EMHEATER

User Manual

EM6 Series Frequency Inverter

China EM Technology Limited

Preface

Thank you for purchasing the EM6 series frequency inverter developed by China EM Technology Limited.

Before unpacking, please check carefully:

- Whether the nameplate model of frequency inverter are consistent with your order ratings. The box contains the frequency inverter, user manual.
- Whether the frequency inverter is damaged during transportation. If you find any omission or damage, please contact us or your local supplier immediately.

First-time Use

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

Due to the continuous improvement of frequency inverter, this document will be updated without prior notice.

Version: V3.3.0

Table of Contents

1. Safety Information and Precautions

Before use, please read this Manual carefully to familiarize yourself with the safety precautions of this product.

Safety Precautions:

- Before wiring, please check whether the input power is off.
- The wiring should be carried out by professional electricians.
- The grounding terminal must be grounded.
- After the completing the emergency stop circuit wiring, please check whether the emergency stop action is effective.
- Do not connect the output line of the frequency Inverter to the housing.
- Do not short circuit the output line.
- Please confirm whether the voltage of the AC main circuit power supply is consistent with the rated voltage of the Inverter.
- Please connect the brake resistor according to the wiring diagram.
- Do not connect the power cord to the output terminals U, V and W.
- Do not connect the contactor to the output circuit.
- Be sure to install the protective housing before powering on. Be sure to disconnect the power supply before removing the housing.
- Do not place the frequency Inverter with reset retry function near the mechanical equipment. Because it will suddenly restart when the alarm stops.
- It can alarm and reset only after confirming that the running signal is cut off. If it alarms and resets in the running signal state, the frequency Inverter may start suddenly.
- Do not touch the terminal of frequency Inverter. There is high voltage on the terminal, which is very dangerous.
- Do not change wiring and disassemble terminals during power-on.

- The inspection and maintenance should be carried out after the main circuit power supply is cut off.
- Please do not modify the frequency Inverter without permission.

2 Product Information

2.1 Products Label and Model Designation

EM6 - G 3 - 7d5

❶ ❷ ❸ ❹

❶	EM6 Series Frequency Inverter
❷	Products Type: G: General use
❸	Voltage range: 1: Single phase 220V 3: Three phase 380V
❹	Adaptable motor: 7d5: 7.5KW ;011: 11KW

2.2 Model and Dimension data

Matching inverter				Appearance and installing dimension (Unit: mm)					
Model	Voltage (V)	Power (kW)	Current (A)	High		Width		Depth	d
				H	H1	W	W1	D	
Single phase 220V input & Three phase 220V output									
EM6-G1-d75	220	0.75	3.8	170	160	79	60.5	127	Φ5
EM6-G1-1d5		1.5	7						
EM6-G1-2d2		2.2	9	187	173	86	68	144	Φ4
EM6-G1-004		4.0	15	237	216	111	88	168	Φ5
EM6-G1-5d5		5.5	20						
Three phase 380V input & Three phase 380V output									
EM6-G3-1d5	380	1.5	3.8	170	160	79	60.5	127	Φ5
EM6-G3-2d2		2.2	5.1	187	173	86	68	144	Φ4
EM6-G3-004		4.0	9	216	204	101	83.5	151	Φ4
EM6-G3-5d5		5.5	12.6						
EM6-G3-7d5		7.5	16.1	237	216	111	88	168	Φ5
EM6-G3-011		11	25	249	237	143	130	172	Φ5

2.3 Selection Guide of Braking Component

Inverter Power	Recommend braking reisistor		Braking unit	Remark
	Power	Resistance		
Single phase 220V				
EM6-G1-d75	100W	200Ω	Built-in as standard	-
EM6-G1-1d5	300W	100Ω		
EM6-G1-2d2	300W	100Ω		
EM6-G1-004	1000W	75Ω		
EM6-G1-5d5	1000W	75Ω		
Three phase 220V				
EM6-G3-1d5	300W	400Ω	Built-in as standard	-
EM6-G3-2d2	300W	250Ω		
EM6-G3-004	500W	150Ω		
EM6-G3-5d5	800W	100Ω		
EM6-G3-7d5	1000W	75Ω		
EM6-G3-011	1200W	50Ω		

3. Installation

3.1 Installation Environment

1. The place with indoor vents or ventilation devices.
2. The environment temperature shall be -10℃~40℃. If the temperature is over 40℃but less than 50℃, better to take down the cover of frequency inverter or open the front door of cabinet to facilitate heat dissipation.
3. Try to avoid high temperature and wet place; the humidity shall be less than 90% without frost deposit.
4. Avoid direct sunlight.
5. Keep away from flammable, explosive and corrosive gas and liquid.
6. No dust, floating fiber and metal particles.
7. Install on the place without strongly vibration. And the vibration should be not over 0.6G, please pay attention to far away from the punching machine, etc.
8. Keep away from electromagnetic interference source.

3.2 Control Circuit and Main Circuit Terminals Description

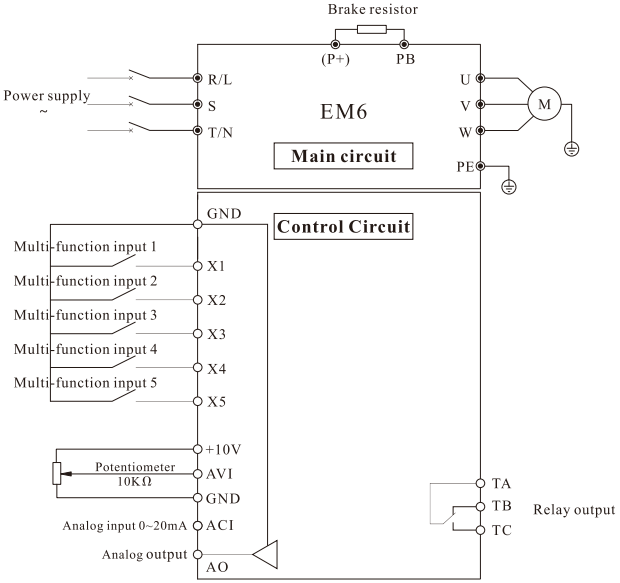


Diagram 2-1 Control Circuit and Main Circuit Wiring

3.2.1 Description of control circuit terminals

Terminal Symbol	Terminal Name	Terminal function description
R, S, T	Power supply	380V: R, S, T (220V: L, N or R, T) If the leakage protection switch is added, in order to prevent the misoperation of the leakage switch, please select the

Terminal Symbol	Terminal Name	Terminal function description
		equipment with a sensitivity of more than 200mA and an operation time of more than 100ms.
U, V, W	Inverter output, to connect the motor	In order to reduce leakage current, the motor connection line should not exceed 50 meters.
PE	Grounding	Frequency Inverter should be well grounded.
X1	Digital input X1	Set by parameter F5.02, the factory default is forward
X2	Digital input X2	Set by parameter F5.03, the factory default is reverse
X3	Digital input X3	Set by parameter F5.04, the factory default is multi-speed first
X4	Digital input X4	Set by parameter F5.05, the factory default is multi-speed second
X5	Digital input X5	Set by parameter F5.06, the factory default is external reset signal input
GND	Signal common terminal	Zero potential of input and output signal
AVI	0-10 signal input	0-10V
10V	Power supply for frequency setting potentiometer	+10V, 10mA Max
ACI	4-20 mA analog input	4-20mA
AO	Analog output signal	Set by parameter F6.10
TA, TB, TC	Relay output	Set by parameter F5.07 Contact capacity: AC 250V/3A DC 24V/2A

4. Operation and Display

4.1 Instruction of Operation and Display

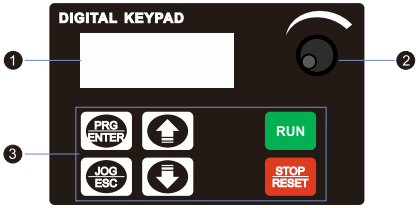
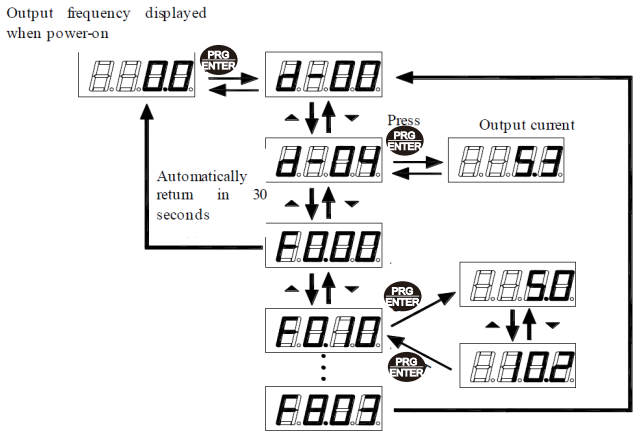


Diagram 4-1 Control panel

No.	Name	Function	
1	Main LED display area	The 4-digit LED display is able to display the setting frequency, output frequency, monitoring data and Error codes.	
2	Encoder knob	Frequency, data or function code increase or decrease; the encoder knob has the confirmation key function	
3	Operation key area	PRG ENTER	It is used to read and modify parameters. Press it to enter the parameter group or display the parameter value.
		JOG ESC	It is used for jog operation of frequency inverter or return of parameter setting
		▲	Increase data or function code.
		▼	Decrease data or function code.
		RUN	Running key: Start the frequency inverter in the keypad control mode.
		STOP RESET	Stop/Reset key: Stop the frequency inverter when it is in the running state and perform the reset operation when it is in the error state. The functions of this key are restricted by b9-00.

Method of returning to the original interface after setting parameters:

1. Power off and then power on again.
2. Select d-00 and press SET.
3. Press the SET key to hold for 3s.



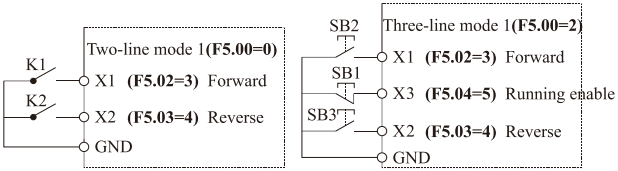
4.1.1 Set the run command mode of frequency inverter

The run command mode of frequency inverter is set by parameter F0.02:

There are two start-stop modes: panel control start-stop mode and terminal control start-stop mode.

Panel control start-stop mode(F0.02=0): To use the panel control start-stop frequency inverter, press the green button on the panel to start, and the red button to stop.

Terminal control start-stop mode(F0.02=1):



4.1.2 Frequency setting method of frequency inverter

The frequency setting mode of the inverter is set by parameter F0.03. When F0.03=4, the running frequency is set by potentiometer; When F0.03=2, the running frequency is input by AVI (0-10V potentiometer can be connected externally); 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 be increasing/decreasing frequency).

4.2 Function Code Table

Code	Parameter Name	Functional description	Default
Group F0: Basic Function Parameters			
F0.00	Inverter Power	0.0-99.9kw	Model dependent
F0.01	Control mode	0: V/F control 1: open-loop vector	0
F0.02	Run command selection	0: Panel run command 1: Terminal run command	0
F0.03	Primary frequency source X selection	0: Digital setting (preset frequency F0-07, UP/DOWN, modifiable according to the value of F0 -07, no memory of power failure) 1: Digital setting (preset frequency F0-07, UP/DOWN, modifiable according to the value of F0-07, memory of power failure)	4

Code	Parameter Name	Functional description	Default
		2: AI1(AVI) 3: AI2(ACI) 4: AI3 (keyboard potentiometer) 5: Multi-speed instruction 6: Simple PLC 7: PID	
F0.04	Auxiliary frequency source Y selection	Same as F0.03	0
F0.05	Operation of primary and auxiliary frequencies	0: primary + auxiliary 1: primary - auxiliary 2: greater of the two values 3: smaller of the two values	0
F0.06	Frequency source selection	0: Primary frequency source X 1: Operation result of primary and auxiliary frequencies (determined by operation F0.05) 2: switch between primary frequency source X and auxiliary frequency source Y 3: switch between primary frequency source X and operation result of primary and auxiliary frequencies 4: switch between auxiliary frequency source Y and operation result of primary and auxiliary frequencies	0
F0.07	Frequency digit setting	0-Maximum frequency	50.00Hz
F0.08	Maximum output frequency	Upper limit frequency - 400.0Hz	50.00Hz
F0.09	Upper limit frequency	Lower limit frequency - Maximum output frequency	50.00Hz

Code	Parameter Name	Functional description	Default
F0.10	Lower limit frequency	0-Upper limit frequency	0.00Hz
F0.11	Treatment when reaching the lower limit frequency	0: Zero speed running 1: Run at the lower limit frequency 2: Shut down	0
F0.12	First acceleration time	0.1～999.9s	10.0s
F0.13	First deceleration time	0.1～999.9s	10.0s
F0.14	Running direction	0: Forward 1: Reverse 2: Reverse prohibition This selection between forward and reverse is valid only when the command comes from the panel. The reverse prohibition is valid no matter where the command comes from.	0
F0.15	User password	0～9999	0
F0.16	Software version	-	-
F0.17	Parameter initialization	0: no operation 1: Restore factory default value (excluding motor parameters) 2: Fault clearing 3: Restore all parameters to factory default values (including motor parameters)	0
F0.18	Frequency decimal point	1~2	2
F0.20	Holding of digital set stop	0: No hold 1: Hold	1
Group F1: V/F control parameter			
F1.00	V/F curve setting	0: Linearity curve	0

Code	Parameter Name	Functional description	Default
		1: Square curve 2: 1.5 power curve 3: 1.2 power curve 4: Multi-point VF curve 5: VF complete separation 6: VF semi-separation	
F1.01	Torque lift	0.0~30.0% his value is set as a percentage of the rated voltage of the motor. If it is 0, it will be switched to automatic torque lift.	3.0%
F1.02	Torque lift cutoff frequency	0.0~50.00Hz	50.00Hz
F1.03	Carrier frequency setting	2.0～16.0KHz	Model dependent
F1.04	V/F frequency value F1	0.01Hz ~ F1.06	12.50Hz
F1.05	V/F voltage value V1	0.0% ~ F1.07	25.0%
F1.06	V/F frequency value F2	F1.04~F1.08	25.00Hz
F1.07	V/F voltage value V2	F1.05~F1.09	50.0%
F1.08	V/F frequency value F3	F1.06~Motor rated frequency	37.50Hz
F1.09	V/F voltage value V3	F1.07~100.0%	75.0%
F1.10	Torque lifting mode	0~3	3
F1.11	Braking ratio	0~100%	90%
F1.12	Torque compensation gain	0~150%	0%
F1.13	VF overexcitation gain	0~200%	25%
F1.14	Oscillation suppression mode	0~6	5
F1.15	VF separated voltage source	0～9	0
F1.16	VF separated voltage source digit setting	0 ~ motor rated voltage	0
F1.17	VF separated voltage rising time	0~1000	0

Code	Parameter Name	Functional description	Default
F1.18	VF separated voltage decelerating time	0~1000	0
F1.19	VF separation stop mode selection	0~1	0
F1.20	VF separation current closed loop control setting	0 ~ current limiting level	100
Group F2: Vector control parameter			
F2.00	Velocity loop low speed Kp	1～100	20
F2.01	Velocity loop low speed Ki	1～10.00	0.50
F2.02	Velocity loop high speed Kp	1～100	10
F2.03	Velocity loop high speed Ki	1～10.00	1.00
F2.04	Velocity loop low speed frequency calculation switch point	Lower limit frequency ~Maximum frequency	10.00Hz
F2.05	Velocity loop high speed frequency calculation switch point	Lower limit frequency ~ Maximum frequency	30.00Hz
F2.06	Motor slip compensation gain	0.0~100.0%	0.0%
F2.10	Current loop Kp	0～60000	2000
F2.11	Current loop Ki	0～60000	1300
F2.14	Open-loop vector slip compensation gain	0～200%	100%
F2.19	Speed control (drive) torque upper limit digit setting	0～200.0%	150.0%
F2.20	Maximum torque coefficient in field-weakenin g region	50～200%	100%
F2.21	M-axis current loop scale coefficient	5~300	5
F2.22	M-axis current loop integral coefficient	0~65535	0

Code	Parameter Name	Functional description	Default
F2.23	Open-loop vector velocity loop filtering time constant	0~100	25
F2.24	Open-loop vector torque lift	0~500	100
F2.25	Open-loop vector torque lift cutoff frequency	Lower limit frequency ~ Maximum frequency	20.00Hz
F2.26	Torque set filter	0~31	28
F2.27	Maximum field-weakenin g voltage overmodulatio n coefficient	0~110%	105%
F2.28	Flux observation compensation coefficient	0~100%	100%
F2.29	Flux observation filter coefficient	0~2000	300
F2.30	T-axis current closed-loop coefficient	0~500	0
F2.31	Torque limiting mode		0~1
Group F3: Auxiliary running parameters			
F3.00	Starting mode	0: Start by the start-up frequency 1: Start by the start-up frequency after DC braking	0
F3.01	Start-up frequency	0.50～20.00Hz	0.50Hz
F3.02	Start-up frequency holding time	0.0~60.0s	0
F3.03	Start DC braking current	0.0~100%	0.0%
F3.04	Start DC braking time	0.0~60.0s	0.0s
F3.05	Stop mode	0: Stop in deceleration mode, 1: Stop in deceleration mode + DC braking 2: Stop in free mode	0
F3.06	Starting frequency of stop DC braking	0.00 ~ Upper limit frequency	0.00Hz

Code	Parameter Name	Functional description	Default
F3.07	Stop DC braking current	0.0~100%	0.0%
F3.08	Stop DC braking time	0.0~30.0s	0.0s
F3.16	Function of STOP/RESET key	0: No state 1: Enabled in any situation	1
Group F4: Auxiliary running parameters 2			
F4.00	Forward jog frequency setting	0.00～50.00Hz	10.00Hz
F4.01	Reverse jog frequency setting	0.00～50.00Hz	10.00Hz
F4.02	Jog acceleration time	0.1～999.9s	Model dependent
F4.03	Jog deceleration time	0.1～999.9s	Model dependent
F4.04	Second acceleration time	0.1～999.9s	10.0s
F4.05	Second deceleration time	0.1～999.9s	10.0s
F4.06	Multi-function button	0: Void 1: When the frequency inverter is running, the jog priority is the highest 2: Reverse running 3: Switch between forward and reverse	1
F4.07	Hopping frequency	0.0 ~ Upper limit frequency	0.00Hz
F4.08	Hopping range	0.0~10.0Hz	0.00Hz
F4.09	Hopping frequency 2	0.0 ~ Upper limit frequency	0.00Hz
F4.10	Hopping range 2	0.0~10.0Hz	0.00Hz
F4.11	Hopping frequency 3	0.0 ~ Upper limit frequency	0.00Hz
F4.12	Hopping range 3	0.0~10.0Hz	0.00Hz
F4.13	Hopping frequency 4	0.0 ~ Upper limit frequency	0.00Hz
F4.14	Hopping range 4	0.0~10.0Hz	0.00Hz
Group F5: Digital input and output parameters			

Code	Parameter Name	Functional description	Default
F5.00	FWD/REV Terminal control mode	0: Two-wire control mode 1 1: Two-wire control mode 2 2: Three-wire control mode 1 3: Three-wire control mode 2	0
F5.01	Terminal function test when power on	0: Terminal run command is invalid when power on 1: Terminal run command is valid when power on	0
F5.02	Input terminal X1 function	0: No function 1: Forward jog control 2: Reverse jog control 3: Forward control (FWD) 4: Reverse control (REV) 5: Three-wire running control 6: Free stop control 7: External stop signal input (STOP) 8: External reset signal input (RST) 9: External fault normally open input 10: Frequency up command (UP) 11: Frequency down command (DOWN) 12: Multi-speed selection S1 13: Multi-speed selection S2 14: Multi-speed selection S3 15: The run command channel is forced to be the terminal 17: Stop DC braking command 18: Frequency source switch (F0.06) 22: Counter reset signal (Fb.10 counting function) 23: Counter trigger signal (Fb.10	3
F5.03	Input terminal X2 function		4
F5.04	Input terminal X3 function		12
F5.05	Input terminal X4 function		13
F5.06	Input terminal X5 function		8

Code	Parameter Name	Functional description	Default
		counting function) 24: Timer reset signal (Fb.10 timing function) 25: Timer trigger signal (Fb.10 timing function) 26: Acceleration/deceleration time selection (switch between acceleration/deceleration time 1 and acceleration/deceleration time 2)	
F5.07	Relay R output function setting	0: No function 1: The frequency inverter is ready for running 2: The frequency inverter is running 3: The frequency inverter is running at zero speed 4: Stop due to external fault 5: Inverter fault 6: Frequency/velocity arrival signal (FAR) 7: Frequency/velocity detection signal (FDT) 8: Output frequency reaching the upper limit 9: Output frequency reaching the lower limit 10: Inverter overload alarm 11: Timer overflow signal (relay output when reaching the set time of Fb.13) 12: Counter detection signal (relay output when the counter value reaches the counter detection value	5

Code	Parameter Name	Functional description	Default
		of FB12)	
F5.08	R close delay	0.0~999.9s	0.0s
F5.09	R Disconnect delay	0.0~999.9s	0.0s
F5.10	Frequency reaches the FAR detection range	0.00Hz～15.00Hz	5.00Hz
F5.11	FDT set value	0.00Hz ~Upper limit frequency	10.00Hz
F5.12	FDT lagged value	0.00～30.00Hz	1.00Hz
F5.13	UF/DOWN terminal modification rate	0.10Hz～200.00Hz/s	1.00Hz/s
F5.15	Input terminal valid logic setting (X1 ~ X5)	0~31 Bit0 ~ Bit4 correspond to X1 ~ X5 respectively 0: It means positive logic, that is, the connection between Xi terminal and common terminal is valid, and the disconnection is invalid 1: It means negative logic, that is, the connection between Xi terminal and common terminal is invalid, and the disconnection is valid	0
F5.16	X1 filter coefficient	0～9999	5
F5.17	X2 filter coefficient	0～9999	5
F5.18	X3 filter coefficient	0～9999	5
F5.19	X4 filter coefficient	0～9999	5
F5.20	X5 filter coefficient	0～9999	5
Group F6: Analog input and output functions			
F6.00	AVI input lower limit voltage	0.0～100.0%	0.0%
F6.01	AVI input upper limit voltage	0.0～100.0%	100.0%
F6.02	Corresponding setting of	-100.0%～100.0%	0.0%

Code	Parameter Name	Functional description	Default
	AVI lower limit		
F6.03	Corresponding setting of AVI upper limit	-100.0%～100.0%	100.0%
F6.04	ACI input lower limit current	0.0～100.0%	0.0%
F6.05	ACI input upper limit current	0.0～100.0%	100.0%
F6.06	Corresponding setting of ACI lower limit	-100.0%～100.0%	100.0%
F6.07	Corresponding setting of ACI upper limit	-100.0%～100.0%	100.0%
F6.08	Analog input signal filtering time constant	0.1～5.0s	0.1s
F6.09	Analog input anti-vibration deviation limit	0.0～100.0%	0.0%
F6.10	AO analog output terminal function selection	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	0
F6.11	AO functional lower limit	0.0~100.0%	0.0%
F6.12	AO functional upper limit	0.0~100.0%	100.0%
F6.13	AO output lower limit	0.0~100.0%	0.0%
F6.14	AO output upper limit	0.0~100.0%	100.0%
Group F7: Program running parameters (PLC)			
F7.00	Multi-speed frequency 1	F0.10~F0.09	5.00Hz
F7.01	Multi-speed frequency 2	F0.10~F0.09	10.00Hz
F7.02	Multi-speed frequency 3	F0.10~F0.09	15.00Hz

Code	Parameter Name	Functional description	Default
F7.03	Multi-speed frequency 4	F0.10~F0.09	20.00Hz
F7.04	Multi-speed frequency 5	F0.10~F0.09	25.00Hz
F7.05	Multi-speed frequency 6	F0.10~F0.09	37.50Hz
F7.06	Multi-speed frequency 7	F0.10~F0.09	50.00Hz
F7.07	Programmable running control (simple PLC running)	0: Single cycle 1: Continuous cycle 2: Maintain the final value after single cycle	0
F7.08	Stop memory selection	0: Stop without memory 1: Stop with memory	0
F7.09	Power off memory selection	0: power off without memory 1: power off with memory	0
F7.10	T1 running time	0.0～999.9s	10.0s
F7.11	T2 running time	0.0～999.9s	10.0s
F7.12	T3 running time	0.0～999.9s	10.0s
F7.13	T4 running time	0.0～999.9s	10.0s
F7.14	T5 running time	0.0～999.9s	10.0s
F7.15	T6 running time	0.0～999.9s	10.0s
F7.16	T7 running time	0.0～999.9s	10.0s
F7.17	T1 running mode	0: Forward running, select acceleration time 1 1: Forward running, select acceleration time 2 2: Reverse running, select acceleration time 1 3: Reverse running, select acceleration time 2	0
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
F7.26	Multi-speed is in priority	0: No priority 1: Multi-speed is in priority, priority level is lower than jog	1

Code	Parameter Name	Functional description	Default
Group F8: PID parameters			
F8.00	PID control characteristics	0: Positive effect 1: Negative effect	0
F8.01	PID given quantity selection	0: Digit setting 1: Keyboard potentiometer setting 2: AVI input 3: ACI input	0
F8.02	PID feedback quantity selection	0: AVI input 1: ACI input	0
F8.03	PID digit setting	PID range lower limit~ PID range upper limit	3.0
F8.04	PID command acceleration /deceleration time	0.0～100.0s	0.0S
F8.05	PID bias setting	0~100.0%	0.0%
F8.06	PID bias holding time	0~6000s	0s
F8.07	Upper limit of PID bias	0~100.0%	100.0%
F8.08	Lower limit of PID bias	0.0% ~100.0% (Maximum frequency)	0.0%
F8.09	Proportional gain	0.0~600.0	25.0
F8.10	Integral time	0: Nointegral 0.1~100.0s	1.0s
F8.11	Derivative time	0.00: No derivative 0.00~10.00s	0.00
F8.12	PID output upper limit	0.0~100.0%	100.0%
F8.13	PID output lower limit	0.0~100.0%	0.0%
F8.14	PID output filtering time	0.00~10.00s	0.00s
F8.15	Feedback fault action selection	0: Run at upper limit frequency 1: Run at lower limit frequency 2: Run at digit set frequency 3: Stop in deceleration mode 4: Stop in free mode	2

Code	Parameter Name	Functional description	Default
F8.16	Loss detection value	0.0~100.0%	0.0%
F8.17	Loss detection time	0.0~100.0s	1.0s
F8.18	Overvalue detection value	0.0~100.0%	100.0%
F8.19	Overvalue detection time	0.0~100.0s	1.0s
F8.20	PID sleep control	0: No sleep function 1: Internal wake-up 2: External input terminal control	0
F8.21	Sleep shutdown mode	0: Stop in deceleration mode 1: Stop in free mode	0
F8.22	Sleep frequency	0.00 Hz ~Maximum frequency	0.00
F8.23	Sleep pressure	F8.25~100.0%	95.0%
F8.24	Sleep delay time	0.0~6000.0s	30.0s
F8.25	Wake-up pressure	0.0%~F8.23	80.0%
F8.26	Wake-up delay time	0.0~60.0s	3.0s
F8.27	PID range lower limit	-3276.8~ 3276.8	0.0
F8.28	PID range upper limit	-3276.8~ 3276.8	10.0
F8.29	Number of decimal points of the range	0: Display no decimal point 1: Display one decimal point 2: Display two decimal points 3: Display three decimal points This parameter is only used to control the decimal point display of F8.03, F8.25, F8.26, d0-11 and d0-12.	1
F8.30	Water shortage detection frequency	0.00 Hz ~Maximum frequency	48.00Hz
F8.31	Water shortage detection pressure	0.0~F8.28	0.0
F8.32	Water shortage detection time	0~6500.0s	60.0s
F8.33	Water shortage restart time	0~6500.0s	600.0s

Code	Parameter Name	Functional description	Default
F8.34	Number of restarts due to water shortage	9999	6
F8.36	Photovoltaic pump running mode	0: Disable 1: Photovoltaic pump running mode 1 2: Photovoltaic pump running mode 2	0
F8.37	MPPT low point working voltage	0 ~ MPPT high point working voltage	Model dependent
F8.38	MPPT high point working voltage	MPPT low point working voltage ~ 1000V	Model dependent
F8.39	Water shortage fault shielding	0: No shielding 1: Shielding	0
F8.40	Undervoltage restart enabling	0: Disable 1: Enable	0
F8.41	Undervoltage restart delay	0.0s~360.0s	10.0s
F8.42	Self-start when power on	0: Disable 1: Enable	0
F8.43	Proportion of the water shortage detection current in the no-load current of the photovoltaic pump	0.0~300.0%	0.0%
F8.44	Minimum running frequency for water output of the photovoltaic pump	0~99.99Hz	0.00 Hz
F8.45	Water shortage detection time of the photovoltaic pump	0~250.0s	0.0s
F8.46	Swing frequency control	0: Disable 1: Enable	0
F8.47	Swing amplitude control	0: Fixed swing amplitude	0

Code	Parameter Name	Functional description	Default
		The reference value of swing amplitude is the maximum output frequency (F0.08). 1: Variable swing amplitude The reference value of swing amplitude is the given channel frequency.	
F8.48	Starting mode selection after swing frequency stop	0: Start according to the memory before stop 1: Restart	0
F8.49	Swing frequency amplitude value	0.0%~100.0%	0.0%
F8.50	Hopping frequency	0.0%~50.0%	0.0%
F8.51	Swing frequency rising time	0.1s~400.0s	5.0s
F8.52	Swing frequency drop time	0.1s~400.0s	5.0s
F8.53	Delay of the lower limit of swing frequency	0.1s~999.9s	5.0s
F8.54	Delay of the lower limit of swing frequency	0.1s~999.9s	5.0s
Group F9: Motor parameter setting			
F9.00	Rated power		Model dependent
F9.01	Rated voltage	1~500V	
F9.02	Rated current	0.01～99.99A	
F9.03	Rated rotation speed	0～60000rpm	
F9.04	Rated frequency	1.0～400.00Hz	
F9.05	Parameter identification	1.0～400.00Hz	50.00Hz
F9.06	Stator resistance	0: Disable parameter identification; 1: Enable static identification of parameters, automatically set to 0 at the end of identification;	0
F9.11	No-load current	-	Model

Code	Parameter Name	Functional description	Default
			dependent
Group FA: Protection parameter setting			
FA.00	Overload protection	0000~9999	0000
FA.01	Motor overload protection factor	30%～110%	100%
FA.02	Undervoltage protection level	220V: 150~280V 380V: 300~480V	180V 360V
FA.03	Overvoltage stall enable	0: Disable 1: Enable	1
FA.04	Overvoltage limit level	220V: 350~380V 380V: 660~790V	375V 720V
FA.05	Current limiting level	30%～200%	150%
FA.06	Frequency drop rate during current limiting	0～99.99Hz/s	0
FA.07	Selection of current limiting action	0: Void 1: Acceleration/deceleration is effective, and constant speed is ineffective 2: Acceleration/deceleration is effective, and constant speed is effective	0
FA.08	Inverter overload alarm level	50～150%	120%
FA.09	Inverter overload alarm delay	0.0~15.0s	5.0s
FA.10	Oscillation suppression coefficient	0～200	30
FA.11	Amplitude	0～1000	20
FA.12	Oscillation suppression lower limit frequency	0.0 ~ Oscillation suppression upper limit frequency (200.00Hz)	5.00Hz
FA.13	Oscillation suppression upper limit frequency	Oscillation suppression lower limit frequency(0) ~ 200.00Hz	50.00Hz
FA.16	Number of automatic fault	0～10	0

Code	Parameter Name	Functional description	Default
	resets		
FA.17	Automatic fault reset interval time	0.5～25.0s	3.0s
FA.18	VFovercurrent/ove rvoltage suppression enable	0: No operation 1: Enable overcurrent suppression 2: Enable overvoltage suppression 3: Enable overcurrent/overvoltage suppression	3
FA.19	VF overcurrent suppression Kp	0～100	20
FA.20	Current compensation factor of VF multiple speed overcurrent stall action	50～200	50
FA.21	VF overvoltage suppression Kp	0～100	60
FA.22	Maximum frequency of VF overvoltage stall rise	0～50	5
FA.23	VF overvoltage stall voltage regulation Kp	0～100	80
FA.24	Powerdown and undervoltage stop mode	0~1	0
FA.26	Output phase loss	0: Disable output phase-loss protection 1: Enable output phase-loss protection	1
FA.27	DC braking voltage	220V:370V 380V:660V	
Group Fb: Display and special parameter setting			
Fb.00	Operation monitoring parameters	0～15	0
Fb.01	Stop monitoring parameters	0～15	1

Code	Parameter Name	Functional description	Default
Fb.02	Motor rotation speed display factor	0.01～99.99	1.00
Fb.03	Current fault	0～9999	0
Fb.04	Previous fault	0～9999	0
Fb.05	Fault before the previous fault	0～9999	0
Fb.06	Fault voltage	0～9999	0
Fb.07	Fault current	0～999.9	0
Fb.08	Fault setting frequency	0～300.0	0
Fb.09	Fault running frequency	0～300.0	0
Fb.10	Counting and timing mode	000～303	103
Fb.11	Counter reset value setting	0～9999	1
Fb.12	Counter detection value setting	0～9999	1
Fb.13	Time setting	0～9999s	0
Fb.20	Software upgrade date (year)	-	
Fb.21	Software upgrade date (day/month)	-	
Fb.22	Display software version	-	
Fb.23	Product series		321
Fb.24	Auxiliary display of stop and running (dual display only)	0~15	4
Group FP: Factory parameter setting			
FP.00	Factory password	1~9999	0000
Group d: Monitoring parameters			
d0.00	Output frequency (Hz)	0.00～400.00Hz	0.01Hz
d0.01	Set frequency (Hz)	0.00～400.00Hz	0.01Hz
d0.02	Output voltage (V)	0～999V	1V
d0.03	Bus voltage (V)	0～999V	1V
d0.04	Output power (A)	0.0～999.9A	0.1A
d0.05	Motor rotation speed (Krpm)	0～60000Krpm	1Krpm

Code	Parameter Name	Functional description	Default
d0.06	Analog input AVI (V)	0.00～10.00V	0.01V
d0.07	Analog input ACI (mA)	0.00～20.00mA	0.01mA
d0.08	Analog output AO (V)	0.00～10.00V	0.01V
d0.09	Input terminal state (Relay, X1-X5)	0～3FH	1H
d0.10	Temperature	0～9999	0.1℃
d0.11	PID given value	PID range lower limit ~ PID range upper limit	1
d0.12	PID feedback value	PID range lower limit ~ PID range upper limit	1
d0.13	Current counting value	0～9999	1s
d0.14	Current timing value (s)	0～9999s	1s
d0.15	Accumulative running time of frequency inverter (h)	0～9999h	1h
d0.16	Accumulative power-on time of frequency inverter (h)	0～9999h	1h
d0.17	U-phase current sampling bias value	0～4095	
d0.18	V-phase current sampling bias value	0～4095	
d0.19	W-phase current sampling bias value	0～4095	

4.3 Fault Alarm and Countermeasures

Fault Type	Display	Possible Causes	Solutions
Overvoltage in accelerated running	OU1	1. Abnormal input voltage 2. Restart the motor in rotation	1. Check the input power supply 2. Change the setting to start after DC braking
Overvoltage in decelerated	OU2	1. Deceleration time is too short	1. Extend deceleration time

Fault Type	Display	Possible Causes	Solutions
running		2. Abnormal input voltage	2. Check the input power supply
Overvoltage in constant speed running	OU3	Abnormal input voltage	Check the input power supply
Hardware acceleration overcurrent	OCC1	1. Acceleration time is too short 2. The power of frequency inverter is small 3. Improper setting of V/F curve or torque lift 4. The IGBT module is damaged	1. Extend acceleration time 2. Choose a frequency inverter with a large powe 3. Adjust the V/F curve or torque lift 4. Contact the supplier for help
Hardware deceleration overcurrent	OCC2	1. Deceleration time is too short 2. The power of frequency inverter is small 3. The IGBT module is damaged	1. Extend deceleration time 2. Choose a frequency inverter with a large power 3. Contact the supplier for help
Hardware constant speed overcurrent	OCC3	1. The grid voltage is low 2. The load is mutated or abnormal 3. The power of frequency inverter is small 4. The IGBT module is damaged	1. Check the input power supply 2. Check the load or reduce load mutation 3. Choose a frequency inverter with a large powe 4. Contact the supplier for help
Overcurrent in software accelerated running	OCS1	1. Acceleration time is too short 2. The power of frequency inverter is small 3. Improper setting of V/F	1. Extend acceleration time 2. Choose a frequency inverter with a large power 3. Adjust the V/F curve or torque lift

Fault Type	Display	Possible Causes	Solutions
		curve or torque lift	
Overcurrent in software decelerated running	OCS2	1. Deceleration time is too short 2. The power of frequency inverter is small	1. Extend deceleration time 2. Choose a frequency inverter with a large power
Overcurrent in software constant speed running	OCS3	1. The grid voltage is low 2. The load is mutated or abnormal 3. The power of frequency inverter is small	1. Check the input power supply 2. Check the load or reduce load mutation 3. Choose a frequency inverter with a large power
Power module fault	EFO	1. Inverter output short circuited or grounded 2. Inverter transient overcurrent 3. The control board is abnormal or seriously disturbed 4. The power device is damaged	1. Check the motor wiring 2. See overcurrent countermeasures 3. Contact the factory for help 4. Contact the factory for help
Overvoltage during shutdown	OU	1.Abnormal input voltage	1.Check the voltage of power supply
Constant speed overvoltage	OU3	1. The voltage of power supply is too high 2. The load is mutated or abnormal	1. Check whether the voltage of power supply is too high 2. Check the load or reduce load mutation
Undervoltage	LU	1. Abnormal input voltage 2. Relay failed to pull in	1. Check the voltage of power supply 2. Contact the factory for help

Fault Type	Display	Possible Causes	Solutions
Over-temperature	OH	1. The ambient temperature is too high 2. The space around the frequency inverter is small 3. The air duct is blocked 4. The cooling fan is not running	1. Improve the environment 2. Adjust the space 3. Clean and clear the air duct 4. Check the power supply of the fan and the fan itself
Inverter overload	OL1	1. Improper setting of V/F curve or torque lift 2. The grid voltage is too low 3. Acceleration time is too short 4. The motor is overloaded	1. Adjust the V/F curve and torque lift 2. Check the grid voltage 3. Extend acceleration time 4. Choose a more powerful frequency inverter
Motor overload	OL2	1. Improper setting of V/F curve or torque lift 2. The grid voltage is too low 3. Locked rotor or load mutation is too large 4. Motor overload protection factor is not set correctly	1. Adjust the V/F curve and torque lift 2. Check the grid voltage 3. Check the load 4. Set the motor overload protection factor correctly
Current bias error	BIAS	1. Hardware failure	1. Contact the supplier for help
Cycle-by-Cycle current liming fault	CBC	1. The power of frequency inverter is small 2. The load is mutated or abnormal	1. Choose a frequency inverter with a large power 2. Check the load or reduce load mutation
Low PID feedback lower limit value	FBL	1. PID feedback line is loose 2. The feedback quantity is less than the disconnection	1. Check the feedback line 2. Adjust the detection input threshold

Fault Type	Display	Possible Causes	Solutions
		detection value	
PID feedback exceeds the upper limit	FBH	When the PID feedback quantity is greater than the feedback overvalue detection value, and the duration is longer than the PID feedback overvalue detection time, the frequency inverter alarms the fault FBH	1. Check the feedback line 2. Adjust the detection input threshold
EEPROM reading/writing error	EEEP	1. EEPROM fault	1. Contact the factory for help
Dual CPU communication failure	CE	1. CPU communication failure	1. Contact the factory for help
External equipment fault	EF	1. External device fault input terminal is closed	1. Disconnect the external device fault input terminal and clear the fault(check the cause)
Parameter setting failure	EPA		
Communication disconnection	E485		
Software overcurrent	SFOC		Check whether the communication line is well connected and whether the line sequence is correct.
Water shortage fault	ELH		Adjust acceleration/deceleration time; Motor parameters do not match, restart parameter

Fault Type	Display	Possible Causes	Solutions
			identification;
Output phase-loss fault	SPO	1. The wiring from the inverter to motor is not normal 2. The three-phase output of the frequency inverter is unbalanced 3. The driver board is abnormal 4. The module is abnormal	1. Troubleshoot wiring problems 2. Check whether the three-phase winding of the motor is normal 3. Contact the factory for help 4. Contact the factory for help
Warning			
Parameter setting error	EPA1	The three-wire function of the inverter is not set correctly	Check whether the three-wire system of the inverter terminal is set correctly
Sleep mode	SLEP	The frequency inverter goes into sleep mode	

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