# ONE TECH

## Barrier Gate Manual

**(DZX2.1 Control Board )**

(The third version)
(Pictures for reference only, the product prevail in kind)

# Contents

## Warning!

For safety, please do follow the instruction strictly to manage

this product:

1. It is forbidden to open the barrier cabinet top cover or door

when it is working.

2. There must be a grounding connection for the barrier cabinet.

3. Make sure there is no person or any obstruction under the

boom when it is falling.

4. Before delivery, the barrier gate spring and the boom length

are well-balanced. It is not allowed to change the boom length

or weight randomly. If needed, please check with the technician.

# 1. Brief Introduction

Thanks for you to buy our product. This product uses the latest mold designing technology, die-casting manufacturing technology. So the quality is reliable. And the mechanism uses gear worm and crank link structure, which make the boom operate quickly and steadily. And the maintenance will be easy and convenient.
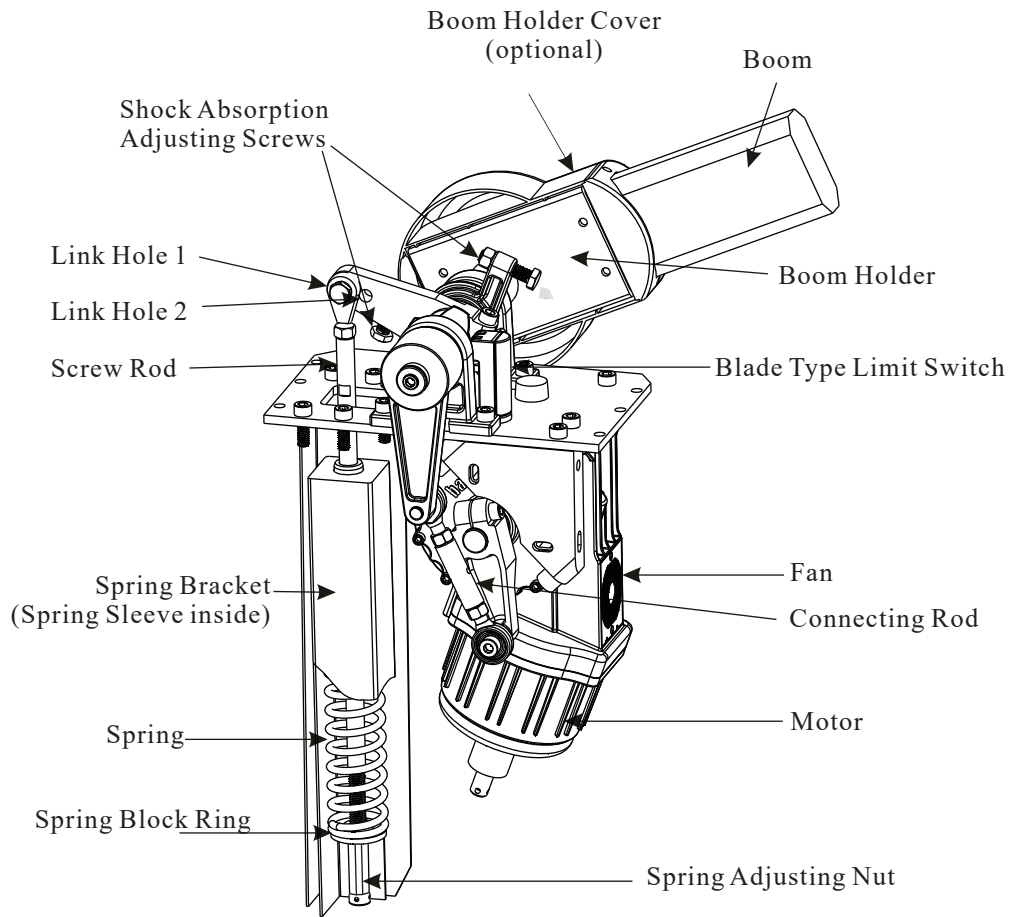
# 2. Functions and Features

2.1. Advanced manual release, manually operate the arm quickly when power off, and automatic reset when power on.
2.2. Boom running smoothly with a motor transmission of cranks and shafts.
2.3. Remote control to operate the barrier gate.
2.4. Auto-reverse when the boom meets obstruction, and auto-stop mode is optional.
2.5. Infrared photocells interface is available. (need to install photocell device)
2.6. Loop detector interface is available, to avoid hitting the car, and automatic boom falling down after car passing. (need to install loop detector)
2.7. Integrated RS485 communication interface, to control the boom up, down and stop by computer.
2.8. Interface for traffic light.
2.9. Integrated counter function, can store the times of opening signal, deduct the times when car passing the loop, boom falling down after car passing through, well improve the traffic efficiency.
2.10. Integrated with auto-closing function, coordinated with counter function, if the numbers of car passed less than the stored numbers, the boom will auto fall down by countdown, but will be new countdown if there is up signal or loop detector signal.

# 3 Technical Data

3.1.Working temperature (motor and control panel): -30℃ ~ + 85℃

3.2.Working Power : 220V±10%, 50HZ, or 110V ±10%, 60HZ

3.3.Rated Power: 300W

3.4.Humidity: ≤90% RH

3.5.Distance of remote control: L ≥ 30M

3.6.Insulation Grade: F

## 4. Mechanism Structure

Boom Holder Cover (optional)

Boom

Shock Absorption Adjusting Screws

Link Hole 1

Link Hole 2

Boom Holder

Screw Rod

Blade Type Limit Switch

Spring Bracket (Spring Sleeve inside)

Fan

Connecting Rod

Spring

Motor

Spring Block Ring

Spring Adjusting Nut

（Figure 1）

## 5. Installation Direction Definition

When placing the order, please confirm "left-installed" or "right-installed", Figures as below:

Left-installed          Entrance↑          Right-installed
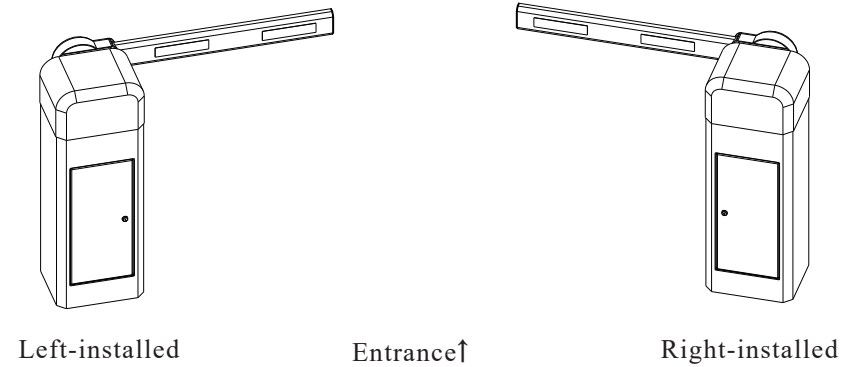
（Figure 2）

## 6. Mechanical Part Installation and Adjustment

### 6.1. Installation of Cabinet

Please select the correct type of barrier gate according to the specifications of the place, and then fix the barrier cabinet with expansion bolts (refer to Figure 3) .

Expansion Bolts

178

166

（Figure 3)

Reference Size          Cabinet Fixing Bar

（According to the supplementary size）

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## 6.2. Disassembly Method of Cabinet Top Cover

Warning: please make sure the power is disconnected before this adjustment!

Arm holder

Cabinet Top Cover

Fixing Screws

Remove the Top Cover Upwardly

Fixing Nuts

（Figure 4）

Unscrew two screws inside the top cover, under boom holder;
Open the cabinet door, and unscrew the two fixing nuts inside the cabinet door;
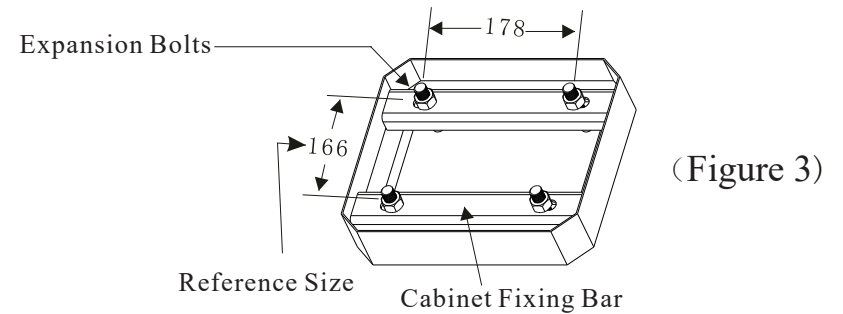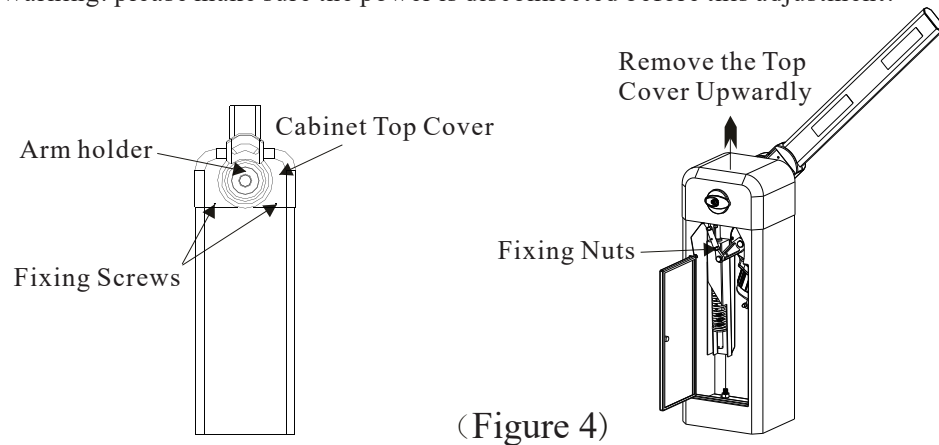Remove the top cover. (refer to Figure 4)

## 6.3. Clutch Using, Spring Selection, Installation and Adjustment

### 6.3.1. Clutch Using

Unlock the clutch device with the clutch key clockwise, move the boom to the horizontal and vertical position manually to make sure there is no obstruction, then power on. (refer to Figure 5)

Press down by right hand

or Pull up

Turn the clutch by left hand

Lock        Unlock
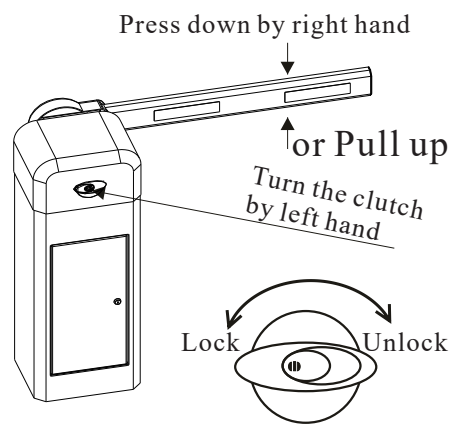
（Figure 5）

Notes of clutch using:
6.3.1.1. When unlocking the clutch at horizontal position, and the clutch can be only locked at horizontal position; when unlocking the clutch at vertical position, and the clutch can be only locked at vertical position.
6.3.1.2. When unlocking the clutch at horizontal (or vertical) position, after adjusting the boom position, need to adjust the motor to be same position manually, then the clutch can be locked. For example, when power off, the boom is at horizontal position, adjust the boom to be vertical position, need to add the motor to be vertical position, and then lock the clutch, otherwise the boom may fall down.
6.3.1.3. Spring balance need to match the boom length and weight, if the boom length or weight changed, need to readjust the spring balance.

### 6.3.2. Spring Selection

The length of spring please in kind prevail, designing change without notice.
Spring Selection Table (This parameter is based on the boom made in our company)

| Boom Type | Boom Length (M) | Spring Selection (Diameter Φ: MM) | Link Hole Selection |
|---|---|---|---|
| Straight Boom | 6≥L≥5 | Φ6.5 | Link Hole 1 |
| | 5.5＞L≥4 | Φ6.5 | Link Hole 2 |
| | 4＞L≥3.5 | Φ5.5 | Link Hole 1 |
| | 3.5＞L≥2.5 | Φ4.5 | Link Hole 2 |
| Fence Boom | 4.5≥L≥4 | Φ7.0 | Link Hole 1 |
| | 4＞L≥3 | Φ6.5 | Link Hole 1 |
| Fence Boom | 4≥L≥3 | Φ7.0 | Link Hole 1 |
| | 3＞L≥2 | Φ6.5 | Link Hole 1 |

6.3.3. Spring Installation
6.3.3.1.Select a suitable spring, insert them into the spring sleeve.
6.3.3.2.Put the whole assembled sleeve into the spring bracket.
6.3.3.3.Take a screw rod insert it from the upward square whole to the spring sleeve in the middle of the spring, use screws to fix the top of the screw rod with the balance crank by link hole 1 or link hole 2.
6.3.3.4. Install the spring block ring and spring adjusting nut at the bottom of the screw rod, turn the nut clockwise to adjust the spring pressure, make it counterpoise the boom weight.
6.3.4. Spring Replacement
6.3.4.1. Pull up the boom to vertical position. If power off, unlock the clutch device, pull up the boom to vertical position manually, and make sure the boom won't fall down.
6.3.4.2. Turn the spring adjusting nut counterclockwise, to disassemble the nut and spring block ring.
6.3.4.3. Push down the boom to horizontal position manually, loosen the fixing screw of the screw rod, and take out the screw rod from the spring sleeve.
6.3.4.4. Loosen the fixing screws of spring bracket, take off spring sleeve, change the spring, put spring sleeve into spring bracket.
6.3.4.5.Insert the screw rod and fix it to the selected link hole.
6.3.4.6.Push up the boom to vertical position, and make sure the boom won't fall down.
6.3.4.7. Install the spring block ring and spring adjusting nut at the bottom of the screw rod, turn the nut clockwise to adjust the spring pressure, make it counterpoise the boom weight.

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### 6.3.4. Spring Adjustment

Open the clutch, move the boom at 45 degree, if the boom can't stop at 45 degree well, means the spring is not balanced, need to adjust. If the boom falling down, need to tight the spring; if the boom lifting up, need to loosen the spring. Pull up the boom to vertical position, and make sure the boom won't fall down, turn the spring adjusting nut clockwise to adjust the spring tight, turn counterclockwise to adjust the spring loose. Turning several times, move the boom at 45 degree to check it's balanced, repeatedly adjust until the boom can stop at 45 degree.

## 7. Electrical Diagram Explanations and Instructions

All the electrical connections are done before delivery, and please don't change it randomly. The necessity is connect the power and grounding connection. Explanations and instructions for the main functions and interfaces as following (from left to right):

### 7.1. Up limit/down limit relay output interface:

This interface is for up limit (or down limit) relay output (no power, switch signal), system can get the signal of boom position from this interface.
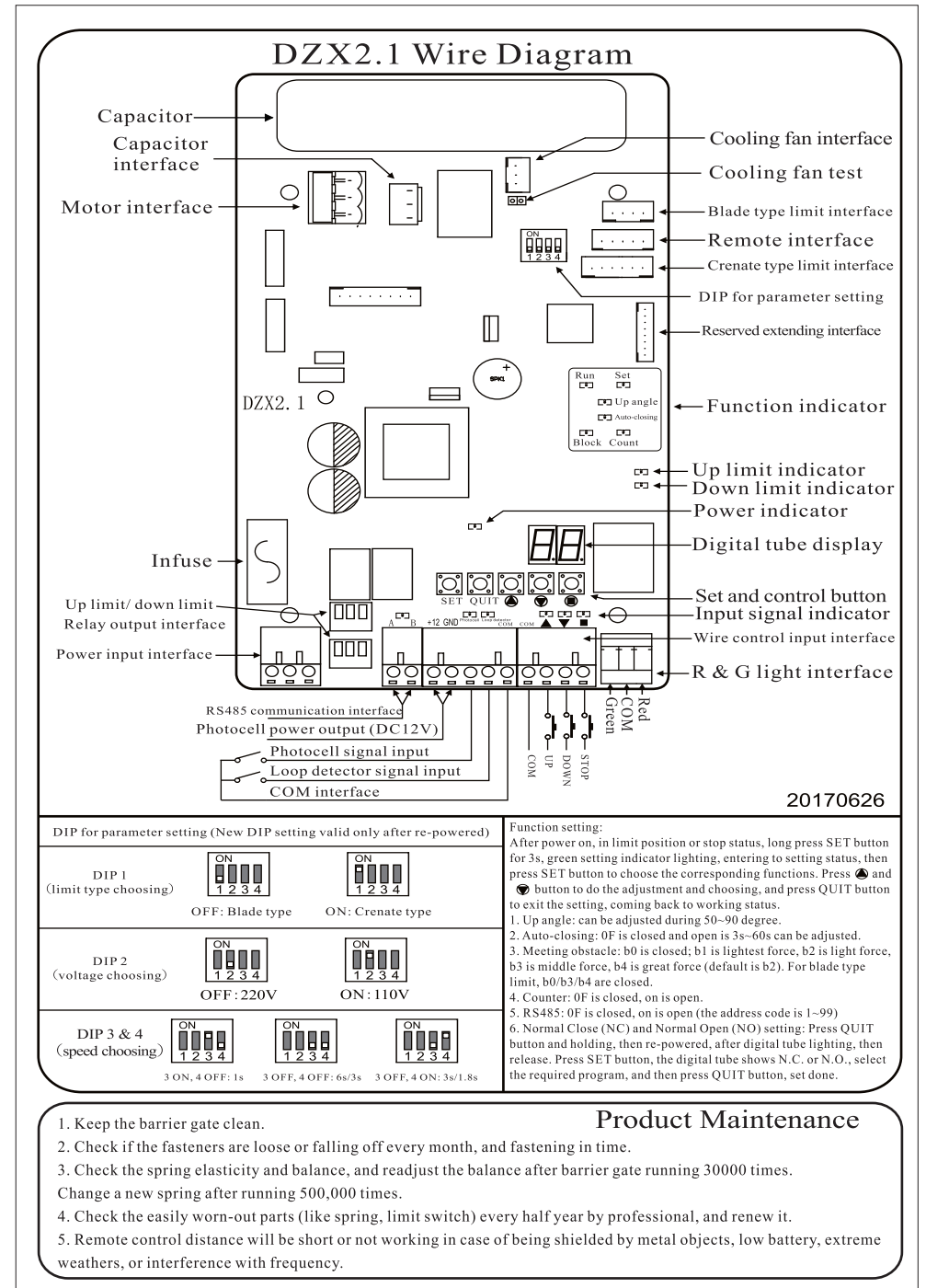
### 7.2. RS485 communication interface:

This interface is for connecting the PC serial port via UTP-unshielded twisted pair, RS485-RS232 convertor, or RS485-USB convertor. Realize computer control the barrier gate, and oversee the status of barrier gate according to the communication protocol. Address can be set by setting menu.

### 7.3. Photocell and loop detector interface:

The left 2 ports is for DC 12V power output, can provide power for photocell (currency less than 0.5A); the right 3 ports are photocell signal input, loop detector signal input and COM. The dry contact signal NO and COM of the photocell receiver, connecting to "Photocell signal input" and "COM" interfaces of the control board. The dry contact signal NO and COM of the loop detector output, connecting to "Loop detector signal input" and "COM" interfaces of the control board.

### 7.4. Wire control signal input interface:

This interface is dry contact input signal, UP (or DOWN, or STOP) connect with "COM", the control board will response accordingly. User can use this interface to connect IC card system or parking system, and it can also connect button switch to control the barrier. Main control board wire control drive requirements, please refer to Appendix D.



DZX2.1 Wire Diagram

Capacitor
Capacitor interface
Motor interface
Infuse
Up limit/ down limit Relay output interface
Power input interface
RS485 communication interface
Photocell power output (DC12V)
Photocell signal input
Loop detector signal input
COM interface

Cooling fan interface
Cooling fan test
Blade type limit interface
Remote interface
Crenate type limit interface
DIP for parameter setting
Reserved extending interface
Function indicator
Up limit indicator
Down limit indicator
Power indicator
Digital tube display
Set and control button
Input signal indicator
Wire control input interface
R & G light interface

Red / COM / Green
COM / UP / DOWN / STOP

DZX2. 1

Run   Set
Up angle
Auto-closing
Block   Count

SET  QUIT

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DIP for parameter setting (New DIP setting valid only after re-powered)

DIP 1 (limit type choosing)
OFF: Blade type        ON: Crenate type

DIP 2 (voltage choosing)
OFF : 220V        ON : 110V

DIP 3 & 4 (speed choosing)
3 ON, 4 OFF: 1s    3 OFF, 4 OFF: 6s/3s    3 OFF, 4 ON: 3s/1.8s

Function setting:
After power on, in limit position or stop status, long press SET button for 3s, green setting indicator lighting, entering to setting status, then press SET button to choose the corresponding functions. Press ⏏ and ⏏ button to do the adjustment and choosing, and press QUIT button to exit the setting, coming back to working status.
1. Up angle: can be adjusted during 50~90 degree.
2. Auto-closing: 0F is closed and open is 3s~60s can be adjusted.
3. Meeting obstacle: b0 is closed; b1 is lightest force, b2 is light force, b3 is middle force, b4 is great force (default is b2). For blade type limit, b0/b3/b4 are closed.
4. Counter: 0F is closed, on is open.
5. RS485: 0F is closed, on is open (the address code is 1~99)
6. Normal Close (NC) and Normal Open (NO) setting: Press QUIT button and holding, then re-powered, after digital tube lighting, then release. Press SET button, the digital tube shows N.C. or N.O., select the required program, and then press QUIT button, set done.

### Product Maintenance

1. Keep the barrier gate clean.
2. Check if the fasteners are loose or falling off every month, and fastening in time.
3. Check the spring elasticity and balance, and readjust the balance after barrier gate running 30000 times. Change a new spring after running 500,000 times.
4. Check the easily worn-out parts (like spring, limit switch) every half year by professional, and renew it.
5. Remote control distance will be short or not working in case of being shielded by metal objects, low battery, extreme weathers, or interference with frequency.

### 7.5. Red/Green Traffic interface:

This interface is no power, same as switch, "COM" need to connect with corresponding power of the R&G light. When boom falling down to horizontal position, red light will keep lighting; when boom lifting up to vertical position, green light will keep lighting. During be boom falling down or lifting up, the red and green will light alternately.

### 7.6. Function Setting

### 7.6.1. Auto-closing Function Setting:

When the boom open to the up limit position, start to being countdown according to the set time, after countdown completed, the boom will be auto-closing.

Setting method as following: in limit position or stop status, long press "SET" button for 3 seconds, greening setting indicator lighting, entering to setting status (the same below), "Auto-closing" indicator lighting, digital tube displays the current setting status. "OF" means the auto-closing function is off. Press▲and ▼button to set the time (seconds), the time can be set as 3~60s. After setting well, press "QUIT" button to exit the setting, coming back to working status.

When the boom open to up limit position, "Auto-closing" indicator lighting, at the same time, the digital tube displays countdown time, after countdown completed, the boom will be auto-closing.

In the countdown process, if there is up or loop detector signal, main control board will wait for the signal to disappear, then will be countdown again. If there is stop signal, this auto-closing will end; next time, when the boom open to up limit position, the auto-closing will restart. If there is down signal, boom will fall down directly.

### 7.6.2. Auto-reversing Function Setting:

When the boom meets obstacle during falling down, it will auto-reverse (lift up), at the same time, "Block" indicator lighting and the buzzer sounding "di-di", user can adjust the force of meeting obstacle or close auto-reversing function.

Setting method as following: entering to setting status (same as above), press "SET" button until "Block" indicator lighting, digital tube display the force of meeting obstacle, as following:

b1 is lightest force;

b2 is light force;

b0, b3, b4 are closing auto-reversing function.

Press▲and▼button to set the force. After setting well, press "QUIT" button to exit the setting, coming back to working status.

### 7.6.3. Counting Function Setting:

When the motorcade pass the barrier, there will be many up signal input, the main control board will record and show the numbers. And when the car passes the loop one by one, it will minus one by one, when it become zero, the boom will be auto-closing.

Setting method as following: entering to setting status (same as above), press "SET" button until "Block" indicator lighting, digital tube display the force of meeting obstacle, as following:

Setting method as following: entering to setting status (same as above), press "SET" button until "Count" indicator lighting, the display will show on or oF status, you can choose on or off by pressing▲or▼button. After setting well, press "QUIT" button to exit the setting, coming back to working status.

When counting function is on, and the up signal is over 2 times, the "Count" indicator lighting, at the same time, the display will show the number of signal input. When the boom opens to up limit position, the number will clear by pressing "Stop" button (of the remote controller), the number will clear and boom falling down by pressing "Down" button (of the remote controller). It couldn't count if press "Up" button. In order to improve the traffic efficiency, for the license plate recognition system and the large traffic flow entrance and exit, it's better to open auto-closing and counting functions.

### 7.6.4. RS485 Communication Function Setting:

setting method of the address code as following: entering to setting status (same as above), the display will show oF, means RS485 is off, you can press ▲or ▼ button to open RS485 and choose the address code from 1 to 99 (in the command table, "Open" command supports counting function).

### 8 Common Malfunction and Solutions

8.1. The boom moves a little and then stops, when rising and falling .
8.1.1. Check up if DIP 1 sets correctly.
8.2. The boom falls down normally, and need to press "Up" button for many times, then can lift up to limit position.
8.2.1. Readjust the balance spring.
8.3. For 3s barrier gate, sometimes the boom lifts up with slow response.
8.3.1. DIP 3 down, and DIP 4 up for 3s/1.8s barrier.
8.4. There is block on 1s barrier gate, or shaking seriously on 3s or 6s barrier gate.
8.4.1. Check up if DIP 3 and DIP 4 set correctly.
8.5. There is big noise on 1s barrier gate.
8.5.1. Check up if DIP 2 sets correctly. DIP 2 down is for 220V motor, DIP 2 up is for 110V motor.
8.6. When power son, Press "Up" or "Down" button, there is no reaction on the boom.
8.6.1. Check up the power supply and the fuse.
8.6.2. Check up if the remote controller matches radio receiver; or check up if the battery inside lack of power.

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8.6.3. Check up if there is co-channel interference, and press the buttons on the control board to check if can work.

8.6.4. Check up if the external protection circuit was in failure or in the protection status. Check up if the indicator of photocell and loop detector are lighting. Re-power, check up if the digital tube has the instructions as below, if has means the control board detects the corresponding signal is at work, need to exclude the signal, and then can work normally.

L1: Boom stop signal of wire control;        L2: Boom down signal of wire control;
L3: Boom up signal of wire control;          L4: Loop detector signal;
L5: Photocell signal;                    L6: Boom stop signal from remote control;
L7: Boom down signal of remote control;    L8: Boom up signal of remote control.

# 9 Service Items

9.1. Free service is offered for component parts in one year warranty time (not includes the barrier boom).

9.2. Lifetime service with charge accordingly.

9.3. Technical questions are supported.

9.4. The below items and situations are not included in the range of free service:

9.4.1. The user does not follow the instruction and cause any damage of the product.

9.4.2. The power supply is not stable, over the range of permitted voltage or not accordant to safety electric using standard.

9.4.3. The user installs or uses the product in wrong methods, cause damage to the control system.

9.4.4. Natural disaster causes damage to the product.

9.4.5. Warranty time is over.

9.4.6. Service items are out of our promises.

# 10 Maintenance

10.1. Keep the barrier gate clean.
10.2. Check the joints ever month in case of any loose parts.
10.3. Check the spring elasticity after the barrier gate running 30000 times.
10.4. Check the easily worn-out parts (such as spring, limit switch) every half year and renew it.
10.5. Remote control distance will be shortened or not work in cases like big object screening, battery exhausting, extreme weather.
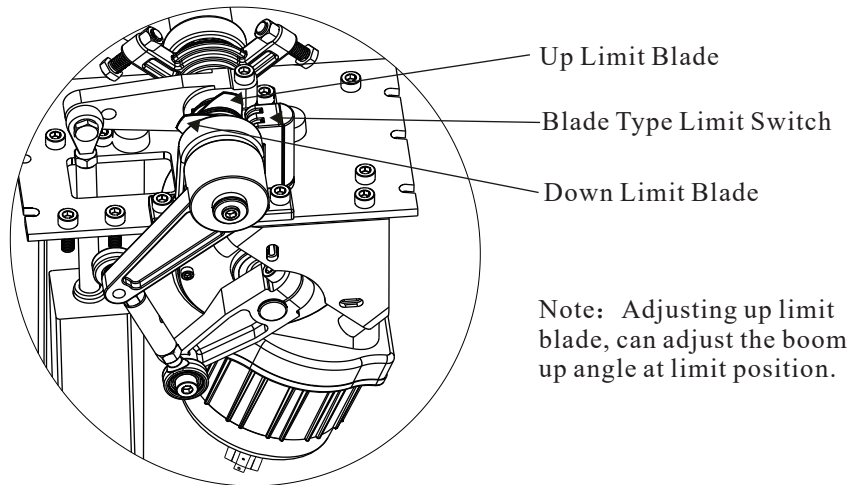
# 11 Packing list

| Name | Specification | Quantity | Unit | Application |
|---|---|---|---|---|
| Screws, Nuts, Flat Pad | M12*70 | 2 | sets | Fixing the boom |
| Boom Fixing Bar | | 1 | pcs | |
| Boom Holder Plastic Cover | | 1 | sets | Optional |
| Cabinet Fixing Bar | | 2 | pcs | Fixing the cabinet |
| Expansion Screws | M16*150 | 4 | sets | Fixing the cabinet |
| Support Post | | 1 | pc | Optional |
| Radio Emitter | | 1 | pcs | Optional |
| Keys | | 2 | pcs | |
| Spare spring | | 1 | pc | Spare Use |
| Remote controller | | 2 | pcs | |
| Manual | | 1 | pc | |
| Clutch | | 1 | pc | |

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## Appendix

### I. Adjustment of Blade Type Limit Switch:

Working principle of limit switch: In the process of boom falling down, when the limit blade turns into the limit slot, the corresponding red indicator light is on, motor will power off and stop running; In the process of boom lifting up, when the limit blade turn into the limit slot, the corresponding green indicator light is on, motor will power off and stop running.

Up Limit Blade

Blade Type Limit Switch

Down Limit Blade

Note：Adjusting up limit blade, can adjust the boom up angle at limit position.

### Adjusting methods as following:

1. If need the boom up angle less than 90 degree, loose the fixing screws of the up limit blade, turning the blade to make sure the green indicator lighting at the corresponding position, then fixing the screws.

2. If boom can't lift up or lift up very difficultly after boom fall down to down limit position, need to adjust the down limit blade to make the red indicator lighting in advance.

### II. Remote Control Coding

Two types of remote control, multi frequencies for choice. If need to add or change remote control, methods as following:
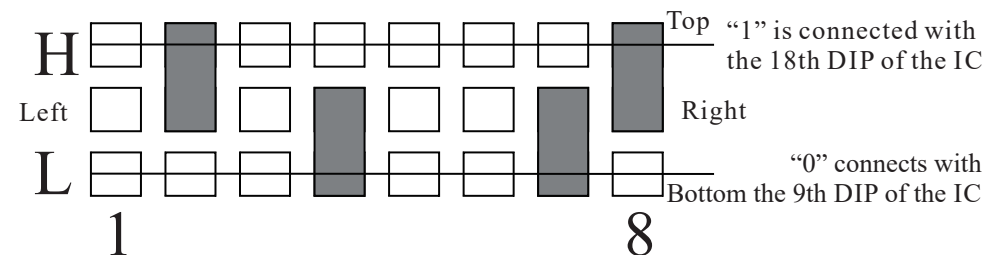
1. Learning type

Learning method 1: Before connect power to the barrier gate, keep pressing button "STOP", then connect to power, after about 6 seconds, indicator of the receiver from lighting to flashing 4 times then off. That means learning well. (Note: during learning, please don't loose the button, or you need to relearn).

Learning method 2: Press button "UP" and "STOP" of the well learning remote controller at the same time for 4 seconds, indictor of the receiver keep lighting means entering to learning status; during 3 seconds, press button "STOP" of the not learning remote controller for 2 seconds (or press 2 times continuously), indicator of receiver flashes 4 times. That means learning well. If the remote controller doesn't receive any effective signal, it will quit learning status.
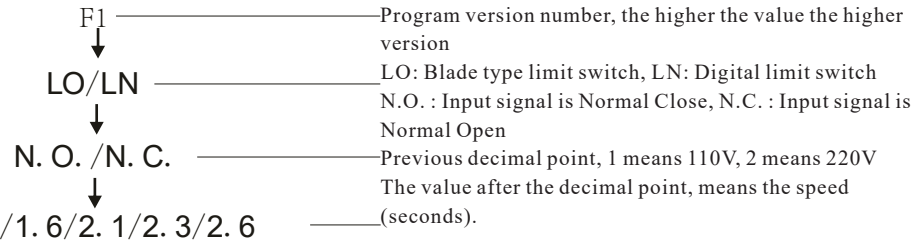
2. Fixed type:

The code of remote controller and receiver should be the same. Coding method: open the remote controller, take out the battery, there is dial plate, the direction is from right to left. The solder between middle port and top port is state "1". The solder between middle port and bottom port is state "0". Empty is state "X". The code as below is 10XX0X1X (Warning: please take out the battery before coding!).

H

Left

L

1                                        8

Top    "1" is connected with
          the 18th DIP of the IC

Right

"0" connects with
Bottom the 9th DIP of the IC

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# III. Digital Tube Display Character of Control Board Explanations

1. Power on, digital tube display character explanations:

F1 ——————— Program version number, the higher the value the higher version

LO/LN ——————— LO: Blade type limit switch, LN: Digital limit switch

N. O. /N. C. ——————— N.O. : Input signal is Normal Close, N.C. : Input signal is Normal Open
Previous decimal point, 1 means 110V, 2 means 220V

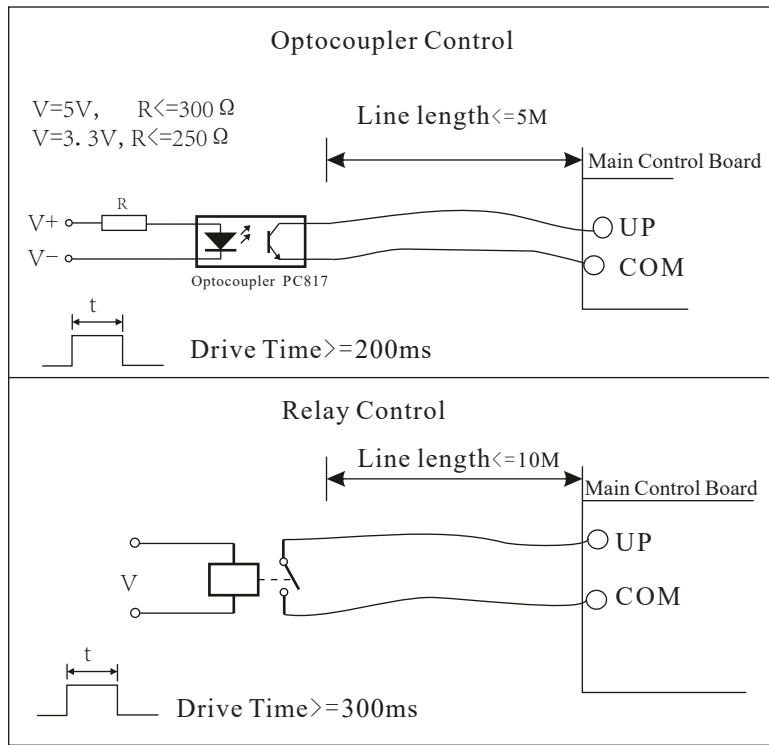1. 1/1. 3/1. 6/2. 1/2. 3/2. 6 ——————— The value after the decimal point, means the speed (seconds).

2. Running, digital tube display character explanations:

During running, or at stop status, disply: ——

When the boom falling down to down limit, display: 1.1/1.3/1.6/2.1/2.3/2.6

# IV. Main Control Board Wire Control Drive Requirements



Optocoupler Control

V=5V,    R<=300 Ω
V=3. 3V, R<=250 Ω

Line length<=5M

Main Control Board

V+
R
Optocoupler PC817
V-

○ UP
○ COM

t

Drive Time>=200ms

Relay Control

Line length<=10M

Main Control Board

V

○ UP
○ COM

t

Drive Time>=300ms

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# V. RS485 Communication Protocol

PC issued format, baud rate: 9600bps

| Add | Command | Fixed Data 00H | Odd and Even verify (the first 3 bytes XOR) |
|---|---|---|---|
| 1 Byte | 1 Byte | 1 Byte | 1Byte |

Command Table

| Address | Meaning | PC Command | Equipment Response | Example |
|---|---|---|---|---|
| Byte 0: adress | | 01H-63H: Device address 00H: Broadcast address, all connected devices respond | No response from the barrier/ broadcast | |
| Byte 1: PC command / barrier response | checking the barrier status | 00H (No broadcast) | 00H: Unknown 09H: Up limit 0CH: Down limit | PC: 03-00-00-03(query NO.3 barrier) Barrier: 03-00-00-03 (unknown) Or barrier: 03-09-00-0A (Up) Or barrier: 03-0C-00-0F (Down) Or barrier: no response (mistake or no this barrier) |
| | Stop | 01H | 01H: Stop command received | PC: 05-01-00-04 (query NO.5 barrier) Barrier: 05-01-00-04 (received) Or barrier: no response (mistake or no this barrier) |
| | Up | 03H | 03H: Up command received | PC:05-03-00-06 (query NO.5 barrier) Barrier: 05-03-00-06 (received) Or barrier: no response (mistake or no this barrier) PC: 00-03-00-03 (broadcast) Barrier: no response (broadcast is not allowed to response) |
| | Down | 05H | 05H: Down command received | PC:09-05-00-0C (query NO.9 barrier) Barrier: 09-05-00-0C (received) Or barrier: no response (mistake or no this barrier) PC: 00-05-00-05 (broadcast) Barrier: no response (broadcast is not allowed to response) |
| | Return remote Stop signal | | 02H: Remote stop command received | Set address to be 01H, return 01-02-00-03 |
| | Return remote Up signal | | 02H: Remote up command received | Set address to be 01H, return 01-04-00-05 |
| | Return remote Down signal | | 02H: Remote down command received | Set address to be 01H, return 01-06-00-07 |

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