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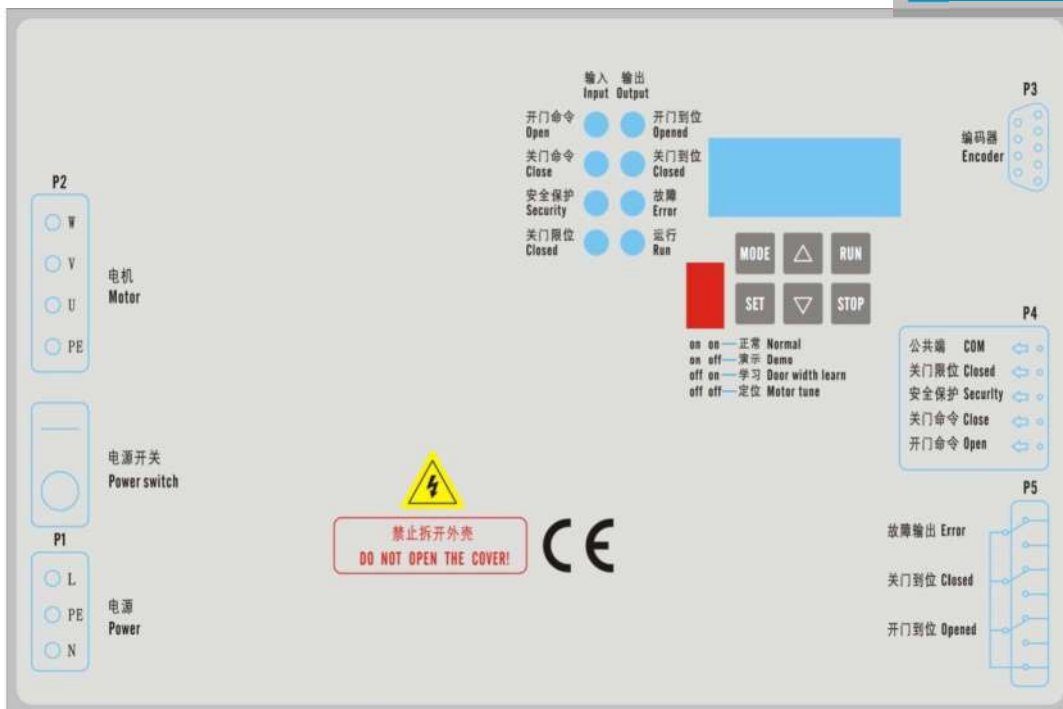深圳市英威腾电气股份有限公司
SHENZHEN INVT ELECTRIC CO., LTD.

EC30 Door Controller

User Manual

Safety precautions

In this manual, the safety precautions are divided into the following two categories:

⚠Danger: dangers arising from operating not as required may cause serious injury or even death.

⚠Notice: dangers arising from operating not as required may cause moderate or minor injury as well as damage to equipment.

We strongly suggest that when installing, debugging and maintaining the system the users should carefully read this chapter and strictly follow the safety precautions required in the content of this chapter to operate. Any injury or damage caused by violation operations shall have nothing to do with our company.

1. Installation

⚠Danger
■ Please install the controller onto the flame-retardant objects such as metal to avoid possible breaking out of fire! ■ Please keep away from combustible articles to avoid possible breaking out of fire!

⚠Notice
■ The lead head or screw is not allowed to fall into the system in order to avoid possible damage to the controller! ■ Please make sure the place where the controller is installed to have little vibration and have no direct sunshine! ■ Please make sure the site where the controller is installed to be strong enough to bear the weight of the controller to avoid possible falling accident and the relevant injury! ■ In unpacking, if the controller is found damaged, please don't install! ■ In case that the packing list is not in conformity with the name of the real object, please don't install! ■ In moving the controller, you should handle gently, or there will be possible damage to the equipment! ■ Don't touch the components of the controller with your hands, or there will be possible electrostatic damage to the controller!

2. Wiring

⚠Danger
■ The guidance of the manual must be followed, and the constructors have to be professional electric engineering personnel, in order to avoid electric shock and injury accident! ■ The controller and the power supply have to be separated by a breaker to avoid possible

breaking out of fire!

- Please make right and standard ground connection for the controller according to the standard to avoid the danger of electric shock!

⚠ Notice

- Definitely not connect the input power supply to the output terminals (U, V, W) of the controller. Please notice the mark of the wiring terminals so as not to connect wrongly! Or the controller may be damaged!
- Make sure the wiring circuits meet the EMC requirements and the safety standard in your region. Or accident may occur!
- The communication line must adopt the shielded twisted pair with the line space of 20~30mm and the shielded layer being grounded!
- Make sure the rated voltage of the product is consistent with the voltage of the alternating current power supply, in order to avoid possible injury accident and possible breaking out of fire!
  Notice to check whether the peripheral circuit connecting to the controller has short circuit; whether the connected circuit is secure, otherwise the controller will be damaged!
- No part of the controller needs any withstand voltage test which has been conducted when the product leaves the factory, or accident may occur!

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3. Power On

⚠ Danger

- Power on is only allowed when the cover plate of the controller is covered. After power on, don't open the cover plate and touch any input or output terminal of the controller, otherwise possible electric shock may be caused!
- The wiring of all peripheral accessories must follow the guidance of the manual, and wiring shall be made properly according to the circuit wiring method provided in the manual. Or accident may occur!
- Please don't arbitrarily change the factory parameters of the controller. Or possible damage to the equipment may be caused!
- Non-professional technical personnel are not allowed to test the signal in running of the controller, or possible injury or possible damage to the equipment may occur!

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4. Maintenance, check and part replacement

⚠ Danger

- Please don't carry out repair and maintenance for the equipment when it's electrified. Or possible electric shock may occur!
- Personnel who haven't received professional training are not allowed to carry out repair and maintenance for the controller. Or personal injury or damage to equipment may be caused!
- After replacement of controller, the parameters have to be set, and all pluggable inserts have to

be plugged in power off!

- When carrying out maintenance and check, the input power supply should be disconnected five minutes in advance, to avoid electric shock.

5. How to use the controller when the rated voltage is exceeded

If the external voltage is not within the permitted operating voltage range prescribed by the manual, the use of the controller may cause damage to device of the controller. If it's necessary to use here, please transform the voltage with corresponding boosting or dropping equipment in advance.

6. Lightning impulse protection

This series of controllers are equipped with lightning stroke over-current protection equipment, and so are of a certain degree of self-protection ability against lightning inducing thunder. For place where lightning takes place frequently, the customers should also add the protection equipments onto the front end of the controller.

7. Altitude and derating use

In area where the altitude is over 1,000m, due to the reduced heat dissipation effect caused by thin air, it's necessary to derate the controller in order to use here, and in case of this place consult our company for related technical information.

8. Notice for scrapping the controller

The electrolytic capacitor of the main circuit and the electrolytic capacitor on the printed board may explode in incineration, and the plastic parts may produce toxic gases in incineration, therefore please treat the above articles as industrial refuse.
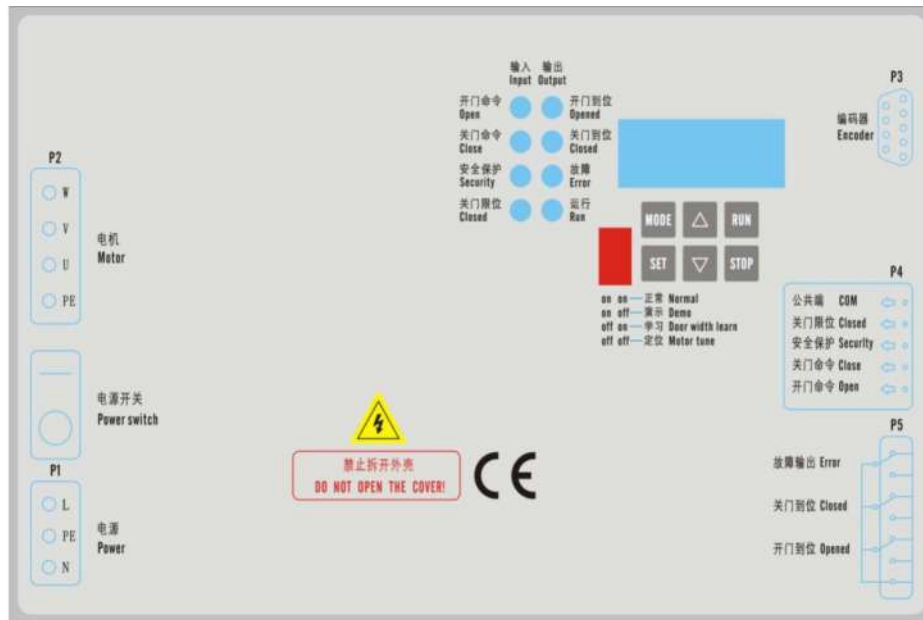
9. About adaptive motor

This controller is adaptive for alternating current permanent magnet synchronous motor, please be sure to choose the controller according to the nameplate of the motor.

The short circuit inside the cable or motor may cause the alarm of the controller or even damage to the controller. Therefore, please first conduct insulation short circuit test for the initially installed motor and cable, and it's necessary to conduct this test regularly in daily maintenance. Notice that, in conducting such test, it's necessary to totally disconnect the controller and the tested part.

Table of Contents

1. Product Introduction

EC30 door controller unit is a driving system controlling permanent magnet synchronous motor and is specified for elevator door, and it's able to achieve the best door opening and closing speed curve, efficient, reliable, easy to operate and of small mechanical vibration; the EC30 door operator controller is applicable to the door system whose net door opening width is (700~1500) mm.

Its main characteristics are as follows:

Self-learning of door width;

Demonstration of automatic door opening and closing;

Failure alarm and self-protection function;

Selectable sandwich and detection function;

1.1. Ratings

Input voltage	Rated frequency	Rated power	Output voltage	Output current
AC220V±15%	50/60Hz	400W	0～220V	2A

## 1.2. Operating Conditions

1. Altitude:

   Below 1000m, 100% rated current output;

   1000~2000m, 95% rated current output;

   2000~3000m, 85% rated current output:

2. Relative humidity is not bigger than 90% (at 25℃);

3. Voltage: 200V~250V.50~60Hz;

4. In the ambient air, there shouldn't be corrosive and inflammable gases and conductive dust;

2. Electric debugging

2.1. Description on the Controller Interface

P1: Input terminal of single phase alternating current power supply
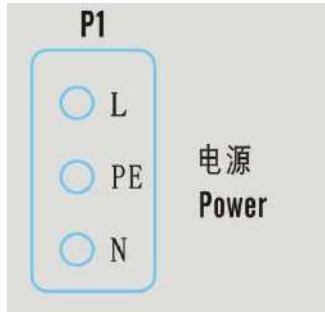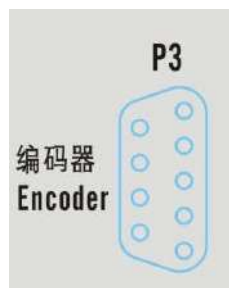

Pin	Signal	Remarks
P1-1	L	Line power phase
P1-2	PE	Protective Earth
P1-3	N	Neutral

P2: Motor power line terminal

| Serial number	Signal	Remarks
P2-1	W	Motor phase W
P2-2	V	Motor phase V
P2-3	U	Motor phase U
P2-4	PE	Protective Earth

P3: Terminal of encoder of the motor

P4: Door operator signal input terminal

Pin	Signal	Remarks
P4-1	OPEN	Door opening command input terminal
P4-2	CLOSE	Door closing command input terminal
P4-3	SECURITY	Safety protection command input terminal
P4-4	CLOSED	Door closing in place input terminal
P4-5	COM	Common terminal of the input terminal

P5: Door operator signal output terminal
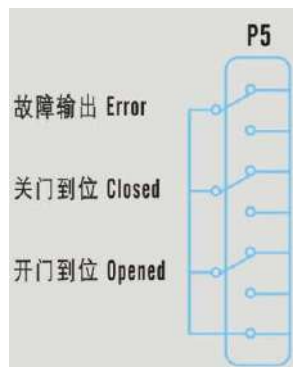
Pin	Signal	Remarks
P5-1	COM	Common terminal of the output terminal
P5-2	OPENED	Door opening in place output N.O. end
P5-3		Door opening in place output N.C. end
P5-4	CLOSED	Door closing in place output N.O. end
P5-5		Door closing in place output N.C. end
P5-6	ERROR	Fault output N.O. end
P5-7		Fault output N.C. end

2.2. Panel Operation Instructions
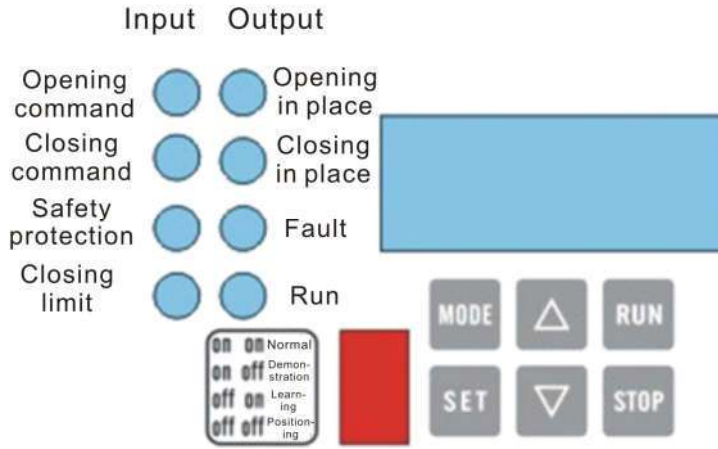
Through the operation panel, the user may modify the functional parameters of the door controller and monitor the operating state of the controller.

1. Description on buttons of the operation panel

| Button	Description
MODE	Programming key, for entering or exiting the first class menu and for deleting the shortcut parameters.
SET	Confirmation key, for gradually entering the menu screen and for confirmation of setting of parameters.
△	Ascending key, for ascending of the data or function code.
▽	Decreasing key, for decreasing of the data or function code.
RUN	Operation key, for the controller to execute corresponding run command.
STOP	In running state, press the key may stop the running operation.

2. Dial switch function description

Dial 1 state	Dial 2 state	Function	Function description
ON	ON	Normal	The door operator enters into the state to normally receive the door opening and closing commands
ON	OFF	Demonstration	The door operator enters into the demonstration running state, and press RUN key will start the demonstration running
OFF	ON	Learning	The door operator enters into the running state to learn the door width, and press the RUN key will start learning the door width
OFF	OFF	Positioning	The door operator enters into the running state to position the motor, and press the RUN key will start learning the angle of the motor.

3. Indicator light description

| Indicator light	Function description
Door opening command	When the door opening command is input, the light will shine
Door closing command	When the door closing command is input, the light will shine
Safety protection	When the safety protection switch has an input, the light will shine
Door closing limit	When the door closing limit switch has an input, the light will shine
Door opening in place	When door opening is in place, the light will shine
Door closing in place	When the door closing is in place, the light will shine
Fault	When the frequency converter has a fault, the light will shine
Running	When the frequency converter has an output, the light will shine

2.3. Basic Operation of the Buttons

For example: the example to change the function code F1-09 (the door operator inertia) from 1.5 to 2.0.
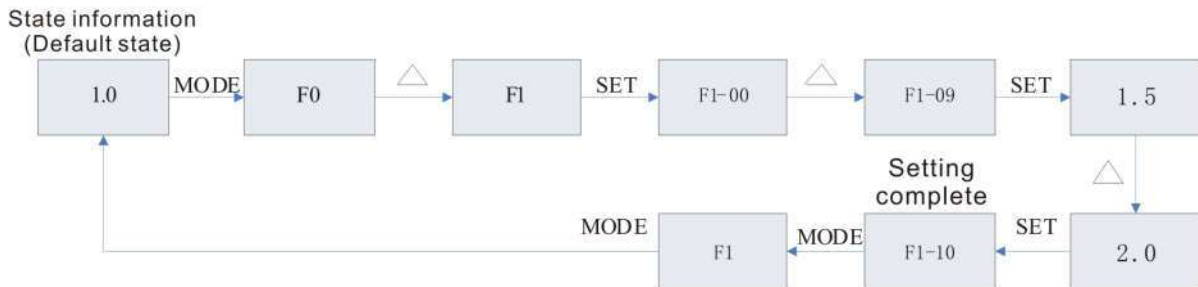
2.4. Wiring Diagram

Notice: when matching the cable used for door opening and closing in place output, it's necessary to confirm that the logic state of the door controller is consistent with the logic received by the control cabinet, and the factory state of the door controller is N.C. output. The user shall select the logic state of the in place output according to the practical situation of the main control cabinet.
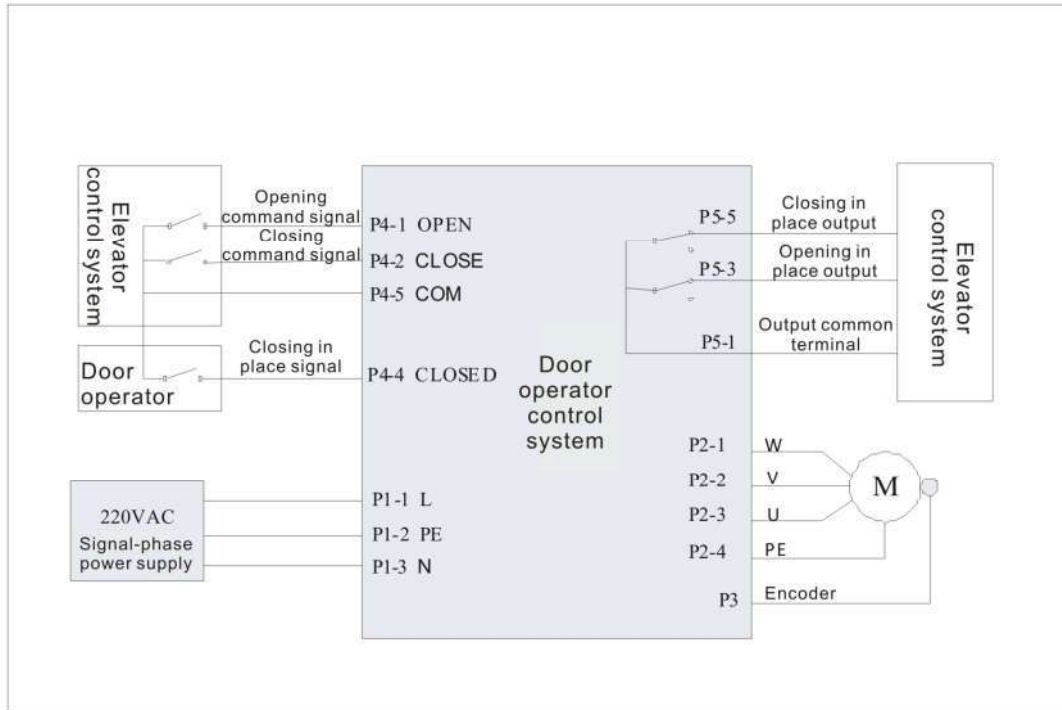
2.5. Debugging Steps

Before delivery, the door operator has finished the setting of functional parameters, so there is no need to debug any more. In case it's necessary to debug, please follow the following steps to finish the debugging.

1. Preparation before debugging

   Turn SW1, SW2 to OFF, OFF position, and check whether the wiring of the door operator is right. Then power on.

2. Positioning of the motor

   Before delivery, the positioning has been done, and in general there is no need to position any more. If the frequency converter or the motor is replaced, then it's necessary to position once again.

   a. Turn SW1, SW2 to OFF, OFF position.

   b. Push aside the door operator to the middle position, to prevent the motor from getting stuck and resulting in inaccurate positioning.

   c. Press the RUN key, and the frequency converter will start positioning, and meanwhile the door operator will move slightly. Two seconds later, the frequency converter will stop outputting and the positioning is finished.

3. The learning of door width

Place the door into the middle position and turn SW1 to OFF and SW2 to ON, and then press the RUN key, at this time, the self-learning will begin and the door will move with a closing trend. If the door moves with an opening trend, the parameter F0-01 needs to be changed (if the parameter is 0, then change it to 1, and if the parameter is 1, then change it to 0).

The learning process of door width is as follows:

Door closing→Door close limit→Door opening→Door open limit→Door closing→Door close limit

After the learning of door width is finished, the controller will stop moving.

4. Continuous demonstration running;

Turn SW1 to On and SW2 to OFF, and at this time the door will move with a closing trend until the door closing is in place. Then press RUN key once again, and the door operator will repeat the door opening and closing demonstration running, which may be stopped by pressing STOP key.

Through the demonstration running, the user may observe whether the door operator runs normally and whether the speed meets the requirements.

5. Normal running

Turn SW1, SW2 to ON, and the door operator will close the door in place and will maintain the torque. At this time, the debugging is finished, and the door operator is waiting for the control system to send out door opening and closing commands.

Notice: The modified parameter cannot be written when the motor movement, please turn the dial to the positioning state to modify the parameters

2.6. Adjustment for motion curve
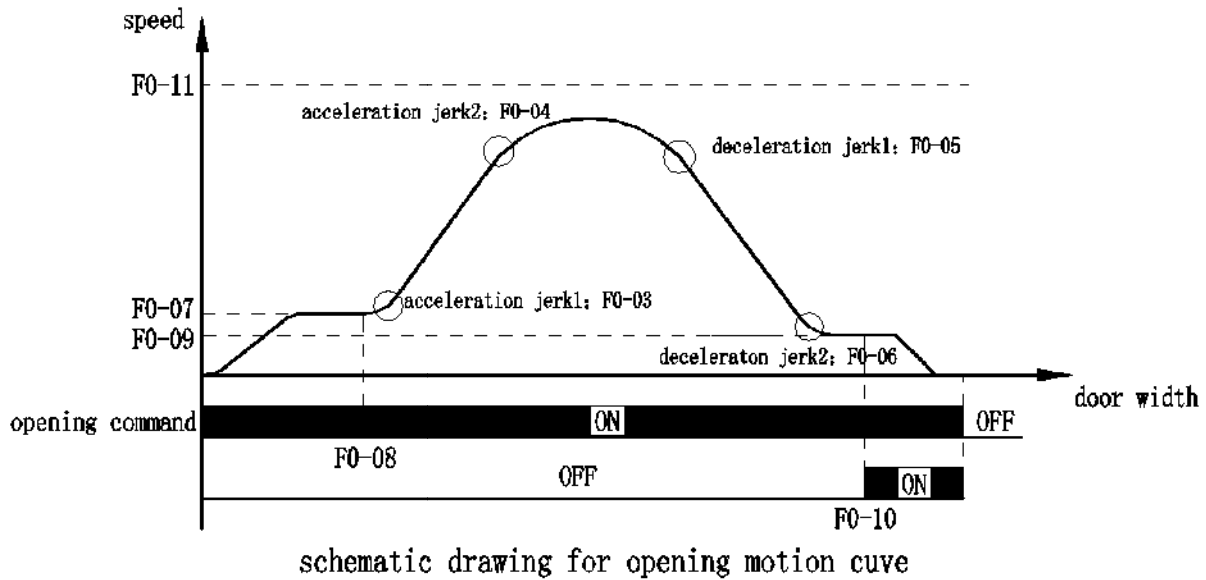
2.6.1. Opening motion curve
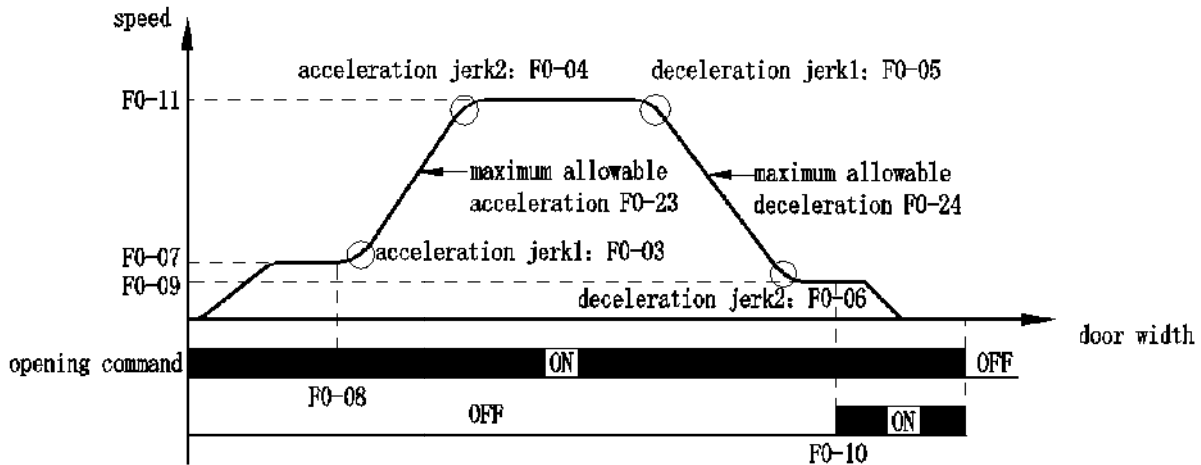
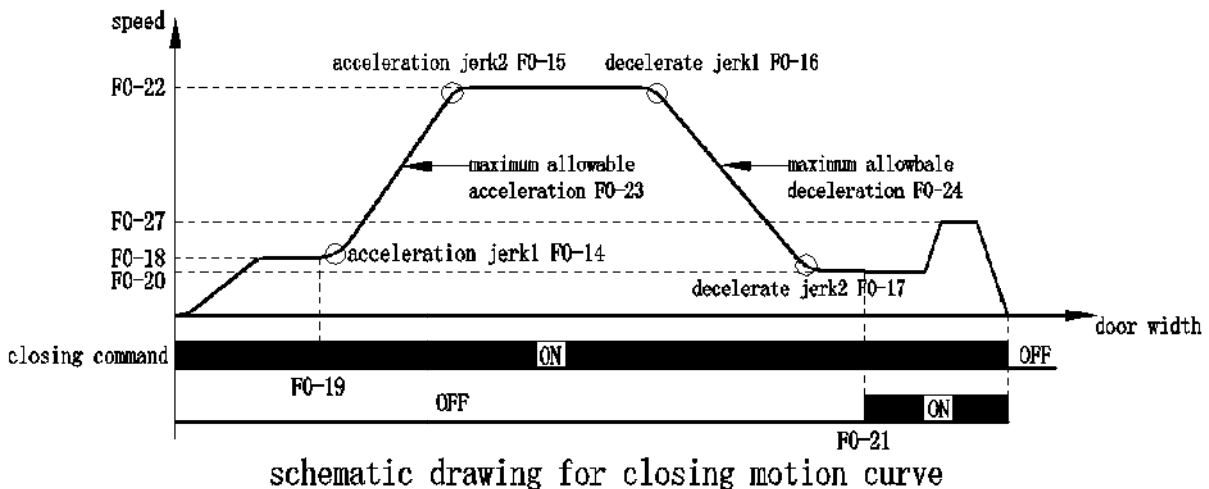schematic drawing for opening motion curve

Velocity changing when door operator opening: the door operator accelerate to F0-07(starting speed),when opening command take effect. The door operator accelerate to F0-11(maximum allowable speed),till the door position reached to F0-08(starting low speed distance).After a period of time ,begin to slow down to F0-09(open to get to speed).The door operator creeping motion with velocity of open to get to low speed ,after the door position reached to F0-10(open to get to low speed distance).And into the holding state ,the value of torque is F4-02(opening hold torque).

Acceleration changing when door operator opening: The acceleration gradually increase, when the door position reached to F0-08(starting low speed distance).The acceleration jerk is F0-03.Eventually,the acceleration reached to F0-12(maximum allowable acceleration).The acceleration decreases gradually until it reaches zero, when the velocity will be reached to F0-11(maximum allowable speed).The acceleration is F0-04.The speed will slow down after a period of time. The deceleration jerk is F0-05.Eventually the deceleration reached to F0-13(maximum allowable deceleration).The deceleration changed to F0-06(deceleration jerk 2), when the velocity will be reached to F0-09(open to get to speed)

The maximum allowable speed and maximum allowable acceleration already has been determined in general .The speed controlled by four acceleration jerk. Sometimes the door width is too narrow to complete action of the door operator , so it can't reached to the maximum allowable speed and maximum allowable acceleration. The motion curve as shown in the following figure.

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speed

F0-11

acceleration jerk2: F0-04

deceleration jerk1: F0-05

acceleration jerk1: F0-03

F0-07
F0-09

deceleraton jerk2: F0-06

door width

opening command   ON   OFF

F0-08   OFF

ON

F0-10

schematic drawing for opening motion cuve

2.6.2. Closing motion curve

speed

acceleration jerk2 F0-15   decelerate jerk1 F0-16

F0-22

maximum allowable
acceleration F0-23

maximum allowbale
deceleration F0-24

F0-27

F0-18
F0-20

acceleration jerk1 F0-14

decelerate jerk2 F0-17

door width

closing command   ON   OFF

F0-19   OFF

ON

F0-21

schematic drawing for closing motion curve

Velocity changing when door operator opening: the door operator accelerate to F0-18(starting speed),when opening command take effect. The door operator accelerate to F0-22(maximum allowable speed),till the door position reached to F0-19(starting low speed distance).After a period of time ,begin to slow down to F0-20(close to get to speed).Though parameters F0-25(unlocking distance of synchronous door vane) and F0-27(speed of closing door vane) to set the working of door vane. The door operator into the holding state when it completed . The value of torque is F4-05(closing hold torque).

Acceleration changing when door operator opening: The acceleration gradually increase, when the door position reached to F0-19(starting low speed distance).The acceleration jerk is F0-14.Eventually,the acceleration reached to F0-23(maximum allowable acceleration).The acceleration decreases gradually until it reaches zero, when the velocity will be reached to F0-22(maximum allowable speed).The acceleration is F0-15.The speed will slow down after a period of time. The deceleration jerk is F0-16.Eventually the deceleration reached to F0-24(maximum allowable deceleration).The deceleration changed to F0-17(deceleration jerk 2), when the velocity will be reached to F0-20(close to get to speed)

The maximum allowable speed and maximum allowable acceleration already has been determined in general .The speed controlled by four acceleration jerk. Sometimes the door width is too narrow to complete action of the door operator , so it can't reached to the maximum allowable speed and maximum allowable acceleration. The motion curve as shown in the following figure.
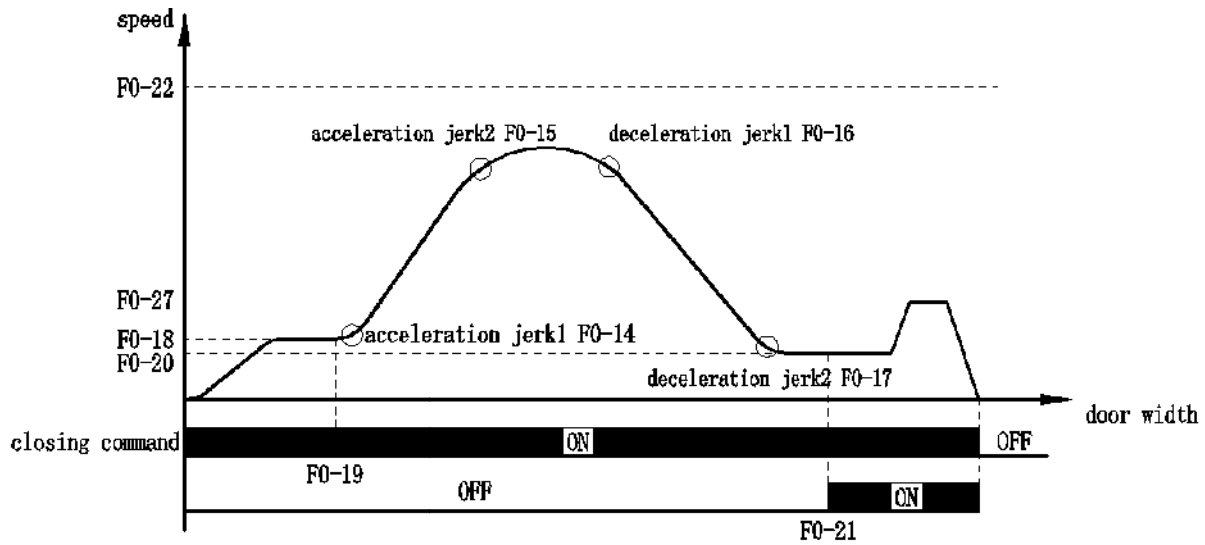
schematic drawing for closing motion curve

2.6.3. Door vane regulation parameters

Modifying the parameters F0-28（Types of door vane）in order to make different types of door operator functional . Corresponding parameter 0: Asynchronous,;1: Synchronous

Linkage parameters will change if you modifying this parameter .The linkage parameters as the following table.

Code	Description	Asynchronous	Synchronous	Unit
F0-01	Running direction selection of motor 0: forward 1: reverse	0	1	1
F0-08	Opening curve: starting low speed distance	22	10	mm
F0-21	Closing curve: close to get to low speed distance	25	15	mm
F0-25	Unlocking distance of synchronous door vane	0	45	mm
F4-24	Close hole toque at the outside of the close to reach the error scope 0: no hold torque 1: have hold torque	1	0	1

2.6.4. Motor regulation parameters

Rated torque of the default motor is 2.3N·m If using a motor torque is 5N·m or others. You must modifying the parameter F2-21(Types of motor). Corresponding parameter 0: 2.3 N·m ;1: 5 N·m;2: Reinforce type motor

Linkage parameters will change if you modifying this parameter .The linkage parameters as the following table.

Code	Description	2.3 N·m	5 N·m	Reinforce type motor	Unit
F2-01	Motor power	43	94	94	W
F2-02	Pole number of motor	16	16	8	1
F2-04	Rated frequency of motor	24	24	12	Hz
F2-06	Rated torque of motor	2.3	5.0	5.0	N.m
F2-07	Rated current of motor	0.8	1.2	1.2	A
F2-08	Roller diameter of motor	45	45	50	mm

3. Description on Functional Parameters

3.1. Monitoring Parameter List

No.	Monitor information	unit
0	Motor speed	RPM
1	Motor running speed	mm/s
2	Duty speed	mm/s
3	Duty voltage	V
4	Output torque	PU
5	Output current	A
6	DC bus voltage	V
7	Current position of door operator	mm
8	Running number of times myriabit	*1000
9	Running number of times	1
10	Running time hour	h
11	Running time minute	min
12	Monitoring of IO input state	
13	Monitoring of relay output state	
14	Opening time	ms

3.2. Parameter list

3.2.1. F0 Curve parameters

Code	Description	Minimum	Maximum	Default	Unit
F0-00	Running mode selection 0: positioning mode of motor angle; 1: learning mode of door operator width; 2: auto demonstration mode of door operator; 3: control mode of door operator terminal;	0	3	0	1
F0-01	Running direction selection of motor 0: forward 1: reverse	0	1	1	1
F0-02	Door width note: The value of door operator that divided from the middle is half of actual door operator value. This value is got from door width learning.	0	3000	0	mm
F0-03	Opening curve: acceleration jerk 1	10	6000	700	mm/s3
F0-04	Opening curve: acceleration jerk 2	10	6000	900	mm/s3
F0-05	Opening curve: deceleration jerk 1	10	6000	800	mm/s3
F0-06	Opening curve: deceleration jerk 2	10	6000	600	mm/s3
F0-07	Opening curve: starting speed	5	100	50	mm/s
F0-08	Opening curve: starting low speed distance	1	100	10	mm
F0-09	Opening curve: open to get to speed	5	100	15	mm/s
F0-10	Opening curve: open to get to low speed distance	1	100	15	mm
F0-11	Opening curve: maximum allowable speed	50	1000	500	mm/s
F0-12	Opening curve: maximum allowable acceleration	100	6000	1000	mm/s2
F0-13	Opening curve: maximum allowable deceleration	100	6000	1000	mm/s2
F0-14	Closing curve: acceleration jerk 1	100	6000	700	mm/s3
F0-15	Closing curve: acceleration jerk 2	100	6000	800	mm/s3
F0-16	Closing curve: deceleration jerk 1	100	6000	800	mm/s3
F0-17	Closing curve: deceleration jerk 2	100	6000	500	mm/s3
F0-18	Closing curve: starting speed	5	100	30	mm/s
F0-19	Closing curve: starting low speed distance	1	100	2	mm
F0-20	Closing curve: close to get to speed	5	100	15	mm/s
F0-21	Closing curve: close to get to low speed distance	1	100	15	mm
F0-22	Closing curve: maximum allowable speed	50	1000	500	mm/s
F0-23	Closing curve: maximum allowable acceleration	100	3000	1000	mm/s2

F0-24	Opening curve: maximum allowable deceleration	100	3000	1000	mm/s2
F0-25	Unlocking distance of synchronous door vane	0	3000	45	mm
F0-26	Curve acceleration of closing door vane	0	9000	300	mm/s2
F0-27	Speed of closing door vane	0	1000	80	mm/s
F0-28	Types of door vane	0	1	1	1

3.2.2. F1 Speed regulation parameters

Code	Description	Minimum	Maximum	Default	Unit
F1-00	Proportional gain of speed loop 1	1	100	10	1
F1-01	Integral gain of speed loop 1	1	100	10	1
F1-02	Proportional gain of speed loop 2	1	100	8	1
F1-03	Integral gain of speed loop 2	1	100	8	1
F1-04	Switching speed of speed loop	20	400	100	mm/s
F1-05	Switch bandwidth of speed loop	0	100	10	mm/s
F1-06	Filtering coefficient 0	100	9999	1000	1
F1-07	Filtering coefficient 1	10	500	300	1
F1-08	Filter coefficient2	10	500	300	1
F1-09	Door operator inertia	0.1	9.9	2.5	kg-m2
F1-10	Protection threshold value of over speed	100	300	180	%
F1-11	Regulation mode	2	2	2	1
F1-12	Carrier frequency	2	12	10	KHz
F1-13	Dead-zone compensation coefficient	0.01	2	0.4	1

3.2.3. F2 Motor parameters

Code	Description	Minimum	Maximum	Default	Unit
F2-00	Motor overload coefficient	0.02	3.00	1.00	PU
F2-01	Motor power	0.1	999.9	43	W
F2-02	Pole number of motor	2	100	16	1
F2-03	Rated speed of motor	1	9999	180	RPM
F2-04	Rated frequency of motor	0.01	99.99	24	Hz
F2-05	Rated voltage of motor	100	999	125	V
F2-06	Rated torque of motor	0.1	999.9	2.3	N.m
F2-07	Rated current of motor	0.1	5	0.8	A
F2-08	Roller diameter of motor	10	9999	45	mm
F2-09	Deceleration ratio	1	1	1	1
F2-10	Roping ratio	1	1	1	1
F2-11	A motor D axle inductance	0.01	90	8.5	mH
F2-12	A motor Q axle inductance	0.01	90	8.5	mH
F2-13	B motor D axle inductance	0.01	90	8.5	mH
F2-14	B motor Q axle inductance	0.01	90	8.5	mH

F2-15	Equivalent resistance	0.01	90	0.2	Ω
F2-16	Time constant	0.01	99.99	0.28	1
F2-17	A motor positioning angle	0	999.9	0	degree
F2-18	B motor positioning angle	0	999.9	0	degree
F2-19	A motor enable	1	1	1	1
F2-20	B motor enable	0	0	0	1
F2-21	Types of motor	0	2	0	1

3.2.4. F3 Driver parameters

Code	Description	Minimum	Maximum	Default	Unit
F3-00	Driver number	0	0	0	1
F3-01	Rated voltage of driver	100	500	220	V
F3-02	Rated current of driver	0	5	2.8	A
F3-03	Adjustment coefficient of current	0.1	2	1	1
F3-04	Adjustment coefficient of voltage	0.1	2	1	1
F3-05	Current limit of driver	1	10	5	A
F3-06	Over voltage point of bus	0	999	390	V
F3-07	Under voltage point of bus	0	999	220	V
F3-08	Input voltage	0	999	220	V
F3-09	Debugging parameter	0	1	0.36	V
F3-10	Dead time	3	6	5	us
F3-11	Debugging parameter	0	2	1	1
F3-12	Debugging parameter	0	2	1	1
F3-13	Start-up delay of sealing star relay	0	20	0.1	s

3.2.5. F4 Door operator parameters

Code	Description	Minimum	Maximum	Default	Unit
F4-00	Open to reach the error	2	100	20	mm
F4-01	Open to reach output delay	100	2000	200	ms
F4-02	Opening hold torque	10	145	90	%
F4-03	Close to reach the error	2	100	5	mm
F4-04	Close to reach output delay	100	2000	500	ms
F4-05	Closing hold torque	10	145	90	%
F4-06	Opening torque limit	1	2.5	2.5	PU
F4-07	Closing torque limit	1	2.5	2.5	PU
F4-08	Running speed of power on reset	10	100	50	mm/s
F4-09	Learn running speed of door width	10	100	50	mm/s
F4-10	Manual running enable	0	1	0	1
F4-11	Manual running speed	0	999	50	mm/s
F4-12	Manual running acceleration	10	2048	800	mm/s2
F4-13	Manual motion deceleration	10	2048	800	mm/s2
F4-14	Opening hold time of demonstration	0	999.9	3	s

Code	Description				
	running				
F4-15	Closing hold time of demonstration running	0	999.9	3	s
F4-16	Automatically running of demonstration	0	1	0	1
F4-17	Hold time of opening and closing; 0: keeping continuous running; Others: stop when time is out	0	99.9	0	s
F4-18	Debugging parameter	0	2	1	1
F4-19	Line input mode 0：two phase input 1：three phase input 2：single phase input	0	1	0	1
F4-20	Learning torque of door width	0.1	2.5	1.2	PU
F4-21	Running mode parameter 0：dial state is first priority after the restart 1：parameter is first priority after the restart，dial is not valid	0	0	0	1
F4-22	In place hold torque 0:no hold torque 1:have hold torque	0	1	1	1
F4-23	Stop receiving instructions time	0	20	5	1
F4-24	Close hole toque at the outside of the close to reach the error scope 0: no hold torque 1:have hold torque	0	1	0	1

3.2.6. F5 Door operator parameters

Code	Description	Minimum	Maximum	Default	Unit
F5-00	Major and subordinate state setting 0: Major state; able to reopen the door. 1: subordinate state; unable to reopen the door	0	1	0	mm
F5-01	Deceleration of reopening	50	8000	3000	mm/s2
F5-02	Round corner of reopening	50	8000	3000	mm/s3
F5-03	Unlock distance of reopening	0	300	30	mm
F5-04	Speed error, when error value is bigger than this value, reopen the door	100	500	120	ms/s
F5-05	Detection time of reopening	10	999	100	ms
F5-06	Detection torque of reopening, in speed up part	10	200	140	%
F5-07	Detection torque of reopening, in slow down part	10	200	120	%
F5-08	Detection torque of reopening, in low speed part	10	200	100	%

F5-09	Time limit of closing and opening: When opening or closing time exceeds this time and still do not reach the place, then enter torque holding mode.0: Limit of opening and closing is invalid.	0	30	20	s
F5-10	Output signal of relay 1 0: open to reach signal (switch or pulse) 1: close to reach signal (switch or pulse) 2: fault output 3: sandwich and detection output 4: opening output 5: closing output 6: limit open to reach signal 7: limit close to reach signal	0	9	0	1
F5-11	Output signal of relay 2	0	9	1	1
F5-12	Output signal of relay 3	0	9	2	1
F5-13	Output signal of relay 4	0	9	1	1
F5-14	Output signal of relay 5	0	9	0	1

3.2.7. F8 Adjustment parameters of door operator

Input 1 to complete corresponding operation and return to 0 when completed.

Code	Description
F8-00	Parameter initialization
F8-01	Fault resetting
F8-02	Clearing of history fault
F8-03	Clearing of running number of times

3.3. Fault listing

Check history fault through FA.

code	Fault description	Fault cause	Handling method
1	IPM module fault	Frequency converter damage	Replace frequency converter
		Wiring error of motor	Adjust motor wiring
		Motor burn out	Replace the motor
		Motor does not position	Motor positioning
2	Over current	Wiring error of motor	Adjust motor wiring
		Motor does not position	Motor positioning
		The wire of encoder is broken	Check the encoder if it is connected correctly
5	Overload of motor	Overlarge resistance when opening or closing the door	To check if there is foreign matter or mechanical jam but do not get stuck
		Wiring error of motor	Adjust motor wiring
6	Overload of driver	Frequency converter damage	Replace frequency converter
		Wiring error of motor	Adjust motor wiring
		Motor burn out	Replace the motor
		Motor does not position	Motor positioning
7	Over voltage of DC bus	AC220 Power supply input error	Check power supply wiring
8	under voltage of DC bus	AC220 Power supply input error	Check power supply wiring (Note：automatically recover after power on)
9	Over speed of motor	Motor does not position	Motor positioning
10	Encoder fault	Connection problem of encoder	Check wiring of encoder
		Encoder hardware damage	Replace the motor