

KM100 Series Inverter

USER MANUAL

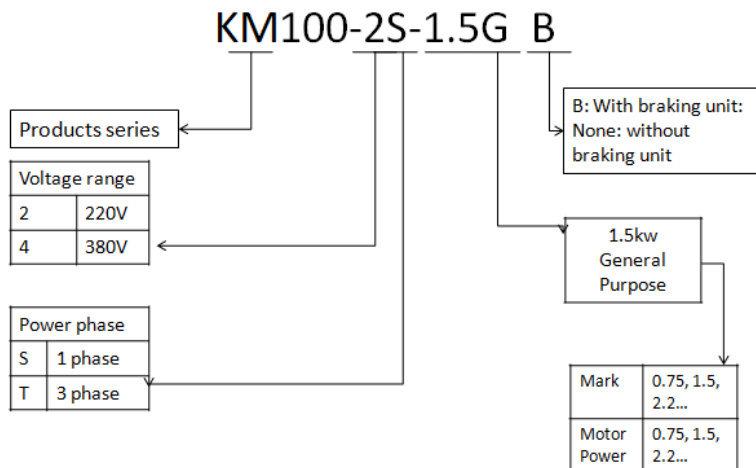


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Chapter 1: Production introduction

1.1 Model introduction



1.2 Name plate

Product name, power	→	KAMAN AC DRIVES 1.5KW
Product model	→	MODEL: KM100-2S1.5G
Output specification	→	OUTPUT: AC 3PH 0-220V 0-600Hz 7A
Input specification	→	INPUT: AC 1PH 220V ±15%
Serial No.	→	NO:
Kaman Automation		

1.3. Outline overall and installing dimensions

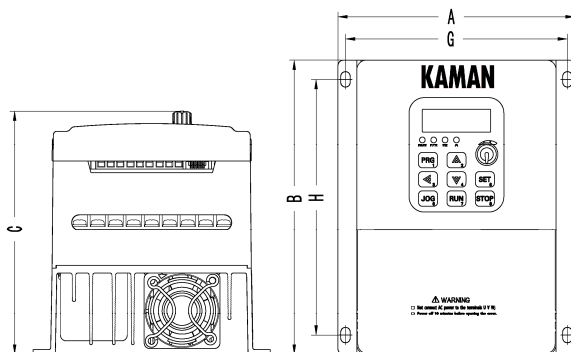


Fig 1 (Wall mounted)

AC drive model	Installation hole site mm		Outline dimension mm			Mounting bolt mm	Fig / Dim.
	G	H	A	B	C		
KM100 Series							
KM100-2S0.75GB	117	135	125	155	128.5	M4	Fig 1
KM100-2S1.5GB	117	135	125	155	128.5	M4	Fig 1
KM100-2S2.2GB	117	135	125	155	154.5	M4	Fig 1

1.4. Selection of Power of Braking Resistor

In theory, the power of the braking resistor is consistent with the braking power. But in consideration that the de-rating is 70%, you can calculate the power of the braking resistor according to the formula $0.7 \times P_r = P_b \times D$.

P_r refers to the power of resistor.

D refers to the braking frequency (percentage of the regenerative process to the whole working process)

Application	Elevator	Winding and unwinding	Centrifuge	Occasional braking load	General application
Braking Frequency	20%–30 %	20%–30%	50%–60%	5%	10%

Below table provides data for reference. You can select different resistance and power based on actual needs. However, the resistance must not be lower than the recommended value. The power may be higher than the recommended value.

The braking resistor model is dependent on the generation power of the motor in the actual system and is also related to the system inertia, deceleration time and potential energyload. For systems with high inertia, and/or rapid deceleration times, or frequent braking sequences, the braking resistor with higher power and lower resistance value should be selected.

Below table recommended values of braking resistor

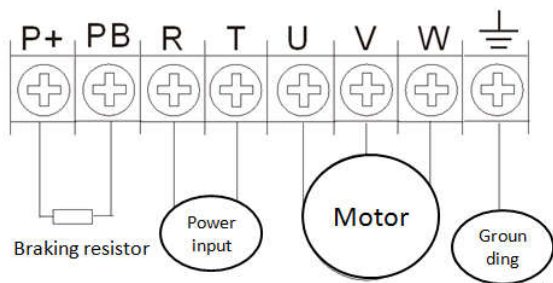
AC drive models	Recommended Power	Recommended Braking resistor	Built in /external connect	Remark
Single phase 220V				
KM100-2S0.75GB	80W	$\geq 150\Omega$	Built in option	Added B when built in after model
KM100-2S1.5GB	100W	$\geq 100\Omega$		
KM100-2S2.2GB	100W	$\geq 70\Omega$		

Chapter 2: Production installation

2.1. Main loop circuit terminals wiring

2.1.1 Single phase AC Drive main loop terminal

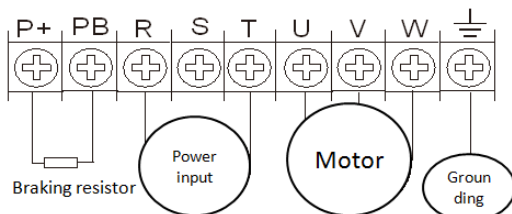
Applicable motor model : KM100-2S0.4GB~2S2.2GB



Terminals Mark	Name	Description
R T	Single phase power supply input	Connect single phase 220V power supply
U V W	AC drive output terminal	Connect to 3 phase motor
P+ PB	Braking unit connecting terminal	External connect braking resistor
⏏	Grounding terminals	Ac drive grounding terminals

2.1.2. Three phase AC Drive main loop terminal

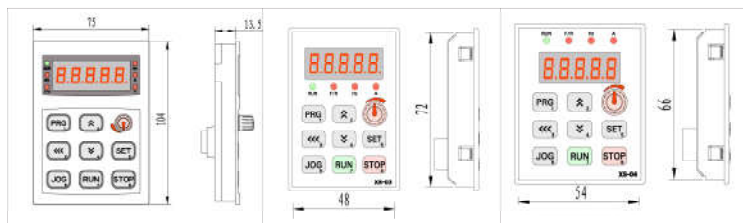
Applicable motor model : KM100-4T0.75GB ~ 4T3.7G/KM100-2T0.4G ~ 2T2.2GB



Terminals	Name	Description
R S T	3 phase power supply input	Connect single phase 220V power supply
U V W	AC drive output terminal	Connect to 3 phase motor
P+ PB	Braking unit connecting terminal	External connect braking resistor
⏏	Grounding terminals	Ac drive grounding terminals

2.2 External connection operation keypad dimension(unit mm)

3 kinds of keypad can be selection.



XS-01 ★

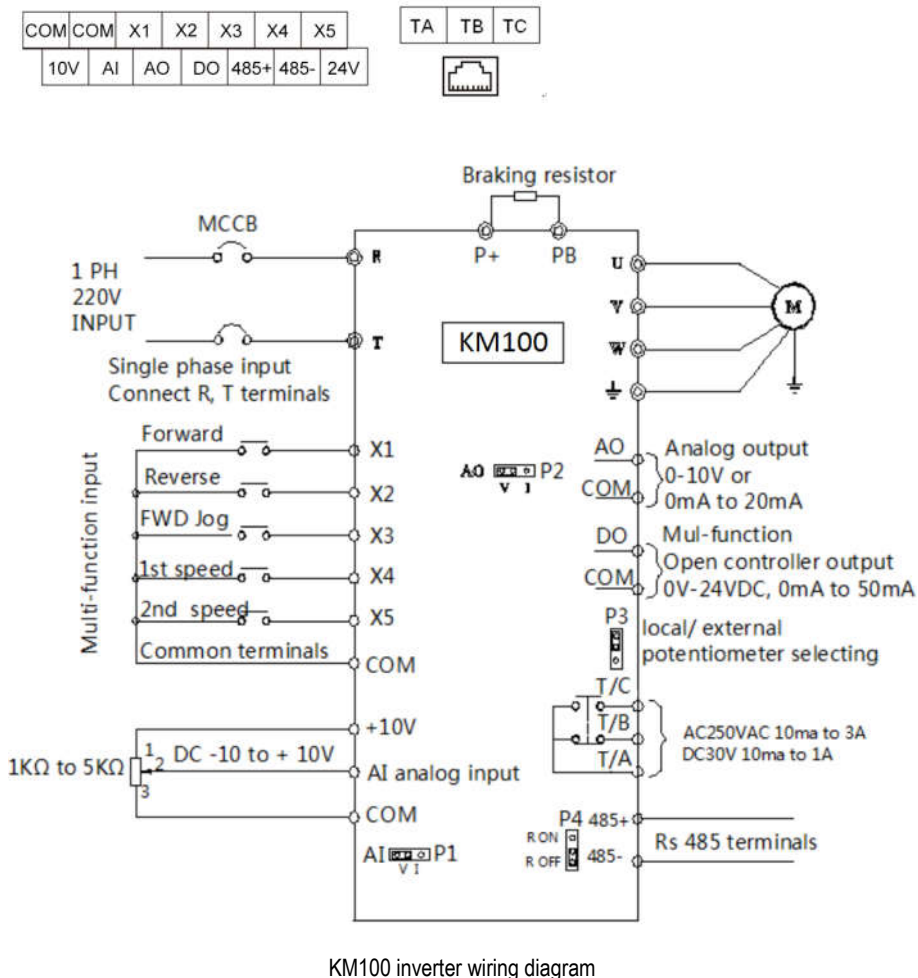
XS-03

XS-04

★The keypad kit X2-01T, the dimension 94.4*70

2.3. Control loop terminals and connection

2.3.1 control terminals layout and connection



KM100 inverter wiring diagram

2.3.2 Control terminals function description

Terminal label	Terminal name	Function description
X1 COM	Multi-function input terminal 1	1: input specification : 24V DC , 5mA 2. Frequency range : 0 ~ 200Hz 3. Voltage range : 10V ~ 30V
X2 COM	multi-function input terminal 2	
X3 COM	multi-function input terminal 3	
X4 COM	Multi-function input terminal 4	
X5 COM	Multi-function input terminal 5 High speed pulse train input terminal	
10V COM	Supply 10V power supply	Provides 10V power supply, maximum output current:10mA, Connect potentiometer, the resistor of potentiometer is 1-5KΩ.
24V COM	24V external power supply	Provide 24V power supply, maximum current is 200mA. Use for power on sensors or small relay
AI COM	Analog input terminal	1. Input voltage range : DC 0—10V 2. Input impedance : 22KΩ
AO COM	Analog output terminal	Output current or voltage signal selected by jumper P2 of controller board. Voltage signal range: 0-10V, current signal range:0-20mA
DO COM	Open controller output terminal	Multi-function signal output
TA TB TC	Relay output	Multiple relay output: TA and TC is normal open, TA and TB is normal close. Specification: AC250V,3A/DC30V, 1A
485+ 485-	485 communication	Built in Rs485 connection terminals

Terminal label	Terminal name	Function description
Slide switch definition:		
P1: AI1 input,	Left: voltage, Right: Current	
P2: AO analog output:	Left: voltage, Right: Current	
P3: external;/local keypad selection	UP: external DOWN: local	
P4: RS485 terminal resistor	UP: Enable, DOWN: disable	

Chapter 3: Function parameters list

Function code	Name	Setting range	Factory setting	Modify
P0 Basic function parameters				
P0.00	Motor control mod selection	0 : (reserve) 1 : V/F control	1	★
P0.01	Running command reference	0: Keypad (operation panel) 1 : External terminal 2 : RS485 communication	0	☆
P0.02	Memory of digital setting frequency upon power failure	0: not memory ; 1: memory	1	☆
P0.03	Main frequency source reference	0: keypad digital frequency setting, not memorize after power failure 1: keypad digital frequency setting, memorized after power failure. 2: Analog AI1 (-10v-10v) 3: Analog AI2 (0-10v/4-20mA) 4: Keypad potentiometer 5: PULSE trains frequency reference 6: simple PLC 7: multi- step reference 8. Process-PID 9: communication	1	★

Function code	Name	Setting range	Factory setting	Modify
P0.04	Maximum frequency	50.00Hz ~ 4000.00Hz	50.00Hz	★
P0.05	Upper limit frequency	P0.06 ~ P0.04	50.00Hz	★
P0.06	Lower limit frequency	0.00Hz ~ P0.05	0.00Hz	☆
P0.07	Digital frequency reference	0.00Hz ~ P0.04	50.00Hz	☆
P0.08	Acceleration time 1	0.00s ~ 65000s	Per model	☆
P0.09	Deceleration time 1	0.00s ~ 65000s	Per model	☆
P0.10	Rotation direction	0 forward ; 1 : reverse	0	☆
P0.11	Carrier frequency	0.5kHz ~ 16.0kHz	Per model	☆
P0.12	Carrier frequency auto adjustment select	0 : not auto adjust ; 1: auto adjust	1	☆
P0.13	Parameters restore	0 : no operation 1: Restore factory setting, motor parameters P2 group no restore 2 : Clear records	0	★
P0.14	Auxiliary frequency source Y Reference	As same as P0.03 (main frequency source reference)	0	★
P0.15	Auxiliary frequency source selection when superimposed	0: Respect to the maximum frequency (P0.04) 1 : Respect to main frequency source reference (P0.03)	0	☆

Function code	Name	Setting range	Factory setting	Modify
P0.16	Range of auxiliary frequency source Y selection when superimposed	0% ~ 150%	100%	☆
P0.17	frequency source superimposed selection	Unit digit : frequency source selection 0: main frequency source 1: Arithmetic result of main and auxiliary(arithmetic relationship depends on tens digit) 2: Switchover between main frequency source and auxiliary source 3: Switchover between main source and arithmetic result between of main and auxiliary source. 4: Switchover between auxiliary source and arithmetic result between of main and auxiliary source. Ten digit : The arithmetic relationship between main and auxiliary. 0 : main + auxiliary 1 : main – auxiliary 2 : Biggest one among two 3 : Smallest one among two	00	☆
P0.18	Run command terminals combination mode	0 : two lines 1 1: two lines 2	0	★

Function code	Name	Setting range	Factory setting	Modify
		2 : three lines 1 3 : threes lines 2		
P1 Start and stop group				
P1.00	Startup mode	0 : Start directly 1: DC brake first and start from starting frequency 2 : Reserve	0	☆
P1.01	Starting frequency	0.00Hz ~ 10.00Hz	0.00Hz	☆
P1.02	Starting frequency holding time	0.0s ~ 100.0s	0.0s	★
P1.03	Startup DC braking current	0% ~ 100%	0%	★
P1.04	Startup DC braking time	0.0s ~ 100.0s	0.0s	★
P1.05	Stop mode	0 : deceleration ; 1 : free stop	0	☆
P1.06	Initial frequency of stop DC braking	0.00Hz ~ maximum P0.04	0.00Hz	☆
P1.07	Waiting time of stop DC braking	0.0s ~ 100.0s	0.0s	☆
P1.08	Stop DC braking current	0% ~ 100%	0%	☆
P1.09	Stop DC braking time	0.0s ~ 100.0s	0.0s	☆
P1.10	Brake use ratio	0% ~ 100%	100%	☆
P1.11	Inversion control	0: allow run in reverse, 1: reverse is forbidden	0	★
P1.12	Jog frequency	0.00Hz ~ maximum frequency	5.00Hz	☆

Function code	Name	Setting range	Factory setting	Modify
P1.13	Speed tracking mode	0 : Reserve 1 : target frequency 2 : maximum frequency	0	
P1.14	Speed tracking speed	0 ~ 100	20	
P1.15	Speed tracking frequency reference	0 ~ maximum	50.0Hz	
P2 Motor parameters group				
P2.01	Motor type selection	0 : general asynchronous motor 1 : frequency inverter motor	0	★
P2.02	Motor rated power	0.1kW ~ 1000.0kW	Per model	★
P2.03	Motor rated frequency	0.00Hz ~ maximum frequency	50.00Hz	★
P2.04	Motor rated speed	0rpm ~ 65535rpm	1460rpm	★
P2.05	Motor rated voltage	0V ~ 2000V	Per model	★
P2.06	Motor rated current	0.1A ~ 2000A	Per model	★
P2.07	Stator resistance (asynchronous motor)	0.001Ω ~ 65.535Ω	Per model	★
P2.08	Rotor resistance (asynchronous motor)	0.001Ω ~ 65.535Ω	Per model	★
P2.09	Leakage inductive reactance (asynchronous motor)	0.01mH ~ 655.35mH	Per model	★

Function code	Name	Setting range	Factory setting	Modify
P2.10	Mutual inductive Reactance (asynchronous motor)	0.1mH ~ 6553.5mH	Per model	★
P2.27	Motor auto tuning	1 : static auto tuning 2 : rotating tuning (complete tuning)	0	★
P3 Motor vector control group parameters				
P3.00	Speed loop proportional gain 1	1 ~ 100	30	☆
P3.01	Speed loop integral time 1	0.01s ~ 10.00s	0.50s	☆
P3.02	Switching frequency 1	0.00 ~ P3.05	5.00Hz	☆
P3.03	Speed loop proportional gain 2	1 ~ 100	20	☆
P3.04	Speed loop integral time 2	0.01s ~ 10.00s	1.00s	☆
P3.05	Switching frequency 2	P3.02 ~ P0.04	10.00Hz	☆
P3.06	Slip compensation coefficient	50% ~ 200%	100%	☆
P3.07	Speed loop filter time constant	0.000s ~ 0.100s	0.000s	☆
P3.08	Vector control over excitation gain	0 ~ 200	64	☆

Function code	Name	Setting range	Factory setting	Modify
P3.09	Upper limit of torque source selection in speed control mode	0 : set by P3.10 function code 1 : AI1 setting 2 : AI2 setting 3 : Potentiometer of keypad 4 : PULSE train setting 5 : communication	0	☆
P3.10	Upper limit of torque digital setting in speed control mode	0.0% ~ 200.0%	150.0%	☆
P3.11	Reserve			☆
P3.12	Reserve			☆
P3.13	current loop proportionality coefficient at low frequency	20% ~ 500%	100%	☆
P3.14	current loop integral coefficient at low frequency	20% ~ 500%	100%	☆
P3.15	current loop proportionality coefficient at high frequency	20% ~ 500%	100%	☆
P3.16	current loop integral coefficient at high frequency	20% ~ 500%	100%	☆

Function code	Name	Setting range	Factory setting	Modify
P3.17	Filter time reference value of speed loop	0 ~ 80ms	2ms	☆
P3.18	Current construction filter	0.1 ~ 50.0ms	1.0ms	☆
P4 V/F control parameters group				
P4.00	VF curve setting	0 : 0: Linear V / F curve 1 : Multi-point V / F curve 2 : Square V / F curve 3 : VF separation mode 1 4 : VF separation mode 1	0	★
P4.01	Torque boost	0.0% : (auto torque boost) 0.1% ~ 30.0%	Per model	☆
P4.02	Torque boost cut-off frequency	0.00Hz ~ maximum	50.00Hz	★
P4.03	VF Slip compensation gain coefficient	0.0% ~ 200.0%	0.0%	☆
P4.04	VF over excitation gain	0 ~ 200	64	☆
P4.05	VF vertex point 1 output frequency	0.00Hz ~ P4.07	0.00Hz	★
P4.06	VF vertex point 1 output voltage proportional	0.0% ~ 100.0%	0.0%	★
P4.07	VF vertex point 2 output frequency	P4.05 ~ P4.09	0.00Hz	★

Function code	Name	Setting range	Factory setting	Modify
P4.08	VF vertex point 2 output voltage proportional	0.0% ~ 100.0%	0.0%	★
P4.09	VF vertex point 3 output frequency	P4.07 ~ motor rated frequency	0.00Hz	★
P4.10	VF vertex point 3 output voltage proportional	0.0% ~ 100.0%	0.0%	★
P4.11	The voltage source selection when VF isolated	0 : digital reference (P4.13) 1 : AI1 reference 2 : AI2reference 3 : keypad potentiometer reference 4 : PULSE train reference (X5)	0	☆
P4.12	The voltage source setting when VF isolated	0V ~ motor rated voltage	0V	☆
P4.13	The voltage acceleration time when VF isolated	0.0s ~ 1000.0s		
P4.14	The voltage deceleration time when VF isolated	0.0s ~ 1000.0s This time value stands for decelerate to stop from 0 to rated voltage of motor		
P5 Input terminals				
P5.00	X1 terminals function define	0 : No operation 1 : forward running (FWD)	1	★
P5.01	X2 terminals function define	2 : Reverse running (REV) 3 : 3 lines control mode	2	★

Function code	Name	Setting range	Factory setting	Modify
P5.02	X3 terminals function define	4 : Jog forward (FJOG) 5 : Reverse forward (RJOG)	4	★
P5.03	X4 terminals function define	6 : Free stop 7 : Fault reset (RESET)	12	★
P5.04	X5 terminals function define	8: Normal open input of external fault 9: Terminal UP	13	★
P5.05	X6 terminals function define (extension)	10: Terminal DOWN 11 : UP/DOWN reset (Terminal, keypad)	0	★
P5.06	X7 terminals function define (extension)	12 : Multiple segment terminals 1	0	★
P5.07	X 8 terminals function define (extension)	13 : Multiple segment terminals 2 14 : Multiple segment terminals 3	0	★
P5.08	X 9 terminals function define (extension)	15 : Multiple segment terminals 4 16: Acceleration/ deceleration selection terminals 1	0	★
P5.09	X 10 terminals function define (extension)	17 :Acceleration/ deceleration selection terminals 2 18 : Normal close input of external fault 19: Stop by external terminals (only valid for running command by keypad) 20 : Frequency reference source switch 21 : X5 pulse train input 22 : Switch between main frequency and preset frequency reference 23: Switch between auxiliary frequency	0	★

Function code	Name	Setting range	Factory setting	Modify
		and preset frequency reference 24 : running command switch terminal 25 : PID pause 26 : PID action direction change for reverse 27 : PID integral pause 28 : PID parameters switch terminal. 29 : counter input 30: counter reset 31: length counter input 32 : length reset 33 : counter valid 34 : Swing frequency pause 36 : accel/decel. forbidden 37 : DC brake command 38: running command switch terminal 2 39: frequency reference activate terminal 40: Motor select terminal 1 41: speed/torque control 42: running pause 43: user fault define by terminal 1 44: user fault define by terminal 2 46: Torque control forbidden 47: emergency stop		

Function code	Name	Setting range	Factory setting	Modify
		48: stop by external terminal (by deceleration 4 reference) 49 : DC braking in deceleration 50 : Currently time		
P5.10	X terminal filter time	0.000s ~ 1.000s	0.010s	☆
P5.11	Line AI1 minimum setting	-10.00V ~ P5.13	0.20V	☆
P5.12	Corresponding value of line AI1 minimum setting	-100.0% ~ +100.0%	0.0%	☆
P5.13	Line AI1 maximum setting	P5.11 ~ +10.00V	10.00V	☆
P5.14	Corresponding value of line AI1 maximum setting	-100.0% ~ +100.0%	100.0%	☆
P5.15	AI1 filter time	0.00s ~ 10.00s	0.10s	☆
P5.16	reserve			
P5.21	Minimum value reference of potentiometer keypad	0.00V ~ P5.23	0.20V	☆
P5.22	Corresponding value of minimum value reference of potentiometer keypad	-100.0% ~ +100.0%	0.0%	☆
P5.23	Maximum value	P5.21 ~ +10.00V	10.00V	☆

Function code	Name	Setting range	Factory setting	Modify
	reference of potentiometer keypad			
P5.24	Corresponding value of maximum value reference of potentiometer keypad	-100.0% ~ +100.0%	100.0%	☆
P5.25	Filter time of potentiometer	0.00s ~ 10.00s	0.10s	☆
P5.26	PULSE minimum input	0.00kHz ~ P5.28	0.00kHz	☆
P5.27	Corresponding value of PULSE minimum input	-100.0% ~ 100.0%	0.0%	☆
P5.28	PULSE maximum input	P5.26 ~ 100.00kHz	50.00kHz	☆
P5.29	P Corresponding value of PULSE maximum input	-100.0% ~ 100.0%	100.0%	☆
P5.30	PULSE filter time	0.00s ~ 10.00s	0.10s	☆
P3.31	reserve			
P5.32	AI less than minimum input setting selection	Unit's digit : A1 less than minimum input setting selection 0: Corresponding setting for minimum input 1 : 0.0% Ten digit :	0	☆

Function code	Name	Setting range	Factory setting	Modify
		AI2 less than minimum input setting selection, as same as above Hundred digit: potentiometer of keypad less than minimum input selection, as above.		
P5.36	Input terminal positive/negative logic setting	LED OFF: Positive ON : Negative BIT0:X1 BIT1:X2 BIT2:X3 BIT3:X4 BIT4:X5	0	★
P6 Output terminals				
P6.00	FM terminal output selection	0:Pulse trains output (FMP) 1:open collect digital output (FMR)	0	☆
P6.01	Relay output of controller board	0 : No output 1 : VFD running 0 : No output	3	☆
P6.02	reserve	1 : Frequency running	1	☆
P6.03	reserve	2 : frequency arrival	0	☆
P6.04	DO output selecting	3: Fault output (free stop fault)	1	☆
P6.05	reserve	4 : Frequency level detect FDT 1 output 5 : Frequency level detect FDT 2 output 6: 0 speed running (no output when free stop)	4	☆

Function code	Name	Setting range	Factory setting	Modify
		7 : 0 speed running 2 (stop with output) 8 : upper limit frequency arrive 9 : lower limit frequency arrive 10: frequency arrive 1 output 11: frequency arrive 1 output 12: power on arrive 13: Running time arrive 14: preset timing arrive 15: setting counter arrive 16: Programmed counter arrive		
P6.06	reserve	1: setting frequency	0	☆
P6.07	AO output terminal	2: current output	0	☆
P6.08	reserve	3: Torque output 4: Power output 5: Output voltage 6 : PULSE trains input (100.% corresponding to 100.0kHz) 7 : AI1 8: reserve 8: reserve 10 : length 11 : counter value 12 : communication setting 13: motor speed 14 : output current(100.0%	1	☆

Function code	Name	Setting range	Factory setting	Modify
		corresponding to 1000.0A) 15: Output voltage (100.0% corresponding to 1000.0V) 16: Output voltage (rated torque)		
P6.09	reserve			
P6.10	AO1 zero offset	-100.0% ~ 100.0%	0.0%	☆
P6.11	AO1 gain	-10.00 ~ 10.00	1.00	☆
P6.12	reserve			
P6.13	reserve			
P6.14	reserve			
P6.15	Local relay output ON delay time	0.0s ~ 3600.0s	0.0s	☆
P6.16	reserve			
P6.17	DO output ON delay time	0.0s ~ 3600.0s	0.0s	☆
P6.18	reserve			☆
P6.19	reserve			☆
P6.20	DO output terminal valid status selection	OFF : Positive ; ON : Negative BIT0: Relay BIT1: Reserve BIT2 : Reserve BIT3 : DO BIT4 : Reserve BIT5 : Reserve	---	☆

Function code	Name	Setting range	Factory setting	Modify
P6.21	Local relay output OFF delay time	0.0s ~ 3600.0s	0.0s	☆
P6.22	Reserve			
P6.23	Reserve			
P6.24	DO output OFF action delay time	0.0s ~ 3600.0s	0.0s	☆
P6.25	reserve			
P6.26	reserve			
P7 Keypad and display				
P7.00	User password	0 ~ 65535	0	☆
P7.01	Function code group display selection	BIT0: A group display BIT1: B group display BIT2: D group display BIT3: F group display	--	☆
P7.02	User store password	00000~65535	0000	★
P7.03	Parameters write protection	0: allow to write 1: don't allow to write	0	☆
P7.04	JOG key function selection	0 : JOG key invalid 1: switching between of keypad and remote communication (between terminals and remote communication) 2: switch forward and reverse 3: forward jog 4: reverse jog	3	★

Function code	Name	Setting range	Factory setting	Modify
P7.05	STOP function	0: STOP button enable only under keypad control mode 1: Stop button is enable under any control mode 2: reset function of stop button is enable when terminals control 3: stop function of stop buttons is disable when terminals control	3	☆
P7.06	LED running display parameters 1	0000 ~ PPPP Bit00 : running frequency (Hz) Bit01 : Output current (A) Bit02 : Output voltage (V) Bit03 : Machine speed Bit04 : DC bus voltage Bit05 : frequency setting Bit06 : counting value Bit07 : Length Bit08 : XI input status Bit09 : DO output status Bit10 : AI voltage(V) Bit11 : Reserve Bit12 : input voltage of potentiometer (V) Bit13 : PID reference Bit14 : output power	----	☆

Function code	Name	Setting range	Factory setting	Modify
P7.07	LED running display parameters 1	0000 ~ PPPP Bit00 : linear speed Bit01 : PID feedback Bit02 : PLC step Bit03 : PULSE input pulse frequency Bit04 : current power on time Bit05 : current running time Bit06 : the remaining running time Bit07 : main frequency Bit08 : auxiliary frequency Bit09 : encoder feedback speed Bit10 : actual feedback feedback Bit11 : Before AI revise voltage Bit12 : reserve Bit13 : torque reference Bit14 : PULSE input frequency	----	☆
P7.08	LED display parameters on stop	0000 ~ PPPP Bit00 : frequency setting(Hz) Bit01 : DC bus voltage (A) Bit02 : AI voltage (V) Bit03 : reserve Bit04 : voltage of potentiometer (V) Bit05 : counting value Bit06: length value Bit07 : Machine speed	----	☆

Function code	Name	Setting range	Factory setting	Modify
		Bit08 : PID reference Bit09 : DI status Bit10 : DO status		
P7.09	Machine load display coefficient	0.0001 ~ 6.5000	1.0000	●
P7.10	Heat sink of inverter temperature	0.0°C ~ 100°C	-	●
P7.12	Accumulative total running time	0h ~ 65535h	-	●
P7.13	Production Series NO.			☆
P7.14	Software version			☆
P7.15	Machine load speed display number of decimal point	0 : 0 decimal point 1 : 1 decimal point 2 : 2 decimal point 3 : 3 decimal point	0	●
P7.16	reserve			
P8 Auxiliary parameters group				
P8.00	The unit of acceleration/deceleration time	0 : 1s 1 : 0.1s 2 : 0.01s 3: 0.001s	1	★
P8.01	Jog acceleration time	0.0s ~ 6500.0s	10.0s	☆
P8.02	Jog deceleration time	0.0s ~ 6500.0s	10.0s	☆
P8.03	Acceleration time 2	0.0s ~ 6500.0s	10.0S	☆

Function code	Name	Setting range	Factory setting	Modify
P8.04	Deceleration time 2	0.0s ~ 6500.0s	10.0S	☆
P8.05	Acceleration time 3	0.0s ~ 6500.0s	10.0S	☆
P8.06	Deceleration time 3	0.0s ~ 6500.0s	10.0S	☆
P8.07	Acceleration time 4	0.0s ~ 6500.0s	10.0S	☆
P8.08	Deceleration time 4	0.0s ~ 6500.0s	10.0S	☆
P8.09	Auxiliary torque upper limit	0.0% ~ 200.0%	10.0%	★
P8.10	reserve			
P8.11	Jumping frequency 1	0.00Hz ~ maximum frequency	0.00Hz	☆
P8.12	Jumping frequency 2	0.00Hz ~ maximum frequency	0.00Hz	☆
P8.13	Jumping frequency range	0.00Hz ~ maximum frequency	0.01Hz	☆
P8.14	Frequency selecting is forbidden during acceleration/ deceleration	0 : invalid ; 1 : valid	0	☆
P8.15	1/2 of acceleration time frequency switch point	0.00Hz ~ maximum frequency	0.00Hz	☆
P8.16	1/2 of deceleration time frequency switch point	0.00Hz ~ maximum frequency	0.00Hz	☆
P8.17	Terminal jog function priority selection	0 : not priority ; 1 : priority	0	☆

Function code	Name	Setting range	Factory setting	Modify
P8.18	Upper limit frequency source reference mode	0 : P0.05 reference 1 : AI1 reference 2 : AI2 reference 3 : potentiometer of keypad 4 : PULSE trains setting 5 : communication setting	0	★
P8.19	Upper limit frequency offset	0.00Hz ~ maximum P0.04	0.00Hz	☆
P8.20	reserve			☆
P8.21	reserve			★
P8.22	reserve			☆
P8.23	Terminals UP/DOWN charge rate	0.001Hz ~ 65.535Hz	1.00Hz	☆
P8.24	accelerate/ decelerate mode	0 : accelerate/ decelerate with straight line ; 1 : S curve accelerate/ decelerate A	0	★
P8.25	S curve time scale of starting step	0.0% ~ (100.0%-P8.26)	30.0%	★
P8.26	S curve time scale of close step	0.0% ~ (100.0%-P8.25)	30.0%	★
P8.27	Forward/ reverse dead zoon time	0.0s ~ 3000.0s	0.0s	☆
P8.28	reserve			☆
P8.29	Running mode selection	0 : running as lower limit frequency	0	☆

Function code	Name	Setting range	Factory setting	Modify
	when frequency less than lower limit frequency	1 : stop 2 : zero speed running		
P8.30	Terminal start when power on protection select	0 : not protection ; 1 : protection	0	☆
P8.31	Drop control	0.00Hz ~ 10.00Hz	0.00Hz	☆
P8.32	FDT1 level	0.00Hz ~ maximum frequency	50.00Hz	☆
P8.33	FDT 1 lag value	0.0% ~ 100.0%	5.0%	☆
P8.34	Frequency arrival detecting range	0.0% ~ 100.0% (maximum)	0.0%	☆
P8.35	FDT2 level	0.00Hz ~ maximum frequency	50.00Hz	☆
P8.36	FDT2 lag value	0.0% ~ 100.0%	5.0%	☆
P8.37	Every arrival frequency detecting value 1	0.00Hz ~ maximum frequency	50.00Hz	☆
P8.38	Every frequency arrival detecting range 1	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8.39	Every arrival frequency detecting value 2	0.00Hz ~ maximum frequency	50.00Hz	☆
P8.40	Every frequency arrival detecting range 2	0.0% ~ 100.0% (maximum frequency)	0.0%	☆
P8.42	Time of timer setting method	0 : P8.43 digital set 1 : AI1 reference 2 : AI2 reference	0	☆

Function code	Name	Setting range	Factory setting	Modify
		3 : potentiometer of keypad Range of analog input corresponding to P8.43		
P8.43	Time value of timer	0.0min ~ 6500.0min	0Min	☆
P8.44	Zero current detect level	0.0% ~ 300.0% ; (100.0% corresponding to motor rated current, stop without output)	5.0%	☆
P8.45	0 current detect delay time	0.01s ~ 600.00s	0.10s	☆
P8.46	Zero current detect delay time	0.01s ~ 600.00s	200.0%	☆
P8.47	over current set point by software	0.0% (no detect) 0.1% ~ 300.0% (motor rated current)	0.00s	☆
P8.48	Any current arrival 1	0.0% ~ 300.0%(motor rated current)	100.0%	☆
P8.49	Range of any current arrival 1	0.0% ~ 300.0%(motor rated current)	0.0%	☆
P8.50	Any current arrival 1	0.0% ~ 300.0%(motor rated current)	100.0%	☆
P8.51	Range of any current arrival 1	0.0% ~ 300.0%(motor rated current)	0.0%	☆
P8.52	AI1 input voltage lower limit protection	0.00V ~ P8.53	3.00V	☆
P8.53	AI1 input voltage upper limit protection	P8.52 ~ 11.00V	7.00V	☆
P8.54	Cooling fan control	0: fans working when AC drive running	0	☆

Function code	Name	Setting range	Factory setting	Modify
		1: Fans working once power up 2 : fans works reach set temperature		
P8.55	Module temperature reach and DO output	0°C ~ 100°C	75°C	☆
P8.56	Current running time reach and DO output	0min ~ 65535min	0	☆
P8.57	Motor selection	0: motor 1 ; 1: motor 2	0	★
P8.58	Fans temperature reach	0°C ~ 100°C	45°C	☆
P8.68	If voltage output when 0 speed running	0 : has output 1: no output	0	★
P8.70	Braking unit working	0 : working when it need 1 : working as well under stop mode	0	★
P8.71	Filter time of keypad display time	0.001 ~ 1.000s	0.100S	☆
P9 PID function group				
P9.00	PID reference	0: digital set (P9.01) 1 : AI1 2 : AI2 3 : potentiometer of keypad 4 : PULSE trains (X5) 5 : communication 6 : multiple step speed	0	☆
P9.01	PID reference value set	0.0% ~ 100.0%	50.0%	☆
P9.02	PID feedback value	0 : analog AI1	0	☆

Function code	Name	Setting range	Factory setting	Modify
		1 : analog AI2 2 : reserve 3 : AI1-AI2 4 : PULSE train (X5) 5 : communication 6 : AI1+AI2 7 : MAX(AI1 , AI2) 8 : MIN(AI1 , AI2)		
P9.03	PID adjust property	0 : positive ; 1 : negative	0	☆
P9.04	PID reference feedback range	0 ~ 65535	1000	☆
P9.05	proportional gain P1	0.0 ~ 100.0	20.0	☆
P9.06	integral time I1	0.01s ~ 10.00s	2.00s	☆
P9.07	derivative time D1	0.000s ~ 10.000s	0.000s	☆
P9.08	PID inversion cut of frequency for reverse	0.00 ~ maximum frequency	2.00HZ	☆
P9.09	PID limit deviation	0.0% ~ 100.0%	0.0%	☆
P9.10	PID differential amplitude limiting	0.00% ~ 100.00%	0.10%	☆
P9.11	PID reference change time	0.00 ~ 650.00s	0.00s	☆
P9.12	PID feedback filter time	0.00 ~ 60.00s	0.00s	☆
P9.13	PID output filter time	0.00 ~ 60.00s	0.00s	☆
P9.14	reserve		-	☆

Function code	Name	Setting range	Factory setting	Modify
P9.15	proportional gain P2	0.0 ~ 100.0	20.0	☆
P9.16	integral time I2	0.01s ~ 10.00s	2.00s	☆
P9.17	derivative time D2	0.000s ~ 10.000s	0.000s	☆
P9.18	PID parameters switchover condition	0 : no switch 1 : terminals 2 : Switchover according to deviation	0	☆
P9.19	PID parameters switchover deviation 1	0.0% ~ PA.20	20.0%	☆
P9.20	PID parameters switchover deviation 2	PA.19 ~ 100.0%	80.0%	☆
P9.21	PID starting value	0.0% ~ 100.0%	0.0%	☆
P9.22	PID starting value holding time	0.00 ~ 650.00s	0.00s	☆
P9.23	Positive maximum between twice deviation output	0.00% ~ 100.00%	1.00%	☆
P9.24	Negative maximum between twice deviation output	0.00% ~ 100.00%	1.00%	☆
P9.25	PID integral property	Unit digit: integral separation 0 : invalid ; 1 : valide Ten digit: if stop integral calculating when output reach to limit 0 : continue ; 1 : stop	00	☆

Function code	Name	Setting range	Factory setting	Modify
P9.26	PID feedback loss detect value	0.0% : no detect for loss 0.1% ~ 100.0%	0.0%	☆
P9.27	PID feedback loss detect time	0.0s ~ 20.0s	0.0s	☆
P9.28	PID stop calculating	0: stop without calculating, 1: stop and calculating	0	☆
P9.29	wake up frequency	Sleeping frequency (P9.31) ~ maximum (P0.10)	0.00Hz	☆
P9.30	Wake up delay time	0.0s ~ 6500.0s	0.0s	☆
P9.31	sleeping frequency	0.00Hz ~ wake frequency (P9.29)	0.00Hz	☆
P9.32	Sleeping delay time	0.0s ~ 6500.0s	0.0s	☆
P9.33	Wake up function define	0 : as frequency (P9.29) 1 : as percentage (P9.34)	0	☆
P9.34	Wake up value	0.0% ~ 100.0%	0.0%	☆
PA Multiple stop command, PLC running group				
PA.00	Multi-step speed 1	-100.0% ~ 100.0% (100.0% corresponding to P0.04)	5.0%	☆
PA.01	Multi-step speed 2	-100.0% ~ 100.0%	10.0%	☆
PA.02	Multi-step speed 3	-100.0% ~ 100.0%	15.0%	☆
PA.03	Multi-step speed 4	-100.0% ~ 100.0%	20.0%	☆
PA.04	Multi-step speed 5	-100.0% ~ 100.0%	25.0%	☆
PA.05	Multi-step speed 6	-100.0% ~ 100.0%	30.0%	☆
PA.06	Multi-step speed 7	-100.0% ~ 100.0%	35.0%	☆
PA.07	Multi-step speed 8	-100.0% ~ 100.0%	40.0%	☆

Function code	Name	Setting range	Factory setting	Modify
PA.08	Multi-step speed 9	-100.0% ~ 100.0%	45.0%	☆
PA.09	Multi-step speed 10	-100.0% ~ 100.0%	50.0%	☆
PA.10	Multi-step speed 11	-100.0% ~ 100.0%	55.0%	☆
PA.11	Multi-step speed 12	-100.0% ~ 100.0%	60.0%	☆
PA.12	Multi-step speed 13	-100.0% ~ 100.0%	65.0%	☆
PA.13	Multi-step speed 14	-100.0% ~ 100.0%	70.0%	☆
PA.14	Multi-step speed1 5	-100.0% ~ 100.0%	75.0%	☆
PA.15	Multi-step speed1 5	-100.0% ~ 100.0%	80.0%	☆
PA.16	PLC running mode	0 :Stop when single circle running finish 1 : Keep final value when single circle running finish 2 : continue circle running	0	☆
PA.17	PLC running Power-off memory select	Unit digit : 0 : no memory when power off ; 1 : power-off memory Ten digit : 0 : no memory when stop ; 1: stop memory	00	☆
PA.18	PLC 1 st step running time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PA.19	PLC 1 st acceleration/ deceleration time select	0 ~ 3	0	☆
PA.20	PLC 2 nd step running time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆

Function code	Name	Setting range	Factory setting	Modify
PA.21	PLC 2 nd acceleration/ deceleration time select	0 ~ 3	0	☆
PA.22	PLC 3 rd step running time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PA.23	PLC 3 rd acceleration/ deceleration time select	0 ~ 3	0	☆
PA.24	PLC 4 th step running time	0.0s(h) ~ 6500.0s(h)	0.0s(h)	☆
PA.25	PLC 4 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.26	PLC 5 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.27	PLC 5 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.28	PLC 6 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.29	PLC 6 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.30	PLC 7 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.31	PLC 7 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.32	PLC 8 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆

Function code	Name	Setting range	Factory setting	Modify
PA.33	PLC 8 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.34	PLC 9 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.35	PLC 9 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.36	PLC 10 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.37	PLC 10 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.38	PLC 11 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.39	PLC 11 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.40	PLC 12 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.41	PLC 12 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.42	PLC 13 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.43	PLC 13 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.44	PLC 14 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆

Function code	Name	Setting range	Factory setting	Modify
PA.45	PLC 14 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.46	PLC 15 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.47	PLC 15 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.48	PLC 16 th step running time	0.0s(h) ~ 6553.5s(h)	0.0s(h)	☆
PA.49	PLC 16 th acceleration/ deceleration time select	0 ~ 3	0	☆
PA.50	PLC running time unit	0 : s (second) ; 1 : h (hour)	0	☆
PA.51	Multiple step command 1 frequency reference	0 : function code PA.00 reference 1 : AI1 2 : AI2 3: potentiometer keypad 4 : PULSE trains 5 : PID reference 6 : digit reference , UP/DOWN is changeable	0	☆
PA.52	reserve			
PA.53	reserve			
Pb Swing frequency, fixed length, count				
Pb.00	Swing frequency setting mode	0 : corresponding to center frequency 1 : corresponding to maximum	0	☆

Function code	Name	Setting range	Factory setting	Modify
		frequency		
Pb.01	Swing frequency range	0.0% ~ 100.0%	0.0%	☆
Pb.02	Suddenly jump frequency range	0.0% ~ 50.0%	0.0%	☆
Pb.03	Swing frequency period	0.1s ~ 3000.0s	10.0s	☆
Pb.04	Delta wave rise time of swing frequency	0.1% ~ 100.0%	50.0%	☆
Pb.05	length set	0m ~ 65535m	1000m	☆
Pb.06	Actual length	0m ~ 65535m	0m	☆
Pb.07	Pulse per meter, unit: 0.1	0.1 ~ 6553.5	100.0	☆
Pb.08	count value setting	1 ~ 65535	1000	☆
Pb.09	Assign of count value	1 ~ 65535	1000	☆
PC Group Torque control				
PC.00	Torque control selection	0 : speed control 1 : Torque control mode 1 (no torque output in reverse) 2: Torque control mode 2	0	☆
PC.01	Torque reference upper limit	0 : Digital setting by (PC.03) 1 : AI 2: Reserve 3: potentiometer of keypad 4: PULSE trains 5 : Communication	0	☆

Function code	Name	Setting range	Factory setting	Modify
PC.02	Reserve			
PC.03	torque reference by digital set	-200.0% ~ 200.0%	150.0%	☆
PC.04	Torque filter time	0.0 ~ 10.0S	0.1S	☆
PC.05	Maximum frequency in forward under torque control	0.00Hz ~ maximum frequency	50.0Hz	☆
PC.06	Maximum frequency in reverse under torque control	0.00Hz ~ maximum frequency	50.0Hz	☆
PC.07	Acceleration time of torque control	0.00s ~ 65000s	0.0S	☆
PC.08	Deceleration time of torque control	0.00s ~ 65000s	0.0S	☆
PC.09	Torque control frequency source	Unit's digit: frequency source when torque output is positive Ten's digit: frequency source when torque output is negative	0	☆
Pd Group Communication parameters				
Pd.00	Series communication protocol selection	0 : MODBUS Protocol	0	
Pd.01	communication Baud rate	Unit's digit : MODBUS 0 : 300BPS 1 : 600BPS	5	☆

Function code	Name	Setting range	Factory setting	Modify
		2 : 1200BPS 3 : 2400BPS 4 : 4800BPS 5 : 9600BPS 6 : 19200BPS 7 : 38400BPS 8 : 57600BPS 9 : 115200BPS		
Pd.02	Format of data	0: No parity (8.N-2) 1: Even parity (8.E-1) 2: Odd parity (8.O-1) 3: No parity (8.N-1)	0	☆
Pd.03	Local address	1 ~ 247 ; 0 take as for Broadcast address	1	☆
Pd.04	Response delay	0ms ~ 20ms	2	☆
Pd.05	Communication timeout	0.0 (invalid) ; 0.1s ~ 60.0s	0.0	☆
Pd.06	Reserve			
CO Group monitor parameters				
CO.00	Running frequency (Hz)			
CO.01	Output current (A)			
CO.02	Output voltage (V)			
CO.03	Machine speed			
CO.04	Dc bus voltage			

Function code	Name	Setting range	Factory setting	Modify
CO.05	Frequency reference			
CO.06	Counting value			
CO.07	Length value			
CO.08	X input terminal status			
CO.09	DO output status/ Temperature of igbt module			
CO.10	AI voltage (V)			
CO.11	Reserve			
CO.12	Voltage of potentiometer (V)			
CO.13	PID reference			
CO.14	Output power			
CO.15	Output torque			
CO.16	Linear speed			
CO.17	PID feedback			
CO.18	PLC stage			
CO.19	PLUSE trains input frequency			
CO.20	Current power on time			
CO.21	Running time after power on			
CO.22	The remaining running time after power on			

Function code	Name	Setting range	Factory setting	Modify
CO.23	Main frequency X display			
CO.24	Auxiliary frequency Y display			
CO.25	Encoder feedback speed			
CO.26	Actual feedback speed			
CO.27	AI voltage before revised			
CO.28	Reserve			
CO.29	Torque reference			
CO.30	PULSE input frequency			
CO.31	Communication value			
EO Group Fault and protection				
EO.00	Motor overload protection	0 : forbidden ; 1 : allow	1	
EO.01	Motor overload protection gain	0.20 ~ 10.00	1.00	
EO.02	Motor overload pre-alarm coefficient	50% ~ 100%	80	
EO.03	Reserve			
EO.08	Fault automatic reset times	0 ~ 100	20	
EO.09	Fault DO action	0 : on action	0	

Function code	Name	Setting range	Factory setting	Modify
	selection when fault automatic reset period	1 : action		
EO.10	Interval time of fault automatic reset	0.1s ~ 100.0s	0.0	
EO.11	Input power phase missing protection	0 : disable 1: enable	1	
EO.12	Output power phase missing protection	0 : disable 1: enable	1	
EO.18	instantaneous stop selection	0 : Disable 1: Deceleration 2 : deceleration to stop	0	
EO.19	Judged voltage of instantaneous stop action pause	80.0% ~ 100.00%	90.0	
EO.20	instantaneous stop voltage ramp up judge time	0.00s ~ 100.00s	0.50	
EO.21	instantaneous stop action judge voltage	60.0% ~ 100.0% (Standard DC bus voltage)	80.0	
EO.22	Load missing protection selection	0 : disable 1 : enable	0	
EO.23	Load missing detected level	0.0 ~ 100.0%	10.0%	
EO.24	Load missing detect	0.0 ~ 60.0s	0.1S	

Function code	Name	Setting range	Factory setting	Modify
	time			
EO.25	Over speed detected value	0.0% ~ 50.0% (maximum frequency)	20.0%	
EO.26	Over speed detected time	0.0s ~ 60.0s	1.0	
EO.27	Speed deviation too big detect value	0.0% ~ 50.0% (maximum frequency)	10	
EO.28	Speed deviation too big detect time	0.0s ~ 60.0s	10.0S	
EO.29	Back up frequency reference when abnormal	00.0% ~ 100.0% (maximum frequency PO-10)	0.0	
EO.30	Motor temperature PTC protection value	0 : Disable 1: enable	0	
EO.31	Reserve			
EO.32	Reserve			
EO.33	Reserve			
EO.34	Quick current limit selection	0 : disable 1 : enable	1	
EO.35	Module temperature protection	0.0°C ~ 100.0°C	95.0°C	
EO.36	Grounding short circuit protection power on	0 : Disable 1 : enable	1	
EO.37	Reserve			

Function code	Name	Setting range	Factory setting	Modify
EO.38	Under voltage point setting	30.0% ~ 120.0% 3 phase: 100.00% corresponding to DC voltage 350.00V 1 phase: 100.00% corresponding to DC voltage 200.00V	100.0%	
EO.39	Over voltage point setting	85.0% ~ 100.0% 3 phase: 100.00% corresponding to DC voltage 800.00V 1 phase: 100.00% corresponding to DC voltage 400.00V	100.0%	
E1 Group (reserve)				
E2 Group Fault record				
E2.00	The 3 rd (latest one) fault type.	0 : no fault 1 : over current on acceleration (E001)		
E2.01	The 3 rd fault information	2 : over current on deceleration (E002) 3 : over current on fixed speed (E003) 4 : over voltage on acceleration (E004) 5 : over voltage on deceleration (E005) 6 : over voltage on fixed speed (E006) 7 : control power fault (E007) 8 : under voltage fault (E008) 9 : inverter unit fault (E009) 10 : input power phase missing (E010) 11 : output power phase missing (E011)		

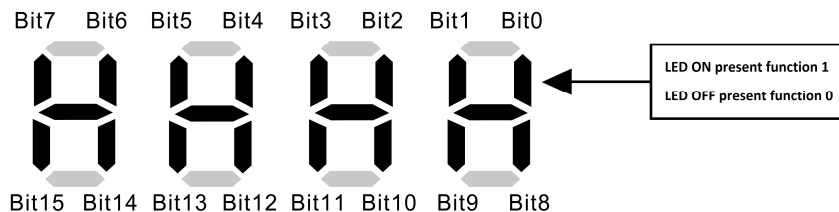
Function code	Name	Setting range	Factory setting	Modify
		12: motor to ground short circuit fault (E012) 13: Inverter hardware fault (E013) 14 : inverter overload E014) 15 : motor overload (E015) 16 : module overheat (E016) 17 : parameters write/read abnormal (E017) 18 : external fault (E018) 19 : running time arrival E019) 20: power on time arrival (E020) 21 : current detect fault (E021) 22 : motor over temperature (E022) 23 : contactor abnormal (E023) 24 : communication fault (E024) 25 : encoder /PG fault (E025) 26 : motor auto tuning fault (E026) 28 : hardware over current protection (E028)		
E2.02	Frequency when the 3 rd (latest one) fault	—		
E2.03	Current when the 3 rd (latest one) fault	—		
E2.04	DC bus voltage when the 3 rd (latest one) fault	—		

Function code	Name	Setting range	Factory setting	Modify
E2.05	Input terminals state when the 3 rd (latest one) fault	—		
E2.06	Output terminals state when the 3 rd (latest one) fault	—		
E2.07	Ac drive status when the 3 rd (latest one) fault	—		
E2.08	The 3 rd (latest one) fault time (Timing start from this time power on)	—		
E2.09	The 3 rd (latest one) fault time (Timing start from this time running start)	—		
E2.10	The 2 nd fault type			
E2.11	The 2 nd fault information			
E2.12	Frequency when the 2 nd (latest one) fault	—		
E2.13	Current when the 2 nd (latest one) fault	—		
E2.14	DC bus voltage when the 2 nd (latest one) fault	—		
E2.15	Input terminals state	—		

Function code	Name	Setting range	Factory setting	Modify
	when the 2 nd (latest one) fault			
E2.16	Output terminals state when the 2 nd (latest one) fault	—		
E2.17	Ac drive status when the 2 nd (latest one) fault	—		
E2.18	The 2 nd (latest one) fault time (Timing start from this time power on)	—		
E2.19	The 2 nd (latest one) fault time (Timing start from this time running start)	—		
E2.20	The 1 st fault type			
E2.21	The 1 st fault information			
E2.22	Frequency when the 1 st (latest one) fault	—		
E2.23	Current when the 1 st (latest one) fault	—		
E2.24	DC bus voltage when the 1 st (latest one) fault	—		
E2.25	Input terminals state when the 2 nd (latest one)	—		

Function code	Name	Setting range	Factory setting	Modify
	fault			
E2.26	Output terminals state when the 1 st (latest one) fault	—		
E2.27	Ac drive status when the 1 st (latest one) fault	—		
E2.28	The 1 st (latest one) fault time (Timing start from this time power on)	—		
E2.29	The 1 st (latest one) fault time (Timing start from this time running start)	—		

BIT introduction :



Chapter 4: Fault diagnosis and troubleshooting

Fault code description and trouble shooting

Function code	Fault name	Possibility reason	Solution
E001	Over current during acceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Perform the motor auto tuning. 3: Increase the acceleration time. 4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
E002	Overcurrent During deceleration	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The acceleration time is too	1: Eliminate external faults. 2: Perform the motor auto tuning. 3: Increase the acceleration time.

Function code	Fault name	Possibility reason	Solution
		short. 4: Manual torque boost or V/F curve is not appropriate. 5: The voltage is too low. 6: The startup operation is performed on the rotating motor. 7: A sudden load is added during acceleration. 8: The AC drive model is of too small power class.	4: Adjust the manual torque boost or V/F curve. 5: Adjust the voltage to normal range. 6: Select rotational speed tracking restart or start the motor after it stops. 7: Remove the added load. 8: Select an AC drive of higher power class.
E003	over current at constant speed	1: The output circuit is grounded or short circuited. 2: Motor auto-tuning is not performed. 3: The voltage is too low. 4: A sudden load is added during operation. 5: The AC drive model is of too small power class	1: Eliminate external faults. 2: Perform the motor autotuning. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Select an AC drive of higher power class.
E004	Overvoltage during acceleration	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time.

Function code	Fault name	Possibility reason	Solution
		4: The braking unit and braking resistor are not installed.	4: Install the braking unit and braking resistor.
E005	Overvoltage during deceleration	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
E006	Overvoltage at constant speed	1: The input voltage is too high. 2: An external force drives the motor during deceleration	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
E007	Control power supply fault	The input voltage is not within the allowable range.	Adjust the input voltage to the allowable range.
E008	Under voltage	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or agent

Function code	Fault name	Possibility reason	Solution
		4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	
E009	AC Drive parts fault	1.AC drive output short circuit 2. cable from AC drive to motor too long 3. IGBT module over heat 4. IGBT module damaged 5. driving abnormal	1.To check the cable insulation, to check with disconnect motor cable 2. add AC reactor 3. to contact agent
E010	Input phase missing	1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightening board is faulty. 4: The main control board is faulty	1: Eliminate external faults. 2: Contact the agent
E011	Power output phase missing	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor three-phase winding is normal. 3: Contact the agent

Function code	Fault name	Possibility reason	Solution
E012	Short circuit to ground	The motor is short circuited to the ground.	Replace the cable or motor.
E013	AC drive hardware fault	1. exist over over current 2. exist over voltage	1. Find solution of over current fault trouble shooting. 2. Find solution of over voltage fault trouble shooting
E014	AC drive overload	1. Boost torque is too big under VF control 2. accel. and decel. time is too short 3. motor parameters setting is improperly 4. Restart motor which in counter rotate 5 . The grid voltage is too lower 6. load is too big or motor block load 7. AC drive selected is too load	1.Reduce boost torque 2. increase the accel./decel. time 3.reset motor parameters 4.Recue current limit and adopt speed tracking 5. Too check grid voltage 6.Too check load 7.change bigger power AC drive
E015	Motor load	1. Motor have wrong parameters setting 2. Input voltage of grid is too low	1, Reset the motor parameters 2, check the input source of grid 3, Check the motor load if in

Function code	Fault name	Possibility reason	Solution
		3. Load is too big or motor is blocked	good condition
E016	Module overheat	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The AC Drive module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the AC Drive module.
E017	EEPROM read/ write fault	The EEPROM chip is damaged.	Replace the main control board.
E018	External equipment fault	Through multiple terminals X input external fault signal 2.Terminals error operation	1.runing reset 2.Contact agent
E019	Accumulative running time reached	The accumulative running time reaches the setting value.	Clear the record through the parameter initialization function
E020	Accumulative power-on time reached	The accumulative power-on time reaches the setting value	Clear the record through the parameter initialization function
E021	Current detect fault	1. Current hall detect damaged 2.Driving board fault	1. check the hall and plug if loose 2. contact to agent
E022	Overheat fault of	1.Motor temperature	1.motor heat dissipation is not

Function code	Fault name	Possibility reason	Solution
	motor	2. motor temperature sensor fault	good 2.checkthe connecting of halls and sensor
E023	Contactor fault	1.Contactor is abnormal 2.driving board and power supply is not good	1.change the contactor 2.contact agent
E024	Communication fault	1.Upper control abnormal 2.communication cable is not good 3.communicaiton parameters setting is correct	1. Check the connection of upper controller 2. Check communication cable 3.To set correct parameters
E026	Motor auto-tuning fault	1: The motor parameters are not set according to the nameplate. 2: The motor auto-tuning times out.	1: Set the motor parameters according to the nameplate properly. 2: Check the cable connecting the AC drive and the motor.
E028	Quick current limit fault	1.load is too big and motor is blocked 2.AC drive power used is too small 3.don't performed motor auto tuning	1. Check the motor and machine load 2. perform motor auto tuning.
E032	Load missing fault	Ac drive running current is less than E0.23 setting value	Check if motor if disconnect from AC drive and check the parameters setting.

Function code	Fault name	Possibility reason	Solution
E033	PID feedback missing fault	The PID feedback value is less than P9.26 set value	Check the feedback setting

Chapter 5: Communication protocol description

Overview of communication agreement

Standard RS485 communication interface is collocated for the AC drive; ModBus communication agreement is adopted according to the international standard for active/passive communication. The user is able to make use of PC/PLC, upper computer and main station AC drive for centralized control (set up the revision status of control command, operation frequency and related functional code parameters of frequency converter; execute surveillance to the working status and fault information of frequency converter) and thus adapt to specific application requirements.

5.1. Protocol format

MOBUS RTU forma

Large than 3.5 bytes of transmission time	Slave address	Function code	Data	CRC check	Large than 3.5 bytes of transmission time
Frame starting		PDU			Frame end

5.2. Slave machine address

5.2.1. for broadcast address , the slave address can be set for 1 ~ 247

5.3 PDU parts

5.3.1. Function code 03 : (read data)

Read multiple AC drive function code parameters, running status, monitor parameters and fault information, can read at most 6 continuous address of AC drive parameters.

Host machine data send

PDU part	03	Register starting address high bit	Resistor starting address low bit	High address of number of register	Low address of number of
----------	----	------------------------------------	-----------------------------------	------------------------------------	--------------------------

					register
Date length (Byte)	1	1	1	1	1

Slave machine response :

PDU part	03	Read number of bytes(2* number of register)		Read content	
Date length (Byte)	1	1		2* number of register	

5.3.2. Function 06 (Write EEPROM)

Write operation command, running frequency, function code parameter for single Ac dive

Host machine send.

PDU part	06	Register starting address high bit	Register starting address low bit	High address of number of register	Low address of number of register
Date length (Byte)	1	1	1	1	1

Slave machine response :

PDU par	06	Register starting address high bit	Register starting address low bit	High address of number of register	Low address of number of register
Date length (Byte	1	1	1	1	1

Objection response code	Corresponding mistake
01	Password is wrong
02	Command code is wrong
03	CRC check wrong
04	Invalid address
05	Invalid parameters
06	Parameter change is invalid
07	System is locked
08	Performing EEPROM operation

5.4 .CRC checking

CRC check	CRC low address	CRC high address
Data length (Byte)	1	1

CRC hecking function as following

```
unsigned int crc_chk_value(unsigned char*data_value, unsigned char length)
```

```
{
    unsigned int crc_value=0xFFFF;
    inti;
    while(length--)
    { crc_value^=*data_value++;
    for(i=0;i<8;i++)
    { if(crc_value&0x0001)
    crc_value=( crc_value>>1)^0xA001;
    else
    crc_value=crc_value>>1;
    }
    }
}
```

```
return(crc_value);
}
```

5.5. Communication parameter definition

AC drive parameter address CRC calculation

Register definition	Register address space
Function parameters	Named P group for initial letter of function code, only change P letter for 0 is communication address. For example: the function code P8.14 communication address is 0x080E
Operation command	0x2000
AC drive current status	0x3000
Fault information	0x3100
Frequency reference	0x4000

Note :

5.5.1 it will cause the service life of EEPROM reducing if performance write function frequently. Only write the value of RAM OK in some parameters communication mode which no need storage.

5.5.2 Operation command code corresponding to running control code

Operation command code	running control code
0x0001	Forward running
0x0002	Reverse running
0x0003	Forward Jog
0x0004	Reverse Jog
0x0005	Coast to stop (free stop)
0x0006	Acceleration to stop
0x0007	Fault reset

5.5.3.AC drive status code corresponding indicator meaning:

Ac drive status code	indicator meaning
0x0001	Forward running
0x0002	Reverse running
0x0003	Stop

5.5.4 The high address of fault information code is 0, the low address corresponding to suffix E0. of AC drive fault code, for example, the fault information code 0x000C, stand for AC drive fault code E012.

5.5.5 Monitor parameters and its communication address. (P7.02 set for 01)

SN	Monitor content	Communication W/R address
0	Running frequency (Hz)	5000H
1	Output current (A)	5001H
2	Output voltage (V)	5002H
3	Machine speed display	5003H
4	DC bus voltage (V)	5004H
5	Frequency reference (Hz)	5005H
6	Count value	5006H
7	Length value	5007H
8	X input status	5008H
9	DO output status	5009H
10	AI1 voltage (V)	500AH
11	AI2 voltage (V)	500BH
12	Voltage of potentiometer	500CH
13	PID reference	500DH
14	Output power (Kw)	500EH
15	Output torque(%)	500FH

16	Linear speed	5010H
17	PID feedback	5011H
18	PLC step	5012H
19	Input PULSE trains (Hz)	5013H
20	Current power on time	5014H
21	Current running time	5015H
22	The rest running time	5016H
23	Main frequency source	5017H
24	Auxiliary frequency source	5018H
25	Feedback speed (unit0.1Hz)	5019H
26	Encoder feedback speed	501AH
27	Before AI1 revise voltage	501BH
28	Before AI2 revise voltage	501CH
29	Torque reference	501DH
30	PULSE input frequency	501EH
31	Communication setting	501FH

5.6 Take examples

5.6.1 Start 1# AC drive forward running

Host machine request:

Slave address	Function code	Register starting address high bit	Resistor starting address low bit	register data high address	register data low address	CRC check low address	CRC check low address
01	06	20	00	00	01	43	CA

Slave machine response: AC drive forward running, feedback the same host machine request date.

5.6.2 Set AC drive running frequency is 50Hz

Host machine request:

Slave address	Function code	Register starting address high bit	register starting address low bit	register data high address	register data low address	CRC check low address	CRC check low address
01	06	40	00	27	10	86	36

Slave machine response: AC drive runs with 50Hz, feedback the same host machine request date.

5.6.3 Write AC drive current output voltage, frequency response: output frequency 227V.

Host machine request:

Slave address	Function code	Register starting address high bit	Register starting address low bit	Register data high address	register data low address	CRC check low address	CRC check low address
01	03	50	02	00	01	34	CA

Slave machine response :

Slave address	Function code	Read high address of date	Read low address of date	1 st high address of register	1 st low address of register	CRC check low address	CRC check low address
01	03	00	02	00	E3	A5	83