HITBOT

Product Brochure

The most affordable or nothing.

Main category: Industrial robot arm /Collaborative robot arm /
Electric gripper/Intelligent actuator/Automation solutions

Huiling-tech Robotic Co.,Ltd.

Z-Arm 2442/Z-Arm XX42

High precision
Repeatability
±0.03mm

Large Payload
3kg

Large Arm Span
J1 axis 220mm
J2 axis 200mm

Competitive Price
Industrial-level quality
Comsumptive price

Model Definition

Z-Arm T2442C0-A0T1M1-G1-FXXX-01

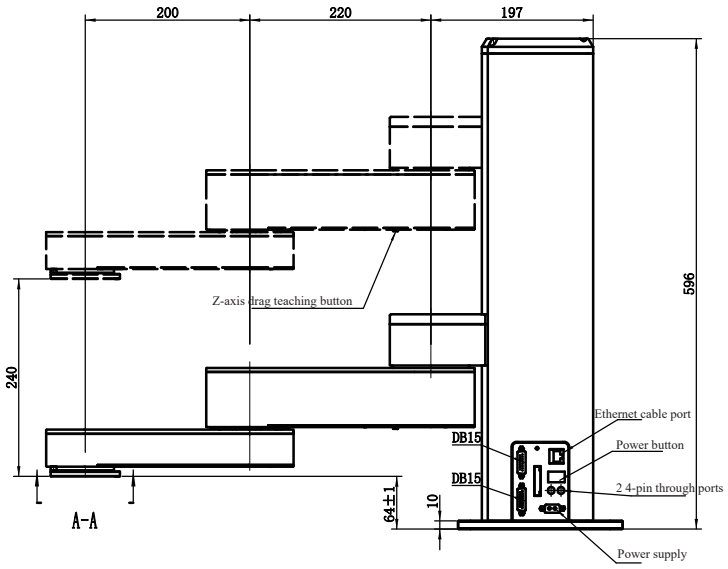
T	24	42	C	0	A0	T1
Blank: Four axis F: Five axis T: Three axis	If z-axis stroke is 240,here is 24	If robot arm span is 420, here is 42	Collaborative Non-collaborative N	0 is silver color 1 is black color	A0 means two straight-through cables A2 means two vacuum tubes	T1: the standard configuration of the I/O version, which can be adapted to Z-EFG-8S/Z-EFG-12/Z-EFG-20/ Z-EFG-30 T2: the I/O version has 485, which can be connected to Z-EFG-100/ Z-EFG-50 users and others who need 485 communication

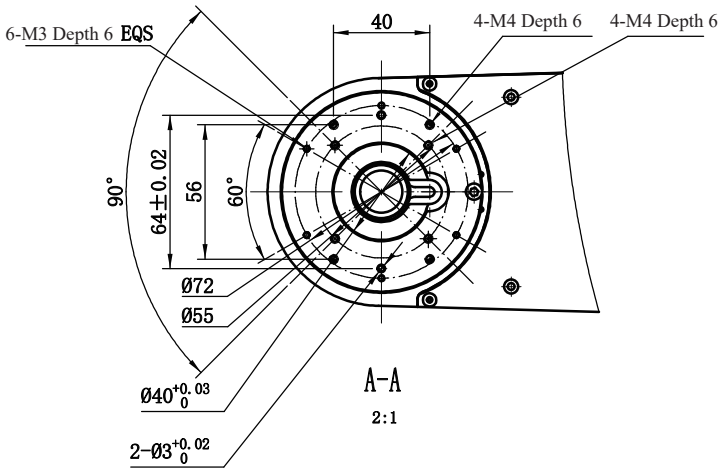
M1	G1	FXXX-01
M1: Second arm motion range ±164 deg (rotate outwards) M2: Second arm motion range 15deg - 345deg （rotate inwards）	Blank: no need to install electric grippers; G1: Required to install the electric gripper, which is installed horizontally to realize the hollow wiring; G2: Required to install the electric gripper, which is installed vertically to realize the hollow wiring.	F: Non-standard customized option, if it is a standard product, it is blank XXX: XXX: Customer label number 01: version number

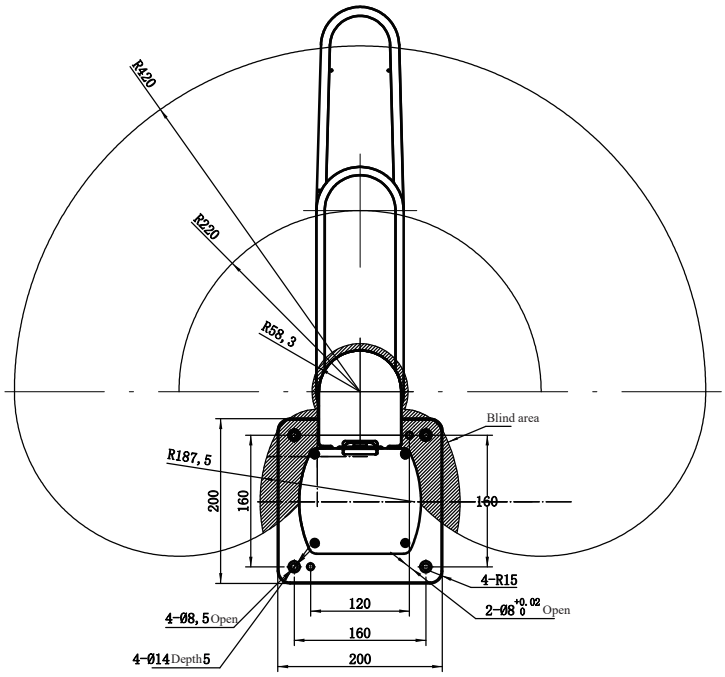
Specification Parameter

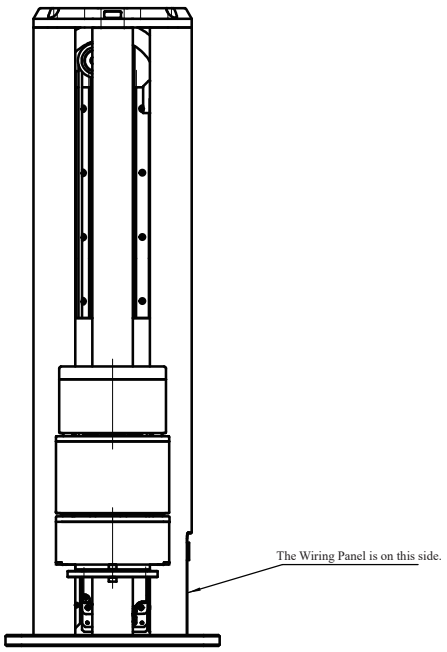
Z-Arm XX42 Collaborative Robot arm	Parameters
1 axis arm length	220mm
1 axis rotation angle	±90°
2 axis arm length	200mm
2 axis rotation angle	±164°
Z axis stroke	Height can be customized
R axis rotation range	±1080°
Linear speed	1255.45mm/s（payload 1.5kg） 1023.79mm/s（payload 2kg）
Repeatability	±0.03mm
Standard payload	2kg
Maximum payload	3kg
Degree of freedom	4
Power supply	220V/110V50-60HZ adapt to 24VDC peak power 500W
Communication	Ethernet
Expandability	Built-in integrated motion controller provides 24 I/O + under-arm expansion
Z-axis can be customized in height	0.1m-1m
Z-axis dragging teaching	/
Electrical interface reserved	Standard configuration: 24*23awg (unshielded) wires from the socket panel through the lower arm cover Optional: 2 φ4 vacuum tubes through the socket panel and flange
Compatible HITBOT electric grippers	T1：the standard configuration of the I/O version, which can be adapted to Z-EFG-8S/Z-EFG-12/Z-EFG-20/ Z-EFG-30 T2：the I/O version has 485, which can be connected to Z-EFG-100/ Z-EFG-50 users and others need 485 communication
Breathing light	/
Second arm range of motion	Standard：±164°　Optional：15-345deg
Optional accessories	/
Use environment	Ambient temperature: 0-55°C Humidity: RH85 (no frost)
I/O port digital input (isolated)	9+3+forearm extension (optional)
I/O port digital output (isolated)	9+3+forearm extension (optional)
I/O port analog input (4-20mA)	/
I/O port analog output (4-20mA)	/
Robot arm height	596mm
Robot arm weight	240mm stroke net weight 19kg
Base size	200mm*200mm*10mm
Distance between base fixing holes	160mm*160mm with four M8*20 screws
Collision detection	√
Drag teaching	√

Motion Range M1 Version (Rotate Outwards)

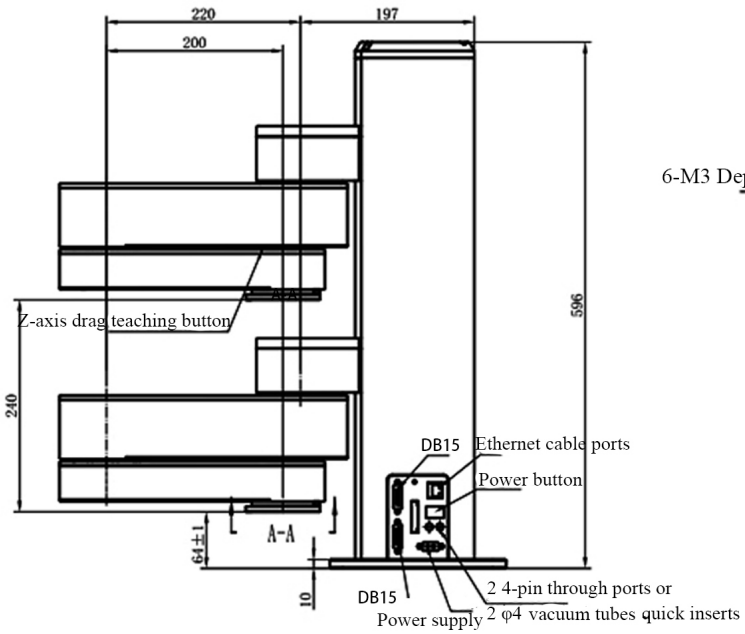


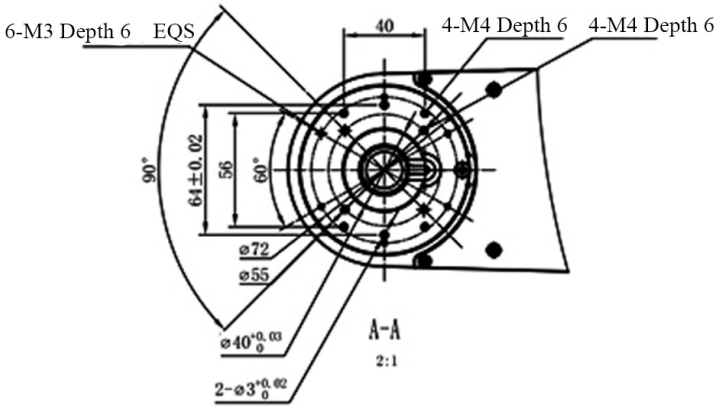


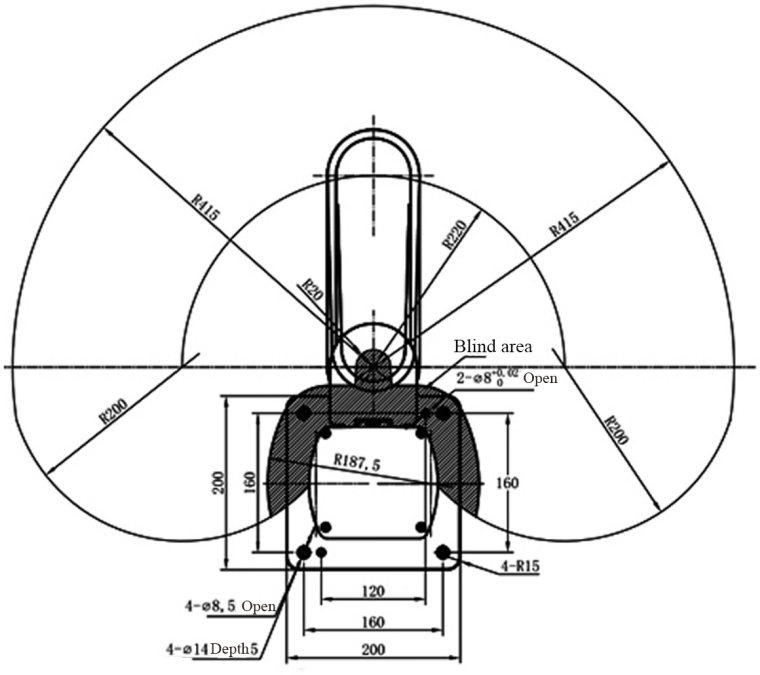


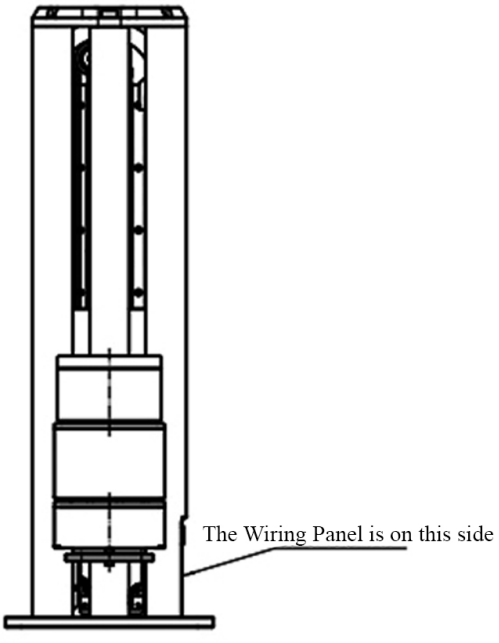


Motion Range M2 Version (Rotate Outwards)

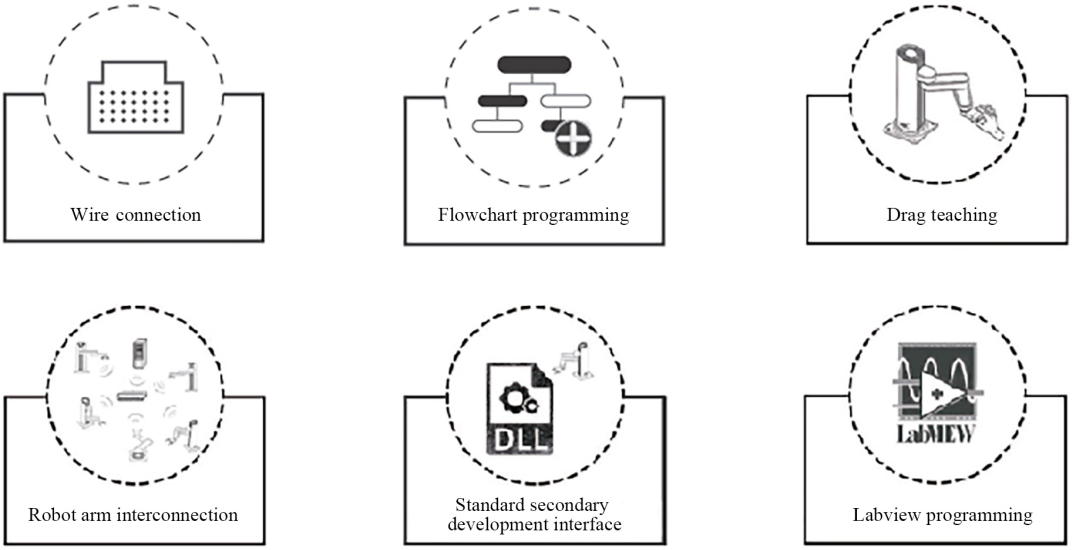








Instructions



Interface Introduction

The Z-Arm 2442 robot arm interface is installed in 2 locations, the side of the robot arm base (defined as A) and the back of the end arm.The interface panel at A has a power switch interface (J1), 24V power supply interface DB2 (J2), output to user I/O port DB15 (J3), user input I/O port DB15 (J4) and IP address configuration buttons (K5). Ethernet port (J6), system input/output port (J7), and two 4-core straight-through wires sockets J8A and J9A.

Interface Diagram and Instructions for Use

1. General schematic diagram of the base interface at A (shown in Figure 1)

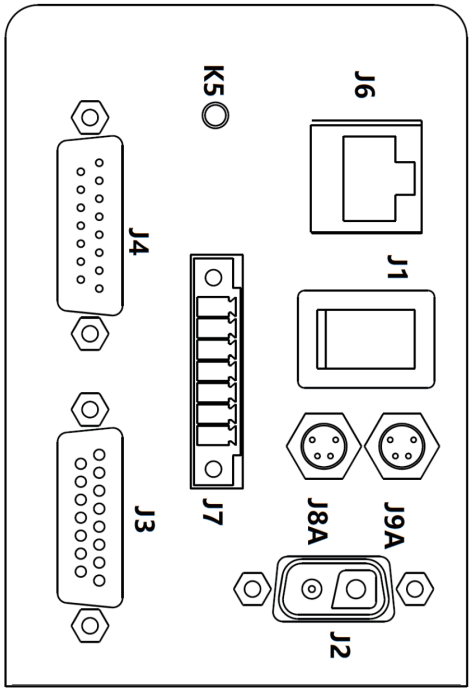


Figure 1

2. Figure 1 interface definition description

(1) J1 is the power switch interface, which is used to control the power on and off;
(2) J2 is the power input port, 24V DC voltage source input;
(3) J3 is the I/O output port, with 9 groups of internal optocoupler isolated NPN outputs;
(4) J4 is the user I/O input port, with 9 sets of internal optocoupler isolated inputs;
(5) K5 robot arm IP address configuration button, press and hold the button to power on, the robot arm enters the IP address configuration state;
(6) J6 is the ethernet port, used for computer communication;
(7) J7 is the I/O input expansion port, with 3 imput and 3 output;
(8) J8A is a 4-core straight through wire aviation plug to the end of J8B;
(9) J9A is a 4-core straight through wire aviation plug to the end of J9B.

3. The internal circuit design of the J3 and J4 interfaces in Figure 1

(1) J3 interface DB15 male pin definition (shown in Figure 2)

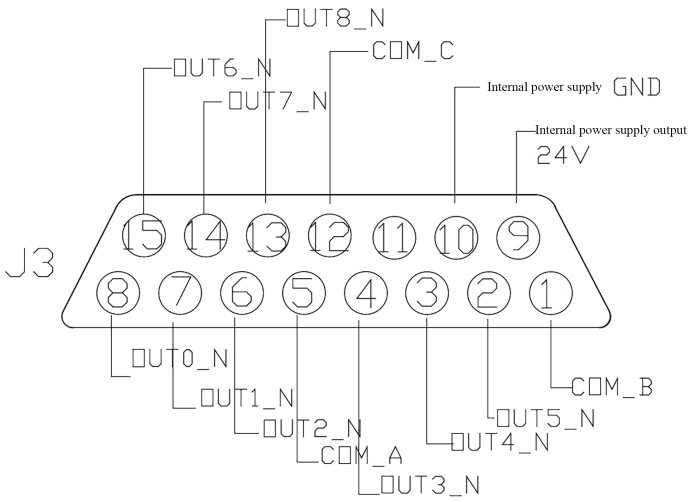


Figure 2

(2) J3 I/O output port internal simplified circuit design (shown in Figure 3)
There are 9 output ports for I/O output, OUT0_N OUT1_N OUT2_N share COM_A, OUT3_N OUT4_N OUT5_N share COM_B, OUT6_N OUT7_N OUT8_N share COM_C, built-in ordinary optocoupler isolator, open-collector output, the user needs to connect pull-up or pull-down resistor according to the power supply requirements when applying. For example, 24V power supply pull up 4.7K resistance application.

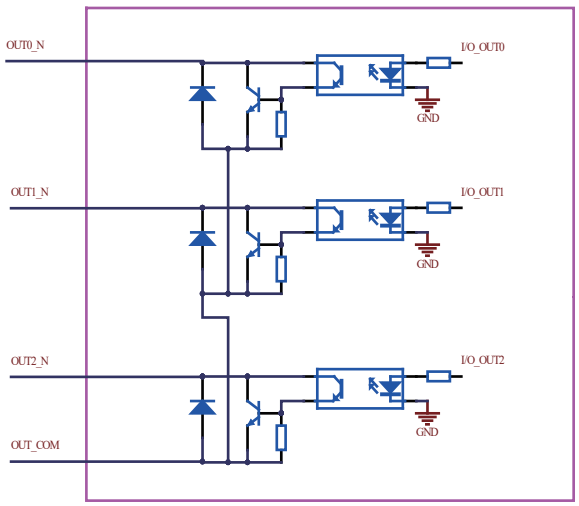
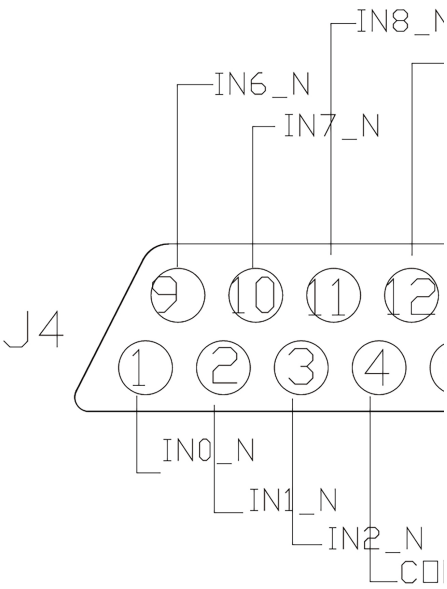
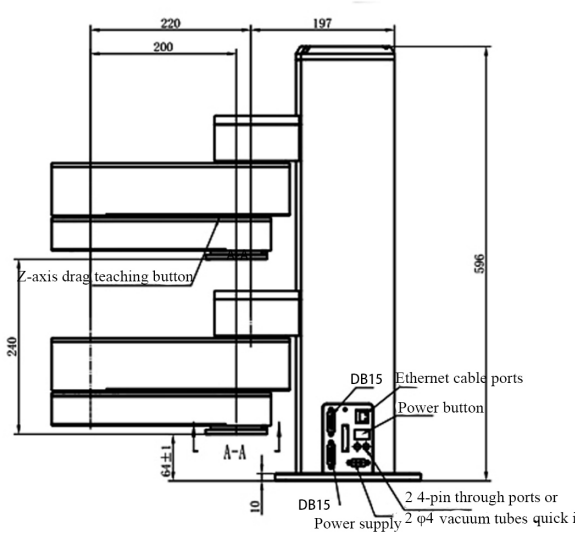


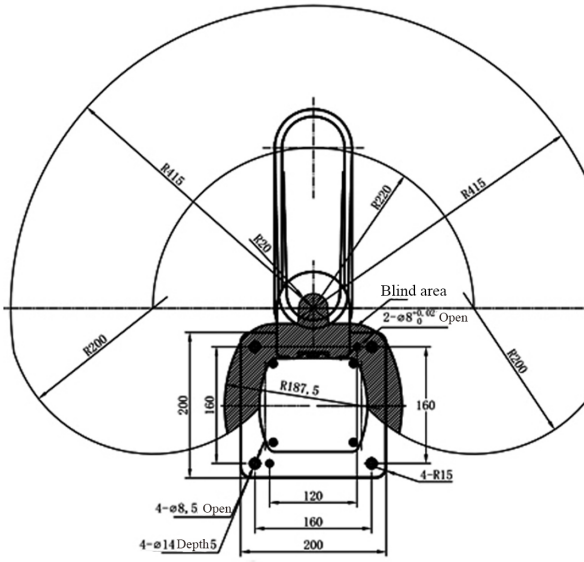
Figure 3

(3) The definition of J4 interface DB15 female (shown in Figu



Figure





(4) J4 I/O input port internal control circuit design (shown in F
There are 9 input ports for the robot I/O imput, IN0_N IN1
COM_B, IN6_N IN7_N IN8_N share COM_C, built-in optoc
ability, working drive current is recommended at about 10mA
and the typical input voltage is 24V.

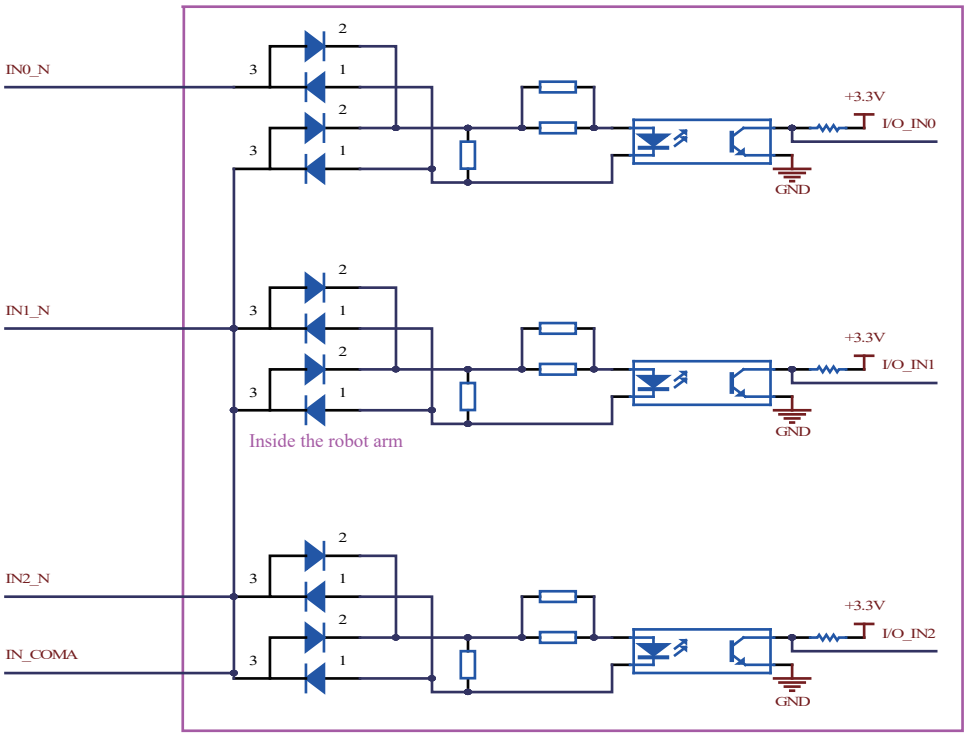
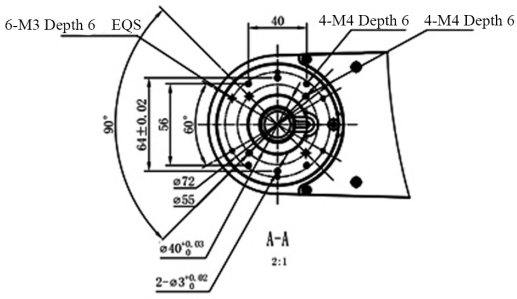
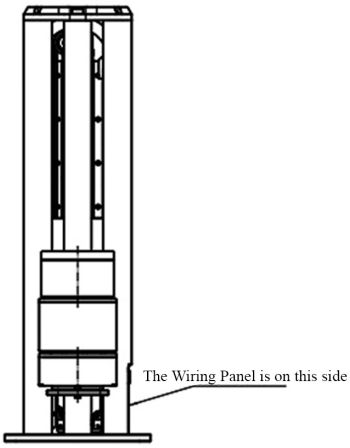


Figure 5





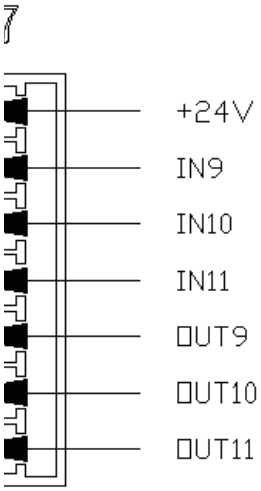


Figure 6

J10 and IN11 share the internal GND. When the +24V terminal

T10 OUT11 share the internal GND, NPN type output, when the he port).

4. The B I/O interface panel general schematic diagram, as shown in Figure 7

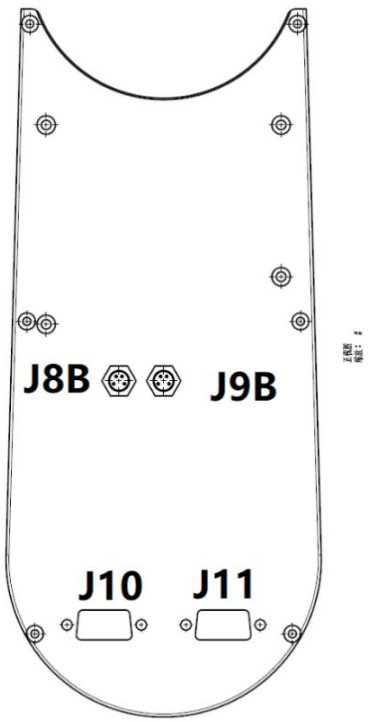


Figure 7

5. The B interface definition

(1) J8A is a 4-core straight through wire aviation plug to the end of J8B;
(2) J9A is a 4-core straight through wire aviation plug to the end of J9B;
(3) J10 is the I/O input and output port, and the end of the robot arm provides users with simple I/O control;
(4) J11 is the interface for controlling the electric gripper, and the end of the robot arm is provided for the users to control the electric gripper.

6. J10, J11 interface internal circuit design

J10 interface DB9 female pin definition

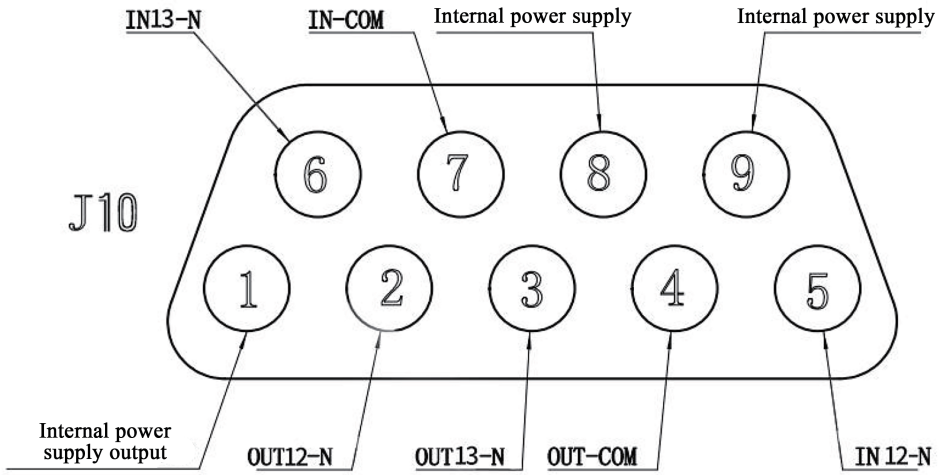


Figure 8

7. J10 internal simplified circuit design

The robot arm I/O port input has a built-in optocoupler isolator to achieve electrical isolation and strong anti-interference ability.
The working drive current is recommended at about 10mA, the current is too small to affect the drive performance, and the typical input voltage is 24V.The I/O output, open-collector output, the user needs to connect the pull-up resistor according to the power supply requirements when applying. For example, 24V power supply pull up 4.7K resistance application.

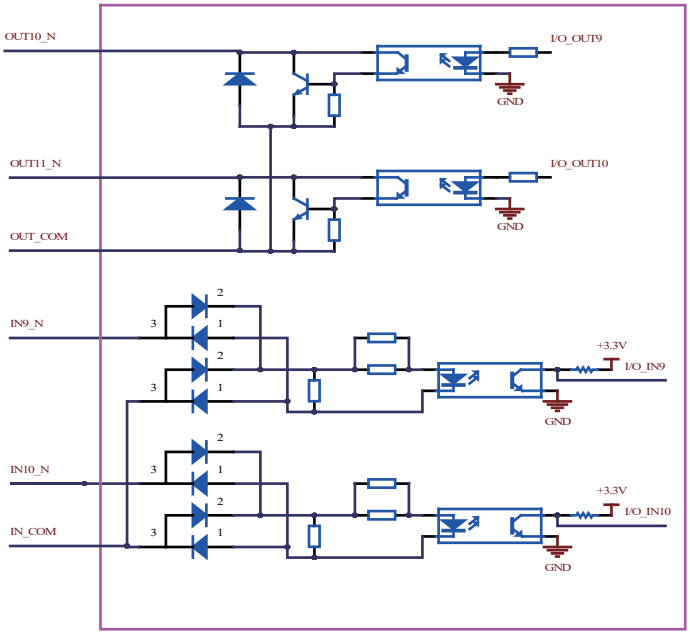


Figure 9

8. J11 interface DB9 male with needle pin definition

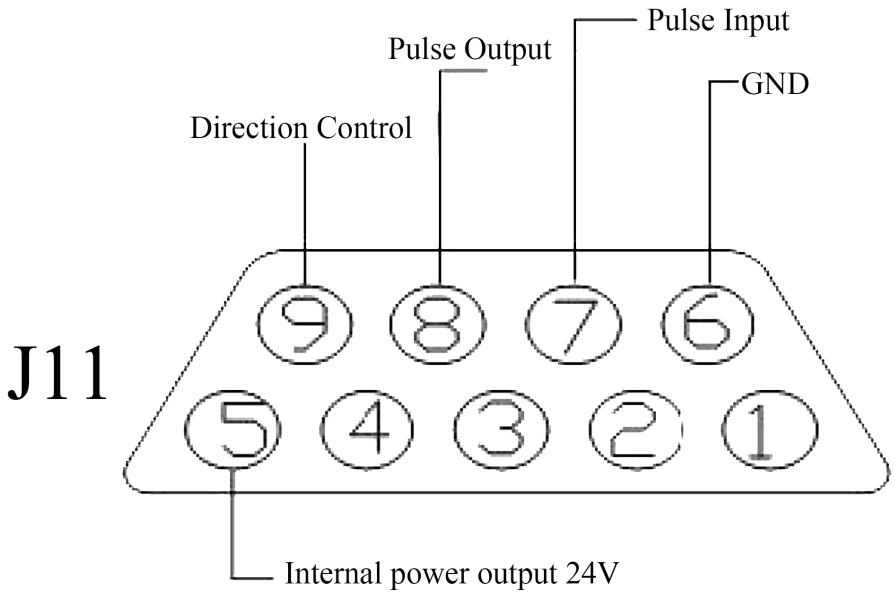


Figure 10

Precautions

1. Payload inertia

The payload center of gravity and the recommended payload range with the Z axis movement inertia are shown in Figure 11.

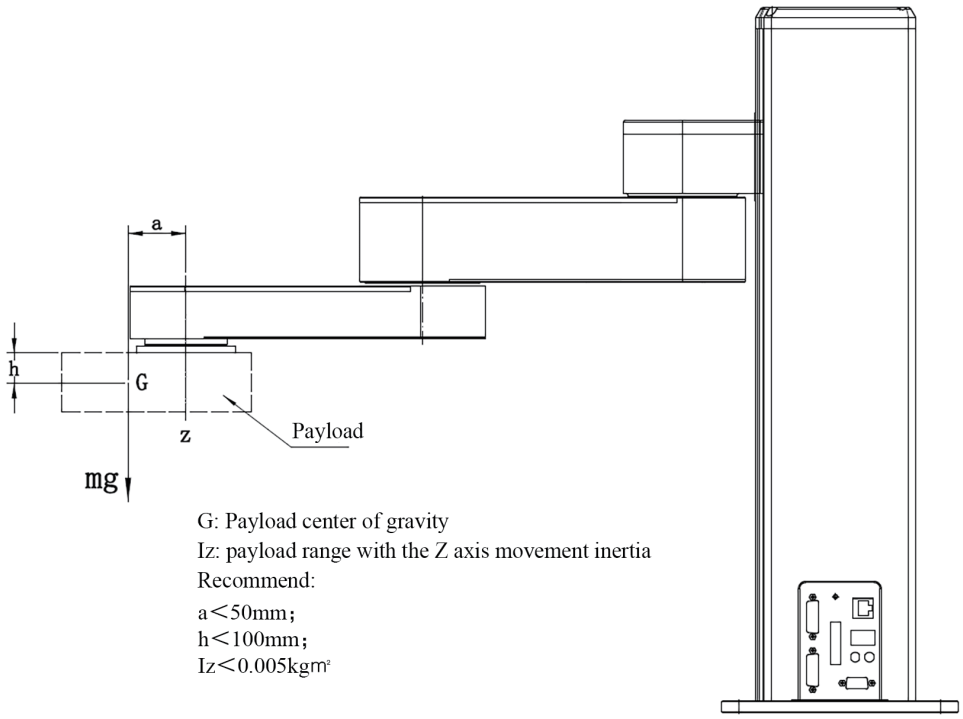


Figure11 XX42 series payload description

2. Collision force

Trigger force of horizontal joint collision protection: the force of XX42 series is 40N.

3. Z-axis external force

The external force of the Z axis shall not exceed 120N.

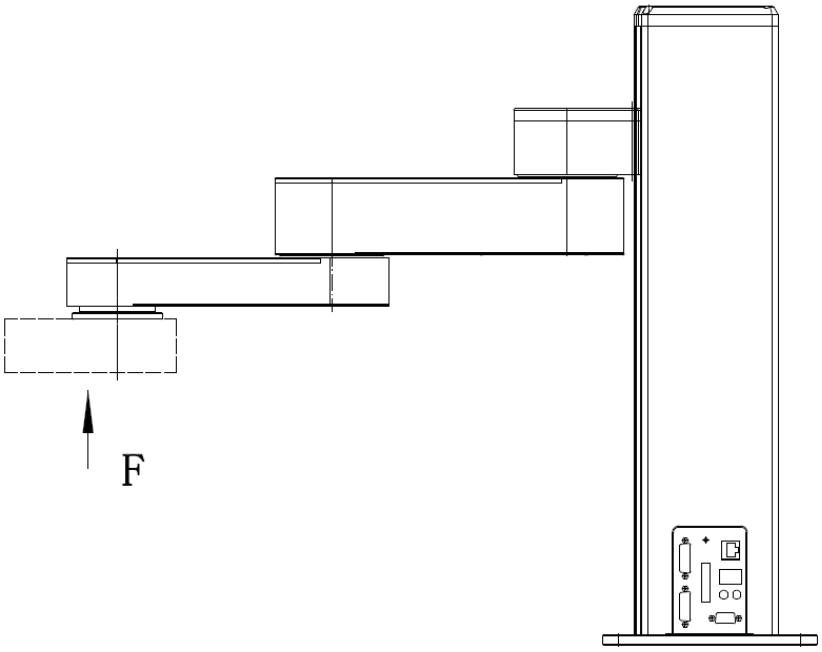
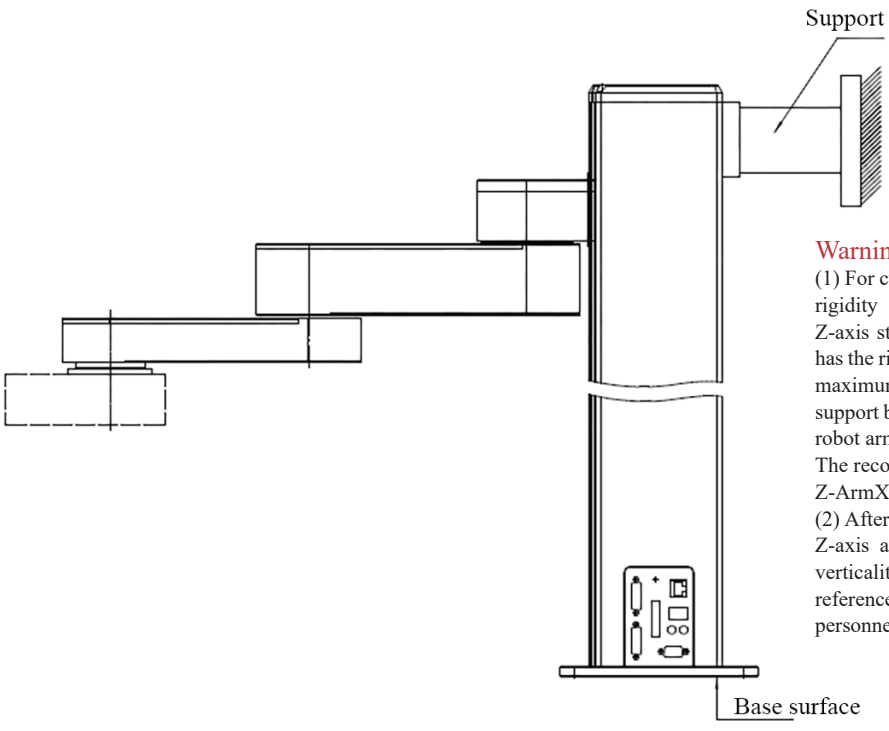


Figure 12

4. Notes for installation of customized Z axis, see Figure 13 for details.



Warning:

(1) For customized Z-axis with a large stroke, The Z-axis rigidity decreases as the stroke increases. When the Z-axis stroke exceeds the recommended value, the user has the rigidity requirement, and the speed is >50% of the maximum speed, it is highly recommended to install a support behind the Z-axis to ensure that the rigidity of the robot arm meets the requirement at high speed.

The recommended value are as follows:

Z-ArmXX42 series Z-axis stroke >600mm

(2) After the Z-axis stroke is increased, the verticality of Z-axis and the base will be greatly reduced. If strict verticality requirements for the Z-axis and the base reference are not applicable, please consult the technical personnel separately.

Figure 13

5.Power cable hot-plugging forbidden. Reverse warning when the positive and negative poles of the power supply are disconnected.

6. Do not press down the horizontal arm when the power is off.

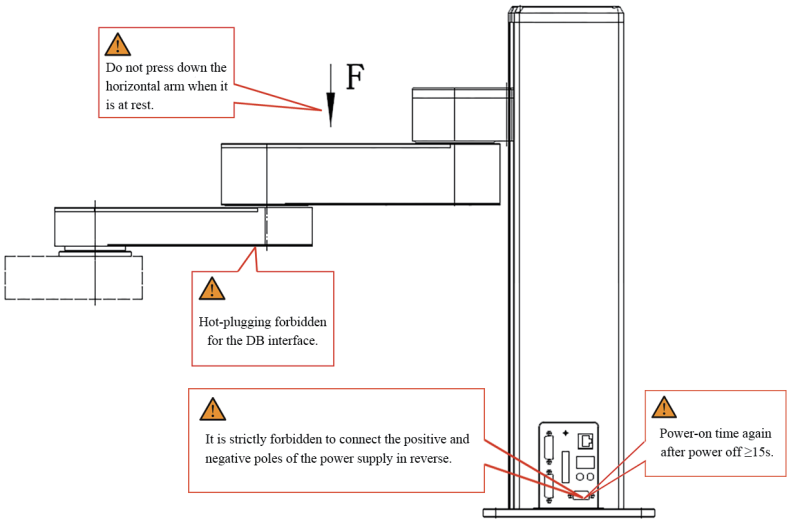


Figure 14

DB15 Connector Recommendation

Recommended model: Gold-plated male with ABS shell YL-SCD-15M
Gold-plated female with ABS shell YL-SCD-15F
Size Description: 55mm*43mm*16mm
(Refer to Figure 15)

Figure 15

Robot Arm Compatible Grippers Table

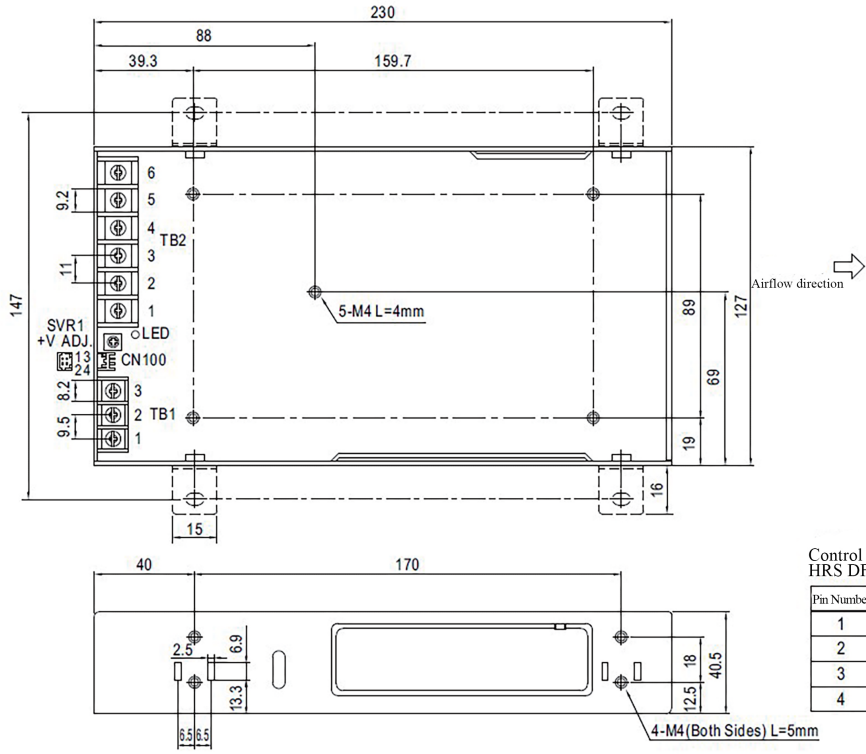
Robot Arm Model No.	Compatible Grippers
XX42 T1	Z-EFG-8S NK/Z-EFG-12 NK/Z-EFG-20 NM NMA/Z-EFG-20S/ Z-EFG-30NM NMA The 5th axis 3D printing
XX42 T2	Z-EFG-50 ALL/Z-EFG-100 TXA

Power Adapter Installation Size Diagram

XX42 configuration 24V 500W RSP-500-SPEC-CN power supply

■ Robot arm body size

Robot case number: 226A Unit: mm



AC input terminal
Pin Definition(TB1)

Pin Number	Pin Function
1	AC/L
2	AC/N
3	FG ⏚

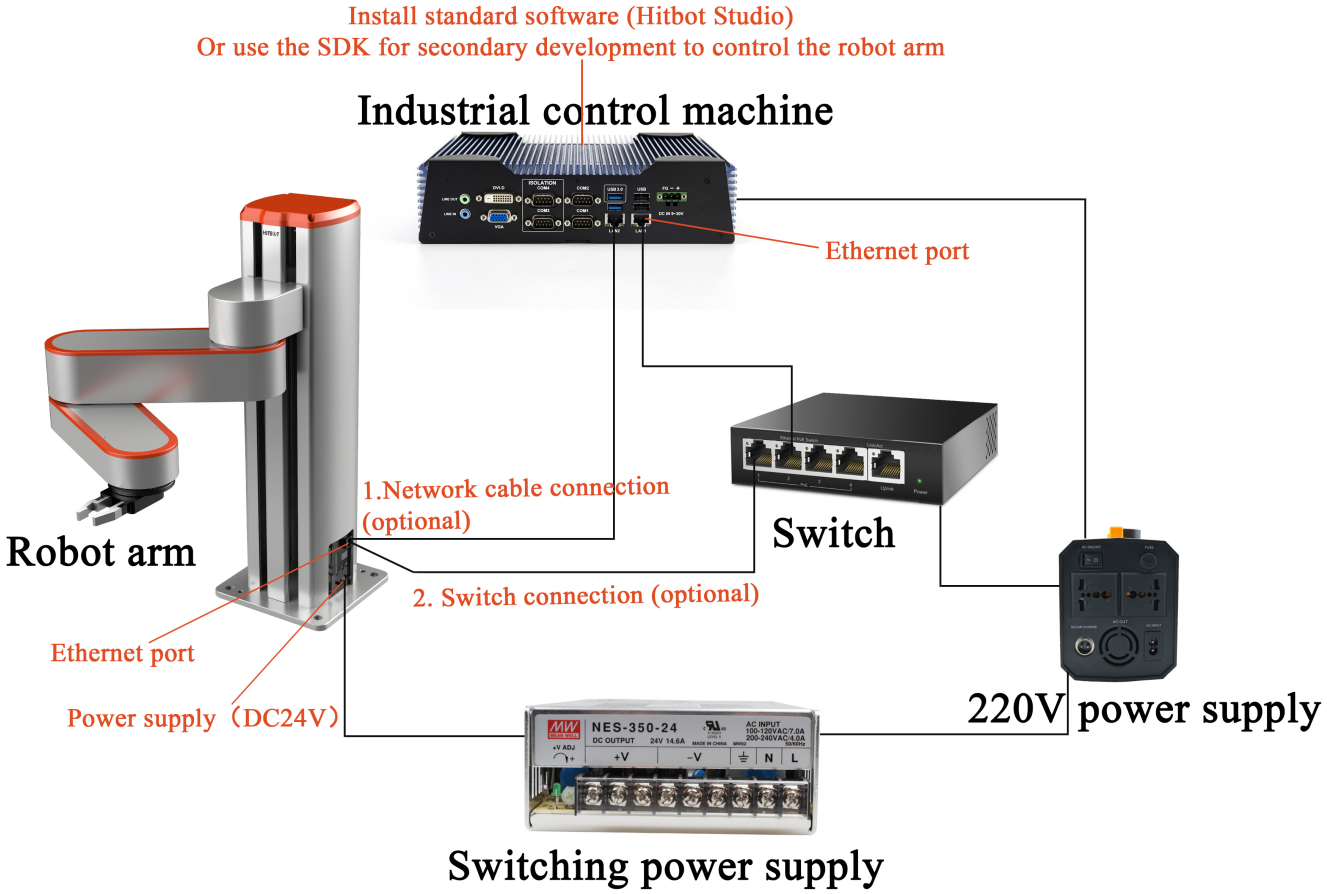
DC output terminal
Pin Definition(TB2)

Pin Number	Pin Function
1~3	DC OUTPUT -V
4~6	DC OUTPUT +V

Control Pin Definition(CN100):
HRS DF11-14DP-2DS or equivalent model No.

Pin Number	Pin Function	Corresponding connector	Terminal
1	-S	HRS DF11-14DS or equivalent model No.	HRS DF11-**SC or equivalent model No.
2	+S		
3	RC-		
4	RC+		

Diagram of The External Use Environment of The Robot Arm



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