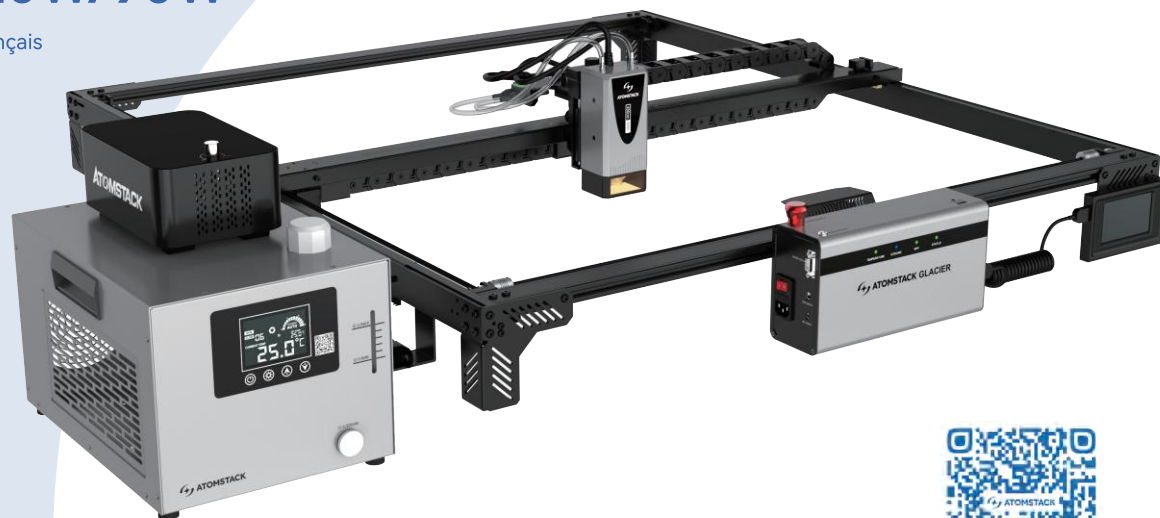




# Laser Engraver

## User Manual Glacier 120W/90W

- English ◦ Deutsch ◦ Français
- Italiano ◦ Español



## Table of Contents

|                                                     |    |
|-----------------------------------------------------|----|
| 01. Safety Statements and Warnings .....            | 02 |
| 02. Package Contents .....                          | 05 |
| 03. Device Installation .....                       | 07 |
| 04. Product Status and Indicators .....             | 19 |
| 05. Feature Introduction .....                      | 21 |
| 06. Machine Maintenance .....                       | 30 |
| 07. Control Software .....                          | 31 |
| 08. LightBurn Software Installation and Usage ..... | 32 |
| 09. FAQs .....                                      | 39 |
| 10. Contact Us .....                                | 41 |

# 01 Security Statment and warning

**Before operating the Laser Engraver, please read the manual carefully and follow the instructions for assembly and operation. If this manual does not effectively solve your problem, please contact our support team.**

1. This product is a laser engraver system .Components, must be installed in other manufacturers of laser engraver for use. The product belongs to Class 4 laser products. The laser system itself must meet the requirements of IEC 60825-1 latest version, otherwise the product is prohibited to be used.
  2. Your laser engraver shall have a protective housing which, when in place, prevents human access to laser radiation.
  3. If a protective housing is equipped with an access panel which provides "walk-in" access then:
    - a) means shall be provided so that any person inside the protective housing can prevent activation of a laser hazard that is equivalent to Class 3B or Class 4.
    - b) a warning device shall be situated so as to provide adequate warning of emission of laser radiation equivalent to Class 3R in the wavelength range below 400 nm and above 700 nm, or of laser radiation equivalent to Class 3B or Class 4 to any person who might be within the protective housing.
    - c) where "walk-in" access during operation is intended or reasonably foreseeable, emission of laser radiation that is equivalent to Class 3B or Class 4 while someone is present inside the protective housing of a Class 1, Class 2, or Class 3R product shall be prevented by engineering means.
- NOTE: Methods to prevent human access to radiation when persons are inside the protective housing can include pressure sensitive floor mats, infrared detectors, etc.
4. The laser itself has a protective cover. The protective cover is fastened by Magnetically mounted. When the laser is installed on the laser engraver, the protective cover should be checked to be reliably locked, and can not be removed in the energized state.
  5. The housing of the laser engraver should have an interlock function. When the housing is opened or removed, the laser can be automatically turned off.
  6. The laser engraver should have an emergency stop button, which can immediately stop the output of the laser when pressed under unexpected circumstances.
  7. The laser engraver should have a reset button, which can resume work under the condition of confirming safety after lifting the interlock or emergency stop.
  8. Laser engraver should use physical keys, dongle, password system and other ways to manage and control, to prevent personnel without security training operation of this kind of equipment.
  9. On the laser engraver any window or channel that can actively observe or passively receive the laser radiation should be set up warning marks.
  10. If the laser burns the skin or eyes, please go to a nearby hospital for examination and treatment immediately.

## **User Safety Statement**

Laser can harm human eyes and skin. Do not expose your eyes or skin directly to the laser. The laser product has an optical lens and emits a straight laser beam. The light emitted by the product, whether direct or reflected, is extremely harmful because it can spread over long distances while maintaining high light density. When handling the product, you must wear appropriate eye protection goggles (OD5+) to protect your eyes from laser (including reflected and scattered light) damage. Reflected and scattered light spilled into unexpected areas should be attenuated and/or absorbed.

## 2.1 Laser Safety

We have installed a laser protection cover on the laser, which can greatly filter out the diffuse reflection of the laser spot. However, when using a laser engraving machine, it is recommended that you wear laser protective goggles. Avoid exposing your skin to a Class4 laser beam, especially at close range. Teenagers must be supervised by their parents during use. Do not touch the laser engraving module when the machine is starting.

## 2.2 Fire Safety

Cutting burns the substrate, and high-intensity laser beams generate extremely high temperatures and a large amount of heat. Some materials may catch fire during cutting, generating gas and smoke inside the equipment. When the laser beam hits the material, a small flame usually appears at this point. It will move with the laser and will not be on continuously when the laser passes. Do not leave the machine unattended during the engraving process. After use, be sure to clean the debris, and flammable materials in the laser cutting machine. Be sure to have a fire extinguisher nearby to ensure safety. When using a laser engraving machine, smoke, steam, particles, and potentially toxic materials (plastics and other combustible materials) are generated, which may harm health.

## 2.3 Material Safety

Do not engrave materials with unknown properties. Recommended materials: wood, bamboo, leather, plastic, fabric, paper, opaque acrylic, glass, metal. Materials not recommended: gems, transparent materials, any reflective materials, including reflective metals, etc. Glass and reflective metal materials can only be engraved after they turn black.

## 2.4 Use Safety

The engraving machine can only be used in a horizontal position and must be firmly fixed to prevent fires caused by accidental movement or falling from the workbench during the working process. It is forbidden to point the laser at people, animals, or any flammable objects, whether they are in working condition or not.

## 2.5 Electrical Safety

To prevent accidents such as fires and electric shocks, the laser engraving machine provides a power adapter with a ground wire. When using the laser engraving machine, plug the power plug into a grounded power socket.

## 2.6 Environmental Safety

When installing engraving and cutting equipment, please ensure that the workplace is clean, and there are no flammable and explosive materials around the equipment. When engraving or cutting, a metal plate must be placed below the bottom.

## Disclaimer and warning

This product is not a toy and is not suitable for people under 15 years of age. Do not allow children to touch the laser Module. Please be careful when operating in a situation involving children.

This product is a laser module, visit <http://www.atomstack.com/laserengraverdownload> for complete "user manual" and the latest instructions and warnings. AtomStack reserves the right to update this Disclaimer and Safe Operation Guidelines.

Please be sure to read this document carefully before using the product to understand your legal rights, responsibilities and safety instructions; Otherwise, it may bring property loss, safety accident and hidden danger of personal safety. Once you use this product, you shall be deemed to have understood and accepted all terms and contents of this document. User undertakes to be responsible for his or her actions and all consequences arising therefrom. User agrees to use the Product only for legitimate purposes and agrees to all terms and contents of this document and any relevant policies or guidelines that AtomStack may establish. You understand and agree that AtomStack may not be able to provide you with the cause of the damage or accident and provide you with AtomStack's after-sale service unless you provide the original engraving or cutting files, engraving software configuration parameters used, operating system information, video of the engraving or cutting process, and operational steps prior to the occurrence of a problem or failure.

AtomStack is not liable for any and all losses arising from the user's failure to use the product in accordance with this manual.

AtomStack has the ultimate right to interpret the document, subject to legal compliance. AtomStack reserves the right to update, modify, or terminate the Terms without prior notice.

**FCC statement:**

**This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:**

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

**Warning:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 1.Reorient or relocate the receiving antenna.
- 2.Increase the separation between the equipment and receiver.
- 3.Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 4.Consult the dealer or an experienced radio/TV technician for help.

**FCC radiation exposure statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

**Adhering to these instructions helps ensure safe and effective use of the equipment.**

## 02

## Package Contents



Upper Support Beam Assembly



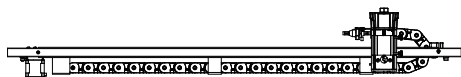
Lower Support Beam Assembly



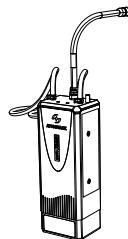
Y-Axis Left Linear Rail Assembly



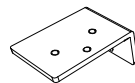
Y-Axis Right Linear Rail Assembly



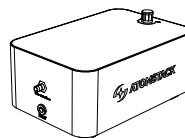
X-Axis Assembly



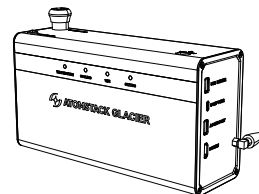
Laser Module



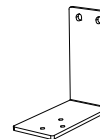
Short Drag Chain Bracket



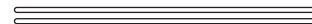
Air Assist



Control Box Assembly



Long Drag Chain Bracket



Optical Shafts

## 02

## Package Contents



Ø10mm Tube with Adapter



Focus Piece



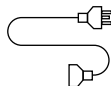
Flexible Couplings



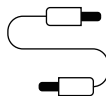
Control Screen



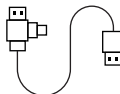
HDMI Screen Cable



Power Cord



Air Assist Cable



Data Cable



Safety Goggles



Lint-Free Cloth



USB Key



USB drive



Screw Pack

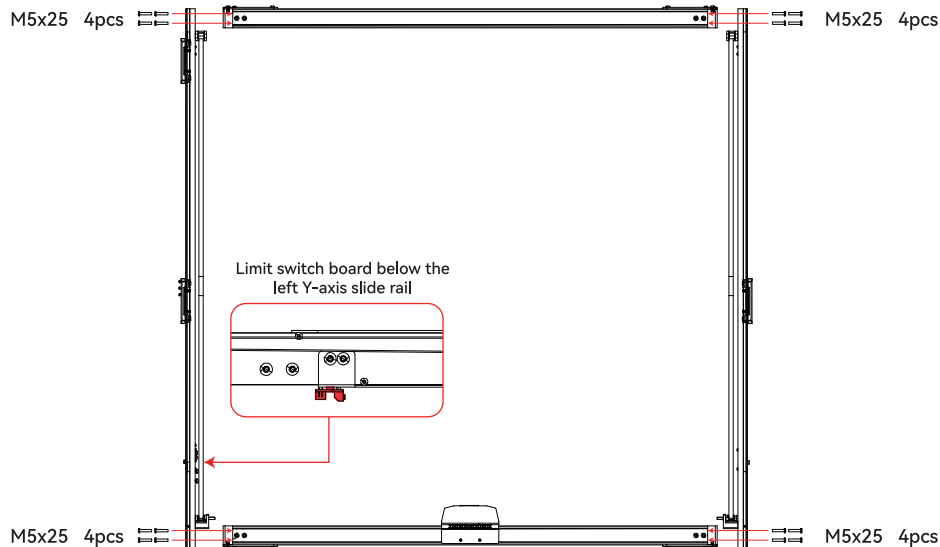


Tool Kit

## 03

## Device Installation

1. Place the upper and lower support beams on a level worktable. Then, assemble the Y-Axis left and right linear rails horizontally onto the upper and lower support beams as shown in the diagram. Secure the Y-Axis left and right linear rails to the support beams using 16 M5×25 screws.



### Note:

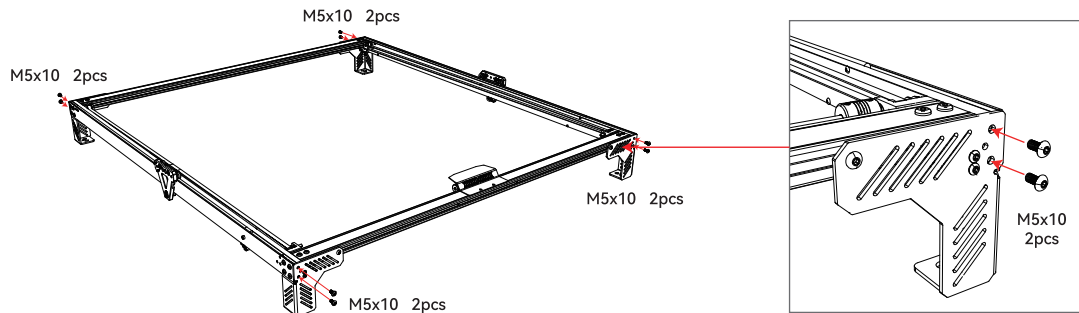
When fastening the screws, first insert all screws, adjust alignment, and then tighten them sequentially. Do not install the left and right linear rails in the wrong orientation. The limit switch board is located under the left linear rail.

## 03

## Device Installation

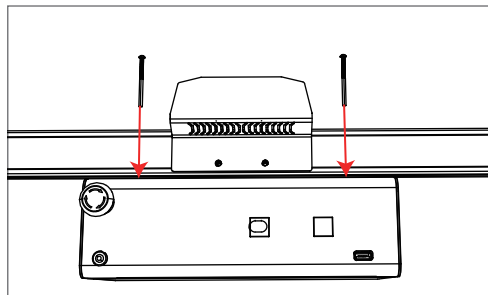
2. Securing the Y-Axis Left and Right Linear Rails to the risers.

Use 4 M5×10 screws at each end of the Y-Axis left and right linear rails to attach them securely to the risers.



3. Installing the Control Box.

Secure the control box to the lower support beam using 2 M3×45 screws.

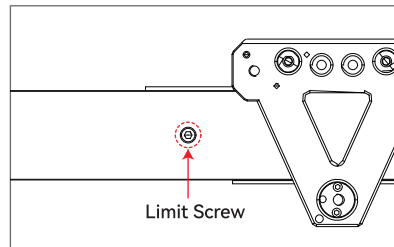
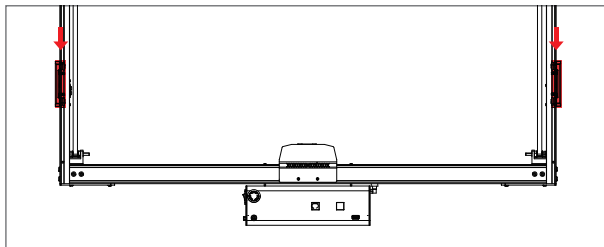


## 03

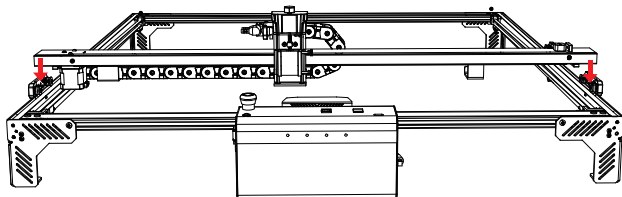
### Device Installation

#### 4. Installing the X-Axis Assembly

4.1 Move the sliders on the Y-Axis left and right linear rails toward the outer limit screws of the Y-Axis left and right rails.



4.2 Vertically assemble the X-Axis assembly onto the Y-Axis left and right sliders.



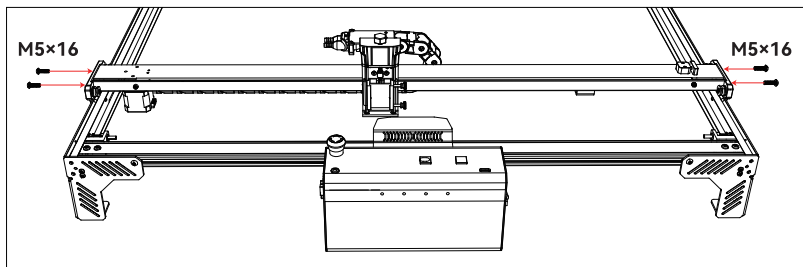
**Note:**

Ensure the X-Axis assembly is oriented correctly.  
Do not move the Y-Axis left and right sliders up or down while installing the X-Axis assembly.

## 03

### Device Installation

4.3 Fix the X-axis assembly to the Y-axis left slider and Y-axis right slider using 4 M5×16 screws.



**Note:**

Use M5×16 screws for the screw holes at both ends of the X-axis.

5. Assembling the Coupling and Optical Shaft.

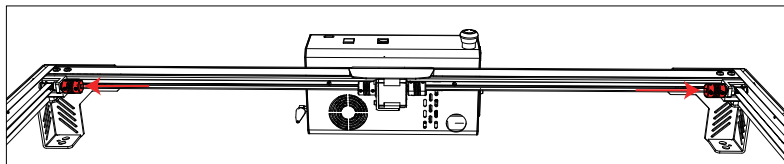
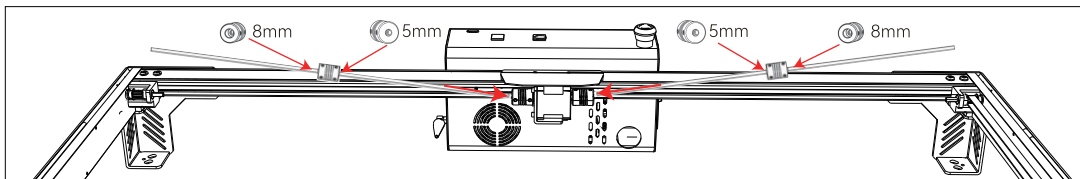
5.1 Insert the optical shaft into the coupling.



## 03

### Device Installation

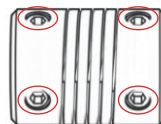
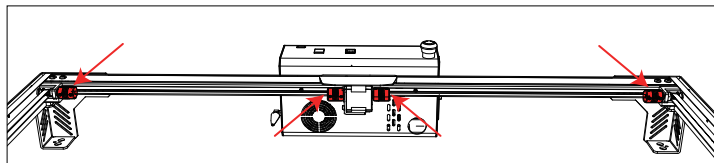
5.2 Assemble one end of the optical shaft into the coupling hole next to the motor on the lower support beam. Then, horizontally slide the coupling along the optical shaft and assemble it onto the optical shafts above the Y-Axis left and right linear rails.



**Note:**

One end of the coupling hole has a diameter of 8 mm, and the other end has a diameter of 5 mm.  
Orient the 8 mm ends toward the Y-Axis left and right linear rails, respectively.

5.3 Tighten the screws on the four couplings. Each coupling has four screws.

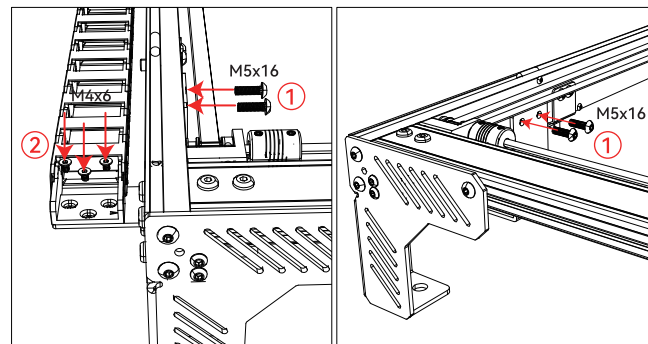


# 03

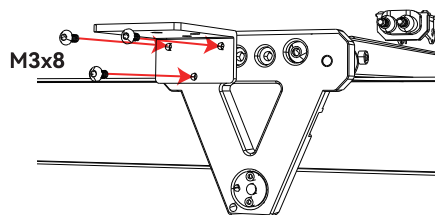
## Device Installation

6. Assembling the Y-Axis Drag Chain Bracket.

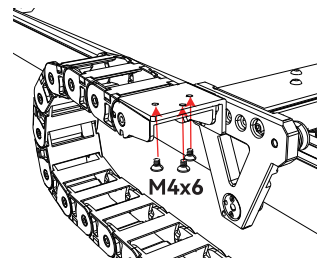
6.1 First, use 2 M5×16 screws to attach the L-shaped drag chain bracket (long) from the inner side of the Y-Axis left linear rail to the Y-Axis left rail. Then, use 3 M4×6 screws from top to bottom to secure the other end of the drag chain to the bracket.



6.2 First, use 3 M3×8 screws to attach the short L-shaped drag chain bracket to the slider on the Y-Axis left linear rail. Then, secure the other end of the drag chain vertically to the L-shaped bracket using 3 M4×6 screws from bottom to top.



Mounting bracket to the left Y-axis slide block



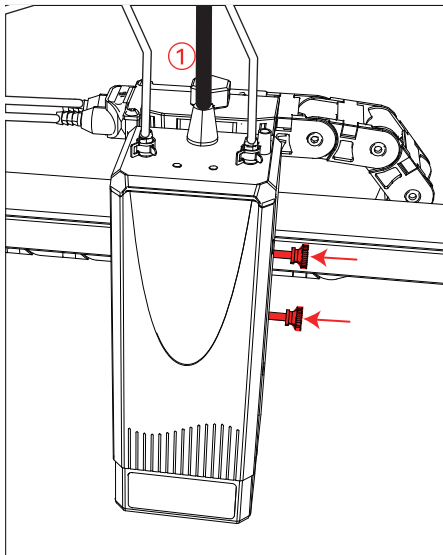
Attach the drag chain to the L-shaped bracket

## 03

### Device Installation

#### 7. Laser Installation

Vertically install the laser onto the Z-Axis. From the right side, secure it with 2 screws, and connect the air tube to the designated position.



#### 8. Wiring

##### 8.1 Laser Power & Water Inlet/Outlet Tubes:

For the laser, align the male aviation connector on top of the laser according to the arrow direction on the connector, and insert it horizontally into the female connector. Assemble the water inlet and outlet tube fittings horizontally onto the corresponding inlet/outlet ports on the Z-Axis bracket.

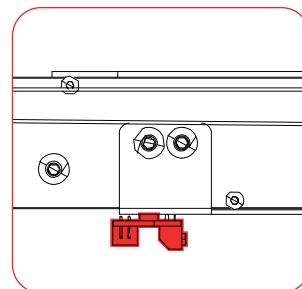
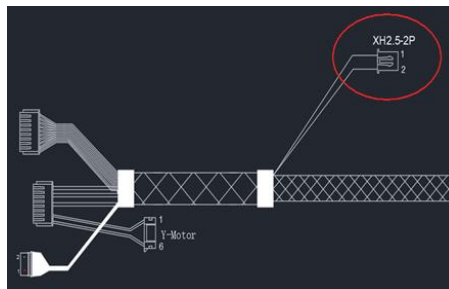


# 03

## Device Installation

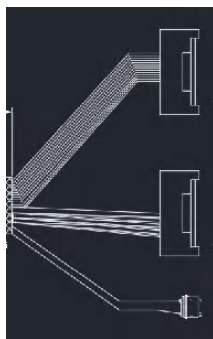
### 8.2 Limit Switch Under Y-Axis Left Linear Rail:

Connect the XH2.5-2P male connector at one end of the Y-Axis left drag chain to the 2-pin socket of the limit switch located under the Y-Axis left linear rail.

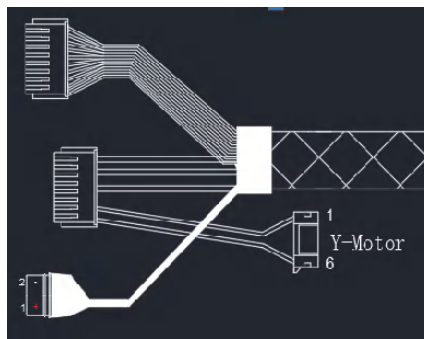


### 8.3 Control Box:

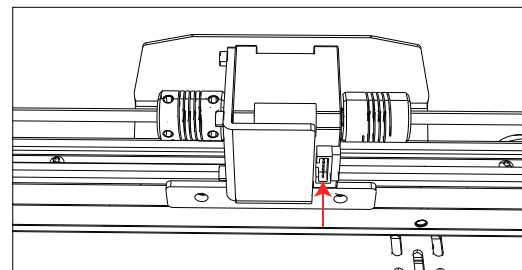
Horizontally connect the mainboard wiring to the X/Y connectors, ensuring that the male and female terminals match at both ends. Then, connect the 6-pin Y-Axis motor connector to the motor socket on the lower support beam.



Mainboard cable



X/Y axis cables



Y-Axis Motor on the Lower Support Beam

## 03

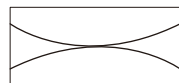
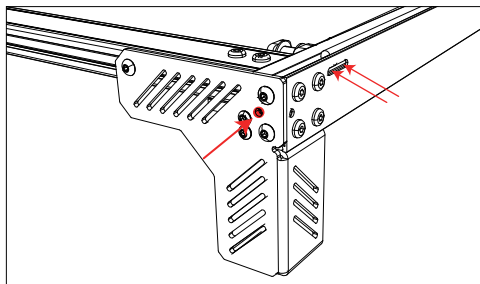
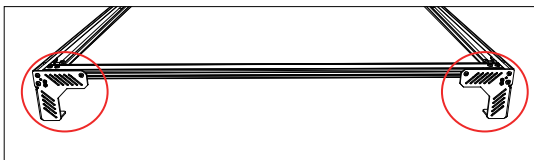
## Device Installation

### 9. Timing Belt Tension Adjustment

If the timing belts become loose after prolonged use, adjust them according to the following steps:

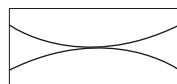
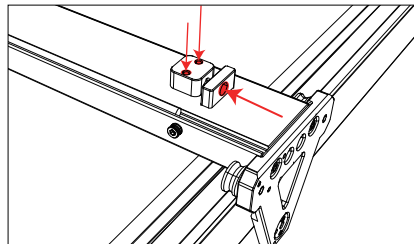
#### 9.1 Y-Axis Left/Right Timing Belt Tension Adjustment:

As shown in the diagram, first loosen the two screws on the bracket. Turn the screws clockwise to increase the belt tension, or counterclockwise to decrease it. The timing belts should not be too tight or too loose. Press the upper and lower belts together with your thumb and forefinger, the ideal tension allows the belts to touch and then rebound slightly.



#### 9.2 X-Axis Timing Belt Tension Adjustment:

As shown in the diagram, loosen the two screws on the bracket, then adjust the timing belt tension by turning the screws. The belts should not be too tight or too loose. Press the upper and lower belts together with your thumb and forefinger, the ideal tension allows the belts to touch and then rebound slightly.

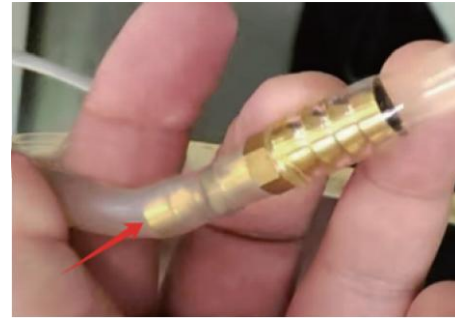
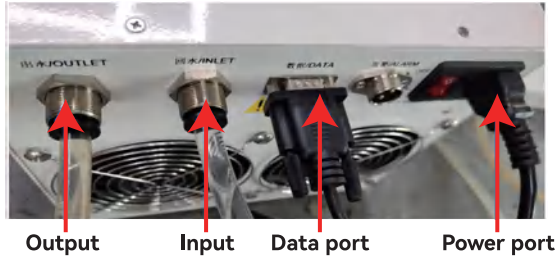


## 03

### Device Installation

#### 10. Water Chiller Wiring

There are two transparent water tubes with an outer diameter of 10 mm: one connects to the water outlet of the chiller, and the other connects to the water inlet. There are also two milky semi-transparent tubes with an outer diameter of 8 mm for the engraving machine: one connects to the adapter on the water return side, and the other connects to the adapter on the water outlet side. The laser's water inlet/outlet and the chiller's water inlet/outlet form a closed circulation loop.



**Note:**

Turn on the water chiller before using the machine to prevent high temperatures from damaging the laser.

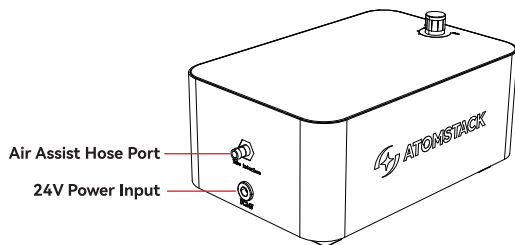
## 03

### Device Installation

#### 11. Air Assist Wiring

11.1 Connect the black silicone air tube (outer diameter 8 mm) to the air outlet. The airflow passes through the silicone tube to the laser.

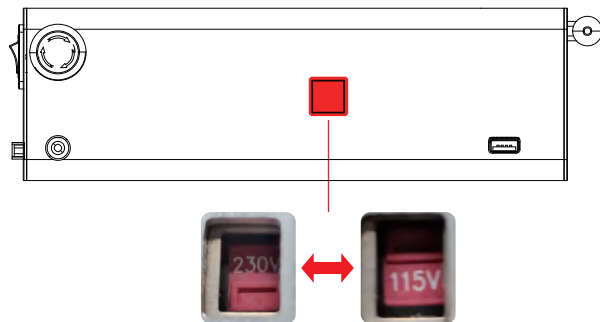
11.2 Air pump power cable (DC connector): one end connects to the AIR Assist port on the control box (power output), and the other end connects to the air pump power input (power input).



#### Note:

After unpacking the product, first check the control box power voltage and the water chiller voltage.

1. The control box is set to 230 V by default. Users must confirm the local mains voltage. If the local voltage is 110 V, select the correct voltage setting in the slot on top of the control box before powering it on, ensuring it matches the local voltage. Do not adjust the voltage while the device is powered on.
2. Check the specifications of the water chiller. Ensure that the voltage rating matches the local voltage before use.



# 03

## Device Installation

### 12. Antifreeze Filling

Note:

- 1) Prepare a measuring cup and a funnel before filling.
- 2) Determine the antifreeze dilution ratio according to the local annual minimum temperature.
- 3) Use only purified or distilled water; do not use tap water.

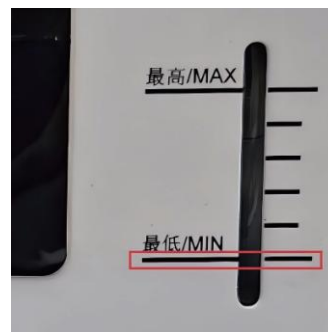
12.1 Determine the required amounts of antifreeze concentrate and purified water.

| Local Year-Round Minimum Temperature (°C) | Recommended Mixing Ratio (Antifreeze Concentrate: Purified Water) | Antifreeze Concentrate (ml) | Purified Water (ml) |
|-------------------------------------------|-------------------------------------------------------------------|-----------------------------|---------------------|
| $T > 5$                                   | 0                                                                 | 0                           | 1800                |
| $-10 \leq T < 5$                          | 2:8                                                               | 360                         | 1440                |
| $-20 \leq T < -10$                        | 3:7                                                               | 540                         | 1260                |
| $-30 \leq T < -20$                        | 4:6                                                               | 720                         | 1080                |
| $-40 \leq T < -30$                        | 5:5                                                               | 900                         | 900                 |
| $-50 \leq T < -40$                        | 6:4                                                               | 1080                        | 720                 |

12.2 According to the local annual minimum temperature, mix the antifreeze in the measuring cup as per the table above and pour it into a container larger than 2 L.

12.3 Unscrew the water tank cap of the chiller, and slowly pour the antifreeze into the water tank using a funnel.

12.4 Check the antifreeze level. The level must be above the minimum water line; a lower level will trigger a low-water warning on the chiller.



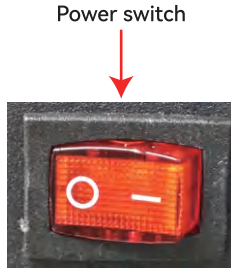
12.5 Tighten the water tank cap.

## 04

## Product Status and Indicators

### 1. Power Button:

When the power is connected, the indicator remains steadily red. "O" indicates OFF; "—" indicates ON.

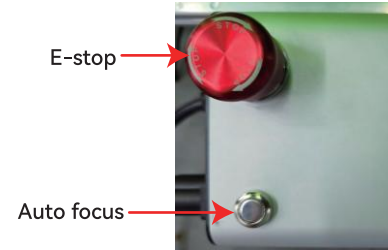


### 2. Emergency Stop Switch:

When the power is connected, the indicator remains steadily red. "O" indicates OFF; "—" indicates ON.

2.1. Press in case of an emergency requiring immediate power cut-off.

2.2. To restore power: rotate clockwise while pressing, then release to allow the switch to pop up.



### 3. Status Indicators:

#### 3.1. Laser Temperature Warning Indicator:

Normal condition:  $16^{\circ}\text{C} < \text{Laser temperature} < 40^{\circ}\text{C}$ , green light steadily on.

Caution condition:  $40^{\circ}\text{C} \sim 50^{\circ}\text{C}$ , yellow light steadily on.

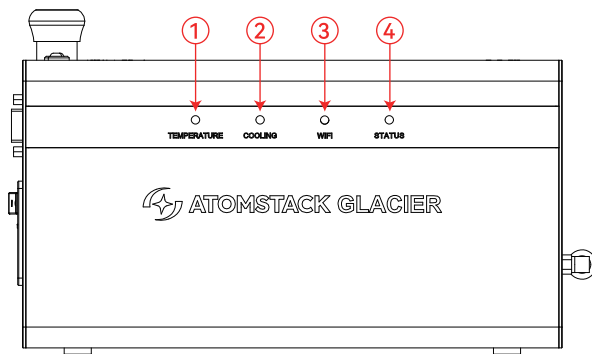
Alarm condition:  $> 50^{\circ}\text{C}$ , red light flashing with buzzer alarm.

Alarm condition:  $< 16^{\circ}\text{C}$ , red light flashing with buzzer alarm.

## 04

## Product Status and Indicators

### 3. Status Indicators:



① Laser Temperature Warning Indicator

② Water Chiller Startup Indicator

③ Wi-Fi Connection Indicator

④ Machine Status Indicator

#### 3.1. Laser Temperature Warning Indicator:

Normal condition:  $16^{\circ}\text{C} < \text{Laser temperature} < 40^{\circ}\text{C}$ , green light steadily on.

Caution condition:  $40^{\circ}\text{C} \sim 50^{\circ}\text{C}$ , yellow light steadily on.

Alarm condition:  $> 50^{\circ}\text{C}$ , red light flashing with buzzer alarm.

Alarm condition:  $< 16^{\circ}\text{C}$ , red light flashing with buzzer alarm.

#### 3.2. Water Chiller Startup Warning Indicator:

Normal startup: green light steadily on.

Abnormal startup (e.g., flow alarm, low water level alarm): red light flashing with buzzer alarm.

#### 3.3. Wi-Fi Connection Indicator:

Successful connection: green light steadily on.

Connecting: blue light flashing.

Connection failure: red light flashing with buzzer alarm.

#### 3.4. Machine Status Warning Indicator:

Standby mode: green light steadily on.

Operating mode: green light flashing.

Abnormal condition (e.g., laser temperature abnormality, water chiller startup abnormality, flame alarm, limit switch triggered, laser recognition failure): red light flashing with buzzer alarm.

## 05

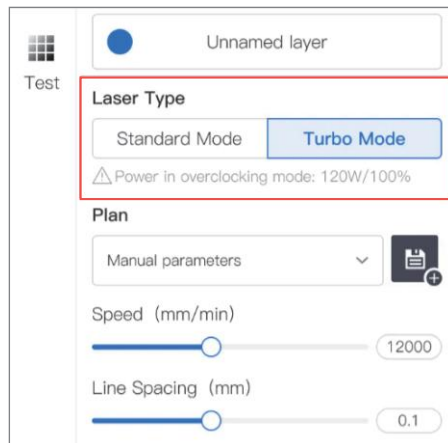
## Feature Introduction

### 1. Overclock Mode:

In the Glacier control software, there are two selectable modes: Normal Mode and Overclock Mode.

Normal Mode: The laser outputs at standard power.

Overclock Mode: The laser power is increased by 20% compared to Normal Mode.



### Precautions:

- When entering Overclock Mode, adjust power and speed appropriately.
- Prolonged use of Overclock Mode may reduce the laser's lifespan; it is recommended to use it sparingly.