User’s Guide of DO3000 Door Operator

Language: EN

Change Record

No.	Document No.	Modification Description	Date	Signature
1	CNT1700304	Newly archived	Jan.02, 2018	Chen Chong
2	CNE1900210	Added HAA24360AK,HAA24360AE2 electrical debugging	Feb.19,2019	Zhu Ying
3	CNE1901161	Added HAA24360AK3,HAA24360AK4,HAA24360G7~HAA24360G11, ERROR CORRECTION	July 29,2019	Zhu Ying
4	CNT1901164	Added DOL debug parameters	Nov.08,2019	Zhu Ying

Remarks:

1. Product Introduction

DO3000 permanent-magnetism frequency-conversion door operator is a door drive system which is driven by the permanent magnet synchronous motor and controlled by stepless speed adjustment and frequency conversion system. It can achieve the best open/close speed curve, with the features such as efficiency, reliability, simple operation and less mechanical vibration. DO3000 permanent-magnetism frequency-conversion door operator applies to the door system with the net door width of (700 ~ 1800) mm.

Main characteristics are as follows:

1 Synchronous motor angle learning (static)

2 Door width learning

3 Automatic open/close demonstration

4 Fault alarm and automatic protection

5 Baffle detection selection

6 Synchronous/asynchronous door coupler selection

1.1. Technical Parameters

Input voltage: AC220V±20%;

a) Controller:

Rated frequency: 50/60Hz;

Output voltage: 0～220V;

Output frequency: 0～50Hz

b) Motor:

Rated voltage: AC80V;

Rated speed: 180r/min;

Rated power: 94W

1.2. Working conditions

a) Altitude 1000m below, 100% rated current output;

1000~2000m, 95% rated current output;

2000~3000m, 85% rated current output;

b) The maximum relative humidity of the wettest month at site is 95%, and the average monthly minimum temperature is not higher than 25 ℃;

c) The fluctuation of supply voltage relative to the rated voltage should be within ±15%

d) Ambient air should not contain corrosive and flammable gases and conductive dust;

2. Electrical Debugging (1)

Part Number: HAA24360AK1~HAA24360AK4, HAA24360AE2

2.1 Wiring of controller

2.1.1 Wiring of HAA24360AK1,HAA24360AK3 controller components (as shown in Fig.2-1)

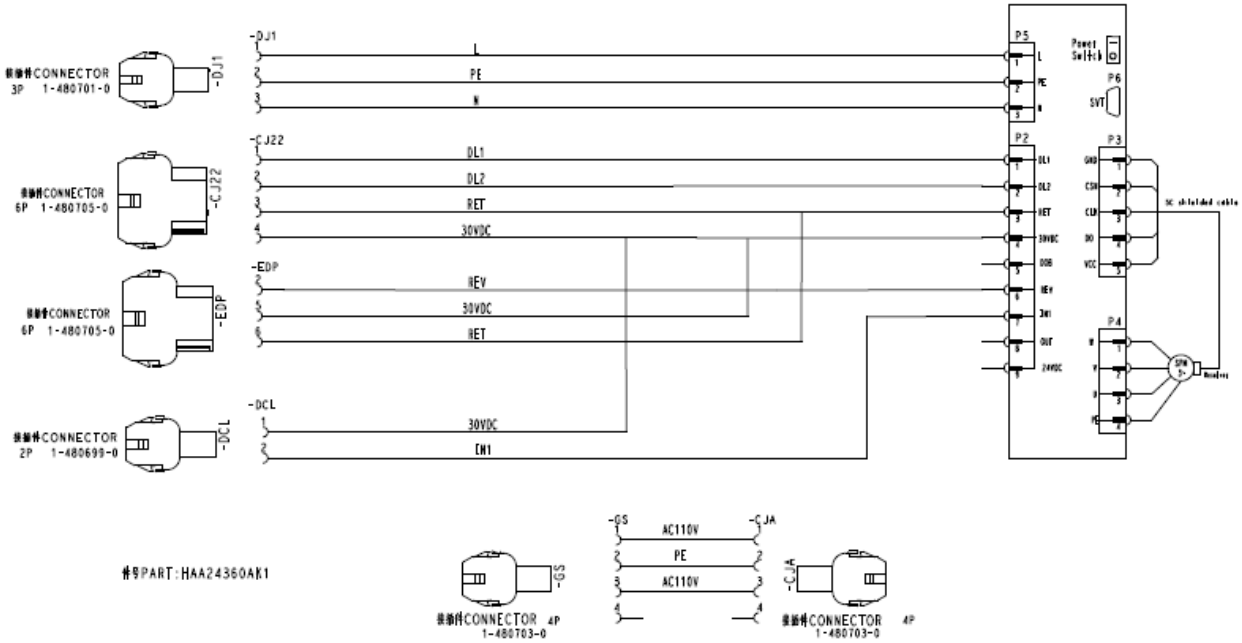


Fig.2-1 Wiring of HAA24360AK1, HAA24360AK3 controller

2.1.2 Wiring of HAA24360AK2,HAA24360AK4 controller components (as shown in Fig.2-2)

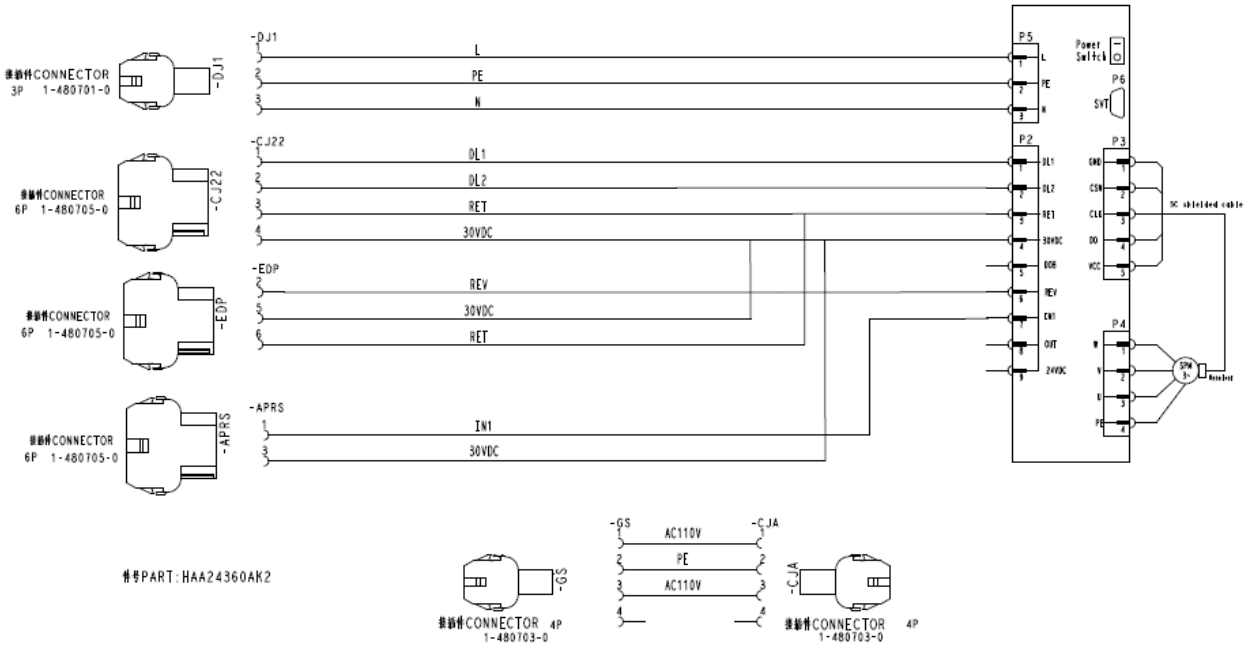


Fig.2-2 Wiring of HAA24360AK2,HAA24360AK4 controller

2.1.3 Wiring of HAA24360AE2 controller components (as shown in Fig.2-3)

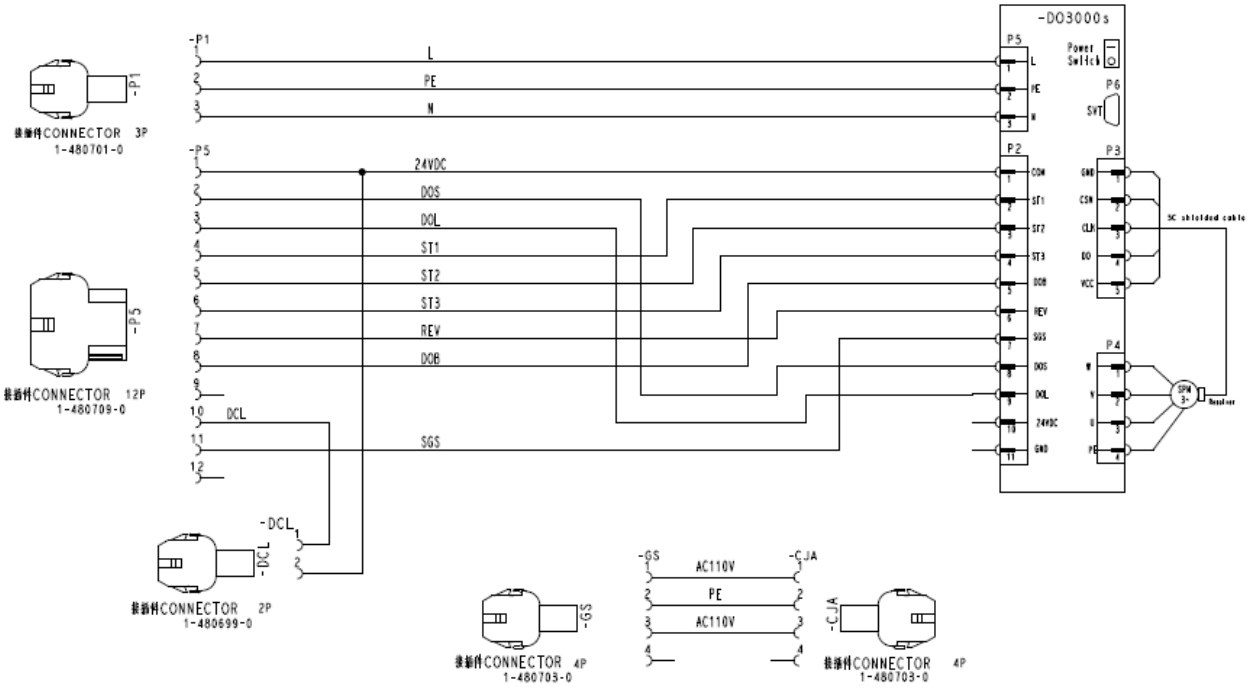


Fig.2-3 Wiring of HAA24360AE2 controller

2.2 Definitions and Descriptions of Terminals

2.2.1 Controller case

2.2.1.1 HAA24360AK1 ~ HAA24360AK4 controller

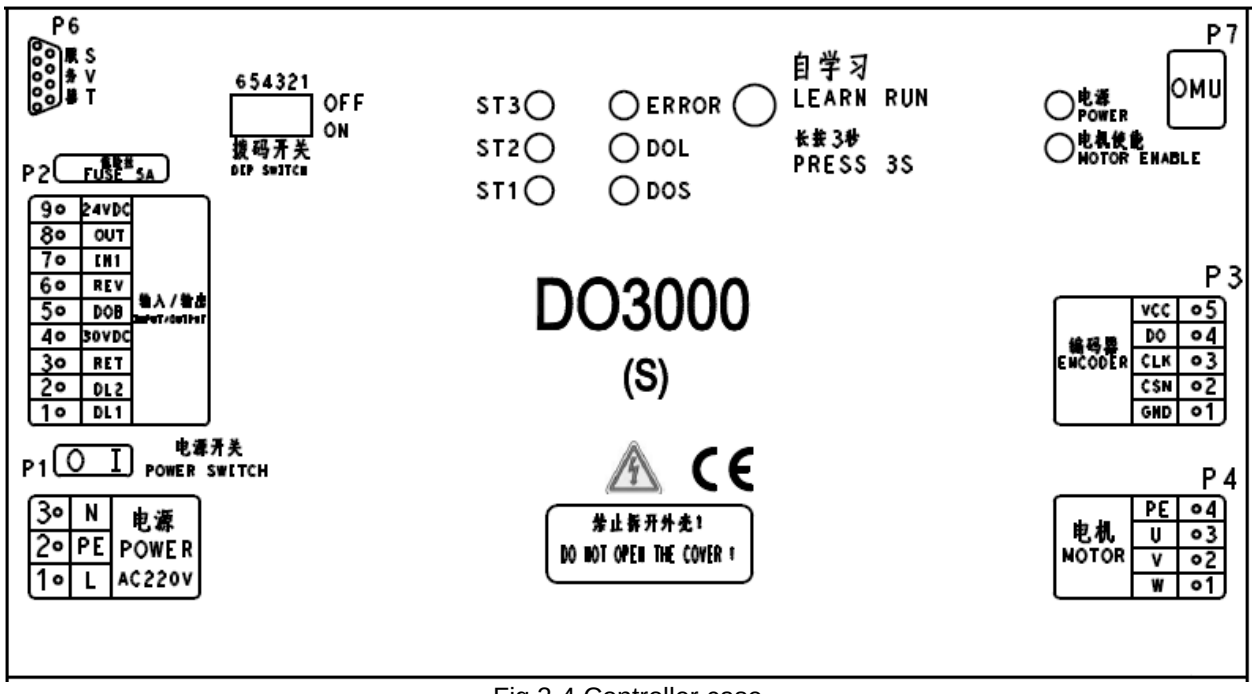


Fig.2-4 Controller case

2.2.1.2 HAA24360AE2 controller

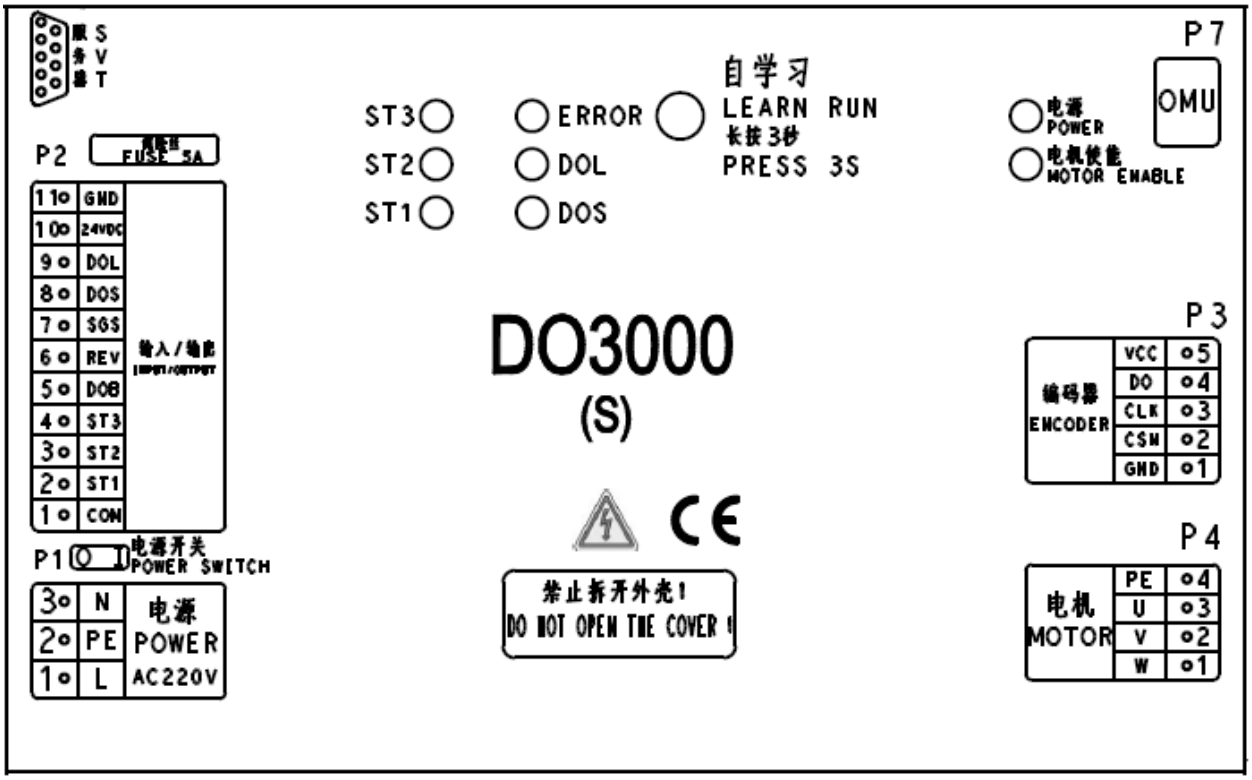


Fig.2-5 Controller case

The circles in the figure represent the indicator and learning button:

Power indicator: normally on when the power is normal.

Motor enable indicator: normally on when the motor strongly outputs.

ST1 / ST2 / ST3: ST code input signal, normally on when it is effective

DOS: turns on when the passenger protection is triggered.

DOL: normally on when the door is opened to the place

ERROR: normally on when the controller is out of service

Learning button: for the learning of controller angle and door width

2.2.1.3 Definitions and descriptions of input/output ports

Definitions and descriptions of terminals are as shown in the following table:

Power line:

Terminal	Description
P1-1	L: live wire
P1-2	PE: protection earthing wire
P2-3	N: null wire

Input/output signals (Part number: HAA24360AK1~HAA24360AK4):

Terminal	Description
P2-1	RSL communication port
P2-2	RSL communication port
P2-3	0V
P2-4	DC30V, power from host computer
P2-5	DOB, open button signal

P2-6	REV, light screen beam signal
P2-7	IN1, reserved input terminal
P2-8	DCL, reserved close-to-place signal
P2-9	DC24V, processed on DC30V to provide the light screen beam power

Input/output signals (Part number: HAA24360AE2):

Terminal	Description
P2-1	COM, common terminal of input
P2-2	ST1, ST code signal
P2-3	ST2, ST code signal
P2-4	ST3, ST code signal
P2-5	DOB, open button signal
P2-6	REV, light screen beam signal
P2-7	SGS, safety gate shoe signal
P2-8	DOS, passenger protection feedback signal
P2-9	DOL, open-to-place signal
P2-10	24VDC, 24V power
P2-11	GND, ground wire

Motor encoder signal:

Terminal	Description
P3-1	GND, ground wire
P3-2	CSN, chip selection signal
P3-3	CLK, clock signal
P3-4	DO, data signal
P3-5	VCC, power supply signal

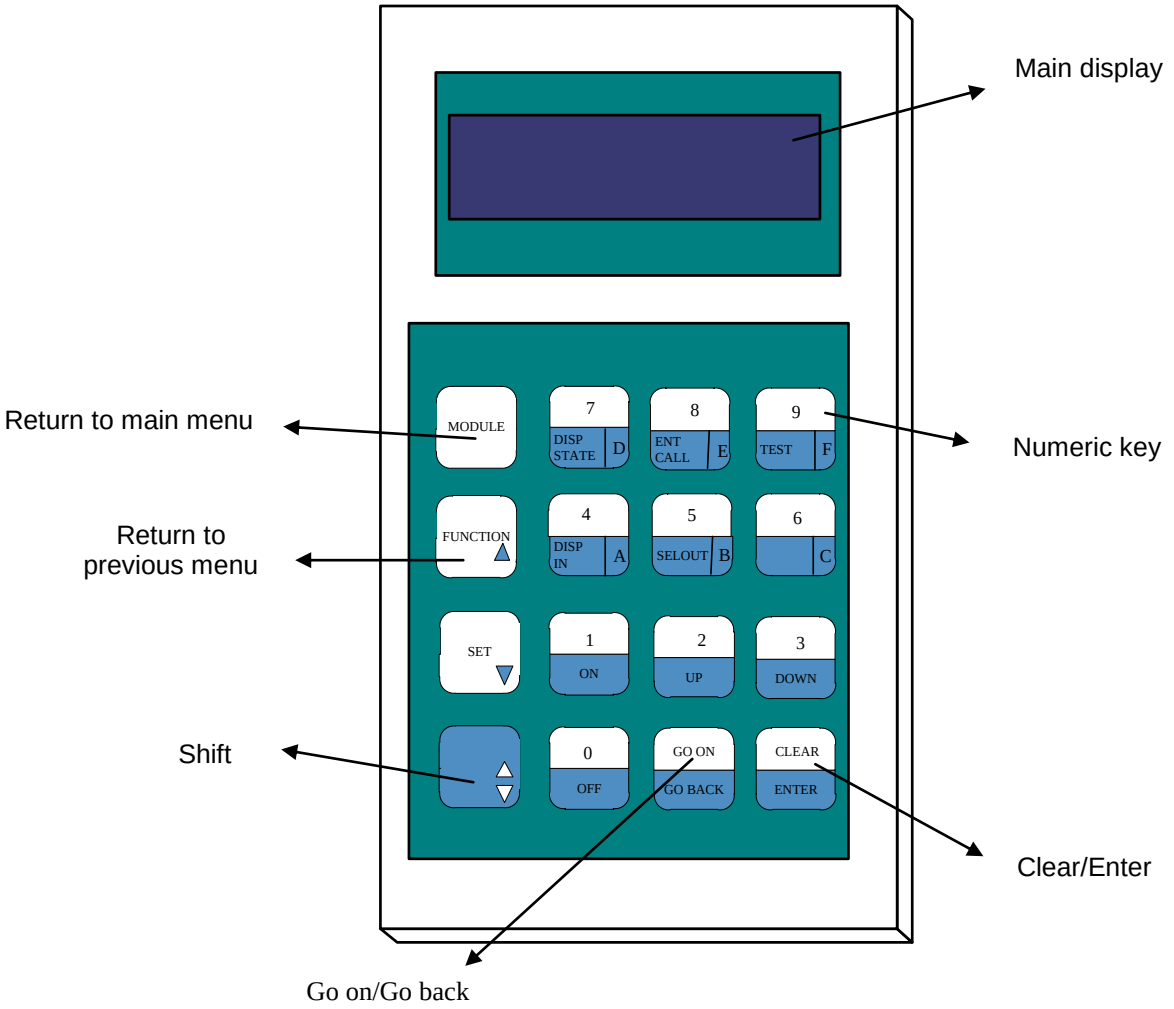
Motor power line signal:

Terminal	Description
P4-1	W, W phase of motor
P4-2	V, V phase of motor
P4-3	U, U phase of ,motor
P4-4	PE, protection earthing wire

2.3 Description of Server

2.3.1 Introduction of server

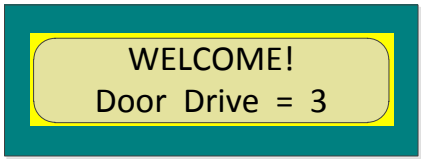
Special server is easy to operate and in line with the operating habits of debugging personnel. The server is as shown in the figure below.

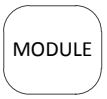


Three lines of buttons at the right side of server comprise of two rows. If you want to use the upper functions, directly press the button; if you want to use the functions below, press the conversion key + this button.

2.3.2 Operating Examples

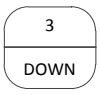
After power-on, the server displays the following:



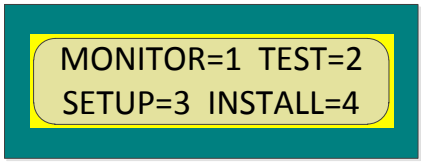
This interface is the main interface of server. Press 

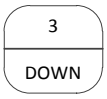
at the upper left corner to return to this interface.

For example: enter the curve menu (331)

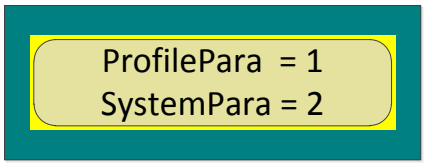
In the main menu interface, press 

to enter the following interface:

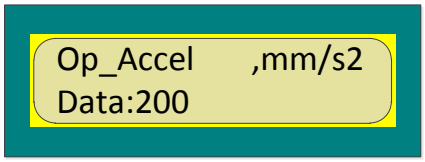


Press 

to enter the following interface:



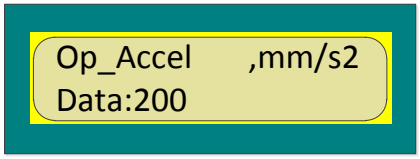
Press 1 / ON to enter the following interface:



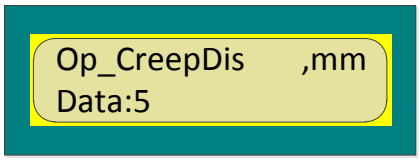
2.3.3 Parameters modification

The display interface of the server can display up to two rows of data. The data displayed by parameter menu is current data. You can modify this parameter according to the following method: (if the buffer distance of opening should be modified, change it from 5 to 1)

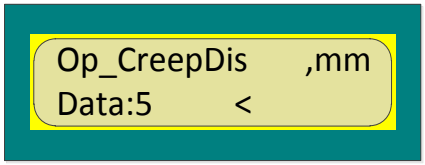
First enter the curve parameter menu according to the previous step as shown below:



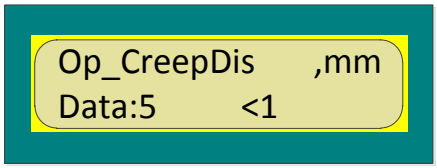
Then click the Go Back button GO ON / GO BACK until it appears as follows:



You can see the original value of 5, and modify the parameter through the combination key of △▽ + CLEAR / ENTER as shown below:

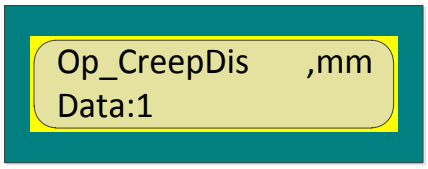


Input the modified value at this time as follows:



If the input is wrong, clear it by clicking CLEAR / ENTER.

If the input is correct, confirm it with the combination key △▽ + CLEAR / ENTER. It displays the following:



The modification of parameters is done.

2.4 Debugging Description

2.4.1 Precaution for door operator debugging:

1. System address settings
2. The elevator is in the maintenance state, ST code is 001 (ST1 is 0, ST2 is 0, ST3 is 1).
3. The door operator is installed and the wiring is correct. Before the power-on, push the hanger plate, and the door moves under resistance; unplug the three-phase power line plug of motor, and then push the hanger plate, and the door runs smoothly, i.e. there is no mechanical jamming.
4. The controller of this door operator matches 1.2A rated current motor and synchronous door coupler by default. If you need to switch to asynchronous door coupler and 0.8A rated current motor, you need to change the Door Coupler Type in the M-3-3-1 to 0, and the Rated I in the M-3-3-3 to 0.8A.

Note: Because the controller has the outage anti-collision function, there is obvious resistance when the hanger plate is pushed before the power-on.

2.4.2 Basic debugging steps:

2.4.2.1 Power-on of door operator

Turn on the power switch of controller, and if the controller power indicator goes on, the controller power is normal.

2.4.2.2 Learning

1. Operation of enclosure panel

Push the hanger plate to the middle, press the learning button on the enclosure and hold it for 3s until it starts to move. The door operator automatically conducts the angle learning and door width learning. During the angle learning, the hanger plate seeks the optimum position through the continuous inching, and directly transfers to the door width learning. Door width learning process is as follows: close → close arrive → open → open arrive → close → close arrive

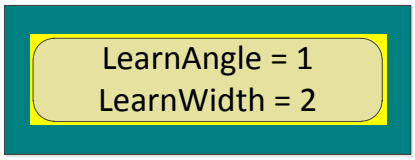
In case of the malposition or reverse open/close action, check the abnormality description.

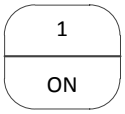
2. Server operation

Server operation separates the angle learning from door width learning, and the angle learning should be carried out prior to the door width learning.

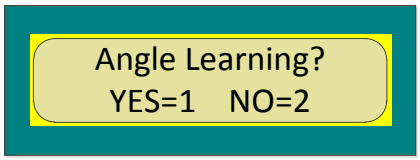
Specific steps are as follows:

First push the door to the middle position, and the server enters menu 34 as follows:

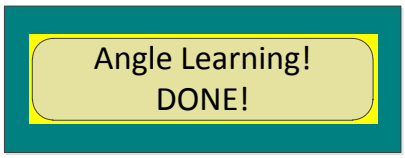


Then press 

and enter the door operator angle learning option as shown below:

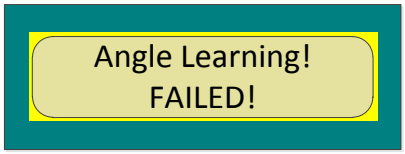


Press 1 ON again, and the hanger plate obtains the initial angle through the continuous inching. After the completion, the server displays the following:



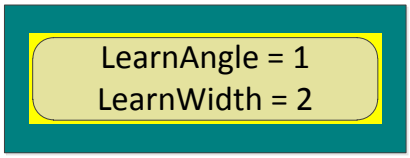
It means that the angle learning is done and the following operations may be conducted.

If the server displayed is as follows:

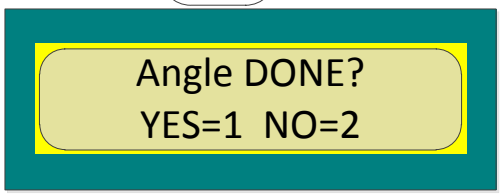


It means the failure of angle learning, check the abnormality description.

After the completion of angle learning, enter menu 34 to see the display as follows.



Then press 2 UP and enter the door operator angle learning option as shown below:

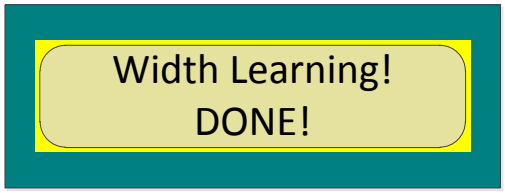


Confirm whether the angle learning is done, and if it is completed, press 1 ON, so that the door operator conducts the door width learning as follows:

Close ⟶ close arrive ⟶ open ⟶ open arrive ⟶ close ⟶ close arrive

In case of the malposition or reverse open/close action, check the abnormality description.

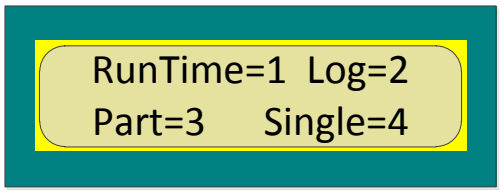
When the door operator stops moving, the server displays:



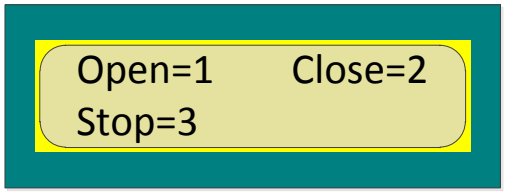
It means that the door width learning is completed. However, make sure whether the door is opened/closed in place and whether the open/close actions are reversed.

2.4.2.3 Demo operation of door operator

Enter menu 32 to see the display as follows:



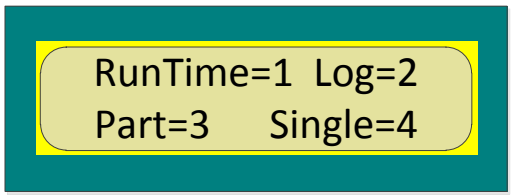
Click 4 to access the single open/close menu as shown below:

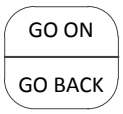


At this point, press 1 to open the door one time, press 2 to close the door one time, and press 3 halfway to stop the door operator.

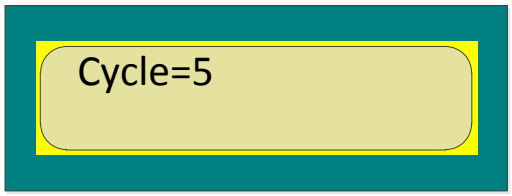
After the debugging of door operator, single open/close action may be performed to verify that the operating curve is smooth.

Press SET button to return to the previous menu as shown below:

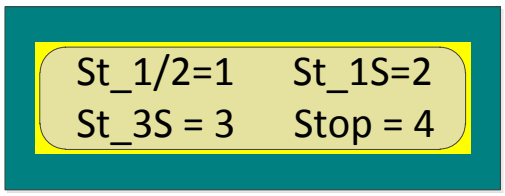


Press the Go on/go back key 

to see the display as follows:



Press 5 to enter the recycling open/close menu as follows:



St_1/2 means that the open/close interval is 0.5S, St_1S means the interval is 1S, and St_3S means the interval is 3S.

Cycle operation is mainly used in the door test rig demo operation.

2.5 Open/close Curve

The open/close curve is shown as follows

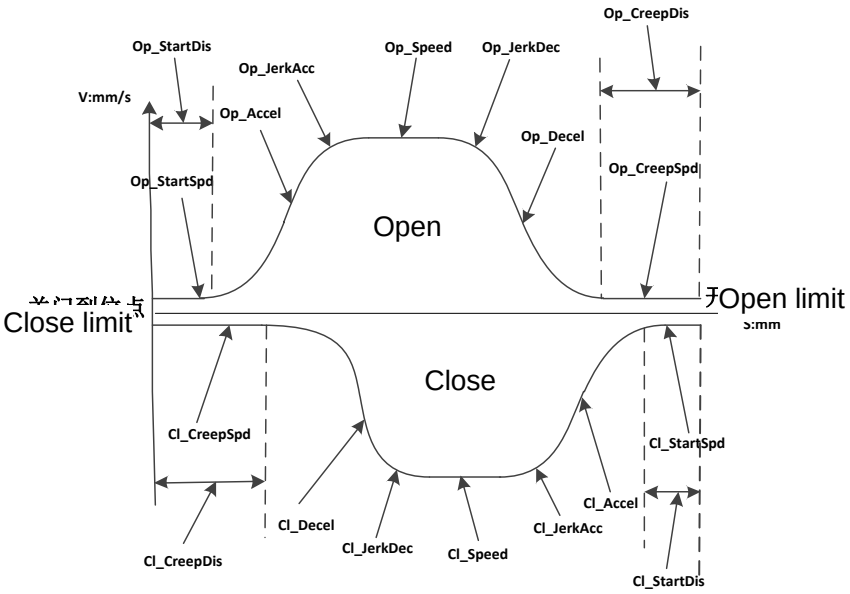
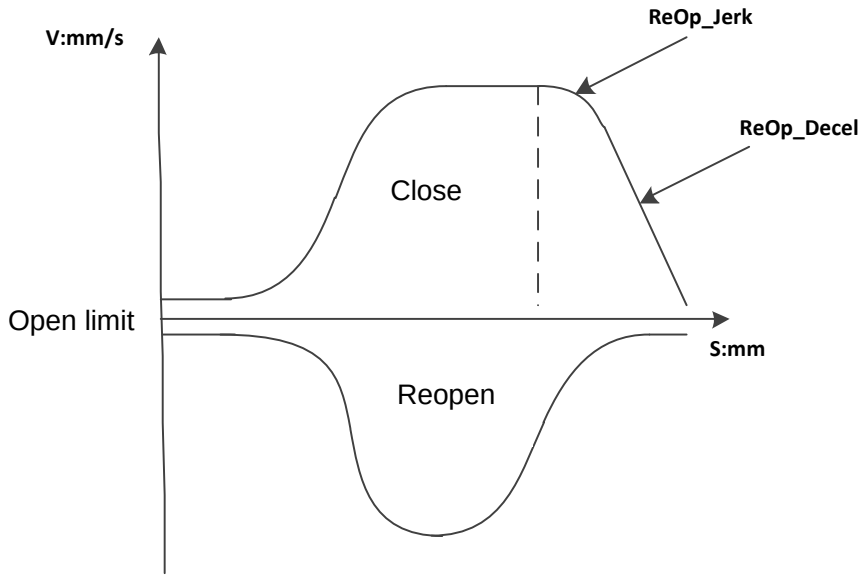


图 3

Parameter	Menu	Function No.	Description	Password Level
Op_Accel	331	1	Open acceleration	0
Op_Decel	331	2	Open deceleration	0
Op_StartDis	331	3	Open start buffer distance	0
Op_StartSpd	331	4	Open start buffer speed	0
Op_CreepDis	331	5	Open arrive buffer distance	0
Op_CreepSpd	331	6	Open arrive buffer speed	0
Op_Speed	331	7	Max. open speed	0
Op_JerkAcc	331	16	Open jerk acceleration	1
Op_JerkDec	331	17	Open jerk deceleration	1
Cl_Accel	331	8	Close acceleration	0
Cl_Decel	331	9	Close deceleration	0
Cl_StartDis	331	10	Close start buffer distance	0
Cl_StartSpd	331	11	Close start buffer speed	0
Cl_CreepDis	331	12	Close arrive buffer distance	0
Cl_CreepSpd	331	13	Close arrive buffer speed	0
Cl_Speed	331	14	Max. close speed	0
Cl_JerkAcc	331	18	Close jerk acceleration	1
Cl_JerkDec	331	19	Close jerk deceleration	1

Password level means that the parameter can be operated only if the password permission is obtained.

Reopen curve is shown as below:



Parameter	Menu	Function No.	Description	Password Level
ReOp_Decel	331	15	Open acceleration	0
ReOp_Jerk	331	20	Open deceleration	1

2.6 Abnormality Handling

For the abnormality handling, first enter the level 1 password, and then modify the parameters following the steps.

View the fault code with server. Enter menu 322 and view the fault log, of which 3221 first shows the most recent fault and its occurrence time. Scroll it down to view the historical fault record, and a total of last 16 faults can be recorded. 3222 means the total number of occurrences of each fault. Enter menu 3223 to clear the fault log, and menu 3224 can clear the number of faults.

Description of fault codes:

No.	Alarm	Server Display	Detection Result	Description
1	Hardware overcurrent Software overcurrent	OverCurrent IPMOverCurr	Output current of IPM module exceeds the rated value	Power wiring on the door operator is likely to be grounded or short-circled. Under normal circumstances, the resistance between the ground wires should be above MΩ, and the resistance between the coils should keep in balance.
2	Over speed	OverSpeed	Speed of door operator motor is beyond the defined speed.	Motor speed may exceed the limit; Initial angle of motor is incorrect, and angle learning is necessary.
3	Overvoltage	HighVoltage	The voltage of door operator bus is detected to be lower than the upper limit of specification range.	Check if the input power supply is high
4	Current sampling circuit damaged	SensorError	Current sampling circuit of door operator drive may be damaged.	Replace the door operator drive
5	Encoder error	EncoderError	The connection between the encoder fitted on the motor and door operator drive is	The encoder wiring of door operator motor may be disengaged or disconnected. Encoder wiring has about +5V voltage amplitude, so

			abnormal.	please avoid strong magnetic field or electric field.
6	Over load	OverLoad	Door operator drive output exceeds the limit for a certain period of time.	Check whether the hanger plate can move smoothly.
7	Low voltage	LowVoltage	The voltage of door operator bus is detected to be lower than the lower limit of specification range.	Due to instantaneous power outage, the supply voltage may reduce. In addition, the power supply capacity may be insufficient. When the voltage is low, DC bus voltage is about 210V.
8	Door width error	DoorWidthErr	Door width learning error	For the first slow operation, there is large difference between the open/close distance and door width obtained at learning stage. Check whether it can move smoothly and whether the door width data is correct.
9	Initial angle learning error	LearAngleErr	Initial angle learning result error	Check whether the machine is jammed, whether the motor phase sequence is correct, and whether the encoder wire and motor power line are loose.
10	Open failure	OpenFailWarn	Door operator can not be completely open, with the open action failure alarm	In case of fault during the open process of door operator, check whether the machine is jammed.
11	Phase lost alarm	PhaseLost	Too large difference between the feedback current value and given current value exceeds the alarm threshold	When the power line loses one phase or several phases, there is large difference between the feedback current value and given value. Check whether the motor power line comes off or is short-circled. The fuse on the capacitor bus is blown. Check the circuit board for the blowout of fuse.
12	Lower lost	PowerLost	The voltage of door operator bus is detected to be lower than the specified value	Supply voltage of door operator is too low or the power cord is in poor contact.
13	Learning error	SelfLearnErr	Delivered controller is directly put into operation without learning.	Conduct the angle learning and door width learning.

2.6.1 Angle learning failure

In case of angle learning alarm, first check the motor power line for looseness or reverse connection, and if no problem is found, pull the hanger plate to the middle and try again.

2.6.2 Reverse open/close order of door width learning

For the door width learning, the door should be theoretically closed, then opened and finally closed, and in case of the reverse order, the following instructions should be followed:

Step 1: Enter the server menu 332 and change OpenDirection parameter to the opposite.

Step 2: Cut off the power, and re-power to conduct the learning again, and check whether the open/close direction is correct.

2.6.3 Open/close not arrive for door width learning

Conduct the following operations without the jamming:

Open not arrive: enter the server menu 333, turn up LearnTriveTrq and conduct the learning again.

Close not arrive: enter the server menu 332, turn up ClArriveTroque and conduct the learning again.

2.6.4 Door width learning failure

Check whether the ST code signal received by the door controller is 001 or not，and if not, the door width learning can not be carried out.

2.7 Viewing the Controller Status and Parameters

2.7.1 Status Monitoring

Function No.	Name	SVT Display	Description
M311 (Status monitoring): check the operating status of door operator			
1	Working mode of drive	WORKING: normal working mode ERRMode: Error working mode	
2	Working status of drive	RDY: Ready ACT: Action INI: Initialized DED: dead LCK: lock	
3	Operating status of door	[!]: fault][: Close arrive [ ]: Open arrive <>: Open action ><: Close action [S]: 停止	
4	Current position of door operator	0mm	
M312 (Input monitoring): check the input of door operator			
1	ST code	Upper case is effective, and lower case is ineffective	Low level effective, no adjustable
2	Meaning of ST code	Open/close order of corresponding protocol	
3	Open button DOB	Upper case is effective, and lower case is ineffective	High level effective, the effective level is adjustable in the system settings
4	Light screen beam signal REV	Upper case is effective, and lower case is ineffective	High level effective, the effective level is adjustable in the system settings
M313 (output monitoring): check the output of door operator			
1	Open arrive DOL	Upper case is effective, and lower case is ineffective	
2	Close fault DOS	Upper case is effective, and lower case is ineffective	
M314 (motor monitoring):			
1	Speed reference	SpdRef	
2	Speed feedback	SpdNow	

3	Current reference	CurRef	
4	Current feedback	CurNow	
5	Motor torque	Torque	Percentage display
6	Rotor angle	RotAng	i.e. electrical angle
M315 (Learning result):			
1	Learning Result	Door Width	Door width data
M316 (open/close count):			
1	Open/close count	ALLCnt	Click the Go On button to clear the data
2	Current open/close count	CurCnt	Click the Go On button to clear the data
M317 (open/close time):			
1	Close time	CloTime	
2	Open time	OpTime	
M321 (run time):			
1	Total run time	Total Run Time	Total power-on time
M322 (log)			
1	Trouble record	Trouble Record	Recent 16 troubles
2	Trouble number	Trouble Number	Number of troubles
3	Clear trouble record	Clear Record	Clear trouble record
4	Clear trouble number	Clear Number	Clear trouble record
M323 (part)			
1	Software version	SoftWV	1
M324 (Single)			
1	Single open	Open	
2	Single close	Close	
3	Stop	Stop	
M325 (Cycle)			
1	Open and close door interval 0.5S	St_1/2	
2	Open and close door interval 1.0S	St_1S	
3	Open and close door interval 3.0S	St_3S	
4	Stop	Stop	

2.7.2 Parameter List

Controller parameters are as follows:

Function No.	Name	SVT Display	Setting Range	Ex-factory Value	Concealed Class	Attribute
M331（Profile Parameters）:						
1	Open acceleration	Op_Accel	200~1500	1200	0	Normally
2	Open deceleration	Op_Decel	200~1500	800	0	Normally

Function No.	Name	SVT Display	Setting Range	Ex-factory Value	Concealed Class	Attribute
3	Open start buffer distance	Op_StartDis	1~100	12	0	Normally
4	Open start buffer speed	Op_StartSpd	5~100	25	0	Normally
5	Open arrive buffer distance	Op_CreepDis	1~100	15	0	Normally
6	Open arrive buffer speed	Op_CreepSpd	5~50	20	0	Normally
7	Max. open speed	Op_Speed	100~700	600	0	Normally
8	Close acceleration	Cl_Accel	200~1500	1200	0	Normally
9	Close deceleration	Cl_Decel	200~1500	1200	0	Normally
10	Close start buffer distance	Cl_StartDis	1~100	1	0	Normally
11	Close start buffer speed	Cl_StartSpd	5~100	60	0	Normally
12	Close arrive buffer distance	Cl_CreepDis	1~100	12	0	Normally
13	Close arrive buffer speed	Cl_CreepSpd	5~50	20	0	Normally
14	Max. close speed	Cl_Speed	100~700	600	0	Normally
15	Reopen deceleration	Reop_Decel	200~10000	3500	1	Normally
16	Open jerk acceleration	Op_JerkAcc	400~3000	1600	1	Normally
17	Open jerk deceleration	Op_JerkDec	400~3000	1200	1	Normally
18	Close jerk acceleration	Cl_JerkAcc	400~3000	800	1	Normally
19	Close jerk deceleration	Cl_JerkDec	400~3000	500	1	Normally
20	Reopen jerk deceleration	Reop_Jerk	400~3000	3000	1	Normally
21	Mandatory close speed	NDG_Speed	20~80	40	1	Normally
22	Door coupler type	DoorCouplerType	0= Asynchronou-s 1= Synchronous	1	1	Outage
23	Door coupler distance	DoorCouplerDis	1~300	53	1	Normally
24	Door coupler speed	SCouplerSpd	20~700	100	1	Normally

Function No.	Name	SVT Display	Setting Range	Ex-factory Value	Concealed Class	Attribute
M332 (System parameters):						
1	Run mode	RunMode	1=Standard protocol 2=Extend 3 wire protocol	2	0	Normally
2	Door width data	DoorWidth	learning acquisition	110	0	Normally
3	open/close arrive gap	ArriveGap	1~80	10	0	Normally
4	Open arrive torque	OpArriveTroque	0~300	180	0	Normally
5	Close arrive torque	ClArriveTroque	0~300	80	0	Normally
6	REV high/low level setting	REVLevelType	0~1	0	0	Normally
7	DOB high/low level setting	DOBLevelType	0~1	1	0	Normally
8	open/close direction selection	OpenDirection	0~1	0	1	Outage
9	PP inactive distance	InactivePP	1~100	10	1	Normally
M333(motor parameters):						
1	Rated current	Rated I	10~1000	120	0	Outage
2	Number of motor poles	Num_MotorPole	1~20	8	0	Outage
3	Number of encoder pulses	Num_EncoderPulse	360~10000	4096	0	Outage
4	Initial angle of encoder	IniAngle_Encoder	learning acquisition	0	0	Outage
5	Distance of gear for synchronizing wheel	Dis_Gear	2~20	5	0	Outage
6	Number of gears for synchronizing wheel	Num_Gear	2~50	26	0	Outage
7	Power-on initial speed	InitSpd	20~80	60	0	Normally
8	Max. learning torque	LearnTorq	40~300	130	0	Normally
9	Learning open arrive toque	LearnArriveTrq	0~300	120	0	Normally
10	Open hold torque	Op_HoldTorq	10~100	60	1	Normally
11	Close hold torque	Cl_HoldTorq	10~100	80	1	Normally

Function No.	Name	SVT Display	Setting Range	Ex-factory Value	Concealed Class	Attribute
12	Hold torque time	HoldTorqTime	0~24	0	1	Normally
13	Hold speed	HoldSpeed	20~80	40	1	Normally
14	Reopen torque	Reop_JudgeTorq	50~200	100	1	Normally
15	Reopen acceleration compensation	Reop_TorqAccSlp	0~100	70	1	Normally
16	Reopen deceleration compensation	Reop_TorqDecSlp	0~100	10	1	Normally
17	Reopen torque limit	Reop_LimitTorq	50~700	200	1	Normally
18	Max. open torque	Op_MaxTorq	10~700	200	1	Normally
19	Low-speed open torque	Op_LowSpdTorq	10~700	200	1	Normally
20	Close max torque	Cl_MaxTorq	10~700	200	1	Normally
21	Close low speed torque	Cl_LowSpdTorq	10~700	200	1	Normally
22	Allowable error of initial angle	Angle EE	10~100	50	2	Normally
23	Initial angle learning torque	AngleDutyRatio	200~700	400	2	Normally
24	High speed ring gain	SpdP1 Gain	0~4000	1800	2	Normally
25	High speed ring integral time	SpdI1 Gain	0~4000	50	2	Normally
26	Low speed ring gain	SpdP2 Gain	0~4000	960	2	Normally
27	Low speed ring integral time	SpdI2 Gain	0~4000	30	2	Normally
28	PI switching speed point	PI ChangSp	0~700	5	2	Normally
29	PI switching slope	PI ChangeSlp	1~20	1	2	Normally
30	Current loop gain	CurrentP Gain	100~5120	400	2	Normally
31	Current loop integral time	CurrentI Gain	0~1000	67	2	Normally
32	Speed feedback filter	Speed Filter	0~200	100	2	Normally
33	Current reference filter	Current Filter	0~2000	0	2	Normally

Function No.	Name	SVT Display	Setting Range	Ex-factory Value	Concealed Class	Attribute
34	Reopen judge time	Reop_JudgeT	10~1000	50	2	Normally
35	Open fault judge time	Op_JudgeT	10~10000	4000	2	Normally
M336（Debug parameters）：						
1	Cycle operation allowed bits	EN_Cycle	0~1	1	1	Normally
2	Emergency opening mode	EmgOpenMode	0~1	1	1	Outage
3	Service tool enable bits	EN_SVT	0~1	0	2	Normally
4	Learning completion flag	LearnJudge	0~1	0	2	
5	Hold torque enable	En_HoldTorq	0~1	1	2	Normally
6	Overload threshold	OL_Threshold	1~200	80	2	Normally
7	Phase loss threshold	PHL Threshold	10~200	100	2	Normally
8	Software overcurrent threshold	OC2 Threshold	0~700	400	2	Normally
9	Failure lock number	Num_Failure Lock	1~30	5	2	Normally
10	Failure recover time	T_FailureRec	1~60	5	2	Normally
11	Parameter change enable bits	EN_ParaChange	0~1	0	2	Normally
12	Power-on initialization time	Init_Time	1000~10000ms	3500	2	Power-on
13	Power-on DOL output time	DOL_Time	0~2000ms	500	2	Power-on

3. Electrical Debugging (2)

Part number: HAA24360G1~G11

3.1 Wiring of controller

3.1.1 Wiring of HAA24360G1, HAA24360G7 controller components (as shown in Fig.3-1)

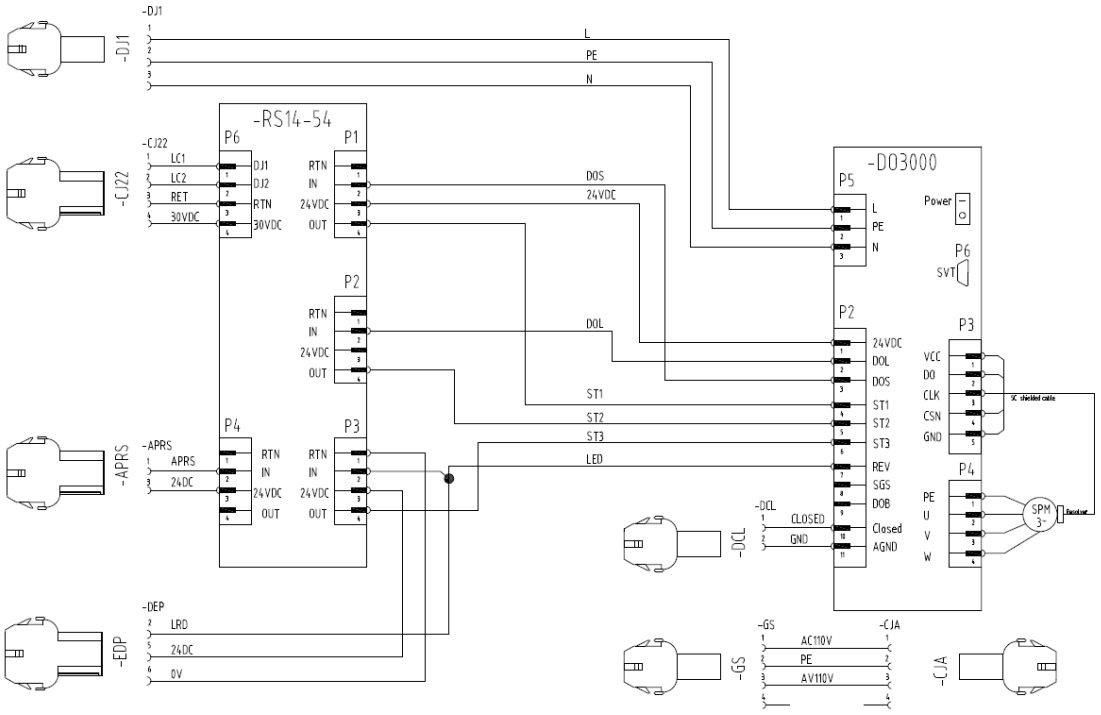


Fig.3-1 Wiring of HAA24360G1, HAA24360G7 controller components

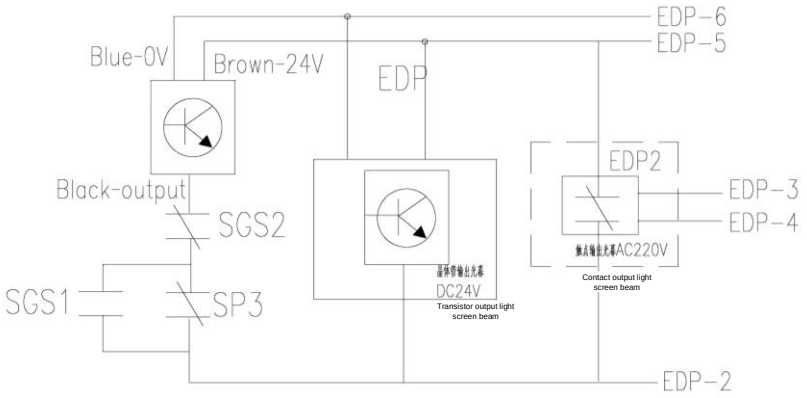


Fig.3-2 Wiring of HAA24360G1, HAA24360G7 controller component light screen beam

3.1.2 Wiring of HAA24360G2 controller components (as shown in Fig.3-3)

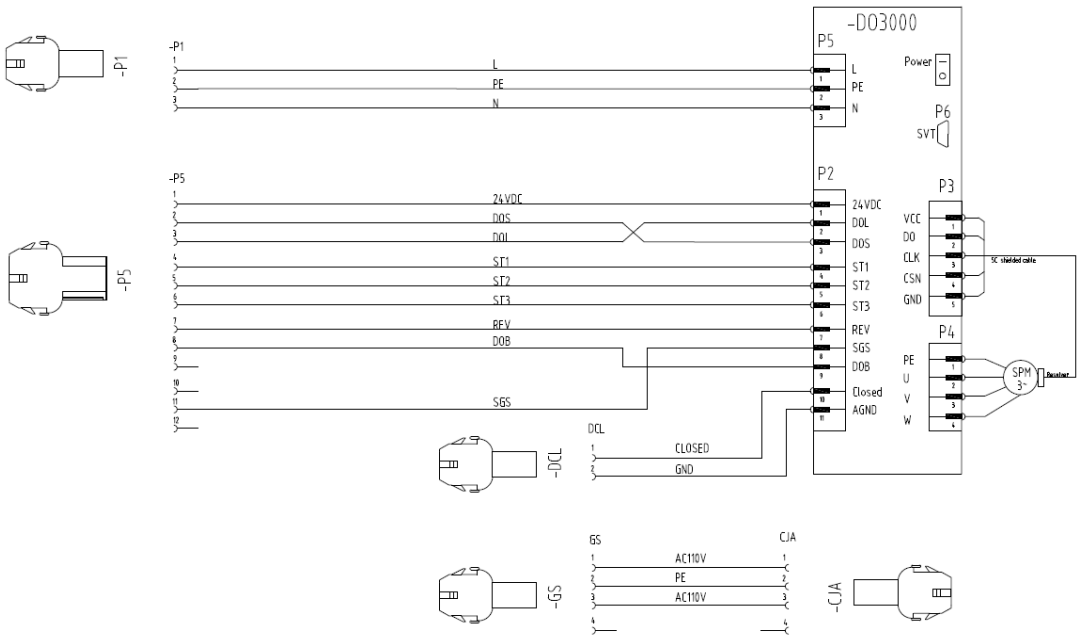


Fig.3-3 Wiring of HAA24360G2 controller components

3.1.3 Wiring of HAA24360G3, HAA24360G8 controller components (as shown in Fig.3-4)

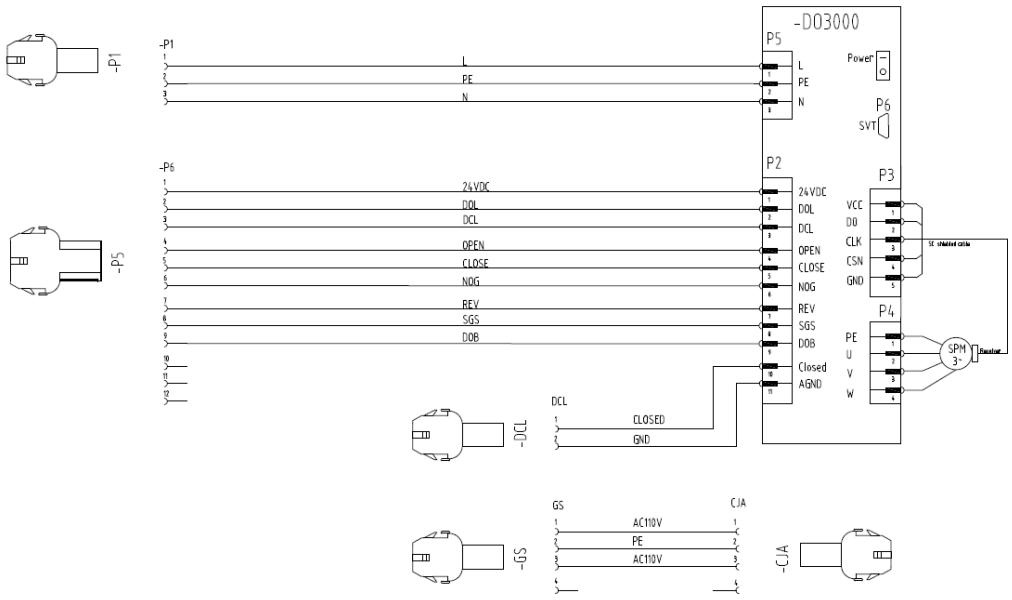


Fig.3-4 Wiring of HAA24360G3, HAA24360G8 controller components

3.1.4 Wiring of HAA24360G4, HAA24360G9 controller components (as shown in Fig.3-5)

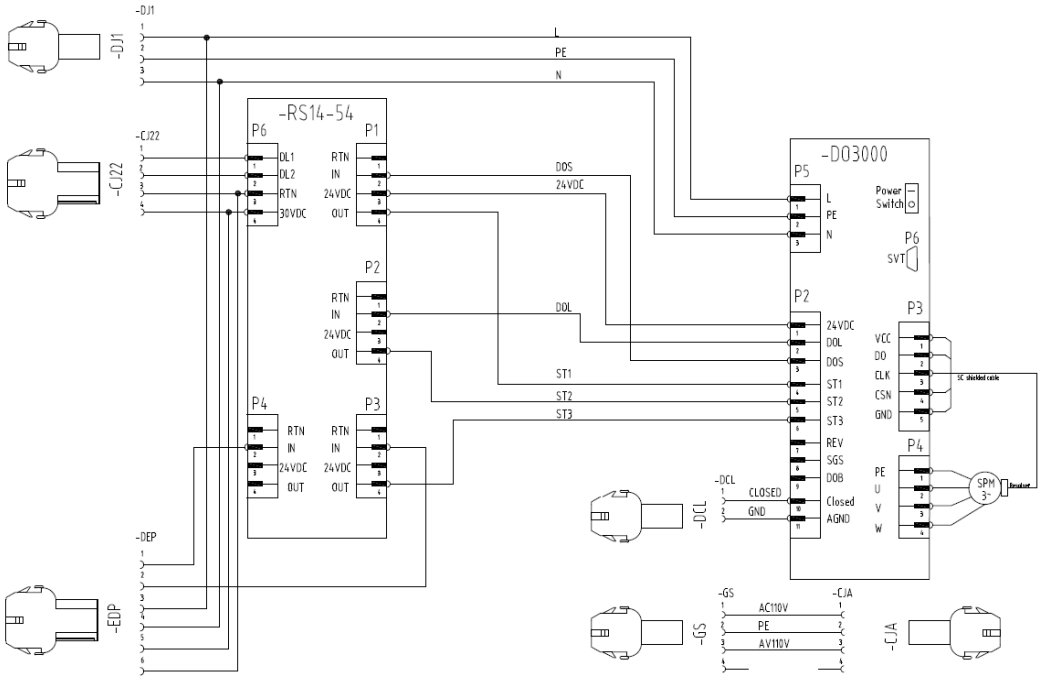


Fig.3-5 Wiring of HAA24360G4, HAA24360G9 controller components

3.1.5 Wiring of HAA24360G5, HAA24360G10 controller components (as shown in Fig.3-6)

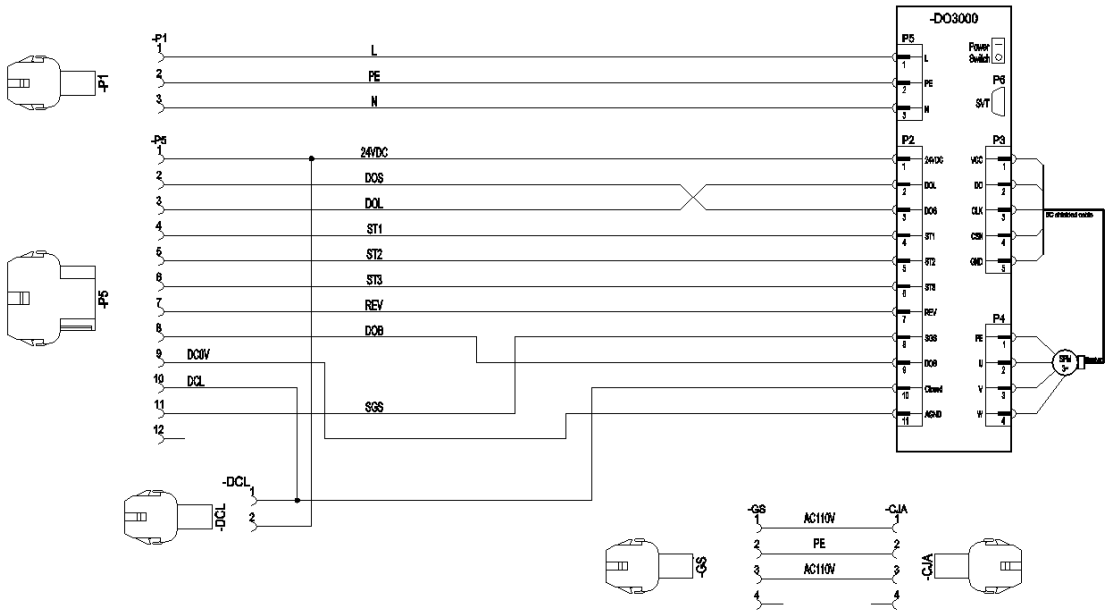


Fig.3-6 Wiring of HAA24360G5, HAA24360G10 controller components

3.1.6 Wiring of HAA24360G6, HAA24360G11 controller components (as shown in Fig.3-7)

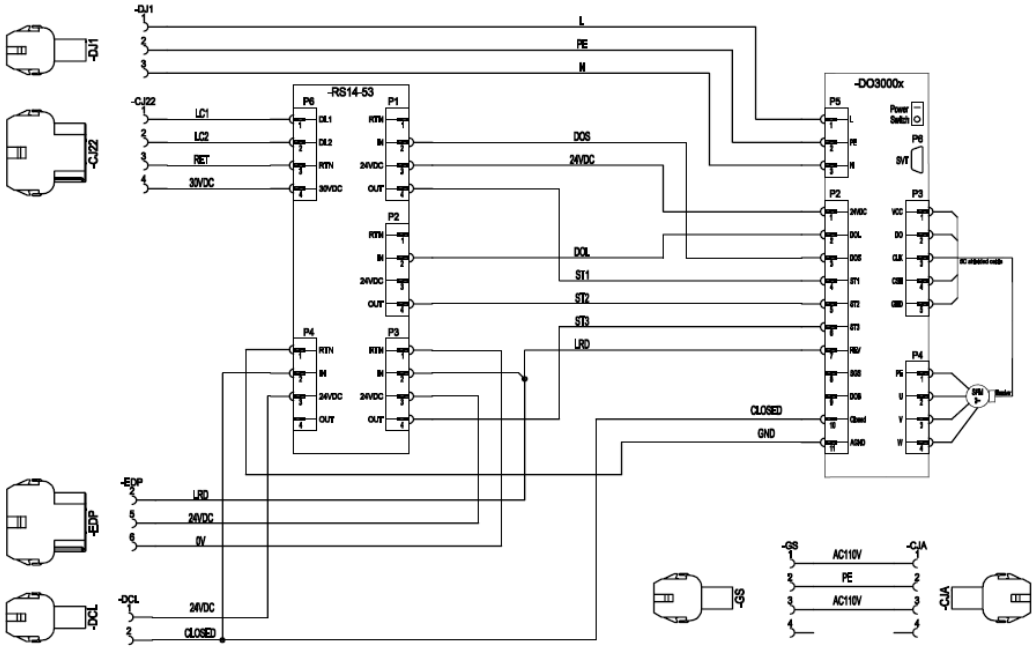


Fig.3-7 Wiring of HAA24360G6, HAA24360G11 controller components

3.2 Controller Interface

3.2.1 Controller case

3.2.1.1 HAA24360G1, HAA24360G2, HAA24360G4, HAA24360G7, HAA24360G9 Controllers

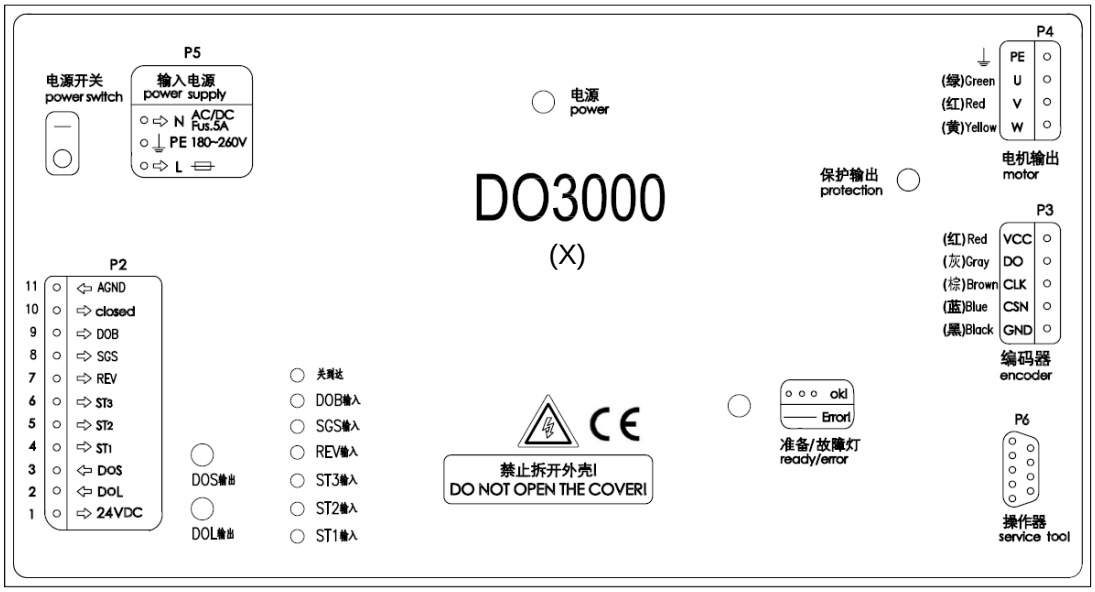


Fig.3-8 Controller case

3.2.1.2 HAA24360G5, HAA24360G6, HAA24360G10, HAA24360G11 Controllers

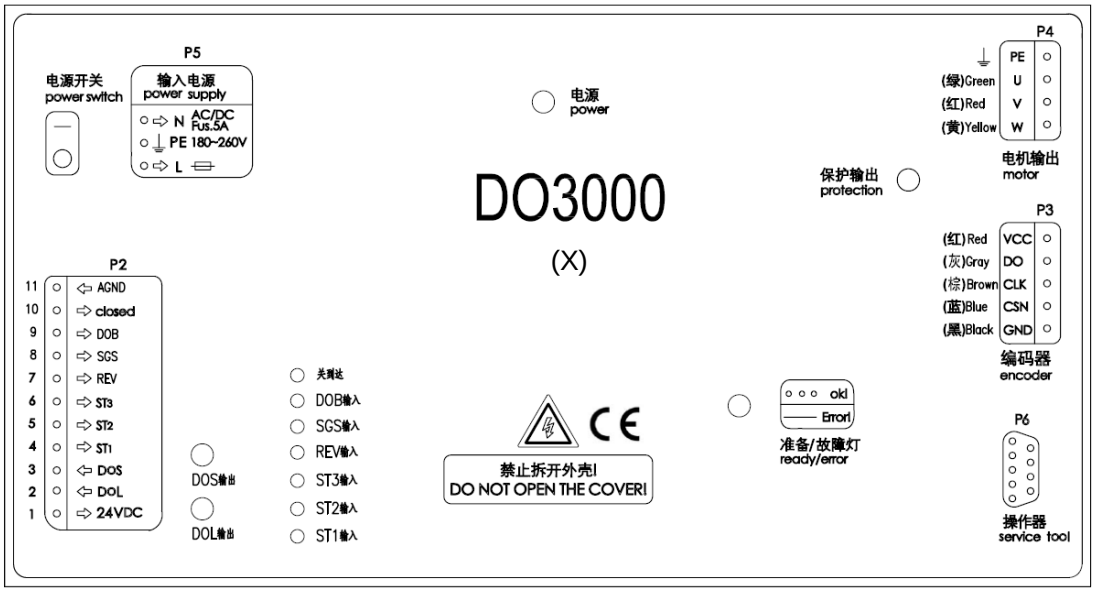


Fig.3-9 Controller case

- The circles on the figure represent the indicators corresponding to various functions

Power: normally on when power works properly

Ready/error: blink at normal conditions, and normally on in case of fault

Close arrive: normally on when the close arrive signal is input after the door is closed in place.

ST1/ST2/ST3: ST code signal input, normally on with signal.

REV input: light screen beam signal input, normally on if light screen beam signal is input

SGS: passenger protection input, normally on with signal

DOB: open button input, normally on with signal

DOS output: passenger protection, blink if the door operator is blocked at the close process

DOL output: normally on when the open arrive signal is output by controller after the door is opened in place

Protection: off without the motor output, and normally on with motor output

3.2.1.3 HAA24360G3, HAA24360G8 controller case

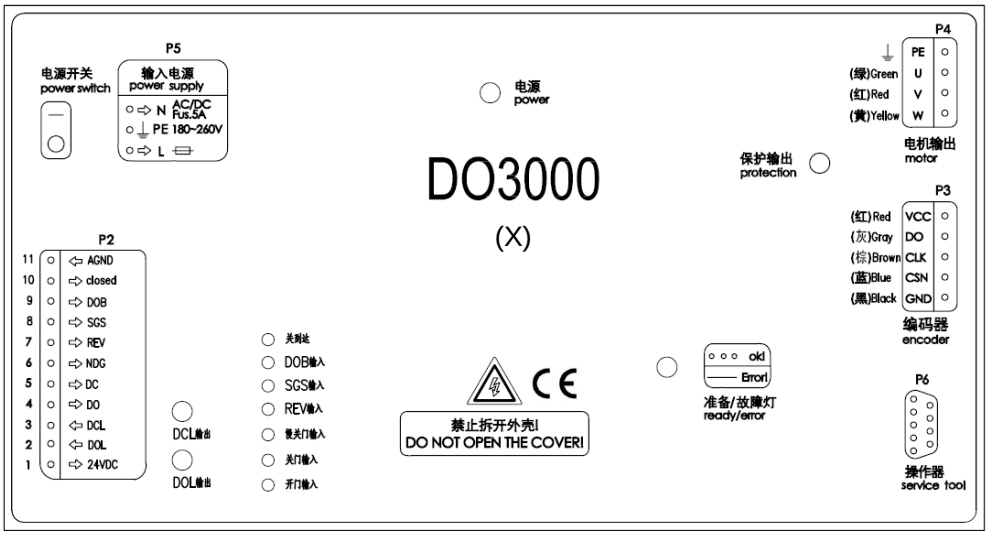


Fig.3-10 Controller case

- The circles on the figure represent the indicators corresponding to various functions

Power: normally on when power works properly

Ready/error: blink at normal conditions, and normally on in case of fault

Close arrive: normally on when the close arrive signal is input after the door is closed in place.

DO/DC/NDG: open, close and slow close signal input, ST code signal input, normally on with signal.

REV input: light screen beam signal input, normally on if light screen beam signal is input

SGS: passenger protection input, normally on with signal

DOB: open button input, normally on with signal

DCL output: normally on when the close arrive signal is output by controller after the door is closed in place

DOL output: normally on when the open arrive signal is output by controller after the door is opened in place

Protection: off without the motor output, and normally on with motor output

3.2.1.4 Definitions and descriptions of input/output ports

Definitions and descriptions of input/output ports are as shown in Tables 3-1,3-2 and 3-3。

Table 3-1 Definitions of power ports

Terminal	Definition
P5-1	L (220VAC、187V~253V)

P5-2	PE
P5-3	N

Table 3-2 Definitions and descriptions of input ports

Terminal	Definition
P2-1	24VDC, 24V power input
P2-4	ST1/DO
P2-5	ST2/DC
P2-6	ST3/NDG
P2-7	REV
P2-8	SGS
P2-9	DOB
P2-10	CLOSED

Table 3-3 Definitions and descriptions of output ports

Terminal	Definitions
P2-2	DOL
P2-3	DOS/DCL

3.3 Use of Server

3.3.1 Introduction for use of server

Special server, with simple operation and high efficiency, is as shown in Fig.3-11.

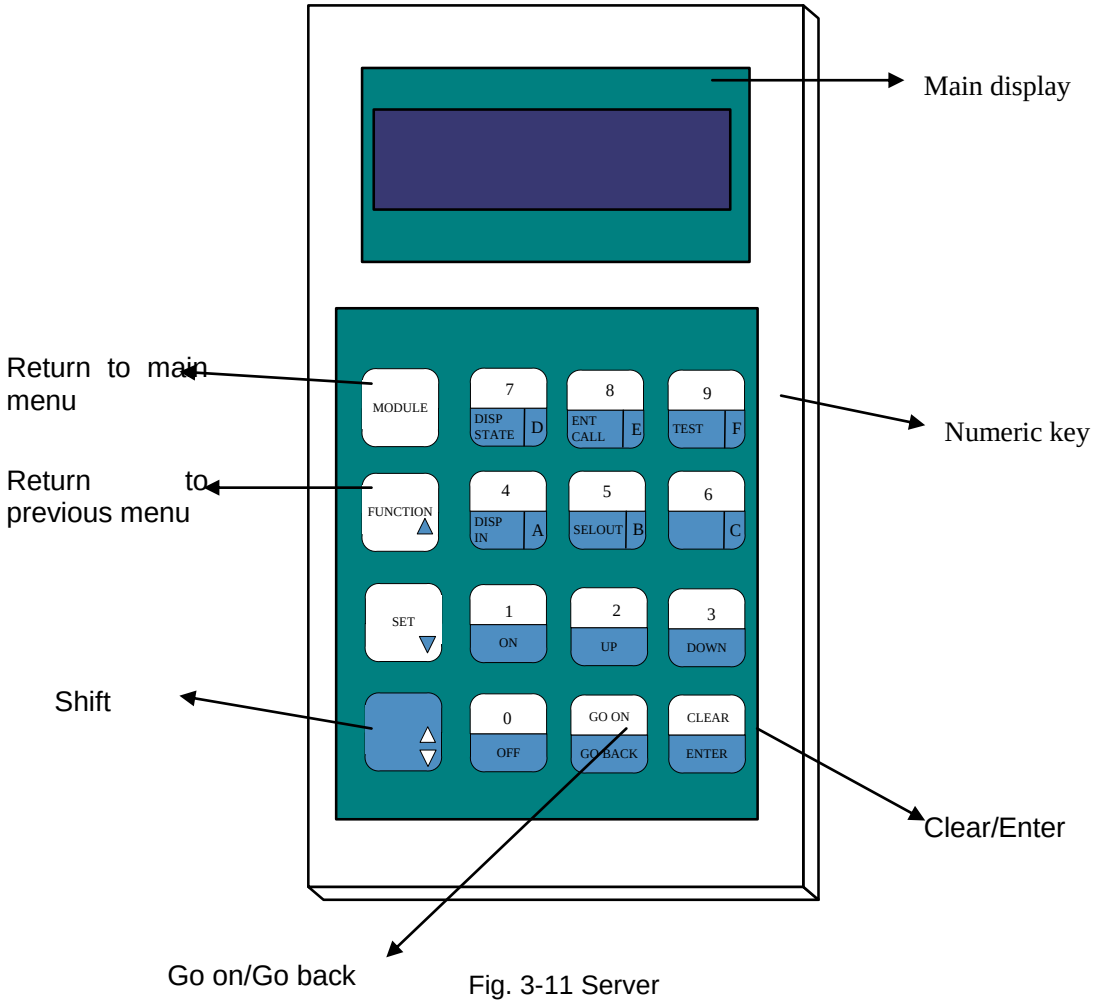
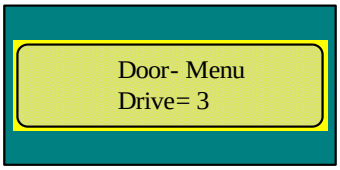


Fig. 3-11 Server

Three lines of buttons at the right side of server comprise of two rows. If you want to use the upper functions, directly press the button; if you want to use the functions below, press the conversion key + this button. Special attention should be paid to GO ON, GO BACK, CLEAR and ENTER described in the following debugging document.

3.3.2 Operation examples

After power-on, the server displays as follows:



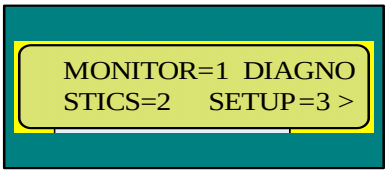
This is the main interface of server. Press 

at the upper left corner of keyboard to directly return to this interface.

For example: enter the menu 3311 (curve parameters)

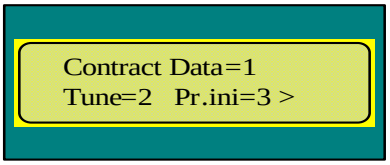
Press 

on the main menu interface to enter the following interface



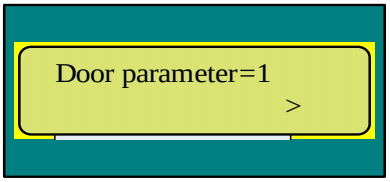
Then press 

to enter the following interface



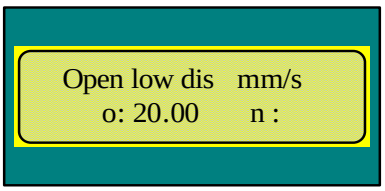
And then press 

to enter the following interface



3.3.3 Data modification

The operation interface of server displays two rows of data, with the original data (old, "o" for short) showing at left side of second row and new data (new, "n" for short) input at the right side as follows:



Data input: taking 40 as an example, first press "4", and then press "0" twice. "40.00" appears at the right

side. Confirm this is the data to be input, and press  + 

. If "400.00" is input by accident, press 

to delete one "0"

3.4 Debugging Description

3.4.1 Make sure that the following requirements are met before debugging the door operator:

- For HAA24360G1, HAA24360G7 controller components, the system addresses are set as follows:

  DOS (reverse open) : front door 53-1/rear door 54-1

  DOL (open arrive) : front door 53-2/rear door 54-2

  EDP (light screen beam) : front door 53-3/rear door 54-3

- Elevator is in the maintenance state
- Emergency stop button of top car is pressed
- Randomly attached cables are correctly connected according to Fig.3-1 ~ Fig.3-7.
- Door operator has been installed and connected correctly. Before the power-on, the hanger plate bears the running resistance when pushed and runs smoothly after the three-phase power plug P4 of motor pulled out.

Note: Because the controller has the outage anti-collision function, there is obvious resistance when the hanger plate is pushed before the power-on.

Unaccomplished matters should be strictly handled according to the safety specifications of elevator!

- ※The controller and motor have been matched before the delivery of complete machine. The debugging should be conducted by reference to the basic debugging steps in 2.4.2.
- ※If the controller or motor has been replaced, the debugging should be conducted by reference to the advanced debugging steps in 2.4.3.

3.4.2 Basic debugging steps:

3.4.2.1 Power-on of door operator

If the power indicator goes on after the controller is switched on, the power of controller is normal.

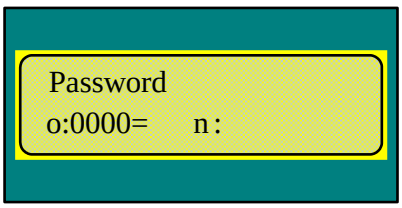
3.4.2.2 Enter the password

1. Enter the menu 3311, go back to Password, input the password 8888, and then enter the password 4321.

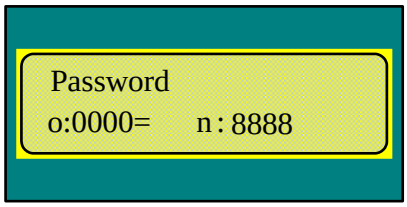
Specific operations are as follows:

Enter the menu M3311, press 

and go back to the last parameter:

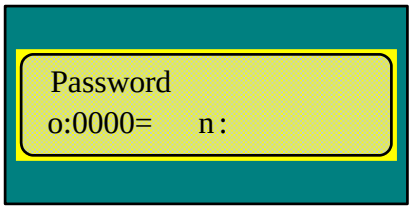


Enter the password 8888:

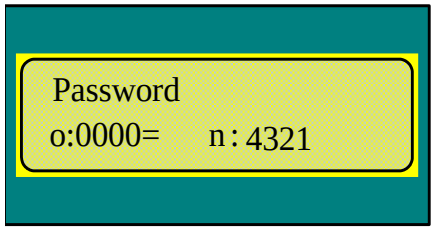


Press  + 

to confirm; Menu interface turns into:

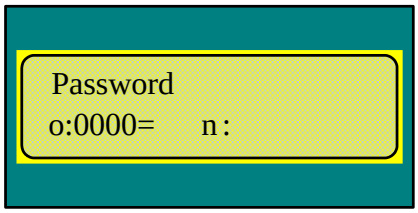


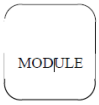
Enter the password 4321



Press  + 

to confirm; Menu interface turns into:



Press 

and return to main menu.

In case of no operation for server in 5 min, enter the password again.

3.4.2.3 Learning

Step 1. Enter the menu M3311, change the operating mode comand source into "0".

Step 2. Enter the menu M3312, change the feedback mode into "0".

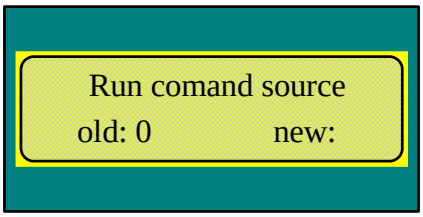
Step 3. Enter the menu M334, press Enter key to conduct learning.

Note: The learning should be conducted strictly in accordance with above steps. If the learning is directly conducted without steps 1 and 2, door operator may fail and only can return to normal after the outage (wait for the power indicator to completely go off) and power-on again.

Specific operations are as follows:

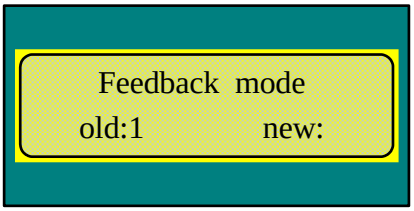
Enter the menu M3311, press 

to select the following parameters. If it is not 0, set it to 0:

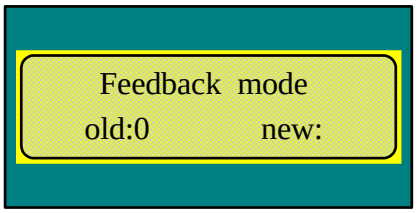


Press MODULE to return.

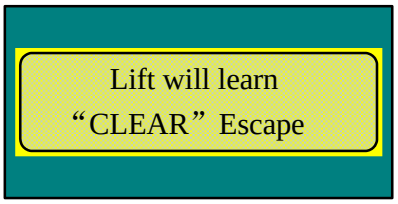
Enter the menu M3312, press GO ON / GO BACK to select the following parameters:



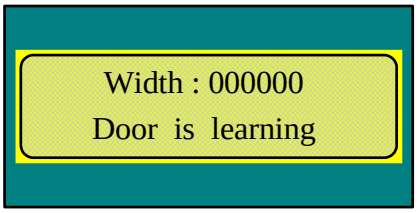
If this value is not 0, set it to 0, and press ▲▼ + CLEAR / ENTER to confirm



Press MODULE to return to main menu, enter the menu M334:



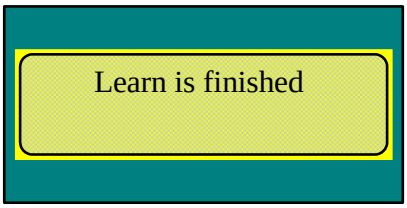
Press ▲▼ + CLEAR / ENTER to start learning; start interface of learning is as follows:

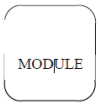


Operating process of door at learning:

close→close arrive→open→open arrive→close→close arrive

End interface of learning is as follows:



Press 

to return to main menu.

After the end of learning, i.e. the last close arrive, the motor is at dead status.

After the end of learning, enter the menu M3311 to view "DR half range"; in case of center opening door operator, this value is equal to about half the open door width ＋60mm

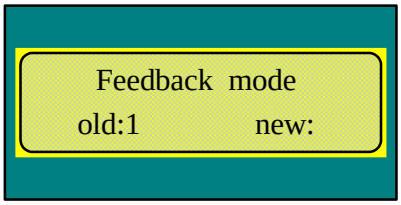
3.4.2.4 Demo operation of door operator

1. Enter the menu 3312, and determine whether Feedback is 0. If it is not 0, change it into 0.
2. Enter the menu 3311, and change operating mode Run comand source into 2.
3. Enter the menu 313 and press Enter key to conduct the demo operation.
4. Enter the menu 313, go back to Stop press ENTER, and press Enter key to stop the demo operation

Specific operations are as follows:

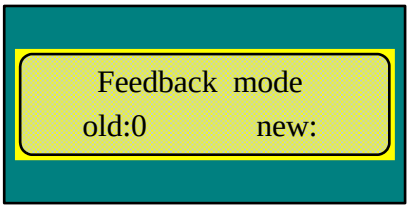
Enter the menu M3312, press 

to select the following parameters:



If the value is not 0, set it to 0, and press 
+ 

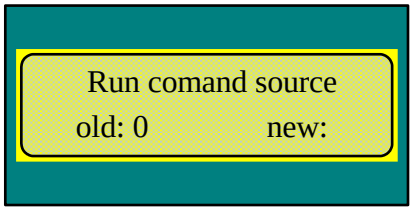
to confirm

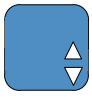


Press 

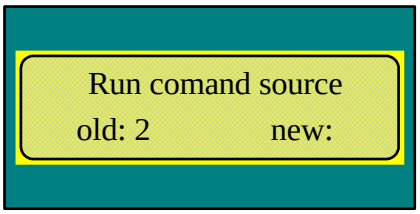
to return to main menu, and enter the menu M3311, press 

to select the following parameters:



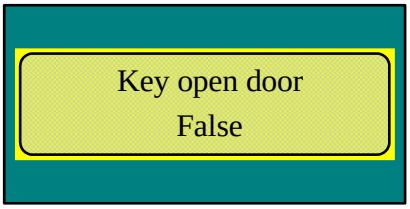
If the value is 0, set it to 2 (if it is not 0, first set it to 0), and press 
+ 

to confirm



Press 

to return to main menu and enter the menu M313 with interface as follows:

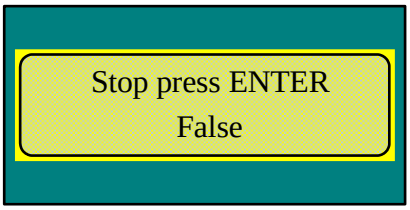


Press  + 

to start the demo operation; door operator continuously opens and closes the door

Press 

to stop it, and select the following parameters



Press  + 

to stop the demo operation, and press 

to return to main menu

3.4.2.5 Normal settings of door operator

3.4.2.5.1 Settings of HAA24360G1, HAA24360G2, HAA24360G4 ~ HAA24360G7, HAA24360G9 ~ HAA24360G11 controller components

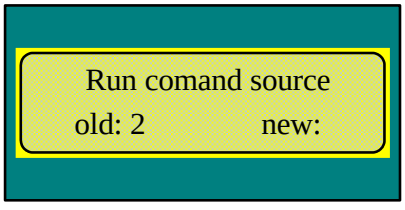
Before the normal settings of door operator, emergency stop button should be reset, top car should be under the service status and among ST code indicators ST1, ST2 and ST3 on the controller panel, only ST3 should be on

1. Enter the menu 3311 and change Run comand source into 0.
2. Enter the menu 3312 and change Feedback mode into 1.
3. Enter the menu 3311, and change Run comand source into 6.

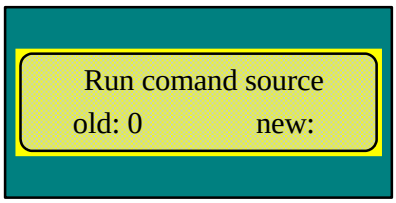
Specific operation steps:

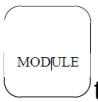
Enter the menu M3311, and press 

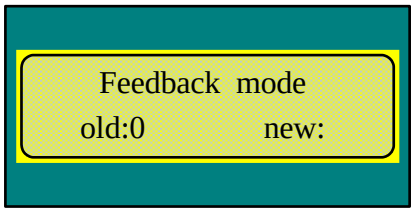
to select the following parameters:



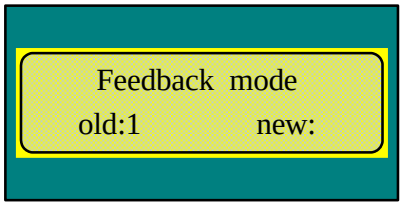
If the value is not 0, first set it to 0, and press  +  to confirm



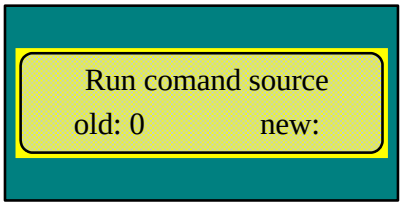
Press  to return to main menu, enter the menu M3312, and press  to select the following parameters:



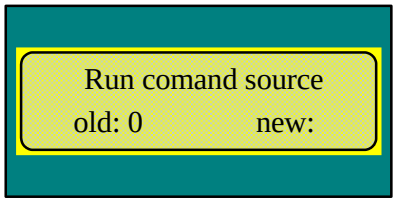
Set the value to 1, and press  +  to confirm



Press  to return to main menu, enter the menu M3311, and press  to select the following parameters:



If the value is not 0, first set it to 0, and press  +  to confirm



Set the value into 6, and press  +  to confirm

Press 

to return to main menu; door operator closes door in place and holds the torque

3.4.2.5.2 Settings of HAA24360G3, HAA24360G8 controller components

1. Enter the menu 3311 and change Run comand source into 0.
2. Enter the menu 3311 and change Run comand source into 3.

3.4.3 Advanced debugging steps:

3.4.3.1 Power-on of door operator

If the power indicator goes on after the controller is switched on, the power of controller is normal.

3.4.3.2 Enter the password

Implement it by reference to section 2.4.2.2

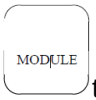
3.4.3.3 Positioning

In case of operating mode 0, pull the door to the middle, input 332, press ENTER key. Door moving a little distance (about two centimeters, if the door does not move, then reposition the door) indicates that the positioning is complete.

Enter the menu 3313, change the first parameter "Rated Power" to select the motor type. Rated Power is set to 94.3 for 5.0N • M motor.

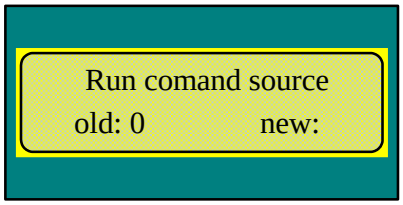
After replacing the motor or controller, the motor parameters should be reset.

3.4.3.4 Set the motor rotation direction

Press 

to return to main menu, enter the menu M3311, press 

to select the following parameters; If it is not 0, set it to 0:



Pull the door to the middle, press 

return to main menu, and enter the menu M311:

Press 
+ 

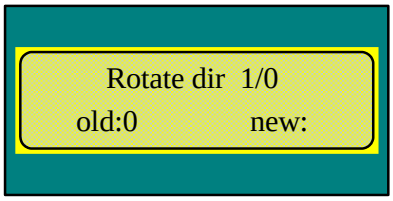
so that the door will move to a direction, and press 

to stop it

If the door moves to the open direction, the rotation direction of motor should not be modified.

If the door moves to the close direction, enter the menu M3311 and press 

to select the following parameters:



If the value is 0, change it into 1. Otherwise change it to 0, press 
+ 

to confirm and press

MODULE to return to main menu.

3.4.3.5 Learning

Implement it by reference to section 3.4.2.3

3.4.3.6 Demo operation of door operator

Implement it by reference to section 3.4.2.4

3.4.3.7 Normal settings of door operator

Implement it by reference to section 3.4.2.5

Note: 1. All parameters including "Run command source" can be modified only when "Run command source" is 0.

2. "Feedback mode" should be set to 0 at the time of commissioning. At the end of commissioning, for HAA24360G1/ HAA24360G2/ HAA24360G4/ HAA24360G5/ HAA24360G6/ HAA24360G7/ HAA24360G9/ HAA24360G10/ HAA24360G11 controller components, the value should be set to 1; for HAA24360G3/HAA24360G8 controller components, it should remain unchanged (0).

3. For HAA24360G1/ HAA24360G2/ HAA24360G4/ HAA24360G5/ HAA24360G6/ HAA24360G7/ HAA24360G9/ HAA24360G10/ HAA24360G11 controller components, "Run command source" can be set to 6 only when emergency stop button is reset, top car is under the service status and "Feedback mode" is set to 1.

3.5 Open/close curve

3.5.1 Open curve

Open curve is as shown in Fig.3-12.

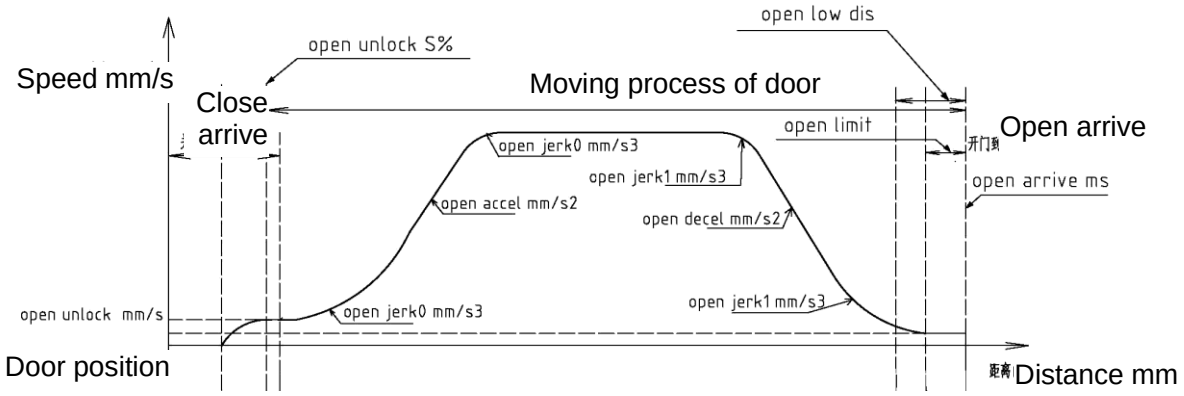


Fig.3-12 Open Curve

Parameters	Menu	Function No. and Position	Description
Open low dis mm	3311	4	Open low-speed distance
Open unlock mm/s		5	Open unlock speed
Open unlock S%		6	Open unlock distance
Open accel mm/s2		7	Open acceleration
Open jerk0 mm/s3		8	Open jerk acceleration
Open decel mm/s2		9	Open deceleration
Open jerk1 mm/s3		10	Open jerk deceleration
Open limit	3315	15	Open arrive limit
Open arrive ms		17	Open arrive time ms

3.5.2 Close Curve

Close curve is as shown in Fig.3-13.

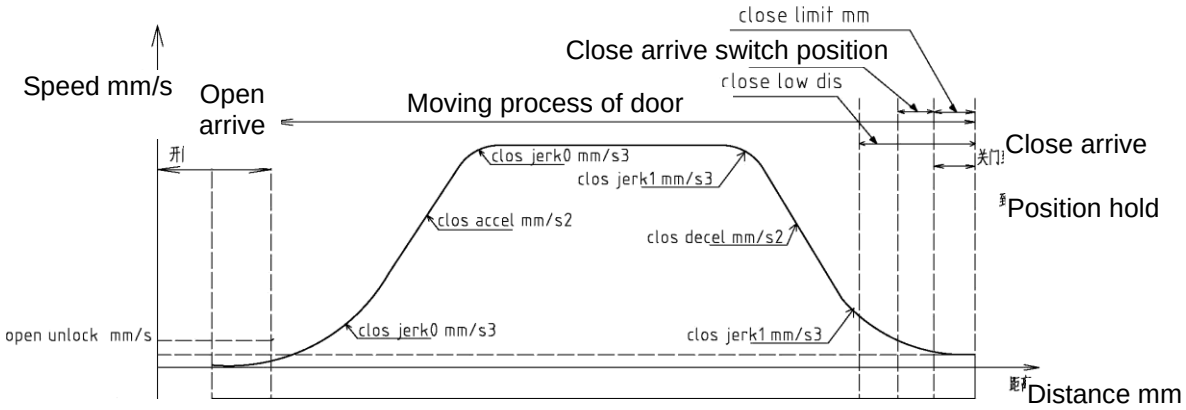
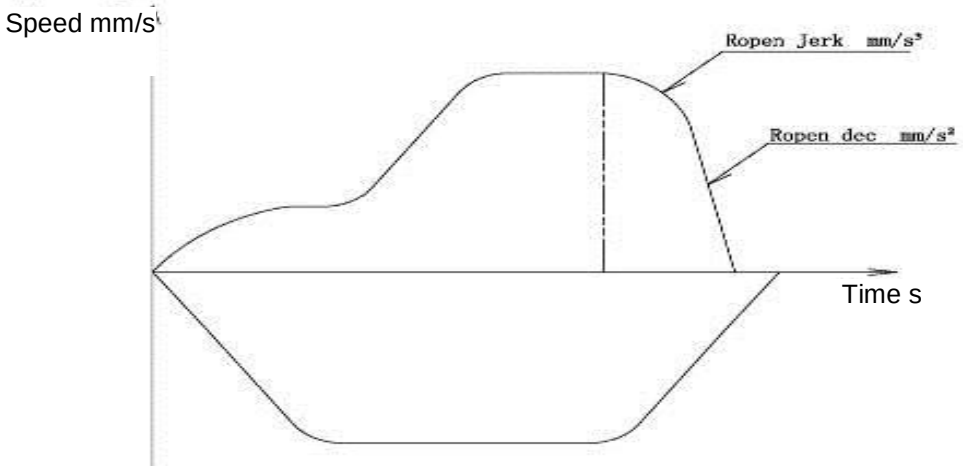


Fig. 3-13 Close Curve

Parameters	Menu	Function No. and Position	Description
Close arrive mm/s	3311	11	Close arrive speed
Close low dis mm		12	close low-speed distance
Close accel mm/s2		13	Close acceleration
Close jerk0 mm/s3		14	Close jerk acceleration
Close decel mm/s2		15	Close deceleration
Close jerk1 mm/s3		16	Close jerk deceleration
Close unlock mm/s		17	Close unlock speed
Close unlock S%		18	Close unlock distance
Close limit mm	3315	19	Close arrive position

3.5.3 Reopen curve

Reopen curve is as shown in Fig.3-14.



Parameters	Menu	Function No. and Position	Description
Ropen Dec	3315	21	Reverse open deceleration
Ropen Jerk		22	Reverse open jerk deceleration

Fig. 3-14 Reopen curve

3.6 Common Troubleshooting

You can view the fault code through server. Enter the menu 321 to view the current fault, and enter the menu 322 to view the historical fault. Enter the menu 324, and press ENTER key to clear the fault.

3.6.1 Door operator can not open the door

Control system issues the open/close signal, but the door operator can not open / close the door

Step 1: For HAA24360G1/ HAA24360G2/ HAA24360G4/ HAA24360G5/ HAA24360G6/ HAA24360G7/ HAA24360G9/ HAA24360G10/ HAA24360G11 controller components, enter 3312, and confirm that Feedback mode should be set to 1; for HAA24360G3/HAA24360G8 controller components, enter 3312, and confirm that Feedback mode should be set to 0.

Step 2: For HAA24360G1/ HAA24360G2/ HAA24360G4/ HAA24360G5/ HAA24360G6/ HAA24360G7/ HAA24360G9/ HAA24360G10/ HAA24360G11 controller components, enter 3311, and confirm that run commd source should be set to 6; for HAA24360G3/HAA24360G8 controller components, enter 3311, and confirm that run commd source should be set to 3.

Step 3: For HAA24360G1/ HAA24360G2/ HAA24360G4/ HAA24360G5/ HAA24360G6/ HAA24360G7/ HAA24360G9/ HAA24360G10/ HAA24360G11 controller components, check whether RS14 wiring is connected reliably, whether RS14 dial code address is 53, and the open / close address settings of control cabinet are correct.

3.6.2 Control system can not receive the arrive signal

After close or open arrive, the control cabinet does not accept the open / close arrive signal of door operator

Step 1: In case of open or close arrive, check whether the corresponding arrive light on the controller is on, and if so, go to Step 2, and if not, go to Step 3

Step 2: Remove P2 plug, run the door operator (i.e., operating modes 1, 2, and 6). Check whether the P2-1 and P2-2 or P2-1 and P2-3 can be switched on/off normally, and if so, the door operator controller is normal, and the control system signal fails (control cabinet wiring or parameter settings), and if not, the door operator controller is damaged.

Step 3: Too large door width after learning may result in the residue of door width after open arrive. Check whether DR half range (door width) in 3311 is consistent with the actual door width. For the center opening door, this value is equal to about half the actual door width + 60mm, and for the side opening door, this value is equal to the actual door width +60 mm.

3.6.3 Door does not stop when moving to the open limit

Generally, the sharp belt sliding sounds may go off, and there are two possibilities:

1. At manual operation, i.e. run commd source = 0, the door will move along a direction after 311 operation command is issued, and only stop when clear key is pressed. This is a normal phenomenon.
2. This situation generally occurs in learning. Check whether the belt is loosened.
3. Positioning angle is not accurate, and re-positioning is necessary (pull the door to the middle)

3.6.4 Door operator repeats open/close actions

Step 1: If the arrive indicator goes on in case of open arrive, the door operator moves in place. If the door operator is closed for no reason, check whether the control system gives the door operator the close signal

Step 2: If the arrive indicator does not go on in case of open arrive, check whether the door width is too large. For the center opening door, this value is equal to about half the actual door width + 60mm, and for the side opening door, this value is equal to the actual door width +60 mm

Step 3: Check whether the close arrive input and output indicators go on in case of close arrive, and check whether the close arrive input switch is valid.

3.6.5 Door operator fails or jitters at open/close

A: Cut off the power of door operator, remove the plug P4 of motor power line, and respectively measure the resistance between two phases. It should reach three-phase equilibrium (30 ~ 40Ω), and the resistance between the ground and power lines should be infinite

B: In case of no multimeter, remove the plug P4 of motor power line. If door moves smoothly when pulled, and jitters when two phases are short-circuited, the door operator is normal.

3.6.6 View the fault

View the fault code (322) with server. Fault information is as shown in the following table:

Fault	Causes	Troubleshooting
BASE FAULT	Debris in or damage of	Remove the debris and confirm whether the controller is

	controller	damaged.
	Any two phases of motor are short-circuited	Measure whether the three-phase resistance of motor is balanced with a multimeter (for 5.0NM motor, it is about 30 Ω). In case of three-phase imbalance or large difference of resistance value, the motor is damaged.
DC link OVT	Input voltage is too high	Check the input power voltage
PVT lost	Encoder loop of controller is abnormal	Replace the controller
	Encoder cable is disconnected or short-circuited	Rearrange the encoder cable
	Encoder hardware is damaged	Replace the motor
MOTOR OVERLOAD	Resistance during open/close process	Check for the foreign matter or mechanical jam or too large door width
	Phase loss of motor during the operation of door operator	Check the motor power line
	Encoder cable is broken	Rearrange the encoder cable
POWER LOST	Any one phase of motor is short to ground	Measure the resistance between the motor three-phase and ground which should be infinite.
	Input voltage is too low	Measure the input voltage which should be 220V ± 20%

3.7 Parameters of Controller

Parameters of controller are as shown in the following table:

Table 3-4 Parameters of door operator controller

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
M311 (Monitoring parameters A)						
0	Software version	Based on the actual conditions	Based on the actual conditions	※		
1	Operating frequency	Frequency out Hz	0~50.00	※		
2	Motor speed	Motor Speed RPM		※		
3	Rotor position	Rotor position	0~359.9	※		
4	Dictated speed	Dictated V mm/s		※		
5	Dictated output voltage	Output voltage V	0~900V	※		
6	Dictated torque current	Mtr trq PU	1.0 — >rated torque	※		
7	Output current	Output current A	0~999.9A	※		
8	High limit of run count	Run count(10000)		※		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
9	Low limit of run count	Run Count(1)		※		
M312 (Monitoring parameters B)						
0	DC bus voltage	DC link V	0~9999v	※		
1	ST code status	ST1 ST2 ST3	Based on the actual conditions	※		
2	Encoder position	Encoder position	0~65536	※		
3	Current location	Door position	00000	※		
4	INPUT1	INPUT1		※		
5	INPUT2	INPUT2		※		
M313(Monitoring parameters C)						
0	Open input	Key open door False		※		
1	Close input	Key close door False		※		
2	Stop	Stop press ENTER False		※		
M3311(Field adjustment parameters)						
0	REV normally on/ off selection	REV NO/NC	0: normally on 1: normally off	1/0		For HAA24360G1/2/5/6/7/10/11, it is 1, and for HAA24360G3/4/8/9, it is 0
1	Rotation direction negation	Rotate dir 1/0	0,1	1		
2	Run command source	RUN comd source	0~3, 5~6 1 Single run 2 Continuous run 3 DO/DC 5 Basic mode of ST code 6 Extension mode of ST code	6/3		For HAA24360G1/2/5/6/7/10/11, it is 6, and for HAA24360G3/8, it is 3, and for HAA24360G4/9, it is 5
3	Door range	DR half range mm	0~65535	■		
4	Open low-speed distance	Open low dis mm	0~100	5		
5	Open start unlock speed	Open unlock mm/s	5~100mm/s	60		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
6	Open start unlock distance	Open unlock S %	0~30.0%	5.0%		
7	Open acceleration	Open accel mm/s2	10~2048mm/s/s	800		
8	Open jerk acceleration	Open Jerk0 mm/s3	10~2048mm/s/s/s	800		
9	Open deceleration	Open Decel mm/s2	10~2048mm/s/s	800		
10	open jerk deceleration	Open Jerk1 mm/s3	10~2048mm/s/s/s	800		
11	Close arrive speed	Clos arrive mm/s	5~100mm/s	25		
12	Close low-speed distance	Close low dis mm	5~100	60		
13	Close acceleration	Clos accel mm/s2	10~2048mm/s/s	700		
14	Close jerk acceleration	Clos Jerk0 mm/s3	10~2048mm/s/s/s	700		
15	Close deceleration	Clos Decel mm/s2	10~2048mm/s/s	600		
16	Close jerk deceleration	Clos Jerk1 mm/s3	10~2048mm/s/s/s	600		
17	Close start unlock speed	Clos unlock mm/s	5~150mm/s	35		
18	Close start unlock distance	Clos unlock s%	0~30.0%	0.5		
19	Password	Password	0~9999	8888/4321		
M3312 (Regulator parameters)						
0	Proportional gain1(high speed)	SpdP1 gain	0~10000	1000		
1	Integral gain 1(high speed)	SpdI1 gain	0~10000	800		
2	Proportional gain2(low speed)	Spdp2 gain	0~10000	1000		
3	Integral gain 2(low speed)	SpdI2 gain	0~10000	800		
4	PI switching threshold value	SGP tran21h thr %	0~100	5		
5	PI switching band width	SGP tran21 band%	0~100	5		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
6	Speed feedback filtration	Sfbk filter	0～66 (high/low)	33		
7	Proportional filtration by reference to torque	Prop filter	0~3	0		
8	Motor overspeed	overspeed (pu)	1.00~2.00 1.0: Rated RPM	1.25		
9	Regulation method	Regulation methord	0:VF 1: closed ring of asynchronous motor 2: Synchronous motor	2		
10	Feedback mode	Feedback mode	0: DO/DC open/close signal 1: ST code open/close signal	1/0		For HAA24360G3/8 component, it is 0
11	Current loop KP	Curp gain	0~9999	512		
12	Current loop KI	Curi gain	0~9999	150		
13	Motor torque limit (open)	OP DRV Limit PU	0.00~2.50	2.00		
14	Brake torque limit(open)	OP REG Limit PU	0.00~2.50	2.00		
15	Motor torque limit(close)	CL DRV Limit PU	0.00~2.50	2.00		
16	Brake torque limit(close)	CL REG Limit PU	0.00~2.50	2.00		
17	Overload protection coefficient of motor	Mtr ovl i fac PU	0.1~2.0	1.2		
18	PVT protection sensitivity factor	PVT threshld min	0~10 0: disable The greater the number, the lower the sensitivity	0		
M3313(Motor parameters)						
0	Motor power	Rated Power	0.1~999.9KW	94.3		
1	Number of poles	Number of poles	0002~0016	0016		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
2	Rated RPM	Rated RPM	1~9999	0180		
3	Rated frequency	Rated frq	1.00Hz~99.99Hz	24.00		
4	Rated voltage	Rated voltage	0~999V	80		
5	Rated current	Rated I (A)	1.0~999.9	001.0		
6	Roller diameter	Shv diam mm	10~10000mm	00045		
7	Gear ratio	Gear ratio	1.0~100.0	001.0		
8	Rope ratio	Rope ratio	1~6	1		
9	Rotor position offset	Rotor pos offset	0~65535	■		
10	Stator resistance	resisit s	0.000~9.999 Ω	2.790		
11	Stator inductance	Induct s(mH)	0.0~999.9mH	252.4		
12	Rotor resistance	Resist rotor	0.000~9.999Ω	1.820		
13	Rotor inductance	Induct r(mH)	0.0~999.9mH	252.4		
14	Mutual inductance	mutual induct	0.0~999.9mH	240.6		
15	No-load current	No load current	0.0~999.9A	2.7		
M3314(Drive scaling parameters)						
0	Drive No.	Drive Size	0~100	000		
1	Rated voltage	Drv Rtd Volt (V)	0~1000	0220		
2	Rated current	Drive Rtd i RMS (A)	0.0~999.9	002.5		
3	Current adjustment factor	Drv i fscale (A)	0.000~2.000	1.50		
4	Voltage adjustment factor	Bus fscale (V)	0.000~2.000	1.050		
5	Current limit (overcurrent)	Drv i limit (A)	0.0~999.9	005.0		
6	Bus overvoltage point	Bus ovt (PU)	0.00~2.00	1.4		
7	Bus undervoltage point	DC link UV (PU)	0.00~1.00	0.60		
8	Input voltage	Line fscale (V)	0.00~2.00	1.00		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
	coefficient					
9	Brake voltage	M1 pick V (PU)	0.00~1.00 1.00:1000V	0.35		
10	Dead time	Drv dead time (us)	2~20	03		
11	PWM compensation	Drv PWM comp PU	0.00~2.00	1.00		
12	Over modulation factor	Drv k mod (PU)	0~100	100		
13	Carrier frequency	Switch frq (PU)	0～12 KHz	10		
14	Running time (hours)	Run time hour	0~65535H Power-down save	※		*
15	Running time (minutes)	Run time second	0~59MIN Power-down save	※		*
M3315(Enhanced parameters)						
0	Run hold time	Run hold time	0~99.9s 0: continuously run Others: stop when time is up	00.0		
1	Power-on speed	Power on V mm/s	10~100mm/s	0050		
2	Door range measurement speed	Learn V mm/s	10~100mm/s	0050		
3	Close arrive response time	Close arrive	200~3000ms	2000		
4	Open arrive response time	Open arrive	500~3000ms Torque hold is activated after arrive	800		
5	Arrive signal selection	Arr sw select	0: Yes for open arrive and close arrive 1: None for open arrive and yes for close arrive 2: None for open arrive and close arrive	1		
6	Open hold torque	Open hold torq%	0~200.0%	090.0 %		
7	Close hold torque	Close hold torq%	0~200.0%	100.0 %		
8	Baffle	Baffle timer	0~999ms	200		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
	detection time	ms	0: non-function			
9	High speed baffle torque	Baffle torq Hi %	0~200.0% Baffle torque at acceleration	120.0 %		
10	Close constant baffle torque	Baffle torq Mid %	0~200.0% Baffle torque (ACC=0)	70.0 %		
11	Low-speed baffle torque	Baffle torq Lo %	0~200.0% Baffle torque at deceleration	105.0 %		
12	RY1 function selection	Ry1 function	0: open arrive signal (open/ close or pulse) 1:Close arrive signal (open/ close or pulse) 2:fault output 3: Baffle detection output 4: Open output 5: Close output 6:Limit open arrive signal 7: Limit close arrive signal 8: DOS 9: DOL	0		
13	RY2 function selection	Ry2 function		8/1		For HAA24360G1/2/5/6/7/10/11, it is 8, and for HAA24360G3/4/8/9, it is 1
14	Stop closing torque function	CL low torq	0~2000 % 0: non-function 100%: 5Nm motor torque Enabled, recommended setting is≥30%, can be adjusted	0		
15	Open arrive limit	Open limit mm	0~1000mm	10		
16	Open speed	Open speed mm/s	0~508mm/s	0508		
17	Open arrive speed	Open arrive mm/s	5~100mm/s	020		
18	Door coupler type	Door Coupler 0/1/2	0: Asynchronous door coupler 1: Synchronous door coupler 2: Integrated car door synchronous door coupler	2		
19	Close arrive	Close limit mm	0~1000mm	10		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
	limit					
20	Close speed	Close speed mm/s	0~508mm/s	508		
21	Reverse open deceleration	Ropen dece mm/s2	500~9999mm/s/s	9000		
22	Reverse open jerk deceleration	Ropen Jerk mm/s3	500~9999mm/s/s/s	1200		
23	Demo open arrive hold time	Demo open hold s	0~999.9s	003.0		
24	Demo close arrive hold time	Demo clos hold s	0~999.9s	003.0		
25	Manual acceleration	Man accel mm/s2	10~2048mm/s2	0300		
26	Manual deceleration	Man decel mm/s2	10~2048mm/s2	0500		
27	Manual speed	Man speed mm/s	0~999mm/s	0050		
28	Master or slave status setting	Master or Slave	0: master, reopen is allowed 1: slave, reopen is not allowed	0		
29	DOL Power Reset Delay	DOL_PRD	0~9999	2000		
M3316(VF parameters)						
0	Current sampling AD offset mode	AD OFFSET mode	0:Auto offset 1:Manual offset 2:No offset	0		
1	Torque boost	TORQUE_BOOST	0~50.0%	20.0 %		
2	Current sampling AD offset Manual offset for W phase	AD OFFSET W	0~1000	■		
3	Current sampling AD offset Manual offset for V phase	AD OFFSET V	0~1000	■		
4	Baffle detection switch frequency	Baffle freq sw	0~99.99HZ	00.50		
5	Force open	Force open	0~4	1/3		

Function No.	Name	SVT Display	Setting Range	Default	Range	Attribute
	function	mode				

1. The parameters marked with ※ can only be viewed but not modified.
2. The parameters marked with ■ are obtained through learning and can be manually input and modified.
3. Door coupler defaults to the integrated car door lock synchronous door coupler. Door coupler in M3315 is type 2; in case of asynchronous door coupler, the door coupler type in M3315 needs to be modified to 0; in case of common synchronous door coupler, the door coupler type in M3315 needs to be modified to 1.
4. In case of integrated car door lock synchronous door coupler, the Clos arrive mm/s for M3311 and M3315 should not be set too small at same time, and the product should not be less than 50mm.
5. In case of force open mode 0, the force open function is invalid; in case of 1, force open is available if DCL is off +010 is triggered under extended ST code mode; in case of 2, force open is available if DCL is disconnected and triggered under extended ST code mode; in case of 3, force open is controlled by system under DO/DC mode; in case of 4, force open is available if DCL is triggered under DO/DC mode.

4. Maintenance

4.1 Regular Maintenance of Door Operator

To ensure the reliable operation of door operator, it is necessary to conduct the maintenance for the door operator as follows:

No.	Items	Content
1	Slider	Adjust the gap between the slider and sill, and check the wear degree
2	Regulating wheel of hanger	Adjust the gap between the regulating wheel of hanger and guide rail and check the wear of regulating wheel
3	Hanger roller	Check the running status of hanger roller
4	Guide rail	Clear the guide surface, add the grease, and check the wear degree
5	Synchronous belt	Check and adjust the tightness
6	Contact switch	Check whether the contact switch is in good contact, and adjust the relative position
7	Cable	Check the cable for damage

4.2 Replacement Standards of Wearing Parts

No.	Name	Replacement Standard
1	Contact switch	Plastic shell is broken, and spring contact is blackened
2	Slider	Slider is worn badly and hanger plate moves with jitter
3	Regulating wheel of hanger	Regulating wheel can not rotate smoothly or is worn seriously
4	Hanger roller	Polyurethane is obviously worn, wheel shakes, and there is abnormal noise in rotation
5	Synchronous belt	Synchronous belt is seriously worn or significantly broken
6	Synchronous belt wheel	Synchronous belt wheel can not rotate smoothly, there are obvious abnormal sounds and axial shaking
7	Limit shaft sleeve of door coupler	Outer layer of polyurethane of limit shaft sleeve is worn seriously

4.3 Scrapping Standards of Products

1. Severe plastic deformation of door operator caused by transportation, installation or abnormality.
2. The wear, distortion and other deformation of mechanical parts of door operator after long-term use leading to the failure of open/close or large noise, which can not be removed by the replacement of corresponding wearing parts
3. Change failure of replacement parts after the fault of controller and motor