

VEICHI

Manual

AC70T Crane Purpose VFD Manual

VEICHI

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Chapter 1 Overview

1.1 Safety requirement and cautions

Please do totally understand this part before using the inverter.

Warning signs and meanings

This manual has used following signs which means there is an important part of security. While observing against the rules, there is a danger of injury even death or machine system damage.

 Danger	Danger: Wrong operation may cause death or large accident.
 Caution	Caution: Wrong operation may cause minor wound.

Operation requirement

Only professionally trained persons can be allowed to operate the equipment. "Professional trained persons" means the workers must have experience professional trained skill, and must be familiar with installation, wiring, running and maintain and can rightly deal with emergency cases in use.

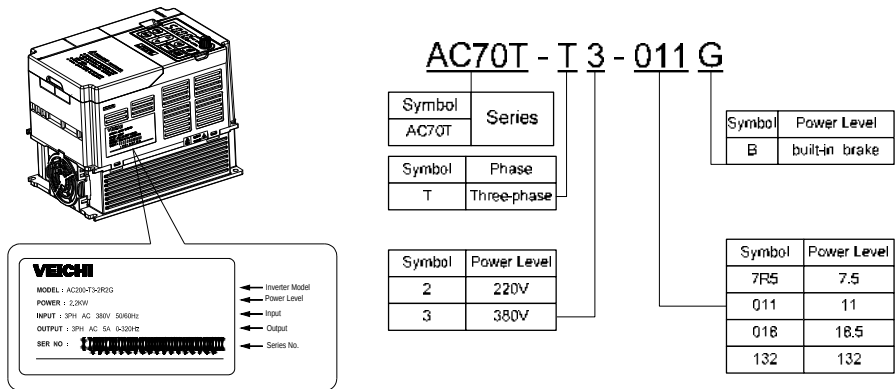
Safety guidance

Warning signs come for your security. They are measures to prevent the operator and machine system from damage. Please carefully read this manual before using and strictly observe the regulations and warning signs while operating.

- Correct transportation, store, installation, careful operation and maintenance are important for inverter safe operation. In transport and store process, make sure the inverter is free from impact and vibration. It must be stored where is dry without corrosive air and conductive dust, and the temperature must be lower than 60℃.
- This product carries dangerous voltage and controls driver machine with potential danger. If you don't abide by the regulations or requirements in this manual, there is danger of body injury even death and machine system damage.
- Do not wire while the power is connected. Otherwise, there is danger of death for electric shock. Before wiring, inspection and maintenance, please cut off power supply of all related equipment's and ensure main DC voltage in safe range. And please operate it after 5 mins.
- Power wire, motor wire and control wire should be all connected firmly. Earth must be reliable and earth resistance must be lower than 10Ω.
- Human body electrostatic will damage inner sensitive components seriously. Before operation, please follow ESD measures. Otherwise, there is danger of inverter damage.
- Inverter output voltage is pulse wave. If components such as capacitor which improves power factor and pressure-sensitive resistance for anti-thunder and so on are installed at the output side, please dismantle them or change to input side.
- No switch components such as breaker and contactor at the output side (If there must be one, please make sure the output current is 0 while the switch acting).
- No matter where the fault is, there is danger of serious accident. So there must be additional external prevent measures or other safety devices.
- Only used in application fields as maker stated. No use in equipments related to special fields such as emergency, succor, ship, medical treatment, aviation, nuclear and etc.
- Only Veichi Electric co., Ltd service department or its authorized service center can maintain the products. It may cause product fault while using accessories not authorized or permitted. Any defective components must be changed in time in maintenance.

1.2 Before Use

On receiving your order, please check the package and confirm intact before opening, and check if there's any damage, scratch or dirt (damages caused during transportation are not within the company's warranty). If there's any damage caused during transportation, please contact us or the transport company immediately. After confirming the receipt of the goods intact, please re-confirm if the product and your order are consistent.



Model	Applicable motor	Input VOLT	Rated Current	Model	Applicable motor	Input VOLT	Rated Current
AC70T-T3-R75-B	0. 75KW	3 Phase 380VAC	2. 3A	AC70T-T3-037-B	37KW	3 Phase 380VAC	75A
AC70T-T3-1R5-B	1. 5KW		3. 7A	AC70T-T3-045-B	45KW		90A
AC70T-T3-2R2-B	2. 2KW		5A	AC70T-T3-055-B	55KW		120A
AC70T-T3-004-B	4KW		10A	AC70T-T3-075-B	75KW		150A
AC70T-T3-5R5-B	5. 5KW		13A	AC70T-T3-090-B	90KW		180A
AC70T-T3-7R5-B	7. 5KW		17A	AC70T-T3-110	110KW		210A
AC70T-T3-011-B	11KW		25A	AC70T-T3-132	132KW		250A
AC70T-T3-015-B	15KW		32A	AC70T-T3-160	160KW		310A
AC70T-T3-018-B	18KW		38A	AC70T-T3-185	185KW		340A
AC70T-T3-022-B	22KW		45A	AC70T-T3-200	200KW		380A
AC70T-T3-030-B	30KW		60A				

1.3 Technical criterion

Items		Criterion
Power input	Voltage,frequency	Three phase 380V 50/60Hz ;
	Allowable fluctuations	voltage unbalance rate:<3%; Frequency:±5%; aberration rate: as IEC61800-2

	Inrush current	Lower than rated current	
	Power factor	≥ 0.94 (with DC reactor)	
	Efficiency	$\geq 96\%$	
Output	Output voltage	Output under rated condition: 3 phase, 0~input voltage, inaccuracy<5%	
	Output frequency	G type:0~600Hz	
	Output frequency	Max frequency $\pm 0.5\%$	
	Overload capacity	G type: 150% rated current/1 min, 180% rated current/10s, 200% rated	
Main Control performance	Steady speed accuracy	V/F without PG, VC without PG, V/F with PG, VC with PG	
	Starting torque	Optimized SVPWM mode	
	Steady speed accuracy	0.7~16.0kHz	
	Starting torque	VC without PG: rated load 1:100; VC with PG: rated load 1:1000	
	Steady speed accuracy	VC without PG: $\leq 2\%$ rated synchronized speed; VC with PG: $\leq 0.05\%$ rated	
	Starting torque	VC without PG: when 0.5Hz, 150% rated torque; VC with PG: when 0Hz,	
	Torque response	VC without PG: $\leq 20\text{ms}$; VC with PG: $\leq 10\text{ms}$	
	Frequency accuracy	Digit setting: max frequency $\times \pm 0.01\%$; Analog setting: max frequency $\times \pm 0.2\%$	
Basic functions	Frequency resolution	Digit setting: 0.01Hz; Analog setting: max frequency $\times 0.05\%$	
	DC braking capacity	Starting frequency:0.00~50.00Hz; Braking time:0.0~60.0s; Braking	
	Torque boost capacity	Auto torque upgrade 0.0%~100.0%; Manual torque upgrade 0.0%~30.0%	
	V/F curve	4 modes: one linearity torque characteristic curve ,one self-setting V/F curve mode, one drop torque characteristic curve (1.1- 2.0 powers),and square V/F	
	Acceleration/Deceleration curve	2 modes: linear Acceleration/Deceleration and S curve Acceleration/Deceleration. 4 sets of ACC/DEC, time unit 0.01s selectable,	
	Rated output voltage	Rely on power supply voltage compensate function, while motor rated voltage is 100%, set it at the range of 50-100%(output can not over input voltage).	
	Voltage	While power supply voltage fluctuates, it can auto-keep constant output	
	Auto energy-saving running	While under V/F control mode, according to load situation, auto-optimize output voltage to save energy.	
	Auto-limit current	Auto-limit the current while running to prevent over current break trouble.	
	Instant power off	While instant power off, realize continual operation by bus voltage control.	
	Standard functions	PID control, speed track, power off restart, jump frequency, upper/lower frequency limit control, program operation, multi- speed, RS485, analog	
	Frequency setting channels	Keyboard digital setting, Analog voltage/current terminal AI1, Analog voltage/current terminal AI2, Communication given and multi-channel terminal selection, Main and auxiliary channel combination, expansion card, supporting	
	Feedback input channel	Voltage/Current Terminal AI1, Voltage/Current Terminal AI12, Communication given, Low-speed pulse input PUL, extension card	
	Running command	Operation panel given, external terminal given, communication given,	
	Input command signal	Start, stop, FWD/REV, JOG, multi-step speed, free stop, reset, ACC/DEC time selection, frequency given channel selection, exterior fault alarm.	
	Exterior output signal	1 relay output, 1 collector output, 1 AO output: 0~10V output or 4~20mA output, or frequency pulse output	
Protection function		Overvoltage, under-voltage, current limit, over-current, overload, electric thermal relay, overheat, overvoltage stall, data protection, rapid speed	
Keyboar	LED display	Single file 5 digital tube display	Can monitor one state variable

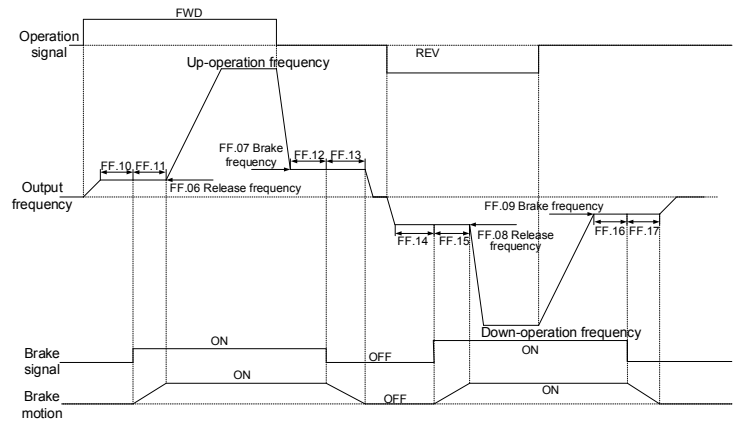
d display		Two file 5 digital tube display	Can monitor two state variables
	Parameter copy	Can upload or download function code information of inverter to realize fast	
	State monitor	Output frequency, given frequency, output current, input voltage, output voltage, motor speed, PID feedback, PID given value, module temperature	
	Fault alarm	,Over-voltage, under-voltage, over-current, short circuit, phase failure, overload, overheat, overvoltage stall, current limit, or data protection	
Environ ment	Install place	altitude $\leq 1000\text{m}$, above 1000m down the rated amount, each increase of 100m down the rated amount of 1%;no condensation, ice ,rain, snow, hail; solar radiation below $700\text{W}/\text{m}^2$, air pressure 70-106 kPa	
	Temperature, humidity	-10~+50℃, above 40℃ down the rated amount, the max temperature:60℃	
	Vibration	9~200Hz, 5.9m/s ² (0.6g)	
	Store temperature	-30—+60℃	
	Installation	Hanging type, cabinet type	
	Protection degree	IP20	
	Cooling mode	Forced air cooling	

1.4 Product Features

- 1. Special VFD for lifting:** high working efficiency, fast response, good speed regulation performance, stable operation, no impact and high safety factor.
- 2. Stall protection function (closed-loop mode):** When the actual speed is detected to exceed 115% of the rated speed during operation, the frequency inverter signal sends a brake signal to achieve emergency braking.
- 3. Anti-slip protection function (closed loop mode):** In the closed loop mode, when the inverter is energized in the standby state, when the motor is detected to rotate, the function is activated immediately, and the inverter is locked at the zero speed output, which provides the system operation. It has maximum security.
- 4. Zero servo hover function (closed loop mode):** that is, at zero speed, keeping the brake open and keeping the lifting mechanism hovering in the air.
- 5. Full-range torque monitoring function:** Torque monitoring during operation, when the torque output is detected, immediately block the output and achieve emergency stop.
- 6. Remote monitoring module (extension):** realizes remote positioning, online monitoring, remote fault diagnosis and other functions of mechanical equipment; provides customers with a wider range of value-added services.
- 7. Light-load high-speed function:** When running in the light load or empty hook state, the frequency is automatically increased (constant power zone) through the built-in load measurement mode calculation, effectively improving the working efficiency of the lifting machine by 10% to 50%.
- 8. Output abnormal protection:** torque monitoring during operation, when the torque output is detected or no load, immediately block the output and achieve emergency stop.
- 9. The rotary operation is stable:** the low-speed operation is smooth and coherent, there is no stop-and-go phenomenon, the gear position is stable, the boom is continuous and smooth, and there is no "pause" phenomenon.
- 10. Rotary eddy current control:** The built-in eddy current controller adopts PWM pulse width modulation to adjust the output voltage duty ratio in real time according to the operating frequency, which is superior to the traditional eddy current voltage regulation module.
- 11. Flexible torque control (slewing):** The "soft belt" is powerful and fast, and the boom does not rebound smoothly.
- 12. Anti-sway function (variable):** The swing is limited by dynamically adjusting the frequency of the inverter and the acceleration/deceleration time. When the object reaches the set speed, the swing is small or basically stops when it stops.
- 13. Special brake logic control:** realize the special brake logic control through the release frequency, release current,

brake release time, brake holding time, etc., to ensure the system is safe and reliable.

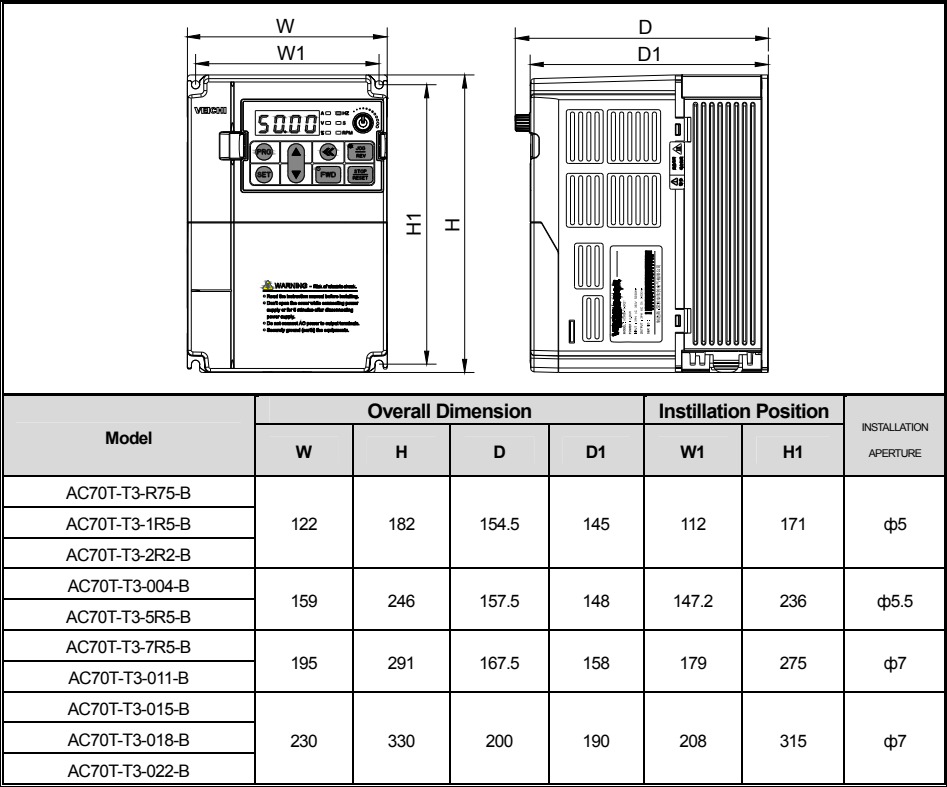
14. Brake timing description: When the brake is not energized, it is in the state of holding the brake, and must be released under the condition that the brake is energized; through the release frequency, release current, brake release time, brake holding brake Time, etc., to achieve a dedicated brake logic control to ensure that the system is safe and reliable to avoid slipping.

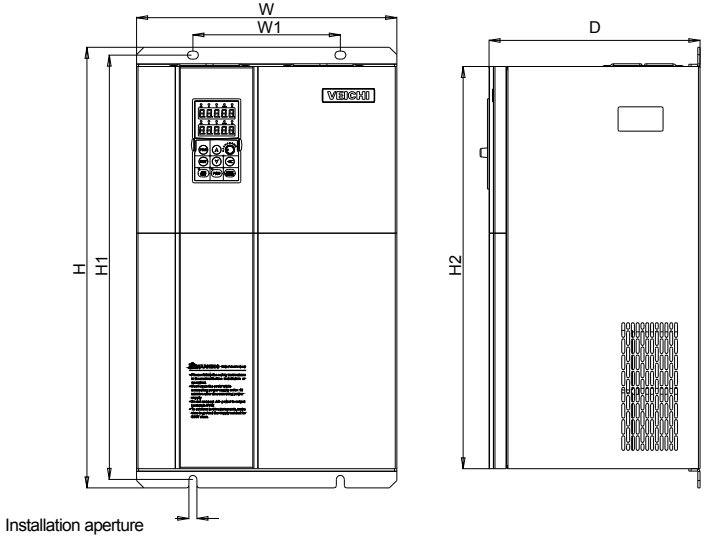


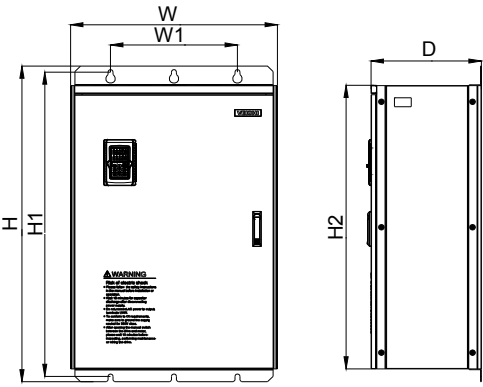
Chapter 2 Installation

This section specifies the considerations necessary for reliable and safe operation of the product by users.

Overall Dimension of Inverter (Plastic)

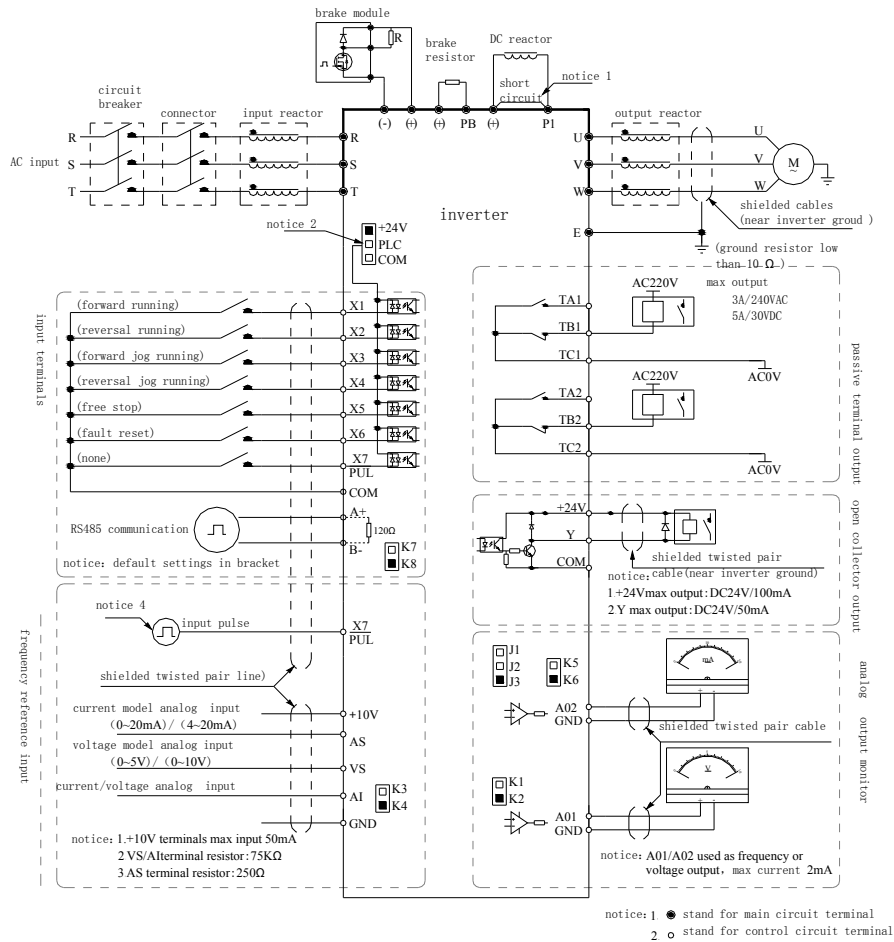


 Installation aperture							
Model	Overall Dimension				Instillation Position		INSTALLATION APERTURE
	W	H	D	H2	W1	H1	
AC70T-T3-030-B	255	410	225	370	180	395	Φ7
AC70T-T3-037-B							
AC70T-T3-045-B							
AC70T-T3-055-B	305	570	260	522	180	550	Φ9
AC70T-T3-075-B	380	620	290	564	240	595	φ11
AC70T-T3-090-B							
AC70T-T3-110							

							
Model	Overall Dimension				Instillation Position		INSTALLATI ON
	W	H	D	H2	W1	H1	
AC70T-T3-132	500	780	340	708	350	755	φ11
AC70T-T3-160	650	1060	400	950	400	1023	φ16
AC70T-T3-185							
AC70T-T3-200							

Standard Connection Diagram

• Standard Connection Diagram



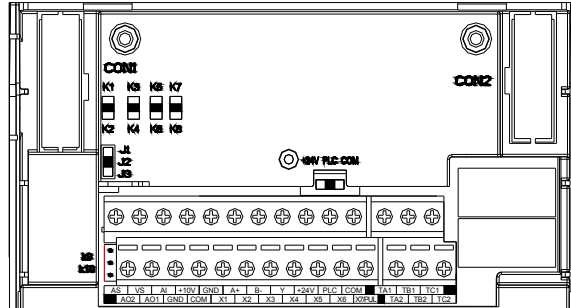
- Note: 1. When installing DC reactor, make sure to dismantle the short connector between terminal P1 and (+) .
2. NPN or PNP transistor signal can be selected as input of multi-function input terminal (X1~X7/PUL) .
Inverter built-in power supply (+24V terminal) or external power supply (PLC terminal) can be chosen as bias voltage. Factory setting '+24V' short connect with 'PLC'.
3. Analog monitor output is the special output for meters such as frequency meter, current meter and voltage meter. It can't be used for control operations such as feedback control.
4. As there are multi pulse styles, please refer to the line connect mode description details.

• Auxiliary Terminal Output Capacity

Terminal	Function Definition	Max Output
+10V	10V auxiliary power supply output, constitutes loop	50mA

A0	Analog monitor output, constitutes loop with GND.	Max output 2mA as frequency, voltage
+24V	24V auxiliary power supply output, constitutes loop	100mA
Y	Collector open circuit output; can set the action-object by program.	DC24V/50mA
TA/TB/TC	Passive connector output; can set the action-object by program.	3A/240VAC

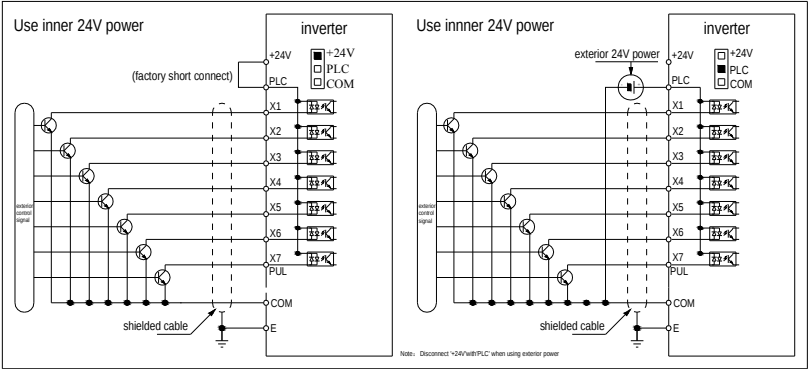
• Connection Function Specification of Switch Terminals



Switch Terminal	Selecting Position	Function Specification
S1	K1	AO1:0~20mA or 4~20mA current output
	K2	AO1:0~10V voltage output
S2	K3	AI:0~20mA or 4~20mA input current
	K4	AI: 0~10V input voltage
S3	K5	AO2: 0.0~100kHz (J1 on), open collector circuit output
	K6	AO2:0.0~100kHz (J1 on), active source output
S4	K7	RS485: connect with 120Ω terminal resistor
	K8	RS485:connect without 120Ω terminal resistor
S5	J1	AO2:0.0~100kHz frequency output(PWM eddy current pulse wave output)
	J2	AO2:0~20mA or 4~20mA current output
	J3	0~10V voltage output
S6	+24V	Short +24V terminal and PLC terminal
	PLC	PLC terminal receiving external power input
	COM	Short PLC terminal and COM terminal
S7	K9	Disconnect GND terminal and PE discharge loop
	K10	Connect GND terminal and PE discharge loop

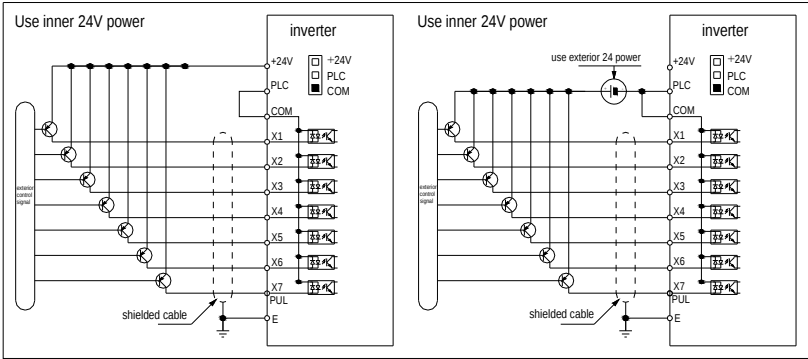
Multi-functional Contact Input Connection

- NPN transistor connection mode



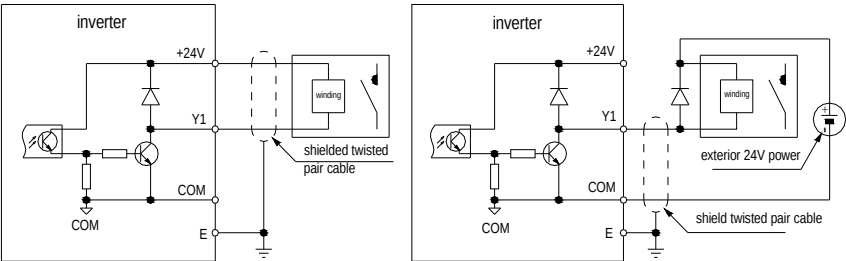
NPN Transistor Digital Input Signal Connection Mode

- PNP transistor connection mode

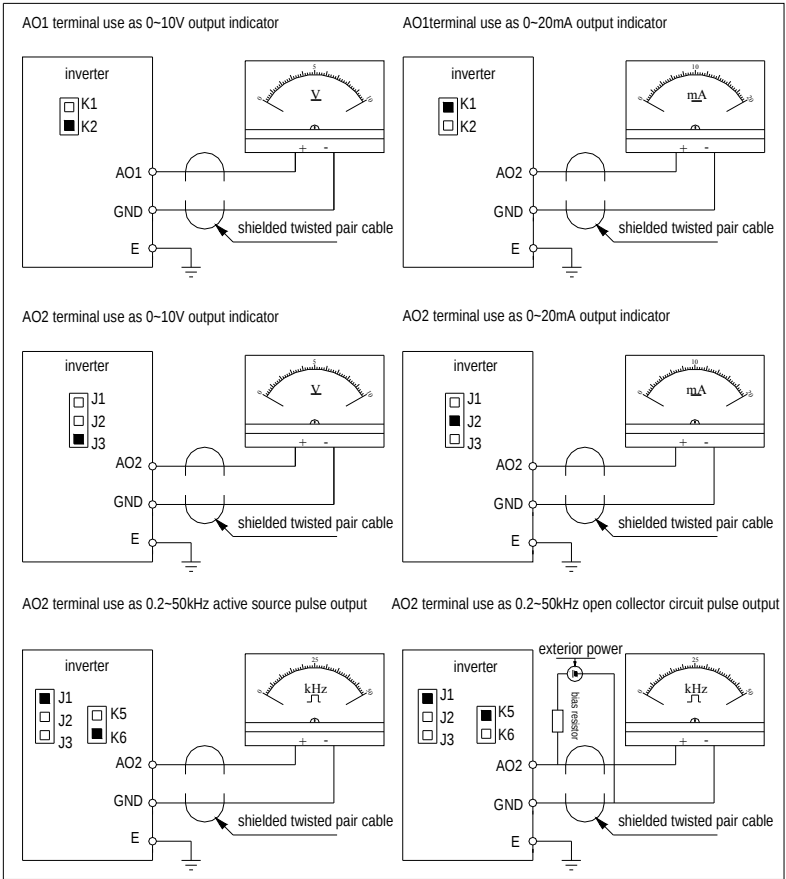


PNP Transistor Digital Input Signal Connection Mode

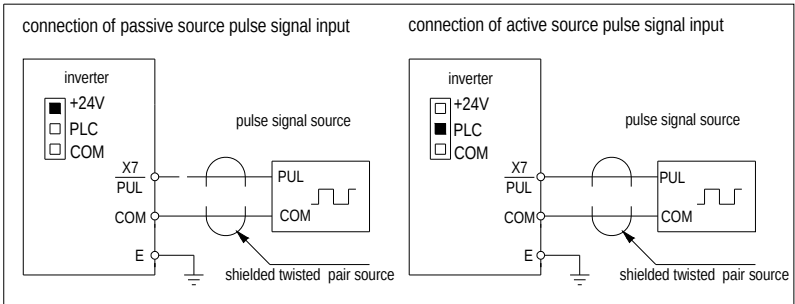
Digital output signal connection



Analog Output Signal Connection



Connection of Pulse Input Signal



Chapter 3 Keyboard layout and functions specification

• Keyboard appearance



• Key function

Key	Name	Function
	Menu key	Enter menu while standby or running. Press this key to return while modify parameter. While standby or running, press for 1 sec to enter condition monitoring interface.
	Confirm/modify key	Press to modify parameter while in menu interface. Press again to confirm after modifying. While standby or running, press to change LED monitoring items at stop.
	Up/down key	Select parameter group in menu interface. Modify parameter in modify state. Modify given frequency, PID given while at standby or monitoring state (While given frequency, PID are set by keyboard and [F4.09] needs to be set).
	Shift key	Select digit of function No. modified by up/down key; Select parameter digits modified by up/down key.
	Forward run key	While run/stop is controlled by keyboard, press this key, inverter forward runs, and the indicator is always on. While reverse, the indicator sparks.
	Jog/reverse key	This key can be defined by [F4.07]. Press it, machine reverses and indicator is off if it is defined as REVERSE. Machine will jog and indicator is on if it is defined as JOG.
	Stop/reset key	Machine stops if press it while run/stop is controlled by keyboard. Its efficiency range is defined by [F4.08]. Inverter resets if press it in fault state (no reset if fault is not solved).

	Keyboard potentiometer	Can be used as input channel for given frequency, upper frequency limit, given torque, given PID or PID feedback setting.
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• **Indicator light meanings**

Name	State	Meaning
Unit indicator light	Hz	Frequency unit
	A	Current unit
	V	Voltage unit
	S	Time unit
	RPM	Motor speed unit
	%	Percent unit
State indicator light	FWD	Forward running
	FWD	Reverse running
	FWD	Stop
Function indicator light	REV/JOG	Jog.
	REV/JOG	Reverse.

Chapter 4 Function Parameter Table

This chapter just provides function parameter table. Specifications refer to AC200 technical manual or inquiry the company.

“●” : Parameter can be changed in the running state.

“○” : Parameter can't be changed in the running state.

“×” : Parameter can be read only.

“—” : Factory setting parameter, only factory can set.

“※” : Parameter is related to the model.

Special parameters group

4.1 Lifting special parameter group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FF.00	Application type selection	0: General 1: hoisting mechanism (closed loop) 2: Translation mechanism 3: Rotating mechanism 4: Construction lift 5: Lifting mechanism (open loop)	5	○	0xF00
FF.01	Brake mode selection	LED '0' digit: brake release 0: frequency opens 1: frequency and current associated with opening LED '00' digit: starting direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '000' digit: stop direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '0000' digit: brake control frequency jump 0: invalid 1: valid	1001	○	0xF01

FF.02	Run command control	LED '0' digit: reverse control during operation 0: not allowed to run 1: Allow reverse operation LED '00' digit: zero-crossing frequency jump function 0: Invalid 1: Valid LED '000' digit: Reserved	0010	○	0xF02
FF.03	Restart waiting delay during braking	0.00-10.00s	0.30s	○	0xF03
FF.04	Brake release current coefficient	10.0-100.0%	30.0%	○	0xF04
FF.05	Zero crossing frequency	0.00-10.00Hz	1.00Hz	○	0xF05
FF.06	Up release frequency	0.00-10.00Hz	2.00Hz	○	0xF06
FF.07	Up brake frequency	0.00-10.00Hz	2.00Hz	○	0xF07
FF.08	Down release frequency	0.00-10.00Hz	2.00Hz	○	0xF08
FF.09	Down brake frequency	0.00-10.00Hz	2.00Hz	○	0xF09
FF.10	Delay before the lift	0.00-10.00s	0.20s	○	0xF0A
FF.11	Delay after the lift	0.00-10.00s	0.10s	○	0xF0B
FF.12	Delay before the upward brake	0.00-10.00s	0.00s	○	0xF0C
FF.13	Delay after the up brake	0.00-10.00s	0.50s	○	0xF0D
FF.14	Down delay before the release	0.00-10.00s	0.30s	○	0xF0E
FF.15	Delay after down release	0.00-10.00s	0.10s	○	0xF0F
FF.16	Delay before the brake	0.00-10.00s	0.00s	○	0xF10
FF.17	Delay after down brake	0.00-10.00s	0.30s	○	0xF1A
FF.18 -FF.24	Reserved				
FF.25	Current judgment enable during operation	0~1	1	○	0xF19
FF.26	In-service current detection	0%~50%	5%	○	0xF1A

FF.27	Running current detection time	0.000~1.000s	0.400s	○	0xF1B
FF.28	Light load upscaling function selection	0: Invalid 1: Judging by current 2: Judging by weight	0	○	0xF1C
FF.29	Load measurement time	0.000~5.000s	1.000s	○	0xF1D
FF.30	Upward upswing judgment threshold	0.0~80.0%	50.0%	○	0xF1E
FF.31	Up frequency up frequency limit	0.00~Max frequency	65.00Hz	●	0xF1F
FF.32	Downward upselling threshold	0.0~80.0%	50.0%	○	0xF20
FF.33	Downward frequency up frequency	0.00~Max frequency	65.00Hz	●	0xF21
FF.34-FF.35		Reserved			
FF.36	Rotary flexible control option	LED '0' digit: rotary flexible control 0: off 1: open LED '00' digit: flexible control acceleration and deceleration time 0: off 1: open LED '000' digit: Reserved	0000	●	0xF24
FF.37	Flexible control starting deviation frequency	0.00~20.00Hz	2.50Hz	●	0xF25
FF.38	Flexible control direction changes deviation frequency	0.00~20.00Hz	2.50Hz	●	0xF26
FF.39	Flexible control acceleration time 1	0.00~650.00s	20.00s	●	0xF27
FF.40	Flexible control deceleration time 2	0.00~650.00s	20.00s	●	0xF28
FF.41	Acceleration/deceleration time 1 switches to the frequency of acceleration/deceleration time 2	0.00~Max frequency	0.00Hz	●	0xF29
FF.42	Acceleration/deceleration time 2 switches to the frequency of acceleration/deceleration time 3	0.00~Max frequency	0.00Hz	●	0xF2A

FF.43	Acceleration/deceleration time 3 switches to Acceleration/deceleration time 4 frequency	0.00~Max frequency	0.00Hz	●	0xF2B
FF.44	Reserved				0xF2C
FF.45	Eddy current frequency 1	0.00~Max frequency	20.00Hz	●	0xF2D
FF.46	Eddy current frequency 2	0.00~Max frequency	40.00Hz	●	0xF2E
FF.47	Eddy current frequency 3	0.00~Max frequency	40.00Hz	●	0xF2F
FF.48	Zero speed duty cycle	0.00~100.0%	80.00%	●	0xF30
FF.49	Eddy current frequency 1 corresponds to duty cycle	0.00~100.0%	40.00%	●	0xF31
FF.50	Maximum duty cycle	0.00~100.0%	80.00%	●	0xF32
FF.51	Stop vortex maintenance time	0.0~3000.0S	60.00s	○	0xF33
FF.52	Eddy current output carrier	0.20-4.00kHz	2.00kHz	○	0xF34
FF.53	Duty cycle polarity selection	0: Invalid 1: Valid	1	○	0xF35
FF.54	Shutdown duty cycle change rate	0.0%/100ms	1.0ms	●	0xF36
FF.55	Brake failure detection	0: Invalid 1: Valid	0	○	0xF37
FF.56	Brake failure detection times	0~10	3	○	0xF38
FF.57	Brake failure detection torque	0.0~150.0%	100.0%	○	0xF39
FF.58	Brake failure detection frequency threshold	0.00~5.00Hz	1.00Hz	○	0xF3A
FF.59	Brake failure detection frequency threshold filtering	0.0~2.000s	0.200s	○	0xF3B
FF.60	Anti-flow hook function selection	0: Invalid 1: Valid	0	○	0xF3C

FF.61	Anti-flow hook start threshold	0.00~5.00Hz	1.00Hz	○	0xF3D
FF.62	Anti-flow hook maintenance time	0.0~3000.0s	60.0s	○	0xF3E
FF.63	Anti-flow hook start threshold filtering	0.0~2.000s	0.100s	○	0xF3F
FF.65 -FF.69	Reserved				
FF.70	Rotary brake mode selection	0: electric brake: 1: power off brake	0	●	0xF46
FF.72	Encode cable missing detection	LED '0' digit: A/B phase 0: off 1: on LED '00' digit: Z phase 0: off 1: on	0001		

4.2 Basic parameters group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F0.00	Motor control mode	Asynchronous motor control mode: 0: V/F control 3: High-performance VC without PG 4: High-performance VC with PG	0	○	0x000
F0.01	Reserved				0x001
F0.02	Run command channel	0: Keyboard control 1: Terminal control 2: RS485 communication control 3: Optional card	0	●	0x002
F0.03	Frequency given source channel A	0: Keyboard number given 1: Keyboard potentiometer given 2: VS voltage analog given 3: AI analog given	0	●	0x003
F0.04	Frequency given source channel B	4: AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given	1	●	0x004
F0.05	Frequency channel B reference source	0: Max. output frequency as reference source	0	●	0x005

F0.06	Frequency given source selection	0: Channel A 1: Channel B 2: Channel A+Channel B 3: Channel A-Channel B 4: Max. value of Channel A and Channel B 5: Min. value of Channel A and Channel B	0	●	0x006
F0.07	Running command binding	LED"0"digit: keyboard command instruction binding LED"00"digit: terminal command instruction binding LED"000"digit: communication command instruction binding LED"0000"digit: optional card command instruction binding 0 : no binding 1 : keyboard number given frequency 2 : Keyboard potentiometer given 3 : VS voltage analog given 4 : AI current/voltage analog given 5 : AS current analog given 6 : Terminal pulse PUL given 7 : RS485 communication given 8 : Terminal UP/DW control 9 : PID control given A: Program control (PLC) given B: Optional card C: Multi-speed given	0000	●	0x007
F0.08	Keyboard number setting frequency	0~upper limit	50.00Hz	●	0x008
F0.09	Max frequency output	upper limit~600.00Hz	50.00Hz	○	0x009
F0.10	Upper limit frequency source selection	0: Upper limit frequency digital given 1: Keyboard potentiometer given 2: Terminal VS analog given 3:Terminal AI analog given 4: Terminal AS analog given 5: Terminal pulse PUL given 6: RS485 communication given	0	●	0x00A
F0.11	Upper frequency limit digital setting	Lower limit frequency~max frequency	50.00Hz	●	0x00B
F0.12	Lower limit frequency	0.00~upper limit frequency	0.00Hz	●	0x00C

F0.13	Lower limit frequency running mode	0: Stop output, enter into pause running state 1: Run at lower limit frequency	1	○	0x00D
F0.14	ACC time 1	0.01-650.00s	3.0	※	0x00E
F0.15	DEC time 1	0.01-650.00s	3.0	※	0x00F
F0.16	Rotary direction selection	LED“0”digit: running direction takes the opposite 0: Direction unchanged 1: Direction takes the opposite LED“00”digit: running direction prohibited 0: Forward and reverse commands are allowed 1: Only FWD command allowed 2: Only REV command allowed LED“000”digit: frequency control direction selection 0: Invalid 1: Valid LED“0000”digit: reserved	0000	○	0x010
F0.17~F0.18		Reserved			
F0.19	Parameter initialization	0: No action 1: Restore factory default (not restoring motor parameters) 2: Restore factory default (restoring motor parameters) 3: Clear malfunction records	0	●	0x013

4.3 Run Control Parameters

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F1.00	Start-up mode running	0: Start by start-up frequency 1: Braking first then start by start-up frequency 2: Speed tracking, judge direction then start	0	○	0x100
F1.01	Start pre-excitation time	0.00~60.00s	0.00s	○	0x101
F1.02	Start-up frequency	0.00~60.00Hz	0.50Hz	○	0x102
F1.03	Start-up frequency holding time	0.0~50.0s	0.0s	○	0x103
F1.04	Braking current before start	0.0~150.0%	60.0%	○	0x104
F1.05	Braking time before start	0.0~60.0s	0.0s	○	0x105
F1.06	Speed tracking speed	0.00~60.00s	0.50s	○	0x106

F1.07	Speed tracking stop delay	0.00~60.00s	1.00s	○	0x107
F1.08~F1.09		Reserved			0x108
F1.10	Stop mode	0: DEC stop 1: Free stop	0	●	0x10A
F1.11	DC braking initial frequency when stop	0.00~50.00Hz	1.00Hz	○	0x10B
F1.12	DC braking current when stop	0.0~150.0%	60.0%		0x10C
F1.13	Reserved				0x10D
F1.14	DC braking holding time when stop	0.0~60.0s	0.0s	○	0x10E
F1.15	Detection frequency when stop	0.00~50.00Hz	0.50Hz	●	0x10F
F1.16	ACC/DEC selection	LED “0” digit: time base selection 0: max frequency 1: fixed frequency 50Hz 2: set frequency LED “00” digit: S ACC/DEC selection 0: Beeline ACC/DEC 1: S Curve ACC/DEC LED “000/0000” digit: reserved LED “0000” digit: reserved	0010	○	0x110
F1.17	ACC start S curve time	0.00~10.00	0.10s	○	0x111
F1.18	ACC finish S curve time	0.00~10.00	0.10s	○	0x112
F1.19	DEC start S curve time	0.00~10.00	0.10s	○	0x113
F1.20	DEC finish S curve time	0.00~10.00	0.10s	○	0x114
F1.21	ACC time 2	0.01~650.00s	10.00s	●	0x115
F1.22	DEC time 2	0.01~650.00s	10.00s	●	0x116
F1.23	ACC time 3	0.01~650.00s	10.00s	●	0x117
F1.24	DEC time 3	0.01~650.00s	10.00s	●	0x118
F1.25	ACC time 4	0.01~650.00s	10.00s	●	0x119
F1.26	DEC time 4	0.01~650.00s	10.00s	●	0x11A
F1.27	Emergency stop DEC	0.01~650.00s	1.00s	●	0x11B
F1.28	FWD&REV dead time	0.0~120.0s	0.0s	○	0x11C
F1.29	Zero speed torque frequency threshold	0.00~10.00Hz	0.50Hz	●	0x11D
F1.30	Zero speed torque holding coefficient	0.0~150.0%	60.0%	●	0x11E
F1.31	Zero speed torque holding time	0.0~6000.0s If set 6000.0s, always hold	0	●	0x11F

F1.32-F1.34		Reserved			0x120
F1.35	Power off restart action selection	0: Invalid 1: Valid	0	○	0x123
F1.36	Power off restart waiting time	0.00~60.00s	0.50s	○	0x124
F1.37	Reserved				0x125
F1.38	JOG running frequency	0.00-Max frequency	5.00Hz	●	0x126
F1.39	JOG ACC time	0.01~650.00s	10.00s	●	0x127
F1.40	JOG DEC time	0.01~650.00s	10.00s	●	0x128
F1.41	Jump frequency 1	0.00-Max frequency	0.00Hz	●	0x129
F1.42	Jump frequency range 1	0.00-Max frequency	0.00Hz	●	0x12A
F1.43	Jump frequency 2	0.00-Max frequency	0.00Hz	●	0x12B
F1.44	Jump frequency range 2	0.00-Max frequency	0.00Hz	●	0x12C

4.4 Digital Terminal Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F2.00	Multifunction input terminal 1(X1)	Refer to 4.2 Function Selection Table	1	○	0x200
F2.01	Multifunction input terminal 2(X2)		2	○	0x201
F2.02	Multifunction input terminal 3(X3)		4	○	0x202
F2.03	Multifunction input terminal 4(X4)		5	○	0x203
F2.04	Multifunction input terminal 5(X5)		6	○	0x204
F2.05	Multifunction input terminal 6(X6)		8	○	0x205
F2.06	Multifunction input terminal 7(X7/PUL)		0	○	0x206
F2.07	Reserved		0	○	0x207
F2.08	X1-X4 terminal trait selection	0: On valid 1: Off valid LED "0" digit: X1 terminal LED "00" digit: X2 terminal LED "000" digit: X3 terminal LED "0000" digit: X4terminal	0000	●	0x208
F2.09	X5-X7 terminal trait selection	0: On valid 1: Off valid LED "0" digit: X5 terminal LED "00" digit: X6 terminal LED "000" digit: X7 terminal LED "0000" digit::reserved	0000	●	0x209
F2.10	X1 valid detection delay	0.000-6.000S	0.010	●	0x20A

F2.11	X1 invalid detection delay	0.000-6.000S	0.010	●	0x20B
F2.12	X2 valid detection delay	0.000-6.000S	0.010	●	0x20C
F2.13	X2 invalid detection	0.000-6.000S	0.010	●	0x20D
F2.14	X3 valid detection delay	0.000-6.000S	0.010	●	0x20E
F2.15	X3 invalid detection	0.000-6.000S	0.010	●	0x20F
F2.16	X4 valid detection delay	0.000-6.000S	0.010	●	0x210
F2.17	X4 invalid detection	0.000-6.000S	0.010	●	0x211
F2.18	X5 valid detection delay	0.000-6.000S	0.010	●	0x212
F2.19	X5 invalid detection	0.000-6.000S	0.010	●	0x213
F2.20	X6 valid detection delay	0.000-6.000S	0.010	●	0x214
F2.21	X6 invalid detection	0.000-6.000S	0.010	●	0x215
F2.22	X7 valid detection delay	0.000-6.000S	0.010	●	0x216
F2.23	X7 invalid detection	0.000-6.000S	0.010	●	0x217
F2.24-F2.25		Reserved			0x218
F2.26	Terminal control running mode	0: 2-line 1 1: 2-line 2 2: 3-line 1 3: 3-line 2	0	○	0x21A
F2.27	Terminal operation protection	0: OFF 1:ON LED "0" digit: Terminal operate protection when abnormal exit LED "00" digit: Jog terminal operate protection when abnormal exit LED "000" digit: Operate protection when command channel switched to terminal LED "0000" digit: reserved	0111	○	0x21B
F2.28	Counter input source	0: Normal X terminal 1: High speed input terminal PUL 2: PG card counting value	0	●	0x21C
F2.29	Counter input frequency division	0-6000	0	●	0x21D
F2.30	PUL input min frequency	0.00-50.00kHz	0.00kHz	●	0x21E
F2.31	PUL min frequency corresponding setting	0.00-100.00%	0.00%	●	0x21F
F2.32	PUL input max	0.00-50.00kHz	50.00kHz	●	0x220
F2.33	PUL max frequency corresponding setting	0.00-100.00%	100.00%	●	0x221
F2.34	PUL filter time	0.000s-9.000s	0.100s	●	0x222
F2.35	PUL cut-off frequency	0.000-1.000kHz	0.010kHz	●	0x223

F2.36	UP/DW terminal control mode	0: Off electricity storage 1: Off electricity not storage 2: Valid in running, clear zero at stop	0	○	0x224
F2.37	ACC/DEC speed of UP/DW terminal controlling frequency	0.01-50.00Hz/s	0.50Hz/s	●	0x225
F2.38	Reserved				0x226
F2.39	Timer time unit	0: Second 1: Minute 2: Hour	0	●	0x227
F2.40	Timer setting value	0-65000	0	●	0x228
F2.41	Counter max value	0-65000	1000	●	0x229
F2.42	Counter setting value	0-65000	500	●	0x22A
F2.43	Reserved				0x22B
F2.44	Output terminal polarity selection	0: Positive 1: Negative LED "0" digit: Terminal Y LED "00" digit: Relay output terminal 1 LED "000" digit: Relay output terminal 2	0000	●	0x22C
F2.45	Output terminal 1	Refer to 4.2 Function selection table	1	●	0x22D
F2.46	Relay output 1		32	●	0x22E
F2.47	Relay output 2		32	●	0x22F
F2.48	Y1 output delay time	0.000-6.000s	0.010s	●	0x230
F2.49	Relay 1 output delay	0.000-6.000s	0.010s	●	0x231
F2.50	Relay 2 output delay	0.000-6.000s	0.010s	●	0x232
F2.51	Output frequency level 1 (FDT1)	0.00-Max frequency	2.00Hz	●	0x233
F2.52	FDT1 lag	0.00-Max frequency	1.00Hz	●	0x234
F2.53	Output frequency level 2 (FDT2)	0.00-Max frequency	2.00Hz	●	0x235
F2.54	FDT2 lag	0.00-Max frequency	1.00Hz	●	0x236
F2.55	Given frequency arriving checkout range	0.00-50.00Hz	2.00Hz	●	0x237
F2.56	Y1 output invalid delay time	0.000-6.000s	0.010s	●	0x238
F2.57	Relay 1 output invalid delay time	0.000-6.000s	0.010s	●	0x239
F2.58	Relay 2 output invalid delay time	0.000-6.000s	0.010s	●	0x23A

4.5 Analog Terminal Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
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F3.00	VS Lower limit	0.00-10.00V	0.00V	●	0x300
F3.01	VS Lower limit corresponding setting	-100.00-100.00%	0.00%	●	0x301
F3.02	VS upper limit	0.00-10.00V	10.00V	●	0x302
F3.03	VS upper limit corresponding setting	-100.00-100.00%	100.00%	●	0x303
F3.04	VS filter time	0.00-6.00s	0.010s	●	0x304
F3.05	VS zero point loop voltage	0.00-10.00V	0.00V	●	0x305
F3.06	AI(VS) lower limit	0.00-10.00V	0.00V	●	0x306
F3.07	AI (VS)lower limit corresponding setting	0.00-100.00%	0.00%	●	0x307
F3.08	AI used as VS upper	0.00-10.00V	10.00V	●	0x308
F3.09	AI (VS)upper limit corresponding setting	0.00-100.00%	100.00%	●	0x309
F3.10	AI filter time	0.00-6.00s	0.010s	●	0x30A
F3.11	AS lower limit	0.00-20.00mA	4.00mA	●	0x30B
F3.12	AS lower limit corresponding setting	0.00-100.00%	0.00%	●	0x30C
F3.13	AS upper limit	0.00-20.00mA	20.00mA	●	0x30D
F3.14	AS upper limit corresponding setting	0.00-100.00%	100.00%	●	0x30E
F3.15	AS filter time	0.000-6.000s	0.010s	●	0x30F
F3.16	AI used as AS lower limit	0.00-20.00mA	4.00mA	●	0x310
F3.17	AI (AS) lower limit corresponding setting	0.00-100.00%	0.00%	●	0x311
F3.18	AI used as AS lower limit	0.00-20.00mA	20.00mA	●	0x312
F3.19	AI (AS) upper limit corresponding setting	0.00-100.00%	100.00%	●	0x313
F3.20	Vs terminal function selection (used as X)	See X terminal function	0	○	0x314
F3.21	VS high level setting	0.00-100.00%	70.00%	●	0x315
F3.22	VS low level setting	0.00-100.00%	30.00%	●	0x316
F3.23	AI terminal function selection (used as X)	See X terminal function	0	○	0x317
F3.24	AI high level setting	0.00~100.00%	70.00%	●	0x318
F3.25	AI low level setting	0.00~100.00%	30.00%	●	0x319
F3.26	AS terminal function selection (as X)	See X terminal function	0	○	0x31A
F3.27	AS high level setting	0.00~100.00%	70.00%	●	0x31B
F3.28	AS low level setting	0.00~100.00%	30.00%	●	0x31C

F3.29	Valid state setting when analog used as terminal	0: low level 1: high level LED 0 digit: VS LED 00 digit: AI LED 000 digit: AS LED 0000 digit: reserved	0000	●	0x31D
F3.30	Analog input curve selection	LED "0" digit: VS 0: Beeline (default) 1: curve 1 2: curve 2 LED "00" digit: AI (Select voltage or current input by wire jumper) LED "000" digit: AS LED "0000" digit: reserved	0000	●	0x31E
F3.31	Reserved				0x31F
F3.32	Curve 1 lower limit	0.00~10.00V	0.00V	●	0x320
F3.33	Curve 1 lower limit corresponding setting	0.00~100.00%	0.0%	●	0x321
F3.34	Curve 1 inflection point 1 input voltage	0.00~10.00V	3.00V	●	0x322
F3.35	Curve 1 inflection point1 corresponding setting	0.00~100.00%	30.00%	●	0x323
F3.36	Curve 1 inflection point 2 input voltage	0.00~10.00V	6.00V	●	0x324
F3.37	Curve 1 inflection point2 corresponding setting	0.00~100.00%	60.00%	●	0x325
F3.38	Curve 1 upper limit	0.00~10.00V	10.0V	●	0x326
F3.39	Curve 1 upper limit corresponding setting	0.00~100.00%	100.00%	●	0x327
F3.40	Curve 2 lower limit	0.00~10.00V	0.00V	●	0x328
F3.41	Curve 2 lower limit corresponding setting	0.00~100.00%	0.00%	●	0x329
F3.42	Curve 2 inflection point 1 input voltage	0.00~10.00V	3.00V	●	0x32A
F3.43	Curve 2 inflection point1 corresponding setting	0.00~100.00%	30.00%	●	0x32B
F3.44	Curve 2 inflection point 2 input voltage	0.00~10.00V	6.00V	●	0x32C
F3.45	Curve 2 inflection point2 corresponding setting	0.00~100.00%	60.00%	●	0x32D
F3.46	Curve 2 upper limit	0.00~10.00V	10.00V	●	0x32E
F3.47	Curve 2 upper limit corresponding setting	0.00~100.00%	100.00%	●	0x32F
F3.48-F3.52		Reserved			0x330

F3.53	A0 output signal selection	LED “0” digit: AO1 0: 0~10V 1: 4.00~20.00mA 2: 0.00~20.00mA LED “00” digit: AO2 0: 0~10V 1: 4.00~20.00mA 2: 0.00~20.00mA 3: FM frequency pulse output 4: Frequency output	0040	●	0x335
F3.54	A01 output selection	0: Given frequency 1: Output frequency 2: Output current 3: Input voltage 4: Output voltage 5: Machine speed 6: Given torque 7: Output torque 8: PID given value 9: PID feedback value	0	●	0x336
F3.55	A02 output selection	10: Output power 11: Bus voltage 12: VS input value 13: AI input value 14: AS input value 15: PUL input value 16: Module temperature 1 17: Module temperature 2 18: RS485 given	1	●	0x337
F3.56	A01 output gain	25.0~200.0%	100.0%	●	0x338
F3.57	A01 output signal bias	-10.0~10.0%	0.0%	●	0x339
F3.58	A01 output filter	0.000~6.000s	0.010s	●	0x33A
F3.59	A02 output gain	25.0~200.0%	100.0%	●	0x33B
F3.60	A02 analog output signal bias	-10.0%~10.0%	0.0%	●	0x33C
F3.61	A02 output filter	0.000~6.000s	0.010s	●	0x33D
F3.62	A02FM frequency output lower limit	0.00~100.00kHz	0.20kHz	●	0x33E
F3.63	A02FM frequency output upper limit	0.00~100.00kHz	50.00kHz	●	0x33F
F3.64-F3.79		Reserved			

4.6 System Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F4.00	Parameter and key lock selections	0: Not locked 1: Function parameter locked 2: Function parameter and key locked (except for RUN/STOP/JOG) 3: All function parameter and key locked	0	●	0x400
F4.01	User password	0~9999	0	●	0x401
F4.02-F4.03		Reserved			0x402
F4.04	LCD keyboard language selection	0: Chinese 1: English	0	●	0x404
F4.05	Parameter copy	0: No function 1: Send inverter parameters to keyboard and save 2: Send keyboard parameters to inverter Remaining value: no operation	0	○	0x405
F4.06	Keyboard special function selection	LED 0 digit: DIE monitor on 0: Off 1: On LED 00 digit: no keyboard potentiometer lock sampling value 0: Off 1: On LED 000 digit: reserved LED 0000 digit: reserved	0000	○	0x406
F4.07	REV/JOG selection	0: REV 1: JOG	0	○	0x407
F4.08	STOP key setting	0: Non-keyboard control mode is invalid 1: Non-keyboard control mode stop according to stop mode 2: Non-keyboard control mode stop according to free mode	1	○	0x408
F4.09	UP/DOWN key selection	LED "0" digit: keyboard UN/DOWN key modify selection 0: Invalid 1: Modify frequency setting by keyboard numbers F0.08	0011	○	0x409

		2: Modify PID give setting by key board numbers Fb.01 LED "00" digit: power down save 0: No save frequency after power down 1: Save frequency after power down LED "000" digit: action limit 0: Adjusting in operation & stop 1: Adjusting only in operation, stop for holding 2: Adjusting in operation, stop for clearing LED "0000" digit: reserved			
F4.10	Keyboard potentiometer lower limit	0.00~5.00V	0.50V	●	0x40A
F4.11	Keyboard potentiometer lower limit corresponding setting	0.00~100.00%	0.00	●	0x40B
F4.12	Keyboard potentiometer upper limit	0.00~5.00V	4.50V	●	0x40C
F4.13	Keyboard potentiometer upper limit corresponding setting	0.00~100.00%	100.00	●	0x40D
F4.14	The display content of the first line in running state	LED "0" and "00" digit: display the first group 00~63 LED "000" and "0000" digit: display the second group 00~63	1101	●	0x40E
F4.15	The display content of the first line in running	Same as above	0402	●	0x40F
F4.16	The display content of the first line in stop state	Same as above	1100	●	0x410
F4.17	The display content of the first line in stop state	Same as above	0402	●	0x411
F4.18	The display content of the second line in running state	Same as above	0402	●	0x412
F4.19	The display content of the second line in running state	Same as above	1210	●	0x413
F4.20	The display content of the second line in stop	Same as above	0402	●	0x414
F4.21	The display content of the second line in stop	Same as above	1210	●	0x415

F4.22	Keyboard display item setting	LED “0” digit: output frequency selection 0: Aim frequency 1: Running frequency LED “00” digit: reserved LED “000” digit: power display dimension 0: percentage (%)	0000	●	0x416
F4.23	Reserved (debug monitor selection)	LED “0” digit: C-00~C-39 0: Normal 1: Debug LED “00” digit: C-40~69 0: No display 1: Normal LED “000” digit: reserved LED “0000” digit: reserved	0000	●	0x417
F4.24	Rotate speed display coefficient	0.0~500.0%	100.0%	●	0x418
F4.25	Power display coefficient	0.0~500.0%	100.0%	●	0x419
F4.26	Alarm selection 1	LED “0” digit: E.EEP fault (EEPROM storage fault) 0: Alarm and free stop 1: Alarm and continue operation LED “00” digit: reserved LED “000” digit: reserved LED “0000” digit: reserved	0000	●	0x41A
F4.27	Reserved				0x41B
F4.28	Fan control	0: After power on the fan runs	1	●	0x41C
F4.29	Dynamic braking	0: Off 1: On	0	●	0x41D
F4.30	Dynamic braking	115.0%~140.0%	125.0%	●	0x41E
F4.31	Dynamic braking	0.0~100.0%	10.0%	●	0x41F
F4.32	PWM carrier frequency	0.7~16.0kHz	Model set	※	0x420
F4.33	PWM control mode	LED “0” digit: carrier associated with temperature 0: Temperature independent 1: Temperature dependent LED “00” digit: carrier associated with output frequency 0: Independent 1: Dependent LED “000” digit: random PWM valid 0: Prohibited 1: Valid LED “0000” digit: PWM	1111	●	0x421

		modulation mode 0: Only use three-phase modulation 1: Two-phase and three-phase modulation automatically switched			
F4.34-F4.37		Reserved			0x422

4.7 Motor Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F5.00	Motor mode	0: Asynchronous motors (AM) 1: Permanent magnet synchronous motors (PM)	0	×	0x500
F5.01	Number of motor poles	2~98	4	○	0x501
F5.02	Motor rated power	0.1~1000.0kW	Model set	※	0x502
F5.03	Motor rated frequency	0.01~max frequency	Model set	※	0x503
F5.04	Motor rated speed	1~6500rpm	Model set	※	0x504
F5.05	Motor rated voltage	1~1500V	Model set	※	0x505
F5.06	Motor rated current	0.1~3000.0A	Model set	※	0x506
F5.07	Asynchronous motor no-load current	0.1~3000.0A	Model set	※	0x507
F5.08	Asynchronous motor stator resistance	0.01~50.00%	Model set	※	0x508
F5.09	Asynchronous motor rotor resistance	0.01~50.00%	Model set	※	0x509
F5.10	Asynchronous motor stator leakage inductance	0.01~50.00%	Model set	※	0x50A
F5.11	Asynchronous motor stator inductance	0.1~2000.0%	Model set	※	0x50B
F5.12	synchronous motor stator resistance	0.01~50.00%	Model set	※	0x50C
F5.13	Synchronous machine d axis inductance	0.01~200.00%	Model set	※	0x50D
F5.14	Synchronous machine q axis inductance	0.01~200.00%	Model set	※	0x50E
F5.15	Synchronous machine back EMF	1~1500V	Model set	※	0x50F
F5.16	Synchronous machine encoder installation angle	0.0°~360.0°	Model set	※	0x510
F5.17-F5.19		Reserved			0x511
F5.20	Motor parameters self-adjustment	0: No operation 1: Rotary type self-study	0	○	0x514

	selections	2: Static type self-study 3: Fast static self-learning			
F5.21	Synchronous machine poles searching function	LED “0” digit: closed-loop vector 0: OFF 1: ON 2: On, only operate firstly when electrify LED “00” digit: open-loop vector 0: OFF 1: ON 2: ON, only operate firstly when electrify	0010	○	0x515
F5.22-F5.29		Reserved			0x516
F5.30	Speed feedback or encoder mode	LED “0” digit: encoder mode 0: Common ABZ encoder 1: Rotary encoder LED “00” digit: encoder direction 0: same direction 1: reverse direction LED “000” digit: wire break inspection 0: OFF 1: ON LED “0000” digit: Z pulse correction enabled 0: OFF 1: ON	0000	○	0x51E
F5.31	ABZ encoder lines	0-10000	1024	○	0x51F
F5.32	wire break inspection time	0.100-60.000s	2.000s	●	0x520
F5.33	Rotary encoder poles	2~128	2	○	0x521
F5.34-F5.35		Reserved	1	○	0x522
F5.36	First-order filter of encoder speed inspection	0.0~100.0ms	1.0ms	●	0x524
F5.37-F5.49		Reserved			

4.8 Motor VC Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F6.00	ASR(speed loop) proportional gain 1	0.01~100.00	10.00	●	0x600
F6.01	ASR integral time 1	0.000~6.000s	0.500s	●	0x601
F6.02	ASR filter time1	0.0~100.0ms	0.0ms	●	0x602

F6.03	ASR switch frequency 1	0.00~Max frequency	0.00Hz	●	0x603
F6.04	ASR (speed loop) proportional gain 2	0.01~100.00	10.00	●	0x604
F6.05	ASR (speed loop) integral time 2	0.000~6.000s	0.500s	●	0x605
F6.06	ASR filter time 2	0.0~100.0ms	0.0ms	●	0x606
F6.07	ASR switch frequency 2	0.00~Max frequency	5.00Hz	●	0x607
F6.08	Electric motor torque limit	0.0~250.0%	180.0%	●	0x608
F6.09	Power generation torque limit	0.0~250.0%	180.0%	●	0x609
F6.10	Current loop D-axis proportional gain	0.001~4.000	1.000	●	0x60A
F6.11	Current loop D-axis integral gain	0.001~4.000	1.000	●	0x60B
F6.12	Current loop Q-axis proportional gain	0.001~4.000	1.000	●	0x60C
F6.13	Current loop Q-axis integral gain	0.001~4.000	1.000	●	0x60D
F6.14	Reserved				0x60E
F6.15	Vector control motor slip compensation	0.0~250.0%	100.0%	●	0x60F
F6.16	Vector control generator slip compensation	0.0~250.0%	100.0%	●	0x610
F6.17	Reserved				0x611
F6.18	Position compensation control	0:OFF 1:ON	0	●	0x612
F6.19	compensation gain	0.0~250.0%	10.0%	●	0x613
F6.20	compensation limit	0.0~100.0%	0.1%	●	0x614
F6.21	compensation effective range	0.0~100.0%	10.0%	●	0x615
F6.22	Over excitation braking gain	0.0~500.0%	100.0%	●	0x616
F6.23	Over excitation braking amplitude limit	0.0~250.0%	100.0%	●	0x617
F6.24	Vector control energy saving function	0:OFF 1:ON	0	●	0x618
F6.25	Energy saving control	0.0~80.0%	50.0%	●	0x619
F6.26	Energy saving control low-pass filter	0.000~6.000s	0.010s	●	0x61A
F6.27	Motor constant power area power limit	0.0~250.0%	150.0%	●	0x61B
F6.28	Motor weak magnetic current upper limit	0.0~250.0%	60.0%	●	0x61C
F6.29	Motor weak magnetic	0.0~200.0%	0.0%	●	0x61D

	feed forward gain				
F6.30	Motor weak magnetic	0.0~500.0%	100.0%	●	0x61E
F6.31	Reserved				0x61F
F6.32	MTPA gain	0.0~400.0%	100.0%	●	0x620
F6.33	MTPA filter time	0.0~100.0ms	1.0ms	●	0x621
F6.34	Reserved				0x622
F6.35	Low frequency pull in current	0.0~100.0%	10.0%	●	0x623
F6.36	High frequency pull in current	0.0~100.0%	10.0%	●	0x625
F6.37	Frequency of current pulled in	0.0~100.0%	10.0%	●	0x625
F6.38-F6.69		Reserved			

4.9 Motor V/F Control Parameter

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F8.00	Linear VF curve selection	0: Beeline VF curve 1-9: 1.1-1.9 idempotent VF curve respectively 10: square VF curve 11: self-defined V/F curve	0	○	0x800
F8.01	Self-setting voltage V1	0.0~100.0%	3.0%	○	0x801
F8.02	Self-setting frequency F1	0.00-max frequency	1.00Hz	○	0x802
F8.03	Self-setting voltage V2	0.0~100.0%	28.0%	○	0x803
F8.04	Self-setting frequency F2	0.00-max frequency	10.00Hz	○	0x804
F8.05	Self-setting voltage V3	0.0~100.0%	55.0%	○	0x805
F8.06	Self-setting frequency F3	0.00-max frequency	25.00Hz	○	0x806
F8.07	Self-setting voltage V4	0.0~100.0%	78.0%	○	0x807
F8.08	Self-setting frequency F4	0.00-max frequency	37.50Hz	○	0x808
F8.09	Self-setting voltage V5	0.0~100.0%	100.0%	○	0x809
F8.10	Self-setting frequency F5	0.00-max frequency	50.00Hz	○	0x80A
F8.11	Output voltage	25.0~120.0%	100.0%	○	0x80B
F8.12	Torque boost	0.0~30.0%	0.0%	●	0x80C
F8.13	Torque boost cut-off frequency	0.0~100.0%	100.0%	●	0x80D
F8.14	Slip compensation gain	0.0~200.0%	100.0%	●	0x80E
F8.15	Slip compensation limit	0.0~300.0%	100.0%	●	0x80F
F8.16	Slip compensation filter time	0.000~6.000s	0.200s	●	0x810
F8.17	Surge suppression gain	0.0~900.0%	100.0%	●	0x811
F8.18	Reserved				0x812

F8.19	Auto energy saving control	0: Off 1: On	0	○	0x813
F8.20	Energy saving frequency lower limit	0.0~50.00Hz	15.00Hz	○	0x814
F8.21	Energy saving voltage lower limit	20.0~100.0%	50.0%	○	0x815
F8.22	Energy saving voltage regulation rate	0.000~0.200V/MS	0.010V/MS	●	0x816
F8.23	Energy saving voltage recovery rate	0.000~2.000V/MS	0.200V/MS	●	0x817
F8.24-F8.29		Reserved			0x818
F8.30	Output voltage source of voltage-frequency separation	0: function code F8.31 setting 1: Keyboard potentiometer given 2: Analog VS given 3: Analog AI given 4: Analog AS given 5: Pulse PUL given 6: PID output given 7: RS485 communication given 8: Optional card	0	●	0x81E
F8.31	Output voltage of voltage-frequency separation number setting	0.0~100.0%	0.0%	●	0x81F
F8.32	Output voltage of voltage-frequency separation ACC time	0.0~100.00s	10.00s	●	0x820
F8.33	Output voltage of voltage-frequency separation DEC time	0.0~100.00s	10.00s	●	0x821
F8.34	Voltage-frequency separation stop model	0: Output voltage and frequency ACC/DEC no interaction 1: Output voltage down to 0V, then output frequency start to decrease	0	●	0x822
F8.35-F8.38		Reserved			

4.10 Protection and Malfunction Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FA.00	OC suppression function	0: Suppression valid 1: ACC/DEC valid, constant speed invalid	0	●	0xA00
FA.01	OC suppression point	0.0 ~ 300.0%	160.0%	●	0xA01
FA.02	OC suppression gain	0.0 ~ 500.0%	100.0%	●	0xA02

FA.03	Current hardware protection settings	LED “0” digit: (CBC) 0: Off 1: On LED “00” digit: OC protection interference suppression 0: Off 1: First grade interference suppression 2: Second grade interference suppression LED “000” digit: SC protection First grade interference suppression 0: Off 1: First grade interference suppression 2: Second grade interference suppression LED “0000” digit: Reserved	0001	○	0xA03
FA.04	Reserved				0xA04
FA.05	Bus over voltage hardware protection	0: Off 1: On	1	○	0xA05
FA.06	Bus over voltage suppression function	LED “0” digit: Over voltage suppression control 0: Prohibited 1: Valid in DEC 2: Valid both in ACC/DEC LED “00” digit: Over-excitation control 0: Off 1: On LED “000” digit: Reserved LED “0000” digit: Reserved	0012	○	0xA06
FA.07	Bus over voltage suppression point	110.0 ~ 150.0%	128.0%	※	0xA07
FA.08	Bus over voltage suppression gain	0.0 ~ 500.0%	100.0%	●	0xA08
FA.09	Bus under voltage suppression function	0: Prohibited 1: Valid	0	○	0xA09
FA.10	Bus under voltage suppression point	60.0 ~ 90.0%	80.0%	※	0xA0A
FA.11	Bus under voltage suppression gain	0.0 ~ 500.0%	100.0%	●	0xA0B
FA.12	Bus under voltage protection point	60.0 ~ 90.0%	60.0%	※	0xA0C
FA.13	Reserved				0xA0D

FA.14	Earth short-circuit detection after power on	0: Off 1: On	0	○	0xA0E
FA.15	Loss phase protection	LED “0” digit: Output loss phase protection 0: Off 1: On LED “00” digit: Input loss phase protection 0: Off 1: Open the alarm 2: Open the fault LED “000” digit: Reserved LED “0000” digit: Reserved	0011	○	0xA0F
FA.16	Motor overload protection curve coefficient	0.0~250.0%	100.0%	○	0xA10
FA.17	Load pre alarm detection setting	LED “0” digit: Detection selection (protection 1) 0: Not detected 1: Detected load is too large 2: Detected load is too large only at constant speed 3: Insufficient load detected 4: Insufficient load only at constant speed LED “00” digit: Alarm selection 0: Alarm and continue operation 1: Fault protection and free stop LED “000” digit: Detection selection (protection 2) 0: Not detected 1: Detected load is too large 2: Detected load is too large only at constant speed 3: Insufficient load detected 4: Insufficient load only at constant speed LED “0000” digit: Alarm selection 0: Alarm and continue operation 1: Fault protection and free stop	0000	○	0xA11

FA.18	Load pre alarm detection level 1	0.0~200.0%	130.0%	○	0xA12
FA.19	Load pre alarm detection	0.0~60.0s	5.0s	○	0xA13

	time 1				
FA.20	Load pre alarm detection level 2	0.0~200.0%	30.0%	○	0xA14
FA.21	Load pre alarm detection time 2	0.0~60.0s	5.0s	○	0xA15
FA.22	Reserved				0xA16
FA.23	Protection action when speed slip is too large	LED “0” digit: Detection selection 0: Not detected 1: Detected at constant speed 2: Detecting LED “00” digit: Alarm selection 0: Free stop and report fault 1: Alarm and continue operation LED “000” digit: Reserved LED “0000” digit: Reserved	0000	○	0xA17
FA.24	detection threshold when speed slip is too large	0.0~60.0%	10.0%	○	0xA18
FA.25	detection time when speed slip is too large	0.0~60.0s	2.0s	○	0xA19
FA.26	Stall protection action	LED “0” digit: Detection selection 0: Not detected 1: Detected at constant speed 2: Detecting LED “00” digit: Alarm selection 0: Free stop and report fault 1: Alarm and continue running LED “000” digit: Reserved LED “0000” digit: Reserved	0000	○	0xA1A
FA.27	Stall detection threshold	0.0~150.0%	110.0%	○	0xA1B
FA.28	Stall detection time	0.000~2.000s	0.010s	○	0xA1C
FA.29-FA.36		Reserved			0xA1D
FA.37	Malfunction self-recovery times	0~5	0	○	0xA25
FA.38	Malfunction self-recovery interval	0.1~100.0s	1.0s	○	0xA26
FA.39	Malfunction diagnosis information	See fault code table	—	×	0xA27
FA.40	Malfunction types	See fault code table	—	×	0xA28

FA.41	Malfunction running frequency	0.00~Max frequency	--	×	0xA29
FA.42	Malfunction output voltage	0~1500V	--	×	0xA2A
FA.43	Malfunction output current	0.1~2000.0A	--	×	0xA2B
FA.44	Malfunction bus voltage	0~3000V	--	×	0xA2C
FA.45	Malfunction module temperature	0~100℃	--	×	0xA2D
FA.46	Malfunction machine state	LED “0” digit: Running direction 0: FWD 1: REV LED “00” digit: Running status 0: Stop 1: ACC 2: DEC 3: Constant speed LED “000” digit: Reserved LED “0000” digit: Reserved	--	×	0xA2E
FA.47	Malfunction input terminal status	See input terminal chart	--	×	0xA2F
FA.48	Malfunction output terminal status	See output terminal chart	--	×	0xA30
FA.49	The last malfunction types	Please see malfunction code table	--	×	0xA31
FA.50	The last malfunction running frequency	0.00~Max frequency	--	×	0xA32
FA.51	The last malfunction output voltage	0~1500V	--	×	0xA33
FA.52	The last malfunction output current	0.1~2000.0A	--	×	0xA34
FA.53	The last malfunction bus voltage	0~3000V	--	×	0xA35
FA.54	The last malfunction module temperature	0~100℃	--	×	0xA36

FA.55	The last machine state	LED “0” digit: Running direction 0: FWD 1: REV LED “00” digit: Running status 0: Stop 1: Constant speed 2: ACC 3: DEC LED “000” digit: Reserved LED “0000” digit: Reserved	--	×	0xA37
FA.56	The last malfunction input terminal state	See input terminal chart	--	×	0xA38
FA.57	The last malfunction output terminal state	See output terminal chart	--	×	0xA39
FA.58	The first two malfunction types	Please see malfunction code table	--	×	0xA3A
FA.59	The first three malfunction types	Please see malfunction code table	--	×	0xA3B

4.11 Multi-Speed and PLC Function Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FC.00	PLC Speed 1	0.00~Max frequency	50.00Hz	●	0xC00
FC.01	PLC Speed 2	0.00~Max frequency	20.00Hz	●	0xC01
FC.02	PLC Speed 3	0.00~Max frequency	30.00Hz	●	0xC02
FC.03	PLC Speed 4	0.00~Max frequency	40.00Hz	●	0xC03
FC.04	PLC Speed 5	0.00~Max frequency	50.00Hz	●	0xC04
FC.05	PLC Speed 6	0.00~Max frequency	40.00Hz	●	0xC05
FC.06	PLC Speed 7	0.00~Max frequency	30.00Hz	●	0xC06
FC.23	PLC Speed 8	0.00~Max frequency	20.00Hz	●	0xC07
FC.08	PLC Speed 9	0.00~Max frequency	10.00Hz	●	0xC08
FC.09	PLC Speed 10	0.00~Max frequency	20.00Hz	●	0xC09
FC.10	PLC Speed 11	0.00~Max frequency	30.00Hz	●	0xC0A
FC.11	PLC Speed 12	0.00~Max frequency	40.00Hz	●	0xC0B
FC.12	PLC Speed 13	0.00~Max frequency	50.00Hz	●	0xC0C
FC.13	PLC Speed 14	0.00~Max frequency	40.00Hz	●	0xC0D
FC.14	PLC Speed 15	0.00~Max frequency	30.00Hz	●	0xC0E

FC.15	PLC running Mode selection	LED “0” digit: cycle mode 0: Stop after single cycle 1: Continuous cycles 2: Keep final value after single cycle LED “00” digit: Time unit 0: second 1: minute 2: hour LED “000” digit: Power down memory mode 0: not save 1: save LED “0000” digit: Start-up mode 0: Restart from the 1st stage 1: Restart from the stop stage 2: Continue from the time when stop	0000	●	0xC0F
FC.16	PLC 1st Step running	0.0~6500.0(s/m/h)	10.0	●	0xC10
FC.17	PLC 2nd Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC11
FC.18	PLC 3rd Step running	0.0~6500.0(s/m/h)	10.0	●	0xC12
FC.19	PLC 4th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC13
FC.20	PLC 5th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC14
FC.21	PLC 6th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC15
FC.22	PLC 7th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC16
FC.23	PLC 8th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC17
FC.24	PLC 9th Step running	0.0~6500.0(s/m/h)	10.0	●	0xC18
FC.25	PLC 10th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC19
FC.26	PLC 11th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC1A
FC.27	PLC 12th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC1B
FC.28	PLC 13th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC1C
FC.29	PLC 14th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC1D
FC.30	PLC 15th Step running time	0.0~6500.0(s/m/h)	10.0	●	0xC1E
FC.31	PLC 1 st -15th Step direction and ADD/DEC time	LED “0” digit: current step run direction 0: FWD 1: REV LED “00” digit: ACC/DEC time in	0000	●	0xC1F
FC.32			0000	●	0xC20
FC.33			0000	●	0xC21
FC.34			0000	●	0xC22
FC.35			0000	●	0xC23

FC.36		this step 0: ACC/DEC time 1 1: ACC/DEC time 2 2: ACC/DEC time 3 4: ACC/DEC time 4 LED “000” digit: reserved LED “0000” digit: reserved	0000	●	0xC24
FC.37			0000	●	0xC25
FC.38			0000	●	0xC26
FC.39			0000	●	0xC27
FC.40			0000	●	0xC28
FC.41			0000	●	0xC29
FC.42			0000	●	0xC2A
FC.43			0000	●	0xC2B
FC.44			0000	●	0xC2C
FC.45			0000	●	0xC2D
FC.46-FC.48		Reserved			0xC2E
FC.49	Swing frequency control	0: invalid 1: valid	0	●	0xC31
FC.50	Swing frequency amplitude control	0: Relative to central frequency 1: Relative to max frequency	0	●	0xC32
FC.51	Reserved				0xC33
FC.52	Swing frequency amplitude	0.0~100.0%	10.0%	●	0xC34
FC.53	Jump frequency	0.0~50.0%	10.0%	●	0xC35
FC.54	Swing frequency rising time	0.00~650.00s	5.00s	●	0xC36
FC.55	Swing frequency falling time	0.00~650.00s	5.00s	●	0xC37
FC.56	Reserved				0xC38

4.12 Communication Control Function Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
Fd.00	Main-slave machine selection	LED “0” digit: Modbus main-slave selection 0: Slave machine 1: Main machine LED “00” digit: reserved LED “000” digit: reserved LED “0000” digit: reserved	0000	○	0xD00
Fd.01	485 communication address	1~247	1	○	0xD01
Fd.02	Communication baud rate selection	LED “0” digit: 485 communication 0: 1200 bps 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps	0003	○	0xD02

		5: 38400 bps LED "00" digit: reserved LED "000" digit: reserved LED "0000" digit: reserved			
Fd.03	Modbus data format	0: (N,8,1) format 1: (E,8,1) format 2: (O,8,1) format 3: (N,8,2) format 4: (E,8,2) format 5: (O,8,2) format	0	○	0xD03
Fd.04	Communication ratio setting	0.00~5.00	1.00	●	0xD04
Fd.05	Modbus communication answer delay	0~500ms	0ms	●	0xD05
Fd.06	Modbus communication overtime fault time	0.1~100.0s	1.0s	●	0xD06
Fd.07	Modbus communication fault action mode selection	0: No checkout overtime fault 1: Alarm and stop freely 2: Alarm and continue running 3: Forced stop	0	●	0xD07
Fd.08	Modbus transmission response dispose	0: Write operation with response 1: Write operation without response	0	●	0xD08
Fd.09	Main machine sending selection	LED "0" digit: the first group transmitting frame selection 0: Invalid 1: Main machine run command 2: Main machine given frequency 3: Main machine output frequency 4: Main machine upper limit frequency 5: Main machine given torque 6: Main machine output torque 7: Torque control FWD speed limit 8: Torque control REV speed limit 9: Main machine given PID A: Main machine feedback PID B: Reserved LED "00" digit: the second group transmitting frame selection Same as above LED "000" digit: the third group transmitting frame selection Same as above LED "0000" digit: the fourth group transmitting frame selection	0031	●	0xD09

		Same as above			
Fd.10	RS485 communication	0: Modbus communication	0	●	0xD0A

4.13 Factory parameters corresponding to industry application macros

4.14 Lifting mechanism dedicated macro

NO.	Function description	Range of settings and definition	Factory set (open loop)	Factory set (closed loop)
F0.00	Motor control mode	0: Open loop vector control mode 1 4: PG high performance vector control	0	4
F0.02	Run command channel	Controlled by terminals	1	1
F0.03	Frequency given source channel A	Keyboard given frequency	0	0
F0.08	Keyboard number setting frequency	0.00~max frequency	10.00Hz	10.00Hz
F0.14	ACC time 1	0.01~650.00s	6.0s	6.0s
F0.15	DEC time 1	0.01~650.00s	2.0s	3.0s
F2.00	Multifunction input terminal 1(X1)	FWD	1	1
F2.01	Multifunction input terminal 2(X2)	REV	2	2
F2.02	Multifunction input terminal 3(X3)	Malfunction reset	8	8
F2.03	Multifunction input terminal 4(X4)	Multispeed terminal 1	16	16
F2.04	Multifunction input terminal 5(X5)	Multispeed terminal 2	17	17
F2.05	Multifunction input terminal 6(X6)	Multispeed terminal 3	18	18
F2.06	Multifunction input terminal 7(X7/PUL)	Multispeed terminal 4	19	19
F2.45	Output terminal 1	Brake control function	33	33
F2.46	Relay output 1	Fault trip alarm1	4	4

F2.47	Relay output 2	Brake control function	33	33
FC.00	PLC Speed 1	0.00~Max frequency	25.00Hz	25.00Hz
FC.02	PLC Speed 3	0.00~Max frequency	30.00Hz	30.00Hz
FC.06	PLC Speed 7	0.00~Max frequency	40.00Hz	40.00Hz
FC.14	PLC Speed 15	0.00~Max frequency	50.00Hz	50.00Hz
Fd.07	Modbus communication fault action mode selection	Do not detect timeout failures	0	0
FF.00	Application type selection	1: hoisting mechanism (closed loop) 5: Lifting mechanism (open loop)	5	1
FF.01	Brake mode selection	LED '0' digit: brake release 0: frequency opens 1: frequency and current associated with opening LED '00' digit: starting direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '000' digit: stop direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '0000' digit: brake control frequency jump 0: invalid 1: valid	1001	1001
FF.02	Run command control	LED '0' digit: reverse control during operation 0: not allowed to run 1: Allow reverse operation LED '00' digit: zero-crossing frequency jump function 0: Invalid 1: Valid LED '000' digit: Reserved	0010	0010
FF.03	Restart waiting delay during braking	0.00-10.00s	0.30	0.30
FF.04	Brake release current coefficient	10.0-100.0%	30.0%	30.0%
FF.05	Zero crossing frequency	0.00-10.00Hz	1.00Hz	1.00Hz
FF.06	Up release frequency	0.00-10.00Hz	2.00Hz	1.00Hz
FF.07	Up brake frequency	0.00-10.00Hz	2.00Hz	0.00Hz
FF.08	Down release frequency	0.00-10.00Hz	2.00Hz	0.50Hz

FF.09	Down brake frequency	0.00-10.00Hz	2.00Hz	0.00Hz
FF.10	Delay before the lift	0.00-10.00s	0.20s	0.30s
FF.11	Delay after the lift	0.00-10.00s	0.10s	0.10s
FF.12	Delay before the upward brake	0.00-10.00s	0.00s	0.00s
FF.13	Delay after the up brake	0.00-10.00s	0.50s	0.50s
FF.14	Down delay before the release	0.00-10.00s	0.30s	0.30s
FF.15	Delay after down release	0.00-10.00s	0.10s	0.10s
FF.16	Delay before the brake	0.00-10.00s	0.00s	0.00s
FF.17	Delay after down brake	0.00-10.00s	0.30s	0.50s
FF.25	Current judgment enable during operation	0~1	1	1
FF.26	In-service current detection	0%~50%	5%	5%
FF.27	Running current detection time	0.000~1.000s	0.400s	0.400s
FF.55	Brake failure detection	0: Invalid 1: Valid	0	0
FF.56	Brake failure detection times	0~10	3	3
FF.57	Brake failure detection torque	0.0~150.0%	100.0%	100.0%
FF.58	Brake failure detection frequency threshold	0.00~5.00Hz	1.00Hz	1.00Hz
FF.59	Brake failure detection frequency threshold filtering	0.0~2.000s	0.200s	0.200s
FF.60	Anti-flow hook function selection	0: Invalid 1: Valid	0	0
FF.61	Anti-flow hook start threshold	0.00~5.00Hz	1.00Hz	1.00Hz
FF.62	Anti-flow hook maintenance time	0.0~3000.0s	60.0s	60.0s
FF.63	Anti-flow hook start threshold filtering	0.0~2.000s	0.100s	0.100s

Construction elevator special macro

NO.	Function description	Range of settings and definition	Factory default
F0.00	Motor control mode	Open loop vector control mode 1	0
F0.02	Run command channel	Terminal control	1
F0.03	Frequency given source channel A	Keyboard number given	0
F0.08	Keyboard number setting frequency	0~upper limit	15.00Hz
F0.14	ACC time 1	0.01~650.00s	6.0s
F0.15	DEC time 1	0.01~650.00s	2.0s
F2.00	Multifunction input terminal 1(X1)	FWD	1
F2.01	Multifunction input terminal 2(X2)	REV	2
F2.02	Multifunction input terminal 3(X3)	Multispeed terminal 1	16
F2.03	Multifunction input terminal 4(X4)	Multispeed terminal 2	17
F2.04	Multifunction input terminal 5(X5)	Multispeed terminal 3	18
F2.05	Multifunction input terminal 6(X6)	Multispeed terminal 4	19
F2.06	Multifunction input terminal 7(X7/PUL)	Malfunction reset	8
F2.45	Output terminal 1	Brake control function	33
F2.46	Relay output 1	Fault trip alarm1	4
F2.47	Relay output 2	Brake control function	33
FC.00	PLC Speed 1	0.00~Max frequency	50.00Hz
FC.02	PLC Speed 3	0.00~Max frequency	30.00Hz
FC.06	PLC Speed 7	0.00~Max frequency	40.00Hz
FC.14	PLC Speed 15	0.00~Max frequency	50.00Hz
FF.00	Application type selection	Lifting mechanism (open loop)	5

FF.01	Brake mode selection	LED '0' digit: brake release 0: frequency opens 1: frequency and current associated with opening LED '00' digit: starting direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '000' digit: stop direction selection 0: The torque is the same as the running direction 1: The torque is always in the forward direction LED '0000' digit: brake control frequency jump 0: invalid 1: valid	1111
FF.02	Run command control	LED '0' digit: reverse control during operation 0: not allowed to run 1: Allow reverse operation LED '00' digit: zero-crossing frequency jump function 0: Invalid 1: Valid LED '000' digit: Reserved	0010
FF.03	Restart waiting delay during braking	0.00-10.00s	0.30s
FF.04	Brake release current coefficient	10.0-100.0%	30.0%
FF.05	Zero crossing frequency	0.00-10.00Hz	1.00Hz
FF.06	Up release frequency	0.00-10.00Hz	2.00Hz
FF.07	Up brake frequency	0.00-10.00Hz	2.00Hz
FF.08	Down release frequency	0.00-10.00Hz	2.00Hz
FF.09	Down brake frequency	0.00-10.00Hz	2.00Hz
FF.10	Delay before the lift	0.00-10.00s	0.20s
FF.11	Delay after the lift	0.00-10.00s	0.10s
FF.12	Delay before the upward brake	0.00-10.00s	0.00s

FF.13	Delay after the up brake	0.00-10.00s	0.50s
FF.14	Down delay before the release	0.00-10.00s	0.30s
FF.15	Delay after down release	0.00-10.00s	0.10s
FF.16	Delay before the brake	0.00-10.00s	0.00s
FF.17	Delay after down brake	0.00-10.00s	0.30s
FF.25	Current judgment enable during operation	0~1	1
FF.26	In-service current detection	0%~50%	5%
FF.27	Running current detection time	0.000~1.000s	0.400s
FF.55	Brake failure detection	0: Invalid 1: Valid	0
FF.56	Brake failure detection times	0~10	3
FF.57	Brake failure detection torque	0.0~150.0%	100.0%
FF.58	Brake failure detection frequency threshold	0.00~5.00Hz	1.00Hz
FF.59	Brake failure detection frequency threshold filtering	0.0~2.000s	0.200
FF.60	Anti-flow hook function selection	0: Invalid 1: Valid	0
FF.61	Anti-flow hook start threshold	0.00~5.00Hz	1.00Hz
FF.62	Anti-flow hook maintenance time	0.0~3000.0s	60.0s
FF.63	Anti-flow hook start threshold filtering	0.0~2.000s	0.100s

Rotating mechanism dedicated macro

NO.	Function description	Range of settings and definition	Factory default
F0.00	Motor control mode	Open loop vector control mode 1	0
F0.02	Run command channel	Terminal control	1
F0.03	Frequency given source	Keyboard number given	0
F0.08	Keyboard number setting frequency	0~upper limit	8.00Hz

F0.14	ACC time 1	0.01~650.00s	10.0s
F0.15	DEC time 1	0.01~650.00s	2.0s
F2.00	Multifunction input terminal 1(X1)	FWD	1
F2.01	Multifunction input terminal 2(X2)	REV	2
F2.02	Multifunction input terminal 3(X3)	Multispeed terminal 1	8
F2.03	Multifunction input terminal 4(X4)	Multispeed terminal 2	16
F2.04	Multifunction input terminal 5(X5)	Multispeed terminal 3	17
F2.05	Multifunction input terminal 6(X6)	Multispeed terminal 4	18
F2.06	Multifunction input terminal 7(X7/PUL)	Malfunction reset	19
F2.45	Output terminal 1	Brake control function	1
F2.46	Relay output 1	Fault trip alarm1	4
F2.47	Relay output 2	Brake control function	1
F3.53	A0 output signal selection	Frequency output LED "00" digit: Reserved LED "000" digit: Reserved	0040
FC.00	PLC Speed 1	0.00~Max frequency	20.00Hz
FC.02	PLC Speed 3	0.00~Max frequency	35.00Hz
FC.06	PLC Speed 7	0.00~Max frequency	45.00Hz
FC.14	PLC Speed 15	0.00~Max frequency	50.00Hz
Fd.07	Modbus communication fault action mode selection	No checkout overtime fault	0
FF.00	Application type selection	Rotating mechanism	3
FF.36	Rotary flexible control option	LED '0' digit: rotary flexible control 0: off 1: open LED '00' digit: flexible control acceleration and deceleration time 0: off 1: open	0011
FF.37	Flexible control starting deviation frequency	0.00~20.00Hz	2.50Hz

FF.38	Flexible control direction changes deviation frequency	0.00~20.00Hz	2.50Hz
FF.39	Flexible control acceleration time 1	0.00~650.00s	20.00s
FF.40	Flexible control deceleration time 2	0.00~650.00s	20.00s
FF.41	Acceleration/deceleration time 1 switches to the frequency of acceleration/deceleration time 2	0.00~Max frequency	9.00Hz
FF.42	Acceleration/deceleration time 2 switches to the frequency of acceleration/deceleration time 3	0.00~Max frequency	21.00Hz
FF.43	Acceleration/deceleration time 3 switches to Acceleration/deceleration time 4 frequency	0.00~Max frequency	36.00Hz
FF.45	Reserved	0.00~Max frequency	20.00Hz
FF.46	Eddy current frequency 1	0.00~Max frequency	40.00Hz
FF.47	Eddy current frequency 2	0.00~Max frequency	40.00Hz
FF.48	Eddy current frequency 3	0.00~100.0%	80.00%
FF.49	Zero speed duty cycle	0.00~100.0%	40.00%
FF.50	Eddy current frequency 1 corresponds to duty cycle	0.00~100.0%	80.00%
FF.51	Maximum duty cycle	0.0~3000.0s	60.00s
FF.52	Stop vortex maintenance time	0.20~4.00kHz	2.00kHz
FF.53	Eddy current output	Valid	1
FF.54	Duty cycle polarity selection	0.0%/100ms	1.0ms
FF.70	Rotary brake mode selection	0: electric brake: 1: power off brake	0

Translation mechanism dedicated macro

NO.	Function description	Range of settings and definition	Factory default
F0.00	Motor control mode	Open loop vector control mode 1	0
F0.02	Run command channel	Terminal control	1
F0.03	Frequency given source channel A	Keyboard number given	0
F0.08	Keyboard number setting frequency	0~upper limit	20.00Hz
F0.14	ACC time 1	0.01~650.00s	3.0s
F0.15	DEC time 1	0.01~650.00s	3.0s
F2.00	Multifunction input terminal 1(X1)	FWD	1
F2.01	Multifunction input terminal 2(X2)	REV	2
F2.02	Multifunction input terminal 3(X3)	Malfunction reset	8
F2.03	Multifunction input terminal 4(X4)	Multispeed terminal 1	16
F2.04	Multifunction input terminal 5(X5)	Multispeed terminal 2	17
F2.05	Multifunction input terminal 6(X6)	Multispeed terminal 3	18
F2.06	Multifunction input terminal 7(X7/PUL)	Multispeed terminal 4	19
F2.45	Output terminal 1	The inverter is running	1
F2.46	Relay output 1	Fault trip alarm1	4
F2.47	Relay output 2	The inverter is running	1
FC.00	PLC Speed 1	0.00~Max frequency	35.00Hz
FC.02	PLC Speed 3	0.00~Max frequency	50.00Hz
FC.06	PLC Speed 7	0.00~Max frequency	40.00Hz
FC.14	PLC Speed 15	0.00~Max frequency	50.00Hz
Fd.07	Modbus communication fault action mode selection	No checkout overtime fault	0
FF.00	Application type selection	Translation mechanism	2

4.15 Light load speed up function

FF.28	Light load upscaling function selection	0: Invalid 1: Judging by current	0
FF.29	Load measurement time	0.000~10.000s	1.000s
FF.30	Upward upswing judgment threshold	0.0~100.0%	50.0%
FF.31	Up frequency up frequency limit	0.00~100.00Hz	65.00Hz
FF.32	Downward upselling threshold	0.0~100.0%	50.0%
FF.33	Downward frequency up frequency	0.00~100.00Hz	65.00Hz

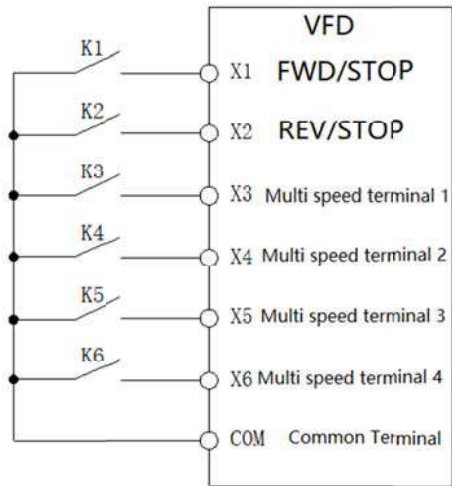
When the output frequency is equal to the motor rated frequency F5.03, the up-convert value is judged after the FF.29 set time is maintained, and if the up-conversion condition is satisfied, the up-conversion is performed. Take the current judgment as an example for explanation: when going up, when the output current (the percentage of the rated motor current) is less than FF.30, the frequency is raised, the frequency of the boost is limited by FF.31; when the line is down, when the output current (the rated current of the motor) When the percentage is less than FF.32, the frequency is increased. The frequency of the boost is limited by FF.33.

4.16 Multi-speed setting instructions

Multi-speed terminal 4	Multi-speed terminal 3	Multi-speed terminal 2	Multi-speed terminal 1	Terminal Speed
OFF	OFF	OFF	ON	1X [FC.00]
OFF	OFF	ON	OFF	2X [FC.01]
OFF	OFF	ON	ON	3X [FC.02]
OFF	ON	OFF	OFF	4X [FC.03]
OFF	ON	OFF	ON	5X [FC.04]
OFF	ON	ON	OFF	6X [FC.05]
OFF	ON	ON	ON	7X [FC.06]
ON	OFF	OFF	OFF	8X [FC.07]
ON	OFF	OFF	ON	9X [FC.08]
ON	OFF	ON	OFF	10X [FC.09]
ON	OFF	ON	ON	11X [FC.10]
ON	ON	OFF	OFF	12X [FC.11]
ON	ON	OFF	ON	13X [FC.12]
ON	ON	ON	OFF	14X [FC.13]
ON	ON	ON	ON	15X [FC.14]

Multi-speed control has priority next to jog. When the user selects multi-speed operation, four multi-function input terminals must be set as multi-speed control terminals.

The four multi-speed control terminals are combined with the (COM) on/off (ON/OFF) combination state to control which speed the inverter is running. Its operation and direction are controlled by the running signal and direction given by the running command channel [F0.02]. The acceleration and deceleration time defaults to plus or minus time 1[F0.14], [F0.15], and can also be added through the acceleration/deceleration time selection terminal set by the multi-function input terminal [F2.00~F2.06]. Select the acceleration and deceleration time.



Terminal Connection Diagram

4.17 Terminal Input and Output Function Selection

X	Function Specification	X	Function Specification	X	Function Specification
0	No function	16-19	Multispeed terminal 1-4	41	Timer clear terminal
1	FWD	20	PID control cancel	42	Counter clock input terminal
2	REV	21	PID control pause	43	Counter clear terminal
3	3-line running(Xi)	22	PID trait switch	44	DC braking command
4	FWD JOG	23	PID gain switch	45	Pre excitation command terminal
5	REV JOG	24-26	PID given switch 1-3	48	Command channel switch to keyboard
6	Free stop	27-29	PID feedback switch1-3	49	Command channel switch to terminal
7	Emergency stop	30	PLC pause	50	Command channel switch to communication
8	Malfunction reset	31	PLC restart	51	Command channel switch to expansion card
9	External fault input	32	ACC/DEC time selection terminal 1	52	Operation banned
10	Frequency UP	33	ACC/DEC time selection terminal 2	53	Forward banned
11	Frequency DW	34	ACC/DEC pause	54	Reverse banned
12	UP/DW clear	35	Swing frequency input	60	Speed torque control switch
13	Switch channel A to channel B	36	Swing frequency pause	61	Position control switch
14	channel combination switch to A	37	Swing frequency reset	No Definition Code:38-39, 46-47,	

15	channel combination switch to B	40	Timer trigger terminal	55-59:Reserved	
Y	Function Specification	Y	Function Specification	Y	Function Specification
0	No output	1	Running	2	REV running
3	FWD running	4	Fault trip alarm1 (alarm when fault self-recovery)	5	Fault trip alarm 2(no alarm when fault self-recovery)
6	External fault stop	7	Under voltage	8	Finish ready for running
9	Output frequency level test 1(FDT1)	10	Output frequency level test 2(FDT2)	11	Reach given frequency
12	0 speed running	13	Reach upper frequency limit	14	Reach lower frequency limit
15	Program running circle completed	16	Program running speed completed	17	PID feedback exceeds upper limit
18	PID feedback under lower limit	19	PID feedback sensor wire break	21	Timer time arrived
22	Counter reaching max value	23	Counter reaching setting value	24	Dynamic braking
25	PG feedback wire break	26	Emergency stop	27	Load pre-alarm output 1
28	Load pre-alarm output 2	29	Motor overload pre alarm	30	RS485 given
31	Reserved	32	Brake controlling function		

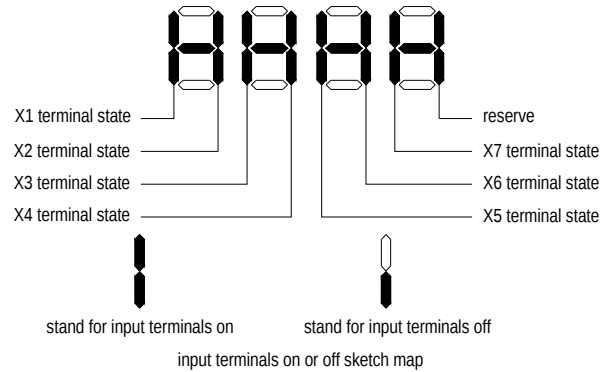
4.18 Monitor Code

Access 'C' parameter group by pressing 'PRG' for more than 2s; check the current state of inverter.

Function Code	Function name	Range of settings and definition	Address
C-00	Given frequency	0.01Hz	2100H
C-01	Output frequency	0.01Hz	2101H
C-02	Output current	0.1A	2102H
C-03	Input voltage	0.1V	2103H
C-04	Output voltage	0.1V	2104H
C-05	Machine speed	1RPM	2105H
C-06	Given torque	0.1%	2106H
C-07	Output torque	0.1%	2107H
C-08	PID given value	0.1%	2108H
C-09	PID feedback value	0.1%	2109H
C-10	Output power	0.1%	210AH
C-11	Bus voltage	0.1V	210BH
C-12	Module temperature 1	0.1℃	210CH
C-13	Module temperature 2	0.1℃	210DH
C-14	Input terminal X on state	See input terminal diagram	210EH
C-15	Output terminal Y on state	See output terminal diagram	210FH
C-16	Analog VS input value	0.001V	2110H
C-17	Analog AI input value	0.001V/0.001mA	2111H
C-18	Analog AS input value	0.001mA	2112H
C-19	Impulse signal PUL input	0.001kHz	2113H
C-20	Analog output AO1	0.01V	2114H
C-21	Analog output AO2	0.01V/0.01mA/0.01kHz	2115H
C-22	Counting value of counter		2116H
C-23	Running time after electrifying	0.1h	2117H
C-24	Local accumulative running time	Hour	2118H
C-25	Inverter power level	kW	2119H
C-26	Inverter rated voltage	V	211AH
C-27	Inverter rated current	A	211BH
C-28	Software version		211CH
C-29	PG feedback frequency	0.01Hz	211DH
C-30	Extended terminal input state	See input terminal diagram	211EH
C-31	Extended terminal output state	See output terminal diagram	211FH
C-32-C-34		Reserved	2120H
C-35	Counted time of timer	sec/min/h	2123H
C-36	Fault pre alarm code		2124H

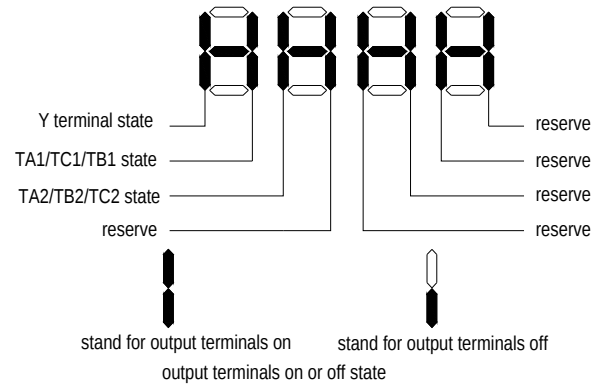
C-37	Total power consumption (low position)	1°	2125H
C-38	Total power consumption (high position)	10000°	2126H
C-39	Power factor angle	1°	2127H

Input Terminal on/off State Diagram:



Tip: connection diagrams of C-30 monitor expansion input terminals X8 ~ X10 are the same as above, but only displaying the first three valid.

Output Terminal on/off State Diagram:



Tip: connection diagrams of C-31 monitor expansion output relay TA3-TC3 and TA4-TC4 are the same as above, but only displaying the first two valid.

Chapter 5 Fault Diagnoses and Treatment Measures

This chapter explains the display content and measures of the inverter fault, alarm and operation fault. In addition, the poor condition caused by the inverter and motor failures and the corresponding processing measures will be briefly described. Tuning Guide on trial use is also referred to in this chapter

5.1 Fault Types

Type	The action of the inverter when the fault occurs
Equipment failure	When the inverter detects a fault, the following conditions occur: ● The text indicating the fault content appears on the keyboard; ● The output of the inverter is cut off and the motor coasts to a stop; ● When function [F2.45] is selected as 3 (fault trip alarm 1), the Y terminal outputs a valid open collector switch output; ● When the function [F2.46]/[F2.47] is selected as 3 (fault trip alarm 1), the TA1-TC1, TA2-TC2 terminals output the closed passive switch output, TB1-TC1, TB2-TC2 terminals Output disconnected passive switching output; ● For overload (OL), overcurrent (OC), system abnormal (SC), overvoltage (OU), and under-voltage (LU2) types of faults, if [FA.37] is not 0, at this time, If the above fault occurs, the inverter will automatically restart after the time interval set by [FA.38].
External fault	In some applications, the fault signal of the external associated device is included in the variable frequency control system for monitoring, protection, switching control, etc. At this time, if a multi-function contact input terminal is defined as "external fault", when the external associated device When the fault signal is valid, the inverter lockout output gives an alarm signal.

5.2 Fault information

Keyboard display	Fault code	Fault type	Possible causes	Treatment
	64	Too low voltage while stop	● Power supply is too low ● Voltage detection circuit is abnormal	● Check input power, clear fault. ● Seek support from factory.
	10	Too low voltage in run	● Power supply is too low ● Power capacitance is too small, or there is big impact current in the power grid. ● Inner DC main contractor is not connect well	● Check input power, clear fault. ● Improve power supply. ● Seek support from factory.
	7	Accel. over-voltage	● Power voltage fluctuation over limit. ● Start when motor is running .	● Detect power voltage and clear fault. ● Restart motor until it completely stop. Set E-30 as 1or2.
	8	Decel. over-voltage	● Deceleration time is too short.	● Prolong Deceleration time. ● Reduce load inertia or improve

			• Load potential energy or inertia is too large. • Power voltage fluctuation over limit.	inverter capacitance or add braking unit. • Detect power voltage and clear fault.
EoU3	9	Constant speed over-voltage	• Power voltage fluctuation over limit.	• Detect power voltage and clear fault. • Install input reactor.
EoU4	28	Over-voltage while stop	• Power voltage fluctuation over limit.	• Check input power, clear fault. • Seek support from factory.
EoC1	4	Accel. over-current	• Acceleration time is too short. • Start running motor. • V/F curve setting is not suitable. Or torque boost too high. • Inverter capacitance is too small.	• Prolong acc time. • Restart motor until it totally stop. Set E-30 as 1or2. • Reset V/F curve or torque boost value. • Select inverter with right capacitance.
EoC2	5	Decel. over-current	• Deceleration time is too short. • Load potential energy or inertia is too large. • Power voltage fluctuation over limit.	• Prolong Deceleration time. • Connect external braking resistance or braking unit. • Select inverter with right capacitance.
EoC3	6	Constant speed over-current	• Sudden load change. • Power grid voltage is too low.	• Check load change and clear it. • Check input power, clear fault.
EoL1	11	Motor over-load	• V/F curve setting is not suitable. Or torque boost too high. • Power grid voltage is too low. • incorrect overload protection setting. • Locked-rotor run or too heavy load. • Universal motor long time low speed run.	• Reset V/F curve or torque boost value. • Check input power, clear fault. • Unreasonable H-56 setting. • Adjust load or select inverter with right capacitance. • If need long time low speed run, please choose special motor for inverter.
EoL2	12	Inverter over-load	• Load is too heavy. • Acceleration time is too short. • Start running motor. • V/F curve setting is not suitable. Or torque boost too high.	• Select inverter with right capacitance. • Prolong acceleration time • Restart motor until it totally stop. Set E-30 as 1or2. • Reset V/F curve or torque boost value.

	1	System abnormality	- Acceleration time is too short. - Short circuit between inverter output phases or earth. - Module is damaged. - Electromagnetic disturb.	- Prolong acceleration time. - Check periphery equipments and restart after fault cleared. - Seek support from factory. - Check system wiring, earth, shield and deal as required.
	16	Inverter over-heat	- Temperature is too high. - Air channel is blocked. - Fan connection parts is loose. - Fan is damaged. - Temperature detection circuit fault	- Make the environment meet the requirement. - Clear the air channel. - Check and reconnect the wire - Change the same new fan. - Seek support from factory.
	15	Rectifier over-heat	- Temperature is too high. - Air channel is blocked. - Fan connection parts is loose. - Fan is damaged. - Temperature detection circuit fault	- Make the environment meeting the requirement. - Clear the air channel. - Check and reconnect the wire. - Change the same new fan. - Seek support from factory.
	20	Motor static detection fault	- Detection overtime - Start static detection while motor is running. - Capacitance difference is too big between motor and inverter. - Motor parameter setting mistake.	- Check motor connection wire. - Detect after motor stopping totally. - Change inverter model. - Reset parameter according to nameplate.
 	21/69	Memory fault	- Electromagnetic disturb in memory period. - EEPROM damage.	- resume load and save. - Seek support from factory.
	30	Reserved	•	Seek support from factory.
 	13/65	Input side open phase	3-phase input power open phase.	- Check 3-phase power supply and the phase. - Check 3-phase power supply wiring.
	14	Ouput side open phase	3-phase output power open phase	- Check 3-phase output voltage and current. - Check wiring.
	E.Gnd	Output earth	Output earth terminal short circuit.	Check wiring and insulation.
	19	Current detection	- Detect circuit fault. - Phase imbalance	- Seek for technic support. - Check motor and wiring.

		fault		
	17	Inverter external fault	Peripheral equipment fault protection.	Check peripheral equipment.
	E.PAn	Keyboard connect fault	- Keyboard wire fault. - Keyboard component damage.	- Check keyboard wire. - Seek support from factory.
	18	Rs485com munication fault	- Unsuitable baud rate setting. - Communication wire breaks. - Communication format does not match upper machine.	- Set suitable baud rate setting. - Check communication wire. - Set right communication format.
	26	Parameter copy fault	- Parameter copy communication is fault. - Copy keyboard is not match the inverter.	- Check wire. - Select the specified external keyboard model.
	E.ECF	Extend card connection fault	- Communication between extend card and frequency inverter overtime. - Extend card does not match frequency inverter.	- Check connector, and re-insert wire. - Choose the named card.
	27	PG card connection abnormal	PG card and inverter connection failure	Check the connection
	29/66	PID feedback failure	- PID feedback upper limit of disconnection alarm is improper - PID feedback lower limit of disconnection alarm is improper - PID feedback wiring unreliable - Sensor with feedback failure - Feedback input loop failure	- Confirm the sensor state,if broken, change it. - Repair the wiring. - Confirm the setting value of [Fb.27] and [Fb.28].
	31	Initial position angle learning failed	Check motor parameters	- Check motor parameters; - Learn after the motor is stationary; - Seek technical support from manufacturers.
	32/70	Speed deviation is too large	- Checkout time or check level setting is unreasonable - Motor parameter is	- Check the motor parameters and re-learn again; - Check the [FA.24]/[FA.25] parameter

			abnormal	settings; • Seek technical support from manufacturers.
	33/71	Speed protection	• [FA.27]/[FA.28] parameter setting is abnormal • Motor parameter is abnormal • Check the F6 group vector control parameters	• Check the motor parameters and re-learn again; • Check the [FA.27]/[FA.28] parameter settings;
	34/67	Load protection 1	• The checkout time or check level setting is unreasonable	• Check the [FA.18]/[FA.19] parameter settings;
	35/68	Load protection 2	• The checkout time or check level setting is unreasonable	• Check the [FA.20]/[FA.21] parameter settings;
	36	CPU timeout	• CPU timing timeout	• Seek technical support from manufacturers.
E.042	42	PG card AB phase disconnection failure	• Encoder AB phase disconnected	• Check the encoder and PG card cable
E.043	43	PG card B phase disconnection failure	• Encoder B phase disconnected	• Check the encoder and PG card cable
E.044	44	PG card A phase disconnection failure	• Encoder A phase disconnected	• Check the encoder and PG card cable
E.045	45	PG card Z phase disconnection failure	• Encoder Z phase disconnected	• Check the encoder and PG card cable
E.061	61	Brake failure detection failure	Insufficient brake braking torque	• Check if the brake braking torque is insufficient
E.062	62	Current or torque detection failure before opening the brake	If the detection current reaches the opening frequency, the current is reported to be lower than the opening judgment current.	• Check if the inverter motor parameters match the actual motor parameters • The output side of the inverter is connected to the motor reliably.

E.063	63	Current detection failure during operation	The running current abnormality is less than the FF.05 setting value.	•Check if the inverter motor parameters match the actual motor parameters •The output side of the inverter is connected to the motor reliably.
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5.3 Failure warning

Fault display	Communication code	Fault name
A.072	72	Agent GPRS lock machine alarm
A.073	73	Non-agent GPRS lock alarm
A.074	74	485 communication alarm
A.075	75	PG card AB phase disconnection alarm
A.076	76	PG card B phase disconnection alarm
A.077	77	PG card A phase disconnection alarm
A.078	78	Slook alarm
A.079	79	Weighing alarm

Chapter 6 Selection of recommended accessories

6.1 Selection of brake resistance

Selection of brake resistance according to generate power of motor, which associated with inertia, DEC time, potential energy load, etc. the bigger inertia of system, the shorter DEC time, more frequent braking, the more power, smaller resistance of resistor.

VFD Model	Rated Current	Brake unit	Resistor power for lifting	Resistor power for Slewing & luffing	Resistor Value	Set
AC70T-T3-R75-B	2.3A	Built-in	≥300W	≥150W	≥300Ω	1
AC70T-T3-1R5-B	3.7A	Built-in	≥750W	≥300W	≥250Ω	1
AC70T-T3-2R2-B	5A	Built-in	≥1.1kW	≥550W	≥200Ω	1
AC70T-T3-004-B	8.5A	Built-in	≥2kW	≥750W	≥120Ω	1
AC70T-T3-5R5-B	13A	Built-in	≥3kW	≥1.1kW	≥80Ω	1
AC70T-T3-7R5-B	17A	Built-in	≥4kW	≥1.5kW	≥65Ω	1
AC70T-T3-011-B	25A	Built-in	≥5.5kW	≥2.2kW	≥43Ω	1
AC70T-T3-015-B	32A	Built-in	≥7.5kW	≥3kW	≥32Ω	1
AC70T-T3-018-B	38A	Built-in	≥10kW	≥3.6kW	≥20Ω	1
AC70T-T3-022-B	45A	Built-in	≥11kW	≥4.4kW	≥18Ω	1
AC70T-T3-030-B	60A	Built-in	≥15kW	≥6kW	≥15Ω	1
AC70T-T3-037-B	75A	Built-in	≥19kW	≥7.4kW	≥12Ω	1
AC70T-T3-045-B	90A	Built-in	≥23kW	≥9kW	≥10Ω	1
AC70T-T3-055-B	110A	Built-in	≥28kW	≥11kW	≥8Ω	1
AC70T-T3-075-B	150A	Built-in	≥38kW	≥15kW	≥6Ω	1
AC70T-T3-090-B	180A	Built-in	≥23kW	≥9kW	≥12Ω	2
AC70T-T3-110	210A	BU30-3-75*2	≥28kW	≥11kW	≥10Ω	2
AC70T-T3-132	250A	BU30-3-75*2	≥33kW	≥13kW	≥9Ω	2
AC70T-T3-160	310A	BU30-3-100*2	≥40kW	≥16kW	≥8Ω	2
AC70T-T3-185	340A	BU30-3-100*2	≥48kW	≥18kW	≥6Ω	2
AC70T-T3-200	380A	BU30-3-100*2	≥48kW	≥20kW	≥6Ω	2

6.2 Selection of PG Card

- PG card order model

PG01-ABZ-05-C/D1	DC5 V supply, incremental encoder(differential signals)
AC200PG01	DC5 V supply, incremental encoder(differential signals, line break detection, frequency division)



PG Card

6.3 Instruction of close-loop control mode

Select high performance vector control mode with PG when PG card was configured (F0.00=4), Make sure reliable connection between encoder and PG card, and then input correct motor parameters.

F5.00	F5.01	F5.02	F5.03
Motor type	Poles number	Rated power	Rated frequency
F5.04	F5.05	F5.06	
Rated PRM	Rated VOLT	Rated Current	

Input encoder type and resolution correctly

F5.30	F5.31
Speed feedback and encoder type	ABZ encoder resolution

Auto tuning of motor

F5.20(Motor parameters self-adjustment selections)	0: null 1: Rotary type self-study	2: Static type self-study 3: Fast static self-learning
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Static type Self-study would be preference in construction and hoist industry. Set 2 in parameters **F5.20**, motor parameters Self-study will be started after pressing **FWD** button

The open-loop vector control mode is selected. operation steps are basically the same as those of high-performance vector with PG. F0.00 is selected as the open-loop vector control mode 1, and the steps of inputting the encoder type and the number of lines need to be skipped.

6.4 Encoder selection and installation guidance

1. Mechanical install

1) Common encoder shape and coupling as shown below:

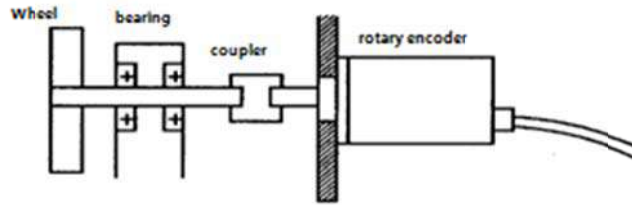
			
Solid shaft type	Flexible coupling for solid shaft	Hallow shaft type	Mounting Bracket

2) Flexible coupling(or Mounting bracket)must be applied in installation for flexible connection, Avoid damage of encoder due to rigid connection.

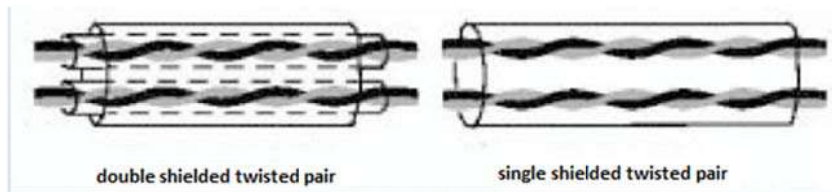
3) There are exact concentricity (ensure coaxial)between encoder shaft and motor shaft, Maximum radial displacement ±0.2mm,maximum

axial displacement $\pm 0.05\text{mm}$, maximum angle difference of $\pm 2^\circ\text{C}$. Squeeze, bending phenomenon should not exist after the coupling is installed; when the motor rotary, the cam phenomenon or axial endplay phenomenon should not exist.

- 4) When installing the hollow shaft encoder, the mounting bracket should be installed in a free state and cannot be bent to deform or pre-force, otherwise it will reduce the vibration suppression and shock resistance of the encoder, causing the encoder output signal is unstable or even damaged.
- 5) The encoder is mounted on the connecting belt and the gear meshing position. If the extension shaft is used, it should be fixed by the bearing firstly, and then combines the rotary encoder and coupler. As below:



- 6) The encoder cable must be twisted shielded signal cable, each pair of differential signals corresponding to a pair of twisted pair. The signal cable must not be disconnected during installation, and if the cable does need to be extended, the continuity of the connection should be ensured. It is better to connect the signal extension cable with soldering welding.



- 7) Encoder shielded cable should be grounded at both ends, single-ended ground can only resist low-frequency interference, cannot afford high-frequency interference.



Chapter 7 Periodic Overhaul and Maintenance

7.1 Overhaul

Frequency inverter is composed by semi-conductive components, passive electronic component and motive component. All of these components have useful life. Even under normal working environment, some of the components can not work after the life time. To avoid malfunction, daily checking, periodic overhaul, component changing and other maintenance should be carried out to prevent. We suggest one overhaul every 3-4 months after installation.

• Daily checking

To avoid machine damage and to prolong life time, please check the following items everyday.

Items	Checking content	Treatment
Power supply	Check if power supply meets the requirement and whether there is lack-phase.	Treat it as nameplate explains.
Surroundings	Check whether it meets the environment requirement.	Make sure the problem and solve it.
Cooling system	Check whether the inverter or the motor heat or change color abnormally and cooling fan working state.	Check whether it overload. Tighten screw. Check whether cooling fan is dirty or stall rotate.
Motor	Check if there is abnormal vibration or noise.	Tighten machine and electric connection and lubricate the machine components.
Load	Check whether output current is over the rated value of the motor or the inverter and has lasted for a period.	Make sure whether it overload and whether the machine model is right.

• Periodic overhaul

Under normal state, one overhaul every 3 or 4 months is ok. Please confirm the actual overhaul period according to the machine use condition and work circumstance while using the machine.

Items	Checking content	Treatment
Whole	Check insulated resistance; Check circumstance.	Tighten and change bad component; Clear and improve circumstance.
Electric connection	• Check whether the wire and connector color changes, whether there is disrepair, crack color change or aging in insulated layer. • Check whether the connect terminals are frayed, damaged or loose. • Earth checking.	• Change bad wires. • Fasten terminals and change bad terminals. • Measure earth resistance and fasten earth terminals.
Mechanical connection	• Check if there is abnormal vibration or noise or something is loose.	• Tighten, lubricate and change the bad components.
semi-conductive component	• Check whether there is dust or rubbish. • If there is obvious out change	• Clean operation environment • Change damaged component

Electrolytic capacitor	Whether there is liquid leak, color change or crack. Whether the safety valve outcrop, inflation, creak or liquid leak.	Change damaged component
Peripheral equipment	Peripheral equipment outlook and insulation checking.	Clear and change damaged component.
PCB	Peculiar smell color change, bad rust and connector checking.	- Fasten connector - Clear PCB - Change damaged PCB
Cooling system	- Check whether the fan is damaged or blocked up. - Whether rubbish and dust is stuck to the heatsink . - whether the air inlet/outlet blocked Or is there something sticking to the inlet/outlet.	- Clean operation environment - Change damaged component
Keyboard	Whether it is damaged. Check whether display is complete.	Change damaged component
Motor	Check if there is abnormal vibration or noise.	Tighten machine and electric connection and lubricate the machine components.

7.2 Maintenance

All equipments and components have useful life. Right maintenance can prolong the lifetime. But it can not avoid damage. Please change the components before their lifetime over.

Component	Useful lifetime
Fan	2~3year
Electrolytic capacitor	4~5 year
PCB	8~10 year

The replacement of the other components has strict requirements on maintenance technology and product familiarity. And they cannot be used without strict detection after replacement. So we suggest the user not to replace the other inner components. If they need to change indeed, please contact to the dealer or the sales department of Manufacture Company.

Appendix: Modbus Communication Protocol

• Communication Frame Structure

Communication data format is as follows:

The byte composition: Including initiation bit, 8 data bit, check bit and stop bit.

Initiation Bit	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8	Check bit	Stop bit
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One frame message must be transmitted as a continued data flow, and if there is a interval over 1.5 byte before ending, the receiving equipment will clear the half-baked information. And the next byte will be considered as the address field of a new frame. Similarly, if the interval between a new frame start-up and the former frame is smaller than 3.5 byte time, the receiving equipment will consider that it is the continuation of former one frame. Since the jumbled frame, the final CRC checking value is incorrect, which would lead to the communication mistake.

• Communication Control Parameter Group Address Specification:

Function Specification	Address Definition	Data Meaning Specification			R/W Characteristic
Communication Given Frequency	0x3000 or 0x2000	0～32000 is corresponding to 0.00Hz～320.00Hz			W/R
Communication Command Setting	0x3001 or 0x2001	0000H: No order			W/R
		0001H: FWD running			
		0002H: REV running			
		0003H: FWD jog			
		0004H: REV jog			
		0005H: DEC stop			
		0006H: free stop			
		0007H: malfunction reset			
		0008H: Running banned command			
		0009H: Running allowed command			
State of Inverter	0x3002 or 0x2002	Bit0	0: stop	1:running	R
		Bit1	0:non-acc state	1: ACC	
		Bit2	0:non-dec state	1: DEC	
		Bit3	0: Forward	1: REV	
		Bit4	0: normal	1: fault	
		Bit5	0: GPRS unlocked	1:GPRS	
		Bit6	0: no pre- alarm	1: pre alarm	
Frequency Inverter Fault Code	0x3003 or 0x2003	current inverter fault code（refer to fault code table）			R
Communication Given Upper Frequency	0x3004 or 0x2004	0～32000 is corresponding to 0.00Hz～320.00Hz			W/R
Communication Torque Setting	0x3005 or 0x2005	0～1000 is corresponding to 0.0～100.0%			W/R
The FWD Max Frequency limit in	0x3006 or 0x2006	0～1000 is corresponding to 0.0～100.0%			W/R

Torque Control			
The REV Max Frequency limit in Torque Control	0x3007 or 0x2007	0~1000 is corresponding to 0.0~100.0%	W/R
Communication Given PID Setting	0x3008 or 0x2008	0~1000 is corresponding to 0.0~100.0%	W/R
Communication Given PID Feedback	0x3009 or 0x2009	0~1000 is corresponding to 0.0~100.0%	W/R
Voltage Frequency separation voltage value setting	0x300A or 0x200A	0~1000 is corresponding to 0.0~100.0%	W/R
Fault and pre- alarm code reading	0x3010 or 0x2010	0-63 is the fault code 64- is the pre alarm code	R
Output terminal state	0x3010 or 0x2010	External borrowing inverter output terminal BII0 – Y BIT1 – TA1-TB1-TC1; BIT2 – TA2-TB2-TC2	R
AO1 output	0x3021 or 0x2021	0-10000 corresponds output 0-10V,0-20mA	R
AO2 output	0x3022 or 0x2022	0-10000 corresponds output 0-10V,0-20mA,0-50kHz	R

Note: The other function code addresses refer to "Communication Address" of function code table. While using writing command (06 H), if the highest digit of parameter function code address domain is 0, it only write in the RAM of inverter, and on storage when power off; if the high half digit of parameter function code address is 1, it write in EEPROM, which means power off storage. For instance, F0 parameter group: 0X00XX (RAM); 0X10XX (EEPROM)

• **List of fault code meanings for abnormal response information from slave machine:**

Fault Code	Meanings
1	Order code fault
3	CRC checking fault
4	Illegal address
5	Illegal data
6	Unable to modify when running
8	Inverter busy (EEPROM is storing)
9	Value over limit
10	Reserved parameters can't be modify
11	Number of Bytes wrong when reading

Warranty Card

Profile

User Name : _____

Address : _____

Contacts : _____ Phone : _____ Fax : _____

Model : _____ Machine Code : _____

Agent/Distributor Profile

Delivery Company : _____

Contacts : _____ Phone : _____ Delivery Date : _____

Warranty Clauses

The Company solemnly states that since the day users purchase from my company (hereinafter referred to as manufacturer),they can enjoy the following warranty services;

1.Since the date of purchase, users can enjoy the following warranty services of the product:

1) Within 30 days after shipment,the company promises returning,replacement and maintenance of the product.

2) Within 90 days after shipment,the company promises replacement and maintenance of the product.

3) Within 18 months after shipment,the company promises only maintenance of the product.

4) Products exported to countries except China shall not enjoy the warranties mentioned above.

2. Since the date of purchase, users can enjoy the service of the company when they pay for the service.

3. Exception Clauses: Product failures caused by the following reasons would not enjoy the free warranty services of the manufacturer:

1) Failures caused by operations of users that is not operated in accordance with the requirements of the product manual;

2) Failures caused when users repair or renovate the product without communicating with the manufacturer in advance;

3) Failures caused by abnormal aging of the product resulted from poor using environment;

4) Failures caused by earthquake, fire or other natural disasters or abnormal voltage;

5) Failures caused by damage during transportation(mode of transportation is decided by users and the company only helps to handle cargo shipment procedures).

4. In the following conditions, the manufacturer have the right not to provide warranty services:

1) When the marks,trademarks or nameplates of the products are destroyed or can not be identified;

2) When users do not pay for the product according to signed contract;

3) When users intentionally hiding the improper operations during installation, wiring and maintenance;

5. For products that enjoy all returning,replacement and maintenance services, first the product should be returned to the company and after responsibility confirmation,the product can be replaced or repaired.

Certificate of Approval



The product has been checked and proved to be qualified for delivery in conformity with standard.