4XH32QB151210-321

Small General-purpose AC Drive

User Manual

220V 0.4KW-5.5KW

400V 0.4KW-7.5KW

- Please read this Manual carefully and understand all the contents in it for correct installation and use.
- This Manual should be handed over to and properly kept by the end user.
- The technical specification of this product may be subject to change without notice.

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Statement

Thank you for using our AC drive. Please read this User Manual carefully before use, and use it after you are familiar with the safety precautions of this product.

Safety Precautions:

1. Before wiring, ensure that the input power supply is in power-off state.
2. Wiring must be performed by professional electrical engineers.
3. Grounding terminals must be grounded.
4. Be sure to check for proper operation after wiring the emergency stop circuit.
5. Do not connect the output wire of the AC drive to the shell, and pay attention that the output wire should not be short-circuited.
6. Please check whether the voltage of the AC main circuit power is consistent with the rated voltage of the AC drive.
7. Do not perform a withstand voltage test on the AC drive.
8. Please connect the brake resistor according to the wiring diagram.
9. Do not connect the power cord to the output U, V, W terminals.
10. Do not connect the contactor to the output circuit.
11. Be sure to install the protective cover before power-on. When removing the cover, be sure to disconnect the power supply.
12. If you want to reset the AC drive with the retry function, do not get close to the mechanical equipment, because it will restart suddenly when the alarm stops.
13. After confirming that the running signal is cut off, the alarm can be reset. If the alarm is reset under running signal status, the AC drive may start suddenly.
14. Do not touch the terminals of the AC drive, which is very dangerous because there is high voltage on them.
15. While the power is on, do not change the wiring and do not remove or install the terminals.
16. Cut off the main circuit power supply before inspection or maintenance.
17. Do not modify the AC drive without authorization.

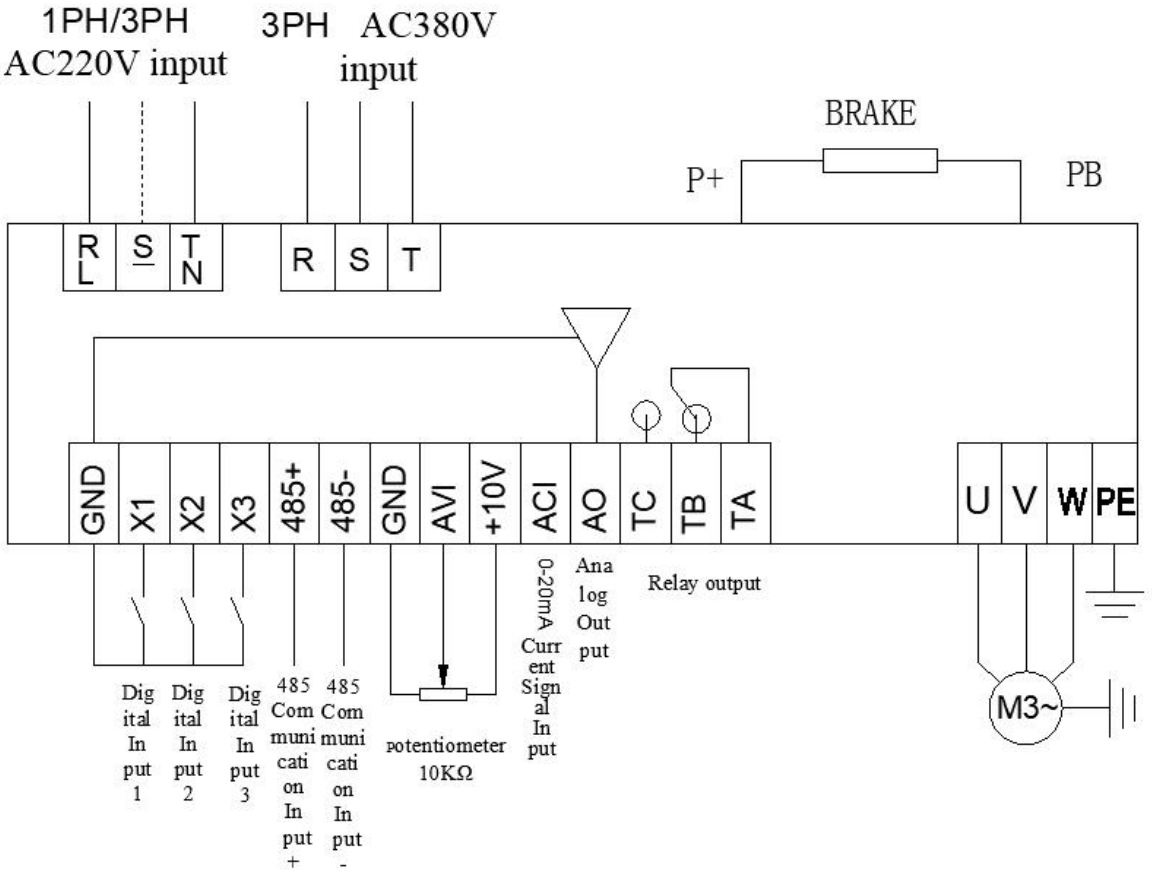
1. Technical data

Rated data of AC drive					
Model	Power	Power supply	Output current (A)	Overall dimension L*W*H (mm)	Installation dimension L * W -mounting screw
0.4S1-220V	0.4KW	Single-phase AC 200V-240V 50Hz/60Hz	2.1	170*79*127	60.5*160-M5
0.75S1-220V	0.75KW		3.8		
1.5S1-220V	1.5KW		7		
2.2S1-220V	2.2KW		9.0	187*86*144	173*68-M4
3.0S1-220V	3.0KW		13	216*101*151	204*83.5-M4
4.0S1-220V	4.0KW		15	237*111*168	216*88-M5
5.5S1-220V	5.5KW		20		
0.4S3-220V	0.4KW	Three-phase AC 200V-240V 50Hz/60Hz	2.1	170*79*127	60.5*160-M5
0.75S3-220V	0.75KW		3.8		
1.5S3-220V	1.5KW		7		
2.2S3-220V	2.2KW		9.0	187*86*144	173*68-M4
3.0S3-220V	3.0KW		13	216*101*151	204*83.5-M4
4.0S3-220V	4.0KW		15	237*111*168	216*88-M5
5.5S3-220V	5.5KW		20		
0.4G3-380V	0.4KW	Three-phase AC 340V-440V 50Hz/60Hz	1.5	170*79*127	60.5*160-M5
0.75G3-380V	0.75KW		2.1		
1.5G3-380V	1.5KW		3.8		
2.2G3-380V	2.2KW		5.1	187*86*144	173*68-M4
3.0G3-380V	3.0KW		7.1		
4.0G3-380V	4.0KW		9.0	216*101*151	204*83.5-M4
5.5G3-380V	5.5KW		12.6		
7.5G3-380V	7.5KW		16.1	237*111*168	216*88-M5

Selection of braking resistor				
Model	Power	Input power supply	Power of braking resistor	Resistance of braking resistor
0.4S1-220V	0.4KW	Single-phase AC 200V-240V 50Hz/60Hz	100 W	250 Ω
0.75S1-220V	0.75KW		100 W	200 Ω
1.5S1-220V	1.5KW		300 W	100 Ω
2.2S1-220V	2.2KW		300 W	100 Ω
4.0S1-220V	4.0KW		500 W	75 Ω
5.5S1-220V	5.5KW		1000 W	75 Ω
0.4S3-220V	0.4KW	Three-phase AC	100 W	250 Ω

0.75S3-220V	0.75KW	200V-240V 50Hz/60Hz	100 W	200 Ω
1.5S3-220V	1.5KW		300 W	100 Ω
2.2S3-220V	2.2KW		300 W	100 Ω
4.0S3-220V	4.0KW		500 W	75 Ω
5.5S3-220V	5.5KW		1000 W	75 Ω
0.4G3-380V	0.4KW	Three-phase AC 340V-440V 50Hz/60Hz	100 W	750 Ω
0.75G3-380V	0.75KW		100 W	750 Ω
1.5G3-380V	1.5KW		300 W	400 Ω
2.2G3-380V	2.2KW		300 W	250 Ω
4.0G3-380V	4.0KW		500 W	150 Ω
5.5G3-380V	5.5KW		800 W	100 Ω
7.5G3-380V	7.5KW		1000 W	75 Ω

2. Installation and wiring

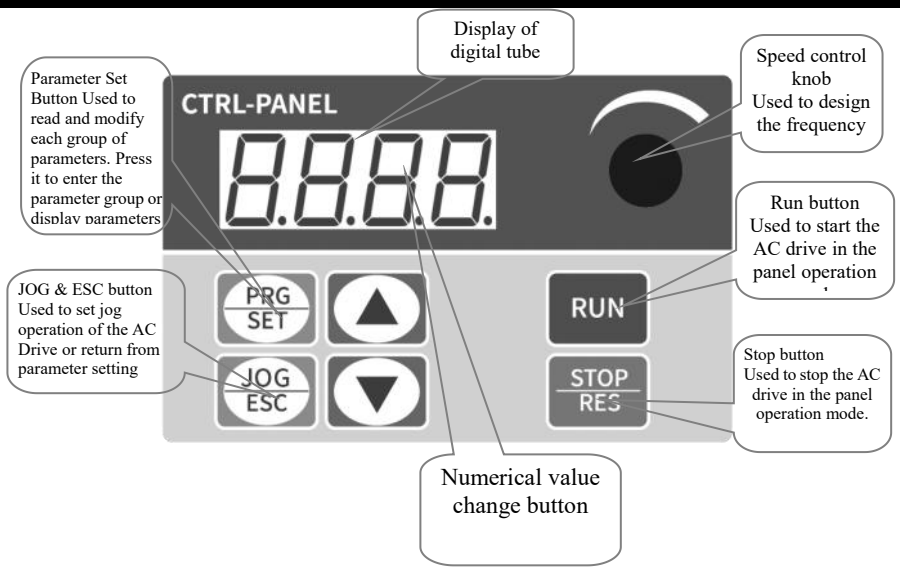


Description of Terminal Function		
Terminal	**Usage**	**Setting and Description**
R, S, T	Power supply of AC Drive: 380V model, connect to R, S, T terminals 220V model, connect to R, S or R, T terminals (determined by the label on the terminal)	Air switch should be used as the overcurrent protection device in the front of the AC drive input power supply. If a LCDI is provided, to prevent its malfunction, please choose a LCDI whose sensitivity level is above 200mA and action time is more than 100ms.
U, V, W	AC drive output, connected to the motor	To reduce the leakage current, the motor connecting cable should not exceed 50m wherever possible.
PE	Grounding	The AC drive should be well grounded.
X1	Digital input X1	Set via parameter F5.02, the factory default is FWD
X2	Digital input X2	Set via parameter F5.03, the factory default is REV
X3	Digital input X3	Set via parameter F5.04, the factory default is set to Multi-speed Step 1
X4	485 Communication input +	The factory default is set to 485+
X5	485 Communication input -	The factory default is set to 485-
GND	Common port of signal	Zero potential of input/output signal
AVI	0-10V signal input	0-10V

10V	Frequency set potentiometer power supply	+10V, max. 10mA
ACI	4-20mA analog input	4-20mA
AO	Analog output signal	Set via parameter F6.10
TA, TB, TC	Relay output	Set via parameter F5.07 Contact capacity: AC 250V/3A DC 24V/2A

3. Commissioning and operation

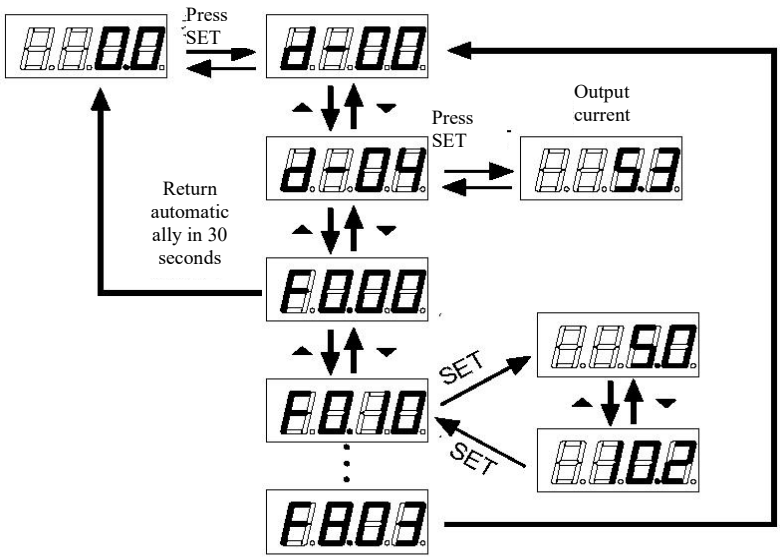
① Operation panel and methods



Steps to return to the original interface after setting the parameters:

1. Power it off and power it on again. 2. Select parameter d-00, and then press SET button. 3. Long press SET button

Display output frequency after power on



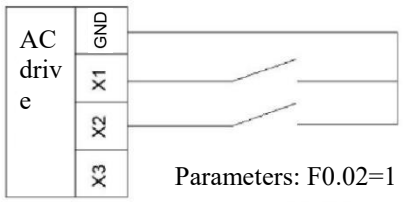
② Setting the running command mode of AC drive

Set the running command mode of AC drive via parameter F0.02: There are two command modes: panel control start/stop, and terminal control start/stop:

(1) Panel control start/stop: (the factory setting is panel start/stop F0.02=0)

When you use the panel to control the AC drive, press the green button on the panel to start it, and the red button to stop it. The AC drive starts Forward by default. Forward and Reverse are set via the input terminals X1-X5, (REV is set to 4).

(2) Terminal control start/stop: (the factory setting is terminal start/stop F0.02=1)



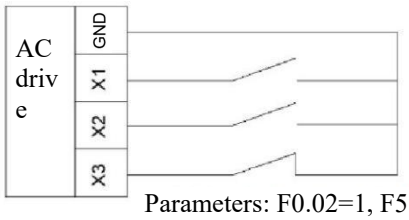
Parameters: F0.02=1

Common port

Forward when connected, stop when disconnected

Reverse when connected, stop when disconnected

Two-wire Control Mode 1



Common port

Forward when connected, keep forward when disconnected

Reverse when connected, keep reverse when disconnected

Stop when disconnected

Parameters: F0.02=1, F5.04=5, F5.00=2

Three-wire Control Mode 1

③ Setting the frequency of AC drive

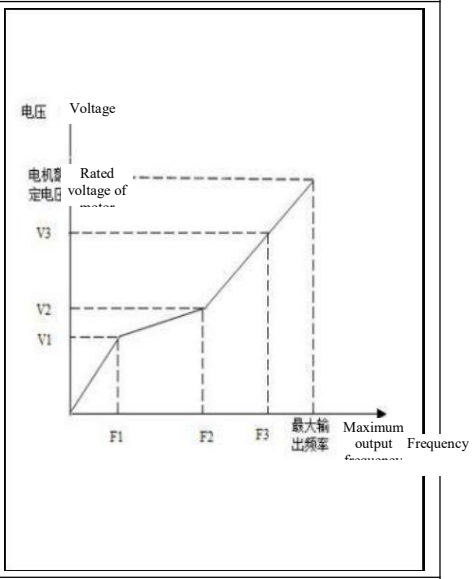
Set the frequency of AC drive via parameter F0.03. When F0.03=4, the running frequency is set by the potentiometer; when F0.03=2, the running frequency is input by AVI (0-10V can be connected to a potentiometer);

when F0.03=3, the running frequency is input by ACI (4-20mA); when F0.03=1, it is controlled by the external terminal (the switching value is set to frequency increment/decrement).

4. Parameter table

Parameters	Name	Factory default	Setting range	Description
Group F0 - Basic Operating Parameters				
F0.00	AC drive power	By model	0.0-99.9kw	Current power of AC drive
F0.01	Control mode	0	0-1	0: V/F control 1: Open loop vector
F0.02	Running command selection	0	0-2	0: Panel running command 1: Terminal running command 2: Communication running command
F0.03	Main frequency source X selection	4	0-8	0: Digital setting (preset frequency F0-07, adjusted by UP/DOWN, power off without memory) 1: Digital setting (preset frequency F0-07, adjusted by UP/DOWN, power off with memory) 2: AI1 (AVI) 3: AI2 (ACI) 4: AI3 (Keyboard potentiometer) 5: Multi-speed command 6: Simple PLC 7: PID 8: Communication
F0.04	Auxiliary frequency source Y selection	0	0-8	Same as F0.03
F0.05	Main and auxiliary frequency calculation	0	0-3	0: Main + auxiliary 1: Main - auxiliary 2: Max. (main, auxiliary) 3: Min. (main, auxiliary)
F0.06	Frequency source selection	0	0-4	0: Main frequency source X 1: Main and auxiliary calculation (determined by calculation in F0.05) 2: Switchover between main frequency source X and auxiliary frequency source Y 3: Switchover between main frequency source X and “main & auxiliary calculation” 4: Switchover between auxiliary frequency source Y and “main & auxiliary calculation”
F0.07	Digital frequency setting	50.00Hz	0-Maximum frequency	The set value is the given initial value of digital frequency
F0.08	Maximum output frequency	50.00Hz	Upper limit frequency-400.0Hz	The maximum output frequency is the highest frequency allowed for the output of the AC Drive, and the benchmark for acceleration and deceleration settings.

F0.09	Upper limit frequency	50.00Hz	Lower limit frequency - maximum output frequency	The running frequency must not exceed this frequency
F0.10	Lower limit frequency	0.00Hz	0-Upper limit frequency	The running frequency must not be lower than this frequency
F0.11	Upper limit frequency arrival processing	0	0-2	0: Zero-speed running 1: Running at the lower limit frequency 2: Stop
F0.12	Acceleration time 1	10.0s	0.1~999.9s	The time required for the AC drive to accelerate from zero frequency to the maximum output frequency
F0.13	Deceleration time 1	10.0s	0.1~999.9s	Time required for the AC drive to decelerate from the maximum output frequency to zero frequency
F0.14	Operation direction	0	0-2	0: Forward rotation, 1: Reverse rotation, 2: Reverse rotation prohibited This parameter is valid when the panel is selected as the running command source for Forward and Reverse rotation. For Reverse rotation prohibited, the AC drive will not reverse rotation regardless of the running command source.
F0.15	User password	0	0~9999	When a number other than 0 is set, the password will work; after decryption, if 0000 is set, the password function will be canceled.
F0.16	Software version	xx.xx	01.00-99.99	Current software version.
F0.17	Parameter initialization	0	0-3	0: No action 1: Restore factory defaults (excluding motor parameters) 2: Fault clearing 3: Restore all parameters to factory defaults (including motor parameters)
F0.18	Reserved			
F0.19	Reserved			
F0.20	Retentive selection of digital setting frequency upon stop	1	0-1	0: Not retentive 1: Retentive
Group F1 - V/F Control Parameters				
F1.00	V/F curve setting	0	0-4	0: Linear curve 1: Square curve 2: 1.5 power curve 3: 1.2 power curve 4: Multi-point VF curve
F1.01	Torque boost	3.0%	0.0~30.0%	Manual torque boost, this value is set as a percentage relative to the rated voltage of the motor. When it is 0, it switches to automatic torque boost.
F1.02	Cut-off frequency of	15.00Hz	0.0~50.00Hz	The cut-off frequency for manual torque

	torque boost			boost
F1.03	Carrier frequency setting	By model	2.0~16.0KHz	Increasing the carrier frequency can reduce noise, but it will increase the heat generation of the AC Drive.
F1.04	V/F frequency value F1	12.50Hz	0.01~Frequency value F2	
F1.05	V/F voltage value V1	25.0%	0.0~Voltage value V2	
F1.06	V/F frequency value F2	25.00Hz	Frequency value F1~Frequency value F3	
F1.07	V/F voltage value V2	50.0%	Voltage value V1~Voltage value V3	
F1.08	V/F frequency value F3	37.50Hz	Frequency value F2~Motor rated frequency	
F1.09	V/F voltage value V3	75.0%	Voltage value V2~100.0% (motor rated voltage)	
F1.10	AVR function	0	0~2	0: Invalid; 1: Valid in the whole process; 2: Invalid during deceleration, valid during acceleration and at constant speed
F1.11	Braking ratio	90%	0~100%	Braking ratio of braking resistor
F1.12	Torque compensation gain	0%	0~150%	
F1.13	V/F over-excitation gain	84%	0~200%	
F1.14	Oscillation suppression mode	5	0~6	
Group F2 - Vector Control Parameters				
F2.00	Speed loop low speed Kp	20	1~100	
F2.01	Speed loop low speed Ki	0.50	1~10.00	
F2.02	Speed loop high speed Kp	10	1~100	
F2.03	Speed loop high speed Ki	1.00	1~10.00	
F2.04	Calculation switching point of speed loop low-speed frequency	10.00Hz	Lower limit frequency ~ maximum frequency	
F2.05	Calculation switching point of speed loop high-speed frequency	30.00Hz	Lower limit frequency ~ maximum frequency	
F2.06	Electric slip compensation gain	0%	0~100.0%	

F2.07	Reserved			
F2.08	Reserved			
F2.09	Reserved			
F2.10	Current loop Kp	2000	0~60000	
F2.11	Current loop Ki	1300	0~60000	
F2.12	Reserved			
F2.13	Reserved			
F2.14	Slip compensation gain of open loop vector	100%	0~200%	
F2.15	Reserved			
F2.16	Reserved			
F2.17	Reserved			
F2.18	Reserved			
F2.19	Digital setting of torque limit in speed control (drive)	150.0%	0~200.0%	
F2.20	Maximum torque coefficient of field weakening area	100%	50~200%	
F2.21	M-axis current loop scale coefficient	5	5~300	
F2.22	M-axis current loop integral coefficient	0	0~65535	
F2.23	Speed loop filter time constant of open loop vector	25	0~100	
F2.24	Open loop vector torque boost	100	0~500	
F2.25	Cut-off frequency of open loop vector torque boost	20.00Hz	Lower limit frequency ~ maximum frequency	
F2.26	Torque given filter	28	0~31	
F2.27	Maximum field weakening voltage overmodulation factor	105%	0~110%	
F2.28	Flux observation compensation factor	100%	0~100%	
F2.29	Flux observation filter coefficient	300	0~2000	
F2.30	T-axis current closed-loop coefficient	0	0~500	
F2.31	Torque limiting method	0	0~1	
F2.32	Reserved			
F2.33	Reserved			
Group F3 - Auxiliary Operating Parameters				

F3.00	Start method	0	0-1	0: Start by start frequency 1: Start by start frequency after DC braking
F3.01	Start frequency	0.50Hz	0.50~20.00Hz	Initial frequency of AC drive start
F3.02	Start frequency hold time	0	0.0~60.0s	Start frequency running time
F3.03	DC braking current at start	0.0%	0.0~100%	Current value for applying DC braking When the rated current of the motor is less than or equal to 80% of the rated current of the AC Drive, it is the percentage base relative to the rated current of the motor; When the rated current of the motor is greater than 80% of the rated current of the AC drive, it is the percentage base relative to 80% of the rated current of the AC drive;
F3.04	DC braking time at start	0.0s	0.0~60.0s	Duration of applying DC braking
F3.05	Stop mode	0	0~2	0: Decelerate to stop 1: Decelerate to stop + DC braking 2: Free stop
F3.06	DC braking start frequency at stop	0.00Hz	0.00~Upper limit frequency	When the frequency reaches the preset frequency, DC braking starts to work
F3.07	DC braking current at stop	0.0%	0.0~100%	Current value for applying DC braking is the same as “DC braking at start”
F3.08	DC braking time at stop	0.0s	0.0~30.0s	Duration of applying DC braking
F3.09~F3.15	Reserved			
Group F4 - Auxiliary Operating Parameters 2				
F4.00	FWD jog frequency setting	10.00Hz	0.00~50.00Hz	Set jog FWD & REV frequency
F4.01	REV jog frequency setting			
F4.02	Jog acceleration time	By model	0.1~999.9s	Set jog acceleration and deceleration time
F4.03	Jog deceleration time			
F4.04	Accelerationtime 2	10.0s	0.1~999.9s	
F4.05	Deceleration time 2	10.0s	0.1~999.9s	
F4.06	Set priority to JOG	1	0~1	0: Invalid 1: When the AC drive is running, JOG has the highest priority
F4.07	Skip frequency	0.00Hz	0.0~Upper limit frequency	By setting the skip frequency and range, the AC drive can avoid the mechanical resonance point of the load.
F4.08	Skip range	0.00Hz	0.0~ 10.0Hz	
Group F5 - Digital I/O Parameters				
F5.00	FWD/REV terminal control mode	0	0-3	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1

				3: Three-wire control mode 2
F5.01	Terminal function test at power-on	0	0-1	0: Terminal running command is invalid when power on 1: Terminal running command is valid when power on
F5.02	Functions of input terminal X1	3	0~27	0: No function 1: Forward jog control 2: Reverse jog control 3: Forward rotation control (FWD) 4: Reverse rotation control (REV) 5: Three-wire control6: Free stop control 7: External stop signal input (STOP) 8: External reset signal input (RST) 9: External fault normally open (NO) input 10: Frequency increment command (UP) 11: Frequency decrement command (DOWN) 12: Multi-speed selection S1 13: Multi-speed selection S2 14: Multi-speed selection S3 15: Running command channel is forced to be terminal 16: Reserved 17: Stop DC braking command 18: Frequency source switchover (F0.06) 19: Reserved 20: Reserved 21: Reserved 22: Counter reset signal (Fb.10 counting function) 23: Counter trigger signal (Fb.10 counting function) 24: Timer reset signal (Fb.10 timing function) 25: Timer trigger signal (Fb.10 timing function) 26: Acceleration/Deceleration time selection (switchover between Acceleration/Deceleration time 1 and Acceleration/Deceleration time 2)
F5.03	Functions of input terminal X2	4	0~27	
F5.04	Functions of input terminal X3	12	0~27	
F5.05	Functions of input Terminal X4(communication version: 485+)	13	0~27	Reserved
F5.06	Functions of input terminal X5 (communication version: 485-)	8	0~27	Reserved
F5.07	Relay R output function setting	5	0~14	0: No function 1: AC drive ready for run

				2: AC drive running 3: AC drive running at zero speed 4: External fault shutdown 5: AC drive fault 6: Frequency/speed arrival signal (FAR) 7: Frequency/speed level detection signal (FDT) 8: Output frequency reaches the upper limit 9: Output frequency reaches the lower limit 10: AC drive overload prewarning 11: Timer overflow signal (relay output when the timing reaches the set time in Fb.13) 12: Counter detection signal (relay output when the count value reaches the counter detected value in Fb.12) 13: Counter reset signal (reserved) 14: Reserved
F5.08	R closing delay	0.0s	0.0~999.9s	The delay from the status change of the relay R to the output change
F5.09	R opening delay			
F5.10	Frequency reaches the FAR detection amplitude	5.00Hz	0.00Hz~15.00Hz	When the output frequency falls within the positive and negative detection width of the set frequency, the terminal outputs a valid signal (low level).
F5.11	Set value of FDT level	10.00Hz	0.00Hz~Upper limit frequency	
F5.16	X1 filter coefficient	5	0~9999	Used to set the sensitivity of input terminal. If the digital input terminal is susceptible to interference, thus resulting in malfunction, this parameter can be increased to enhance the anti-interference capacity, but if the set value is too high, the sensitivity of input terminal will be reduced. 1: represents the 2MS scan time unit
F5.17	X2 filter coefficient	5	0~9999	
F5.18	X3 filter coefficient	5	0~9999	
F5.19	X4 filter coefficient	5	0~9999	
F5.20	X5 filter coefficient	5	0~9999	
Group F6 - Analog Input and Output Functions				
F6.00	AVI input lower limit voltage	0%	0.00~100.0%	Set AVI lower limit voltage
F6.01	AVI input upper limit voltage	100.0%	0.00~100.0%	Set AVI upper limit voltage
F6.02	Corresponding	0.0%	-100.0%~100.0%	Set the corresponding percentage of AVI
	percentage of AVI lower limit			lower limit, which corresponds to the percentage of the maximum frequency.
F6.03	Corresponding percentage of AVI upper limit	100.0%	-100.0%~100.0%	Set the corresponding percentage of AVI upper limit, which corresponds to the percentage of the maximum frequency.
F6.04	ACI input lower limit	0.0%	0.00~100.0%	Set ACI input lower limit current

	current			
F6.05	ACI input upper limit current	100.0%	0.00~100.0%	Set ACI input upper limit current
F6.06	Corresponding percentage of ACI lower limit	0.0%	-100.0%~100.0%	Set the corresponding percentage of ACI lower limit, which corresponds to the percentage of the maximum frequency.
F6.07	Corresponding percentage of ACI upper limit	100.0%	-100.0%~100.0%	Set the corresponding percentage of ACI upper limit, which corresponds to the percentage of the maximum frequency.
F6.08	Filter time constant of analog input signal	0.1s	0.1~5.0s	This parameter is used to filter the input signal of AVI, ACI and panel potentiometer to eliminate effects of interference.
F6.09	Analog input debouncing deviation limit	0	0.00~100.0%	When the analog input signal fluctuates frequently around the set value, set this parameter to suppress the frequency variation caused by such fluctuation.
F6.10	AO analog output terminal function selection	0	0~5	0: Output frequency, 0~Maximum frequency 1: Set frequency, 0~Maximum frequency 2: Output current, 0~2 times rated current 3: Output voltage, 0~2 times rated voltage 4: AVI, 0~10V 5: ACI, 0~20mA
F6.11	Lower limit of AO function	0.0	0.0~100.0%	Set the upper and lower limits of the function selected by AO
F6.12	Upper limit of AO function	100.0%		
F6.13	Lower limit of AO output	0.0		Set the upper and lower limits of AO output
F6.14	Upper limit of AO output	100.0%		
Group F7 - Program Running Parameters (PLC)				
F7.00	Multi-speed frequency 1	5.00Hz	Lower limit frequency ~ Upper limit frequency	Set speed 1 frequency
F7.01	Multi-speed frequency 2	10.00Hz	Lower limit frequency ~ Upper limit frequency	Set speed 2 frequency
F7.02	Multi-speed frequency 3	15.00Hz	Lower limit frequency ~ Upper limit frequency	Set speed 3 frequency
F7.03	Multi-speed frequency 4	20.00Hz	Lower limit frequency ~ Upper limit frequency	Set speed 4 frequency
F7.04	Multi-speed frequency 5	25.00Hz	Lower limit frequency	Set speed 5 frequency

			~ Upper limit frequency	
F7.05	Multi-speed frequency 6	37.50Hz	Lower limit frequency ~ Upper limit frequency	Set speed 6 frequency
F7.06	Multi-speed frequency 7	50.00Hz	Lower limit frequency ~ Upper limit frequency	Set speed 7 frequency
F7.07	Programmable operation control (simple PLC operation)	0	0~2	0: Single cycle 1: Continuous cycle 2: Keep the final value after a single cycle
F7.08	Stop memory selection	0	0~1	0: Stop without memory, 1: Stop with memory
F7.09	Power off memory selection	0	0~1	0: Power off without memory, 1: Power off with memory
F7.10	T1 running time	10.0s	0.0~999.9s	Set speed 1 running time
F7.11	T2 running time	10.0s	0.0~999.9s	Set speed 2 running time
F7.12	T3 running time	10.0s	0.0~999.9s	Set speed 3 running time
F7.13	T4 running time	10.0s	0.0~999.9s	Set speed 4 running time
F7.14	T5 running time	10.0s	0.0~999.9s	Set speed 5 running time
F7.15	T6 running time	10.0s	0.0~999.9s	Set speed 6 running time
F7.16	T7 running time	10.0s	0.0~999.9s	Set speed 7 running time
F7.17	T1 running mode	0	0~3	0: FWD, select acceleration time 1 1: FWD, select acceleration time 2 2: REV, select acceleration time 1 3: REV, select acceleration time 2
F7.18	T2 running mode	0		
F7.19	T3 running mode	0		
F7.20	T4 running mode	0		
F7.21	T5 running mode	0		
F7.22	T6 running mode	0		
F7.23	T7 running mode	0		
F7.24	Current running section (reserved)			
F7.25	Current running time (reserved)			
Group F8 - PID Parameters				
F8.00	PID control characteristics	0	0~1	0: Direct action 1: Reverse action
F8.01	PID reference selection	0	0~3	0: Digital setting 1: Keyboard potentiometer setting 2: AVI input 3: ACI input
F8.02	PID feedback selection	0	0~1	0: AVI input 1: ACI input
F8.03	PID digital setting	0.5	Lower limit of PID range ~ Upper limit of PID range	The set value when the PID given source is digital setting

F8.04	PID command acceleration/deceleration time	0.0	0.00~100.0s	
F8.05	PID bias setting	0.0	0 ~100.0%	
F8.06	PID bias hold time	0.0	0 ~ 6000.0s	
F8.07	PID deviation upper limit	100.0	0 ~100.0%	
F8.08	PID deviation lower limit	0.0	00.0%~ 100.0% (Maximum frequency)	
F8.09	proportional gain	25.00	0.00~600.0 0	
F8.10	Integration time	1.0	0: No integral 0.1 - 100.0s	
F8.11	Differential time	0.00	0.00: No differential 0.00 - 10.00s	
F8.12	PID output upper limit	100.0	0.0~100.0%	
F8.13	PID output lower limit	0.0	0.0~100.0%	
F8.14	PID output filter time	0.00	0.00~10.00 s	
F8.15	Feedback fault action selection	2	0~4	0: Running at the upper limit frequency 1: Running at the lower limit frequency 2: Running at the digital setting frequency 3: Decelerate to stop 4: Free stop
F8.16	Loss detection value	0.0	0.0~100.0%	
F8.17	Loss detection	1.0	0.0~100.0s	
	time			
F8.18	Excessive detection value	100.0	0.0~100.0%	
F8.19	Excessive detection time	1.0	0.0~100.0s	
F8.20	PID sleep control	0	0~2	0: No sleep function 1: Internal wake-up 2: External input terminal control
F8.21	Sleep stop mode	0	0~1	0: Decelerate to stop 2: Free stop
F8.22	Sleep frequency	0.00	0.00 Hz ~ maximum frequency	
F8.23	Sleep pressure	95.0%	F8.25 ~100.0%	
F8.24	Sleep delay time	30.0	0.0~6000.0 s	
F8.25	Wake-up pressure	80.0%	0.0%~F8.23	

F8.26	Wake-up delay time	3.0	0.0~60.0s	
F8.27	Lower limit of PID range	0.0	-3276.8~3276.8	Since the display consists of 4 digital tubes, the digits displayed may not match the actual value, but it does not affect the final set value.
F8.28	Upper limit of PID range	10.0	-3276.8~3276.8	Since the display consists of 4 digital tubes, the digits displayed may not match the actual value, but it does not affect the final set value.
F8.29	Decimal places of range	1	0~	0: Not display decimal places 1: Display one decimal place 2: Display two decimal places 3: Display three decimal places This parameter is only used to control the decimal places display of F8.03, F8.25, F8.26, d0-11 and d0-12;
F8.30	Water shortage detection frequency	48.00Hz	0.00Hz~F0.08	
F8.31	Water shortage detection pressure	0.0	0.0~F8.28	
F8.32	Water shortage detection time	60.0s	0~6500.0s	
F8.33	Water shortage restart time	600.0s	0~6500.0s	
F8.34	Restart times of water shortage	6	9999	
F8.35	Reserved			
F8.36	The operation mode of PV pump	0	0~3	0: Disabled 1: The operation mode of PV pump 1 2: The operation mode of PV pump 2
F8.36	Pump related function ON/OFF control	0	0~3	0: Disabled 1: MPPT enabled 2: PV Pump enabled 3: MPPT and PV Pump enabled
F8.37	MPPT minimum operating voltage	By model	0~MPPT maximum operating voltage	If the bus voltage (d-03) is higher than the set value of the maximum operating voltage (F8.38), run at the maximum frequency; if it is lower than the set value of the maximum operating voltage (F8.38), run at the frequency calculated by (busbar voltage)/MPPT maximum operating voltage) * maximum frequency; if it reaches the MTTP minimum operating voltage (F8.37), run at the minimum outflow frequency (F8.40).
F8.38	MPPT maximum operating voltage	By model	MPPT minimum operating voltage~1000V	
F8.39	Water shortage fault shielding	0	0~1	0: Enabled

				1：Disabled
F8.40	Undervoltage restart enabled	0	0~1	0：Disabled 1：Enabled
F8.41	Undervoltage restart delay	10.0s	0.0~360.0s	
F8.42	Power on and start automatically	0	0~1	0：Disabled 1： Enabled
F8.43	No-load current ratio corresponding to water shortage detection current of PV pump	0.0	0.0~300.0%	If the AC drive runs above the minimum outflow frequency (F8.40), and the output current is less than the motor no-load current (F9.11) * the no-load current ratio corresponding to water shortage detection current of PV pump (F8.39), after the water shortage detection time of the PV pump (F8.41), the AC drive reports a water shortage fault (ELT).
F8.44	Minimum outflow frequency of PV pump	0.00	0~99.99H z	
F8.45	Water shortage detection time of PV pump	0.0	0~250.0s	
F8.46	Wobble Enable	0	0~1	0：Disabled 1：Enabled
F8.47	Wobble setting mode	0	0~1	0: Relative to the maximum frequency 1: Relative to the center frequency
F8.48	Wobble Startup Mode	0	0~1	0: Memorize the state before stopping 1: Restart start up
F8.49	Wobble amplitude	0.0%	0.0%~100.0%	
F8.50	Wobble step	0.0%	0.0%~50.0%	
F8.51	Wobble rise time	5.0s	0.1s~400.0s	
F8.52	Wobble fall time	5.0s	0.1s~400.0s	
F8.53	Upper frequency delay	5.0s	0.1s~999.9s	
F8.54	Lower frequency delay	5.0s	0.1s~999.9s	
F8.55				
Group F9 - Motor Parameters				
F9.00	Rated power	By model		Motor parameter setting
F9.01	Rated voltage	By model	1~500V	Motor parameter setting
F9.02	Rated current	By model	0.01~99.99A	
F9.03	Rated speed	By model	0~60000Krpm	
F9.04	Rated frequency	50.0Hz	1.0~400.00Hz	

F9.05	Parameter identification	0	0~1	0: Disable parameter identification; 1: Enable static parameter identification, automatically set to 0 after identification;
F9.06	Stator resistance	By model	0.001~65.535Ω	Different models have corresponding default values, and the parameter identification will automatically change the value;
F9.07~F9.09	Rotor resistance, leakage inductance, mutual inductance, etc.	By model		Different models have corresponding default values, and the parameter identification will automatically change the value;
F9.11	No-load current	By model	0.01~	Set motor no-load current; Different models have corresponding default values, and the parameter identification will automatically change the value;
Group FA - Protection Parameters				
FA.00	Overload protection	0	0~1	0: Invalid 1: Valid
FA.01	Motor overload protection factor	100%	30%~110%	Motor overload protection factor is the percentage of the rated current value of the motor to the rated output current value of the AC drive.
FA.02	Undervoltage protection level	180/360 V	150-280 300~480V	This function code specifies the allowable lower limit voltage of the DC bus when the AC drive works normally.
FA.03	Overvoltage Stall Enable	1	0~1	0: Disable 1: Enable
FA.04	Overvoltage limit level	375/660 V	350-380 660~760V	Overvoltage limit level defines the operating voltage during overvoltage stall protection
FA.05	Current limit level	150%	30%~200%	The current limit level defines the current threshold of the automatic current limit action, and its set value is a percentage relative to the rated current of the AC drive.
FA.06	Frequency drop rate at current limit	0	0~99.99Hz/s	
FA.07	Current limit action selection	0	0~2	0: Invalid 1: Valid during acceleration/deceleration, invalid at constant speed 2: Valid during acceleration and deceleration, valid at constant speed
FA.08	AC drive overload prewarning level	120%	120~150%	The current threshold of the AC drive overload prewarning action, and its set value is a percentage relative to the rated current of the AC drive.
FA.09	AC drive overload prewarning delay	5.0s	0.0~15.0s	The delay time from the output current of the AC drive being continuously greater than the overload prewarning level (FA.08) to the output of the overload prewarning signal.
FA.10	Oscillation suppression coefficient	30	0~200	Generally, increase this setting when motor oscillation occurs.
FA.11	Amplitude suppression	20	0~1000	Set the maximum adjustment amount for

	coefficient			oscillation suppression.
FA.12	Lower limit frequency of oscillation suppression	5.00Hz	0.0~Upper limit frequency of oscillation suppression (200.00Hz)	Below this frequency, oscillation suppression will be ineffective.
FA.13	Upper limit frequency of oscillation suppression	50.00Hz	Lower limit frequency of oscillation suppression (0) - 200.00Hz	Above this frequency, oscillation suppression will be ineffective.
FA.14	Wave-by-wave current limit selection	011	000~111	Ones: Select during acceleration, 0: Invalid, 1: Valid Tens: Select during deceleration, 0: invalid, 1: valid Hundreds: Select at constant speed, 0: invalid, 1: valid Thousands: Reserved
FA.15	Wave-by-wave current limit level	180	80%~200%	Rated current of AC drive
FA.16	Fault auto reset times	0	0~10	When it is set to 0, “auto reset” is disabled, and only manual reset is available. “10” indicates unlimited times, that is, countless times.
FA.17	Fault auto reset interval	3.0s	0.5~25.0s	Set the fault auto reset interval
FA.18	VF overcurrent/overvoltage suppression enable	3	0~3	0: No action 1: Overcurrent suppression enable 2: Overvoltage suppression enable 3: Overcurrent/overvoltage suppression enable
FA.19	VF overcurrent suppression Kp	20	0~100	
FA.20	Compensation factor of speed multiplying current limit	50	50~200	
FA.21	VF overvoltage suppression Kp	60	0~100	
FA.22	VF frequency rise threshold during overvoltage stall	5	0~50	
FA.23	VF voltage regulation during overvoltage stall Kp	80	0~100	
FA.24	Power-off/undervoltage stop mode	0	0~1	0: Report undervoltage fault, free stop; 1: Not report undervoltage fault, stop by the set stop mode (F3.05).
FA.25	Reserved			
FA.26	Output phase loss enable	1	0~1	0: Output phase loss protection disabled 1: Output phase loss protection enabled
Group Fb - Display and Special Parameters				

Fb.00	Operation monitoring parameters	0	0~15	The default display items on the main monitoring interface. The corresponding numbers are parameters of Group d.
Fb.01	Stop monitoring parameters	1	0~15	The default display items on the main monitoring interface. The corresponding numbers are parameters of Group d.
Fb.02	Motor speed display coefficient	1.00	0.01~99.99	It is used to correct the display error of the speed scale and has no influence on the actual speed.
Fb.03	Current fault	0	0~9999	Current fault code
Fb.04	Previous one fault	0	0~9999	Previous one fault code
Fb.05	Previous two fault	0	0~9999	Previous two fault code
Fb.06	Fault voltage	0	0~9999	Bus voltage at fault
Fb.07	Fault current	0	0~999.9	Bus current at fault
Fb.08	Fault setting frequency	0	0~300.0	Set frequency at fault
Fb.09	Fault running frequency	0	0~300.0	Running frequency at fault
Fb.10	Counting and timing mode	103	000~303	Ones: Count arrival processing, 0: Single cycle count, stop output; 1: Single cycle count, continue output; 2: Cycle count, stop output; 3: Cycle count, continue output. Tens: Reserved Hundreds: Timing arrival processing, 0: Single-week timing, stop output; 1: Single-week timing, continue output; 2: Cycle timing, stop output; 3: Cycle timing, continue output. Thousands: Reserved
Fb.11	Counter reset value setting	1	0~9999	Set the counter reset value
Fb.12	Counter detection value setting	1	0~9999	Set the counter detection value
Fb.13	Timing setting	0	0~9999s	Set the timing time
Fb.14	Reserved			
Fb.15	Reserved			
Fb.16	Reserved			
Fb.17	Reserved			
Fb.18	Reserved			
Fb.19	Reserved			
Fb.20	Software Upgrade Date (Year)			
Fb.21	Software Upgrade Date (Month Day)			
Fb.22	Display software version	1.00		
Group FC - Communication Parameters				
FC.00	Communication baud rate	3	0~5	0: 1200 3: 9600 1: 2400 4: 19200 2: 4800 5: 38400
FC.01	Communication form	0	0~6	Data format: <Data length, stop position>

				0: No check, <8,1> 1: Odd parity check, <9,1> 2: Even parity check, <9,1> 3: No check, <8,1> 4: Even parity check, <8,1> 5: Odd parity check, <8,1> 6: No check, <8,2>
FC.02	Communication address	1	1~247	1-247 represents the local address
FC.03	Communication timeout	10.0s	0.0~600.0s	
FC.04	Reserved			
FC.05	Communication error handling	1	0~2	0: No action 1: Alarm 2: Fault shutdown
Group FP - Factory Parameters				
FP.00	Manufacturer password		1~9999	Specific password for system settings

Group d - Monitoring Parameters			
Parameters	**Name**	**Range**	**Smallest Unit**
d-00	Output frequency (Hz)	0.00~400.00Hz	0.01Hz
d-01	Set frequency (Hz)	0.00~400.00Hz	0.01Hz
d-02	Output voltage (V)	0~999V	1V
d-03	Bus voltage (V)	0~999V	1V
d-04	Output current (A)	0.0~999.9A	0.1A
d-05	Motor speed (Krpm)	0~60000Krpm	1Krpm
d-06	Analog input AVI (V)	0.00~10.00V	0.01V
d-07	Analog input ACI (mA)	0.00~20.00mA	0.01mA
d-08	Analog output AO (V)	0.00~10.00V	0.01V
d-09	Input terminal state (Relay, X1-X5)	0~3FH	1H
d-10	Temperature	0~9999	0.1℃
d-11	PID given value	Lower limit of PID range ~ Upper limit of PID range	1
d-12	PID feedback value	Lower limit of PID range ~ Upper limit of PID range	1
d-13	Current count value	0~9999	1s
d-14	Current timing value (s)	0~9999s	1s
d-15	AC drive's cumulative running time (h)	0~9999h	1h
d-16	AC drive's cumulative power-on time (h)	0~9999h	1h
d-17	U-phase current sampling offset	0~4095	
d-18	V-phase current sampling offset	0~4095	
d-19	W-phase current sampling offset	0~4095	

Fault code			
Fault	**Name**	**Possible Causes**	**Solution**

code			
OU1 (1)	Overvoltage during acceleration	Input voltage is abnormal	Check the input power supply
		Rotating motor is restarted	Start after setting to DC braking
OU2 (2)	Overvoltage during deceleration	Deceleration time is too short	Increase the deceleration time
		Input voltage is abnormal	Check the input power supply
OU3 (3)	Overvoltage at constant speed	Input voltage is abnormal	Check the input power supply
OCC1 (4)	Hardware overcurrent during acceleration	Acceleration time is too short	Increase the acceleration time
		AC driver power is low	Choose an AC drive with a large power
		V/F curve or torque boost is improperly set	Adjust V/F curve or torque boost
		IGBT module damaged	Contact the supplier for service
OCC2 (5)	Hardware overcurrent during deceleration	Deceleration time is too short	Increase the deceleration time
		AC driver power is low	Choose an AC drive with a large power
		IGBT module damaged	Contact the supplier for service
OCC3 (6)	Hardware overcurrent at constant speed	Grid voltage is low	Check the input power supply
		The load changes suddenly or is abnormal	Check the load or reduce sudden change in load
		AC driver power is low	Choose an AC drive with a large power
		IGBT module damaged	Contact the supplier for service
OCS1 (7)	Software overcurrent during acceleration	Acceleration time is too short	Increase the acceleration time
		AC driver power is low	Choose an AC drive with a large power
		V/F curve or torque boost is improperly set	Adjust V/F curve or torque boost
OCS2 (8)	Software overcurrent during deceleration	Deceleration time is too short	Increase the deceleration time
		AC driver power is low	Choose an AC drive with a large power
OCS3 (9)	Software overcurrent at constant speed	Grid voltage is low	Check the input power supply
		The load changes suddenly or is abnormal	Check the load or reduce sudden change in load
		AC driver power is low	Choose an AC drive with a large power
EFO (10)	Power module failure	AC drive output is short circuited or grounded	Check the motor wiring
		Instantaneous overcurrent of the AC drive	See the overcurrent solution
		The control board is abnormal or has serious interference	Seek service from the manufacturer
		Power devices are damaged	Seek service from the manufacturer
OU (11)	Overvoltage during stop	Input voltage is abnormal	Check the supply voltage
OU3 (12)	Overvoltage at constant speed	Supply voltage is too high	Check if the supply voltage is too high
		The load changes suddenly or is abnormal	Check the load or reduce sudden change in load
LU (13)	Undervoltage	Input voltage is abnormal	Check the supply voltage

		The relay does not pick up	Seek service from the manufacturer
OH (14)	Over-temperature	Too high ambient temperature	Improve the environment
		The space around the AC drive is small	Adjust the space
		Air duct is clogged	Clean and unclog the air duct
		Cooling fan does not run	Check the fan and its power supply
OL1 (15)	AC drive overload	V/F curve or torque boost is improperly set	Adjust V/F curve and torque boost
		Grid voltage is too low	Check the grid voltage
		Acceleration time is too short	Increase the acceleration time
		The motor is overloaded	Choose an AC drive with a larger power
OL2 (16)	Motor overload	V/F curve or torque boost is improperly set	Adjust V/F curve and torque boost
		Grid voltage is too low	Check the grid voltage
		The motor stalls or the load suddenly changes too much	Check the load
		Motor overload protection factor is incorrectly set	Correctly set the motor overload protection factor
BIAS (17)	Current bias error	Hardware fault	Contact the supplier for service
CBC (18)	Wave-by-wave current limit fault	AC driver power is low	Choose an AC drive with a large power
		The load changes suddenly or is abnormal	Check the load or reduce sudden change in load
FBL (19)	PID feedback below lower limit	PID feedback line is loose	Check the feedback connection
		The feedback value is less than the disconnection detection value	Adjust the detection input threshold
FBH (20)	PID feedback beyond the upper limit	When the PID feedback value is greater than the feedback excessive detection value, and the duration exceeds the PID feedback excessive detection value detection time, the AC drive will send an alarm on fault FBH	Check the feedback connection
			Adjust the detection input threshold
EEEP (21)	EEPROM read and write error	EEPROM fault	Seek service from the manufacturer
CE (22)	Dual CPU communication fault	CPU communication fault	Seek service from the manufacturer
EF (23)	External device fault	External device fault input terminal is closed	Disconnect the external device fault input terminal and clear the fault (check the cause)
EPA (24)	Parameter setting fault		
E485 (25)	Communication disconnection		Check if the communication line connection is abnormal and the line sequence is correct.
SFOC (27)	Software overcurrent		Adjust the acceleration/deceleration time; if the motor parameters do not match, re-identify the parameters;
ELH	WATER SHORTAGE		

	FAULT		
Warning code			
EPA1	Improper parameter setting	The three-wire function of the AC drive is not correctly set	Check if the three-wire terminal system of the AC drive terminals is correctly set
SLEP	Sleep mode	The frequency converter enters sleep mode	

Appendix Communication

1. Parameter Data

The parameter data provides important parameters of the AC drive. The parameter data is described as below:

Parameter Data	Group F (read and write)	F0, F1, F2, F3, F4, F5, F6, F7, F8, F9, FA, FB, FC, FP

The parameter data communication address is defined as follows:

1) When parameter data is read by means of communication, for F0~FP groups of parameter data, the high 16 bits of the communication address are directly 00-0D, and the low 16 bits are directly the parameter number in the group. Example:

   The communication address of F0-16 function parameters is 0010H, where 00H represents Group F0 function parameters, and 10H represents the hexadecimal data format of serial number 16 in the group.

2) When parameter data is written by means of communication

3) For F0~FP groups of parameter data, the high 16 bits of the communication address are directly 00-0D, and the low 16 bits are directly the parameter number in the group. Example:

4) -- Write function parameters F0-16:

5) When it is written, the communication address is 0010H

2. Non-Parameter Data

Non-Parameter Data	Status data (read only)	Group d monitoring parameters, AC drive fault description, AC drive running status
	Control parameter (write only)	Control commands, communication setting values

Status data

Status data is divided into Group d monitoring parameters, AC drive fault description, AC drive running status

Group d Monitoring Parameters For the description of Group d monitoring data, please refer to the relevant description of “Function Parameter Table”, and the address is defined as follows: The high 16 bits in communication address of d0~d15 are 70, and the low 16 bits are the parameter numbers in the group. Example: The communication address of d-11 is 700BH: AC drive fault description

When AC drive fault description is read via communication, the communication address is 8000H. By reading the address data, the host computer can obtain the current fault code of the AC drive. See the description of fault code in the parameters of the “Function Parameter Table”.

AC drive running status

When AC drive running status is read communication, the communication address is 3000H. By reading the address data, the host computer can obtain the current running status of the AC drive, which is defined as follows:

Communication address of AC drive running status	Status definition
3000H	1: Forward running
	2: Reverse running
	3: Stop

Control parameter:

Control parameters include control command, digital output terminal control, analog output AO1 control, analog output AO2 control, high-speed pulse (FMP) output control

Control command:

When FO-02 (command source) is selected as 2: communication control, the host computer can control start-stop of the AC drive and other related commands through the communication address. The control commands are defined in the following table.

Communication address of AC drive running status	Status definition
2000H	1: Forward running
	2: Reverse running
	3: Forward jog
	4: Reverse jog
	5: Free stop
	6: Decelerate to stop
	7: Fault reset

Communication setting value

Communication setting values include data set via communication such as frequency source, torque upper limit source, V/F separation voltage source, PID given source, and PID feedback source. The communication address is 1000H. When the communication address value is set by the host computer, the data range is -10,000~10,000, corresponding to the relative given value range -100.00%~100.00%

3. Modbus communication protocol

The AC drive product series provides RS485 communication interface and supports Modbus-RTU slave communication protocol, so that the user can realize centralized control, such as setting AV drive running commands, modifying or reading parameters, reading the working status and fault information of AV drive, by using a computer or PLC through this communication protocol. This serial communication protocol defines the information content and format transmitted in serial communication, including: master polling (or broadcasting) format; encoding method of the master, including parameters requiring action, data transmission and error check. The slave uses the same structure in response, including action confirmation, data return and error check. If an error occurs when the slave receives a message, or the slave cannot complete the action required by the master, the slave returns a fault message as a response to the master.

3.1 Application

The AC drive is connected to a “single-master multi-slave” PC/PLC control network with RS485 bus as a communication slave.

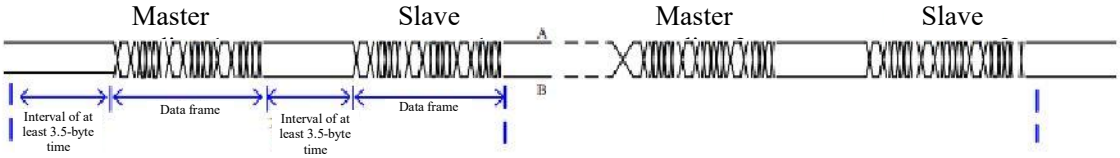
3.2 Bus structure

Topology

Single-master multi-slave system. In the network, each communication device has a unique slave address. A device acts as the master (often a host computer, a PLC or an HMI) and initiates communication to perform parameter read or write operations on slaves. The other devices respond to inquiry or communication operation from the master for the slave. At the same moment, only one device can transmit data, while other devices can only receive data. The setting range of the slave address is 1~247, and 0 is the broadcast communication address. A slave address must be unique in the network

Transmission method

The asynchronous serial and half-duplex transmission mode is used. During asynchronous serial communication, data is sent frame by frame in the form of message. According to the MODBUS-RTU protocol, an interval of at least 3.5-byte time marks the end of the previous message. A new message starts to be sent after this interval.



Master sending 1 Slave response 1 Master sending 2 Slave response 2 Interval of at least 3.5-byte time Interval of at least 3.5-byte time Data frame Data frame A B The built-in communication protocol of the AC drive series is Modbus-RTU slave communication protocol, which allows the drive to provide data to respond to “query/command” from the master or execute the action according to “query/command” from the master. The master can refer to a personal computer (PC), an industrial control device or a programmable logic controller (PLC). The master can communicate with a single slave or send broadcast messages to all slaves. When the master communicates with a single slave, the slave needs to return a message (response) to “query/command” from the master. For a broadcast message sent by the master, the slaves need not return a response.

4. Communication data structure

The Modbus-RTU protocol communication data format of the product series is as follows: the AC drive only supports the reading or writing of Word parameters. Reading command is 0x03, writing command is 0x06, and the command for continuously writing a set of parameters is 0x10. It supports reading and writing of bytes or bits. Example 1: Read parameter d-01 (set frequency), query d-01 set frequency parameter, and receive the return value of 0 Hz

Modbus address	Function code	High bits of Parameter No.	Low bits of Parameter No.	Word count high bits	Word count low bits	CRC low bits	CRC high bits
0x01	0x03	0x70	0x01	0x00	0x01	0x81	0xF7

Response:

Modbus address	Function code	Byte count	Data high bits	Data low bits	CRC low bits	CRC high bits
0x01	0x03	0x02	0x00	0x00	0xB8	0x44

Example 2: Write the parameter F0-08 (maximum frequency of AC drive) to 20.00Hz, and the returned setting value is set successfully

Modbus address	Function code	High bits of Parameter No.	Low bits of Parameter No.	Word count high bits	Word count low bits	CRC low bits	CRC high bits
0x01	0x06	0x00	0x08	0x07	0xD0	0x81	0xF7

Response:

Modbus address	Function code	High bits of Parameter No.	Low bits of Parameter No.	Word count high bits	Word count low bits	CRC low bits	CRC high bits
0x01	0x06	0x00	0x08	0x07	0xD0	0x81	0xF7

Example 3: Reset the parameter to the factory default, set F0-17 to 1, and restore the parameter to the factory default

Modbus address	Function code	High bits of Parameter No.	Low bits of Parameter No.	Word count high bits	Word count low bits	CRC low bits	CRC high bits
0x01	0x06	0x00	0x11	0x00	0x01	0x81	0xF7

Response:

Modbus address	Function code	High bits of Parameter No.	Low bits of Parameter No.	Word count high bits	Word count low bits	CRC low bits	CRC high bits
0x01	0x06	0x00	0x0A	0x07	0xD0	0x81	0xF7

Data frame field description:

Frame header START	Greater than the 35-byte transmission idle time
Slave address ADR	Communication address range: 1 - 247;
Command code CMD	03: Read slave parameters; 06: Write slave parameters; 10: Continuously write a set of parameters
Parameter address H	The internal parameter address of the AC drive, expressed in hexadecimal format. The parameters include parameter and non-parameter data (running status and running command). See the definition of address for details. During transmission, low-order bytes follow the high-order bytes.
Parameter address L	
Number of parameters H	The number of parameters read by this frame. If it is 1, it indicates that 1 parameter is read. During transmission, low-order bytes follow the high-order bytes. When the command code is 03, this protocol can only rewrite 1 parameter at a time, and there is no such field.
Number of parameters L	
Data H	The response data or data to be written. During transmission, low-order bytes follow the high-order bytes.
Data L	
CRC CHK low bits	Detection value: CRC16 verification value. During transmission, high-order bytes follow the low-order bytes. For the calculation method, please refer to the description of CRC check in this section.
CRC CHK high bits	
END	3.5-byte transmission time.

CRC check method:

CRC (Cyclical Redundancy Check) uses the RTU frame format, and the message includes an error detection field based on the CRC method. The CRC field detects the content of the entire message. CRC domain is a binary value of two bytes, containing 16 bits. It is calculated by the transmitting device, and then added to the message. The receiving device will recompute the CRC of received message, and compare it with the value of received CRC field. If the two CRC values are not equal, it means that there is an error in the transmission. The CRC is first stored to 0xFFFF, and then a process is invoked to process the continuous 8-bit byte in the message and the values in the current register. Only 8Bit data in every character is effective for CRC, the start bit, stop bit and parity check bit are all ineffective. During generation of the CRC, every 8-bit character is in exclusive-OR (XOR) with the content in the register, and the result moves in the direction of least significant bit, with the highest significant bit filled by 0. LSB is extracted for detection. If LSB is 1, then the register performs XOR with the preset value; if LSB is 0, no XOR is performed. This process is repeated until eight shifts have been performed. After the last (8^{th}) shift, the next 8-bit byte is in XOR with the current value in register. The final value in register is the CRC value after all the bytes in the of the message are executed. The CRC is added to the message from the low-order byte followed by the high-order byte. The CRC simple function is as follows:

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

5. Parameter address marking rule

Parameter group number and parameter identification number are used to express parameter address.

High-order bytes: 00~0F (Group F), 70 (Group d)

Low-order bytes: 00-FF

For example: to read parameter F3-12, the communication address of F3-12 is expressed as 0xF30C;

Note: Group FP: Parameters can neither be read nor changed; Group d: Parameters can only be read, and cannot be changed.

Some parameters cannot be modified when the AC drive is running. Some parameter cannot be modified regardless of status of the AC drive. In addition, pay attention to the range, unit and description of the parameters when modifying them.

Parameter Group Code	Access Address
FO~FC	0x0000 ~ 0x0EFF
d0	0x7000 ~ 0x70FF

Communication setting value:

Communication setting value is a percentage of the relative value, 10,000 corresponds to 100.00%, -10,000 corresponds to -100.00%;

Parameter address	Parameter Description
1000H	Communication setting value (decimal)
	–10,000 ~ 10,000

Control command input to AC drive: (write-only)

Command word address	Function
2000H	0001: Forward running
	0002: Reverse running
	0003: Forward jog
	0004: Reverse jog
	0005: Free stop
	0006: Decelerate to stop
	0007: Fault reset

Read AC drive state: (read-only)

Status word address	Status word function
3000H	0001: Forward running
	0002: Reverse running
	0003: Stop

AC drive fault description:

AC drive fault address	AC drive fault information	
8000H	0000: No fault	0002: Overcurrent during acceleration
	0003: Overcurrent during deceleration	0004: Overcurrent at constant speed
	0005: Overvoltage during acceleration	0006: Overvoltage during deceleration
	0007: Overvoltage at constant speed	0008: Software overcurrent during deceleration
	0009: Undervoltage fault	000A: AC drive overload
	000B: Motor overload	000E: Over-temperature fault
	000F: External input fault	0010: Communication fault
	0012: Current bias error	0013: PID feedback beyond the limit
	0014: Low PID feedback value	0015: Parameter setting fault
	001F: PID feedback lost during running	0070: EEPROM fault
	Others not listed are reserved	

6. Description of Group FC Communication Parameters

FC-00	Baud rate	Factory default	3
	Ones: Baud rate of Modbus		
	Setting range	0: 1200 1: 2400 2: 4800 3: 9600	4: 19200 5: 38400

This parameter is used to set transmission speed between host computer and AC drive. Note that baud rate of host computer must be the same as that of AC drive. Otherwise, communication will fail. The higher baud rate is, the faster communication will be.

FC-01	Data format	Factory default 6
	Setting range	Data format: <Data length, stop position> 0: No check, <8, N, 1> 1: Odd parity check, <9, O, 1> 2: Even parity check, <9, E, 1> 3: No check, <8, N, 1> 4: Even parity check, <8, E, 1> 5: Odd parity check, <8, O, 1> 6: No check, <8, N, 2>

The data format of host computer must be the same as that of AC drive. Otherwise, communication will fail.

FC-02	Local address	Factory default 1
	Setting range	1~247

This address is unique, which is basis for point-to-point communication between host computer and AC drive.

FC-03	Communication timeout	Factory default 10.0s
	Setting range	0.0s~600.0s

When this parameter is set to a valid value, if the interval between one communication and the next communication exceeds the communication timeout, the system will report a communication fault error. Usually, it is set to be invalid. If this parameter is set in a continuous communication system, the communication status can be monitored.

FC-05	Communication error handling	Factory default	1
	Setting range	0: No action 1: Alarm	2: Fault shutdown

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2. Warranty period

The warranty period of this product is 12 months from the date of delivery. Long-term technical support services will be available after end of the warranty period.

3. Non-warranty scope

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