



# Robot Controller RC4

User Manual

Original Instruction





## Multi-Axis Robot

- Pick-and-Place / Assembly / Array and Packaging / Semiconductor / Electro-Optical Industry / Automotive Industry / Food Industry
- Articulated Robot
  - Delta Robot
  - SCARA Robot
  - Wafer Robot
  - Electric Gripper
  - Integrated Electric Gripper
  - Rotary Joint



## Single-Axis Robot

- Precision / Semiconductor / Medical / FPD
- KK, SK
  - KS, KA
  - KU, KE, KC



## Torque Motor Rotary Table

- Aerospace / Medical / Automotive Industry / Machine Tools / Machinery Industry
- RAB Series
  - RAS Series
  - RCV Series
  - RCH Series



## Ballscrew

- Precision Ground / Rolled
- Super S Series
  - Super T Series
  - Mini Roller
  - Ecological & Economical Lubrication Module E2
  - Rotating Nut (R1)
  - Energy-Saving & Thermal-Controlling (Cool Type)
  - Heavy Load Series (RD)
  - Ball Spline



## Linear Guideway

- Automation / Semiconductor / Medical
- Ball Type--HG, EG, WE, MG, CG
  - Quiet Type--QH, QE, QW, QR
  - Other--RG, E2, PG, SE, RC



## Bearing

- Machine Tools / Robot
- Crossed Roller Bearing
  - Ballscrew Bearing
  - Linear Bearing
  - Support Unit



## DATORKER® Robot Reducer

- Robot / Automation Equipment / Semiconductor Equipment / Machine Tools
- WUT-PO Type
  - WUI-CO Type
  - WTI-PH Type
  - WTI-AH Type



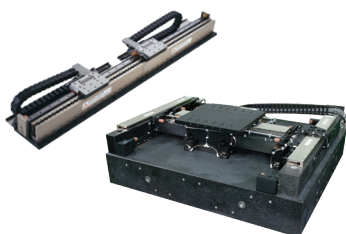
## AC Servo Motor & Drive

- Semiconductor / Packaging Machine / SMT / Food Industry / LCD
- Drives--D1, D1-N, D2T/D2T-LM
  - Motors--50W-2000W



## Medical Equipment

- Hospital / Rehabilitation Centers / Nursing Homes
- Robotic Gait Training System
  - Hygiene System
  - Robotic Endoscope Holder



## Linear Motor

- Automated Transport / AOI Application / Precision / Semiconductor
- Iron-core Linear Motor
  - Coreless Linear Motor
  - Linear Turbo Motor LMT
  - Planar Servo Motor
  - Air Bearing Platform
  - X-Y Stage
  - Gantry Systems



## Torque Motor & Direct Drive Motor

- Machine Tools
- Torque Motor--TMRW Series
- Inspection / Testing Equipment / Robot
- Direct Drive Motor--DMS, DMY, DMN Series

## Warranty Terms and Conditions

The period of warranty shall commence at the received date of HIWIN product (hereafter called “product”) and shall cover a period of 12 months. The warranty does not cover any of the damage and failure resulting from:

1. The damage caused by using with the production line or the peripheral equipment not constructed by HIWIN.
2. Operating method, environment and storage specifications not specifically recommended in the product manual.
3. The damage caused by changing installation place, changing working environment, or improper transfer after being installed by the professional installer.
4. Product or peripheral equipment damaged due to collision or accident caused by improper operation or installation by the unauthorized staff.
5. Installing non-genuine HIWIN products.

The following conditions are not covered by the warranty:

1. Product serial number or date of manufacture (month and year) cannot be verified.
2. Using non-genuine HIWIN products.
3. Adding or removing any components into/out the product without authorized.
4. Any modification of the wiring and the cable of the product.
5. Any modification of the appearance of the product; removal of the components inside the product. e.g., remove the outer cover, product drilling or cutting.
6. Damage caused by any natural disaster. i.e., fire, earthquake, tsunami, lightning, windstorms and floods, tornado, typhoon, hurricane etc.

HIWIN does not provide any warranty or compensation to all the damage caused by above-mentioned circumstances unless the user can prove that the product is defective.

For more information towards warranty terms and conditions, please contact the technical staff or the dealer who you purchased with.

 **WARNING**

- Improper modification or disassemble the robot might reduce the robot function, stability or lifespan.
- The end-effector or the cable for devices should be installed and designed by a professional staff to avoid damaging the robot and robot malfunction.
- Please contact the technical staff for special modification coming from production line set up.
- For the safety reason, any modification for HIWIN product is strictly prohibited.

# Safety Precautions

## Safety Information

### ● Safety Responsibility and Effect

1. This chapter explains how to use the robot safely. Be sure to read this chapter carefully before using the robot.
2. The user of the HIWIN industrial robot has responsibility to design and install the safety device meeting the industrial safety regulations in order to ensure personal safety.
3. In compliance with the safety information on industrial robot described in this manual can't guarantee that *HIWIN* robot will not occur any safety problems.
4. This machine is defined as a partly completed machinery, the associated hazards must be handled by system integrator in accordance with ISO 102018-1/ ISO 102018-2.
5. A safety-related part of control system (SRP/CS) should conform to the requirement of performance level d and category 3 according to ISO 13849-1.
6. The installation for emergency functions shall be defined by the system integrator in accordance with ISO 10218-1/ ISO 10218-2.

### ● Safety Operation Principle

1. Before connecting the power supply for HIWIN industrial robot startup assembly procedure, check whether the specification of factory output voltage matches the specification of input voltage of the product. If it does not match, ensure to use the corresponding transformer (HIWIN optional transformer is recommended).
2. Emergency Stop button (on Teach Pendant or from external emergency stop switch) must be pressed before turning off the power, and then switch off the power switch.
3. While connecting to the external I/O or the signal, please operate in the condition that the power switch is turned off to prevent from a shortcut caused by mistaken touch in the process, and resulting in damage.

---

## *Safety Precautions*

---

### i.General

All personnel involved in the use or setup of the industrial robot arm must read the safety related literature for the robot arm and instruction manual in detail and operate it in accordance with the specifications.

<b>Safety Symbol</b>
----------------------

 **DANGER**

- Users must strictly abide by the content description, otherwise it will cause serious casualties.

 **WARNING**

- Users must strictly abide by the content instructions, otherwise it may cause minor injuries or equipment damage.

 **CAUTION**

- ❖ User must strictly abide by the content description, otherwise it may cause poor product performance.

<b>Use Limit</b>
------------------

Robotic arm is prohibited for use in the following environments and uses

- Personnel carrying purposes
- Explosive environment
- Environment without safety precautions
- Outdoor environment
- Environment affected by oil, water, dust, etc.

## ii.Relevant Personnel

Electrical or mechanical work on industrial robot arms is only permitted by professionals.

### **WARNING**

- All personnel working on industrial robotic arms must read and understand the manual containing the safety section of the system of the robotic arm.

### **System Integrator**

Refers to the person who integrates the industrial robot arm into a set of equipment according to safety regulations and puts it into operation.

The system integrator is responsible for the following tasks:

- Install industrial robot arm.
- Industrial machinery arm related equipment connection work.
- Risk assessment of the overall system.
- Use safe guard devices.
- Confirm that the components used by the safe guard devices are in compliance with regulations.
- Placement, replacement, setup, operation, maintenance and repair work is only permitted for specially trained personnel in accordance with the operating instructions for the components of the industrial robot arm.

## **User**

Users must be professionally trained, have the knowledge and experience in this area, and be familiar with the prescribed standards, and thus be able to make a correct judgment of the work to be performed and identify potential hazards.

Users can be defined into three categories based on operational permissions:

1. Operator
  - ◆ System startup and shutdown
  - ◆ Power on and off
  - ◆ Alarm system status recovery
2. Engineer
  - ◆ Operating personnel usage authority
  - ◆ Programming and changing
  - ◆ Arm teaching operation
3. Expert
  - ◆ Engineer usage authority
  - ◆ Mechanical arm maintenance work

## **Operator Safety Precautions**

The manner and scale of the work and the possible hazards must be explained to the relevant personnel before work, and relevant training courses must be carried out on a regular basis. In the event of an accident or technical correction, a training course must be re-run.

## **System Set Up Safety Precautions**

The system set up only allows specially trained personnel to perform and work in accordance with the installation, setup, operation and other relevant documents provided by the original manufacturer.

## **Maintenance Personnel's Precautions**

Maintenance should only be carried out by specially trained personnel in accordance with the instructions and operating instructions.



### iii. Robotic Arm Working Range Definition

- Working area

The working area of the robot is defined as the area of motion under motion constraints, and the working area must be limited to the minimum required.

- Collaboration area

The area in which the operator and the robot arm may work together in the protection zone. The collaboration area includes the working area and the stopping distance of the robotic arm and the additional axis (optional). The area can be protected by an isolation device.

Note: Stop distance = reaction distance (time to get the message) + braking distance (time to receive the message)

- Protective area

A protected area is an area of the working area that is protected by a safe guard device. The area must include working areas and collaboration areas, and the safety areas ensure safety in the working area.

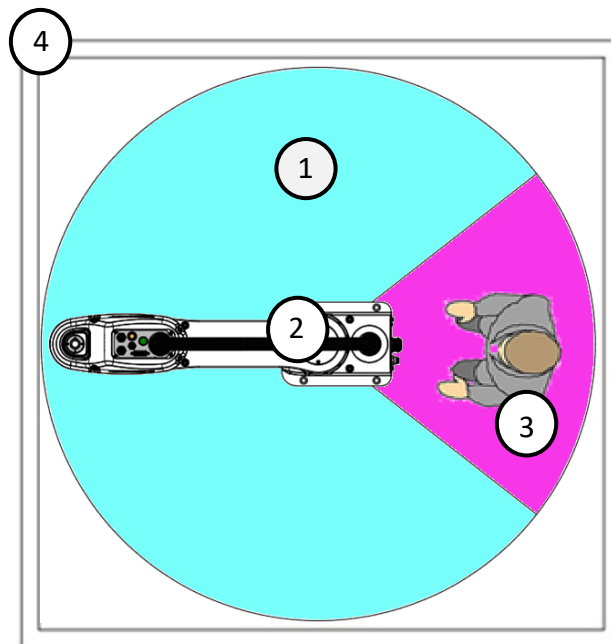


Illustration of axis J1

1. Working area
2. Robot
3. Collaboration area
4. Protective area

#### iv. Description of Safety Functions

Industrial robotic arms must have the following safety features:

- Selection of operating mode of the robot arm
- Safe guard devices
- Emergency stop device
- Teach pendant enable switch

The safety function of the robot arm system is to prevent loss of personnel or property. If the function is not complete or in failure state, the industrial robot arm must be prohibited from operating.

#### **Manual Operation Mode**

The manual operation mode is used for program design, program operation check or teaching, etc. When performing manual operation, pay attention to the followings:

- All actions must be operated within the protection area.
- Do not damage or potentially damage the relevant equipment due to operates the robotic arm.
- Operation must be carried out outside the protected area as much as possible.

Both manual and automatic modes of operation in the protected area are not permitted unless the arm is equipped with a certified speed monitoring accessory from the manufacture.

#### **Automatic Mode**

The automatic mode startup should include the following conditions:

- The safe guard devices have been set up and confirmed that their functions are working properly.
- All suspended security should restore its full functionality.
- Confirm that there are no people in the protected area.
- Relevant workflow rules are complied.

To enter the protection area in this mode, the emergency stop function must be activated before entering.

## **Safe Guard Devices Description**

The safe guard device must use the components approved by the safety regulations and set and plan according to the relevant regulations.

The robotic arm system must be automatically activated to receive the safety signal. In the event of a connection failure during automatic mode operation, an emergency stop must be triggered. When reconnecting after disconnection, the device cannot be automatically started directly and must be started manually. Manual slow running (T1) and manual fast running (T2) modes allow the guard not activate. A method must be provided to confirm that no personnel are in the protected area when the automatic mode is activated.

Users must strictly abide by the content description, otherwise it will cause serious casualties.

Temporary fences can be used during system installation and can be set according to ISO 10218-2 regulations

## **Stop Functions**

### Emergency Stop Description

Emergency stop related precautions

- Confirm that the function is functioning normally every six months.
- System integrators should provide emergency stop devices to ensure that the machine is operational or that a hazardous situation exists.
- At least one external emergency stop device is installed. Make sure that additional emergency stop devices are available for use without or losing the teach pendant.
- Provide interface to connect external emergency stop devices.
- The emergency stop function can be triggered when the safety control system connected to the robot arm is cut off.
- The risk assessment should assess whether the emergency stop is not triggered when the robotic arm control system is turned off and provides a response.
- If a tool or other device connected to the robot is dangerous, it must be connected to the emergency stop circuit on the equipment side.

## v. Warnings and Precautions

### General considerations

#### DANGER

1. All operating procedures should be assessed by professional and in compliance with related industrial safety regulations.
2. When operating robot, operator needs to wear safety equipment, such as workwear for working environment, safety shoes and helmets.
3. When encountering danger or other emergency or abnormal situation, please press the emergency stop button immediately. After danger is eliminated, move the robot away with low speed in manual mode.
4. When considering safety of the robot, the robot and the system must be considered at the same time. Be sure to install safety fence or other safety equipment and the operator must stand outside the safety fence while operating the robot.
5. A safety zone should be established around the robot with an appropriate safety device to stop the unauthorized personnel from access.
6. While installing or removing mechanical components, be aware of a falling piece which may cause injury to operator.
7. Ensure the weight of workpiece does not exceed the rated load or allowable load moment at wrist. Exceeding these values could lead to the driver alarm or malfunction of the robot.
8. Do not climb on manipulator.
9. Do not store the machine in the environment with corrosion and flammable gas or close to the flammable object.
10. Do not operate the machine in the environment with moisture, water or grease.
11. Do not operate the machine at the place where vibration or the strong impact occurs.
12. Do not immerse the electric wires into grease or water.
13. Do not connect or operate the machine with wet hands.
14. Do not operate the machine in potentially explosive environment.
15. Please ensure the controller is grounded.
16. Keep hands away from the inner part of the controller while it is connecting to the power or during operating.
17. Do not touch the heat sink, regenerative resistance, the power supply or the computer inside the controller while it is operating due to its high temperature.

18. Be sure power is disconnected prior to repair and maintenance, and ensure to operate under the condition of no electrical shock risk.
19. Do not disassembly the controller without permission. If there's any issues, please contact our engineers.

 **WARNING**

1. The personnel installing robot should be trained and licensed.
2. To ensure personal safety, robot installation must comply with this manual and related industrial safety regulations.
3. The control cabinet should not be placed near high voltage or machines that generate electromagnetic fields to prevent interference that could cause the robot to deviation or malfunction.
4. Using non-HIWIN spare parts to repair may cause robot damage or malfunction.
5. Beware of the heat generated by the controller and servo motor.
6. Do not overbend the cable to avoid poor circuit contact or unexpected damage.
7. Do not stand on the controller or put heavy objects on it.
8. Do not block the vent or put foreign objects into the controller.
9. Please ensure the controller is fixed on the base.
10. Do not pull the connector violently or twist the electric wires excessively.
11. Do not frequently switch ON/OFF the power switch and the control button.
12. Please ensure that the robot, the emergency stop switch and the controller are functioning properly before performing any work.
13. Do not shutdown the power switch during the operation.
14. Do not open, modify, disassemble and maintain the machine without permission.
15. The power must be disconnected when the machine does not operate in a long time.
16. Do not turn off the power of the controller when modifying the program or parameter. Otherwise, the data stored in the controller will be damaged.
17. When changing the program or parameters inside the robot controller, do not turn off the power of the controller. Otherwise, the internal data of the controller will be damaged.
18. After the brake of a servo motor is released, the robot will be moved due to gravity and it may injured the operator.
19. The industrial robots can be applied for the different industrial environments.
20. When the operating procedures are interrupted, the special attention should be paid during the troubleshooting.

## Precautions during operations

### DANGER

1. Teaching, jogging or programming should be done outside of the safety fence. If it is inevitable to enter the safety fence, press the emergency stop button before entrance. Operation should be restricted at low speed and beware of surrounding safety.
2. All operations shall be executed by trained staff.
3. All operations are required to perform in the safe area.

## Maintenance Precautions

### DANGER

1. Please contact us if the procedure not specified by HIWIN is needed.
2. Please contact us if the replacement of the component not specified by HIWIN is needed.
3. Be sure to carry out regular maintenance, otherwise it will affect the service life of the robot or other unexpected danger.
4. Prior to repair and maintenance, please switch off power supply.
5. Maintenance and repair should be performed by a qualified operator with a complete understanding of the entire system to avoid risk of robot damage and personal injury.
6. When replacing the components, avoid foreign object going into the robot.

## Precautions for using End Effector

End effectors can be basically divided into the following two categories:

- A. Gripper: Mainly for pick and place operations, such as pneumatic, electric gripper, vacuum suction cup, etc.
- B. Tools: Mainly for processing operations, such as welding, cutting, surface treatment, etc.

### DANGER

1. More attention must be paid to the design of the end effector to prevent power loss or any other errors that could lead to workpiece falling or damage.
2. The tool-type end effector is usually equipped with high voltage, high temperature and active rotary shaft. Special attention should be paid to the operating safety.

3. The end effector should be mounted firmly on the robot to avoid workpiece fall during operation which may cause personal injury or hazard.

 **WARNING**

1. The end effector may be equipped with its own control unit. During installation, pay attention to installed location. Ensure that the control unit does not interfere with robot operation.
2. The gripper-type end effector should prevent the workpiece from dropping or damaging when the robot experiences a power error or other errors. If potential dangers or abnormal situations exist when using end effector, the associated hazards must be handled by the system integrator in accordance with the related standards.

**Precautions for using Hydraulic and Pneumatic**

 **DANGER**

1. When using the pneumatic or hydraulic system, the gripped workpiece may fall due to insufficient pressure or gravity.
2. The pneumatic or hydraulic system must be equipped with the relief valve, so that it can be applied in an emergency.

 **WARNING**

1. More attention should be paid to the pressure remained in the pneumatic systems after the power is disconnected.
2. The internal pressure must be released before the pneumatic systems are maintained.
3. More attention should be paid to the pressure in the pneumatic system as it is several times more than the atmosphere pressure.



## Emergency Stop Switch Precautions

### DANGER

1. The robot or other control component should have at least one device for immediate halt, such as an emergency stop switch.
2. The emergency stop button must be installed in an easily accessible location for quick stop.
3. While executing an emergency stop, power to the servo motor will be cut, and all movements will be stopped. And the control system will be shut down. Emergency stop should be reset if the restoration of operating procedure is wanted.
4. Avoid using emergency stop to replace a normal stop procedure. This could reduce the lifespan of the robot.

### WARNING

1. When an emergency stop is performed, the power of the drive is cut off, all operations are stopped, and the control system of the robot arm is turned off.
2. To resume execution, reset the emergency stop switch.
3. Emergency stop is immediate stop: Immediately stop the movement of the robot arm and cut off the power of the drive.
4. The emergency stop switch is for emergency stop only.
5. HIWIN's industrial robot arm has two emergency stop switches, one of which is located on the teach pendant and the other is automatically connected to the controller via a dedicated cable. If there is a need for other emergency stop switches, the other means of connection can be used to achieve the purpose of emergency stop.
6. Based on the relevant industrial safety regulations, the emergency stop switch needs to be directly connected to the control box of the robot arm through a physical connection line.
7. Additional installed safety equipment must comply with PLD level.

## CONTENTS

1	Specification .....	18
1.1	Standard Specification .....	18
1.2	Standard and Optional Equipment .....	19
1.3	Appearance Dimensions .....	21
1.4	Appearance Component .....	22
1.5	Operating Environment.....	23
1.6	Sticker and Label .....	24
2	Installation .....	26
2.1	Installation Dimensions.....	26
2.2	Multifunctional Installation Handler.....	30
2.3	Basic Architecture .....	32
2.3.1	Connection Method .....	32
2.3.2	Transformer Installation (Optional) .....	34
2.4	Controller Boot/Shutdown Program Description .....	36
2.5	Power and Signal Cable Connection .....	37
2.6	Emergency Stop Switch Connection (E-STOP) (optional).....	39
3	External Input / Output.....	41
3.1	Function I/O .....	42
3.2	Digital I/O .....	43
3.3	Example of Connection .....	44
3.4	RS-232 Port.....	48
3.5	RS-485 Port.....	50
3.6	External I/O expansion interface (optional).....	52
3.6.1	CC-LINK Interface (optional) .....	53
3.6.2	PROFINET IO Interface (optional).....	54
3.6.3	Encoder data acquisition module (optional) .....	55
3.6.4	I/O Module with 32CH Digital Outputs (optional).....	57
3.6.5	I/O Module with 32CH Digital Inputs (optional).....	59
3.6.6	I/O Module with 16CH DO and 16CH DI (optional) .....	62
4	Maintenance .....	65
4.1	Fan Filter.....	65
4.2	Confirmation of Robot System Operation .....	66
4.3	Fuse .....	67
5	Robot/Controller Requirements Questionnaire .....	68

**Version Update**

<b>Edition</b>	<b>Date</b>	<b>Applicable Range</b>	<b>Remark</b>
1.0.0	2019.06.05	RC4	Preliminary edition
1.0.1	2019.08.05	RC4	Modified chapter 1.2 standard and optional table
1.0.2	2019.09.05	RC4	Modified chapter 3.6
1.0.3	2019.10.17	RC4	Modified chapter 1.2 standard and optional table
1.0.4	2020.01.03	RC4	Modified chapter 3.6

# 1 Specification

## 1.1 Standard Specification

Item		RC4 Controller
Model		RC4
Controllable robot type		RS405-LU Series
Positioning control		PTP (point-to-point) CP (continuous path)
Joint control		AC servo
Operating system		Caterpillar
Memory capacity	Point data	5000
	Step number	10000
Teaching method		Remote
Communication interface	RS232	1
	RS485	1
	Ethernet	1
	USB	2
External I/O signals (standard)	Emergency stop	Input:1
	Function I/O	Input:8 / Output:8
	Digital I/O	Input:16 / Output:8
Power	Power source (VAC)	Single-phase 200-240
	Power capacity (KVA)	1.65
	Power frequency (Hz)	50/60
	Voltage drop (msec)	10 or less
	Rating output current (A)	6
	Current leakage (mA)	30
Weight (kg)		13
protection rating		20
Temperature range for workplaces (°C)		5-45
Relative humidity for workplaces (%RH)		20-75 (non-condensing)
Storage temperature range (°C)		5~45
Storage relative humidity (%RH)		20-75 (non-condensing)
Power signal cable [ Note1]		3 m

Note1: The power signal cable has a bending radius of at least 70 mm and is not allowed for use with the cable drag chain.

## 1.2 Standard and Optional Equipment

Standard and optional equipment for RC4 controller.

Item	No.	Standard	Optional	Remark
Power Cable	RC400C001-1	●	○	Refer to CH 2.3
Accessory Kit	RC400C001-2	●	○	Refer to table 1
I/O Wiring Set	N/A		○	Refer to table 2
Expansion Content	N/A		○	Refer to table 3

Table 1: Accessory kit item content:

Item	No.	Quantity
D-SUB Connector 15P	RC400C001-3	1
Housing of D-SUB Connector 15P	RC400C001-4	1
High Density D-SUB Connector 44P	RC400C001-5	1
Housing of High-Density D-SUB Connector 44P	RC400C001-6	1
Fuse 10A(Fuse1~2)	RC400C001-7	2
Fuse 1A(Fuse3~4)	RC400C001-8	2
Fan Filter	RC400C001-9	2

Table 2: D-SUB connector wiring set item content:

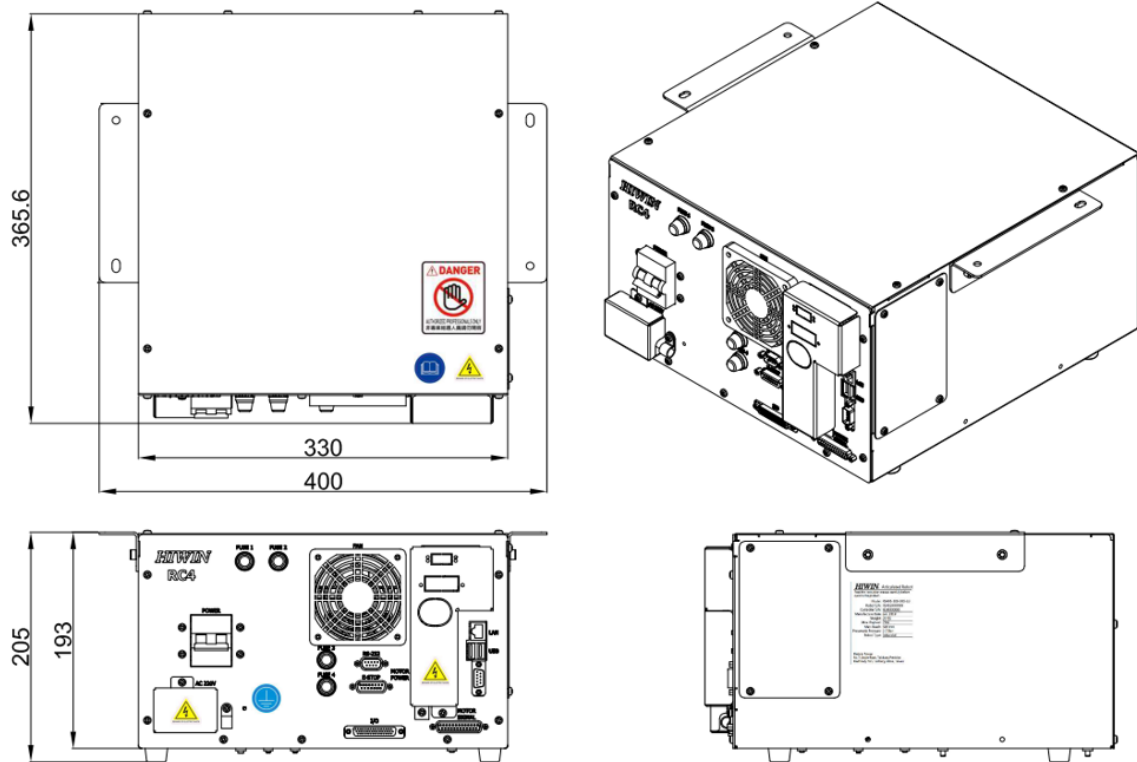
Item	No.	Quantity
44P Terminal Socket	RC400C001-10	1
Signal Cable(5M)	RC400C001-11	1

Table 3: Expansion content:

Item		No.	Remark
2KVA Transformer Box		RC400C001-12	Refer to CH 2.3.2
Transformer Power Cable		RC400C001-13	
Emergency Stop Switch Unit 5M		RC400C001-14	Refer to CH 2.6
CC-Link Expansion Module		RC400C001-15	Refer to CH 3.6.1
PROFINET Expansion Module		RC400C001-16	Refer to CH 3.6.2
Conveyor tracking	Encoder data capture module	RC400C001-17	Refer to CH 3.6.3
	Ethernet Cable (3m)	RC400C001-18	
	Cable grommet	RC400C001-19	
	Encoder	RC400C001-20	
Digital Output Expansion Module (32ch)		RC400C001-21	Refer to CH 3.6.4
Ethernet Cable (3m)		RC400C001-18	
Cable grommet		RC400C001-19	
Digital Input Expansion Module (32ch)		RC400C001-22	Refer to CH 3.6.5
Ethernet Cable (3m)		RC400C001-18	
Cable grommet		RC400C001-19	
Digital I/O Expansion Module (16DI/16DO)		RC400C001-23	Refer to CH 3.6.6
Ethernet Cable (3m)		RC400C001-18	
Cable grommet		RC400C001-19	

## 1.3 Appearance Dimensions

The following below shows appearance dimensions of RC4. (Unit: mm)

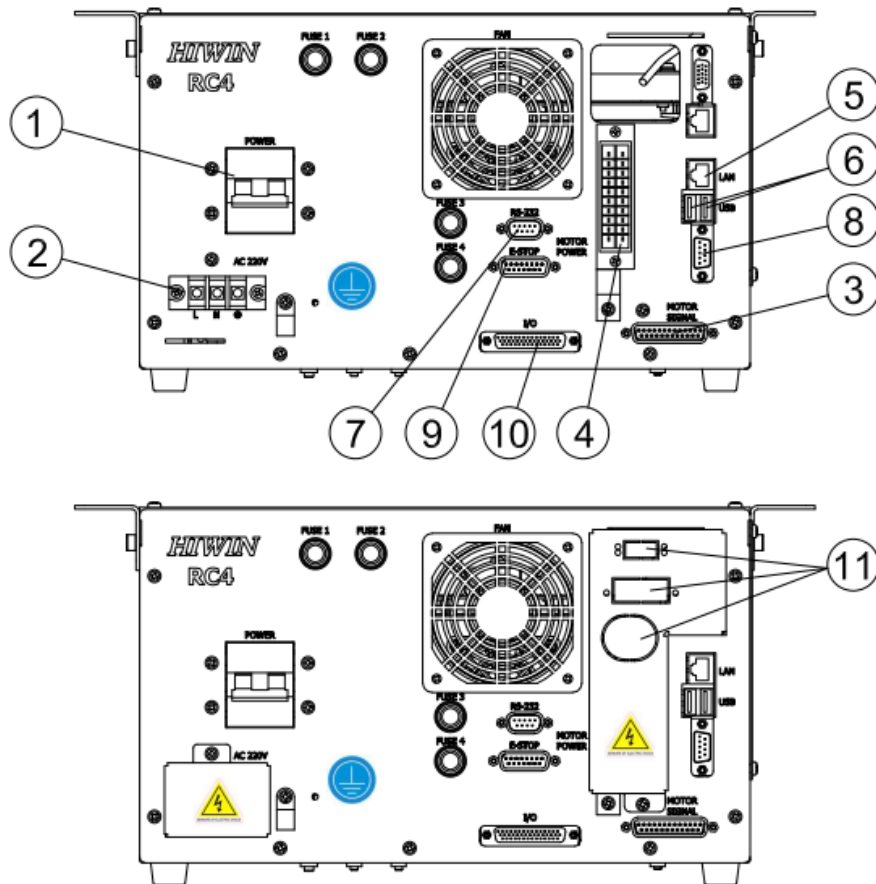


### CAUTION

- ❖ As a complete installation dimension, some space needs to be reserved for the cables. Please refer to CH2.1.

## 1.4 Appearance Component

The function of each connector outside the RC4 controller.



No.	Item	Description
1	Power Switch	Switch power ON/OFF
2	Main Power Source	Inlet single phase AC220V
3	Signal Connector Cable (Motor Signal)	Connect controller to the robot manipulator
4	Power Connector Cable (Motor Power)	Connect controller to the robot manipulator
5	Network Connector	Ethernet signal transmission
6	USB Connector	USB signal transmission
7	RS232 Connector	RS232 signal transmission
8	RS485 Connector	RS485 signal transmission
9	Emergency Stop Connector	Connect to external emergency stop device
10	I/O Connector	Connect to I/O device
11	Functional expansion hole	External function expansion



## 1.5 Operating Environment

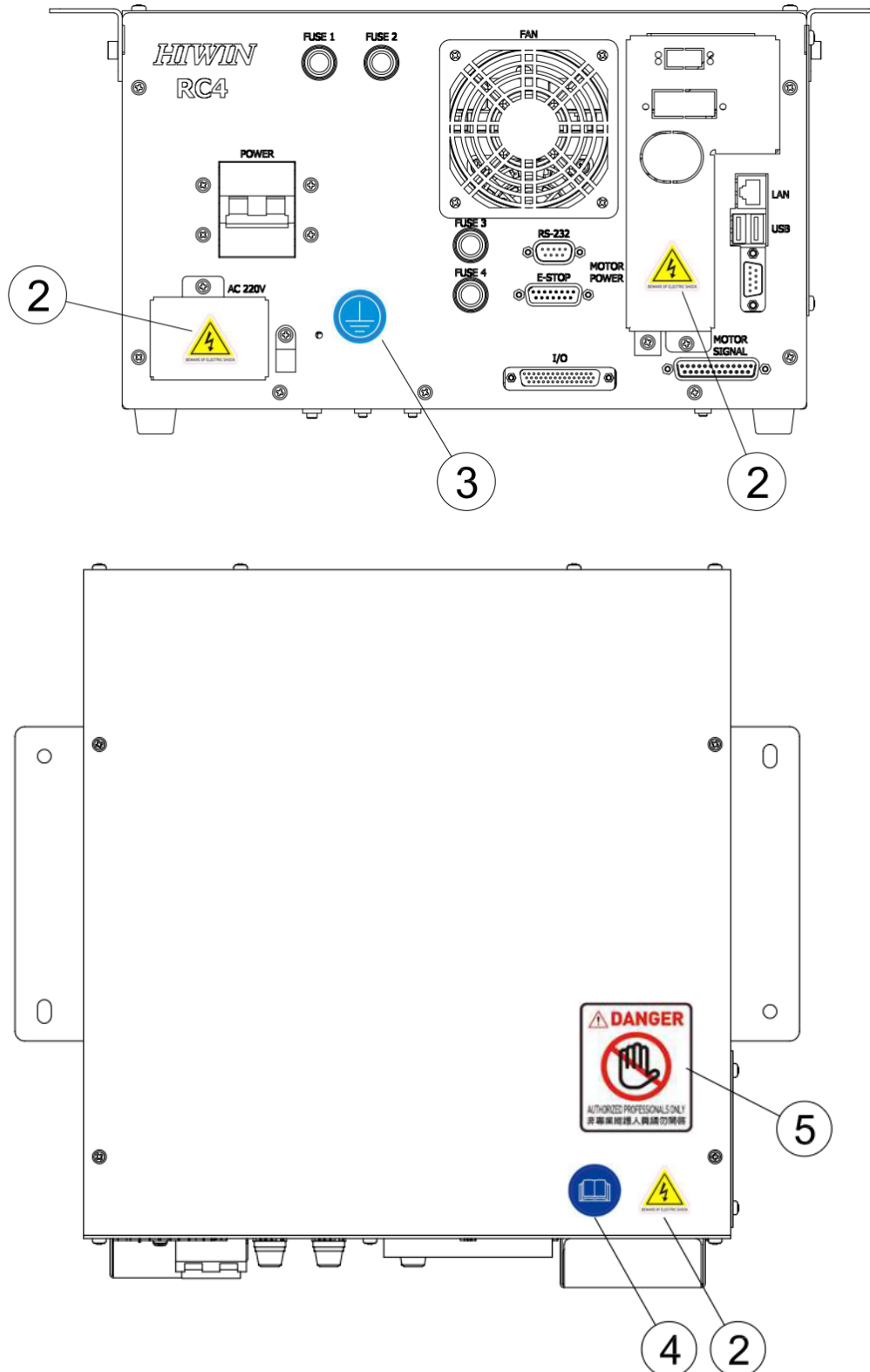
The robot controller employs the IEC protection rating as IP20 (open). In addition, IP20 indicates the protection rating for the solid, not for grease and water.

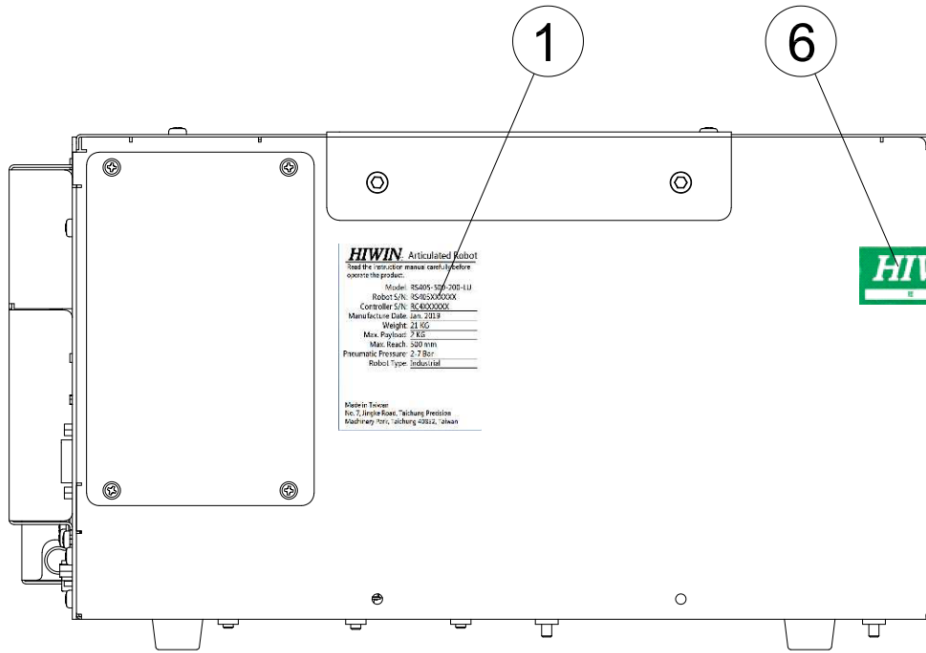
### WARNING

- The controller should not be placed at the environment with moisture, with high temperature, under direct sunlight or potentially explosive environment.
- Please keep the controller away from the strong electric field or the magnetic field.
- The rear side of the controller is provided with a heat dissipation hole, please make sure that there is 100mm of heat dissipation space behind the controller.
- Please place the controller flat and stable and avoid shock or vibration.
- Do not contaminate flammable or corrosive solvents or gases.
- Avoid dust, oil mist, salt, metal powder or other contaminants.
- Placement at a higher altitude will result in reduced performance.
- If the temperature and humidity change greatly, the inner parts of the robot may condense and cause damage.
- Do not use in corrosive environments such as acids and alkalis. Use in environments that are prone to rust such as salt, which may cause rusting of components.

## 1.6 Sticker and Label

The following shows the appearance stickers and labels of RC4 controller.





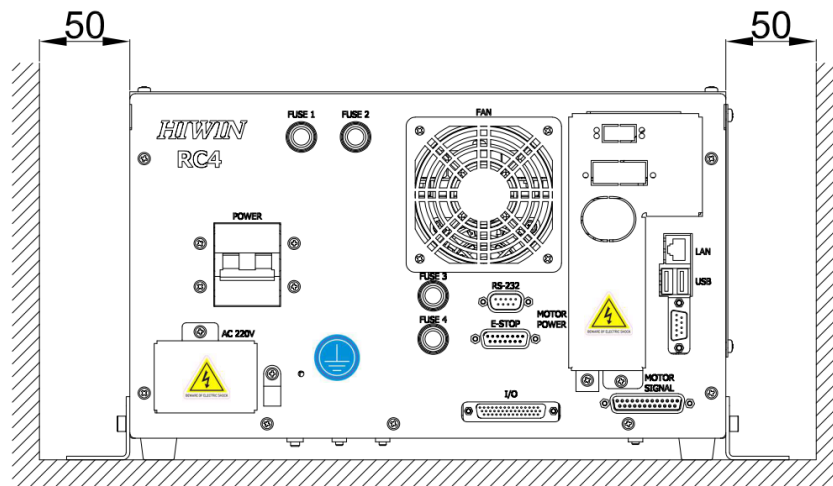
No.	Illustration	Description
1		Controller specification
2		Beware of electric shock
3		Grounding
4		Transport by multiple people
5		Danger: authorized professionals only
6		Tamper seal sticker

## 2 Installation

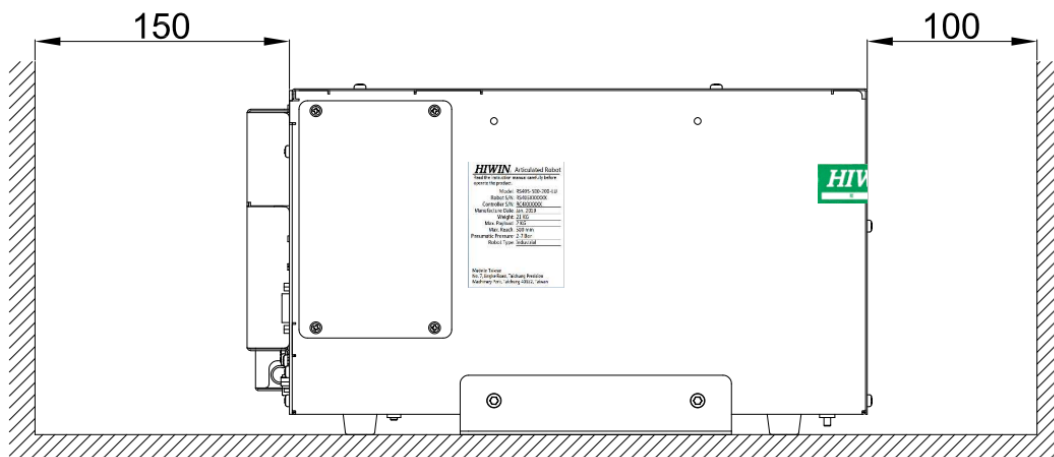
### 2.1 Installation Dimensions

The controller can be set to "planar" and "upright". For ease of maintenance and ventilation around the controller, please set it as shown.

#### Planar

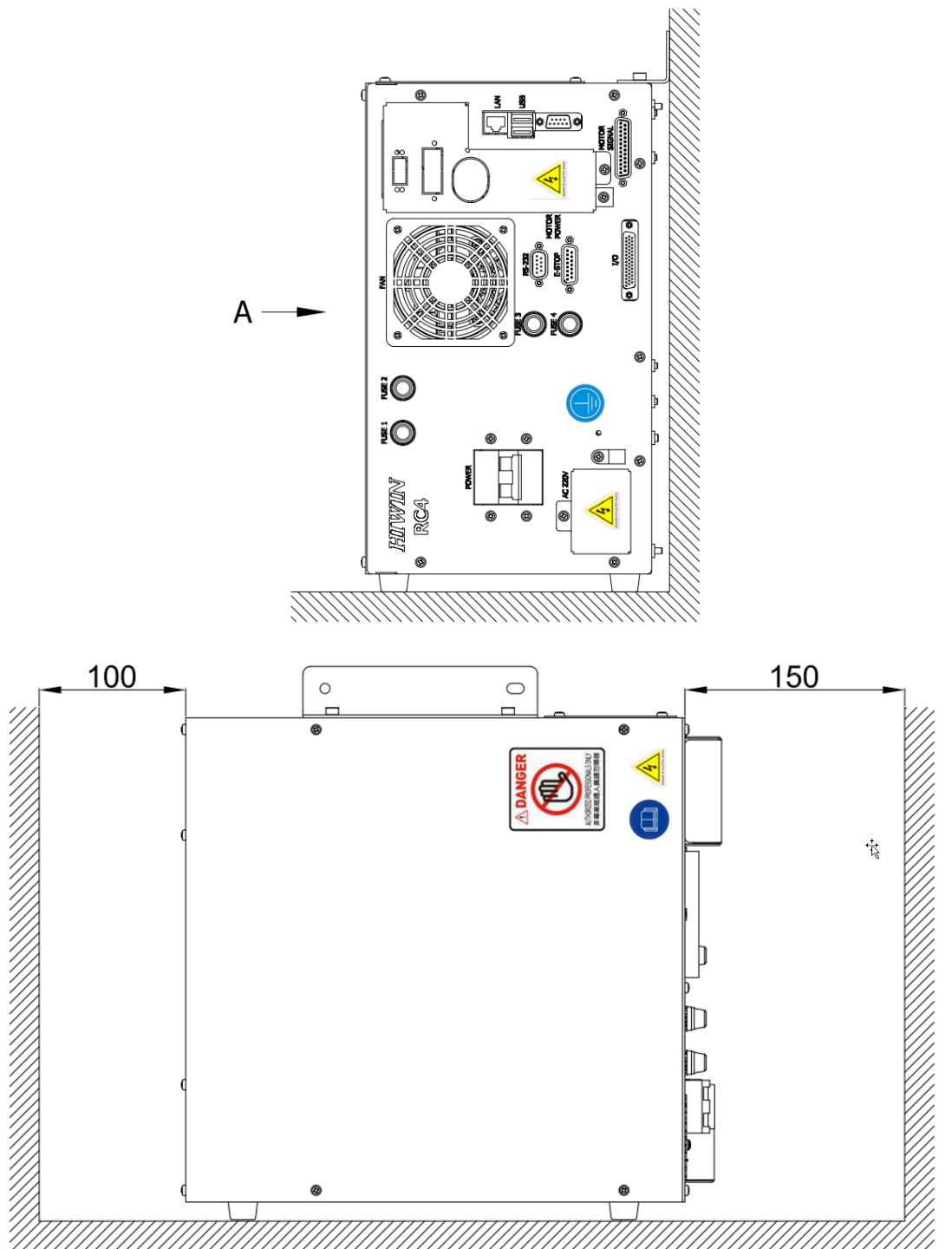


It is recommended to reserve 150mm outlet space in front of the controller panel.



(Unit: mm)

**Upright**



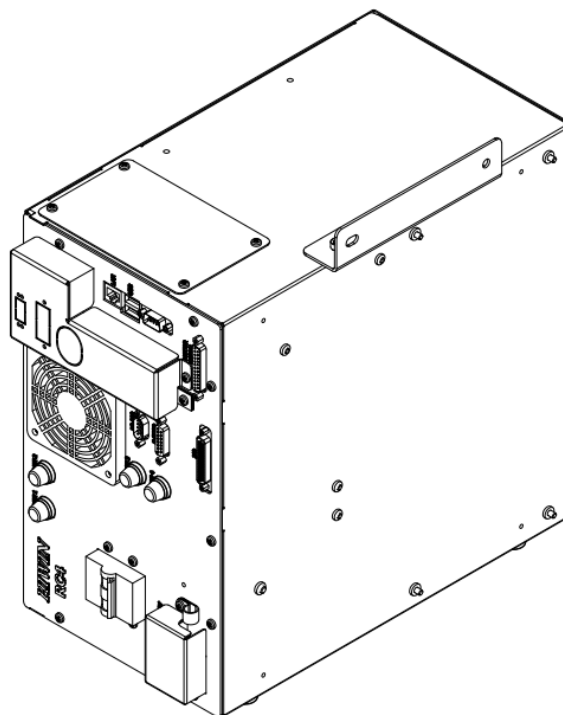
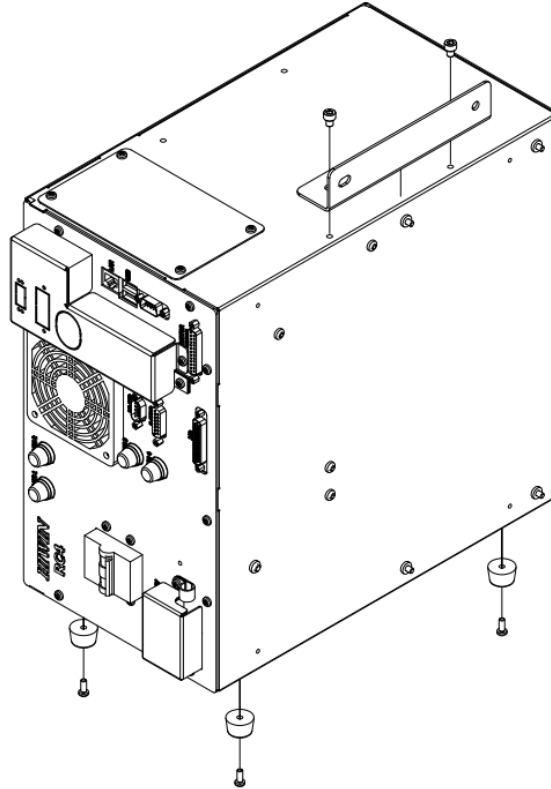
(Unit: mm)

**! CAUTION**

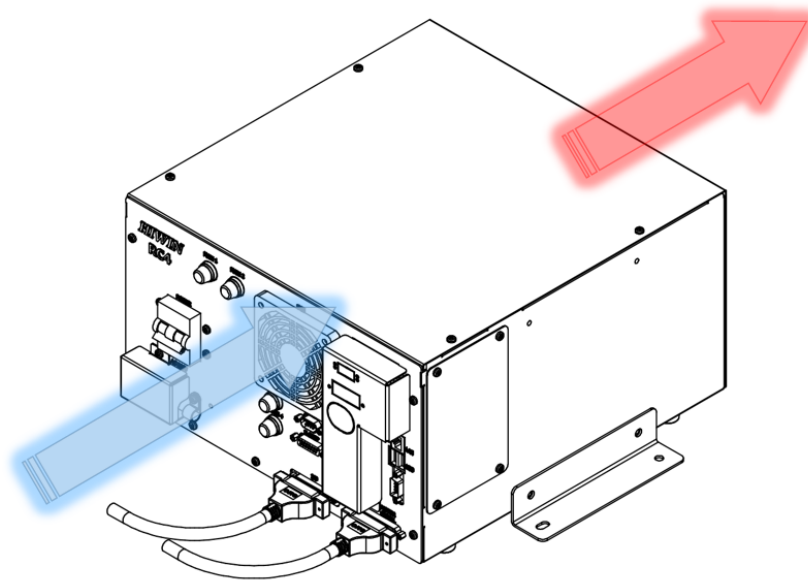
- ❖ Refer to the above method for controller placement. Do not reverse the 180 degree and ensure the installation pitch.

**Description:**

Place the controller upright, you must remove a fixed sheet metal part and replace the plastic foot from the bottom of the controller to the original side fixing point, as shown below. The plastic foot bolt is M4X0.7PX10L.



### Controller heat dissipation



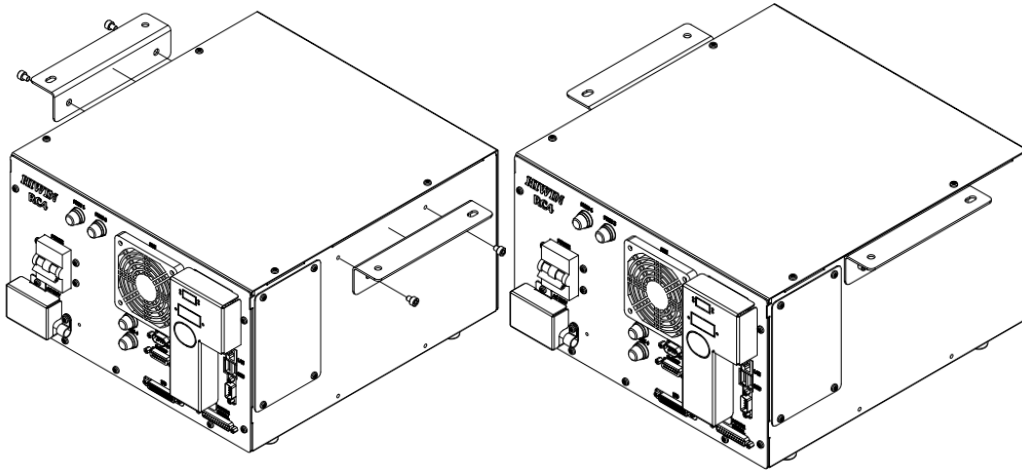
**!** CAUTION

- ❖ The temperature of the air vent of the controller is high. Do not install a heat-resistant device at the air vent.

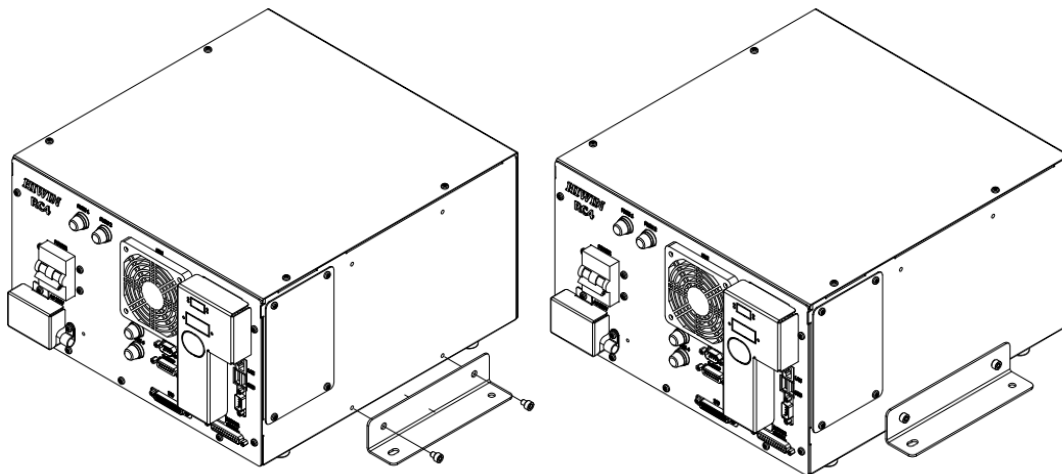
## 2.2 Multifunctional Installation Handler

The controller has two sets of multi-function holders.

The fix sheet metal can be assembled above the controller and used as a handle sheet metal for transportation purposes. The installation method is shown in the figure below. The bolt used is M5X0.8PX6L.

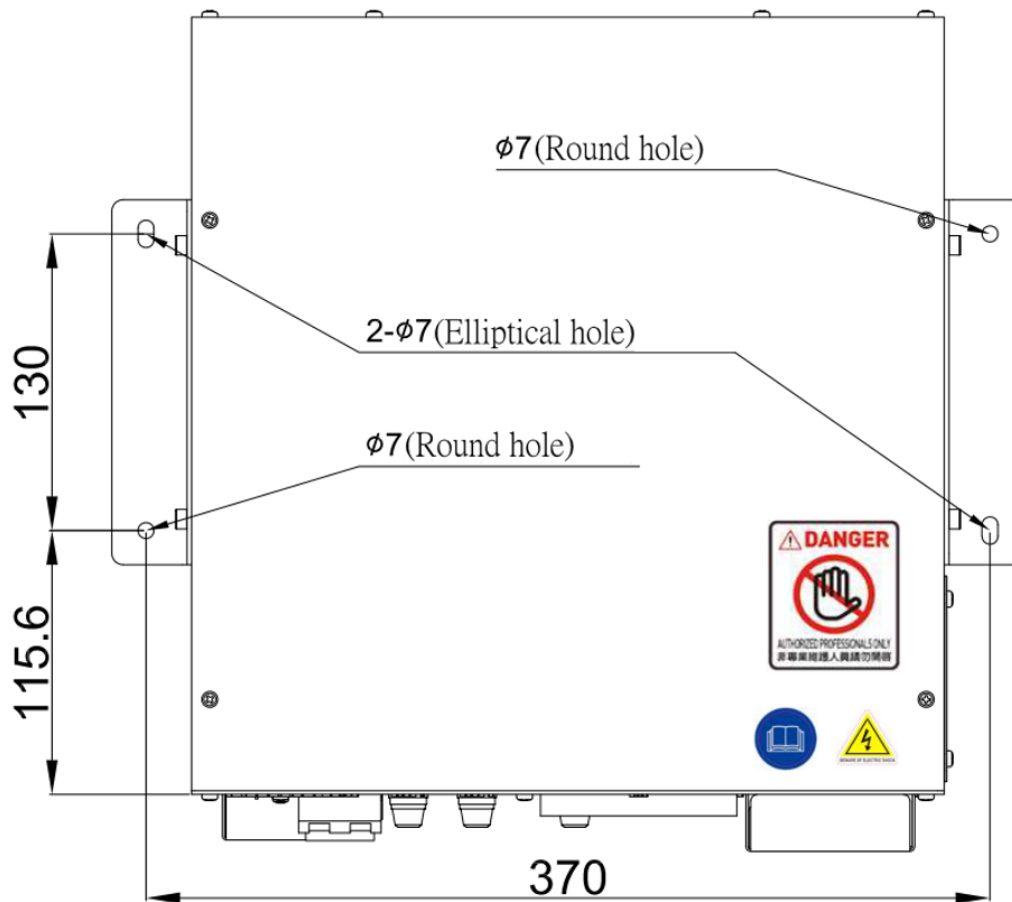


The handler can be assembled under the controller to position the controller as a lock. The installation method is as shown below.





Corresponding size of multi-function handler. (Unit:mm)



**! CAUTION**

- ❖ In order to fix to the gantry, thread the hole according to the size shown.

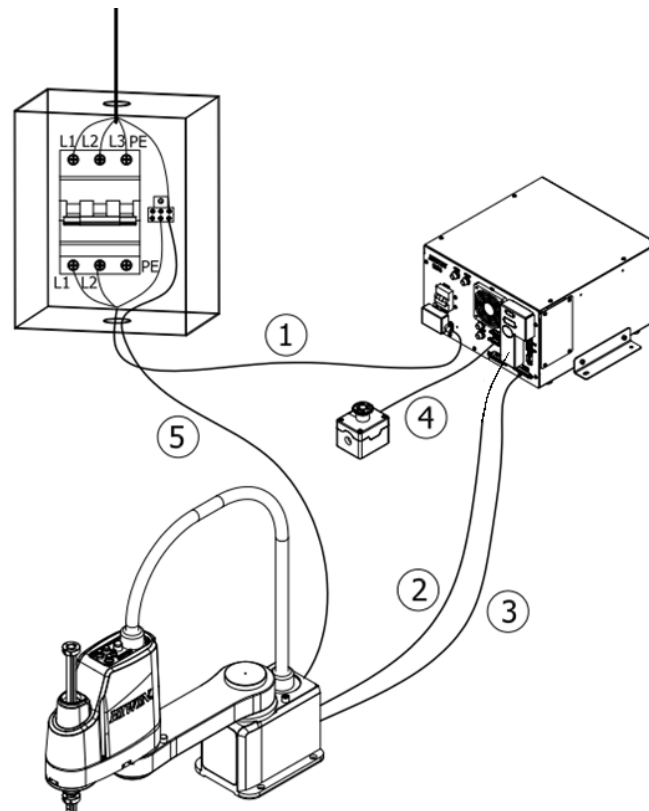
## 2.3 Basic Architecture

### 2.3.1 Connection Method

The picture below is an example of basic connection architecture for RS405. RS405 controller needs to be supplied with single-phase AC200-240V and the ground connection should be separated from main power breaker.

#### CAUTION

- ❖ Instead of connecting the ground by devices or system ground, the correct way is to connect to power ground directly, and high-quality wires whose diameters are 14AWG or bigger diameters must be used. The power can be turned on and tested after connecting the main components mentioned below. Please make sure that the grounding of manipulator must connected to the power grounding directly.

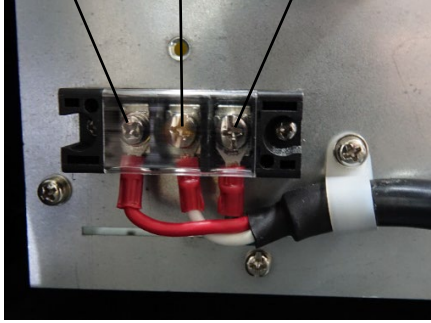


No.	Basic connection structure
1	Main Power Cable
2	Power Cable
3	Signal Cable
4	Emergency Stop Switch
5	Robot arm ground wire [Note]

Note: Please prepare the UL1015, 16AWG ground wire.

Description:

The controller power cable is 3m long and it is connected to the controller as follows:

Controller power cable connection	<p>(1) Remove protective cover.                  (2) Connect the power cable.                  (3) Use retaining strap to hold the wire.                  (4) Cover the protective cover and lock it.</p>	<p><b>L(Red)    N(White)    Ground (Green)</b></p> 							
	<table border="1"> <thead> <tr> <th>Define</th> <th>Color</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>Red</td> </tr> <tr> <td>N</td> <td>White</td> </tr> <tr> <td>Ground</td> <td>Green</td> </tr> </tbody> </table>	Define	Color	L	Red	N	White	Ground	Green
Define	Color								
L	Red								
N	White								
Ground	Green								

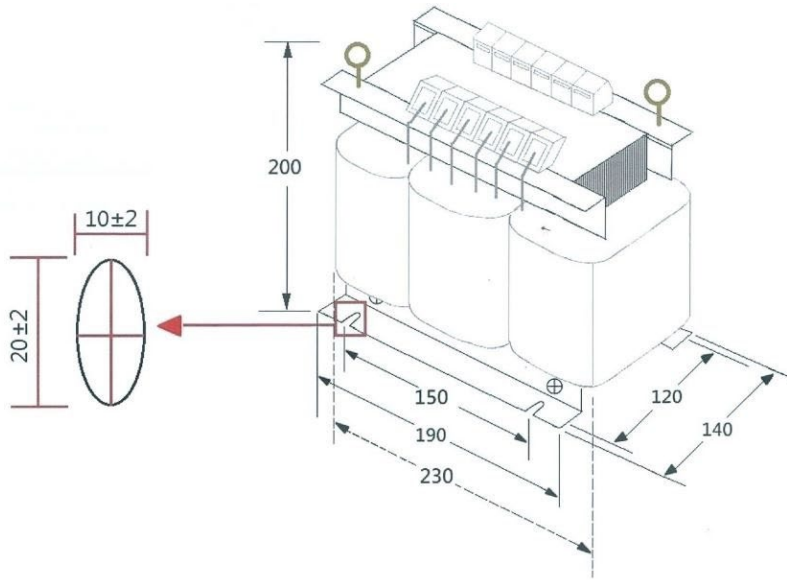
**⚠ WARNING**

- When installing the power cable, make sure that there is no risk of electric shock after turning off the power.
- Be sure to connect the ground wire of the power cable to the ground of the power box.

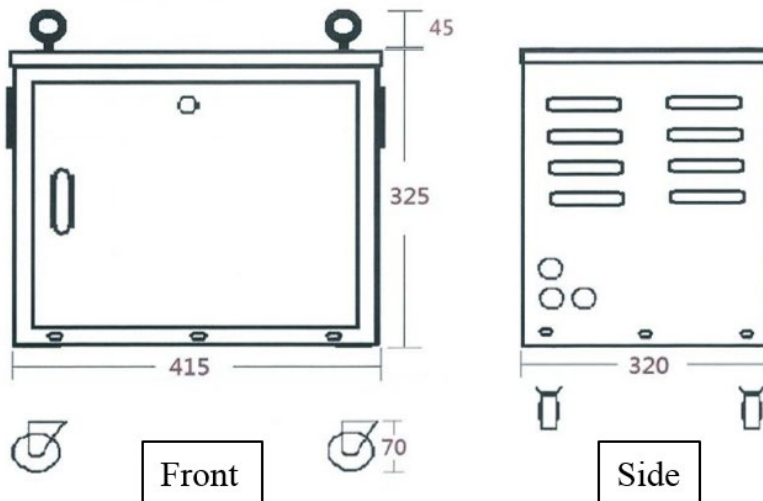
### 2.3.2 Transformer Installation (Optional)

The transformer is an optional item for this product. The input voltage specification of the controller is single-phase 220V. If the power supply voltage specifications of the client are different, the transformer can be used in series. The installation can refer to the dimensions below.

#### 2KVA Transformer



2KVA transformer, case / 2KVA transformer, case, UL version



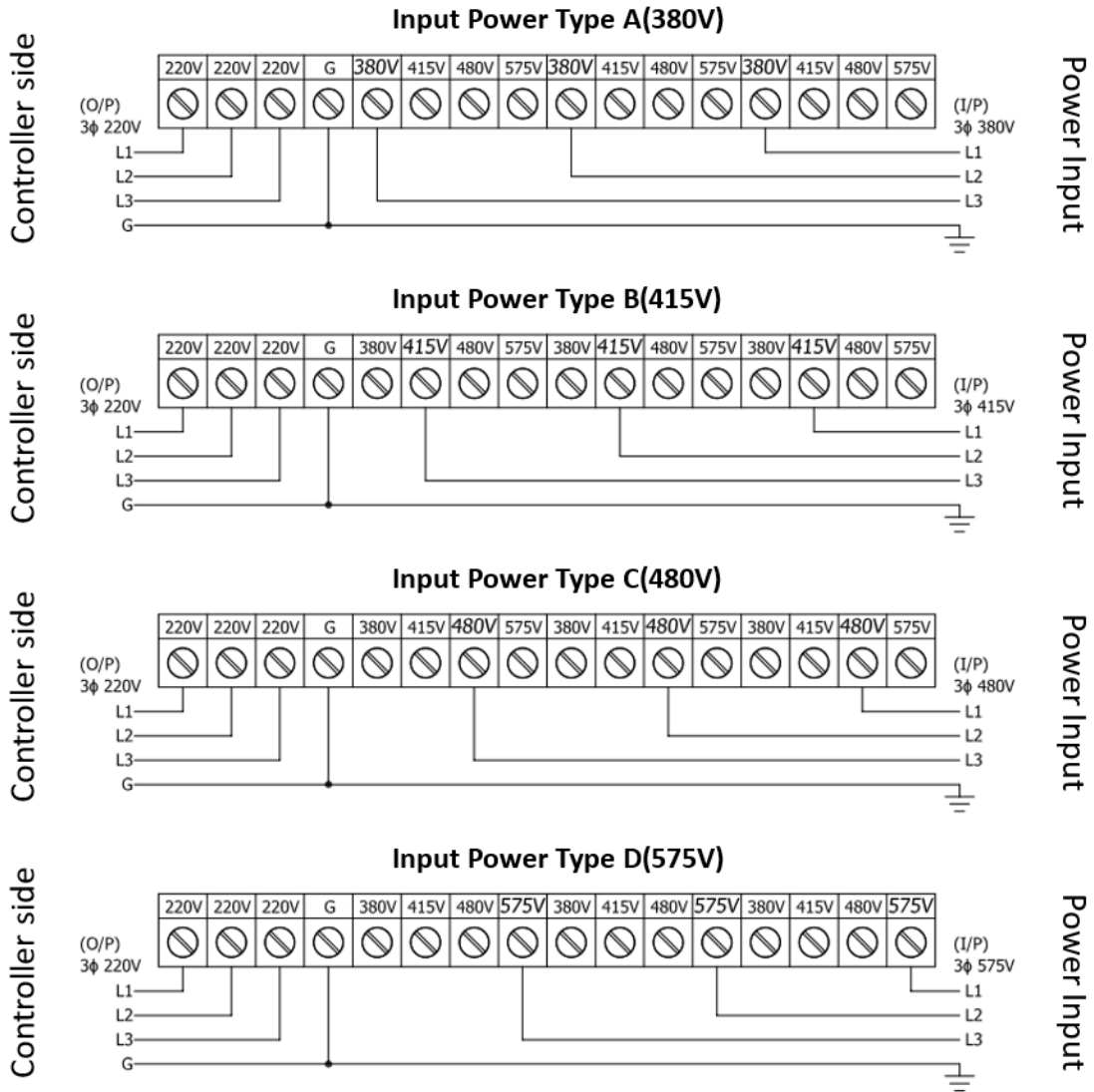
(Unit: mm)

#### CAUTION

- ❖ It is recommended to reserve 360mm space on the front of the cabinet so that the door can be opened and pay attention to the cooling space of the rear fan.

RC4 controller input voltage specification is single phase 220V.

If the power supply specifications of the client are different, the transformer must be connected in series.



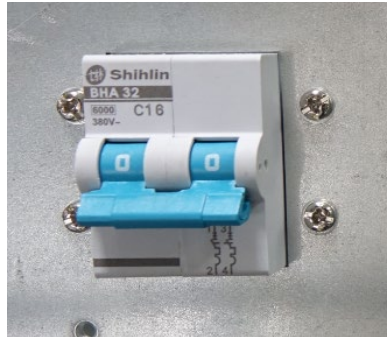
**! CAUTION**

- ❖ Before running for a test, please make sure that the manipulator is securely installed to prevent from tipping during the motion.

## 2.4 Controller Boot/Shutdown Program Description

### ■ Boot

Power on by flipping up the power switch.



### ■ Shutdown

Procedure for shutting down are as follows:

- Step1. Stop the motion of the robot manipulator.
- Step2. Press the emergency stop button, then wait 5 seconds.
- Step3. Flipping the power switch off.

### ⚠ CAUTION

- ❖ Operator must not leave until the power switch is switched off.

### ⚠ WARNING

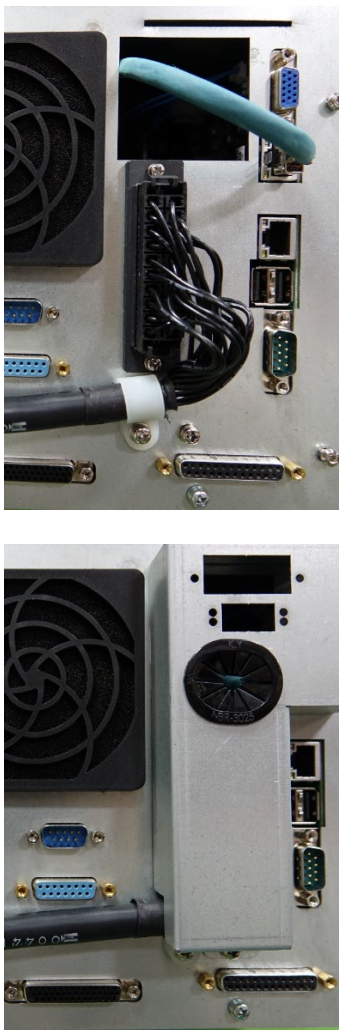

- If the above process is not completed, do not directly switch off the power switch or the main power switch on the controller. If the power is off, the controller may be damaged.
- Do not turn the power back on immediately after turning off the power switch. Wait 30 seconds before turning the power on.
- In order to stop the moving manipulator, avoid using the emergency stop. Press the stop button to stop the program.
- Stop the movement of the manipulator before shutting down, and then perform the shutdown procedure to avoid the unintended danger of the manipulator being interrupted during the exercise.

## 2.5 Power and Signal Cable Connection

### Description:

The power and signal cable of the manipulator are connected to the controller as follows.

### Connection Method:

<p>Manipulator power cable connection</p>	<ol style="list-style-type: none"> <li>1. Disassemble the protective cover.</li> <li>2. The power supply cable is a 20P double-row rectangular connector. Pay attention to the connector label when connecting. This connector has directionality. If it cannot be inserted, please convert it to 180 degrees and insert it again.</li> <li>3. After the connection is completed, use the fixed buckle to hold the wire, as shown in the right figure.</li> <li>4. Assemble the protective cover back and secure the screw.</li> </ol>	
<p>Manipulator signal cable connection</p>	<ol style="list-style-type: none"> <li>1. The signal cable is a 25P D-sub connector. This connector has directionality. If it cannot be inserted, please convert it to 180 degrees and insert it again.</li> <li>2. After the connection is completed, secure screw the connector to the panel.</li> </ol>	

 **WARNING**

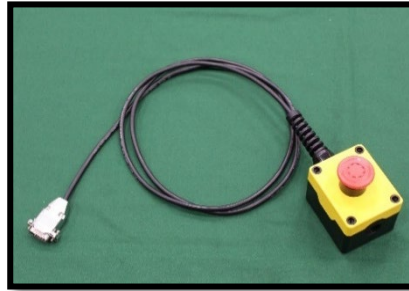
- Insert the connector in parallel with the pin to avoid the internal pin insertion, resulting in bending deformation.
- Depending on the state of use of the robot, the temperature of the cable will rise slightly. Remove the external protective plastic sleeve before connecting.
- When disassembling and handling, please avoid the connector being severely impacted by external force.
- Please make sure the serial number on the robot label corresponds to the serial number on the controller label, because of each controller saves the setting parameters of a specific robot. If the connection is wrong, it may result in abnormal system issues, damages, even unpredictable hazards.
- It is prohibited to connect a robot to another controller, even with the same model.



## 2.6 Emergency Stop Switch Connection (E-STOP) (optional)

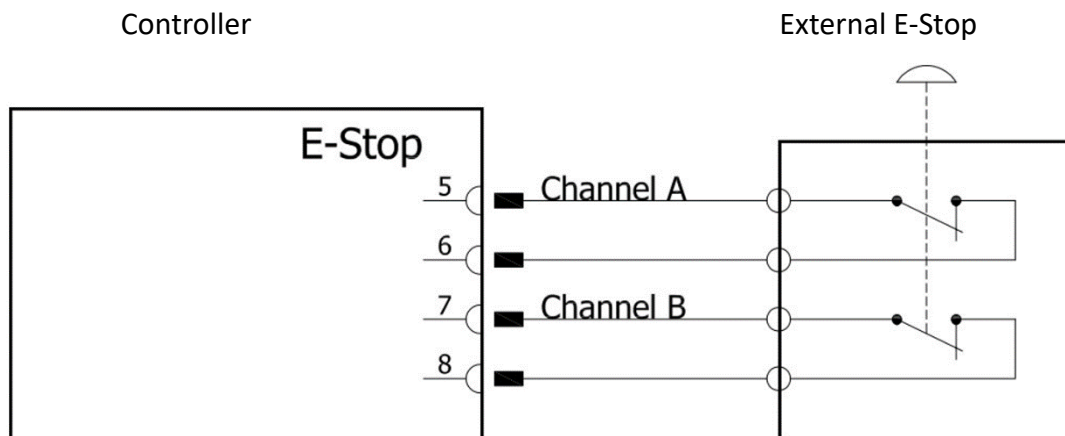
### Description:

The connector is a female D-SUB 15P connector for emergency stop. Emergency stop switch (optional equipment) is a button box with a 5m wire. It should be placed at the position, which is easy to reach. D-SUB 15P soldering connector is included in the connector kit.



### Emergency stop switch wiring diagram

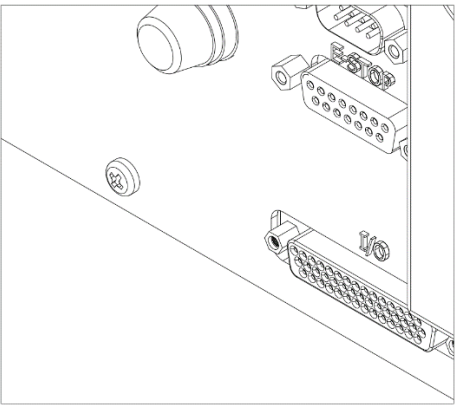
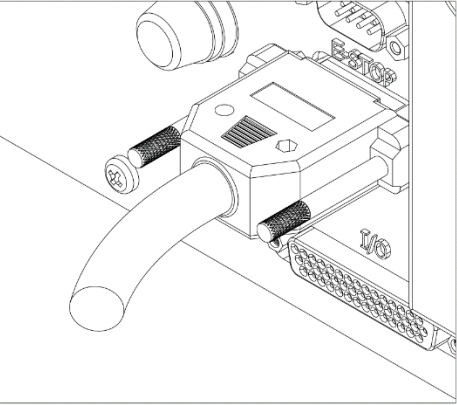
Controller emergency stop connector is a dual circuit contact, which should be connected with an external dual circuit emergency stop device additionally. This device should be a dry contact (uncharged) switch. Ensure the connector is connected correctly and the emergency stop device is accessible to the operator before the robot functions.



### DANGER

- The emergency stop device must be connected to the controller and be placed at the position accessible to operator, and any signal or power source should not come into contact with or come into contact with any metal enclosure. Incorrect method of using can cause a severe damage or loss of life and property.

**Connection Method:**

<p>The emergency stop of the robot arm needs to be connected to the E-STOP interface of the controller panel. (The E-STOP interface is a D-SUB 15P connector.)</p>	
<p>Connect the D-SUB connector to the E-STOP interface and securely lock the connector to the panel.</p>	

 **CAUTION**

- ❖ Please ensure this emergency stop switch and the emergency stop on the teach pendant are in reset status.
- ❖ The external device connected to the emergency stop switch circuit should be dry contact (uncharged) switch. It is forbidden to use a live circuit to connect to the controller emergency stop switch circuit.

### 3 External Input / Output

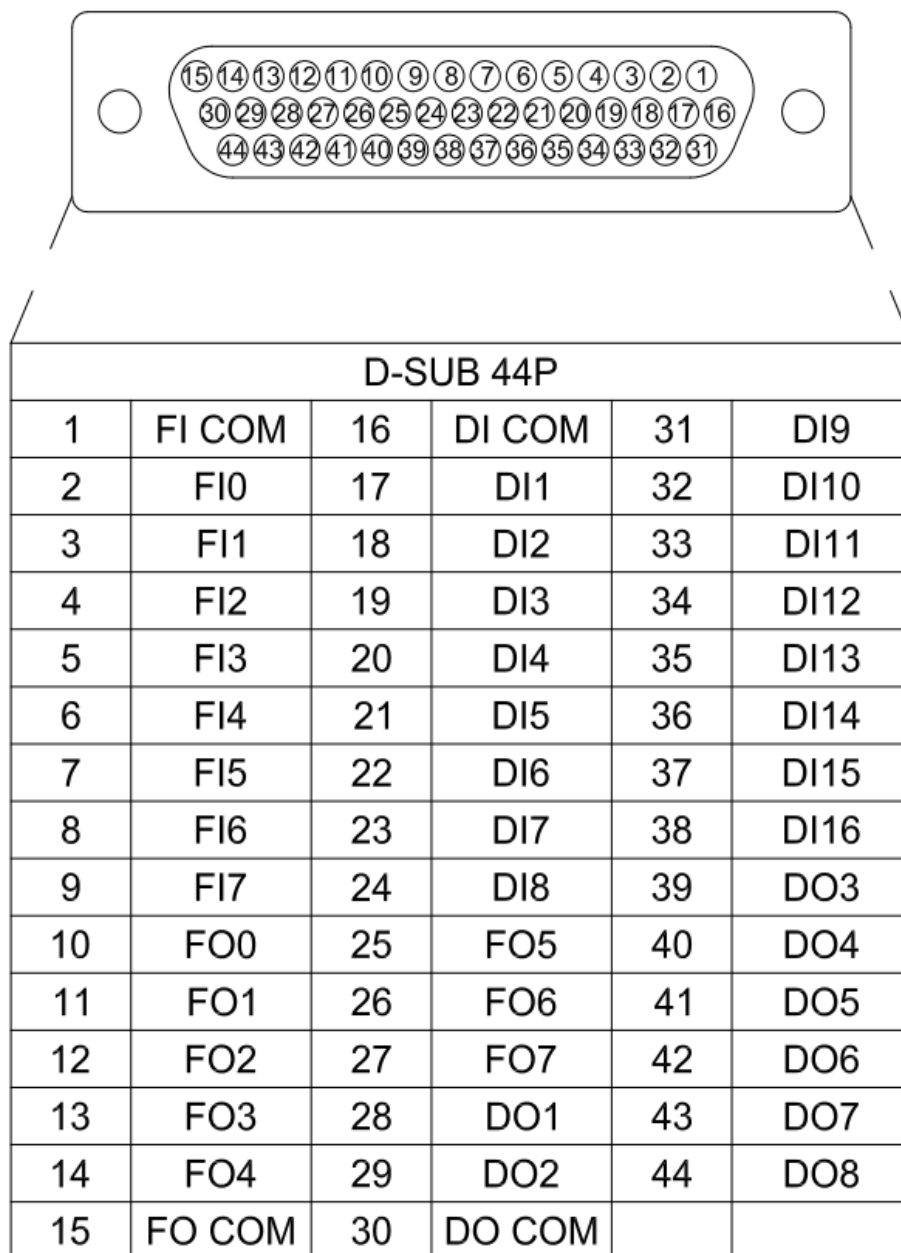
**Description:**

The external input/output consists of a D-SUB 44P and contains 8FI/8FO, 16DI/8DO.

An external I/O wiring set (optional equipment) can be used to include the cable and terminal block. The connector accessory kit contains the D-SUB 44P solder connector.

There are two types of controller external I/O:

1. Function I/O (FI/O) → specific function I/O
2. Digital I/O (DI/O) → external I/O for customer's configuration

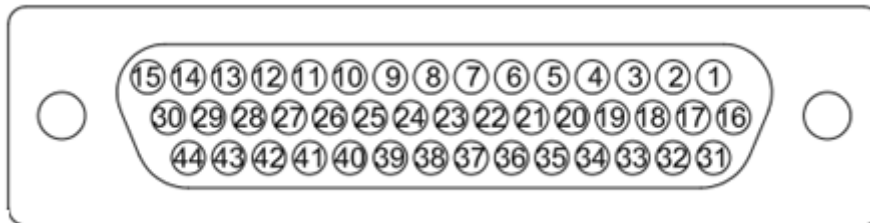


### 3.1 Function I/O

**Description:**

Standard equipment has function I/O of 8IN/8OUT, which are all in the D-SUB 44P connector.

**Function I/O List**



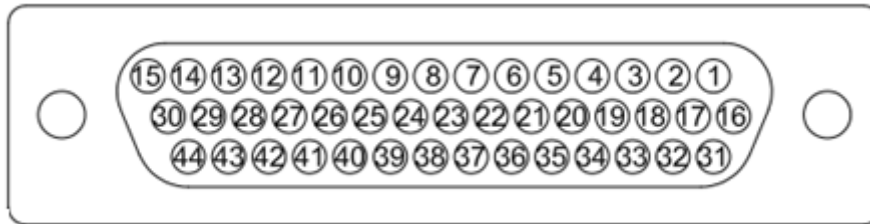
INPUT		
Pin	Parameter	Function
2	START	Execute program
3	HOLD	Pause program
4	STOP	Stop program
5	ENBL	Enable Function I/O
6	RSR1/PNS1	Robot service request 1 / program selection 1
7	RSR2/PNS2	Robot service request 2 / program selection 2
8	RSR3/PNS3	Robot service request 3 / program selection 3
9	RSR4/PNS4	Robot service request 4 / program selection 4
OUTPUT		
Pin	Parameter	Function
10	RUN	Program running
11	HELD	Program pausing
12	FAULT	Controller failure
13	READY	Controller ready
14	ACK1/SNO1	RSR 1 feedback signal / selection program No. 1
25	ACK2/SNO2	RSR 2 feedback signal / selection program No. 2
26	ACK3/SNO3	RSR 3 feedback signal / selection program No. 3
27	ACK4/SNO4	RSR 4 feedback signal / selection program No. 4

## 3.2 Digital I/O

### Description:

Standard equipment has 16IN/8OUT digital I/O, distributed in D-SUB 44P connector.

### Digital I/O List



D-SUB 44P			
Pin	Parameter	Pin	Parameter
17	DI[1]	33	DI[11]
18	DI[2]	34	DI[12]
19	DI[3]	35	DI[13]
20	DI[4]	36	DI[14]
21	DI[5]	37	DI[15]
22	DI[6]	38	DI[16]
23	DI[7]	39	DO[3]
24	DI[8]	40	DO[4]
28	DO[1]	41	DO[5]
29	DO[2]	42	DO[6]
31	DI[9]	43	DO[7]
32	DI[10]	44	DO[8]

### 3.3 Example of Connection

- (1) Digital INPUT can be an NPN or PNP, adjusted by pin 1 (FI COM) and pin 16 (DI COM), supplied by an external power supply.

COM→24V: NPN

COM→0V: PNP

- (2) Digital OUTPUT can be an NPN or PNP, adjusted by pin 15 (FO COM) and pin 30 (DO COM), supplied by an external power supply.

COM→0V: NPN

COM→24V: PNP

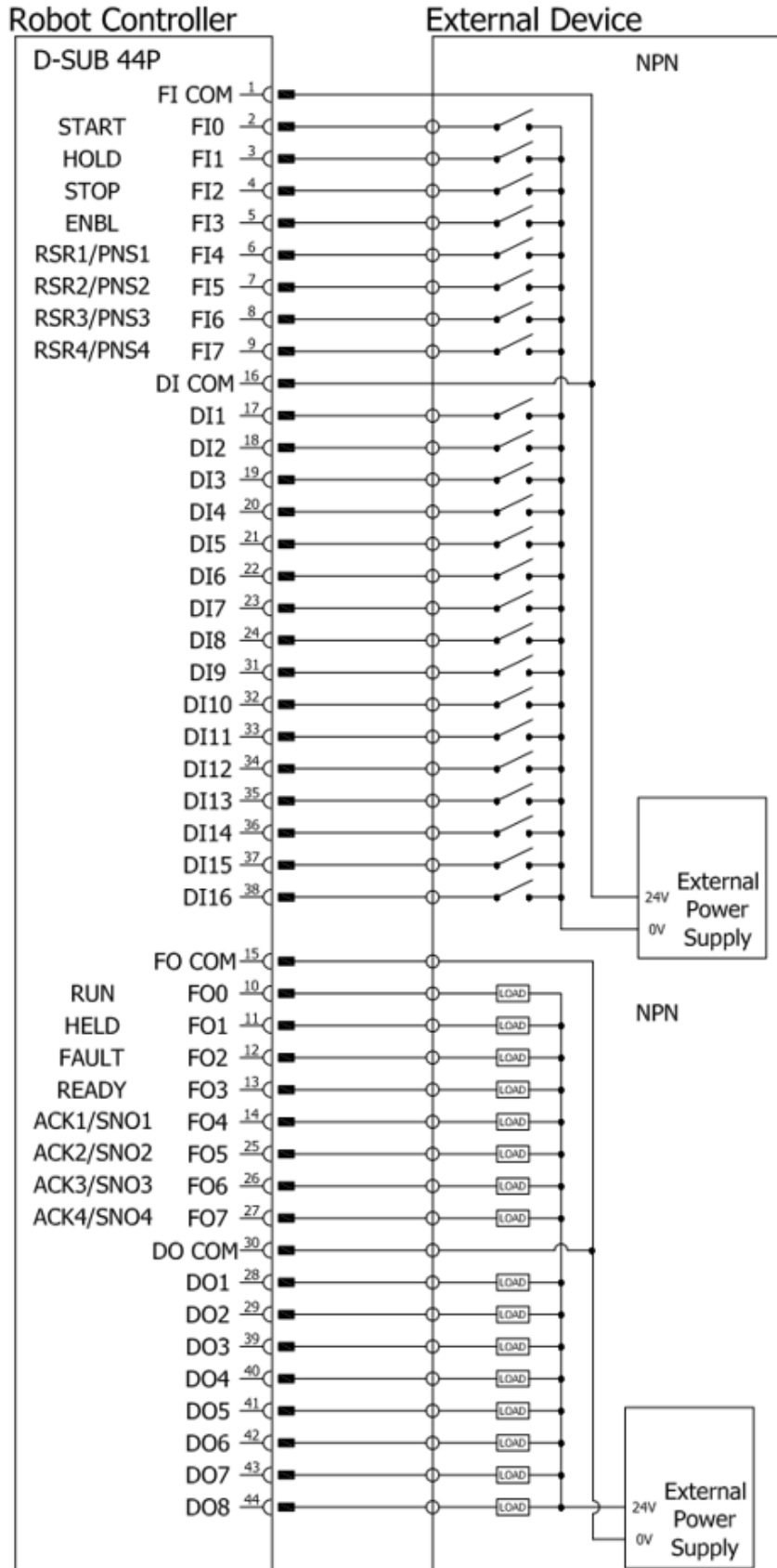


#### CAUTION

- ❖ The maximum current at the single output supplied by external output is 100mA.

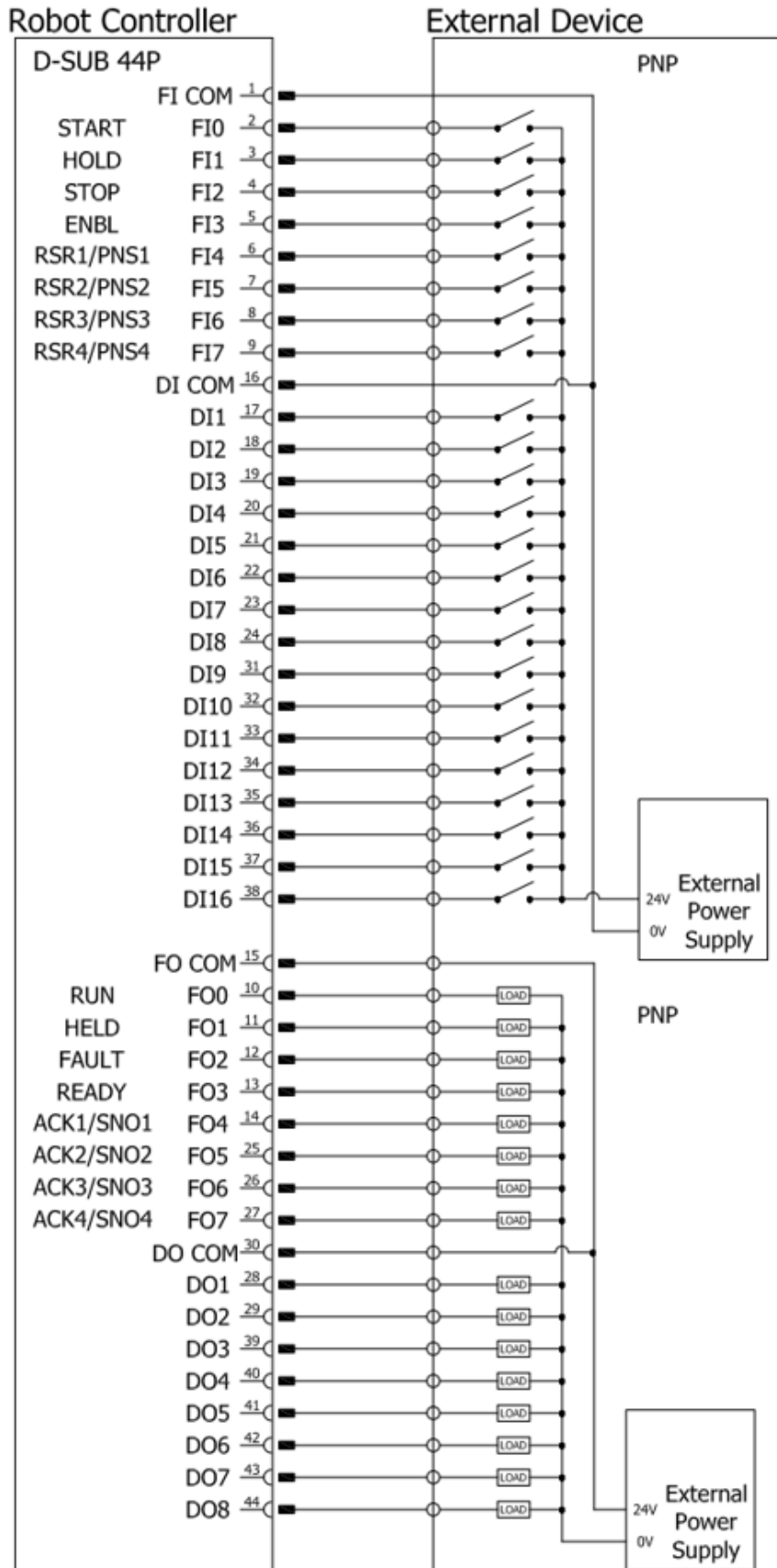
D-SUB 44P

INPUT: NPN    OUTPUT: NPN



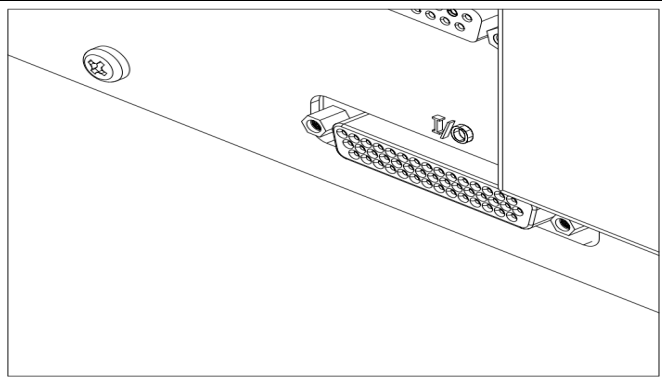
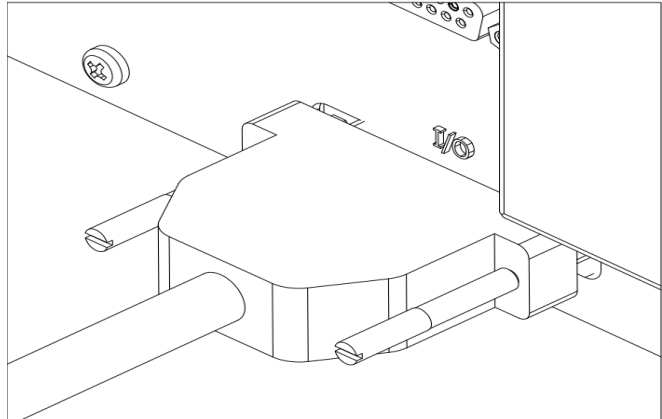
D-SUB 44P

INPUT: PNP    OUTPUT: PNP





**Connection method:**

<p>The I/O connector of the controller. The connector has directionality. If it cannot be inserted, please convert the angle and insert it again.</p>	
<p>Plug in the connector and secure the screw indeed.</p>	

 **DANGER**

- No signal or power supply should be close to or in contact with any metal case. Incorrect method of using can cause a severe damage or loss of life and property.

 **WARNING**

- To prevent the internal component from damage, any wiring operation must be done only when the controller is disconnected.

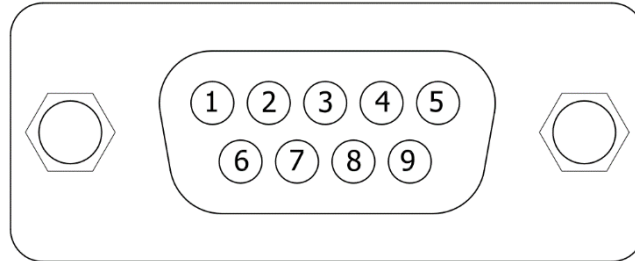
 **CAUTION**

- ❖ Please make sure the screws on the connector are secured.

### 3.4 RS-232 Port

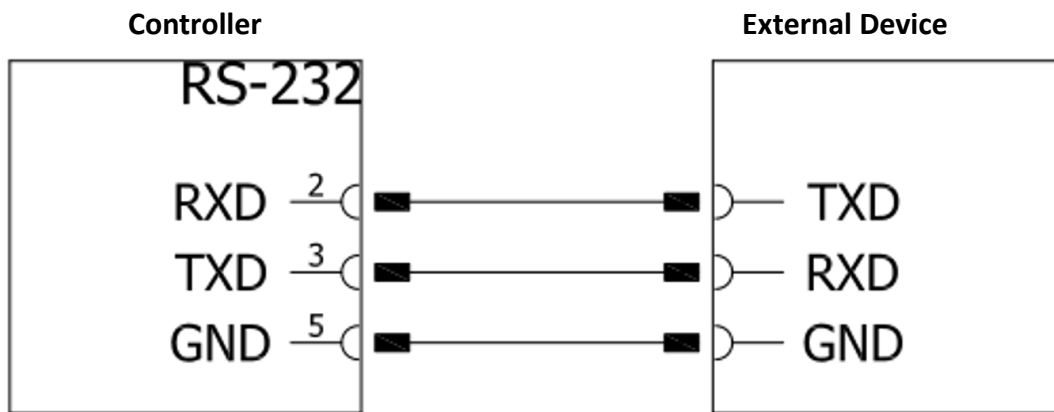
**Description:**

The following figure shows the pin assignment of RS-232 controller.

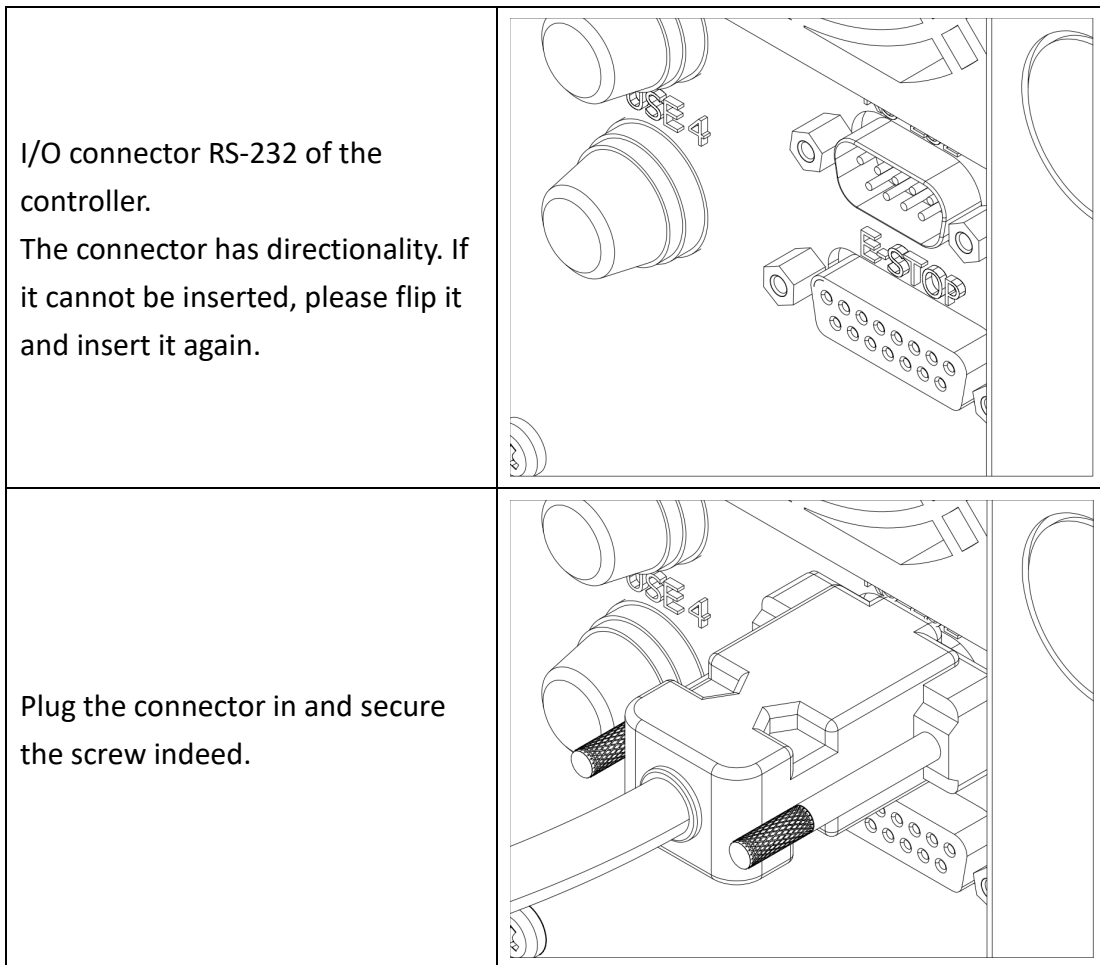


Pin	Description
2	RXD-Receiver
3	TXD-Transmit
5	GND -Ground

The following figure shows the connection method with external device.



**Connection method:**



 **DANGER**

- No signal or power supply should be close to or in contact with any metal case. Incorrect method of using can cause a severe damage or loss of life and property.

 **WARNING**

- To prevent the internal component from damage, any wiring operation must be done only when the controller is disconnected.

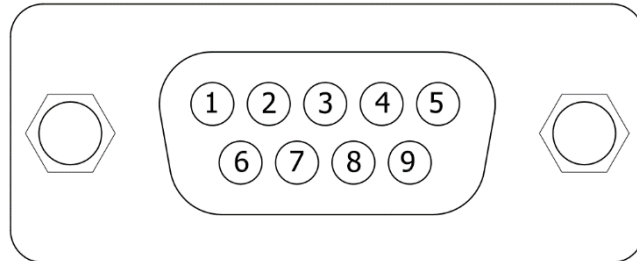
 **CAUTION**

Please make sure the screws on the connector are secured.

### 3.5 RS-485 Port

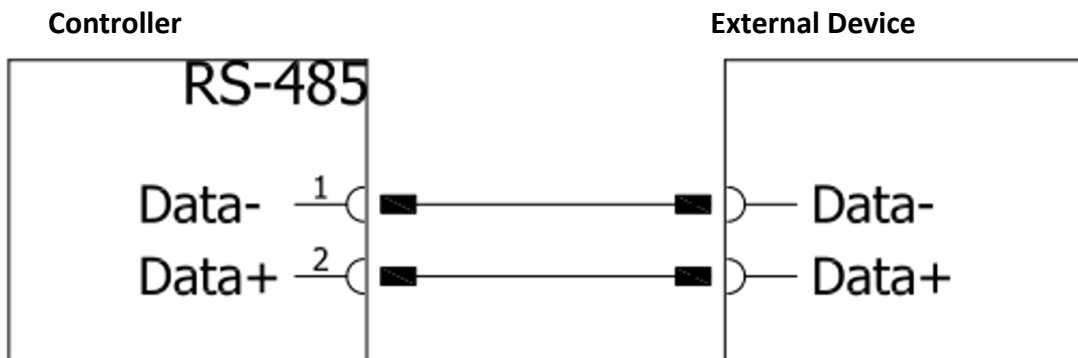
**Description:**

The following figure shows the pin assignment of RS-485 controller.



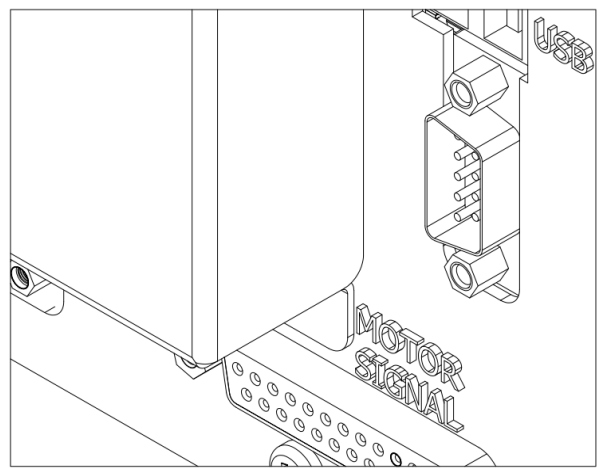
PIN	Description
1	Data-
2	Data+

The following figure shows the connection method with external device.

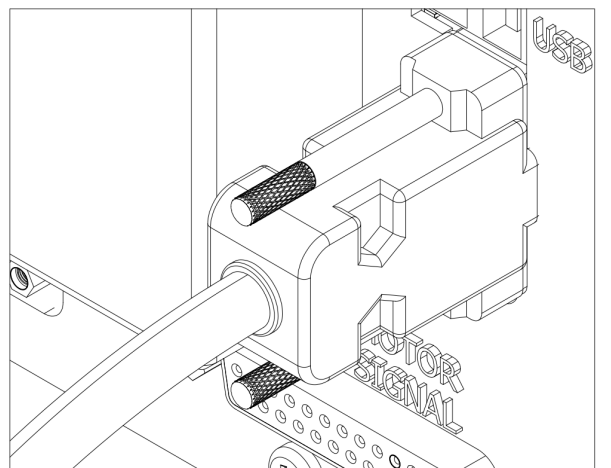


**Connection method:**

I/O connector RS-485 of the controller.  
The connector has directionality. If it cannot be inserted, please flip it and insert it again.



Plug the connector in and secure the screw indeed.



 **DANGER**

- No signal or power supply should be close to or in contact with any metal case. Incorrect method of using can cause a severe damage or loss of life and property.

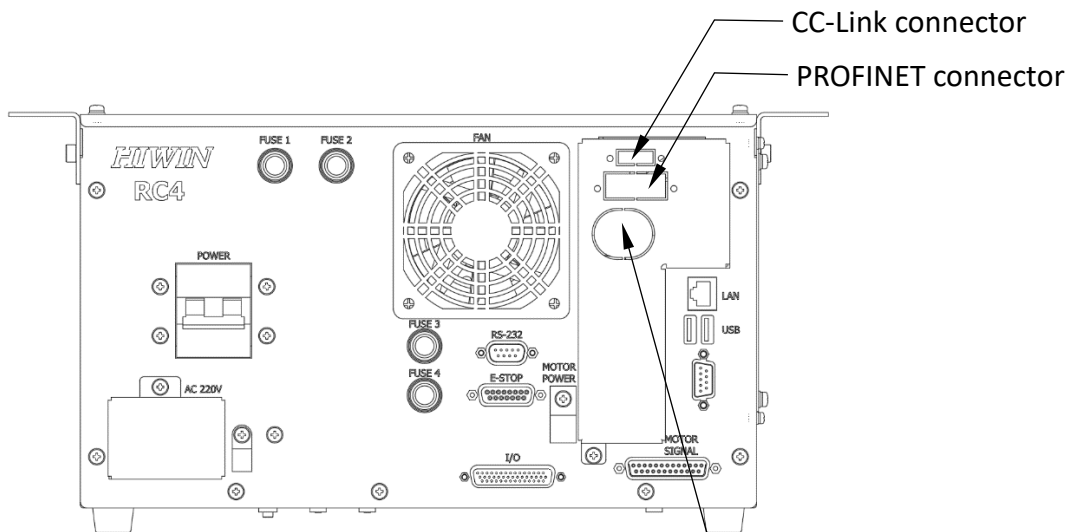
 **WARNING**

- To prevent the internal component from damage, any wiring operation must be done only when the controller is disconnected.

 **CAUTION**

- ❖ Please make sure the screws on the connector are secured.

### 3.6 External I/O expansion interface (optional)



Install cable grommet and ethernet cable.

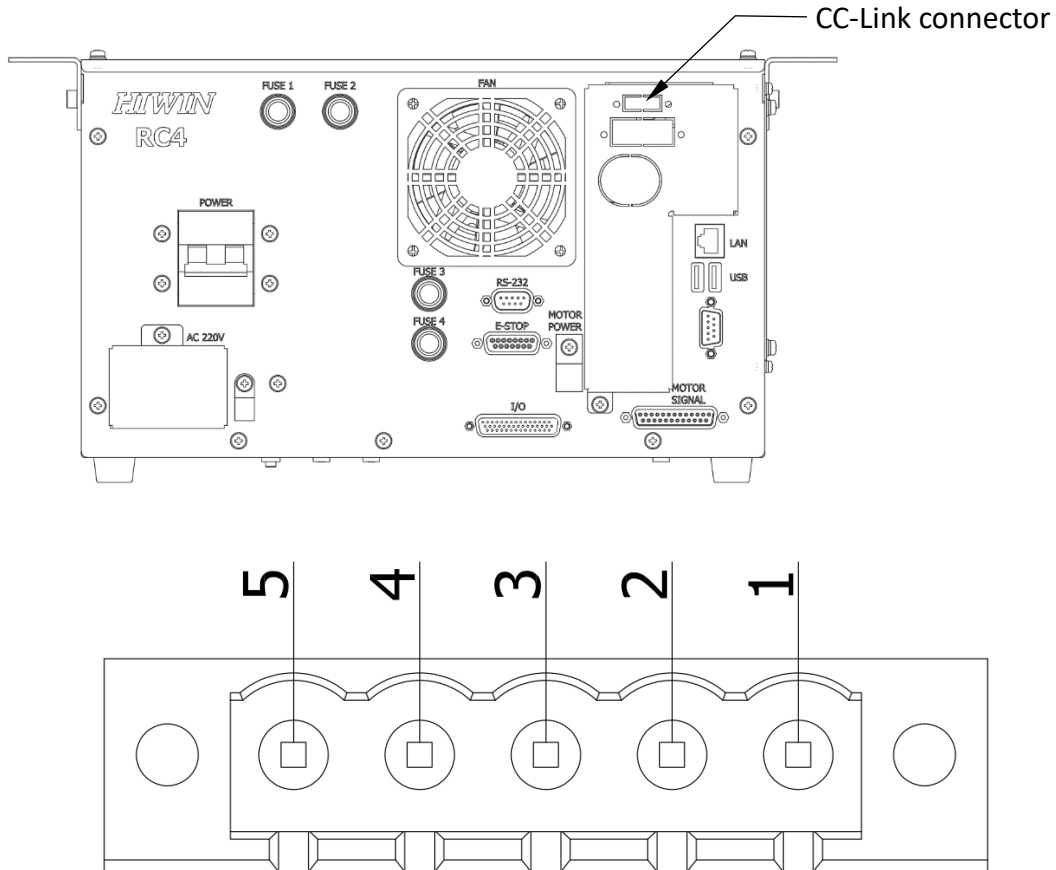
Expansion module:

- 32 channel DO module
- 32 channel DI module
- 16DI & 16DO module
- Encoder data acquisition module

### 3.6.1 CC-LINK Interface (optional)

**Description:**

The following figure shows the pin assignment of CC-LINK controller.

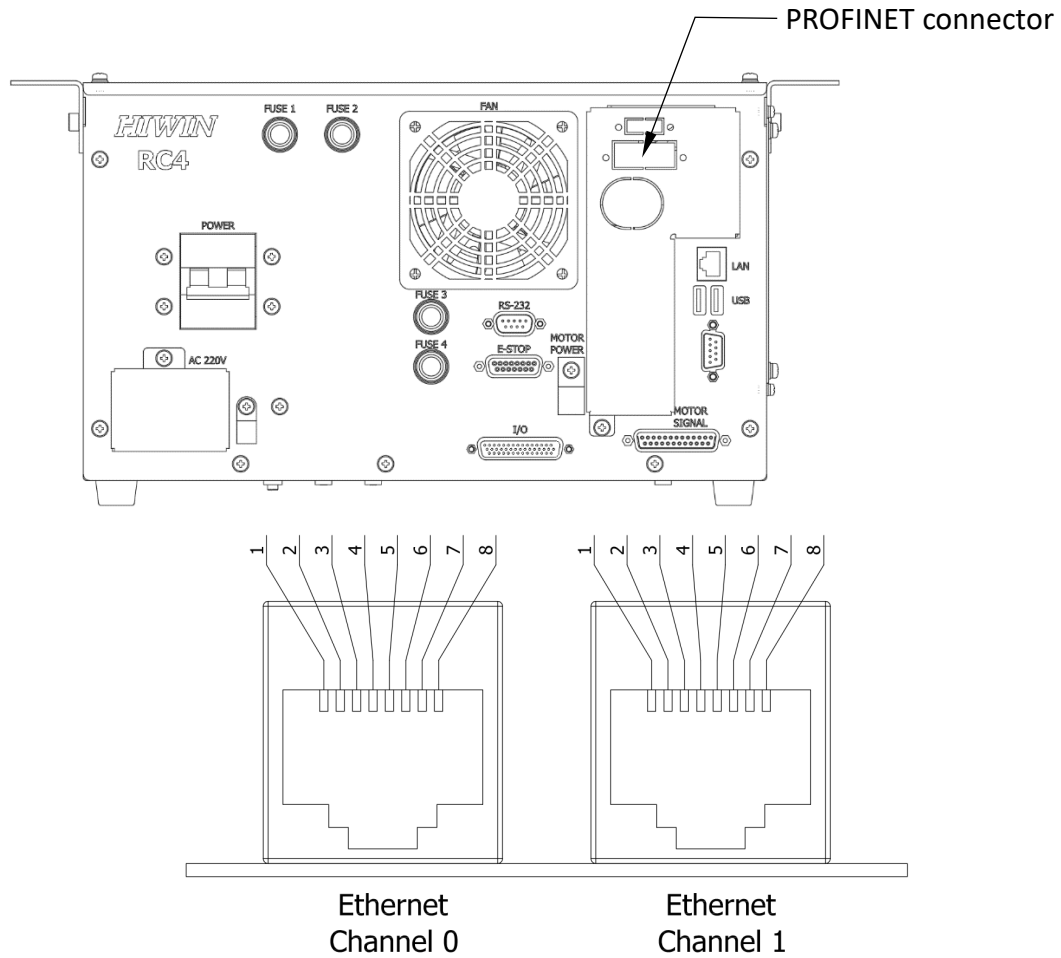


Pin	Signal	Description
1	DA	Data A
2	DB	Data B
3	DG	Data Ground
4	SLD	Shield
5	FG	Field Ground

### 3.6.2 PROFINET IO Interface (optional)

**Description:**

The following figure shows the pin assignment of PROFINET controller.



Pin	Signal	Description
1	TX+	Transmit Data +
2	TX-	Transmit Data -
3	RX+	Receive Data +
4	Term 1	Connected to each other and terminated to PE through RC circuit
5	Term 1	
6	RX-	Receive Data -
7	Term 2	Connected to each other and terminated to PE through RC circuit
8	Term 2	



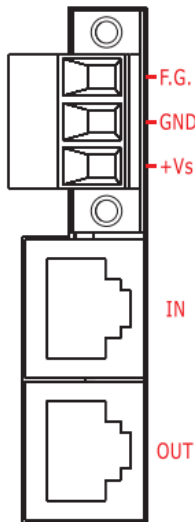
### 3.6.3 Encoder data acquisition module (optional)

**Description:**

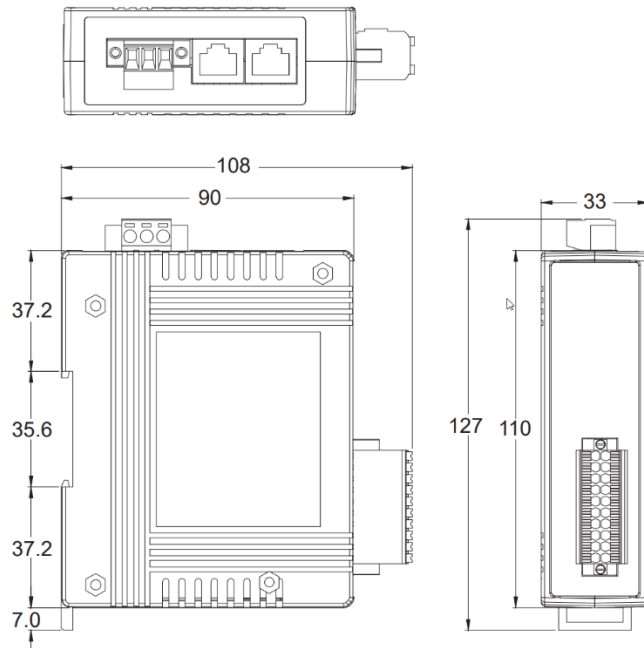
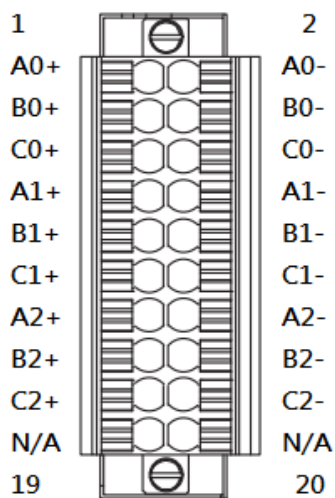
The encoder data acquisition module is used with the encoder, and its pin definition is shown below.

**! CAUTION**

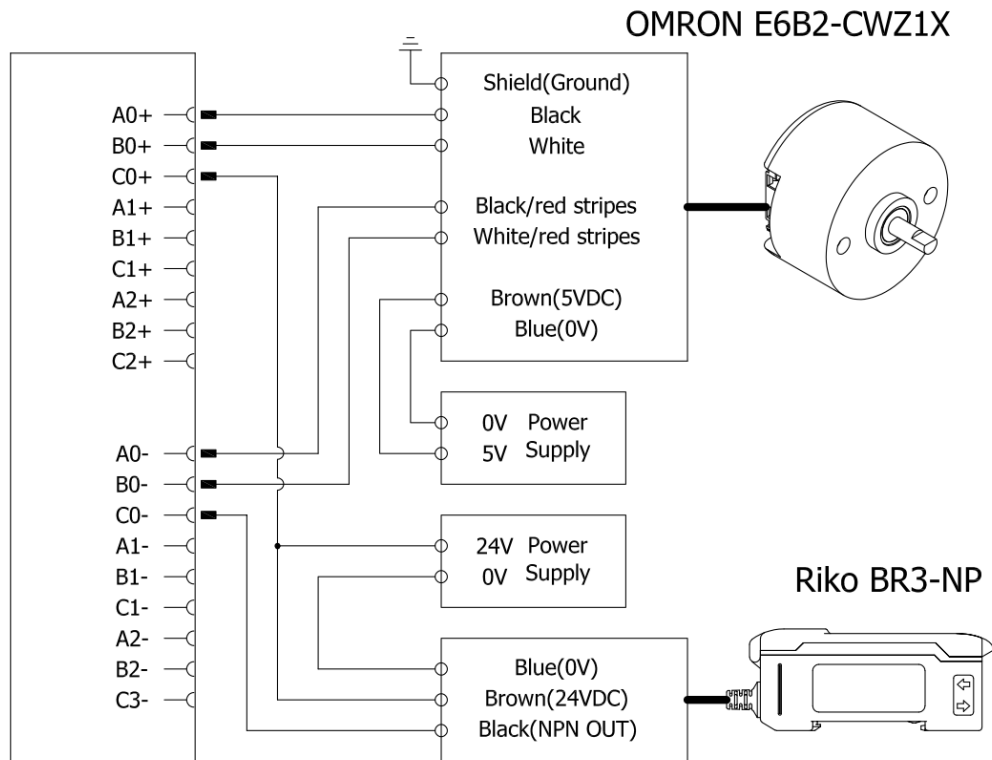
- ❖ Use an incremental rotary encoder with differential output signal.



Signal	Description
F.G	Frame Ground
GND	Power supply: Ground 0V
+Vs	Power supply: +24V <sub>DC</sub>
IN	EtherCAT signal input
OUT	EtherCAT signal output



The pin assignment of the encoder data acquisition module is shown below.

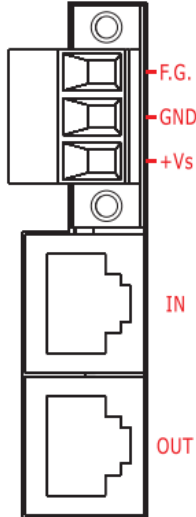


Signal	Description	Channel
A0+	Encoder input A0+	Channel 0
A0-	Encoder input A0-	
B0+	Encoder input B0+	
B0-	Encoder input B0-	
C0+	24 VDC	
C0-	Latch NPN out	
A1+	Encoder input A1+	Channel 1
A1-	Encoder input A1-	
B1+	Encoder input B1+	
B1-	Encoder input B1-	
C1+	24 VDC	
C1-	Latch NPN out	
A2+	Encoder input A2+	Channel 2
A2-	Encoder input A2-	
B2+	Encoder input B2+	
B2-	Encoder input B2+	
C2+	24 VDC	
C2-	Latch NPN out	

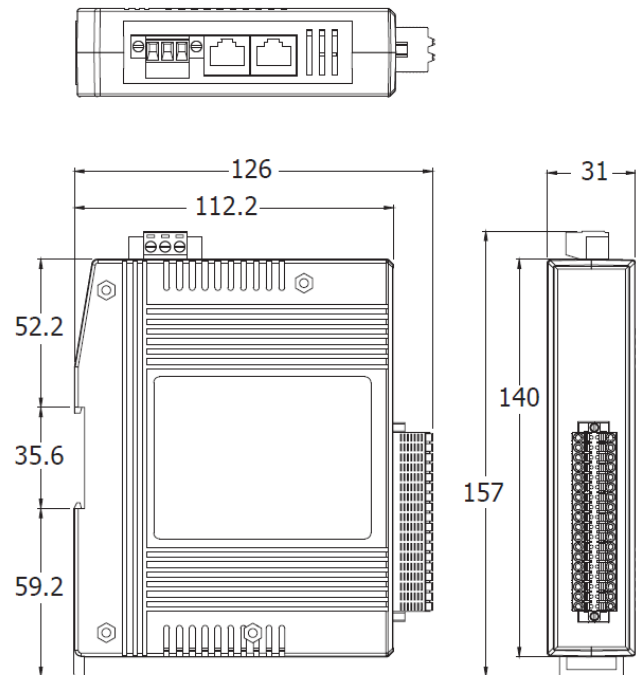
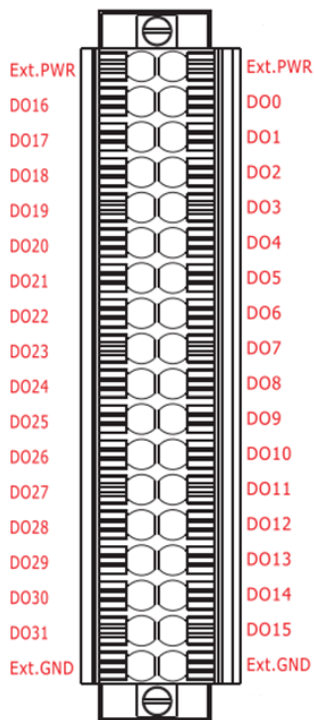
### 3.6.4 I/O Module with 32CH Digital Outputs (optional)

**Description:**

The following figure shows the pin assignment of the I/O module with 32ch digital outputs.

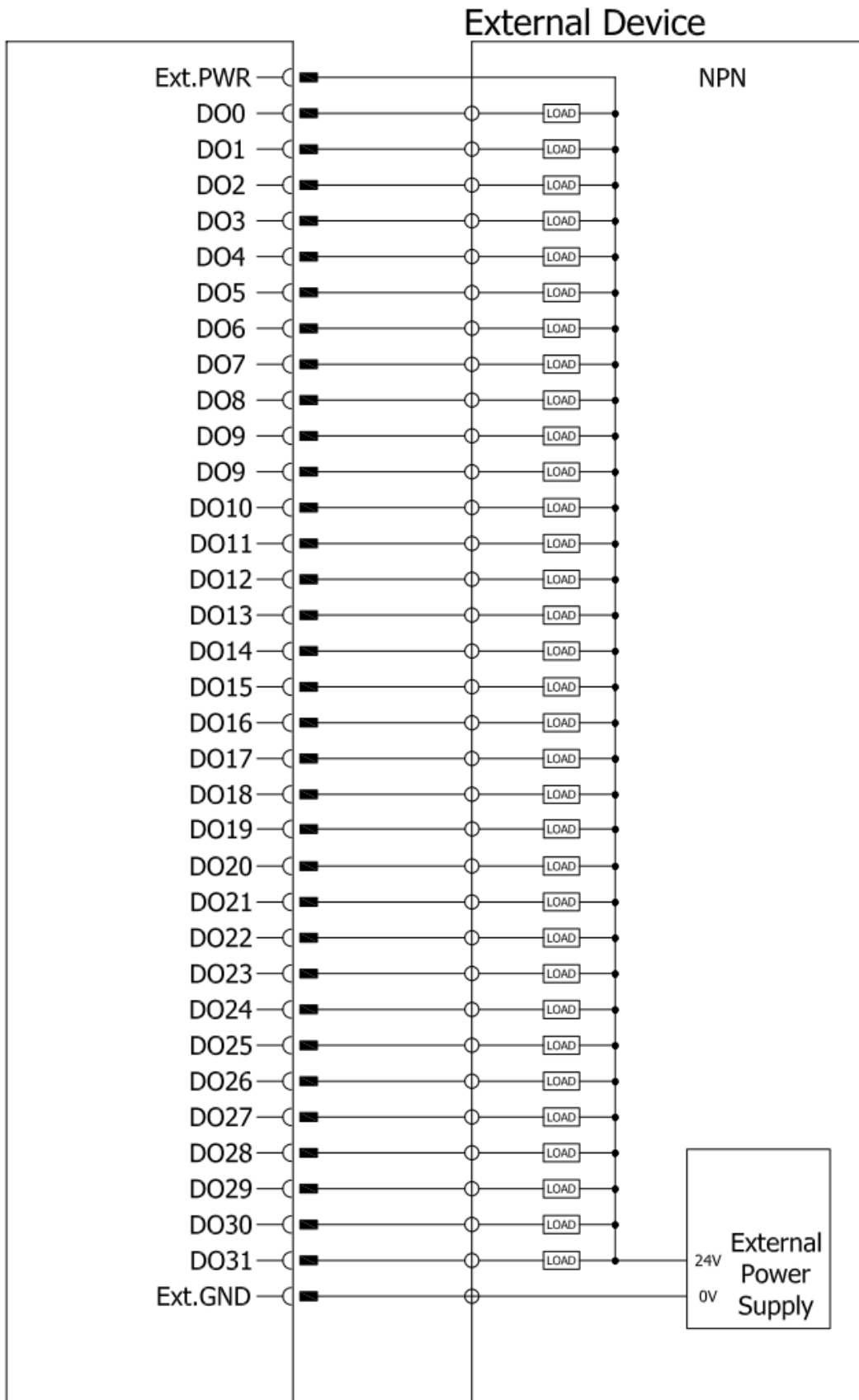


Signal	Description
F.G	Frame Ground
GND	Power supply: Ground 0V
+Vs	Power supply: +24V <sub>DC</sub>
IN	EtherCAT signal input
OUT	EtherCAT signal output



**CAUTION**

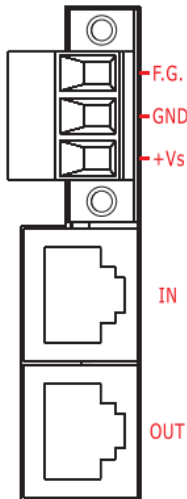
- ❖ The number of expansion modules and the number of I/O channels can be changed flexibly, so the DI/DO number on the device and the DI/DO number on the software interface will be different.



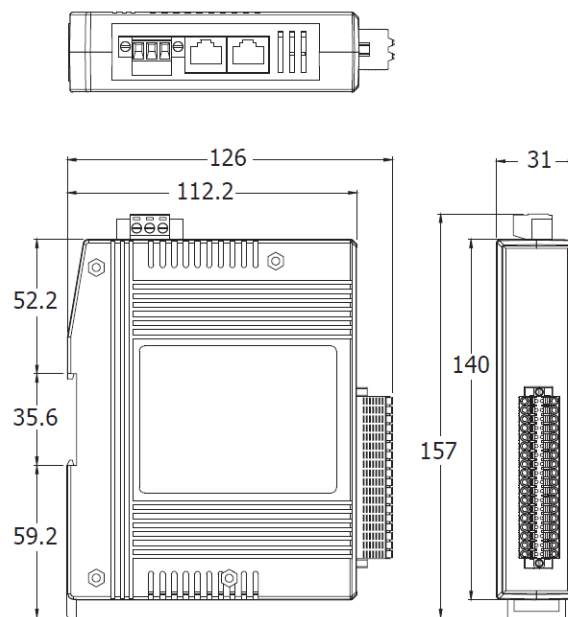
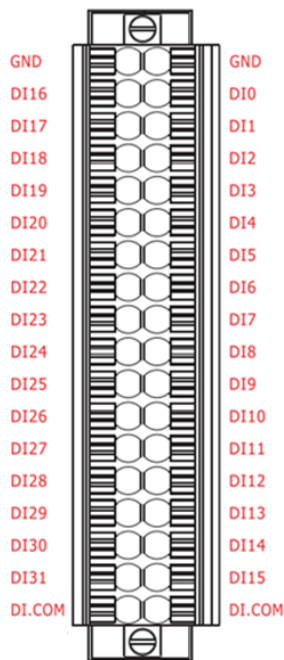
### 3.6.5 I/O Module with 32CH Digital Inputs (optional)

**Description:**

The following figure shows the pin assignment of the I/O module with 32ch digital inputs.



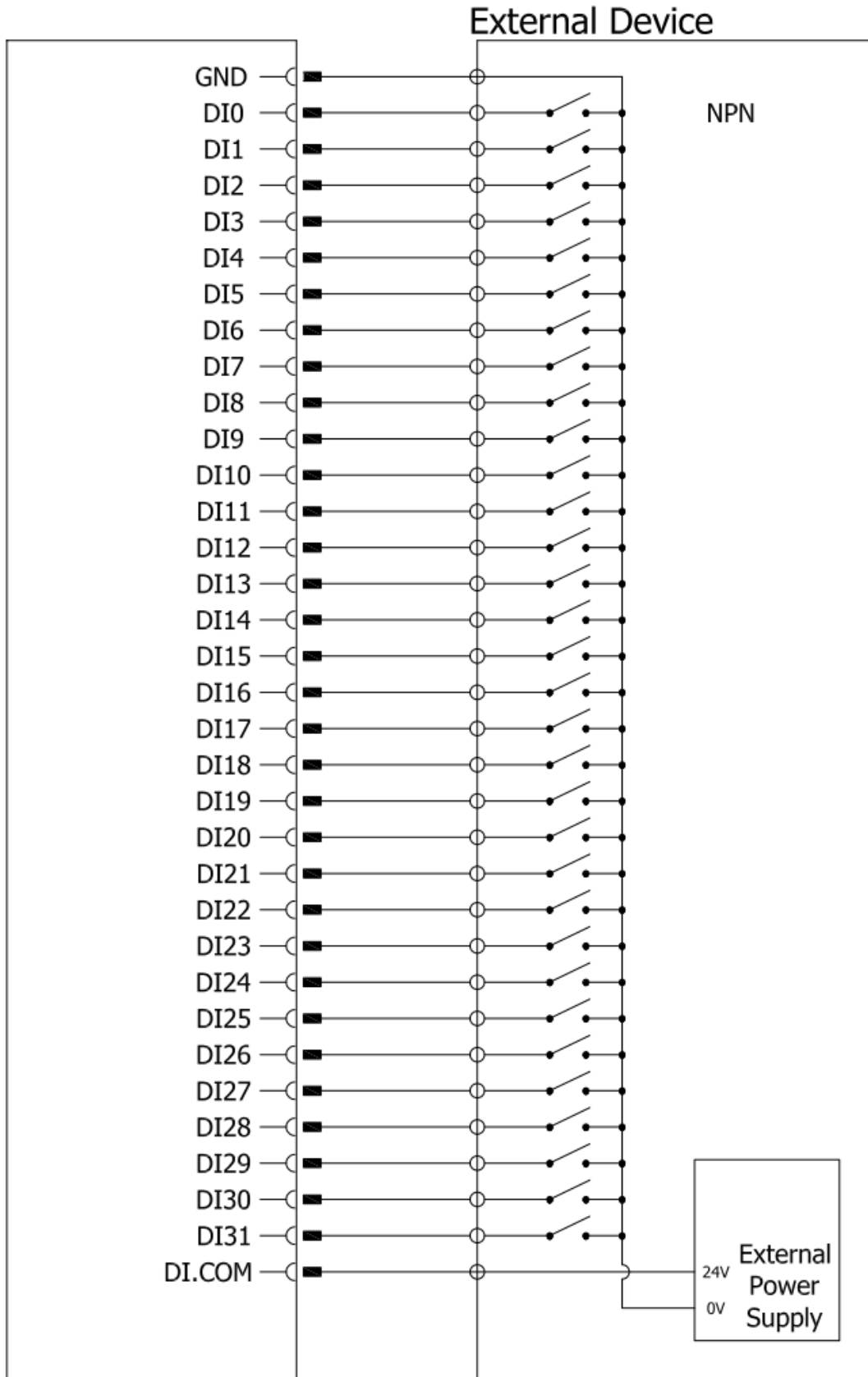
Signal	Description
F.G	Frame Ground
GND	Power supply: Ground 0V
+Vs	Power supply: +24V <sub>DC</sub>
IN	EtherCAT signal input
OUT	EtherCAT signal output

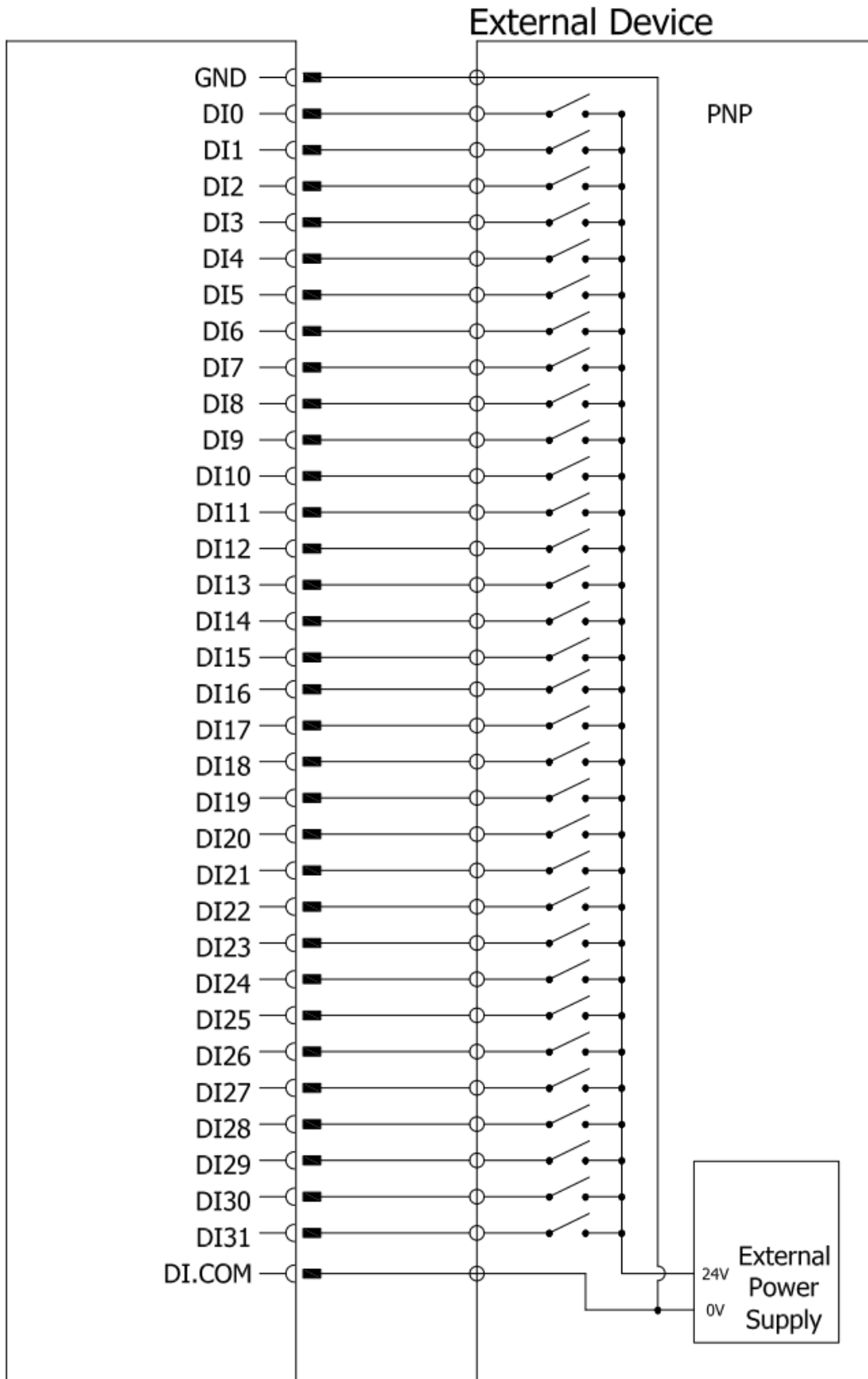


Digital INPUT can be an NPN or PNP, adjusted by DI COM, supplied by an external power supply. (COM→24V: NPN / COM→0V: PNP)

**! CAUTION**

- ❖ The number of expansion modules and the number of I/O channels can be changed flexibly, so the DI/DO number on the device and the DI/DO number on the software interface will be different.

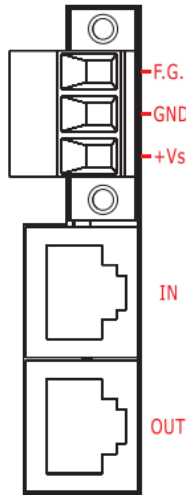




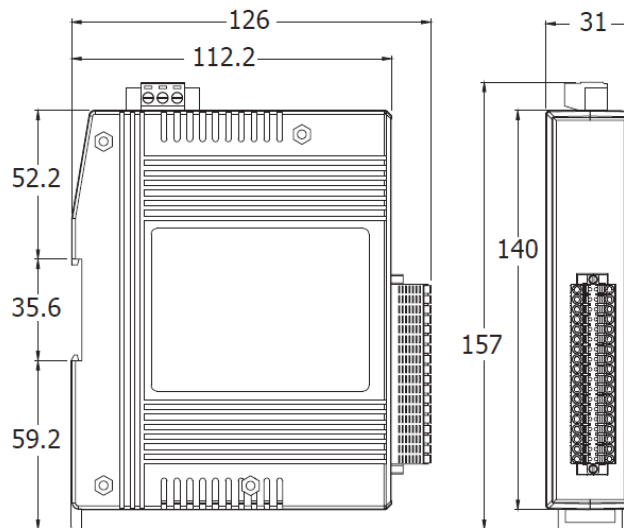
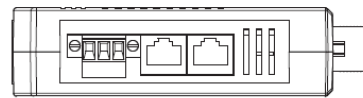
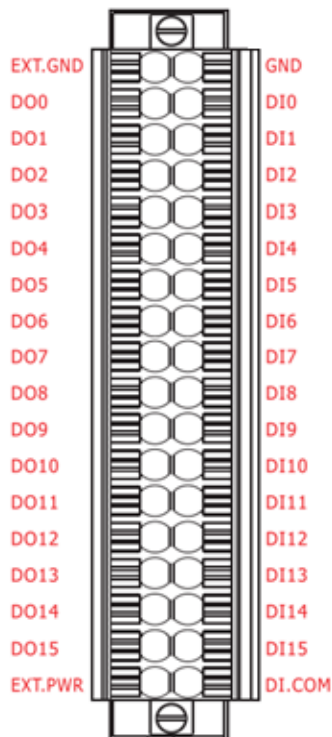
### 3.6.6 I/O Module with 16CH DO and 16CH DI (optional)

**Description:**

The following figure shows the pin assignment of the I/O module with 16ch digital inputs and 16ch digital outputs.



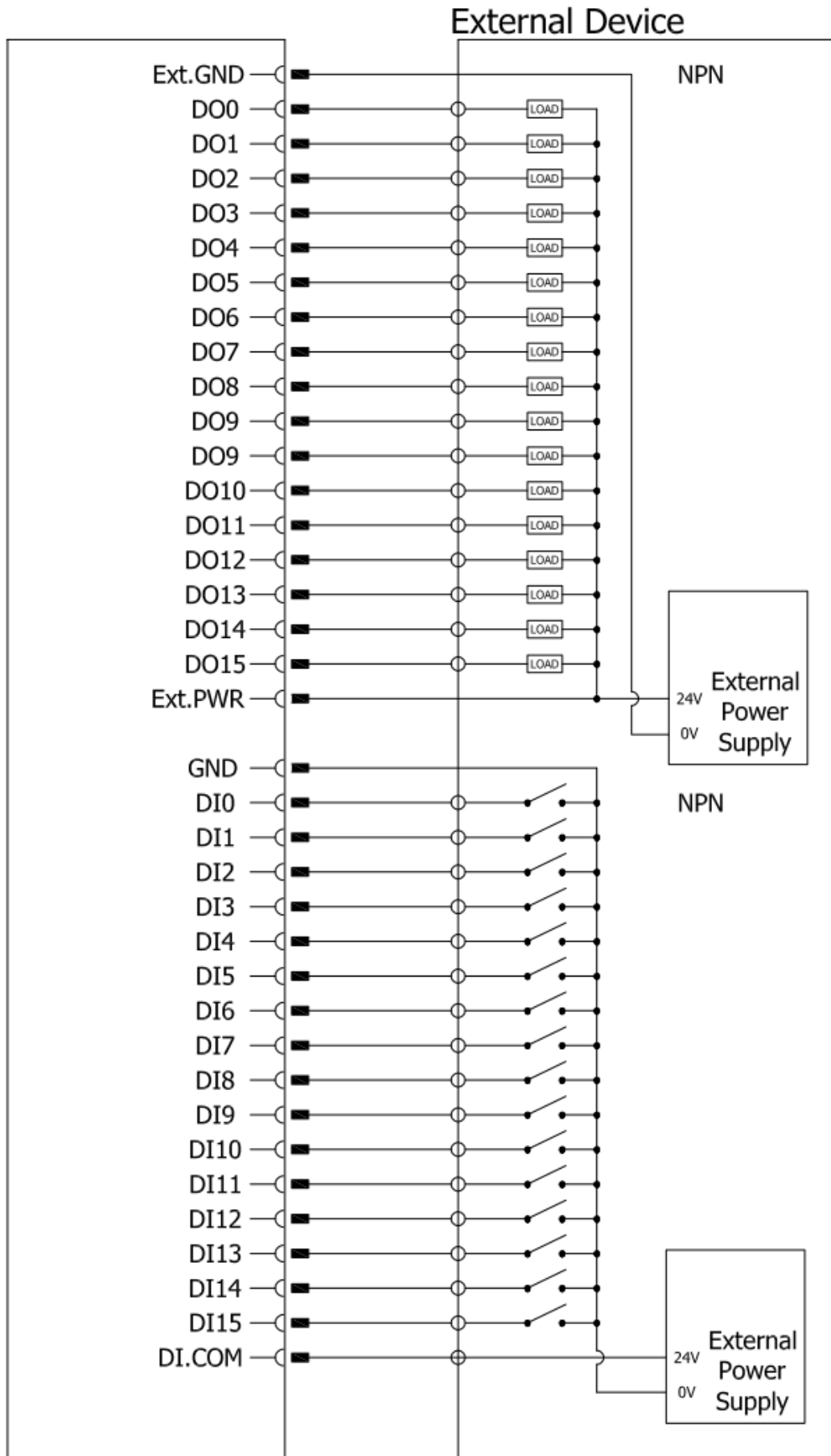
Signal	Description
F.G	Frame Ground
GND	Power supply: Ground 0V
+Vs	Power supply: +24V <sub>DC</sub>
IN	EtherCAT signal input
OUT	EtherCAT signal output

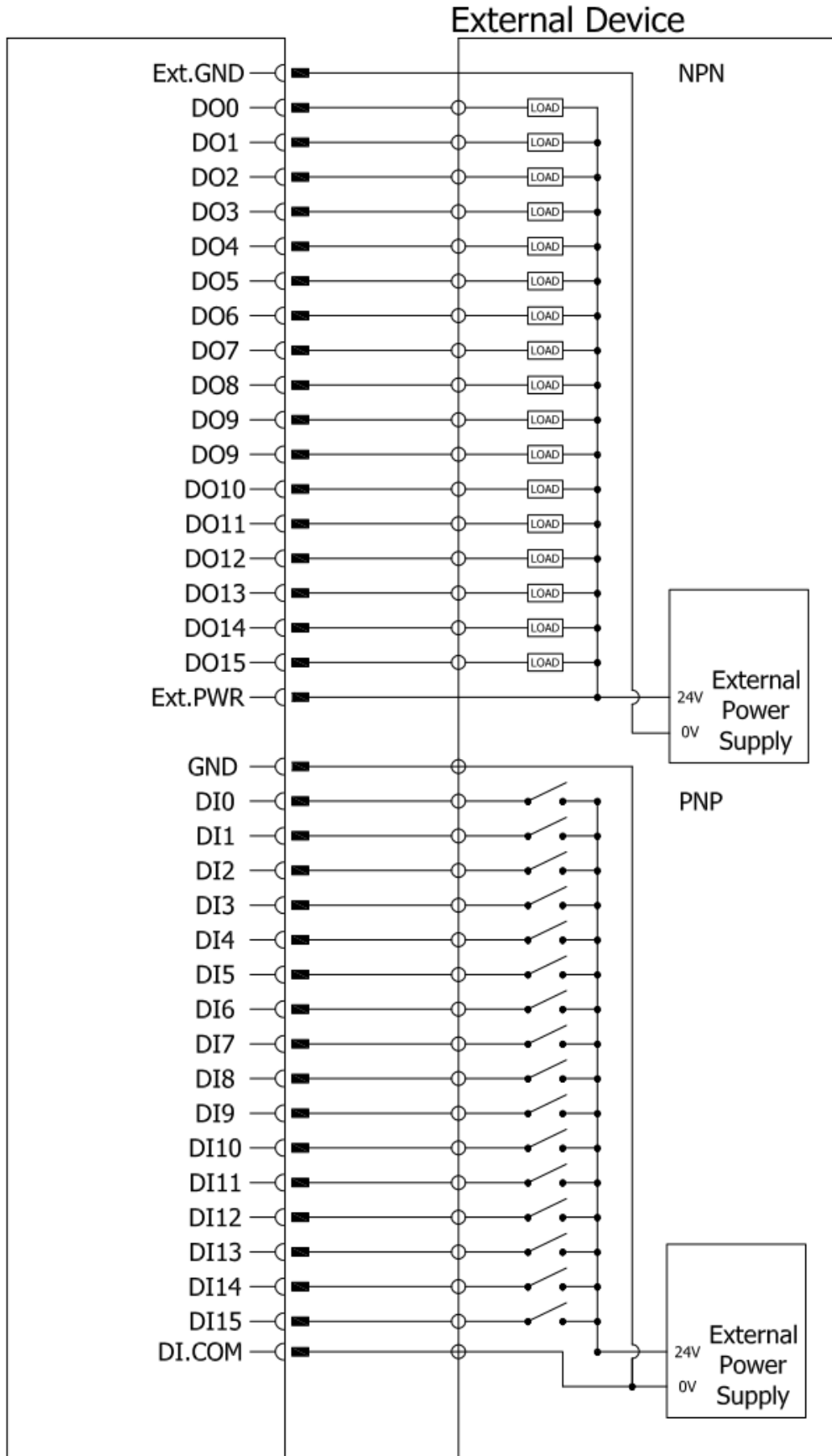


**! CAUTION**

- ❖ The number of expansion modules and the number of I/O channels can be changed flexibly, so the DI/DO number on the device and the DI/DO number on the software interface will be different.







## 4 Maintenance

### 4.1 Fan Filter

The fan inlet hole of the controller contains filter. The filter has the effect of blocking external foreign matter and filtering the air. It needs to be checked regularly, and the frequency of replacing the filter depends on the working environment.

Step1. Remove the fan filter cover.

Step2. Replace the internal filter.

Step3. Mount the fan filter cover.



### CAUTION

- ❖ The accumulation of foreign matter causing internal filter experiencing poor convection. This may cause the inner controller occurring over-temperature and controller to fail or damage.

## 4.2 Confirmation of Robot System Operation

The following describes how to confirm the robot system operation after maintaining the robot manipulator or controller.

- (1) Connect all the cables that is required, see Chapter 2 Basic Architecture.
- (2) After the controller power is turned ON, the fan starts to run.
- (3) After the controller power is turned on for about three minutes, the LED indicator status flashes. (RS405/RS410-LU series)



- (1) Operate the software and execute the Manual or Auto mode. The robot arm is energized and the LED status is maintained to be steady.
- (2) Execute the Manual or Auto mode and confirm that the robot arm is operating normally without vibration or abnormal sound.

### WARNING

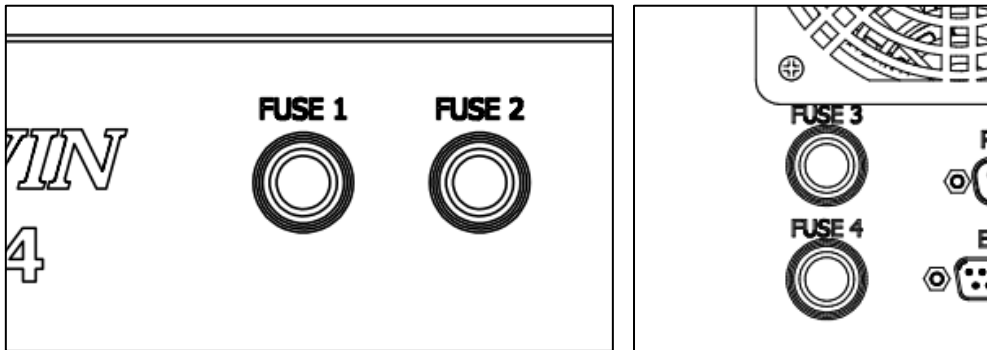
- When checking the operation, check that there is no setting or wiring error.
- If the robot arm performs an abnormal operation due to a setting or wiring error, immediately press the emergency stop switch to stop the robot arm.
- When the operation is confirmed, if the robot arm is abnormal; and if it does not stop immediately, it will not only damage the device, but also causing major safety problems.

### CAUTION

- ❖ The display on the controller needs to be correct for the model of the robot arm. Please be careful not to make mistakes and avoid danger.

## 4.3 Fuse

If the controller fails to start, try to check if the fuse on the RC4 panel is blown:



Inspection method:

- Step1. Turn the FUSE1, FUSE2 fuse holder cover counterclockwise.
- Step2. Take out the FUSE1 and FUSE2 fuses and check if the fuse is blown.
- Step3. If the fuse is blown, replace the fuse.
- Step4. FUSE1 and FUSE2 specifications are 10A (5.2mm\*20mm) glass fuses.
- Step5. After the fuse is replaced, lock the fuse holder cover back.

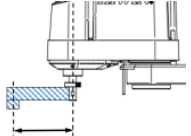
When the emergency stop circuit is short-circuited due to external factors, and the robot arm cannot be enabled. The inspection method is as follows:

- Step1. Repeat above steps, check if FUSE3 and FUSE4 are blown.
- Step2. FUSE3 and FUSE4 specifications are 1A (5.2mm\*20mm) glass fuses.

### WARNING

- The fuse replacement must be operated with the controller switched off.
- Do not replace fuses with different amperages or replace fuses with other conductive materials (wire, iron).

## 5 Robot/Controller Requirements Questionnaire

Customer information		Date:	
Company: Contact Person: Phone: Address:		Form completed by:	
Application	<input type="checkbox"/> Industry <input type="checkbox"/> Food <input type="checkbox"/> Medical <input type="checkbox"/> Other _____		
Maximum reach *	_____ mm	Payload*	_____ kg
Repeatability *	± _____ mm		
Distance *	_____ mm (The distance of the center of mass of the workpiece from ball spline)		
Cycle time*	_____ sec.		
J3 stroke*	<input type="checkbox"/> 200mm <input type="checkbox"/> 400mm		
Power type*	<input type="checkbox"/> Single phase 200V~240V <input type="checkbox"/> Other _____ V		
Power and signal cable length*	<input type="checkbox"/> 2m   Other(optional): <input type="checkbox"/> 5m <input type="checkbox"/> 10m		
IP Protection grade	<input type="checkbox"/> IP20   Other(optional): <input type="checkbox"/> IP54 <input type="checkbox"/> Cleanroom(Class100)		
Communication format	<input type="checkbox"/> Ethernet <input type="checkbox"/> RS-232 <input type="checkbox"/> Modbus-TCP(TCP/IP) Other(optional): <input type="checkbox"/> CC-Link <input type="checkbox"/> PROFINET <input type="checkbox"/> DeviceNet <input type="checkbox"/> EtherNet/IP		
Expansion module (optional)	<input type="checkbox"/> DO32 module <input type="checkbox"/> DI32 module <input type="checkbox"/> DI16 & DO16 module <input type="checkbox"/> Conveyor tracking module (Encoder data acquisition module 、 encoder 、 ethernet cable) <input type="checkbox"/> High-speed ethernet Cable(3m)		
Other (optional)	<input type="checkbox"/> Emergency stop button switch (5m) <input type="checkbox"/> Bellow <input type="checkbox"/> Ball spline grease(G04) <input type="checkbox"/> Reducer grease(G11) <input type="checkbox"/> Cable grommet <input type="checkbox"/> I/O connector wiring set		
Recommended specification :		HIWIN adviser :	

Fields marked with \* are required.

## **Robot Controller - RC4 (Original Instruction) User Manual**

Publication Date : January 2020

- 
1. HIWIN is a registered trademark of HIWIN Technologies Corp. For your protection, avoid buying counterfeit products from unknown sources.
  2. Actual products may differ from specifications and photos provided in this catalog. These differences may be the result of various factors including product improvements.
  3. HIWIN will not sell or export products or processes restricted under the "Foreign Trade Act" or related regulations. Export of restricted products should be approved by proper authorities in accordance with relevant laws and shall not be used to manufacture or develop nuclear, biochemical, missiles or other weapons.
  4. HIWIN website for patented product directory: [http://www.hiwin.tw/Products/Products\\_patents.aspx](http://www.hiwin.tw/Products/Products_patents.aspx)



## Subsidiaries / Research Center

### HIWIN GmbH

OFFENBURG, GERMANY  
[www.hiwin.de](http://www.hiwin.de)  
[www.hiwin.eu](http://www.hiwin.eu)  
[info@hiwin.de](mailto:info@hiwin.de)

### HIWIN JAPAN

KOBE · TOKYO · NAGOYA · NAGANO ·  
TOHOKU · SHIZUOKA · HOKURIKU ·  
HIROSHIMA · FUKUOKA · KUMAMOTO,  
JAPAN  
[www.hiwin.co.jp](http://www.hiwin.co.jp)  
[info@hiwin.co.jp](mailto:info@hiwin.co.jp)

### HIWIN USA

CHICAGO, U.S.A.  
[www.hiwin.com](http://www.hiwin.com)  
[info@hiwin.com](mailto:info@hiwin.com)

### HIWIN Srl

BRUGHERIO, ITALY  
[www.hiwin.it](http://www.hiwin.it)  
[info@hiwin.it](mailto:info@hiwin.it)

### HIWIN Schweiz GmbH

JONA, SWITZERLAND  
[www.hiwin.ch](http://www.hiwin.ch)  
[info@hiwin.ch](mailto:info@hiwin.ch)

### HIWIN s.r.o.

BRNO, CZECH REPUBLIC  
[www.hiwin.cz](http://www.hiwin.cz)  
[info@hiwin.cz](mailto:info@hiwin.cz)

### HIWIN SINGAPORE

SINGAPORE  
[www.hiwin.sg](http://www.hiwin.sg)  
[info@hiwin.sg](mailto:info@hiwin.sg)

### HIWIN KOREA

SUWON · CHANGWON, KOREA  
[www.hiwin.kr](http://www.hiwin.kr)  
[info@hiwin.kr](mailto:info@hiwin.kr)

### HIWIN CHINA

SUZHOU, CHINA  
[www.hiwin.cn](http://www.hiwin.cn)  
[info@hiwin.cn](mailto:info@hiwin.cn)

### Mega-Fabs Motion Systems, Ltd.

HAIFA, ISRAEL  
[www.mega-fabs.com](http://www.mega-fabs.com)  
[info@mega-fabs.com](mailto:info@mega-fabs.com)

### HIWIN TECHNOLOGIES CORP.

No. 7, Jingke Road,  
Taichung Precision Machinery Park,  
Taichung 40852, Taiwan  
Tel: +886-4-23594510  
Fax: +886-4-23594420  
[www.hiwin.tw](http://www.hiwin.tw)  
[business@hiwin.tw](mailto:business@hiwin.tw)