03	Start frequency	0.00Hz～10.00Hz	0.00Hz	√
B6-04	Start frequency maintain time	0.0s～100.0s	0.0s	×
B6-05	Start DC brake current /pre-excitation current	0%～100%	0%	×
B6-06	Start DC braking time/pre-excitation time	0.0s～100.0s	0.0s	×
B6-07	Acceleration/ Deceleration mode	0: Linear acceleration/deceleration 1:S curve acceleration/deceleration A	0	×
B6-08	Time scale of S curve starts	0.0%～(100.0%-B6-09)	30.0%	×
B6-09	Time scale of S curve ends	0.0%～(100.0%-B6-08)	30.0%	×
B6-10	Stop mode	0:Deceleration stop 1:Free stop	0	√
B6-11	Stop DC braking start frequency	0.00Hz～maximum frequency	0.00Hz	√
B6-12	Stop DC brake wait time	0.0s～100.0s	0.0s	√
B6-13	Stop DC brake current	0%～100%	0%	√
B6-14	Stop DC braking time	0.0s～100.0s	0.0s	√

B7 Group Keyboard and display				
B7-01	QUICK key function selection	0: QUICK invalid 1: Switch between the command channel of the operation panel and the remote command channel (terminal command channel or communication command channel) 2: Forward/Reverse switching. 3: Forward Jog 4: Reverse Jog	2	×
B7-02	STOP/RST key function	0: Only in keyboard mode, STOP/RST key stop function is enabled. 1: In any operating mode, STOP/RST key stop function is enabled (when controlled by terminal or communication, it is free to stop) 2: In any operating mode, STOP/RST key stop function is enabled (when controlled by terminal or communication, E037 external faulty occurs)	0	√
B7-03	LED line1 running display selection	00: Running frequency 01: Setting frequency 02: DC bus voltage	0	√
B7-05	LED line1 stop display selection	03: Output voltage 04: Output current 05: Output power(kW) 06: Output torque(%) 07: DI input terminal status 08: DO output terminal status 09: AI1 voltage(V) 10: AI2 voltage(V) 11: Reserved (no function) 12: Count value 13: Length value 14: Load speed display 15: PID Setting 16: PID feedback 17: PLC status 18: HDI input (DI5terminal)pulse frequency(kHz) 19: Feedback frequency(Hz) 20: The remaining running time. 21: AO1output voltage(V) 22: AO2 output voltage(V) 23: HDO pulse output frequency(KHZ) 24: Reserved (no function) 25: Accumulated power-on time(Hour) 26: Timing elapsed time(Min)	1	√

		27: Timing setting time(Min) 28: Communication setting value 29: Reserved (no function) 30: Main frequency A display(Hz) 31: Auxiliary frequency B display(Hz) 32: Multi-speed present stage speed 33: PLC total set time 34: PLC elapsed time 35: Torque target value 36: PLC remaining running time		
B7-06	Load speed display coefficient	0.0001～3.2000	1.0000	√
B7-07	Inverse module radiator temperature	0.0℃～100.0℃	-	○
B7-10	Braking voltage action point	100%～160%	128%	√
B7-11	User password (Used to lock the keyboard)	0～32766 (After setting up, be sure to keep in mind)	0	√
B7-13	Cumulative power-on time H	0H～32767H	-	○
B7-14	Accumulative power consumption	0KW.H～32767kW.H	-	○
B7-18	LED line2 running display selection	See B7-03	4	√
B7-19	LED line2 stop display selection	See B7-03	2	√
B8 Group auxiliary functions				
B8-00	Jog running frequency	0.00Hz～Maximum frequency	2.00Hz	√
B8-01	Jog acceleration time	0.0s～3200.0s	20.0s	√
B8-02	Jog deceleration time	0.0s～3200.0s	20.0s	√
B8-03	Acceleration time 2	0.0s～3200.0s	Depends on model	√
B8-04	Deceleration time 2	0.0s～3200.0s	Depends on model	√
B8-05	Acceleration time 3	0.0s～3200.0s	Depends on model	√
B8-06	Deceleration time3	0.0s～3200.0s	Depends on model	√
B8-07	Acceleration time 4	0.0s～3200.0s	Depends on model	√
B8-08	Deceleration time 4	0.0s～3200.0s	Depends on model	√
B8-09	Jump frequency 1	0.00Hz～maximum frequency	0.00Hz	√

B8-10	Jump frequency 2	0.00Hz～maximum frequency	0.00Hz	√
B8-11	Jump frequency range	0.00Hz～maximum frequency	0.01Hz	√
B8-12	Dead zone of forward/reverse	0.0s～3000.0s	0.0s	√
B8-13	Reverse control forbidden	0: Allowed 1: Not allowed (it is invalid in torque control)	0	√
B8-14	Operation mode of setting frequency lower than lower limit frequency	0: Run with lower limit frequency. 1: Stop 2: Zero speed operation	0	√
B8-15	Droop control	0.00Hz～10.00Hz This function is generally used for load distribution when multiple motors are driving the same load. Droop control means that as the load increases, the output frequency of the ac drive is reduced, and realize the load uniformity of multiple motors.This parameter refers to the output frequency drop value when the ac drive outputs the rated load.	0.00Hz	√
B8-16	Set the accumulative power-on arrival time	0h～32000h	0h	√
B8-18	Start protection selection	Unit: Power on start protection 0: No protection(The terminal is closed before power-on to allow operation) 1: Protection (The terminal is closed before power-on and it is not allowed to run) Hundred units: Normal terminal protection 0: No protection(Normal state, it can run as long as the terminal is closed) 1: Protection(Normal state, if the terminal is closed before starting, it needs to disconnect the terminal first, then close the terminal and start)	101	√
B8-19	Frequency detection value(FDT1)	0.00Hz～Maximum frequency	50.00Hz	√
B8-20	Frequency detection lag value (FDT1)	0.0%～100.0%(FDT1electrical level)	5.0%	√
B8-21	Frequency reached detection width	0.0%～100.0%(maximum frequency)	0.0%	√
B8-22	Whether the jumping frequency is effective during acceleration and deceleration	0: Disabled 1: Enabled	0	√
B8-25	Acceleration time 2 and acceleration time	0.00Hz～Maximum frequency	0.00Hz	√

	1 switch frequency point			
B8-26	Deceleration time 1 and deceleration time 2 switch frequency point	0.00Hz～Maximum frequency	0.00Hz	√
B8-27	Reversed jog frequency	0.00Hz～Maximum frequency When the factory value is not 0.00Hz, the reversal jog frequency is controlled by B8-27; When the factory value is 0.00Hz, the reversal jog frequency is controlled by B8-00.	0.00Hz	√
B8-28	Frequency detection value(FDT2)	0.00Hz～Maximum frequency	50.00Hz	√
B8-29	Frequency detection lag value(FDT2)	0.0%～100.0%(FDT2 electrical level)	5.0%	√
B8-30	Any reached frequency detection value1 1	0.00Hz～Maximum frequency	50.00Hz	√
B8-31	Any reached frequency detection width 1	0.0%～100.0%(Maximum frequency)	0.0%	√
B8-32	Any reached frequency detection value 2	0.00Hz～Maximum frequency	50.00Hz	√
B8-33	Any reached frequency detection width 2	0.0%～100.0%(Maximum frequency)	0.0%	√
B8-34	Zero current detection level	0.0%～100.0% 100.0% corresponding to motor rated current	5.0%	√
B8-35	Zero current detection delay time	0.01s～60.00s	0.10s	√
B8-36	Output current exceeds the limit value	0.0%(No detection) 0.1%～300.0%(Motor rated current)	200.0%	√
B8-37	Output current exceeds the limit detection delay time	0.00s～60.00s	0.00s	√
B8-38	Any reached current 1	0.0%～300.0%(Motor rated current)	100.0%	√
B8-39	Any reached current 1 width	0.0%～300.0%(Motor rated current)	0.0%	√
B8-40	Torque level detection value(FDT)	0.0%～200.0%(Motor rated current)	100.0%	√
B8-41	Torque level lagged value(FDT)	0.0%～100.0%(Motor rated current)	5.0%	√
B8-42	Timing function selection	0: Invalid 1: Valid	0	√

B8-43	Timing run time selection(Automatic stop to timing run time reaches)	0: B8-44 setting 1: AI1 2: AI2 3: Keyboard potentiometer Analogue input range corresponding to B8-44	0	√
B8-44	Timing run time	0.0Min～3200.0Min	0.0Min	√
B8-45	AI1 input voltage protection value lower limit	0.00V～B8-46 When the value of analog input AI1 is greater than B8-46, or AI1 input is less than B8-45, the ac drive multi-function DO outputs "AI1 input over limit ON signal, which is used to indicate whether the input voltage of AI1 is within the set range.	3.10V	√
B8-46	AI1 input voltage protection value upper limit	B8-45～10.00V	6.80V	√
B8-47	Module temperature reaches	0.0℃～100.0℃	75.0℃	√
B8-48	wake-up pressure deviation	0.0%～100.0%	80.0%	√
B8-50	Wake up delay time	0.0s～600.0s	2.0s	√
B8-51	Dormancy frequency	0.00HZ～300.00HZ	0.00HZ	√
B8-52	Dormancy delay time	0.0s～600.0s	10.0s	√
B8-53	Present running reaching time setting	0.0Min～3200.0Min	0.0Min	√
B9 Group Faulty and protection				
B9-00	Motor overload protection selection	0: Not allowed 1: Allowed	1	√
B9-01	Motor overload protection coefficient	50.0%～125.0%(Relative motor rated current)	100.0%	√
B9-02	Motor overload pre-alarm coefficient	20%～100%(Relative to the maximum value of accumulated number of motor overload) It is used to give an early alarm signal to the control system through DO before the motor overload fault protection. The pre-alarm coefficient is used to determine the degree of pre-alarm before the motor overload protection. The larger the value, the smaller the warning advance.	50%	√
B9-03	Overvoltage stall gain	0～200 The larger the value, the stronger the ability to suppress overvoltage, but the actual deceleration time will be longer. Under the premise of no overvoltage, the smaller the gain setting, the better.	0	√
B9-04	Overvoltage stall	115%～150%	138%	√

	protection voltage	During the deceleration of the ac drive, when the DC bus voltage exceeds the overvoltage stall protection voltage, the ac drive stops decelerating and maintains the current operating frequency, and continues to decelerate after the bus voltage drops.		
B9-05	Over current stall gain	0～200 (when it is 0, the over-current stall function is cancelled) the larger the value, the stronger the over-current suppression capability. For the load with small inertia, the over-current stall gain should be small, otherwise the system dynamic response will slow down. For loads with large inertia, this value should be large, otherwise the suppression effect is not good, and over-current faults may occur.	20	√
B9-06	Over current stall protection current	10.0%～210.0% During the acceleration and deceleration of the ac drive, when the output current exceeds the over-current stall protection current, the ac drive stops the acceleration and deceleration process, and continues to accelerate and decelerate after the output current drops.	160.0%	√
B9-09	Automatic failure reset times	0～20	0	√
B9-10	Fault DO output terminal action selection during automatic reset	0: No action 1: Action	0	√
B9-11	Faulty automatic reset interval time	0.100s～32.000s	1.000s	√
B9-12	Input phase loss protection selection	0: Not allowed 1: Allowed	1	√
B9-13	Output phase loss /output current unbalance protection selection	0: Not allowed 1: Allowed	1	√
B9-14	The first fault type	0: No fault	—	○
B9-15	The second fault type	1: IGBT Short circuit fault	—	○
B9-16	The third (latest) fault type	2: Acceleration overcurrent 3: Deceleration overcurrent 4: Constant speed overcurrent 5: Acceleration overvoltage 6: Deceleration overvoltage 7: Constant speed overvoltage 8: Stop drive overvoltage 9: Under voltage	—	○

		10: Ac drive overload 11: Motor overload 12: Input phase loss 13: Output phase loss or three phase unbalance 14: Module overheating 15: External fault 16: Abnormal communication 19: Motor tuning abnormally 21: Read/write parameter abnormally 22: rive hardware abnormally(clear the latch timeout) 23: Motor short circuit with ground 24: AD too large null shift 26: Temperature sensor disconnection fault 27: User-self define faulty 1 28: User-self define faulty 2 29: Power on time arrival 31: PID feedback disconnect faulty 37: Keyboard STOP Key fault 40: Rapid current limitation timeout 41: Automatic reset times over limit		
B9-17	The third (latest) fault frequency	—	—	○
B9-18	The third (latest) fault current	—	—	○
B9-19	The third (latest) fault bus voltage	—	—	○
B9-23	The third (latest) fault accumulative power on time	—	—	○
B9-27	The second fault frequency	—	—	○
B9-28	The second fault current	—	—	○
B9-29	The second fault bus voltage	—	—	○
B9-33	The second fault accumulative power on time	—	—	○
B9-37	The first fault frequency	—	—	○
B9-38	The first fault current	—	—	○
B9-39	The first fault Bus voltage	—	—	○
B9-43	The first fault power accumulative on time	—	—	○

B9-49	Three consecutive failure pause time	1.0s～600.0s	180.0s	√
B9-50	Hardware overcurrent elimination time	0.1s～600.0s	1.0s	√
B9-51	AC drive overload warning coefficient	0～100%(Relative to the maximum value of the cumulative number of ac drive overloads)	50%	√
B9-52	Software current limit and frequency reduction enable	0: Enable 1: Disable	0	√
B9-53	Software current limiting and frequency reduction level	120.0%～220.0%(Relative ac drive rated current)	170.0%	√
B9-54	Maximum drop rate when current is limited	0.00Hz～100.00Hz	2.50Hz	√
B9-55	Current limit cut off frequency	0.00Hz～Maximum Frequency B0-05	10.00Hz	√
B9-59	Instantaneous stop deceleration power generation enable	0: Invalid 1: Decelerate power generation to maintain bus voltage (Deceleration time is set by B9-66)	0	√
B9-60	Instantaneous stop power generation recovery judgment voltage	70.0%～100.0%	90.0%	√
B9-61	Instantaneous stop power generation recovery judgment time	0.0s～100.0s	0.5s	√
B9-62	Deceleration power generation start action voltage	60.0%～100.0%(Stand bus voltage)	80.0%	√
B9-63	Load loss protection selection	0: Invalid 1: Valid Then when the ac drive output current is less than the load loss detection level B9-64 and the duration is greater than the load loss detection time B9-65, the ac drive will report a load loss fault E030.	0	√
B9-64	Load loss detection level	0.0%～100.0%	10.0%	√
B9-65	Load loss detection time	0.0s～60.0s	1.0s	√
B9-66	Instantaneous power failure deceleration	0.0s～3200.0s	3.0S	√

	time			
BA Group PID Function				
BA-00	PID given source	0: BA-01 setting 1: AI1 2: AI2 3: Keyboard potentiometer 4: HDI pulse setting(DI5) 5: Communication setting (communication address 1000H) 6: Multi-segment instrument given	0	√
BA-01	PID value given	0.00 kg～BA-04	0.00 kg	√
BA-02	PID feedback source	0: AI1 1: AI2 2: Reserved 3: AI1-AI2 4: HDI pulse setting(DI5) 5: Communication given (communication address 1000H) 6: AI1+AI2 7: MAX(|AI1|, |AI2|) 8: MIN(|AI1|, |AI2|)	0	√
BA-03	PID effect direction	0: Positive effect(The smaller the PID feedback, the bigger the frequency output 1: Negative effect(The smaller the PID feedback, the smaller the frequency output	0	√
BA-04	pressure gauge	0.00～99.99 kg For example: If the pressure gauge is 1.0MPA, then BA-04 = 10.00 kg If the pressure gauge is 1.6MPA, then BA-04 = 16.00 kg	0.00 kg	√
BA-05	Proportional gain Kp	0～32000(The larger the value, the faster the response and the bigger the oscillation)	800	√
BA-06	Integral gain Ki	0～32000(The larger the value, the faster the response and the bigger the overshoot)	1500	√
BA-09	PID deviation limit	0.0%～100.0%(The deviation between PID setting and feedback is less than this setting, PID adjustment is suspended)	0.0%	√
BA-24	Feedback excessive detection value	0.0%～100.0%	100.0%	√
BA-25	Feedback too large detection time	0.0s～600.0s	1.0s	√
BA-26	PID feedback loss detection value	0.0%: No judgement feedback loss 0.1%～100.0% Feedback disconnection detection: When the feedback value is less than the feedback loss	0.0%	√

		detection value BA-26, the system starts the detection timing. When the timing time exceeds BA-27, the ac drive reports E031 feedback disconnection fault.		
BA-27	PID feedback loss detection time	0.0s～200.0s	3.0s	√
BB Group Swing Frequency, Length And Count				
BB-00	Swing frequency setting mode	0: Corresponds to the center frequency 1: Corresponds to the maximum frequency	0	√
BB--01	Swing frequency range	0.0%～100.0%	0.0%	√
BB--02	Jump frequency range	0.0%～50.0%	0.0%	√
BB--03	Swing frequency cycle	0.1s～3000.0s	10.0s	√
BB--04	Swing frequency triangular wave rise time	0.1%～100.0%	50.0%	√
BB--05	Setting length	0m～32000m	1000m	√
BB--06	Actual length	0m～32000m	0m	√
BB--07	Pulses per meter	0.1～3200.0	100.0	√
BB--08	Setting count	1～32000	1000	√
BB--09	Assigned counter	1～32000	1000	√
BC Group Multi-segment Instrument, Simple PLC				
BC-00	Multi-segment instrument 0	-100.0%～100.0% (When it is a negative value, regardless of the forward rotation command or the reverse rotation command, it is the reverse operation); (When it is a positive value, the forward command is for forward running, and the reverse command is for reverse running);	0.0%	√
BC-01	Multi-segment instrument 1	-100.0%～100.0%	0.0%	√
BC-02	Multi-segment instrument 2	-100.0%～100.0%	0.0%	√
BC-03	Multi-segment instrument 3	-100.0%～100.0%	0.0%	√
BC-04	Multi-segment instrument 4	-100.0%～100.0%	0.0%	√
BC-05	Multi-segment instrument 5	-100.0%～100.0%	0.0%	√
BC-06	Multi-segment instrument 6	-100.0%～100.0%	0.0%	√
BC-07	Multi-segment	-100.0%～100.0%	0.0%	√

	instrument 7			
BC-08	Multi-segment instrument 8	-100.0%～100.0%	0.0%	√
BC-09	Multi-segment instrument 9	-100.0%～100.0%	0.0%	√
BC-10	Multi-segment instrument 10	-100.0%～100.0%	0.0%	√
BC-11	Multi-segment instrument 11	-100.0%～100.0%	0.0%	√
BC-12	Multi-segment instrument 12	-100.0%～100.0%	0.0%	√
BC-13	Multi-segment instrument 13	-100.0%～100.0%	0.0%	√
BC-14	Multi-segment instrument 14	-100.0%～100.0%	0.0%	√
BC-15	Multi-segment instrument 15	-100.0%～100.0%	0.0%	√
BC-16	Simple PLC running mode	0: Once time running drive stop 1: Keep the final value at the end of a single run 2: Keeping circulating	0	√
BC-17	Simple PLC power loss memory record selection	Digit: Power loss memory record selection 0: Power loss no memory record 1: Power loss with memory record Ten digit: Stop memory record selection 0: No memory record 1: Stop with memory record	00	√
BC-18	Simple PLC segment 0 running time	0.0～3200.0(s、h、Min)	0.0	√
BC-19	Simple PLC segment 0 acceleration/ deceleration time selection	0～3	0	√
BC-20	Simple PLC segment 1 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-21	Simple PLC segment 1 acceleration /deceleration time	0～3	0	√
BC-22	Simple PLC segment 2 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-23	Simple PLC segment 2 acceleration /deceleration time selection	0～3	0	√
BC-24	Simple PLC segment 3 running time	0.0～3200.0(s、 h、Min)	0.0	√

BC-25	Simple PLC segment 3acceleration/deceleration time selection	0～3	0	√
BC-26	Simple PLC segment 4 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-27	Simple PLC segment 4 acceleration /deceleration time selection	0～3	0	√
BC-28	Simple PLC segment 5 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-29	Simple PLC segment 5acceleration/deceleration time selection	0～3	0	√
BC-30	Simple PLC segment 6 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-31	Simple PLC segment 6 acceleration /deceleration time selection	0～3	0	√
BC-32	Simple PLC segment 7 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-33	Simple PLC segment 7 acceleration /deceleration time selection	0～3	0	√
BC-34	Simple PLC segment 8 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-35	Simple PLC segment 8 acceleration /deceleration time selection	0～3	0	√
BC-36	Simple PLC segment 9 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-37	Simple PLC segment 9 acceleration /deceleration time selection	0～3	0	√
BC-38	Simple PLC segment 10 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-39	Simple PLC segment 10 acceleration /deceleration time selection	0～3	0	√
BC-40	Simple PLC segment 11 running time	0.0～3200.0(s、 h、Min)	0.0	√

BC-41	Simple PLC segment 11 acceleration /deceleration time selection	0～3	0	√
BC-42	Simple PLC segment 12 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-43	Simple PLC segment 12 acceleration /deceleration time selection	0～3	0	√
BC-44	Simple PLC segment 13 running time	0.0～3200.0s(s、 h、Min)	0.0	√
BC-45	Simple PLC segment 13 acceleration /deceleration time selection	0～3	0	√
BC-46	Simple PLC segment 14 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-47	Simple PLC segment 14 acceleration /deceleration time selection	0～3	0	√
BC-48	Simple PLC segment 15 running time	0.0～3200.0(s、 h、Min)	0.0	√
BC-49	Simple PLC segment 15 acceleration /deceleration time selection	0～3	0	√
BC-50	Simple PLC running time unit	0: s(s); 1: h(h); 2: Min(Min)	0	√
BC-51	Multi-segment instruction 0 given mode	0: Function BC-00 setting 1: AI1 2: AI2 3:Keyboard potentiometer 4: HDI pulse 5: PID 6: Digit frequency (B0-08)setting	0	√
Bd Group Communication Parameters				
BD-00	Baud rate	3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS	5	√
BD-01	MODBUS data format	0: No check(8-N-2) 1: Parity check(8-E-1)	0	√

		2: Odd check(8-O-1) 3: No check 8-N-1(MODBUS valid)		
BD-02	Drive address	0～247,0 broadcast address	1	√
BD-03	Response delay	0.000s～1.000s(MODBUS valid)	0.002s	√
BD-04	Communication timeout fault time	0.000～30.000s 0.0(No judgement communication failure) If the correct communication data is not received beyond this set time, the ac drive will report a communication failure(E016)	0.000s	√
BD-06	Communication read current resolution	0:0.01A 1:0.1A	1	√
BP Group Function management				
BP-00	Software version	-	-	○
BP-01	Parameter initialization	00: No operation 01: Restore factory parameters, excluding motor parameters 02: Clear record information 03: Restore factory parameters (all)	0	×
BP-04	Parameter locked	0: Not locked(Parameters can be read and written) 1: Locked (In addition to this parameter, the parameter lock can only be read)	0	
L0 Group Torque control parameter				
L0-00	Speed/torque control selection	0: Speed control 1: Torque control(Valid when B0-14 is 0 or 3)	0	×
L0-01	Torque setting source selection under torque control	0: Digit setting1(L0-03) 1: AI1 2: AI2 3:Keyboard potentiometer	0	×
L0-02	Maximum frequency limiting source in torque control mode	0: Digit set1(L0-03) 1: AI1 2: AI2 3: Keyboard potentiometer	0	×
L0-03	Torque digit setting under torque control mode	-200.0%～200.0%	100.0%	√
L0-05	Torque control forward maximum frequency	0.00Hz～maximum frequency	50.00Hz	√
L0-06	Torque control reserve maximum frequency	0.00Hz～maximum frequency	50.00Hz	√
L0-07	Torque control acceleration time	0.01s～320.00s	0.01s	√
L0-08	Torque control deceleration time	0.01s～320.00s	0.01s	√
L0-09	Torque frequency acceleration time	0.01s～3200.0s	2.0s	√

L0-10	Torque frequency deceleration time	0.01s～3200.0s	2.0s	√
L5 Group Control Optimization Parameters				
L5-00	DPWM switching upper limit frequency	0.00Hz～15.00Hz	8.00Hz	√
L5-01	PWM modulation method	0: Asynchronous modulation 1: Synchronous modulation	0	√
L5-02	Dead zone compensation mode selection	0:No compensation 1: Compensation mode 1	1	√
L5-03	Random PWM depth	0:Random PWM invalid 1～10: PWM carrier frequency random depth.	0	√
L5-05	Current detection compensation	0～100	5	√
L5-06	Undervoltage point setting	60.0%～140.0%	100.0%	√
L5-08	Dead zone time adjustment	0～200	80	√
L5-09	Overvoltage point setting	200.0V～2500.0V	Depends on type	×
L5-10	current displays the starting value	0.0A～20.0A	Depends on type	√

Monitoring parameters list:

Function code	Name	Minimum unit	Communication address
Group D0 Basic monitoring parameters			
D0-00	Running frequency（Hz）	0.01Hz /0.1HZ	7000H
D0-01	Set frequency（Hz）	0.01Hz /0.1HZ	7001H
D0-02	Bus voltage（V）	0.1V	7002H
D0-03	Output voltage（V）	1V	7003H
D0-04	Output current（A）	0.1A	7004H
D0-05	Output power（kW）	0.1kW	7005H
D0-06	Output torque（%）	0.1%	7006H
D0-07	DI terminal input state.	1	7007H
D0-08	DO Terminal output state.	1	7008H
D0-09	AI1 voltage（V）	0.01V	7009H

D0-10	AI2 voltage（V）	0.01V	700AH
D0-11	Radiator temperature	0.1℃	700BH
D0-12	Count value	1	700CH
D0-13	Length value	1	700DH
D0-14	Load speed display	1RPM	700EH
D0-15	PID setting	0.01kg	700FH
D0-16	PID feedback	0.01kg	7010H
D0-17	PLC step	1	7011H
D0-18	HDI input pulse frequency（Hz）	0.01kHz	7012H
D0-19	Feedback speed（unit 0.01Hz）	0.01Hz /0.1HZ	7013H
D0-20	Remaining running time	0.1Min	7014H
D0-21	AO1 voltage	0.01V	7015H
D0-22	AO2 voltage	0.01V	7016H
D0-23	HDO output pulse frequency	0.01kHz	7017H
D0-25	Power-on time	1 h	7019H
D0-26	Timed run time	0.1Min	701AH
D0-27	Timer setting time	0.1Min	701BH
D0-28	Communication set value.	0.01%	701CH
D0-30	Main frequency A display	0.01Hz /0.1HZ	701EH
D0-31	Auxiliary frequency B display	0.01Hz /0.1HZ	7021H
D0-32	Multi-segment speed stage		7022H
D0-35	target torque（%）	0.1%	7023H
D0-41	Input DI Status		7029H
D0-42	Output terminal Status		702AH
D0-49	Cumulative power consumption	KW.H	7031H
D0-51	U Phase Current	0.1A	7033H
D0-52	V Phase Current	0.1A	7034H
D0-53	W Phase Current	0.1A	7035H

Chapter 6 Main Parameter Function Description

Group B0 basic function group

B0-00	GP type setting		Factory setting	Depends on model
	Setting range	1	G type（Constant torque load model）	
		2	P type（Fan, water pump load model）	

B0-01	Motor control mode		Factory setting	2
	Setting range	0	Speed sensor-less vector control（SVC1）	
		1	Reserve	
		2	V/F control	
		3	Speed sensor-less vector control（SVC2）	

0: Speed sensor-less vector control （SVC1）

The open loop vector control is applicable to the high performance control situations. A ac drive can only drive one motor. Such as machine tool, centrifuge, drawing machine, injection molding machine etc.

1: Speed sensor vector control.

In the case of closed-loop vector control which is suitable for high precision speed control or torque control, the motor must be equipped with an encoder, for the driver P Card should be installed and matched with the encoder. a drive can only drive one motor. Such as high speed papermaking machinery, lifting machinery, elevator and other loads.

2: V/F control

It is applicable to the situation where load requirements are not strict or a ac drive can drive multiple motors, such as the fan and pump load.

Tip: when selecting vector control mode, the identification of motor parameter must be carried out. Only accurate motor parameters can give full play to the advantages of vector control. By adjusting the function code of the speed regulator parameter H2, better performance can be obtained.

3: Speed sensor-less vector control （SVC2）

Open loop vector control, suitable for high performance control occasions with large torque requirements, one inverter can only drive one motor. Such as punches, pile drivers, polishing machines, winding, lifting and other loads.

B0-02	Command source selection		Factory setting	0
	Setting range	0	Operation panel command channel.（LED off）	
		1	Terminal command channel.（LED on）	
		2	Communication command channel（LED flashing）	

Select the input channel of the drive control command.

ac drive control commands include: start, stop, forward, reverse, jog etc.

0: Operation panel command channel (" LOCAL "LED off); controlled by RUN, STOP/RST keys on the operation panel.

1: Terminal command channel (" LOCAL " LED on); controlled by the multi-function input terminal

FWD, REV, JOGF, JOGR, etc.,

2: Communication command channel (" LOCAL " LED flash) operation command is given by the upper computer through communication.

Communication function parameters, reference "group Pd communication parameters" instructions and relevant communication card illustration released with communication card, appendix of this instruction contained brief explanation of communication card.

B0-03	Main frequency source A selection		Factory setting	4
	Setting range	0	Digital set（preset frequencyB0-08，UP/DOWN Can be modified，without power-lost memory）	
		1	Digital setting（preset frequencyB0-08，UP/DOWN Can be modified，with power-lost memory）	
		2	AI1	
		3	AI2	
		4	Keyboard potentiometer	
		5	Pulse setting（DI5）	
		6	Multi-segment instruction	
		7	PLC	
		8	PID	
		9	Communication given	

Selection of the main frequency input channel of the drive. There are 10 main frequency channels:

0: Digital setting (not saved when power-off)

Set the initial value of the frequency B0-08 "preset frequency". The setting frequency value of the ac drive can be changed by using the key " ▲ and ▼ " of the keyboard (or of multi-function input terminal). When the ac drive is switched off and on, the set frequency value is restored to B0-08 "digital preset frequency" value.

1: Digital setting (saved when power-off)

Set the initial value of the frequency B0-08 "preset frequency". The setting frequency value of the ac drive can be changed by using the key " ▲ and ▼ " of the keyboard (or of multi-function input terminal). When the ac drive is power-failure and on, the setting frequency will be save and the correction via the keyboard or the terminal "▲ and ▼" is memorized.

It is important to note that B0-23 is the "digital setting frequency stop-save selection", and B0-23 is used to select whether the frequency correction is saved or cleared when the ac drive stop. Note that B0-23 is related to standstill and not power-failure memory.

2: AI1

3: AI2

4: Keyboard potentiometer

The frequency is determined by the analog input terminal. The control panel provides 2 analog input terminals (AI1, AI2).

Among them, AI1 input is 0V ~ 10V voltage, AI2 input can be 0V ~ 10V voltage or 4mA ~ 20mA current The input voltage values of AI1, AI2 and Keyboard potentiometer are corresponding to the target frequency.

5. Pulse given(DI5)

The frequency is set by the terminal pulse. Pulse given signal specification: voltage range of 9V ~ 30V, frequency range 0kHz ~ 100kHz. The pulse given can only be input from the multi-function input terminal DI5.

The relation between DI5 terminal input pulse frequency and the corresponding setting, configured by B4-28 ~ B4-31 , is 2 point-linear relation.100.0% of input pulses setting refers to the percentage of maximum frequency as B0-10 .

6: Multi-segment instructions

When selecting multi-segment instruction operation mode, it is necessary to combine different states of input terminals via digital input, corresponding to different setting values of frequency can be set up to 4 multi-segment instruction terminals with 16 states. may via the group PC function code corresponds to any 16 " multi-segment instruction ", " multi-segment instruction" is corresponding to the percentage of maximum frequency B0-10.

When the digital input terminal is used as a multi-segment instruction terminal function, it needs to be set in group P4.Please refer to the relevant functional parameters illustrations of group P4.

7: Simple PLC

When configing simple PLC as frequency source, the operation frequency source of the drive can be switched to any of 16 frequency instructions, of which retention time and acceleration/deceleration time can be set. Please refer to group PC of instructions.

8: PID

Selecting PID control output as the running frequency is generally used for the process closed-loop control, such as constant pressure closed-loop control and constant tension closed-loop control.

When the PID is used as the frequency source, it is necessary to set the "PID function" parameters of the group PA.

9: Communication given

The main frequency source is given by the upper computer by means of communication.

<table>
<tr><td rowspan="11">B0-04</td><td colspan="2">Auxiliary frequency source B selection</td><td>Factory setting</td><td>0</td></tr>
<tr><td rowspan="10">Setting range</td><td>0</td><td colspan="2">Digital setting（preset frequencyB0-08，UP/DOWN Can be modified，without power-lost memory）</td></tr>
<tr><td>1</td><td colspan="2">Digital setting（preset frequency B0-08，UP/DOWN Can be modified，with power-lost memory）</td></tr>
<tr><td>2</td><td colspan="2">AI1</td></tr>
<tr><td>3</td><td colspan="2">AI2</td></tr>
<tr><td>4</td><td colspan="2">Keyboard potentiometer</td></tr>
<tr><td>5</td><td colspan="2">Pulse setting（DI5）</td></tr>
<tr><td>6</td><td colspan="2">Multi-segment instruction</td></tr>
<tr><td>7</td><td colspan="2">PLC</td></tr>
<tr><td>8</td><td colspan="2">PID</td></tr>
<tr><td>9</td><td colspan="2">Communication given</td></tr>
</table>

The auxiliary frequency source it is the same as the main frequency source A when the auxiliary frequency

source is used as the independent frequency setting (that is, the frequency source is switched from A to B).Refer to the instructions of B0-03.

When the auxiliary frequency source is used as superposition setting (that is, the frequency source is A+B, switch A to A+B or switch B to A+B), it should be noted that:

a) when the auxiliary frequency source is given by digital assignment, preset frequency (B0-08) is disable, The frequency adjustment via the key▲、▼ (or the UP and DOWN of the multi-function input terminal), be made on the basis of a main frequency .

b) when the auxiliary frequency source is given by analog input (AI1, AI2, Keyboard potentiometer) or pulse input, 100% of the input corresponds to the auxiliary frequency source range can be set by B0-05 and B0-06.

c) The frequency source is given by pulse input, which is similar to the analog input.

Note: the auxiliary frequency source B and the main frequency source A cannot be set to the same channel, that is same to B0-03 and B0-04, otherwise it is easy to cause confusion.

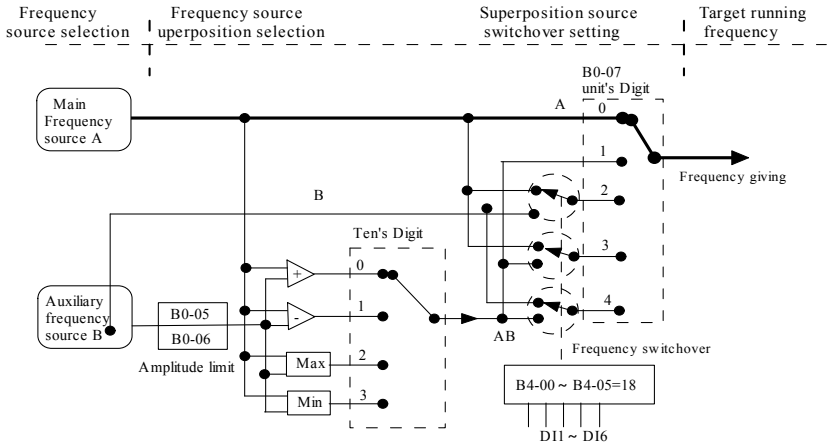
B0-05	The auxiliary frequency source B range selection at superposition		Factory setting	0
	Setting range	0	Relative to the maximum frequency	
		1	Relative to the main frequency source A	
B0-06	The auxiliary frequency source B range at superposition		Factory setting	0
	Setting range		0%～150%	

When the frequency source is selected as "frequency superposition ", these two parameters are used to determine the adjustment range of the auxiliary frequency source.

B0-05 is used to determine the object of the auxiliary frequency source range, and can be relative to the maximum frequency or the main frequency source A, if main frequency source was chosen, the auxiliary frequency source range will vary following main frequency A.

B0-07	Frequency source superposition selection		Factory setting 2
	setting range	ones	Frequency source selection
		0	Main frequency source A
		1	Main and auxiliary operation results (the operation relationship is determined by the tens .)
		2	Main frequency source A and auxiliary frequency source B switch.
		3	The main frequency source A switches with main and auxiliary operation results
		4	The auxiliary frequency source B switches with main and auxiliary operation results
		tens	Main frequency source and auxiliary operation relationship.
		0	Main + auxiliary
		1	Main -auxiliary
		2	Maximum of both
		3	Minimum of both

Select the frequency given channel via this parameter. The frequency is set by the combination of the main frequency source A and the auxiliary frequency source B.



When the main/auxiliary operation is selected as the frequency source, the offset frequency can be set by B0-21 and superimposed on the main and auxiliary operation results.

B0-08	Preset frequency	Factory setting	50.00Hz
	Setting range	0.00～Maximum frequency (effective for digital setting of frequency source selection)	

When the selection of frequency source is "digital set" or "terminal UP/DOWN", the function code value sets the initial value for the frequency of the drive.

B0-09	Running direction		Factory setting 0
	Setting range	0	Same direction
		1	Opposite direction

By changing the function code, the steering of motor can be changed without changing the motor connection. Which is same as adjusting the rotation direction of the motor in any two lines(U ,V, W)
Tip: after the parameter is initialized, the motor will return to its original state. Be careful of the situation under which the rotation of the motor is strictly unallowed to change when the system was commissioned.

B0-10	Maximum frequency	Factory setting	50.00 Hz
	Setting range	50.00Hz～3000Hz	

In the , the analog input, pulse input (DI5), and multi-segment instruction, etc. as the frequency source .100.0% scaling corresponds to B0-10.
The maximum output frequency of the can reach 3200Hz, to give consideration to both the frequency instruction resolution and the frequency input range, the number of decimal places can be set by B0-22. When B0-22 is set to 1, the frequency resolution is 0.1Hz, and the range of B0-10 is at 50.0Hz ~ 3000.0Hz.

When B0-22 is set to 2, the frequency resolution is 0.01Hz, and the range of B0-10 is at 50.00Hz～300.00Hz.

Note: Modification of B0-22 will change the frequency resolution of all frequency-related functional parameters.

B0-11	Upper limit frequency source		Factory setting	0
	Setting Range	0	B0-12 setting	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		4	HDI setting（DI5 terminal）	
		5	Communication setting	

Define the source of the upper limit frequency. The upper limit frequency can be set via the digital assignment (B0-12), analog input, HDI, and communication. When the upper limit frequency is set by analog input, 100% of the analog input corresponds to B0-12.

For example using torque control mode at the scene of the winding, in order to avoid material breakage, the upper limit frequency will be set by analog input. When the drive reaches the upper limit frequency , the drive will keep running at this frequency.

B0-12	Upper limit frequency	Factory setting	50.00Hz
	Setting range	Lower limit frequencyB0-14～Maximum frequency B0-10	
B0-13	Upper limit frequency offset	Factory setting	0.00Hz
	Setting range	0.00Hz～Maximum frequency B0-10	

When the upper limit frequency is set by the analog or HDI, B0-13 is the offset of the set value, and the offset frequency is superimposed with the upper limit frequency of B0-11 as the set value of the final upper limit frequency.

B0-14	Lower limit frequency	Factory setting	0.00Hz
	Setting range	0.00Hz～Upper limit frequency B0-12	

When the frequency of instructions is lower than the lower frequency limit set by B0-14, the ac drive can stop and run at the lower frequency or at zero speed, depends on the setting of B8-14 (operation mode of set frequency lower than the lower limit frequency).

B0-15	Carrier frequency	Factory setting	Depends on model
	Setting range	0.5kHz～16.0kHz	

This function adjusts the carrier frequency of the ac drive. By adjusting the carrier frequency, it can reduce the noise of the motor, avoid the resonance of the mechanical system, reduce the leakage current to the ground and the interference produced by the drive.

When the carrier frequency is low, the higher harmonic component of the output current increases, the motor loss increases and temperature rises fast. When the carrier frequency is high, the motor loss decreases and temperature rises slow, but the ac drive loss, temperature . Adjusting the carrier frequency will affect the following performance.

Carrier frequency	low → high
Motor noise	big → little
Output current waveform	bad → good
Motor temperature rise	high → low
Drive temperature rise	low → high
Leakage current	small → big
External radiation interference	slight → strong

For different power of drive, the carrier frequency of the factory setting is different. Although the user can modify, but need to note: if the carrier frequency set to a higher value than the factory, will lead to ac drive radiator temperature increase, the drive need be derated otherwise a danger of overheating occurs.

B0-16	Carrier frequency is adjusted with temperature	Factory setting	1
	Setting range	0: No 1: Yes	

The carrier frequency is adjusted with the temperature, which means that the ac drive detects the higher temperature of the radiator and automatically reduces the carrier frequency so as to reduce the temperature. When the radiator temperature is low, the carrier frequency gradually returns to the set value. This feature can reduce the frequency of the drive overheating alarm.

B0-17	Acceleration time1	Factory setting	Depends on model
	Setting range	0.00s～32000s	
B0-18	deceleration time 1	Factory setting	Depends on model
	Setting range	0.00s～32000s	

The acceleration time refers to the time required for the drive to accelerate from the zero frequency to the acceleration/deceleration base frequency (via B0-25). See t1 in figure 6-1.
Deceleration time refers to the time required for the drive to decelerate to zero frequency from the acceleration/deceleration base frequency (via B0-25), as shown in figure 6-1.

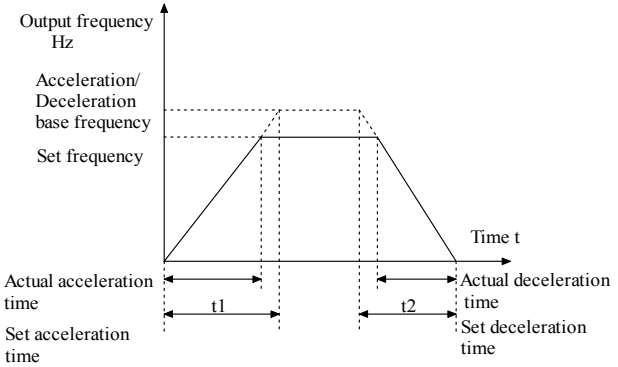


Figure 6-1 Acceleration/Deceleration time

The provides four groups of acceleration/deceleration time, the user can select via the digital input terminal S. and the four groups of acceleration/deceleration time are set by the following function code: Group 1: B0-17, B0-18; Group 2: B8-03, B8-04;

Group 3: B8-05, B8-06; Group 4: B8-07, B8-08.

B0-19	Acceleration/deceleration time unit		Factory setting	1
	Setting range	1	0.1s	
		2	0.01s	

In order to meet the needs of various sites, the provides three kinds of acceleration/deceleration time units:1 second, 0.1 second and 0.01 second.

Note: when the function parameters are modified, the number of decimal places in the four groups of acceleration/ deceleration time will change, as well corresponding acceleration/deceleration time. Attention should be paid.

B0-21	Auxiliary frequency source bias frequency at superposition	Factory setting	0.00Hz
	Setting range	0.00Hz maximum frequency~B0-10	

The function code is effective only when the main/auxiliary operation is selected as the frequency source. When the frequency source is the main/auxiliary operation, B0-21 is used as the bias frequency, and superposed with the main/auxiliary operation as the final frequency setting value, which make frequency setting more flexible.

B0-22	Frequency command resolution		Factory setting	2
	Setting range	1	0.1Hz	
		2	0.01Hz	

This parameter is used to determine the resolution of all functional codes related to frequency.

When the frequency resolution is 0.1hz, the maximum output frequency of the can reach 3000Hz, while the frequency resolution is 0.01Hz, the maximum output frequency is 300.00Hz.

Note: when modifying this function parameter, the number of decimal places of the parameters related to the frequency will change and the corresponding frequency as well. Attention should be paid.

B0-23	Stop memory selection at digital setting frequency		Factory setting	1
	Setting range	0	No	
		1	Yes	

This function is enabled when the frequency source is set by digital.

"No memory" means that when the ac drive is at a stop, the digital setting frequency value is restored to the value of B0-08 (preset frequency), and the frequency correction made via the key▲、▼ or the terminal UP and DOWN is cleared.

"Memory" means that after the ac drive stop the frequency of the digital setting will be saved as last set value. and the frequency correction made via the key▲、▼ or the terminal UP and DOWN is effective.

B0-25	Acceleration/deceleration time reference frequency		Factory setting	0
	Setting range	0	Maximum frequency（B0-10）	
		1	Set frequency	
		2	100Hz	

Acceleration/deceleration time means the time ac/decelerated from zero frequency to B0-25, and figure 6-1 is the diagram of acceleration/deceleration time.

When the B0-25 is set to 1, the acceleration/deceleration time is related to the setting frequency. If the setting frequency changes frequently then the acceleration of the motor is attention should be paid.

B0-26	Frequency instruction UP/DOWN benchmark at running time		Factory setting	0
	Setting range	0	Operating frequency	
		1	Setting frequency	

This parameter is effective only when the frequency source is set by the digital.

Used to determine the key ▲, ▼ or terminal UP/DOWN action, adopting what way to correct set frequency depends on if the object frequency is regulated on the operating frequency or a set frequency. The difference between the two sets is obvious when the ac drive is in the acceleration and deceleration process, that is, if the operating frequency of the drive is not same as the setting frequency, the selection of the parameter varies greatly.

B0-27	Command source binding frequency source	Factory setting	000
	Setting range	0nes	Operation panel command binding frequency source selection.
		0	No binding
		1	Digital set frequency source
		2	AI1
		3	AI2
		4	Keyboard potentiometer
		5	HDI pulse set（DI5）
		6	Multi-segment instruction
		7	Simple PLC
		8	PID
		9	Communications given
		Tens	Terminal command binding frequency source selection. （0～9，same as ones）
		Hundreds	Communication command binding frequency source selection. （0～9，same as ones）

It defines a combination of three types of running command and nine kinds of frequency assignment channels to facilitate synchronous switching.

The meaning of the frequency assignment channel above is the same as that the main frequency source A is set by B0-03, please refer to the B0-03 function code description.

Different running command channels can bond to same frequency assignment channel.

When the command source binds to frequency source, the frequency source set by B0-03 ~ B0-07 is no longer effective when the command source is effective.

Group B1 motor parameters

B1-00	Motor type selection		Factory setting	0
	Setting range	0	Normal asynchronous motor	
		1	Variable frequency asynchronous motor.	
		2	Permanent magnet synchronous motor	
B1-01	Rated capacity		Factory setting	Depends on model
	Setting range		0.1kW～1000.0kW	
B1-02	Rated voltage		Factory setting	Depends on model
	Setting range		1V～2000V	
B1-03	Rated current		Factory setting	Depends on model
	Setting range		0.01A～320.00A（drive capacity<=55kW） 0.1A～3200.0A（drive capacity >55kW）	
B1-04	Rated frequency		Factory setting	Depends on model
	Setting range		0.01Hz～ maximum frequency	
B1-05	Rated speed		Factory setting	Depends on model
	Setting range		1rpm～32000rpm	

The above function code is the motor rating plate parameter, regardless of VF control or vector control the relevant parameters need to be set according to the motor rating plate.

In order to obtain better VF or vector control performance, it is necessary to adjust the motor parameters and the accuracy of the results is closely related to the correct rating plate parameters.

B1-06	Asynchronous motor stator resistance	Factory setting	Depends on model
	Setting range	0.001Ω～30.000Ω	
B1-07	Asynchronous motor rotor resistance	Factory setting	Depends on model
	Setting range	0.001Ω～32.000Ω（Drive capacity <=55kW） 0.0001Ω～3.2000Ω（Drive capacity >55kW）	
B1-08	Asynchronous motor leakage reactance	Factory setting	Depends on model
	Setting range	0.01mH～320.00mH（Drive capacity <=55kW） 0.001mH～65.535mH（Drive capacity >55kW）	
B1-09	Asynchronous motor mutual reactance	Factory setting	Depends on model
	Setting range	0.1mH～3200.0mH（Drive capacity <=55kW） 0.01mH～320.00mH（Drive capacity >55kW）	
B1-10	Asynchronous motor no-load current	Factory setting	Depends on model
	Setting range	0.01A～B1-03（Drive capacity <=55kW） 0.1A～B1-03（Drive capacity >55kW）	

The B1-06 ~ B1-10 is the parameter of the asynchronous motor which is usually not on the rating plate of the motor, and can be accessed by automatic tuning of the drive Among them, the "static tuning" of asynchronous motor can only obtain B1-06 - B1-08 parameters, the "full tuning of the asynchronous motor" get not only all five parameters but also the encoder phase sequence, current loop PI parameters, etc.

When changing the rated power of the motor (B1-01) or the motor rated voltage (B1-02), the ac drive will automatically modify the B1-06 ~ B1-10 parameter values and restore the 5 parameters to the common standard Y series motor parameters.

If the asynchronous motor cannot be tuned during operation, the function code can be entered according to the parameters provided by the motor manufacturer.

B1-37	Tuning selection		Factory setting	0
	Setting range	0	No operation	
		1	Asynchronous motor static tuning	
		2	Asynchronous motor fully tuned	

0: No operation, no tuning.

1: Asynchronous motor static tuning.

Applicable to asynchronous motor and load not easy to remove or fully tune. Before carry out the static tuning of the asynchronous motor, the motor type and the motor rating plate parameters must be set correctly, the ac drive can get B1-06 ~ B1-08 parameters.

Action description: set B0-02= 0, then set B1-37 = 1, then press the RUN key(B0-02= 0), and the ac drive will start static tuning.

2: The asynchronous motor complete tuning

To ensure the dynamic control performance of the drive, please select complete tuning. and the motor must be disconnected with the load to keep the motor in no-load condition. During complete tuning the static tuning should be done first and then according to B0-17 accelerated motor to 80% of the rated frequency, after a period of time, in accordance with B0-18 decelerated to stop and end tuning.

Before the complete tuning of the asynchronous motor, in addition to setting the motor type and the motor rating plate parameter B1-00 ~ 1-05, the encoder type and encoder pulse number B1-27 and B1-28 need to be set correctly.

The asynchronous motor is fully tuned and the ac drive can obtain the five motor parameters of B1-06 ~ B1-10, as well as the AB phase sequence B1-30 of the encoder and the vector control current loop PI parameters B2-13 ~ B2-16.

Action description: set B0-02= 0, then set B1-37 = 2, then press the RUN key, the ac drive will be fully tuned. In the no-load tuning process, the drive first completes the load tuning then accelerates to B0-08 according to the acceleration time B0-17, and after a period of time, decelerated to stop and end the tuning according to deceleration time B0-18. Note that B0-08 must be set to a non-zero value, otherwise the identification cannot proceed normally.

B2 vector control parameters

The P2 group function code is effective only for vector control, and ineffective for VF control.

B2-00	Speed loop proportional gain 1	Factory setting	20
	Setting range	1～100	
B2-01	Speed loop integral time 1	Factory setting	0.50s
	Setting range	0.01s～10.00s	
B2-02	Switching frequency 1	Factory setting	5.00Hz
	Setting range	0.00～B2-05	
B2-03	Speed loop proportional gain 2	Factory setting	15
	Setting range	0～100	

B2-04	Speed loop integral time 2	Factory setting	1.00s
	Setting range	0.01s～10.00s	
B2-05	Switching frequency 2	Factory setting	10.00Hz
	Setting range	B2-02～maximum output frequency	

The ac drive runs at different frequencies and can choose different speed loop PI parameters. When the operating frequency is lower than the switching frequency 1 (B2-02),the speed loop PI parameters are B2-00 and B2-01. When the operating frequency is greater than the switching frequency 2, the speed loop PI parameter is B2-03 and B3-04. The speed loop PI parameter between the switching frequency 1 and the switching frequency 2 is a linear switch between two groups of PI parameters, as shown in figure 6-2:

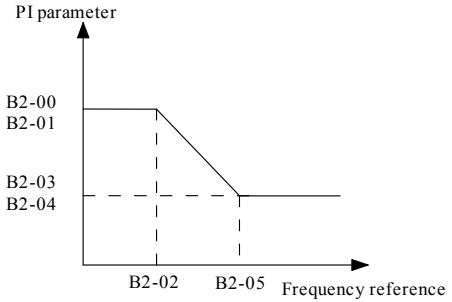


Figure 6-2 PI parameter figure

By setting the proportional coefficient and integral time of the speed regulator, the dynamic response characteristics of the vector control can be adjusted.

Increasing the proportional gain and decreasing the integral time can accelerate the dynamic response of the speed loop. However, it is possible to oscillate the system when the proportional gain is too large or integral time too small. The proposed adjustment method is:

If the factory parameter cannot meet the requirements, a fine adjustment will be made on the basis of the factory value. Increase the proportional gain to ensure the system does not oscillate. Then the integration time is reduced, so that the system has a fast response characteristic and small overshoot.

Note: if the PI parameter is not set properly, it may cause excessive speed overshoot. Even the overvoltage fault occurred.

B2-06	Vector control slip gain	Factory setting	100%
	Setting range	50%～200%	

B2-07	Speed loop filter time constant	Factory setting	0.015s
	Setting range	0.000s～0.100s	

In the vector control mode, the output of the speed loop regulator is the torque current instruction, which is used to filter the torque instruction. This parameter is generally not adjusted, and the filtering time can be increase when the speed fluctuation is large. If the motor is oscillating, the parameter should be reduced appropriately.

The speed loop filter time constant is small then the output torque of the drive may fluctuate , but the

response of speed is fast.

B2-08	Vector control over excitation gain	Factory setting	64
	Setting range	0～200	

During the deceleration of the converter, the over excitation control can suppress the bus voltage rise and avoid the overvoltage fault. The higher the excitation gain the stronger the suppression.
It is necessary to improve the excitation gain in the case of the deceleration process. However, excessive excitation gain will lead to an increase in output current, which needs to be careful.
In the case of small inertia, there is no voltage increase in the deceleration, and the excitation gain is proposed to be 0. As well as in the case of braking resistance.

B2-09	Torque upper limit source under speed control mode		Factory setting	0
	Setting range	0	B2-10	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		4	HDI assignment	
		5	Communication assignment	
B2-10	Torque upper limit digital setting under speed control mode		Factory setting	150.0%
	Setting range		0.0%～200.0%	

In the speed control mode, the maximum output torque of the converter is controlled by the torque limit source.
B2-09 is used to select the setting source of torque limit. When analog HDI pulse and communication setting are adopted, the 100% of setting corresponds to B2-10 and 100% of B2-10 is the rated torque of the drive.

B2-13	Excitation adjustment proportional gain	Factory setting	2000
	Setting range	0～20000	
B2-14	Excitation adjustment integral gain	Factory setting	1300
	Setting range	0～20000	
B2-15	Torque adjustment proportional gain	Factory setting	2000
	Setting range	0～20000	
B2-16	Torque adjustment integral gain	Factory setting	1300
	Setting range	0～20000	

The vector control current loop PI adjustment parameter, which is automatically obtained after the full tuning of the asynchronous motor or the no-load tuning of the synchronous machine, generally does not need to be modified.
It should be reminded that the integral regulator of the current loop does not use the integral time as the dimension, but set the integral gain directly. higher Current loop PI gain an lead to the oscillation of control loops, so when the current oscillation or greater torque ripple occur, the PI proportional gain and integral time should be manually reduced.

Group B3 V/F control parameters

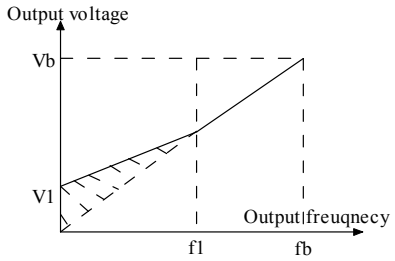
The function code of this group is only effective for V/F control, and not for vector control.
V/F control is suitable for the application of fan, water pump, etc., a ac drive with multiple motors or large difference of the power of drive and the motor.

B3-00	V/F curve setting		Factory setting	0
	Setting range	0	Line V/F	
		1	Multipoint V/F	
		2	Square V/F	
		10	V/F Complete separation mode	

0: Line V/F. Suitable for ordinary constant torque load.
1: Multi-point V/F. It is suitable for special loads such as dehydrator and centrifuge. By setting the parameters of B3-03 ~ B3-08, any VF curve can be obtained
2: Square V/F. Suitable for centrifugal load such as fan and pump.
10: VF complete separation mode. the output frequency of the converter is independent from the output voltage, the output frequency is determined by the frequency source, the output voltage is determined by B3-13 (VF separation voltage source). This mode is applied in induction heating, drive power, torque motor control, etc.

B3-01	Torque boost	Factory setting	Depends on model
	Setting range	0.1%～30%	
B3-02	Torque boosts cutoff frequency	Factory setting	50.00Hz
	Setting range	0.00Hz～maximum output frequency	

In order to compensate V/F to control the low frequency torque, compensation is made for the output voltage of ac drive. However, the torque boost is too large, the motor is easy to overheat and converter overcurrent.
When the load is heavy and the motor start torque is not enough, it is recommended to increase this parameter. The torque can be reduced when the load is lighter. When the torque boost is set to 0.0, automatic torque boost is enabled. The drive calculates the required torque boost value according to the motor stator resistance and other parameters.
Torque boost cutoff frequency: at this frequency, torque boost is effective, exceeding this set frequency, and torque boost fails, as shown in figure 6-3.



V1: Voltage of manual torque boost
Vb: Maximum output voltage
f1: Cutoff frequency of manual torque boost
fb: Rated running frequency

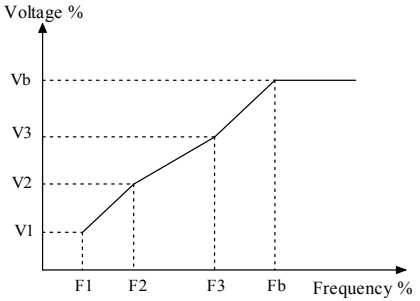
Figure 6-3 Schematic diagram of manual torque improvement

B3-03	Multipoint VF frequency point F1	Factory setting	5.00Hz
	Setting range	0.00Hz～B3-05	
B3-04	Multipoint VF voltage point V1	Factory setting	15.0%
	Setting range	0.0%～100.0%	
B3-05	Multipoint VF frequency point F2	Factory setting	17.50Hz
	Setting range	B3-03～B3-07	
B3-06	Multipoint VF voltage point V2	Factory setting	45.0%
	Setting range	0.0%～100.0%	
B3-07	Multipoint VF frequency point F3	Factory setting	35.00Hz
	Setting range	B3-05～motor rated frequency（B1-04）	
B3-08	Multipoint VF voltage point V3	Factory setting	80.0%
	Setting range	0.0%～100.0%	

B3-03 ~ B3-08 six parameters define multi-segment V/F curves.

The curve of multi-point V/F should be set according to the load characteristics of the motor. note that the relationship between the three voltage points and the frequency points must be met:V1 < V2 <V3, F1 < F2 < F3. Figure 6-4 shows the setting of the multi-point VF curve.

Too high voltage at low frequency may cause the motor to overheat or even burn, the drive may overcurrent stall or current protection.



1-Keyboard potentiometer: 1st, 2nd and 3rd voltage percentages of multi-point V/F

F1-F3: 1st, 2nd and 3rd frequency percentages of multi-point V/F

Vb: Rated motor voltage

Fb: Rated motor running frequency

Figure 6-4 Multi-point V/F curve setting schematic

B3-09	VF slip compensation gain	Factory setting	0.0%
	Setting range	0%～200.0%	

This parameter is effective only for the asynchronous motor.

VF slip compensation can compensate the motor speed deviation generated by the asynchronous motor when the load is increased, so that the motor speed can be stable when the load changes.

VF slip compensation gain is set to 100.0%, indicates that the slip compensated for the motor with rated load is rated slippage of the motor, rated slip can be obtained by calculation of H1 group rated frequency of the drive and rated speed.

When adjusting the VF slip compensation gain, the motor speed is basically the same as the target speed under the rated load. it is necessary to adjust the gain appropriately when they are not same.

B3-10	VF over excitation gain	Factory setting	32
	Setting range	0～200	

During the deceleration of the drive, the over excitation control can suppress the bus voltage rise and avoid the overvoltage fault. The higher the excitation gain, the stronger the suppression.
It is necessary to improve the excitation gain in the case of the speed reduction process. However, excessive excitation gain will lead to an increase in output current, which needs to be considered in application.
In the case of small inertia, there is no voltage increase in the motor deceleration, and the excitation gain is proposed to be 0. In the case of braking resistance it should be set to 0 as well.

B3-11	VF oscillation suppression gain	Factory setting	0
	Setting range	0～100	

The selection method of the gain is minimized under the condition of suppression so as to avoid effects on VF operation. Please set this gain to 0 when the motor is not oscillating. Only when the motor obviously oscillates, it is necessary to increase the gain properly, and the larger the gain, the more effective the suppression of oscillation. When using the suppression oscillation function, the motor rated current and no-load current parameters are required to be accurate, otherwise the VF oscillation suppression is not good.

B3-13	VF Separated voltage source	Factory setting	0
	Setting range	0	Digital set（B3-14）
		1	AI1
		2	AI2
		3	Keyboard potentiometer
		4	HDI pulse set（DI5）
		5	Multi-segment instruction
		6	Simple PLC
		7	PID
		8	Communication given
		100.0% Corresponding motor rated voltage.（B1-02）	
B3-15	VF Separate voltage digital Setting	Factory setting	0V
	Setting range	0V～Motor rated voltage	

VF separation is generally applied in induction heating, drive power supply and torque motor control. When selecting VF separation control, the output voltage can be set by the function code B3-14 or by analog , multi-segment instruction, PLC, PID or communication. When the non-digital setting is used, 100%, of set value corresponds to the rated voltage of the motor .when the output percentage set by the analog is negative, the absolute value is effective.
0: Digital assignment (B3-14), the voltage is set directly by B3-14.
1: AI1
2: AI2
3: Keyboard potentiometer
The voltage is set by the analog input terminal.

4: HDI pulse assignment (DI5), the voltage is set by the terminal pulse. Pulse signal specification: voltage range of 9V ~ 30V, frequency range 0kHz ~ 100kHz.
5. Multi-segment instruction, the H4 group and HC group parameters should be set to determine the relationship between the set signal and voltage.
6: Simple PLC, when the voltage source is simple PLC, the FC group parameters need to be set to determine the set output voltage.
7: PID, the output voltage is generated according to the PID closed-loop. See PID profile in group HA
8: Communication assignment: the voltage is assigned by the upper machine via communication. When the above voltage source selects 1 ~ 8, 0 ~ 100% corresponds to the output voltage 0V ~ motor rated voltage.

B3-14	AVR Automatic voltage regulation	Factory setting	0
	Setting range	0: Invalid 1: Valid in whole process 2: Only invalid when decelerates	

Group B4 input terminal DI

The drive is equipped with 5 multi-function digital input terminals (of which DI5 can be used as high speed pulse input terminal) and 2 analog input terminals. If need more terminals, the multi-function input and output expansion card can be available.
The multi-function input and output expansion card has 3 multi-function digital input terminals (S6 ~ S8) and 1 analog input terminal (Keyboard potentiometer).

B4-00	DI1 terminal function selection	Factory setting	1（Forward running）
B4-01	DI2 terminal function selection	Factory setting	2（reverse running）
B4-02	DI3 terminal function selection	Factory setting	9（Failure reset）
B4-03	DI4 terminal function selection	Factory setting	0
B4-04	DI5 terminal function selection	Factory setting	0
B4-05	DI6 terminal function selection	Factory setting	0

These parameters are used to set the function of the digital multifunction input terminal, which can be selected as shown in the following table:

Set value	Function	Description
0	No	The unused terminal can be set to "no function" to prevent misoperation.
1	Forward（FWD）	The drive rotation can be controlled by external terminals.
2	Reverse（REV）	
3	Three-wire operation control	To determine the drive is running under three - line control mode. For details, please refer to the description of function code B4-11 (" terminal command mode ").
4	Forward jog（FJOG）	Jog operation frequency and jog acceleration/deceleration time refer to the description of function code B8-00, hB8-01 andB8-02.
5	Reverse jog（RJOG）	

6	Terminal UP	To change The increasing and descending command of the frequency when the external terminal set the frequency. When the frequency source is set by the digital, the setting frequency can be adjusted up and down.
7	Terminal DOWN	
8	Free stop	The drive blocks the output, and the motor's stop process is not controlled by the drive. This has the same meaning as the free stop described in B6-10.
9	Failure reset（RESET）	Use terminal to perform the function of failure reset. Same function as the RESET button on the keyboard. This function can realize remote fault reset.
10	Running suspend	The drive decelerates to stop, but all the running parameters are saved. Such as PLC parameters, Pendulum frequency parameters, PID parameters. After the terminal signal cancels, the drive is restored to the running state before stop.
11	External faults NO input	When the signal is sent to the Ac drive, the Ac drive reports the fault E015, and the fault treatment is carried out according to the fault protection action mode (the detailed content refers to the function code B9-47).
12	Multi-segment speed terminal 1	The 16 states of the four terminals can be used to achieve 16 speed or 16 other instructions. See the table below for details.
13	Multi-segment speed terminal 2	
14	Multi-segment speed terminal 3	
15	Multi-segment speed terminal 4	
16	Acceleration/deceleration time selection terminal 1	Through the four states of the two terminals, the selection of four acceleration and deceleration times is realized, and the detailed contents are shown in the table below.
17	Acceleration/deceleration time selection terminal 2	
18	Frequency source switching	For selecting different frequency source according to frequency source function code (B0-07) Settings, when set a switch between two frequency source as frequency source,the terminal is used to switch in two frequency sources.
19	UP/DOW Setting clear(terminal, keyboard)	When the frequency is set by a digital frequency, the terminal can clear the frequency value of the terminal UP/DOWN or keyboard UP/DOWN, frequency can be restored to the value set by B0-08.
20	Operation command switch terminal 1	When the command source is set to terminal control (B0-02=1), this terminal can perform switching between terminal control and keyboard control When the command source is set to communication control (B0-02=2), this terminal can perform switching between communication control and keyboard control.

21	Acceleration/deceleration disable	Ensure that the Ac drive is not affected by external signal (except the stop command), and maintain the current output frequency.
22	PID pause	The PID is temporarily disabled, the Ac drive maintains the current output frequency, and the PID control of the frequency source is disable.
23	PLC State reset	The PLC is suspended during operating, and the ac drive can be restored to the initial state of the simple PLC by this terminal.
24	Swing frequency pause	The Ac drive output at the center frequency and the swing frequency function is paused.
25	Counter input	The input terminal of the count pulse.
26	Counter reset	The counter state is cleared.
27	Length count input	Input terminal of Length count value
28	Length reset	The length cleared
29	Torque control disabled	Torque control is disabled, and the Ac drive switch to the speed control mode.
30	HDI(pulse) frequency input (only effective for DI5)	DI5 functions as a pulse input terminal.
31	No function	No function
32	Immediate DC braking	When the terminal is enabled, the drive switches directly to the DC braking state.。
33	External failures normal close input	When the external fault normal close signal is sent to the Ac drive, the drive will report the fault E015 and stop.
34	Frequency modification enable	If the function is enabled, when the frequency varies, the drive does not respond to the changing until the terminal state is ineffective.
35	PID action reversed	When the terminal is enabled, the PID act direction is opposite to the direction set by BA-03.
36	External stop terminals 1	When controlled by keyboard, the terminal can be used to STOP the Ac drive, which is equivalent to the function of the STOP button on the keyboard.
37	Control command switch terminal 2	Used to switch between terminal control and communication control. If the terminal control is selected as command source, the system can be switched to communication control. Vice versa.
38	PID Integral pause	When the terminal is enabled, the PID integral function is suspended, but the PID proportion and the differential function are still effective.
39	Frequency source A and preset frequency switching	The terminal is effective and frequency source A is replaced by preset frequency (B0-08).
40	Frequency source B and preset	The terminal is effective and frequency source B is

	frequency switch	replaced by preset frequency (B0-08).
41-42	No function	
43	PID Parameters switching	PID parameter switching condition is the input terminal (BA-18 =1), when the terminal is invalid, the PID parameter is set via BA-05 ~ BA-07; then BA-15 ~ BA-17 when it is valid.
44	User-defined fault 1	When the user-defined fault 1 and 2 are valid, the Ac drive will alarm E027 and E028 and select the action mode set by B9-49 according to the fault protection action.
45	User-defined fault 2	
46	Speed control/torque control switch	Switch between torque control and speed control mode. When the terminal is invalid, the drive runs in the mode defined by L0-00 (speed/torque control) and switches to another mode when it is valid.
47	Emergency stop	When the terminal is valid, the ac drive stops as soon as possible, and the current during the stop process is at the upper limit current This function is used to meet the requirement that the Ac drive needs to be stopped as soon as the system is in a state of emergency.
48	External stop terminals 2	In any control mode (panel control, terminal control, communication control), this terminal can be used to slow down and stop the drive, and the deceleration time is fixed as deceleration time 4.
49	Deceleration DC braking	When the terminal is valid, the drive decelerate to the starting frequency of the DC braking, and then switches to the DC braking state.
50	Running time clear	When the terminal is effective, the timing value of the operation of the converter is cleared, and the function needs to be used with the timing operation (B8-42) and the running time (B8-53).

Multi-segment instruction description: four multi-stage instruction terminals can be combined into 16 states, which correspond to value of16 instructions, as shown in the table below.

K4	K3	K2	K1	Instruction set	Parameter
OFF	OFF	OFF	OFF	Multi-segment instruction 0	BC-00
OFF	OFF	OFF	ON	Multi-segment instruction 1	BC-01
OFF	OFF	ON	OFF	Multi-segment instruction 2	BC-02
OFF	OFF	ON	ON	Multi-segment instruction 3	BC-03
OFF	ON	OFF	OFF	Multi-segment instruction 4	BC-04
OFF	ON	OFF	ON	Multi-segment instruction 4	BC-05
OFF	ON	ON	OFF	Multi-segment instruction 6	BC-06
OFF	ON	ON	ON	Multi-segment instruction 7	BC-07
ON	OFF	OFF	OFF	Multi-segment instruction 8	BC-08

ON	OFF	OFF	ON	Multi-segment instruction 9	BC-09
ON	OFF	ON	OFF	Multi-segment instruction 10	BC-10
ON	OFF	ON	ON	Multi-segment instruction 11	BC-11
ON	ON	OFF	OFF	Multi-segment instruction 12	BC-12
ON	ON	OFF	ON	Multi-segment instruction 13	BC-13
ON	ON	ON	OFF	Multi-segment instruction 14	BC-14
ON	ON	ON	ON	Multi-segment instruction 15	BC-15

When multi-segment speed is set as the frequency source, the 100.0% of function code BC-00 ~ BC-15 corresponds to the maximum frequency B0-10. the multi-stage instruction can be used as a source of PID or a voltage source for VF separation control, to meet the need of switching between different set values.
The selection of terminal function of acceleration/deceleration time is shown as follows:

Terminal 2	Terminal 1	Acceleration or deceleration time selection	Parameter
OFF	OFF	Acceleration time 1	B0-17、B0-18
OFF	ON	Acceleration time 2	B8-03、B8-04
ON	OFF	Acceleration time 3	B8-05、B8-06
ON	ON	Acceleration time 4	B8-07、B8-08

B4-10	DI Terminal input filtering time	Factory setting	0.010s
	Setting range	0.000s～1.000s	

Set the software filtering time of the input terminal state. This parameter can be increased to enhance the anti-interference ability if the input terminals are prone to interference. However, the increase of the filtering time will slow down the respond of the input terminal.

B4-11	Terminal command mode		Factory setting	0
	Setting range	0	Two wires 1	
		1	Two wires 2	
		2	Three wires 1	
		3	Three wires 2	
		4	Three wires 3	

This parameter defines four different ways to control the operation of the drive through external terminals. Note: for convenient illustration, DI1, DI2 and DI3 of the multi-function input terminals of DI1 ~ DI6 are selected as external terminals. In other words, the functions of DI1, DI2 and DI3 are selected by setting the values of B4-00 ~ B4-02, and the detailed function definition is set in the setting range of B4-00 ~ B4-07.
0: Two-wire mode 1, this is the most common mode. The positive and reverse operation of the motor is determined by the terminal DI1 and DI2.
The function code is set as follows:

Function code	Name	Set value	Description
B4-11	Terminal command mode	0	Two wires 1
B4-00	DI1 Terminal function selection	1	（FWD）
B4-01	DI2 Terminal function selection	2	（REV）

K1	K2	Running direction
1	0	Forward
0	1	Reverse
1	1	Stop running
0	0	Stop running

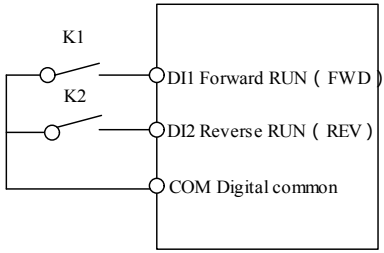


Figure 6-5 Two-wire mode 1

As shown above, in this control mode, K1 is closed and the ac drive is at appositive run forward. K2 closed then at a reverse run, K1 and K2 closed or opened at the same time, the ac drive stop.

1: Two-wire mode 2, in this mode, DI1 terminal function is operation enable terminal, whileDI2 terminal function determines the running direction.

The function code is set as follows:

Function code	Name	Set value	Description
B4-11	Terminal command model	1	Two wires 2
B4-00	DI1 Terminal function selection	1	Operation enable
B4-01	DI2 Terminal function selection	2	Forward/reverse direction

K1	K2	Running direction
1	0	Forward
1	1	Reverse
0	0	Stop running
0	0	Stop running

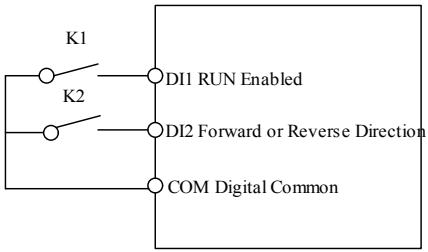


Figure 6-6 Two-wire mode 2

As shown in the figure above, the drive forwards with K1 close and K2 open. Reverses with K2 close and stop when K1 is open.

2: Three-wire mode control mode 1. In this mode S3 set as an enabling terminal and rotation direction controlled by DI1 and DI2.

Function code	Name	Set value	Description
B4-11	Terminal command model	2	Three-wires 1
B4-00	DI1Terminal function selection	1	（FWD）
B4-01	DI2 Terminal function selection	2	（REV）
B4-02	DI3 Terminal function selection	3	Three-wire operation control

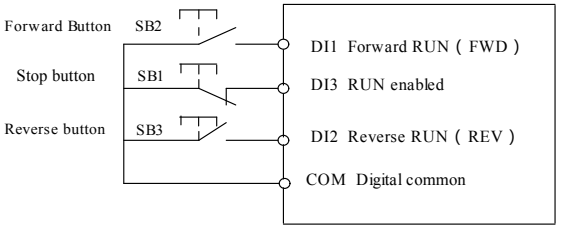


Figure 6-7 Three-wire control mode 1

As shown in the figure above, When the SB1 button is closed, the drive forwards as press the SB2 button and reverses as press the SB3 button, stop once the SB1 is released.,SB1 button must be kept closed under the situation of normal start and run. The function of SB2, SB3 take effects on the edge of closing action, the operation of the drive depends on the final state of three buttons.

3: three-wire control mode 2. DI3 button is enabling terminal, the operation command is given by DI1 and the direction by the state of DI2.

The function code is set as follows:

Function code	Name	Set value	Description
B4-11	Terminal command model	3	Three-wires 2
B4-00	DI1 Terminalfunction selection	1	Operation enable
B4-01	DI2 Terminal function selection	2	Forward/reverse direction
B4-02	DI3 Terminal function selection	3	Three-wire operation control

K	Running direction
0	Forward
1	Reverse

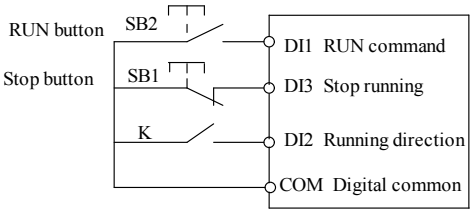


Figure 6-8 Three-wire control mode 2

As shown in the figure above, When the SB1 button is closed, press the SB2 button and the ac drive starts to run, K is open then drive forwards and K closed the drive reverses; The SB1 button is released then the drive stop immediately. In normal start-up and operation, SB1 button must be kept closed.

The command of the SB2 button takes effect on the edge of close action.

B4-12	Vary rate of the terminal UP/DOWN	Factory setting	1.00Hz/s
	Setting range	0.01Hz/s～65.535Hz/s	

Used to set the setting frequency of the terminal UP/DOWN. The speed of the frequency change is the variables in frequency per second, When the B0-22 (frequency decimal point) is 2, the value range is 0.001Hz/s ~ 65.535Hz/s. When B0-22 (frequency decimal) is 1, the value range is 0.01Hz/s ~ 320.00Hz/s.

B4-13	AI1 minimum input	Factory setting	0.00V
	Setting range	0.00V～B4-15	

B4-14	AI1 minimum input Corresponding setting	Factory setting	0.0%
	Setting range	-100.00%～100.0%	
B4-15	AI1 maximum input	Factory setting	10.00V
	Setting range	B4-13～10.00V	
B4-16	AI1 maximum input Corresponding setting	Factory setting	100.0%
	Setting range	-100.00%～100.0%	
B4-17	AI1 filter time	Factory setting	0.10s
	Setting range	0.00s～10.00s	

The above function code is used to set the relationship between the analog input voltage and its relative set value.

When the input voltage of analog is greater than the "maximum input" (B4-15), the analog voltage is calculated according to "maximum input"; Similarly, when the analog input voltage is less than the "minimum input" (B4-13), the minimum input or 0.0% is calculated according to the setting of "V below minimum input setting selection" (B4-34).

When the analog input is current input, 1mA current is equivalent to 0.5V voltage.

AI1 input filter time, used to set the AI1 software filtering time, when the analog is easy to be disturbed, please increase the filtering time, so that the detection value of analog tends to be stable, but the greater the filtering time will lead to slow response for analog testing, please set according to the practical application.

In different applications, the meaning of the corresponding value of analog setting 100.0% is different, please refer to the instructions of each application.

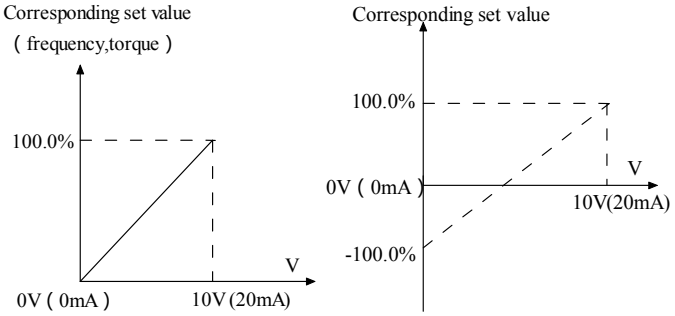


Figure 6-9 The corresponding relation between analog assignment and set value

The following are two typical Settings:

B4-18	AI2 minimum input	Factory setting	0.00V
	Setting range	0.00V～B4-20	
B4-19	AI2 minimum input Corresponding setting	Factory setting	0.0%
	Setting range	-100.00%～100.0%	
B4-20	AI2 maximum input	Factory setting	10.00V
	Setting range	B4-18～10.00V	

B4-21	AI2 maximum input Corresponding setting	Factory setting	100.0%
	Setting range	-100.00%～100.0%	
B4-22	AI2 filter time	Factory setting	0.10s
	Setting range	0.00s～10.00s	

The function and use method of curve 2, please refer to the description of curve 1.

B4-23	Input terminal evalid mode selection 1		Factory setting	00000
	Setting range	Ones place	DI1 Terminal valid state setting	
		0	Positive logic	
		1	Anti-logical	
		Tens	DI2 Terminal valid state setting（0～1，,the same as DI1）	
		Hundreds	DI3 Terminal valid state setting（0～1，,the same as DI1）	
		Thousands	DI4 Terminal valid state setting（0～1，,the same as DI1）	
B4-24	Input terminal valid mode selection 2		Factory setting	00000
	Setting range	Ones	DI5 Terminal valid state setting	
		0	Positive logic	
		1	Anti-logical	
		Tens	DI6 Terminal valid state setting（0～1，,the same as DI1）	

Used for setting effective state mode of the digital input terminal. When the positive logic is selected, it is effective when the corresponding input terminal connects with COM, and ineffective when they are disconnected. When anti-logic is selected, the contrary is the case.

B4-28	HDI minimum input	Factory setting	0.00kHz
	Setting range	0.00kHz～B4-30	
B4-29	HDI minimum input Corresponding setting	Factory setting	0.0%
	Setting range	-100.00%～100.0%	
B4-30	HDI maximum input	Factory setting	50.00kHz
	Setting range	B4-28～50.00kHz	
B4-31	HDI maximum input Corresponding setting	Factory setting	100.0%
	Setting range	-100.00%～100.0%	
B4-32	HDI filter time	Factory setting	0.10s
	Setting range	0.00s～10.00s	

This group of function codes is used to set the relationship between the DI5 pulse frequency and the corresponding setting.

The pulse frequency can only be through the DI5 channel input to converter. The application of this group function is similar to that of curve 1.please refer to the description of curve 1.

B4-34	AI1 AI2 HDI Lower than minimum input setting selection		Factory setting	000
	Setting range	0	Corresponding minimum input Settings	
		1	0.0%	

This function code is used for setting. When the input voltage of the analog is less than the "minimum input", the corresponding setting of the analog is determined.

The individual bits, tens and hundreds of the functional codes correspond to the analog inputs of AI1, AI2, and Keyboard potentiometer respectively. If the choice is 0, when V input is lower than the "minimum input", the corresponding setting of the analog shall be the "minimum input corresponding setting" (B4-14, B4-19, B4-24) for the curve defined by the function code.

If the choice is 1, when V input is lower than the minimum input, the analog corresponding setting is 0.0%.

Group B5 output terminals DO

drive is equipped with two multi-function analog output terminals AO1, AO2, two multi-function relay output terminals TA1 - TB1 - TC1, TA2 TC2, 1 FM terminals (optional as high-speed pulse output terminals, as well the switch of open collector output).

B5-00	FM Terminal output mode selection		Factory setting	0
	Setting range	0	Pulse output（HDO）	
		1	Open collector output（FM）	

The FM terminal is a programmable reusable terminal, which can be used as a high speed pulse output terminal (HDO), or as a switching output terminal (FM) of the open collector circuit.

As the pulse output HDO, the highest frequency of the output pulse is 100kHz, and the HDO related function is shown in B5-06.

B5-01	Open collector output FM function selection	Factory setting	0
B5-02	Relay 1 output function selection（TA1-TB1-TC1）	Factory setting	2
B5-03	Relay 2 output function selection（TA2-TB2-TC2）	Factory setting	0

The above five function codes are used to select five digital output functions.

Function description of DO multi-function output terminal is as follows:

Set value	Function	Description
0	No output	No function
1	Drive is at a run	Indicates that the drive is in a running state and has an output frequency (which can be zero), outputs ON signal.
2	Fault output(fault stop)	Output ON signal when the Ac drive fails and stops.
3	Frequency level detects FDT1 output	Please refer to the description of function code B8-19 and B8-20.
4	Frequency reaches	Please refer to the description of function code B8-21.
5	Zero speed running (no output during shutdown)	When the drive runs and the output frequency is 0, output ON signal.

		The signal is OFF when the drive is down.
6	Motor overload alarm	Before the motor overload protection action, according to the threshold value of the overload prediction alarm, the ON signal is output after the warning threshold is exceeded. Motor overload parameter setting see function code B9-00 ~B9-02.
7	Drive overload alarm	Before the Ac drive overload protection occurs 10s, output ON signal
8	Set counter reaches	When counter reaches the value set by BB-08, the ON signal is output.
9	Specified counter reaches	When the value of the counter reaches the value set by BB-09, the ON signal is output. Count function refers to Hb group function specification.
10	Length reaches	Output ON signal when the actual length of the test exceeds the length set by BB-05.
11	PLC one cycle finished	When a simple PLC operation completes a cycle, output a pulse signal with a width of 250ms.
12	Cumulative running time reaches	When the Ac drive runs more than B8-17 set time, output ON signal.
13	Frequency being limited	When the setting frequency exceeds the upper limit frequency or lower limit frequency, and the frequency of Ac drive output reaches the upper limit frequency or lower limit frequency, output ON signal.
14	Torque being limited	In the speed control mode, the drive is in a stall protection state when the output torque reaches the torque limit value, and the ON signal is output.
15	Run ready	When the main circuit of the drive and the control circuit are stable, and the drive does not detect any fault information, the ac drive is in a running state and output ON signal.
16	AI1>AI2	When the value of the analog input AI1 is greater than the input value of AI2, output ON signal.
17	Upper Limit frequency reached	When the running frequency reaches the upper limit frequency, output ON signal.
18	Lower limit frequency (no output when stopped)	When the running frequency reaches the lower limit frequency, output ON signal. The signal is OFF when the machine is down.
19	Under voltage state output.	When the drive is in under-voltage state, output ON signal.
20	Communication set	Please refer to the communication protocol.
21	No function	No function
22	No function	No function
23	Zero speed running 2 (output	When the output frequency of Ac drive is 0, output ON

	when stop.）	signal. The signal is also ON when the machine is down.
24	Cumulative power-on time reaches	When the Ac drive accumulates time (B7-13) exceeds the set time of B8-16, the ON signal is output.
25	Frequency level detection of FDT2 output	Please refer to the description of function code B8-28 and B8-29.
26	Frequency 1 reaches the output	Please refer to the description of function code B8-30 and B8-31
27	Frequency 2 reaches the output	Please refer to the description of function code B8-32and B8-33.
28	Current 1 reaches the output	Please refer to the description of function code B8-38 and B8-39.
29	Current 2 reaches the output	Please refer to the description of function code B8-40 and B8-41.
30	Timing reaches output	When the timing function selection (B8-42) is valid, the ac drive will output the ON signal after the running time is set.
31	AI1 Input over-limit	When the value of the analog input AI1 is greater than that of B8-46 (AI1 input protection upper limit) or less than B8-45 (AI1 input protection lower limit), output ON signal.
32	Load loss	When the drive is in the drop state, output ON signal.
33	Reverse operation	When the drive is in reverse operation, output ON signal.
34	Zero current state	Please refer to the description of function code B8-28 and B8-29.
35	Module temperature reached	The drive module radiator temperature (B7-07) reaches the set module temperature arrival value (B8-47) and outputs ON signal.
36	Software current over-limit	Please refer to the description of function code B8-36 and B8-37.
37	Lower limit frequency reached(output when stop)	When the running frequency reaches the lower limit frequency, output ON signal. The signal is also ON the stop state.
38	Alarm output	When the Ac drive fails, and the processing mode of the fault is to continue running, the Ac drive alarm output.
39	Motor over temperature alarm	When the motor temperature reaches B9-58 (alarm threshold for motor overtemperature), output ON signal. (motor temperature can be viewed through D0-34)
40	Running time reached	When the ac drive starts to run more than the time set by B8-53, output ON signal.
41	Fault output	No output for free stop failure and under-voltage.
42	At least one multi-segment speed terminal closed	Means at least one multi-segment terminal closed

B5-06	HDO Output function selection (pulse output terminal)	Factory setting	0
B5-07	AO1 Output function selection	Factory setting	0
B5-08	AO2 Output function selection	Factory setting	1

The HDO output pulse frequency range is 0.01kHz ~ B5-09, and B5-09 can be set between 0.01kHz ~ 100.00kHz.

The range of analog output AO1 and AO2 is 0V ~ 10V, or 0mA ~ 20mA.

The ranges of pulse output or analog output and relation of corresponding function are shown in the following table:

Set value	Function	Function corresponding to a pulse or analog output of 0.0% ~ 100.0%
0	Operating frequency	0～Maximum output frequency
1	Set frequency	0～Maximum output frequency
2	Output current	0 ~ 2 times motor rated current.
3	Output torque (absolute value)	0～ 2 times motor rated torque
4	Output power	0～ 2 times motor rated capacity
5	Output voltage	0～1.20 times drive rated voltage.
6	HDI Pulse input	0.01kHz～100.00kHz
7	AI1	0V～10V
8	AI2	0V～10V（or 0～20mA）
9	Keyboard potentiometer	0V～10V
10	Length	0～Maximum setting length
11	Counter value	0～Maximum count value
12	Communication setting	0.0%～100.0%
13	Motor speed	0～Speed corresponds to maximum output frequency
14	Output current	0.0A~1000.0A
15	Output voltage	0.0V~1000.0V
16	Output torque (actual value of torque)	-2 times the rated torque of the motor ~2 time

B5-09	HDO Output maximum frequency	Factory setting	20.00kHz
	Setting range	0.01kHz～100.00kHz	

The function code is used to select the maximum frequency value of the HDO output pulse.

B6 Group start and stop control

B6-00	Starting method		Factory setting	0
	Setting range	0	Direct start	
		1	Speed tracking restart	
		2	Pre-excitation start (ac asynchronous motor)	

0: Direct start

If the DC braking time is set to 0, the ac drive starts from the startup frequency. If not, the DC braking is executed then starts at startup frequency. It is suitable for small inertial loads that the motor may rotate at

startup.

1: Speed tracking restart

The ac drive first determines the speed and direction of the motor, and then starts the motor with the tracking frequency of the motor. For the running motor a non-impact start will be executed. And he instantaneous power failure of the large inertia load is applied. In order to ensure the performance of the speed tracking restart, the parameters of the motor H1 group need to be set accurately.

2: The asynchronous motor pre-excitation start

It is only effective for the asynchronous motor and used to establish the magnetic field before the motor runs. The pre-excitation current and time are shown in the function code B6-05 and B6-06.

If the pre-excitation time is set to 0, the ac drive cancels the pre-excitation process and starts from the startup frequency. When the pre-excitation time is not 0, the pre-excitation restart can improve the dynamic response performance of the motor.

B6-01	Speed tracking mode		Factory setting	0
	Setting range	0	Start from the stop frequency	
		1	Start from zero	
		2	Start from the maximum frequency.	

In order to complete the speed tracking process in the shortest time, select mode of the ac drive tracking the motor speed:

0: Tracking down from the frequency of power failure, this is usually chosen.

1: Tracking up from 0 frequency, and select it when the power-off time is too long.

2:Tracking down from the maximum frequency, generally used for generating load.

B6-02	Speed tracking frequency	Factory setting	20.00HZ
	Setting range	0.00HZ～100.00HZ	

When the speed tracking is restarted, select the speed of tracking.

The larger the parameter the faster the tracking speed. But too large parameter may cause the tracking unreliable.

B6-03	Start frequency	Factory setting	0.00Hz
	Setting range	0.00Hz～10.00Hz	
B6-04	Start frequency retention time	Factory setting	0.0s
	Setting range	0.0s～100.0s	

To ensure the motor torque at startup, set the appropriate startup frequency. In order to fully establish the magnetic flux when the motor starts, it needs to maintain startup frequency for a certain time.

The startup frequency B6-03 is not limited by the lower limit frequency, but when the target frequency is less than the starting frequency, the ac drive does not start and is in standby mode.

During the forward and reverse switching, the start frequency retention time is disabled. The start frequency retention time is not included in the acceleration time, but in the running time of the simple PLC.

Example 1:

B0-03 = 0 frequency source is set by the digital

B0-08 = 2.00Hz digital set frequency is 2.00Hz.

B6-03 = 5.00Hz starting frequency is 5.00Hz.

B6-04 = 2.0s startup frequency retention time is 2.0s.

Now the ac drive will be in standby mode, and the output frequency will be 0.00Hz.

Example 2:

B0-03 = 0 frequency source is set by the digital.

B0-08 = 10.00Hz digital setting frequency is 10.00Hz.

B6-03 = 5.00Hz startup frequency is 5.00Hz.

B6-04 = 2.0s startup frequency retention time 2.0s.

Now the ac drive accelerates to 5.00Hz, and after 2.0s, it accelerates to a set frequency of 10.00Hz.

B6-05	Start DC brake current/pre-excitation current	Factory setting	0%
	Setting range	0%～100%	
B6-06	Start DC braking time/pre-excitation time	Factory setting	0.0s
	Setting range	0.0s～100.0s	

DC braking is generally used to make the motor stop and restart. The pre-excitation is used to set up the magnetic field of the asynchronous motor before starting and improve the response speed.

DC braking is effective only when the startup mode is direct start. At this time, the ac drive starts the DC braking by the DC braking setting current, and then starts running after the DC braking time ends. If the DC braking time is set to 0, it will be started without DC braking. The larger the DC brake current, the greater the braking force.

If the starting mode is the pre-excitation start of the asynchronous motor, the ac drive presets the magnetic field in advance according to the set pre-excitation current, and then starts to run after the set pre-excitation time ends. If the pre-excitation time is set to 0, the drive starts directly without the pre-excitation process.

Starting DC brake current/pre-excitation current is relative to the percentage of the rated current of the drive.

B6-07	Acceleration/Deceleration mode		Factory setting	0
	Setting range	0	Linear acceleration/deceleration	
		1	S curve acceleration/deceleration A	

Select the mode of frequency variation of ac drive in the process of start and stop.

0:Linear acceleration/deceleration

The output frequency accelerates and decelerates linearly. The provides four kinds of acceleration/deceleration time which can be selected by the multi-function digital input terminal (B4-00 ~ B4-08).

1: S curve acceleration/deceleration A

The output frequency accelerates and decelerates according to the S curve. The S curve is used in places where gentle start or stop is required, such as elevators and conveyor belts. The function code B6-08 and B6-09 respectively defines the time scale of the beginning and end of the S curve acceleration and deceleration.

2: S curve acceleration/deceleration B

In the S curve acceleration/deceleration B, the motor rated frequency f is always the inflection point of the S curve. See figure 6-11. Generally used in high - speed areas above rated frequency need quick

acceleration and deceleration.

When the setting frequency is above the rated frequency, the acceleration/deceleration time is:

$$t = \left\{ \frac{4}{9} \times (\frac{f}{f_b})^2 + \frac{5}{9} \right\} \times T$$

Where f is the setting frequency, fb is the rated frequency of the motor, and T is the time to accelerate from 0 to the rated frequency fb.

B6-08	S curve start time proportion	Factory setting	30.0%
	Setting range	0.0%～（100.0%-B6-09）	
B6-09	S curve stop time proportion	Factory setting	30.0%
	Setting range	0.0%～（100.0%-B6-08）	

The function code B6-08 and B6-09 defines respectively the ratio of the start and end time of the S curve acceleration and deceleration A, and the two functional codes should be met the condition of: B6-08 + B6-09 ≤ 100.0%.

In figure 6-10, t1 is the time defined by parameter B6-08, and the slope of the output frequency increases gradually during this period.T2 is the time defined by parameter B6-09, and the slope of the output frequency tends gradually to 0 during this period. Between t1 and t2, the slope of the output frequency varition is fixed, that is linear acceleration/deceleration.

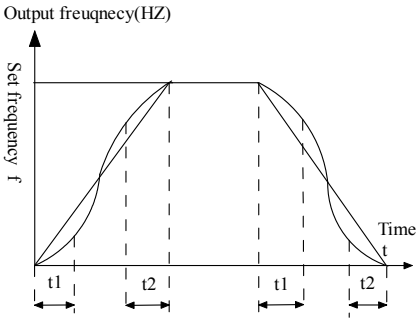


Figure 6-10 S curve acceleration/deceleration A diagram

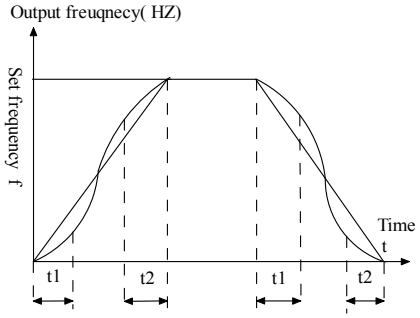


Figure 6-11 S curve acceleration/deceleration B diagram

B6-10	Stop method	Factory setting	0
	Setting range	0	Deceleration stop
		1	Free stop

0: Deceleration stop

After the stop command is enabled, the ac drive will reduce the output frequency according to the deceleration time, stop when the frequency goes to zero.

1: Free stop

When the stop command is enabled, the drive immediately stops the output, and the motor will stop freely according to the mechanical inertia.

B6-11	Start frequency of DC brake stop	Factory setting	0.00Hz
	Setting range	0.00Hz～maximum frequency	
B6-12	Wait time of DC brake stop	Factory setting	0.0s
	Setting range	0.0s～36.0s	
B6-13	Stop DC brake current	Factory setting	0%
	Setting range	Stop DC brake current.	
B6-14	Stop DC braking time	Factory setting	0.0s
	Setting range	0.0s～36.0s	

Stop DC braking start frequency: during deceleration stop, when the operating frequency is reduced to this frequency, the DC braking process begins.

Stop DC braking wait time: after the operating frequency is reduced to the starting frequency of the stop DC braking, the drive will stop the output for a period of time and then start the DC braking process. It is used to prevent overcurrent and other faults caused by DC braking at high speed.

Stop DC brake current: means the output current of the DC braking is relative to the percentage of the rated current of the motor. The larger the value is, the stronger the DC braking effect is, but the greater the heating of the motor and drive.

Stop DC braking time: the duration of DC braking. This value is 0 and the DC braking process is cancelled. Stop DC braking process as shown in figure 6-12.

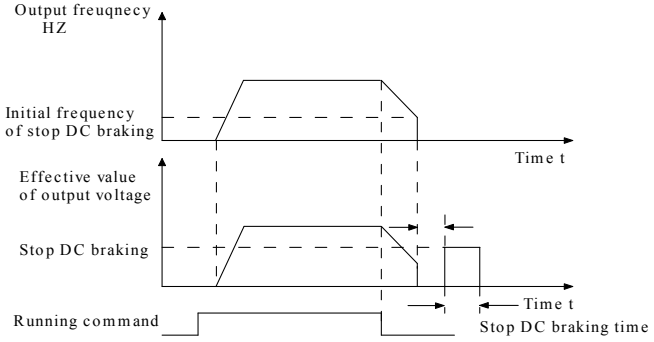


Figure 6-12 Stop DC braking diagram

B7 Group keyboard and display

B7-01	QUICK Key function selection		Factory setting	2
	Setting range	0	QUICK key is disabled	
		1	Switch between operation panel command channel and remote command channel (terminal command channel or communication command channel).	
		2	Forward and reverse switching	
		3	Forward jog	
		4	Reverse jog	

QUICK key is the multi-function key, which can be set by the function code. This key can be used to switch between the stop and operation.

0:No function

1: Keyboard command and remote operation switching

Command sources switching, means switching between the current command source and the keyboard control (local operation). If the current command source is keyboard control, this key function is ineffective.

2: Forward/Reverse switching

Switch the direction of the frequency instruction via the MF K key. This function is effective only when the command source is the operation panel command channel.

3: FJOG

Through the keyboard QUICK key to operate forward jog (FJOG).

4: RJOG

Through the keyboard QUICK key to operate Reverse jog (RJOG) .

B7-02	STOP/RST key function		Factory setting	0
	Setting range	0	Only in keyboard operation mode, STOP/RST key STOP function is valid.	
		1	In any operating mode, the STOP/RST key STOP function is valid.	
B7-03	LED running display selection		Factory setting	0
	Setting range		0～36	
B7-05	LED stop display selection		Factory setting	1
	Setting range		0～36	

Normal display (return after six presses) : Operation frequency 1 (Hz)

Press SHIFT key for the 1st time: Set frequency (Hz)

2nd time: The bus voltage (V)

3rd time: Output voltage (V)

4th time: Output current (A)

5th time：Display the following variables set by B7-03 and B7-05:

00: Running frequency

01: Setting frequency

02: DC bus voltage

03: Output voltage
04: Output current
05: Output power(kW)
06: Output torque(%)
07: DI input terminal status
08: DO output terminal status
09: AI1 voltage(V)
10: AI2 voltage(V)
11: Reserved (no function)
12: Count value
13: Length value
14: Load speed display
15: PID Setting
16: PID feedback
17: PLC status
18: HDI input (DI5terminal)pulse frequency(kHz)
19: Feedback frequency(Hz)
20: The remaining running time.
21: AO1output voltage(V)
22: AO2 output voltage(V)
23: HDO pulse output frequency(KHZ)
24: Reserved (no function)
25: Accumulated power-on time(Hour)
26: Timing elapsed time(Min)
27: Timing setting time(Min)
28: Communication setting value
29: Reserved (no function)
30: Main frequency A display(Hz)
31: Auxiliary frequency B display(Hz)
32: Multi-speed present stage speed
33: PLC total set time
34: PLC elapsed time
35: Torque target value
36: PLC remaining running time

B7-06	Load speed display coefficient	Factory setting	1.0000
	Setting range	0.0001～3.2000	

When the load speed needs to be displayed, the corresponding relationship between the output frequency of the converter and the load speed is adjusted by this parameter.

B7-07	Drive module radiator temperature	Factory setting	0
	Setting range	0.0℃～100.0℃	

Show the temperature of IGBT drive module. The temperature protection value of IGBT is different for different models.

B7-10	Braking voltage action point	100%～160% Rated DC voltage	128%	√

B7-13	Cumulative power-on time	Factory setting	0h
	Setting range	0h～32000h	

Show the accumulative power-on time of the ac drive from delivery.

When the time reaches the set power-on time (B8-17), the multifunction digital output function (24) of the ac drive will output ON signal.

B7-14	Cumulative power consumption	Factory setting	-
	Setting range	0～32000kw.H	

Show the cumulative power consumption of the drive so far.

Group B8 auxiliary functions

B8-00	Jog running frequency	Factory setting	2.00Hz
	Setting range	0.00Hz～maximum frequency	
B8-01	Jog acceleration time	Factory setting	20.0s
	Setting range	0.0s～3200.0s	
B8-02	Jog deceleration time	Factory setting	20.0s
	Setting range	0.0s～3200.0s	

Define the frequency and acceleration/deceleration time of the ac drive at jog operation .And the starting mode is fixed as the direct starting mode (B6-00 =0), and the stop mode is fixed as the deceleration stop (B6-10 =0).

B8-03	Acceleration time 2	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	
B8-04	Deceleration time 2	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	
B8-05	Acceleration time 3	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	
B8-06	Deceleration time 3	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	
B8-07	Acceleration time 4	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	
B8-08	Deceleration time 4	Factory setting	20.0s
	Setting range	0. 0s～3200.0s	

The provides four sets of acceleration/deceleration time, namely B0-17, B0-18 and the above three groups.

The definitions of four groups' deceleration time are exactly the same. Please refer to B0-17 and B0-18 related instructions.

Through the different combination of multi-function digital input terminal S, you can switch to select four groups acceleration/deceleration time. Please refer to the instructions in function code B4-01 ~ B4-05 for specific use.

B8-09	Jump frequency 1	Factory setting	0.00Hz
	Setting range	0.00Hz～Maximum frequency	
B8-10	Jump frequency 2	Factory setting	0.00Hz
	Setting range	0.00 Hz～Maximum frequency	
B8-11	Jump frequency range	Factory setting	0.00Hz
	Setting range	0.00～Maximum frequency	

When the set frequency is within the range of the jump frequency, the actual running frequency will be running at the jump frequency closed to the set frequency. By setting the jump frequency, the ac drive can avoid the mechanical resonance of the load.

The can set two jump frequency points. If both jump frequencies are set to 0, the jump frequency function is cancelled. the principle of jump frequency and jump frequency range is indicated as figure 6-13.

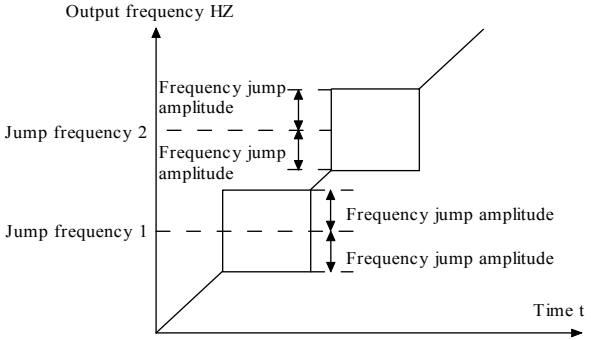


Figure 6-13 Jump frequency diagram

B8-12	Forward and reverse dead zone time	Factory setting	0.0s
	Setting range	0.00s～3000.0s	

In the transient process of setting the drive forward and reverse, the transient time in the output 0Hz. as shown in figure 6-14:

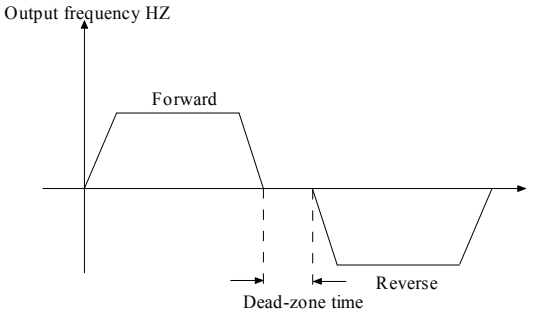


Figure 6-14 Schematic diagram of the dead zone time of forward/reverse

B8-13	Reverse control enable		Factory setting	0
	Setting range	0	On	
		1	Off	

This parameter sets whether the drive is allowed to run in the reverse state. In the case where the motor is not allowed to reverse, set B8-13=1.

B8-14	Operation mode of setting frequency lower than the lower limit frequency		Factory setting	0
	Setting range	0	Lower limit frequency operation	
		1	Stop	
		2	Zero speed operation	

When the setting frequency is lower than the lower limit frequency, the operating state of the ac drive can be selected by this parameter. The provides three modes of operation to meet various application needs.

B8-15	Droop control	Factory setting	0.00Hz
	Setting range	0.00Hz～10.00Hz	

His function is generally used for the load distribution when multiple motors drive the same load.
Droop control refers to as the load increases, the drive output frequency drops, so when multiple motors drive the same load, the load of the motor output frequency drop more, thus can reduce the load of the motor, realize the multiple motors load well-distributed.
This parameter refers to the output frequency drop value of the drive when the rated load is outputted.

B8-16	Set cumulative power-on reaching time	Factory setting	0h
	Setting range	0h～32000h	

When the accumulative power-on time (B7-13) reaches the time set by B8-16, the ac drive multi-function digital DO outputs ON signal.

B8-17	Set cumulative running reaching time	Factory setting	0h
	Setting range	0h～32000h	

Used to set the running time of the drive.
When the cumulative running time (B7-09) reaches this set time, the ac drive multi-function digital DO outputs ON signal.

B8-18	Start protection selection		Factory setting	0
	Setting range	0	No protection	
		1	Protection	

This parameter relates to the safety protection function of ac drive.
If the parameter is set to 1, if the drive is powered on and operation command is effective (such as the terminal operation command is closed before power-on), the ac drive does not respond to the operation command, you must cancel operation command once, the ac drive responds till the operation command is effective again.
In addition, if the parameter is set to 1, if the drive resets fault reset and operation command is effective,

the drive does not respond to the operation command, you must first cancel the operation command to remove running protection state.

This parameter is set to 1, which prevents the danger from motor responding to the operation order when power on or fault reset without knowing it.

B8-19	Frequency detection value.（FDT1）	Factory setting	50.00Hz
	Setting range	0.00Hz～maximum frequency	
B8-20	Frequency detection lag value.（FDT1）	Factory setting	5.0%
	Setting range	0.0%～100.0%（FDT1level）	

When the running frequency is higher than the frequency detection value, the multifunction output of the ac drive outputs ON signal, and when the frequency is lower than a certain frequency of the detected value, the DO output ON signal is cancelled.

The above parameters are used to set the detection value of the output frequency and the lag value of the output action release, where B8-20 is the percentage of the hysteresis frequency relative to the frequency detection value B8-19. Figure 6-15 shows the function of FDT.

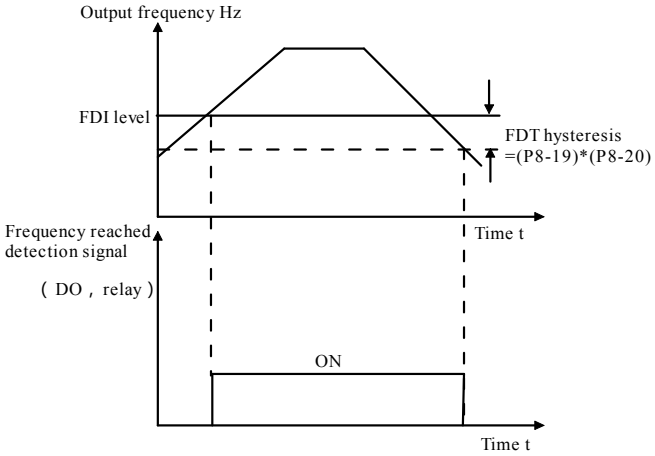


Figure 6-15 FDT level diagram

B8-21	Frequency reaches detection width	Factory setting	0.0%
	Setting range	0.00～100%maximum frequency	

When operation frequency of the drive is in a certain range of target frequency the drive multifunction DO outputs ON signal.

This parameter is used to set the detection range of the reached frequency, which is the percentage of the maximum frequency. Figure 6-16 is a schematic diagram of reached frequency.

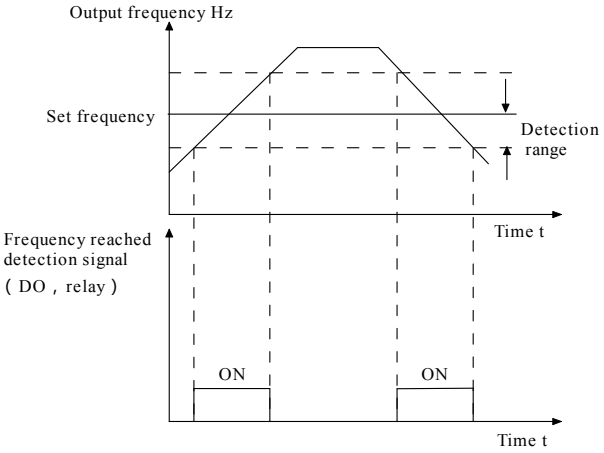


Figure 6-16 Frequency reached detection amplitude

B8-22	Whether the jumping frequency is valid during acceleration and deceleration.	Factory setting	0
	Setting range	0：Invalid 1：valid	

The function code is used to set the jump frequency in the acceleration\deceleration process.

When it is set to be effective, when the running frequency is in the range of the jump frequency, the actual running frequency will skip the specified jump frequency boundary.

Figure 6-17 is a schematic diagram of the effective jumping frequency during acceleration/deceleration.

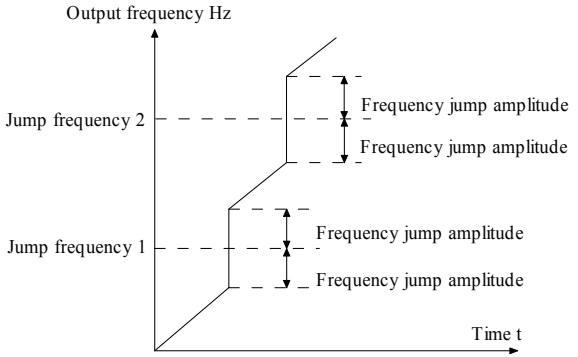


Figure 6-17 Schematic diagram of effective jump frequency during acceleration/ deceleration

B8-25	Acceleration time 1 and acceleration time 2 switch frequency points	Factory setting	0.00Hz
	Setting range	0.00Hz～Maximum frequency	
B8-26	Deceleration time 1 and deceleration time 2 switch frequency point	Factory setting	0.00Hz
	Setting range	0.00Hz～Maximum frequency	

This function is effective when the selection of acceleration/deceleration time has not been switched through the input terminal, used in the process of drive operation, not by S input terminals but according to the operating frequency range, Choose different acceleration/deceleration time.

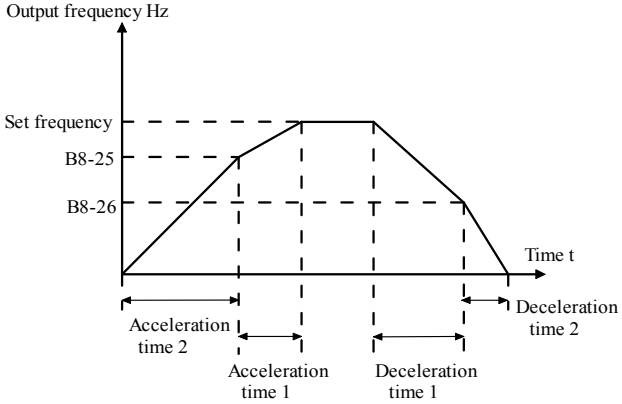


Figure 6-18 Schematic diagram of acceleration/deceleration time switching

Figure 6-18 shows the schematic diagram of the accecleration/deceleration time switching. In the acceleration process, if the operating frequency is less than B8-25, the acceleration time 2 is selected; If the running frequency is greater than B8-25, acceleration time 1 is selected.

In the deceleration process, if the operating frequency is greater than B8-26, deceleration time 1 is selected, and if the operating frequency is less than B8-26, deceleration time 2 is selected.

B8-27	Terminal jog priority	Factory setting	0
	Setting range	0：Ineffective 1：Effective	

This parameter is used for setting whether the terminal jog function has the highest priority.

When the terminal jog priority is effective, if the terminal jog command occurs in the running process, the drive is switched to the terminal jog operation state.

B8-28	Frequency detection value（FDT2）	Factory setting	50.00Hz
	Setting range	0.00Hz～Maximum frequency	
B8-29	Frequency detection lag value（FDT2）	Factory setting	5.0%
	Setting range	0.0%～100.0%（FDT2level）	

The function of this frequency detection is exactly the same as that of FDT1. Please refer to the relevant instructions of FDT1, namely the description of function code B8-19 and B8-20.

B8-30	Random reached frequency detection value 1	Factory setting	50.00Hz
	Setting range	0.00Hz～Maximum frequency	
B8-31	Random reached frequency detection range 1	Factory setting	0.0%
	Setting range	0.0%～100.0%（Maximum frequency）	
B8-32	Random reached frequency detection value 2	Factory setting	50.00Hz
	Setting range	0.00Hz～Maximum frequency	

B8-33	Random reached frequency detection rang 2	Factory setting	0.0%
	Setting range	0.0%～100.0%（Maximum frequency）	

When the output frequency of the drive is in the range of the positive and negative detection value of the random reached frequency detection value, the multi-function DO outputs ON signal.

The provides two sets of random reached frequency detection parameters, setting the frequency value and frequency detection range respectively. Figure 6-19 shows the schematic of this function.

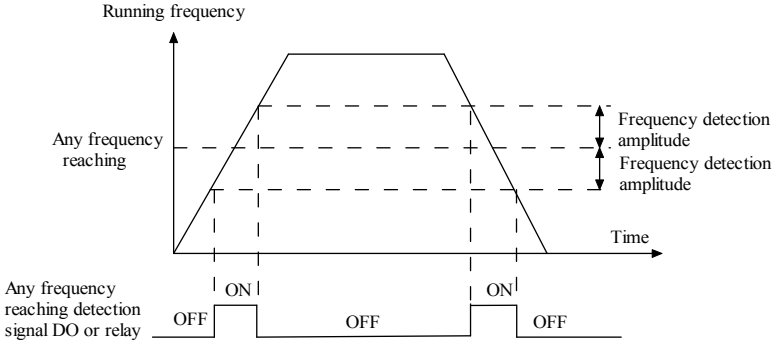


Figure 6-19 Schematic diagram of random reached frequency detection

B8-34	Zero current detection level	Factory setting	5.0%
	Setting range	0.0%～300.0%（Motor rated current）	
B8-35	Zero current detection delay time	Factory setting	0.10s
	Setting range	0.00s～600.00s	

When the output current of the converter is less than or equal to zero current detection level, and the duration exceeds zero current detection delay time, the drive multi-function DO outputs ON signal. Figure 6-20 shows the schematic diagram of zero current detection.

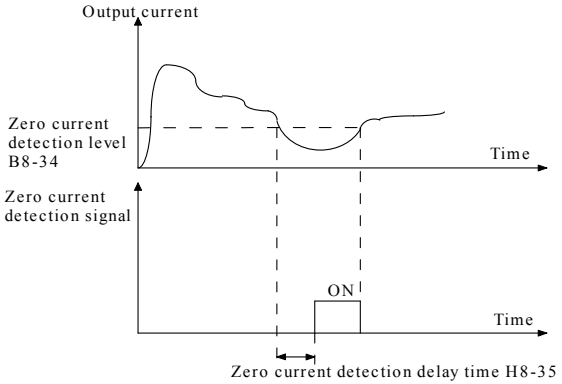


Figure 6-20 Schematic diagram of zero current detection

B8-36	Output current over-limit value	Factory setting	200.0%
	Setting range	0.0%（no detection）	

		0.1%～300.0%（Motor rated current）	
B8-37	Output current over-limit detection delay time	Factory setting	0.00s
	Setting range	0.00s～600.00s	

When the drive output current is greater than over-limit value, and the duration is longer than the delay time of the software overcurrent detection, the drive multi-function DO outputs ON signal, figure 6-21 schematic for the output current over-limit function.

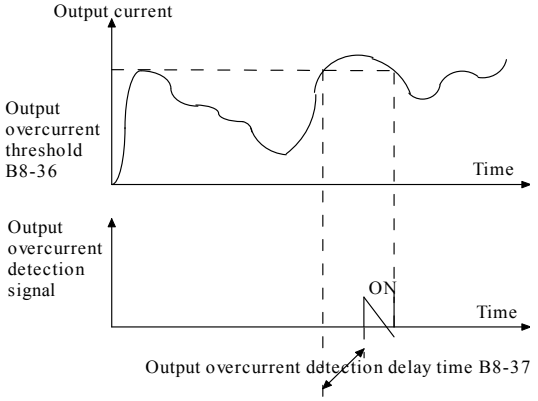


Figure 6-21 Output current over-limit detection

B8-38	Random reached current 1	Factory setting	100.0%
	Setting range	0.0%～300.0%（Motor rated current）	
B8-39	Random reached current width 1	Factory setting	0.0%
	Setting range	0.0%～300.0%（Motor rated current）	
B8-40	Random reached current 2	Factory setting	100.0%
	Setting range	0.0%～300.0%（Motor rated current）	
B8-41	Random reached current width 2	Factory setting	0.0%
	Setting range	0.0%～300.0%（Motor rated current）	

When output current of the drive is within positive/negative detection width of the set random reached current, the drive multi-function DO outputs ON signal.

The provides two sets of random reached current and detection width parameters. Figure 6-22 is the function diagram.

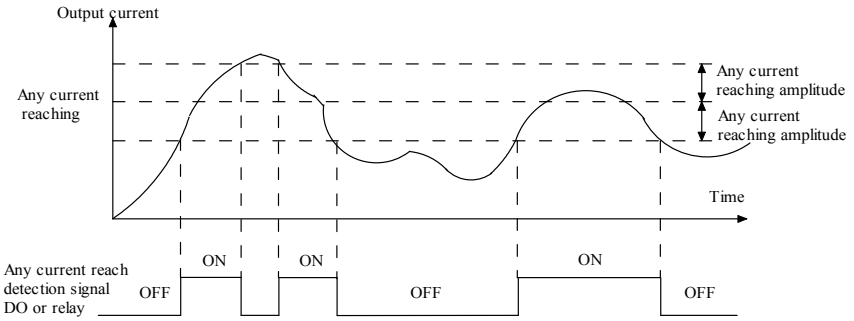


Figure6-22 Schematic diagram of random reached current

B8-42	Timing function selection		Factory setting	0
	Setting range	0	Invalid	
		1	Valid	
B8-43	Timing run-time selection		Factory setting	0
	Setting range	0	B8-44 assign	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		100% of analog input range corresponds to B8-44.		
B8-44	Timing run-time		Factory setting	0.0Min
	Setting range		0.0Min～3200.0Min	

This set of parameters is used to complete the timing operation of the drive.

When the timing function of B8-42 is enabled, the drive starts the timer when it starts, and the drive will stop automatically after the set timing run-time. At the same time, the multi-function DO outputs ON signal.

The drive is timed from 0 at every start, and the timing remaining run-time can be viewed through D0-20. The timing run-time is set by B8-43 and B8-44, and the time unit is minutes.

B8-45	AI1 Input voltage protection value lower limit	Factory setting	3.10V
	Setting range	0.00V～B8-46	
B8-46	AI1 Input voltage protection value upper limit	Factory setting	6.80V
	Setting range	B8-45～10.00V	

When the value of the analog input AI1 is greater than B8-46 or less than B8-47, the ac drive multi-function DO outputs "AI1 input over-limit" ON signal, indicating whether the input voltage of AI1 is within the set range.

B8-47	Module temperature reached	Factory setting	75℃
	Setting range	0.00V～B8-46	

When the radiator temperature of the drive reaches the temperature, the drive multi-function DO outputs

"module temperature reached" ON signal.

B8-53	Run-time reached	Factory setting	0.0Min
	Setting range	0.0Min～3200.0Min	

When the operating time reaches set value, the ac drive multi-function digital DO outputs "run-time reached" ON signal.

Group B9 failure and protection

B9-00	Motor overload protection selection		Factory setting	1
	Setting range	0	No	
		1	Yes	
B9-01	Motor overload protection coefficient		Factory setting	100%
	Setting range		20%～125%	

B9-00=0: no motor overload protection function, there may be the danger of motor overheating, and it is recommended to install heat relay between the drive and the motor;

Long time overload of motor will cause serious heat, this parameter is used to set the coefficient of thermal relay protection for the motor by ac drive. Motor overload protection point = (allowed maximum load current/drive rated current) * 100%.

In the case of large drive driving small motor, it is necessary to correctly set the function code to protect the motor. When one drive drives multiple motors, the thermal relay protection function of the drive will fail, in order to protect the motor, Please install the thermal protection relay on the input wiring terminal of each motor.

The user needs to set the value of B9-01 according to the actual overload capacity of the motor, and this parameter setting too big may cause the motor overheat damage and the ac drive did not alarm the danger!

B9-02	Motor overload warning coefficient.	Factory setting	50%
	Setting range	50%～100%	

This function is used to give a warning signal to the control system before the motor overload fault protection. The warning coefficient is used to determine the degree of warning before the motor overload protection. The larger the value, the smaller the warning amount.

When the output current accumulation of the drive is greater than the product of the overloaded inverse time curve and B9-02, the drive multi-function digital DO outputs "motor overload warning" ON signal.

B9-03	Overvoltage stall gain	Factory setting	0
	Setting range	0 （no）～100	
B9-04	Overvoltage stall protection voltage	Factory setting	138%
	Setting range	120%～150%（three phases）	

when the DC bus voltage exceeds the overvoltage stall protection voltage, the drive stops the deceleration to remain in the current operating frequency, and continues to decelerate after the bus voltage drops.

The overvoltage stall gain is used to adjust the ability of the drive to suppress overvoltage during the deceleration process. The greater the value, the stronger the ability to suppress overvoltage. Without overvoltage, the smaller gain is better.

For the load of small inertia, the overvoltage stall gain should be small, otherwise the system dynamic response will be slow. For large inertia load, this value should be large, otherwise the suppress effect is not good, and there may be overvoltage failure .When the overvoltage stall gain is set to 0, the function is cancelled.

B9-05	Overcurrent stall gain	Factory setting	20
	Setting range	0～100	
B9-06	Overcurrent stall protection current.	Factory setting	160%
	Setting range	100%～210%	

In the acceleration and deceleration process of the drive, when the output current exceeds the overcurrent stall protection current, the drive stops the acceleration and deceleration process and keeps at the current operating frequency, and then continues to accelerate and decelerate after the output current drops.

Overcurrent stall gain, used to adjust the drive's ability to suppress overcurrent during acceleration and deceleration. The larger this value is, the stronger the suppression capacity is. Without overcurrent, the smaller the gain is, the better. For the load with small inertia, the gain of overcurrent stall should be small, otherwise the dynamic response of the system will slow down. For large inertia load, this value should be large, otherwise the suppression effect is not good, overcurrent fault may occur. When the overcurrent stall gain is set to 0, the overcurrent stall function is cancelled.

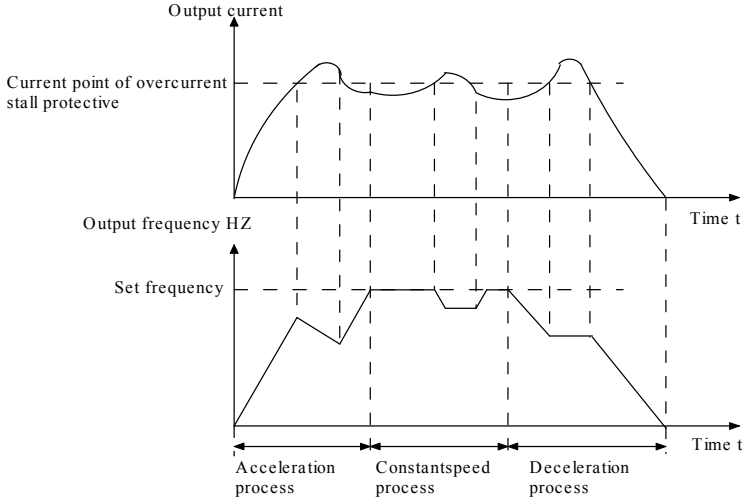


Figure6-23 Schematic diagram of overcurrent stall protection

B9-09	Fault Automatic reset times	Factory setting	0
	Setting range	0～20	

When ac drive selects fault automatic reset, it is used to set the number of automatic reset times. More than this number, the ac drive maintains the state of failure.

B9-10	Fault DO action selection during automatic reset	Factory setting	1
	Setting range	0：No	1：Yes

If the ac drive set the fault automatic reset function, during the fault automatic reset, fault DO can be set through B9-10.

B9-11	Fault automatic reset interval time	Factory setting	1.0s
	Setting range	0.1s～100.0s	

The waiting time from the fault alarm of the ac drive to the automatic fault reset.

B9-12	Input phase loss \ contactor actuation protection selection	Factory setting	1
	Setting range	0：No 1：Yes	

drive G18.5kW and above has the input missing phase protection function.

B9-13	Output phase loss protection selection	Factory setting	1
	Setting range	0：No 1：Yes	

Select whether to protect the output phase missing.

B9-14	First failure type	0～51
B9-15	Second failure type	
B9-16	The third (latest) fault type	

Record the last three fault types of ac drive, 0 is trouble-free. Please refer to chapter 8 for the possible causes and solutions of each failure code.

B9-17	Frequency of third failure	Frequency of the latest failure
B9-18	Current of third failure	current of the latest failure
B9-19	Bus voltage of the third failure	Bus voltage of the latest failure
B9-20	Input terminal state of the third failure	The state of the S terminal in the latest failure. When the input terminal is on and the corresponding binary bit is 1 .0 for off, the state of all S is converted to a decimal number display.
B9-21	The output terminal of the third failure	The state of all the output DO terminals in the latest failure, as follow When the input terminal is on and the corresponding binary bit is 1.0 for off, the state of all output terminal DO is converted to a decimal number display.
B9-22	Drive state of third failure	No function
B9-23	Power-on time of third failure	Power-on time of the latest failure
B9-24	Run-time of the third failure	Running time of the latest failure
B9-27	Frequency of the second failure	Same as B9-17～B9-24

B9-28	Current of the second failure		Same as B9-17～B9-24	
B9-29	Bus voltage of the second failure			
B9-30	Input terminal state of the second failure			
B9-31	The output terminal of the second failure			
B9-32	Drive state of the second failure			
B9-33	Power-on time of the second failure			
B9-34	Run-time of the second failure			
B9-47	Fault protection action selection 1		Factory setting	00000
	Setting range	Ones	Motor overload（E011）	
		0	Free stop	
		1	Stop mode	
		2	Continue running	
		Tens	Input phase loss（E012） （same as ones place）	
		Hundreds	Output phase loss（E013） （same as ones place）	
		Thousands	External fault（E015） （same as ones place）	
		Ten thousands	Abnormal communication（E016） （same as ones place）	
B9-48	Fault protection action selection 2		Factory setting	00000
	Setting range	Ones	Encoder failure（E020）	
		0	Free stop	
		1	Switches to VF and stops by stop mode	
		2	Switch to VF, continue running.	
		Tens	Function code read and write abnormal（E021）	
		0	Free stop	
		1	stops by stop mode	
		Hundreds	No function	
		Thousands	Motor overheat（E025） （same as B9-47 ones place）	
		Ten thousands	Run-time reached（E026） （same as B9-47 ones place）	

B9-49	Fault protection action selection 3		Factory setting	00000
	Setting range	Ones	User-defined fault. 1（E027） （same asB9-47 ones place）	
		Tens	User-defined fault. 2（E028） （same asB9-47 ones place）	
		Hundreds	Power-on time reached（E029） （same asB9-47 ones place）	
		Thousands	Load loss（E030）	
		0	Free stop	
		1	Stops by the stop mode	
		2	Decelerate to 7% of the rated frequency of the motor and automatically return to the set frequency without load loss.	
		Ten thousands	Run-time PID feedback loss.（E031） （same asB9-47 ones place）	
B9-50	Fault protection action selection 4		Factory setting	00000
	Setting range	Ones	Excessive speed deviation（E042）（same asB9-47 ones place）	
		Tens	Motor overspeed（E043）（same asB9-47 ones place）	
		Hundreds	Initial position error（E051）（same asB9-47 ones place）	
		Thousands	Speed feedback error（E052）（same asB9-47 ones place）	
		Ten thousands	No function	

When "free stop" is selected, the ac drive displays E0** and stops directly.

When the "stop mode" is selected, the ac drive will display A**, and it will stop by stop mode, and the E0** will be displayed.

When the option is "continues operating", the drive will continue running and display A**, and the running frequency is set by B9-54.

B9-54	Continues running frequency selection during failure		Factory setting	0
	Setting range	0	Run at current frequency	
		1	Run at a set frequency	
		2	Run at upper limit frequency	
		3	Run at lower limit frequency	
		4	Run with abnormal standby frequency	
B9-55	Abnormal standby frequency		Factory setting	100.0%
	Setting range		0.0%～100.0%	

When a fault occurs during the operation of the drive, and the handling mode of the fault is set to continue running, the converter displays the A** and runs at the frequency determined by B9-54.

When the abnormal standby frequency is selected, the value set by the B9-55 is relative to the percentage of the maximum frequency.

B9-59	Instantaneous power-off operation selection		Factory setting	0
	Setting range	0	Invalid	
		1	Decelerate	
		2	Decelerate to stop	

B9-60	Instantaneous power-off operation determine voltage	Factory setting	90.0%
	Setting range	80.0%～100.0%	
B9-61	Instantaneous power-off voltage determine time	Factory setting	0.50s
	Setting range	0.00s～100.00s	
B9-62	Instantaneous power-off determine voltage	Factory setting	80.0%
	Setting range	60.0%～100.0%（standord bus voltage）	

This function means that, in the instantaneous power-failure or sudden reduction of voltage, the drive compensates the load feedback energy for the reduction of DC bus voltage of the drive by reducing the output speed, so as to maintain the drive running continuously.

If B9-59 = 1, the drive slows down when the power is cut off or the voltage drops suddenly, and when the bus voltage returns to normal, the drive normally accelerates to set frequency operation. The basis of judging bus voltage return to normal is that bus voltage is normal and its duration longer than setting time B9-61.

If B9-59 =2, during instantaneous power-failure or voltage suddenly drops, the drive will slow down until it stops.

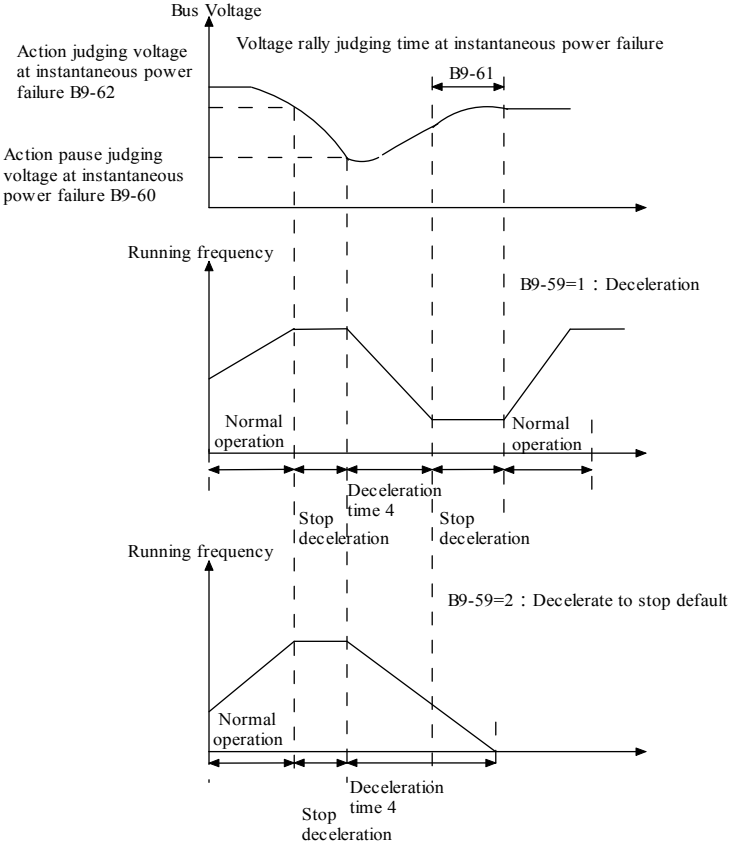


Figure 6-24 Schematic diagram of instantaneous power-failure action

B9-63	Off load protection selection		Factory setting	0
	Setting range	0	Ineffective	
		1	Effective	
B9-64	Off load detection level		Factory setting	10.0%
	Setting range		0.0%～100.0%（Motor rated current）	
B9-65	Off load detection time		Factory setting	1.0s
	Setting range		0.0s～60.0s	

If the off-load protection function is effective, when the output current of the drive is less than the off-load detection level B9-64 and the duration is longer than the off-load detection time B9-65, the output frequency of the drive will automatically be reduced to 7% of the rated frequency. If the load recovers, the drive automatically recovers to run at a set frequency.

Group BA process control PID function

PID control is a common method of process control. Through the proportion, integral and differential operation of the difference between the feedback signal and the target signal, the closed-loop system is constructed by adjusting the output frequency of the drive. Make the controlled variable stable at the target value.

It is suitable for flow control, pressure control and temperature control. Figure 6-25 is the control principle diagram of PID control process.

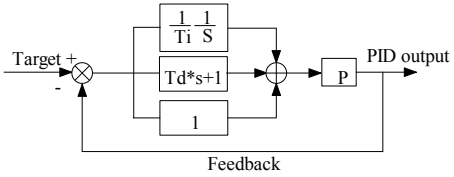


Figure 6-25 Process PID principle block diagram

BA-00	PID given source		Factory setting	0
	Setting range	0	BA-01 set	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		4	HDI pulse（DI5）	
		5	Communication	
		6	Multi-segment command	
BA-01	PID digital setting		Factory setting	0.00kg
	Setting range		0.00kg～BA-04	

This parameter is used to select the target setting channel for the process pid

BA-02	PID feedback source		Factory setting	0
	Setting range	0	AI1	
		1	AI2	
		2	Keyboard potentiometer	
		3	AI1－AI2	
		4	HDI pulse（DI5）	
		5	Communication	
		6	AI1+AI2	
		7	MAX（|AI1|,|AI2|）	
		8	MIN （|AI1|,|AI2|）	

This parameter is used to select the feedback channel of process PID.

BA-03	PID action direction		Factory setting	0
	Setting range	0	Positive	
		1	Negative	

Positive effect: when the PID feedback signal is less than the set value, the output frequency of drive increases. Tension control occasions such as coil.

Reaction: when the PID feedback signal is less than the set value, the output frequency of the ac drive decreases. Tension control occasions such as reeling.

This function is affected by the PID action direction of multifunctional terminal (function 35), and attention should be paid to it in use.

BA-04	pressure gauge	0.00～99.99 kg For example: If the pressure gauge is 1.0MPA, then BA-04 = 10.00 kg If the pressure gauge is 1.6MPA, then BA-04 = 16.00 kg	0.00 kg
BA-05	Proportional gain Kp	0～32000(The larger the value, the faster the response and the bigger the oscillation)	800
BA-06	Integral gain Ki	0～32000(The larger the value, the faster the response and the bigger the overshoot)	1500
BA-09	PID deviation limit	0.0%～100.0%(The deviation between PID setting and feedback is less than this setting, PID adjustment is suspended)	0.0%
B8-48	wake-up pressure deviation	0.0%～100.0%	80.0%
B8-50	Wake up delay time	0.0s～600.0s	2.0s
B8-51	Dormancy frequency	0.00HZ～300.00HZ	0.00HZ
B8-52	Dormancy delay time	0.0s～600.0s	10.0s
BA-24	Feedback excessive detection value	0.0%～100.0%	100.0%
BA-25	Feedback too large detection time	0.0s～600.0s	1.0s

BA-26	PID feedback loss detection value	0.0%: No judgement feedback loss 0.1%～100.0% Feedback disconnection detection: When the feedback value is less than the feedback loss detection value BA-26, the system starts the detection timing. When the timing time exceeds BA-27, the ac drive reports E031 feedback disconnection fault.	0.0%
BA-27	PID feedback loss detection time	0.0s～200.0s	3.0s

Group BB Pendulum frequency, fixed length and counting

The pendulum frequency function is suitable for industries such as textiles and chemical fiber, as well as occasions requiring traverse and winding functions. Pendulum frequency function refers to the drive output frequency to set frequency as the center swing up and down, operation frequency in time axis trajectory as shown in figure 6-26, the swing amplitude set by Pb - 00 and Pb - 01 set, it is 0 when Pb - 01 is set to 0, the pendulum frequency doesn't work.

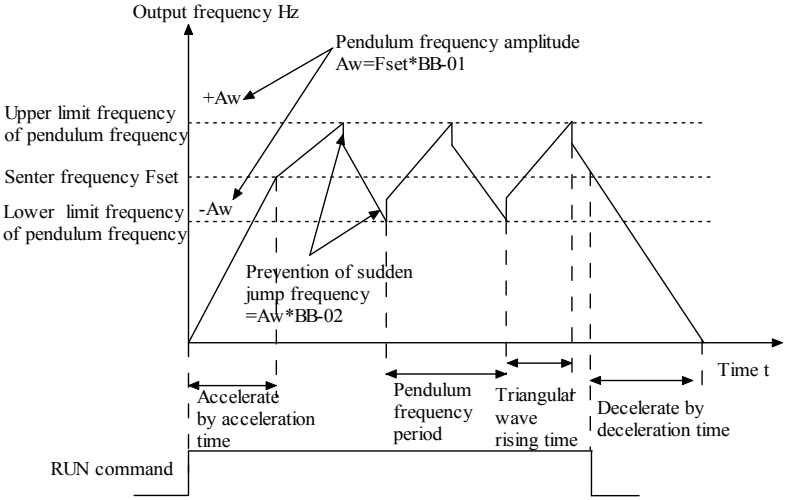


Figure 6-26 Pendulum frequency work

BB-00	Pendulum amplitude setting mode		Factory setting	0
	Setting range	0	Relative to the center frequency	
		1	Relative to maximum frequency	

This parameter is used to determine the base value of the pendulum amplitude.

0: Relative to central frequency (B0-07 frequency source), it is a variable pendulum amplitude system. The pendulum amplitude varies with the change of the central frequency (set frequency).

1: Relative to the maximum frequency (B0-10), it is fixed pendulum amplitude system. pendulum amplitude is fixed.

BB-01	Pendulum frequency range	Factory setting	0.0%
	Setting range	0.0%～100.0%	
BB-02	Jump frequency range	Factory setting	0.0%
	Setting range	0.0%～50.0%	

This parameter is used to determine the value of pendulum amplitude and jump frequency.

When the pendulum amplitude is set relative to the central frequency, the pendulum amplitude AW = the frequency source B0-07 × amplitude BB-01.When the pendulum amplitude is set relative to the maximum frequency (BB-001), the pendulum amplitude AW = the maximum frequency B0-10 ×amplitude BB-01.

When the amplitude of the jump frequency is a pendulum frequency operation , the jump frequency is relative to the frequency percentage of the pendulum amplitude , that is , the jump frequency = pendulum amplitude AW × jump frequency amplitude BB-02. If the pendulum amplitude is selected relative to the center frequency (BB-00 = 0) , the jump frequency is the variable . If the pendulum amplitude is selected relative to the maximum frequency (BB-00 = 1) , the jump frequency is a fixed value .

The operation frequency of the pendulum frequency is constrained by the upper and lower limit frequency.

BB-03	Pendulum frequency period	Factory setting	10.0s
	Setting range	0.0s～3000.0s	
BB-04	Triangle wave rise time coefficient	Factory setting	50.0%
	Setting range	0.0%～100.0%	

Pendulum frequency period: The time value of a complete pendulum frequency period

The rise time coefficient of triangular wave is BB-04, which is the time percentage of the rise time of triangular wave relative to the pendulum frequency period BB-03. The rise time of the triangular wave = pendulum frequency period BB-03 × triangular wave rise time coefficient BB-04, the unit is second.

The time of the triangle wave is equal to the frequency period BB-03 times (1- triangular wave rise time coefficient BB-04), units is seconds.

BB-05	Setting length	Factory setting	1000m
	Setting range	0m～32000m	
BB-06	Actual length	Factory setting	0m
	Setting range	0m～32000m	
BB-07	Pulses per meter	Factory setting	100.0
	Setting range	0.1～3200.0	

The above function code is used for fixed-length control.

The length information needs to be collected through the multi-function digital input terminal. The number of pulses sampled at the terminals is divided by pulse per meter BB-07, and the actual length of BB-06 can be calculated. When the actual length is greater than the set length BB-05, the multi-function digital DO outputs "length reached" ON signal.

In the process of fixed-length control, the length reset operation can be performed with the multi-function input terminal (S function selection is 28). Please refer to B4-00 ~ B4-09 for details.

In the application, the corresponding input terminal function should be set as "length count input" (function 27). When the pulse frequency is high, DI5 port must be used.

BB-08	Setting count value	Factory setting	1000
	Setting range	1～32000	
BB-09	Specified count value	Factory setting	1000
	Setting range	1～32000	

The count value needs to be collected through the multi-function digital input terminal. In the application, the corresponding input terminal function should be set as "counter input" (function 25), and the DI5 port must be used when the pulse frequency is high.

When the count value reaches the set value BB-08, the multi-function digital outputs "set count value reached" ON signal, then the counter stops counting.

When the count value reaches the specified value BB-09, the multi-function digital outputs "specified count value reached" ON signal, and the counter continues to count until reaches the "set count value" then stops.

The specified count value BB-09 should not be larger than the set count value BB-08. Figure 6-27 is a schematic diagram of set count value and specified count value reach.

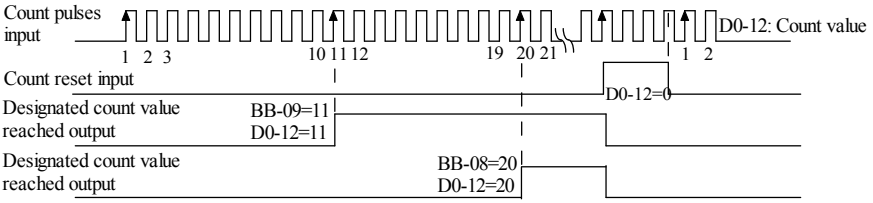


Figure 6-27 The schematic diagram of the setting of set/specified count value

Group BC Multi - segment command and simple PLC function

The multi-segment command of drive has more abundant function than the normal multi-segment speed. In addition to realizing the multi-segment speed function, it can also be used as the voltage source for separated VF and the setting source of the PID process. For this reason, the dimension of the multi-segment command is relative value.

Simple PLC can only complete the simple combination of multi-segment command.

BC-00	Multi-segment command 0	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-01	Multi-segment command 1	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-02	Multi-segment command2	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-03	Multi-segment command3	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-04	Multi-segment command4	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-05	Multi-segment command5	Factory setting	0.0%

	Setting range	-100.0%～100.0%	
BC-06	Multi-segment command6	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-07	Multi-segment command7	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-08	Multi-segment command8	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-09	Multi-segment command9	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-10	Multi-segment command10	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-11	Multi-segment command11	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-12	Multi-segment command12	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-13	Multi-segment command13	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-14	Multi-segment command14	Factory setting	0.0%
	Setting range	-100.0%～100.0%	
BC-15	Multi-segment command15	Factory setting	0.0%
	Setting range	-100.0%～100.0%	

Multi-segment command can be used in three situations: as a frequency source, as a voltage source for separated VF, as the setting source of process PID.

In the three applications, the dimension of the multi-segment instruction is a relative value, the range is -100.0% ~ 100.0%, It is the percentage of the relative maximum frequency when it is used as the frequency source, and the percentage relative to the rated voltage of the motor when it is used as the voltage source of the VF separation. Because the PID is set as a relative value, the multi-segment instruction does not need to be dimensionally converted as the PID setting source.

Multi-segment instructions need to be switched according to the different status of multi-function digital S. Please refer to group H4 related instructions for details.

BC-16	Simple PLC operation mode		Factory setting	0
	Setting range	0	Single operation end stop	
		1	Hold the final value at the end of a single run	
		2	Keep circulating	

Simple PLC functions have two functions: as the frequency source or the voltage source of VF separation

Figure 6-28 is a schematic diagram of simple PLC as the frequency source. In the case of simple PLC as the frequency source, the positive and negative of BC-00 ~ BC-15 determines the direction of operation. If it is negative, it means that the drive runs in the reverse direction.

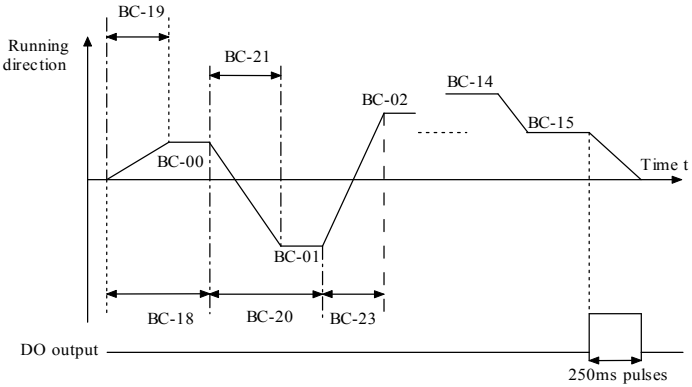


Figure 6-28 Simple PLC diagram

As the frequency source, PLC has three operation modes, which are not available as the VF separation voltage source. Among them:

0: Single operation end stop

The drive completes a single cycle and automatically stops, and it needs to give the operation command again to start.

1: The final value of the single operation is maintained

When the drive completes a single cycle, it automatically maintains the last segment of running frequency.

2: Keep circulating

The drive completes a loop and automatically starts the next loop, stop until there is a stop command.

BC-17	Simple PLC power-off memory selection		Factory setting	00
	Setting range	Ones	Power-off memory selection	
		0	No	
		1	Yes	
		Tens	Stop memory selection	
		0	No	
		1	Yes	

PLC power-failure memory refers to the memory of the running phase and frequency of PLC before power-off, and the next time it is powered on, it continues to run from the memory stage. If you choose not to memory, the PLC process will be restarted every time the power is turned on.

PLC stop memory is to record the running phase and frequency of the previous PLC during the downtime, and continue to run from the memory stage in the next run. If you choose not to record, the process will restart every time you start the PLC.

BC-18	Simple PLC segment 0 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-19	Simple PLC segment 0 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	

BC-20	Simple PLC segment 1 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-21	Simple PLC segment 1 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-22	Simple PLC segment 2 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-23	Simple PLC segment 2 acceleration/deceleration	Factory setting	0
	Setting range	0～3	
BC-24	Simple PLC segment 3 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-25	Simple PLC segment 3 acceleration/deceleration time.	Factory setting	0
	Setting range	0～3	
BC-26	Simple PLC segment 4 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-27	Simple PLC segment 4 acceleration/deceleration time.	Factory setting	0
	setting range	0～3	
BC-28	Simple PLC segment 5 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-29	Simple PLC segment 5 acceleration/deceleration time.	Factory setting	0
	setting range	0～3	
BC-30	Simple PLC segment 6 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-31	Simple PLC segment 6 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-32	Simple PLC segment 7 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-33	Simple PLC segment 7 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-34	Simple PLC segment 8 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-35	Simple PLC segment 8 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-36	Simple PLC segment 9 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	
BC-37	Simple PLC segment 9 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-38	Simple PLC segment 10 operation time	Factory setting	0.0s（h）
	Setting range	0.0 s（h）～3200.0s（h）	
BC-39	Simple PLC segment 10 acceleration/deceleration time	Factory setting	0
	Setting range	0～3	
BC-40	Simple PLC segment 11 operation time	Factory setting	0.0s（h）
	Setting range	0.0s（h）～3200.0s（h）	

BC-41	Simple PLC segment 11 acceleration/deceleration time		Factory setting	0
	Setting range		0～3	
BC-42	Simple PLC segment 12 operation time		Factory setting	0.0s（h）
	Setting range		0.0s（h）～3200.0s（h）	
BC-43	Simple PLC segment 12 acceleration/deceleration time		Factory setting	0
	setting range		0～3	
BC-44	Simple PLC segment 13 operation time		Factory setting	0.0s（h）
	setting range		0.0s（h）～3200.0s（h）	
BC-45	Simple PLC segment 13 acceleration/deceleration time		Factory setting	0
	Setting range		0～3	
BC-46	Simple PLC segment 14 operation time		Factory setting	0.0s（h）
	Setting range		0.0s（h）～3200.0s（h）	
BC-47	Simple PLC segment 14 acceleration/deceleration time		Factory setting	0
	Setting range		0～3	
BC-48	Simple PLC segment 15 operation time		Factory setting	0.0s（h）
	Setting range		0.0s（h）～3200.0s（h）	
BC-49	Simple PLC segment 15 acceleration/deceleration time		Factory setting	0
	Setting range		0～3	
BC-50	Simple PLC operation time unit		Factory setting	0
	setting range	0	Second	
		1	Hour	
BC-51	Multi-segment command 0 given method		Factory setting	0
	Setting range	0	Function code BC-00 given	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		4	HDI pulse	

This parameter determines the set channel for the multi-segment command 0.

In addition to selecting BC-00, there are many other options for switching between multi-segment instructions and other assignment modes. When multi-segment instruction or simple plc is used as a frequency source, It is easy to switch between two kinds of frequency sources.

Group BD communication parameters

BD-00	Baud rate	Factory setting	5
	Setting range	3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS	

The parameter is used to set the data transmission rate between the upper computer and the drive. Note that the baud rate set by the upper computer and the ac drive must be consistent, otherwise the

communication cannot be carried out. The greater the baud rate, the faster the communication.

BD-01	Data format	Factory setting	0
	Setting range	0: No check: data format <8,N,2> 1: Even check: data format <8,E,1> 2: Odd check: data format <8,O,1> 3: No check: data format < 8-N-1 >	

The data format set by the upper computer and the drive must be consistent. Otherwise, the communication cannot be carried out.

BD-02	Local address	Factory setting	1
	Setting range	1～247，0 is broadcast address	

When the local address is set to 0, it is the broadcast address to realize the broadcast function of the host computer. This machine address is unique (except broadcast address) , which is the foundation for the point - to - point communication between the upper computer and the ac drive.

BD-03	Response delay	Factory setting	2ms
	Setting range	0～20ms	

Response delay: refers to the interval between the end of data reception and the transmission of data to the upper computer. If the response delay is less than the system processing time, the response time delay will be subject to system processing time, such as response delay is longer than system processing time, after the system processes the data, the waiting is delayed until the response delay time reaches and the data is transmitted to the upper computer.

BD-04	Communication time out	Factory setting	0.0 s
	Setting range	0.0 s（invalid）；0.1～60.0s	

When the function code is set to 0.0 s, the communication timeout parameter is ineffective.
When the function code is set to effective values, the system will report a communication failure error (E016) if the interval between one communication and the next communication exceeds the communication timeout period. Usually, it is set to ineffective. If the secondary parameters are set in a continuous communication system, the communication status can be monitored.

BD-06	Communication read current resolution	Factory setting	0
	Setting range	0：0.01 A； 1：0.1A	

Group BP parameter management group

BP-00	Software version	Factory setting	0
	Setting range	0～32000	
BP-01	Parameter initialization	Factory setting	0
	Setting range 0	No operation	
	Setting range 1	Restore factory parameters, excluding motor parameters.	
	Setting range 2	Clear record information	

1. Restore factory setting , excluding motor parameters

After setting BP-01 to 1, most of the function parameters of the drive are restored to the factory setting, but motor parameters, frequency instructions, decimal point (B0-22), fault record information, accumulative operation time (B7-09), cumulative power-on time (B7-13) and accumulative power consumption (B7-14) do not recover.

2. Clear record information

Eliminate drive fault record information, accumulative operation time (B7-09), cumulative power-on time (B7-13), cumulative power consumption (B7-14).

4. Backup user's current parameters

Backup the parameters set by the current user. Backup the current set values of all functions parameters to facilitate customer recovery after parameters adjustment.

5. Restore user backup parameters

Restore the user parameters backed up, that is, restores backup parameter by setting the BP-01 to 4.

BP-04	Function code modification attribute		Factory setting	0
	Setting range	0	Modificable	
		1	Not modificable	

The user sets whether the function code parameter can be modified to prevent the risk of the function parameter being changed by mistake.

The function code is set to 0, and all function codes can be modified. When set to 1, all function codes can only be viewed and cannot be modified.

Group L0 Torque control and limiting parameters

L0-00	Speed/Torque control options		Factory setting	0
	Setting range	0	Speed control	
		1	Torque control	

Selection of ac drive control mode: speed control or torque control.

The multifunctional digital S terminal of the has two functions related to torque control: torque control disable(function 29), speed control/torque control switch(function 46). The two terminals should be used in conjunction with L0-00 to achieve the switching between speed and torque control.

When the speed control/torque control switch terminal is ineffective, the control mode is determined by L0-00, and if the speed control/torque control switch is effective, the control mode is equal to the value of L0-00.

In any case, when torque control disable terminal is effective, the ac drive is fixed in a speed control mode.

L0-01	Torque source selection under torque control		Factory setting	0
	Setting range	0	Digital set（L0-03）	
		1	AI1	
		2	AI2	
		3	Keyboard potentiometer	
		4	HDI pulse（DI5 terminal）	
		5	Communication given	
		6	MIN（AI1,AI2）	
		7	MAX（AI1,AI2）	
L0-03	Torque digital setting under torque control		Factory setting	0
	Setting range		-200.0%～200.0%	

L0-01 is used to select the torque set source, and there are eight torque setting modes.

The torque setting adopts relative value, and of which 100.0% corresponds to the rated torque of the drive. Setting range -200.0% ~ 200.0% indicates that the maximum torque of the converter is 2 times the rated torque of the drive.

When the torque is set in mode 1 ~ 7, 100% of the communication, analog input and the pulse input is corresponding toL0-03.

L0-05	Torque control forward maximum frequency	Factory setting	50.00Hz
	Setting range	0.00Hz～maximum frequency（B0-10）	
L0-06	Torque control reverse maximum frequency	Factory setting	50.00Hz
	Setting range	0.00Hz～maximum frequency（B0-10）	

For setting in the torque control mode, the maximum operating frequency of the forward or reverse of the ac drive.

In torque control, if the load torque is less than the motor output torque, the motor speed will continue to rise, in order to prevent the occurrence of accidents such as coasters. The maximum speed of motor must be restricted in torque control.

L0-07	Torque control acceleration time	Factory setting	0.00s
	Setting range	0.00s～32000s	
L0-08	Torque control deceleration time	Factory setting	0.00s
	Setting range	0.00s～32000s	

In torque control mode, the difference between output torque and load torque determines the speed change rate of motor and load. Therefore, the speed of motor may change rapidly, resulting in noise or excessive mechanical stress. By setting the torque control acceleration and deceleration time, the motor speed can change smoothly.

However, for the situations where torque fast response is needed, the acceleration and deceleration time of torque control should be set to 0.00s. For example, two motors are connected to drive the same load. In order to ensure the uniform distribution of load, a ac drive is set up as the host, and the speed control mode is adopted. The other drive is slave and adopts torque control, and the actual output torque of the

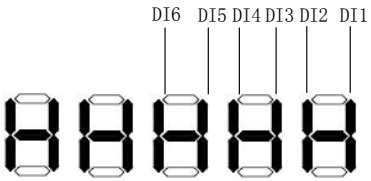
host is taken as the torque instruction of the slave. At this time, the slave torque needs to follow the host quickly, so the acceleration and deceleration time of the slave torque control is 0.00s.

Group D0 monitoring parameter group

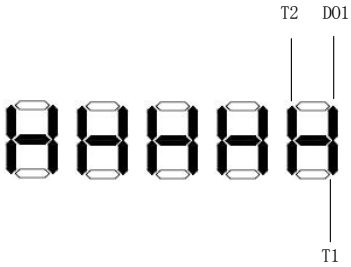
The d0 parameter group is used to monitor the drive running state information, the customer can view through the panel to facilitate the spot debugging, also can read the parameter group value through the communication to use in the upper computer monitor. The communication address is: 0x7000-0x7044
Of which D0-00 ~ D0-31 is the operation and stop monitoring parameters defined in B7-03 and B7-04.
Specific parameter function code, parameter name and minimum unit refer to the following table.

Function code	Name	Minimum unit	Remark
Group PU Basic monitoring parameters			
D0-00	Running frequency（Hz）	0.01Hz	B0-22=1, unit is 0.1HZ B0-22=2, unit is 0.01HZ
D0-01	Set frequency（Hz）	0.01Hz	B0-22=1, unit is 0.1HZ B0-22=2, unit is 0.01HZ
D0-02	Bus voltage（V）	0.1V	
D0-03	Output voltage（V）	1V	
D0-04	Output current（A）	0.1A	0.0A～3200.0A
D0-05	Output power（kW）	0.1kW	
D0-06	Output torque（%）	0.1%	
D0-07	DI terminal input state.	1	Decimal number display
D0-08	DO Terminal output state.	1	Decimal number display
D0-09	AI1 voltage（V）	0.01V	
D0-10	AI2 voltage（V）	0.01V	
D0-12	Count value	1	
D0-13	Length value	1	
D0-14	Load speed display	1	The display values are described in B7-12.
D0-15	PID setting	1	0.01kg
D0-16	PID feedback	1	0.01kg
D0-17	PLC phase	1	
D0-18	HDI input pulse frequency（Hz）	0.01kHz	
D0-19	Feedback speed（unit 0.01Hz）	0.01Hz	Display the actual output frequency of the drive. B0-22=1, unit is 0.1HZ B0-22=2, unit is 0.01HZ
D0-20	Remaining running time	0.1Min	The introduction of timing operation is shown in the parameter B8-42 ~ B8-44.
D0-21	AO1 voltage	0.01V	
D0-22	AO2 voltage	0.01V	

D0-23	HDO output pulse frequency	0.01kHz	
D0-24	Line speed	m/Min	Display the linear speed of the DI5 high-speed pulse sampling which is calculated according to the actual pulse number and BB-07(pulse number per meter) per minute.
D0-25	Power-on time	1 h	
D0-26	Timed run time	0.1Min	
D0-27	Timer setting time	0.1Min	
D0-28	Communication set value.	0.01%	Displays the data written by the address 0x1000.
D0-30	Main frequency A display	0.01Hz	
D0-31	Auxiliary frequency B display	0.01Hz	
D0-32	Multi-segment speed stage		
D0-35	target torque （%）	0.1%	7023H
D0-41	Input DI Status		7029H
D0-42	Output terminal Status		702AH
D0-49	Cumulative power consumption	KW.H	7031H
D0-51	U Phase Current	0.1A	7033H
D0-52	V Phase Current	0.1A	7034H
D0-53	W Phase Current	0.1A	7035H



D0-41: Input DI Status



D0-41: Output terminal Status

Chapter 7 Communication Protocol

1. Communication configuration

All data are in hexadecimal. The communication baud rate is set by BD-00, and data form set by BD-01.

2. Slave address

The address of the drive is set by BD-02, and 0 is the broadcast address. slave address can be set 1 ~ 247.

3. Function code 03: The function code for reading variable.

1. Readable parameter address distribution:

Function name	Address	Data and implications
Running status	3000H	0001: Forward
		0002: Reverse
		0003: Stop
Monitoring parameter	1000H	Frequency /PID/Torque communication set value(-10000～10000)(Decimal)
	1001H	Operating frequency
	1002H	Bus voltage
	1003H	Output voltage
	1004H	Output current
	1005H	Output power
	1006H	Output torque
	1007H	Running speed
	1008H	DI Terminal input flag
	1009H	DO Terminal output flag
	100AH	AI1 voltage
	100BH	AI2 voltage
	100CH	IGBT temperature
	100DH	Count value input
	100EH	Length value input
	100FH	Load speed
	1010H	PID setting
	1011H	PID feedback
	1012H	PLC step
	1013H	HDI input pulse frequency , Unit 0.01kHz
	1014H	Feedback speed, Unit 0.1Hz
	1015H	Remaining running time

	1016H	AI1 Input voltage
	1017H	AI2 Input voltage
	1018H	Reserved (no function)
	1019H	Line speed
	101AH	Present Power-on time
	101BH	Present running time
	101CH	HDI input pulse frequency, unit 1Hz
	101DH	Communication set value
	101EH	Actual feedback speed
	101FH	Main frequency A display
	1020H	Auxiliary frequency B display
Error	8000H	0000: No fault
		0001: IGBT short circuit
		0002: Acceleration overcurrent
		0003: Deceleration overcurrent
		0004: Constant speed overcurrent
		0005: Acceleration overvoltage
		0006: Deceleration overvoltage
		0007: Constant speed overvoltage
		0008: Reserved (no function)
		0009: Under-voltage fault
		000A: Drive overload
		000B: Motor overload
		000C: Input phase-loss
		000D: Output phase-loss/ output current unbalanced
		000E: IGBT overheating
		000F: External fault
		0010: Communication anomaly
		0012: Current detection fault
		0013: Motor tuning fault
		0014: Reserved (no function)
		0015: Parameter read-write anomaly
		0016: Drive hardware fault
		001A: Operating time reached
		001B: User-defined fault 1

		001C: User-defined fault 2
		001D: Power-on time reached
		001E: Load loss
		001F: PID feedback loss in running
		0028: Fast speed limit timeout failure
Function parameters	FX-YZ	Corresponding to the current value of the function code, high address: FX, low address: YZ
B0～BE	F000H～FEFFH	The function code is BC-21, The address is FC15H
BP	1F00H～1F04H	
L0	A000H～A008H	
L5	A500H～A509H	
D0	0x7000～0x70FF	

2. Communication frame content

The upper computer reads 2 data from the drive as the running frequency and the bus voltage. The address is 1001H and 1002H. The upper computer needs to send the following data to the drive:

Slave address	Function code	Parameter address high byte	Parameter address low byte	Read Data high byte	Read data low byte	CRC Parity bit high byte	CRC Parity bit low byte
01	03	10	01	00	02	91	0B

The drive frequency set value is 50.00Hz (hexadecimal is 1388H), and the bus voltage is 540.0V (hexadecimal is 1518H). The drive feedback the following data to the upper computer: where n=2 is the number of read variables.

Slave address	Function code	Read byte quantity (2*n)	The first data high byte	The first data low byte	The second data high byte	The second data low byte	CRC Parity high byte	CRC Parity low byte
01	03	04	13	88	15	18	70	07

4. Function code 06: The function code that represents the write variable.

1. Writable parameter address distribution:

Function name	Address	Data and implications
Communication control command	2000H	0001: Forward
		0002: Reverse
		0003: Jog forward
		0004: Jog reverse
		0005: Free stop
		0006: Deceleration stop
		0007: Fault reset
Frequency /PID/ Torque communication	1000H	0.00%～100.00%,when setting 10000(Hexadecimal: 2710H),corresponding maximum frequency or Maximum

set frequency value address		PID setting or maximum torque.
Password address	1F00H	0.0%～100.0%
Relay setting	2001H	BIT2: TA0-TB0-TC0 relay output control BIT3: TA1-TB1-TC1 relay output control BIT4: FMoutput control
AO1output control	2002H	0～7FFFequates 0%～100%
AO2 output control	2003H	0～7FFFequates 0%～100%
Pulse(HDI)output control	2004H	0～7FFFequates0%～100%
Function code group Number	Communication Address	The function code address in RAM modified by Communication
B0～BE Group	F000H～FEFFH	0000H～0EFFH If the function code is BC-21, the address is expressed as 0C15H;
BP Group	1F00H～1F04H	0F00H～0F04H
L0 Group	A000H～A008H	4000H～4008H
L5 Group	A500H～A509H	4500H～4509H

☞ Note: Frequently writing function code parameters will reduce EPROM service life. Some parameters need not be stored in the communication mode, only the values in RAM need to be modified.

☞ Note: The communication set value is the percentage of relative value, 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.

The percentage is the percentage of the maximum frequency (B0-05) for the frequency dimension. For the data of the torque dimension, the percentage is value of B2-10 (the torque upper limit digital setting).

2. Communication frame content

Example1:

The acceleration time of the drive is modified by the upper computer to 30.0s, which corresponding to the hexadecimal of 012CH, and the setting value is automatically saved when power-off. The acceleration time B0-10 corresponding to the hexadecimal address:F00AH.

Then the upper computer sends the following data to the drive:

Slave address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC parity high byte	CRC parity low byte
01	06	F0	0A	01	2C	9A	85

The drive responds the following data to the upper computer:

Slave address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC parity high byte	CRC parity low byte
01	06	F0	0A	01	2C	9A	85

Example 2:

The deceleration time of the drive is modified by the upper computer to 30.0s, which corresponds to the hexadecimal data: 012CH, but set value will not be saved . The deceleration time B0-11 corresponds to the hexadecimal address: 000BH.

Then the upper computer sends the following data to the drive:

Slave address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC parity high byte	CRC parity low byte
01	06	00	0B	01	2C	F8	45

The drive responds the following data to the upper computer.

Slave address	Function code	Parameter address high byte	Parameter address low byte	Data high byte	Data low byte	CRC parity high byte	CRC parity low byte
01	06	00	0B	01	2C	F8	45

Chapter 8 Fault Diagnosis and Countermeasures

8.1 Fault Alarm and Countermeasures

Fault code	Fault type	Troubleshooting	Countermeasures
E001	Inverter unit protection	1.Short circuit of frequency converter output 2.The wiring of motor and frequency converter is too long 3.The internal wiring of the drive is loose 4.Driving board anomaly	1.Eliminate peripheral faults 2.Install reactor or output filter 3.Plug in all connections reliably 4. Change the board
E002	Acceleration overcurrent	1.The acceleration time is too short 2.Vector control mode and no parameter identification is performed 3.Manual torque boost or V/F curve is not suitable 4.Start the rotating motor 5.Impact Load during acceleration 6.The drive capacity is small	1.Increase the acceleration time 2.dentify the motor parameters 3.Adjust the torque or V/F curve manually 4.Select speed tracking to start or wait for the motor to stop before starting 5.Cancel the impact load 6.Select the frequency converter with higher power level
E003	Deceleration overcurrent	1.The deceleration time is too short. 2.Vector control mode and no parameter identification is performed. 3. Impact load during deceleration. 4. No braking unit and brake resistance are installed.	1.Increase deceleration time. 2.Identify the motor parameters. 3.Cancel the impact load. 4. Install the brake unit and resistance.
E004	Constant speed overcurrent	1.Vector control mode and no parameter identification is performed. 2.Whether there is a impact load in the operation. 3.Lower capacity of frequency converter.	1.Identify the motor parameters. 2. Cancel the impact load. 3.Select the frequency converter with higher power level.
E005	Acceleration overvoltage	1.High input voltage. 2.Drag the motor to run in the acceleration process. 3.The acceleration time is too short. 4. No braking unit and brake resistance are installed.	1. Adjust the voltage to normal range. 2.Cancel the force or install the braking resistance. 3. Increase the acceleration time. 4.Install the braking unit and resistance.
E006	Deceleration overvoltage	1.High input voltage. 2.Drag the motor to operate during the deceleration process. 3.The deceleration time is too short. 4.No braking unit and brake resistance are installed.	1. Adjust the voltage to normal range. 2. Cancel the force or install the braking resistance. 3. Increase deceleration time. 4. Install the braking unit and resistance.

E007	Constant speed overvoltage	1. High input voltage. 2. There are external forces to drive the motor during operation.	1. Adjust the voltage to normal range. 2. Cancel the force or install the braking resistance.
E008	Stop overvoltage	1. Bus voltage detection disconnection, bus voltage detection circuit failure	1. check the bus voltage wire connection and change the powerboard
E009	Under-voltage fault	1. Instantaneous power failure 2. The input voltage of the converter is not in the scope of the specification 3. The bus voltage is abnormal 4. The rectifier bridge and buffer resistance are abnormal. 5.Abnormal powerboard and control board	1. Reset failure. 2. Adjust voltage to normal range. 3. Seek technical support.
E010	Drive overloaded	1. Whether the load is too large or the motor is blocked. 2. The drive capacity is small.	1. Reduce load and check motor and mechanical conditions. 2. Select the drive with higher power
E011	Motor overload	1. Whether the setting of the motor protection parameter B9-01 is appropriate. 2. Whether the load is too large or the motor is blocked. 3. The drive capacity is small	1. Set this parameter correctly. 2. Reduce load and check motor and mechanical conditions. 3. Select the drive with higher power
E012	Input phase loss	1.The three-phase input power supply is abnormal. 2.Abnormal driving board, lightning protection board and control board.	1. Check and solve the problems existing in the peripheral circuit. 2. Seek technical support.
E013	Output phase loss and three phase output unbalanced	1.Abnormal leads of the converter to the motor. 2.Unbalanced three-phase output of drive during motor operation. 3.Abnormal driving board and IGBT	1. Eliminate peripheral faults. 2. Check whether the three-phase winding of the motor is normal and eliminate. 3.Change the boards
E014	IGBT overheating	1.The environment is too hot. 2.Air duct obstruction. 3.Fan damage 4.Thermal resistance of the IGBT is damaged. 5.the drive IGBT damage	1.Reduce the ambient temperature. 2.Clear the air duct. 3.Replace the fan 4.Replace the thermal resistor. 5.Replace the drive IGBT.
E015	External equipment failure	1.Input the signal of external fault via the multi-function terminal S.	1.Reset operation.
E016	Communication failure	1.The upper computer is not working properly. 2.The communication line is abnormal. 3.The communication parameter group HD is not set correctly.	1.Check the upper computer connection. 2.Check the communication cable. 3.Set the communication parameters correctly.

E019	Motor tuning fault	1. The motor parameters are not set according to the rating plate. 2. Parameter identification process time out.	1. Set motor parameters correctly according to the rating plate. 2. Check wiring from the drive to the motor
E021	EEPROM Read/write failure	1. EEPROM chip damage	1.Replace main control board
E022	Drive hardware failure.(Clear latch timeout)	1. Overvoltage 2. Overcurrent	1. Overvoltage fault treatment. 2. Overcurrent fault treatment.
E023	Short circuit to ground	1.The motor is short circuit to the ground.	1. Replace cable or motor.
E024	AD Zero drift is too large	1.Check Hall device abnormal 2. Powerboard abnormal	1.Change the hall devices 2.Change the powerboard
E026	Temperature sensor disconnection fault	1.Temperature sensor bad connection	1.Check the temperature sensor wire connection
E027	User-defined fault. 1	1. Input the signal of user-defined fault 1 via the multi-function terminal S.	1.Reset operation.
E028	User-defined fault. 2	1.Input the signal of user-defined fault 2 via the multi-function terminal S.	1.Reset operation.
E029	Accumulated power-on time reached fault	1.Accumulated power-on time reached the set value.	1.Use parameter initialization to clear record information.
E031	PID feedback disconnection fault	1.PID feedback is less than BA-26 setting value	1. Check PID feedback signal or set BA-26 as one suitable value
E037	STOP key on keyboard stop fault	1.In terminal running channel or communication running channel, press the stop key on the keyboard	1.Check whether it is human operation
E040	Hardware current limit over time faulty	1. Whether the load is too large or the motor is blocked 2.The drive capacity is too small	1.Reduce the load and check the motor and mechanical conditions 2.Choose a frequency converter with a higher power rating
E041	Automatic resets times exceeds the limit	1.External fault or ac drive fault	1.Check the fault record for corresponding troubleshooting

8.2 Common Faults and Solutions

The following faults may be encountered during the operating of the drive. Please refer to the following methods for simple failure analysis:

Number	Fault phenomenon	Possible reasons	Solutions
1	Power-on and no display	No grid voltage or too low; Failure of switch-power supply on frequency converter drive board; The rectifier bridge is damaged; Frequency converter buffer resistance damage; Control board, keyboard failure; The control board is disconnected from the driver board and the keyboard.	Check the input power; Check the bus voltage; Replug 8 cores and 28 core ribbon cable; Seek factory service;
2	Display software version	The connection between the drive board and the control board is poor; Damage of components on the control board; The motor or motor line is short-circuited to ground; Hall failure; The grid voltage is too low;	Replug 8 cores and 28 core ribbon cable; eek factory service;
3	Power-on and display "E023" alarm	The motor or output wires are short-circuited to ground Frequency converter damage;	Measuring the insulation of the motor and the output line with a megger; Seek factory service;
4	The drive display normally, and the "proram version" is displayed during operation and immediately stopped	Fan damaged or blocked; The peripheral control terminal wiring has a short circuit to ground.	Replace the fan; Eliminate external short circuit fault
5	Frequently report E014 (IGBT overheating)	High carrier frequency setting; Fan damage or duct blockage; Internal device damage (thermocouple or other);	Reduce carrier frequency (B0-22); Replace fan and clean air duct; Seek factory service;
6	The motor does not rotate after the drive running.	Motor and motor line; Parameter setting error of frequency converter (motor parameter); Poor connection between the drive board and the control board; Driver board failure;	Reconfirm the connection between the drive and the motor; Replace the motor or eliminate mechanical failure; Check and reset the motor parameters;

7	Input terminal disabled	Parameter setting error; External signal error; The OP and 24V jumper is loose; Control board failure;	Check and reset the P4 group related parameters; Reconnect external signal lines; Reconfirm OP and 24V jumper; Seek factory service;
8	Frequency converter frequently display overcurrent and overvoltage fault	The motor parameter setting is not correct; The acceleration/deceleration time is not suitable; Load fluctuation;	Reset motor parameters or carry out motor tuning; Set appropriate acceleration/deceleration time; Seeking factories and services;
9	Power-on display 88888	Damage of related devices on the control board;	Replace the control board;

Guarantee Agreement

Warranty of the company products executes in accordance with "the quality assurance" in instructions.

1. Warranty period is 12 months from the date of purchasing the product
2. Even within 12 months, maintenance will also be charged in the following situations:
   2.1.Incorrect operation (according to the manual) or the problems are caused by unauthorized repair or transformation.
   2.2.The problems are caused by exceeding the requirements of standards specifications to use the drive.
   2.3 After purchase, loss is caused by falling damage or improper transportation.
   2.4 The devices' aging or failure is caused by bad environment (corrosive gas or liquid).
   2.5 Earthquake, fire wind disaster, lightning, abnormal voltage or other accompanied natural disasters cause the damage.
   2.6 Damage is caused during transport (note: the mode of transportation is determined by customers, the company helps to handle the transferring procedures of goods).
   2.7 Unauthorized tearing up the product identification (e.g.: Nameplate, etc.); the serial number does not match the warranty card.
   2.8 Failing to pay the money according purchase agreement.
   2.9 Cannot objectively describe the installation, wiring, operation, maintenance or other using situation to the company's service units.