

# **VEVOR<sup>®</sup>**

**TOUGH TOOLS, HALF PRICE**

Technical Support and E-Warranty Certificate

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## **CNC ENGRAVING MACHINE USER MANUAL**

**MODEL: S3020**

We continue to be committed to provide you tools with competitive price.

"Save Half", "Half Price" or any other similar expressions used by us only represents an estimate of savings you might benefit from buying certain tools with us compared to the major top brands and does not necessarily mean to cover all categories of tools offered by us. You are kindly reminded to verify carefully when you are placing an order with us if you are actually saving half in comparison with the top major brands.

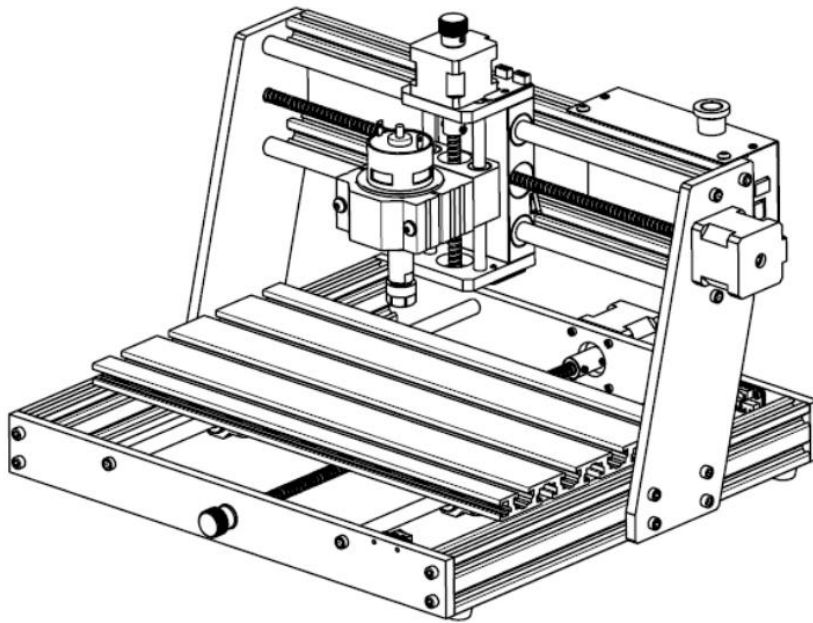


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## CNC ENGRAVING MACHINE

**MODEL: S3020**










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.

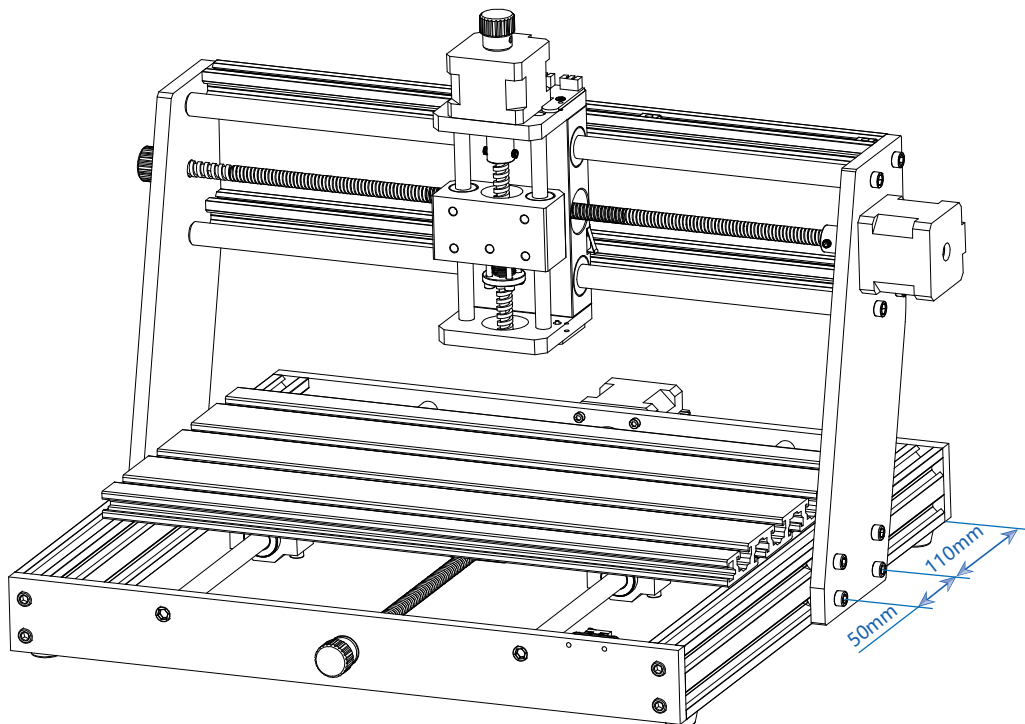
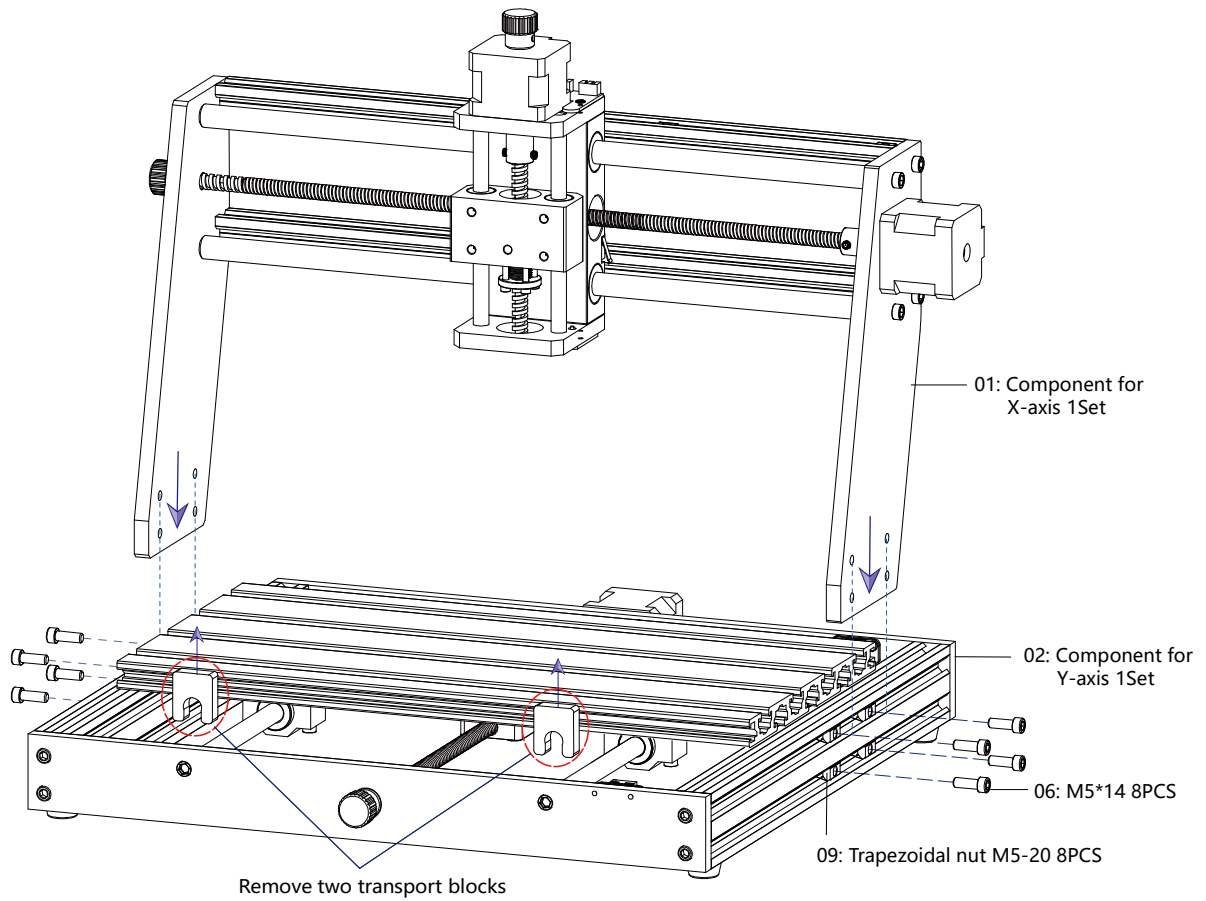
**SAVE THESE INSTRUCTIONS**

# 1.Parts List

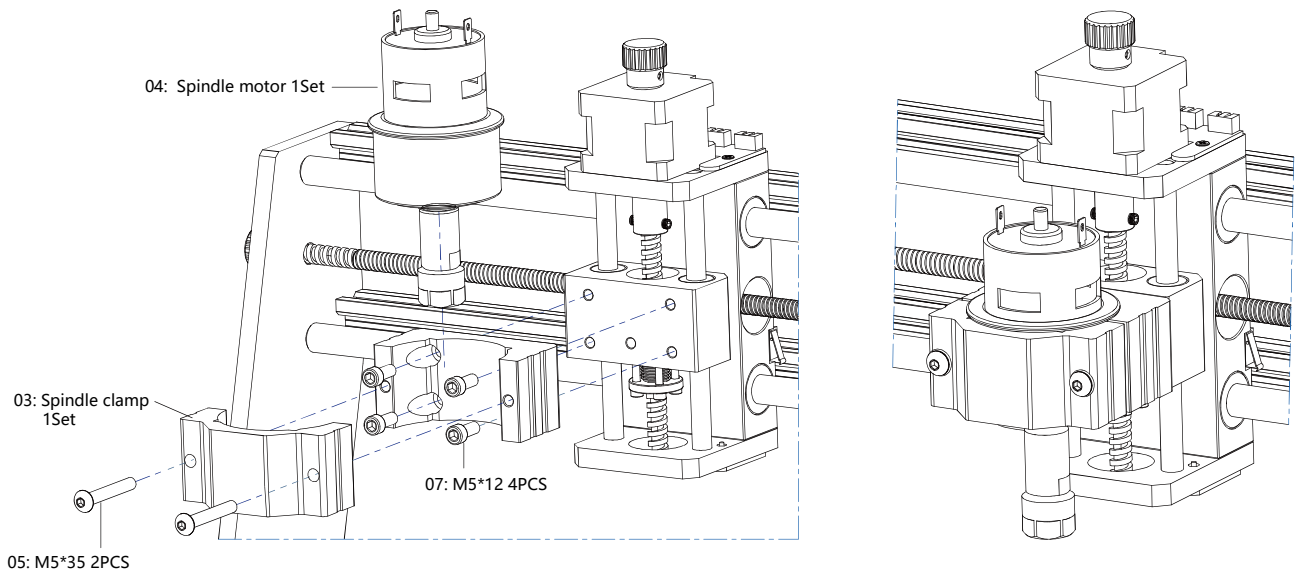
S3020 Parts List					
Part No	Part Name	Explanation	Quantity	Picture	Remark
01	Component for X-axis	—	1Set		
02	Component for Y-axis	—	1Set		
03	Spindle clamp	Φ52, Aluminum	1Set		
04	Spindle motor	775	1Set		
		C16-ER11-35L 5mm			
	Fixing ring	Φ52			
05	Inner hexagon screw	M5*35	2		
06	Inner hexagon screw	M5*14	8		
07	Inner hexagon screw	M5*12	4		
08	Inner hexagon screw	M4*6	4		
09	Trapezoidal nut	M5-20	8		Already assembled
10	Control box	—	1Set		
11	Offline controller and data cable	Touch screen with SD card	1Set		
12	X/Z Stepper motor wire	4P,length 360mm	2	—	
13	Y Stepper motor wire	4P,length 480mm	1	—	
14	Spindle motor wire	2P,length 480mm	1	—	
15	X-Limit wire	3P,length 470mm	1	—	
16	Z-Limit wire	3P,length 400mm	1	—	
17	Y-Limit wire	3P,length 300mm	1	—	
18	USB cable	—	1	—	
19	Power supply	24V,5A	1		
20	Milling cutter	—	1Set		
21	Pressing plate	50*20*3	4		Pressing plate assembly drawing 
22	Screw	M6*40	4		
23	Screw	M6*45	4		
24	Butterfly nut	M6	4		
25	Washer	M6*2mm	4		
26	Inner Hexagon Wrench	2/2.5/3/4mm	1Set		
27	Nut Wrench	14/17mm	1Set		
28	Probe	—	1		
29	Soft brush	—	1		
30	Winding pipe	—	1	—	
31	U Disk	—	1		
32	Instruction manual	—	1	—	

## 2. Machine Assembly

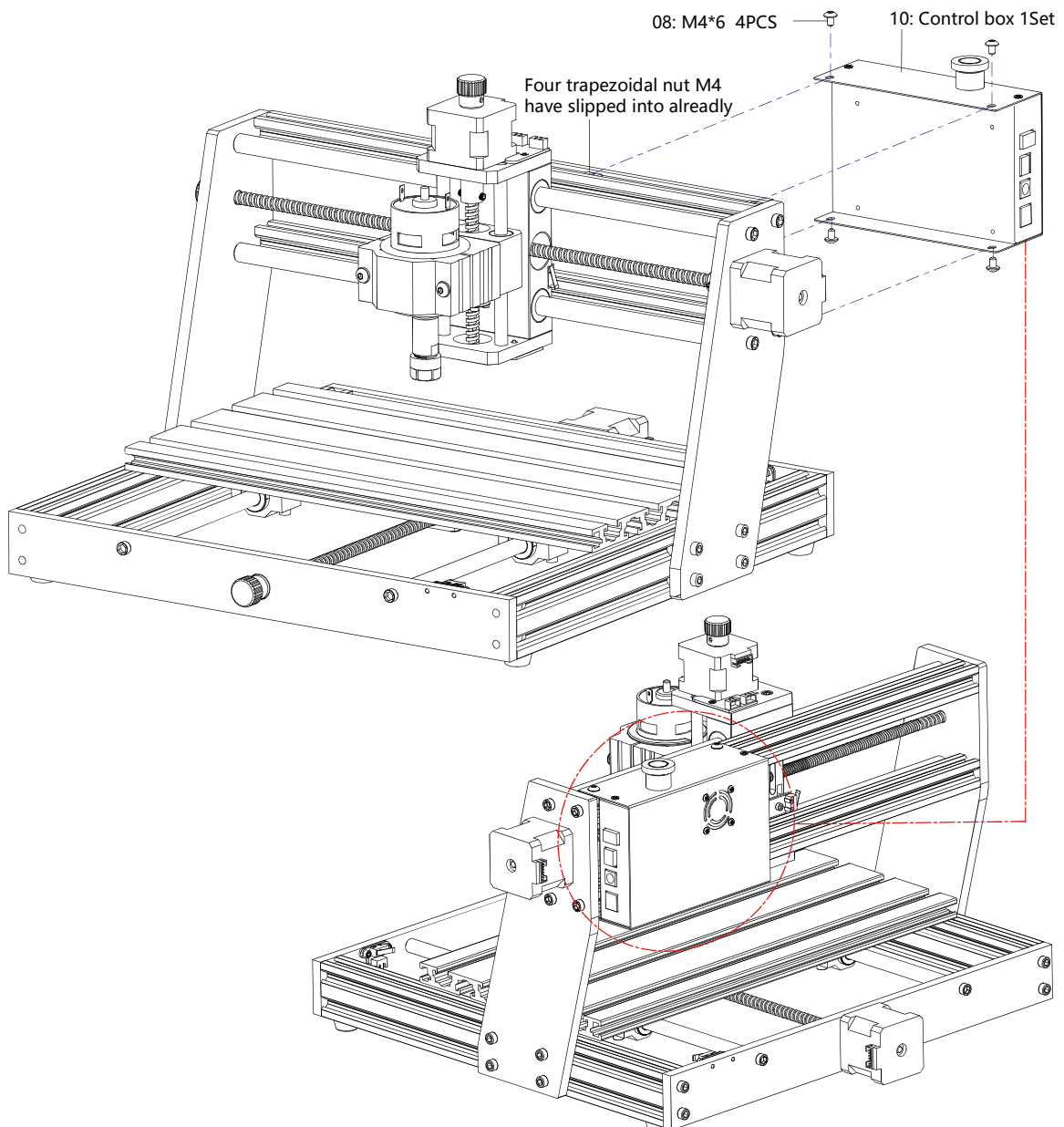
### ① X-axis and Y-axis component assembly



## ② Spindle fixture and motor assembly

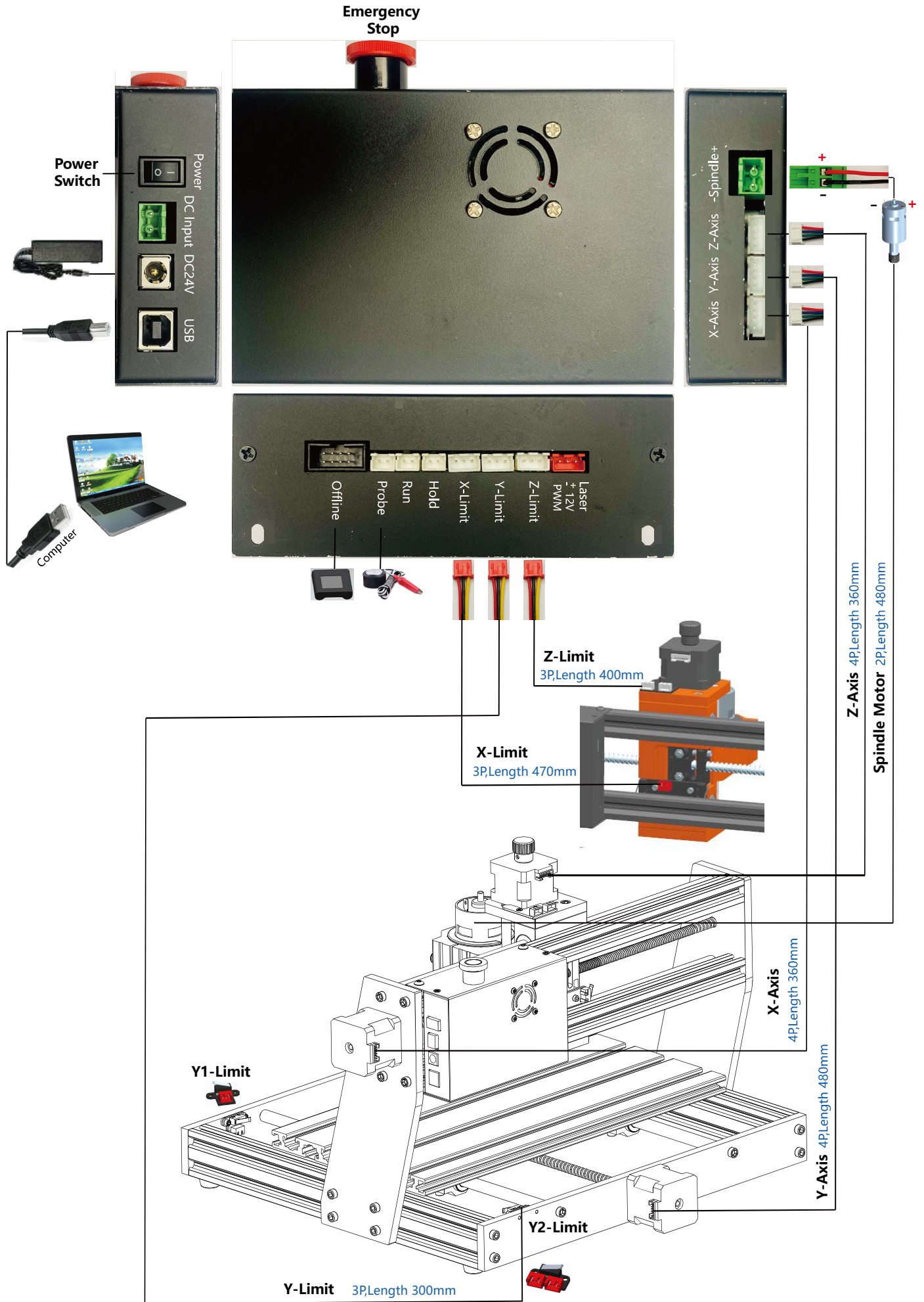


## ③ Control box assembly





### 3. Instructions for ports on the control-box



## 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:

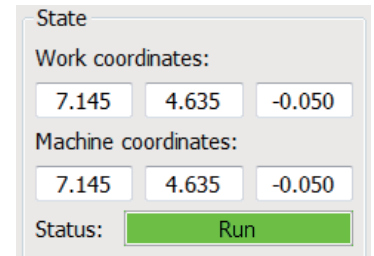
Represents current X, Y & Z local coordinates of the CNC.

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.ZZ-30F100; G0Z1; G38.ZZ-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

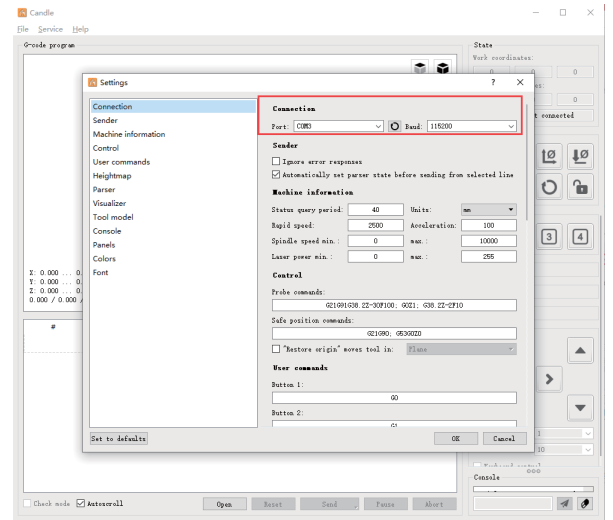
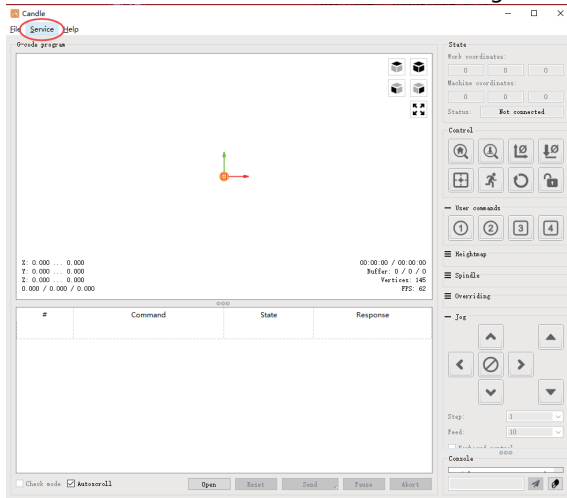
For the first time use, please connect the device to the computer via USB cable, and click the **CH341SER.exe** file in the driver folder to install the driver. Under normal circumstances, the Win10 system will automatically identify and install the driver. For Win7 and Win8 systems, please install it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

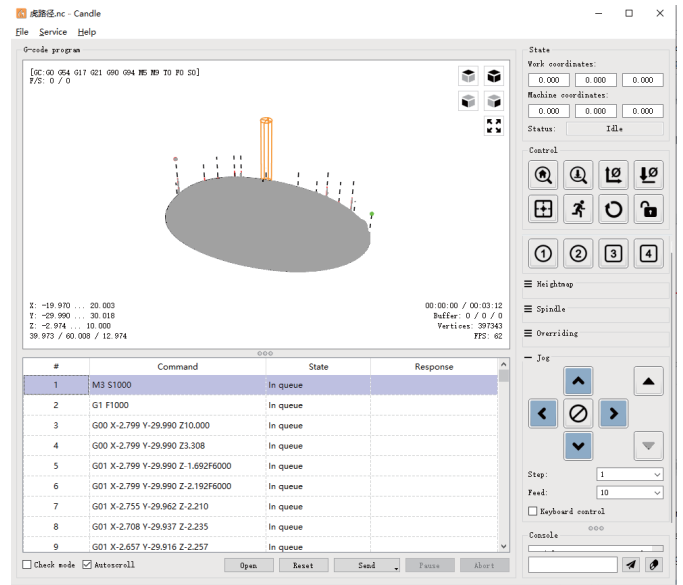
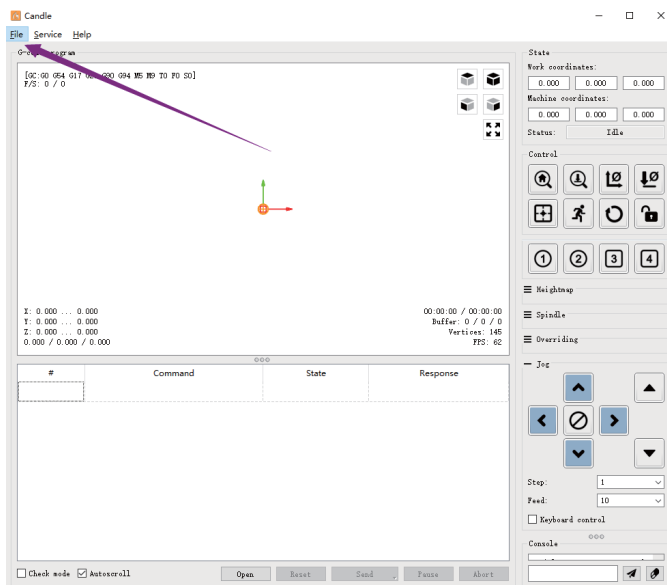
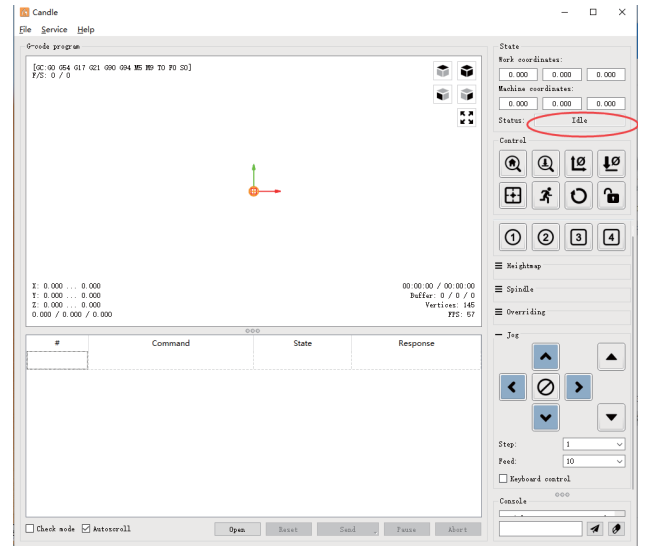


### (3). Complete connection

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

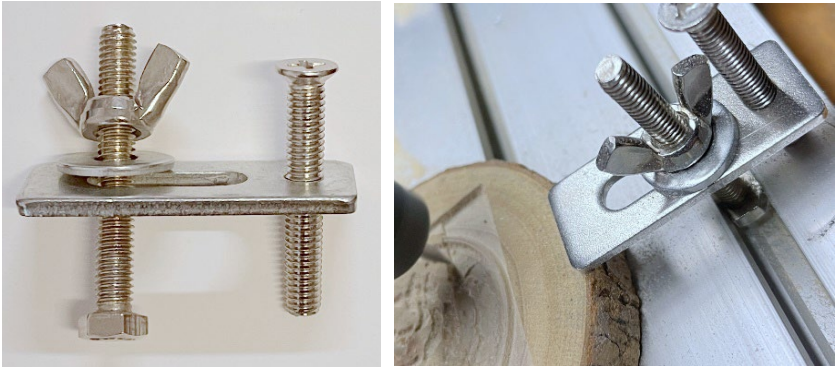
Click "File" option at the top of candle, then click "New" to create G-Code. On the command bar at the bottom of the interface, click "Open" to select a G code file that has been made to import the file. After importing, the middle of the interface will display a visual graph composed of tool paths (the 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.

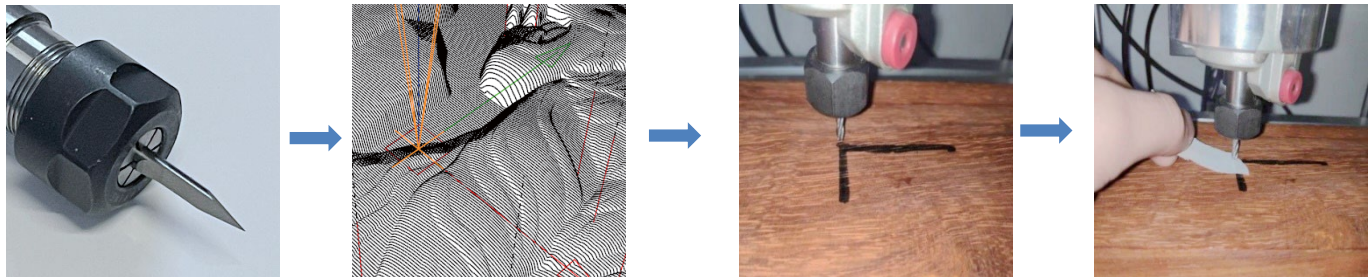
Before running the G code program, you need to find the position of the engraving figure relative to the overall engraving plate. There is a three-axis coordinate system in the visual graphics. The origin of the three-axis coordinate system is the tool setting point of the actual processing graphic.



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   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.

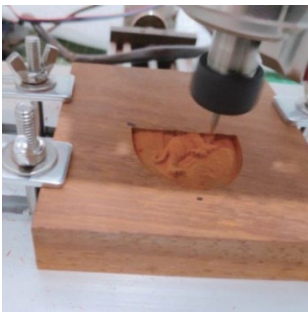
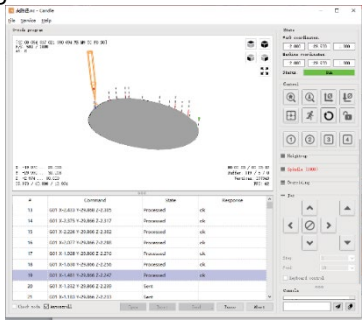


(6) Start carving

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.

### 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.

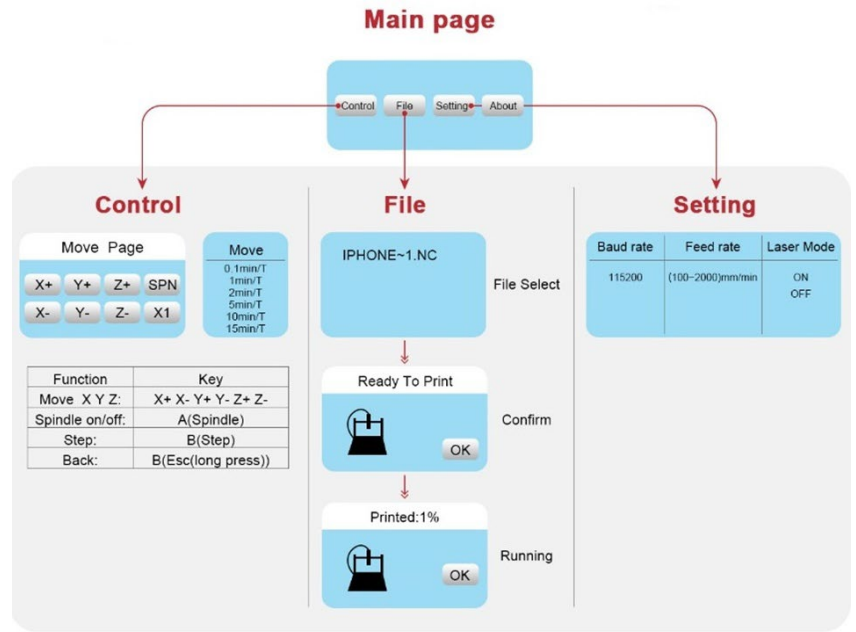
### 5.4 Confirm the engraving page:

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  $\pm 100/\text{Click}$ ; **Z+**/**Z-**: Change Feed rate by  $\pm 10/\text{Click}$ ; **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
<p>Computer and offline controller cannot control the machine's normal movement or engrave abnormally</p>	<p>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.</p>
<p>The machine is connected to the computer and powered on, but the engraving software shows a connection failure</p>	<p>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).</p>
<p>The software displays an alarm error, the controller is locked, and clicking reset and unlock does not eliminate it</p>	<p>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.</p>
<p>The engraved content appears as a mirrored reflection of the original image, and the manual control movement direction is incorrect</p>	<p>Just set the Grbl parameters in the software to reverse the direction of the X or Y axis.</p>
<p>The engraved content appears rotated by 90 degrees</p>	<p>Check if the connection joints of the controller's XY axis have been swapped. Simply swap the connections back.</p>

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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