BG Series Barrier Gate
Instruction Manual

Warning:

Read and follow these instructions carefully before installation, which involves with some important information about installation, usage, maintenance and safety.

Any undefined operation under this instruction is not allowed. Improper usage of the barrier gate can result in damage to the product and cause serious injury or property losses.

Please keep this instruction properly for future reference.

The design and manufacture of the Barrier Gate is totally complied with the current regulations.

Considering the possibility of danger, the installation must strictly comply with construction standards and electrical operation procedures as following:

- Before installation, please check if additional equipment or materials are needed to meet specific requirements.
- The handling of packing materials must comply with local regulations.
- Please do not modify any parts, except for those defined under this instruction. Any undefined modification may cause troubles. Any damages to the product arising therefrom shall be beyond the liability of the company.
- Please do not leak water or any liquid into the controller or any other open devices. Please disconnect the power immediately if any mentioned cases happened.
- Please keep this product away from heat and open fire. Or it may damage the components; cause the failure or other hazards.
- Spring adjustment, operation mode setting, induction devices installation must be operated by qualified professionals.

Table of Contents:

1. Product Outline

The BG series servo barrier gate, which researched, developed and manufactured by our company, adopts international advanced technology, mechanical and electrical integrated design; achieves the fully automated and intelligent, convenient and safe to use.

2. Functions and Features

1. Efficient and precise planetary reducer drive with mechanical and electrical integrated. More convenient operation, safe and reliable, completely maintenance free during its service.

2. The moving parts and balance spring devices which are in their optimal function enable the boom work with soft start slow stop in fast and stable, without impact, which reduces the driving power in maximum, extends its service lift.

3. No clutch devices, no position sensor, the gate automatically open when the power is off. When the power is on, the gate automatically reset, and the gate returns to being closed, which realizes the truly unattended parking system; Special requirements can be met through setting up the DIP switch on the control board to manually operate the boom.

4. Humanized anti-collision boom protection, when the vehicle accidently hits the gate boom, boom can be swung out to avoid damage to the vehicle and the barrier gate.

5. Advanced servo control system, with fast speed and high accuracy, it genuinely realized the PID closed loop control between running speed and acceleration. It'll automatically adapt to the load changes.

6. The dedicated controller system has high integration and strong logic performance. It can be connected to any highway and bridge, intelligent parking systems.

7. 485 communication interface makes it easy to remote control the barrier gate and feedback its state.

8. Through setting up the DIP switch, users can choose operation mode and operation parameters, which will meet different customer's requirements in maximum for different functions.

9. High-sensitivity arm auto reverse function. To prevent incorrect operation and other

accidents like crash or hitting.

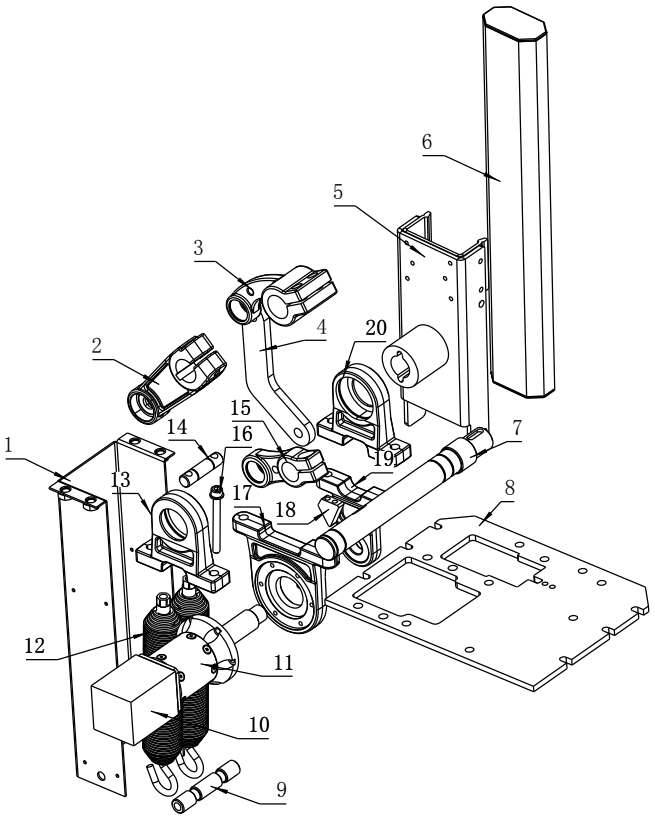
10. High-strength precision cast steel, with outdoor metal powder electrostatic spraying surface treatment, IP class up to 54

11. This product uses the DC 24V low voltage servo motor, adjusts to the global voltage, compatibles with solar system, wind power generation, moveable work anywhere anytime.

3. Technical Parameter List

Barrier Gate	BG2506	BG3009	BG4014	BG5025	BG6035
Boom Length	≤ 2.5m φ75mm Round Bar	≤ 3m φ75mm Round Bar/Octagonal Bar 80×46mm	≤ 4m φ75mm Round Bar /Octagonal Bar 80×46mm	≤ 5m Octagonal Bar 80×46mm	≤ 6m Octagonal Bar 80×46mm
Open/Close Time	0.6 sec	0.9 sec	1.4 sec	2.5 sec	3.5 sec
Power Consumption	150w	100w			
Max. Power Consumption	150w	100w			
Power Supply	AC110-264V/47-63Hz				
Max. Power (Standby)	8W				
Machine Case	2mm Steel Plate				
Machine Case Size （W×D×H）	338 × 330 × 960mm				
Net Weight	51kg				
Operating Temperature Range	-40~+80 ℃				
Driving Method	Servo Motor + Planetary Reducer				
Protection Class IP	54				
Insulation Class	F				
Relative Humidity	≤ 90%				
Motor No-load Speed	3000r/min				
Service Life	5-10 million times				
Remote Control Distance	≤30m (wide open area, sunny weather)				
Running Noise	＜50dB				
Surface Treatment	Outdoor metal powder electrostatic spraying				

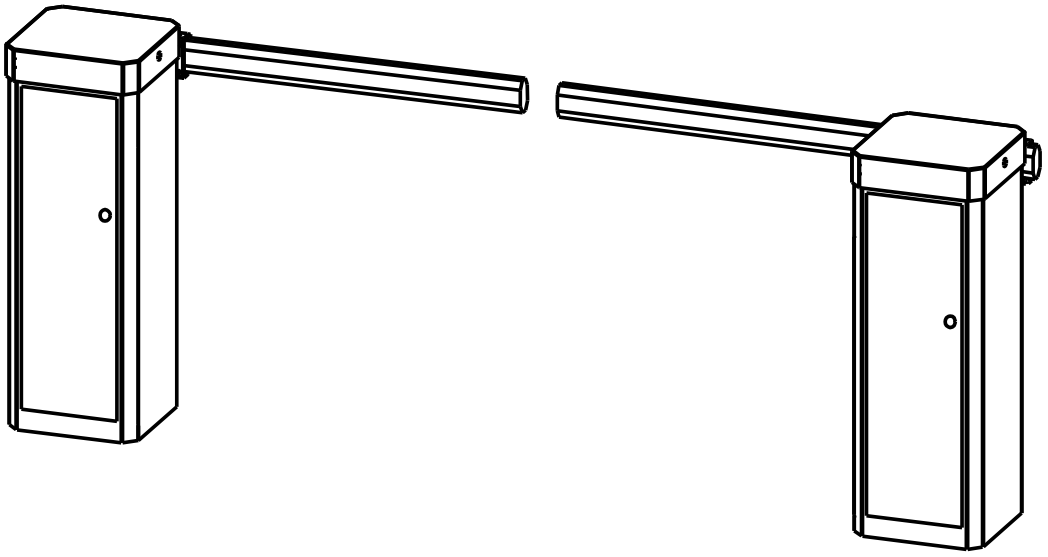
4. Machine Core Components



1 Spring bracket
2 Balance crank
3 Spindle curved balance boom
4 Curved rod
5 Boom tray head
6 Boom
7 Output shaft
8 Mainboard
9 Spring rod(lower)
10 Servo motor
11 Planet gear reducer
12 Spring
13 Output shaft bearing
14 Spring rod(upper)
15 Initiative crank
16 Soket head cap screw M8*140
17 Motor cabinet(big)
18 Limit block
19 Motor cabinet(small)
20 Output shaft bearing

Machine Core Drawing

5. Installation Direction Definition



Leftward

Rightward

6. Assembly and Installation

6.1 Pre-Installation Check

Note:

Barrier Gate Installation must be carried out by qualified technician; Installation must comply with relevant regulations. Before installation, please read this instruction carefully.

Please check if the installation spot has enough space for installing barrier gate, confirm the installation direction of barrier gate boom.

Please make sure that the boom will operate freely without any impediment.

Please make sure the mainboard is strong enough and the size is suitable.

Please check the installation spots for all the relative equipments to avoid any collision.

6.2 Basic Structure Installation

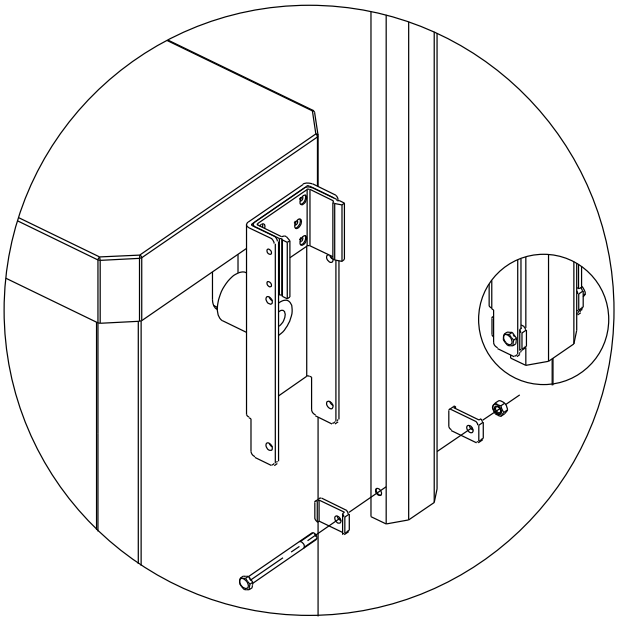
Please check the accessories according to the packing list (Packing list shown in this instruction)

Please determine the position of anchor bolt holes and control cable according to the installation of barrier gate, drill 4 holes for expansion bolt M12 or embed 4pcs of M12 anchor bolts based on the press board.

Separately wire the power cable and control line with conductors and bury them to its corresponding place, leave enough cable on the ground.

Put the barrier gate in the right position (Keep the swing-out collision prevention and vehicle passing on the same direction), align the press board to the anchor bolts, lock and fasten them.

Put the boom into boom tray head according to the hole position, use the spanner to clamp the boom by screws, gasket and screws nuts.



6.3 Boom Balance Adjustment

The tension balance of spring is relative to the boom length, the spring has been assembled in the factory according to the different boom length, also the relative adjustments on boom operating speed、operating balance during opening/closing process has been set up before delivery. Even so, it is necessary to check the boom balance again after installation. In order to make a steady performance of barrier gate, please make sure the spring is in its best force. Spring tense must be re-adjusted if there were any changes on the boom length. Please check and adjust according to the following steps.

The Length of Boom(L=boom length)	Spring Specification
L＜3.5 M	Spring diameter =4.5mm×1pc
3.5 M≤L≤4.0 M	Spring diameter =5.5mm×1 pc
4.0 M＜L＜5.5 M	Spring diameter =4.5mm×1 pc Spring diameter =5.5mm×1 pc
5.5 M≤L≤6.0 M	Spring diameter =5.5mm×2 pcs

1. Open the barrier gate side door and remove the upper cover.

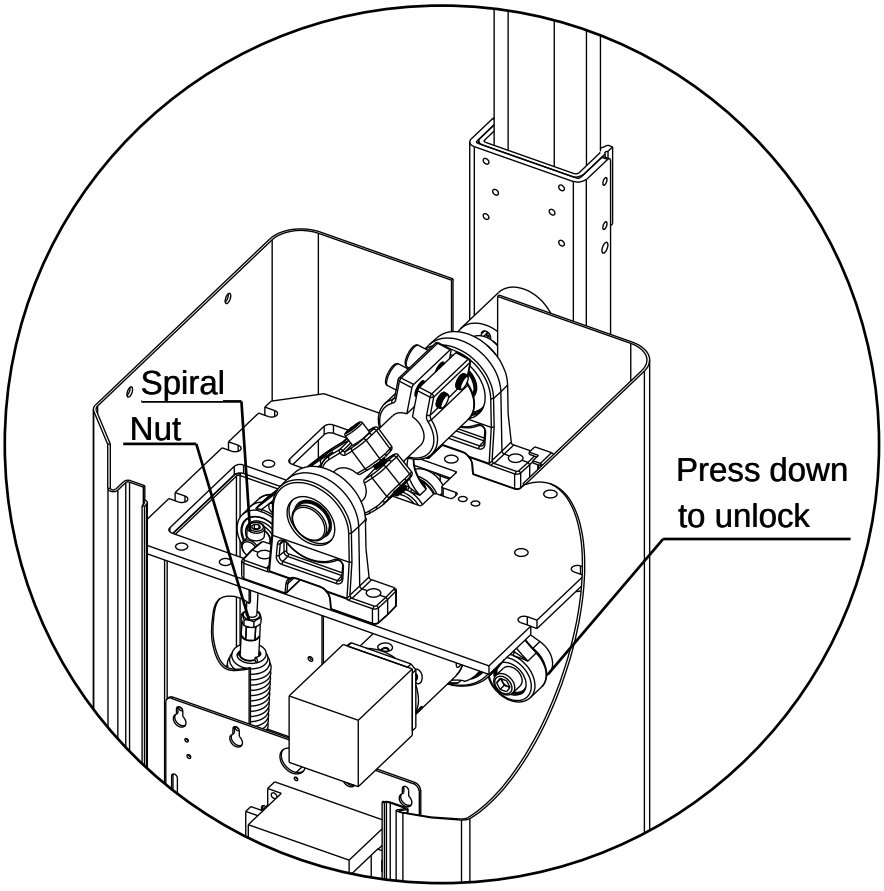
2. Unplug the power cord.

3. Toggle the crank from the side door to unlock it, manually adjust the boom to the position of 45 degrees then release the hand. If the boom keeps stable on the position of

45 degrees angle or slowly opens to the position of 90 degrees angle, indicating that it is with the best spring force.

4. If the boom opening speed is too fast or cannot open in place, indicating that the spring force is too large or too small, under which, the force should be adjusted. First, loosen the nuts on the top of the spring (press the boom down to its horizontal place in order to make it easier to loosen the nuts), rotating the spiral to increase or decrease the tension of spring, release the spiral to let the boom automatically lift to check the spring tension.

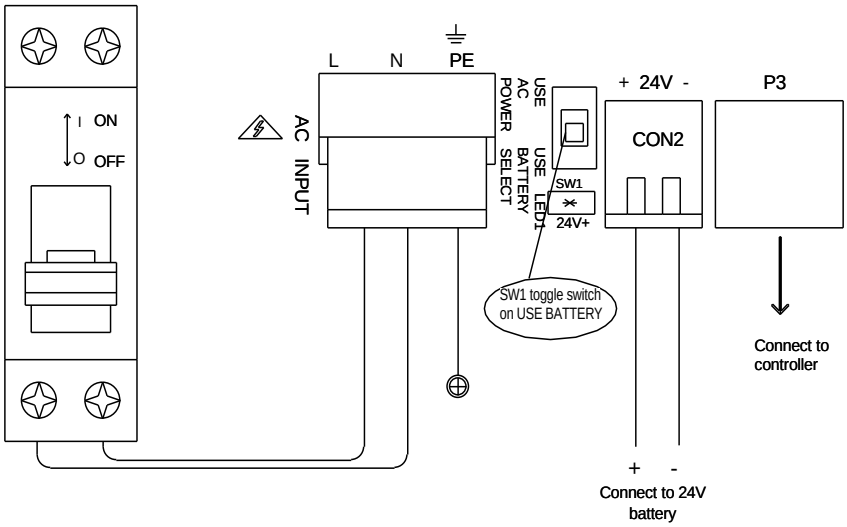
5. Through repeating the above forth step to adjust the boom to its best balance, press the boom down to its horizontal position and then fasten the nuts on the top of the spring, adjustment is finished.



6.4 Power Wiring

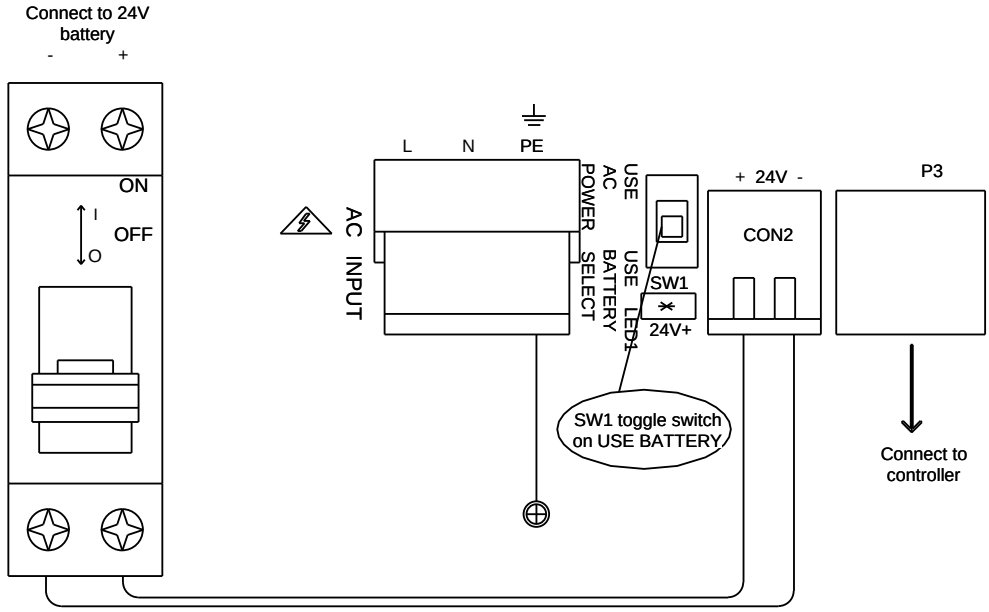
The SW1 toggle switch on the power module has been put on the position of USE AC

in the factory. To ensure operational safety and avoid damage to the components, please disconnect the circuit breaker first, and then connect the L and N of AC power into the input port of circuit breaker.



If the barrier works with 24V battery, please turn the SW1 toggle switch which is on the power module to “USE BATTERY”, and connect the battery output cable to CON2 terminal.At the same time please pay attention to the “+” and “-” poles. When using the battery, the function of boom up while power failure will be invalid.

Note: The installation and after sales maintenance for this product must be carried out by professional technicians. The factory is free of responsibility to any damage caused by improper operation.



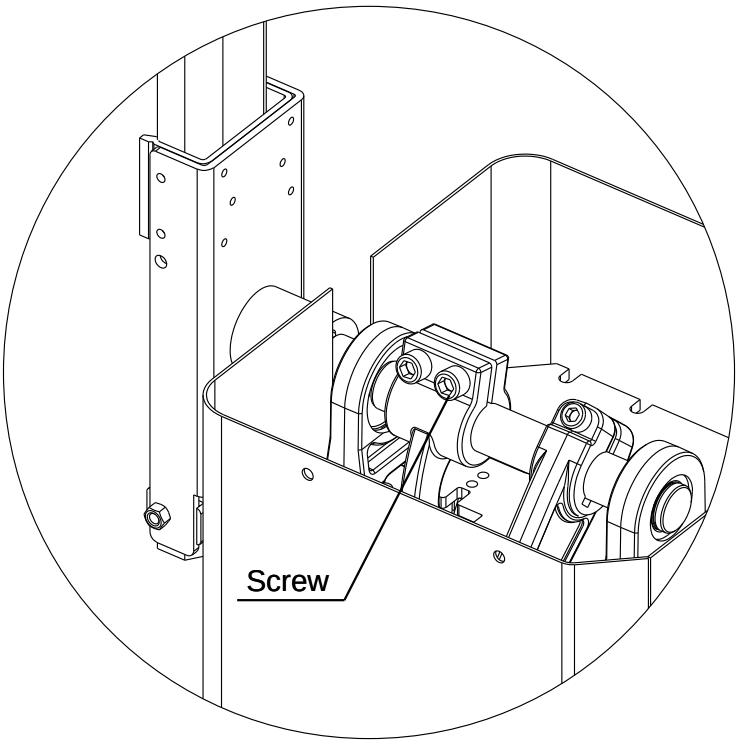
6.5 Electrify Check

Please close the circuit breaker to connect the power after correctly wired. The indicator light on the control board will be on once the power is connected; meanwhile, the buzzer will ring for several seconds. If the boom is in its vertical position this moment, it'll slowly close automatically, if the boom was in its horizontal position before connecting the power, it'll open to vertical position at first then close to horizontal position, the travel learning is complete. The opening/closing of barrier gate can be controlled by remote control thereafter. If there is no above state, please cut off the power immediately, check the wiring, re-power until everything is confirmed.

6.6 Vertical adjustment of barrier boom

If the barrier gate boom cannot open to its vertical position or close to its horizontal position. Please take the following steps to adjust it:

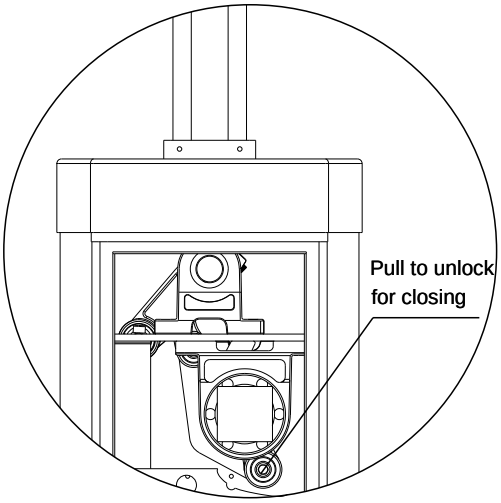
1. Open the barrier gate door, unplug the power cord.
2. Open and remove the upper cover.
3. Loosen the two fasten screws on the spindle curved balance boom so that the boom can be repositioned by hand. Adjust the boom to its horizontal position manually. Use the torque wrench to tighten the two fastening screws (locking force is 72 N·m)
4. Connect the power to work, check whether the boom opens/closes in place. If not, please re-adjust it after power off until achieving the ideal state.

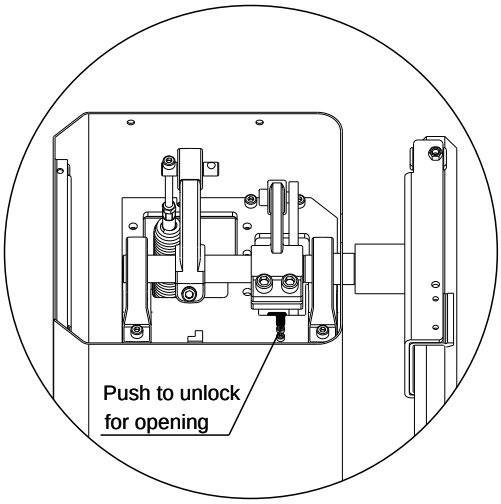


6.7 Manually Open/Close

The barrier gate may stay in the vertical or horizontal mechanical dead-center position when power off, if to manually open/close the boom at this time, please follow the steps as below:

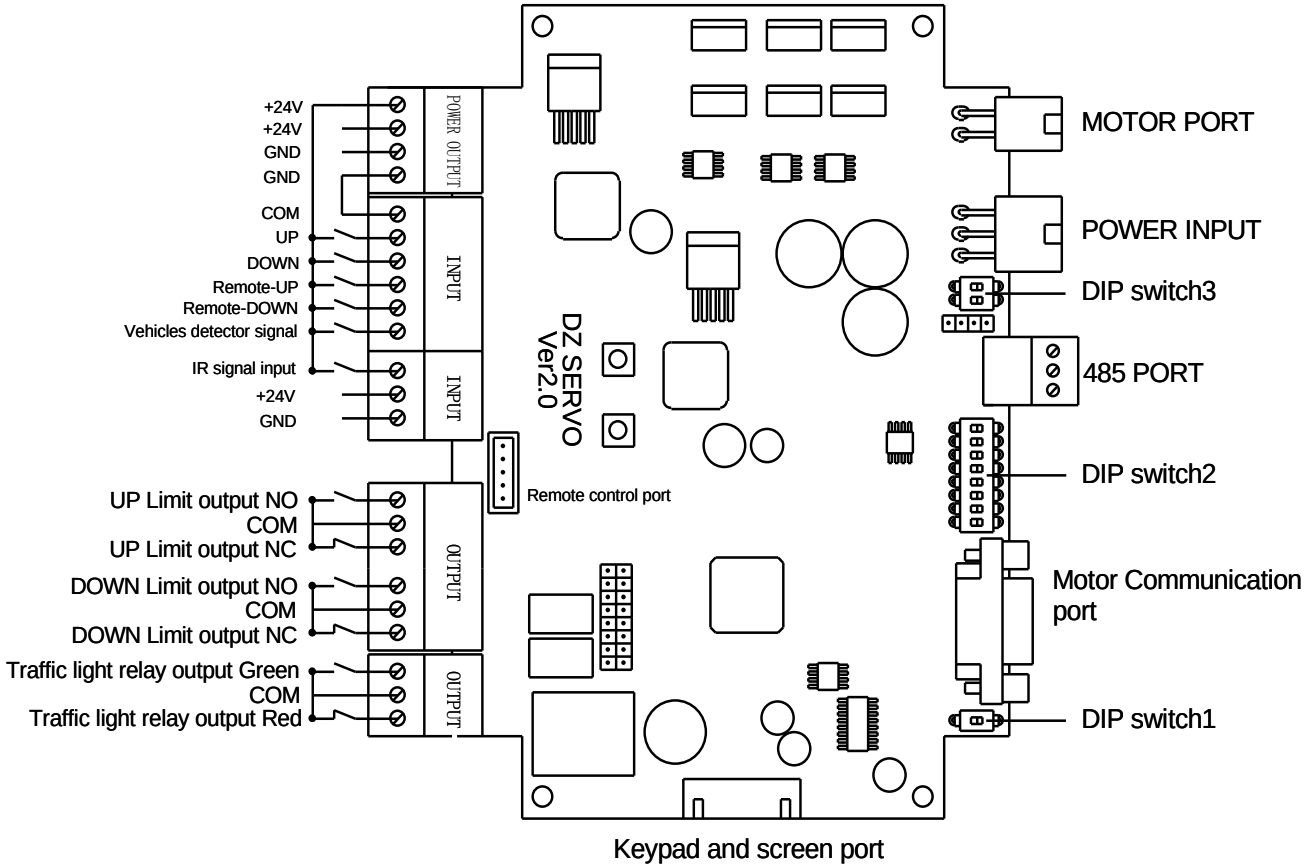
1. Open the barrier gate door.
2. Unplug the power cord
3. Closing when boom in vertical position: Pull the crank connected rod down to leave the dead-center position, press down the boom manually (Pull to Unlock)
4. Opening when boom in horizontal position: Remove the upper cover first, use the screwdriver to push the crank connected rod away from the dead-center position (shown as photo). At this time, the boom will be lifted due to the spring tension. (Push to Unlock)





Note: Please stabilize the boom when manually open it, in order to avoid any unnecessary damage caused by the spring tension.

7. DZ Servo Control Board Wiring



Warning!

DZ SERVO controller is specially designed for the use of medium speed, high speed barrier gates. The configuration for most of the barrier gate systems can be accomplished by using a standard version controller. The position of the boom is continuously detected by the servo motor encoder, which replaces the limit switches used in conventional barrier control systems.

The combination of the encoder and the controller unit ensures the maximum control to the boom optimum running position.

The controller can extend the function by using an I / O box (485 to TCP / IP) that can provide many additional functions. Software modifications are usually made in the manufacturer. The barrier gates have been properly wired by the manufacturer and can be powered on directly. The circuit connections that need to be made during the installation are described in the above picture.

Note!

If some special functions are required, the controller's connection may differ from which shown in this illustration.

Important Note:

All command generators (push buttons, limit switches, etc.) must be connected by the volt-free contact way.

7.1 Wiring Instruction

Motor Port: Insert 4 ends motor cable port.

Power Port: Insert 6 ends power cable port.

Motor Communication Interface: Plug in series communication

485 Serial Port: Can be connected with 485 communication signal.

External Receiver Interface: Insert external receiver wire.

+24V	Output +24V;
GND	Ground;
COM	Input signal common port (input signal shorts out with GND)
OPEN	Opening signal input port (another port connects with +24V port)
CLOSE	Closing signal input port (when inputting, another port connects to +24V port)
Remote Control Open	Remote control opening signal input port (when inputting, another port connects to +24V port)
Remote Control Close	Remote control closing signal input port (when inputting, another port connects to +24V port)
Loop Detector	Loop detector signal input port (when inputting, another port connects to +24V port))
Infrared Sensor	Infrared anti-smashing input port (when inputting, another port connects to +24V port))

Emergency Stop Emergency stop signal input port (when inputting, another port connects to +24V port))

Boom Swing Out Signal Boom swing out signal input port (after inputting this signal, the control board will alarm, removing this signal, it needs to be re-powered to work)

Note: After inputting the OPEN/CLOSE signal, the operation will be in high speed fleet mode, all OPEN signals are with counting function (the program will remember the open signal, it'll close only when the loop detector detecting the signal of the same counting number), if this function is not required, please connect to remote control open/close port.

Opening in place signal NC Opening in place signal output: NC;

COM Opening in place signal output: common terminal

Opening in place signal NO Opening in place signal output: NO;

Closing in place signal NC Closing in place signal output: NC;

COM Closing in place signal output: common terminal

Closing in place signal NO Closing in place signal output: NO;

R&G Traffic Light Relay Green Green light signal output: NC;

COM Signal output: common terminal

R&G Traffic Light Relay Red Red light signal output: NO;

7.2 DIP Switch Function

After toggling the DIP switch, it'll be effective after re-powered.

DIP Switch 1: Barrier Gate Right side/Left side fixed setting.

ON	OFF
Leftward	Rightward

DIP Switch 2:

	ON	OFF
No.1: NO/NC Mode Selection	NC	NO
No.2: Power Off Status Selection	Boom Automatically Open (by default)	Unlocking When Power Off
No.3: Meeting Obstacle Selection	Automatic Reverse When Meeting Obstacle	Stop When Meeting Obstacle
No.4: Closing Speed Adjustment Selection	1.3s for Option	Fastest (by default)

No.5,6,7,8: Delay Automatic Close Setting				
Delay Time	No.5	No. 6	No.7	No.8
Off (by default)	OFF	OFF	OFF	OFF
1s	OFF	OFF	OFF	ON
2s	OFF	OFF	ON	OFF
3s	OFF	OFF	ON	ON
4s	OFF	ON	OFF	OFF
5s	OFF	ON	OFF	ON
8s	OFF	ON	ON	OFF
10s	OFF	ON	ON	ON
15s	ON	OFF	OFF	OFF
20s	ON	OFF	OFF	ON
25s	ON	OFF	ON	OFF
30s	ON	OFF	ON	ON
35s	ON	ON	OFF	OFF
40s	ON	ON	OFF	ON
50s	ON	ON	ON	OFF
60s	ON	ON	ON	ON

DIP Switch 3: Angle Adjustment of Barrier Boom (suitable for some areas that the boom can’t reach the vertical position caused by obstacle.)

Angle	No.1	No.2
90° (by default)	OFF	OFF

80°	OFF	ON
70°	ON	OFF
60°	ON	ON

7.3 Specific Function Description

1. Automatic travel learning: after powering on, barrier gate will learn the travel automatically, to slowly open in place first, then to slowly close in place, after which the travel learning is complete. The boom will be in its vertical position as final state.

2. Open/Close function: connect Open signal port to +24V to send Open signal; connect Close signal port to +24V to send Close signal. If fleet counting mode is not required, please connect to +24V and remote control open signal for opening; connect to +24V and remote control close signal for closing.

3. Remote control open/close signal function: The control board is inserted with external receiver and 2 remote controls have already been equipped, press OPEN to lift the boom, press CLOSE to drop the boom. Please refer to the remote control drawing.

4. Anti-smashing signal function: connect external anti-smashing equipment signal to +24V infrared anti-smashing signal terminal, the boom will up if the signal is detected during the closing process.

5. Loop detector function: After loop detector coil detecting the passing of vehicles, the boom will automatically close, connect signal line to +24V and loop detector signal input port.

6. Fire alarm input signal/Emergent stop input signal: This signal has the highest priority. Barrier gate will emergently stop under emergency condition. The boom will be automatically reset (travel learning) after removing this signal.

7. Boom swing out signal: connect this signal to the boom swing out signal input port, after detecting this signal, the control board will alarm. After removing this signal and being re-powered, the boom will be operated normally.

8. Delay closed function: No.5-8 on Dip switch 2 are for it. The boom will automatically close in the settled delaying time after opening in place. This function will be

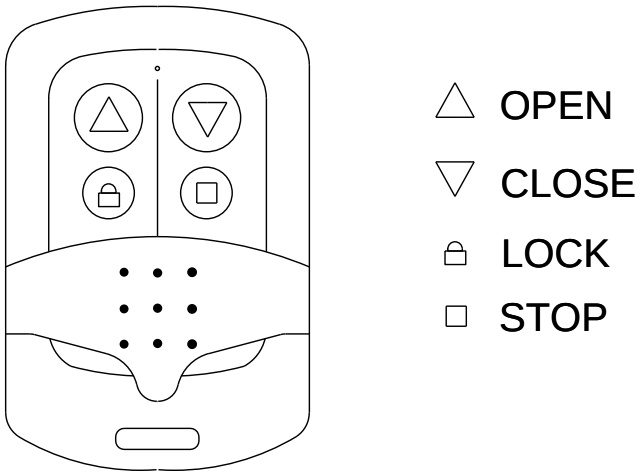
reset once the infrared or other anti-smashing signals are detected.

9. Remote control learning and delete: The updated external receiver of barrier gate has the function of learning and delete, before which, users should open the external receiver shell.

Learning: Press the white button on the control board of external receiver for 2 seconds, the indicator light will be on; press the button to be learned on the remote control twice, light will flash, after which remote control learning is complete.

Delete: Press the white button on the control board of external receiver for 2 seconds, the indicator light will be on; hold pressing until the light is off, after which all the remote controls will be deleted.

Remote Control Diagram



Press OPEN、CLOSE button, barrier gate will operate accordingly. Press STOP button during closing process, the barrier gate will immediately give priority to the implementation of the opening action, under this circumstance, the lock button is invalid.

7.4 Output Signal

1. Barrier gate open in place signal, relay output two ways (NC, C, NO)

2. Barrier gate close in place signal, relay output two ways (NC, C, NO)

3. Barrier gate with 10A traffic light signal, relay output two ways (NC, C, NO), contacts can pass 10A current.

7.5 Alarm Information

The buzzer has different warning tone

1 tone cycle over-current alarm

2 tones cycle hardware malfunction

3 tones cycle hardware malfunction

4 tones cycle self-check back to zero failure (unable to learn the travel)

5 tones cycle motor wiring/power failure

6 tones cycle boom swing out alarm

8. Technical Support

If the operational failure can't be handled by your technical staff, please contact our authorized service representative or professional assistance.

Please provide the barrier gate model, product serial number, controller version and other information when contact us for technical support services, which you can find in barrier gate model plate.

9. Packing List

Number	Title	Qty	Unit	Note
1	Barrier gate machine	1	Unit	Included in machine package
2	Machine case press board	2	Piece	
3	Expansion bolt M12	4	Set	
4	Remote control	2	Unit	
5	Case Key	2	Unit	
6	Instruction	1	Piece	
7	Barrier gate boom	1	unit	Optional, separate package
8	Boom holder	1	unit	Optional
9	Expansion bolt M8	4	Set	Optional, for fixing boom holder
10	Plug-in Machine control	1	unit	Optional

The manufacturer reserves the right to modify the technical specifications of the product to meet the latest technological developments with prior notice.

This instruction and service terms involved are to the final interpretation of the product manufacturer.