

User Manual

ProBG8000 Series Barrier Gate

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Doc Version: 1.0

English

Thank you for choosing our product. Please read the instructions carefully before operation. Follow these instructions to ensure that the product is functioning properly. The images shown in this manual are for illustrative purposes only.



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If there is any issue related to the product, please contact us.

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About the Company

ZKTeco is one of the world's largest manufacturer of RFID and Biometric (Fingerprint, Facial, Finger-vein) readers. Product offerings include Access Control readers and panels, Near & Far-range Facial Recognition Cameras, Elevator/floor access controllers, Turnstiles, License Plate Recognition (LPR) gate controllers and Consumer products including battery-operated fingerprint and face-reader Door Locks. Our security solutions are multi-lingual and localized in over 18 different languages. At the ZKTeco state-of-the-art 700,000 square foot ISO9001-certified manufacturing facility, we control manufacturing, product design, component assembly, and logistics/shipping, all under one roof.

The founders of ZKTeco have been determined for independent research and development of biometric verification procedures and the productization of biometric verification SDK, which was initially widely applied in PC security and identity authentication fields. With the continuous enhancement of the development and plenty of market applications, the team has gradually constructed an identity authentication ecosystem and smart security ecosystem, which are based on biometric verification techniques. With years of experience in the industrialization of biometric verifications, ZKTeco was officially established in 2007 and now has been one of the globally leading enterprises in the biometric verification industry owning various patents and being selected as the National High-tech Enterprise for 6 consecutive years. Its products are protected by intellectual property rights.

About the Manual

This manual introduces the operations of **ProBG8000 Series Barrier Gate**.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.

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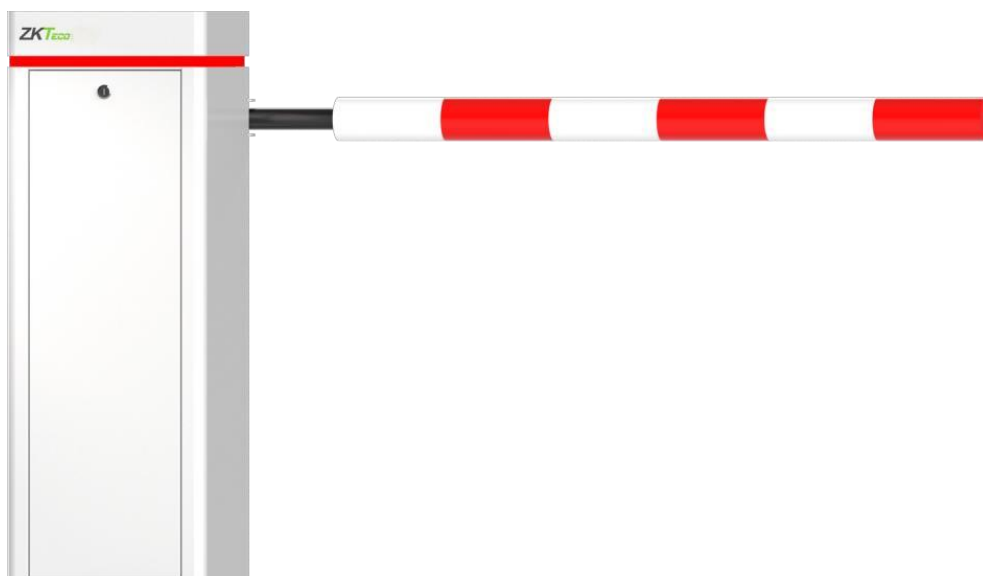
1 Overview

1.1 Product Introduction

The ProBG8000 Series is a new intelligent high-speed servo barrier gate equipped with a high-performance servo motor. It features fast response, smooth transmission, and strong output torque. With encoder-based precise adjustment of speed and position, this barrier can ensure smooth barrier arm raising and lowering with a soft cushioning effect. The gears of the servo motor undergo carburizing heat treatment and high-precision grinding, featuring high transmission efficiency, low energy consumption, strong impact resistance, and long service life.

This product supports independent adjustment of boom arm opening speed and boom arm closing speed, and features a multi-stage speed operation mode to further enhance operational stability. This product is also compatible with a 24V uninterruptible power supply and solar power, ensuring normal operation even during power outages. Built-in interactive colorful LED lights support customizable colors and dynamic effects to visually indicate of the opening and closing status, combining technology and practicality.

Widely Apply to parking lots, Shopping mall, transportation hubs, scenic spots, industrial parks, hospitals, and highway toll stations.



1.2 Features and Functionalities

- The Cabinet panel is made of a 2.0mm cold-rolled steel through an electrophoretic and double-layer powder spraying process.
- Uses a high-performance servo motor, with rapid response, strong power, low noise, and smooth operation.
- MCBF up to 10 million cycles, long service life.
- The servo main board integrates radar/infrared/RS485 interfaces, and features a digital keypad for adjustment.
- Built-in colorful LED lights, 4 dynamic modes.
- Carbon anti-collision boom design, fast opening and closing speed.
- Supports multiple protections including anti-collision, boom arm detachment, and boom arm bouncing
- Supports over-current/over-voltage/over-load/fault protection and power reverse connection protection.
- The speed can be adjusted between 0.3 to 3s.
- Wide-temperature design for reliable operation in various outdoor conditions.
- IP54, with multiple protections including rust resistance and UV resistance.

1.3 Technical Parameters

Basic Parameters	Description
Power Supply	AC110V/220V $\pm$ 10% 50/60Hz; DC24V 20A
Rated Power	400W
Motor Type	DC 24V brushless servo motor
Cabinet Color	White
Cabinet Material	Q235 Cold rolled steel
Boom Type	Circle straight boom
Boom Length	ProBG8030L/R: $\leq$ 3m ProBG8045L/R: $\leq$ 4.5m
Operating Speed	0.3s~3s(adjustable)
Operating Temperature	-35 $^{\circ}$ C~+80 $^{\circ}$ C
Operating Humidity	<90%
Protection Level	IP54
Remote Control Distance	$\leq$ 30m
Remote Control Frequency	433MHz
Motor MCBF	$\geq$ 10 million times
Dimensions	370 $\times$ 310 $\times$ 1020mm
Package Size	1108 $\times$ 485 $\times$ 445 mm
Net Weight	42 $\pm$ 1kg
Gross weight	45 $\pm$ 1kg

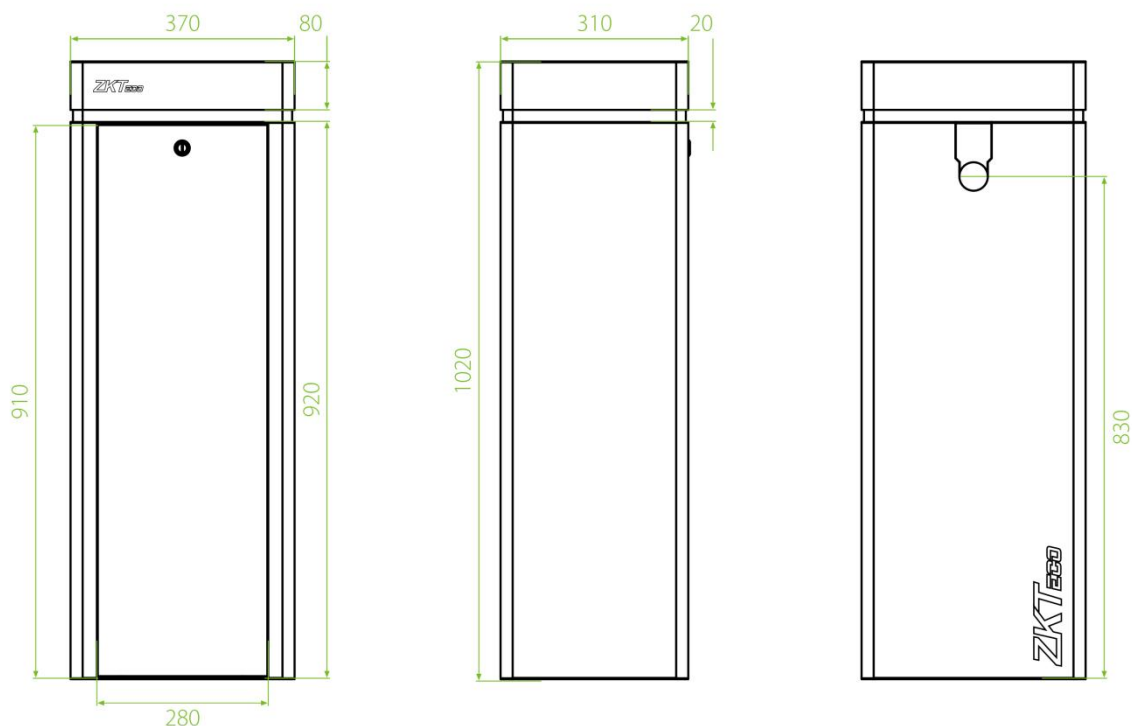
1.4 Spring Specification

Boom Type	Boom Length	Spring size	number of springs
Circle straight boom	L $\leq$ 3m	3.5mm	1
Circle straight boom	L $\leq$ 4.5m	4.0mm	2



1. The barrier boom arm has been factory-adjusted to a balanced state. If the boom length is changed or the spring is removed, the device must be re-balanced.
2. **Adjustment Instructions:** If the boom arm vibrates excessively during closing, it means that the spring force is not enough, and the spring should be tightened. If the boom arm vibrates excessively during opening, it means that the spring force is too large, and the spring should be loosened.

1.5 Dimensions(mm)



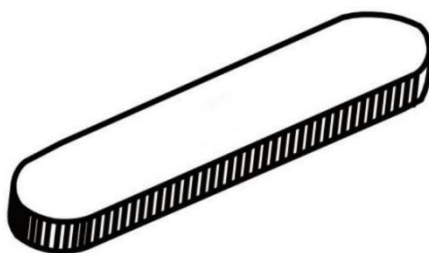
- * 1. All parameter data above are subject to the test reports issued by ZKTeco Laboratory.
- 2. Product images in this manual are for illustration purposes only. The actual product may vary slightly. Please refer to the actual product.

2 Installation Procedure

2.1 Concrete Base

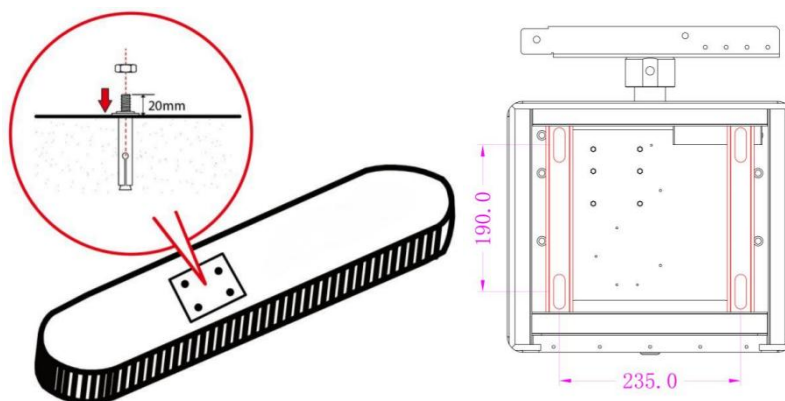
Determine the enclosure position as requirement, then pour a concrete base. The concrete base should be approximately 150mm larger than the overall dimensions of the device on each side, with a thickness of approximately 200mm. Actual dimensions shall be determined based on on-site installation requirements.

*If a concrete base is not installed, ensure that the mounting surface can securely fixed the device to maintain stable operation.



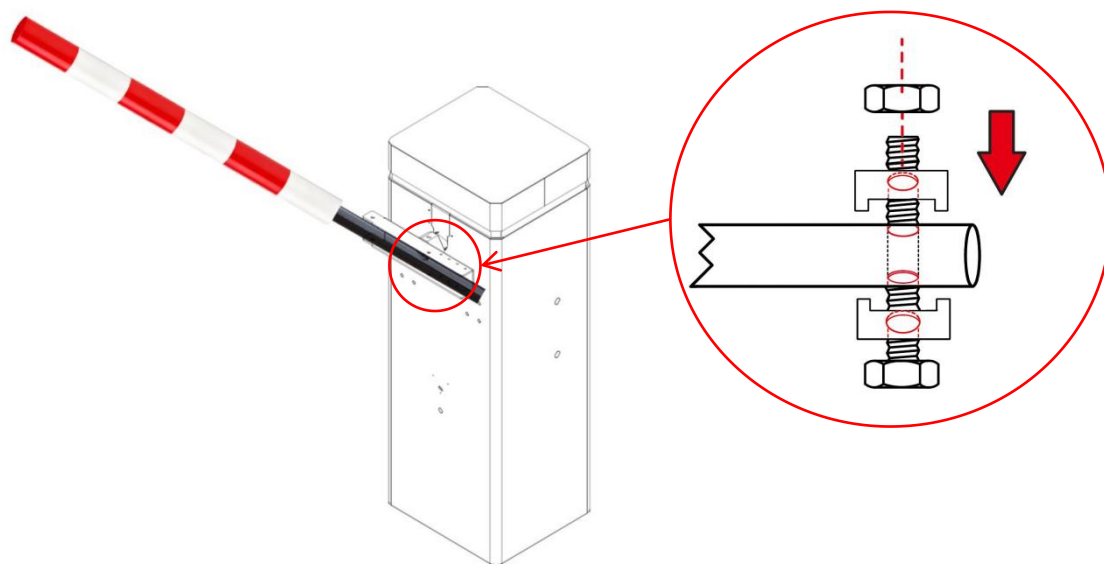
2.2 Installation Procedure

- Use a screw pad to mark the installation position of the cabinet.
- Drive four expansion bolts (M12×150) into the concrete base.
- Position the cabinet and install screw pads and use a spanner to tighten nuts.

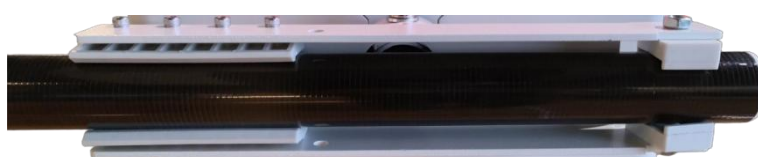


2.3 Boom Installation

- Place the boom into the boom tray head according to the hole location.
- Use the spanner to clamp the round boom by screws, gasket, and screws nuts.



- Installation diagram

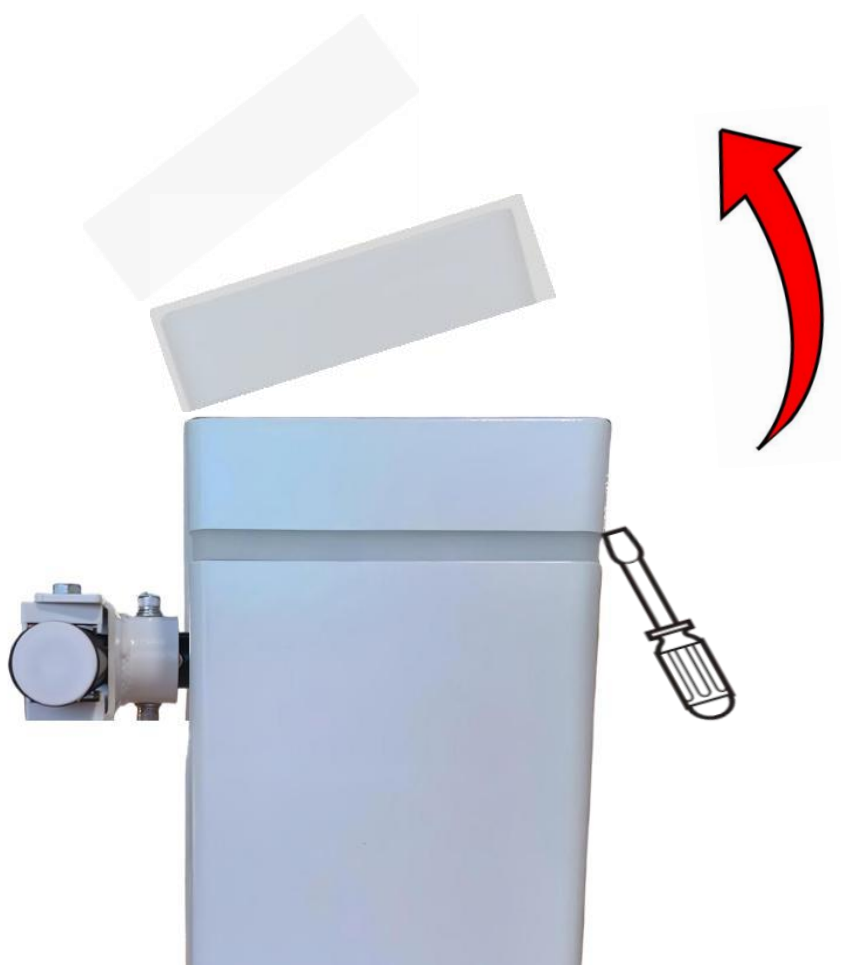


2.4 Mainboard Wiring Instructions

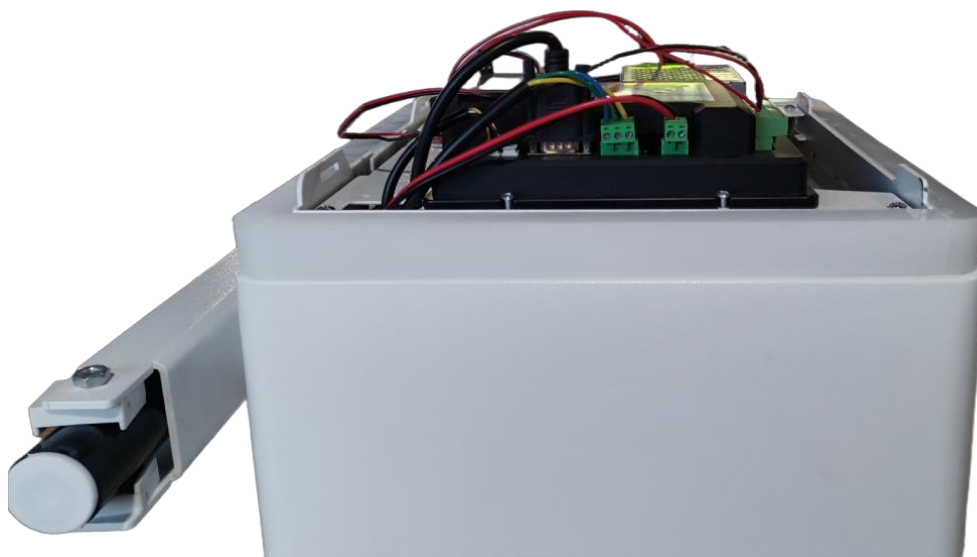
- Step 1: Open the cabinet door and remove the two screws in the area outlined in red.



- Step 2: Insert a flat-blade screwdriver into the inner edge of the top cover, apply upward force, and remove the cover.



- Step 3: Remove the top cover, then connect the "OP" and "GND" port on the mainboard to the "OUT1" port on the camera.



2.5 External Anti-smash Device (Optional)

External radar, vehicle detector, pressure wave, or other sensing methods can be connected to achieve anti-smash protection.

**For detailed installation instructions of external devices, please refer to the relevant manuals.*

• Radar Installation Diagram

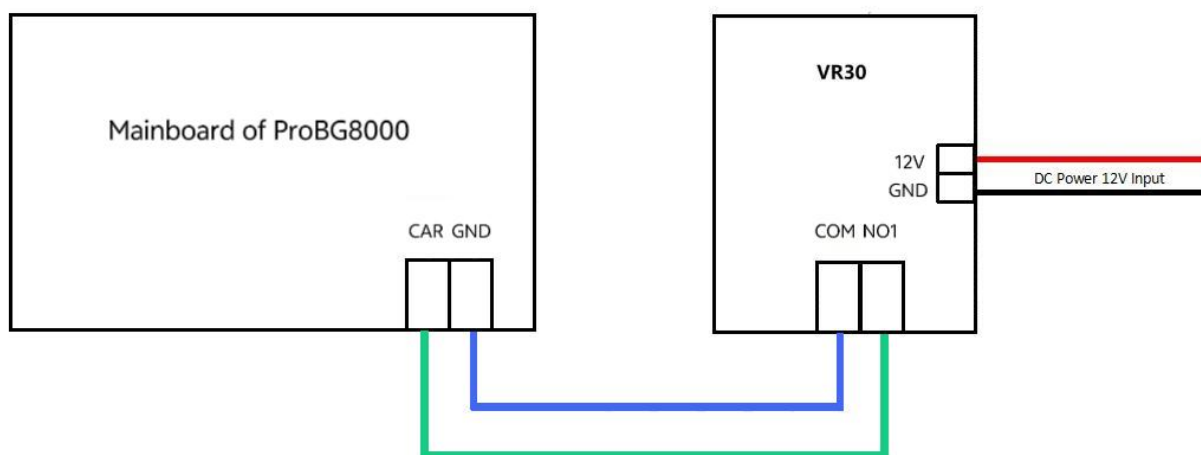


1. The recommended installation height for the radar is 65–80 cm. Two pre-drilled holes are provided on the side of the barrier cabinet. The installation position can be selected based on vehicle type.
2. If vehicles with a chassis height exceeding 90 cm are present on site, it is recommended to install a pole mounted radar or manually set the barrier boom to normally open. The pole shall be installed 25–30 cm from the barrier arm, with the radar mounted 120 cm above the ground.

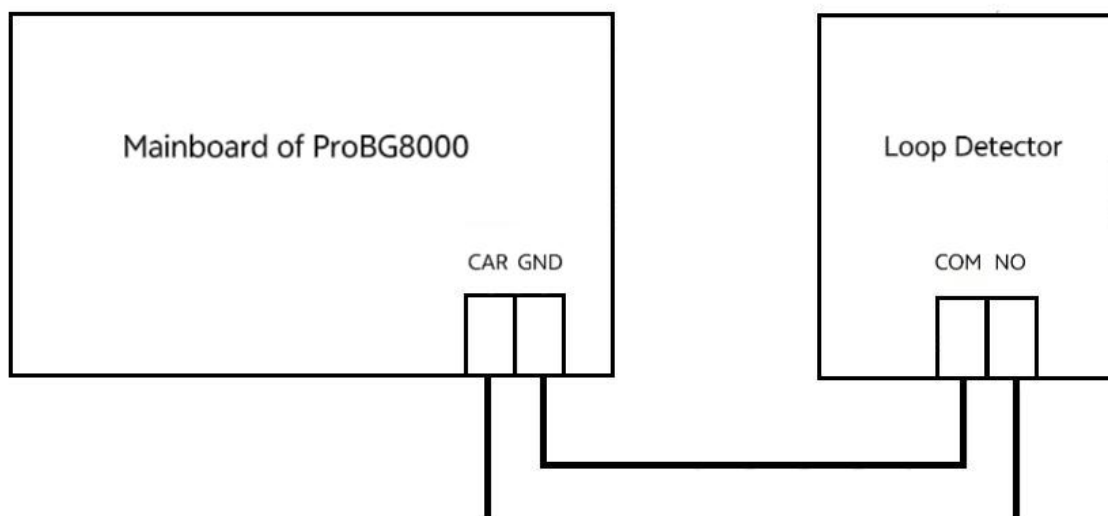
• Connection with VR30 Radar

Connect the "CAR" and "GND" on the barrier mainboard to the "NO1" and "COM" on the radar respectively.

***Note: The radar requires DC 12V power supply. Do not draw power from the main board.**



- Connection with Loop Detector

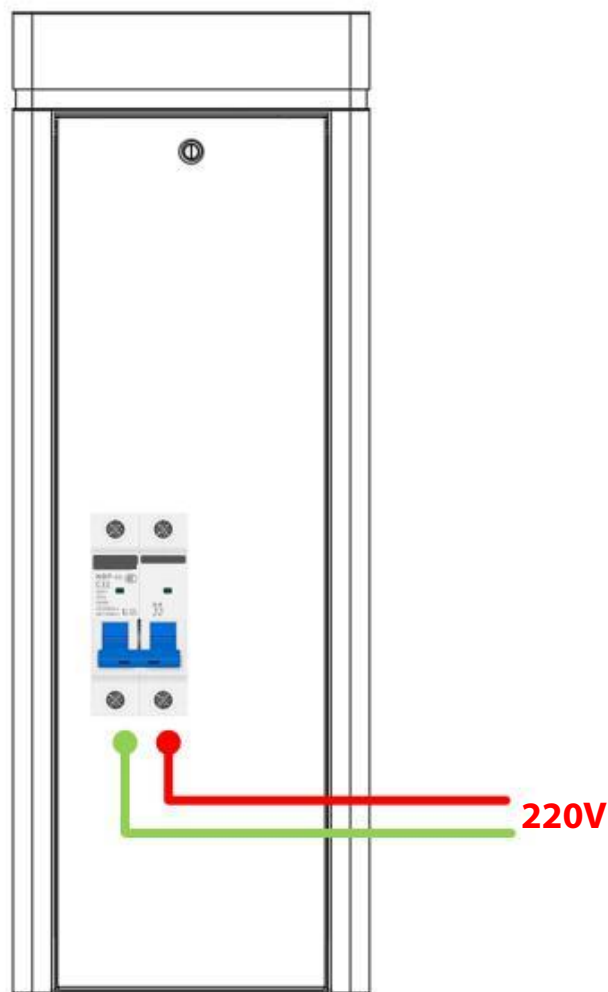


Coil Circumference	Coil Number
3m	Based on requirements, ensure that the inductance is between 100μH to 200μH
3m to 6m	5 to 6 turns
6m to 10m	4 to 5 turns
10m to 25m	3 turns
25m	2 turns

2.6 Power Connection

After completing the assembly of the unit, check that all components are properly installed and securely fastened. Once confirmed, connect the circuit breaker to the 220V power supply.

***Do not power on the barrier for testing without the barrier boom installed.**



2.7 Remote Control Pairing/Unpairing

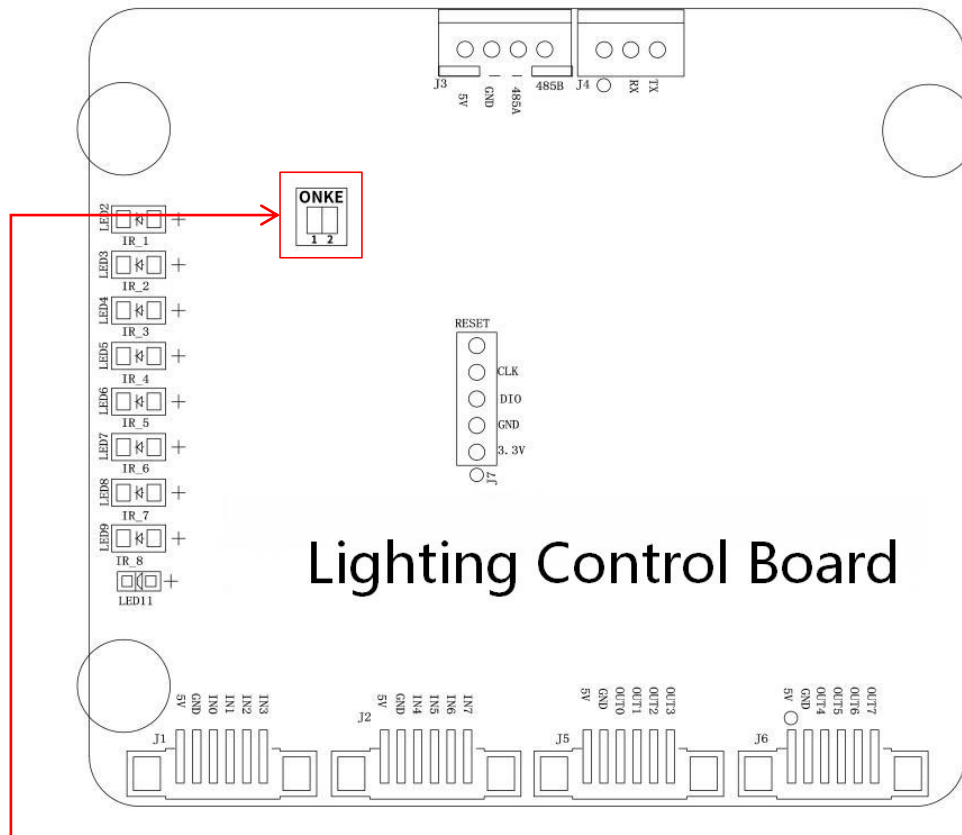
- **Pairing:**

Long press [Menu] to enter menu "F-00," then press [Open/+] to increment to "F-14". Press [menu] again, then the digital display will show "0". Press and hold the [Open], [Close], and [Stop] buttons on the remote control one after another, each for approximately 1 second. When the digital display value increases by 1 and a beep sounds, the pairing is successful.

- **Unpairing:**

Long press [Menu] to enter menu "F-00," then press [Open/+] to increment to "F-21". Press [menu] again, then the digital display will show the number of currently paired remote controls. Continue pressing the [Open/+] to adjust the value to match or be less than the number of paired remote controls. Then press the [Menu] again. When a beep sounds, the remote control pairing clearing operation is complete.

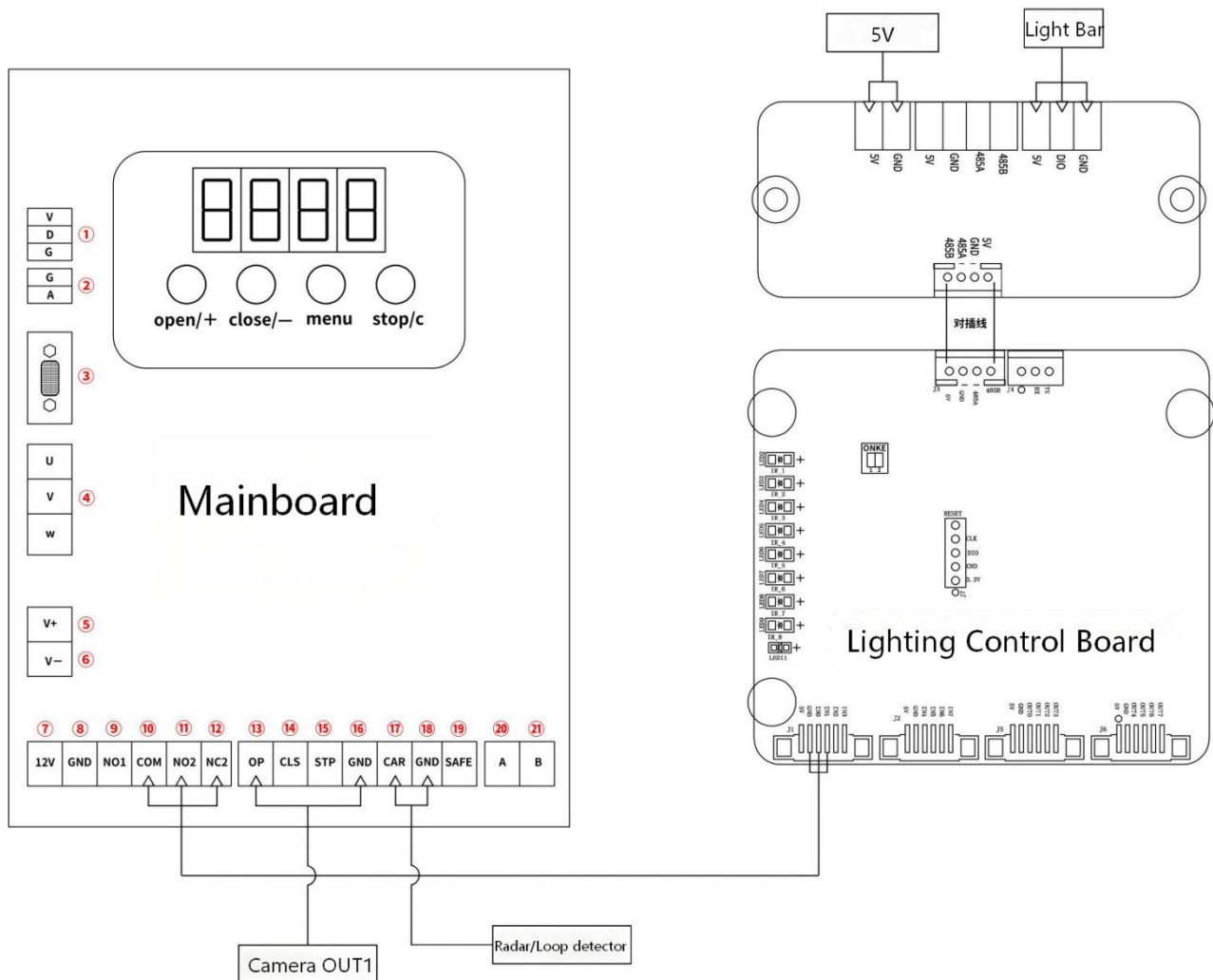
2.8 Lighting Mode Configuration



Four different lighting modes can be selected by different combinations of switch 1 and switch 2 on the "ONKE"

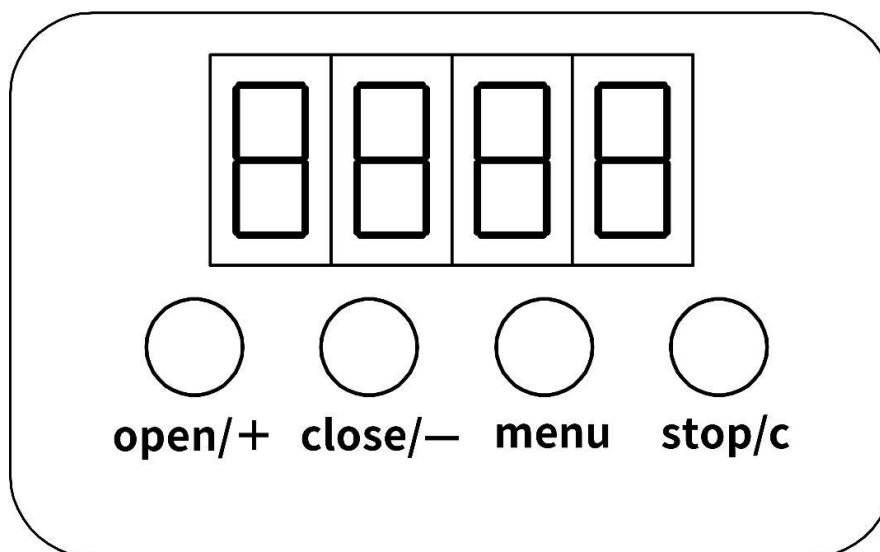
Mode	Open	Close	Remarks
Mode 1 (ONKE: 1 up, 2 up)	Green flowing	Red breathing	
Mode 2 (ONKE: 1 down, 2 down)	Green flowing	Red breathing	If no change in IO status occurs after the red light breathes for 20s, the blue and white lights will cycle breathing.
Mode 3 (ONKE: 1 up, 2 down)	Blue flashing	Red breathing	
Mode 3 (ONKE: 1 down, 2 up)	Blue flowing	Colorful flowing	

3 Controller Instructions



① Remote Control Port	② Light Sensor Port	③ Motor Encoder Port
④ Motor Power Port	⑤ 24V Power Input V+	⑥ 24V Power Input V-
⑦ 12V Power Output	⑧ GND Power Output	⑨ Relay 1 Normally Open Port
⑩ Relay Common Port	⑪ Relay 2 Normally Open Port	⑫ Relay 2 Normally Close Port
⑬ Open Input	⑭ Close Input	⑮ Stop Input
⑯ Control Signal Common Port	⑰ Vehicle Detector Input	⑱ Detection Signal Common Port
⑲ Anti-smash Signal Input	⑳ RS485+	㉑ RS485-

• Button Description



- **Open/+:** This button is used to open the barrier boom. When in setting mode, it can be used to increase menu items and adjust setting values upward. In parameter setting mode, short press increments 1 each time; long press continuously increases the value until reaching the maximum.
- **Close/– :** This button is used to close the barrier boom. When in setting mode, it can be used to decrease menu items and adjust setting values downward. In parameter setting mode, short press decrements 1 each time; long press continuously decreases the value until reaching the minimum.
- **Menu:** Used to enter setting mode and confirm setting values.
- **Stop/C:** This button is used to stop the barrier boom. When in setting mode, it can be used to exit setting mode or cancel the currently set value. When pressing this button to exit setting mode, the main board will emit a long beep as a prompt.

4 Controller Parameter Configuration

Items		Default	Range	Description
F00	Boom Arm Opening Speed	60	1-100	Controls the opening speed of the barrier. The larger the number is set, the faster the speed.
F01	Boom Arm Closing Speed	60	1-100	Controls the closing speed of the barrier. The larger the number is set, the faster the speed.
F02	Boom Arm Opening Brake Position	30	0-90	The angle at which deceleration begins during boom arm opening. Unit: degree. If the end speed of opening is too fast, decrease this value.
F03	Boom Arm Closing Brake Position	60	0-90	The angle at which deceleration begins during boom arm closing. Unit: degree. If the end speed of closing is too fast, increase this value.

F04	Boom Arm Opening Acceleration Time	10	0-255	The time it takes to accelerate from 0 to the F00 opening speed when the boom arm is opening. The smaller the value, the faster the acceleration.
F05	Boom Arm Closing Acceleration Time	10	0-255	The time it takes to accelerate from 0 to the F01 closing speed when the boom arm is closing. The smaller the value, the faster the acceleration.
F06	Boom Arm Opening End Speed	10	1-100	The end speed of the boom arm opening.
F07	Boom Arm Closing End Speed	10	1-100	The end speed of the boom arm closing.
F08	Close Limit Adjustment	6	1-255	Fine-tuning of the horizontal position. The boom arm stops closing when reaching the certain distance of lower limit.
F09	Open Limit Adjustment	6	1-255	Fine-tuning of the Vertical position. The boom arm stops opening when reaching the certain distance of upper limit.
F10	No-ground Sense Automatic Closing Time	0	0-255	The time of the boom arm closes automatically. Unit: second. The auto-close function will be disabled when the value is 0.
F12	Delay Time for Closing	2	0-255	Set the ground sense delay time after vehicle passage. The larger the set value, the longer the closing delay. Unit: 0.1 second.
F13	Power-on Self-learning Speed	20	0-50	Speed for finding the opening and closing limits.
F14	Remote Control Pairing	0	0-50	After entering this menu, the number of learned remote controls is displayed. Remote control pairing: Press and hold the [Open], [Close], and [Stop] buttons on the remote control one after another, each for approximately 1 second. When the digital display value increases by 1 and a beep sounds.
F15	Sensitivity of the Boom Arm Bouncing	25	1-30	The response time of Bouncing. The smaller the value, the more sensitive.
F17	Motor Forward and Reverse Rotation	0	0-1	Barrier boom arm rotation direction.
F19	Ground Sense Count	1	0-2	0: Disabled 1: Intelligent count (recommended) 2: Standard count: When the number of vehicles that have passed matches the number of open commands, the barrier boom arm will close after

				the last vehicle passes.
F20	Self-test	0	0-255	Auto test interval. Used for burn-in testing. 0 disables auto test.
F21	Reset	0	0-255	5: Clear remote controls 10: Restore factory settings
F22	Firmware Version			0: Firmware version 1: Device operation count
F23	Photosensitive Threshold	100	0-300	When the light sensor detects the current ambient light intensity falls below this threshold, the fill light will turn on.
F26	Photosensitive Value			Photosensitive value at current light intensity
F27	Boom Arm Open Priority	2	0-3	Range: 0-3 Default: 2 1: Pressing Close or Stop is invalid during boom arm opening. Close is only effective after the boom arm has fully opened. Pressing Stop during closing will open the boom arm. 2: Close is invalid during boom arm opening, but Stop is valid. Stop is also valid during closing. 3: During boom arm opening, when a vehicle passes over the loop detector and the loop signal disappears, the boom arm will immediately close without waiting for fully open. This can prevent tailgating. In this mode, all other functions are the same as mode 2.
F28	Low-Speed Closing Angle	25	0-80	The angle at which low-speed operation begins during closing.
F29	Relay 1 Output Mode	0	0-13	0: Continuous output at open limit – The relay remains closed when the boom arm is fully open, and remains open when the boom arm is not fully open. 1: Continuous output at close limit – The relay remains closed when the boom arm is fully closed, and remains open when the boom arm is not fully closed. 2: Time-controlled output – The relay closes when the scheduled light-on time is reached, and opens when the scheduled light-off time is reached.

			3: Light-controlled output – The relay closes when the ambient brightness falls below the value set in parameter F12. When the brightness remains above the F12 value and stable for one minute, the relay opens. 4: The relay closes when the ground sense signal is present, and opens when the ground sense signal is removed. 5: Open signal synchronous output – The relay will close for 1s and then disconnect when receives an boom arm open signal. This can serve as an open signal for another boom arm to achieve synchronized opening. 6: Close signal synchronous output – The relay will close for 1s and then disconnect when receives an boom arm close signal(Including auto-close after vehicle passes). This can serve as an close signal for another boom arm to achieve synchronized closing. 7: Open limit pulse output – The relay closes for 1s an disconnects when the boom arm reaches the fully open position. 8: Close limit pulse output – The relay closes for 1s an disconnects when the boom arm reaches the fully close position. This can serve as an open signal for another boom arm to achieve interlock control. 9: Lock indicator output – The relay closes when convoy mode is entered, and disconnects when convoy mode is exited. This can be connected to an alarm light or other devices to indicate convoy mode status. 10: Reserved. 11: Boom arm operation output – The relay closes when the boom arm is in operation, and disconnects when the boom arm stops. 12: Boom arm opening status output – The relay closes when the boom arm is operating in the opening direction or is fully open, and disconnects in all other states. This can be used to connect a green indicator light. 13: Boom arm closing status output – The relay
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				closes when the boom arm is operating in the closing direction or is fully close, and disconnects in all other states. This can be used to connect a red indicator light.
F30	Relay 2 Output Mode	1	0-13	Same as above
F31	Boom Arm Opening Brake Speed	6	1-10	The smaller the number, the more pronounced the deceleration effect.
F32	Boom Arm Closing Brake Speed	6	1-10	The smaller the number, the more pronounced the deceleration effect.
F33	Anti-freeze Temperature	0	-40~65	The anti-freeze or anti-rust function will activate when the temperature falls below this value. This function needs to be matched with F35.
F34	Time Setting			Set the device time. After entering the menu, press the [+] or [-] button to adjust the time, and press the [M] button to save.
F35	Anti-freeze Duration	0	0~120	0: Disables anti-freeze or anti-rust function >0: Unit: minute. The boom arm will move slightly at intervals set by this parameter. The movement is minimal and barely noticeable, preventing the device from freezing in low temperatures.
F36	Current Temperature			Current controller temperature.
F38	Low-Speed Operation Angle	65	10-90	The start angle for low-speed operation during boom arm opening.
F39	Set Baud Rate	1	0-1	0:9600 1:19200
F40	Set Address	0	0-255	Set controller address.
F41	Ground Sense Anti-smash Mode	0	0-1	0: Turns to open when a vehicle is present during boom arm closing 1: Turns to stop when a vehicle is present during boom arm closing
F42	Event Auto-reporting Control	0	0-4	0: Disables auto-reporting function. 1: Auto-reports events via RS485 when the boom arm status changes. 2: Auto-reports events via RS485 when the ground sense input changes. 3: Auto-reports events via RS485 when either the boom arm status or the ground sense input

				changes. 4: Auto-reports events via RS485 when any status of the barrier changes.
F43	Power-on Close Mode	0	0-1	0: The boom arm remains in its position upon power-up. 1: The boom arm automatically closes upon power-up.
F44	Ground Sense Closing Memory	0	0-1	0: Disabled 1: While the open signal remains active, if a vehicle passes through the boom arm, the controller will remember this ground sense signal. After the open signal is removed, the boom arm will still automatically close.
F45	Stop Buffer Time	0	0-255	The time from receiving a stop command to coming to a complete stop. Unit: 0.1 second.
F46	Angle of Disable Ground Sense	10	0-60	Ground sense detection is disabled after the boom arm reaches the set angle during closing. Unit: degree.
F47	Convoy Mode	0	0-3	Range: 0-3, Default: 0. 0 disables this function. 1: Opening the gate with the remote control directly enters convoy mode. In this mode, the ground sense signal is disabled. The mode is exited only when the boom arm is closed. Closing through the console or the remote control can exit convoy mode. Opening through the console does not enter convoy mode. 2: Pressing and holding the remote control "Open" button for 4 seconds enters convoy mode. 3: Pressing and holding the remote control "Open" button for 8 seconds enters convoy mode.
F49	Find Open/Close Limit	0	0-2	0: Automatically find open/close limit on power-up 1: Find only the open limit on power-up 2: Find only the close limit on power-up
F53	Buzzer Frequency	0	0-2	0: Buzzer does not sound. 1: Continuous sound when ground sense signal is active.

				2: Beeps once every second when ground sense signal is active.
F55	Ground Sense Signal Stabilization Time	12	1-255	The time from when the ground sense signal is detected to when the controller confirms it as valid. Unit: 0.01 second.
F56	Open Signal Stabilization Time	12	1-255	The time from when the open signal is detected to when the controller confirms it as valid. Unit: 0.01 second.
F58	Lock at Close Limit	0	0-2	0: Disabled 1: Lock at close limit to prevent lifting to horizontal position. After the boom arm has fully lowered, if an attempt is made to lift it without a command, the motor applies a counter-force to keep the arm at the horizontal position. 2: Lock at close limit to prevent lifting above the lower limit. After the boom arm has fully lowered, if manual lifting is detected, the motor applies a counter-force to return the arm to the lower limit, preventing forced lifting for passage.
F59	Boom Arm Bouncing Disable Angle	10	0-90	The boom arm bouncing function is disabled after the boom arm reaching the set angle during closing.
F60	Close Signal Stabilization Time	12	0-255	The time from when the close signal is detected to when the controller confirms the signal as valid. Unit: 0.01 second.
F65	Power-off Open Mode	0	0-1	0: Disable 1: Enable
F67	Overload Protection Current	15	1-15	The maximum allowable output current of the motor. Unit: A. This parameter must be less than the maximum current of the switching power supply.
F69	Anti-smash Port Multiplexing	0	0-6	Range: 0-6, Default: 0 0 Anti-smash: When a signal is received during closing, the boom arm will immediately raise for anti-smash and remain raised (highest priority). 1 Ground Sense: Opens the boom arm when a signal is present; closes when the signal disappears. 2 Reserved

				3 Radar Anti-smash: When the boom arm is fully open, if a person passes in front of a vehicle and triggers the radar, the boom arm will not close. Closing must be triggered by a valid signal from a vehicle detector through the ground sense input. 4 Open 5 Close 6 Stop
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5 Error Code and Solution

Error Code		Solve
NUL	Limit Not Detected	1. When "NUL" is displayed on the controller after power-up, it indicates that the controller has not yet found the limit. After a normal "Open" or "Close" command is given, the controller will find the limit according to the set speed and position.
E01	Motor Stall	1. Abnormality: Obstruction occurs during boom arm operation. If the obstruction has been removed and the boom arm operates normally on the next cycle, the fault will clear automatically. Otherwise, check whether any obstacles are present in the motor and remove them. 2. The motor drive wire may be disconnected or loose. Secure the connection or reconnect.
E02	Unable to detect motor or Hall error	1. The motor Hall signal wire may be disconnected or loose. Secure the connection or reconnect. 2. The Hall circuit inside the motor is faulty. Replace the motor. 3. The Hall circuit on the controller is faulty. Replace the controller.
E03	Motor Over-current	1. The current exceeds the set range during motor operation. If the current returns to normal on the next run, the fault will clear automatically. 2. If this fault occurs after increasing the boom arm speed, either increase the overload protection current(F67) or reduce the boom arm speed. 3. There may be a short circuit in the motor drive wire or in the motor's internal coils.
E05	Unlearned Route	1. The controller requires adaptation when first used. After pressing the "+" and "-" buttons to perform one open and one close, the

		device will automatically learn and save the travel positions, and this fault code will clear automatically. The travel positions do not need to be learned again after a subsequent power cycle. 2. Check whether the motor drive wire and Hall signal cable are connected correctly and whether the terminals are secure. After confirming proper wiring, power cycle the controller and follow the procedure described in step 1 above.
E06	Remote Control Mismatch	1. When pairing the remote control, if the current remote control type does not match the original type, it is recommended to replace it with a new remote control for learning. If you still wish to learn this remote control, it is recommended to clear all learned remote controls before learning it.
E07	Remote Control Pairing Duplicate	1. The current remote control has already been paired and does not need to be learned again.
E08	Power Supply Voltage Low	1. The switching power supply voltage is too low. If the fault persists after disconnecting the switching power supply for approximately 1 minute and then reconnecting it, it is recommended to replace the switching power supply. 2. Check the label on the switching power supply. The output voltage of the switching power supply should be DC 24V.
E10	Boom Arm Abnormally Lifted	1. After the boom arm has fully closed, if the boom arm is manually lifted, the controller will apply a counter-force to prevent lifting and report this error. This fault will clear automatically upon receiving a normal open command. 2. After the boom arm has fully closed, if the boom arm is lifted by spring tension or pushed up by a support rod, readjust the horizontal position to ensure the boom arm cannot be lifted or pushed up.

6 Product Packing List

Material	Quantity
Barrier Machine	1
Barrier Boom	1
Wireless Remote	2
Keys	2
Screw kit	1
Chassis Pressure Plate	2
Conformity Certificate	1

7 Warranty

This product promises a warranty period of 1 years. Upon normal use of the product, damages are covered by the warranty. However, damages caused by the following conditions are not covered by the warranty.

- Damages caused by incorrect operation and violation of operating procedures.
- Damages caused by repairing the product without authorization.
- Abnormalities and damages caused by extremely harsh operating conditions and operating environment beyond the machine's ability to withstand.
- Damages caused by irresistible factors (such as earthquake, tsunami, typhoon).

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