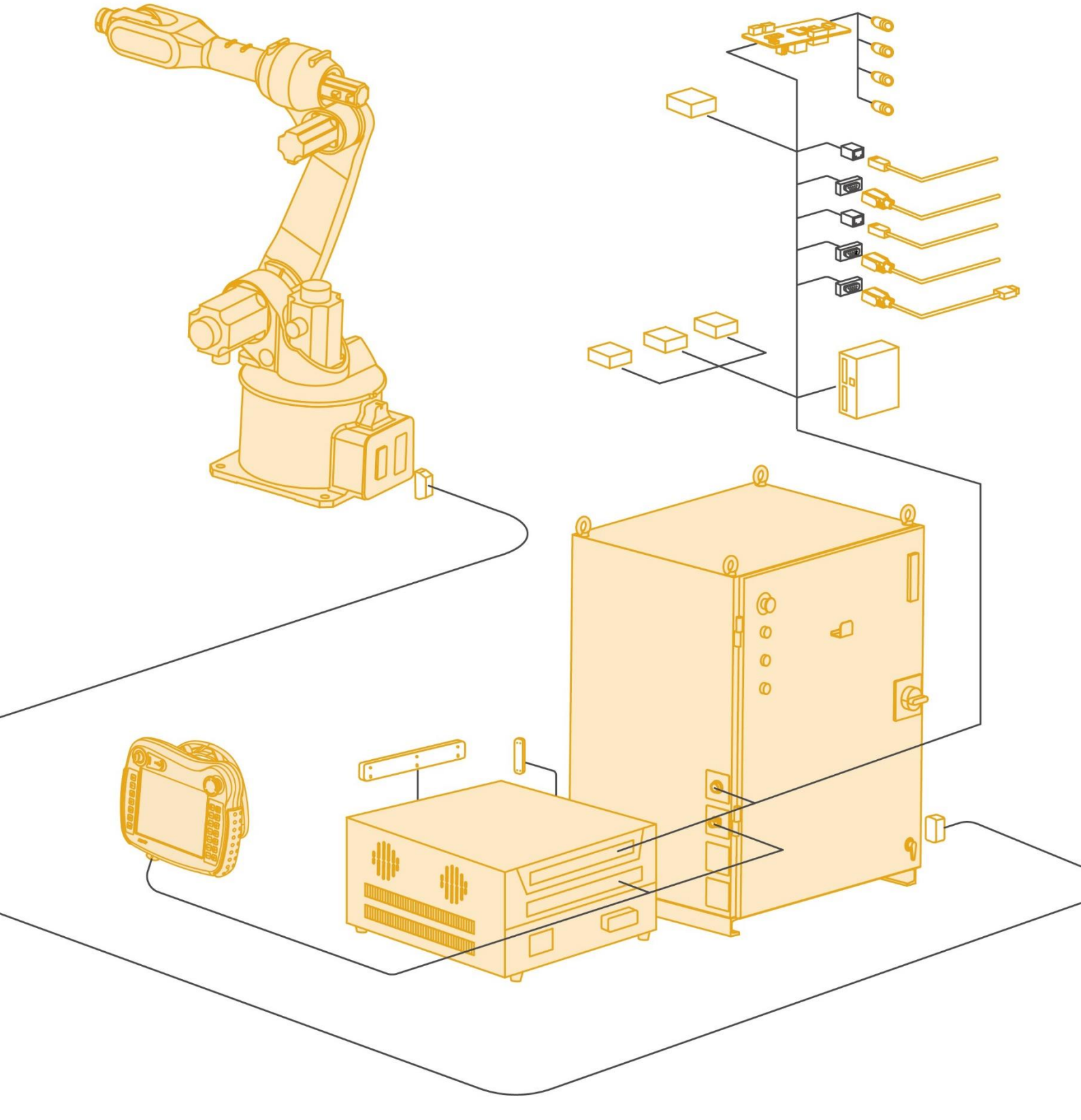
PEITIAN ROBOTICS

Optional Accessories Installation and User Manual

V1.6.0



Introduction

About this manual

This manual is to enable technicians to quickly, correctly and safely install and use the standard and optional accessories of the robot and related control cabinets, and to familiarize the relevant precautions.

Operating prerequisites

Before operating the robot, be sure to carefully read the product's general safety instructions and safety precautions. Users must understand safety knowledge and basic operating knowledge before operating the robot.

Please refer to:

- "inCube2x Control Cabinet Manual"
- "ARC4-50/75 Control Cabinet Manual"
- "ARC4-165 Control Cabinet Manual"
- "ARC5 Series Control Cabinet Manual-ARC5-12 and ARC5-25"
- "ARC5-280 Control Cabinet Manual"

Target groups

- Operator
- Product technician
- Technical service personnel
- Teacher

Common logo meanings

The symbols appearing in the manual and their meanings are detailed in Table 1 below.

Table 1 Logo used in this article

Logo	Meaning
 Danger	If instructions are not followed, an accident may occur, resulting in serious or fatal injury.
 Warning	If instructions are not followed, an accident may occur, resulting in moderate or minor injuries, or only material damage.

Logo	Meaning
 Notice	Prompts you to pay attention to the environmental conditions and important matters, or quick operation methods.
 Tip	You are prompted to refer to other literature and instructions for additional information or more detailed operating instructions for acquire.

Manual description

The content of this manual will be supplemented and revised. Please pay attention to the "Download Center" of our company's website regularly to obtain the latest version of the manual in time.

Website URL: http://robot.peitian.com/

Revision history

Revision history accumulates descriptions of each document update. The latest version of document contain contains the updated content of all previous document versions.

Table 2 Document Revision Records

Version	Release time	Modification instructions
V1.0.0	2020.07.30	First official release
V1.1.0	2020.08.05	1. Add the content of "inCube2S control cabinet external expansion I/O module installation" 2. Delete the content "inCube2S (as a slave) supports Modbus communication"
V1.2.0	2020.08.25	1. Add optional accessories for AIR4-560A: outlet from the bottom of the base 2. Correction: In all configurations of "external expansion IO module", replace "user IO terminal module" with "dedicated IO terminal module"
V1.3.0	2020.09.15	The models with outgoing cables on the manipulator side have been increased from the original AIR8-710A to the two models AIR8-710A/AIR10-1420A.
V1.3.1	2020.11.05	Fixed known bug: InCube20/21 series control cabinet's external expansion MF, IO part description error. The control cabinet side of DB9 head connected is X003, correct the relevant instructions and diagrams
V1.4.0	2020.12.23	Add "Software Function Package" chapter
V1.4.1	2021.01.20	The document number is changed to "UM-GP001-018"
V1.4.2	2021.02.01	Added "BDI module and BDO module" chapter
V1.4.3	2021.07.22	Corrected the "BDI module and BDO module" chapter

Version	Release time	Modification instructions
V1.4.4	2021.09.01	Corrected the chapter "16.5 Station Address Dipping Instructions"
V1.4.5	2021.09.16	Added IEB J5, J6, J7 interface description
V1.4.6	2021.10.20	Fix known bugs
V1.4.7	2021.11.20	1. Added "conveyor tracking option" 2. Add "PLC_MF installation size" 3. Add the "size of BDI and BDO"
V1.4.8	2022.02.10	Added "Chapter 6 - axis limit ring"
V1.4.9	2022.05.06	Fix known bugs
V1.5.0	2022.05.06	Switch the inCube20/22 control cabinet to version P2.0
V1.5.1	2023.06.05	Added "Chapter 8 ARC5 Cable Entry Components"
V1.6.0	2024.02.26	Fix known bugs Add "SCARA Robot Telescopic Cover and Protective Cover" Add "ARC5-280 control cabinet isolation transformer" Add "Standard heavy-duty line for ARC5-280 control cabinet" Add "RARC5-280 drag chain heavy-duty line for control cabinet"

Document number and version

The document number and version information are shown in Table 3.

Table 3 Document related information

Project	Illustrate
Manual name	"Optional Accessories Installation and User Manual"
Manual number	UM-GP001-018
Manual version	V1.6.0

Statement of Applicable Safety Standards

The requirements that the industrial robot system design meets are detailed in Table 4.

Table 4 Statement of Applicable Safety Standards

Standard	Illustrate	Version
2006/42/EC	Mechanical instruction: Machinery instruction 2006/42/EC (new version) with changes to	2006

Standard	Illustrate	Version
	95/16/EC by include of the European Parliament and the European Council of 17 May 2006	
2014/30/EU	Electromagnetic compatibility instruction: 2014/30/EU instruction issued by the European Parliament and the European Council on February 26, 2014 to balance electromagnetic compatibility regulations among member states.	2014
2014/68/EU	Pressure equipment instruction: 2014/68/EU instruction of the European Parliament and the European Council of 15 May 2014 to equalize pressure equipment regulations among Member States. (Only applicable to robots with hydropneumatic counterweights.)	2014
ISO13850	Machinery safety: Emergency shutdown design principles	2015
ISO13849-1	Machinery safety: Control system safety components; Part 1: General design principles	2015
ISO12100	Machinery safety: General design principles, risk assessment and risk reduction	2010
ISO10218-1	Industrial robots - safety requirements: Part 1: Robots (Tip: The content complies with ANSI/RIAR.15.06-2012, Part 1)	2011
61000-6-2	Electromagnetic Compatibility (EMC): Part 6-2: Professional Basic Standards; Immunity in Industrial Environments	2005
61000-6-4+A1	Electromagnetic Compatibility (EMC): Part 6-4: General standards; Radiated interference in industrial environments	2011
60204-1+A1	Machinery safety: Electrical equipment of machinery; Part 1: General requirements	2009
IEC 60529	Enclosure protection level (IP code): This standard is used for protection levels of electrical equipment with rated voltage not exceeding 72.5kv protected by enclosures.	2001

Contents

1 Forearm I/O elbow plug

1.1 Overview

There are 2 types of 12-pin aviation plugs for the forearm, see Table 1-1 for details.

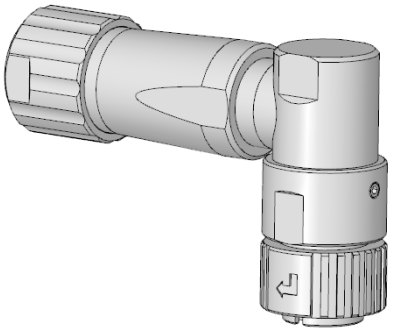
Table 1-1 Forearm 12-core aviation plug

Name	Specification	Adapted to manipulator	Part No	Construct dosage	Standard/optional
Straight tube aviation plug	LF10WBPD-12S	AIR4-560A/AIR6L-A/AIR7-920B/AIR8-710B	P09020100050 or P04083000433	Pick one of two	Standard configuration
Elbow aviation plug	LF10WBLP-12SA		P09020100009		Optional

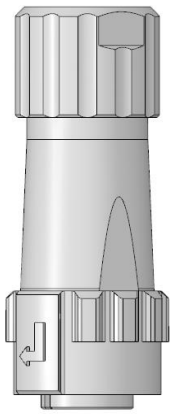
The forearm 12-pin air plug provides elbow air plug option (refer to Figure 1-1(a)) for electrical signal transmission, installed at the front end of the robot wrist, and connected to the cable and connector of the manipulator;

The direction of the standard straight tube aviation insertion line is perpendicular to the axis of the forearm. When it is necessary to avoid possible interference with the forearm accessories or in special application scenarios, the curved tube aviation insertion can be used instead of the straight tube aviation insertion (refer to Figure 1-1(b));

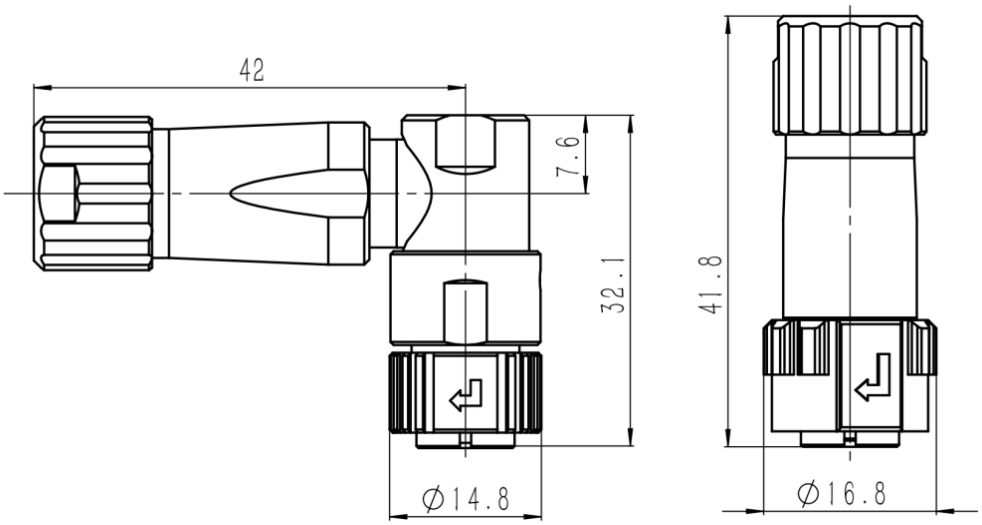
The direction of the curved pipe aviation plug-in line is horizontal with the axis of the forearm. For the difference in overall dimensions, please refer to Figure 1-1(c).



(a) Optional accessories: curved pipe aviation plug



(b) Factory standard accessories: straight pipe aviation plug



(c) Overall dimensions of straight pipe aviation plug and curved pipe aviation plug

Figure 1-1 Aviation plug

1.2 Installation steps

Installation steps:

Step1. Please refer to Figure 1-2. Unscrew and remove the metal cover of the aviation insert in the opposite direction of the rotation direction indicated by the metal cover of the aviation insert.

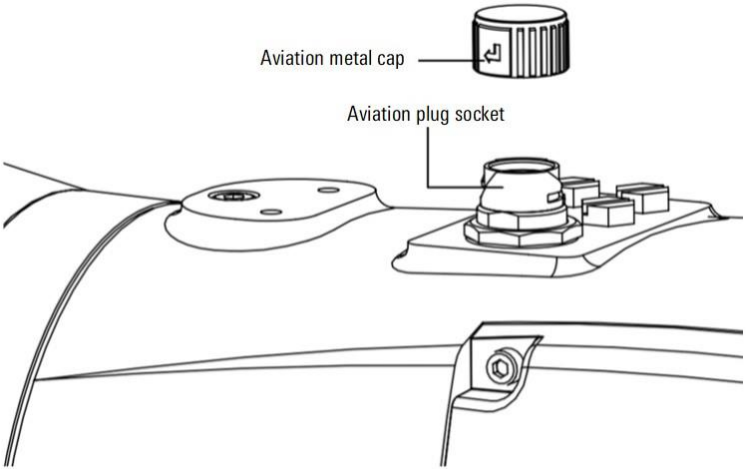


Figure 1-2 Step 1 diagram

Step2. Insert the curved pipe plug into the I/O interface of the forearm of the manipulator (refer to the aviation plug socket in Figure 1-3).

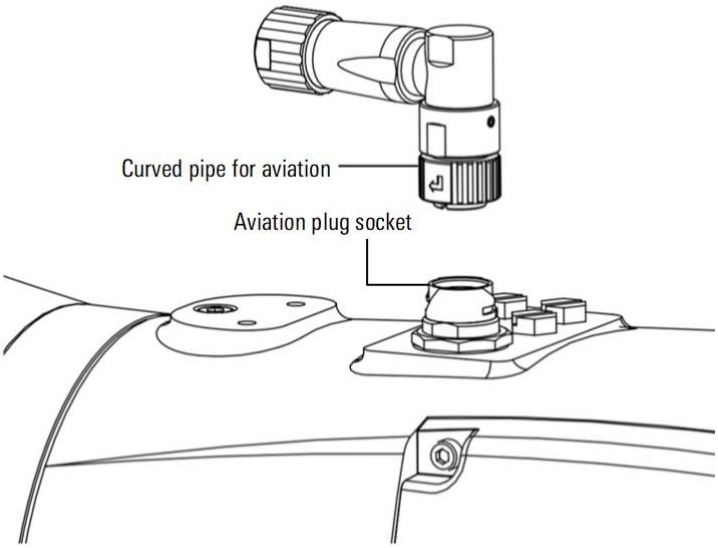


Figure 1-3 Step 2 diagram

Step3. Rotate the locking ring according to the direction of rotation indicated on the locking ring, refer to Figure 1-4.

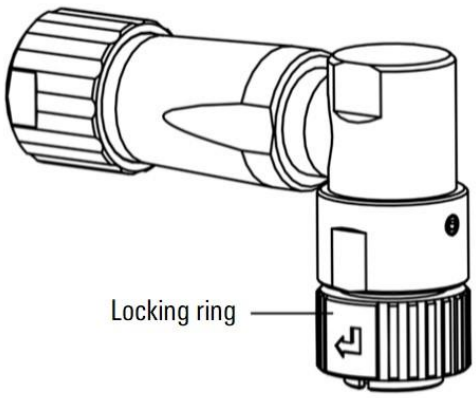


Figure 1-4 Step 3 diagram

2 Robot protective clothing

2.1 Overview

This option is used to provide additional protection to manipulator in special application scenarios.

The diagram of dust-proof and wear-resistant clothing is shown in Figure 2-1. For specifications of dust-proof and wear-resistant clothing, see Table 2-1.

Figure 2-1 Diagram of dust-proof and wear-resistant clothing

Table 2-1 Specification table of dust-proof and wear-resistant clothing

Name	Specification	Adapted to manipulator	Part No	Standard/optional
Dust-proof and wear-resistant protective clothing	Domestic fabric, double-sided coating, wear-resistant, dust-proof and other properties	AIR6L-A/AIR7-920B	P01995000498	Optional
		AIR10-1420A	P01995000512	

2.2 Assembly steps

Tip

- Before installation, please adjust manipulator to the calibration attitude (3 axis 90°, other axes 0°) and then cut off the power supply.
- Pay attention to cleaning the surface of the robot before installation to reduce internal wear and extend service life.

Dust-proof and wear-resistant clothing fitting steps:

Step1. When installing the 4/5/6 axis, please follow the arrow in Figure 2-2 to open it and wrap it from the bottom direction. After installation, the opening should be directly above the 4-6 axes.

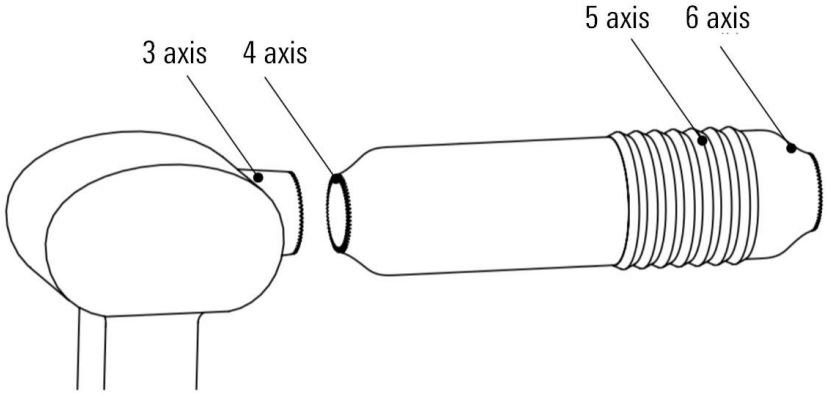


Figure 2-2 Diagram of step 2

Step2. When installing the 1/2/3 axis, please open it according to the arrow in Figure 2-3. The 3-axis should be placed around the periphery of the 4 axis and gradually wrapped in the direction of the 1 axis. After installation, the opening should be located behind the robot.

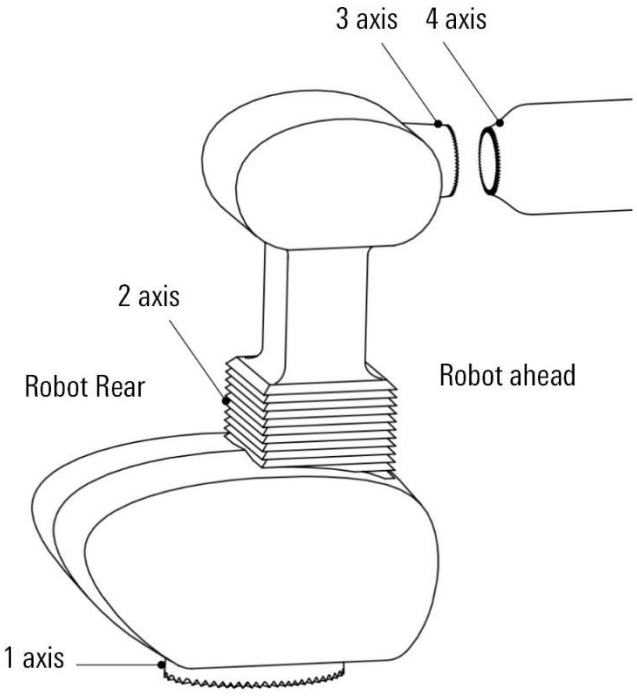


Figure 2-3 Diagram of step 3

Step3. When installing the base, open the opening and wrap it from the front to the rear. Note that the base cable must pass through the outlet. Refer to Figure 2-4.

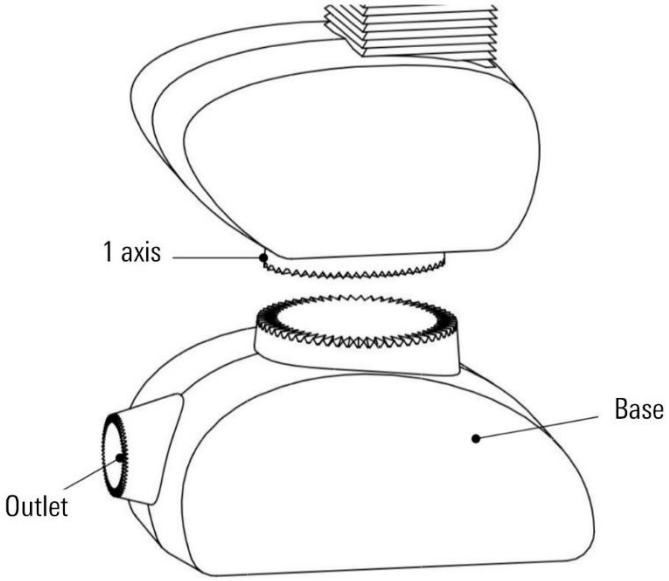


Figure 2-4 Diagram of step 4

Notice

Dust-proof and wear-resistant robot protective clothing has certain dust-proof and waterproof vapor effects, and is used in scenes with a lot of dust and water vapor, such as grinding.

3 Heavy-duty line outlet method at the base of the manipulator

3.1 Outlet from the bottom of the base

3.1.1 Overview

When the robot is installed on a desktop and used, the cables can be hidden from the bottom of the base, making the desktop clean and beautiful. When the installation space at the robot base is narrow and there is insufficient space for cable outlet backwards, the cable outlet from the bottom of the base can be used, such as when installing the robot on equipment such as machine tools.

3.1.2 Adapted to manipulator

For the AIR4-560A/AIR7-920B/AIR8-710B/AIR10-1420, you can choose the cable outlet method at the bottom of the base (the standard method is outlet backwards). The specifications of the heavy-duty wire connector are the same as the standard configuration.


Tip

If you choose this wiring method, it must be pre-installed by production personnel before leaving the factory.

3.1.3 Heavy-duty plug size

The size of the heavy-duty plug at the bottom of the AIR4-560A/AIR7-920B/AIR8-710B/AIR10-1420 base is the same as the standard configuration. Refer to Figure 3-1.

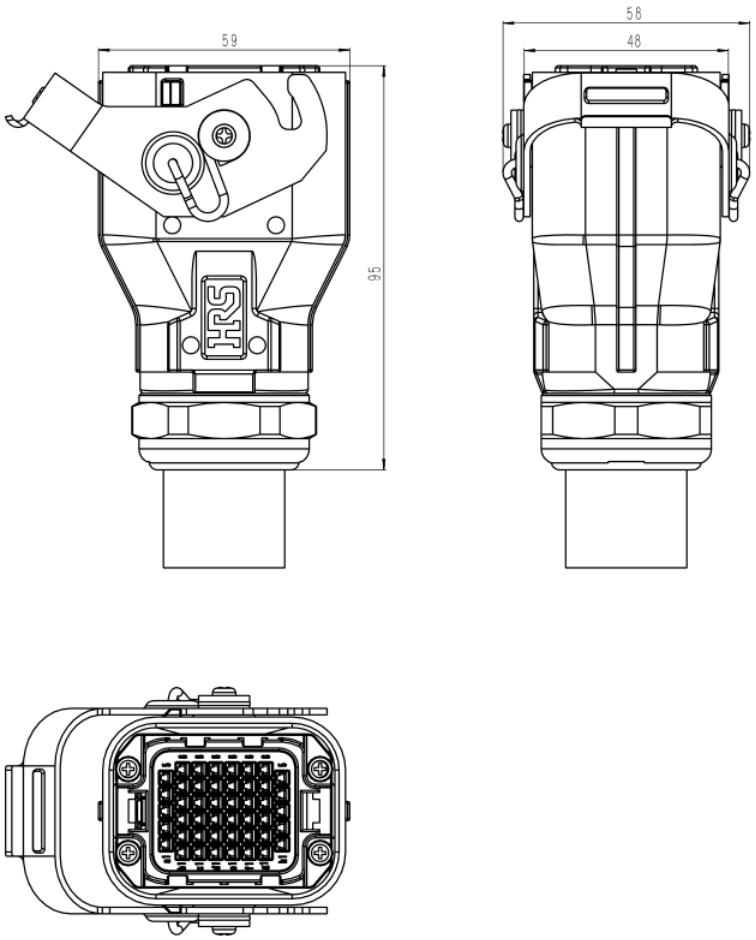


Figure 3-1 AIR4-560A base bottom outlet heavy-duty plug size

3.1.4 Instructions for outlet at the bottom of the manipulator base

The diagram of the cable outlet from the rear of the AIR4-560A (standard configuration) refers to Figure 3-2. The diagram of the cable outlet from the bottom of the AIR4-560A base (optional) refers to Figure 3-3. The diagram of the cable outlet from the rear of the AIR7-920B (standard configuration) refers to Figure 3-4. The diagram of the cable outlet from the bottom of the AIR7-920B base (optional) refers to Figure 3-5. For the diagram of the cable outlet from the rear of the AIR8-710B (standard configuration), refer to Figure 3-6. For the diagram of the cable outlet from the bottom of the base of the AIR8-710B (optional), please refer to Figure 3-7.

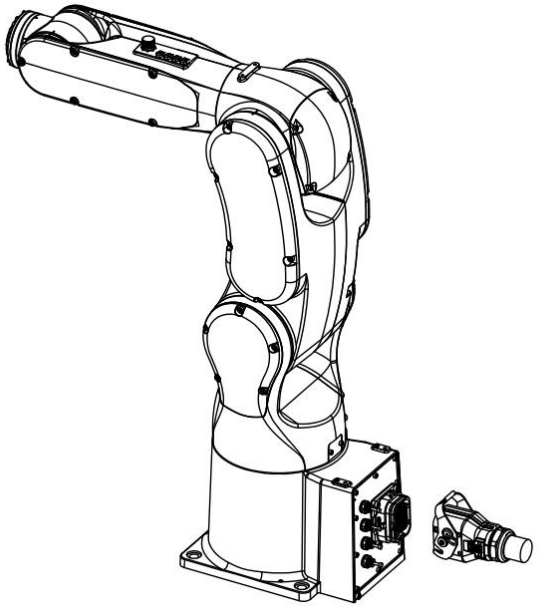


Figure 3-2 Diagram of rear outlet of AIR4-560A (standard configuration)

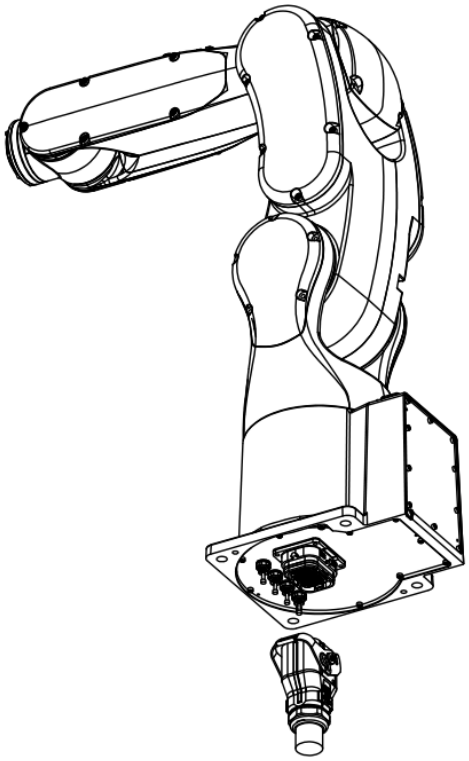


Figure 3-3 Diagram of the bottom outlet of the AIR4-560A base (optional)

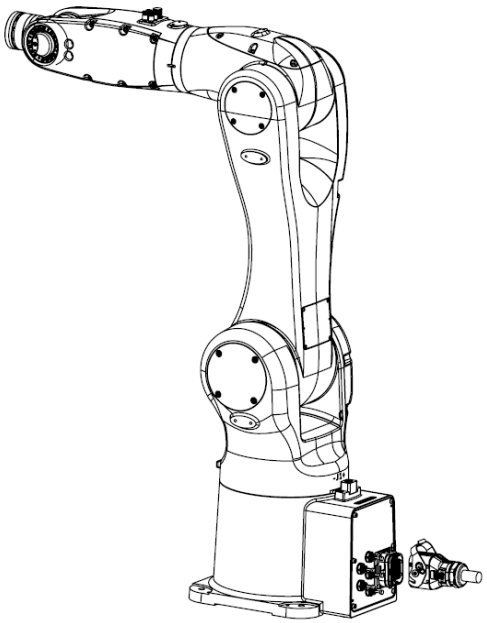


Figure 3-4 Diagram of AIR7-920B base rear outlet (standard configuration)

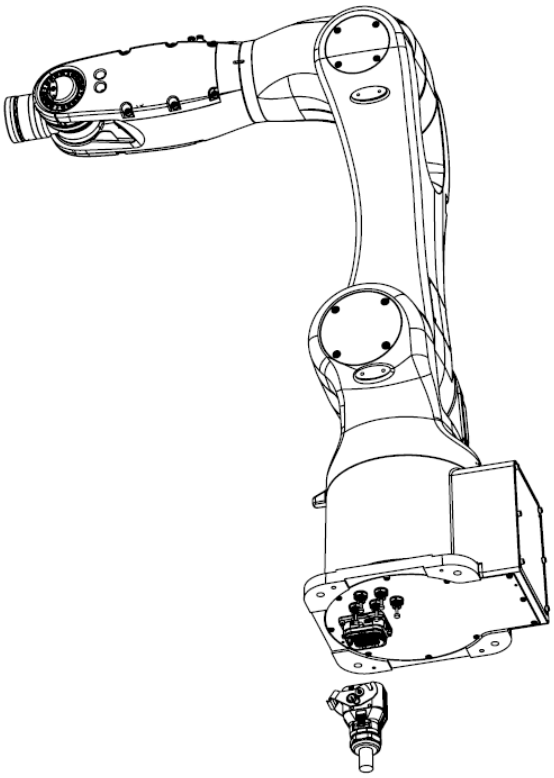


Figure 3-5 Diagram of the bottom outlet of the AIR7-920B base (optional)

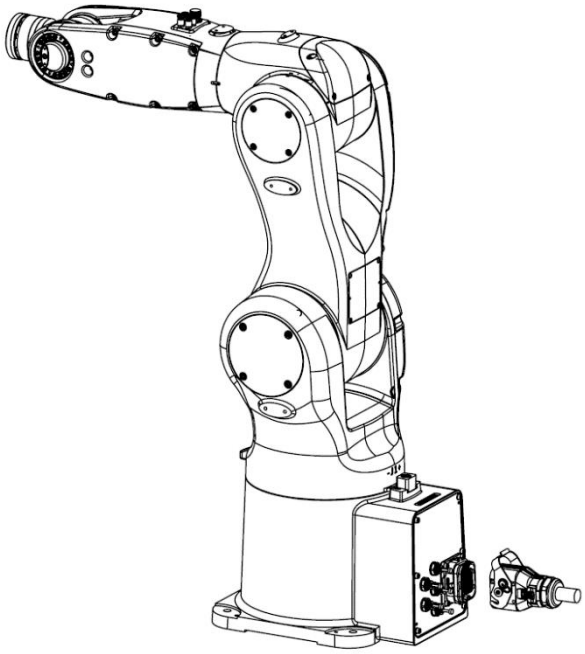


Figure 3-6 Diagram of AIR8-710B base rear outlet (standard configuration)

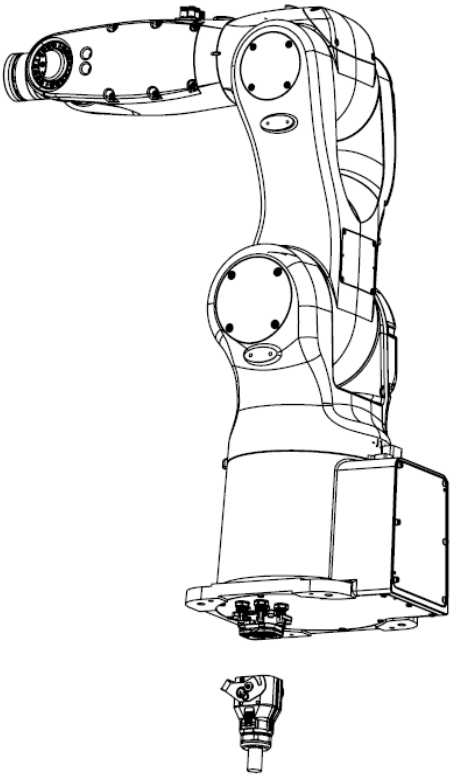


Figure 3-7 Diagram of the bottom outlet of the AIR8-710B base (optional)

4 SCARA robot telescopic cover and protective cover

4.1 Overview

When the robot works in a dusty or humid environment, installing a telescopic cover and a protective cover on the screw can isolate most foreign matter and reduce corrosion and contamination of the screw by foreign matter, thereby preventing adverse effects on the lubrication effect and improving the service life of the robot.

4.2 Specification

Table 4-1 Telescopic cover and protective cover specification table

Name	Specification	Adapted to manipulator	Part No	Construct quantity	Standard/optional
Telescopic cover	Silicone material, wear-resistant and dust-proof	AIR3SC-400A/AIR6SC-600A/AIR6SC-750A	P01055001600-1	2	Optional (only supported before leaving the factory)
Stroke screw shield	ABS material, wear-resistant and dust-proof	AIR12SC series/AIR20SC series	P01045000092-1	1	Optional
Telescopic cover (200mm stroke)	High-quality three-proof cloth material, wear-resistant, dust-proof and other properties	AIR12SC/AIR20SC	P01055001741	1	Optional (only supported before leaving the factory)
Telescopic cover (400mm stroke)	High-quality three-proof cloth material, wear-resistant, dust-proof and other properties	AIR12SC/AIR20SC	P01055001742	1	Optional (only supported before leaving the factory)
protective cover	ABS material, wear-resistant and dust-proof	AIR12SC/AIR20SC	P01045000092	1	Optional (only supported before leaving the factory)


Notice

Robots with a screw stroke of 600mm cannot add a stroke screw protective cover.

4.3 Robot specifications after adding telescopic cover

The changes in the robot screw stroke and screw length after adding the telescopic cover are shown in Table 4-2.

Table 4-2 Robot specification table after adding telescopic cover

Model	Original stroke of screw	Screw stroke after adding telescopic cover	Original screw length	Length of screw after adding telescopic cover
AIR6SC-600Z20A	200	140	410	530
AIR6SC-750Z20A	200	140	410	530
AIR6SC-600Z30A	300	240	510	630
AIR6SC-750Z30A	300	240	510	630
AIR12SC/AIR20SC	200	170	460	460

4.4 Protective cover size

The dimensions of the screw protective cover for the 400mm stroke are shown in Figure 4-1.

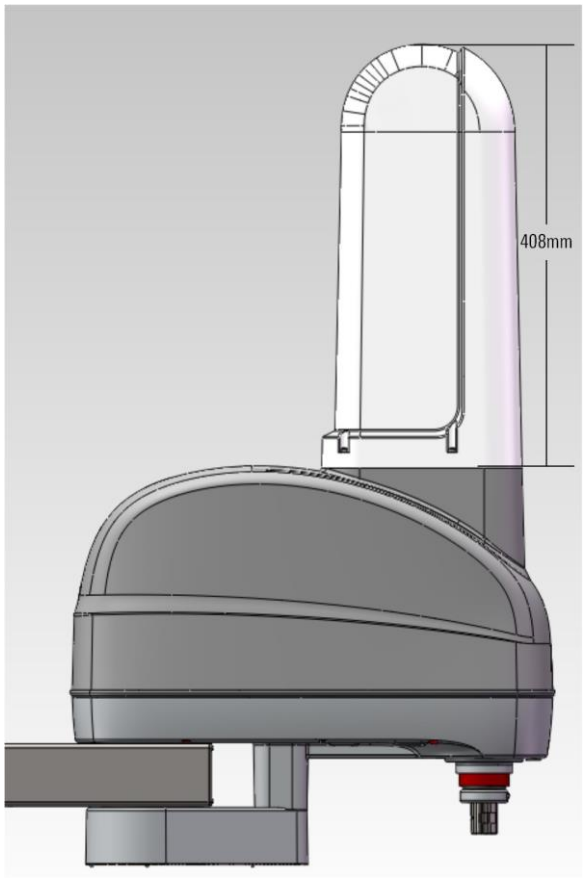


Figure 4-1 Diagram of the dimensions of the screw protective cover for 400mm stroke

4.5 Protective cover installation method

Required parts and specifications for installing the protective cover.

Table 4-3 Parts required for fixing the AIR6-1450A

Part name	Specification	Quantity	Part No
Single head hexagonal copper column	M4×28+6	4	P02110000060
Hexagon socket head screws	M4×8	4	P02020100252

Installation method is as follows:

Step1. Fix 4 single-head hexagonal copper posts (M4×28+6) on the manipulator.

Step2. Insert the protective cover on the 4 single-ended hexagonal copper posts.

Step3. Fix the protective cover with 4 hexagon socket head screws (M4×8).

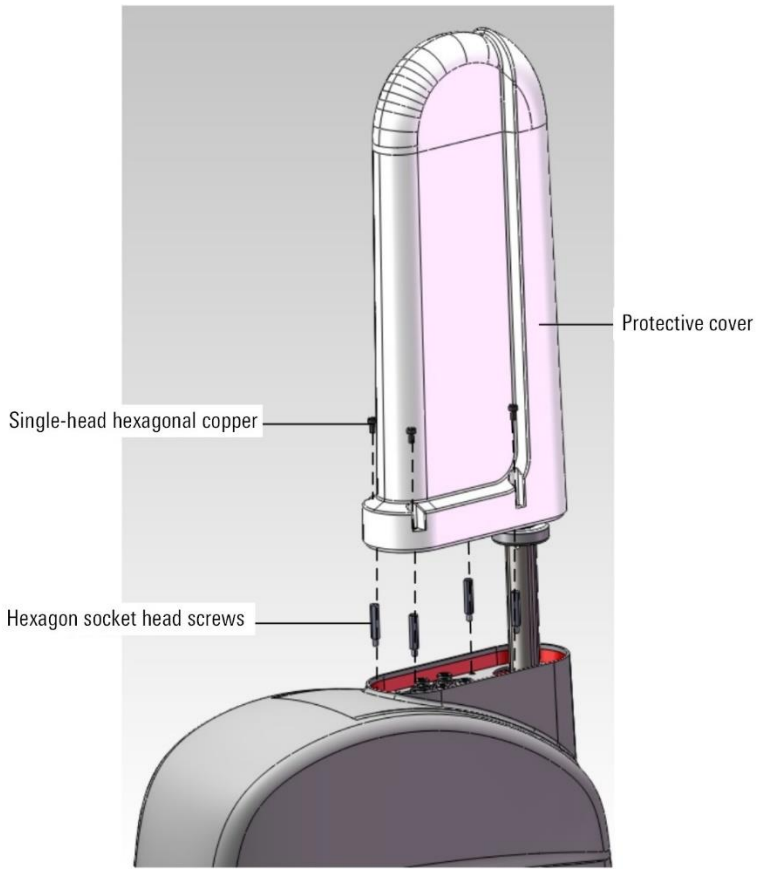


Figure 4-2 Diagram of protective cover

5 I/O wiring harness on the manipulator

5.1 IO wiring harness on SCARA robot

Configuration instructions

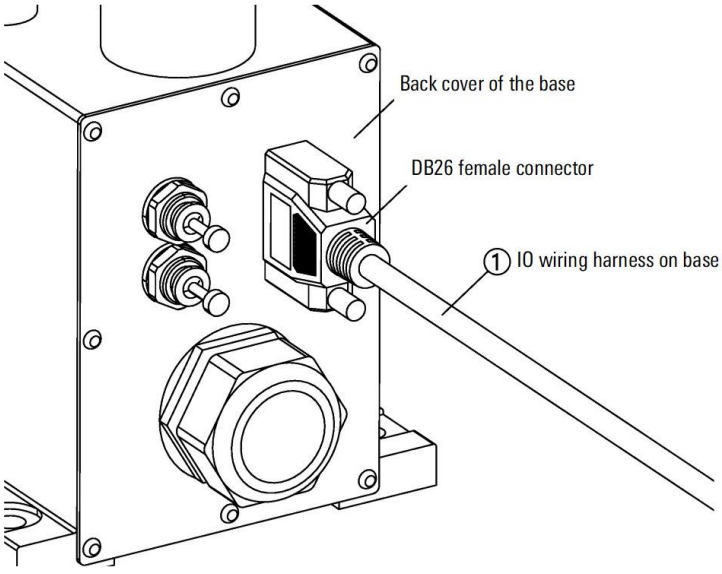
The I/O harness configuration description on the SCARA series robot is as shown in Table 5-1.

Table 5-1 User I/O harness configuration instructions on the SCARA series robot

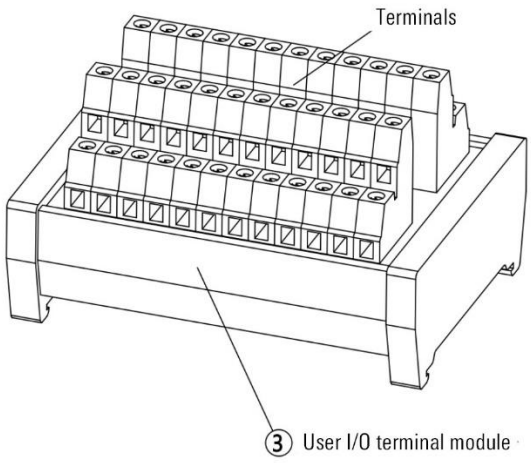
Name	Specification	Adapted to manipulator	Part No	Construct dosage	Standard/optional
I/O wiring harness on forearm	1m	AIR3SC-400A/AIR6SC-600A/AIR12SC/AIR20SC/AIR6SC-750A	P04082000910	1	Optional
I/O harness on base	2.5m		P04082000909	1	Optional

Connection step

Step1. Connect one end of the I/O wire harness with the DB26 female connector on the base to the DB interface on the back cover of the base, and connect the loose wire end on the other side to the terminal of the user I/O terminal module. The station serves as the I/O input terminal (refer to Figure 5-1).



(a)



(b)

Figure 5-1 Diagram of I/O harness connection on the base

Step2. Connect one end of the I/O wire harness with the DB26 male connector on the forearm to the DB interface on the sheet metal of the forearm bellows, and connect the loose wire end on the other side to the customer's own end effector (refer to Figure 5-2).

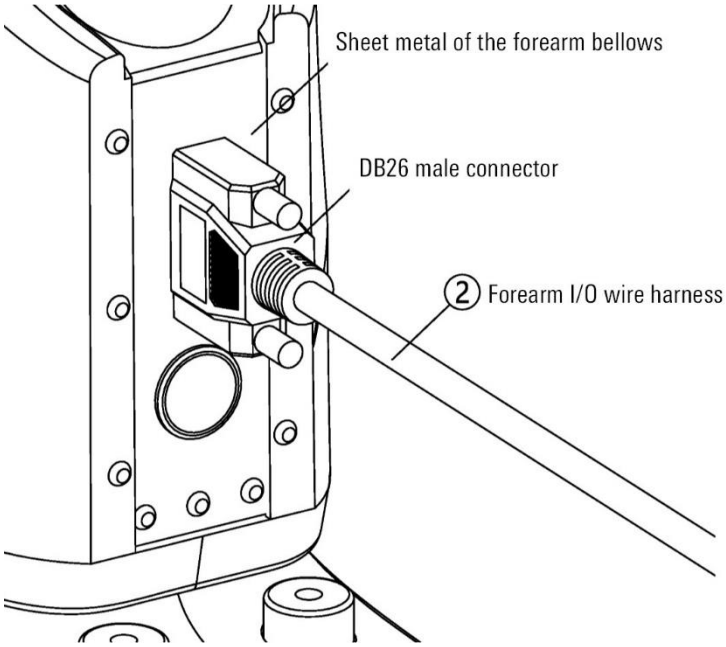


Figure 5-2 I/O harness connection diagram on the forearm

5.2 IO wiring harness on the floor-standing model manipulator

Configuration instructions

The I/O wiring harness configuration description on the floor-standing robot is as shown in Table 5-2.

Table 5-2 User I/O harness configuration instructions on the robot

Name	Specification	Adapted to manipulator	Part No	Construct dosage	Standard/optional
Floor-standing model 12 pin forearm IO wiring harness	2m	AIR10-1420C/ AIR12-2000C-HI/AIR12-1420C/AIR20-2000C/AIR25-1700C/AIR35-1700C/AIR50-2250B/AIR75-2100B/AIR80-2250B/ AIR165-2700B/ AIR220-3100/AIR220-2700/AIR130-2700/AIR130-3100/AIR170-2700/AIR170-3100/ AIR280-2700	P04082001501	1	Optional
Floor-standing model 12 pin base IO wiring harness	5m		P04082001500	1	Optional

Connection step

Step1. Plug ① one end of the base IO harness with a SA2010-S12B12pin jack-type cable plug into the SA2015-P12B 12pin front nut socket on the electrical installation board, and the other end is loosely wired as the I/O input (refer to Figure 5-3).

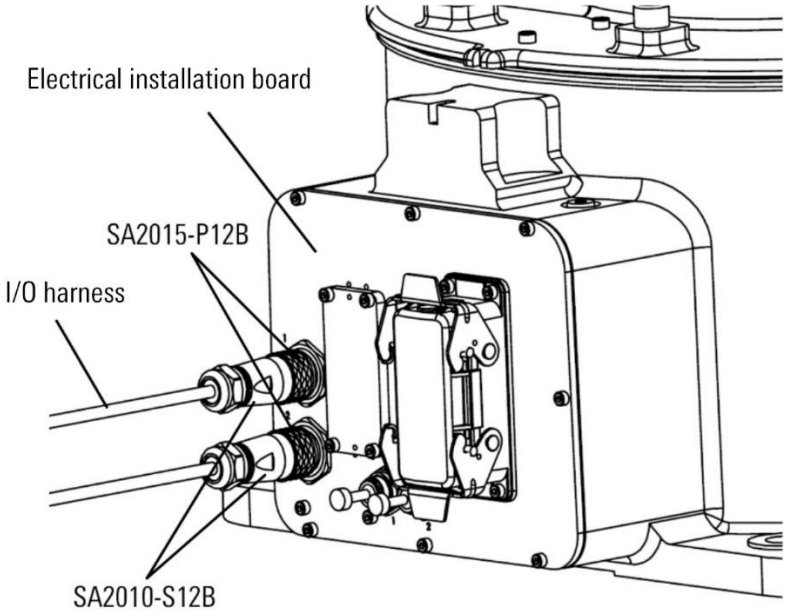


Figure 5-3 I/O harness connection diagram on the base

Step2. Plug the ② SA2010-P12B 12 pin pin cable plug at one end of the forearm IO harness into the SA2011-S12B 12 pin cable docking socket on the user interface mounting plate, and connect the loose wire at the other end to the customer's own end effector (reference Figure 5-4).

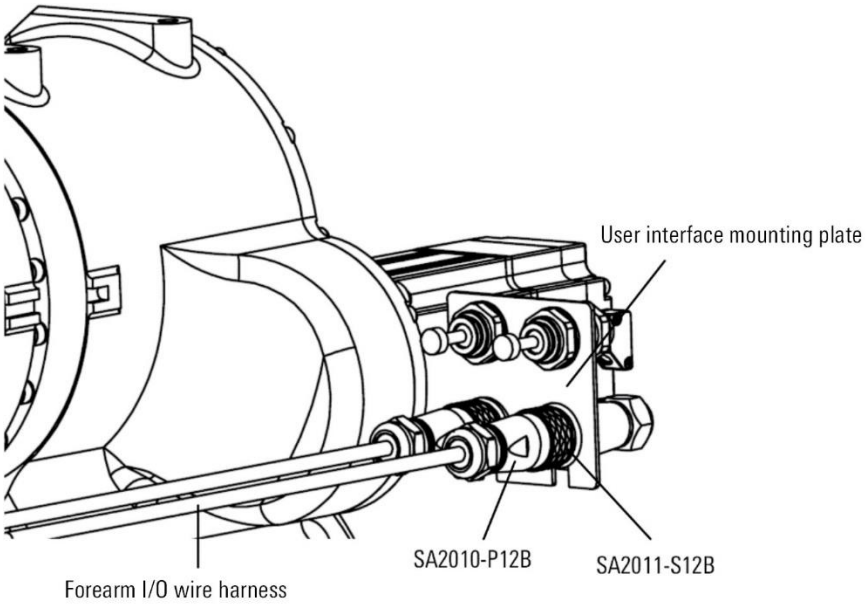


Figure 5-4 I/O harness connection diagram on the forearm

6 1 axis limit ring

6.1 1 axis limit ring for AIR4-560A

When the robot is equipped with standard limit blocks, the movement range of 1 axis is -170°~+170°. After installing the optional limit ring, the position of the limit block can be adjusted to achieve the limit range expected by the user. The maximum adjustable movement range is -151.5°~+151.5°, and the minimum adjustable movement range is -1.5°~+1.5°.

Limit ring accessories

Add a limit ring accessory to the base of AIR4-560A. The manipulator after installing the limit ring is as shown in Figure 6-1. The required accessories are shown in Figure 6-2.

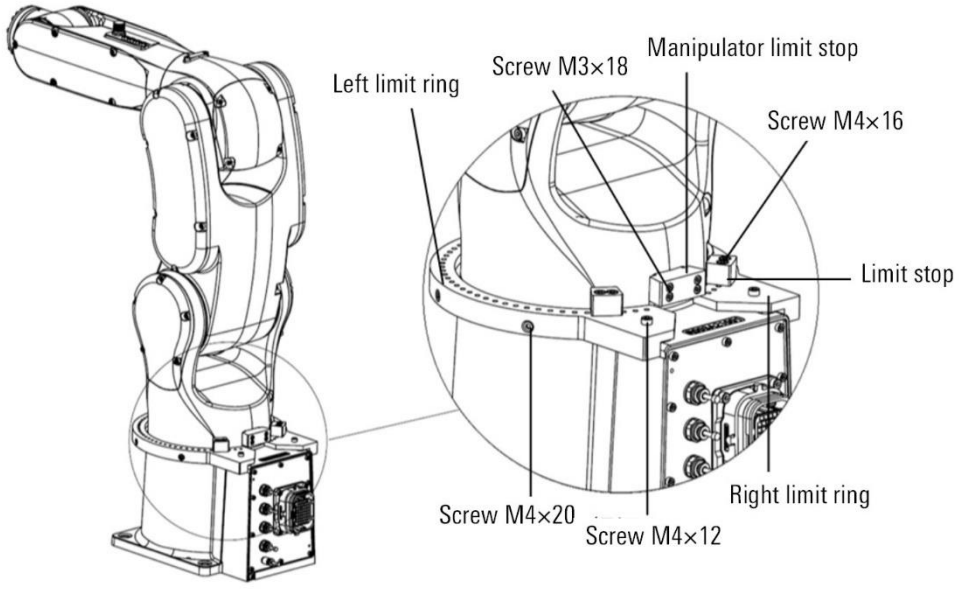


Figure 6-1 Overview of AIR4-560A installation limit ring

Figure 6-2 Option attribute list

Name	Quantity	Adapted to manipulator	Part No	Standard/optional
Left limit ring	1	AIR4-560A	P01025001650	Optional
Right limit ring	1	AIR4-560A	P01025001651	Optional
Limit stop	2	AIR4-560A	P01025001652	Optional
Manipulator limit stop	1	AIR4-560A	P01025001653	Optional
Screw M4×12	2		P02020100269	
Screw M4×20	6		P02020100270	
Screw M4×16	4		P02020100320	
Screw M3×18	4		P02020100395	

Installation instructions

If this option is used, it must be pre-installed by production personnel before leaving the factory.

Instructions for use

Users can adjust the installation position of the limit block as needed, and different positions produce different limit angles. As shown in Figure 6-3, unscrew the M4×16 screw on the limit block, adjust the angle of the limit block, and then tighten the screw. The minimum angular interval that the limit block can be adjusted is 5°.

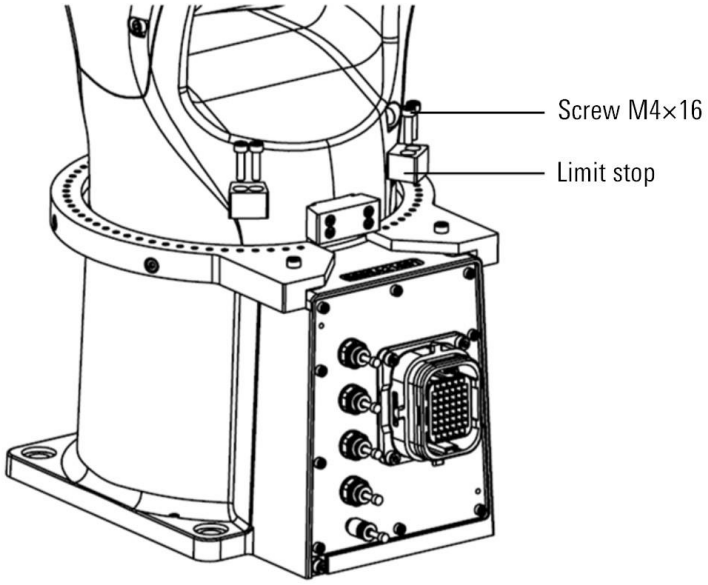


Figure 6-3 Limit block installation diagram

When the limit block is fixed to the Figure 6-4 (left) position, the 1-axis rotatable angle is ±1.5°, which is the minimum movement range.

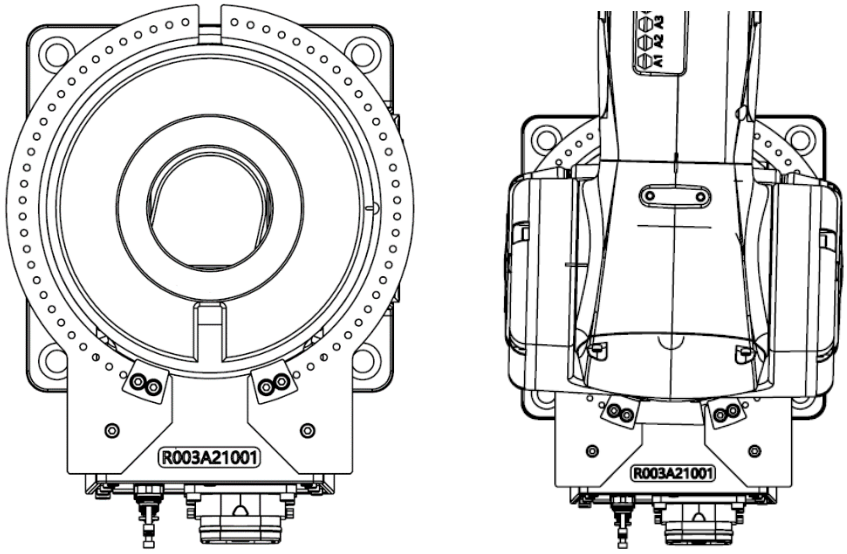


Figure 6-4 Minimum limit angle attitude diagram

When the limit block is fixed to the Figure 6-5 (left) position, the 1-axis rotatable angle is ±151.5°, which is the maximum movement range.

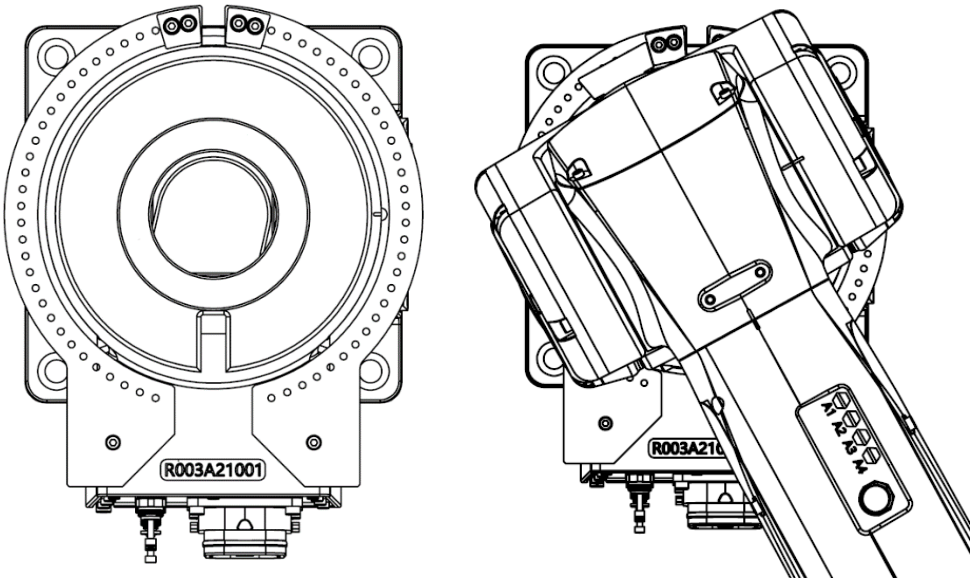


Figure 6-5 Maximum limit angle attitude diagram

6.2 1 axis limit ring for AIR7-920B/AIR8-710B

When the robot is equipped with standard limit blocks, the movement range of 1 axis is -170°~+170°. After installing the optional limit ring, the position of the limit block can be adjusted to reach the limit range expected by the user. The maximum adjustable movement range is -149°~+149°, and the minimum adjustable movement range is -4° ~+4°.

Limit ring accessories

Add a limit ring accessory to the base of AIR7-920B/AIR8-710B. The manipulator after installing the limit ring is as shown in Figure 6-6(taking AIR7-920B as an example). The required accessories are shown in Table 6-1.

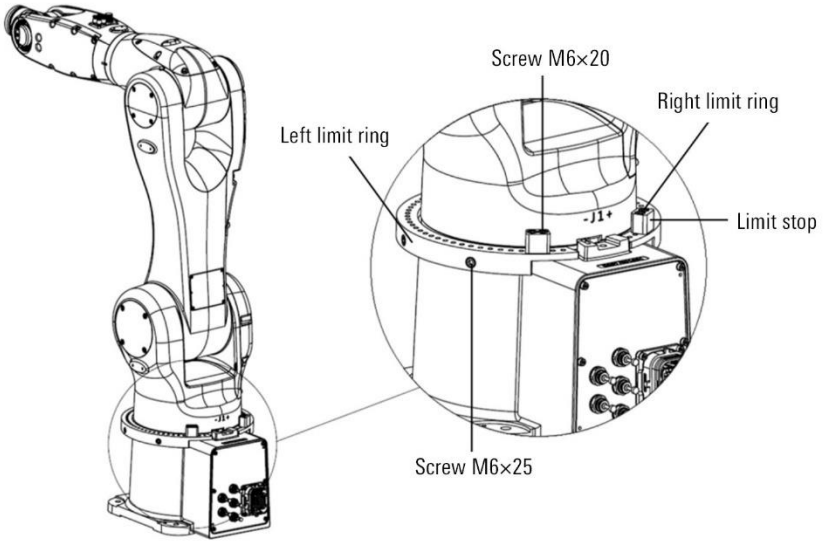


Figure 6-6 Overview of AIR7-920B installation limit ring

Table 6-1 Option attribute list

Name	Quantity	Adapted to manipulator	Part No	Standard/optional
Left limit ring	1	AIR7-920B/AIR8-710B	P01025001668	Optional
Right limit ring	1	AIR7-920B/AIR8-710B	P01025001669	Optional
Limit block	2	AIR7-920B/AIR8-710B	P01025001670	Optional
Screw M6×20	4		P02020100324	
Screw M6×25	6		P02020100349	

Installation instructions

If this option is used, it must be pre-installed by production personnel before leaving the factory.

Instructions for use

Users can adjust the installation position of the limit block as needed, and different positions produce different limit angles. As shown in Figure 6-7, unscrew the M6×20 screw on the limit block, adjust the angle of the limit block, and then tighten the screw. The minimum angular interval that the limit block can be adjusted is 5°.

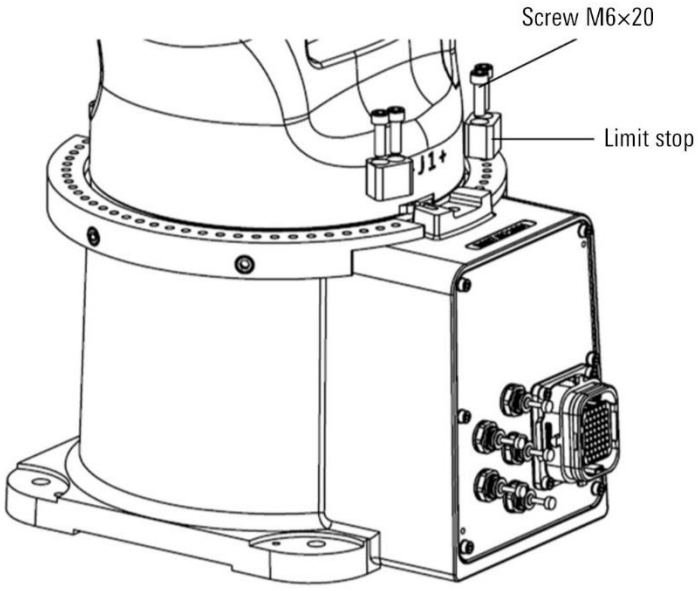


Figure 6-7 Limit block installation diagram

When the limit block is fixed to the Figure 6-8(left) position, the 1-axis rotatable angle is ±149°, which is the maximum range of motion.

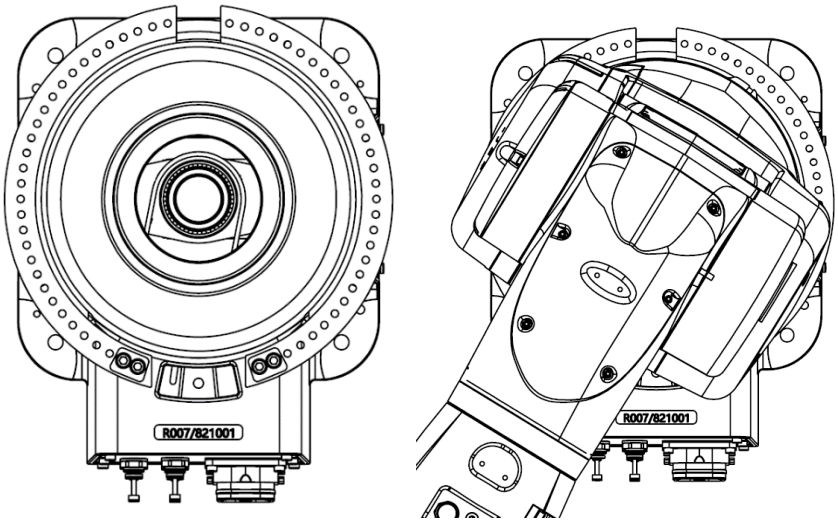


Figure 6-8 Maximum limit angle attitude diagram

When the limit block is fixed to the Figure 6-9(left) position, the 1-axis rotatable angle is ±4°, which is the minimum movement range.

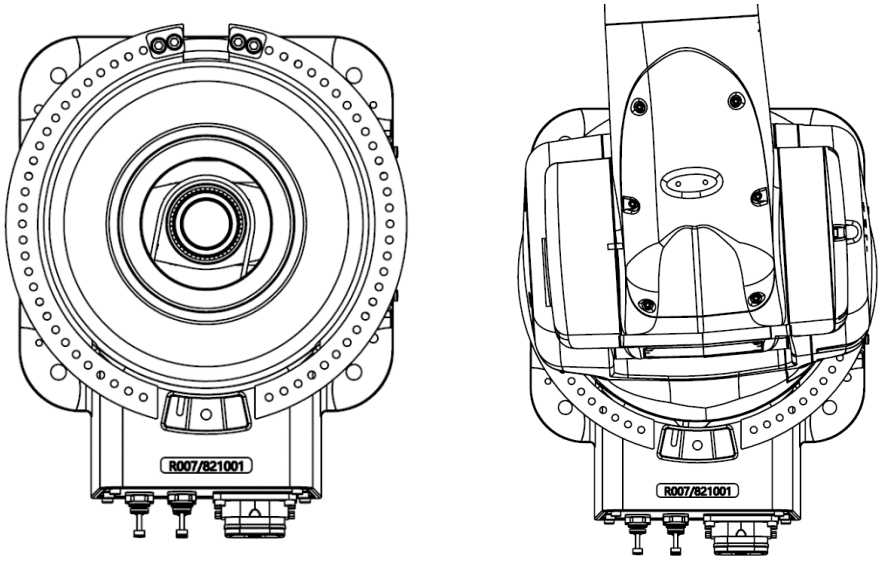


Figure 6-9 Minimum limit angle attitude diagram

7 ARC5-280 control cabinet isolation transformer

The location of the isolation transformer inside the ARC5-280 control cabinet is as shown in Figure 7-1. The name and part No are shown in Table 7-1.

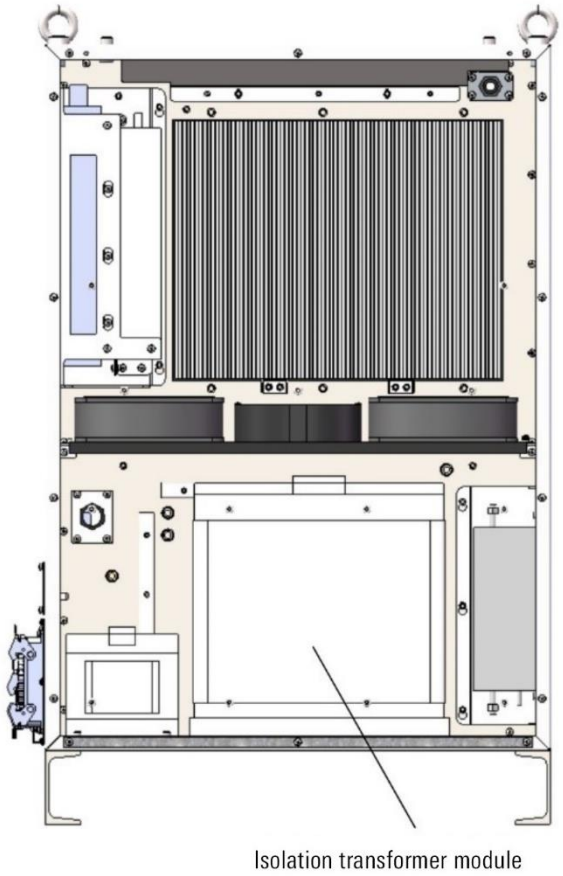


Figure 7-1 Diagram of isolation transformer in ARC5-280 cabinet

Table 7-1 Isolation transformer module model list

Name	Quantity	Adaptation control cabinet	Part No	Standard/optional
ARC5-280-isolation transformer module	1	ARC5-280	PC5100000109	Optional, assembled in the control cabinet before leaving the factory

8 ARC5 cable entry assembly

The lead cable of the ARC5 control cabinet needs to enter the cabinet from the cable entry assembly on the right side of the control cabinet, such as Figure 8-1. The control cabinet comes standard with a set of cable entry assemblies, each of which contains contain 1 cable entry frames, 4 small cable grommets and 6 module plugs:

- The 4 cable grommets are 1 KT8, 2 KT12 and 1 KT4/5;
- The six module plugs are 2 ST12 and 4 ST5 respectively (see Table 8-1 for the corresponding relationship between core and plug model specifications).

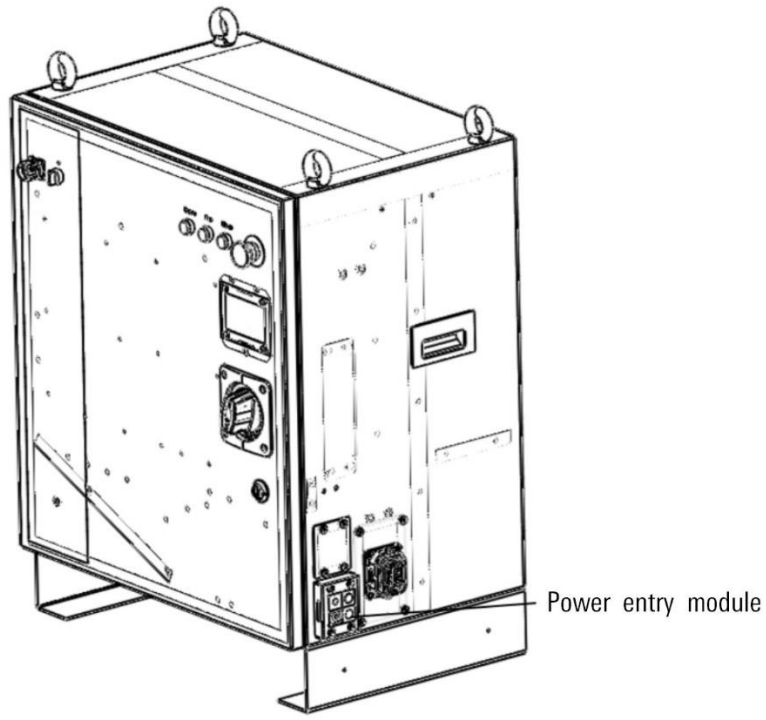


Figure 8-1 Diagram of cable entry module

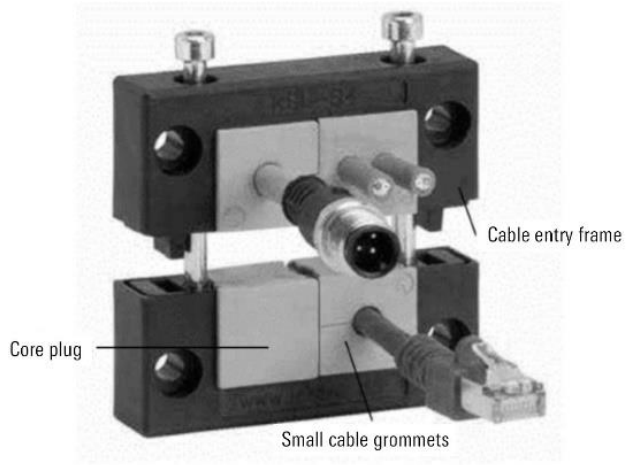
When this cable entry assembly is installed as standard, six module plugs will be installed on two KT12 and one KT4/5 cable cores, and the power cord will be entered into the cabinet from the KT8 cable cores. In order to meet the introduction needs of more wire harnesses, space for another cable entry component is reserved above the standard entry component. Customers can select appropriate cable core specifications based on the outer diameter of the cable harness accessories selected (or customer-made). For the wire diameter of accessories and the corresponding single-core cable core model, see Table 8-1.

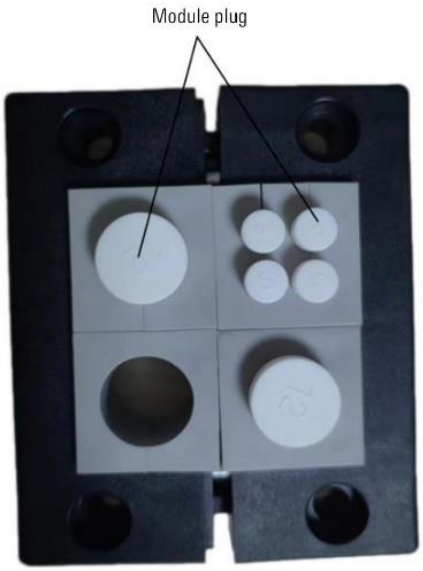
Table 8-1 ARC5 control cabinet entry cable single-core cable core model table

Import cable name	Incoming cable part No	Import cable properties	Cable grommet model	Cable grommet part No
ARC5-12 power cord	P04082000512	ARC5-12 standard (outer diameter 8mm)	KT8	P01055001539
ARC5-25 power cord	P04082000321	ARC5-25 standard (outer diameter 8mm)	KT8	P01055001539

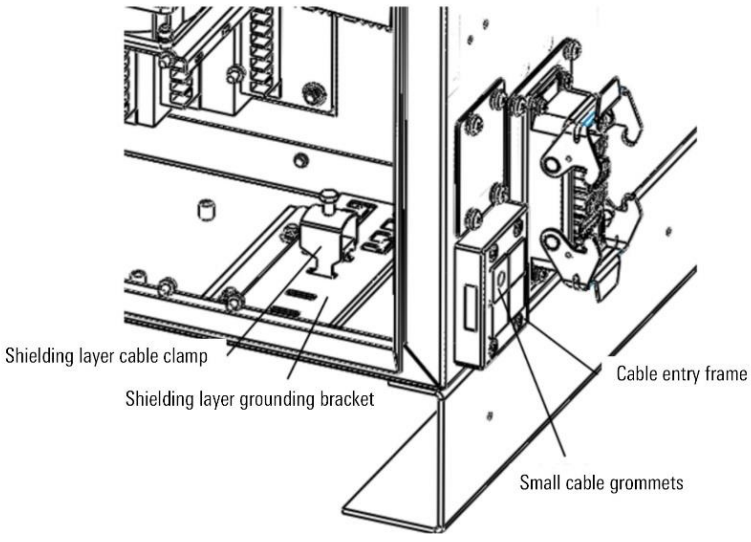
Import cable name	Incoming cable part No	Import cable properties	Cable grommet model	Cable grommet part No
SCRC10-outside cabinet RS232 wiring harness	P04082000843	Optional (outer diameter 4mm)	KT4	P01055001548
SCRC10 - RS485 wiring harness outside the cabinet.	P04082000844	Optional (outer diameter 4mm)	KT4	P01055001548
SCRC10-outside cabinet RS485 wiring harness	P04082000844	Optional (outer diameter 4mm)	KT4	P01055001548
Industrial network cable	P04082000279	Optional (outer diameter 5mm)	KT5	P01055001619
	P04082000279	Optional (outer diameter 5mm)	KT5	
inCube20-User DI terminal module cable	P04082001304	Optional (outer diameter 12mm)	KT12	P01055001617
inCube20-User DO terminal module cable	P04082001305	Optional (outer diameter 12mm)	KT12	P01055001617
PWM and analog output_voltage and current input cable	P04082000594	Optional (outer diameter 10mm)	KT10	P01055001500
The magnetic scale and CAN_encoder share the same	P04082000596	Optional (outer diameter 6mm)	KT6	P01055001498

When installing the cable entry assembly to introduce the wire harness, you need to first remove the connected wire harness inside the cabinet, adjust the wiring inside the cabinet, and then clamp the introduced wire harness into the small cable core (if the wire harness has a shielding layer, it needs to be in the appropriate position Peel off the outer covering and expose the shielding layer. After the installation of the lead-in component is completed, use a cable clamp to press the shielding layer on the grounding bracket); after the inner part of the wiring harness cabinet is adjusted, fix the small cable core in the lead-in frame (not required the position of the cable core is replaced with a core plug), and the upper and lower parts of the frame are locked with screws, and the entire assembly is fixed to the side of the cabinet with screws. As shown in Figure 8-2.





(a)



(b)

Figure 8-2 Use of cable entry

In addition to the single-core cable grommets provided in Table 8-1, customers can also combine cable grommets of different specifications according to the actual cable outer diameter and quantity used. If there are more cables, they can also be reserve a position to add a set of cable entry components. The specifications and models of optional cable entry accessories are shown in Table 8-2.

Table 8-2 ARC5 control cabinet cable entry accessories specification model table

Name	Cable grommet model	Cable grommet part No	Specification
Cable entry frame	KEL6/4	P01055001496	Opening size: 46x46mm, height 17mm
Small cable grommets (without plugs)	KT2	P01055001621	Outer diameter 2mm~3mm
Small cable grommets (without plugs)	KT3	P01055001540	Outer diameter 3mm~4mm
Small cable grommets (without plugs)	KT4	P01055001548	Outer diameter 4mm~5mm
Small cable grommets (without plugs)	KT5	P01055001619	Outer diameter 5mm~6mm
Small cable grommets (without plugs)	KT6	P01055001498	Outer diameter 6mm~74mm
Small cable grommets (without plugs)	KT7	P01055001622	Outer diameter 7mm~8mm
Small cable grommets (without plugs)	KT8	P01055001539	Outer diameter 8mm~9mm
Small cable grommets (without plugs)	KT9	P01055001624	Outer diameter 9mm~10mm
Small cable grommets (without plugs)	KT10	P01055001500	Outer diameter 10mm~11mm
Small cable grommets (without plugs)	KT11	P01055001625	Outer diameter 11mm~12mm
Small cable grommets (without plugs)	KT12	P01055001617	Outer diameter 12mm~13mm
Small cable grommets (without plugs)	KT13	P01055001499	Outer diameter 13mm~14mm
Small cable grommets (without plugs)	KT14	P01055001626	Outer diameter 14mm~15mm
Small cable grommets (without plugs)	KT15	P01055001627	Outer diameter 15mm~16mm
Small cable grommets (without plugs)	KTs16	P01055001628	Outer diameter 16mm
Small cable grommets (without plugs)	KT2/3	P01055001629	Outer diameter 2xφ3mm
Small cable grommets (without plugs)	KT2/4	P01055001630	Outer diameter 2xφ4mm

Name	Cable grommet model	Cable grommet part No	Specification
Small cable grommets (without plugs)	KT2/5	P01055001497	Outer diameter 2xφ5mm
Small cable grommets (without plugs)	KT2/6	P01055001631	Outer diameter 2xφ6mm
Small cable grommets (without plugs)	KT2/7	P01055001632	Outer diameter 2xφ7mm
Small cable grommets (without plugs)	KT2/8	P01055001633	Outer diameter 2xφ8mm
Small cable grommets (without plugs)	KT4/3	P01055001634	Outer diameter 4xφ3mm
Small cable grommets (without plugs)	KT4/4	P01055001635	Outer diameter 4xφ4mm
Small cable grommets (without plugs)	KT4/5	P01055001618	Outer diameter 4xφ5mm
Small cable grommets (without plugs)	KT4/6	P01055001636	Outer diameter 4xφ6mm
Core plug	BTK	P01055001504	-
Module plug	ST2	P01055001637	Φ2mm
Module plug	ST3	P01055001638	Φ3mm
Module plug	ST4	P01055001639	Φ4mm
Module plug	ST5	P01055001640	Φ5mm
Module plug	ST6	P01055001641	Φ6mm
Module plug	ST7	P01055001642	Φ7mm
Module plug	ST8	P01055001643	Φ8mm
Module plug	ST9	P01055001644	Φ9mm
Module plug	ST10	P01055001645	Φ10mm
Module plug	ST11	P01055001646	Φ11mm
Module plug	ST12	P01055001647	Φ12mm
Module plug	ST13	P01055001648	Φ13mm
Module plug	ST14	P01055001649	Φ14mm
Module plug	ST15	P01055001650	Φ15mm
Module plug	ST16	P01055001651	Φ16mm

9 Manipulator-control cabinet connection cable

9.1 Overview

This option is used to connect the manipulator to the control cabinet.

This option is suitable for use in high-frequency continuous reciprocating motion scenarios of the manipulator, such as robots moving on ground rails.

9.2 Standard heavy-duty line for inCube series control cabinets

Configuration instructions

For the specification table of inCube2S/20/22 standard heavy-duty line, see Table 9-1.

Table 9-1 inCube2S/20/22 standard heavy-duty line specification table

Name	Adaptation control cabinet (A side)	Compatible with manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
InCube2S-6 standard heavy-duty line	inCube2S-6	AIR3SC-400A/AIR6SC-600A	2.5m	P04082000803	Standard configuration	Figure 9-7 Table 9-4
			5m	P04082000924	Optional	
			10m	P04082001480	Optional	
InCube2S-20 standard heavy-duty line	inCube2S-20	AIR12SC/AIR20SC	5m	P04082001496	Optional	Figure 9-8 Table 9-5
inCube20 standard heavy-duty line	inCube20/ARC5-12	AIR4-560A/AIR6-1450A/AIR7-920B/AIR8-710B/AIR10-1420B/AIR10-1210A/AIR12-940A	5m	P04082000567	Standard configuration	Figure 9-5 Table 9-2
			10m	P04082000830	Optional	
			15m	P04082000863	Optional	
inCube22 standard heavy-duty line	inCube20/ARC5-25	AIR25-1700B/AIR20-2000B/AIR12-2000B-HI	5m	P04082000929	Standard configuration	Figure 9-6 Table 9-3
			10m	P04082001173	Optional	
			15m	P04082001174	Optional	
			20m	P04082001175	Optional	

Heavy-duty plug size

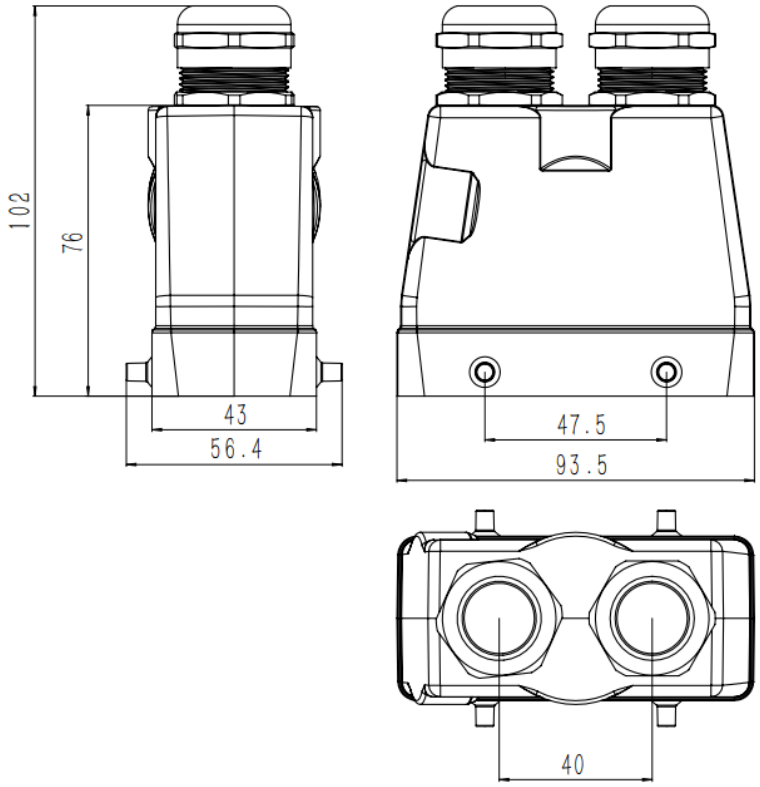


Figure 9-1 AIR8-710A/AIR10-1420A model manipulator end heavy-duty plug size

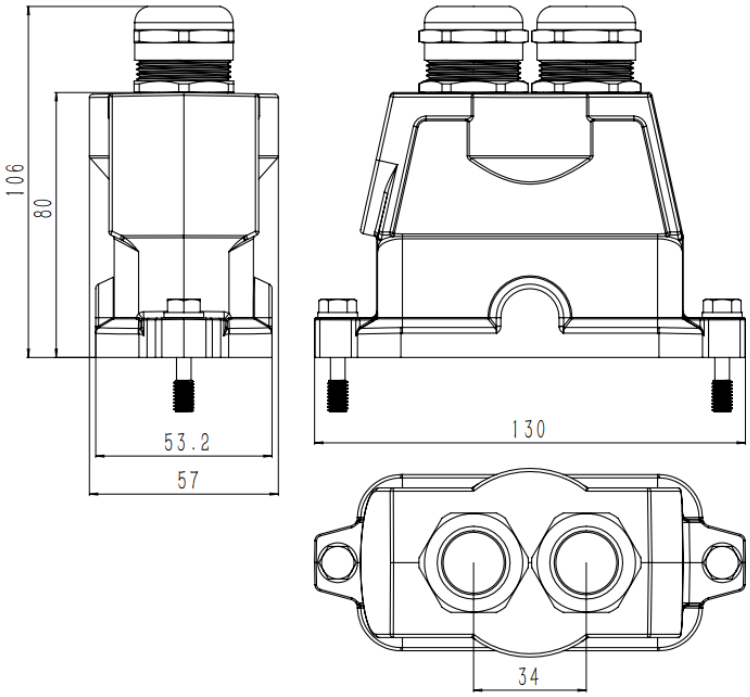


Figure 9-2 AIR6L-A manipulator end heavy load dimension drawing

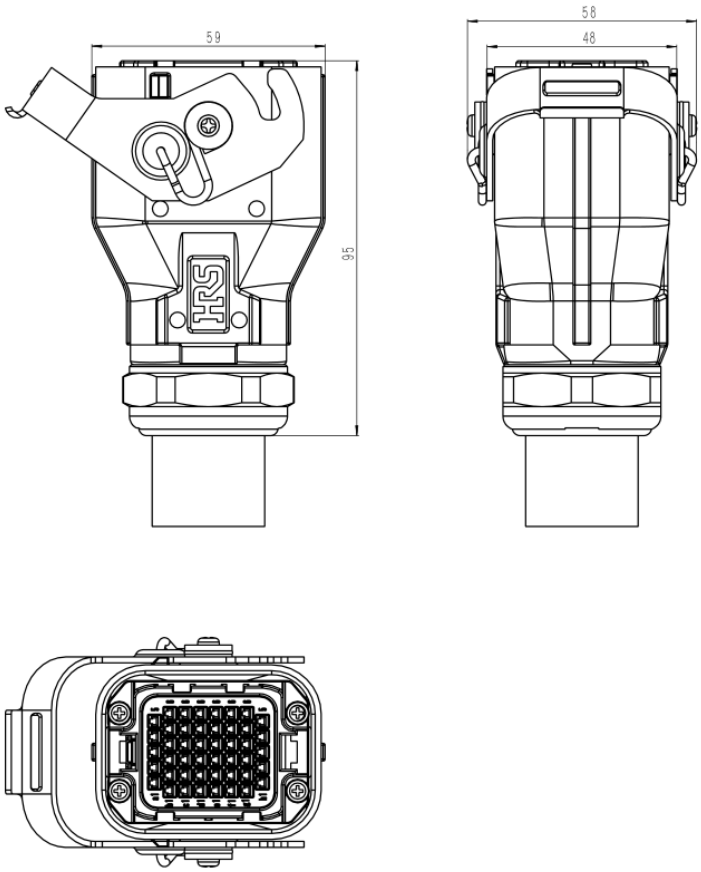


Figure 9-3 inCube20/2S heavy duty connector dimensions

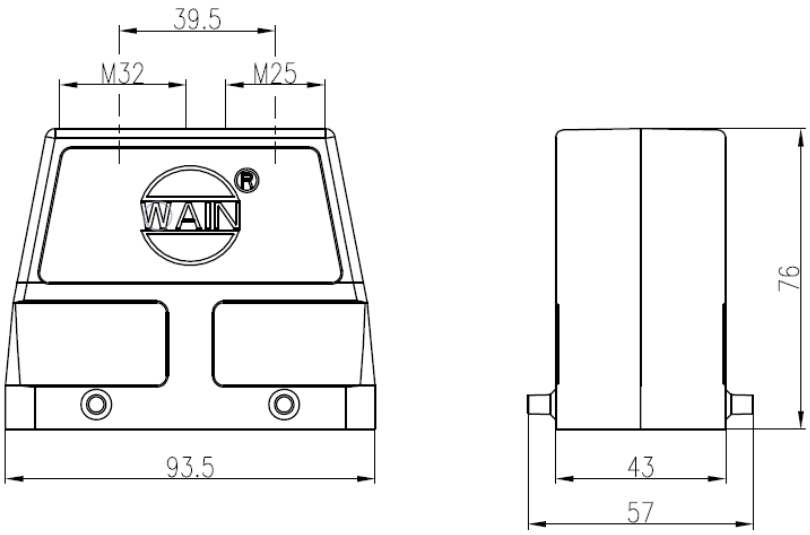


Figure 9-4 inCube22 heavy duty connector dimensions

inCube20 standard heavy-duty line

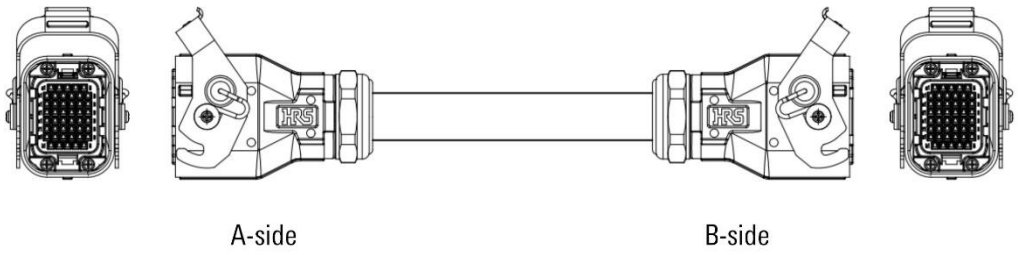


Figure 9-5 inCube20 standard heavy-duty line (adapted to AIR4-560A, AIR6-1450A models) diagram

Table 9-2 inCube20 standard heavy-duty line (adapted to AIR4-560A, AIR6-1450A models) specification table

Name	Specification	A-side connected device	B-side connected device	Wire diameter	Minimum bending radius
inCube20 standard heavy-duty line	5m	Single side buckle	Single side buckle	20.2±0.6mm	10D
	10m	Single side buckle	Single side buckle	20.2±0.6mm	
	15m	Single side buckle	Single side buckle	20.2±0.6mm	

inCube22 standard heavy-duty line

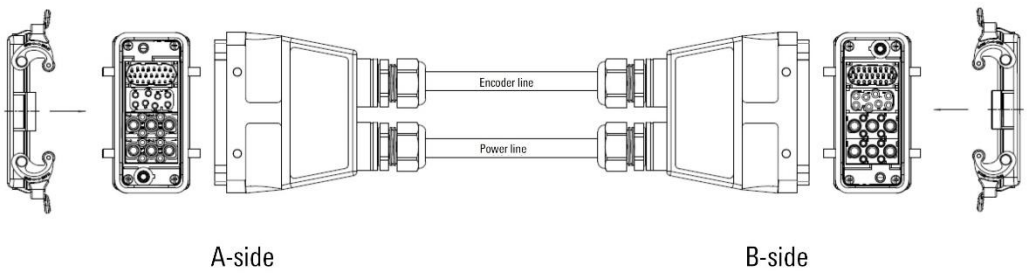


Figure 9-6 inCube22 standard heavy-duty line diagram

Table 9-3 inCube22 standard heavy-duty line specification table

Name	Specification	A-side connected device	B-side connected device	Power line	Encoder line	Minimum bending radius
inCube22 standard heavy-duty line	5m	Double side buckle	Double side buckle	About 22mm	About 11.5mm	8D
	10m	Double side buckle	Double side buckle	About 20.5mm	About 11.5mm	
	15m	Double side buckle	Double side buckle	About 20.5mm	About 17mm	
	20m	Double side buckle	Double side buckle	About 20.5mm	About 17mm	

inCube2S-6 standard heavy-duty line (adapted to AIR3SC-400A/AIR6SC-600A models)

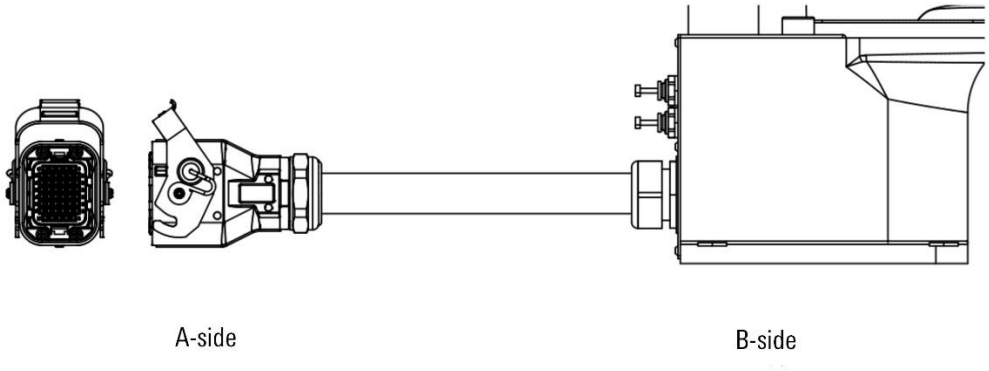


Figure 9-7 inCube2S-6 standard heavy-duty line (AIR3SC-400A/AIR6SC-600A model) diagram

Table 9-4 inCube2S-6 standard heavy-duty line (AIR3SC-400A/AIR6SC-600A model) specification table

Name	Specification	A-side connected device	B-side connected device	Wire diameter	Minimum bending radius
inCube2S-6 standard heavy-duty line (AIR3SC-400A/AIR6SC-600A model)	2.5m	Single side buckle	Cable Connector	About 20.2mm	10D
	5m	Single side buckle	Cable Connector	About 20.2mm	

inCube2S-20 standard heavy-duty line (adapted to AIR12SC/AIR20SC models)

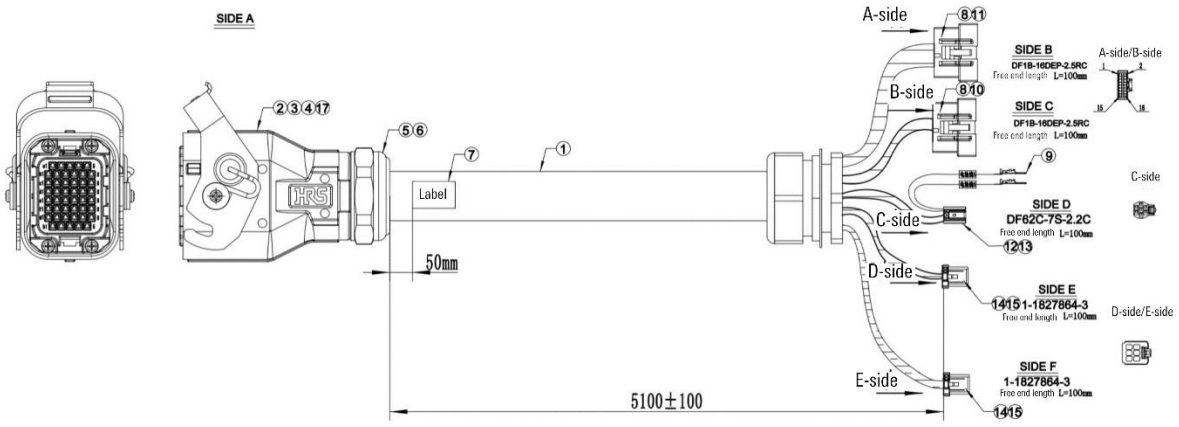


Figure 9-8 inCube2S-20 standard heavy-duty line (AIR12SC/AIR20SC model) diagram

Table 9-5 inCube2S-20 standard heavy-duty line (AIR12SC/AIR20SC model) specification table

Name	Specification	A-side connected device	B-side connected device	Wire diameter	Minimum bending radius
inCube2S-20 standard heavy-duty line (AIR12SC/AIR20SC model)	5m	Single side buckle	Cable Connector	About 20.2mm	6D

9.3 Standard heavy-duty line for ARC4 series control cabinets

Configuration instructions

For the specification table of ARC4-50/75/165 standard encoder line and standard power line, please refer to Table 9-6.

Table 9-6 ARC4-50/75/165 standard encoder line and standard power line specification table

Name	Adaptation control cabinet (A side)	Adaptation manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
ARC4-50/ARC4-75 encoder line	ARC4-50/ARC4-75	AIR50-2230A/AIR75-2100	5m	P04082000607	Standard configuration	Figure 9-9 Table 9-7
			10m	P04082000813	Optional	
			15m	P04082000814		
ARC4-50/ARC4-75 power line			5m	P04082000606	Standard configuration	Figure 9-11 Table 9-9
			10m	P04082000817	Optional	
			15m	P04082000818		
ARC4-165 encoder line	ARC4-165	AIR165-2750A	10m	P04082000670	Standard configuration	Figure 9-9 Table 9-7
			15m	P04082000821	Optional	
ARC4-165 power line			10m	P04082000672	Standard configuration	Figure 9-13 Table 9-11
			15m	P04082000824	Optional	

Encoder line

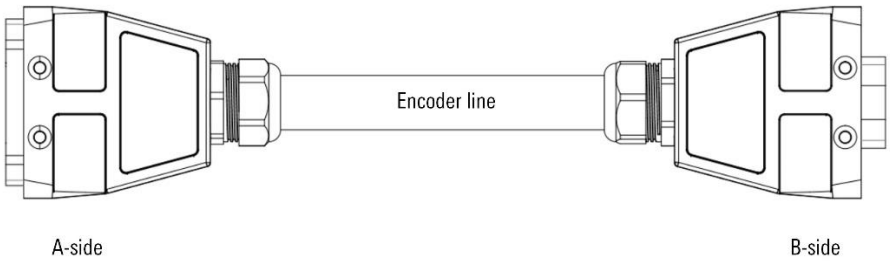


Figure 9-9 ARC4-50/ARC4-75/ARC4-165 encoder line diagram

Table 9-7 ARC4-50/ARC4-75/ARC4-165 encoder line specification table

Name	A-side connected form	B-side connected form	Wire diameter (mm)	Minimum bending radius
ARC4-50/ARC4-75 encoder line	Buckle connection	Buckle connection	11	8D
ARC4-165 encoder line	Buckle connection	Buckle connection	19	

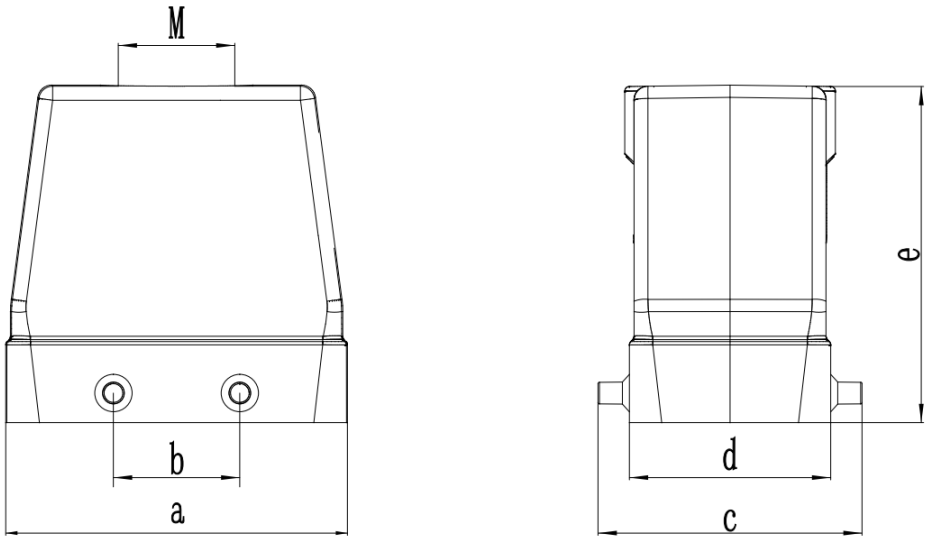


Figure 9-10 Encoder line heavy-duty connector dimensions

Table 9-8 Encoder line heavy-duty connector size table

Control cabinet	a	b	c	d	e	M
ARC4-50/ARC4-75	73	27	56.4	43	72	M25
ARC4-165	73	27	56.4	43	72	M32

Power line

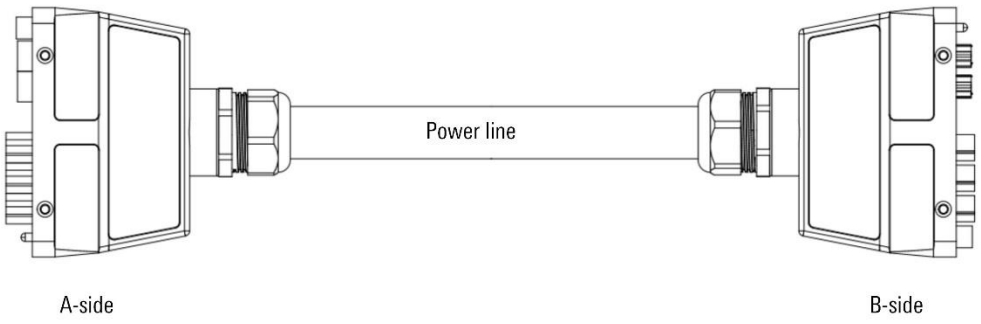


Figure 9-11 ARC4-50/ARC4-75 power line diagram

Table 9-9 ARC4-50/ARC4-75 power line specification table

Name	A-side connected form	B-side connected form	Wire diameter/mm	Minimum bending radius
ARC4-50/ARC4-75 power line	Buckle connection	Buckle connection	23	6D

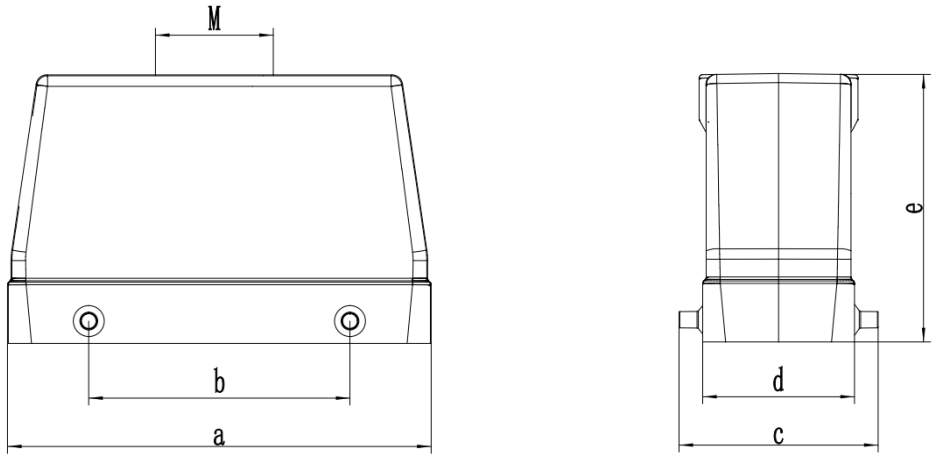


Figure 9-12 Power line heavy-duty connector dimensions

Table 9-10 Power line heavy-duty connector size table

Control cabinet	a	b	c	d	e	M
ARC4-50/ARC4-75	120	74	56.4	43	76	M32
ARC4-165	120	74	56.4	43	76	2×M32

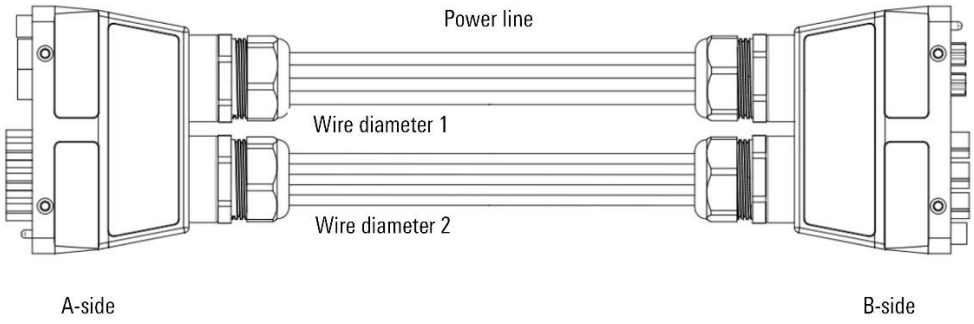


Figure 9-13 ARC4-165 power line diagram

Table 9-11 ARC4-165 power line specification table

Name	A-side connected form	B-side connected form	Wire diameter 1/mm	Wire diameter 2/mm	Minimum bending radius
ARC4-165 power line	Buckle connection	Buckle connection	22.5	22.5	6D

9.4 Standard heavy-duty line for ARC5-280 control cabinet

Please refer to Table 9-12 for the specification table of standard heavy-duty line of ARC5-280 control cabinet.

Table 9-12 ARC5-280 standard heavy-duty line specification table

Name	Adaptation control cabinet (A side)	Compatible with manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
AIR280-2700 outside cabinet heavy-duty power wiring harness	ARC5-280	AIR80-2250B/ AIR165-2700B/ AIR50-2230B/ AIR280-2700A/ AIR170-3100A/ AIR170-2700A/ AIR130-3100A/ AIR130-2700A/ AIR220-3100A/ AIR220-2700A	8m	P04082001494	Standard configuration	Figure 9-14 Table 9-13
			15m	P04082001510	Optional	
			20m	P04082001511	Optional	
			25m	P04082001502	Optional	
ARC5-280 off-cabinet encoder line-Sun			8m	P04082001472	Standard configuration	Figure 9-16 Table 9-15
			15m	P04082001512	Optional	
			20m	P04082001513	Optional	
			25m	P04082001503	Optional	

AIR280-2700 outside cabinet heavy-duty power wiring harness

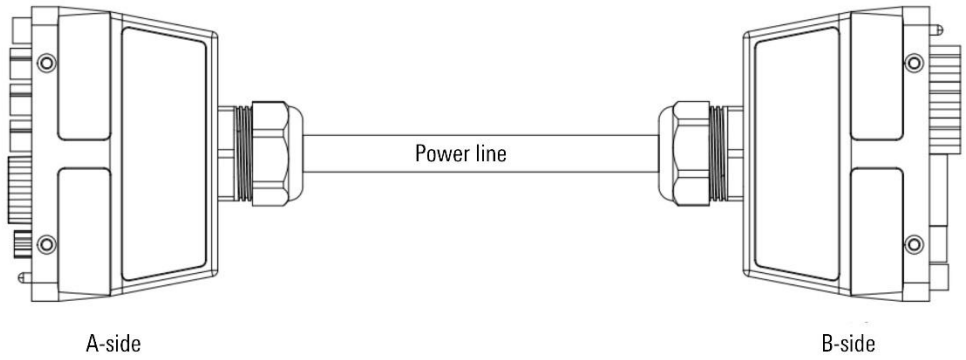


Figure 9-14 Diagram of AIR280-2700 heavy-duty power wiring harness outside the cabinet

Table 9-13 AIR280-2700 off-cabinet heavy-duty power wiring harness specification table

Name	A-side connected form	B-side connected form	Wire diameter (mm)	Minimum bending radius
AIR280-2700 outside cabinet heavy-duty power wiring harness	Buckle connection	Buckle connection	24.1	8D

AIR280-2700 outside cabinet heavy-duty power wiring harness heavy-duty plug

The AIR280-2700 heavy-duty power wiring harness outside the cabinet and the ARC5-280 power drag chain line use the same heavy-duty plug model at the control cabinet end (A-end) and manipulator end (B-end). For the heavy-duty plug size, see Figure 9-15 and Table 9-14.

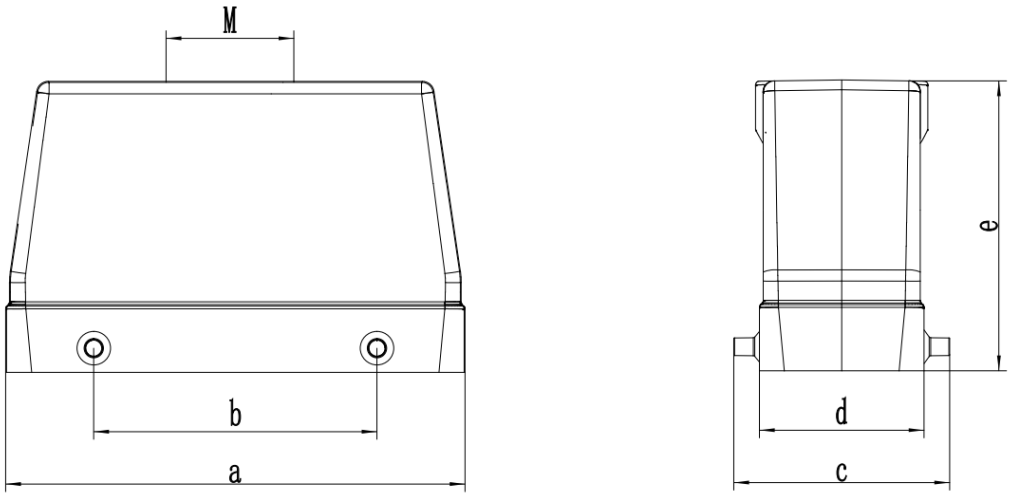


Figure 9-15 Diagram of power line heavy-duty plug dimensions

Table 9-14 Power line heavy-duty plug size table

Control cabinet	a	b	c	d	e	M
ARC5-280	120	74	57	43	76	M40

ARC5-280 off-cabinet encoder wiring harness

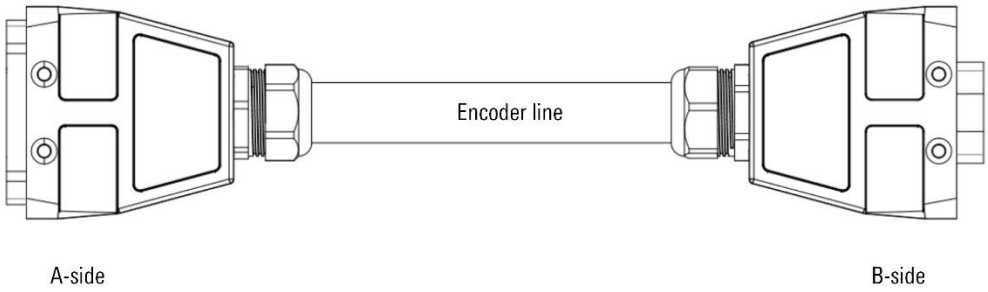


Figure 9-16 ARC5-280 outside the cabinet encoder line-sun harness diagram

Table 9-15 ARC5-280 off-cabinet encoder wire-sun harness specification table

Name	A-side connected form	B-side connected form	Wire diameter (mm)	Minimum bending radius
ARC5-280 off-cabinet encoder line-Sun	Buckle connection	Buckle connection	16.7	8D

ARC5-280 off-cabinet encoder harness heavy-duty plug

The heavy-duty plug models used by the ARC5-280 off-cabinet encoder harness and the ARC5-280 encoder drag chain line at the control cabinet end (end A) and the manipulator end (end B) are the same. For the heavy-duty plug dimensions, see Table 9-16.

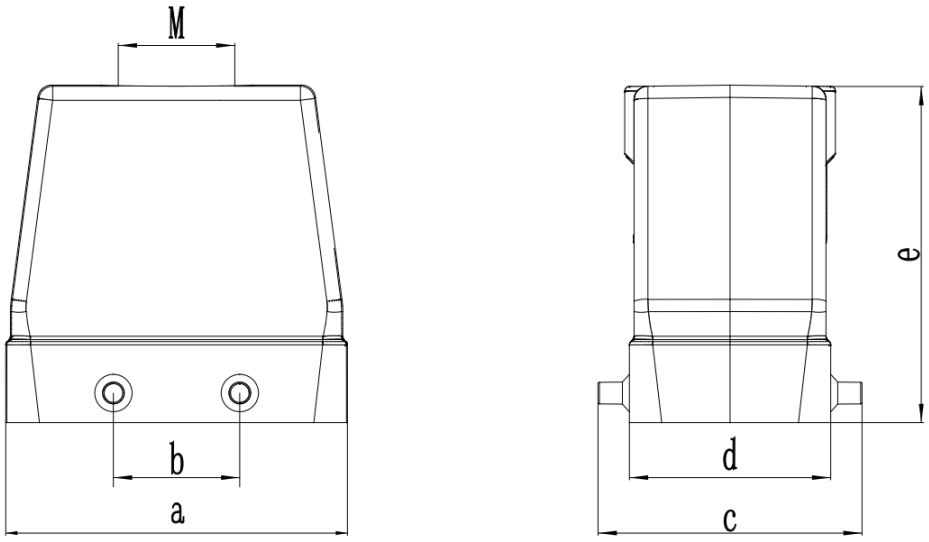


Figure 9-17 Encoder line heavy-duty plug diagram

Table 9-16 Encoder line heavy-duty plug size table

Control cabinet	a	b	c	d	e	M
ARC5-280	73	27	56.4	43	72	M25

9.5 ARC5-280 control cabinet drag chain heavy-duty line

For the specification table of the drag chain heavy-duty line of the 3ARC5-280 control cabinet, see Table 9-17.

Table 9-17 ARC5-280 control cabinet drag chain heavy-duty line specification table

Name	Adaptation control cabinet (A side)	Compatible with manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
ARC5-280 power drag chain line	ARC5-280	AIR80-2250B/ AIR165-2700B/ AIR50-2230B/ AIR75-2100/ AIR280-2700A/ AIR170-3100A/ AIR170-2700A/ AIR130-3100A/ AIR130-2700A/ AIR220-3100A/ AIR220-2700A	8m	P04082001514	Optional	Figure 9-18 Table 9-18
			15m	P04082001515		
			20m	P04082001516		
			25m	P04082001517		
ARC5-280 encoder drag chain line			8m	P04082001518		Figure 9-19 Table 9-19
			15m	P04082001519		
			20m	P04082001520		
			25m	P04082001521		

ARC5-280 power drag chain line

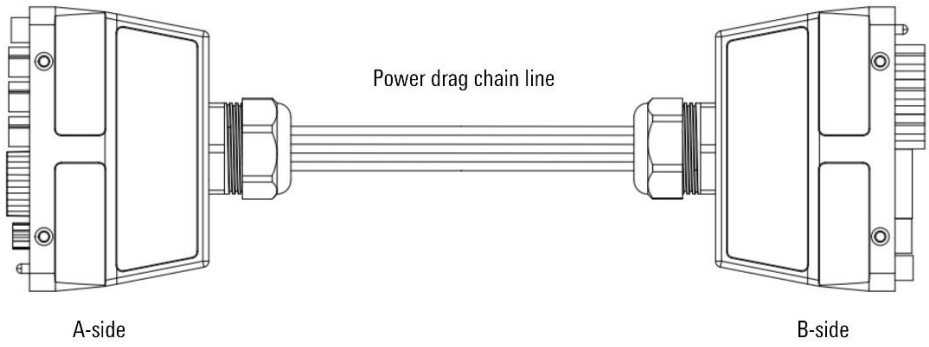


Figure 9-18 Diagram of ARC5-280 power drag chain line

Table 9-18 ARC5-280 power drag chain line specification table

Name	A-side connected form	B-side connected form	Wire diameter (mm)	Minimum bending radius
ARC5-280 power drag chain line	Buckle connection	Buckle connection	32	6D

ARC5-280 encoder drag chain line

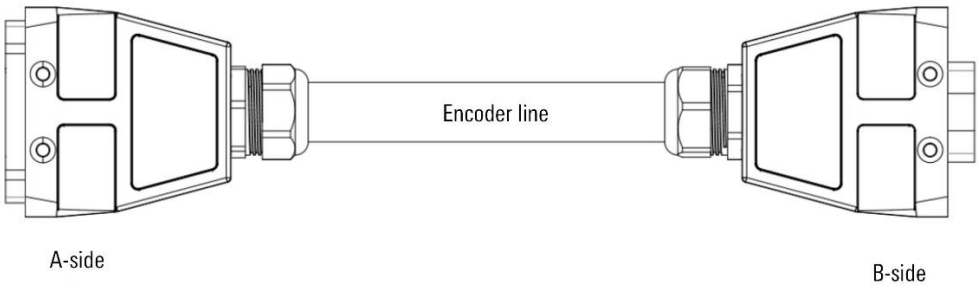


Figure 9-19 Diagram of ARC5-280 encoder drag chain line

Table 9-19 ARC5-280 encoder drag chain line specification table

Name	A-side connected form	B-side connected form	Wire diameter (mm)	Minimum bending radius
ARC5-280 encoder drag chain line	Buckle connection	Buckle connection	13.3	6D

9.6 Highly flexible drag chain heavy-duty line for inCube series control cabinets

Configuration instructions

For the specification table of inCube20/22 drag chain heavy-duty line, see Table 9-20.

Table 9-20 inCube 10/12/20/22 heavy-duty line specification table

Name	Adaptation control cabinet (A side)	Adaptation manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
inCube20 drag chain heavy-duty line	inCube20/ARC5-12	AIR4-560A/AIR6-1450A/AIR7-920B/AIR8-710B/AIR10-1420B/AIR10-1210A/AIR12-940A	5m	P04082000790	Optional	Figure 9-24 Table 9-21
			10m	P04082001791		
			15m	P04082000792		
inCube22 drag chain heavy-duty line	inCube22/ARC5-25	AIR25-1700B/AIR20-2000B/AIR12-2000B-HI	10m	P04082001350		Figure 9-25 Table 9-22
			15m	P04082001351		
			20m	P04082001340		

Heavy-duty plug size

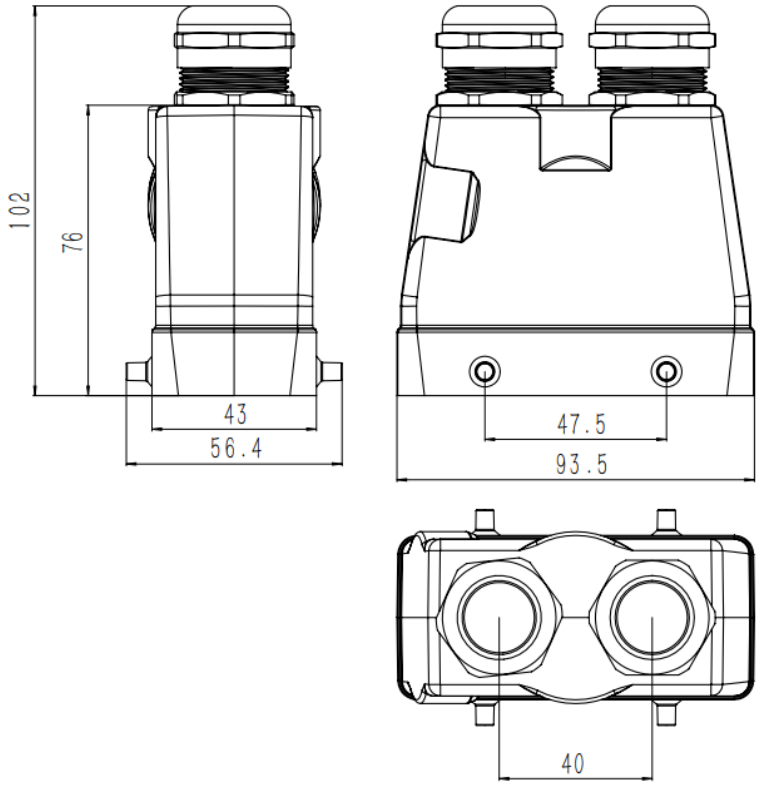


Figure 9-20 AIR8-710A/AIR10-1420A model manipulator end heavy-duty plug size

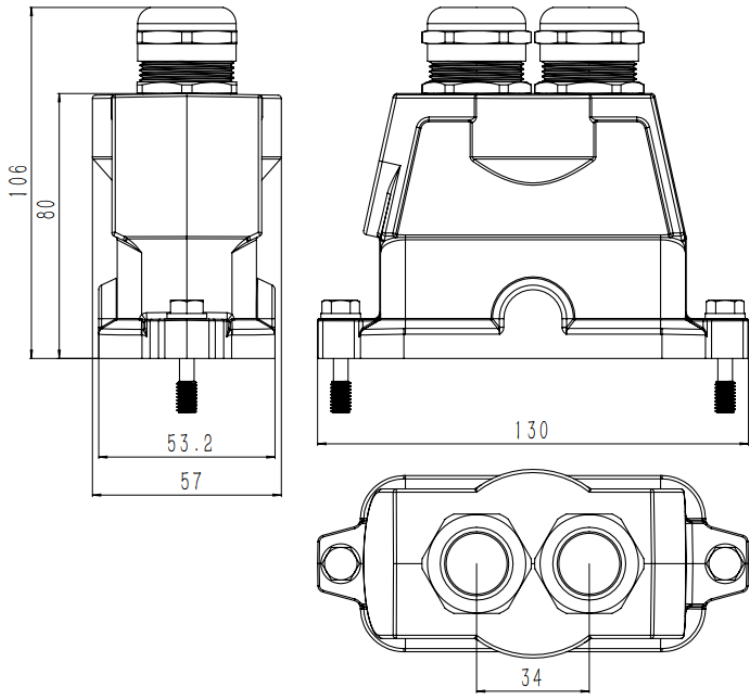


Figure 9-21 AIR6L-A manipulator end heavy-duty dimension drawing

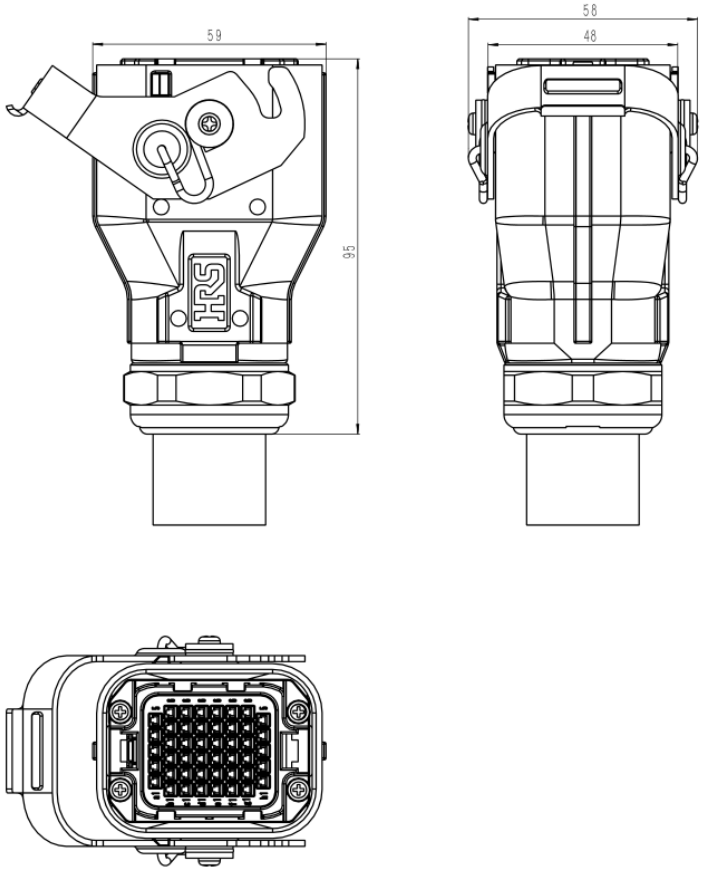


Figure 9-22 inCube20/2S heavy duty connector dimensions

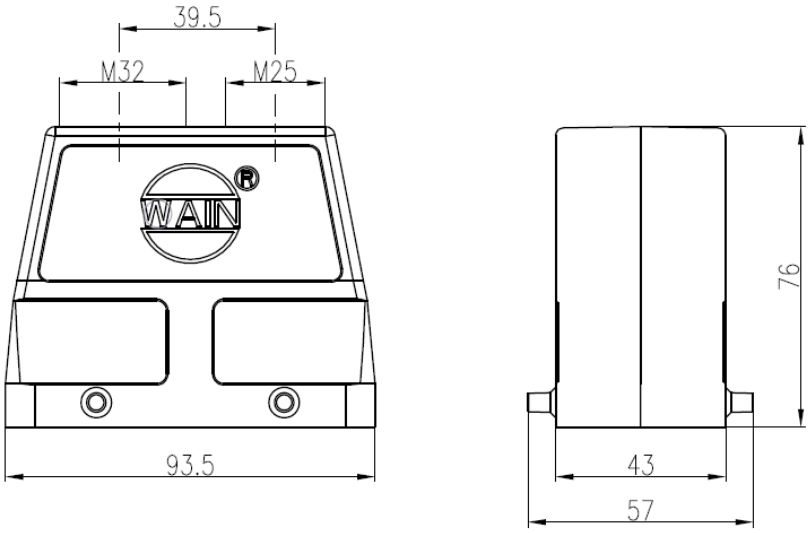


Figure 9-23 inCube22 heavy duty connector dimensions

inCube20 drag chain heavy-duty line

Figure 9-24 inCube20 heavy-duty drag chain line outline diagram

Table 9-21 inCube20 heavy-duty drag chain line specification table

Name	A-side connected form	B-side connected form	Wire diameter/mm	Minimum bending radius	Number of bends
inCube20 drag chain heavy-duty line	Buckle connection	Buckle connection	23	10D	10 million times

inCube22 drag chain heavy-duty line

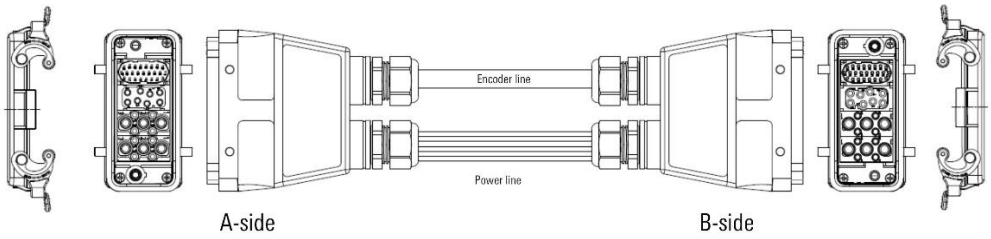


Figure 9-25 inCube22 heavy-duty drag chain line outline diagram

Table 9-22 inCube22 heavy-duty drag chain line specification table

Name	A-side connected form	B-side connected form	Encoder line/mm	Power line/mm	Minimum bending radius	Number of bends
inCube22 drag chain heavy-duty line	Double side buckle connected	Double side buckle connected	18	25	8D	10 million times

9.7 Highly flexible drag chain heavy-duty line for ARC4 series control cabinet

Configuration instructions

For the specification table of ARC4-50/75/165 high-flexible drag chain encoder line and high-flexible drag chain power line, see Table 9-23.

Table 9-23 ARC4-50/75/165 high flexible drag chain encoder line and high flexible drag chain power line specification table

Name	Adaptation control cabinet (A side)	Compatible with manipulator model (B side)	Specification	Part No	Standard/optional	Refer to
ARC4-50/ARC4-75 encoder drag chain cable	ARC4-50/ARC4-75	AIR50-2230A/AIR75-2100	10m	P04082000644	Optional	Figure 9-26 Table 9-24
			15m	P04082000645		
ARC4-50/ARC4-75 power drag chain line			10m	P04082000689	Optional	Figure 9-28 Table 9-26
			15m	P04082000690		
ARC4-165 encoder drag chain cable	ARC4-165	AIR165-2750A	10m	P04082000704	Optional (supports P1.2 and later versions)	Figure 9-26 Table 9-24
			15m	P04082000705		
ARC4-165 power drag chain line			10m	P04082000708	Optional (supports P1.2 and later versions)	Figure 9-28 Table 9-26
			15m	P04082000709		

Encoder line

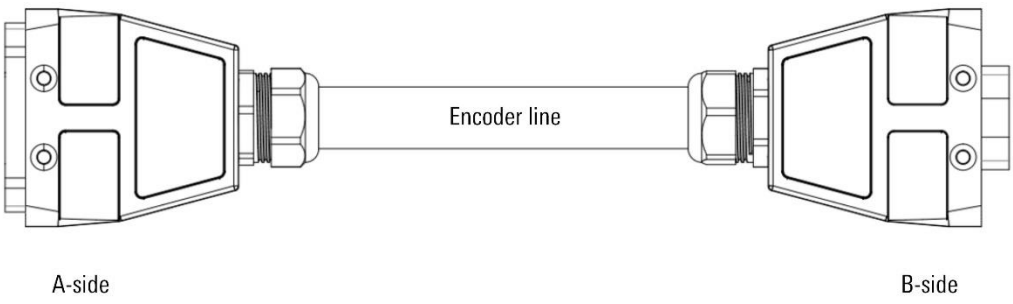


Figure 9-26 Diagram of the appearance of the ARC4-50/ARC4-75/ARC4-165 encoder fixed line and drag chain line

Table 9-24 ARC4-50/ARC4-75/ARC4-165 encoder fixed line and drag chain line specification table

Name	A-side connected form	B-side connected form	Wire diameter/mm
ARC4-50/ARC4-75 encoder drag chain cable	Buckle connection	Buckle connection	17
ARC4-165 encoder drag chain cable	Buckle connection	Buckle connection	25

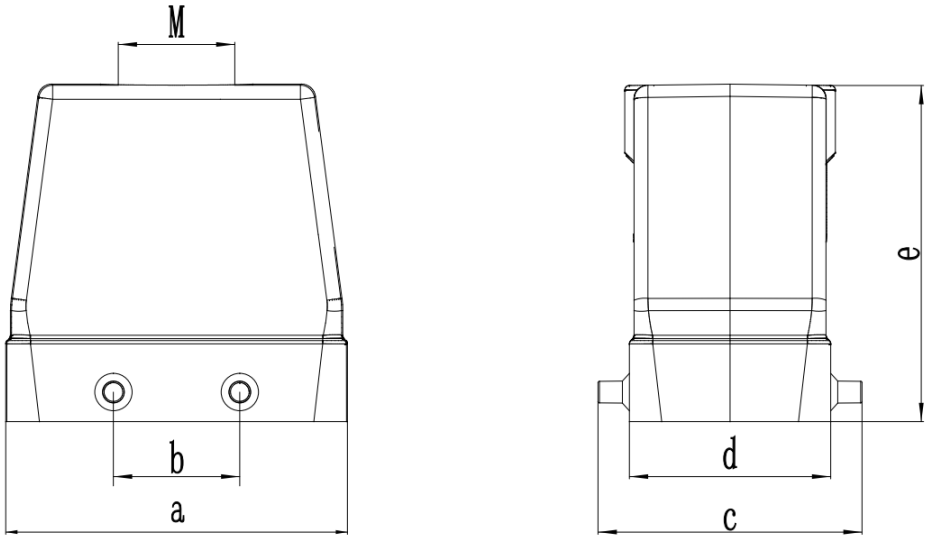


Figure 9-27 Encoder line heavy-duty connector dimensions

Table 9-25 Encoder line heavy-duty connector size table

Control cabinet	a	b	c	d	e	M
ARC4-50/ARC4-75	73	27	56.4	43	72	M25
ARC4-165	73	27	56.4	43	72	M32

Power line

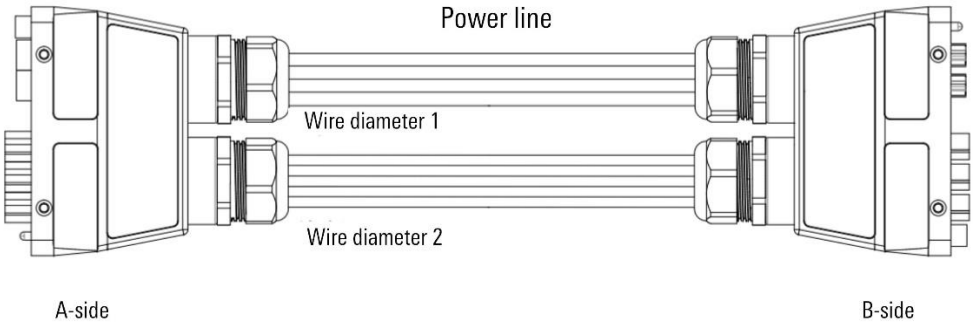


Figure 9-28 Diagram of the appearance of AIR165 power fixed line and AIR50/75/165 power drag chain line

Table 9-26 Specification table of AIR165 power fixed line and AIR50/75/165 power drag chain line

Name	A-side connected form	B-side connected form	Wire diameter 1/mm	Wire diameter 2/mm	Minimum bending radius	Number of bends
ARC4-50/ARC4-75 power drag chain line	Buckle connection	Buckle connection	32	32	6D	10 million times
ARC4-165 power drag chain line	Buckle connection	Buckle connection	32	32		

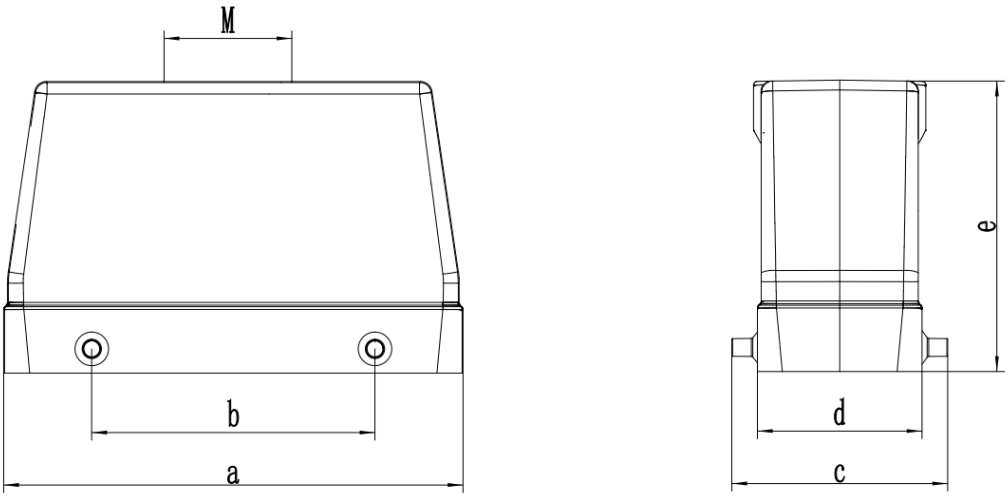


Figure 9-29 Dimensions of power line heavy-duty connector

Table 9-27 Power line heavy-duty connector size table

Control cabinet	a	b	c	d	e	M
ARC4-50/ARC4-75	120	74	56.4	43	76	M32
ARC4-165	120	74	56.4	43	76	2×M32

10 Teach pendant-control cabinet connected cable

10.1 Overview

This option is used in different space situations to facilitate the selection of the appropriate teach pendant cable length.

For the specifications of the teach pendant-control cabinet connection cable, see Table 10-1.

Table 10-1 Teach pendant-control cabinet connection cable specification table

Name	Adapted to manipulator or control cabinet	Specification	Part No	Standard/optional
Teach pendant external wiring harness	inCube20/22/2S, ARC4-50/75/165	5m	P04082000346	Standard configuration
		10m	P04082000587	Optional; standard for ARC4-165
		15m	P04082000588	Optional
		20m	P04082000589	Optional

For the legend of the external wiring harness of the teach pendant, refer to Figure 10-1. For detailed instructions, please refer to Table 10-2.

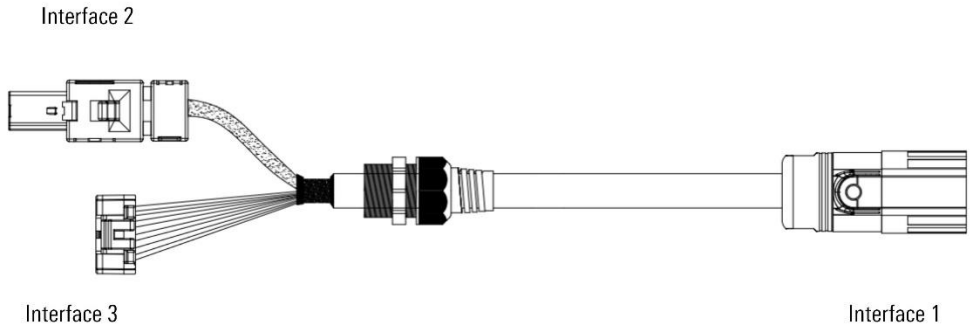


Figure 10-1 Teach pendant external wiring harness legend

Table 10-2 Teach pendant external wiring harness description

Serial number	Illustrate	Remark
Interface 1	M23 connector plug	Corresponds to the M23 socket on inCube20/22 and ARC4-50/75/165 respectively
Interface 2	Network cable connector	-
Interface 3	Power and signal cable connectors	Single row 10P connector plug

10.2 Teach pendant and inCube/ARC5 series control cabinet connection steps

Connection steps:

Step1. The teach pendent connection interface adopts quick-plug connector connection. Turn the teach pendant shielding knob to level 1 to enable the teach pendant function.

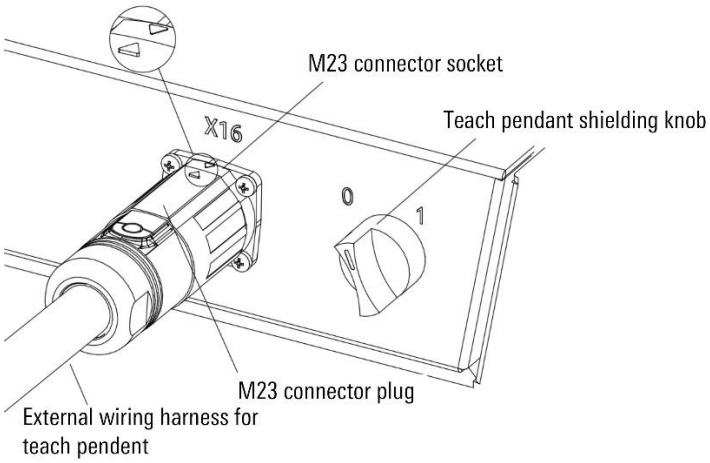


Figure 10-2 Teach pendant connection interface

Notice

inCube2S control cabinet has no shielding knob. You need to click the [System/Restart and Logout/Teach Pendant Shield] option on the main interface of the teach pendant to enter the [Lock Screen] interface as shown in Figure 10-3. The "Lock Screen" interface is displayed in the middle of the interface. The teach pendant has been blocked, and the emergency stop function of the teach pendant is invalid. Please unplug the teach pendant in time." prompts. Click the <Unlock> button at this time, and the unlocking will be invalid. You can click < Enable Teach > at the top left of the interface, switch to the interface as shown in Figure 104, and then click the < Unlock > button to re-enter the main interface of the teach pendent.

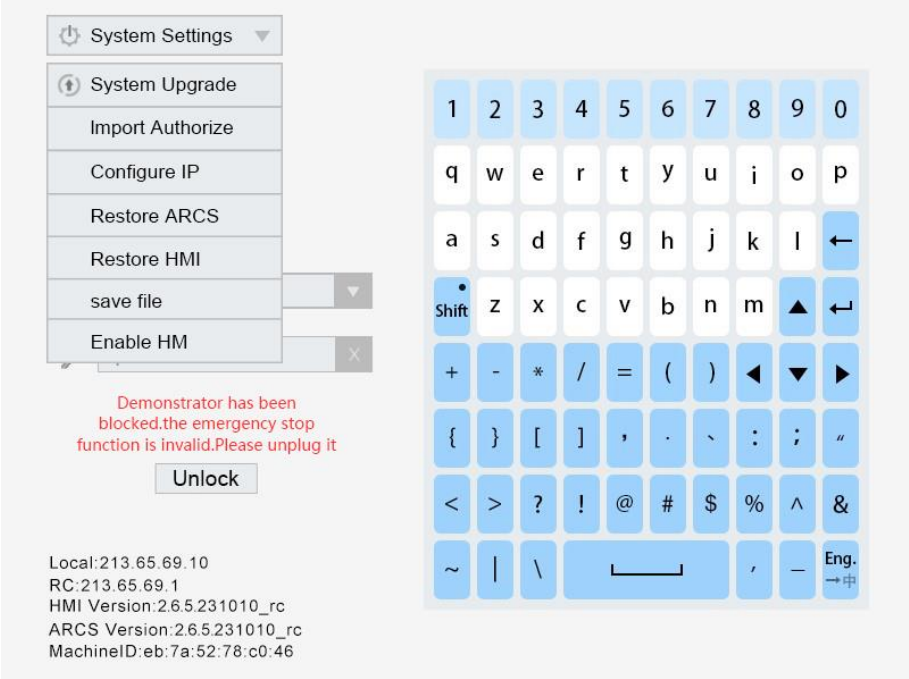


Figure 10-3 Teach pendant [lock screen] interface 1

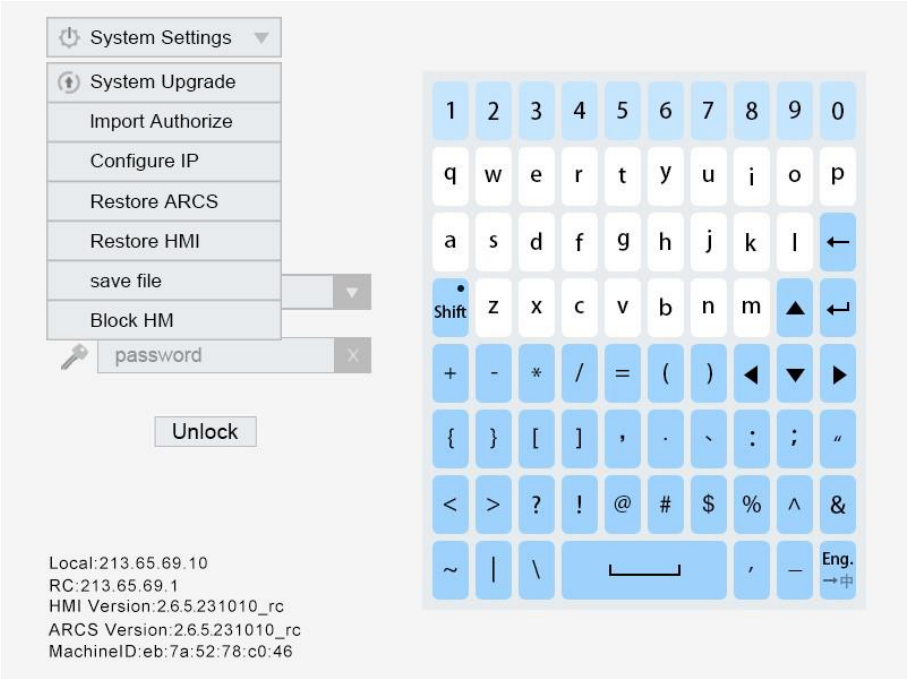


Figure 10-4 Teach pendant [lock screen] interface 2

Step2. Align the triangular symbol of the connector plug with the triangular symbol of the connector socket (e.g. partial enlarged view of Figure 10-2), push the connector plug, and rotate 45° clockwise to make it with the connector socket, clamp. See the box in Figure 10-5 for the location of the socket.

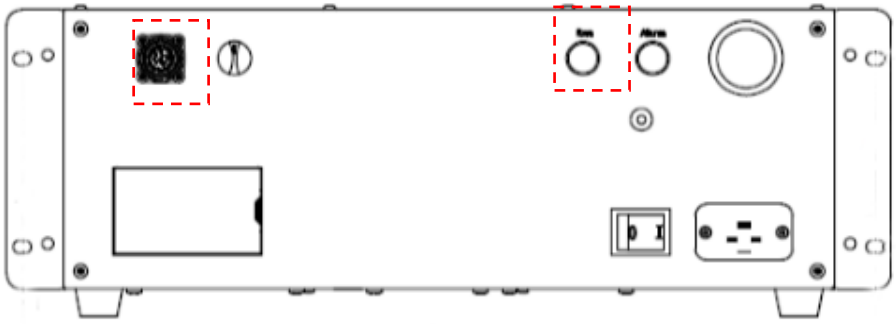


Figure 10-5 Socket location on the inCube20/22 control cabinet

When it is necessary to replace the teach pendant external wiring harness of different lengths, the replacement steps are:

Step1. Use a phillips screwdriver to unscrew the four M4×10 cross-recessed countersunk head self-tapping screws on the back cover of the teach pendant, and remove the back cover. Refer to Figure 10-6.

Step2. Insert the external wire harness of the teach pendant through the opening on the lower right side of the teach pendant housing, clamp the cable connector in the opening, and use 2 M3×6 cross-recessed pan-head screws to press the wire harness shielding layer onto the shield clamp, refer to Figure 10-7.

Step3. Connect the end of the external wiring harness of the teach pendant with the network cable plug to the network cable socket on the circuit board of the teach pendant. Connect the power and signal cable connectors to the single-row 10P connector socket on the circuit board of the teach pendant. Refer to Figure 10-7.

Step4. Tighten the cable connector, close the teach pendant back cover, and tighten the screws.

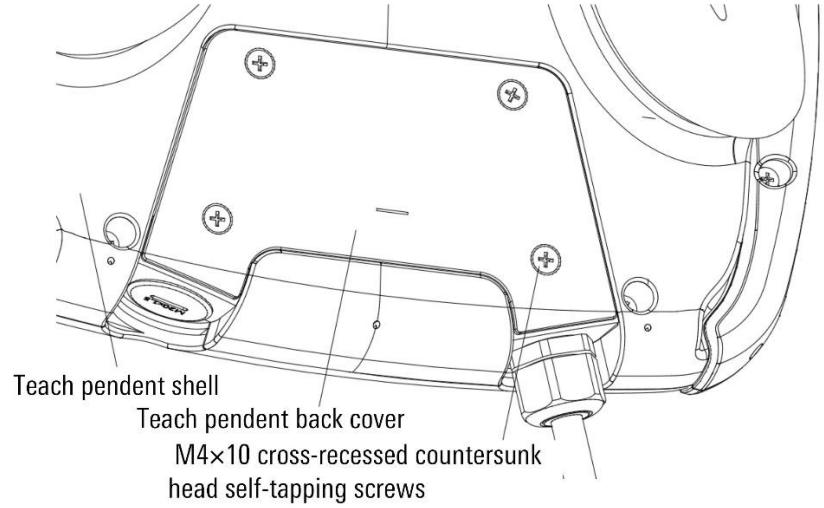


Figure 10-6 Diagram of replacing the external wiring harness of the teach pendant 1

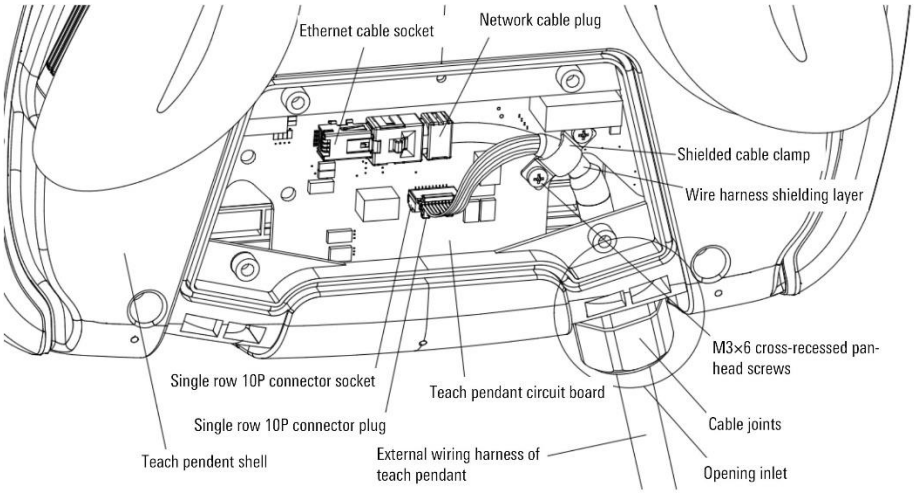


Figure 10-7 Diagram of replacing the external wiring harness of the teaching pendant 2

10.3 Connection steps between the teach pendent and the ARC4 series control cabinet

Connection steps:

Step1. The teach pendent connection interface adopts quick-plug connector connection. Align the triangle symbol on the M23 connector plug of the external wire harness of the demonstrator with the triangle symbol on the M23 connector socket (such as the enlarged view in Figure 10-8), push the plug, and rotate 45 degrees clockwise to clamp it with the socket.

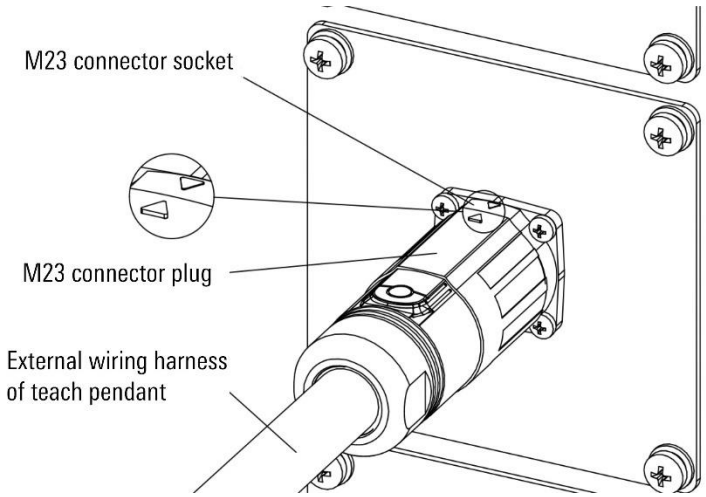


Figure 10-8 Teach pendant connection interface

When it is necessary to replace the teach pendant external wiring harness of different lengths, the replacement steps are:

Step1. Use a phillips screwdriver to unscrew the four M4×10 cross-recessed countersunk head self-tapping screws on the back cover of the teach pendant, and remove the back cover. Refer to Figure 10-9.

Step2. Insert the external wire harness of the teach pendant through the opening on the lower right side of the teach pendant housing, clamp the cable connector in the opening, and use 2 M3×6 cross-recessed pan-head screws to press the wire harness shielding layer onto the shield clamp, refer to Figure 10-10.

Step3. Connect the end of the external wiring harness of the teach pendant with the network cable plug to the network cable socket on the circuit board of the teach pendant. Connect the power and signal cable connectors to the single-row 10P connector socket on the circuit board of the teach pendant. Refer to Figure 10-10.

Step4. Tighten the cable connector, close the teach pendant back cover, and tighten the screws.

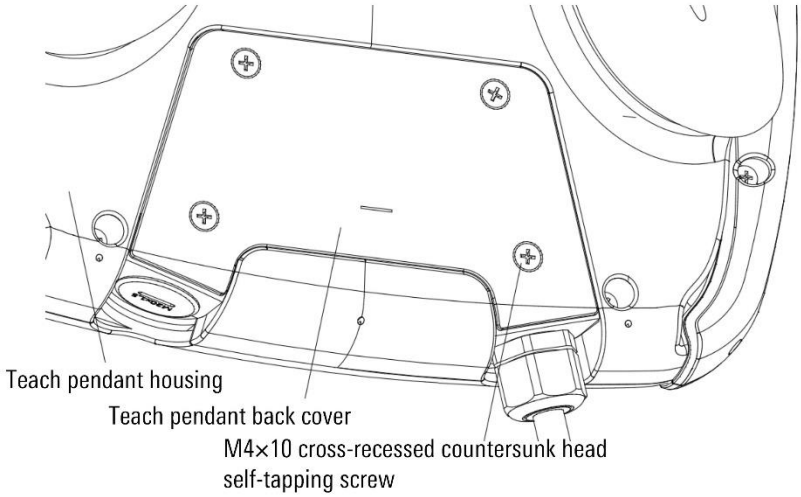


Figure 10-9 Diagram 1 of replacing the external wiring harness of the teach pendant

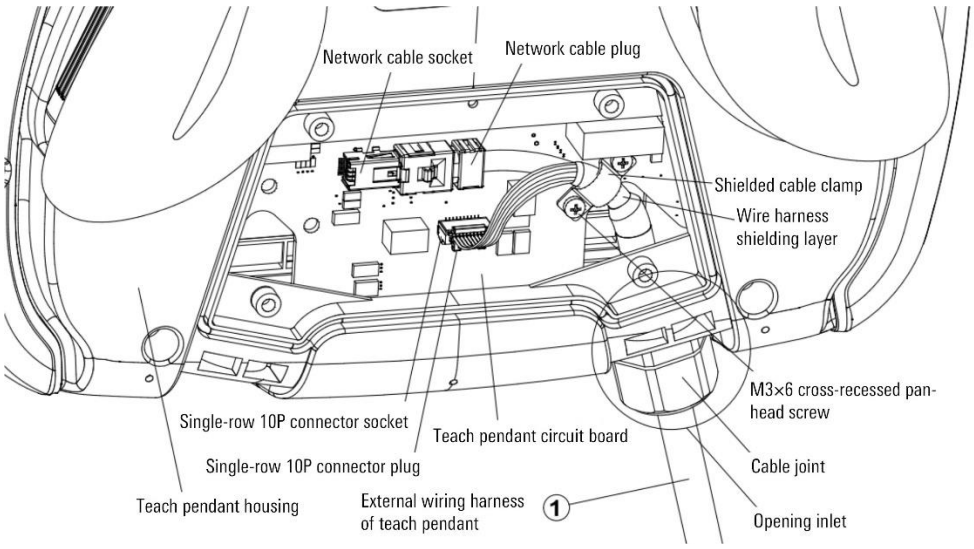


Figure 10-10 Diagram 2 of replacing the external wiring harness of the teach pendant

11 EtherCAT communication module

11.1 Overview

This optional accessory is used for external expansion of axis drive and EtherCAT (Ethernet Control Automation Technology) communication, and is an installation wiring outside the cabinet.

11.2 EtherCAT industrial network cable connected to inCube/ARC5 series control cabinet

Configuration instructions

For details on the external EtherCAT configuration of the inCube series control cabinet, see Table 11-1.

Table 11-1 inCube series control cabinet external expansion EtherCAT configuration table

Name	Specification	Adaptation control cabinet	Corresponding cabinet interface	Part No	Construct dosage	Standard/optional
Industrial network cable	5m	inCube2S	EtherCAT	P04082000279	1	Optional
		inCube20/22	EtherCAT			

Connect inCube2S

Plug the industrial network cable into the EtherCAT interface of the cabinet (refer to Figure 11-1).

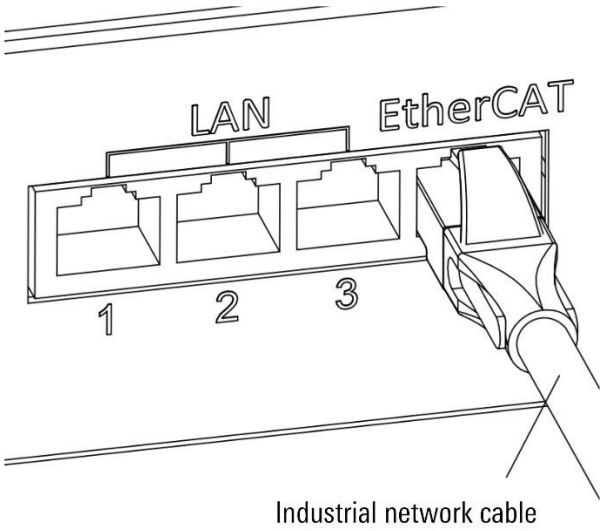


Figure 11-1 EtherCat wiring of inCube2S

Connect inCube20/22

Plug the industrial network cable into the EtheCAT interface of inCube20/22 (refer to Figure 11-2).

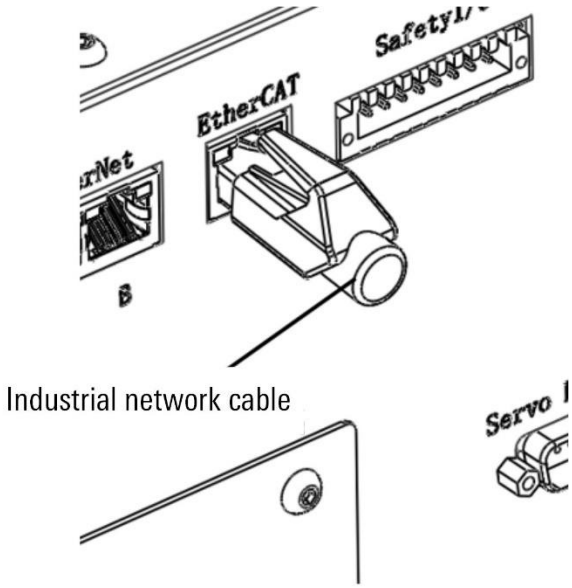


Figure 11-2 EtherCat wiring for inCube /22

Connect ARC5

Plug the industrial network cable into the EtheCAT interface of ARC5 (refer to Figure 11-3).

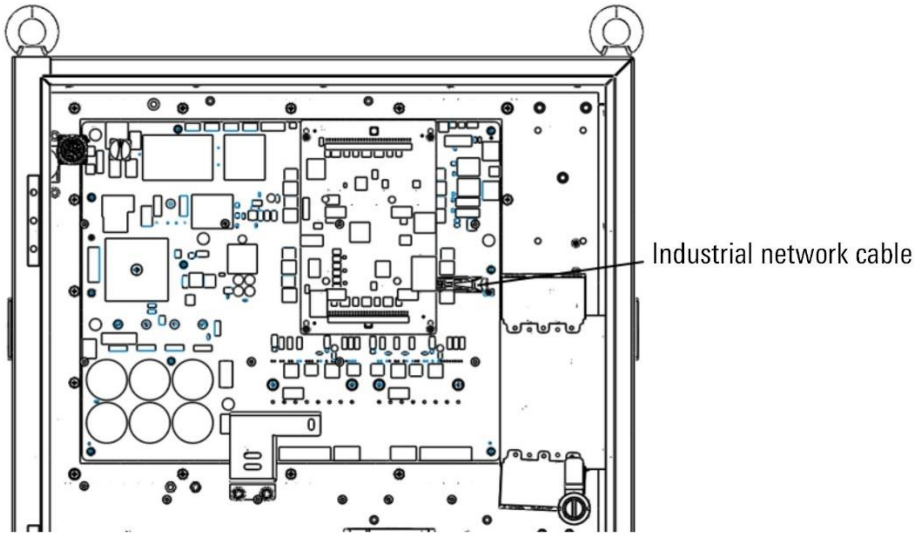


Figure 11-3 EtherCat wiring for ARC5

11.3 EtherCAT communication module is connected to ARC4 series control cabinet

Configuration instructions

For information about the part No of the EtherCAT communication module of the ARC4 series control cabinet, see Table 11-2.

Table 11-2 ARC4 series control cabinet EtherCAT communication module part No

Name	Part No
ARC4-50_EtherCAT communication module	PC5100000050
ARC4-165_EtherCAT communication module	PC5100000051

For configuration instructions of the EtherCAT communication module of the ARC4 series control cabinet, see Table 11-3.

Table 11-3 Main configuration table of EtherCAT communication module of ARC4 series control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	Network port plug installation plate	Square sheet metal bezel	ARC4-50/75/165	P01035000360	1	Optional
2	Network port plug	RJ45 network port plug		P04083000059	1	
3	EtherCAT cabinet network cable	0.5m 5e network cable		P04082000096	1	
4	Industrial network cable	5 meters category 6 network cable		P04082000279	1	

Connection step

Step1. Use a Phillips screwdriver to remove the original reserved cable installation plate (refer to Figure 11-4), and remove the① network port plug installation plate (refer to Figure 11-5) installed on the cabinet.

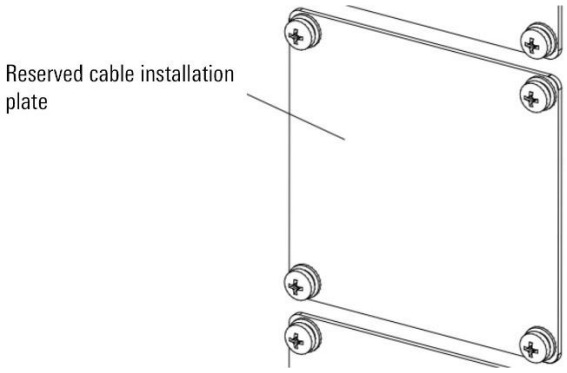


Figure 11-4 Reserved cable installation plate

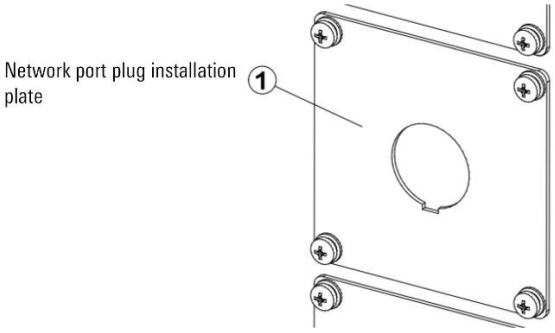


Figure 11-5 Network port plug installation plate

Step2. Install the ② network port plug (refer to Figure 11-6) on the network port plug installation plate.

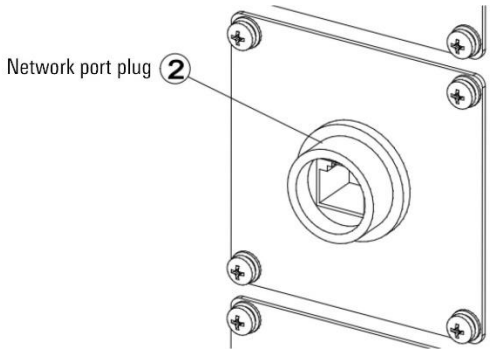


Figure 11-6 Network port plug

Step3. Connect one end of the ③ EtherCAT cabinet network cable to the ② network port plug, and the other end to the CN1B interface of the J6 driver. Arrange the cables in the cabinet reasonably (refer to Figure 11-7).

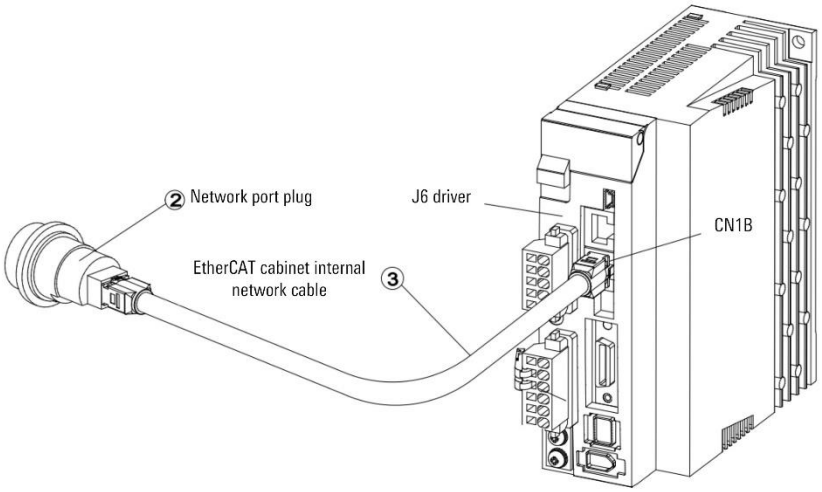


Figure 11-7 Diagram of the CN1B interface connecting the J6 driver

Step4. Connect one end of the ④ industrial network cable to the ② network port plug, and the other end to the user's own application module (refer to Figure 11-8).

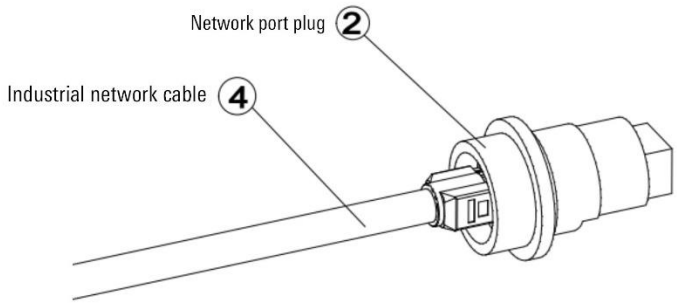


Figure 11-8 EtherCat cabinet external wiring diagram

12 RS232 communication cable

12.1 Overview

This optional accessory is used to connect the external expansion PLC module and RS232 (asynchronous transmission standard interface) communication, which belongs to the installation wiring outside the cabinet.

12.2 RS232 interface cable is connected with inCube series/ARC5 control cabinet

Configuration instructions

Please refer to Table 12-1 for details on the RS232 expansion configuration of the control cabinet.

Table 12-1 Main configuration table of control cabinet external expansion RS232

Name	Specification	Adaptation control cabinet	Corresponding cabinet interface	Part No	Construct dosage	Standard/optional
SCRC10-outside cabinet RS232 wiring harness	3m	inCube2S/20/22/ ARC5	RS232	P04082000843	1	Optional

Connect inCube2S/20/22/ARC5

Connect one end of the SCRC10-outside cabinet RS232 wire harness with a double-row 6P connector to the RS232 interface of the cabinet (refer to Figure 12-1), and connect the other end of the DB9 male connector to the user's own on the application module. The interface of the ARC5 control cabinet is on the MCBS fixed on the cabinet door sheet metal, such as Figure 12-2 is a diagram of the interface distribution of the MCBS from bottom to top after opening the front door.

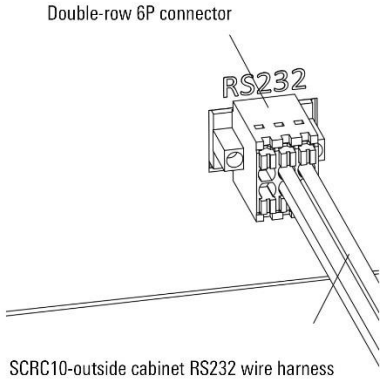


Figure 12-1 SCRC10-Outside cabinet RS232 wiring harness wiring diagram

Figure 12-2 ARC5 MCBS interface distribution diagram

12.3 RS232 interface cable is connected with ARC4 series control cabinet

Configuration instructions

For details about the part No of the ARC4 series control cabinet external expansion RS232, please refer to Table 12-2.

Table 12-2 ARC4 series control cabinet external expansion RS232 communication cable part No

Name	Part No
ARC4-50/75/165_RS232 communication cable	PC5100000072

Please refer to Table 12-3 for the configuration instructions of ARC4 series control cabinet external expansion RS232.

Table 12-3 Main configuration table of ARC4 series control cabinet external expansion RS232

Serial number	Name	Specification	Adapted to manipulator or control cabinet	Part No (adaptive product)	Construct dosage	Standard/ optional
1	M12 connector mounting plate	Square sheet metal baffle	ARC4-50/75/165	P01035000614	1	Optional
2	MCB-RS232 cabinet wiring harness	3C loose wire, 0.48 meters long		P04082000725	1	
3	ARCCD10-RS232 wiring harness	3C*22#PUR gray cable, 3 meters long		P04082000278	1	

Connection step

Step1. Remove the original reserved cable mounting plate (refer to Figure 12-3) with a cross screwdriver and install the M12 connector mounting plate (refer to Figure 12-4) on the cabinet.

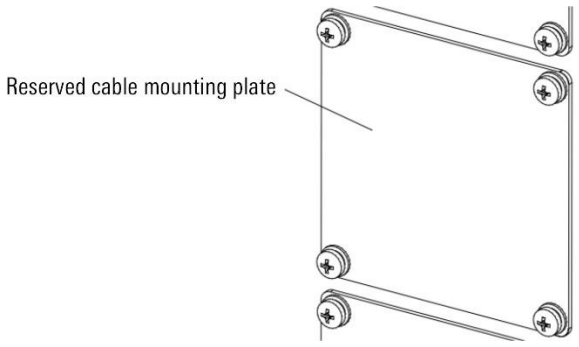


Figure 12-3 Reserved cable installation plate

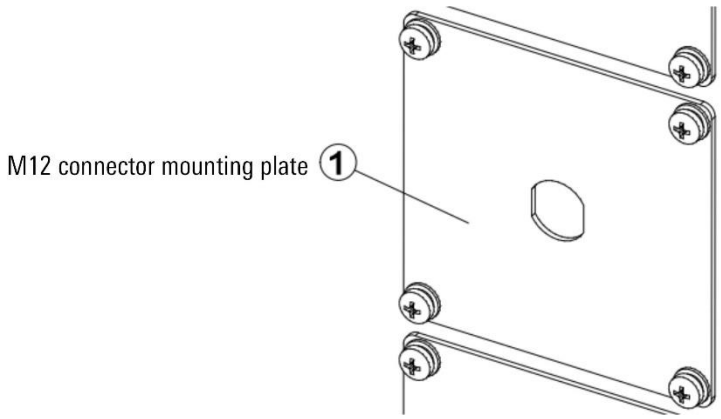


Figure 12-4 M12 connector mounting plate

Step2. Install the M12 female connector (reference Figure 12-5) on the M12 connector mounting plate.

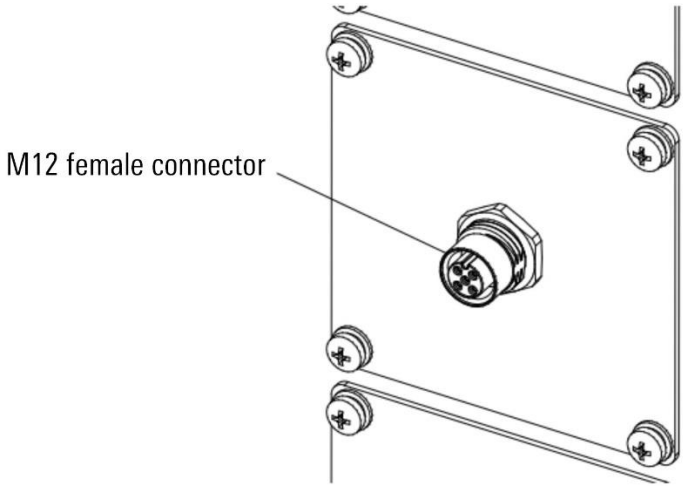


Figure 12-5 M12 female connector

Step3. Connect one end of MCB-RS232 cable harness in the cabinet (4P connector connector) to the X205 serial port of MCB, and the other end to the M12 female connector, and arrange the cables in the cabinet reasonably, refer to Figure 12-6.

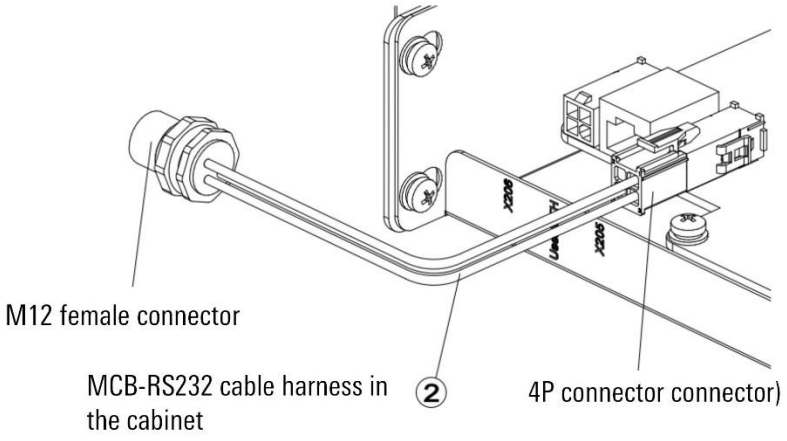
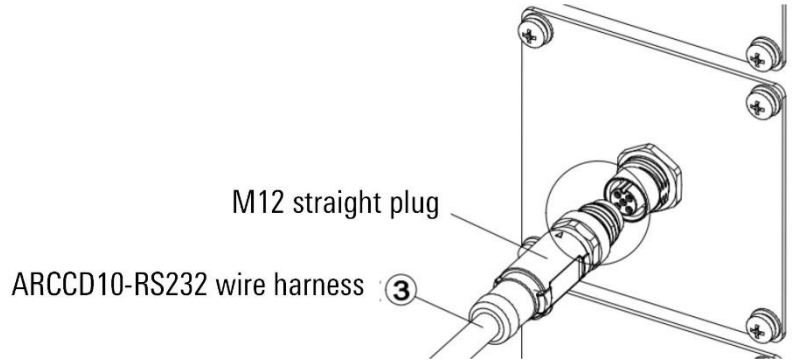
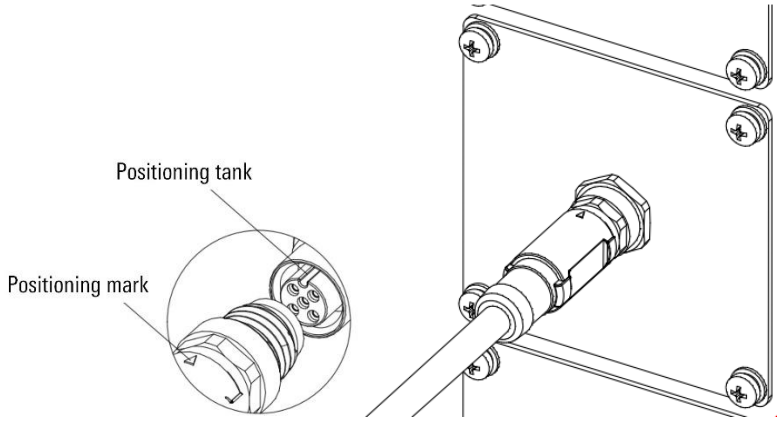


Figure 12-6 Diagram of the X205 serial port connected to MCB

Step4. Connect the end of the ARCCD10-RS232 wire harness with the M12 straight plug to the M12 female connector of the cabinet according to the triangular positioning mark (refer to Figure 12-7), the other end is connected to the user's own application module.



(a)



(b)

Figure 12-7 ARCCD10-RS232 wiring harness external wiring diagram

13 Ethernet industrial network cable

13.1 Overview

This option is for Ethernet communication.

13.2 Ethernet interface cable is connected to inCube/ARC5 series control cabinet

Configuration instructions

For details on the external Ethernet configuration of the inCube series control cabinet, see Table 13-1.

Table 13-1 inCube series control cabinet external expansion Ethernet configuration table

Name	Length	Adaptation control cabinet	Corresponding cabinet interface	Part No	Construct dosage	Standard/optional
Industrial network cable	5m	inCube2S	LAN	P04082000279	1	Optional
		inCube20/22/ARC5	EtherNet			

Connect inCube2S

Plug the industrial network cable into the LAN interface of the cabinet (choose one, refer to Figure 13-1).

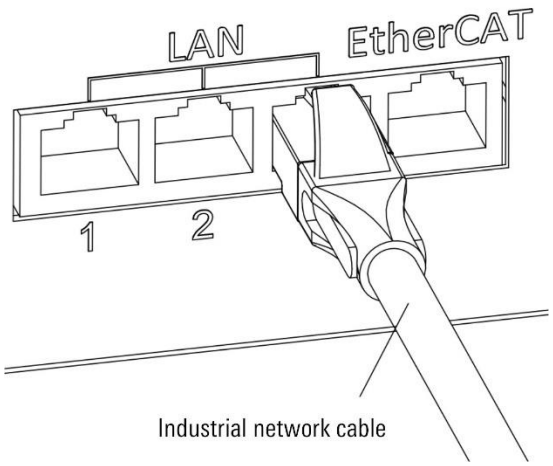


Figure 13-1 Ethernet wiring diagram of inCube2S

Connect inCube20/22

Plug the industrial network cable into the Ethernet interface of the cabinet (refer to Figure 13-2).

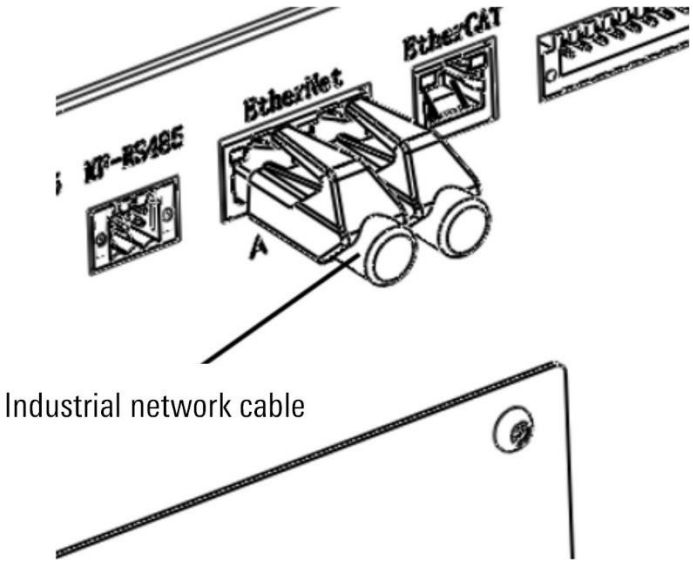


Figure 13-2 Ethernet wiring diagram of inCube20 /22

13.3 Ethernet interface cable is connected to ARC4 series control cabinet

Configuration instructions

Please refer to Table 13-2 for details on the external ethernet configuration of the ARC4 series control cabinet.

Table 13-2 Main configuration table of EtherCAT communication module of ARC4 series control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	Network port plug installation plate	Square sheet metal baffle	ARC4-50/75/165	P01035000360	1	Optional
2	Network port plug	RJ45 network port plug		P04083000059	1	
3	Industrial network cable	5 meters Category 6 network cable		P04082000279	1	

Connection step

Step1. Remove the original reserved cable mounting plate (refer to Figure 13-3) with a cross screwdriver, and install the ① network plug mounting plate (refer to Figure 13-4) on the cabinet.

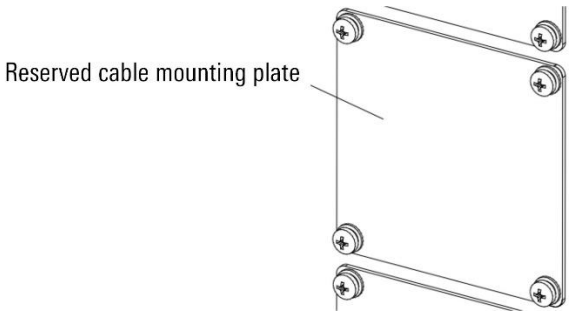


Figure 13-3 Reserved cable installation plate

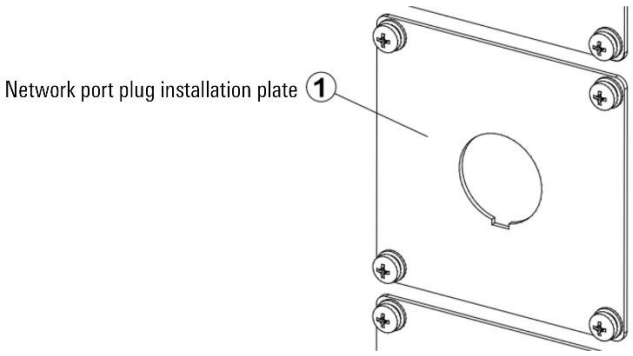


Figure 13-4 Network port plug installation plate

Step2. Install the ② network port plug (refer to Figure 13-5) on the network port plug installation plate.

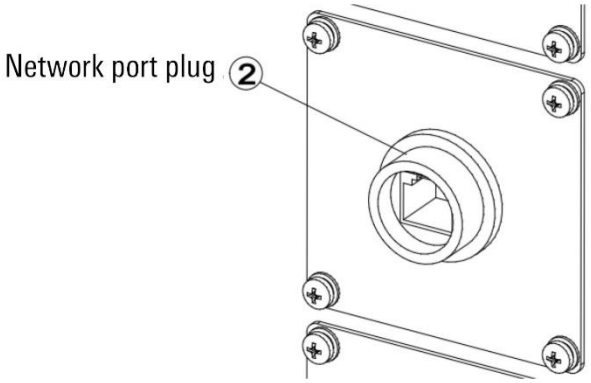


Figure 13-5 Network port plug

Step3. One end of the ③ industrial network cable is connected to the network port plug, and the other end is connected to the user's own application module. Refer to Figure 13-6.

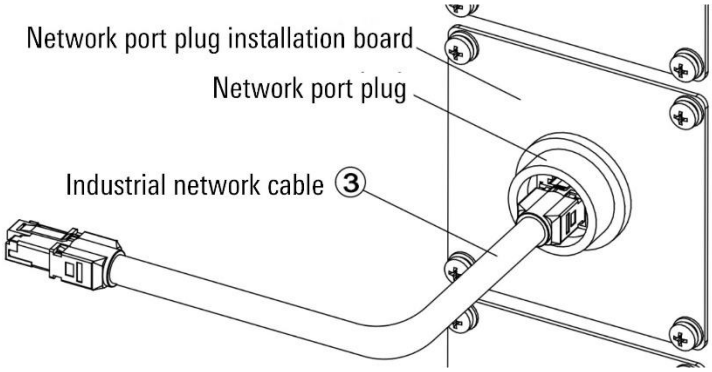


Figure 13-6 Diagram of industrial network cable connecting to network port plug

14 Modbus communication cable

14.1 Overview

This option is for Modbus communication. Currently only inCube20/22/ARC5 (as a slave) supports Modbus communication.

14.2 Modbus interface cable is connected to inCube series control cabinet

Configuration instructions

For details on the inCube20/22 control cabinet expansion Modbus configuration instructions, see Table 14-1.

Table 14-1 inCube20/22 control cabinet external expansion Modbus main configuration table

Name	Specification	Adaptation control cabinet	Corresponding cabinet interface	Part No	Construct dosage	Standard/optional
RS485 wiring harness outside the cabinet	5m	inCube20/22	PLC-RS485	P04082000844	1	Optional

Connect inCube20/22

For the inCube20/22 control cabinet, connect one end of the RS485 wiring harness outside the cabinet to the PLC-RS485 interface of the cabinet (refer to Figure 14-1), and the other end to the user's own application module (one end of the Weidmuller connector is a cold-pressed terminal).

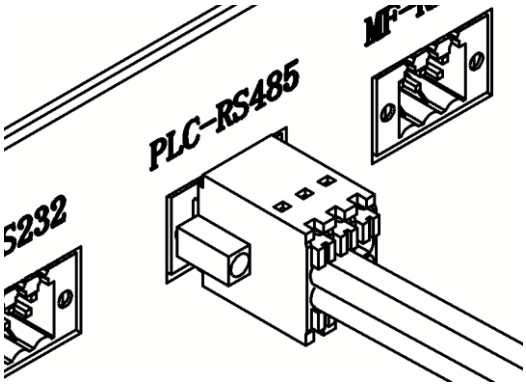


Figure 14-1 External expansion Modbus wiring

Connect ARC5

The interface distribution of ARC5 is shown in Figure 12-1(b). The connection method is consistent with the inCube20/22 control cabinet.

15 PROFINET communication module

15.1 Overview

This option is used to expand the PROFINET communication function.

15.2 PEB module introduction and installation dimensions

Tip

For detailed usage of the PEB module, please refer to our company's "PEB User manual".

The PEB module is packaged in a separate shell and placed outside the cabinet (mounted on the control cabinet track with the help of buckles). It requires 24V DC power supply and grounding. For its interface diagram and related instructions, please refer to Figure 15-1 and Table 15-1.

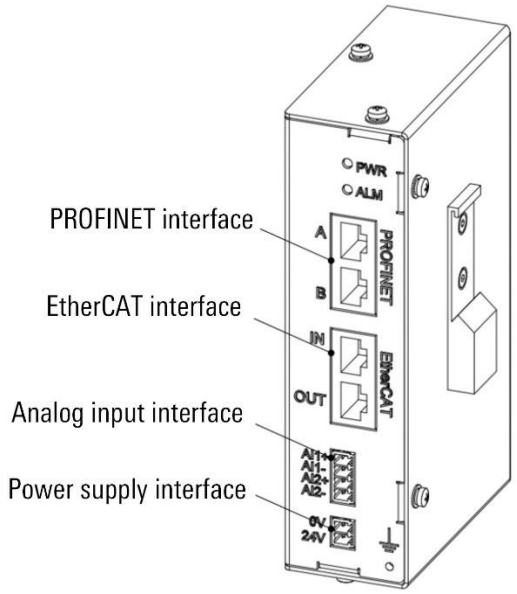


Figure 15-1 PEB module interface diagram

Table 15-1 PEB module interface introduction

Interface name	Illustrate
PROFINET interface	Connected to devices that support the Profinet protocol through the PROFINET interface, it can only be used as a slave station, not as a master station.
EtherCAT interface	\
Analog input interface	Supports two analog input modes: current 0mA~20mA and voltage 0V~10V
Power supply interface	\

Figure 15-2 is the PEB module size diagram.

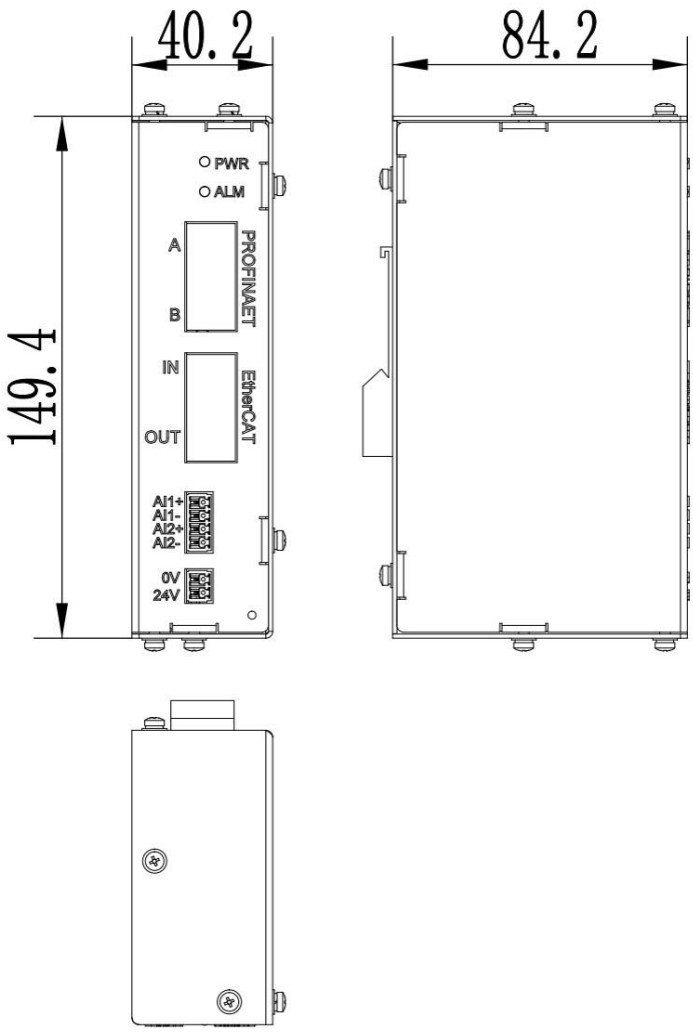


Figure 15-2 PEB module size diagram

15.3 PROFINET communication module is connected to inCube series control cabinet

15.3.1 PROFINET communication module connected to inCube20/22 control cabinet

Configuration instructions

For information about the part No of the PROFINET communication module in the inCube20/22 control cabinet, see Table 15-2.

Table 15-2 inCube20/22 control cabinet PROFINET communication module part No

Name	Part No
inCube20/22_PROFINET communication module	PC5100000099

inCube20/22 control cabinet PROFINET communication module configuration instructions are detailed in Table 15-3.

Table 15-3 Main configuration table of PROFINET communication module in inCube20/22 control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Remark
1	inCube20-plug-in accessories sheet metal	sheet metal	inCube20/22	P01035000943	1	
2	Guide	Shanghai Pinzhe/H66-IR		P01055000009	0.43	The material is 1m and needs to be cut to about 420mm
3	Cross recessed pan head combination screws	M4X8		P02023000019	3	Quantity 3
4	Cross recessed pan head combination screws	M5X10		P02023000025	6	Quantity 6
5	PEB module	-		P05255000890	1	
6	Communication network cable	1m		P04082000381	1	
7	Industrial network cable	5m		P04082000279	1	
8	Single row 4P connector plug	4pin/direct plug-in		P03085100006	1	Other functional interfaces of the PEB module are not required by Profinet
9	Single row 2P connector plug	2pin/direct plug-in		P03085100005	1	

Connection step

Step1. Use 3 M4X8 cross-recessed pan head combination screws to install the inCube20-external accessory sheet metal and guide rail to the back of the control cabinet, such as Figure 15-3.

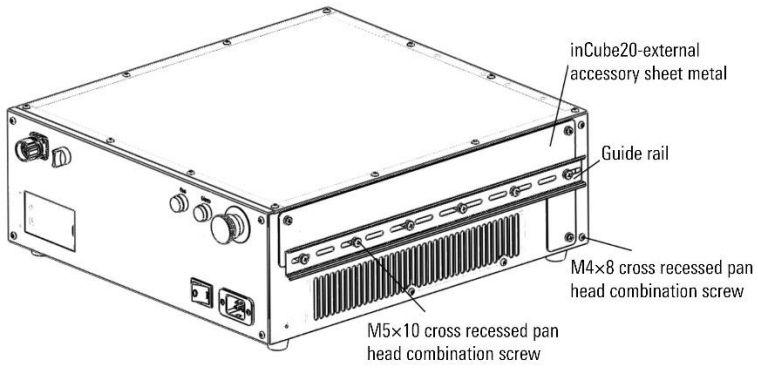


Figure 15-3 Installing inCube20-external sheet metal and guide rails

Step2. Install the PEB module on the guide rail through its own installation buckle, refer to Figure 15-4.

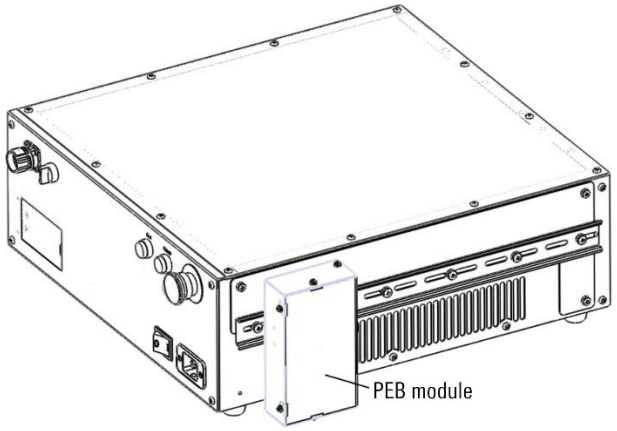


Figure 15-4 Install the PEB module on the guide rail

Notice	The PEB module needs to be placed close to the front panel of the control cabinet to avoid blocking the air duct.

Step3. According to actual needs, use a communication network cable to connect the Ethercat interface of the control cabinet (the control cabinet corresponds to the Ethercat interface) and the EtherCAT-IN interface of the PEB module; use an industrial network cable to connect the Profinet-A interface of the PEB module and the PLC device, refer to Figure 15-5.

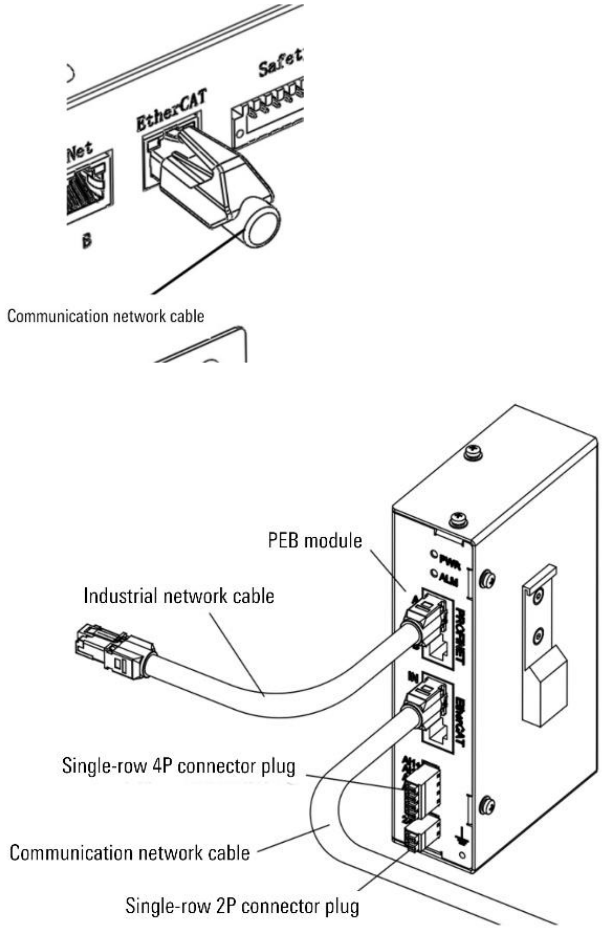


Figure 15-5 PEB module wiring

Step4. The single-row 2P connector is installed on the 24V power interface of the PEB module (the corresponding interface is 0V 24V), which is convenient for users to access the power supply equipment.

Tip

In addition to PROFINET, the PEB module also provides other functional interfaces, which users can choose according to their actual needs: the single-row 4P connector is installed on the analog input interface of the PEB module (the corresponding interface is AI1 + AI1-AI2 + AI2-), which is convenient for users to access analog devices. For details, please refer to our "PEB user Manual".

15.4 The PROFINET communication module is connected to the ARC5 control cabinet

Configuration instructions

For detailed information about the part No of the PROFINET communication module of the ARC5 control cabinet, see Table 15-4.

Table 15-4 ARC5 control cabinet PROFINET communication module part No

Name	Part No
ARC5_PROFINET communication module	PC5100000100

For configuration instructions of the PROFINET communication module of the ARC5 control cabinet, see Table 15-5.

Table 15-5 Main configuration table of PROFINET communication module in ARC5 control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Remark
1	Guide	Shanghai Pinzhe/H66-IR	ARC5	P01055000009	0.07	The material is 1m and needs to be cut to about 70mm
2	Hexagonal flange nut	M5		P02031400001	2	Quantity 2
3	PEB module	-		P05255000890	1	
4	Communication network cable	1m		P04082000381	1	
5	Industrial network cable	5m		P04082000279	1	
6	Single row 4P connector plug	4 pin/direct plug-in		P03085100006	1	Other functional interfaces of the PEB module are not required by Profinet
7	Single row 2P connector plug	2pin/direct plug-in		P03085100005	1	

Connection step

Step1. Use 2 M5 hexagonal flange nuts to install the guide rail to the lower left side of the middle partition of the control cabinet, as shown in Figure 15-6.

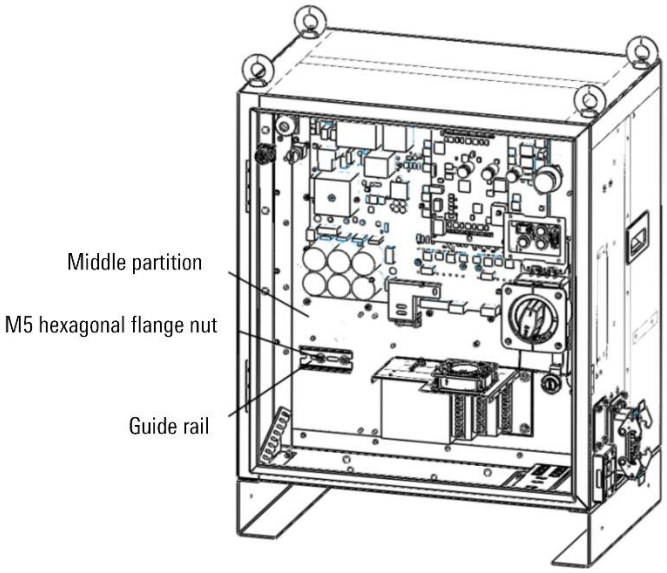


Figure 15-6 Mounting guide rail

Step2. Install the PEB module on the guide rail through its own mounting buckle, refer to Figure 15-7.

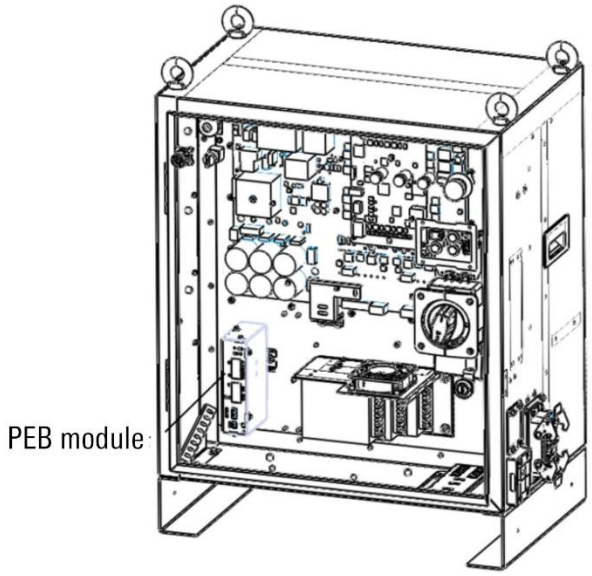


Figure 15-7 Install the PEB module on the rail

Notice

If the PEB module and the MF module are selected at the same time, please note that there is a space margin of about 10mm~20mm between the two guide rails.

Step3. According to actual needs, use a communication network cable to connect the Ethercat interface on the DCBS board of the control cabinet and the EtherCAT-IN interface of the PEB module; use an industrial network cable to connect the Profinet-A interface of the PEB module and the PLC device. The industrial network cable passes through the cable core on the right side of the control cabinet. Pass out the cabinet, refer to Figure 15-8.

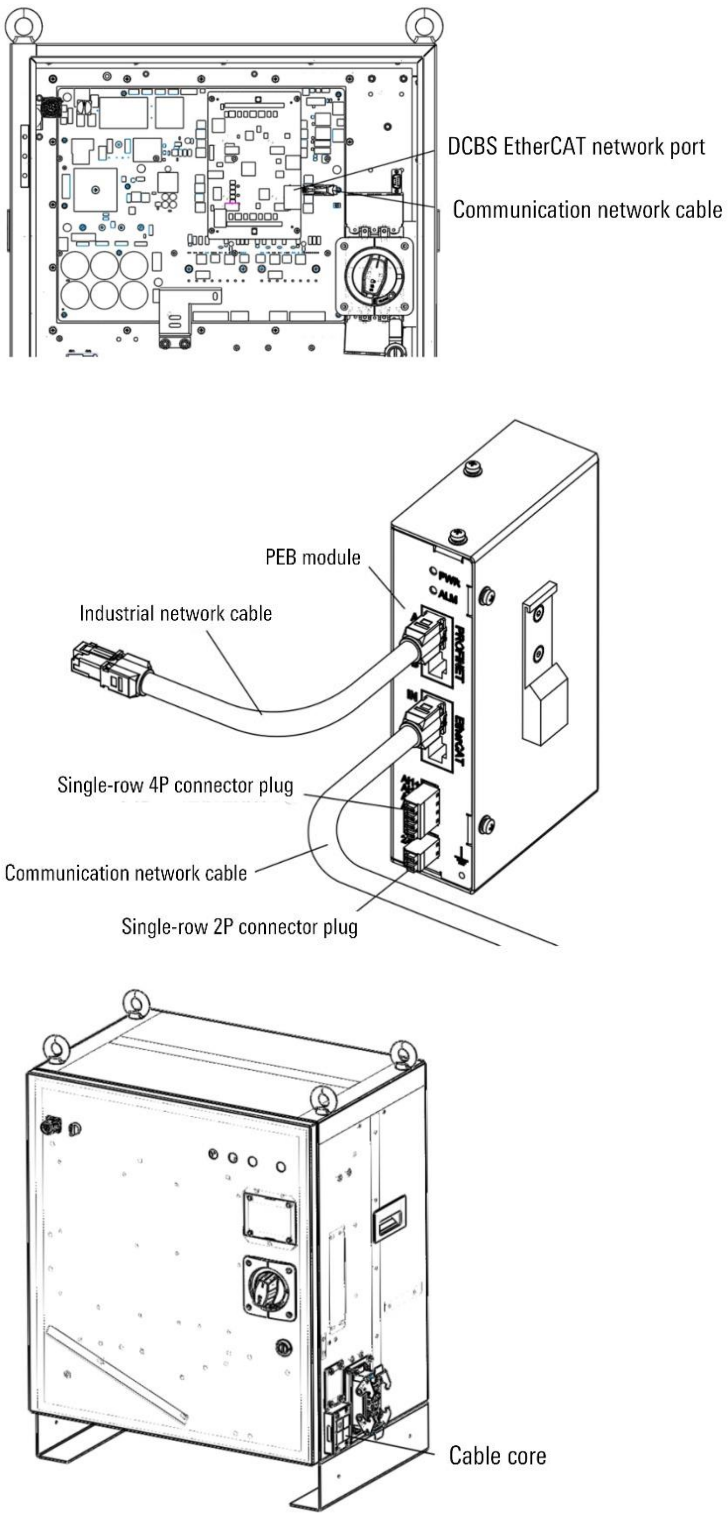


Figure 15-8 PEB module wiring

Step4. The single-row 2P connector is installed on the 24V power interface of the PEB module (the corresponding interface is 0V 24V), which is convenient for users to access the power supply equipment.

Tip

In addition to PROFINET, the PEB module also provides other functional interfaces, which users can choose according to their actual needs: the single-row 4P connector is installed on the analog input interface of the PEB module (the corresponding interface is AI1 + AI1-AI2 + AI2-), which is convenient for users to access analog devices. For details, please refer to our "PEB user Manual".

In addition to the above-mentioned industrial network cables, if the user needs to use other wiring harnesses

	on the PEB module that require connected to go outside the cabinet, cable cores with appropriate wire diameters must be selected and installed in the cable entry frame to ensure the protection level of the ARC5 control cabinet.

15.5 PROFINET communication module is connected to ARC4 series control cabinet

Configuration instructions

For information about the part No of the external PROFINET communication module of the ARC4 series control cabinet, see Table 15-6.

Table 15-6 ARC4 series control cabinet external expansion PROFINET communication module part No

Name	Part No
ARC4-50_PROFINET communication module	PC5100000070
ARC4-50/75/165_PROFINET communication module	PC5100000071

For configuration instructions of the external PROFINET communication module of the ARC4 series control cabinet, see Table 15-7.

Table 15-7 Main configuration table of ARC4 series control cabinet external expansion PROFINET communication module

Serial number	Name	Specification	Adapted to manipulator or control cabinet	Part No	Construct dosage
1	Network port plug installation plate	Square sheet metal baffle	ARC4-50/75	P01035000360	1
2	Network port plug	RJ45 network port plug	ARC4-50/75/165	P04083000059	1
3	EtherCAT cabinet network cable	0.5m 5e network cable	ARC4-50/75/165	P04082000096	1
4	EtherCAT industrial network cable	1 meter Category 6 network cable	ARC4-50/75/165	P04082000381	1
5	PEB module	EtherCAT to PROFINET	ARC4-50/75/165	P05255000890	1
6	Industrial network cable	5 meters Category 6 network cable	ARC4-50/75/165	P04082000279	1
7	Terminal block plug	Single row 4P plug	ARC4-50/75/165	P03085100006	1
8	Terminal block plug	Single row 2P plug	ARC4-50/75/165	P03085100005	1

Installation steps

Step1. Use a cross screwdriver to remove the original reserved cable installation plate (refer to Figure 15-9), and remove the network port plug installation plate (refer to Figure 15-10) installed on the cabinet.

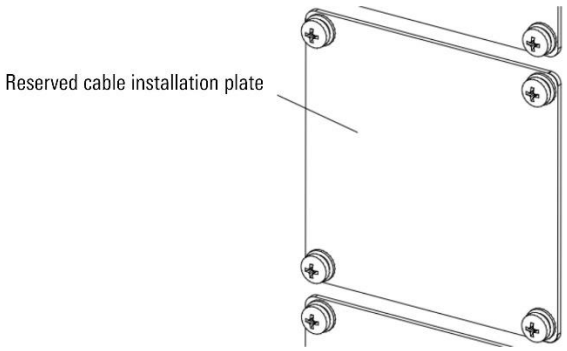


Figure 15-9 Reserved cable installation plate

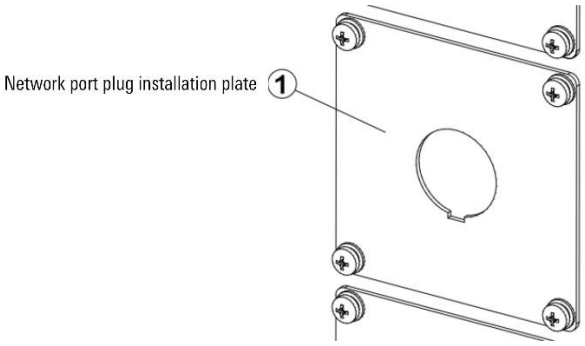


Figure 15-10 Network port plug installation plate

Step2. Install the network port plug (refer to Figure 15-11) on the network port plug installation plate.

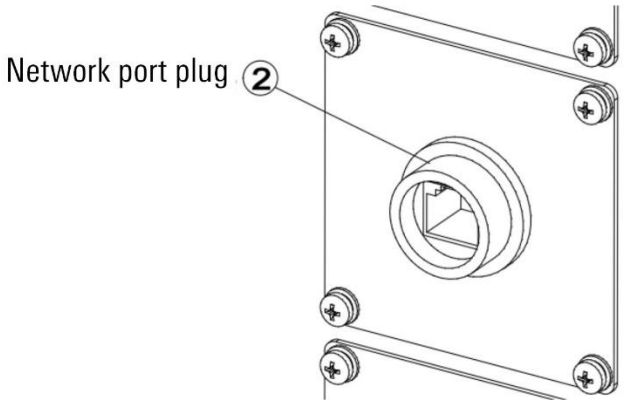


Figure 15-11 Network port plug

Step3. Connect one end of the EtherCAT cabinet network cable to the network port plug, and the other end to the CN1B interface of the J6 driver. Arrange the cables in the cabinet reasonably, refer to Figure 15-12.

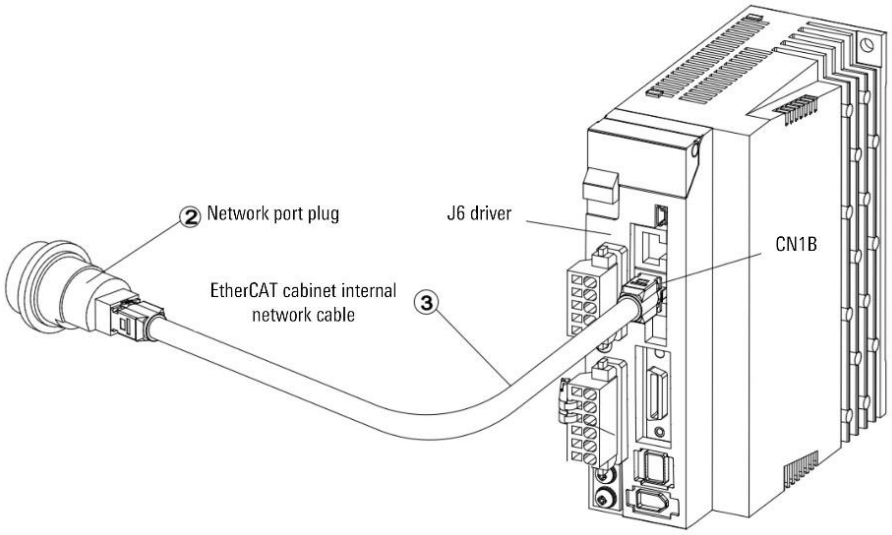


Figure 15-12 Diagram of the CN1B interface connecting the J6 driver

Step4. Connect one end of the EtherCat industrial network cable to the network port plug of the cabinet and the other end to the EtherCAT/IN interface of the PEB module; Connect one end of the industrial network cable to the PROFINET/A interface of the PEB module, and the other end to the user's own PLC module, refer to Figure 15-13.

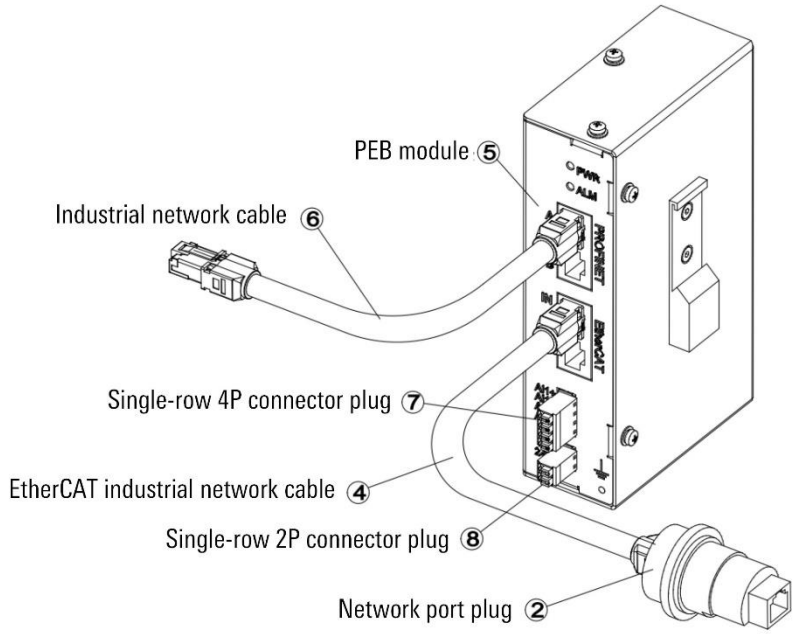


Figure 15-13 Diagram of the interface connecting to the PEB module

Step5. The power supply interface needs to be connected to a 24V power supply module, which is provided by the customer.

16 User I/O connection terminal block

16.1 Overview

The user I/O connection terminal block is used to provide convenient wiring for users due to the large number of user I/O signals in general.

User I/O connection terminal blocks for inCube2S/20/22, ARC5 and ARC4-50/75/165 control cabinets are optional.

16.2 User I/O connection terminal block installation for inCube series control cabinets

16.2.1 User I/O connection terminal block (optional) installation for inCube2S control cabinet

Configuration instructions

The user I/O connection terminal block of the inCube2S control cabinet is an optional product. This option uses a 5m wire length to lead the user I/O signals on the control cabinet panel to the terminal block for user convenience.

For information about the part No of the user I/O connection terminal block of the inCube2S control cabinet, see Table 16-1.

Table 16-1 User I/O connection terminal block part No of inCube2S control cabinet

Name	Part No
inCube2S_ user I/O connection terminal block	PC5100000074

For details on the configuration of the user I/O connection terminal block of the inCube2S control cabinet, see Table 16-2.

Table 16-2 Main configuration table of user I/O connection terminal block of inCube2S control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
1	SCRC10-User DI terminal module cable	5m	inCube2S	P04082000849	1
2	SCRC10-User DO terminal module cable	5m		P04082000846	1
3	inCube2S user IO terminal module	178mm*48mm*48mm		P05050000018	2

Pin definition

Tip

For the user I/O definition of inCube2S control cabinet, refer to Table 16-4. For more information, please refer to our company's "inCube2S Control Cabinet User Manual".

The diagram and description of the user I/O connection terminal block are Figure 16-1 and Table 16-3 respectively.

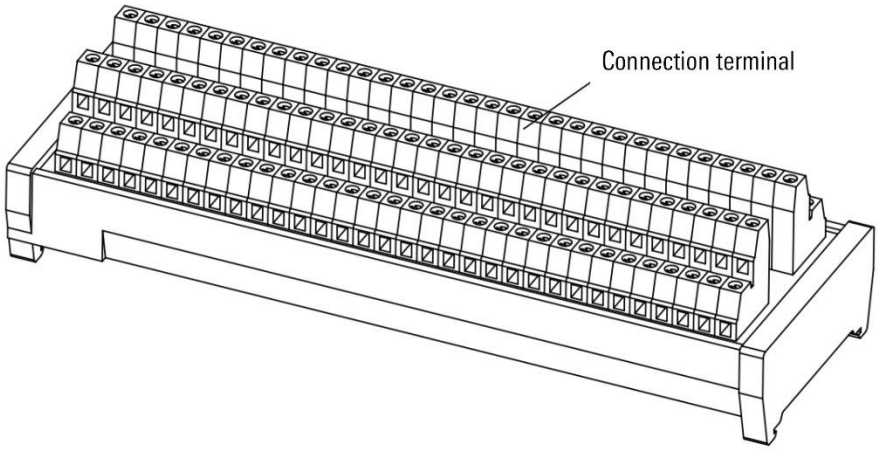


Figure 16-1 Diagram of inCube2S user I/O connection terminal block

Table 16-3 User I/O connection terminal block composition description

Name	Illustrate
Terminals	For pin definitions, see Table 16-4
DB50 male socket	For pin definitions, see Table 16-4

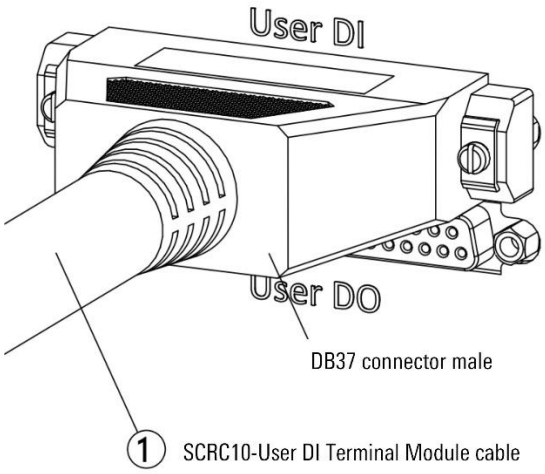
Table 16-4 User I/O definition of inCube2S control cabinet

User DI		User DO	
DB37 pin	Definition	DB37 pin	Definition
A1	OPERATED_DI1	B1	OPERATED_DO1
A2	OPERATED_DI2	B2	OPERATED_DO2
A3	OPERATED_DI3	B3	OPERATED_DO3
A4	OPERATED_DI4	B4	OPERATED_DO4
A5	OPERATED_DI5	B5	OPERATED_DO5
A6	OPERATED_DI6	B6	OPERATED_DO6
A7	OPERATED_DI7	B7	OPERATED_DO7
A8	OPERATED_DI8	B8	OPERATED_DO8
A9	OPERATED_DI9	B9	OPERATED_DO9
A10	OPERATED_DI10	B10	OPERATED_DO10
A11	OPERATED_DI11	B11	OPERATED_DO11
A12	OPERATED_DI12	B12	OPERATED_DO12
A13	OPERATED_DI13	B13	OPERATED_DO13
A14	OPERATED_DI14	B14	OPERATED_DO14
A15	OPERATED_DI15	B15	OPERATED_DO15
A16	OPERATED_DI16	B16	OPERATED_DO16

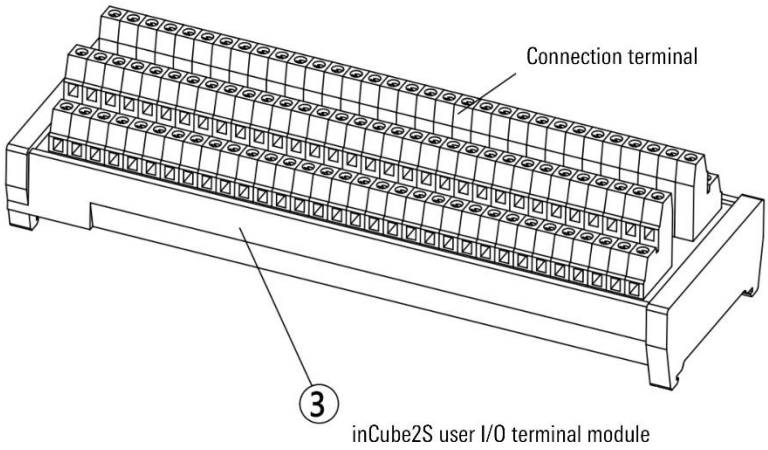
User DI		User DO	
DB37 pin	Definition	DB37 pin	Definition
A17	OPERATED_DI17	B17	OPERATED_DO17
A18	OPERATED_DI18	B18	OPERATED_DO18
A19	OPERATED_DI19	B19	OPERATED_DO19
A20	OPERATED_DI20	B20	OPERATED_DO20
A21	OPERATED_DI21	B21	OPERATED_DO21
A22	OPERATED_DI22	B22	OPERATED_DO22
A23	OPERATED_DI23	B23	OPERATED_DO23
A24	OPERATED_DI24	B24	OPERATED_DO24
A25	OPERATED_DI25	B25	OPERATED_DO25
A26	OPERATED_DI26	B26	OPERATED_DO26
A27	Not Connected	B27	Not Connected
A28	DI_COM_2	B28	GND_EX
A29	DI_COM_2	B29	GND_EX
A30	DI_COM_2	B30	GND_EX
A31	DI_COM_1	B31	GND_EX
A32	DI_COM_1	B32	GND_EX
A33	DI_COM_1	B33	GND_EX
A34	GND_EX	B34	D+24V_FWD
A35	GND_EX	B35	D+24V_FWD
A36	D+24V_EX	B36	D+24V_FWD
A37	D+24V_EX	B37	D+24V_FWD

Connection step

Step1. Connect the SCRC10-User DI Terminal Module cable with the DB37 connector male to the User DI interface of the cabinet, and the loose wire on the other side is terminated on the terminal of the inCube2S User I/O Terminal Module, refer to Figure 16-2.



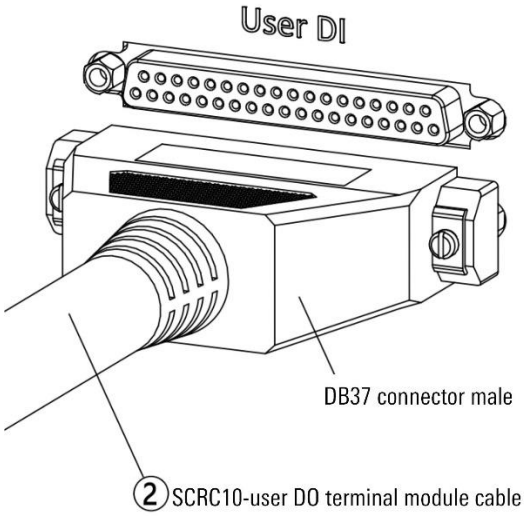
(a)



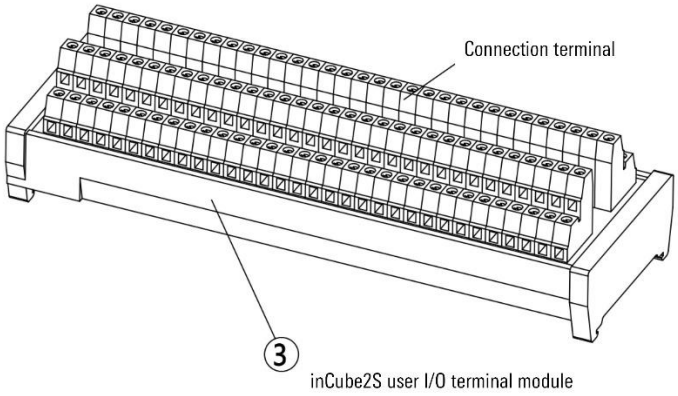
(b)

Figure 16-2 inCube2S control cabinet user DI module wiring diagram

Step2. Connect the SCRC10-user DO terminal module cable with DB37 connector male to the User DO interface of the cabinet, and the loose wire terminating on the other side is connected to the same inCube2S user I/O terminal module. The terminal block pins are freely defined by the customer, refer to Figure 16-3.



(a)



(b)

Figure 16-3 inCube2S control cabinet user DO module wiring diagram

16.2.2 User I/O connection terminal block for inCube20/22/ARC5 control cabinet (optional) installation

Configuration instructions

The user I/O connection terminal block of inCube20/22/ARC5 control cabinet is optional. This option uses a 5m wire length to lead the user I/O signals on the control cabinet panel to the terminal block for user convenience.

For information about the part No of the user I/O connection terminal block of the inCube20/22/ARC5 control cabinet, see Table 16-5.

Table 16-5 User I/O connection terminal block part No of inCube20/22/ARC5 control cabinet

Name	Part No
inCube20/22_ user I/O connection terminal block	PC5100000096

For details on the configuration of the user I/O connection terminal block of the inCube20/22/ARC5 control cabinet, see Table 16-6.

Table 16-6 Main configuration table of user I/O connection terminal block of inCube20/22/ARC5 control cabinet

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
1	inCube20-User DI terminal module cable	5m	inCube20/22/ARC5	P04082001304	1
2	inCube20-User DO terminal module cable	5m		P04082001305	1
3	inCube2S user IO terminal module	178mm*48mm*48mm		P05050000018	1

Pin definition

Tip

For the user I/O definition of inCube20/22/ARC5 control cabinet, refer to Table 16-8. For more information, please refer to our company's "inCube20 Control Cabinet User Manual" and "inCube22 Control Cabinet User Manual".

For the diagram and description of the user I/O connection terminal block, please refer to Figure 16-4 and Table 16-8 respectively.

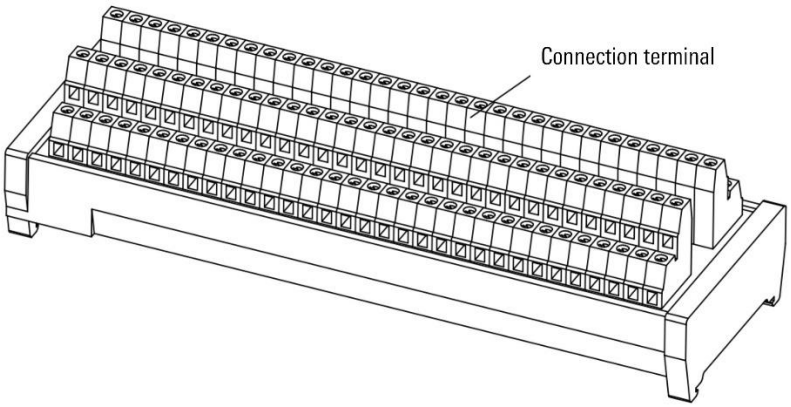


Figure 16-4 inCube20/22/ARC5 user I/O connection terminal block diagram

Table 16-7 User I/O connection terminal block composition description

Name	Illustrate
Terminals	For pin definitions, see Table 16 8
Weidmuller Push-In Terminal Connector	For pin definitions, see Table 16 8

Table 16-8 User I/O definition for inCube20/22/ARC5 control cabinet

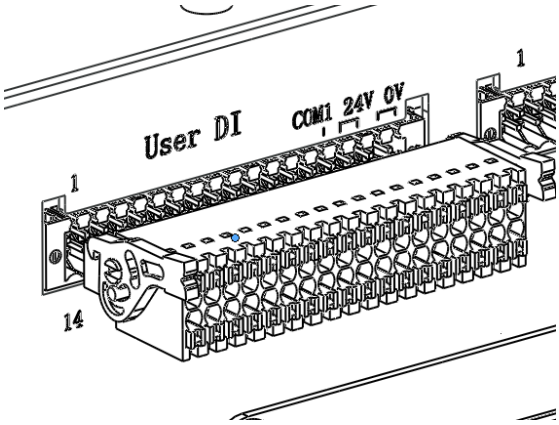
User DI		User DO	
Quick plug terminal connector pin	Definition	Quick plug terminal connector pin	Definition
A1	OPERATED_DI1	B1	OPERATED_DO1
A2	OPERATED_DI14	B2	OPERATED_DO14
A3	OPERATED_DI2	B3	OPERATED_DO2

User DI		User DO	
Quick plug terminal connector pin	Definition	Quick plug terminal connector pin	Definition
A4	OPERATED_DI15	B4	OPERATED_DO15
A5	OPERATED_DI3	B5	OPERATED_DO3
A6	OPERATED_DI16	B6	OPERATED_DO16
A7	OPERATED_DI4	B7	OPERATED_DO4
A8	OPERATED_DI17	B8	OPERATED_DO17
A9	OPERATED_DI5	B9	OPERATED_DO5
A10	OPERATED_DI18	B10	OPERATED_DO18
A11	OPERATED_DI6	B11	OPERATED_DO6
A12	OPERATED_DI19	B12	OPERATED_DO19
A13	OPERATED_DI7	B13	OPERATED_DO7
A14	OPERATED_DI20	B14	OPERATED_DO20
A15	OPERATED_DI8	B15	OPERATED_DO8
A16	OPERATED_DI21	B16	OPERATED_DO21
A17	OPERATED_DI9	B17	OPERATED_DO9
A18	OPERATED_DI22	B18	OPERATED_DO22
A19	OPERATED_DI10	B19	OPERATED_DO10
A20	OPERATED_DI23	B20	OPERATED_DO23
A21	OPERATED_DI11	B21	OPERATED_DO11
A22	OPERATED_DI24	B22	OPERATED_DO24
A23	OPERATED_DI12	B23	OPERATED_DO12
A24	OPERATED_DI25	B24	OPERATED_DO25
A25	OPERATED_DI13	B25	OPERATED_DO13
A26	OPERATED_DI26	B26	OPERATED_DO26
A27	DI_COM_1	B27	Not Connected
A28	DI_COM_2	B28	Not Connected
A29	D+24V_EX	B29	D+24V_EX
A30	D+24V_EX	B30	D+24V_EX
A31	D+24V_EX	B31	D+24V_EX
A32	D+24V_EX	B32	D+24V_EX
A33	GND_EX	B33	GND_EX
A34	GND_EX	B34	GND_EX
A35	GND_EX	B35	GND_EX

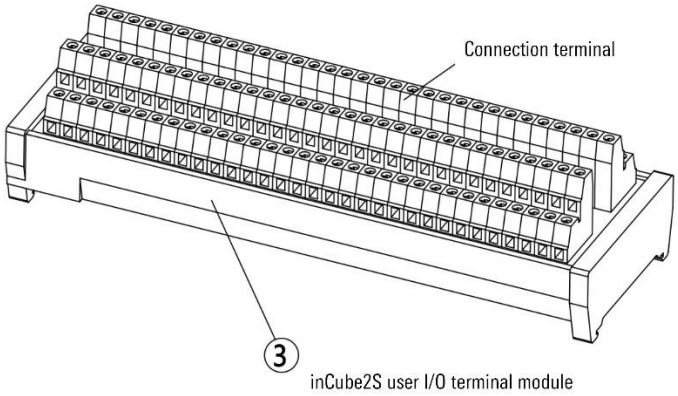
User DI		User DO	
Quick plug terminal connector pin	Definition	Quick plug terminal connector pin	Definition
A36	GND_EX	B36	GND_EX

Connection steps

Step1. Connect the inCube20-user DI terminal module cable with a quick-plug terminal connector to the User DI interface of the cabinet, and connect the loose wire terminal on the other side to the terminal block of the inCube2S user I/O terminal module. Refer to Figure 16-5.



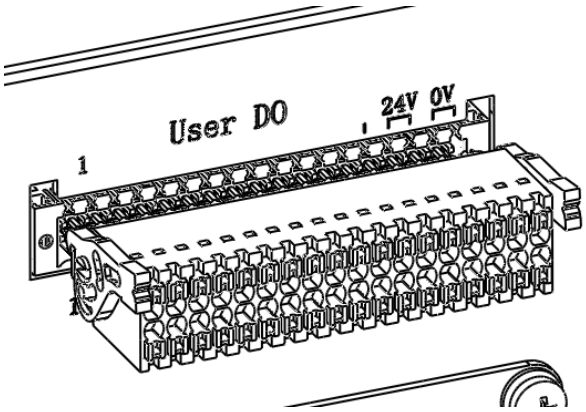
(a)



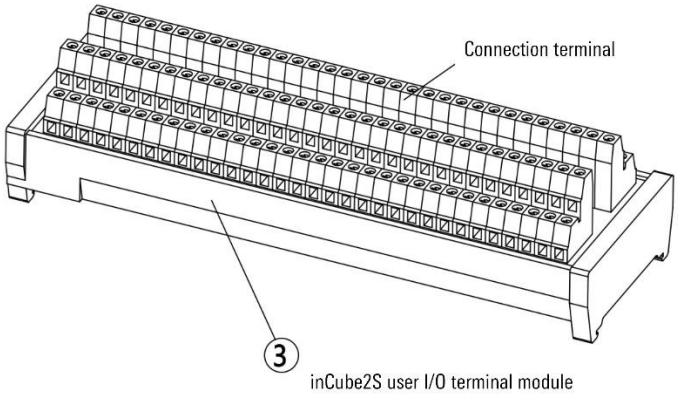
(b)

Figure 16-5 inCube20/22 control cabinet user DI module wiring diagram

Step2. Connect the inCube20-user DO terminal module cable with a quick-plug terminal connector to the user DO interface of the cabinet, and connect the loose wire terminal on the other side to the terminal block of the same inCube2S user I/O terminal module. The platform pins are freely defined by the customer, refer to Figure 16-6.



(a)



(b)

Figure 16-6 inCube20/22 control cabinet user DO module wiring diagram

Tip

The interface distribution of ARC5 is shown in Figure 12-1(b). The connection method is consistent with the inCube20/22 control cabinet.

16.3 ARC4 series control cabinet user I/O connection terminal block (optional) installation

PLC_MF installation dimensions

The front and side installation dimensions of PLC_MF are shown in Figure 16-7 and Figure 16-8.

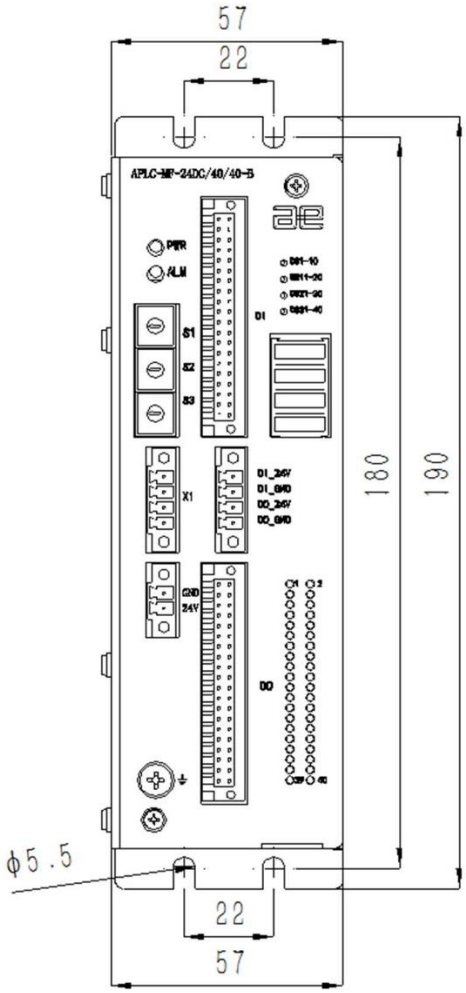


Figure 16-7 PLC_MF front installation dimensions

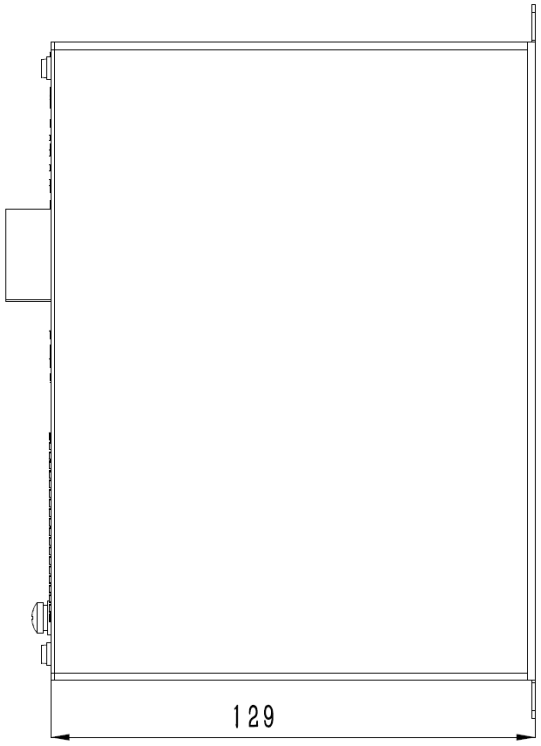


Figure 16-8 PLC_MF side installation dimension diagram

Configuration instructions

ARC4-50/75/165 control cabinet user I/O connection terminal block is optional. This option is used to lead the DI/DO interface on the PLC_MF out of the control cabinet for customer connection.

For detailed information about the part No of the user I/O connection terminal block of the ARC4-50/75/165 control cabinet, see Table 16-9.

Table 16-9 User I/O connection terminal block part No of ARC4-50/75/165 control cabinet

Name	Part No
ARC4-50_User IO connected terminal block	PC5100000062
ARC4-165_User IO Connection Terminal Block	PC5100000063

For the user I/O connection terminal block configuration description of the ARC4-50/75/165 control cabinet, see Table 16-10.

Table 16-10 Main configuration table of user I/O connection terminal block of ARC4-50/75/165 control cabinet

Serial number	Name	Specification	Adapted to manipulator or control cabinet	Part No	Construct dosage
1	User I/O female mounting plate	Square sheet metal baffle	ARC4-50	P01035000638	2
2	MF user I/O cabinet cable	0.9m	ARC4	P04082000787	2
3	M4×10 cross recessed pan head combination screws	M4×10	ARC4	P02023000020	8
4	MF user I/O cabinet external line	5m	ARC4	P04082000788	2
5	User I/O terminal module	137mm*48mm*48mm	ARC4	P05050000011	2

Pin definition


Tip

For detailed user I/O definitions of the ARC4 series control cabinet, please refer to Table 16-12. For more information, please refer to our company's "ARC4-50/75 Control Cabinet User Manual" and "ARC4-165 Control Cabinet User Manual".

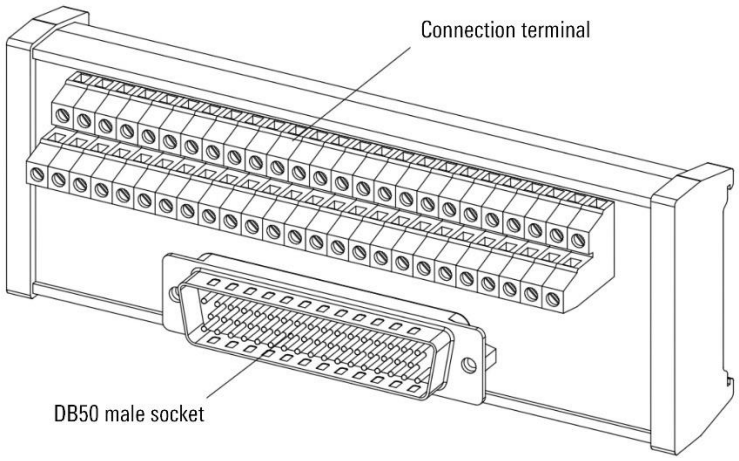


Figure 16-9 User I/O terminal module

For the diagram and description of the user I/O connection terminal block, please refer to Figure 16-9 and Table 16-11 respectively.

Table 16-11 User I/O connection terminal block composition description

Name	Illustrate
Terminals	For pin definitions, see Table 16-12
DB50 male socket	For pin definitions, see Table 16-12

Table 16-12 User I/O definition of ARC4 series control cabinet

Cabinet side-42P flange joint		User terminal module—DB50		User terminal module—terminal block	
Pin	Definition	Pin	Definition	Pin	Definition
1	DIN/DOUT_01	1	DIN/DOUT_01	1	DIN/DOUT_01
2	DIN/DOUT_02	2	DIN/DOUT_02	2	DIN/DOUT_02
3	DIN/DOUT_03	3	DIN/DOUT_03	3	DIN/DOUT_03
4	DIN/DOUT_04	4	DIN/DOUT_04	4	DIN/DOUT_04
5	DIN/DOUT_05	5	DIN/DOUT_05	5	DIN/DOUT_05
6	DIN/DOUT_06	6	DIN/DOUT_06	6	DIN/DOUT_06
7	DIN/DOUT_07	7	DIN/DOUT_07	7	DIN/DOUT_07
8	DIN/DOUT_08	8	DIN/DOUT_08	8	DIN/DOUT_08
9	DIN/DOUT_09	9	DIN/DOUT_09	9	DIN/DOUT_09
10	DIN/DOUT_10	10	DIN/DOUT_10	10	DIN/DOUT_10
11	DIN/DOUT_11	11	DIN/DOUT_11	11	DIN/DOUT_11
12	DIN/DOUT_12	12	DIN/DOUT_12	12	DIN/DOUT_12
13	DIN/DOUT_13	13	DIN/DOUT_13	13	DIN/DOUT_13
14	DIN/DOUT_14	14	DIN/DOUT_14	14	DIN/DOUT_14
15	DIN/DOUT_15	15	DIN/DOUT_15	15	DIN/DOUT_15

Cabinet side-42P flange joint		User terminal module—DB50		User terminal module—terminal block	
Pin	Definition	Pin	Definition	Pin	Definition
16	DIN/DOUT_16	16	DIN/DOUT_16	16	DIN/DOUT_16
17	DIN/DOUT_17	17	DIN/DOUT_17	17	DIN/DOUT_17
18	DIN/DOUT_18	18	DIN/DOUT_18	18	DIN/DOUT_18
19	DIN/DOUT_19	19	DIN/DOUT_19	19	DIN/DOUT_19
20	DIN/DOUT_20	20	DIN/DOUT_20	20	DIN/DOUT_20
21	DIN/DOUT_21	21	DIN/DOUT_21	21	DIN/DOUT_21
22	DIN/DOUT_22	22	DIN/DOUT_22	22	DIN/DOUT_22
23	DIN/DOUT_23	23	DIN/DOUT_23	23	DIN/DOUT_23
24	DIN/DOUT_24	24	DIN/DOUT_24	24	DIN/DOUT_24
25	DIN/DOUT_25	25	DIN/DOUT_25	25	DIN/DOUT_25
26	DIN/DOUT_26	26	DIN/DOUT_26	26	DIN/DOUT_26
27	DIN/DOUT_27	27	DIN/DOUT_27	27	DIN/DOUT_27
28	DIN/DOUT_28	28	DIN/DOUT_28	28	DIN/DOUT_28
29	DIN/DOUT_29	29	DIN/DOUT_29	29	DIN/DOUT_29
30	DIN/DOUT_30	30	DIN/DOUT_30	30	DIN/DOUT_30
31	DIN/DOUT_31	31	DIN/DOUT_31	31	DIN/DOUT_31
32	DIN/DOUT_32	32	DIN/DOUT_32	32	DIN/DOUT_32
33	DIN/DOUT_33	33	DIN/DOUT_33	33	DIN/DOUT_33
34	DIN/DOUT_34	34	DIN/DOUT_34	34	DIN/DOUT_34
35	DIN/DOUT_35	35	DIN/DOUT_35	35	DIN/DOUT_35
36	DIN/DOUT_36	36	DIN/DOUT_36	36	DIN/DOUT_36
37	DIN/DOUT_37	37	DIN/DOUT_37	37	DIN/DOUT_37
38	DIN/DOUT_38	38	DIN/DOUT_38	38	DIN/DOUT_38
39	DIN/DOUT_39	39	DIN/DOUT_39	39	DIN/DOUT_39
40	DIN/DOUT_40	40	DIN/DOUT_40	40	DIN/DOUT_40
41	DI_24V/DO_24V	41	DI_24V/DO_24V	41	DI_24V/DO_24V
42	DI_GND/DO_GND	42	DI_GND/DO_GND	42	DI_GND/DO_GND

Connection step

Step1. Remove the original reserved cable mounting plate (refer to Figure 16-10) with a cross screwdriver, and install the ① user I/O female mounting plate (refer to Figure 16-11) on the cabinet.

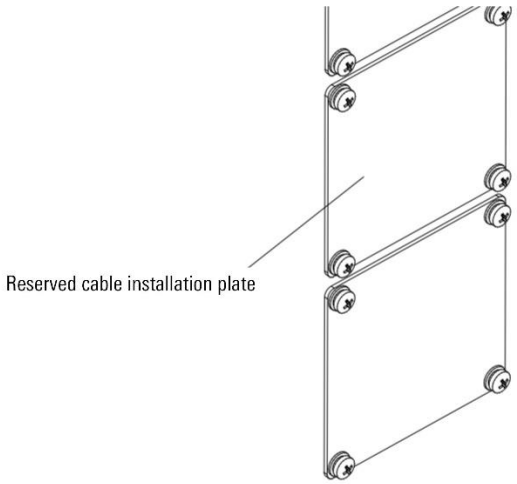


Figure 16-10 Reserved cable installation plate

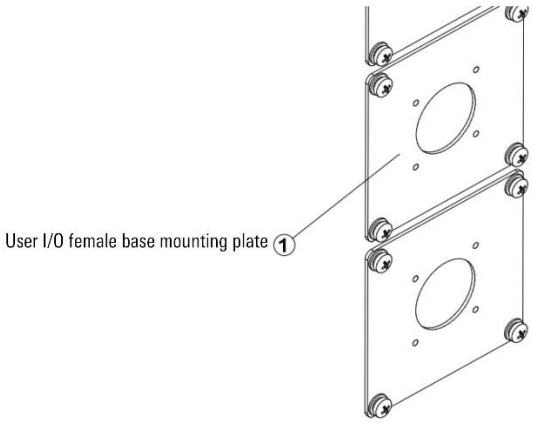


Figure 16-11 User I/O female base mounting plate

Step2. Install two ②MF user I/O cabinet lines with a 42P square flange socket at one end of the double-row 40P connector plug through 8 ③M4X10 cross-recessed pan head combination screws to install on the user I/O female mounting plate, refer to Figure 16-12.

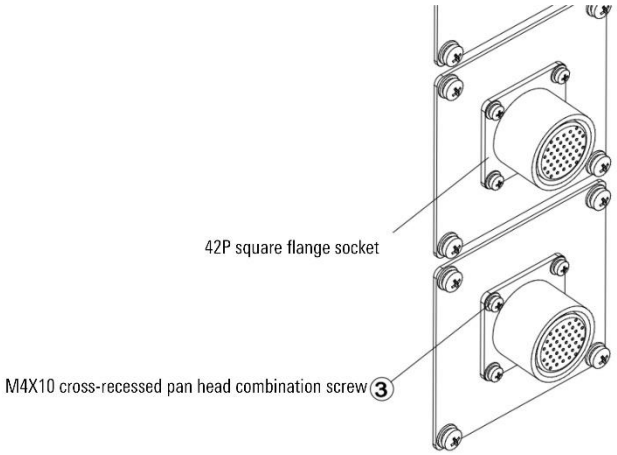


Figure 16-12 42P square flange socket

Step3. Plug the other end of ②MF user I/O cabinet cable into the DI/DO interface on PLC_MF, refer to Figure 16-13.

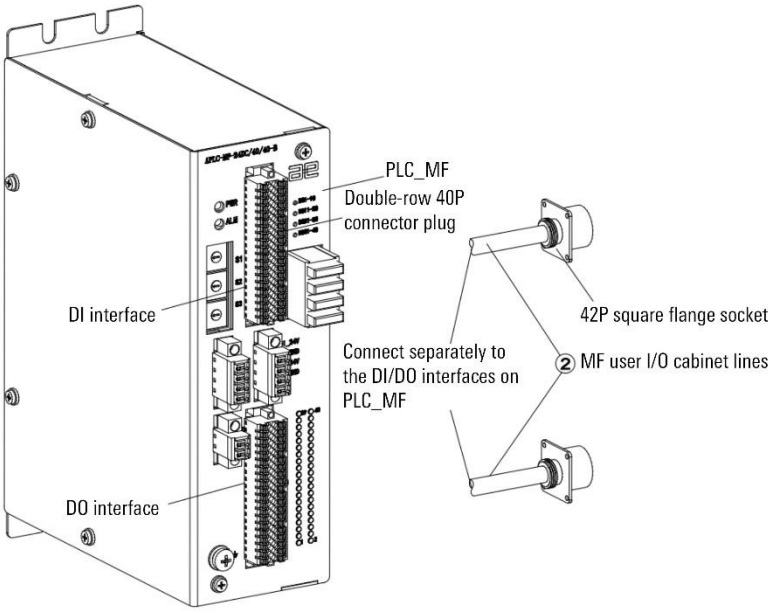


Figure 16-13 Connect the DI/DO interface on PLC_MF

Step4. Connect one end of the MF user I/O cabinet external line with a 42P round plug to the 42P square flange socket on the cabinet, and the other end of the DB50 female connected connector to user I/O terminal module on the DB50 male socket, user I/O terminal module is fixed in the appropriate position through the guide rail according to the actual needs of the customer. Users can use the I/O functions through the terminal blocks on it. The two user I/O terminal modules are DI module and DO module respectively. There is no hard distinction requirement. They are distinguished according to the actual convenience of use. Refer to Figure 16-14.

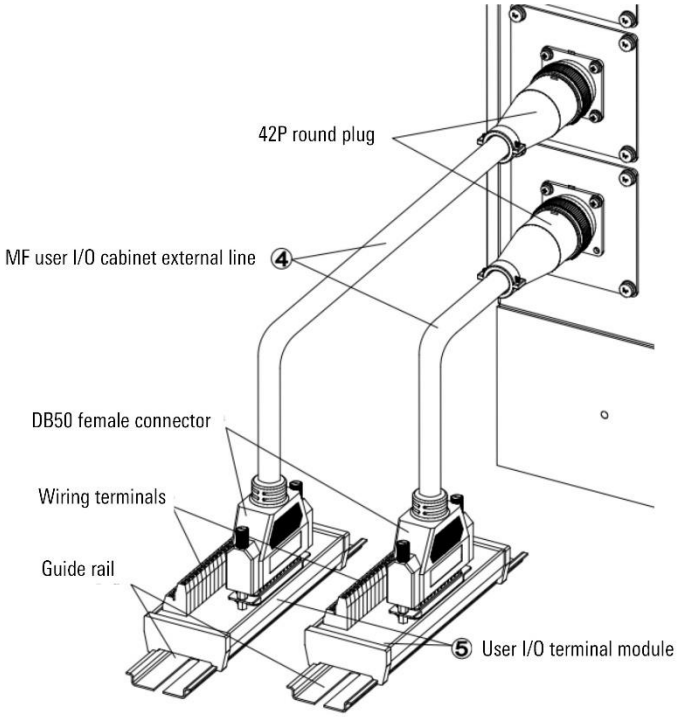


Figure 16-14 Connecting the user I/O terminal module

Step5. The PLC_MF module needs to be connected to a 24V power supply, and the power supply module is prepared by the customer. Please refer to and for the shape and size information of PLC_MF. The baud rate setting of PLC_MF is as shown in Table 16-14.

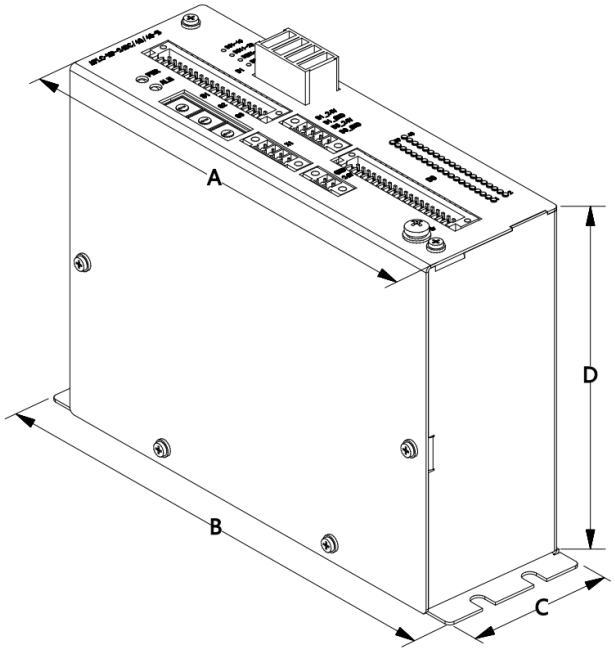


Figure 16-15 Outline drawing of PLC_MF

Table 16-13 Installation size information of PLC_MF

MF	A/cm	B/cm	C/cm	D/cm (connector not included)
P3.1	17	19	5.8	13

Table 16-14 PLC_MF baud rate setting

DIP switch points	Baud rate	DIP switch points	Baud rate
0	1200	7	56000
1	2400	8	57600
2	4800	9	115200
3	9600	A	230400
4	14400	B	460800
5	19200	C	921600
6	38400	other	1200

17 External expansion I/O module

17.1 Overview

This option is used to additionally expand the number of IOs.

Tip

The external expansion MF I/O is all PNP type, and it has nothing to do with whether the IO of the cabinet itself is NPN or PNP.

17.2 inCube series control cabinet external expansion MF I/O module (optional) installation

17.2.1 inCube2S/20/22 control cabinet external expansion MF I/O module installation

Configuration instructions

For information about the part No of the inCube2S/20/22 control cabinet external expansion MF I/O module, see Table 17-1.

Table 17-1 inCube2S/20/22 control cabinet external expansion MF I/O module part No

Name	Part No
inCube2S_external expansion MF I/O module	PC5100000075

For details on the configuration instructions of the inCube2S/20/22 control cabinet external MF I/O module, see Table 17-2.

Table 17-2 Main configuration table of inCube2S control cabinet external expansion MF I/O module

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
1	SCRC10-outside cabinet RS485 wiring harness	5m	inCube2S/20/22	P04082000844	1
2	External expansion PLC_MF	P3.1 and later versions		P05050000001	1
3	Fuse	2A-Plug-in type		P03071000033	4
4	Single row 4P connector plug	4 cores		P03085100050	2
5	Single row 2P connector plug	2 cores		P03085100051	1
6	Standard cabinet MF user I/O adapter cable	0.5m		P04082000797	2
7	Dedicated IO terminal module	137mm*48mm*48mm		P05050000010	2

Pin definition

For the diagram and description of the external expansion MF I/O connection terminal block, please refer to Figure 16-9 and Table 16-11 respectively.

Connection steps

Step1. Connect one end of the SCRC10-cabinet RS485 wiring harness with double rows of 6P connectors to the RS485 interface on the cabinet, connect the other end of the SCRC10-cabinet RS485 wiring harness to the outer expansion PLC_MF, the shield is connected to the ground, and the other two signal lines are connected to the corresponding X1 " + ", " - ", refer to Figure 17-1.

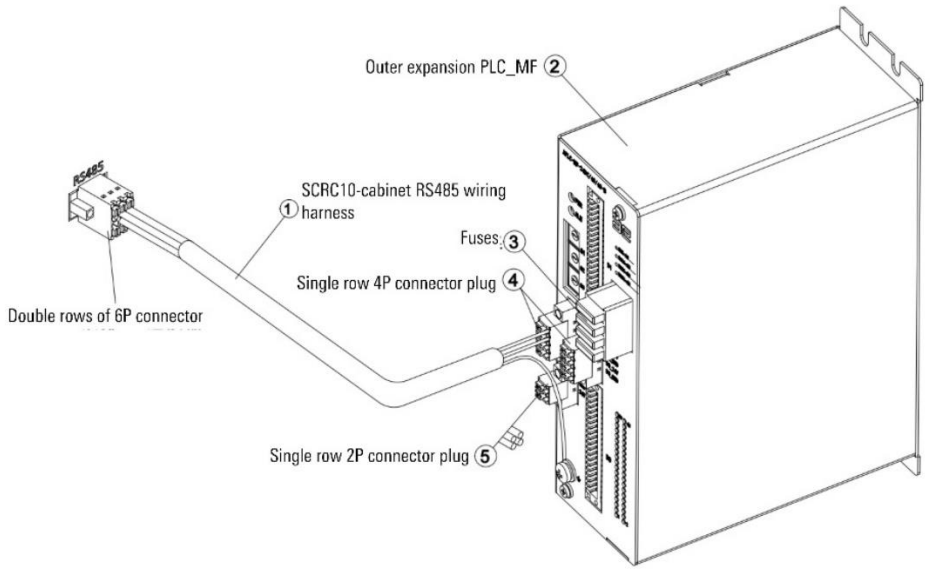


Figure 17-1 Connect to external expansion PLC_MF

Step2. External 24V power supply connected to 0V, 24V signals.

Step3. Connect one end of the two standard cabinet MF user I/O adapter cables to the DI interface and DO interface on the external expansion PLC_MF, and the other end to the user I/O terminal module, refer to Figure 17-2. PLC_MF baud rate setting refers to Table 16-14.

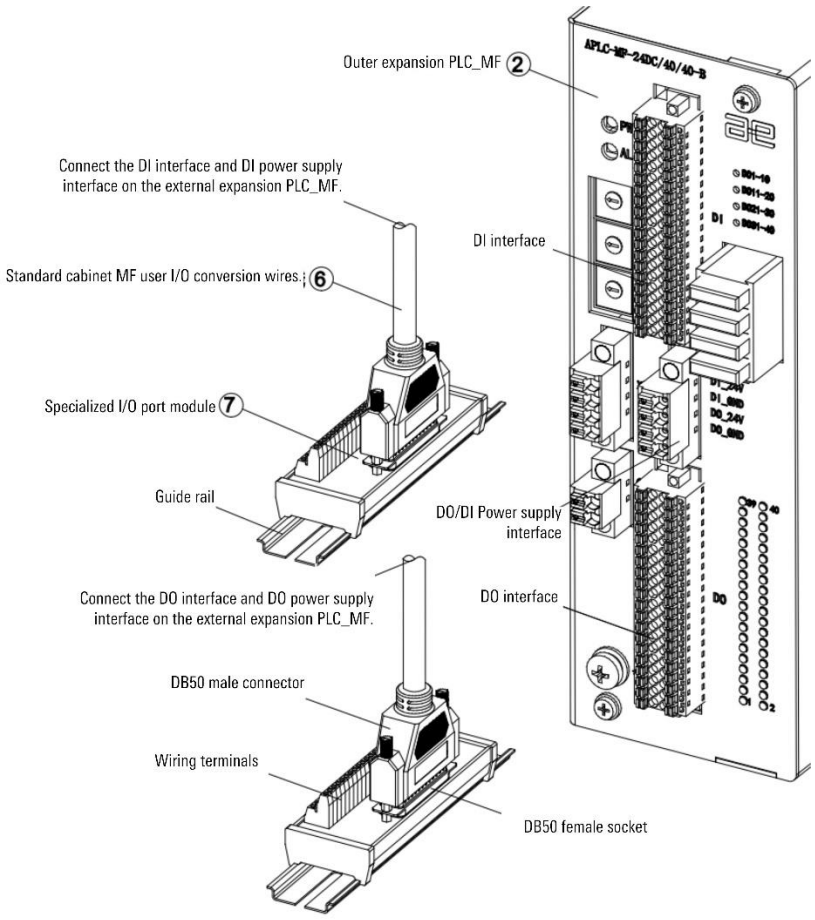


Figure 17-2 Diagram of connecting user I/O terminals

17.3 Installation of external expansion MF I/O module in ARC5 control cabinet

Configuration instructions

For information about the part No of the ARC5 control cabinet external expansion MF I/O module, see Table 17-3.

Table 17-3 ARC5 control cabinet external expansion MF I/O module part No

Name	Part No
ARC5_External expansion MF I/O module	PC5100000101

For configuration instructions of the ARC5 control cabinet external expansion MF I/O module, see Table 17-4.

Table 17-4 Main configuration table of ARC5 control cabinet external expansion MF I/O module

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
1	ARC5-RS485 wiring harness in cabinet	0.75m	ARC5	P04082001172	1
2	External expansion PLC_MF	P3.1 and later versions		P05050000001	1
3	Fuse	2A-Plug-in type		P03071000033	4
4	Single row 4P connector plug	4 cores		P03085100050	2

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
5	Single row 2P connector plug	2 cores		P03085100051	1
6	ARC5-MF user IO adapter cable	2.5m		P04082001368	2
7	Dedicated IO terminal module	137mm*48mm*48mm		P05050000010	2
8	Type I non-metallic insert lock nut	M5		P02031600001	4

Pin definition

For the diagram and description of the external expansion MF I/O connection terminal block, please refer to Figure 16-9 and Table 16-11 respectively.

Connection steps

Step1. Use four M5-I type non-metal insert locking nuts to fix the external expansion PLC_MF to the middle partition of the ARC5 control cabinet, refer to Figure 17-3.

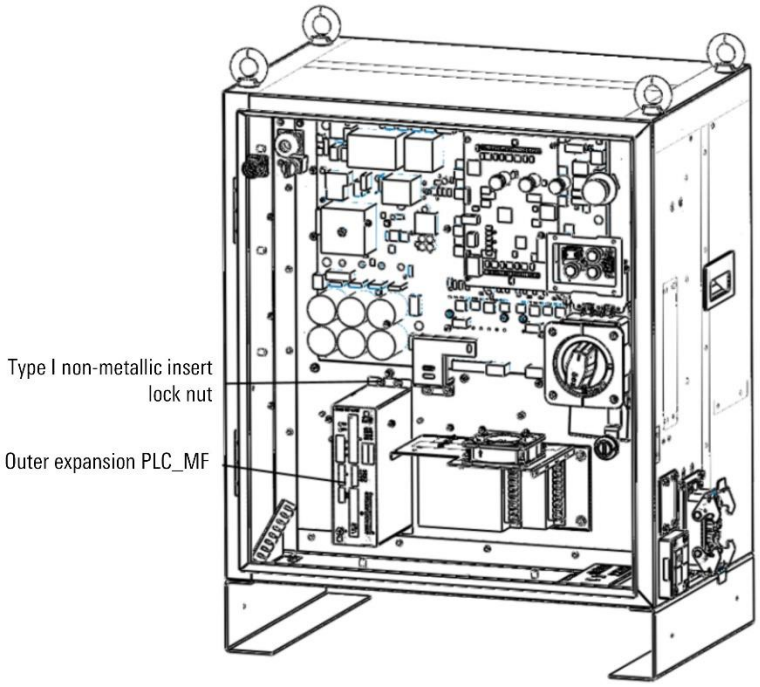


Figure 17-3 Install the external expansion PLC_MF in the ARC5 cabinet

Step2. Connect one end of the SCRC10-outside cabinet RS485 wiring harness with a double-row 6P connector to the MF-RS485 interface on the MCBS board (the interface location is as shown in the figure, open the cabinet door and look from bottom to top , the third 6pin connector from the left), connect the other end of the SCRC10-outside cabinet RS485 harness to the external expansion PLC_MF, shielding layer Connect to the ground, and the other two signal lines are connected to the "+" and "-" corresponding to X1, refer to Figure 17-4.

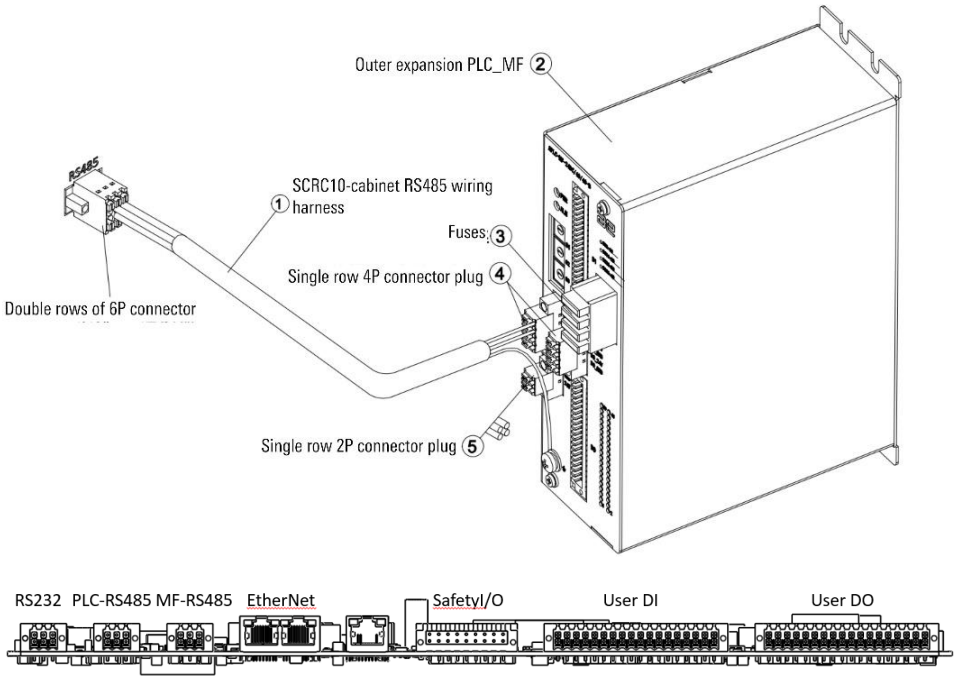


Figure 17-4 Connect to external expansion PLC_MF

Step3. The external 24V power supply is connected to the 0V and 24V signals.

Step4. Connect one end of the two ARC5-MF user IO adapter cables to the DI interface and DO interface on the expansion PLC_MF, and the other end to the user MF I/O terminal module, refer to Figure 17-5. Two ARC5-MF user IO adapter cables are connected out of the cabinet through the cable core on the right side of the control cabinet. For the PLC_MF baud rate setting, refer to Table 16-14.

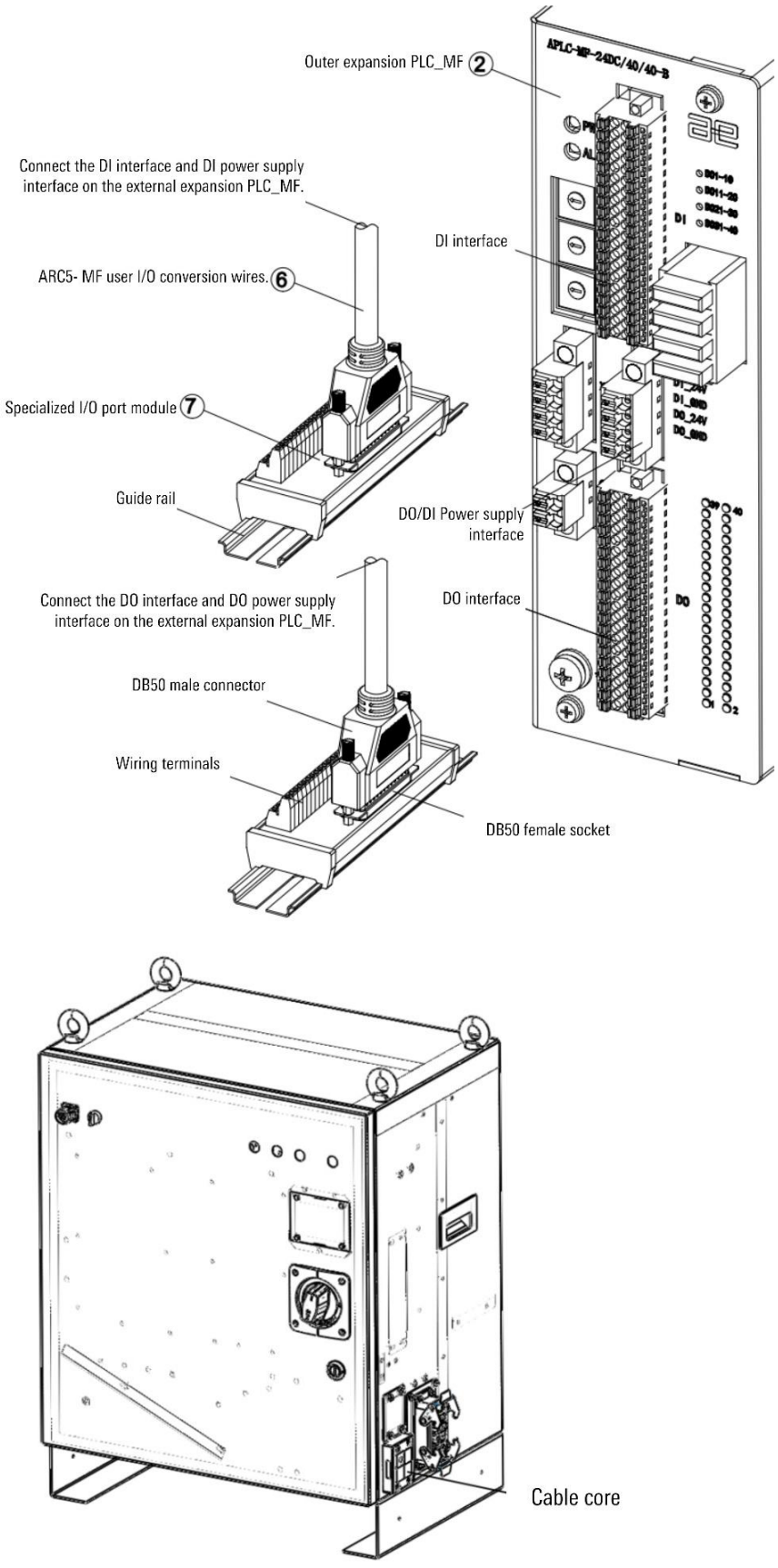


Figure 17-5 Diagram of connecting user I/O terminal

Tip

The ARC5-MF user IO adapter cable needs to be passed out of the cabinet from the cable core on the right side of the control cabinet. The cable core specifications must be selected according to the wire diameter to ensure the protection level of the ARC5 control cabinet.

17.4 ARC4 series control cabinet external expansion MF I/O module (optional) installation

Configuration instructions

For information about the part No of the external expansion MF I/O module of the ARC4 series control cabinet, see Table 17-5.

Table 17-5 External expansion MF I/O module part No of ARC4 series control cabinet

Name	Part No
ARC4-50/75/165 external MF I/O module	PC5100000038

Please refer to Table 17-6 for configuration instructions of the external expansion MF I/O module of the ARC4 series control cabinet.

Table 17-6 Main configuration table of the external expansion MF I/O module of the ARC4 series control cabinet

Serial number	Name	Specification	Adapted to manipulator or control cabinet	Part No	Construct dosage
1	M12 connector mounting plate	Square sheet metal baffle	ARC4	P01035000614	1
2	Standard cabinet external expansion MF cabinet internal cable	0.3m	ARC4	P04082000795	1
3	Standard cabinet expansion MF cabinet exterior line	5m	ARC4	P04082000796	1
4	External expansion PLC_MF	P3.1 and later versions	ARC4	P05050000001	1
5	Fuse	2A-Plug-in type	MF	P03071000033	4
6	Single row connector plug	4 cores	MF	P03085100050	2
7	Single row connector plug	2 cores	MF	P03085100051	1
8	Standard cabinet MF user I/O adapter cable	0.5m	ARC4	P04082000797	2
9	Dedicated IO terminal module	137mm*48mm*48mm	ARC4	P05050000010	2

Pin definition

For the diagram and description of the external expansion MF I/O connection terminal block, please refer to Figure 16-9 and Table 16-11 respectively.

Connection steps

Step1. Remove the original reserved cable mounting plate (refer to Figure 17-6) with a cross screwdriver and install the M12 connector mounting plate (refer to Figure 17-7) on the cabinet.

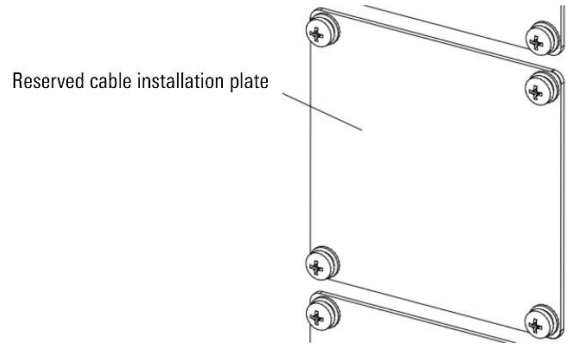


Figure 17-6 Reserved cable installation plate

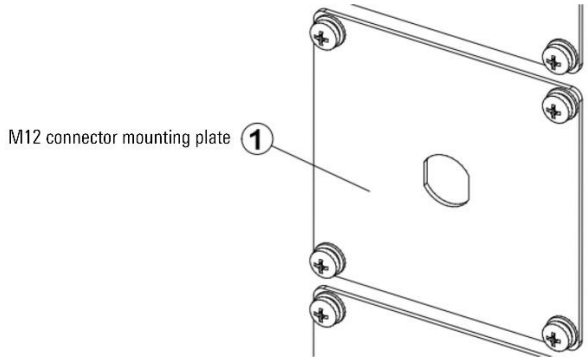


Figure 17-7 M12 connector mounting plate

Step2. Install the M12 female connector (reference Figure 17-8) on the M12 connector mounting plate.

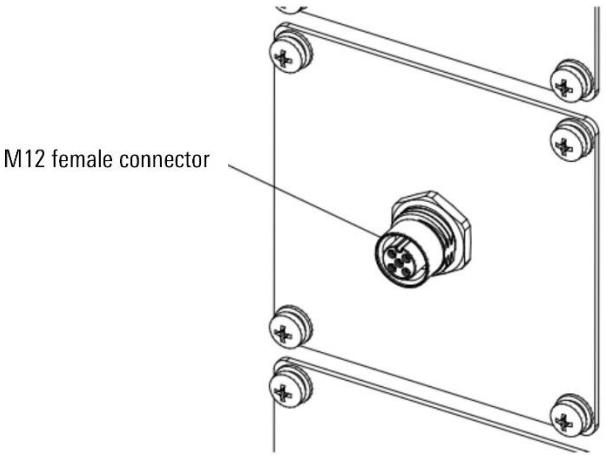


Figure 17-8 M12 female connector

Step3. Connect the loose ends of the standard cabinet external expansion MF cabinet internal cables to the power interface and 485 interface of PLC_MF respectively according to the drawing, and arrange the cables in the cabinet reasonably, refer to Figure 17-9.

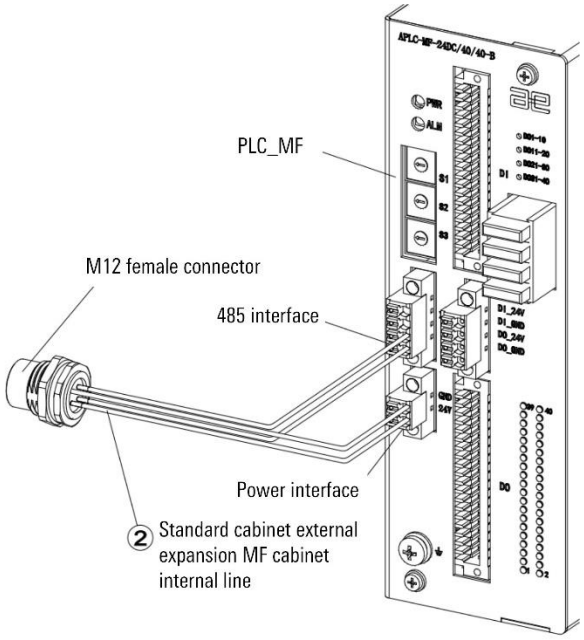


Figure 17-9 Diagram of connecting external expansion MF

Step4. One end of the standard cabinet with an M12 connector outside the MF cabinet is connected to the M12 female connector of the cabinet according to the triangular positioning mark, and the other end is connected to the power interface of the expansion PLC_MF (single row 2P connector plug) and 485 interface (single row 4P connector plug), refer to Figure 17-10.

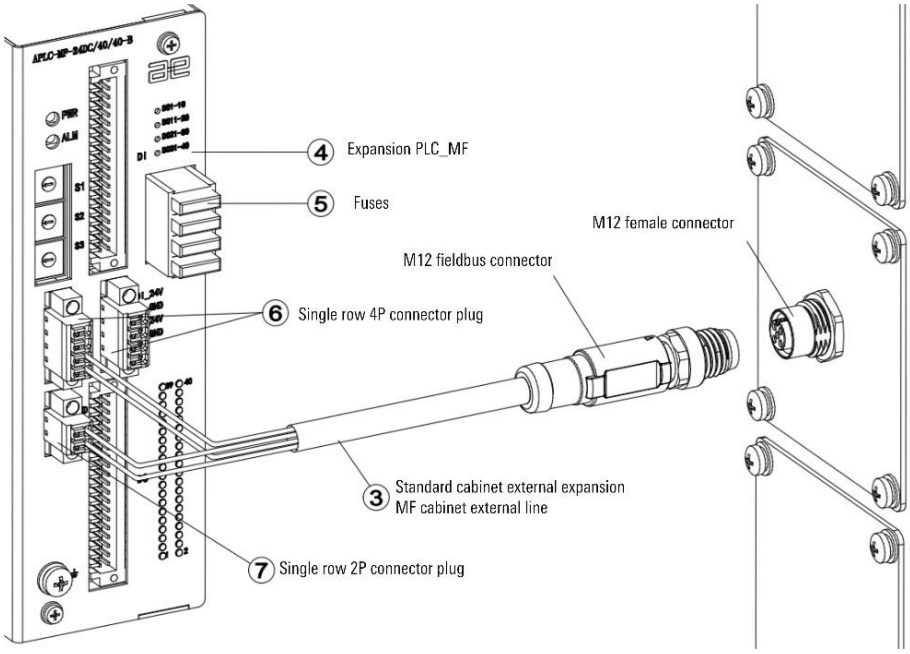


Figure 17-10 Diagram of connecting external expansion PLC_MF

Step5. Connect one end of the two standard cabinet MF user I/O adapter cables to the DI interface and DO interface on the external expansion PLC_MF, and the other one end is connected to the user I/O terminal module, refer to Figure 17-11. PLC_MF baud rate setting refers to Table 16-14.

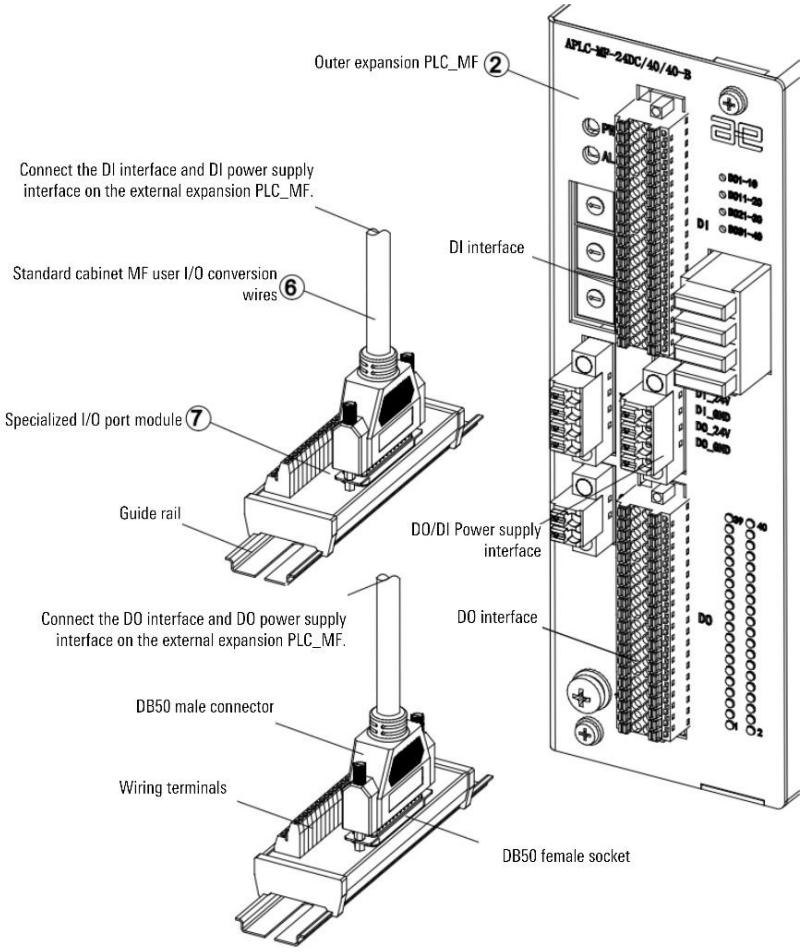


Figure 17-11 Diagram of connecting user I/O terminals

17.5 BDI module and BDO module

17.5.1 Overview

BDI modules and BDO modules can be used to expand the number of user DI/DOs. It communicates with the control cabinet through the internal bus AE-modbus of the Peitian robot, which supports 16 channels of DI (BDI) and 8 channels of DO (BDO) respectively. In order to facilitate users to use, BDI and BDO have the following features:

- Both BDI modules and BDO modules support cascading
- The BDI module can be configured into PNP and NPN working modes through different wiring methods.
- BDO supports high current output within 2A

Tip

The extensions of BDI and BDO modules are only applicable to software versions above V2.6.4.

17.5.2 Interface description

The BDI module interface include has the following three types:

- Power input interface
- AE-modbus communication interface
- DI communication interface

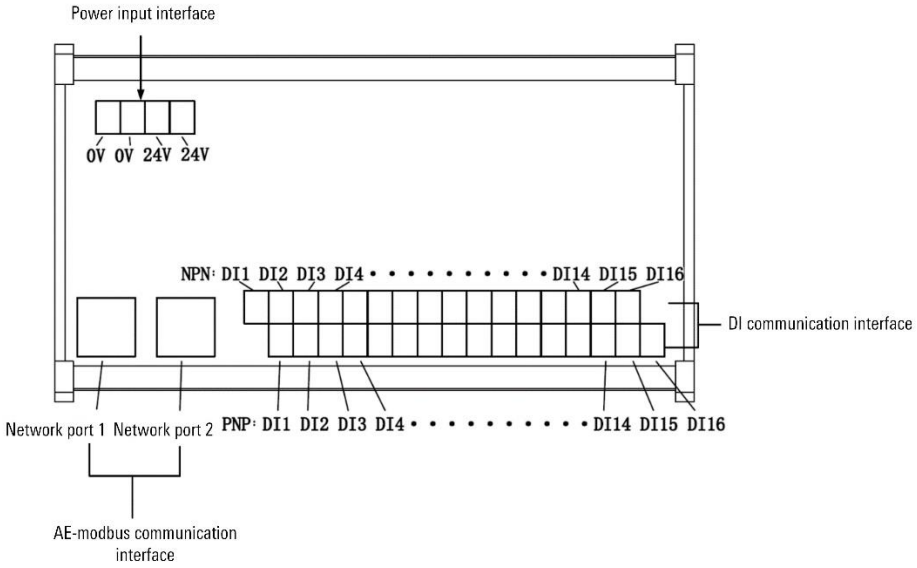


Figure 17-12 BDI module interface diagram

Table 17-7 BDI module interface description

Project	Illustrate
Power input interface	Provides two power input interfaces, the power input is 24VDC, and can be cascaded with the external power supply connected.
AE-modbus communication interface	Provides two RJ-45 type AE-modbus communication interfaces, which can be cascaded.
DI communication interface	Provides 16 DI communication interfaces. The DI communication interface is a terminal block. Users can choose NPN or PNP type input according to needs.

BDO module include following 3 types:

- Power input interface
- AE-modbus communication interface
- DO communication interface

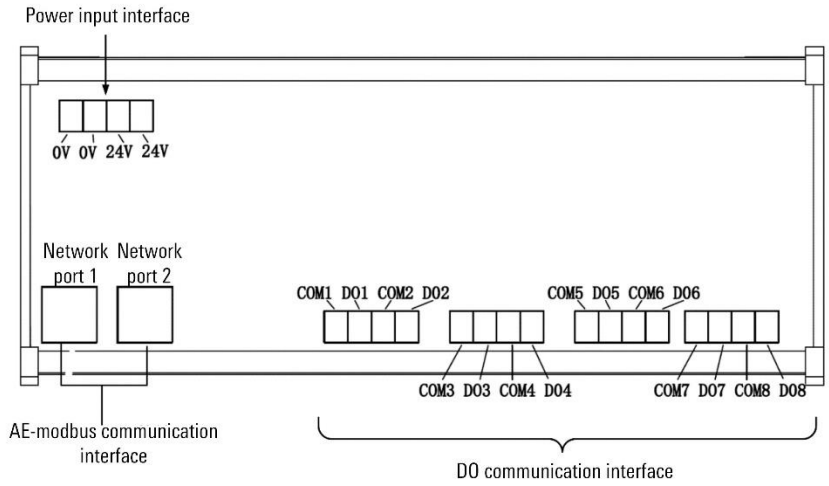


Figure 17-13 BDO module interface diagram

Table 17-8 BDO module interface description

Project	Illustrate
Power input interface	Provides two power input interfaces, the source input is 24VDC, and can be cascaded with the external power supply connected.
AE-modbus communication interface	Provides two RJ-45 type AE-modbus communication interfaces, which can be cascaded.
DO communication interface	Provides 8-channel DO communication interface. The DO communication interface is a terminal block and provides 8 pairs of normally open contacts. The user can connect the COM pin to 0V or 24V to configure the polarity of the DO.

17.5.3 Connection method

The following figure takes the connection method of "16-way DI + 16-way DO" as an example to illustrate the overall wiring method of BDI and BDO.

- BDI and BDO are cascaded through network cables and powered by an external power module.
- All BDI/BDO modules are finally connected to the control cabinet through the MF-RS485 to RJ45 cable. The plugs and interfaces of the MF-RS485 to RJ45 cable corresponding to different types of control cabinets are shown in Table 17-9.

Table 17-9 Plug and interface description of MF-RS485 to RJ45 cable corresponding to different types of control cabinets

Serial number	Control cabinet model	Control cabinet interface	MF-RS485 to RJ45 wiring harness connector model
1	inCube20/22/2S, ARC5	RS485 interface	B2CF3.50/06/180FSNBKBX jack type

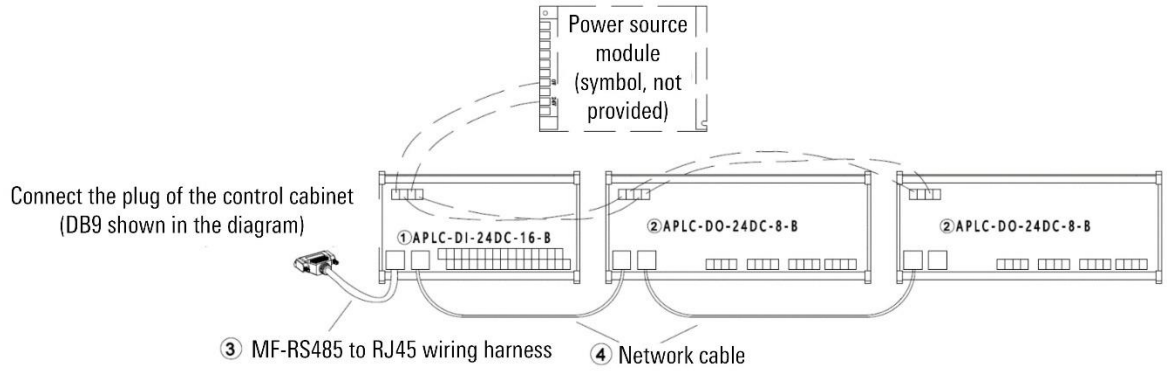


Figure 17-14 Connection diagram of "16 DI+16 DO"

For detailed information about the part No of each module, see Table 17-10.

Table 17-10 BDI module and BDO module part No

Serial number	Name	Part No	Size	Standard/optional
1	APLC-DI-24DC-16-B	P05050000004	150mm (length) x88mm (width) x50mm (height)	Optional
2	APLC-DO-24DC-8-B	P05050000005	195mm (length) x88mm (width) x50mm (height)	Optional
3	MF-RS 485 to RJ45 harness (inCube20/2S/22/ARC5) (The connector type on the control cabinet side is B2CF3.50/06/180FSNBKBX)	P04082001162	-	Optional
4	RJ45 network cable	P04082000035	-	Optional

17.6 ARC5 external expansion 48-channel IO module (NPN type)

17.6.1 Overview

The ARC5 external 48-channel IO module (NPN type) is used in the ARC5 control cabinet to expand the number of user DI/DO. It communicates with the control cabinet through the AE-modbus internal bus of the Peitian robot, and supports a total of 48 DI and 48 DO expansions. In order to facilitate user use, the 48-channel IO module has the following features:

- The DO module only supports NPN working mode. If you need to connect an external PNP output, you need to use the corresponding polarity conversion module;
- The DI module can be configured into PNP and NPN working modes through different wiring methods.

17.6.2 Configuration instructions

For detailed information about the ARC5 external 48-channel IO module (NPN type), see Table 17-11.

Table 17-11 ARC5 external expansion 48-channel IO module (NPN type) part No

Name	Part No
ARC5-12/25 external expansion 48-channel IO module (NPN type)	PC5100000097
ARC5-280 external expansion 48-channel IO module (NPN type)	PC5100000108

For configuration instructions of the ARC5 external 48-channel IO module (NPN type), see Table 17-12.

Table 17-12 Main configuration table of ARC5 external 48-channel IO module (NPN type)

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage
1	BDIO-48IN-48OUTPCBA		ARC5	P05245000128	1
2	ARC5-IO board components	Sheet metal and fastener components		P05255001742	1
3	IO board power harness	1.52m		P04082001334	1
4	ARC5-MCBS-48IO wiring harness	0.64m		P04082001365	1

17.6.3 Pin definition

DI interface

PNP or NPN type sensor signals, switch signals, and relay contact signals can be used as user DI inputs. The DI interface supports PNP and NPN sensor inputs. When using an NPN sensor, the common terminal COM needs to be directly connected to the 24V power supply. When using a PNP sensor, the common terminal corresponding to the DI needs to be connected to the power source. For the pin definition and wiring method of the DI of the external 48-channel IO module, please refer to Figure 17-16 and Table 17-13 respectively.

Table 17-13 External expansion 48-channel IO module DI interface definition list

Screen printing position	Signal meaning	In/Out
DI1	Configurable digital input	In
DI2	Configurable digital input	In
DI3	Configurable digital input	In
DI4	Configurable digital input	In
DI5	Configurable digital input	In
DI6	Configurable digital input	In
DI7	Configurable digital input	In
DI8	Configurable digital input	In
DI9	Configurable digital input	In
DI10	Configurable digital input	In
DI11	Configurable digital input	In
DI12	Configurable digital input	In

Screen printing position	Signal meaning	In/Out
DI13	Configurable digital input	In
DI14	Configurable digital input	In
DI15	Configurable digital input	In
DI16	Configurable digital input	In
DI17	Configurable digital input	In
DI18	Configurable digital input	In
DI19	Configurable digital input	In
DI20	Configurable digital input	In
DI21	Configurable digital input	In
DI22	Configurable digital input	In
DI23	Configurable digital input	In
DI24	Configurable digital input	In
DI25	Configurable digital input	In
DI26	Configurable digital input	In
DI27	Configurable digital input	In
DI28	Configurable digital input	In
DI29	Configurable digital input	In
DI30	Configurable digital input	In
DI31	Configurable digital input	In
DI32	Configurable digital input	In
DI33	Configurable digital input	In
DI34	Configurable digital input	In
DI35	Configurable digital input	In
DI36	Configurable digital input	In
DI37	Configurable digital input	In
DI38	Configurable digital input	In
DI39	Configurable digital input	In
DI40	Configurable digital input	In
DI41	Configurable digital input	In
DI42	Configurable digital input	In
DI43	Configurable digital input	In
DI44	Configurable digital input	In
DI45	Configurable digital input	In
DI46	Configurable digital input	In

Screen printing position	Signal meaning	In/Out
DI47	Configurable digital input	In
DI48	Configurable digital input	In
COM	Input common	
24V	24V power supply	Power
GND	Signal ground	GND

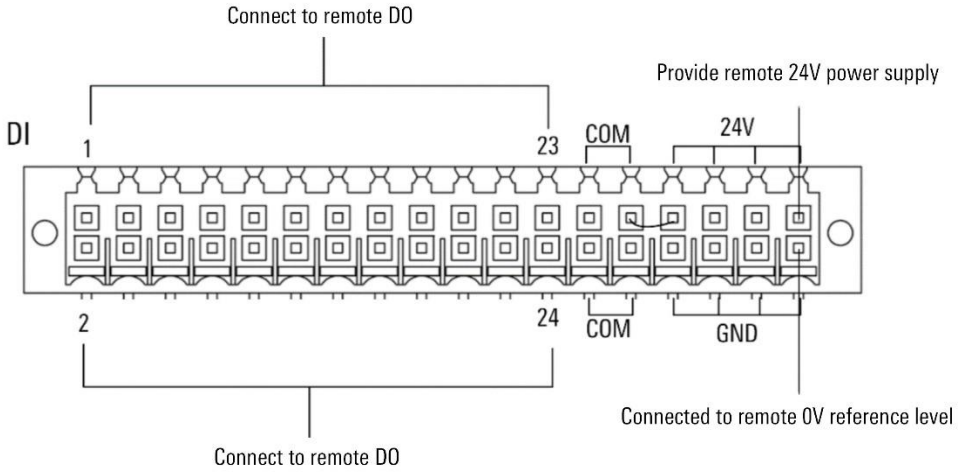


Figure 17-15 User DI interface instructions (NPN input)

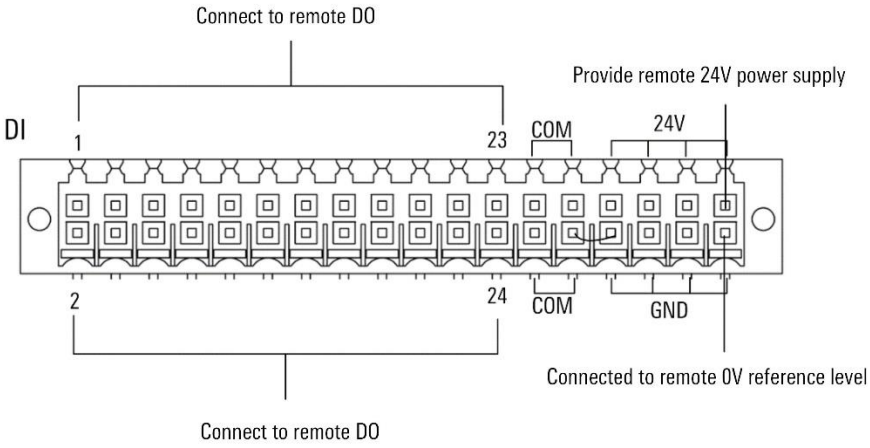


Figure 17-16 User DI interface instructions (PNP input)

DO interface

The CB30i control cabinet provides users with 48 DO interfaces. The DO polarity is NPN. The maximum input current of a single channel of all DOs is 100mA. For interface usage information, refer to Table 17-14 and Figure 17-17.

If you need to connect external PNP polarity sensors or switches, you need to use the corresponding polarity switching equipment.

Table 17-14 User DO interface definition list

Screen printing position	Signal meaning	In/Out
DO1	NPN digital output	Out
DO2	NPN digital output	Out
DO3	NPN digital output	Out
DO4	NPN digital output	Out
DO5	NPN digital output	Out
DO6	NPN digital output	Out
DO7	NPN digital output	Out
DO8	NPN digital output	Out
DO9	NPN digital output	Out
DO10	NPN digital output	Out
DO11	NPN digital output	Out
DO12	NPN digital output	Out
DO13	NPN digital output	Out
DO14	NPN digital output	Out
DO15	NPN digital output	Out
DO16	NPN digital output	Out
DO17	NPN digital output	Out
DO18	NPN digital output	Out
DO19	NPN digital output	Out
DO20	NPN digital output	Out
DO21	NPN digital output	Out
DO22	NPN digital output	Out
DO23	NPN digital output	Out
DO24	NPN digital output	Out
DO25	NPN digital output	Out
DO26	NPN digital output	Out
DO27	NPN digital output	Out
DO28	NPN digital output	Out
DO29	NPN digital output	Out
DO30	NPN digital output	Out
DO31	NPN digital output	Out
DO32	NPN digital output	Out
DO33	NPN digital output	Out
DO34	NPN digital output	Out

Screen printing position	Signal meaning	In/Out
DO35	NPN digital output	Out
DO36	NPN digital output	Out
DO37	NPN digital output	Out
DO38	NPN digital output	Out
DO39	NPN digital output	Out
DO40	NPN digital output	Out
DO41	NPN digital output	Out
DO42	NPN digital output	Out
DO43	NPN digital output	Out
DO44	NPN digital output	Out
DO45	NPN digital output	Out
DO46	NPN digital output	Out
DO47	NPN digital output	Out
DO48	NPN digital output	Out
24V	Power interface for freewheeling	Power
GND	ground	GND

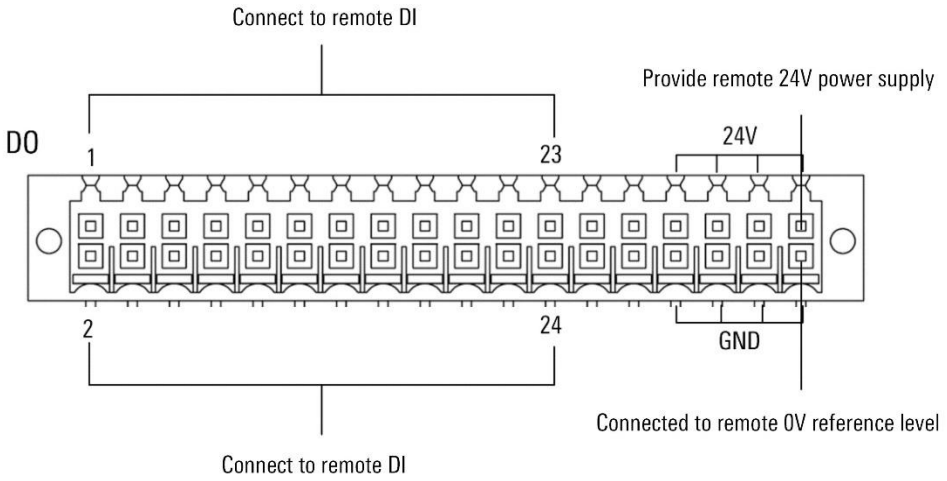


Figure 17-17 User DO interface instructions

Connection steps

Step1. Use a hexagonal wrench to fix the male and female hexagonal isolation column M3x15+6 to the MCBS board, and use cross-recessed pan head screws M3x6 to fix the IO board mounting sheet metal to the isolation column. Use cross recessed pan head combination screws M3x8 to fix the BDIO-48IN-48OUTPCBA board on the IO board mounting sheet metal.

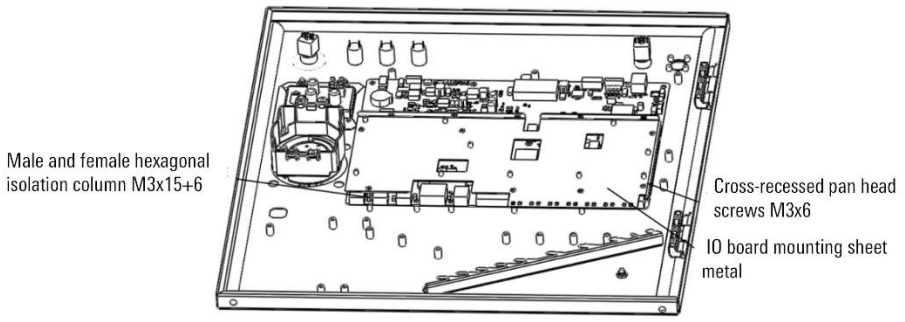


Figure 17-18 Install the IO board mounting plate

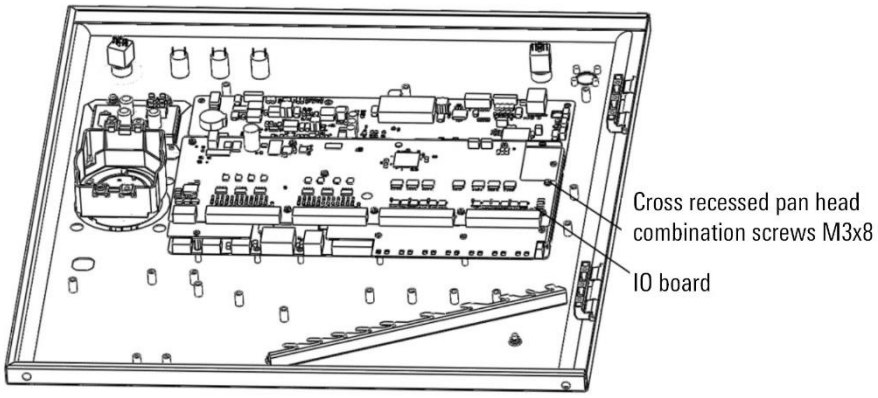


Figure 17-19 Install the 48-channel IO board

Step2. Connect the 24V output of the switching power supply to the 24V power input connector X3 of the IO board using the IO board power harness.

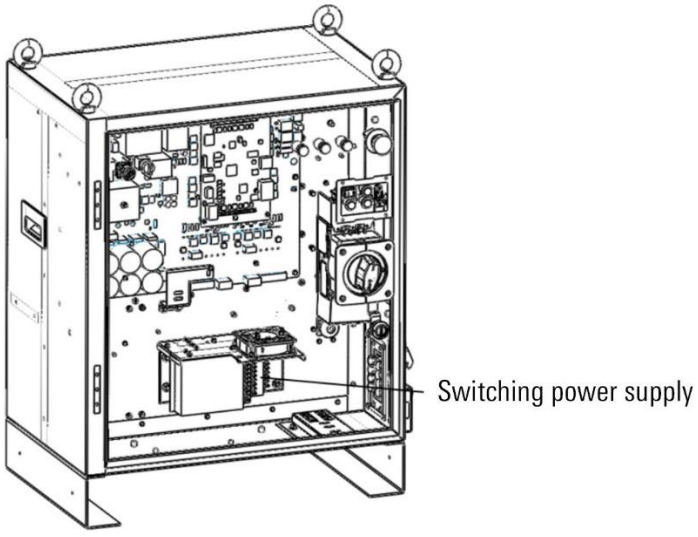


Figure 17-20 Switching power supply

Step3. Connect one end of the ARC5-MCBS-48IO harness to the MCBS MF_RS485 connector and the other end to the IO board X1 connector. As shown in Figure 17-21 and Figure 17-22.

Figure 17-21 Diagram of connecting MCBS

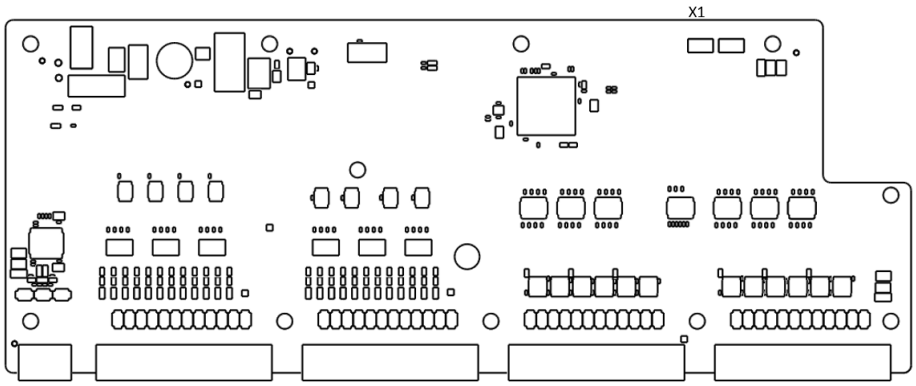


Figure 17-22 Diagram of connecting BDIO-48IN-48OUTPCBA

Tip

The external expansion 48-channel IO module lead cable needs to be led out from the cabinet according to actual needs. According to the lead wire specifications, select an appropriate cable core and install it on the right side of the control cabinet.

17.7 Station address dialing instructions

The station address is the slave address on the RS485 bus of the control cabinet, starting from 0x01. There are 3 DIP switches on PLC_MF:

- The first DIP switch (SW1) function: baud rate setting, usually set to B, which represents 460800.
- The function of the second DIP switch (SW2): set the high 4 bits of the slave address to 0.
- The third DIP switch (SW3) function: the lower 4 bits of the slave address are set, generally set to 1 or 2. Depending on the number of other slave stations, it is set to 2 when there is ENP and set to 1 when there is no ENP.

The configurable slave stations include on the bus: PLC-MF, BDI/BDO and ENP. The main difference is whether the control cabinet and manipulator contain ENP. When contain has ENP, the 0x01 address slave station is ENP.

Examples are as follows:

There is no ENP for inCube2S, inCube20 and inCube22 control cabinets. Click [System/System Configuration/PLC Slave Station Configuration] on the main interface of teach pendant. In the PLC slave station, you can choose to configure the MF, BDI and BDO station addresses starting from 0x01 and sorting them in order.

18 IEB (multi-function communication module)

18.1 Overview

IEB is an optional accessory for attaching to MCB/MCBS/MCBF modules. It provides expansion interfaces such as CAN, magnetic scale, incremental encoder, absolute encoder, analog output, analog input, and PWM output. For use by users.

Tip

This optional accessory generally cannot be used independently and needs to be used in conjunction with user wiring harness and software functions to achieve communication.

18.2 Installation of multi-function communication module (optional) in inCube series control cabinet

18.2.1 Installation of multi-function communication module in inCube20/22 control cabinet

Module configuration instructions

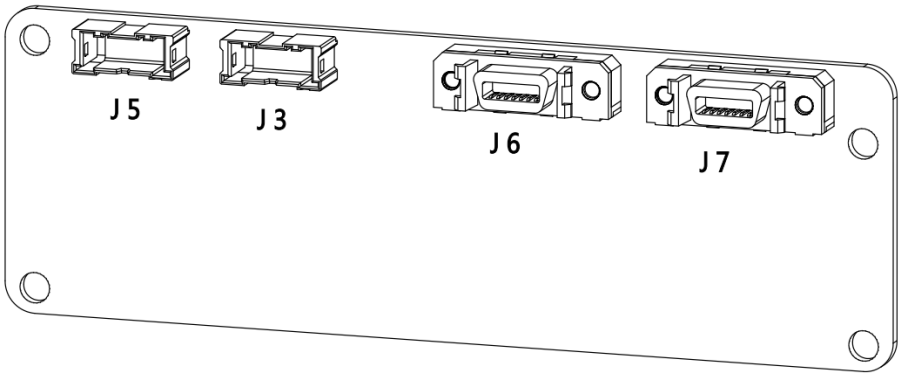
inCube20/22 control cabinet multi-function communication module configuration instructions are detailed in Table 18-1.

Table 18-1 Main configuration table of inCube20/22 control cabinet multi-function communication module

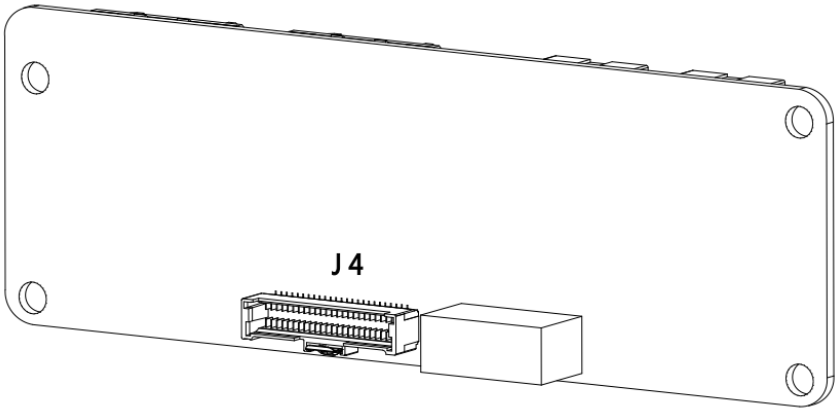
Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	MCBS-IEB	MCBS-IEB_P1.1 and above	inCube20/22	P05245000108	1	Optional
2	ARCCD20-installation of gusset sheet metal	-		P01035000547	1	
3	Cross recessed pan head combination screws	M4X8		P02023001004	4	
4	ARCCD20-MCBS and gusset cable	inside the cabinet		P04082000595	1	
5	The magnetic scale and CAN_encoder share the same wiring harness	5m		P04082000596	According to usage According to usage	
6	PWM and	5m		P04082000594	1	

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
	analog output_voltage and current input harness-5 meters				1	
7	Integrated spring terminal block	54mm*45mm*40mm		P09050410004	1	

MCBS-IEB front and back diagrams and interface descriptions refer to Figure 18-1 and Table 18-2 respectively.



(a) Front view



(b) Back view

Figure 18-1 MCBS-IEB front and back diagram

Table 18-2 MCBS-IEB interface description

Rank number	Project	Illustrate
1	MCBS-IEB	Second generation multifunctional communication module
1.1	J4	MCBS-IEB and MCBS connectors
1.2	J5	PWM output and analog output interface
1.3	J3	Voltage input and current input interface

Rank number	Project	Illustrate
1.4	J7	Encoder interface
1.5	J6	Magnetic scale and CAN interface

For the diagram and definition of the shared wiring harness and SCSI pin between the magnetic scale and CAN_encoder, please refer to Figure 18-2 and Table 18-3 respectively.

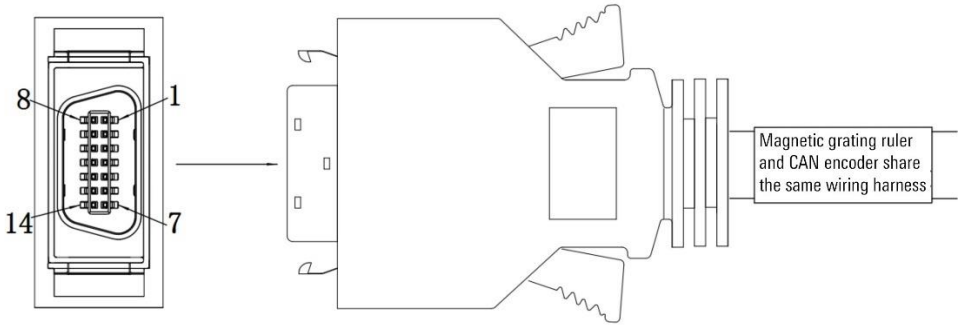


Figure 18-2 Diagram of the shared wiring harness and SCSI pins between the magnetic scale and CAN_encoder

Table 18-3 Magnetic scale and CAN_encoder share wiring harness and SCSI pin definition

SCSI pin	J6	Significance	J7	Significance
1			A-	Incremental encoder A-
2	GND_5V_ISO	CAN isolation ground	A+	Incremental encoder A+
3			Z-	Incremental encoder Z-
4				
5			Z+	Incremental encoder Z+
6	MRR_Z	Magnetic scale Z		
7	MRR_X			
8	CAN_O_L	CAN_L	B-	Incremental encoder B-
9	CAN_O_H	CAN_H	B+	Incremental encoder B+
10				
11	D+24V_MRR	Magnetic scale 24V power supply	ENC1_D+	Absolute encoder Data+ (RS485)
12	GND_MRR_ISO	Magnetic scale isolation ground	GND	reference place
13	MRR_A	Magnetic scale A	ENC1_D-	Absolute encoder Data- (RS485)
14	MRR_B	Magnetic scale B	D+5V_ENC	Encoder 5V output

PWM and analog output_voltage and current input harness (5m) diagram and pin definition refer to Figure 18-3 and Table 18-4 respectively.

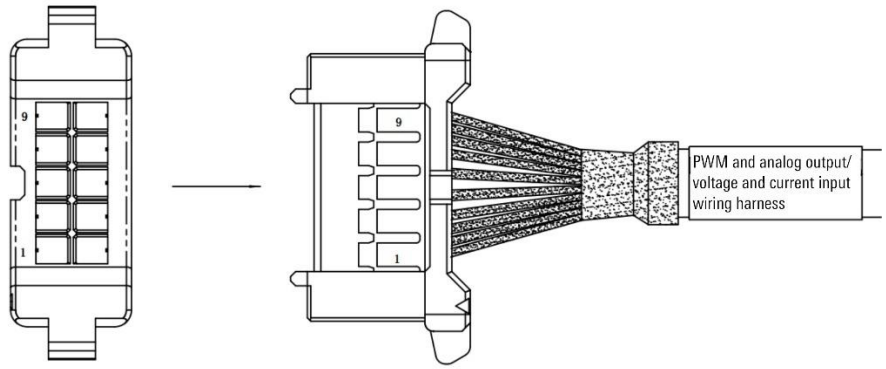


Figure 18-3 PWM and analog output_voltage and current input harness (5m) diagram

Table 18-4 PWM and analog output_voltage and current input harness (5m) pin definition

Pin	J3	Significance	J5	Significance	Remark
1	VOLTAGE_INPUT_01_P	Voltage input 1	ANALOG_OUT_0	Analog output 0	Pin order refer to the markings on the connector
2	VOLTAGE_INPUT_02_P	Voltage input 2	ANALOG_OUT_1	Analog output 1	
3	GND	reference ground	ANALOG_OUT_2	Analog output 2	
4	GND	reference ground	GND	reference ground	
5	VOLTAGE_INPUT_03_P	Voltage input 3	USER_D+24V	PWM isolated 24V power supply	
6	CURRENT_INPUT_01_P	Current input 1	USER_GND	PWM isolation ground	
7	GND	reference ground	PWM_OUT_CON_01	PWM output 1	
8	GND	reference ground	PWM_OUT_CON_02	PWM output 2	
9	CURRENT_INPUT_02_P	Current input 2	PWM_OUT_CON_03	PWM output 3	
10	CURRENT_INPUT_03_P	Current input 3	PWM_OUT_CON_04	PWM output 4	

Connection and configuration steps

Step1. Use a hexagonal screwdriver to unscrew the four hexagonal screws on the rear panel of the control cabinet and remove the cover plate. Refer to Figure 18-4.

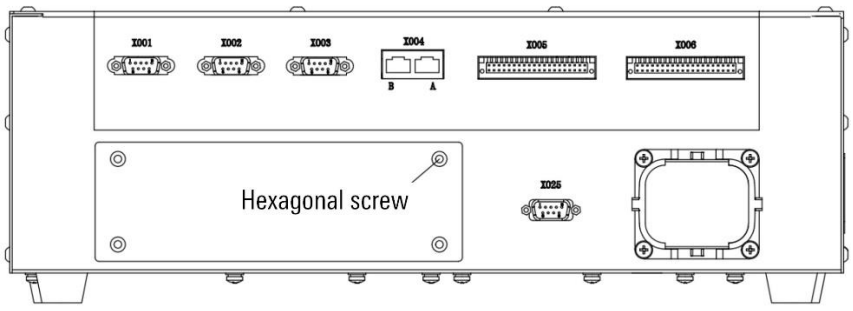
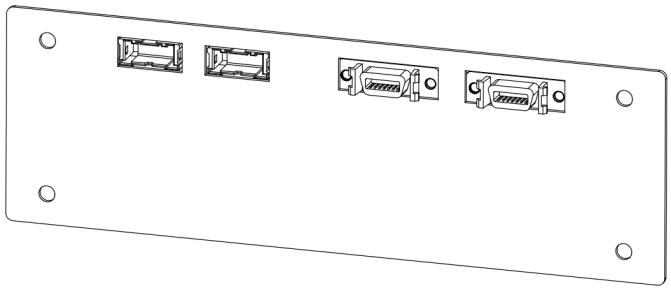


Figure 18-4 Diagram of the rear panel of the control cabinet

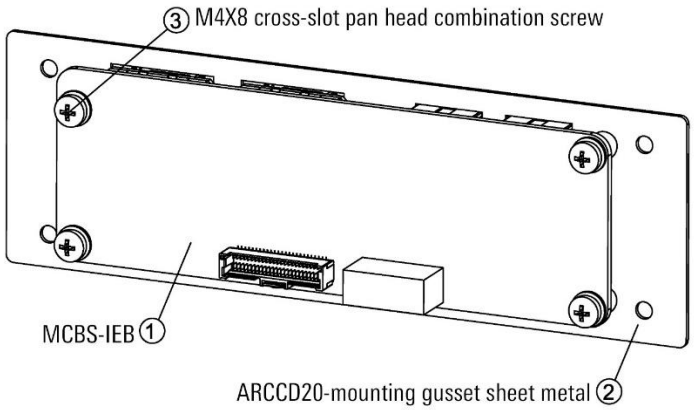
Tip

The four hexagon socket head screws need to be saved for subsequent use.

Step2. Fix the MCBS-IEB to the ARCCD20-mounting gusset sheet metal with 4 M4X8 cross-slot pan head combination screws, refer to Figure 18-5.



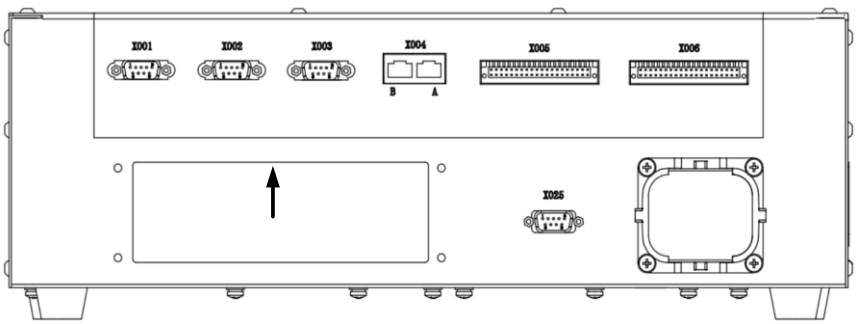
(a)



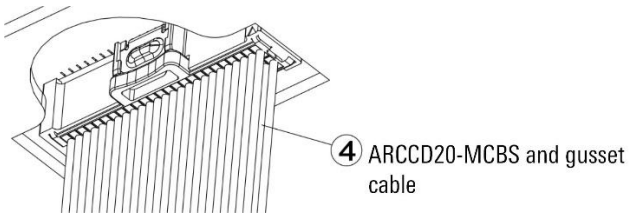
(b)

Figure 18-5 Install MCBS-IEB

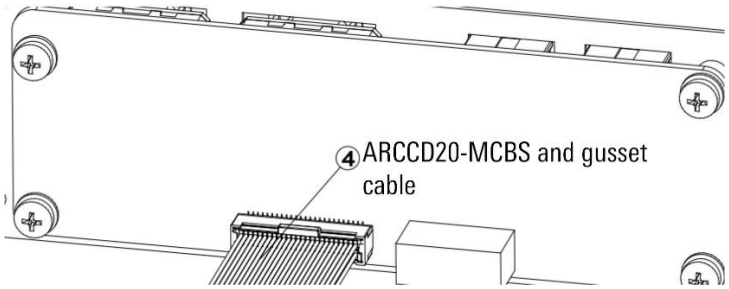
Step3. Connect one side of the ARCCD20-MCBS and gusset cable to the position of the arrow as shown in Figure 18-6, and the other side to the MCBS-IEB connector corresponding to J4.



(a)



(b)



(c)

Figure 18-6 Installation of ARCCD20-MCBS and gusset cable

Step4. Use 4 hexagon socket screws removed in step 1 to fix the ARCCD20-mounting plate sheet metal to the rear panel, refer to Figure 18-7.

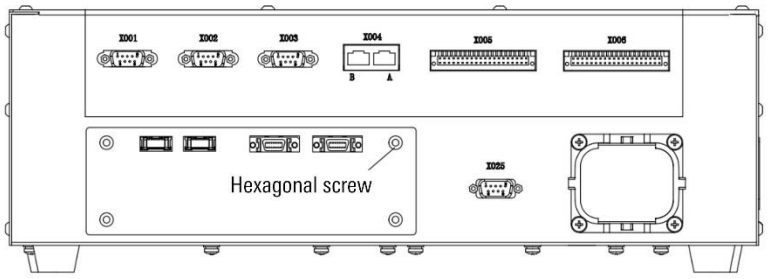


Figure 18-7 ARCCD20-diagram after installing the gusset plate and fixing the sheet metal

Step5. Connect the outside lines of the cabinet according to the functions used, refer to Figure 18-8:

a) Use PWM output and analog output signal: use PWM and analog output _ voltage and current input wiring harness -5 meters connected to J5;

b) Use voltage input and current input signals: use PWM and analog output _ voltage and current input wiring harness -5 meters connected to J3;

c) Use encoder signal: use magnetic scale and CAN_encoder to share the wiring harness connected to J7;

d) Use magnetic ruler and CAN signal: Connect to J6 with magnetic ruler and CAN_ encoder shared wiring harness.

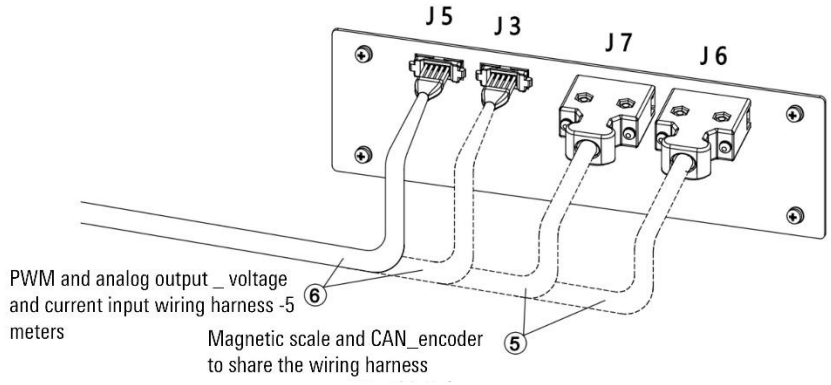


Figure 18-8 MCBS-IEB front view

Notice

The voltage input and current input interfaces have voltage and current range limits. Exceeding the limits may cause device damage. Please strictly follow the range in Table 18-5.

Table 18-5 Analog output of J3_Voltage and current range limits

Connector	Pin	Function	Parameter	Numerical value	Unit
J3	1	Voltage input 1	Voltage	-10~+10	V
	2	Voltage input 2	Voltage	-10~+10	V
	5	Voltage input 3	Voltage	-10~+10	V
	6	Current input 1	current	0~+20	mA
	9	Current input 2	current	0~+20	mA
	10	Current input 3	current	0~+20	mA

Table 18-6 J5 ' s PWM and analog output_voltage and current range limits

Connector	Pin	Function	Parameter	Numerical value	Unit	Remark
J5	1	Voltage output 1	Voltage	-10~+10	V	Analog voltage and current output multiplexed pins Voltage output load resistance minimum value 1Kohm
	2	Voltage output 2	Voltage	-10~+10	V	
	3	Voltage output 3	Voltage	-10~+10	V	
	1	Current output 1	current	0~+20	mA	Analog voltage and current output multiplexed pins Maximum current
	2	Current output 2	current	0~+20	mA	
	3	Current output 3	current	0~+20	mA	

Connector	Pin	Function	Parameter	Numerical value	Unit	Remark
						output load resistance 600ohm
	7	PWM output 1	Voltage	0~+24	V	Adjustable duty cycle, minimum load resistance 1Kohm
	8	PWM output 2	Voltage	0~+24	V	
	9	PWM output 3	Voltage	0~+24	V	
	10	PWM output 4	Voltage	0~+24	V	

J6 is the CAN_magnetic scale common interface. The magnetic scale has an input level of 24V. For the input circuit diagram, please refer to Figure 18-9.

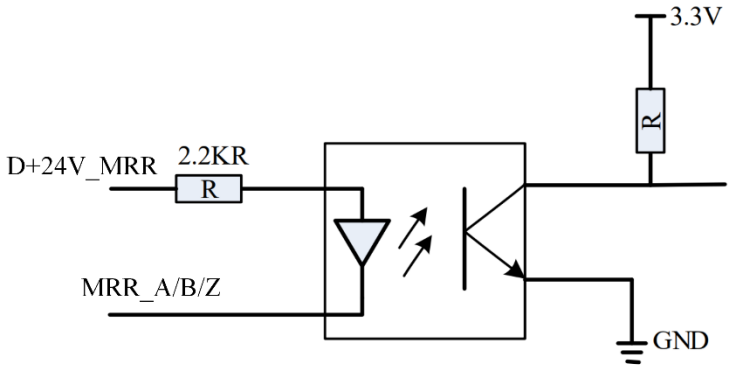


Figure 18-9 Magnetic scale input circuit diagram

Step6. Turn on the control cabinet and click [System/System Configuration/PLC Slave Configuration] on the teach pendant main interface to enter the [PLC Slave Configuration] interface. As shown in Figure 18-10.

Figure 18-10 [PLC slave configuration] interface

Step7. Select the serial number to be configured, click < Configuration >, and enter the [Configuration PLC Slave] interface. As shown in Figure 18-11.

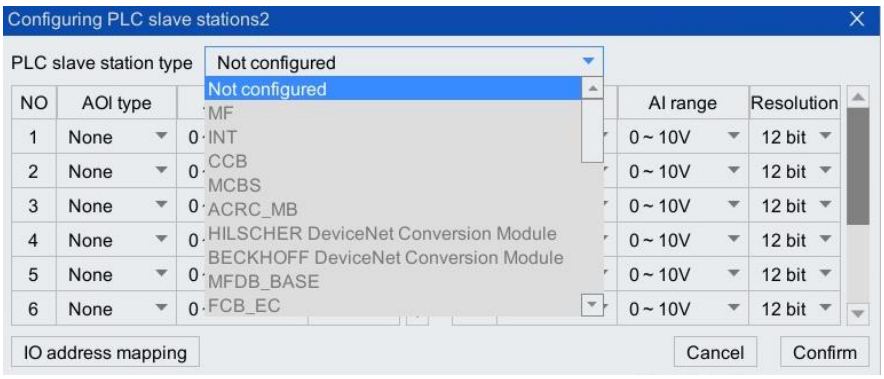


Figure 18-11 [Configure PLC slave station] interface

Step8. Select "IEB" or "IEB_BASE" in [PLC Slave Type], and configure the type and range of AO and AI signals as shown in Figure 18-12.

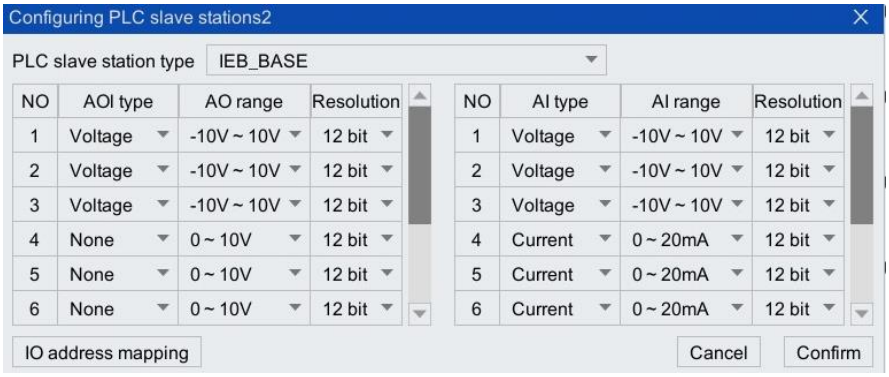


Figure 18-12 [Configuring PLC slave] interface parameter configuration example

18.2.2 Installation of multi-functional communication module in inCube2S control cabinet

Module configuration instructions

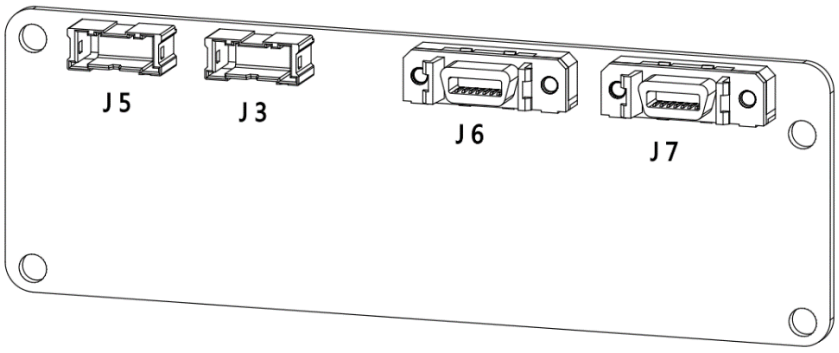
For details on the configuration of the multi-function communication module in the inCube2S control cabinet, see Table 18-7.

Table 18-7 Main configuration table of inCube2S control cabinet multi-function communication module

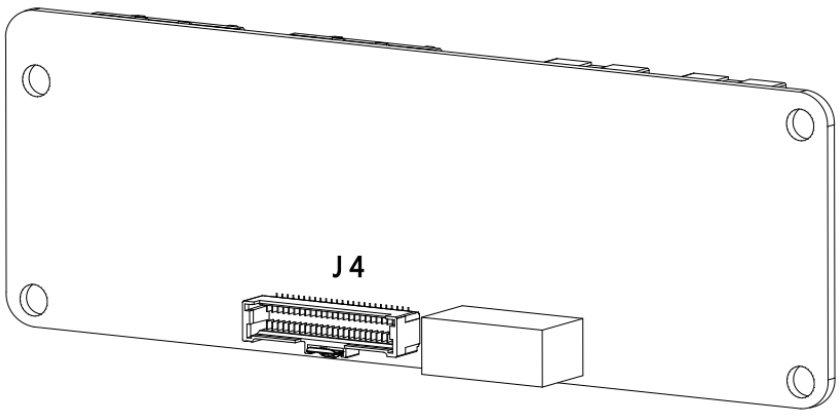
Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	MCBS-IEB	MCBS-IEB_P1.1 and above	inCube2S	P05245000108	1	Optional
2	inCube2S-installation of gusset sheet metal	-		P01035000693	1	
3	Cross recessed pan head combination screws	M4X8		P02023001004	4	

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
4	ARCCD20-MCBS and gusset cable	inside the cabinet		P04082000595	1	
5	The magnetic scale and CAN_encoder share the same wiring harness	5m		P04082000596	According to usage	
					According to usage	
6	PWM and analog output_voltage and current input harness-5 meters	5m		P04082000594	1	
					1	
7	Integrated spring terminal block	54mm*45mm*40mm		P09050410004	1	

MCBS-IEB front and back diagrams and interface descriptions refer to Figure 18-13 and Table 18-8 respectively.



(a) Front view



(b) Back view

Figure 18-13 MCBS-IEB front and back diagram

Table 18-8 MCBS-IEB interface description

Rank number	Project	Illustrate
1	MCBS-IEB	Second generation multifunctional communication module
1.1	J4	MCBS-IEB and MCBS connectors
1.2	J5	PWM output and analog output interface
1.3	J3	Voltage input and current input interface
1.4	J7	Encoder interface
1.5	J6	Magnetic scale and CAN interface

For the diagram and definition of the shared wiring harness and SCSI pin between the magnetic scale and CAN_encoder, please refer to Figure 18-14 and Table 18-9 respectively.

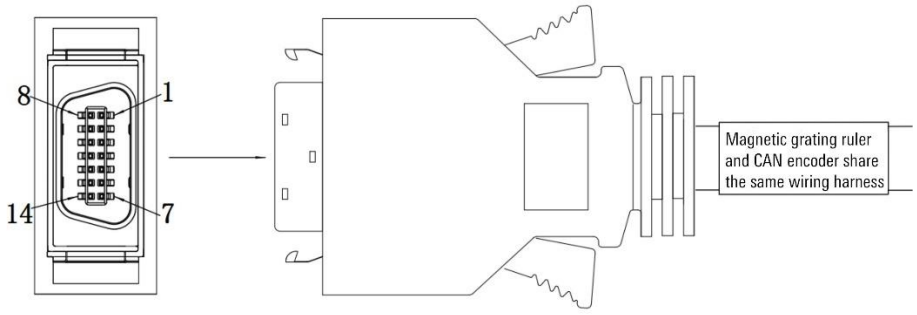


Figure 18-14 Diagram of the shared wiring harness and SCSI pins between the magnetic scale and CAN_encoder

Table 18-9 Magnetic scale and CAN_encoder share wiring harness and SCSI pin definition

SCSI pin	J6	Significance	J7	Significance
1			A-	Incremental encoder A-
2	GND_5V_ISO	CAN isolation ground	A+	Incremental encoder A+
3			Z-	Incremental encoder Z-
4				
5			Z+	Incremental encoder Z+
6	MRR_Z	Magnetic scale Z		
7	MRR_X			
8	CAN_O_L	CAN_L	B-	Incremental encoder B-
9	CAN_O_H	CAN_H	B+	Incremental encoder B+
10				
11	D+24V_MRR	Magnetic scale 24V power supply	ENC1_D+(RS485)	Absolute encoder Data+
12	GND_MRR_ISO	Magnetic scale isolation ground	GND	reference ground
13	MRR_A	Magnetic scale A	ENC1_D-(RS485)	Absolute value encoder

SCSI pin	J6	Significance	J7	Significance
				Data-
14	MRR_B	Magnetic scale B	D+5V_ENC	Encoder 5V output

PWM and analog output_voltage and current input harness (5m) diagram and pin definition refer to Figure 18-15 and Table 18-10 respectively.

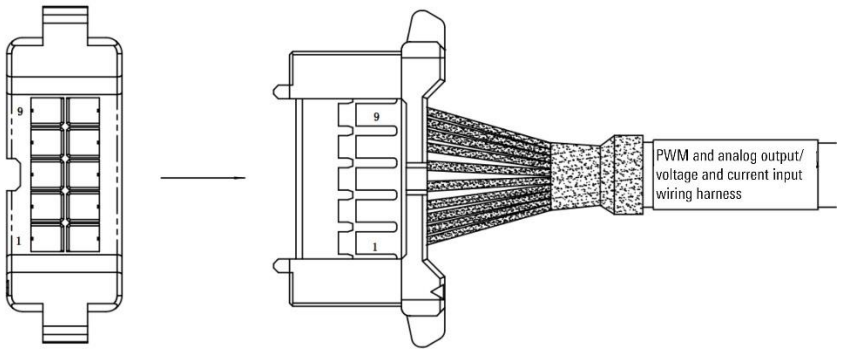


Figure 18-15 PWM and analog output_voltage and current input harness (5m) diagram

Table 18-10 PWM and analog output_voltage and current input harness (5m) pin definition

Pin	J3	J5	Remark
1	Voltage input 1	Analog output 0	Pin order refer to the markings on the connector
2	Voltage input 2	Analog output 1	
3	Reference ground	Analog output 2	
4	Reference ground	Reference ground	
5	Voltage input 3	PWM isolated 24V power supply	
6	Current input 1	PWM isolation ground	
7	Reference ground	PWM output 1	
8	Reference ground	PWM output 2	
9	Current input 2	PWM output 3	
10	Current input 3	PWM output 4	

Connection and configuration steps

Step1. Use a hexagonal screwdriver to unscrew the four hexagonal screws on the rear panel of the control cabinet and remove the cover plate. Refer to Figure 18-16.

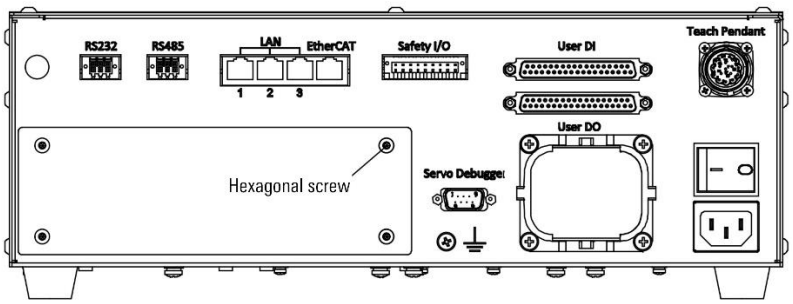
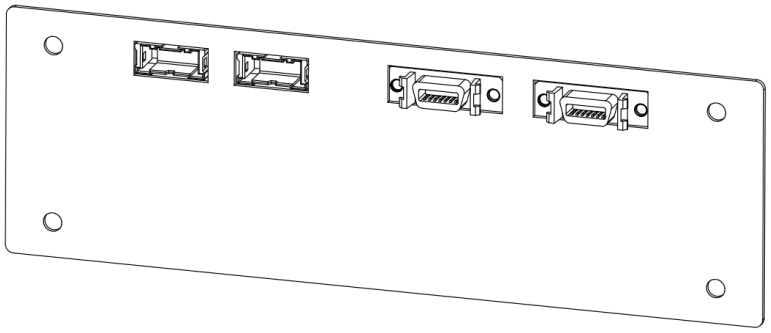


Figure 18-16 Diagram of the rear panel of the control cabinet

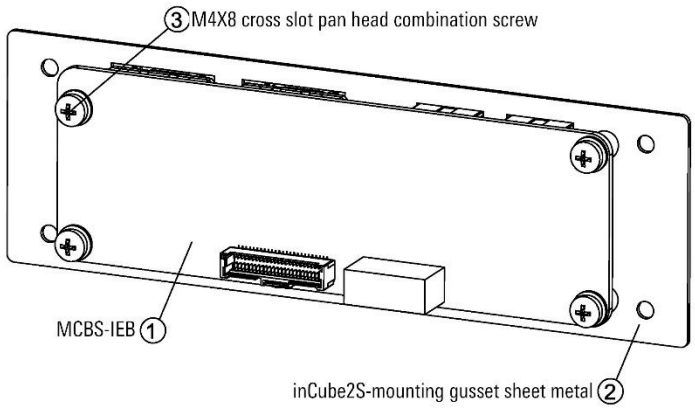
Tip

The four hexagon socket head screws need to be saved for subsequent use.

Step2. Fix the MCBS-IEB to the inCube2S-mounting gusset sheet metal with 4 M4X8 cross slot pan head combination screws, refer to Figure 18-17.



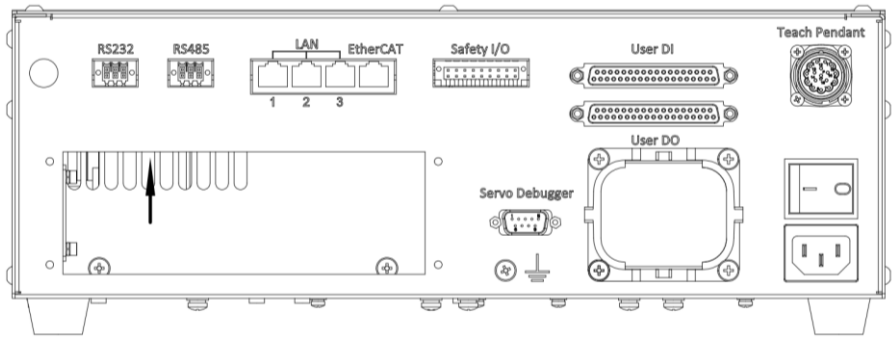
(a)



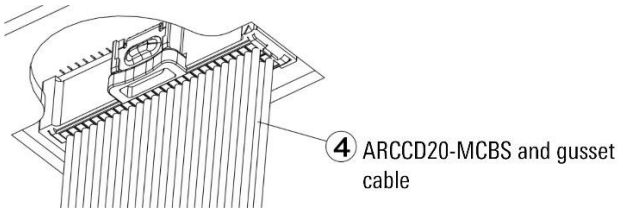
(b)

Figure 18-17 Install MCBS-IEB

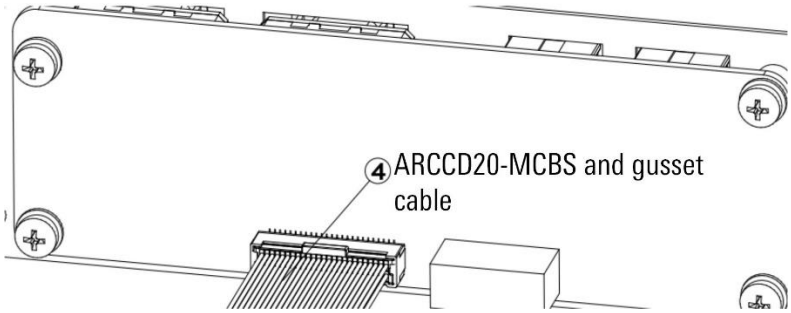
Step3. Connect the ARCCD20-MCBS and gusset cable on one side to the position of arrow 18 (a) as shown in Figure 18-18, and on the other side to the MCBS-IEB connector corresponding to J4.



(a)



(b)



(c)

Figure 18-18 Installation of ARCCD20-MCBS and gusset cable

Step4. Use 4 hexagon socket screws removed in step 1 to fix the inCube2S-mounting plate sheet metal to the rear panel, refer to Figure 18-19.

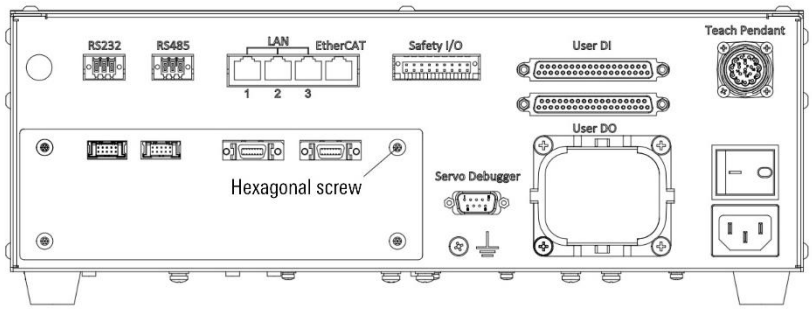


Figure 18-19 inCube2S - diagram of mounting gusset sheet metal after fixing

Step5. Connect the outside lines of the cabinet according to the functions used, refer to Figure 18-20:

a) Use PWM output and analog output signal: use PWM and analog output_voltage and current input wiring harness-5 meters connected to J5;

b) Use voltage input and current input signals: use PWM and analog output_voltage and current input wiring harness -5 meters connected to J3;

c) Use encoder signal: connect to J7 with magnetic scale and CAN_encoder shared harness;

d) Use magnetic ruler and CAN signal: Connect to J6 with magnetic ruler and CAN_encoder shared wiring harness.

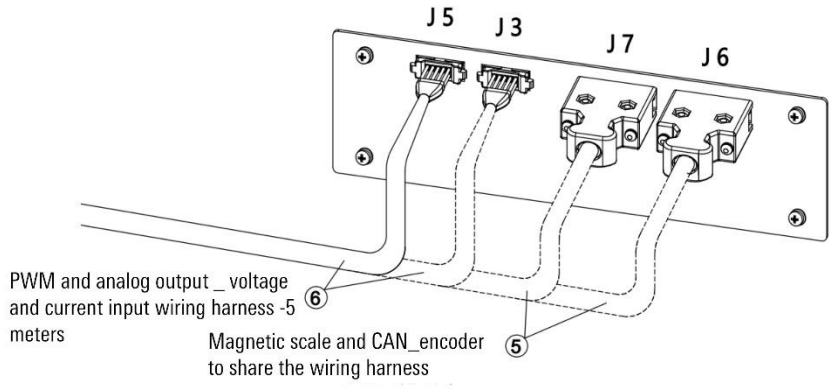


Figure 18-20 MCBS-IEB front view

Notice

The voltage input and current input interfaces have voltage and current range limits. Exceeding the limits may cause device damage. Please strictly follow the ranges in Table 18-11.

Table 18-11 Analog output_voltage and current range limit

Connector	Pin	Function	Parameter	Numerical value	Unit	Remark
J3	1	Voltage input 1	Voltage	-10~+10	V	
	2	Voltage input 2	Voltage	-10~+10	V	Input resistance 10Kohm
	5	Voltage input 3	Voltage	-10~+10	V	
	6	Current input 1	current	0~+20	mA	
	9	Current input 2	current	0~+20	mA	Input resistance 240ohm
	10	Current input 3	current	0~+20	mA	

Table 18-12 J5' s PWM and analog output_voltage and current range limits

Connector	Pin	Function	Parameter	Value	Unit	Remark
J5	1	Voltage output 1	Voltage	-10~+10	V	Analog voltage and current output multiplexed pins Voltage output load resistance minimum value 1Kohm
	2	Voltage output 2	Voltage	-10~+10	V	
	3	Voltage output 3	Voltage	-10~+10	V	
	1	Current output 1	current	0~+20	mA	Analog voltage and current output multiplexed pins Maximum current output load resistance 600ohm
	2	Current output 2	current	0~+20	mA	
	3	Current output 3	current	0~+20	mA	
	7	PWM output 1	Voltage	0~+24	V	Adjustable duty cycle, minimum load resistance 1Kohm
	8	PWM output 2	Voltage	0~+24	V	
	9	PWM output 3	Voltage	0~+24	V	
	10	PWM output 4	Voltage	0~+24	V	

J6 is the CAN_magnetic scale common interface. The magnetic scale has an input level of 24V. For the input circuit diagram, please refer to Figure 18-21.

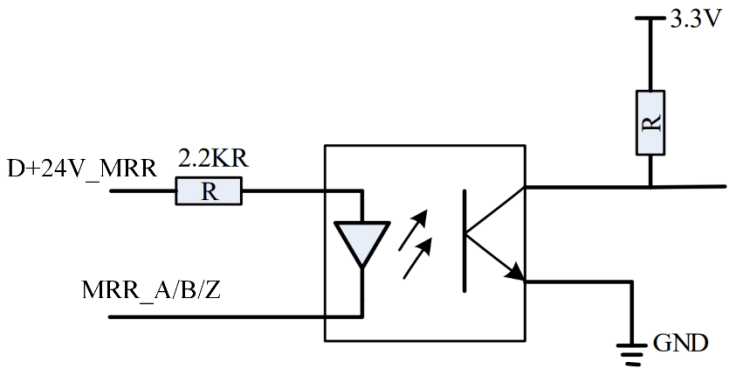


Figure 18-21 Magnetic scale input circuit diagram

Step6. Turn on the control cabinet and click [System/System Configuration/PLC Slave Configuration] on the teach pendant main interface to enter the [PLC Slave Configuration] interface. As shown in Figure 18-22.

Figure 18-22 [PLC slave configuration] interface

Step7. Select the serial number to be configured, click <Configuration>, and enter the [Configuration PLC Slave] interface. As shown in Figure 18-23.

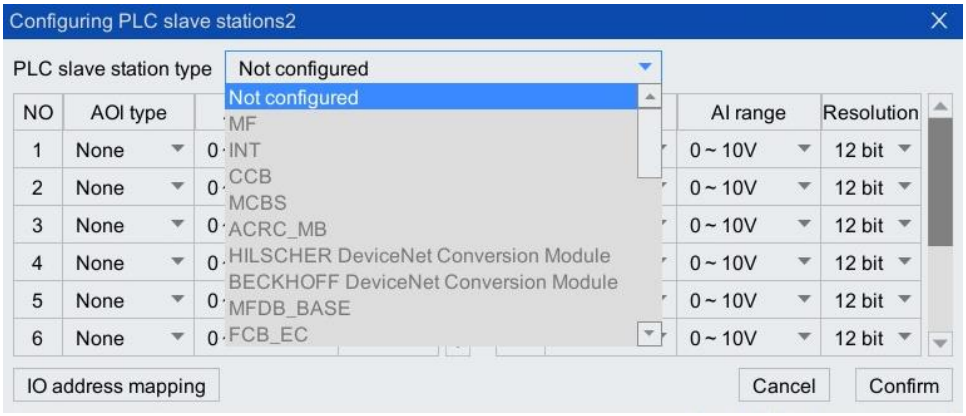


Figure 18-23 [Configure PLC slave station] interface

Step8. Select "IEB" or "IEB_BASE" in [PLC Slave Type], and configure the type and range of AO and AI signals shown in Figure 18-24.

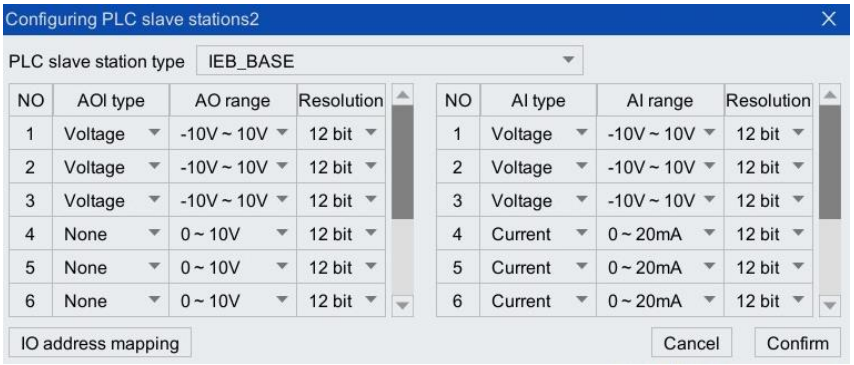


Figure 18-24 [Configuring PLC slave] interface parameter configuration example

18.3 Installation of multi-function communication module in ARC5 control cabinet

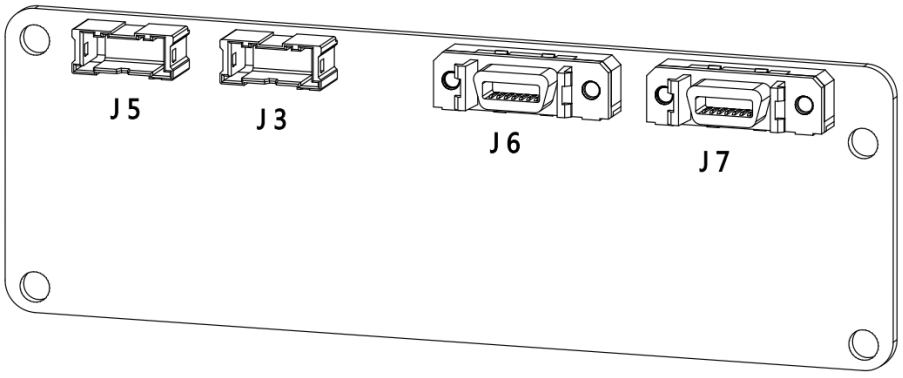
Module configuration instructions

For configuration instructions of the multi-function communication module of the ARC5 control cabinet, see Table 18-13.

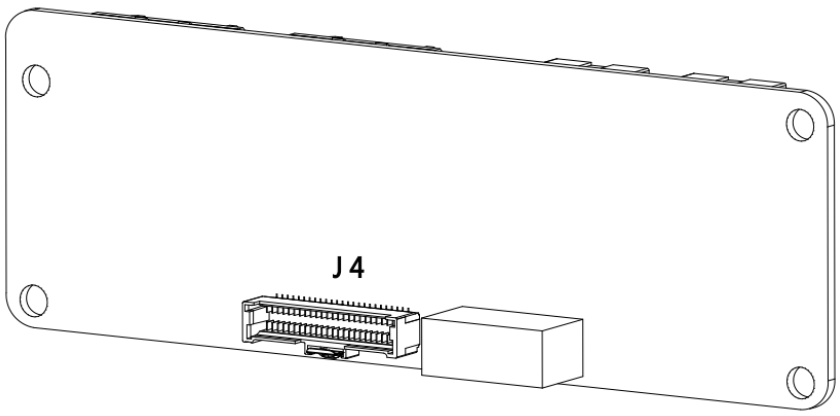
Table 18-13 Main configuration table of ARC5 control cabinet multi-function communication module

Serial number	Name	Specification	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	MCBS-IEB	MCBS-IEB_P1.1 and above	ARC5	P05245000108	1	Optional
2	Cross recessed pan head combination screws	M4x8		P02023001004	4	
3	ARC5-MCBS and gusset cable	inside the cabinet		P04082001166	1	
4	The magnetic scale and CAN_encoder share the same wiring harness	5m		P04082000596	According to usage	
					According to usage	
5	PWM and analog output_voltage and current input harness-5 meters	5m		P04082000594	1	
					1	
6	Integrated spring terminal block	54mm*45mm*40mm		P09050410004	1	

MCBS-IEB front and back diagrams and interface descriptions refer to Figure 18-25 and Table 18-14 respectively.



(a) Front view



(b) Back view

Figure 18-25 MCBS-IEB front and back diagram

Table 18-14 MCBS-IEB interface description

Rank number	Project	Illustrate
1	MCBS-IEB	Second generation multifunctional communication module
1.1	J4	MCBS-IEB and MCBS connectors
1.2	J5	PWM output and analog output interface
1.3	J3	Voltage input and current input interface
1.4	J7	Encoder interface
1.5	J6	Magnetic scale and CAN interface

The diagram and definition of the shared wiring harness and SCSI pins of the magnetic scale and CAN_encoder refer to Figure 18-26 and Table 18-15 respectively.

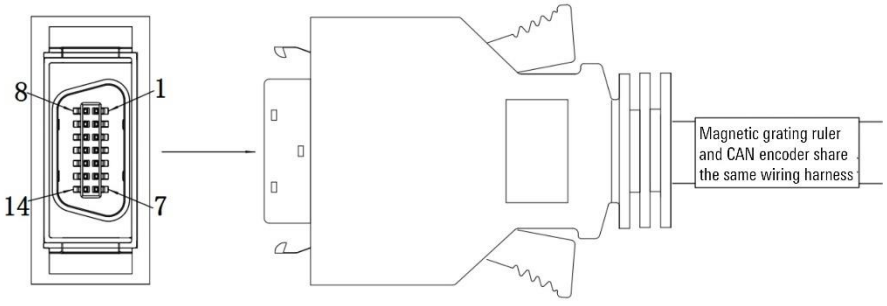


Figure 18-26 Diagram of the shared wiring harness and SCSI pins between the magnetic scale and CAN_encoder

Table 18-15 Magnetic scale and CAN_encoder share wiring harness and SCSI pin definition

SCSI pin	J6	Significance	J7	Significance
1			A-	Incremental encoder A-
2	GND_5V_ISO	CAN isolation ground	A+	Incremental encoder A+
3			Z-	Incremental encoder Z-
4				

SCSI pin	J6	Significance	J7	Significance
5			Z+	Incremental encoder Z+
6	MRR_Z	Magnetic scale Z		
7	MRR_X			
8	CAN_O_L	CAN_L	B-	Incremental encoder B-
9	CAN_O_H	CAN_H	B+	Incremental encoder B+
10				
11	D+24V_MRR	Magnetic scale 24V power supply	ENC1_D+	Absolute encoder Data+ (RS485)
12	GND_MRR_ISO	Magnetic scale isolation ground	GND	reference ground
13	MRR_A	Magnetic scale A	ENC1_D-	Absolute encoder Data- (RS485)
14	MRR_B	Magnetic scale B	D+5V_ENC	Encoder 5V output

PWM and analog output_voltage and current input harness (5m) diagram and pin definition refer to Figure 18-27 and Table 18-16 respectively.

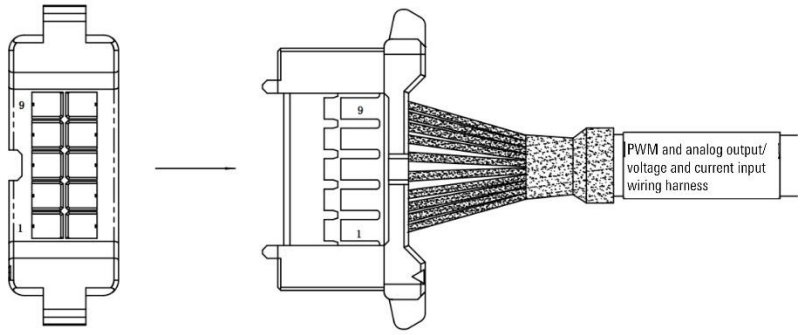


Figure 18-27 PWM and analog output_voltage and current input harness (5m) diagram

Table 18-16 PWM and analog output_voltage and current input harness (5m) pin definition

Pin	J3	Significance	J5	Significance	Remark
1	VOLTAGE_INPUT_01_P	Voltage input 1	ANALOG_OUT_0	Analog output 0	Pin order refer to the markings on the connector
2	VOLTAGE_INPUT_02_P	Voltage input 2	ANALOG_OUT_1	Analog output 1	
3	GND	reference ground	ANALOG_OUT_2	Analog output 2	
4	GND	reference ground	GND	reference ground	
5	VOLTAGE_INPUT_03_P	Voltage input 3	USER_D+24V	PWM Isolated 24V Power Supply	
6	CURRENT_INPUT_01_P	Current input 1	USER_GND	PWM isolation ground	
7	GND	reference ground	PWM_OUT_CON_01	PWM output 1	
8	GND	reference ground	PWM_OUT_CON_02	PWM output 2	

Pin	J3	Significance	J5	Significance	Remark
9	CURRENT_INPUT_02_P	Current input 2	PWM_OUT_CON_03	PWM output 3	
10	CURRENT_INPUT_03_P	Current input 3	PWM_OUT_CON_04	PWM output 4	

Connection and configuration steps

Step1. Use a Phillips screwdriver to remove the M3x8 cross-recessed pan head combination screws on the MCBS, and separate the MCBS board from the front door sheet metal, as shown in Figure 18-28.

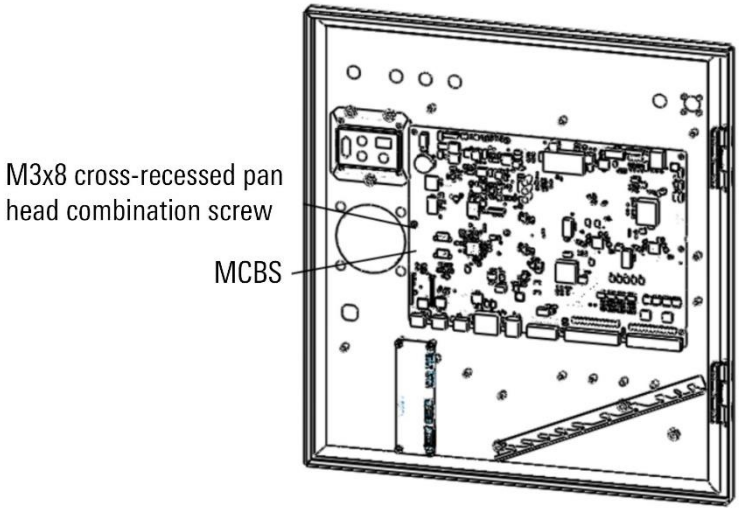
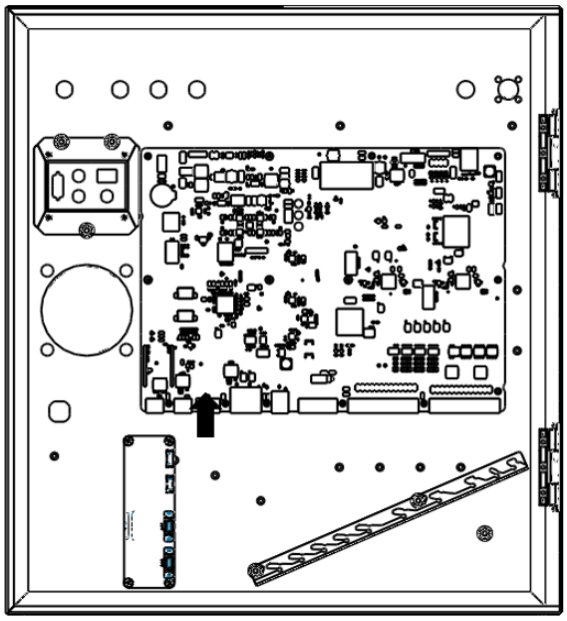
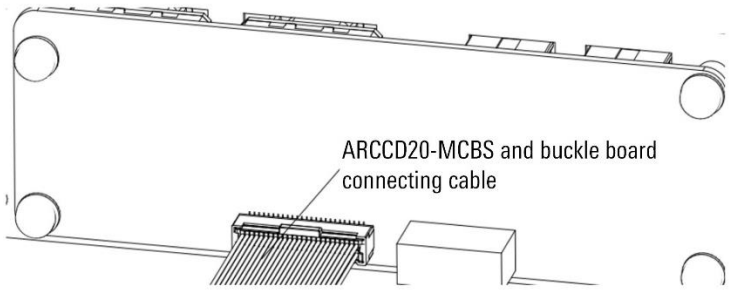


Figure 18-28 Front door MCBS diagram

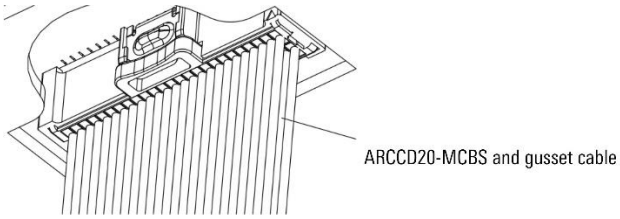
Step2. Connect one side of the ARC5-MCBS and gusset cable to the back position indicated by the arrow, and the other side to the connector corresponding to J4 of the MCBS-IEB.



(a)



(b)



(c)

Figure 18-29 Installation of ARC5-MCBS and gusset cable

Step3. Use the cross recessed pan head combination screws M3x8 to install the MCBS-IEB on the front door, and use the previously removed cross recessed pan head combination screws M3x8 to re-fix the MCBS on the front door, refer to Figure 18-30. When installing, pay attention to the wiring of the ARC5-MCBS and gusset cable connected in the previous step, and do not press the wiring harness when the circuit board is fixed.

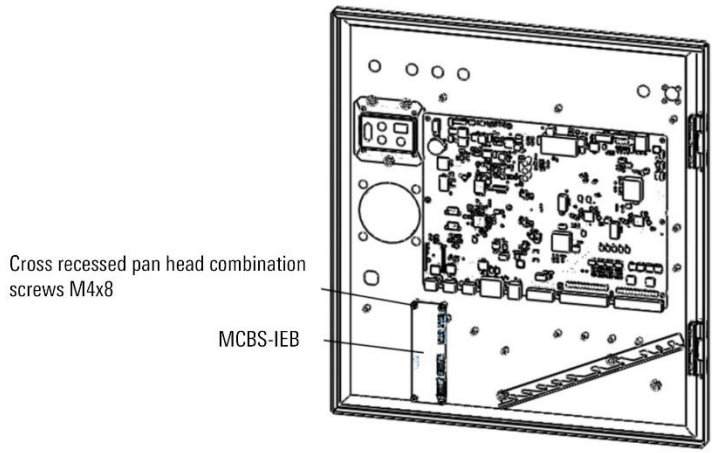


Figure 18-30 MCBS-IEB installation diagram

Step4. Connect the outside lines of the cabinet according to the functions used, refer to Figure 18-31:

a) Use PWM output and analog output signals: Use PWM and analog output_voltage and current input harness-5 meters connected to J5;

b) Use voltage input and current input signal: PWM and analog output _ voltage and current input harness - 5 meters connected to J3;

c) Use encoder signal: connect to J7 with magnetic ruler and CAN_ encoder shared wire harness;

d) Using magnetic scale and CAN signal: Use magnetic ruler and CAN_encoder to share the wiring harness connected to J6.

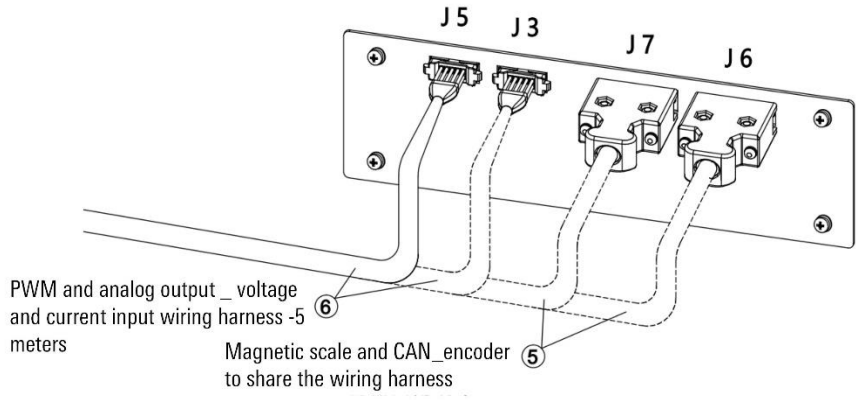


Figure 18-31 MCBS-IEB front view

Notice

The voltage input and current input interfaces have voltage and current range limits. Exceeding the limits may cause device damage. Please strictly follow the range in Table 18-17.

Table 18-17 Analog output of J3_Voltage and current range limits

Connector	Pin	Function	Parameter	Value	Unit
J3	1	Voltage input 1	Voltage	-10~+10	V
	2	Voltage input 2	Voltage	-10~+10	V
	5	Voltage input 3	Voltage	-10~+10	V
	6	Current input 1	current	0~+20	mA
	9	Current input 2	current	0~+20	mA
	10	Current input 3	current	0~+20	mA

Table 18-18 J5' s PWM and analog output_voltage and current range limits

Connector	Pin	Function	Parameter	Value	Unit	Remark
J5	1	Voltage output 1	Voltage	-10~+10	V	Analog voltage and current output multiplexed pins Voltage output load resistance minimum value 1Kohm
	2	Voltage output 2	Voltage	-10~+10	V	
	3	Voltage output 3	Voltage	-10~+10	V	
	1	Current output 1	current	0~+20	mA	Analog voltage and current output
	2	Current	current	0~+20	mA	

Connector	Pin	Function	Parameter	Value	Unit	Remark
		output 2				multiplexed pins Maximum current output load resistance 600ohm
	3	Current output 3	current	0~+20	mA	
	7	PWM output 1	Voltage	0~+24	V	Adjustable duty cycle, minimum load resistance 1Kohm
	8	PWM output 2	Voltage	0~+24	V	
	9	PWM output 3	Voltage	0~+24	V	
	10	PWM output 4	Voltage	0~+24	V	

J6 is the CAN_magnetic scale shared interface. The magnetic scale has an input level of 24V. For the input circuit diagram, please refer to Figure 18-32.

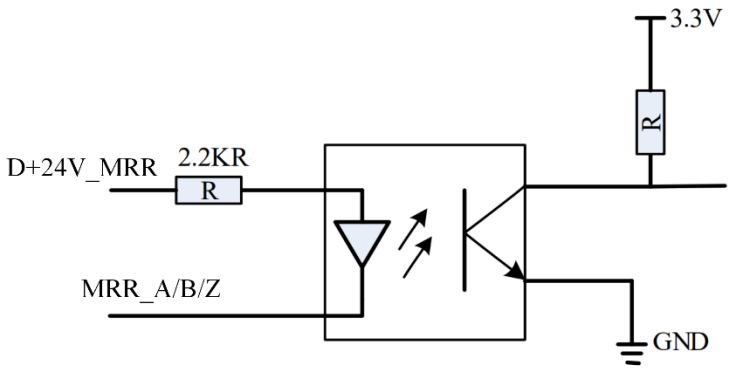


Figure 18-32 Magnetic scale input circuit diagram

Step5. Turn on the control cabinet and click [System/System Configuration/PLC Slave Configuration] on the teach pendant main interface to enter the [PLC Slave Configuration] interface. As shown in Figure 18-33.

Figure 18-33 [PLC slave configuration] interface

Step6. Select the serial number to be configured, click < Configuration >, and enter the [Configuration PLC Slave] interface. As shown in Figure 18-34.

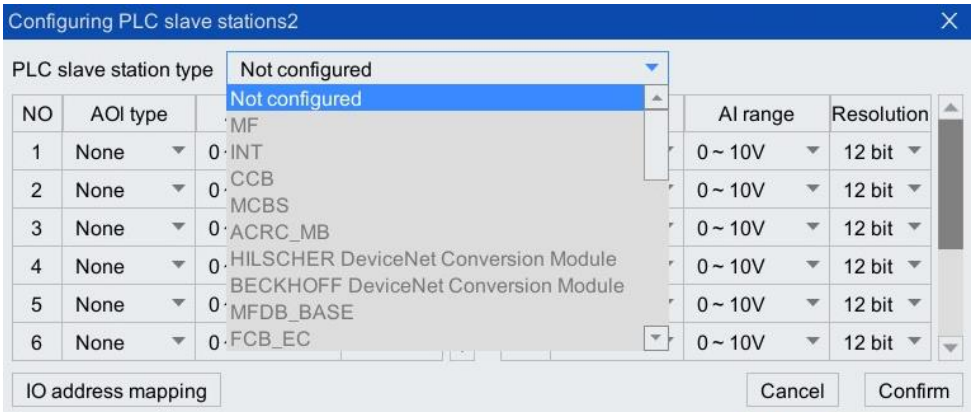


Figure 18-34 [Configure PLC slave station] interface

Step7. Select "IEB" or "IEB_BASE" in [PLC Slave Type], and configure the type and range of AO and AI signals as shown in Figure 18-35.

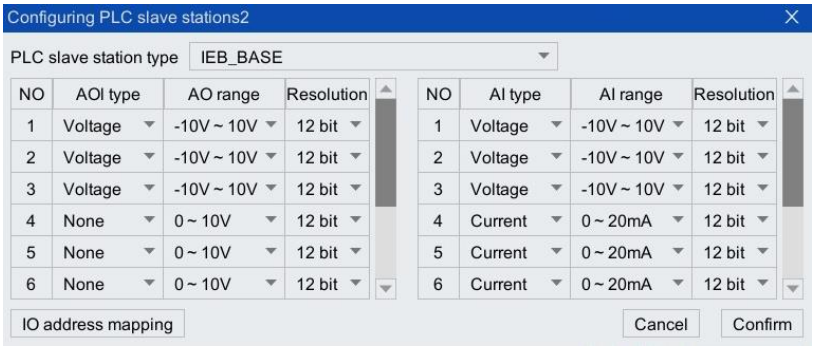


Figure 18-35 [Configuring PLC slave] interface parameter configuration example

18.4 ARC4 series control cabinet multi-function communication module (optional) installation

Module configuration instructions

For configuration instructions of the multi-function communication module of the ARC4 series control cabinet, see Table 18-19.

Table 18-19 Main configuration table of ARC4 series control cabinet multi-function communication module

Serial number	Name	Specification	Control cabinet	Part No	Construct quantity	Remark
1	M12 connector sheet metal	Square sheet metal baffle	ARC4	P01035000614	1	Optional
2	MCB-IEB mounting plate	For installing MCB-IEB	ARC4	P01035000616	1	
3	MCB-IEB	MCB-IEB_P1.2 and	ARC4	P05245000088	1	

Serial number	Name	Specification	Control cabinet	Part No	Construct quantity	Remark
		above				
4	Single head hexagonal stud	M4X20	ARC4	P02110000027	6	
5	Cross recessed pan head combination screws	M4X8	ARC4	P02023000019	10	
6	ARCCD20-MCBS and gusset cable	inside the cabinet	ARC4	P04082000595	1	
7	CAN_magnetic scale shared wiring harness	Connect MCB-IEB_J6 and M12 connector cabinet inside	ARC4-50/75	P04082000780	1	Optional (choose one of three)
			ARC4-165	P04082000781		
8	Incremental encoder harness	Connect MCB-IEB_J7 and M12 connector cabinet inside	ARC4-50/75	P04082000778	1	
			ARC4-165	P04082000779		
9	Analog output harness	Connect MCB-IEB_J5 and M12 connector cabinet inside	ARC4-50/75	P04082000782	1	
			ARC4-165	P04082000783		
10	ARCCD10-shared wiring harness outside the gusset cabinet	Black twisted pair shielded wire, 5 meters long	ARC4	P04082000777	1	
11	Integrated spring terminal block	54mm*45mm*40mm	ARC4	P09050410004	1	Optional

For the diagram and description of the MCB-IEB interface, please refer to Figure 18-36 and Table 18-20 respectively.

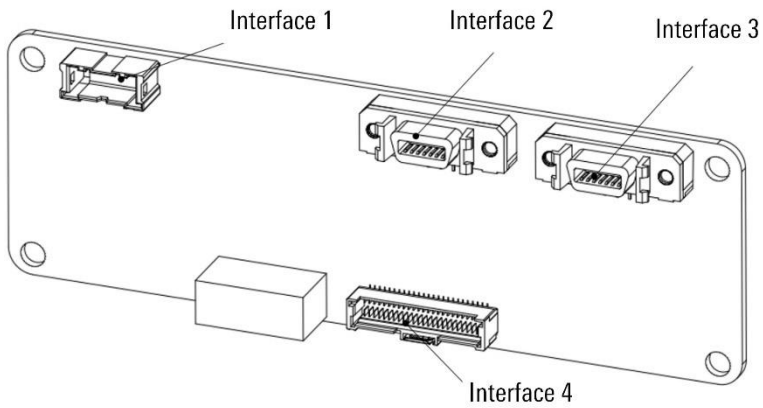


Figure 18-36 MCB-IEB interface diagram

Table 18-20 MCB-IEB interface description

Project	Illustrate	Remark
Interface 1	Analog output interface	J5

Project	Illustrate	Remark
Interface 2	Incremental encoder interface	J7
Interface 3	CAN_magnetic scale common interface	J6
Interface 4	Connection interface with MCB	J2

Connection steps

Step1. Use a Phillips screwdriver to remove the original reserved cable installation plate (reference Figure 18-37), and remove the M12 connector installation plate (reference Figure 18-38) installed on the cabinet.

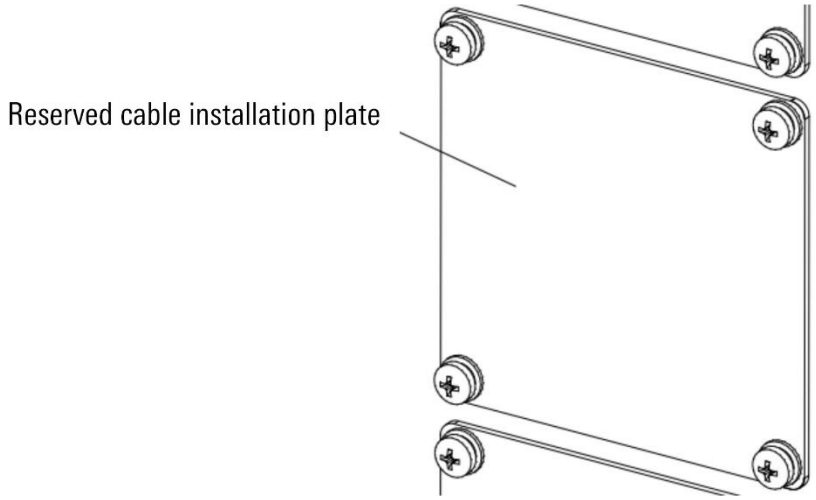


Figure 18-37 Reserved cable installation plate

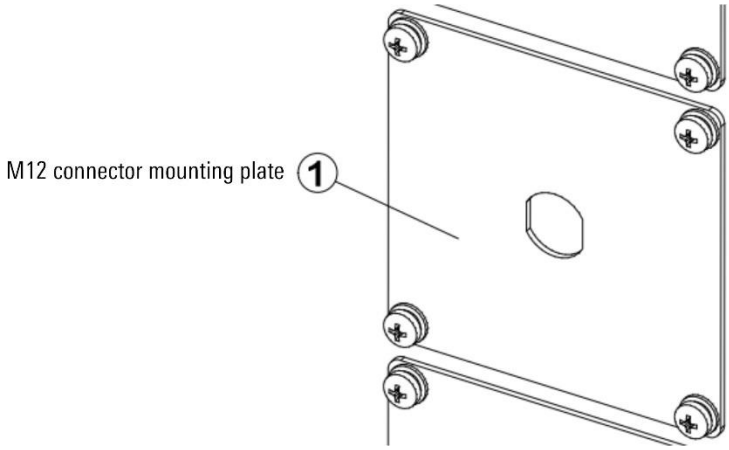


Figure 18-38 M12 connector mounting plate

Step2. Install the M12 female connector (reference Figure 18-39) on the M12 connector mounting plate.

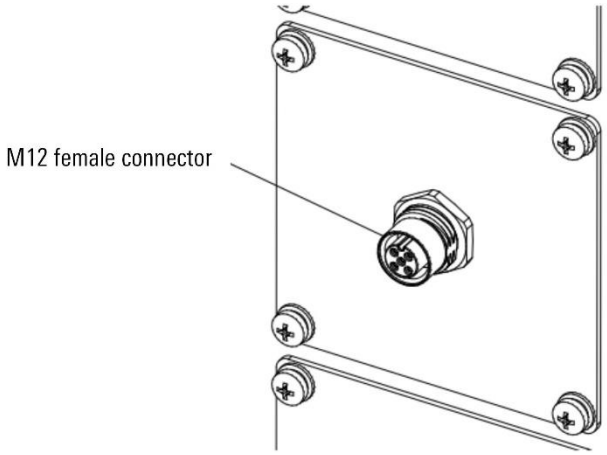


Figure 18-39 M12 female connector

Step3. Pass the MCB-IEB mounting plate through 5 M4×20 single-head hexagonal screws and 5 M4×8 cross recessed pan head combination screws are fixed on the MCB, and MCB-IEB is passed through 4 M4×8 cross recessed pan head combination screws fixed on MCB-IEB mounting plate, refer to Figure 18-40.

Step4. Connect the ARCCD20-MCBS and 50P connector plugs at both ends of the gusset cable to the 50P connector receptacle on the MCB and MCB-IEB respectively, refer to Figure 18-41.

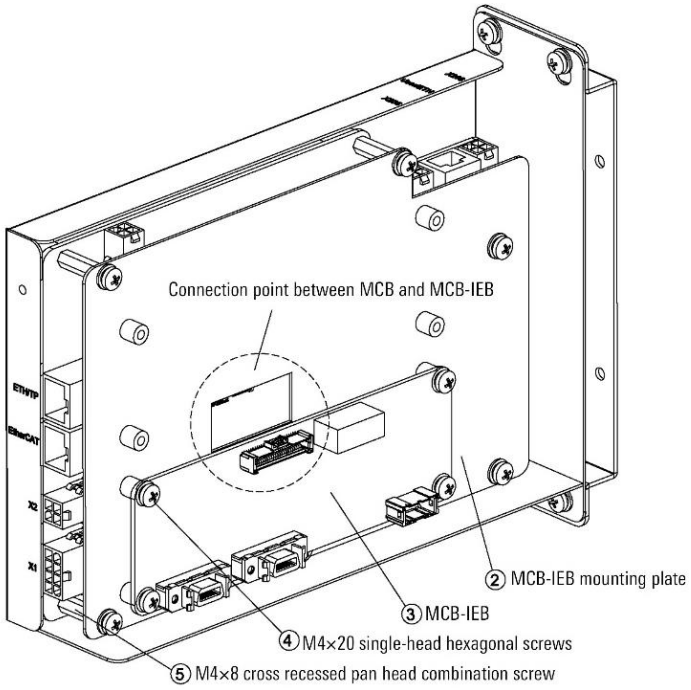


Figure 18-40 Install MCB-IEB

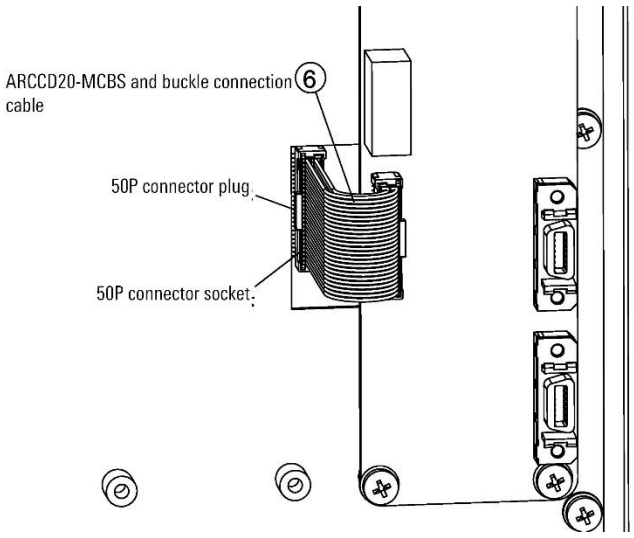


Figure 18-41 MCB and MCB-IEB connection

Step5. As shown in Figure 18-42, according to actual needs, the CAN_magnetic grating scale common wiring harness or incremental encoder wiring harness or analog output wiring harness which is connected to the corresponding interface on MCB-IEB CAN_magnetic grating scale common wiring harness connected to J6 interface, incremental encoder wiring harness connected to J7 interface, analog output wiring harness to J5 interface), install the M12 female connector at the other end on the M12 connector mounting board.

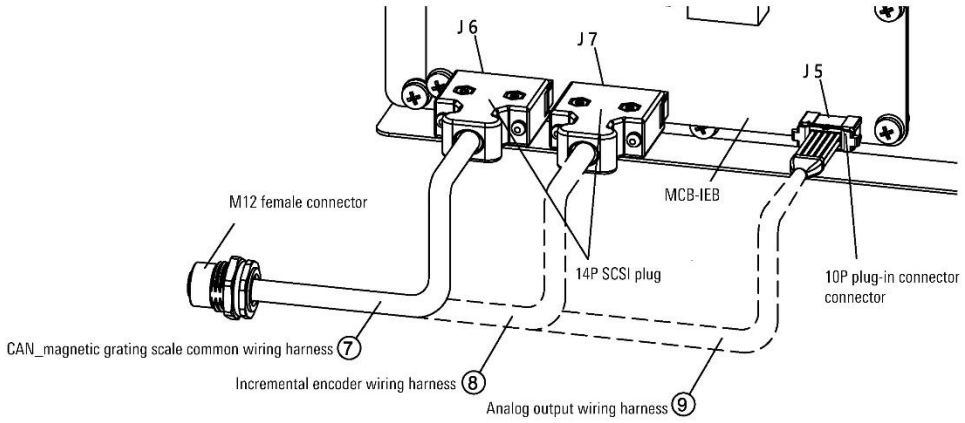


Figure 18-42 Multi-function communication module connection diagram

Step6. Connect one end of the ARCCD10-gusset cabinet external common wiring harness with an M12 straight plug to the M12 female connector of the cabinet according to the triangular positioning mark, and the other end to the integrated spring terminal block, refer to Figure 18-43.

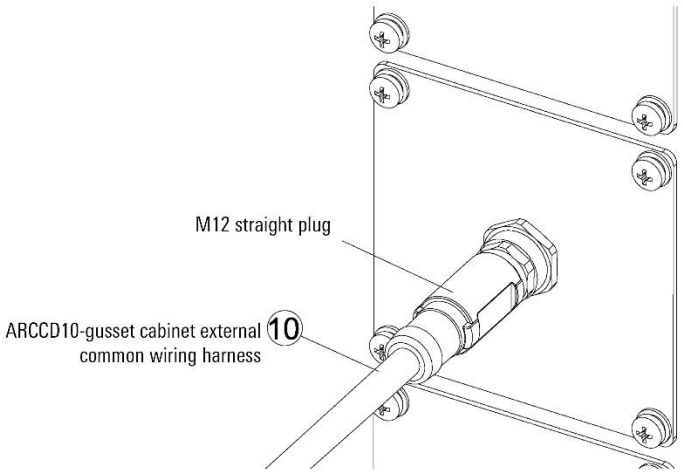


Figure 18-43 ARCCD10-gusset cabinet external common harness wiring

19 User I/O polarity conversion module

19.1 Overview

This option is a terminal block and polarity adapter plate for the "user IO interface" of the control cabinet 20/22/ARC5.

19.2 inCube20/22/ARC5 control cabinet user DO polarity conversion module installation

Configuration instructions

The user DO polarity conversion module is a terminal block and polarity transfer board used for the "user DO interface" of the inCube20/22/ARC5 control cabinet. This module realizes the "user DO interface" of the control cabinet to the terminal block through cables. The transfer also realizes the polarity conversion from NPN to PNP of the user DO signal.

For information about the part No of the inCube20/22/ARC5 control cabinet user IO polarity conversion module, see Table 19-1.

Table 19-1 inCube20/22/ARC5 control cabinet user IO polarity conversion module part No

Name	Part No
inCube20/22/ARC5_User DO polarity conversion module	PC5100000110

The default connection object of the user DO interface is "user IO terminal module", and the default polarity of its 26-way DO is NPN. When PNP polarity DO is required, the "user IO terminal module" can be replaced by the "user DO polarity conversion module" (one user DO polarity conversion module supports 16 channels of signals, and the polarity conversion needs to be matched according to the actual demand quantity number of modules), there is no need to change the connected cable between the control cabinet and the IO module, and there is no need to change the control cabinet software configuration.

The inCube20/22/ARC5 user DO polarity conversion module configuration description is detailed in Table 19-2.

Table 19-2 Main configuration table of user DO polarity conversion module

Serial number	Name	Specification	Part No	Construct dosage	Remark
1	Standard cabinet NPN to PNP module	NPN type for DO to PNP type, each module supports up to 16 channels 113mm*87mm*40mm	P03065000002	2	
2	inCube20-User DO terminal module cable	5m	P04082001305	1	

For the user DO polarity conversion module interface diagram and description, please refer to Figure 19-1 and Table 19-3 respectively.

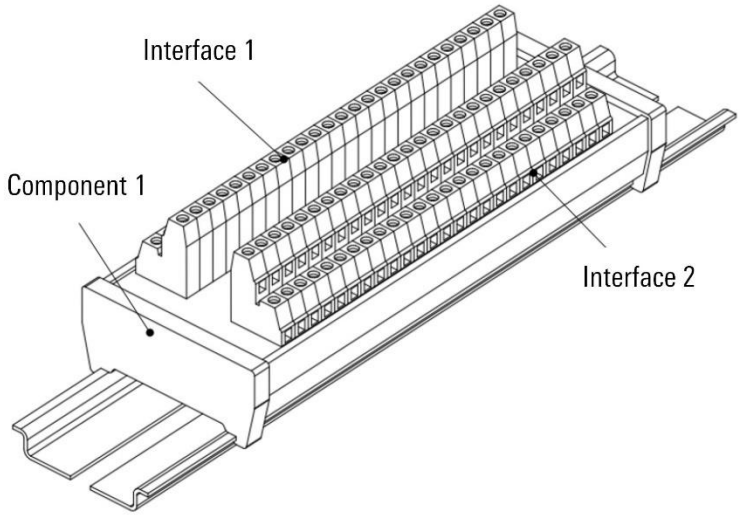


Figure 19-1 inCube20/22/ARC5 user DO polarity conversion module interface diagram

Table 19-3 inCube20/22/ARC5 user DO conversion module interface description

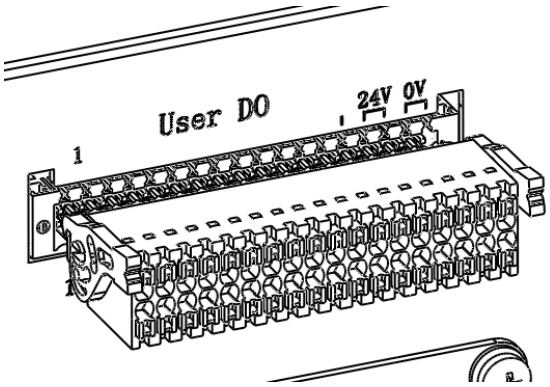
Project	Illustrate
Interface 1	Signal input interface
Interface 2	Signal output interface

Connection steps

Fix the polarity conversion module on the guide rail, and the guide rail is installed in the appropriate position according to the actual needs of the customer; connect the inCube20-user DO terminal module cable with a quick-plug terminal connector to the user DO interface of the cabinet (inCube20/22 control Cabinet user DO refers to Figure 19-2(a), ARC5 control cabinet user DO refers to Figure 19-2(b)), the loose wire terminal on the other side is connected to the standard cabinet NPN to PNP module interface 1, the customer uses a cable to connect to interface 2 (refer to Figure 19-2).

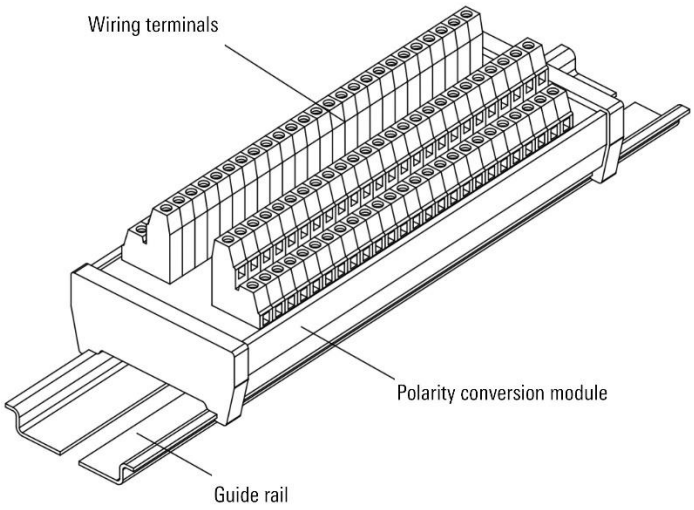
The external power supply 24V is connected to the input and output 24V of the user DO polarity conversion module respectively. The external power supply 0V is connected to the 0V of the user DO connector of the control cabinet and the 0V of the output end of the user DO polarity conversion module respectively, as shown in Figure 19-2(d).

The pins of the terminal block are freely defined by the customer, and the customer realizes the polarity conversion function through the wiring terminal block, refer to Figure 19-2(c).

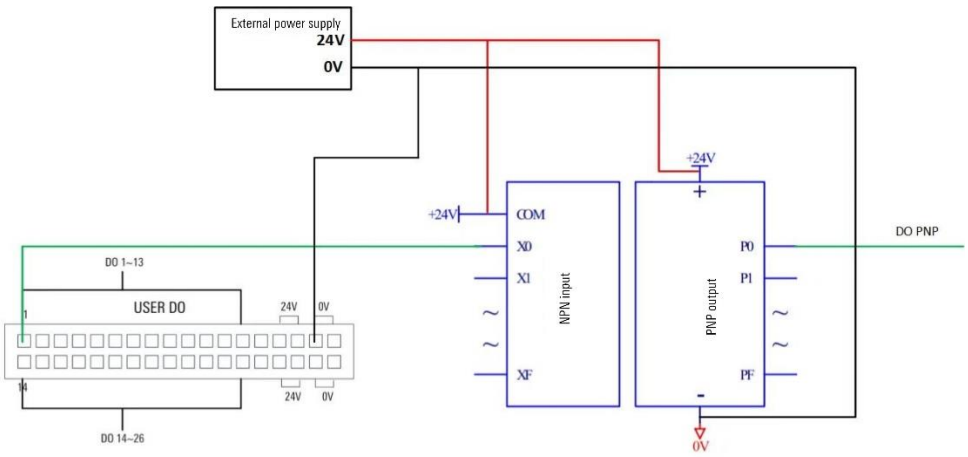


(a)

(b)



(c)



(d)

Figure 19-2 Polarity conversion module connection diagram

Tip

When the ARC5 control cabinet uses a polarity conversion module, the inCube20-user DO terminal module cable passes out of the control cabinet from the cable core on the right side of the control cabinet. The specifications of the cable core must be selected according to the wire diameter.

20 PNP/NPN polarity conversion module

20.1 Overview

This option is DI/DO polarity conversion of MF for ARC4 series and inCube series control cabinets.

20.2 Configuration instructions

For details on the configuration of the PNP/NPN polarity conversion module, see Table 20-1.

Table 20-1 Main configuration table of PNP/NPN polarity conversion module

Serial number	Name	Specification	Part No	Construct dosage	Remark
1	NPN and PNP mutual conversion module	NPN/PNP type conversion for IO, each module supports up to 8 channels 87mm*87mm*45mm	P03065000001	2	Choose one from three
2	NPN to PNP module	NPN type for DI/DO to PNP type, each module supports up to 16 channels 113mm*87mm*40mm	P03065000002		
3	PNP to NPN module	PNP type for DO to NPN type, each module supports up to 16 channels 113mm*87mm*40mm	P03065000003		

For the diagram and description of the PNP/NPN polarity conversion module interface, please refer to Figure 1-1 and Table 20-2 respectively.

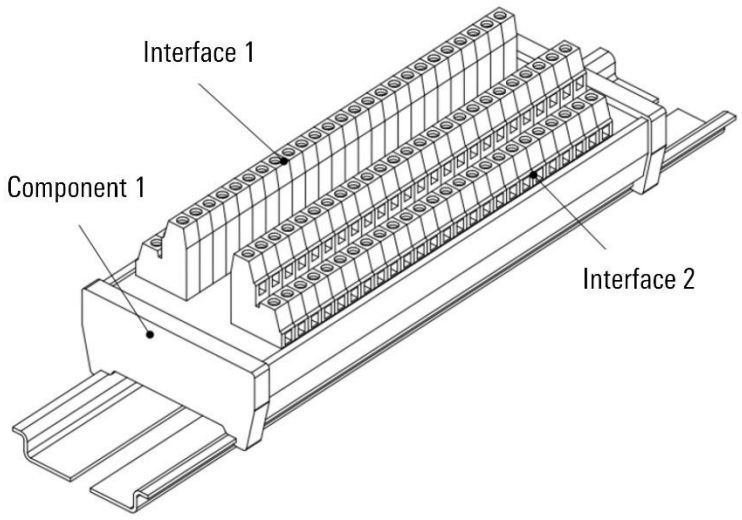


Figure 20-1 PNP/NPN polarity conversion module interface diagram

Table 20-2 PNP/NPN conversion module interface description

Project	Illustrate
Interface 1	Signal input interface
Interface 2	Signal output interface

20.3 Installation steps

Fix the polarity conversion module on the guide rail. The guide rail is installed in the appropriate position according to the actual needs of the customer. The customer realizes the polarity conversion function through the terminal block. Refer to Figure 20-2.

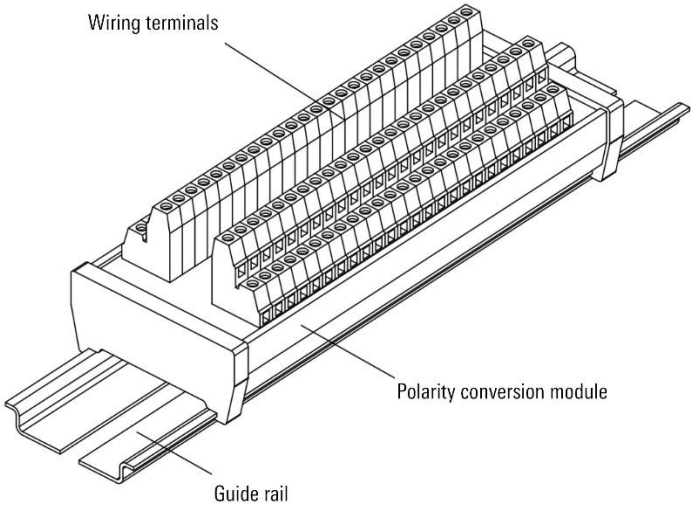


Figure 20-2 Diagram of polarity conversion module

20.4 Connect the control cabinet

inCube20/22 control cabinet provides users with 26 DO interfaces, and the DO polarity is NPN. When DO is connected to an external load, in order to avoid damage to the interface when it is turned off, "24V" needs to be connected to the external power supply. If you need to connect external PNP polarity sensors or switches, you need to use the corresponding polarity switching equipment. Figure 20-3 shows the connection method between the PNP/NPN polarity conversion module and the user DO interface of the control cabinet.

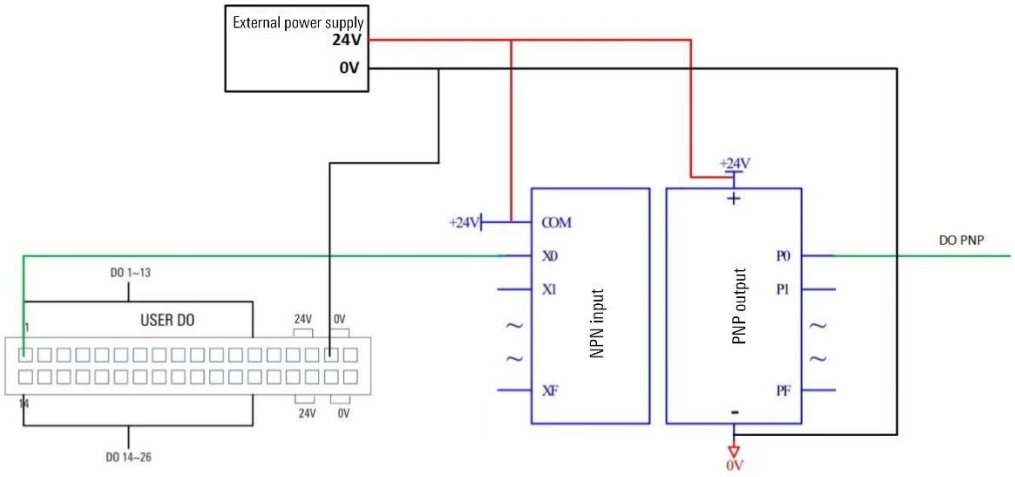


Figure 20-3 Diagram of the connection between the polarity conversion module and the control cabinet

21 19-inch cabinet fixing device

21.1 Overview

This option is used to fix the inCube series control cabinet in a 19-inch cabinet, and a cabinet pallet needs to be placed at the bottom to bear the load.

Tip

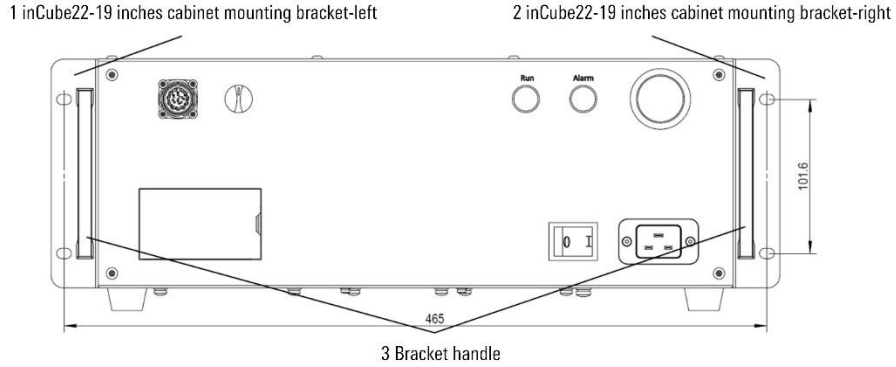
- The cabinet pallet needs to be prepared by the customer.
- The depth of the cabinet should be greater than 600mm, and there should be ventilation holes on the left and right sides.

21.2 19-inch cabinet mounting bracket for inCube20/22 control cabinet

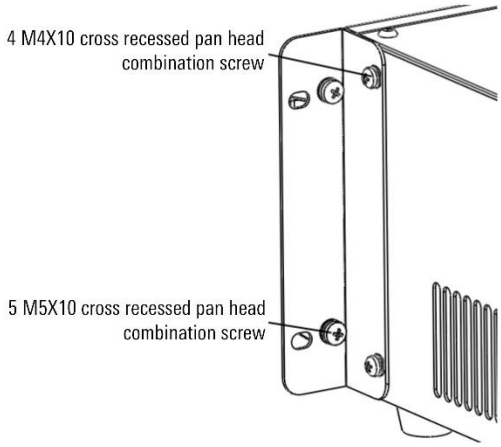
For a diagram of the inCube20/22 control cabinet fixed on a 19-inch cabinet, refer to Figure 21-1. For configuration instructions, see Table 21-1.

Table 21-1 inCube20 /22 control cabinet fixed in 19-inch cabinet configuration instructions

Serial number	Name	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	inCube22-19 inches cabinet mounting bracket-left	inCube20 /22	P01035000764	1	Optional
2	inCube22-19 inches cabinet mounting bracket-right		P01035000765	1	Optional
3	Bracket handle		P01055000251	2	Optional
4	M5X10 cross recessed pan head combination screw		P02023000025	4	Optional
5	M4X10 cross recessed pan head combination screw		P02023000020	4	Optional



(a)



(b)

Figure 21-1 inCube20/22 series control cabinet 19-inch cabinet installation bracket diagram cabinet stacking fixture

22 Cabinet stacking fixtures

22.1 Overview

This option is used for stacking control cabinets.

22.2 Installation of cabinet stacked connectors for inCube2S control cabinet

The inCube2S control cabinet stacking effect refers to Figure 22-1. For configuration instructions, please refer to Table 22-1.

Table 22-1 Main configuration table of cabinet stacking connectors of inCube2S control cabinet

Serial number	Name	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	Cabinet stacking connector	inCube2S	P01035000521	4	Optional
2	M4X10 cross recessed pan head combination screw		P02023000020	8	Optional

Tip

Each stacked layer requires 4 cabinet stacked connectors and 8 M4X10 cross slot pan head combination screws.

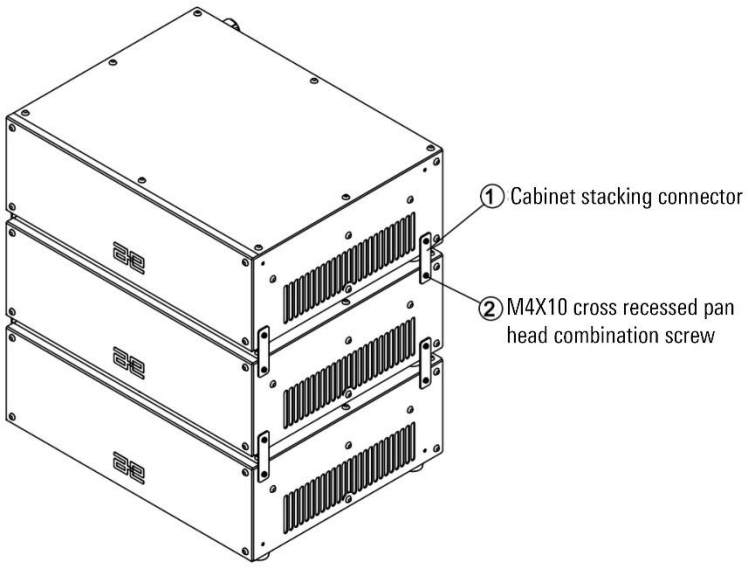


Figure 22-1 inCube2S control cabinet stacking effect

22.3 Installation of cabinet stacked connectors for inCube20/22 control cabinets

For the stacking effect of inCube20/22 control cabinets, refer to Figure 22-2. For configuration instructions, please refer to Table 22-2.

Table 22-2 Main configuration table of cabinet stacking connectors of inCube20/22 control cabinet

Serial number	Name	Adaptation control cabinet	Part No	Construct dosage	Standard/optional
1	Cabinet stacking connector	inCube20/22	P01035000521	4	Optional
2	M4X10 cross recessed pan head combination screw		P02023000020	8	Optional

Tip

The cabinet stacking connectors are installed on both sides of the cabinet for stacking the cabinet. Each stacking layer requires 4 cabinet stacking connectors and 8 M4X10 cross slot pan head combination screws.

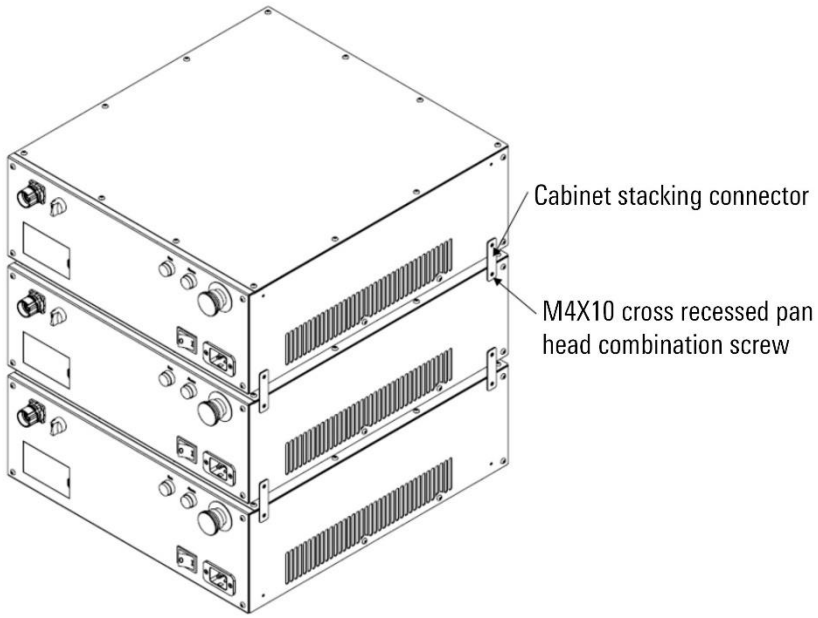


Figure 22-2 inCube20/22 control cabinet stacking effect

23 Teach pendent fixing device

23.1 Overview

This optional accessory is used to place teach pendant on the inCube series control cabinet (ARC4 series standard cabinet teach pendant can be hung on the bracket of the cabinet door). Customers can fix it on the safety fence and other positions according to actual needs.

For the diagram of the teach pendant fixation device, refer to Figure 23-1. For configuration instructions, please refer to Table 23-1.

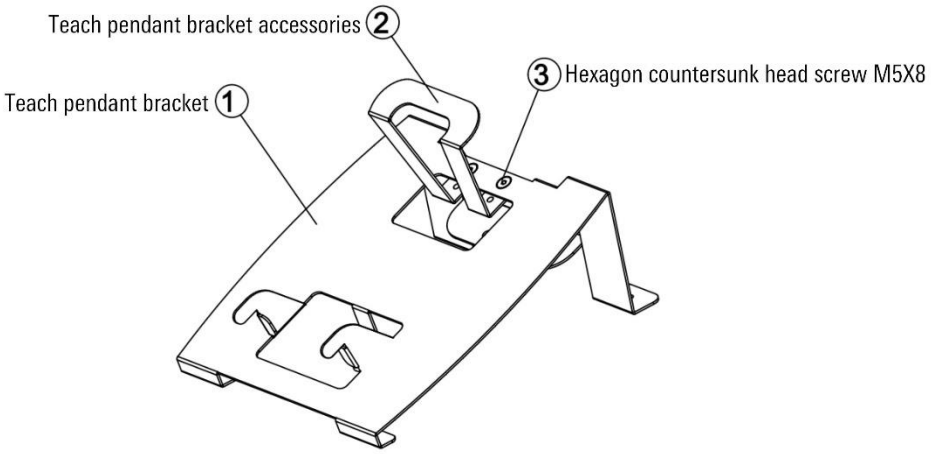


Figure 23-1 Diagram of the teach pendant fixture

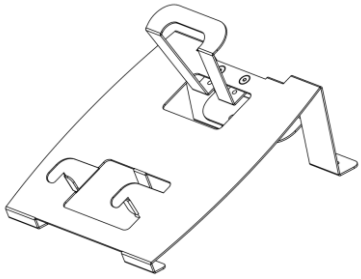
Table 23-1 Main configuration table of teach pendant fixture

Serial number	Name	Adaptation control cabinet	Part No	Remark
1	Teach pendant bracket	inCube20/22	P01035000263	Optional
2	Teach pendant bracket accessories		P01035000383	Optional
3	Hexagon countersunk head screw M5X8		P02021100078	Optional

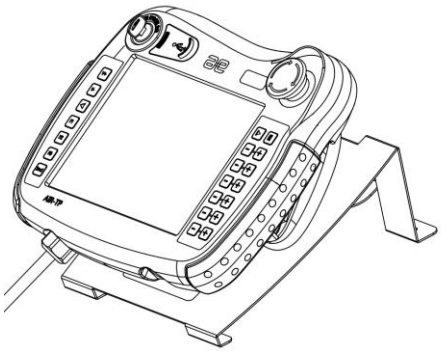
23.2 Installation instructions

The teach pendant stand has two usage modes: horizontal and vertical.

- For the relative position and effect of installing parts horizontally, please refer to Figure 23-2, (a) is the state without placing the teach pendant, (b) is the state after placing the teach pendant.
- For the relative position and effect of vertically placed parts installation, please refer to Figure 23-3, (a) is the state without placing the teach pendant, (b) is the state after placing the teach pendant and hanging it on the safety fence.

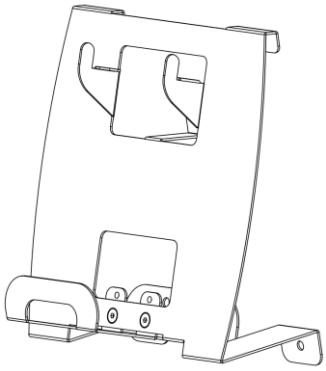


(a) The state where teach pendant is not placed

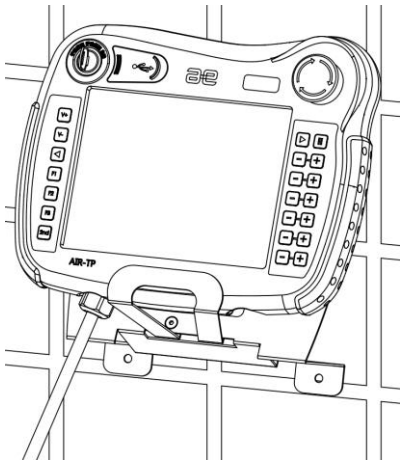


(b) The state after placing teach pendant

Figure 23-2 The rendering of the teach pendant placed horizontally



(a) The state where teach pendant is not placed



(b) The state after placing teach pendant

Figure 23-3 Rendering of teach pendant placed vertically

24 Leakage protector

This optional accessory is installed in the customer's distribution box to avoid frequent tripping problems caused by ordinary leakage protection. For specifications, see Table 24-1.

Table 24-1 Leakage protector specifications

Name	Part No	Specification	Adaptation control cabinet	Remark
Leakage protector	P04090000033	Chint NB1L-40-C16	inCube series control cabinet	Optional

25 Software feature package

Tip

For detailed usage of each software function package, please refer to our company's "XX Function Package Instructions".

25.1 Conveyor belt online tracking function

For the material names and numbers related to the conveyor belt online tracking function, please refer to Table 25-1.

Table 25-1 Name and number of materials related to conveyor belt online tracking function

Material name	Part No
inCube1x/2x/ARC5_conveyor tracking module (driver + absolute encoder)	PC6230780000

Encoder installation dimensions

When the "driver + encoder" method is selected for the conveyor belt, the installation dimensions of the encoder and bracket are as shown in Figure 25-1 and Figure 25-2.

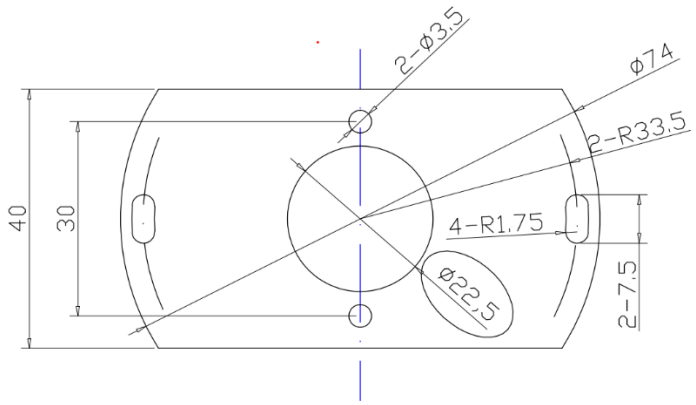
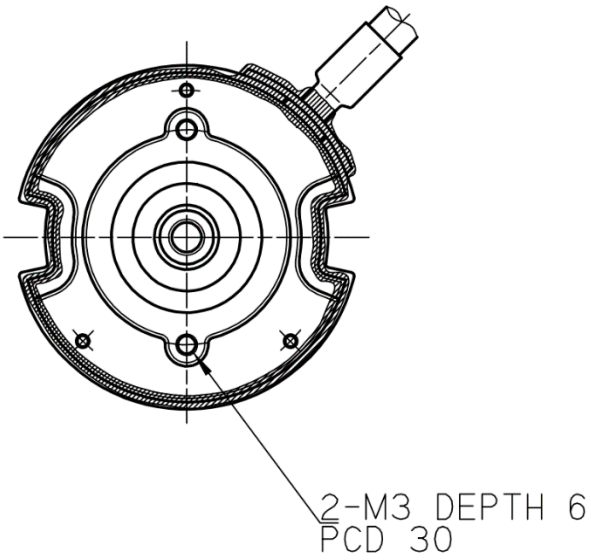
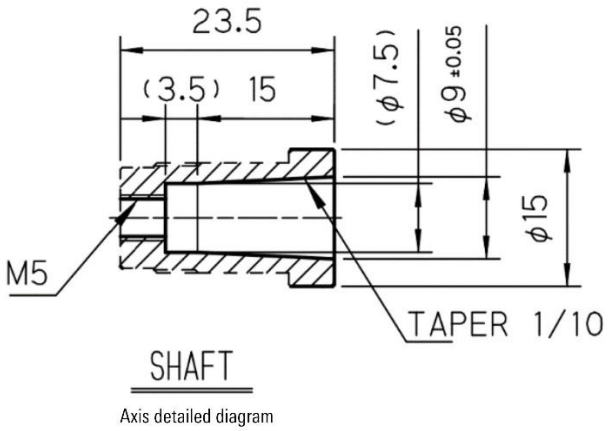


Figure 25-1 Dimensional drawing of mounting bracket

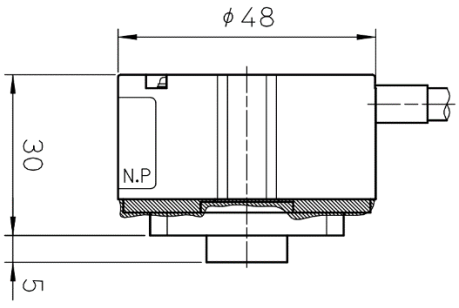


(a) Bottom view of encoder

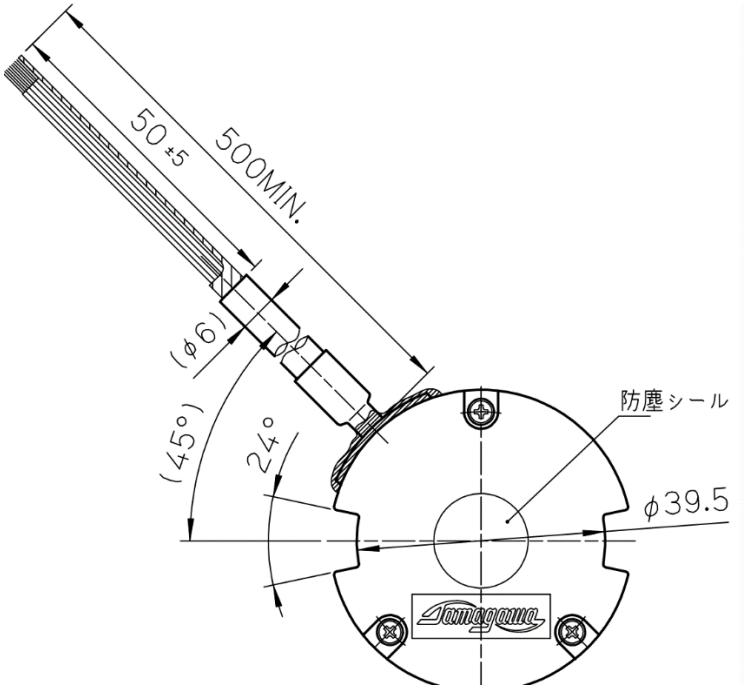


Axis detailed diagram

(b) Encoder external connected hole plan view



(c) Encoder side view



(d) Encoder top view

Figure 25-2 Encoder installation dimension diagram

Driver installation dimensions

When the "driver + encoder" method is selected for the conveyor belt, the overall dimensions of the servo driver are as shown in Figure 25-3.

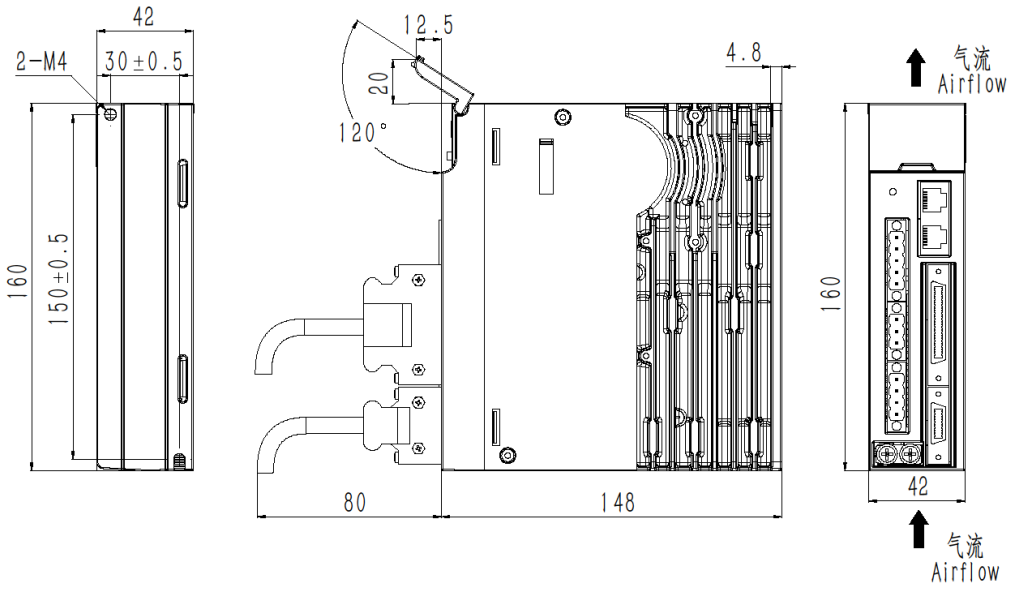


Figure 25-3 Appearance of AE5110-R90A1B, AE5110-2R8A1B

25.2 Bending function package

For the material names and numbers related to the bending function package, please refer to Table 25-2.

Table 25-2 Bending function package related material name and part No

Material name	Part No
ARC4-50/75/165_Bending machine communication module	PC5100000042
inCube2x_down-moving bending communication module	PC5100000041
ARC4 double-speed finger-up bending bag	PC5100000078
ARC4 four-speed finger up dynamic bending bag	PC5100000079

25.3 Analog communication function package

For the material names and numbers related to the analog communication function package, please refer to Table 25-3.

Table 25-3 Analog communication function package related material name and part No

Material name	Part No
inCube20/21_Analog communication module	PC5100000058
inCube2S_Analog communication module	PC5100000082
ARC5_Analog communication module	PC5100000106

25.4 CANopen communication function package

For the material names and numbers related to the CANopen communication function package, please refer to Table 25-4.

Table 25-4 CANopen communication function package related material name and part No

Material name	Part No
inCube20/21_Welding machine communication module (CANopen)	PC5100000059
ARC5_Welding machine communication module (CANopen)	PC5100000107

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WeChat Official Account

Official Website

Sevice Hotline : 400-990-0909
Official Website : http://robot.peitian.com

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