TORQ Drive
User Manual

Model: PM-D1-C

Edition: 2025. E1

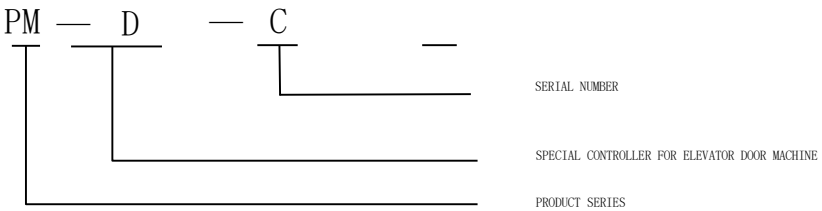
1 Safety Notes

- The equipment should be handled carefully, otherwise the equipment may be damaged.
- Metal materials like screw and gasket should be prevented from entering into the controller, otherwise damage or fire may be occurred. In case that bare metal is shown in the cable end, it should be wrapped with the insulating tape. Otherwise, a significant safety risk or function failure would be occurred.
- Please do proper grounding, otherwise it may run abnormally or cause a risk of electric shock.
- Don't touch any input or output terminals of the controller after power-on, otherwise there is a risk of electric shock.
- During operation, any nonprofessionals are not allowed to test the signal. Otherwise, personal injury may happen and the equipment may be damaged.
- All plugging parts should not be inserted or pulled out until power off. Repairs and maintenance of equipment is not allowed if power on, otherwise there is a risk of electric shock.

When scrapping the drive, please note:

- The electrolytic capacitor of the main circuit and the electrolytic capacitor on the printed board may explode when incinerated.
- Toxic gases are produced when devices are incinerated. Please treat it as industrial waste.

2 Product Information



2.1 Operating environment

Note: If the input power is not in the range of single-phase AC 180 ~ 264V, it is easy to cause the driver to be damaged or unusable.

Environmental requirements	Operation place	Free from direct sunlight, dust, corrosive gas, combustible gas, oil mist, etc.
	Altitude	Lower than 3000 meters. (Above 3000 meters need derating use). In the area over 3000 meters above altitude, the cooling effect of the controller becomes worse due to the thin air. Please take cooling measures.
	Temperature	-20 ~ +45 °C (Over 50°C, measures should be taken to derate or reduce the temperature.)
	Humidity	Less than 90%RH without condensation or ice
	Vibration	Less than 5.9m/s 2 (0.6g)
	Storage Temperature	-40℃ ~ +70℃
	Protection grade	IP20
	Cooling method	Natural cooling

2.2 Technical specifications

Items		Description
Drive power	Working voltage	Single phase, AC180V ~ AC264V
	Working Frequency	50 Hz±5%，60Hz±5%
Signal input	Opening door signal	Optocoupler isolation input; (standby can be defined according to the customer, the default is the maintenance input)
	Closing door signal	
	Nudging signal	
	Reserved input	
Signal output	Opening entirely signa	1） Contact Max. Capacity: AC250V/0.5A， DC30V/1A; inductive load require derating. 2）According to the needs of the elevator system, select the connection of normally open contact or closed contact. (standby can be defined according to the customer, default is safety trackpad output)
	Closing entirely signal	
	Locked-rotor signal	
	standby	
Operation mode	Default terminal run mode.	
Learning	Refer to section 3.4 for debugging steps	

3 System Debugging

3.1 Terminal definition

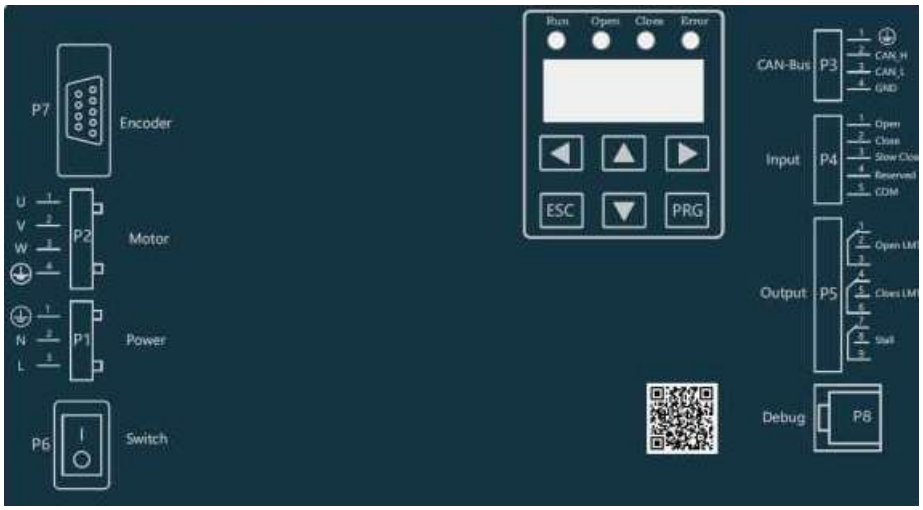


Fig 3.1 Terminal schematic diagram of door drive

3.2 System wiring

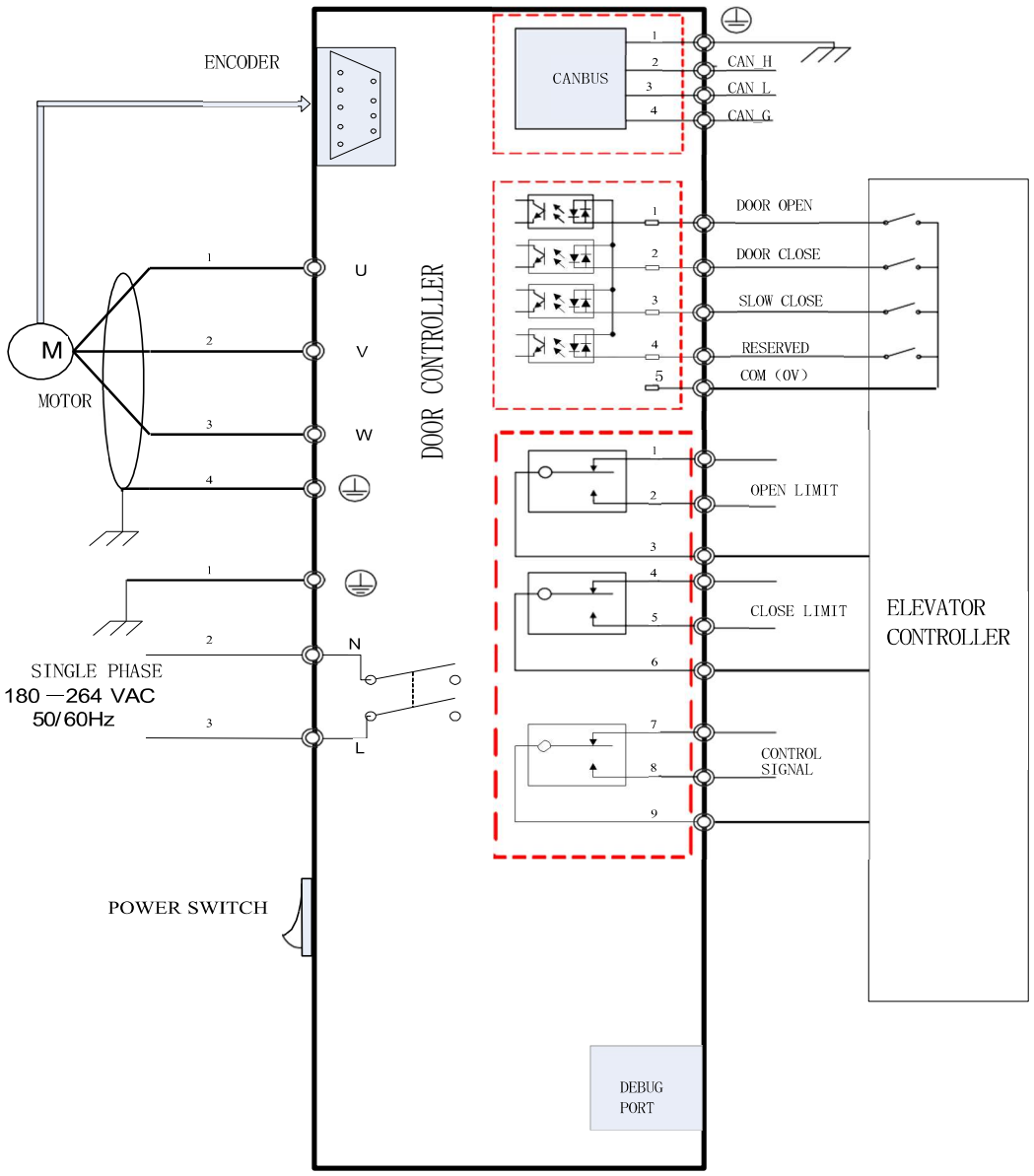


Fig 3.2 Wiring diagram of door drive

The site must be wired in accordance with the elevator system requirement of normally opening and closing, and it need to be confirmed that the connection is correct and the plug-in is put in place.

3.3 Key display setting instructions

3.3.1 Power on the system, LED indicator, and change F01.04 (open/close direction) parameter from 1 to 0 as an example:

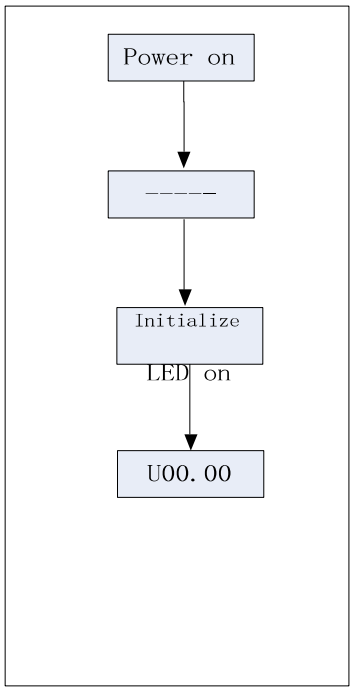


Fig 3.1 Power-on LED indication

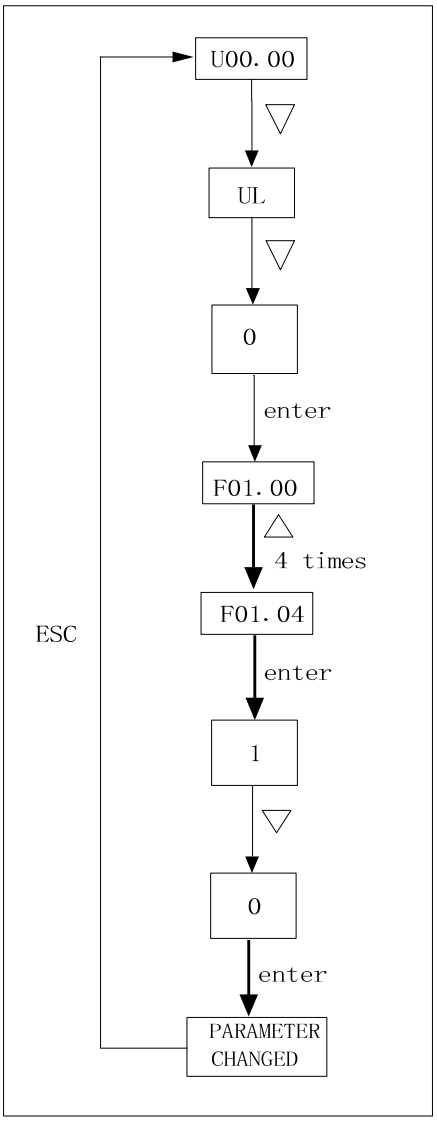


Fig 3.1 Parameter setting instructions

3.3.2 Show instructions

Panel debugger has U status monitoring interface, F function parameter interface, U status interface input and output terminal status are as follows

I / O status interface indication	Input status interface (U00.08)		1: Door open command 2: Door close command 3: Forced door close command 4: Spare If the decimal in the lower right corner is on, it means that the signal input is valid (in this example, the door open command is valid)
	Output status interface (U00.09)		1: Open the door in place 2: Closed the door in place 3: stall 4: spare If the decimal in the lower right corner is on, it means that the signal output of this channel is valid (in this example, it is valid to open the door)

3.4 Debugging steps

Step 1: Check whether the wiring of the door machine is correct and reliable, and whether the encoder and motor wires are loose. Input single-phase AC power in the range of 180V ~ 264V.

Step 2: Door machine door width learning (shortcut key "Exit + ▼" by 1 second.)
Set F02.02 = 1, the door machine starts door width self-learning. The “running” indicator light is on. Close the door first, then open the door, and then close the door. When the “running” indicator light is off, self-learning is over.

Step3: Make sure the wiring is normal, then you can put it into power and run normally.

Note: if the self-learning running direction of the door width is "open the door first, close the door later, open the door again", it is considered that the running direction of the door machine is opposite to the actual requirements, and the parameters of F01.04 can be adjusted.

4 Function Parameters

4.1 U group monitoring functional group parameters

Function code	Function name	Setting range	Minimum unit	Factory default	Change of validity
U00.00	Encoder pulse	——	1	——	●
U00.01	Speed	——	0.001m/s	——	●
U 00.02	Output current	——	0.01A	——	●
U 00.03	DC bus voltage	——	1V	——	●
U 00.04	Motor temperature	——	1℃	——	●
U 00.05	Heat-sink temperature	——	1℃	——	●
U 00.06	Software Version	——	——	——	●
U 00.07	Actual door position	——	0.1mm	——	●
U 00.08	Input terminal status	——	——	——	●
U 00.09	Output terminal status	——	——	——	●

Function code	Function name	Setting range	Minimum unit	Factory default	Change of validity
U 00.10	Self-learning door width	——	0.1mm	——	●
U 00.11	Running times high	——	——	——	●
U 00.12	Running times low	——	——	——	●
U 00.13	First Fault record	——	——	——	●
U 00.14	Second Fault record	——	——	——	●
U 00.15	Third Fault record	——	——	——	●
U 00.16	Reserved				●
……					●
U 00.31	Reserved				●

4.2 F group debugging functional group parameters

Function code	Function name	Setting range	unit	Factory default	Change of validity
F01.00	Operating command selection	0：Keypad mode; 3：CAN mode; 4：Demo mode;	1	0	★
F01.04	Running direction setting	0：The same as the setting direction; 1：Opposite to the setting direction;	1	0	★

Function code	Function name	Setting range	unit	Factory default	Change of validity
F01.05	Carrier frequency	5~15kHz	1kHz	15 kHz	★
F01.08	Door width no learning enable	0~1	1	1	★
F01.14	Parameter initialization	0：No operation; 1：Reset to Factory default;	1	0	★
F01.17	Motor back EMF	0~220V	1V	80V	★
F01.18	Motor rated voltage	0~220V	1V	85V	★
F01.19	Motor rated current	0~2.2A	0.01A	0.65A	★
F01.20	Motor rated frequency	0~99.99Hz	0.01Hz	83.33Hz	★
F01.21	Motor rated speed	0~9999r/min	1r/min	500r/min	★
F01.22	Motor pole number	0~50p	1p	20p	★
F01.29	Motor D-axis inductance	0~9999mH	1mH	60mH	★
F01.30	Motor Q-axis inductance	0~9999mH	1mH	60mH	★
F01.31	Motor stator resistance	0~9999 Ω	1 Ω	25 Ω	★
F02.02	Self-learning	1: Door width learning; 2. Magnetic Pole learning	1	0	★
F02.03	Door width	0~6000.0mm	0.1mm	490.0 mm	☆
F02.07	Driving wheel diameter	0~200.0mm	0.1mm	25.4mm	★
F02.16	Door opening distance	0~100.0mm	0.1mm	40.0mm	☆
F02.18	Door opening speed	0~1.000m/s	0.001 m/s	0.030 m/s	☆
F02.19	Door opening arc rise time	0~10.0s	0.1s	2.0s	☆

Function code	Function name	Setting range	unit	Factory default	Change of validity
F02.20	Door reference running speed	0~0.88 m/s	0.001 m/s	0.600 m/s	☆
F02.22	Door opening arc fall time	0~10.0s	0.1s	2.0s	☆
F02.25	OD reference speed percent	0~100%	1%	55%	☆
F02.27	Door opening creeping distance	0~100.0mm	0.1mm	1.0mm	☆
F03.03	Door closing arc rise time	0~10.0s	0.1s	2.0s	☆
F03.06	Door closing arc fall time	0~10.0s	0.1s	2.0s	☆
F03.09	CD reference speed percent	0~100%	1%	45%	☆
F03.11	Door closing creeping distance	0~100.0mm	0.1mm	0	☆
F03.13	Cam route	0~ 100.0mm	0.1mm	45.0mm	☆
F03.14	Cam running speed	0~1.000m/s	0.001 m/s	0.087 0m/s	☆
F03.17	Door opening holding torque	0.0%~100.0%	0.1%	55.0%	☆
F03.18	Maximum torque for OD	0.0%~150.0%	0.1%	100.0 %	☆
F03.19	Open the door in place finally holding torque	0.0%~100.0%	0.1%	45.0%	☆
F03.22	Door closing holding torque	0.0%~100.0%	0.1%	45.0%	☆
F03.23	Maximum torque for CD	0.0%~150.0%	0.1%	70.0%	☆
F03.25	Close the door in place finally holding torque	0.0%~100.0%	0.1%	40.0%	☆
F04.23	OD locked-rotor signal output	0：No output; 1：Output;	1	0	☆

Function code	Function name	Setting range	unit	Factory default	Change of validity
F05.02	CD locked-rotor handling	0：Follow the elevator system command; 1：Automatic reverse opening;	1	0	☆
F05.04	Locked-rotor memory enabling	0：Invalid 1：Enable	1	0	☆
F05. 08	Abnormal deceleration time	0.0~20.0s	0.1s	0.5s	☆
F05.05	Power-on operation mode	0：Follow the elevator system command 1：Automatic anti-open.	1	0	☆
F05.13	Login password setting	0~9999	1	0	☆

Fault code list

Code	Description	Cause Analysis	solution
17	Under-voltage	1、System power off	Check if the input voltage is single-phase and the voltage is in the range of 180-264VAC.
		2、Low supply voltage	
18	Over-voltage	1、High supply voltage	
19	IPM over temperature	1、Ambient temperature is too high	Check the ambient temperature and take cooling measures.
		2、The door machine has a large resistance and a large self-closing force	Adjust machinery to reduce drag.
21	locked-rotor	1、Mechanical blocking, self - closing force is too large	Adjust machinery to reduce drag.
		2、Parameter setting is not reasonable	Set F01.14 = 1, restore factory value, and debug again.
22	E2PROM fault	1、Controller internal	Seek service.

		components failure	
23	Self-learning fault	1、Motor wire 、encoder wire is incorrect connected or plug-in is not inserted in place	Check wires
		2、Parameter setting is not reasonable	Set F01.14 = 1, restore factory value, and debug again.
		3、Mechanical blocking	Move the car door position and learn again.
		4、Encoder fault	Check or replace the encoder.
24	Current detection fault 1	1、Motor wiring error or loose	Check wires
		2 、 Controller internal anomaly	Seek service.
25	Current detection fault 2	1 、 Controller internal anomaly	Seek service.
26	Belt slipping error	1、Broken belt	Check the belt.
		2、Slack belt is severe	Check the belt.
		3、Door width is different from actual	Re-door width self-learning.
27	Over-torque fault	1、The running resistance is too large of door machine	Check the door mechanism and reduce the resistance of opening /Closing the door.
		2、The torque parameter is set too small	Set F01.14 = 1, restore factory value
28	Encoder fault	1、Bad encoder	1. Check the U00.00 parameter and turn the motor. This data varies between 0 ~ 4096 2. Replace the motor with the same specification, and if the Err28 is still reported, then seek service.
29	Temperature sensor fault	1、The wiring problem of sensors inside the controller	seek service.
		1、Over-voltage/ Over-current	Check the on-site supply power
		2、Motor wire is wrongly connected or there is a	Check the motor wiring

31	IPM module fault	short circuit between U /V / W / PE	
		3、leakage current	Check the motor wiring and power wiring
		4 、 Internal IPM is damaged	seek service.
49	OD timeout	1、Door opening resistance is too large or mechanical jam	Check if the door opens smoothly.
		2、Door width learning was not successful	Set F01.14 = 1, restore factory value, and debug again.
		3、Encoder is disconnected or damaged	Check the encoder
50	CD timeout	1、Door closing resistance is too large or mechanical jam	heck if the door opens smoothly.
		2、Door width learning was not successful	Set F01.14 = 1, restore factory value, and debug again.
		3 、 Encoder is disconnected or damaged	Check the encoder
52	Over-speed protection	1、Parameter setting error	Set F01.14 = 1, restore factory value, and debug again.
		2、Motor wire or encoder wire is wrongly connected	Check the wiring is correct and reliable.
53	CAN bus fault	1 、 Bus error in CAN communication mode	Check the Bus wiring.
55	Motor over-temperature	1、Motor temperature is too high	Power off and wait for the motor temperature to cool down before re-commissioning.
56	Motor temperature sensor fault	1、Motor internal sensor wiring problem	seek service.
57	AI model learning fault	1、AI self-learning errors	Set F01.14 = 1, restore factory value, and debug again.
58	Cam blocked	1 、 Cam cannot retract normally	Check if the cam runs abnormally

4.3 Changing the specification based on the curve

4.3.1 Changing the specification based on the curve of door opening

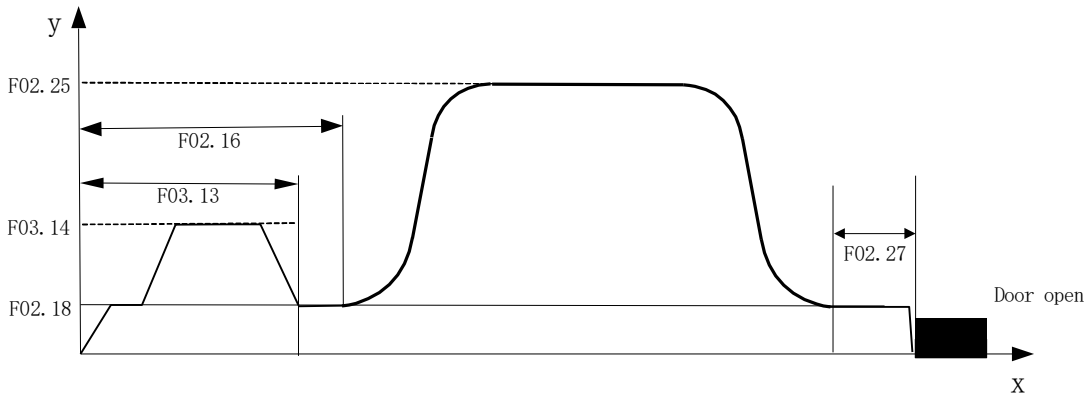


Fig 4-1 The curve of door opening diagram of door drive

Instructions for curve of door opening

A: After drive received the order of door opening, the door open the cam with a start speed of F02.18 and a middle max speed of F03.14, cam route is F03.13, when the running distance over F02.16, it starts to run at the curve speed, and the max speed of the curve is F02.25;

B: When the door runs at F02.27 with the speed of F02.18 in place of door opening, arrive at the end of door opening and output the in place single at the same time.

C: The door opening time has a great influence on F02.19 (the rising time of the opening circle) and F02.22 (the falling time of the opening circle). Increasing these two values will increase the opening time; decreasing these two values will reduce the opening time.

Note: x means route, y means speed;

4.3.2 Changing the specification based on the curve of door closing

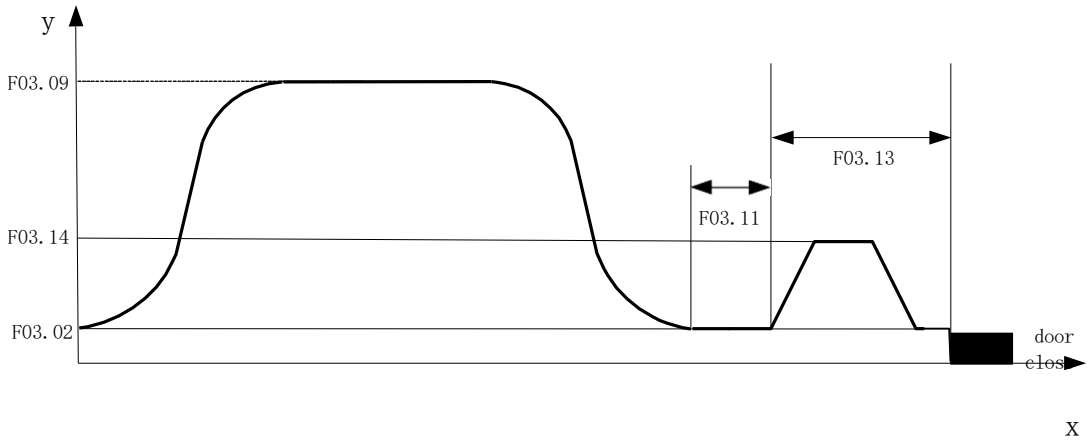


Fig 4-2 The curve of door closing diagram of door drive

Instructions for curve of door opening

A: After drive received the order of door closing, the door run curve with a start speed of F03.02 and a middle max speed of F03.09;

B: At the end of the curve reaches the distance of F03.11 again, it will enter the cam-receiving phase. After the door runs F03.13, it will arrive at the end of door closing and output the in place single at the same time.

C: The door closing time has a great influence on F03.03 (the rising time of the closing circle) and F03.06 (the falling time of the closing circle). Increasing these two values will increase the closing time; decreasing these two values will reduce the closing time.

Note：x means route， y means speed；

5 Installation Size

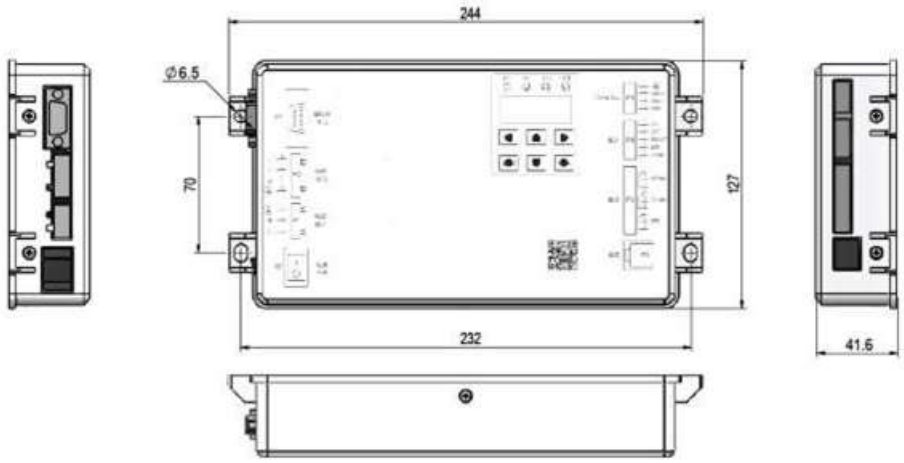


Fig 4-1 The diagram of door drive size

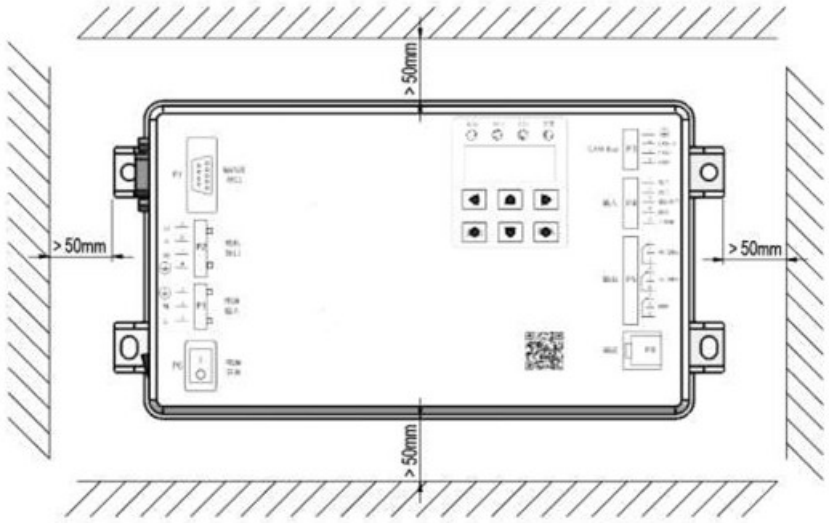


Fig 4-2 Installation diagram of door drive

6 Maintenance

6.1 Maintenance

Lots of factors such as ambient temperature, humidity, PH value, dust, and vibration, internal component aging and wearing may raise the chance of the occurrence of potential faults. Therefore, it is quite necessary to do monthly checking and periodical maintenance to the drive during store or use.

User shall operate drive according to user manual, do the periodical maintenance (12 months as general) to ensure reliable running of drive. Maintenance includes:

a) Check the heat dissipation of the door drive is normal or not;

b) Check the terminal wiring has been loosened or not;

c) Clean dust inside drive at regular intervals;

d) Check the foreign matter has fallen into the drive or not, do not directly touch the door drive internal circuit.

e) Do not modify the door drive without authorization, otherwise there is a risk of damage to it and
personnel safety.

6.2 Store

Environmental Features	Requirements	Remark
Environment Temperature	-40 ℃~70℃	Storage temperature for a long time should not be higher than 30 ℃ to avoid the capacitance characteristics degradation. Avoid any condensation and freezing environment caused by temperature shock.

Relative Humidity	<90%RH	Forbid to expose the drive to the sun and rain, otherwise the drive will be damaged or can't be used any more. Recommend taking desiccant and plastic film sealing measures.
Store Environment	Free from direct sunlight, dust, corrosive gas, combustible gas, vibration, oil mist, steam, gas, water. The environment also needs to be with less salt.	