

# User Manual

## Barrier Gate–ProBG3000 Series

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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.



For further details, please visit our company's website  
[www.zkteco.com](http://www.zkteco.com).

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# 1 Overview

## 1.1 Introduction

ProBG3000 Series are high performance and high-speed barrier gates. It has a high-performance Servo Motor, simple and reliable transmission structure, high-temperature durable control panel, humanized interactive appearance design, and anti-collision protection gate connector design.

## 1.2 Appearance

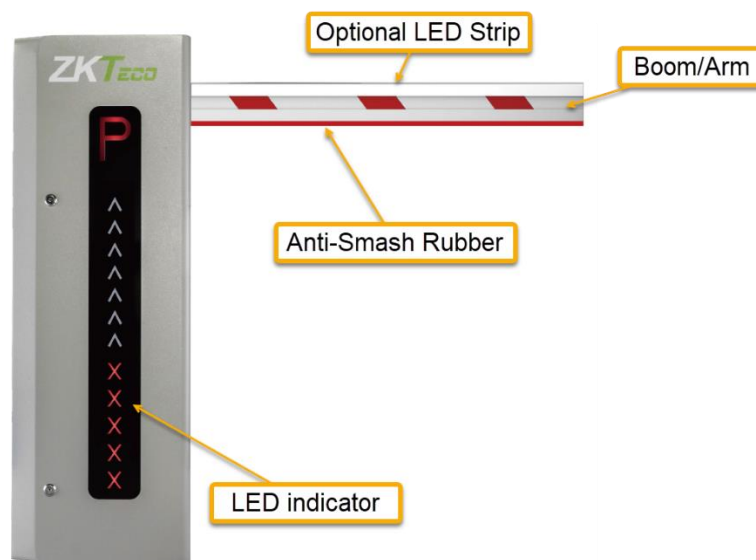


Fig. 1.1

# 2 Product Installation

## 2.1 Installation Precautions

- Before installing the parking barrier on the ground, check for the solidity of the base.
- If the ground is not firm and level, it is required to set a cement base before installation.
- Do not change the wiring connection inside the device when the power is in ON state.
- The GND wire should be connected to the cabinet for protection.

## 2.2 Cable Embedding

- Prepare  $\phi 25$  thick protective sleeve and cable in advance.
- Connect the Route cables through protective sleeves.
- Use a tool to open a cable tray on the ground.

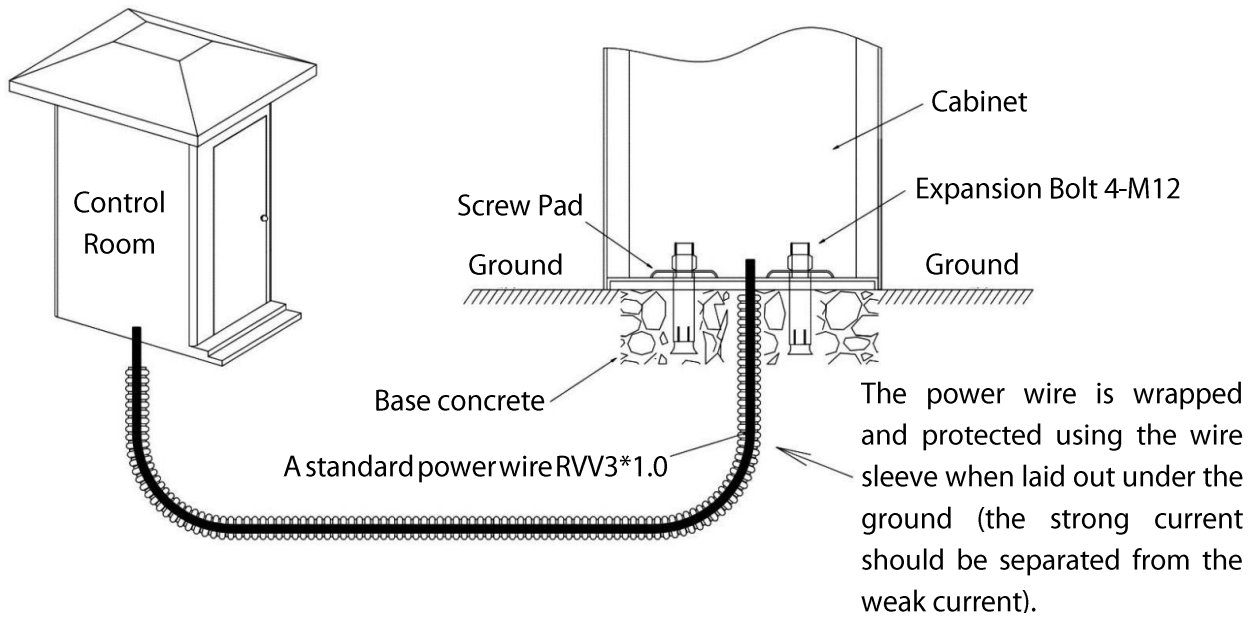


Fig. 2.1

## 2.3 Installation Procedure

- Use a screw pad to mark the installation position of the cabinet.
- Drive four expansion bolts into the bolt holes, as shown in **Fig. 2.2**.
- Install screw pads and use a spanner to tighten nuts, as shown in **Fig. 2.3**.

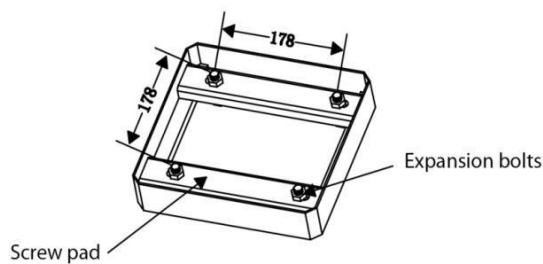


Fig. 2.2

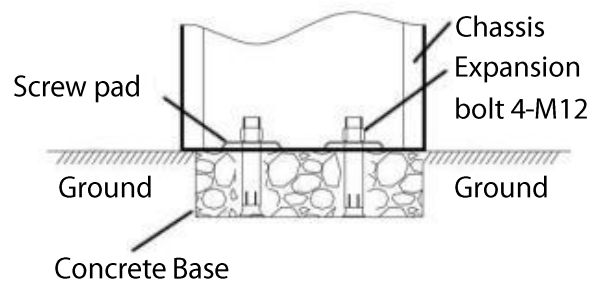


Fig. 2.3

## 2.4 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.

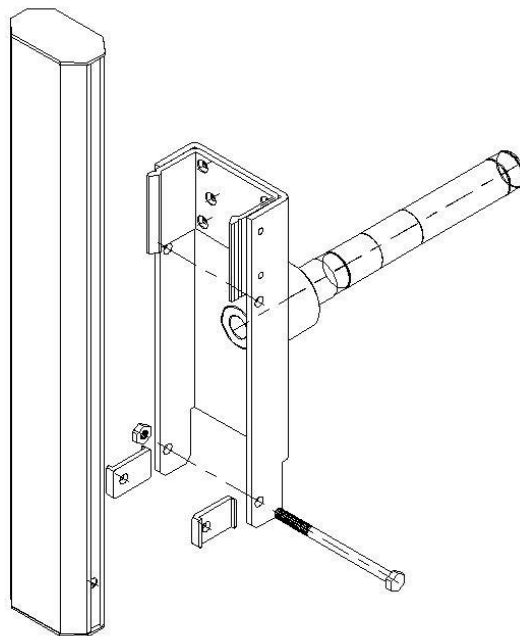


Fig. 2.4

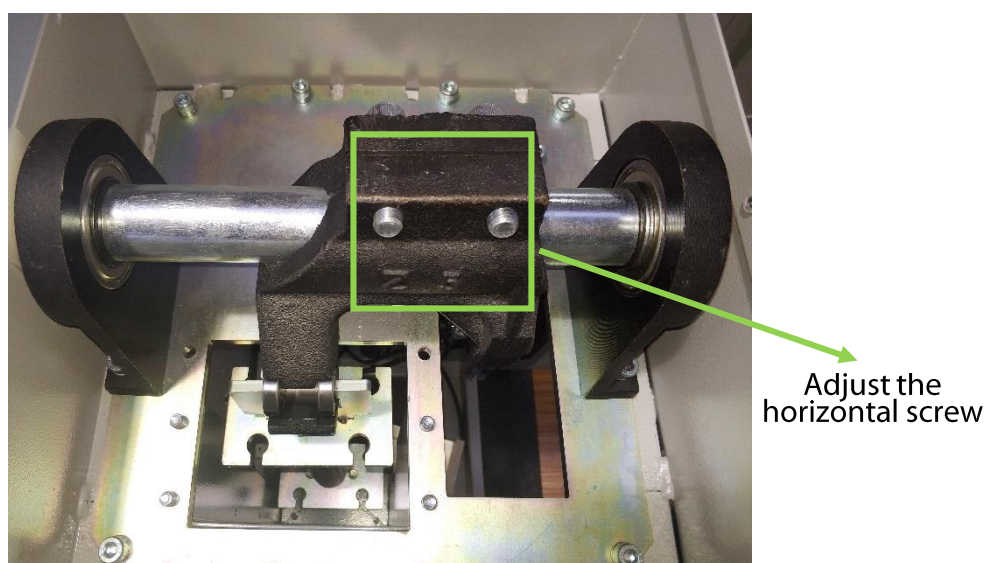
## 3 Springs Testing and Adjustment

- Based on the standard guidelines set for the booms, all of the barrier gates are set up in the factory accordingly.
- The spring used in the mechanism is in a highly tense state. And all the adjustments of the barrier must be carried only after the spring is in a loose state.
- Please check the stiffness and placement of the boom after it is installed and operated for the first time.
- Once the weight of the boom is balanced by the tension applied by the spring, the barrier gate can be operated properly. Therefore, if any change is applied (for example: after exerting excessive force) to the boom it must be re-adjusted in accordance with the steps mentioned below.

### 3.1 Adjust the Position of Boom

To adjust the position of the boom, please take the steps as below:

- Open the barrier gate door and remove the cover.
- Loosen the two fasten screws of the DZ-1 on the boom shaft with the M12's Allen wrench so that the boom can be repositioned by hand.
- Adjust the position of the boom (horizontal position, as shown in **Fig. 3.1**).
- Use the torque wrench to tighten the two fastening screws (72 Nm).

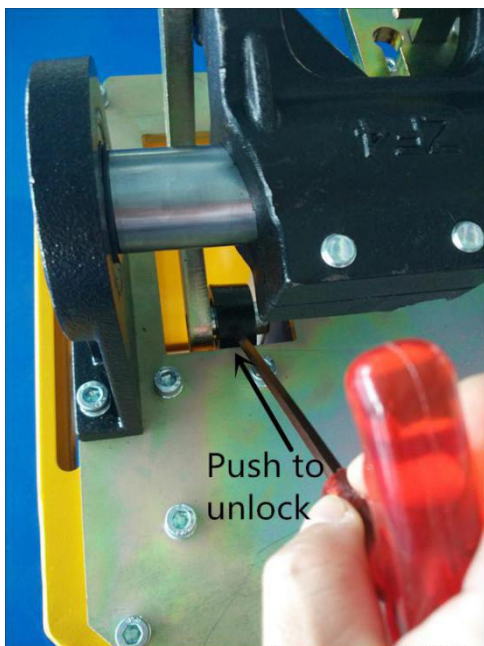


**Fig. 3.1**

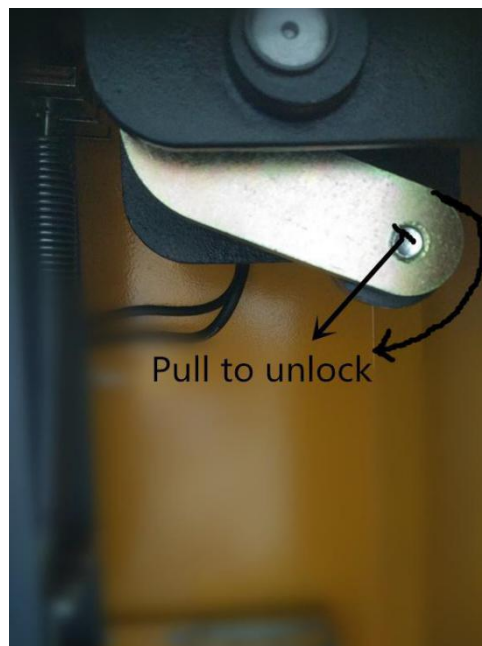
#### **Unlocking Arm Manually When Power is Off**

When there is no power, the barrier gate maybe in a vertical or horizontal mechanical dead point position. To unlock the arm manually at suh position of the boom, please follow the steps as mentioned below.

1. **Lifting the boom:** Use the screwdriver to push the crank connected rod away from the dead point position, lift the barrier gate manually (Push to Unlock).
2. **Dropping the boom:** Use hand to pull the crank connected rod down to leave the dead point position, drop the barrier gate manually (Pull to Unlock).



Push to unlock

**Fig. 3.2**

Pull to unlock

**Fig. 3.3**

### 3.2 Adjust Spring Setting

According to the length of the boom, assemble the compression spring. Also, tighten or loosen the adjusted handle to maintain the boom stable at 45°. It is the best way to test spring strength.

#### **Exceptions:**

When there is a power failure, the barrier gates open automatically, and a greater spring force is required.


### 3.3 Testing Spring Setting


1. Open the door of the barrier machine case with a key and remove the mounting plate.
2. Unplug the power cord.
3. Manually adjust the boom to the position of about 45° and release hand.
4. If the boom is stable in this position and does not move, it indicates that the spring adjustment is correct.

## 4 Power Connection

### 4.1 Connection

1. Connect the L and N to the air switch and PE to the ground screws (Yellow-Green Line).

 Only the provided power connection cables should be used to connect the main power supply (the internal power is already connected to the factory).

 After switching the power off, it is recommended to wait for at least 10 seconds before switching the power on again otherwise it may damage the equipment.

2. To use AC power, please toggle the **SW1 Switch** to **USE AC POWER** as shown in **Fig. 4.1**.

When **SW1** is toggled to **USE AC POWER**, 24V OUTPUT (CON2) can be connected to a 24V infrared detector or vehicle detector power supply.

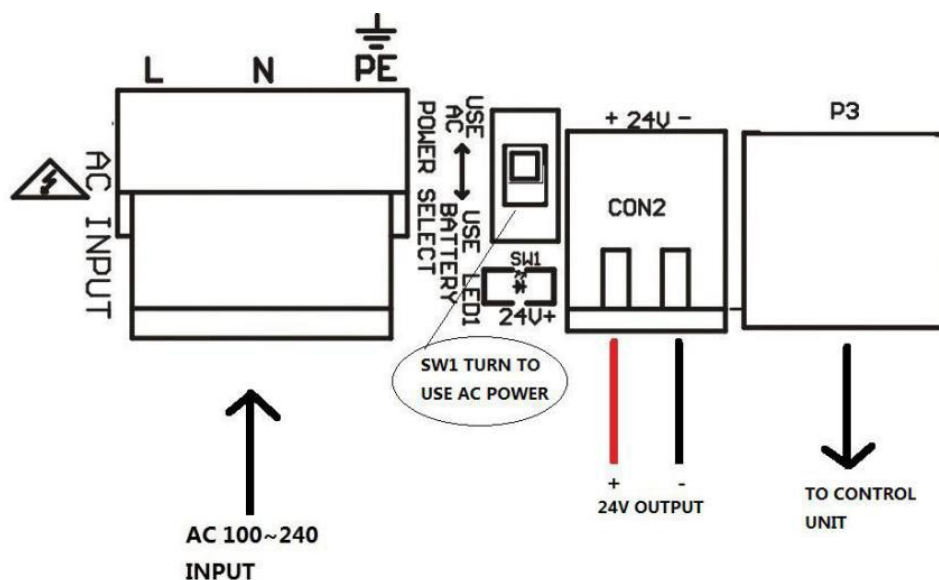


Fig. 4.1



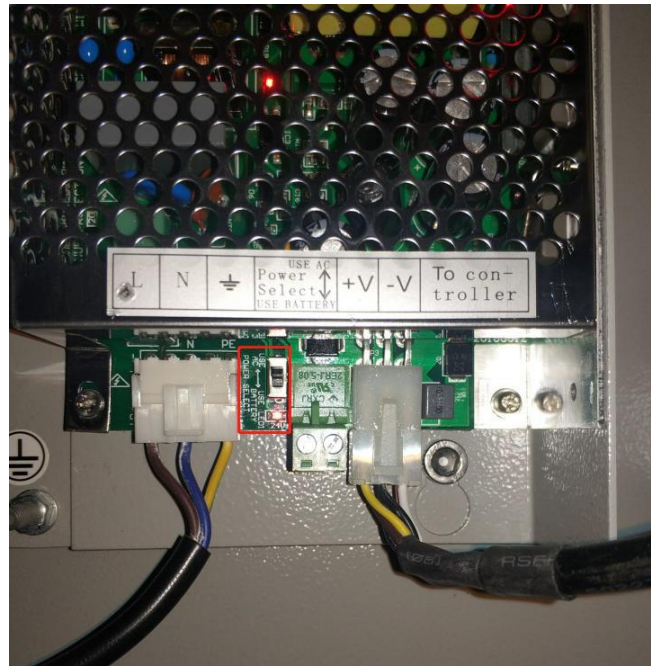


Fig. 4.2

3. This barrier gate can also be powered by a 24V battery. Check the below image for the connection.

**!** Put the **SW1** Toggle Switch to **USE BATTERY** to use a battery for power supply input and confirm +/- polarity when connecting the battery. Do not reverse the battery connection.

When **SW1** is toggled to **USE BATTERY**, CON2 can input 24V battery to power barrier gate.

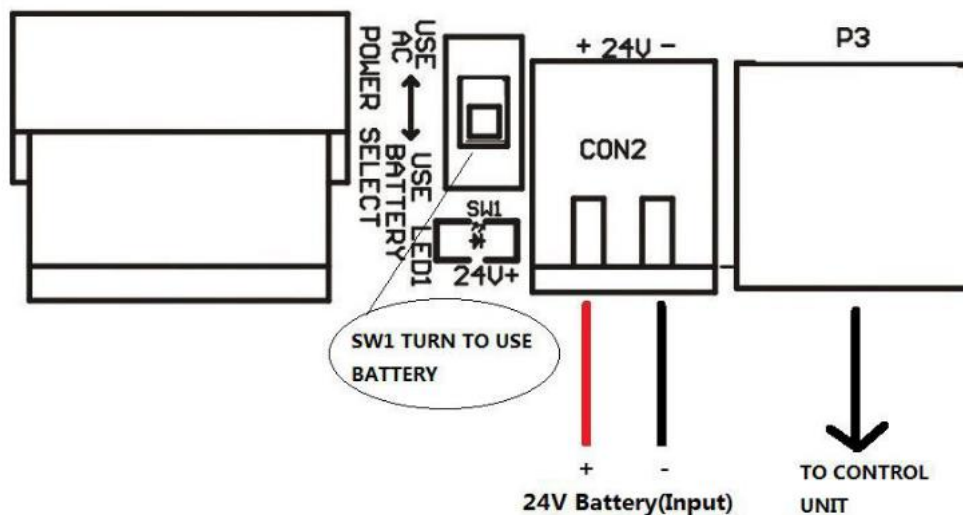


Fig. 4.3

## 4.2 Technical Parameters

| Model<br>Item                              | ProBG3030<br>L/R         | ProBG3045<br>L/R | ProBG3060<br>L/R | ProBG3130<br>L/R    | ProBG3230<br>L/R | ProBG3240<br>L/R |
|--|--------------------------|------------------|------------------|---------------------|------------------|------------------|
| <b>Boom Length</b>                         | 3m                       | 4.5m             | 6m               | 3m                  | 3m               | 4m               |
| <b>Opening Time</b>                        | 0.9s                     | 2.5s             | 4.5s             | 1s                  | 2s               | 3s               |
| <b>Boom Type</b>                           | Straight/Telescopic Boom |                  |                  | 90°<br>Folding Boom | Fence Boom       |                  |
| <b>Boom with LED</b>                       | Optional                 |                  |                  |                     | No               |                  |
| <b>Power Consumption</b>                   | Max 100W                 |                  |                  |                     |                  |                  |
| <b>Power Supply</b>                        | 24V DC, AC 100 to 240V   |                  |                  |                     |                  |                  |
| <b>Controller Frequency</b>                | 50Hz to 60Hz             |                  |                  |                     |                  |                  |
| <b>Housing Material</b>                    | Powder Coated Steel      |                  |                  |                     |                  |                  |
| <b>Packed Weight (No Boom)</b>             | 60KG                     |                  |                  |                     |                  |                  |
| <b>Control Board Voltage</b>               | 24V DC/max 300mA         |                  |                  |                     |                  |                  |
| <b>Working Temp</b>                        | -40° to +75°C            |                  |                  |                     |                  |                  |
| <b>Mean Cycles Between Failures (MCFB)</b> | 5 million times          |                  |                  |                     |                  |                  |
| <b>Driving Unit</b>                        | Servo Motor              |                  |                  |                     |                  |                  |
| <b>IP Rating</b>                           | IP54                     |                  |                  |                     |                  |                  |

### **Interchangeable Boom Direction**



L: Case on the left side,  
and boom on the right side



R: Case on the right side,  
and boom on the left side

**Fig. 4.4**

## 5 Control Board PIN Diagram

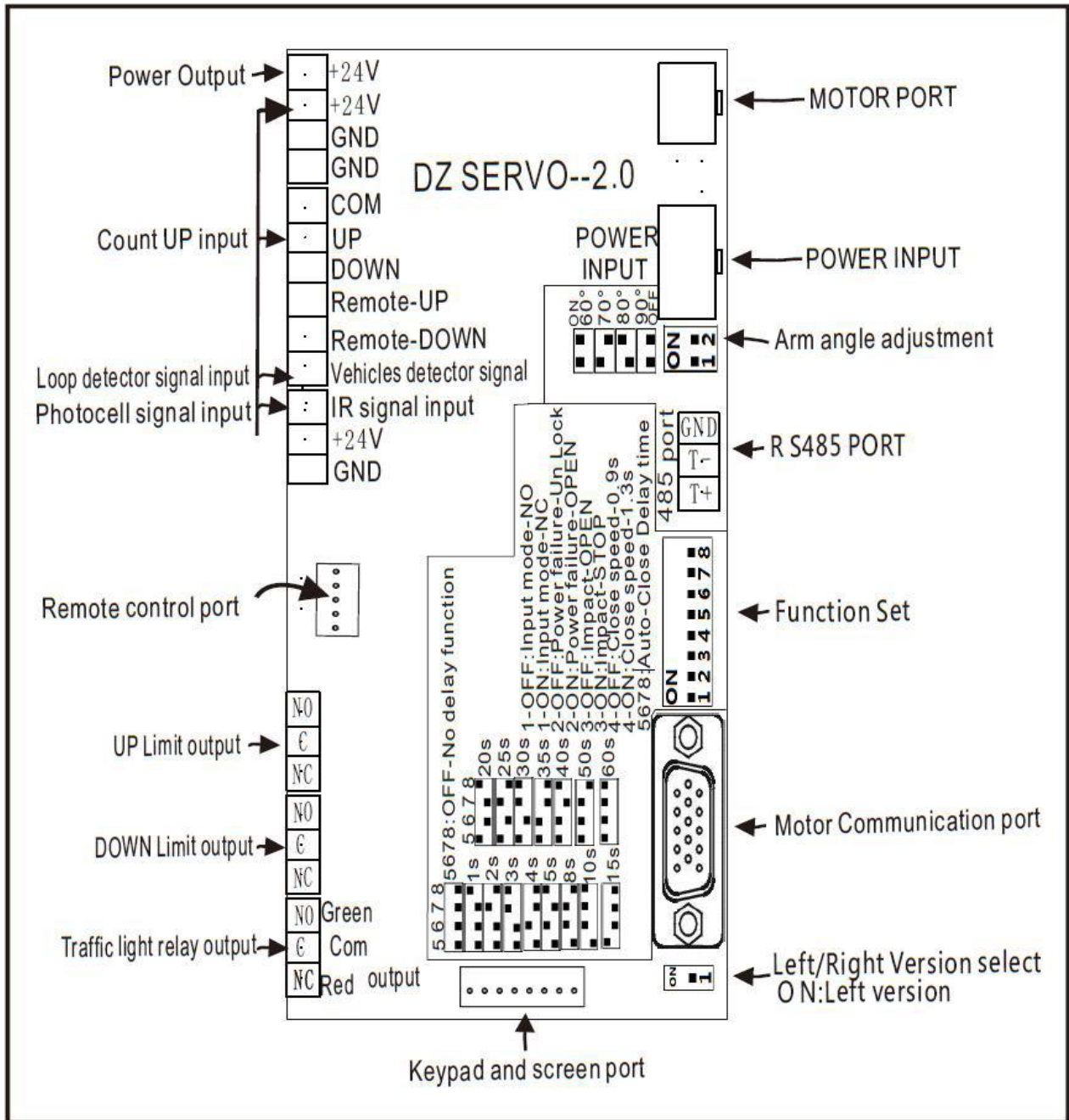


Fig. 5.1

## 5.1 DIP Switch Settings

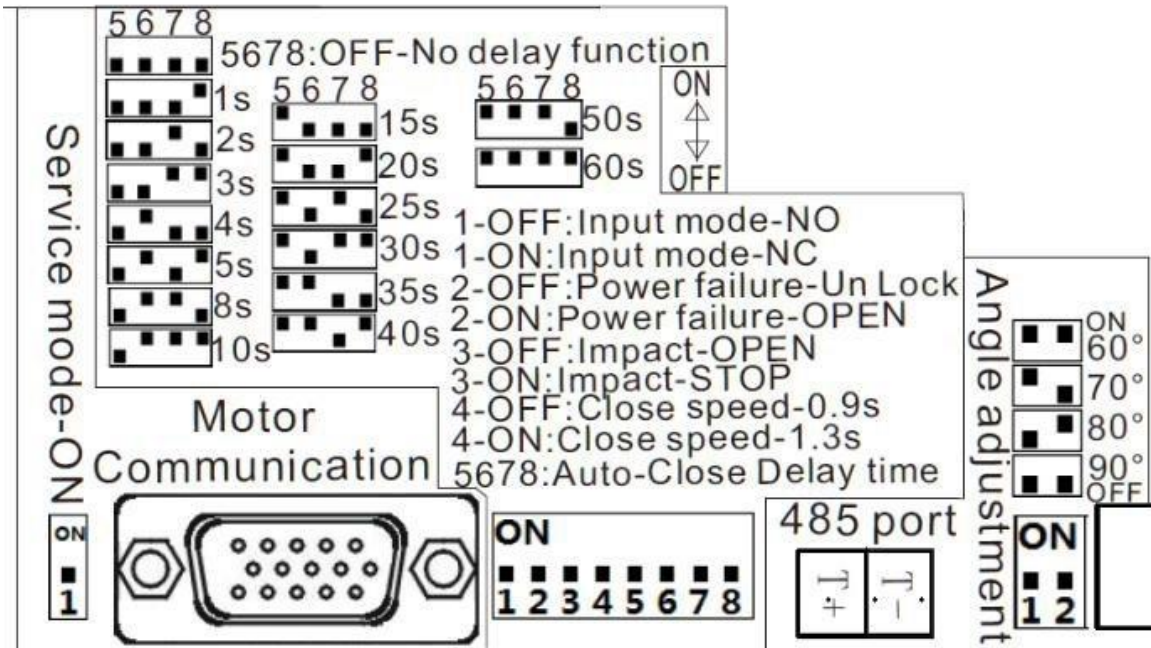


Fig. 5.2

1. In DIP Switch 1, ON is for NC (Normally Closed) and OFF for NO (Normally Open). (Default mode, do not modify)
2. In DIP Switch 2, ON is for automatic opening and OFF is for self-locking when the power is off.
3. In DIP Switch 3, ON is for automatic stop and OFF is for automatic reversing when the boom meets an external obstacle.
4. With DIP Switch 4, auto-closing speed can be adjusted. ON is for auto-closing speed of 1.3s whereas OFF is for 0.9s for the boom. (for the ProBG3030 model only)
5. The DIP Switch 5, 6, 7, 8 are used for delaying automatic closing of the boom. The delay time for automatic closing of the boom can be set are 1s, 2s, 3s, 4s, 5s, 8s, 10s, 15s, 20s, 25s, 30s, 35s, 40s, 50s, 60s as shown in **Fig. 5.2**.
6. If the boom cannot reach the vertical position due to any obstacle, the boom can be adjusted at an angle of 60°, 70°, 80°, and 90°. A separate DIP switch is provided on the board for the same (1, 2 Switches).
7. The maintenance mode switch is convenient for possible repairing and adjusting. (Default mode, do not modify).

## 5.2 Input Interface

- The RS485 interface can connect with the computer to check the barrier gate state and alarm information.



**NOTE:** Only the professional developers can operate, ask the sales staff to provide RS485 Protocol.

- The parking lot's open/close control signal and remote control's open/close signal are separate. The arm opening has memory function, it remembers the number of pulse arm opening and closes once the counted number of cars passes by. (must be equipped with a vehicle detector)
- "UP" and "DOWN" signal ports are available on the mainboard.
- All input ports are in optoelectronic isolation. The input voltage range lies between DC5 to 24V.
- The vehicle detector signal input and infrared signal input uses the output COM, NC of the loop detector. (normally the No.4 and No.11 are related to the detector)



**NOTE:** The barrier gate does not respond to the closing command when the coil is not connected.

## 5.3 Output Interface Introduction

- Line 1 Barrier Gate Vertical Position Signal, Relay Dry Node Signal (NC, C, NO).
- Line 1 Barrier Gate Horizontal Position Signal, Relay Dry Node Signal (NC, C, NO).
- Line 1 10A R&G Traffic Light Signal, Relay Dry Junction Signal (NC, C, NO), contacts can pass 10A current.

## 5.4 Connecting to Other Parking Device

### 5.4.1 License Plates Recognition Machine (LPR) and Control Panel

The boom lifts automatically after LPR recognizes and verifies license plates (the function of the Control Panel is similar to LPR). The wiring diagram is shown in **Fig. 5.3**.

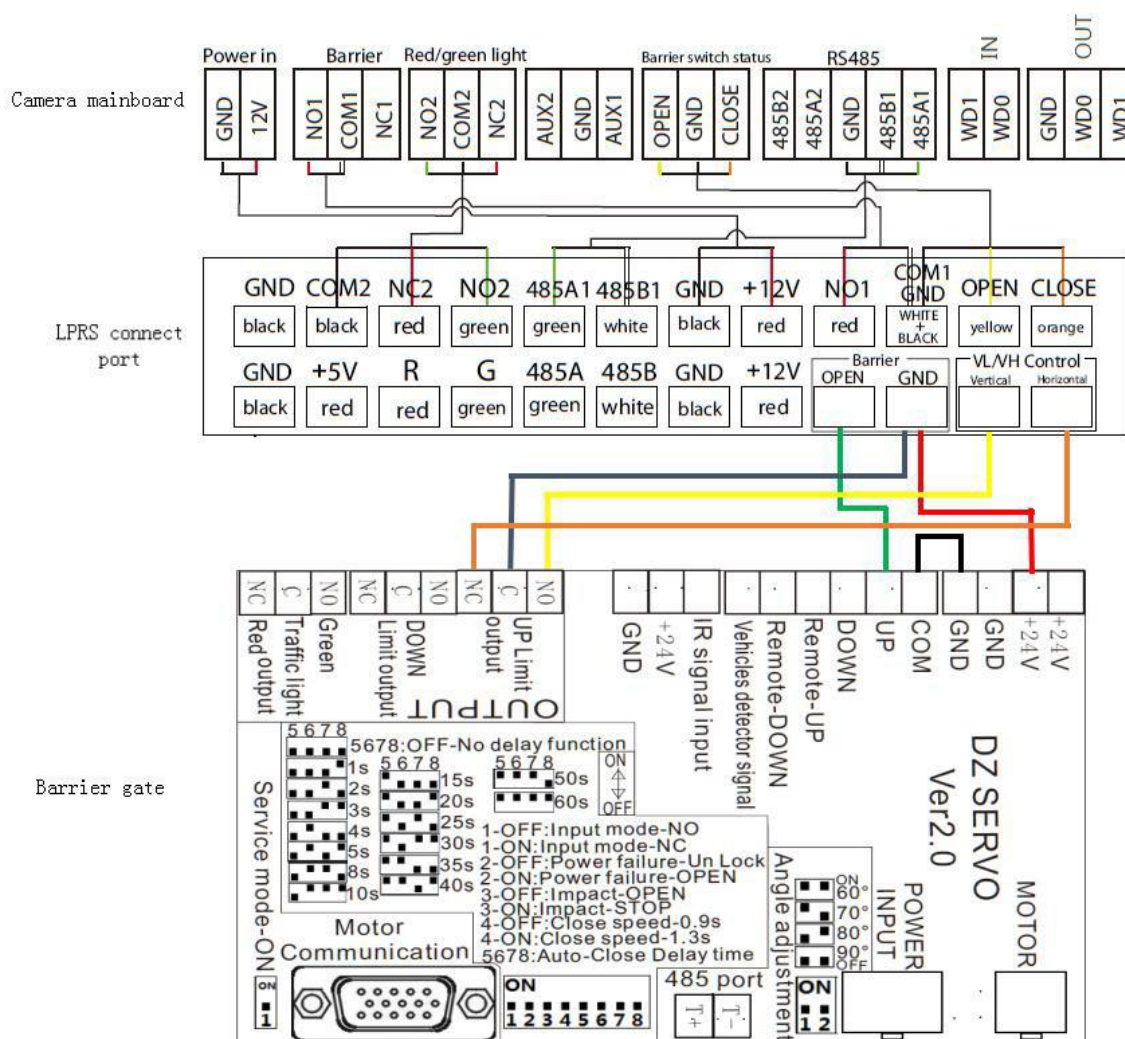


Fig. 5.3

### 5.4.2 Connect to the inBio Controller (UHF System)

The UHF reader is connected to the controller, which then connects with the barrier gate control board. The UHF tag authorizes the user's card number information in the software to the door of the controller and then swipes the card to open the door automatically.

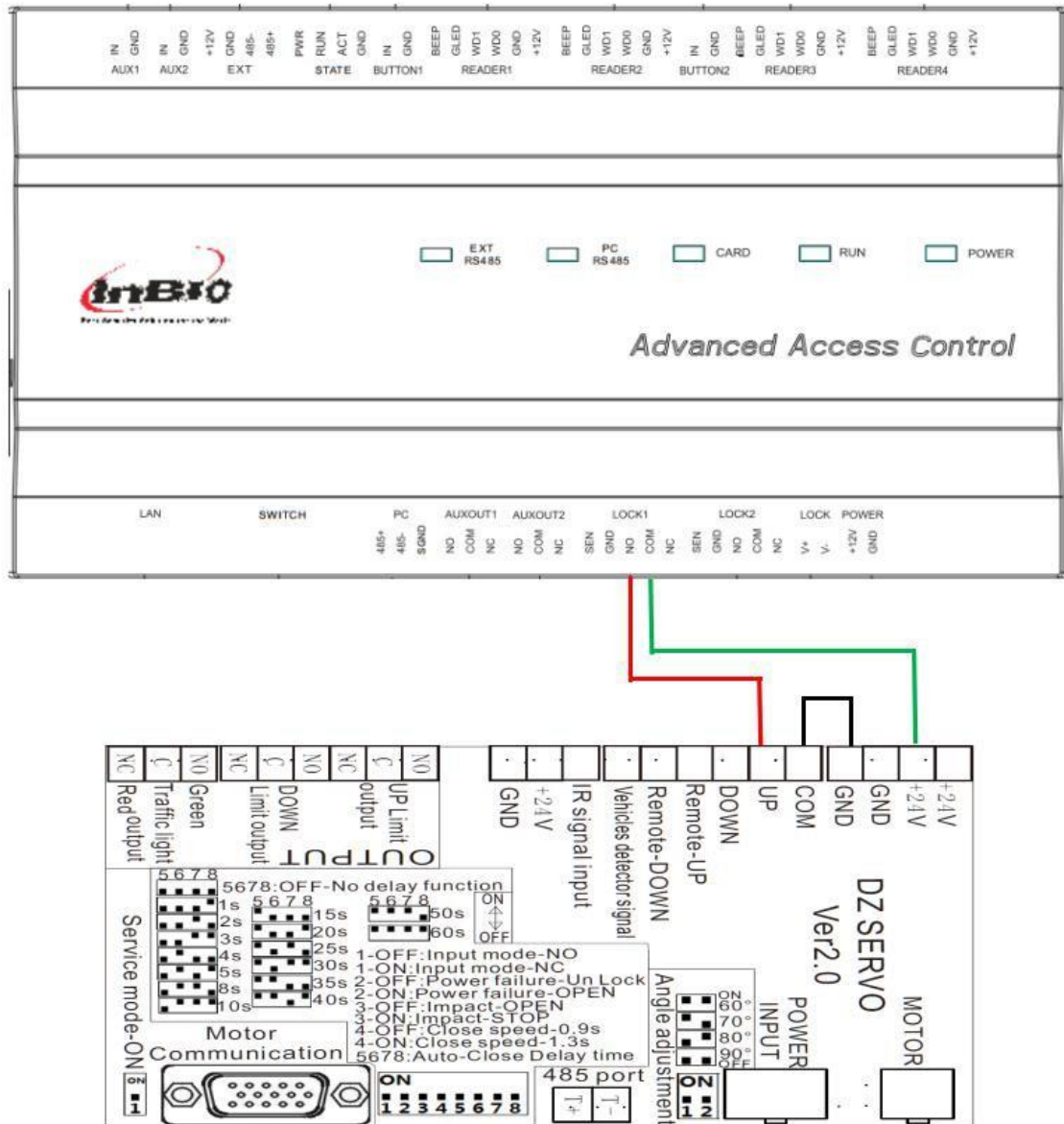


Fig. 5.4



### 5.4.3 Loop Detector

Loop detectors in the parking system consist of the loop, loop detector, and control board. The loop is installed under the ground. When the loop detects a vehicle, the boom resists falling. After the vehicle pass, the boom falls automatically.

The wiring diagram is shown in **Fig. 5.5** (If only the Loop Detector is used, the "IR signal input" needs to be directly connected with +24V).

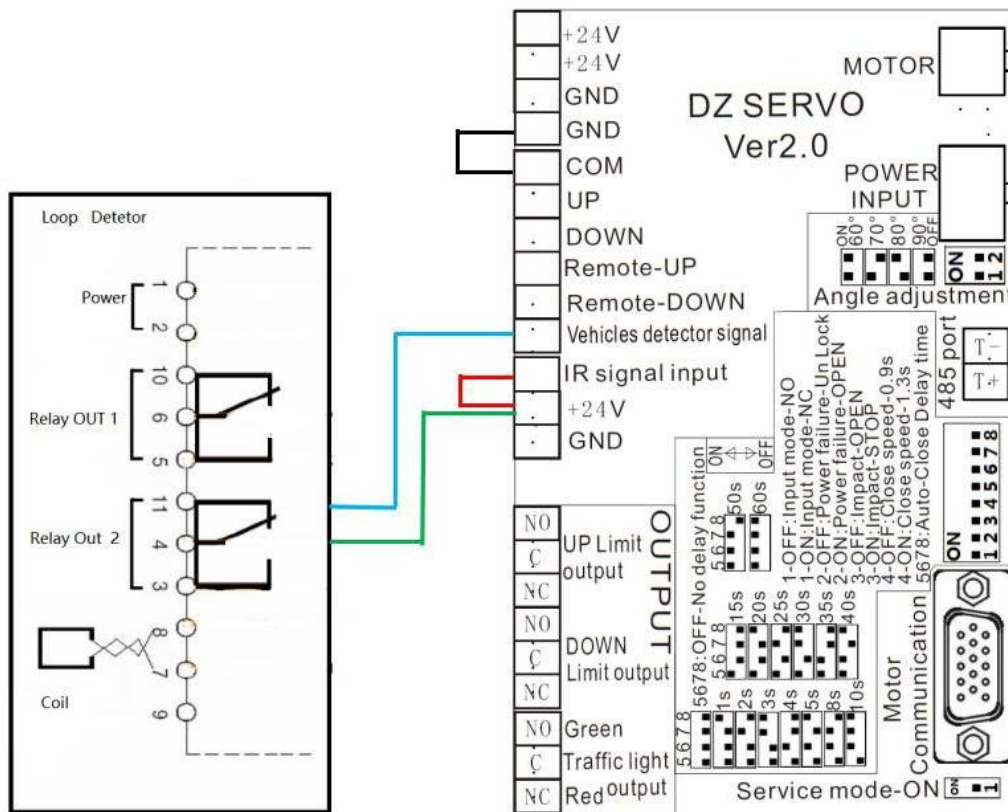


Fig. 5.5

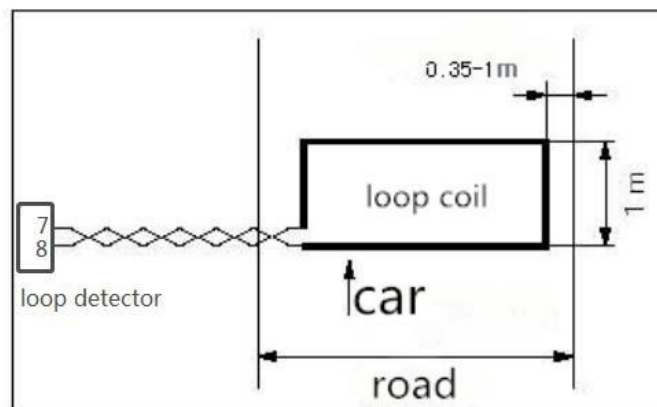
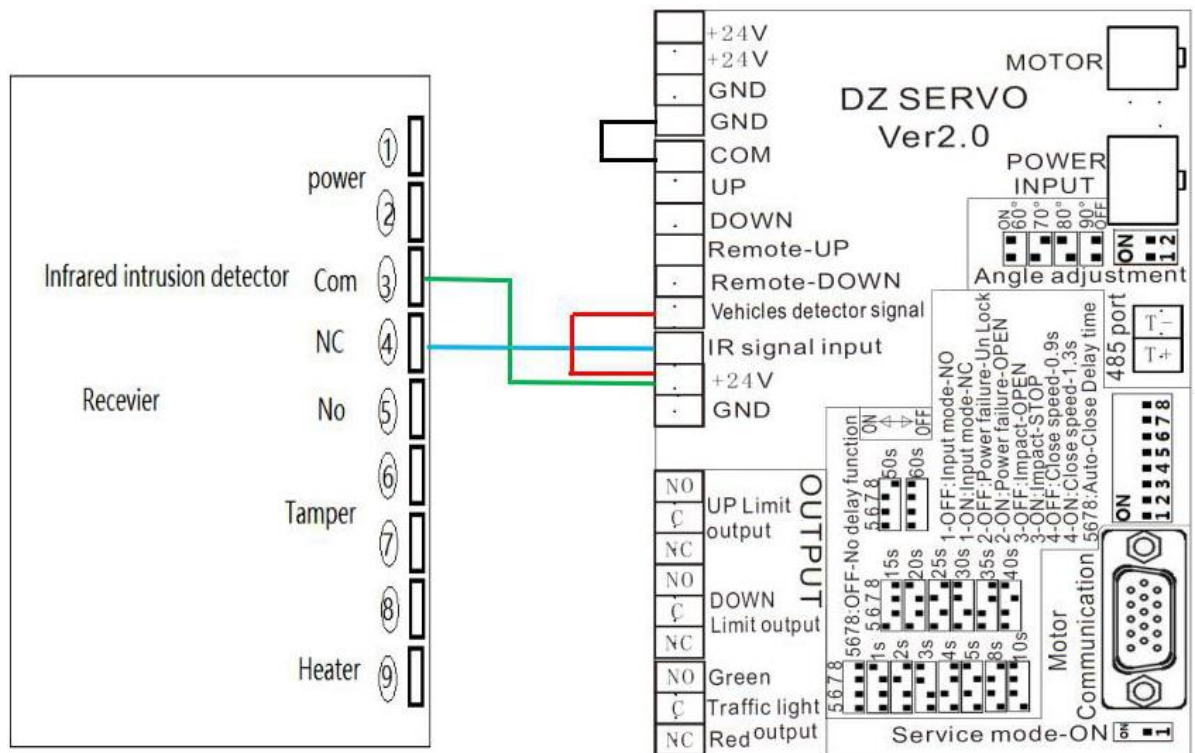


Fig. 5.6

| Coil Circumference | Coil Number   |
|--------------------|---|
| 3m                 | According to the actual situation, ensure that the inductance value is between 100 uH and 200 uH. |
| 3-6 m              | 5-6 turns   |
| 6-10m              | 4-5 turns   |
| 10-25 m            | 3 turns   |
| 25 m               | 2 turns   |

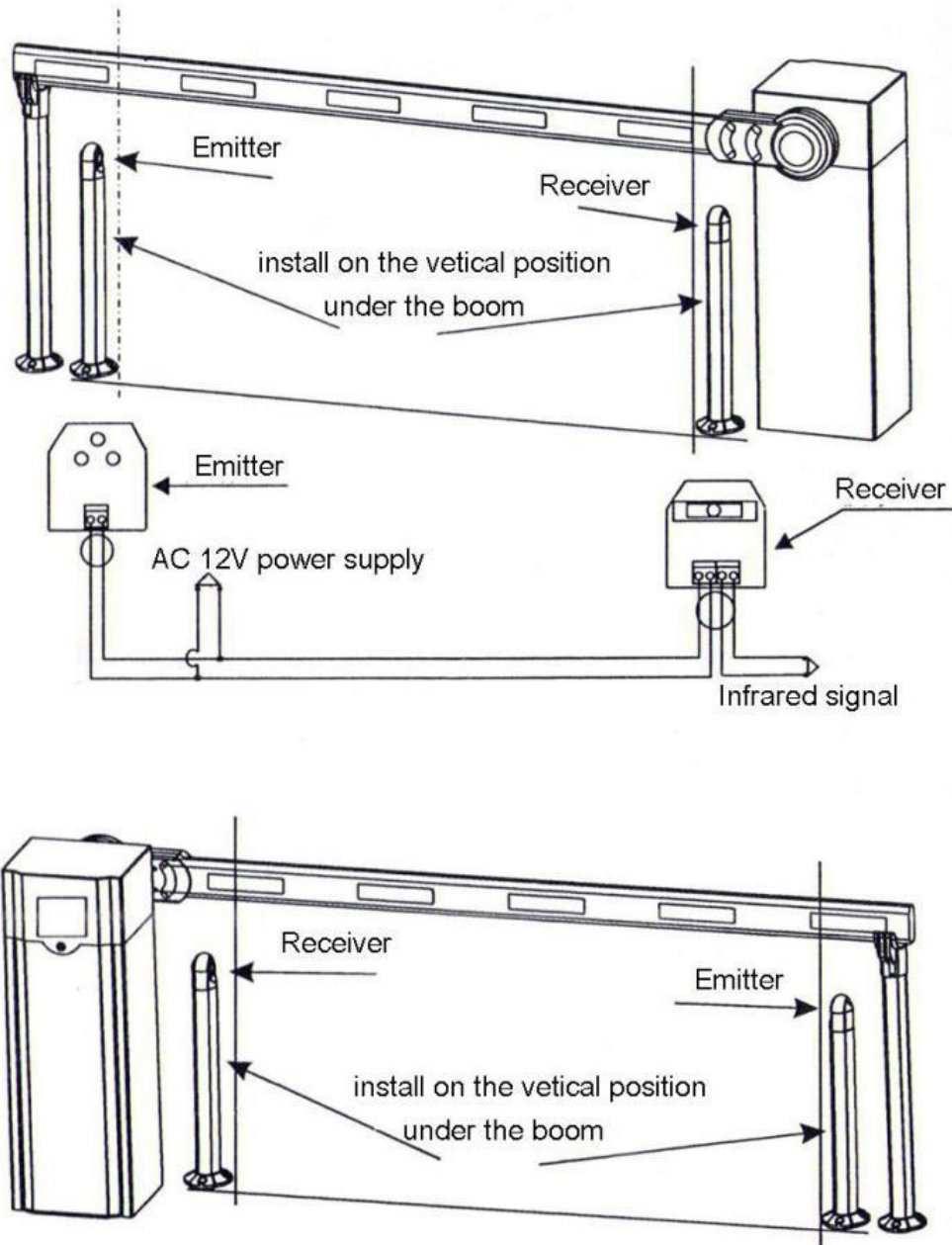
### 5.4.4 Infrared Intrusion Detector

If a car or person exists between the transmitter and receiver of the Infrared Intrusion Detector, the boom will not fall. After the vehicle or person passes, the boom will fall automatically. The wiring diagram is shown in **Fig. 5.7**.



**Fig. 5.7**

### Installation of the Infrared Photocell Beam Detector



**Fig. 5.8**

### 5.4.5 When the loop detector and the IR are used at the same time.

Check the wiring diagram (Fig. 5.9.) to view the connections when the loop detector and the IR are used at the same time.

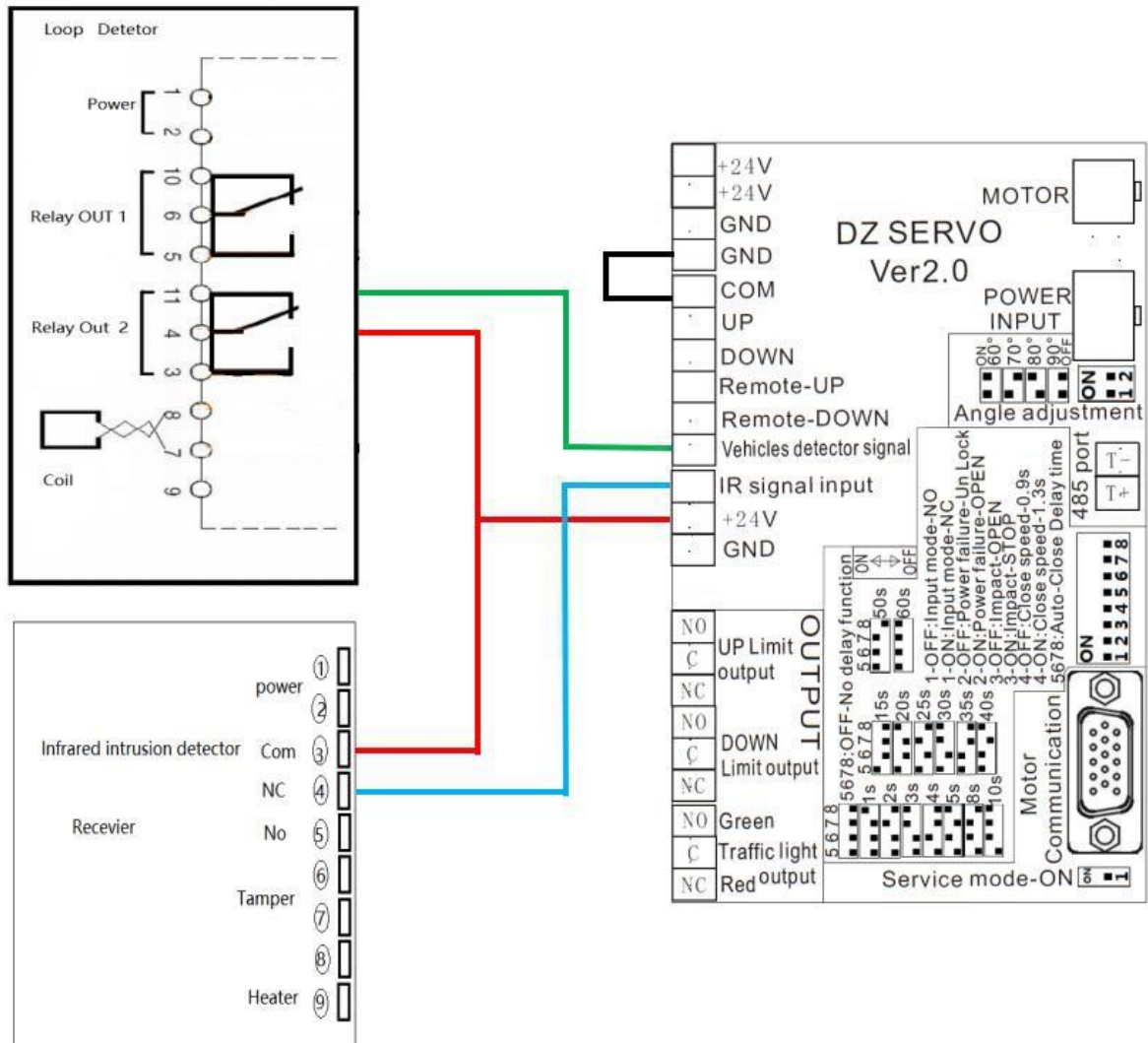
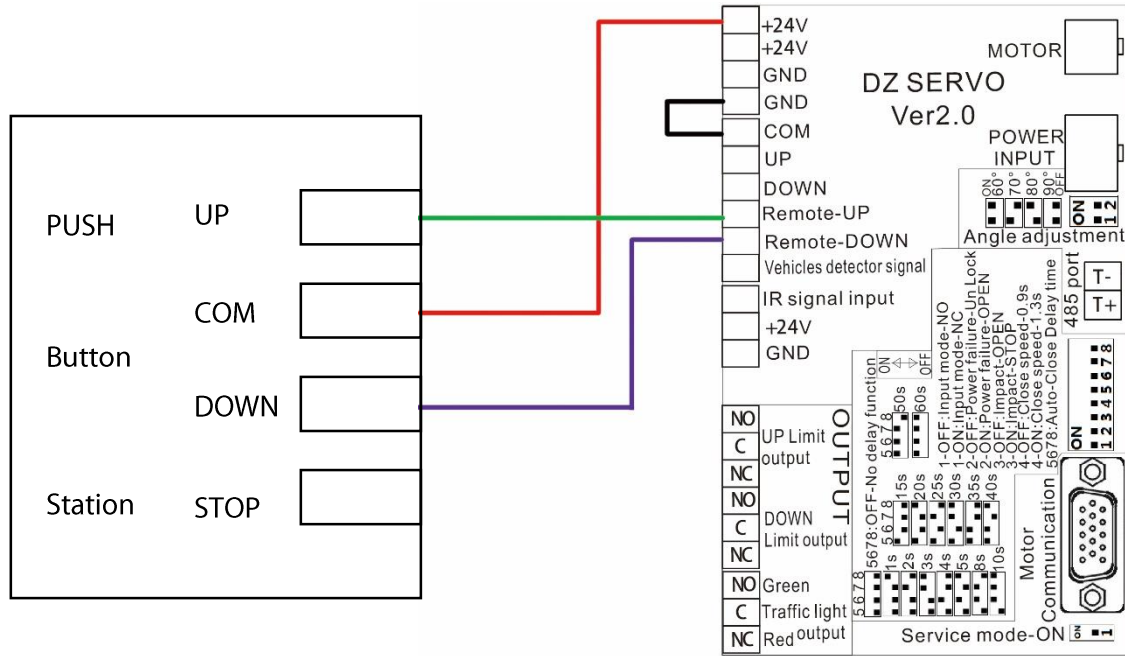


Fig. 5.9

### 5.4.6 Wiring Diagram of the Push Button Station

The wiring diagram of the Push button station is shown in **Fig. 5.10**.




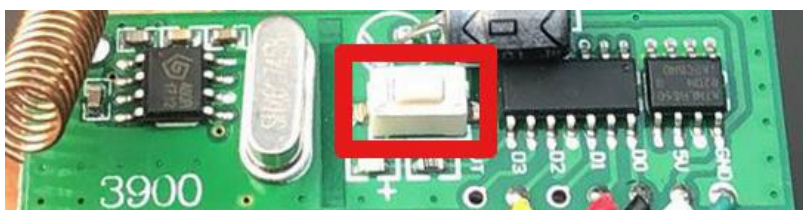
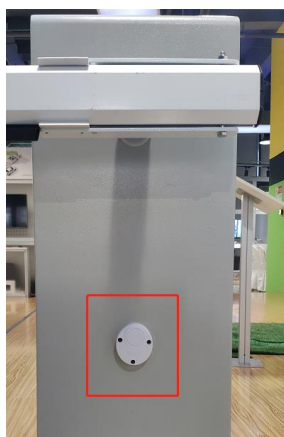
**Fig. 5.10**

## 6 Appendix

### 6.1 Remote Controller Matching and Deleting Instruction

1. **Match:** Press the **White Button** until the red light turns on. Then press any key on the remote controller until the red signal starts flashing, which indicates the match is successful.
2. **Delete:** Press the **White Button** for about 10s until the red light starts blinking, which indicates that deletion occurred successfully.

 **NOTE:** The frequency of remote control is 433MHz. The remote controller of other brands may not be compatible.



### 6.2 Anti-collision Function

The boom requires the installation of 1 or 2 fixing screws for collision protection. It prevents the boom from falling off (for Straight/Telescopic boom arm).



## 6.3 ProBG Regulation Parameters

### Parameter Name Interpretation

1. **d00SPA** - Program Name



2. **PA\_\_00** - Parameter Options



3. **1d0000** - Parameter Value



4. **PA\_\_AST** - Reset



**NOTE:** After resetting the parameter value, the control board will give an alarm. At this time, select the parameter PA\_31 and press the **Enter** key to change 1d0000 to 1d0001.

\*\*\_Err - Error warning (Normally : 00000)



### Description of Alarm Signal

- **00\_Err** - Current overload
- **11\_Err** and **22\_Err** - Hardware failure
- **33\_Err** - Self-checking fault
- **44\_Err** - Motor wiring fault or AC power failure detection
- **55\_Err** - Boom shedding detection

## **Errors and their Solutions**

| <b>Alarm Tone</b> | <b>Error Code</b> | <b>Issue and Solution</b>   |
|-------------------|-------------------|---|
| 1                 | 00_Err            | <b>Issue:</b> Current overload.<br><b>Solution:</b> Fix the current load on the device.   |
| 2                 | 11_Err            | <b>Issue:</b> Mainboard issue.<br><b>Solution:</b> Please install a new mainboard.  |
| 3                 | 22_Err            | <b>Issue:</b> Mainboard issue.<br><b>Solution:</b> Please install a new mainboard.  |
| 4                 | 33_Err            | <b>Issue:</b> Can be faulty motor connection or the boom won't be in balanced position.<br><b>Solution:</b> <ul style="list-style-type: none"> <li>• Check whether the mechanical movement is proper.</li> <li>• Check the connection of the motor or change mainboard.</li> <li>• Check if the boom is in the balance position.</li> </ul> |
| 5                 | 44_Err            | <b>Issue:</b> Improper motor encoder plug connection or mainboard issue.<br><b>Solution:</b> Check the connection of motor encoder plug or change mainboard.  |
| 6                 | 55_Err            | <b>Issue:</b> DIP switch 1 may not be OFF or issue with anti-collision detection signal wiring of the boom.<br><b>Solution:</b> <ul style="list-style-type: none"> <li>• Check whether DIP switch 1 is OFF.</li> <li>• Check the wiring of the anti-collision detection signal of the boom.</li> </ul>                                      |
| Always            | -                 | <b>Issue:</b> May have improper connection between the vehicle detector signal and IR signal.<br><b>Solution:</b> Check whether the vehicle detector signal and IR signal are directly connected to +24V.   |

## **Key Instructions**

- **MENU:** Menu key is used for switching in the above four parameters.
- **L/R ←/→ :** Left and right key are used for selecting the corresponding parameter character
- **UP ↑ :** Add key is used for adding 1 for each press. (0 to 9)
- **ENTER:** ENTER key is used for entering into the specific parameter setting item.



### **Parameter Interpretation**

**1d0000, 2d0000, 3d0000, and 4d0000** indicates that the current parameter is 0000, corresponding to the modification from the rightmost bit 1 to the rightmost bit 4.

#### **Return Time Parameter:**

- PA\_07 (1 to 40): Small number, small acceleration
- PA\_\_09 (1500 to 6000): Large number, long time

#### **Open Time Parameter:**

- PA\_10, PA\_11 (100 to 9999)
- PA\_12 (01 to 99)

#### **Close Time Parameter:**

- PA\_13, PA\_14 (100 to 9999)
- PA\_15 (01 to 99)



#### **NOTE:**

PA\_10 and PA\_13 represent the motor speed.

PA\_11 and PA\_14 represent runtime.

PA\_12 and PA\_15 represent the ratio of acceleration and deceleration.

For example: A value of 30 is 1:1, greater than 30 is acceleration and less than 30 is deceleration.

**Close Position Parameter:** PA\_\_20 (01 to 9999)

**Open Position Parameter:** PA\_\_21 (01 to 9999)

**Obstacle Sensitivity:** PA\_\_23 (10 to 99)

**Boom Signal:** PA\_\_30 (0 to 1, Short wiring is 1) (Default value - 1d0000).

**Vehicle Detector and IR Signal:** PA\_\_31 (0 to 1, Short wiring is 1) (Default value - 1d0001).

The specific parameters are as follows:



**NOTE:** These parameters shall be adjusted according to the length of boom.

| Boom: 3m; Speed: 0.9s | Boom: 4.5m; Speed: 2.5s | Boom: 6m; Speed: 4.5s |
|-----------------------|-------------------------|-----------------------|
| PA_07: 05             | PA_07: 05               | PA_07: 05             |
| PA_08: 8500           | PA_08: 8500             | PA_08: 8500           |
| PA__09: 1850          | PA__09: 6800            | PA__09: 7850          |
| PA__10: 1850          | PA__10: 1100            | PA__10: 550           |
| PA__11: 1800          | PA__11: 4200            | PA__11: 5350          |
| PA__12: 55            | PA__12: 50              | PA__12: 20            |
| PA__13: 1650          | PA__13: 750             | PA__13: 400           |
| PA__14: 1900          | PA__14: 4750            | PA__14: 6150          |
| PA__15: 85            | PA__15: 55              | PA__15: 20            |

| Fence Boom: 3m;<br>Speed: 2s | Fence Boom: 4m;<br>Speed: 3s | Folding boom: 3m;<br>Speed: 1s |
|------------------------------|------------------------------|--------------------------------|
| PA_07: 05                    | PA_07: 05                    | PA_07: 05                      |
| PA__09: 2250                 | PA_08: 8500                  | PA_08: 8500                    |
| PA__10: 1350                 | PA__09: 6800                 | PA__09: 1850                   |
| PA__11: 3350                 | PA__10: 850                  | PA__10: 1650                   |
| PA__12: 35                   | PA__11: 4700                 | PA__11: 1850                   |
| PA__13: 900                  | PA__12: 50                   | PA__12: 20                     |
| PA__14: 3700                 | PA__13: 600                  | PA__13: 1600                   |
| PA__15: 15                   | PA__14: 5350                 | PA__14: 2050                   |
|                              | PA__15: 65                   | PA__15: 25                     |

**Balance Spring Selection Table**

| Boom Type                       | Boom Length<br>L (M)  | Spring Wire Diameter<br>D (mm) | No. of Springs |
|---------------------------------|-----------------------|--------------------------------|----------------|
| <b>Telescopic Straight Boom</b> | $2.5 < L < 3.5$       | D=3.5                          | 2              |
|                                 | $3.5 \leq L \leq 4.0$ | D=3.5                          | 3              |
|                                 | $4.0 < L < 5.0$       | D=3.5                          | 4              |
|                                 | $5.0 \leq L \leq 6.0$ | D=3.5+4.5                      | 3+2            |
| <b>90° Folding Boom</b>         | $L \leq 3$            | D=3.5                          | 3              |
| <b>Fence Boom</b>               | $L \leq 3$            | D=4.5                          | 2              |
|                                 | $3 < L \leq 4$        | D=3.5+4.5                      | 2+2            |

(For reference only, subject to the actual product.)

 **NOTE:**

- Set the boom length before adjusting the parameters.
- Replacing the long boom with a shorter boom requires the spring to be removed for balance.
- Once parameter settings are reset, the machine will always alarm. Set the PA\_31 parameter to 1d0001. (1.5 version mainboard)
- The above parameters are for reference only, be sure to adjust the parameters according to the length of the boom.
- After the resetting of parameter settings, the machine will always alarm. To avoid any issue, set the PA\_25 parameter to 1d0001 and PA\_31 parameter to 1d0001 (2.0 version mainboard).
- After reset, the machine settings restores to 3m boom parameters.

## 6.4 Packing Accessories List

| Part Name                    | Quantity |
|------------------------------|----------|
| M14*150 Chassis Fixing Screw | 4 pcs    |
| Chassis Fixing Press Plate   | 2 pcs    |
| Remote Controller            | 2 pcs    |
| Chassis Keys                 | 2 pcs    |
| M8*110 Boom Arm Fixing Screw | 2 pcs    |

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