YD660 High Speed Door Servo Control System User Manual (Digital Display)

Preface

Thank you for using high performance multi-functional speed door controller.

This manual provides the instruction of controller installation, parameter setting, fault diagnostic, trouble shooting and daily maintenance to the end users

Please read the manual carefully before install the controller, ensure installation and operation properly .Keep the manual and hand it over to the user.

Please contact the after sales service center or regional representative office or reseller in case you have any question or any special requirement on the controller application .

This manual is for YD660 door controller series produced by our company , Subject to change without notice.

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Chapter 1 General

1.1 Controller technical specification

● Input & output characteristic

◆Input voltage range : 220V±15%

◆Input frequency range : 47~63Hz

◆Output voltage range : 0~Rated input voltage

◆Output frequency range : 0~400Hz

● Interface characteristic

◆Digital input: 9 channels.

◆Communication port: 1X RS-485 Port.

◆Collector open output : 1 channel (interlock output).

◆Relay output: 3 Channels (1 brake relay &2 function output relays).

◆Power supply:24V、12V DC Max.1A output current.

● Technical performance

◆Overload : 150% Rated current 60s; 200%Rated current 15s.

● Function characteristic

◆Frequency setting : Digital setting.

◆Provides up to 30 fault protection functions ：over current 、over voltage、under voltage 、over temperature 、loss phase 、over load , etc.

Chapter 2 Wiring

2.1 Terminals diagram

2.1.1 Mains circuit terminals function description :

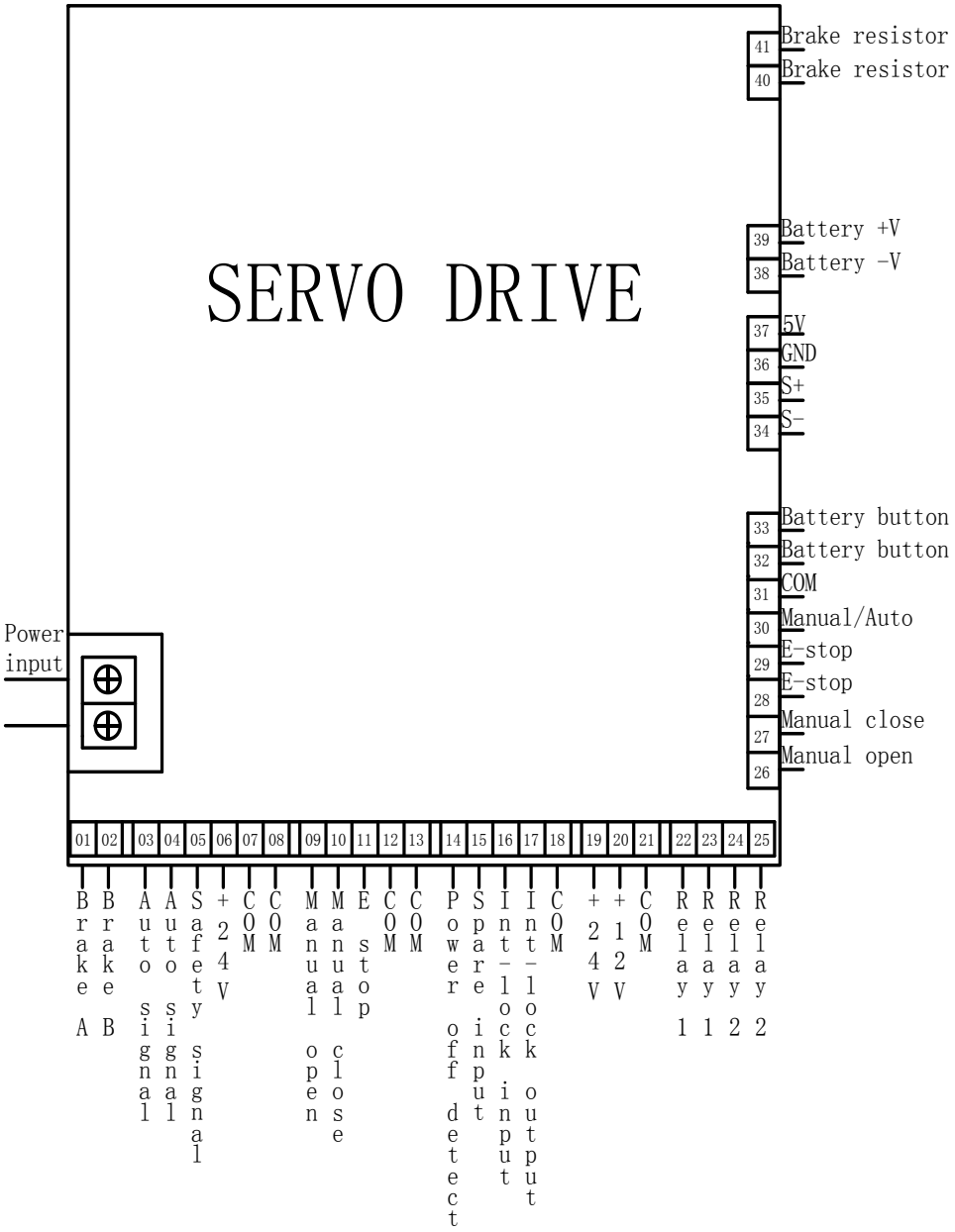
Terminals name	Function description
L、N	Single phase L、N
Aviation plug 1(4X)	Motor output terminals
Aviation plug 2(6X)	Encoder input terminals
PE	Protective ground

2.1.2 Control circuit terminals

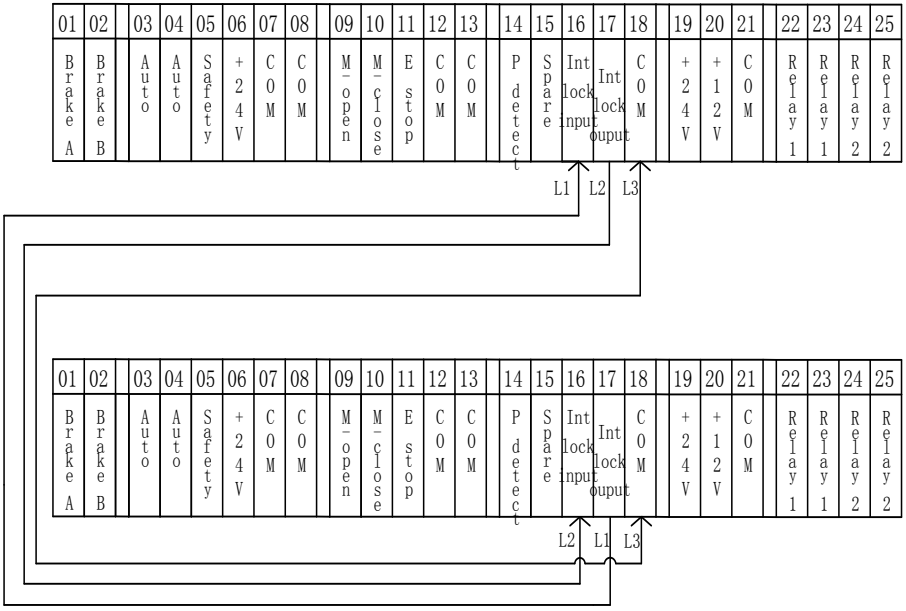
01	02		03	04	05	06	07	08		09	10	11	12	13		14	15	16	17	18		19	20	21		22	23	24	25
Brake A	Brake B		Auto signal	Auto signal	Safety signal	+24V	COM	COM		Manual open	Manual close	E stop	COM	COM		Power off detect	Spare input	Int-lock input	Int-lock output	COM		+24V	+12V	COM		Relay 1	Relay 1	Relay 2	Relay 2

Fig.2-1 Control circuit terminals

2.2 Standard wiring diagram



Interlock wiring between 2 controllers



Remark: 1. Interlock output signal from controller A should be connected to interlock input signal of controller B.

2. Interlock output signal from controller B should be connected to interlock input signal of controller A.

3 .The terminal: COM of controller A & B should be connected together.

4 .Controller A & B need to change para:FC-18=1.

5 .If you want Controller A & B to work together,you need to change para:FC-19=1.

Fig.2-2 Interlock wiring between 2 controllers

2.3 Terminal description

Terminals name	Terminals function description
Input signals	Digital input terminal, it is an optic-couple input which isolates +24V & DCM. Input voltage range: 24V (no need external power supply) Input impedance: 4.7kΩ
24V	The controller +24V DC power supply 。Max. output current: 1A
12V	The controller +12V DC power supply 。Max. output current: 1A
COM	Input signal common terminal, all input sinals become activated when short circuit with COM terminal. +24V、+12V DC power supply negative, **+24V & +12V total max. current <= 1A**
Relay1	Relay 1 output, all relays are independent, NO. or NC. contact can be selected via parameter setting
Relay2	Relay 2 output, all relays are independent, NO. or NC. contact can be selected via parameter setting

Chapter 3 Operation

This product is divided into liquid crystal display and digital display, which can be selected according to customer needs.

3.1 Operation panel description

3.1.1 Operation panel illustration

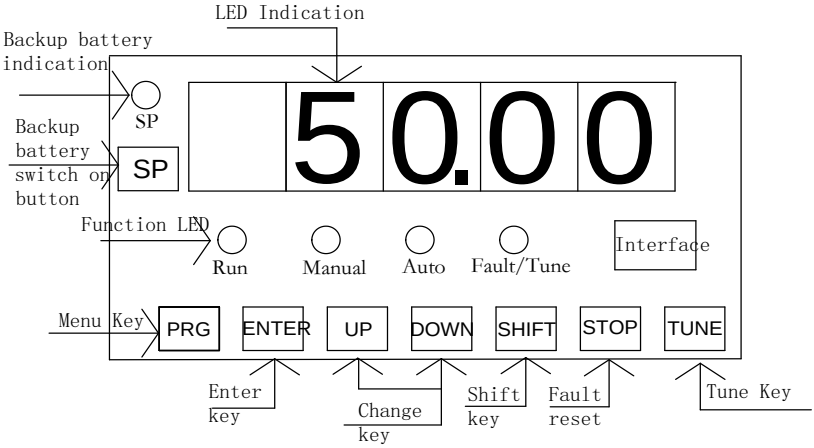


Fig3-1 OP. illustration

3.1.2 Keypad description

Key pad	Name	Function description
MENU	Program key	Enter or escape menu , quick menu modify.
ENTTER	Confirm key	Enter menu , confirm the parameter setting .
UP	increase key	Increase the setting value or function code .
DOWN	Decrease key	Decrease the setting value or function code .
SHIFT	Shift key	when change the setting value of the parameter, it can be used to shift the position of the digit.
RESET	Reset key	Fault reset.
BATTERY	Battery key	Used to open the brake after power failure.

3.1.3 Indication function description

Function indication description :

Name	Description
RUN	Controller running
MAMUAL	Manual running
AUTO	Auto running
Fault	Fault indicator

3.2 Operation flowchart

3.2.1 Parameter setting

3 levels menu:

1、Function code group number (level 1 menu) ;

2、Function code (level 2 menu) ;

3、Function setting value (level 3 menu) 。

Explanation : For level 3 menu, press MENU or ENT back to level 2 menu。Different : Press ENT the parameter setting is saved , then return to level 2 menu and shift to the next function code ; press MENU will return to level 2 menu directly, the parameter setting is not saved, and stay at the existing function code.

Example: Change the setting of F1.01 from 00.50Hz to 05.00Hz .

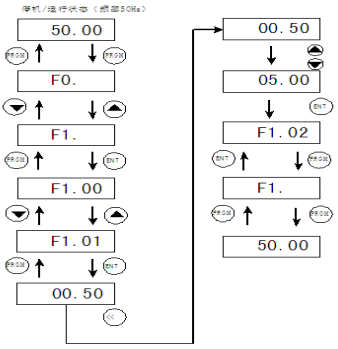


Fig.3-2 Level 3 menu operation flowchart

Under level 3 menu, if the parameter without flashing digit, that means the parameter can't be modified , the reason might be :

1. That parameter can't be modified , it is a actual value, running record , etc.
2. That parameter can't be modified under operating mode , but can be modified under stop mode.

3.2.2 Fault reset

Relative fault message will be displayed when controller fault occurred , using the RESET keypad can reset it , after the controller be reset, it changes to standby mode 。If no reset done after fault occurred, the controller will stay at protective status , no operation until reset .

3.2.3 Fault

Various of fault information is provided by the professional door controller, for details please ref. to the chapter of controller fault and trouble shooting .

Chapter 4 Quick setting

This Product can choose abs encoder mode (FC.00=1) and origin mode(FC.00=0), Learning limit methods in the same way. But the origin mode needs to be connected to the origin signal and After power-off it needs to return The origin. The abs encoder mode can be moved freely after power off. So the factory default values are abs encoder mode.

4.1 Procedure of limit learnning method

1. Connect the encoder with the controller firstly , otherwise E007fault will be displayed , it will report E019 failure for the first power-on，press the RESET keypad to clear the fault.if connection is correct , display : NoL，that means the setting of top and bottom limit position should be done . If that has been done before, there will be no indication of NoL.

2. Press the emergency stop switch firstly，the press manual open and manual close push button at the same time for 3 seconds , the controller will go into position setting status and indicates A00，now it is in the position setting status，can start the position setting .

3. Release the emergency stop push button，using the manual open and manual close push button to run the door. If the running direction is different，change the parameters ： **FC-39=1**.

4. When the running direction is correct，using the manual open and manual close push button to run the door to bottom limit position (door closed position) , then press Emergency stop push button , press the close push button shortly ,when A01 disappear ， the bottom limit setting is finish。

5. Release the emergency stop push button，using the manual open and manual close push button to run the door to top limit position (door opened position) , then press emergency stop push button , press the open push button shortly , when A02 disappear，the top limit setting is finish。

6. The limit setting finish ， release the emergency stop push button ， if the controller is set in automatic mode , the door will close after the delay closing setting time.

Attention ：（1）Should setting the limit position firstly .

（2）During the setting if E009 indicated ， should switch off then on the controller to reset the controller or press the RESET keypad to clear the fault ， after that please repeat the steps 1-5.

The parameters can be modified accordingly as required, ref. to the following parameters table ：

Function code	LED indication function description	Range description	Initial value	Comm Addr
F1-11	Door Acc time	1～10000ms	700ms	0x010B
F1-12	Door Dec time	1～10000ms	500ms	0x010C
F1-13	Door smoothing time	0～1000ms	30ms	0x010D
FC-00	Limit mode selection	0～1 0:origin limit 1:abs Encoder limit	1	0x0C00
FC-01	Manual button operation mode	0～2 0:normal mode 1:single button mode 2:jog mode	2	0x0C01
FC-03	Jog frequency	0.0Hz～300.0Hz	30.0Hz	0x0C03
FC-04	Door open fast frequency	0.0Hz～320.0Hz	250.0Hz	0x0C04
FC-05	Door close fast frequency	0.0Hz～320.0Hz	150.0Hz	0x0C05
FC-06	Door open slow frequency	0.0Hz～300.0Hz	30.0Hz	0x0C06
FC-07	Door close slow frequency	0.0Hz～300.0Hz	30.0Hz	0x0C07
FC-10	Open buffer percentage	5%～100%	15%	0x0C0A
FC-11	Close buffer percentage	5%～100%	15%	0x0C0B
FC-12	Door ajar height	5%～100%	70%	0x0C0C
FC-13	Delay closing time	0～6500.0s	5.0s	0x0C0D
FC-18	interlock selection	0～1 0:Single running 1:two machines linked running	0	0x0C12
FC-19	Interlock linkage selection	0～1 0：linkage disable 1：linkage enable Note：if choose linkage on ,FC-18 should be set to 1	0	0x0C13

FC-20	Interlock delay time	0～6500.0s	2.0s	0x0C14
FC-21	Interlock function under manual mode	0～1 0:interlock off 1:interlock on Note : interlock disable under Jog mode	0	0x0C15
FC-22	External Auto open signal under manual mode	0～1 0:Auto-open and ajar height open signal disable under manual mode . 1:Auto-open and ajar height open signal enable under manual mode . Note : Not valid for Jog mode.	0	0x0C16

Chapter 5 Function parameter list

Explanation:"○": Set at any time, take effect immediately.

"●": Set when stop, take effect immediately

"◎": Read only, cannot set

Function code	LED indication function description	Range description	Default	Property	Comm Addr
F0-02	Motor speed	-9999～9999rpm	0	◎	0x0002
F0-04	Bus voltage	0～999.9V	0	◎	0x0004
F0-05	Current value	0～99.99A	0	◎	0x0005
F0-06	DI Status	0～0xFFF	0	◎	0x0006
F0-07	DO Status	0～0xFFF	0	◎	0x0007
F0-16	Sys version	0～65535	-	◎	0x0010
F0-26	Motor Temperature	-100℃～+135℃	-	◎	0x001A
F1-11	Door Acc time	1～10000ms	700ms	○	0x010B
F1-12	Door Dec time	1～10000ms	500ms	○	0x010C
F1-13	Door smoothing time	0～1000ms	30ms	○	0x010D
F6-00	DI filter time	0～9999ms	10ms	○	0x0600
F6-01	DI1 logic DI1～DI5	00000～11111 0: Hi level effective NO. 1: Low level effective NC. One place: DI1 Auto open signal Tens place: DI2 Protection signal Hundreds place: DI3 Manual open signal Thousands place: DI4 Manual close signal	10000	○	0x0601

		Ten thousands place: DI5 Emergency stop			
F6-02	DI2 logic DI6～DI10	00000～11111 0：Hi level effective NO. 1：Low level effective NC. One place: DI6 Power off detection Tens place: DI7 Spare input Hundreds place: DI8 Interlock input Thousands place: DI9 Manual/Auto Ten thousands place: DI10 Rserved	00000	○	0x0602
F6-04	Auto-open terminal sel	22～34 Arrange function code to terminals accordingly. 0.No function 22.Radar open signal 23.Photoelectric signal 24.Manual open signal 25.Manual close signal 26.Emergency stop 27.Manual/Auto selection 28.Power off detection 29.Interlock input 30. ajar open signal 31.ajar open protection sig 32. Fire smoke signal 33. Fire light-sensitive signal 34.origin signal	22	●	0x0604
F6-05	Protection terminal sel		23	●	0x0605
F6-06	Manual open terminal sel		24	●	0x0606
F6-07	Manual close terminal sel		25	●	0x0607
F6-08	Emergency stop terminal sel		26	●	0x0608
F6-09	Power off terminal sel		28	●	0x0609
F6-10	Spare terminal selection		34	●	0x060A
F6-11	Interlock input terminal selection		29	●	0x060B
F6-12	Manual/Auto terminal sel		27	●	0x060C
F6-15	DO1 logic DO1～DO5	00000～11111 0：Hi level effective NO. 1：Low level effective NC.	0	○	0x060F

		One place: DO1 Relay 1 Tens place: DO2 Relay 2 Hundreds place: DO3 Interlock output Thousands place: DO4 Brake relay Ten thousands place: DO5 Self-locking(forbid change)			
F6-16	Relay 1 output function selection	18～28 0.No function 18.Brake output active 19.Door closed active 20.Door opening active (effective for auto mode) 21.Door opened active 22.Door running active 23.Door not at the bottom limit active. 24. Electromagnetic lock Function acive (Need change Para:FC-27=1) 25.Fire alarm active 26.Fire spray active 27.Door opening active 28.Door closing active 29.Interlock active 30.Fault active	0	○	0x0610
F6-17	Relay 2 output function selection		0	○	0x0611
F6-18	Interlock output function selection		29	○	0x0612
F6-19	Brake relay output function selection		18	○	0x0613
F6-21	Relay 1 delay output	0～6000.0s Relay output after a set time	0.0s	○	0x0615
F6-22	Relay 2 delay output		0.0s	○	0x0616
F6-23	Relay 1 output delay	0～6000.0s Relay output turns off after a set time	0.0s	○	0x0617
F6-24	Relay 2 output delay		0.0s	○	0x0618

F6-26	Auto-open signal delay	0～6000.0s	0.0s	○	0x061A
F6-27	Protection signal delay	0～6000.0s	0.0s	○	0x061B
F8-17	Resistor value	10～999Ω	100Ω	○	0x0811
F8-18	Resistor power	30～65000W	200W	○	0x0812
FC-00	Limit mode selection	0～1 0:origin limit 1:abs Encoder limit	1	●	0x0C00
FC-01	Manual button operation mode	0～2 0:normal mode 1:single button mode 2:jog mode	2	●	0x0C01
FC-02	Protection signal activated -open frequency	0.0Hz～300.0Hz Note: If FC-02=0.0, Open frequency=FC.04	0.0Hz	○	0x0C02
FC-03	Jog frequency	0.0Hz～320.0Hz Jog frequency only using in manual mode.	30.0Hz	○	0x0C03
FC-04	Door open fast frequency	0.00Hz～320.0Hz Set the fast speed frequency	250.0Hz	○	0x0C04
FC-05	Door close fast frequency	0.00Hz～300.0Hz Set the fast speed frequency	150.0Hz	○	0x0C05
FC-06	Door open slow frequency	0.0Hz～300.0Hz Set the slow speed frequency	30.0Hz	○	0x0C06
FC-07	Door close slow frequency	0.0Hz～300.0Hz Set the slow speed frequency	30.0Hz	○	0x0C07
FC-08	Top limit value (Low value)	Top limit value by the learn mode FC-09*65536+FC-08	0	○	0x0C08
FC-09	Top limit value (High value)		0	○	0x0C09

FC-10	Open buffer percentage	5%～100%	15%	○	0x0C0A
FC-11	Close buffer percentage	5%～100%	15%	○	0x0C0B
FC-12	Door ajar height	5%～100%	70%	○	0x0C0C
FC-13	Delay closing time	0～6500.0S Delay closing time after door opened.	5.0s	○	0x0C0D
FC-14	Bottom limit value (Low value)	Bottom limit value by the learn mode FC-15*65536+FC-14	0	○	0x0C0E
FC-15	Bottom limit value (High value)		0	○	0x0C0F
FC-16	Auto mode manual button function	0～1 0:Manual open and manual close button no effect 1:Manual open and manual close button effective	1	○	0x0C10
FC-17	Limit deviation	0～9.999*100 0:no effect If door running over the limit devidtion, E026fault will be displayed.	1.000	○	0x0C11
FC-18	Interlock selection	0～1 0:Single running 1:Two machines linked running	0	○	0x0C12
FC-19	Interlock linkage selection	0～1 0: linkage disable 1: linkage enable Note: if choose linkage on ,FC-18 should be set to 1	0	○	0x0C13
FC-20	Interlock delay time	0～6500.0s	2.0s	○	0x0C14
FC-21	Interlock function under manual mode	0～1 0:interlock off	0	○	0x0C15

		1:interlock on Note : interlock disable under Jog mode			
FC-22	External Auto open signal under manual mode	0～1 0:Auto-open and ajar height open signal disable under manual mode . 1:Auto-open and ajar height open signal enable under manual mode . Note : Not valid for Jog mode.	0	○	0x0C16
FC-23	Door opening protective time	0～6500.0s The open running time longer than this protective time, fault E027 indicated. 0:No protective .	15.0s	○	0x0C17
FC-24	Door closing protective time	0～6500.0s The open running time longer than this protective time, fault E028 indicated. 0:No protective .	15.0s	○	0x0C18
FC-25	Bottom limit gain	0～5.000*100 When the door is too heavy, the stop position is lower than the bottom limit setting position , modify the setting of this parameter can make the door stop at acceptable stop range .	0	○	0x0C19
FC-26	Power off function selection	0～3 0: Keep the status as that before power off. 1 : When power off is detected,door changes to	0	○	0x0C1A

		automatic open in slow speed then stop at top limit position . Can jog up or down the door. 2 : When power off is detected, door changes to automatic close in slow speed then stop at bottom limit position . Can jog up or down the door. 3 : When power off is detected ,door stop , Can jog up or down the door.			
FC-27	Electromagnetic lock function	0～1 0:Function no effect. 1:Function effective . Note: when this function is enable , one of the relay 1-2 should be assigned as Electromagnetic lock function	0	○	0x0C1B
FC-28	Electromagnetic lock start up delay	0.0～6500.0s	0.0s	○	0x0C1C
FC-29	Electromagnetic lock turns off delay	0.0～6500.0s	0.0s	○	0x0C1D
FC-30	Origin detection method	0～2 0: Find origin manually 1:Automatically find origin after power on 2:When manual up and auto open signals are detected, automatically find origin . Note:Only origin mode effective	00000	◎	0x0C1E

FC-31	Continue running after emergency stop button released or fault reset	0～1 0: No continue running. 1: Continue running .	0	○	0x0C1F
FC-32	Top limit gain (origin mode effective)	0～9999*1000pls After finding the origin, the height of the next opening is lower than the origin value. Purpose:Prevent mistakes in finding origin next time.	30	○	0x0C20
FC-33	Brake frequency threshold	0.0Hz～250.0Hz Brake close when lower than this frequency setting. 0:No effect	5.0Hz	○	0x0C21
FC-34	Brake open delay	0.00～650.00s	0.00s	○	0x0C22
FC-35	Brake close delay	0.00～650.00s	0.00s	○	0x0C23
FC-36	Spare terminal function	0～9 can be used as other input terminal(DI1～DI9)	0	○	0x0C24
FC-37	Open cycles (Low value)	Indication of the open cycles FC-38*65536+FC-37	0	○	0x0C25
FC-38	Open cycles (High value)		0	○	0x0C26
FC-39	Motor running direction	0～1 0: Forward 1: Reverse	0	○	0x0C27
FC-40	Fire door function-delay close time	0.0～6500.0s 0:Function disable if setting not equal to 0 , the spare input(F6-10=32) need assigned as the fire	0	○	0x0C28

		control terminal			
FC-41	Fire door function-stop half way position	30%～100%	70%	○	0x0C29
FC-42	Fire door function-2 input terminals control	0～1 0: Fire smoke detection control 1:Fire light-sensitive and smoke detection control	0	○	0x0C2A
FC-43	Servo output enable delay	0～65000ms Before the brake is released, the servo outputs in advance to prevent the door from sliding down.	100ms	○	0x0C2B
FC-44	Servo output disable delay	0～65000ms Before the brake is closed, the servo output will delay turned off to prevent the door from sliding down.	200ms	○	0x0C2C
FC-45	Learning limit minimum height value	0～9999rpm 0: Function disable Prevent mistakes caused by mislearning.	1rpm	○	0x0C2D
FC-46	3rd speed distance setting	0～65535pls 3rd speed running distance after 2nd slow running.	5000pls	○	0x0C2E
FC-47	3rd speed setting	0～999.9rpm 3rd speed after 2rd slow running.	5.0rpm	○	0x0C2F
FC-48	Servo Overheat delay	0.0～6500.0s 0: Function disable. Servo temperature continues to reach 90℃, fault E010 will indicated.	0.1s	○	0x0C30
FC-49	Auto/Manual mode switch	0～3 0:Level trigger	0	○	0x0C31

	fuction setting	1:Edge trigger 2:Only Auto mode 3:Only Manual mode			
FC-50	Antifreeze function	-100℃～+135℃ 0: Function disable. After setting the antifreeze temperature, when the motor temperature is lower than the set value, the antifreeze function is activated	0℃	●	0x0C32
F1-46	Systerm initialization	0～3 0：No operation 1：Resume factory setting value. 2：Clear the historical record.	0	●	0x012E
F1-47	User password	0～65535 0:No password After setting the password, you must enter the correct password to modify related parameters	0	○	0x012F

Chapter 6 Fault alarm and Treatment

6.1 Fault Diagnosis and Treatment

Fault code	Fault causes	Fault reason	Solution
E001	Short circuit	1.Accelaration time too short 2. IGBT failure 3.Failure caused by disturbance 4.PE.connection not reliable	1.Increase the acceleration time 2.Check peripheral equipment. 3.Check the grounding . 4.Call for support.
E00C	Software over current		
E002	Hardware over voltage	1.Deceleration time too short. 2.Load inertia too high. 3. Power supply voltage abnormal.	1.Increase deceleration time . 2.Increase the brakeing resistor. 3.Check the power supply.
E00B	Software over voltage		
E003	EEPROM R/W failure	1.Parameter read/write error 2.EEPROM damaged	1. Power off and restart 2. Init parameters. 3. Ask for service.
E004 E006	AD Init failure	1. Interference. 2. Drive hardware fault	1. Power off and restart 2. Ask for service.
E005	Braking Resistor Overload	1. Power supply voltage too high. 2.Resistor power too small. 3.Closing speed too fast	1.Check the power supply 2. Increase the brakeing resistor power. 3. Reduce running speed
E007	Encoder communication fault	1.Communication interrupt	1.Check the connection between the encoder and the controller . 2. Replace the encoder

Fault code	Fault causes	Fault reason	Solution
E008	Encoder magnetic field too weak	1.Magnetic is not installed . 2.The magnetic is ageing - magnetic field get weak .	1.Reinstall the magnetic in good way. 2.Replace with new magnetic.
E009	Encoder data overflow	1.The encoder position data higher than the max. value or lower than the min. value .	1.Set the top limit and bottom limit again.
E00A	Under voltage	1. Power supply voltage too low. 2.Power cord is too thin. 3. Overload	1.Check the power supply 2.Replace the power cord 3.Reduce running speed and load.
E00D	Motor overload	1. Continuous use above the rated load. 2. Motor stall or load increased suddenly. 3.Motor power not enough to drive the load.	1. Reduce load 2. Choose the controller or motor with higher power.
E00E	Servo overload		
E00F	Motor overheat	1.Overcurrent instantaneously . 2.Short circuit between phases or phase to grounding . 3.Enviromental temperature too high . 4.Power supply circuit abnormal . 5.Control board abnormal .	1.Reduce load . 2.Check cables . 3.Check the power supply 4.Lower the temperature. 5.Ask for service.
E010	Servo overheat		

Fault code	Fault causes	Fault reason	Solution
E012	Motor overspeed	1.UVW phase sequence error 2. Running too fast	1.Check motor wire 2.Reduce running speed 3.Ask for service
E014	Motor run start overspeed	1.Starting while the motor is rotating	1.Starting after Motor stops
E015	Inertia ratio learn failure	1.Learning over 40S	1. Reduce learning speed 2. Increase Acc Time
E018	Encoder overheat	1. Motor runs for a long time 2.Enviromental temperature too high	1.Increase run interval 2.Lower the temperature. 3.Ask for service
E019	Encoder battery fault	1.Disconnect the encoder cable from the controller 2.The battery is not connected properly 3.Battery voltage is too low	1.Press “RESET” clear 2.Check the battery installation position. 3. Replace battery
E026	Over limit fault	1.Encoder data transmit error 2.external interference	1.Power off and restart 2. Relearn limit 3.Increase FC-17 Para
E027	Door open running over time	1.The door is too high and the door open protective time setting too short . 2.The door load is too heavy , the open slow speed setting is too low. 3.Motor power is too low.	1.Increase the open protective time FC-23 2.Increase the door open slow frequency FC-06 3.Replace the motor with higher power. 4.Ask for service.

Fault code	Fault causes	Fault reason	Solution
E028	Door close running over time	1. The door is too high and the door close protective time setting too short. 2.The door load is too heavy , the close slow speed setting is too low. 3.Motor power is too low.	1. Increase the open protective time FC-24 2. Increase the door open slow frequency FC-07 3. Replace the motor with higher power. 4. Ask for service.
NOL	Unlearned limit	1.Removed the encoder 2.Replace battery 3.First time installation	1. Relearn limit
STOP	Emergency stop signal	1.Estop button pressed 2.External Estop button pressed 3.Estop button broken	1. Release E-stop button 2.Check buttons and control lines
PROT	Regular maintenance	1. Reaching the maintenance interval	1. Long press “ENT” clear 2.Seek factory maintenance