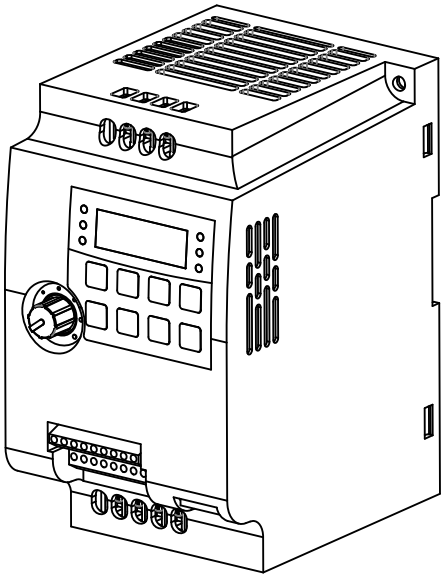
INVERTER

200MN Series

Operation Manual



control and protect your motor

Preface

(1) Thanks for purchasing the frequency converter produced by our company. This series of frequency converter is a kind of high-performance vector converter that can be used to control and adjust the speed of three-phase AC asynchronous motor. With good load adaptability, high-precision speed controllability, low-speed high-torque output performance, excellent overload capacity and abundant setting functions, it's widely applied in various automatic production equipment such as textile, machine tool, package, draught fan, water pump and paper-making, etc.

(2) Please read the user manual carefully to give full play to functions of frequency converter and ensure safety of users. Please hand the manual to final users for proper conservation.

(3) The figures in the user manual are simply for explanations and they may be different from your ordered product.

(4) The product may be changed due to upgrade and constant improvement of product, then corresponding changes of the user manual will not be informed with further notice.

(5) If you're not clear about usage or feel uncertain about the descriptions of user manual, please contact with our company for technical support.

(6) If needing to order the user manual due to damage or loss, please contact with regional agents or customer service center of our company, or login the website of our company to download electronic version.

(7) The box should contain the machine that you have ordered, qualification certificate and user manual. If any damage during transportation process, discrepancy between product specification and actual product, or any omission, please contact with our company or your supplier for solutions.

Ordering instructions

The specification of the product is 0.4-2.2KW. Due to compact design of product, voltage and current mode of input and output analog signal are prefabricated by manufacturer. Default setting is 0-10V for voltage analog input and 0-10V for voltage analog output. If needing to prefabricate to be current signal, please inform dealer or manufacturer before order.

Introduction

General functions and descriptions of this series of frequency converter:

(1) Abundant voltage classes: support three voltage classes, namely single-phase 220V, three-phase 220V and three-phase 380V.

(2) Abundant control modes: apart from vector control of velocity sensor, sensor-less vector control (SVC) and V/F control, it also supports V/F separation control.

(3) Field bus: support Modbus-RTU.

(4) Brand-new SVC algorithm.

Brand-new SVC creates better low-velocity stability, stronger low-frequency load capacity and supports torque control of SVC.

Function	Descriptions
Fast current limiting	Avoid over-current fault of frequency convertor
Dual motor switch	Two sets of motor parameters can realize dual motor switch
Restore user parameters	Users can save or restore own parameter settings
More accurate AIAO	After factory calibration (or spot calibration), AIAO accuracy can be<20mv
Show customized parameters	Users can customize function parameters to be displayed
Show altered parameters	User can view function parameters after modification
Optional fault handing ways	Users can select action modes of converter after confirming certain faults: free halting, deceleration halting, continual operation. The users can also select frequency for continual operation.

PID parameter switch	Two sets of PID parameters can switch by terminal or based on deviation
PID feedback loss detection	PID feedback loss detection value realizes protection during PID operation
DIDO positive/negative logic	Users can set positive/negative logic of DIDO
DIDO response delay	Users can set response delay time of DIDO
Run under instantaneous stop	Frequency converter continues running within short time if instantaneous power outage occurs or voltage decreases
Timing operation	Support timing operation for 6,500 minutes at most

Contents

Chapter 1 Safety Information and Precautions

Safety definition: safety precautions are divided into two categories in the user manual:

Danger: serious injury and death may occur due to operation against requirements;

Caution: moderate or minor injury, equipment damage may occur due to operation against requirements;

Please read this chapter carefully when installing, debugging and maintaining the system, and operate as per safety precautions. The company will not be liable for any injury and loss caused by operation against requirements.

1.1 Precautions

1.1.1 Before installation:

Danger

(1) If any water in control system, lack or damage of component when opening box, please do not install!

(2) If any discrepancy between packing list and actual product, please do not install!

Danger

(3) Please move the equipment gently, otherwise it may be damaged!

(4) If any damaged driver or frequency converter missing parts, please do not use! There's risk of injury!

(5) Do not touch components of control system with hands, otherwise there's danger of static electricity!

1.1.2 During installation:

Danger

(1) Install on flame retardant objects like metal and keep away from combustible, otherwise fire may occur!

(2) Do not screw fixed bolts of components at random especially those with red marking!

Caution

(6) Do not put wire head or bolt in driver, otherwise the driver may be damaged!

(7) Please install the driver in place with little vibration and keep out of the sun.

(8) When above two frequency converters are put in the same cabinet, please pay attention to installation position to ensure heat dissipation effect.

1.1.3 During wiring:

Danger

(9) Please observe the guidance of user manual and make professional electric engineering staff for construction, otherwise unexpected danger may occur!

(10) There should be breaker between frequency converter and power, otherwise fire may occur!

(11) Please ensure that power is at zero-energy state before wiring, otherwise electric shock may occur!

(12) Please keep correct earthing of converter as per standards, otherwise electric shock may occur!

Danger

(13) Do not connect input power to output terminal (U, V, W) on frequency converter. Pay attention to marking on wiring terminal and do not wire wrongly, otherwise driver may be damaged!

(14) Ensure that all wiring conform to EMC requirements and regional safety standard. All wire diameters refer to suggestions in manual, otherwise accident may occur!

(15) Do not connect brake resistor directly between DC bus (+) (-) terminals, otherwise fire may occur!

(16) Encoder shall use shielded wire single and ensure reliable earthing for terminal of shielding layer!

1.1.4 Before electrifying:

Caution

(17) Please confirm the consistence between voltage class of input power and rated voltage class of frequency converter; correctness of wiring positions of power input terminal (R, S, T) and output terminals (U, V, W). Check if any short circuit of peripheral circuit connecting to driver and if wiring circuit is tightened, otherwise driver may be damaged!

(18) Neither part of frequency converter needs withstand voltage test as the product has been tested, otherwise accident may be caused!

Danger

(19) Electrify frequency converter after covering cover plate, otherwise electric shock may occur!

(20) Wiring of all periphery accessories shall comply with manual guidance and keep correct wiring as per circuit connection method in manual, otherwise accident may occur!

1.1.5 After electrifying:

Danger

(21) Do not open cover plate after electrifying, otherwise electric shock may occur!

(22) Do not touch driver or peripheral circuit with wet hands, otherwise electric shock may occur!

(23) Do not touch any input or output terminal of frequency converter, otherwise electric shock may occur!

(24) When firstly electrifying, frequency converter will conduct security detection of external strong-current loop, and do not touch U, V, W wiring terminal of driver or wiring terminal of motor, otherwise electric shock may occur!

1.1.6 During operation:

Danger

(25) Do not touch cooling fan or discharge resistance to feel temperature, otherwise burn may occur!

(26) Non-professional artisan shall not detect signal, otherwise personal injury or device damage may occur!

Caution

(27) Avoid things falling in device during operation of frequency converter, otherwise damage may occur!

(28) Do not control driver by turning on or off contactor, otherwise damage may occur!

1.1.7 During maintenance:

Danger

(29) Do not repair or maintain device when electrifying, otherwise electric shock may occur!

(30) Only maintain and repair driver when voltage of frequency converter <DC36V since 2 minutes after outage, otherwise residual electric charge on capacitance may cause personal injury!

(31) Those without professional training shall not repair or maintain frequency converter, otherwise personal injury or device damage may occur!

(32) Parameters shall be set after changing frequency converter, all pluggable plugins shall be inserted and plugged after outage!

1.2 Precautions

1.2.1 Insulation inspection of motor

When firstly using motor, using motor again after putting for a long time and regularly checking motor, insulation inspection of motor is essential to prevent damaging frequency converter due to invalid insulation of motor winding. During insulation inspection, separate motor wire from frequency converter. 500V voltage-type tramegger is suggested and ensure measured insulation resistance ≥5MΩ.

1.2.2 Thermal protection of motor

If selected motor does not match with rated capacity of frequency converter, especially if rated power is larger than that of frequency converter, please adjust related parameter values of motor protection or install thermal relay in front of motor for protection.

1.2.3 Operation above power frequency

The frequency converter offers output frequency at 0Hz ~ 3200Hz. If users need to operate at above 50Hz, please consider the tolerance of mechanical device.

1.2.4 Vibration of mechanical device

Mechanical resonance point of load device may exist at certain output frequency of frequency converter, and hopping frequency parameter can be set to avoid.

1.2.5 About heating and noise of motor

Output voltage of frequency converter is PWM wave containing certain harmonic, so temperature rise, noise and vibration of motor will slightly increase when comparing with power frequency operation.

1.2.6 Voltage-sensitive parts or capacitance of improving power factor exist on output side

Output of frequency converter is PMB wave. If capacitance of improving power factor or voltage dependent resistor for thunder prevention is installed on output side, instantaneous over current and even damage of frequency converter can be caused easily. Please do not use.

1.2.7 Switching devices such as contactor for input and output terminals of frequency converter

If contactor is installed between power and input terminal of frequency converter, this contactor is not allowed to control the start and stop of frequency converter. If this contactor is required to control the start and stop of frequency converter, the interval should be not less than one hour. Frequent charging and discharging will easily reduce the lifespan of capacitor within frequency converter. If switching devices such as contactor are installed between output terminal and motor, ensure the operation of frequency converter without output, otherwise module damage may occur easily.

1.2.8 Use beyond rated voltage value

It's not suitable to use this series of frequency converter beyond operating voltage range allowed by the manual, otherwise device damage may be caused. If necessary, please use corresponding voltage boosting or dropping equipment for voltage transformation.

1.2.9 Three-phase input changes to be two-phase input

Do not change three-phase frequency converter to be two-phase, otherwise fault or damage may occur.

1.2.10 Lightening impulse protection

There's lightening stroke over-current protection device in frequency converter, so it has certain self-protection ability for inductive thunder. If lightening stroke is frequent in the place of client, additional protection in front of frequency converter is essential.

1.2.11 Altitude and derating use

In the region with altitude exceeding 1,000m, the heat dissipation effect of frequency converter weakens due to thin air, so it's necessary to derate for use. Please contact our company for consultation.

1.2.12 About adaptive motor

(33) Standard adaptive motor is four-pole squirrel-cage asynchronous induction motor. If it's not above motor, please select frequency converter as per rated current of motor;

(34) Cooling fan and rotor spindle of non-variable frequency motor is coaxial connection. If rotation speed reduces, cooling effect of fan will reduce, so the occasion of overheating motor should be installed with strong exhaust fan or changed to be variable frequency motor;

(35) Standard parameters of adaptive motor have been built in frequency converter. It's necessary to identify motor parameters or modify default value based on actual situation to conform to actual value as far as possible, otherwise operation effect and protection performance may be affected.

(36) Short circuit of cable or within motor can lead to alarm and even explosion of frequency converter. Please firstly conduct insulation short-circuit test for initially installed motor and cable, and it's also essential for daily maintenance. Please completely separate frequency converter from tested part when conducting the test.

Chapter 2 Product Information

2.1 Naming rule

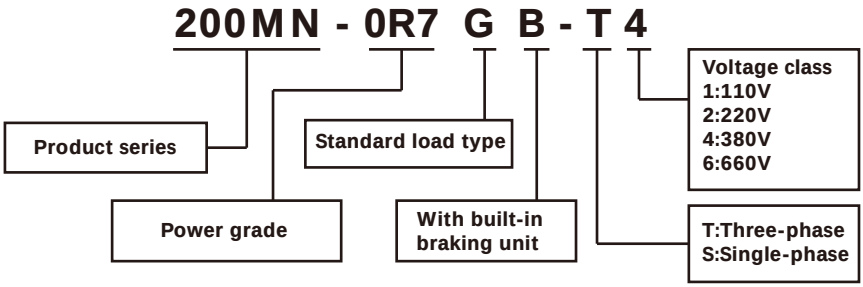


Figure 2-1 Naming specification

2.2 Nameplate

MODEL: 200MN-0R7GB-T4
POWER: 0.75kW
INPUT: 3PH AC380V 50Hz/60Hz
OUTPUT: 3PH AC0V~380V 0Hz~300Hz 2.4A
S/N: Code bar

Figure 2-2 Nameplate

2.3 Rated adaption parameters

Table 2-1 Model and technical parameters of 200MN frequency converter

Model of frequency converter	Power capacity kVA	Input current A	Output current A	Adaptive motor kW	HP
Single-phase power: 220V, 50/60Hz					
200MN-0R4GB-S2	1.0	5.4	2.3	0.4	0.5
200MN-0R7GB-S2	1.5	8.2	4.0	0.75	1
200MN-1R5GB-S2	3.0	14.0	7.0	1.5	2
200MN-2R2GB-S2	4.0	23.0	9.6	2.2	3
Three-phase power: 220V, 50/60Hz					
200MN-0R7GB-T4	1.5	3.4	2.1	0.75	1
200MN-1R5GB-T4	3.0	5.0	3.8	1.5	2
200MN-2R2GB-T4	4.0	5.8	5.1	2.2	3
200MN-3R7GB-T4	5.9	10.5	9.0	3.7	5
200MN-5R5GB-T4	8.9	14.6	13	5.5	7.5
200MN-7R5GB-T4	11	20.5	17	7.5	10
200MN-11GB-T4	17	26	25	11	15

2.4 Technical specification

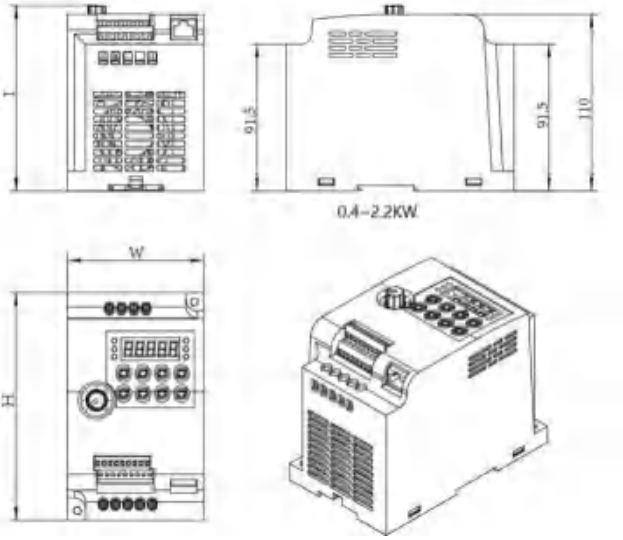
Table 2-2 Technical specification of frequency converter

Items		Specifications	
Basic function	Highest frequency	Vector control: 0 ~ 300Hz V/F control: 0 ~ 3200Hz	
	Carrier frequency	0.5kHz ~ 16kHz Adjust carrier frequency automatically based on load characteristic	
	Input frequency resolution	Number setting: 0.01Hz Simulation setting: highest frequency ×0.025%	
	Control mode	SVC FVC V/F control	
	Starting torque	G-style machine: 0.5Hz/150% (SVC); 0Hz/180% (FVC) P-style machine: 0.5Hz/100%	
	Speed regulation range	1: 100 (SVC)	1: 1000 (FVC)
	Speed stabilizing precision	±0.5% (SVC)	±0.02% (FVC)
	Torque control precision	±5% (FVC)	
	Overload capacity	G-style machine: 150% rated current at 60s; 180% rated current at 3s P-style machine: 120% rated current at 60s; 150% rated current at 3s	
	Torque promotion	Automatic torque promotion; manual torque promotes by 0.1%~30.0%	
	V/F curve	Three ways: linear type; multi-point type; N^{th} power type V/F curve (1.2 power, 1.4 power, 1.6 power, 1.8 power, 2 power)	
	V/F separation	Two ways: full separation, semi-separation	
	Acceleration/deceleration curves	Linear or S-curve acceleration/deceleration way. Four kinds of acceleration/deceleration time Acceleration/deceleration time range: 0.0~6500.0s	
	DC braking	DC braking frequency: 0.00Hz~maximum frequency; Braking time: 0.0s~36.0s braking action; Current value: 0.0%~100.0%	
	Inching control	Inching frequency range: 0.00Hz~50.00Hz; Inching acceleration/deceleration time 0.0s~6500.0s	
	Simple PLC, multi-stage velocity operation	Realize 16-stage velocity operation at most through built-in PLC or control terminal	
	Built-in PID	Easy to realize process control, closed-loop control system	
	Automatic voltage regulation	Keep constant output voltage automatically if any change of network voltage	
	Overvoltage, overcurrent, stalling control	Limit current/voltage automatically during operation, prevent frequent tripping caused by over-current and over-voltage	
	Fast current-limiting function	Reduce over-current fault, protect normal operation of converter	
	Torque limit and control	"Nawy" character limit torque during operation, prevent frequent overcurrent tripping, closed-loop vector mode can realize torque control	
	Field bus	Standard ModBus	
Indivi	Excellent performance	Realize motor control with high-performance current vector control	

dualized functions	Operate under instantaneous stop	Offset reduced voltage through load feedback energy if instantaneous outage, keep continual operation of frequency converter within short time
	Fast current limiting	Avoid frequent over-current fault of frequency convertor
	Timing control	Timing control function: set time range 0.0Min ~ 6500.0Min
	Multi-motor switch	Two sets of motor parameters realize switch control of 2 motors
Operation	Command source	Given operation panel, given control terminal, given serial communication port. Switch through multiple ways
	Frequency source	10 frequency sources: given digit, given analog voltage, given analog current, given pulse, given serial port. Switch through multiple ways
	Auxiliary frequency source	10 auxiliary frequency sources. Realize auxiliary frequency trimming and frequency synthesis flexibly
	Input terminals	5 digital input terminals, in which 1 terminal supports high-speed impulse input at100Hz 1 supports voltage support at 0 ~ 10V or current input at 0 ~ 20mA (prefabricated analog by manufacturer is 0.75~2.2KW and it's voltage by default)
	Output terminals	1 digital output terminal, 1 relay output terminal, 1 analog output terminal, support current input at 0 ~ 20mA or voltage support at 0 ~ 10V (prefabricated analog by manufacturer is 0.75~2.2KW and users can't modify it. It's voltage by default)
Display and keyboard operation	LED display	Display parameters
	Key locking and function selection	Partial or all locking of keys, define function range of some keys to prevent misoperation
	Protection function	Short-circuit detection of motor when electrifying, input/output default phase protection, over-current protection, over-voltage default phase protection, over-current protection, over-voltage, overload protection
Operating environment	Using place	Indoor without direct sunlight, dust, corrosive gas, combustible gas, oil mist, water vapor, dropping water or salinity
	Altitude	< 1,000m
	Environment temperature	-10℃~ + 40℃ (environment temperature at 40℃~50℃, please derate to use
	Humidity	< 95%RH, no condensing drops
	Virbration	< 5.9m/s^2 (0.6g)
	Storage temperature	-20℃~ + 60℃

2.5 Hole dimension of product installation

2.5.1 Product dimension



Model of frequency converter	Height (H)	Width (W)	Depth (D)	Package size (mm)	Packing quantity	Weight	
Single-phase power: 220V, 50/60Hz						NW	GW
200MN-0R7GB-S2	142	85	115.7	210*110*165	8	0.9	1.1
200MN-1R5GB-S2	142	85	115.7	210*110*165	8	0.9	1.1
200MN-2R2GB-S2	142	85	115.7	210*110*165	8	0.9	1.1
Three-phase power: 380V, 50/60Hz							
200MN-0R7GB-T4	142	85	115.7	210*110*165	8	0.9	1.1
200MN-1R5GB-T4	142	85	115.7	210*110*165	8	0.9	1.1
200MN-2R2GB-T4	142	85	115.7	210*110*165	8	0.9	1.1
200MN-3R7GB-T4	186	125	159	285*220*235	4	1.7	2.1
200MN-5R5GB-T4	186	125	159	285*220*235	4	1.8	2.2
200MN-7R5GB-T4	248	160	174	410*310*300	4	3.2	3.8
200MN-11GB-T4	248	160	174	410*310*300	4	3.2	3.8

2.7 Routine maintenance of frequency converter

2.7.1 Routine maintenance

The influence of environment temperature, humidity, dust and vibration will lead to aging of internal components and potential fault, or reduce lifespan of frequency converter, so it's necessary to conduct routine and regular maintenance.

Routine inspection items:

(1) If any abnormal change of sound during motor operation

(2) If any vibration during motor operation

(3) If any change of installing environment for frequency converter

(4) If normal work of cooling fan for frequency converter

(5) If overheating of frequency converter

2.7.2 Regular inspection

Regular inspection items:

(1) Inspect air channel and clean regularly

(2) Inspect if any loosening of screw

(3) Inspect if any arc trace of wiring terminal

2.7.3 Storage of frequency converter

After purchasing frequency converter, users should pay attention to following issues for temporary and long-term storage:

1. Put in packaging box of our company as per original package for storage.

2. Long-term storage will lead to deterioration of electrolytic capacitor. Ensure electrifying once for at least 5 hours within 2 years, and voltage regulator should be used to gradually increase input voltage to rated value.

2.8 Module selection guidance of braking parts

Table 2-7 Model selection table of braking parts of 200MN frequency converter

Model of frequency converter	Recommended power for brake resistance	Recommended resistance value for brake resistance	Braking unit	Remark
Single-phase 20V				
200MN-0R4GB-S2	80W	≥200Ω	Standard built-in	No special instructions
200MN-0R7GB-S2	80W	≥150Ω		
200MN-1R5GB-S2	100W	≥100Ω		
200MN-2R2GB-S2	100W	≥70Ω		
Three-phase 380V				
200MN-0R7GB-T4	150W	≥300Ω	Standard built-in	No special instructions
200MN-1R5GB-T4	150W	≥220Ω		
200MN-2R2GB-T4	250W	≥200Ω		
200MN-3R7GB-T4	300W	≥130Ω		
200MN-5R5GB-T4	400W	≥90Ω		
200MN-7R5GB-T4	500W	≥65Ω		
200MN-11GB-T4	800W	≥43Ω		

Chapter 3 Mechanical and Electrical Installation

3.1 Mechanical installation

3.1.1 Installation environment:

(37) Environment temperature: ambient environment temperature has great influence on lifespan of frequency convertor, so operating ambient temperature of frequency convertor is not allowed to exceed temperature range (-10℃~50℃).

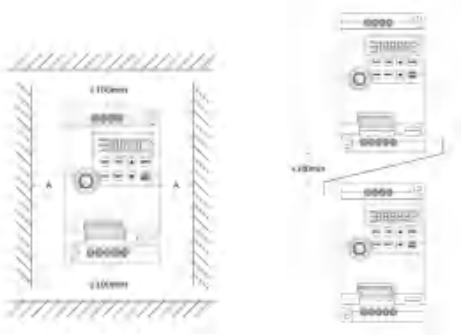
(38) Put frequency converter on surface of flame retardant object and leave enough space for heat dissipation around. Large heat produces when the frequency converter operates. Besides, install vertically on installation support with screw.

(39) Install in the place with little vibration. Vibration shall be < 0.6G. Keep away from punch.

(40) Avoid installing in the place with direct sunlight, humidity and dropping water, etc.

(41) Avoid installing in the occasions with corrosive, inflammable and explosive gas in the air.

(42) Avoid installing in the place with oil stain, dust and metal dust.



Body installation drawing Top and bottom installation drawing

Figure 3-1 Installation diagram of 200MN frequency converter

Power grade	Installation dimension	
	B	A
≤15kW	≥100mm	No requirements

3.1.2 Heat dissipation should be noticed for mechanical installation.

Please pay attention to below:

(43) Install frequency converter vertically so that heat can dissipate upward, prohibit inverting. If there are multiple frequency converters in cabinet, abreast installation is suggested. For the occasions requiring top and bottom installation, install thermal insulation guide plate as per drawing 3-1.

(44) Installation space follows by drawing 3-1 to ensure heat dissipation space of frequency converter.Consider heat dissipation situation of other components within cabinet.

(45) Installation bracket shall be flame retardant material.

(46) For the occasion with metal dust, suggest installing radiator outside cabinet. The space of full sealing cabinet should be as large as possible.

3.2 Electrical installation

3.2.1 Terminal and wiring of main circuit

1) Description of terminal of main circuit for single-phase frequency converter

Terminal marking	Name	Description
L1, L2	Input terminal of single-phase power	Contact point of single-phase 220V AC power
(+) , PB	Connection terminal of brake resistance	Connect brake resistance
U, V, W	Output terminal of converter	Connect three-phase motor
PE\	Earthing terminal	Earthing terminal

2) Description of terminal of main circuit for three-phase frequency converter

Terminal marking	Name	Description
R, S, T	Input terminal of single-phase power	Contact point of single-phase 220V AC power
(+) , PB	Connection terminal of brake resistance	Connect brake resistance
U, V, W	Output terminal of converter	Connect three-phase motor
PE\	Earthing terminal	Earthing terminal

Wiring precautions:

(47) Input power L1, L2 or R, S, T:

(48) Connection terminal (+), PB of brake resistance:

Confirm the model with built-in brake unit, then the connection terminal of brake resistance is valid. Model selection of brake resistance refers to recommended value and wiring distance should be <5m, otherwise frequency converter may be damaged.

(49) Connection terminal P1, (+) of external DC reactor

For the frequency converter at above 220V37KW and 380V75kW, connection strap between P1 and (+) terminals needs to be removed when installing DC reactor externally, and connect DC reactor between two terminals.

(50) Earthing terminal PE\

For different models, the marking of earthing terminal may be different, but the meaning is same. In above descriptions, PE\ means that earthing marking is PE or .

Keep reliable earthing of earthing terminal and resistance value of ground wire should be <0.1Ω, otherwise it will lead to abnormal operation and even damage of device. Do not use earthing terminal PE or and N terminal on null line of power in common.

3.2.2 Control terminal and wiring

1) Layout diagram of terminals on control circuit is as below:

Figure 3-5 Layout diagram of terminals on control circuit

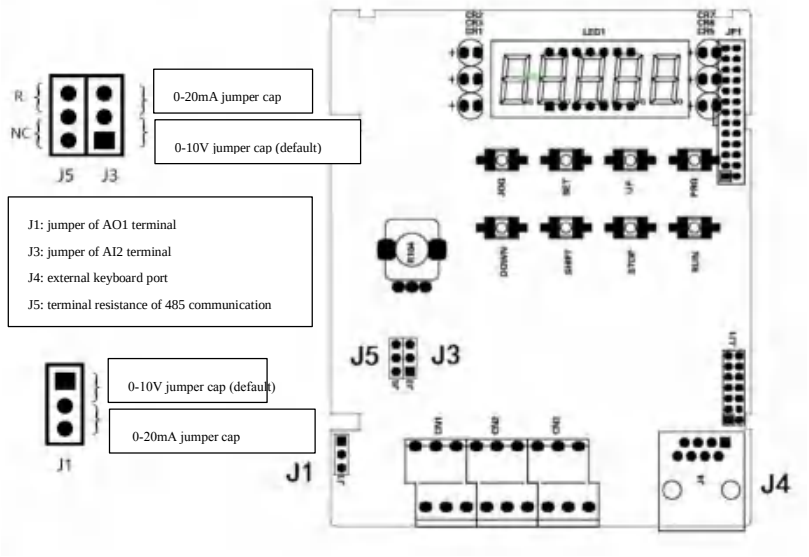
2) Functional descriptions of control terminals:

Table 3-3 Functional descriptions of control terminals of 200MN frequency converter

Type	Terminal symbol	Terminal name	Functional descriptions
Power	+10V-GND	Connect + 10V power externally	Offer +10V power externally, max. output current: 10mA Be commonly used as working power of external potentiometer, resistance value range of potentiometer: 1kΩ~5kΩ
	+24V-COM	Connect + 24V power externally	Offer +24V power externally, be used as working power of digital input/output terminal and power of external sensor Max. output current: 200mA

Analog input	AI1-GND	Analog input terminal 1	1. Range of input voltage: DC 0V~10V 2. Input impedance: 22kΩ This terminal has been lead by panel potentiometer and subsequent procedure settings of AI1 correspond to panel potentiometer
	AI2-GND	Analog input terminal 2	1. Input range: DC 0V~10V/4mA~20mA, depend on J3 jumper on control panel 2. Input impedance: 22kΩ for voltage input, 500Ω for current input
Digital input	DI1- COM	Digital input 1	1. Optical coupling isolation, be compatible with bipolar input 2. Input impedance: 4.2kΩ 3. Voltage range for level input: 12V~30V
	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	J5 jumper on control panel decides voltage or current output. Output voltage range: 0V~10V Output current range:0mA~20mA
Digital output	DO1-COM	Digital output 1	Optical coupling isolation, bipolar open collector output Output voltage range: 0V~24V; output current range: 0mA~50mA
Relay output	T/A-T/B	Normally closed	Drive capability of contact: AC250V, 3A, COS ø=0.4 DC 30V, 1A
	T/A-T/C	Normally open	

3) Functional description of jumper and auxiliary terminals:



Warning: this series of 0.4-2.2KW whole-specification analog quantity jumper is prefabricated to be voltage output at 0~10V. If requiring analog quantity signal of current, users can explain before order. Please do not separate or change jumper position without permission of manufacturer.

Figure 3-6 Location diagram of jumper and auxiliary terminals

Table 3-4 Functional description of jumper and auxiliary terminals for 200MN frequency converter

Jumper marking		Name	Description
Auxiliary terminal	J4	External keyboard port	External keyboard port
	J1	AO1 analog output selection	Decide output type of analog output terminal AO1 is voltage or current output. Voltage output by default. (As shown in Figure 3-6, short circuit of 1-2 is voltage output, short circuit of 2-3 is current output) Output voltage range: 0V-10V Output current range: 0mA -20mA
	J3	AI2 analog input selection	Decide input type of analog input terminal AO1 is voltage or current input. Voltage input by default. (As shown in Figure 3-6, short circuit of 1-2 is voltage input, short circuit of 2-3 is current input) Input voltage range: DC 0V-10V Input current range: 0mA -20mA
	J5	485 communication	Matching selection of 485 terminal resistance

4) Wiring description of control terminals:

(51) Analog input terminal:

Due to weak analog voltage signal, it's easily influenced by external interference, shield cable is commonly used and wiring distance is as short as possible, which should not exceed 20m as shown in Figure 3-7. In the occasion where certain analog signal is seriously interfered, the side of analog signal source should be installed with filter capacitor or ferrite core as shown in Figure 3-7.

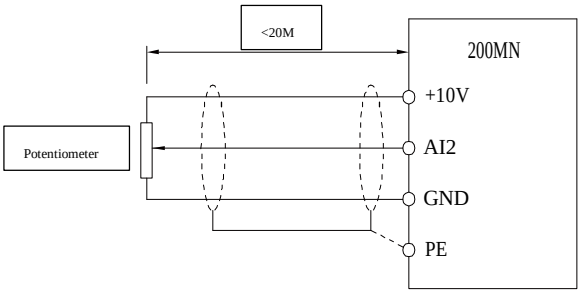


Figure 3-7 Wiring diagram of analog input terminal

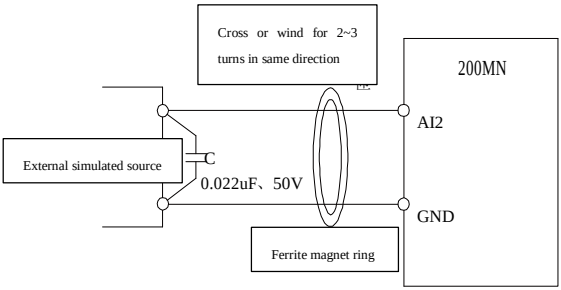


Figure 3-8 Treatment wiring diagram of analog input terminal

(52) Digital input terminal: wiring method of DI terminal

Shield cable is commonly used and wiring distance is as short as possible, which should not exceed 20m. If using active way to drive, necessary smoothing measures should be adopted for crosstalk of power. It's suggested to use contactor control way.

(53) DO digital output terminal: if digital output terminal needs to drive relay, absorber diode should be installed on two sides of relay coil, otherwise DC 24V power may be damaged.

Chapter 4 Operation and Display

4.1 Interface introductions of operation and display

The operating panel can modify the function parameters of frequency converter, monitor the working status of the frequency converter, control the running of the frequency converter (start, halt), etc. The exterior and function area are shown as below:

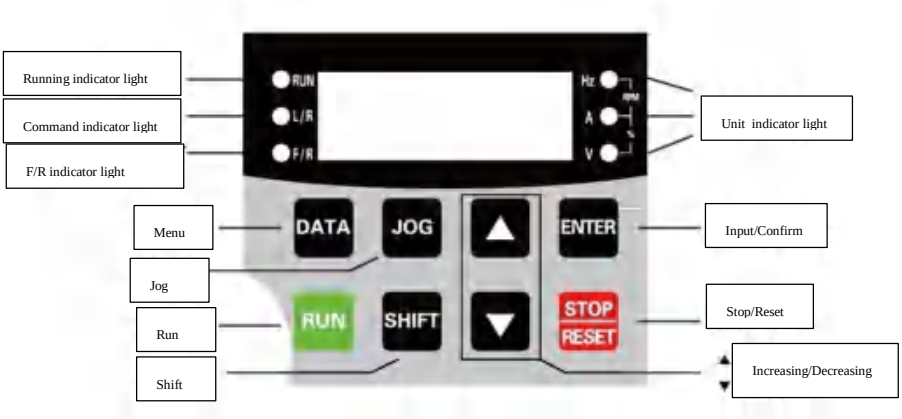


Figure 4-1 Schematic diagram of operation panel

1) Instructions of function indicator light:

RUN: When the light is off, it means the converter is in halt state. When the light is bright, it means the converter is in running state.

L/R: Keyboard operation, terminal operation and remote operation (communication control) indicating light. When the light is off, it means the keyboard is in operation control state. If the light is bright, it means terminal is in operation control state. If the light flickers, it means it's in remote control state.

F/R: Reversing light, when the light is bright, it means it's in normal running state.

2) Unit indicator light:

Hz: frequency unit

A: current unit

V: voltage unit

RMP (Hz+A): Rotate speed unit

% (A+V): %

3) Digital display area:

5-bit LED displays setting frequency, output frequency, kinds of monitoring data and warning code, etc.

4) Instructions of keyboard button

Table 4-1 Keyboard function

Key	Name	Function
DATA	Programming key	Enter or exit first-level menu
ENTER	Enter key	Enter menu step-by-step, set parameters and confirm them
△	Increasing key	Increasing data or function code
▽	Decreasing key	Decreasing data or function code

SHIFT	Shift key	In the stop display interface and running display interface, you can cycle through display parameters; when modifying parameters, parameters of the bit can be modified
RUN	Running key	In keyboard mode, used to run the operation
STOP/RESET	Stop / Reset	When running, press this button to stop the operation; fault alarm state, it can be used to reset the key features that restrict the function code P7-02
JOG	Jog Key	Function switch based on P7-01, defined as command source or quickly switch direction

4.2 Viewing and modifying methods of function code

Operation panel 200MN frequency converter adopts three-level menu structure for parameter settings and other operations. Three-level menus are: function parameter group (first level)→function code (second level)→function code setting (third level). Operational flow is shown in Figure 4-2.

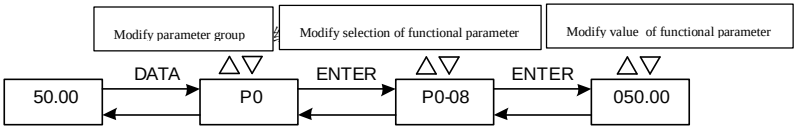
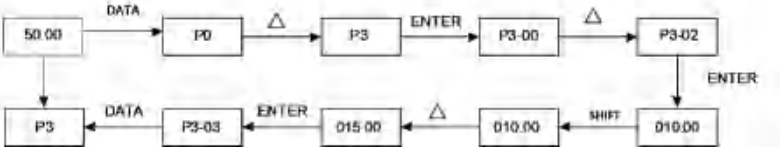


Figure 4-2 Flow chart of three-level menus

Instructions: when operating third-level menu, press the DATA key or ENTER key to return to the second-level menu. The difference is: press ENTER to save the setup parameter and return to the second-level menu, and then automatically shift to the next function code; press the SET key will directly return to the second-level menu without saving the parameters, and return to the current function code.

Example: the function code P3-02 is set to change from 10.00Hz 15.00Hz. (Bold text indicates the flashing bit)



Under status of third-level menu, if there is no flashing bit for parameters, the function code can't be modified, and the possible reasons are below:

1) The function code is parameter that can't be modified, such as actual detection parameter and operation record parameter, etc.

2) The function code can't be modified under running status, and it can only be modified after halting.

4.3 Display mode of parameters

Parameter display mode is mainly set for users to view functional parameters with different spread patterns based on actual demand, and there are three parameter display modes.

Name	Description
Functional parameter mode	Display functional parameters of frequency converter in order, including P0~PF, A0~AF, U0~UF functional parameter group
User-defined parameter mode	User-defined functional parameters (define 32 parameters at most), users can confirm functional parameters to be displayed through PE group

User-modified parameter mode	Functional parameters being not consistent with factor default

Related functional parameters are PP-02 and PP-03 as below:

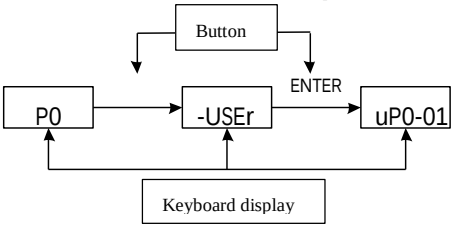
PF-02	**Display property of functional parameter mode**		**Factory default**	**11**
	Setting range	Unit	U group display selection	
		0	Not display	
		1	Display	
		Decade	A group display selection	
		0	Not display	
		1	Display	
PF-03	**Display selection of defined parameter mode**		**Factory default**	**00**
	Setting range	Unit	User-defined parameter display selection	
		0	Not display	
		1	Display	
		Decade	User-modified parameter display selection	
		0	Not display	
		1	Display	

Display code of each parameter display mode is as below:

Parameter display mode	Display
Functional parameter mode	-bASE
User-defined parameter mode	-USEr
User-modified parameter mode	--L--

Switch mode is as below:

Currently, it's functional parameter mode and switch to user-defined parameter mode



4.4 Operation mode of user-defined parameters

The setting of user-defined menu aims to make users view and modify common functional parameters fast. In the user-defined menu, display mode of parameters is "uP3-02" and it means functional parameter P3-02. The effect of modifying parameters in the user-defined menu is the same with modifying under common programming state.

Functional parameters of the user-defined menu derive from PE group, which selects functional parameters. If it's set to be P0-00, it means not selection and 30 pairs can be set. If it displays "NULL" when entering the menu, it means that user-defined menu is null.

16 common parameters have been initially saved in user-defined menu for the convenience of users:

P0-01: control mode
P0-02: selection of command source
P0-03: selection of principal frequency source
P0-07: selection of frequency source
P0-08: preset frequency
P0-17: acceleration time
P0-18: deceleration time
P3-00: setting of V/F curve

P3-01: torque promotion
P4-00: function selection of DI1 terminal
P4-01: function selection of DI2 terminal
P4-02: function selection of DI3 terminal
P5-04: output selection of DO1
P5-07: output selection of AO1
P6-00: starting mode
P6-10: halting mode

The users can edit user-defined menu based on their own specific demands.

4.5 Viewing method of state parameters

Under halting or running state, display multiple state parameters through "SHIFT" key. Binary choice of function code P7-03 (running parameters 1), P7-04 (running parameters 2), P7-05 (halting parameters) decides whether this parameter is displayed.

Under halting state, 16 halting parameters can be selected to display, including: frequency setting, bus voltage, DI input state, DO output state, voltage of analog input AI2, actual count value, actual length value, PLC running steps, display of loading speed, PID setting, impulse frequency of PULSE input and 3 retention parameters. Switch selected parameters in order by pressing the key.

Under running state, there are five running state parameters, namely running frequency, setting frequency, bus voltage, output voltage and output current, all of which are displayed by default. Other display parameters include output power, output torque, DI input state, DO output state, voltage of analog input AI2, actual count value, actual length value, linear speed, PID setting and PID feedback, etc. Binary choice of function code P7-03 and P7-04 decides whether this parameter is displayed. Switch selected parameters in order by pressing the key.

When electrifying frequency converter after power failure, displayed parameters will be the selected parameters before power failure.

4.6 Password settings

The frequency converter is equipped with user password protection function. When PF-00 is set to be none-zero, namely user password, password protection takes effect after exiting edit state of function code. Press DATA key again and "-----" displays. Input user password correctly to enter common menu, otherwise it can't be entered.

To cancel password protection function, password is required and set PF-00 to be 0.

4.7 Automatic tuning of motor parameters

Select running mode of vector control. Before running frequency converter, input nameplate parameter of motor correctly. 200MN frequency converter matches standard motor parameters based on the nameplate parameter. Vector control mode has strong dependence on motor parameters. To obtain good control performance, correct parameters of controlled motor should be obtained.

Steps of automatic tuning of motor parameters are as below:

Select command source (P0-P2) to be command channel of operation panel, then input below parameters as per actual parameters of motor (select as per current motor):

Motor selection	Parameter
Motor 1	P1-00: type selection of motor; P1-01: rated power of motor; P1-02: rated voltage of motor; P1-03: rated current of motor; P1-04: rated frequency of motor; P1-05: rated speed of motor
Motor 2	A2-00: type selection of motor; A2-01: rated power of motor; A2-02: rated voltage of motor; A2-03: rated current of motor; A2-04: rated frequency of motor; A2-05: rated speed of motor

If the motor can be completely separated from load, P1-37 (A2-37 for motor 2) is selected to be 2 (complete tuning of asynchronous machine) and press RUN key on key panel, then the frequency converter will automatically calculate below parameters of motor:

Motor selection	Parameter
Motor 1	P1-06: stator resistance of synchronous machine; P1-07: D-axis inductance of synchronous machine P1-08: Q-axis inductance of synchronous machine; P1-09: mutual inductance resistance of

	asynchronous machine P1-10: no-load current of asynchronous machine
Motor 2	A2-06: stator resistance of synchronous machine; A2-07: D-axis inductance of synchronous machine A2-08: Q-axis inductance of synchronous machine; A1-09: mutual inductance resistance of asynchronous machine A1-10: no-load current of asynchronous machine

Finish automatic tuning of motor parameters.

If the motor can't be completely separated from load, P1-37 (A2-37 for motor 2) is selected to be 1 (static tuning of asynchronous machine) and press RUN key on key panel.

Chapter 5 Functional Parameter Table

To simplify the instructions as far as possible, the user manual does not make descriptions of parameter table. If any questions, the user can refer to the user manual of enhanced version of 200G series, which can be downloaded from the official website of our company, or required from manufacturer and dealer.

PP-00 is set to be non-zero value, namely setting the parameter protection password. Under mode of functional parameter and user-modified parameter, the parameter menu can only be accessed after entering correct password. To cancel the password, PP-00 needs to be set as 0.

Parameter menu under mode of user-modified parameter is not protected with password. P group and A group are basic function parameters, U group is monitoring parameter. The symbols in functional table are as follows:

"☆": It indicates the set value of the parameter can be changed under halt and running status of frequency converter;

"★": It indicates the set value of the parameter can not be changed under running status of frequency converter;

"●": It indicates the value of this parameter is the actually measured value and can not be changed;

"*": It indicates that the parameter is "factory default" and can only be set by the manufacturer, and users are prohibited to operate;

Table of basic functional parameters

Function code	Name	Setting range	Factory default	Modify
P0 basic function group				
P0-00	G/P type display	1: G type (constant-torque load type) 2: P type (fan and pump load type)	Depend on machine type	●
P0-01	Control mode of the first motor	0: Speed sensorless vector control (SVC) 1 Speed sensor vector control (FVC) 2: V/F control	0	★
P0-02	Command source selection	0: Command channel of operation panel (LED OFF) 1: Command channel of terminal (LED ON) 2: Command channel of communication (LED flickers)	0	☆
P0-03	X selection of main frequency source	0: Digital setting (preset frequency P0-08, UP/DOWN can be modified, no memory in the case of power failure) 1: Digital setting (preset frequency P0-08, UP/DOWN can be modified, with memory in the case of power failure) 2: AI2 (panel potentiometer) 3: AI2 4: AI3 (remote panel potentiometer) 5: PULSE setting (DI5) 6: Multi-segment command 7. Simple PLC 8: PID 9: Communication given	0	★
P0-04	Y selection of auxiliary frequency source	Be the same as P0-03 (X selection of main frequency source)	0	★
P0-05	Y range selection of	0: Be relative to maximum frequency	0	☆

Function code	Name	Setting range	Factory default	Modify
	auxiliary frequency source in the case of superposition	1: Be relative to frequency source X		
P0-06	Y range of auxiliary frequency source in the case of superposition	0% ~ 150%	100%	☆
P0-07	Superposition selection of frequency source	Units digit: frequency source selection 0: Main frequency source X 1: Main/auxiliary operation result (operation relation is determined by tens digit) 2: Switch between main frequency source X and auxiliary frequency source Y 3: Switch between main frequency source X and main/auxiliary operation result 4. Switch between auxiliary frequency source Y and main/auxiliary operation result Tens digit: main/auxiliary operation relation of frequency source 0: Main + auxiliary 1: Main – auxiliary 2: Maximum value between the two 3. Minimal value between the two	00	☆
P0-08	Preset frequency	0.00Hz ~ maximum frequency (P0-10)	50.00Hz	☆
P0-09	Running direction	0: Same direction 1: Opposite direction	0	☆
P0-10	Maximal frequency	50.00Hz ~ 600.00Hz	50.00Hz	★
P0-11	Upper-limit frequency source	0: Setting of P0-12 1: AI1 2: AI2 3: AI3 4: PULSE setting 5: Communication given	0	★
P0-12	Upper-limit frequency	Lower limit frequency P0-14 ~ maximum frequency P0-10	50.00Hz	☆
P0-13	Upper-limit frequency offset	0.00Hz ~ maximum frequency P0-10	0.00Hz	☆
P0-14	Lower limit frequency	0.00Hz ~ upper-limit frequency P0-12	0.00Hz	☆
P0-15	Carrier frequency	0.5kHz ~ 16.0kHz	Depend on machine type	☆
P0-16	Adjust carrier frequency with temperature	0: No 1: Yes	1	☆
P0-17	Acceleration time 1	0.00s ~ 65000s	Depend on machine type	☆

Function code	Name	Setting range	Factory default	Modify
P0-18	Deceleration time 1	0.00s ~ 65000s	Depend on machine type	☆
P0-19	Acceleration/Deceleration time unit	0: 1s 1: 0.1s 2: 0.01s	1	★
P0-21	Offset frequency of auxiliary frequency source in the case of superposition	0.00Hz ~ maximum frequency P0-10	0.00Hz	☆
P0-22	Frequency command resolution	1: 0.1Hz 2: 0.01Hz	2	★
P0-23	Memory selection of digital setting frequency in the case of power failure	0: No memory 1: with memory	0	☆
P0-24	Motor selection	0: Motor 1 1: motor 2	0	★
P0-25	Reference frequency of acceleration/deceleration time	0: Maximum frequency P0-10 1: Frequency setting 2: 100Hz	0	★
P0-26	UP/DOWN reference of frequency command while running	0: Frequency operation 1: frequency setting	0	★
P0-27	Command source binds frequency source	Units digit: operation panel command binds frequency source selection 0: No binding 1: Digital setting frequency 2: AI1 3: AI2 4: AI3 5: PULSE setting (DI5) 6: Multi-segment speed 7: Simple PLC 8: PID 9: Communication given Tens digit: terminal command binds frequency source selection Hundreds digit: communication command binds frequency source selection Thousands digit: automatic operation binds frequency source selection	0000	☆
P1 group Parameters of the first motor				
P1-00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
P1-01	Rated power of motor	0.1kW ~ 1000.0kW	Depend on	★

Function code	Name	Setting range	Factory default	Modify
			machine type	
P1-02	Rated voltage of motor	1V ~ 400V	Depend on machine type	★
P1-03	Rated current of motor	0.01A ~ 655.35A (power of frequency converter <=55kW 0.1A ~ 6553.5A (power of frequency converter>55kW)	Depend on machine type	★
P1-04	Rated frequency of motor	0.01Hz ~ maximum frequency	Depend on machine type	★
P1-05	Rated speed of motor	1rpm ~ 65535rpm	Depend on machine type	★
P1-06	Stator resistance of asynchronous motor	0.001Ω ~ 65.535Ω (power of frequency converter<=55kW) 0.0001Ω～6.5535Ω (power of frequency converter>55kW)	Tuning parameter	★
P1-07	Rotor resistance of asynchronous motor	0.001Ω ~ 65.535Ω (power of frequency converter<=55kW 0.0001Ω～6.5535Ω (power of frequency converter>55kW)	Tuning parameter	★
P1-08	Leakage inductive reactance of asynchronous motor	0.01mH ~ 655.35mH (power of frequency converter<=55kW) 0.001mH ~ 65.535mH (power of frequency converter>55kW)	Tuning parameter	★
P1-09	Mutual inductive reactance of asynchronous motor	0.1mH ~ 6553.5mH (power of frequency converter<=55kW) 0.01mH ~ 655.35mH (power of frequency converter>55kW)	Tuning parameter	★
P1-10	No-load current of asynchronous motor	0.01A ~ P1-03 (power of frequency converter<=55kW) 0.1A ~ P1-03 (power of frequency converter>55kW)	Tuning parameter	★
P1-27	Line number of encoder	1 ~ 65535	1024	★
P1-28	Type of encoder	0: ABZ incremental encoder 1: Standby 2: Rotary transformer	0	★
P1-30	AB phase sequence of ABZ incremental encoder	0: Forward direction 1: Reverse direction	0	★
P1-34	Number of pole-pairs of rotating transformer	1 ~ 65535	1	★
P1-36	Disconnection detection of speed feedback PG	0.0: no action 0.1s ~ 10.0s	0.0	★
F1-37	Tuning selection	0: No operation 1: Static tuning of asynchronous motor 2: Complete tuning of asynchronous motor	0	★
P2 group Vector control parameters of the first motor				

Function code	Name	Setting range	Factory default	Modify
P2-00	Proportional gain 1 of speed loop	1 ~ 100	30	☆
P2-01	Integral time 1 of speed loop	0.01s ~ 10.00s	0.50s	☆
P2-02	Switching frequency 1	0.00 ~ P2-05	5.00Hz	☆
P2-03	Proportional gain 2 of speed loop	1 ~ 100	20	☆
P2-04	Integral time 2 of speed loop	0.01s ~ 10.00s	1.00s	☆
P2-05	Switching frequency 2	P2-02 ~ maximum frequency	10.00Hz	☆
P2-06	Slip gain of vector control	50% ~ 200%	100%	☆
P2-07	Filter time constant of speed loop	0.000s ~ 0.100s	0.000s	☆
P2-08	Over-excitation gain of vector control	0 ~ 200	64	☆
P2-09	Upper-limit source of torque under speed control mode	0: Setting of function code P2-10 1: AI1 2: AI2 3: AI3 4: PULSE setting 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1,AI2) Full range of item 1-7 corresponds to P2-10	0	☆
P2-10	Upper-limit digital setting of torque under speed control mode	0.0% ~ 200.0%	150.0%	☆
P2-13	Proportional gain of excitation regulation	0 ~ 60000	2000	☆
P2-14	Integral gain of excitation regulation	0 ~ 60000	1300	☆
P2-15	Proportional gain of torque regulation	0 ~ 60000	2000	☆
P2-16	Integral gain of torque regulation	0 ~ 60000	1300	☆
P3 group V/F control parameters				
P3-00	VF curve setting	0: Straight-line V/F 1: Multi-point V/F 2: Square V/F 3: 1.2 power V/F 4: 1.4 power V/F 6: 1.6 power V/F 8: 1.8 power V/F 9: Reserve 10: Complete separation mode of VF 11: Semi-separation mode of VF	0	★

Function code	Name	Setting range	Factory default	Modify
P3-01	Torque promotion	0.0%: (automatic torque promotion) 0.1% ~ 30.0%	Depend on machine type	☆
P3-02	Cut-off frequency of torque promotion	0.00Hz ~ maximum frequency	50.00Hz	★
P3-03	Frequency point 1 of multi-point VF	0.00Hz ~ P3-05	0.00Hz	★
P3-04	Voltage point 1 of multi-point VF	0.0% ~ 100.0%	0.0%	★
P3-05	Frequency point 2 of multi-point VF	P3-03 ~ P3-07	0.00Hz	★
P3-06	Voltage point 2 of multi-point VF	0.0% ~ 100.0%	0.0%	★
P3-07	Frequency point 3 of multi-point VF	P3-05 ~ rated frequency of motor (P1-04)	0.00Hz	★
P3-08	Voltage point 3 of multi-point VF	0.0% ~ 100.0%	0.0%	★
P3-09	VF slip compensation gain	0.0% ~ 200.0%	0.0%	☆
P3-10	VF over-excitation gain	0 ~ 200	64	☆
P3-11	VF oscillation suppression gain	0 ~ 100	Depend on machine type	☆
P3-13	VF separated voltage source	0: Digital setting (P3-14) 1: AI1 2: AI2 3: AI3 4: PULSE setting (DI5) 5: Multi-segment command 6: Simple PLC 7: PID 8: Communication given Note: 100.0% correspond to rated voltage of motor	0	☆
P3-14	Digital setting of VF separated voltage	0V ~ rated voltage of motor	0V	☆
P3-15	Rise time of VF separated voltage	0.0s ~ 1000.0s Note: time of 0V changing to be rated voltage of motor	0.0s	☆
P4 group Input terminal				
P4-00	DI1 terminal function selection	0: No function 1: Forward operation 2: Reverse operation 3: Three-wire operation control 4: Forward jog 5: Reverse jog 6: Terminal UP 7: Terminal DOWN	1	★
P4-01	DI2 terminal function selection		4	★
P4-02	DI3 terminal function selection		9	★
P4-03	DI4 terminal function selection		12	★

Function code	Name	Setting range	Factory default	Modify
P4-04	DI5 terminal function selection	8: Free halt 9: Fault reset 10: Operation stops 11: Normally-open input of external fault 12: Multi-segment command terminal 1 13: Multi-segment command terminal 2 14: Multi-segment command terminal 3 15: Multi-segment command terminal 4 16: Selection terminal 1 of acceleration/ deceleration time 17: Selection terminal 2 of acceleration/ deceleration time 18: Switch of frequency source 19: UP/DOWN setting reset (terminal, keyboard) 20: Switch terminal of operation command 21: Forbid acceleration/ deceleration 22: PLD stops 23: PLC status reset 24: Swing frequency stops 25: Counter input 26: Counter reset 27: Length counter input 28: Length reset 29: Torque control prohibits 30: PULSE frequency input (only valid for DI5) 31: Reserve 32: Immediate DC braking 33: Normally-closed input of external fault 34: Frequency modification enables 35: Reverse PID action direction 36: External halt terminal 1 37: Switch terminal 2 of control command 38: PID integration stops 39: Switch between frequency source X and preset frequency 40: Switch between frequency source Y and preset frequency 41: Motor selection terminal 1 42: Motor selection terminal 2 43: Switch of PID parameters 44: User-defined fault 1 45: User-defined fault 2	13	★

Function code	Name	Setting range	Factory default	Modify
		46: Switch between speed control/ torque control 47: Emergency halt 48: External halt terminal 2 49: Deceleration DC braking 50: Reset running time 51-59: Reserve		
P4-10	Command way of terminal	0: two-wire type 1 1: two-wire type 2 2: two-wire type 1 3: two-wire type 2	0.010s	☆
P4-11	UP/DOWN change rate	0.001Hz/s ~ 65.535Hz/s	0	★
P4-12	Minimum input of AI curve 1	0.00V ~ P4-15	1.00Hz/s	☆
P4-13	Corresponding setting of minimum input of AI curve 1	-100.0% ~ +100.0%	0.00V	☆
P4-14	Maximum input of AI curve 1	P4-13 ~ +10.00V	0.0%	☆
P4-15	Corresponding setting of maximum input of AI curve 1	-100.0% ~ +100.0%	10.00V	☆
P4-16	Filter time of AI1	0.00s ~ 10.00s	100.0%	☆
P4-17	Minimum input of AI curve 2	0.00V ~ P4-20	0.10s	☆
P4-18	Corresponding setting of minimum input of AI curve 2	-100.0% ~ +100.0%	0.00V	☆
P4-19	Maximum input of AI curve 2	P4-18 ~ +10.00V	0.0%	☆
P4-20	Corresponding setting of maximum input of AI curve 2	-100.0% ~ +100.0%	10.00V	☆
P4-21	Filter time of AI2	0.00s ~ 10.00s	100.0%	☆
P4-22	Minimum input of AI curve 3	-10.00V ~ P4-25	0.10s	☆
P4-23	Corresponding setting of minimum input of AI curve 3	-100.0% ~ +100.0%	-10.00V	☆
P4-24	Maximum input of AI curve 3	P4-23 ~ +10.00V	-100.0%	☆
P4-25	Corresponding setting of maximum input of AI curve 3	-100.0% ~ +100.0%	10.00V	☆
P4-26	Filter time of AI3	0.00s ~ 10.00s	100.0%	☆
P4-27	Minimum input of PULSE	0.00kHz ~ P4-30	0.10s	☆
P4-28	Corresponding setting of	-100.0% ~ 100.0%	0.00kHz	☆

Function code	Name	Setting range	Factory default	Modify
	minimum input of PULSE			
P4-29	Maximum input of PULSE	P4-28 ~ 100.00kHz	0.0%	☆
P4-30	Maximum input setting of PULSE	-100.0% ~ 100.0%	50.00kHz	☆
P4-31	Filter time of PULSE	0.00s ~ 10.00s	100.0%	☆
P4-32	AI curve selection	Units digit: AI curve selection 1: Curve 1 (2 points, refer to P4-13 ~ P4-16) 2: Curve 2 (2 points, refer to P4-18 ~ P4-21) 3: Curve 3 (2 points, refer to P4-23 ~ P4-26) 4: Curve 4 (4 points, refer to A6-00 ~ A6-07) 5: Curve 5 (4 points, refer to A6-08 ~ A6-15) Tens digit: AI2 curve selection, ditto Hundreds digit: AI3 curve selection, ditto	0.10s	☆
P4-33	Setting selection of AI being lower than minimum input	Units digit: setting selection of AI1 being lower than minimum input 0: correspond to minimum input setting 1: 0.0% Tens digit: setting selection of AI2 being lower than minimum input, ditto Hundreds digit: setting selection of AI3 being lower than minimum input, ditto	321	☆
P4-34	DI1 delay time	0.0s ~ 3600.0s	000	☆
P4-35	DI2 delay time	0.0s ~ 3600.0s	0.0s	★
P4-36	DI3 delay time	0.0s ~ 3600.0s	0.0s	★
P4-37	Effective mode selection 1 of DI terminal	0: High level is valid 1: Low level is valid Units digit: DI1; Tens digit: DI2; Hundreds digit: DI3; Thousands digit: DI4; Ten-thousand digit: DI5	0.0s	★
P4-38	Effective mode selection 2 of DI terminal	0: High level is valid 1: Low level is valid Units digit: DI6; Tens digit: DI7; Hundreds digit: DI8; Thousands digit: DI9; Ten-thousand digit: DI10	00000	★
P4-39	Command way of terminal	0: two-wire type 1 1: two-wire type 2 2: two-wire type 1 3: two-wire type 2	00000	★
P5 group Output terminal				
P5-02	Function selection of relay on control panel	0: No output 1: Frequency converter under operation	2	☆

Function code	Name	Setting range	Factory default	Modify
	(T/A-T/B-T/C)	2: Fault output (fault halts)		
P5-04	DO1 output function selection	3: Frequency level detects FDT1 output 4: Frequency arrives 5: Zero-speed operation (no output when halting) 6: Overload pre-alarm of motor 7: Overload pre-alarm of frequency converter 8: Set count value arrives 9: Designated count value arrives 10: Length arrives 11: PLC cycle finishes 12: Accumulative running time arrives 13: Frequency under limitation 14: Torque under limitation 15: Readiness for operation 16: AI1>AI2 17: Upper-limit frequency arrives 18: Lower-limit frequency arrives (related to operation) 19: Under-voltage status output 20: Communication setting 21: Positioning finishes (reserve) 22: Positioning approaches (reserve) 23: Zero-speed operation 2 (output when halting) 24: Accumulative electrifying time arrives 25: Frequency level detects FDT2 output 26: Frequency 1 arrives output 27: Frequency 2 arrives output 28: Current 1 arrives output 29: Current 2 arrives output 30: Timing arrives output 31: AI1 input exceeds limitation 32: Load failure 33: Under reverse operation 34: Zero-current status 35: Module temperature arrives 36: Output current exceeds limitation 37: Lower-limit frequency arrives (output when halting) 38: Alarm output (continue operation) 39: Over-temperature pre-alarm of motor 40: Running time arrives	1 4	☆ ☆

Function code	Name	Setting range	Factory default	Modify
P5-07	AO1 output function selection	0: Running frequency 1: Setting frequency 2: Output current 3: Output torque 4: Output power 5: Output voltage 6: PULSE input (100.% corresponds to 100.0kHz) 7: AI1 (panel potentiometer) 8: AI2 9: AI3 (remote panel potentiometer) 10: Length 11: Counter value 12: Communication given 13: Motor speed 14: Output current (100.0% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Reserve	0	☆
P5-10	AO1 zero offset coefficient	-100.0% ~ +100.0%	0.0%	☆
P5-11	AO1 gain	-10.00 ~ +10.00	1.00	☆
P5-18	RELAY1 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-19	RELAY2 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-20	DO1 output delay time	0.0s ~ 3600.0s	0.0s	☆
P5-22	Valid status selection of DO output terminal	0: Positive logic 1: Reverse logic Units digit: FMR Tens digit: RELAY1 Thousands digit: DO1	00000	☆
P6 group Start-stop control				
P6-00	Starting mode	0: Start directly 1: Restart speed tracking 2: Start pre-exciting (DC asynchronous motor)	0	☆
P6-01	Speed tracking way	0: Start from halting frequency 1: Start from zero speed 2: Start from maximum frequency	0	★
P6-02	Speed tracking	1 ~ 100	20	☆
P6-03	Starting frequency	0.00Hz ~ 10.00Hz	0.00Hz	☆
P6-04	Retention time of starting frequency	0.0s ~ 100.0s	0.0s	★
P6-05	Starting DC braking current/pre-exciting	0% ~ 100%	0%	★

Function code	Name	Setting range	Factory default	Modify
	current			
P6-06	Starting DC braking time/pre-exciting time	0.0s ~ 100.0s	0.0s	★
P6-07	Acceleration/Deceleration way	0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration A 2: S-curve acceleration/deceleration B	0	★
P6-08	Time proportion of S curve at beginning segment	0.0% ~ (100.0%-P6-09)	30.0%	★
P6-09	Time proportion of S curve at ending segment	0.0% ~ (100.0%-P6-08)	30.0%	★
P6-10	Halt mode	0: Deceleration halt 1: Free halt	0	☆
P6-11	Starting frequency of DC braking when halting	0.00Hz ~ maximum frequency	0.00Hz	☆
P6-12	Waiting time of DC braking when halting	0.0s ~ 100.0s	0.0s	☆
P6-13	DC braking current when halting	0% ~ 100%	0%	☆
P6-14	DC braking time when halting	0.0s ~ 100.0s	0.0s	☆
P6-15	Usage rate of braking	0% ~ 100%	100%	☆
P7 group Keyboard and display				
P7-01	Function selection of JOG key	0: JOG is invalid 1: Switch between command channel of operation panel and remote command channel (terminal command channel or communication command channel) 2: Forward/Reverse switch 3: Forward jog 4: Reverse jog	0	★
P7-02	Function of STOP/RESET key	0: Halt function of STOP/RES is only valid under keyboard operation mode 1: Halt function of STOP/RES is valid under any operation mode	1	☆
P7-03	Display parameters of LED operation 1	0000 ~ FFFF Bit00: Running frequency 1 (Hz) Bit01: Setting frequency (Hz) Bit02: Bus voltage (V) Bit03: Output voltage (V) Bit04: Output current (A) Bit05: Output power (kW) Bit06: Output torque (%) Bit07: DI input status Bit08: DO output status Bit09: AI1 voltage (V)	1F	☆

Function code	Name	Setting range	Factory default	Modify
		Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: Counter value Bit13: Length value Bit14: Display of load speed Bit15: PID setting		
P7-04	Display parameters of LED operation 2	0000 ~ FFFF Bit00: PID feedback Bit01: PLC stage Bit02: PULSE frequency (kHz) Bit03: Running frequency 2 (Hz) Bit04: Residual running time Bit05: voltage of AI1 before calibration (V) Bit06: voltage of AI2 before calibration (V) Bit07: voltage of AI3 before calibration (V) Bit08: Linear speed Bit09: Current electrifying time (Hour) Bit10: Current running time (Min) Bit11: PULSE frequency (Hz) Bit12: Setting value of communication Bit13: Feedback speed of encoder (Hz) Bit14: X display of principal frequency (Hz) Bit15: Y display of auxiliary frequency (Hz)	0	☆
P7-05	Display parameters of LED halt	0000 ~ FFFF Bit00: Setting frequency (Hz) Bit01: Bus voltage (V) Bit02: DI input status Bit03: DO output status Bit04: AI1 voltage (V) Bit05: AI2 voltage (V) Bit06: AI3 voltage (V) Bit07: Count value Bit08: Length value Bit09: PLC stage Bit10: Load speed Bit11: PID setting Bit12: PULSE frequency (kHz)	33	☆
P7-06	Display coefficient of load speed	0.0001 ~ 6.5000	1.0000	☆
P7-07	Radiator temperature of inverter module	0.0℃ ~ 100.0℃	-	●
P7-08	Radiator temperature of	0.0℃ ~ 100.0℃	-	●

Function code	Name	Setting range	Factory default	Modify
	rectifier bridge			
P7-09	Accumulative running time	0h ~ 65535h	-	●
P7-10	Product number	-	-	●
P7-11	Software version number	-	-	●
P7-12	Display decimal point digit of load speed	0: 0 decimal point 1: 1 decimal point 2: 2 decimal points 3: 3 decimal points	1	☆
P7-13	Accumulative electrifying time	0h ~ 65535h	-	●
P7-14	Accumulative power consumption	0 ~ 65535 kilowatt hours	-	●
P8 group Auxiliary function				
P8-00	Running frequency of jog	0.00Hz ~ maximum frequency	2.00Hz	☆
P8-01	Acceleration time of jog	0.0s ~ 6500.0s	20.0s	☆
P8-02	Deceleration time of jog	0.0s ~ 6500.0s	20.0s	☆
P8-03	Acceleration time 2	0.0s ~ 6500.0s	Depend on machine type	☆
P8-04	Deceleration time 2	0.0s ~ 6500.0s	Depend on machine type	☆
P8-05	Acceleration time 3	0.0s ~ 6500.0s	Depend on machine type	☆
P8-06	Deceleration time 3	0.0s ~ 6500.0s	Depend on machine type	☆
P8-07	Acceleration time 4	0.0s ~ 6500.0s	Depend on machine type	☆
P8-08	Deceleration time 4	0.0s ~ 6500.0s	Depend on machine type	☆
P8-09	Hopping frequency 1	0.00Hz ~ maximum frequency	0.00Hz	☆
P8-10	Hopping frequency 2	0.00Hz ~ maximum frequency	0.00Hz	☆
P8-11	Hopping frequency range	0.00Hz ~ maximum frequency	0.01Hz	☆
P8-12	Forward/Reverse dead time	0.0s ~ 3000.0s	0.0s	☆
P8-13	Reverse control enables	0: Allow 1: Prohibit	0	☆
P8-14	Operation mode of setting frequency being lower than lower-limit frequency	0: Run at lower-limit frequency 1: Halt 2: Zero-speed operation	0	☆
P8-15	Droop control	0.00Hz ~ 10.00Hz	0.00Hz	☆
P8-16	Set accumulative electrifying arrival time	0h ~ 65000h	0h	☆
P8-17	Set accumulative operation arrival time	0h ~ 65000h	0h	☆
P8-18	Start protection selection	0: No protection 1: protection	0	☆
P8-19	Frequency detection	0.00Hz ~ maximum frequency	50.00Hz	☆

Function code	Name	Setting range	Factory default	Modify
	value (FDT1)			
P8-20	Lagged value of frequency detection (FDT1)	0.0% ~ 100.0% (FDT1 level)	5.0%	☆
P8-21	Detection width of frequency arrival	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-22	If hopping frequency is valid during acceleration/ deceleration process	0: Invalid 1: valid	0	☆
P8-25	Switch frequency point of acceleration time 1 and acceleration time 2	0.00Hz ~ maximum frequency	0.00Hz	☆
P8-26	Switch frequency point of deceleration time 1 and deceleration time 2	0.00Hz ~ maximum frequency	0.00Hz	☆
P8-27	Priority of terminal jog	0: Invalid 1: valid	0	☆
P8-28	Frequency detection value (FDT2)	0.00Hz ~ maximum frequency	50.00Hz	☆
P8-29	Lagged value of frequency detection (FDT2)	0.0% ~ 100.0% (FDT2 level)	5.0%	☆
P8-30	Detection value 1 of any arrival frequency	0.00Hz ~ maximum frequency	50.00Hz	☆
P8-31	Detection width 1 of any arrival frequency	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-32	Detection value 2 of any arrival frequency	0.00Hz ~ maximum frequency	50.00Hz	☆
P8-33	Detection width 2 of any arrival frequency	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8-34	Detection level of zero current	0.0% ~ 300.0% 100.0% corresponds to rated current of motor	5.0%	☆
P8-35	Detect delay time of zero current	0.01s ~ 600.00s	0.10s	☆
P8-36	Ultra-limit value of output current	0.0% (no detection) 0.1% ~ 300.0% (rated current of motor)	200.0%	☆
P8-37	Ultra-limit output current detects delay time	0.00s ~ 600.00s	0.00s	☆
P8-38	Any arrival current 1	0.0% ~ 300.0% (rated current of motor)	100.0%	☆
P8-39	Width of any arrival current 1	0.0% ~ 300.0% (rated current of motor)	0.0%	☆
P8-40	Any arrival current 2	0.0% ~ 300.0% (rated current of motor)	100.0%	☆
P8-41	Width of any arrival current 2	0.0% ~ 300.0% (rated current of motor)	0.0%	☆
P8-42	Timing function selection	0: Invalid 1: valid	0	☆
P8-43	Selection of timing	0: P8-44 setting	0	☆

Function code	Name	Setting range	Factory default	Modify
	operation time	1: AI1 2: AI2 3: AI3 Range of analog input corresponds to P8-44		
P8-44	Timing operation time	0.0Min ~ 6500.0Min	0.0Min	☆
P8-45	Lower-limit protection value of AI1 input voltage	0.00V ~ P8-46	3.10V	☆
P8-46	Upper-limit protection value of AI1 input voltage	P8-45 ~ 10.00V	6.80V	☆
P8-47	Module temperature arrives	0℃ ~ 100℃	75℃	☆
P8-48	Cooling fan control	0: Fan operates while running 1: Fan operates all the time	0	☆
P8-49	Awakening frequency	Dormant frequency (P8-51) ~ maximum frequency (P0-10)	0.00Hz	☆
P8-50	Awakening delay time	0.0s ~ 6500.0s	0.0s	☆
P8-51	Dormant frequency	0.00Hz ~ Awakening frequency (P8-49)	0.00Hz	☆
P8-52	Dormant delay time	0.0s ~ 6500.0s	0.0s	☆
P8-53	Setting of operation arrival time	0.0Min ~ 6500.0Min	0.0Min	☆
P9 group Fault and protection				
P9-00	Overload protection selection of motor	0: Prohibit 1: allow	1	☆
P9-01	Overload protection gain of motor	0.20 ~ 10.00	1.00	☆
P9-02	Overload pre-alarm coefficient of motor	50% ~ 100%	80%	☆
P9-03	Over-voltage stall gain	0 ~ 100	0	☆
P9-04	Over-voltage stall protection voltage	120% ~ 150%	130%	☆
P9-05	Over-current stall gain	0 ~ 100	20	☆
P9-06	Over-current stall protection current	100% ~ 200%	150%	☆
P9-07	Over-earth short-circuit protection selection while electrifying	0: Invalid 1: Valid	1	☆
P9-09	Automatic reset time of fault	0 ~ 20	0	☆
P9-10	DO selection of fault during period of automatic rest	0: No action 1: Action	0	☆
P9-11	Interval time of automatic reset of fault	0.1s ~ 100.0s	1.0s	☆

Function code	Name	Setting range	Factory default	Modify
P9-12	Open-phase protection selection of input	0: Prohibit 1: allow	1	☆
P9-13	Open-phase protection selection of output	0: Prohibit 1: allow	1	☆
P9-14	The first fault type	0: No fault 1: Reserve 2: Accelerated over-current 3: Decelerated over-current 4: Constant-speed over-current 5: Accelerated over-voltage 6: Decelerated over-voltage 7: Constant-speed over-voltage 8: Buffer resistance overload 9: Under-voltage 10: Overload of frequency converter 11: Overload of motor 12: Default phase of input	-	●
P9-15	The second fault type	13: Default phase of output 14: Over-temperature of module 15: External fault 16: Abnormal communication 17: Abnormal contactor 18: Abnormal current detection 19: Abnormal motor tuning 20: Abnormal encoder/PG card 21: Abnormal read-write of parameter 22: Abnormal hardware of frequency converter 23: Over-earth short-circuit of motor 24: Reserve 25: Reserve	-	●
P9-16	The third (last time) fault type	26: Running time arrives 27: User-defined fault 1 28: User-defined fault 2 29: Electrifying time arrives 30: Load failure 31: PID feedback losses while running 40: Rapid current limitation overtimes 41: Switch motor while running 42: Too large speed variation 43: Over-speed of motor 45: Over-temperature of motor 51: Error of initial location	-	●
P9-17	Frequency of the third (last time) fault	-	-	●
P9-18	Current of the third (last time) fault	-	-	●

Function code	Name	Setting range	Factory default	Modify
P9-19	Bus voltage of the third (last time) fault	-	-	●
P9-20	Input terminal status of the third (last time) fault	-	-	●
P9-21	Output terminal status of the third (last time) fault	-	-	●
P9-22	Frequency converter status of the third (last time) fault	-	-	●
P9-23	Electrifying time of the third (last time) fault	-	-	●
P9-24	Running time of the third (last time) fault	-	-	●
P9-27	Frequency of the second fault	-	-	●
P9-28	Current of the second fault	-	-	●
P9-29	Bus voltage of the second fault	-	-	●
P9-30	Input terminal status of the second fault	-	-	●
P9-31	Output terminal status of the second fault	-	-	●
P9-32	Frequency converter status of the second fault	-	-	●
P9-33	Electrifying time of the second fault	-	-	●
P9-34	Running time of the second fault	-	-	●
P9-37	Frequency of the first fault	-	-	●
P9-38	Current of the first fault	-	-	●
P9-39	Bus voltage of the first fault	-	-	●
P9-40	Input terminal status of the first fault	-	-	●
P9-41	Output terminal status of the first fault	-	-	●
P9-42	Frequency converter status of the first fault	-	-	●
P9-43	Electrifying time of the first fault	-	-	●
P9-44	Running time of the first fault	-	-	●
P9-47	Fault protection action selection 1	Units digit: overload of motor (11) 0: Free halt	00000	☆

Function code	Name	Setting range	Factory default	Modify
		1: Halt as per halting way 2: Continue running Tens digit: default phase of input (12) Hundreds digit: default phase of output (13) Thousands digit: external fault (15) Ten-thousand digit: abnormal communication (16)		
P9-48	Fault protection action selection 2	Units digit: abnormal encoder/PG card (20) 0: Free halt Tens digit: abnormal read-write of function code (21) 0: Free halt 1: Halt as per halting way Hundreds digit: reserve Thousands digit: over-temperature of motor (25) Ten-thousand digit: running time arrives (26)	00000	☆
P9-49	Fault protection action selection 3	Units digit: user-defined fault 1 (27) 0: Free halt 1: Halt as per halting way 2: Continue running Tens digit: user-defined fault 1 (28) 0: Free halt 1: Halt as per halting way 2: Continue running Hundreds digit: electrifying time arrives (29) 0: Free halt 1: Halt as per halting way 2: Continue running Thousands digit: load failure (30) 0: Free halt 1: Decelerate to halt 2: Decelerate to 7% of rated frequency of motor and continue running, recover to setting frequency for running in the case of no load failure Ten-thousand digit: PID feedback loss while running (31) 0: Free halt 1: Halt as per halting way 2: Continue running	00000	☆
P9-50	Fault protection action selection 4	Units digit: too large speed variation (42)	00000	☆

Function code	Name	Setting range	Factory default	Modify
		0: Free halt 1: Halt as per halting way 2: Continue running Tens digit: over-speed of motor (43) Hundreds digit: error of initial position (51)		
P9-54	Continual running frequency selection in the case of fault	0: Run at current running frequency 1: Run at setting frequency 2: Run at upper-limit frequency 3: Run at lower-limit frequency 4: Run at abnormal standby frequency	0	☆
P9-55	Abnormal standby frequency	60.0% ~ 100.0% (100.0% corresponds to maximum frequency P0-10)	100.0%	☆
P9-57	Over-temperature protection threshold value of motor	0℃ ~ 200℃	110℃	☆
P9-58	Over-temperature pre-alarm threshold value of motor	0℃ ~ 200℃	90℃	☆
P9-59	Action selection of instant power failure	0: Invalid 1: Decelerate 2: Decelerate to halt	0	☆
P9-60	Reserve	P9-62 ~ 100.0%	100.0%	☆
P9-61	Voltage promotion judgment time of instant power failure	0.00s ~ 100.00s	0.50s	☆
P9-62	Judgement voltage of instant failure action	60.0% ~ 100.0% (standard bus voltage)	80.0%	☆
P9-63	Load-failure protection selection	0: Invalid 1: Valid	0	☆
P9-64	Load-failure detection level	0.0 ~ 100.0%	10.0%	☆
P9-65	Load-failure detection time	0.0 ~ 60.0s	1.0s	☆
P9-67	Over-speed detection value	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-68	Over-speed detection time	0.0s ~ 60.0s	5.0s	☆
P9-69	Detection value of too large speed variation	0.0% ~ 50.0% (maximum frequency)	20.0%	☆
P9-70	Detection time of too large speed variation	0.0s ~ 60.0s	0.0s	☆
PA group PID function				
PA-00	PID given source	0: PA-01 setting 1: AI1	0	☆

Function code	Name	Setting range	Factory default	Modify
		2: AI2 3: AI3 4: PULSE setting (DI5) 5: Communication given 6: Multi-segment command given		
PA-01	PID value given	0.0% ~ 100.0%	50.0%	☆
PA-02	PID feedback source	0: AI1 1: AI2 2: AI3 3: AI1-AI2 4: PULSE setting (DI5) 5: Communication given 6: AI1+AI2 7: MAX（|AI1|, |AI2|） 8: MIN（|AI1|, |AI2|）	0	☆
PA-03	PID action direction	0: Forward action 1: Reverse action	0	☆
PA-04	PID given feedback range	0 ~ 65535	1000	☆
PA-05	Proportional gain Kp1	0.0 ~ 100.0	20.0	☆
PA-06	Integral time Ti1	0.01s ~ 10.00s	2.00s	☆
PA-07	Differential time Td1	0.000s ~ 10.000s	0.000s	☆
PA-08	PID reverse cut-off frequency	0.00 ~ maximum frequency	2.00Hz	☆
PA-09	PID deviation limitation	0.0% ~ 100.0%	0.0%	☆
PA-10	Differential limitation range of PID	0.00% ~ 100.00%	0.10%	☆
PA-11	Variation time of PID given	0.00 ~ 650.00s	0.00s	☆
PA-12	Filter time of PID feedback	0.00 ~ 60.00s	0.00s	☆
PA-13	Filter time of PID output	0.00 ~ 60.00s	0.00s	☆
PA-14	Reserve	-	-	☆
PA-15	Proportional gain Kp2	0.0 ~ 100.0	20.0	☆
PA-16	Integral time Ti2	0.01s ~ 10.00s	2.00s	☆
PA-17	Differential time Td2	0.000s ~ 10.000s	0.000s	☆
PA-18	Switching condition of PID parameters	0: Not switch 1: Switch through DI terminal 2: Switch automatically as per deviation	0	☆
PA-19	Switching deviation 1 of PID parameters	0.0% ~ PA-20	20.0%	☆
PA-20	Switching deviation 2 of PID parameters	PA-19 ~ 100.0%	80.0%	☆
PA-21	Initial value of PID	0.0% ~ 100.0%	0.0%	☆
PA-22	Retention time of initial value of PID	0.00 ~ 650.00s	0.00s	☆
PA-23	Forward maximum value	0.00% ~ 100.00%	1.00%	☆

Function code	Name	Setting range	Factory default	Modify
	of two output deviations			
PA-24	Reverse maximum value of two output deviations	0.00% ~ 100.00%	1.00%	☆
PA-25	Integral property of PID	Units digit: integration separation 0: Invalid 1: Valid Tens digit: if stop integration after outputting to limited value 0: Continue integration 1: Stop integration	00	☆
PA-26	Detection value of PID feedback loss	0.0%: Not judge feedback loss 0.1% ~ 100.0%	0.0%	☆
PA-27	Detection time of PID feedback loss	0.0s ~ 20.0s	0.0s	☆
PA-28	Halt operation of PID	0: Not operate while halting 1: Operate while halting	0	☆
Pb group Swing frequency, fixed length, count				
Pb-00	Setting way of swing frequency	0: Be relative to central frequency 1: Be relative to maximum frequency	0	☆
Pb-01	Range of swing frequency	0.0% ~ 100.0%	0.0%	☆
Pb-02	Range of kick frequency	0.0% ~ 50.0%	0.0%	☆
Pb-03	Cycle of swing frequency	0.1s ~ 3000.0s	10.0s	☆
Pb-04	Rise time of triangular wave of swing frequency	0.1% ~ 100.0%	50.0%	☆
Pb-05	Setting length	0m ~ 65535m	1000m	☆
Pb-06	Actual length	0m ~ 65535m	0m	☆
Pb-07	Pulse number per meter	0.1 ~ 6553.5	100.0	☆
Pb-08	Setting count value	1 ~ 65535	1000	☆
Pb-09	Designated count value	1 ~ 65535	1000	☆
PC group Multi-segment command, simple PLC				
PC-00	Multi-seg command 0	-100.0% ~ 100.0%	0.0%	☆
PC-01	Multi-seg command 1	-100.0% ~ 100.0%	0.0%	☆
PC-02	Multi-seg command 2	-100.0% ~ 100.0%	0.0%	☆
PC-03	Multi-seg command 3	-100.0% ~ 100.0%	0.0%	☆
PC-04	Multi-seg command 4	-100.0% ~ 100.0%	0.0%	☆
PC-05	Multi-seg command 5	-100.0% ~ 100.0%	0.0%	☆
PC-06	Multi-seg command 6	-100.0% ~ 100.0%	0.0%	☆
PC-07	Multi-seg command 7	-100.0% ~ 100.0%	0.0%	☆
PC-08	Multi-seg command 8	-100.0% ~ 100.0%	0.0%	☆
PC-09	Multi-seg command 9	-100.0% ~ 100.0%	0.0%	☆
PC-10	Multi-seg command 10	-100.0% ~ 100.0%	0.0%	☆
PC-11	Multi-seg command 11	-100.0% ~ 100.0%	0.0%	☆
PC-12	Multi-seg command 12	-100.0% ~ 100.0%	0.0%	☆
PC-13	Multi-seg command 13	-100.0% ~ 100.0%	0.0%	☆
PC-14	Multi-seg command 14	-100.0% ~ 100.0%	0.0%	☆

Function code	Name	Setting range	Factory default	Modify
PC-15	Multi-seg command 15	-100.0% ~ 100.0%	0.0%	☆
PC-16	Simple PLC running way	0: Single running ends and halts 1: Single running ends and keeps final value 2: Circulate all the time	0	☆
PC-17	Memory selection of simple PLC in the case of power failure	Units digit: memory selection in the case of power failure 0: No memory in the case of power failure 1: With memory in the case of power failure Tens digit: memory selection in the case of power failure 0: No memory in the case of power failure 1: With memory in the case of power failure	00	☆
PC-18	Running time of 0 segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-19	Acceleration/Deceleration time selection of 0 segment of simple PLC	0 ~ 3	0	☆
PC-20	Running time of 1st segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-21	Acceleration/Deceleration time selection of 1st segment of simple PLC	0 ~ 3	0	☆
PC-22	Running time of 2nd segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-23	Acceleration/Deceleration time selection of 2nd segment of simple PLC	0 ~ 3	0	☆
PC-24	Running time of 3rd segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-25	Acceleration/Deceleration time selection of 3rd segment of simple PLC	0 ~ 3	0	☆
PC-26	Running time of 4th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-27	Acceleration/Deceleration time selection of 4th segment of simple PLC	0 ~ 3	0	☆
PC-28	Running time of 5th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-29	Acceleration/Deceleration time selection of 5th segment of simple PLC	0 ~ 3	0	☆

Function code	Name	Setting range	Factory default	Modify
PC-30	Running time of 6th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-31	Acceleration/Deceleration time selection of 6th segment of simple PLC	0 ~ 3	0	☆
PC-32	Running time of 7th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-33	Acceleration/Deceleration time selection of 7th segment of simple PLC	0 ~ 3	0	☆
PC-34	Running time of 8th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-35	Acceleration/Deceleration time selection of 8th segment of simple PLC	0 ~ 3	0	☆
PC-36	Running time of 9th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-37	Acceleration/Deceleration time selection of 9th segment of simple PLC	0 ~ 3	0	☆
PC-38	Running time of 10th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-39	Acceleration/Deceleration time selection of 10h segment of simple PLC	0 ~ 3	0	☆
PC-40	Running time of 11th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-41	Acceleration/Deceleration time selection of 11th segment of simple PLC	0 ~ 3	0	☆
PC-42	Running time of 12th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-43	Acceleration/Deceleration time selection of 12th segment of simple PLC	0 ~ 3	0	☆
PC-44	Running time of 13th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-45	Acceleration/Deceleration time selection of 13th segment of simple PLC	0 ~ 3	0	☆
PC-46	Running time of 14th segment of simple PLC	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆
PC-47	Acceleration/Deceleration time selection of 14th segment of simple PLC	0 ~ 3	0	☆
PC-48	Running time of 15th	0.0s (h) ~ 6553.5s (h)	0.0s（h）	☆

Function code	Name	Setting range	Factory default	Modify
	segment of simple PLC			
PC-49	Acceleration/Deceleration time selection of 15th segment of simple PLC	0 ~ 3	0	☆
PC-50	Running time unit of simple PLC	0: s 1: h	0	☆
PC-51	Given way of multi-seg command 0	0: Function code PC-00 given 1: AI1 2: AI2 3: AI3 4: PULSE 5: PID 6: Preset frequency (P0-08) given, UP/ DOWN can be modified	0	☆
Pd group Communication parameters				
Pd-00	Baud rate	Units digit: MODBUS 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS Tens digit: reserve Hundreds digit: reserve Thousands digit: CANlink baud rate 0: 20 1: 50 2: 100 3: 125 4: 250 5: 500 6: 1M	6005	☆
Pd-01	Data format	0: No verification (8-N-2) 1: Even verification (8-E-1) 2: Odd verification (8-O-1) 3: 8-N-1	0	☆
Pd-02	Machine address	1 ~ 247, 0 is broadcast address	1	☆
Pd-03	Answering delay	0ms ~ 20ms	2	☆
Pd-04	Communication overtime	0.0 (invalid), 0.1s ~ 60.0s	0.0	☆
Pd-05	Data transfer format selection	Units digit: MODBUS 0: Non-standard MODBUS protocol 1: Standard MODBUS protocol Tens digit: reserve	30	☆

Function code	Name	Setting range	Factory default	Modify
Pd-06	Communication reads current resolution ratio	0: 0.01A 1: 0.1A	0	☆
PE group User-customized function code				
PE-00	User function code 0	P0-00 ~ PF-xx A0-00 ~ Ax-xx U0-xx ~ U0-xx	P0.10	☆
PE-01	User function code 1		P0.02	☆
PE-02	User function code 2		P0.03	☆
PE-03	User function code 3		P0.07	☆
PE-04	User function code 4		P0.08	☆
PE-05	User function code 5		P0.17	☆
PE-06	User function code 6		P0.18	☆
PE-07	User function code 7		P3.00	☆
PE-08	User function code 8		P3.01	☆
PE-09	User function code 9		P4.00	☆
PE-10	User function code 10		P4.01	☆
PE-11	User function code 11		P4.02	☆
PE-12	User function code 12		P5.04	☆
PE-13	User function code 13		P5.07	☆
PE-14	User function code 14		P6.00	☆
PE-15	User function code 15		P6.10	☆
PE-16	User function code 16		P0.00	☆
PE-17	User function code 17		P0.00	☆
PE-18	User function code 18		P0.00	☆
PE-19	User function code 19		P0.00	☆
PE-20	User function code 20		P0.00	☆
PE-21	User function code 21		P0.00	☆
PE-22	User function code 22		P0.00	☆
PE-23	User function code 23		P0.00	☆
PE-24	User function code 24		P0.00	☆
PE-25	User function code 25		P0.00	☆
PE-26	User function code 26		P0.00	☆
PE-27	User function code 27		P0.00	☆
PE-28	User function code 28		P0.00	☆
PE-29	User function code 29		P0.00	☆
PF group Function code management				
PF-00	User password	0 ~ 65535	0	☆
PF-01	Parameter initialization	0: No operation 01: Recover factory parameters, excluding motor parameters 02: Clear record information 04: Backup current parameters of user 501: Recover backup parameters of user	0	★
PF-02	Display selection of function parameter group	Units digit: display selection of U group 0: Not display 1: Display	11	★

Function code	Name	Setting range	Factory default	Modify
		Tens digit: display selection of A group 0: Not display 1: Display		
PF-03	Display selection of personalized parameter group (this function is valid for 200G and invalid for 200MN)	Units digit: display selection of user-customized parameter group 0: Not display 1: Display Tens digit: display selection of user-modified parameter group 0: Not display 1: Display	00	☆
PF-04	Modifying attribute of function code	0: Can be modified 1: Can't be modified	0	☆
A0 group Torque control parameters				
A0-00	Control mode selection of speed/torque	0: Speed control 1: Torque control	0	★
A0-01	Torque setting source selection under torque control mode	0: Digital setting 1 (A0-03) 1: AI1 (panel potentiometer) 2: AI2 3: AI3 (remote panel potentiometer) 4: PULSE 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1,AI2) (Full range of item 1-7, correspond to digital setting of A0-03)	0	★
A0-03	Digital setting of torque under torque control mode	-200.0% ~ 200.0%	150.0%	☆
A0-05	Forward maximum frequency of torque control	0.00Hz ~ maximum frequency	50.00Hz	☆
A0-06	Reverse maximum frequency of torque control	0.00Hz ~ maximum frequency	50.00Hz	☆
A0-07	Acceleration time of vector control	0.00s ~ 65000s	0.00s	☆
A0-08	Deceleration time of vector control	0.00s ~ 65000s	0.00s	☆
A1 group (reserve)				
A2 group Control of the second motor				
A2-00	Motor type selection	0: Common asynchronous motor 1: Variable frequency asynchronous motor	0	★
A2-01	Rated power of motor	0.1kW ~ 1000.0kW	Depend on machine type	★
A2-02	Rated voltage of motor	1V ~ 400V	Depend on	★

Function code	Name	Setting range	Factory default	Modify
			machine type	
A2-03	Rated current of motor	0.01A ~ 655.35A (power of frequency converter <=55kW 0.1A ~ 6553.5A (power of frequency converter>55kW)	Depend on machine type	★
A2-04	Rated frequency of motor	0.01Hz ~ maximum frequency	Depend on machine type	★
A2-05	Rated speed of motor	1rpm ~ 65535rpm	Depend on machine type	★
A2-06	Stator resistance of asynchronous motor	0.001Ω ~ 65.535Ω (power of frequency converter<=55kW) 0.0001Ω～6.5535Ω (power of frequency converter>55kW)	Depend on machine type	★
A2-07	Rotor resistance of asynchronous motor	0.001Ω ~ 65.535Ω (power of frequency converter<=55kW) 0.0001Ω～6.5535Ω (power of frequency converter>55kW)	Depend on machine type	★
A2-08	Leakage inductive reactance of asynchronous motor	0.01mH ~ 655.35mH (power of frequency converter<=55kW) 0.001mH ~ 65.535mH (power of frequency converter>55kW)	Depend on machine type	★
A2-09	Mutual inductive reactance of asynchronous motor	0.1mH ~ 6553.5mH (power of frequency converter<=55kW) 0.01mH ~ 655.35mH (power of frequency converter>55kW)	Depend on machine type	★
A2-10	No-load current of asynchronous motor	0.01A ~ A2-03 (power of frequency converter<=55kW) 0.1A ~ A2-03 (power of frequency converter>55kW)	Depend on machine type	★
A2-27	Line number of encoder	1 ~ 65535	1024	★
A2-28	Type of encoder	0: ABZ incremental encoder 1: Reserve 2: Rotary transformer	0	★
A2-29	PG selection of speed feedback	0: Local PG 1: Expanded PG 2：PULSE input (DI5)	0	★
A2-30	AB phase sequence of ABZ incremental encoder	0: Forward direction 1: Reverse direction	0	★
A2-34	Number of pole-pairs of rotating transformer	1 ~ 65535	1	★
A2-36	Disconnection detection of speed feedback PG	0.0: no action 0.1s ~ 10.0s	0.0	★
A2-37	Tuning selection	0: No operation 1: Static tuning of asynchronous motor 2: Complete tuning of asynchronous motor	0	★

Function code	Name	Setting range	Factory default	Modify
A2-38	Proportional gain 1 of speed loop	1 ~ 100	30	☆
A2-39	Integral time 1 of speed loop	0.01s ~ 10.00s	0.50s	☆
A2-40	Switching frequency 1	0.00 ~ A2-43	5.00Hz	☆
A2-41	Proportional gain 2 of speed loop	1 ~ 100	20	☆
A2-42	Integral time 2 of speed loop	0.01s ~ 10.00s	1.00s	☆
A2-43	Switching frequency 2	A2-40 ~ maximum frequency	10.00Hz	☆
A2-44	Slip gain of vector control	50% ~ 200%	100%	☆
A2-45	Filter time constant of speed loop	0.000s ~ 0.100s	0.000s	☆
A2-46	Over-excitation gain of vector control	0 ~ 200	64	☆
A2-47	Upper-limit source of torque under speed control mode	0: A2-48 setting 1: AI1 2: AI2 3: AI3 4: PULSE setting 5: Communication given 6: MIN (AI1, AI2) 7: MAX (AI1, AI2) Full range of item 1-7 corresponds to digital setting of A2-48	0	☆
A2-48	Upper-limit digital setting of torque under speed control mode	0.0% ~ 200.0%	150.0%	☆
A2-51	Proportional gain of excitation regulation	0 ~ 20000	2000	☆
A2-52	Integral gain of excitation regulation	0 ~ 20000	1300	☆
A2-53	Proportional gain of torque regulation	0 ~ 20000	2000	☆
A2-54	Integral gain of torque regulation	0 ~ 20000	1300	☆
A2-55	Integral attribute of speed loop	Units digit: integral separation 0: Invalid 1: Valid	0	☆
A2-61	Control mode of the second motor	0: Speed sensorless vector control (SVC) 1: Speed sensor vector control (FVC) 2: V/F control	0	★
A2-62	Acceleration/Deceleration time selection of the second motor	0: Be the same with the first motor 1: Acceleration/Deceleration time 1 2: Acceleration/Deceleration time 2 3: Acceleration/Deceleration time 3	0	☆

Function code	Name	Setting range	Factory default	Modify
		4: Acceleration/Deceleration time 4		
A2-63	Torque promotion of the second motor	0.0%: Automatic torque promotion 0.1% ~ 30.0%	Depend on machine type	☆
A2-65	Oscillation suppression gain of the second motor	0 ~ 100	Depend on machine type	☆
A5 group Control optimization parameters				
A5-00	DPWM switches upper-limit frequency	0.00Hz ~ 15.00Hz	12.00Hz	☆
A5-01	PWM modulation system	0: Asynchronous modulation 1: Synchronous modulation	0	☆
A5-02	Compensation mode selection of dead time	0: No compensation 1: Compensation mode 1 2: Compensation mode 2	1	☆
A5-03	Random PWM depth	0: Random PWM is invalid 1 ~ 10: Random depth of PWM carrier frequency	0	☆
A5-04	Rapid current limiting enables	0: Not enable 1: Enable	1	☆
A5-05	Current detection compensation	0 ~ 100	5	☆
A5-06	Setting of under-voltage point	60.0% ~ 140.0%	100.0%	☆
A5-07	SVC optimization model selection	0: No optimization 1: Optimization mode 1 2: Optimization mode 2	1	☆
A5-08	Dead time regulation	100% ~ 200%	150%	☆
A6 group AI curve setting				
A6-00	Inflection point 2 input of AI curve 4	A6-02 ~ A6-06	0.00V	☆
A6-01	Corresponding setting of inflection point 2 input of AI curve 4	-100.0% ~ +100.0%	0.0%	☆
A6-02	Maximum input of AI curve 4	A6-06 ~ +10.00V	3.00V	☆
A6-03	Corresponding setting of maximum input of AI curve 4	-100.0% ~ +100.0%	30.0%	☆
A6-04	Minimum input of AI curve 5	-10.00V ~ A6-10	6.00V	☆
A6-05	Corresponding setting of minimum input of AI curve 5	-100.0% ~ +100.0%	60.0%	☆
A6-06	Inflection point 1 input of AI curve 5	A6-08 ~ A6-12	10.00V	☆
A6-07	Corresponding setting of inflection point 1 input of	-100.0% ~ +100.0%	100.0%	☆

Function code	Name	Setting range	Factory default	Modify
	AI curve 5			
A6-08	Inflection point 2 input of AI curve 5	A6-10 ~ A6-14	-10.00V	☆
A6-09	Corresponding setting of inflection point 2 input of AI curve 5	-100.0% ~ +100.0%	-100.0%	☆
A6-10	Maximum input of AI curve 5	A6-12 ~ +10.00V	-3.00V	☆
A6-11	Corresponding setting of maximum input of AI curve 5	-100.0% ~ +100.0%	-30.0%	☆
A6-12	Setting jump point of AI1	-100.0% ~ 100.0%	3.00V	☆
A6-13	Setting jump range of AI1	0.0% ~ 100.0%	30.0%	☆
A6-14	Setting jump point of AI2	-100.0% ~ 100.0%	10.00V	☆
A6-15	Setting jump range of AI2	0.0% ~ 100.0%	100.0%	☆
A6-24	Setting jump point of AI3	-100.0% ~ 100.0%	0.0%	☆
A6-25	Setting jump range of AI3	0.0% ~ 100.0%	0.5%	☆
A6-26	Inflection point 2 input of AI curve 4	A6-02 ~ A6-06	0.0%	☆
A6-27	Corresponding setting of inflection point 2 input of AI curve 4	-100.0% ~ +100.0%	0.5%	☆
A6-28	Maximum input of AI curve 4	A6-06 ~ +10.00V	0.0%	☆
A6-29	Corresponding setting of maximum input of AI curve 4	-100.0% ~ +100.0%	0.5%	☆
A7 User programmable card parameters				
A7-00	User programmable function selection	0: Invalid 1: Valid	0	★
A7-01	Control mode selection of output terminal on control panel	0: Control of frequency converter 1: Control of user programmable control card Units digit: FMP (FM terminal as pulse output) Tens digit: relay (T/A-T/B-T/C) Hundreds digit: DO1 Thousands digit: FMR (FM terminal as digital output) Ten-thousand digit: AO1	0	★
A7-02	Programmable card expands AI3 terminal function configuration			★
A7-03	FMP output	0.0% ~ 100.0%	0.0%	☆
A7-03	FMP output	0.0% ~ 100.0%	0.0%	☆
A7-04	AO1 output	0.0% ~ 100.0%	0.0%	☆

Function code	Name	Setting range	Factory default	Modify
A7-05	Digital output	Binary setting Units digit: FMR Tens digit: relay Hundreds digit: DO	1	☆
AC group AIAO calibration				
AC-00	AI1 measured voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-01	AI1 display voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-02	AI1 measured voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-03	AI1 display voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-04	AI2 measured voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-05	AI2 display voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-06	AI2 measured voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-07	AI2 display voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-08	AI3 measured voltage 1	-9.999V ~ 10.000V	Factory calibration	☆
AC-09	AI3 display voltage 1	-9.999V ~ 10.000V	Factory calibration	☆
AC-10	AI3 measured voltage 2	-9.999V ~ 10.000V	Factory calibration	☆
AC-11	AI3 display voltage 2	-9.999V ~ 10.000V	Factory calibration	☆
AC-12	AO1target voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-13	AO1measured voltage 1	0.500V ~ 4.000V	Factory calibration	☆
AC-14	AO1target voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-15	AO1measured voltage 2	6.000V ~ 9.999V	Factory calibration	☆
AC-20	AI2 measured current 1	0.000mA ~ 20.000mA	Factory calibration	☆
AC-21	AI2 sampling current 1	0.000mA ~ 20.000mA	Factory calibration	☆
AC-22	AI2 measured current 2	0.000mA ~ 20.000mA	Factory calibration	☆
AC-23	AI2 sampling current 2	0.000mA ~ 20.000mA	Factory calibration	☆
AC-24	AO1ideal current 1	0.000mA ~ 20.000mA	Factory	☆

Function code	Name	Setting range	Factory default	Modify
			calibration	
AC-25	AO1measured current 1	0.000mA ~ 20.000mA	Factory calibration	☆
AC-24	AO1ideal current 2	0.000mA ~ 20.000mA	Factory calibration	☆
AC-25	AO1measured current 2	0.000mA ~ 20.000mA	Factory calibration	☆

Table of monitoring parameters

Function code	Name	Minimum unit
U0 group Basic monitoring parameters		
U0-00	Running frequency (Hz)	0.01Hz
U0-01	Setting frequency (Hz)	0.01Hz
U0-02	Bus voltage (V)	0.1V
U0-03	Output voltage (V)	1V
U0-04	Output current (A)	0.01A
U0-05	Output power (kW)	0.1kW
U0-06	Output torque (%)	0.1%
U0-07	DI input status	1
U0-08	DO output status	1
U0-09	AI1 voltage (V)	0.01V
U0-10	AI2 voltage (V)	0.01V
U0-11	AI3 voltage (V)	0.01V
U0-12	Counter value	1
U0-13	Length value	1
U0-14	Load speed display	1
U0-15	PID setting	1
U0-16	PID feedback	1
U0-17	PLC stage	1
U0-18	Input PULSE frequency (Hz)	0.01kHz
U0-19	Feedback speed (0.1Hz)	0.1Hz
U0-20	Residual running time	0.1Min
U0-21	AI1 voltage before calibration	0.001V
U0-22	AI2 voltage before calibration	0.001V
U0-23	AI3 voltage before calibration	0.001V
U0-24	Linear speed	1m/Min
U0-25	Current electrifying time	1Min
U0-26	Current running time	0.1Min
U0-27	PULSE frequency	1Hz
U0-28	Setting value of communication	0.01%
U0-30	X display of principal frequency	0.01Hz
U0-31	Y display of auxiliary frequency	0.01Hz
U0-32	Check any memory address value	1
U0-34	Temperature value of motor	1℃
U0-35	Target torque (%)	0.1%

U0-37	Power factor angle	0.1 °
U0-39	Target voltage of VF separation	1V
U0-40	Output voltage of VF separation	1V
U0-41	Visual display of DI input status	1
U0-42	Visual display of DO input status	1
U0-43	Visual display 1 of DI function status (function 01-function 40)	1
U0-44	Visual display 2 of DI function status (function 41-function 80)	1
U0-59	Setting frequency (%)	0.01%
U0-60	Running frequency (%)	0.01%
U0-61	Status of frequency converter	1

Chapter 6 EMC (Electromagnetic Compatibility)

6.1 Definition

Electromagnetic compatibility means that electrical equipment operates under environment of electromagnetic interference, but it does not interfere electromagnetic environment and realizes the function stably.

6.2 Introduction of EMC standard

According to requirements of national standard GB/T12668.3, frequency converter shall conform to requirements of two aspects: electromagnetic interference and anti-electromagnetic interference.

Our current products execute latest international standards: IEC/EN61800-3: 2004 (Adjustable speed electrical power drive systems part 3: EMC requirements and specific test methods), which is equal to national standard GB/T12668.3.

IEC/EN61800-3 mainly checks frequency converter from two aspects: electromagnetic interference and anti-electromagnetic interference. Electromagnetic interference mainly tests radiated interference, conducted interference and harmonic interference of frequency converter (requirements on the frequency converter for civil use). Anti-electromagnetic interference mainly tests conduction immunity, radiated immunity, surge immunity, fast changed pulse group, ESD immunity and immunity of low-frequency terminal of power (specific test items include: 1. immunity test for input voltage sag, interruption and change; 2. immunity test for commutation notch; 3. immunity test for harmonic input; 4. change test for input frequency; 5. unbalance test for input voltage; 6. fluctuation test for input voltage). The test is conducted as per strict requirements of above IEC/EN61800-3, and please install our company products as per instructions of 7.3, which own good electromagnetic compatibility under general industry environment.

6.3 EMC guidance

6.3.1 Influence of harmonic: higher harmonic of power will damage frequency converter, so it's suggested to install AC input reactor in the places with weak quality of power grid.

6.3.2 Electromagnetic interference and installing precautions: there are two kinds of electromagnetic interference. One is interference of surrounding electromagnetic noise for frequency converter, and another is interference produced by frequency converter for peripheral equipment.

Installing precautions:

(1) Earthing wire of frequency converter and other electrical products should be well grounded;

(2) Do not layout power input and output line or weak current signal line (e.g. control circuit) of frequency converter in parallel, layout them vertically if possible;

(3) It's suggested to use shield cable or steel tube shield power line for output power line of frequency converter, and keep reliable earthing of shield layer. For the lead of equipment with interference, it's suggested to use dual twisted pair shield control line and keep reliable earthing of shield layer;

(4) For the motor cable exceeding 100m, output filter or electric reactor should be installed.

6.3.3 Handling method of interference produced by peripheral electromagnetic equipment for frequency converter: in general, the cause of frequency converter produces electromagnetic influence is that many relays, contactors or electromagnetic brakes are installed nearby frequency converter. If any malfunction of frequency converter due to interference, it's suggested to adopt below methods:

(1) The devices producing interference are installed with surge suppressor;
(2) Install filter in input terminal of frequency converter as per 7.3.6 for operation;
(3) Control signal line and lead of detection circuit adopt shield cable, and keep reliable earthing.

6.3.4 Handling method of interference produced by peripheral equipment for frequency converter: there are two kinds of noise, namely radiated interference of frequency converter and conducted interference of frequency converter. These two interference lead to electromagnetic or electrostatic induction of peripheral electrical equipment, and then cause malfunction of equipment. Aiming at different interference, below solutions can be referred:

(1) The signal of instruments, receivers and sensor for measurement is generally weak. If they are near to frequency converter or in the same control cabinet, the frequency converter is easily interfered and malfunction produces. It's suggested to adopt below solutions: keep away from interference source as far as possible; do not layout signal line and power line in parallel, or bundle up them in parallel; signal line and power line adopt shield line, keep reliable earthing; install ferrite core (range of blanketing frequency is 30 ~ 1000MHz) on output side of frequency converter and wind 2~3 turns in the same direction. For serious situation, EMC output filter can be installed;
(2) If interfered equipment share the same power with frequency converter, conducted interference will produce. If interference can't be eliminated through above method, EMC filter shall be installed between frequency converter and power (refer to 7.3.6 for model selection operation)
(3) Independent earthing of peripheral equipment can eliminate the interference produced by leak current of ground lead of frequency converter.

6.3.5 Leak current and handling: there are two kinds of forms of leak current when using frequency converter: leak current to ground, and leak current between lines.

1) Factors influencing leak current to ground and solutions:

There is distributed capacitance between wire and ground. The larger the distributed capacitance, the larger the leak current will be, so reduce the distance between frequency converter and motor to decrease distributed capacitance. The larger the carrier frequency, the larger the leak current will be, so decrease carrier frequency to reduce leak current. However, decreasing carrier frequency will lead to increasing motor noise. Please note that installing reactor is an effective way to solve leak current.

Leak current increases with enlargement of loop current, so the larger the motor power, the larger the corresponding leak current will be.

2) Factors influencing leak current between lines and solutions:

There is distributed capacitance between output wiring of frequency converter. If the current passing circuit contains higher harmonic, resonance may be caused to produce leak current. If using thermal relay at this time, malfunction may occur.

The solution is to reduce carrier frequency or install output reactor. When using frequency converter, it's not suggested to install thermal relay between frequency converter and motor, but use electric over-current protection function of frequency converter.

6.3.6 Precautions about installing EMC input filter on power input terminal:

(1) Caution: please strictly abide by rated value when using filter. As filter is I-class electric appliance, metal shell of filter should contact well with metal of installing cabinet, and good electric conduction continuity is required, otherwise there is risk of electric shock and EMC effect will be seriously influenced;

(2) According to EMC test, filter and PE terminal of frequency converter should be connected on the same ground, otherwise EMC effect will be seriously influenced;

(3) The filter should be installed nearby power input terminal of frequency converter.

Chapter 7 Fault Diagnosis and Countermeasures

7.1 Fault warning and countermeasures

200MN frequency converter owns 24 warning information and protection functions. Once the fault occurs, protection function starts action and the frequency converter stops output. Fault relay of frequency converter starts contact action and fault code displays on display panel of frequency converter. Before seeking for service, users can examine by themselves as per instructions in this chapter to analyze fault cause and find out solutions. If the causes are those in dotted line box, please seek for service and contact with agent of frequency converter or our company directly.

Fault name	Inverter unit protection
Display of operation panel	Err01
Check fault cause	1. Short circuit of output loop of frequency converter 2. Too long wiring between motor and frequency converter 3. Overheating module 4. Internal wiring of frequency converter becomes loose 5. Abnormal main control panel 6. Abnormal driver board 7. Abnormal inversion module
Fault handling method	1. Eliminate peripheral fault 2. Install electric reactor or output filter 3. Check if blocking of air channel and normal work of fan, eliminate existing problems 4. Insert all connecting lines 5. Seek for technical support 6. Seek for technical support 7. Seek for technical support
Fault name	Accelerated over-current
Display of operation panel	Err02
Check fault cause	1. Earthing or short circuit of output loop of frequency converter 2. Control way is vector and there is no parameter identification 3. Too short acceleration time 4. Manual torque promotion or V/F curve is not suitable 5. Low voltage 6. Start rotating motor 7. Impact load during acceleration process 8. Model selection of frequency converter is small
Fault handling method	1. Eliminate peripheral fault 2. Conduct parameter identification of motor 3. Increase acceleration time 4. Adjust manual torque promotion or V/F curve 5. Adjust voltage to normal range 6. Start tracking rotation speed or restart after motor stops 7. Cancel impact load 8. Select the frequency converter with larger power grade
Fault name	Decelerated over-current
Display of operation panel	Err03
Check fault cause	1. Earthing or short circuit of output loop of frequency converter

	2. Control way is vector and there is no parameter identification 3. Too short acceleration time 4. Low voltage 5. Impact load during acceleration process 6. No brake unit or brake resistance is installed
Fault handling method	1. Eliminate peripheral fault 2. Conduct parameter identification of motor 3. Increase acceleration time 4. Adjust voltage to normal range 5. Cancel impact load 6. Install brake unit and brake resistance
Fault name	Constant-speed over-current
Display of operation panel	Err04
Check fault cause	1. Earthing or short circuit of output loop of frequency converter 2. Control way is vector and there is no parameter identification 3. Low voltage 4. Impact load during acceleration process 5. Model selection of frequency converter is small
Fault handling method	1. Eliminate peripheral fault 2. Conduct parameter identification of motor 3. Adjust voltage to normal range 4. Cancel impact load 5. Select the frequency converter with larger power grade
Fault name	Accelerated over-voltage
Display of operation panel	Err05
Check fault cause	1. Low input voltage 2. External force drives motor to operate during acceleration process 3. Too short acceleration time 4. No brake unit or brake resistance is installed
Fault handling method	1. Adjust voltage to normal range 2. Cancel external force or install brake resistance 3. Increase acceleration time 4. Install brake unit and brake resistance
Fault name	Decelerated over-voltage
Display of operation panel	Err06
Check fault cause	1. High input voltage 2. External force drives motor to operate during deceleration process 3. Too short deceleration time 4. No brake unit or brake resistance is installed
Fault handling method	1. Adjust voltage to normal range 2. Cancel external force or install brake resistance 3. Increase deceleration time 4. Install brake unit and brake resistance
Fault name	Constant-speed over-voltage
Display of operation panel	Err07
Check fault cause	1. High input voltage

	2. External force drives motor to operate during deceleration process
Fault handling method	1. Adjust voltage to normal range 2. Cancel external force or install brake resistance
Fault name	Fault of control power
Display of operation panel	Err08
Check fault cause	1. Input voltage is not within specified range
Fault handling method	1. Adjust voltage to specified range
Fault name	Under-voltage fault
Display of operation panel	Err09
Check fault cause	1. Instantaneous power failure 2. Voltage on input terminal of frequency converter is not within specified range 3. Abnormal busbar voltage 4. Abnormal rectifier bridge and buffer resistance 5. Abnormal driver board 6. Abnormal control panel
Fault handling method	1. Reset fault 2. Adjust voltage to normal range 3. Seek for technical support 4. Seek for technical support 5. Seek for technical support 6. Seek for technical support
Fault name	Overload of frequency converter
Display of operation panel	Err10
Check fault cause	1. Too large load or locked-rotor of motor 2. Model selection of frequency converter is small
Fault handling method	1. Decrease load, check motor and machinery 2. Select the frequency converter with larger power grade
Fault name	Overload of motor
Display of operation panel	Err11
Check fault cause	1. Is protection parameter P9-01 of motor set properly 2. Too large load or locked-rotor of motor 3. Model selection of frequency converter is small
Fault handling method	1. Set the parameter correctly 2. Decrease load, check motor and machinery 3. Select the frequency converter with larger power grade
Fault name	Default phase of input
Display of operation panel	Err12
Check fault cause	1. Abnormal three-phase input power 2. Abnormal driver board 3. Abnormal anti-thunder panel 4. Abnormal main control panel
Fault handling method	1. Check and eliminate problems in peripheral circuit 2. Seek for technical support

	3. Seek for technical support 4. Seek for technical support
Fault name	Default phase of output
Display of operation panel	Err13
Check fault cause	1. Abnormal lead from frequency converter to motor 2. Unbalanced three-phase output of frequency converter during motor operation 3. Abnormal driver board 4. Abnormal module
Fault handling method	1. Eliminate peripheral fault 2. Check if three-phase winding is normal and remove fault 3. Seek for technical support 4. Seek for technical support
Fault name	Overheating module
Display of operation panel	Err14
Check fault cause	1. Too high environment temperature 2. Air channel is blocked 3. Fan is damaged 4. Thermistor of module is damaged 5. Inverter module is damaged
Fault handling method	1. Reduce environment temperature 2. Clear the fan 3. Change the fan 4. Change the thermistor 5. Change the inverter module
Fault name	Fault of peripheral equipment
Display of operation panel	Err15
Check fault cause	1. Input signal of external fault through multi-function terminal DI 2. Input signal of external fault through virtual IO function
Fault handling method	1. Reset operation 2. Reset operation
Fault name	Communication fault
Display of operation panel	Err16
Check fault cause	1. Abnormal work of host computer 2. Abnormal communication line 3. Incorrect setting of communication expansion card P0-28 4. Incorrect setting of PD group of communication parameter
Fault handling method	1. Check wiring of host computer 2. Check wiring of communication line 3. Set type of communication expansion card correctly 4. Set communication parameters correctly
Fault name	Contactor fault
Display of operation panel	Err17
Check fault cause	1. Abnormal driver board and power 2. Abnormal contactor
Fault handling	1. Change driver board or power

method	2. Change contactor
Fault name	Fault of current detection
Display of operation panel	Err18
Check fault cause	1. Abnormal Hall device 2. Abnormal driver board
Fault handling method	1. Change Hall device 2. Change driver board
Fault name	Tuning fault of motor
Display of operation panel	Err19
Check fault cause	1. Motor parameter is not set as per nameplate 2. Parameter identification process overtimes
Fault handling method	1. Set motor parameter correctly as per nameplate 2. Check the lead between frequency converter and motor
Fault name	Fault of encoding disk
Display of operation panel	Err20
Check fault cause	1. Model of encoder does not match 2. Incorrect wiring of encoder 3. Encoder is damaged 4. Abnormal PG card
Fault handling method	1. Set model of encoder correctly based on actual situation 2. Remove wiring fault 3. Change encoder 4. Change PG card
Fault name	Read-write fault of EEPROM
Display of operation panel	Err21
Check fault cause	1. EEPROM chip is damaged
Fault handling method	1. Change main control panel
Fault name	Hardware fault of frequency converter
Display of operation panel	Err22
Check fault cause	1. Over-voltage exists 2. Over-current exists
Fault handling method	1. Process as per over-voltage fault 2. Process as per over-current fault
Fault name	To-ground short circuit fault
Display of operation panel	Err23
Check fault cause	1. To-ground short circuit of motor
Fault handling method	1. Change cable or motor
Fault name	Fault of reaching accumulative operation time
Display of operation panel	Err26

Check fault cause	1. Accumulative operation time reaches set value
Fault handling method	1. Use parameter initialization function to eliminate recorded information
Fault name	User defined fault 1
Display of operation panel	Err27
Check fault cause	1. Input signal of user defined fault 1 through multi-function terminal DI 2. Input signal of user defined fault 1 through virtual IO function
Fault handling method	1. Reset operation 2. Reset operation
Fault name	User defined fault 2
Display of operation panel	Err28
Check fault cause	1. Input signal of user defined fault 2 through multi-function terminal DI 2. Input signal of user defined fault 2 through virtual IO function
Fault handling method	1. Reset operation 2. Reset operation
Fault name	Fault of reaching accumulative electrifying time
Display of operation panel	Err29
Check fault cause	1. Accumulative electrifying time reaches set value
Fault handling method	1. Use parameter initialization function to eliminate recorded information
Fault name	Off-load fault
Display of operation panel	Err30
Check fault cause	1. Running current of frequency converter is < P9-64
Fault handling method	1. Confirm if load is separated or if P9-64, P9-65 parameter settings conform to actual operation condition
Fault name	Fault of PID feedback loss during operation
Display of operation panel	Err31
Check fault cause	1. PID feedback is smaller than PA-26 set value
Fault handling method	1. Check PID feedback signal or set PA-26 to be a suitable value
Fault name	Cycle-by-cycle over-current fault
Display of operation panel	Err40
Check fault cause	1. Too large load or locked-rotor of motor 2. Model selection of frequency converter is small
Fault handling method	1. Decrease load, check motor and machinery 2. Select the frequency converter with larger power grade
Fault name	Fault of motor switch during operation
Display of operation panel	Err41
Check fault cause	1. Alter current motor selection through terminal during operation of frequency converter
Fault handling	1. Switch motor after frequency converter halts

method	
Fault name	Fault of too large speed deviation
Display of operation panel	Err42
Check fault cause	1. Incorrect parameter setting of encoder 2. No parameter identification is conducted 3. Too large speed deviation, parameter settings of P9-69, P9-60 are irrational
Fault handling method	1. Set parameters of encoder correctly 2. Conduct parameter identification 3. Set detection parameters rationally based on actual situation
Fault name	Over-speed fault of motor
Display of operation panel	Err43
Check fault cause	1. Incorrect parameter setting of encoder 2. No parameter identification is conducted 3. Settings of over-speed detection parameters P9-69, P9-60 are irrational
Fault handling method	1. Set parameters of encoder correctly 2. Conduct parameter identification 3. Set detection parameters rationally based on actual situation
Fault name	Over-temperature fault of motor
Display of operation panel	Err45
Check fault cause	1. Wiring of temperature sensor is loose 2. Motor temperature is too high
Fault handling method	1. Detect temperature sensor and eliminate fault 2. Decrease carrier frequency or adopt other heat dissipation measures to handle heat dissipation of motor
Fault name	Error of initial position
Display of operation panel	Err51
Check fault cause	1. Motor parameter deviates largely from actual value
Fault handling method	1. Reconfirm if motor parameters are correct especially if setting of rated current is small

7.2 Common faults and handling methods

Below fault s may occur during using process of frequency converter, please refer to below methods for simple fault analysis:

Figure 8-1 Common faults and handling methods

No.	Fault phenomenon	Possible causes	Solutions
1	No display when electrifying	No or too low network voltage; fault of switch power on driver board of frequency converter; rectifier bridge is damaged; buffer resistance of frequency converter is damaged; fault of control panel and keyboard; disconnected wiring between control panel, driver board and keyboard;	Check input power; check busbar voltage; pull out and insert flat cable again; seek for service from manufacturer
2	Display HC when	Bad contact between driver board	Pull out and insert flat cable

	electrifying	and control panel; Related devices on control panel are damaged; to-ground short-circuit of motor or motor line; Hall fault; too low network voltage;	again; seek for service from manufacturer
3	Display “Err23” when electrifying	To-ground short-circuit of motor or output line; frequency converter is damaged;	Measure insulation between motor and output line with tramegger; seek for service from manufacturer
4	Normal display when electrifying, display “HC” after operation and shut down	Fan is damaged or blocked; short-circuit wiring of peripheral control terminal;	Change fan; eliminate external short-circuit fault
5	Frequent alarm of Err14 (overheating module)	Higher setting of carrier frequency; fan is damaged or air channel is blocked; internal devices of frequency converter are damaged (thermocouple or others)	Reduce carrier frequency (P0-15); change fan, clear air channel; seek for service from manufacturer
6	Motor doesn’t rotate after frequency converter operates	Motor and motor line; wrong parameter setting of frequency converter (motor parameter); bad contact between driver board and control panel; fault of driver board	Reconfirm wiring between frequency converter and motor; change motor or eliminate mechanical fault; check and reset motor parameters
7	Invalid DI terminal	Wrong parameter setting; wrong external signal; OP and +24V jumper loosen; fault of control panel	Check and reset parameters of P4 group; reconnect external signal line; reconfirm OP and +24V jumpers; seek for service from manufacturer
8	Motor speed can’t promote when closed-loop vector controls	Encoder fault; wrong wiring or poor contact of encoder; fault of PG card; fault of driver board	Change code disk and reconfirm wiring; change PG card; seek for service
9	Frequent alarm of over-voltage and over-current fault	Incorrect parameter setting of motor; inappropriate acceleration/deceleration time; fluctuation of load;	Reset motor parameters or tune motor; set acceleration and deceleration time; seek for service from manufacturer
10	Display Err17 when electrifying (or operation)	Soft starting contactor is not closed;	Check if contactor cable is loose; check if any fault with contactor; check if any fault with 24V power
11	Display  when electrifying	Related devices on control panel are damaged;	Change control panel;

Appendix A: 200MN Modbus Communication Protocol

200MN series frequency converter provides RS232/RS485 communication interface and supports Modbus communication protocol. Users can realize centralized control through computer or PLC, set run command of frequency converter through communication protocol, modify or read parameters of function code, read working condition and fault information of frequency converter, etc.

1. Protocol content

The serial communication protocol defines transmissive information contents and using format of serial communication, including format for polling of host (or broadcast), encoding method of host such as function code of required action, transmission data and error verification, etc. The response of slave also adopts same structure and the contents include action confirmation, data return and error verification, etc. If any error of slave when receiving information or failure to finish the action required by host, the slave will organize a fault message as response feedback for the host.

Application mode: frequency converter accesses to "single-host and multiple-slave" PC/PLC control network with RS232/RS485 bus.

Structure of bus

(1) Interface mode

RS232/RS485 hardware interface

(2) Transmission mode: asynchronous serial and half-duplex. For the host and slave at the same moment, one can only send data and another can only receive data. During serial asynchronous communication process, data is sent with the form of message frame by frame.

(3) Topological structure: single-host and multiple-slave system. The setting range of slave address is 1~247 and 0 is address of broadcast communication. Slave address in network should be unique.

Protocol description

Communication protocol of SN200G series frequency converter is a kind of asynchronous serial master-slave Modbus communication protocol, and only one device (host) in the network can establish protocol (called as "query/command"). Other devices (slave) can only response the "query/command" of host by providing data or take corresponding actions based on "query/command" of host. Host refers to personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc, and slave means SN200G series frequency converter. The host can not only communicate with certain slave separately, but issue broadcast information to all inferior slaves. For separately accessed "query/command" of host, the slave needs to return a message (called as response). For the broadcast information issued by the host, the slave does not need to feedback response to host.

Structure of communication materials: communication data format of modbus protocol for SN200G series frequency converter is as below:

For RTU mode, message sending starts with pause time for at least 3.5 characters. Diverse character time under network Baud rate is easily realized (as shown in below T1-T2-T3-T4). The first domain of transmission is equipment address.

The available transmission character is hexadecimal 0...9, A...F. Network equipment detects network bus constantly, including pausing interval time. When receiving first domain (address domain), each equipment will decode to judge if sending to own. After the last transmission character, the pause time of at least 3.5 characters marks the ending of message. A new message will start after the pause.

The whole message frame should be continuous streaming transfer. If the dwell time exceeds 1.5 characters before frame finishes, receiving equipment will refresh incomplete message and assume that next byte is address domain of a new message. Similarly, if a new message starts within time of 3.5 characters following previous message, receiving equipment will consider it as the delay of previous message, and then error will be caused, as it's impossible for the value of final CRC domain to be correct.

RTU frame format:

Frame header START	Time of 3.5 characters

Slave ADR	Address: 1~247
CMD code	03: read slave parameters; 06: write slave parameters
DATA（N-1）	Data content: address of function code parameters, number of function code parameters, value of function code parameters, etc.
DATA（N-2）	
……	
DATA0	
CRC CHK high-order	Detection value: CRC value
CRC CHK low-order	
END	Time of 3.5 characters

CMD (command instruction) and **DATA** (material description)

CMD code: 03H, read N word (12 words at most). For example: start address F002 of frequency converter with slave address being 01 reads 2 values successively.

CMD message of host

ADR	**01H**
CMD	03H
Start address high-order	F0H
Start address low-order	02H
Register No. high-order	00H
Register No. low-order	02H
CRC CHK low-order	CRC CHK value to be calculated
CRC CHK high-order	

Response message of slave

PD-05 is set as 0:

ADR	**01H**
CMD	03H
Byte No. high-order	00H
Byte No. low-order	04H
Data F002H high-order	00H
Data F002H low-order	00H
Data F003H high-order	00H
Data F003H low-order	01H
CRC CHK low-order	CRC CHK value to be calculated
CRC CHK high-order	

FD-05 is set as 1:

ADR	**01H**
CMD	03H
Byte No.	04H
Data F002H high-order	00H
Data F002H low-order	00H
Data F003H high-order	00H
Data F003H low-order	01H
CRC CHK low-order	CRC CHK value to be calculated
CRC CHK high-order	

CMD code: 06H, write one word. For example: write 5000 (1388H) in F00AH address of frequency converter with slave address being 02H.

CMD message of host

ADR	02H
CMD	06H
Data address high-order	F0H
Data address low-order	0AH
Data content high-order	13H
Data content low-order	88H
CRC CHK low-order	CRC CHK value to be calculated
CRC CHK high-order	

Response message of slave

ADR	02H
CMD	06H
Data address high-order	F0H
Data address low-order	0AH
Data content high-order	13H
Data content low-order	88H
CRC CHK low-order	CRC CHK value to be calculated
CRC CHK high-order	

Verification mode - CRC verification mode: CRC (Cyclical Redundancy Check) uses RTU frame format, and message includes error detection domain based on CRC method. CRC domain detects the contents of whole message. CRC domain is two-byte and includes 16-bit binary system value. It's added to message after calculation by transmission equipment. Receiving equipment recalculates CRC of received message and compares with value in received CRC domain. If two CRC values are not equal, the transmission is wrong.

CRC firstly stores 0xFFFF, and then calls a course to process successive 8-bit bytes in message and value in current register. Only 8Bit data in each character is valid for CRC, start bit, stop bit and parity check bit are invalid.

During producing process of CRC, each 8-bit byte is XOR with register contents separately. Finally, it moves to the direction of least significant bit, and most significant bit is filled with 0. LSB is extracted for detection. If LSB is 1, register is XOR with preset value. If LSB is 0, no action. Repeat the whole process for 8 times. After last bit (8^{th} bit) finishes, next 8-bit byte is XOR with current value of register alone. The final value in register is CRC value after all bytes in message are executed.

When adding CRC to message, add low byte firstly and then high byte. Simple function of CRC is as below:

```
unsigned int crc_chk_value ( unsigned char *data_value,unsigned char length ) {
        unsigned int crc_value=0xFFFF ;
        int i ;
        while ( length-- )        {
                crc_value^=*data_value++ ;
                for ( i=0 ; i<8 ; i++ )    {
                        if ( crc_value&0x0001 )
                {
                                crc_value= ( crc_value>>1 )
^0xa001 ;
                        }
                        else
                        {
                                crc_value=crc_value>>1 ;
```

```
                    }
                }
            }
            return ( crc_value ) ;
        }
```

Address definition of communication parameter

This part is communication content used for controlling operation of frequency converter, setting state and related parameters of frequency converter.

Read-write function code parameter (some function codes can't be modified, but are simply used or monitored by manufacturer).

Marking rules of function code parameter address:

Express rules with group No. and marking No. of function code being parameter address:

High byte: P0~PF (P group), A0~AF (A group), 70~7F (U group); low byte: 00~FF

E.g.: P3-12, address is expressed as P30C;

Note: PF group: neither read nor modify parameters;

U group: only read but not modify parameters.

When the frequency converter is in running status, some parameters can't be modified. Some parameters can't be modified no matter what is the status of frequency converter. When modifying the function code parameters, range, unit and related descriptions of parameters should be also noticed.

Besides, as EEPROM is frequently stored, it will reduce lifespan of EEPROM. Therefore, under communication mode, some function codes don't have to be stored, and only modify the value in RAM.

If it's P group parameter, changing high-order F of the function code address to be 0 can realize the function. If it's A group parameter, changing high-order A of the function code address to be 4 can realize the function. Corresponding function code address is expressed as below: high-order byte: 00~0F (P group), 40~4F (A group); low-order byte: 00~FF.

E.g.: function code P3-12 is not stored in EEPROM, the address is expressed as 030C; function code A0-05 is not stored in EEPROM, the address is expressed as 4005; the address can only write RAM and conduct read action. When reading, it's invalid address. For all parameters, CMD code 07H can also be used to realize the function.

When the frequency converter is in running status, some parameters can't be modified. Some parameters can't be modified no matter what is the status of frequency converter. When modifying the function code parameters, range, unit and related descriptions of parameters should be also noticed.

Halt/running parameters:

Parameter address	Parameter description
1000	*Communication setting value (-10000~10000) (decimal system)
1001	Running frequency
1002	Busbar voltage
1003	Output voltage
1004	Output current
1005	Output power
1006	Output torque
1007	Running speed
1008	DI input mark
1009	DO output mark
100A	AI1 voltage
100B	AI2 voltage
100C	AI3 voltage
100D	Count value input
100E	Length value input

100F	Loading speed
1010	PID setting
1011	PID feedback
1012	PLC step
1013	PULSE frequency, unit 0.01kHz
1014	Feedback speed, unit 0.1Hz
1015	Residual running time
1016	AI1 voltage before calibration
1017	AI2 voltage before calibration
1018	AI3 voltage before calibration
1019	Linear speed
101A	Current electrifying time
101B	Current running time
101C	PULSE frequency, unit 1Hz
101D	Communication setting value
101E	Actual feedback speed
101F	Principal frequency X display
1020	Auxiliary frequency Y display

Note:

Communication setting value is percentage of relative value, namely 10000 corresponds to 100.00%, -10000 corresponds to -100.00%. For frequency dimension, this percent is the percentage of relatively largest frequency (P0-10). For the data of torque dimension, this percent is P2-10, A2-48, A3-48, A4-48 (upper limit setting of torque respectively corresponds to first and second motor).

Input command order to frequency converter: (only write)

Command word address	**Command function**
2000	0001: forward operation
	0002: reverse operation
	003: forward jog
	0004: reverse jog
	0005: free halt
	0006: decelerate to halt
	0007: fault reset

Read status of frequency converter: (only read)

Status word address	**Status word function**
3000	0001: forward operation
	0002: reverse operation
	0003: halt

Cryptographic check of parameter locking: (if returning to be 8888H, pass cryptographic check)

Password address	**Contents of inputting password**
1F00	*****
Command address	Command contents
2001	BIT0: DO1 output control BIT1: DO2 output control BIT2: RELAY1 output control BIT3: RELAY2 output control BIT4: FMR output control

	BIT5: VDO1 BIT6: VDO2 BIT7: VDO3 BIT8: VDO4 BIT9: VDO5

Control of analog output **AO1**: (only write)

Command address	Command contents
2002	0 ~ 7FFF means 0% ~ 100%

Control of analog output **AO2**: (only write)

Command address	Command contents
2003	0 ~ 7FFF means 0% ~ 100%

Control of **PULSE** output: (only write)

Command address	Command contents
2004	0 ~ 7FFF means 0% ~ 100%

Fault description of frequency converter:

Fault address	Fault message
8000	0000: no fault 0001: reserve 0002: accelerated over-current 0003: decelerated over-current 0004: constant-speed over-current 0005: accelerated over-voltage 0006: decelerated over-voltage 0007: constant-speed over-voltage 0008: overload fault of buffer resistance 0009: under-voltage fault 000A: overload of frequency converter 000B: overload of motor 000CL: default phase of input 000D: default phase of output 000E: overheating module 000F: external fault 0010: abnormal communication 0011: abnormal contactor 0012: current detection fault 0013: motor tuning fault 0014: fault of encoder/PG card 0015: abnormal read-write of parameter 0016: hardware fault of frequency converter 0017: over-ground short-circuit fault of motor 0018: reserve 0019: reserve 001A: reach running time 001B: user-defined fault 1 001C: user-defined fault 2 001D: reach electrifying time 001E: load failure 001F: PID feedback loss during operation 0028: overtime fault of fast current-limiting

	0029: fault of motor switch during operation 002A: too large velocity misalignment 002B: supervelocity of motor 002D: over-temperature of motor 005A: wrong setting of line number of encoder 005B: not connecting with encoder 005C: error of initial position 005E: error of velocity feedback
Communication fault address	Functional description of fault
8001	0000: no fault 0001: wrong password 0002: wrong command code 0003: wrong CRC verification 0004: invalid address 0005: invalid parameter 0006: invalid parameter alternation 0007: system is locked 0008: EEPROM operation is proceeding

Description of **PD** group communication parameters

Pd-00	**Baud rate**	**Factory default**	6005
	Setting range	Units digit: MODUBS Baud rate 0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS 5: 9600BPS 6: 19200BPS 7: 38400BPS 8: 57600BPS 9: 115200BPS	

The parameter is used to set data transmission rate between host computer and frequency converter. Please note that the Baud rate of host computer and frequency converter should be consistent. Otherwise, communication is unable to proceed. The larger the Baud rate, the faster the communication speed.

Fd-01	**Data format**	**Factory default**	0
	Setting range	0: no verification: data format <8,N,2> 1: even verification: data format <8,E,1> 2: odd verification: data format <8,O,1> 3: no verification: data format <8-N-1>	

The data format of host computer and frequency converter should be consistent. Otherwise, communication is unable to proceed.

Pd-02	**Local address**	**Factory default**	1
	Setting range	1~247, 0 is broadcast address	

If local address is set as 0, namely broadcast address, broadcast function of host computer can be realized.

Local address is unique (apart from broadcast address), and it's the basis to realize point-to-point communication between host computer and frequency converter.

Pd-03	Response delay	Factory default	2ms
	Setting range	0~20ms	

Response delay: interval time between ending time of data reception of frequency converter and time of sending data of host computer. If response delay is shorter than system processing time, response delay takes system processing time as criterion. If response delay is longer than system processing time, delay await is required after system processes data. After reaching response delay time, data will be sent to host computer.

Pd-04	Communication overtime	Factory default	0.0 s
	Setting range	0.0 s (invalid) 0.1~60.0s	

If function code is set to be 0.0s, parameter of communication overtime is invalid.

If function code is set to be valid value, interval time between one communication and next communication exceeds communication overtime, the system will give alarm of communication fault (Err 16). Under normal conditions, it's set to be invalid. If setting sub-parameter in the system of continuous communication, communication status can be monitored.

Pd-05	Communication protocol selection	Factory default	0
	Setting range	0: non-standard Modbus protocol 1: Standard Modbus protocol	

PD-05=1: select standard Modbus protocol.

PD-05=0: when reading command, number of bytes returned by slave has one more byte than standard Modbus protocol. See details in "5 communication data structure" of the protocol.

Pd-05	Communication reads current resolution	Factory default	0
	Setting range	0：0.01A 1：0.1A	

It's used to confirm output unit of current value when communication reads output current.

Warranty Agreement

1. The warranty period of this product is 18 months (be subject to barcode information on machine). If any fault or damage under normal use as per specification within warranty period, our company will be liable for free maintenance.

2. If any damage caused by below reasons within warranty period, certain maintenance fee will be charged:

A. Machine damage caused by misoperation, arbitrary repair and renovation;

B. Machine damage caused by fire, flood, abnormal voltage, other natural disasters and secondary disasters, etc.

C. Hardware damage caused by man-made falling and transport after purchase;

D. Damage caused by operation against user manual provided by our company;

E: Fault and damage caused by other obstacles beyond machine (such as factor of peripheral equipment);

3. If any fault or damage of product, please fill in each item of *Warranty Card* correctly and in details.

4. The maintenance costs refer to latest *Price List of Maintenance* of our company.

5. In general, the warranty card will not be reissued. Please reserve it well and show it to maintenance staff for maintenance.

6. If any problems during service process, please contact with agent or our company promptly.

7. The manufacturer reserves interpretation power of the agreement.

Warranty Card

<table>
<tr><td rowspan="3">User information</td><td colspan="2">Unit address:</td></tr>
<tr><td>Unit name:</td><td>Contact person:</td></tr>
<tr><td>Zip code:</td><td>Contact number:</td></tr>
<tr><td rowspan="3">Product information</td><td colspan="2">Product model:</td></tr>
<tr><td colspan="2">Barcode on machine (paste here):</td></tr>
<tr><td colspan="2">Agent name:</td></tr>
<tr><td>Fault information</td><td colspan="2">(Maintenance time and contents):

Maintenance staff:</td></tr>
</table>

Please give this user's manual to
the end user and keep it properly.

V20180905