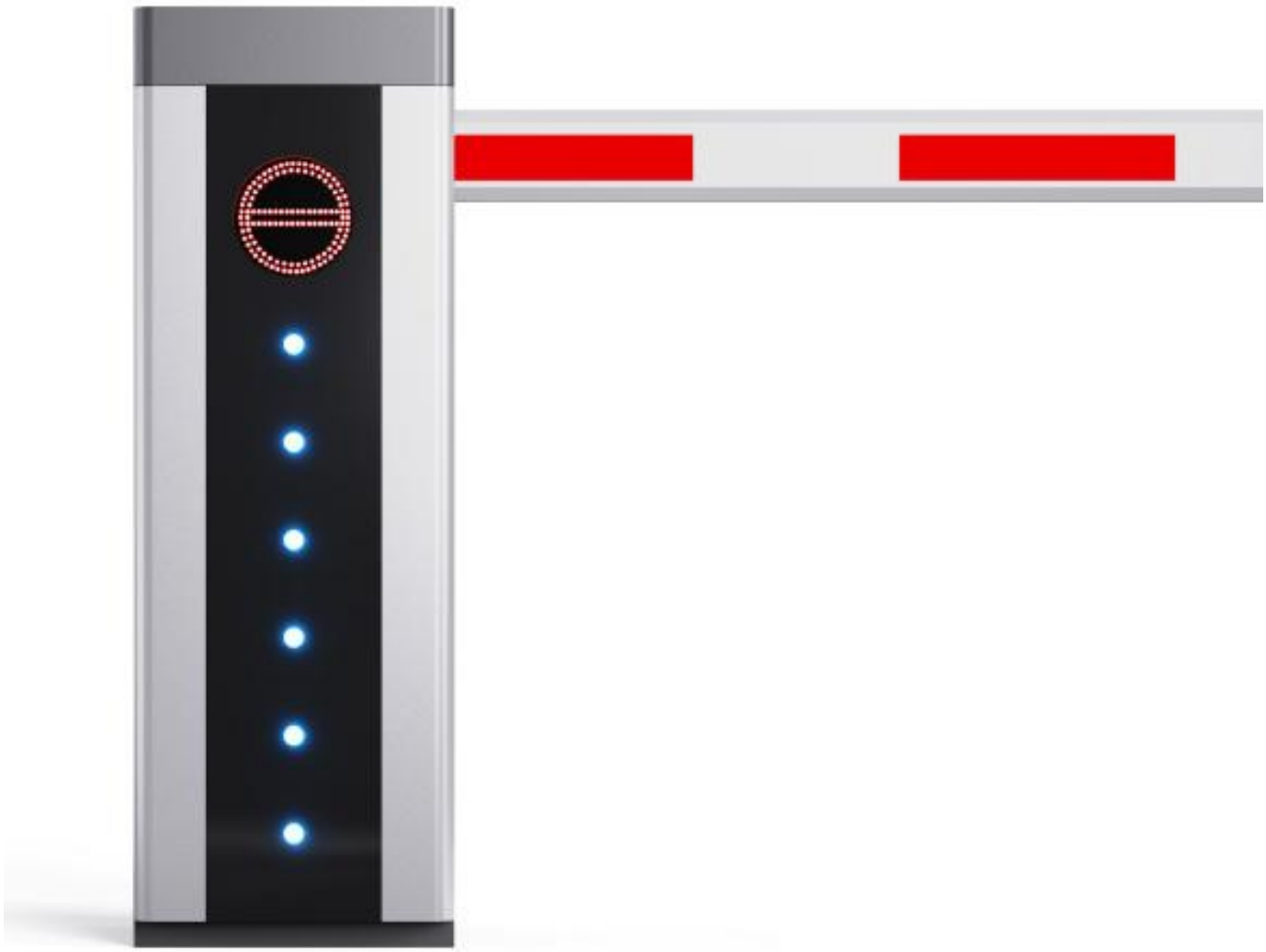
6th DC Brushless Motor Barrier Gate Manual



Model: DZ-2411B

Dear Customer,

Greetings!

Thank you for choosing our company's product. To fully leverage the product's superior performance, please read this manual carefully before use.

This manual includes information on the product's performance advantages, specifications, structural features, control interface instructions, on-site installation and debugging guidance, and the packing list. By reading this manual, you will gain a better understanding of the product's construction characteristics, usage requirements, and precautions, ensuring safe use and extending the barrier's lifespan.

For safe operation, please strictly adhere to the following guidelines:

1. To avoid personal injury, do not open the door or cover while the barrier gate is operates.
2. The barrier gate's housing must be grounded to prevent electrical shock.
3. Do not stand, walk, or place objects under the barrier arm while the barrier gate is in operation.
4. The arm and spring have been pre-matched to a balanced state before leaving the factory. To avoid balance issues, do not arbitrarily alter the length or weight of the barrier arm. If you need any changes, please consult the professional.

Also, we have provided detailed descriptions of potential issues that may arise during installation and use, looked over the causes, and offered corresponding solutions to help you address the problems you've encountered.

 We also welcome your valuable suggestions during use, and we are committed to providing you with professional and comprehensive service.

Once again, thank you for choosing our meticulously manufactured product. We look forward to having more opportunities to serve you in the future!

Catalog

1. Product Performance

The 6th DC brushless barrier gate uses the latest suspension design, overcoming the traditional issue of uneven force from side-mounted installations. It features a centrally positioned, neutral motor installation with a three-link transmission design, ensuring a compact structure and smooth operation. The spring design includes five different diameters, making balance adjustment more convenient and extending spring lifespan. This barrier gate boasts a stylish appearance, smaller motor, higher overall aesthetics, and better cost performance. It is an intelligent, avant-garde, highly secure, and reliable product with exceptional performance and quality.

1、Features

1) Operation speed can be adjusted.
2) Slow up and slow down can be adjusted.
3) The limit angle can be adjusted.
4) The barrier arm can be manually operated in case of power failure.
5) 418 frequency learning code anti-copy remote controller.
6) Infrared photocell sensor IO signal input function.
7) Loop detector and radar IO signal anti-collision signal input function.
8) Up, down and stop IO signal input function.
9) Counting (fleet) function.
10) Traffic light IO signal output function.
11) Up and down in place, normally open and normally closed signal output function.
12) Delay arm drop function.
13) Arm auto-reverse function.
14) Automatic lifting function when power is off(requires additional power storage module).
15) IO port single-key cycle up and down function.
16) Loop detector normally open and normally closed function.
17) One car and one arm to prevent toll evasion function.
18) Collision warning function (requires additional fee for installing the alarm and sensors) (optional).
19) The IO port closes the signal input function.
20) 24V storage battery input function.

2. Technical Specifications

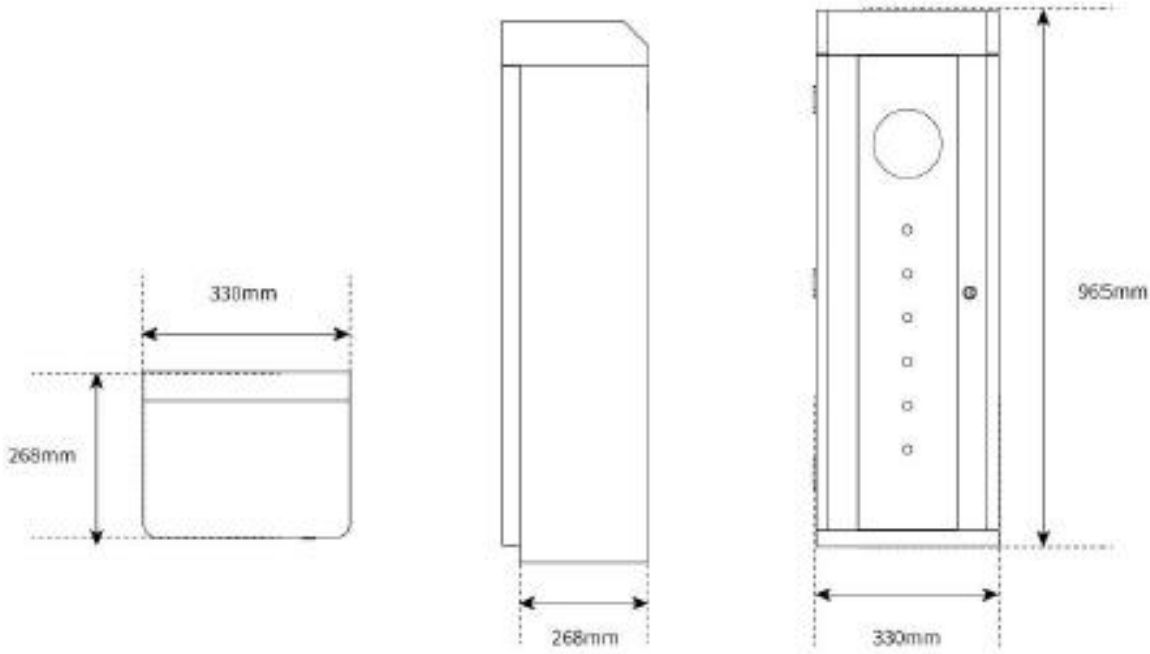
1. Operating temperature: -30°C to +80°C
2. Rated voltage: DC24V
3. Operating speed: 1.5 s to 8 s
4. Rated current: 5A
5. Rated power: 90W
6. No-load speed: 1850rpm
7. Rated speed: 1400rpm
8. Rated torque: 59.6N. m
9. Relative humidity: ≥85%
10. Remote control range: ≤50 meters (clear, sunny weather)
11. Protection level: IP54
12. Maximum arm length: 6m

3. Safety Features

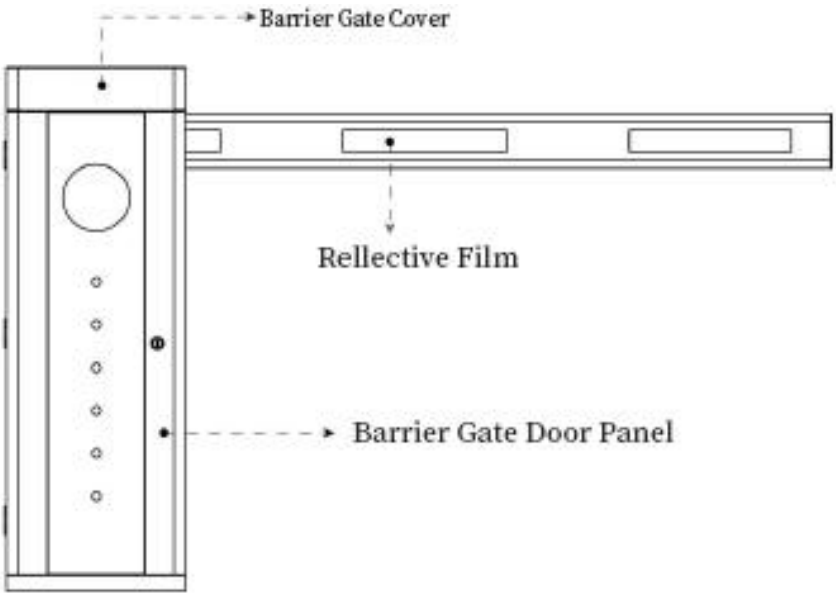
1. Auto-reverse function: the barrier boom will automatically open once meeting obstacles during its closing process to reduce the damage.
2. Ground sensing anti-smashing: When the barrier arm is falling, if it receives a ground sensing signal, it will automatically rise; the arm will not fall during the triggering period, and after the ground sensing signal is restored, the barrier arm will automatically fall to ensure safety.
3. Ground sensing priority design: When the barrier arm is falling, if an emergency occurs, as long as the ground sensing signal is received, the barrier will execute the opening and anti-smashing instructions regardless of whether it is in the opening or closing state.
4. If you choose anti-smash rubber strips and high-density foam round arms, you can also reduce the damage to people or cars caused by accidents.
5. Arm lifting priority design: When the barrier arm is closing, it will respond to the arm lifting command immediately if it is given a arm lifting command. When the barrier arm is opening, it will not respond to the arm closing command if it is given a arm closing command.

2. Product Dimensions, Structure, and Wiring Instructions

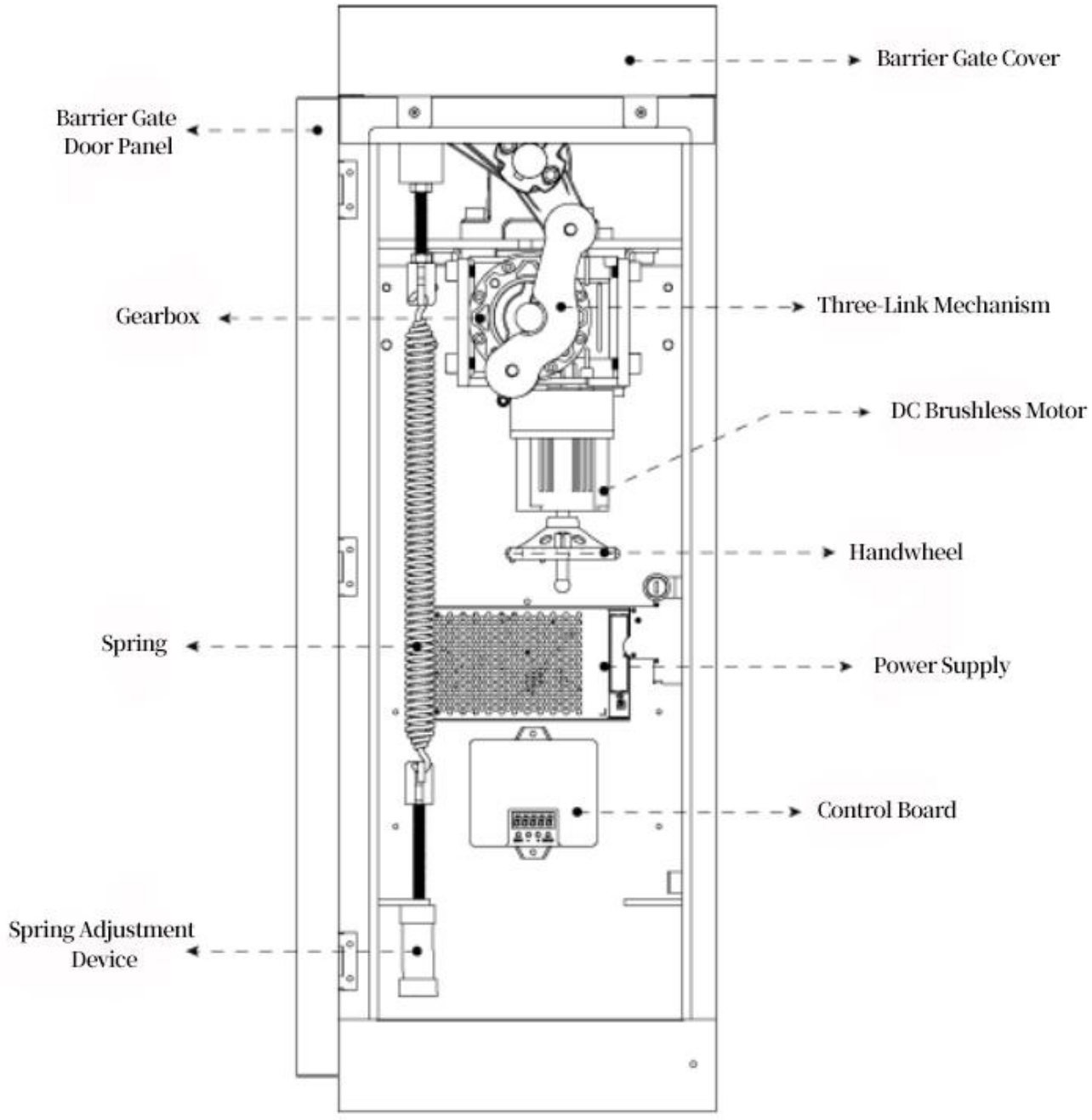
1. Specifications and Dimensions



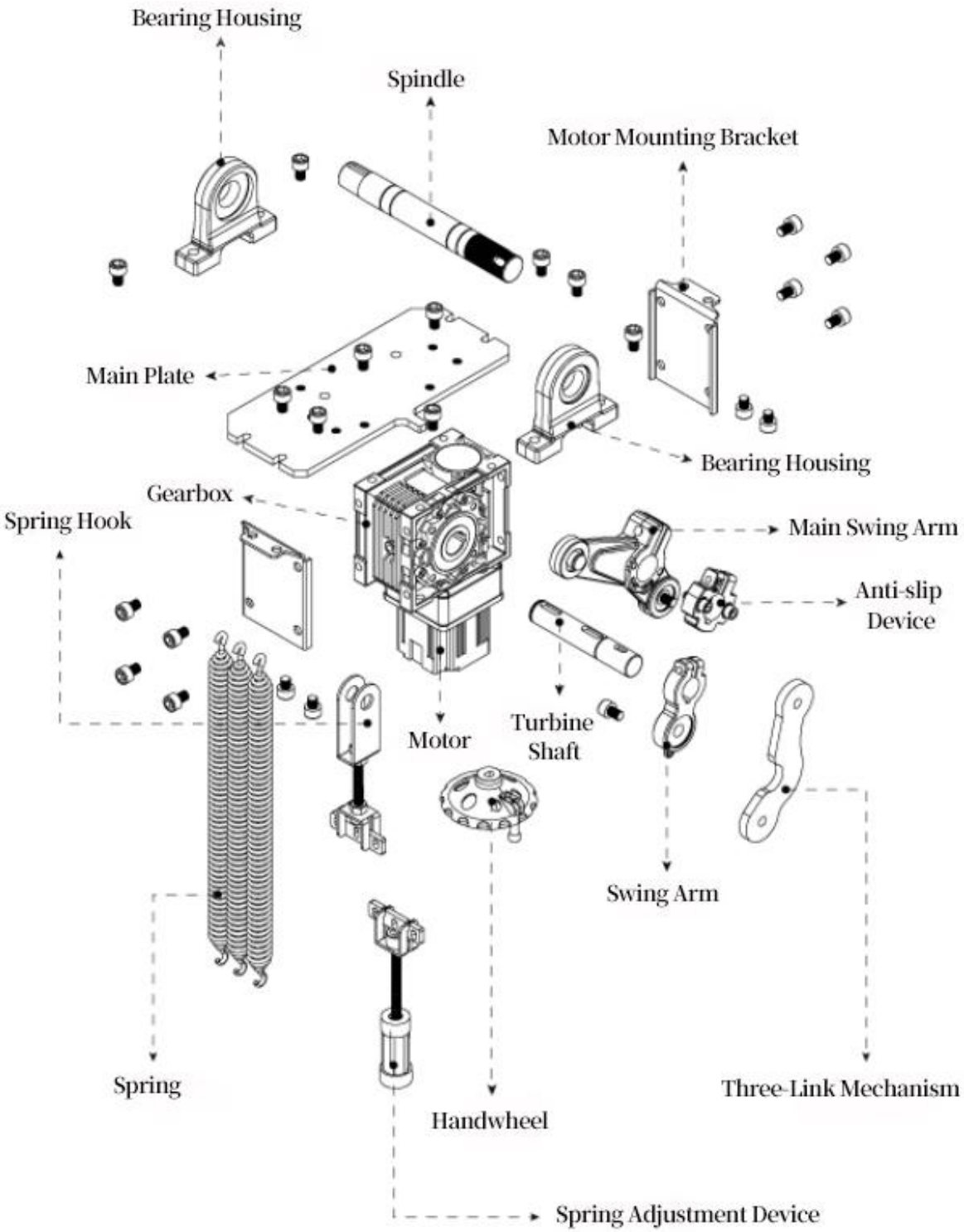
2. Product Dimensions



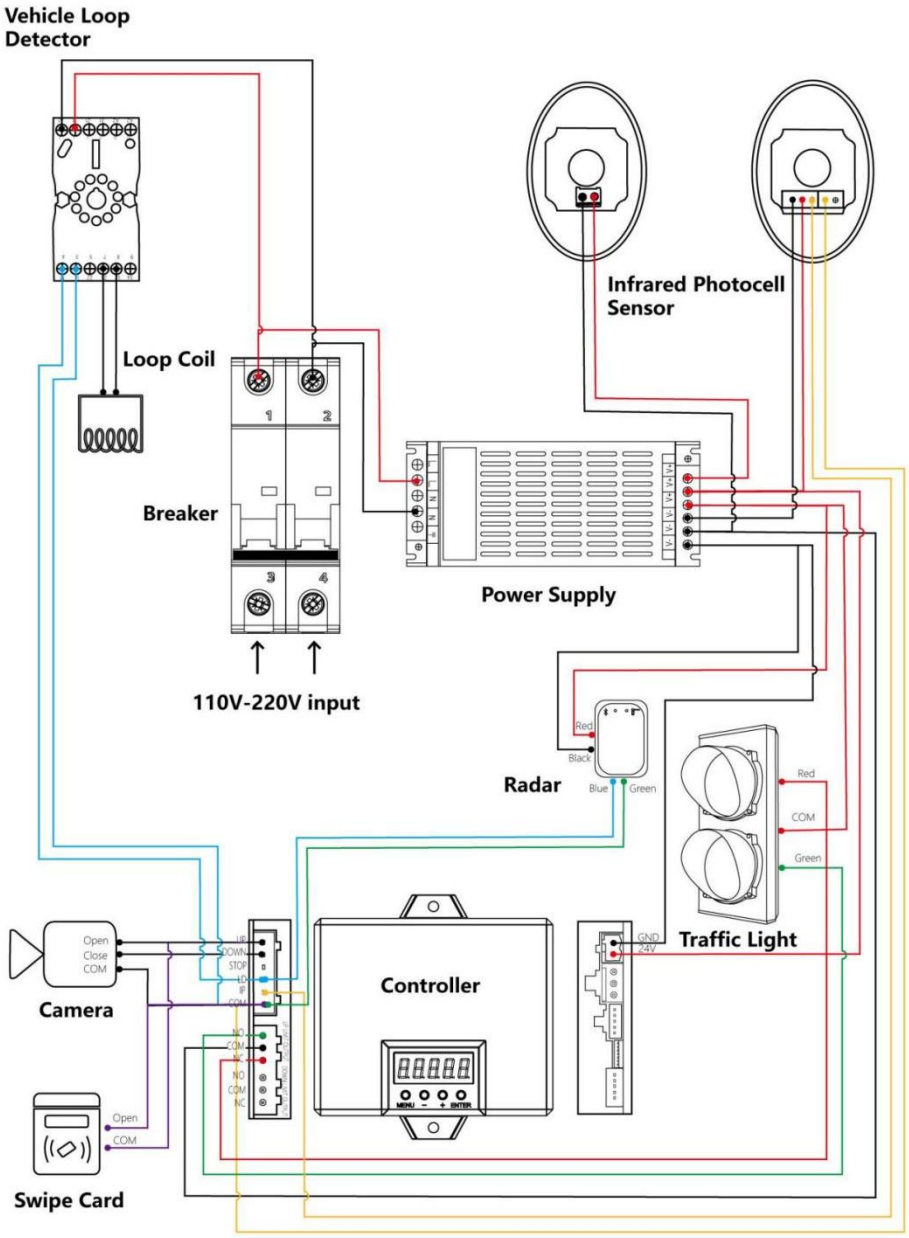
3. Internal Structure of the Barrier Gate



4. Motor Structure



5. Wiring Diagram



Friendly Reminder:

The anti-collision port serves to raise the barrier arm when triggered, and the arm will not fall after the vehicle passes.

The ground sensor port ensures that the barrier arm does not fall when triggered, and the arm will automatically fall after the vehicle has passed and the signal disappears.

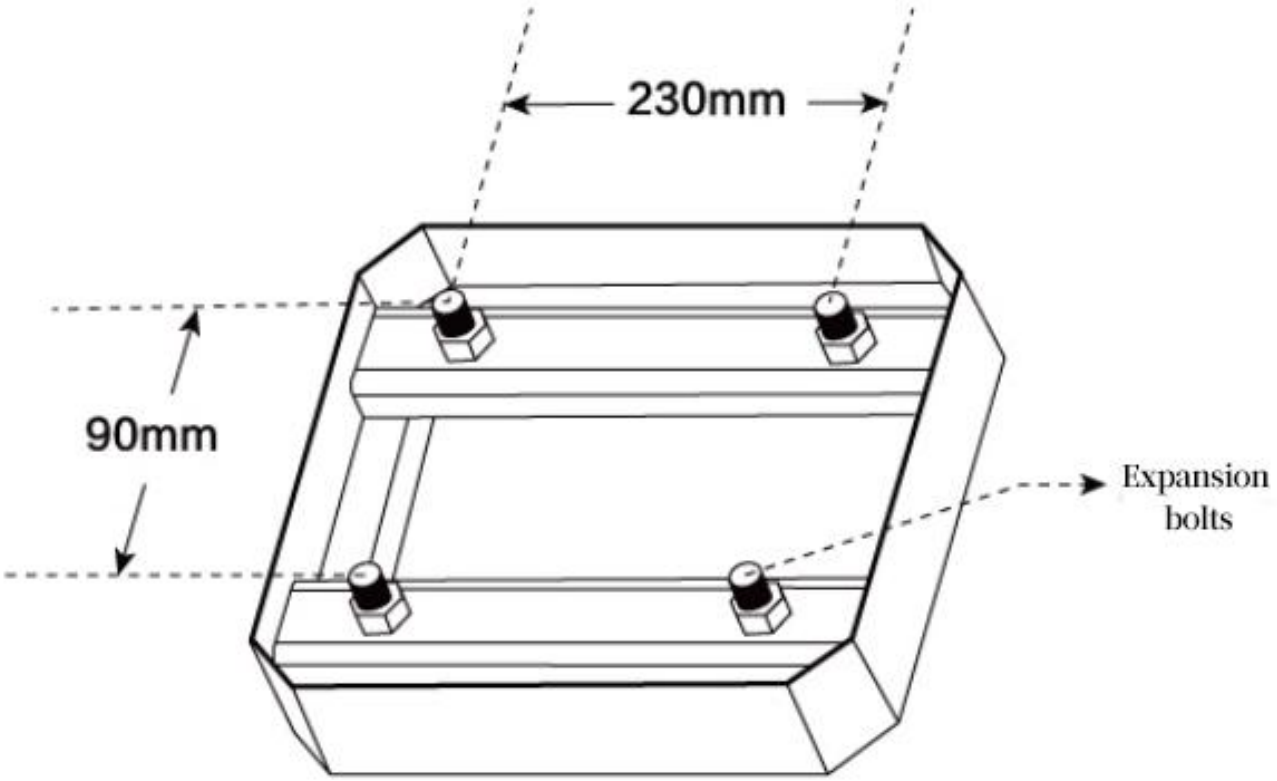
External 12V power supply devices (such as radar or infrared sensors) should not be directly powered from this controller, as it may cause abnormal rising and lowering issues, and damage resulting from such issues will not be covered under warranty.

3. Installation Instructions

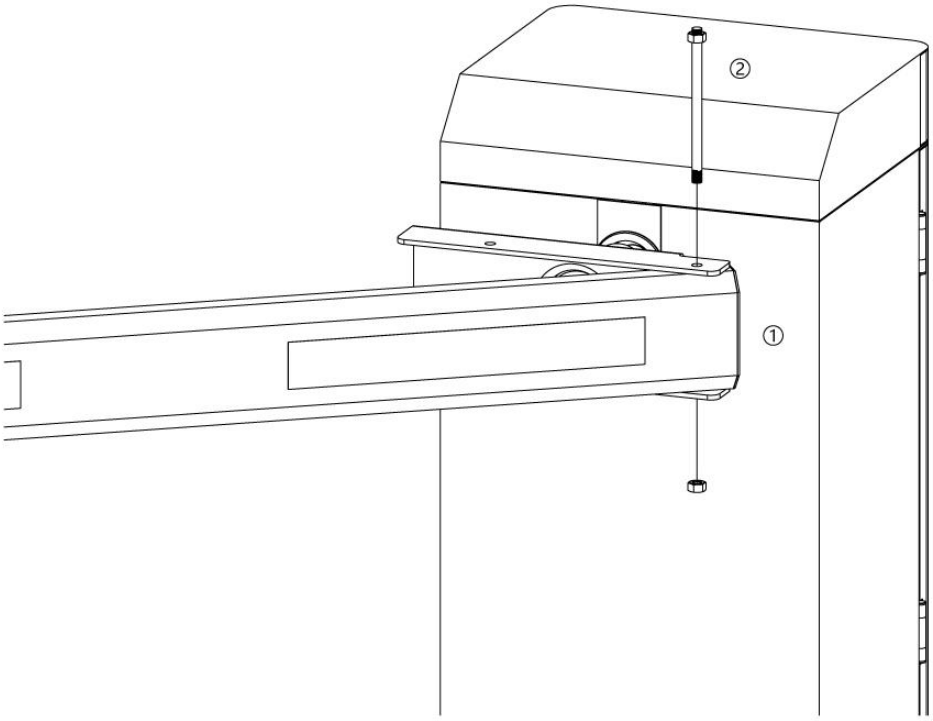
1. Barrier Housing Installation

1) Pouring the Base:
Determine the desired position for the barrier gate and pour a concrete base. The base dimensions should be approximately 150mm larger than the dimensions of the barrier gate, the thickness about 200mm.

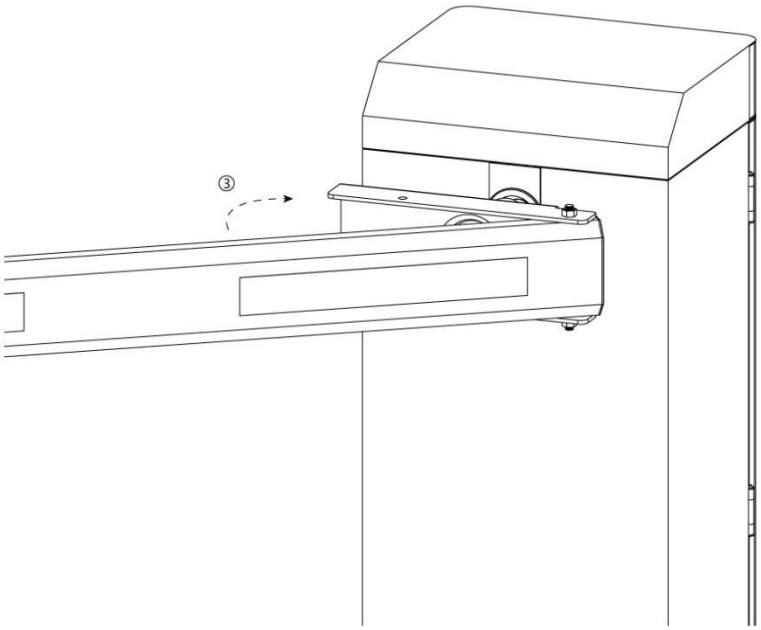
2) Securing the Barrier Gate:
Drill holes at the predetermined positions and insert expansion bolts (M16*200). Place the control box in position and secure it firmly.



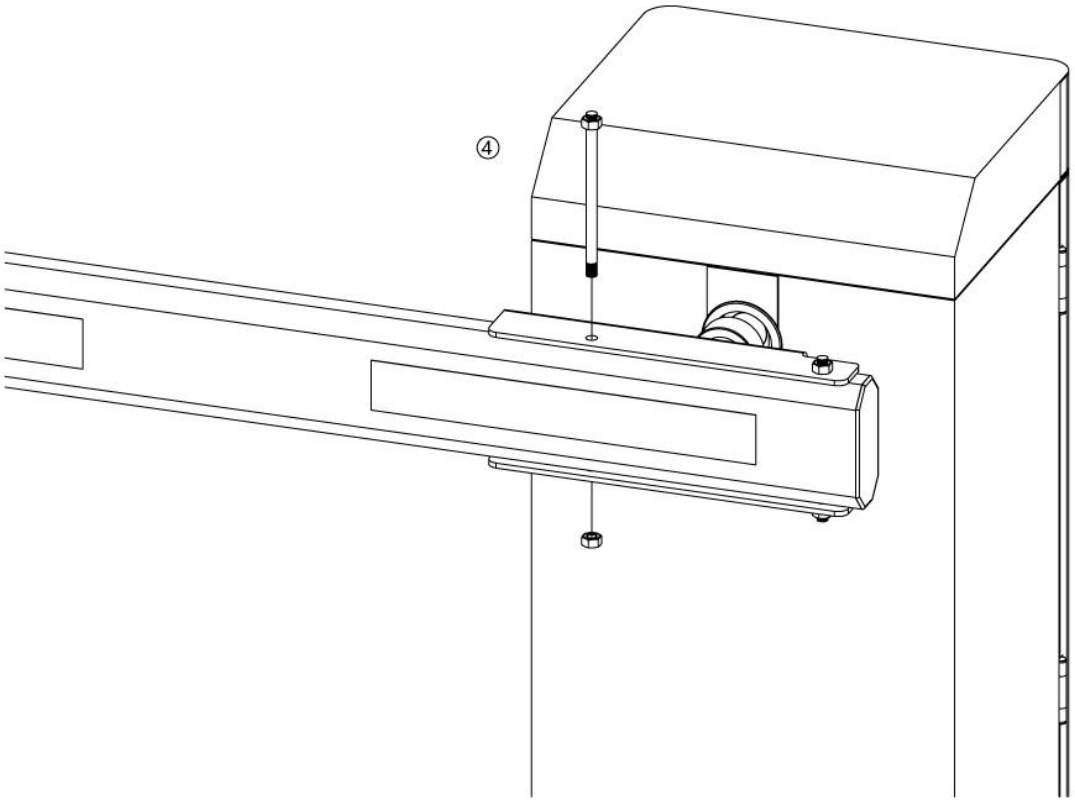
2. Barrier Arm Installation



1) Before tightening the anti-tamper screws, please place the fixing pads above and below the barrier arm.
2) Insert the anti-tamper screws and tighten them securely.



3) After tightening the anti-tamper screws, push the barrier arm firmly into the head clamp.



4) Then, insert and tighten the second anti-tamper screw (Note: The second anti-tamper screw does not need fixing pads).

3. Debugging

After the complete assembly of the barrier gate, check that all components are properly aligned and securely fitted. Use the handwheel at the rear of the motor to perform a test UP and DOWN of the barrier arm. After confirming that everything is correct, power on for testing and adjust the barrier arm to ensure it is level.

4. Calibrate the Barrier Arm Position

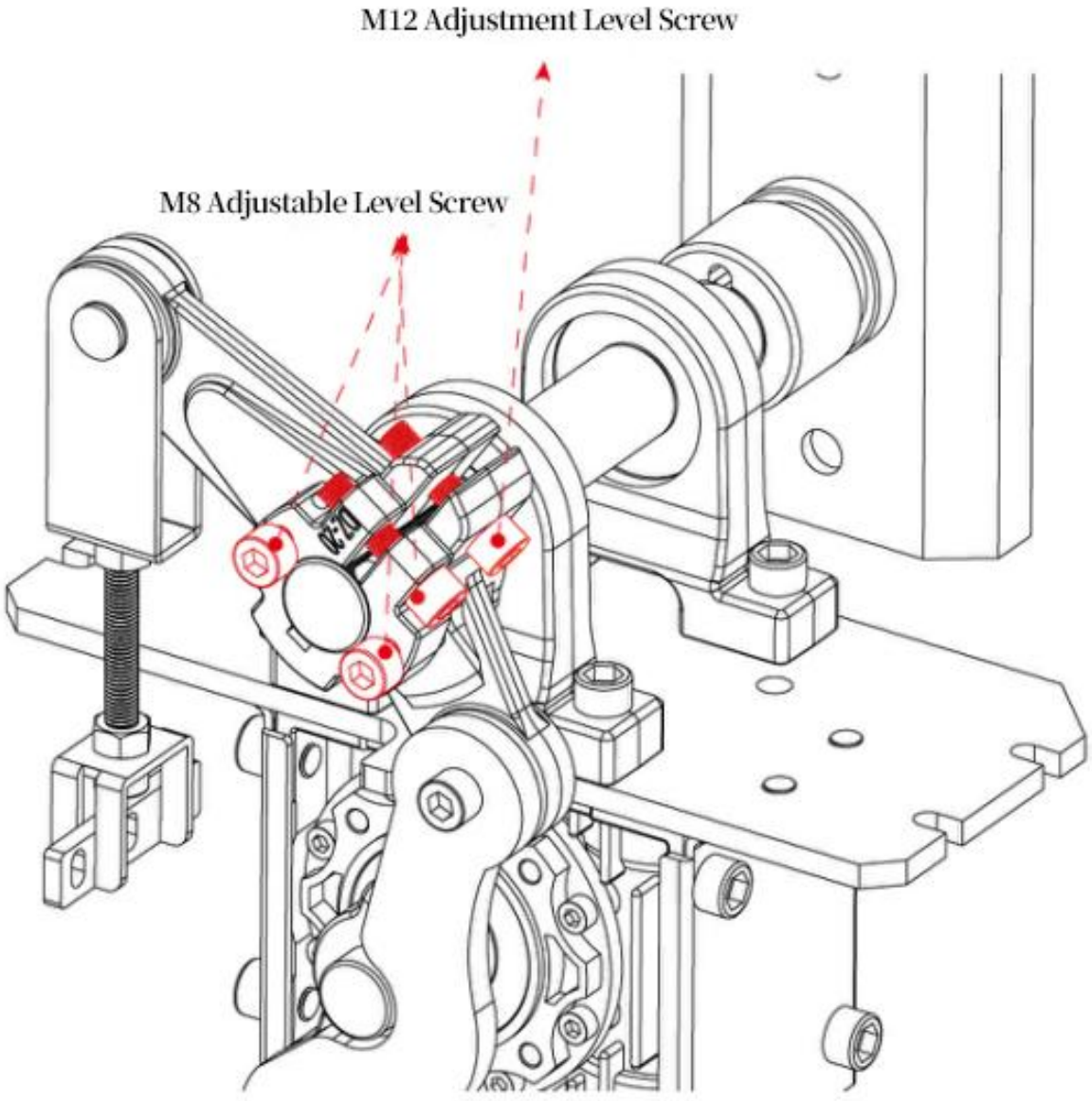
To calibrate the barrier arm position (for example, after excessive force has been applied), follow these steps:

1) Open the barrier housing and remove the cover.

2) Use an M12 Allen wrench to loosen one of the fastening screws on the DZ-1 of the swing arm shaft so that you can manually reposition the barrier arm.

3) Adjust the position of the barrier arm (level position, as shown in the diagram below).

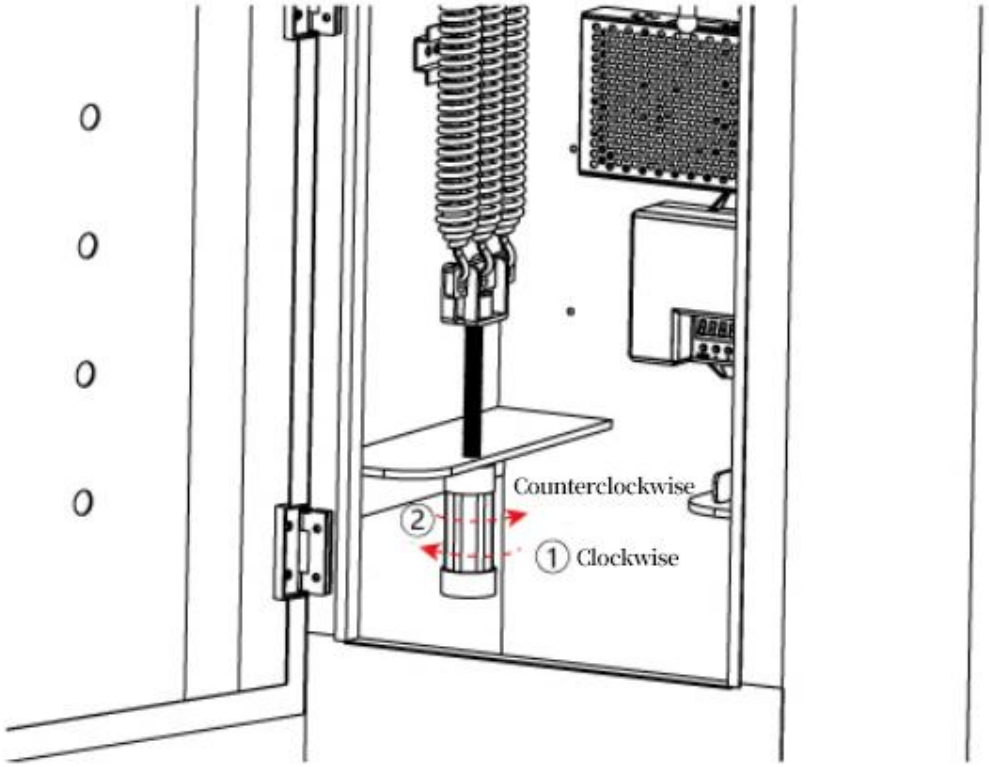
4) Use the Allen wrench to tighten the two fastening screws again.



5. Spring Installation, Removal, and Tension Adjustment

To remove the spring, follow these steps with the barrier arm in the 90° open position:
1) Loosen the spring adjustment handle by turning it counterclockwise by hand, which will allow the spring to be easily removed.
2) Adjust Spring Tension:
To increase the spring tension, rotate the spring adjustment handle clockwise.
To decrease the spring tension, rotate the spring adjustment handle counterclockwise.

Using this feature allows fine-tuning of the tension balance between the barrier arm and the motor. Adjust as needed to achieve precise tension balance, which can effectively reduce motor load and extend service life.

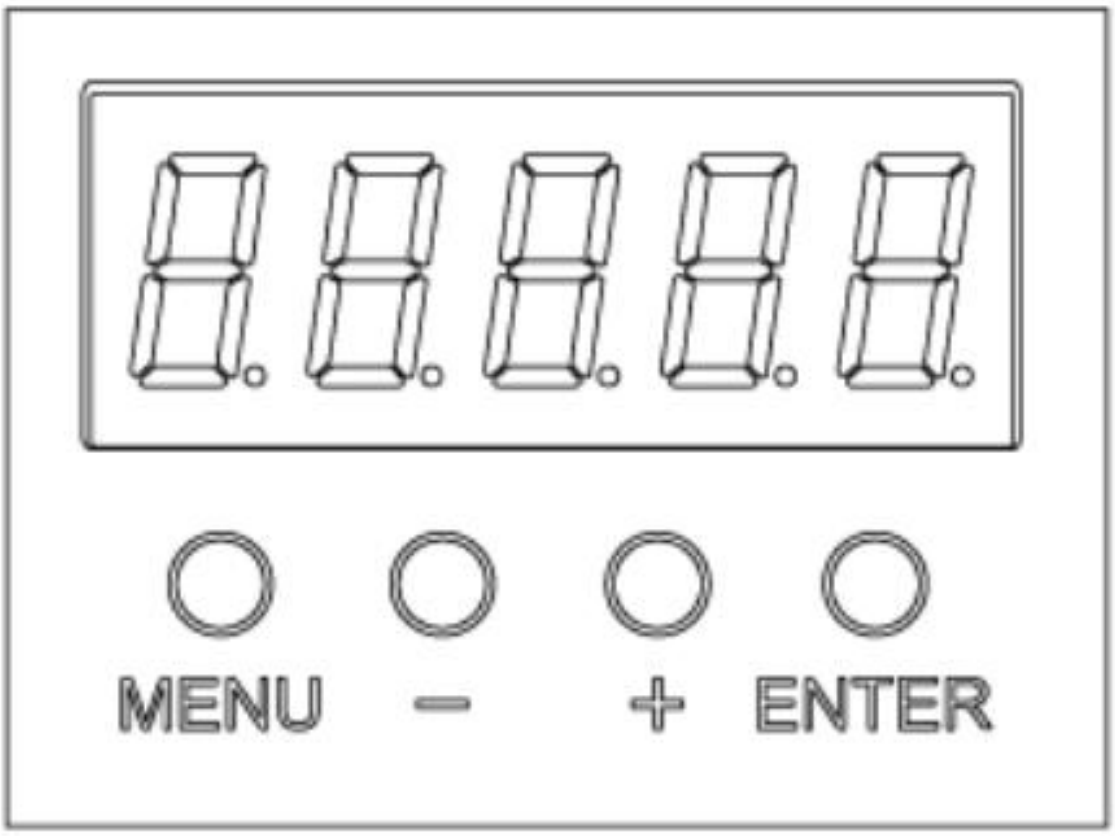


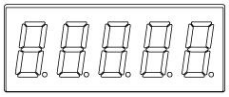
1. Tighten in clockwise direction.
2. Loosen in counterclockwise direction.

4. Channel Change Barrier Gate Control Board Button Descriptions

1. Mainboard Button Descriptions

The mainboard buttons are located on the front of the control box and consist of 4 buttons, as shown in the diagram below.



1、Digital Display: 
2、MENU: Menu.
3、The "-" and "+" buttons are used for paging up and down.
4、ENTE: Confirm.

2. Function and Parameter Table

No.	Parameter Name	Parameter	Default Value	Note
H00-00	Open speed adjustment	25-95	25	The larger the number, the faster the speed.
H00-01	Close speed adjustment	25-95	25	The larger the number, the faster the speed.
H00-02	Open decelerate angle	5-40	35	The larger the angle value, the less likely it is to shake the arm when reach in place, and the larger the number, the slower it will be.
H00-03	Close decelerate angle	5-40	40	The larger the angle value, the less likely it is to shake the arm when reach in place, and the larger the number, the slower it will be.
H00-04	Open accelerate adjustment	1-20	1	The smaller the number, the faster the speed.
H00-05	Close accelerate adjustment	1-20	5	The smaller the number, the faster the speed.
H00-06	Open in place angle	1-30	1	Step size is 1, when greater than 11 degrees,automatic detection of one side (need to set 37 items, 47 items of gearbox need to be set to 4, the reason is that the wiring method is different), the larger the number, the angle is less than 90 degrees.
H00-07	Close in place angle	1-30	2	The step size is 1, the larger the number, the angle is smaller than 0 degree.
H00-08	Auto reverse force adjustment	7-13	15	The step size is 1, which is different for each model and needs to be set separately. The smaller the number, the more sensitive it is.
H00-09	Delay closing adjustment	0-90	0	The step size is 100; 0 means no automatic rod drop, other values mean automatically drop the rod; this parameter is for the situation of no ground sense signal and non-automatic operation, 0: off; 1: means 1 second.
H00-10				
H00-11	Auto-test mode setting	0-2	0	0: No automatic operation; 1: Automatic operation, power off clearance; 2: Automatic operation, power off memory; 3: Intelligent automatic operation. 1: No automatic test after power failure recovery; 2: Normal test after power failure; 3: Testing when arm operate in half way.
H00-12	Self-locking force setting	0-5	0	0: invalid; 1 or 2: Valid; When the angle of the arm operation changes, the self-locking force can be set, the maximum is 2.
H00-13	Motor deceleration time when paused	1-20	2	The larger the setting, the longer the pause time needs to be.
H00-14	left and right models setting	0-1	1	Left and right model settings, when UP&Down direction is reversed, or when changing the arm direction, you need to switch between 0 and 1 and then power off and restart.
H00-15	Energy-saving Arm close direction setting	0-2	0	0: Invalid; 1: Valid for Arm close (energy-saving voltage is determined by 49 items); 2: Valid for Arm lifts.
H00-16	RS485 communication address setting	1-32	1	Up to 32 slaves can be connected.
H00-17	RS485 communication rate setting	0-2	0	0:9600，1:19200，2:38400； Change the parameters and re-power on to take effect.
H00-18	Self-test after power on	0-2	2	0：Port or remote signal self-test; 1：Self-test after power on; 2：Cooperate with remote control for self-test.
H00-19	SET key setting	0-3	0	3：Make debug Arm open&close for keyboard SET.
H00-20	Monitoring parameter setting index	0-15	7	Used to display the contents of the monitoring parameter table.
H00-21	Reset	0-3	0	1: Reset adjustment; 2: Clear accumulated times; 3: Clear accumulated times and restore factory settings, return to 0 after execution.

H00-22	Acceleration time parameter setting	0-1	1	The larger the value, the slower the acceleration.
H00-23	Minimum output setting	12-30	13	The minimum output duty cycle of Arm open&close.
H00-24	STOP key function setting	12-30	0	0: Press Pause at any time to stay in the current state; 1: When the arm is falling, press the STOP key to switch to the command of raising the arm; 2: When the external stop signal is always short-circuited, the starting rod is given priority, and the pause is invalid.
H00-25	Keep settings	1-20		
H00-26	Camera counting time setting	0-1	0	0: 10 minutes automatically cleared, non-0 is the set time.
H00-27	Ground Proximity Selection Settings	0-1	0	0: Disabled; 1: Turn off the ground sense function when the fence pole is close to the ground.
H00-28				
H00-29	Multi-function input selection setting	0-2	0	0: No function; 1: When the alarm input is valid, stop directly; 2: When the alarm input is valid, only the alarm will be prompted and operate normally. The alarm input signal is only valid at the original counting port. 3: The fire port is enabled, the ground sense is invalid, and it is released when the pole is dropped; the signal is a trigger input type. 0: No counting function; 10:counting of rod ports. When the alarm signal input is valid, the counting port needs to be selected at the same time, and the enable is determined by setting the ten digit; When the fire port is enabled and the counting function is started at the same time, set it to 13 When it is set separately as the count of starting poles: set it to 10; When fire protection is enabled (set to 3), external independent counting port access is valid; If you only need to stop by fault input, you only need to set it to 1; If the counting function of tens is not needed, don't worry about it.
H00-30	DO1 function output setting	0~1	0	0: Arm open in place; 1: Arm close in place; 2: Up and down in place; 3: Fault input alarm (when item 29 is set to 1, it is valid).
H00-31	DO2 function output setting		1	
H00-32	DO3 function output setting		1	
H00-33	485 communication status control settings		0	485 communication, analog input port data.
H00-34	Peak pattern		0	Long press the remote control to disable the use of the IO port; 0: No inhibition; 1 or 2: Valid; 3: Turn off the ground sense.
H00-35	Peak status settings		0	Set when 34 items are valid; 1: Port input signal is invalid; (When the ground sense is turned off, set 34 items to 3, and set 35 items to 1)

H00-36	Buzzer settings		1	0: Off; 1: Valid.
H00-37	Unilateral stroke setting			500~1000 （For bilateral detection, see the sixth item of monitoring parameters. For bilateral detection, the parameter is invalid.）
H00-38	Keep unusable settings			
H00-39	One car one pole setting		0	0: Invalid; 1: Valid (When it is valid, only one car can pass when encountering the ground sense).
H00-40	Ground sense input level type setting		0	0: Normally open; 1: Normally closed.
H00-41	Self-test close speed setting		20	Self-test the arm speed, the larger the number, the faster the speed. Added 41 items of self-test drop speed adjustment, mainly used when there is no spring, the drop speed is too fast; at the same time, the 10th item is changed to self-test speed adjustment.
H00-42	When power failure, the arm open, whether need to alarm			0：alarm 1：not alarm　if open arm automatically when power off is unavailable（H00-15，this function is invalid
H00-43	one relay for open and close together		0~1	0：invalid 1：open and close by one relay
H00-44	IO and remote invalid			0：valid 1：remote invalid 2：IO port invalid 3：remote and IO port all invalid
H00-45	Run timeout protection time			The running time exceeds the set value，erro-07 occurs
H00-46	Effective level of infrared detection			0：NC valid 1：NC invaid
H00-47	Motor model setting		0	0: Large ratio gear; 1: Small ratio gear; 2: Turbine worm short rod; 3: Turbine worm heavy rod; 4: Turbine worm rod long rod.
H00-48	Ground sense detection time parameter setting		1	The smaller the number, the more sensitive the ground sense is.
H00-49	Energy saving open & close arm voltage setting		160	18.0~23.0V;If the number is too large, it will not work properly when the power is off.
H00-50	Ground sense invalid close speed delay time setting		10	After turning up in place, delay a certain time before you can fall again.
H00-51				
H00-52	In place timeout setting		17	After the timeout period, the time limit is in place to output the time.
H00-53				
H00-54				
H00-55				
H00-56	Version Number			
Monitoring Parameter Table				

	0	Operating speed	0~2500		
	1	Motor Feedback Angle	0~90 degree		
	2	bus voltage (V)	0~40.0		Make sure that the power supply voltage is greater than 22.0V at any time. Otherwise, an undervoltage fault will be reported.
	3	Output current			
	4	Hall state	0~7		
	5	Commutation times			
	6	Total number of operation			
	7	operation time(ms)	0~9000		
	8	Cumulative number of operation	0`99999999		When displaying 32 digits, if it exceeds the maximum number of digits that can be displayed currently, you can use the UP key to scroll up and down.
	9	Number of automatic operation	0~99999999		
	10	Anti-collision times	0~99999999		
	11	Downswing times	0~99999999		
	12	Power-on time (minutes)	0~99999999		
	13	Power on times	0~99999999		
	14	Operating status	Binary Display		
	15	Error Code	0~7		1: Hall fault; 2: Undervoltage (lower than 22.0V) ; 3: Overcurrent protection 4: Stall protection.
	16				
	17				
	18				
	19	Number of Arm lifts	0-65535		
	20	Number of Arm closes	0-65535		
	21	Number of STOP	0-65535		
	22	Number of groud senses	0-65535		
	23	Number of Infrared shots	0-65535		
	24	Number of Arm lifts	0-65535		When the counting port is enabled, you can see how many counts have been counted through this parameter.

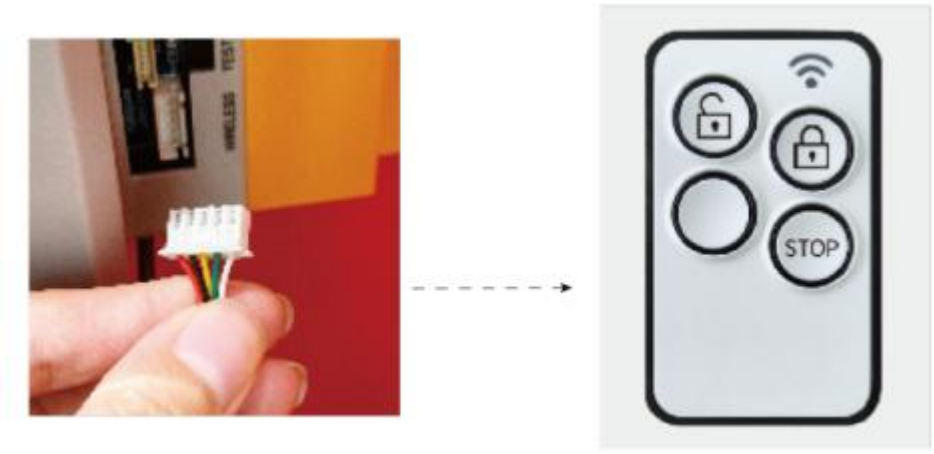
5. Error Codes

EFF-01: Hall Fault	Check the motor or wiring.	This is usually due to the motor or motor wiring not being properly connected.
EFF-02: Undervoltage Fault	Voltage is below 22.0V.	This could be due to insufficient voltage from the power supply or battery.
EFF-03: Overcurrent Protection	Heavy load or damaged driver board, incorrect motor wiring.	Check if the motor wiring is properly connected and replace the driver or adjust the load.
EFF-04: Stall Protection	The limit has not been reached after 5 continuous attempts.	Reset the limit points or check if there is an issue with the limit device.
05: Thermal protection 06: Overvoltage fault		Overvoltage will only be reported when the 24V voltage is too high or the resistor is working continuously, and the overheat protection of the MOS tube.

1. Learning Mode

Our company's remote control adopts an IC special learning code remote control with a 433MHz wireless frequency. It features strong anti-interference ability and a long remote control distance, which can reach more than 100 meters in sunny weather and open areas. It is easy to use and durable. The learning code remote control receiver can store 30 remote control codes of different types, with no limit on the number of remote controls using the same code. The specific operation process is as follows.

Solution A:



Learning a New Remote Control:

Disconnect the 24V power supply of the controller and ensure the nixie tube is completely powered off.

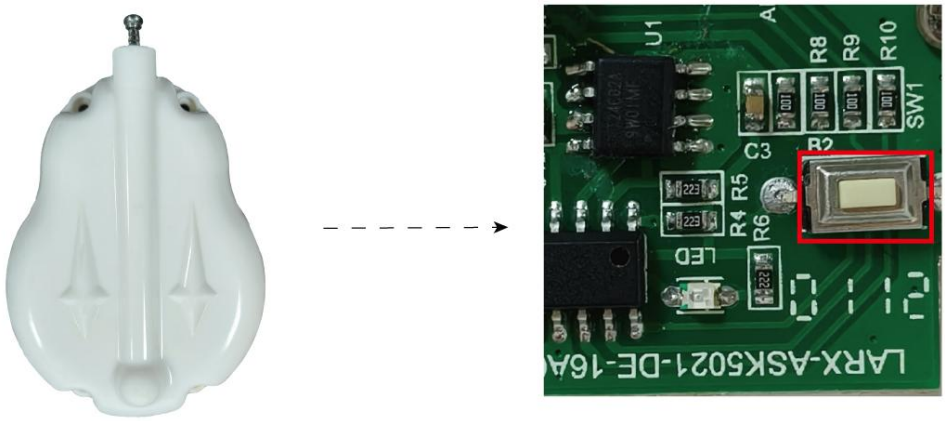
Reconnect the 24V power supply, and immediately press and hold both the "Unlock Button" and "Lock Button" on the remote control simultaneously to complete the learning within 5 seconds.

Deleting All Remote Control Codes:

Disconnect the 24V power supply of the controller and confirm that the control board has no display.

After restoring the 24V power supply, immediately press and hold both the "Unlock Button" and "STOP Button" simultaneously for 5 seconds to complete the deletion.

Solution B:



Learning a New Remote Control:

Open the controller and locate the built-in receiver module at the bottom right corner.

Press and hold the white button at the top right corner of the module for 5 seconds, then release it when the red light stays on.

Press any button on the remote control to be learned; the red light will flash to indicate successful learning.

Deleting All Remote Control Codes:

Press and hold the white button on the receiver module for approximately 10 seconds until the red light flashes continuously, then release it to complete the deletion.

2. Operation Speed Reference Table

Menu Code / Parameters / Arm Length	Arm UP			Arm DOWN		
	H00-00	H00-02	H00-04	H00-01	H00-03	H00-05
Medium Octagonal arm, 3m, 1.5s (without rubber strip)	95	30	8	95	30	8
Medium Octagonal arm, 3m, 1.5s (with rubber strip)	95	25	8	95	25	8
Large Octagonal arm, 3m, 1.5s (without rubber strip)	45	30	10	45	30	10
Large Octagonal arm, 3m, 1.5s (with rubber strip)	35	40	10	35	40	10
3m round arm 1.5s	95	25	8	95	25	8

6. Service

1) 1 Year Free Repair (Excludes barrier arm and remote control)
2) Lifetime Paid Repairs
3) Technical Support

The following conditions are not covered under free repair (or replacement):

1) Damage caused by user failure to install according to the manufacturer's service manual.
2) Damage due to unstable power supply, exceeding the system's specified voltage range, or non-compliance with national electrical safety standards.
3) Damage to the system's appearance due to improper installation or use by the user.
4) Damage caused by natural disasters or other uncontrollable factors.
5) Repairs needed after the warranty period has expired.
6) Services not promised by the manufacturer.

7. Product Maintenance and Warranty

1) Regularly Clean: Frequently clean the surface of the control box to remove dust and debris, keeping the barrier surface clean.
2) Monthly Inspection: Check for any loose or missing fasteners once a month and tighten them as needed.
3) Spring Balance Check: After 30,000 operations, inspect the spring balance and readjust as necessary.
4) Semi-Annual Inspection: Have a professional check the wear on easily worn parts every six months and replace any worn components promptly.
5) Remote Control Range Issues: If the remote control distance is too short, check if the receiver is shielded by metal objects or if the battery is low. Note that remote control distance can be significantly affected by weather conditions such as rain, fog, wind, and snow, which is normal.

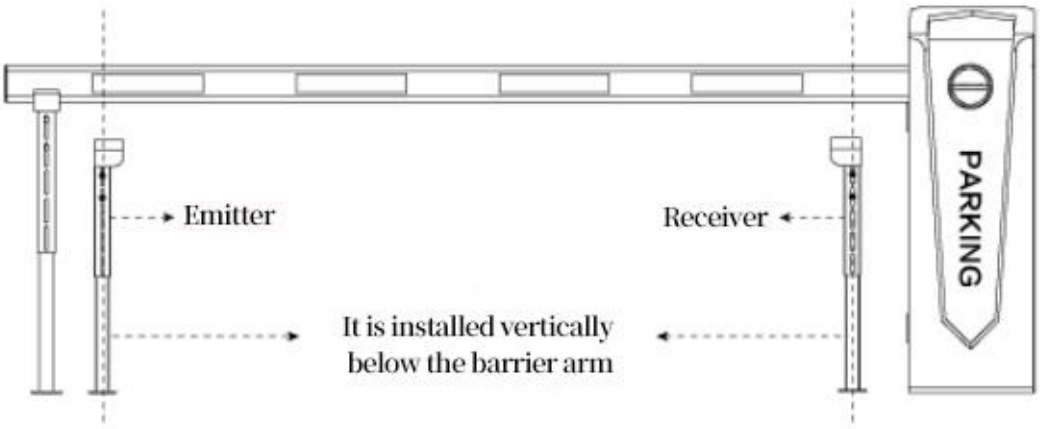
8. Packing List

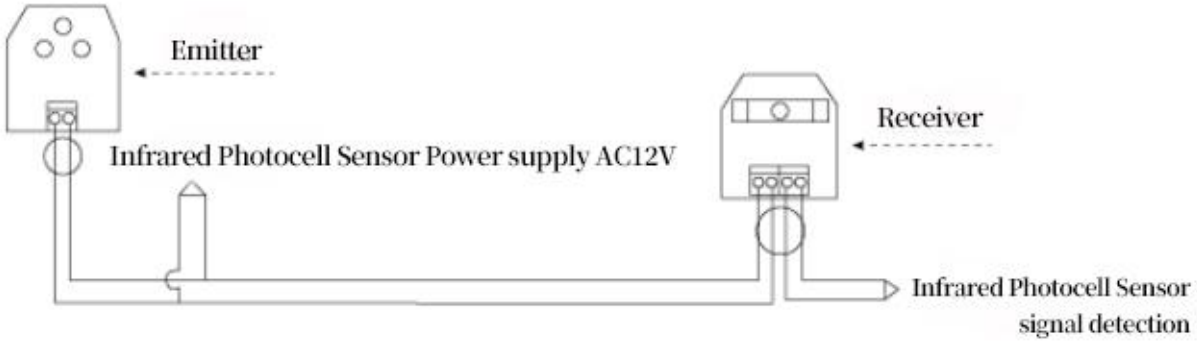
Name	Specification	Qty	Unit	Note
Screws, Nuts, and Flat Washers	M12*70 M8*85	2	Piece	Secure the Barrier Arm
Barrier mounting batten		2	Piece	Secure the Barrier Housing
Expansion bolt	M12*150	4	Unit	Secure the Barrier Housing
Case Key		2	Unit	
Remote controller		2	Unit	

9. Appendix

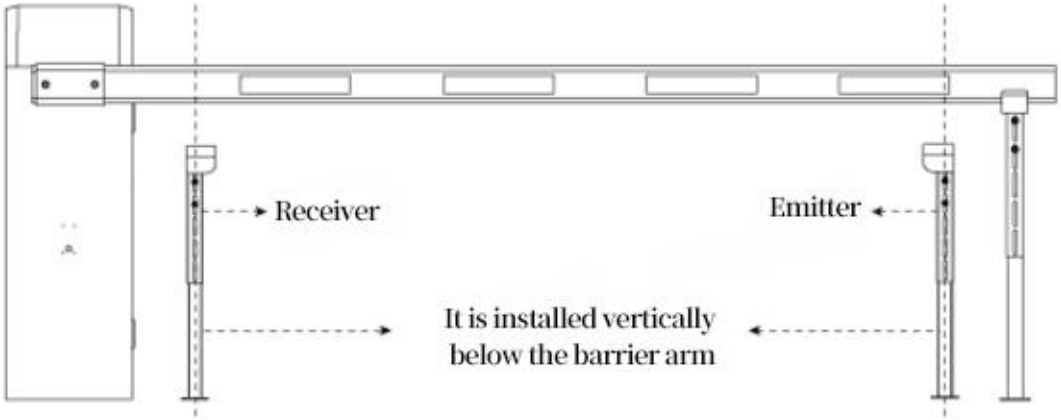
Infrared Emitter for Collision Prevention Installation

The installation of the infrared emitter for collision prevention is shown in the diagram below

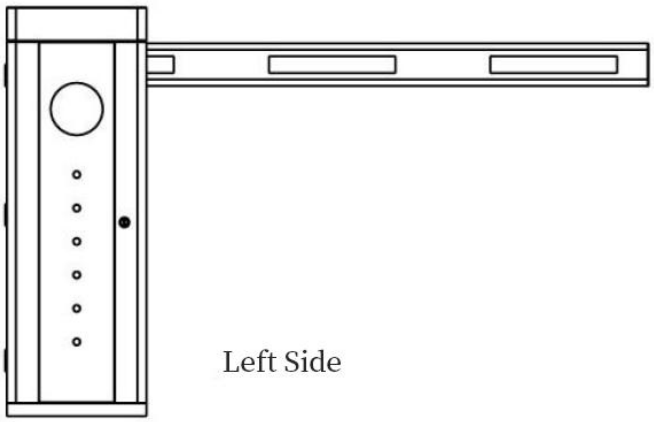




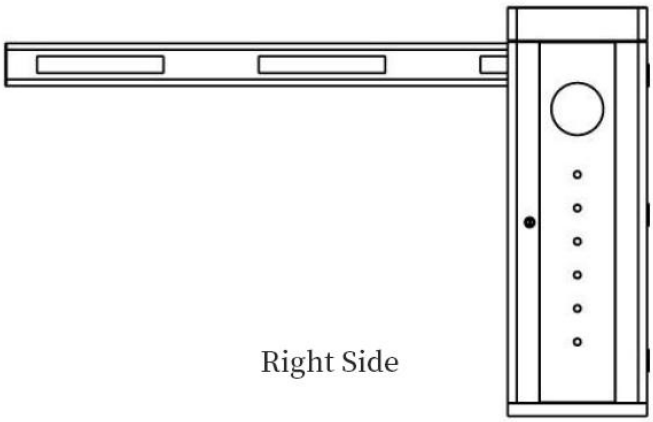
(Infrared Photocell Sensor installation)



10. Left and Right Installation Definition



Left Side



Right Side