User Manual

SBT2000S Swing Barrier Turnstile

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English

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

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If there is any issue related to the product, please contact us.

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About the Company

ZKTeco is one of the world's largest manufacturer of RFID and Biometric (Fingerprint, Facial, Finger-vein) readers. Product offerings include Access Control readers and panels, Near & Far-range Facial Recognition Cameras, Elevator/floor access controllers, Turnstiles, License Plate Recognition (LPR) gate controllers and Consumer products including battery-operated fingerprint and face-reader Door Locks. Our security solutions are multi-lingual and localized in over 18 different languages. At the ZKTeco state-of-the-art 700,000 square foot ISO9001-certified manufacturing facility, we control manufacturing, product design, component assembly, and logistics/shipping, all under one roof.

The founders of ZKTeco have been determined for independent research and development of biometric verification procedures and the productization of biometric verification SDK, which was initially widely applied in PC security and identity authentication fields. With the continuous enhancement of the development and plenty of market applications, the team has gradually constructed an identity authentication ecosystem and smart security ecosystem, which are based on biometric verification techniques. With years of experience in the industrialization of biometric verifications, ZKTeco was officially established in 2007 and now has been one of the globally leading enterprises in the biometric verification industry owning various patents and being selected as the National High-tech Enterprise for 6 consecutive years. Its products are protected by intellectual property rights.

About the Manual

This manual introduces the operations of SBT2000S Swing Barrier Turnstile Product.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.

Document Conventions

Conventions used in this manual are listed below:

GUI Conventions

For Device	
Convention	**Description**
< >	Button or key names for devices. For example, press <OK>
[ ]	Window names, menu items, data table, and field names are inside square brackets. For example, pop up the [New User] window
/	Multi-level menus are separated by forwarding slashes. For example, [File/Create/Folder].

Symbols

Convention	Description
	This implies about the notice or pays attention to, in the manual
	The general information which helps in performing the operations faster
	The information which is significant
	Care taken to avoid danger or mistakes
	The statement or event that warns of something or that serves as a cautionary example.

Table of Contents

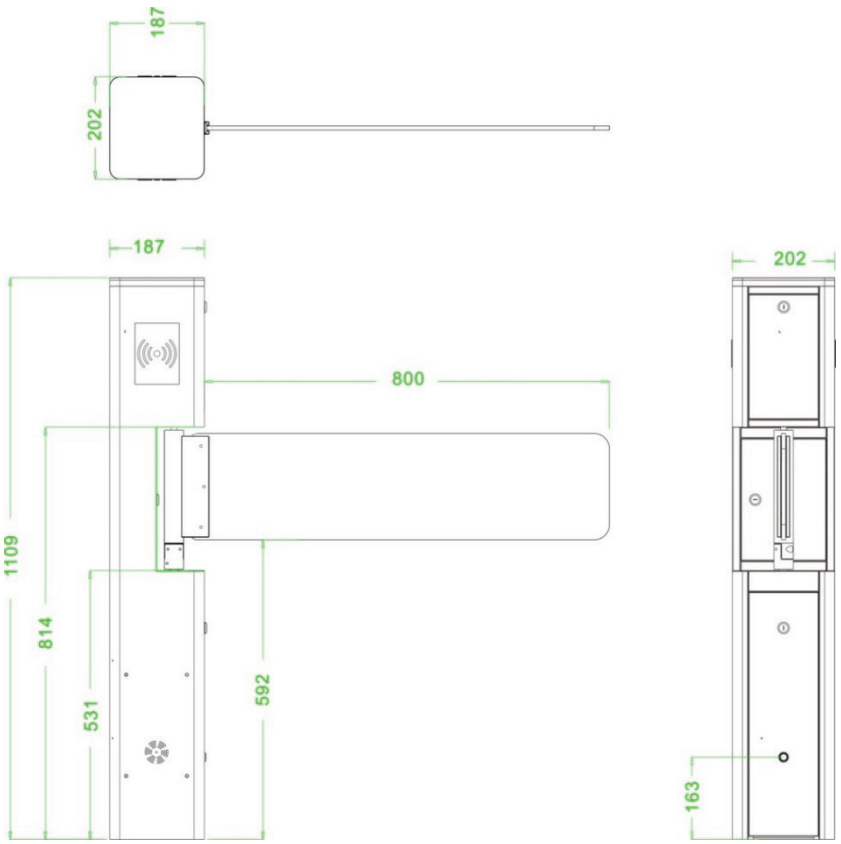
1 Overview

The SBT2000S swing barrier turnstile is designed for smooth and silent operation and draws very little power. It is made of SPCC which makes SBT2000S swing barrier turnstile highly durable. These barriers are normally held in a locked position, thus denying access to the secured side. Upon SBT2000S's reader (RFID and/or fingerprint) positively recognizing a user's valid access card or fingerprint, its barriers swing automatically, thus allowing users passage to the secured side. During emergencies, the barriers automatically swing, thereby ensuring users fast unencumbered exit to safety. During power outage, the user can push through the barrier easily to exit to safety. The SBT2000S swing barrier turnstile provides both security and convenient space, all in a very durable and elegant compact design. The reader of device can be connected to fingerprint recognition and RFID.

1.1 Chassis and Dimensions

SBT2000S series, with SPCC, provide simple and beautiful design with anti-corrosion. It provides orderly and civilized passage to people while restricting illegal personnel access. In case of emergencies, it ensures timely evacuation channel smoothly for personnel's convenience.

SBT2000S's appearance and dimensions are shown in below figure:



1.2 Mechanical System

The mechanical system of this swing barrier turnstile includes the chassis and the core component. The chassis is a carrier where the reader, the sensor, and the lock are installed. The product's core components mainly consist of the **Motor**, the **Frame**, and the **Swing Arm**.

1.3 Electronic Control System

The electronic control system of a swing barrier turnstile is mainly composed of the **Reader**, the **Control Panel**, the **Access controller**, **IR sensor** and the **Transformer**.

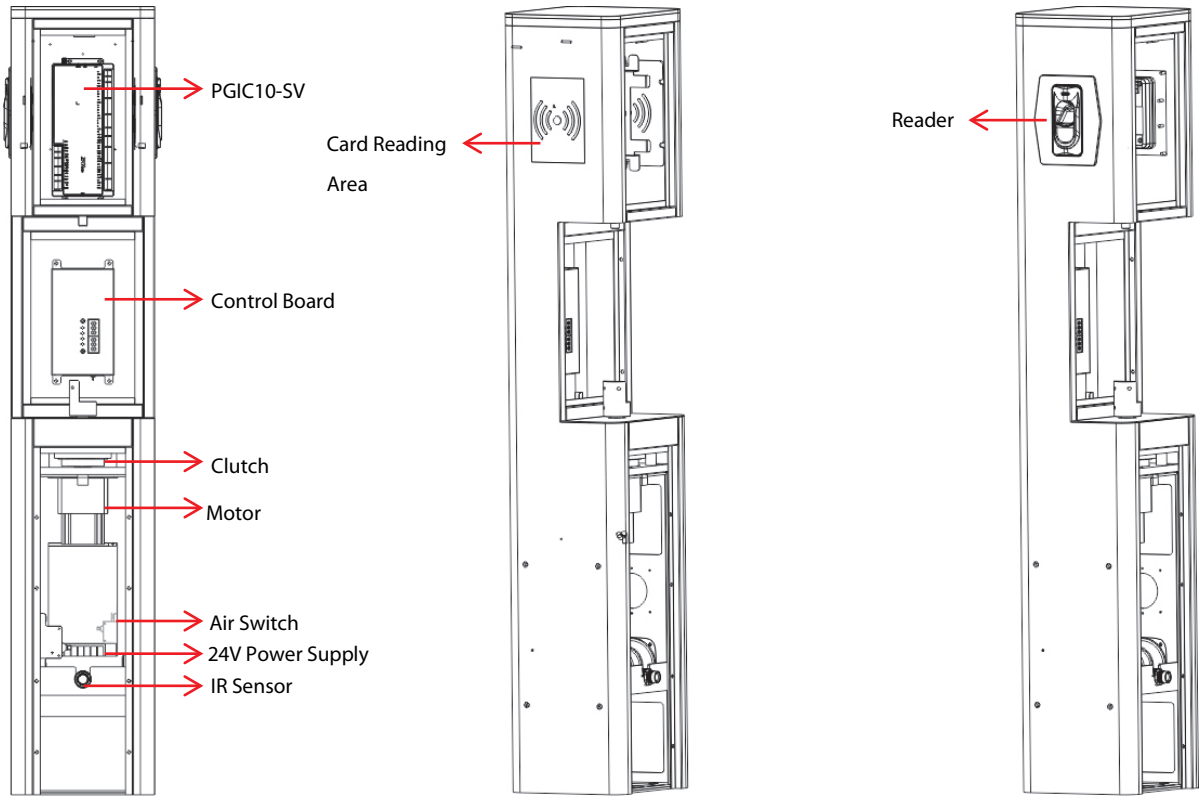
Reader: The reader reads the data in the RFID smart card and sends it to the controller.

Control panel: The control panel is the system's control center that receives signals from the access controller, performs logical judgment and processing of these signals, and sends executive commands to the electric motor.

Access Controller: The access controller provides convenient access to authorized persons while restricting access to unauthorized people.

IR Sensor:-It is mainly used to detect object or person and avoid crush.

Transformer:-The voltage is step down by a transformer to 24V and supplied to the control panel.



1.4 Working Principle

1. When the power is turned on, SBT2000S performs Power-on Self-Test. If no failure is detected, the barrier starts to operate normally. If a failure is detected, the system displays related messages and Error code on the LCD display screen so that the user can have a quick knowledge of the technical issue and solve the problem.

2. When the reader detects a valid card, the buzzer will give an audible prompt, indicating that the card is being read successfully. And then, the reader sends signals to the access controller to request permission to pass through the passage. If the signal is authorized, the access controller will send the open signal to the master control panel.

3. After receiving the signal from the access controller, the control panel sends valid control signals to the electric motor and opens the barrier.

1.5 Technical Specifications

Dimension(mm)	L=200, W=185, H=1100
Input Voltage	AC100V to120V/200V to 240V,50Hz to 60Hz
Input Control Signal	Switching Signal
Working Temperature	-10°C to 55°C
Infrared Sensor	1
Operational Voltage	DC 24V
Working Humidity	20% to 93%
Throughput rate	Maximum: 10 person/minute
Working Environment	Indoor/Outdoor (with shelter)

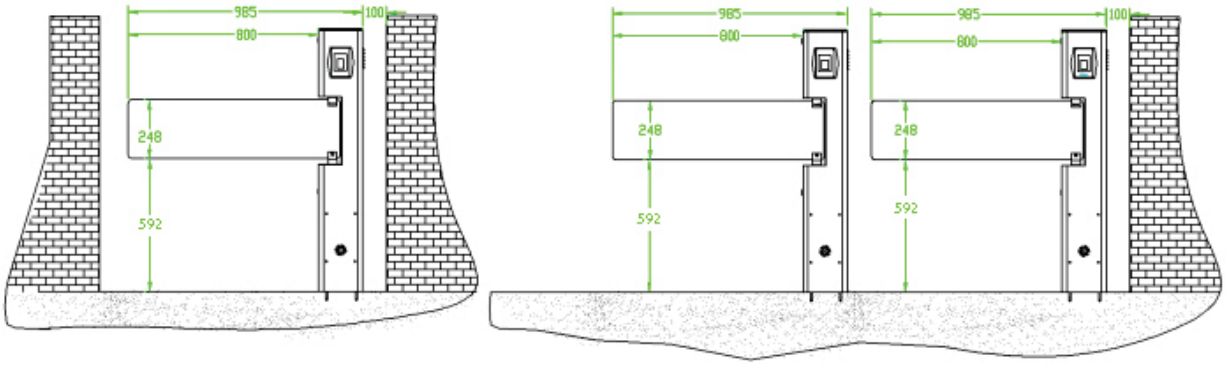
2 Installation

2.1 Installation Notes

1. It is recommended that the swing barrier turnstile be installed on a horizontal solid platform with 50 mm to 100 mm in height, the horizontal angle must not be greater than ±0.7°.
2. It is recommended that the swing barrier turnstile should not be used in the corrosive environment.
3. Make sure the earth wire of the system is reliably connected to avoid personal injuries or other accidents.
4. After installation, check whether the connection is reliable at the connecting points of the earth wire, at the connector assemblies and wiring points of the circuits, as well as at each movable part of the swing barrier turnstile. Any loose nuts, screws and other fasteners should be tightened in time to avoid any failures caused by long-time operations.

2.2 Installation Position

The installation position of the swing barrier turnstile depends on its size. If the swing barrier turnstile is installed near a wall, a distance of 100 mm between the swing barrier turnstile and the wall needs to be reserved for ease of installing the device. The SBT2000S swing barrier turnstile may form a single channel, or two channels with a SBT2000S swing barrier turnstile, as shown in below figure.



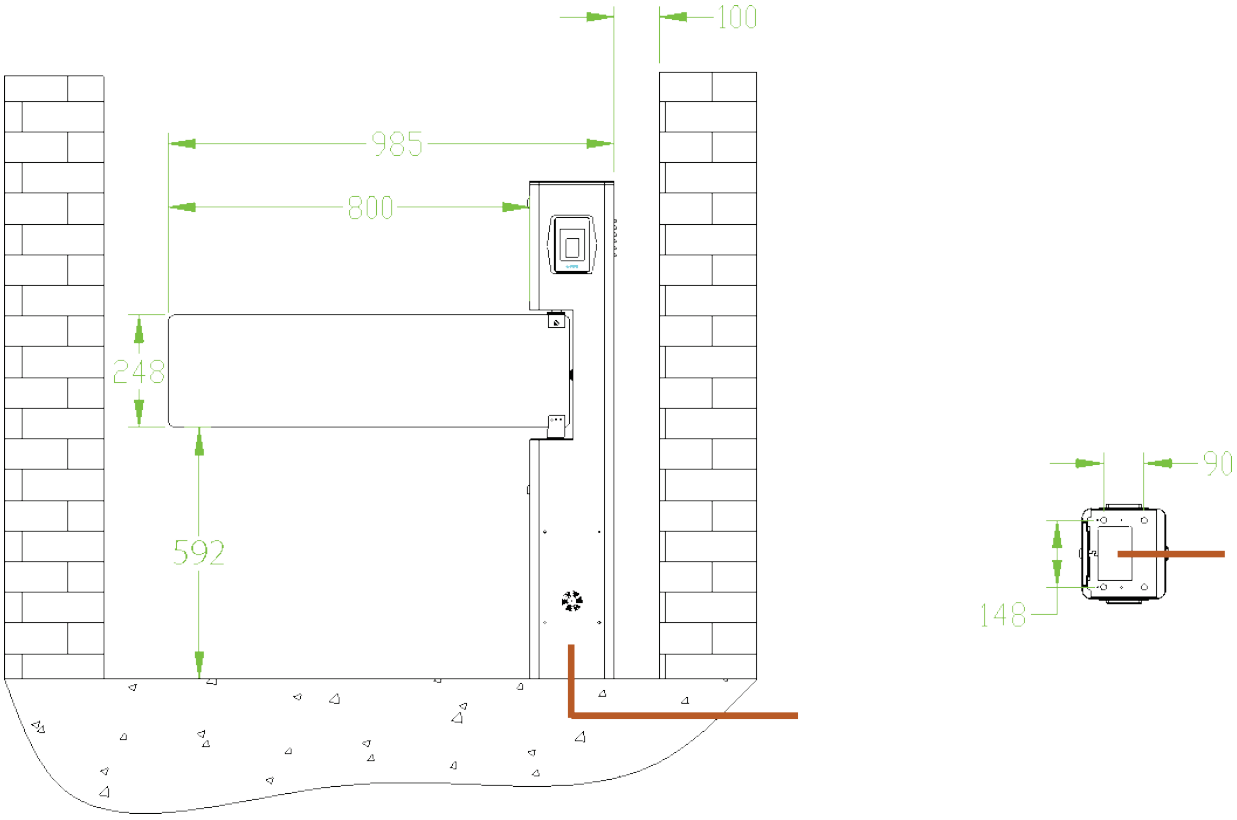
SBT2000S Single Channel and Dual Channel

2.3 Cables Installation and Fixation

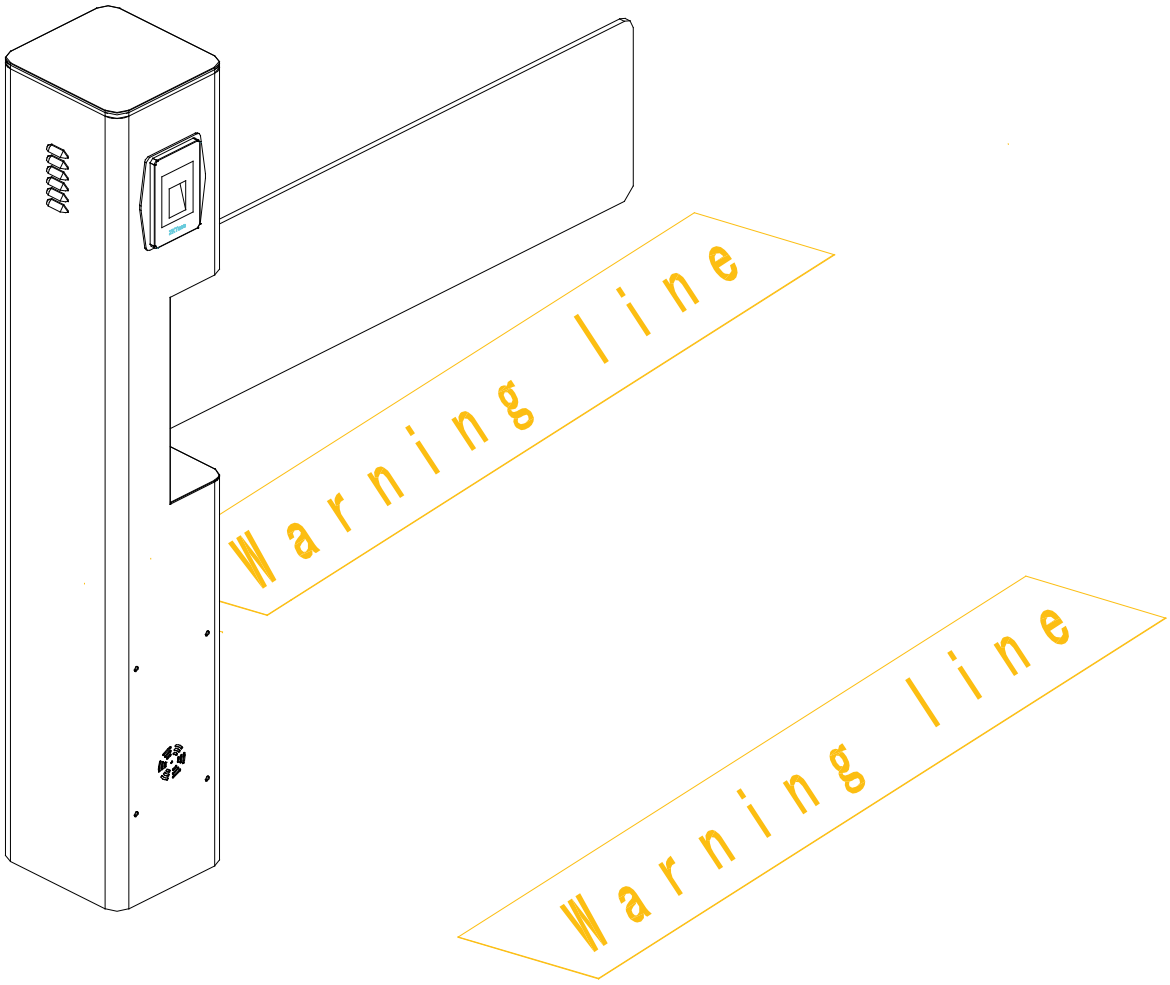
For the outlets of the concealed cables, please refer to the below diagram showing the mounting holes. The input voltage for this swing barrier turnstile is AC100V to120V/200V to 240V. The PVC conduits are

buried 100mm under the ground, with the height of the exposed part about exceeding 100mm. In addition, the conduit outlet is bent back to prevent ingress of water into the conduit.

SBT2000S installation holes and cabling positions are shown in the below figure.



Mark out the screw holes at the center of the stand, and the edge of the chassis base on the ground according to the sizes (as shown in the above figure). Use a hammer drill to perforate M12 screw holes and then install the screws. Place the swing barrier turnstile according to the sizes and positions as shown in the figure before installation and fixation. Then, connect all the cables and perform the power-on test. If the test is OK, tighten the screws. It is recommended that a warning line be marked out on the ground after the barrier is installed, so as to prompt the pedestrian to stand behind the warning line when swiping the card. (as shown in below figure).



3 Menu & their Functions

3.1 Function Introduction

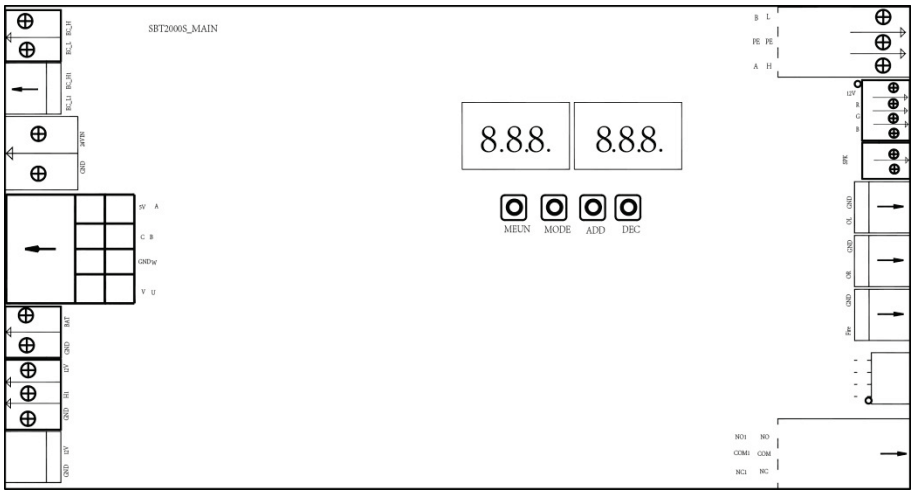
There are 4 keys on the control panel, “MEUN”, "MODE", "ADD" and "DEC".

MEUN: It is used for enter Settings menu and also for confirming the current modified value.

MODE: It is used to go back to the previous menu and discard the current operation.

ADD: It is used for navigating the upper menu item and increasing the value.

DEC: It is used for navigating to the lower menu item and decreasing the value.



3.2 Menu Introduction

1. **Display Mode(01EXXX)**
   - (01E000) Display current position of swing arm
   - (01E001) Infrared input signal (displayed by press 7421 code, 1 is valid.)
   - (01E002) Control input signal (displayed by press 8421 code, 0 is valid.)
   - (01E003) Test mode (the digital LED displays "---" in the test mode)
   - (01E004) Display version number

2. **Correct Barrier Position(02EXXX)**
   - (02E001) Zero position
   - (02E002) Left opening position
   - (02E003) Right opening position

   Adjust the position only when SBT2000S is installed properly.

When setting the zero position, you can manually push the swing arm for fine-tuning. If the swing arm exceeds a certain angle, it will be invalid. (At this time, the digital LED displays 02E000).

3. Passing Mode(03EXXX)

- (03E000) Right control, left control (default)
- (03E001) Right control, left forbidden
- (03E002) Right forbidden, left control
- (03E003) Right forbidden, left forbidden

Examples are as follows: If you want to set the gate access mode as Right controlled, Left forbidden.

Step 1: Long press "MENU" to enter Settings. Short press the MODE button twice to enter the access mode (03EXXX).

Step 2: Press "ADD" or "DEC" to adjust the function parameters value (03E001).

Step 3: Long press the "MENU" button to save the parameters after adjustment.

4. Automatic Closing Time for Unmanned Passage(04EXXX)

After pedestrian passes through the last infrared sensor, the gates will remain open for the specified time, then closes immediately. The valid value for Automatic Closing Time can be set between 1 to 60 seconds and the default value is 5s.

5. Gate Opening Speed(05EXXX)

Set the Gate Opening Speed to open the gate. The smaller the number is set, the faster the speed. The Gate Opening Speed value can be set between 1 to 5 and the default value is 3.

6. Gate Opening Deceleration Distance(06EXXX)

The larger the number, the longer the deceleration time and the more stable the swing arm operation. The Gate Opening Deceleration Distance can be set between 10 to 25 and the default value is 16.

7. Gate Closing Speed(07EXXX)

Set the Gate Closing Speed to close the gate. The smaller the number is set, the faster the speed. The Gate Closing Speed value can be set between 1 to 5 and the default value is 3.

8. Left Gate Closing Deceleration Distance(08EXXX)

The larger the number, the longer the deceleration time and the more stable the swing arm operation. The Left Gate Closing Deceleration Distance value can be set between 10 to 25 and the default value is 16.

9. Right Gate Closing Deceleration Distance(09EXXX)

The larger the number, the longer the deceleration time and the more stable the swing arm operation. The Right Gate Closing Deceleration Distance value can be set between 10 to 25 and the default value is 16.

10. Gate Closing Delay Time(10EXXX)

The Gate Closing Delay Time value can be set between 2 to 60 seconds and the default value is 5s.

11. Clutch Start Angle(11EXXX)

Set angle at which clutch starts and the valid value of Clutch Start Angle can be set between 1-10. The default value is 1.

12. Clutch Unlock Mode(12EXXX)

The different Clutch Unlock Modes are as follows:

- (12E000) Delayed unlock
- (12E001) Swipe to unlock (default)

13. Fire Opening Direction(13EXXX)

The different Fire Opening Directions are as follows: -

- (13E000) Right open (default)
- (13E001) Left open
- (13E002) Closed

14. Volume Setting(14EXXX)

Adjust the volume of the device as required. The larger the number, the louder the sound. The valid value of Volume Setting lies between 0-30 and the default value is 8.

15. Alarm Tone Setting(15EXXX)

- (15E000) Closed
- (15E001) Open (default)

16. In/Out Voice Exchange(16EXXX)

- (16E000) Right in, left out (default)
- (16E001) Right out, left in

17. Anti-crush Setting(17EXXX)

- (17E000) Stop anti-crush (default)
- (17E001) Close

18. Reset(18EXXX)

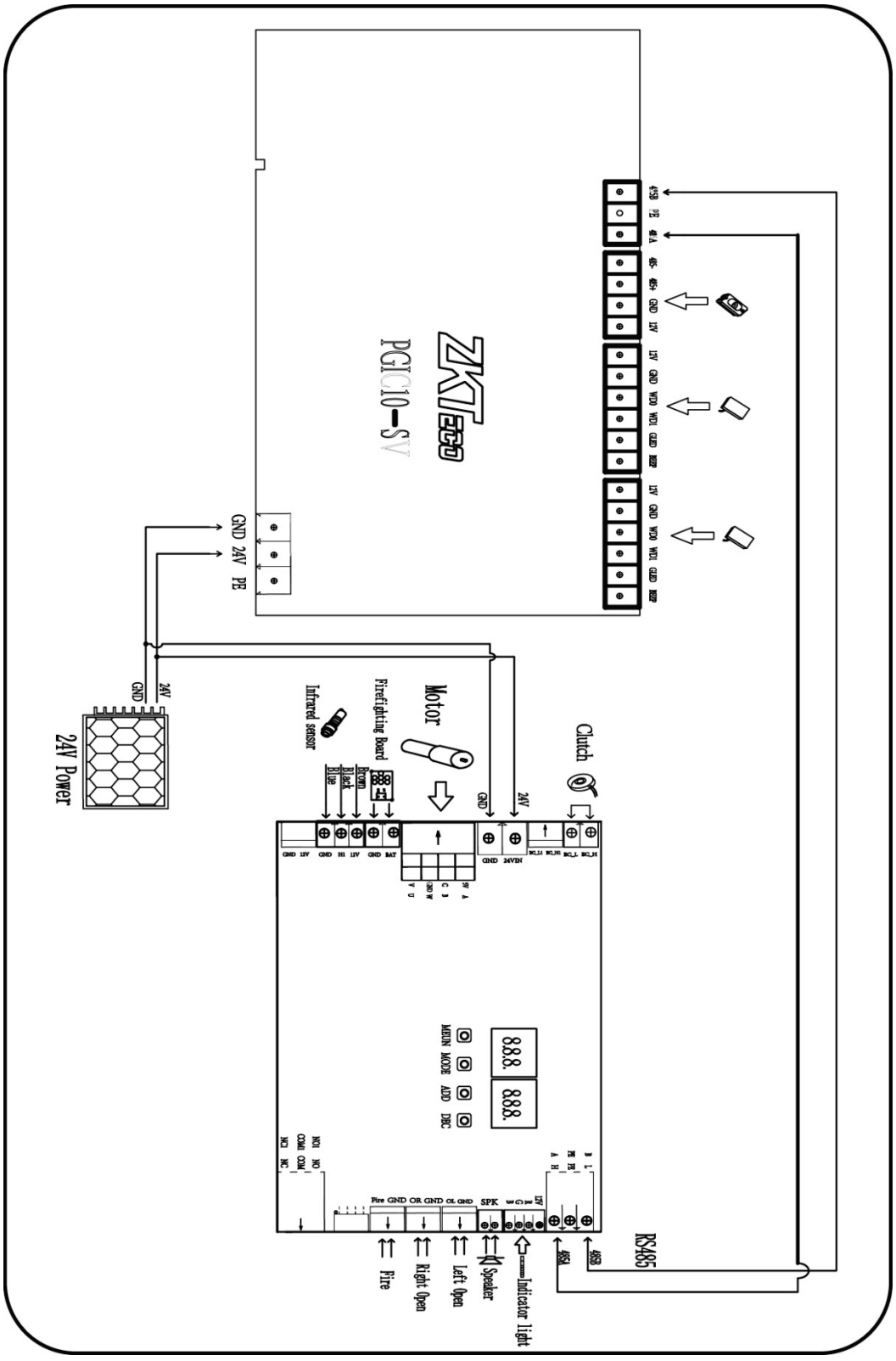
- (18E000) Normal work (default)
- (18E001) Reset

3.3 Error Code

Error Code	Cause
ER0002	Power-on Self-test failure, Hall limit detection error
ER0004	Run Timeout
ER0008	Clutch Locked
ER016	The code disk detection failed.
ER032	Electric Motor Shaft Lock Protection failure
ER064	Electric Motor output anomaly
ER128	Fire protection failure during Self-Check

3.4 Wiring Diagram and Function

Check circuit according to the following wiring diagram:



The functions of all the terminals at each zone are as:

1. **System Power Input :** The voltage is changed by a transformer to 24V and supplied to the master control panel.
2. **Firefighting port:** It is used during emergencies ensuring users fast exit to safety.
3. **Right open (ADD button), left open (DEC button):** These buttons control the barrier to open to the left or right side.
4. **Access control power supply:** It supplies power for the access board.
5. **RS485 communication port:** It is used for receiving external signals.
6. **Electromagnetic clutch:** It is connected to the electromagnet inside the core component to prevent collision and crush.
7. **Connecting cable of the motor:** It is connected to the motor and supplies power to the electric motor.
8. **LED light:** It is connected to the light belt on the top of the device.
9. **IR Sensor:** It is connected to the swing arm/barrier to achieve anti-crush function.

4 Maintenance

4.1 Chassis Maintenance

The chassis is made up of SPCC. After being in service for a substantial period, there may be rust stains on its surface. Regularly sand the chassis' surface with a sandpaper carefully. Coat its surface with anti-rust oil and do not cover the infrared sensor.

4.2 Movement Maintenance

Cut off power supply before maintenance. Open the door, clean dust from the surface and apply lubricant for smooth movement. Check and tighten other connection parts.

4.3 Power Supply Maintenance

- Cut off power supply before maintenance.
- Check whether any of the plug, nut, screw, or fastener is loose, if it is, then it needs to be tightened.
- Do not replace the connection position at random.
- Check whether the external power supply is exposed and timely wrapped. If there is any leakage, regular servicing is required.
- Check the technical parameters of the menu setting interface is normal.
- Replace the aging electronic components.

Note: SBT2000S swing barrier maintenance must be maintained by professional personnel, especially the movement and the electric control part. For ensuring operational safety, cut off the power supply when the barrier is not in use.

5 Troubleshooting

No.	Failure Description	Cause and Solution
1	Gate open, but it is not in place	Cause: It may be due to substantial motor resistance. Solution: Increase the value of minimum compensation speed.
2	No sound	Cause: It may be due to if speaker wire is loose or volume is turned off. Solution: 1. Check if the speaker wire is loose. 2. Check if voice is turned off.
3	Swing arm is not centred	Cause: It may be due to incorrect position of swing arm. Solution: Go to the menu of "Swing arm zero correction" and adjust it to the zero position.
4	The control panel LCD shows "Encoder wiring error"	Cause: It may be due to reversed wiring of encoder A and B phase. Solution: Please check if the wiring of encoder A and B phase is reversed. If yes, replace it.
5	The direction of gate open is inconsistent with swiping card.	Cause: It may be due to reversed signal line of access controller left and right gate. Solution: Please check if access controller left and right gate signal line is reversed. If yes, adjust right and left gate signal line.
6	Swipe card, but gate does not open.	Cause: It may be due to if menu setting interface does not exist or gate signal of access controller is not connected properly or if current mode is set to "card unavailable". Solution: 1. Check if the menu setting interface exist or not. 2. Check if the gate signal of the access controller is connected to the gate controller. 3. Enter menu to see if current mode is set to "card unavailable".

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