User Manual

BGM400 Series Barrier Gate

Date: November 2023

Doc Version: 1.0

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.
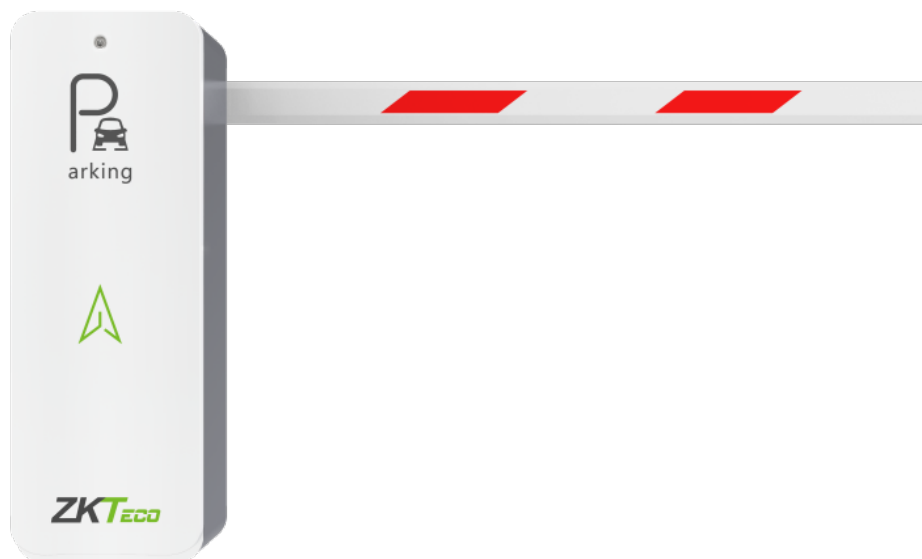
For further details, please visit our Company's website www.zkteco.com.

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1   Overview

1.1 Basic Features

- Adopting DC brushless motor drive and servo control, the running speed of the gate is infinitely adjustable, and the gate pole runs smoothly with little noise.

- The stopper lever is smooth, and the jittering amplitude of the gate lever is small (can be adjusted to the best state by pressing the key).

- Available 24V uninterruptible power supply and solar power supply, even if the power outage can also run smoothly.

- All digital setting operation, can also realize the whole network digital management.

1.2 Application Field

Management of vehicles at parking lot entrances and exits, as well as at entrances and exits of residential communities, businesses, public institutions, and park

2   Technical Parameters and Basic Functions

2.1   Technical Parameters

Device Model	BGM400L/R
Dimension of Main Unit	330*265*980mm
Packing Size	430*375*1100mm
Working Environment Parameters	**Power Supply:** AC220V/110V±10% 50/60HZ.
	Working Voltage: DC24V, 10A.
	Rated Power: 160W.
	Operating Temperature of Movement and Controller: -30℃ or 75℃.
	Working Humidity: ≤90%RH.
	Remote Control Frequency: 433MHZ, learning code.
	Remote Control Distance: ≤ 30 meters.
Take-Off And Landing Lever Time	Boom length 6 meters ≥ 4.5 ≥ 3 meters, starting speed 1.5 to 6 seconds can be infinitely adjustable.
Movement	Movement for the three-stage gear deceleration plus four-boom structure.
	Motor winding material: pure copper.
	The long and short swing arm and connecting boom are made of cast steel.
	The integrated mold design incorporates a three-stage gear reducer and a four-linkage mechanism, ensuring straightforward and efficient movement, as well as convenient installation and maintenance.
	The main shaft is #40mm in diameter, made of 45# steel, with galvanized surface.
	Balance spring (∮5.5/∮6.5)*∮40*420, according to the length of the boom optional side-by-side two. (Adapted according to different pole lengths.)
Gate Lever	Octagonal telescopic pole, cross-section size, big pole 86*44*1.0mm, small pole 80*37*1.0mm.

	Large octagonal two-rail, cross-section size 100*45*1.0mm.
Enclosure	Q235 cold gadolinium steel plate, steel plate thickness T=1.5mm, surface powder coating, 200℃ high temperature baking for 20min.
Net Weight	40KG
Protection Grade	IP54
Leakage Current	Leakage current ≤ 2mA.
Insulation Resistance	Under normal conditions, the insulation resistance of motor power line ≥ 1MΩ (megohm).
Grounding Resistance	AC work grounding resistance ≤ 0.1Ω.
MCBF	≥2,000,000 times of opening and closing the gate.

2.2 Basic Functions

1. Switch gate angle at 90°±2°.

2. Equipped with standard switch inputs for on, off, stop interface, enabling remote control via a small program on a mobile phone.

3. Automatic monitoring ensures adjustable anti-smash bar strength and sensitive time without requiring additional external gate facilities.

4. Controller timeout protection: automatically stops the gate if abnormal operation exceeds the specified start and stop time.

5. Gate control through wireless remote, wired buttons for the gate open, close, stop.

6. Features traffic light and breathing system light functions.

7. Self-learning and fleet counting function capabilities.

8. Rebound function in case of obstruction.

9. Time-delay automatic function.

2.3 Test Technical Parameter

| Test Item	Test Requirement
Limit	Mechanical and electronic limits are firmly installed, and the induction device is normal.
Lift Boom Operation	The take-off and landing boom runs smoothly, without shaking, interference and abnormal sound.

| Test Item	Test Requirement
Position Boom Level	The lifting boom is perpendicular to the horizontal, and the falling boom is parallel to the horizontal, without skew.
Mainboard Function	Control board parameters are set properly.
Spring	The operation performance is good, no difference.
Remote Control Unit	The remote controller is sensitive, and the distance test meets ≤30 meters.
Insulation	Motor power line insulation resistance ≥1MΩ (megohm).

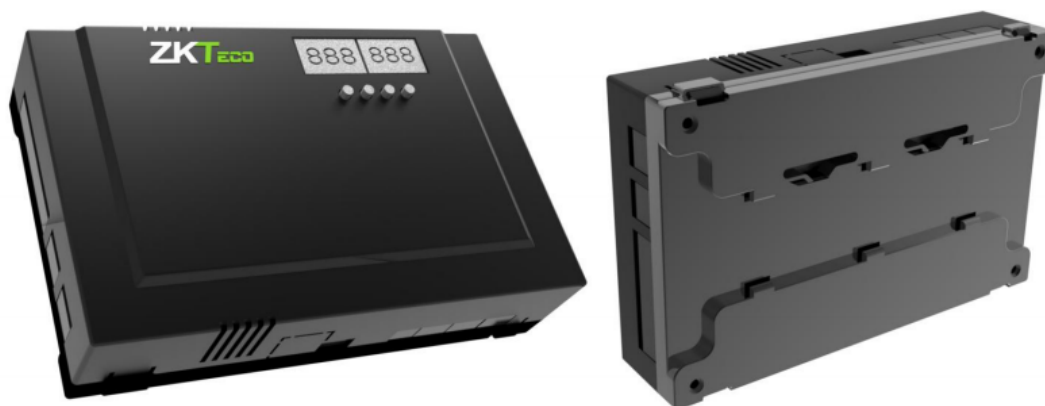# 3 Appearance
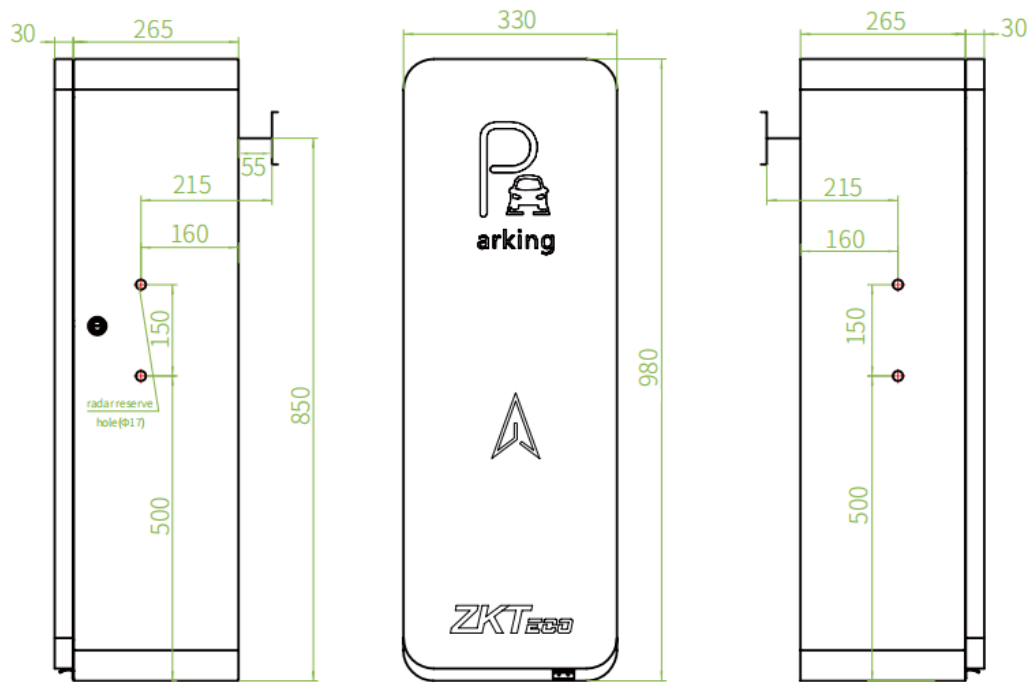
Left And Right Direction Definitions:
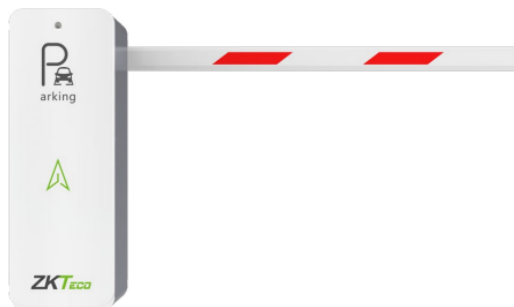
L：The chassis on the left，the boom on the right
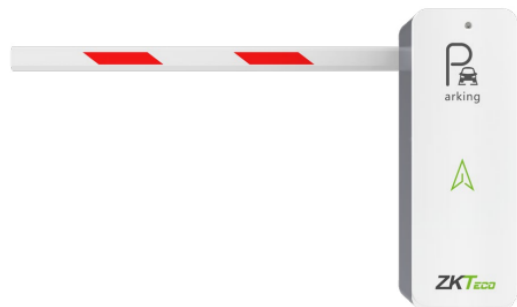
R：The chassis on the right，the boom on the left

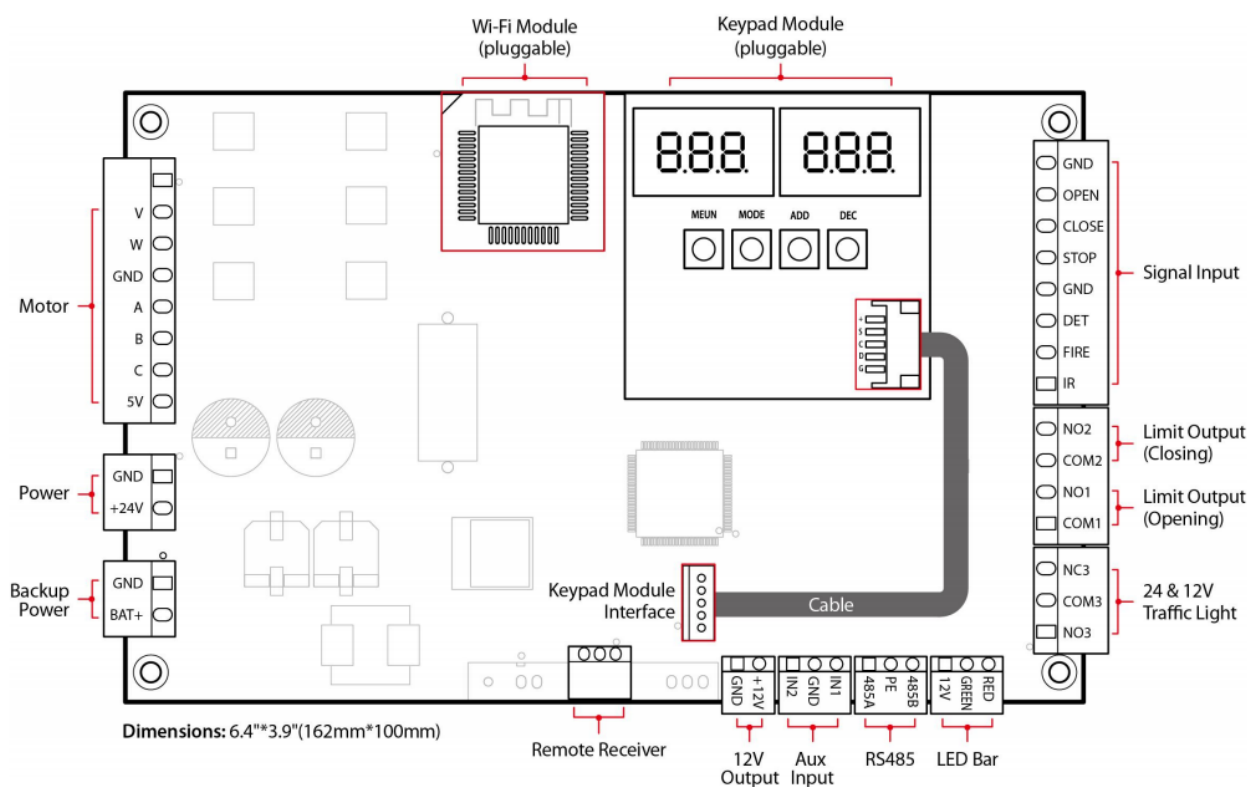# 4 Control Panel Wiring Instructions

Front View

Back View

Control Panel Wiring Diagram:

5 Product Function and Operation Description

5.1 Check the Gate before Powering On

1. Check that the gate is connected to a 24V/10A DC power supply.

2. Check whether the polarity of all external wiring (power line, motor line, ground sensing line) is correct, and the connection is firm and stable. Incorrect wiring polarity may result in gate malfunction. If the motor forward and reverse line is reversed, the digital display on the main board (normally, the display increases when the gate is opened, and the number decreases when the gate is closed), as well as the markings on the control handle or the control switch will be the opposite of the actual action of the gate.

5.2 Gate Power-Up Self-Test Process

1. After powering on the gate, the digital tube on the controller's main board displays the corresponding status. The main board and motor undergo an initial self-test to synchronize. It is essential to manually press the "on" and "off" buttons on the main board for the self-test to learn the travel limits. The main board automatically memorizes the motor travel, enabling subsequent power restoration to be controlled only via the remote or license plate recognition camera with "on" or "off" commands.

2. The gate's self-test involves learning the two fixed limit positions of the motor. Ensure that the self-test learning trip, when open, exceeds 90°, and when closed, is less than 0°. This establishes a baseline for subsequent horizontal and vertical adjustments.

Note: The first installation, the first power on, you must use the mainboard "on" and "off" button complete self-check to learn the opening and closing travel.
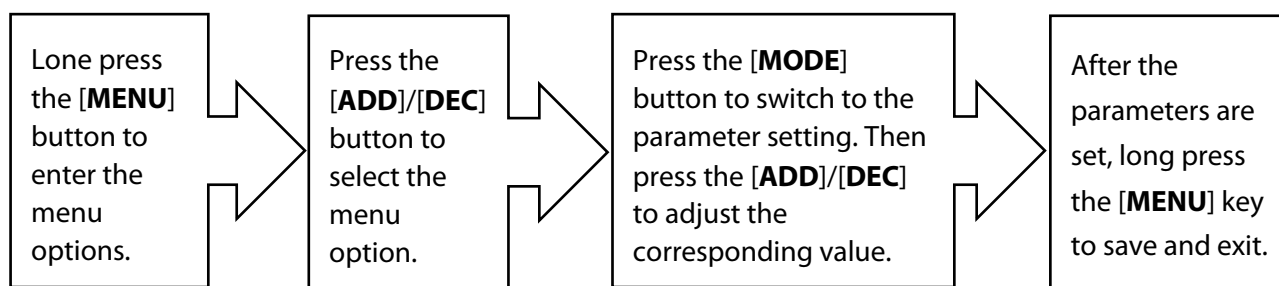
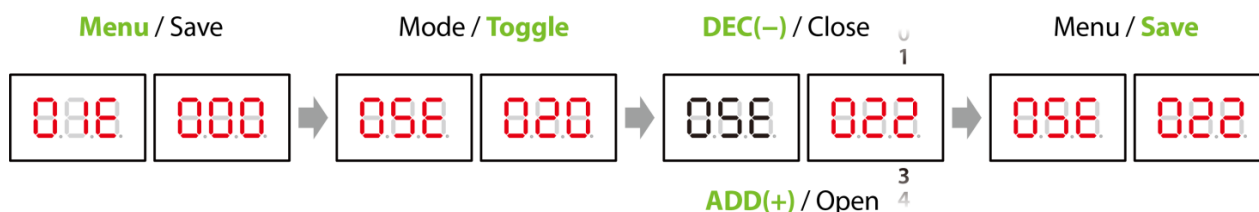## 5.3 Mainboard Parameter Setting Process

● **Key Description**
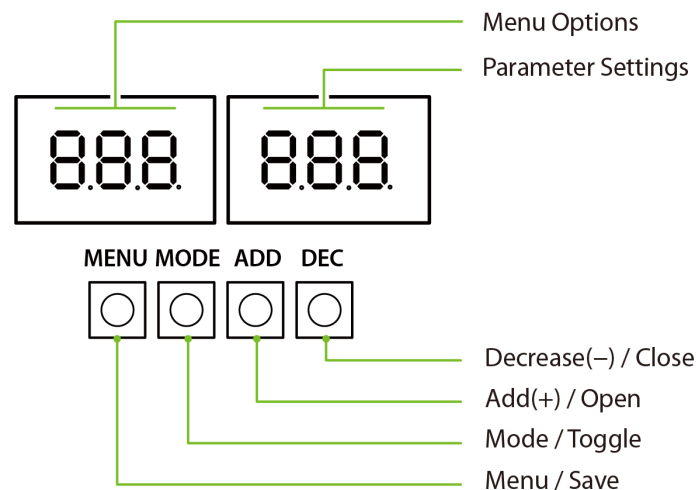
Menu / Save	Go to the Menu Options / Save the Parameter Settings.
Mode / Toggle	Stop the boom arm / Switch menu options and parameter settings.
Add(+) / Open	Open the barrier gate, go to the next menu option, or add one when modifying the value.
Decrease(-) / Close	Close the barrier gate, return to the previous menu option, or subtract one when modifying the value.

Note: Digital tube display, the left side shows menu options, the right side shows parameter settings.

● **Operating Procedure**

Lone press the [**MENU**] button to enter the menu options.	Press the [**ADD**]/[**DEC**] button to select the menu option.	Press the [**MODE**] button to switch to the parameter setting. Then press the [**ADD**]/[**DEC**] to adjust the corresponding value.	After the parameters are set, long press the [**MENU**] key to save and exit.

For example, set the value of the closing speed to 22 (05E.XXX, default value 20, valid values 10~32).

Menu / Save	Mode / **Toggle**	**DEC(−)** / Close	Menu / **Save**
0.1.E 0.0.0	0.5.E 0.2.0	0.5.E 0.2.2	0.5.E 0.2.2

ADD(+) / Open

5.4 Parameter Settings Description

Items	Menu Options	Functions	Description
01E.XXX	**Display Mode** (default is 0)	• **01E.000** Displays current position of the swing arm • **01E.001** Controls input signal • **01E.002** Test mode (the digital LED displays "---" in the test mode) • **01E.003** Number of boom openings • **01E.004** Version Information	Description of the display after entering the menu: **XFX.XXX** • **01E.000**. Device status • **01E.001**. Display status, display "**X**F-**.**---". First position: 0: No self-test (**0**F-**.**---) 1: Open in place (**1**F-**.**---) 2: Close in place (**2**F-**.**---) 4: Pause (**4**F-**.**---) 5: Opening the gate (**5**F-**.**---) 6: Closing the gate (**6**F-**.**---) • **01E.002**. Test mode • **01E.003**. After the count is greater than 999999, the displayed number goes to zero • **01E.004**.Display version information, for example: 01-.-02
02E.XXX	**Boom Arm Opening Speed** (default is 24)	Valid values:10 to 32	The higher the value, the faster the speed
03E.XXX	**Boom Arm Opening Brake Stroke** (default is 30)	Valid values: 0 to 100	1. The larger the value, the larger the brake stroke. 2. Too larger the brake stroke may cause the gate to open out of position.
04E.XXX	**Boom Arm Opening Brake Speed** (default is 10)	Valid values: 0 to 100	1. The smaller the value, the stronger the brake speed. 2. Too small the brake speed may cause the gate to open out of position.
05E.XXX	**Boom Arm Closing Speed** (default is 20)	Valid values: 10 to 32	The higher the value, the faster the speed
06E.XXX	**Boom Arm Closing Brake Stroke** (default is 40)	Valid values: 0 to 100	1. The larger the value, the larger the brake stroke. 2. Too larger the brake stroke may cause the gate to close out of place.

Items	Menu Options	Functions	Description
07E.XXX	**Boom Arm Closing Brake Speed** (default is 10)	Valid values: 0 to 100	1. The smaller the value, the stronger the brake speed. 2. Too small the brake speed may cause the gate to close out of position.
08EXXX	**Bounce back sensitivity** (default is 40)	Valid values: 20 to 100	1. The value of 100 turns off this function. 2. The larger the value, the longer the rebound time when encountering the block.
09E.XXX	**Close Limit Adjustment** (default is 4)	Valid values: 0 to 60	Press **[+/-]** to adjust the position according to the situation and press **[Menu/Save]** to save, which can be set between 0 to 60.
10E.XXX	**Open Limit Adjustment** (default is 4)	Valid values: 0 to 60	Press **[+/-]** to adjust the position according to the situation and press **[Menu/Save]** to save, which can be set between 0 to 60.
11E.XXX	**Automatic Closing Time for Unmanned Passage** (default is 0)	Valid values: 5 to 60s	1. The value of 0 turns off this function. 2. If the "**Boom Arm Opening Memory**" function is turned on, the gate will not be closed after the unmanned time when the button [Open] is pressed. The boom arm opening memory function takes priority.
12E.XXX	**Boom Arm Opening Memory** (default is 0)	• **12E.000:** Close • **12E.001:** Open	Boom arm opening memory is limited to the use of an external remote receiver and ground sense together.
13E.XXX	**Core Component Position** (default is 1)	• **13E.000:** Right • **13E.001:** Left	Restoring the factory settings will not restore the core component position to its default value.
14E.XXX	**Restore Factory Settings** (default is 0)	• **14E.000:** Normal • **14E.001:** Reset	**Note:** The function does not clear Core Component Position and Core Component Polarity.

Items	Menu Options	Functions	Description
15X.XXX	**Remote Control Pairing** (default is 0)	• **150.XXX:** Normal • **151.XXX:** Add • **152.XXX:** Clear	The last three digits indicate the number of remotes that have been added so far. Up to 500 remotes are supported. **Note:** *1. Restoring the factory settings will not clear the remote control.* *2. Modifying the remote control type will clear the remote control.*
16E.XXX	**RS485 Address** (default is 0)	Valid values: 0 to 250	
17E.XXX	**Ground Sense Delay Time Setting** (default is 0)	Valid values: 0 to 251s	Set the ground sense delay time by press **[+/-]** button, the larger the number set, the longer the delay time, the valid value is 0 to 251.
18E.XXX	**Core Component Type** (default is 2)	• **18E.000:** 20A to 0.6S • **18E.001:** 18B to 1.2S • **18E.002:** 18B to 2.5S	1. Please set the parameters according to the core component. 2. Reserved menu, restore the factory settings, the core component type will not restore the default value.
19E.XXX	**Boom Arm Length** (default is 2)	• **19E.000:** 1 to 3m • **19E.001:** 3.5 to 4.5m • **19E.002:** 5 to 6m	Reserved menu, restore the factory settings, the boom arm length will not restore the default value.
20E.XXX	**Core Component Polarity** (default is 0)	• **20E.000:** Forward • **20E.001:** Reverse	When the core component polarity is wrong, buzzer alarm, digital tube display: **EL0.001**
21E.XXX	**Power-off Open Mode** (default is 1)	• **21E.000:** Disable • **21E.001:** Enable	
22E.XXX	**Open/Close Limit LED State** (default is 0)	• **22E.000:** Open limit green light breathing, Close limit red light breathing • **22E.001:** Open limit green light always on, Close limit red light always on • **22E.002:** Open limit green light flashes, Close limit red light breathing	

Items	Menu Options	Functions	Description
23E.XXX	**Open/Close RLED State** (default is 0)	• **23E.000:** Red light flashing • **23E.001:** Red light is always on	Red light status throughout opening and closing the boom arm.
24E.XXX	**Remote Control Type** (default is 0)	• **24E.000:** 433MHz frequency • **24E.001:** 430MHz frequency	

5.5 Remote Control Settings

Number of added remote controls

Function options (0, 1, 2)
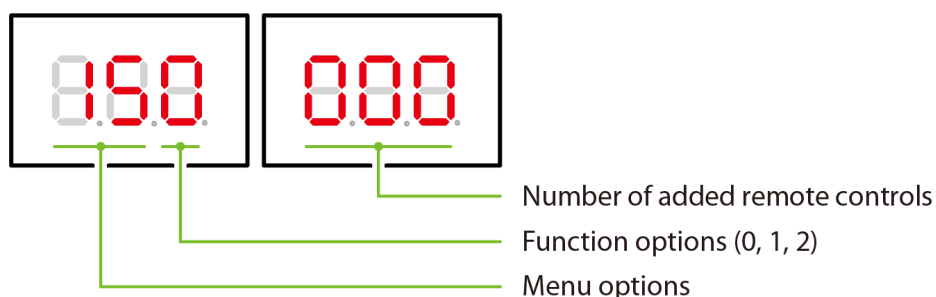
Menu options

5.5.1 Remote Control Pairing

This operation is used to pair (add) the remote control and the steps are shown below.

1. Long press the [**MENU/**Save] button to enter the **Menu Options**, at this time the digital tube display will show .

2. Then press [**ADD/DEC**] to set to "**Remote Control Pairing(15X.XXX)**" function, at this time the digital tube display will show .

3. Then press [MODE**/Toggle**] to switch to "**Parameter Settings**" function, at this time the digital tube display will show .

4. Press [**ADD**] key to set to 1 (increase the remote control), at this time the digital tube display will show .

5. At this time, press any key on the remote control until you hear a drop from the mainboard, automatically back to the menu options, indicating that the pairing (add) success, the digital tube at

    this time shows 150 008 ; finally long press the [MENU**/Save**] button to exit the menu.

5.5.2 Cleaning the Remote Control

This operation is used to clear all paired remotes, as follows.

1. Long press the [**MENU/**Save] button to enter the **Menu Options**. At this time, the digital tube display

    shows 008 000 .

2. Press [**ADD/DEC**] to set to "**Remote Control Pairing(15X.XXX)**" function. At this time, the digital

    tube display shows 158 888 .

3. Press [MODE**/Toggle**] to switch to "**Parameter Settings**" function. At this time, the digital tube

    display shows 150 888 .
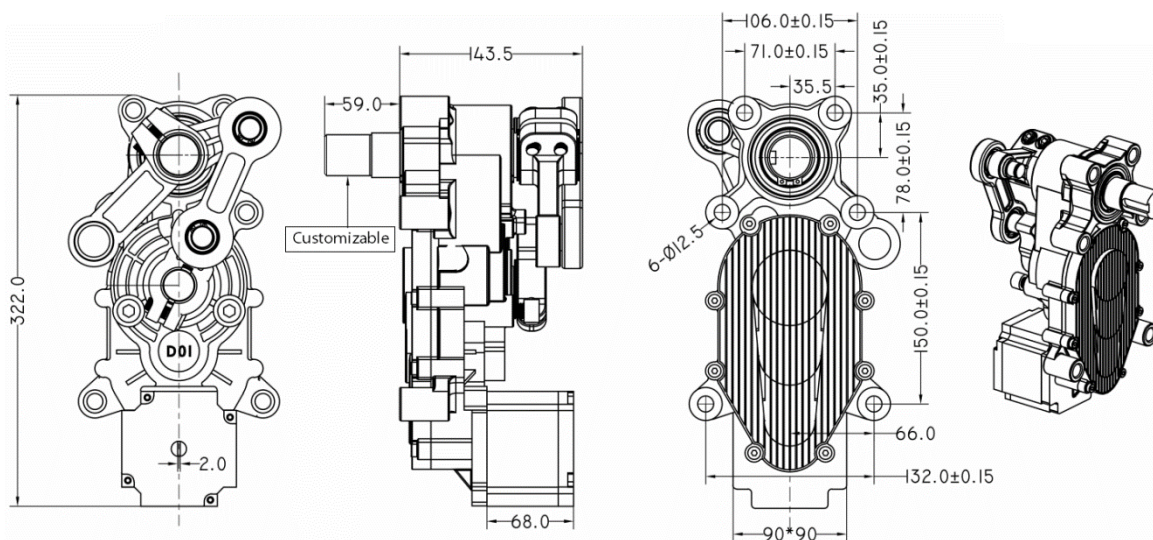
4. Press [**ADD**] key to set to 2 (clear the remote control), at this time the digital tube display shows

    152 888 .

5. Long press the [MENU**/Save**] button to save the settings and exit, and all the added remotes will be cleared at the same time.

6 Movement Description

6.1 Dimensions

6.2 Horizontal and Vertical Angle Adjustment of Boom Arm (Mechanical Adjustment)

Note: The horizontal and vertical angles of the boom arm have been adjusted before leaving the factory. Please do not adjust them without the guidance of professionals to avoid mechanical damage.

1. **Adjust the horizontal position of the boom arm:**

    The connecting boom crank features an overlapping structure, aligning the two rotation points of the connecting boom arm with the output shaft of the reducer along a line. The boom arm is horizontally positioned in this configuration. If the boom arm is not level or is inclined, adjust by loosening the two rocker screws, align the boom arm to level, and then tighten the screws.
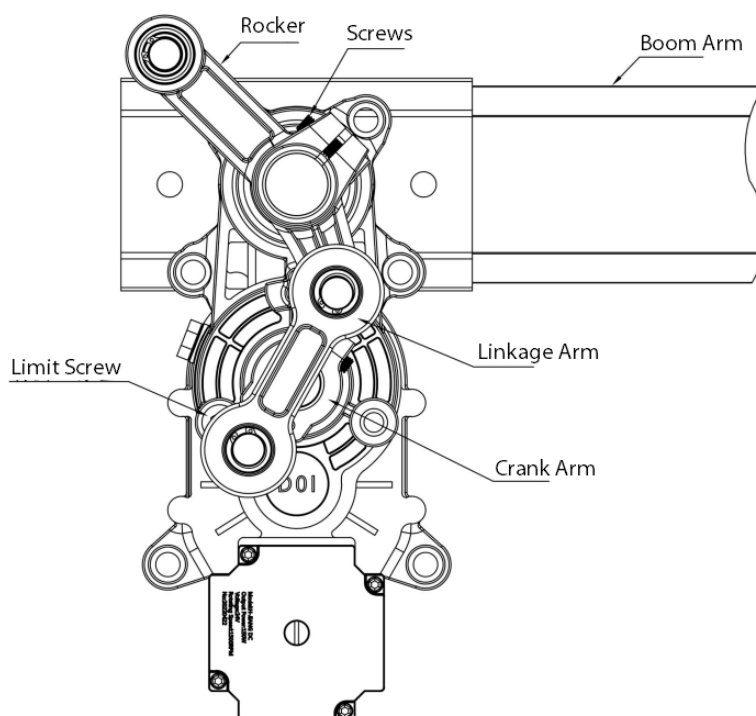
2. Adjust the vertical position of the boom arm (adjusted by mechanical structure)

The connecting boom arm crank is in an unfolded shape, aligning the two rotation points of the connecting boom arm and the reducer's output shaft in an unfolded 3-point line. This represents the boom arm's vertical position. If the boom arm is not vertically aligned and is inclined, adjust by loosening the two screws on the rocker arm, rotate the boom arm to the vertical position, and then tighten the screws.
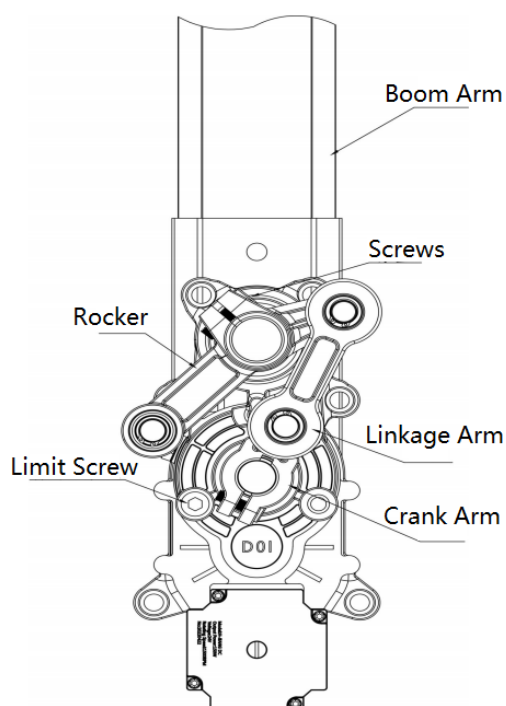
6.3 Direction Interchange of the Boom Arm

The operation steps are as follows:
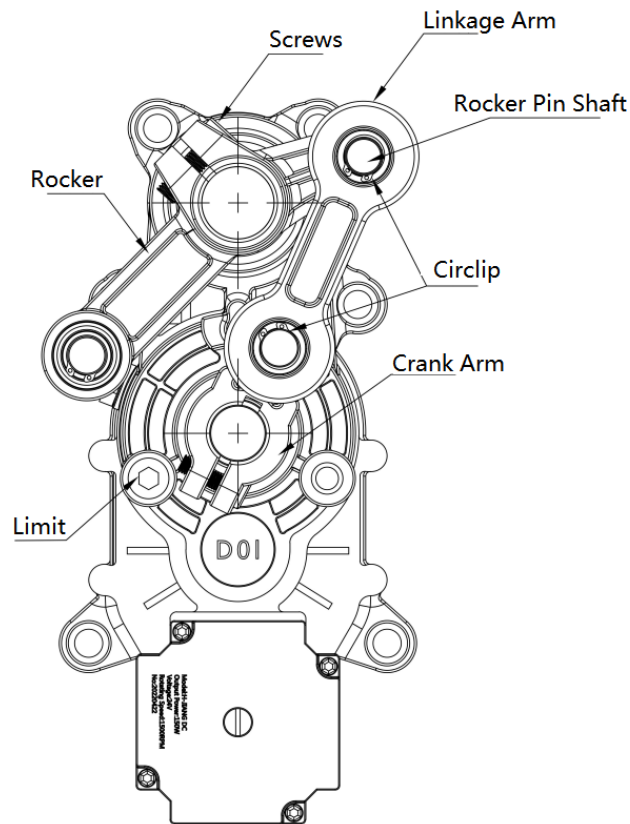
1. Before operation, please turn off the power. Remove the snap rings at both ends of the linkage arm with the external snap ring pliers and take out the linkage arm.

2. Loosen the two screws on the rocker, take out the rocker (the notch can be expanded with the help of the inclined iron to take out faster), take out the rocker pin shaft and change the direction.

3. Remove one screw on the limit, move it to the symmetrical position on the other side, and then lock it.

4. After installing the rocker pin shaft of the rocker, install the linkage arm and snap rings.

5. After adjusting the angle of the boom arm, lock the rocker screw.

Note: If it is difficult to remove the linkage arm, loosen the rocker and crank arm screw and remove them together, and then remove the linkage arm.

6. After the mechanical operation, you need to set the movement parameter 13E Core Component Position on the motherboard, such as changing from L to R, the value of this parameter should be set from 1 to 0, or set the direction of the movement on the app.

6.4 Spring Adjustment

If the boom arm shakes during the upward movement, adjust the spring to a looser setting. Conversely, if the boom arm shakes during the downward movement, adjust the spring to a tighter setting.
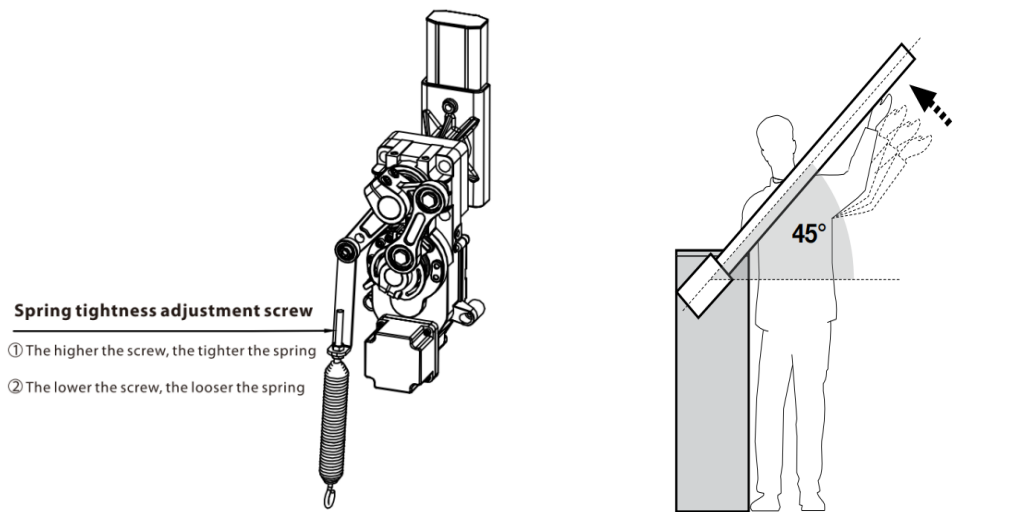
1. The best balance is when the barrier boom is at 45°.

2. The spring wire diameter is adapted to different boom lengths: 3m boom with φ4.5mm; 4.5m boom with φ5.5mm and 6m boom with φ6.5mm. (If the boom is too short （less than 2m), do not install the spring).

7 Troubleshooting

SN	Trouble Description	Cause	Solution
1	The Power Supply has a 24V output, but the mainboard power indicator does not light up.	1. 24V output wiring might be reversed. 2. The mainboard might work abnormally. 3. Loose wiring.	1. Swap the DC output wiring. 2. Replace the Mainboard. 3. Tighten the wiring.
2	The AC input is normal, but the power indicator is off.	1. The power fuse might be blown. 2. Abnormal power supply. 3. Loose wiring.	1. Replace the fuse. 2. Replace the power supply. 3. Tighten the wiring.
3	The power indicator is on, the landing boom indicator is normal, and the motor is not running.	1. The motor wiring might be wrongly connected, or the wiring is loose. 2. The internal encoder of the motor may work abnormally. 3. The motor stroke limit exceeds the position.	1. Check the wiring according to the wiring diagram, and tighten the wiring if required. 2. Reconnect the motor wire. 3. Re-adjust the motor limit parameters.
4	The remote-control buttons do not respond.	1. The remote control is not using ZKTeco brand, or it is from another model. 2. The remote control does not match. 3. The remote control or the receiver is damaged. 4. The remote-control battery is completely discharged.	1. Confirm to use ZKTeco brand and its applicable models for remote control. 2. Rematch remote control. 3. Replace the remote control or the receiver. 4. Replace the remote-control battery.
5	The boom cannot be closed normally after the machine is being powered on.	1. The barrier gate is not installing the barrier boom, so the motor cannot be closed due to the strong pull of the spring. 2. The length of the installed boom is too short, and the spring is too tight.	1. Install the boom normally or remove all the spring. 2. Adjust the spring according to the length of the boom.
6	The loop detector signal is not working.	1. Wrong signal wiring. 2. Install loop coil with few or too many turns. 3. Detector damage.	1. Connect according to the wiring diagram. 2. Calculate the circumference of the loop coil according to the width of the lane, and then confirm the number of turns installed. 3. Replace new loop detector.

SN	Trouble Description	Cause	Solution
7	The radar detector signal is not working.	1. Wrong signal wiring. 2. Distance and environment learning is not correct. 3. Detector damage.	1. Connect according to the wiring diagram. 2. Complete the installation test through the radar installation video or the user manual. 3. Replace new radar detector.
8	Abnormal shaking of the barrier boom occurred while opening and closing.	Spring too tight or too loose and the running speed too fast.	If the boom arm open shaking, it is necessary to loosen the spring and slow down the speed appropriately; If the boom arm close shaking, it is necessary to tighten the spring and slow down the speed appropriately.
9	The boom is not vertical and parallel after opening or closing.	1. The spindle is not properly calibrated. 2. Encoder travel limit error.	1. Loosen the screw on the spindle connecting arm and then adjust and calibrate the spindle direction. 2. Adjust travel limit parameters again.
10	Abnormal sound is heard when the motor is running.	1. The motor rotor bearing is being damaged. 2. Operating handle broken.	1. Replace new motor. 2. Replace the new operating handle.

8 Packing List

No.	Content	Quantity
1	Remote Controller	2 pcs
2	Key	2 pcs
3	Pull Blast Screw	4 pcs
4	Gate Lever Fixing Screw	2 pcs
5	Gate Lever Plate	1 pc

9 After-Sales Service

1. When the equipment works abnormally, it must be repaired by professional personnel, if it can not be solved, please contact the supplier.

2. This product has free warranty within one year.

3. Lifetime paid maintenance is provided.

4. The following conditions are not covered by the free warranty:

   a) Users do not install and use the product according to the instructions, resulting in damage to the product.

   b) The power supply is unstable, exceeding the specified range of the product or not in line with national standards for safe use of electricity and cause damage to the product.

   c) Product damage caused by natural disasters and other irresistible factors.

   d) Appearance damage caused by improper use of the user.

5. The company reserves the right to update the product.

ZKTeco Industrial Park, No. 32, Industrial Road,

Tangxia Town, Dongguan, China.

Phone : +86 769 - 82109991

Fax   : +86 755 - 89602394

www.zkteco.com