Preface

FR500D series inverter designed special for elevator application. Combined with the control requirements of elevator application, FR500D is developed for construction elevator, simple passenger elevator, and elevator machinery.

Please refer to the commissioning guide for the commissioning in the manual

IMPORTANT NOTES

◆To illustrate the details of the products，pictures in this manual based on products with outer casing or safety cover being removed. When using this product, please be sure to well install outer casing or covering by the rules, and operating in accordance with the manual contents.

◆The illustrations in this manual are for illustration only and may vary with different products you have ordered.

◆The company is committed to continuous improvement of products, product features will continue to upgrade, the information provided is subject to change without notice.

◆If there is any questions when using, please contact our regional agents or our customer service center:(+86-0755-33067999)

◆For other products, please visit our website. http://www.frecon.com.cn

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Chapter 1 Product Information

1.1 Nameplate

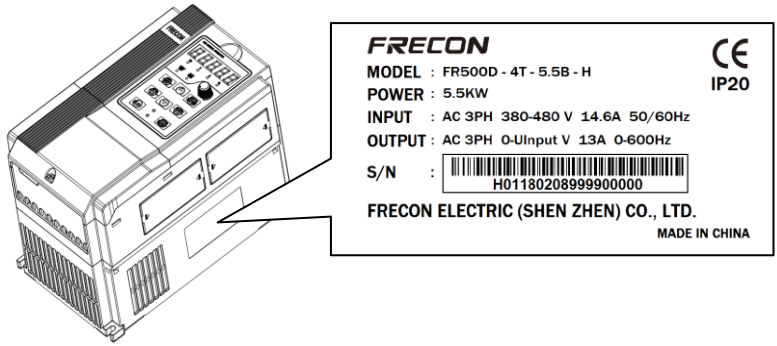


Fig.1-1 Nameplate

Model Instruction

Model numbers on name plate consist of numbers, symbols, and letters, to express its respective series, suitable power type, power level and other information.

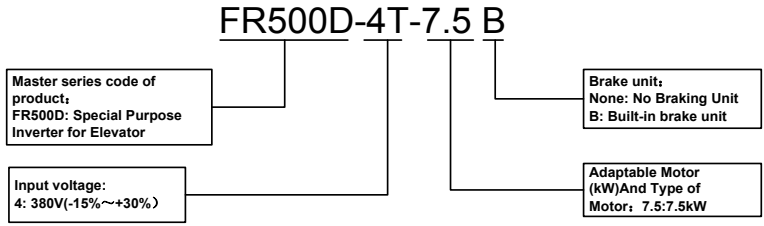


Fig.1-2 Product Model Naming Rules

1.2 FR500D series Special Purpose Inverter Model Selection

Table 1-1 FR500D series model table

Model No.	Power capacity KVA	Rated Input current A	Rated output current A	Applicable motor kW	HP	Size
3-Phase：380V，50/60Hz Range：-15%～+30%						
FR500D-4T-2.2B	4	5.8	5.5	2.2	3	R1
FR500D-4T-4.0B	6	11	9.5	3.7,4	5	
FR500D-4T-5.5B	8.9	14.6	13	5.5	7.5	
FR500D-4T-7.5B	11	20.5	17	7.5	10	R2
FR500D-4T-011B	17	26	25	11	15	R3
FR500D-4T-015B	21	35	32	15	20	
FR500D-4T-018B	24	38.5	37	18.5	25	
FR500D-4T-022B	30	46.5	45	22	30	R4
FR500D-4T-030B	40	62	60	30	40	
FR500D-4T-037(B)	57	76	75	37	50	R5
FR500D-4T-045(B)	69	92	91	45	60	R6
FR500D-4T-055(B)	85	113	112	55	70	
FR500D-4T-075(B)	114	157	150	75	100	
FR500D-4T-090	134	186	176	90	125	R7
FR500D-4T-110	160	220	210	110	150	

1.3 Product Terminal Configuration

1.3.1 Main Circuit Terminals

◆2.2～7.5KW Main Circuit Terminals

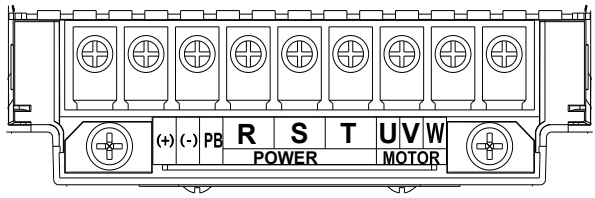


Fig.1-3 2.2～7.5kW Main Circuit Terminal Diagram

◆ 11～18KW Main Circuit Terminals

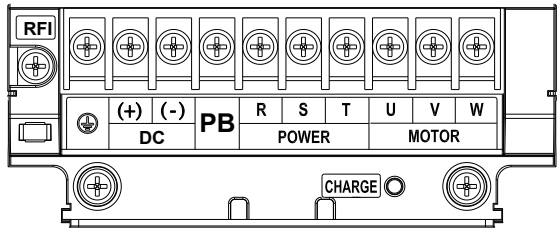


Fig.1-4 11～18kW Main Circuit Terminal Diagram

◆22～37KW Main Circuit Terminals

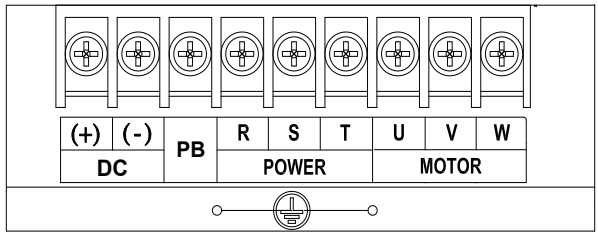


Fig.1-5. 22～37kW Main Circuit Terminal Diagram

◆45～75KW Main Circuit Terminals

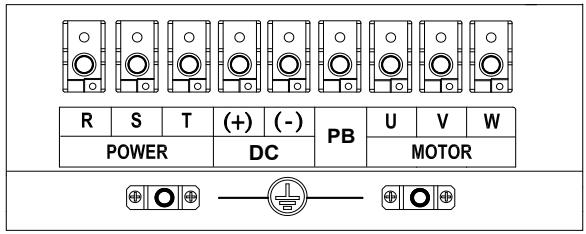


Fig.1-6. 45～75kW Main Circuit Terminal Diagram

◆90~110KW Main Circuit Terminals

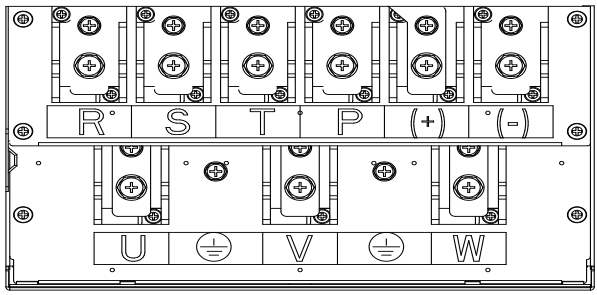


Fig.1-7. 90~110kW Main Circuit Terminal Diagram

Table 1-2 Functions of Inverter Main Circuit Terminals

Terminal Label	Description
R, S, T	AC Power Input Terminal, connected to three-phase 380V AC power.
U, V, W	Inverter AC output terminal, connected to three-phase AC motor
(+) , (-)	Respectively to be positive and negative terminal of internal DC bus
PB	Braking resistor connection terminals, one end connected to (+), the other end of PB.
⏚	Ground terminal, connected to the earth.

1.3.2 Control Circuit Terminals

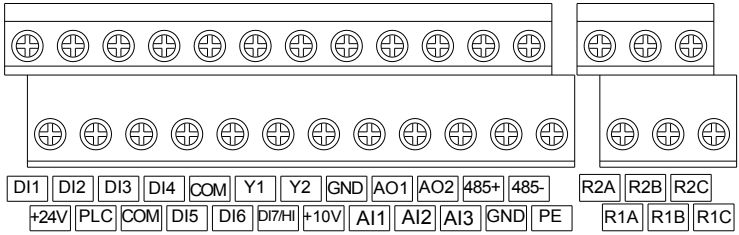


Fig. 1-8 Control Terminals Diagram

Table 1-3 FR500D Inverter Control Circuit Terminal Functions

Type	Terminal Symbol	Terminal Name	Description
Power Supply	+10V-GND	＋10V Power Supply	Output +10V Power Supply, Maximum Output Current: 10mA. Generally use for power supply of external potentiometer, resistance range of potentiometer: 1～5kΩ
	+24V-COM	24V Power Supply	Output +24V power supply, generally use for power supply of digital input/output terminal and external sensor, maximum output current: 200mA.
	PLC	External Power Input Terminal	Factory default in connection with +24V,when using an external signal to drive DI1~DI7, PLC need to be connected to external power, and disconnected with +24V power terminal.
Analog Input	AI1-GND	Analog Input Terminal 1	Input Range: DC 0～10V/0～20mA, selected by AI1,AI2 toggle switches on control board. Input Impedance:250kΩ for voltage input, 250Ω for current input.
	AI2-GND	Analog Input Terminal 2	
	AI3-GND	Analog Input Terminal 3	Input voltage range: DC -10～+10V Input Impedance: 250kΩ
Digital Input	DI1- COM	Digital Input Terminal 1	Maximum input frequency: 200Hz Input Impedance: 2.4kΩ Voltage Range of level-input:9V～30V
	DI2- COM	Digital Input Terminal 2	
	DI3- COM	Digital Input Terminal 3	
	DI4- COM	Digital Input Terminal 4	
	DI5- COM	Digital Input Terminal 5	
	DI6- COM	Digital Input Terminal 6	
	DI7/HI-COM	Digital Input Terminal 7 or high-speed pulse input	Besides the features of DI1~DI6, DI7 also can be the channel of high-speed pulse input. Maximum input frequency: 100kHz.

Analog Output	AO1-GND	Analog Output Terminal 1	Output range：DC 0～10V/0～20mA, selected by A01,A02 toggle switches on control board. Impedance required≥10kΩ
	AO2-GND	Analog Output Terminal 2	
Digital Output	Y1-COM	Open Collector Output 1	Voltage Range: 0～24V Current Range: 0～50mA
	Y2/HO-COM	Open Collector Output 2or high-speed pulse output	Apart from Y1 characteristics, Y2 also can be the channel of high-speed pulse input. Maximum output frequency: 100kHz.
Relay Output	R1A-R1C	normal open terminal	Contact driving ability: AC250V，3A，COSØ=0.4。 DC 30V，1A
	R1B-R1C	normal close terminal	
	R2A-R2C	normal open terminal	
	R2B-R2C	normal close terminal	
485 Communication	485+-485-	485 Communication Terminals	Speed: 4800/9600/19200/38400/57600/115200bps. RS485 toggle switch on control board, setting the terminal matching-resister
	GND	485 Communication Shield Ground	
Shielded	PE	Shield Grounding	It's use for grounding the shield of terminal-wire
Aid Interface		External Keyboard Interface	When connected to operation board, the longest communication distance is up to 50m, adopt the standard network cable (RJ45)
	UP/DOWNLOAD	Parameter Copy Card Interface	

1.4 Dimensions, installation dimensions and weight

◆4.0～18kW Dimensions and wall mounting dimensions

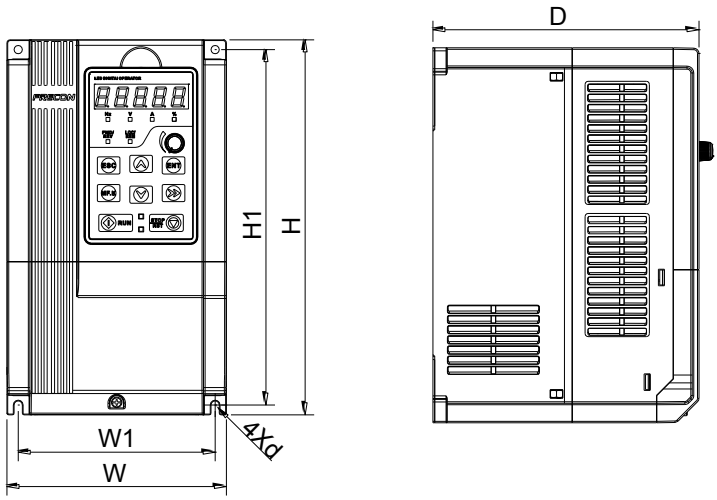


Fig.1-9 4Kw~18kW Wall Installation Diagram

◆ 22～110kW Dimensions and installation dimensions

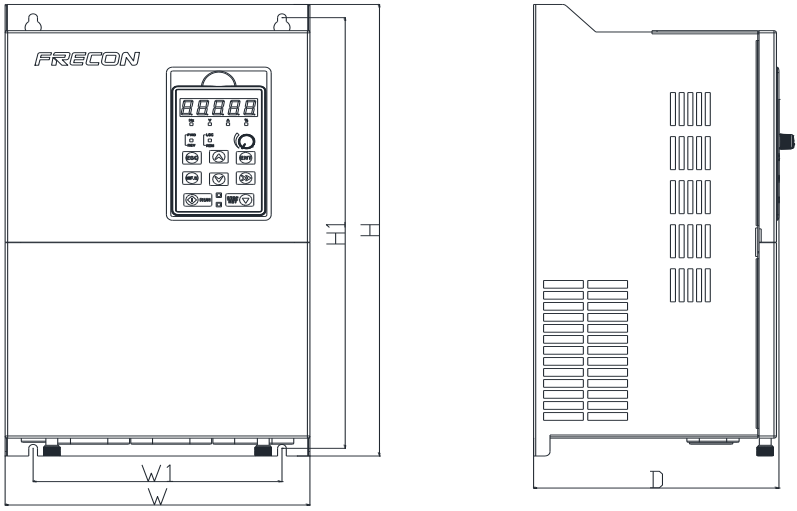


Fig.1-10 22～110kW Wall mounting diagram

Table 1-4 Wall Mounting Size Table

Model NO.	External and installation dimensions（mm）						Weight（Kg）
	W	W1	H	H1	D	Mounting Hole Diameter	
3-Phase:380V，50/60Hz Range:-15%～+30%							
R1	116.6	106.6	186.6	176.6	175	4.5	2.5
R2	146	131	249	236	177	5.5	3.9
R3	198	183	300	287	185	5.5	6.2
R4	245	200	410	391	200	7	11.8
R5	275	200	470	451	215	7	15
R6	310	200	620	601	262	9.5	26
R7	310	200	650	620	350	11.5	45

Chapter 2 Commissioning guide

FR500D series designed special for elevator application supports open loop & close loop vector control as well as below functions:

2.1 Single multi-step speed terminal elevator controller

The high speed and leveling speed is controlled by high speed terminal's on-off, the wiring is as below

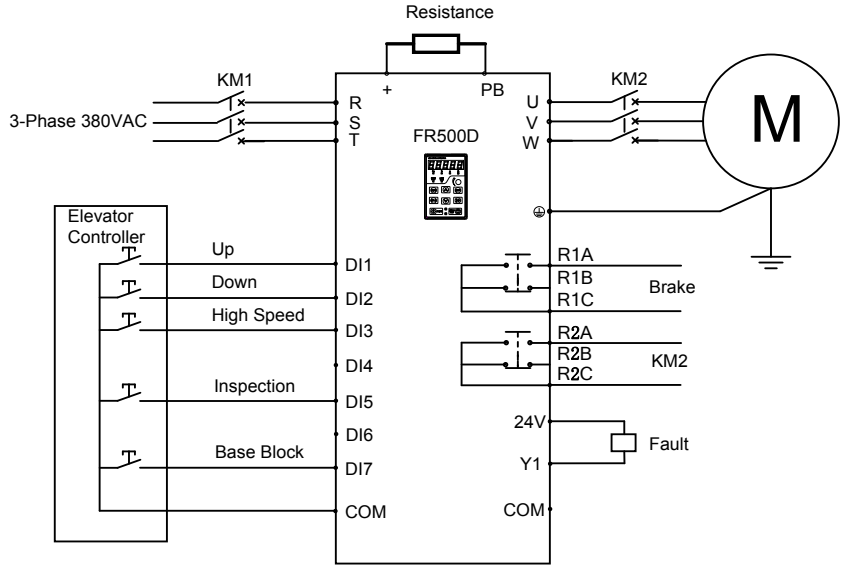


Fig. 2-1 Wiring of single multi-step speed terminal elevator controller

To complete the wiring of controller, elevator and motor, no need R2 & Y1 wiring if the controller is without operation contactor (KM20) and fault signal receive. Then commissioning procedure as below

1,To set high speed and leveling speed, which are switched through one high speed terminal, setting parameter as below:

F12.00= Leveling speed

F12.01=High speed

2, To set maintenance speed. Maintenance speed and leveling speed will be common in some elevator controllers, if no maintenance signal output, no need wiring for maintenance; If maintenance signal output available, the speed can be set via function code

H00.13=Maintenance speed

3,Base block signal, no need wiring of base block if base block signal is not available in elevator controller; If base block is available, most of elevator controllers provide normally closed signal, if so need to set DI7 in anti-logic as below

F04.14=00010

4,Maintenance operation testing, the elevator controller switched to maintenance operation mode, and press LIFT UP or LIFT DOWN to check if the running direction is consistent. If not, exchange UP and DOWN signal line, means exchange DI1 & DI2 signal lines

5,Trial run in normal mode, switch to normal operation mode for testing, to improve the comfort by adjusting acceleration & deceleration (F03.00, F03.01) and S curve time (F03.11)

2.2 Two multi-step speed terminal elevator controller

High speed is controlled by one of terminals' on-off, another terminal is for the control of leveling speed or 0 speed according to different controller. The wiring is as below:

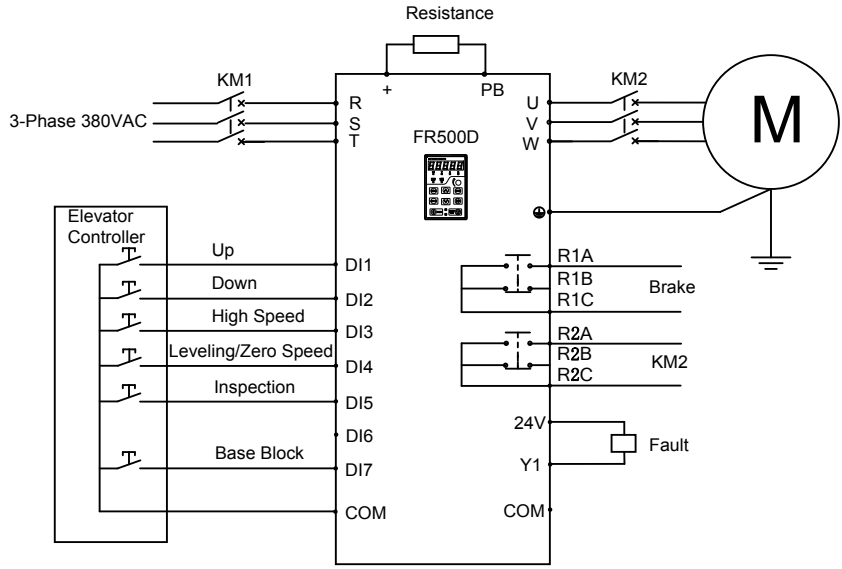


Fig. 2-2 Wiring of two multi-step speed terminal elevator controller

To complete the wiring of controller, elevator and motor, no need R2 & Y1 wiring if the controller is without operation contactor (KM20) and fault signal receive. Then commissioning procedure as below

1,To set high speed and leveling speed, which are switched through these two terminals. If the terminal signals of the controller are high speed signal and leveling speed signal, related setting parameter is as below:

F12.00= 0

F12.01=High speed

F12.02= Leveling speed

If the terminal signals of the controller are high speed signal and 0 speed signal, related setting parameter is as below:

F12.00= Leveling speed

F12.01=High speed

F12.02= 0

2, To set maintenance speed. Maintenance speed and leveling speed will be common in some elevator controllers, if no maintenance signal output, no need wiring for maintenance; If maintenance signal output available, the speed can be set via function code

H00.13=Maintenance speed

3,Base block signal, no need wiring of base block if base block signal is not available in elevator controller; If base block is available, most of elevator controllers provide normally closed signal, if so need to set DI7 in anti-logic as below

F04.14=00010

4,Maintenance operation testing. The elevator controller switched to maintenance operation mode,

and press LIFT UP or LIFT DOWN to check if the running direction is consistent. If not, exchange UP and DOWN signal line, means exchange DI1 & DI2 signal lines

5,Trial run in normal mode, switch to normal operation mode for testing, to improve the comfort by adjusting acceleration & deceleration (F03.00, F03.01) and S curve time (F03.11)

2.3 Emergency Operation Mode

When elevator is in operation, if system power supply is suddenly cut off, it may cause the passenger to be locked in the car

FR500D series elevator inverter supports emergency UPS power supply input and continue emergency operation, emergency signal receives from DI6 of inverter, the wiring is as below

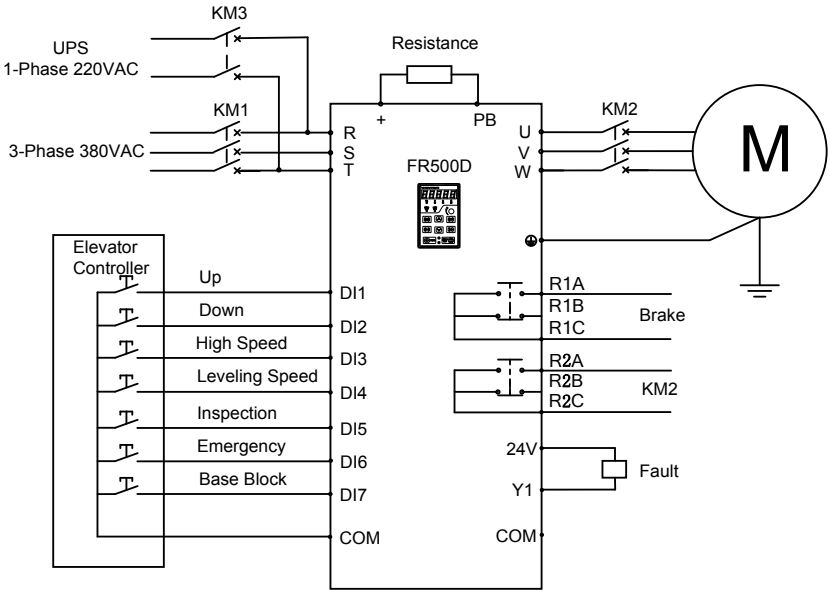


Fig. 2-3 Emergency mode wiring

When grid power supply cut off, elevator controller switched to be USP power supply and transmit emergency signal to inverter, then inverter will switch to emergency operation automatically. FR500D supports 220V single phase input and 380V three phase USP power supply.

In emergence mode, inverter will run via emergency operation frequency(H00.12), and run via acceleration time of F03.06 and deceleration time of F03.07. Meanwhile, if emergency operation frequency(H00.12) is controlled by H00.30, please refer to H00.30 parameter description

2.4 Inspection Operation Mode

When inspection signal is valid, inverter frequency will be given by H00.13, meanwhile the acceleration and deceleration time will be set by F03.04 & F03.05

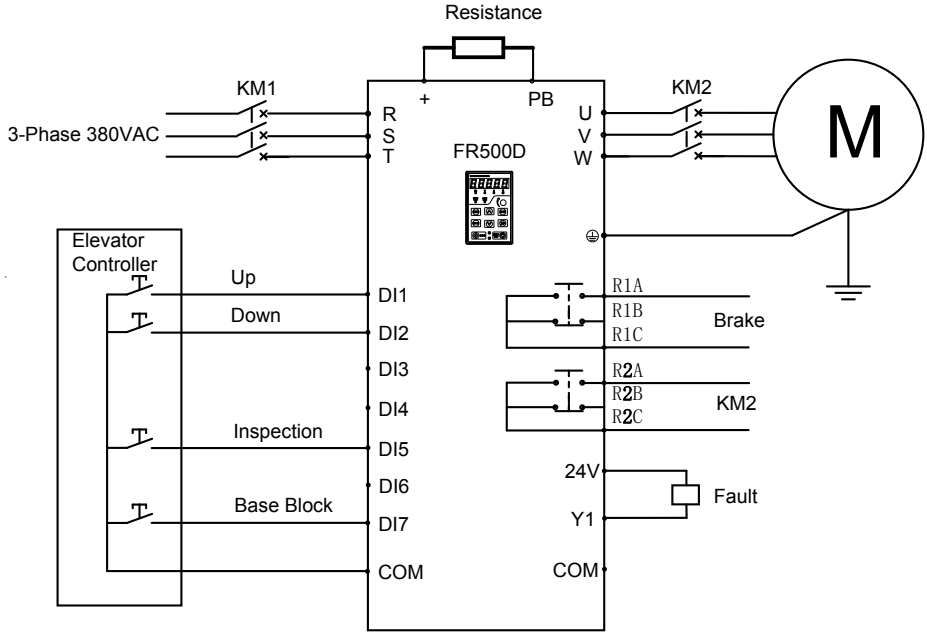


Fig. 2-3 Inspection mode

2.5 Closed Loop Vector Control

FR500D series supports closed vector control, providing kinds of PG card to different encoder, please refer to Chapter 5 for PG card details. And please refer to the wiring as below:

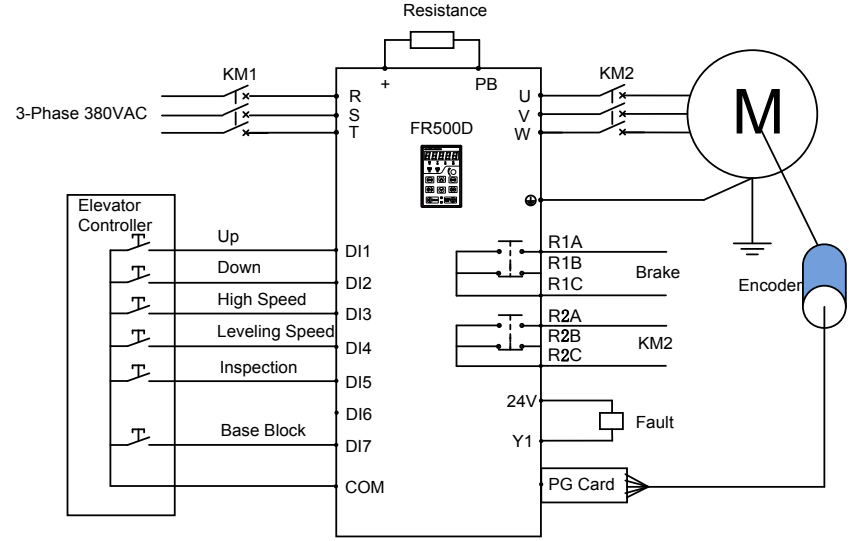


Fig. 2-5 Wiring of inverter with closed loop vector control

To complete the wiring of controller, elevator and motor and the wiring of PG card and encoder, no need R2 & Y1 wiring if the controller is without operation contactor (KM20) and fault signal receive. Then commissioning procedure is as below:

1,To set high speed and leveling speed,, related setting parameter according to the wiring is as below:

F12.00= 0
F12.01=High speed
F12.02= Leveling speed

2, To set maintenance speed. Maintenance speed and leveling speed will be common in some elevator controllers, if no maintenance signal output, no need wiring for maintenance; If maintenance signal output available, the speed can be set via function code

H00.13=Maintenance speed

3,Base block signal, no need wiring of base block if base block signal is not available in elevator controller; If base block is available, most of elevator controllers provide normally closed signal, if so need to set DI7 in anti-logic as below

F04.14=00010

4,Maintenance operation testing. First, set F00.08=1, then switch the elevator controller to maintenance operation mode, and press LIFT UP or LIFT DOWN to check if the running direction is consistent. If not, exchange UP and DOWN signal line, means exchange DI1 & DI2 signal lines

5,To check encoder direction, set F00.08=1, then switch the elevator controller to maintenance operation mode, and press LIFT UP or LIFT DOWN to check if the output frequency is consistent with feedback speed of encoder (Shown in U00.33). If output frequency is positive, the speed of U00.33 should be also positive; If output frequency is negative, the speed of U00.33 should be also negative. If the directions are not consistent, need to set F08.25=1 or exchange A & B pulse of encoder, then to check output frequency is consistent with feedback speed of encoder.

6,Operation in closed loop vector control mode, to set encoder line number of F08.23, also set motor and encoder speed ratio of F08.27, and set F00.08 for closed loop vector control mode, to switch the elevator controller to maintenance operation mode, and press LIFT UP or LIFT DOWN to check if elevator is working normally

7,Trial run in normal mode, to switch elevator controller to be normal operation mode for testing, to improve the comfort by adjusting acceleration & deceleration (F03.00, F03.01) and S curve time (F03.11)

2.6 Multi-step speed setting method

In different elevator controllers, the combination difference of multi-step speed terminal output signal will cause the parameter setting difference of leveling speed and high speed, please refer to below diagram for the parameter setting:

DI4(F04.03=14)	DI3(F04.02=13)	Speed setting parameter
0	0	F12.00
0	1	F12.01
1	0	F12.02
1	1	F12.03

Speed parameter of group F12 will be set by percentage, 100.0% corresponded to maximum frequency (Setting value of F01.08),meanwhile every step speed can be acceleration time and deceleration time independently, please refer to below diagram for the details

Multi step speed	Parameter for selecting accel and decel time
F12.00	F12.34

F12.01	F12.35
F12.02	F12.36
F12.03	F12.37

FR500D totally supports four group of acceleration time and deceleration time, time selection parameter range 0~3, please refer to below parameter setting:

	0th group	1st group	2nd group	3th group
Acceleration time	F03.00	F03.02	F03.04	F03.06
Deceleration time	F03.01	F03.03	F03.05	F03.07

Chapter 3 Function Parameters

3.1 The Basic Function Parameters

Table 3-1 Basic Function Parameters

Function Code	Name	Descriptions	Default Value	Attribute
Group F00: System Parameters				
F00.00	User Password	0～65535	0	×
F00.02	Parameter Protection	0: All parameter programmable 1: Only F00.02 and this parameter programmable	0	×
F00.04	Default Value Control	0: No operation 1: Restore all parameters to factory default (excluding motor parameters) 2: Clear fault record 3: Back up current user parameters 4: Restore user backup parameters 5: Restore factory default (include motor parameter) 6: Power consumption zero clearing(U00.35)	0	×
F00.05	Copy of Parameters	0: No operation 1: Upload parameter 2: Download parameter (excluding motor parameters) 3: Download parameter (including motor parameters)	0	×
F00.08	Motor control mode	0: Voltage/Frequency (V/F) control 1:Sensor-less vector control 1 2: Sensor-less vector control 2 3:Close loop vector control with PG card	1	×
F00.13	Carrier frequency	0.700～16.000kHz	Model defined	△
F00.18	Fan control	0: Run at power-on 1: Fan working during running	1	×
F00.20	Inverter rated power	4～75kW	Model defined	⊙
F00.21	Inverter rated voltage	380V	Model defined	⊙
F00.22	Inverter rated current	11~157A	Model defined	⊙
F00.23	Software version	0.00～655.35	Model defined	⊙
F00.24	Dealer password	0～65535	0	×

F00.25	Setting operation time	0～65535h(0: Invaild)	0h	×
Group F01: Frequency Given				
F01.08	Maximum Frequency（Fmax)	20.00～600.00Hz	50.00Hz	×
F01.09	Upper Limit Frequency(Fup)	Fdown～Fmax	50.00Hz	×
F01.10	Lower Limit Frequency(Fdown)	0.00～Fup	0.00Hz	×
F01.11	Given frequency lower than the frequency control of lower limit	0：Run by the lower frequency 1：After running time of lower limit frequency, it will run on speed of 0.	0	×
F01.12	Running time of lower limit frequency	0.0～6000.0s	60.0s	×
Group F02: Control of Run/Stop				
F02.00	Command Source Selection of Run/Start	0：Operation Panel (LED off) 1：External Terminal (LED on) 2：Computer Communications (LED flash)	1	×
F02.01	Running direction	0: Forward 1: Reverse	0	×
F02.03	Dead time between forward and reverse	0.0～6000.0s	0.0s	×
F02.14	Stop DC braking current	0.0～150.0%	100.0%	×
F02.17	Dynamic brake	0: Disabled 1: Enabled 2: Enabled at running 3: Enabled at deceleration	1	×
F02.18	Dynamic Brake Voltage	480～800V	700V	×
F02.19	Brake use ratio	5.0～100.0%	100.0%	×
F02.20	Output selection at 0Hz	0: No voltage output 1: voltage output	1	×
Group F03: Accel/Decel Parameters				
F03.00	Acceleration Time1	0.00～600.00s	4.00s	△
F03.01	Deceleration Time1	0.00～600.00s	2.00s	△
F03.02	Acceleration Time2	0.00～600.00s	4.00s	△
F03.03	Deceleration Time2	0.00～600.00s	2.00s	△
F03.04	Acceleration Time3	0.00～600.00s	4.00s	△
F03.05	Deceleration Time3	0.00～600.00s	2.00s	△
F03.06	Acceleration Time4	0.00～600.00s	4.00s	△
F03.07	Deceleration Time4	0.00～600.00s	1.00s	△
F03.10	Accel/Decele curve	0: Linear Accel/Decel 1: S-curve Accel/Decel	1	×
F03.11	Initial segment time of acceleration of S curve	0.00～600.00s	1.00s	×
F03.12	Time unit selection	0: 0.1s 1: 0.01s	1	×

F03.15	End segment time of acceleration of S curve	0.00～600.00s	1.00s	×
F03.16	Initial segment time of deceleration of S curve	0.00～600.00s	1.00s	×
F03.17	End segment time of deceleration of S curve	0.00～600.00s	0.00s	×
Group F04: Digital Input Terminals				
F04.00	Function of terminal DI1	0: No function 1: Running forward (FWD) 2: Running reverse (REV) 3: Three-wire control 4: JOG forward 5: JOG reverse 6: Coast to stop 7: Fault reset (RESET) 8: Running suspended 9: External fault input 10: Terminal UP 11: Terminal DOWN 12: UP/DOWN (including ∧/∨ key) adjustment clear 13: Multi-step frequency terminal 1 14: Multi-step frequency terminal 2 15: Multi-step frequency terminal 3 16: Multi-step frequency terminal 4 17: Accel/Decel time determinant 1 18: Accel/Decel time determinant 1 19: Accel/Decel disabled(ramp stop not inclusive) 20: Switch to auxiliary speed setting 21: PLC status reset 22: Simple PLC paused 23: Simple PLC paused 24: PID adjustment direction 25: PID integration paused 26: PID parameter switch 27: Swing frequency pause(output the current frequency) 28: Swing frequency reset(output the central frequency) 29: Run command switched to keypad control 30: Run command switched to terminal control 31: Run command switched to communication control 32: Count input 33: Count clear 34: Length count 35: Length clear	1	×
F04.01	Function of terminal DI2		2	×
F04.02	Function of terminal DI3		13	×
F04.03	Function of terminal DI4		14	×
F04.04	Function of terminal DI5		51	×
F04.05	Function of terminal DI6		52	×
F04.06	Function of terminal DI7		53	×

		36: DC brake input command at Stop 37～49：Reserved 50:Special purpose inverter enable 51: Elevator maintenance signal 52: Elevator emergency signal 53: Enable flag(Base Block)		
F04.13	Terminal DI1～DI5 positive/negative logic	DI5,DI4,DI3,DI2,DI1 0: Positive logic(Terminals are on at 0V/off at 24V) 1: Negative Logic (Terminals are off at 0V/on at 24V)	00000	×
F04.14	Terminal DI6～AI3 positive/negative logic	AI3,AI2,AI1,DI7,DI6 0: Positive logic 1: Negative Logic	00000	×
Group F05	**Digital Output**			
F05.00	Y1 output function	0: No output 1: Drive is running 2: Fault output 3: Frequency-level detection FDT1 output 4: Frequency-level detection FDT2 output 5: Drive in 0Hz running 1(no output at stop) 6: Drive in 0Hz running 2(output at stop) 7: Upper limit frequency attained 8: Lower limit frequency attained 9: Frequency attained 10: Inverter is ready to work 11: Drive (motor) overloaded alarm 12: Inverter overheat warning 13: Current running time attained 14: Accumulative power-on time attained 15: Consecutive running time attained 16: PLC cycle completed 17: Set count value attained 18: Designated count value attained 19: Length attained 20: Under load alarm 21～29：Reserved 30:Elevator brake output 31: Operation contactor output 32: Emergency signal time completed 33: Light load direction search	2	×
F05.01	Y2 output function		32	×
F05.02	Relay 1 output function		30	×
F05.03	Relay 2 output function		31	×

		completed 34: Light load direction search direction		
F05.08	Enabled state of digital output	R2,R1,Y2,Y1 0: Positive logic 1: Negative logic	0001	×
Group F08 Parameters of Motor 1				
F08.00	Motor Type	0: async motor 1: PMSM 2: Single phase asynchronous motors(Remove capacitor) 3:Single phase asynchronous motors (No need to remove capacitor)	0	×
F08.01	Power rating of motor 1	4～75kW	Model defined	×
F08.02	Rated voltage of motor 1	380V	Model defined	×
F08.03	Rated current of motor 1	11~157A	Model defined	×
F08.04	Rated frequency of motor 1	20.00～Fmax	Model defined	×
F08.05	Rated speed of motor 1	1～30000	Model defined	×
F08.08	Stator resistance R1 of async motor 1	0.001～65.535Ω	Model defined	×
F08.09	Rotor resistance R2 of async motor 1	0.001～65.535Ω	Model defined	×
F08.10	Leakage inductance L1 of async motor 1	0.01～655.35mH	Model defined	×
F08.11	Mutual inductance L2 of asynchronous motor 1	0.1～6553.5mH	Model defined	×
F08.12	No-load current of async motor 1	0.1～1500.0A	Model defined	×
F08.13	Field weakening coeff 1 of async motor 1	0.0～100.0	87%	×
F08.14	Field weakening coeff 2 of async motor 1	0.0～100.0	75%	×
F08.15	Field weakening coeff 3 of async motor 1	0.0～100.0	70%	×
F08.16	Stator resistance of PMSM	0.001～65.535Ω	Model defined	×
F08.17	D inductance of PMSM	0.01～655.35mH	Model defined	×
F08.18	Q inductance of PMSM	0.01～655.35mH	Model defined	×
F08.19	Counter electromotive force	0～60000V	280V	×
F08.20	Encoder mounting angle	0.0～359.9°	0	×
F08.21	Motor poles	0～1000	4	⊙

F08.23	Encoder line number	0～10000	1024	×
F08.24	Encoder type	0:ABZ Incremental encoder 1:UVW Incremental encoder 2:Rotary encoder 3:ECN1313 4:ERN1387	0	×
F08.25	ABZ incremental encoder AB phase sequence	0：Positive 1：Negative	0	×
F08.26	Speed feedback PG card disconnection detection time	0.0: No action 0.1～10.0s	0.0s	×
F08.27	Motor and encoder speed ratio	0.001～60.000	1.000	×
F08.30	Autotuning of motor 1	0: No autotuning 1: Static autotuning of motor 2: Rotary autotuning of motor	0	×
Group F09 V/f Control Parameters of Motor 1				
F09.00	V/f curve setting	0: Linear V/f 1: Multi-stage V/f 2: 1.2nd power V/F 3: 1.4th power V/F 4: 1.6th power V/F 5: 1.8th power V/F 6: 2.0nd power V/F 7: V/F complete separation 8: V/F half separation	1	×
F09.01	Torque boost	0.0% (fixed torque boost) 0.1～30.0%	0.0%	△
F09.02	Cut-off frequency of torque boost	0.00～Fmax	50.00Hz	△
F09.03	Multi-point V/F frequency 1(F1)	0.00～F09.05	0.00Hz	△
F09.04	Multi-point V/F voltage 1 (V1)	0.0～100.0	0.0%	△
F09.05	Multi-point V/F frequency 2(F2)	F09.03～F09.05	5.00Hz	△
F09.06	Multi-point V/F voltage 2 (V2)	0.0～100.0	14.0%	△
F09.07	Multi-point V/F frequency 3(F3)	F09.05～F09.09	25.00Hz	△
F09.08	Multi-point V/F voltage 3 (V3)	0.0～100.0	50.0%	△
F09.09	Multi-point V/F frequency 4(F4)	F09.07～Motor rated frequency	50.00Hz	△
F09.10	Multi-point V/F voltage 4 (V4)	0.0～100.0 Ue=100.0%	100.0%	△
F09.11	V/F slip compensation gain	0.0～300.0%	80.0%	△

F09.12	Stator voltagedrop compensation gain	0.0～200.0%	100.0%	△
F09.13	Excitation boost gain	0.0～200.0%	100.0%	△
F09.14	Oscillation Suppression	0.0～300.0%	100.0%	△
Group F10: Motor 1 Vector Control				
F10.01	ASR low-speed proportional gain Kp1	0.0～100.0	15.0	△
F10.02	ASR low-speed integration time Ti1	0.001～30.000s	0.050s	△
F10.03	ASR switching frequency 1	0.00 Hz～F10.06	5.00Hz	△
F10.04	ASR high-speed proportional gain Kp2	0.0～100.0	10.0	△
F10.05	ASR high-speed integration time Ti2	0.001～30.000s	0.100s	△
F10.06	ASR switching frequency 2	F10.03～Fup	10.00Hz	△
F10.07	ASR input filtering time	0.0～500.0ms	3.0ms	△
F10.08	ASR output filtering time	0.0～500.0ms	0.0ms	△
F10.09	Vector control slip gain	50.0～200.0%	100.0%	▵
F10.10	Digital setting of torque upper limit in speed control mode	80.0～200.0%	165.0%	×
F10.11	Excitation adjustment proportional gain Kp1	0.00～10.00	0.50	▵
F10.12	Excitation adjustment integral gain Ti1	0.0～3000.0ms	10.0ms	▵
F10.13	Torque adjustment proportional gain Kp2	0.00～10.00	0.50	▵
F10.14	Torque adjustment integral gain Ti2	0.0～3000.0ms	10.0ms	▵
Group F11 Protection Parameters				
F11.00	Current limit control	0: Current limit disabled 1: Current limit mode 1 2: Current limit mode 2	2	×
F11.01	Current limit	100.0～200.0%	150.0%	×
F11.02	Frequency decreasing time(limit current in constant speed operation)	0.0～6000.0s	5.0s	▵
F11.03	Current limit mode 2 proportion gain	0.1～100.0%	3.0%	▵
F11.04	Current limit mode 2 integral time	0.00～10.00s	1.00s	▵
F11.10	Protection action 1	Unit's place: Bus under voltage 0: Fault reported and coast to stop 1: Fault reported to the stop mode	03000	×

		2: Fault reported but continue to run 3: Fault protection disabled		
		Ten's digit :Power input phase Loss (Err09)		
		Hundred's digit :Power output phase loss(Err10)		
		Thousand's digit:Motor overload (Err11)		
		Ten thousand's digit:Inverter overload(Err12)		
F11.11	Protection action 2	Unit's place：External equipment fault（Err13) 0: Fault reported and coast to stop 1: Fault reported to the stop mode 2: Fault reported but continue to run 3: Fault protection disabled	00000	×
		Ten's digit: EEPROM read/write fault (Err15)		
		Hundred's digit: Communication overtime error (Err18)		
		Thousand's digit: PID feedback loss (Err19)		
		Ten thousand's digit: Continuous running time reached (Err20)		
F11.12	Protection action 3	Unit's place: Module temperature detection disconnection（Err24) 0：Fault reported and coast to stop 1: Fault reported to the stop mode 2：Fault reported but continue to run 3: Fault protection disabled	30	×
		Ten's digit: Load becoming 0 (Err25)		
F11.14	Frequency selection for continuing to run upon fault	0: Current running frequency	1	×
		1: Set frequency		
		2: Frequency upper limit		
		3: Frequency lower limit		
		4: Backup frequency upon abnormality		
F11.15	Backup frequency upon abnormality	0.00～Fmax	0.00Hz	×
F11.18	Overload alarm	Unit's place: detection option:	10	×
		0: Always detect		

		1: Detect at constant speed only Ten's digit : compared object 0: Rated current of motor 1: Rated current of drive		
F11.19	Overload alarm threshold	20.0～200.0%	150.0%	×
F11.20	Overload alarm activated time that exceeding threshold	0.1～60.0s	9.0s	×
F11.22	Detection level of power loss	5.0～100.0%	20.0%	×
F11.23	Detection time of power loss	0.1～60.0s	5.0s	×
F11.27	Times of automatic reset	0～20	0	×
F11.28	Interval of automatic reset	0.1～100.0s	1.0s	×
F11.40	Deviation of overspeed and speed too big action selection	Units：Overspeed action protection selection 0：Fault report and coast to stop 1：Warming and deceleration to stop 2：Warming and continue to run via fault frequency Tens：Speed deviation too big action selection（Err38） 0：Fault report and coast to stop 1：Warming and deceleration to stop 2：Warming and continue to run via fault frequency	00	×
F11.41	Overspeed detection value	0.0～150.0%	120.0%	×
F11.42	Overspeed detection time	0.0～60.0s	1.0s	×
F11.43	Speed deviation detection value too big	0.0～50.0%	20.0%	×
F11.44	Speed deviation detection value too big	0.0～60.0s	5.0s	×
Group F12: Multi-Reference and Simple PLC Function				
F12.00	Reference 0	-100.0～100.0%	10.0%	△
F12.01	Reference 1	-100.0～100.0%	30.0%	△
F12.02	Reference 2	-100.0～100.0%	50.0%	△
F12.03	Reference 3	-100.0～100.0%	100.0%	△
F12.04	Reference 4	-100.0～100.0%	0.0%	△
F12.34	Acceleration/deceleration time of simple PLC reference 0	0～3	0	△

F12.35	Acceleration/deceleration time of simple PLC reference 1	0～3	0	△
F12.36	Acceleration/deceleration time of simple PLC reference 2	0～3	0	△
F12.37	Acceleration/deceleration time of simple PLC reference 3	0～3	0	△
F12.38	Acceleration/deceleration time of simple PLC reference 4	0～3	0	△
Group F16 Keys and Display of Keypad Parameters				
F16.01	Function of STOP/RST key	0: STOP/RST key valid only when under keypad control 1: STOP/RST key valid under any run command source	1	×
F16.02	Keys locked option	0: Not locked 1: Full locked 2: Keys locked other than RUN, STOP/RST 3: Keys locked other than STOP/RST 4: Keys locked other than >>	0	×
F16.03	LED displayed parameters setting 1 on running status	0～99(correspond U00.00～U00.99)	0	△
F16.04	LED displayed parameters setting 2 on running status	0～99(correspond U00.00～U00.99)	6	△
F16.05	LED displayed parameters setting 3 on running status	0～99(correspond U00.00～U00.99)	3	△
F16.06	LED displayed parameters setting 4 on running status	0～99(correspond U00.00～U00.99)	2	△
F16.07	LED displayed parameters setting 1 on stop status	0～99(correspond U00.00～U00.99)	1	△
F16.08	LED displayed parameters setting 2 on stop status	0～99(correspond U00.00～U00.99)	6	△
F16.09	LED displayed parameters setting 3 on stop status	0～99(correspond U00.00～U00.99)	15	△
F16.10	LED displayed parameters setting 4 on stop status	0～99(correspond U00.00～U00.99)	16	△
Group U00 Status Monitoring				
U00.00	Running frequency	0.00～Fup	0.00Hz	⊙

U00.01	Set frequency	0.00～Fmax	0.00Hz	⊙
U00.02	Output voltage	0～660V	0.0V	⊙
U00.03	Output current	0.0～3000.0A	0.0A	⊙
U00.04	Output power	0.0～3000.0kW	0.0kW	⊙
U00.05	Estimated Motor Speed	0～60000rpm	0rpm	⊙
U00.06	Bus voltage	0～1200V	0V	⊙
U00.07	Synchronous Frequency	0.00～Fup	0.00Hz	⊙
U00.08	PLC step	0～15	1	⊙
U00.09	Program Operation Time	0.0～6000.0s(h)	0.0s(h)	⊙
U00.10	PID set	0～60000	0	⊙
U00.11	PID feedback	0～60000	0	⊙
U00.12	Status of DI1～DI5 digital input terminal	DI5 DI4 DI3 DI2 DI1	00000	⊙
U00.13	Status of DI6～DI7 digital input terminal	DI7 DI6	00	⊙
U00.14	Status of digital output terminal	R2 R1 Y2 Y1	0000	⊙
U00.15	AI1 input	0.0～100.0%	0.0%	⊙
U00.16	AI2 input	0.0～100.0%	0.0%	⊙
U00.17	AI3 input	-100.0～100.0%	0.0%	⊙
U00.18	Keypad potentiometer input	0.0～100.0%	0.0%	⊙
U00.19	HI input	0.00～100.00kHz	0.00kHz	⊙
U00.20	AO1 output	0.0～100.0%	0.0%	⊙
U00.21	AO2 output	0.0～100.0%	0.0%	⊙
U00.22	HO output	0.00～100.00kHz	0.00kHz	⊙
U00.23	Temperature of inverter	-40.0℃～120.0℃	0.0℃	⊙
U00.24	Accumulative power-on time	0～65535min	0min	⊙
U00.25	Accumulative running time	0～6553.5min	0.0min	⊙
U00.26	Cumulative power-on time	0～65535h	0h	⊙
U00.27	Cumulative running time	0～65535h	0h	⊙
U00.28	Count value	0～65535	0	⊙
U00.29	Length value	0～65535m	0m	⊙
U00.30	Linear speed	0～65535m/min	0m/Min	⊙
U00.31	Output torque	0.0～300.0%	0.0%	⊙
U00.33	Encoder detected speed	0～60000rpm	0rpm	⊙
U00.34	Encoder line number monitoring	0～65535	0	⊙
Group U01 Fault Record				
U01.00	Code of the latest fault	0: No fault Err01：Accel overcurrent Err02：Decel overcurrent	Err00	⊙

		Err03：Constant-speed overcurrent		
		Err04：Accel overvoltage		
		Err05：Decel overvoltage		
		Err06：Constant-speed overvoltage		
		Err07：Bus undervoltage		
		Err08：Short circuit		
		Err09：Power input phase loss		
		Err10：Power output phase loss		
		Err11：Motor overload		
		Err12：Inverter overload		
		Err13：External equipment fault		
		Err14：Module overheat		
		Err15：EEPROM read/write fault		
		Err16：Motor auto-tuning cancelled		
		Err17：Motor auto-tuning fault		
		Err18：Communication overtime error		
		Err19：PID feedback loss		
		Err20：Continuous running time reached		
		Err21：Parameter upload fault		
		Err22：Parameter download fault		
		Err23：Braking unit fault		
		Err24：Module temperature detection disconnection		
		Err25：Lose-load failure/alarm of Inverter		
		Err26：With-wave current limit fault		
		Err27：Inverter soft-start relay is off		
		Err28:Software version compatibility fault		
		Err29：Instantaneous overcurrent		
		Err30：Instantaneous overvoltage		
		Err36：PG card disconnection		
		Err37：Over speed		
		Err38：Speed deviation too big		
		Err40：Setting operation time ends		
		Err41：Overload warming fault		
		Err43：Light load direction search		

		fault		
U01.01	Running frequency when the latest fault occurred	0.00～Fup	0.00Hz	⊙
U01.02	Output current when the latest fault occurred	0.0～3000.0A	0.0A	⊙
U01.03	Bus voltage when the latest fault occurred	0～1200V	0V	⊙
U01.04	Cumulative running time when the latest fault occurred	0～65535h	0h	⊙
U01.05	Code of previous fault	The same with U01.00	Err00	⊙
U01.06	Running frequency when previous fault occurred	0.00～Fup	0.00Hz	⊙
U01.07	Output current when previous fault occurred	0.0～3000.0A	0.0A	⊙
U01.08	Bus voltage when previous fault occurred	0～1200V	0V	⊙
U01.09	Cumulative running time when previous fault occurred	0～65535h	0h	⊙
U01.10	Before-previous fault code	The same with U01.00	Err00	⊙
U01.11	Running frequency when before-previous fault occurred	0.00～Fup	0.00Hz	⊙
U01.12	Output current when before-previous fault occurred	0.0～3000.0A	0.0A	⊙
U01.13	Bus voltage when before-previous fault occurred	0～1200V	0V	⊙
U01.14	Cumulative running time when before-previous fault occurred	0～65535h	0h	⊙
U01.15	Previous 3 categories of faults	The same with U01.00	Err00	⊙
U01.16	Previous 4 categories of faults	The same with U01.00	Err00	⊙
U01.17	Previous 5 categories of faults	The same with U01.00	Err00	⊙
U01.18	Previous 6 categories of faults	The same with U01.00	Err00	⊙
U01.19	Previous 7 categories of faults	The same with U01.00	Err00	⊙
U01.20	Previous 8 categories of faults	The same with U01.00	Err00	⊙
U01.21	Previous 9 categories of faults	The same with U01.00	Err00	⊙

Group H00: Elevator Special Purpose Group				
H00.00	Special Purpose Inverter Function Enable	0: Invalid 1: Valid	1	×
H00.01	Brake Open Delay	0.00～10.00s	0.00s	×
H00.02	Start Frequency	0.00～10.00Hz	5.00Hz	×
H00.03	Start Frequency Holding Time	0.00～10.00s	0.00s	×
H00.04	Brake Release Delay	0.00～10.00s	0.30s	×
H00.05	Brake Open Frequency (Rising)	0.00～10.00Hz	1.00Hz	×
H00.06	Brake Release Frequency (Rising)	0.00～10.00Hz	0.20Hz	×
H00.07	Brake Open Frequency (Falling)	0.00～10.00Hz	1.00Hz	×
H00.08	Brake Release Frequency (Falling)	0.00～10.00Hz	0.20Hz	×
H00.09	Brake Open Current	0.0～100.0%	40.0%	△
H00.10	Brake Open Frequency Holding Time	0.00～10.00s	0.30s	×
H00.11	Brake Open Type	0: Open according to frequency 1: Open according to frequency & current	0	×
H00.12	Emergency Operation Frequency	0.00～50.00Hz	5.00Hz	△
H00.13	Maintenance Operation Frequency	0.00～50.00Hz	8.00Hz	△
H00.14	Emergency Signal Processing	0: Lift Stop 1: Lift Powered on By UPS And Run	1	×
H00.15	Running Contactor Release Delay	0.00~10.00s	0.20s	×
H00.16	Running Contactor Open Delay	0.00~10.00s	0.10s	×
H00.17	Stop DC Injection Time ,	0.00~10.00s	0.50s	×
H00.18	Short Floor Function	0:Invalid 1:Short Floor Function 2:Senior Short Floor Function	0	×
H00.19	Short Floor Speed	0.0～100.0%	60.0%	×
H00.20	Leveling Jerk	0.0~100.0%	0.0%	×
H00.21	Leveling Jerk Frequency	0.00~1.00	0.20	×
H00.22	Motor Mode Slip	0.00~3.00Hz	0.00Hz	×
H00.23	Generator Mode Slip	0.00~3.00Hz	0.00Hz	×
H00.24	Emergency Signal Valid Time	0.0～500.0s	10.0s	×
H00.25	Emergency Signal Invalid Time	0.0～1000.0s	180.0s	×
H00.26	Light load direction	0: Invalid	1	×

	search enable	1: Valid		
H00.27	Light load direction detection time	0.0～5.0s	1.0s	×
H00.28	UPS lower limit	0.0～200.0%	70.0%	×
H00.29	UPS lower limit error	0: Invalid 1: Valid	1	×
H00.30	Emergency mode frequency given by terminal	0: Invalid 1: Valid	0	×
H00.31	Emergency mode intelligent drive output	0: Invalid 1: Valid	1	×
H00.32	Emergency mode output percentage	0.0～100.0%	100.0%	×
H00.33	Emergency signal running invalid time	0.0～1000.0s	60.0s	×
H00.34	Err41 overload times setting	0～5	2	×
H00.35	Err41 times interval time	0～1000Min	60Min	×
H00.36	Err41 overload reset time	0～1000s	120s	×
H00.37	Err41 overload reset time timing		0s	⊙
H00.38	Err41 overload times		0	⊙
H00.39	S curve Time 5	0.00～60.00s	1.00s	△
H00.40	S curve Time 6	0.00～60.00s	1.00s	△
H00.41	Coefficient of S curve time when short floor function is enabled	0.00～1.00	0.7	△
H00.42	Percentage of torque when leveling	0.0～120.0%	0.0%	×
H00.43	Torque boost Kp when leveling	0.000～1.000	0.100	△
H00.44	Torque boost Ki when leveling	0.000～1.000	0.300	△
H00.45	Duration for torque boost	0.0～10.0s	1.0s	△

3.2 H00 group function code detailed explanation

H00.00	Special Purpose Inverter Function Enable	0：Invalid 1：Valid	1	×

0：Invalid

1：Valid

Special purpose for elevator, group H00is valid

H00.01	Brake 0pen Delay	0.00～10.00s	0.00s	×
H00.02	Start Frequency	0.00～10.00Hz	5.00Hz	×
H00.03	Start Frequency Holding Time	0.00～10.00s	0.00s	×
H00.04	Brake Release Delay	0.00～10.00s	0.30s	×
H00.05	Brake Open Frequency (Rising)	0.00～10.00Hz	1.00Hz	×
H00.06	Brake Release Frequency (Rising)	0.00～10.00Hz	0.20Hz	×
H00.07	Brake Open Frequency	0.00～10.00Hz	1.00Hz	×

	(Falling)			
H00.08	Brake Release Frequency (Falling)	0.00～10.00Hz	0.20Hz	×
H00.09	Brake Open Current	0.0～100.0%	40.0%	△
H00.10	Brake Open Frequency Holding Time	0.00～10.00s	0.30s	×
H00.15	Running Contactor Release Delay	0.00~10.00s	0.20s	×
H00.16	Running Contactor Open Delay	0.00~10.00s	0.10s	×
H00.17	Stop DC Injection Time ,	0.00~10.00s	0.50s	×

Setting function code H00.01~H00.10 and H00.15~H00.17 can improve the comfort when elevator start star/stop, DC brake current when braking to stop can be adjusted by F02.14, every function code shown as below:

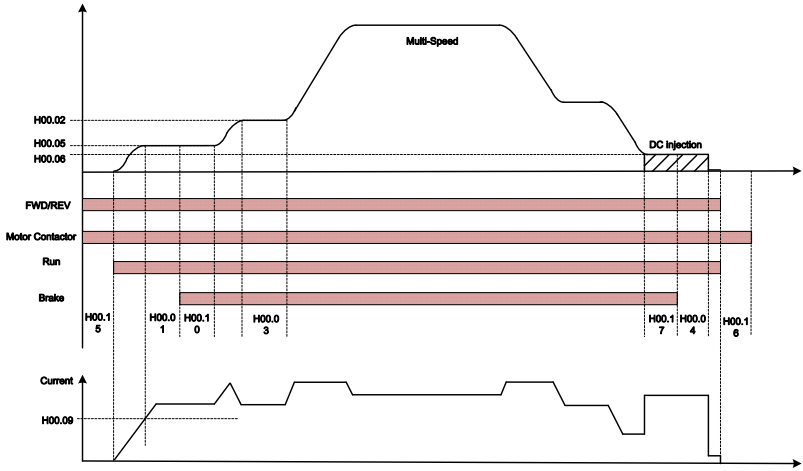


Figure 3.1 Elevator Operation Logic

H00.05(Brake Open Frequency (Rising)),H00.06(Brake Release Frequency (Rising)) and H00.07(Brake Open Frequency (Falling)),H00.08(Brake Release Frequency (Falling)) are same meanings, rising group use for frequency adjusting on FWD, falling group use for frequency adjusting on REV.

H00.11	Brake Open Type	0: Open according to frequency 1: Open according to frequency & current	0	×

0：Open according to frequency

Criteria for judging the brake opening is inverters output reach to the setting frequency of H00.05 (rising) or H00.07 (falling), and then open the brake by setting time of H00.01 (Brake Open Delay).

1: Open according to frequency and current

Criteria for judging the brake opening is inverters output reach to the setting frequency of H00.05 (rising) or H00.07 (falling), meanwhile, inverter current reach H00.09 (brake open current) setting value.

H00.12	Emergency Operation Frequency	0.00～50.00Hz	20.00Hz	△

When emergency signal input, inverters will entry emergency operating mode, the frequency of H00.12 will be the operation frequency of inverter, and inverter will select accel/decel time 4 as current accel/decel time.

H00.13	Maintenance Operation Frequency	0.00～50.00Hz	20.00Hz	△

When maintenance signal input, the frequency of H00.13 will be the operation frequency of inverter

H00.14	Emergency Signal Processing	0: Elevator no run 1: Elevator Powered on By UPS And Run	1	×

0: 0: Elevator no run

When emergency signal input, inverter no output

1: Elevator Powered on By UPS And Run

When emergency signal input, inverter is powered by UPS and output via emergency operation frequency

H00.18	Short Floor Function	0:Invalid 1:Short Floor Function 2:Senior Short Floor Function	0	×

0: Invalid

Short floor function is invalid

1: Short floor function

When elevator is running during short floor and when short floor function is triggered, inverter will continue to run via setting speed of H00.19.

2：Senior short floor function

When elevator is running during short floor and when short floor function is triggered, inverter will calculate remaining running time and maintain current frequency to run till remaining time finished

H00.19	Short Floor Speed	0.0～100.0%	60.0%	×

When H00.18=1, inverter run via speed of H00.19 when running in short floor

H00.20	Leveling Jerk	0.0~100.0%	0.0%	×
H00.21	Leveling Jerk Frequency	0.00~1.00	0.20	×

The parameters are used for improving the jerk when elevator stop

H00.22	Motor Mode Slip	0.00~3.00Hz	0.00Hz	×

The parameter used for improving the leveling when elevator is falling. If leveling is good when elevator is falling with half load but leveling is not good when elevator is falling without load, to increase the value of H00.02 to improve the leveling.

H00.23	Generator Mode Slip	0.00~3.00Hz	0.00Hz	×

The parameter used for improving the leveling when elevator is rising. If leveling is good when elevator is rising with half load but leveling is not good when elevator is rising without load, to increase the value of H00.23 can improve the leveling.

H00.24	Emergency Signal Valid Time	0.0～500.0s	10.0s	×
H00.25	Emergency Signal Invalid Time	0.0～1000.0s	180.0s	×
H00.33	Emergency signal running invalid time	0.0～1000.0s	60.0s	×

When emergency signal is valid, inverter start timing, when timing is over setting value of H00.24, and when output terminal function (Y1 Y2 R1 R2) selected to be “32” the function of emergency signal time completed, the terminal output valid signal and last setting time of H00.25(if VFD is running then it will last H00.33 setting time), then terminal output is invalid.

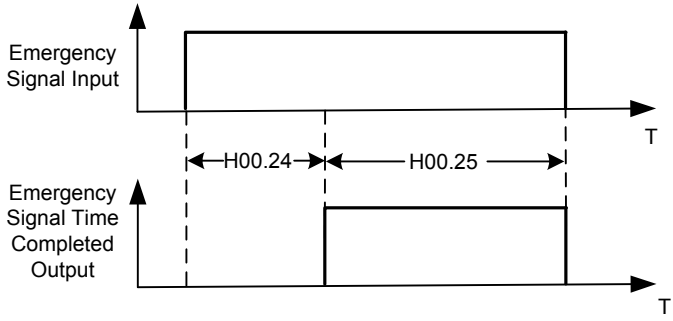


Figure 3.2 Emergency signal time completed logic

H00.26	Light load direction search enable	0：Invalid 1：Valid	1	×

0：Invalid

No load detection, execute according to the running direction

1：Valid

Inverter detects elevator light load direction

H00.27	Light load direction detection time	0.0～5.0s	1.0s	×

This function is used for setting light load direction detection time in emergency mode. In emergency mode, when H00.26=1 and start running, inverter completes detection of light load direction automatically, then inverter will run with light load direction, and output “Light load direction search completed” and “Light load direction search direction” signal via terminal Y1, Y2, R1, R2.

When detected light load direction is same with given running command direction, inverter will stop and continue to run via detected light load direction, running timing diagram as below:

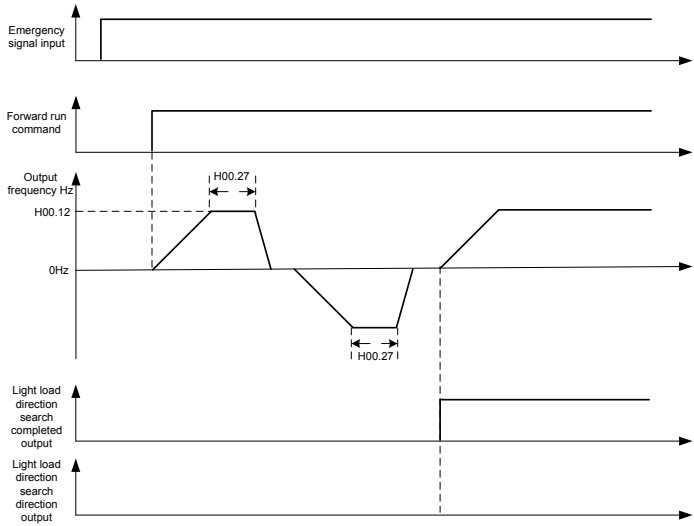


Figure 3.3 Light load direction search timing diagram

When detected light load direction is opposite with given running command direction, inverter continues to run with emergency setting frequency, running timing diagram as below:

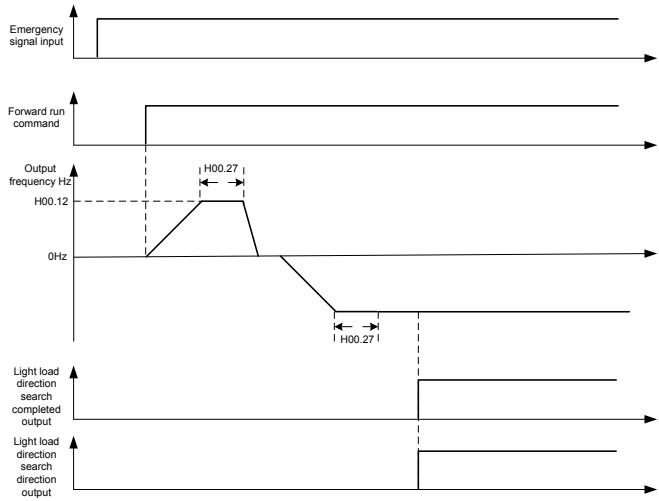


Figure 3.4 Light load direction search timing diagram

H00.28	UPS voltage lower limit	0.0～200.0%	70.0%	×

Used for setting UPS power voltage lower limit, when inverter is detecting light load direction, UPS power voltage is lower than the setting of H00.28, inverter will change to detect reverse direction

H00.29	UPS voltage lower limit error	0：Invalid 1：Valid	1	×

0：Invalid

When light load direction detection completed, inverter run via light load direction

1：Valid

When detecting light load direction, when UPS power voltages in both direction are lower than setting of H00.28, inverter will trip with Err43

H00.30	Emergency mode frequency given by terminal	0：Invalid 1: Valid	1	×

0：Invalid

In emergency mode, frequency is given by H00.12

1：Valid

In emergency mode, when terminal given is invalid, given frequency is 0Hz, when terminal given valid, frequency given by H00.12

H00.31	Emergency mode intelligent drive output	0：Invalid 1：Valid	1	×

0：Invalid

In emergency mode, inverter output according to the setting drive mode

1：Valid

In emergency mode, inverter output via setting of H00.32

H00.32	Emergency mode output percentage	0.0～100.0%	100.0%	×

Used for setting output percentage when H00.31=1

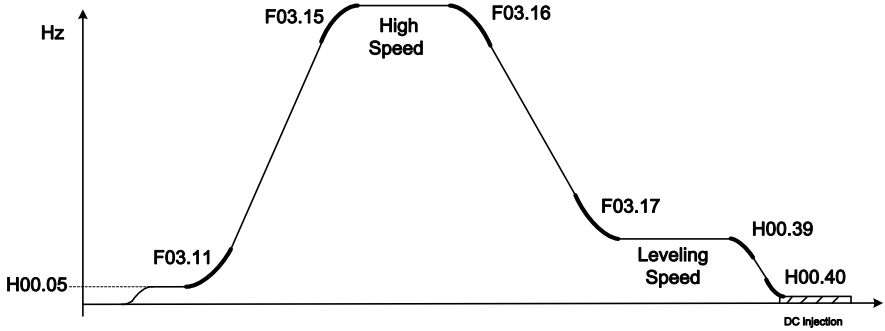
H00.34	Err41 overload times setting	0～5	2	×
H00.35	Err41 times interval time	0～1000Min	60Min	×
H00.36	Err41 overload reset time	0～1000s	120s	×

H00.37	Err41 overload reset time timing		0s	⊙
H00.38	Err41 overload times		0	⊙

When Err41 overload fault, system will record Err41 overload fault times which is displayed in H00.38. When fault reset, if no again Err41 within setting time (H00.35), zero clearance in H00.38; If again Err41 within setting time H00.35, the value will be accumulated in H00.38, when the value H00.38 is bigger than the value H00.34, system will forbid Err41 reset, only after setting time H00.36 can reset Err41. H00.37 FOR reset time timing.

F03.11	S curve Time 1	0.00～600.00s	1.00s	×
F03.15	S curve Time 2	0.00～600.00s	1.00s	×
F03.16	S curve Time 3	0.00～600.00s	1.00s	×
F03.17	S curve Time 4	0.00～600.00s	1.00s	×
H00.39	S curve Time 5	0.00～60.00s	1.00s	△
H00.40	S curve Time 6	0.00～60.00s	0.50s	△

S curve time setting:



H00.41	Coefficient of S curve time when short floor function is enabled	0.00～1.00	0.7	△

When short floor function is enabled and triggered, deceleration time will multiple this coefficient set by H00.41.

H00.42	Percentage of torque boost when leveling	0.0～120.0%	0.0%	×
H00.43	Torque boost Kp when leveling	0.000～1.000	0.100	△
H00.44	Torque boost Ki when leveling	0.000～1.000	0.300	△
H00.45	Duration for torque boost	0.0～10.0s	1.0s	△

This Four function codes are used to increase the torque when leveling.

Chapter 4 Troubleshooting

FR500D inverter provides a number of warning information and protection, when a fault occurs, the protective function is activated, the inverter will stop output, inverter fault relay contact, and in the inverter displays the fault code on the display panel. Before seeking service user can press the self-examination tips in this section, analyze problems, and identify solutions. If the problem still cannot be excluded, seek services, or contact the dealer you purchase the inverter with my company.

Display	Fault Name	Possible Causes	Solutions
Err01	Accel overcurrent	1: The output circuit is grounded or short circuited. 2: The acceleration time is too short. 3: Manual torque boost or V/F curve is not appropriate. 4: The voltage is too low. 5: The startup operation is performed on the rotating motor. 6: A sudden load is added during acceleration. 7: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Increase the acceleration time. 3: Adjust the manual torque boost or V/F curve. 4: Adjust the voltage to normal range. 5: Select rotational speed tracking restart or start the motor after it stops. 6: Remove the added load. 7: Select an AC drive of higher power class
Err02	Decel overcurrent	1: The output circuit is grounded or short circuited. 2: The deceleration time is too short. 3: The voltage is too low. 4: A sudden load is added during deceleration. 5: The braking unit and braking resistor are not installed.	1: Eliminate external faults. 2: Increase the deceleration time. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Install the braking unit and braking resistor.
Err03	Constant-speed overcurrent	1: The output circuit is grounded or short circuited. 2: The voltage is too low. 3: A sudden load is added during operation. 4: The AC drive model is of too small power class.	1: Eliminate external faults 2: Adjust the voltage to normal range. 3: Remove the added load 4: Select an AC drive of higher power class.
Err04	Accel overvoltage	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration 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 a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.

Err05	Decel overvoltage	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.
Err06	Constant-speed overvoltage	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.
Err07	Bus undervoltage	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. 4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or Frecon.
Err08	Short circuit	1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The module overheats. 4: The internal connections become loose. 5:The main control board is faulty 6: The drive board is faulty. 7: The inverter module is faulty.	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables properly. 5: Contact the agent or Frecon. 6. Ask for technical support 7. Ask for technical support
Err09	Power input phase loss	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 or FRECON.
Err10	Power output phase loss	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 or Frecon.
Err11	Motor overload	1: F11-17 is set improperly. 2: The load is too heavy or locked-rotor occurs on the	1: Set F11-17 correctly. 2: Reduce the load and check the motor and the

		motor. 3: The AC drive model is of too small power class.	mechanical condition. 3: Select an AC drive of higher power class.
Err12	Inverter overload	1: The load is too heavy or locked-rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err13	External equipment fault	1: External fault signal is input via DI.	Reset the operation.
Err14	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 inverter 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 inverter module.
Err15	EEPROM read/write fault	The EEPROM chip is damaged.	Replace the main control board.
Err16	Motor auto-tuning cancelled	Since the identification process, press STOP / RST key	Press STOP / RST key to reset
Err17	Motor auto-tuning fault	1: the motor and the inverter output terminals are not connected 2: The motor does not disengage the load 3: The electrical fault	1: check the connection between the inverter and motor 2: The motor is disengaged load 3: Check the motor
Err18	Communication overtime error	1: The PC is not working properly 2: The communication line is not normal 3: F15 set communication parameters set incorrectly	1: Check the PC Connection 2: Check the communication cable 3: The communication parameters are set correctly
Err19	PID feedback loss	PID feedback set value is less than F13.24	Check the PID feedback signal or set to an appropriate value F13.24
Err20	Continuous running time reached	Set the running time to reach this function	reference F05.14 Description
Err21	Parameter upload fault	1: Is not installed or is not plugged parameter copy card 2: Parameter copy card anomalies 3: The control board abnormalities	1: a copy of the card is properly installed parameters 2: for technical support 3: for technical support

Err22	Parameter download fault	1: Is not installed or is not plugged parameter copy card 2: Parameter copy card anomalies 3: The control board abnormalities	1: A copy of the card is properly installed parameters 2: For technical support 3: For technical support
Err23	Braking unit fault	1: The brake line failure or damage the brake pipe 2: An external braking resistor is too small	1: Check the brake unit, replace the brake pipe 2: Increasing the braking resistor
Err24	Module temperature detection disconnection	The temperature sensor failure or cable break	For technical support
Err25	Load disconnected	The AC drive running current is lower than F11.22	Check that the load is disconnected or the setting F11-22 and F11-23 is correct.
Err26	With-wave current limit fault	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err27	Inverter soft-start relay is off	1: The grid voltage is too low 2: Rectifier module failure	1: Check the grid voltage 2: Demand for technical support
Err28	Software version compatibility fault	1: The upper and lower transmission module parameters in the parameter version of the control panel version mismatch.	re-upload module parameters to pass down
Err29	Instantaneous overcurrent	1. Inverter output circuit being grounded or short-circuit; 2. The acceleration and deceleration time is too short; 3. Manually torque boost or V/F curve not appropriate; 4. Voltage too low; 5. Start the running motor; 6. Sudden-load in the acceleration process; 7. Model selection of inverter power is too small.	1. Troubleshooting peripheral problems; 2. To increase the acceleration time; 3. Adjust the manually torque boost or V/F curve; 4. Adjust the voltage to normal range; 5. Select RPM track start or start after motor stopped; 6. Cancel sudden-load; 7. Select the inverter with larger power.
Err30	Instantaneous overvoltage	1: Input voltage is too high; 2. There is external force drag the motor to run in deceleration process; 3. The deceleration time is too short; 4. No installation of braking	1: Adjust the voltage to normal range; 2. Cancel external force or install brake resistor; 3. To increase the deceleration time; 4. Install braking resistor

		resistor.	
Err36	PG card disconnection	1,Encoder no signal or lack of signal 2,Encoder damage 3,Speed feedback PG disconnection detection time setting unreasonable	1.Check the feedback line if disconnection 2. Check sensor if working abnormally 3. Adjust the time to be the reasonable one
Err37	Overspeed(FVC mode)	1,Encoder parameter setting incorrect 2,No motor auto-tuning 3,Motor overspeed detection parameter F11.41 and F11.42 setting unreasonable	1,Correct encoder parameter setting 2,Do motor auto-tuning 3,According to actual condition to set reasonable detection value
Err38	Speed deviation too big (FVC mode)	1,Encoder parameter setting incorrect 2,No motor auto-turning 3,Speed deviation detection too big parameter F11.43 and F11.44 setting unreasonable	1,Setting correct speed deviation value 2,Make load stable 3,Correct setting
Err40	Setting running time ends	1. Running time is bigger than F00.25	Contact the agent or FRECON.
Err41	Overload warming fault	1. Elevator overload 2. Check the setting of F11.18,F11.19,F11.20	1. Lesser people 2. To set right parameter of F11.18,F11.19,F11.20
Err43	Light load direction search error	1. Wrong UPS lower voltage setting 2. UPS power too small 3. No need this error	1. Reset H00.28 2.Select matching UPS power 3. Set H00.29 to be invalid

Chapter 5 PG Card

FR500D series is equipped with PG cards showed as below, as optional parts, is the necessary part for inverter with closed loop vector control mode. PG card feedback the real-time speed of motor through the signal acquisition from encoder to achieve the precise control of motor speed and steering

Model	Description	Connection mode
EXC-PG01	The differential input PG card	Terminal connection
EXC-PG02	Open collector, push input PG card	Terminal connection
EXC-PG03	Rotary transformer PG card	DB9 interface
EXC-PG05	ECN1313 PG card	Terminal connection
EXC-PG06	Sin-Cos encoder PG card	DB15 interface

Relative Parameters

Function code	Code Name	Setting Range	Default	Attr
F00.08	Motor control method	Unit's place: Motor1 control method 0: V/F control 1: Sensor-less vector control mode1 2: Sensor-less vector control mode2 3: Close-loop control(with PG card) Ten's place: Motor2 control method 0: V/F control 1: Sensor-less vector control mode1 2: Sensor-less vector control mode2 3: Close-loop control(with PG card)	11	×
F08.23	Encoder line count	0-65535	1024	×
F08.24	Encoder selection	0:ABZ incremental encoder 1:UVW incremental encoder 2:Rotary transformer 3:ECN1313	0	×
F08.25	AB phase sequence	0: Positive 1: Negative	0	×
F08.30	Auto-tuning	0: No autotuning 1: Static autotuning of motor 2: Rotary autotuning of motor	0	×

Set these parameter according to different encoder

Function code explanation:

1)F00.08 = 33(Close-loop control, with PG card)

2)When choosing ABZ incremental encoder, F08.24 should be rightly set.

3)When choosing ABZ incremental encoder, need to check that AB phase sequence is the same with frequency.

Installation diagram shown as below C-1:

1) All kinds of PG cards are installed in the same place
2) Cut off the power when to install PG card or uninstall it.
3) Connecting the 20 PIN interface of PG card to J3 interface of control board.

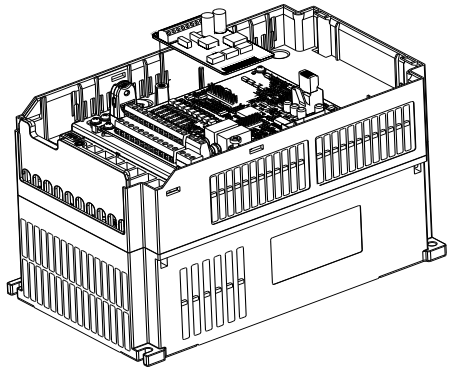


Fig.C-1 PG card installation

5.1 ABZ encoder PG card

External view:

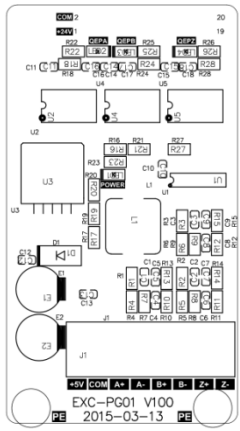


Fig.C-2(a)EXC-PG01

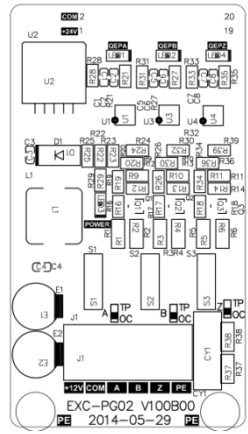


Fig.C-2(b)EXC-PG02

Table C-1 Technical parameter

Model	Power	Characteristics of the input signal		Characteristics of the ouput signal	
		Response frequency range	Input impedance	Output frequency range	Output current
EXC-PG01	5V	0-300KHz		0-300KHz	200mA
EXC-PG02	12V	0-80KHz		0-80KHz	100mA

Terminals outline drawing:

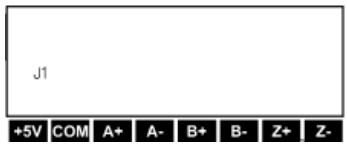


Fig.C-3(a)EXC-PG01 terminals

Fig.C-3(b)EXC-PG02 terminals

Table C-2 Terminal function description

Model	Connection object	Interface name	Description
EXC-PG 01	The differential input incremental encoder interface	A+,A-	Encoder output signal A, maximum frequency 300kHz
		B+,B-	Encoder output signal B, maximum frequency 300kHz
		Z+,Z-	Encoder output signal Z, zero signal
		+5V	Supply +5V/200mA power
		COM	Power earthing
EXC-PG 02	Open collector, Push input incremental encoder interface	+12V	Supply +12V/100mA power
		COM	Power earthing
		A	Encoder output signal A, maximum frequency 80kHz
		B	Encoder output signal B, maximum frequency 80kHz
		Z	Encoder output signal Z, zero signal
		PE	Shielding line

Schematic diagram of the application connection

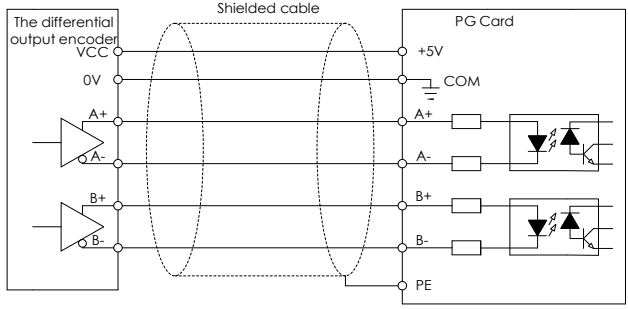


Fig. C-4 Connection schematic diagram of EXC-PG01 and the differential output encoder

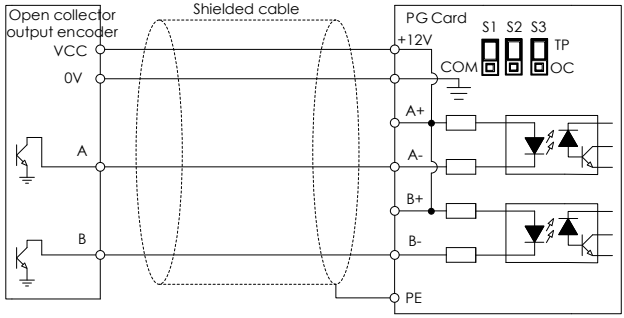


Fig. C-5 Connection schematic diagram of EXC-PG01

And the open collector output encoder

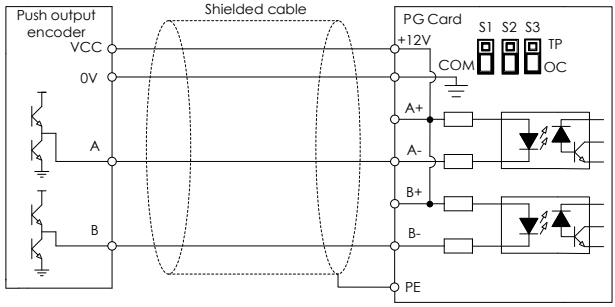


Fig. C-6 Connection schematic diagram of EXC-PG01

and the push output encoder

Usage method

1) Follow Figure C-1 to loading PG card
2) Follow Figure C-4,C-5,C-6 to connect PG card and encoder
3) Shielded cable earthing line PE is connected directly to the fixed screw of PG card
4) According to the actual situation to set the inverter parameters as follow:

Parameter setting	Description
F00.08 = 3	Close-loop control(with PG card)
F08.23 = 1024	Encoder line number, setting as the specification of encoder
F08.24 = 0	ABZ incremental encoder
F08.25 = 0	AB phase sequence.

5.2 Rotary transformer PG card

Outline and its interface：

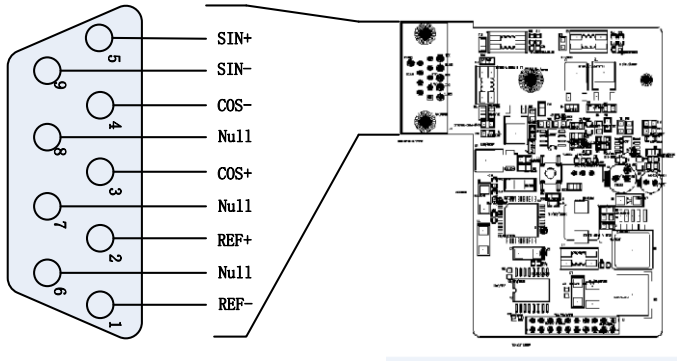


Fig.C-7 EXC-PG03 Schematic diagram and its DB9 pin interface

DB9 PIN

PIN	1	2	3	4	5	6	7	8	9
Name	REF-	REF+	COS+	COS-	SIN+	Null	Null	Null	SIN-

PIN function

Model	Connecting object	Pin name	Description
EXC-PG03	Rotary transformer	COS+,COS-	Cosine signal
		SIN+,SIN-	Sine signal
		REF+,REF-	Voltage reference signal
		Null	Null

Usage method

1) Follow Figure C-1 to loading PG card
2) Shielded cable earthing line PE is connected directly to the fixed screw of PG card
3) According to the actual situation to set the inverter parameters as follow:

Parameter setting	Description
F00.08 = 3	Close-loop control(with PG card)
F08.24 = 2	Select the rotary transformer

5.3 ECN1313 PG Card

Outline and its interface：

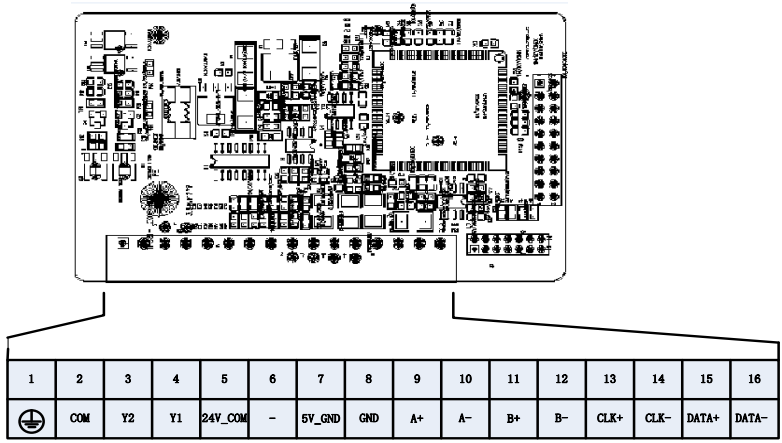


Fig.C-8 EXC-PG05 ECN1313 PG terminals

Terminals：

Model	Connecting Object	Pin Name	Description
EXC-PG05	ECN1313 Encoder	⏚	GND
		24_COM,COM	24V output and its common terminal
		5V_GND,GND	5V output and its ground
		A+,A-	A differential signal
		B+,B-	B differential signal
		Y1	B signal OC output (24V)
		Y2	A signal OC output (24V)
		CLK+, CLK-	ECN1313 differential clock input
		DATA+, DATA-	ECN1313 differential data input

Usage method

1) Follow Figure C-1 to loading PG card
2) Shielded cable earthing line PE is connected directly to the fixed screw of PG card
3) According to the actual situation to set the inverter parameters as follow:

Parameter setting	Description
F00.08 = 3	Close-loop control(with PG card)
F08.24 = 3	Select the ECN1313 encoder

5.4 Sin-Cos encoder PG card

Outline and its interface：

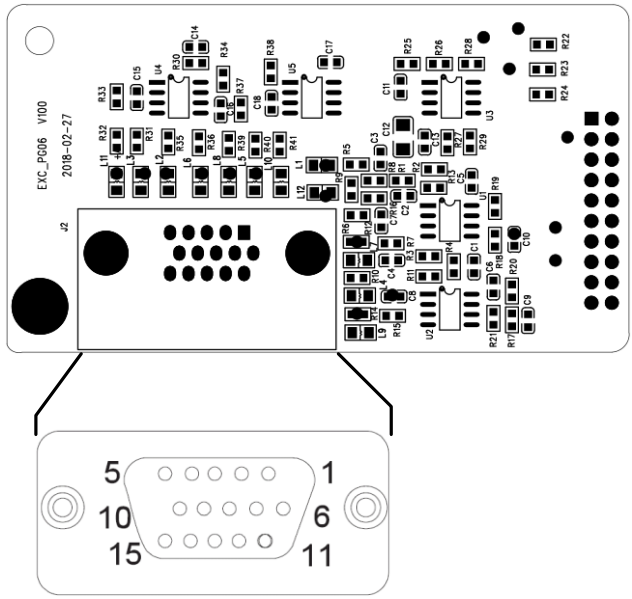


Fig.C-9 EXC-PG06 Sin-Cos encoder PG card

DB15 PIN：

Num.	Pin Name	Description
1	B-	Differential signal B-
2	NC	Null
3	R+	Differential signal R+
4	R-	Differential signal R-
5	A+	Differential signal A+
6	A-	Differential signal A-
7	GND	Power ground
8	B+	Differential signal B+
9	PG VCC	+5V Power
10	C+	Differential signal C+
11	C-	Differential signal C-
12	D+	Differential signal D+
13	D-	Differential signal D-
14,15	NC	Null