Preface

First of all, thank you for purchasing and using the A600 series frequency inverter developed and produced by our company!

The A600 series inverter is a general-purpose high-performance current vector inverter, mainly used to control and adjust the speed and torque of three-phase AC asynchronous motors. A600 adopts high-performance vector control technology, low-speed and high-torque output, has good dynamic characteristics, super overload capability, stable performance, powerful protection functions, simple human-machine interface and easy operation. Can be used in weaving, papermaking, wire drawing, machine tools, packaging, food, fans, water pumps and various automated production equipment drives.

This manual will provide you with relevant details and notes on the installation, wiring, functional parameters, daily maintenance, fault diagnosis and troubleshooting of the A600 series inverter. In order to use the A600 series inverter correctly, give full play to the excellent performance of the product and ensure the safety of users and equipment, please be sure to read this manual carefully before using this series of inverter.

As we are committed to continuous product improvement, the information provided by our company is subject to change without further notice. If you have any questions or special requirements about the use of this series of inverters, please feel free to contact our after-sales service center, we will serve you wholeheartedly!

Catalogue

Chapter 1 Safety Information and Precautions

Security definition:
In this manual, safety precautions are divided into the following two categories:

Danger: Danger caused by failure to operate as required may result in serious injury or even death.

Note: Danger caused by failure to operate as required may result in moderate or minor injuries, as well as equipment damage.

Users are requested to read this chapter carefully when installing, debugging and maintaining this system, and be sure to operate in accordance with the safety precautions required in this chapter. Our company has nothing to do with any injuries or losses caused by illegal operations.

1.1 Safety Precautions

Use stage	Safety level	Item
Before installation	Danger	◆ If you find that water has entered the control system, parts are missing or parts are damaged when unpacking, please do not install it! ◆ If the packing list does not match the name of the actual product, please do not install it!
	Notice	◆ Be careful when transporting, otherwise there is a risk of damaging the equipment! ◆ Please do not use damaged drives or inverters with missing parts. Risk of injury! ◆ Do not touch the components of the control system with your hands, otherwise there is a risk of static electricity damage!
When installing	Danger	◆ Please install it on flame-retardant objects such as metal; keep away from flammable materials. Otherwise it may cause a fire alarm! ◆ Do not twist the fixing bolts of equipment components at will, especially the bolts marked with red!
	Notice	◆ Do not allow wire stubs or screws to fall into the drive. Otherwise, the drive may be damaged! ◆ Please install the drive in a place with little vibration and away from direct sunlight. ◆ When two or more inverters are placed in the same cabinet, please pay attention to the installation position to ensure the heat dissipation effect.
When wiring	Danger	◆ Construction must be carried out by professional electrical engineers, otherwise unexpected dangers may occur! ◆ There must be a circuit breaker between the inverter and the power supply, otherwise a fire alarm may occur! ◆ Please confirm that the power supply is in a zero-energy state before wiring, otherwise there is a risk of electric shock! ◆ Please conduct correct grounding of the inverter according to the standards, otherwise there is a risk of electric shock!

	Notice	◆ Never connect input power to the output terminals (U, V, W) of the frequency converter. Pay attention to the markings on the terminal blocks and do not connect the wrong wires! Otherwise, the drive may be damaged! ◆ Never connect the braking resistor directly between the (+) and (-) terminals of the DC bus. Otherwise it may cause a fire alarm! ◆ Please refer to the recommendations in the manual for the wire diameter used. Otherwise an accident may occur! ◆ The encoder must use shielded wire, and the shielding layer must ensure that the single end is reliably grounded!
Before powering on	Danger	◆ Please confirm whether the voltage level of the input power supply is consistent with the rated voltage level of the inverter; whether the wiring positions on the power input terminals (R, S, T) and output terminals (U, V, W) are correct; and pay attention to check the connection with the drive. Check whether there is a short circuit in the connected peripheral circuits and whether the connected lines are tight, otherwise the driver will be damaged! ◆ No part of the inverter needs to undergo a withstand voltage test. The product has already been tested for this before leaving the factory. Otherwise it may cause an accident!
	Notice	◆ The inverter must be covered with the cover before it can be powered on. Otherwise it may cause electric shock! ◆ The wiring of all peripheral accessories must comply with the instructions in this manual and be wired correctly according to the circuit connection methods provided in this manual. Otherwise it may cause an accident!

Use stage	Safety level	Item
After power on	Danger	◆ Do not open the cover after powering on. Otherwise there is a risk of electric shock! ◆ Do not touch any input and output terminals of the inverter. Otherwise there is a risk of electric shock!
	Notice	◆ If parameter tuning is required, please be aware of the risk of injury due to motor rotation. Otherwise it may cause an accident! ◆ Please do not change the inverter manufacturer parameters at will. Otherwise it may cause damage to the equipment!
Running	Danger	◆ Non-professional technical personnel are not allowed to detect signals during operation. Otherwise it may cause personal injury or equipment damage! ◆ Do not touch the cooling fan and discharge resistor to test the temperature. Otherwise burns may occur!
	Notice	◆ When the inverter is running, avoid anything falling into the equipment. Otherwise, the equipment may be damaged! ◆ Do not use the contactor on and off method to control the start and stop of the driver. Otherwise, the equipment may be damaged!
During maintenance	Danger	◆ Personnel without professional training are not allowed to perform repairs and maintenance on the inverter. Otherwise it may cause personal injury or equipment damage! ◆ Do not perform repairs or maintenance on the equipment while the power is on. Otherwise there is a risk of electric shock! ◆ Maintenance and repair of the drive can only be carried out after confirming that the input power of the inverter is cut off for 10 minutes. Otherwise, the residual charge on the capacitor may cause harm to people! ◆ Before carrying out maintenance work on the frequency converter, ensure that the frequency converter is safely disconnected from all power supplies. ◆ All pluggable plug-ins must be plugged and pulled without power! ◆ Parameters must be set and checked after replacing the inverter.

	Notice	◆ The rotating motor feeds power to the frequency converter, causing the frequency converter to become live even when the motor is stopped and power is removed. Before carrying out maintenance work on the frequency converter, ensure that the motor is safely disconnected from the frequency converter.

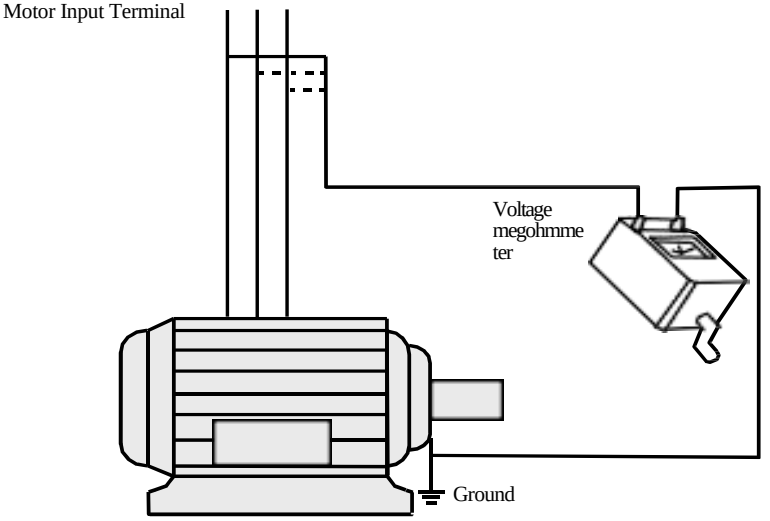
1.2 Precautions

1) Residual current protector RCD requirements

During operation of the equipment, a large leakage current will flow through the protective ground conductor. Please install a B-type leakage protector (RCD) on the primary side of the power supply. When selecting a leakage current protector (RCD), you should consider the transient and steady-state leakage currents to the ground that may occur when the equipment is started and running. Choose a special RCD with measures to suppress high-order harmonics, or a general-purpose RCD with larger residual current.

2) Motor insulation check

When the motor is used for the first time, before reuse after being left for a long time, and during regular inspections, the motor insulation should be checked to prevent damage to the inverter due to insulation failure of the motor windings. When checking the insulation, be sure to separate the motor connection from the inverter. It is recommended to use a 500V voltage megohmmeter to ensure that the measured insulation resistance is not less than 5MΩ.



3) Thermal protection of motors

If the selected motor does not match the rated capacity of the inverter, especially when the rated power of the inverter is greater than the rated power of the motor, be sure to adjust the motor protection parameters in the inverter or install a thermal relay in front of the motor to protect the motor.

4) Operation above power frequency

This frequency converter provides an output frequency of 0Hz~500Hz. If the customer operates above 50Hz, please consider the endurance of the mechanical device.

5) Vibration of mechanical device

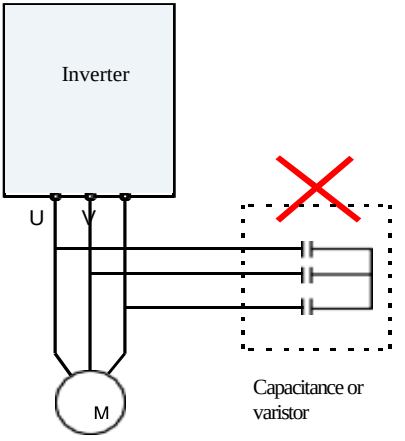
At some output frequencies, the inverter may encounter the mechanical resonance point of the load device, which can be avoided by setting the jump frequency parameters in the inverter.。

6) About motor heat and noise

Since the output voltage of the frequency converter is a PWM wave and contains certain harmonics, the temperature rise, noise and vibration of the motor will increase slightly compared with power frequency operation.

7) When there is a voltage-sensitive device or a capacitor to improve the power factor on the output side

The output of the frequency converter is a PWM wave. If the output side is equipped with a capacitor to improve the power factor or a varistor for lightning protection, it may easily cause instantaneous overcurrent of the frequency converter or even damage the frequency converter. Please do not use.



8) Contactors and other switching devices used at the input and output ends of the frequency converter

If a contactor is installed between the power supply and the input end of the frequency converter, this contactor is not allowed to control the start and stop of the frequency converter. This contactor must be used to control the start and stop of the inverter.

9) Use outside the rated voltage value

It is not suitable to use the inverter outside the allowable operating voltage range specified in the manual, as it may easily cause damage to the components in the inverter. If necessary, please use the corresponding step-up or step-down device to transform the power supply before inputting it to the inverter.

10) Lightning surge protection

Although this series of inverters are equipped with a lightning overcurrent protection device and have certain self-protection capabilities against induced lightning, customers in areas with frequent lightning strikes should also install a lightning protection device on the front end of the inverter.

11) Altitude and derating use

In areas where the altitude exceeds 1000m, the heat dissipation effect of the inverter becomes poor due to the thin air, so it is necessary to derate the inverter. In this case, please contact our company for technical consultation.

12) Some special usage

If customers need to use methods other than the recommended wiring diagrams provided in this manual, such as common DC bus, please consult our company.

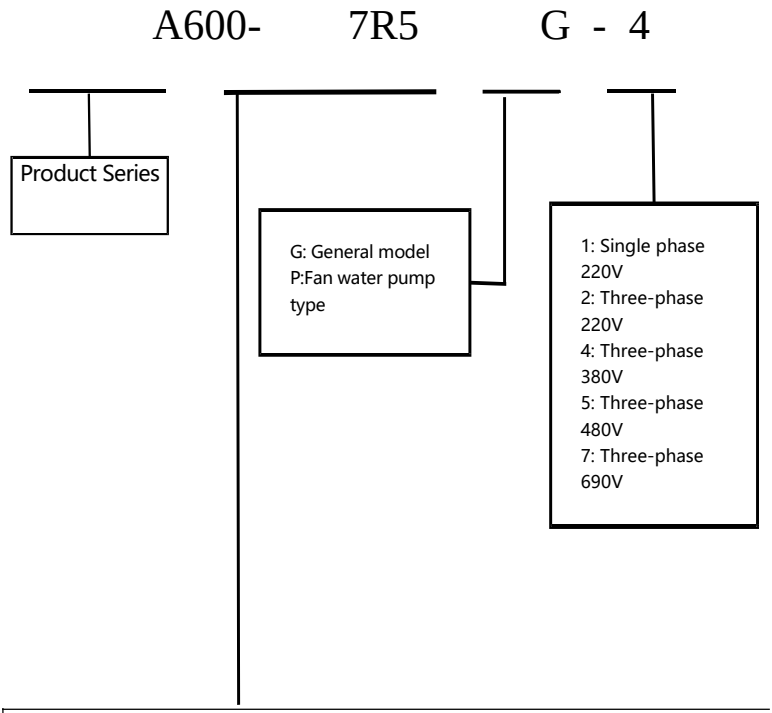
13) Pay attention when scrapping the inverter

The electrolytic capacitors in the main circuit and the electrolytic capacitors on the printed circuit board may explode when burned. Toxic gases are produced when plastic parts are burned. Please dispose of it as industrial waste.

Chapter 2 Product Information

Safety Precautions
• Do not carry the inverter by holding the front cover or terminal cover. If you only hold the front cover, the main body will fall and there is a risk of injury.
• When operating the inverter, follow the procedures specified for electrostatic discharge precautions (ESD). Otherwise, the internal circuit of the inverter will be damaged due to static electricity.

2.1 Model



Adapted motor

Model	R75	1R5	---	015	---
Power KW	0.75	1.5	---	15	---

NOTE

- Three-phase 380V~480V, 37G and below have built-in braking unit.

2.2 Technical specifications

Table 2-1 A600 series inverter technical specifications

Item		Technical specifications	
Basic functions	Input frequency resolution	Digital setting: 0.01Hz; Analog setting: Maximum frequency ×0.025%	
	Control method	Open loop vector control (SVC); Closed loop vector control (FVC); V/F control.	
	Starting torque	0.25Hz/150%（SVC）；0Hz/180%（FVC）	
	Speed range	1：200 （SVC）	1：1000 （FVC）
	Steady speed accuracy	±0.5%（SVC）	±0.02%（FVC）
	Torque control accuracy	FVC：±3%； SVC：5Hz 以上 ±5%。	
	Torque boost	Automatic torque boost; manual torque boost 0.1%~30.0%.	
	V/F curve	Four ways: linear type; multi-point type; complete V/F separation; incomplete V/F separation.	
	Acceleration and deceleration curve	Straight line or S curve acceleration and deceleration mode; Four acceleration and deceleration times, the acceleration and deceleration time range is 0.0~6500.0s.	
	DC braking	DC braking starting frequency: 0.00Hz~maximum frequency; braking time: 0.0s~36.0s; Braking action current value: 0.0%~100.0%.	
	Jog control	Jogging frequency range: 0.00Hz~50.00Hz; Jog acceleration and deceleration time 0.0s~6500.0s.	
	Simple PLC, multi-speed operation	Up to 16-speed operation can be achieved through built-in PLC or control terminals.	
	Built-in PID	It can easily realize process control closed-loop control system.	
	Automatic voltage regulation (AVR)	When the grid voltage changes, it can automatically keep the output voltage constant.	
	Overvoltage and overflow stall control	Automatically limits current and voltage during operation to prevent frequent overcurrent and overvoltage tripping.	
	Quick current limiting function	Minimize over-current faults and protect the normal operation of the inverter.	
	Torque Limiting and Control	The "excavator" feature automatically limits the torque during operation to prevent frequent overcurrent trips. Brake; vector control mode can realize torque control.	
Personaliza	Instant stop	During an instantaneous power outage, the load feedback energy is used to compensate for the voltage drop, maintaining the inverter for a short period of time. Continue to operate within the interval.	
	Quick current limit	Avoid frequent overcurrent faults in the frequency converter.	

tion features	Virtual IO	Five groups of virtual DIDO can realize simple logic control.
	Timing control	Timing control function: setting time range 0.0Min ~ 6500.0Min.
	Multiple motor switching	Two sets of motor parameters can realize switching control of two motors.
	Multithread bus support	Supports six fieldbuses: Modbus, Profibus-DP, CANlink, CANopen, Profinet, and EtherCAT.
	Motor overheating protection	Optional IO expansion card 1, analog input AI3 can accept motor temperature sensor input (PT100, PT1000).
	Multiple encoder support	Supports differential, open collector, UVW, resolver, etc.

Item		Technical specifications
Run	Run command	Operation panel given, control terminal given, serial communication port given. Can be switched in various ways
	Frequency command	10 kinds of frequency commands: digital given, analog voltage given, analog current given, pulse given, serial port given. Can be switched in various ways
	Auxiliary frequency command	10 kinds of auxiliary frequency commands. Flexible implementation of auxiliary frequency fine-tuning and frequency synthesis
	Input terminal	Standard: ● 5 DI terminals, 1 of which supports high-speed pulse input up to 100kHz ● 2 AI terminals, 1 only supports 0 ~ 10V voltage input, 1 supports 0 ~ 10V voltage input or 0 ~ 20mA current input Expansion capabilities: ● 5 DI terminals ● 1 AI terminal, supports -10V ~ 10V voltage input, and supports PT100/PT1000
	Output terminal	Standard: ● 1 high-speed pulse output terminal (optional open collector type) ● Supports square wave signal output from 0~100kHz ● 1 DO terminal ● 1 relay output terminal ● 1 AO terminal, supports 0 ~ 20mA current output or 0 ~ 10V voltage output expansion capability: ● 1 DO terminal ● 1 relay output terminal ● 1 AO terminal, supports 0 ~ 20mA current output or 0 ~ 10V voltage output
Display and keyboard operation	LED display	Display parameters
	Parameter copy	Optional LCD operation panel enables quick copying of parameters
	Key lock and function selection	It can lock part or all of the keys and define the scope of some keys to prevent misoperation.
	Phase loss protection	Input phase loss protection, output phase loss protection

Protective function	Instantaneous overcurrent protection	Shut down at more than 250% of rated output current
	Overvoltage protection	Stop when the main circuit DC voltage is above 820V
	Under voltage protection	Stop when the main circuit DC voltage is below 350V
	Overheating protection	Protection will be triggered when the inverter bridge overheats
	Overload protection	Run at 150% rated current for 60s and then stop (A600-T450G is: run at 130% of rated current for 60s and then stop)
	Overcurrent protection	Shutdown protection when the rated current exceeds 2.5 times of the inverter
	Brake protection	Braking unit overload protection, braking resistor short circuit protection
	Short circuit protection	Output phase-to-phase short circuit protection, output short circuit protection to ground

Item		Technical specifications
Environment	Place of use	Indoors, away from direct sunlight, dust, corrosive gases, flammable gases, oil mist, water vapor, dripping water or salt, etc.
	Altitude	There is no need to derate for use below 1000m. Derate by 1% for every 100m above 1000m. Please contact the manufacturer for use above 3000m. (Note: The maximum operating altitude of the 0.4~3kW drive is 2000m. If you need to use Please contact the manufacturer for above 2000m)
	Ambient temperature	- 10℃ ~ + 40℃, derating is required when the temperature exceeds 40℃, the ambient temperature Derate by 1.5% when the temperature rises by 1℃. The maximum ambient temperature is 50°C.
	Humidity	Less than 95%RH, no condensation
	Vibration	小于 5.9m/s^2 (0.6g)
	Storage temperature	- 20℃ ~ + 60℃

2.3 Models and technical data

Inverter model	Power supply capacity (KVA)	Input current (A)	Output current (A)	Adapted motor	
				KW	HP
Single-phase power supply: 220V (-10%~+15), 50/60Hz					
A600-R40G1	1.0	5.4	2.3	0.4	0.5
A600-R70G1	1.5	8.2	4.0	0.75	1
A600-1R5G1	3.0	14	7.0	1.5	2
A600-2R2G1	4.0	23	9.6	2.2	3

Three-phase power supply: 220V (-10%~+15), 50/60Hz					
A600-R40G2	1.5	3.4	2.1	0.4	0.5
A600-R75G2	3	5	3.8	0.75	1
A600-1R5G2	4	5.8	5.1	1.5	2
A600-2R2G2	5.9	10.5	9	2.2	3
A600-4R0G2	8.9	14.6	13	3.7	5
A600-5R5G2	17	26	25	5.5	7.5
A600-7R5G2	21	35	32	7.5	10
A600-011G2	30	46.5	45	11	15
A600-015G2	40	62	60	15	20
A600-018G2	57	76	75	18.5	25
A600-022G2	69	92	91	22	30
A600-030G2	85	113	112	30	40
A600-2T37G	114	157	150	37	50

Inverter model	Power supply capacity (KVA)	Input current (A)	Output current (A)	Adapted motor	
				KW	HP
Three-phase power supply: 380V (-10%~+15), 50/60Hz					
A600-1R5G4	3.0	5	3.8	1.5	2
A600-2R2G4	4.0	5.8	5.1	2.2	3
A600-3R0G4	5.0	8.0	7.2	3.0	4
A600-4R0G4	5.9	10.5	9	4.0	5
A600-5R5G4	8.9	14.6	13	5.5	7.5
A600-7R5G4	11	20.5	17	7.5	10
A600-011G4	17	26	25	11	15
A600-015G4	21	35	32	15	20
A600-018G4	24	38.5	37	18.5	25
A600-022G4	30	46.5	45	22	30
A600-030G4	54	57	60	30	40
A600-037G4	63	69	75	37	50
A600-045G4	81	89	91	45	60
A600-055G4	97	106	112	55	75
A600-075G4	127	139	150	75	100
A600-090G4	150	164	176	90	120
A600-110G4	179	196	210	110	150
A600-132G4	220	240	253	132	180
A600-160G4	263	287	304	160	210
A600-185G4	305	323	340	185	240
A600-200G4	334	365	377	200	260
A600-220G4	375	410	426	220	285

A600-250G4	404	441	465	250	320
A600-280G4	453	495	520	280	370
A600-315G4	517	565	585	315	420
A600-355G4	565	617	650	355	480
A600-400G4	629	687	725	400	530
A600-450G4	716	782	820	450	600
A600-500G4	800	820	900	500	680
A600-560G4	930	950	1020	560	750
A600-630G4	1050	1050	1120	630	850
A600-720G4	1120	1150	1220	720	960

2.4 Installation dimensions

A600-1R5G4~A600-720G4 Overall size

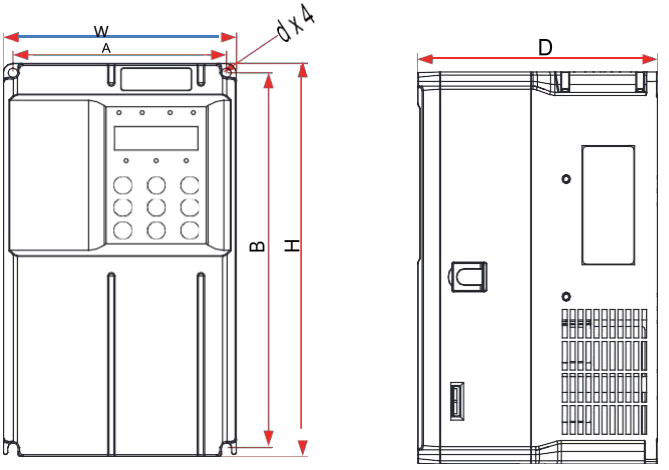


Figure 2-2 Schematic diagram of A600 appearance dimensions and installation dimensions

Table 2-3 A600 appearance and installation hole dimensions (three-phase 380V~480V)

Inverter model	Installation hole position(mm)		Overall dimensions (mm)			Installation hole diameter (mm)
	A	B	H	W	D	
A600-1R5G4B	79	154	164	89	125	Ø4
A600-2R2G4B						
A600-3R0G4B						
A600-4R0G4B	86	173	184	97	145	Ø5
A600-5R5G4B						
A600-7R5G4B	131	245	257	146.5	185	Ø6
A600-011G4B						
A600-015G4B						
A600-018G4B	151	303	320	170	205	Ø6
A600-022G4B						
A600-030G4B	120	385	400	200	220	Ø7
A600-037G4B						
A600-045G4	200	493	510	260	252	Ø7
A600-055G4						

Inverter model	Installation hole position (mm)		Overall dimensions (mm)			Installation hole diameter (mm)
	A	B	H	W	D	
A600-055G4H	200	493	510	260	252	Ø7
A600-075G4						
A600-090G4	200	630	660	320	300	Ø9
A600-110G4						
A600-132G4	250	755	780	400	345	Ø12
A600-160G4						
A600-185G4						
A600-200G4	300	872	900	460	350	Ø12
A600-220G4						
A600-250G4	360	922	950	500	350	Ø12
A600-280G4						
A600-315G4	500	1065	1100	650	360	Ø12
A600-355G4						

A600-400G4	500	1315	1350	700	380	Ø14
A600-450G4						
A600-500G4						
A600-560G4	600	1460	1500	900	400	Ø14
A600-630G4						
A600-720G4						

2.5 Wiring Diagram

2.5.1 Wiring Diagram

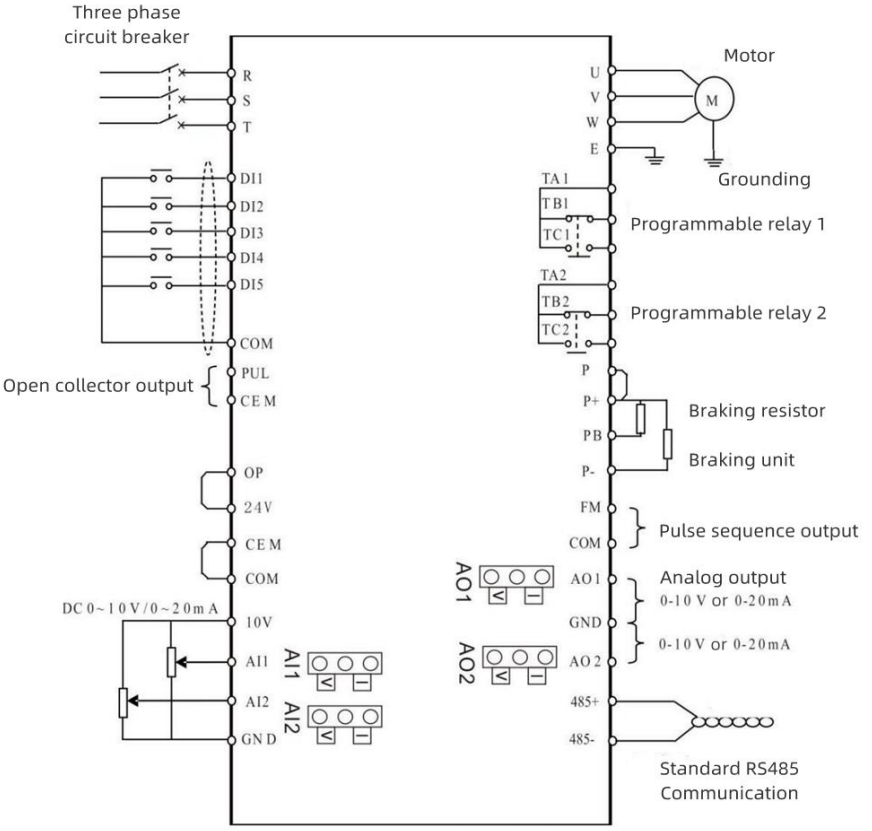


Figure 2-3 Three-phase 380V~480V standard wiring diagram

2.5.2 Function description and precautions

1） A600- series inverter main circuit terminals

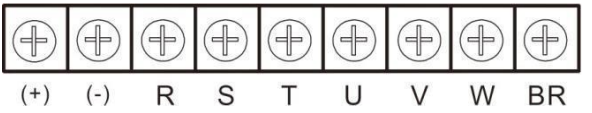


Figure 2-4 A600-1R5G4 ~ A600-022G4 main circuit terminal distribution diagram

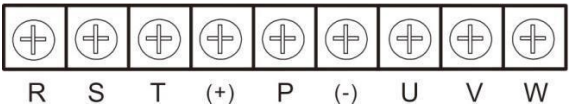
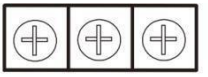


Figure 2-5 A600-030G4 ~ A600-045G4 main circuit terminal distribution diagram



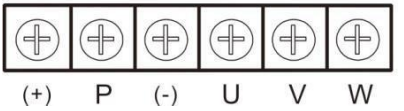


Figure 2-6 A600-055G4 ~ A600-720G4 main circuit terminal distribution diagram

Terminal marking	Terminal name	Function Description
R、S、T	Three-phase power input terminal	AC input three-phase power connection point
(+) 、 (-)	DC bus positive and negative terminals	Common DC bus input point, connection of external braking unit of 37kW and above contact
(+) 、BR	Braking resistor connection terminal	Brake resistor connection points for 37kW and below
U、V、W	Inverter output terminal	Connect three-phase motor
⏚	Ground terminal (PE)	Protective grounding

2）Main circuit cable selection

It is recommended to use symmetrical shielded cables for input and output main circuit cables. Compared with four-core cables, the use of symmetrical shielded cables can reduce electromagnetic radiation in the entire conduction system.

3) Input power R, S, T

There is no phase sequence requirement for the input side wiring of the frequency converter.

The specifications and installation methods of external main circuit wiring must comply with

local regulations and relevant IEC standards.

The filter should be installed close to the input terminals of the inverter, and the connecting cable between them should be less than 30cm. The ground terminal of the filter and the ground terminal of the frequency converter should be connected together, and ensure that the filter and the frequency converter are installed on the same conductive installation plane, and the conductive installation plane is connected to the main ground of the cabinet.

4) DC bus (+), (-)

- Note that there is residual voltage at the (+) and (-) terminals of the DC bus just after a power outage. You must wait until the CHARGE light goes out and confirm that the power outage has occurred for 10 minutes before wiring operations can be performed. Otherwise, there is a risk of electric shock.
- When using external braking components for 90kW and above, please note that the polarity of (+) and (-) cannot be reversed, otherwise it will cause damage to the inverter and braking components or even fire.
- The wiring length of the braking unit should not exceed 10m. Twisted pair or tightly paired

  parallel wiring should be used.
- Do not connect the braking resistor directly to the DC bus, as this may cause damage

  to the inverter or even fire.

5) Braking resistor connection terminal (+), BR

- The braking resistor connection terminal is only valid for models of 30kW and below and confirmed to have a built-in braking unit.
- Please refer to the recommended value for braking resistor selection and the wiring distance should be less than 5m. Otherwise, the inverter may be damaged.
- Note that there should be no flammable objects around the braking resistor. Prevent the

  braking resistor from overheating and igniting surrounding components.
- After connecting the braking resistor, for models below 30kW with a built-in braking unit, set the "P6-15" braking usage rate and "P9-08" braking unit action starting voltage parameters appropriately according to the actual load.

6) Inverter output side U, V, W

- The external main circuit wiring specifications and installation methods need to comply

  with local regulations and relevant IEC standards.
- Do not connect capacitors or surge absorbers to the output side of the inverter, otherwise

  the inverter may be constantly protected or even damaged.
- When the motor cable is too long, electrical resonance is likely to occur due to the influence of distributed capacitance, which may cause damage to the motor insulation or generate a large leakage current, causing overcurrent protection of the inverter. When the motor cable length is greater than 100m, an AC output reactor must be installed near the inverter.
- It is recommended to use shielded wires for output motor cables. The shielding layer needs to be 360° overlapped on the structure using a cable shielding grounding bracket, and the shielding layer lead wire should be crimped to the PE terminal.
- The lead wire of the motor cable shielding layer should be as short as possible, and the

width

- should not be less than 1/5 of the length.

7) Ground terminal (PE)

- The terminal must be reliably grounded, and the ground wire resistance must be less than
- 10Ω. Otherwise, the equipment may malfunction or even be damaged.
- The ground terminal and the N terminal of the power supply neutral line cannot be shared.
- The protective grounding conductor must use yellow-green cable.
- The main circuit shielding layer is grounded.
- It is recommended that the inverter be installed on a conductive metal mounting surface to ensure that the entire conductive bottom of the inverter and the mounting surface are well overlapped.
- The filter should be installed on the same mounting surface as the frequency converter to ensure the filtering effect of the filter.

8) Grid system requirements

This product is suitable for power grid systems with a grounded neutral point. If it is used in an IT power grid system (neutral point is insulated from the ground or grounded with high impedance), the varistor (VDR) to ground jumper and safety capacitor (EMC) Remove the ground jumper, such as No. 1 and No. 2 screws as shown in the figure below, and the filter cannot be installed, otherwise it may cause injury or damage to the inverter.

When a leakage circuit breaker is configured, if the circuit breaker trips during startup, the safety capacitor (EMC) jumper to ground can be removed, using the No. 2 screw as shown in the figure below.

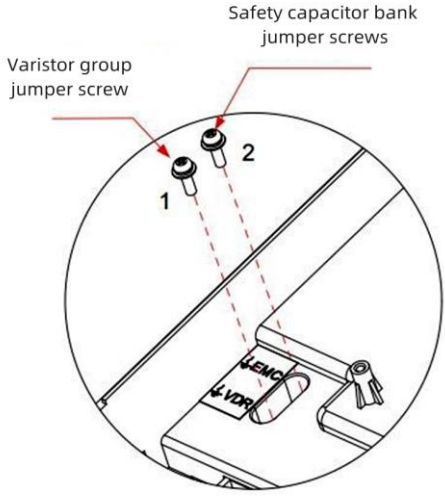


Figure 2-4 Schematic diagram of the position of the varistor (VDR) and safety capacitor (EMC) to ground jumpers

2.5.3

1) Control circuit terminal distribution

Control circuit terminal arrangement

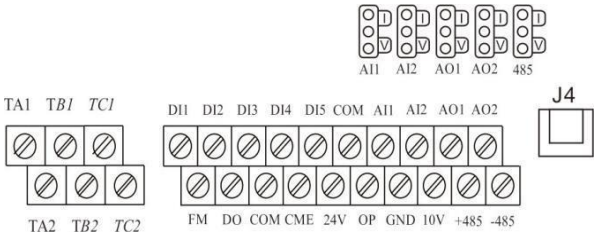


Figure 2-5 Control circuit terminal layout diagram

Table 1-4 A600 inverter control terminal function description

Category	Symbol	Terminal name	Function Description
Power supply	+10V-GND	External +10V power supply	Provides +10V power to the outside, maximum output current: 10mA Generally used as working power supply for external potentiometers. Potentiometer resistance range: 1kΩ~5kΩ
	+24V-COM	External +24V power supply	Provides +24V power to the outside, generally used as digital input and output terminals For power supply and external sensor power supply, maximum output current: 200mA
	OP	External power input terminal	The factory default is connected to +24V. When using external signals to drive DI1~DI5, the OP needs to be connected to the external power supply and connected to the +24V power supply. Source terminal disconnected
Analog input	AI1-GND	Analog input terminal 1	Input range: 0Vdc~10Vdc/0mA~20mA, determined by the Determined by AI1 jumper selection. Input impedance: 22kΩ for voltage input.
	AI2-GND	Analog input terminal 2	Input range: 0Vdc~10Vdc/0mA~20mA, determined by the Determined by AI2 jumper selection. Input impedance: 22kΩ for voltage input.
Analog	AO1-GND	Analog output 1	Voltage or current output is determined by the AO1 jumper selection on the control board. Output voltage range: 0V~10V. Output current range: 0mA~20mA

outp ut	AO1-GND	Analog output 1	The voltage or current output is determined by the AO2 jumper selection on the control board. Output voltage range: 0V~10V; Output current range: 0mA~20mA

Catego ry	Symbol	Terminal name	Function Descriptio n
Jumpe r	AI1	AI1 input selection	Voltage and current input are optional, the default is voltage input
	AI2	AI2 input selection	Voltage and current input are optional, the default is voltage input
	AO1	AO1 output selection	Voltage and current output are optional, and the default is voltage output.
	AO2	AO2 output selection	Voltage and current output are optional, and the default is voltage output.
	485	RS485 terminal matching Resistor selection jumper	RS485 terminal matching resistor selection
Digit al input	DI1	Digital input 1	Optocoupled isolation, compatible with bipolar input Input impedance: 1.39kΩ Voltage range when effective level input: 9V~30V
	DI2	Digital input 2	
	DI3	Digital input 3	
	DI4	Digital input 4	
	DI5	High-speed pulse input terminal	In addition to the characteristics of DI1~DI4, it can also be used as a high-speed pulse input channel. road. Maximum input frequency: 100kHz; input impedance: 1.03kΩ
Digit al outp ut	DO1-CME	Digital output 1	Optocoupler isolation, bipolar open collector output, output voltage range: 0V~24V; output current range: 0mA~50mA Note: The digital output ground CME and the digital input ground COM are internally isolated, but CME and COM have been externally shorted before leaving the factory (DO1 defaults to +24V drive at this time). When DO1 wants to be driven by an external power supply When operating, the external short circuit between CME and COM must be disconnected.
	FM- COM	High-speed pulse output	Constrained by parameter P5-00 "FM terminal output mode selection"; When used as high-speed pulse output, the maximum frequency is 100kHz; When used as an open collector output, the specifications are the same as DO1.
Relay	T1A-T1B	Normally closed terminal	Contact driving capacity: 250Vac, 3A, COSØ=0.4

output 1	T1A-T1C	Normally open terminal	30Vdc, 1A
Relay output 2	T2A-T2B	Normally closed terminal	Contact driving capacity: 250Vac, 3A, COSØ=0.4 30Vdc, 1A
	T2A-T2C	Normally open terminal	

Derating is required when the ambient temperature exceeds 23°C. For every 1°C increase in ambient temperature, the output current decreases by 1.8mA. The maximum output current is 170mA at an ambient temperature of 40°C. When the user shorts OP to 24V, the current of the DI terminal must also be taken into account.

Chapter 3 Keypad Operation

3.1 Keypad operation instructions

A600 series inverters can perform parameter operation, status monitoring and control through the LED operation panel.

3.2 LED operation keypad introduction

Using the operation keypad, you can perform parameter setting/modification, working status monitoring, operation control (start, stop) and other operations on the inverter. The appearance of the operation keypad and the names of the operation keys are as shown in the figure below:

Figure 3-1 Schematic diagram of the operation keypad

3.2.1 Function indicator light

Light on Light off Light flashing

Indicator status		Status description
RUN running indicator light	RUN	Light off: shutdown
	RUN	Light on: running

Indicator status	Status description

LOCAL/REMOT Run command indicator light		Light off: keypad control
		Light on: terminal control
		Flashing: communication control
REV forward and reverse indicator light		Light off: forward running
		Light on: reverse operation
ALM Tuning/Torque Control/Fault Indicator		Light off: normal operation
		Light on: Torque control mode
		Slow flash: tuning status (1 time/second)
		Quick flash: fault status (4 times/second)

3.2.2 Keypad button functions

Key	Name	Key Function
PROG	Programming key	Enter or exit the first-level menu.
ENETER	Confirm key	Enter the menu screen step by step and confirm the setting parameters.
△	Increment key	Increment of data or parameters.
▽	Decrement key	Decrement of data or parameters.
SHIFT	Shift key	In the shutdown display interface and running display interface, you can cycle through the selection of display parameters. number; when modifying parameters, you can select the modification bit of the parameter.
RUN	Run key	In the "operation panel" start-stop control mode, it is used for running operations.
STOP	Stop/Reset	In the running state, press this key to stop the running operation. This feature is controlled by parameter P7-02; in

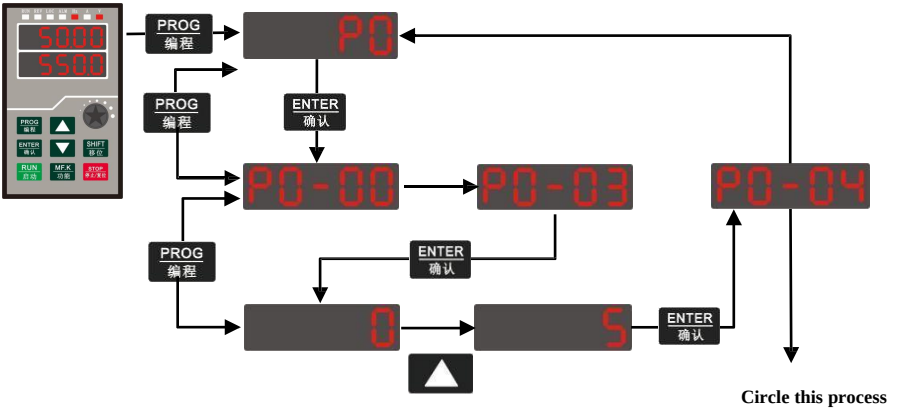
		the fault alarm state, it can be used to reset the operation.
MF.K	Multi-function selection key	Switch between the selected functions according to the setting value of P7-01.

3.2.4 Parameter viewing and modification methods

The operation panel of the A600 inverter adopts a three-level menu structure for parameter setting and other operations. The three-level menus are:

1) Function parameter group (first-level menu)
2) Parameters (secondary menu)
3) Parameter setting value (three-level menu)

After entering each level of menu, when the display digit flashes, you can press the ▲, ▼, or ▸ keys to make modifications. The operation process is shown in the figure below:



3-2 The third-level menu operation flow chart changes the parameters

a) When operating in the third-level menu, you can press the PRG key or ENETER key to return to the second-level menu. The difference between the two is:

Press the ENTER key to save the set parameters and return to the secondary menu, and automatically transfer to the next parameter; press the PRG key to abandon the current parameter modification and directly return to the secondary menu of the current parameter number.

b) In the third-level menu state, if the parameter does not have a flashing bit, it means that the parameter cannot be modified. The possible reasons are:

(1) This parameter is an unmodifiable parameter, such as inverter type, actual detection parameters, operation record parameters, etc.

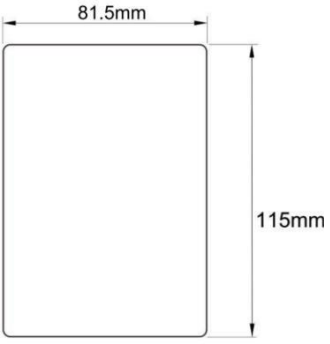
(2) This parameter cannot be modified during operation and must be shut down before

modification can be made.

3.2.5 Parameter composition

Parameter group	Function description	Description
P0 ~ PP A0 ~ AC	Basic parameters	Operating instructions, frequency instructions, motor parameters, control methods, AI/AO characteristic calibration Correct and optimize control parameters.
U0	Monitor parameter group	Display of basic monitoring parameters of the frequency converter.

3.3 Keypad base dimension

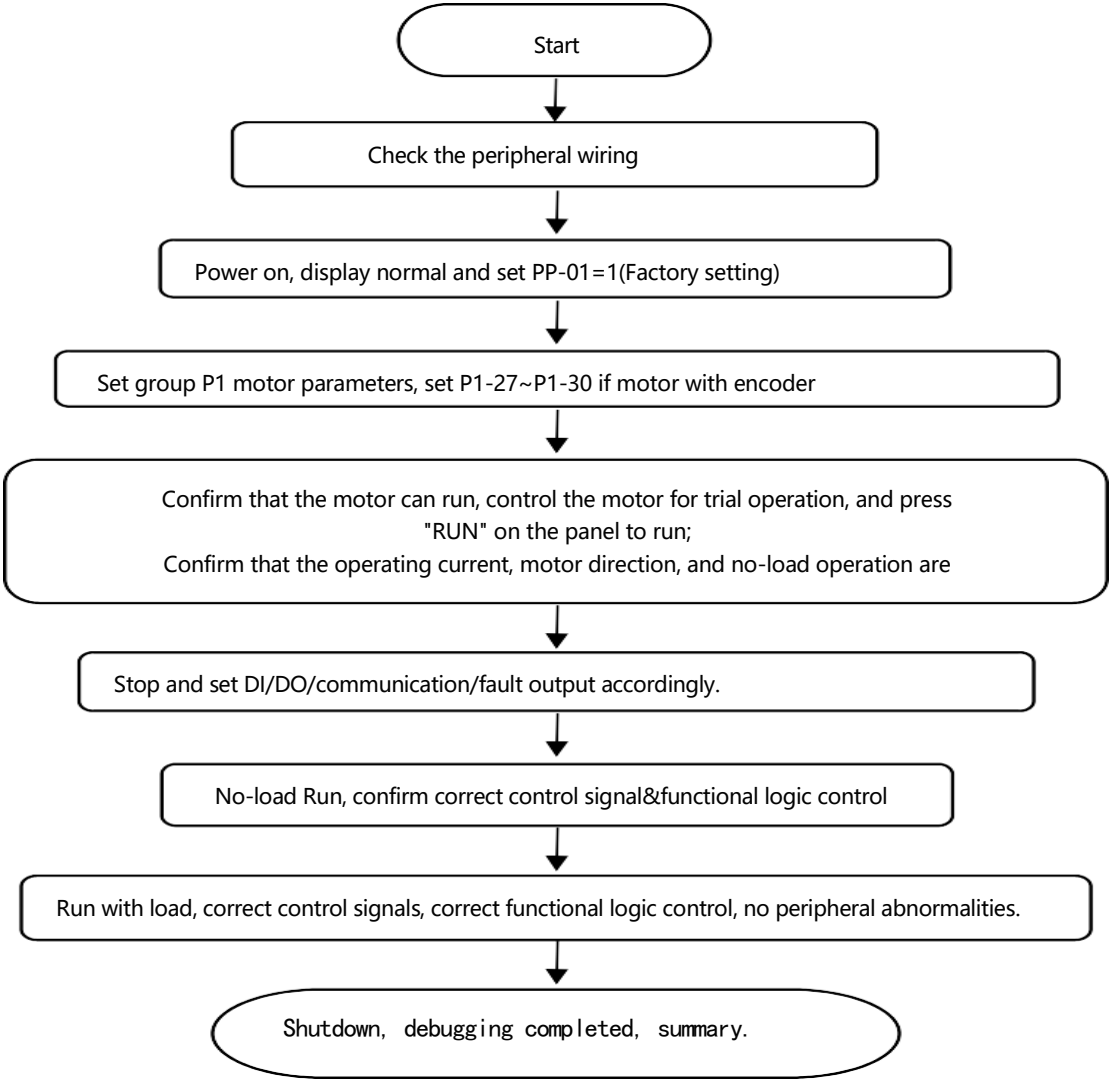


3-2 Keypad base dimension

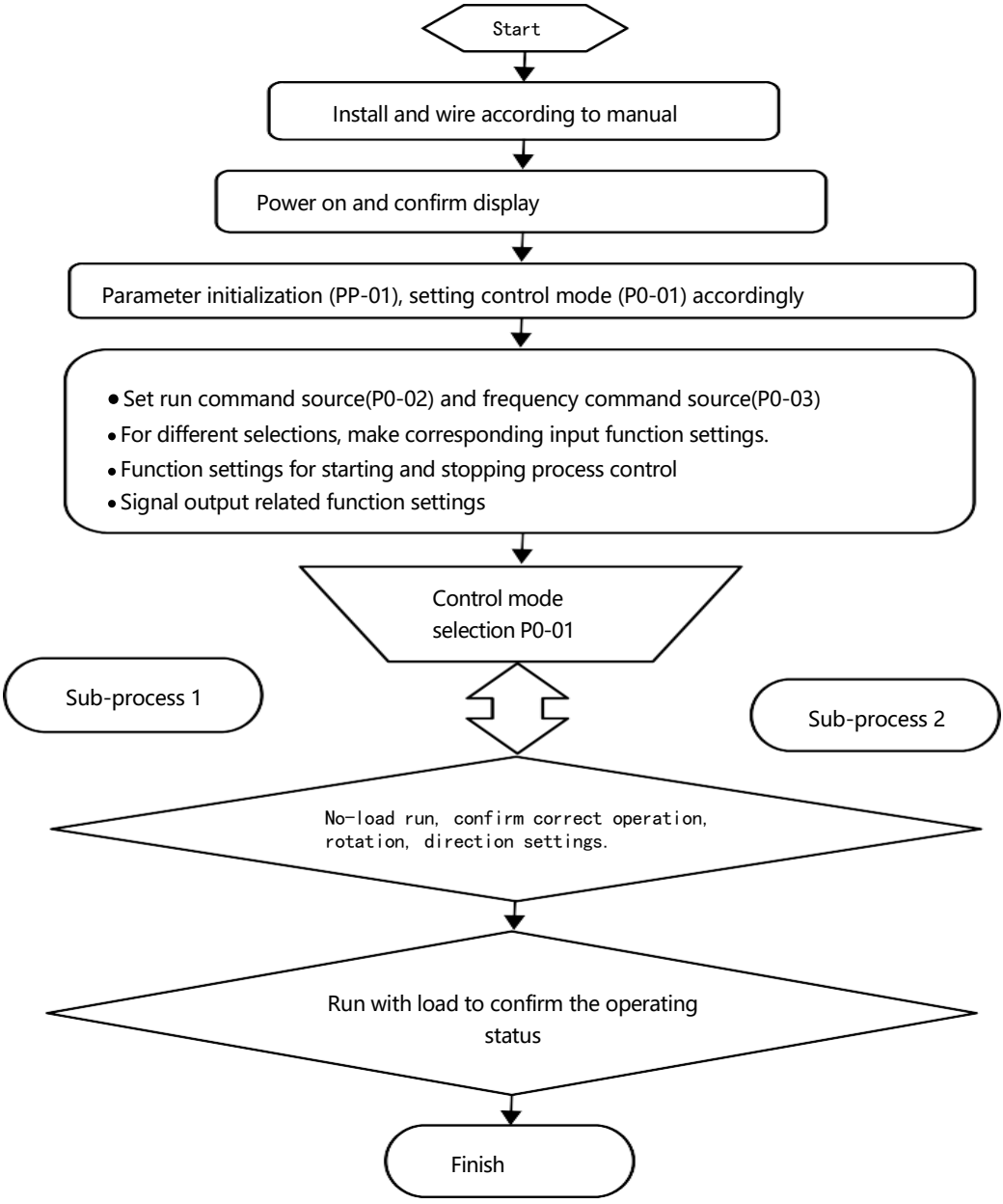
Chapter 4 Operation Process and Self-Study

This chapter introduces the basic debugging steps of the inverter, mainly including the frequency command setting, start-up and stop control of the inverter. According to the content of this chapter, the trial operation of the inverter-controlled motor can be realized.

4.1 Quick Debugging Guide



4.2 General flow chart of inverter debugging



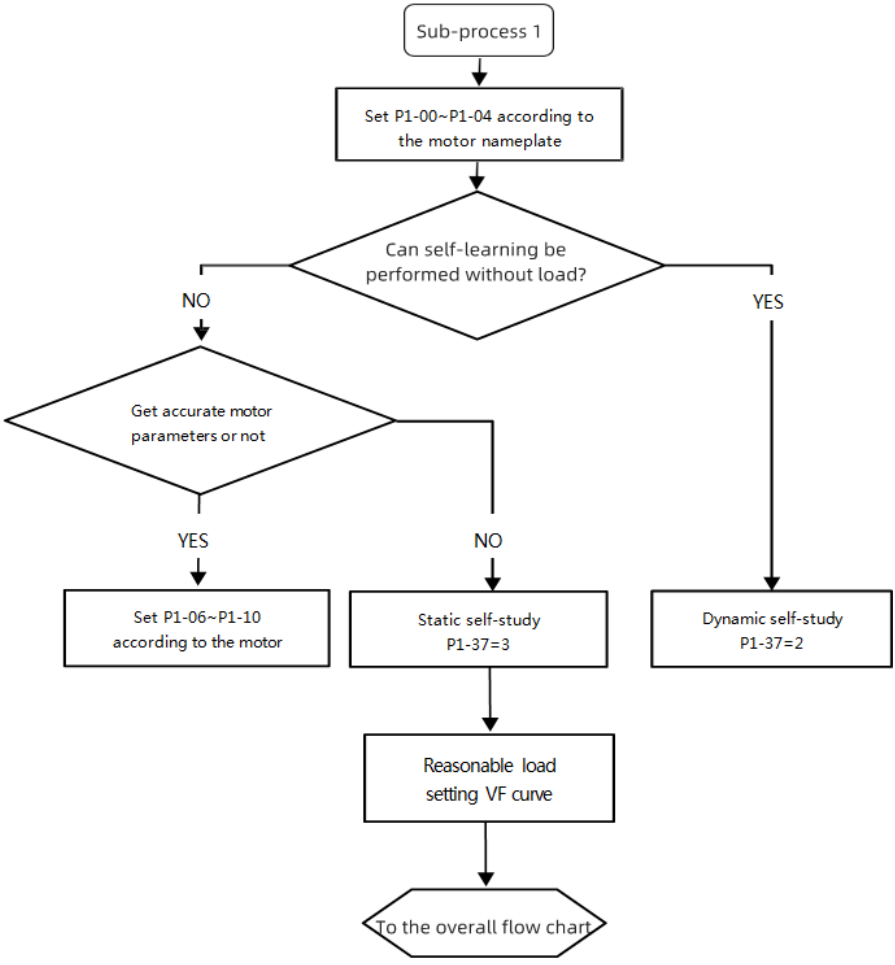


Figure 3-3 Inverter debugging sub-flow chart 2 (vector control)

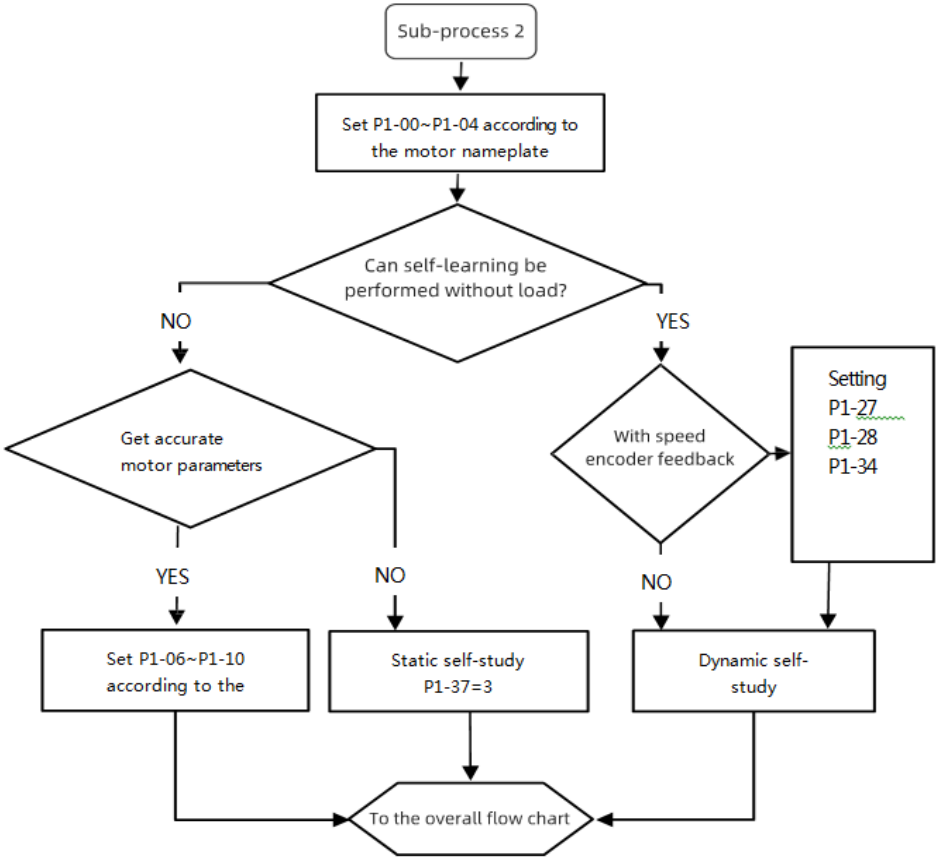


Figure 3-4 Inverter debugging sub-flow chart 2 (vector control)

4.3 Things to check before turning on power

Be sure to confirm the following items before turning on the power.

Item	Content
Confirmation of power supply voltage	Please confirm whether the power supply voltage is correct AC380V~480V 50/60Hz.
	Please wire the power input terminals (R/S/T) reliably.
	Make sure the inverter and motor are properly grounded.
Confirmation of connection between inverter output terminals and motor terminals	Please confirm whether the connection between the inverter output terminals (U/V/W) and the motor terminals is firm.
Confirmation of connection of inverter control circuit terminals	Please confirm whether the connection between the control circuit terminals of the inverter and other control devices is secure.
Confirmation of the status of the inverter control terminals	Confirm whether the inverter control circuit terminals are all in the OFF state (the inverter is not running)
Load confirmation	Please confirm whether the motor is in no-load state and not connected to the mechanical system.

4.4 Display status confirmation after turning on the power

State	Display	Description
Normal	50.00	The factory default display is digital setting 50.00Hz
When failure	Err02	When a fault occurs, the inverter is in shutdown state and the fault type is displayed.

4.5 Parameter initialization

PP-01	Parameter initialization		Factory default	0
	Setting range	0	No operation	
		1	Restore factory parameters, excluding motor parameters	
		2	Clear record information	
		4	Back up user's current parameters	
		501	Restore user backup parameters	

1：Restore factory settings, excluding motor parameters

After setting PP-01 to 1, most of the inverter function parameters are restored to the factory parameters, but the motor parameters, frequency command decimal point (P0-22), fault record information, cumulative running time (P7-09), cumulative power-on Time (P7-13), accumulated power consumption (P7-14), and inverter module radiator temperature (P7-07) are not restored.

2：Clear record information

Clear the inverter fault record information, accumulated running time (P7-09), accumulated power-on time (P7-13), and accumulated power consumption (P7-14).

4：Back up user's current parameters

Back up the parameters set by the current user. The current setting values of all functional parameters are backed up. To facilitate customers to recover after parameter adjustment is disordered.

501：Restore user backup parameters

Restore the previously backed up user parameters, that is, restore the parameters backed up by setting PP-01 to 4.

4.6 Motor control method selection basis

Para meter	Description	Application
P0-01: Select motor control	Set to 0: No speed sensor vector control (SVC)	Refers to open-loop vector control, which is suitable for common high-performance control situations. One inverter only Can drive a motor. Such as machine tools, centrifuges, wire drawing machines, injection molding machines and other loads.
	Set to 1: Speed sensor vector control (FVC)	It refers to closed-loop vector control. An encoder must be installed on the motor end, and the inverter must be equipped with a PG card of the same type as the encoder. Suitable for high-precision speed control or torque control applications. One frequency converter can only drive one motor. Such as high-speed papermaking machinery, lifting machinery, elevators and other loads.
	Set to 2: V/F control (Speed open loop control)	It is suitable for situations where the load requirements are not high, or where one frequency converter drives multiple motors, such as fans and pumps. It can be used in situations where one frequency converter drives multiple motors.

4.7 Self-study

Methods for the inverter to obtain the internal electrical parameters of the controlled motor include: dynamic tuning, static tuning 1, static tuning 2, manual input of motor parameters.

Tuning mode	Application	Tuning effect
No-load dynamic tuning P1-37 = 2	Where the motor and application system can be easily separated	Optimum
Load dynamic tuning P1-37 = 2	Where it is inconvenient to separate the motor from the application system, but it can be operated with the load OK. The friction of the load is small, and it is close to no load when running at constant speed.	The smaller the friction, the better the effect
static tuning 1 P1-37 = 1	Situations where it is difficult to separate the motor from the load and dynamic tuning operation is not allowed.	Generally good

Static tuning 2 P1-37 = 3	When it is difficult to separate the motor from the load and dynamic tuning operation is not allowed, it is recommended to use this mode for static tuning. The tuning time is longer than static tuning 1.	Good
Enter parameters manually	When it is difficult to separate the motor from the application system, copy the motor parameters of the same model that have been successfully tuned by the inverter before and input them into the corresponding parameters of P1-00 ~ P1-10.	Good

The steps for automatic tuning of motor parameters are as follows:

The following takes the default parameter tuning method of motor 1 as an example. The tuning method of motor 2 is the same, except that the parameter number needs to be changed accordingly.

Step 1: If the motor can be completely decoupled from the load, in the event of a power outage, mechanically detach the motor from the load so that the motor can rotate freely without load.

Step 2: After powering on, first select the inverter command command (P0-02) as the

operation panel command channel.

Step 3: Accurately enter the nameplate parameters of the motor (such as P1-00 ~ P1-05). Please enter the following parameters according to the actual parameters of the motor (selected based on the current motor):

Motor selection	Parameters
Motor 1	P1-00: Motor type selection P1-01: Motor rated power P1-02: Motor rated voltage P1-03: Motor rated current P1-04: Motor rated frequency P1-05: Motor rated speed
Motor 2	A2-00 ~ A2-05: Same as above definition

If there is an encoder, enter the encoder parameters (P1-27, P1-28, P1-30).

Step 4: If it is an asynchronous motor, please select 2 for P1-37 (tuning selection, motor 2 corresponds to A2-37

parameter)

(Complete tuning of asynchronous machine), press ENTER key to confirm. At this time, the keyboard displays

TUNE, as shown in the following figure:

Then press the RUN key on the keyboard panel. The inverter will drive the motor to accelerate, decelerate, and run forward and reverse. The running indicator light will light up. The tuning operation lasts for about 2 minutes. When the above display message disappears, it returns to the normal parameter display state, indicating that the tuning is completed.

After this complete tuning, the frequency converter automatically calculates the following parameters of the motor:

Motor selection	Parameters
Motor 1	P1-06: Asynchronous motor stator resistance P1-07: Asynchronous motor rotor resistance P1-08: Asynchronous motor leakage inductance P1-09: Asynchronous motor mutual inductance

	P1-10: Asynchronous motor no-load current
Motor 2	A2-06 ~ A2-10: Same definition as above

If the motor cannot be completely separated from the load, please select 3 (asynchronous machine static tuning 2) for P1-37 (A2-37 for motor 2), and then press the RUN key on the keyboard panel to start the tuning operation of the motor parameters.

Chapter 5 Function Parameter Table

The password of the variable frequency drive is only used to lock the panel operation. After setting the password, when reading and writing operating parameters through the keyboard, password verification is required every time after exiting the operation and entering again； During communication operations, read and write operations can be performed directly without password (except for PP and PF groups). The parameter menu in the user-defined parameter mode is not protected by a password.

Group A and Group P are the basic function parameters. Group U is the monitoring function parameter。

The symbols in the function table are explained as follows：

"☆"：modifiable parameter under any condition；

"★"：not modifiable parameter under run status；

"●"：the actual detected parameter, not modifiable;

"*"：factory parameter, only modifiable for factory, not allowed for users modifying

- **Brief table of basic function parameters**

Parameter	Name	Set Range	Factory default	Modification
Group P0 Basic Run Parameters				
P0-00	GP type	1：G type （constant torque load type） 2：P type（fan, water pump load type）	Model dependent	•
P0-01	Motor 1 control mode	0：Speed Sensor-less Vector Control（SVC） 1：Vector control with speed sensor（FVC） 2：Voltage/Frequency (V/F) control	2	★
P0-02	Command source selection	0：Operational panel control (LED off) 1：Terminal control (LED on) 2：Communication control (LED flashing)	0	☆

P0-03	Main frequency source X selection	0：Digital setting (non-retentive at power failure) 1：Digital setting (retentive at power failure) 2：AI1 3：AI2 4：Panel potentiometer 5：PULSE setting (DI5) 6：Multi-reference 7：Simple PLC setting 8：PID setting 9：Communication setting	4	★

Parameter	Name	Set Range	Factory default	Modification
P0-04	Auxiliary frequency source Y selection	The same as P0-03 (main frequency source X selection)	0	★
P0-05	Range of auxiliary frequency Y for X and Y operation	0：Relative to the maximum frequency 1：Relative to frequency source X	0	☆
P0-06	Range of auxiliary frequency Y for X and Y operation	0%~150%	100%	☆

P0-07	Frequency source superposition selection	One's place: frequency source superposition 0: Main frequency source X 1: X and Y operation (operation relationship determined by ten's digit) 2: Switchover between X and Y 3: Switchover between X and 'X and Y operation' 4: Switchover between Y and 'X and Y operation' Ten's place: X and Y operation relationship 0: X+Y 1: X-Y 2: The maximum of the two 3: The minimum of the two	00	☆
P0-08	Preset frequency	0.00Hz~ maximum frequency (P0-10)	50.00Hz	☆
P0-09	Running direction	0: Same direction 1: Reverse direction	0	☆
P0-10	Maximum frequency	50.00Hz~500.00Hz	50.00Hz	★
P0-11	Source of frequency upper limit	0: Set by P0-12 1: AI1 2: AI2 3: AI3 4: PIULSE setting 5: Communication setting	0	★
P0-12	Frequency upper limit	Frequency lower limit (P0-14) to maximum frequency (P0-10)	50.00Hz	☆
P0-13	Frequency upper limit offset	0.00Hz~ maximum frequency P0-10	0.00Hz	☆
P0-14	Frequency lower limit	0.00Hz~ upper limit frequency P0-12	0.00Hz	☆
P0-15	Carrier frequency	Model dependent	Model dependent	☆
P0-16	Carrier frequency adjustment with	0: No 1: Yes	1	☆

	temperature			

Parameter	Name	Set Range	Factory default	Modification
P0-17	Acceleration time 1	0.00s~650.00s(P0-19=2) 0.0s~6500.0s(P0-19=1) 0s~65000s(P0-19=0)	Model dependent	☆
P0-18	Deceleration time 1	0.00s~650.00s(P0-19=2) 0.0s~6500.0s(P0-19=1) 0s~65000s(P0-19=0)	Model dependent	☆
P0-19	Acceleration/ Deceleration time unit	0：1 second 1：0.1 seconds 2：0.01seconds	1	★
P0-21	Frequency offset of auxiliary frequency source for X and Y operation	0.00Hz~ maximum frequency P0-10	0.00Hz	☆
P0-22	Frequency reference resolution	2：0.01Hz	2	★
P0-23	Retentive of digital setting frequency upon power failure	0：Not retentive 1：Retentive	0	☆
P0-24	Motor selection	0：Motor 1 1：Motor 2	0	★
P0-25	Acceleration/ Deceleration	0：Maximum frequency (P0-10) 1：Set frequency 2：100Hz	0	★

	time base frequency			
P0-26	Base frequency for UP/DOWN modification during running	0：Running frequency 1：Set frequency	0	★
P0-27	Binding command source to frequency source	One's place：Binding operation panel command to frequency source 0：No binding 1：Digital setting frequency 2：AI1 3：AI2 4：AI3 5：PULSE setting（DI5） 6：Multi-reference 7：Simple PLC 8：PID 9：Communication setting Ten's place：Binding terminal command to frequency source Hundred's frequency: Binding operation command to frequency source	0000	☆
P0-28	Communication expansion card type	0：Modbus communication card 1：Profi bus-DP、CANopen、Profinet、EtherCAT communication card	0	★

Parameter	Name	Set Range	Factory default	Modification
Group P1 Motor 1 Parameter				
P1-00	Motor type selection	0：Common asynchronous motor 1：Variable frequency asynchronous motor	0	★
P1-01	Rated motor power	0.1kW~1000.0kW	Model dependent	★
P1-02	Rated motor voltage	1V~2000V	Model dependent	★
P1-03	Rated motor current	0.01A~655.35A (Inverter power≤55KW) 0.1A~6553.5A (Inverter power≤55KW)	Model dependent	★
P1-04	Rated motor frequency	0.01Hz~ Maximum frequency	Model dependent	★
P1-05	Rated motor rotational speed	1rpm~65535rpm	Model dependent	★
P1-06	Stator resistance (asynchronous motor)	0.001Ω~65.535Ω（AC drive power≤55kW） 0.0001Ω~6.5535Ω（AC drive power >55kW）	Tuning parameters	★
P1-07	Rotor resistance (asynchronous motor)	0.001Ω~65.535Ω（AC drive power≤55kW） 0.0001Ω~6.5535Ω（AC drive power >55kW）	Tuning parameters	★
P1-08	Leakage inductance reactance (asynchronous	0.01mH~655.35mH（AC drive power≤55kW） 0.001mH~65.535mH（AC drive power >55kW）	Tuning parameters	★

	motor)			
P1-09	Mutual inductance reactance (asynchronous motor)	0.1mH~6553.5mH（AC drive power≤ 55kW） 0.01mH~655.35mH（AC drive power >55kW）	Tuning parameters	★
P1-10	No-load current (asynchronous motor)	0.01A~P1-03（AC drive power ≤ 55kW） 0.1A~P1-03（AC drive power >55kW）	Tuning parameters	★
P1-27	Encode pulses per revolution	1~65535	1024	★
P1-28	Encode type	0：ABZ incremental encode 2：Resolver	0	★
P1-30	A/B phase sequence of ABZ incremental encoder	0：Forward 1：Reserve	0	★
P1-34	Number of pole pairs of resolver	1~65535	1	★
P1-36	PG wire-break fault detection time	0.0s : No action 0.1s~10.0s		
P1-37	Tuning selection	0：No operation 1：Asynchronous motor static tuning 2：Asynchronous motor complete tuning 3：Asynchronous motor static complete tuning	0	★

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
Group 2 Motor 1 Vector Control Parameter				
P2-00	Speed loop proportional gain 1	1~100	30	☆

P2-01	Speed loop integral time 1	0.01s~10.00s	0.50s	☆
P2-02	Switchover frequency 1	0.00~P2-05	5.00Hz	☆
P2-03	Speed loop proportional gain 2	1~100	20	☆
P2-04	Speed loop integral time 2	0.01s~10.00s	1.00s	☆
P2-05	Switchover frequency 2	P2-02~ Maximum frequency	10.00Hz	☆
P2-06	Vector control slip gain	50%~200%	100%	☆
P2-07	SVC speed feedback filter time	0.000s~0.100s	0.015s	☆
P2-09	Torque upper limit source in speed control mode	0：Parameter P2-10 setting 1：AI1 2：AI2 3：AI3 4：PULSE setting（DI5） 5：Communication settingf 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) The full scale of optional1-7 corresponds to P2-10	0	☆
P2-10	Digital setting of torque upper limit in speed control mode	0.0%~200.0%	150.0%	☆

P2-11	Torque upper limit command selection in speed control mode (Power generation)	0：Parameter P2-10 setting（No distinction is made between electric and power generation） 1：AI1 2：AI2 3：AI3 4：PULSE setting 5：Communication setting 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 8：Parameter P2-12 setting The full scale of optional1-7 corresponds to P2-12	0	☆
P2-12	Torque upper limit digital setting in speed control mode Fixed (Power generation)	0.0% ~ 200.0%	150.0%	☆
P2-13	Excitation adjustment Integral gain	0~60000	2000	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
P2-15	Torque adjustment proportional gain	0~60000	2000	☆
P2-16	Torque adjustment integral gain	0~60000	1300	☆
P2-17	Speed loop integral property	One's place:integral separation 0：Disabled 1：Enable	0	☆

P2-21	Maximum torque coefficient in field weakening zone	50~200%	100%	☆
P2-22	Generating power limit enable	0：Disabled 1：Valid throughout the process 2：Constant speed takes effect 3：Deceleration takes effect	0	☆
Group P3 V/F Control Parameters				
P3-00	V/F 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：Reserved 10：V/F complete separation mode 11：V/F semi-separation mode	0	★
P3-01	Torque boost	0.0%：（Automatic torque boost） 0.1%~30.0%	Model dependent	☆
P3-02	Torque boost cut-off frequency	0.00Hz~ Maximum frequency	50.00Hz	★
P3-03	Multi-point V/F frequency point 1	0.00Hz~P3-05	0.00Hz	★
P3-04	Multi-point V/F voltage point 1	0.0%~100.0%	0.0%	★
P3-05	Multi-point V/F frequency point 2	P3-03~P3-07	0.00Hz	★
P3-06	Multi-point V/F voltage point 2	0.0%~100.0%	0.0%	★
P3-07	Multi-point V/F frequency point 3	P3-05~ Motor rated frequency (P1-04)	0.00Hz	★
P3-08	Multi-point V/F voltage point 3	0.0%~100.0%	0.0%	★
P3-10	V/F over-excitation gain	0~200	64	☆
P3-11	V/F oscillation suppression gain	0~100	40	☆

Parameter	Name	Set Range	Factory default	Modification
P3-13	V/F separated voltage source	0：Digital setting（P3-14） 1：AI1 2：AI2 3：AI3 4：PULSE PULSE setting（DI5） 5：Multi-reference 6：Simple PLC 7：PID 8：Communication setting Note：100.0% corresponds to the rated motor voltage	0	☆
P3-14	V/F separated voltage digital setting	0V~ motor rated voltage	0V	☆
P3-15	Voltage rise time of V/F separation	0.0s~1000.0s Note：it indicates the time from 0V to the rated voltage of the motor	0.0s	☆
P3-16	Voltage deceleration time for V/F separation	0.0s~1000.0s Note：it indicates the time from 0V to the rated voltage of the motor	0.0s	☆
P3-17	Stop mode selection upon V/F separation	0：Frequency/voltage declining to 0 independently 1：Frequency declining after the voltage declines to 0	0	☆
P3-18	Over-current stall action current	50~200%	150%	★
P3-19	Over-current stall inhibition enable	0：Disable 1：Enable	1	★
P3-20	Over-current stall suppression gain	0~100	20	☆

P3-21	Current compensation coefficient for double-speed over-loss-peed action	50~200%	50%	★
P3-22	Overvoltage stall action voltage	Three phase 380~480V Type：30.0V~800.0V Three phase 200~240V Type：30.0V~800.0V	★	
P3-23	Overvoltage stall enable	0：Disable 1：Enable	1	★
P3-24	Overvoltage stall suppression frequency gain	0~100	30	☆
P3-25	Overvoltage stall inhibits voltage gain	0~100	30	☆
P3-26	Overvoltage stall maximum rise frequency limit	0~50Hz	5Hz	★

Parameter	Name	Set Range	Factory default	Modification
Group 4 Input Terminal Parameters				
P4-00	DI1 terminal function selection	0：No function 1：forward running FWD or according to the order 2：Reverse running REV or forward and reverse running direction 3：Three-line operation control 4：Forward jog（FJOG） 5：Reserve jog（RJOG） 6：Terminal UP 7：Terminal DOWN 8：Free parking 9：Fault reset（RESET） 10：Operation pause 11：External fault normally open input 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：Acceleration and deceleration time selection terminal 1 17：Acceleration and deceleration time selection terminal 2 18：Frequency source switching 19：UP/DOWN setting clear (terminal,	1	★
P4-01	DI2 terminal function selection		2	★
P4-02	DI3 terminal function selection		3	★
P4-03	DI4 terminal function selection		12	★
P4-04	DI5 terminal function selection		13	★

P4-05	DI6 terminal function selection	keyboard) 20：Control command switching terminal 1 21：Prohibition of acceleration and deceleration 22：PID pause 23：Simple PLC status reset 24：Swing frequency pause 25：Counter input 26：Counter reset 27：Length count input 28：Length reset 29：Torque control prohibited 30：PULSE setting frequency input（Only valid for DI5） 31：Reserved 32：Immediate DC braking 33：External fault normally closed input 34：Frequency modification enable 35：PID action direction is reserved 36：External parking terminal 1	0	★

Parameter	Name	Set Range	Factory default	Modification
P4-06	DI7 terminal function selection	37：Control command switching terminal 2 38：PID integration suspended 39：Frequency source X and preset frequency switch 40：Frequency source Y and preset frequency switch 41：Motor terminal selection function	0	★
P4-07	DI8 terminal function selection		0	★

P4-08	DI9 terminal function selection	42：Reserved 43：PID parameter switch 44：User-defined fault 1 45：User-defined fault 2 46：Speed control/torque control switching 47：Emergency parking 48: External parking terminal 2 49：Deceleration DC braking 50：This running time is cleared 51：Two-wire/three-wire switching 52：Reverse is prohibited 53-59：Reserved	0	★
P4-09	DI10 terminal function selection		0	★
P4-10	DI filter time	0.000s~1.000s	0.010s	☆
P4-11	Terminal command mode	0：Two-wire type 1 1：Two-wire type 2 2：Three-wire type 1 3：Three-wire type 2	0	★
P4-12	Terminal UP/DOWN change rate	0.001Hz/s~65.535Hz/s	1.00Hz/s	☆
P4-13	AI curve 1 minimum input	0.00V~P4-15	0.00V	☆
P4-14	AI curve 1 minimum input corresponding setting	-100.0%~+100.0%	0.0%	☆
P4-15	AI curve 1 maximum input	P4-13~+10.00V	10.00V	☆
P4-16	AI curve 1 maximum input corresponding setting	-100.0%~+100.0%	100.0%	☆
P4-17	AI1 filter time	0.00s~10.00s	0.10s	☆
P4-18	AI curve 2 minimum input	0.00V~P4-20	0.00V	☆
P4-19	AI curve 2 minimum corresponding setting	-100.0%~+100.0%	0.0%	☆
P4-20	AI curve 2	P4-18~+10.00V	10.00V	☆

	minimum input			
P4-21	AI curve 2 maximum corresponding setting	-100.0%~+100.0%	100.0%	☆

Parameter	Name	Set Range	Factory default	Modification
P4-22	AI2 filter time	0.00s~10.00s	0.10s	☆
P4-23	AI curve 3 minimum input	-10.00V~P4-25	-10.00V	☆
P4-24	AI curve 3 minimum input corresponding setting	-100.0%~+100.0%	-100.0%	☆
P4-25	AI curve 3 maximum input	P4-23~+10.00V	10.00V	☆
P4-26	AI curve 3 maximum input Corresponding setting	-100.0%~+100.0%	100.0%	☆
P4-27	AI3 filter time	0.00s~10.00s	0.10s	☆
P4-28	PULSE input minimum frequency	0.00kHz~P4-30	0.00kHz	☆
P4-29	PULSE minimum input frequency Corresponding setting	-100.0%~100.0%	0.0%	☆
P4-30	PULSE maximum input frequency	P4-28~100.00kHz	50.00kHz	☆
P4-31	PULSE maximum input frequency corresponding setting	-100.0%~100.0%	100.0%	☆

P4-32	PULSE filter time	0.00s~10.00s	0.10s	☆
P4-33	AI curve selection	one's place：AI1 curve selection 1：curve 1（2 points, see P4-13~P4-16） 2：curve 2（2 points，see P4-18~P4-21） 3：curve 3（2 points，see P4-23~P4-26） 4：curve 4（4 points，see A6-00~A6-07） 5：curve 5（4 points，see A6-08~A6-15）Tens place：AI2 curve selection，same as above Hundreds place：AI3 curve selection，the same as above	321	☆
P4-34	AI is lower than the minimum input setting selection	one's place：AI1 is lower than the minimum input setting selection 0：corresponding minimum input setting 1：0.0% Tens place：AI2 is lower than minimum input setting selection, same as above Hundreds place：AI3 is lower than the minimum input setting selection, same as above	000	☆
P4-35	DI1 delay time	0.0s~3600.0s	0.0s	★
P4-36	DI2 delay time	0.0s~3600.0s	0.0s	★
P4-37	DI3 delay time	0.0s~3600.0s	0.0s	★

Parameter	Name	Set Range	Factory default	Modification

P4-38	DI terminal effective mode selection 1	0：Valid for active high 1: Active low One's place DI1 Tens place：DI2 Hundreds place：DI3 Thousands place：DI4 Ten thousand places：DI5	00000	★
P4-39	DI terminal effective mode selection 2	0：Valid for active high 1：Active low One's place：DI6 Tens place：DI7 Hundreds place：DI8 Thousands：DI9 Ten Thousands Place：DI10	00000	★
Group P5 Output Terminal Parameter				
P5-00	FM terminal output mode selection	0：PULSE output (FMP) 1：Switch quantity output (FMR)	0	☆
P5-01	FMR function selection（Open collector output terminal）	0：No output 1：The inverter is running 2：Fault output (Free pause fault) 3：Frequency level detection 1 4：Frequency reached 5：Running at zero speed (no output when stopped) 6：Motor overload pre-alarm 7：Frequency converter overload pre-alarm 8：Set count value reach 9：The designated count value is reached 10：Length reached 11：Simple PLC cycle complete 12：Accumulated running time reached 13：Frequency limitation 14：Torque is being limited 15：Ready to run 16：AI1>AI2 17：Upper limit frequency reached 18：Lower limit frequency reached	0	☆
P5-02	Relay 1 function selection (T1A-T1B-T1C)		1	☆
P5-03	Relay 2 function selection（T2A-T2B-T2C）		2	☆

		(related to operation)		

Parameter	Name	Set Range	Factory default	Modification
P5-04	DO1 Output selection function	19：Under-voltage status 20：Communication setting 21：Reserved 22：Reserved 23：Zero-speed running 2（also output when stopping） 24：Accumulated power-on time is reached 25：Frequency level detection 2 26：Frequency 1 reached output 27：Frequency 2 reached output 28：Current 1 reaches the output 29：Current 2 reaches the output 30：Timed arrival output 31：AI1 input limited exceeded 32：Dropping 33：Reverse running 34：Zero current state 35：Module temperature reached 36：The output current exceeds the limit 37：Lower limit frequency reached (output at stop) 38：Warning (all faults) 39：Motor over temperature 40：The running time arrives 41：Fault (free shutdown fault and	0	☆
P5-05	Expansion card DO2 output selection		4	☆

		under voltage no output)		
P5-06	FMP output function selection	0：Operation frequency 1：Set frequency 2：Output current 3：Output torque（absolute value, as a percentage of the motor） 4：Output power 5：Output voltage 6：PULSE input (100.0% corresponding 100.0kHz)	0	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**

P5-07	AO1 Output function selection	7：AI1 8：AI2 9：Panel potentiometer 10：Length 11：Count the value 12：Communication setting 13：Motor speed 14：Output current (100.0% corresponding 1000.0A) 15：Output Voltage (100.0% corresponding 1000.0V) 16：Motor output torque（The actual value, as a percentage of the motor） FMP output function selection	0	☆
P5-08	AO2 Output function selection		4	☆
P5-09	FMP output Maximum frequency	0.01kHz~100.00kHz	50.00kHz	
P5-10	AO1 zero offset coefficient	-100.0%~+100.0%	0.0%	
P5-11	AO1 gain	-10.00~+10.00	1.00	
P5-12	AO2 zero offset coefficient	-100.0%~+100.0%	0.0%	
P5-13	AO2 gain	-10.00~+10.00	1.00	
P5-17	FMR output delay time	0.0s~3600.0s	0.0s	
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	
P5-21	DO2 output delay time	0.0s~3600.0s	0.0s	

P5-22	DO output terminal effective state selection	0：Positive logic 1：Inverse logic One's place：FMR Tens place：RELAY1 Hundreds place：RELAY2 Thousands：DO1 Ten Thousand Places：DO2	00000	

Parameter	Name	Set Range	Factory default	Modification
Group P6 Start-stop Control				
P6-00	Start method	0：Direct start 1：Speed tracking restart 2：Pre-excitation start (AC asynchronous motor) 3：SVC quick start	0	☆
P6-01	Speed tracking method	0：Start from the stop frequency 1：Start from the power frequency 2：Start from the maximum frequency	0	★
P6-02	Speed tracking	1~100	20	☆
P6-03	Start frequency	0.00Hz~10.00Hz	0.00Hz	☆
P6-04	Start frequency hold time	0.0s~100.0s	0.0s	★
P6-05	Start DC braking current / Pre-excitation current	0%~100%	50%	★
P6-06	Start DC braking current/ Pre-excitation current	0.0s~100.0s	0.0s	★
P6-07	Acceleration and deceleration method	0：Linear acceleration and deceleration 1：Static S-curve 2：Dynamic S-curve acceleration and deceleration	0	★

P6-08	S-Curve segment start time scale	0.0%~(100.0%-P6-09)	30.0%	★
P6-09	Time ratio at the end of S curve	0.0%~(100.0%-P6-08)	30.0%	★
P6-10	Stop method	0：decelerate to stop 1：free parking	0	☆
P6-11	Stop frequency of DC braking at stop	0.00Hz~ Maximum frequency	0.00Hz	☆
P6-12	Waiting time for stop DC braking	0.0s~100.0s	0.0s	☆
P6-13	Stop AC braking current	0%~100%	50%	☆
P6-14	Stop AC braking time	0.0s~100.0s	0.0s	☆
P6-15	Braking usage rate	0%~100%	100%	☆
P6-18	Speed tracking current	30%~200%	Model dependent	★
P6-21	Demagnetizing time (Valid for SVC)	0.00~5.00s	Model dependent	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
P6-23	Over-excitation selection	0：not valid 1：Only valid for deceleration 2：Valid throughout the process	0	☆
P6-24	Over-excitation suppression current value	0~150%	100%	☆
P6-25	Over-excitation gain	1.00~2.50	1.25	☆
Group P7 Keyboard and Display				
P7-00	Digital tube missing picture inspection enable	0~1	0	☆

P7-01	MF.K key function selection	0：MF.K Disable 1：Switch between the command channel on the operation panel and the remote command channel (terminal command channel or communication command channel) 2：Forward and reserve switching 3：Forward jog 4：Reverse jog	0	★
P7-02	STOP/RESET Key function	0：Only in the keyboard operation mode, te STOP/RES key stop function is valid 1：In any operation mode, STOP/RES key stop function is valid	1	☆
P7-03	LED1 running display Parameters 1	0000~FFFF Bit00: Operating 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) Bit10: AI2 voltage (V) Bit11: AI3 voltage (V) Bit12: count value Bit13: length value Bit14: Load speed display Bit15: PID setting	1F	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modificatio**

				n
P7-04	LED1 running display Parameters 2	0000~FFFF Bit00：PID feedback Bit01：PLC status Bit02：PULSE input pulse frequency (kHz) Bit03： Running frequency 2（Hz） Bit04：Remaining running frequency Bit05：AI1 voltage before calibration (V) Bit06：AI2 voltage before calibration (V) Bit07：AI3 voltage before calibration (V) Bit08： Motor speed Bit09： Current power-on time (Hour) Bit10： Current running time (Min) Bit11：PULSE output pulse frequency（Hz） Bit12：Communication setting value Bit13： Encode feedback speed (Hz) Bit14：Main frequency X display (Hz) Bit15：Auxiliary frequency Y display (Hz)	0	☆
P7-05	LED1 stop display parameters	0000~FFFF Bit00: Set frequency (Hz) Bit01：Bus voltage (V) Bit02：DI output status Bit03：DO input status Bit04：AI1 voltage (V) Bit05：AI2 voltage (V) Bit06：AI3 voltage (V) Bit07：Count value Bit08：Length Bit09：PLC statues Bit10：Load speed Bit11：PID setting Bit12：PULSE input pulse frequency kHz	33	☆
P7-06	Load speed display	0.001~65.000	2.92	☆

	coefficient			
P7-07	Inverter module radiator temperature	-20℃ ~120℃	-	●

Parameter	Name	Set Range	Factory default	Modification
P7-08	Product code	-	-	●
P7-09	Accumulated running time	0h~65535h	-	●
P7-10	Performance version number	-	-	●
P7-11	Function version number	-	-	●
P7-12	Load speed display decimal places	One's place: decimal places of U0-14 0：0 decimal place 1：1 decimal place 2：2 decimal places Tens places：U0-19/U0-29 decimal places 1：1 decimal place 2：2 decimal places	20	☆
P7-13	Accumulated power-on time	0~65535 hours	-	●
P7-14	Accumulated power consumption	0~65535 degrees	-	●
P7-17	LED2 stop display parameters	U0-00~U0-75	2	★
P7-18	LED2 running display parameters	U0-00~U0-75	2	★
Group P8 Auxiliary Function				
P8-00	Jog operation frequency	0.00Hz~ Maximum frequency	2.00Hz	●
P8-01	Jog acceleration frequency	0.0s~6500.0s	20.0s	

P8-02	Jog deceleration frequency	0.0s~6500.0s	20.0s	
P8-03	Acceleration time 2	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	Model dependent	
P8-04	Deceleration time 2	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	Model dependent	
P8-05	Acceleration time 3	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	Model dependent	
P8-06	Deceleration time 3	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	Model dependent	
P8-07	Acceleration time 4	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	0.0s	

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
P8-08	Deceleration time 4	0.00s~650.00s（P0-19=2） 0.0s~6500.0s（P0-19=1） 0s~65000s（P0-19=0）	0.0s	☆
P8-09	Received data gain (frequency)	-10.00~10.00	1.00	☆
P8-10	Hop frequency 2	0.00Hz~ Maximum frequency	0.00Hz	☆
P8-11	Hop frequency amplitude	0.00Hz~ Maximum frequency	0.00Hz	☆
P8-12	Forward and reverse dead zone	0.0s~3000.0s	0.0s	☆

	time			
P8-13	Inversion control enable	0：Disable 1：Enable	0	☆
P8-14	The set frequency is lower than the lower limit frequency operation mode	0：Run at lower frequency 1：Stop 2：Zero speed operation	0	☆
P8-15	Droop control	0.00%~100.00%	0.00%	☆
P8-16	Set cumulative power-on arrival time	0h~65000h	0h	☆
P8-17	Set cumulative running arrival time	0h~65000h	0h	☆
P8-18	Start protection selection	0：No protection 1：Protection	0	☆
P8-19	Frequency detection value 1	0.00Hz~ Maximum frequency	50.00Hz	☆
P8-20	Frequency detection hysteresis value 1	0.0%~100.0%（FDT1 level）	5.0%	☆
P8-21	Frequency reach detection width	0.0%~100.0%（Maximum frequency）	0.0%	☆
P8-22	Whether the jumping frequency is valid during acceleration and deceleration	0：Disable 1：Enable	0	☆
P8-25	Switching frequency point between acceleration time 1 and acceleration time 2	0.00Hz~ Maximum frequency	0.00Hz	☆
P8-26	Switching frequency point between deceleration time 1 and deceleration time 2	0.00Hz~ Maximum frequency	0.00Hz	☆

P8-27	Terminal jog priority	0：Disable 1：Enable	0	☆
P8-28	Frequency detection value 2	0.00Hz~ Maximum frequency	50.00Hz	☆
P8-29	Frequency detection hysteresis value 2	0.0%~100.0%（FDT2 level）	5.0%	☆
P8-30	Arbitrary arrival frequency detection value 1	0.00Hz~ Maximum frequency	50.00Hz	☆
P8-31	Arbitrary arrival frequency detection width 1	0.0%~100.0%（Maximum frequency ）	0.0%	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
P8-32	Arbitrary arrival frequency detection value 2	0.00Hz~ Maximum frequency	50.00Hz	☆
P8-33	Arbitrary arrival frequency detection width 2	0.0%~100.0%（Maximum frequency ）	0.0%	☆
P8-34	Zero current detection level	0.0%~300.0% 100.0% corresponding motor rated current	5.0%	☆
P8-35	Zero current detection delay time	0.01s~600.00s	0.10s	☆
P8-36	The output current exceeds the limit	0.0%（Does not detect） 0.1%~300.0%（Motor rated current）	200.0%	☆
P8-37	Output current overrun detection delay time	0.00s~600.00s	0.00s	☆
P8-38	Arbitrary arrival current 1	0.0%~300.0%(Motor rated current)	100.0%	☆

P8-39	Arbitrary arrival current 1 width	0.0%~300.0%(Motor rated current)	0.0%	☆
P8-40	Arbitrary arrival current 2	0.0%~300.0%(Motor rated current)	100.0%	☆
P8-41	Arbitrary arrival current 2 width	0.0%~300.0%(Motor rated current)	0.0%	☆
P8-42	Timing function selection	0: Disable 1: Enable	0	★
P8-43	Timing running time selection	0：P8-44 setting 1：AI1 2：AI2 3：AI3 Analog input range according to P8-44	0	★
P8-44	Timing running time	0.0Min~6500.0Min	0.0Min	★
P8-45	AI1 input voltage protection lower limit	0.00V~P8-46	3.10V	☆
P8-46	AI1 input voltage protection upper limit	P8-45~10.00V	6.80V	☆
P8-47	Module temperature arrival	0℃ ~100℃	75℃	☆
P8-48	Cooling fan control	0：Fan runs only during operation 1：Fan always runs	0	☆
P8-49	Wake-up frequency	Sleep frequency (P8-51)~Maximum frequency（P0-10)	0.00Hz	☆

Parameter	Name	Set Range	Factory default	Modification
P8-50	Wake-up delay time	0.0s~6500.0s	0.0s	☆
P8-51	Sleep frequency	0.00Hz~ Wake-up frequency（P8-49)	0.00Hz	☆
P8-52	Sleep delay time	0.0s~6500.0s	0.0s	☆
P8-53	Arrival time of this run	0.0~6500.0 分钟	0.0Min	☆
P8-54	Output power correction factor	0.00%~200.0%	100.0%	☆
P8-55	Scram deceleration time	0~6553.5	Model dependent	☆
Group P9 Fault and Protection				
P9-00	Motor overload protection selection	0：Forbid 1：Permit	1	☆
P9-01	Motor overload protection gain	0.20~10.00	1.00	☆
P9-02	Motor overload pre-alarm coefficient	50%~100%	80%	☆
P9-03	Overvoltage stall gain	0~100	30	☆
P9-04	Overvoltage stall protection voltage	650V~800V	770V	☆
P9-07	Power-on-to-ground short-circuit protection options	One's place：Short circuit to ground after power on protection selection 0：Disable 1：Enable Tens place：Power-on-to-ground short-circuit protection options before operating 0：Disable 1：Enable	01	☆

P9-08	Starting voltage of braking unit action	Three phase 380~480V Type: 330.0V~800.0V Three phase 200~240V Type: 330.0V~800.0V	★	
P9-09	Fault automatic reset times	0~20	0	☆
P9-10	Action selection for fault D0 during fault automatic reset	0: Non action 1: Action	0	☆
P9-11	Automatic fault reset interval time	0.1s~100.0s	1.0s	☆
P9-12	Input phase loss\ contactor draw protection option	One's place: input phase loss selection 0: Forbid input phase loss protection 1: Protection when both software and hardware input phase conditions are met 2: Protected as long as the software input phase condition is met 3: Protected as long as the hardware input phase condition is met Tens place: contactor draw protection option 0: Prohibit 1: Permit	11	☆

Parameter	Name	Set Range	Factory default	Modification
P9-13	Phase loss protection selection	One's place：Output phase loss protection selection 0：Prohibit 1：Permit Tens place：Output phase loss protection selection before operating 0：Prohibit 1：Permit	01	☆
P9-14	First fault type	0：No fault 1：Reserved 2：Acceleration overcurrent 3：Deceleration overcurrent 4：Constant speed overcurrent 5：Acceleration overvoltage 6：Deceleration overvoltage 7：Constant speed overvoltage 8：Buffer resister overload 9：Under-voltage 10：VFD overload 11：Motor overload 12：Input phase loss 13：Output phase loss 14：Module overhead	-	●

P9-15	Second fault type	15：External fault 16：Communication fault 17：Contactor abnormal 18：Current detection abnormal 19：Motor tuning abnormal 20：Encode /PG card abnormal 21：Parameter read and write abnormal 22：VFD hardware abnormal 23：Motor-to-ground short circuit 25：Reserved 26：Running time arrival 27：User-defined fault 1 28：User-defined fault 2 29：Power-on time arrival	-	●

Parameter	Name	Set Range	Factory default	Modification
P9-16	Third fault type	30：Load drop 31：PID feedback loss during running 40：Fast current limit timeout 41：Switch motor when running 42: Speed deviation is too large 43：Motor over-speed 45：Motor overheating 51：Initial position error 55：The slave is faulty during master/slave control	-	●
P9-17	Frequency at third fault (Latest)	0.00Hz~655.35Hz	0.00Hz	●

P9-18	Current value at third fault (Latest)	0.00A~655.35A	0.00A	●
P9-19	Bus voltage at third fault (Latest)	0.0V~6553.5V	0.0V	●
P9-20	Input terminal status at third fault (Latest)	0~9999	0	●
P9-21	Output terminal status at third fault (Latest)	0~9999	0	●
P9-22	VFD status at third fault (Latest)	0~65535	0	●
P9-23	Power-on time at third fault (Latest)	0s~65535s	0s	●
P9-24	Running time at third fault (Latest)	0.0s~6553.5s	0.0s	●
P9-27	Frequency at second fault	0.00Hz~655.35Hz	0.00Hz	●
P9-28	Current value at second fault	0.00A~655.35A	0.00A	●
P9-29	Bus voltage at second fault	0.0V~6553.5V	0.0V	●
P9-30	Input terminal status at second fault	0~9999	0	●
P9-31	Output terminal status at second fault	0~9999	0	●
P9-32	VFD status at second fault	0~65535	0	●

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
P9-33	Power-on time at second fault	0s~65535s	0s	●
P9-34	Running time at second	0.0s~6553.5s	0.0s	●

	fault			
P9-37	Frequency at first fault	0.00Hz~655.35Hz	0.00Hz	●
P9-38	Current value at first fault	0.00A~655.35A	0.00A	●
P9-39	Bus voltage at first fault	0.0V~6553.5V	0.0V	●
P9-40	Input terminal status at first fault	0~9999	0	●
P9-41	Output terminal status at first fault	0~9999	0	●
P9-42	VFD status at first fault	0~65535	0	●
P9-43	Power-on time at first fault	0s~65535s	0s	●
P9-44	Running time at first fault	0.0s~6553.5s	0.0s	●
P9-47	Fault protection action selection 1	One's place：Motor overload (Err11) 0：Free stop 1：Stop according to stop method 2：Keep on running Tens place：input phase loss (Err12)Hundreds place：output phase loss (Err13)Thousands：External fault (Err15) Ten Thousand Places：Communication abnormal (Err16)	00000	☆
P9-48	Fault protection action selection 2	One's place：Encode/PG card abnormal (Err20) 0：Free stop Tens place：Parameter read and write abnormal (Err21) 0：Free stop 1：Stop according to stop method Hundreds place：VFD overload fault action selection（Err10） 0：Free stop 1：Derated operation Thousands：Motor overheating (Err45) Ten Thousand Places：Running	00000	☆

		time arrival (Err26)		

Parameter	Name	Set Range	Factory default	Modification

P9-49	Fault protection action selection 3	one's place：User-defined fault1(27) 0：Free stop 1：Stop according to stop method 2：Continue running Tens place：User-defined fault2(28) 0：Free stop 1：Stop according to stop method 2：Continue running Hundreds place：power-on time arrival (29) 0：Free stop 1：Stop according to stop method 2：Continue running Thousands：Load drop(30) 0：Free stop 1：Decelerate to stop 2：Decelerate to 7% of the rated frequency of the motor and then continue to run. It will automatically resume running at the set frequency when the load is not dropped. Ten Thousand Places: PID feedback loss during operation (31) 0：Free stop 1：Stop according to stop method 2：Continue running	00000	☆
P9-50	Fault protection action selection 4	One's place：Speed deviation too much(42) 0：Free stop 1：Stop according to stop method 2：Continue running Tens place：Motor over speed (43) Hundreds place：Initial position error (51)	00000	☆
P9-54	Continue running frequency selection when power is happening	0：Running at current frequency 1：Running at setting frequency 2：Running at the upper limit frequency 3：Running at the lower limit frequency 4：Running at the abnormal standby frequency operation	0	☆
P9-55	Abnormal standby frequency	0.0%~100.0% (100.0% corresponding Maximum frequency P0-10)	100.0%	☆

Parameter	Name	Set Range	Factory default	Modification
P9-56	Motor temperature sensor type	0：Non-temperature sensor 1：PT100 2：PT1000	0	☆
P9-57	Motor overheating protection threshold	0℃ ~200℃	110℃	☆
P9-58	Motor overheating pre-alarm threshold	0℃ ~200℃	90℃	☆
P9-59	Instantaneous power failure function selection	0：Disable 1：Bus voltage constant control 2：Deceleration stop 3：Shock suppression	0	★
P9-60	Instantaneous power failure recovery voltage	80%~100%	85%	★
P9-61	Instantaneous power failure voltage recovery judgement time	0.0~100.0s	0.5S	★
P9-62	Instantaneous power failure action voltage	60%~100%	80%	★
P9-63	Load drop protection selection	0：Disable 1：Enable	0	☆
P9-64	Load drop detection level	0.0~100.0%	10.0%	☆
P9-65	Load drop 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：No detection 0.1~60.0s	1.0s	☆
P9-69	Speed-deviation too much detection value	0.0% ~50.0% (Maximum frequency)	20.0%	☆
P9-70	Speed-deviation too much detection time	0.0s：不detection 0.1~60.0s	5.0s	☆

P9-71	Instant stop non-stop gain Kp	0~100	40	☆
P9-72	Instant stop non-stop integral coefficient Ki	0~100	30	☆
P9-73	Instant stop non-stop action deceleration time	0~300.0s	20.0s	★
Group PA PID Functions				
PA-00	PID given source	0：PA-01 setting 1：AI1 2：AI2 3：AI3 4：PULSE setting（DI5） 5：Communication setting 6：Multi-reference given	0	☆

Parameter	Name	Set Range	Factory default	Modification
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 setting 6：AI1+AI2 7：MAX(|AI1|, |AI2|) 8：MIN(|AI1|, |AI2|)	0	☆
PA-03	PID action direction	0：Forward 1：Reverse	0	☆
PA-04	PID given feedback range	0~65535	1000	☆
PA-05	Ratio gain KP1	0.0~1000.0	20.0	☆
PA-06	Integration time TI1	0.01s~10.00s	2.00s	☆

PA-07	Differential time TD1	0.000s~10.000s	0.000s	☆
PA-08	PID reversal cut-off time	0.00~ Maximum frequency	0.00Hz	☆
PA-09	PID deviation limit	0.0%~100.0%	0.0%	☆
PA-10	PID differential limit	0.00%~100.00%	0.10%	☆
PA-11	PID given change time	0.00~650.00s	0.00s	☆
PA-12	PID feedback harmonic filter time	0.00~60.00s	0.00s	☆
PA-13	PID output harmonic filter time	0.00~60.00s	0.00s	☆
PA-14	Reserved	-	-	☆
PA-15	Ratio gain KP2	0~1000.0	20.0	☆
PA-16	Integration time TI2	0.01s~10.00s	2.00s	☆
PA-17	Differential time TD2	0.000s~10.000s	0.000s	☆
PA-18	PID Parameter switch condition	0：Non-switch 1：Switch by DI terminals 2：Automatic switch by deviation 3：Automatic switch by operation frequency	0	☆
PA-19	PID Parameter switch deviation 1	0.0%~PA-20	20.0%	☆
PA-20	PID Parameter switch deviation 2	PA-19~100.0%	80.0%	☆
PA-21	PID initial value	0.0%~100.0%	0.0%	☆
PA-22	PID initial value keep time	0.00~650.00s	0.00s	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**

PA-25	PID integral property	One's place：Integral separation 0：Disable 1：Enable Tens place：if stop integral when reaching the limit value 0：Continue integral 1：Stop integral	00	☆
PA-26	PID feedback loss detection value	0.0%：Not change feedback value loss 0.1%~100.0%	0.0%	☆
PA-27	PID feedback loss detection time	0.0s~20.0s	0.0s	☆
PA-28	PID stop calculation	0：Non-calculation when stopping 1: Calculate when stopping	0	☆
Group Pb Swing frequency, Fixed length and count				
Pb-00	Swing setting mode	0：Relative to center frequency 1：Relative to maximum frequency	0	☆
Pb-01	Swing frequency amplitude	0.0% ~ 100.0%	0.0%	☆
Pb-02	Sudden jump frequency width	0.0% ~ 50.0%	0.0%	☆
Pb-03	Swing frequency period	0.1s ~ 3000.0s	10.0s	☆
Pb-04	Triangular wave rise time of swing frequency	0.1% ~ 100.0%	50.0%	☆
PB-05	Setting length	0m~65535m	1000m	☆
PB-06	Real length	0m~65535m	0m	☆
PB-07	Pulse number per M	0.1~6553.5	100.0	☆
PB-08	Setting count value	1~65535	1000	☆
PB-09	Appointed count value	1~65535	1000	☆
Group PC Multi-step、Command and Simple PLC				
PC-00	Multi-step command 0	-100.0%~100.0%	0.0%	☆
PC-01	Multi-step command 1	-100.0%~100.0%	0.0%	☆
PC-02	Multi-step command	-100.0%~100.0%	0.0%	☆

	2			
PC-03	Multi-step command 3	-100.0%~100.0%	0.0%	☆
PC-04	Multi-step command 4	-100.0%~100.0%	0.0%	☆
PC-05	Multi-step command 5	-100.0%~100.0%	0.0%	☆
PC-06	Multi-step command 6	-100.0%~100.0%	0.0%	☆
PC-07	Multi-step command 7	-100.0%~100.0%	0.0%	☆
PC-08	Multi-step command 8	-100.0%~100.0%	0.0%	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
PC-09	Multi-step command 9	-100.0%~100.0%	0.0%	☆
PC-10	Multi-step commande10	-100.0%~100.0%	0.0%	☆
PC-11	Multi-step command 11	-100.0%~100.0%	0.0%	☆
PC-12	Multi-step command 12	-100.0%~100.0%	0.0%	☆
PC-13	Multi-step command 13	-100.0%~100.0%	0.0%	☆
PC-14	Multi-step command 14	-100.0%~100.0%	0.0%	☆
PC-15	Multi-step command 15	-100.0%~100.0%	0.0%	☆
PC-16	Simple PLC running mode	0：Shutdown at the end of a single operation 1：Keep the final value at the end of a single operation 2：Keep looping	0	☆

PC-17	Simple PLC Power-down memory selection	one's place：Power-down memory selection 0：Non-memory when powering down 1：Memory when powering down Tens place：memory selection when stopping 0：non-memory when stopping 1：memory when stopping	00	☆
PC-18	Simple PLC Selection 0 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-19	Simple PLC Selection 0 acceleration and deceleration time selection	0~3	0	☆
PC-20	Simple PLC Selection 1 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-21	Simple PLC Selection 1 acceleration and deceleration time selection	0~3	0	☆
PC-22	Simple PLC Selection 2 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-23	Simple PLC Selection 2 acceleration and deceleration time selection	0~3	0	☆
PC-24	Simple PLC Selection 3 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-25	Simple PLC Selection 3 acceleration and deceleration time selection	0~3	0	☆
PC-26	Simple PLC Selection 4 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-27	Simple PLC Selection 4 acceleration and deceleration time selection	0~3	0	☆
PC-28	Simple PLC Selection 5 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆

Parameter	Name	Set Range	Factory default	Modification
PC-29	Simple PLC Selection 5 acceleration and deceleration time selection	0~3	0	☆
PC-30	Simple PLC Selection 6 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-31	Simple PLC Selection 6 acceleration and deceleration time selection	0~3	0	☆
PC-32	Simple PLC Selection 7 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-33	Simple PLC Selection 7 acceleration and deceleration time selection	0~3	0	☆
PC-34	Simple PLC Selection 8 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-35	Simple PLC Selection 8 acceleration and deceleration time selection	0~3	0	☆
PC-36	Simple PLC Selection 9 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-37	Simple PLC Selection 9 acceleration and deceleration time selection	0~3	0	☆
PC-38	Simple PLC Selection 10 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-39	Simple PLC Selection 10 acceleration and deceleration time selection	0~3	0	☆
PC-40	Simple PLC Selection 11 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-41	Simple PLC Selection 11 acceleration and deceleration	0~3	0	☆

	time selection			
PC-42	Simple PLC Selection 12 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-43	Simple PLC Selection 12 acceleration and deceleration time selection	0~3	0	☆
PC-44	Simple PLC Selection 13 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-45	Simple PLC election 13 acceleration and deceleration time selection	0~3	0	☆
PC-46	Simple PLC Selection 14 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-47	Simple PLC Selection 14 acceleration and deceleration time selection	0~3	0	☆
PC-48	Simple PLC Selection 15 running time	0.0s(h)~6553.5s(h)	0.0s(h)	☆
PC-49	Simple PLC Selection 15 acceleration and deceleration time selection	0~3	0	☆
PC-50	Simple PLC running time unit	0：s（second）1：h (hour)	0	☆

Parameter	Name	Set Range	Factory default	Modification
PC-51	Multi-reference 0 given mode	0：Parameter PC-00 give 1：AI1 2：AI2 3：AI3 4：PULSE setting 5：PID 6：Preset frequency（P0-08）given，UP/DOWN can be modifiable	0	☆
Group Pd Communication Parameters				

Pd-00	Baud rate	one's place：MODBUS 0：300BPS 1：600BPS 2：1200BPS 3：2400BPS 4：4800BPS 5：9600BPS 6：19200BPS 7：38400BPS 8：57600BPS 9：115200BPS Tens place：Profibus-DP 0：115200BPs 1：208300BPs 2：256000BPs 3：512000Bps Hundreds place：Reserved Thousands：CANlink Baud rate 0：20 1：50 2：100 3：125 4：250 5：500 6：1M	5005	☆

Parameter	Name	Set Range	Factory default	Modification

Pd-01	MODBUS Data format	0：No parity (8-N-2) 1：Even parity (8-E-1) 2：Odd parity (8-O-1) 3：No parity (8-N-1) (MODBUS Enable)	0	☆
Pd-02	Local address	0：Broadcast address 1~247(Modbus、Profibus-DP、CANlink、Profinet、EtherCAT Enable)	1	☆
Pd-03	MODBUS response delay	0~20ms(MODBUS Enable)	2	☆
Pd-04	Serial port communication timeout period	0.0：Disable 0.1 ~ 60.0s(Modbus、 Profibus-DP 、CANopen、 Profinet、EtherCAT Enable)	0.0	☆
Pd-05	Data transmission format selection	one's place :Modbus 0: Non-standard Modbus Protocol 1: Standard Modbus Protocol Tens place :Profibus-DP、CANopen、 Profinet、EtherCAT 0:PPO1 format 1:PPO2 format 2:PPO3 format 3:PPO5 format	31	☆
Pd-06	Communication reading current resolution	0：0.01A（≤55kW时Enable） 1：0.1A	0	☆
Pd-08	Profibus-DP、CANopen、 Profinet 、EtherCAT Communication interruption detection time	0.0s：Disable 0.1~60.0s	0	☆
Group PE Water Supply Parameters				
PE-00	Sleep pressure deviation value	0.0~PE-04	0.0%	☆
PE-01	Sleep ratio	0~10，unit 5Hz/S	02	☆
PE-02	Sleep frequency	0.00Hz~ Maximum frequency（	2.00Hz	☆

		P0-10)		

Parameter	Name	Set Range	Factory default	Modification
PE-03	Holding pressure time	000.0~999.9S	2.0	☆
PE-04	Wake-up pressure deviation	0.0~PA-01	5.0%	☆
PE-05	Wake-up delay time	000.0~999.9S	0.0	☆
PE-06	Hibernation frequency reduction time	000.0~100.0S	2.0	☆
PE-07	Water shortage detection mode selection	0：no detection 1：current mode 2：pressure mode 3：both of 1 and 2	0	☆
PE-08	Water shortage detection pressure	0.0~PA-01	0.5%	☆
PE-09	Water shortage detection frequency	0.00Hz~ Maximum frequency（P0-10）	5.00Hz	☆
PE-10	Water shortage detection time	000.0~999.9S	5.0	☆
PE-11	Water shortage detection current	0.01~rated current of the set type	00.01	☆
PE-12	Automatic reset interval for water shortage fault	001~100S	15	☆
PE-13	PID high threshold alarm set value	0.0%~100%	100.0	☆
PE-14	PID high threshold alarm detection time	000~200S，set 0 will not alarm	0.0	☆
PE-15	PID low threshold alarm set value	0.0%~100%	0.0	☆
PE-16	PID low threshold alarm detection time	000~200S，set 0 is not alarm	0.0	☆
PE-17	Power-on automatic	0：Close 1：Open	0	☆

	operation selection			
PE-18	Automatic running delay time	00.1~100S	1.00	☆
PE-19	Antifreeze function selection	0：Close 1：Open	0	☆
PE-20	Antifreeze period	000~9999S，When set to 0, it always runs at the antifreeze operating frequency	0	☆
PE-21	Antifreeze running time	000~9999S	60	☆
PE-22	Antifreeze running frequency	0.00~30.00Hz	10.00	
Group PP Function Code Management				
PP-00	User password	0~65535	0	☆
PP-01	Parameter initialization	0：Non operation 01：Restore factory parameters，not include motor parameter 02：Clear record information 04：Restore user backup parameter 501：Restore use current parameter	0	★

Parameter	Name	Set Range	Factory default	Modification
PP-02	Function parameter group display selection	one's place：Group U display selection 0：non display 1：display Tens place：Group A display selection 0：non display 1：display	11	★
PP-03	Personalized parameter group display selection	One's place：Customized user parameter group display selection 0：non display 1：display Tens places: User modified parameter group display selection 0：Non display 1：Display	00	☆
PP-04	Function code modification characteristics	0：Can be modified 1：Can not be modified	0	☆
Group A0 Torque Control Parameter				
A0-00	Speed/Torque control mode selection	0：Speed control 1：Torque control	0	★
A0-01	Torque setting selection under torque control mode	0：Digital setting 1(A0-03) 1：AI1 2：AI2 3：AI3 4：PULSE setting 5：Communication setting 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) （full range for 1-7 option, related to A0-03 digital setting）	0	★

A0-03	Torque digital setting under torque control mode	-200.0%~200.0%	150.0%	☆
A0-05	Torque control forward maximum frequency	0.00Hz~ Maximum frequency	50.00Hz	☆
A0-06	Torque control reverse maximum frequency	0.00Hz~ Maximum frequency	50.00Hz	☆
A0-07	Torque acceleration filter time	0.00s~650.00s	0.00s	☆
A0-08	Torque deceleration filter time	0.00s~650.00s	0.00s	☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
Group A1 Group Virtual IO				
A1-00	Virtual VDI1 terminal function selection	0~59	0	★
A1-01	Virtual VDI2 terminal function selection	0~59	0	★
A1-02	Virtual VDI3 terminal function selection	0~59	0	★
A1-03	Virtual VDI4 terminal function selection	0~59	0	★
A1-04	Virtual VDI5 terminal function selection	0~59	0	★

A1-05	Virtual VDI terminal status setting mode	One's place：Virtual VDI1Tens place：Virtual VDI2 Hundreds place：Virtual VDI3Thousands ：Virtual VDI4Ten Thousand Places：Virtual VDI5 0：Virtual VDOx status will decide if VDI valid or not 1：Function code A1-06 sets if VDI valid or not	00000	★
A1-06	Virtual VDI terminal status setting	0：Disable 1：Enable one's place：Virtual VDI1Tens place：Virtual VDI2Hundreds place：Virtual VDI3Thousands ：Virtual VDI4 Ten Thousand Places：Virtual VDI5	00000	★
A1-07	AI1 terminal for DI function selection	0~59	0	★
A1-08	AI2 terminal for DI function selection	0~59	0	★
A1-09	AI3 terminal for DI function selection	0~59	0	★
A1-10	AI terminal for DI valid mode selection	0：High level valid 1：Low level valid One's place：AI1 Tens place：AI2 Hundreds place：AI3	000	★

Parameter	Name	Set Range	Factory default	Modification
A1-11	Virtual VDO1 output function selection	0：internal short connection with DIx 1~41: P5 group Physics DO output selection	0	☆
A1-12	Virtual VDO2 output function selection	0：internal short connection with DIx 1~41：P5 group Physics DO output selection	0	☆
A1-13	Virtual VDO3 output function selection	0：internal short connection with DIx 1~41：P5 group Physics DO output selection	0	☆
A1-14	Virtual VDO4 output function selection	0：internal short connection with DIx 1~41：P5 group Physics DO output selection	0	☆
A1-15	Virtual VDO5 output function selection	0：internal short connection with DIx 1~41：P5 group Physics DO output selection	0	☆
A1-16	VDO1 output delay time	0.0s~3600.0s	0.0s	☆
A1-17	VDO2 output delay time	0.0s~3600.0s	0.0s	☆
A1-18	VDO3 output delay time	0.0s~3600.0s	0.0s	☆
A1-19	VDO4 output delay time	0.0s~3600.0s	0.0s	☆
A1-20	VDO5 output delay time	0.0s~3600.0s	0.0s	☆

A1-21	VDO output terminal valid status selection	0：Positive logic 1：Negative logic One's place：VDO1Tens place：VDO2Hundreds place：VDO3Thousands：VDO4 Ten Thousand Places：VDO5	00000	☆
Group A 2 The Second Motor Parameter				
A2-00	Motor type selection	0：Normal asynchronous motor 1：Variable-frequency asynchronous motor	0	★
A2-01	Motor rated power	0.1kW~1000.0kW	Model dependent	★
A2-02	motor rated voltage	1V~2000V	Model dependent	★

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
A2-03	Motor rated current	0.01A~655.35A(VFD power≤ 55kW) 0.1A~6553.5A(VFD power >55kW)	Model dependent	★
A2-04	Motor rated frequency	0.01Hz~ Maximum frequency	Model dependent	★
A2-05	Motor rated speed	1rpm~65535rpm	Model dependent	★
A2-06	asynchronous motor stator resister	0.001Ω~65.535Ω(VFD power≤ 55kW) 0.0001Ω~6.5535Ω(VFD power >55kW)	Model dependent	★

A2-08	asynchronous motor leakage inductance	0.01mH~655.35mH(VFD power≤55kW) 0.001mH~65.535mH(VFD power >55kW)	Model dependent	★
A2-09	asynchronous motor mutual inductance	0.1mH~6553.5mH(VFD power≤ 55kW) 0.01mH~655.35mH(VFD power >55kW)	Model dependent	★
A2-10	asynchronous motor empty load current	0.01A~A2-03(VFD power≤ 55kW) 0.1A~A2-03(VFD power >55kW)	Model dependent	★
A2-27	Encode line number	1~65535	1024	★
A2-28	Encode type	0：ABZ Incremental encoder 2：Resolver transformer	0	★
A2-29	Speed feedback PG selection	0：Local PG 1：ExtendPG 2：PULSE setting input （DI5）	0	★
A2-30	ABZ incremental encoder AB phase sequence	0：Forward 1：Reverse	0	★
A2-31	Encoder installation angle	0.0~359.9°	0.0°	★
A2-34	Number of pole pairs of resolver transformer	1~65535	1	★
A2-36	Speed feedback PG Disconnection detection time	0.0：No action 0.1s~10.0s	0.0	★
A2-37	Tuning selection	0：No action 1：Asynchronous VFD static tuning 2：Asynchronous VFD full tuning 3：Asynchronous VFD static full tuning	0	★
A2-38	Speed loop ratio gain 1	1~100	30	☆

A2-39	Speed loop integration time 1	0.01s~10.00s	0.50s	☆
A2-40	Switch frequency 1	0.00~A2-43	5.00Hz	☆

Parameter	Name	Set Range	Factory default	Modification
A2-41	Speed loop ratio gain2	1~100	20	☆
A2-42	Speed loop integration time2	0.01s~10.00s	1.00s	☆
A2-43	Switch frequency 2	A2-40~ Maximum frequency	10.00Hz	☆
A2-44	Vector control slip gain	50%~200%	100%	☆
A2-45	SVC torque filtering constant	0.000s~0.100s	0.000s	☆
A2-47	Torque upper limit source under speed control mode	0：A2-48 setting 1：AI1 2：AI2 3：AI3 4：PULSE setting 5：Communication setting 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 1-7 optional full range is related to A2-48 digital setting	0	☆
A2-48	Torque upper limit setting under speed control mode	0.0%~200.0%	150.0%	☆

A2-49	Torque upper limit command selection under speed control mode (Power generation)	0：Parameter A2-48 setting 1：AI1 2：AI2 3：AI3 4：PULSE PULSE setting 5：Communication setting 6：MIN(AI1,AI2) 7：MAX(AI1,AI2) 8：1-7 optional full range is related to A2-50 digital setting	0	☆
A2-50	Torque upper limit digital setting under speed control mode (Power generation)	0.0% ~ 200.0%	150.0%	☆
A2-51	Excitation regulation proportional gain	0~60000	2000	☆
A2-52	Excitation regulation integration gain	0~60000	1300	☆
A2-53	Torque regulation proportional gain	0~60000	2000	☆
A2-54	Torque regulation integration gain	0~60000	1300	☆

Parameter	Name	Set Range	Factory default	Modification
A2-55	Speed loop integration gain	one's place：Integral separation0：Disable 1：Enable	0	☆
A2-59	The maximum torque coefficient in the weak field	50~200%	100%	☆
A2-60	Generation power limit enabled	0：Disable 1：Valid throughout 2：Constant speed takes effect 3：Deceleration takes effect	0	☆
A2-61	Upper generation capacity	0.0~200.0%	Model dependent	☆
A2-62	The second motor control mode	：Speed sensorless vector control (SVC) ：Flux vector control (FVC) 2：V/F control	0	★
A2-63	The second motor acceleration and deceleration time selection	0：Same as the first motor 2：Acceleration and deceleration time 3：Acceleration and deceleration time 4:Acceleration and deceleration time	0	☆
A2-64	The second motor torque boost	0.0%：Automatic torque boost 0.1%~30.0%	Model dependent	☆
A2-66	The second motor	0~100	40	☆

	oscillation suppression gain			
Group A 5 Control Optimization Parameter				
A5-00	DPWM switch upper limit frequency	5.00Hz~ Maximum frequency	8.00Hz	☆
A5-01	PWM modification mode	0：Asynchronous modification 1：Synchronous modification	0	☆
A5-02	Dead zone compensation mode selection	0：No compensation 1：Compensation mode 1	1	☆
A5-03	Random PWM depth	0：Random PWM Disable 1~10：PWM carrier frequency random depth	0	☆
A5-04	Quick current limitation enable	0：Non enable 1：Enable	1	☆
A5-05	Current detection delay compensation	0~100	0	★
A5-06	Undervoltage point setting	Three phase690V Type：00.0V~650.0VThree phase380V Type：00.0V~400.0V Three phase220V Type：40.0V~200.0V		☆

Parameter	**Name**	**Set Range**	**Factory default**	**Modification**
A5-07	SVC optimization mode selection	0：Non optimization 1：Optimization mode 1 2：Optimization mode 2	2	★
A5-08	Dead zone time adjustment	100~200	150	★
A5-09	Overvoltage point setting	Three phase380V Type：200.0V~820.0V Three phase220VType：200.0V~400.0V		★
Group A6 AI Curve Setting				

A6-00	AI curve 4 minimum input	-10.00V~A6-02	0.00V	☆
A6-01	AI curve 4 minimum input relative setting	-100.0%~+100.0%	0.0%	☆
A6-02	AI curve4 inflection point1 input	A6-00~A6-04	3.00V	☆
A6-03	AI curve 4 inflection point 1 input relative setting	-100.0%~+100.0%	30.0%	☆
A6-04	AI curve4 inflection point 2 input	A6-02~A6-06	6.00V	☆
A6-05	AI curve 4 inflection point 2 input relative setting	-100.0%~+100.0%	60.0%	☆
A6-06	AI curve 4 maximum input	A6-04~+10.00V	10.00V	☆
A6-07	AI curve 4 maximum input relative setting	-100.0%~+100.0%	100.0%	☆
A6-08	AI curve 5 minimum input	-10.00V~A6-10	-10.00V	☆
A6-09	AI curve 5 minimum input relative setting	-100.0%~+100.0%	-100.0%	☆
A6-10	AI curve5 inflection point1 input	A6-08~A6-12	-3.00V	☆
A6-11	AI curve 5 inflection point 1 input relative setting	-100.0%~+100.0%	-30.0%	☆
A6-12	AI curve5 inflection point2 input	A6-10~A6-14	3.00V	☆
A6-13	AI curve 5 inflection point 2 input relative setting	-100.0%~+100.0%	30.0%	☆
A6-14	AI curve 5 maximum input	A6-12~+10.00V	10.00V	☆
A6-15	AI curve 5 maximum input relative setting	-100.0%~+100.0%	100.0%	☆
A6-24	AI1 setting jumping	-100.0%~100.0%	0.0%	☆

	point			
A6-25	AI1 setting jumping amplitude	0.0%~100.0%	0.5%	☆

Parameter	Name	Set Range	Factory default	Modification
A6-26	AI2 setting jumping point	-100.0%~100.0%	0.0%	☆
A6-27	AI2 setting jumping amplitude	0.0%~100.0%	0.5%	☆
A6-28	AI3 setting jumping point	-100.0%~100.0%	0.0%	☆
A6-29	AI3 setting jumping amplitude	0.0%~100.0%	0.5%	☆
Group A7 User Programmable Card Parameter				
A7-00	User programmable feature selection	0：Disable 1：Enable	0	★
A7-01	Control board output terminal control mode selection	0：VFD control 1：User programmable control card control One's place：FMR（FM terminal as switching output） Tens place：Relay（T/A-T/B-T/C Hundreds place：DO1 Thousands：FMP（FM terminal as switch value output） Ten Thousand Places：AO1	0	★

A7-02	Programmable card extended AIAO terminal function configuration	0：AI3 voltage input， AO2 voltage output 1：AI3 voltage input， AO2 current output 2：AI3 current input， AO2 voltage output 3：AI3 current input， AO2 current output 4：AI3 PTC input， AO2 voltage output 5：AI3 PTC input， AO2 current output 6： AI3 PT100 input， AO2 voltage output 7： AI3 PT100 input， AO2 current output	0	★
A7-03	FMP output	0.0%~100.0%	0.0%	☆
A7-04	AO1 output	0.0%~100.0%	0.0%	☆
A7-05	Switch value output	Binary setting One's place：FMR Tens place：Relay 1 Hundreds place：DO	000	☆
A7-06	Programmable card frequency given	-100.00%~100.00%	0.0%	☆
A7-07	Programmable card torque given	-200.0%~200.0%	0.0%	☆

Parameter	Name	Set Range	Factory default	Modification
A7-08	Programmable card command given	0：No command 1：Forward command 2：Reverse command 4：Reverse jog 5：Free stop 6：Deceleration stoip 7：Fault reset	0	☆
A7-09	Programmable card given fault	0：No fault 80~89：Fault code	0	☆
Group A8 Point-to-point Communication Parameter				
A8-00	Point-to-point communication function selection select	0：Disable 1：Enable	0	☆
A8-01	Master-slave selection	0：The master machine 1：The slave machine	0	☆
A8-02	Slave commands follow master-slave information exchange	one's place：Follow the slave command 0：从The slave machine does not follow the master run command. 1：The slave follows the master and runs commands Tens place：Slave fault information transmission 0：Slave machine fault information is not transmitted 1：Slave fault information transmission Hundreds place：The host shows that the slave is offline 0：The host does not report a fault	011	★

		when the slave goes offline 1：The slave machine goes offline and the host reports a fault (Err16)		
A8-03	Slave receiving data function selection	0：Operating frequency 1：Target frequency	0	☆
A8-04	Receive data zero offset	-100.00%~100.00%	0.00%	★
A8-05	Receive data gain	-10.00~100.00	1.00	★
A8-06	Point-to-point communication interruption detection time	0.0~10.0s	1.0s	☆
A8-07	Point-to-point communication host data sending cycle	0.001~10.000s	0.001s	☆
A8-11	Windows	0.20~10.00Hz	0.50Hz	☆

- **Summary of monitoring parameter**

Parameter	Name	Minimum unit	Address
Group U0 The table of monitoring parameter			
U0-00	Running frequency (Hz)	0.01Hz	7000H
U0-01	Setting frequency (Hz)	0.01Hz	7001H
U0-02	Bus voltage (V)	0.1V	7002H
U0-03	Output voltage (V)	1V	7003H
U0-04	Output current (A)	0.01A	7004H
U0-05	Output power (kW)	0.1kW	7005H
U0-06	Output torque (%)	0.1%	7006H
U0-07	DI output status	1	7007H
U0-08	DO input status	1	7008H
U0-09	AI1 voltage (V)	0.01V	7009H
U0-10	AI2 voltage（V）/ current（mA）	0.01V/0.01mA	700AH
U0-11	AI3 voltage (V)	0.01V	700BH
U0-12	Count value	1	700CH
U0-13	Length	1	700DH
U0-14	Load speed	1RPM	700EH
U0-15	PID setting	1	700FH
U0-16	PID feedback	1	7010H
U0-17	PLC state	1	7011H
U0-18	Input PULSE setting frequency (Hz)	0.01kHz	7012H
U0-19	Feedback speed (Hz)	0.01Hz	7013H
U0-20	Remaining running time	0.1Min	7014H
U0-21	Voltage before AI1 calibration	0.001V	7015H
U0-22	Voltage before AI2 calibration（V）/ current (mA)	0.001V/0.01mA	7016H
U0-23	Voltage before AI3 calibration	0.001V	7017H
U0-24	Motor speed	1RPM	7018H
U0-25	Current power-on time	1Min	7019H
U0-26	Current running time	0.1Min	701AH

U0-27	Input PULSE setting frequency	1Hz	701BH
U0-28	Communication setting value	0.01%	701CH
U0-29	Encode feedback speed	0.01Hz	701DH
U0-30	Main frequency X display	0.01Hz	701EH

Parameter	Name	最小单位	通讯地址
U0-31	Accessory Y display	0.01Hz	701FH
U0-32	Check any RAM address value	1	7020H
U0-34	Motor temperature value	1℃	7022H
U0-35	Target torque (%)	0.1%	7023H
U0-36	Resolver position	1	7024H
U0-37	Power factor angle	0.1°	7025H
U0-38	ABZ position	1	7026H
U0-39	V/F Separation target voltage	1V	7027H
U0-40	V/F Separation output voltage	1V	7028H
U0-41	DI Visual display of output status	1	7029H
U0-42	DO Visual display of input status	1	702AH
U0-43	DI Visual display of function status 1(function 01-40)	1	702BH
U0-44	DI Visual display of function status 2(function 41-80)	1	702CH
U0-45	Fault details	1	702DH
U0-58	Z signal counter	1	703AH
U0-59	Setting frequency (%)	0.01%	703BH
U0-60	Running frequency (%)	0.01%	703CH
U0-61	VFD status	1	703DH
U0-62	Current fault code	1	703EH
U0-63	Point-to-point host communication sends torque value	0.01%	703FH
U0-64	Number of slave stations	1	7040H
U0-65	Torque upper limit	0.1%	7041H
U0-73	Motor number	0：Motor 1 1：Motor 2	7049H
U0-74	VFD output torque	0.1%	704AH
U0-76	Accumulated power consumption is low	0.1 degree	704CH
U0-77	Accumulated power consumption is high	1 degree	704DH
U0-78	Line speed	1m/Min	704EH

Chapter 6 Parameter description

Group P0 Basic function

P0-00	GP type display		Factory default	Related to Type
	Set Range	1	Type G （Constant torque load）	
		2	Type P （Fan and water pump loads）	

These parameters are only used to check the type by the user, they can not be modified.

1：Suitable for constant torque loads with specified rated parameters

2：Suitable for variable torque loads with specified rated parameters (fans, water pump loads)

P0-01	Motor 1 control mode		Factory default	0
	Set Range	0	Sensor-less Vector Control（SVC）	
		1	Vector control with speed sensor （FVC）	
		2	V/F control	

0：Sensor-less Vector Control

It refers to open-loop vector control, which is suitable for common high-performance control situations. One frequency inverter can only drive one motor, such as machine tools, centrifuges, wire drawing machines, Note plastic machines and other loads.

1：Vector control with speed sensor

It refers to closed-loop vector control. An encoder must be installed on the motor end, and the frequency inverter must be equipped with a PG card of the same type as the encoder. It is suitable for high-precision speed control or torque control applications. One frequency inverter can only drive one motor, such as high-speed paper making machinery, hoisting machinery, elevators and other loads.

2：V/F control

It is suitable for situations where the load requirements are not strict, or where one frequency converter drives multiple motors, such as fans and pumps. It can be used in situations where one frequency converter drives multiple motors.

Tip: When selecting the vector control mode, the motor parameter tuning process must be performed. Only accurate motor parameter can take advantage of the vector control method. By adjusting the Group P2 parameter function code of the speed regulator (the second is group A2), better performance can be obtained.

P0-02	Command source selection		Factory default	0
	Set Range	0	Operation panel command channel （LED off）	
		1	Terminal command channel （LED on）	
		2	Communication command channel （LED flashes）	

Select the input channel of the inverter control command. Frequency converter control commands include: start, stop, forward rotation, reverse rotation, jog, etc.

0：Operation panel command channel ("LOCAL/REMOT" light is off);

Run command control is performed by the RUN and STOP/RES buttons on the operation panel.

1：Terminal command channel ("LOCAL/REMOT" light is on;

Run command control is carried out by multi-function input terminals FWD, REV, JOGF, JOGR, etc.

2：Communication command channel ("LOCAL/REMOT" light flashes)

Running commands are given by the host computer through communication. When selecting this option, a communication card (Modbus-RTU, Profibus-DP card, CANlink card, user programmable control card or

CANopen card, etc.) must be selected.

When the communication mode is Profibus-DP and PZD1 data is valid, the inverter control command is given by PZD1 data. When the user programmable card is valid, the user programmable card writes the control command to A7-08 as the inverter control command. In other cases, write the control command through address 0x2000. For the control command definition, see Appendix I: A600 communication address definition. The supplementary instructions for the communication card are distributed with the communication card. The appendix of this manual contains a brief description of the communication card.

P0-03	Main frequency source X selection		Factory default	0
	Set Range	0	Digital setting（Preset frequency P0-08，UP/DOWN can be modified，No memory when power off）	
		1	Digital setting（Preset frequency P0-08，UP/DOWN can be modified. Memory when power off）	
		2	AI1	
		3	AI2	
		4	Panel potentiometer（AI3）	
		5	PULSE setting (DI5)	
		6	Multi-segment instructions	
		7	PLC	
		8	PID	
		9	Communication given	

Select the input channel of the main given frequency of the inverter.

There are 10 main given frequency channels:

0: Digital setting (no memory when power off)

The initial value of the set frequency is the value of P0-08 "Preset frequency". The set frequency value of the inverter can be changed through the ▲ and ▼ keys of the keyboard (or the UP and DOWN keys of the multi-function input terminal). After the inverter is powered off and powered on again, the set frequency value returns to the value of P0-08 "Digital setting preset frequency".

1: Digital setting (memory when power-off)

Set the initial value frequency to the value of P0-08 "Preset frequency". The set frequency value of the frequency inverter can be changed through the ▲ and ▼ keys of the keyboard (or the UP and DOWN keys of the multi-function input terminal). When the inverter is powered off and powered on again, the set frequency is the set frequency at the time of the last power outage, and is memorized through the ▲ and ▼ keys on the keyboard or the correction amount of the terminals UP and DOWN.

It should be reminded that P0-23 is the "digital setting frequency stop memory selection". P0-23 is used to select whether the frequency correction amount is memorized or cleared when the inverter is stopped. P0-23 is related to shutdown, not to power-down memory, so please pay attention during application.

2:AI1 3:AI2 4:AI3

The frequency is determined by the analog input terminal. The A600 control board provides 2 analog input terminals (AI1, AI2).

Among them：

AI1 is 0V ~ 10V voltage input

AI2 can be 0V ~ 10V voltage input or 0mA ~ 20mA current input. AI3 is selected by the AI2 jumper on the control board as the panel potentiometer input.

The input voltage values of AI1, AI2, and AI3, and the related relationship curve with the target frequency can be freely selected by the user.

A600 provides 5 sets of related curves, of which 3 sets of curves are straight-line relationships (corresponding relationship between 2 points), and 2 sets of curves are arbitrary curves with 4-point corresponding relationships. Users can use the P4-13 ~ P4-27 function codes and the A6 group function code to set.

Function code P4-33 is used to set the three analog inputs AI1~AI3, and select which group among the 5 groups

of curves respectively.
When AI is given as frequency, 100.0% of voltage / current input corresponding setting refers to the percentage relative to Maximum frequency P0-10.
5. PULSE setting given (DI5)
The frequency is given through the terminal DI5 high-speed PULSE setting.
PULSE setting given signal specifications: voltage range 9V ~ 30V, frequency range 0kHz ~ 100kHz. The PULSE setting can only be given from the multi-function input terminal DI5 input.
The relationship between the DI5 terminal input PULSE setting frequency and the corresponding setting is set through P4-28~P4-31. The corresponding relationship is a 2-point straight-line corresponding relationship. 100.0% of the corresponding setting of the PULSE setting input refers to the relative Maximum frequency P0-10 percentage.
6. Multi-segment instructions
When selecting the multi-segment command operation mode, different state combinations of the digital input DI terminals need to be used to correspond to different set frequency values. A600 can be set with 4 multi-segment command terminals (terminal functions 12 to 15). The 16 states of the 4 terminals can correspond to any 16 "multi-segment commands" through the PC group function code. The "multi-segment command" is the relative maximum frequency P0-10 percentage.
When the digital input DI terminal functions as a multi-segment command terminal, corresponding settings need to be made in Group P4. For details, please refer to the relevant function parameter descriptions of Group P4.
7. Simple PLC
When the frequency source is a simple PLC, the operating frequency source of the inverter can switch between 1 to 16 arbitrary frequency instructions. The holding time and respective acceleration and deceleration time of 1 to 16 frequency instructions can also be set by the user. For details, refer to PC group related instructions.
8.PID
Select the output of process PID control as the operating frequency. It is generally used for on-site process closed-loop control, such as constant pressure closed-loop control, constant tension closed-loop control, etc. When applying PID as the frequency source, you need to set the parameters related to the "PID function" of the PA group.
9. Communication given
It refers to the frequency given by the communication method.
When using Modbus communication, the host computer gives data through the communication address 0x1000. The data format is data with 2 decimal points, and the data range is -P0-10~+P0-10.
For example, PZD1 (0X1000) is 5000, which is 50.00hz. PZD1 is -5000, which is -50.

A communication card must be installed when using communication. The four communication cards of A600 are all optiona and users can choose according to their needs. If the communication protocol is Modbus-RTU, Profibus-DP or CANopen, you need to select the corresponding serial communication according to P0-28 protocol. The CANlink protocol is always valid.

P0-04	Auxiliary frequency source Y selection		Factory default	0
	Set Range	0	Digital setting（Preset frequency P0-08，UP/DOWN can be modified. No memory when power off）	
		1	Digital setting（Preset frequency P0-08，UP/DOWN can be modified. Memory when power off）	
		2	AI1	
		3	AI2	
		4	Panel potentiometer（AI3）	
		5	PULSE setting (DI5)	
		6	Multi-segment instructions	
		7	PLC	
		8	PID	
		9	Communication setting	

When the auxiliary frequency source is used as an independent frequency given channel (that is, the frequency source is selected as X to Y switching), its usage is the same as the main frequency source X. For the usage method, please refer to the relevant instructions of P0-03.

When the auxiliary frequency source is used as a superimposed given (that is, the composite frequency given by the main frequency source X and the auxiliary frequency source Y), you need to pay attention to:

1. When the auxiliary frequency source is a digital given, the preset frequency (P0-08) does not work. The user adjusts the frequency through the ▲ and ▼ keys of the keyboard (or the UP and DOWN of the multi-function input terminal) directly on the main frequency. The adjustment based on a given frequency.
2. When the auxiliary frequency source is analog input reference (AI1, AI2, AI3) or pulse input reference, 100% of the input setting corresponds to the auxiliary frequency source range, which can be set through P0-05 and P0-06.
3. When the frequency source is pulse input given, it is similar to analog given.

Tip: The auxiliary frequency source Y selection and the main frequency source X selection cannot be set to the same channel, that is, P0-03 and P0-04 should not be set to the same value, otherwise it will easily cause confusion.

P0-05	Auxiliary frequency source Y range selection during superposition		Factory default	0
	Set Range	0	Relative to the maximum frequency	
		1	Relative to main frequency source XX	
P0-06	Auxiliary frequency source Y range during superposition		Factory default	100%
	Set Range		0% ~ 150%	

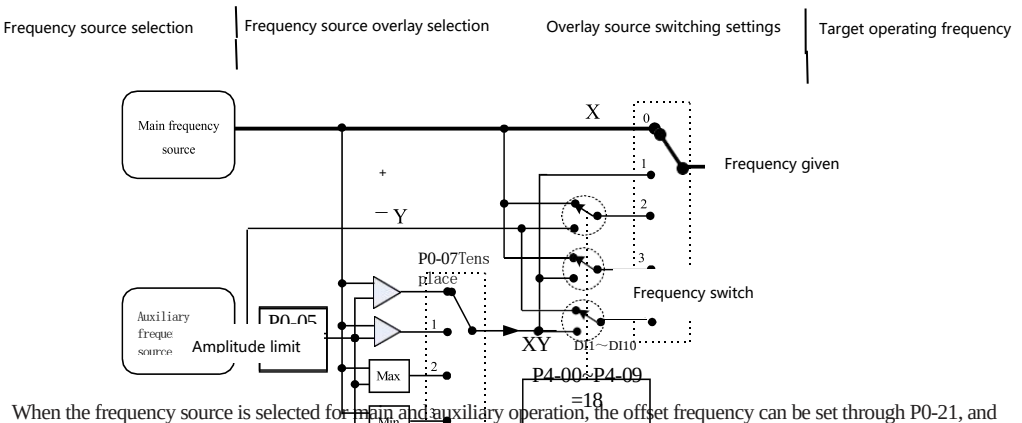
When the frequency source is selected as "frequency superposition", these two parameters are used to determine the adjustment range of the auxiliary frequency source.

P0-05 is used to determine the object corresponding to the auxiliary frequency source range. It can be selected to be relative to the maximum frequency or to the main frequency source X. If it is selected to be relative to the main frequency source, the range of the auxiliary frequency source will follow the main frequency source. changes with

the change of frequency X.

P0-07	Frequency source overlay selection		Factory default	0
	Set Range	one's place	Frequency source selection	
		0	Main frequency source X	
		1	Main and auxiliary operation results (the operation relationship is determined by the tens digit)	
		2	Switching between main frequency source X and auxiliary frequency source Y	
		3	Switching between main frequency source X and main and auxiliary operation results	
		4	Switching between auxiliary frequency source Y and main and auxiliary operation results	
		Tens place	Frequency source main and auxiliary operation relationship	
		0	Main + Auxiliary	
		1	Main + Auxiliary	
		2	The maximum value of both	
		3	The minimum value of both	

Use this parameter to select the frequency given channel. Frequency given is achieved through the combination of main frequency source X and auxiliary frequency source Y.



When the frequency source is selected for main and auxiliary operation, the offset frequency can be set through P0-21, and the offset frequency can be superimposed on the main and auxiliary operation results to flexibly respond to various needs.

P0-08	Preset frequency	Factory default	50.00 Hz
	Set Range	0.00 ～Maximum frequency（It is valid when the frequency source selection mode is digital setting.）	

When the frequency source is selected as "digital setting", this function code value is the initial value of the frequency digital setting of the inverter.

P0-09	Running direction selection		Factory default	0
	Set Range	0	Run in default direction; FWD/REV indicator light is off	
		1	Run in the opposite direction to the default direction; the FWD/REV indicator light is always Bright	

By changing this function code, the motor steering can be changed without changing the motor wiring. Its function is equivalent to adjusting any two lines of the motor (U, V, W) to achieve the conversion of the motor rotation direction.

P0-10	Maximum frequency	Factory default	50.00 Hz
	Set Range	50.00Hz ~ 500.00Hz	

In A600, 100.0% of analog input, pulse input (DI5), multi-segment instructions, etc. are calibrated relative to P0-10 when used as frequency sources.

P0-11	Upper limit frequency source		Factory default	0
	Set Range	0	P0-12 setting	
		1	AI1	
		2	AI2	
		3	Panel potentiometer （AI3）	
		4	PULSE setting (DI5)	
		5	Communication setting	

Define the source of the upper frequency limit. The upper limit frequency can from digital setting (P0-12), analog input, PULSE setting or communication given. When using analog (AI1, AI2, AI3) settings, PULSE settings (DI5) or communication settings, it is similar to the main frequency source, see the introduction of P0-03.
For example, when the torque control method is used at the winding control site, in order to avoid the "speeding" phenomenon caused by material disconnection, the upper limit frequency can be set with analog quantities. When the frequency converter runs to the upper limit frequency value, the frequency converter keeps running at the upper limit frequency.

P0-12	Upper limit frequency	Factory default	50.00Hz
	Set Range	Lower limit frequencyP0-14 ~ the maximum frequency P0-10	

Setting upper limit frequency. Set range P0-14 ~ P0-10

P0-13	Upper limit frequency offset	Factory default	0.00Hz
	Set range	0.00Hz ~ Maximum frequency P0-10	

When the upper limit frequency source is set to analog or PULSE setting, P0-13 is used as the offset of the set value, and the offset frequency is added to the upper limit frequency value set by P0-11 as the final upper limit frequency setting value.

P0-14	lower limit frequency	Factory default	0.00Hz
	Set Range	0.00Hz ~ Upper limit frequency P0-12	

When the frequency command is lower than the lower limit frequency set by P0-14, the frequency inverter can stop, it can also run at the lower limit frequency, or run at zero speed. The operating mode can be set by P8-14

(the set frequency is lower than the lower limit frequency operation mode).

P0-15	Carrier frequency	Factory default	Related to type
	Set range	0.5kHz ~ 16.0kHz	

This function adjusts the carrier frequency of the frequency converter. By adjusting the carrier frequency, the motor noise can be reduced, the resonance point of the mechanical system can be avoided, the line leakage current to the ground can be reduced, and the interference caused by the frequency converter can be reduced.

When the carrier frequency is low, the high-order harmonic component of the output current increases, the motor loss increases, and the motor temperature rise increases.

When the carrier frequency is higher, the motor loss decreases and the motor temperature rise decreases, but the frequency converter loss increases, the frequency converter temperature rise increases, and the interference increases.

Adjusting the carrier frequency affects the following performance:

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

Frequency Inverters with different powers have different factory settings of carrier frequency. Although users can modify it as needed, they need to pay attention to: If the carrier frequency is set higher than the factory value, it will cause the temperature rise of the inverter radiator to increase. At this time, the user needs to derate the inverter, otherwise the inverter will be in danger of overheating alarm.

P0-16	Carrier frequency adjusts with temperature	Factory default	1
	Set Range	0：No；1：Yes	

The carrier frequency is adjusted with temperature, which means that when the inverter detects that its own radiator temperature is high, it automatically reduces the carrier frequency in order to reduce the temperature rise of the inverter. When the radiator temperature is low, the carrier frequency gradually returns to the set value. This function can reduce the chance of overheating alarm of the frequency converter.

P0-17	Acceleration time 1	Factory default	Model dependent
	Set Range	0.00s ~ 650.00s(P0-19=2) 0.0s ~ 6500.0s(P0-19=1) 0s ~ 65000s(P0-19=0)	
P0-18	Deceleration time 1	Factory default	Model dependent
	Set Range	0.00s ~ 650.00s(P0-19=2) 0.0s ~ 6500.0s(P0-19=1) 0s ~ 65000s(P0-19=0)	

Acceleration time refers to the time required for the inverter to accelerate from zero frequency to the acceleration and deceleration reference frequency (determined by P0-25), see t1 in Figure 6-1. The deceleration time refers to

the time required for the inverter to decelerate from the acceleration and deceleration reference frequency (determined by P0-25) to zero frequency, see t2 in Figure 6-1.

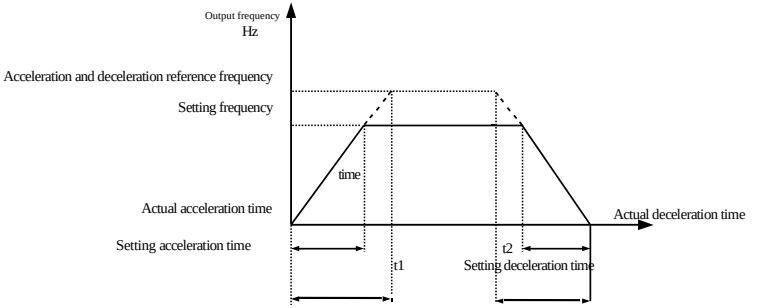


Figure 6-1 Schematic diagram of acceleration and deceleration time

A600 provides 4 groups of acceleration and deceleration times. Users can use the digital input terminal DI to switch and select. The four groups of acceleration and deceleration times are set through the following function codes:

The first group: P0-17, P0-18; The second group: P8-03, P8-04; The third group: P8-05, P8-06; The fourth group: P8-07, P8-08.

P0-19	Acceleration and deceleration time unit		Factory default	1
	Set Range	0	1 second	
		1	0.1 seconds	
		2	0.01 seconds	

In order to meet the needs of various sites, A600 provides 3 acceleration and deceleration time units, which are 1 second, 0.1 second and 0.01 second. Note: When modifying this function parameter, the number of decimal points displayed in the four groups of acceleration and deceleration times will change, and the corresponding acceleration and deceleration times will also change. Pay special attention during application.

P0-21	Auxiliary frequency source offset frequency during superposition	Factory default	0.00Hz
	Set range	0.00Hz ~ Maximum frequency P0-10	

This function code is only valid when the frequency source is selected for primary and auxiliary operation.

When the frequency source is used for main and auxiliary operation, P0-21 is used as the bias frequency, and is superimposed with the main and auxiliary operation results as the final frequency setting value, making the frequency setting more flexible.

P0-22	Frequency command resolution		Factory default	2
	Set Range	2	0.01Hz	

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

P0-23	Digital setting frequency shutdown memory selection		Factory default	0
	Set range	0	No memory	
		1	Memory	

This function is only valid when the frequency source is digital setting.

"No memory" means that after the inverter is stopped, the digital set frequency value returns to the value of P0-08 (preset frequency), and the frequency correction made by the ▲ and ▼ keys on the keyboard or the terminals UP and DOWN is cleared.

"Memory" means that after the inverter is stopped, the digital set frequency remains as the set frequency at the time of the last stop, and the frequency correction made by the ▲ and ▼ keys on the keyboard or the terminals UP and DOWN remains valid.

P0-24	Motor parameter group selection		Factory default	0
	Set Range	0	Motor parameter group 1	
		1	Motor parameter group 2	

A600 supports the application of time-sharing driving of 2 motors by the inverter. The 2 motors can separately set motor nameplate parameters, independent parameter tuning, select different control methods, independently set parameters related to operating performance, etc.

Motor parameter group 1 corresponds to the function parameter groups P1 and P2, and motor parameter group 2 corresponds to the function parameter group A2. The user selects the current motor parameter group through the P0-24 function code, or switches the motor parameters through the digital input terminal DI. When there is a conflict between function code selection and terminal selection, the terminal selection shall prevail.

P0-25	Acceleration and deceleration time base frequency		Factory default	0
	Set Range	0	Maximum frequency（P0-10）	
		1	Setting frequency	
		2	100Hz	

The acceleration and deceleration time refers to the acceleration and deceleration time from zero frequency to the frequency set by P0-25. Figure 6-1 is a schematic diagram of the acceleration and deceleration time.

When P0-25 is selected as 1, the acceleration and deceleration time is related to the set frequency. If the set frequency changes frequently, the acceleration of the motor will change, so attention needs to be paid during application.

P0-26	Runtime frequency command UP/DOWN benchmark		Factory default	0
	Set Range	0	Running frequency	
		1	Setting frequency	

This parameter is only valid when the frequency source is digital setting.

It is used to determine how to correct the set frequency when the ▲ and ▼ keys of the keyboard or the terminal UP/DOWN are activated, that is, whether the target frequency increases or decreases based on the operating frequency or increases or decreases based on the set frequency.

The difference between the two settings is obvious when the frequency converter is in the process of acceleration and deceleration, that is, if the operating frequency of the frequency converter is different from the set frequency, the different selections of this parameter will vary greatly.

P0-27	Command source bundled frequency source		Factory default	000
	Set Range	one's place	Operation panel command binding frequency source selection	
		0	No bundling	
		1	Digital setting frequency	
		2	AI1	
		3	AI2	
		4	AI3	
		5	PULSE PULSE setting (DI5)	
		6	Multi-reference	
		7	Simple PLC	

		8	PID
		9	Communication setting
		Tens place	Terminal command binding frequency source selection（0 ~ 9，same as the one's place）
		Hundreds place	Terminal command binding frequency source selection（0 ~ 9，same as the one's place）

Define the bundling combinations between three operating command channels and nine frequency given channels to facilitate synchronous switching. The meaning of the above frequency given channel is the same as the main frequency source X selection P0-03, please refer to the P0-03 function code description. Different running command channels can be bundled with the same frequency given channel.

When the command source has a bound frequency source, the frequency sources set by P0-03~P0-07 will no longer take effect while the command source is valid.

P0-28	Serial communication protocol selection		Factory default	0
	Set Range	0	MODBUS-RTU protocol	
		1	Profibus-DP bridge or CANopen bridge	

A600 uses the serial port to implement three communication protocols: MODBUS, Profibus-DP bridge, and CANopen bridge. Only one of the three protocols is supported at the same time. Please set this parameter correctly according to actual needs

Group P1 Motor 1 Parameter

P1-00	Motor mode type		Factory default	0
	Set Range	0	Ordinary asynchronous motor	
		1	Variable frequency asynchronous motor	
P1-01	Rated power		Factory default	Model dependent
	Set Range		0.1kW ~ 1000.0kW	
P1-02	Rated voltage		Factory default	Model dependent
	Set Range		1V ~ 2000V	
P1-03	Rated current		Factory default	Model dependent
	Set Range		0.01A ~ 655.35A(VFD power≤ 55kW) 0.1A ~ 6553.5A(VFD power >55kW)	

P1-04	Rated frequency	Factory default	Model dependent
	Set Range	0.01Hz ~Maximum frequency	
P1-05	Rated speed	Factory default	Model dependent
	Set Range	1rpm ~ 65535rpm	

The above function codes are motor nameplate parameters. Regardless of whether VF control or vector control is used, the relevant parameters need to be accurately set according to the motor nameplate.

In order to obtain better VF or vector control performance, motor parameter tuning is required, and the accuracy of the tuning results is closely related to the correct setting of the motor nameplate parameters.

P1-06	Asynchronous motor stator resistance	Factory default	Tuning parameters
	Set Range	0.001Ω ~ 65.535Ω(VFD power≤ 55kW) 0.0001Ω ~ 6.5535Ω(VFD power>55kW)	
P1-07	Asynchronous motor rotor resistance	Factory default	Tuning parameters
	Set Range	0.001Ω ~ 65.535Ω(VFD power≤ 55kW) 0.0001Ω ~ 6.5535Ω(VFD power>55kW)	
P1-08	Asynchronous motor leakage inductance	Factory default	Tuning parameters
	Set Range	0.01mH ~ 655.35mH(VFD power≤ 55kW) 0.001mH ~ 65.535mH(VFD power>55kW)	
P1-09	Asynchronous motor mutual inductance	Factory default	Tuning parameters
	Set Range	0.1mH ~ 6553.5mH(VFD power≤ 55kW) 0.01mH ~ 655.35mH(VFD power >55kW)	
P1-10	Asynchronous motor no-load current	Factory default	Tuning parameters
	Set Range	0.01A ~ P1-03(VFD power≤ 55kW) 0.1A ~ P1-03(VFD power >55kW)	

P1-06~P1-10 are the parameters of the asynchronous motor. These parameters are generally not found on the motor nameplate and need to be obtained through automatic tuning of the inverter. Among them, "Static tuning of asynchronous motor" can only obtain three parameters P1-06~P1-08, while "Dynamic tuning of asynchronous motor" can obtain not only all 5 parameters here, but also the encoder phase sequence and current loop PI. Parameters etc.

When changing the motor rated power (P1-01) or motor rated voltage (P1-02), the inverter will automatically modify the P1-06 ~ P1-10 parameter values and restore these 5 parameters to the commonly used standard Y series motor parameters.

If the asynchronous motor cannot be tuned on site, you can enter the above corresponding function code according to the parameters provided by the motor manufacturer.

P1-27	Encoder line number	Factory default	1024
	Set Range	1 ~ 65535	

Set the number of pulses per revolution of the ABZ or UVW incremental encoder.

In the vector control mode with speed sensor, the number of encoder pulses must be set correctly, otherwise the motor will not operate normally.

P1-28	Encode type		Factory default	0
	Set Range	0	ABZ incremental encoder	
		1	UVW incremental encoder	
		2	Resolver	
		3	Sin Cos encoder	
		4	Line-saving UVW encoder	

A600 supports multiple encoder types. Different encoders require different PG cards. Please choose the PG card correctly

when using it. Asynchronous motors generally only use ABZ incremental encoders and resolvers.

After installing the PG card, set P1-28 correctly according to the actual situation, otherwise the inverter may not operate normally.

P1-30	ABZ incremental encoder AB phase sequence		Factory default	0
	Set Range	0	Forward	
		1	Reverse	

This function code is only valid for ABZ incremental encoder, that is, it is valid only when P1-28=0. Used to set the phase sequence of the AB signal of the ABZ incremental encoder.

This function code is valid for asynchronous motors. During dynamic tuning of asynchronous motors, the AB phase sequence of the ABZ encoder can be obtained.

P1-31	Encoder mounting angle	Factory default	0.0°
	Set Range	0.0° ~ 359.9°	

P1-32	UVW encoder UVW phase sequence		Factory default	0
	Set Range	0	Forward	
		1	Reverse	
P1-33	UVW encoder offset angle		Factory default	0.0°
	Set Range		0.0° ~ 359.9°	

P1-34	Number of pole pairs of resolver	Factory default	1

The resolver has a pole pair number. When using this encoder, the pole pair number parameters must be set correctly.

P1-36	Speed feedback PG disconnection detection time	Factory default	0.0s
	Set Range	0.0s：No action 0.1s ~10.0s	

Used to set the detection time of encoder disconnection fault. When set to 0.0s, the frequency inverter does not detect encoder disconnection fault. When the inverter detects a disconnection fault and the duration exceeds the time set by P1-36, the inverter will alarm ERR20.

P1-37	Tuning selection		Factory default	0
	Set Range	0	No operation	
		1	Asynchronous machine static tuning1	
		2	Dynamic tuning of asynchronous machines	
		3	Asynchronous machine static tuning 2	

In order to ensure the best control performance of the inverter during vector control, please disconnect the load from the

motor and use rotation tuning to perform motor parameter self-learning, otherwise the vector control effect will be affected. Please use static tuning 2 when the motor has a large inertia load that is not easy to disconnect and vector control is required.

Before parameter self-learning, the motor type and nameplate parameters P1-00~P1-05 need to be correctly set. During closed-loop vector control, the encoder type and pulse number P1-27 and P1-28 need to be additionally set.

Tuning action description: Set the motor nameplate parameters and self-learning type, then press the RUN key, and the inverter will perform static tuning. 0: No operation, that is, tuning is prohibited.

1: Static tuning of asynchronous machines 1. It is suitable for situations where asynchronous motors and large inertia loads are difficult to disconnect and cannot perform rotational tuning.

2: Dynamic tuning of asynchronous machine

During the dynamic tuning process, the inverter first performs static tuning, and then accelerates to 80% of the motor's rated frequency according to the acceleration time P0-17. After maintaining for a period of time, it decelerates to a stop according to the deceleration time P0-18 and ends tuning.

3: Static tuning of asynchronous machine 2

It is suitable for self-learning of motor parameters when the motor is stationary without an encoder.

Action description: Set the function code to 3, and then press the RUN key, the inverter will perform no-load

tuning. Description: Tuning supports motor tuning in keyboard operation mode, terminal mode, and communication mode

Group P2 vector control parameters

Group P2 function codes are only valid for vector control and invalid for VF control.

P2-00	Speed loop proportional gain 1	Factory default	30
	Predetermined area	1 ~ 100	
P2-01	Speed loop integration time 1	Factory default	0.50s
	Predetermined area	0.01s ~ 10.00s	
P2-02	Switching frequency 1	Factory default	5.00Hz
	Predetermined area	0.00 ~ P2-05	
P2-03	Speed loop proportional gain 2	Factory default	20
	Predetermined area	0 ~ 100	
P2-04	Speed loop integration time 2	Factory default	1.00s
	Predetermined area	0.01s ~ 10.00s	
P2-05	switching frequency 2	Factory default	10.00Hz
	Predetermined area	P2-02 ~ Maximum output frequency	

When the frequency inverter runs at different frequencies, different speed loop PI parameters can be selected. When the running frequency is less than switching frequency 1 (P2-02), the speed loop PI adjustment parameters are P2-00 and P2-01. When the running frequency is greater than the switching frequency 2, the speed loop PI adjustment parameters are P2-03 and P3-04. The speed loop PI parameters between switching frequency 1 and switching frequency 2 are linear switching of two sets of PI parameters, as shown in Figure 6-2:

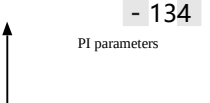


Figure 6-2 PI parameter diagram

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

Increasing the proportional gain and reducing the integration time can speed up the dynamic response of the speed loop. However, if the proportional gain is too large or the integration time is too small, the system may oscillate. The recommended adjustment method is:

If the factory parameters cannot meet the requirements, fine-tune the parameters based on the factory values. First increase the proportional gain to ensure that the system does not oscillate; then reduce the integration time so that the system has faster response characteristics and less overshoot.

Note: Improper PI parameter setting may result in excessive speed overshoot. Even an overvoltage fault occurs when the overshoot falls back.

P2-06	Vector control slip gain	Factory default	100%
	Predetermined area	50% ~ 200%	

For speed sensorless vector control, this parameter is used to adjust the steady speed accuracy of the motor: when the motor is loaded and the speed is low, increase this parameter, and vice versa.

For vector control with speed sensor, this parameter can adjust the output current of the inverter under the same load.

P2-07	SVC speed feedback filter time	Factory default	0.050s
	Predetermined area	0.000s~1.000s	

The SVC speed feedback filter time only takes effect when P0-01=0. Increasing P2-07 can improve the motor stability, but the dynamic response will become weaker. Otherwise, the dynamic response will be strengthened, but if it is too small, it will cause the motor to oscillate. Normally no adjustment is required.

P2-09	Torque upper limit source in speed control mode		Factory default	0
	Predetermined area	0	P2-10	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE pulse (DI5)	
		5	Communication settings	
P2-10	Digital setting of torque upper limit in speed control mode		Factory default	150.0%
	Predetermined area		0.0% ~ 200.0%	

In speed control mode, the maximum value of the inverter output torque is controlled by the torque upper limit source. P2-09 is used to select the setting source of the torque upper limit. When set through analog, PULSE pulse, and

communication, 100% of the corresponding setting corresponds to P2-10, and 100% of P2-10 corresponds to the frequency inverter. Rated output current.

For the settings of AI1, AI2, and AI3, see the introduction of the AI curve of group P4 (select the respective curves through P4-33). For the PULSE pulse, see the introduction of P4-28 ~ P4-32.

If it is currently a point-to-point communication slave and receives data as torque reference, the host will directly send the torque digital setting. See the introduction of group A8 point-to-point communication.

Otherwise, the host computer writes the data from -100.00% to 100.00% through the communication address 0x1000, of which 100.00% corresponds to P2-10. Support MODBUS, CANopen, CANlink, Profibus-DP.

P2-13	Excitation adjustment proportional gain	Factory default	2000
	Predetermined area	0 ~ 60000	
P2-14	Excitation adjustment integral gain	Factory default	1300
	Predetermined area	0 ~ 20000	
P2-15	Torque adjustment proportional gain	Factory default	2000
	Predetermined area	0 ~ 20000	
P2-16	Torque adjustment integral gain	Factory default	1300
	Predetermined area	0 ~ 20000	

Vector control current loop PI adjustment parameters, which will be automatically obtained after dynamic tuning of the asynchronous machine, and generally do not need to be modified.

It should be reminded that the integral regulator of the current loop does not use the integral time as the dimension, but directly sets the integral gain. If the current loop PI gain is set too large, it may cause the entire control loop to oscillate. Therefore, when the current oscillations or torque fluctuations are large, you can manually reduce the PI proportional gain or integral gain here.

P2-20	Maximum output voltage coefficient	Factory default	105%
	Predetermined area	100%~110%	

The maximum output voltage coefficient indicates the ability of the inverter to increase the maximum output voltage. Increasing P2-20 can increase the maximum output voltage of the motor in the field weakening zone.

Large load capacity, but the motor current ripple increases, which will increase the motor's heat generation; conversely, the motor's maximum load capacity in the field weakening zone will decrease, but the motor current ripple will decrease, which will reduce the motor's heat generation. Generally no adjustment is required.

P2-21	Maximum torque coefficient in field weakening zone	Factory default	100%
	Predetermined area	50%~200%	

parameter will only take effect when the motor runs above the rated frequency. When the motor needs to accelerate rapidly to more than 2 times the rated frequency of the motor and the actual acceleration time is long, appropriately reduce P2-21; when the motor runs at 2 times the rated frequency and the speed drops significantly after being loaded, increase P2-21 appropriately. Generally no changes are required.

Group P3 V/F control parameters

This group of function codes is only valid for V/F control, not for vector control. V/F control is suitable for general-purpose loads such as fans and water pumps, or for applications where one inverter is equipped with multiple motors, or where the power of the inverter is significantly different from that of the motor.

P3-00	V/F curve setting		Factory default	0
	Predetermined area	0	Linear V/F	
		1	Multipoint V/F	
		2	Square V/F	
		3	1.2 times V/F	
		4	1.4 times V/F	
		6	1.6 times V/F	
		8	1.8 times V/F	
		9	Reserve	
		10	VF fully separated mode	
		11	VF semi-separate mode	

0: Straight line V/F. Suitable for ordinary constant torque loads.

1: Multi-point V/F. Suitable for special loads such as dehydrators and centrifuges. At this time, any VF relationship curve can be obtained by setting the P3-03~P3-08 parameters.

2: Squared V/F. Suitable for centrifugal loads such as fans and water pumps.

3~8: VF relationship curve between straight line VF and square VF.

10: VF complete separation mode. At this time, the output frequency and output voltage of the inverter are independent of each other. The output frequency is determined by the frequency source, and the output voltage is determined by P3-13 (VF separation voltage source).

VF complete separation mode is generally used in induction heating, inverter power supply, torque motor control and other occasions. 11: VF semi-separated mode. In this case, V and F are proportional, but the proportional relationship can be set through voltage source P3-13, and the relationship between V and F is also related to

The rated voltage of the motor in group P1 is related to the rated frequency.

Assuming that the voltage source input is X (X is a value from 0~100%), the relationship between the inverter output voltage V and frequency F is: V/F=2 * (Motor rated voltage)/(Motor rated frequency)

P3-01	Torque boost	Factory default	Model confirmed
	Predetermined area	0.0% ~ 30%	
P3-02	Torque boost cutoff frequency	Factory default	50.00Hz
	Predetermined area	0.00Hz ~ Maximum output frequency	

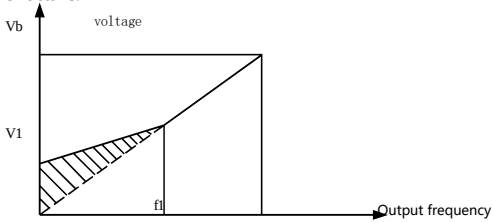
In order to compensate for the low-frequency torque characteristics of V/F control, some boost compensation is made to the inverter output voltage at low frequencies. However, if the torque boost setting is too large, the motor will easily overheat and the inverter will easily overcurrent.

When the load is heavy and the motor starting torque is insufficient, it is recommended to increase this parameter. The torque boost can be reduced when the load is light.

When the torque boost is set to 0.0, the inverter performs automatic torque boost. At this time, the inverter automatically calculates the

required torque boost value based on parameters such as motor stator resistance.

Torque boost torque cutoff frequency: below this frequency, the torque boost torque is effective. If it exceeds this set frequency, the torque boost is invalid. See Figure 6-3 for details.



V1：Manual torque boost voltage

fb

Vb：Maximum output voltage

f1：Manual torque boost cutoff frequency fb：Rated operating frequency

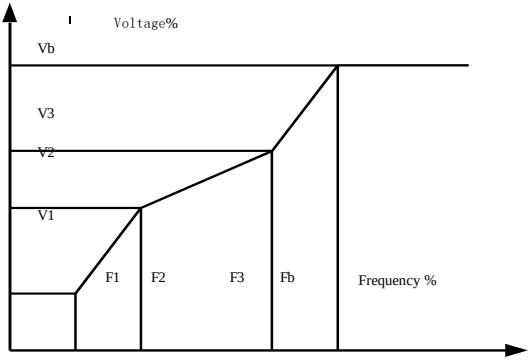
Figure 6-3 Manual torque boost diagram

P3-03	Multi-point VF frequency point F1	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ P3-05	
P3-04	Multi-point VF voltage point V1	Factory default	0.0%
	Predetermined area	0.0% ~ 100.0%	
P3-05	Multi-point VF frequency point F2	Factory default	0.00Hz
	Predetermined area	P3-03 ~ P3-07	
P3-06	Multi-point VF voltage point V2	Factory default	0.0%
	Predetermined area	0.0% ~ 100.0%	
P3-07	Multi-point VF frequency point F3	Factory default	0.00Hz
	Predetermined area	P3-05 ~ motor rated frequency (P1-04) Note: The rated frequency of the second motor is A2-04	
P3-08	Multipoint VF voltage point V3	Factory default	0.0%
	Predetermined area	0.0% ~ 100.0%	

P3-03 ~ P3-08 six parameters define multi-segment V/F curves.

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

Setting the voltage too high at low frequencies may cause the motor to overheat or even burn out, and the inverter may experience overcurrent stall or overcurrent protection.



V1-V3: Multi-speed V/F voltage percentage of segments 1-3

F1-F3: multi-speed V/F frequency percentage of the 1st to 3rd stages

Vb: motor rated voltage Fb: motor rated operating frequency

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

P3-09	VF slip compensation gain	Factory default	0.0%
	Predetermined area	0% ~ 200.0%	

This parameter is only valid for asynchronous motors.

VF slip compensation can compensate for the motor speed deviation produced by the asynchronous motor when the load increases, so that the motor speed can basically remain stable when the load changes. The VF slip compensation gain is set to 100.0%, which means that when the motor is with rated load, the slip compensated is the rated slip of the motor, and the rated slip of the motor is calculated by the inverter through the rated frequency and rated speed of the P1 group motor. When adjusting the VF slip compensation gain, the principle is generally that the motor speed is basically the same as the target speed under rated load. When the motor speed is different from the target value, the gain needs to be fine-tuned appropriately.

P3-10	VF overexcitation gain	Factory default	64
	Predetermined area	0 ~ 200	

During the deceleration process of the frequency inverter, overexcitation control can suppress the rise in bus voltage and avoid overvoltage faults. The greater the overexcitation gain, the stronger the suppression effect. In situations where the inverter is prone to overvoltage alarm during deceleration, the overexcitation gain needs to be increased. However, if the overexcitation gain is too large, it will easily lead to an increase in the output current, which needs to be weighed in the application.

For applications with very small inertia and no voltage rise during motor deceleration, it is recommended to set the overexcitation gain to 0; for applications with a braking resistor, it is also recommended to set the overexcitation gain to 0.

P3-11	VF oscillation suppression gain	Factory default	40
	Predetermined area	0 ~ 100	

The selection method of this gain is to make it as small as possible while effectively suppressing oscillation, so as not to adversely affect the VF operation. On the phone

When the machine has no oscillation, please select this gain to be 0. Only when the motor oscillates obviously, the gain needs to be appropriately increased. The larger the gain, the more obvious the suppression of oscillation.

When using the oscillation suppression function, the motor rated current and no-load current parameters must be accurate, otherwise the VF oscillation suppression effect will be poor.

P3-13	VF separate voltage source		Factory default	0
	Predetermined area	0	Digital settings (P3-14)	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE (DI5)	
		5	Multi-segment instructions	
		6	Simple PLC	
		7	PID	
		8	Communication given	
		100.0% Corresponding motor rated voltage (P1-02、A2-02)		
P3-14	VF separate voltage digital setting		Factory defaul	0V
	Predetermined area		0V ~Motor rated voltage	

VF separation is generally used in induction heating, inverter power supply and torque motor control.

When selecting VF separation control, the output voltage can be set through function code P3-14, or it can come from analog quantity, multi-segment instruction, PLC, PID or communication given. When using non-digital settings, 100% of each setting corresponds to the rated voltage of the motor. When the percentage of analog output settings is a negative number, the absolute value of the setting is used as the effective setting value.

0: Digital setting (P3-14)
The voltage is set directly by P3-14. 1:AI1 2:AI2 3:AI3
The voltage is determined by the analog input terminals.
4. PULSE pulse setting (DI5)
The voltage is given through terminal pulse.
Pulse given signal specifications: voltage range 9V ~ 30V, frequency range 0kHz ~ 100kHz.
5. Multi-segment instructions
When the voltage source is a multi-segment instruction, the P4 group and PC group parameters need to be set to determine the corresponding relationship between the given signal and the given voltage. The 100.0% given by the PC group parameter multi-segment instruction refers to the percentage relative to the rated voltage of the motor.
6. Simple PLC
When the voltage source is a simple PLC, the PC group parameters need to be set to determine the given output voltage.
7.PID
The output voltage is generated according to the PID closed loop. For details, please refer to the introduction of PA group PID.
8. Communication give refers to the voltage given by the host computer through communication.

VF separation voltage source selection is similar to frequency source selection. Please refer to P0-03 Main frequency source selection introduction. Among them, 100.0% of the settings corresponding to various selections refers to the rated voltage of the motor (take the absolute value of the corresponding setting value).

P3-15	VF separation voltage rise time	Factory default	0.0s
	Predetermined area	0.0s ~ 1000.0s	
P3-16	VF separation voltage drop time	Factory default	0.0s
	Predetermined area	0.0s ~ 1000.0s	

The voltage rise time of VF separation refers to the time required for the output voltage to accelerate from 0 to the rated voltage of the motor, see t1 in the figure. The voltage drop time of VF separation refers to the time required for the output voltage to decelerate from the motor rated voltage to 0, see t2 in the figure.

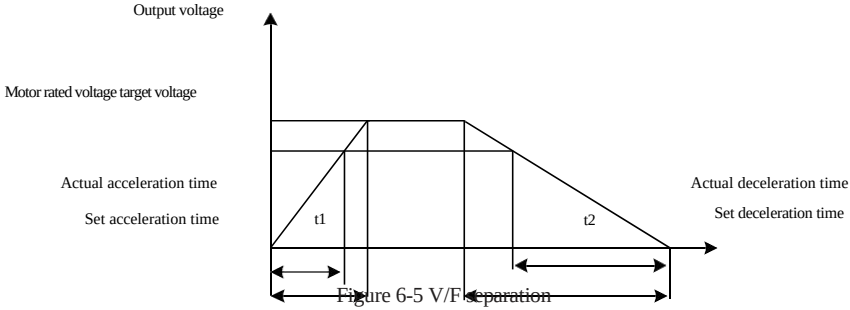


Figure 6-5 V/F separation diagram

P3-17	VF separation shutdown mode selection	Factory default	0s
	Predetermined area	0: Frequency/voltage decrease to 0 independently 1: Frequency decreases again after voltage decreases to 0	

0: Frequency/voltage independently reduced to 0

The V/F separation output voltage decreases to 0V according to the voltage drop time (P3-15); the V/F separation output frequency decreases to 0Hz according to the deceleration time (P0-18) at the same time.

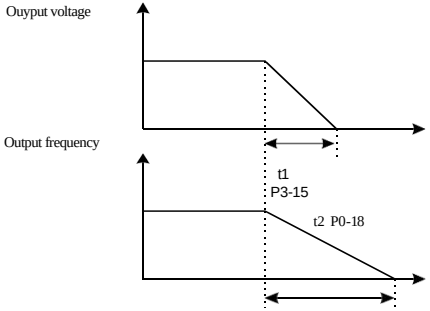


Figure 6-6 V/F split output voltage/frequency independently reduced to 01: The frequency decreases again after the voltage decreases to 0: The V/F separation output voltage first decreases to 0V according to the voltage drop time (P3-15), and then the frequency decreases to 0Hz according to the deceleration time (P0-18).1

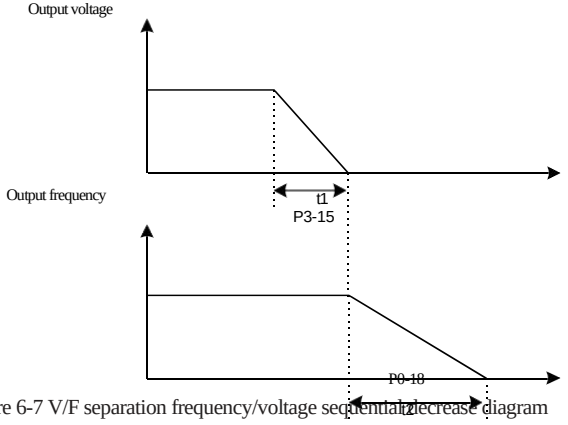


Figure 6-7 V/F separation frequency/voltage sequential decrease diagram

● Frequency inverter output current (torque) limit

During acceleration, constant speed, and deceleration, if the current exceeds the overcurrent stall current point (150%), the overcurrent stall will take effect. When the current exceeds the overcurrent stall point, the output frequency begins to decrease until the current returns to the overcurrent stall. After the frequency reaches the target frequency, the frequency will start to accelerate upward to the target frequency, and the actual acceleration time will be automatically lengthened. If the actual acceleration time cannot meet the requirements, the "P1-21 overcurrent stalling action current" can be appropriately increased."

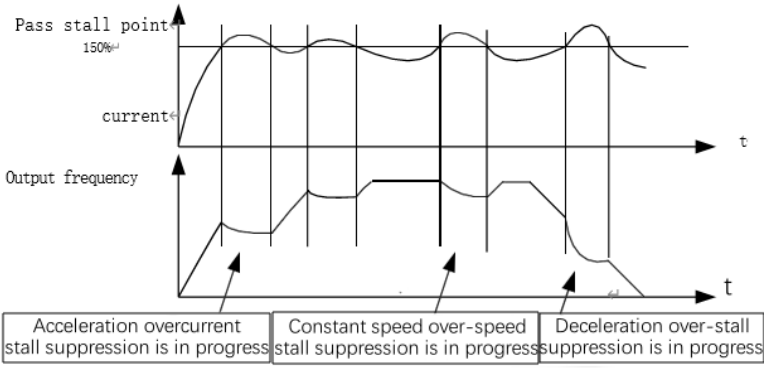


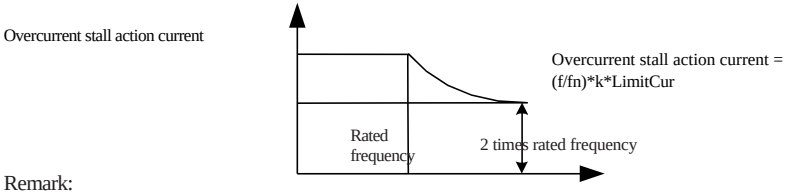
Figure 6-8 Overcurrent stall action diagram

Function code	Function definition	Factory value	Predetermined area	Parameter Description
P3-18	Overcurrent stall action current	150%	50%~200%	Current that initiates overcurrent stall suppression action
P3-19	Overcurrent stall suppression enable	1	0~1	0 invalid, 1 valid
P3-20	Overpass Stall Suppression Gain	20	0~100	If the current exceeds the overcurrent stall current point, the overcurrent stall suppression will take effect and the actual acceleration time Automatically stretch
P3-21	Double speed overcurrent stall action current compensation coefficient	50%	50%~200%	Reduce the high-speed overcurrent stalling action current. It is invalid when the compensation coefficient is 50. The action current in the field weakening zone Corresponds to P3-18

In the high-frequency area, the motor drive current is small. Compared with the rated frequency below, the speed of the motor drops greatly for the same stall current. In order to improve the operating characteristics of the motor, the stall action current above the rated frequency can be reduced. In some centrifuges In situations where the operating frequency is high, the field weakening is required several times, and the load inertia is large, this method has a good effect on acceleration performance.

Transition stall action current exceeding rated frequency = (fs/fn) * k * LimitCur;

fs is the operating frequency, fn is the rated frequency of the motor, k is P3-21 "Double speed over-speed stall action current compensation coefficient", LimitCur is P3-18 "Over-speed stall action current";



Remark:

过The stall action current of 150% means 1.5 times the rated current of the inverter;

For high-power motors, the carrier frequency is below 2kHz. Due to the increase in pulsating current, the wave-by-wave current limiting response starts before the overcurrent stall prevention action, resulting in insufficient torque. In this case, please reduce the overcurrent stall prevention action current.

Frequency inverter bus voltage limit (and braking resistor turn-on voltage setting)

If the bus voltage exceeds the overvoltage stall point 760V, it means that the electromechanical system is already in the power generation state (motor speed > output frequency), the overvoltage stall will take effect, the output frequency will be adjusted (the excess electricity fed back will be consumed), and the actual deceleration time will automatically Stretch to avoid tripping protection. If the actual deceleration time cannot meet the requirements, the overexcitation gain can be appropriately increased.

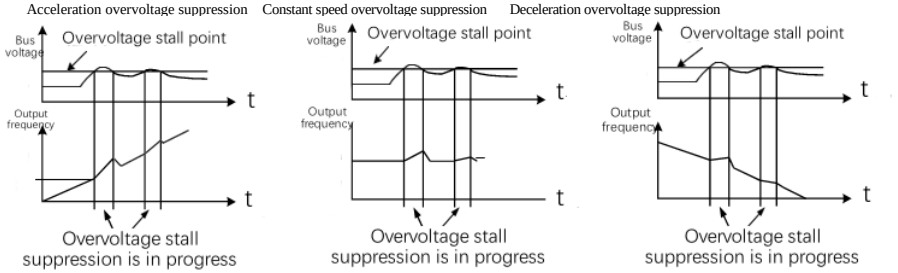


Figure 6-10 Overvoltage stall action diagram

Function code	Function definition	Factory default	Predetermined area	Parameter Description
P3-22	Overvoltage stall action voltage	760V	200.0V~2000.0V	-
P3-23	Overvoltage stall enable	1	0~1	0 invalid, 1 valid, the default overvoltage stall gain is valid
P3-24	Overvoltage stall suppression frequency gain	30	0~100	Increasing P3-24 will improve the control effect of the bus voltage, but the output frequency will fluctuate. If the output frequency fluctuates greatly, P3-24 can be appropriately reduced. Increasing P3-25 can reduce the overshoot of the bus voltage.
P3-25	Overvoltage Stall Suppression Voltage Gain	30	0~100	
P3-26	Overvoltage stall maximum rising frequency limit	5Hz	0~50Hz	Overvoltage suppression maximum rising frequency limit

Remark:
Please pay attention to the following when using a braking resistor or installing a braking unit or an energy feedback unit:
Please set the value of P3-11 "overexcitation gain" to "0". If it is not "0", it may cause excessive current during operation. Please set the value of P3-23 "Overvoltage Stall Enable" to "0". If it is not "0", it may cause the deceleration time to be extended.

Function code	Function definition	Factory default	Predetermined area	Parameter Description
P3-27	Slip compensation time constant	0.5s	0.1 ~ 10.0s	If the set value is too small, regenerative overvoltage fault (Err07) may easily occur in large inertia loads.

The smaller the response time value of slip compensation is set, the faster the response speed will be.

Group P4 input terminal

The A600 series inverter comes standard with 5 multi-functional digital input terminals (DI5 can be used as a high-speed pulse input terminal) and 2 analog input terminals. If the system requires more input and output terminals, a multi-function input and output expansion card can be selected. The multi-function input and output expansion card has 5 multi-function digital input terminals (DI6 ~ DI10).

Function code	Name	Factory default	Remark
P4-00	DI1 terminal function selection	1 (Forward running)	Standard configuration
P4-01	DI2 terminal function selection	4 (Forward jog)	Standard configuration
P4-02	DI3 terminal function selection	9 (Fault reset)	Standard configuration
P4-03	DI4 terminal function selection	12 (Multi-step speed 1)	Standard configuration

P4-04	DI5 terminal function selection	13 (Multi-step speed 2)	Standard configuration
P4-05	DI6 terminal function selection	0	Expand
P4-06	DI7 terminal function selection	0	Expand
P4-07	DI8 terminal function selection	0	Expand
P4-08	DI9 terminal function selection	0	Expand

These parameters are used to set the functions of the digital multi-function input terminals. The selectable functions are as shown in the following table:

Set value	Function	Explanation
0	No function	Unused terminals can be set to "no function" to prevent malfunctions.
1	Forward running (FWD)	Control the forward and reverse rotation of the frequency inverter through external terminals。
2	Reverse operation (REV)	
3	Three-wire operation control	Use this terminal to determine whether the inverter operating mode is the three-wire control mode. Details Please refer to the description of function code P4-11 ("Terminal command mode").
4	Forward jog (FJOG)	FJOG is jog forward operation, and RJOG is jog reverse operation. For the jogging operating frequency and jogging acceleration and deceleration time, please refer to the description of function codes P8-00, P8-01, and P8-02.
5	Reverse jog (RJOG)	
6	Terminal UP	Modify the increment and decrement instructions of the frequency when the frequency is given by the external terminal. When the frequency source is set to digital setting, the set frequency can be adjusted up or down.
7	Terminal DOWN	
8	free parking	The frequency inverter blocks the output. At this time, the motor's stopping process is not controlled by the frequency inverter. This method has the same meaning as the free parking described in P6-10.
9	Fault reset (RESET)	Use terminals to perform fault reset function. Same function as the RESET key on the keyboard. Use this function to achieve remote fault reset.
10	Run pause	The inverter decelerates to a stop, but all operating parameters are memorized. Such as PLC parameters, swing frequency parameters, and PID parameters. After this terminal signal disappears, the inverter returns to the running state before stopping.
11	External fault normally open input	When this signal is sent to the inverter, the inverter reports fault ERR15 and

		Perform fault handling in protective action mode (see function code P9-47 for details).
12	Multi-segment command terminal 1	Through the 16 states of these four terminals, 16 speeds or 16 other instructions can be set. See Appendix 1 for details.
13	Multi-segment command terminal 2	
14	Multi-segment command terminal 3	
15	Multi-segment command terminal 4	
16	Acceleration and deceleration time selection terminal 1	Through the four states of these two terminals, four types of acceleration and deceleration time can be selected. See Appendix 2 for details.
17	Acceleration and deceleration time selection terminal 2	

Set value	Function	Explanation
18	Frequency source switching	Used to switch between different frequency sources. According to the setting of the frequency source selection function code (P0-07), when switching between two frequency sources is set as the frequency source, the The terminal is used to switch between two frequency sources.
19	UP/DOWN setting clear (terminal, keyboard)	When the frequency given is a digital frequency given, this terminal can clear the frequency value changed by terminal UP/DOWN or keyboard UP/DOWN, so that the given frequency can be restored to The value set by P0-08.
20	Control command switching terminal 1	When the command source is set to terminal control (P0-02=1), this terminal can switch between terminal control and keyboard control. When the command source is set to communication control (P0-02=2), this terminal can communicate Switch between control and keyboard control.
21	Acceleration and deceleration prohibited	Ensure that the frequency inverter is not affected by external signals (except stop commands) and maintains the current output frequency.
22	PID pause	PID is temporarily disabled, the inverter maintains the current output frequency and no longer performs PID adjustment of the frequency source.
23	PLC status reset	The PLC is paused during execution. When running again, this terminal can be used to restore the inverter to the initial state of the simple PLC.
24	Swing frequency pause	The frequency inverter outputs at the center frequency. The swing frequency function is paused.
25	Counter input	Input terminal for counting pulses.
26	Counter reset	Clear the counter status.
27	length count input	Input terminal for length counting.
28	Length reset	The length is cleared to zero.
29	Torque control disabled	The inverter is prohibited from performing torque control and the inverter enters the speed control mode.
30	PULSE frequency input	DI5 functions as a pulse input terminal.
32	Immediate DC braking	When this terminal is valid, the inverter directly switches to DC braking state.
33	External fault normally closed input	When the external fault normally closed signal is sent to the inverter, the inverter reports fault ERR15 and stops.
34	Frequency modification enabled	If the DI1 terminal is valid, the frequency modification is allowed; if the DI1 terminal is invalid, the frequency modification is prohibited.
35	PID action direction is reversed	When this terminal is valid, the PID action direction is opposite to the direction set by PA-03.
36	External parking terminal 1	During keyboard control, this terminal can be used to stop the inverter.

37	Control command switching terminal 2	Used to switch between terminal control and communication control. If the command source is selected as terminal control, the system switches to communication control when the terminal is valid; and vice versa.
38	PID points suspended	When this terminal is valid, the integral adjustment function of PID is suspended, but the proportional adjustment and differential adjustment functions of PID are still effective.
39	Frequency source X and preset frequency switching	If this terminal is valid, the frequency source X is replaced by the preset frequency (P0-08)
40	Frequency source Y and preset frequency switching	If this terminal is valid, the frequency source Y is replaced by the preset frequency (P0-08).
41	Motor selection terminal 1	Through the two states of the terminal, 2 sets of motor parameters can be switched. See Appendix Table 3 for details.
42	reserve	Reserve
43	PID parameter switching	When the PID parameter switching condition is the DI terminal (PA-18=1), when this terminal is invalid, the PID parameters use PA-05 ~ PA-07; when this terminal is valid, use PA-15 ~ PA-17。
44	User-defined fault 1	When user-defined faults 1 and 2 are valid, the inverter will alarm ERR27 and ERR28 respectively, and the inverter will select the action mode selected by P9-49 according to the fault protection action for processing.
45	User-defined fault 2	
46	Speed control/torque control switching	Make the frequency inverter switch between torque control and speed control modes. When this terminal is invalid, the inverter runs in the mode defined by A0-00 (speed/torque control mode). When this terminal is valid, it switches to another mode. It can be switched through the terminal during operation, and it will take effect immediately after switching.
47	Emergency pull over	When this terminal is valid, the inverter stops at the fastest speed, and the current is at the set current upper limit during the stopping process. This function is used to meet the requirement that the inverter needs to stop as soon as possible when the system is in an emergency state.
48	External parking terminal 2	In any control mode (panel control, terminal control, communication control), this terminal can be used to decelerate the inverter to a stop. At this time, the deceleration time is fixed to deceleration time 4.
49	Deceleration DC braking	When this terminal is valid, the inverter first decelerates to the stop DC braking starting frequency, and then switches to the DC braking state.
50	This running time is cleared to zero	When this terminal is valid, the timing time of the current running of the frequency inverter will be cleared. This function needs to be used in conjunction with scheduled operation (P8-42) and current running time arrival (P8-53).

51	Two-wire/three-wire switching	Used to switch between two-wire and three-wire control. If P4-11 is two-wire type 1, it will switch to three-wire type 1 when this terminal function is valid. So on and so forth.
52	No reversal	This terminal is valid and prohibits reverse rotation of the inverter. Same function as P8-13.

4 multi-segment command terminals can be combined into 16 states, and each of these 16 states corresponds to 16 command setting values. Details are shown in Table 1:

Attachment 1 Multi-segment instruction function description

K4	K3	K2	K1	Command settings	Corresponding parameters
OFF	OFF	OFF	OFF	Multi-segment instruction 0	PC-00
OFF	OFF	OFF	ON	Multi-segment instruction 1	PC-01
OFF	OFF	ON	OFF	Multi-segment instruction 2	PC-02
OFF	OFF	ON	ON	Multi-segment instruction 3	PC-03
OFF	ON	OFF	OFF	Multi-segment instruction 4	PC-04
OFF	ON	OFF	ON	Multi-segment instruction 5	PC-05
OFF	ON	ON	OFF	Multi-segment instruction 6	PC-06
OFF	ON	ON	ON	Multi-segment instruction 7	PC-07
ON	OFF	OFF	OFF	Multi-segment instruction 8	PC-08
ON	OFF	OFF	ON	Multi-segment instruction 9	PC-09
ON	OFF	ON	OFF	Multi-segment instructions 10	PC-10
ON	OFF	ON	ON	Multi-segment instructions 11	PC-11
ON	ON	OFF	OFF	Multi-segment instructions 12	PC-12
ON	ON	OFF	ON	Multi-segment instructions 13	PC-13
ON	ON	ON	OFF	Multi-segment instructions 14	PC-14
ON	ON	ON	ON	Multi-segment instructions 15	PC-15

When the frequency source is selected as multi-speed, 100.0% of function code PC-00~PC-15 corresponds to the maximum frequency P0-10. In addition to being a multi-speed function, multi-segment instructions can also be used as a given source for PID or as a voltage source for VF separation control to meet the need to switch between different given values.

Appendix 2 Acceleration and deceleration time selection terminal function description

Terminal 2	Terminal 1	Acceleration or deceleration time selection	Corresponding parameters
OFF	OFF	Acceleration time 1	P0-17、P0-18
OFF	ON	Acceleration time 2	P8-03、P8-04
ON	OFF	Acceleration time 3	P8-05、P8-06
ON	ON	Acceleration time 4	P8-07、P8-08

Appendix Table 3 Motor selection terminal function description

Terminal 1	Motor selection	Corresponding parameter group
OFF	Motor 1	Group P1、P2
ON	Motor 2	Group A2

P4-10	DI filter time	Factory default	0.010s
	Predetermined area	0.000s ~ 1.000s	

Set the software filtering time of DI terminal status. If the input terminal is susceptible to interference and causes malfunction, this parameter can be increased to enhance the anti-interference capability. However, increasing the filter time will cause the response of the DI terminal to slow down.

P4-11	Terminal command mode		Factory default 0
	Predetermined area	0	Two-wire type 1
		1	Two-wire type 2
		2	Three-wire type 1
		3	Three-wire type 2

This parameter defines four different ways to control the operation of the inverter through external terminals.

Note: For the convenience of explanation, three terminals DI1, DI2, and DI3 among the multi-function input terminals DI1 to DI10 are randomly selected as external terminals below. That is, the functions of the three terminals DI1, DI2 and DI3 are selected by setting the values of P4-00 ~ P4-02. For detailed function definition, see the setting range of P4-00 ~ P4-09.

0: Two-wire mode 1: This mode is the most commonly used two-wire mode. The forward and reverse operation of the motor is determined by terminals DI1 and DI2. The function code settings are as follows:

Function code	Name	Set value	Function description
P4-11	Terminal command mode	0	Two-wire type 1
P4-00	DI1 terminal function selection	1	Forward running (FWD)
P4-01	DI2 terminal function selection	2	Reverse operation (REV)

K1	K2	Run command
1	0	Forward
0	1	Reverse
1	1	Stop
0	0	Stop

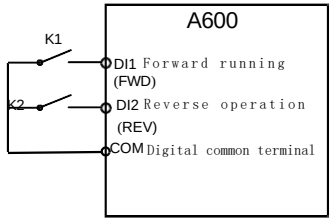


Figure 6-11 Two-wire mode 1

As shown in the figure above, in this control mode, K1 is closed and the inverter runs forward. K2 is closed and reverses, K1 and K2 are closed or disconnected at the same time, and the inverter stops running.

1: Two-wire mode 2: When using this mode, the DI1 terminal function is the running enable terminal, and the DI2 terminal function determines the running direction. The function code settings are as follows:

Function code	Name	Set value	Function description
P4-11	Terminal command mode	1	Two-wire type 2
P4-00	DI1 terminal function selection	1	Run enable
P4-01	DI2 terminal function selection	2	Forward and reverse running direction

K1	K2	Run command
1	0	Forward
1	1	Reverse
0	0	Stop
0	1	Stop

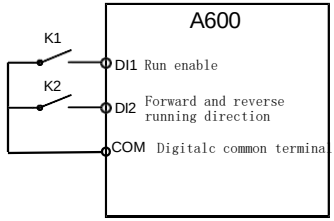


Figure 6-12 Two-wire mode 2

As shown in the figure above, in this control mode, when K1 is closed, K2 is disconnected and the frequency inverter runs forward, and K2 is closed and the frequency inverter rotates reverse; when K1 is disconnected, the frequency inverter stops running.

2: Three-wire control mode 1: In this mode, DI3 is the enable terminal, and the direction is controlled by DI1 and DI2 respectively. The function code settings are as follows:

Function code	Name	Set value	Function description
P4-11	Terminal command mode	2	Three-wire type 1
P4-00	DI1 terminal function selection	1	Forward running (FWD)
P4-01	DI2 terminal function selection	2	Reverse operation (REV)
P4-02	DI3 terminal function selection	3	Three-wire operation control

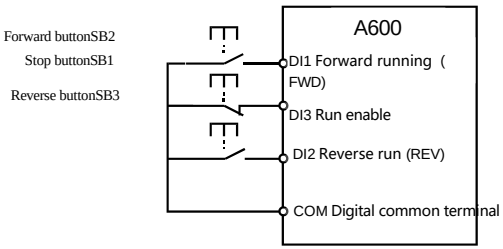


Figure 6-13 Three-wire control mode 1

As shown in the figure above, in this control mode, when the SB1 button is closed, pressing the SB2 button will cause the inverter to rotate forward, pressing the SB3 button will cause the inverter to rotate reversely, and when the SB1 button is turned off, the inverter will stop. During normal startup and operation, the SB1 button must be kept closed.

The commands of the SB2 and SB3 buttons take effect as soon as the closing action occurs. The operating status of the inverter is based on the last key action of the three buttons.

3: Three-wire control mode 2: DI3 in this mode is the enable terminal, the running command is given by DI1, and the direction is determined by the status of DI2. The function code settings are as follows

Function code	Name	set value	Function description
P4-11	Terminal command mode	3	Three-wire type 2
P4-00	DI1 terminal function selection	1	Run enable
P4-01	DI2 terminal function selection	2	Forward and reverse running direction
P4-02	DI3 terminal function selection	3	Three-wire operation control

K	Running direction
0	Forward
1	Reverse

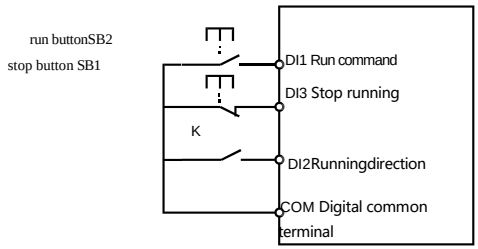


Figure 6-14 Three-wire control mode 2

As shown in the figure above, in this control mode, when the SB1 button is closed, press the SB2 button to make the inverter run, K is turned off and the inverter runs forward, K is turned on and the inverter runs reverse; when the SB1 button is turned off, the inverter stops instantly. During normal startup and operation, the SB1 button must be kept closed, and the command of the SB2 button will take effect at the closing edge.

P4-12	Terminal UP/DOWN change rate	Factory default		1.0
	Predetermined area		0.001Hz/s ~ 65.535H	

Used to set the terminal UP/DOWN to adjust the speed of frequency change when adjusting the set frequency, that is, the amount of frequency change per second.

P4-13	AI Curve 1 Minimum Input	Factory default	0.00V
	Predetermined area	0.00V ~ P4-15	
P4-14	AI curve 1 minimum input corresponding setting	Factory default	0.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-15	AI Curve 1 Maximum Input	Factory default	10.00V
	Predetermined area	P4-13 ~ 10.00V	
P4-16	AI curve 1 maximum input corresponding setting	Factory default	100.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-17	AI1 filter time	Factory default	0.10s
	Predetermined area	0.00s ~ 10.00s	

The above function code is used to set the relationship between the analog input voltage and the set value it represents.
When the analog input voltage is greater than the set "maximum input" (P4-15), the analog voltage is calculated according to the "maximum input"; similarly, when the analog input voltage is less than the set "minimum input" (P4-15) P4-13), it is calculated based on the minimum input or 0.0% according to the setting of "AI lower than minimum input setting selection" (P4-34).
When the analog input is a current input, 1mA current is equivalent to 0.5V voltage.
AI1 input filter time is used to set the software filter time of AI1. When the on-site analog quantity is easy to be interfered, please increase the filter time to make the detected analog quantity become stable. However, the larger the filter time, the greater the influence of the analog quantity detection will be. The response speed becomes slower, and how to set it needs to be weighed according to the actual application.
In different applications, the nominal value corresponding to 100.0% of the simulation setting has different meanings. For details, please refer to the instructions in each application section.

The following illustrations show two typical settings:

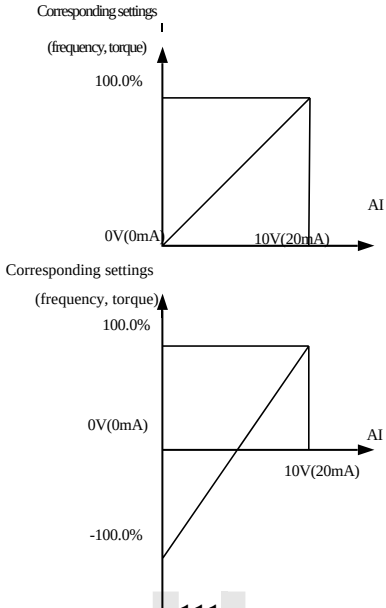


Figure 6-15 Correspondence between analog given and set value

P4-18	AI Curve 2 Minimum Input	Factory default	0.00V
	Predetermined area	0.00V ~ P4-20	
P4-19	AI curve 2 minimum input corresponding setting	Factory default	0.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-20	AI Curve 2 Maximum Input	Factory default	10.00V
	Predetermined area	P4-18 ~ 10.00V	
P4-21	AI curve 2 maximum input corresponding setting	Factory default	100.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-22	AI2 filter time	Factory default	0.10s
	Predetermined area	0.00s ~ 10.00s	

For the functions and usage of Curve 2, please refer to the description of Curve 1.

P4-23	AI Curve 3 Minimum Input	Factory default	0.00V
	Predetermined area	0.00s ~ P4-25	
P4-24	AI curve 3 minimum input corresponding settings	Factory default	0.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-25	AI Curve 3 Max Input	Factory default	10.00V
	Predetermined area	P4-23 ~ 10.00V	
P4-26	AI curve 3 maximum input corresponding setting	Factory default	100.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-27	AI3 filter time	Factory default	0.10s
	Predetermined area	0.00s ~ 10.00s	

For the functions and usage of Curve 3, please refer to the description of Curve 1.

P4-28	PULSE minimum input	Factory default	0.00kHz
	Predetermined area	0.00kHz ~ P4-30	
P4-29	PULSE minimum input corresponding setting	Factory default	0.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-30	PULSE maximum input	Factory default	50.00kHz
	Predetermined area	P4-28 ~ 50.00kHz	
P4-31	PULSE maximum input corresponding setting	Factory default	100.0%
	Predetermined area	-100.00% ~ 100.0%	
P4-32	PULSE filter time	Factory default	0.10s
	Predetermined area	0.00s ~ 10.00s	

This group of function codes is used to set the relationship between the DI5 pulse frequency and the corresponding settings. The pulse frequency can only be input to the inverter through the DI5 channel.

The application of this group of functions is similar to Curve 1, please refer to the description of Curve 1.

P4-33	AI curve selection		Factory default	321
	Predetermined area	ones digit	AI1 curve selection	
		1	Curve 1 (2 points, see P4-13 ~ P4-16)	
		2	Curve 2 (2 points, see P4-18 ~ P4-21)	
		3	Curve 3 (2 points, see P4-23 ~ P4-26)	
		4	Curve 4 (4 points, see A6-00 ~ A6-07)	
		5	Curve 5 (4 points, see A6-08 ~ A6-15)	
		Tens digit	AI2 curve selection (1 ~ 5, same as above)	
		Hundreds digit	AI3 curve selection (1 ~ 5, same as above)	

The ones, tens and hundreds digits of this function code are respectively used to select the setting curves corresponding to the analog inputs AI1, AI2 and AI3. 3 Each analog input can select any one of the 5 curves.

Curve 1, Curve 2 and Curve 3 are all 2-point curves and are set in the P4 group of function codes, while Curve 4 and Curve 5 are all 4-point curves and need to be set in the A6 group of function codes.

The A600 inverter standard unit provides 2 analog input ports.

P4-34	AI below minimum input setting selected		Factory default	000
	Predetermined area	Ones digit	AI1 is below the minimum input setting selection	
		0	Corresponds to the minimum input setting	
		1	0.0%	
		Tens digit	AI2 is lower than the minimum input setting selection (0 ~ 1, same as above)	
		Hundreds digit	AI3 is lower than the minimum input setting selection (0 ~ 1, same as above)	

This function code is used to set how to determine the corresponding setting of the analog input when the voltage of the analog input is less than the set "minimum input". The ones, tens and hundreds digits of this function code correspond to analog inputs AI1, AI2 and AI3 respectively. If 0 is selected, when the AI input is lower than the "minimum input", the setting corresponding to the analog quantity is the "minimum input corresponding setting" of the curve determined by the function code. (P4-14, P4-19, P4-24). If 1 is selected, when the AI input is lower than the minimum input, the corresponding setting of the analog value is 0.0%.

P4-35	DI1 delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P4-36	DI2 delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P4-37	DI3 delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	

Used to set the delay time of the inverter when the DI terminal status changes. Currently, only DI1, DI2, and DI3 have the function of setting delay time.

P4-38	DI terminal valid mode selection 1		Factory default 00000
	Predetermined area	Ones digit	DI1 terminal valid status setting
		0	Active high level
		1	Active low
		Tens digit	DI2 terminal valid status setting (0 ~ 1, same as above)
		Hundreds digit	DI3 terminal valid status setting (0 ~ 1, same as above)
		Thousands digit	DI4 terminal valid status setting (0 ~ 1, same as above)
		Ten thousand digit	DI5 terminal valid status setting (0 ~ 1, same as above)

P4-39	DI terminal valid mode selection 2		Factory default 00000
	Predetermined area	Ones digit	DI6 terminal valid status setting
		0	Active high level
		1	Active low
		Tens digit	DI7 terminal valid status setting (0 ~ 1, same as above)
		Hundreds digit	DI8 terminal valid status setting (0 ~ 1, same as above)
		Thousands digit	DI9 terminal valid status setting (0 ~ 1, same as above)
		Ten thousand digit	DI10 terminal valid status setting (0 ~ 1, same as above)

Used to set the valid status mode of digital input terminals.

When selected to be active at high level, it is valid when the corresponding DI terminal is connected to COM and invalid when disconnected. When selected to be active at low level, the corresponding DI terminal is invalid when connected to COM and valid when disconnected.

P4-40	AI2 input signal selection	Factory default	0
	Predetermined area	0: Voltage signal 1: Current signal	

AI2 supports voltage/current signal input, which needs to be selected through jumpers. When the jumper is selected for voltage or current, P4-40 needs to be set accordingly.

Group P5 output terminal

The A600 series inverter comes standard with 1 multi-function analog output terminal, 1 multi-function digital output terminal, 2 multi-function relay output terminals, and 1 FM terminal (can be selected as a high-speed pulse output terminal or as a set Switching output with open electrode).

P5-00	FM terminal output mode selection		Factory default	0
	Predetermined area	0	Pulse output (FMP)	
		1	Switching output (FMR)	

The FM terminal is a programmable multiplex terminal that can be used as a high-speed pulse output terminal (FMP) or an open-collector switching output terminal (FMR).

When outputting FMP as a pulse, the maximum frequency of the output pulse is 100kHz. For the related functions of FMP, please refer to the description of P5-06.

P5-01	FMR function selection (open collector output terminal)	Factory default	0
P5-02	Relay 1 output function selection (TA1-TB1-TC1)	Factory default	2
P5-03	Relay 2 output function selection (TA2-TB2-TC2)	Factory default	0
P5-04	DO1 output function selection (open collector output terminal)	Factory default	1
P5-05	Expansion card DO2 output function selection	Factory default	4

The above 5 function codes are used to select the functions of 5 digital outputs. The function description of multi-function output terminal is as follows:

Set value	Function	Explanation
0	no output	The output terminal has no function
1	The inverter is running	Indicates that the inverter is running and has output frequency (can be zero),
2	Fault output (fault shutdown)	At this time, the ON signal is output. When the inverter fails and shuts down, it outputs an ON signal.
3	Frequency level detection FDT1 output	Please refer to the description of function codes P8-19 and P8-20.
4	frequency arrival	Please refer to the description of function code P8-21.
5	Running at zero speed (no output when stopped)	When the inverter is running and the output frequency is 0, the ON signal is output. When the inverter is in stop state, this signal is OFF.
6	Motor overload warning	Before the motor overload protection takes action, it is judged based on the overload pre-alarm threshold, and the ON signal is output after exceeding the pre-alarm threshold. For motor overload parameter setting, please refer to function codes P9-00 ~ P9-02.

7	Frequency inverter overload warning	10s before the inverter overload protection occurs, the ON signal is output.

Set value	Function	Explanation
7	Frequency inverter overload warning	10s before the inverter overload protection occurs, the ON signal is output.
8	Set count value reached	When the count value reaches the value set by Pb-08, the ON signal is output.
9	The specified count value is reached	When the count value reaches the value set by Pb-09, the ON signal is output. For counting function, please refer to Pb group function description.
10	length reached	When the actual length detected exceeds the length set by Pb-05, the ON signal is output.
11	PLC cycle completed	When the simple PLC completes a cycle, it outputs a pulse signal with a width of 250ms.
12	Accumulated running time reached	When the cumulative running time of the inverter exceeds the time set by P8-17, the ON signal is output.
13	Frequency is limited	When the set frequency exceeds the upper limit frequency or lower limit frequency, and the inverter outputs
14	Torque is limited	When the frequency also reaches the upper limit frequency or lower limit frequency, the ON signal is output.
15	Ready to run	In the speed control mode of the frequency inverter, when the output torque reaches the torque limit value, the frequency inverter is in the stall protection state and outputs an ON signal at the same time.
16	AI1>AI2	When the value of analog input AI1 is greater than the input value of AI2, the ON signal is output.
17	Upper limit frequency reached	When the operating frequency reaches the upper limit frequency, the ON signal is output.
18	Lower limit frequency reached (no output when stopped)	When the operating frequency reaches the lower limit frequency, the ON signal is output. This signal is OFF in shutdown state.
19	Undervoltage status output	When the frequency inverter is in an undervoltage state, it outputs an ON signal.
20	Communication settings	Please refer to the communication protocol.
21	Reserve	Reserve
22	Reserve	Reserve
23	Zero speed running 2 (also output when stopped)	When the inverter output frequency is 0, it outputs an ON signal. This signal is also ON in the shutdown state.
24	Accumulated power-on time reached	When the cumulative power-on time of the inverter (P7-13) exceeds the time set by P8-16, the ON signal is output.

25	Frequency level detection FDT2 output	Please refer to the description of function codes P8-28 and P8-29.
26	Frequency 1 reaches the output	Please refer to the description of function codes P8-30 and P8-31.
27	Frequency 2 reaches the output	Please refer to the description of function codes P8-32 and P8-33.
28	Current 1 reaches the output	Please refer to the description of function codes P8-38 and P8-39.
29	Current 2 reaches the output	Please refer to the description of function codes P8-40 and P8-41.

Set value	Function	Explanation
30	Timing arrival output	When the timing function selection (P8-42) is valid, the inverter will output the ON signal after the current running time reaches the set timing time.
31	AI1 input exceeds limit	When the value of analog input AI1 is greater than P8-46 (AI1 input protection upper limit) or less than P8-45 (AI1 input protection lower limit), the ON signal is output.
32	Loading	When the inverter is in load-shedding state, it outputs ON signal.
33	Running in reverse	When the frequency inverter is running in the reverse direction, it outputs an ON signal.
34	Zero current state	Please refer to the description of function codes P8-34 and P8-35
35	The module temperature reaches	When the inverter module radiator temperature (P7-07) reaches the set module temperature arrival value (P8-47), the ON signal is output
36	Software current exceeds limit	Please refer to the description of function codes P8-36 and P8-37.
37	Lower limit frequency reached (also output when stopped)	When the operating frequency reaches the lower limit frequency, the ON signal is output. This signal is also ON in the shutdown state.
38	Alarm output	When a fault occurs in the inverter and the fault processing mode is to continue running, Frequency inverter alarm output.
39	Motor over temperature alarm	When the motor temperature reaches P9-58 (motor overheating pre-alarm threshold), the ON signal is output. (Motor temperature can be viewed through U0-34)
40	This running time arrives	When the inverter starts running this time longer than the time set by P8-53, it will output the ON signal.
41	Failure output	Free stop fault and no output due to under voltage.

P5-06	FMP output function selection (pulse output terminal)	Factory default	0
P5-07	AO1 output function selection	Factory default	0
P5-08	AO2 output function selection	Factory default	1

The FMP terminal output pulse frequency range is 0.01kHz~P5-09 (FMP output maximum frequency), and P5-09 can be set between 0.01kHz~100.00kHz.

The output range of analog output AO1 and AO2 is 0V ~ 10V, or 0mA ~ 20mA. The scaling relationship between the range of pulse output or analog output and the corresponding function is as shown in the following table:

Set value	Function	Function range (corresponding to pulse or analog output 0.0%~100.0%)
0	Operating frequency	0 ~ Maximum output frequency
1	Set frequency	0 ~ Maximum output frequency

2	Output current	0 ~ 2 times motor rated current
3	Motor output torque (absolute value, percentage relative to the motor)	0 ~ 2 times motor rated torque
4	Output Power	0 ~ 2 times motor rated power

Set value	Function	Function range (corresponding to pulse or analog output 0.0%~100.0%)
5	Output voltage	0 ~ 1.2 times the rated voltage of the inverter
6	PULSE pulse input	0.01kHz ~ 100.00kHz
7	AI1	0V ~ 10V
8	AI2	0V ~ 10V (or 0 ~ 20mA)
9	AI3	0V ~ 10V
10	length	0 ~ Maximum set length
11	count value	0 ~ Maximum count value
12	Communication settings	0.0% ~ 100.0%
13	Motor speed	0 ~ The rotation speed corresponding to the maximum output frequency
14	Output current	0.0A ~ 1000.0A
15	Output voltage	0.0V ~ 1000.0V
16	Motor output torque (actual value, percentage relative to motor)	-2 times the rated torque of the motor ~ 2 times the rated torque of the motor
17	Frequency inverter output torque (actual value, percentage relative to the frequency inverter)	

P5-09	FMP output maximum frequency	Factory default	50.00kHz
	Predetermined area	0.01kHz ~ 100.00kHz	

When the FM terminal is selected as pulse output, this function code is used to select the maximum frequency value of the output pulse.

P5-10	AO1 zero bias coefficient	Factory default	0.0%
	Predetermined area	-100.0% ~ +100.0%	
P5-11	AO1 gain	Factory default	1.00
	Predetermined area	-10.00 ~ +10.00	
	Expansion card AO2 zero	Factory default	0.00%

P5-12	offset coefficient		
	Predetermined area	-100.0% ~ +100.0%	
P5-13	Expansion card AO2 gain	Factory default	1.00
	Predetermined area	-10.00 ~ +10.00	

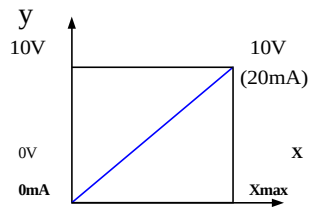
The above function codes are generally used to correct the zero drift of analog output and the deviation of output amplitude. It can also be used to customize the required AO output curve.

If the zero offset is represented by "b", the gain is represented by k, the actual output is represented by Y, and the standard output is represented by X, then the actual output is: Y=kX + b

Among them, 100% of the zero-bias coefficient of AO1 and AO2 corresponds to 10V (or 20mA). The standard output refers to the amount represented by the analog output corresponding to the output of 0V ~ 10V (or 0mA ~ 20mA) without zero-bias and gain correction.

For example: If the analog output content is the operating frequency, and you want the actual output to be 8V (or 16mA) when the frequency is 0, as shown in the figure below, you need to set the zero offset to "80%"; you want the actual output to be 8V when the frequency is the maximum frequency. To output 3V (or 6mA), as shown in the figure below, the gain needs to be set to "-0.50".

When there is no zero offset or gain



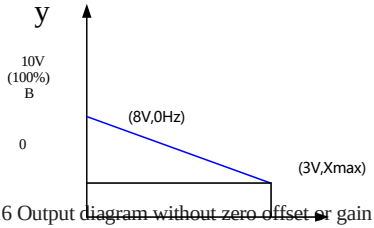


Figure 6-16 Output diagram without zero offset or gain

Zero bias b = y-kx =

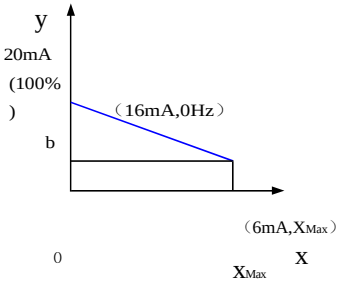
When the zero bias coefficient is 100%, it corresponds to 10v, so when b=8v

The corresponding zero bias coefficient=8v/10v*100%

K=(y-b)/x=(actual output-zero offset)/standard output=(3V-8V)/10V=-0.5

Figure 6-17 Output diagram with zero offset or gain (voltage type)

Current type



Zero bias b = y-kx = y（x=0时）

When the zero bias coefficient is 100%, it corresponds to 20mA, so b is 16mA

Corresponding zero bias coefficient at 16mA = $\frac{16mA}{20mA} \times 100\% = 80\%$

K=(y-b)/x=(actual output-zero offset)/standard output=(6mA-16mA)/20mA=-0.5

Figure 6-18 Output diagram with zero offset or gain (current type)

P5-17	FMR output delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P5-18	RELAY1 output delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P5-19	RELAY2 output delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P5-20	DO1 output delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	
P5-21	DO2 output delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 3600.0s	

Set the delay time from the status change to the actual output change of the output terminal FMR, relay 1, relay 2, DO1 and DO2.

P5-22	DO output terminal valid status selection		Factory default	00000
	Predetermined area	ones digit	FMR valid status selection	
		0	positive logic	
		1	Counter logic	
		Tens digit	RELAY1 valid status setting (0 ~ 1, same as above)	
		Hundreds digit	RELAY2 terminal valid status setting (0 ~ 1, same as above)	
		Thousands digit	DO1 terminal valid status setting (0 ~ 1, same as above)	
		Ten thousand digit	DO2 terminal valid status setting (0 ~ 1, same as above)	

Define the output logic of output terminals FMR, relay 1, relay 2, DO1 and DO2. 0: Positive logic, the digital output terminal and the corresponding common terminal are connected to the valid state, and disconnected to the invalid state;

1: Inverse logic, the digital output terminal is in an invalid state when connected to the corresponding public terminal, and the digital output terminal is in a valid state when disconnected.

P5-23	AO1 output signal selection	Factory default	0
	Predetermined area	0: Voltage signal 1: Current signal	

AO1 supports voltage/current signal output, which needs to be selected through jumpers. When the jumper is selected as voltage or current, P5-23 needs to be set accordingly.

Group P6 start and stop control

P6-00	Start mode		Factory default	0
	Predetermined area	0	direct start	
		1	Speed tracking restart	
		2	Pre-excitation start (AC asynchronous motor)	

0: Start directly

If the starting DC braking time is set to 0, the inverter starts running from the starting frequency.

If the starting DC braking time is not 0, DC braking will be performed first, and then operation will start from the starting frequency. Suitable for small inertia loads where the motor may rotate during startup.

1: Speed tracking and restart

The frequency inverter first determines the motor's speed and direction, then starts at the tracked motor frequency, and implements a smooth and impact-free start to the rotating motor. Suitable for restarting after instantaneous power outage of large inertia loads. In order to ensure the performance of speed tracking restart, it is necessary to accurately set the parameters of the motor P1 group.

2: Asynchronous machine pre-excitation start

It is only valid for asynchronous motors and is used to establish the magnetic field before the motor runs. For pre-excitation current and pre-excitation time, please refer to the function code

P6-05, P6-06 description. If the pre-excitation time is set to 0, the inverter cancels the pre-excitation process and starts from the starting frequency. If the pre-excitation time is not 0, pre-excitation before starting can improve the dynamic response performance of the motor.

P6-01	Speed tracking method		Factory default	0
	Predetermined area	0	Start with frequency of downtime	
		1	Start from the power frequency	
		2	Start from maximum frequency	

In order to complete the speed tracking process in the shortest time, select the method for the inverter to track the motor speed:

0: Track downward from the frequency at the time of power outage. This method is usually used.

1: Used when power frequency is switched to variable frequency, and used when restarting after a long power outage.

2: Track downward from the maximum frequency, used for general power generation loads.

P6-02	Speed tracking speed	Factory default	20
	Predetermined area	1 ～ 100	

When speed tracking restarts, select the speed of speed tracking.

The larger the parameter, the faster the tracking speed. However, setting it too large may cause unreliable tracking results.

P6-03	Start frequency	Factory default	0.00Hz
	Predetermined area	0.00Hz ～ 10.00Hz	
P6-04	Start frequency hold time	Factory default	0.0s
	Predetermined area	0.0s ～ 100.0s	

In order to ensure the motor torque during starting, please set the appropriate starting frequency. In order to fully establish magnetic flux when the motor starts, the starting frequency needs to be maintained for a certain period of time.

The starting frequency P6-03 is not limited by the lower limit frequency. However, when the set target frequency is lower than the starting frequency, the inverter does not start and is in standby state.

During the forward and reverse switching process, the starting frequency holding time has no effect.

The startup frequency holding time is not included in the acceleration time, but is included in the running time of the simple

PLC.

example 1:

P0-03 = 0 The frequency source is digital given

P0-08 = 2.00Hz, the digital setting frequency is 2.00Hz P6-03 = 5.00Hz, the starting frequency is 5.00Hz

P6-04 = 2.0s The starting frequency holding time is 2.0s

At this time, the frequency inverter will be in standby state, and the frequency inverter output frequency is 0.00Hz.

Example 2:

P0-03 = 0 The frequency source is digital given

P0-08 = 10.00Hz digital setting frequency is 10.00Hz P6-03 = 5.00Hz starting frequency is 5.00Hz

P6-04 = 2.0s The starting frequency holding time is 2.0s

At this time, the frequency inverter accelerates to 5.00Hz, continues for 2.0s, and then accelerates to the given frequency of 10.00Hz.

P6-05	Starting DC braking current/pre-excitation current	Factory default	0%
	Predetermined area	0% ~ 100%	
P6-06	Start DC braking time/pre-excitation time	Factory default	0.0s
	Predetermined area	0.0s ~ 100.0s	

Start DC braking, which is generally used to stop and then start a running motor. Pre-excitation is used to establish the magnetic field of the asynchronous motor before starting it to improve the response speed.

Starting DC braking is only effective when the starting mode is direct start. At this time, the inverter first performs DC braking according to the set starting DC braking current, and then starts running after the starting DC braking time has passed. If the DC braking time is set to 0, it will start directly without DC braking. The greater the DC braking current, the greater the braking force.

If the starting mode is asynchronous machine pre-excitation start, the frequency inverter will first establish a magnetic field in advance according to the set pre-excitation current, and then start running after the set pre-excitation time. If the pre-excitation time is set to 0, it will start directly without going through the pre-excitation process.

There are two situations for starting DC braking current/pre-excitation current relative to the base value.

1)When the rated current of the motor is less than or equal to 80% of the rated current of the inverter, it is a percentage base value relative to the rated current of the motor.

2) When the rated current of the motor is greater than 80% of the rated current of the inverter, it is the percentage base value relative to 80% of the rated current of the inverter.

P6-07	Acceleration and deceleration mode	Factory default	0
	Predetermined area	0	Linear acceleration and deceleration
		1	Static S-Curve
		2	Dynamic S-Curve

Select the frequency change mode of the inverter during starting and stopping. 0: Linear acceleration and deceleration

The output frequency increases or decreases linearly. MD500 provides 4 types of acceleration and deceleration times. It can be selected through the multi-function digital input terminals (P4-00 ~ P4-08).

1: Static S-curve

When the target frequency is fixed, the output frequency increases or decreases according to the S-curve. Suitable for use in places requiring gentle start or stop, such as elevators, conveyor belts, etc.

2: Dynamic S-curve

When the target frequency changes dynamically in real time, the output frequency increases or decreases in real time according to the S curve. Suitable for occasions with high comfort requirements and fast real-time response.

Note: The dynamic S-curve time and target frequency cannot be too large. If the acceleration and deceleration time is greater

than 100s or the target frequency is greater than 6 times the rated frequency of the motor, the dynamic S-curve will be invalid and it will automatically switch to linear acceleration and deceleration mode.

P6-08	S-curve starting time proportion	Factory default	30.0%
	Predetermined area	0.0% ~ (100.0%-P6-09)	
P6-09	S curve end time proportion	Factory default	30.0%
	Predetermined area	0.0% ~ (100.0%-P6-08)	

Function codes P6-08 and P6-09 respectively define the starting and ending period ratios of the static S-curve. The two function codes must satisfy: P6-08 + P6-09 ≤ 100.0%.

In Figure 6-19, t1 is the parameter defined by parameter P6-08. During this period of time, the slope of the output frequency change gradually increases. t2 is the time defined by parameter P6-09. During this time period, the slope of the output frequency change gradually changes to 0. During the time between t1 and t2, the slope of the output frequency change is fixed, that is, linear acceleration and deceleration is performed in this interval.

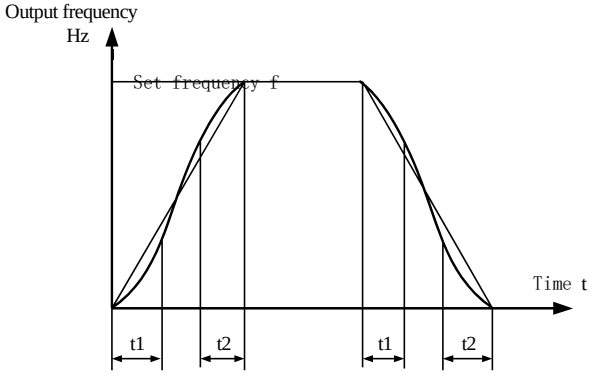


Figure 6-19 Static S-curve diagram

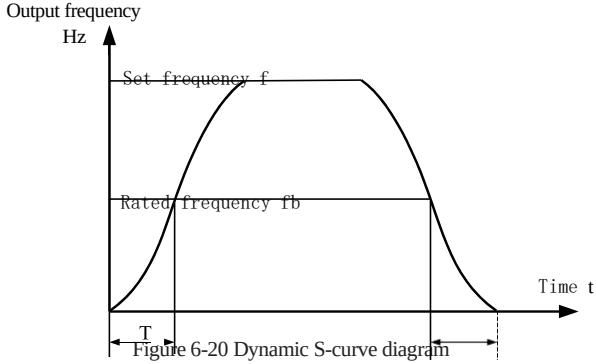


Figure 6-20 Dynamic S-curve diagram

P6-10	shutdown mode	Factory default	0
		0	Slow down and stop

	Predetermined area	1	free parking

0: Slow down and stop

After the stop command is valid, the inverter reduces the output frequency according to the deceleration time, and stops after the frequency drops to 0. 1: After the coast-to-stop command is valid, the inverter immediately terminates its output, and the motor coasts to a stop according to mechanical inertia.

P6-11	Stop DC braking starting frequency	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P6-12	Stop DC braking waiting time	Factory default	0.0s
	Predetermined area	0.0s ~ 36.0s	

P6-13	Stop DC braking current	Factory default	0%
	Predetermined area	0% ~ 100%	
P6-14	Stop DC braking time	Factory default	0.0s
	Predetermined area	0.0s ~ 36.0s	

Stop DC braking starting frequency: During deceleration and stop, when the operating frequency drops to this frequency, the DC braking process starts.

Shutdown DC braking waiting time: After the operating frequency is reduced to the shutdown DC braking starting frequency, the inverter first stops output for a period of time, and then starts the DC braking process. It is used to prevent overcurrent and other faults that may be caused by starting DC braking at higher speeds.

Stop DC braking current: Stop DC braking current, there are two situations relative to the base value.

1. When the rated current of the motor is less than or equal to 80% of the rated current of the inverter, it is a percentage base value relative to the rated current of the motor.

2. When the rated current of the motor is greater than 80% of the rated current of the inverter, it is the percentage base value relative to 80% of the rated current of the inverter.

Stop DC braking time: the time the DC braking amount is maintained. If this value is 0, the DC braking process is cancelled.

The shutdown DC braking process is shown in the schematic diagram in Figure 6-21.

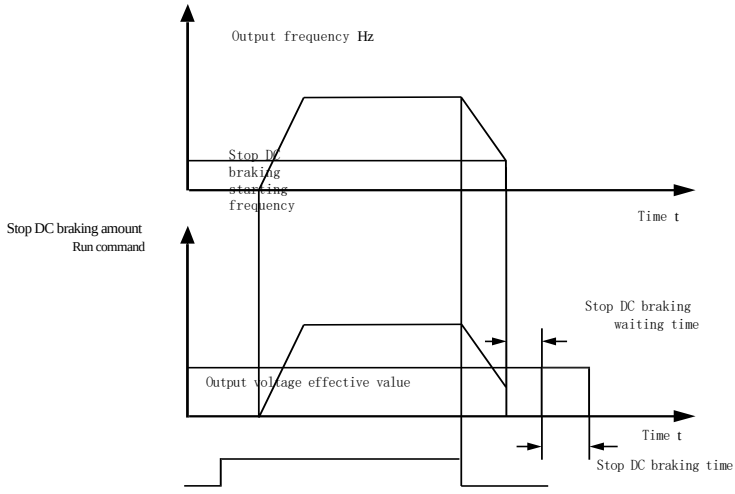


Figure 6-21 Shutdown DC braking diagram

P6-15	Brake usage	Factory default	100%
	Predetermined area	0% ~ 100%	

It is only valid for inverters with built-in braking units.

It is used to adjust the duty cycle of the dynamic unit. If the braking utilization rate is high, the braking unit action duty cycle will be high and the braking effect will be strong. However, the bus voltage of the inverter will fluctuate greatly during the braking process

P6-18	Speed tracking current	Factory default	Model confirmed
	Predetermined area	30% ~ 200%	

The maximum current during the speed tracking process is limited to the "speed tracking current" setting value range. If the setting value is too small, the speed tracking effect will become worse.

P6-21	Demagnetization time	Factory default	Model confirmed
	Predetermined area	0.0s~5.0s	

The demagnetization time is the minimum interval between shutdown and startup. This function code will only take effect after the speed tracking function is enabled. Setting a value that is too small can easily cause overvoltage faults.

Group P7 Keyboard and Display

P7-01	MF.K key function selection		Factory default	0
	Predetermined area	0	MF.K key is invalid	
		1	Switching between operation panel command channel and remote command channel (terminal command channel or communication command channel)	
		2	Forward and reverse switching	
		3	forward jog	
		4	Reverse jog	

The MF.K key is a multi-function key, and the function of the MF.K key can be set through this function code. This key can be used to switch between shutdown and running.

0: This key has no function.

1: Switch between keyboard commands and remote operations.

Refers to the switching of command sources, that is, the switching of the current command source and keyboard control (local operation). If the current command source is keyboard control, this key function is invalid.

2: Forward and reverse switching

Use the MF.K key to switch the direction of the frequency command. This function is only valid when the command source is the operation panel command channel.

3: forward jog

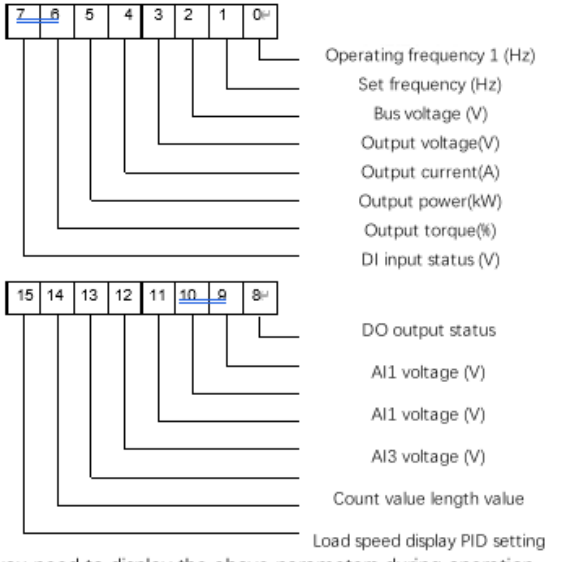
Forward jogging (FJOG) is achieved through the MF.K key on the keyboard.

4: Reverse jog

Reverse jog (RJOG) is achieved through the MF.K key on the keyboard.

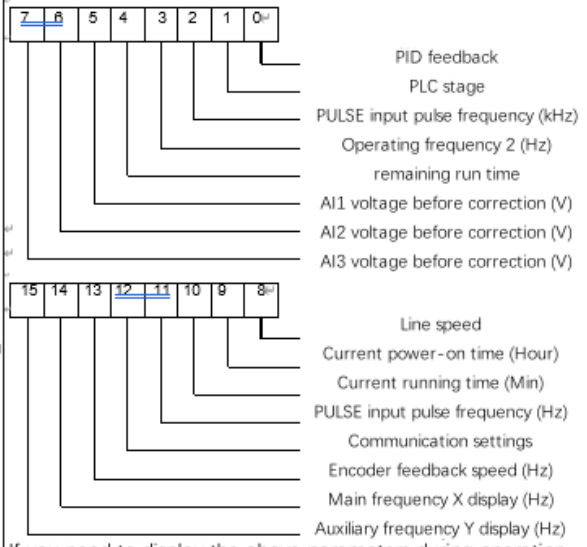
P7-02	STOP/RESET key function		Factory default	1
	Predetermined area	0	Only in keyboard operation mode, the STOP/RES key stop function is valid.	
		1	In any operating mode, the STOP/RES key shutdown function is effective	

	LED1 running display parameter 1	Factory defaut	1F
P7-03	Predetermined area: 0000 ~ FFFF		



If you need to display the above parameters during operation, set the corresponding position to 1, convert this binary number to hexadecimal and set it in P7-03.

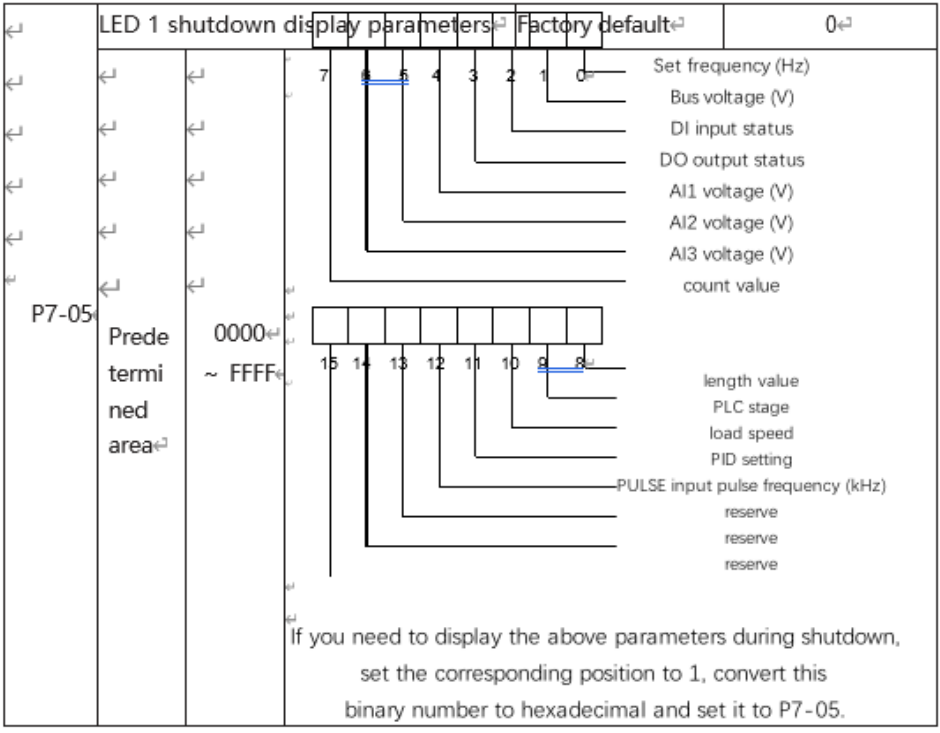
	LED1 running display parameters2	Factory default	0
P7-04	Predetermined area: 0000 ~ FFFF		



If you need to display the above parameters during operation, , set the corresponding position to 1, convert this binary number to hexadecimal and set it to P7-04.

Running display parameters are used to set the parameters that can be viewed when the inverter is running.

The maximum number of status parameters that can be viewed is 32. Select the status parameters that need to be displayed according to the binary digits of P7-03 and P7-04 parameter values. The display order starts from the lowest bit of P7-03.



P7-06	Load speed display coefficient	Factory default	1.0000
	Predetermined area	0.0001 ~ 6.5000	

When the load speed needs to be displayed, this parameter can be used to adjust the corresponding relationship between the inverter output frequency and the load speed. For the specific correspondence, please refer to the description on P7-12.

P7-07	Inverter module radiator temperature	Factory default	-
	Predetermined area	0.0℃ ~ 100.0℃	

Display the temperature of the inverter module IGBT.

The IGBT over-temperature protection values of inverter modules of different models are different.

P7-08	Product ID	Factory default	-
	Predetermined area	–	

Display the inverter product number.

P7-09	Cumulative running time	Factory default	0 小时
	Predetermined area	0h ~ 65535h	

Displays the cumulative running time of the inverter. When the running time reaches the set running time P8-17, the multi-

functional digital output function (12) of the frequency inverter outputs an ON signal.

P7-10	Performance version number		Factory default	
	Predetermined area		Performance version number	
P7-11	Software version number		Factory default	
	Predetermined area		Control board software version number.	
P7-12	Load speed display decimal point		Factory default	1
	Ones digit	0	0 decimal places	
		1	1 decimal place	
		2	2 decimal places	
		3	3 decimal places	
	Tens digit	1	1 decimal point	
		2	2 decimal points	

Ones digit:

Used to set the number of decimal points for load speed display. The following example illustrates how the load speed is calculated: If the load speed display coefficient P7-06 is 2.000 and the load speed decimal point P7-12 is 2 (2 decimal points), when the inverter operating frequency is 40.00Hz, the load speed is: 40.00*2.000 = 80.00 (2 decimal points) show)

If the inverter is in stop state, the load speed is displayed as the speed corresponding to the set frequency, that is, "set load speed". Taking the set frequency of 50.00Hz as an example, the load speed in the shutdown state is: 50.00*2.000 = 100.00 (displayed with 2 decimal points)

Tens digit:

1: U0-19/U0-29 are displayed with 1 decimal point respectively.

2: U0-19/U0-29 are displayed with 2 decimal points respectively.

P7-13	Accumulated power-on time	Factory default	-
	Predetermined area	0 ~ 65535 hours	

Displays the cumulative power-on time of the inverter since leaving the factory.

When this time reaches the set power-on time (P8-17), the inverter's multi-function digital output function (24) outputs an ON signal.

P7-14	Cumulative power consumption	Factory default	-
	Predetermined area	0 ~ 65535 degrees	

Displays the cumulative power consumption of the inverter so far.

P7-15	Performance temporary software version number	Factory default	-
	Predetermined area	-	
P7-16	Function temporary software version number	Factory default	-
	Predetermined area	-	
P7-17	LED2 shutdown display parameters	Factory default	2
	Predetermined area	U0-00~U0-75	
P7-18	LED2 running display parameters	Factory default	4
	Predetermined area	U0-00~U0-75	

P8 组 Accessibility features

P8-00	Jogging operating frequency	Factory default	2.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-01	Jog acceleration time	Factory default	20.0s
	Predetermined area	0.0s ~ 6500.0s	
P8-02	Jog deceleration time	Factory default	20.0s
	Predetermined area	0.0s ~ 6500.0s	

Define the given frequency and acceleration and deceleration time of the inverter during jog.

During inching operation, the starting mode is fixed to direct start mode (P6-00=0), and the stopping mode is fixed to deceleration stop (P6-10=0).

P8-03	Acceleration time 2	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	
P8-04	Deceleration time 2	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	
P8-05	Acceleration time 3	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	
P8-06	Deceleration time 3	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	
P8-07	Acceleration time 4	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	
P8-08	Deceleration time 4	Factory default	Model confirmed
	Predetermined area	0. 0s ~ 6500.0s	

A600 provides 4 sets of acceleration and deceleration times, namely P0-17\P0-18 and the above 3 sets of acceleration and deceleration times. The definitions of the four groups of acceleration and deceleration times are exactly the same, please refer to the relevant instructions of P0-17 and P0-18.

Through different combinations of the multi-function digital input terminal DI, 4 groups of acceleration and deceleration times can be switched and selected. For specific usage methods, please refer to the relevant instructions in function codes P4-01 ~ P4-05.

P8-09	Jump frequency 1	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-10	Jump frequency 2	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-11	Jump frequency amplitude	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	

When the set frequency is within the jump frequency range, the actual operating frequency will run at a jump frequency closer to the set frequency. By setting the jump frequency, the frequency inverter can avoid the mechanical resonance point of the load.

A600 can set two jump frequency points. If both jump frequencies are set to 0, the jump frequency function will be cancelled. For the principle diagram of jump frequency and jump frequency amplitude, please refer to Figure 6-22.

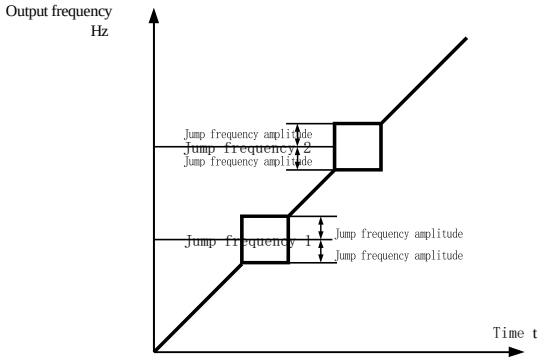


Figure 6-22 Schematic diagram of hopping frequency

P8-12	Forward and reverse dead time	Factory default	0.0s
	Predetermined area	0.0s ~ 3000.0s	

Set the transition time at output 0Hz during the forward and reverse transition of the frequency inverter, as shown in the figure below:

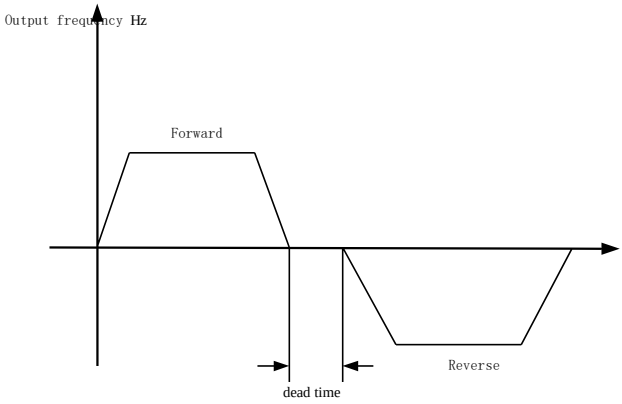


Figure 6-23 Forward and reverse dead time diagram

P8-13	Reverse frequency prohibited	Factory default	0
	Predetermined area 0	Invalid	
	Predetermined area 1	Efficient	

When the frequency given by "communication reference" or "analog reference" is a negative value, the running direction of the motor will change, and this frequency is called "reverse frequency".

Through this parameter, you can set whether the inverter allows the motor to run in the reverse state. When the motor is not allowed to run in the reverse direction, set P8-13=1; when setting P8-13=0, the motor is allowed to run in the reverse direction.

P8-14	The set frequency is lower than the lower limit frequency operation mode	Factory default	0
	Predetermined area 0	Run at lower frequency	
	Predetermined area 1	shutdown	
	Predetermined area 2	Zero speed operation	

When the set frequency is lower than the lower limit frequency, the operating status of the inverter can be selected through this parameter. A600 provides three operating modes to meet various application needs.

P8-15	Sag control	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ 10.00Hz	

The droop rate allows for a slight speed difference between the master and slave stations, thereby avoiding conflicts between them. The default value of this parameter is 0 .

Only when both the master machine and the slave machine adopt the speed control mode, the droop rate needs to be adjusted. For each transmission process, the appropriate droop rate needs to be gradually found in practice. It is recommended not to set P8-15 too large, otherwise the load When it is larger, the steady-state speed will decrease significantly. Both master and slave must set droop rate.

Droop speed = synchronous frequency × output torque × droop rate ÷10

For example: P8-15 = 1.00, synchronization frequency 50Hz, output torque 50%, then: droop speed = 50Hz×50%×1.00÷10=2.5Hz

Actual frequency of the inverter = 50Hz –2.5Hz =47.5Hz

P8-16	Set the cumulative power-on arrival time	Factory default	0h
	Predetermined area	0h ~ 65000h	

When the accumulated power-on time (P7-13) reaches the power-on time set by P8-16, the multi-function digital DO of the frequency inverter outputs an ON signal. The following examples illustrate its application:

Example: Combined with the virtual DI\DO function, the inverter fault alarm output is realized after the set power-on time reaches 100 hours. Solution: Virtual DI1 terminal function, set to user-defined fault 1: A1-00=44;

The virtual DI1 terminal valid state is set to come from virtual DO1: A1-05=0000; the virtual DO1 function is set to the power-on time arrival: A1-11=24;

Set the cumulative power-on arrival time to 100 hours: P8-16=100.

Then when the accumulated power-on time reaches 100 hours, the inverter fault outputs Err27.

P8-17	Set cumulative running arrival time	Factory default	0h
	Predetermined area	0h ~ 65000h	

Used to set the running time of the inverter.

When the accumulated running time (P7-09) reaches this set running time, the multi-functional digital DO of the frequency inverter outputs an ON signal.

P8-18	Start protection selection		Factory default	0
	Predetermined area	0	Not protected	
		1	Protect	

This parameter relates to the safety protection function of the frequency inverter.

If this parameter is set to 1, if the run command is valid when the inverter is powered on (for example, the terminal run command is in the closed state before power on), the inverter will not respond to the run command, and the run command must be removed first, and then the run command will be valid again. The inverter will respond.

In addition, if this parameter is set to 1, if the running command is valid at the time of inverter fault reset, the inverter will not respond to the running command. The running command must be removed first to eliminate the running protection state.

Setting this parameter to 1 can prevent the danger caused by the motor responding to the running command when powering on or resetting the fault without knowing it.

P8-19	Frequency detection value (FDT1)	Factory default	50.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-20	Frequency detection hysteresis value (FDT1)	Factory default	5.0%
	Predetermined area	0.0% ~ 100.0% (FDT1 level)	

When the operating frequency is higher than the frequency detection value, the multi-function output DO of the frequency inverter outputs an ON signal. When the frequency is lower than the detection value by a certain frequency value, the DO output ON signal is cancelled.

The above parameters are used to set the detection value of the output frequency and the hysteresis value of output action release. Where P8-20 is the percentage of the hysteresis frequency relative to the frequency detection value P8-19. The figure below is a schematic diagram of the FDT function.

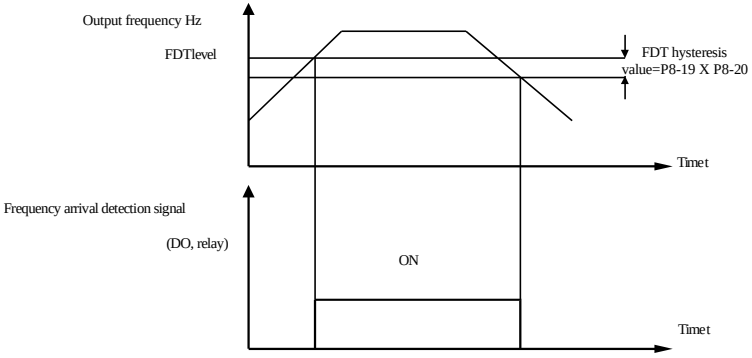


Figure 6-24 FDT level diagram

P8-21	Frequency reaches detection width	Factory default	0.0%
	Predetermined area	0.00 ~ 100% (maximum frequency)	

When the operating frequency of the frequency inverter is within a certain range of the target frequency, the multi-function DO of the frequency inverter outputs an ON signal. This parameter is used to set the detection range of frequency arrival, which is a percentage relative to the maximum frequency. The following figure is a schematic diagram of frequency arrival.

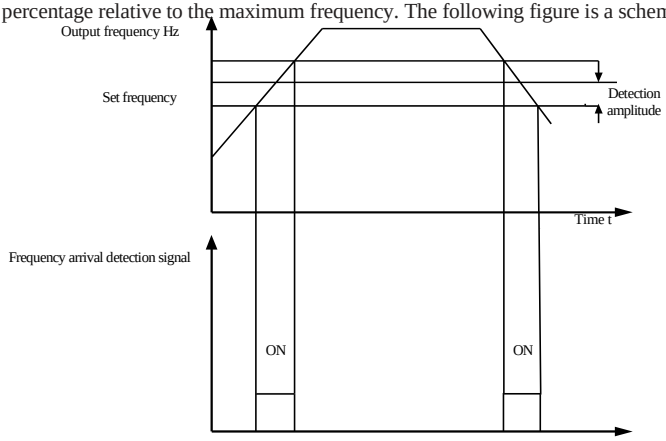


Figure 6-25 Schematic diagram of frequency arrival detection amplitude

P8-22	Whether the jump frequency is valid during acceleration and deceleration.	Factory default	0
	Predetermined area	0: Invalid; 1: Valid	

This function code is used to set whether the jump frequency is valid during acceleration and deceleration.

When set to valid, when the operating frequency is within the jump frequency range, the actual operating frequency will skip the set jump frequency boundary. Figure 6-26 is a schematic diagram of the effective jumping frequency during acceleration and deceleration.

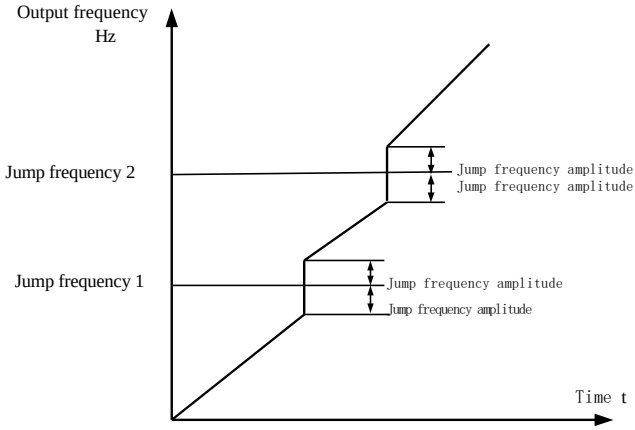


Figure 6-26 Schematic diagram of the effective jumping frequency during acceleration and deceleration.

P8-25	Acceleration time 1 and acceleration time 2 switching frequency point	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-26	Deceleration time 1 and deceleration time 2 switch frequency point	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	

This function is valid when the motor is selected as motor 1 and the acceleration and deceleration time is not selected through DI terminal switching. It is used to select different acceleration and deceleration times according to the operating frequency range without using the DI terminal during the operation of the frequency converter.

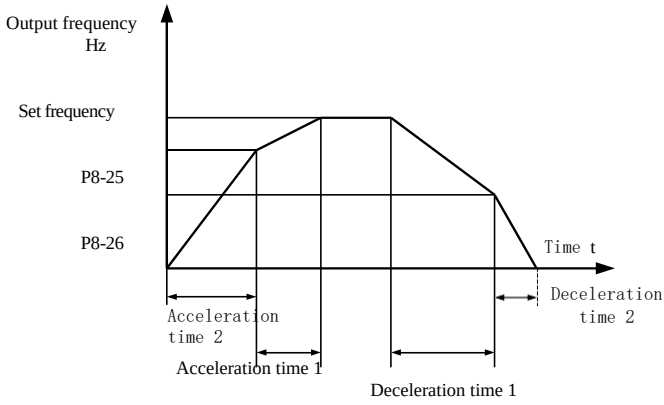


Figure 6-27 Schematic diagram of acceleration and deceleration time switching

Figure 6-22 is a schematic diagram of acceleration and deceleration time switching. During acceleration, if the operating frequency is less than P8-25, select acceleration time 2; if the operating frequency is greater than P8-25, select acceleration time 1.

During the deceleration process, if the running frequency is greater than P8-26, select deceleration time 1; if the running frequency is less than P8-26, select deceleration time 2.

P8-27	Click priority	Factory default	0
	Predetermined area	0: Invalid; 1: Valid	

This parameter is used to set whether the terminal jog function has the highest priority.

When the terminal jog priority is valid, if a terminal jog command occurs during operation, the inverter will switch to the terminal jog operating state.

P8-28	Frequency detection value (FDT2)	Factory default	50.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-29	Frequency detection hysteresis value (FDT2)	Factory default	5.0%
	Predetermined area	0.0% ~ 100.0% (FDT2 level)	

This frequency detection function is exactly the same as that of FDT1. Please refer to the relevant instructions of FDT1, that is, the instructions of function codes P8-19 and P8-20.

P8-30	Arbitrary arrival frequency detection value 1	Factory default	50.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
P8-31	Arbitrary arrival frequency detection width 1	Factory default	0.0%
	Predetermined area	0.0% ~ 100.0% (maximum frequency)	
P8-32	Arbitrary arrival frequency detection value 2	Factory default	50.00Hz
	Predetermined area	0.00Hz ~ maximum frequency	
	Arbitrary arrival frequency	Factory default	0.0%

P8-33	detection width 2		
	Predetermined area	0.0% ~ 100.0% (maximum frequency)	

When the output frequency of the frequency converter is within the positive and negative detection amplitude range of any reaching frequency detection value, the multi-function DO outputs an ON signal.

A600 provides two sets of arbitrary arrival frequency detection parameters, respectively setting the frequency value and frequency detection range. Figure 6-23 is a schematic diagram of this function.

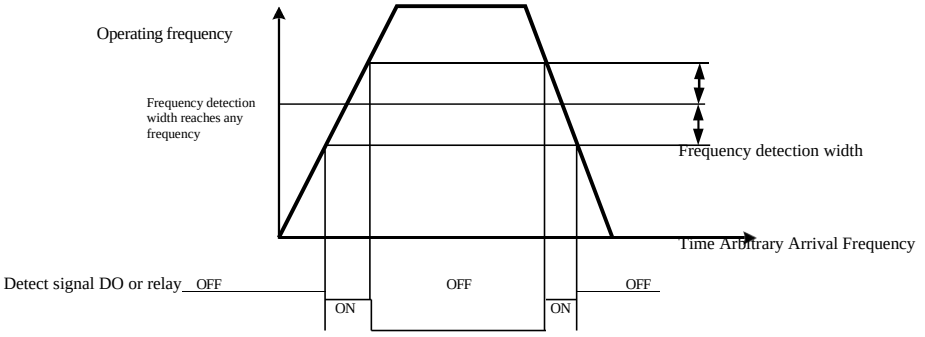


Figure 6-28 Schematic diagram of arbitrary arrival frequency detection

P8-34	Zero current detection level	Factory default	5.0%
	Predetermined area	0.0% ~ 300.0% (Motor rated current)	
P8-35	Zero current detection delay time	Factory default	0.10s
	Predetermined area	0.00s ~ 600.00s	

When the output current of the frequency converter is less than or equal to the zero current detection level and the duration exceeds the zero current detection delay time, the multi-function DO of the frequency converter outputs an ON signal. Figure 6-29 is a schematic diagram of zero current detection.

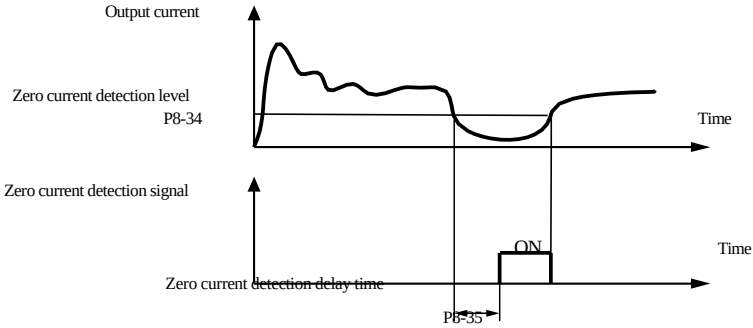
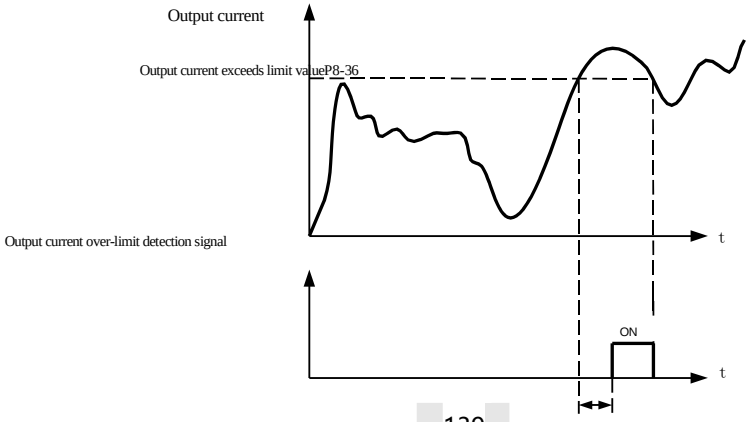


Figure 6-29 Schematic diagram of zero current detection

P8-36	Output current exceeds limit value	Factory default	200.0%
	Predetermined area	0.0% (not detected); 0.1% ~ 300.0% (motor rated current)	
P8-37	Output current over-limit detection delay time	Factory default	0.00s
	Predetermined area	0.00s ~ 600.00s	

When the output current of the frequency converter is greater than or exceeds the limit detection point, and the duration exceeds the software over-current point detection delay time, the multi-function DO of the frequency converter outputs an ON signal. Figure 6-30 is a schematic diagram of the output current over-limit function.



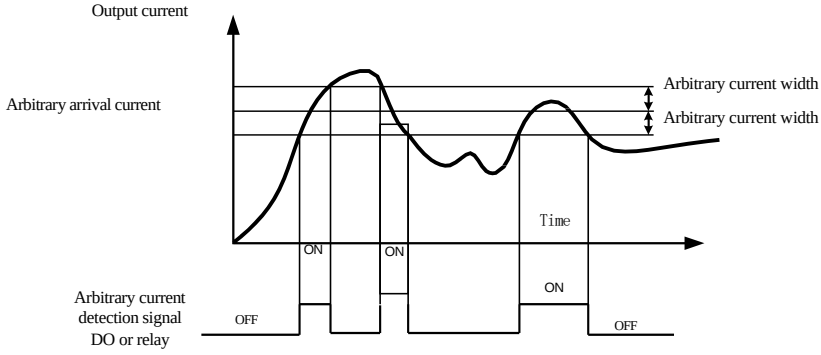
Output current over-limit detection delay time P8-37

Figure 6-30 Schematic diagram of output current over-limit detection

P8-38	Any arrival current 1	Factory default	100.0%
	Predetermined area	0.0% ~ 300.0% (Motor rated current)	
P8-39	Any reach current 1 width	Factory default	0.0%
	Predetermined area	0.0% ~ 300.0% (Motor rated current)	
P8-40	Any arrival current 2	Factory default	100.0%
	Predetermined area	0.0% ~ 300.0% (Motor rated current)	
P8-41	Arbitrary current 2 width	Factory default	0.0%
	Predetermined area	0.0% ~ 300.0% (Motor rated current)	

When the output current of the frequency converter is within the positive and negative detection width of any set current, the multi-function DO of the frequency converter outputs an ON signal.

A600 provides two sets of arbitrary arrival current and detection width parameters. The following figure is a functional schematic diagram



OFF

Figure 6-31 Schematic diagram of arbitrary arrival frequency detection

P8-42	Timing function selection		Factory default	0
	Predetermined area	0	invalid	
		1	valid	
P8-43	Scheduled running time selection		Factory default	0
	Predetermined area	0	P8-44 Setting	
		1	AI1	
		2	AI2	
		3	AI3	
			Analog input range 100% corresponds to P8-44	
P8-44	Scheduled running time		Factory default	0.0Min
	Predetermined area		0.0Min ~ 6500.0Min	

This group of parameters is used to complete the timing operation function of the frequency converter.

When P8-42 timing function selection is valid, the frequency converter starts timing when it starts. After reaching the set timing running time, the frequency converter automatically stops and the multi-function DO outputs an ON signal.

Each time the inverter is started, timing starts from 0, and the remaining running time of the timing can be viewed through U0-20.

The scheduled running time is set by P8-43 and P8-44, and the time unit is minutes.

P8-45	AI1 input voltage protection value lower limit	Factory default	3.10V
	Predetermined area	0.00V ~ P8-46	
P8-46	AI1 input voltage protection value upper limit	Factory default	6.80V
	Predetermined area	P8-45 ~ 11.00V	

When the value of analog input AI1 is greater than P8-46, or the AI1 input is less than P8-45, the inverter's multi-function DO outputs the "AI1 input over limit" ON signal to indicate whether the input voltage of AI1 is within the set range.

P8-47	The module temperature reaches	Factory default	75℃
	Predetermined area	0.00V ~ P8-46	

When the inverter radiator temperature reaches this temperature, the inverter's multi-function DO outputs the "module temperature reached" ON signal.

P8-48	Cooling fan control	Factory default	0
	Predetermined area	0: The fan runs during operation; 1: The fan always runs.	

Used to select the action mode of the cooling fan. When selected as 0, the fan will run when the inverter is running. If it is stopped,

When the radiator temperature is higher than 40 degrees, the fan will run. When the radiator temperature is lower than 40 degrees in the shutdown state, the fan will not run.

When selected as 1, the fans will run uniformly after power-on.

P8-49	wake frequency	Factory default	0.00Hz
	Predetermined area	Sleep frequency (P8-51) ~ maximum frequency (P0-10)	
	Wake-up delay time	Factory default	0.0s

P8-50	Predetermined area	0.0s ~ 6500.0s	
P8-51	sleep frequency	Factory default	0.00Hz
	Predetermined area	0.00Hz ~ wake-up frequency (P8-49)	
P8-52	sleep delay time	Factory default	0.0s
	Predetermined area	0.0s ~ 6500.0s	

This set of parameters is used to implement sleep and wake-up functions in water supply applications.
During the operation of the inverter, when the set frequency is less than or equal to the sleep frequency of P8-51, after the delay time of P8-52, the inverter enters the sleep state and stops automatically.
If the inverter is in sleep state and the current running command is valid, when the set frequency is greater than or equal to the wake-up frequency of P8-49, the inverter will start after the delay time of P8-50.
Under normal circumstances, please set the wake-up frequency to be greater than or equal to the sleep frequency. If the wake-up frequency and sleep frequency are both set to 0.00Hz, the sleep and wake-up functions will be invalid.
When the sleep function is enabled, if the frequency source uses PID, whether the PID is calculated in the sleep state is affected by function code PA-28. At this time, PID calculation during shutdown must be selected (PA-28=1).

P8-53	Arrival time of this run	Factory default	0.0Min
	Predetermined area	0.0Min ~ 6500.0Min	

When the running time of this startup reaches this time, the multi-function digital DO outputs the "Running Time Arrival" ON signal.

P8-54	Output power correction coefficient	Factory default	100.0%
	Predetermined area	0.0% ~ 200.0%	

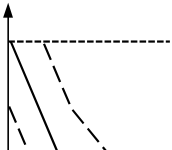
When the output power (U0-05) does not correspond to the expected value, this value can be used to linearly correct the output power

Group P9 Fault and Protection

- Motor overload protection

Function code	Function definition	Factory default	Predetermined area
P9-00	Motor overload protection selection	1	0: No motor overload protection function, it is recommended to use a heating relay in front of the motor at this time; 1: At this time, the frequency converter has overload protection function for the motor. For protection settings, please refer to P9-01 and P9-02;
P9-01	Motor overload protection gain	1.00	0.10 ~ 10.00
P9-02	Motor overload warning coefficient	80%	50% ~ 100%

In order to effectively protect motors with different loads, this parameter needs to be set according to the motor's overload capability. The motor overload protection is an inverse time limit curve. The motor overload protection curve is shown in Figure 6-32:



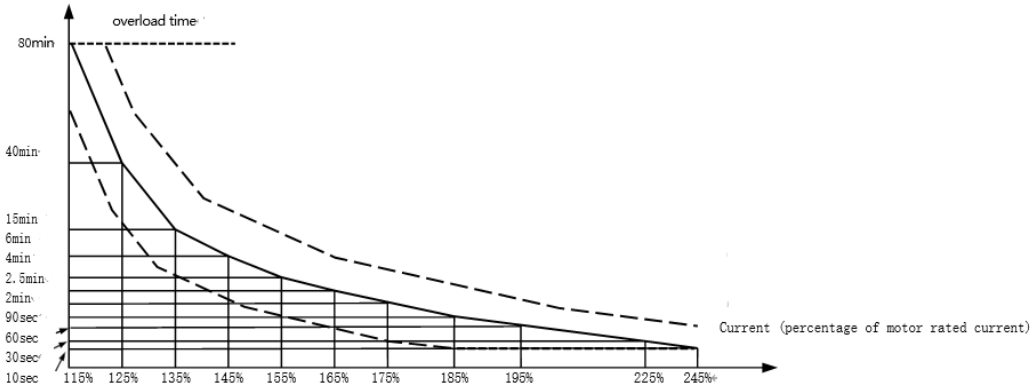


Figure 6-32 Schematic diagram of inverse time curve of motor overload protection

1). When the motor operating current reaches 175% times the motor rated current, the motor will report motor overload (Err11) after continuous operation for 2 minutes;

When the motor operating current reaches 115% of the motor's rated current, a motor overload (Err11) will be reported after continuous operation for 80 minutes.

For example: motor rated current 100A

If P9-01 is set to 1.00, then when the motor operating current reaches 125% of 100A (125A), the inverter will report a motor overload fault after 40 minutes

If P9-01 is set to 1.20, then when the motor operating current reaches 125% of 100A (125A), the inverter will report a motor overload fault after 40*1.2=48 minutes;

The maximum overload time is 80 minutes and the minimum time is 10 seconds.

●Example of motor overload protection adjustment: The motor needs to run at 150% of the motor current for 2 minutes to report overload. From the motor overload curve, we know that the current of 150% (I) is located at 145% (I1) and 155% (I2) Within the current range, 145% current for 6 minutes(T1) overload, 155% current for 4 minutes (T2) overload, Then it can be concluded that the 5-minute overload calculation of 150% of the motor's rated current under the default settings is as follows: T = T1 + (T2 - T1)*(I - I1)/(I2 -I1) = 6 + (4 - 6)*(150% – 145%)/(155% –145%) = 5 (minutes), so it can be concluded that the motor needs to report overload in 2 minutes at 150% motor current, and the motor overload protection gain: P9-01 = 2 ÷ 5 = 0.4

Note: The user needs to correctly set the value of P9-01 according to the actual overload capacity of the motor. If this parameter is set too large, it is easy to cause the motor to be damaged due to overheating and the inverter will not alarm in time for protection!

●Motor overload pre-warning coefficient indicates: when the motor overload detection level reaches the set value of this parameter, the multi-function output terminal DO or fault relay (RELAY) outputs a motor overload pre-alarm signal. This parameter is based on the continuous operation of the motor at a certain overload point. Calculation of the time percentage when no overload fault is reported.

For example: when the motor overload protection gain is set to 1.00 and the motor overload warning coefficient is set to 80%, if the motor current reaches

When the motor continues to run at 145% of the rated motor current for 4.8 minutes (80%×6 minutes), the multi-function output terminal DO or fault relay RELAY outputs a motor overload warning signal.

P9-02	Motor overload warning coefficient	Factory default	80%
	Setting range	50% ~ 100%	

This function is used to give an early warning signal to the control system through DO before motor overload fault protection. This early warning coefficient is used to determine how much early warning is provided before motor overload protection. The larger the value, the smaller the warning advance amount.

When the cumulative output current of the inverter is greater than the product of the overload inverse time curve and P9-02, the multi-functional digital DO of the inverter outputs the "motor overload pre-alarm" ON signal.

P9-07	Short-circuit protection selection to ground after power-on	Factory default	1
	Setting range	0: invalid; 1: valid	

You can choose the inverter to detect whether the motor is short-circuited to ground when it is powered on.If this function is valid, the UVW end of the inverter will have voltage output for a period of time after power-on.

P9-08	Braking unit action starting voltage	Factory default	Model confirmed
	Setting range	200.0~2000.0V	

The starting voltage Vbreak for the built-in braking unit to operate. The setting reference for this voltage value is:： 800 ≥ Vbreak ≥ （1.414Vs+30）

Vs- input AC power voltage of the inverter

Note: Improper setting of this voltage may cause the built-in braking unit to operate abnormally!

P9-09	Number of automatic fault resets	Factory default	0
	Setting range	0 ~ 20	

When the inverter selects automatic fault reset, it is used to set the number of automatic resets. After exceeding this number, the inverter remains in fault state.

P9-10	Fault during automatic fault reset DO action selection	Factory default	0
	Set range	0: No action; 1: Action	

If the inverter is set with the automatic fault reset function, whether the fault DO is activated during the automatic fault reset can be set through P9-10.

P9-11	Automatic fault reset interval	Factory default	1.0s
	Set range	0.1s ~ 100.0s	

The waiting time between the inverter fault alarm and automatic fault reset.

P9-12	Input phase loss \ contactor pull-in protection selection	Factory default	11
	Set range	Units digit: input phase loss protection; tens digit: contactor pull-in protection	

		0: Prohibited; 1: Allowed

Select whether to protect the input phase loss or contactor closing.

P9-13	Output phase loss protection selection	Factory default	1
	Set range	0: Prohibited;1: Allowed	

Select whether to protect the output phase loss. If you select 0, a fault will not be reported when the output phase loss actually occurs.
At this time, the actual current is larger than the current displayed on the panel, which is risky. Use with caution.

P9-14	First fault type	0 ~ 99
P9-15	Second fault type	
P9-16	Third (most recent) fault type	

Record the latest three fault types of the inverter, 0 means no fault. For the possible causes and solutions of each fault code, please refer to the relevant instructions in Chapter 8.

P9-17	The frequency of the third failure	The frequency of the most recent failure
P9-18	The current during the third fault	Current at last fault
P9-19	Bus voltage during the third fault	Bus voltage at the time of the most recent fault
P9-20	Input terminal status when the third fault occurs	The status of the digital input terminals at the time of the latest fault, the sequence is: BIT9 BIT8 BIT7 BIT6 BIT5 BIT4 BIT3 BIT2 BIT1 BIT0 DI0 DI9 DI8 DI7 DI6 DI5 DI4 DI3 DI2 DI1 When the input terminal is ON, the corresponding secondary bit is 1, and when OFF, it is 0. All DI statuses are converted to decimal numbers for display.
P9-21	Output terminal for the third fault	The status of all output terminals at the time of the latest BIT4 BIT3 BIT2 BIT1 BIT0 fault, in order DO2 DO1 REL2 REL1 FMP When the output terminal is ON, its corresponding binary bit is 1. If OFF, it is 0, and the status of all output terminals is converted into decimal numbers for display.
P9-22	Inverter status when fault occurs for the third time	reserve
P9-23	Power-on time when the third fault occurs	The power-on time of the latest fault
P9-24	Running time at third failure	The current operating time of the most recent failure

P9-27	The frequency of the second failure	Same as P9-17 ~ P9-24
P9-28	The current during the second fault	
P9-29	Bus voltage during the second fault	
P9-30	Input terminal status during the second fault	
P9-31	Output terminal when fault occurs for the second time	
P9-32	Inverter status when fault occurs for the second time	
P9-33	Power-on time when the second fault occurs	
P9-34	Running time at second failure	

P9-37	First failure frequency	Same as P9-17 ~ P9-24
P9-38	Current at first fault	
P9-39	Bus voltage at first fault	
P9-40	Input terminal status at first fault	
P9-41	Output terminal at first fault	
P9-42	Inverter status at first fault	
P9-43	Power-on time at first failure	
P9-44	Operating time at first failure	

P9-47	Fault protection action selection 1		Factory default	00000
	Set range	ones digit	Motor overload (Err11)	
		0	Free shutdown	
		1	Stop according to stop mode	
		2	continue running	
		tenth place	Input phase loss (Err12) (same bit)	
		hundreds	Output phase loss (Err13) (same bit)	
		Thousands	External fault (Err15) (same bit)	
		Ten thousand	Communication exception (Err16) (same bit)	

P9-48	Fault protection action selection 2		Factory default	00000
	Set range	ones digit	Encoder failure (Err20)	
		0	Free shutdown	
		1	Switch to VF and stop according to stop mode	
		2	Switch to VF and continue running	
		tens digit	Function code read and write exception (Err21)	
		0	Free shutdown	
		1	Stop according to stop mode	
		hundreads digit	reserve	
		thousands digit	Motor overheating (Err25) (same as P9-47 ones digit)	
		ten thousand digit	Running time arrived (Err26) (same as P9-47 ones digit)	
P9-49	Fault protection action selection 3		Factory default	00000
	Set range	ones digit	User-defined fault 1 (Err27) (same as P9-47 ones digit)	
		tens digit	User-defined fault 2 (Err28) (same as P9-47 ones digit)	
		hundreads digit	Power-on time arrived (Err29) (same as P9-47 ones digit)	
		thousands digit	Load drop (Err30)	
		0	Free shutdown	
		1	Stop according to stop mode	
		2	Jump directly to 7% of the rated frequency of the motor and continue running. If the load is not lost, it will automatically return to the set frequency.	
		ten thousands digit	PID feedback is lost during running (Err31) (same as P9-47 ones digit)	
P9-50	Fault protection action selection 4		Factory default	00000
	Set range	ones digit	Speed deviation is too large (Err42) (same as P9-47 ones digit)	
		tens digit	Motor overspeed (Err43) (same as P9-47 ones digit)	
		hundreads digit	Initial position error (Err51) (same as P9-47 ones digit)	
		thousands	Speed feedback error (Err52) (same as P9-47 ones digit)	

		digit	
		ten thousands digit	reserve

When "freewheel stop" is selected, the inverter displays Err** and stops directly.

When "Stop according to stop mode" is selected: the inverter displays A**, and stops according to the stop mode, and displays Err** after stopping. When "continue running" is selected: the inverter continues to run and displays A**, and the running frequency is set by P9-54.

P9-54	Frequency selection to continue operation in case of failure		Factory default	0
	Set range	0	Run at current operating frequency	
		1	Run at set frequency	
		2	Run at upper limit frequency	
		3	Run at lower frequency	
		4	Operating at abnormal backup frequency	

P9-54	Frequency selection to continue operation in case of failure		Factory default	0
	Set range	0	Run at current operating frequency	
		1	Run at set frequency	
		2	Run at upper limit frequency	
		3	Run at lower frequency	
		4	Operating at abnormal backup frequency	
P9-55	Abnormal backup frequency		Factory default	100.0 %
	Set range		0.0% ~ 100.0%(maximum frequency)	

When a fault occurs during the operation of the inverter and the fault handling method is set to continue running, the inverter displays A** and runs at the frequency determined by P9-54.

When the abnormal backup frequency operation is selected, the value set by P9-55 is a percentage relative to the maximum frequency.。

P9-56	Motor temperature sensor type		Factory default	0
	Set range	0	No temperature sensor	
		1	PT100	
		2	PT1000	
P9-57	Motor overheat protection threshold		Factory default	110℃
	Set range		0℃ ~ 200℃	
	Motor overheating pre-		Factory default	90℃

P9-58	alarm threshold		
	Set range	0℃ ~ 200℃	

The temperature signal of the motor temperature sensor needs to be connected to the multi-function input and output expansion card. This card is an optional accessory. The analog input AI3 of the expansion card can be used as the motor temperature sensor input. The motor temperature sensor signal is connected to the AI3 and PGND terminals.
The AI3 analog input terminal of MD500 supports two motor temperature sensors, PT100 and PT1000. The sensor type must be set correctly when using it. The motor temperature value is displayed in U0-34.
When the motor temperature exceeds the motor overheating protection threshold P9-57, the inverter will give a fault alarm and handle it according to the selected fault protection action mode.
When the motor temperature exceeds the motor overheat pre-alarm threshold P9-58, the inverter's multi-function digital DO outputs the motor over-temperature pre-alarm ON signal.

●Continuous operation in case of instantaneous power failure (non-stop in case of instantaneous power failure)

As shown in the figure below: When the bus voltage drops below the "instantaneous non-stop action judgment voltage", the instantaneous non-stop process takes effect, the output frequency of the inverter automatically decreases, allowing the motor to be in a power generation state, and the instantaneous non-stop function allows feedback The electric energy reaching the bus voltage keeps the bus voltage around the "momentary stop non-stop action judgment voltage", allowing the system to decelerate to 0Hz normally.

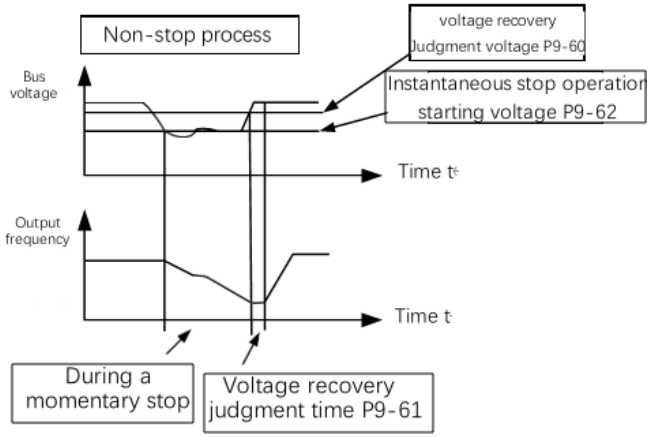


Figure 6-33 Schematic diagram of the process of instantaneous stop and non-stop

function code	Name	Set range	Factory default	Attributes
P9-59	Instant stop and non-stop function selection	0~2	0	★
P9-60	Momentary stop action pauses to judge voltage	80%~100%	85%	★
P9-61	Instantaneous power failure and non-stop voltage recovery judgment time	0.0~100.0s	0.5s	★

P9-62	Instantaneous non-stop action to determine voltage	60%~100%	80%	★
P9-71	Instantaneous stop gain Kp	0~100	40	☆
P9-72	Instantaneous stop integral coefficient Ki	0~100	30	☆
P9-73	Instant stop and non-stop action deceleration time	0~300.0s	20.0s	★

Remark:

- In constant bus voltage control, when the power grid resumes power supply, the inverter output frequency continues to run to the target frequency. In deceleration stop mode, when the power grid resumes power supply, the inverter continues to decelerate to 0Hz and stop until the inverter issues a start command again.
- The purpose of non-stop instantaneous stop is to ensure that when the power supply of the power grid is abnormal, the motor can decelerate and stop normally, so that the motor can start immediately after the power supply of the power grid is restored to normal, without causing sudden under-voltage failure of the motor when the power supply of the power grid is abnormal. Free stop: In a large inertia system, it takes a long time for the motor to free stop. When the power supply to the power grid is normal, since the motor is rotating at high speed, starting the motor at this time can easily cause overload or overcurrent faults in the frequency converter.

P9-63	Load loss protection options		Factory default	0
	Set range	0	invalid	
		1	valid	
P9-64	Load shedding detection level		Factory default	10.0%
	Set range		0.0% ~ 100.0% (Motor rated current)	
P9-65	Load drop detection time		Factory default	1.0s
	Set range		0.0s ~ 60.0s	

If the load loss protection function is valid, when the inverter output current is less than the load loss detection level P9-64 and the duration is greater than the load loss detection time P9-65, the inverter output frequency will automatically reduce to 7% of the rated frequency. During the load-shedding protection period, if the load is restored, the inverter will automatically resume running at the set frequency.

P9-67	Overspeed detection value	Factory default	20.0%
	Set range	0.0% ~ 50.0% (maximum frequency)	
P9-68	Overspeed detection time	Factory default	1.0s
	Set range	0.0s ~ 60.0s	

This function is only valid when the inverter is running in vector control with speed sensor.

When the inverter detects that the actual speed of the motor exceeds the maximum frequency, the excess value is greater than the overspeed detection value P9-67, and the duration is greater than the overspeed detection time P9-68, the inverter fault alarm Err43 will be handled according to the fault protection action method. .

When the overspeed detection time is 0.0s, the overspeed fault detection is cancelled.

P9-69	Excessive speed deviation detection value	Factory default	20.0%
	Set range	0.0% ~ 50.0% (maximum frequency)	

P9-70	Excessive speed deviation detection time	Factory default	5.0s
	Set range	0.0s ~ 60.0s	

This function is only valid when the inverter is running in vector control with speed sensor.

When the inverter detects a deviation between the actual speed of the motor and the set frequency, and the deviation is greater than the excessive speed deviation detection value P9-69, and the duration is greater than the excessive speed deviation detection time P9-70, the inverter fault alarm Err42, And handle it according to the fault protection action method.

When the excessive speed deviation detection time is 0.0s, the excessive speed deviation fault detection is cancelled.

PA Group Process Control PID Function

PID control is a common method of process control. By performing proportional, integral and differential operations on the difference between the feedback signal of the controlled quantity and the target signal, and by adjusting the output frequency of the frequency converter, a closed-loop system is formed to stabilize the controlled quantity. target value. It is suitable for process control occasions such as flow control, pressure control and temperature control. Figure 6-34 is the control principle block diagram of process PID.

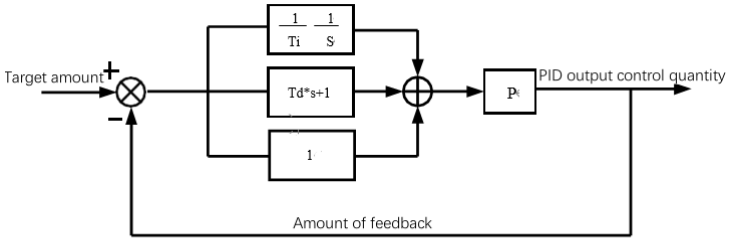


Figure 6-34 Process PID principle block diagram

PA-00	PID given source		Factory default	0
	Set range	0	PA-01 setting	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE pulse (DI5)	
		5	communication	
		6	multi-segment instructions	
PA-01	PID value given		Factory default	50.0%
	Set range		0.0% ~ 100.0%	

This parameter is used to select the target quantity given channel of the process PID.

The set target value of process PID is a relative value, and the setting range is 0.0%~100.0%. Similarly,

the feedback quantity of PID is also a relative quantity, and the function of PID is to make the two relative quantities the same.

PA-02	PID feedback source		Factory default	0
	Set range	0	AI1	
		1	AI2	
		2	AI3	
		3	AI1 - AI2	
		4	PULSE pulse (DI5)	
		5	Communication	
		6	AI1+AI2	
		7	MAX(|AI1|, |AI2|)	
		8	MIN (|AI1|, |AI2|)	

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

The feedback amount of process PID is also a relative value, and the setting range is 0.0%~100.0%.

PA-03	PID action direction		Factory default	0
	Set range	0	Positive effect	
		1	reaction	

Positive effect: When the PID feedback signal is less than the given value, the inverter output frequency increases. Such as the tension control situation of winding. Reaction: When the PID feedback signal is less than the given value, the inverter output frequency decreases. Such as unwinding tension control occasions. This function is affected by the reversal of the multi-function terminal PID action direction (function 35), so please pay attention when using it.

PA-04	PID given feedback range	Factory default	1000
	Set range	0 ~ 65535	

The PID given feedback range is a dimensionless unit, used for PID given display U0-15 and PID feedback display U0-16. The relative value of PID's given feedback is 100.0%, corresponding to the given feedback range PA-04. For example, if PA-04 is set Set to 2000, then when the PID given is 100.0%, the PID given display U0-15 is 2000.

PA-05	Proportional gain Kp1	Factory default	20.0
	Set range	0.0 ~ 1000.0	
PA-06	Integration time Ti1	Factory default	2.00s
	Set range	0.01s ~ 10.00s	
PA-07	Differential time Td1	Factory default	0.000s
	Set range	0.00 ~ 10.000	

Proportional gain Kp1:
Determines the adjustment intensity of the entire PID regulator. The larger Kp1 is, the greater the adjustment intensity. This parameter is 100. 0 means that when the deviation between the PID feedback amount and the given amount is 100.0%, the PID regulator's adjustment range for the output frequency command is the maximum frequency.
Integration time Ti1:
Determines the intensity of integral adjustment of the PID regulator. The shorter the integration time, the greater the adjustment intensity. The integral time refers to when the deviation between the PID feedback amount and the given amount is 100.0%, the integral regulator continuously adjusts after this time, and the adjustment amount reaches the maximum frequency.
Differential time Td1:
Determines the strength of the PID regulator's adjustment of the deviation change rate. The longer the differential time, the greater the adjustment intensity. The differential time means that when the feedback amount changes 100.0% within this time,

the adjustment amount of the differential regulator is the maximum frequency.

PA-08	PID inversion cutoff frequency limit	Factory default	0.00Hz
	Set range	0．00 ~ maximum frequency	

In some cases, only when the PID output frequency is a negative value (that is, the frequency converter is reversed), is it possible for the PID to control the given amount and the feedback amount to the same state, but too high a reversing frequency is not allowed in some situations. , PA-08 is used to determine the upper limit of the reversal frequency.

PA-08 Description: When the frequency source is pure PID, the PID reverse cutoff frequency is the current PID output minimum value; when the frequency source is pure PID

When +PID, PA-08 acts on the main +PID as a whole, that is, when the frequency source is the main +PID, the final output frequency is the minimum value. When the frequency source is PID, the frequency output upper and lower limits and range: For example: the frequency source is pure PID or main +PID

●The reversal cutoff frequency is 0 or reversal is prohibited (i.e. any one of the following three) (1)PA-08=0, P8-13=0; (2)PA-08=0, P8-13=1; (3)PA-08!=0, P8-13=1

Output upper limit: upper limit frequency Output lower limit: lower limit frequency

Output range: lower limit frequency ~ upper limit frequency (i.e. P0-14 ~ P0-12)

●The reversal cutoff frequency is not 0 and reversal is not prohibited (i.e. PA-08!=0, P8-13=0) Output upper limit: upper limit frequency

Output lower limit: - Inversion cutoff frequency

Output range: - Inversion cutoff frequency ~ upper limit frequency

PA-09	PID deviation limit	Factory default	0.0%
	Set range	0. 0% ~ 100.0%	

When the deviation between the PID given value and the feedback value is less than PA-09, the PID stops adjusting. In this way, when the deviation between the given and the feedback is small, the output frequency is stable and unchanged, which is very effective for some closed-loop control situations.

PA-10	PID differential limiting	Factory default	0.10%
	Set range	0．00% ~ 100.00%	

In a PID regulator, the differential effect is relatively sensitive and can easily cause system oscillation. Therefore, the PID differential effect is generally limited to a small range. PA-10 is used to set the range of the PID differential output.

PA-11	PID given change time	Factory default	0.00s
	Set range	0.00s ~ 650.00s	

PID given change time refers to the time required for the PID given value to change from 0.0% to 100.0%.

When the PID given changes, the PID given value changes linearly according to the given change time, reducing the adverse impact of the given mutation on the system.

PA-12	PID feedback filter time	Factory default	0.00s
	Set range	0.00s ~ 60.00s	
PA-13	PID output filter time	Factory default	0.00s
	Set range	0.00s ~ 60.00s	

PA-12 is used to filter the PID feedback quantity. This filtering is beneficial to reducing the impact of interference on the feedback quantity, but it will reduce the response performance of the process closed-loop system.

PA-13 is used to filter the PID output frequency. This filtering will weaken the sudden change of the inverter output frequency, but will also reduce the response performance of the process closed-loop system.

PA-15	Proportional gain Kp2	Factory default	20.0
	Set range	0.0 ~ 1000.0	
PA-16	Integration time Ti2	Factory default	2.00s
	Set range	0.01s ~ 10.00s	

PA-17	Differential time Td2		Factory default	0.000s
	Set range		0.00 ~ 10.000	
PA-18	PID parameter switching conditions		Factory default	0
	Set range	0	No switching	
		1	Switching via DI terminal	
		2	Automatic switching based on deviation	
		3	Automatically switches based on operating frequency	
PA-19	PID parameter switching deviation 1		Factory default	20.0%
	Set range		0.0% ~ PA-20	
PA-20	PID parameter switching deviation 2		Factory default	80.0%
	Set range		PA-19 ~ 100.0%	

In some applications, a set of PID parameters cannot meet the needs of the entire operating process, and different PID parameters need to be used in different situations.

This set of function codes is used to switch between two sets of PID parameters. The setting method of the regulator parameters PA-15~PA-17 is similar to the parameters PA-05~PA-07.

The two sets of PID parameters can be switched through the multi-function digital DI terminal, or automatically switched according to the PID deviation.

When selecting multi-function DI terminal switching, the multi-function terminal function selection should be set to 43 (PID parameter switching terminal). When the terminal is invalid, select parameter group 1 (PA-05~PA-07). When the terminal is valid, select parameter group 2 (PA-15~PA-17).

When automatic switching is selected, and the absolute value of the deviation between the reference and feedback is less than the PID parameter switching deviation 1 PA-19, the PID parameter selects parameter group 1. When the absolute value of the deviation between reference and feedback is greater than PID switching deviation 2 PA-20, PID parameter selection selects parameter group 2. When the deviation between reference and feedback is between switching deviation 1 and switching deviation 2, the PID parameters are the linear interpolation values of the two sets of PID parameters, as shown in Figure 6-35.

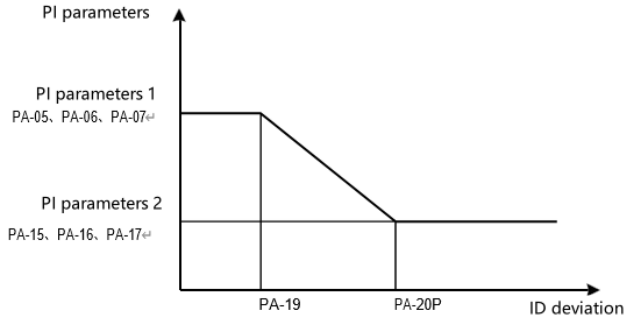


Figure 6-35 PID parameter switching

PA-21	PID initial value	Factory default	0.0%
	Set range	0.0% ~ 100.0%	
	PID initial value holding time	Factory default	0.00s

PA-22	Set range	0.00s ~ 650.00s

When the frequency converter starts, the PID output is fixed to the PID initial value PA-21. After the PID initial value holding time PA-22, the PID starts the closed-loop adjustment operation. Figure 6-36 is a functional diagram of the PID initial value.

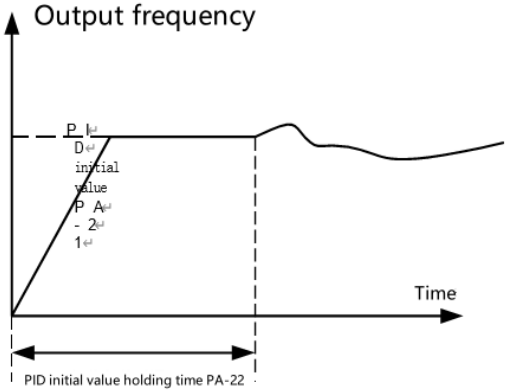


Figure 6-36 PID initial value function diagram

PA-25	PID integral attribute		Factory default	00
	Set range	ones digit	integral separation	
		0	invalid	
		1	valid	
		tens digit	Whether to stop integration after the output reaches the limit value	
		0	Continue to accumulate points	
		1	Stop points	

Integral separation:

If the integral separation is set to be valid, then when the multi-function digital DI integral pause (function 22) is valid, the PID integral PID integral operation stops. At this time, only the proportional and differential functions of the PID are valid.

When the integral separation is selected as invalid, regardless of whether the multi-function digital DI is valid or not, the integral separation is invalid. Whether to stop integration after the output reaches the limit value:

After the PID operation output reaches the maximum value or minimum value, you can choose whether to stop the integral function. If you choose to stop integration, the PID integral will stop calculating at this time, which may help reduce the overshoot of the PID.

PA-26	PID feedback loss detection value	Factory default	0.0%
	Set range	0.0%: Do not judge feedback loss; 0.1% ~ 100.0%	

PA-27	PID feedback loss detection time	Factory default	0.0s
	Set range	0.0s ~ 20.0s	

This function code is used to determine whether PID feedback is lost.
When the PID feedback amount is less than the feedback loss detection value PA-26, and the duration exceeds the PID feedback loss detection time PA-27, the inverter will alarm fault Err31 and handle it according to the selected fault handling method.

PA-28	PID shutdown operation		Factory default	0
	Set range	0	Stopped and does not operate
		1	Halt operation

Used to select whether the PID continues to operate when the PID is in shutdown state. In general applications, PID operation should stop in the shutdown state.

Group Pb Swing frequency, fixed length and counting

The swing frequency function is suitable for textile, chemical fiber and other industries, as well as occasions that require traversing and winding functions.
The swing frequency function refers to the inverter output frequency, which swings up and down with the set frequency as the center. The trajectory of the operating frequency on the time axis is shown in Figure 6-37, where the swing amplitude is set by Pb-00 and PB-01. When Pb-01 is set to 0, the swing amplitude is 0, and the swing frequency has no effect at this time.

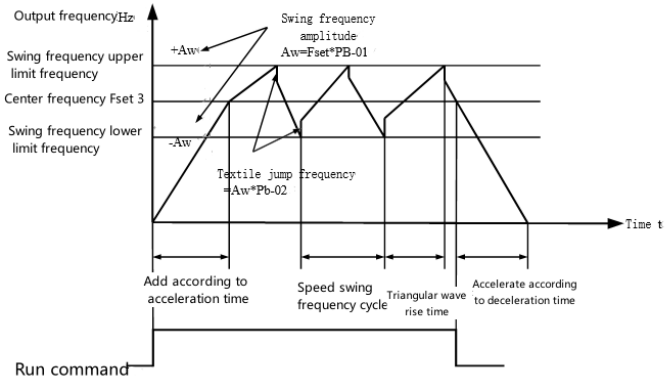


Figure 6-37 Swing frequency working diagram

Pb-00	Swing setting method	Factory default	0
	Set range 0	relative to center frequency	
	Set range 1	relative to the maximum frequency	

Use this parameter to determine the base amount of the swing.

0: Relative to the center frequency (P0-07 frequency source), it is a variable amplitude system. The swing amplitude changes with the change of the center frequency (set frequency).

1: Relative to the maximum frequency (P0-10), it is a fixed-swing system with a fixed swing.

	Swing frequency amplitude	Factory default	0.0%

Pb-01	Set range	0.0% ~ 100.0%	
Pb-02	Kick frequency amplitude	Factory default	0.0%
	Set range	0.0% ~ 50.0%	

Use this parameter to determine the swing amplitude and kick frequency values.

When the swing amplitude is set relative to the center frequency (Pb-00=0), the swing amplitude AW = frequency source P0-07 × swing amplitude Pb-01. When the swing amplitude is set relative to the maximum frequency (Pb-00=1), the swing amplitude AW = maximum frequency P0-10 × swing amplitude Pb-01.

The kick frequency amplitude is the frequency percentage of the kick frequency relative to the swing amplitude during swing frequency operation, that is: pop frequency = swing amplitude AW × kick frequency amplitude Pb-02. If the swing amplitude is selected relative to the center frequency (Pb-00=0), the burst frequency is the change value. If the swing amplitude is selected relative to the maximum frequency (Pb-00=1), the burst frequency is a fixed value.摆频运行频率，受上限频率和下限频率的约束。

Pb-03	Swing frequency period	Factory default	10.0s
	Set range	0.0s ~ 3000.0s	
Pb-04	Triangular wave rise time coefficient	Factory default	50.0%
	Set range	0.0% ~ 100.0%	

Swing frequency cycle: the time value of a complete swing frequency cycle.

The triangular wave rising time coefficient Pb-04 is the time percentage of the triangular wave rising time relative to the swing frequency period Pb-03. Triangular wave rise time = swing frequency period Pb-03 × triangular wave rise time coefficient Pb-04, the unit is seconds.

Triangular wave falling time = swing frequency period Pb-03× (1 - triangular wave rising time coefficient Pb-04), the unit is seconds.

Pb-05	Set length	Factory default	1000m
	Set range	0m ~ 65535m	
Pb-06	Actual length	Factory default	0m
	Set range	0m ~ 65535m	
Pb-07	pulses per meter	Factory default	100.0
	Set range	0.1 ~ 6553.5	

The above function code is used for fixed length control.

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

During the fixed length control process, the length reset operation can be performed through the multi-function DI terminal (DI function selection is 28). For details, please refer to P4-00~P4-09.

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

Pb-08	Set count value	Factory default	1000
	Set range	1 ~ 65535	
Pb-09	Specify count value	Factory default	1000
	Set range	1 ~ 65535	

Counting values need to be collected through multi-functional digital input terminals. In the application, the corresponding

input terminal function needs to be set to "counter input"
(Function 25), when the pulse frequency is higher, the DI5 port must be used.
When the count value reaches the set count value Pb-08, the multi-function digital DO outputs the "set count value reached" ON signal, and then the counter stops counting.
When the count value reaches the specified count value Pb-09, the multi-function digital DO outputs the "specified count value reached" ON signal. At this time, the counter continues counting until the "set count value" is reached. The counter does not stop.
The specified count value Pb-09 should not be greater than the set count value Pb-08. Figure 6-38 is a schematic diagram of the set count value arrival and designated count value arrival functions.

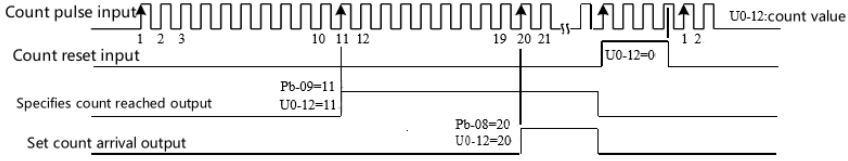


Figure 6-38 Schematic diagram of setting count value given and specified count value given

PC group multi-segment instructions and simple PLC functions

The multi-segment instructions of A600 have richer functions than ordinary multi-segment speeds. In addition to realizing the multi-segment speed function, it can also be used as a voltage source for VF separation and a given source of process PID. For this reason, the dimensions of multi-segment instructions are relative values.
The simple PLC function is different from the user programmable function of the A600. The simple PLC can only complete the simple combination operation of multi-segment instructions. For user-programmable functions that are more abundant and practical, please refer to the relevant instructions of the A7 group.

PC-00	Multi-segment instruction 0	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-01	Multi-segment instruction 1	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-02	Multi-segment instruction 2	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-03	Multi-segment instruction 3	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-04	Multi-segment instruction 4	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-05	Multi-segment instruction 5	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-06	Multi-segment instruction 6	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-07	Multi-segment instruction 7	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-08	Multi-segment instruction 8	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	

PC-09	Multi-segment instruction 9	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-10	Multi-segment instruction 10	Factory default	0.0Hz
	Set range	-100.0% ~ 100.0%	
PC-11	Multi-segment instruction 11	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-12	Multi-segment instruction 12	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-13	Multi-segment instruction 13	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-14	Multi-segment instruction 14	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
PC-15	Multi-segment instruction 15	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	

Multi-segment instructions can be used in three situations: as a frequency source, as a VF separated voltage source, and as a process PID setting source.

In the three application scenarios, the dimension of the multi-segment command is a relative value, ranging from -100.0% to 100.0%. When used as a frequency source, it is a percentage relative to the maximum frequency; when used as a VF separation voltage source, it is relative to the rated voltage of the motor. Percentage; and since the PID given is originally a relative value, multi-segment instructions as the PID setting source do not require dimension conversion. Multi-segment instructions need to be switched according to the different states of the multi-function digital DI. For details, please refer to the relevant instructions of the P4 group.

PC-16	Simple PLC operation mode		Factory default	0
	Set range	0	Stop at the end of a single run	
		1	Keep the final value at the end of a single run	
		2	Keep looping	

The simple PLC function has two functions: as a frequency source or as a VF separated voltage source.

Figure 6-39 is a schematic diagram when a simple PLC is used as the frequency source. When a simple PLC is used as the frequency source, the positive and negative values of PC-00 ~ PC-15 determine the running direction. If it is a negative value, it means the inverter runs in the opposite direction.

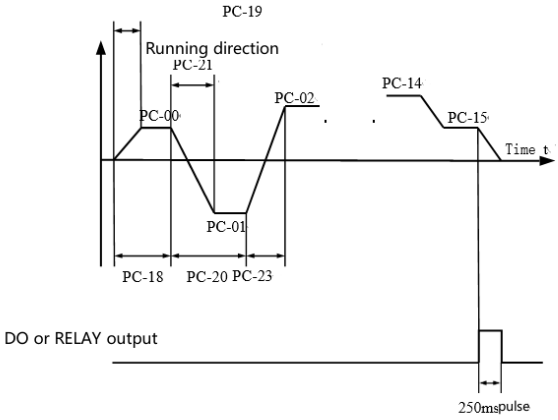


Figure 6-39 Simple PLC diagram

When used as a frequency source, PLC has three operating modes, but when used as a VF separation voltage source, it does not have these three modes. Among them: 0: Stop at the end of a single operation. The inverter automatically stops after completing a single cycle. It needs to give a running command again to start.

1: Maintain final value at the end of a single operation. After the inverter completes a single cycle, it automatically maintains the operating frequency and direction of the last segment.

2: After the frequency converter completes one cycle, it will automatically start the next cycle and stop when there is a stop command.

PC-17	Simple PLC power-off memory selection		Factory default	00
	Set range	ones digit	Power-off memory selection	
		0	No memory when power off	
		1	Power-off memory	
		tens digit	Stop memory selection	
		0	No memory when shutdown	
		1	shutdown memory	

PLC power-off memory refers to memorizing the operating stage and operating frequency of the PLC before power-off, and continuing to run from the memory stage when the power is turned on next time. If you choose not to memorize, the PLC process will be restarted every time you power on.

PLC shutdown memory records the previous running stage and running frequency of the PLC when it stops, and continues running from the memory stage the next time it runs. If you choose not to remember, the PLC process will be restarted every time it is started.

PC-18	Simple PLC 0th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-19	Simple PLC 0th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
	Simple PLC first stage running time	Factory default	0.0s(h)

PC-20	Set range	0~6500.0s(h)	
PC-21	Simple PLC first stage acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-22	Simple PLC second stage running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-23	Simple PLC second stage acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-24	Simple PLC 3rd stage running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-25	Simple PLC 3rd stage acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-26	Simple PLC 4th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-27	Simple PLC 4th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	

PC-28	Simple PLC 5th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-29	Simple PLC 5th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-30	Simple PLC 6th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-31	Simple PLC 6th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-32	Simple PLC 7th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-33	Simple PLC 7th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-34	Simple PLC 8th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-35	Simple PLC 8th segment acceleration and deceleration time	Factory default	0
	Set range	0～ 3	

PC-36	Simple PLC 9th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-37	Simple PLC 9th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-38	Simple PLC 10th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-39	Simple PLC 10th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-40	Simple PLC 11th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-41	Simple PLC 11th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-42	Simple PLC 12th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-43	Simple PLC 12th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-44	Simple PLC 13th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	
PC-45	Simple PLC 13th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-46	Simple PLC 14th segment running time	Factory default	0.0s(h)
	Set range	0~6500.0s(h)	

PC-47	Simple PLC 14th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-48	Simple PLC 15th segment running time	Factory default	0.0s(h)
	Set range	0~6500.05s(h)	

PC-49	Simple PLC 15th segment acceleration and deceleration time	Factory default	0
	Set range	0～3	
PC-50	Simple PLC run time unit	Factory default	0
	Set range 0	S（Second）	
	1	h（hour）	

PC-51	Multi-segment instruction 0 given mode		Factory default	0
	Set range	0	function code PC-00 given	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE	
		5		P I D
		6		Preset frequency (P0-08) is given, UP/DOWN can be modified

This parameter determines the given channel of multi-segment instruction 0.

Multi-segment instruction 0 In addition to PC-00, there are a variety of other options to facilitate switching between multi-short instructions and other given methods. When multi-segment instructions are used as frequency sources or simple PLC is used as frequency sources, switching between the two frequency sources can be easily realized.

Pd group communication parameters

Please refer to "A600 Communication Protocol"

PE group constant pressure water supply parameter group

PE-00	Sleep pressure deviation	Factory default	0.0
	Set range	0.0~PE-04	

Sleep pressure = set pressure (PA-01) - deviation value PE-00

PE-01	sleep rate	Factory default	2
	Set range	0~10 (unit: 5Hz/S)	

After entering sleep mode, the frequency decreases at a rate

PE-02	sleep frequency	Factory default	2.00
	Set range	0.00Hz~ maximum frequency (P0-10)	

If the operating frequency is lower than the sleep frequency, it directly enters sleep detection.

PE-03	compress time	Factory default	2.0
	Set range	000.0~999.9S	

The time the pressure is maintained after the pressure reaches the set value.

PE-04	arousal pressure bias	Factory default	5.0
	Set range	0.0~PA-01	

Wake-up pressure = set pressure (PA-01) - sleep pressure deviation value (PE-01) - wake-up pressure deviation value (PE-04).

PE-05	Wake-up delay time	Factory default	0.0
	Set range	000.0~999.9S	
PE-06	Sleep frequency reduction time (water leakage coefficient)	Factory default	2.0
	Set range	000.0~100.0S	

Sleep frequency reduction time (water leakage coefficient), the time required to enter sleep after reaching the pressure set value.

PE-07	Water shortage detection method selection	Factory default	0
	Set range	0: No detection 1: Current mode 2: Pressure mode 3: Use both	
PE-08	Water shortage detection pressure	Factory default	0.5
	Set range	0.0~PA-01	

When the feedback pressure is less than the PE-08 setting value, the water shortage detection is performed. When PE-07=0, the water shortage detection is turned off.

PE-09	Water shortage detection frequency	Factory default	5.00
	Set range	0.00Hz~ maximum frequency（P0-10）	
PE-10	Water shortage detection time	Factory default	5.0
	Set range	000.0~999.9S	
	Water shortage detection current	Factory default	0.01
	Set range	0.01~Rated current of the set model	

PE-09 is the comparison frequency for judging whether there is water shortage. When the operating frequency is greater than this frequency, it starts to judge whether there is water shortage.

PE-11 is the percentage of the motor's rated current. When the operating current is less than this current, it is judged to be water shortage.

●Current mode

The operating frequency is higher than PE-09 and the output current is lower than PE-11. After timing out PE-10, the alarm Err34 will occur.

●Pressure method

The operating frequency is higher than PE-09 and the feedback pressure is lower than PE-08. After timeout PE-10, the alarm Err34 will occur.

PE-13	PID high limit alarm	Factory default	100.0
	Set range	0.0%~100.0%	
	PID high limit alarm	Factory	000.0

PE-14		default	
	Set range	000.0~200.0S	
PE-15	PID low limit alarm	Factory default	0.0
	Set range	0.0%~100.0%	
PE-16	PID low limit alarm detection time	Factory default	000.0
	Set range	000.0~200.0S	

Water pump pressure protection:
(When the PID high limit alarm detection time PE-14 = 0, the high-pressure protection is turned off)
PID low-limit alarm detection time PE-16 = 0, when the low-pressure protection is turned off)
PE-14 is not 0, and the feedback pressure is higher than PE-13. Alarm Err33
PE-16 is not 0, the feedback pressure is lower than PE-15, alarm Err32

PE-17	Automatic operation selection after power-on	Factory default	0
	Set range	0: off 1: on	
PE-18	Automatic run delay time	Factory default	1.0
	Set range	00.1~100S	

Automatically run after power on:
(Turn off when PE-17 = 0 is selected for automatic operation after power-on)
Delay PE-18 to start running after power-on

PE-19	Antifreeze function selection	Factory default	0
	Set range	0: off 1: on	
PE-20	Antifreeze cycle	Factory default	0
	Set range	000~9999S	
PE-21	Antifreeze running time	Factory default	60
	Set range	000~9999S	
PE-22	Antifreeze operation frequency	Factory default	10.00
	Set range	0.00~30.00Hz	

Antifreeze function:

(Anti-freeze function enable PE-19 = 1), anti-freeze cycle PE-20 intermittent operation, each operation time PE-21. During the antifreeze running time, if the target output frequency is lower than the antifreeze frequency, the output frequency is maintained at the PE-22 antifreeze frequency. Hibernation function description:

Enable sleep logic when frequency source P0-03= 8 (PID):

●Entry conditions

The PID output target frequency is lower than the sleep frequency PE-02 or the holding time expires PE-03, and sleep begins.

●Deceleration stage

Deceleration speed PE-01 until sleep frequency PE-02

●Reduced frequency operation

Run at PE-02 frequency for a period of time, PE-06 frequency reduction time

●Stop and sleep

PID given value Keyboard operation logic:

Press the ▲ and ▼ keys on the keyboard to adjust the PA-01 target value by 1% each time (according to the PA-04 pressure gauge range).

PP group user password

PP-00	user password	Factory default	0
	Set range	0 ~ 65535	

If PP-00 is set to any non-zero number, the password protection function will take effect. The next time you enter the menu, you must enter the password correctly, otherwise you cannot view and modify the function parameters. Please remember the user password you set.

Setting PP-00 to 00000 will clear the set user password and invalidate the password protection function.

PP-01	Parameter initialization		Factory default	0
	Set range	0	No action	
		1	Restore factory parameters, excluding motor parameters	
		2	Clear record information	
		4	Back up user parameters	
		501	Restore user parameters	

1. Restore factory settings, excluding motor parameters

After setting PP-01 to 1, most of the inverter function parameters are restored to the factory parameters, but the motor parameters, frequency command decimal point (P0-22), fault record information, cumulative running time (P7-09), cumulative power-on Time (P7-13), cumulative power consumption

(P7-14) Not restored.

2. Clear record information

Clear the inverter fault record information, accumulated running time (P7-09), accumulated power-on time (P7-13), and accumulated power consumption (P7-14).

4. Back up the user's current parameters

Back up the parameters set by the current user. Back up the current setting values of all function parameters. To facilitate customers to recover after parameter adjustment is disordered.

501. Restore user backup parameters

Restore the previously backed up user parameters, that is, restore the parameters backed up by setting PP-01 to 4.

PP-02	Display properties in function parameter mode		Factory default	11
	Set range	ones digit	U group display selection	
		0	Do not show	
		1	show	
		tens digit	Group A display selection	
		0	Do not show	
		1	show	
PP-03	Personalized parameter display selection		Factory default	00
	Set range	ones digit	User-defined parameter display selection	
		0	Do not show	
		1	show	
		tens digit	User change parameter display selection	
		0	Do not show	
		1	show	

The parameter display mode is mainly established to facilitate users to view functional parameters in

different arrangements according to actual needs. Three parameter display modes are provided:

Name	Describe
function parameter mode	Display the inverter function parameters in sequence, including P0~PF, A0~AF, and U0~UF function parameter groups.
User Change Parameter Method	Functional parameters inconsistent with factory parameters

When one of the personalized parameter mode display selections (PP-03) is displayed, you can switch to different parameter display modes by pressing the QUICK key. The default value is only functional parameter mode display.

The display code of each parameter display mode is:

Parameter display mode	Indicate
function parameter mode	-bASE
User customized parameter mode	-USEr
User Change Parameter Method	--C--

A600 inverter provides two sets of personalized parameter display modes: user-customized parameter mode and user-changed parameter mode.

The user-customized parameter group is the parameters set by the user to the PE group. A maximum of 32 parameters can be selected. These parameters are summarized together to facilitate customer debugging.

In the user-customized parameter mode, a symbol u is added by default before the user-customized function code. For example: P1-00. In the user-customized parameter mode, the display effect is uP1-00.

The user changes the parameter method, which means that the user has changed parameters that are different from the factory default. User-changed parameter groups are helpful for customers to view a summary of changed parameters and to facilitate on-site problem finding.

In the user-changing parameter mode, a symbol c is added by default before the user-customized function code. For example: P1-00. In the user-changing parameter mode, the display effect is cP1-00.

PP-04	Function code modifies attributes		Factory default	0
	Set range	0	Can be modified	
		1	Can not be modified	

The user sets whether the function code parameters can be modified to prevent the risk of function parameters being accidentally modified.

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

Group A0 Torque control and limiting parameters

A0-00	Speed/torque control method selection		Factory default	0
	Set range	0	speed control	
		1	Torque control	

Used to select the inverter control mode: speed control or torque control. Note: This function code cannot be used to switch during the operation of the inverter.

The A600's multi-function digital DI terminal has two functions related to torque control: torque control prohibition (function 29), speed control/torque control switching (function 46). These two terminals must be used in conjunction with A0-00 to achieve switching between speed and torque control. When the speed control/torque control switching terminal is invalid, the control mode is determined by A0-00. If the speed control/torque control switching is valid, the control mode is equivalent to the inversion of the value of A0-00.

In any case, when the torque control prohibition terminal is valid, the inverter is fixed to the speed control mode.

A0-01	Torque setting source selection in torque control mode		Factory default	0
	Set range	0	Digital settings (A0-03)	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE pulse (DI5)	
		5	communication given	
		6	MIN(AI1,AI2)	
		7	MAX(AI1,AI2)	

A0-03	Torque digital setting in torque control mode	Factory default	150.0%
	Set range	-200.0% ~ 200.0%	

A0-01 is used to select the torque setting source. There are 8 torque setting methods in total.

Torque setting adopts relative value, 100.0% corresponds to the rated torque of the motor. Set range -200.0%~200.0%, indicating that the maximum torque of the inverter is 2 times the rated torque of the inverter.

When the torque given is positive, the frequency converter runs forward. When the torque given is negative, the frequency converter runs reverse. The torque setting sources are described as follows:

0: Digital setting (A0-03)

Refers to the target torque directly using the A0-03 setting value.

1:AI1

2:AI2

3:AI3

It means that the target torque is determined by the analog input terminal. The A600 control board provides 2 analog input terminals (AI1, AI2), and the optional I/O expansion card can provide another 1 analog input terminal (AI3).

AI1 is 0V ~ 10V voltage input

AI2 can be a 0V ~ 10V voltage input or a 0mA ~ 20mA current input. AI3 can be selected as a - 10V ~ 10V voltage input by the J8 jumper on the control board.

The user can freely select the corresponding relationship curve between the input voltage values of AI1, AI2, and AI3 and the target torque through P4-33.

A600 provides 5 sets of corresponding relationship curves, 3 of which are straight-line relationships (2-point correspondence), and 2 sets of curves are arbitrary curves with 4-point correspondence. Users can use P4-13 ~ P4-27 function code and A6 group function code to set.

Function code P4-33 is used to set the three analog inputs AI1~AI3 and select which group among the 5 groups of curves

respectively.

When AI is used as a frequency reference, the voltage/current input corresponds to 100.0% of the setting, which refers to the percentage of the relative torque digital setting A0-03. 4. PULSE pulse (DI5)

The target torque is given through the high-speed pulse of terminal DI5.

Pulse given signal specifications: voltage range 9V ~ 30V, frequency range 0kHz ~ 100kHz. Pulse reference can only be input from multi-function input terminal DI5.

The relationship between the DI5 terminal input pulse frequency and the corresponding setting is set through P4-28~P4-31.

The corresponding relationship is a straight line corresponding relationship between 2 points. 100.0% of the corresponding setting of the pulse input refers to the relative torque number. Set the percentage of A0-03.

5. Communication given

It means that the target torque is given by communication method.
When it is a point-to-point communication slave and receives data as torque reference, use the host to transmit data as communication reference value (see the relevant instructions of group A8)
When Profibus-DP and CANOpen communication are valid and PZD1 is used as the frequency reference, the data value transmitted by PDZ1 is directly used, and the range is: -P0-10~P0-10. (Note: When using the MD38DP2 expansion card, please refer to the card's instructions)
When using Modbus communication, the host computer gives data through the communication address 0x1000. The data format is data with 2 decimal points, and the data range is -P0-10~+P0-10.
For example, PZD1 (0X1000) is 5000, which is 50.00hz. PZD1 is -5000, which is -50.00hz.
A communication card must be installed when using communication. The four communication cards of A600 are all optional. Users can choose according to their needs. If the communication protocol is Modbus-RTU, Profibus-DP or CANopen, you need to select the corresponding serial communication according to P0-28. protocol. The CANlink protocol is always valid.

A0-05	Torque control forward maximum frequency	Factory default	50.00Hz
	Set range	0.00Hz ～maximum frequency（P0-10）	
A0-06	Torque control reverse maximum frequency	Factory default	50.00Hz
	Set range	0.00Hz ～maximum frequency（P0-10）	

During torque control, the acceleration and deceleration time of the frequency upper limit is set in P8-07 (acceleration)/P8-08 (deceleration). Used to set the forward or reverse maximum operating frequency of the inverter in torque control mode.
When the inverter torque is controlled, if the load torque is less than the motor output torque, the motor speed will continue to rise. In order to prevent accidents such as overspeed in the mechanical system, the maximum motor speed during torque control must be limited.
If it is necessary to dynamically and continuously change the maximum frequency of torque control, it can be achieved by controlling the upper limit frequency.

A0-07	Torque acceleration time	Factory default	0.00s
	Set range	0.00s ～ 650.00s	
A0-08	Torque acceleration time	Factory default	0.00s
	Set range	0.00s ～ 650.00s	

In the torque control mode, the difference between the motor output torque and the load torque determines

the speed change rate of the motor and the load. Therefore, the motor speed may change rapidly, causing problems such as noise or excessive mechanical stress. By setting the torque control acceleration and deceleration time, the motor speed can be changed smoothly.

In the torque control of small torque start, it is not recommended to set the torque acceleration and deceleration time; if the torque acceleration and deceleration time is set, it is recommended to appropriately increase the speed filter coefficient;

When quick torque response is required, set the torque control acceleration and deceleration time to 0.00s.

For example: two motors are hard-connected to drive the same load. In order to ensure even load distribution, one frequency converter is set as the master machine and uses speed control. The other frequency converter is the slave machine and uses torque control. The actual output rotation of the host machine is Torque is used as the torque command of the slave machine. At this time, the torque of the slave machine needs to follow the master machine quickly, so the torque control acceleration and deceleration time of the slave machine is 0.00s.

Group A1 Virtual DI, Virtual DO

A1-00	Virtual VDI1 terminal function selection	Factory default	0
	Set range	0 ~ 59	
A1-01	Virtual VDI2 terminal function selection	Factory default	0
	Set range	0 ~ 59	
A1-02	Virtual VDI3 terminal function selection	Factory default	0
	Set range	0 ~ 59	
A1-03	Virtual VDI4 terminal function selection	Factory default	0
	Set range	0 ~ 59	
A1-04	Virtual VDI5 terminal function selection	Factory default	0
	Set range	0 ~ 59	

Virtual VDI1~VDI5 are functionally identical to DI on the control board and can be used as multi-functional digital inputs. For detailed settings, please refer to the introduction of P4-00 ~ P4-09.。

A1-05	Virtual VDI terminal valid status setting mode		Factory default	0000 0
	Set range	ones digit	Virtual VDI1	
		0	Whether the VDI is valid is determined by the status of the virtual VDOx	
		1	Set whether VDI is valid by function code A1-06	
		tens digit	Virtual VDI2 (0 ~ 1, same as above)	
		hundreads digit	Virtual VDI3 (0 ~ 1, same as above)	
		thousands digit	Virtual VDI4 (0 ~ 1, same as above)	
		ten thousand digit	Virtual VDI5 (0 ~ 1, same as above)	

A1-06	Virtual VDI terminal status settings		Factory default	0000 0
	Set range	ones digit	Virtual VDI1	
		0	invalid	
		1	valid	
		tens digit	Virtual VDI2 (0 ~ 1, same as above)	
		hundreads digit	Virtual VDI3(0 ~ 1, same as above))	
		thousands digit	Virtual VDI4 (0 ~ 1, same as above)	
		ten thousand digit	Virtual VDI5 (0 ~ 1, same as above)	

Different from ordinary digital input terminals, the status of virtual VDI can be set in two ways and selected through A1-05. When the selected VDI state is determined by the state of the corresponding virtual VDO, whether VDI is in a valid state depends on whether the VDO output is valid or invalid, and VDIx is uniquely bound to VDOx (x is 1 to 5).

When the VDI status is selected to be set by function code, the status of the virtual input terminal is determined through the binary bits of function code A1-06. The following examples illustrate how to use virtual VDI.

Example 1: When selecting the VDO state to determine the VDI state, if you want to complete the following function: "When the AI1 input exceeds the upper and lower limits, the inverter will alarm for fault and stop", you can use the following setting method:

Set the function of VDI1 to "User-defined fault 1" (A1-00=44);

Set the VDI1 terminal valid status mode to be determined by VDO1 (A1-05=xxx0); Set the VDO1 output function to "AI1 input exceeds the upper and lower limits" (A1-11=31);

Then when the AI1 input exceeds the upper and lower limits, the VDO1 output is in the ON state. At this time, the VDI1 input terminal status is valid, and the inverter VDI1 receives user-defined fault 1, and the inverter will alarm Err27 and stop.

Example 2: When selecting function codeA1-06 to set the VDI state, if you want to complete the following function: "After the inverter is powered on, it automatically enters the running state", you can use the following setting method:

Set the function of VDI1 to "forward run" (A1-00=1);

Set the VDI1 terminal effective state mode to be set by function code (A1-05=xxx1);

Set the VDI1 terminal status to valid (A1-06=xxx1); set the command source to "terminal control" (P0-02=1); set the startup protection selection to "no protection" (P8-18=0);

After the inverter is powered on and initialized, it is detected that VDI1 is valid, and this terminal corresponds to forward operation, which is equivalent to the inverter receiving a terminal forward operation command, and the inverter immediately starts forward operation.

A1-07	Function selection when AI1 terminal is used as DI		Factory default	0
	Set range		0 ~ 59	
A1-08	Function selection when AI2 terminal is used as DI		Factory default	0
	Set range		0 ~ 59	
A1-09	Function selection when AI3 terminal is used as DI		Factory default	0
	Set range		0 ~ 59	
A1-10	Valid mode selection when AI is used as DI		Factory default	
	Set range	ones digit	AI1	
		0	Active high level	
		1	Active low	
		tens digit	AI2 (0 ~ 1, same bit)	
		hundreads digit	AI2 (0 ~ 1, same bit))	

This group of function codes is used to use AI as DI. When AI is used as DI, when the AI input voltage is greater than 7V, the AI terminal status is high level. When the AI input voltage is lower than 3V, the AI terminal status is low level. . There is hysteresis between 3V~7V

A1-10 is used to determine whether AI high level is the active state or low level is the active state when AI is used as DI.

As for the function settings when AI is used as a DI, it is the same as the normal DI settings. Please refer to the description of the relevant DI settings of the P4 group. Figure 6-40 takes the AI input voltage as an example to illustrate the relationship between the AI input voltage and the corresponding DI status:

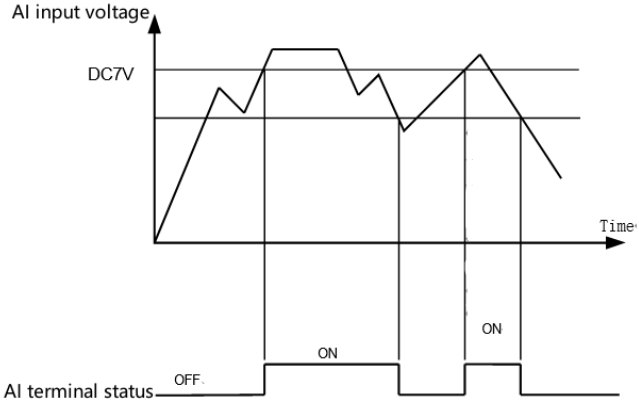


Figure 6-40 AI terminal valid status judgment

	Virtual VDO1 output function	Factory default	0

A1-11	selection		
	Set range	0: Internally shorted to physical DIx 1 ~ 40: See group P5 physical DO output selection	
A1-12	Virtual VDO2 output function selection	Factory default	0
	Set range	0: Internally shorted to physical DIx 1 ~ 40: See group P5 physical DO output selection	
A1-13	Virtual VDO3 output function selection	Factory default	0
	Set range	0: Internally shorted to physical DIx 1 ~ 40: See group P5 physical DO output selection	
A1-14	Virtual VDO4 output function selection	Factory default	0
	Set range	0: Internally shorted to physical DIx 1 ~ 40: See group P5 physical DO output selection	
A1-15	Virtual VDO5 output function selection	Factory default	0
	Set range	0: Internally shorted to physical DIx 1 ~ 40: See group P5 physical DO output selection	
A1-16	VDO1 output delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	
A1-17	VDO2 output delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	
A1-18	VDO3 output delay time	Factory default	0.0s
	Set range	0.0s ~ 3600.0s	

A1-19	VDO4 output delay time		Factory default	0.0s
	Set range		0.0s ~ 3600.0s	
A1-20	VDO5 output delay time		Factory default	0.0s
	Set range		0.0s ~ 3600.0s	
A1-21	VDO output terminal valid status selection		Factory default	0000 0
	Set range	ones digit	VDO1	
		0	positive logic	
		1	Counter logic	
		tens digit	VDO2 (0 ~ 1, same bit)	

		hundreads digit	VDO3 (0 ~ 1, same bit)
		thousands digit	VDO4 (0 ~ 1, same bit)
		ten thousandsdigit	VDO5 (0 ~ 1, same bit)

The virtual digital output function is similar to the DO output function of the control board and can be used to cooperate with the virtual digital input VDIx to implement some simple logic control.

When the virtual VDOx output function is selected as 0, the output status of VDO1~VDO5 is determined by the input status of DI1~DI5 on the control board. At this time, VDOx and Dix correspond one to one.

When the virtual VDOx output function is selected as non-0, the function settings and usage of VDOx are the same as the DO output related parameters of Group P5. Please refer to the description of related parameters of Group P5.

The output valid state of the same VDOx can be selected as positive logic or negative logic, set through A1-21. Users can check whether the current status of VDOX is valid through U0-08. The application examples of VDIx include the use of VDOx, please refer to them.

Group A2 2nd motor parameters

A600 can switch between 2 motors. The 2 motors can set the motor nameplate parameters respectively, perform motor parameter tuning separately, select VF control or vector control respectively, set encoder related parameters separately, and can be set separately with VF control. Or parameters related to vector control performance.

The function code of group A2 corresponds to motor 2. All parameters of group A2 have the same content definition and usage method as the relevant parameters of the first motor. The description will not be repeated here. Users can refer to the description of the relevant parameters of the first motor.

A2-00	Motor type selection		Factory default	0
	Set range	0	Ordinary asynchronous motor	
		1	Variable frequency asynchronous motor	
A2-01	rated power		Factory default	Model confirmed
	Set range		0.1kW ~ 1000.0kW	

A2-02	Rated voltage	Factory default	Model confirmed
	Set range	1V ~ 2000V	
A2-03	Rated current	Factory default	Model confirmed
	Set range	0.01A ~ 655.35A(Inverter power≤ 55kW) 0.1A ~ 6553.5A(Inverter power >55kW)	
A2-04	Rated frequency	Factory default	Model confirmed
	Set range	0.01Hz ~maximum frequency	
A2-05	Rated speed	Factory default	Model confirmed
	Set range	1rpm ~ 65535rpm	

A2-06	Asynchronous motor stator resistance	Factory default	Model confirmed
	Set range	0.001Ω ~ 65.535Ω(Inverter power≤ 55kW) 0.0001Ω ~ 6.5535Ω(Inverter power>55kW)	
A2-07	Asynchronous motor rotor resistance	Factory default	Model confirmed
	Set range	0.001Ω ~ 65.535Ω(Inverter power≤ 55kW) 0.0001Ω ~ 6.5535Ω(Inverter power>55kW)	
A2-08	Asynchronous motor leakage inductance	Factory default	Model confirmed
	Set range	0.01mH ~ 655.35mH(Inverter power≤ 55kW) 0.001mH ~ 65.535mH(Inverter power >55kW)	
A2-09	Asynchronous motor mutual inductance	Factory default	Model confirmed
	Set range	0.1mH ~ 6553.5mH(Inverter power≤ 55kW) 0.01mH ~ 655.35mH(Inverter power >55kW)	

A2-10	Asynchronous motor no-load current		Factory default	Model confirmed
	Set range		0.01A ~ A2-03(Inverter power≤ 55kW) 0.1A ~ A2-03(Inverter power >55kW)	
A2-27	Encoder line number		Factory default	1024
	Set range		1 ~ 65535	
A2-28	Encoder type		Factory default	0
	Set range	0	ABZ incremental encoder	
		1	UVW incremental encoder	
		2	Resolver	
		3	SinCos encoder	
		4	Line-saving UVW encoder	

A2-29	Speed feedback PG selection		Factory default	0
	Set range	0	Local PG	
		1	Extended PG	
		2	PULSE pulse input (DI5)	
A2-30	ABZ incremental encoder AB phase sequence		Factory default	0
	Set range	0	forward	
		1	reverse	
	Encoder mounting angle		Factory default	0.0°

A2-31	Set range		0.0° ~ 359.9°	
A2-32	UVW encoder UVW phase sequence		Factory default	0
	Set range	0	forward	
		1	reverse	
A2-33	UVW encoder offset angle		Factory default	0.0°
	Set range		0.0° ~ 359.9°	
A2-34	Number of pole pairs of resolver		Factory default	1
	Set range		1 ~ 65535	
A2-36	Speed feedback PG disconnection detection between		Factory default	0.0s
	Set range		0.0: No action 0.1s ~ 10.0s	

A2-37	Tuning selection		Factory default	0
	Set range	0	No action	
		1	Asynchronous machine static tuning 1	
		2	Dynamic tuning of asynchronous machines	
		3	Asynchronous machine static tuning 2	

A2-38	Speed loop proportional gain 1	Factory default	30
	Set range	1 ~ 100	
A2-39	Speed loop integration time 1	Factory default	0.50s
	Set range	0.01s ~ 10.00s	
A2-40	Switching frequency 1	Factory default	5.00Hz
	Set range	0.00 ~ A2-43	
A2-41	Speed loop proportional gain 2	Factory default	15
	Set range	0 ~ 100	

A2-42	Speed loop integration time 2	Factory default	1.00s
	Set range	0.01s ~ 10.00s	
A2-43	Switch frequency 2	Factory default	10.00 Hz

	Set range		A2-40 ~ Maximum output frequency	
A2-44	Vector control slip gain		Factory default	100%
	Set range		50% ~ 200%	
A2-45	SVC torque filter constant		Factory default	28
	Set range		1 ~ 31	
A2-47	Torque upper limit source in speed control mode		Factory default	0
	Set range	0	A2-48 setting	
		1	AI1	
		2	AI2	
		3	AI3	
		4	PULSE settings	
		5	Communication settings	
		6	MIN(AI1,AI2)	
		7	MAX(AI1,AI2)	
A2-48	Digital setting of torque upper limit in speed control mode		Factory default	150.0 %
	Set range		0.0% ~ 200.0%	
A2-51	Excitation adjustment proportional gain		Factory default	2000
	Set range		0 ~ 20000	
A2-52	Excitation adjustment integral gain		Factory default	1300
	Set range		0 ~ 20000	
A2-53	Torque adjustment proportional gain		Factory default	2000
	Set range		0 ~ 20000	
A2-54	Torque adjustment integral gain		Factory default	1300
	Set range		0 ~ 20000	
A2-55	Speed loop integral properties		Factory default	0
	Set range		Units place: integral separation 0: invalid; 1: valid	

A2-61	2nd motor control method		Factory default	0
	Set range	0	Speed sensorless vector control (SVC)	
		1	Speed sensor vector control (FVC)	
		2	V/F control	

A2-62	2nd motor acceleration and deceleration time selection		Factory default	0
	Set range	0	Same as motor 1	
		1	Acceleration and deceleration time 1	
		2	Acceleration and deceleration time 2	
		3	Acceleration and deceleration time 3	
		4	Acceleration and deceleration time 4	
A2-63	2nd motor torque boost		Factory default	Model confirmed
	Set range		0.0%: Automatic torque boost 0.1% ~ 30.0%	
A2-65	2nd motor oscillation suppression gain		Factory default	Model confirmed
	Set range		0 ~ 100	

Group A5 controls optimization parameters

A5-00	Factory default	8.00Hz
	5.00Hz ~ maximum frequency	

Only valid for VF control.

The wave generation mode of the asynchronous machine VF is determined when it is running. A value lower than this value is a 7-segment continuous modulation mode, and on the contrary, it is a 5-segment intermittent modulation mode.

In the 7-segment continuous modulation mode, the switching loss of the frequency converter is larger, but the current ripple is smaller; in the 5-segment intermittent debugging mode, the switching loss is smaller and the current ripple is larger; but at high frequencies, it may cause The instability of motor operation generally does not require modification.

For VF operation instability, please refer to function code P3-11, and for inverter loss and temperature rise, please refer to function code P0-15;

A5-01	PWM modulation method		Factory default	0
	Set range	0	Asynchronous modulation	
		1	synchronous modulation	

Only valid for VF control.

Synchronous modulation means that the carrier frequency changes linearly with the output frequency, ensuring that the ratio between the two (carrier ratio) remains unchanged. It is generally used when the output frequency is high, which is beneficial to the output voltage quality.

At lower output frequencies (below 100Hz), synchronous modulation is generally not needed, because the ratio of carrier frequency to output frequency is relatively high at this time, and the advantages of asynchronous modulation are more

obvious.

Synchronous modulation only takes effect when the operating frequency is higher than 85Hz, and asynchronous modulation is fixed below this frequency.

A5-02	Dead zone compensation mode selection		Factory default	1
	Set range	0	No compensation	
		1	Compensation mode 1	

This parameter generally does not need to be modified. Only when there are special requirements for the output voltage waveform quality, or when the motor has oscillation or other abnormalities, you need to try to switch to different compensation modes.

A5-03	Random PWM depth		Factory default	0
	Set range	0	Random PWM invalid	
		1 ~ 10	PWM carrier frequency random depth	

Setting random PWM can make the monotonous and harsh motor sound softer and help reduce external electromagnetic interference. When the random PWM depth is set to 0, the random PWM is invalid. Adjusting random PWM to different depths will give different effects.

A5-04	Fast current limit enable		Factory default	1
	Set range	0	Disable	
		1	Enable	

Enabling the fast current limiting function can minimize the overcurrent fault of the frequency converter and ensure uninterrupted operation of the frequency converter.

If the frequency converter continues to be in the rapid current limiting state for a long time, the frequency converter may be damaged due to overheating. This situation is not allowed. Therefore, when the frequency converter is in rapid current limiting for a long time, it will alarm fault Err40, indicating that the frequency converter is overloaded and needs to be shut down. .

A5-05	Current sensing compensation	Factory default	5
	Set range	0 ~ 100	

Used to set the current detection compensation of the inverter. Setting it too large may cause the control performance to decrease. Generally no modification is required.

A5-06	Undervoltage point setting	Factory default	Model confirmed
	Set range	200.00V~2000.0V	

Used to set the voltage value of the inverter undervoltage fault Err09 fault. Factory default is related to the model.

Voltage level	Undervoltage point base value
Single phase 220V	200V
Three phase 220V	200V

Three phase 380V	350V
Three phase 480V	350V
Three phase 690V	650V
Three phase 1140V	1100V

A5-07	SVC optimization mode selection		Factory default	2
	Set range	1	Optimization mode 1	
		2	Optimization mode 2	

Asynchronous motor SVC optimization mode generally does not require adjustment.

A5-08	Dead time adjustment	Factory default	150%
	Set range	100% ~ 200%	

Valid only for 1140V voltage level.

Adjusting this value can improve the effective voltage utilization. Adjusting it too small can easily lead to unstable system operation. User modification is not recommended.

A5-09	Overvoltage point setting	Factory default	Model confirmed
	Set range	200.0V ~ 2200.0V	

Used to set the voltage value of the inverter overvoltage fault. Factory default for different voltage levels are:

Voltage level	Over voltage point Factory default
Single phase 220V	400.0V
Three phase 220V	400.0V
Three phase 380V	810.0V
Three phase 480V	890.0V
Three phase 690V	1300.0V
Three phase 1140V	2000.0V

Note: Factory default is also the upper limit of the inverter's internal overvoltage protection. This parameter setting will take effect only when the A5-09 setting value is smaller than the Factory default of each voltage level. When it is higher than Factory default, Factory default shall prevail.

Group A6 AI curve settings

A6-00	AI Curve 4 Minimum Input	Factory default	0.00V
	Set range	-10.00V ~ A6-02	
A6-01	AI curve 4 minimum input corresponding settings	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-02	AI Curve 4 Inflection Point 1 Input	Factory default	3.00V
	Set range	A6-00 ~ A6-04	

A6-03	AI curve 4 inflection point 1 input corresponding settings	Factory default	30.0%
	Set range	-100.0% ~ 100.0%	

A6-04	AI Curve 4 Inflection Point 2 Input	Factory default	6.00V
	Set range	A6-02 ~ A6-06	
A6-05	AI curve 4 inflection point 2 input corresponding settings	Factory default	60.0%
	Set range	-100.0% ~ 100.0%	
A6-06	AI Curve 4 Max Input	Factory default	10.00V
	Set range	A6-06 ~ 10.00V	
A6-07	AI curve 4 maximum input corresponding setting	Factory default	100.0%
	Set range	-100.0% ~ 100.0%	
A6-08	AI Curve 5 Minimum Input	Factory default	0.00V
	Set range	-10.00V ~ A6-10	
A6-09	AI curve 5 minimum input corresponding settings	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-10	AI Curve 5 Inflection Point 1 Input	Factory default	3.00V
	Set range	A6-08 ~ A6-12	
A6-11	AI curve 5 inflection point 1 input corresponding settings	Factory default	30.0%
	Set range	-100.0% ~ 100.0%	
A6-12	AI Curve 5 Inflection Point 2 Input	Factory default	6.00V
	Set range	A6-10 ~ A6-14	
A6-13	AI curve 5 inflection point 2 input corresponding settings	Factory default	60.0%
	Set range	-100.0% ~ 100.0%	
A6-14	AI Curve 5 Max Input	Factory default	10.00V
	Set range	A6-14 ~ 10.00V	
A6-15	AI curve 5 maximum input corresponding setting	Factory default	100.0%
	Set range	-100.0% ~ 100.0%	

The functions of Curve 4 and Curve 5 are similar to Curve 1 ~ Curve 3, but Curve 1 ~ Curve 3 are straight lines, while Curve 4 and Curve 5 are

4-point curve can achieve more flexible correspondence. The figure below is a schematic diagram of curve 4~curve 5.

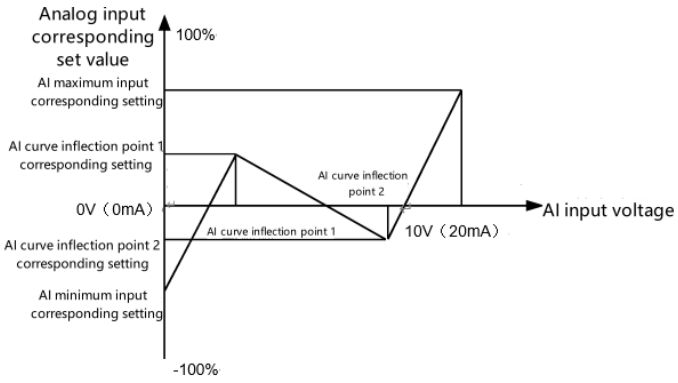


Figure 6-42 Schematic diagram of curve 4 and curve 5

When setting Curve 4 and Curve 5, please note that the minimum input voltage, inflection point 1 voltage, inflection point 2 voltage, and maximum voltage of the curve must increase in sequence.

AI curve selection P4-33 is used to determine how analog input AI1~AI3 is selected among 5 curves.

A6-24	AI1 sets jump point	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-25	AI1 sets the jump amplitude	Factory default	0.5%
	Set range	0.0% ~ 100.0%	
A6-26	AI2 sets jump point	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-27	AI2 sets the jump amplitude	Factory default	0.5%
	Set range	0.0% ~ 100.0%	
A6-28	AI3 sets jump point	Factory default	0.0%
	Set range	-100.0% ~ 100.0%	
A6-29	AI3sets the jump amplitude	Factory default	0.5%
	Set range	0.0% ~ 100.0%	

The analog inputs AI1~AI3 of A600 all have the set value jump function.

The jump function means that when the analog corresponding setting changes between the upper and lower jump points, the analog corresponding setting value is fixed to the value of the jumping point.

For example: the voltage of analog input AI1 fluctuates up and down 5.00V, the fluctuation range is 4.90V~5.10V, the minimum input of AI1 is 0.00V corresponding to 0.0%, the maximum input of 10.00V corresponds to 100.%, then the detected AI1 corresponds to the setting Fluctuating between 49.0%~51.0%. Set AI1 and set the jump point A6-24 to 50.0%, set AI1 and set the jump amplitude A6-25 to 1.0%, then when the above AI1 input is processed by the jump function, the corresponding setting of the AI1 input obtained is fixed at 50.0%. AI1 is transformed into a stable input, eliminating fluctuations.

Group A7 User Programmable Functions

See the supplementary instructions for "User Programmable Control Card"

Group A8 Point-to-point communication

A8-00	Effective choice for point-to-point communication	Factory default	0
	Set range	0: invalid; 1: valid	

Select whether the point-to-point communication function is valid.

Point-to-point communication refers to direct data communication between two or more A600 inverters, which is implemented using CANlink. It is used to realize a host computer's given target frequency and target torque to one or more slave machines based on its own frequency or torque signal.

When the CANlink cards of multiple inverters are connected, the CANlink card of the end inverter should be connected to the terminal resistor. The connection method is described in the appendix. When point-to-point communication is valid, the CANlink communication addresses of the master and the slave are automatically matched internally and no special settings are required. The point-to-point communication rate is set through Fd-00.

A8-01	Master-slave selection	Factory default	0
	Set range	0: Host; 1: Slave	

Used to select whether the inverter is a master or a slave;

For point-to-point communication, you only need to set the CANlink communication baud rate, and the communication address is automatically assigned according to the current host or slave.

A8-02	Master-slave information exchange	Factory default	011
	Set range	Units digit: Follow the slave command 0: The slave machine does not follow the host running command. 1: The slave follows the host's running command and runs the tens digit: the slave's fault information transmission 0: Slave machine fault information is not transmitted 1: Slave fault information transmission Hundreds digit: The host shows that the slave is offline. 0: The slave is offline and the host does not report a fault. 1: The slave machine goes offline and the master reports a fault (Err16)	

Note: When an abnormality occurs in the connection with the slave machine, the master machine will not report a fault when it is not running, but will report a fault (Err16) when it is running.

When the slave is under master-slave control and P0-02 is set to 2 (communication control), if the ones digit of A8-02 is set to 1, the slave will run/stop together with the host's run command.

If the tens digit of A8-02 is set to 1, when the slave fails, fault information will be sent to the host; if the hundreds digit of A8-02 is set to 1, the slave will alarm when the station is dropped.

A8-03	Host sending data function selection	Factory default	0

	Set range	0: running frequency 1: Target frequency

0: The frequency passed by the master to the slave is the operating frequency of the master. If the droop rate of P8-15 is not 0, then the frequency passed by the master to the slave is the droop control frequency. This situation is applied in droop control or speed synchronous control (i.e. The slave machine is in speed mode); in load distribution control (that is, the slave machine is in torque mode), the master transmits to the slave the operating frequency of the master. At this time, it should be ensured that the value of P8-15 is 0.

1: The target frequency passed by the master to the slave is the master's target frequency.

A8-04	Receive data zero offset	Factory default	0.00%
	Set range	-100.00% ~ 100.00%	
A8-05	Receive data gain	Factory default	1.00
	Set range	-10.00 ~ 10.00	

Modify the received data for user-defined command relationship between master and slave. When A0-00=0, A8-04 and A8-05 correct the frequency command;
When A0-00=1, A8-04 and A8-05 correct the torque command.
If the zero offset is represented by b, the gain is represented by k, the data received by the slave is represented by x, and the actually used data is represented by y, then the actually used data y = kx + b; the range is -100.00% ~ 100.00%.

A8-06	Point-to-point communication interruption detection time	Factory default	1.0s
	Set range	0.0s ~ 10.0s	

Set the host or slave communication interruption detection time for point-to-point communication. Setting it to 0 means no detection.

A8-07	Point-to-point communication host data sending cycle	Factory default	0.001 s
	Set range	0.001s ~ 10.000s	

Set the period for the host to send data during point-to-point communication.

A8-11	Windows	Factory default	0.5Hz
	Set range	0.20Hz ~ 10.00Hz	

This function code is valid during master-slave control. Setting the value can ensure that the speed of the master and the slave is synchronized within the window range.

U0 group monitoring parameter group

The U0 parameter group is used to monitor the operating status information of the inverter. Customers can view it through the panel to facilitate on-site debugging. They can also read the parameter group value through communication for host computer monitoring. The communication address is 0x7000~0x7044.

Among them, U0-00 ~ U0-31 are the running and shutdown monitoring parameters defined in P7-03 and P7-04. Please refer to Table 6-1 for specific parameter function code, parameter name and minimum unit.

U0-00	Operating frequency	Display range	0.00 ~ 500.00Hz(P0-22=2)
U0-01	Set frequency		0.00 ~ 500.00Hz(P0-22=1)

Displays the theoretical operating frequency and the absolute value of the set frequency of the inverter. For the actual output frequency of the inverter, see U0-19

U0-02	bus voltage	Display range	0.0V ~ 3000.0V

Display the inverter bus voltage value

U0-03	The output voltage	Display range	0V ~ 1140V

Display the inverter output voltage value during operation

U0-04	Output current	Display range	0.00A ~ 655.35A (Inverter power≤ 55KW) 0.0A ~ 6553.5A (Inverter power >55KW)

Display the output current value of the inverter during operation. Display the output power value of the inverter during operation. The percentage output value of the rated torque of the motor.Display the inverter output power value during operation

U0-05 U0-06	Output torque	Display range	-200.0% ~ 200.0%

Percent output value of motor rated torque

U0-07	DI input status	Display range	0 ~ 32767

Display the current DI terminal input status value. After being converted into binary data, each bit corresponds to a DI input signal. A value of 1 indicates that the input is a high-level signal, and a value of 0 indicates that the input is a low-level signal. The corresponding relationship between each bit and the input terminal is as follows:

Bit0	Bit1	Bit2	Bit3
DI1	DI2	DI3	DI4
Bit4	Bit5	Bit6	Bit7
DI5	DI6	DI7	DI8
Bit8	Bit9	Bit10	Bit11
DI9	DI10	VDI1	VDI2
Bit12	Bit13	Bit14	Bit15
VDI3	VDI4	VDI5	–

U0-08	DO output status	Display range	0 ~ 1023

Display the current DO terminal output status value. After being converted into binary data, each bit corresponds to a DO signal. If it is 1, it means the output is high level, and if it is 0, it means the output is low level. The corresponding relationship between each bit and the output terminal is as follows:

Bit0	Bit1	Bit2	Bit3
DO3	Relay 1	Relay 2	DO1
Bit4	Bit5	Bit6	Bit7
DO2	VDO1	VDO2	VDO3
Bit8	Bit9	Bit10	Bit11
VDO4	VDO5		

U0-10	AI2 voltage (V)/current (mA)	Display range	0.00V ~ 10.57V 0.00mA ~ 20.00mA

When P4-40 is set to 0, the AI2 sampling data display unit is voltage (V). When P4-40 is set to 1, the AI2 sampling data display unit is current (mA).

U0-14	Load speed display	Display range	0 ~ 65535

The displayed value is described in P7-12.

U0-15	PID setting	Display range	0 ~ 65535
U0-16	PID feedback	Display range	0 ~ 65535

Display PID setting value and feedback value, the value format is as follows: PID setting = PID setting (percentage) *PA-04 PID feedback = PID feedback (percentage) *PA-04

U0-18	PULSE input pulse frequency	Display range	0.00kHz ~ 100.00KHz

Display DI5 high-speed pulse sampling frequency, the minimum unit is 0.01KHz

U0-19	feedback speed	Display range	-320.00Hz ~ 320.00Hz -500.0Hz ~ 500.0Hz

Display the actual output frequency of the inverter

The ten-digit setting value of function code P7-12 (the number of decimal points displayed in load speed) represents the number of decimal points of U0-19/U0-29. When it is set to 2, the number of decimal points of U0-19 is 2, and the display range It is -320.00Hz ~ 320.00Hz;

When it is set to 1, the number of decimal points in U0-19 is 1, and the display range is -500.0Hz ~ 500.0Hz.

U0-20	remaining run time	Display range	0.0 ~ 6500.0 minutes

Displays the remaining running time during scheduled operation. For the introduction of scheduled operation, see the introduction of parameters P8-42 ~ P8-44.

U0-21	AI1 voltage before correction	Display range	0.000V ~ 10.570V
U0-22	AI2 voltage/current before correction	Display range	0.000V ~ 10.570V 0.000mA ~ 20.000mA
U0-23	AI3 voltage before correction	Display range	-10.570V ~ 10.570V

Displays the analog input sampled voltage/current actual value.
The actual voltage/current used has been linearly corrected to make the deviation between the sampled voltage/current and the actual input voltage/current smaller. For the actual correction voltage/current, see U0-09, U0-10, and U0-11. For the correction method, see the AC group introduction.

U0-24	Line speed	Display range	0 ~ 65535 meters/minute

Displays the linear velocity of DI5 high-speed pulse sampling in meters/minute

Calculate the linear velocity value based on the actual number of sample pulses per minute and Pb-07 (number of pulses per meter)

U0-29	Encoder feedback speed	Display range	320.00Hz ~ 320.00Hz -500.0Hz ~ 500.0Hz
U0-27	PULSE input pulse frequency	Display range	0 ~ 65535Hz

Displays the DI5 high-speed pulse sampling frequency in 1Hz. It is the same data as U0-18, only the displayed unit is different.Displays the data written through communication address 0x1000.

Displays the motor running frequency actually measured by the encoder.

U0-28	Communication settings	Display range	-100.00% ~ 100.00%

The tendigit setting value of function code P7-12 (number of decimal points displayed for load speed) represents the number of decimal points of U0-19/U0-29. When it is set to 2, the number of decimal points of U0-29 is 2, and the display range It is -320.00Hz ~ 320.00Hz;

When it is set to 1, the number of decimal points in U0-29 is 1, and the display range is -500.0Hz ~ 500.0Hz.

U0-30	Main frequency X display	Display range	0.00Hz ~ 500.00Hz

Display main frequency source X frequency setting

U0-30	Auxiliary frequency Y display	Display range	0.00Hz ~ 500.00Hz

Display auxiliary frequency Y frequency setting

U0-34	Motor temperature value	Display range	0℃ ~ 200℃

Displays the motor temperature value sampled by AI3. For motor temperature detection, see P9-56 for introduction.Display the current torque upper limit setting value

U0-35	target torque	Display range	-200.0% ~ 200.0%

U0-36	Spin position	Display range	0 ~ 4095

Display the current position signal of the resolver

U0-37	power factor angle	Display range	

Displays the current operating power factor angle

U0-38	ABZ location	Display range	0 ~ 65535

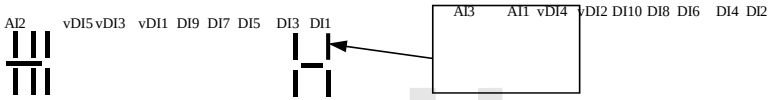
Display the current ABZ or UVW encoder AB phase pulse count

This value is the number of pulses after 4 times the frequency. If it is displayed as 4000, the actual number of pulses passed by the encoder is 4000/4=1000. When the encoder rotates forward, the value increases automatically. When the encoder rotates reversely, The value decreases automatically. When it increases to 65535, it starts counting from 0 again. When it decreases to Restart counting from 65535 at 0

Check this value to determine whether the encoder is installed normally.

When the display is running in the VF separation state, the target output voltage and the current actual output voltage VF separation are shown in the relevant introduction of the P3 group.Visually display the DI terminal status, the display format is as follows:

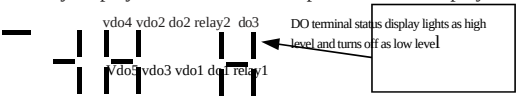
U0-41	Visual display of DI input status	Display range	-



T h e D I terminal status display lights up to high level and goes off to low level.

U0-42	DO output status intuitive display	Display range	-

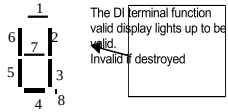
Visually display the DO terminal output status, the display format is as follows:



U0-43	Visual display of DI function status 1	Display range	

Visually display whether terminal functions 1 to 40 are valid

The keyboard has a total of 5 digital tubes. Each digital tube display can represent 8 function selection digital tubes. The definition of the digital tubes is as follows:



The digital tubes represent functions 1 ~ 8, 9 ~ 16, 17 ~ 24, 25 ~ 32, 33 ~ 40 from right to left respectively.

U0-44	Visual display of DI function status 2	Display range	-

Visually display terminal functions 41 to 59. Is the display mode similar to U0-43? The digital tubes represent functions 41 to 48, 49 to 56, 57 to 59 from right to left respectively.

U0-58	Z signal counter	Display range	0 ~ 65535

Display the current ABZ or UVW encoder Z-phase pulse count

Each time the encoder rotates forward or reverse, the corresponding value will be increased or decreased by 1. Checking this value can detect whether the encoder is installed normally.

Displays the current set frequency and operating frequency, 100.00% corresponds to the maximum frequency of the inverter (P0-10). Displays the operating status information of the inverter. The data definition format is as follows:

U0-59	Set frequency	Display range	-100.00% ~ 100.00%
U0-60	Set frequency	Display range	-100.00% ~ 100.00%

U0-61	Inverter running status	Display range	0 ~ 65535
U0-61	Bit0	0: Stop; 1: Forward rotation; 2: Reverse rotation	
	Bit1		
	Bi2	0: constant speed; 1: acceleration; 2: deceleration	
	Bit3		
	Bit4	0: Bus voltage is normal; 1: Under voltage	

U0-62	Current fault code	Display range	0 ~ 99

Display current fault code

U0-63	Point-to-point communication sends values	Display range	-100.00% ~ 100.00%
U0-64	Number of slave stations	Display range	0 ~ 63

Displays communication data when point-to-point communication is valid. U0-63 is the data value sent by the host, and U0-64 is the number of online slave stations that the master station can view.

U0-65	Torque upper limit	Display range	-200.00% ~ 200.00%

Display the current upper limit of given torque

U0-66	Communication expansion card model	Display range	Displays the communication expansion card model. Correspondence between the displayed value and the expansion card model 100: CANopen 200: Profibus-DP 300: CANlink 400: Profinet
U0-67	Communication expansion card software version number	Display range	Displays the communication expansion card version number.

U0-68	Communication expansion card inverter status	Display range	Display communication expansion card inverter status. Correspondence between Bit bits and status. bit1: running direction bit2: Whether the inverter is faulty bit3: Target frequency reached bit4~bit7: reserved bit8~bit15: fault code
U0-69	Frequency transmitted to communication expansion card	Display range	0.01Hz The frequency transmitted by the inverter to the communication expansion card, The communication expansion card feeds back information to the host computer.
U0-70	The speed transmitted to the communication expansion card	Display range	1RPM The speed transmitted by the inverter to the communication expansion card, The communication expansion card feeds back information to the host computer.
U0-71	Special current display for communication expansion card (A)	Display range	Special current display for communication card.
U0-72	Communication card error status	Display range	Error status of communication expansion card.

U0-73	Motor serial number	Display range	0: Motor 1 1: Motor 2
U0-74	Inverter output torque	Display range	-300-300%

The torque output value based on the frequency converter current is used for master-slave control in an unexpected way via CAN communication. Please select U0-74 as the torque current given by the slave machine.

Chapter 7 Fault Diagnosis and Countermeasures

•Safety Precautions

Danger

- It is strictly prohibited to perform wiring while the power is on, and be sure to keep all circuit breakers in the OFF state. Otherwise there is a

Warn

●Please ensure that the inverter is grounded in accordance with local regulations. Otherwise there is a risk of electric shock or fire.

●Do not disassemble the casing or touch the internal circuit after the inverter is powered on. Otherwise there is a risk of electric shock.

●Fault inspection must be carried out by professionals. Non-professionals are strictly prohibited from inspecting, maintaining and repairing the inverter. Otherwise there is a risk of electric shock or fire.

●When installing the inverter in a closed cabinet or chassis, please use a cooling fan or cooling air conditioner to fully cool it to keep the inlet air

Note

●When performing installation work, please cover the upper part of the inverter with cloth or paper to prevent metal chips, oil, water, etc. from drilling into the inside of the inverter. If foreign matter enters the inside of the inverter, it may cause the inverter to

•Adjustment guide before commissioning of the inverter

- Open loop vector control mode (P0-01=0 factory default value)

This control mode is used to control the speed and torque of the motor in applications where the motor does not have encoder speed feedback. In this control mode, the motor parameters need to be self-study to complete the automatic tuning of the motor parameters.

Problems and glitches	Countermeasures
An overload or overcurrent fault occurs during motor starting.	●Motor parameters (P1-01~P1-05) are set according to the motor nameplate. ●Carry out motor parameter tuning (P1-37). It is best to perform motor dynamics if conditions permit. Fully tuned.
Slow response of torque or speed below 5Hz, motor vibration	●To improve the response of torque and speed, it is necessary to strengthen the speed loop proportional adjustment (increase the setting value of P2-00 in units of 10) or reduce the speed loop integral time (decrease P2-01 in units of 0.05); If vibration occurs, it is necessary to weaken P2-00 and increase the value of P2-01 parameter.
Torque or speed response above 5Hz is slow and the motor vibrates.	●To improve the response of torque and speed, it is necessary to strengthen the speed loop proportional adjustment (increase the setting value of P2-03 in units of 10) or reduce the speed loop integral time (decrease P2-04 in units of 0.05); • If vibration occurs, it is necessary to weaken P2-03 and increase the value of P2-04 parameter.
Low speed accuracy	●When the motor load speed deviation is too large, the vector slip compensation gain needs to be increased (P2-06), increase or decrease in units of 10%.
Large speed fluctuations	●When the motor speed fluctuates abnormally, the speed filter time (P2-07) can be appropriately increased in units of 0.001s.
The motor is noisy	●Appropriately increase the carrier frequency value (P0-15) in units of 1.0KHz; (Note: Increasing the carrier frequency will increase the motor leakage current)
The motor torque is insufficient or the output is insufficient	• Whether the torque upper limit is limited, increase the torque upper limit (P2-10) in speed mode; increase the torque command in torque mode

●Closed-loop vector control mode (P0-01=1)

This mode is used in applications where the motor has encoder speed feedback. It is necessary to correctly set the number of encoder lines, encoder type and signal direction to complete the automatic tuning of the motor parameters.

Problems and glitches	Countermeasures
Overcurrent or	• Correctly set the number of encoder lines, type, and encoder

overload fault is reported at startup	direction
An overload or overcurrent fault occurs during motor rotation.	●Motor parameters (P1-01~P1-05) are set according to the motor nameplate. ●Carry out motor parameter tuning (P1-37). It is best to carry out motor parameter tuning if conditions permit. Dynamic complete tuning.

Problems and glitches	**Countermeasures**
Slow response of torque or speed below 5Hz, motor vibration	●To improve the response of torque and speed, it is necessary to strengthen the speed loop proportional adjustment (P2-00 increases the setting value in units of 10) or reduce the speed loop integral time (P2-01 • Decrease by 0.05); • If vibration occurs, the P2-00 and P2-01 parameter values need to be weakened.
Torque or speed response above 5Hz is slow and the motor vibrates.	●To improve the response of torque and speed, it is necessary to strengthen the speed loop proportional adjustment (P2-03 increases the setting value in units of 10) or reduce the speed loop integral time (P2-04 • Decrease by 0.05); • If vibration occurs, the P2-03 and P2-04 parameter values need to be weakened.
Large speed fluctuations	●When the motor speed fluctuates abnormally, the speed filter time (P2-07) can be appropriately increased in units of 0.001s.
The motor is noisy	●Appropriately increase the carrier frequency value (P0-15) in units of 1.0kHz; (Note: Increasing the carrier frequency motor leakage current will increase)
The motor torque is insufficient or the output is insufficient	●Whether the upper limit of torque is limited? Increase the upper limit of torque in speed mode (P2- 10); Increase torque command in torque mode

●V/F control mode (P0-01=2)

This mode is used in applications where the motor does not have encoder speed feedback and is not sensitive to motor parameters. It only needs to correctly set the rated voltage and rated frequency of the motor.

Problems and glitches	**Countermeasures**
Motor vibrates during operation	• Increase the oscillation suppression parameter (P3-11) in units of 10 (maximum adjustment to 100);
Overcurrent alarm at high power starting	• Reduce torque boost (P3-01), adjust in 0.5% units;

The current is too high during operation	●Correctly set the rated voltage (P1-02) and rated frequency (P1-04) of the motor; • Reduce torque boost (P3-01), adjust in 0.5% units;
The motor is noisy	●Appropriately increase the carrier frequency value (P0-15) in units of 1.0kHz; (Note: Increasing the carrier frequency motor leakage current will increase)
Sudden unloading of heavy load will report overvoltage, deceleration will report overvoltage.	●Confirm that the overvoltage stall enable (P3-23) is set to the enabled state; increase the overvoltage stall gain (P3-24/P3-25, factory default 30) in units of 10 (Maximum adjustment to 100); ●Reduce the overvoltage stall action voltage (P3-22 factory 770V), use 10V as the unit Bit reduction (minimum adjustment to 700V);
Sudden heavy load reports overcurrent, acceleration reports overcurrent	●Increase the overcurrent stall gain (P3-20 factory default 20) in units of 10 (maximum adjustment to 100); ●Reduce the overcurrent stall action current (P3-18 factory default of 150%), with 10% as the Unit reduction (minimum adjustment to 50%);

•Fault alarm and countermeasures

The following fault types may be encountered during the use of the inverter. Please refer to the following methods for simple fault analysis:

Fault name and panel display	Troubleshooting	Troubleshooting Countermeasures
acceleration overcurrent Err02	There is grounding or short circuit in the inverter output circuit.	●Troubleshoot peripheral faults and detect whether there is a short circuit in the motor or interrupt contactor
	The control mode is FVC or SVC and No parameter identification was performed	• Set the motor parameters according to the motor nameplate and identify the motor parameters.
	Rapid acceleration conditions, acceleration time setting is too short	• Increase acceleration time
	Overcurrent stall suppression setting is inappropriate	●Confirm that the overcurrent stall suppression function (P3-19) has been enabled; • ●The setting value of overcurrent stall action current (P3-18) is too large, it is recommended to adjust it within 120% to 150%; • The overcurrent stall suppression gain (P3-20) is set too small, and it is recommended to adjust it within 20 to 40;
	Manual torque boost or inappropriate V/F curve	• Adjust manual boost torque or V/F curve
	Start a rotating motor	• Select speed tracking to start or wait for the motor to stop before starting.
	subject to external interference	●Check historical fault records. If the current value at the time of fault is far from the overcurrent point, you need to find the source of interference. If there are no other interference sources, it may be a problem with the driver board or Hall device.
Deceleration overcurrent Err03	There is grounding or short circuit in the inverter output circuit.	• Troubleshoot peripheral faults and detect whether the motor is short-circuited or open-circuited
	The control mode is FVC or SVC and no parameter identification is performed.	• Set the motor parameters according to the motor nameplate and identify the motor parameters.
	Rapid deceleration condition, deceleration time setting is too short	• Increase deceleration time

	Overcurrent stall suppression setting is inappropriate	●Confirm that the overcurrent stall suppression function (P3-19) has been enabled; ●The setting value of overcurrent stall action current (P3-18) is too large, it is recommended to adjust it within 120% to 150%; ●The overcurrent stall suppression gain (P3-20) is set too small, and it is recommended to adjust it within 20 to 40;
	No braking unit and braking resistor installed	• Install braking unit and resistor
	subject to external interference	●Check historical fault records. If the current value at the time of fault is far from the overcurrent point, you need to find the source of interference. If there are no other interference sources, it may be a problem with the driver board or Hall device.

Fault name and panel display	**Troubleshooting**	**Troubleshooting Countermeasures**
Constant speed overcurrent Err04	The inverter output circuit exists Ground or short circuit	• Troubleshoot peripheral faults and detect whether the motor is short-circuited or open-circuited
	The control mode is FVC or SVC and no parameter identification is performed.	• Set the motor parameters according to the motor nameplate and identify the motor parameters.
	Overcurrent stall suppression setting is inappropriate	●Confirm that the overcurrent stall suppression function (P3-19) has been enabled; ●The setting value of overcurrent stall action current (P3-18) is too large, it is recommended to adjust it within 120% to 150%; ●The overcurrent stall suppression gain (P3-20) is set too small, it is recommended to adjust it within 20 to 40
	Inverter selection is too small	• Under stable operating conditions, if the operating current exceeds the rated current of the motor or the rated output current of the inverter, please select an inverter with a larger power level.
	subject to external interference	●Check historical fault records. If the current value at the time of fault is far from the overcurrent point, you need to find the source of interference. If there are no other sources of interference, it is possible It's a problem with the driver board or Hall device.
	Input voltage is too high	• Adjust voltage to normal range

acceleration overvoltage Err05		• Cancel the external power or install a braking resistor
	Overvoltage suppression setting is inappropriate	●Confirm that the overvoltage suppression function (P3-23) has been enabled; ●The overvoltage suppression action voltage (P3-22) setting value is too large, and it is recommended to adjust it within 770V~700V; ●The overvoltage suppression gain (P3-24) is set too small, it is recommended to be between 30 and Adjust within 50;
	No braking unit and braking resistor installed	• Install braking unit and resistor
	Acceleration time too short	• Increase acceleration time
Deceleration overvoltage Err06	Overvoltage suppression setting is inappropriate	●Confirm that the overvoltage suppression function (P3-23) has been enabled; • ●The overvoltage suppression action voltage (P3-22) setting value is too large, and it is recommended to adjust it within 770V~700V; • The overvoltage suppression gain (P3-24) is set too small, and it is recommended to adjust it within 30 to 50;
	During the deceleration process, there is an external force that drives the motor to run.	• Cancel the external power or install a braking resistor
	Deceleration time too short	• Increase deceleration time
	No braking unit and braking resistor installed	• Install braking unit and resistor

Fault name and panel display	Troubleshooting	Troubleshooting Countermeasures
Constant speed overvoltage Err07	Overvoltage suppression setting is inappropriate	●Confirm that the overvoltage suppression function (P3-23) has been enabled; ●The overvoltage suppression action voltage (P3-22) setting value is too large, and it is recommended to adjust it within 770V~700V; ● ●The overvoltage suppression frequency gain (P3-24) is set too small, and it is recommended to adjust it within 30 to 50; ● The maximum rising frequency of overvoltage suppression (P3-26) is set too small, and it is recommended to adjust it within 5~20Hz;
	During operation, there is an external force that drives the motor to run.	● Cancel the external power or install a braking resistor
Buffer power failure Err08	The bus voltage fluctuates up and down at the undervoltage point	● Seek technical support
Undervoltage fault Err09	momentary power outage	●Enable non-stop function after instantaneous power failure (P9-59) to prevent instantaneous power outage and undervoltage faults
	The input voltage of the frequency converter is not within the specification requirements. range	● Adjust voltage to normal range
	Bus voltage is abnormal	● Seek technical support
	Rectifier bridge, snubber resistor, driver board, control board are abnormal	● Seek technical support
Frequency converter overload Err10	load too large or the motor is stalled	● Reduce load and check motor and mechanical conditions
	Inverter selection is too small	● Choose an inverter with a larger power level

Motor overload Err11	Is the setting of motor protection parameter P9-01 appropriate?	• Set this parameter correctly
	Is the load too large or the motor is stalled?	• Reduce load and check motor and mechanical conditions
Input phase loss Err12	The three-phase input power supply is abnormal.	• Check and eliminate problems in peripheral lines
	The driver board, lightning protection board, main control board, and rectifier bridge are abnormal.	• Seek technical support
Output phase loss Err13	Motor failure	• Check whether the motor is open circuit
	The lead wire from the inverter to the motor is abnormal.	• Troubleshoot peripheral problems
	The three-phase output of the inverter is unbalanced when the motor is running.	• Check whether the three-phase windings of the motor are normal and troubleshoot
	Abnormality of driver board and IGBT module	• Seek technical support

Fault name and panel display	Troubleshooting	Troubleshooting Countermeasures
Module overheated Err14	Ambient temperature is too high	• Lower ambient temperature
	Air duct blocked	• Clean the air duct
	Fan damaged	• Replace fan
	Module thermistor is damaged	● Seek manufacturer service
	The inverter module is damaged	● Seek manufacturer service
External device failure Err15	Input external fault signal through multi-function terminal DI	●Troubleshoot peripheral faults and confirm that the machine is allowed to restart (P8-18), reset operation
	Input signal of external fault via virtual IO function	● Confirm that the virtual IO group parameters of group A1 are set correctly and run after reset.
communication fail Err16	The host computer is not working properly	● Check the host computer wiring
	Communication line is abnormal	● Check communication cable
	Communication expansion card P0-28 setting is incorrect	● Correctly set the communication expansion card type
	Communication parameter PD group setting is incorrect	● Correctly set communication parameters
	If the fault still cannot be eliminated after the above detection is completed, you can try to restore the factory settings.	
Contactor failure Err17	Abnormality of driver board and power supply	● Seek manufacturer service
	Contactor abnormality	● Seek manufacturer service
	Lightning protection board abnormality	● Seek manufacturer service
Current detection failure Err18	Check for abnormality of Hall device	● Seek manufacturer service
	Abnormal driver board	● Seek manufacturer service
Motor tuning failure Err19	Motor parameters are not set according to the nameplate	● Correctly set the motor parameters according to the nameplate
	Parameter identification process timed out	● Check the inverter to motor leads
		● Check whether the encoder line number setting is correct. P1-27. Check whether the encoder signal line connection is correct and firm.

Encoder failure Err20	Encoder model does not match	● Correctly set the encoder type according to actual conditions
	Encoder connection error	● Check PG card power supply and phase sequence
	Encoder damaged	● Replace encoder
	PG card abnormality	● Replace PG card
EEPROM Read and write failure Err21	EEPROM chip damaged	Seek manufacturer service

Fault name and panel display	Troubleshooting	Troubleshooting Countermeasures
Short circuit fault to ground Err23	Motor short circuit to ground	Replace cable or motor
Cumulative running time reached fault Err26	The cumulative running time reaches the set value	Use parameter initialization function to clear record information
User defined fault 1 Err27	Input the signal of user-defined fault 1 through the multi-function terminal DI	Reset operation
	Signal input for user-defined fault 1 via virtual IO function	Reset operation
User defined fault 2 Err28	Input the signal of user-defined fault 2 through the multi-function terminal DI	Reset operation
	Signal input for user-defined fault 2 via virtual IO function	Reset operation
Accumulated power-on time reached fault Err29	The cumulative power-on time reaches the set value	Use parameter initialization function to clear record information

load loss fault Err30	The operating current of the inverter is less than P9-64	Confirm whether the load is detached or whether the parameter settings of P9-64 and P9-65 comply with the actual operating conditions.
PID feedback loss failure during operation Err31	PID feedback is less than PA-26 setting value	Check the PID feedback signal or set PA-26 to an appropriate value
PID Low limit alarm Err32	PID feedback is less than PE-15 setting value	2).Set PE-15 to an appropriate value
PID High limit alarm Err33	PID feedback is greater than the PE-13 setting value	● Set PE-13 to an appropriate value
Water shortage alarm Err34	Operating frequency is higher than PE-09 and output current is lower than PE-11	● Set PE-08 and PE-11 to an appropriate value
	Operating frequency is higher than PE-09 and feedback pressure is lower than PE-08	
Wave current limiting fault Err40	Whether the load is too large or the motor is stalled	Reduce load and check motor and mechanical conditions
	Inverter selection is too small	Choose an inverter with a larger power level

Fault name and panel display	Troubleshooting	Troubleshooting Countermeasures
Switching motor failure while running Err41	Change the current motor selection through the terminals while the frequency converter is running	● Carry out motor switching operation after the inverter is stopped.
Excessive speed deviation fault Err42	Encoder parameter setting is incorrect	Correctly set encoder parameters
	No parameter identification was performed	● Perform motor parameter identification
	Excessive speed deviation detection parameters P9-69 and P9-70 are set	Perform motor parameter identification

	unreasonably	
Motor overspeed fault Err43	Encoder parameter setting is incorrect	4)Correctly set encoder parameters
	No parameter identification was performed	c) Perform motor parameter identification
	The settings of motor overspeed detection parameters P9-67 and P9-68 are unreasonable.	3 Reasonably set detection parameters according to actual conditions
Motor over temperature fault Err45	Temperature sensor wiring is loose	3 Check temperature sensor wiring and troubleshoot
	Motor temperature is too high	• Increase the carrier frequency or take other heat dissipation measures to heat the motor
Master-slave control slave failure Err55	The slave machine fails, check the slave machine	• Troubleshoot according to the slave machine fault code

•Common faults and solutions

serial number	Fault phenomenon	Possible Causes	Approach
1	No display after power on	The grid voltage is not available or too low	9) Check input power
		Switching power supply failure on the inverter drive board	●Check 24V and 10V on the control board Is the output voltage normal?
		The connection between the control board, drive board and keyboard is broken	• Re-plug the 8-core and 34-core cables
		The inverter buffer resistor is damaged	• Seek manufacturer service
		Control panel and keyboard failure	
		Rectifier bridge damaged	
2	Always displays when power on -A-C-	The connection between the drive board and the control board is in poor contact.	2 Re-plug the 8-core and 28-core cables
		Related components on the control board are damaged	• Seek manufacturer service
		The motor or motor wire has a short	

		circuit to ground.	
		Hall failure	
		Grid voltage is too low	

	Fault phenomenon	Possible Causes	Approach
3	Power on display alarm displayErr23	The motor or output line is short-circuited to ground.	• Use a megger to measure the insulation of the motor and output lines
		The inverter is damaged	**14)** Seek manufacturer service
4	The frequency converter displays normally after powering on, and displays after running -A-C- and shut down immediately	The fan is damaged or blocked	◆Replace fan
5	Frequently reports Err14 (module overheating) Barrier Err14	Carrier frequency set too high	◆Reduce carrier frequency (P0-15)
6	The motor does not rotate after the inverter is running.	The fan is damaged or the air duct is blocked	◆Replace the fan and clean the air duct
		The internal components of the inverter are damaged (heat sensitive resistor or other)	◆Seek manufacturer service
		Poor contact between the drive board and the control board	◆unplug and plug the cable again and make sure the connection is secure
		Driver board failure	◆Seek manufacturer service
7	DI terminal failure	Parameter setting error	◆Check and reset related parameters of P4 group
		External signal error	◆Reconnect the external signal cable
		OP and +24V jumper loose	◆Reconfirm the OP and +24V jumpers and ensure they are tight
		Control board failure	◆Seek manufacturer service
	During closed-	Encoder failure	◆Replace the code wheel and reconfirm

8	loop vector control, the motor speed cannot be increased.		the wiring
		The encoder is wrongly connected or has poor contact.	◆Rewire and ensure good contact
9	The frequency converter frequently reports overcurrent and overvoltage faults	Motor parameter settings are incorrect	◆Reset motor parameters or perform motor tuning
		Acceleration and deceleration time is inappropriate	◆Set appropriate acceleration and deceleration time
			Seek manufacturer service
10	Err17 when powering on (or running)	The soft start contactor is not closed	B Check whether the contactor cable is loose C Check whether the contactor is faulty D Check whether the contactor 24V power supply is faulty E Seek manufacturer service

Chapter 9 Communication Protocol

7.1A600 communication data address definition

A600 series inverters support four communication protocols: Modbus-RTU, CANopen, CANlink, and Profibus-DP. User programmable cards and point-to-point communication are derivatives of the CANlink protocol. The host computer can control, monitor and modify the functional parameters of the inverter through these communication protocols.

A600 communication data can be divided into function code data and non-function code data. The latter includes running commands, running status, running parameters, alarm information, etc.

- A600 **function code data**

function code The data are important setting parameters of the inverter. A600 adds group A functional parameters as follows:

A600 function code data	Group P (readable and writable)	P0、P1、P2、P3、P4、P5、P6、P7、P8、P9、PA、PB、PC、Pd、PE、PF
	Group A (readable and writable)	A0、A1、A2、A3、A4、A5、A6、A7、A8、A9、AA、AB、AC、AD、AE、AF

function code data communication address is defined as follows: 1. When reading function code data for communication
For the function code data of groups F0~FF and A0~AF, the high sixteen bits of the communication address are directly the function group number, and the low sixteen bits are directly the serial number of the function code in the function group. For example:
F0-16 function parameter, its communication address is F010H, where F0H represents the F0 group function parameter, 10H represents the hexadecimal data format of the function code serial number 16 in the function group
AC-08 function parameter, its communication address is AC08, where ACH represents the AC group function parameter, 08H represents the hexadecimal data format of the function code serial number 8 in the function group
2. When writing function code data for communication
For the function code data of the F0~FF group, the upper sixteen bits of the communication address are divided into 00~0F or F0~FF according to whether it is written to EEPROM. The lower sixteen bits are directly the serial number of the function code in the function group. For example, as follows :
Write function parameters F0-16
When there is no need to write to EEPROM, its communication address is 0010H. When it is necessary to write to EEPROM, its communication address is F010H.
For the A0~AF group function code data, the upper sixteen bits of the communication address are divided into 40~4F or A0~AF according to whether it needs to be written to EEPROM. The lower sixteen bits are directly the serial number of the function code in the function group.

A600 **•A600 non-function code data**

A600 non-function code data	status data (read only)	Group U monitoring parameters, inverter fault description, inverter operating status
	Control parameters (just write)	Control commands, communication setting values, digital output terminal control, analog output AO1 control, Analog output AO2 control, high-speed pulse (FMP) output control, parameter initialization

1、Status data

The status data is divided into group U monitoring parameters, inverter fault description, and inverter operating status. Group U parameter monitoring parameters. For the description of group U monitoring data, see the relevant descriptions in Chapters 5 and 6.
Its address is defined as follows:

U0~UF, the high sixteen bits of its communication address are 70~7F, and the low sixteen bits are the serial number of the monitoring parameter in the group, for example: U0-11, its communication address is 700BH

Frequency converter fault description

When reading the inverter fault description through communication, the communication address is fixed at 8000H. By reading this address data, the host computer can obtain the current inverter fault code. For the fault code description, see the definition in P9-14 function code in Chapter 5.

Inverter running status

When reading the running status of the frequency converter through communication, the communication address is fixed at 3000H. By reading this address data, the host computer can obtain the current running status information of the frequency converter, which is defined as follows:

Frequency converter running status communication address	Read status word definition
3000H	1: Forward running
	2: Reverse operation
	3: Shutdown

2. Control parameters

The control parameters are divided into control commands, digital output terminal control, analog output AO1 control, analog output AO2 control, and high-speed pulse (FMP) output control control commands. When P0-02 (command source) is selected as 2: communication control, the host computer can control the start and stop of the inverter and other related commands through this communication address. The control command is defined as follows:

Control command communication address	Command function
2000H	1: Forward running
	2: Reverse operation
	3: forward jog
	4: Reverse jog
	5: Free shutdown
	6: Deceleration and stop
	7: Fault reset

Communication settings:

The main user of the communication setting value is the frequency source, torque upper limit source, VF separation voltage source, PID given source, PID feedback source, etc. selected as the given data in the communication given in A600. Its communication address is 1000H. When the host computer sets the communication address value, its data range is - 10000~10000, corresponding to the relative given value - 100.00%~100.00%

Digital output terminal control:

When the digital output terminal function is selected as 20: communication control, the host computer can control the digital output terminals of the frequency converter through this communication address, which is defined as follows:

Digital output terminal control communication address	Command content
2001H	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

Analog output AO1, AO2, high-speed pulse output FMP control

When the analog output AO1, AO2, high-speed pulse output FMP output function is selected as 12: communication setting, the host computer can control the analog quantity and high-speed pulse output of the frequency converter through this communication address, which is defined as follows:

Output control communication address		Command content
AO1	2002H	0 ～ 7FFF indicates 0％～ 100％
AO2	2003H	
FMP	2004H	

Parameter initialization

This function needs to be used when the parameter initialization operation of the frequency converter needs to be implemented through the host computer.

If PP-00 (user password) is not 0, you first need to perform password verification through communication. After the verification passes, the host computer will initialize parameters within 30 seconds.

The communication address for user password verification is 1F00H. Directly write the correct user password to this address to complete the password verification.

The address for communication parameter initialization is 1F01H, and its data content is defined as follows:

Parameter initialization communication address	Command function
1F01H	1: Restore factory parameters
	2: Record information clearly
	4: Restore user backup parameters
	501: Back up user's current parameters

7.5 A600Modbus communication protocol

A600 series inverters provide RS485 communication interface and support Modbus-RTU slave communication protocol. Users can achieve centralized control through computers or PLC, set the inverter operating commands through this communication protocol, modify or read function code parameters, and read the working status and fault information of the inverter.

- **Agreement**

This serial communication protocol defines the information content and usage format transmitted in serial communication. These include: host polling (or broadcast) format; host encoding method, including: function code requiring actions, transmission data and error checking, etc. The slave's response also adopts the same structure, including: action confirmation, return data and error checking, etc. If an error occurs when the slave receives information, or it cannot complete the action required by the host, it will organize a fault message as a response and feed it back to the host.

•Application method

The frequency converter is connected to the "single master multiple slaves" PC/PLC control network with RS485 bus as a communication slave.

•Bus structure

5Hardware interface

The RS485 expansion card MD38TX1 hardware needs to be inserted into the inverter.

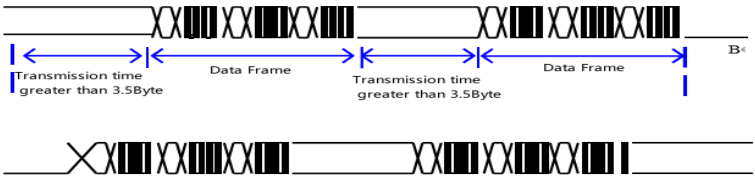
6Topology

Single master multi-slave system. Each communication device in the network has a unique slave address. One of the devices serves as the communication host (usually a flat PC host computer, PLC, HMI, etc.), actively initiates communication, and performs parameter reading or writing operations on the slave. Other devices are communication slaves, responding to the host's inquiries or communication operations on this machine. Only one device can send data at the same time, while other devices are in receiving state.

The Set range of the slave address is 1~247, 0 is the broadcast communication address. Slave addresses in the network must be unique.

7 Communication transmission methods

Asynchronous serial, half-duplex transmission mode. During the serial asynchronous communication process, data is sent one frame at a time in the form of messages. The MODBUS-RTU protocol stipulates that when the idle time without data on the communication data line is greater than the transmission time of 3.5Byte, it indicates a new The beginning of the communication frame.



The built-in communication protocol of the A600 series inverter is the Modbus-RTU slave communication

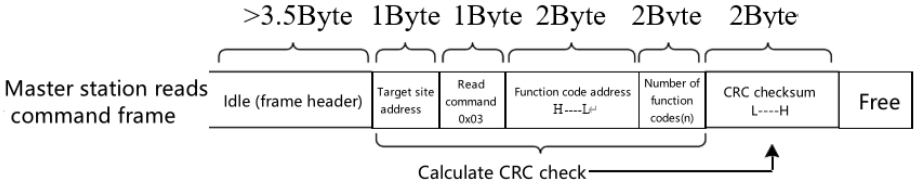
protocol, which can respond to the "query/command" of the host, or take corresponding actions according to the "query/command" of the host, and communicate data responses.

The host can refer to a personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc. The host can both

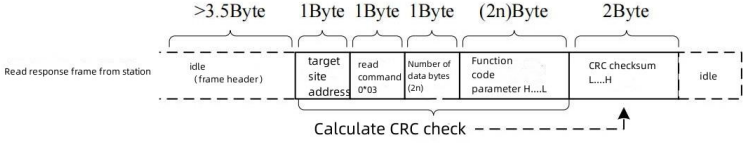
A slave communicates alone and can also publish broadcast information to all subordinate slaves. For the host's separate access "query/command", the accessed slave must return a response frame; for the broadcast information sent by the host, the slave does not need to feedback a response to the host.

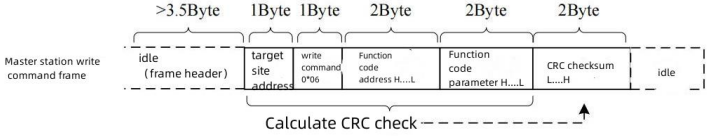
•Communication data structure

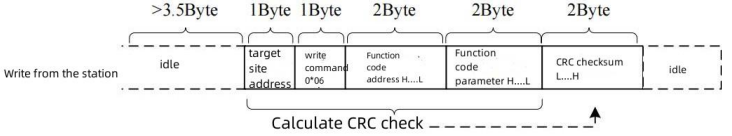
The Modbus-RTU protocol communication data format of the A600 series inverter is as follows. The inverter only supports reading or writing of Word type parameters, and the corresponding communication read operation command is Ox03; the write operation command is 0x06, and does not support the reading and writing of bytes or bits. operate:



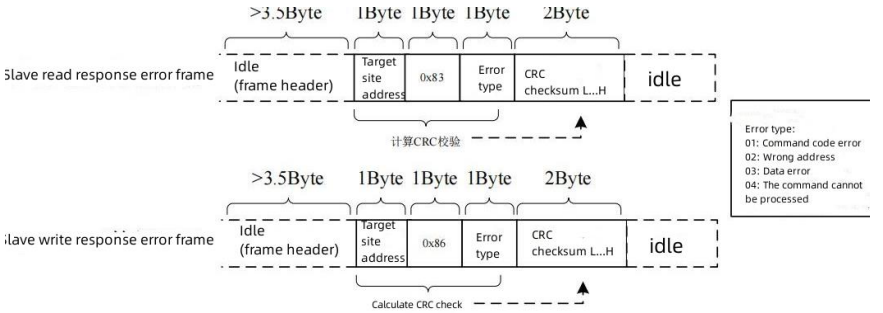
Theoretically, the host computer can read several consecutive function codes at one time (that is, n can reach up to 12), but be careful not to cross the last function code of this function code group, otherwise an error will be returned.







If the slave detects a communication frame error or fails to read or write due to other reasons, it will reply with an error frame.



Data frame field description:

Frame header START	Idle greater than 3.5 character transmission time
Slave address ADR	Communication address range: 1 ~ 247; 0 = broadcast address
Command code CMD	03: Read slave parameters; 06: Write slave parameters
function code address H	The internal parameter address of the frequency converter is expressed in hexadecimal; it is divided into function code type and non-function code type (such as running status parameters, running commands, etc.) parameters, etc. See the address definition for details. When transmitting, the high byte comes first and the low byte comes last.
function code address L	
Number of function codes H	The number of function codes read in this frame. If it is 1, it means reading 1 function code. When transmitting, the high byte comes first and the low byte comes last. This protocol can only rewrite 1 function code at a time and does not have this field.
Number of function codes L	
Data H	The response data, or the data to be written, is transmitted with the high byte first and the low byte last.
Data L	
CRC CHK low bit	Detection value: CRC16 check value. When transmitting, the low byte comes first and the high byte comes last. For details on the calculation method, see the description of CRC check in this section.
CRC CHK high bit	
END	3.5 characters

CRC check method:RC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection field based on the CRC method. The CRC field checks the contents of the entire message. The CRC field is two bytes containing a 16-bit binary value. It is calculated by the transmitting device and added to the message. The receiving device recalculates the CRC of the received message and compares it with the value in the received CRC field. If the two CRC values are not equal, there is an error in the transmission.

The CRC is first stored in 0xFFFF, and then a procedure is called to process the consecutive 8-bit bytes in the message with the value in the current register. Only the 8Bit data in each character is valid for CRC, the start bit, stop bit and parity bit are invalid.

During the CRC generation process, each 8-bit character is XORed individually with the register content, the result is moved in the direction of the least significant bit, and the most significant bit is filled with 0s. The LSB is extracted and detected. If the LSB is 1, the register is XORed individually with the preset value.If LSB is 0, do not proceed. The entire process is repeated 8 times. After the last bit (bit 8) is completed, the next 8-bit byte is XORed individually with the current value of the register. The value in the final register is the CRC value

after all bytes in the message have been executed.

When the CRC is added to a message, the low byte is added first, then the high byte. The simple function of CRC is as follows:

```
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 parameters

Read and write function code parameters (some function codes cannot be changed and are only for manufacturer use or monitoring):

- **function code parameter address marking rules**

Use the function code group number and label as the parameter address to express the rule:
High byte: P0~PF (Group P), A0~AF (Group A), 70~7F (Group U) Low byte: 00~FF
For example: if you want to access function code P3-12, the access address of function code is expressed as 0xF30C; Note: PF group: parameters can neither be read nor changed; U group: parameters can only be read and cannot be changed.
Some parameters cannot be changed when the inverter is running; some parameters cannot be changed no matter what state the inverter is in; When changing function code parameters, pay attention to the parameter range, unit, and related instructions.

function code group number	Correspondence access address	Communication modifies the function code address in RAM
P0 ~ PE group	0xF000 ~ 0xFEFF	0x0000 ~ 0x0EFF
A0 ~ AC group	0xA000 ~ 0xACFF	0x4000 ~ 0x4CFF
U0 group	0x7000 ~ 0x70FF	

Note that since the EEPROM is frequently stored, the service life of the EEPROM will be reduced. Therefore, some function codes do not need to be stored in communication mode, and only the value in RAM can be changed.

If group P parameters are used, to implement this function, just change the high-order F of the function code address to 0. If it is a group A parameter, to implement this function, just change the high-order A of the function code address to 4. The corresponding function code address is expressed as follows:

High byte: 00~0F (P group), 40~4F (A group) low byte: 00~FF such as:

Function codeP3-12 is not stored in EEPROM, and the address is expressed as 030C; function codeA0-05 is not stored in EEPROM, and the address is expressed as 4005;

This address means that the RAM can only be written and cannot be read. When reading, it is an invalid address. For all parameters, command code 07H can also be used to implement this function.

Shutdown/operation parameter section:

Parameter address	Parameter Description	Parameter address	Parameter Description
1000H	* Communication setting value (decimal) –10000 to 10000	1010H	PID settings
1001H	Operating frequency	1011H	PID feedback
1002H	bus voltage	1012H	PLC steps
1003H	The output voltage	1013H	PULSE input pulse frequency, unit 0.01kHz
1004H	Output current	1014H	Feedback speed, unit 0.1Hz
1005H	Output Power	1015H	remaining run time
1006H	Output torque	1016H	AI1 voltage before correction
1007H	Running speed	1017H	AI2 voltage before correction
1008H	DI input flag	1018H	AI3 voltage before correction
1009H	DO output flag	1019H	Line speed
100AH	AI1 voltage	101A	Current power-on time

		H	
100BH	AI2 voltage	101B H	Current running time
100CH	AI3 voltage	101C H	PULSE input pulse frequency, unit 1Hz
100DH	Count value input	101D H	Communication settings
100EH	Length value input	101E H	actual feedback speed
100FH	load speed	101F H	Main frequency X display
–	–	1020H	Auxiliary frequency Y display

* Notice:

The communication setting value is a percentage of the relative value, 10000 corresponds to 100.00%, and -10000 corresponds to -100.00%.

For frequency dimension data, the percentage is relative to the maximum frequency (F0-10); for torque dimension data, the percentage is P2-10 and A2-48 (torque upper limit digital setting, respectively corresponding to the One and two motors).

Control command input to the inverter: (write only)

Command word address	Command function
2000H	0001：Forward running
	0002：reverse run
	0003：forward jog
	0004：Reverse jog
	0005：Free shutdown
	0006：Deceleration to stop
	0007：Fault reset

Read inverter status: (read only)

Status word address	Status word function
3000H	0001：Forward running
	0002：reverse run
	0003：shutdown

Parameter lock password verification: (if the return value is 8888H, it means the password verification is passed)

password address	Enter password content
1F00H	*****

Digital output terminal control: (write only)

command address	Command content
2001H	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

Analog output AO1 control: (write only)

command address	Command content
2002H	0 ~ 7FFF indicates 0% ~ 100%

Analog output AO2 control: (write only)

command address	Command content
2003H	0 ~ 7FFF indicates 0% ~ 100%

Pulse (PULSE) output control: (write only)

command address	Command content
2004H	0 ~ 7FFF indicates 0% ~ 100%

Frequency converter fault description:

Inverter fault address	Frequency converter fault information	
8000H	0000: No fault 0001: Reserved 0002: Acceleration overcurrent 0003: Deceleration overcurrent 0004: Constant speed overcurrent 0005: Acceleration overvoltage 0006: Deceleration overvoltage 0007: Constant speed overvoltage 0008: Buffer resistor overload fault 0009: Undervoltage fault 000A: Inverter overload 000B: Motor overload 000C: Input phase loss 000D: Output phase loss 000E: Module overheating 000F: External fault 0010: Communication abnormality 0011: Contactor abnormality 0012: Current detection failure 0013: Motor tuning failure 0014: Encoder/PG card failure	0015: Parameter reading and writing exception 0016: Inverter hardware failure 0017: Motor to ground short circuit fault 0018: Reserved 0019: Reserved 001A: Running time arrives 001B: User-defined fault 1 001C: User-defined fault 2 001D: Power on time arrived 001E: Load drop 001F: PID feedback lost during runtime 0028: Fast current limit timeout fault 0029: Switching motor failure during operation 002A: Speed deviation is too large 002B: Motor over speed 002D: Motor over temperature 005A: Encoder line number setting error 005B: Encoder not connected 005C: Initial position error 005E: Speed feedback error

7.3 Pd group communication parameter description

	baud rate	Factory default	5005
		Units digit: MODBUS baud rate	

Pd-00	Set range	0：300BPS	5：9600BPS
		1：600BPS	6：19200BPS
		2：1200BPS	7：38400BPS
		3：2400BPS	8：57600BPS
		4：4800BPS	9：115200BPS

This parameter is used to set the data transmission rate between the host computer and the inverter. Note that the baud rate set by the host computer and the inverter must be consistent, otherwise, communication cannot be carried out. The larger the baud rate, the faster the communication speed.

Pd-01	Data Format	Factory default	0
	Set range	0: No verification: data format <8,N,2> 1: Even test: data format <8,E,1> 2: Odd parity: data format <8,O,1> 3: No verification: data format <8-N-1>	

The data format set by the host computer and the inverter must be consistent, otherwise, communication cannot be carried out.

Pd-02	Local address	Factory default	1
	Set range	1~247, 0 is the broadcast address	

When the local address is set to 0, it is the broadcast address, realizing the broadcast function of the host computer.

The local address is unique (except the broadcast address), which is the basis for realizing point-to-point communication between the host computer and the inverter.

Pd-03	response delay	Factory default	2ms
	Set range	0~20ms	

Response delay: refers to the interval between the end of the inverter's data reception and the sending of data to the host computer. If the response delay is less than the system processing time, the response delay shall be based on the system processing time. If the response delay is longer than the system processing time, the system will delay waiting until the response delay time is up before sending data to the host computer after processing the data. send data.

Pd-04	Communication timeout	Factory default	0.0 s
	Set range	0.0 s (invalid); 0.1~60.0s	

When the function code is set to 0.0 s, the communication timeout parameter is invalid.

When the function code is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout, the system will report a communication failure error (Err16). Normally, it is set to invalid. If you are in a system with continuous communication, you can set secondary parameters to monitor the communication status.

Pd-05	Data transfer format selection	Factory default	3 1
	Set range	Units digit: Mondbus 0: Non-standard Modbus-RTU protocol; 1: Standard Modbus-RTU protocol Ten digits: Profibus-DP, CANopen, Profinet, EtherCAT 0: PP01 format 1: PP02 format 2: PP03 format 3: PP05 format	

Pd-05=31: Select the standard Modbus protocol.

Pd-05=30: When reading the command, the number of bytes returned by the slave is one more byte than the standard Modbus protocol. For details, please refer to the "Communication Data Structure" section of this protocol.

Pd-06	Communication reading current resolution	Factory default	0
	Set range	0：0.01A；1：0.1A	

Used to determine the output unit of the current value when the communication reads the output current.

Appendix B Braking resistor and braking unit selection

4.1 Selection of braking resistor resistance

During braking, almost all the regenerative energy of the motor is consumed in the braking resistor. According to the formula:

$$U \times U/R = Pb$$

U-braking voltage for stable braking of the system (U value is different for different systems, 380Vac system generally takes 700V); Pb-braking power

4.1 Selection of braking resistor power

Theoretically, the power of the braking resistor is the same as the braking power, but the derating is considered to be 70%.

According to the formula:

$$0.7 \times Pr = Pb \times D$$

Pr-power of resistor;

D-braking frequency, that is, the proportion of the regeneration process in the entire working process.

Common applications	elevator	Unwinding and unwinding	centrifuge	accidental braking load	General occasions
Braking frequency value	20% ~30%	20 ~30%	50%~60%	5%	10%

Table 1 is guidance data. Users can choose different resistor values and powers according to the actual situation (but the resistance must not be less than the recommended value in the table, and the power can be larger.) The selection of the braking resistor needs to be based on the motor power generation in the actual application system. Determining the power is related to the system inertia, deceleration time, potential energy load, etc. The customer needs to choose according to the actual situation. The greater the inertia of the system, the shorter the deceleration time required, and the more frequent the braking, the larger the power and the smaller the resistance of the braking resistor need to be.

Inverter model	Recommended power of braking resistor	Recommended resistance value of braking resistor	Braking unit	Remark
Single phase 220V				
A600-R40G1	80W	≥ 200Ω	Standard built-in	No special instructions
A600-R70G1	80W	≥ 150Ω		
A600-1R5G1	100W	≥ 100Ω		

A600-2R2G1	100W	≥ 70Ω		
Three phase 220V				
A600-R40G2	150W	≥ 150Ω	Standard built-in	No special instructions
A600-R75G2	150W	≥ 110Ω		
A600-1R5G2	250W	≥ 100Ω		
A600-2R2G2	300W	≥ 65Ω		
A600-4R0G2	400W	≥ 45Ω		

Inverter model	Recommended power of braking resistor	Recommended resistance value of braking resistor	Braking unit	Remark
Three phase 220V				
A600-5R5G2	800W	≥ 22Ω	Standard built-in	No special instructions
A600-7R5G2	1000W	≥ 16Ω		
A600-011G2	1500W	≥ 11Ω	Standard built-in	Add B after the inverter model number
A600-015G2	2500W	≥ 8Ω		
A600-018G2	3.7 kW	≥ 6.7Ω	External	ACBUN-45
A600-022G2	4.5 kW	≥ 6.7Ω	External	ACBUN-45
A600-030G2	5.5 kW	≥ 5Ω	External	ACBUN-60
A600-037G2	7.5 kW	≥ 3.3Ω	External	ACBUN-90
A600-045G2	4.5 kW×2	≥ 5Ω×2	External	ACBUN-60×2
A600-055G2	5.5 kW×2	≥ 5Ω×2	External	ACBUN-60×2
A600-075G2	16kW	≥ 3.3Ω×2	External	ACBUN-90×2
Three phase380V				
A600-1R5G4	150W	≥ 220Ω		
A600-2R2G4	250W	≥ 200Ω		
A600-3R0G4	300W	≥ 150Ω		
A600-4R0G4	300W	≥ 130Ω		
A600-5R5G4	400W	≥ 90Ω		
A600-7R5G4	500W	≥ 65Ω		

A600-011G4	800W	≥ 43Ω		
A600-015G4	1000W	≥ 32Ω		
A600-018G4	1300W	≥ 25Ω		
A600-022G4	1500W	≥ 22Ω		
A600-030G4	2500W	≥ 16Ω		
A600-037G4	3.7 kW	≥ 12.6Ω		
A600-045G4	4.5 kW	≥ 9.4Ω	External	MDBUN-60-T
A600-055G4	5.5 kW	≥ 9.4Ω	External	MDBUN-60-T
A600-075G4	7.5 kW	≥ 6.3Ω	External	MDBUN-90-T
A600-090G4	4.5 kW×2	≥ 9.4Ω×2	External	MDBUN-60-T×2
A600-110G4	5.5 kW×2	≥ 9.4Ω×2	External	MDBUN-60-T×2

Appendix C Warranty Agreement

4 The warranty period of this product is 18 months (based on the barcode information on the fuselage). During the warranty period, if the product fails or is damaged under normal use in accordance with the user manual, our company will be responsible for free repairs.

5 During the warranty period, if damage occurs due to the following reasons, a certain maintenance fee will be charged:

5.1 Machine damage caused by errors in use and unauthorized repairs and modifications;

5.2 Machine damage caused by fire, flood, voltage abnormality, other natural disasters and secondary disasters;

5.3 Hardware damage caused by human falling and transportation after purchase;

5.4 Machine damage caused by not operating according to the product user manual provided by our company;

5.5 Failures and machine damage caused by failures other than the machine (such as external equipment factors).。

6 When the product malfunctions or is damaged, please fill in the "Product Warranty Card" correctly and in detail.。

7 If you have any questions during the service process, please contact our after-sales service center in time.

Warranty Card

<table>
<tr><td rowspan="4">Customer Information</td><td colspan="2">Company name:：</td></tr>
<tr><td colspan="2">Company address：</td></tr>
<tr><td colspan="2">Contact person：</td></tr>
<tr><td colspan="2">Contact number：</td></tr>
<tr><td rowspan="3">Product information</td><td>Product number：</td><td rowspan="3">Fault description</td></tr>
<tr><td>Purchase time：</td></tr>
<tr><td>Body barcode：</td></tr>
<tr><td>Service records</td><td colspan="2"></td></tr>
</table>