

**VEICHI**



# MANUAL

**AC200 Series Frequency Inverter**

## CONTENT

<b>Chapter 1 Overview</b> .....	<b>1</b>
1.1 Safety requirement and cautions .....	1
1.2 Before Use .....	2
1.3 Technical criterion .....	2
<b>Chapter 2 Installation</b> .....	<b>5</b>
<b>Chapter 3 Keyboard layout and functions specification</b> .....	<b>11</b>
<b>Chapter 4 Function Parameter Table</b> .....	<b>13</b>
4.1 Basic parameters .....	13
4.2 Terminal Input and Output Function Selection .....	42
4.3 Monitor Code .....	43
4.4 Fault Code .....	44
<b>Chapter 5 Periodic Overhaul and Maintenance</b> .....	<b>45</b>
5.1 Overhaul .....	45
5.2 Maintenance .....	46
<b>Appendix : Modbus Communication Protocol</b> .....	<b>47</b>



## 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.

 <b>Danger</b>	<b>Danger:</b> Wrong operation may cause death or large accident.
 <b>Caution</b>	<b>Caution:</b> Wrong operation may cause minor wound.

#### Operation requirement

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

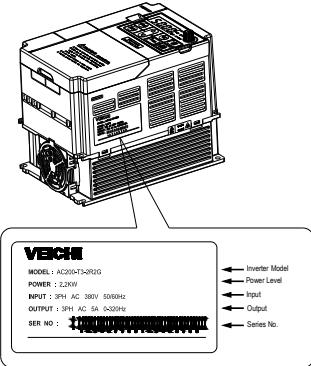
#### Safety guidance

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 transport, store, installation and careful operation an 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°C.
- 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 equipments 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.



## AC200 T 3 011 G

Symbol	Series
AC200	

Symbol	Phase
T	Three-phase
S	Single-phase

Symbol	Power Level
2	220V
3	380V
6	660V
11	1140V

Symbol	Power Level
G	General
GD	Cabinet machine with base

Symbol	Power Level
7R5	7.5
011	11
018	18.5
132	132

Voltage	220V	380V	660V	1140V	Voltage	220V	380V	660V	1140V
Power	Rated Output Current (A)				Power	Rated Output Current (A)			
0.4	2.5				110	380	210	121	75
0.75	4	2.5			132	420	250	150	86
1.5	7	3.7			160	550	310	175	105
2.2	10	5.0			185	600	340	198	115
4	16	10			200	660	380	218	132
5.5	20	13			220	720	415	235	144
7.5	30	17	10		250		470	270	162
11	42	25	15		280		510	330	175
15	55	32	18		315		600	345	208
18.5	70	38	22		355		670	380	220
22	80	45	28		400		750	430	260
30	110	60	35		450		800	466	270
37	130	75	45	25	500		860	540	325
45	160	90	52	31	560		990	600	365
55	200	110	63	38	630		1100	680	400
75	260	150	86	52	710		1260	750	480
90	320	180	98	58					

### 1.3 Technical criterion

Items		Criterion
Power input	Voltage, frequency	Single phase 220V 50Hz/60Hz Three phase 380V 50Hz/60Hz    Three phase 220V 50Hz/60Hz Three phase 660V 50Hz/60Hz    Three phase 1140V 50Hz/60Hz
	Allowable fluctuations	voltage unbalance rate: <3%; Frequency: ±5%; aberration rate: as IEC61800-2 required
	Inrush current	Lower than rated current
	Power factor	≥0.94(with DC reactor)
	Efficiency	≥96%
Output	Output voltage	Output under rated condition: 3 phase, 0V~input voltage, inaccuracy <5%

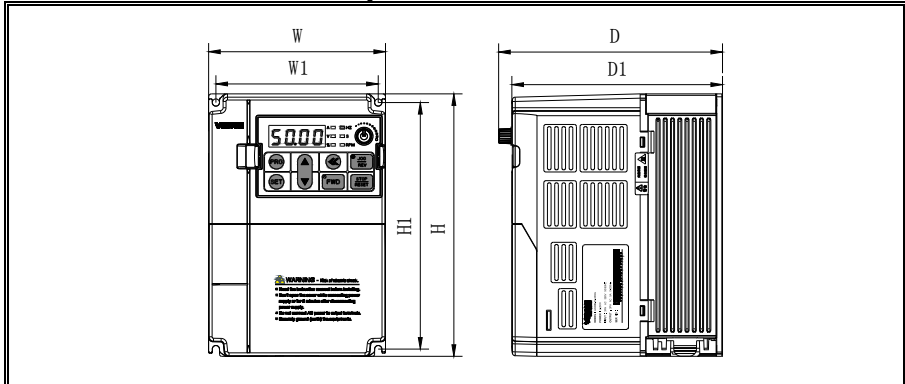
	Output frequency range	G type:0Hz-600Hz
	Output frequency accuracy	Max frequency $\pm 0.5\%$
	Overload capacity	G type:150% rated current/1 min, 180% rated current/10s, 200% rated current/0.5s
Main Control performance	Motor control mode	V/F without PG ,VC without PG, V/F with PG,VC with PG
	Modulate mode	Optimized SVPWM mode
	Carrier frequency	0.7kHz~16.0kHz
	Speed range	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 synchronized speed
	Starting torque	VC without PG: when 0.5Hz, 150% rated torque VC with PG: when 0Hz, 200% rated torque
	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 $\times \pm 0.2\%$
	Frequency resolution	Digit setting: 0.01Hz Analog setting: max frequency $\times 0.05\%$
Basic functions	DC braking capacity	Starting frequency: 0.00Hz~50.00Hz Braking time: 0.0s~60.0s Braking current: 0.0%~150.0% rated current
	Torque upgrade 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 user setting V/F curve mode, one drop torque characteristic curve (1.1- 2.0 powers) and square V/F curve mode.
	Acceleration/Deceleration curve	2 modes: linear Acceleration/Deceleration and S curve Acceleration/Deceleration.4 sets of Acceleration/Deceleration time ,unit 0.01s selectable, longest time: 650.00s.
	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 auto-adjust	While power supply voltage fluctuates,it can auto-keep constant output voltage.
	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 treatment	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 output, frequency impulse output.	

	Frequency set channels	Keyboard digital set, keyboard potentiometer, analog voltage terminal VS, analog voltage/current terminal AI, analog current terminal AS, communication given and multi channels terminal selection, master-slave channels combination, expansion card, switch by various modes	
	Feedback input channel	Voltage terminal VS, voltage/current terminal AI, current terminal AS, communication given, pulse input PUL.	
	Running command channel	Operation panel given, external terminal given, communication given, expansion card given	
	Input command signal	Start, stop, FWD/REV, JOG, multi-step speed, free stop, reset, acceleration/deceleration time selection, frequency given channel selection, exterior fault alarm.	
	Exterior output signal	Two relay output, one collector output, one AO output: 0V~10V output or 4mA~20mA output, another AO output: 0V~10V output or 4mA~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 protection, input/output loss phase protection	
Keyboard display	LED display	Single file 5 digital tube display	Can monitor one state variable
		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 parameter copy.	
	State monitor	Output frequency, given frequency, output current, input voltage, output voltage, motor speed, PID feedback, PID given value, module temperature etc monitor parameters..	
Fault alarm	Over-voltage, under-voltage, over-current, short circuit, loss phase, overload, overheat, overvoltage stall, current limit, or data protection destroyed; Fault running state; Fault history.		
Environment	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 70kPa-106 kPa	
	Temperature, humidity	$-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$ , above $40^{\circ}\text{C}$ down the rated amount, the maximum temperature : $60^{\circ}\text{C}$ (no load running), 5%—95%RH (no condensation)	
	Vibration	$9\text{Hz} \sim 200\text{Hz}$ , $5.9\text{m}/\text{s}^2$ (0.6G)	
	Store temperature	$-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$	
	Installation	Hanging type, cabinet type	
	Protection degree	IP20	
	Cooling mode	Forced cooling	

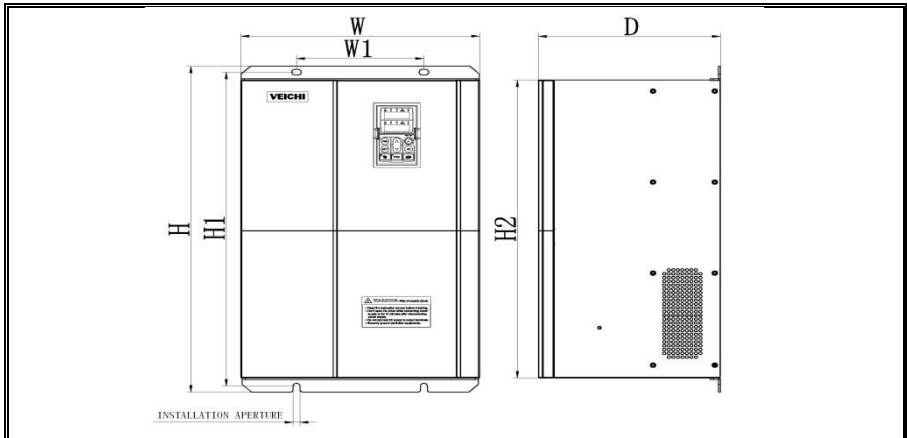
## Chapter 2 Installation

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

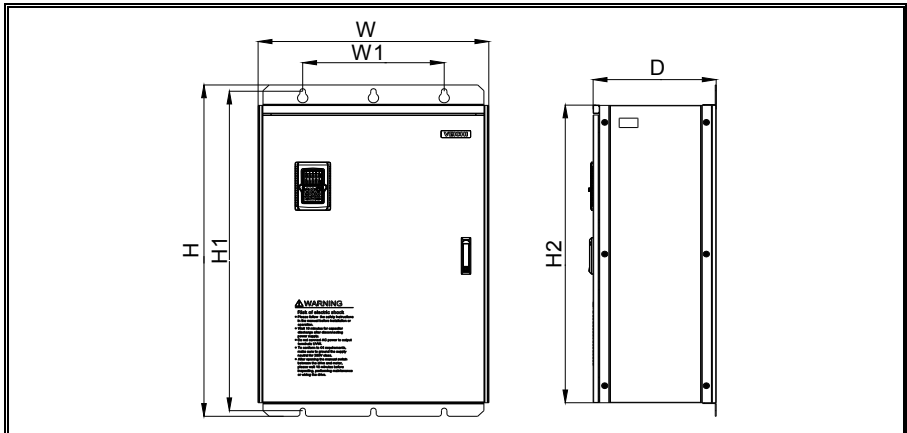
### Overall Dimension of Inverter and Keyboard



MODEL	W	W1	H	H1	D	D1	INSTALLATION APERTURE
AC200-S2-R40G	122	112	182	171	154.5	145	φ5
AC200-S2-R75G							
AC200-S2-1R5G							
AC200-S2-2R2G	159	147.2	246	236	157.5	148	φ5.5
AC200-T3-R75G	122	112	182	171	154.5	145	φ5
AC200-T3-1R5G							
AC200-T3-2R2G							
AC200-T3-004G	159	147.2	246	236	157.5	148	φ5.5
AC200-T3-5R5G							
AC200-T3-7R5G	195	179	291	275	167.5	158	φ7
AC200-T3-011G							
AC200-T3-015G	230	208	330	315	200	190	φ7
AC200-T3-018G							
AC200T3-022G							



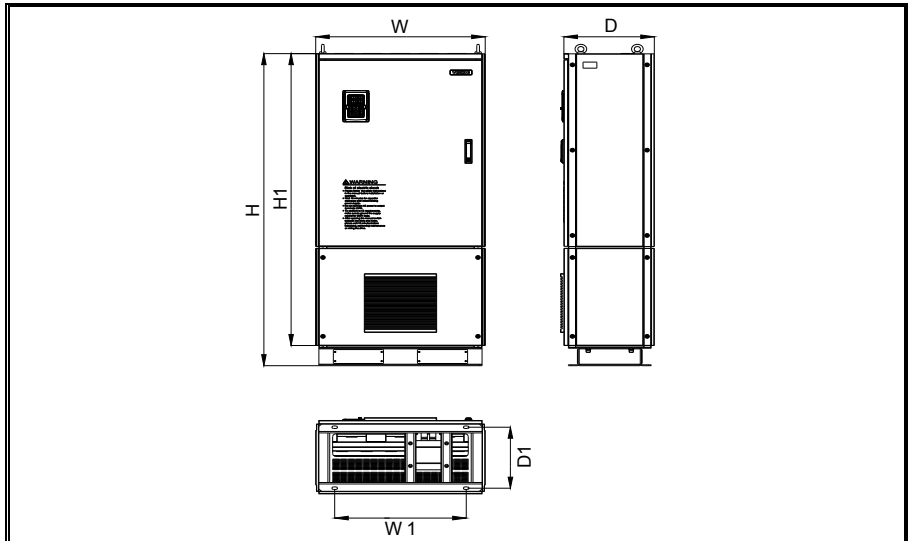
MODEL	Overall Dimension				Instillation Position		INSTALLATION APERTURE
	W	H	D	H2	W1	H1	
AC200-T3-030G	255	410	225	370	180	395	φ7
AC200-T3-037G	305	570	260	522	180	550	φ9
AC200-T3-045G							
AC200-T3-055G							
AC200-T3-075G	380	620	290	564	240	595	φ11
AC200-T3-090G							
AC200-T3-110G							



MODEL	Overall Dimension				Instillation Position		INSTALLATION APERTURE
	W	H	D	H2	W1	H1	
AC200-T3-132G	500	780	340	708	350	755	φ11

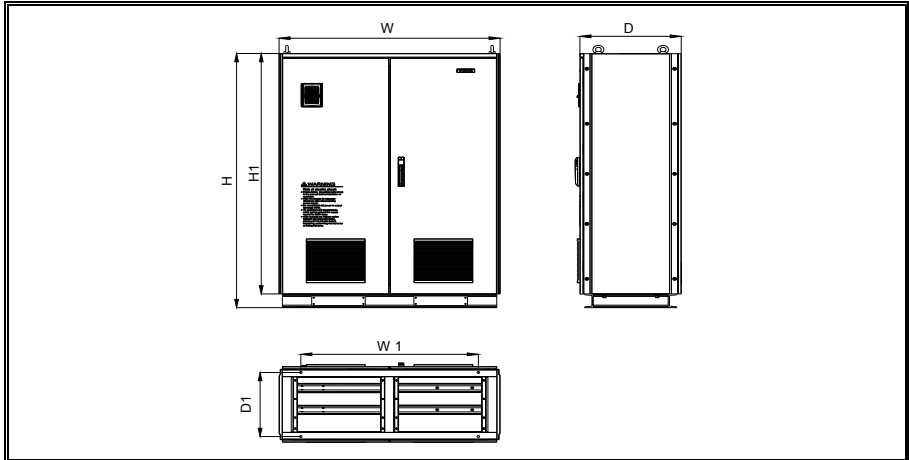


AC200-T3-160G	650	1060	400	950	400	1023	φ16
AC200-T3-185G							
AC200-T3-200G							
AC200-T3-220G	750	1170	400	1050	460	1128	φ18
AC200-T3-250G							
AC200-T3-280G							
AC200-T3-315G	850	1280	450	1150	550	1236	φ20
AC200-T3-355G							
AC200-T3-400G							

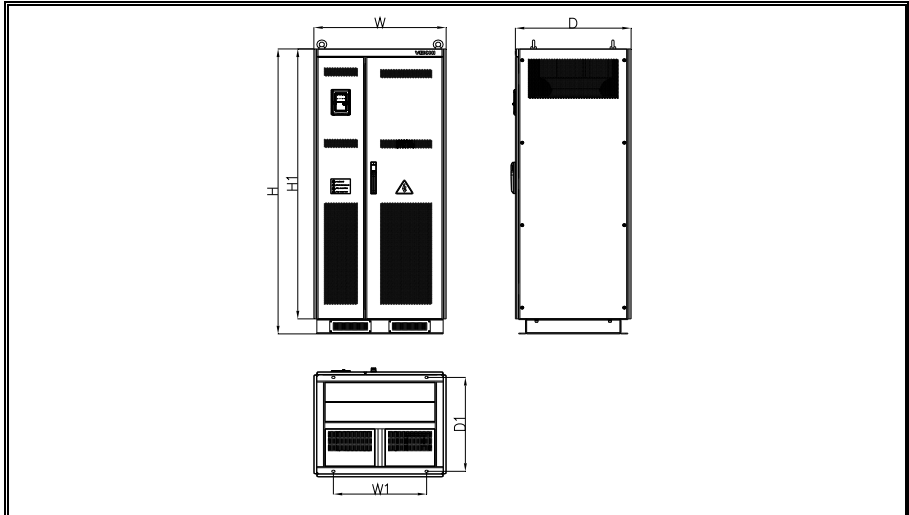


MODEL	Overall Dimension				Installation Position		INSTALLATION APERTURE
	W	H	D	H1	W1	D1	
AC200-T3-160GD	650	1600	400	1500	492	332	φ14
AC200-T3-185GD							
AC200-T3-200GD							
AC200-T3-220GD	750	1700	400	1600	582	332	φ14
AC200-T3-250GD							
AC200-T3-280GD							
AC200-T3-315GD	850	1800	450	1700	622	382	φ14
AC200-T3-355GD							
AC200-T3-400GD							

Notice: DC Reactor Inside



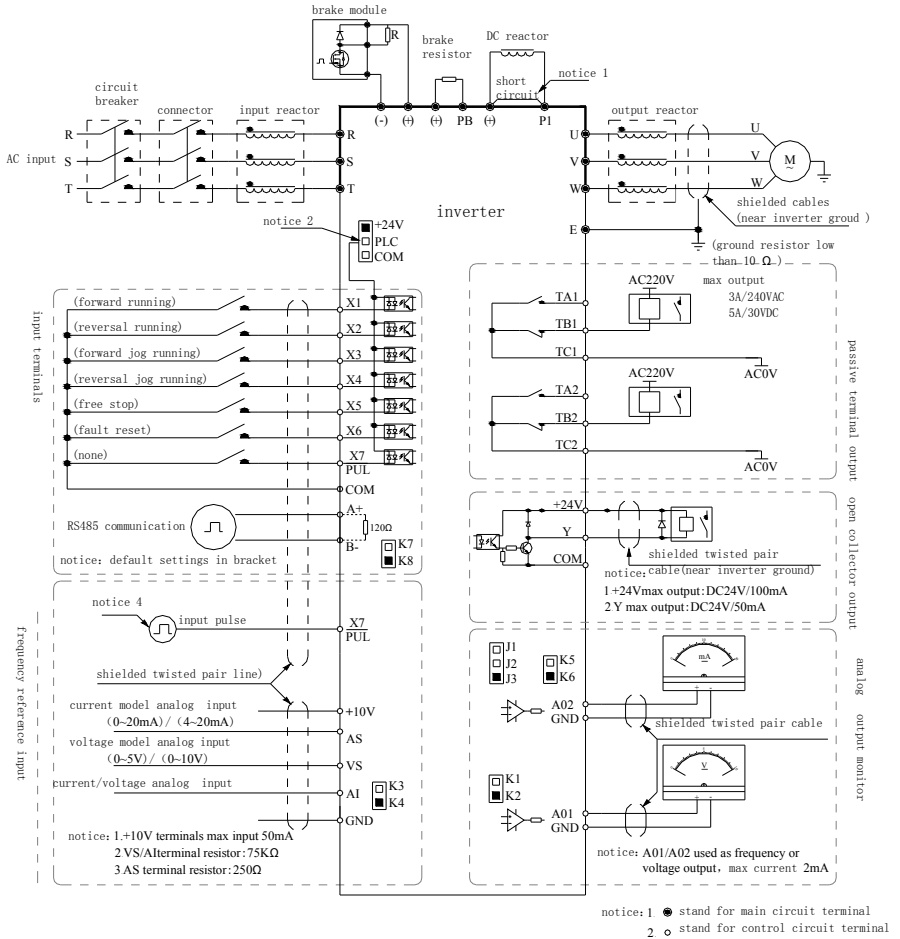
MODEL	Overall Dimension				Installation Position		INSTALLATION APERTURE
	W	H	D	H1	W1	D1	
AC200-T3-450G	1200	1850	550	1750	960	466	φ14
AC200-T3-500G							
AC200-T3-560G							



MODEL	Overall Dimension				Installation Position		INSTALLATION APERTURE
	W	H	D	H1	W1	D1	
AC200-T3-630G	800	1900	700	1800	564	626	φ14
AC200-T3-710G							

## Standard Connection Diagram

### ● Standard Connection Diagram

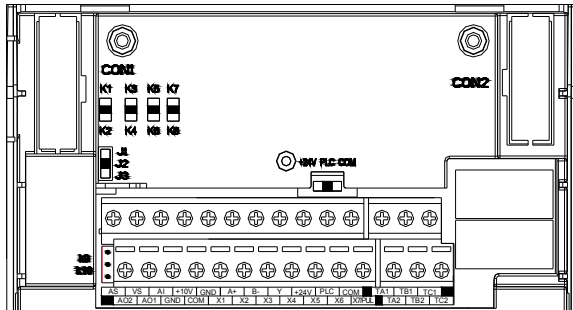


- Note: 1. When installing DC reactor, make sure to dismantle the short connector between terminal P1 and (+).
2. NPN or PNP transistor signal can be selected as input of multi-function input terminal (X1~X7/PUL).
- Inverter built-in power supply (+24V terminal) or external power supply (PLC terminal) 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 with GND.	50mA
A01/A02	Analog monitor output, constitutes loop with GND.	Max output 2mA as frequency, voltage signal,
+24V	24V auxiliary power supply output, constitutes loop with COM.	100mA
Y	Collector open circuit output; can set the action-object by program.	DC24V/50mA
TA1/TB1/TC1 TA2/TB2/TC2	Passive connector output; can set the action-object by program.	3A/240VAC 5A/30VDC

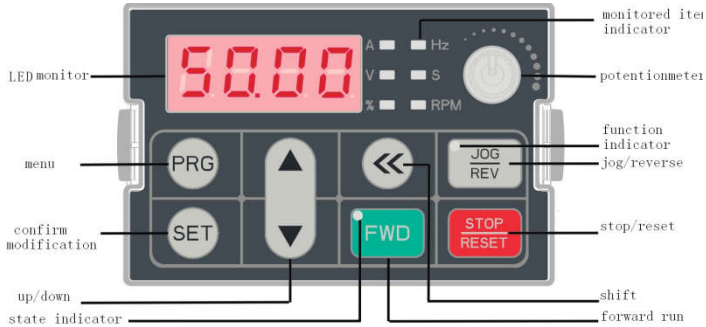
● Connection Function Specification of Switch Terminals











Switch Terminal	Selecting Position	Function Specification
S1	K1	AO1: 0 mA ~ 20mA or 4 mA ~ 20mA current output
	K2	AO1: 0V ~ 10V voltage output
S2	K3	AI: 0 mA ~ 20mA or 4 mA ~ 20mA input current
	K4	AI: 0V ~ 10V input voltage
S3	K5	AO2: 0.0 kHz ~ 100kHz (J1 on), open collector circuit output
	K6	AO2: 0.0 kHz ~ 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 kHz ~ 100kHz frequency output
	J2	AO2: 0 mA ~ 20mA or 4 mA ~ 20mA current output
	J3	0 V ~ 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

## Chapter 3 Keyboard layout and functions specification

### ● Keyboard appearance



### ● Key function

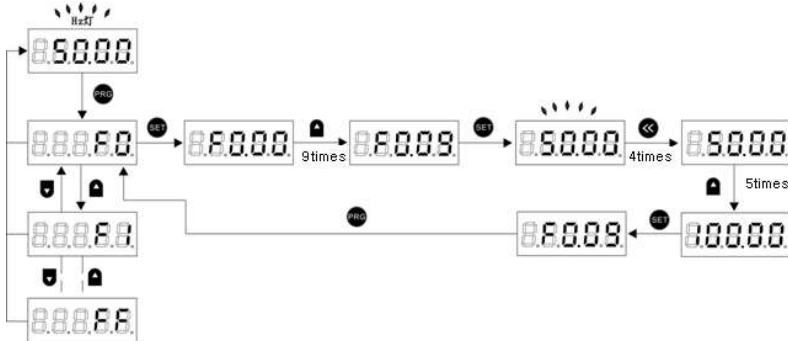
Key	Name	Function
	Menu key	Enter menu while standby or running. Press this key to return while modify parameter. While standby or running, press for 1 sec to enter condition monitoring interface.
	Confirm/modify key	Press to modify parameter while in menu interface. Press again to confirm after modifying. 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.

### ● Indicator light meanings

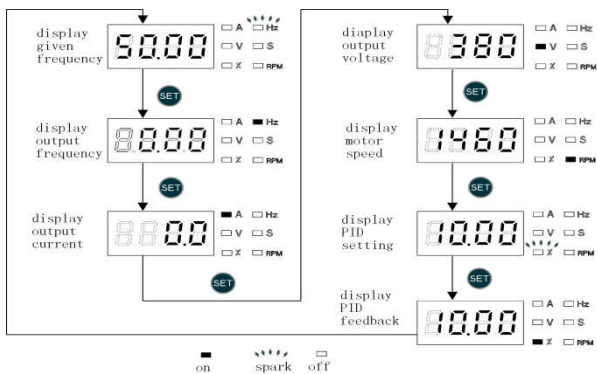
Name	State	Meaning
Unit indicator light	Hz	Spark/On
	A	On
	V	Spark/On
	S	On
	RPM	On
	%	Spark/On
State indicator light	FWD	On
	FWD	Spark
	FWD	Off
Function indicator light	REV/JOG	On
	REV/JOG	Off

● Basic LED operation

It displays frequency 50.00Hz when stop. Here F0.09=100.00 setting will be taken as an example to explain the basic LED operation.



● Run monitoring setting



## 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.

### 4.1 Basic parameters

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F0.00	Motor control mode	<b>Asynchronous motor control mode:</b> 0: V/F control 3: High-performance VC without PG 4: High-performance VC with PG <b>Synchronous motor control mode:</b> 6: High-performance VC without PG 7: VC with PG <b>Other control:</b> 8: Voltage frequency separation output 1/2/5: Reserved	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 4: AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given	0	●	0x003
F0.04	Frequency given source channel B	7: UP/DW control 8: PID control given 9: Program control (PLC) given 10: Optional card 11: Multi-steps speed given	1	●	0x004
F0.05	Frequency channel B reference source	0: Max. output frequency as reference source 1: A set 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	0Hz~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 7: Optional card	0	●	0x00A
F0.11	Upper frequency limit digital setting	Lower limit frequency~max frequency	50.00Hz	●	0x00B
F0.12	Lower limit frequency	0.00Hz~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	0.01s~650.00s	Model set	※	0x00E
F0.15	DEC time 1	0.01s~650.00s	Model set	※	0x00F
F0.16	Rotary direction selection	<p><b>LED“0”digit: running direction takes the opposite</b>  0: Direction unchanged  1: Direction takes the opposite</p> <p><b>LED“00”digit: running direction prohibited</b>  0: Forward and reverse commands are allowed  1: Only FWD command allowed  2: Only REV command allowed</p> <p><b>LED“000”digit: frequency control direction selection</b>  0: Invalid  1: Valid</p> <p><b>LED“0000”digit: reserved</b></p>	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

### 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	0.00s~60.00s	0.00s	○	0x101
F1.02	Start-up frequency	0.00Hz~60.00Hz	0.50Hz	○	0x102
F1.03	Start-up frequency holding time	0.0s~50.0s	0.0s	○	0x103
F1.04	Braking current before start	0.0%~150.0%	60.0%	○	0x104
F1.05	Braking time before start	0.0s~60.0s	0.0s	○	0x105
F1.06	Speed tracking speed	0.00s~60.00s	0.50s	○	0x106
F1.07	Speed tracking stop delay	0.00s~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	0.00Hz~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	0.0s~60.0s	0.0s	○	0x10E
F1.15	Detection frequency when stop	0.00Hz~50.00Hz	0.50Hz	●	0x10F
F1.16	ACC/DEC selection	<b>LED "0" digit: time base selection</b> 0: max frequency 1: fixed frequency 50Hz 2: set frequency <b>LED "00" digit: S ACC/DEC selection</b> 0: Beeline ACC/DEC 1: S Curve ACC/DEC <b>LED "000/0000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	0010	○	0x110
F1.17	ACC start S curve time	0.00s~10.00s	0.10s	○	0x111
F1.18	ACC finish S curve time	0.00s~10.00s	0.10s	○	0x112
F1.19	DEC start S curve time	0.00s~10.00s	0.10s	○	0x113
F1.20	DEC finish S curve time	0.00s~10.00s	0.10s	○	0x114
F1.21	ACC time 2	0.01s~650.00s	10.00s	●	0x115
F1.22	DEC time 2	0.01s~650.00s	10.00s	●	0x116
F1.23	ACC time 3	0.01s~650.00s	10.00s	●	0x117
F1.24	DEC time 3	0.01s~650.00s	10.00s	●	0x118
F1.25	ACC time 4	0.01s~650.00s	10.00s	●	0x119
F1.26	DEC time 4	0.01s~650.00s	10.00s	●	0x11A
F1.27	Emergency stop DEC	0.01s~650.00s	1.00s	●	0x11B
F1.28	FWD&REV dead time	0.0s~120.0s	0.0s	○	0x11C
F1.29	Zero speed torque frequency threshold	0.00Hz~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	0.0s~6000.0s If set 6000.0s, always hold	0s	●	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	0.00s~60.00s	0.50s	○	0x124
F1.37	Reserved				0x125
F1.38	JOG running frequency setting	0.00Hz~Max frequency	5.00Hz	●	0x126
F1.39	JOG ACC time	0.01s~650.00s	10.00s	●	0x127
F1.40	JOG DEC time	0.01s~650.00s	10.00s	●	0x128
F1.41	Jump frequency 1	0.00Hz~Max frequency	0.00Hz	●	0x129
F1.42	Jump frequency range 1	0.00Hz~Max frequency	0.00Hz	●	0x12A
F1.43	Jump frequency 2	0.00Hz~Max frequency	0.00Hz	●	0x12B
F1.44	Jump frequency range 2	0.00Hz~Max frequency	0.00Hz	●	0x12C

### Quantum 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	0.000s~6.000s	0.010s	●	0x20A
F2.11	X1 invalid detection delay	0.000s~6.000s	0.010s	●	0x20B
F2.12	X2 valid detection delay	0.000s~6.000s	0.010s	●	0x20C
F2.13	X2 invalid detection delay	0.000s~6.000s	0.010s	●	0x20D

F2.14	X3 valid detection delay	0.000s~6.000s	0.010s	●	0x20E
F2.15	X3 invalid detection delay	0.000s~6.000s	0.010s	●	0x20F
F2.16	X4 valid detection delay	0.000s~6.000s	0.010s	●	0x210
F2.17	X4 invalid detection delay	0.000s~6.000s	0.010s	●	0x211
F2.18	X5 valid detection delay	0.000s~6.000s	0.010s	●	0x212
F2.19	X5 invalid detection delay	0.000s~6.000s	0.010s	●	0x213
F2.20	X6 valid detection delay	0.000s~6.000s	0.010s	●	0x214
F2.21	X6 invalid detection delay	0.000s~6.000s	0.010s	●	0x215
F2.22	X7 valid detection delay	0.000s~6.000s	0.010s	●	0x216
F2.23	X7 invalid detection delay	0.000s~6.000s	0.010s	●	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	06000	0	●	0x21D
F2.30	PUL input min frequency	0.00kHz~50.00kHz	0.00kHz	●	0x21E
F2.31	PUL min frequency corresponding setting	0.00%~100.00%	0.00%	●	0x21F
F2.32	PUL input max frequency	0.00kHz~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	0.000kHz~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	0.01Hz/s~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 LED "0000" digit: reserved	0000	●	0x22C
F2.45	Output terminal 1	Refer to 4.2 Function selection table	1	●	0x22D
F2.46	Relay output 1		4	●	0x22E
F2.47	Relay output 2		11	●	0x22F
F2.48	Y1 output delay time	0.000s~6.000s	0.010s	●	0x230
F2.49	Relay 1 output delay time	0.000s~6.000s	0.010s	●	0x231
F2.50	Relay 2 output delay time	0.000s~6.000s	0.010s	●	0x232
F2.51	Output frequency level 1 (FDT1)	0.00Hz~Max frequency	30.00Hz	●	0x233
F2.52	FDT1 lag	0.00Hz~Max frequency	1.00Hz	●	0x234
F2.53	Output frequency level 2 (FDT2)	0.00Hz~Max frequency	50.00Hz	●	0x235
F2.54	FDT2 lag	0.00Hz~Max frequency	1.00Hz	●	0x236
F2.55	Given frequency arriving checkout range	0.00Hz~50.00Hz	2.00Hz	●	0x237

### Analog Terminal Parameter Group

NO.	Function description	Range of settings and definition	Factory setting	Feature	Address
F3.00	VS Lower limit	0.00V~10.00V	0.00V	●	0x300
F3.01	VS Lower limit corresponding setting	-100.00%~100.00%	0.00%	●	0x301
F3.02	VS upper limit	0.00V~10.00V	10.00V	●	0x302
F3.03	VS upper limit corresponding setting	-100.00%~100.00%	100.00%	●	0x303
F3.04	VS filter time	0.00s~6.00s	0.010s	●	0x304
F3.05	VS zero point loop voltage	0.00V~10.00V	0.00V	●	0x305
F3.06	AI (VS) lower limit	0.00V~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 limit	0.00V~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	0.00s~6.00s	0.010s	●	0x30A
F3.11	AS lower limit	0.00mA~20.00mA	4.00mA	●	0x30B
F3.12	AS lower limit corresponding setting	0.00%~100.00%	0.00%	●	0x30C
F3.13	AS upper limit	0.00mA~20.00mA	20.00mA	●	0x30D
F3.14	AS upper limit corresponding setting	0.00%~100.00%	100.00%	●	0x30E
F3.15	AS filter time	0.000s~6.000s	0.010s	●	0x30F
F3.16	AI used as AS lower limit	0.00mA~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	0.00mA~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	0.00V~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	0.00V~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	0.00V~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	0.00V~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	0.00V~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	0.00V~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	0.00V~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	0.00V~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	<b>LED "0" digit: A01</b> 0: 0V~10V 1: 4.00mA~20.00mA 2: 0.00mA~20.00mA <b>LED "00" digit: A02</b> 0: 0V~10V 1: 4.00mA~20.00mA 2: 0.00mA~20.00mA 3: FM frequency pulse output <b>LED "000" digit: reserved</b>	0000	●	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	0.000s~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	0.000s~6.000s	0.010s	●	0x33D
F3.62	A02FM frequency output lower limit	0.00kHz~100.00kHz	0.20kHz	●	0x33E
F3.63	A02FM frequency output upper limit	0.00kHz~100.00kHz	50.00kHz	●	0x33F
F3.64-F3.79		Reserved			



## 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	<b>LED 0 digit: D/E monitor on</b> 0: Off 1: On <b>LED 00 digit: no keyboard potentiometer lock sampling value</b> 0: Off 1: On <b>LED 000 digit: reserved</b> <b>LED 0000 digit: reserved</b>	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	<b>LED "0" digit: keyboard UN/DOWN key modify selection</b> 0: Invalid 1: Modify frequency setting by keyboard numbers F0.08 2: Modify PID give setting by keyboard numbers Fb.01 <b>LED "00" digit: power down save</b> 0: No save frequency after power down	0011	○	0x409

		1: Save frequency after power down <b>LED "000" digit: action limit</b> 0: Adjusting in operation & stop 1: Adjusting only in operation, stop for holding 2: Adjusting in operation, stop for clearing <b>LED "0000" digit: reserved</b>			
F4.10	Keyboard potentiometer lower limit	0.00V~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	0.00V~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	<b>LED "0" and "00" digit: display the first group</b> 00~63 <b>LED "000" and "0000" digit: display the second group</b> 00~63	1101	●	0x40E
F4.15	The display content of the first line in running state	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 state	Same as above	0402	●	0x414
F4.21	The display content of the second line in stop state	Same as above	1210	●	0x415
F4.22	Keyboard display item setting	<b>LED "0" digit: output frequency selection</b> 0: Aim frequency 1: Running frequency <b>LED "00" digit: reserved</b> <b>LED "000" digit: power display</b>	0000	●	0x416

F4.23	Reserved ( debug monitor selection )	<b>LED "0" digit: C-00~C-39</b> 0: Normal 1: Debug <b>LED "00" digit: C-40~69</b> 0: No display 1: Normal <b>LED "000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	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	<b>LED "0" digit: E.EEP fault (EEPROM storage fault)</b> 0: Alarm and free stop 1: Alarm and continue operation <b>LED "00" digit: reserved</b> <b>LED "000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	0000	●	0x41A
F4.27	Reserved				0x41B
F4.28	Fan control	0: After power on the fan runs 1: Stop associated with temperature, running is rotary 2: Running associated with temperature, stop while the fan stops	1	●	0x41C
F4.29	Dynamic braking enabled	0: Off 1: On	0	●	0x41D
F4.30	Dynamic braking operation voltage	115.0%~140.0%	125.0%	●	0x41E
F4.31	Dynamic braking utilization	0.0%~100.0%	10.0%	●	0x41F
F4.32	PWM carrier frequency	0.7kHz~16.0kHz	Model set	※	0x420
F4.33	PWM control mode	<b>LED "0" digit: carrier associated with temperature</b> 0: Temperature independent 1: Temperature dependent <b>LED "00" digit: carrier associated with output frequency</b> 0: Independent 1: Dependent <b>LED "000" digit: random PWM valid</b> 0: Prohibited 1: Valid <b>LED "0000" digit: PWM modulation mode</b> 0: Only use three-phase modulation 1: Two-phase and three-phase modulation automatically switched	1111	●	0x421

F4.34-F4.37	Reserved			0x422
-------------	----------	--	--	-------

### 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	0.1kW~1000.0kW	Model set	※	0x502
F5.03	Motor rated frequency	0.01Hz~max frequency	Model set	※	0x503
F5.04	Motor rated speed	1rpm~65000rpm	Model set	※	0x504
F5.05	Motor rated voltage	1V~1500V	Model set	※	0x505
F5.06	Motor rated current	0.1A~3000.0A	Model set	※	0x506
F5.07	Asynchronous motor no-load current	0.1A~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	1V~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 selections	0: No operation 1: Rotary type self-study 2: Static type self-study 3: Reserved	0	○	0x514
F5.21	Synchronous machine poles searching function	<b>LED "0" digit: closed-loop vector</b> 0: OFF 1: ON 2: On, only operate firstly when electrify <b>LED "00" digit: open-loop vector</b>	0010	○	0x515

		0: OFF 1: ON 2: ON, only operate firstly when electrify			
F5.22-F5.29		Reserved			0x516
F5.30	Speed feedback or encoder mode	<b>LED "0" digit: encoder mode</b> 0: Common ABZ encoder 1: Rotary encoder <b>LED "00" digit: encoder direction</b> 0: same direction 1: reverse direction <b>LED "000" digit: wire break inspection</b> 0: OFF 1: ON <b>LED "0000" digit: Z pulse correction enabled</b> 0: OFF 1: ON	0000	○	0x51E
F5.31	ABZ encoder lines	0-10000	1024	○	0x51F
F5.32	wire break inspection time	0.100s~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	0.0ms~100.0ms	1.0ms	●	0x524
F5.37-F5.49		Reserved			

### 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	0.000s~6.000s	0.500s	●	0x601
F6.02	ASR filter time1	0.0ms~100.0ms	0.0ms	●	0x602
F6.03	ASR switch frequency 1	0.00Hz~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	0.000s~6.000s	0.500s	●	0x605
F6.06	ASR filter time 2	0.0ms~100.0ms	0.0ms	●	0x606
F6.07	ASR switch frequency 2	0.00Hz~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 gain	0.0%~80.0%	50.0%	●	0x619
F6.26	Energy saving control low-pass filter	0.000s~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 feed forward gain	0.0%~200.0%	0.0%	●	0x61D
F6.30	Motor weak magnetic gain	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	0.0ms~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			

**Torque Control Parameter**

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
F7.00	Torque/Speed control	0:Speed control 1:Torque control	0	●	0x700
F7.01	Torque given channels selection	0: keyboard number given 1: Keyboard potentiometer setting 2: Analog VS 3: Analog AI 4: Analog AS 5: Pulse PUL 6: RS485 communication given 7: Optional card	0	●	0x701
F7.02	Torque keyboard number setting	0%~100.0%	0.0%	●	0x702
F7.03	Torque input lower limit	0.00%~100.00%	0.00%	●	0x703
F7.04	Lower limit corresponding setting	-200.00%~200.00%	0.00%	●	0x704
F7.05	Torque input upper limit	0%~100.00%	100.00%	●	0x705
F7.06	Upper limit corresponding setting	-200.00%~200.00%	100.00%	●	0x706
F7.07	Given first-order filter time	0.000s~6.000s	0.100S	●	0x707
F7.08	Output torque upper limit	0%~200.0%	150.0%	●	0x708
F7.09	Output torque lower limit	0%~200.0%	0%	●	0x709
F7.10	Torque control FWD speed limit selection	0: function code F7.12setting 1: Keyboard potentiometer setting×F7.12 2: Analog VS×F7.12 3: Analog AI×F7.12 4: Analog AS×F7.12 5: Pulse PUL×F7.12 6: RS485 communication given×F7.12 7: Optional card×F7.12	0	●	0x70A

F7.11	Torque control REV speed limit selection	0: function code F7.13 setting 1: Keyboard potentiometer setting×F7.13 2: Analog VS×F7.13 3: Analog AI×F7.13 4: Analog AS×F7.13 5: Pulse PUL×F7.13 6: RS485 communication given×F7.13 7: Optional card×F7.13	0	●	0x70B
F7.12	Torque control FWD max speed limit	0.0%~100.0%	100.0%	●	0x70C
F7.13	Torque control REV max speed limit	0.0%~100.0%	100.0%	●	0x70D
F7.14	Reversed				0x70E

### 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	0.00Hz~max frequency	1.00Hz	○	0x802
F8.03	Self-setting voltage V2	0.0%~100.0%	28.0%	○	0x803
F8.04	Self-setting frequency F2	0.00Hz~max frequency	10.00Hz	○	0x804
F8.05	Self-setting voltage V3	0.0%~100.0%	55.0%	○	0x805
F8.06	Self-setting frequency F3	0.00Hz~max frequency	25.00Hz	○	0x806
F8.07	Self-setting voltage V4	0.0%~100.0%	78.0%	○	0x807
F8.08	Self-setting frequency F4	0.00Hz~max frequency	37.50Hz	○	0x808
F8.09	Self-setting voltage V5	0.0%~100.0%	100.0%	○	0x809
F8.10	Self-setting frequency F5	0.00Hz~max frequency	50.00Hz	○	0x80A
F8.11	Output voltage percentage	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	0.000s~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	0.0Hz~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	0.000V/ms~0.200V/ms	0.010 V/ms	●	0x816
F8.23	Energy saving voltage recovery rate	0.000V/ms~2.000 V/ms	0.200 V/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	0.0s~100.00s	10.00s	●	0x820
F8.33	Output voltage of voltage-frequency separation DEC time	0.0s~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			

### 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	<b>LED "0" digit: (CBC)</b> 0: Off 1: On	0001	○	0xA03

		<b>LED "00" digit: OC protection interference suppression</b> 0: Off 1: First grade interference suppression 2: Second grade interference suppression <b>LED "000" digit: SC protection First grade interference suppression</b> 0: Off 1: First grade interference suppression 2: Second grade interference suppression <b>LED "0000" digit: Reserved</b>			
FA.04	Reserved				0xA04
FA.05	Bus over voltage hardware protection	0: Off 1: On	1	○	0xA05
FA.06	Bus over voltage suppression function	<b>LED "0" digit: Over voltage suppression control</b> 0: Prohibited 1: Valid in DEC 2: Valid both in ACC/DEC <b>LED "00" digit: Over-excitation control</b> 0: Off 1: On <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Reserved</b>	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	<p><b>LED “0” digit: Output loss phase protection</b>  0: Off  1: On</p> <p><b>LED “00” digit: Input loss phase protection</b>  0: Off  1: Open the alarm  2: Open the fault</p> <p><b>LED “000” digit: Reserved</b>  <b>LED “0000” digit: Reserved</b></p>	0011	○	0xA0F
FA.16	Motor overload protection curve coefficient	0.0%~250.0%	100.0%	○	0xA10
FA.17	Load pre alarm detection setting	<p><b>LED “0” digit: Detection selection (protection 1)</b>  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</p> <p><b>LED “00” digit: Alarm selection</b>  0: Alarm and continue operation  1: Fault protection and free stop</p> <p><b>LED “000” digit: Detection selection (protection 2)</b>  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</p> <p><b>LED “0000” digit: Alarm selection</b>  0: Alarm and continue operation  1: Fault protection and free stop</p>	0000	○	0xA11

FA.18	Load pre alarm detection level 1	0.0%~200.0%	130.0%	○	0xA12
FA.19	Load pre alarm detection time 1	0.0s~60.0s	5.0s	○	0xA13
FA.20	Load pre alarm detection level 2	0.0%~200.0%	30.0%	○	0xA14
FA.21	Load pre alarm detection time 2	0.0s~60.0s	5.0s	○	0xA15
FA.22	Reserved				0xA16
FA.23	Protection action when speed slip is too large	<b>LED "0" digit: Detection selection</b> 0: Not detected 1: Detected at constant speed 2: Detecting <b>LED "00" digit: Alarm selection</b> 0: Free stop and report fault 1: Alarm and continue operation <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Reserved</b>	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	0.0s~60.0s	2.0s	○	0xA19
FA.26	Stall protection action	<b>LED "0" digit: Detection selection</b> 0: Not detected 1: Detected at constant speed 2: Detecting <b>LED "00" digit: Alarm selection</b> 0: Free stop and report fault 1: Alarm and continue running <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Reserved</b>	0000	○	0xA1A
FA.27	Stall detection threshold	0.0%~150.0%	110.0%	○	0xA1B
FA.28	Stall detection time	0.000s~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	0.1s~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	0.00Hz~Max frequency	--	×	0xA29
FA.42	Malfunction output voltage	0V~1500V	--	×	0xA2A
FA.43	Malfunction output current	0.1A~2000.0A	--	×	0xA2B
FA.44	Malfunction bus voltage	0V~3000V	--	×	0xA2C
FA.45	Malfunction module temperature	0℃~100℃	--	×	0xA2D
FA.46	Malfunction machine state	<b>LED "0" digit: Running direction</b> 0: FWD 1: REV <b>LED "00" digit: Running status</b> 0: Stop 1: ACC 2: DEC 3: Constant speed <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Reserved</b>	--	×	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	0.00Hz~Max frequency	--	×	0xA32
FA.51	The last malfunction output voltage	0V~1500V	--	×	0xA33
FA.52	The last malfunction output current	0.1A~2000.0A	--	×	0xA34
FA.53	The last malfunction bus voltage	0V~3000V	--	×	0xA35
FA.54	The last malfunction module temperature	0℃~100℃	--	×	0xA36
FA.55	The last machine state	<b>LED "0" digit: Running direction</b> 0: FWD 1: REV <b>LED "00" digit: Running status</b> 0: Stop 1: Constant speed 2: ACC 3: DEC <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Reserved</b>	--	×	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

### PID Process Control Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
Fb.00	PID controller given signal source	0: Keyboard digit PID given 1: Keyboard potentiometer given 2: Terminal VS voltage analog given 3: Terminal AI voltage and current analog given 4: Terminal AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given 7: Optional card 8: Terminal selection	0	●	0xB00
Fb.01	Keyboard digit PID given/feedback	0.00%~100.0%	50.0%	●	0xB01
Fb.02	PID given changing time	0.00s~60.00s	1.00s	●	0xB02
Fb.03	PID controller feedback signal source	0: Keyboard digit PID given 1: Keyboard potentiometer given 2: Terminal VS voltage analog given 3: Terminal AI voltage and current analog given 4: Terminal AS current analog given 5: Terminal pulse PUL given 6: RS485 communication given 7: Optional card 8: Terminal selection	2	●	0xB03
Fb.04	Feedback signal filter time	0.000s~6.000s	0.010s	●	0xB04
Fb.05	Feedback signal gain	0.00~10.00	1.00	●	0xB05
Fb.06	Given and feedback range	0~100.0	100.0	●	0xB06

Fb.07	PID control selection	<b>LED "0" digit: Feedback feature selection</b> 0: Positive feature 1: Negative feature <b>LED "00" digit: Reserved</b> <b>LED "000" digit: Reserved</b> <b>LED "0000" digit: Differential adjustment properties</b> 0 : Differential of deviation 1 : Differential of feedback	0100	●	0xB07
Fb.08	PID preset output	0.0%~100.0%	100.0%	●	0xB08
Fb.09	PID preset output running time	0.0s~6500.0s	0.0s	●	0xB09
Fb.10	PID control deviation limit	0.0%~100.0%	0.0%	●	0xB0A
Fb.11	Proportional gain P1	0.000~8.000	0.100	●	0xB0B
Fb.12	Integral time I1	0.0s~600.0s	1.0s	●	0xB0C
Fb.13	Differential gain D1	0.000s~6.000s	0.000s	●	0xB0D
Fb.14	Proportional gain P2	0.000~8.000	0.100	●	0xB0E
Fb.15	Integral time I2	0.0s~600.0s	1.0s	●	0xB0F
Fb.16	Differential gain D2	0.000s~6.000s	0.000s	●	0xB10
Fb.17	PID parameter switching condition	0: No switch 1: Use DI terminal to switch 2: Switch according to deviation	0	●	0xB11
Fb.18	Low value of switching deviation	0.0%~100.0%	20.0%	●	0xB12
Fb.19	High value of switching deviation	0.0%~100.0%	80.0%	●	0xB13
Fb.20	Reserved				0xB14
Fb.21	Differential limit	0.0%~100.0%	5.0%	●	0xB15
Fb.22	PID output upper limit	0.0%~100.0%	100.0%	●	0xB16
Fb.23	PID output lower limit	-100.0%~Fb.19	0.0%	●	0xB17
Fb.24	PID output filter time	0.000s~6.000s	0.000s	●	0xB18
Fb.25	Feedback wire break detection time	0.0s~120.0s	1.0s	●	0xB19
Fb.26	Feedback wire break action selection	0: Go on PID operation without alarm 1: Stop and alarm malfunction 2: Go on PID operation and output alarm signal 3: Run at the current frequency and output alarm signal	0	●	0xB1A
Fb.27	Wire break alarm upper	0.0%~100.0%	100.0%	●	0xB1B

Fb.28	Wire break alarm lower limit	0.0%~100.0%	0.0%	●	0xB1C
Fb.29	Closed-loop suspend detection threshold	0.0%~100.0%	0.0%	●	0xB1D
Fb.30	Closed-loop suspend detection time	0.0s~600.0s	1.0s	●	0xB1E
Fb.31	Reserved				0xB1F

### Multi-Speed and PLC Function Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
FC.00	PLC Speed 1	0.00Hz~Max frequency	10.00Hz	●	0xC00
FC.01	PLC Speed 2	0.00Hz~Max frequency	20.00Hz	●	0xC01
FC.02	PLC Speed 3	0.00Hz~Max frequency	30.00Hz	●	0xC02
FC.03	PLC Speed 4	0.00Hz~Max frequency	40.00Hz	●	0xC03
FC.04	PLC Speed 5	0.00Hz~Max frequency	50.00Hz	●	0xC04
FC.05	PLC Speed 6	0.00Hz~Max frequency	40.00Hz	●	0xC05
FC.06	PLC Speed 7	0.00Hz~Max frequency	30.00Hz	●	0xC06
FC.23	PLC Speed 8	0.00Hz~Max frequency	20.00Hz	●	0xC07
FC.08	PLC Speed 9	0.00Hz~Max frequency	10.00Hz	●	0xC08
FC.09	PLC Speed 10	0.00Hz~Max frequency	20.00Hz	●	0xC09
FC.10	PLC Speed 11	0.00Hz~Max frequency	30.00Hz	●	0xC0A
FC.11	PLC Speed 12	0.00Hz~Max frequency	40.00Hz	●	0xC0B
FC.12	PLC Speed 13	0.00Hz~Max frequency	50.00Hz	●	0xC0C
FC.13	PLC Speed 14	0.00Hz~Max frequency	40.00Hz	●	0xC0D
FC.14	PLC Speed 15	0.00Hz~Max frequency	30.00Hz	●	0xC0E
FC.15	PLC running Mode selection	<b>LED "0" digit: cycle mode</b> 0: Stop after single cycle 1: Continuous cycles 2: Keep final value after single cycle <b>LED "00" digit: Time unit</b> 0: second 1: minute 2: hour <b>LED "000" digit: Power down memory mode</b> 0: not save 1: save <b>LED "0000" digit:Start-up mode</b> 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 time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC10



FC.17	PLC 2nd Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC11
FC.18	PLC 3rd Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC12
FC.19	PLC 4th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC13
FC.20	PLC 5th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC14
FC.21	PLC 6th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC15
FC.22	PLC 7th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC16
FC.23	PLC 8th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC17
FC.24	PLC 9th Step running	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC18
FC.25	PLC 10th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC19
FC.26	PLC 11th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC1A
FC.27	PLC 12th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC1B
FC.28	PLC 13th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC1C
FC.29	PLC 14th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC1D
FC.30	PLC 15th Step running time	0.0(s/m/h)~6500.0(s/m/h)	10.0	●	0xC1E
FC.31	PLC 1 <sup>st</sup> -15th Step direction and ADD/DEC time	<b>LED "0" digit: current step run direction</b> 0: FWD 1: REV <b>LED "00" digit: ACC/DEC time in this step</b> 0: ACC/DEC time 1 1: ACC/DEC time 2 2: ACC/DEC time 3 4: ACC/DEC time 4 <b>LED "000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	0000	●	0xC1F
FC.32			0000	●	0xC20
FC.33			0000	●	0xC21
FC.34			0000	●	0xC22
FC.35			0000	●	0xC23
FC.36			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 amplitude	0.0%~50.0%	10.0%	●	0xC35
FC.54	Swing frequency rising time	0.00s~650.00s	5.00s	●	0xC36
FC.55	Swing frequency falling time	0.00s~650.00s	5.00s	●	0xC37
FC.56	Reserved				0xC38

### Communication Control Function Parameter Group

NO.	Function description	Range of settings and definition	Factory default	Feature	Address
Fd.00	Main-slave machine selection	<b>LED "0" digit: Modbus main-slave selection</b> 0: Slave machine 1: Main machine <b>LED "00" digit: reserved</b> <b>LED "000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	0000	○	0xD00
Fd.01	485 communication address	1~247	1	○	0xD01
Fd.02	Communication baud rate selection	<b>LED "0" digit: 485 communication</b> 0: 1200 bps 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps 5: 38400 bps <b>LED "00" digit: reserved</b> <b>LED "000" digit: reserved</b> <b>LED "0000" digit: reserved</b>	0003	○	0xD02
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	0ms~500ms	0ms	●	0xD05
Fd.06	Modbus communication overtime fault time	0.1s~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	<b>LED "0" digit: the first group transmitting frame selection</b> 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 <b>LED "00" digit: the second group transmitting frame selection</b> Same as above <b>LED "000" digit: the third group transmitting frame selection</b> Same as above <b>LED "0000" digit: the fourth group transmitting frame selection</b> Same as above	0031	●	0xD09
Fd.10	RS485 communication port configuration	0: Modbus communication 1: serial port communication	0	●	0xD0A

## 4.2 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, 55-59:Reserved	
15	channel combination switch to B	40	Timer trigger terminal		
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

### 4.3 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

#### 4.4 Fault Code

Display	Code	Fault type	Display	Code	Fault type	Display	Code	Fault type
E. SC	1	System abnormal	E.oC1	4	ACC over current	E.oC2	5	DEC over current
E.oC3	6	Overcurrent at constant speed	E.oU1	7	ACC over voltage	E.oU2	8	DEC over voltage
E.oU3	9	Overvoltage at constant speed	ELU2	10	Undervoltage when running	E.oL1	11	Motor overload
E.oL2	12	Inverter overload	E.LF R.LF	13/65	Input side loss phase	E.oLF	14	Output side loss phase
E.oH2	15	Rectifier overheat	E.oH1	16	Inverter overheat	E.EF	17	External fault
E.CE R.CE	18/74	RS485 communication abnormal	E.HAL	19	Current detection fault	EFE1	20	Motor detection fault
EEEE REEP	21/69	Storage fault	EFE1	25	Motor detection fault	ECPE	26	Parameter copy abnormal
E.PG	27	PG card connection abnormal	E.oU4	28	Over voltage at stop	EP id RP id	29/66	PID feedback fault
L.FE	30	Keyboard identification fault, check C-36	E.RE	31	Learning fault of Initial position angle	EdEF RdEF	32/70	Speed deviation too large
ESPd RSPd	33/71	Stall protection	ELd1 RLd1	34/67	Load protection 1	ELd2 RLd2	35/68	Load protection 2
E.CPU	36	CPU over time	ELoC	37	OTP verification fault	E038	38	Synchromotor out-off step
LU1	64	Undervoltage at stop	RO72	72	GPS locked	RO73	73	GPS wire break

## Chapter 5 Periodic Overhaul and Maintenance

### 5.1 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	<ul style="list-style-type: none"> <li>● Check whether the wire and connector color changes, whether there is disrepair, crack color change or aging in insulated layer.</li> <li>● Check whether the connect terminals are frayed, damaged or loose.</li> <li>● Earth checking.</li> </ul>	<ul style="list-style-type: none"> <li>● Change bad wires.</li> <li>● Fasten terminals and change bad terminals.</li> <li>● Measure earth resistance and fasten earth terminals.</li> </ul>
Mechanical connection	<ul style="list-style-type: none"> <li>● Check if there is abnormal vibration or noise or something is loose.</li> </ul>	<ul style="list-style-type: none"> <li>● Tighten, lubricate and change the bad components.</li> </ul>
semi-conductive component	<ul style="list-style-type: none"> <li>● Check whether there is dust or rubbish.</li> <li>● If there is obvious out change</li> </ul>	<ul style="list-style-type: none"> <li>● Clean operation environment</li> <li>● Change damaged component</li> </ul>
Electrolytic capacitor	<ul style="list-style-type: none"> <li>● Whether there is liquid leak, color change or crack. Whether the safety valve outcrop, inflation, creak or liquid leak.</li> </ul>	<ul style="list-style-type: none"> <li>● Change damaged component</li> </ul>

Peripheral equipment	<ul style="list-style-type: none"> <li>● Peripheral equipment outlook and insulation checking.</li> </ul>	<ul style="list-style-type: none"> <li>● Clear and change damaged component.</li> </ul>
PCB	<ul style="list-style-type: none"> <li>● Peculiar smell color change, bad rust and connector checking.</li> </ul>	<ul style="list-style-type: none"> <li>● Fasten connector</li> <li>● Clear PCB</li> <li>● Change damaged PCB</li> </ul>
Cooling system	<ul style="list-style-type: none"> <li>● Check whether the fan is damaged or blocked up.</li> <li>● Whether rubbish and dust is stuck to the heatsink .</li> <li>● whether the air inlet/outlet blocked Or is there something sticking to the inlet/outlet.</li> </ul>	<ul style="list-style-type: none"> <li>● Clean operation environment</li> <li>● Change damaged component</li> </ul>
Keyboard	<ul style="list-style-type: none"> <li>● Whether it is damaged. Check whether display is complete.</li> </ul>	<ul style="list-style-type: none"> <li>● Change damaged component</li> </ul>
Motor	<ul style="list-style-type: none"> <li>● Check if there is abnormal vibration or noise.</li> </ul>	<ul style="list-style-type: none"> <li>● Tighten machine and electric connection and lubricate the machine components.</li> </ul>

## 5.2 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 can not 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
----------------	------	------	------	------	------	------	------	------	-----------	----------

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 locked	
		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 Torque Control	0x3006 or 0x2006	0~1000 is corresponding to 0.0%~100.0%			W/R

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 B110 -- Y BIT1 -- TA1-TB1-TC1; BIT2 -- TA2-TB2-TC2	R
AO1 output	0x3021 or 0x2021	0~10000 corresponds output 0V~10V,0mA~20mA	R
AO2 output	0x3022 or 0x2022	0~10000 corresponds output 0V~10V,0mA~20mA,0kHz~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