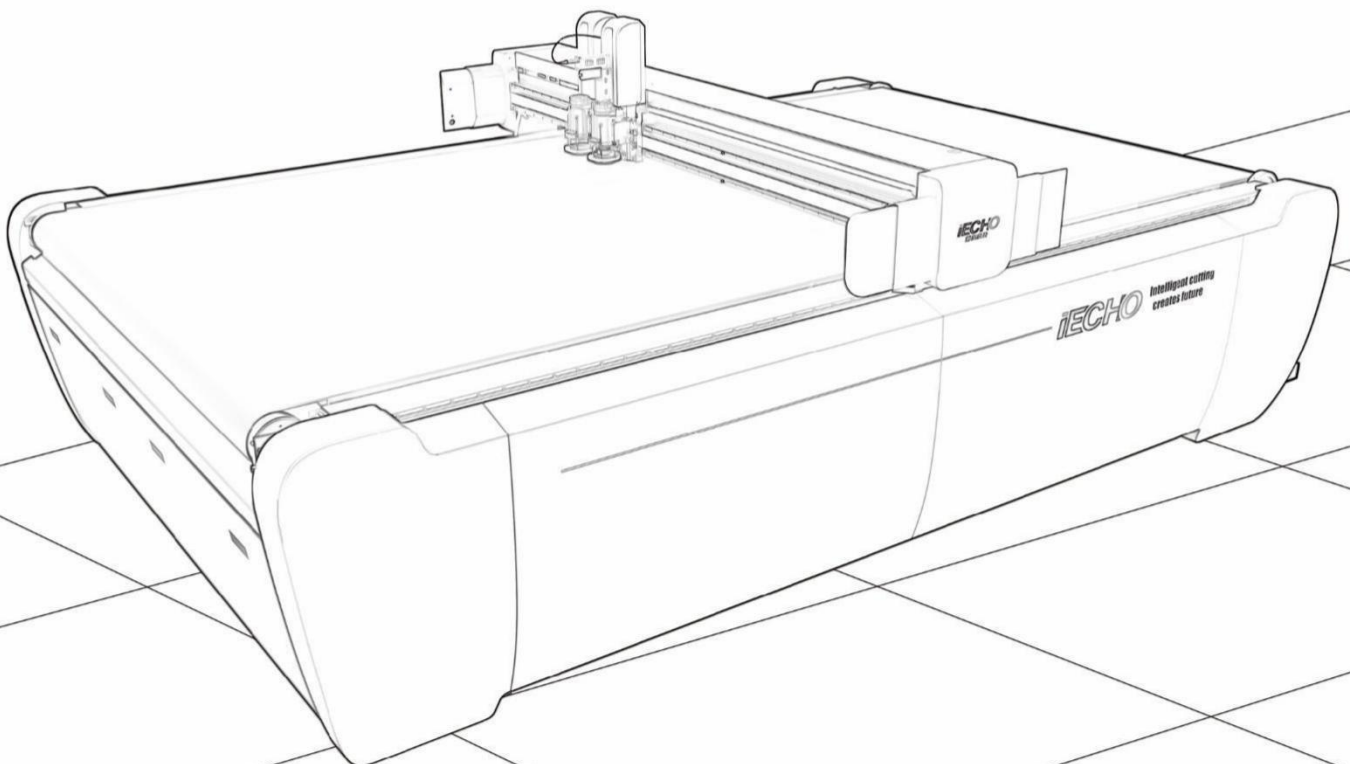


**IECHO**

# BK4 MACHINE PRODUCT SPECIFICATION

HIGH SPEED DIGITAL  
CUTTING SYSTEM



IECHO Science & Technology Co., Ltd.

## FOREWORD

Dear customer :

Hello!

BK4 series high-precision digital cutting system can automatically and accurately complete the processes of full cutting, half cutting, engraving, punching, crease, marking, etc. at the same time, it is equipped with or equipped with receiving and automatic feeding system to quickly complete blanking and cleaning. It is suitable for the production of advertising signs, printing and packaging, automobile interior decoration, furniture sofa, composite materials and other industries, Is the real all-round champion of material cutting. Thank you for choosing to use IECHO high-speed digital cutting system!

When compiling this manual, we strive to be comprehensive and easy to understand. In order to facilitate your better use of the equipment, please read the user manual carefully, operate according to the steps, and keep it properly after reading. From the beginning to the end, IECHO's "star service" will accompany you. No matter what problems you have, please contact us according to the telephone and address on the user manual. We are always waiting to serve you.

Thank you again for choosing IECHO products, if there is any change for the manual contents due to product improvement, we apologize in advance that we won't make another notice



- Please read the product manual carefully before using the product.
- To ensure production safety, please read the "safety instructions".

## Safety instructions



### note

In principle, all installation, putting into use and maintenance work should only be completed by qualified professionals !



### note

There is a risk of serious injury to personnel and property under the following circumstances :

- ◆ Remove the housing without authorization
- ◆ Incorrect installation and use



### note

Internal or external changes to the equipment can only be made after prior consultation with Hangzhou IECHO Technology Co., Ltd



### note

The company shall not be liable for safety injuries caused by the use of accessories not authorized by Hangzhou IECHO Technology Co., Ltd



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# 1. Equipment Overview

## 1.1. Features

BK4 series cutting machine adopts the overall frame structure layout and brand-new appearance design. Adhering to the design concept of efficient, accurate cutting and intelligent processing of IECHO equipment, it takes a higher level in cutting efficiency, operation stability and noise reduction.

- Efficient motion control system, high-speed motion and smooth operation;
- The circulating air pump cooling system solves the contradiction between sound insulation and heat dissipation, and the noise reduction effect is obvious;
- High mechanical strength for high load work;
- High precision CCD positioning to ensure cutting accuracy;
- Vacuum area control;
- Energy saving vortex vacuum control;
- Cutting head processing technology.

## 1.2. Composition

BK4 series cutting machine is composed of electrical control cabinet, cutting machine, vacuum pump and other auxiliary equipment. It can be equipped with automatic feeding system, computer rack, CCD, automatic knife initialization and other functional modules; The software part consists of data processing software and cutting machine control software. (please refer to the corresponding software manual for software use)

According to user requirements, one or more of the following tools can be configured: UCT, EOT, milling tool, V-CUT, Creasing tool, PRT, punching tool, general drawing pen, etc. (please refer to 1.6 tool introduction for details)

## 1.3. Working Principles

Import the files into SmartCut/iBrightCut, the user can process the files (editing and nesting) and send the processed cutting files to CutterServer. According to the cutting files, the controlling system will create motion control signals. With the signals, servo motors execute the tools lift/down and modules movement. Thereby, the machine achieves the high-speed and high-precision





#### 1.4. Technical Parameters

Definition	Parameter
Model	BK4-2516
Cutting Area	2500mm×1600mm
Machine Dimension	3380mm×2200mm×1330mm
Area covered	According to the configuration, it's around 10-15 m <sup>2</sup>
Weight	880KG
Max Speed	1800mm/s
Max Cutting Thickness	50mm
Accuracy	0.1 mm
Modules	Can be installed up to 2 cutting heads
File formats	DXF 、 PLT 、 PDF 、 HPG 、 HPGL 、 TSK 、 BRG 、 XML 、 CUT 、 OXF 、 ISO 、 AI 、 PS 、 EPS
Interface	Serial port/USB/
Adsorption	Vacuum Pump
Air supply Requirement	0.6~0.8MPa, Dry compressed air
Power Requirement	Three-phase 380V/single phase 220V 50Hz
Rated power	13KW
Storage Temperature	Temperature 0°C-40°C , Humidity 20%-80%RH







### 1.5. Cutting head

	<p>Universal cutting head</p>	<p>All tools can be installed in (Except for milling tools over 450W)</p>	<p>Cutting thickness: 50mm</p>
	<p>Punch head</p>	<p>Two punches are set. It can punch round holes or slotted and V-shaped knife holes.</p>	<p>Punching Max: 10mm thick material</p>



## 1.6. Cutting tools

Illustration	Name	Ab.	Feature	Material
	Tangent Tool	CUT	Universal Cutting Tool for materials up to 5mm thick. Fast speed and low cost.	Cardboard, Chevron board, ABS board, Gasket, Carbon fiber prepreg, PVC tarpaulin, PE, XPE, Label, e
	Electric Oscillating Tool	EOT	High-frequency electric-driven tool with 80W power options. Max cutting speed 1m/s for soft and medium-density materials.	Chevron board, Corrugated board, Gasket board, Gray cardboard, PE, XPE, EPE, PU leather composite sponge, Coil car mat
	Pneumatic Oscillating Tool	POT	Powerful air-driven tool with extended stroke for dense materials up to 50mm thick.	Composites, Honeycomb board, Asbestos gasket, Graphite gasket, Sponge, EPE, etc.
	Kiss-Cut Tool	KCT	By adjusting the position of the tool tip, the material can be accurately positioned and processed, and the upper material can be accurately cut through without damaging the bottom lining material of the lower layer. It is mainly suitable for cutting vinyl material.	Vinyl, sticker, reflective film, etc.










	<p>Driven Rotary Tool</p>	<p>DRT</p>	<p>Cutting tool with driven rotary blade for fabrics and technical textiles with high processing speed.</p>	<p>Fabrics, carbon fiber, glass fiber, aramid, carpet, etc.</p>
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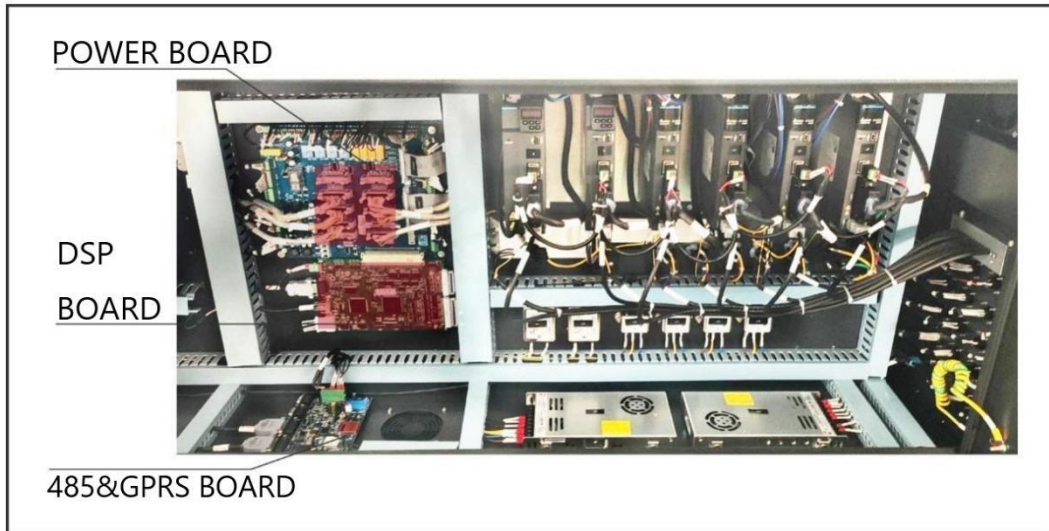


Illustration	Name	Ab	Feature	Material
	V-CUT Tool	V-CUT	Tool with 5 cutting angles (0°,15°,22.5°, 30°, 45°). Create 3D structural design	Honeycomb board, sandwich board, KT board, Gray board, etc
	Powerful Rotary Tool	PRT	The cutting speed is fast and it is not easy to burn wire. With the hair splitter, it can directly cut wool materials. Wool separator can be added.	textiles, carbon fiber, glass fiber, carpet, fur, etc. °
	Creasing Tool	CTT	Creasing wheels for carton box making	Corrugated board, carton board, etc
	CNC Router	URT	Standard material suction device, compressed air cooling. power : 450W ; RPM : 60000rpm ; Max thickness : 16mm °	Acrylic, Di-bond, aluminum composite, MDF, et

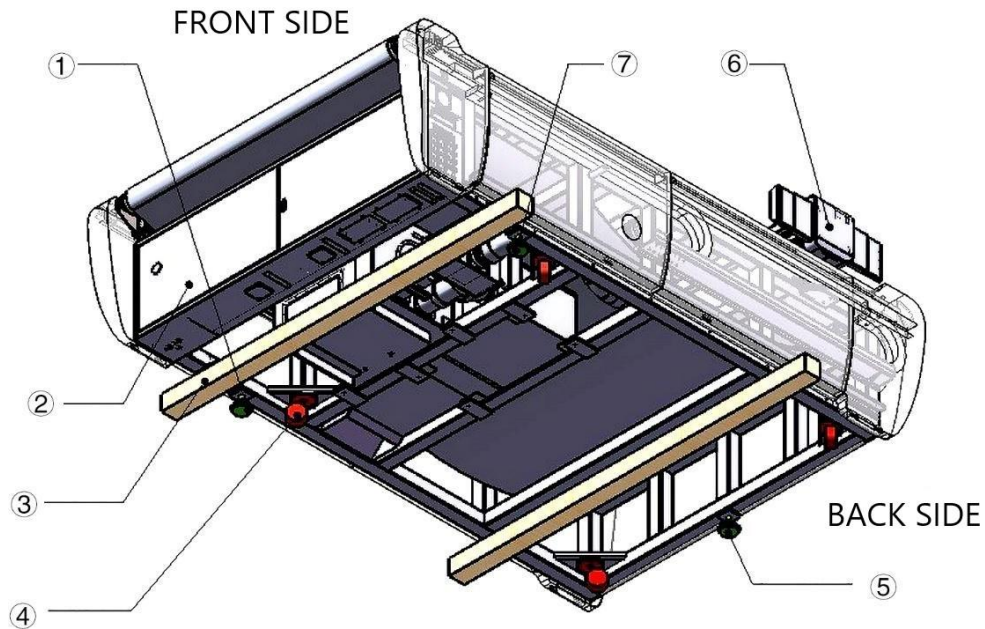


## 1. 7. Circuit Boards introductions

- Location diagram of circuit board of electrical box



## 2. Installation



Item	Name	Item	Name
1	Base frame A	2	Main box
3	Packing batten A	4	Caster
5	Base frame C	6	Gantry
7	Base frame B		

BK4 Bottom view

### 2.1. Installation of complete machine

#### 2.1.1. Loading and unloading

- Use a forklift (the arm length of the forklift shall not be less than 2.3m) to operate from the side of the machine, and pay attention to the center of gravity of the machine. Since the center of gravity

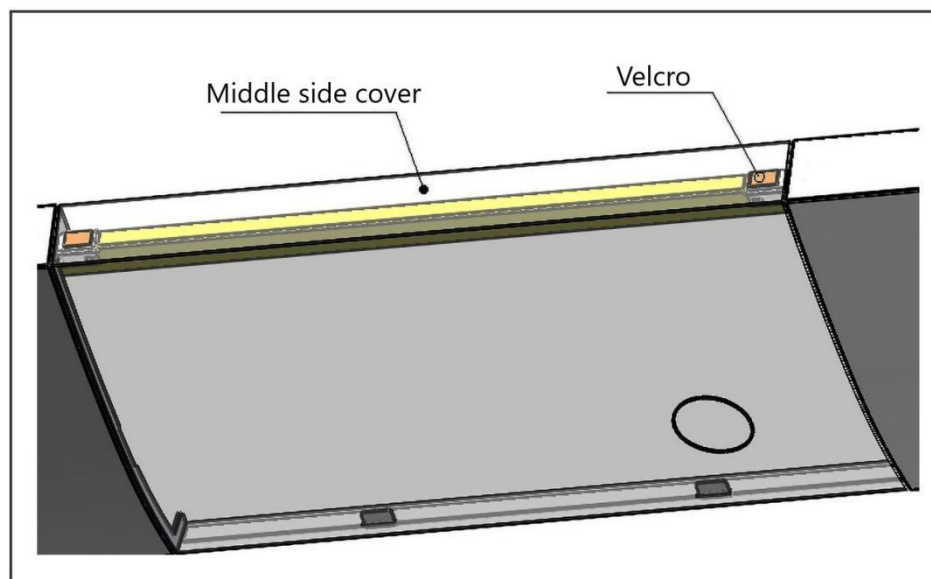


of the equipment is biased towards the front end, the cross beam is usually moved to the rear end for fixation.

- Use lifting device: four lifting ring mounting holes are provided on both sides of the equipment table to facilitate lifting with lifting rings.
- Two sleepers are installed at the bottom of the factory equipment, which can be directly placed on the flat ground °

### 2. 1. 2. Disassembly and assembly of the cover

Before installation, remove 4 middle side covers on both sides. The middle side cover is fixed on the machine with two 3M Velcro stickers on the left and right. Pull up the left and right sides of the upper part of the middle side cover to separate the bonding surface, and then remove the middle side cover °



BK4 Installation position of middle side cover

### 2. 1. 3. Remove the packing batten

Remove the fixing bolts of the packing wooden strip with an 8mm wrench, lift the equipment and take



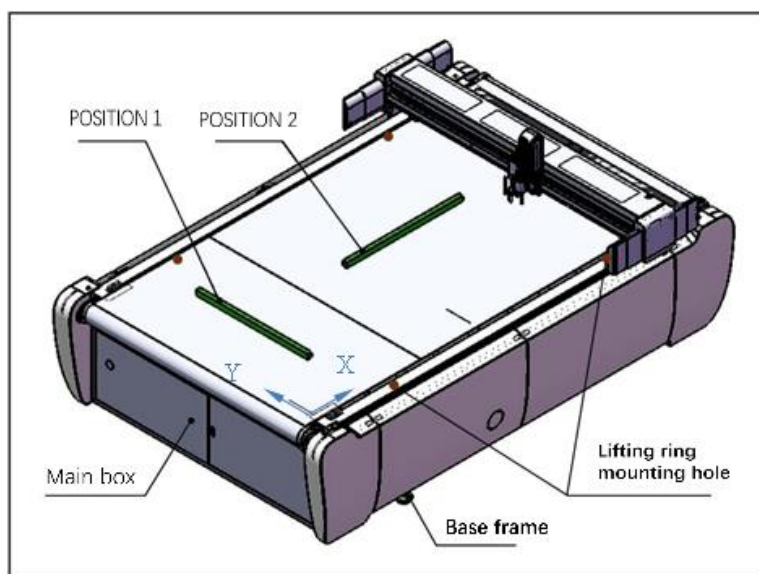
out the packing wooden strip. (forklift or "lengthening" foot can be used to lift the machine)

#### 2. 1. 4. Move the machine

The equipment is equipped with casters, which can be used to move the machine on a flat site. Before pushing the equipment, be sure to "shorten" the anchor to make the casters fall to the ground.

#### 2. 1. 5. Initial leveling of the base frame

After the equipment is moved to the installation site, adjust the base frame height to make the casters of the equipment completely suspended, and then start to adjust the table level. Note: the weight of BK4 2516 equipment is 880Kg, and the ground flatness of the equipment installation position shall not be greater than 2cm.



Schematic diagram of horizontal adjustment

#### Leveling methods :

- (1) Turn on the power and air supply, and open the air pump and air valve.
- (2) Place the level on the felt at position 1 (Y direction) as shown in the figure, and adjust anchor a



and anchor B to center the bubble of the level. Note that the felt at the place where the level ruler is placed shall be clean and avoid the felt joint.

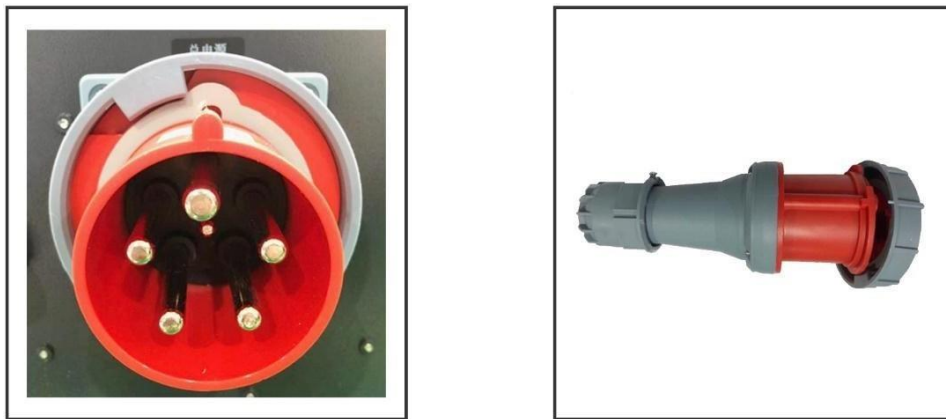
(3) Place the level on the felt at position 2 (x direction) as shown in the figure, and adjust the anchor C to center the bubble of the level. Note that the felt at the place where the level ruler is placed shall be clean and avoid the felt joint.

(4) Tighten the lock nut on the base frame

## 2.2. Power supply

Users need to provide 3-phase 5-wire power supply (3 phase lines / 1 zero line / 1 ground wire), and connect the power supply to the main input terminal of the power supply with 5-core cable.

The power access terminal of the equipment electrical box is shown in the figure.



POWER PLUG

The power output terminal of the equipment electrical box is shown in the figure. The electrical box is provided with a 380V three-phase power socket and several 220V power sockets, which can



Power supply socket



provide power for computer console, vacuum cleaner, milling cutter, feeding rack, etc.

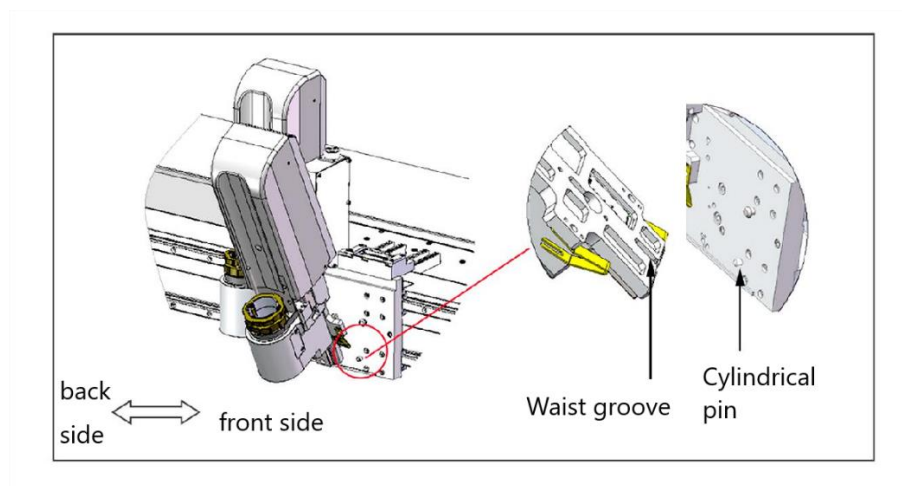
### 2.3. Air supply

An air source interface is set at the back of the equipment electrical box, and a 12mm diameter air pipe needs to be used to connect the "main air source inlet". Note: if the equipment is equipped with additional functions such as milling cutter and pneumatic vibrating cutter, the corresponding air source interface of the electrical box can be used; If there is no additional configuration, be sure to keep the



interface closed to avoid air leakage affecting the normal use of the equipment.

### 2.4. Cutting head installation

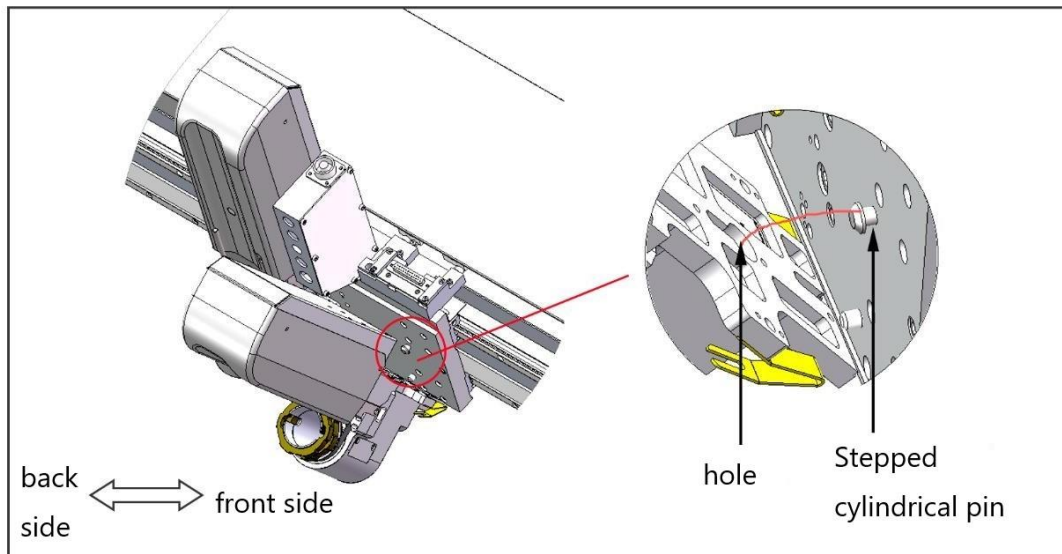


- Tilt the machine head to the support plate on the beam, and the bottom of the machine head is close to the mounting surface of the support plate. Make sure that the waist groove on the back of the head

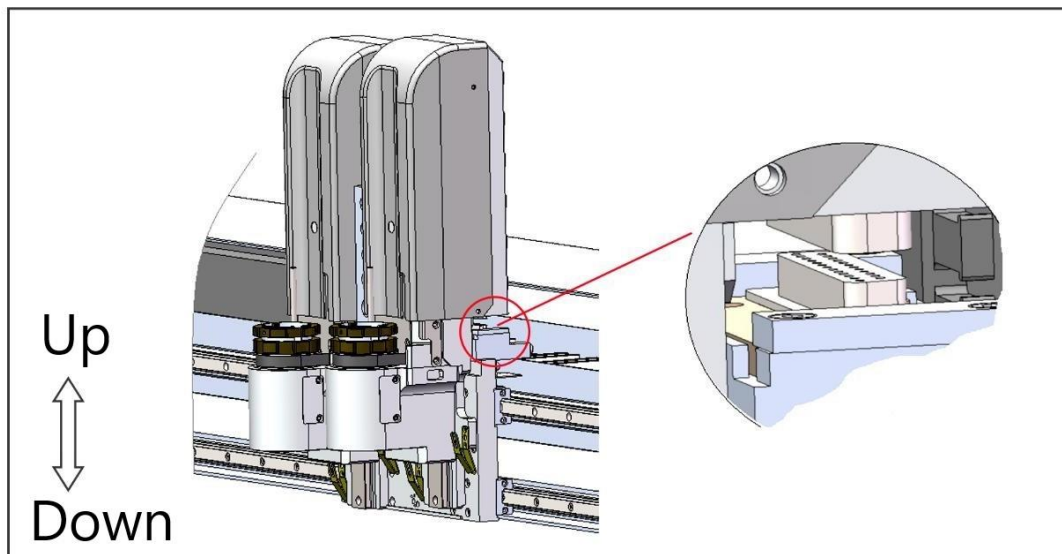




slides into the cylindrical pin on the support plate.

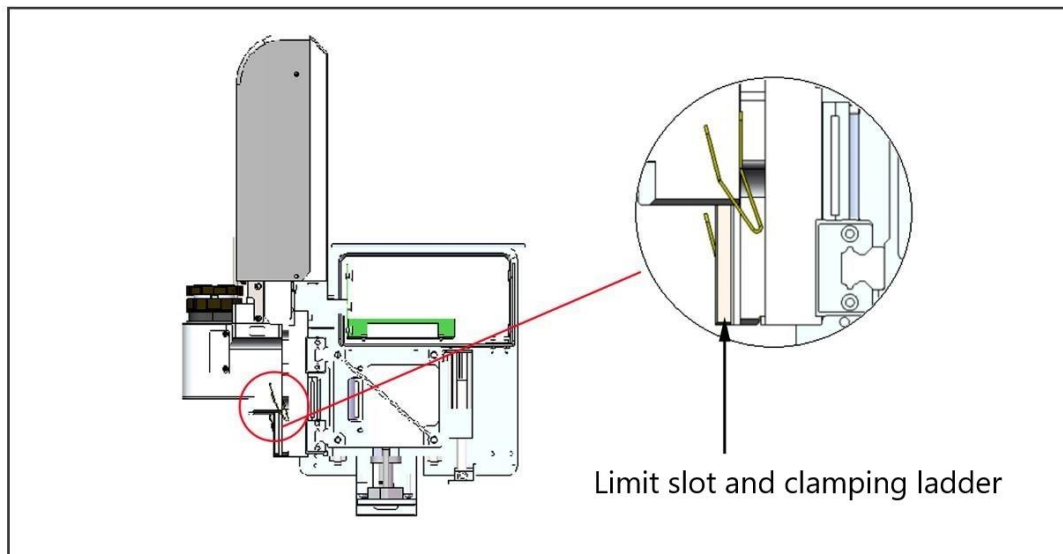


- Rotate the nose forward with the bottom of the nose as the rotating shaft. Make sure that the stepped cylindrical pin on the support plate slides into the hoist block on the back of the head.

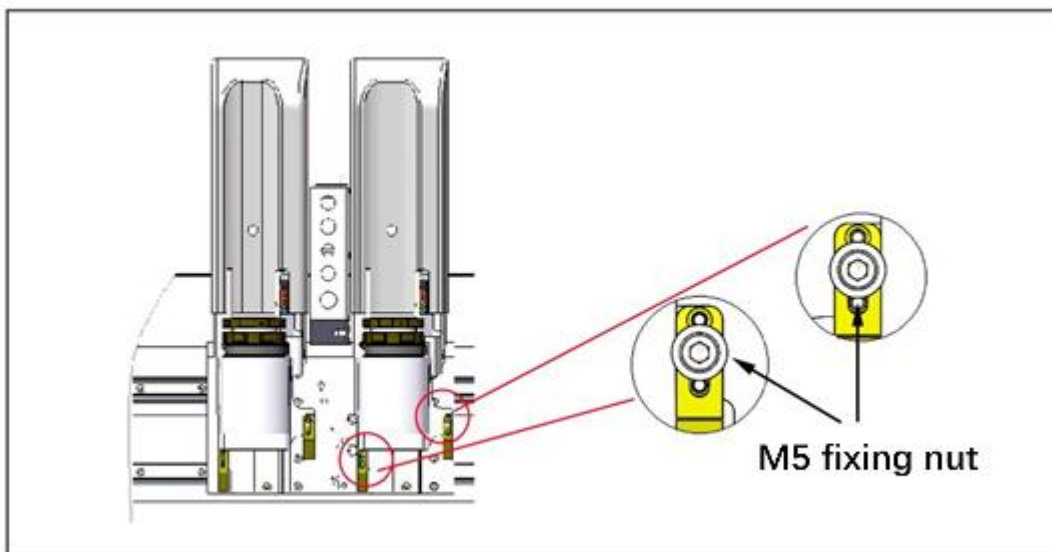


- Push the head down to the bottom (about 15mm), and insert the female flat plug on the head into the male flat plug on the support plate.





- Note: the limit slot on the back of the head must fit the clamping step on the support plate.

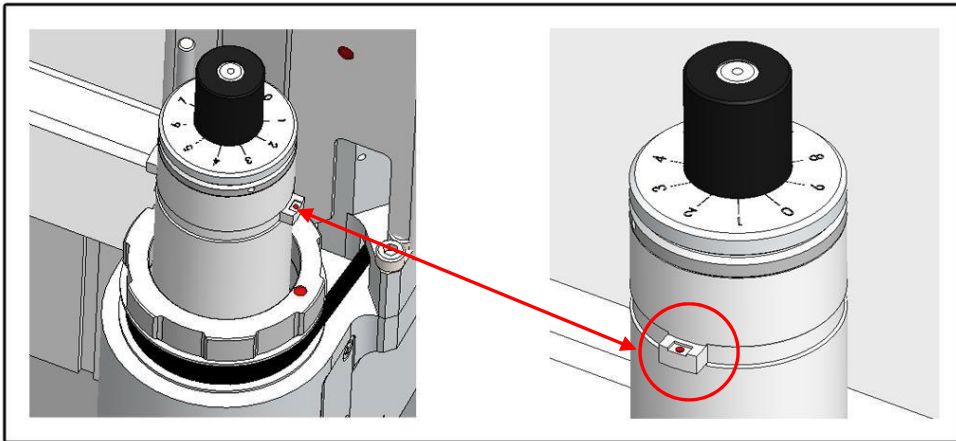
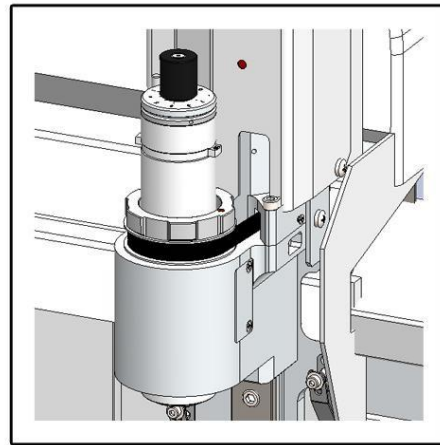
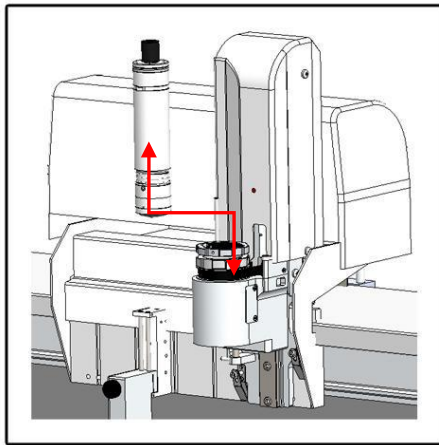


- After installation in place, tighten two M5 fixing screws with 4mm Allen wrench.

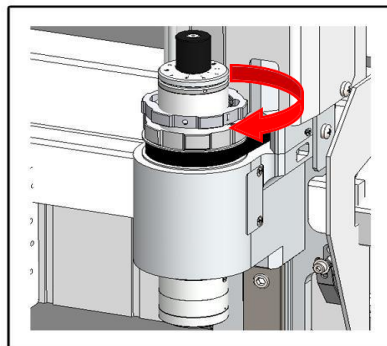


## 2.5. Cutting tools installation

### 2.5.1. UCT installation



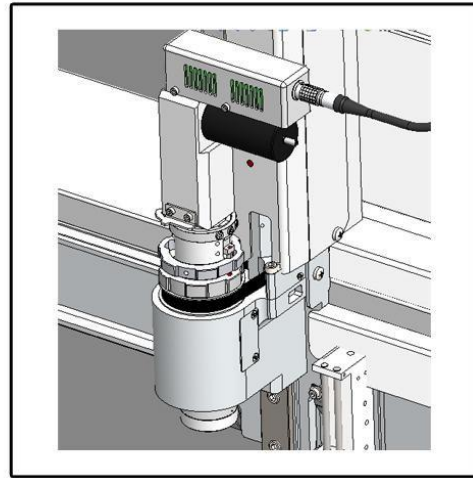
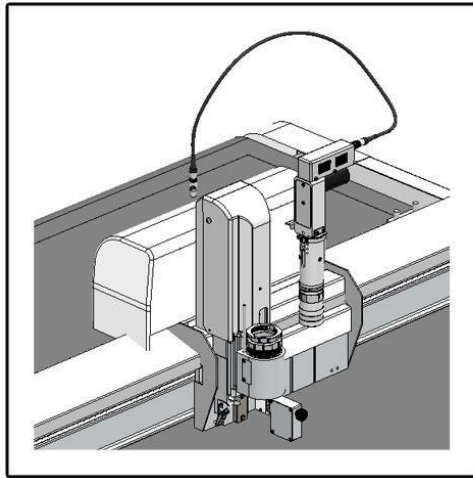
- Put the sharp knife tool into the machine head, and the red dot in the UCT corresponds to the red dot on the machine head.



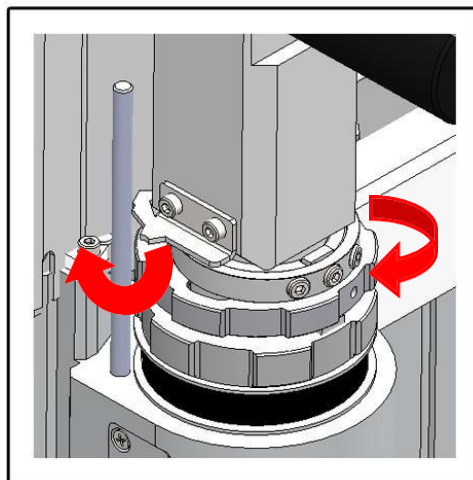
- After the UCT is completely put into the machine head, tighten it clockwise to complete the installation.



### 2.5.2. EOT installation



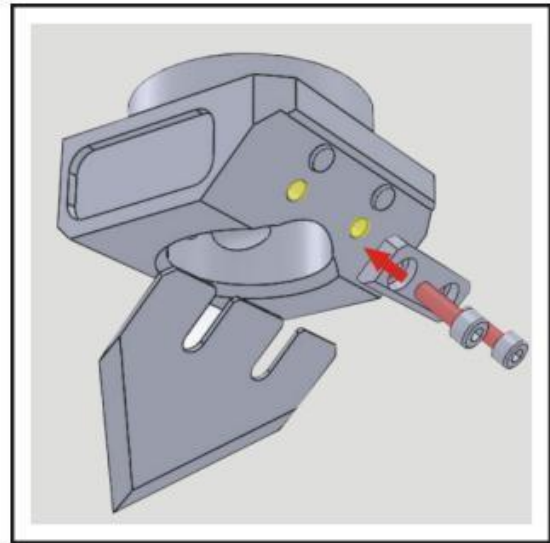
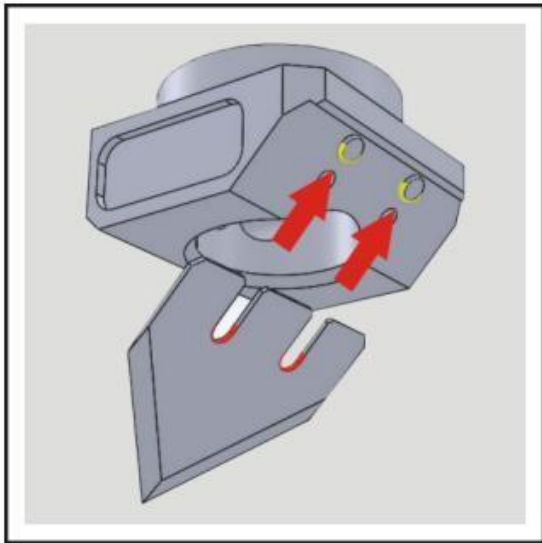
- Put the EOT into the machine head, and the red dot in the EOT corresponds to the red dot on the machine head



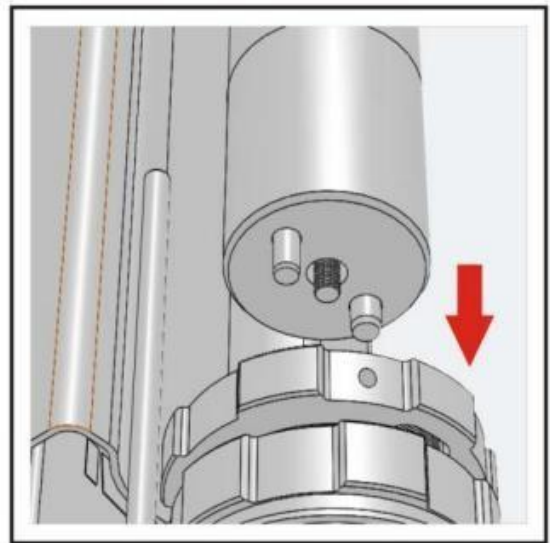
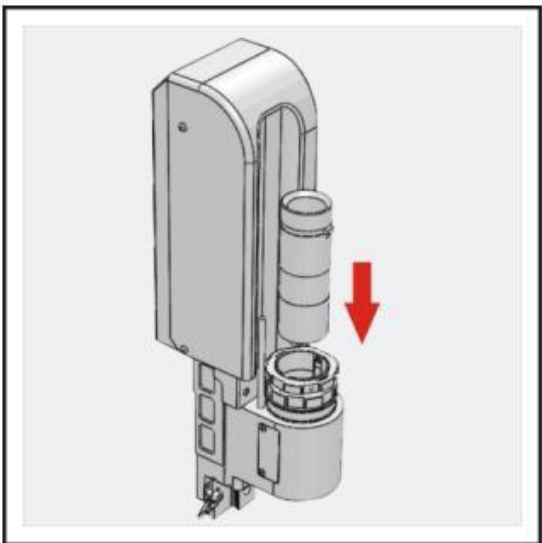
- After the EOT is completely put into the machine head, tighten it clockwise, lock the fixing block, and the installation is completed.



### 2.5.3. V-CUT installation

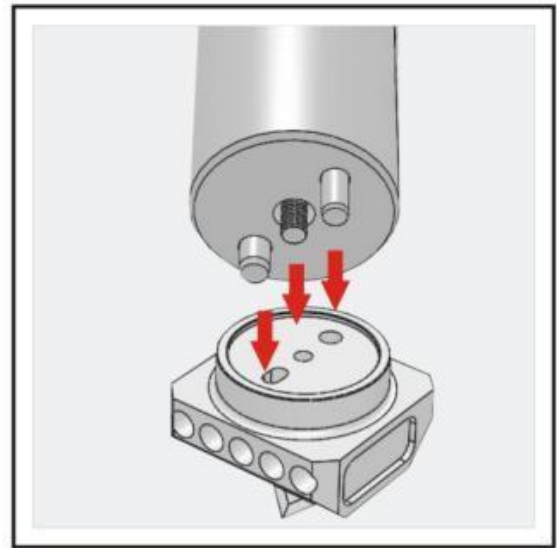
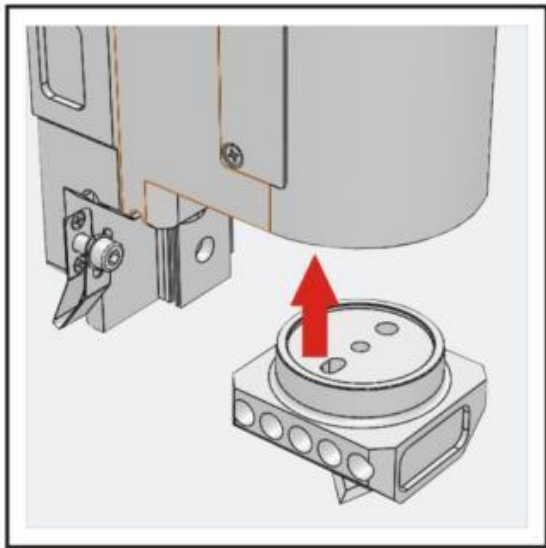


- First install the blade on the inclined cutter base, be careful about the blade slot and the locating pin on the inclined plane, and tighten two M4 \* 8 screws.

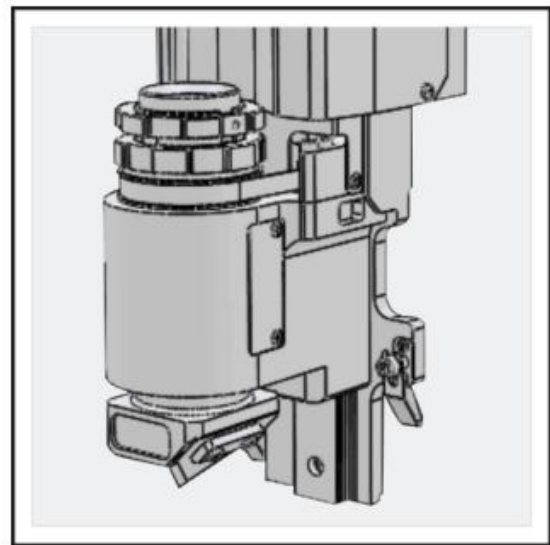
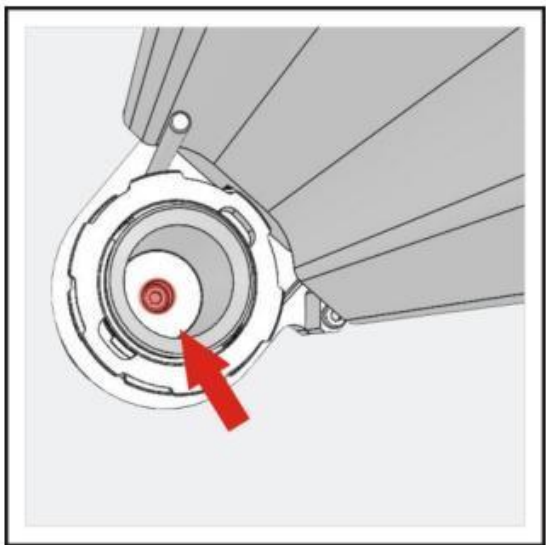


- The red dot is opposite to the red dot. Install the handle part of the oblique knife on the tool base of the machine head.





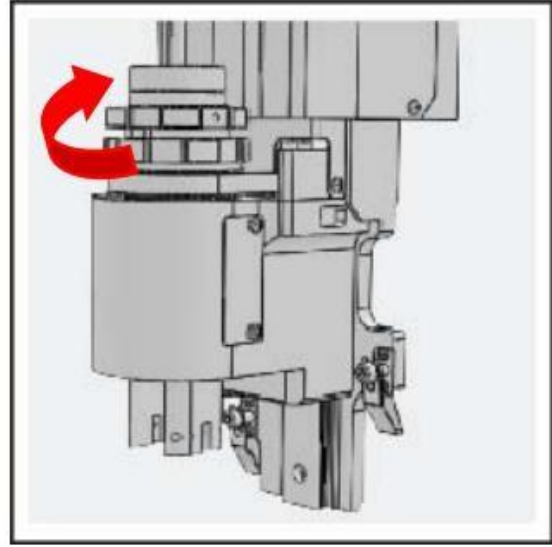
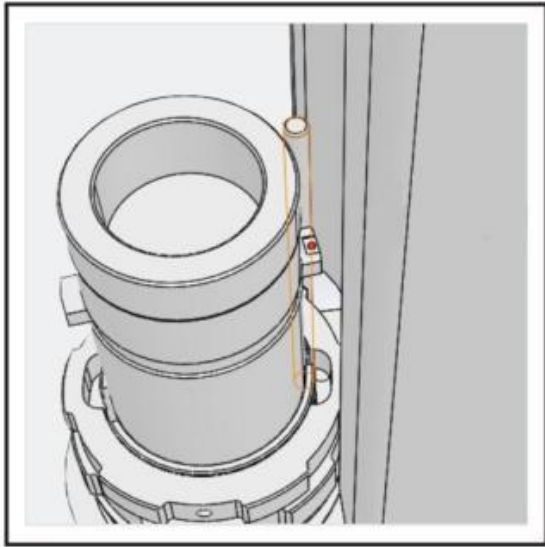
- Place the oblique tool holder at the bottom of the tool handle, and pay attention to the correspondence between the size of the positioning hole and the positioning pin of the tool handle.



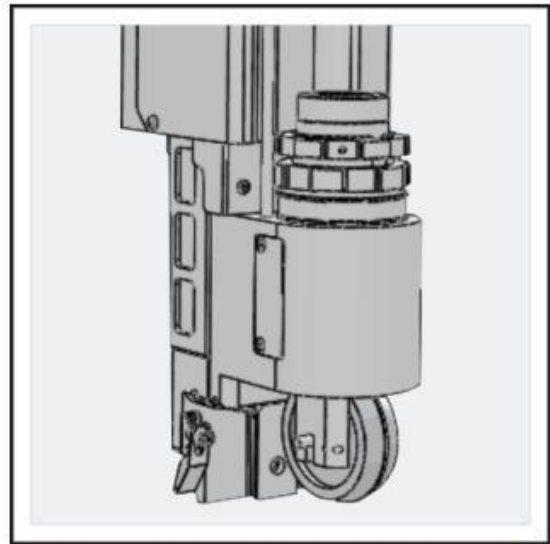
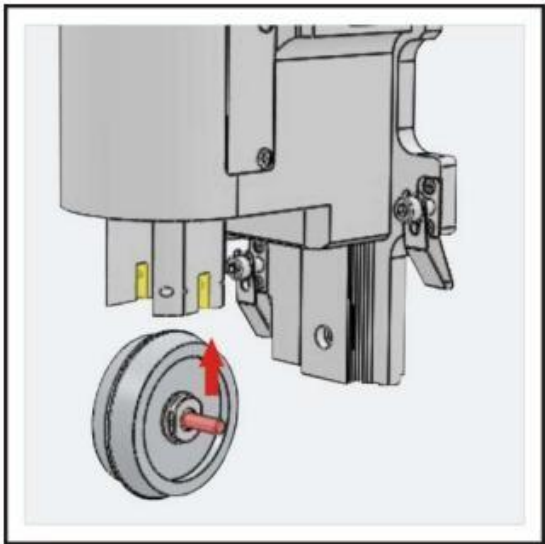
- Lock the inner screw of the tool handle from above with M4 hexagon socket tool.



#### 2.5.4. Creasing tool installation



- The red dot is opposite to the red dot. First install the handle part of the oblique knife on the tool base of the machine head.



- Buckle the pressure shaft into the two rectangular grooves of the tool handle from bottom to top.
- Check its stability.



## 3. Operation

### 3.1. Preparation

- Before starting the machine, be sure to observe whether there are people in the working area of the machine to ensure safety.
- Before starting the machine, be sure to tidy the machine table to ensure that there are no sundries in the X \ y drag chain slot during starting.
- Check whether the y-direction guide rail has lubricating oil.
- Check whether the air pressure reaches 0.6MPa.
- Check whether the tool selection and installation are correct.

### 3.2. Steps

- Power on the machine.
- The cutting machine starts to reset. Reset process: head height reset, X and Y direction reset, head rotation reset, head moving to the origin position.
- Adjust the tool depth of the machine head to avoid cutting the felt.
- Lay the materials to be cut on the cutting table, and turn on the vacuum pump to make the cutting materials adsorb on the cutting table smoothly. If it is a breathable material, it needs to be covered with film.

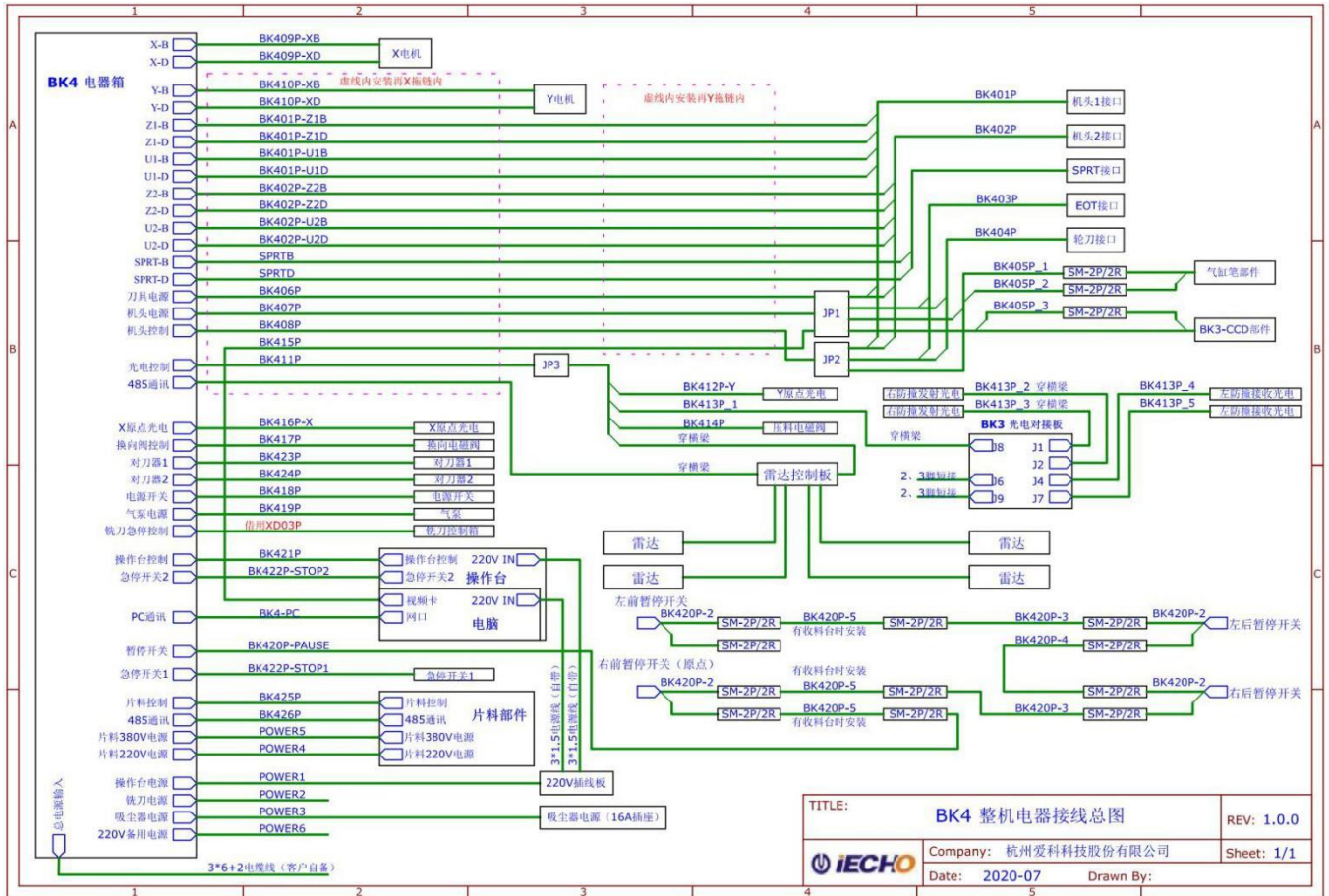
Open "IECHO digital cutting system" and import the sample file designed by the user (the data format can be DXF, PLT, PDF, HPG, HPGL, TSK, BRG, XML, cut, oxf, ISO, AI, PS, EPS, etc.). The system



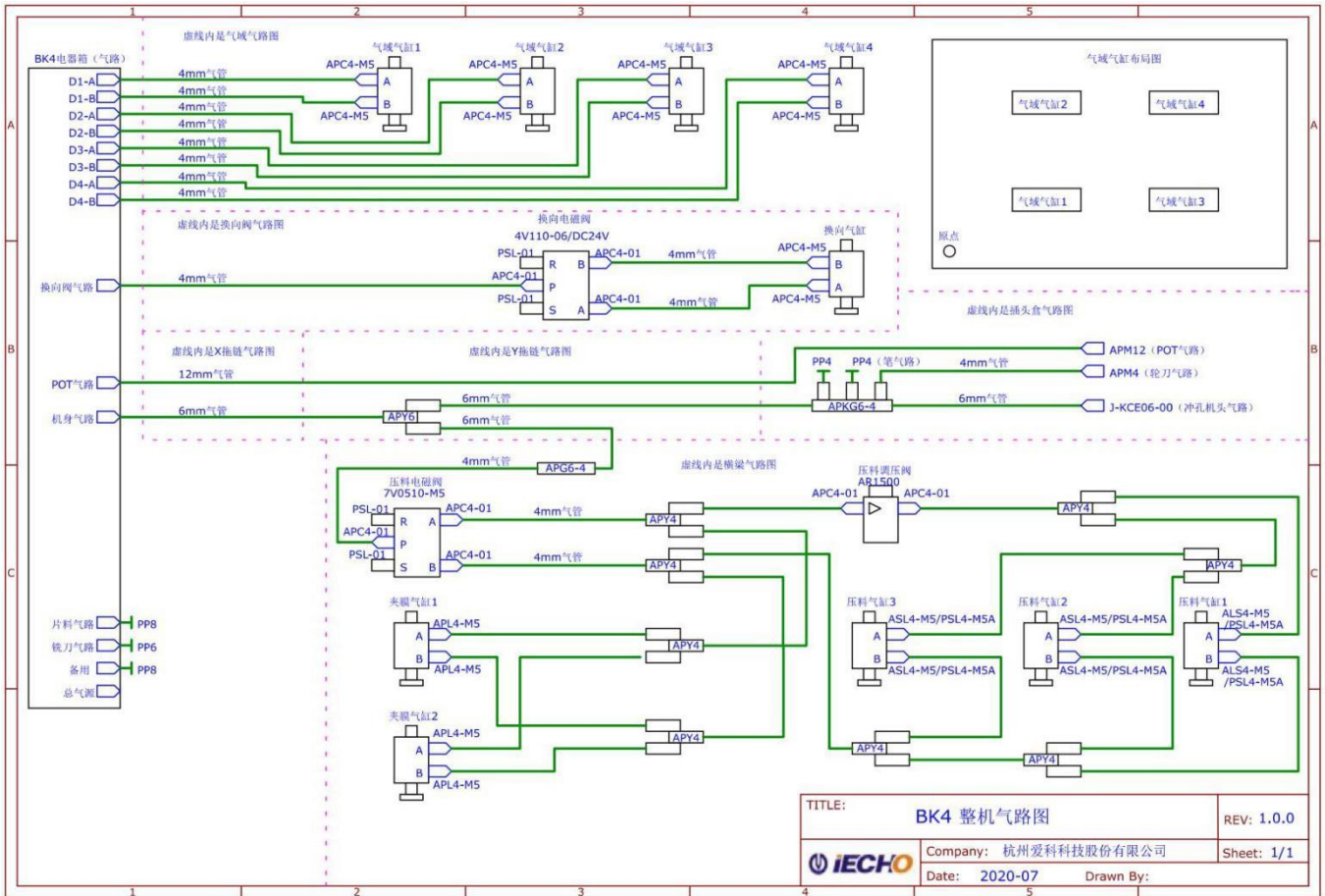


## 4. Electrical wiring instructions

### 4.1. BK4 Circuit diagram of Machine



## 4.2. BK4 Gas circuit diagram



## 5. Common Error and Troubleshooting

Item	Common error	Trouble shooting
1	Cutter cannot start	<ol style="list-style-type: none"> <li>1.Check whether the circuit breaker tripped.</li> <li>2.Check whether the fuse is burned out.</li> <li>3.Check whether the red switch is broken.</li> <li>4.Check the plug connected to electrical box interface with a multi meter. Check whether the circuit of the 220V power</li> </ol>
2	Cutter suction force weakened, failed to fix the materials well	<ol style="list-style-type: none"> <li>1.Put one piece of plastic film on the surface of the materials if they are breathable.</li> <li>2.Clean the vacuum entrance filter net if it is blocked.</li> <li>3.Check whether there`s leakage on the vacuum plate and pipes.</li> </ol>
3	Materials couldn't cut though	<ol style="list-style-type: none"> <li>1.Knife height not enough; Increase cutting knife depth.</li> <li>2.Change new blades.</li> <li>3.Check the flatness of the cutting table;</li> </ol> <p>Contact services if needed.</p> <ol style="list-style-type: none"> <li>4.Materials cannot totally cut off; Put a piece of perforated paper on the table surfac</li> </ol>
4	Could not cut off patterns at the corners	Open the dialogue box of Cutter Parameter Setting, reset the Knife Up Compensation and Knife Down Compensation
5	Files are sent CutterServer failed	Use Diagnose function in CutterServer, to check the DSP version



## 6. Safety Attentions

- GND electrical wire connected to the ground.
- Use the required specification wires for electric power connection since the big power of the machine.
- Check the synchronous belt before switch on the machine, in case it's blocked by materials fragments.
- Press the Emergency stop button or switch off the power in case of emergency.
- Operators and staffs shall not reach into the danger area when the cutter is working.
- In principle, any troubleshooting work or inspection on the cutter is to be carried out only when the power is off.
- Cutting heads adjustment and tools changes shall be carried out only when it is stopped.



## The design and use of this product comply with relevant specifications :

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2021.11.16



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