

# Python550F-B6/T6/C3 |

## Quick Start Guide |



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**TOUCH YOUR DREAMS  
WITH ROBOT FINGERTIPS**

## Preface

To ensure the proper operation of the product, please read this Guide carefully before operation. This Guide is applicable to the Python550F-B6/C3/T6. The 4-axis control system of Python robots consists of the electric control cabinet, body, extension module, vision system, Teach Pendant, HMI, industrial PC, low-voltage power supply, etc. The system supports various high-speed industrial field buses, such as external axis extension through EtherCAT and servo, multi-type module extension through Modbus TCP, and communication with industrial field equipment such as vision controller and HMI through EtherNET, to realize the flexible operation and control of robots.

### Target readers

Operators, robot programmers, maintenance personnel, technical support, and salesperson.

### List of related manuals

The manuals related to the product are listed below for your reference as needed.

| Reference                                                      |
|----------------------------------------------------------------|
| <i>Python550F-B6 Robot User Manual — Mechanical Part</i>       |
| <i>Python Series Robot User Manual — Electrical Part</i>       |
| <i>YiKingSoft Software Manual</i>                              |
| <i>Modbus Communication Manual</i>                             |
| <i>ConfigIO Configuration Manual</i>                           |
| <i>YiKingSoft Vision Application Manual</i>                    |
| <i>Socket Communication Manual</i>                             |
| <i>Independent External Axis Function Manual</i>               |
| <i>Kingkong Instruction Manual — Common Instructions</i>       |
| <i>Kingkong Instruction Manual — Extended Instructions</i>     |
| <i>Kingkong Instruction Manual — Pick Process Instruction</i>  |
| <i>Kingkong Instruction Manual — Place Process Instruction</i> |

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# 1. Overview

## 1.1 Safety notice



### **Danger**

- ◆ Failing to comply with product safety requirements may result in personal injury or death.
- ◆ This Guide only contains general instructions for the product. Please read the safety precautions in other manuals carefully before using the product.

- 1) Before installing, operating, and maintaining the equipment, please read and understand the safety precautions in the robot body and control cabinet manual.
- 2) To ensure personal and equipment safety, please follow all safety precautions stated on the equipment and in the manual when installing, operating, and maintaining the equipment.
- 3) Note that the contents marked with "Caution", "Warning", and "Danger" in this Guide do not represent all safety precautions that should be observed, but only serve as a supplement to safety precautions.
- 4) Use the equipment in an environment that meets the design specifications. Otherwise, it may cause failure. Any malfunction or component damage caused by failure to comply with relevant specifications is not within the scope of equipment quality assurance.
- 5) Our company will not bear any legal responsibility for personal safety accidents and property losses caused by improper operation of equipment.

## 1.2 Manual acquisition

This Guide is shipped with the product. If an electronic PDF file is required, you can obtain it in the following ways:

- Log in to the official website of RobotPhoenix (<http://www.robotphoenix.com>) to download.

## 2. Unpacking and Handling

Preparation for unpacking: Scissors/utility knife (×1), and safety gloves (×1).

### 2.1 Unpacking procedures

Step 1: Remove the outer packaging.

Wear safety gloves, cut off the strap of the carton with scissors/utility knife, and remove the carton.

Tools: safety gloves and scissors/utility knife.



#### Caution

- ◆ Use scissors/utility knife to unpack for safety.
- ◆ Wear safety gloves to prevent scratches, as the cut strap has sharp corners.

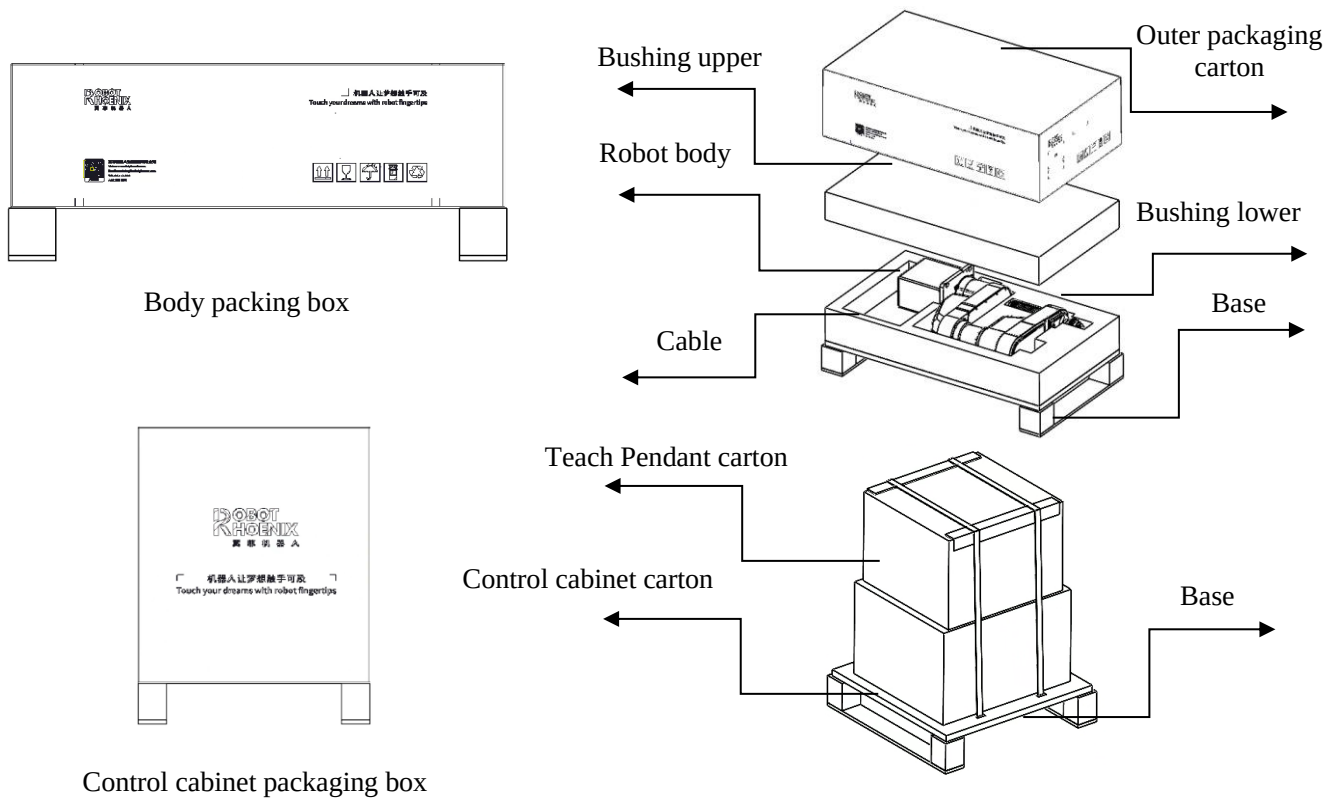


Figure 2-1 Diagram of outer packaging (Python550F-B6/C3 model)

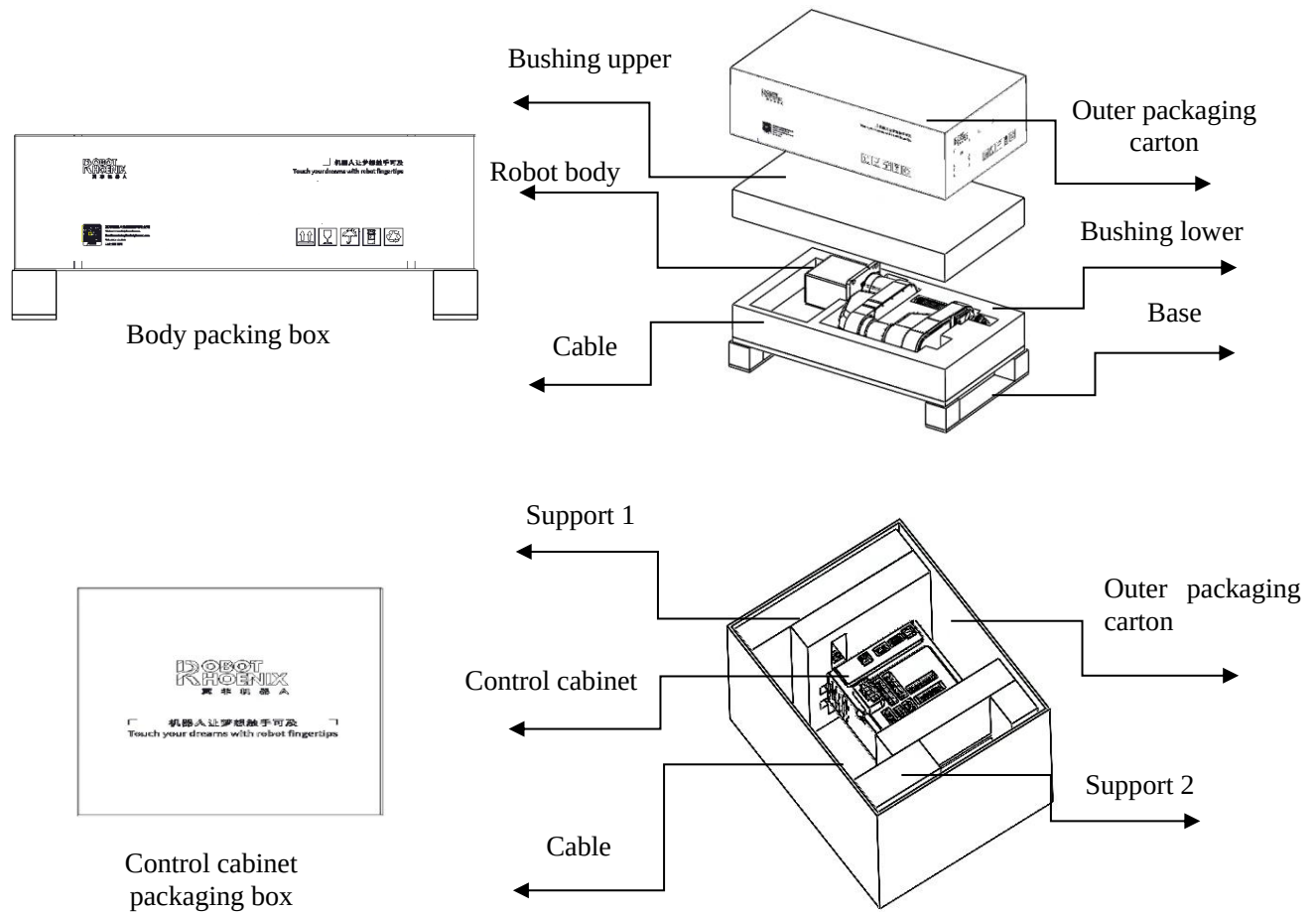


Figure 2-2 Diagram of outer packaging (Python550F-T6 model)

Step 2: Remove the outer packaging of the Teach Pendant and control cabinet.

- 1) Use scissors to cut off the packing strap that fixes the Teach Pendant carton;
- 2) Move the Teach Pendant carton above the control cabinet carton to the open ground.
- 3) Hold the bottom of the Teach Pendant carton and transport it to the target position.
- 4) Cut off the strap of the control cabinet carton with scissors;
- 5) Move the control cabinet carton above the base to the open ground, paying attention to the orientation of the control cabinet;
- 6) Hold the bottom of the control cabinet carton and transport it to the target position.

Tools: scissors/utility knife.

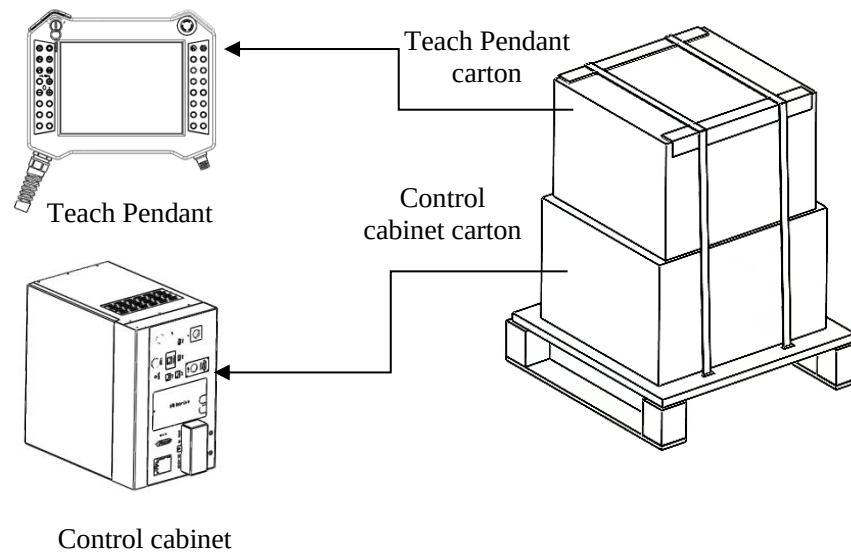


Figure 2-3 Removal of the Teach Pendant and control cabinet packaging (Python550F-B6/C3 model)

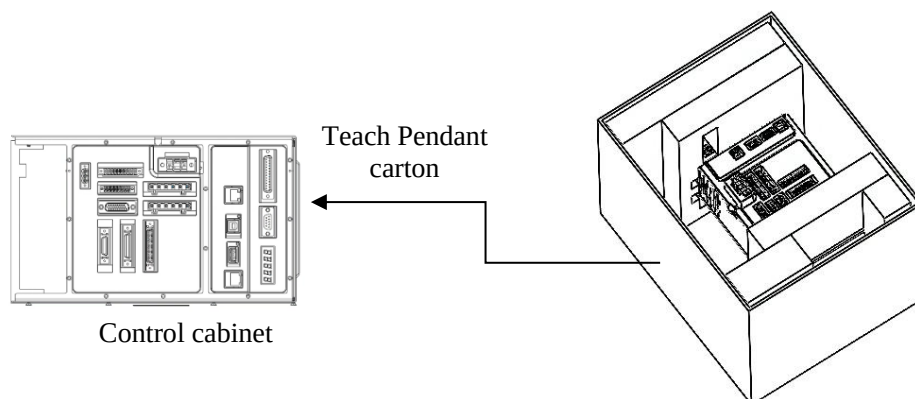


Figure 2-4 Removal of the Teach Pendant and control cabinet packaging (Python550F-T6 model)

Step 3. Take out the robot body.

Remove the robot from the bushing and carry it to the target position.

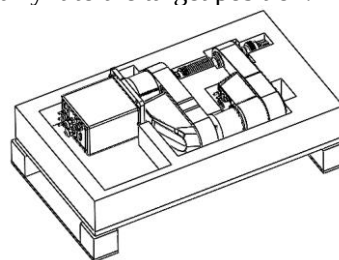


Figure 2-5 Removal of the robot body

**Caution**

- ◆ If repackaging is required, please follow the above steps in reverse order. Wear safety gloves to prevent scratches and operate carefully to prevent damage to the equipment.
- ◆ Take out the equipment carefully to avoid bumping.

## 2.2 Handling procedures

Prepare safety gloves, safety shoes, forklift, etc., before handling, and keep at least two people ready.

**Caution**

- ◆ Wear safety shoes and gloves for handling.
- ◆ Hold it firmly before handling to prevent the equipment from slipping or any damage.

### 2.2.1 Handling of the control cabinet and Teach Pendant

The handling personnel can carry the Teach Pendant and control cabinet with both hands.

### 2.2.2 Handling of the robot body

- 1) Handle the robot body in a proper state.

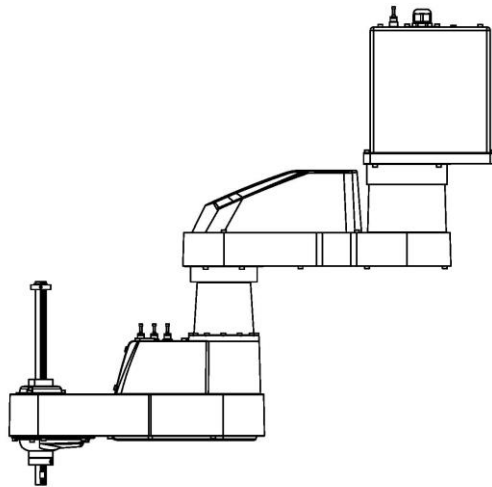


Figure 2-6 State of the robot body

- 2) Disconnect the power supply of all devices.
- 3) Disconnect the power cable and signal cable connected to the control cabinet.
- 4) Remove the base fixing screws and then the robot from the base.
- 5) Secure the robot to the handling tool.

#### ◆ Manual handling

For manual handling, secure the robot to the handling tool or hold the shaded portion (base bottom and big arm) with your hands. Be sure to handle it by two or more people.

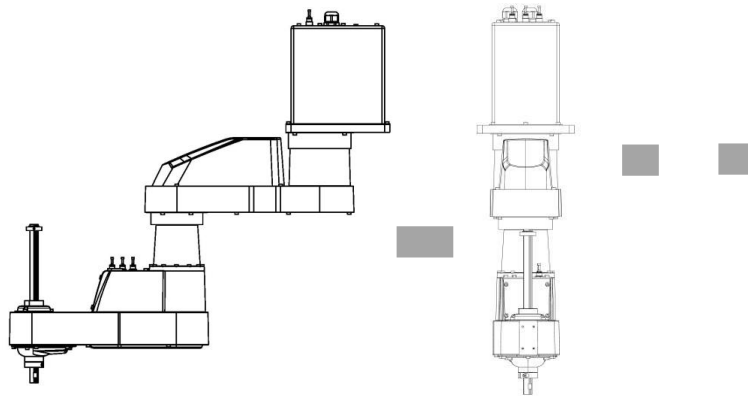


Figure 2-7 Manual handling position

### ◆ Forklift handling

When using a forklift for handling, please place the robot onto the EPE foam bushing and base, insert the fork into the base, and handle it together with the robot. Be careful not to trip or skew during handling, and transport it slowly.

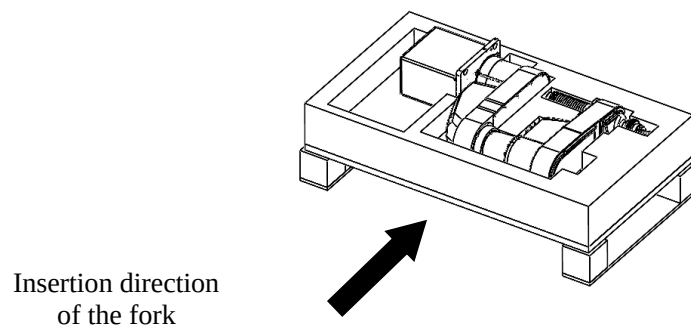


Figure 2-8 Diagram of forklift handling direction

### 3. Fixing

Before fixing the product, check the product size and ensure enough space. Please refer to the manual of each product for the installation size.

#### 3.1 Fixing of the control cabinet

In the standard installation position, keep the mounting surface stable and flat, without tipping or deformation.

Secure the control cabinet on the mounting surface with accompanying brackets and screws, as shown in the following figure:

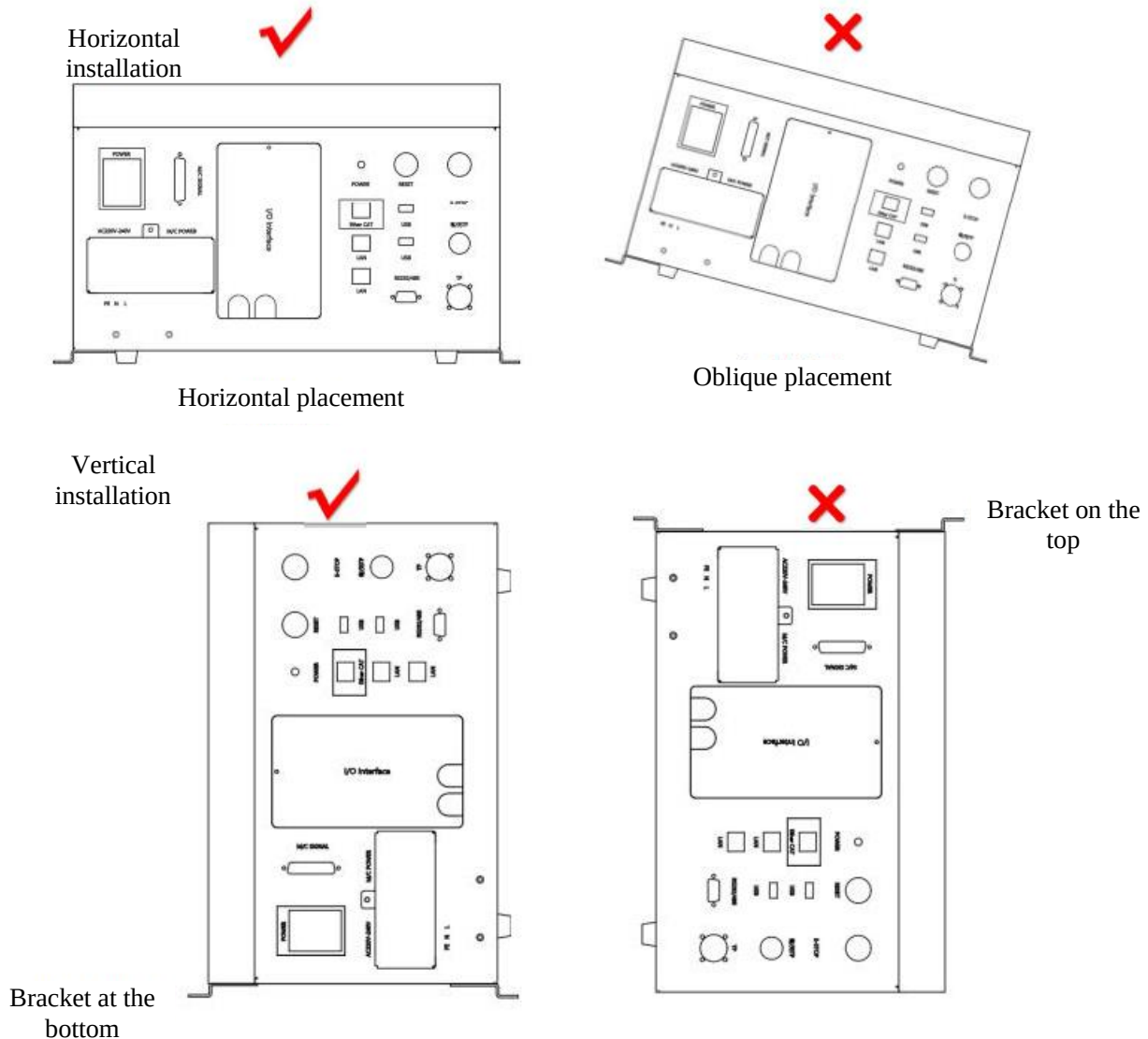


Figure 3-1 Installation plane requirements of Python550F-B6/C3

#### 3.2 Fixing of the base



#### Caution

- ◆ Do not conduct equipment installation, wiring, maintenance, and inspection, or part replacement by non-professional personnel.
- ◆ Install safety fences on the system. Otherwise, it may cause serious safety accidents.

- ◆ When installing the system, do not interfere with surrounding buildings, structural parts, or equipment. Otherwise, serious injury or major damage may occur.
- ◆ Fix the robot body before turning on the power supply or operating system. Otherwise, it may cause body tipping, resulting in serious injury or major damage.

**Caution**

- ◆ Do not modify the equipment.
- ◆ Do not install the equipment in places with a strong electric field or strong electromagnetic interference.
- ◆ Remove the mounting screws of the robot body and hold the robot body to prevent it from tipping.

1) Secure the base to the platform with four screws. Use six M6 bolts of grade 10.9 or 12.9 specified in GB/T 3098.1, with a tightening torque of 12 Nm.

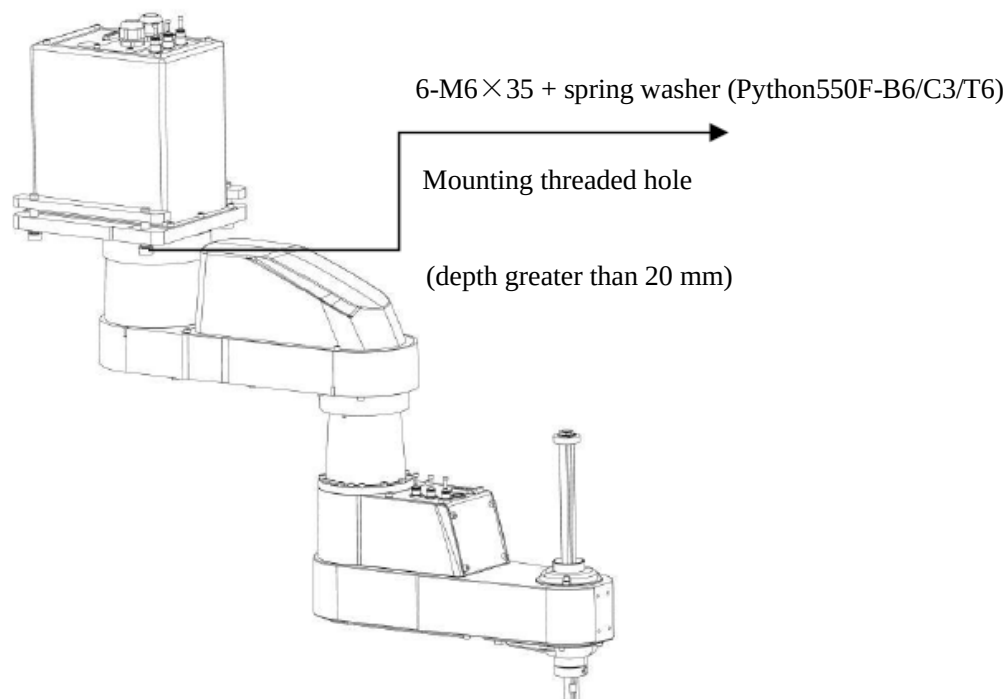


Figure 3-2 Diagram of base installation

## 4. Connection

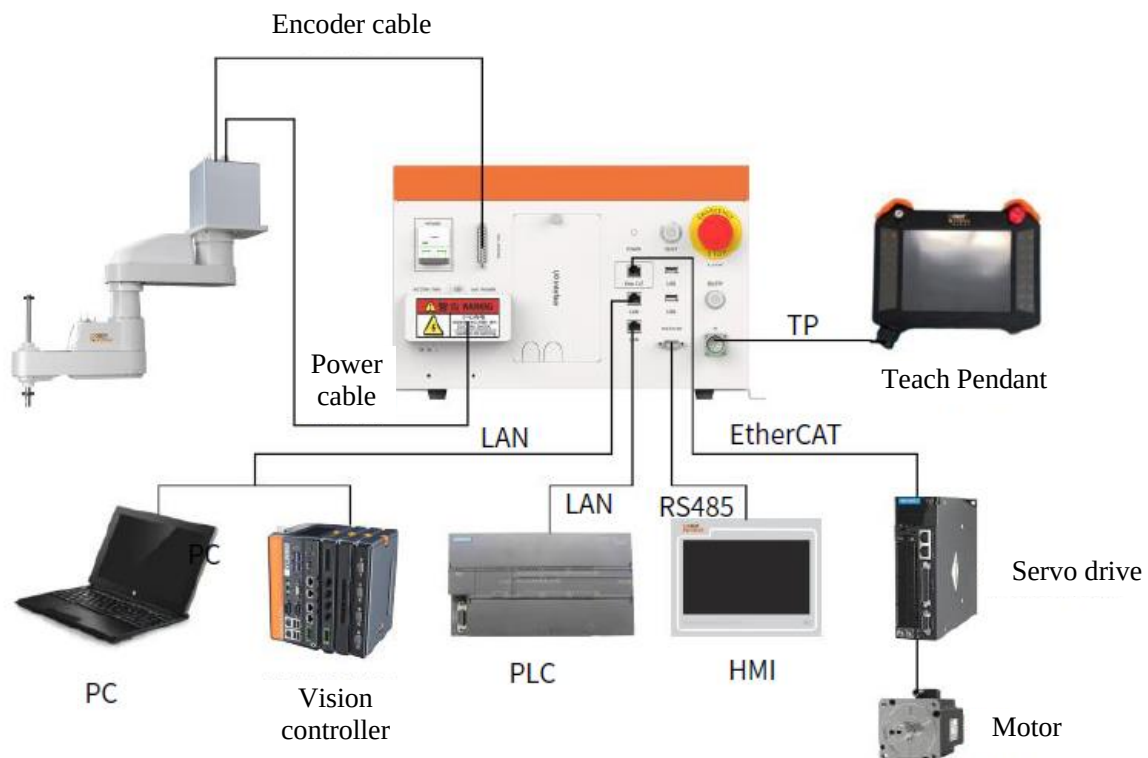


Figure 4-1 Typical system application wiring diagram of Python550F-B6/C3

Connect the power cable and encoder cable led out from the two plastic connectors on the base side respectively to the power plug and encoder plug of the control cabinet shown in the figure, tighten the corresponding fixing screws, and connect the plug on one side of the Teach Pendant to the TP plug of the control cabinet. Refer to the *YiKingSoft Software Manual* for detailed operation of the Teach Pendant.



Figure 4-2 Typical system application wiring diagram of Python550F-T6

## 4.1 Grounding requirements



### Warning

- ◆ To prevent electric shock, ground the robot and control cabinet.

To improve the anti-interference ability of the system, ensure that the robot body is reliably grounded, and the incoming terminal of the body base is equipped with a grounding rod.

## 4.2 Power connection



### Warning

- ◆ Do not operate by non-professional personnel, instead by qualified personnel.
- ◆ To prevent electric shock, ground the control cabinet after cutting off the power supply to the control cabinet.
- ◆ Connect the power cable to the plug that complies with local safety specifications or disconnected devices, instead of the factory power supply.
- ◆ Please read and understand the *Python Series Robot User Manual — Electrical Part* before operation.

The control cabinet adopts a single-phase AC 220 V power supply. Before delivery, it is equipped with a proper cable, of which one end is a three-pin power plug, and the other end is a pin-type crimping terminal with L, N, and PE tubes. If the customer chooses the cable, it must comply with the safety specifications as follows: 3 cores, cross-sectional area  $\geq 1.5 \text{ mm}^2$ , rated current  $>10 \text{ A}$ . The recommended specifications for the external circuit breaker are as follows: rated current  $\geq 16 \text{ A}$ , trip curve C.



Figure 4-3 Power supply wiring diagram



Figure 4-4 Power connection diagram of Python550F-B6/C3

As shown in the figure above, connect the three wires of the power cord to the corresponding positions of the 3-PIN input terminal in the order of PE/N/L from left to right according to the terminal identification.



Figure 4-5 Power connection diagram of Python550F-T6



## Danger

◆ Please be sure to follow the order of PE/N/L when connecting the power cord to avoid electric shock caused by wrong connection and short circuit.

### 4.3 Power and encoder cable connection

The product is equipped with the encoder and power cables to be connected to the robot body. Please connect according to the figure below.

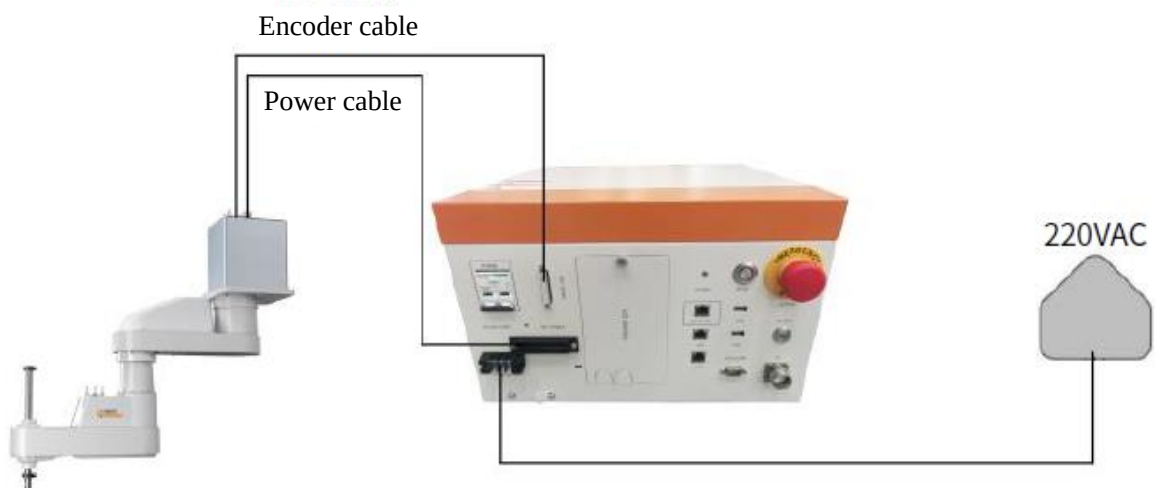


Figure 4-6 Encoder/Power cable connection diagram of Python550F-B6/C3

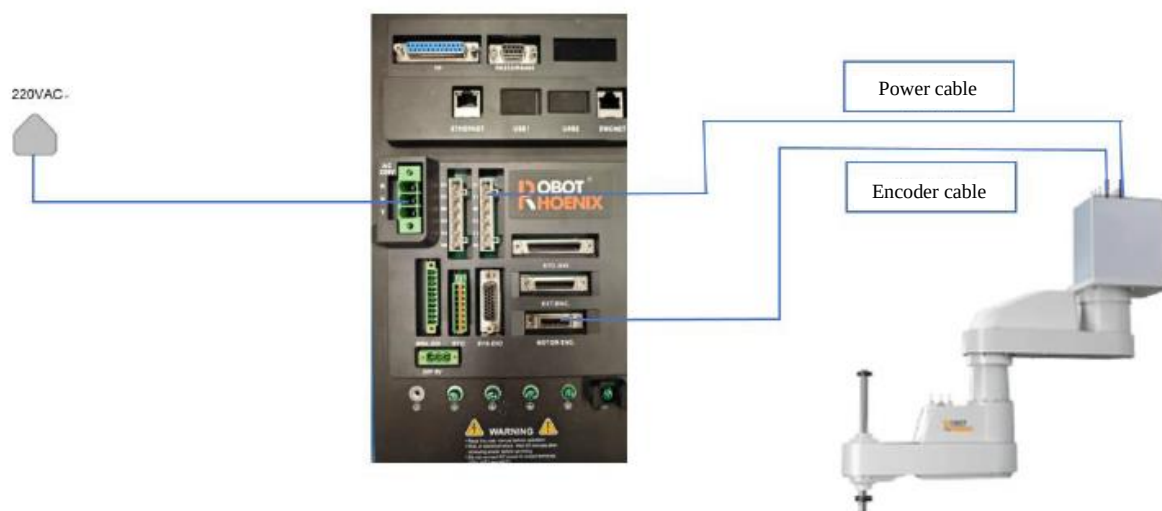


Figure 4-7 Encoder/Power cable connection diagram of Python550F-T6

**Caution**

◆ When connecting the encoder and power cables of the control cabinet to the body, do not make mistakes. Otherwise, the robot system may fail to operate normally, and serious safety accidents may occur.

## 4.4 Teach Pendant connection

The product is equipped with a Teach Pendant for robot teaching. Please refer to the *YiKingSoft Software Manual* for detailed operation of the Teach Pendant.

The connection between the Teach Pendant and the control cabinet is as follows:

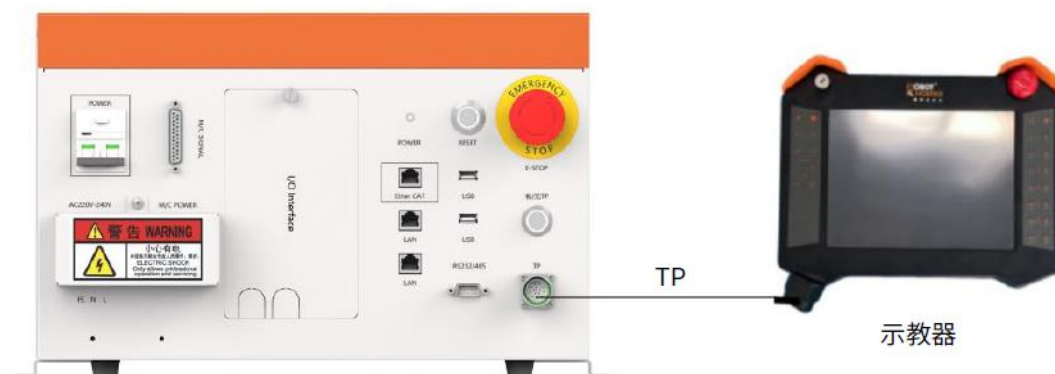


Figure 4-8 Teach Pendant connection diagram of Python550F-B6/C3

## 4.5 User wiring/air tube

### 4.5.1 User wiring

The robot has a dedicated signal line defined by the user and supports a 15-PIN connector. The signal definition of the connecting line on the robot arm side corresponds to the signal definition of the connector on the base side. The user only needs to make and define the DB15 connectors on the body side and the base side, and connect them to the corresponding position.



- ◆ One set of male and female DB15 connectors are provided in equipment accessories.

#### 4.5.2 User air tube

| Max. operating pressure        | Quantity | Specification (outer diameter×inner diameter) |
|--------------------------------|----------|-----------------------------------------------|
| 0.59MPa(6kgf/cm <sup>2</sup> ) | 3        | Φ4mmxΦ2.5mm                                   |



- ◆ Both ends of the air tube are attached with quick couplings according to the outer diameter.

#### 4.6 Input and output I/O wiring

The control cabinet I/O interface supports PNP and NPN, and comes standard with PNP. When the upper device is the relay output, use the 24 V power supply in the cabinet, and perform the input wiring as follows:

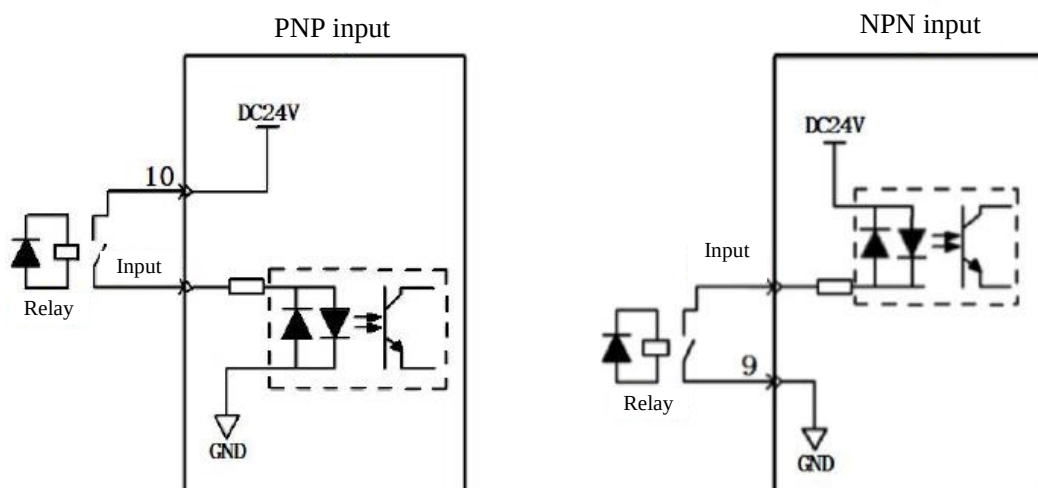


Figure 4-9 Input wiring of Python550F-B6/C3

When the output is connected to the relay load, use the 24 V power supply in the cabinet, and perform the output wiring as follows:

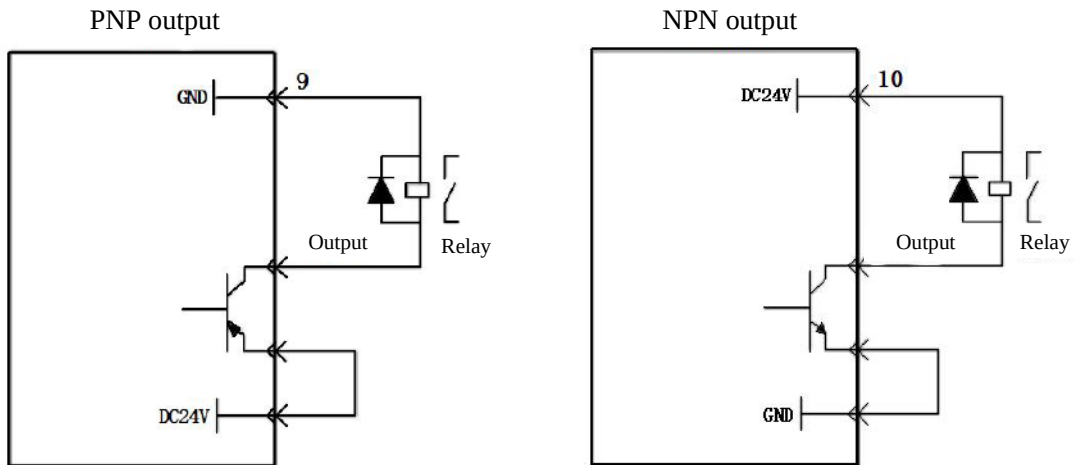


Figure 4-10 Output wiring of Python550F-B6/C3



Figure 4-11 External I/O wiring interface of Python550F-B6/C3 control cabinet

This interface is an external active output point, with a maximum output current of 250 mA. The standard configuration is active at the high level, and the special configuration is active at the low level. The high and low levels can be distinguished by the label on the outside of the cabinet.

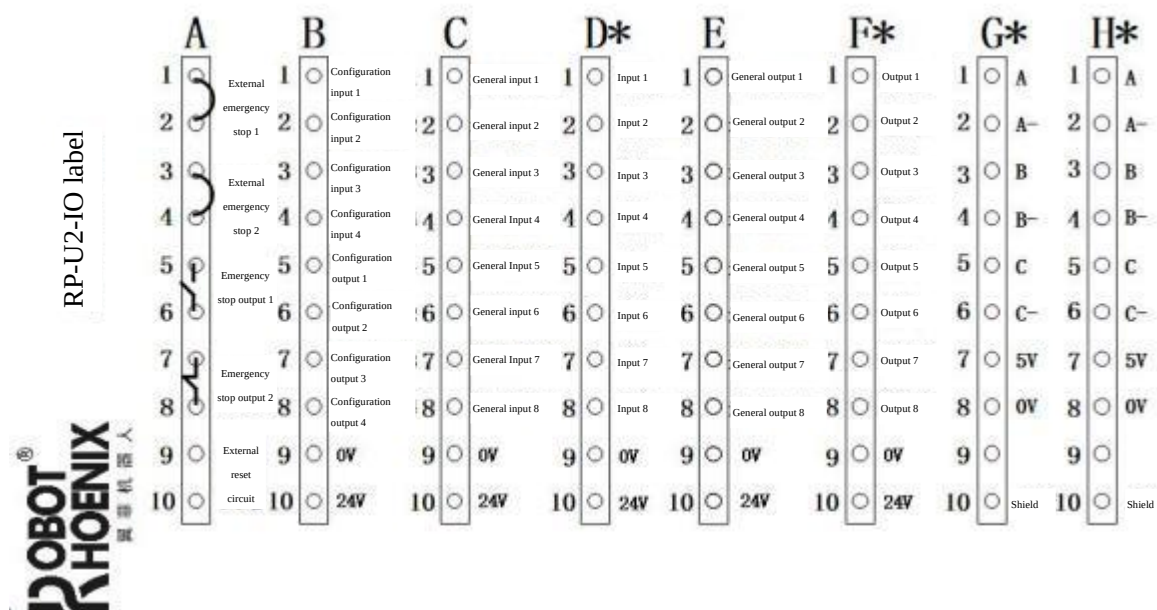


Figure 4-12 External I/O definition of control cabinet



◆ Column A is listed as safe wiring, which has been short-circuited before delivery. Users need to remove the external emergency stop before connecting.



◆ Column B is configurable I/O, start, stop, camera trigger, alarm output, etc.

## 5. Commissioning Procedures

| Steps                            | Sub-steps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Robot installation inspection | a. Confirm that the robot body and control cabinet are installed firmly.<br>b. Confirm that the power cable and encoder cable of the control cabinet are tightly connected to the robot body.<br>c. Confirm that the cable plug of the control cabinet is connected correctly, and all connections are effectively protected.<br>d. Confirm that the Teach Pendant is properly connected to the control cabinet.<br>e. Confirm that the "mode switch" on the Teach Pendant is turned to manual.<br>f. Confirm that the emergency stop button is pressed.                                                                                                                                                                                                                                                                             |
| 2. Power-on                      | a. Confirm that the supply voltage is within the required range.<br>b. Turn on the power supply.<br>c. Wait for the YiKingSoft to start automatically, or start the YiKingSoft manually.<br>d. Check whether the red light on the control cabinet flashes (status: emergency stop).<br>e. Pull up the emergency stop button, press the reset button, and check whether the green light flashes (status: ready).<br>f. Check the emergency stop button: <ul style="list-style-type: none"> <li>● Press the emergency stop button.</li> <li>● Check whether the red light on the control cabinet flashes (status: emergency stop).</li> <li>● Pull up the emergency stop button, press the reset button, and check whether the green light flashes (status: ready).</li> </ul>                                                         |
| 3. Robot jog                     | a. Open the jog interface and select the coordinate system.<br>b. Turn the enable switch on the back of the Teach Pendant to the middle position (status: pause).<br>c. Press the button on the right side of the Teach Pendant to jog the robot, or click the corresponding arrow on the screen (status: jog).<br>d. During the jog process, turn the enable switch to the lower position, and the robot will stop moving (status: pause). <ul style="list-style-type: none"> <li>● For more operations, please refer to 13. <i>Jog</i> under Chapter 5 of the <i>YiKingSoft Software Manual</i>.</li> </ul>                                                                                                                                                                                                                        |
| 4. Zone detection                | a. Push or jog axis 1 to align the zero mark of axis 1.<br>b. Observe the angle of axis 1 at the jog interface, which shall be 0° under normal conditions.<br>c. Push or jog axis 2 to align the zero mark of axis 2.<br>d. Observe the angle of axis 2 at the jog interface, which shall be 0° under normal conditions.<br>e. The zero position for axes 3 and 4 is not mandatory. Generally, the zero position of axis 3 is raised close to the hard limit, and that of axis 4 depends on the installation angle of the gripper.<br><b>Note:</b> Axes 3 and 4 are provided with brakes, so they can only be pushed when the brakes are open. <ul style="list-style-type: none"> <li>● To reset the zero position, please refer to 3. <i>Operation</i> under Chapter 5 of <i>YiKingSoft Software Manual</i> for details.</li> </ul> |
| 5. Program editing               | a. Enter advanced permissions other than basic.<br>b. Create a new program or modify the original program.<br>c. Save the program.<br>d. Compile the program. If the compilation fails, modify the program according to the prompts until the compilation passes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <ul style="list-style-type: none"> <li>• Please refer to the <i>Kingkong Instruction Manual</i> for details.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6. Commissioning | <p>Perform commissioning in manual mode or in automatic mode at a low speed.</p> <p>a. Manual: Turn the enable switch to the middle position, and press the run button  or click "commissioning". If a warning message pops up, please confirm according to the prompt, move the cursor to the next command, and then press the run button  or click "commissioning" again.</p> <p>b. Automatic: Turn the key to automatic mode, reduce the speed to less than 10%, and then press the run button  or click "commissioning".</p> |
| 7. Formal run    | <p>a. Run at normal speed in automatic mode.</p> <p>b. Turn the key to automatic mode.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## © Technical services

RobotPhoenix LLC is willing to provide information on the robot operation and troubleshooting and offer detailed consultations. If your robot malfunctions during operation, please contact our service center immediately and provide as detailed information about the robot as possible, and then we will provide you with a timely solution.

## © Contact information

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