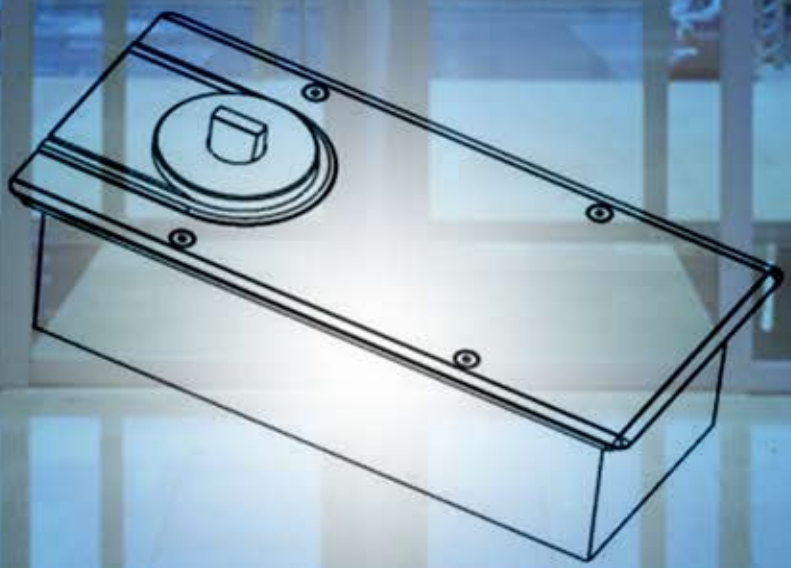
UNDER-FLOOR
SWING DOOR OPERATOR
MANUAL



Contents

Warnings

Please read this instruction manual carefully before the installation of door-automated system.
This manual is exclusively for qualified installation personnel. The manufacturer is not responsible for improper installation and failure to comply with local electrical and building regulations.

Keep all the components of door operator system and this manual for further consultation.

In this manual, please pay extra attention to the contents:

- Be aware of the hazards that may exist in the procedures of installation and operation of the door-automated system. Besides, the installation must be carried out in conformity with local standards and regulations.
- If the system is correctly installed and used following all the standards and regulations, it will ensure a high degree of safety.
- Make sure that the doors works properly before installing the door-automated system and confirm the doors are appropriate for the application.
- Do not let children operate or play with the door-automated system.
- Do not cross the path of the door-automated system when operating.
- Please keep all the control devices and any other pulse generator away from children to avoid the door-automated system being activated accidentally.
- Do not make any modifications to any components except that it is mentioned in this manual.
- Shut of power before connection, and the product must be earthed.
- If there is a failure that cannot be solved and is not mentioned in this manual, please contact qualified installation personnel.
- Do not use the door-automated system before all the procedures and instructions have been carried out and thoroughly read.
- Test the door-automated system weekly and have qualified installation personnel to check and maintain the system at least every 6-month.
- Install warning signs (if necessary) on the both sides of the door to warn the people in the area of potential hazards

0 instructions

This manual is used for the PD / PDS series products of Headbird, including PD-120A / 180A / 240B and PDS-180.

PD series operator is suitable for the door with the maximum door weight of 100-200kg and the maximum door width of 1000-1500mm. PDS-180 is a two-way door operator.

All of the above products are intelligent chip control, with large output torque and low noise, which are widely used in the automatic control of indoor / semi indoor swing door.

Due to the continuous innovation and improvement of the company's product technology, the technical performance and parameters of the product may be changed without further notice.

1 System composition

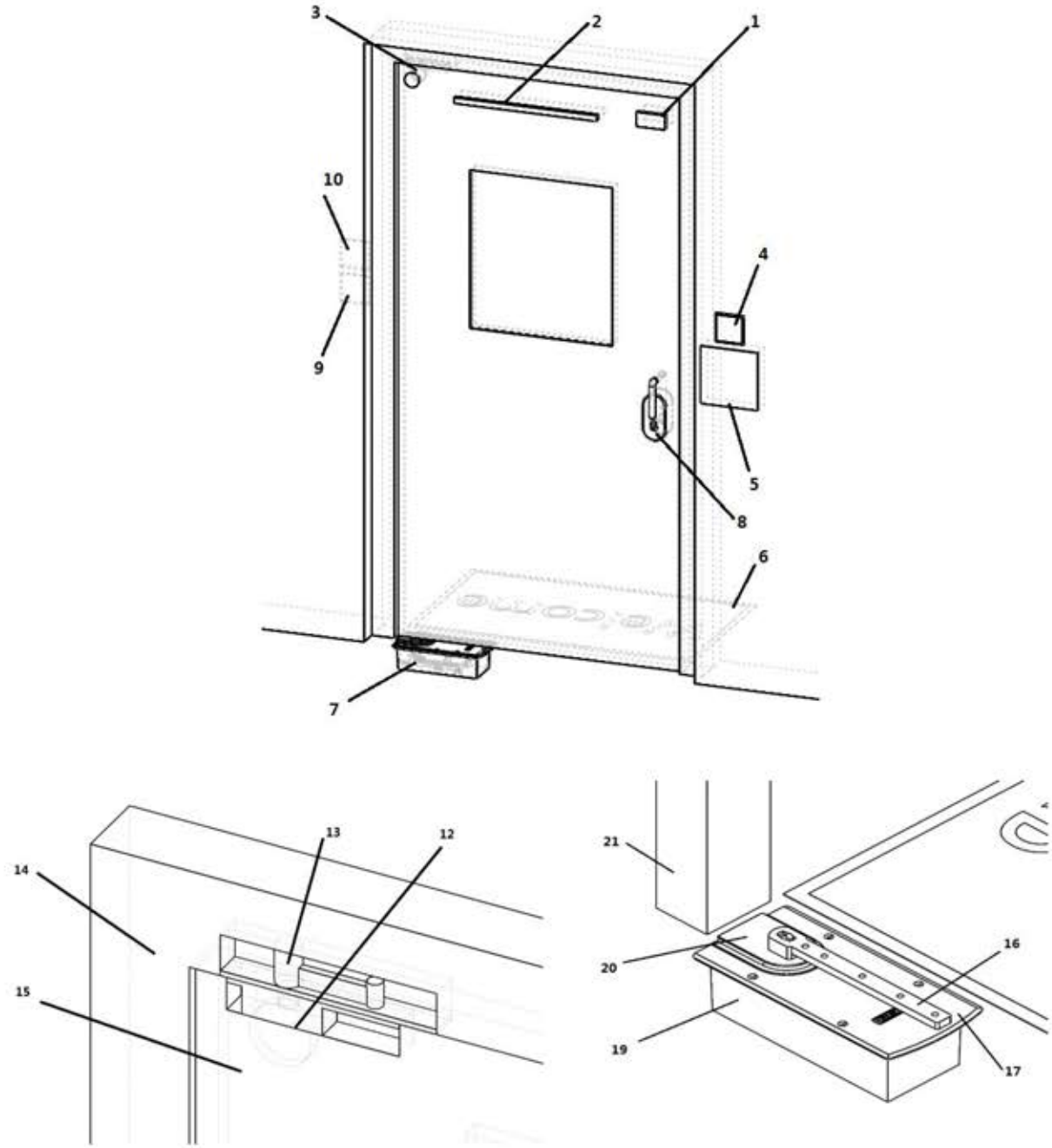


Figure 1 Composition of system

1 Electric magnetic lock or Electric bolt lock　　2 O/C Clamp-proof sensor　　3 Upper pivot unit

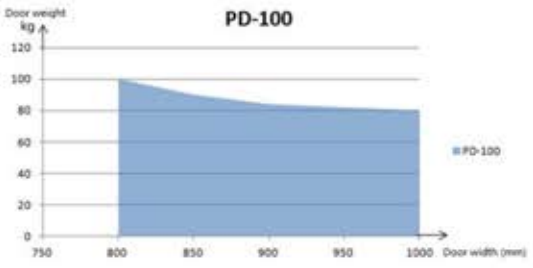
4 Exit card reader or Button	5 Controller	6 Activating floor mat sensor
7 Drive unit & door rail	8 Handle or wireless fingerprint lock	
9 Mode switch	10 Enter card reader	11 Remote controller
12 Upper pivot with frame	13 Upper pivot with door	14 Frame
15 Door	16 Door rail	17 Cover plate
19 Drive unit	20 Dustproof cover	21 Frame

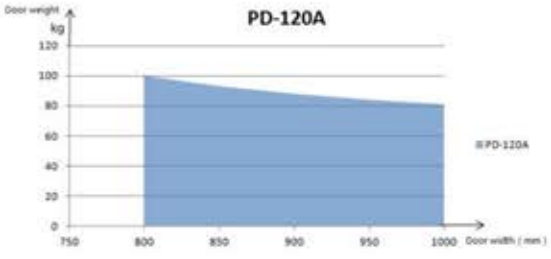
2 Technical specifications

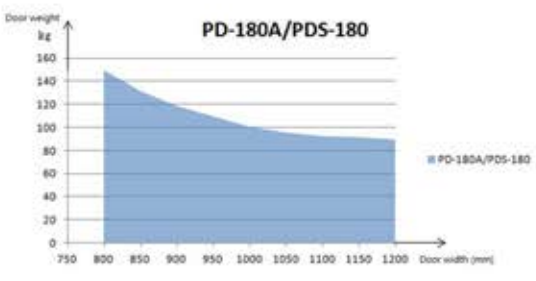
2.1 Technical parameters

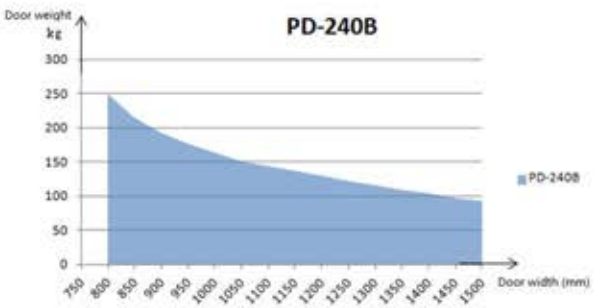
Model	PD-100	PD-120A	PD-180A	PD-240B	PDS-180
Open direction	One-way				Two-way
Size of door operator（mm）	320×110×70	296×132×84	296×132×84	358×184×108	310x170x84
Operator weight（kg）	5.5	6.5	6.5	11.5	9
Distance from shaft center to door edge（mm）	69	74	74	110	66
Max. door weight（kg）	100	100	150	250	150
Max. door width（mm）	1000	1000	1200	1500	1200
Max.output torque（Nm）	47	47	70	110	70
Max. power（W）	35	35	35	55	35
Degree of protection IP	54	67	67	67	54
Standby power（W）	≤6				
Ambient working temperature（℃）	-40~+85				
Working noise（dB）	＜60				
Power	220V±10%，55Hz				
Use environment	Indoor, no water				

2.2 Application range of PD/ PDS series operators









2.3 Overall dimensions of operator

2.3.1 PD-100

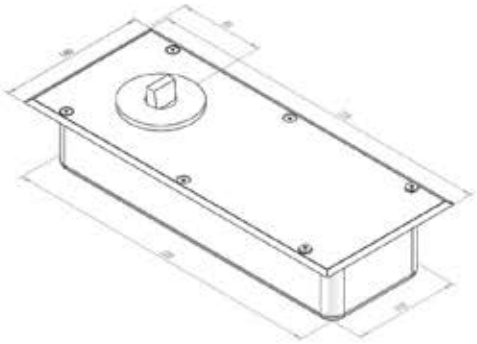


Fig.1 PD-100

2.3.2 PD-120A/PD-180A

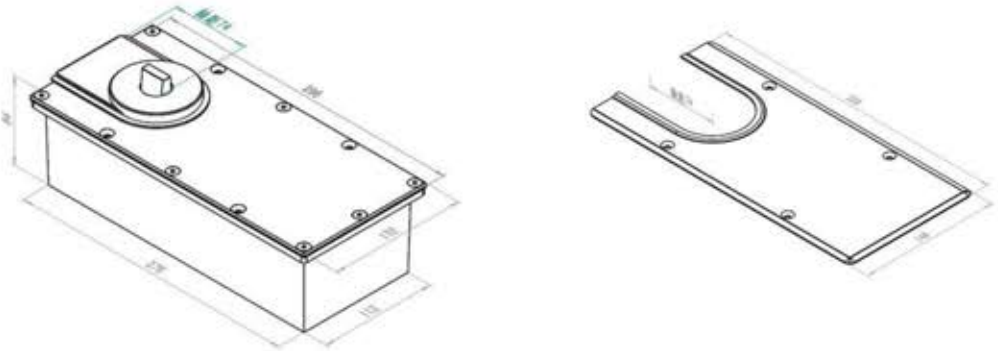


Fig.2 PD-120A/PD-180A

2.3.3 PD-240B

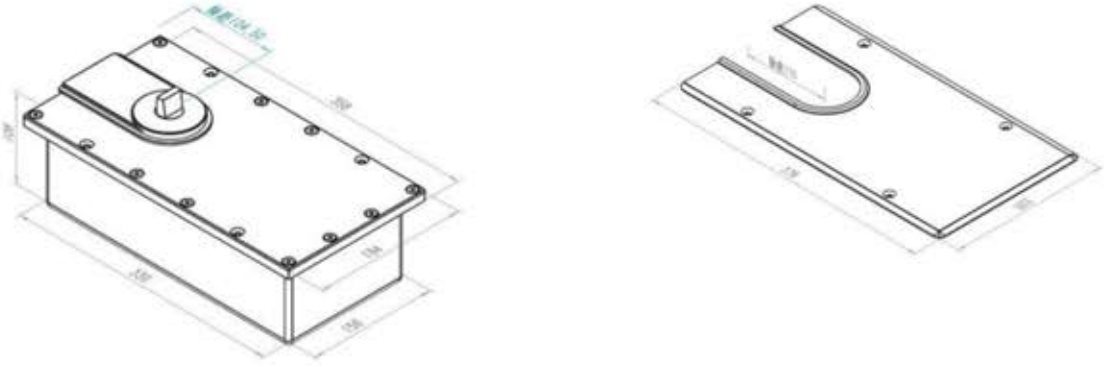


Fig.3 PD-240B

2.3.4 PDS-180

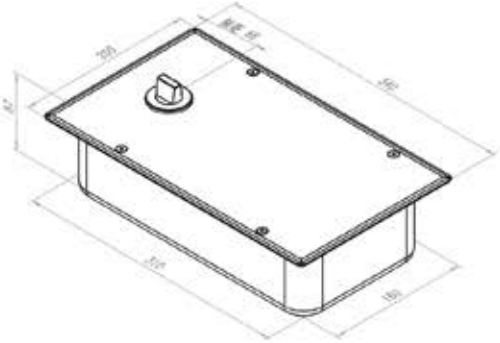


Fig.4 PDS-180

3 Accessories and installation

3.1 Accessories

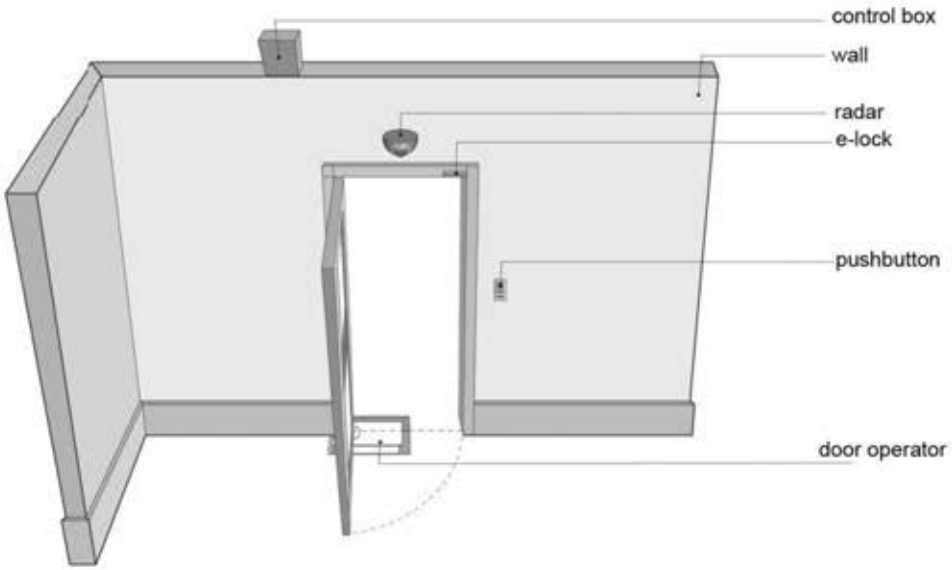
The following accessories are configured according to the model and use of the operator, some of which are optional

No.	Model	Use & name	Pic
1	P-PDL1	Light top hinge（installed on frame）for PD-100/120A/180A/PDS-180	
2	P-PDL2	Light top hinge（installed on the door）for PD-100/120A/180A/PDS-180	
3	P-PDL3	Light bottom hinge（installed on the door）for PD-100/120A/180A/PDS-180	
4	P-PDH1	Harvy top hinge（installed on frame）for PD-240B	
5	P-PDH2	Harvy top hinge（installed on door）for PD-240B	
6	P-PDH3	Harvy bottom hinge（installed on the door）for PD-240B	
7	P-PDBM2	Top patch fittings	
8	P-PDBM3	Bottom patch fittings	
9	MPC-2200BDD for single door)/BSD for double door	Controller for single door / controller for double door	

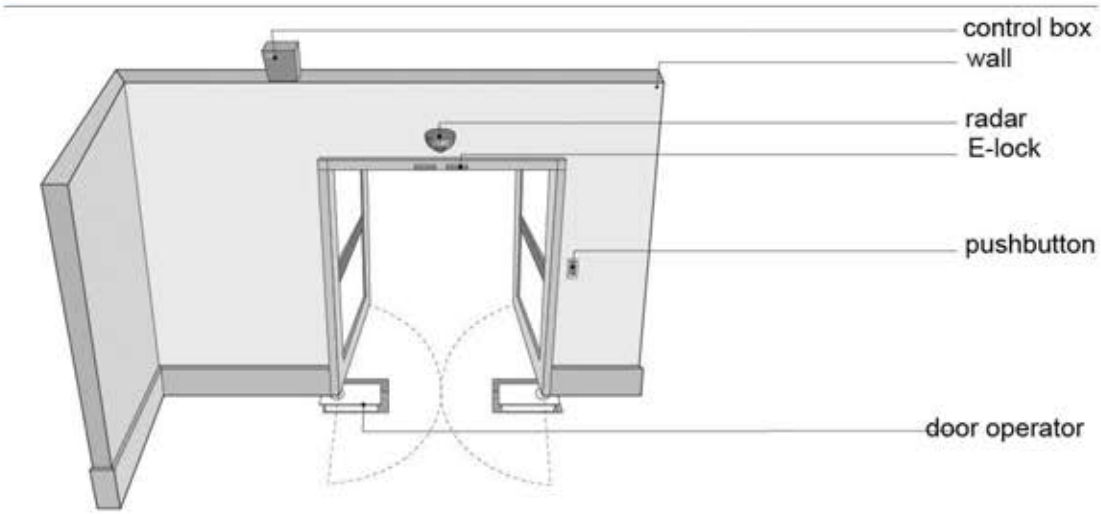
10	MPC-RC2	Remote control handle	
11	MPC-R1	Remote receiver	
12		Light curtain	
13		Status select	
14		Wireless push button	
15		RADAR	
16	MPC-GS01	KEY SWITCH	

3.2 System layout

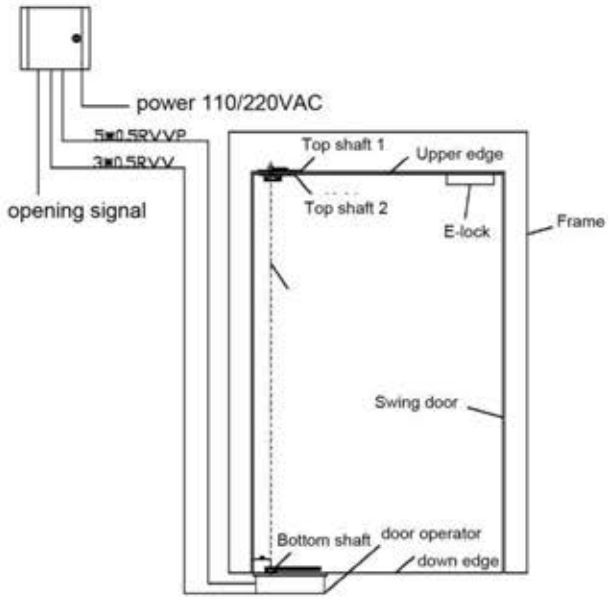
3.2.1 System layout for PD-100/120A/180A/2 40B, one-way opening

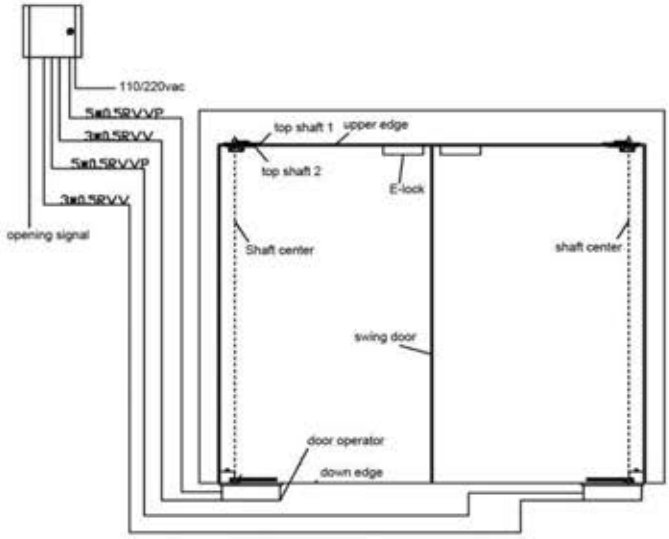


3.2.2 System layout for PDS-180，two-way opening



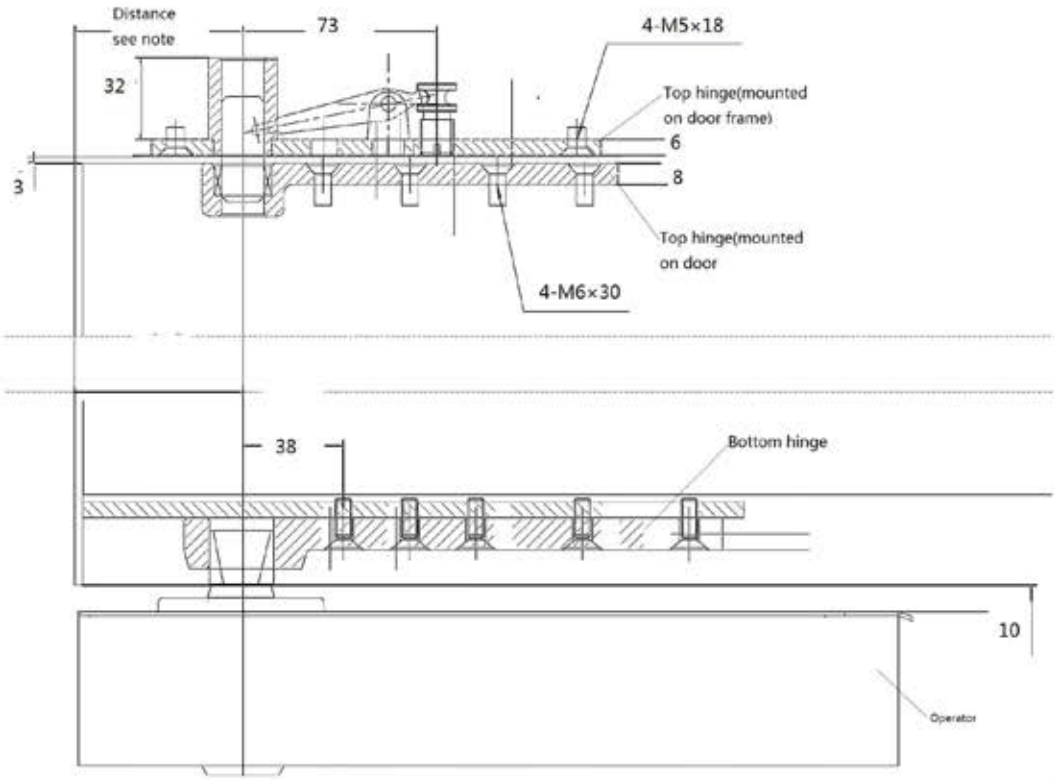
3.2.3 Wiring





3.3 Accessories installing

3.3.1 Upper and bottom hinge installing



Note:

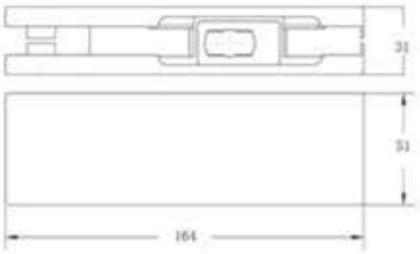
distance 1) 69, in PD-100

2)74, in PD-120A/180A

3)66, in PDS-180

4)110, in PS-240B

3.3.2 Patch fitting for glass door



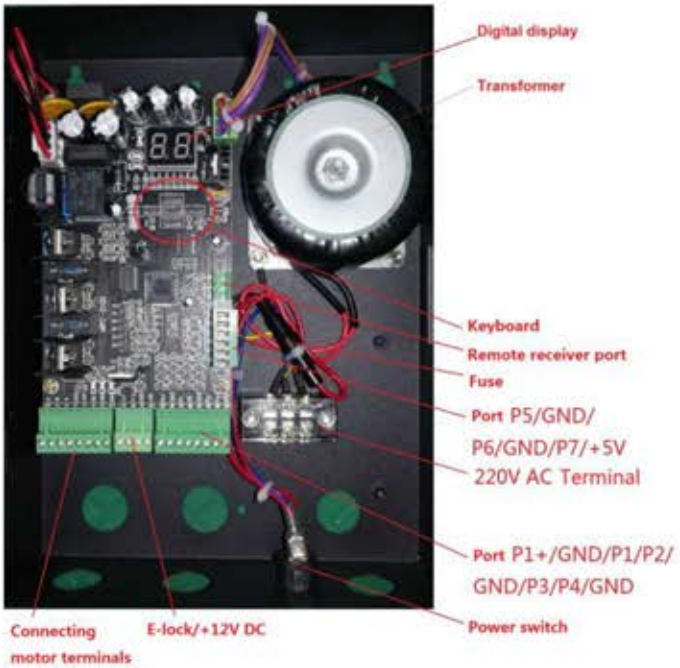
4 Controller and wiring

4.1 Controller

Model: MPC-2200BDD for single door，MPC-2200BSD for double door

4.1.1 Size

4.1.2 Controller composition

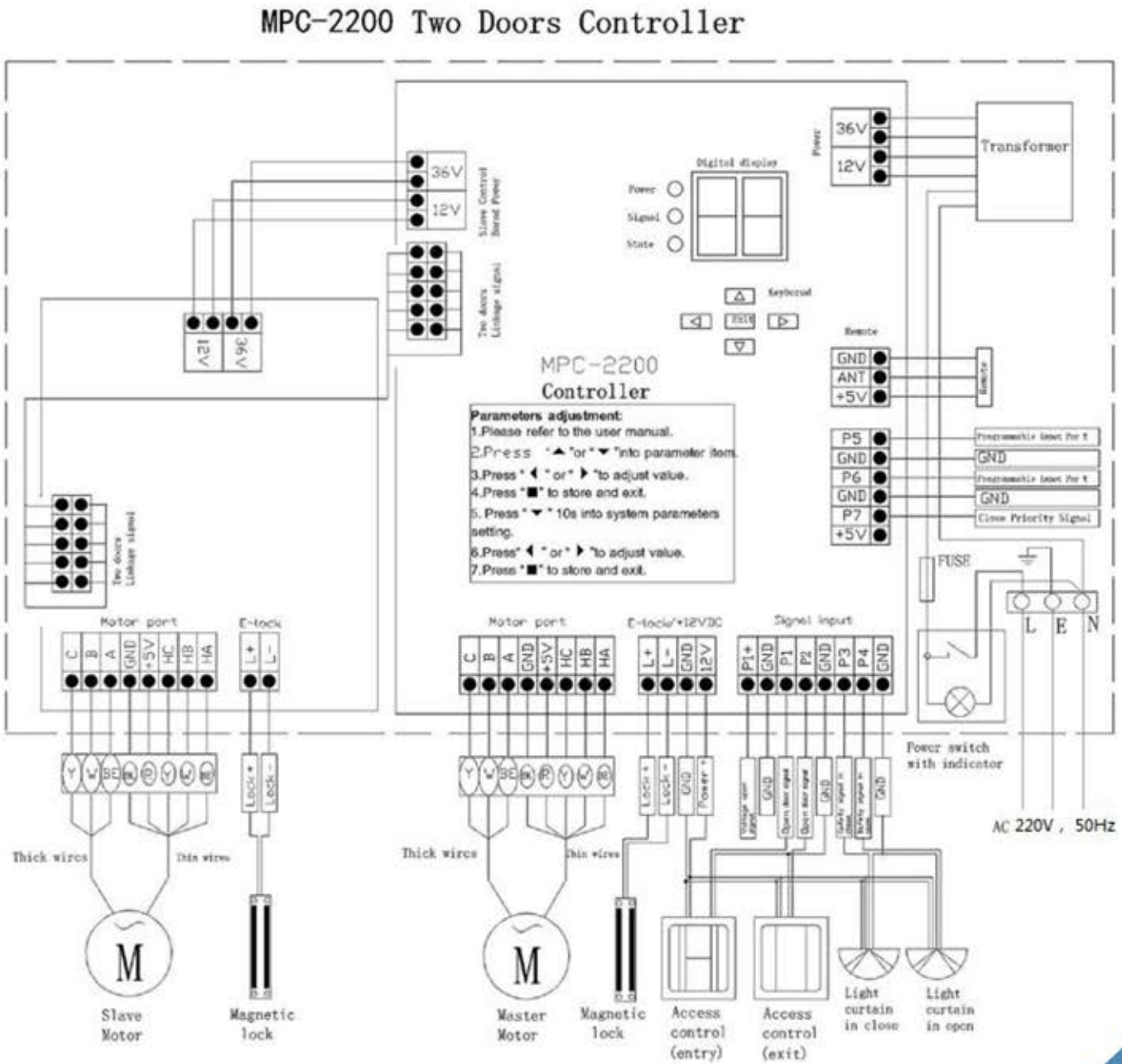


4. 1. 3 Technical parameters

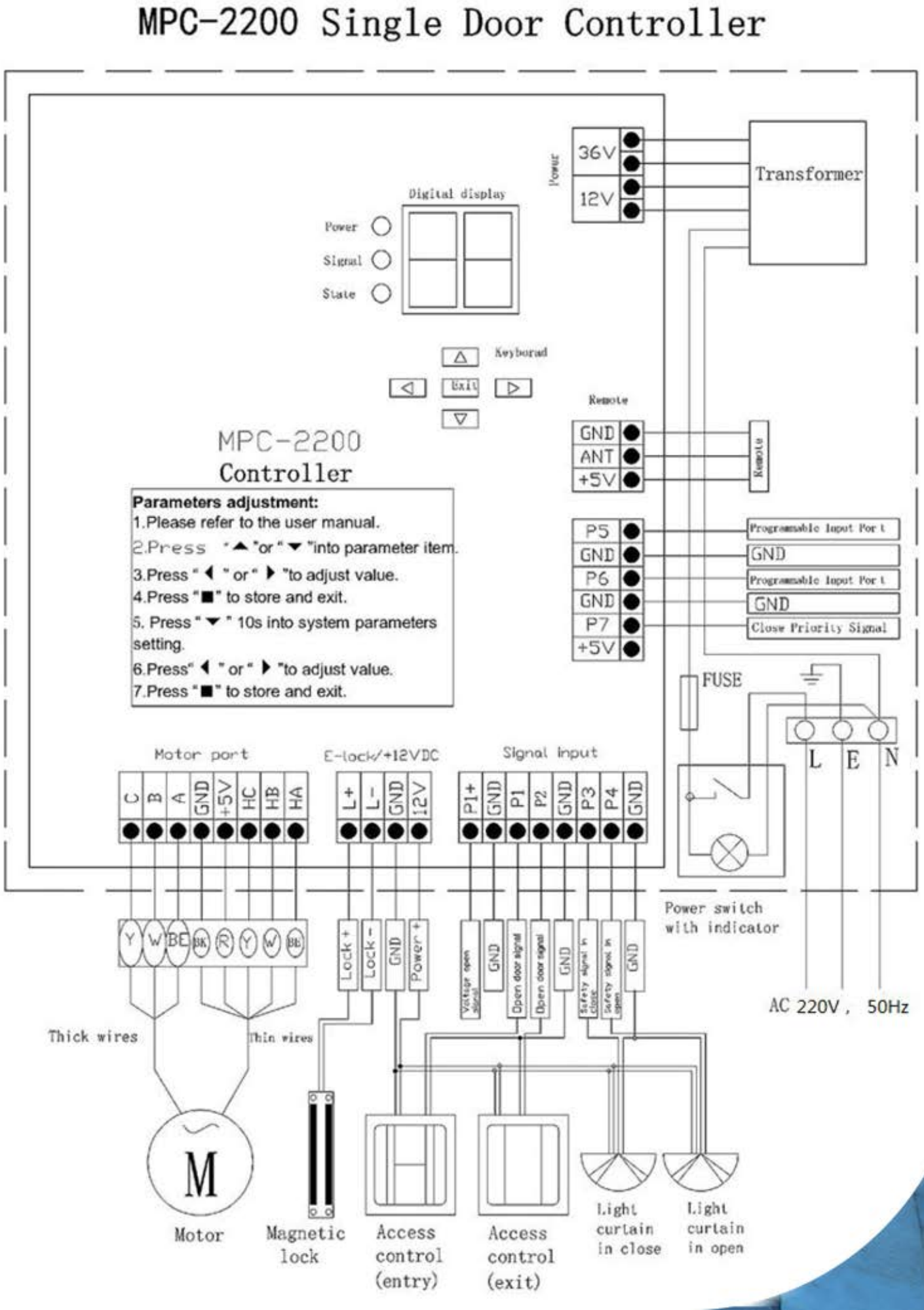
Electric lock output	DC12V，Maxmum 0.5A，Normally open / normally closed is set by software
Power	AC 110V，60Hz
Rated current	＜1A
Maximum power	45W
Standby power	＜2W
Ambient temperature	-40℃to85℃
Controller size	230x200x80mm

4. 2 System wiring diagram

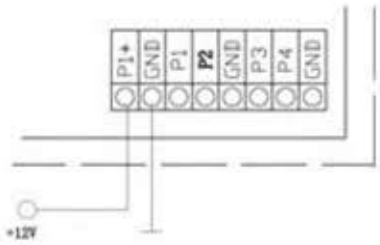
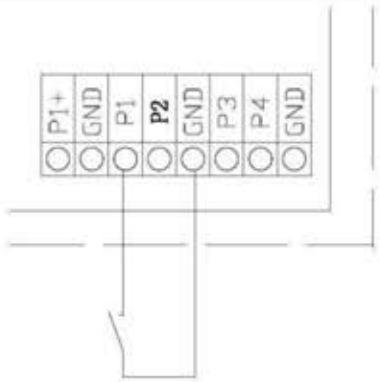
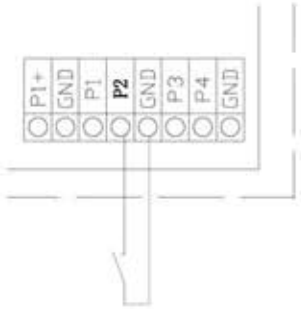
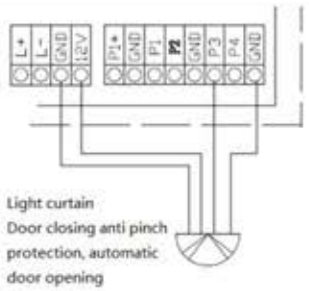
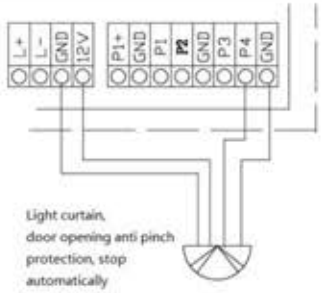
4. 2. 1 MPC-2200BSD for double door

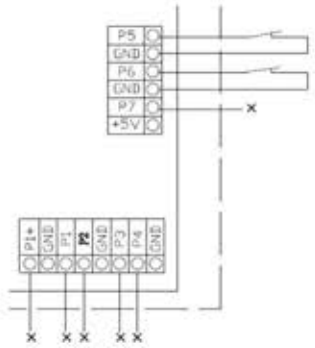
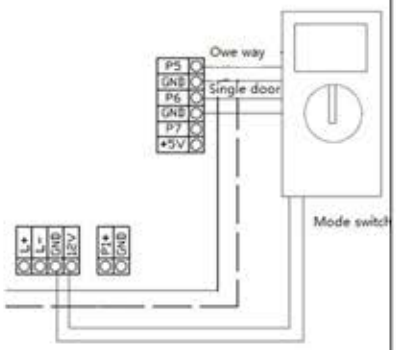
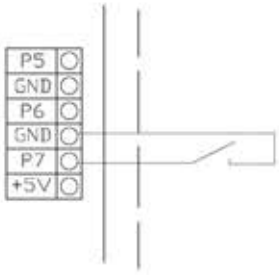
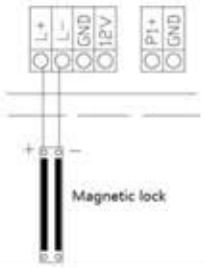
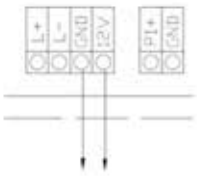


4.2.2 MPC-2200BDD for single door



4. 3 Controller ports function and wiring

No.	Port number	Port function	Port wiring diagram	Note
1	P1+/GND	Door opening signal input, + 12V high level effective		Access control system can be connected
2	P1/GND	Door opening signal input, short circuit effective		When the value in parameter item 26 is 0, the door is normally closed. The door is opened when the signal input P1, and the door will close automatically after the door is opened for a period of time. For other meanings, please refer to the description of parameter item 26.It can be connected to access control, door opening button, radar switch, etc.
3	P2/GND	In case of single door, it is the signal input of forced closing		It can be connected to access control, door opening button, radar switch, etc.
4	P3/GND	Safety signal input during closing, short circuit is effective		If there is blocking signal input in the process of closing the door, the door bounces open Safety light curtain can be connected
5	P4/GND	Safety signal input during opening, short circuit is effective		If there is blocking signal input in the process of opening the door, the door stops. Safety light curtain can be connected

6	P5/GND P6/GND	Programmable input port, values 0-2 in parameter item 30 can define different functions	When the value is 0  When the value is 1  	Different value in parameter item 30: 0: only the two-way operator is effective, and when the door is closing automaticly after open, the other input signals will be invalid if P5 and P6 input signals are used, or other input signals will be shielded. 1: P5 realizes one-way control function in the mode switch system, and P6 controls single door in mode switch. 2: P5 controls the one-way function in the mode switch, and P6 is the highest priority input port
7	P7/GND	Forced door closing signal input, short circuit effective	 	P7 forced door closing signal input port, with priority higher than P1 and P2
8	L+/L-	Electric lock output port	 	Electric lock + 12 VDC output, pay attention to the "+" and "-" poles of electric lock.
9	+12V DC/GND	DC + 12V output port	 	**The total load current shall not exceed 0.5A.**

Operator connection port:

Terminals A,B and C: motor drive output terminals, respectively connected with blue, white and yellow thick wires of the operator.

Ha, Hb, HC, + 5V, GND terminals: they are the input terminals of the signal of the operator, which are respectively connected to the blue, white, yellow, red and black thin wires of the unit. When the transmission distance of the signal wire exceeds 5m, the shielded cable must be used and the single terminal shall be grounded.

Note: 3-core motor cable and 5-core signal cable must be wired separately to prevent mutual interference. The wire joint shall be welded with solder and sheathed with heat shrinkable pipe for waterproof treatment. It is forbidden to connect 3-core motor cable and 5-core signal cable together during installation.

Remote receiving port:

+5V/ANT/GND, which can be connected with the optional remote control receiver.

4.3 Parameter setting

4.3.1 Common parameter setting

Parameter number	Function	Setting range	Factory value	Explain
1	Door opening speed	0-30	20	The opening process is divided into three stages: initial stage, intermediate stage and slow moving stage. This door opening speed is the speed in the middle stage of door opening, the value is relative value, 0 is the slowest, 30 is the fastest.
2	Closing speed	0-30	20	he closing process can be divided into three stages: initial stage, intermediate stage and slow moving stage. The closing speed is the speed in the middle stage of closing, the value is the relative value, 0 is the slowest, 30 is the fastest.
3	Door opening angle	0-99	25	The angle between the open stop position and the closed position, with the range of 45-180 °
4	Adjustment of closing position for master door	0-99	50	It is only used for two-way operator to adjust the master door to the closing position accurately.
5	Door opening holding time	0-30	1	In automatic mode, when the door is opened in place, it will stop for a period of time before closing automatically. This stop hold time can be adjusted as needed. 0-30 seconds adjustable.
6	Door closing anti pinch delay	0-30	10	When the safety light curtain is not connected, if the door is blocked (people are trapped) during the closing process, the door will open; the smaller the delay, the more sensitive
7	Pressure door force	0-10	5	The force exerted on the door to prevent wind when the door is about to be closed in place.
8	Mode selection	0-4	1	0 push to close: when the door is unlocked, manually open the door, and the door will close automatically after releasing at any position. 1 push to open: when the door is unlocked, manually push the door body for more than 5 degrees, the door body will automatically start to 90 degrees, stop and maintain, and then automatically close the door. 2. No 3 magnetic lock, 4 electric plug lock Note： if you want to select parameter 15 electric lock delay, you must first select one of these 3 or 4.
9	Door opening direction	0-1	0	0 open clockwise, 1 open counterclockwise
10	Remote add	0-40	0	Up to 40 remote controls can be added.

11	Slave door opening speed	0-30	20	It is only used for two-way operator, the value in parameter item 20 must be adjusted to 1 (not synchronized)
12	Slave door closing speed	0-30	20	It is only used for two-way operator, the value in parameter item 20 must be adjusted to 1 (not synchronized)
13	Slave door opening angle	0-99	25	It is only used for two-way operator, the value in parameter item 20 must be adjusted to 1 (not synchronized)
14	Adjustment of closing position for slave door	0-99	50	It is only used for double door and two-way operater, to adjust the slave door to the closing position accurately.
15	Electric lock delay	0-99	0	When opening the door, the unlocking time is delayed to eliminate the residual magnetism of the electric lock.
16	Slow moving distance of door closing	0-10	3	When the door is about to be in place, the rotation angle will be larger when the relative value is larger, so as to reduce the impact force when the door is closed.
17	Slow moving distance of door opening	0-10	3	When the door is about to be in place, the rotation angle will be larger when the relative value is larger, so as to reduce the impact force of the door when the door is in place and stopped.
18	Door opening anti pinch delay	0-30	15	When the safety light curtain is not connected, if the door is blocked (people are clamped) during the opening process, the door will stop rotating. The smaller the delay, the more sensitive
19	Door opening delay	0-85	0	Delay to open the door and wait for the electric lock to open first
20	Double door synchronization	0-1	0	For two doors, 0 is synchronous, 1 is not synchronous
21				
22	Remote delete	0-10	0	0 reserved, 10 deleted

4.3.2 System parameter setting

Note: long press the key ▼ for 10 seconds to enter the system parameter setting. The system parameter has been set in the factory, and the user does not need to set it except in special circumstances.

Improper setting will cause unknown failure. Please consult the agent or our company for settings.

Parameter number	Function	Setting range	Factory value	Explain
23	Controller mode	0-2	0	0: single door; 1: double door open in the same direction; 2: double door opposite direction open, only for two-way door system.
24	One way or two way selection	0-1	0	0: one way; 1: two way;
25	Motor output	0-24	5	0: maximum 24: minimum

	torque			
26	P1 port function	0-3	0	This item is invalid for two-way door system and cannot be set 0: positive logic: the door is normally closed, P1 has a signal to open the door, and the door will close automatically after a period of time. 1: Anti logic: the door is normally open, P1 or P7 has a signal to close the door, and opens the door when it is disconnected (no signal). 2. P1 opens the door, P7 closes the door: P1 stops when there is a signal to open the door, P7 closes the door; 3: P1 inching open, inching close: P1 short circuit (with signal) open, normally open, then short circuit close, similar to button switch function.
27	Motor encoder direction	0-1	0	0: clockwise 1: counterclockwise
28	Lock type	0-2	0	0：Lock when power on, 1：lock when power off, 2: Lock when power on at the 0 position
29	Wind proof mode at the door opening position	0-2	0	0: off 1: windproof 2: strong windproof
30	P5/P6 port function	0-2	0	0: P5 and P6 is inputed signal when door automatically close after open. all opening signal is shielded (that is, the door opening signal is invalid in the process of closing the door), and it is only used for the two-way operator; 1: P5 controls one-way in mode switch, P6 only switches single door when mode switch is applied to double door system; 2: When P5 controls one-way in mode switch and P6 is the highest priority input port
31	Protection mode	0-2	0	0: lock release: door closing is blocked, fault code E9 appears, L + / L- are powered off. After removing the obstruction, push the door back to 0 ° position by hand, the fault code will be eliminated and the system will return to normal. 1: Access control: in this state, the lock is powered off, and when the door is blocked and fault code E9 appears, L + / L- are powered on. When P1 has a signal, L + / L- are powered off for 5 seconds. After removing the obstruction, the manual push door to return to 0 position and the system returns to normal. 2: Automatic restore: stop after closing many times for a period of time， no fault code. After 10 minutes, it starts

				again, and the manual push door to return to 0 position and the system returns to normal.
32	P3, P4 functions	0-3	0	P3 / P4 are respectively safety signal input during closing / opening, 0: when P3 door closing process safety signal input, the door reverses; when P4 door opening process safety signal input, the door stops (normally open signal) 1: P3 safety signal input during door closing stops the door, P4 safety signal input during door opening stops the door (normally open signal) 2: P3 safety signal input in the process of closing the door reverses the door, and P4 safety signal input in the process of opening the door stops the door (normally closed signal) 3: P3 safety signal input during door closing will stop the door, P4 safety signal input during door opening will stop the door (normally closed signal)
33	Two way follow-up function	0-1	0	For two-way operater only, 0: normal, 1: follow-up
34	Detection angle of electric plug lock	0-99	0	
35	Number of motor magnetic poles	0-2	0	0:4 poles, 1: 6 poles, 2: 8 poles
36	Two-waay 0 positioning holding torque	0-5	0	0: maximum, 5: minimum. It is only used for wind proof when the door is closed when the two-way operator is not locked
37	Angle multiplier	0-1	0	0: normal, 1: double angle
38	One way standby holding torque	0-5	4	0: maximum, 5: minimum. It is used to one-way door to prevent wind at the door closed position when the door is unlocked
39				
40	Restore factory settings	0-10	0	10：Restore factory settings

4.3.3 Troubleshooting

Fault code	Cause of failure	Troubleshooting
E0	System error	Replace the circuit board
E1	Motor not connected	Check the motor wiring
E2	Motor or wire failure	Check the motor wiring or replace the motor
E3	Two way port error	Check the linkage wires between two door operator
E4	12 voltage too high	Check AC12V input

E5	12 voltage too low	Check AC12V input, electric lock and DC12V port
E6	36 voltage too high	Check the power input voltage
E7	36 voltage too low	Check AC36V input
E8	No door body detected	Check the connection between the output shaft the door body or replace the operator
E9	Door closing obstruction	Check the door body, hinge and remove obstacles
EA	Encoder direction error	Check whether parameter 27 is set correctly
C3	Abnormal safety sensor	Check the safety sensor connected to P3 port
C4	Abnormal safety sensor	Check the safety sensor connected to P4 port
Ax	Two way self-learning error	Check the motor wiring sequence and remove obstacles

Note: in the application of double door controller, if the fault code is displayed as FX, it is the slave fault, the fault reason and handling method are the same as above.

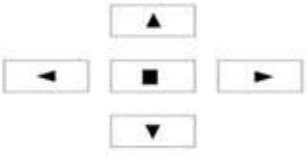
5 System commissioning

5.1 Preparation before commissioning

- Read the user manual carefully;
- Complete all mechanical installation of the system as required;
- Accurate wiring of the system (including grounding wire);
- Check the system wiring again to ensure that the wiring is correct;
- Before power on, push and close the door repeatedly and at a constant speed by hand. The door shall rotate freely without jamming, interruption and no rotation of the output shaft of the unit only when the door is turned (there is clearance at the connection of the output shaft). If there is any of the above problems, it must be eliminated first, otherwise it will seriously affect the normal operation of the unit.

5.2 Commissioning

5.2.1 Controller keyboard



▲	Parameter number up switch key; press in standby mode to enter parameter setting state
▼	Parameter number down switch key
◄	Value decrease key
►	Value increase key
■	Save / exit, save parameter exit after setting state is pressed

5.2.2 Parameter setting

Press the ▲ key to enter the setting state, press the ▲ or ▼ key to select the parameter to be set, and then press the value increase or decrease key to set the value of the parameter.

After setting the value, press the "■"(store, exit) key to complete the setting.

5.2.3 Pay attention to two points when power on

- When it is used for double door unit, the value in parameter item 23 "controller mode" needs to be set to "1".
- When the system is powered on at the initial time, or power on again after power off, it shall ensure that the door rotates towards the closing position and not towards the opening direction, so as to correctly complete the initial learning reset

process of the system. If the door turns to the opening position, adjust the value "0" or "1" in parameter item 9 "opening direction" to "1" or "0", which will change the direction of the door.

- 5.2.4 Remote (optional)

- 5.2.4.1 Remote control key function description

Mode	Description
Auto	When the door is opened, the door will hold open for a period of time (the opening time can be controlled) and then automatically closed.
One way	One way traffic. It is used when the market is closed, such as shopping malls, supermarkets and banks.
Night	All input ports are in invalid state except the highest priority input port.
Normally open	The door normally open mode is used for occasions with large flow of people

5.2.4.2 Remote authorization

Select parameter item 10, press the value increase or decrease key to enter the remote control authorization status, press any key of the remote to learn the code, the authorization indicator light (status light) flashes once, and the digital displays "1", at this time, the remote has been authorized successfully. To authorize multiple remotes, repeat the above steps.

5.2.4.3 Delete remote control authorization

Select parameter item 22, adjust the value to "10", and press the "■"(store, exit) key to delete all remote authorizations.

5.2.5 mode selector switch (optional)

Dimensions: 105×45×49mm

Working voltage: AC/DC 12~24V

Function selection: Automatic → normally open → normally closed → single door → manual

Turn the key to the right to select the function mode, and then turn it to the left for confirmation. After selection, the key will return to the middle position naturally, and the system will enter the selected mode.

See P5 and P6 port wiring diagram in 4.2 for mode switch wiring

5.2.6 Basic parameters that may need to be adjusted during commissioning

During commissioning, if the factory setting value of the parameter item can meet the use requirements, there is no need to adjust the value. Some of the parameters listed in the table below may need to be adjusted, or the values of other parameters not listed in the table need to be adjusted.

Process	Related parameter items	Coping with problems
Opening process	1. Door opening speed	Select appropriate door opening speed
	3. Door opening angle	Adjust the door opening angle
	9. Door opening direction	Ensure that the door turns to the closed position when the power is initially on
	17. Slow moving distance of door opening	Adjust the speed when the door is about to be opened to reduce the impact

	19. Door opening delay	Ensure that the electromagnetic lock is unlocked before opening the door
	23. Controller mode	The factory default value is single door, which needs to be adjusted in case of double doors
	27. Motor encoder direction	Adjust this item when the motor rotates in the opposite direction
	29. Wind proof mode at the door opening position	Keep the door in the open position to prevent swing caused by wind
	35 Number of motor magnetic poles.	The factory default value is 4 magnetic poles, and the number of other magnetic poles of the motor needs to be adjusted
Closing process	2. Closing speed	Select appropriate closing speed
	6. Door closing anti pinch delay	When the door is blocked and jammed, the door reversal delay time
	7. Pressure door force	Adjust the output torque of the operator when the door is about to be closed
	16. Slow moving distance of door closing	Adjust the speed when the door is about to be closed to reduce the impact of door closing
	28. Lock type	Select lock type of electric lock
Others	8. Mode selection	Push to open, push to close and electric lock types can be set
	10. Remote add	Add remote
	25. Motor output torque	The output torque of the motor can be adjusted according to the load and the use environment
	40. Restore factory settings	

6 Maintenance

- System maintenance shall be carried out at least once a year;
- Inspect and fasten all fastening screws and other standard parts;
- Inspect and lubricate all rotating parts;
- Inspect other parts of the system, and replace them in time in case of damage;
- Power on the system and observe whether the opening and closing actions and control functions are normal;
- During system maintenance, attention shall be paid to potential injury risks such as electric shock, mechanical impact, door body clamping, etc., and the maintenance work shall be completed by professionals.

Due to the continuous innovation and improvement of the company's product technology, the contents of this manual are subject to change without further notice. Thanks!