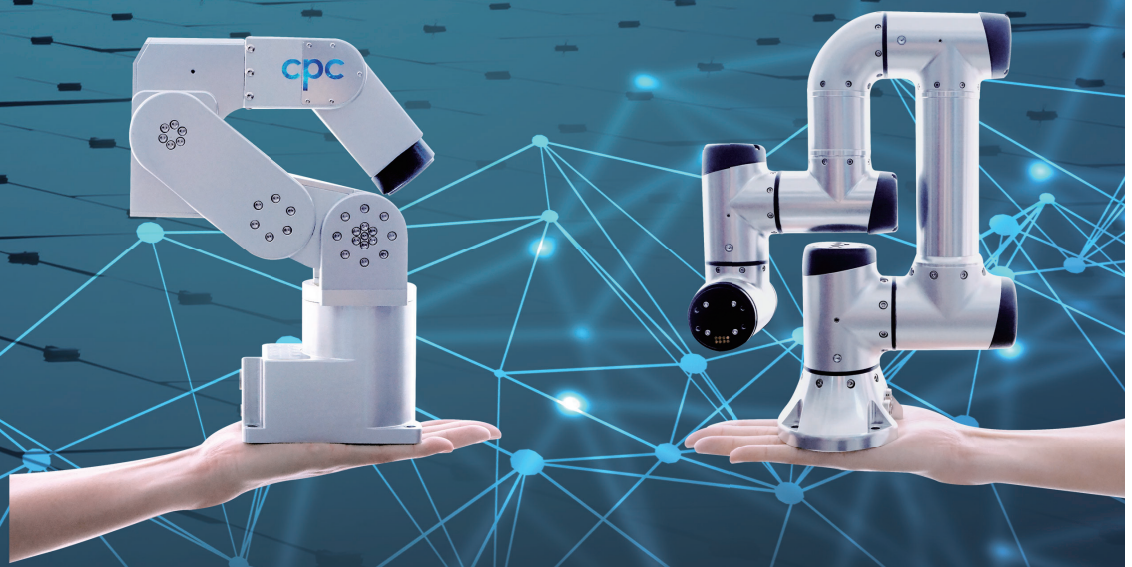
CHIEFTEK PRECISION CO., LTD.

cpcRobot

6 - axis robot



CHIEFTEK PRECISION CO., LTD.

HEADQUARTERS
CHIEFTEK PRECISION CO., LTD.
No.3, Dali 1st Rd., Xinshi Dist., Southern Taiwan Science Park, Tainan City .741-45, Taiwan (R.O.C)
TEL:+886-6-505 5858 Http://www.chieftek.com
E-mail:service@mail.chieftek.com

CHIEFTEK PRECISION USA
2280 E. Locust Court.
Ontario, CA 91761, USA
Tel:+1-909-773-1200
Fax:+1-909-773-1202

cpc Europa GmbH
Industriepark 314,
D 78244 Gottmadingen, Germany
TEL:+49-7731-59130-38
FAX:+49-7731-59130-28

CHIEFTEK MACHINERY KUNSHAN CO., LTD.
No.1188, Hongqiao Rd, Kunshan, Jiangsu, P.R. China
TEL:+86-512-5525 2831
FAX:+86-512-5525 2851

* cpc reserves the right to revise any information(technical details) any time without notice, for printing mistakes or any other incidental mistakes. We take no responsibility.

2022.08.29 Printed in Taiwan

cpc is the leading foundation provider to achieve your industry 4.0 vision.

cpcRobot

6 - axis robot

The current five significant trends in the robotics industry are
1. Smart learning.
2. Autonomous movement.
3. Implement into new markets.
4. Energy saving.
5. Reduce reliance on labor.

cpc Chieftek Precision Co., Ltd. has always been an essential player in the industrial supply chain. cpc uses self-developed DD motors, mechanical components, drives, and encoders to provide small-sized robotic arms in the market to achieve automation goals in energy saving, mobility, and new market applications.

Tired of the unchangeable production lines?

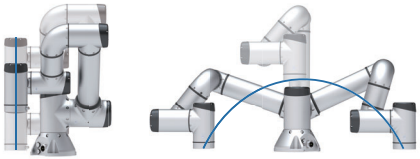
Rearranging production lines anytime you want to?

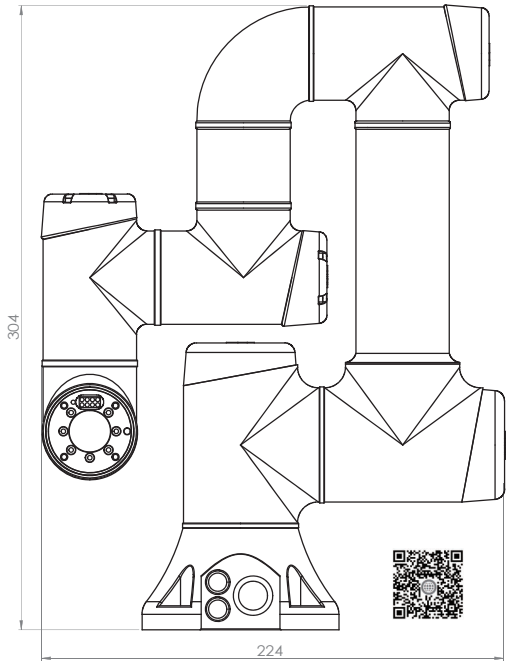
Executing multiple different commands at the same time?

Let cpc's miniature robots help you! Super small & super light! Your best choice to maximize the flexibility and efficiency of your production lines!

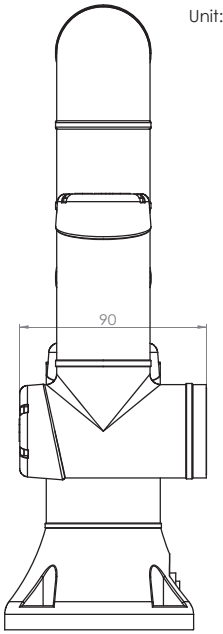
S0 6 - axis robot

- Small footprint
- Lightweight
- Class-leading repeatability
- Collaborative
- Folding design
- Low noise
- Class-leading torque motor
- High performance servo drive
- High resolution optical absolute encoder
- Brakes in all axes
- Internal cable arrangement
- Tool I/O port
- Side connection / Bottom connection





Unit: mm

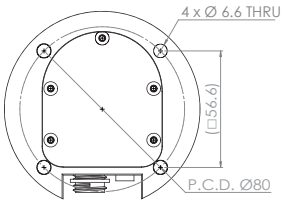


S0 is the smallest collaborative robot in the market with 0.5 kg payload capacity. 3.5 kg weight allows the robot to move dexterously and operate in limited space with optimal usage. The special folding design creates more path planning to get higher motion efficiency. In the trend of human-robot collaboration, the productivity of the product line will be improved greatly.

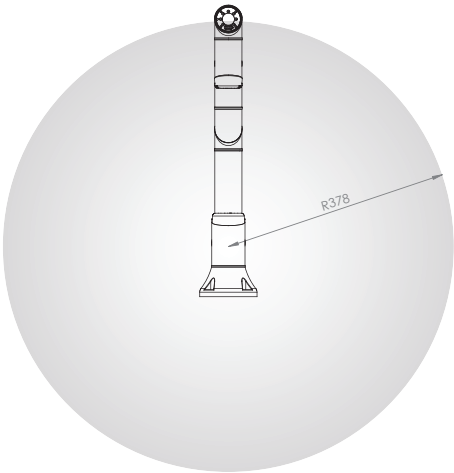
Specifications

Item		Unit	S0
Payload		kg	0.5
Reach	Vertical	mm	446
	Horizontal	mm	378
*Repeatability		μm	+/- 10
Weight		kg	3.5
Power supply		V,A	48 Vdc, 5A
Brakes		Axis	1,2,3,4,5,6
Communication			TCP/IP, Modbus TCP to controller/ EtherCAT to robot
Max. motion range		J1 (Base)	+/- 360°
		J2 (Shoulder)	+/- 360°
		J3 (Elbow)	+/- 360°
		J4 (Wrist)	+/- 360°
		J5 (Wrist)	+/- 360°
		J6 (Wrist)	Infinite
**Max. speed		J1 (Base)	160°/sec
		J2 (Shoulder)	160°/sec
		J3 (Elbow)	180°/sec
		J4 (Wrist)	360°/sec
		J5 (Wrist)	360°/sec
		J6 (Wrist)	360°/sec
*Max. TCP speed		mm/s	600
IP protection rating		IP54	
Product Safety Certification		EN ISO 12100 EN ISO 10218-1 EN 60204-1 EN ISO 13849-1 ISO/TS 15066 ISO/DIS 10218-1.2	

* When the temperature of the robot is constant.
** The maximum speed depends on the center of mass offset.

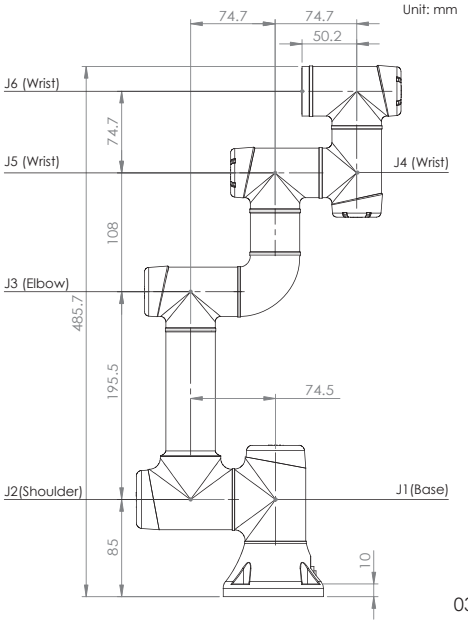


Motion area



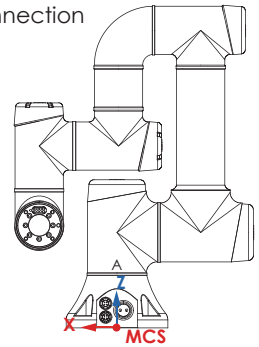
Dimensions

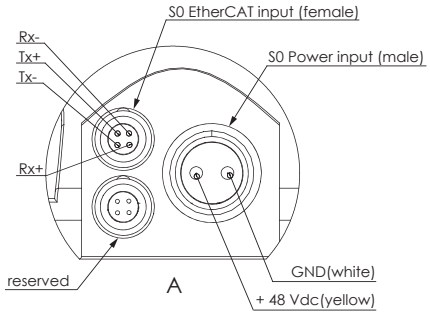
Unit: mm



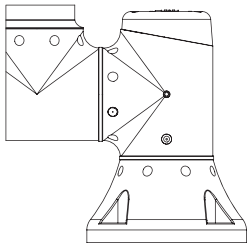
S0 power/signal input and MCS Coordinate System

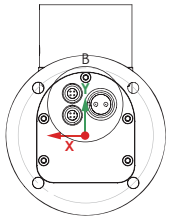
Side connection

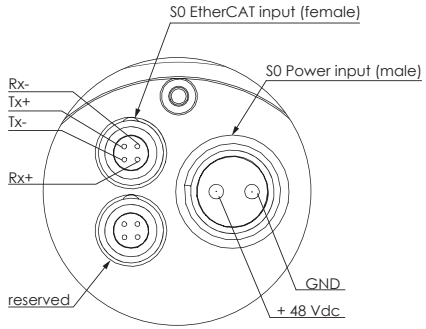




Bottom connection





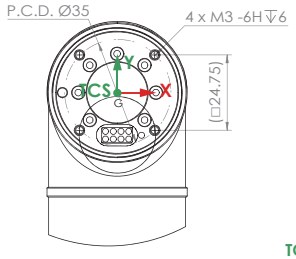


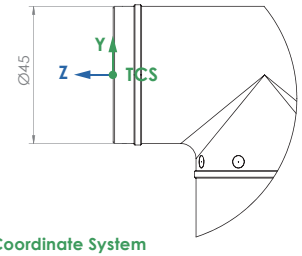
MCS Coordinate System

B

S0 end connection dimensions and TCS coordinate System

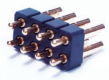
Unit : mm



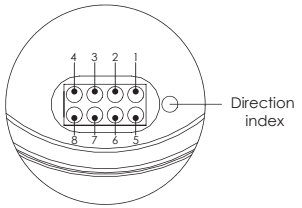


TCS Coordinate System

Tool I/O port



Corresponding pogo pin connector attached

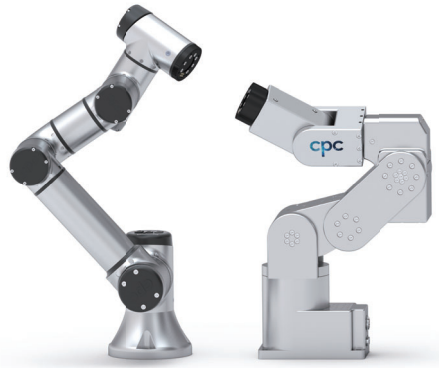


G

Pin definition

Number	Definition	Description
1	Grounding	Grounding
2	AI-0	analog input (0~10V)
3	DI-0	digital input
4*	DO-0 or power or ground	Digital output or 0/12/24 V or ground
5	Power	0/12/24 V
6	AI-1	analog input (0~10V)
7	DI-1	digital input
8*	DO-1 or power or ground	Digital output or 0/12/24 V or ground

* The user can set the output signal as PNP, NPN, or pull/push via the interface.

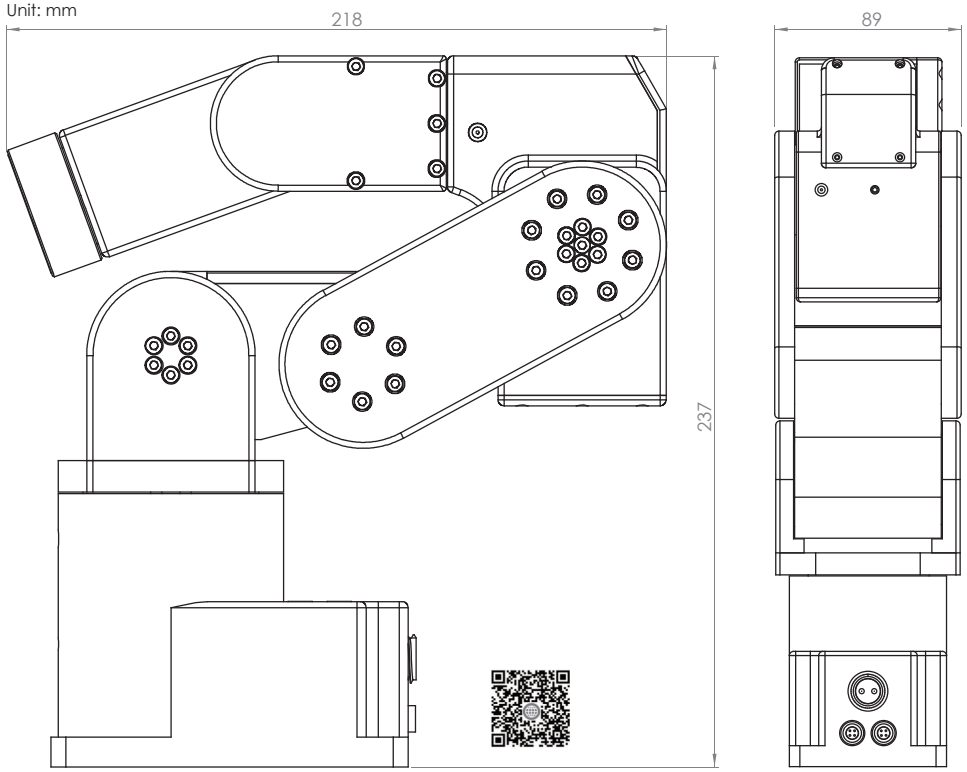


DB0 6 - axis robot

- Small footprint
- Lightweight
- Class-leading repeatability
- Industrial
- Folding design
- Low noise
- Class-leading torque motor
- High performance servo drive
- High resolution optical absolute encoder
- Brakes in J1, J2, J3 and J4 axes
- Internal cable arrangement
- High rigidity
- Tool I/O port
- Side connection / Bottom connection

Teach-in panel

Unit: mm



DB0 is a compact, 4.7 kg weight 6-axis robot arm with high rigidity. These features create high precise motion and operate in limited space with optimal usage. 5 µm repeatability makes higher precision mission to be done. DB0 also provides a guided panel to complete the path planning easily.

Specifications

Item		Unit	DB0
Payload		kg	0.5
Reach	Vertical	mm	460
	Horizontal	mm	331
*Repeatability		µm	+/- 5
Weight		kg	4.7
Power supply		V,A	48 Vdc, 5A
Brakes		Axis	1,2,3,4
Communication			TCP/IP, Modbus TCP to controller/ EtherCAT to robot
IP protection rating		IP40	
Product Safety Certification		EN ISO 12100 EN ISO 10218-1 EN 60204-1 EN ISO 13849-1 ISO/DIS 10218-1.2	

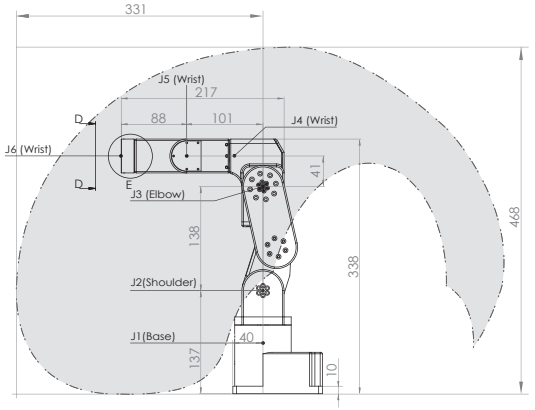
Item	Unit	DB0
Max. motion range	J1 (Base)	+ 175° / - 175°
	J2 (Shoulder)	+ 160° / - 15°
	J3 (Elbow)	+ 170° / - 80°
	J4 (Wrist)	+ 175° / - 175°
	J5 (Wrist)	+ 90° / - 90°
	J6 (Wrist)	Infinite
**Max. speed	J1 (Base)	180°/sec
	J2 (Shoulder)	180°/sec
	J3 (Elbow)	180°/sec
	J4 (Wrist)	360°/sec
	J5 (Wrist)	360°/sec
	J6 (Wrist)	360°/sec
*Max. TCP speed	mm/s	1000

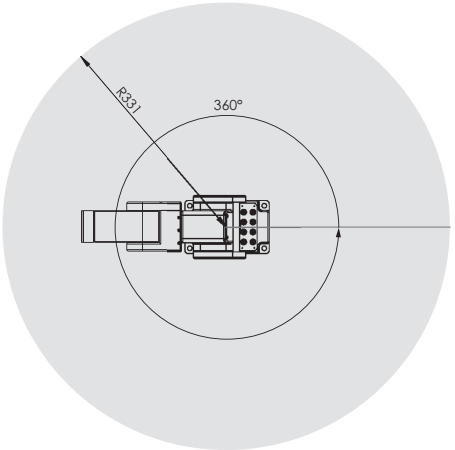
* When the temperature of the robot is constant.
** The maximum speed depends on the center of mass offset.

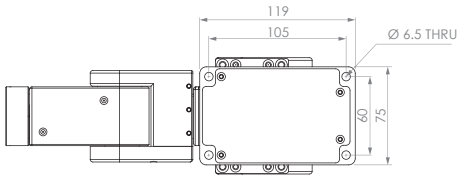
Dimensions

Motion area

Unit: mm



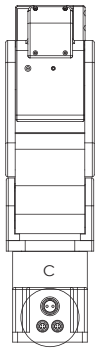


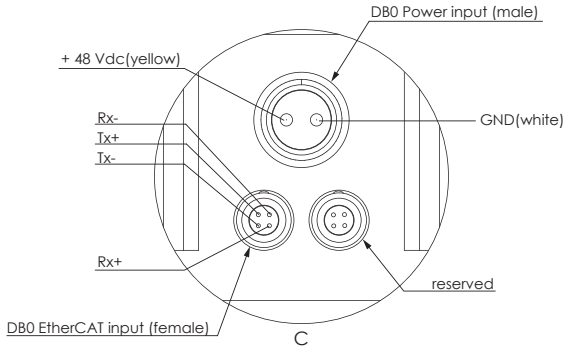


Base mounting hole

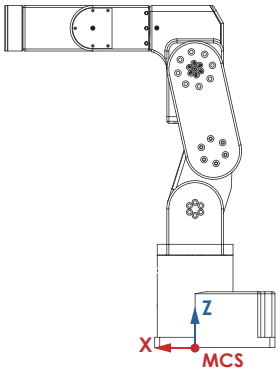
DB0 power/signal input and MCS Coordinate System

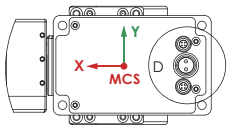
Side connection

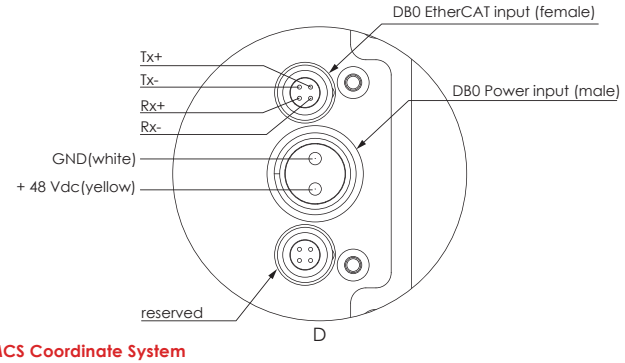




Bottom connection

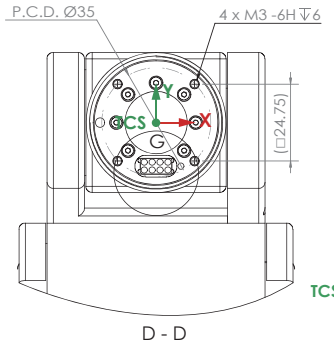






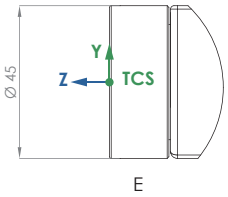
MCS Coordinate System

DB0 end connection dimensions and TCS coordinate System



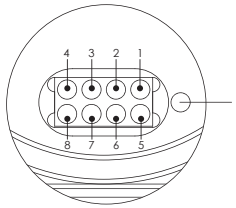
TCS Coordinate System

Unit : mm



Tool I/O port

Corresponding pogo pin connector attached



Pin definition

Number	Definition	Description
1	Grounding	Grounding
2	AI-0	analog input (0~10V)
3	DI-0	digital input
4*	DO-0 or power or ground	Digital output or 0/12/24 V or ground
5	Power	0/12/24 V
6	AI-1	analog input (0~10V)
7	DI-1	digital input
8*	DO-1 or power or ground	Digital output or 0/12/24 V or ground

* The user can set the output signal as PNP, NPN, or pull/push via the interface.

Robot Ordering information

S	0	N	03	S	G	J	
							Customization
						Tool I/O Signal: G: Typical I/O EC : EtherCAT	
					The rotation angle of the final axis: S: unlimited D: ±360°		
				Wiring length: 03 : 3m			
			Connection direction: N- side direction B- bottom direction				
		Size : 0					
	Product type : DB : Industrial S : Collaborative						

Accessories

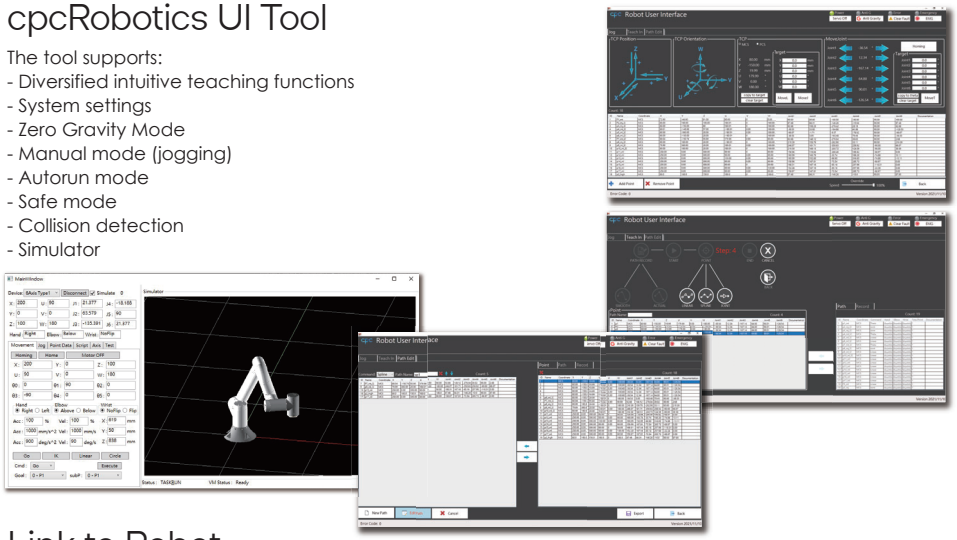
IPC Controller: NXP LS1046A X86 Series

Power Supplier: 10A@48VDC

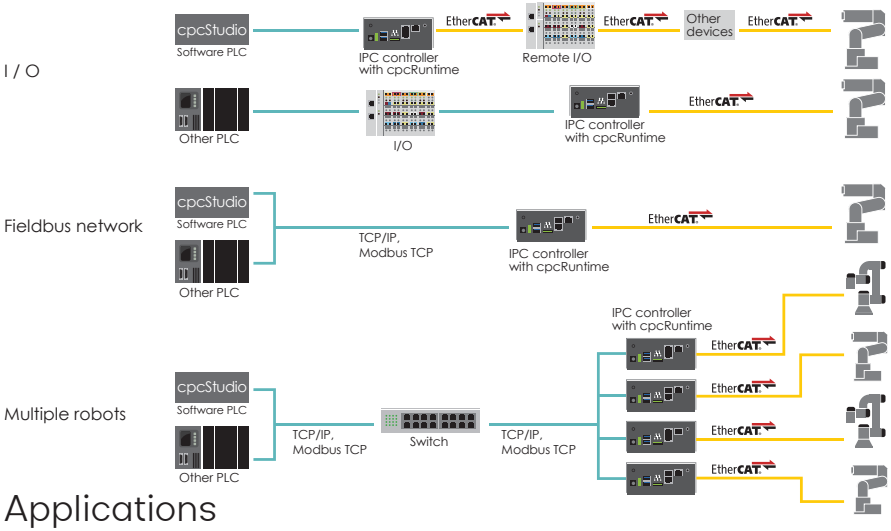
E-stop

cpcRobotics UI Tool

The tool supports:
- Diversified intuitive teaching functions
- System settings
- Zero Gravity Mode
- Manual mode (jogging)
- Autorun mode
- Safe mode
- Collision detection
- Simulator



Link to Robot



Applications

ATC Automatic Tool Changer System

ATC Automatic tool change system

In the process of automation, robot arms are increasingly required to perform multitasking to optimize the use of simple design and space efficiency. Therefore, automatic tool change can greatly reduce downtime and tool change time in the robot system. It is seen as an essential requirement to increase production capacity. Direct Technology has launched an automatic tool change system for micro-robots, including the holder, tool/robot joint, and various connectors.
Its unique patented design is purely mechanically combined, so it brings the following main feature:

1. Quick and easy

No external air pressure and power are needed, and the tool exchange can be completed during the movement of the robot arm, which simplifies the entire tool change system and saves the time for tool exchange.

2. High reliability

Because it does not rely on extra power sources, there is no need to worry about the instability of the source and can keep the reliability and integration accuracy of the entire tool changer.

3. Lightweight

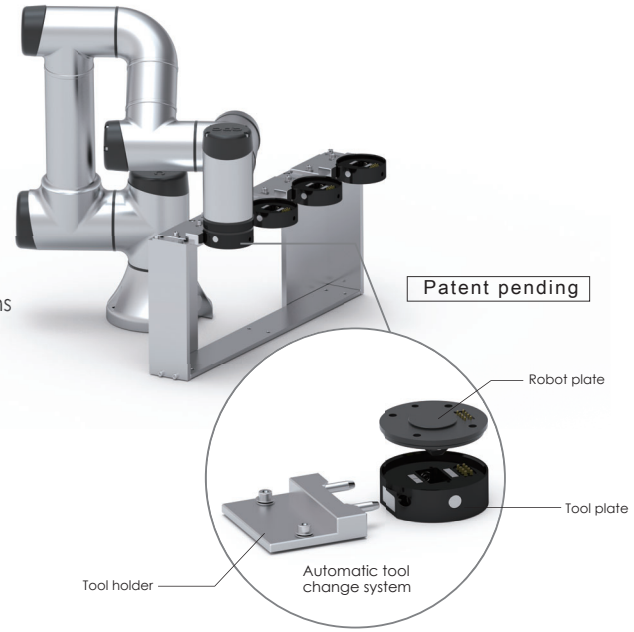
Compare to the same class, because of no extra adapters; it will not increase the excessive load consumption of the robot arm.

4. Magnet support guiding：all directions mechanical fixing

Using the permanent magnet to fix the connecting plate and the tool holder greatly reduces the risk of mechanical wear.

5. Provide electrical connector interface / Customization

Provide customized air pressure and electrical connectors to suit the various tools of the different applications.



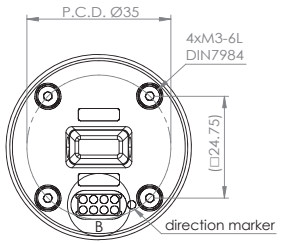
Tool changing system specifications

Specification	unit	ACT-45
Max. payload	kg	2
Bending force	N	200
XY axis maximum Static moment	Nm	30
Z axis maximum Static moment	Nm	30
Weight	kg	0.068
Repeatability	mm	+/- 0.01
Electrical I/O	-	8x1A@24 Vdc

Tool changing mechanism - tool / fixture connecting plate

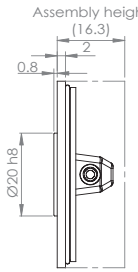
Robot side：

Robot plate dimensions

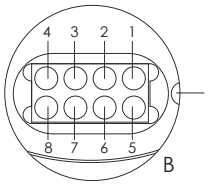


Robot plate connecting plate

Robot plate input interface



Pogo pin



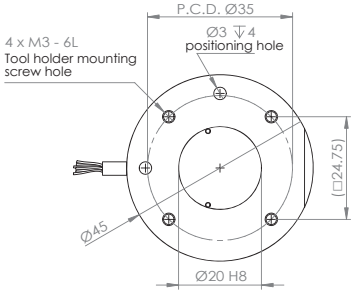
Pogo pin

The relationship between the pins and the wiring

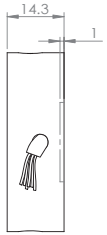
input interface	output interface
Pogo pin / No.	Flying wire / Color
1	green
2	yellow
3	purple
4	blue
5	orange
6	white
7	black
8	red

tool side：

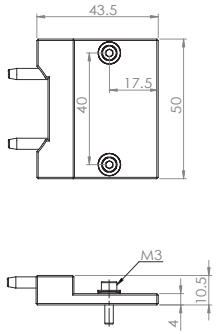
Tool plate dimensions



Tool plate output interface

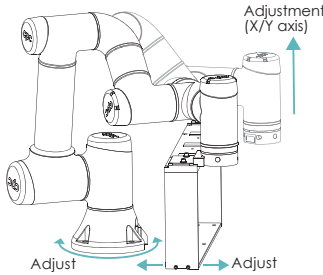


Tool holder

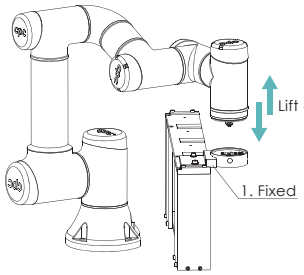


cpcRobot

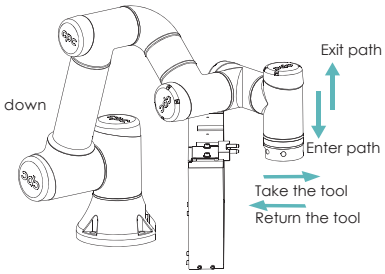
Tool changer installation and setting



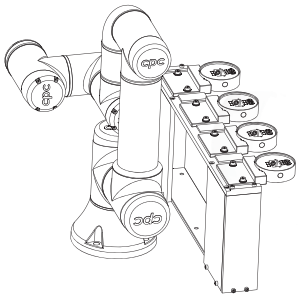
Robot plate and tool plate aligned on the same coordinate to engage.



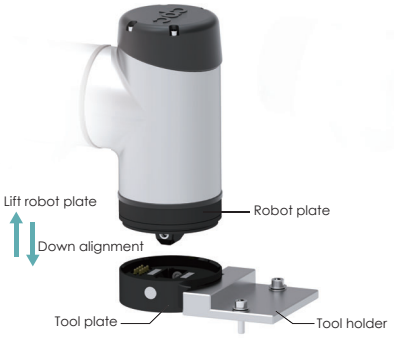
Mounting tool holders and lift / down to align the plate

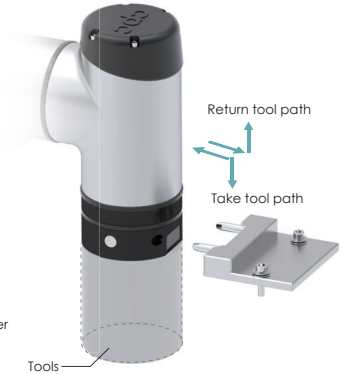


Using a simple process to test the changing cycle. Fine-tune the TCS to the engaging is smooth and exact.



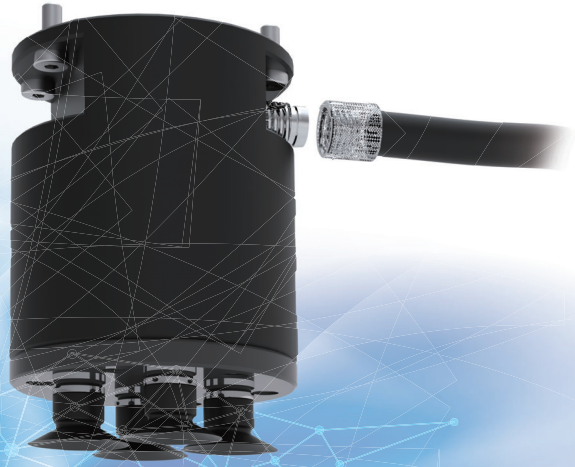
Setup multiple tool holders.





Tool changer ordering information

ATC	45	M	P	F	N	J	
							Customization
						Air pressure connector: N: none	
					Output electrical interface: F: Flying wire C: M8 connector		
				Input electrical interface: P： Pogo pin F： Flying wire C： M8 connector			
			Part: M: Robot plate T: Tool plate H: Tool holder				
		Size：45					
	Product type： ATC Automatic tool change system						



VA Vacuum gripper

VA Vacuum gripper

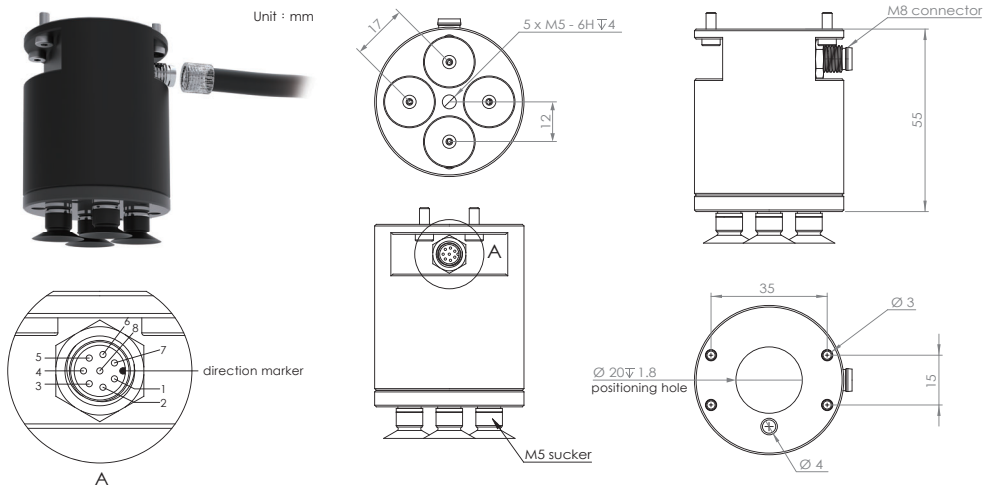
VA is a compact integrated vacuum gripper that includes a vacuum pump, pressure detector, and solenoid valve to form a complete vacuum cycle system. Users don't need to prepare a vacuum source. Since there is no tracheal distribution, using the gripper with the arm will avoid the problem of entanglement in the past.
In addition, the vacuum pump, air pressure detector, and solenoid valve can be controlled independently. The user can determine the optimal process for operating the gripper. The VA vacuum gripper can be installed directly on the cpcRobot and ATC automatic tool changing system to achieve plug-and-play function.

VA Vacuum gripper	
Model	VA-45
Actuation energy	DC power
Weight (kg)	0.23
Maximum suction load (kg)*	0.9
Maximum vacuum pressure (mbar)**	-500
Maximum flow (l/min)**	0.55
Operating temperature (℃)	5-50
Pressure sensor	
Rated pressure range (mbar)	0-1010
Output voltage (V)	1-5

* The suction direction of the standard product is vertical, and the actual use must take into account the diameter of the sucker, the installation direction, and the position of the center of gravity.
** This ideal value will depend on atmospheric pressure conditions.

Features

- Plug and play function
- Built-in vacuum ejector, all-electric supply, no need for external pipes.
- Built-in air pressure sensor.
- The pump operation can be controlled freely; therefore, the pump duty cycle can be used efficiently, and the service life can be increased.
- The M5 air pad can be replaced based on application needs. The unused 5xM5 threaded holes must be sealed with set screws.



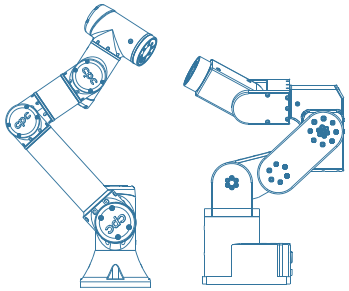
Pin table

Number	Function	Wire diameter	color
1	24V	28 AWG	white
2	DI-1 (Pump switch)	28 AWG	blue
3	DI-0 Vaccum no/off	28 AWG	pink
4	DO-1	28 AWG	gray
5	DO-0	28 AWG	yellow
6	AO-1	28 AWG	green
7	AO-0 (Pressure sensing)	28 AWG	brown
8	GND	28 AWG	red

VA Vacuum gripper ordering information

VA	45	S	15	03	-J	
						Customization*
					Cable length：03：3m	
				Air pad diameter： Ø8x5 Max. Ø10x4 Max. Ø15x4 Max.		
			Number of Air pad: S: Standard O: None			
		size：45				
Production type: VA Vacuum gripper						

*Note: The user can design the customized mounting hole of the pad and positioning hole on VA gripper.

cpcRobot

Not only for users, but also for designers
cpc's products inspire you!
Together with cpc to achieve new levels of innovation!