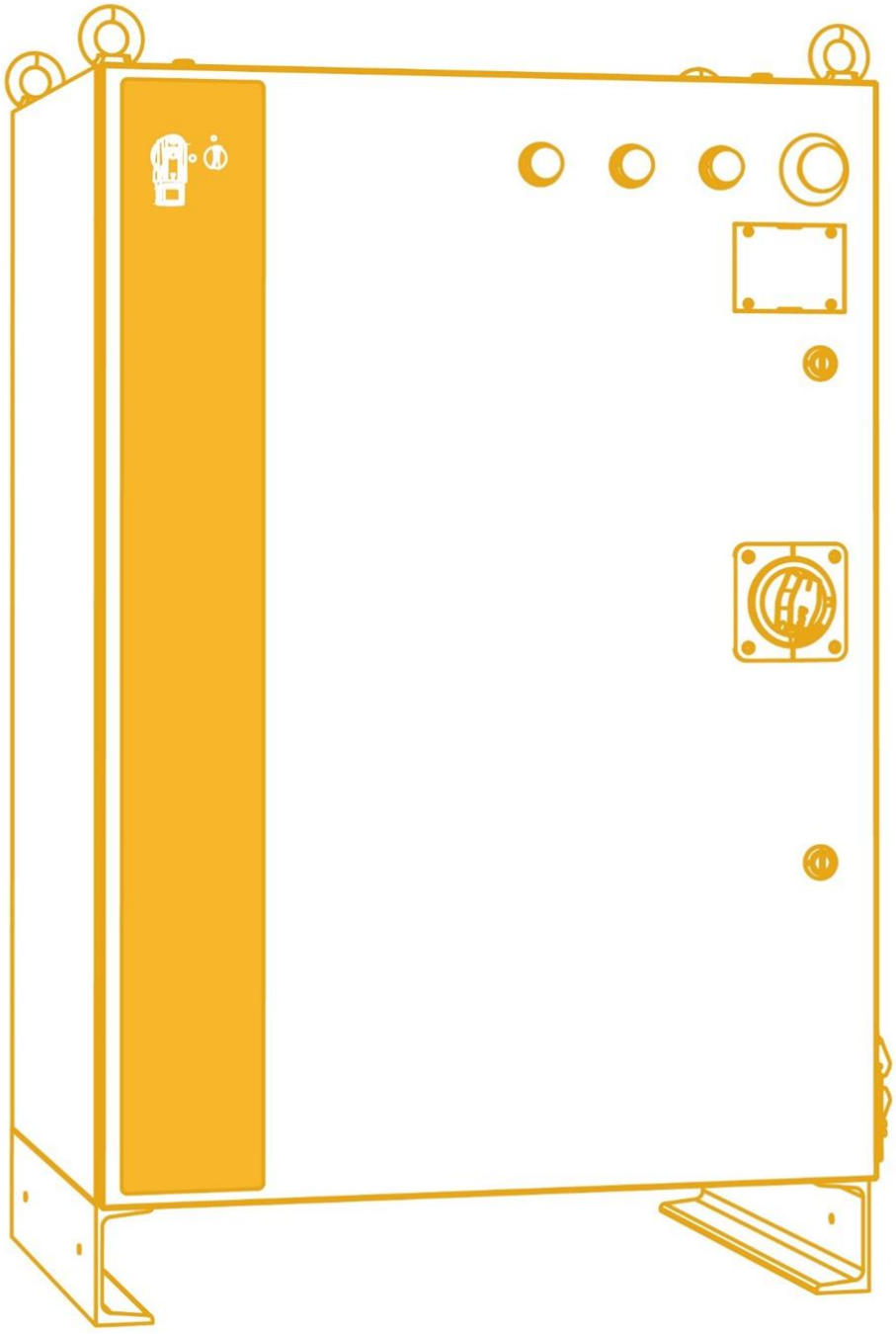
XINJE

RX3-A603 Control Cabinet



Introduction

About This Manual

This manual is designed to assist technicians in installing and operating the RX3-A603 control cabinet quickly, correctly, and safely, as well as to familiarize them with the relevant precautions and the procedures for performing regular maintenance on the control cabinet.

Operational Prerequisites

Before operating the robot, please carefully read the General Safety Instructions and Safety Precautions for this product. Users should only operate the robot after having acquired the necessary safety knowledge and basic operating skills.

Please refer to the following when necessary:

- Large-Load Industrial Robot Manipulator Handbook
- AIR-TP Teaching Pendant Operation Manual
- ARL Programming Manual
- Industrial Robot System Quick Start Guide

Target Groups

- operation staff
- Product Technical Specialist
- Technical Support Personnel
- Robot Instructor

Common Symbol Meanings

The symbols and their meanings listed in this manual are detailed in Table 1 below.

Table 1: Identifiers used in this paper

Sign	Meaning
	Failure to follow the instructions may lead to an accident, resulting in serious or fatal personal injury.
	If the instructions are not followed, an accident may occur, resulting in a moderate or minor injury, or it may merely cause material loss.
	Informations regarding environmental conditions and important considerations, or quick operation shortcuts.
	Please refer to additional literature and instructions for further information or more detailed operating guidelines.

User Manual

This manual may be supplemented or updated; please regularly check the "Download Center" on our companys website to obtain the latest version of this manual.

Our companys website : en.xinje.com

Revision History

The Revision History records the notes for each document update. The latest document version contains all updates from all previous document versions.

Table 2 – Document Revision History

Edition	Release Time	Modification Notes
V 1.0.0	2025 .12 .31	First official release

Document Number and Version

For document number and version information, please refer to Table 3.

Table 3 – Document Related Information

Document Name	RX3-A603 Control Cabinet Manual
Document Number	UM-P05110000049-001
Document Version	V 1.0.0

Declaration of Compliance with Safety Standards

The requirements for industrial robotic system design are detailed in Table 4.

Table 4: Declaration of Applicable Safety Standards

Standard	Explain	Edition
2006/42/EC	**Mechanical Command:** Mechanical Directive 2006/42/EC (New Version), issued by the European Parliament and the European Council on 17 May 2006, amending Directive 95/16/EC.	2006
2014/30/EU	**Electromagnetic Compatibility Directive:** Directive 2014/30/EU, issued by the European Parliament and the European Council on 26 February 2014, aimed at harmonizing electromagnetic compatibility regulations among the Member States.	2014

Standard	Explain	Edition
2014/68/EU	**Pressure Equipment Directive:** Directive 2014/68/EU, issued by the European Parliament and the European Council on 15 May 2014, aimed at harmonizing the pressure equipment regulations across the Member States. (Only applicable to robots equipped with a hydraulic/pneumatic balancing counterweight.)	2014
ISO 13850	**Mechanical Safety:** Emergency Shutdown Design Principle	2015
ISO 13849-1	**Mechanical Safety:** Control System Safety Components; Part 1: General Design Principles	2015
ISO 12100	**Mechanical Safety:** General design principles, risk assessment, and risk mitigation	2010
ISO 10218-1	**Industrial Robots – Safety Requirements:** Part 1: Robotics (Note: The content complies with ANSI/RIAR.15.06-2012, Part 1)	2011
61000-6-2	**Electromagnetic Compatibility (EMC):** Part 6-2: Basic Professional Standards; Immunity in Industrial Environments	200 5
61000-6-4 + A1	**Electromagnetic Compatibility (EMC):** Part 6-4: General Standards; Radiation Interference in Industrial Environments	2011
60204-1 + A1	**Mechanical Safety:** Mechanical and electrical equipment; Part 1: General requirements	2009
IEC 60529	**Enclosure protection rating (IP code):** This standard applies to electrical equipment with a rated voltage exceeding 72.5 kV, for which the protection rating is determined based on the enclosures protective capabilities.	2001

General Safety Instructions

Thank you for purchasing our operator machine. This manual contains essential instructions for the safe operation of the machine. Before using the operator machine, please read the relevant manual carefully and operate the machine correctly only after fully understanding the information provided.

For detailed information about the operators functions, users are advised to thoroughly review the relevant user manual to understand its specifications.

Safety Precautions

Under normal circumstances, the manipulator cannot perform operations on its own; it can only begin operating when a end-effector is installed and peripheral devices and systems are connected to the frame.

When assessing safety, the manipulator should not be considered in isolation but should be evaluated within its overall system context.

When operating the manipulator, ensure that appropriate safety measures are taken for the safety fence.

Warning, Note, and Tip

This manual contains precautions designed to ensure the personal safety of operators and to prevent damage to the operating machine; these precautions are labeled as "Warning" or "Caution" in the text according to their relative importance from a safety perspective, while relevant supplementary information is described as "Tip".

Before operating the machine, the user must carefully read all the information described in the "Warning," "Caution," and "Tip" sections.

Warning	Incorrect operation may result in the death or severe injury of the operator or other personnel involved in the work.
Tip	Incorrect operation may result in minor injuries to the operator or other personnel, or damage to the equipment.

General Precautions

Warning	■ When connecting or disconnecting related peripheral devices (such as safety barriers) and various signals of the operating machine, it is necessary to confirm that the operating machine is in a stopped state to avoid incorrect connections.. ■ Do not operate the manipulator under the circumstances depicted below. Otherwise, this may not only adversely affect the manipulator and its peripheral equipment but also potentially cause injury or death to the

operator:

- For use in combustible environments
- For use in explosive environments
- Use in environments with high levels of radiation
- Use in water or high-humidity environments.
- For use by the carrier or for the purpose of transporting animals.
- Use as a tripod (e.g., when climbing on the operating platform or hanging below it)

■ Operators using an operator machine shall wear the safety equipment shown below before commencing work:

- Workwear suitable for the nature of the job
- safety shoe
- safety helmet
- Depending on the on-site conditions, additional protective equipment—such as safety goggles or protective masks—to safeguard workers may be added.

Personnel performing programming or maintenance tasks must receive appropriate training through the companys relevant training programs.

Installation Precautions

■ When handling or installing the manipulator, always follow the procedures specified in our companys manual. Performing the operation using incorrect methods may cause the manipulator to overturn, resulting in injury or death to the operator.

■ During the first use of the operator machine after installation, always start at a low speed, then gradually increase the speed and check for any abnormalities.

Operating Instructions

■ When operating the manipulator, always ensure that no personnel are present within the safety fence before commencing work. Additionally, inspect for any potential hazards; if any such hazards are identified, eliminate them before proceeding with the operation.

■ When operating the teaching pendant, wearing gloves may increase the risk of operational errors; therefore, it is essential to remove your gloves before beginning any operation.

Programs, system variables, and other information can be stored on storage media such as memory cards. To prevent data loss due to unforeseen incidents, it is recommended that users regularly back up their data.

Programming Considerations

- Whenever possible, programming should be performed outside the safety fence; if it is necessary to perform the programming inside the safety fence due to unavoidable circumstances, the following precautions should be observed:
  - Carefully inspect the area inside the safety fence; only enter the fence after confirming there are no hazards.
  - The emergency stop button should be readily accessible at all times.
  - The operator should operate the machine at a low speed.
  - Operations should only be performed after the status of the entire system has been confirmed, to prevent operators from being placed in hazardous situations due to remote control commands or actions targeting peripheral devices.
- Operators using an operator machine shall wear the safety equipment shown below before commencing work:
  - Workwear suitable for the nature of the job
  - safety shoe
  - safety helmet
  - Depending on the on-site conditions, additional protective equipment—such as safety goggles or protective masks—to safeguard the safety of workers may be added.
- Whenever possible, programming should be performed outside the safety fence; if it is necessary to perform the programming inside the safety fence due to unavoidable circumstances, the following precautions should be observed:
  - Carefully inspect the area inside the safety fence; only enter the fence after confirming there are no hazards.
  - The emergency stop button should be readily accessible at all times.
  - The operator should operate the machine at a low speed.
  - Operations should only be performed after the status of the entire system has been confirmed, to prevent operators from being placed in hazardous situations due to remote control commands or actions targeting peripheral devices.

Upon completion of programming, it is mandatory to perform a test run according to the prescribed procedures; during this process, the operator must perform the operation outside the safety fence.

Personnel performing programming or maintenance tasks must have completed the relevant training provided by our company.

Maintenance Operations Precautions

- When powering on the equipment, certain maintenance tasks carry a risk of electric shock; such tasks should therefore be performed whenever possible while the operating machine and the system power supply are disconnected. Where necessary, specialized maintenance personnel should be appointed to carry out the maintenance operations. During maintenance work, ensure that no other personnel have turned on the power supply; even when powering on the equipment is required before proceeding with the work, the emergency stop button must be pressed before commencing the operation.
- If you need to replace any components, please contact our company.
- When a customer replaces components alone, it may lead to unexpected accidents, resulting in damage to the robotic system or injury to the operating personnel.
- When entering the safety fence area, carefully inspect the entire system to ensure no hazards are present before proceeding inside. If a hazard is present and entry into the fence is unavoidable, monitor the system status closely and exercise extreme caution.
- When replacing components, please use only components designated by our company. Using any component other than those designated may cause damage to the robotic system.

- When disassembling the motor or brake, appropriate measures—such as using a crane for lifting—should be taken before proceeding to avoid the risk of the crane arm or other components falling.
- When it is necessary to move the operator machine as a last resort during maintenance work, please observe the following precautions:
  - Ensure that all evacuation routes remain clear; perform operations only after fully understanding the entire systems operation to prevent the operating machine or peripheral equipment from obstructing escape routes.
  - Always be aware of any potential hazards in your surroundings and prepare yourself so that you can press the emergency stop button at any time when needed.
- When handling heavy component units—such as mobile motors or reducers—it is advisable to use auxiliary equipment, such as cranes, to avoid imposing an excessive workload on the operators. Additionally, incorrect operating procedures should be avoided, as they could potentially lead to injuries or fatalities among the personnel.
- Be careful not to fall due to lubricating oil spilled on the ground; wipe up any spilled lubricating oil as soon as possible to eliminate potential hazards.
- During operation, do not place any part of your body on any part of the operating machine; climbing on the operating machine is strictly prohibited to prevent unnecessary personal injury or adverse effects on the operating machine.
- The following parts may become hot; please be cautious. If you must touch the device while it is hot, please have protective gear, such as heat-resistant gloves, ready:
  - servo motor
  - decelerator
  - Components adjacent to the motor/gearbox

- Control cabinet interior

- When replacing components, any parts removed (e.g., screws) should be correctly reinstalled into their original positions; if any parts are missing or extra parts are found, this should be double-checked and the parts should be installed correctly.
- When performing maintenance on pneumatic or hydraulic systems, always release the internal pressure to zero before proceeding with any operation.
- After replacing the components, ensure that the equipment is tested and operated according to the specified procedures. At this time, the operator must perform the operation outside the safety fence.
- Upon completion of maintenance operations, any grease, debris, water, or other substances that have fallen on the ground around the operating machine or within the safety fence shall be thoroughly cleaned up.
- When replacing components, prevent foreign objects such as dust from entering the operating machine.
- Personnel performing maintenance and repair work must receive training from our company and pass the relevant assessments.
- During maintenance operations, appropriate lighting equipment shall be provided; however, care must be taken to ensure that such lighting equipment does not become the source of new hazards.
- Please refer to this manual for regular maintenance; failure to perform regular maintenance may shorten the service life of the operating machine and may lead to accidents.

Safety Precaution

Before operating the manipulator and its peripheral devices, as well as the entire manipulator system, it is essential to thoroughly assess the safety precautions applicable to both the operators and the system; Figure 1 illustrates a schematic diagram of safe industrial robot operation.

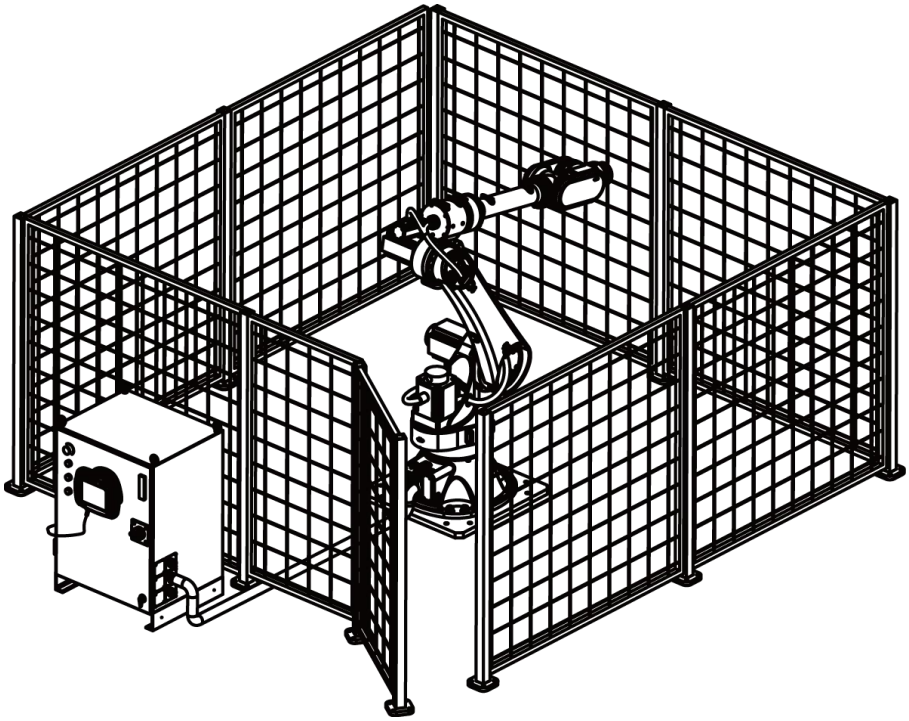


Figure 1: Schematic diagram of safe operation for industrial robots

Operational Personnel Definition

The operators of the robotic system are primarily categorized into three types: operators, trainers, and maintenance engineers. The qualifications required for each of these roles are described as follows:

Console Operator

- Perform the ON/OFF operation on the operators power supply;
- Start the operator program via the operation panel;
- No person shall perform any work within the safety fence.

Instructor

- Performs operator-related functions;
- Operations such as teaching the robotic manipulator can be performed within a safety fence.

Service Engineer

- Perform the duties of an instructor;
- Performs machine maintenance tasks (repair, adjustment, replacement, etc.).

Operational Personnel Safety

When operating, programming, or maintaining an industrial robot, operators, trainers, and maintenance engineers must prioritize safety and should wear at least the following personal protective equipment (PPE) during operation:

- Workwear suitable for the nature of the job
- safety shoe
- safety helmet
- Depending on the on-site conditions, additional protective equipment—such as safety goggles or protective masks—to safeguard workers may be added.

When operating automated systems, it is essential to ensure the safety of personnel; entering the operating range of an operating machine is highly hazardous, and measures should be taken to prevent personnel from entering this range.

The following are general precautions; please take appropriate measures to ensure the safety of the personnel involved:

- Operators using the robotic control system shall receive training from the company and pass the relevant assessments.
- During equipment operation, even if the operator machine appears to have stopped, it may actually be in a "pre-operation" state—waiting for a start signal. This state should still be regarded as the operator machine being in operation. To ensure operator safety, the operator machines operational status should be confirmed through visual indicators (such as an alarm light) or audible signals.
- A safety fence and safety door must be installed around the system; this ensures that operators cannot enter the safety fence unless they open the safety door. The safety door should be equipped with an interlock switch or a safety pin, so that the operating machine will stop immediately when an operator opens the safety door.
- All peripheral devices shall be electrically grounded.
- Peripheral equipment should be positioned as far as possible outside the operating range of the manipulator.
- The operating range of the manipulator should be clearly marked, for example, by drawing lines on the floor, so that the operator has a clear understanding of the manipulators movement range, including that of any tools attached to it, such as the robotic arm.
- A floor-mounted switch or a photoelectric sensor should be installed to issue an alarm – such as a buzzer or light signal – when an operator is about to enter the

operating machines reach area, prompting the machine to stop and thereby ensuring the operators safety.

- A lock should be installed as needed; except for the operator responsible for the operation, the power supply to the operating machine must not be turned on.
- When performing individual debugging of peripheral devices, be sure to disconnect the power supply from the operator station.

Operator Safety

The operator is not authorized to perform any work within the safety fence:

- When the operator machine does not need to be operated, disconnect the power supply from the operator machine control cabinet or press the emergency stop button.
- Operating the machine system should be performed outside the safety fence.
- To prevent unauthorized individuals from entering the operating area of the machinery, or to prevent operators from entering hazardous zones, protective fencing and safety doors shall be installed.
- An emergency stop button should be installed within the operators reach.

The operator control unit is designed to be connected to an external emergency stop button; when this button is pressed, the operator machine will stop immediately.

Instructor Safety

During an operator teaching operation, it may be necessary to enter the operating machines working area; in such cases, particular attention should be paid to safety:

- When it is not necessary to enter the operators reach area, always perform operations outside of this area.
- Before performing a teaching operation, ensure that the robotic manipulator or peripheral equipment is in a safe condition.
- When it is necessary to enter the operating machines movement range for a teaching operation under unavoidable circumstances, the position and status of safety devices (such as the emergency stop button or the teach pendants emergency automatic shutdown switch) should be verified in advance.
- The instructor should take special care to prevent other personnel from entering the operating range of the robotic system.
- Before starting the operator machine, ensure thoroughly that there is no personnel within its operating range and that no abnormalities exist; only then should the machine be operated.
- After completing the teaching process, please follow these steps to perform a test run:

- At low speeds, execute at least one cycle in a single step and verify that no abnormalities have occurred.
- At low speed, run continuously for at least one cycle to confirm that no abnormalities are present.
- At medium speed, run the system continuously for at least one cycle to confirm there are no abnormalities.
- Run the system continuously for one full cycle at the operating speed and verify that no abnormalities are detected.
- Run the program in automatic mode.

- When operating the machine during automatic operation, the instructor must evacuate to outside the safety fence.

Maintenance Engineers Safety

To ensure the safety of maintenance engineers, the following precautions should be observed:

- During operation of the operator machine, do not enter its operating range.
- It is recommended to perform maintenance work while disconnecting the power supply of the control device.Lock the main circuit breaker using appropriate locking devices as needed to prevent other personnel from turning on the power supply.
- In emergency situations where it is necessary to enter the operating machines working area while the machine is powered on, the emergency stop button on the control cabinet or teaching pendant should be pressed before entering. Additionally, the operator should display a "Maintenance in Progress" sign to alert other personnel not to operate the machine without authorization.
- Before performing maintenance work, ensure that the operating machine or peripheral equipment is in a safe condition.
- Do not initiate automatic operation when someone is within the operating range of the manipulator.
- When working near walls, fixtures, or similar structures, or when multiple workers are working in close proximity, care should be taken not to block the escape routes of other workers.
- When the operating machine is equipped with tools, or when movable tools such as conveyor belts are present in addition to the operating machine, due attention should be paid to the operation of these devices.
- During operation, a personnel member who is familiar with the machines control system and capable of identifying potential hazards should be stationed beside the control panel or control box, ensuring they are always within reach to press the emergency stop button at any time.

- When replacing components or reassembling, care should be taken to prevent the adhesion or introduction of foreign objects.
- When working inside a maintenance control device and needing to access components such as units or printed circuit boards, it is essential to disconnect the power supply from the control devices main circuit breaker before proceeding with any operation to prevent electric shock.
- When replacing components, please use only components designated by our company.
- When restarting the manipulator system after completing maintenance operations, ensure in advance that no personnel are present within the manipulators operating range and that the manipulator and its peripheral equipment are in normal operating condition.

Peripherals Security

Program-Related Precautions

- To detect hazardous conditions, limit switches or other detection devices should be used; based on the signals from these devices, the operating machine should be stopped as needed.
- When other operating machines or peripheral devices exhibit abnormal behavior, appropriate measures should be taken—such as stopping the operating machine—even if the operating machine itself is functioning normally.
- For systems in which the operator station and peripheral devices operate in synchronization, special care should be taken to prevent mutual interference.
- This enables the operators handheld controller to monitor the status of all devices within the system, interlock the handheld controller with peripheral devices, and stop the operators machine operation as needed.

Mechanical-Related Precautions

- The operator console system should be kept clean and used in an environment free from exposure to oil, water, dust, or other contaminants.
- Do not use cutting fluids or cleaning agents of unknown composition.
- Limit switches and mechanical brakes shall be used to restrict the operation of the manipulator, thereby preventing any collision between the manipulator and its peripheral equipment.
- No additional user cables, hoses, or similar accessories shall be installed inside the operator station.
- When installing external cables or other equipment around the operating machine, take care not to obstruct the machines movement.
- For models where the internal cables are exposed externally, do not perform any modifications that would obstruct the exposure of the cable sections.

- When installing external devices on the operators console, take care to avoid any interference with other parts of the console.
- For robotic manipulators in operation, frequent power-off or stop operations—such as those triggered by an emergency stop button—can cause the manipulator to malfunction.

Mechanical Safety of Operating Machines

Operating Precautions

When operating the manipulator with slow feed rate, the operator should remain highly vigilant under all circumstances and respond promptly to any emerging issues.

Precautions for The Relevant Procedure

When the operating ranges of multiple manipulators overlap, special care should be taken to prevent mutual interference between them.

Ensure that the robotic manipulators program is configured with a specified work origin, and create a program that starts and ends at this work origin, so that it is clearly visible from outside whether the robotic operation has been completed.

Organizational Considerations

Maintain a clean operating environment for the operators machine, ensuring it is used in an environment free from exposure to oil, water, dust, or other contaminants.

End Effector Safety

When controlling various types of transmission systems (pneumatic, hydraulic, or electrical), after issuing a control command, the time lag between the issuance of the command and the actual execution of the action should be fully taken into account, and the control should be designed with a certain margin of flexibility.

A detection unit should be installed on the end effector to monitor its status and control the manipulators movements.

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1 RX3-A603 Control Cabinet Overview

1.1 Industrial Robotics Overview

Industrial robots consist of the following components:

- Operator Machine
- control cabinet
- demonstrator
- Connection (power supply) cables, etc.

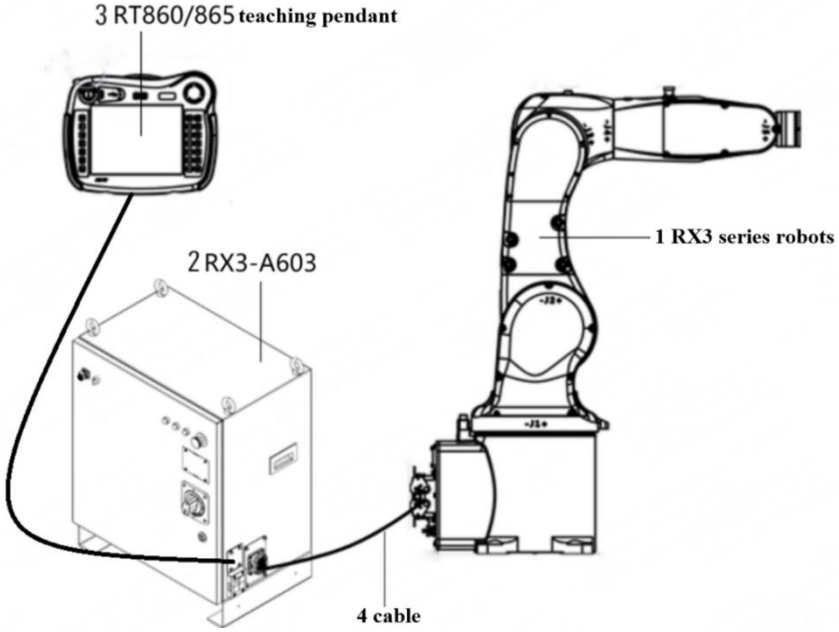


Figure 1–1 Schematic diagram of the robotic system architecture

Figure 1-1 illustrates an example of an industrial robotic system configuration, where:

1.Operator Machine 2.control cabinet

3.demonstrator 4.Connection (power supply) cables

Robot Body

The robotic manipulator refers to the mechanism within a robotic system used for grasping or moving objects (tools or workpieces); it is also known as a manipulator.

Control Cabinet

The control cabinet houses the electrical equipment required for operating the robot, including motor drivers, PLCs, safety modules, power supply modules, motion control modules, and other components; it also provides connection interfaces for linking to the robots main unit and other external devices.

Demonstrator

The teaching pendant is connected to the main control system of the robotic control cabinet and is used for remotely operating the robots manual or automatic mode, recording the robots movement trajectory, displaying and replaying data, recording teaching points, or programming the robot based on these teaching points.

1.2 Control Cabinet Basic Composition

The locations of the internal components within the control cabinet are shown in Figures 1–2 and Figure 1–3.

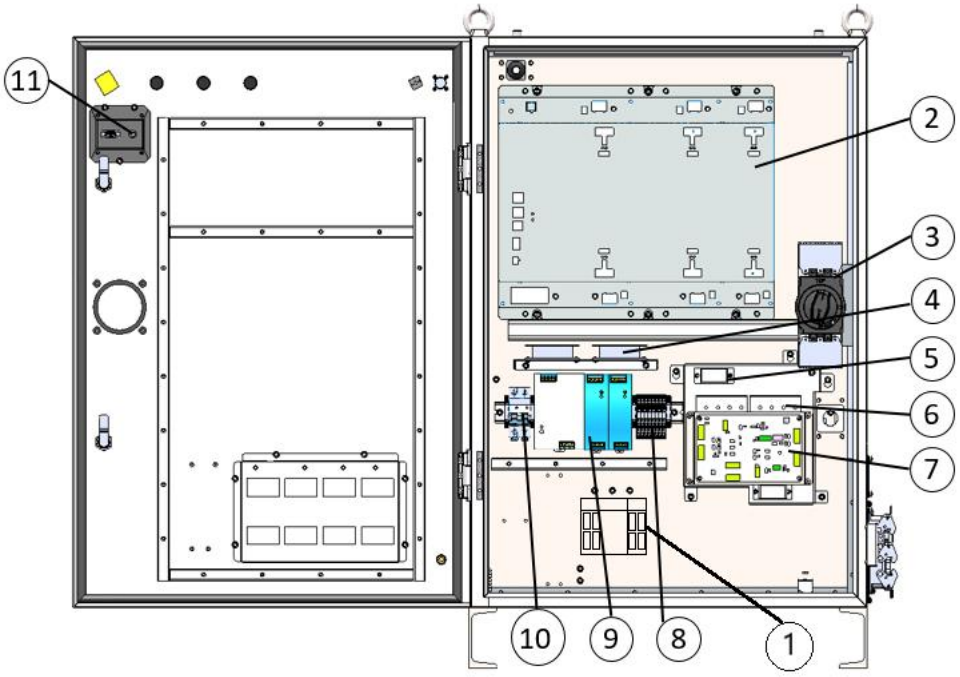


Figure 1-2: Schematic diagram of the internal components in the front chamber of the control cabinet -

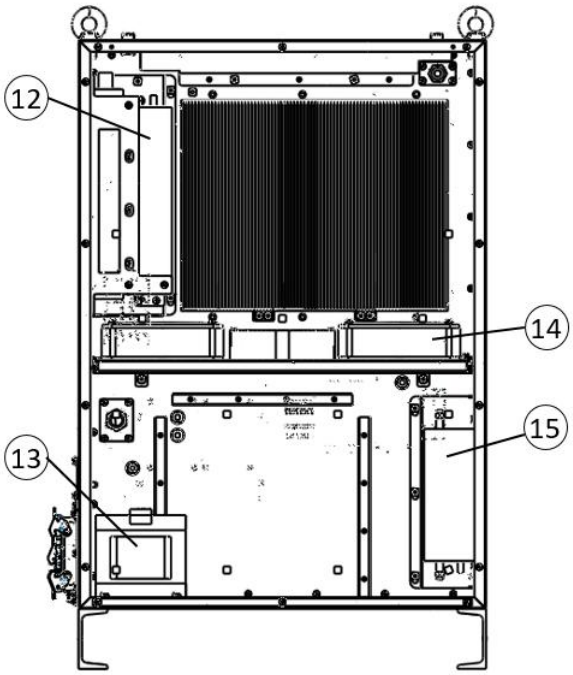


Figure 1-3: Schematic diagram of the internal components in the rear cavity of the control cabinet

For the serial numbers and names of each component, please refer to Table 1-1.

Table 1– 1 Internal Components of the Control Cabinet (Serial Number and Name)

Order Number	Name	Order Number	Name
1	RC6F Main Control Circuit Board	8	220 V power supply terminal
2	actuator	9	Switching Mode Power Supply
3	circuit breaker	11	Manually release the brake button
4	aerofoil fan	12	braking resistor
5	arc deflector	13	transformer
6	contactor	14	aerofoil fan
7	IAB Interface PCB	15	filter

1.3 Control Cabinet Specifications

The characteristic parameters of the RX3-A603 control cabinet are shown in Tables 1- 2.

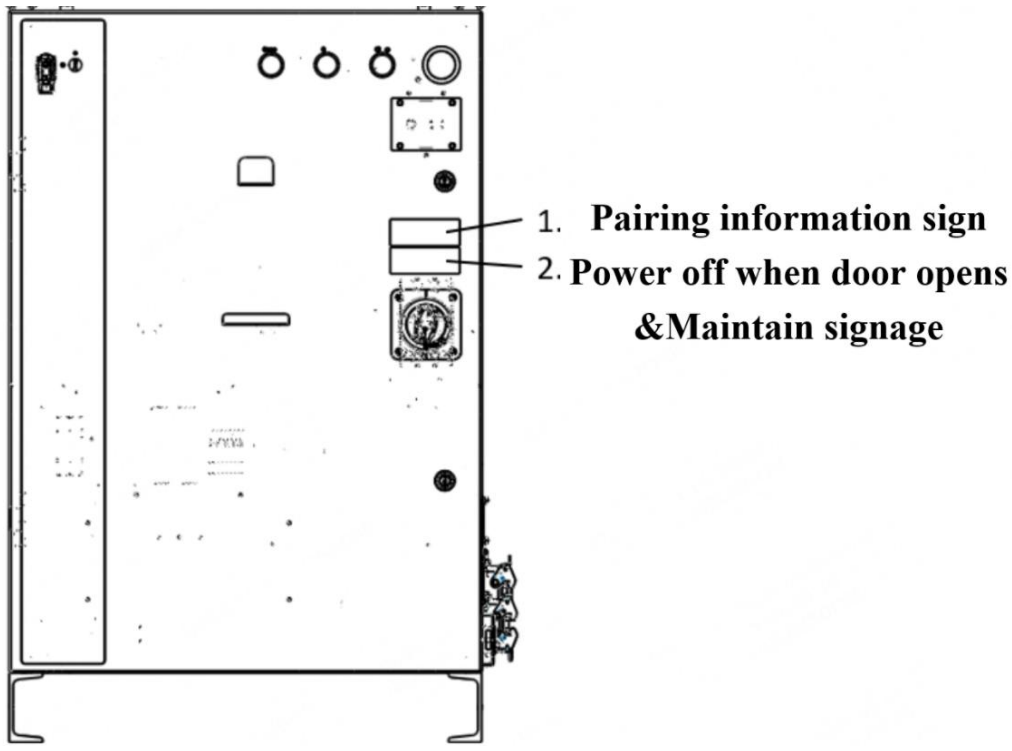
Table 1-2 RX3-A603 Control Cabinet Specification List

Name	Characteristic
Cabinet Type	Vertical high-security cabinet
pigment	gray
weight	140 kg
noise	50dB（ A）

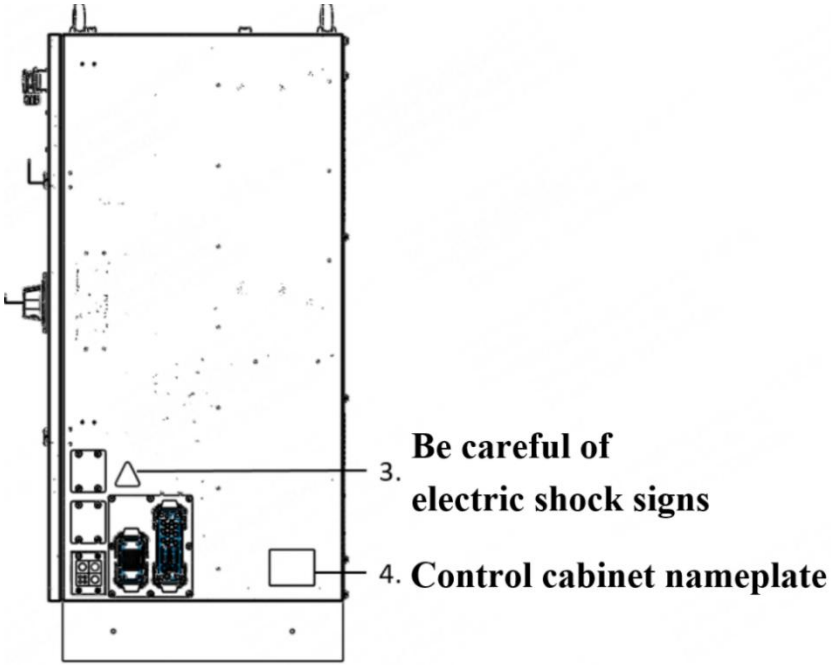
Name	Characteristic	
nominal mains voltage	Three-phase AC 38 0 V ±10%	
supply frequency	50Hz/60Hz	
full-load power	9.5 KVA	
blowing current	25 A	
Vibration operating conditions	work	transport
acceleration of vibration	0.5 g	6 g
working temperature	0℃~45℃	
Temperature rate of change	<1.1K/min	
storage temperature	-25℃~60℃	
Work environment humidity	≤80% RH	
Storage humidity	≤ 90%RH	
Front housing protection rating	IP54	
Backward enclosure protection	I P20	
height	Normal operation at an elevation of 1000 m	
	For elevations between 1000 m and 4000 m: performance rating reduced by	

1.4 Control Cabinet Labels and Meanings

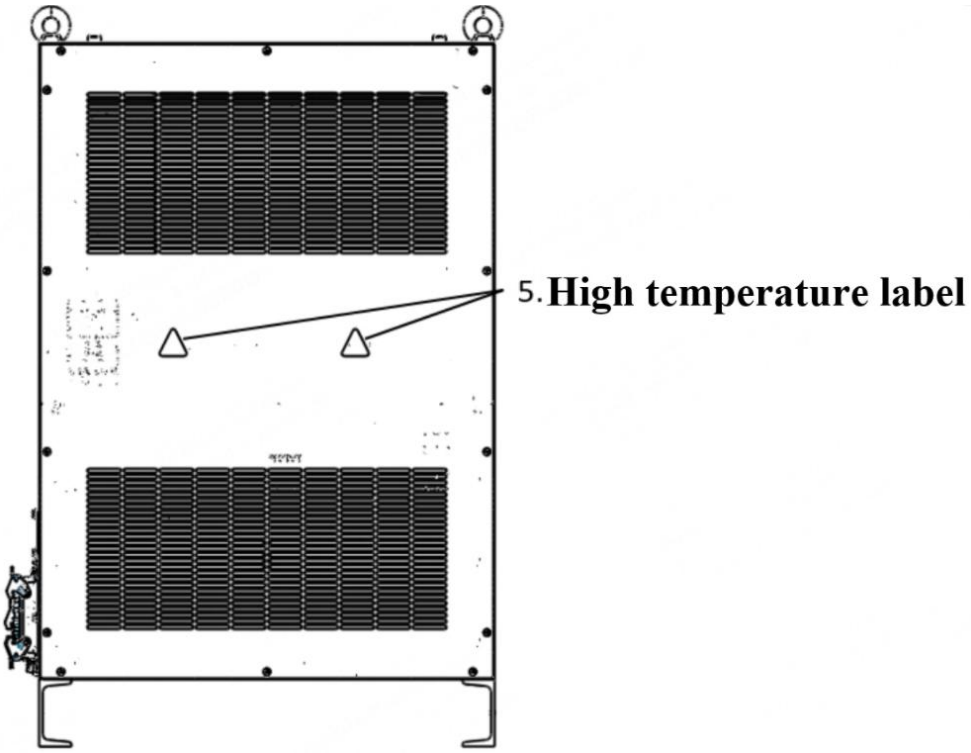
The RX3-A603 control cabinet includes five types of labels; for the specific placement of each label, please refer to Figure 1-4.



(a)



(b)



(c)

Figure 1-4: Schematic diagram of label placement within the 4-control cabinet

Pairing Information Signage

The paired information signage is shown in Figure 1-5.

Figure 1-5 Pair Information Signage

Door Opening & Power Disconnection & Maintenance Signage

The "Power Off & Maintenance" sign is shown in Figure 1-6.

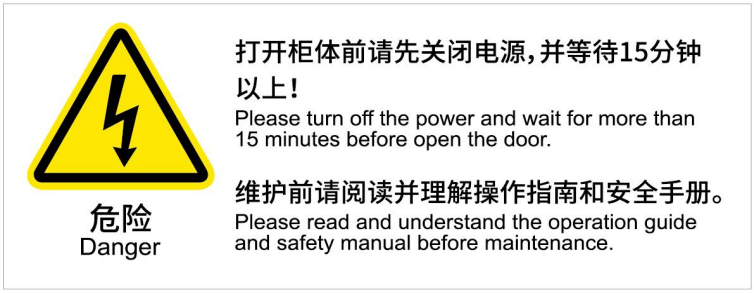


Figure 1-6 Door Power Loss & Maintenance Signage

High-Temperature Warning Sign

Areas marked with a high-temperature warning sign (Figure 1-7) may become hot; upon seeing such a sign, please exercise caution to avoid burns. If you must touch the equipment while it is hot, be sure to use protective gear, such as heat-resistant gloves, before doing so.

Figure 1-7 Pay attention to the high-temperature warning sign

Caution: Electric Shock Hazard

The "Caution: Electric Shock Risk" label is shown in Figure 1-8

Figure 1-8 "Be Careful – Electric Shock Risk" Sign

Control Cabinet Nameplate

The control cabinet nameplate is shown in Figure 1-9; it displays relevant information such as the control cabinet model number, serial number, weight, and manufacturing date (parameters are subject to the actual equipment).

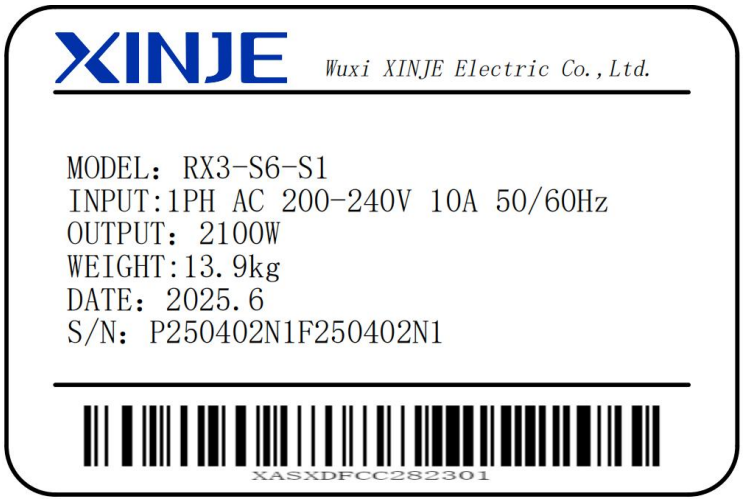


Figure 1-9 Control Cabinet Nameplate

1.5 Control Cabinet Installation Environment

- The ambient temperature range is 0°C to 4 5°C.
- The relative humidity should be between 20% and 80% RH.
- Keep dust, oil mist, and water vapor in the installation environment to a minimum.
- The environment must be free of flammable or corrosive liquids or gases.
- The equipment shall be installed at a distance from any sources of impact or vibration.
- The control cabinet should be maintained at a minimum heat dissipation distance of 20 cm from its surrounding installation environment.

1.6 Control Cabinet Operating Environment

- The control cabinet can operate normally within the temperature range of 0°C to 4 5°C, and can be stored or transported over an extended period within the temperature range of –25°C to 4 5°C. It is also capable of withstanding short-term transportation or storage at a temperature of 70°C for no more than 24 hours (with a backup battery).
- The control cabinet operates normally under relative humidity conditions ranging from 20% to 80% RH.

- The control cabinet can operate normally when the altitude is ≤ 1000 meters. For use at altitudes above 1000 meters, please consult our company.
- The control cabinet can operate normally under atmospheric pressures ranging from 86 kPa to 106 kPa.

2 RX3-A603 Control Cabinet Transportation and Handling

The top surface of the control cabinet is equipped with four M1 0 lifting screws (as shown in Figure 2-1); these can be used with four lifting rings for handling and transportation.

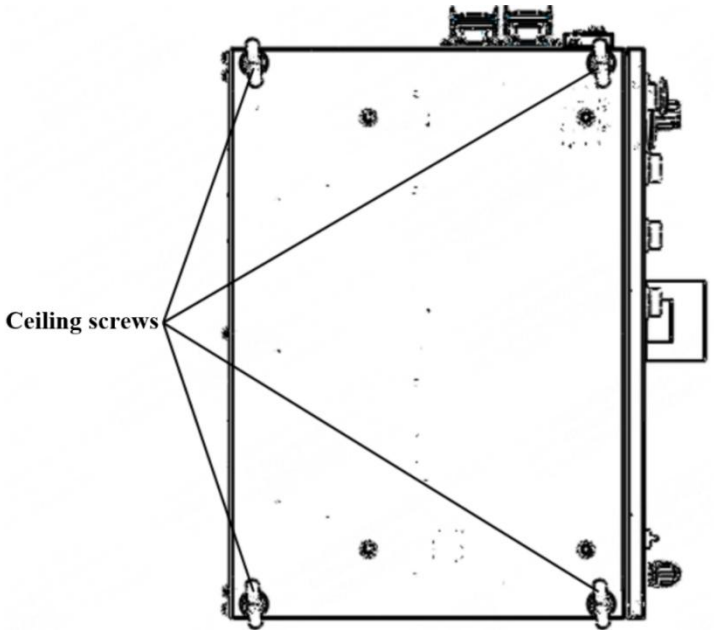


Figure 2-1: Control Cabinet Hanging Ring Handling

注意

When handling the control cabinet using a lifting ring, ensure that the lifting point is positioned along the central axis of the cabinets top surface; otherwise, the cabinet may tilt, potentially leading to collisions or other accidents.

The control cabinet housing is equipped with a forklift handling bracket; the forklift can be used for handling the cabinet as described below (see Figure 2-2).

Figure 2-2: Control Cabinet – Forklift Handling

3 RX3-A603 Control Cabinet Installation and Connection

3.1 Inspection Item

Before installing the control cabinet, the following items must be strictly adhered to:

- Installation personnel must have completed the companys relevant training and may only carry out installation work in compliance with all applicable international and local laws and regulations.
- Upon unpacking, verify that the control cabinet shows no signs of impact or damage.
- Ensure that the installation environment of the control cabinet complies with the requirements specified in Chapter 1.5 of this manual.

3.2 Installation Size

The external dimensions of the RX3-A603 control cabinet are shown in Figure 3-1.

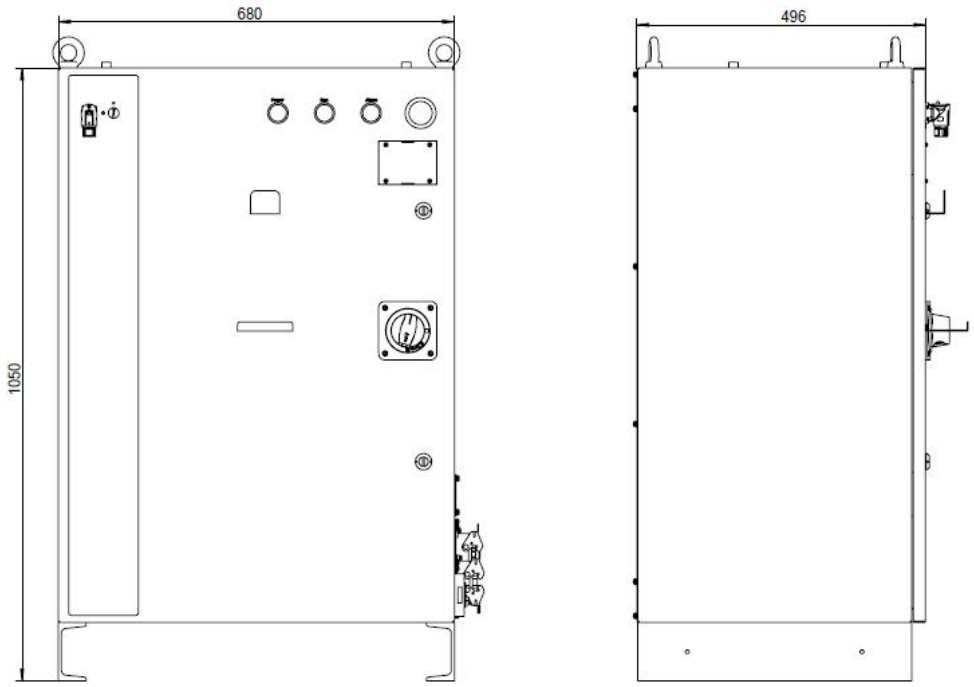


Figure 3-1: Control Cabinet Appearance

3.3 Control Cabinet Electrical Connection Definition

Control Cabinet Heavy-Duty Plug Power Cable Interface Definition

The heavy-load plug power supply interface for the RX3-A603 control cabinet is defined as shown in Figure 3-2.

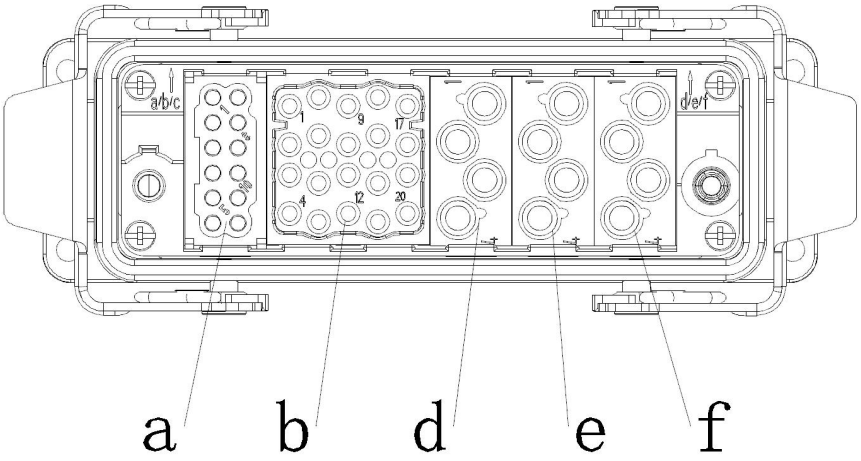


Figure 3-2:RX3-A603 Control Cabinet – Heavy-Duty Power Cable Interface

For the definition of the RX3-A603 control cabinets heavy-load plug power supply interface, please refer to Table 3-1.

Table 3-1: Heavy-Duty Plug Power Cable Interface Definition

Plug Pin Number	**Definition**	**Plug Terminal Number**	**Definition**
f-1	Axis 1 – U1	b-15	Axis 5 – W5
f-2	Axis 1 – V1	b-16	Axis 5 – PE5
f-3	Axis 1 – W 1	b-9	Axis 6 – U6
f-4	Axis 1 – PE1	b-10	Axis 6 – V6
e-1	Axis 2 – U2	b-11	Axis 6 – W6
e-2	Axis 2 – V2	b-12	Axis 6 – PE6
e-3	Axis 2 – W2	a-1	Brake Line – Axle 1: YB1+
e-4	Axis 2 – PE2	a-2	Brake Line – Axle 1 YB1-
d-1	Axis 3 – U3	a-3	Brake Line – Axis 2: YB2+
d-2	Axis 3 – V3	a-4	Brake Line – Axle 2: YB2-
d-3	Axis 3 – W3	a-5	Brake Line – Axis 3 YB3+
d-4	Axis 3 – PE3	a-6	Brake Line – Axis 3 YB3-
b-17	Axis 4 – U4	a-7	Brake Line – Axis 4 YB4+
b-18	Axis 4 – V4	a-8	Brake Line – Axis 4 YB4-
b-19	Axis 4 – W4	a-9	Brake Line – Axis 5 YB5+
b-20	Axis 4 – PE4	a-10	Brake Line – Axis 5 YB5-
b-13	Axis 5 – U5	a-11	Brake Line – Axis 6 YB6+
b-14	Axis 5 – V5	a-12	Brake Line – Axis 6 YB6-

Control Cabinet Heavy Load (Encoder) Interface Definition

The RX3-A603 control cabinets heavy-load (encoder) interface definition is shown in Figure 3-3.

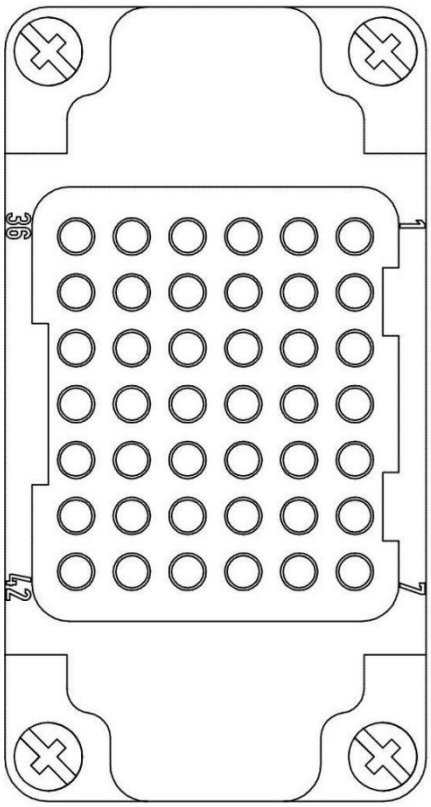


Figure 3-3RX3-A603 Control Cabinet Heavy Load (Encoder) Interface Definition

For details regarding the RX3-A603 control cabinet encoder interface definition, please refer to Table 3-2.

Table 3-2: Encoder Line Interface Definition

Signal Name	Axis Number	Stitch Number	Signal Name	Axis Number	Stitch Number
PS-	1-axis	1	PS-	4-axis	22
PS+	1-axis	2	PS+	4-axis	23
E0V	1-axis	3	E0V	4-axis	24
E5V	1-axis	4	E5V	4-axis	25
PS-	2-axis	8	PS-	5-axis	29
PS+	2-axis	9	PS+	5-axis	30
E0V	2-axis	10	E0V	5-axis	31
E5V	2-axis	11	E5V	5-axis	32
PS-	3-axis	15	PS-	6-axis	36
PS+	3-axis	16	PS+	6-axis	37
E0V	3-axis	17	E0V	6-axis	38
E5V	3-axis	18	E5V	6-axis	39

Encoder Wire Specifications and Connector Dimensions

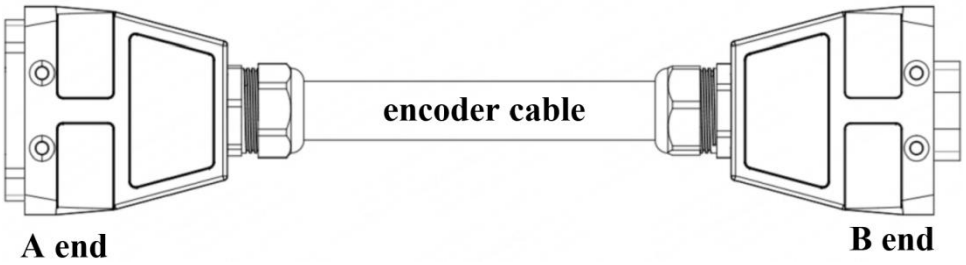


Figure 3-4: RX3-A603 Encoder Wiring Diagram

Table 3-3: RX3-A603 Encoder Cable Specifications Table

Name	A-end Connection Method	B-end Connectivity Model	Wire Diameter/Mm	Minimum Bending Radius
RX3-A603 Encoder Cable	Snap-fit connection	Snap-fit connection	16.7	8D

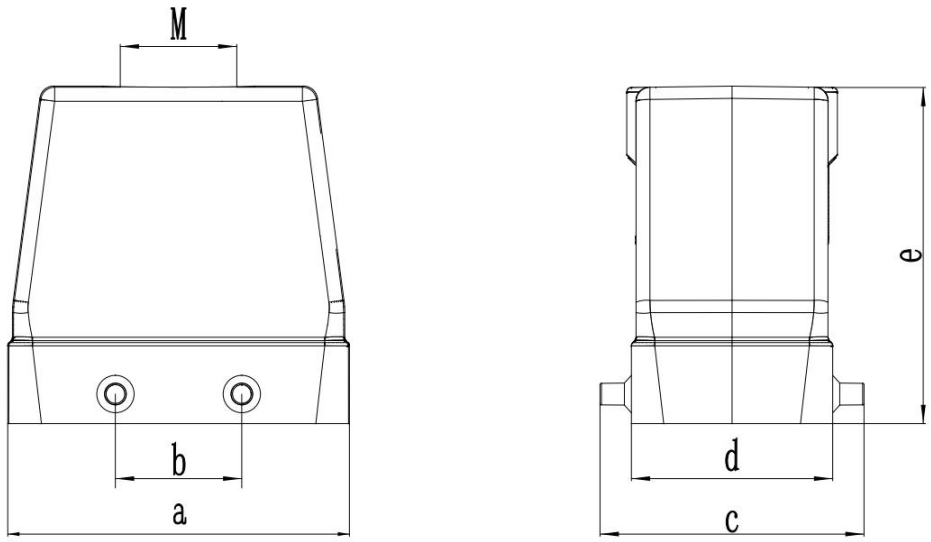


Figure 3-5: Dimensions of the 5-encoder line overload joint

Table 3-4: Encoder Linear Overload Joint Dimension Table

Control Cabinet	a	b	c	d	e	M
RX3-A603	73	27	56.4	43	72	M25

Power Cable Specifications and Connector Dimensions

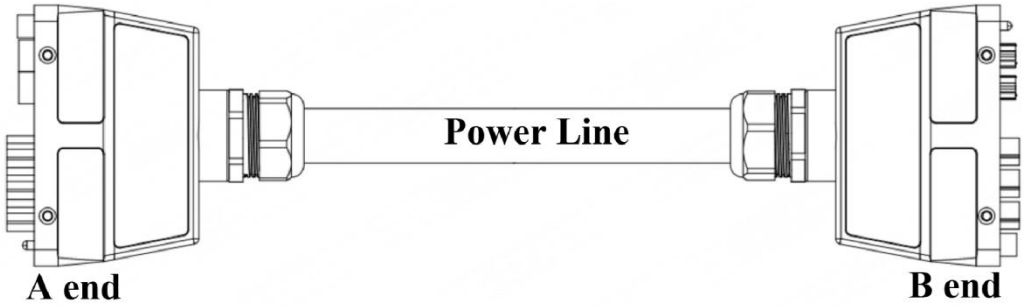


Figure 3-6: Schematic diagram of the 6RX3-A603 power line

Table 3-5 ARC4-165 Power Line Specifications Table

Name	A-end Connection Method	B-end Connectivity Model	Wire Diameter/ 1 mm	Minimum Bending Radius
RX3-A603 Power Line	Snap-fit connection	Snap-fit connection	26.4	6D

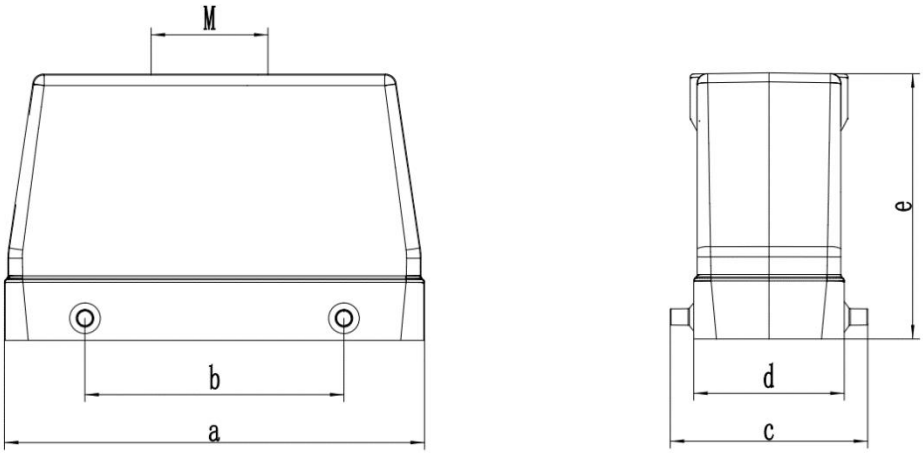


Figure 3-7: Dimension of the high-load connection joint for power lines

Table 3-6: Power Line Heavy-Load Joint Dimension Table

Control Cabinet	a	b	c	d	e	M
RX3-A603	120	74	56.4	43	76	M40

Control Cabinet Input Power Supply Cable Specifications

The 4-core power cable extends through the cabinet side to connect the control cabinet to the power supply; the exit point is shown in Figure 3-8; the two power cable specifications are listed in Table 3-7.

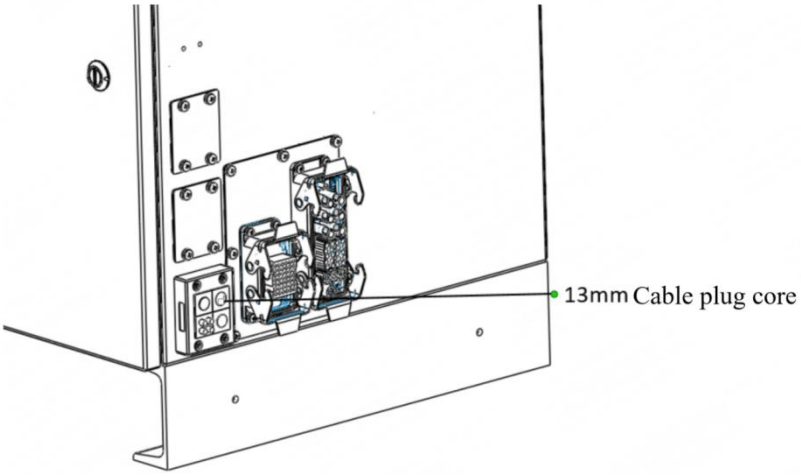


Figure 3-8: Power supply cable inlet schematic diagram

Table 3-7 Power Cable Specifications

Name	P / N	Specifications	Length
power line	/	4x4.0mm²	6 meters

Control Cabinet Input Power Supply Definition

- Nominal voltage: Three-phase AC 380 V.
- Nominal frequency: 50 Hz.
- Full-load power: 9.5 kW.
- Full-load current: 25 A.

Control Cabinet Input Power Supply Requirements

- Voltage: The steady-state voltage value shall be between 0.9 and 1.1 times the nominal voltage.
- Frequency: 0.99–1.01 times the nominal frequency (continuous operation); 0.98–1.02 times the nominal frequency (short-term operation).

Control Cabinet Protection Switch

- The control cabinets protective switch can be either a circuit breaker or a residual current operated circuit breaker (RCCB); the rated current can be selected as 32 A or 40 A; for the instantaneous trip curve, it is recommended to use a circuit breaker with a D-type curve.
- When a residual current operated circuit breaker (RCCB) is selected as the protective switch, it is required that each control cabinet be equipped with one RCCB to reduce the occurrence of leakage protection trips. It is recommended to use electromagnetic RCCBs; for RCCBs with an instantaneous current type of AC, the rated residual operating current should be set to 100 mA.

4 RX3-A603 Control Cabinet – Safe Operation

4.1 Control Cabinet Grounding

The RX3-A603 control cabinet must have a reliable grounding connection; the primary purposes of this grounding connection are:

- Grounding ensures that all unit circuits within the RX3-A603 control cabinet share a common reference zero potential, eliminating any potential difference between the grounds of the individual circuits and thereby guaranteeing the stable operation of the system.
- The reliable grounding of the RX3-A603 control cabinet prevents interference from external electromagnetic fields. The cabinets grounding provides a discharge path for transient interference, allowing the large amount of charge accumulated on the cabinet due to electrostatic induction to be discharged through the earth.
- It ensures a safe working environment. In the event of electromagnetic induction caused by direct lightning strikes, it prevents damage to electronic equipment; when the input voltage of the industrial-frequency AC power supply comes into direct contact with the machine casing due to poor insulation or other reasons, it prevents operators from receiving electric shocks.

For the RX3-A603 control cabinet, the PE terminal should be grounded via the power supply cable inlet; it is essential to ensure that the input terminal of the cable connected to the control cabinet has a reliable ground connection. Additionally, the control cabinet body is equipped with grounding terminals; the appropriate M8 grounding terminals (four grounding points are provided on the two cabinet bases shown in Figure 4-1; the grounding point may be selected based on the actual installation location) should be connected using a 4 mm cable.The grounding conductor (at or above the specified level) shall be connected to a reliable grounding point.

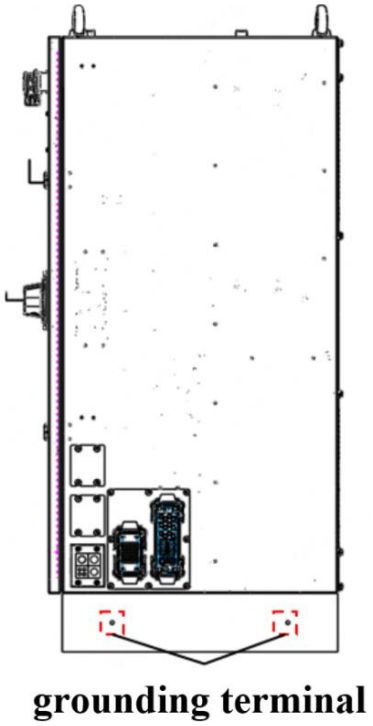


Figure 4-1 Control Cabinet Grounding Point

4.2 Robot System Safety

The robotic system referred to in this document (including the robotic manipulator, control cabinet, teach pendant, and all associated software and hardware) can only operate correctly when peripheral devices and systems are properly configured. These peripheral devices and systems must include the safety fencing, external emergency stop device, and external safety input device required for the safe operation of the robot.

The RX3-A603 control cabinets Safety IO interface incorporates the signal definitions for the aforementioned safety devices; the control cabinet can only operate normally when the Safety IO safety signal has a valid electrical level; otherwise, the control cabinet will issue an alarm. The connection scheme for the Safety IO interface safety signals is shown in Figure 5-2; the names and meanings of the pin numbers in this figure are detailed in Table 5-1.

The safety input signals include the safety fence signal, the external emergency stop input signal, and the external safety input signal; refer to Table 4-1 for details.

Table 4-1: Safe Input Signal Specifications

Signal Name	**Explain**
Safety fence signal	Security light curtain signal for safety fencing Supports PNP-type sensors; requires an external DC24V power supply.
External emergency stop input signal	Emergency stop signal provided to external systems for collaborative operation with robots. When the external system emergency stop button is pressed, the external emergency stop signal on the control cabinet becomes effective; the robot then stops according to STOP0. The external emergency stop output signal requires two channels; one channel serves as a safety chain backup, while the external emergency stop input signal is high-level effective.
External security input signal	This refers primarily to the safety (fault) signals from external systems that collaborate with the robot to perform tasks; the control cabinet will determine whether the robot should be stopped based on the status of the external system. The external safety input signal is high-level effective.

4.3 Robot Stop Mode

According to the definition of the "Stop Function" as stated in Section 9.2.2 of GB5226.1-2008 "Mechanical and Electrical Equipment – Part 1: General Technical Requirements," and taking into account the specific robot design, three stop modes are defined; the corresponding descriptions are provided in Table 4-2:

Table 4-2: Stop Modes and Corresponding Descriptions

Type	**Explain**	
STOP0	Case1	The RC6F sends an alarm signal to the driver via an internal hardwired connection; the driver then executes an immediate stop operation without maintaining the

Type	Explain	
		trajectory. Subsequently, the RC6Fs delayed control mechanism uses Silicon Controlled Rectifier Enable and cut off the power supply – this constitutes an uncontrollable stop operation.
	Case2	The drive experiences an uncontrollable fault, triggering either free-stop or brake-stop operation; this constitutes an uncontrollable stop.
	Case3	When an unexpected external power failure occurs, the drive is unable to execute an immediate stop command; instead, the brake is engaged to halt the drive – this constitutes an uncontrollable stop.
STOP1	The robot stops quickly while maintaining its current planned trajectory; upon stopping, the driver is commanded to execute `servo_off`, and the power supply is 切断 via a thyristor – this constitutes a controlled stop.	
STOP2	The robot should stop quickly while maintaining the current planned path; upon stopping, the servo system should not be turned off nor should the power supply be disconnected – this constitutes a controllable stop.	

5 RX3-A603 Control Cabinet External Interface User Manual

5.1 Control Cabinet Indicator Light Guide

The RX3-A603 control cabinet features three indicator lights (see Figure 5-1), where:

- The white power indicator light on the control cabinet turns on when the control cabinet is started.
- The green power indicator light on the drive unit illuminates when the drive unit is powered on.
- System Abnormality Red Indicator Light: Turns on when there is an abnormality in the control system.

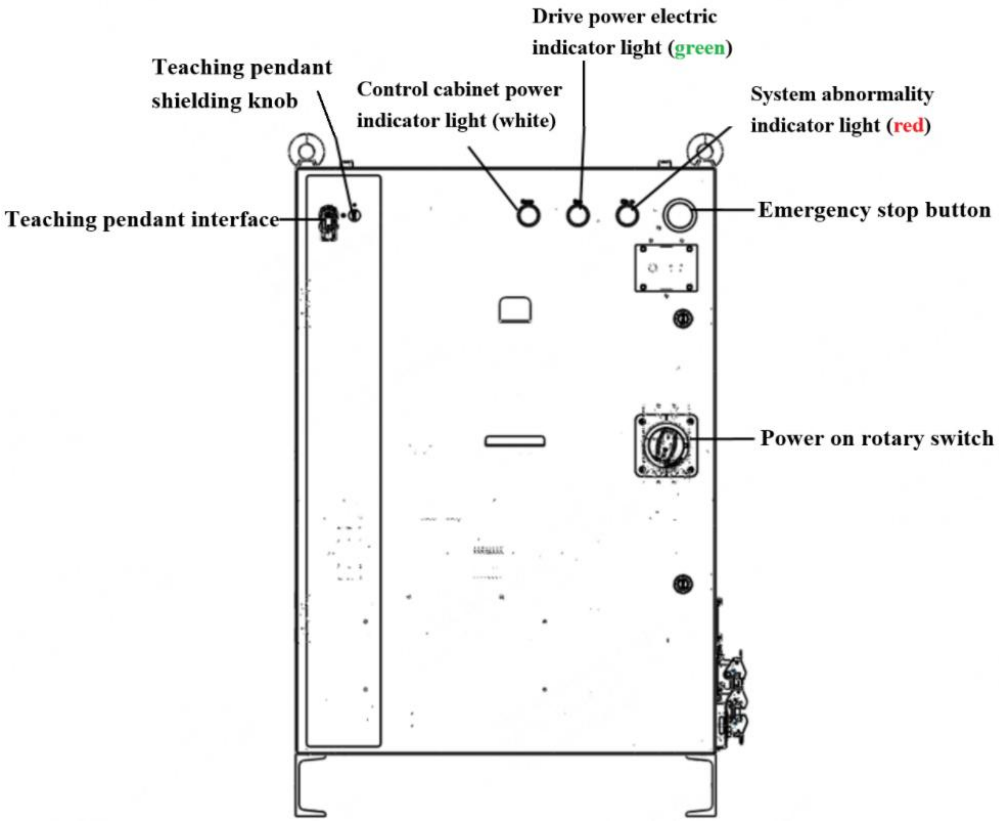


Figure 5-1 Control Cabinet Indicator Lights

5.2 External Switch Functions of The Control Cabinet

Power-On Rotary Switch

The rotary switch on the control cabinet (see Figure 5-1 for its exact location) is used to turn the control cabinets power supply on or off; the text on this rotary switch (refer to Figure 5-2) is explained as follows:

- ON-set up an electric circuit.
- OFF-interrupt.
- OPENRESET – Open door.

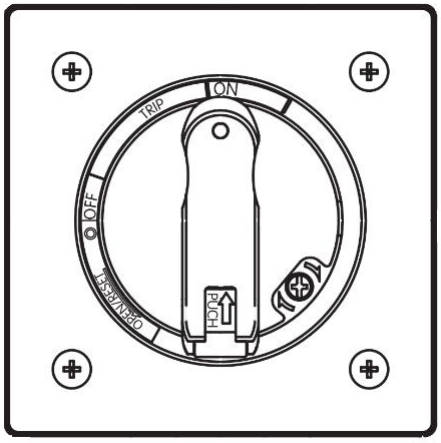


Figure 5-2: Power-On Rotary Switch

Note

Before opening the control cabinet door, always set the switch to the "OPENRESET" position; otherwise, the rotary switch and the circuit breaker may be damaged!

Scram Button

Press the Emergency Stop button to immediately halt the robot (see Figure 5-1). When it is necessary to release the safety state, first rotate the Emergency Stop button upward in the direction indicated on the button.

Note

Do not use the emergency stop button for pausing operations; doing so may damage the operating machine.

5.3 Internal Switch Functions in The Control Cabinet

Teaching Pendant Shielding Knob

RX3-A603 control cabinet teach pendants shielding knob – the knob has two positions: 0 and 1 (see Figure 5-1):

- When the knob is set to Position 1, it indicates that the teaching pendant must be connected for normal operation; otherwise, the control cabinet will trigger an alarm.
- When the knob is set to position 0, it indicates that the teaching pendant can be removed; at this point, the robotic system can continue operating.

When using the teaching pendants shielding knob, first set the knob to position 1 and connect the teaching pendant; then load the control program via the teaching pendant. For a working system where the control commands are pre-defined, the teaching pendant is not required for operation at this time; instead, set the knob to position 0, disconnect the teaching pendant, and control the robotic system using external control knobs or other means.

Note

For systems that still need to operate after removing the teaching pendant, ensure that an external control device is connected to the control cabinet before removing it.

Manually Release The Brake Button

The RX3-A603 control cabinet features a manual brake release function.

The RX3-A603 control cabinet features one manual brake release button; its usage is described below;

The manual brake release button is located within the manual brake release box on the right side of the control cabinet panel; after removing the four screws from the cover plate of the brake release box, you will find the brake release button shown in Figure 5-3.

Follow the manual release brake operation instructions on the back of the brake release cover plate to perform the operation:

Step 1. To remove the brake connector from the shaft whose brake needs to be released (refer to Figure 5-4), use a flat-head screwdriver to pull the brake cable out of the connector; (only one shafts brake should be released at a time).

Step 2. Insert the removed loosen brake wire into pins 9 and 10 of the J3 interface on the IAB interface circuit board, as shown in Figure 5-5;

Step 3. Press and hold the brake button, then manually drag the corresponding shaft of the main unit to the desired position.

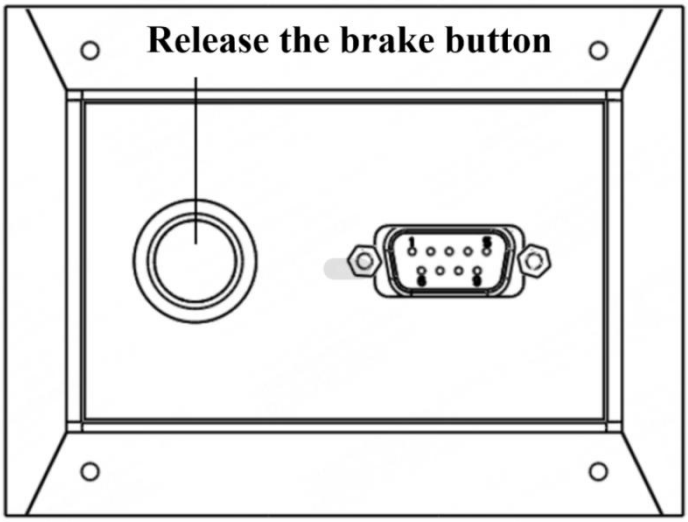


Figure 5-3: Manual brake release button

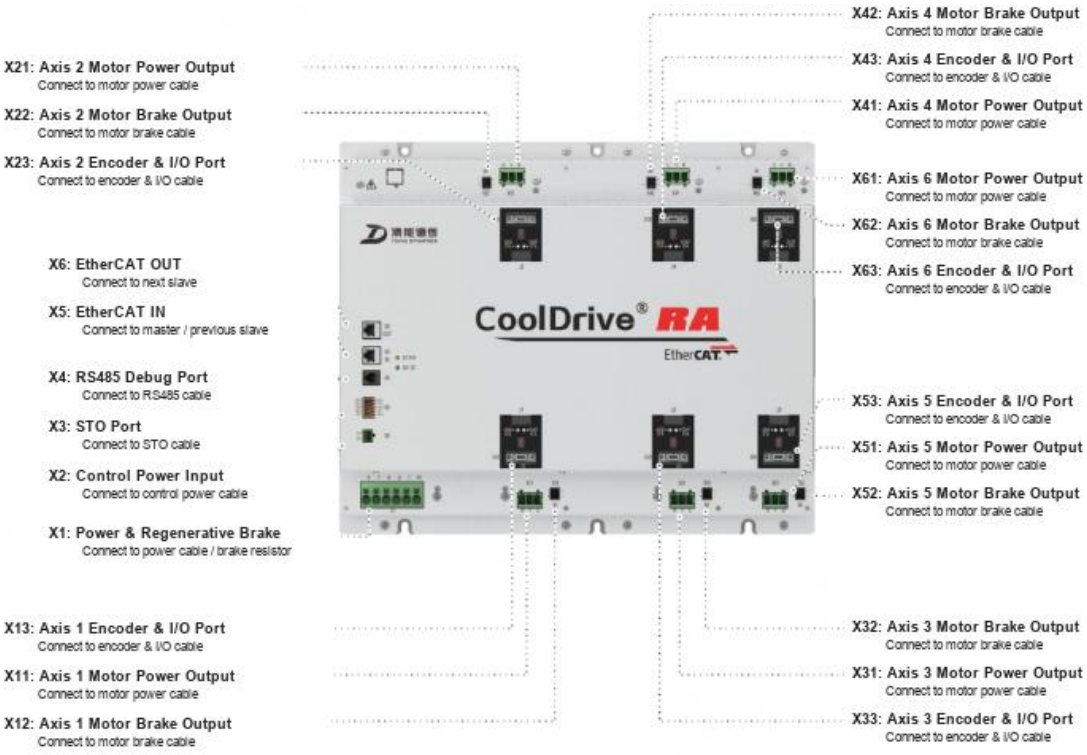


Figure 5-4: Driver Interface

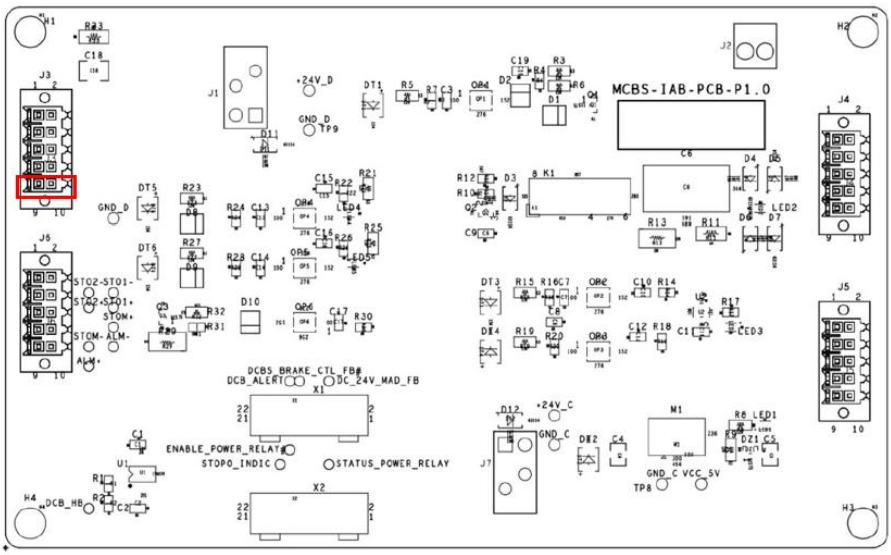


Figure 5-5：IAB Interface PCB

> **Warning**
>
> When using the manual brake release function, please be aware that the corresponding shaft may suddenly drop under the influence of gravity; therefore, it is essential to anticipate the need for auxiliary support and to ensure the safety of personnel in advance.

5.4 Control Cabinet External Interface

The control cabinet features an instructors console installation interface located in the upper-left corner of the front door (see Figure 5-1). The current version has been updated to support RT860 and RT865

instructors consoles; the cabinet door interface is no longer available – the RT860 and RT865 instructors console interfaces are located above the power supply cable.

The RT860 and RT865 teach pendant interfaces are shown in Figure 5-6; the pin numbering for the connector interfaces is detailed in Table 5-1.

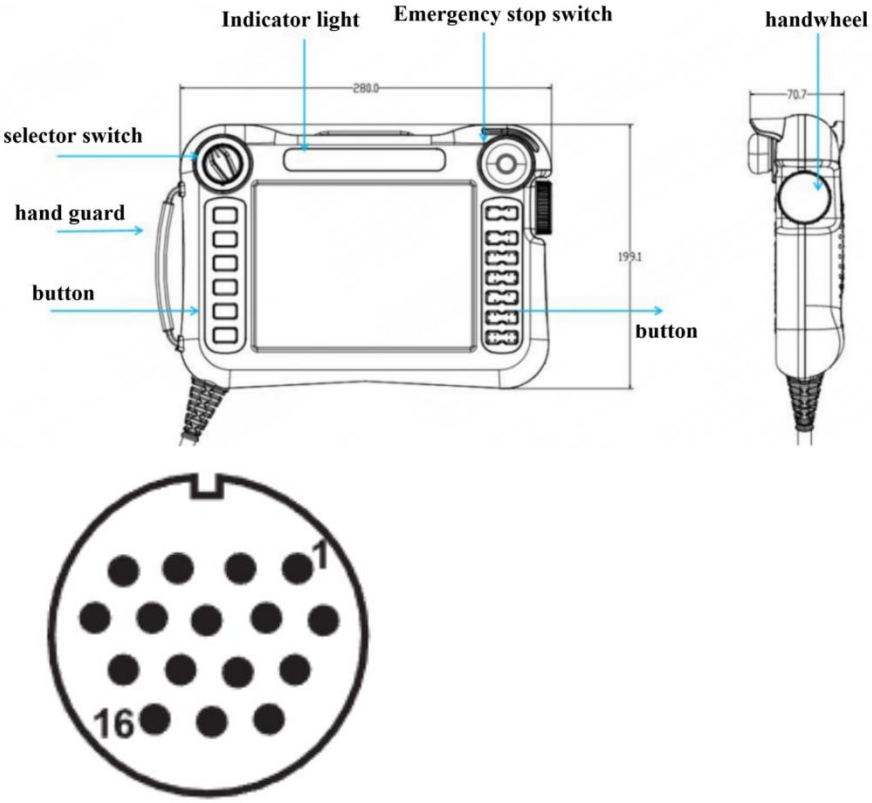


Figure 5-6: Teaching Pendant Interface

Table 5-1: Teaching Pendant Connector Interface Pin Number Definition

Stitch Number	Signal Name	Stitch Number	Signal Name
1	EtherNet TX+	9	RS422R+/RS485A/Emergency Stop Normally Open Contact A
2	EtherNet TX-	10	Power supply: 24V
3	EtherNet RX+	12	Power supply: 24V
4	EtherNet RX-	13	Power supply: 0 V
5	Enable Public Terminal	14	Power supply: 0 V
6	RS422+T-/CAN_L/ Enable Switch – Normally Open Contact	15	Emergency Stop – Normally Closed Point 2
7	RS422+T-/CAN_L/ Enable Switch – Normally Closed Terminal	1 6	Emergency Stop – Normally Closed Point 1
8	RS422R+/RS485A/Emergency Stop Normally Open Contact B		

5.5 Control Cabinet – 24 V Power Supply Module

Three 24 V switching power supplies are installed beneath the internal fan of the control cabinet; these supplies are respectively used for the brake power supply, the control cabinet power supply, and the 24 V backup power supply for optional accessories (or other customer-specific requirements) (see Figure 5-7). Among these, a 150 W switching power supply can be provided for powering optional accessories within the cabinet; the interface specifications are shown in Figure 5-8. When power is required for this switching power supply, it can be connected via U-shaped terminals to supply 24 V power to the optional accessories.

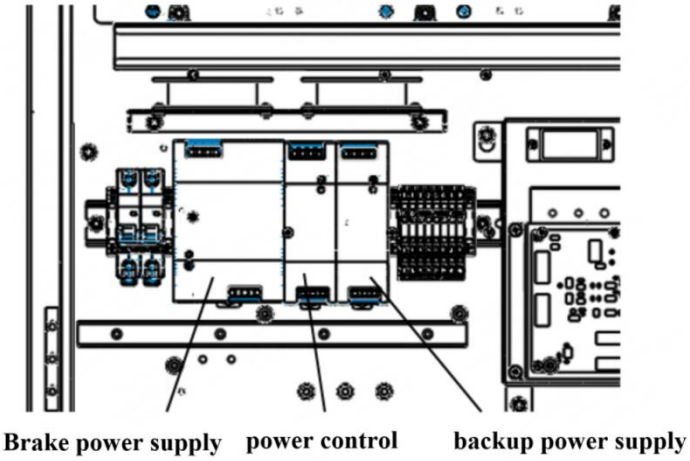
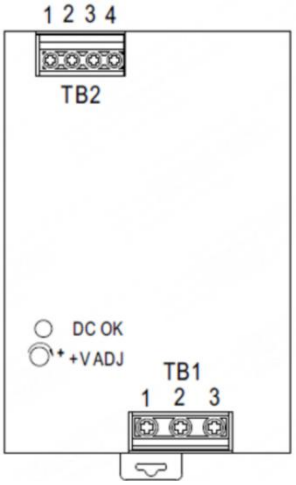


Figure 5-7: Switching Power Supply Location Diagram



TB2 Terminal pin position definition

Pin number	Pin Function
1,2	DC OUTPUT -V
3,4	DC OUTPUT+V

Figure 5-8: Switching Power Supply Interface Definition

6 RX3-A603 Control Cabinet Hardware Module External Interface Specifications

The various hardware modules of the RX3-A603 control cabinet are installed inside the cabinet (see Figures 1-2 for positioning references), providing external interfaces for the control cabinet section; external cables are introduced into the control cabinet via a cable introduction module, as shown in Figure 6-1.

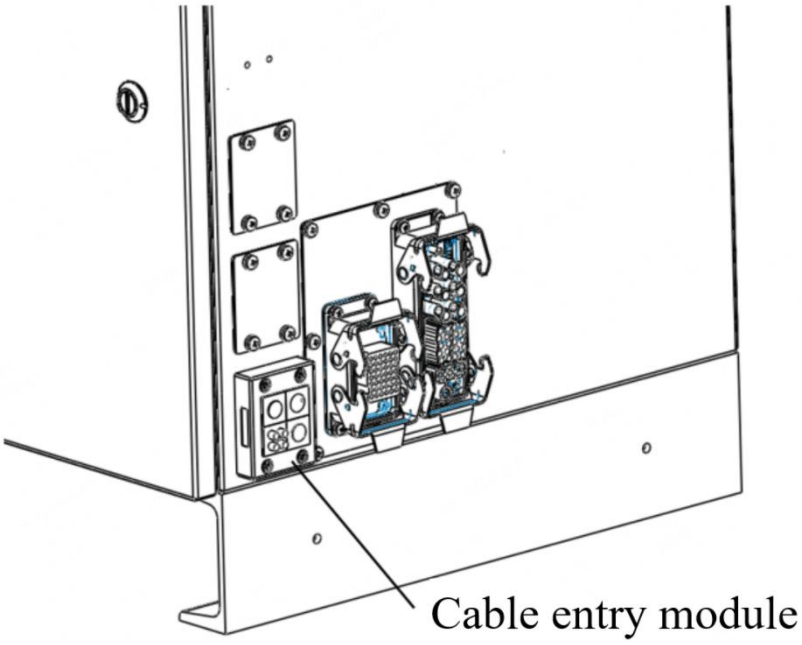
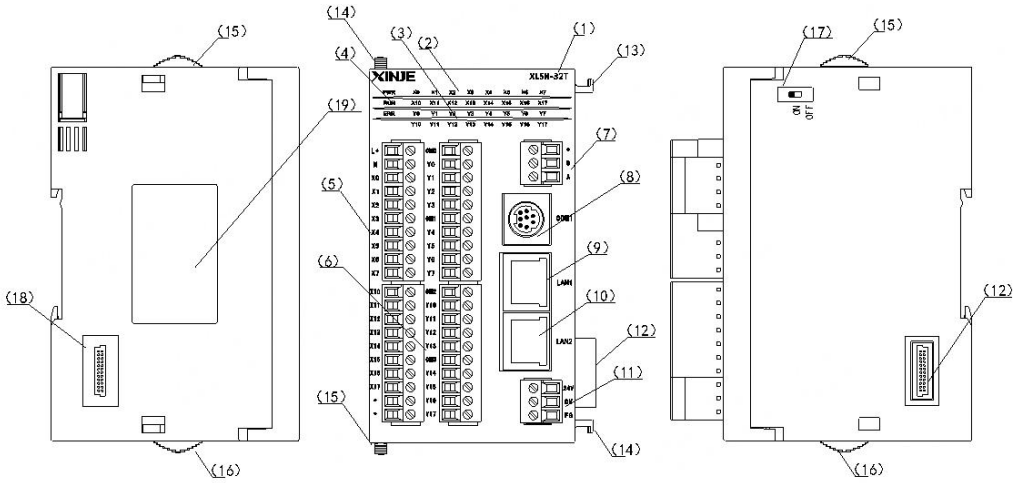


Figure 6-1: Cable Introduction Module Schematic Diagram

When the control cabinet is open (as shown in Figures 1-2), when viewed from bottom to top, the interfaces on the RC6F main control circuit are depicted in Figure 6-2; the external EtherCAT network interface is provided directly by the Driver X6 interface, as shown in Figure 6-3.



The names of each part are as follows:

(1) PLC body model	(9) Communication port 1 (RJ45)
(2) Input labels and indicator lights	(10) Communication port 2 (CANopen)
(3) Output labels and indicator lights	(11) Power supply connection terminal
(4) System indicator light	(12) Right expansion module access port
PWR: Power indicator light	(13) Fixed module hook (top)
RUN: Running indicator light	(14) Fixed module hook (bottom)
ERR: Error indicator light	(15) Sliding lock buckle (top)
(5) Input terminal	(16) Sliding lock buckle (bottom)
(6) Output terminal	(17) Empty
(7) RS485 port (COM2)	(18) Left extended ED module access port (COM3)
(8) RS232 port (COM1)	(19) Product label

Figure 6-2: Schematic diagram of the RC6F interface

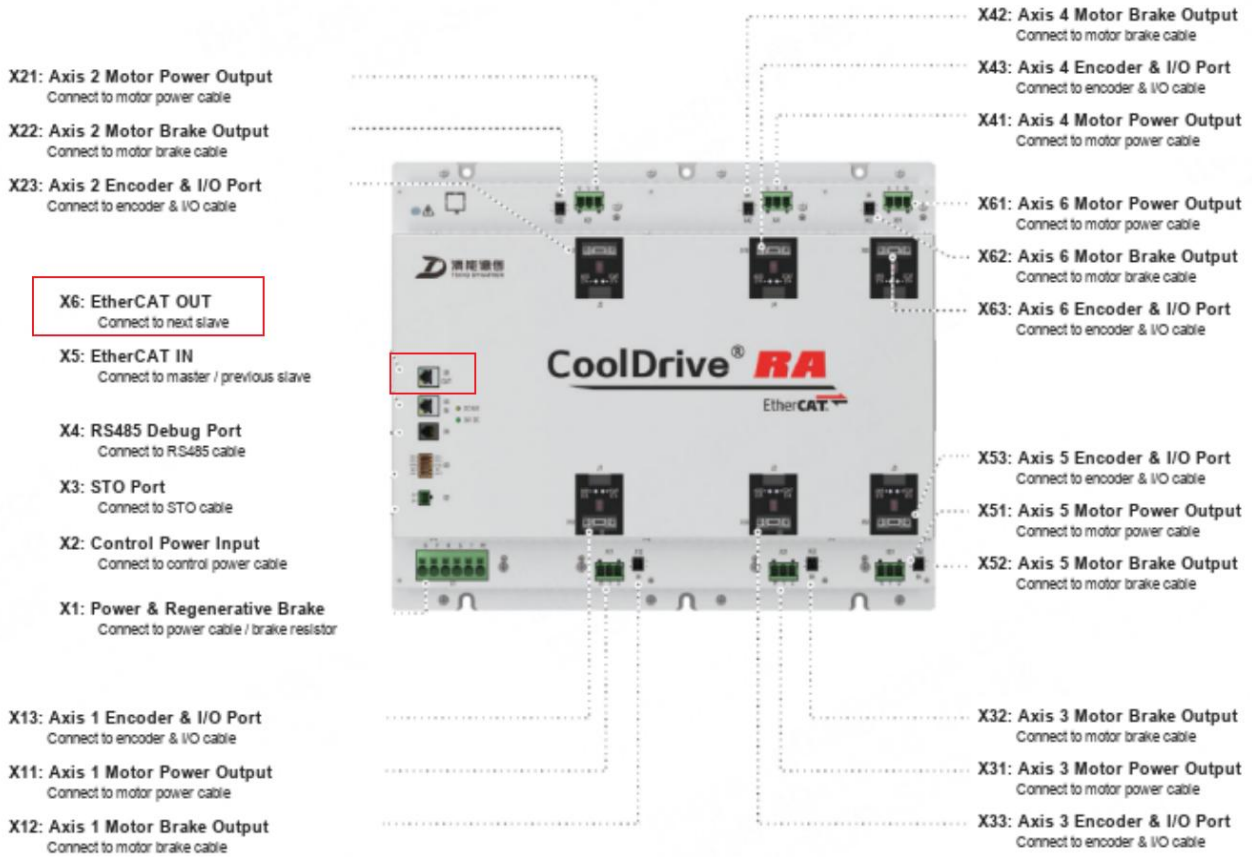


Figure 6-3: Schematic diagram of the expanded EtherCAT interface

6.1 User DI and DO Interfaces

The RX3 series control cabinet provides users with 16 DI channels and one common input terminal interface. The L+24V_ and M0V_ terminals of this power supply interface are exclusively intended for DI function testing only; they should not be used for power output exceeding 0.5 W, as doing so may cause abnormal or failed IO functionality.

When using the DI interface, an external power supply must be used.

"DI-1", "DI-2", "DO-1" and "DO-2" represent user I/O ports.

When using User IO, a 24 V DC power supply must be provided to the User IO terminal block.

1) DI-1 and DI-2 input wiring

- NPN Input Wiring Example

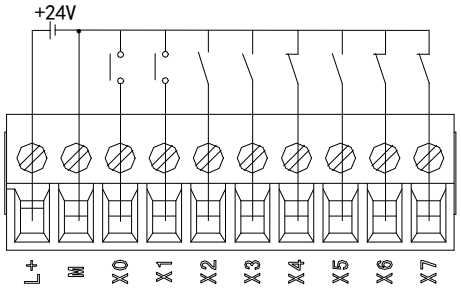
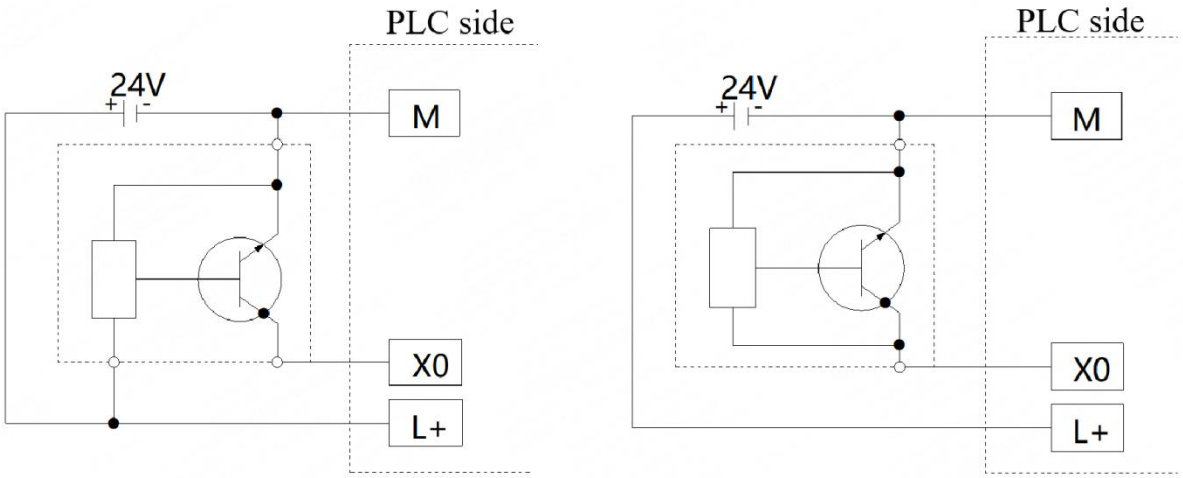


Figure 6-4: Example of a switch button wiring diagram



Three-wire system (NPN type) proximity switch wiring diagram example（Left image）;
Two-wire system (normally open or normally closed) proximity switch wiring diagram example（the right figure）

Figure 6-5: Example of an NPN wiring diagram

- PNP Input Wiring Example

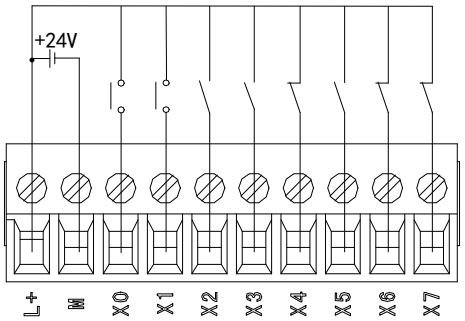
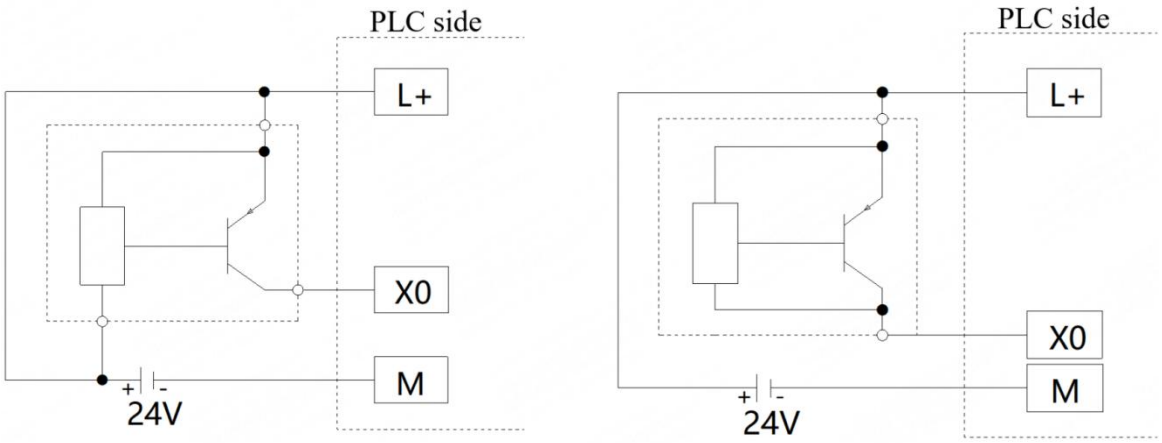


Figure 6-6: Example of a switch button wiring diagram



Three-wire system (PNP type) proximity switch wiring diagram example（Left image）;

Two-wire system (normally open or normally closed) proximity switch wiring diagram example（the right figure）

Figure 6-7: PNP wiring example

2) DO-1 and DO-2 output terminal wiring

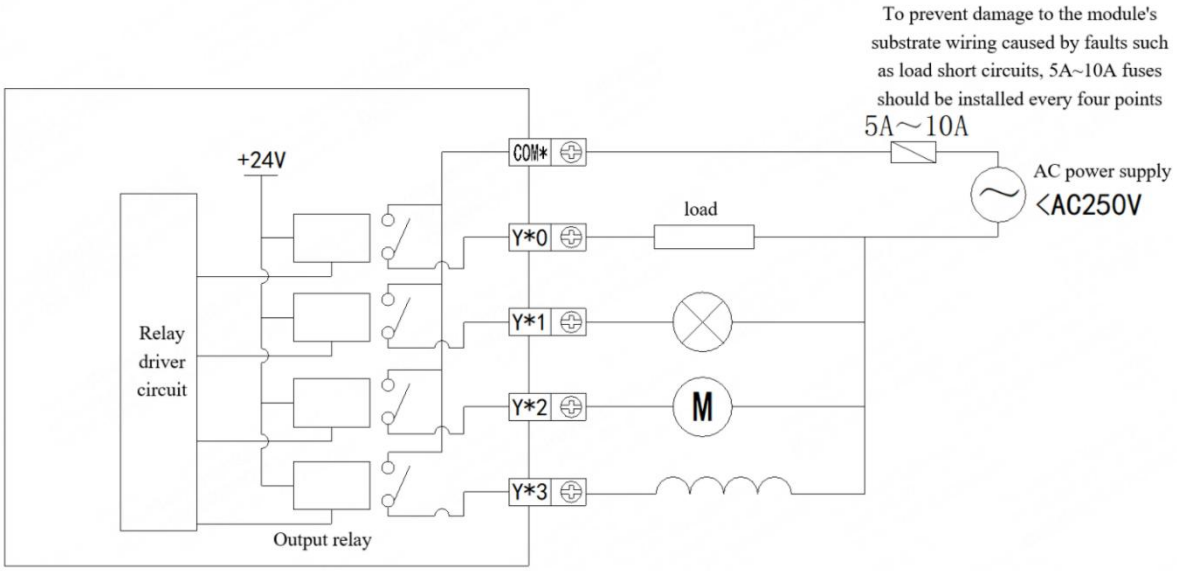


Figure 6-8 Relay-Type Output Wiring Diagram

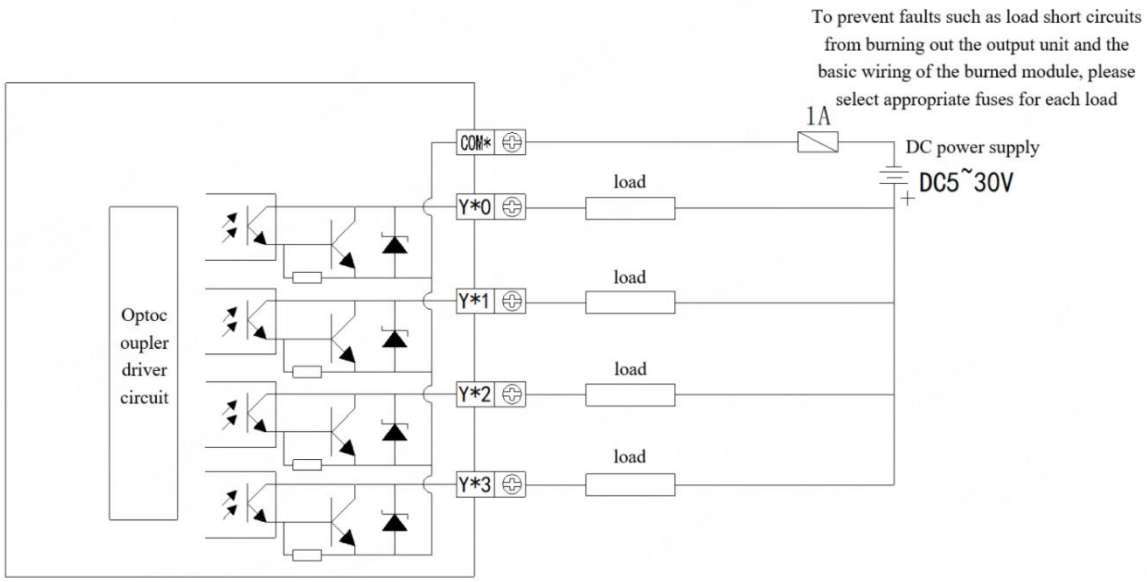


Figure 6-9: Transistor-type output wiring diagram

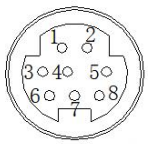
6.2 User RS232 Serial Interface

The RX3 series control cabinet features an RS232 communication interface provided for users; this RS232 interface utilizes plug-and-play terminal connectors.

For the RS232 interface wiring diagram and pin labeling diagram, refer to Figure 6-10.

RS232 serial port (COM1) supports two communication modes: MODBUS and X-NET. It can be used to connect computer programming software and PLC, as well as to connect touch screens and communicate with some instruments and meters

The pin diagram of communication port COM1 is as follows:

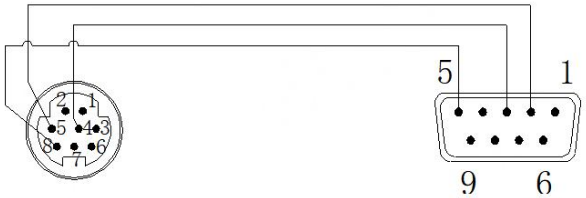


4: RxD
5: TxD
8: GND

Mini Din 8-core plug-in (holes)

download program via RS232 port must use XINJE DVP cable.

Program cables are as below:



Mini Din 8-pin (pins) DB9-pin (holes)

Note: above diagram is for DVP cable. If it is XVP cable, please connect pin1 of Mini Din8 and pin7 of DB9 based on above diagram.

Figure 6-10: RS232 Interface Pin Configuration Diagram

6.3 PLC – RS485 Interface

The MF-RS485 interface on the RX3 series control cabinet is an external expansion interface used to connect to the PLC master station; the RS485 interface features plug-and-play terminal connectors.

The PLC-RS485 interface wiring schematic and pin labeling diagram are shown in Figure 6-11; the cable definition reference table is provided in Table 6-6.

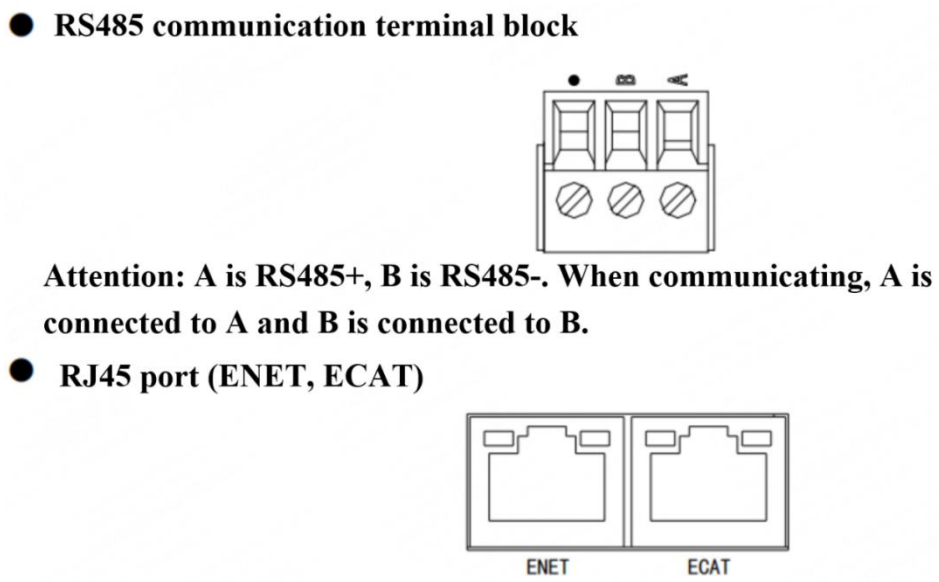


Figure 6-11: PLC-RS485 Interface Pin Configuration Diagram

Table 6-6: PLC-RS485 Interface Definition List

Interface	Pin	Cable Definition
PLC-RS485 interface	·	RS485 GND
	B	RS485-
	A	RS485+

6.4 User Ethernet Port

The RX3-A603 control cabinet provides the user with a switch featuring two user Ethernet ports; these interfaces are used to connect industrial Ethernet networks and sensors that communicate over Ethernet.

The interface diagram for the users Ethernet port is shown in Figure 6-2.

6.5 User EtherCAT Network Port

The RX3-A603 control cabinet is equipped with one reserved EtherCAT interface, which serves as an expansion interface for external axes as well as an EtherCAT protocol conversion port. For the users EtherCAT network port interface diagram, refer to Figure 6-3.

The external shaft extension configuration is as follows: the external shaft driver is installed externally; the control cabinet does not provide power supply for the external shaft motor or the external shaft driver, nor does it provide power supply for the external shaft brake; the external shaft and the control cabinet communicate via an EtherCAT bus; the external shaft drivers alarm can be connected to the control cabinet via a Safety I/O interface; the control cabinet provides two Safety I/O connections.

7 RX3-A603 Control Cabinet Maintenance and Fault Troubleshooting

7.1 Routine Maintenance Items and Cycles

The RX3-A603 control cabinets multi-axis drive debugging interface is located inside the brake-release box on the rear front door of the control cabinet. To access this interface, simply unscrew the four screws on the brake-release box cover plate; the debugging interface will then be visible (refer to Figure 7-1). When debugging the multi-axis drive parameters, use an RS422-to-USB cable to connect to the interface shown in the figure.

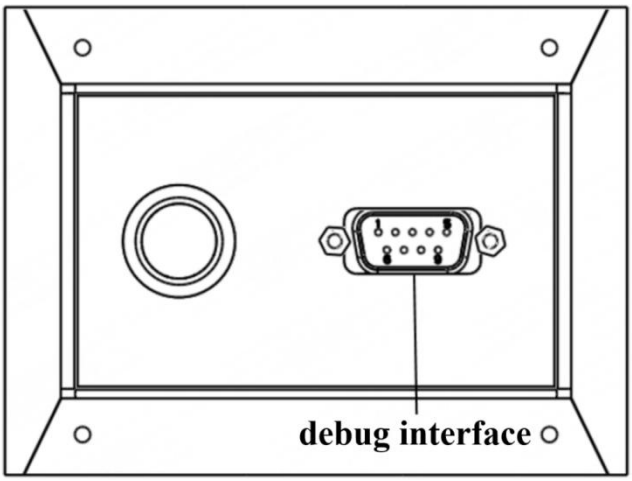


Figure 7-1 Control Cabinet Multi-Axis Drive Debugging Interface

The routine maintenance items and schedules for the RX3-A603 control cabinet are detailed in Table 7-1.

Table 7-1: Routine Maintenance Items and Intervals

Maintenance Project	**Maintenance Cycle**
emergency stop switch	6 months
circuit breaker	6 months
pilot lamp	6 months
Heavy-duty connector	6 months
Fan and air ducts	6 months

Maintenance Process

Check whether the circuit breakers operating reset mechanism operates smoothly (i.e., can turn on and off freely), whether the exterior is clean and free of damage or carbonization, whether indicator lights and other signaling devices are functioning correctly, and whether the connection at the heavy-load connector is loose.

Dust-proof Screen Replacement

The RX3-A603 control cabinet is equipped with two dust filters installed at the air ducts located beneath the rear door assembly and the main cabinet body; refer to Figure 7-2. Under normal operating conditions, the control cabinets dust filters should be cleaned every 3 months and replaced every 12 months; however, in harsh environmental conditions, these intervals should be shortened, as illustrated in Figure 7-3.

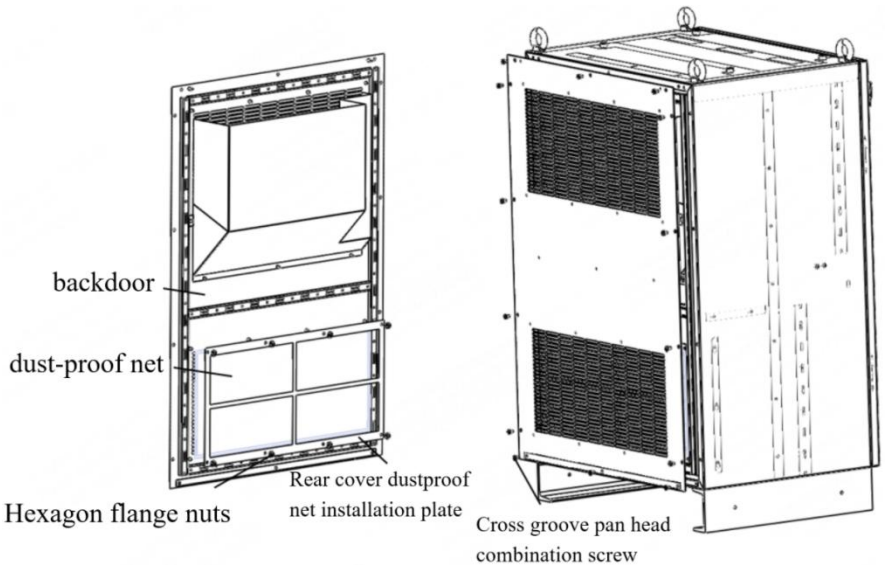


Figure 7-2: Replacement or cleaning of the rear dust filter

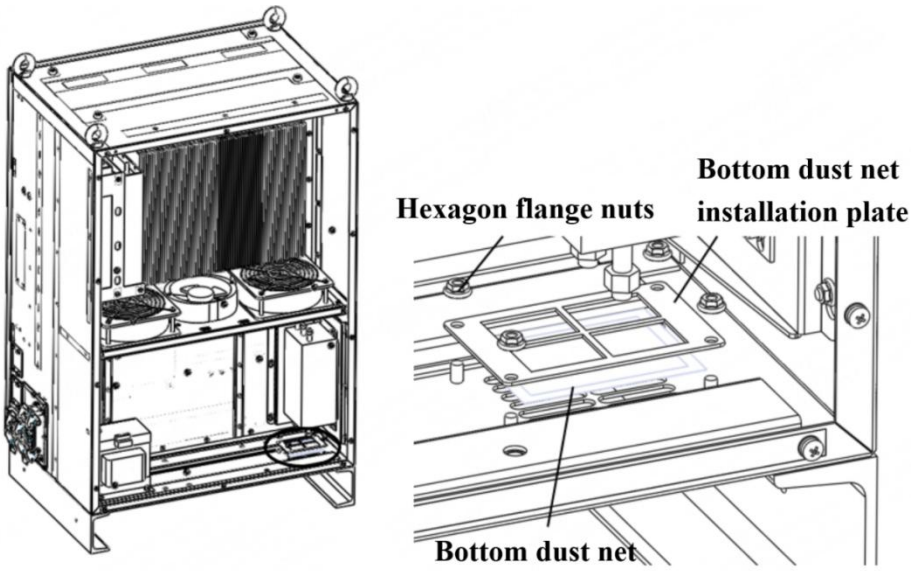


Figure 7-3: Replacement or cleaning of the bottom dust filter mesh

Dust-Proof Mesh Removal Steps:

Step 1. Use a Phillips screwdriver to remove the M5×10 cross-slot Phillips-head combination screw from the upper cover plate, then detach the rear door assembly.

Step 2. Use a socket wrench to remove the M5 hexagonal flange nut from the rear door assembly, then take off the rear cover dust filter installation plate to remove the rear dust filter.

Step 3. Next, use a hex wrench to remove the M5 hexagonal flange nut located at the bottom of the cabinet body, then remove the bottom dust-proof mesh installation plate to take off the bottom dust-proof mesh.

Step 4. Clean or replace the two dust-proof screens mentioned above.

Dust-Proof Mesh Installation Steps:

Step 1. Apply the cleaned or new dust filter to the corresponding metal panel using its built-in double-sided adhesive tape: attach the rear dust filter to the rear door, and attach the bottom dust filter to the bottom of the cabinet body.

Step 2. Use four M5 hexagonal flange-nut fasteners to secure the bottom dust filter to the cabinet body.

Step 3. Use eight M5 hexagonal flange-nut fasteners to secure the rear dust filter mounting plate to the rear door.

Step 4. Secure the rear door assembly to the cabinet body using 14 M5×10 cross-head combination screws.

7.2 Potential Fault Handling Steps

Circuit Breaker

If the circuit breakers operating reset mechanism fails to engage or disengage smoothly, or if the device shows signs of physical damage or carbonization, it shall be replaced immediately. (All above operations shall be performed by personnel holding a valid professional qualification certificate.)

Pilot Lamp

If the indicator light or other indication device fails to send a signal properly, first check whether there is a fault in the connecting circuit; if the circuit is functioning correctly, replace the indication device and observe whether it can now send a signal normally.

Electric Fan

When the fan is rotating abnormally, first check whether there are any faults in the wiring harness; if the wiring is intact, replace the fan and observe whether it now rotates normally.

Heavy-Duty Connector

If a heavy-duty connector or other connection device becomes loose, separate the plug from the socket, reconnect them, and tighten them securely to ensure a reliable connection.

Fuse

If the control cabinets power indicator light is on but certain electrical components are not receiving power, please check whether the corresponding fuse on the adapter board is blown; if so, replace the fuse according to Table 7-2.

Table 7-2: Functions and Replacement Instructions for Each Fuse

RC6F				
Order Number	**Label**	**Model Number**	**Parameter**	**Meaning**
1	F1	/	1A/125VAC	Body; 24VDC isolated power supply
2	F2	/	2A/125VAC	Teaching pendant, 24VDC power supply
3	F 3	/	1A/125VAC	Panel; 24 VDC power supply
4	F4	/	1A/125VAC	Fan; 24 VDC power supply
5	F5	/	2A/125VAC	RC6F,24VDC power supply
6	F6	/	1A/125VAC	Safe I/O, 24VDC isolated power supply

8 RX3-A603 Control Cabinet Storage Conditions

During long-term storage, the control cabinet should be placed in a cool, waterproof location protected from direct sunlight; the specific environmental requirements are listed in Table 8-1 below:

Table 8-1 Storage Conditions

Parameter	**Numeric Value**
Minimum ambient temperature	-25°C
Maximum ambient temperature	+40°C
Maximum ambient temperature for 24-hour storage	+70°C
maximum hnmidity	95% dew-free under constant temperature conditions

RX3-A603 Cable Entry Assembly

The outgoing cables for the RX3-A603 control cabinet shall be routed into the cabinet via the cable entry assembly located on the right side of the control cabinet, as shown in Figure 6-1. The control cabinet comes standard with one set of cable entry assemblies; each assembly consists of one cable entry frame, four small cable core-passing connectors, and six module terminals:

- There are four cables passing through the core: one KT13, two KT12, and one KT4/5;
- The six module plugs consist of two ST12 and four ST5 plugs (for the correspondence between plug types and model specifications, refer to Appendix 14).

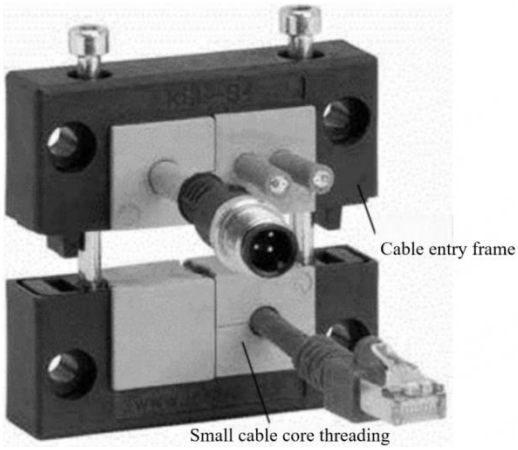
When installed as standard, this cable termination assembly features six module terminals installed on two KT12 and one KT4/5 cable core carriers; the power cable is introduced into the cabinet via a KT13 cable core carrier. To accommodate additional cable harnessing requirements, an additional space for a cable termination assembly is reserved above the standard termination assembly. Customers may select the appropriate cable core carrier specification based on the outer diameter of the cables from the optional cable harness accessories (or custom-made cables) they choose. The cable diameters and corresponding single-core cable core carrier models for the accessories listed in Appendix A are provided in Appendix 14.

Annex 14 – RX3-A603 Control Cabinet Introduction Cable – Single-Core Cable Core Passing Model Table

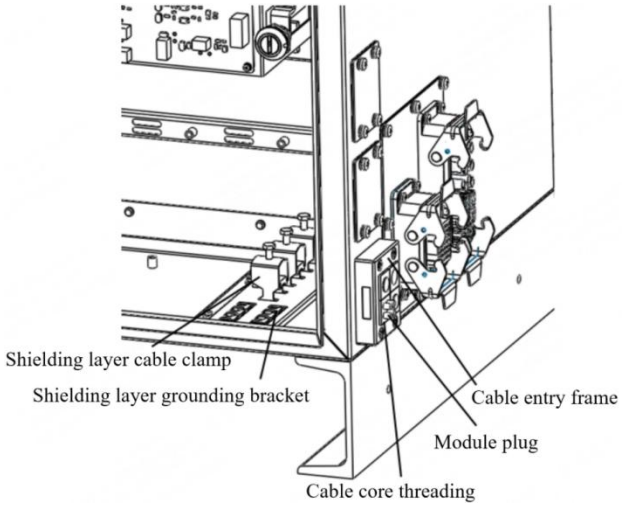
Introduce Cable Name	**Introduce Cable Attributes**	**Cable Core-Through Model**
power line	Standard (outer diameter: 13.4 mm)	K T13
External RS232 cable harness	Optional (outer diameter: 4 mm)	K T4
External RS485 cable harness.	Optional (outer diameter: 4 mm)	K T4
External RS485 cable harness	Optional (Outer diameter: 4 mm)	K T4
Industrial network cable	Optional (Outer diameter: 5 mm)	K T5

	Optional (Outer diameter: 5 mm)	K T5

When installing the cable introduction assembly into the cable harness, first adjust the internal wiring layout within the cabinet after connecting the harness, then insert the introduced cable harness into the small cable core inserter (if the introduced cable harness has a shielding layer, peel back the outer sheath at an appropriate location to expose the shielding layer; after completing the installation of the introduction assembly, use a cable clamp to press the shielding layer against the grounding bracket); once the internal wiring layout within the cable harness cabinet is finalized, fix the small cable core inserter into the introduction frame (where a cable core inserter is not required, use a core inserter plug as a substitute), secure the upper and lower sections of the frame with screws, and use screws to mount the entire assembly to the side of the cabinet.



(a)



(b)

Figure 8-1: Use of cable introduction

In addition to the single-core cable threading solutions provided in Appendix 14, customers may also configure various cable threading configurations based on the actual outer diameter and quantity of the cables being used; for instance, if a large number of incoming cables are required, an additional set of cable termination components may be installed at the reserved location. The available specifications and models of cable termination accessories are listed in Appendix 15.

Annex 15 – RX3-A603 Control Cabinet Cable Entry 配件 Specifications and Model Number Table

Name	**Cable Core-Through Model**	**Specifications**
Cable Entry Frame	KEL 6/4	Opening dimensions: 46x46 mm; height: 17 mm
Small cable core insertion	KT2	Outer diameter: 2 mm – 3 mm
Small cable core insertion	KT3	Outer diameter: 3 mm – 4 mm
Small cable core insertion	K T4	Outer diameter: 4 mm – 5 mm
Small cable core insertion	K T5	Outer diameter: 5 mm – 6 mm
Small cable core insertion	K T6	Outer diameter: 6 mm – 74 mm
Small cable core insertion	KT7	Outer diameter: 7 mm – 8 mm
Small cable core insertion	K T8	Outer diameter: 8 mm – 9 mm
Small cable core insertion	KT9	Outer diameter: 9 mm – 10 mm
Small cable core insertion	K T10	Outer diameter: 10 mm – 11 mm
Small cable core insertion	KT11	Outer diameter: 11 mm – 12 mm
Small cable core insertion	K T12	Outer diameter: 12 mm – 13 mm
Small cable core insertion	KT13	Outer diameter: 13 mm – 14 mm
Small cable core insertion	KT14	Outer diameter: 14 mm – 15 mm
Small cable core insertion	KT15	Outer diameter: 15 mm – 16 mm
Small cable core insertion	KTs16	Outer diameter: 16 mm
Small cable core insertion	KT2/3	Outer diameter: 2×φ 3 mm
Small cable core insertion	KT2/4	Outer diameter: 2 × φ 4 mm
Small cable core insertion	KT2/5	Outer diameter: 2×φ 5 mm
Small cable core insertion	KT2/6	Outer diameter: 2 × φ 6 mm
Small cable core	KT2/7	Outer diameter: 2 × φ 7 mm

Name	Cable Core-Through Model	Specifications
insertion		
Small cable core insertion	KT2/8	Outer diameter: 2 × φ 8 mm
Small cable core insertion	KT4/3	Outer diameter: 4 × φ 3 mm
Small cable core insertion	KT4/4	Outer diameter: 4 × φ 4 mm
Small cable core insertion	KT4/5	Outer diameter: 4 × φ 5 mm
Small cable core insertion	KT4/6	Outer diameter: 4 × φ 6 mm
Core Penetration Plug	BTK	-
Module terminal block	ST2	Φ 2mm
Module Terminal Block	ST3	Φ 3mm
Module Terminal Block	ST4	Φ 4mm
Module Terminal Block	ST5	Φ 5mm
Module Terminal Block	ST6	Φ 6mm
Module Terminal Block	ST7	Φ 7mm
Module terminal block	ST8	Φ 8mm
Module Terminal Block	ST9	Φ 9mm
Module Terminal Block	ST10	Φ 10mm
Module Terminal Block	ST11	Φ 11mm
Module terminal block	ST12	Φ 1 2mm
Module Terminal Block	ST13	Φ 13mm
Module Terminal Block	ST14	Φ 14mm
Module terminal block	ST15	Φ 15mm
Module Terminal	ST16	Φ 16mm

Name	Cable Core-Through Model	Specifications
Block		
Shielded cable clamp	UB12-18	-

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