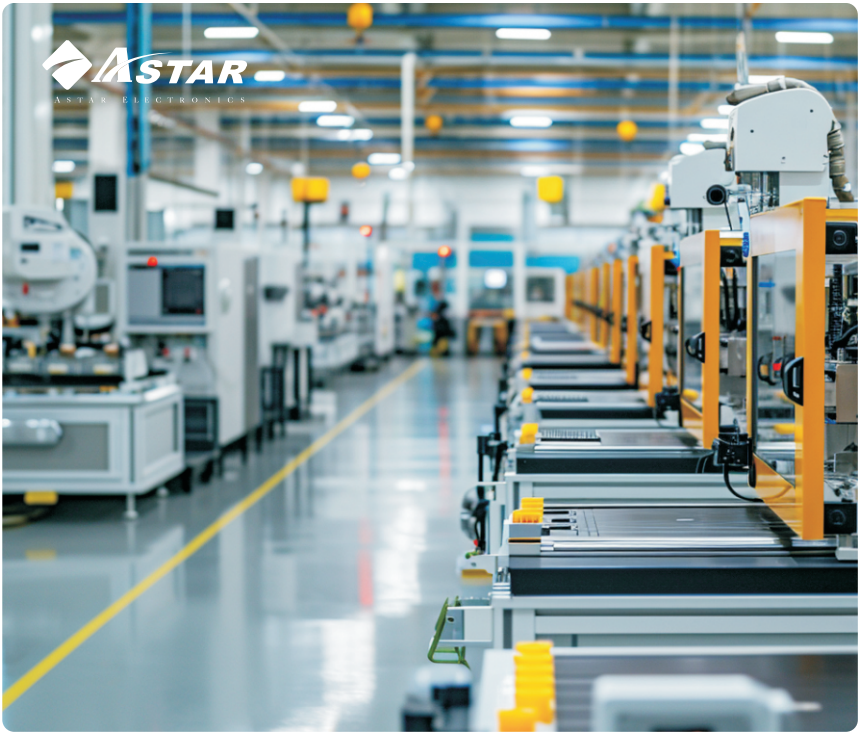


Book type high-performance vector inverter

ATS700 Series

User Manual

Preface

ATS700 is the latest inverter that our company invested 2 million RMB in. Based on ATS600, this product can meet all market demands at the cheapest price, supports TCP/IP (Modbus) protocol, individually paired PLC, PROFIBUS, PROFINET, CANOPEN, CAN, ETHERCAD, etc., and at the same time a parameter can automatically switch to photovoltaic water pump, elevator, synchronous machine, asynchronous machine, etc.

3-year warranty, LED and LCD display, 7 DI (of which DI5 can be used as high-speed pulse input), 2XAI input, 2XAO output, 2XRELAY, STO terminal built-in as standard. In addition, it supports the molding of I/O expansion cards, control boards, power boards, and keyboards, which greatly improves the customer's experience of use, and customers can replace accessories by themselves in the future.

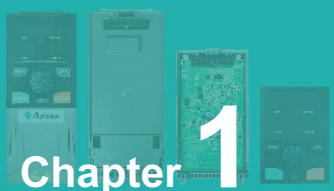
First-time Use

For the users who use this product for the first time, read the manual carefully. If in doubt concerning some functions or performances, contact the technical support personnel of Our company to ensure correct use.

ATTENTIONS

- Please power off when wiring.
- Electronic components inside AC drive are especially sensitive to static electricity, do not put anything into internal of AC drive.And do not touch main circuit board.
- After power cut, if indicator is still lamp, it still have high voltage in AC drive. It is very dangerous, please do not touch internal circuit and components.
- Please ensure the grounding terminals of AC drive is grounded correctly.
- Never connect input power supply with output terminal U,V,W of AC drive.

Contents



Chapter 1

Safety and Attentions

Users are requested to read this chapter carefully when installing, commissioning and repairing this product and perform the operation according to safety precautions as set forth in this chapter without fail. Our company will bear no responsibility for any injury and loss as a result of any violation operation.

Safety signs in this manual	
DANGER	Dangers caused by operations beyond requirements may lead to serious injury,and even death.
CAUTION	angers caused by operations beyond requirements may lead to moderate damages or minor injuries, as well equ-ipment damages.

1.1 Safety Matters

Use Stage	Safety Grade	Precautions
Before Installation	DANGER	✧ Do not install the product if the package is with water, or component is missing or broken; ✧ Do not install the product if the label on the package is not identical to that on the inverter.
	CAUTION	✧ Be careful of carrying or transportation. Risk of devices damage; ✧ Do not use damaged product or the inverters missing component .Risk of injury; ✧ Do not touch the parts of control system with bare hands. Risk of ESD hazard.
Installation	DANGER	✧ Installation base shall be metal or other non-flammable material. Risk of fire; ✧ Do not install inverter in an environment containing explosive gases, otherwise there is danger of explosion; ✧ Do not unscrew the fixing bolts, especially the bolts with red mark.
	DANGER	✧ Do not leave cable strips or screws in the inverter. Risk of inverter damage; ✧ Install the product at the place with less vibration and no direct sunlight;

Use Stage	Safety Grade	Precautions
Installation	DANGER	✧ Consider the installation space for cooling purpose when two or more inverters are placed in the same cabinet.
Wiring	DANGER	✧ Wiring must be performed by authorized and qualified personnel. Risk of danger; ✧ Circuit-breaker should be installed between inverter and the mains. Risk of fire; ✧ Make sure the input power supply has been completely disconnected before wiring. Failure to comply may result in personnel injury and/or equipment damage; ✧ Since overall leakage current of this equipment may be bigger than 3.5mA, for safety's sake, this equipment and its associated motor must be well grounded so as to avoid risk of electric shock; ✧ Never connect the power cables to the output terminals (U,V,W) of the AC drive. Pay attention to the marks of the wiring terminals and ensure correct wiring. Failure to comply will result in damage to the AC drive; ✧ Install braking resistors at terminals (P+)and (P- or PB) only. Failure to comply may result in equipment damage.
	CAUTION	✧ Since all adjustable frequency AC drives from Our company have been subjected to hi-pot test before delivery, users are prohibited from implementing such a test on this equipment. Failure to comply may result in equipment damage. ✧ Signal wires should to the best of the possibility be away from main power lines. If this cannot be ensured, vertical cross-arrangement shall be implemented, otherwise interference noise to control signal may occur. ✧ If motor cables are longer than 100m, it is recommend-ed output AC reactor be used. Failure to comply may result in faults.
Before Power-on	DANGER	✧ Inverter shall be power-on only after the front cover is assembled. Risk of electrical hazard.
	CAUTION	✧ Verify that the input voltage is identical to the rated voltage of product, correct wiring of input terminals R,

Use Stage	Safety Grade	Precautions
Before Power-on	CAUTION	S, T or L1, L2 and output terminals U, V, and W, wiring of inverter and its peripheral circuits, and all wires should be in good connection. Risk of inverter damage.
After Power-on	DANGER	✧ Do not open the cover after power. Rick of electrical hazard; ✧ Do not touches any input/output terminals of inverter with bare hands. Rick of electrical hazard.
	CAUTION	✧ If auto tuning is required, be careful of personal injury when motor is running. Risk of accident; ✧ Do not change the defaults of parameters. Risk of devices damage.
During Operation	DANGER	✧ Non-professionals shall not detect signals during operation. Risk of personal injury or device damage; ✧ Do not touch the fan or the discharging resistor to check the temperature. Failure to comply will result in personal burnt.
	CAUTION	✧ Prevent any foreign items from being left in the devices during operation. Risk of device damage; ✧ Do not control start/stop of inverter by ON/OFF of contactor. Risk of device damage.
Maintenance	DANGER	✧ Please do not make repair and maintenance over equipment in a charged state, or it will give rise to electric shock hazard! ✧ AC drive can be put into maintenance and repair only you confirm the AC drive charge light out, or the remaining electric charge of capacitance will cause damages to people! ✧ Any people who are not trained professionally cannot make repair and maintenance, or it will cause personal injuries or equipment troubles!

1.2 Use Considerations

1.2.1 Motor Insulation Inspection

When the motor is used for the first time or when the motor is reused after being kept, or when periodical inspection is performed, insulation inspection shall be conducted with motor so as to avoid damaging the inverter because of the insulation failure of the motor windings. The motor wires must be disconnected from the inverter during the insulation inspection. It is recommended to use the 500V mega meter, and the insulating resistance measured shall be 5MΩ at least.

1.2.2 Motor Thermal Protection

If the motor rating does not match that of the inverter, especially when the rated power of the inverter is higher than that of the motor, adjust motor protection parameters in the inverter or install thermal relay to protect motor.

1.2.3 Operating with the Frequency Higher than Grid Power Frequency

Output frequency of is 0.00Hz~1200Hz. If product is required to operate above 50.00Hz, please take the endurance of mechanical devices into consideration.

1.2.4 Mechanical Vibrations

Inverter may encounter mechanical resonance point of the load device at certain output frequencies which can be avoided by setting the skip frequency parameters of the inverter.

1.2.5 Motor Heat and Noise

Since output voltage of inverter is PWM wave and contains a certain amount of harmonics, so that the temperature, noise and vibration of the motor will be higher than those when the inverter runs at grid power frequency.

1.2.6 Voltage-sensitive device or capacitor on output side of the AC drive

Do not install the capacitor for improving power factor or lightning protection voltage-sensitive resistor on the output side of the AC drive because the output of the AC drive is PWM wave. Otherwise, the AC drive may suffer transient overcurrent or even be damaged.

1.2.7 Contactor at the I/O terminal of the AC drive

When a contactor is installed between the input side of the AC drive and the power supply, the AC drive must not be started or stopped by switching the contactor on or off. If the AC drive has to be operated by the contactor, ensure that the time interval between switching is at least one hour since frequent charge and discharge will shorten the service life of the capacitor inside the AC drive;

When a contactor is installed between the output side of the AC drive and the motor, do not turn off the contactor when the AC drive is active. Otherwise, modules inside the AC drive may be damaged.

1.2.8 Applied with the Rated Voltage

Apply product with the rated voltage. Failure to comply will damage inverter. If required, take a transformer to boost or step-down voltage.

1.2.9 Do Not Apply a 3-Phase Input Inverter to 2-Phase Input Applications

Do not apply a 3-phase input FR inverter to 2-phase input applications. Otherwise, it will result in faults or damage inverter.

1.2.10 Lightning Protection

The product has integrated lightning over-current protection device which has certain self-protection capacity against the lightning. Additional protection devices have to be installed between inverter and power supply in the area where lightning occurs frequently.

1.2.11 Altitude De-rating

In places where the altitude is above 1000 m and the cooling effect reduces due to thin air, it is necessary to de-rate the AC drive. Contact Our company for technical support.

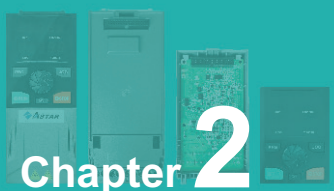
1.2.12 Adaptable Motor

Standard adaptive motor is quadrupole squirrel- cage asynchronous induction motor. If it is not above- mentioned motor, please select AC drive upon rated current of moter. If you need to drive permanent magnet synchronous motor, please consult our company;

The cooling fan of non variable frequency motor and rotor spindle are coaxially connected. While despinning, the fan cooling effect also declines at the same time.Hence, for overheated occasion of moter, you shall install strong exhaust fan or change variable frequency motor;

AC drives have built- in adaptive motor standard parameters. It is necessary to make motor parameter identification or amend default values to accord with actual values, or it will influence operation effects and protective values;

As short circuit existing inside cable or motor will cause inverter alarming, enen explosion. Therefore, please make insulation short- circuit test of initial installed motor and cable first. And the test also is necessary in routine maintenance.



Chapter 2

Product Brief Introduction

2.1 Position and content of nameplate

2.2 Nameplate model description and rated parameters

ATS700 - 4 T - 1.5 G B

① ② ③ ④ ⑤ ⑥

Code	No.	Content
Series Name	①	ATS700 Series
Voltage level	②	2 : 220V 4 : 380V 7 : 690V
Voltage Classification	③	S : Single-phase T : Three phase
Adapted motor power	④	0.4KW~1000KW
Model	⑤	G : Universal type P: Fan pump type
Accessory type	⑥	B : Built in braking unit Empty: None

2.3 Specifications and models of AC drives

Models	Adaptive motor (KW)	Rated capacity (KVA)	Rated input current (A)	Rated output current(A)
Single-phase 220V range: -15%~20%				
ATS700-2S-0.4GB	0.4	1	5.4	2.1
ATS700-2S-0.75GB	0.75	1.5	8.2	3.8
ATS700-2S-1.5GB	1.5	2.8	14	7
ATS700-2S-2.2GB	2.2	3.8	23	9
ATS700-2S-4.0GB	4.0	5.9	40	17
ATS700-2S-5.5GB	5.5	8.5	60	25
ATS700-2S-7.5GB	7.5	10.5	75	32
Three-phase 220V range: -15%~20%				
ATS700-2T-0.4GB	0.4	1	2.7	2.1
ATS700-2T-0.75GB	0.75	1.5	4.2	3.8
ATS700-2T-1.5GB	1.5	2.8	7.7	7
ATS700-2T-2.2GB	2.2	3.8	12	9
ATS700-2T-4.0GB	4.0	5.9	19	17
ATS700-2T-5.5GB	5.5	8.5	28	25
ATS700-2T-7.5GB	7.5	10.5	35	32
ATS700-2T-11GB	11	14.5	47	45
ATS700-2T-15GB	15	19.5	65	60
ATS700-2T-18GB	18.5	24	80	75
ATS700-2T-22G	22	28.5	97	90
ATS700-2T-30G	30	39	115	110
ATS700-2T-37G	37	48	166	152
ATS700-2T-45G	45	58.5	190	176
ATS700-2T-55G	55	71.5	214	210
ATS700-2T-75G	75	97.5	307	304
ATS700-2T-93G	93	121	389	377
ATS700-2T-110G	110	143	435	426
ATS700-2T-132G	132	171.5	468	465
ATS700-2T-160G	160	208	590	585

Models	Adaptive motor (KW)	Rated capacity (KVA)	Rated input current (A)	Rated output current(A)
ATS700-2T-200G	200	260	785	725
ATS700-2T-220G	220	286	883	820
Three-phase 380V range: -15%~20%				
ATS700-4T-0.75GB/1.5PB	0.75/1.5	1.5/2.5	3.4/5	2.1/3.8
ATS700-4T-1.5GB/2.2PB	1.5/2.2	2.5/3.4	5/5.8	3.8/5.1
ATS700-4T-2.2GB/4.0PB	2.2/4	3.4/5.9	5.8/10.5	5.1/9
ATS700-4T-4.0GB/5.5PB	4/5.5	5.9/8.5	10.5/14.6	9/13
ATS700-4T-5.5GB/7.5PB	5.5/7.5	8.5/11	14.6/20.5	13/17
ATS700-4T-7.5GB/11PB	7.5/11	11/13.5	20.5/26	17/25
ATS700-4T-11GB/15PB	11/15	13.5/16	26/35	25/32
ATS700-4T-15GB/18PB	15/18.5	16/21	35/38.5	32/37
ATS700-4T-18GB/22PB	18.5/22	21/24	38.5/46.5	37/45
ATS700-4T-22GB/30PB	22/30	24/30	46.5/62	45/60
ATS700-4T-30GB/37PB	30/37	30/39	62/76	60/75
ATS700-4T-37GB/45PB	37/45	39/49	76/92	75/90
ATS700-4T-45G(B)/55P(B)	45/55	49/59	92/113	90/110
ATS700-4T-55G(B)/75P(B)	55/75	59/72	113/157	110/152
ATS700-4T-75G(B)/93P(B)	75/93	72/100	157/180	152/176
ATS700-4T-93G(B)/110P(B)	93/110	100/116	180/214	176/210
ATS700-4T-110G(B)/132P(B)	110/132	116/138	214/256	210/253
ATS700-4T-132G(B)/160P(B)	132/160	138/167	256/307	253/304
ATS700-4T-160G(B)/185P(B)	160/185	167/200	307/345	304/340
ATS700-4T-185G/200P	185/200	200/225	345/385	340/377
ATS700-4T-200G/220P	200/220	225/280	385/430	377/426
ATS700-4T-220G/250P	220/250	280/309	430/468	426/465
ATS700-4T-250G/280P	250/280	309/349	468/525	465/520
ATS700-4T-280G/315P	280/315	349/398	525/590	520/585
ATS700-4T-315G/355P	315/350	398/434	590/665	585/650
ATS700-4T-355G/400P	355/400	434/494	665/785	650/725
ATS700-4T-400G/450P	400/450	494/560	785/883	725/820

Models	Adaptive motor (KW)	Rated capacity (KVA)	Rated input current (A)	Rated output current(A)
ATS700-4T-450G/500P	450/500	560/615	883/920	820/900
ATS700-4T-500G/550P	500/550	615/676	920/1020	900/1000
ATS700-4T-550G/630P	550/630	676/775	1020/1120	1000/1100
ATS700-4T-630G	630	775	1200	1150
ATS700-4T-710G	710	870	1315	1250
ATS700-4T-800G	800	980	1560	1450
ATS700-4T-900G	900	1100	1760	1710
ATS700-4T-1000G	1000	1230	1960	1900

Attention:

B has an internal brake unit;

(B) is equipped with an internal brake unit, and;

Empty: an external brake unit is optional.

2.4 Technical Features

Project		Description
Control characteristics	Highest frequency	Vector control: 0～600Hz VF control: 0～1200Hz
	Carrier frequency	1K～16kHz; the carrier frequency can be adjusted automatically according to the load characteristics.
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: maximum frequency × 0.1%
	Control mode	V/F control; Open loop vector control (SVC); Closed loop vector control (FVC)
	Motor type	Asynchronous motor, permanent magnet synchronous motor
	Starting torque	G type machine: 0.5Hz/180% (Open-loop/closed-loop vector control) P type machine: 0.5Hz/120% (open loop vector control)
	Speed range	1: 200 (open-loop vector control); 1: 1000 (closed-loop vector control);

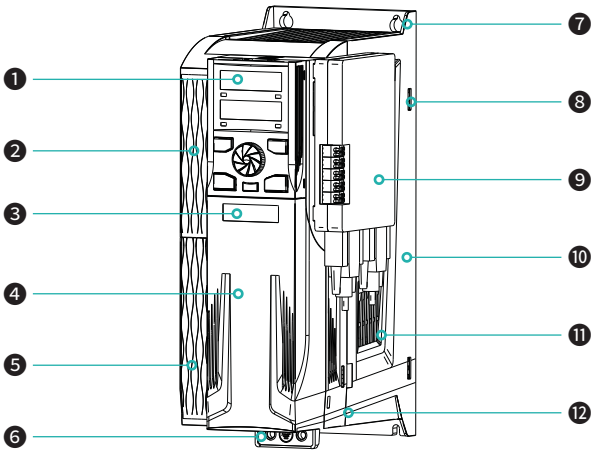
Project		Description
Control characteristics	Textile swing frequency control	Multiple triangular wave frequency control functions
	Fixed length control function	Built in fixed length control module
	Quick current limiting function	Built in fast current limiting algorithm reduces the probability of overcurrent reporting in the frequency converter and improves the overall anti-interference ability of the machine
	Timed control	Timer control function: Set time range from 0h to 65535h
	Standardization of keyboard extension cords	Customers can extend the keyboard using standard Ethernet cables on their own.
	Run Command Channel	Three channels: operation panel given, control terminal given, and serial communication port given. Can be switched in multiple ways
	Frequency source	There are a total of 10 frequency sources: digital given, analog voltage given, analog current given, pulse given, and serial port given. Can be switched in multiple ways
	Auxiliary frequency source	Synchronous and asynchronous integration, combining heavy and light loads
	Functional characteristics	Synchronous and asynchronous integration, combining heavy and light loads Quick settings for application macros such as fire mode, elevator mode, tension control mode, etc
Input and output	External analog power supply	+10V, load capacity 100mA
	External digital power supply	+24V, load capacity 200mA
	Digital input	D1- DI7 multifunctional editable digital input terminal, HDI high-speed pulse input
	Digital output	FM, Pulse output or open collector switch output can be selected
	Digital terminal power mode	NPN or PNP can be selected
	Analog input	Two analog inputs, voltage 0-10V or current 0/4-20mA selectable
	Analog output	Two analog outputs, voltage 0-10V or current 0/4-20mA selectable

Project		Description
Input and output	Programmable relay output	Two relay outputs, contact capacity: 250VAC/3A or 30DC/1A
	Fire fighting mode	STO1 - +24V, STO2 - +24V
	Compatible with multiple encoders	Optional collector open circuit ABZ encoder card, differential input ABZ encoder card, sine cosine encoder card, and rotary encoder card.
	Compatible with multiple communication protocols	Standard Modbus 485 communication protocol, with optional matching resistors Optional bus modules and protocols such as Profinet, Probus, Ethercat, Can, Canopen, etc
Operation and Display	LED display	Dual digital display function parameter settings, status parameter viewing, and fault code viewing
	LCD display	Optional, language selection including Chinese/English /Russian
	Extended external display	Rj45 interface, LED or LCD selectable
	Parameter copying	Using LED LCD can achieve fast parameter replication
	Key locking and function selection	Implement partial or complete locking of keys, define the scope of action of some keys to prevent accidental operation
Protection function	Overpressure stall	Automatic control of bus voltage to prevent overvoltage faults
	Automatic current limiting protection	Automatic output current limitation to prevent overcurrent faults
	Overload pre alarm and warning	Overload early warning and protection
	Output load drop protection	Load drop alarm function
	Input and output phase loss protection	Automatic detection and alarm function for input and output phase loss
	Brake fault protection	Brake detection and alarm function
	Process PID given, feedback, loss detection	Process PID automatic identification of whether the given and feedback are lost, and loss alarm function
	Output ground short circuit protection	Effective protection function against ground short circuit output
	Output phase to phase short circuit protection	Effective protection function for output phase to phase short circuit

Project		Description
Environmental	Place of use	Indoor, not exposed to direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapor, dripping or salt, etc
	Altitude	Below 1000 meters, downgrading is required for use above 1000 meters
	Ambient temperature	-10 ℃ +50 ℃ (ambient temperature is between 40 ℃ 50 ℃, please reduce the rating for use)
	Humidity	Less than 95% RH, no condensation of water droplets
	Vibration	Less than 5.9 meters per second (0.6g)
	Storage temperature	−20℃~+60℃
	Class of pollution	Level 2 (dry, non-conductive dust pollution)
	Protection level	IP20
Standards	Product compliance with safety standards	IEC61800-5-1:2007
	The product complies with EMC standards	IEC61800-3:2005

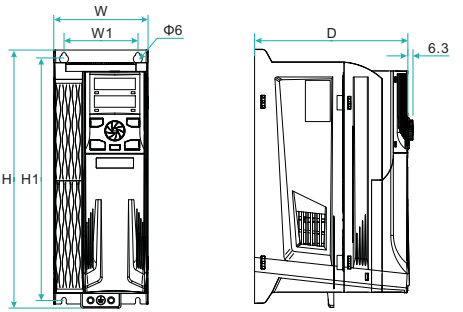
2.5 Product Outline Drawing

The following picture is all components and names of below 2.2KW plastic shell AC drive.

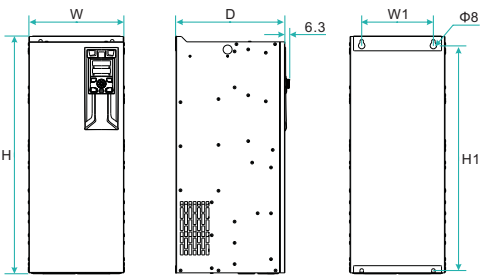


No.	Name	Description
❶	keyboard	LED and LCD operation panel
❷	Top cover	Protect internal components
❸	LOGO	Brand
❹	Terminal cover	Protect internal components
❺	Cover below	Protect internal components
❻	Grounding terminal	Connect the product to the external ground connection point
❼	Installation hole	Install fixed hole positions
❽	Floor	Protect internal components
❾	Expansion module	Extended functional components
❿	Bottom frame	Protect internal components
⓫	Nameplate	Product Information
⓬	Middle frame	Protect internal components

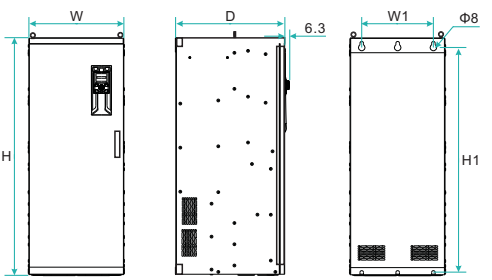
2.6 Appearance and installation dimensions



0.4kW~22kW plastic shell external dimensions and installation dimensions



30kW~450kW sheet metal chassis appearance, size and installation dimensions



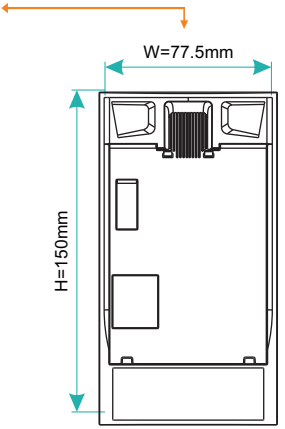
500kW~1000kW cabinet type chassis appearance and installation dimensions

AC Drive Model	Adapter motor (KW)	Installation size(mm)		Dimensions (mm)			Aperture
		W1	H1	W	H	D	d
Input voltage: single-phase 220V Range: -15%~20%							
ATS700-2S-0.4GB	0.4	66	190	80	200	138	4.5
ATS700-2S-0.75GB	0.75						
ATS700-2S-1.5GB	1.5						
ATS700-2S-2.2GB	2.2						
ATS700-2S-4.0GB	4.0	80	250	98	260	170	4.5
ATS700-2S-5.5GB	5.5	90	300	115	310	187	5.5
ATS700-2S-7.5GB	7.5						
Input voltage: three-phase 220V Range: -15%~20%							
ATS700-2T-0.4GB	0.4	66	190	80	200	138	4.5
ATS700-2T-0.7GB	0.7						
ATS700-2T-1.5GB	1.5						
ATS700-2T-2.2GB	2.2						
ATS700-2T-4.0GB	4.0	80	250	98	260	170	4.5
ATS700-2T-5.5GB	5.5	90	300	115	310	187	5.5
ATS700-2T-7.5GB	7.5						
ATS700-2T-11GB	11	140	384	165	395	210	6
ATS700-2T-15GB	15	160	425	220	440	220	7
ATS700-2T-18.5GB	18.5						
ATS700-2T-22G	22	160	535	145	550	255	7
ATS700-2T-30G	30	200	640	265	660	305	10
ATS700-2T-37G	37						
ATS700-2T-45G	45	200	765	300	785	305	10
ATS700-2T-55G	55						
ATS700-2T-75G	75	280	815	340	835	325	10
ATS700-2T-93G	93	300	895	410	915	370	12
ATS700-2T-110G	110						

AC Drive Model	Adapter motor (KW)	Installation size(mm)		Dimensions (mm)			Aperture
		W1	H1	W	H	D	d
ATS700-2T-132G	132	320	995	470	1015	385	12
ATS700-2T-160G	160	500	1115	640	1135	395	12
ATS700-2T-200G	200						
ATS700-2T-220G	220						
Input voltage: three-phase 380V Range: -15%~20%							
ATS700-4T-0.7GB/1.5PB	0.7	66	190	80	200	138	4.5
ATS700-4T-1.5GB/2.2PB	1.5						
ATS700-4T-2.2GB/4.0PB	2.2						
ATS700-4T-4.0GB/5.5PB	4.0	80	250	98	260	170	4.5
ATS700-4T-5.5GB/7.5PB	5.5						
ATS700-4T-7.5GB/11PB	7.5						
ATS700-4T-11GB/15PB	11	90	300	115	310	187	5.5
ATS700-4T-15GB/18.5PB	15						
ATS700-4T-18.5GB/22PB	18.5	140	384	165	395	210	6
ATS700-4T-22GB/30PB	22						
ATS700-4T-30GB/37PB	30	160	425	220	440	220	7
ATS700-4T-37GB/45PB	37						
ATS700-4T-45G(B)/55P(B)	45	160	535	145	550	255	7
ATS700-4T-55G(B)/75P(B)	55	200	640	265	660	305	10
ATS700-4T-75G(B)/93P(B)	75						
ATS700-4T-93G(B)/110P(B)	90	200	765	300	785	305	10
ATS700-4T-110G(B)/132P(B)	110						
ATS700-4T-132G(B)/160P(B)	132	280	815	340	835	325	10
ATS700-4T-160G(B)/185P(B)	160	280	970	340	990	325	10
ATS700-4T-185G/200P	185	300	895	410	915	370	12
ATS700-4T-200G/220P	200						
ATS700-4T-220G/250P	220						

AC Drive Model	Adapter motor (KW)	Installation size(mm)		Dimensions (mm)			Aperture
		W1	H1	W	H	D	d
ATS700-4T-250G/280P	250	320	995	470	1015	385	12
ATS700-4T-280G/315P	280						
ATS700-4T-315G/355P	315	500	1115	640	1135	395	12
ATS700-4T-355G/400P	350						
ATS700-4T-400G/450P	400						
ATS700-4T-450G/500P	450						
ATS700-4T-500G/550P	500	/	/	800	1800	500	Vertical
ATS700-4T-550G/630P	550						
ATS700-4T-630G	630						
ATS700-4T-710G	710	/	/	1100	2200	600	Vertical
ATS700-4T-800G	800						
ATS700-4T-900G	710	/	/	1300	2300	600	Vertical
ATS700-4T-1000G	800						

2.7 External keyboard with tray installation dimension drawing



- The LED keyboard and LCD keyboard have the same external dimensions and installation dimensions, and use the same external bracket;
- The opening size of the external bracket is: W: 77.5mm * H: 150mm.

2.8 Optional accessories

For the detailed functions and usage instructions of the optional accessories, see the related optional accessories description.

If you need the above options, please specify when ordering.

Name	Model	Function
Built in braking unit	Model suffix "B"	'B' comes standard with a built-in energy consuming braking unit, while '(B)' comes with an optional built-in one
Feedback Unit	CI100	Feed back the energy generated by the device during the braking process to the power grid or storage devices to improve energy utilization efficiency and reduce energy loss
External operation panel	700-LED/LCD	LED dual display digital tube display and operation, LCD screen display and operation
Keyboard tray	700-JP-51-04	The external operation panel uses a perforated self fastening bracket
Keyboard extension cable	Rj45 Ethernet cable	Standard 8-core Ethernet cable connects the operation panel to the frequency converter
DC reactor	DCL	Limit the AC component in the current, improve power factor, reduce current pulsation, suppress harmonics, and prevent sudden changes in current

Name	Model	Function
Input reactor	ACR	Suppress surge voltage and surge current, reduce voltage fluctuations, improve power factor, and protect motors
Output choke	OCR	Suppress high-order harmonics, limit voltage change rate, increase transmission distance, balance the distributed capacitive load of cables, increase the short-circuit impedance of the main circuit, and protect the motor
Input filter	RFI	Suppress high-order harmonics, prevent interference, improve system power factor, and alleviate three-phase imbalance
Output filter	RFO	Reduce the harmonics and commutation gap of the main power supply, protect the driving power electronic components from the impact of peak current of the main power supply, suppress the harmonic interference of the driving output, and improve the reliability of the system

2.9 Expansion card

Name	Model	Function
IO expansion card	700-IO	Digital multifunctional input terminal, open collector switch terminal, temperature detection (PT100/PT1000)
Mains synchronous expansion card	700-EPS	Output voltage and power supply voltage detection, phase sequence detection
PLC expansion card	700-PLC	Multi channel programmable relay output
Internet of Things card	700-GPS	Internet of Things
Can bus expansion card	700-CAN	Bus module and communication protocol
Canopen bus expansion card	700-CANOPEN	Bus module and communication protocol
Ethercat bus expansion card	700-ETHERCAT	Bus module and communication protocol
Profinet bus expansion card	700-PN	Bus module and communication protocol
Profbus bus bus expansion card	700-DP	Bus module and communication protocol
Modbus TCP bus expansion card	700-TCP	Bus module and communication protocol
Open collector ABZ encoder card	700-PG1	Open collector PG card【PG1 can only be applied to asynchronous machines; Compatible with complementary output, the encoder card can output DC power with optional+12V or+5V (jumper selection)】

Name	Model	Function
Differential input ABZ encoder card	700-PG3	ABZ differential signal input PG card
Sine cosine encoder interface card	700-PG5	Pg5 is a sine and cosine encoder card with frequency division output.
Rotary encoder interface card	700-PG6	Suitable for rotary encoders, DB9 interface, optional shielded encoder cable.

2.10 Brake Assembly selection Guide

Users can choose different resistance values and power according to the actual situation, (but the resistance value must not be less than the recommended value in the table, the power can be large.) The choice of brake resistance needs to be determined according to the power generated by the motor in the actual application system, which is related to the inertia of the system, deceleration time, and the energy of the potential energy load, etc., which needs to be selected by the customer according to the actual situation. The greater the inertia of the system, the shorter the deceleration time required, and the more frequent the braking resistance, the greater the braking resistance needs to be selected and the smaller the resistance value.

2.10.1 Choice of resistance value

During braking, the regenerative energy of the motor is almost entirely consumed in the braking resistance. According to the formula:

$$U*U/R=Pb$$

- U---- braking voltage of stable braking system (different systems are different, generally 700V for 380VAC system);
- Pb---- Braking power.

2.10.2 Power selection of braking resistor

In theory, the power of the braking resistor is the same as the braking power, but considering a derating of 70%. According to the formula:

$$0.7*Pr=Pb*D$$

- Pr - power of the resistor;
- D - Braking frequency (the proportion of regeneration process to the entire working process), generally taken as 10%. Please refer to the table below:

Application industry	Lift	Roll up and roll up	Centrifuge	Accidental braking load
Proportion	20% ~ 30%	20% ~ 30%	50% ~ 60%	5%

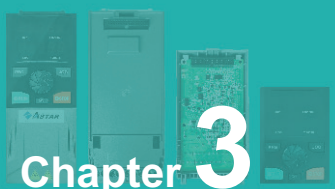
Recommended selection table for braking units and braking resistors

Model	Applicable motor	Braking resistor resistance value	Braking resistor powe	Brake unit
380V three-phase				
ATS700-4T-0.7GB/1.5PB	0.75KW	250~350Ω	0.1KW	Standard built-in
ATS700-4T-1.5GB/2.2PB	1.5KW	200~300Ω	0.2KW	
ATS700-4T-2.2GB/4.0PB	2.2KW	150~250Ω	0.25KW	
ATS700-4T-4.0GB/5.5PB	4KW	100~150Ω	0.3KW	
ATS700-4T-5.5GB/7.5PB	5.5KW	80~100Ω	0.5KW	
ATS700-4T-7.5GB/11PB	7.5KW	60~80Ω	0.7KW	
ATS700-4T-11GB/15PB	11KW	40~50Ω	1KW	
ATS700-4T-15GB/18.5PB	15KW	30~40Ω	1.5KW	
ATS700-4T-18.5GB/22PB	18.5KW	25~30Ω	2KW	
ATS700-4T-22GB/30PB	22KW	20~25Ω	2.5KW	
ATS700-4T-30GB/37PB	30KW	15~20Ω	3KW	
ATS700-4T-37GB/45PB	37KW	15~20Ω	3.5KW	
ATS700-4T-45G(B)/55P(B)	45KW	10~15Ω	4.5KW	Optional built-in
ATS700-4T-55G(B)/75P(B)	55KW	10~15Ω	5.5KW	
ATS700-4T-75G(B)/93P(B)	75KW	8~10Ω	7.5KW	
ATS700-4T-93G(B)/110P(B)	93KW	8~10Ω	9KW	
ATS700-4T-110G(B)/132P(B)	110KW	6~8Ω	11KW	
ATS700-4T-132G(B)/160P(B)	132KW	6~8Ω	13.5KW	
ATS700-4T-160G(B)/185P(B)	160KW	4~6Ω	16KW	
ATS700-4T-185G/200P	185KW	4~6Ω	18.5KW	CBR600-4T200

Model	Applicable motor	Braking resistor resistance value	Braking resistor powe	Brake unit
ATS700-4T-200G/220P	200KW	4~6Ω	20KW	CBR600-4T315
ATS700-4T-220G/250P	220KW	6 - 8Ω * 2	11KW* 2	CBR600-4T315
ATS700-4T-250G/280P	250KW	6 - 8Ω * 2	12.5KW*2	CBR600-4T315
ATS700-4T-280G/315P	280KW	4 - 6Ω * 2	14KW*2	CBR600-4T315
ATS700-4T-315G/355P	315KW	4 - 6Ω * 2	16KW*2	CBR600-4T450
ATS700-4T-355G/400P	355KW	4 - 6Ω * 3	11KW*3	CBR600-4T450
ATS700-4T-400G/450P	400KW	4 - 6Ω * 3	14KW*3	CBR600-4T450
ATS700-4T-450G/500P	450KW	4 - 6Ω * 4	10KW*4	CBR600-4T630
ATS700-4T-500G/550P	500KW	4 - 6Ω * 4	12.5KW*4	CBR600-4T630
ATS700-4T-550G/630P	550KW	4 - 6Ω * 4	14KW*4	CBR600-4T630
ATS700-4T-630G	630KW	4 - 6Ω * 4	16KW*4	CBR600-4T630

BE CAREFUL:

- It is recommended to select the braking resistor according to the recommended resistance range in the table above. In the table, * 2 represents the parallel use of two sets of braking resistors, * 3 represents the parallel use of three sets of braking resistors, and * 4 represents the parallel use of four sets of braking resistors. A larger resistance value can ensure safety in case of brake system failure, but if the resistance value is too high, the braking capacity will decrease, which may cause overvoltage protection in the driver.
- Please install the braking resistor in a well ventilated metal cover. The temperature of the braking resistor is very high during operation, so do not touch it directly.



Chapter 3

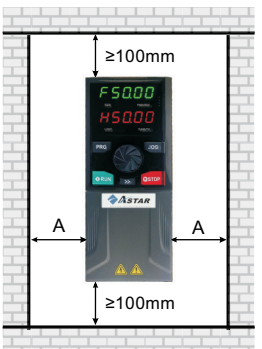
Installation

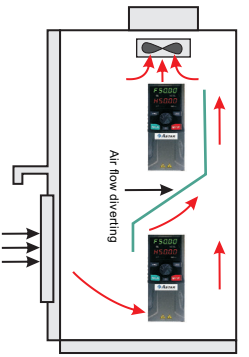
3.1 Mechanical Installation

3.1.1 Installation Environment

- Environment temperature: Surrounding environment temperature has a great impact on lifetime of AC drive, and the operation environment temperature of AC drive shall not exceed allowable temperature range (- 10℃ ~ 40℃).
- While AC drive is installed on the surface of inflaming retardants, and enough space around is necessary for heat dissipation. When AC drive works, it will produce plenty of heats. And make vertical installation onto supporting holder with screw.
- Please install it in some places that are not easy to vibrate. And the vibration shall not be larger than 0. 6G. Especially pay attention to keep away from punching machine and other equipments.
- Avoid to be installed where there are direct sunlights, moist surroundings and water drops.
- Avoid to be installed where there are corrosivity, inflammability and explosive gas.
- Avoid to be installed where there are oil contamination, dirts and metal dusts.

3.1.2 Reminder of installation site





Explanation: When power of AC drives≤ 22kw it means taking no account of size A is permissible. When the power > 22KW, A shall be larger than 50mm.

Explanation: When AC drive is installed upside and underside, please install thermal insulation guide plate as picture shows.

Figure 3-1 Installation diagram of AC drive

3.1.3 The installation of the model needs to pay attention to the problem of heat dissipation. So please note the following:

- Please install the inverter vertically so that the heat can be dissipated upwards. But not upside down. If there are many inverters in the cabinet, it is better to install them side by side. In the occasions that need to be installed up and down, please refer to Figure 3-1 to install the heat insulation deflector.
- The installation space is as shown in Figure 3-1 to ensure the cooling space of the inverter. However, please consider the heat dissipation of other components in the cabinet when arranging.
- The mounting bracket must be made of flame retardant material.
- For applications with metal dust, it is recommended to install the radiator outside the cabinet. At this time, the space in the fully sealed cabinet should be as large as possible.

3.2 Electrical Installation

3.2.1 Model Selection of Main Circuit Peripheral Devices

Models	MCCB (A)	Contactor (A)	Cable of Input Side Main Circuit (mm^2)	Cable of Output Side Main Circuit (mm^2)	Cable of Control Circuit (mm^2)
Single phase 380V range: -15%~+20%					
ATS700-2S-0.4GB	16	10	2.5	2.5	1.0
ATS700-2S-0.75GB	16	10	2.5	2.5	1.0
ATS700-2S-1.5GB	20	16	4	2.5	1.0
ATS700-2S-2.2GB	32	20	6	4	1.0
ATS700-2S-3.7GB	40	32	6	4	1.0
ATS700-2S-5.5GB	63	40	10	4	1.0
ATS700-2S-7.5GB	63	40	10	6	1.0
Three phase 380V range: -15%~+20%					
ATS700-4T-0.75GB/1.5PB	10	10	2.5	2.5	1.0
ATS700-4T-1.5GB/2.2PB	16	10	2.5	2.5	1.0
ATS700-4T-2.2GB/4.0PB	16	10	2.5	2.5	1.0
ATS700-4T-4.0GB/5.5PB	25	16	4	4	1.0

Models	MCCB (A)	Contactor (A)	Cable of Input Side Main Circuit (mm^2)	Cable of Output Side Main Circuit (mm^2)	Cable of Control Circuit (mm^2)
ATS700-4T-5.5GB/7.5PB	32	25	4	4	1.0
ATS700-4T-7.5GB/11PB	40	32	4	4	1.0
ATS700-4T-11GB/15PB	63	40	4	4	1.0
ATS700-4T-15GB/18.5PB	63	40	6	6	1.0
ATS700-4T-18.5GB/22PB	100	63	6	6	1.0
ATS700-4T-22GB/30PB	100	63	10	10	1.0
ATS700-4T-30GB/37PB	125	100	16	10	1.0
ATS700-4T-37GB/45PB	160	100	16	16	1.0
ATS700-4T-45G(B)/55P(B)	200	125	25	25	1.0
ATS700-4T-55G(B)/75P(B)	250	125	35	25	1.0
ATS700-4T-75G(B)/93P(B)	250	160	50	35	1.0
ATS700-4T-93G(B)/110P(B)	350	160	70	35	1.0
ATS700-4T-110G(B)/132P(B)	350	350	120	120	1.0
ATS700-4T-132G(B)/160P(B)	400	400	150	150	1.0
ATS700-4T-160G(B)/200P(B)	500	400	185	185	1.0
ATS700-4T-185G/200P	500	400	185	185	1.0
ATS700-4T-200G/220P	630	600	150*2	150*2	1.0
ATS700-4T-220G/250P	630	600	150*2	150*2	1.0
ATS700-4T-250G/280P	800	600	150*2	150*2	1.0
ATS700-4T-280G/315P	800	800	150*2	150*2	1.0
ATS700-4T-315G/355P	1000	800	150*3	150*3	1.0
ATS700-4T-355G/400P	1000	800	150*4	150*4	1.0
ATS700-4T-400G/450P	1250	1000	150*4	150*4	1.0
ATS700-4T-450G/500P	1250	1000	150*4	150*4	1.0
ATS700-4T-500G/550P	1250	1000	150*4	150*4	1.0
ATS700-4T-550G/630P	1600	1200	150*4	150*4	1.0
ATS700-4T-630G	1600	1600	150*4	150*4	1.0

3.2.2 Peripheral device wiring diagram

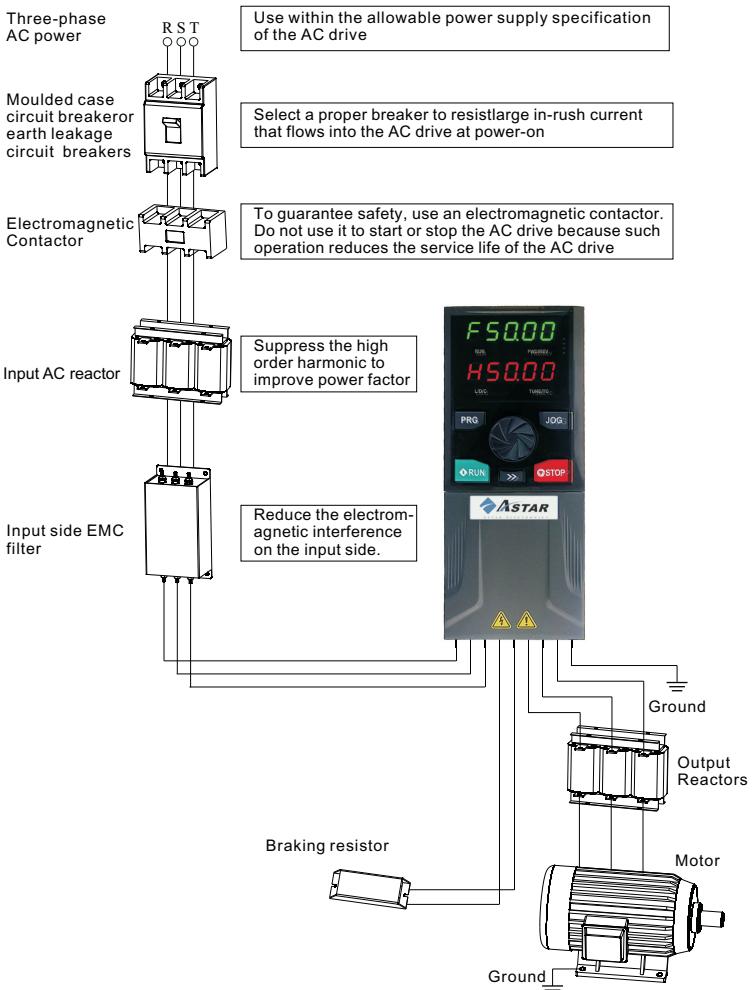
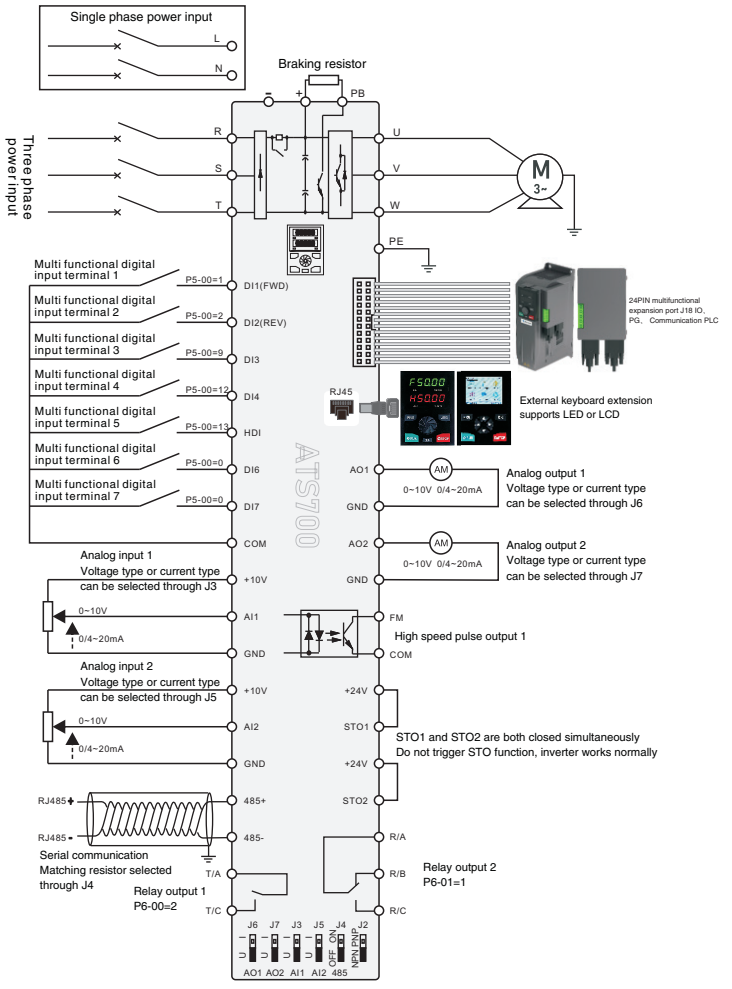


Figure 3-2 Peripheral device wiring diagram

3.3 Wiring method

3.3.1 Terminal Wiring Diagram



3.3.2 Main circuit terminals and wiring

Terminal	Name	Function description
L、N	Single-phase power input terminal	Single-phase 220V AC power connection point
R、S、T	Three-phase power input terminal	AC input three-phase power connection point
P(+)、(-)	DC bus positive and negative terminals	Common DC bus input point
P(+)、PB	Braking resistor connection terminal	Connect the braking resistor
U、V、W	Inverter output terminal	Connecting a three-phase motor
PE	Ground terminal	Ground terminal

3.3.3 Attentions of wiring

Input power supply L, N or R S、T： The input side wiring of the inverter has no phase sequence requirements.

- DC bus P (+), (-): Note that there is residual voltage at the P (+), (-) terminals of the DC bus after a power outage. Wait for the power indicator light on the drive board to turn off and confirm the power outage for 10 minutes before proceeding with wiring operations, otherwise there is a risk of electric shock;
- The wiring length of the braking unit should not exceed 10m. Twisted pair or tight double parallel wiring should be used;
- Do not directly connect the braking resistor to the DC bus, as it may cause damage to the frequency converter or even fire.

Braking resistor connection terminals P (+), PB:

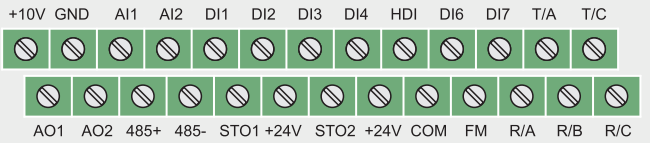
- The recommended values for selecting braking resistors should be referenced, and the wiring distance should be less than 5m. Otherwise, it may cause damage to the frequency converter.

Inverter output side U、V、W：

- The output side of the frequency converter cannot be connected to capacitors or surge absorbers, otherwise it will cause frequent protection or even damage to the frequency converter;

- When the motor cable is too long, due to the influence of distributed capacitance, it is easy to generate electrical resonance, which can cause insulation damage to the motor or generate large leakage current, resulting in overcurrent protection of the frequency converter. When the length of the motor cable is greater than 100m, an AC output reactor must be installed near the iverter;
- Grounding terminal PE: The terminal must be reliably grounded, and the resistance of the grounding wire must be less than 0.1 Ω. Otherwise, it may cause abnormal operation or even damage to the equipment. The grounding terminal and the power neutral wire N terminal cannot be shared.

3.3.4 Programmable multifunctional control terminal



3.3.5 Function Description of Control Terminals

Sort	Terminal	Name	Function Description
Power supply	+10V-GND	External +10V power supply	Provide +10V power supply to the outside, the maximum output current: 10mA Generally used as working power supply of external potentiometer, potentiometer resistance range: 1~5kΩ
	24V-COM	External +24V power supply	Provide +24V power supply to the outside, generally used as the working power supply of digital input and output terminals and external sensor power supply, Maximum output current: 200mA
Analog input	AI1-GND	Analog input terminal 1	Input range: DC0-10V or 0-20mA, AI1 is determined by the J3 selection on the control board and is shipped in voltage mode. AI2 is determined by the J4 selection on the control board and is shipped in voltage mode. Input impedance: 100K Ω for voltage input, 500 Ω for current input
	AI2-GND	Analog input terminal 2	

Sort	Terminal	Name	Function Description
Digital input	DI1-COM	Digital input 1	Optocoupler isolation, compatible with bipolar input, switches NPN or PNP mode through J2 switch, factory set to NPN mode; Input impedance: 3.3kΩ; Voltage range for level input: 9-30V; Among them, HDI5 can be used as a high-speed input port, with a maximum input frequency of 50KHz
	DI2-COM	Digital input 2	
	DI3-COM	Digital input 3	
	DI4-COM	Digital input 4	
	HDI5-COM	Digital input 5	
	DI6-COM	Digital input 6	
	DI7-COM	Digital input 7	
Analog output	AO1-GND	Analog output 1	Output range: DC0-10V or 0-20mA; AO1 is determined by the J6 selection on the control board and is shipped in voltage mode; AO2 is determined by the J7 selection on the control board and is shipped in voltage mode.
	AO2-GND	Analog output 2	
Digital output	FM-COM	High-speed pulse output	Programmable optocoupler isolation, open collector output, maximum frequency: 50KHz; When the collector is open for output, it is consistent with the Y1 specification; Output voltage range: 0/24VDC, output current range: 50mA
	+24V-STO1	Fire mode output	Triggering Err48 fault, the fault type can be distinguished by checking the U1-35 values. 1: STO1 disconnected; 2: STO2 disconnected; 3: STO1 and STO2 are both disconnected
	+24V-STO2		
Communication Interface	485+，485-	Modbus communication interface	Modbus communication interface, can be selected through J4 whether to match resistors
Relay output 1	T/A-T/C	T/A-T/C normally open terminal; R/A-R/C normally open terminal, R/A-R/B normally closed terminal; Contact driving capability: AC250V, 3A, COSφ=0.4, DC30V, 1A.	
Relay output 2	R/A-R/B-R/C		
Relay output 2	RA-RB	Normally closed terminal	Contact drive capability:(Optional accessories: IO1, IO2 support function) AC250V, 3A, COSφ=0.4. DC30V, 1A
	RA-RC	Normally open terminal	
External keyboard interface	Rj45 interface	External keyboard interface	External LED and LCD keyboard interfaces can be extended using standard Ethernet cables

3.3.6 Wiring instructions for signal input terminals

A. AI analog input terminal:

Because weak analog voltage signals are particularly susceptible to external interference, shielded cables are generally required, and the wiring distance should be as short as possible, not exceeding 20m, As shown in the following figure. In some occasions where the analog signal is severely interfered, a filter capacitor or a ferrite core should be added on the analog signal source side.

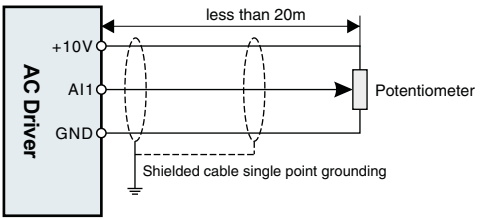
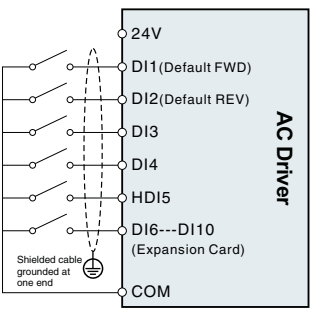


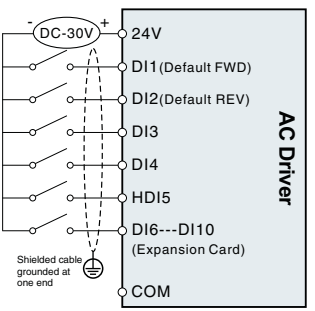
Figure 3-3 Wiring diagram of analog input terminal

B. Digital input terminal:

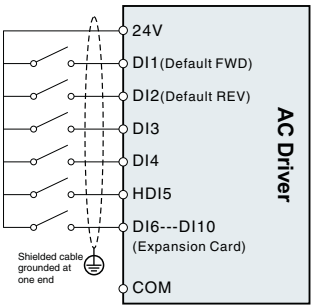
DI wiring mode 1 (factory default wiring mode):
When the DI DIP switch is in NPN mode, no external power supply is used



DI wiring mode 2 :
Use an external power supply when the DI DIP switch is in NPN mode



DI wiring mode 3 :
No external power supply is used when the DI DIP switch is in PNP mode



DI wiring mode 4 :
Use an external power supply when the DI DIP switch is in PNP mode

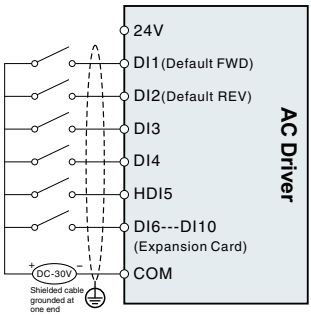
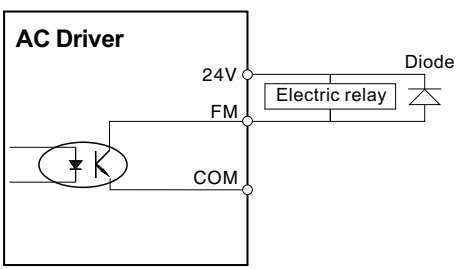


Figure 3-4 Wiring diagram of digital input terminals in four different modes

C. FM digital output terminal:

When the digital output terminal needs to drive the relay, an absorption diode should be installed on both sides of the relay coil, and the driving capacity is not more than 50mA. Otherwise, it is easy to cause damage to the DC 24V power supply.

Note: The polarity of the absorption diode must be installed correctly, As shown in the following figure, otherwise when the digital output terminal has output, the DC 24V power supply will be burned out immediately.



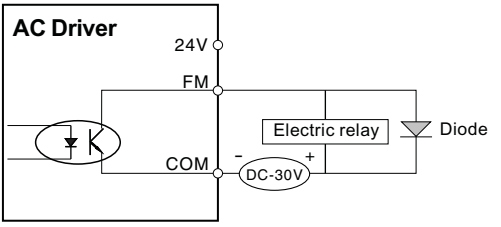


Figure 3-5 Wiring diagram of digital output terminal FM

Chapter 4

Operation and Display

4.1 Keypad description

4.1.1 Keypad explanation and function

Using the operation panel, you can modify the function parameters of the inverter, monitor the working status of the inverter, and control the operation of the inverter (start, stop). Its appearance and functions are shown in the following figure.

LED display operation surface

LCD display operation surface

4.1.2 Function indicator description

Indicator sign	Name	Meaning	Color
RUN	Operating status indicator	On - the inverter is running Off - Inverter is in stop state Flashing - the inverter is in sleep state	Green
L/D/C	Control mode indicator	Off - Inverter is in keypad control mode On - the inverter is in terminal control mode Flashing-Inverter is in remote communication control mode	Red
FWD/REV	Running direction indication	Off - Forward state On - inversion state Flashing - the target frequency is opposite to the actual frequency or is in the reverse running prohibited state	Red
TUNE/TC	Tuning/Torque Control/Fault Indicator	On - torque control Flashing - Tuning\Fault status	Red

4.1.3 Digital display area

5-digit LED display can display the set frequency, output frequency, various monitoring data and alarm codes. The function code is usually displayed as a decimal number. For example, the value of the P0-11 function code is displayed as "50.00", which means the decimal number "50.00". When the function code value is displayed in hexadecimal, the highest digit of the nixie tube displays "H.", indicating that the current function code value is displayed in hexadecimal. For example, the value of the P7-29 function code is displayed as "H. At this time, the value of P7-29 is the hexadecimal number "0x3f".

The user can freely set the monitoring data of stop and running status according to function code P7-29/P7-30, see function code P7-29/P7-30 for details.

4.1.4 Description of keyboard buttons

<table>
<tr><th>Button</th><th>Name</th><th>Function Description</th></tr>
<tr><td>PRG</td><td>Program / Escape key</td><td colspan="2">Enter or exit the first-level menu, return to the upper-level menu</td></tr>
<tr><td>OK</td><td>Enter</td><td>Enter the menu screen step by step, set parameters to confirm</td><td rowspan="3">  </td></tr>
<tr><td>▲</td><td>Increment key (+)</td><td>Increment of data or function code</td></tr>
<tr><td>▼</td><td>Decrement key (-)</td><td>Decrement of data or function code</td></tr>
<tr><td>▶
≫</td><td>Shift key</td><td colspan="2">In the stop display interface and the running display interface, the display parameters can be selected cyclically. For the specific display meaning, please refer to P7-29 and P7-30; when modifying the parameters, you can select the modification bit of the parameter</td></tr>
<tr><td>RUN</td><td>Run key</td><td colspan="2">In keyboard operation mode, used to run operation</td></tr>
<tr><td>STOP</td><td>Stop/Reset key</td><td colspan="2">In the running state, pressing this key can be used to stop the running operation; in the fault alarm state, it can be used to reset the operation. The characteristics of this key are restricted by the function code P7-27.</td></tr>
<tr><td>JOG</td><td>Jog run/Direction keys</td><td colspan="2">When P7-28 is set to 0, it is the jog running button, and when P7-28 is set to 1, it is the direction button. Press this button to reverse the direction.</td></tr>
</table>

4.2 Organization of Inverter Function Codes

Function code group	Function description	Illustrate
P0 ~ PF	Basic function parameter group	Compatible with ATS700 series function codes
A0 ~ A3	Second motor parameter group	The second motor parameters, acceleration and deceleration time, control mode, etc. can be set independently
B0 ~ B6	Enhanced function parameter group	System parameter setting, user function code customization, optimization control, AI/AO correction, master-slave control, brake function and sleep function;
C0 ~ CF	Special plane function selection group	Choose to use different professional inverter functions;
U0 ~ U1	Monitoring parameter group	U0 is the fault record parameter group, and U1 is the user monitoring parameter, which is convenient to check the relevant output status;

4.3 Function code viewing and modification method description

AC drives adopts three-level menu structure for parameter setting and other operations. The three-level menus respectively are: functional parameter group(first-level menu)→function code (second- level menu)-function code setting value (third-level menu). Operational process is shown in Figure 4-2:

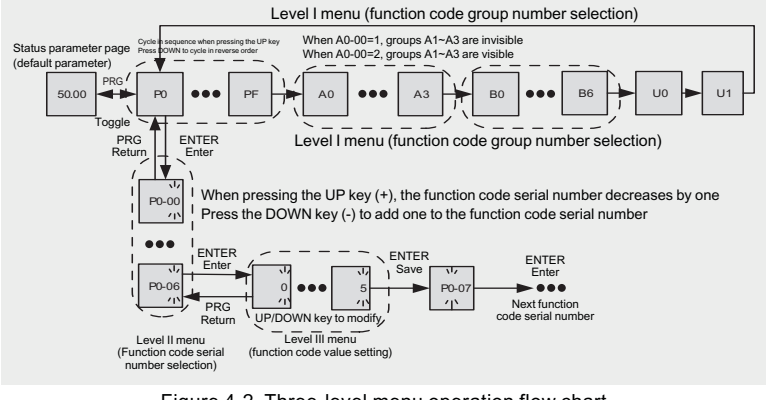


Figure 4-2 Three-level menu operation flow chart

Note:

When operating in the third-level menu, you can press PRG key or ENTER key to return to the second-level menu. But pressing the ENTER key will save the current parameter modification value and transfer to the next function code; while pressing the PRG key will abandon the current parameter modification.

Example: Change function code P1-04 from 0.00Hz to 5.00Hz.

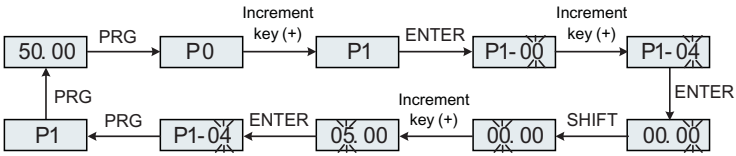
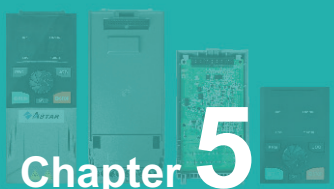


Figure 4-3 Parameter setting operation flow chart

In the third-level menu state, if the parameter has no flashing bit, it means that the parameter value of the function code cannot be modified. For the specific reason, please refer to the description of the function code attribute.



Chapter 5

Synchronous motor open loop vector (SVC) debugging

5.1 Set synchronization type, control mode, and motor parameters

① The motor type is set to synchronous motor and the control mode is SVC, i.e. P0-03=11.

Note: P0-03 has ten digits for motor type selection and one digit for control mode;

Ten digits: 1: synchronous motor, 0: asynchronous motor;

Position: 1: SVC， 2：VVC， 3：FVC

② Set P4-01~P4-06 according to the actual motor parameters.

5.2 Parameter identification

① Connect the motor, if there is a load, set P4-00 to 1; If it is an empty shaft, set P4-00 to 2 and the digital display will show TUNE. To ensure control effectiveness, it is best to set the motor to empty load and P4-00 to 2.

② Press the RUN key to perform parameter identification, wait for TUNE to disappear, and the parameter identification will end.

③ The identification process lasts for about 1 minute and can be exited by pressing the STOP button midway. During this period, a current will be sent to operate the motor at the set acceleration and deceleration time to 60% of the rated frequency of the motor. Observe whether the motor runs smoothly. If it is not stable, press STOP to exit and reach 60% of the rated frequency of the motor. After a period of time, slow down and stop the motor.

④ After the parameter identification is completed, check if the P4-17~P4-20 parameters are normal.

5.3 No load trial operation

① Set the speed to a smaller range, such as P0-11=20Hz.

② Press the run button to check if the motor can accelerate to the set frequency and if the motor current is very low. If the motor can accelerate to the set frequency and the motor current is very small, then the frequency converter is basically normal. Set the frequency to the rated frequency of the motor and check if the motor can accelerate to the set frequency.

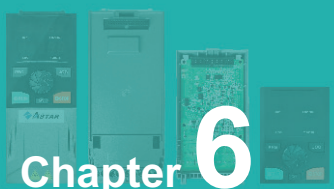
5.4 Quick Start Trial Run

Set up in situations where quick start stop is required, otherwise skip this step. Reduce the motor acceleration time (e.g. set to 1 second), change the PI parameter settings of the speed loop and current loop, press the run button, and check if the motor can accelerate quickly to the set frequency.

5.5 Loading and Running

After the above 5 steps, the motor can be operated with load and the frequency converter can be used normally.

Note: If the system response does not achieve the expected effect when loading or changing the system's moment of inertia, it is necessary to adjust the parameters P3-04 and P3-06 appropriately. If replacing with another type of motor, it is generally necessary to set the rated frequency and rated current of the motor, and then perform parameter identification.

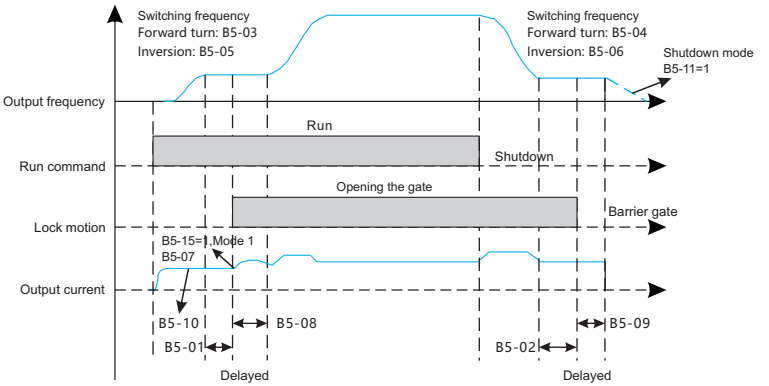


Chapter 6

Guidance on Braking Logic

6.1 Schematic diagram of brake logic

Set up in situations where quick start stop is required, otherwise skip this step. Reduce the motor acceleration time (e.g. set to 1 second), change the PI parameter settings of the speed loop and current loop, press the run button, and check if the motor can accelerate quickly to the set frequency.



6.2 Braking Logic Process

① After receiving the operation command, the frequency converter accelerates to the opening frequency set for B5-03 forward rotation or B5-05 reverse rotation.

② After the frequency reaches the opening frequency, after setting the delay time B5-01 before opening the brake, maintain the operation at the opening frequency.

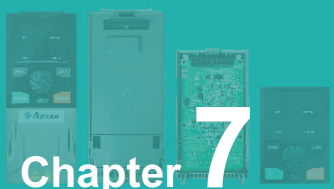
③ If B5-12=1 is set, the current condition needs to be determined when opening the brake, and the output current needs to reach the current threshold set by B5-07. Default to 0 does not determine current.

④ During the period when the brake is not opened, the output can be restricted by setting B5-10. The 32nd function of DO has been set to "brake control output". After the set brake is opened, the B5-08 relay outputs a valid signal to control the brake to open and start accelerating to the set frequency.

⑤ After receiving the shutdown command, the frequency converter slows down to the B5-04 forward rotation or B5-06 reverse rotation closing frequency.

⑥ After reaching the set closing frequency, after a delay time of B5-02 before closing, the relay outputs a closing signal to control the closing of the brake. After setting a delay time of B5-09 after closing, the frequency converter starts to stop and can choose between free stop or deceleration stop modes.

⑦ By default, B5-11 is set to 0, and the shutdown mode is free shutdown. It can be set to 1 through B5-11 and changed to execute deceleration shutdown after the delay ends after closing the brake.

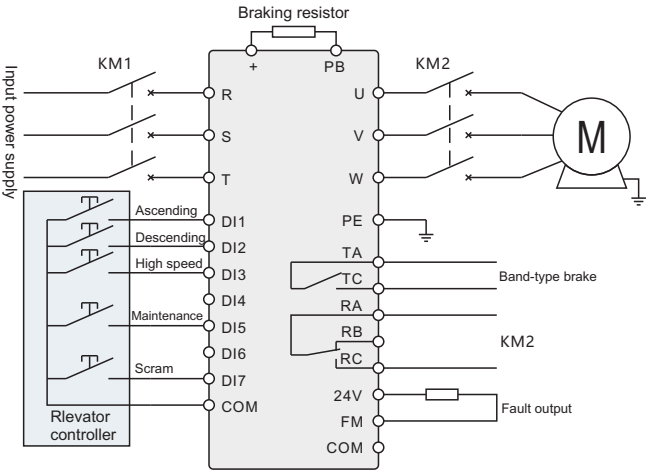


Chapter 7

Application Guidance for Civil Elevators

7.1 Single and Multi speed Terminal Elevator Controller

For elevator controllers with only one multi-stage speed conversion terminal, the high-speed and flat speed segments are controlled by the on/off of the high-speed terminal. The wiring diagram between this type of elevator controller and the frequency converter is as follows:



Wiring diagram of single and multi speed terminal elevator controller and frequency converter

According to the wiring between the controller, frequency converter, and motor on site, for elevators without a running contactor (Km2), The wiring of R2 can be omitted. Similarly, for elevator controllers that do not receive fault signals, The FM wiring can also be disconnected. Complete the wiring and debug according to the following steps.

① Set the high-speed and leveling speeds, and the elevator controller uses a high-speed terminal to switch between high-speed and leveling speeds. The corresponding parameters for setting multiple speed levels are: PC-00=level ing speed, PC-01=high-speed.

② Maintenance speed setting, some elevator controllers share maintenance speed with leveling speed, and there is no maintenance signal output. In this case, the maintenance signal line can be skipped and this step can be skipped; If there is a maintenance signal output, the maintenance speed can be set through the function code, and the corresponding parameter for setting the maintenance speed is B5-15=maintenance speed.

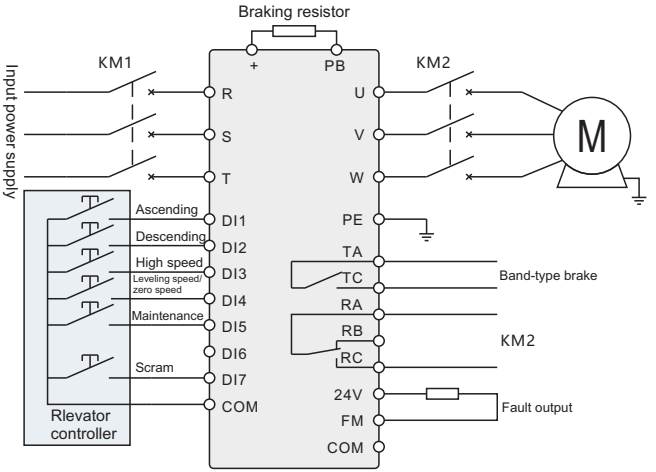
③ Emergency stop signal. If some elevator controllers do not have an emergency stop signal, the emergency stop signal line can be skipped and this step can be skipped; There is an emergency stop signal, set DI7 to emergency stop signal P5-06=54.

④ Maintenance operation test: Switch the elevator controller to maintenance operation mode and test it in the up or down direction to see if the operation direction is consistent. If not, swap the up and down signal lines, namely DI1 and DI2 signal lines, or swap any two phases of the motor output lines U, V, and W.

⑤ Normal mode trial operation, switch the elevator controller to normal operation mode for testing, and adjust the acceleration and deceleration time according to the site.

7.2 Dual multi speed terminal elevator controller

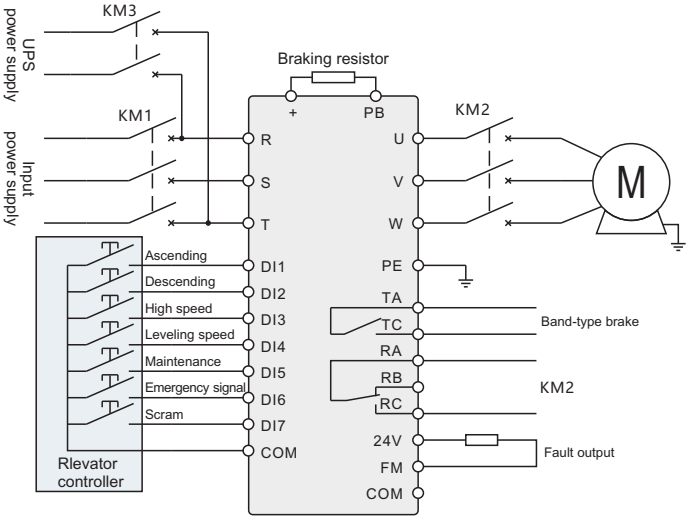
For elevator controllers with two multi-stage speed conversion terminals, the high speed is controlled by the on/off of one terminal, while the other terminal controls the leveling speed or zero speed according to different controllers. The wiring diagram of the elevator controller and frequency converter with two multi-stage speed terminals is as follows:



Wiring diagram of dual multi speed terminal elevator controller and frequency converter

7.3 Emergency operation mode

During the use of the elevator, if the power supply of the system suddenly loses power, it may cause passengers to be trapped in the car. This series of elevator applications can support emergency UPS power supply operation for power outage emergency operation. The emergency signal can be received by the frequency converter terminal DI6, and its wiring diagram is shown in the figure:

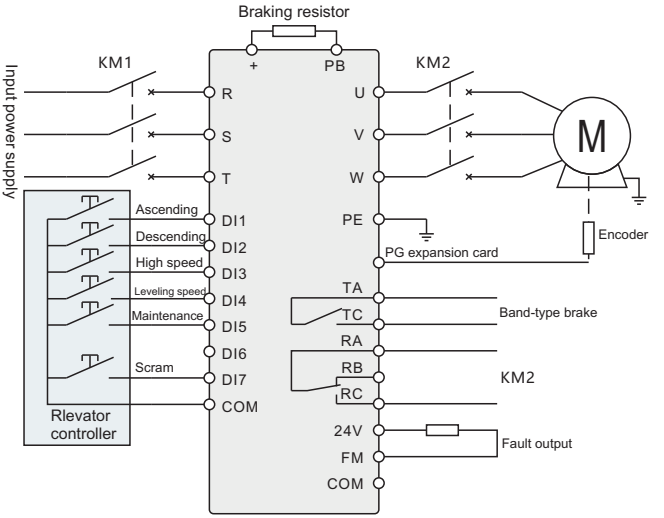


Emergency mode wiring diagram

When the power grid voltage is cut off, the elevator controller switches to UPS power supply and sends an emergency signal to the frequency converter. When the frequency converter receives the emergency signal, it automatically switches to emergency mode operation. Choosing the appropriate voltage level of the frequency converter can support single-phase 220V and three-phase 380V UPS power supply,. In emergency mode, when the elevator controller sends a running signal to the frequency converter, the frequency converter will operate at the emergency operating frequency set by B5-14, and its acceleration and deceleration time will be adjusted according to the time set by P7-07 and P7-08.

7.4 Closed loop elevator control

This series of frequency converter elevator applications can support closed-loop control and provide multiple PG cards to be used with different encoders. Please refer to Chapter 5 for PG card information. The wiring diagram between the elevator controller and the frequency converter during closed-loop elevator control is shown in the following figure:



Closed loop elevator control wiring diagram

According to the wiring between the controller, frequency converter, and motor on site, and the wiring between the PG card and encoder, for elevators without a running contactor (KM2), The wiring of R2 can be omitted. Similarly, for elevator controllers that do not receive fault signals, The FM wiring can also be disconnected. Complete the wiring and debug according to the following steps:

① Set the high-speed and leveling speed according to the wiring method in the diagram, and set the parameters for multi-stage speed as follows: PC-00=0, PC-01=leveling speed, PC-02=high-speed.

② Maintenance speed setting, some elevator controllers share maintenance speed with leveling speed, and there is no maintenance signal output. In this case, the maintenance signal line can be skipped and this step can be skipped; If there is a maintenance signal output, the maintenance speed can be set through the function code. Set maintenance DI5, P5-04=55, and the corresponding parameter for setting maintenance speed is B5-15=maintenance speed.

③ Emergency stop signal. If some elevator controllers do not have an emergency stop signal, the emergency stop signal line can be skipped and this step can be skipped; There is an emergency stop signal, set DI7 to emergency stop signal P5-06=54.

④ Maintenance operation test: Switch the elevator controller to maintenance operation mode and test it in the up or down direction to see if the operation direction is consistent. If not, swap the up and down signal lines, namely DI1 and DI2 signal lines, or swap any two phases of the motor output lines U, V, and W.

⑤ Check the direction of the encoder, switch the elevator controller to maintenance operation mode, test it up or down, and check that the output frequency is consistent with the positive or negative feedback speed of the U1-46 encoder. That is, if the output frequency is positive, the feedback speed of U1-46 also needs to be positive; If the output frequency is negative, the feedback speed of U1-46 also needs to be negative. If the directions are not consistent, P4-29 can be set to 1 or the A and B phase pulses of the encoder can be swapped. After completion, recheck whether the output frequency is consistent with the U1-46 direction.

⑥ Operating in closed-loop control mode, according to the encoder setting of the encoding large line number P4-28, switch P0-03=3 (asynchronous machine FVC) or 13 (synchronous machine FVC) to closed-loop control mode, switch the elevator controller to maintenance operation mode, and test whether the elevator is running normally by pressing up or down.

⑦ Normal mode trial operation, switch the elevator controller to normal operation mode for testing, and adjust the acceleration and deceleration time according to the site.

7.5 Multi speed setting method

For different elevator controllers, the combination of signals output from multiple speed terminals can result in different parameter positions for setting leveling speed and high speed. The speed parameters for the PC group will be set as a percentage, with 100.0% corresponding to the maximum frequency (P0-14 value). The corresponding speed setting parameters for its combination are shown in the following table:

DI3(P5-02=12)	DI4(P5-03=13)	Set speed
0	0	PC-00
1	0	PC-01
0	1	PC-02
1	1	PC-03

This product supports 4 sets of acceleration and deceleration times, with a time selection parameter range of 0-3. The corresponding acceleration and deceleration time setting parameters are shown in the table below:

Project	Group 0	Group 1	Group 2	Group 3
Acceleration time	P0-23	P7-03	P7-05	P7-07
Deceleration Time	P0-24	P7-04	P7-06	P7-08

7.6 Introduction to B5 Group Civil Elevator Application Function Codes

Need to set B5-13=1 and enable the function associated with civilian elevators.

Function code	Name	Description (setting range)	Factory Default
B5-13	Special function enablement for civilian elevators	0: Close 1: Enable	0

Application of elevator usage combined with B5 group brake logic.

Function code	Name	Description (setting range)	Factory Default
B5-00	Brake control enable selection:	0: Prohibited 1: Enable	0
B5-01	Delay before opening the brake	0 ~ 20.0s	0s
B5-02	Delay before closing the brake	0 ~ 20.0s	0.3
B5-03	Rising positive rotation brake opening frequency	0.00Hz ~ 20.00Hz	2.50Hz
B5-04	Rising positive rotation brake closing frequency	0.00Hz ~ 20.00Hz	1.50Hz

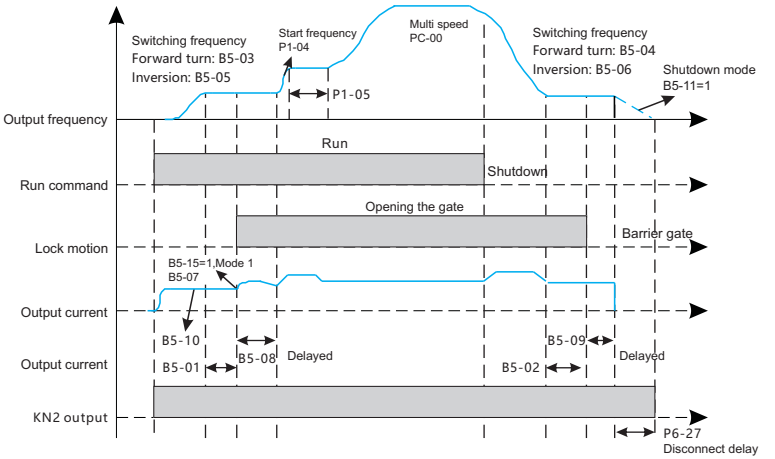
Function code	Name	Description (setting range)	Factory Default
B5-05	Falling reverse brake opening frequency	0.00Hz ~ 20.00Hz	0
B5-06	Falling reverse brake closing frequency	0.00Hz ~ 20.00Hz	0s
B5-07	Brake opening current threshold	0 ~ 100.0	0.3
B5-08	Frequency holding time after opening the brake	0 ~ 20.0s	2.50Hz
B5-09	Frequency holding time after closing the brake	0 ~ 20.0s	1.50Hz
B5-10	Current limit during brake holding period	50.0% ~ 200.0%	2.50Hz
B5-11	Shutdown mode after closing the brake	0: Free shutdown 1: Slow down and stop the machine	1.50Hz

By setting the function codes B5-01~B5-12, the starting and parking comfort of the elevator can be well adjusted, similar to the brake logic usage diagram in the above figure. The accurate meanings of each function code are shown in the following figure, and the selection of starting frequency and starting frequency holding time has been added.

Function code	Name	Description (setting range)	Factory Default
P1-04	Start frequency	0.00 ~ 10.00Hz	5.00Hz
P1-05	Start frequency holding time	0.00 ~ 10.00s	0.00s
P6-00	Relay 1 output	0 ~ 46	32 brake output
P6-01	Relay 2 output	0 ~ 46	1 Run
P6-27	Relay 2 disconnection delay	0 ~ 3600.0s	0

If there is a need to select the starting buffer frequency for the elevator, P1-04 starting frequency and P1-05 starting frequency delay can be set for control.

Applying relay 1 for brake control requires setting P6-00=32 to set the brake output function. If KM2 is connected, the function of relay 2 should be set to run output P6-01=1, and the delay of relay R2 output should be set. It is recommended to use the disconnection delay P6-27 of the relay for setting selection.



B5-03 (frequency of opening the upward positive rotation brake), B5-04 (frequency of closing the upward positive rotation brake), B5-05 (frequency of opening the downward reverse rotation brake), B5-06 (frequency of closing the downward reverse rotation brake), the upward group of the elevator is used for frequency judgment when the frequency converter rotates forward, and the downward group is used for frequency judgment when the frequency converter rotates backward.

Function code	Name	Description (setting range)	Factory Default
B5-11	Shutdown mode after closing the brake	0: Free shutdown 1: Slow down and stop the machine	1.50Hz

This parameter can be used to select whether the shutdown mode after the brake is closed is direct free shutdown or deceleration to 0 shutdown.

Function code	Name	Description (setting range)	Factory Default
B5-12	Brake open mode	0: Open according to frequency 1: Open according to frequency and current	0

0: Open according to frequency

The condition for determining the opening of the brake is that the frequency converter outputs to the frequency set at B5-03 (rising) and B5-05 (falling), and then opens the brake after the time set at B5-01 (brake opening delay).

1: Open according to frequency and current

The judgment condition for opening the brake is not only that the output of the frequency converter should reach the frequency set by B5-03 (rising) and B5-05 (falling), but also that the current of the frequency converter should reach the value set by B5-07 (brake opening current).

Function code	Name	Description (setting range)	Factory Default
B5-14	Emergency operating frequency of elevators	0.00Hz ~ P0-14Hz	20.00Hz

When an emergency signal is input, the frequency converter will enter the emergency operation state, with the operating frequency set by the function code. In the emergency operation state, the frequency converter will select acceleration and deceleration time 4 as the current acceleration and deceleration time.

Function code	Name	Description (setting range)	Factory Default
B5-15	Elevator maintenance operation frequency	0.00Hz ~ P0-14Hz	20.00Hz

When the maintenance signal is input, the operating frequency of the frequency converter will run according to the maintenance operating frequency.

Function code	Name	Description (setting range)	Factory Default
B5-16	Elevator emergency signal processing mode	0: The elevator is not running 1: UPS power supply operation	1

0: The elevator is not running

When there is an emergency signal input, the frequency converter does not output.

1: UPS power supply operation

When there is an emergency signal input, the frequency converter is powered by UPS and can operate and output at the emergency frequency.

Function code	Name	Description (setting range)	Factory Default
B5-17	Elevator ascent correction frequency	0.00Hz ~ 5.00Hz	0

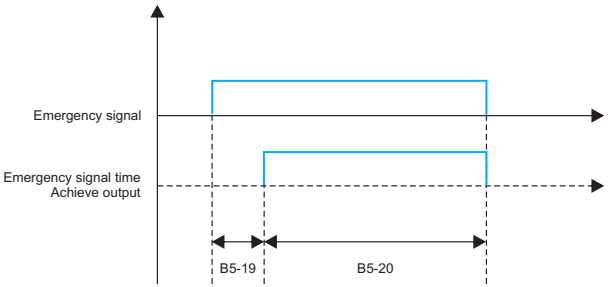
This parameter is used to correct the leveling accuracy of the elevator in power generation mode. For example, when the elevator rises at half load, it will just be at the leveling position, but when it rises at no load, it will exceed the leveling position. Increasing this value can correct the leveling accuracy.

Function code	Name	Description (setting range)	Factory Default
B5-18	Elevator descent correction frequency	0.00Hz ~ 5.00Hz	0

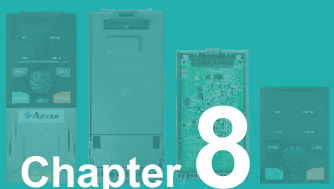
This parameter is used to correct the leveling accuracy of the elevator in electric mode. For example, when the elevator descends at half load, it will just be at the leveling position, but when it descends at no load, it will not reach the leveling position. Increasing this value can correct the leveling accuracy.

Function code	Name	Description (setting range)	Factory Default
B5-19	Effective time of elevator emergency signal	0 ~ 3600.0	0
B5-20	Elevator emergency signal invalid time	0 ~ 3600.0	0

These two parameters are used to set the valid and invalid time of emergency signal output. When the emergency signal is valid, the frequency converter starts timing. When the time exceeds the value set by B5-19, and the output terminal function (Y1 Y2 R1 R2) is selected as 46 (emergency signal time reached) function, the terminal outputs a valid signal and maintains the time set by B5-20. After the time exceeds B5-20, the terminal outputs an invalid signal.



The emergency signal output indicates that civilian elevators are sensitive to the noise of the cooling fan. The elevator fan is silent at P7-26=2, and the cooling fan starts with temperature.



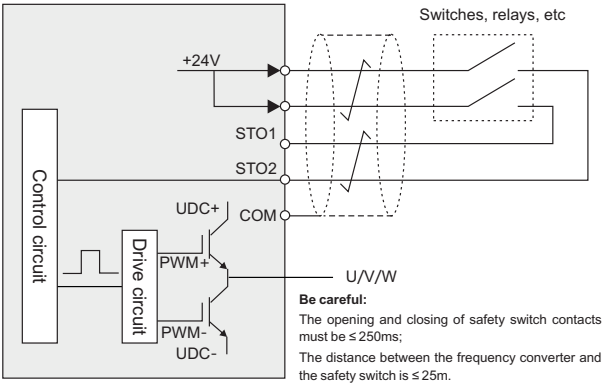
Chapter 8

Overview of STO Function

8.1 Overview of STO Function

Reference standards:

IEC 61508-1、IEC 61508-2、IEC 61508-3、IEC 61508-4、IEC 62061、ISO 13849-1、IEC 61800-5-2.The STO function of this series of frequency converters automatically shuts down when stopped. There is a stop signal set inside the frequency converter, and when this signal is triggered, the frequency converter will automatically stop working. By inputting specific control commands or using external sensors to trigger a stop signal, the frequency converter stops outputting current. This function has high safety and reliability, and can effectively avoid unnecessary equipment damage and personnel injury. When using a frequency converter, please set the parameters of the STO function reasonably to ensure its normal operation and achieve the best results.



8.2 STO Function Logic

Input status and corresponding faults of STO function:

STO input status	Corresponding to STO malfunction
Simultaneously open STO1 and STO2	Trigger STO function, the frequency converter cannot work properly
STO1 and STO2 are both closed simultaneously	The frequency converter can work normally without triggering the STO function

STO input status	Corresponding to STO malfunction
Either STO1 or STO2 is open	Triggering Err48 fault, the fault type can be distinguished by checking the U1-35 values. 1: STO1 disconnected; 2: STO2 disconnected; 3: STO1 and STO2 are both disconnected.

8.3 STO Function Installation Checklist

Before installing STO, please perform a self check according to the table below to ensure that STO is valid.

No.	Project
1	Ensure that the frequency converter can run and stop freely during debugging.
2	Stop the frequency converter (if it is running), cut off the input power and isolate the frequency converter from the power supply through a switch.
3	Connect the circuit correctly according to the STO circuit diagram.
4	Check if the STO input cable is properly connected to+24V and the shielding layer is properly connected to GND COM
5	Power on self-test
6	When the motor stops, test the STO method: Send a stop command to the frequency converter (if it is running) and wait for the motor shaft to be in a stopped state; Activate the STO function and issue a start command to the driver to ensure that the motor remains stationary; Stop activating the STO circuit.
7	Restart the frequency converter and check if the motor is running normally
8	When the motor is running, test the STO method: Start the frequency converter to ensure the normal operation of the motor; Activate the STO circuit; The frequency converter triggers the STO fault Err48 (U1-35 check the fault type and handling), ensuring that the motor stops; Stop activating the STO circuit.
9	Restart the frequency converter and check if the motor is running normally

8.4 Fire Protection Mode Association Function Code

Function code	Name	Description (setting range)	Factory Default
P7-80	Fire mode selection	0: Not enabled; 1: Enable mode 1, allowing terminal emergency stop; 2: Enable mode 2, no shutdown allowed.	0
P7-81	Fire mode frequency setting	0 ~ P0-14	50.00Hz
P5-02	Di3 terminal function selection	0~53	42
P4-03	Di4 terminal function selection	0~53	45

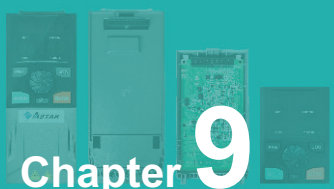
8.5 Introduction to Fire Protection Mode Functions

① When P7-80 is set to 0: Fire fighting mode does not turn on

② When P7-80 is set to 1 (fire mode one): At this time, the digital input terminals (DI1-DI5) are set to function 42, which is the fire mode enable terminal (triggered by rising edge). When this function is effective, the frequency converter operates at the P7.81 set frequency. If a fault is reported during the operation of the frequency converter, it will continue to run without stopping. When this function is effective, the frequency converter will automatically run. When this function is ineffective, the command source needs to give a shutdown command to stop it.

Attention: In this mode, if an emergency situation occurs after the fire mode is activated, pressing the emergency stop button will allow the machine to stop (default DI4 terminal is set to emergency stop function 45).

③ When P7-80 is set to 2 (fire mode 2): At this time, the digital input terminals (DI1-DI5) are set to function 42, which is the fire mode enable terminal (triggered by rising edge). When this function is effective, the frequency converter operates at the set frequency of P7-81. If a fault is reported during the operation of the frequency converter, it will continue to operate without stopping. When this function is effective, the frequency converter will automatically operate and cannot be stopped until it loses power or the machine explodes.



Chapter 9

Tension Control

9.1 Tension control related function codes

Refer to the C1 group function code in the functional parameter table.

9.2 Introduction to Tension Control Scheme

There are two ways to control tension.

1: Can control the output torque of the motor;

2: Control the motor speed.

9.3 Two methods of tension control

9.3.1 Open loop torque control mode

Open loop refers to the absence of tension feedback signals, and the frequency converter can achieve control objectives solely by controlling the output frequency or torque, regardless of the open-loop vector or closed-loop vector. The torque control mode refers to the frequency converter controlling the torque of the motor, not the frequency, and the output frequency automatically changes according to the speed of the material. According to the formula F=T/R (where F is the material tension, T is the torque of the winding shaft, and R is the radius of the winding shaft), it can be seen that if the torque of the winding shaft can be adjusted according to the change of the winding diameter, the tension on the material can be controlled. This is the basis for controlling tension in open-loop torque mode. Another reason for its feasibility is that the tension on the material only comes from the torque of the winding shaft, which mainly acts on the material.

9.3.2 Closed loop speed control mode

Closed loop refers to the need for tension (position) detection feedback signals to form closed-loop regulation. Speed control mode refers to the frequency converter adjusting the output frequency based on the feedback signal to achieve control objectives. Speed mode frequency converters can operate in any of three ways: sensorless vector control, sensorless vector control, and V/F control. The principle of this control mode is to calculate a matching frequency setting value f1 by comparing the material line speed with the actual roll diameter, and then perform PID operation on the tension (position) feedback signal to generate a frequency adjustment value f2. The final frequency output is f=f1+f2. F1 can basically match the linear speed of the winding (unwinding) roller with the linear speed of the material, and then the F2 part only needs to be slightly adjusted to meet the control

requirements, effectively solving the contradiction between response speed and control stability in closed-loop control. In this mode, the tension setting part is invalid. The target value for system control is set in the FA-00PID given source, and the control result is to stabilize the feedback signal of tension (position) at the given value of PID. Please note that when using position signals (such as tension swing rods or floating rollers) for feedback, changing the set value (given by PID) may not necessarily change the actual tension magnitude. Changing the tension magnitude requires modifying the mechanical configuration such as the counterweight of the tension swing rod or floating roller.

9.4 Control mode selection section

Function code	Name	Description (setting range)	Factory Default
C1-00	Tension control mode	0: Invalid 1: Open loop torque mode 2: Closed loop speed mode	0

Select the mode for tension control using this parameter

① Tension control ineffective;

② Open loop torque control mode: without tension detection and feedback, the frequency converter controls the output torque to control the tension on the material. The control of output torque by a frequency converter requires vector control with speed sensors to achieve better control effects.

③ Closed loop speed mode: requires tension detection and feedback, and the frequency converter outputs the frequency through PID closed-loop control to achieve the set tension. The frequency converter controls the output frequency, and its control method can be either sensorless vector control, V/F control, or closed-loop vector control.

Function code	Name	Description (setting range)	Factory Default
C1-01	Retract and retract mode	0: Volume collection 1: Drop the volume	0

Selecting the roll up/down mode can be used with the roll up/down switch terminal. When the roll up/down switch terminal is invalid, the actual roll up/down mode is set the same as this function code. When the winding switch terminal is valid, the actual winding mode is opposite to the setting of this function code.

The relationship between tension direction and winding:

The tension direction is fixed to the direction of the winding tension, which is consistent with the operating direction during non tension control. When switching between winding and unwinding, only change the C1-01 or use the winding and unwinding switching terminal to switch, without changing the forward and reverse operation instructions at the same time.

Function code	Name	Description (setting range)	Factory Default
C1-02	Maximum frequency of roll up	0.00Hz to maximum frequency	30
C1-03	Upper limit frequency for unwinding	0.00Hz to maximum frequency	10

When the tension control is effective, the upper limit frequency for the winding mode and unwinding mode is determined by C1-02 and C1-03.

Function code	Name	Description (setting range)	Factory Default
C1-04	Gear ratio	0.01~600.00	1.85

Mechanical transmission ratio=motor speed/spool speed. The mechanical transmission ratio must be set correctly during tension control

9.5 Tension setting section

Function code	Name	Description (setting range)	Factory Default
C1-05	Tension setting source	0: Function code setting (C1-06) 1: Ai1 2: Ai2 3: AI3 (expansion card) 4: PULSE input pulse setting 5: Communication given	0

This parameter determines the control source of tension:

① 0: The tension is set as a number, and the specific value is set in C1-06.

② 1: AI1, 2: AI2, 3: AI3 Tension is set through analog signals, such as using potentiometers to set tension. When selecting analog tension settings, be sure to set the maximum tension. The maximum value set by the analog quantity usually corresponds to the maximum tension.

③ 4: The tension setting is set through pulse input. The pulse input terminal must be a DI5 terminal. When selecting the pulse setting tension, be sure to set the maximum tension. The maximum value set for the maximum pulse usually corresponds to the maximum tension.

④ 5: Communication settings. When controlling with an upper computer, tension can be set using communication methods.

Function code	Name	Description (setting range)	Factory Default
C1-06	Tension setting	0~30000N	1.85

When C1-05 is set to 0, the tension controlled by the frequency converter is determined by this parameter.

Function code	Name	Description (setting range)	Factory Default
C1-07	Maximum tension	0~30000N	1.85

When selecting the tension source as analog or pulse control for C1-05, this parameter determines the maximum value of the analog or pulse.

9.6 Calculation parameters for roll diameter

Function code	Name	Description (setting range)	Factory Default
C1-08	Calculation method for roll diameter	0: Function code setting (C1-10) 1: Linear velocity calculation 2: Cumulative thickness calculation 3: Ai1 4: Ai2 5: AI3 (expansion card) 6: PULSE pulse input	0

① 0: Set through function code;
② 1: Calculate the roll diameter through linear velocity;
③ 2: Thickness accumulation method for calculating roll diameter;
④ 3, 4, 5: Calculate the roll diameter through analog AI terminals;
⑤ Calculate roll diameter through PILSE pulse input.

Function code	Name	Description (setting range)	Factory Default
C1-09	Maximum roll diameter	1~10000mm	1100
C1-10	Roll diameter	1~10000mm	320

When selecting 3, 4, 5, and 6 as the calculation methods for the roll diameter of C1-08, the maximum input quantity should correspond to the maximum roll diameter. At the same time, when the frequency converter calculates the roll diameter itself, the calculated roll diameter is limited by this parameter.

The diameter of the coil set by C1-09 is limited by this parameter if the frequency converter calculates a coil diameter lower than this value due to improper parameter settings.

Function code	Name	Description (setting range)	Factory Default
C1-11	Initial roll diameter source	0: DI terminal setting 1: Ai1 2: Ai2 3: AI3 (expansion card)	320

Select the input channel for the initial roll diameter.

0: Use DI terminal logic to set 4 initial coil diameters from C1-12 to 15 as numbers

1: AI1, 2: AI2, 3: AI3 The initial roll diameter is determined by analog input, and different ports for analog input are selected

Function code	Name	Description (setting range)	Factory Default
C1-16	Roll diameter filtering time	0.0s~100.0s	1.0s

Filter time for calculating roll diameter to prevent rapid changes in roll diameter

Function code	Name	Description (setting range)	Factory Default
C1-19	Roll diameter reset selection	0: During operation, it is prohibited to reset the roll diameter 1: Allow roll diameter reset during operation	1.0s

The selection of roll diameter reset conditions, the roll diameter reset operation is initiated by the DI terminal function, and the roll diameter is set from C1 to 19 before running to determine whether the reset operation is possible.

Function code	Name	Description (setting range)	Factory Default
C1-20	The roll diameter has reached the set value	1~10000mm	0

When the roll diameter value reaches C1-20, the DO terminal's set roll diameter reaching function is effective.

9.7 Cumulative calculation of roll diameter parameters for thickness

Function code	Name	Description (setting range)	Factory Default
C1-21	Material thickness selection	0: DI terminal setting 1: Ai1 2: Ai2 3: AI3 (expansion card) 4: Communication settings	0
C1-22	Maximum thickness	0.01~100.00mm	0

When parameter 0 is selected for C1-21, the material thickness is set by the DI terminal, and four initial material thicknesses can be digitally set for C1-22~C1-26, which are determined by the DI terminal level logic.

When selecting parameters 1, 2, and 3 for C1-21, the maximum analog input should correspond to the maximum thickness of C1-22.

9.8 Calculation of Roll Diameter Parameters for Linear Velocity

Function code	Name	Description (setting range)	Factory Default
C1-30	Linear velocity input source	0: Function code setting (C1-31) 1: Ai1 2: Ai2 3: AI3 (expansion card) 4: PULSE input pulse given 5: Communication given	0
C1-31	Maximum linear velocity	0.1~6000.0m/min	1000

C1-30: When the input source of linear velocity is 0, the linear velocity is set to the value of C1-31.

After using 1, 2, and 3 analog signals AI as input sources for linear velocity, the correct maximum linear velocity of C1-31 needs to be set for the maximum analog signal.

When the input source of linear velocity is 4, the linear velocity is given by the PULSE input pulse.

When the input source of linear velocity is 5, the linear velocity is given through communication.

Function code	Name	Description (setting range)	Factory Default
C1-32	Actual value of linear velocity	Actual value	Actual value

C1-32: This parameter displays the real-time value of linear velocity.

Function code	Name	Description (setting range)	Factory Default
C1-33	Lower limit of roll diameter calculation frequency	0.00Hz~maximum frequency	1.5
C1-34	Roll diameter calculation delay	0.0~100.0s	6

The parameter C1-33 indicates that when the operating frequency of the frequency converter is lower than the frequency set by this parameter, the roll diameter will no longer participate in the calculation change.

Delay time for calculating the roll diameter of C1-34.

9.9 Tension compensation parameters

Function code	Name	Description (setting range)	Factory Default
C1-40	Upper limit of compensating torque for moment of inertia	0.0~50.0%	5
C1-41	Static friction compensation coefficient	0.0~50.0%	0
C1-42	Dynamic friction compensation coefficient	0.0~50.0%	0

C1-40: Used to compensate for the rotational inertia of the system itself, includ-ing the inertia of motors, transmission systems, reels, etc. This inertia is fixed and independent of the roll diameter. This parameter can be automatically obtained through self-learning with compensation coefficients (this feature is currently retained in the current version), or it can be manually set. When there is an empty or small roll, if the material tension decreases during the acceleration process, increase the coefficient; otherwise, decrease the coefficient.

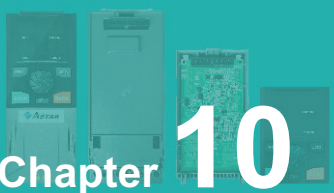
C1-41~42: Taking winding as an example: due to frictional resistance, the tension of the material decreases, which has a more significant impact on small rolls, and also makes the tension non-linear. By setting this parameter, it can be improved.

Function code	Name	Description (setting range)	Factory Default
C1-44	High speed torque compensation coefficient	0.0~50.0%	0
C1-45	Basis for high-speed torque compensation	0: Frequency 1: Linear velocity	0
C1-46	High speed torque compensation speed upper limit	10.0~100.0%	100

Compensation for regulating high-speed torque with C1-44.

When adjusting the compensation of high-speed torque for C1-45, the high-speed is based on frequency or linear velocity.

The upper limit of high-speed compensation adjustment for C1-46.



Chapter 10

Fault Diagnosis and Countermeasures

10.1 Fault alarm and countermeasures

If a fault occurs during the system operation, the inverter will immediately protect the motor to stop the output, and the corresponding inverter fault relay contact will act. The inverter panel displays the fault code. The fault type and common solution corresponding to the fault code are shown in the following table. The list in the table is for reference only, please do not repair or modify it without authorization. If the fault cannot be eliminated, please seek technical support from our company or the product agent.

Table 10-1 Fault alarm and countermeasures

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
Inverter module protection	Err01	◆ Whether the motor connection terminals U, V and W are short-circuited between phases or to ground ◆ Is the module overheated? ◆ Whether the internal wiring of the inverter is loose ◆ Whether the main control board, driver board or module is normal	◆ Contact short circuit ◆ Are the fans and air ducts normal? ◆ Connect all loose wires ◆ Seek technical support
Overcurrent during acceleration	Err04	◆ There is grounding or short circuit in the output circuit of the inverter ◆ The motor parameters are incorrect ◆ The acceleration time is too short ◆ V/F torque boost or inappropriate curve ◆ The input voltage is low ◆ Start the rotating motor ◆ Sudden load during acceleration ◆ Inverter selection is too small	◆ Eliminate peripheral faults ◆ Check parameters and parameter identification ◆ Increase the acceleration time ◆ Adjust the V/F boost torque or curve ◆ Adjust the voltage to the normal range ◆ Select the speed tracking start or wait for the motor to stop before starting ◆ Cancel sudden load ◆ Use inverters with larger power levels

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
Overcurrent during deceleration	Err05	◆ There is grounding or short circuit in the output circuit of the inverter ◆ The motor parameters are incorrect ◆ The deceleration time is too short ◆ The input voltage is low ◆ Sudden load during deceleration ◆ No braking unit and braking resistor ◆ The magnetic flux braking gain is too large	◆ Eliminate peripheral faults ◆ Perform motor parameter identification ◆ Increase the deceleration time ◆ Adjust the voltage to the normal range ◆ Cancel sudden load ◆ Install braking unit and resistance ◆ Reduce the magnetic flux braking gain
Overcurrent in constant speed operation	Err06	◆ There is grounding or short circuit in the output circuit of the inverter ◆ The motor parameters are incorrect ◆ The input voltage is low ◆ Is there a sudden load during operation? ◆ Inverter selection is too small	◆ Eliminate peripheral faults ◆ Check parameters and parameter identification ◆ Adjust the voltage to the normal range ◆ Cancel sudden load ◆ Select the inverter with a larger power level
Overvoltage during acceleration	Err08	◆ The input voltage is too high ◆ There is an external force driving the motor to run during the acceleration process ◆ The acceleration time is too short ◆ No braking unit and braking resistor ◆ The motor parameters are incorrect	◆ Adjust the voltage to the normal range ◆ Cancel external power or install braking resistor ◆ Increase the acceleration time ◆ Install braking unit and resistor ◆ Check parameters and parameter identification
Overvoltage during deceleration	Err09	◆ The input voltage is too high ◆ There is an external force driving the motor to run during the deceleration process ◆ The deceleration time is too short ◆ No braking unit and braking resistor	◆ Adjust the voltage to the normal range ◆ Cancel external power or install braking resistor ◆ Increase the deceleration time ◆ Install braking unit and resistor

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
Overvoltage during constant speed operation	Err10	◆ The input voltage is too high ◆ There is an external force driving the motor to run during the acceleration process	◆ Adjust the voltage to the normal range ◆ Cancel external power or install braking resistor
Undervoltage fault	Err12	◆ Instantaneous power failure ◆ The input voltage of the inverter is not within the range required by the specification ◆ The bus voltage is abnormal ◆ The rectifier bridge and buffer resistance are abnormal ◆ Abnormal drive board ◆ The control panel is abnormal	◆ Reset fault ◆ Adjust the voltage to the normal range ◆ Seek technical support
Drive overload fault	Err13	◆ Whether the load is too large or the motor is blocked ◆ Inverter selection is too small	◆ Reduce the load and check the motor and mechanical conditions ◆ Select the inverter with a larger power level
Motor overload fault	Err14	◆ Whether the setting of motor protection parameter P9-01 is appropriate ◆ Whether the load is too large or the motor is blocked ◆ Inverter selection is too small	◆ Correctly set this parameter ◆ Reduce the load and check the motor and mechanical condition ◆ Select the inverter with a larger power level
drive overheating	Err15	◆ The ambient temperature is too high ◆ The air duct is blocked ◆ The fan is damaged ◆ The module thermistor is damaged ◆ The inverter module is damaged	◆ Lower the ambient temperature ◆ Clean the air duct ◆ Replace the fan ◆ Replace the thermistor ◆ Replace the inverter module

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
Current detection failure	Err17	◆ Whether the internal wiring of the inverter is loose ◆ Is the current detection device normal? ◆ Whether the main control board or driver board is normal	◆ Check the wiring ◆ Seek technical support
Short to ground fault	Err20	◆ Motor short circuit to ground	◆ Replace the cable or motor
Input phase loss fault	Err23	◆ The three-phase input power supply is abnormal ◆ The driver board is abnormal ◆ The lightning protection board is abnormal ◆ The main control board is abnormal	◆ Check and eliminate problems in peripheral circuits ◆ Seek technical support
Output phase loss fault	Err24	◆ The lead wire from the inverter to the motor is abnormal ◆ The three-phase output of the inverter is unbalanced when the motor is running ◆ The driver board is abnormal ◆ Module exception	◆ Eliminate peripheral faults ◆ Check whether the three-phase windings of the motor are normal and troubleshoot ◆ Seek technical support
read and write failure	Err25	◆ EEPROM chip damaged	◆ Replace the main control board
Parameter	Err27	◆ Is the host computer working? ◆ Is the communication connection normal? ◆ Whether the communication parameter P8 group is correct	◆ Check the wiring of the host computer, etc. ◆ Check the communication wiring ◆ Check the parameters of P8 group
Parameter	Err28	◆ Input external normally open or normally closed fault signal through multi-function DI terminal	◆ Fault reset
Excessive speed deviation	Err29	◆ The load is too heavy and the set acceleration time is too short ◆ The setting of fault detection parameters P9-31 and P9-32 is unreasonable	◆ Extend the set acceleration and deceleration time ◆ Reset P9-31 and P9-32

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
User-defined fault 1	Err30	◆ User-defined fault 1 signal input through multi-function terminal DI	◆ Reset
User-defined fault 2	Err31	◆ User-defined fault 2 signal input through multi-function terminal DI	◆ Reset
PID feedback lost at runtime	Err32	◆ PID feedback value is less than the set value of PA-13	◆ Check the feedback signal or reset the PA-13
Fast current limiting	Err33	◆ The load is too large or the stall occurs ◆ The set acceleration time is too short	◆ Reduce the load or replace the inverter with a higher power ◆ Properly extend the acceleration time
load drop failure	Err34	◆ When the load drop detection condition is reached, please refer to P9-28-P9-30 for specific use.	◆ Reset or reset detection conditions
input power failure	Err35	◆ The input voltage is not within the specified range ◆ Power on and off too frequently	◆ Adjust the input voltage ◆ Extend the power cycle
parameter storage exception	Err37	◆ Abnormal communication between DSP and EEPROM chip	◆ Replace the main control board ◆ Seek manufacturer service
The running time has arrived	Err39	◆ The current running time of the inverter > the set value of P7-38	◆ Reset
Accumulated running time reached	Err40	◆ The accumulated running time reaches the set value P7-20	◆ Use parameter initialization function 2 to clear the recording time or reset the accumulated running time
Switching motors during operation	Err42	◆ Switch the motor through the terminals during operation	◆ Motor switch after shutdown

Fault name	Panel display	Troubleshooting	Troubleshooting Countermeasures
Master-slave control communication dropped	Err46	◆ The master is not set but the slave is set ◆ The communication line is abnormal or the communication parameters are incorrect	◆ Set the host and reset the fault ◆ Check the communication line and communication parameter P8 group
SVC shutdown speed feedback abnormal fault	Err47	◆ It is possible that the motor parameters are not self-learning, and there is no protection for abnormal situations such as not connecting the motor	◆ The default setting time for P9-09 is 5 seconds, and the setting time is 0 seconds. This fault can be turned off within the range of 0 to 100.0 seconds.
STO malfunction	Err48	◆ STO-24V disconnected	◆ +24V-STO1 , +24V-STO2 are all closed

10.2 Common faults and their solutions

The following fault conditions may be encountered during the use of the inverter, please refer to the following methods for simple fault analysis.

Table 10-2 Common faults and their solutions

Serial number	Fault phenomenon	Possible reason	Solution
1	No display when power on	◆ The grid voltage is not available or too low ◆ The switching power supply on the drive board of the inverter is faulty ◆ The rectifier bridge is damaged ◆ The buffer resistance of the inverter is damaged ◆ Control panel and keyboard failure ◆ The connection between the control board, the driver board and the keyboard is broken	◆ Check the input power ◆ Check the bus voltage ◆ Re-plug the keyboard and the 30-pin cable ◆ Seek manufacturer service

Serial number	Fault phenomenon	Possible reason	Solution
2	Display "Err20" alarm when power on	◆ The motor or output line is short-circuited to ground ◆ The inverter is damaged	◆ Use a shaker to measure the insulation of the motor and output line ◆ Seek manufacturer service
3	Err15 (module overheating) fault is reported frequently	◆ The carrier frequency setting is too high ◆ The fan is damaged or the air duct is blocked ◆ The internal components of the inverter are damaged (thermocouple or other)	◆ Reduce the carrier frequency (P0-26) ◆ Replace the fan and clean the air duct ◆ Seek manufacturer service
4	The motor does not rotate after the inverter is running	◆ Motor and motor wire ◆ Incorrect setting of inverter parameters (motor parameters) ◆ Poor connection between the drive board and the control board ◆ Drive board failure	◆ Reconfirm the connection between the inverter and the motor ◆ Replace the motor or clear the mechanical fault ◆ Check and reset the motor parameters
5	DI terminal failure	◆ Parameter setting error ◆ External signal error ◆ The position of the DI DIP switch is wrong ◆ Control board failure	◆ Check and reset the relevant parameters of the P5 group ◆ Reconnect the external signal line ◆ Re-confirm whether the position of the DI DIP switch is consistent with the wiring method ◆ Seek manufacturer service
6	The inverter frequently reports overcurrent and overvoltage faults	◆ The motor parameters are set incorrectly ◆ Inappropriate acceleration and deceleration time ◆ Load fluctuation	◆ Reset the motor parameters or perform motor tuning ◆ Set the appropriate acceleration and deceleration time ◆ Seek manufacturer service

10.3 Common faults of synchronous motors and their solutions

10.3.1 Motor starts with heavy load

If the motor does not start normally with load, you can try the following operations:

❶ Increase the upper limit of torque current (P3-21)

When the load is greater than the torque output of the inverter, the inverter will be in a locked-rotor state, and P3-21 can be appropriately increased at this time.

❷ Increase the speed PI adjustment parameter, modify the resistance value or static identification to correct the motor resistance.

The motor resistance parameter (P4-17) will significantly affect the load carrying capacity of the motor at low speed. When the resistance parameter (P4-17) exceeds the actual resistance value by too much (for example, 200% of the actual resistance value), it may cause the motor to reverse at low speed at the upper torque limit current. When the resistance parameter (P4-17) is too much lower than the actual resistance value (for example, 50% of the actual resistance value), it may cause the motor to run in a step-by-step manner, or rotate for a period of time and stop for a period of time. Increasing the speed P value P3-04 at low speed and reducing the speed loop integral time P3-05 may improve the problem caused by too small resistance parameters.

10.3.2 Adjust the speed loop PI parameters (under normal circumstances do not need to adjust)

❶ In general, if the proportional coefficient of speed PI adjustment is too large, it will cause high-frequency vibration of the speed, and the mechanical vibration or electromagnetic noise will increase significantly; if the proportional coefficient is too small and the integration time is too small or the load inertia is too large, it will cause low-frequency vibration of the speed and overshoot of the speed. Obviously, if there is no discharge measures, there may be overvoltage.

❷ If you need to adjust the speed PI parameter, first increase the integral time, increase the ratio if the speed does not oscillate, and then decrease the integral time if the effect is not satisfactory. Generally, the larger the inertia of the system, the smaller the integral time and the larger the proportional coefficient. If the speed filter coefficient is increased, the integral time should be increased, and the proportion can be increased appropriately.

Note:

The inertia of the drive system is equal to the motor inertia plus the load inertia. The inertia of the motor is proportional to the mass of the motor and the square of the diameter of the motor; the inertia of the transmission load is proportional to the mass of the load and the square of the diameter of the transmission wheel; if there is a deceleration or speed-up device, the inertia is proportional to the speed-up ratio and inversely proportional to the deceleration ratio .

For loads with large inertia, if fast speed response is required, the integration time needs to be reduced, but it is easy to cause speed overshoot, resulting in overvoltage of the inverter, and a discharge device is required to discharge. If there is no discharge device, the integration time can be increased.

10.3.3 Adjust the PI parameters of the current loop (under normal circumstances, do not need to adjust)

Under normal circumstances, increasing the proportional coefficient and the integral coefficient will speed up the current response speed, but if too large, it will cause speed shock (specifically, the motor does not rotate, or rotates in random directions, and emits high-frequency electromagnetic noise at the same time). If you need to adjust it, first Adjust the proportional coefficient, and adjust the integral coefficient if the effect is not satisfactory. The PI parameters of the current loop are related to the motor stator resistance, inductance, carrier frequency of the system, and current sampling filter time. When the carrier frequency of the system remains unchanged, the proportional coefficient is proportional to the inductance, and the integral coefficient is proportional to the resistance. Therefore, by identifying The output parameter can roughly determine the adjustment direction of this parameter.

Modbus communication protocol

11.1 Modbus communication protocol

ATS700 series inverter provides RS232/RS485 communication interface and supports Modbus communication protocol. Users can realize centralized control through computer or PLC, set inverter running commands, modify or read function code parameters, and read inverter wor-king status and fault information through this communication protocol.

1.Agreement

The serial communication protocol defines the content and format of information transmitted in serial communication. It includes: host polling (or broadcast) format; host encoding method, including: function code required for action, transmission data and error checking, etc. The response of the slave also adopts the same structure, including: action confirmation, return data and error checking, etc. If the slave has an error in receiving the information, or cannot complete the action required by the master, it will organize a fault message as a response and feed it back to the master.

2.Application method

The inverter is connected to the "single master and multiple slave" PC/PLC control network with RS232/RS485 bus.

3.Bus structure

(1) The interface way RS232/RS485 hardware interface

(2) Transfer method

Asynchronous serial, half-duplex transmission mode. At the same time, only one of the master and slave can send data and the other can only receive data. In the process of serial asynchronous communication, data is sent frame by frame in the form of messages.

(3) Topology

Single master multi-slave system. The setting range of the slave address is 1 to 247, and 0 is the broadcast communication address. Slave addresses in the network must be unique.

4.Protocol description

ATS700 series inverter communication protocol is an asynchronous serial master-slave Modbus communication protocol. Only one device (host) in the network can establish a protocol (called "query/command"), other devices (slave) can only provide The data responds to the "query/command" of the host, or makes corresponding actions according to the "query/command" of the host. The host here refers to personal computer (PC), industrial control equipment or programmable logic controller (PLC), etc., and the slave refers to the ATS700 inverter. The master can not only communicate with a certain slave, but also publish broadcast infor-mation to all the lower slaves. For the "inquiry/command" of the host that is accessed indivi-dually, the slave must return a message (called a response). For the broadcast information sent by the host, the slave does not need to respond to the host.

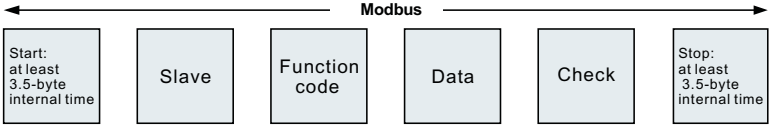
5.Communication frame structure

The Modbus protocol communication data format of ATS700 series inverter is as follows.

Using RTU mode, message transmission starts with a pause interval of at least 3.5 character times. This is the easiest to implement with various character times at the network baud rate (as shown in T1-T2-T3-T4 in the figure below). The first field of the transfer is the device address. The transfer characters that can be used are 0...9,A...F in hexadecimal. The network device continuously detects the network bus, including the pause interval. When the first field (address field) is received, each device decodes it to determine whether it is destined for its own. After the last transmitted character, a pause of at least 3.5 character times marks the end of the message. A new message can start after this pause.

The entire message frame must be transmitted as a continuous stream. If there is a pause of more than 1.5 character times before the frame is complete, the receiving device will flush the incomplete message and assume the next byte is the address field of a new message. Likewise, if a new message follows the previous message in less than 3.5 characters, the receiving device will consider it a continuation of the previous message. This will cause an error because the value in the final CRC field cannot be correct.

RTU Data Frame Format



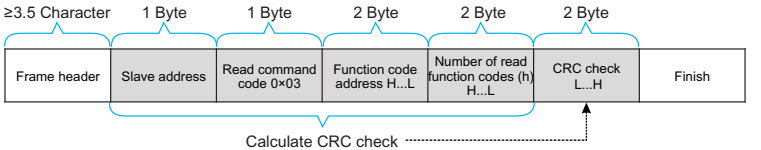
RTU frame format:

Frame header START	3.5 character time
Slave address ADR	Communication address: 1 ~ 247 (set by P8-02)
Command code CMD	03: Read slave parameters; 06: Write slave parameters
Data content DATA (N-1)	Data content: Function code parameter address, function code parameter number, function code parameter value, etc.
Data content DATA (N-2)	
...	
Data content DATA0	
CRC CHK low order	Detection value: CRC16 check value. When transmitting, the low byte comes first and the high byte follows. For the calculation method, please refer to the description of CRC check in this section.
CRC CHK high bits	
END	3.5 character time

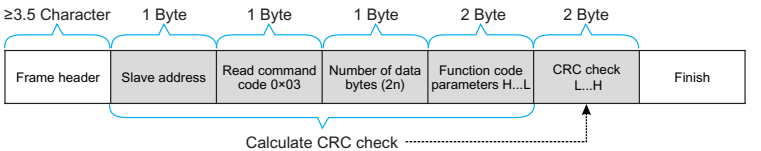
Command command (CMD) and data description (DATA)

Command code: 03H, read N words (Word), can read up to 12 words and N=1~ 12. The specific format is as follows:

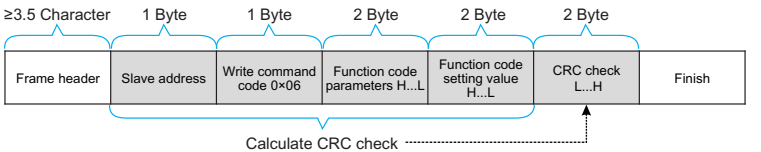
Host read command frame



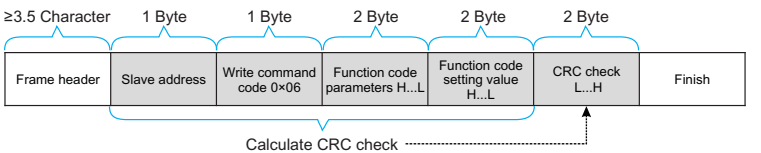
Slave read response frame



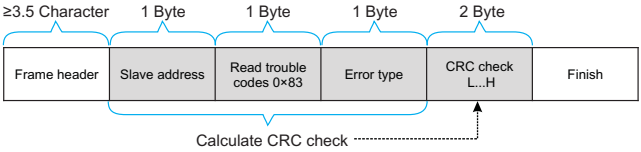
Host write command frame



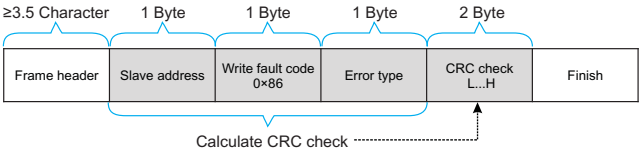
Slave write response frame



If the slave detects a communication frame error, or fails to read and write due to other reasons, it will reply with an error frame. Slave read response error frame:



Slave write response error frame



Example: read the contents of two consecutive parameters starting from P0-03 of the inverter whose slave address P8-02 is 01.

The frame sent by the host is shown in the figure:

Frame header ≥3.5 Character	Slave address 0×01	Read command code 0×03	Function code address 0×F0 0×03	Number of read function codes 0×00 0×02	CRC check 0×07 0×0B	Finish

The slave reply frame is as shown in the figure:

Frame header ≥3.5 Character	Slave address 0×01	Read command code 0×03	Data bytes 0×04	P0.03 parameter value 0×00 0×00	P0.04 parameter value 0×00 0×00	CRC check 0×FA 0×33	Finish

Note: If the write command is unsuccessful, the failure reason will be returned.

6.Check method (CRC check method)

CRC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection field based on the CRC method. The CRC field detects the content 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, it means that there is an error in the transmission.

The CRC is stored in 0xPFPF first, and then a process 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, and the start and stop bits and parity bits are invalid.

In the process of CRC generation, each 8-bit character is XORed with the contents of the register independently, and the result is moved to the direction of the least significant bit, and the most significant bit is filled with 0. The LSB is extracted and detected. If the LSB is 1, the register is individually ORed with the preset value. If the LSB is 0, it is not performed. The whole process is repeated 8 times. After the last bit (8th bit) is completed, the next 8-bit byte is XORed with the current value of the register independently. The value in the final register is the CRC value after all bytes in the message are executed.

When the CRC is added to the message, the low byte is added first, then the high byte. The CRC simple function is as follows:

```
unsigned int crc_chk_value ( unsigned char *data_value,unsigned char length ) {
                    unsigned int crc_value=0xPFPF;
                    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 ) ;
}
```

7. Address Definition of Communication Parameters

This part is the content of communication, which is used to control the operation of the inverter, the status of the inverter and the setting of related parameters.

Read and write function code parameters (some function codes cannot be changed, and are only used by manufacturers or monitored):

Function code parameter address marking rules:

The rules are represented by the function code group number and label as the parameter address:

High-order byte: P0~PF (group P), A0~AF (group A), B0~BF (group B), C0~CF (group C),

D0~DF (group D), 70~7F (group U) low byte: 00~PF

Such as: P0-11, the address is expressed as F00B;

Notice:

PF group: parameters can neither be read nor changed;

Group U: can only be read, parameters 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 the function code parameters, pay attention to the range, unit, and related descriptions of the parameters.

Function code group	Communication visit address	Function code address of communication change RAM
P0 ~ PE	0xF000 ~ 0xPEPF	0x0000 ~ 0x0EPF
A0 ~ AF	0xA000 ~ 0xAPFF	0x4000 ~ 0x4PFF
B0 ~ BF	0xB000 ~ 0xBPFF	0x5000 ~ 0x5PFF
C0 ~ CF	0xC000 ~ 0xCPFF	0x6000 ~ 0x6PFF
U0、U1	0x70xx、0x71xx	

Note that, because 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 the communication mode, just change the value in the RAM.

If it is a parameter of group P, to realize this function, it can be realized only by changing the high-order F of the function code address to 0.

If it is a group A parameter, to realize this function, just change the high-order A of the function code address to 4 to realize it.

The corresponding function code addresses are expressed as follows: high byte: 00~0F (group P), 40~4F (group A) low byte: 00~PF

For example, the function code P0-11 is not stored in the EEPROM, and the address is expressed as 000B; this address indicates that it can only be written to RAM, but cannot be read. When reading, it is an invalid address.

Stop/Run parameter section:

Address	Parameter Description
0X1000/ 0X9000	1000:*communication setting value (-10000~10000) (decimal) (unit: 0.01%), readable and writable
	9000: Communication setting frequency: 0HZ~P0-14 (minimum unit: 0.01HZ), readable and writable
0x1001	Set frequency (unit: 0.01Hz), read only
0x1002	Running frequency (unit: 0.01Hz), read only
0x1003	Bus voltage (unit: 0.1V), read only
0x1004	Output voltage (unit: 0.1V), read only
0x1005	Output current (unit: 0.1A), read only
0x1006	Output power (unit: 0.1kW), read only
0x1007	DI input flag (unit: 1), read only
0x1008	DO output flag (unit: 1), read only
0x1009	PID setting (unit: 1), read only
0x100A	PID feedback (unit: 1), read only
0x100B	Ai1 voltage (unit: 0.01V), read only
0x100C	Ai2 voltage (unit: 0.01V), read only
0x100D	Ao1 output voltage (unit: 0.01V) read only
0x100E	PLC step (unit: 1), read only
0x100F	Speed (unit: 1rpm), read only
0x1010	Count value input (unit: 1), read only
0x1011	Input pulse frequency (unit: 0.01kHz), read only
0x1012	Feedback speed (unit: 0.1Hz), read only
0x1013	Remaining running time (unit: 0.1min), read only
0x1014	AI1 voltage before calibration (unit: 0.001V), read only
0x1015	AI2 voltage before calibration (unit: 0.001V), read only
0x1016	Actual linear speed (unit: 1m/min), read only
0x1017	Load speed (unit: user-defined, refer to P7-31), read only
0x1018	Current power-on time (unit: 1min), read only
0x1019	Current running time (unit: 0.1min) read only
0x101A	Input pulse frequency (unit: 1Hz), read only

Address	Parameter Description
0x101B	Main frequency X display (unit: 0.01Hz), read only
0x101C	Auxiliary frequency Y display (unit: 0.01Hz), read only
0x101D	Target torque (unit: 0.1%), Take the motor rated torque as 100%, read only
0x101E	Output torque (unit: 0.1%), Take the motor rated torque as 100%, read only
0x101F	Output torque (unit: 0.1%), Take the inverter rated current as 100%, read only
0x1020	Torque upper limit (unit: 0.1%, Take the inverter rated current as 100%, read only
0x1021	VF separation target voltage (unit: 1V), read only
0x1022	VF separate output voltage (unit: 1V), read only
0x1023	Reserved, read only
0x1024	Motor 1\2 indication (unit: 1), read only
0x1025	Length value input (unit: 1) read only
0x1026	AO2 output voltage (unit: 0.01V), read only
0x1027	Inverter status (unit: 1), read only
0x1028	Current fault (unit: 1), read only

Example 1: Read the operating frequency of the first device: 0x01 0x03 0x10 0x02 0x00 0x01 0x21 0x0A

0x10 0x02 (1002) operating frequency address, 0x00 0x01 (0001) a data

0x21 0x0A (210A) CRC check value

Example 2: Read the bus voltage, output voltage and output current of the first device at the same time: 0x01 0x03 0x10 0x03 0x00 0x03 CRC check value, the meaning of the data is similar to that of example 1.

Note: The communication setting value is a percentage of the relative value, 10000 corresponds to 100.00%, -10000 corresponds to -100.00%.

For frequency dimension data, the percentage is relative to the maximum frequency (P0-14); for torque dimension data, the percentage is P3-21, P3-23, A3-21, A3-23.

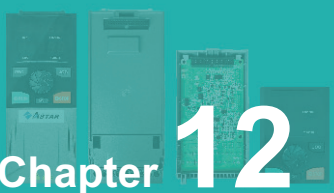
Note: D0 output terminal needs to select 16 (communication control) function.

AO output needs to select 7 (communication control output) function.

Type	Command address	Command content
Control command input (write only)	0x2000	0001: Forward run 0002: Reverse run 0003: Forward jog 0004: Reverse jog 0005: Coast to stop 0006: Decelerate to stop 0007: Fault reset 0008: Fault reset (only in communication control mode can fault reset)
Status read (read only)	0x3000	0001: Forward running 0002: Reverse running 0003: Stop
Digital output terminal control (write only)	0x2001	BIT0: RELAY1 output control BIT1: DO1 output control BIT2: RELAY2 output control
Analog output AO1 control (write only)	0x2002	0 ~ 7PFF means 0% ~ 100%
Analog output AO2 control (write only)	0x2003	0 ~ 7PFF means 0% ~ 100%
Inverter fault address	0x8000	0000: No fault 0001: Reserved 0002: Reserved 0003: Reserved 0004: Acceleration overcurrent 0005: Deceleration overcurrent 0006: Constant speed overcurrent 0007: Stop overcurrent 0008: Acceleration overvoltage 0009: Deceleration overvoltage 000A: Constant speed overvoltage 000B: Stop overvoltage 000C: Undervoltage fault 000D: Inverter overload 000E: Motor overload 000F: Module overheat 0010: Reserved 0011: Current detection fault 0012: Reserved 0013: Reserved 0014: Motor short circuit fault to ground 0015: Motor tuning fault 0016: Reserved

Type	Command address	Command content
Inverter fault address	0x8000	0017: Input phase loss 0018: Output phase loss 0019: EEPROM read and write abnormality 001A: Password input exceeded times 001B: Communication abnormal 001C: External fault 001D: Excessive speed deviation 001E: User-defined fault 1 001F: User-defined fault 2 0020: Loss of PID feedback during runtime 0021: Hardware current limit fault 0022: Loss of load 0023: Overload fault of buffer resistor 0024: The contactor is abnormal 0025: The agent running time has arrived 0026: Motor over temperature (reserved) 0027: Current running time reached 0028: Cumulative running time reached 0029: Power-on time reached 002A: Switching motor failure during operation 002B: Motor overspeed 002C: Reserved 002D: Reserved 002E: reserved 002F: point-to-slave fault

The return address when communication fails: read fault 83XX, write fault 86XX.



Chapter 12

Function & Parameter Table

The function code symbols are explained as follows:

Icons	Content
☆	Indicates that the inverter parameters can be modified during stop and running (0)
★	Indicates that the inverter is in a running state and cannot be modified (1)
○	Indicates that this parameter is a manufacturer's parameter and cannot be changed by the user (3)
●	Indicates the actual detection value of the inverter or the manufacturer's fixed value, which cannot be changed (2)

The communication address in the function parameter table is written in hexade-cimal.

Enhanced function codes: Group A0~Group A3, Group B0~Group B6, opened by function parameter P7-75.

The function code address can be found in Appendix E (P332) of this manual.

Function code	Name	Description (setting range)	Factory Default	Change
Group P0: Basic function group				
P0-00	Product number	Product model: 5 digits display, 2 decimal places	60#.##	●
P0-01	Inverter GP type display	0: G type 1: P type	0	★
P0-02	Rated current	0.1A ~ 3000.0A	Model is determined	●
P0-03	Motor control method	Ones place: motor control mode selection 1: Open loop vector control (speed sensorless vector) 2: VF Control 3: Closed loop vector (with speed sensor vector) Tens place: motor type selection 0: Asynchronous motor 1: Synchronous motor	2	★
P0-04	Run command source	0: Operation panel running command channel (LED off) 1: Terminal command channel (LED on) 2: Communication command channel (LED flashes)	0	★

Function code	Name	Description (setting range)	Factory Default	Change
P0-05	Up\Down to modify the frequency command reference during runtime	0: Running frequency 1: Setting frequency	1	★
P0-06	Main frequency source X selection	0: Up/Down modification frequency, no memory after shutdown 1: Up/Down modification frequency power-off memory 2: AI1 3: AI2 4: Multi-speed 5: Simple PLC 6: PID 7: Communication given 8: PULSE pulse setting 9: Up/Down modifies the frequency, and the memory is stopped when the power is turned off.	1	★
P0-07	Auxiliary frequency source Y selection	0: Up/Down modification frequency, no memory after shutdown 1: Up/Down modification frequency power-off memory 2: AI1 3: AI2 4: Multi-speed 5: Simple PLC 6: PID 7: Communication given 8: PULSE pulse setting 9: Up/Down modifies the frequency, and the memory is stopped when the power is turned off.	0	★
P0-08	Auxiliary frequency source Y range selection	0: relative to the maximum frequency 1: Relative to frequency source X 2: The range is the same as 0 but the main and auxiliary have no negative frequency output	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
P0-09	Auxiliary frequency source Y range	0% to 100%	100%	☆
P0-10	Frequency source selection	Ones place: frequency source selection 0: Main frequency source X 1: Main and auxiliary operation results (the operation relationship is determined by ten digits) 2: Switch between main frequency source X and auxiliary frequency source Y 3: Switch between the main frequency source X and the main and auxiliary operation results 4: Switch between auxiliary frequency source Y and main and auxiliary operation results Tens place: main and auxiliary operation relationship of frequency source 0: main + auxiliary 1: Primary-Secondary 2: the maximum value of the two 3: the minimum value of the two	00	☆
P0-11	Preset frequency	0.00Hz ~ Maximum frequency P0-14	50.00Hz	☆
P0-13	Motor running direction selection	0: Consistent with the current motor direction 1: Opposite to the current motor direction 2: Inversion is prohibited	0	☆
P0-14	Maximum output frequency	When P0-20=1, the adjustable range is 50.0Hz ~ 1200.0Hz; When P0-20=2, the adjustable range is 50.00Hz ~ 600.00Hz;	50.00Hz	★
P0-15	Upper limit frequency source	0: Digital given (P0-16) 1: AI1 2: AI2 3: Communication given 4: PULSE setting	0	★

Function code	Name	Description (setting range)	Factory Default	Change
P0-16	Upper limit frequency	Lower limit frequency P0-18 ~ maximum frequency P0-14	50.00Hz	☆
P0-17	Upper limit frequency offset	0.00 ~ Maximum frequency P0-14	0.00Hz	☆
P0-18	Lower frequency	0.00Hz ~ upper limit frequency P0-16	0.00Hz	☆
P0-19	Command source binding selection	Units digit: selection of frequency source bound by operation panel command 0: no binding 1: Digital setting frequency 2: AI1 3: AI2 4: Multi-speed 5: Simple PLC 6: PID 7: Communication given 8: PULSE pulse setting (DI5) Tens place: Terminal command binding frequency source selection Hundreds place: Communication command binding frequency source selection Thousands: reserved	000	☆
P0-20	Frequency Decimal Selection	1: 1 decimal point 2: 2 decimal places	2	★
P0-21	Acceleration and deceleration time unit	0: 1 second 1: 0.1 seconds 2: 0.01 seconds	1	★
P0-22	Acceleration and deceleration time reference frequency	0: Maximum frequency (P0-14) 1: Preset frequency (P0-11) 2: Motor rated frequency (P4-05 or A1-05)	0	★
P0-23	Acceleration time 1	0s ~ 30000s(P0-21=0) 0.0s ~ 3000.0s(P0-21=1) 0.00s ~ 300.00s(P0-21=2)	10.0s	☆
P0-24	Deceleration time 1	0s ~ 30000s(P0-21=0) 0.0s ~ 3000.0s(P0-21=1) 0.00s ~ 300.00s(P0-21=2)	10.0s	☆

Function code	Name	Description (setting range)	Factory Default	Change
P0-25	Overmodulation voltage boost value	0% ~ 10%	3%	★
P0-26	Carrier frequency	0.5kHz ~ 16.0kHz	Model is determined	☆
P0-27	The carrier frequency is adjusted with temperature	0: Invalid; 1: Valid;	1	☆
P0-28	Parameter initialization	0: No operation 1:Restore factory parameters,excluding motorparameters,P8.00 ， P8-05recordinformation andfrequency decimal point P0-20 2:Clearrecord information 3:Backup current user parameters 4:Restore user backup parameters 5:Restore all parameters	0	★
P0-29	LCD upload and download parameter selection	0: No functionality 1: Upload parameters 2: Download P4/A1 group parameters 3: Download parameters except for P4/A1 group 4: Download all parameters 5: Download P4/A1 group modification parameters 6: Download modification parameters except for P4/A1 group 7: Download all modification parameters	0	★
Group P1: Start-stop control				
P1-00	Start method	0: Direct start 1: Speed Tracking 2: Asynchronous motor pre-excitation start	0	☆
P1-01	Speed tracking method	0: Start from stop frequency 1: Start with target frequency 2: Start from maximum frequency	0	★
P1-02	Maximum speed tracking current	30% ~ 150%	100%	★
P1-03	Speed tracking speed	1 ~ 100	20	☆

Function code	Name	Description (setting range)	Factory Default	Change
P1-04	Start frequency	0.00Hz ~ 10.00Hz	0.00Hz	☆
P1-05	Start frequency hold time	0.0s ~ 100.0s	0.0s	★
P1-06	Start DC braking current	0% ~ 100%	0%	★
P1-07	Start DC braking time	0.0s ~ 100.0s	0.0s	★
P1-08	Selection of acceleration and deceleration frequency curve mode	0: Straight line 1: S curve A 2: S curve B (P1-09 ~ P1-12 unit is 0.01s)	0	★
P1-09	S-curve acceleration start time	0.0% ~ 100.0%	20.0%	★
P1-10	S-curve acceleration end time	0.0% ~ 100.0%	20.0%	★
P1-11	S-curve deceleration start time	0.0% ~ 100.0%	20.0%	★
P1-12	S-curve deceleration end time	0.0% ~ 100.0%	20.0%	★
P1-13	Stop mode	0: Decelerate to stop 1: Free stop	0	☆
P1-14	DC braking start frequency at stop	0.00Hz ~ P0-14	0.00Hz	☆
P1-15	DC braking waiting time at stop	0.0s ~ 100.0s	0.0s	☆
P1-16	Stop braking DC current	0% ~ 100%	0%	☆
P1-17	DC braking time at stop	0.0s ~ 36.0s	0.0s	☆
P1-21	Demagnetization time	0.01s ~ 3.00s	0.50s	★
P1-23	Instantaneous stop and non-stop mode selection	0: invalid 1: Automatically adjust the deceleration rate 2: Decelerate to stop	0	★
P1-24	The deceleration time of the momentary stop and non-stop deceleration stop	0.0s ~ 100.0s	10.0s	★
P1-25	Instantaneous power failure and non-stop effective voltage	60% ~ 85%	80%	★
P1-26	Instantaneous power failure and non-stop recovery of voltage	85% ~ 100%	90%	★
P1-27	Instantaneous power failure and non-stop recovery voltage judgment	0.0s ~ 300.0s	0.3s	★

Function code	Name	Description (setting range)	Factory Default	Change
P1-28	Instantaneous stop and non-stop automatic gain adjustment	0 ~ 100	40	☆
P1-29	Instantaneous stop and non-stop automatic adjustment of integral	1 ~ 100	20	☆
P1-30	Speed tracking current Kp	0 ~ 1000	300	☆
P1-31	Speed tracking current Ki	0 ~ 1000	600	☆
Group P2: V/F control parameters				
P2-00	V/F curve setting	0: Straight line VF curve 1: Multi-point VF curve 2: Square VF curve 3: 1.7th power curve 4: 1.5 power curve 5: 1.3 power curve 6: VF full separation mode 7: V/F half separation mode	0	★
P2-01	Torque boost	0.0% ~ 30.0%	0.0%	☆
P2-02	Torque boost cut-off frequency	0.00Hz ~ Maximum frequency	25.00Hz	★
P2-03	V/F frequency point P1	0.00Hz ~ P2-05	1.30Hz	★
P2-04	V/F voltage point V1	0.0% ~ 100.0%	5.2%	★
P2-05	V/F frequency point P2	P2-03 ~ P2-07	2.50Hz	★
P2-06	V/F voltage point V2	0.0% ~ 100.0%	8.8%	★
P2-07	V/F frequency point P3	0.00Hz ~ 50.00 Hz	15.00Hz	★
P2-08	V/F voltage point V3	0.0% ~ 100.0%	35.0%	★
P2-09	Slip Compensation Coefficient	0.0% ~ 200.0%	50.0%	☆
P2-10	Flux Brake Gain	0 ~ 200	100	☆
P2-11	Oscillation suppression gain	0 ~ 100	Model is determined	☆
P2-13	VF slip compensation time constant	0.02s ~ 1.00s	0.30s	☆
P2-15	Output voltage source selection when VF is separated	0: Digital setting (P2-16) 1: AI1 2: AI2	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
		3: Multi-segment instruction 4: Simple PLC 5: PID		
P2-15	Output voltage source selection when VF is separated	6: Communication given 7: PULSE pulse setting (Di5) 100.0% corresponds to the rated voltage of the motor	0	☆
P2-16	V/F separation output voltage digital setting	0V ~ Motor rated voltage	0V	☆
P2-17	V/F separation output voltage acceleration time	0.0 ~ 3000.0s	1.0s	☆
P2-18	V/F separation output voltage deceleration time	0.0 ~ 3000.0s	1.0s	☆
P2-19	V/F separation and stop mode selection	0: Frequency and output voltage deceleration time are independent 1: After the voltage is reduced to 0, the frequency is reduced again	0	☆
P2-20	VF overcurrent stall enable	0: Close 1: Enable	1	★
P2-21	VF overvoltage stall enable	0: Close 1: Enable	1	★
P2-22	VF overvoltage stall suppression frequency gain	0 ~ 100	30	☆
P2-23	Maximum rise limit frequency for overvoltage stall	0 ~ 50Hz	5	☆
Group P3: Vector control parameters				
P3-00	Switching frequency P1	0.00 ~ P3-02	5.00 Hz	☆
P3-02	Switching frequency P2	P3-00 ~ P0-14	10.00 Hz	☆
P3-04	Low frequency speed proportional gain	0.1 ~ 10.0	4.0	☆
P3-05	Low frequency speed integration time	0.01s ~ 10.00s	0.50s	☆
P3-06	High frequency speed proportional gain	0.1 ~ 10.0	2.0	☆
P3-07	High frequency speed integration time	0.01 ~ 10.00s	1.00s	☆

Function code	Name	Description (setting range)	Factory Default	Change
P3-08	Speed loop integral attribute selection	0: Points take effect 1: Integral separation	0	★
P3-11	Torque current regulator Kp	0 ~ 30000	2200	☆
P3-12	Torque current regulator Ki	0 ~ 30000	1500	☆
P3-13	Excitation current regulator Kp	0 ~ 30000	2200	☆
P3-14	Excitation current regulator Ki	0 ~ 30000	1500	☆
P3-15	Flux Brake Gain	0 ~ 200	0	☆
P3-16	Field weakening torque correction factor	50% ~ 200%	100%	☆
P3-17	Slip compensation gain	50% ~ 200%	100%	☆
P3-18	Speed loop feedback filter time constant	0.000 ~ 1.000s	0.015s	☆
P3-19	Speed loop output filter time constant	0.000 ~ 1.000s	0.000s	☆
P3-20	Electric torque upper limit source	0: P3-21 1: AI1 2: AI2 3: Communication given 4: PLUSE given (The analog range corresponds to P3-21)	0	☆
P3-21	Electric torque upper limit	0.0% ~ 200.0%	150.0%	☆
P3-22	Braking torque upper limit source	0: P3-23 1: AI1 2: AI2 3: Communication given 4: PLUSE given (The analog range corresponds to P3-23)	0	☆
P3-23	Braking torque upper limit	0.0 ~ 200.0%	150.0%	☆
P3-24	Low-speed magnetizing current of synchronous motor	0.0% ~ 50.0%	25.0%	★
P3-25	Magnetizing cut-off frequency of synchronous motor	0% ~ 100%	10%	★
P3-26	Pre-excitation time	0s ~ 5s	0.1s	★

Function code	Name	Description (setting range)	Factory Default	Change
P3-27	Synchronous motor initial position identification enable selection	0: Disable 1: Identification method one 2: Identification method 2	1	★
P3-28	Initial position identification voltage given percentage	30% ~ 130%	80%	★
P3-29	Syn starting minimum carrier frequency	0.8~P0-26 Set the carrier frequency	2.0	☆
P3-40	VVC high-pass filtering coefficient	0~65535	100	★
P3-41	VVC oscillation suppression gain factor	0~65535	100	★
P3-42	Damping coefficient of VVC oscillation suppression	0~500	100	★
Group P4: First motor parameter				
P4-00	Motor parameter tuning	0: No function 1: Static tuning 2: Rotary tuning	0	★
P4-01	Motor 1 rated power	0.1kw ~ 1000.0kw	Model is determined	★
P4-02	Motor 1 rated voltage	1V ~ 1500V	380V	★
P4-03	Motor 1 Number of motor poles	2 to 64	Model is determined	○
P4-04	Motor 1 rated current	0.01A ~ 600.00A(Motor rated power<=30.0KW) 0.1A ~ 6000.0A(Motor rated power>30.0KW)	P4-01 OK	★
P4-05	Motor 1 rated frequency	0.01Hz ~ P0-14	50.00 Hz	★
P4-06	Motor 1 rated speed	0rpm ~ 60000rpm	P4-01 OK	★
P4-07	Motor 1 no-load current	0.01A ~ P4-04 (Motor rated power<=30.0KW) 0.1A ~ P4-04 (Motor rated power>30.0KW)	Model is determined	★
P4-08	Motor 1 stator resistance	0.001Ω ~ 65.535Ω	Model is determined	★
P4-09	Motor 1 rotor resistance	0.001Ω ~ 65.535Ω	Model is determined	★

Function code	Name	Description (setting range)	Factory Default	Change
P4-10	Motor 1 mutual inductance	0.1Mh ~ 6553.5Mh	Model is determined	★
P4-11	Motor 1 leakage inductance	0.01Mh ~ 655.35Mh	Model is determined	★
P4-12	Acceleration at Dynamic Full Tuning	1.0s ~ 6000.0s	10.0s	☆
P4-13	Deceleration at dynamic full tuning	1.0s ~ 6000.0s	10.0s	☆
P4-17	Synchronous motor stator resistance	0.001Ω ~ 65.535Ω	Model is determined	★
P4-18	Synchronous motor D-axis inductance	0.01Mh ~ 655.35Mh	Model is determined	★
P4-19	Synchronous motor Q-axis inductance	0.01Mh ~ 655.35Mh	Model is determined	★
P4-20	Synchronous motor back EMF	1V ~ 65535V	Model is determined	★
P4-21	No-load current of synchronous motor	0.0% ~ 50.0%	10.0%	★
P4-28	Number of encoder pulse lines (before frequency multiplication 4)	1-65535	1024	☆
P4-29	Encoder phase sequence selection	0: Forward 1: Reverse	0	☆
P4-30	Encoder type	0: ABZ encoder 1: UVW encoder 2: Line-saving encoder 3: Rotary encoder 4: Sincosine encoder	0	★
P4-31	Number of pole pairs of rotary encoder	1-65535	1	★
P4-32	Encoder installation position angle	0.0° - 359.9°	0.0°	★

Function code	Name	Description (setting range)	Factory Default	Change
Group P5: Input terminal				
P5-00	DI1 terminal function	0: No function 1: Forward rotation (FWD) 2: Reverse operation (REV) 3: Three-wire running control 4: Forward jog (FJOG) 5: Reverse Jog (RJOG) 6: Terminal UP 7: Terminal DOWN 8: Free parking 9: Fault reset (RESET) 10: run 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 selection terminal 1 17: Acceleration and deceleration selection terminal 2 18: Frequency source switching 19: UP/DOWN setting clear (terminal, keyboard) 20: Running command switching terminal 21: Acceleration and deceleration prohibition 22: PID invalid (pause) 23: PLC status reset 24: Swing frequency pause 25: Timing trigger input 26: Immediate DC braking 27: External fault normally closed input 28: Counter input 29: Counter reset 30: Length count input 31: Length count reset 32: Torque control prohibited 33: PULSE (pulse) frequency input 34: Frequency modification prohibited 35: PID action direction is reversed 36: External parking terminal 1 37: Control command switching terminal 2 38: PID integral pause terminal 39: Frequency source X and preset frequency switching terminal 40: Frequency source Y and preset frequency switching terminal	1	★
P5-01	DI2 terminal function		2	★
P5-02	DI3 terminal function		9	★
P5-03	DI4 terminal function		12	★
P5-04	DI5 terminal function		13	★
P5-05	DI6 terminal function		13	★
P5-06	DI7 terminal function		13	★
P5-07	DI8 terminal function		0	★
P5-08	DI9 terminal function		0	★
P5-09	DI10 terminal function		0	★

Function code	Name	Description (setting range)	Factory Default	Change
		41: Switch between motor 1 and motor 2 42: Trigger fire mode 43: PID parameter switching terminal 44: Speed control/torque control switching 45: Emergency stop 46: External parking terminal 2 47: Deceleration DC braking 48: This running time is cleared 49: Two-wire/three-wire switch 50: Inversion prohibited 51: User-defined fault 1 52: User-defined fault 2 53: Sleep Input(Some DI terminals are supported by expansion cards)		
P5-10	DI terminal filter time	0.000 ~ 1.000s	0.010s	☆
P5-11	Terminal command method	0: Two-wire type 1 1: Two-wire type 2 2: Three-wire type 1 3: Three-wire type 2	0	★
P5-12	Terminal UP/ DOWN change rate	0.01Hz/s ~ 100.00Hz/s	1.00Hz/s	☆
P5-13	Terminal valid logic 1	0: High level 1: low level Ones place: DI1; Tens place: DI2; Hundreds: DI3; Thousands: DI4; Ten thousand: DI5	00000	★
P5-15	AI1 minimum input value	0.00~P5-17	0.00V	☆
P5-16	AI1 minimum input corresponding setting	-100.0% ~ 100.0%	0.0%	☆
P5-17	AI1 maximum input value	P5-15~10.00V	10.00V	☆
P5-18	AI1 maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	☆
P5-19	AI1 input filter time	0.00s ~ 10.00s	0.10s	☆
P5-20	AI2 minimum input value	0.00~P5-22	0.00V	☆

Function code	Name	Description (setting range)	Factory Default	Change
P5-21	AI2minimum input corresponding setting	-100.0% ~ 100.0%	0.0%	☆
P5-22	AI2 maximum input value	P5-20~10.00V	10.00V	☆
P5-23	AI2 maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	☆
P5-24	AI2 input filter time	0.00s ~ 10.00s	0.10s	☆
P5-25	AI3 minimum input value	0.00V ~ 10.00V	0.00V	☆
P5-26	AI3 minimum input corresponding setting	-100.0% ~ 100.0%	0.0%	☆
P5-27	AI3 maximum input value	0.00V ~ 10.00V	10.00V	☆
P5-28	AI3 maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	☆
P5-29	AI3 input filter time	0.00s ~ 10.00s	0.10s	☆
P5-30	PULSE (pulse) input minimum frequency	0.00KHz~P5-32	0.00KHz	☆
P5-31	PULSE (pulse) input minimum frequency corresponding setting	-100.0% ~ 100.0%	0.0%	☆
P5-32	PULSE (pulse) input maximum frequency	P5-30~50.00KHz	50.00KHz	☆
P5-33	PULSE (pulse) input maximum frequency corresponding setting	-100.0% ~ 100.0%	100.0%	☆
P5-34	PULSE input filter time	0.00s ~ 10.00s	0.10s	☆
P5-35	DI1 turn-on delay time	0.0s ~ 3600.0s	0.0s	☆
P5-36	DI1 off delay time	0.0s ~ 3600.0s	0.0s	☆
P5-37	DI2 turn-on delay time	0.0s ~ 3600.0s	0.0s	☆
P5-38	DI2 off delay time	0.0s ~ 3600.0s	0.0s	☆
P5-39	DI3 turn-on delay time	0.0s ~ 3600.0s	0.0s	☆
P5-40	DI3 off delay time	0.0s ~ 3600.0s	0.0s	☆
P5-41	AI1 is selected as DI terminal function	0 ~ 53, the function is the same as the common DI terminal	0	★
P5-42	AI2 is selected as DI terminal function	0 ~ 53, the function is the same as the common DI terminal	0	★

Function code	Name	Description (setting range)	Factory Default	Change
P5-44	Valid mode selection when AI is used as DI terminal	Ones place, AI1: 0: Active high; 1: Active low Ten, AI2: 0: Active high; 1: Active low Hundreds: reserved	0x00	☆
P5-45	AI curve selection	AI multi-point curve selection: Ones place: AI1 0: 2-point straight line P5-15 ~ P5-19 1: Multi-point curve 1: PE-00 ~ PE-07 2: Multi-point curve 2: PE-08 ~ PE-15 Tenth place: AI2 0: 2-point straight line P5-20 ~ P5-24 1: Multi-point curve 1: PE-00 ~ PE-07 2: Multi-point curve 2: PE-08 ~ PE-15 Hundreds: reserved	0x00	☆
Group P6: Output terminal				
P6-00	Control board relay RELAY1 output (TA/TB/TC) selection	0: No output 1: Inverter running signal (RUN) 2: fault output 3: Frequency level detection PDT1 arrival 4: Frequency Arrival (PAR) 5: Running at zero speed 6: Motor overload pre-alarm 7: Inverter overload pre-alarm 8: PLC cycle completed 9: Cumulative running time arrives 10: Frequency limited 11: Ready to run 12: AI1>AI2 13: The upper limit frequency is reached 14: The lower limit frequency is reached 15: Undervoltage status output 16: Communication settings 17: Timer output 18: Reverse running 19: Reserved 20: Set length reached 21: Torque limited	1	☆
P6-01	Control board relay RELAY2 output (RA/RB/RC) selection		1	☆
P6-02	Y1 output selection		1	☆
P6-03	Y2 output selection (optional accessory IO1 support function)		1	☆

Function code	Name	Description (setting range)	Factory Default	Change
		22: Current 1 arrives 23: Frequency 1 arrives 24: Module temperature reached 25: Dropping 26: Cumulative power-on time arrives 27: Timed arrival output 28: The running time has arrived 29: Set count value reached 30: The specified count value arrives 31: Motor 1, Motor 2 indication 32: Brake control output 33: Running at zero speed 2 34: Frequency level detection PDT2 arrival 35: Zero current state 36: Software current overrun 37: The lower limit frequency is reached, and the output is also output when stopped 38: Alarm output 39: Reserved 40: AI1 input overrun 41: Reserved 42: reserved 43: Frequency reached 2 44: Current reaches 2 45: Fault output		
P6-04	FM terminal output mode selection	0: Pulse output (FMP) 1: Open collector switch output (FMR)	0	☆
P6-05	FMR output selection	Same as Y1 output selection	0	☆
P6-09	AO1 output selection	0: Running frequency 1: Set frequency 2: Output current (100% corresponds to twice the rated current of the motor) 3: Output power (100% corresponds to twice the rated power of the motor) 4: Output voltage (100% corresponds to 1.2 times the rated voltage of the inverter)	0	☆
P6-10	AO2 output selection		0	☆
P6-11	FMP output selection		0	☆

Function code	Name	Description (setting range)	Factory Default	Change
		5: Analog AI1 input value 6: Analog AI2 input value 7: Communication settings 8: Output torque 9: length 10: Count value 11: Motor speed 12: Bus voltage (0 to 3 times the rated voltage of the inverter) 13: Pulse input 14: Output current (100% corresponds to 1000.0A) 15: Output voltage (100.0% corresponds to 1000.0V) 16: Output torque (actual torque value - 2 times rated to 2 times rated)	0	☆
P6-12	FMP output maximum frequency	0.01KHz ~ 100.00KHz	50.00	☆
P6-13	AO1 output lower limit	-100.0% ~ P6-15	0.0%	☆
P6-14	The lower limit corresponds to AO1 output	0.00V ~ 10.00V	0.00V	☆
P6-15	AO1 output upper limit	P6-13 ~ 100.0%	100.0%	☆
P6-16	The upper limit corresponds to AO1 output	0.00 ~ 10.00V	10.00V	☆
P6-17	AO2 output lower limit	-100.0% ~ P6-19	0.0%	☆
P6-18	The lower limit corresponds to the AO2 output	0.00V ~ 10.00V	0.00V	☆
P6-19	Ao2 output upper limit	P6-17 ~ 100.0%	100.0%	☆
P6-20	The upper limit corresponds to AO2 output	0.00 ~ 10.00V	10.00V	☆
P6-21	Main relay T pick-up delay	0.0s ~ 3600.0s	0.0s	☆
P6-22	Main relay R pick-up delay	0.0s ~ 3600.0s	0.0s	☆
P6-23	Y1 high level output delay	0.0s ~ 3600.0s	0.0s	☆
P6-26	Main relay T off delay	0.0s ~ 3600.0s	0.0s	☆

Function code	Name	Description (setting range)	Factory Default	Change
P6-27	Main relay R off delay	0.0s ~ 3600.0s	0.0s	☆
P6-28	Y1 low level output delay	0.0s ~ 3600.0s	0.0s	☆
P6-29	Y2 low-level output delay	0.0s ~ 3600.0s	0.0s	☆
Group P7: Accessibility and keyboard display				
P7-00	Jog running frequency	0.00Hz ~ Maximum frequency	6.00Hz	☆
P7-01	Jog acceleration time	0.0s ~ 3000.0s	10.0s	☆
P7-02	Jog deceleration time	0.0s ~ 3000.0s	10.0s	☆
P7-03	Acceleration time 2	0.0s ~ 3000.0s	10.0s	☆
P7-04	Deceleration time 2	0.0s ~ 3000.0s	10.0s	☆
P7-05	Acceleration time 3	0.0s ~ 3000.0s	10.0s	☆
P7-06	Deceleration time 3	0.0s ~ 3000.0s	10.0s	☆
P7-07	Acceleration time 4	0.0s ~ 3000.0s	10.0s	☆
P7-08	Deceleration time 4	0.0s ~ 3000.0s	10.0s	☆
P7-09	Hop Frequency 1	0.00Hz ~ Maximum frequency	0.00Hz	☆
P7-10	Hop Frequency 1 Amplitude	0.00Hz ~ Maximum frequency	0.00Hz	☆
P7-11	Hop Frequency 2	0.00Hz ~ Maximum frequency	0.00Hz	☆
P7-12	Hop Frequency 2 Amplitude	0.00Hz ~ Maximum frequency	0.00Hz	☆
P7-15	Forward and reverse dead time	0.0s ~ 3000.0s	0.0s	☆
P7-16	Keyboard Knob Accuracy	0: default mode 1: 0.1Hz 2: 0.5Hz 3: 1Hz 4: 2Hz 5: 4Hz 6: 5Hz 7: 8Hz 8: 10Hz 9:0.01Hz 10:0.05Hz	2	☆

Function code	Name	Description (setting range)	Factory Default	Change
P7-17	The frequency is lower than the lower limit frequency processing	0: run at the lower frequency limit 1: shutdown 2: Running at zero speed	0	☆
P7-18	Sag rate	0.0% ~ 100.0%	0.0%	☆
P7-19	Delay time for frequency lower than lower limit shutdown	0.0s ~ 600.0s	0.0s	☆
P7-20	Set cumulative operating time	0h ~ 65000h	0h	☆
P7-21	Jog priority	0: Invalid 1: Jog priority mode 1 2: Jog priority mode 2 1) When the user fails or the PID is lost, the jog is still valid 2) Stop mode and DC braking can be set	1	☆
P7-22	Frequency detection value (PDT1 level)	0.00Hz ~ Maximum frequency	50.00Hz	☆
P7-23	Frequency check hysteresis value (PDT1 hysteresis)	0.0% ~ 100.0%	5.0%	☆
P7-24	Frequency arrival detection width	0.0% ~ 100.0%	0.0%	☆
P7-25	Reserve	--	0	●
P7-26	Fan control	0: The fan keeps running 1: The fan runs when the inverter is running (When the temperature is higher than 40°, the fan will also run under shutdown)	1	★
P7-27	STOP/RESET function	0: Only valid in keyboard control 1: The stop or reset function is valid in all control modes	0	☆
P7-28	Quick /JOG key function selection	0: Forward jog 1: Forward and reverse switching 2: Reverse jog	0	★

Function code	Name	Description (setting range)	Factory Default	Change
		3: Switch between panel and remote control 4: Panel frequency source switching (press the Quick key to change)		
P7-29	LED running display	0000 ~ 0xPFPF (hexadecimal number) 0000 to 0xPFPF Bit00: Running frequency 0001 Bit01: Set frequency 0002 Bit02: Bus voltage 0004 Bit03: Output voltage 0008 Bit04: Output current 0010 Bit05: Output power 0020 Bit06: DI input status 0040 Bit07: DO output status 0080 Bit08: AI1 voltage 0100 Bit09: AI2 voltage 0200 Bit10: PID setting value 0400 Bit11: PID feedback value 0800 Bit12: Count value 1000 Bit13: Length value 2000 Bit14: Load speed display 4000 Bit15: PLC stage 8000	H.441F	☆
P7-30	LED stop display	1 ~ 0x1PPF (hexadecimal number) Bit00: Set frequency 0001 Bit01: Bus voltage 0002 Bit02: DI input status 0004 Bit03: DO output status 0008 Bit04: AI1 voltage 0010 Bit05: AI2 voltage 0020 Bit06: PID setting value 0040 Bit07: PID feedback value 0080 Bit08: Count value 0100 Bit09: Length value 0200 Bit10: Load speed display 0400 Bit11: PLC stage 0800 Bit12: Input pulse frequency 1000 Bit13 ~ Bit15: Reserved	H.0043	☆
P7-31	Load speed display factor	0.001 ~ 655.00	1.000	☆

Function code	Name	Description (setting range)	Factory Default	Change
P7-32	Radiator temperature	12℃ ~ 100℃	Measured value	●
P7-33	Cumulative power-on time	0h ~ 65535h	Measured value	●
P7-34	Cumulative running time	0h ~ 65535h	Measured value	●
P7-36	Current running timing enable selection	0:Disable 1: Enable, When the time is up, a fault is reported 2: Enable, When the time is up, a fault is not reported	0	★
P7-37	Selection of timing source for the current run	0: Digital setting P7-38 1: AI1 2: AI2 (AI takes P7-38 as 100%)	0	★
P7-38	Current running time set value	0.0min ~ 6500.0min	0.0min	☆
P7-39	High level timing	0.0s ~ 6000.0s	2.0s	☆
P7-40	low level timing	0.0s ~ 6000.0s	2.0s	☆
P7-41	Activate the protection function	0: Invalid (start terminal command is valid and start directly) 1: Valid	1	☆
P7-43	Frequency reaches detection value 1	0.00Hz ~ P0-14	50.00Hz	☆
P7-44	Frequency detection value 1 arrival width	0.0% ~ 100.0%	0.0%	☆
P7-45	Current reaches detection value 1	0.0% ~ 300.0%	100.0%	☆
P7-46	Current detection value 1 arrival width	0.0% ~ 300.0%	0.0%	☆
P7-49	user password	0 ~ 65535	0	☆
P7-50	Whether the jump frequency is valid during acceleration and deceleration	0: invalid 1: Valid	0	☆
P7-51	Set the power-on arrival time	0h ~ 65530h	0h	☆

Function code	Name	Description (setting range)	Factory Default	Change
P7-53	Acceleration time 1/2 switching frequency point	0.00Hz ~ Maximum frequency (P0-14)	0.00Hz	☆
P7-54	Deceleration time 1/2 switching frequency point	0.00Hz ~ Maximum frequency (P0-14)	0.00Hz	☆
P7-55	Frequency detection value (PDT2 level)	0.00Hz ~ Maximum frequency (P0-14)	50.00Hz	☆
P7-56	Frequency detection PDT2 hysteresis value	0.0% ~ 100.0%	5.0%	☆
P7-57	Frequency reaches detection value 2	0.00Hz ~ Maximum frequency (P0-14)	50.00Hz	☆
P7-58	Frequency arrival detection 2 amplitude	0.0% ~ 100.0%	0.0%	☆
P7-59	Zero current detection value	0.0% ~ 300.0%	10.0%	☆
P7-60	Zero current detection delay time	0.01s ~ 300.00s	1.00s	☆
P7-61	Output current amplitude detection	20.0% ~ 400.0%	200.0%	☆
P7-62	Software overcurrent maximum allowable time	0s~6500.0s	0s	☆
P7-63	Current reaches detection value 2	20.0% ~ 300.0%	100.0%	☆
P7-64	Current arrival detection 2 amplitude	0.0% ~ 300.0%	0.0%	☆
P7-65	LED running display parameter 2	0x0 ~ 0x1PF Bit00: Target torque% 0001 Bit01: Output torque% 0002 Bit02: Pulse input pulse frequency (KHz) 0004 Bit03: DI5 high-speed pulse sampling linear speed (m/min) 0008 Bit04: Motor speed (rmp) 0010 Bit05: AC incoming line current (A) 0020 Bit06: Cumulative running time (h) 0040 Bit07: Current running time (min) 0080		

Function code	Name	Description (setting range)	Factory Default	Change
		Bit08: Cumulative power consumption (kWh) 0100 Bit09 ~ Bit15: Reserved		
P7-67	AI1 input voltage lower limit	0.00V ~ P7-68	2.00V	☆
P7-68	AI1 input voltage upper limit	P7-67 ~ 11.00V	8.00V	☆
P7-69	Module temperature reached	0℃ ~ 90℃	70℃	☆
P7-70	Output power display correction factor	0.001 ~ 3.000	1.000	☆
P7-71	Linear velocity display correction factor	Linear speed=P7-71*Number of HDI pulses sampled per second/PB-07	1.000	☆
P7-72	Cumulative power consumption (kWh)	0 ~ 65535	Measured value	●
P7-73	Performance software version	Performance software version number	#.#	●
P7-74	Functional software version	Function software version number	#.#	●
P7-75	Enhanced function parameter display selection	0: Hide enhanced function parameter group: A0 ~ A3, B0 ~ B5 1: Display enhanced function parameter group: A0 ~ A3, B0 ~ B5	0	☆
P7-76	Motor speed display correction factor	0.0010 ~ 3.0000	1.0000	☆
P7-75	Enable fire protection mode	0: Close 1: Enable	0	☆
P7-76	Set frequency in fire mode	0Hz ~ P0-14	50.00Hz	☆
Group P8: Communication parameters				
P8-00	Baud rate setting	0: 300BPS 1: 600BPS 2: 1200BPS 3: 2400BPS 4: 4800BPS	2	☆

Function code	Name	Description (setting range)	Factory Default	Change
		5: 9600BPS 6: 19200BPS 7: 38400BPS		
P8-01	Data Format	0: No parity <8,N,2> 1: Even parity <8,E,1> 2: odd parity <8,O,1> 3: No parity 1<8,N,1>	0	☆
P8-02	Comunication address	0 ~ 247 (0 is the broadcast address)	1	☆
P8-03	Response time	0ms ~ 30ms	2ms	☆
P8-04	Communication timeout	0ms ~ 30ms	0.0s	☆
P8-05	Communication format selection	0: Standard ModbusRTU protocol 1: Non-standard ModBusRTU protocol	0	☆
P8-06	Background software monitoring function	0: Disable, default 485 communication function 1: On, the background software monitoring function, the 485 communication function cannot be used at this time	0	☆
P8-11	Communication protocol selection	0: Modbus protocol 1: Communication expansion card	0	☆
Group P9: Fault and Protection				
P9-00	Motor overload protection selection	0: Disable 1: Allow	1	☆
P9-01	Motor overload protection gain	0.10~10.00	1.00	☆
P9-02	Motor overload warning coefficient (%)	50% ~ 100%	80%	☆
P9-03	Overvoltage Stall Protection Gain	000 ~ 100	030	☆
P9-04	Overvoltage stall protection voltage	200.0 ~ 1200.0V	760.0V	★
P9-05	VF Overcurrent Stall Protection Gain	0 ~ 100	20	☆

Function code	Name	Description (setting range)	Factory Default	Change
P9-06	VF Overcurrent Stall Protection Current	50% ~ 200%	150%	★
P9-07	VF field weakening area current stall protection factor	50% ~ 200%	100%	★
P9-08	Overvoltage stall allowable rise limit value	0.0% ~ 50.0%	10.0%	☆
P9-11	Fault automatic reset times	0 ~ 20	0	☆
P9-12	Fault relay action selection during automatic fault reset	0: no action 1: Action	0	☆
P9-13	Fault automatic reset interval time	0.1s ~ 100.0s	1.0s	☆
P9-14	Input phase loss enable selection	0: invalid 1: Valid	1	☆
P9-15	Output phase loss enable selection	0: invalid 1: Valid	1	☆
P9-16	Power-on to ground short-circuit protection selection	0: invalid 1: Valid	1	☆
P9-17	Undervoltage fault automatic reset selection	0: Manual reset is required after undervoltage fault 1: After the undervoltage fault, the fault will be reset by itself according to the bus voltage	0	☆
P9-18	Overvoltage suppression mode selection	0: invalid 1: Overvoltage suppression mode 1 2: Overvoltage suppression mode 2	1	★
P9-19	Overexcitation active state selection	0: invalid 1: Only the deceleration process is valid 2: The constant speed and deceleration process is valid during running	2	★

Function code	Name	Description (setting range)	Factory Default	Change
P9-20	Overvoltage suppression mode 2 limit value	1.0% ~ 150.0%	10.00%	★
P9-22	Fault protection action 1	0 ~ 22202; Units place: Motor overload - Err14 0: Free parking 1: stop according to the stop mode 2: keep running Ten: reserved Hundreds place: input phase loss-Err23 Thousands place: output phase loss-Err24 Ten thousand: parameter read and write exception - Err25	00000	☆
P9-23	Fault protection action 2	0 ~ 22222; Ones place: Communication failure - Err27 0: Free parking 1: stop according to the stop mode 2: keep running Tens place: External fault - Err28 Hundreds place: excessive speed deviation fault - Err29 Thousands: User-defined fault 1-Err30 Ten thousand: user-defined fault 2-Err31	00000	☆
P9-24	Fault protection action 3	0 ~ 22222; Ones place: PID feedback lost during runtime - Err32 0: Free parking 1: stop according to the stop mode 2: keep running Tens place: load loss fault - Err34 Hundreds place: software overcurrent - Err16 Thousands place: The current continuous running time reaches -Err39 Ten thousand: the running time reaches - Err40	00000	☆

Function code	Name	Description (setting range)	Factory Default	Change
P9-26	Continue to run frequency selection in case of failure	0: run at the current operating frequency 1: run at the set frequency 2: run at the upper limit frequency 3: Run at the lower frequency limit 4: Run at the standby frequency setting value P9-27	1	☆
P9-27	Abnormal standby frequency set value	0.0% ~ 100.0%	100%	☆
P9-28	Drop load protection option	0: invalid 1: Valid	0	☆
P9-29	Drop load detection level	0.0% ~ 80.0%	20.0%	★
P9-30	Load drop detection time	0.0s ~ 100.0s	5.0s	☆
P9-31	Excessive speed deviation detection value	0.0% ~ 100.0%	20.0%	☆
P9-32	Excessive speed deviation detection time	0.0s ~ 100.0s	0.0s	☆
P9-33	Overspeed detection value	0.0% ~ 100.0%	20.0%	☆
P9-34	Overspeed detection time	0.0s ~ 100.0s	2.0s	☆
P9-35	Motor overload protection current coefficient	100% ~ 200%	100%	☆
P9-36	Motor overheating pre-alarm threshold	0~200℃	80℃	☆
P9-37	Motor overheating protection value	0~200℃	100℃	☆
P9-38	Temperature sensor type selection	0: No temperature sensor 1: PT100 2: PT1000	0	☆
Group PA: PID function				
PA-00	PID setting source	0: Keypad (F10.01) 1: Analog AI1 2: Analog AI2 3: Analog AI3	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
		4: Pulse setting (HDI) 5: Rs485 communication setting 6: Multi-speed command		
PA-01	PID digital setting	0.0 ~ 100.0%	50.0%	☆
PA-02	PID given change time	0.00s ~ 650.00s	0.00s	☆
PA-03	PID feedback source	0: AI1 1: AI2 2: AI1-AI2 3: Communication given 4: PULSE given	0	☆
PA-04	PID action direction	0: Forward action	0	☆
PA-05	PID setting feedback range	0 ~ 65535	1000	☆
PA-06	Proportional gain P	0.0 ~ 100.0	20.0	☆
PA-07	Integral time I	0.01s ~ 10.00s	2.00s	☆
PA-08	Differential time D	0.000s ~ 10.000s	0.000s	☆
PA-09	PID reverse cutoff frequency	0.00 ~ Maximum frequency (P0-14)	0.00Hz	☆
PA-10	Deviation limit	0.0% ~ 100.0%	0.0%	☆
PA-11	Differential clipping	0.00% ~ 100.00%	0.0%	☆
PA-12	PID feedback filter time	0.00 ~ 60.00s	0.00s	☆
PA-13	PID feedback loss detection value	0.00 ~ 60.00s	0.00s	☆
PA-14	PID feedback loss detection time	0.0s ~ 3600.0s	0s	☆
PA-18	Proportional gain P2	0.0 ~ 100.0	20.0	☆
PA-19	Integration time I2	0.01s ~ 10.00s	2.00s	☆
PA-20	Differential time D2	0.000s ~ 10.000s	0.000s	☆
PA-21	PID parameter switching conditions	0: Do not switch 1: DI terminal 2: Automatically switch according to the deviation	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
PA-22	PID parameter switching deviation 1	0.0% ~ PA-23	20.0%	☆
PA-23	PID parameter switching deviation 2	PA-22 ~ 100.0%	80.0%	☆
PA-24	PID initial value	0.0% ~ 100.0%	0.0%	☆
PA-25	PID initial value hold time	0.00s ~ 650.00s	0.00s	☆
PA-26	Twice output deviation positive maximum value	0.00% ~ 100.00%	1.00%	☆
PA-27	Twice output deviation reverse maximum value	0.00% ~ 100.00%	1.00%	☆
PA-28	PID integral properties	Units: Integral separation 0: invalid; 1: Valid Tens place: output to the limit value, whether to stop integration 0: Continue points; 1: Stop integration	00	☆
PA-29	PID shutdown operation	0: stop and do not operate 1: Compute at stop	0	☆
Group Pb: Swing Frequency, Fixed Length and Count				
Pb-00	Swing setting method	0: Relative to the central frequency 1: Relative to the maximum frequency	0	☆
Pb-01	Swing frequency amplitude	0.0% ~ 100.0%	0.0%	☆
Pb-02	Jump frequency amplitude	0.0% ~ 50.0%	0.0%	☆
Pb-03	Swing frequency cycle	0.1s ~ 3000.0s	10.0s	☆
Pb-04	Triangular wave rising time coefficient	0.1% ~ 100.0%	50.0%	☆
Pb-05	Set length	0m ~ 65535m	1000m	☆
Pb-06	Actual length	0m ~ 65535m	0m	☆
Pb-07	Number of pulses per meter	0.1 ~ 6553.5	100.0	☆
Pb-08	Set count value	1 ~ 65535	1000	☆

Function code	Name	Description (setting range)	Factory Default	Change
Pb-09	Designated count value	1 ~ 65535	1000	☆
Group PC: Multi-segment instruction and simple PLC function				
PC-00	Multi-speed 0	-100.0% ~ 100.0%	0.0%	☆
PC-01	Multi-speed 1	-100.0% ~ 100.0%	0.0%	☆
PC-02	Multi-speed 2	-100.0% ~ 100.0%	0.0%	☆
PC-03	Multi-speed 3	-100.0% ~ 100.0%	0.0%	☆
PC-04	Multi-speed 4	-100.0% ~ 100.0%	0.0%	☆
PC-05	Multi-speed 5	-100.0% ~ 100.0%	0.0%	☆
PC-06	Multi-speed 6	-100.0% ~ 100.0%	0.0%	☆
PC-07	Multi-speed 7	-100.0% ~ 100.0%	0.0%	☆
PC-08	Multi-speed 8	-100.0% ~ 100.0%	0.0%	☆
PC-09	Multi-speed 9	-100.0% ~ 100.0%	0.0%	☆
PC-10	Multi-speed 10	-100.0% ~ 100.0%	0.0%	☆
PC-11	Multi-speed 11	-100.0% ~ 100.0%	0.0%	☆
PC-12	Multi-speed 12	-100.0% ~ 100.0%	0.0%	☆
PC-13	Multi-speed 13	-100.0% ~ 100.0%	0.0%	☆
PC-14	Multi-speed 14	-100.0% ~ 100.0%	0.0%	☆
PC-15	Multi-speed 15	-100.0% ~ 100.0%	0.0%	☆
PC-16	PLC operation mode	0: Stop at the end of a single operation 1: Hold the final value for a single run 2: keep looping	0	☆
PC-17	PLC power-down memory selection	0: No memory when power off and no memory when stopped 1: Memory when power off and no memory when stopped 2: No memory when power off and memory when shut down 3: Power-down memory and shutdown memory	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
PC-18	Running time of simple PLC multi-speed 0	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-19	Acceleration/deceleration time of simple PLC multi-speed 0	0 ~ 3	0	☆
PC-20	Running time of simple PLC multi-speed 1	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-21	Acceleration/deceleration time of simple PLC multi-speed 1	0 ~ 3	0	☆
PC-22	Running time of simple PLC multi-speed 2	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-23	Acceleration/deceleration time of simple PLC multi-speed 2	0 ~ 3	0	☆
PC-24	Running time of simple PLC multi-speed 3	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-25	Acceleration/deceleration time of simple PLC multi-speed 3	0 ~ 3	0	☆
PC-26	Running time of simple PLC multi-speed 4	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-27	Acceleration/deceleration time of simple PLC multi-speed 4	0 ~ 3	0	☆
PC-28	Running time of simple PLC multi-speed 5	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-29	Acceleration/deceleration time of simple PLC multi-speed 5	0 ~ 3	0	☆
PC-30	Running time of simple PLC multi-speed 6	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-31	Acceleration/deceleration time of simple PLC multi-speed 6	0 ~ 3	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
PC-32	Running time of simple PLC multi-speed 7	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-33	Acceleration/deceleration time of simple PLC multi-speed 7	0 ~ 3	0	☆
PC-34	Running time of simple PLC multi-speed 8	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-35	Acceleration/deceleration time of simple PLC multi-speed 8	0 ~ 3	0	☆
PC-36	Running time of simple PLC multi-speed 9	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-37	Acceleration/deceleration time of simple PLC multi-speed 9	0 ~ 3	0	☆
PC-38	Running time of simple PLC multi-speed 10	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-39	Acceleration/deceleration time of simple PLC multi-speed 10	0 ~ 3	0	☆
PC-40	Running time of simple PLC multi-speed 11	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-41	Acceleration/deceleration time of simple PLC multi-speed 11	0 ~ 3	0	☆
PC-42	Running time of simple PLC multi-speed 12	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PC-43	Acceleration/deceleration time of simple PLC multi-speed 12	0 ~ 3	0	☆
PC-44	Acceleration/deceleration time of simple PLC multi-speed 13	0.0 ~ 6500.0	0	☆
PC-45	Running time of simple PLC multi-speed 14	0~3 (respectively representing acceleration and deceleration time 1~4)	0.0s(h)	☆

Function code	Name	Description (setting range)	Factory Default	Change
PC-46	Acceleration/deceleration time of simple PLC multi-speed 14	0.0 ~ 6500.0	0	☆
PC-47	Running time of simple PLC multi-speed 15	0~3 (respectively representing acceleration and deceleration time 1~4)	0.0s(h)	☆
PC-48	Acceleration/deceleration time of simple PLC multi-speed 15	0.0 ~ 6500.0	0	☆
PC-49	Running time of simple PLC multi-speed 15	0~3 (respectively representing acceleration and deceleration time 1~4)	0.0s(h)	☆
PC-50	Time unit of multi-speed	0: s (second) 1:h (hour)	0	☆
PC-51	Multi-speed priority mode selection	0: Multi-speed does not have priority 1: Multi-speed priority	1	☆
PC-52	Multi-speed priority acceleration and deceleration time selection	0: Acceleration and deceleration time 1 1: Acceleration and deceleration time 2 2: Acceleration and deceleration time 3 3: Acceleration and deceleration time 4	0	☆
PC-53	Multi-speed PC-00 ~ PC-15 unit selection	0: % 1: Hz	0	☆
PC-55	Multi-segment instruction 0 given mode	0: Function code PC-00 given 1: AI1 2: AI2 3: PULSE pulse 4: PID 5: Preset frequency given (P0-11), UP/DOWN can be modified	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
Group PD: Torque control				
PD-00	Torque command source selection	0: Digital setting (PD-01) 1: AI1 2: AI2 3: Communication given 4: PULSE pulse frequency setting 5: MIN (AI1, AI2) 6: MAX (AI1, AI2) (1-6 option full scale corresponds to PD-01)	0	★
PD-01	Torque digital given	-200.0% ~ 200.0%	150.0%	☆
PD-03	Torque control positive direction maximum frequency	0.00Hz ~ Maximum frequency (P0-14)	50.00Hz	☆
PD-04	Torque control reverse direction maximum frequency	0.00Hz ~ Maximum frequency (P0-14)	50.00Hz	☆
PD-06	Torque command filter time	0.00s ~ 10.00s	0.00s	☆
PD-07	Torque mode frequency acceleration time	0.0s ~ 1000.0s	10.0s	☆
PD-08	Torque mode frequency deceleration time	0.0s ~ 1000.0s	10.0s	☆
PD-10	Speed/torque mode selection	0: Speed mode 1: Torque mode	0	★
Group PE: AI multi-point curve setting				
PE-00	Curve 1 minimum input	-10.00V ~ PE-02	0.00V	☆
PE-01	Curve 1 minimum input corresponding setting	-100.0% ~ 100.0%	0.0%	☆
PE-02	Curve 1 Knee 1 Input	PE-00 ~ PE-04	3.00V	☆
PE-03	Curve 1 inflection point 1 input corresponding setting	-100.0% ~ 100.0%	30.0%	☆
PE-04	Curve 1 Knee 2 Input	PE-02 ~ PE-06	6.00V	☆
PE-05	Curve 1 inflection point 2 input corresponding setting	-100.0% ~ 100.0%	60.0%	☆
PE-06	Curve 1 maximum input	PE-04 ~ 10.00	10.00V	☆

Function code	Name	Description (setting range)	Factory Default	Change
PE-07	Curve 1 maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	☆
PE-08	Curve 2 minimum input	-10.00 ~ PE-10	0.00V	☆
PE-09	Curve 2 minimum input corresponding setting	-100.0% ~ 100.0%	0.0%	☆
PE-10	Curve 2 Knee 1 Input	PE-08 ~ PE-12	3.00V	☆
PE-11	Curve 2 inflection point 1 input corresponding setting	-100.0% ~ 100.0%	30.0%	☆
PE-12	Curve 2 Knee 2 Input	PE-10 ~ PE-14	6.00V	☆
PE-13	Curve 2 inflection point 2 input corresponding setting	-100.0% ~ 100.0%	60.0%	☆
PE-14	Curve 2 maximum input	PE-12 ~ 10.00V	10.00V	☆
PE-15	Curve 2 maximum input corresponding setting	-100.0% ~ 100.0%	100.0%	☆
PE-24	AI1 set jump point	-100.0% ~ 100.0%	0.0%	☆
PE-25	AI1 sets the jump range	0.0% ~ 100.0%	0.5%	☆
PE-26	AI2 set jump point	-100.0% ~ 100.0%	0.0%	☆
PE-27	AI2 set jump range	0.0% ~ 100.0%	0.5%	☆
Group PF: Manufacturer parameters				
PF.00	Factory password	0 ~ 65535	*****	☆
Group A0: Second motor parameter setting				
A0-00	Motor selection	1: Motor No. 1 2: Motor No. 2	1	★
A0-01	The second motor control mode	1: Open loop vector control (speed sensorless vector) 2: VF Control	2	★
A0-02	Second motor acceleration and deceleration time selection	0: Consistent with the first motor 1: Acceleration and deceleration time 1 2: Acceleration and deceleration time 2 3: Acceleration and deceleration time 3	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
		4: Acceleration and deceleration time 4		
Group A1: Second Motor Parameters				
A1-00	Motor parameter tuning	0: no function 1: Static tuning 2: Dynamic full tuning	0	★
A1-01	Motor 2 rated power	0.1Kw ~ 1000.0Kw	Model is determined	★
A1-02	Motor 2 rated voltage	1V ~ 1500V	380V	★
A1-03	Motor 2 Number of motor poles	2 to 64	Model is determined	●
A1-04	Motor 2 rated current	0.01A ~ 600.00A(Motor rated power<=30.0KW) 0.1A ~ 6000.0A(Motor rated power>30.0KW)	A1-01 OK	★
A1-05	Motor 2 rated frequency	0.01Hz ~ Maximum frequency (P0-14)	50.00Hz	★
A1-06	Motor 2 rated speed	1rpm ~ 65535rpm	A1-01 OK	★
A1-07	Motor 2 no-load current	0.01A ~ A1-04 (Motor rated power<=30.0KW) 0.1A ~ A1-04 (Motor rated power>30.0KW)	A1-01 OK	★
A1-08	Motor 2 stator resistance	0.001ohm ~ 65.535ohm	Model is determined	★
A1-09	Motor 2 rotor resistance	0.001ohm ~ 65.535ohm	Model is determined	★
A1-10	Motor 2 mutual inductance	0.1mH ~ 6553.5mH	Model is determined	★
A1-11	Motor 2 leakage inductance	0.01mH ~ 655.35mH	Model is determined	★
A1-12	Acceleration at Dynamic Full Tuning	1.0s ~ 6000.0s	10.0s	☆
A1-13	Deceleration at dynamic full tuning	1.0s ~ 6000.0s	10.0s	☆
Group A2: Second motor VF parameter setting				
A2-00	Torque boost	0.0% ~ 30.0%	0.0%	☆

Function code	Name	Description (setting range)	Factory Default	Change
A2-01	Oscillation suppression gain	0 ~ 100	Model is determined	☆
Group A3: Second motor vector control parameters				
A3-00	Switching frequency P1	0.00Hz ~ A3-02	5.00Hz	☆
A3-02	Switching frequency P2	A3-00 ~ P0-14	10.00Hz	☆
A3-04	Low frequency speed proportional gain	0.1 ~ 10.0	4.0	☆
A3-05	Low frequency speed integration time	0.01s ~ 10.00s	0.50s	☆
A3-06	High frequency speed proportional gain	0.1 ~ 10.0	2.0	☆
A3-07	High frequency speed integration time	0.01s ~ 10.00s	1.00s	☆
A3-08	Speed loop integral attribute selection	0: Points take effect 1: Integral separation	0	★
A3-11	Torque current regulator Kp	0 ~ 30000	2000	☆
A3-12	Torque current regulator Ki	0 ~ 30000	1300	☆
A3-13	Excitation current regulator Kp	0 ~ 30000	2000	☆
A3-14	Excitation current regulator Ki	0 ~ 30000	1300	☆
A3-15	Flux Brake Gain	0~200	0	☆
A3-16	Field weakening torque correction factor	50%~200%	100%	☆
A3-17	Slip Compensation Coefficient	50% ~ 200%	100%	☆
A3-18	Speed loop feedback filter time constant	0.000s ~ 1.000s	0.015s	☆
A3-19	Speed loop output filter time constant	0.000s ~ 1.000s	0.000s	☆
A3-20	Electric torque upper limit source	0: P3-21 2: AI2 1: AI1 (analog range corresponds to P3-21) 3: Communication given 4: PLUSE given	0	☆

Function code	Name	Description (setting range)	Factory Default	Change
A3-21	Electric torque upper limit	0.0% ~ 200.0%	150.0%	☆
A3-22	Braking torque upper limit source	0: P3-23 2: AI2 1: AI1 (analog range corresponds to P3-23) 3: Communication given 4: PLUSE given	0	☆
A3-23	Braking torque upper limit	0.0% ~ 200.0%	150%	☆
Group B0: System parameters				
B0-00	Function code read-only selection	0: invalid 1: read only	0	☆
B0-01	LCD top menu display/LED second line display	0: output current 1: Motor speed 2: Load speed 3: Output voltage 4: PID given 5: PID feedback	0	☆
B0-02	LCD language selection	0: Chinese 1: English	0	☆
B0-03	LED menu toggle selection	0: Disable 1: enable	0	☆
B0-04	Vector operating frequency display selection	0: real-time frequency 1: set frequency	0	☆
B0-05	Display selection during UP/Down adjustment	0: Display the set value 1: Display the current variable value	0	☆
Group B1: User function code customization				
B1-00	Clear custom function code selection	0: invalid 1: Valid	0	☆
B1-01	Custom function code 1	uP0-00 ~ uU1-xx	uP0-03	☆
B1-02	Custom function code 2	uP0-00 ~ uU1-xx	uP0-04	☆
B1-03	Custom function code 3	uP0-00 ~ uU1-xx	uP0-06	☆
B1-04	Custom function code 4	uP0-00 ~ uU1-xx	uP0-23	☆
B1-05	Custom function code 5	uP0-00 ~ uU1-xx	uP0-24	☆

Function code	Name	Description (setting range)	Factory Default	Change
B1-06	Custom function code 6	uP0-00 ~ uU1-xx	uP4-00	☆
B1-07	Custom function code 7	uP0-00 ~ uU1-xx	uP4-01	☆
B1-08	Custom function code 8	uP0-00 ~ uU1-xx	uP4-02	☆
B1-09	Custom function code 9	uP0-00 ~ uU1-xx	uP4-04	☆
B1-10	Custom function code 10	uP0-00 ~ uU1-xx	uP4-05	☆
B1-11	Custom function code 11	uP0-00 ~ uU1-xx	uP4-06	☆
B1-12	Custom function code 12	uP0-00 ~ uU1-xx	uP4-12	☆
B1-13	Custom function code 13	uP0-00 ~ uU1-xx	uP4-13	☆
B1-14	Custom function code 14	uP0-00 ~ uU1-xx	uP5-00	☆
B1-15	Custom function code 15	uP0-00 ~ uU1-xx	uP5-01	☆
B1-16	Custom function code 16	uP0-00 ~ uU1-xx	uP5-02	☆
B1-17	Custom function code 17	uP0-00 ~ uU1-xx	uP6-00	☆
B1-18	Custom function code 18	uP0-00 ~ uU1-xx	uP6-01	☆
B1-19	Custom function code 19	uP0-00 ~ uU1-xx	uP0-00	☆
B1-20	Custom function code 20	uP0-00 ~ uU1-xx	uP0-00	☆
B1-21	Custom function code 21	uP0-00 ~ uU1-xx	uP0-00	☆
B1-22	Custom function code 22	uP0-00 ~ uU1-xx	uP0-00	☆
B1-23	Custom function code 23	uP0-00 ~ uU1-xx	uP0-00	☆
B1-24	Custom function code 24	uP0-00 ~ uU1-xx	uP0-00	☆
B1-25	Custom function code 25	uP0-00 ~ uU1-xx	uP0-00	☆
B1-26	Custom function code 26	uP0-00 ~ uU1-xx	uP0-00	☆
B1-27	Custom function code 27	uP0-00 ~ uU1-xx	uP0-00	☆
B1-28	Custom function code 28	uP0-00 ~ uU1-xx	uP0-00	☆
B1-29	Custom function code 29	uP0-00 ~ uU1-xx	uP0-00	☆
B1-30	Custom function code 30	uP0-00 ~ uU1-xx	uP0-00	☆
B1-31	Custom function code 31	uP0-00 ~ uU1-xx	uP0-00	☆

Function code	Name	Description (setting range)	Factory Default	Change
Group B2: Optimize control parameters				
B2-00	Dead Time Compensation Enable Selection	0: no compensation 1: Compensation	1	☆
B2-01	PWM method	0: Asynchronous modulation 1: Synchronous modulation	0	☆
B2-02	PWM seven-segment/five-segment selection	0: 7 segments in the whole process 1: Seven-segment/five-segment automatic switching	0	☆
B2-03	CBC current limit enable selection	0: Disable 1: enable	1	☆
B2-04	Braking point	330.0V ~ 1200.0V	360.0V 690.0V	☆
B2-05	Undervoltage point	150.0V ~ 500.0V	200.0V 350.0V	☆
B2-06	Random PWM depth setting	0 ~ 6	0	☆
B2-07	0Hz operating mode selection	0: No current output; 1: Normal operation; 2: Output with stop DC braking current P1-16;	0	☆
B2-08	Low frequency carrier limitation mode selection	0: limit mode 0 1: Restricted Mode 1 2: Unlimited (the carrier of all frequency bands is the same)	0	☆
Group B3: AIAO correction parameters				
B3-00	AI1 shows voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-01	AI1 measured voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-02	AI1 shows voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-03	AI1 measured voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-04	AI2 shows voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-05	AI2 measured voltage 1	-9.999V ~ 10.000V	3.000V	☆

Function code	Name	Description (setting range)	Factory Default	Change
B3-06	AI2 shows voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-07	AI2 measured voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-12	AO1 target voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-13	AO1 measured voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-14	AO1 target voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-15	AO1 measured voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-16	AO2 target voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-17	AO2 measured voltage 1	-9.999V ~ 10.000V	3.000V	☆
B3-18	AO2 target voltage 2	-9.999V ~ 10.000V	8.000V	☆
B3-19	AO2 measured voltage 2	-9.999V ~ 10.000V	8.000V	☆
Group B4: Master-slave control parameters				
B4-00	Master-slave control enable selection:	0: Disable 1: Enable	0	★
B4-01	Master-slave selection:	0: Host 1: Slave	0	★
B4-02	Host sending frequency selection:	0: Running frequency 1: Target frequency	0	★
B4-03	Slave follow master command source selection	0: Do not follow 1: Follow	0	★
B4-04	Slave receive frequency coefficient	0.00% ~ 600.00%	100.00%	☆
B4-05	Slave receives torque coefficient	-10.00 ~ 10.00	1.00	☆
B4-06	Slave receives torque bias	-50.00% ~ 50.00%	0.00%	☆
B4-07	Frequency deviation threshold	0.20% ~ 10.00%	0.50%	☆
B4-08	Master-slave communication drop detection time	0.00s ~ 10.0s	0.1s	☆
Group B5: Brake function parameters				
B5-00	Brake control enable selection:	0: Disable 1: Enable	0	★

Function code	Name	Description (setting range)	Factory Default	Change
B5-01	Delay before opening the brake	0 ~ 20.0s	0s	★
B5-02	Delay before closing the brake from 0 to 20.0s	0.0 ~ 20.0s	0.3	★
B5-03	Rising positive rotation brake opening frequency	0.00Hz ~ 20.00Hz	2.50Hz	★
B5-04	Rising positive rotation brake closing frequency	0.00Hz ~ 20.00Hz	1.50Hz	★
B5-05	Falling reverse brake opening frequency	0.00Hz ~ 20.00Hz	2.50Hz	★
B5-06	Falling reverse brake closing frequency	0.00Hz ~ 20.00Hz	1.50Hz	★
B5-07	Brake opening current threshold	0 ~ 100.0	40.0	★
B5-08	Frequency holding time after opening the brake	0 ~ 20.0s	0.5s	★
B5-09	Frequency holding time after closing the brake	0 ~ 20.0s	0.5s	★
B5-10	Current limit during brake holding period	50.0% ~ 200.0%	120.0%	★
B5-11	Shutdown mode after closing the brake	0: Free shutdown 1: Slow down and stop the machine	0	★
B5-12	Brake open mode	0: Open according to frequency 1: Open according to frequency and current	0	★
B5-13	Special function enable-ment for civilian elevators	0: Close 1: Enable	0	★
B5-14	Emergency operating frequency of elevators	0.00Hz ~ P0-14 Hz	20.00Hz	★
B5-15	Elevator maintenance operation frequency	0.00Hz ~ P0-14 Hz	20.00Hz	★
B5-16	Elevator emergency signal processing mode	0: The elevator is not running 1: UPS power supply operation	1	★

Function code	Name	Description (setting range)	Factory Default	Change
B5-17	Elevator ascent correction frequency	0.00Hz ~ 5.00 Hz	0	★
B5-18	Elevator descent correction frequency	0.00Hz ~ 5.00 Hz	0	★
B5-19	Effective time of elevator emergency signal	0 ~ 3600.0	0	★
B5-20	Elevator emergency signal invalid time	0 ~ 3600.0	0	★
Group B6: Sleep wakeup function parameters				
B6-00	Hibernate selection	0: The sleep function is invalid 1: Digital input terminal DI controls sleep function 2: The sleep function is controlled by the PID setting value and feedback value 3: Control the sleep function according to the operating frequency	0	☆
B6-01	Sleep frequency	0.00Hz ~ P0-14	0.00Hz	☆
B6-02	Sleep delay	0.0s ~ 3600.0s	20.0s	☆
B6-03	Wake-up difference	0.0% ~ 100.0% When B6-00=3, the unit becomes Hz	10.0%	☆
B6-04	Wake up delay	0.0s ~ 3600.0s	0.5s	☆
B6-05	Sleep delay frequency output selection	0: PID automatic adjustment 1: Sleep frequency B6-01	0	☆
Group C1: Tension control function parameters				
C1-00	Tension control mode	0: Invalid 1: Open-loop torque control 2: Closed loop speed control	0	★
C1-01	Curling direction	0: Volume collection 1: Drop the volume	0	☆
C1-02	Maximum frequency of roll up	0.00Hz to maximum frequency	30	☆
C1-03	Upper limit frequency for unwinding	0.00Hz to maximum frequency	10	☆

Function code	Name	Description (setting range)	Factory Default	Change
C1-04	Mechanical transmission ratio	0.01 ~ 600.00	1.85	☆
C1-05	Tension setting source	0: Function code setting (C1-06) 1: AI1 2: AI2 3: AI3 (expansion card) 4: PULSE input pulse setting 5: Communication given	0	★
C1-06	Tension setting	0 ~ 30000N	1200	☆
C1-07	Maximum tension	0 ~ 30000N	2100	★
C1-08	Calculation method for roll diameter	0: Function code setting (C1-10) 1: Linear velocity calculation 2: Cumulative thickness calculation 3: AI1 4: AI2 5: AI3 (expansion card) 6: PULSE pulse input	1	★
C1-09	Maximum roll diameter	1~10000mm	1100	★
C1-10	Roll diameter	1~10000mm	320	★
C1-11	Initial roll diameter selection	0: DI terminal setting 1: Ai1 2: Ai2 3: AI3 (expansion card)	0	☆
C1-12	Initial roll diameter 1	1~10000mm	600	☆
C1-13	Initial roll diameter 2	1~10000mm	50	☆
C1-14	Initial roll diameter 3	1~10000mm	50	☆
C1-15	Initial roll diameter 4	1~10000mm	50	☆
C1-16	Roll diameter filtering time	0.1~60.0s	1	☆
C1-17	Roll diameter variation limit 1	1~10000mm	0	○
C1-18	Roll diameter variation limit 2	1~10000mm	0	○

Function code	Name	Description (setting range)	Factory Default	Change
C1-19	Roll diameter reset selection	0: During operation, it is prohibited to reset the roll diameter 1: Allow roll diameter reset during operation	0	☆
C1-20	The roll diameter has reached the set value	1~10000mm	0	☆
C1-21	Material thickness selection	0: DI terminal setting 1: Ai1 2: Ai2 3: AI3 (expansion card) 4: Communication settings	0	☆
C1-22	Maximum thickness	0.01~100.00mm	0	☆
C1-23	Material thickness 1	0.01~100.00mm	0.01	☆
C1-24	Material thickness 2	0.01~100.00mm	0.01	☆
C1-25	Material thickness 3	0.01~100.00mm	0.01	☆
C1-26	Material thickness 4	0.01~100.00mm	0.01	☆
C1-27	Circle benchmark selection	0: Frequency 1: Switching quantity 2: Encoder	0	☆
C1-28	Number of pulses per cycle	1~10000	1	☆
C1-29	Number of laps per layer	1~10000	1	☆
C1-30	Linear velocity input source	0: Function code setting (C1-31) 1: AI1 2: AI2 3: AI3 (expansion card) 4: PULSE input pulse setting 5: Communication given	0	☆
C1-31	Maximum linear velocity	0.1~6000.0m/min	1000	☆
C1-32	Actual value of linear velocity		0	○

Function code	Name	Description (setting range)	Factory Default	Change
C1-33	The lower limit of the frequency of coil diameter calculation	0.00Hz~maximum frequency	1.5	☆
C1-34	Roll diameter calculation delay	0.0~100.0s	6	☆
C1-35	Identification of mechanical inertia coefficient	0: No operation 1: Automatic identification	0	★
C1-36	Coefficient of mechanical inertia identifies torque	0~50.0% (rated torque of motor)	50	★
C1-37	Mechanical inertia compensation coefficient	0-10000	124	☆
C1-38	Material density	0~60000kg/m^3	0	☆
C1-39	Material width	0~60000m	0	☆
C1-40	Moment of inertia compensates the upper limit of torque	0.0~50.0%	5	☆
C1-41	Static friction compensation coefficient	0.0~50.0%	0	☆
C1-42	Dynamic friction compensation coefficient	0.0~50.0%	0	☆
C1-43	Zero speed threshold	0.00Hz to maximum frequency	1	☆
C1-44	High speed torque compensation coefficient	0.0~50.0%	0	☆
C1-45	High speed torque compensation basis	0: Frequency 1: Linear velocity	0	☆
C1-46	High speed torque compensation speed limit	10.0~100.0%	100	☆
C1-47	Reserve	Reserve	--	--
C1-48	Taper pattern	0: Curve taper 1: Linear taper	0	★

Function code	Name	Description (setting range)	Factory Default	Change
C1-49	Taper setting source	0: Function code setting (C1-50) 1: Ai1 2: Ai2 3: AI3 (expansion card)	0	★
C1-50	Taper setting	0.000~1.000	0	☆
C1-51	Taper correction amount	1~10000mm	100	☆
C1-52	Conical inflection point 1	1~10000mm	100	☆
C1-53	Cone setting 1	0.000~1.000	0	☆
C1-54	Conical inflection point 2	1~10000mm	200	☆
C1-55	Cone setting 2	0.000~1.000	0	☆
C1-56	Wire breakage detection selection	0: Invalid 1: Effective	0	☆
C1-57	Lower limit of wire breakage detection frequency	0.00Hz to maximum frequency	10	☆
C1-58	Wire breakage detection error	1~1000mm	10	☆
C1-59	Wire breakage detection time	0.1~60.0s	1	☆
C1-60	Pre drive speed gain	-50.0%~50.0%	0	☆
C1-61	Pre drive torque limit selection	0: PD-02 setting 1: Set limit according to tension	1	☆
C1-62	Pre drive torque gain	-50.0%~50.0%	0	☆
C1-63	Pre drive roll diameter calculation selection	0: Calculation 1: Stop calculation	1	☆
C1-64	Delay in calculating roll diameter after pre drive is completed	0.0s~10.0s	3	☆
C1-65	Adaptive torque selection	0: Forbidden 1: Enable	0	★

Function code	Name	Description (setting range)	Factory Default	Change
C1-66	Initial torque setting source selection	0: Function code setting (C1-67) 1: I1 2: AI2 3: AI3 (expansion card) 4: PULSE input pulse setting 5: Communication given	0	★
C1-67	Initial torque setting	0.0%~200.0%	0	☆
C1-68	Enable pulse disconnection detection	0: Forbidden 1: Enable	0	★
C1-69	Starting frequency of pulse breakage detection	0.00Hz to maximum frequency	0	☆
C1-70	Broken pulse frequency value	0.00Hz~600Hz	0	☆
C1-71	Wire breakage detection delay	0.0s--60.0s	0	☆

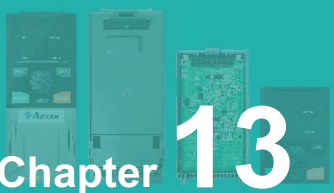
Function code	Name	Description (setting range)	Factory Default	Change
Group U0: Fault logging parameters				
U0-00	Last failure type	00: No fault Err01: Inverter module protection Err04: Overcurrent during acceleration Err05: Overcurrent during deceleration Err06: Overcurrent during constant speed operation Err08: Overvoltage during acceleration Err09: Overvoltage during deceleration Err10: Overvoltage during constant speed operation Err12: Undervoltage fault Err13: Drive overload fault Err14: Motor overload fault Err15: Drive overheated Err17: Current detection failure Err20: Short circuit fault to ground Err23: Input phase loss fault Err24: output phase loss fault Err25: Eeprom operation failure Err27: Communication failure Err28: External fault Err29: The speed deviation is too large Err30: User-defined fault 1 Err31: User-defined fault 2 Err33: Fast current limiting Err34: load drop fault Err32: PID feedback lost during runtime Err35: Input power failure Err37: parameter storage exception Err39: The running time has arrived Err40: Cumulative running time reached Err42: Switch the motor during operation Err46: Master-slave control communication dropped	1	●
U0-01	Last failure type		1	●
U0-02	Types of first and second faults		1	●
U0-03	Frequency of last failure		0.01Hz	●
U0-04	Current at last fault		0.01A	●

Function code	Name	Smallest unit	Change
U0-05	Bus voltage at last fault	0.1V	●
U0-06	Input terminal status at the last fault	1	●
U0-07	Output terminal status at the last fault	1	●
U0-08	Last fault inverter status	1	●
U0-09	Running time at the last fault (starting time after power-on, minutes)	1min	●
U0-10	Running time at the last failure (time from running time, minutes)	1min	●
U0-13	Frequency at last failure	0.01Hz	●
U0-14	Current at previous fault	0.01A	●
U0-15	Bus voltage at previous fault	0.1V	●
U0-16	Input terminal at the previous fault	1	●
U0-17	Output terminal when the previous fault	1	●
U0-18	Last fault inverter status	1	●
U0-19	The running time of the previous fault (start timing after power-on, minutes)	1min	●
U0-20	Time of last failure (timed from runtime, minutes)	1min	●
U0-21	reserved variable	--	●
U0-22	reserved variable	–	●
U0-23	The frequency of the first and second faults	0.01Hz	●
U0-24	Current at the first and second faults	0.01A	●
U0-25	Bus voltage at the first and second faults	0.1V	●
U0-26	Input terminal for the first and second faults	1	●
U0-27	Output terminal when the first and second faults	1	●
U0-28	Inverter status of previous and second faults	1	●
U0-29	The running time of the first and second faults (start timing after power-on, minutes)	1min	●
U0-30	The time of the first and second failures (timed from the running time, minutes)	1min	●

Function code	Name	Smallest unit	Change
Group U1: Application Monitoring Parameters			
U1-00	Operating frequency (Hz)	0.01Hz	●
U1-01	Set frequency (Hz)	0.01Hz	●
U1-02	Bus voltage (V)	0.1V	●
U1-03	Output voltage (V)	1V	●
U1-04	Output current (A)	0.1A	●
U1-05	Output power (Kw)	0.1kW	●
U1-06	DI input status, hexadecimal number	1	●
U1-07	DO output status, hexadecimal number	1	●
U1-08	Voltage after AI1 correction	0.01V	●
U1-09	Voltage after AI2 correction	0.01V	●
U1-10	PID set value, PID set value (percentage)*PA-05	1	●
U1-11	PID feedback, PID feedback value (percentage)*PA-05	1	●
U1-12	Count value	1	●
U1-13	Length value	1	●
U1-14	Motor speed	rpm	●
U1-15	PLC stage, the current segment during multi-speed operation	1	●
U1-16	PULSE pulse input frequency	0.01kHz	●
U1-17	Feedback speed, the actual operating frequency of the motor	0.1Hz	●
U1-18	P7-38 Remaining time of timing time	0.1Min	●
U1-19	AI1 voltage before correction	0.001V	●
U1-20	Voltage before AI2 correction	0.001V	●
U1-21	DI5 high-speed pulse sampling line speed, refer to P7-71 for use	1m/min	●
U1-22	Load speed display (set load speed when stopped), refer to P7-31 for use	customize	●
U1-23	The power-on time	1Min	●

Function code	Name	Smallest unit	Change
U1-24	This running time	0.1Min	●
U1-25	PULSE pulse input frequency, different from U1-16 only in unit	1Hz	●
U1-26	Communication setting frequency value	0.01%	●
U1-27	Main frequency display	0.01Hz	●
U1-28	Auxiliary frequency display	0.01Hz	●
U1-29	Target torque, take the motor rated torque as 100%	0.1%	●
U1-30	Output torque, take the motor rated torque as 100%	0.1%	●
U1-31	Output torque, with the rated current of the inverter as 100%	0.1%	●
U1-32	Torque upper limit, the rated current of the inverter is 100%	0.1%	●
U1-33	VF separation target voltage	1V	●
U1-34	VF split output voltage	1V	●
U1-35	Reserve	—	●
U1-36	Motor serial number currently in use	1	●
U1-37	AO1 target voltage	0.01V	●
U1-38	AO2 target voltage	0.01V	●
U1-39	Inverter running status, 0: Stop, 1: Forward, 2: Reverse, 3: Fault	1	●
U1-40	Inverter current fault	1	●
U1-41	Agent time remaining	1h	●
U1-42	AC incoming line current	0.1A	●
U1-43	PLC current phase remaining time	0.1	●
U1-47	Cumulative running time 1 (cumulative running time = U1-47 + U1-48)	1h	●
U1-48	Cumulative running time 2 (cumulative running time = U1-47 + U1-48)	1min	●
U1-50	Motor temperature	1℃	●

Function code	Name	Smallest unit	Change
U1-41	Agent time remaining	1h	●
U1-42	AC incoming line current	0.1A	●
U1-43	PLC current phase remaining time	0.1	●
U1-47	Cumulative running time 1 (cumulative running time = U1-47 + U1-48)	1h	●
U1-48	Cumulative running time 2 (cumulative running time = U1-47 + U1-48)	1min	●
U1-50	Motor temperature	1℃	●



Chapter 13

Function code address query comparison table

13.1 Function code address query comparison table

Function code	Address	Function code	Address	Function code	Address
Group P0: Basic function group					
P0-00	F000	P0-01	F001	P0-02	F002
P0-03	F003	P0-04	F004	P0-05	F005
P0-06	F006	P0-07	F007	P0-08	F008
P0-09	F009	P0-10	F00A	P0-11	F00B
P0-13	F00D	P0-14	F00E	P0-15	F00F
P0-16	F010	P0-17	F011	P0-18	F012
P0-19	F013	P0-20	F014	P0-21	F015
P0-22	F016	P0-23	F017	P0-24	F018
P0-25	F019	P0-26	F01A	P0-27	F01B
P0-28	F01C	P0-29	F01D		
Group P1: Start-stop control					
P1-00	F100	P1-01	F101	P1-02	F102
P1-03	F103	P1-04	F104	P1-05	F105
P1-06	F106	P1-07	F107	P1-08	F108
P1-09	F109	P1-10	F10A	P1-11	F10B
P1-12	F10C	P1-13	F10D	P1-14	F10E
P1-15	F10F	P1-16	F110	P1-17	F111
P1-21	F115	P1-23	F117	P1-24	F118
P1-25	F119	P1-26	F11A	P1-27	F11B
P1-28	F11C	P1-29	F11D		
Group P2: V/F control parameters					
P2-00	F200	P2-01	F201	P2-02	F202
P2-03	F203	P2-04	F204	P2-05	F205
P2-06	F206	P2-07	F207	P2-08	F208

Function code	Address	Function code	Address	Function code	Address
P2-09	F209	P2-10	F00A	P2-11	F00B
P2-13	F00D	P2-15	F00F	P2-16	F210
P2-17	F211	P2-18	F212	P2-19	F213
Group P3: Vector control parameters					
P3-00	F300	P3-02	F302	P3-04	F304
P3-05	F305	P3-06	F306	P3-07	F307
P3-08	F308	P3-11	F30B	P3-12	F30C
P3-13	F30D	P3-14	F30E	P3-15	F30F
P3-16	F310	P3-17	F311	P3-18	F312
P3-19	F313	P3-20	F314	P3-21	F315
P3-22	F316	P3-23	F317	P3-24	F318
P3-25	F319	P3-26	F31A	P3-27	F31B
P3-28	F31C				
Group P4: First motor parameter					
P4-00	F400	P4-01	F401	P4-02	F402
P4-03	F403	P4-04	F404	P4-05	F405
P4-06	F406	P4-07	F407	P4-08	F408
P4-09	F409	P4-10	F40A	P4-11	F40B
P4-12	F40C	P4-13	F40D	P4-17	F411
P4-18	F412	P4-19	F413	P4-20	F414
P4-21	F415	P4-28	F41C	P4-29	F41D
P4-30	F41E	P4-31	F41F	P4-32	F420
Group P5: Input terminal					
P5-00	F500	P5-01	F501	P5-02	F502
P5-03	F503	P5-04	F504	P5-05	F505
P5-06	F506	P5-07	F507	P5-08	F508
P5-09	F509	P5-10	F50A	P5-11	F50B

Function code	Address	Function code	Address	Function code	Address
P5-12	F50C	P5-13	F50D	P5-15	F50F
P5-16	F510	P5-17	F511	P5-18	F512
P5-19	F513	P5-20	F514	P5-21	F515
P5-22	F516	P5-23	F517	P5-24	F518
P5-25	F519	P5-26	F51A	P5-27	F51B
P5-28	F51C	P5-29	F51D	P5-30	F51E
P5-31	F51F	P5-32	F520	P5-33	F521
P5-34	F522	P5-35	F523	P5-36	F524
P5-37	F525	P5-38	F526	P5-39	F527
P5-40	F528	P5-41	F529	P5-42	F52A
P5-44	F52C	P5-45	F52D		
Group P6: Output terminal					
P6-00	F600	P6-01	F601	P6-02	F602
P6-03	F603	P6-04	F604	P6-05	F605
P6-09	F609	P6-10	F60A	P6-11	F60B
P6-12	F60C	P6-13	F60D	P6-14	F60E
P6-15	F60F	P6-16	F610	P6-17	F611
P6-18	F612	P6-19	F613	P6-20	F614
P6-21	F615	P6-22	F616	P6-23	F617
P6-26	F61A	P6-27	F61B	P6-28	F61C
P6-29	F61D				
Group P7: Accessibility and keyboard display					
P7-00	F700	P7-01	F701	P7-02	F702
P7-03	F703	P7-04	F704	P7-05	F705
P7-06	F706	P7-07	F707	P7-08	F708
P7-09	F709	P7-10	F70A	P7-11	F70B
P7-12	F70C	P7-15	F70F	P7-16	F710

Function code	Address	Function code	Address	Function code	Address
P7-17	F711	P7-18	F712	P7-19	F713
P7-20	F714	P7-21	F715	P7-22	F716
P7-23	F717	P7-24	F718	P7-25	F719
P7-26	F71A	P7-27	F71B	P7-28	F71C
P7-29	F71D	P7-30	F71D	P7-31	F71F
P7-32	F720	P7-33	F721	P7-34	F722
P7-36	F724	P7-37	F725	P7-38	F726
P7-39	F727	P7-40	F728	P7-41	F729
P7-43	F72B	P7-44	F72C	P7-45	F72D
P7-46	F72E	P7-49	F731	P7-50	F732
P7-51	F733	P7-53	F735	P7-54	F736
P7-55	F737	P7-56	F738	P7-57	F739
P7-58	F73A	P7-59	F73B	P7-60	F73C
P7-61	F73D	P7-62	F73E	P7-63	F73F
P7-64	F740	P7-65	F741	P7-67	F743
P7-68	F744	P7-69	F745	P7-70	F746
P7-71	F747	P7-72	F748	P7-73	F749
P7-74	F74A	P7-75	F74B	P7-76	F74C
Group P8: Communication parameters					
P8-00	F800	P8-01	F801	P8-02	F802
P8-03	F803	P8-04	F804	P8-05	F805
P8-06	F806				
Group P9: Fault and Protection					
P9-00	F900	P9-01	F901	P9-02	F902
P9-03	F903	P9-04	F904	P9-05	F905
P9-06	F906	P9-07	F907	P9-08	F908
P9-11	F90B	P9-12	F90C	P9-13	F90D

Function code	Address	Function code	Address	Function code	Address
P9-14	F90E	P9-15	F90F	P9-16	F910
P9-17	F911	P9-18	F912	P9-19	F913
P9-20	F914	P9-22	F916	P9-23	F917
P9-24	F918	P9-26	F91A	P9-27	F91B
P9-28	F91C	P9-29	F91D	P9-30	F91E
P9-31	F91F	P9-32	F920	P9-33	F921
P9-34	F922	P9-35	F923	P9-36	F924
P9-37	F925	P9-38	F926		
Group PA: PID function					
PA-00	FA00	PA-01	FA01	PA-02	FA02
PA-03	FA03	PA-04	FA04	PA-05	FA05
PA-06	FA06	PA-07	FA07	PA-08	FA08
PA-09	FA09	PA-10	FA0A	PA-11	FA0B
PA-12	FA0C	PA-13	FA0D	PA-14	FA0E
PA-18	FA12	PA-19	FA13	PA-20	FA14
PA-21	FA15	PA-22	FA16	PA-23	FA17
PA-24	FA18	PA-25	FA19	PA-26	FA1A
PA-27	FA1B	PA-28	FA1C	PA-29	FA1D
Group PB: Swing Frequency, Fixed Length and Count					
PB-00	FB00	PB-01	FB01	PB-02	FB02
PB-03	FB03	PB-04	FB04	PB-05	FB05
PB-06	FB06	PB-07	FB07	PAB-08	FB08
PB-09	FB09				
Group PC: Multi-segment instruction and simple PLC function					
PC-00	FC00	PC-01	FC01	PC-02	FC02
PC-03	FC03	PC-04	FC04	PC-05	FC05
PC-06	FC06	PC-07	FC07	PC-08	FC08
PC-09	FC09	PC-10	FC0A	PC-11	FC0B

Function code	Address	Function code	Address	Function code	Address
PC-12	FC0C	PC-13	FC0D	PC-14	FC0E
PC-15	FC0F	PC-16	FC10	PC-17	FC11
PC-18	FC12	PC-19	FC13	PC-20	FC14
PC-21	FC15	PC-22	FC16	PC-23	FC17
PC-24	FC18	PC-25	FC19	PC-26	FC1A
PC-27	FC1B	PC-28	FC1C	PC-29	FC1D
PC-30	FC1E	PC-31	FC1F	PC-32	FC20
PC-33	FC21	PC-34	FC22	PC-35	FC23
PC-36	FC24	PC-37	FC25	PC-38	FC26
PC-39	FC27	PC-40	FC28	PC-41	FC29
PC-42	FC2A	PC-43	FC2B	PC-44	FC2C
PC-45	FC2D	PC-46	FC2E	PC-47	FC2F
PC-48	FC30	PC-49	FC31	PC-50	FC32
PC-51	FC33	PC-52	FC34	PC-53	FC35
PC-55	FC37				
Group PD: Torque control					
PD-00	FD00	PD-01	FD01	PD-03	FD03
PD-04	FD04	PD-06	FD06	PD-07	FD07
PD-08	FD08	PD-10	FD0A		
Group PE: AI multi-point curve setting					
PE-00	FE00	PE-01	FE01	PE-02	FE02
PE-03	FE03	PE-04	FE04	PE-05	FE05
PE-06	FE06	PE-07	FE07	PE-08	FE08
PE-09	FE09	PE-10	FE0A	PE-11	FE0B
PE-12	FE0C	PE-13	FE0D	PE-14	FE0E
PE-15	FE0F	PE-24	FE18	PE-25	FE19
PE-26	FE1A	PE-27	FE1B		

Function code	Address	Function code	Address	Function code	Address
Group PF: Manufacturer parameters					
PF-00	FF00				
Group A0: Second motor parameter setting					
A0-00	A000	A0-01	A001	A0-02	A002
Group A1: Second Motor Parameters					
A1-00	A100	A1-01	A101	A1-02	A102
A1-03	A103	A1-04	A104	A1-05	A105
A1-06	A106	A1-07	A107	A1-08	A108
A1-09	A109	A1-10	A10A	A1-11	A10B
A1-12	A10C	A1-13	A10D		
Group A2: Second motor VF parameter setting					
A2-00	A200	A2-02	A202		
Group A3: Second motor vector control parameters					
A3-00	A300	A3-02	A302	A3-04	A304
A3-05	A305	A3-06	A306	A3-07	A307
A3-08	A308	A3-11	A30B	A3-12	A30C
A3-13	A30D	A3-14	A30E	A3-15	A30F
A3-16	A310	A3-17	A311	A3-18	A312
A3-19	A313	A3-20	A314	A3-21	A315
A3-22	A316	A3-23	A317		
Group B0: System parameters					
B0-00	B000	B0-01	B001	B0-02	B002
B0-03	B003	B0-04	B004	B0-05	B005
Group B1: User function code customization					
B1-00	B100	B1-01	B101	B1-02	B102
B1-03	B103	B1-04	B104	B1-05	B105
B1-06	B106	B1-07	B107	B1-08	B108

Function code	Address	Function code	Address	Function code	Address
B1-09	B109	B1-10	B10A	B1-11	B10B
B1-12	B10C	B1-13	B10D	B1-14	B10E
B1-15	B10F	B1-16	B110	B1-17	B111
B1-18	B112	B1-19	B113	B1-20	B114
B1-21	B115	B1-22	B116	B1-23	B117
B1-24	B118	B1-25	B119	B1-26	B11A
B1-27	B11B	B1-28	B11C	B1-29	B11D
B1-30	B11E	B1-31	B11F		
Group B2: Optimize control parameters					
B2-00	B200	B2-01	B201	B2-02	B202
B2-03	B203	B2-04	B204	B2-05	B205
B2-06	B206	B2-07	B207	B2-08	B208
Group B3: AIAO correction parameters					
B3-00	B300	B3-01	B301	B3-02	B302
B3-03	B303	B3-04	B304	B3-05	B305
B3-06	B306	B3-07	B307	B3-12	B30C
B3-13	B30D	B3-14	B30E	B3-15	B30F
B3-16	B310	B3-17	B311	B3-18	B312
B3-19	B313				
Group B4: Master-slave control parameters					
B4-00	B400	B4-01	B401	B4-02	B402
B4-03	B403	B4-04	B404	B4-05	B405
B4-06	B406	B4-07	B407	B4-08	B408
Group B5: Brake function parameters					
B5-00	B500	B5-01	B501	B5-02	B502
B5-03	B503	B5-04	B504	B5-05	B505
B5-06	B506	B5-07	B507	B5-08	B508

Function code	Address	Function code	Address	Function code	Address
B5-09	B509	B5-10	B50A	B5-11	B50B
B5-12	B50C	B5-15	B50F	B5-16	B510
B5-17	B511	B5-18	B512	B5-19	B513
B5-20	B514				
Group B6: Sleep wakeup function parameters					
B6-00	B600	B6-01	B601	B6-02	B602
B6-03	B603	B6-04	B604	B6-05	B605
Group C1: Tension control function parameters					
C1-00	C100	C1-01	C101	C1-02	C102
C1-03	C103	C1-04	C104	C1-05	C105
C1-06	C106	C1-07	C107	C1-08	C108
C1-09	C109	C1-10	C10A	C1-11	C10B
C1-12	C10C	C1-13	C10D	C1-14	C10E
C1-15	C10F	C1-16	C110	C1-17	C111
C1-18	C112	C1-19	C113	C1-20	C114
C1-21	C115	C1-22	C116	C1-23	C117
C1-24	C118	C1-25	C119	C1-26	C11A
C1-27	C11B	C1-28	C11C	C1-29	C11D
C1-30	C11D	C1-31	C11F	C1-32	C120
C1-33	C121	C1-34	C122	C1-35	C123
C1-36	C124	C1-37	C125	C1-38	C126
C1-39	C127	C1-40	C128	C1-41	C129
C1-42	C12A	C1-43	C12B	C1-44	C12C
C1-45	C12D	C1-46	C12E	C1-47	C12F
C1-48	C130	C1-49	C131	C1-50	C132
C1-51	C133	C1-52	C134	C1-53	C135
C1-54	C136	C1-55	C137	C1-56	C138

Function code	Address	Function code	Address	Function code	Address
C1-57	C139	C1-58	C13A	C1-59	C13B
C1-60	C13C	C1-61	C13D	C1-62	C13E
C1-63	C13F	C1-64	C140	C1-65	C141
C1-66	C142	C1-67	C143	C1-68	C144
C1-69	C145	C1-70	C146	C1-71	C147
Group U0: Fault logging parameters					
U0-00	7000	U0-01	7001	U0-02	7002
U0-03	7003	U0-04	7004	U0-05	7005
U0-06	7006	U0-07	7007	U0-08	7008
U0-09	7009	U0-10	700A	U0-13	700D
U0-14	700E	U0-15	700F	U0-16	7010
U0-17	7011	U0-18	7012	U0-19	7013
U0-20	7014	U0-21	7015	U0-22	7016
U0-23	7017	U0-24	7018	U0-25	7019
U0-26	701A	U0-27	701B	U0-28	701C
U0-29	701D	U0-30	701E		
Group U1: Application Monitoring Parameters					
U1-00	7100	U1-01	7101	U1-02	7102
U1-03	7103	U1-04	7104	U1-05	7105
U1-06	7106	U1-07	7107	U1-08	7108
U1-09	7109	U1-10	710A	U1-11	710B
U1-12	710C	U1-13	710D	U1-14	711E
U1-15	711F	U1-16	7110	U1-17	7111
U1-18	7112	U1-19	7113	U1-20	7114
U1-21	7115	U1-22	7116	U1-23	7117
U1-24	7118	U1-25	7119	U1-26	711A
U1-27	711B	U1-28	711C	U1-29	711D

Function code	Address	Function code	Address	Function code	Address
U1-30	711E	U1-31	711F	U1-32	7120
U1-33	7121	U1-34	7122	U1-35	7123
U1-36	7124	U1-37	7125	U1-38	7126
U1-39	7127	U1-40	7128	U1-41	7129
U1-42	712A	U1-43	712B	U1-47	712F
U1-48	7130	U1-50	7132		

WARRANTY

❶ The company solemnly promises that users will enjoy the following warranty services from the date of purchase of products from our company (hereinafter referred to as the manufacturer).

❷ Since the product was purchased by the user from the manufacturer, enjoy the following three guarantee services:

- ⌑ Return, replacement and repair within 30 days of delivery:
- ⌑ Replacement and repair within 90 days of delivery:
- ⌑ Repair within 18 months of delivery:
- ⌑ Except when exporting abroad.

❸ This product enjoys lifetime paid service from the date of purchase by the user from the manufacturer.

❹ Disclaimer: Product failure caused by the following reasons is not covered by the manufacturer's free warranty service:

- ⌑ Failure caused by the user's use and operation in accordance with the requirements of the «Instruction Manual»:
- ⌑ Failure caused by the user to repair or modify the product without communicating with the manufacturer:
- ⌑ Failure caused by abnormal aging of the product due to poor user environment:
- ⌑ Failures caused by natural disasters such as earthquakes, fires, floods or abnormal voltages:
- ⌑ Damage to the product during transportation (the transportation method is specified by the customer, and the company assists in handling the cargo consignment procedures)

❺ Under the following conditions, manufacturers have the right not to provide warranty services:

- ⌑ When the manufacturer's product logo, trademark, nameplate, etc. are damaged or unrecognizable:
- ⌑ When the user fails to pay the purchase price in accordance with the signed contract:
- ⌑ The user intentionally conceals the manufacturer's after-sales service unit when the product is installed, wired, operated, maintained or otherwise improperly used

❻ For the service of return, replacement and repair, the company must return or return to the company, and it can only be returned or repaired after confirming the responsibility vested.

WARRANTY CARD

User information			
User name			
User address			
Postal code		Contact person	
Tel		Fax	
Machine type		Machine code	
Agent / Reseller Information			
Supplier			
Contact			
Tel		Delivery date	

CERTIFICATE OF QUALITY

QC test: _____

This product has been tested by our company's quality department, and its performance meets the standards, passes the inspection, and is approved to leave the factory.

2025.01.15