



# Boom Barrier

## User's Manual



# Foreword

## General

This manual introduces the structure, installation, and maintenance of the boom barrier (hereinafter referred to as the "Barrier").





## Models

Model	Description
DHI-IPMECD-2031-RM1515-T20	Variable frequency boom barrier with 3 m (9.84 ft) folding arm (at the right side), each of the two sections of the arm is 1.5 m (4.92 ft) Opening/closing time: 2 s
DHI-IPMECD-2031-LM1515-T20	Variable frequency boom barrier with 3 m (9.84 ft) folding arm (at the left side), each of the two sections of the arm is 1.5 m (4.92 ft) Opening/closing time: 2 s
DHI-IPMECD-2031-RM2020-T20	Variable frequency boom barrier with 4 m (13.12 ft) folding arm (at the right side), each of the two sections of the arm is 2 m (6.56 ft) Opening/closing time: 2 s
DHI-IPMECD-2031-LM2020-T20	Variable frequency boom barrier with 4 m (13.12 ft) folding arm (at the left side), each of the two sections of the arm is 2 m (6.56 ft) Opening/closing time: 2 s
DHI-IPMECD-2031-RM2525-T30	Variable frequency boom barrier with 5 m (16.40 ft) folding arm (at the right side), each of the two sections of the arm is 2.5 m (8.20 ft) Opening/closing time: 3 s
DHI-IPMECD-2031-LM2525-T30	Variable frequency boom barrier with 5 m (16.40 ft) folding arm (at the left side), each of the two sections of the arm is 2.5 m (8.20 ft) Opening/closing time: 3 s
DHI-IPMECD-2032-RM15-T10	Variable frequency boom barrier with 1.5 m (4.92 ft) straight arm (at the right side) Opening/closing time: 1 s
DHI-IPMECD-2032-LM15-T10	Variable frequency boom barrier with 1.5 m (4.92 ft) straight arm (at the left side) Opening/closing time: 1 s
DHI-IPMECD-2032-RM30-T10	Variable frequency boom barrier with 3 m (9.84 ft) straight arm (at the right side) Opening/closing time: 1 s

DHI-IPMECD-2032-LM30-T10	Variable frequency boom barrier with 3 m (9.84 ft) straight arm (at the left side) Opening/closing time: 1 s
DHI-IPMECD-2032-RM35-T15	Variable frequency boom barrier with 3.5 m (11.48 ft) straight arm (at the right side) Opening/closing time: 1.5 s
DHI-IPMECD-2032-LM35-T15	Variable frequency boom barrier with 3.5 m (11.48 ft) straight arm (at the left side) Opening/closing time: 1.5 s
DHI-IPMECD-2032-RM40-T20	Variable frequency boom barrier with 4 m (13.12 ft) straight arm (at the right side) Opening/closing time: 2 s
DHI-IPMECD-2032-LM40-T20	Variable frequency boom barrier with 4 m (13.12 ft) straight arm (at the left side) Opening/closing time: 2 s
DHI-IPMECD-2032-RM45-T25	Variable frequency boom barrier with 4.5 m (14.76 ft) straight arm (at the right side) Opening/closing time: 2.5 s
DHI-IPMECD-2032-LM45-T25	Variable frequency boom barrier with 4.5 m (14.76 ft) straight arm (at the left side) Opening/closing time: 2.5 s
DHI-IPMECD-2032-RM50-T30	Variable frequency boom barrier with 5 m (16.40 ft) straight arm (at the right side) Opening/closing time: 3 s
DHI-IPMECD-2032-LM50-T30	Variable frequency boom barrier with 5 m (16.40 ft) straight arm (at the left side) Opening/closing time: 3 s
DHI-IPMECD-2032-RM55-T35	Variable frequency boom barrier with 5.5 m (18.04 ft) straight arm (at the right side) Opening/closing time: 3.5 s
DHI-IPMECD-2032-LM55-T35	Variable frequency boom barrier with 5.5 m (18.04 ft) straight arm (at the left side) Opening/closing time: 3.5 s
DHI-IPMECD-2032-RM60-T40	Variable frequency boom barrier with 6 m (19.69 ft) straight arm (at the right side) Opening/closing time: 4 s
DHI-IPMECD-2032-LM60-T40	Variable frequency boom barrier with 6 m (19.69 ft) straight arm (at the left side) Opening/closing time: 4 s

## Safety Instructions

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, may result in property damage, data loss, lower performance, or unpredictable result.
 NOTE	Provides additional information as the emphasis and supplement to the text.

## Revision History

Version	Revision Content	Release Date
V1.0.0	First release.	October 2020

## About the Manual

- The manual is for reference only. If there is inconsistency between the manual and the actual product, the actual product shall prevail.
- We are not liable for any loss caused by the operations that do not comply with the manual.
- The manual would be updated according to the latest laws and regulations of related regions. For detailed information, see the paper manual, CD-ROM, QR code or our official website. If there is inconsistency between paper manual and the electronic version, the electronic version shall prevail.
- All the designs and software are subject to change without prior written notice. The product updates might cause some differences between the actual product and the manual. Please contact the customer service for the latest program and supplementary documentation.
- There still might be deviation in technical data, functions and operations description, or errors in print. If there is any doubt or dispute, please refer to our final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and the company names in the manual are the properties of their respective owners.
- Please visit our website, contact the supplier or customer service if there is any problem occurred when using the device.
- If there is any uncertainty or controversy, please refer to our final explanation.

# Important Safeguards and Warnings

This chapter introduces the contents covering proper handling of the Barrier, hazard prevention, and prevention of property damage. Read these contents carefully before using the Barrier, comply with them when using, and keep the manual well for future reference.

## Power Requirements

- Improper battery use might result in fire, explosion, or inflammation.
- When replacing battery, make sure that the same model is used.
- Use the recommended power cables in the region and conform to the rated power specification.
- Use the power adapter provided with the Barrier; otherwise, it might result in people injury and device damage.
- The power source shall conform to the requirement of the Safety Extra Low Voltage (SELV) standard, and supply power with rated voltage which conforms to Limited power Source requirement according to IEC60950-1. Note that the power supply requirement is subject to the device label.
- Connect device (type-I structure) to the power socket with protective earthing.
- The appliance coupler is a disconnection device. Keep a convenient angle when using it.

## Application Environment Requirements

- Do not aim the Barrier at strong light (such as lighting, sunlight) to focus.
- Transport, use and store the Barrier under the allowed humidity and temperature conditions.
- Prevent any liquid from flowing into the Barrier.
- Install the Barrier in a well-ventilated place, and do not block the ventilation of the Barrier.
- Do not press, vibrate or soak the Barrier during transportation, storage and installation.
- Pack the Barrier with packaging materials provided by its manufacturer or materials with the same quality before transporting it.
- Use the Barrier with a lightning protector to improve the lightning protection performance.
- Ground the Barrier to improve its reliability.

## Operation and Maintenance Requirements

- When the Barrier is working:
  - ◇ Do not stand under the barrier arm;
  - ◇ Do not touch any part or component of the Barrier;
  - ◇ Do not open the cover of the barrier casing to avoid accidents.
- The Barrier is delivered with its internal wiring connected by default. In general conditions do not change the wiring. You only need to connect the Barrier to 220V power supply.
- The barrier casing must be grounded, and a leakage protection switch must be installed at the power supply end.
- Do not place objects, or stand or walk under the Barrier when the barrier arm is falling.

- In case of power failure, turn off the power first, and then swing the barrier arm to a vertical position with the handwheel.
- When the Barrier is delivered, the length of the barrier arm and the balance spring have been matched to a balanced status, and there is no need to change the length and weight of the barrier arm. If necessary, contact professionals.
- External infrared protection devices must be installed by professionals.
- With the spring installed, do not remove barrier arm when it is in a horizontal position.
- Do not operate the clutch when the Barrier is equipped with a spring and the chuck of the barrier arm is in a horizontal position, or no barrier arm is installed.
- When closing the Barrier, do not bump the chuck of the barrier arm, otherwise the primer will rust easily.
- Do not disassemble the Barrier by yourself.
- Use a soft dry and clean cloth dipped in a small amount of neutral detergent to clean the Barrier.
- Use accessories specified by the manufacturer and have them installed and maintained by professionals.
- When using laser beam equipment, avoid the surface of radiation.
- Do not provide two or more power supply methods to the Barrier at the same time, otherwise the Barrier might be damaged.
- It is necessary to frequently remove dust and debris on the surface of the casing and keep the surface of the Barrier clean.
- Check the fasteners once a month of loose or falling off conditions and fasten them in time.
- Inject lubricating oil into the movable connection accessories every three months to maintain a good lubrication state.
- Check the balance spring after running 30,000 times and make balance adjustments in time.
- Consult professionals to check the wear of wearing parts every six months and replace them in time.

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# 1 Introduction

## 1.1 Overview

The Barrier uses digital variable frequency servo controller, allowing stepless speed control of the drive motor without loss of output torque. The opening and closing time of the Barrier can be set from 1 s to 4 s and from 2 s to 6 s respectively, and the Barrier can be controlled by a remote control, with a maximum distance of 50 m.

The Barrier is suitable for scenes such as parking entrance and exit control for supermarkets, hotels, governments, schools, airports, factories, public security and judiciary authorities and more.

## 1.2 Features

### Servo Self-optimization of Barrier Arm Stability

The rising and falling stability of the barrier arm can be set up respectively, after which, regardless of operation speed, the variable frequency servo controller can automatically detect, self-optimize, and eliminate barrier arm shaking. In this way, user experience can be improved and the mechanical and electrical service life of the Barrier can be greatly extended.

### Free of Sensor and Electrical Maintenance

The Barrier uses brushless motor with angle encoder integrated internally. All-digital servo controller makes in-place detection free of sensor. No need of electrical maintenance avoids device wearing and hidden troubles.

### Anti-condensation in Cold Weather

The barrier motor is still powered on with low consumption when it stops working, which makes the motor temperature stay normal even in freezing cold environment. With the lubricating oil not frozen, the Barrier can work normally.

### Auto Opening in Case of Power Failure

If the angle between the barrier arm and the horizontal plane is smaller than 45° during power failure, the barrier arm will automatically fall to the closing state by default. However, if proper rubber gaskets and springs for power-off opening are used, when the Barrier is suddenly powered off, the barrier arm will automatically and slowly rise to the opening state.



## Manual Opening, Closing and Locking of Barrier Arm during Power Failure

During power failure, manually rotate the manual handle or locking handle to operate the barrier arm.

The barrier arm can be locked at any position between horizontal and vertical positions. When the barrier motor stops, swipe down the locking button on the manual handle or locking handle to lock the Barrier. It will not be unlocked even if it is powered on. Swipe up the locking button on the manual handle or locking handle to unlock the Barrier.



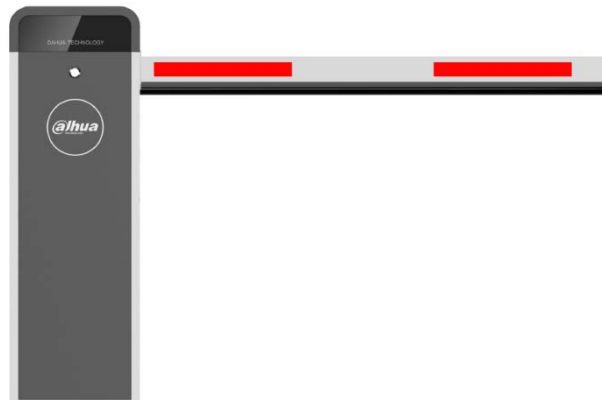
Do not use this function when the power is on; otherwise it might cause hand injury and serious damage to the motor.

# 2 Structure

## 2.1 Appearance

### Straight Arm Barrier

Figure 2-1 Straight arm barrier



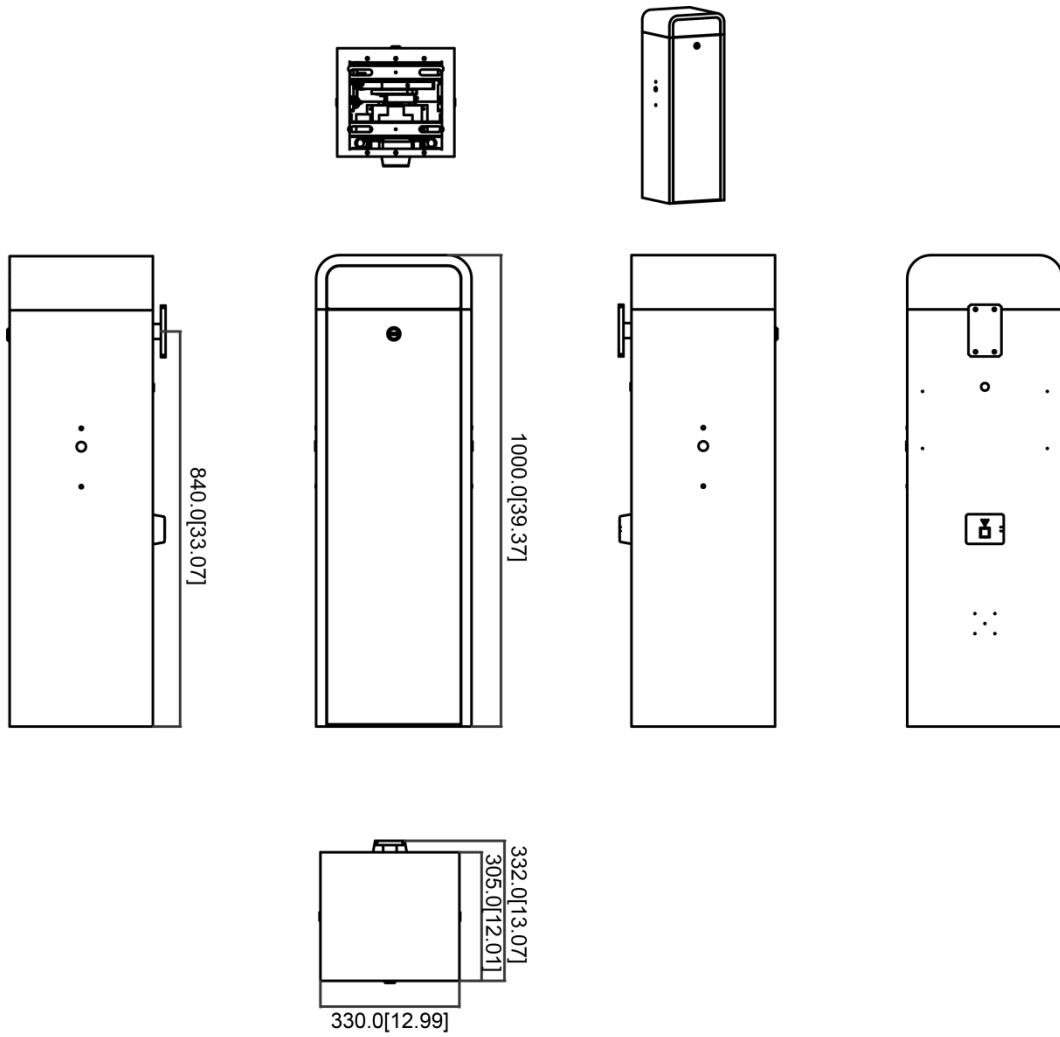
### Folding Arm Barrier

Figure 2-2 Folding arm barrier



## 2.2 Dimensions

Figure 2-3 Dimensions (mm [inch])



## 2.3 Components

Figure 2-4 Components

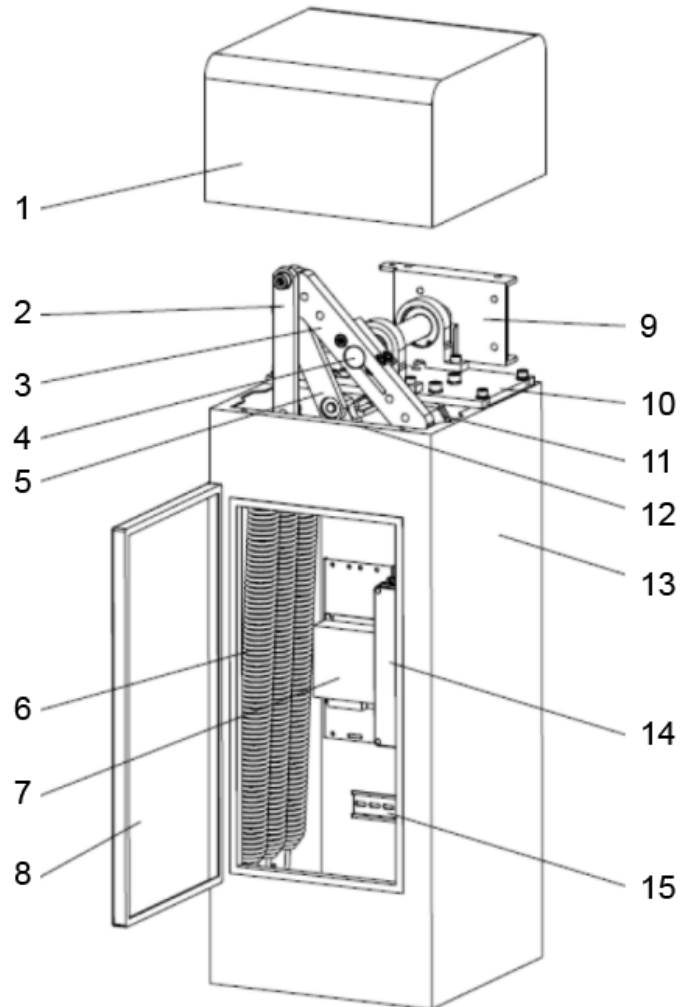


Table 2-1 Description of components

No.	Description	No.	Description
1	Cover	9	Lever
2	Spring rod	10	Base
3	Driven counterweight rocker arm	11	Motor
4	Mainshaft	12	Driving rocker arm
5	Connecting rod	13	Casing
6	Counterweight spring	14	Controller
7	Power supply	15	Ground
8	Door	—	—

# 3 Installation

## 3.1 Installation Position Requirements

- Conspicuous position.
- The barrier arm surface faces outward (intersection).
- The bottom of the Barrier must be on the same plane as the road.

After confirming the position, build the barrier foundation based on the site conditions. Cast-in-place foundation must be built on the non-concrete ground. On the concrete ground, you can directly fix the casing with the expansion bolts that come with the Barrier.

## 3.2 Installing Casing

Step 1 Take out the accessories that come with the Barrier.

Step 2 Place the casing at the selected position. Open the door and use a screwdriver to draw a line on the ground along the waist-type groove of the base plate, then move the casing away.

Step 3 Make four expansion bolt holes of corresponding dimensions.

Step 4 Drill the expansion bolt holes with a depth of 110 mm–120 mm, and place expansion bolts into the holes. Adjust the horizontal and vertical angle of the casing, and then tighten the nuts.

Figure 3-1 Dimensions of casing base (mm [inch])

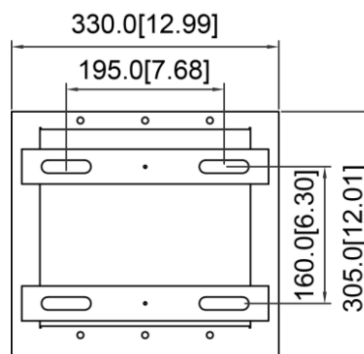


Figure 3-2 Install casing

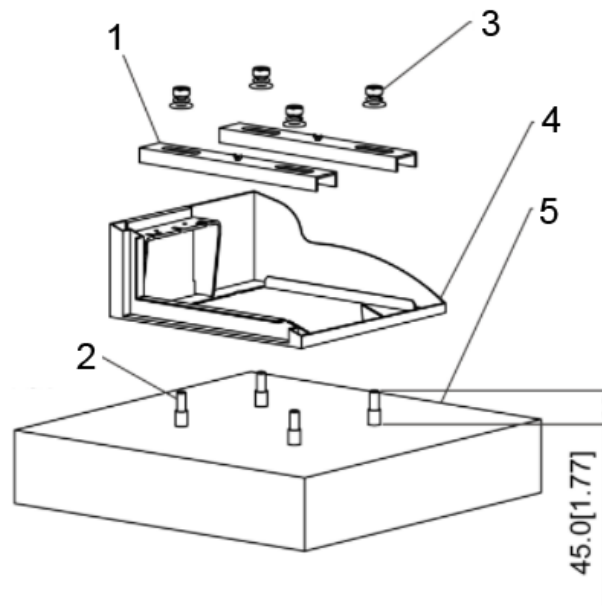


Table 3-1 Description of installation components

No.	Description	No.	Description
1	Two metal plates	4	Casing of the Barrier
2	Four M12 × 120 anchor bolts	5	Concrete foundation or pavement
3	Two sets of M12 nuts, spring gaskets and flat gaskets	—	—

### 3.3 Installing Barrier Arm

Take out barrier arm accessories, and then install the straight arm or the folding arm shown as the following figures.

Figure 3-3 Installing straight arm

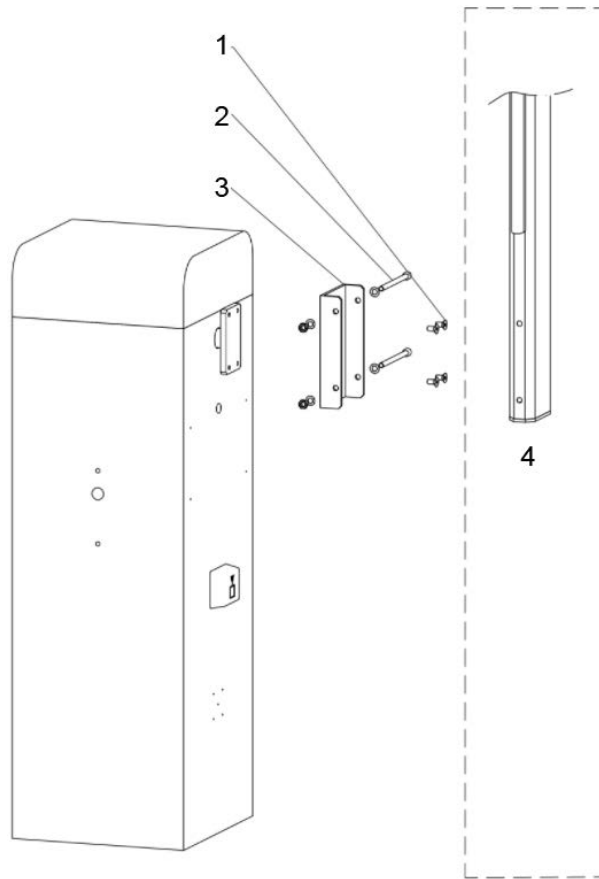


Table 3-2 Description

No.	Description	No.	Description
1	Four M8 × 16 countersunk bolts	3	Lever
2	Two sets of M8 × 120 bolts, flat gaskets and nuts	4	Straight arm

Figure 3-4 Installing folding arm

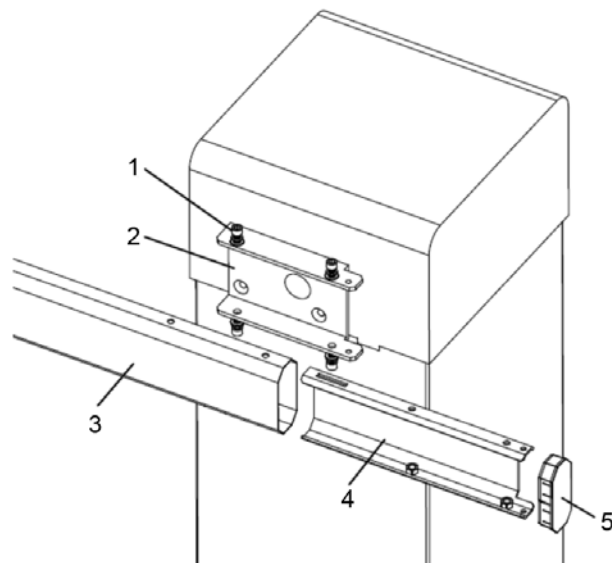


Table 3-3 Description

No.	Description	No.	Description
1	Screw	4	Metal plate
2	Lever	5	Rear cover
3	Arm	—	—

### 3.4 Adjusting Barrier Arm Length

The operating parameters are adjusted before delivery according to the required barrier arm length. When the Barrier is delivered on site, you need to adjust the mechanical balance of the Barrier again to keep the barrier arm in horizontal state.

**Step 1** Determine whether to shorten the barrier arm as required on site, and then install the barrier arm on the Barrier. See "3.3 Installing Barrier Arm."

**Step 2** In power-off state, select the right number of springs and adjust the tightness of each spring to keep the barrier arm suspended at about 40°–45°.

### 3.5 Electrical Wiring

Figure 3-5 Control board ports

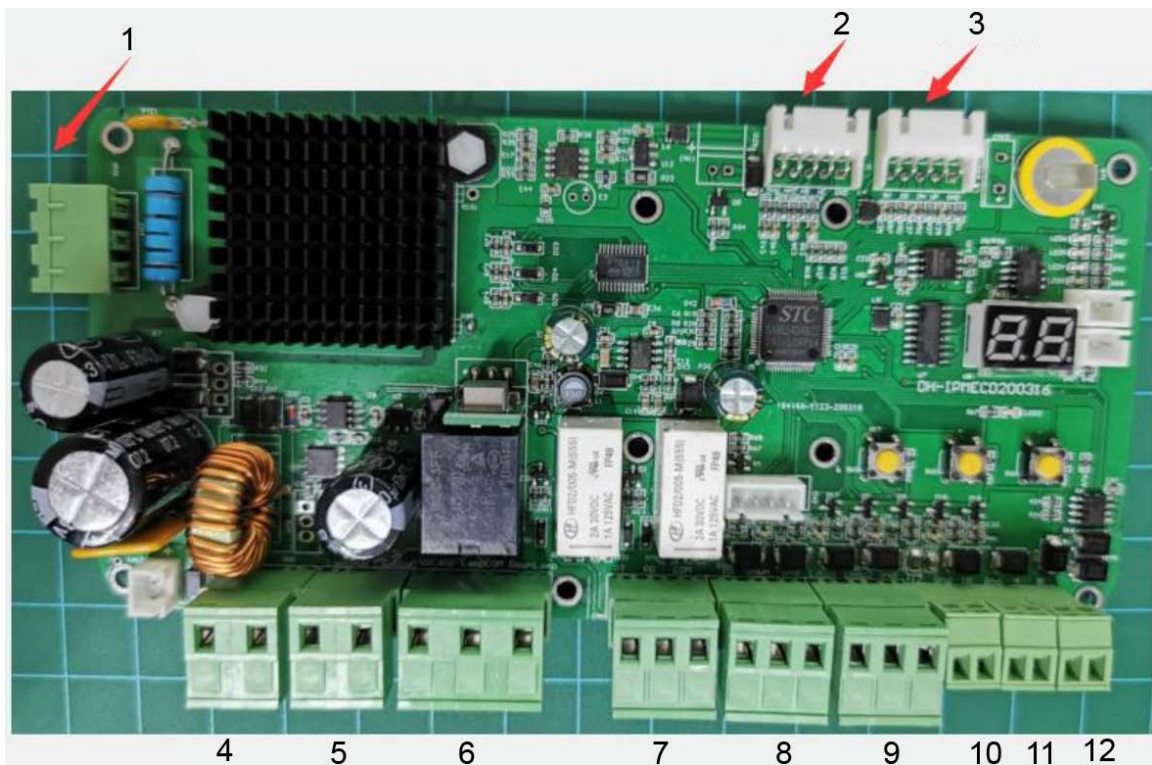


Table 3-4 Description of control board ports

No.	Description	No.	Description
1	Motor power input	7	Opened/closed status output
2	Angle gauge	8	Open/close input
3	Remote control	9	Vehicle detector input
4	24V DC power input	10	12V DC output



No.	Description	No.	Description
5	Traffic light power input	11	IR input
6	Traffic light output	12	RS-485 communication

Figure 3-6 Control board wiring

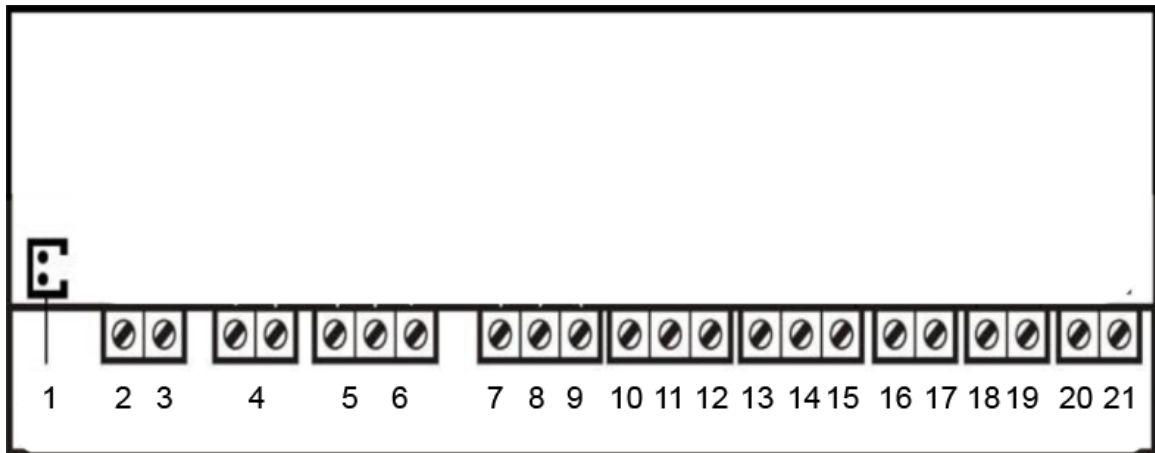


Table 3-5 Description of control board

No.	Description	No.	Description
1	Power off when arm rises	12	GND
2	24V DC power input	13	Radar loop
3	IN power output	14	Radar loop
4	Reserved	15	GND
5	Reserved	16	12V DC power input
6	Reserved	17	OUT output
7	Opened	18	Radar loop
8	Closed	19	GND
9	COM	20	RS485_A
10	Open Barrier	21	RS485_B
11	Close Barrier	—	—

## Opening and Closing Control

Opening priority (falling barrier arm will rise if there is a rise signal) and closing priority (rising barrier arm will fall if there is a fall signal) functions are available. It can be controlled by digital on-off input, remote control, and RS-485 serial commands.

## Automatic Rise when the Barrier Arm Meets Obstacle (Pressure Wave Anti-smashing)

Falling barrier arm will immediately rise to the vertical state when it meets obstacles, to protect vehicles or pedestrians. Sensitivity is adjustable.

## Loop Anti-smashing/Arm Falling

The falling barrier arm will immediately rise to vertical position if the LOOP1 signal is triggered, during which the arm will not fall down until the loop input returns to normal state.



This function is not available when the angle between the arm and water level smaller than 9°.

## Rising Priority

If a vehicle is about to pass when the barrier arm falls, the security guard can press the rising signal on the remote control to make it immediately rise to the opening state, avoiding the vehicle being smashed.

## Auto Delay Closing

When enabling this function, after the barrier arm rises to the vertical position, it will automatically fall to original place after certain delay if neither rising nor falling inputs are triggered. The delay time (1 s–90 s) and enable/disable switch can be configured by user through programming. It is disabled by default.

## Auto Closing by Triggering Loop 1

If neither rising nor falling inputs are triggered, the risen barrier arm will automatically fall to original position after vehicle leaves loop 1.

## Auto Opening by Triggering Loop 2

The LOOP2 input will only trigger the barrier to open when its arm is at horizontal and closed state, auto-closing of the Barrier is not available.

## Smooth Mode

Press and hold the stop key on the remote control for 3 seconds, and the barrier arm automatically rises and keeps vertical. Any falling action will be ignored until you press and hold the close key for 3 seconds to disable the smooth mode.

## Traffic Light Control

After the barrier arm rises to two-thirds, the relay is closed; the normally open port (connecting the green light) outputs 220V AC, and the normally closed port (connecting the red light) is powered off.

After the barrier arm falls to one-third, the relay is released; the normally open port (connecting the green light) is powered off, and the normally closed port (connecting the red light) outputs 220V AC. You can also configure dry contacts or other power outputs.

# 4 Control Board Settings

There are three buttons (**SET**, **+**, **-**) on the control board. During normal operation, **+** is manual rising button; **-** is manual falling button; the LED displays the position state value of the barrier arm (vertical 0 and horizontal 95) or error code in real time.



When configuring the parameters, they are recorded after the barrier arm rises and the LED displays **0**.

**Step 1** Press **SET** (first) and **+** at the same time to enter the programming mode. At the beginning, the LED displays **F1** by default.

**Step 2** Press **SET** to select function. Every time when you press **SET**, the function number is increased by 1 until 9 and then returns to 1 and repeat.

Table 4-1 Function number description

Function number	Description
F1	Rising deceleration point. Incorrect value might cause the barrier arm to rise too slowly or violently shake. Factory default: 35.
F2	Falling deceleration point. Incorrect value might cause the barrier arm to fall too slowly or violently shake. Factory default: 60.
F3	Rebound threshold: 12–99. The larger the value, the slower the speed. Set it to 99 to disable this function. Factory default: 50.
F4	<ul style="list-style-type: none"> <li>Address: 1–99.</li> <li>Factory default: 99.</li> </ul>
F5	<ul style="list-style-type: none"> <li>Auto closing delay: 1 s–99 s. Set it to 91–99 to disable this function.</li> <li>Factory default: 99.</li> </ul>
F6	<ul style="list-style-type: none"> <li>Rising speed: 0–80. The smaller the value, the faster the speed.</li> <li>Factory default: 10 for a reduction ratio of 50 and 20 for a reduction ratio of 100.</li> </ul>
F7	Falling speed: 0–80. The smaller the value, the faster the speed. Factory default: 10 for a reduction ratio of 50 and 20 for a reduction ratio of 100.
F9	Loop filtering time: 0 s–6 s. The larger the value, the longer the filtering time. Set it to 0 to disable this function. Factory default: 0.
C0	Left and right settings: 0 indicates right and 1 indicates left. Factory default: As required by the user.



The C function menu is

Function number	Description	
C1	Relay settings: 0/10-RL1: Outputs red and green light signals; 1/11-RL1: Outputs signals when the barrier arm is operated; 0/1-RL2: Loop output; 10/11-RL2: Rising to position output; RL3: Falling to position output. Factory default: 10.	hidden by default. You need to press and hold <b>SET</b> for 6 seconds in programming state to display the settings.
C2	Smooth function settings of remote control: 0: Disable (default); 1: Enable.	
C3	Repeat opening memory settings: 0: Disable (default); 1: Enable.	
C4	Reduction ratio settings: 0 indicates reduction ratio is 50,1 indicates 100.. Factory default: As required by the user.	
C5	Reserved. The settings cannot be modified.	
C6	Reserved. The settings cannot be modified.	

Step 3 Configure parameters.

Step 4 Under the required function number, press **+** or **-** to display parameters of the function, and then press **+** or **-** within 10 seconds to increase or decrease the parameter value. After modifying the parameters, press **SET** to display the function number again and save the parameters.

Step 5 Press **SET** (first) and **-** at the same time to exit the programming mode. The system will automatically exit the programming mode if there is no input for 30 seconds.

# 5 Maintenance and Operation

It is recommended to inspect the following items every three months:

- Screw looseness

Open the upper cover of the Barrier, and control the barrier arm up and down to inspect whether the screws of the spring rod are loose and whether the retainer rings of the connecting rod are in place. If any of them is not in place the barrier arm will fall off and even smash vehicles. If the screws are loose, first cut off the power, manually tighten the screws, and then power on.

Figure 5-1 Screw looseness

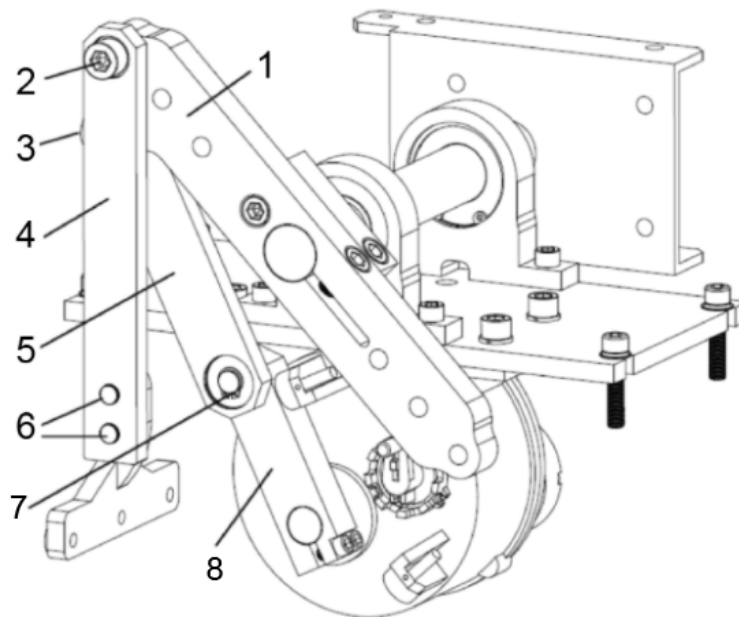


Table 5-1 Description of screw looseness

No.	Description	No.	Description
1	Driven rocker arm	5	Connecting rod
2	M12 screw	6	M10 screw
3, 7	Retainer ring	8	Driving rocker arm
4	Spring rod	—	—

- Damage of cushion rubber gasket

Open the upper cover of the Barrier, and control the barrier arm up and down to check whether the cushion rubber gaskets are damaged when they are being impacted. Remove damaged cushion rubber gaskets and replace them with new ones.

Figure 5-2 Cushion rubber gaskets

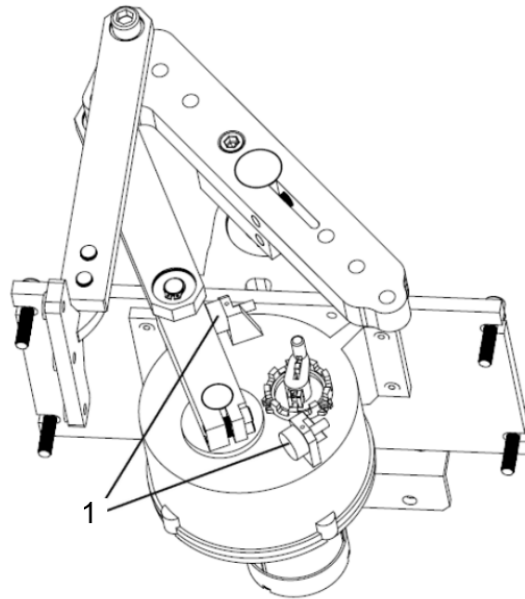


Table 5-2 Description of screw looseness

No.	Description
1	Cushion rubber gaskets

- Spring balance  
 Temporarily turn off the power, and keep the barrier arm at 40°–45° from the horizontal plane to check whether the barrier arm can be still and balanced. If not, adjust the spring tightness. For details, see "3.4 Adjusting Barrier Arm Length."
- Display of control board  
 When the Barrier works, check whether the control board LED displays the normal angle value. If an error code is displayed, find the cause and solve the problem.

# 6 Common Faults and Troubleshooting

## 6.1 Error Code

Table 6-1 Error code description

Error Code	Description
E1	Pulse angle gauge or motor error code.
E3	Rising input error code: Continuous input short circuit for more than 10 seconds is considered as an error.
E4	Falling input error code: Continuous input short circuit for more than 10 seconds is considered as an error.
E5	#1 loop input error code: Continuous input short circuit for more than 10 seconds is considered as an error.
E6	IR input error code: Continuous input short circuit for more than 10 seconds is considered as an error.
E7	Software smooth mode code.
E8	Power failure opening code.
EE	Memory opening code.

## 6.2 Analysis of Common Faults

Table 6-2 Analysis of Common Faults

FAQ	Possible Causes	Solutions
Falling barrier arm suddenly rises in the midway.	If the F3 value is smaller than 25, because of the high rebound sensitivity, barrier arm inertia or wind might cause this problem.	Adjust the rebound value F3 to 50.
	Spring is too tight.	Loosen the spring.
The barrier arm cannot be controlled up and down, while the control board LED displays error code E1.	If the barrier arm cannot rise during power-on, but the control board LED displays the movement angle value when you manually rise the barrier arm, it means that the motor is damaged.	Replace the motor.

FAQ	Possible Causes	Solutions
	If the barrier arm moves slowly, but the control board LED does not display the movement angle value, it means that the angle encoder of the motor is damaged.	Replace the angle encoder of the motor.
The barrier arm violently shakes when it rises or falls.	The barrier arm is not tightly fixed.	Check and fix the barrier arm again.
	The transmission mechanism in the Barrier is loose.	Adjust the limit screws and cushion rubber gaskets of the transmission mechanism.
	The balance spring in the Barrier is broken.	Replace it with a new one of the same specifications.
The controller, rather than the remote control, can control the barrier arm to rise or fall.	The battery of remote control has run out of power.	Check whether the indicator light is on when pressing the remote control. If not, disassemble the remote control to check the condition and position of the battery, or see whether the antenna is intact.
	The remote control is damaged.	Each Barrier is equipped with two wireless remote controls. If only one of them does not work, it means that the remote control is damaged. If both of them do not work, the receiver might be damaged.
	The receiver is damaged.	
The control board is damaged.	Check whether the receiver beeps when pressing the remote control. If yes, it means that the control board is damaged.	



# Appendix 1 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations on how to create a more secured security system.

## **Mandatory actions to be taken for basic equipment network security:**

### **1. Use Strong Passwords**

Please refer to the following suggestions to set passwords:

- The length should not be less than 8 characters;
- Include at least two types of characters; character types include upper and lower case letters, numbers and symbols;
- Do not contain the account name or the account name in reverse order;
- Do not use continuous characters, such as 123, abc, etc.;
- Do not use overlapped characters, such as 111, aaa, etc.;

### **2. Update Firmware and Client Software in Time**

- According to the standard procedure in Tech-industry, we recommend to keep your equipment (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the equipment is connected to the public network, it is recommended to enable the "auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
- We suggest that you download and use the latest version of client software.

## **"Nice to have" recommendations to improve your equipment network security:**

### **1. Physical Protection**

We suggest that you perform physical protection to equipment, especially storage devices. For example, place the equipment in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable equipment (such as USB flash disk, serial port), etc.

### **2. Change Passwords Regularly**

We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

### **3. Set and Update Passwords Reset Information Timely**

The equipment supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

### **4. Enable Account Lock**

The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

## 5. Change Default HTTP and Other Service Ports

We suggest you to change default HTTP and other service ports into any set of numbers between 1024~65535, reducing the risk of outsiders being able to guess which ports you are using.

## 6. Enable HTTPS

We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

## 7. MAC Address Binding

We recommend you to bind the IP and MAC address of the gateway to the equipment, thus reducing the risk of ARP spoofing.

## 8. Assign Accounts and Privileges Reasonably

According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

## 9. Disable Unnecessary Services and Choose Secure Modes

If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

- SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up strong passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

## 10. Audio and Video Encrypted Transmission

If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

Reminder: encrypted transmission will cause some loss in transmission efficiency.

## 11. Secure Auditing

- Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
- Check equipment log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

## 12. Network Log

Due to the limited storage capacity of the equipment, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

## 13. Construct a Safe Network Environment

In order to better ensure the safety of equipment and reduce potential cyber risks, we recommend:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
- The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.

- Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
- Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.

ENABLING A SAFER SOCIETY AND SMARTER LIVING