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CNC ENGRAVING MACHINE
USER MANUAL

MODEL: S4040

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S4040
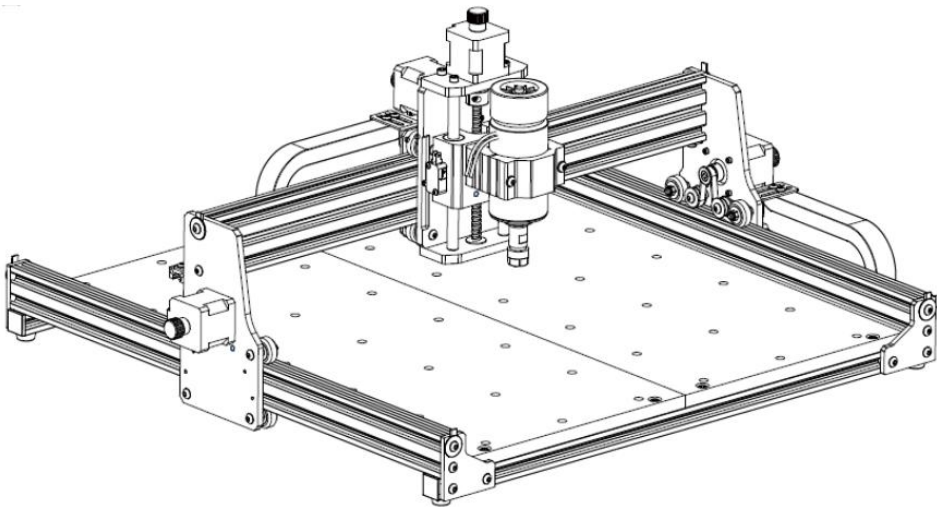
Scan for videos and guides

NEED HELP? CONTACT US!

Have product questions? Need technical support? Please feel free to contact us:

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This is the original instruction, please read all manual instructions carefully before operating. VEVOR reserves a clear interpretation of our user manual. The appearance of the product shall be subject to the product you received. Please forgive us that we won't inform you again if there are any technology or software updates on our product.

	Warning-To reduce the risk of injury, user must read instructions manual carefully.
	Warning- Be sure to wear eye protectors when using this product.
	Indoor Use Only
	Do not touch any rotating parts when the machine is running
	Always wear protective glasses when use the machine
	Prohibited from use in flammable objects or gases
	Do not touch the socket with wet hand to reduce risk of electrocutions
	Please cut off the power immediately in case of emergency
	This product is subject to the provision of European Directive 2012/19/EC. The symbol showing a wheelie bin crossed through indicates that the product requires separate refuse collection in the European Union. This applies to the product and all accessories marked with this symbol. Products marked as such may not be discarded with normal domestic waste, but must be taken to a collection point for recycling electrical and electronic devices

Important Safety Instructions

Warning: To reduce the risk of burns, electrocutions, or injury to persons!
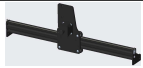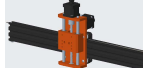
MATTERS NEED ATTENTION
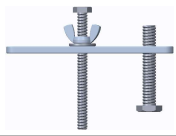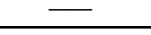
 Warning

◆ Please wear protective glasses when using the machine. In case your eyes hurt.

◆ Before replacing the tool, please disconnect the power supply of the machine to avoid accidents.

◆ Unplug the socket when not in use, before replacing parts and maintaining the machine.

◆ Unplug when assembling and disassembling the unit.

◆ Close supervision is necessary when any appliance is used near children.

◆ To avoid jamming, do not force the unit to operate with excessive pressure.

◆ Do not immerse wires or machines in water, as this can cause electric shock.

◆ This appliance is not intended for use by persons(including children) with reduced physical, sensory, or mental capabilities or lack of experience and knowledge unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

◆ Children should be supervised to ensure that they do not play with the appliance.

◆ If the supply cord or plug is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. Or do not operate this appliance. Return it to the store of service or repair by a professional serviceman.

SAVE THESE INSTRUCTIONS

1.Parts List

Part No	Part Name	Explanation	Quantity	Picture	Remark
		S4040 Parts List			
01	Component for Y1-axis	——	1Set		
02	Component for Y2-axis	——	1Set		
03	Component for X-axis	——	1Set		
04	Aluminum profile (X)	2020V*577mm	2Set		
05	Aluminum profile (Y)	2020V*540mm	1		
06	Workbench	——	2		
07	Spindle clamp	Φ52，Aluminum	1Set		
08	Spindle motor	300w，ER11-8mm	1Set		
09	L-shaped connector	With set screw 2-M5*6	4Set		
10	Inner hexagon screw	M5*35	2		
11	Inner hexagon screw	M5*14	4		
12	Inner hexagon screw	M5*12	12		
13	Inner hexagon screw	M5*10	8		
14	Inner hexagon screw	M5*6	1		
15	Inner hexagon screw	M4*10	6		
16	Inner hexagon screw	M4*8	4		Already assembled
17	Trapezoidal nut	M5-20	16		
18	Hexagon nut	M4	6		
19	Washer	Φ5-Φ20	4		
20	Coverplate	2020	3		
21	Support	——	1		
22	Wire cover plate	——	1		
23	Pressing plate	100mm	4		Pressing plate assembly drawing
24	Screw	M8*55	4		
25	Screw	M6*80	4		
26	Washer	Φ6*2mm	4		
27	Butterfly nut	M6	4		
28	Control box	——	1		
29	Power supply cord	——	1		
30	Offline controller and data cable	Touch screen with SD card	1Set		
31	Towing chain	15*10*660	2	——	Cable has been threaded into the tow chain
32	Spindle motor wire	2P,2100mm	1	——	
33	X Stepper motor wire	4P-6P, 2100mm red	1	——	
34	Y1 Stepper motor wire	4P-6P,2100mm yellow	1	——	
35	Z Stepper motor wire	4P-6P,2100mm white	1	——	
36	Y2 Stepper motor wire	4P-6P,1350mm blue	1	——	
37	Y-Limit wire	2P-3P,1350mm	1	——	
38	X/Z-Limit wire	2P-3P,2100mm	2	——	
39	USB cable	——	1	——	
40	Connection terminal	——	1		
41	Milling cutter	3.175	1		
42	Inner Hexagon Wrench	2/2.5/3/4mm	1Set		
43	Nut Wrench	14/17mm	1Set		
44	Probe	——	1		
45	Soft brush	——	1		
46	U Disk	——	1		
47	Instruction manual	——	1	——	

2. Machine Assembly

① Y-axis component and aluminum profile assembly

20: Coverplate 2020 3PCS

60mm

200mm

56mm

200mm

60mm

Only this hole has M5 teeth

01: Component for Y1-axis 1Set

09: L-shaped connector 4Set

05: 2020V*540 1PCS

02: Component for Y2-axis 1Set

13: M5*10 8PCS

04: 2020V*577 2Set

17: Trapezoidal nut M5-20

17: Trapezoidal nut M5-20 8PCS Slip into in advance

② Workbench assembly

Workben suface is side up

06: Workbench 2PCS

12: M5*12 8PCS

17: Trapezoidal nut M5-20 8PCS
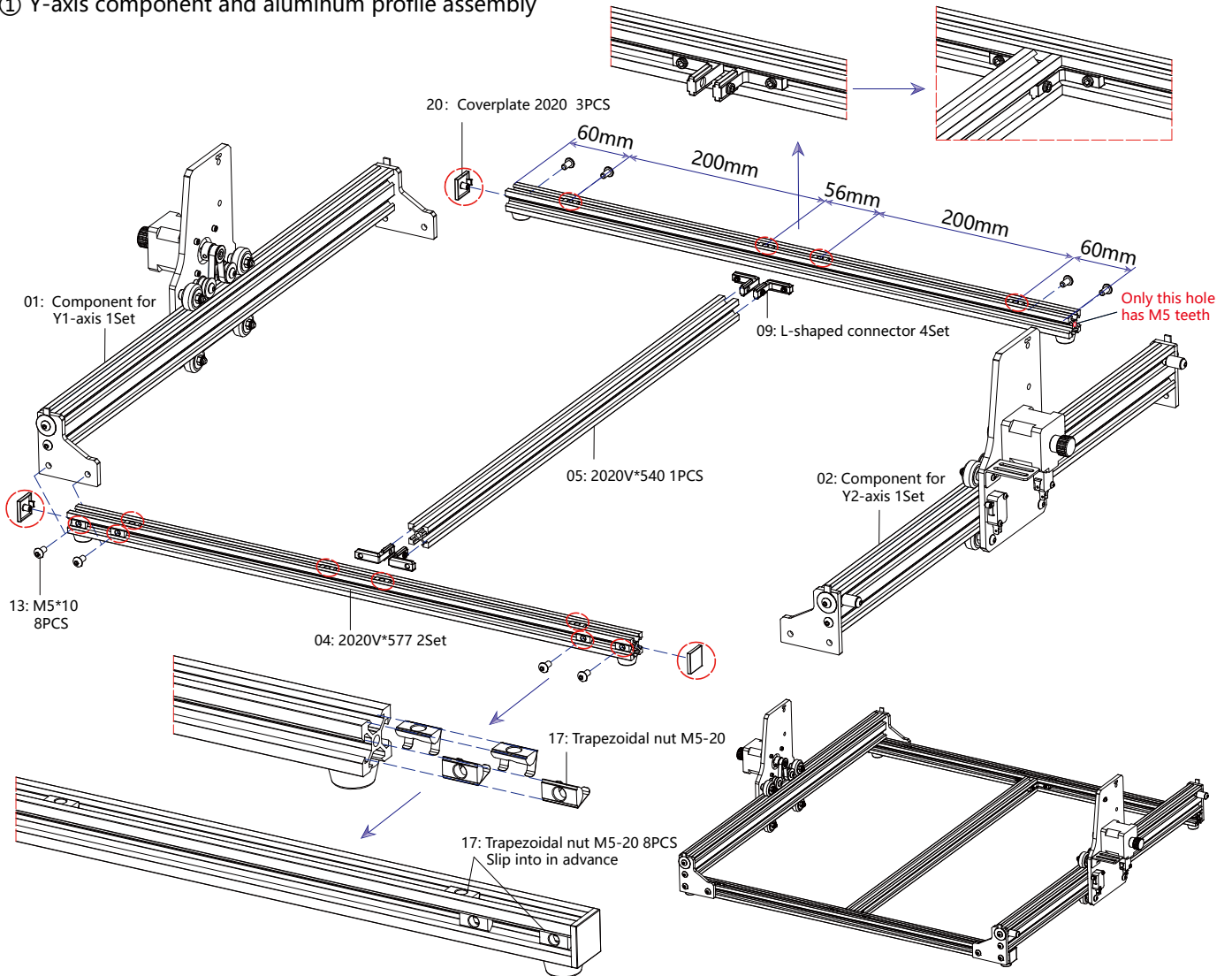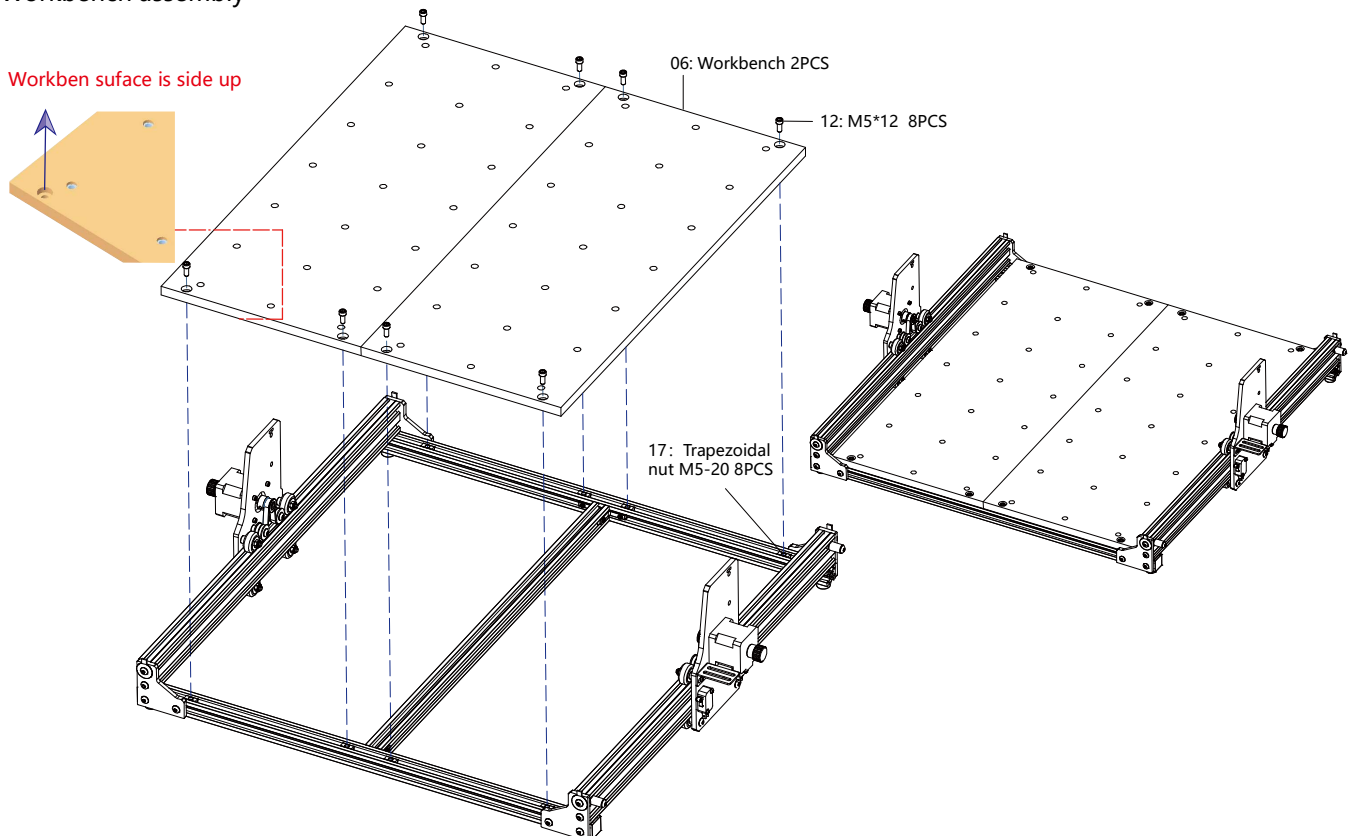
③ X-axis component assembly

03: Component for X-axis 1Set

19: Φ5-Φ20 4PCS

11: M5*14 4PCS
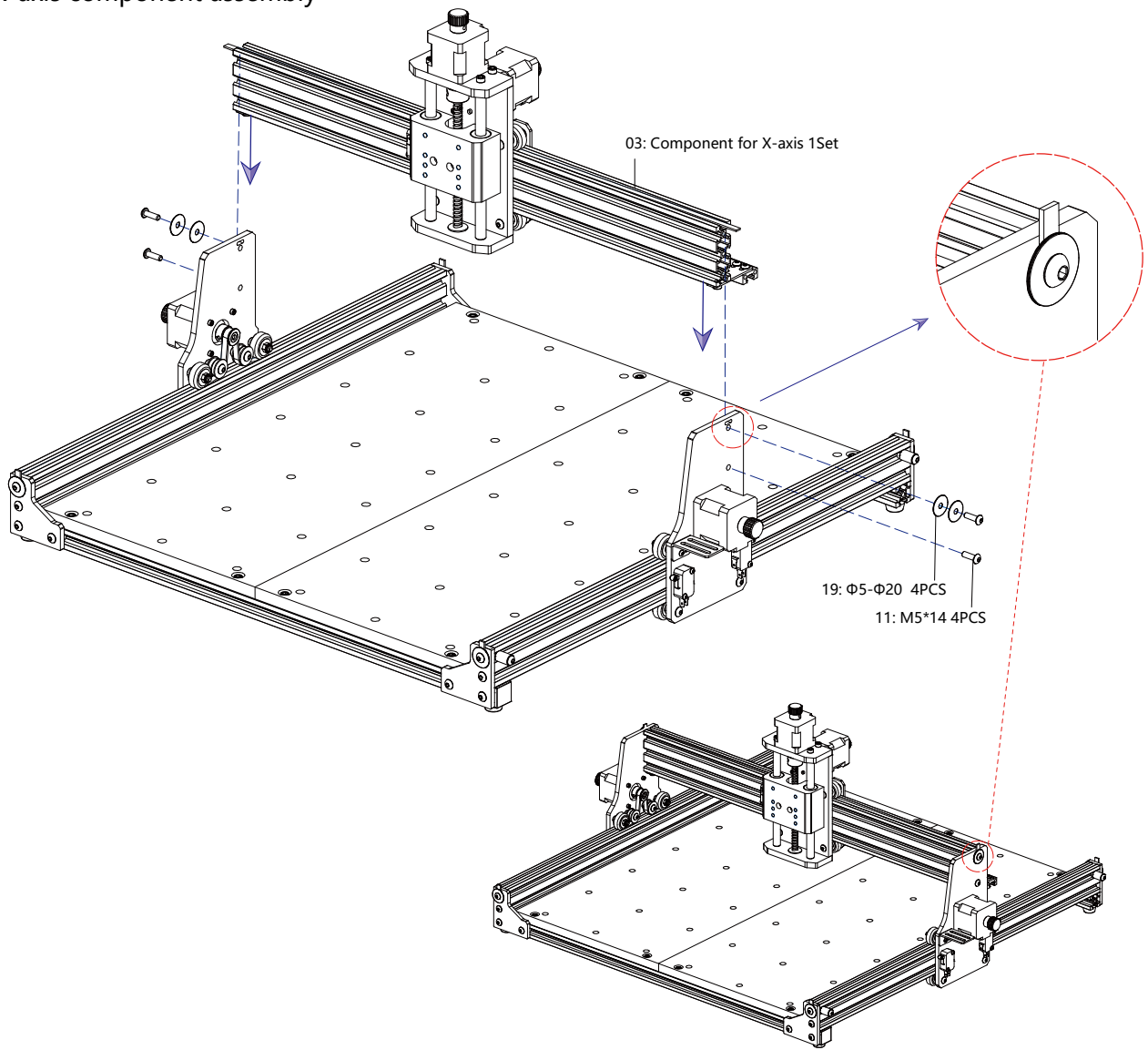
④ Spindle fixture and motor assembly

08: Spindle motor 1Set

07: Spindle clamp 1Set

12: M5*12 4PCS

10: M5*35 2PCS

⑤ Towing chain assembly

15: M4*10 2PCS

16: M4*8 2PCS

31: 10*15*660 1PCS

15: M4*10 2PCS

31: 10*15*660
1PCS

18: Hexagon nut
M4 2PCS

31: 10*15*1000

18: Hexagon nut
M4 2PCS

15: M4*10 2PCS

31: 10*15*660

14: M5*6 1PCS

18: Hexagon nut
M4 2PCS

21: Support 1PCS
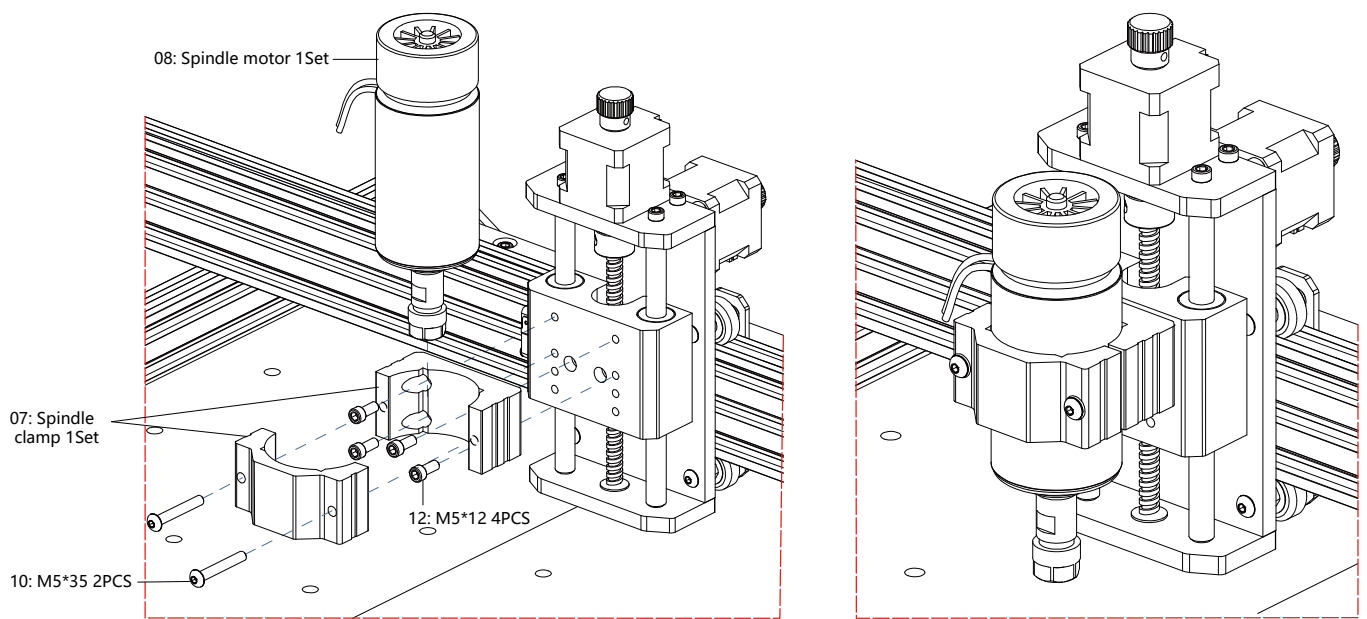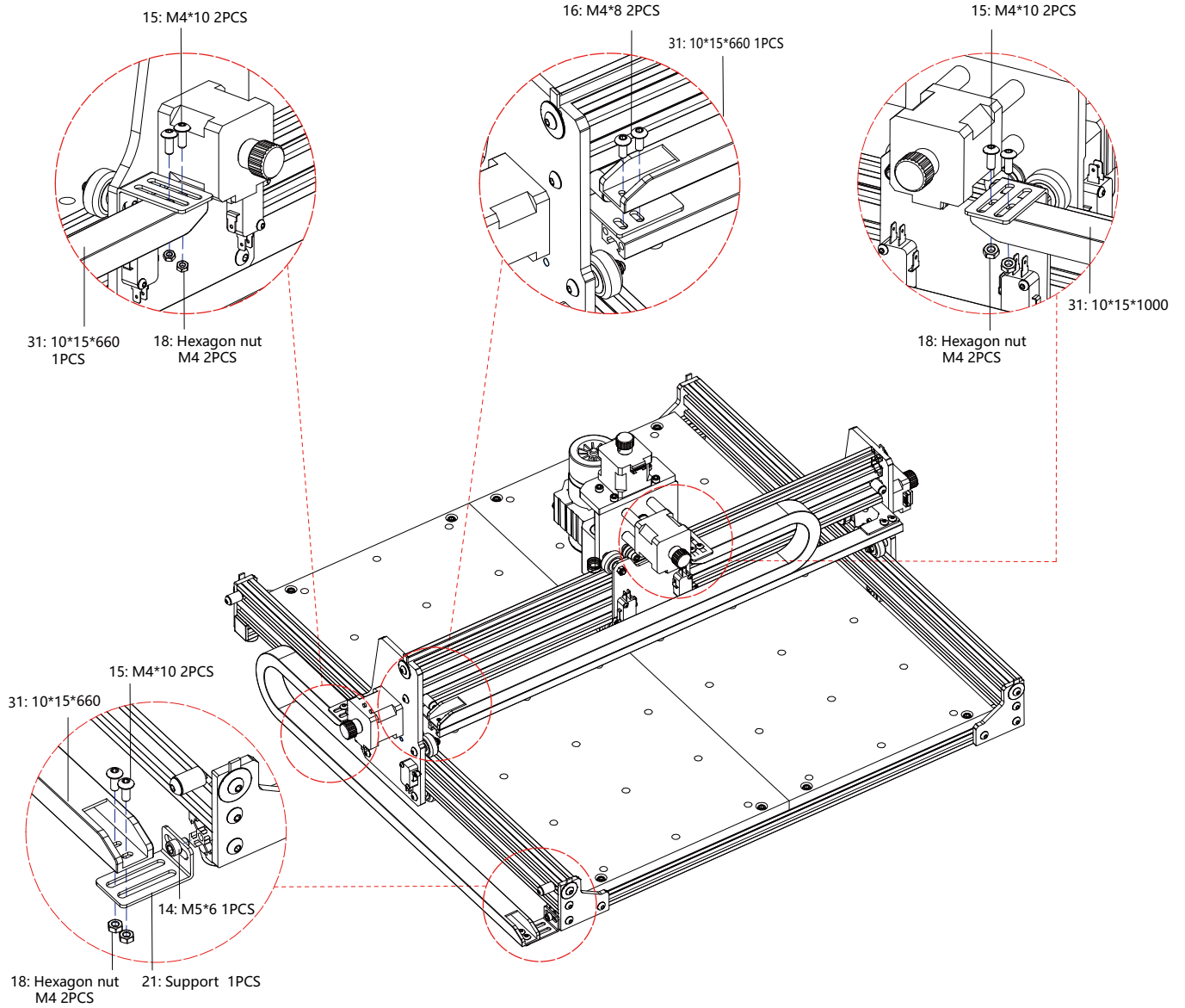
⑥ Machine drawing of completed assembly
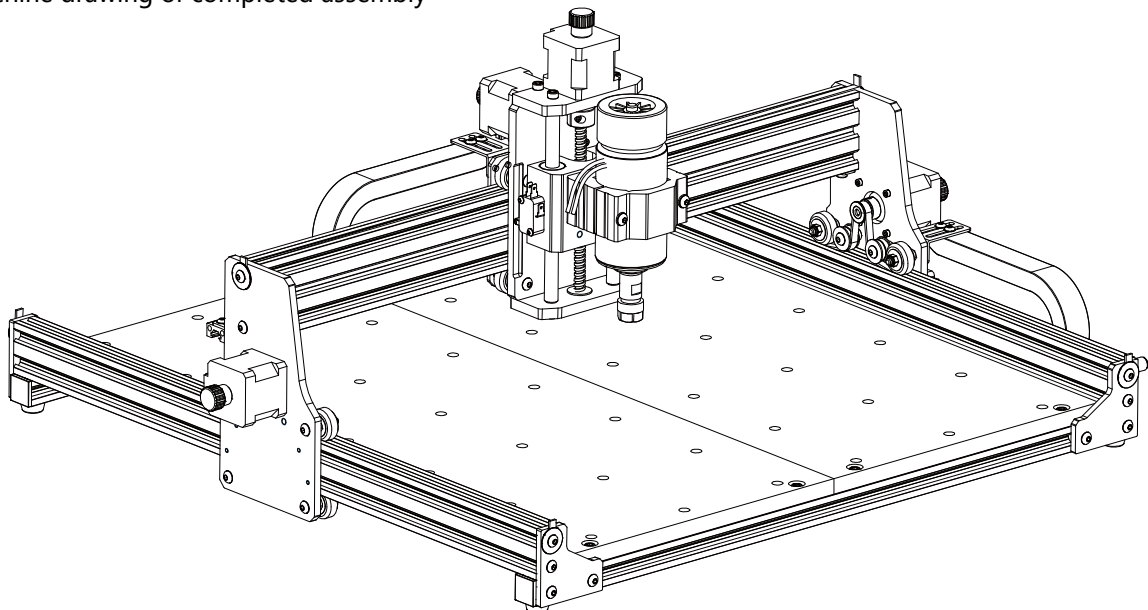
3. Instructions for ports on the control-box

Power Switch

Offline USB Hold Run

Computer

offline controller

Probe X-Limit Y-Limit Z-Limit Laser PWM -24V+ X-Axis Y1-Axis Y2-Axis Z-Axis -Spindle+

X/Y/Z-limit wire can be inserted into any X/Y/Z-limit port without distinction.

a. Y1 motor wire through the slot

b. Install the cover plate to fix the wire

Z-Limit 2P-3P, 2100mm

X-Axis 4P-6P, 2100mm

Y1-Axis 4P-6P, 2100mm

Z-Axis 4P-6P, 2100mm

Spindle Motor 2P, 2100mm

Y2-Axis 4P-6P, 1350mm

Z

Y1

X

Y2

22: Wire cover plate 1PCS

X-Limit 2P-3P, 2100mm

Y-Limit 2P-3P, 1350mm

4. Candle Software

Candle is a GUI application for GRBL-based CNC-machines with G-Code visualizer. Candle is an open-source software suitable for CNC machine tool processing. It supports G code file processing and visual display.

Supported functions:

(1) Controlling GRBL-based CNC-machine via console commands, buttons on form, numpad.
(2) Monitoring CNC-machine state.
(3) Load, edit, save and send G-code files to CNC-machine.
(4) Visualizing G-code files.

4.1 States

Work coordinates:
   Represents current X, Y & Z local coordinates of the CNC.

Machine coordinates:
   Represents current X, Y & Z absolute machine coordinates.

One of following CNC status:
◎ Idle - waiting for a G-code command Running - running a G-code command
◎ Home - homing cycle is executing
◎ Check - G-code command check mode is turned on
◎ Hold - paused by a "!" command, need to be restarted by a "~" command
◎ Alarm - CNC doesn't know where it is and blocks all G-code commands
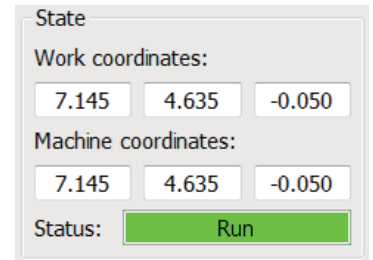
4.2 Control

Home button
Starts the homing cycle procedure with "$H" command

Z-probe
Starts the zero Z-axis search procedure using the command specified in the settings ("Z-probe commands" box). Example command:G91G21; G38.2Z-30F100; G0Z1; G38.2Z-1F10

Zero X/Y
Zeroes the "X" and "Y" coordinates in the local coordinate system. Also retains an local system offset ("G92") for later use.

Restore X/Y/Z
Restores local system coordinates with "G92" command.

Safe Z
Moves tool by "Z"-axis to safe position. Position coordinate can be specified in the "Safe Z" setting. Position must be specified in machine coordinates.

Reset
Resets CNC with "CTRL+X" command

Unlock
Unlocks CNC with "$X" command.

4.3 Software using steps

(1). Install the driver
   For the first time use, please connect the device to the computer via USB cable, and click the **CH341SER.exe** file in the driver folder to install the driver. Under normal circumstances, the Win10 system will automatically identify and install the driver. For Win7 and Win8 systems, please install it manually.

(2) Set the port and connection

After installing the driver, open the device manager of the computer and click on the port option to see the content inside the red box on the screen shown in the figure below (the port information is in brackets).

Remember the port information queried above, switch to the **Candle** software interface and click the "Settings" option in the upper left corner. Selecting the setting will pop up the setting window. Under "Connection", select the port name you queried, select the baud rate 115200, and then click the "ok" to finish the setting.

(3). Complete connection

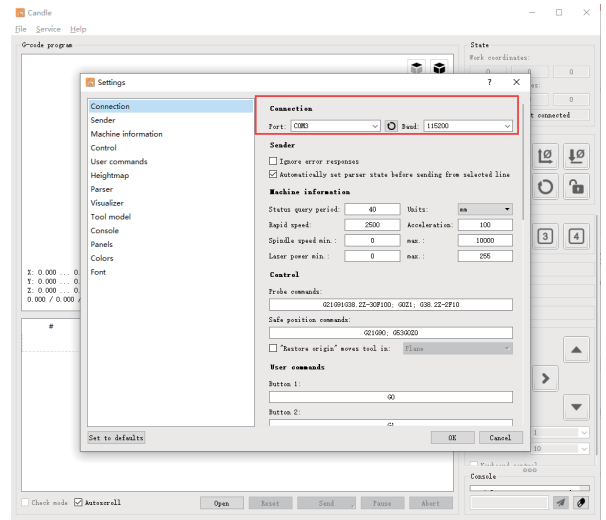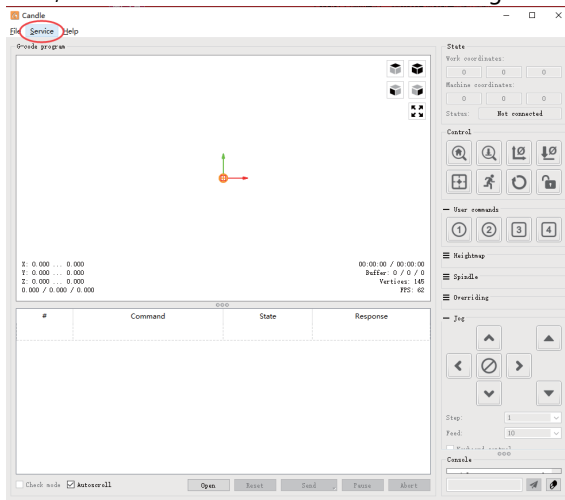After setting the port and baud rate, click Finish. The status bar at the top right of the Candle interface will show Idle, and at the same time, the console at the bottom right will display the information shown below, indicating that the connection has been successfully established.

(4). Processing documents

Click "File" option at the top of candle, then click "New" to create G-Code. On the command bar at the bottom of the interface, click "Open" to select a G code file that has been made to import the file. After importing, the middle of the interface will display a visual graph composed of tool paths (the position of the pen-shaped graph in the graph is the current tool position). In the visualization window, hold down the left mouse button to move to rotate the graph, and hold down the right button to move. Graphics, scrolling the middle wheel can zoom in and out of the graphics. At the same time, the content of the G-Code will be displayed in the lower command bar. During processing, the machine will run one by one according to the G-Code commands.
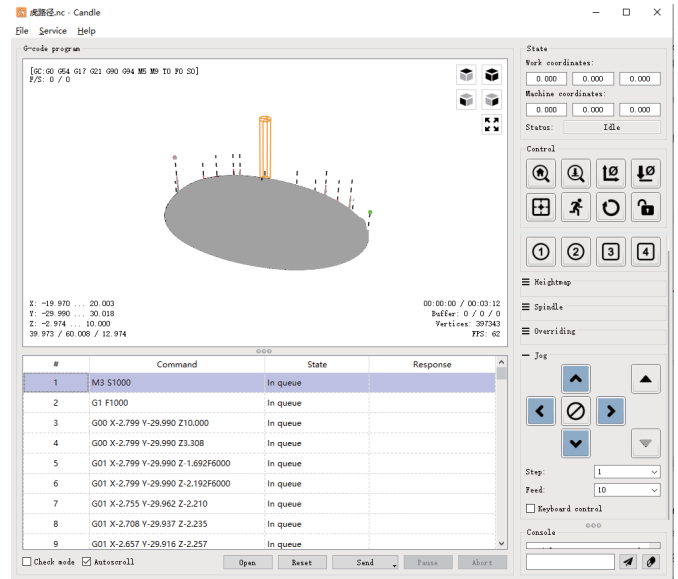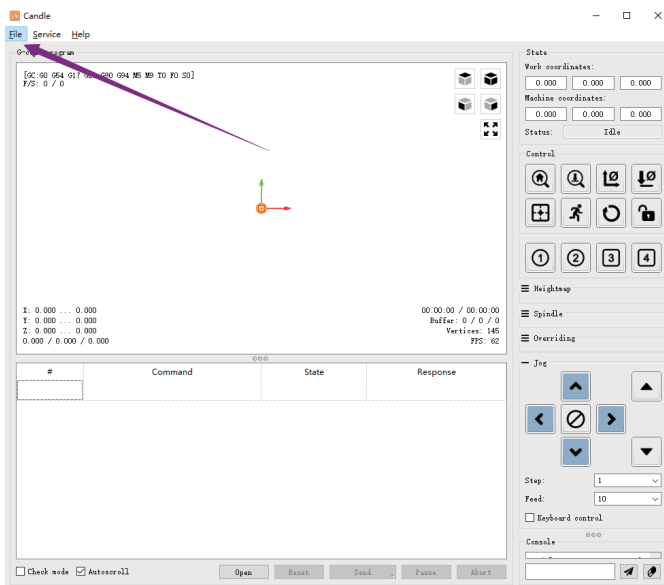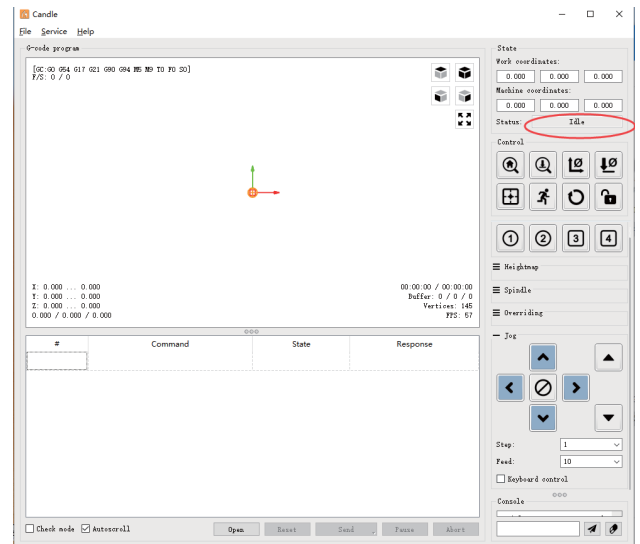
(5). Fixture, tool installation and Set the working coordinate origin

The fixture in the product kit is not assembled. There are four sets in total. The appearance and usage of the assembled fixture are shown in the right figures.

Before running the G code program, you need to find the position of the engraving figure relative to the overall engraving plate. There is a three-axis coordinate system in the visual graphics. The origin of the three-axis coordinate system is the tool setting point of the actual processing graphic.

You can move the tool to determine the position of the engraving graphic relative to the overall engraving plate based on the position of this origin. The engraving figure in the figure below is taken as an example.

After the selected tool position is started, the X/Y and Z axes are reset to zero (the [⌊0] [⌊0] are zeroing X/Y and Z axes buttons). Before returning to zero, make sure that the tool approaches the distance of one sheet of paper for engraving, and then return the X/Y and Z axes to zero (please use a flat-bottom sharp knife when engraving, and use a cylindrical milling cutter when machining planes, slots, and holes) The effect is that the sculpted figure will be carved with the blade tip as the origin.

The ER11 collet on the spindle motor should be clamped into the fixed head first, and it must be clamped in place. When installing the cutter, please do not extend the collet too much, as shown in the first figure below.
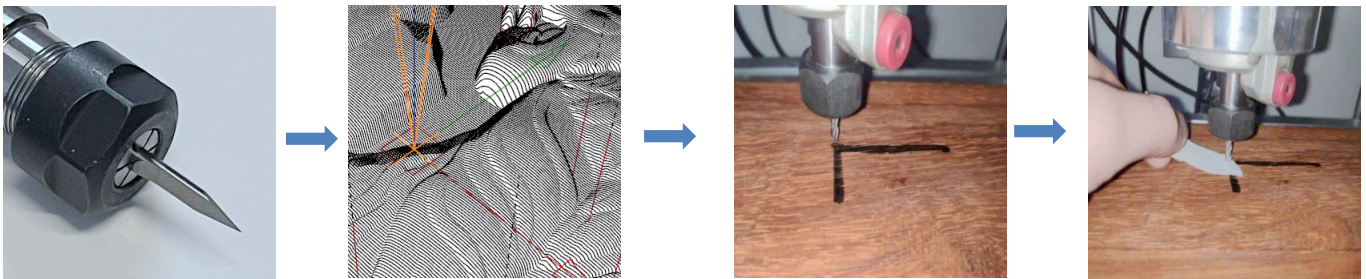
(6) Start carving

After finding the engraving position, click the send button below and the device will automatically start engraving. The status bar at the top right shows running. The visualization window shows that the tool is moving along the tool path. You can choose the pause and stop buttons below when engraving. (After pausing, click again to continue the previous carving. After termination, click Send to start processing from the beginning).

(7). Finished processing

After the processing is completed, the visualization window prompts that the engraving is completed and the time required for carving.
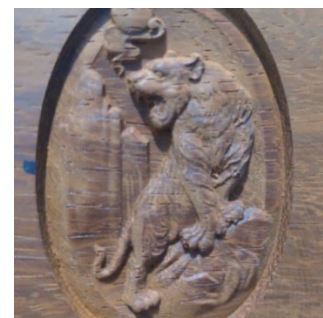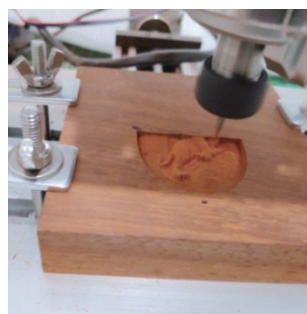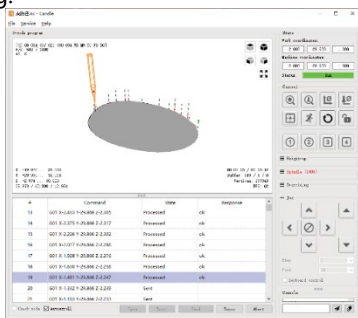
5. Offline controller (Optional)

Note: The offline controller and the computer cannot be connected to the engraving machine at the same time. When using the offline controller, please make sure that the USB cable of the machine and the computer is disconnected.

5.1 Main page:

Y-: right **Y+**: left **Z+**: Send $X to the GRBL motherboard to unlock it.
OK/SPN: Confirm button.

5.2 Control page:

Manually move each axis to the desired position.
X+: X axis move right direction, **X-** opposite. **Y+**: Y axis move forward direction, **Y-** opposite. **Z+**: Z axis move up direction, **Z-** opposite.
OK/SPN: Spindle test switch, press to open the spindle (corresponding to SPN gray on the screen), press again to close the spindle (the corresponding SPN on the screen returns to normal). Long press to enter changing spindle speed page. At this page, Y+/Y- is High/Low spindle speed, long press OK/SPN to exit the changing spindle speed page.
Exit/STP: Function 1: Tap on each axis button of XYZ to change the movement distance by 0.1, 1, 5, 10 cycles each time. Function 2: Press and hold for about 2 seconds to exit.

Main page

5.3 File page:

File list Select the file to be engraved. Support documents include: NC, NCC, TAP, TXT, Gcode, GCO, NL, CUT, CNC .
Y+: up, **Y-**: down
OK/SPN: Confirm the selection and enter the confirmation engraving page.

5.4 Confirm the engraving page:

Confirm that the engraving file is started without errors.
OK/SPN: Confirmation starts, ready to print becomes the progress display percentage, the file selection page is returned after the engraving is completed.

5.5 Settings page:

X+/ X-: Chang Baud rate; **Y+/Y-**: Change Feed rate by ±100/Click; **Z+/Z-**: Change Feed rate by ±10/Click; **OK/SPN**: Change Laser Mode ON/OFF
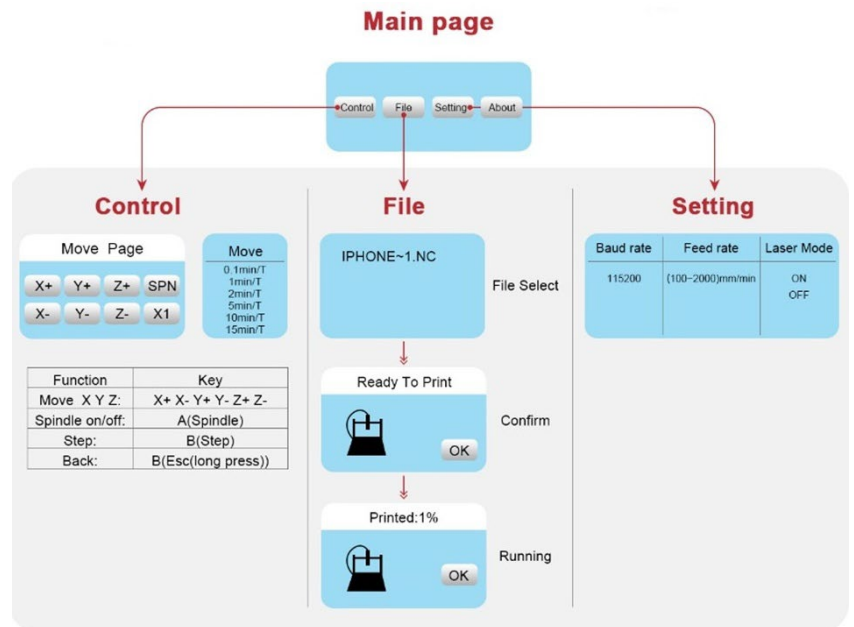
6. Restore factory settings

If the mechanical movement of the machine is smooth, but the engraving movement appears stuck, or the stepper motor does not move, please try to restore the factory settings of the main-board.

Method : Run Candle software and send command **$RST=*** to the machine, then reboot the machine.

CNC Repair Guide

Problem	Solution
Computer and offline controller cannot control the machine's normal movement or engrave abnormally	Check if the offline controller and the computer USB are both connected to the engraving machine. If so, unplug either the offline controller or the computer USB cable. Both cannot be connected to the engraving machine at the same time.
The machine is connected to the computer and powered on, but the engraving software shows a connection failure	Please make sure the computer has the correct driver installed; please check if the USB interface is properly connected; please make sure the COM port is selected correctly (do not select COM1); please make sure the baud rate is selected correctly (choose 115200).
The software displays an alarm error, the controller is locked, and clicking reset and unlock does not eliminate it	Check if the limit switches in the XYZ three-axis direction are pressed down or obstructed by foreign objects. Clean them if necessary. Alternatively, unplug the connection wires of the limit switches. If it returns to normal, the corresponding switch has short-circuited and failed. It can be replaced or temporarily abandoned.
The engraved content appears as a mirrored reflection of the original image, and the manual control movement direction is incorrect	Just set the Grbl parameters in the software to reverse the direction of the X or Y axis.
The engraved content appears rotated by 90 degrees	Check if the connection joints of the controller's XY axis have been swapped. Simply swap the connections back.

Problem	Solution
The engraved image is distorted and misaligned	Please check if there is any slippage between the lead screw motor axis and the coupling. Tighten the set screws on both ends of the coupling.
After modifying the engraving machine firmware parameters, various abnormal machine movements or abnormal engraving sizes occur	Please restore the firmware to factory settings. Run the Candle software, connect to the machine, and in the bottom right command box, enter and send the command $RST=*, then restart the machine.

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