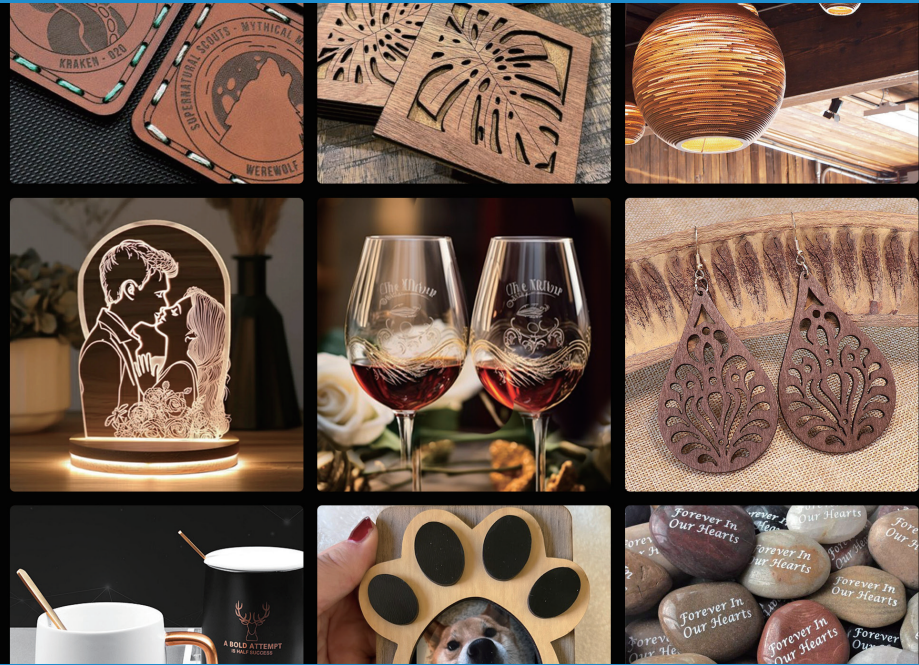




# PRONTO 40/45/60/75 Cabinet Laser Engraver User Manual



Read Carefully Before Use  
Keep for Future Reference



# BEAMING WITH POSSIBILITIES!

Thank you for choosing our laser equipment.

Your CO<sub>2</sub> laser engraving machine is intended for personal and professional use. When used under these instructions, it falls under the category of a **CLASS 1** laser product. But it includes a **CLASS 4** laser system and some components remain **EXTREMELY** dangerous under improper and/or non-intended use. Never disable the preinstalled safety devices and always use your laser safely and responsibly.

Read this manual carefully before operation. It covers the details of correct installation, adjustment, maintenance, and—most importantly—safe operation of your new laser. It is intended to be used in conjunction with your engraving software manual, as the software typically does not only provide image design but also serves as an alternative interface for the laser settings and machine controls. You and any other users of this device should thoroughly understand **BOTH** manuals before attempting to operate the laser.

Keep both manuals for future reference and provide them to **ANYONE** who will install, operate, maintain, or repair this machine. Both manuals should be included if this device is given or sold to a third party.

If you have any comments, suggestions, or questions after reading these manuals, feel free to contact us, and we will address your concerns as soon as possible. Your feedback is invaluable to us in our ongoing efforts to enhance the user experience!



## Welcome to the OMTech Community!

For helpful hints and instructional videos, visit our **Help Center** or join our official laser group! If you encounter any issues with your engraver, please feel free to contact us. Our support team will respond within 24 hours to resolve your concerns.

### Help Center

[help.omtechlaser.com/hc/en-us](https://help.omtechlaser.com/hc/en-us) | 🔍

[First Time Setup](#) | [Safety](#) | [Maintenance](#) | [Troubleshooting](#) | [FAQ](#) | [Hot Tips](#)



Explore on your smart device

### @omtechlaser



**Official Website:** [omtechlaser.com](https://omtechlaser.com)

**Technical Support:** [support@omtechlaser.com](mailto:support@omtechlaser.com)

**Support Tel:** (949) 438-4949

**Address:** Rygel Advanced Machines, 1150 N Red Gum St Ste F, Anaheim, California 92806, USA.

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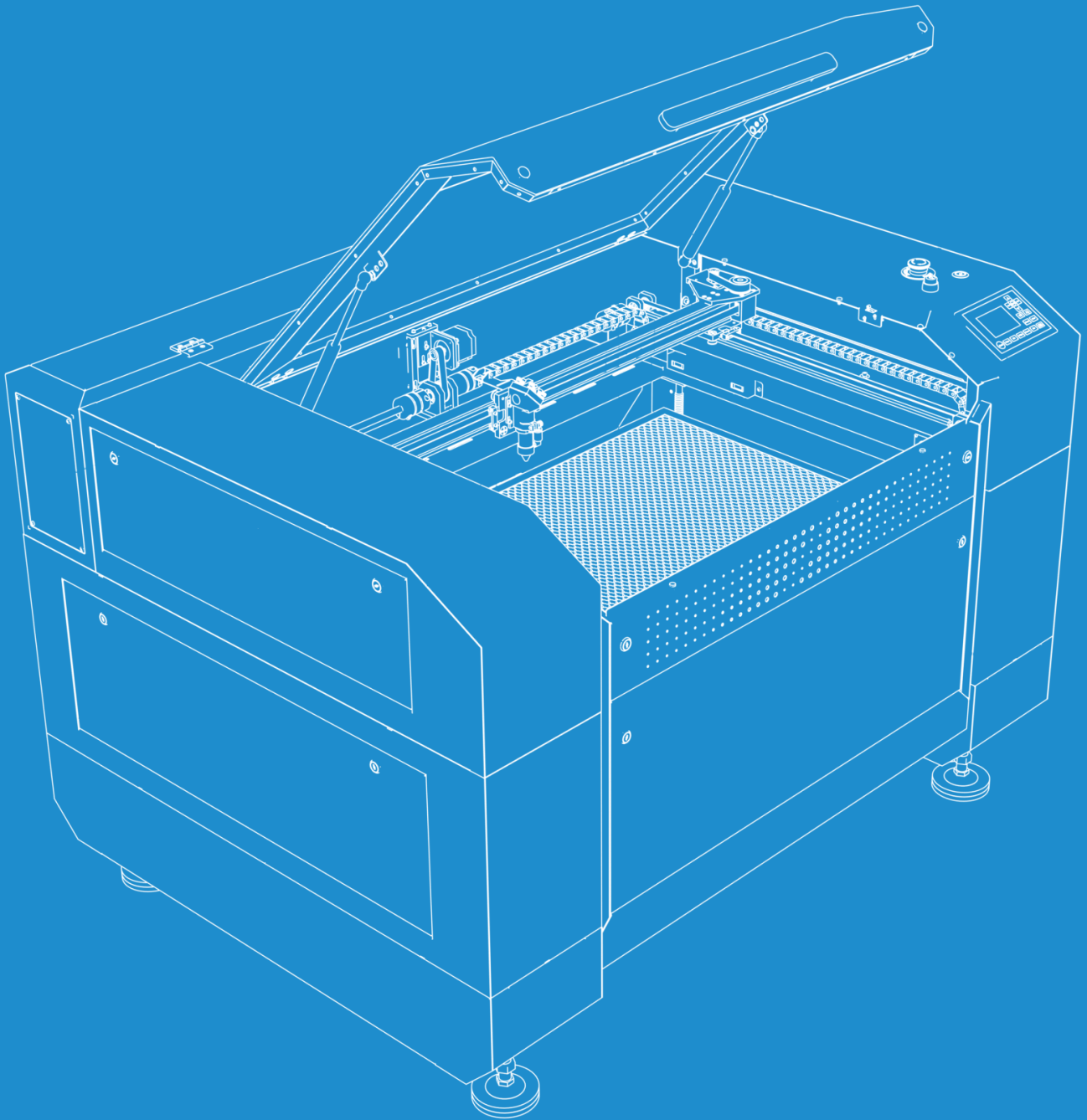
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# 1 Safety Information

## 1.1 Disclaimer

Read this disclaimer carefully **BEFORE** use.

### 1. **As-is**

This product(s) is sold 'as is' and without any express or implied warranties, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

### 2. **Product Modifications**

Any modifications or alterations to OMTech products void any warranties and may result in damage or injury. OMTech shall not be liable for any damages resulting from such modifications or alterations.

### 3. **Compliance with Laws**

Customers shall be liable for ensuring that the use of OMTech products complies with all applicable laws and regulations in their respective jurisdictions. OMTech assumes no responsibility for any violations of laws or regulations resulting from the use of its products.

### 4. **Correct Use**

Always use the product(s) only as directed in the accompanying manual. Failure to follow instructions may result in injury or damage.

Always ensure the operation, installment, maintenance, and repair of the product(s) is carried out by a competent person.

Always make maintenance regularly throughout the product lifecycle, you have the liability to keep the product operating as intended.

Always wear appropriate protective gear.

### 5. **Third-Party Products**

OMTech shall not be liable for any damages or losses resulting from the use of third-party products in conjunction with our products. Customers should refer to the third-party's guidelines or/and warranties (if any) for any third-party products used.

### 6. **Limitation of Liability**

OMTech shall not be liable for any direct, indirect, punitive, incidental, special, or consequential damages to property or life, whatsoever arising out of or connected with the use or misuse of our product(s). In no event shall OMTech's liability exceed the value of the product(s) sold.

This disclaimer states the entire obligation of OMTech with respect to the products. If any part of this disclaimer is determined to be void, invalid, unenforceable, or illegal, including, but not limited to the warranty disclaimers, liability disclaimers, and liability limitations set forth above, then the invalid or unenforceable provision will be deemed superseded by a valid, enforceable provision that most closely matches the intent of the original provision and the remainder of the agreement shall remain in full force and effect.



## 1.2 Designated Use

This laser engraver is intended for engraving signs and logos on consumer products or applicable substrates. Its laser can process a wide variety of materials including wood and cork, paper and cardboard, most plastics, glass, cloth and leather, and stone. It can also be used with some specially coated metals. Use of this system for non-designated purposes or materials is not permitted.

## 1.3 Symbol Guide

The following symbols are used on this machine's labeling or in this manual:



These items present a risk of serious property damage or personal injury.



These items address similarly serious concerns about the laser beam.



These items address similarly serious concerns about electrical components.



These items address similarly serious concerns about fire hazards.



These items address pinching and crushing hazards.



Protective eyewear should be worn by anyone around this machine during operation.



This product is sold in conformity with applicable EU regulations.

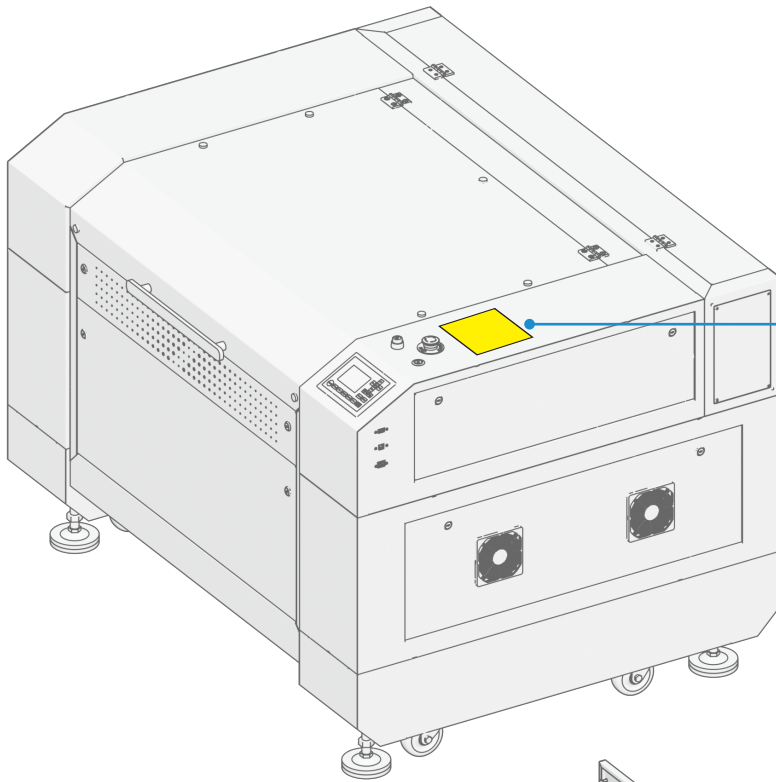


This product contains electrical components that should not be disposed of with regular garbage.

# 1. Safety Information

## 1.4 General Safety Instructions

- Your device should come with instruction labels in the following locations:



**WARNUNG!**

Während des Betriebs  
nicht  
unbeaufsichtigt lassen

**WARNING!**

**DO NOT**  
LEAVE UNATTENDED  
DURING OPERATION

**Achtung**

1. Während des Betriebs **NIEMALS** die Schichtung und den Laser für die Sicht von ungeübten Personen betreten. Lesen Sie die Anweisungen vor Gebrauch sorgfältig durch. Betreten Sie das Gerät nur im Zusammenhang mit der Wartung und einer qualifizierten Person, um Schaden zu vermeiden. Verhindern Sie es, an unbefugte Personen freigelegte Bauteile und / oder Laser zu betreten. Einmalige Personennormen, einschließlich des Laserlichts, sind in der Bedienungsanleitung angegeben.

2. Achten Sie auf die **CE**- und **UK**-Kennzeichnungen. Achten Sie auf die **CE**- und **UK**-Kennzeichnungen der Laserleistung. Lesen Sie die Bedienungsanleitung für die Laserleistung und die Laserleistung des Lasers.

3. Bei allen Laser-**WARTUNGS**-Tätigkeiten muss eine vollständige Sichtprüfung des Laserlichts durchgeführt werden. Lesen Sie die Bedienungsanleitung für die Laserleistung.

4. Das Laserlicht kann **VERLETZUNGEN** verursachen. Lesen Sie die Bedienungsanleitung für die Laserleistung.

5. Achten Sie auf die **CE**- und **UK**-Kennzeichnungen.

6. Lesen Sie die Bedienungsanleitung für die Laserleistung.

7. Lesen Sie die Bedienungsanleitung für die Laserleistung.

8. Lesen Sie die Bedienungsanleitung für die Laserleistung.

9. Lesen Sie die Bedienungsanleitung für die Laserleistung.

10. Lesen Sie die Bedienungsanleitung für die Laserleistung.

11. Lesen Sie die Bedienungsanleitung für die Laserleistung.

12. Lesen Sie die Bedienungsanleitung für die Laserleistung.

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16. Lesen Sie die Bedienungsanleitung für die Laserleistung.

17. Lesen Sie die Bedienungsanleitung für die Laserleistung.

18. Lesen Sie die Bedienungsanleitung für die Laserleistung.

19. Lesen Sie die Bedienungsanleitung für die Laserleistung.

20. Lesen Sie die Bedienungsanleitung für die Laserleistung.

**Attention**

1. Never operate this laser engraving machine without proper training. Read these instructions before use and carefully before use. Do not allow anyone else to operate the device unless they are properly trained and wearing eye protection.

2. Use this device only in accordance with all applicable local and national regulations.

3. Read the manual carefully and understand the instructions before use.

4. Always wear eye protection when operating this device. Do not look directly at the laser beam or the laser light path. Do not look directly at the laser light path when the laser is operating.

5. Do not operate the laser engraving machine in an unattended manner. Do not leave the laser engraving machine unattended for long periods of time. Do not leave the laser engraving machine unattended when the laser is operating.

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20. Do not operate the laser engraving machine in an unattended manner. Do not leave the laser engraving machine unattended for long periods of time. Do not leave the laser engraving machine unattended when the laser is operating.

**DANGER**

VISIBLE AND INVISIBLE CLASS 4  
LASER RADIATION WHEN OPEN

AVOID EYE OR SKIN EXPOSURE TO  
DIRECT OR SCATTERED RADIATION.  
DO NOT INSERT HANDS WHEN OPEN

**GEFAHR**

Sichtbare und unsichtbare Laserstrahlung der Klasse 4  
im geöffneten Zustand.

Bestrahlung von Auge oder Haut.  
Direkte Strahlung oder Streustrahlung vermeiden.  
Hände nicht im geöffneten Zustand einstecken.

**LASER ENGRAVING MACHINE**

Model No.: \_\_\_\_\_ Working Area: \_\_\_\_\_

Laser Power: \_\_\_\_\_ Laser Type: \_\_\_\_\_

Voltage: \_\_\_\_\_ Serial No.: \_\_\_\_\_

MANUFACTURED IN CHINA ON / /

SKU: \_\_\_\_\_

RYGEL ADVANCED MACHINES  
Address: 1939 N. Red Oak St. Suite P Anaheim, CA 92806, USA

This product complies with 21 CFR 1040.10 and 1040.11 except for conformance with EC 9026-1 Ed. 3, as described in Laser Notice No. 36, dated May 9, 2019.

**Legal Advertisements**

Address: 1939 N. Red Oak St. Suite P Anaheim, CA 92806, USA

Importer: Rygel Fibrel Limited  
Address: 41 Chesham Road Ground Floor  
Oxford, OX4 1JN, United Kingdom, W19 7JX

EC REP: APEX EB SPECIALISTS, S.L.  
C/ Puerto de la Merced, 13, C.F. 18-8 29019  
Leganés, Madrid, España  
Tel: +3490450020  
Email: info@apex-es.com

UK REP: APEX CE SPECIALISTS LIMITED  
89, Princes Street, Manchester M1 4HT, UK  
Tel: +44 (0)1617850  
Email: info@apex-uk.com

**Important Notice**

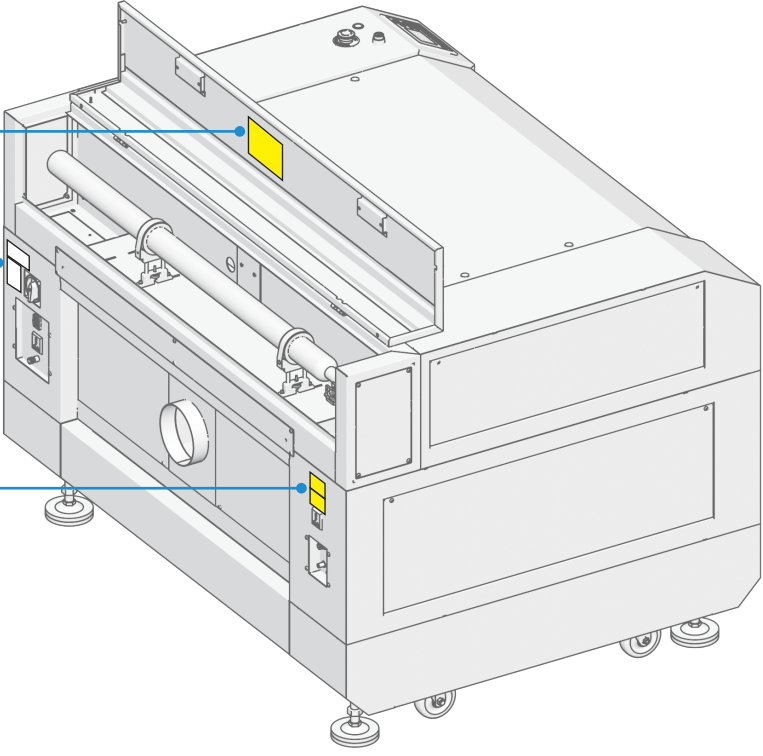
1. Always close the door before adjusting the laser or any productive eyewear rated OOD\* at the 1000000 wavelength.

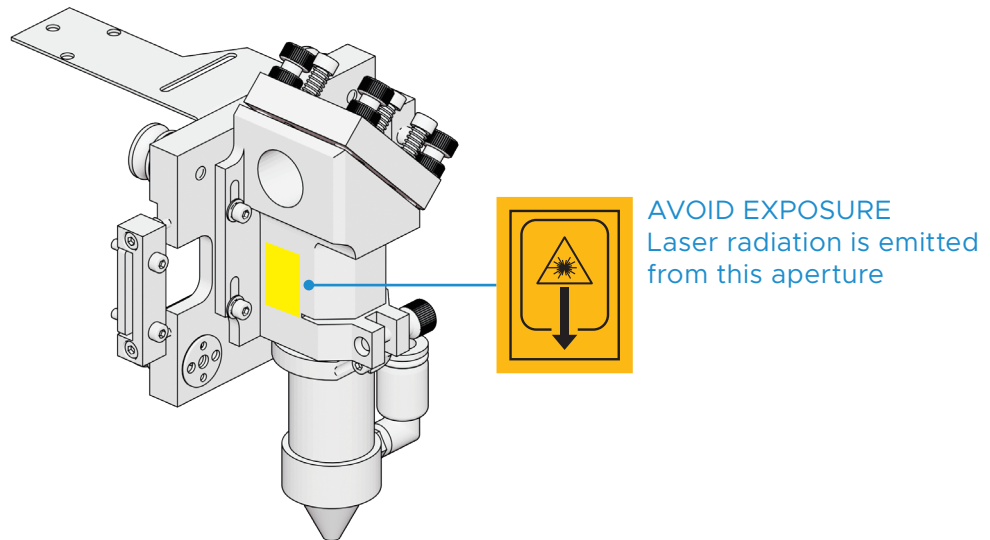
2. As a result of quality assurance testing, some rollers may be present in the laser cooling system's tubes and pipes. This is to ensure quality in all our new machines and does not affect use or safety.

3. DO NOT engrave any metallic surfaces with this machine except as otherwise provided in the manual. The wavelength of CO<sub>2</sub> lasers is unproductive and highly reflective for most metals.

**Wichtige Hinweise**

Aufgrund von Qualitätsüberprüfungen kann in den Röhren und Leitungen des Lasersystems etwas Wasser vorhanden sein. Dies dient der Qualitätsicherung aller unserer neuen Geräte und beeinträchtigt weder den Gebrauch noch die Sicherheit.





For specific details of the nameplate, see the nameplate attached to the machine. If any of these labels is missing, illegible, or becomes damaged, it must be replaced.

- **ALWAYS** follow federal, state, and local laws, codes, and regulations concerning the use of laser marking machinery.
- **ALWAYS** use this machine in accordance with this manual and the manual for the engraving software included with it.



Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- **ALL** personnel involved in the installation, operation, and maintenance of this machine **MUST** read and understand this manual and the separate engraving software manual, particularly the safety instructions. Some components are extremely high voltage and/or produce powerful laser radiation. Substandard performance and longevity, property damage, and personal injury may result from not knowing and following these instructions.

Ensure that this manual and the separate engraving software manual are both included with this machine if it is ever given or sold to a third party.

- **ALL** personnel involved in the installation, operation, and maintenance of this machine **MUST** be familiar with the field of use, the dangers of the machine, and the characteristics of engraving materials, including its reflectivity, conductivity, potential for creating harmful or combustible fumes and so on.
- **DO NOT** allow minors, untrained personnel, or personnel suffering from physical or mental impairment that would affect their ability to follow this manual and the separate engraving software manual to install, operate, maintain, or repair this machine.

# 1. Safety Information

- Any untrained personnel who might be near the machine while it is in operation **MUST** be informed that it is dangerous and be fully instructed on how to avoid injury during its use.
- **ONLY** use this product for its intended purpose, engraving signs and logos on consumer products or applicable substrates. Use of this machine for non-designated purposes or materials is not permitted.
- Limit access to the area where the engraver is in use.

- **ALWAYS** use special protective eyewear when the laser is in use. The active laser is invisible to the human eye and could cause potentially permanent injury.



- **ONLY** touch the components of this product with **ONE HAND** at a time during use to reduce the risk of electric shock.
- It is recommended to use 10–75% of the rated power to enjoy optimal performance and longevity for most applications.



Constantly running your laser above 80% of its rated power can significantly **SHORTEN** the service life of this product.

- **DO NOT** operate this machine continuously for more than 4½ hours. Stop for at least 30 minutes between uses.
- **DO NOT** leave this machine unattended during operation.

Observe the machine throughout the operation. If anything seems to be operating strangely, immediately cut off **ALL** power to the machine and contact either our customer service or your dedicated repair service.



- **NEVER** use this machine while any cover is open to avoid potentially permanent injury. The active laser is invisible to the human eye.
- **NEVER** operate the engraver without any of the water cooling system and exhaust system operating properly. The water cooling system and exhaust system are both essential to the safe use of this device. Water should always be kept clean and around room temperature, and the exhaust system should always comply with all applicable laws and regulations for workplace and environmental air quality.
- Ensure the machine is **FULLY** turned off in the correct order after each use.
- **ALWAYS** keep a fire extinguisher, water hose, or other flame-retardant system nearby in case of accidents.

- Ensure that the local fire department's phone number is displayed nearby.
- In the case of a fire, cut electrical power before dousing the flame. Familiarize yourself with the correct range for your extinguisher before use. Take care not to use your extinguisher too close to the flame, as its high pressure can produce blowback.

## 1.5 Laser Safety Instructions

When used as instructed, this machine is a **CLASS 1** laser product safe for users and bystanders. It complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

However, it includes a **CLASS 4** laser system and some components remain **EXTREMELY** dangerous. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure, which can cause serious property damage and personal injury including but not limited to the following:

- The laser will easily burn nearby combustible materials.
- Some working materials may produce radiation or harmful gases during processing.
- Direct exposure to the laser will cause bodily harm including serious burns and irreparable eye damage.



As such, please be aware of the following:

- **ONLY** use this engraver if its automatic shutoffs are working properly. When you first get this engraver and if you subsequently notice any problems, test them (see below) before undertaking any other work. Do not continue use if the shutoffs do not occur. Turn off the device and contact customer service or your repair service. Never disable these shutoffs.
- **NEVER** leave any part of the cabinet open during operation except (when needed) the pass-through doors.
- **NEVER** interfere with the laser beam.
- **DO NOT** place any part of your body under the laser lens during operation. Take measures to protect yourself from potentially reflected laser beams including the use of screens or personal protective equipment (PPE) such as protective eyewear.
- When using the pass-through doors or otherwise risking exposure to the laser beam, take measures to protect yourself from potentially reflected laser beams including the use of personal protective equipment such as protective eyewear specially designed to filter the specific wavelength of your engraver's laser with an optical density (OD) of 5+.

# 1 Safety Information

- **NEVER** attempt to view the laser directly without protective eyewear. **ALWAYS** wear safety goggles or glasses designed to filter the specific wavelength of your engraver's laser with an optical density (OD) of 5+. As even seemingly matte materials can produce harmful reflected beams, care should be taken to keep anyone without protective eyewear from observing the machine during operation.

**DO NOT** stare or allow others to stare continuously at the laser beam during the operation **EVEN WHEN** the cover is closed and/or you are wearing protective eyewear.



Exercise caution with the red dot positioning light as well, as its direct beam is a **CLASS 1** laser in its own right.

- **DO NOT** stare or allow others to stare continuously at the laser beam during operation even when the cover is closed and/or wearing protective eyewear.
- **ONLY** use this machine as described in the **Material Safety** section of this manual. The laser settings and engraving process must be properly adjusted for specific materials.
- **DO NOT** leave potentially combustible, flammable, explosive, or corrosive materials nearby where they could be exposed to the direct or reflected laser beam.
- **DO NOT** use or leave sensitive EMI equipment nearby. Ensure the area around the laser is free of strong electromagnetic interference during any use.
- **DO NOT** modify or disable this device's provided safety features. **DO NOT** modify or disassemble the laser and do not use the laser if it has been modified or disassembled by anyone except trained and skilled professionals. Dangerous radiation exposure and other injury may result from the use of adjusted, modified, or otherwise incompatible equipment.
- Keep the area free of airborne pollutants, as these might pose a similar risk of reflection, combustion, and so on.
- **DO NOT** use generic coolant or antifreeze in your cooling water, as they may leave corrosive residues and solidify inside your hoses and piping, causing malfunctions and even explosions. Use custom laser-safe formulations or use and store your engraver in a climate-controlled area.

## 1.6 Electrical Safety Instructions

- **ONLY** use this machine with a compatible and stable power supply with less than 5% fluctuation in its voltage.
- **DO NOT** connect other machines to the same fuse, as the laser system will require its full amperage. **DO NOT** use with standard extension cords or power strips. Use only surge protector rated over 2000J.

- **ONLY** turn on the power to this machine when it is well grounded, either via a firm connection to a 3-prong outlet or via a dedicated grounding cable firmly connected to the proper slot on the back of the control cabinet. Do not use with an ungrounded 3-to-2 prong adapter. The machine's grounding should be checked regularly for any damage to the line or loose connections.
- Turn the machine on and off using its key and power buttons in the correct order. The mainboard, galvanometer (galvo), and laser have separate power supplies that are grounded in order. Activating everything at once, too quickly, or in the wrong order may send electrical current to an ungrounded component, causing short circuits and other electrical hazards.
- **ONLY** touch the components of this product with **ONE HAND** at a time during use. The laser is powered by an extremely high voltage connection and placing two hands on the machine at one time during operation has the potential to create a closed circuit with the human body, resulting in electrical shock.
- The area around this laser marking machine should be kept dry, well-ventilated, and environmentally controlled to keep the ambient temperature between 40°F–95°F (5°C–35°C). For best results, keep the temperature at 75°F (25°C) or below. The ambient humidity should not exceed 70%.
- Adjustment, maintenance, and repair of the electrical components of this machine must be done **ONLY** by trained and skilled professionals to avoid fires and other malfunctions, including potential radiation exposure from damage to the laser components. Because specialized techniques are required for testing the electrical components of this marking system, it is recommended such testing only be done by the manufacturer, seller, or repair service.
- Unless otherwise specified, **ONLY** undertake adjustment, maintenance, and repair of the machine when it is turned off, disconnected from its power supply, and fully cooled.
- **DO NOT** handle the water pump (not included) or the water in which it is submerged while the pump is attached to its power supply. Place it in water before connecting it to power and disconnect it from power before removing it.



## 1.7 Material Safety Instructions

- Users of this marking machine are responsible for ensuring that every person present during operation has sufficient Personal Protective Equipment (PPE) to avoid any injury from emissions or byproducts of the materials being processed. In addition to the protective laser eyewear discussed above, this may require masks or respirators, gloves, and other protective outer clothing.
- Users must exercise special caution when working with conductive materials as the buildup of their dust and ambient particles may damage electrical components, cause short circuits, or produce other effects including reflected laser radiation.

# 1 Safety Information

- Users of this marking machine are responsible for confirming that materials to be processed can withstand the heat of a **CLASS 4** laser and will not produce any emissions or byproducts either harmful to people nearby or in violation of any local or national laws or regulations.
- **DO NOT** ever under any circumstances use this laser engraver if the exhaust system is not working properly. Always ensure that the exhaust fan can remove the dust and gas produced by the engraving process in accordance with all applicable local and national laws and regulations. Immediately stop use if the exhaust fan or vent pipe malfunctions. Periodically check the air assist intake filter to ensure it stays free of any dust or debris.
- This machine **CAN** be safely used with the following materials:

## Plastics

- ◆ Acrylonitrile Butadiene Styrene (ABS)
- ◆ Nylon (Polyamide, PA, etc.)
- ◆ Polyethylene (PE)
- ◆ High-Density Polyethylene (HDPE, PEHD, etc.)
- ◆ Biaxially-Oriented Polyethylene Terephthalate (BoPET, Mylar, Polyester, etc.)
- ◆ Polyethylene Terephthalate Glycol (PETG, PET-G, etc.)
- ◆ Polyimide (PI, Kapton, etc.)
- ◆ Polymethyl Methacrylate (PMMA, Acrylic, Plexiglass, Lucite, etc.)
- ◆ Polyoxymethylene (POM, Acetal, Delrin, etc.)
- ◆ Polypropylene (PP, etc.)
- ◆ Styrene

## Others

- ◆ Cardboard
- ◆ Ceramics, including Dishes, Tile, etc.
- ◆ Glass
- ◆ Leather
- ◆ Paper & Paperboard
- ◆ Rubber
- ◆ Stone, including Marble, Granite, etc.
- ◆ Textiles, including Cotton, Suede, Felt, Hemp, etc.
- ◆ Wood, including Cork, MDF, Plywood, Balsa, Birch, Cherry, Oak, Poplar, etc.

For the recommended parameters for the most commonly engraved materials, you can check, see [§5.6 Instructions for Specific Materials](#) on Page 9 for reference.



- This machine **CANNOT** be used with **THE FOLLOWING MATERIALS OR WITH ANY MATERIALS WHICH INCLUDE THEM:**
  - ◆ Artificial Leather containing Hexavalent Chromium (Cr[VI]), due to its toxic fumes
  - ◆ Astatine, due to its toxic fumes
  - ◆ Beryllium Oxide, due to its toxic fumes
  - ◆ Bromine, due to its toxic fumes
  - ◆ Chlorine, including Polyvinyl Butyral (PVB) and Polyvinyl Chloride (PVC, Vinyl, Cintra, etc.), due to its toxic fumes
  - ◆ Fluorine, including Polytetrafluoroethylenes (Teflon, PTFE, etc.), due to its toxic fumes
  - ◆ Iodine, due to its toxic fumes
  - ◆ Metals, due to their conductivity and reflectivity
  - ◆ Phenolic Resins, including various forms of Epoxy, due to their toxic fumes
  - ◆ Polycarbonate (PC, Lexan, etc.), due to its toxic fumes

For all other materials, if you are unsure about its safety or laserability with this device, seek out its material safety data sheet (MSDS). Alternatively, contact our support department for further guidance.

Pay especial attention to information about safety, toxicity, corrosiveness, reflectivity, and reaction(s) to high heat. Never operate the laser on any (such as PVC, teflon, and other halogen-containing substances) that can produce corrosive, hazardous, or even deadly fumes.

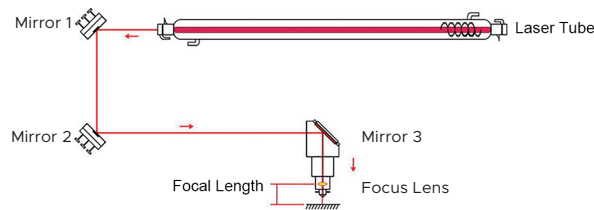
# 2 Introduction

## 2.1 General Information

Your laser engraver works by emitting a powerful laser beam from a glass tube filled with excited carbon dioxide (CO<sub>2</sub>), catalyzing nitrogen (N<sub>2</sub>), and insulating helium (He), reflecting that beam off three mirrors and through a focus lens, and using this focused light to cut and etch designs into certain substrates.

The first mirror is fixed near the end of the laser tube, the second mirror travels along the machine's Y axis, and the third mirror is attached to the laser head that travels along the X axis. Because some dust from the engraving process settles on the mirrors, they require frequent cleaning. Because they move during operation, they also require periodic readjustment using their attached positioning screws to maintain the proper laser path.

### Laser Path



With low-intensity use, the provided laser tube has an average lifespan around 12,000 hours before requiring replacement. However, constantly running your laser above 70% of its maximum rated power can significantly shorten its service life. It is recommended to use settings from 10%–70% of the maximum rated power to enjoy optimal performance and longevity.

Note that this is a high-voltage device and, as a safety precaution, it is recommended to only touch its components with one hand at a time during use. Further note at its rated voltage this device and its components can draw over 30 amps at their maximum settings. Use separate 20 A circuits for the machine's power cord and the water chiller's power cord. Prepare a robust dedicated circuit for the machine ahead of time, or carefully use lower settings to avoid drawing too much power at one time.

## 2.2 Technical Specifications

Model		PRONTO 40	PRONTO 45	PRONTO 60	PRONTO 75
Input Power		AC 220 V, 50 Hz			
Power Consumption		1350 W	1450 W	1700 W	1900 W
Rated Power		80 W	100 W	130 W	150 W
Expected Service Life at <40% / 40–70% / >70% Power		8000/10000/12000 (hr.)			
Laser Wavelength		10640 nm			
Laser Tube	Diameter	2.36 in. / 60 mm	2.36 in. / 60 mm	2.76 in. / 70 mm	2.76 in. / 70 mm
	Length	50 in. / 1250 mm	57.09 in. / 1450 mm	65.0 in. / 1650 mm	72.83 in. / 1850 mm
Mirror	Diameter	0.98 in. / 25 mm			
	Thickness	0.12 in. / 3 mm			
Focus Lens	Diameter	0.78 in. / 20 mm			
	Thickness	0.08 in. / 2 mm			
	Focal Length	2.5 in. / 63.5 mm			
Processing Area		35.4×23.6 (in.) 900×600 (mm)	39.4×23.6 (in.) 1000×600 (mm)	51.2×35.4 (in.) 1300×900 (mm)	62.9×39.3 (in.) 1600×1000 (mm)
Front/Back Pass-Through Area (L×H)		39.3×1.5 (in.) 1000×40 (mm)	45.3×1.5 (in.) 1150×40 (mm)	55.1×1.5 (in.) 1400×40 (mm)	66.9×1.5 (in.) 1700×40 (mm)
Workbed Blades		15	17	21	26
Max. Processing Speed		31.5 ips / 800 mm/s			
Max. Acceleration	X-Axis	472 ips <sup>2</sup> / 12000 mm/s <sup>2</sup>			
	Y-Axis	315 ips <sup>2</sup> / 8000 mm/s <sup>2</sup>			
Min. Letter Size		0.39×0.39 (in.) / 1×1 (mm)			
Req. Operating Environment	Humidity Range	70%			
	Temp. Range	40–95 (°F) / 5–35 (°C)			
Provided Operating Software		RDWorks			
Compatible Operating Software		RDWorks, CorelLaser, LightBurn			
Supported Image Formats		.svg, .dxf, .plt, .ai, .jpg, .bmp			
Graphic Operating Modes		Raster, Vector, Combined			
Certification		CE, FDA			
Dimensions (L×W×H)		59×44×40.2 (in.) 150×112×102 (cm)	67×44×40.2 (in.) 165×112×102 (cm)	74.8×56×40.2 (in.) 190×142×102 (cm)	87×60×40.2 (in.) 220×152×102 (cm)
Net Weight		562 lb. / 255 kg	631 lb. / 286 kg	793.7 lb. / 360 kg	981 lb. / 445 kg

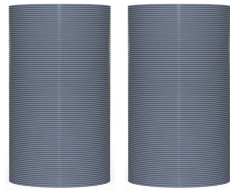
# 2 Introduction

## 2.3 Components

### 2.3.1 Package List



A



B



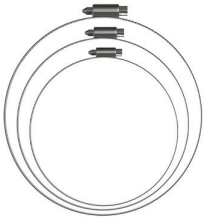
C



D



E



F



G



H



I



J



K



L



M



N



O



P



Q



R



S



T



U



V



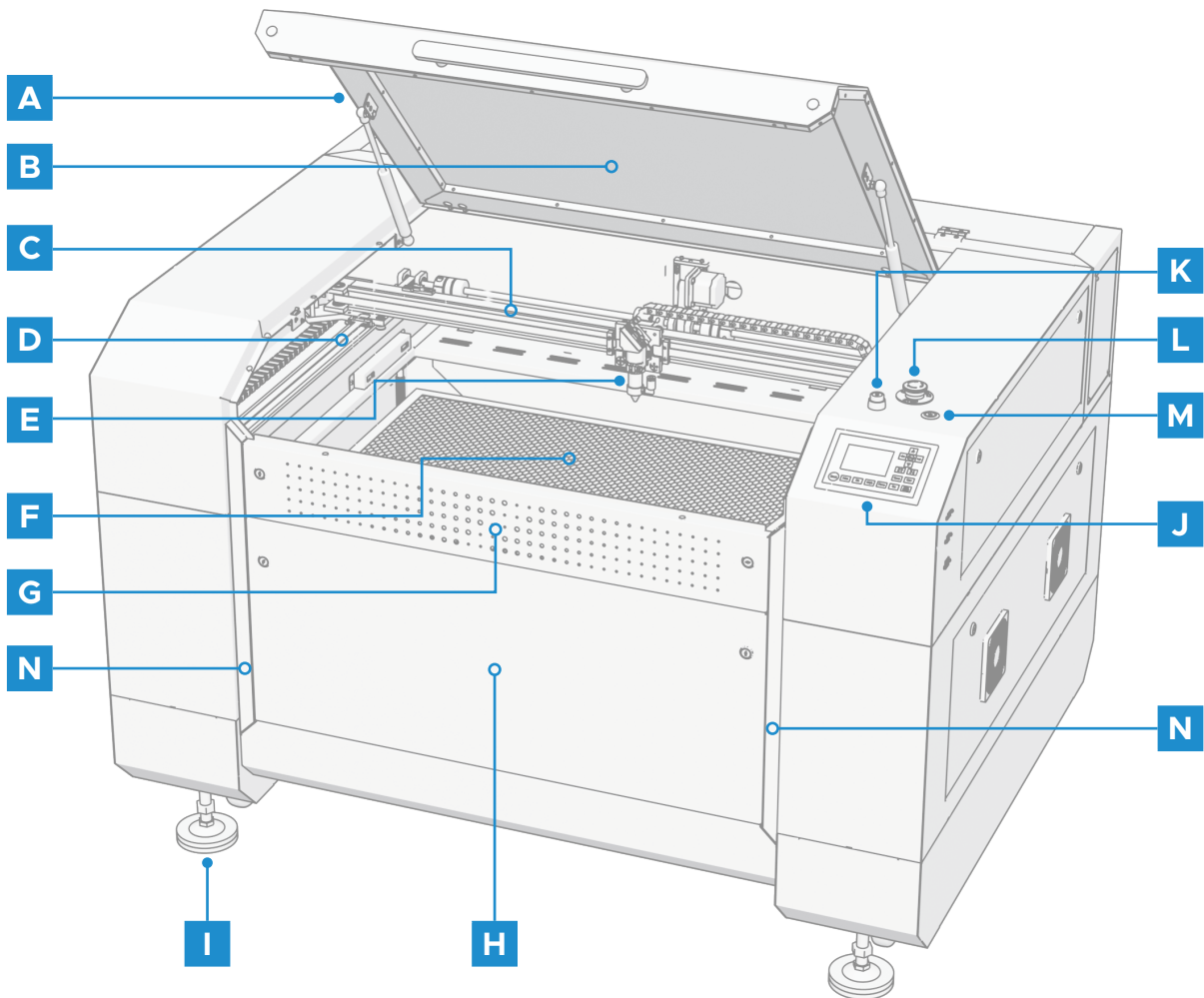
W

No.	Item	Qty.
<b>A</b>	Exhaust Fan	<b>1 or 2 (PRONTO 75 Only)</b>
<b>B</b>	Exhaust Pipes, 150 mm Diameter and 1.5 m Long	<b>2 or 4 (PRONTO 75 Only)</b>
<b>C</b>	Power Cord	1
<b>D</b>	USB Cable	1
<b>E</b>	Ethernet Cable	1
<b>F</b>	Pipe Clamps, 150 mm Diameter	<b>3 or 6 (PRONTO 75 Only)</b>
<b>G</b>	Laser Keys with A Focal Length Ruler	2
<b>H</b>	Access Keys	4
<b>I</b>	USB Flash Drive with Engraving Software Included	1
<b>J</b>	Focus Lens Repair Tools	2
<b>K</b>	A Set of Hex Wrenches	1
<b>L</b>	Flat-head Screwdriver	1
<b>M</b>	Phillips-head Screwdriver	1
<b>N</b>	Water Inlet Hose for Water Cooling Systems (Blue)	1
<b>O</b>	Water Outlet Hose for Water Cooling Systems (White)	1
<b>P</b>	Water Chiller Alarm Cable	1
<b>Q</b>	Reverse Compensation Card	1
<b>R</b>	Air Assist Pump	1
<b>S</b>	Double-sided Tape	1
<b>T</b>	Silicone Sealant	1
<b>U</b>	Water Hose Clamps	2
<b>V</b>	Ceramic testing Resistor	1
<b>W</b>	Tool Box	1

# 2 Introduction

## 2.3.2 Main Parts

Front



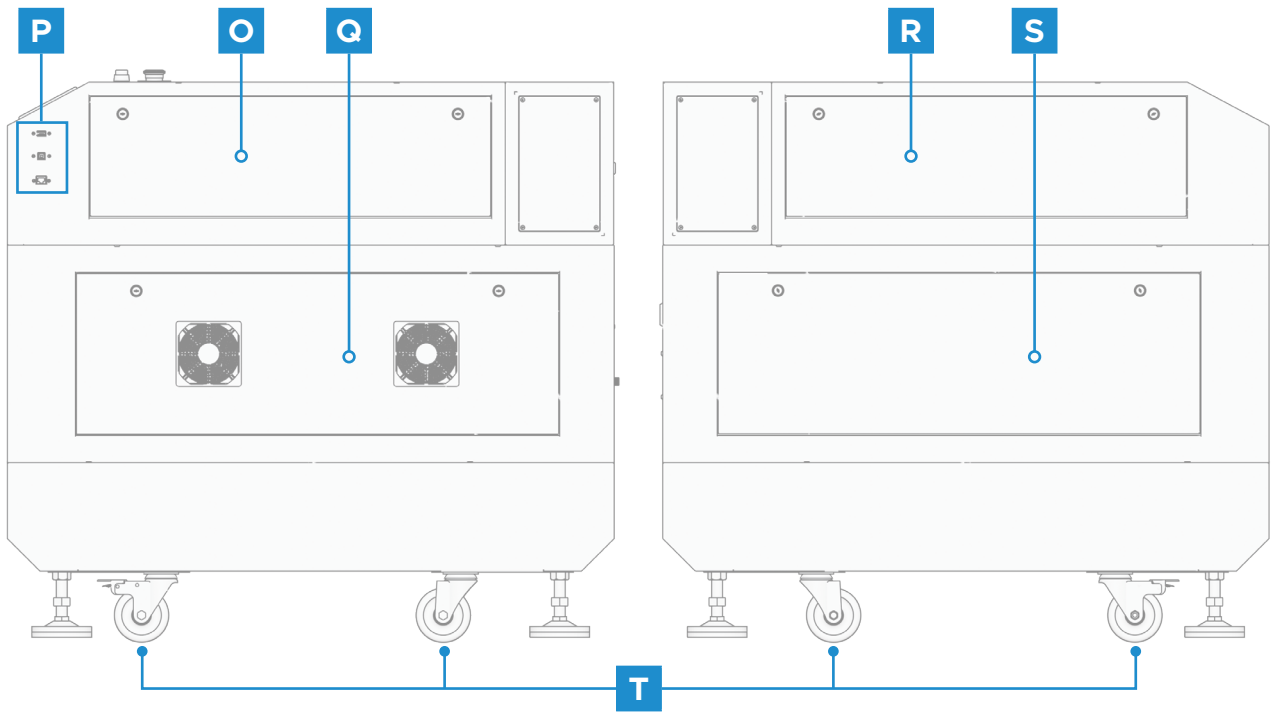
A	<b>Cover</b>	Provides access to the main bay for placing and retrieving materials, as well as fixing the laser path alignment and other maintenance. Power to the laser is automatically cut when the cover is opened.
B	<b>Viewing Window</b>	Protects you and others from the laser and its reflection, allowing monitoring of the engraving process. However, you should never stare continuously at the laser during operation, even through the window.
C	<b>X-Axis Rail</b>	Holds Mirror 2, supports the movement of the laser head left and right across the workbed.

D	<b>Y-Axis Rail</b>	Supports the movement of the X-axis rail up and down across the workbed.
E	<b>Laser Head</b>	Holds Mirror 3, the focus lens, and the air assist outlet.
F	<b>Workbed</b>	Can be adjusted in height to fit thinner and thicker materials, as well as adjusted between the aluminum and honeycomb platforms.
G	<b>Pass-Through Door</b>	Opens to allow larger pieces of material to be fed through the workbed. Additional care must be taken to avoid seeing or suffering exposure to the laser beam and its reflection, and avoid the heavy material falling down to your feet when taking it out.
H	<b>Front Access Door</b>	Provides access to the area below the workbed for easy cleanup. The power of this machine will be automatically cut off for safety when opening this door. This is also where the accessories are located when the engraver first arrives.
I	<b>Feet</b>	Can be rotated down to help anchor the machine in place.
J	<b>Control Panel</b>	Provides hands-on control of the engraving process, including manual movement of the laser head and firing of the laser.
K	<b>Laser Key</b>	<p>Controls the power supply to your laser tube and air assist pump. Turn it on after the control system power and turn it off before.</p> <ul style="list-style-type: none"> <li>• For saving energy, the air assist pump only starts during the working process, and after the work is completed, the air assist pump will automatically shut down with a 20-second delay.</li> <li>• For your own safety and that of passersby, this engraver can be locked shut using the laser key. It is recommended that you use it to lock the machine between sessions, preventing any unauthorized operation of the machine.</li> </ul>
L	<b>Emergency Stop</b>	Stops the machine instantly by pressing it down in an event of emergency. Turning it clockwise releases the button. Due to risks of fire and other hazards during engraving, this engraver includes this large and easy-to-reach emergency stop button on the control panel.
M	<b>Reset</b>	<p>Turns on the laser power supply after inserting the laser key.</p> <p>Press it after the emergency stop button when turning on the machine; Press it after temporarily opening and closing the cover (A) or the front access door (H);</p> <p>No need to press it when turning off the machine.</p>
N	<b>Indicator Lights</b>	Indicates the machine state: yellow in standby, green during active lasing, red for errors.

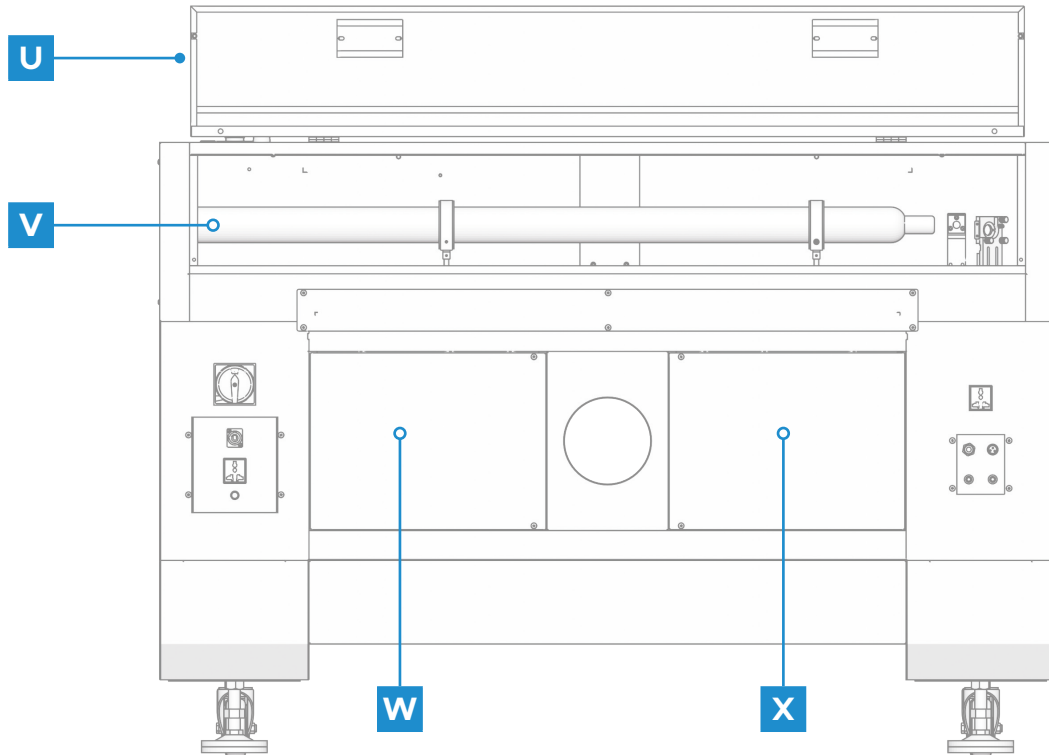
# 2 Introduction

Right

Left



Back

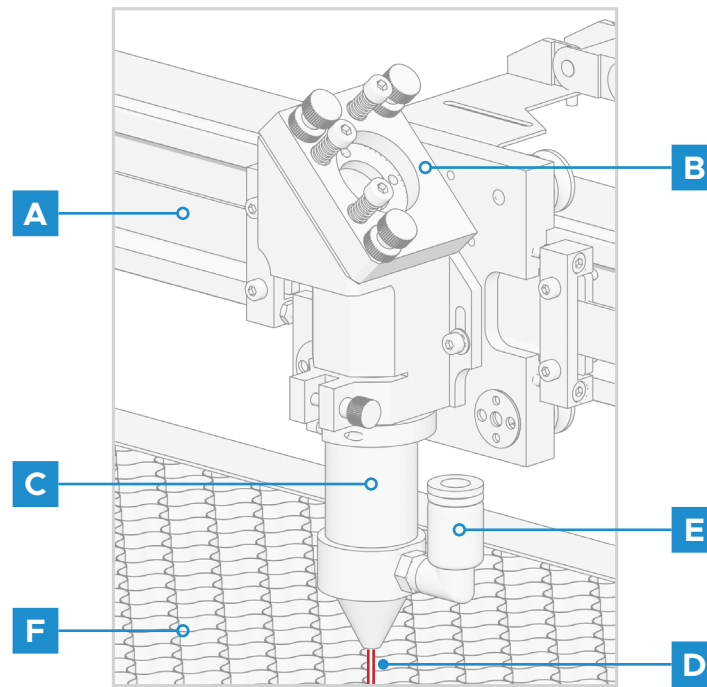




O	<b>Top Right Access Door</b>	Provides access to the control panel, buttons, and sensors for maintenance at the front rear, and sides and repair.
P	<b>Connection Inputs</b>	Includes the machine's ports for its USB, computer, and Ethernet connections.
Q	<b>Bottom Right Access Door</b>	Provides access to the mainboard, motor drivers, and control power supply.
R	<b>Left Top Access Door</b>	Provides access to the second mirror for maintenance and repair.
S	<b>Left Bottom Access Door</b>	Provides access to the Z axis rail lifting motor and air pressure sensor for maintenance and repair.
T	<b>Caster Wheels</b>	Moves or anchors the machine. The front wheels include locks to anchor the engraver in place.
U	<b>Top Rear Access Door</b>	Opens to the laser bay, holding the laser tube and its connections.
V	<b>Laser Tube</b>	Produces your engraving laser safely with helium, nitrogen, and CO <sub>2</sub> gas and water cooled filled inside. Its connection to the laser power supply is extremely high voltage and extremely dangerous.
W	<b>Back Left Access Door</b>	Backup access door for maintenance and repair.
X	<b>Back Right Access Door</b>	Provides access to the laser source for maintenance and repair.

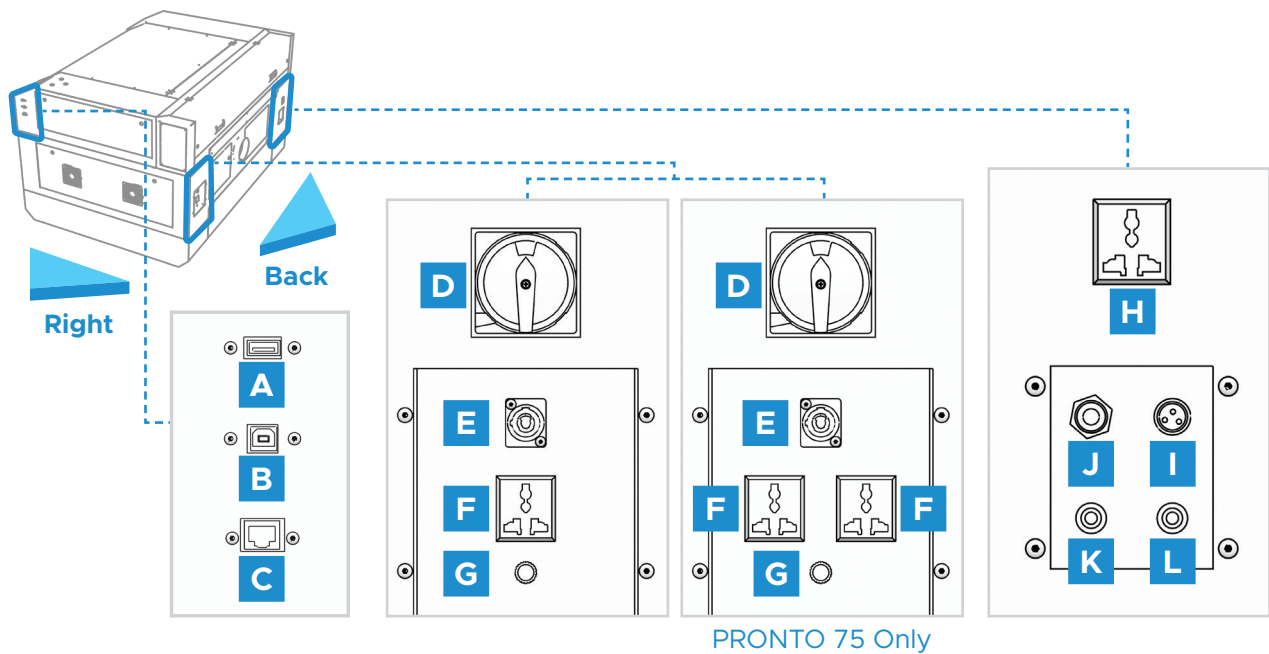
# 2 Introduction

## 2.3.3 Laser Head



A	<b>X Axis Rail</b>	Moves along the Y axis, with its movement controlled by limit switches.
B	<b>Mirror 3</b>	Transfers the laser from Mirror 2 to the focus lens. Can adjust its angles.
C	<b>Focus Lens</b>	With a diameter of 20 mm, directs and focuses the laser beam to its point of contact with the engraving material.
D	<b>Laser</b>	The engraving laser itself is invisible but highly dangerous, thus avoid any direct exposure to your skin or eyes.
E	<b>Air Assist</b>	Blows pressurized air to kill sparks and blow away gas and debris as you engrave.
F	<b>Workbed</b>	Holds the target material, moves the material up and down. You can use the provided focal length ruler (G) to get the correct height for perfect focus for any thickness of material.

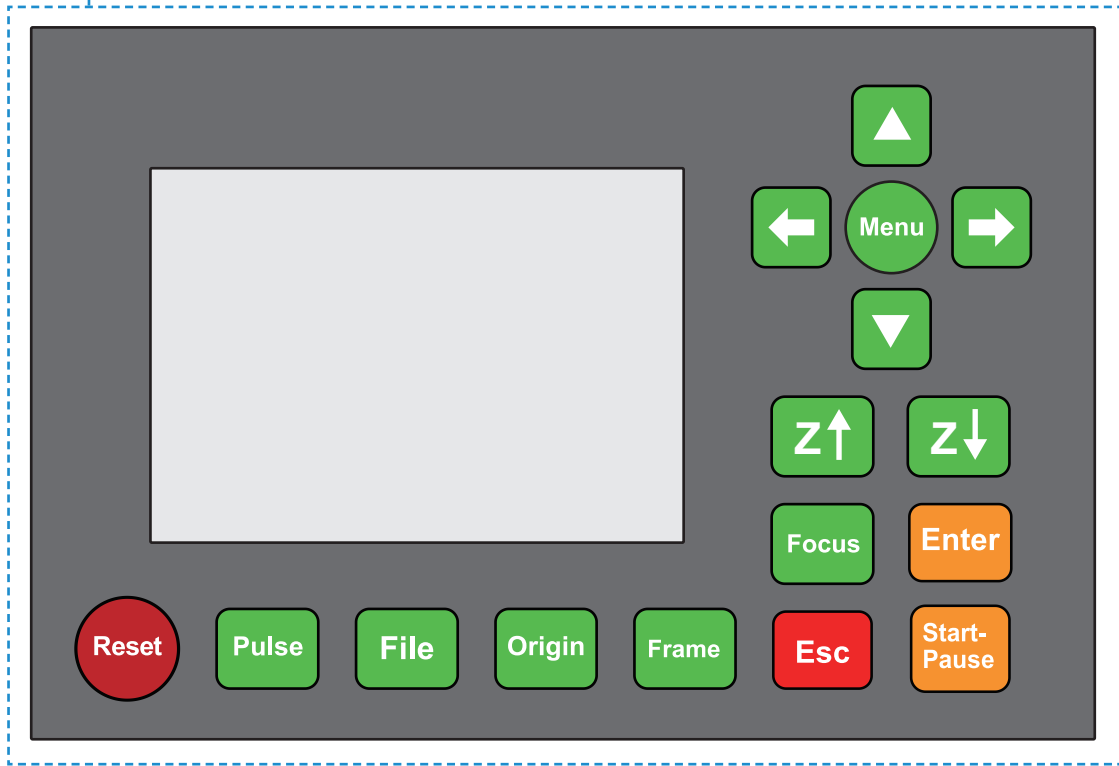
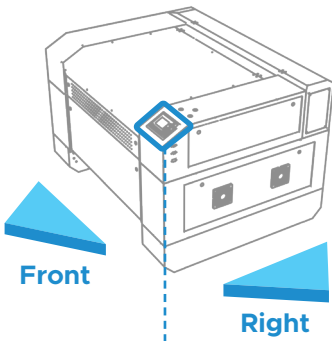
## 2.3.4 Connection Inputs
















A	<b>USB Drive</b>	Allows you to load and save designs and parameters directly onto the engraver.
B	<b>USB Cable</b>	Connects to your control computer and its engraving software.
C	<b>Ethernet Cable</b>	Connects to your control computer and its engraving software.
D	<b>Main Power Switch</b>	Controls the main power supply to the machine. For saving energy, the exhaust fan only starts during the working process, and after work is completed, the exhaust fan will automatically shut down after 30 seconds.
E	<b>Main Power Port</b>	Provides main power supply with the standard 3-prong main power cable.
F	<b>Exhaust Fan</b>	Provides power to an exhaust fan.
G	<b>Grounding</b>	Connects to the dedicated grounding cable for safety if applicable.
H	<b>Air Assist Pump</b>	Connects to the air assist pump and grounds it.
I	<b>Chiller Alarm</b>	Connects to the water chiller alarm cable.
J	<b>Air Assist Intake</b>	Connects to the air assist pump with a hose of 8 mm diameter.
K	<b>Water Inlet</b>	Connects to the outlet of a water cooling system.
L	<b>Water Outlet</b>	Connects to the inlet of a water cooling system.

# 2 Introduction

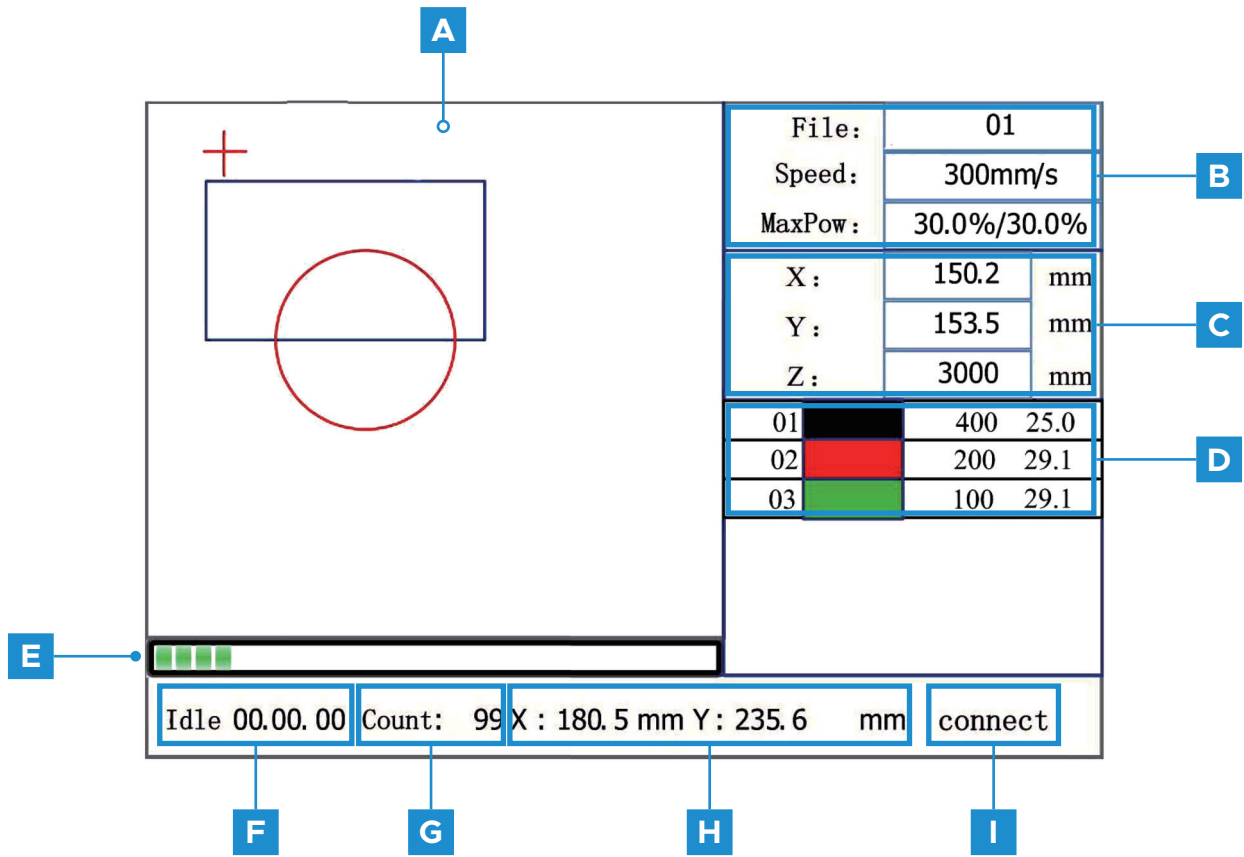
## 2.3.5 Control Panel



Button	Description
	Returns the machine to the saved default parameters.
	Manually fires the laser.
	Opens the file control menu.
	Sets the starting point for the laser head.
	Traces the outline of the current design for sizing.
	Opens the function menu.
	Moves the laser head along the X axis or the left/right cursor.
	Moves the laser head along the Y axis or the up/down cursor.
	Moves the workbed up and down along the Z axis.
	Autofocuses the laser head.
	Enters a command or confirms your selection.
	Stops work or exits from a submenu.
	Starts or pauses the work..

# 2 Introduction

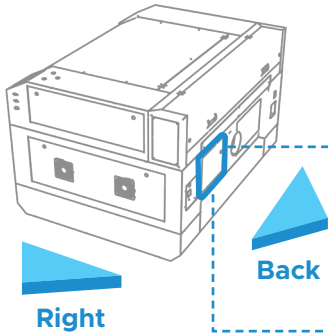
## 2.3.6 Panel Screen



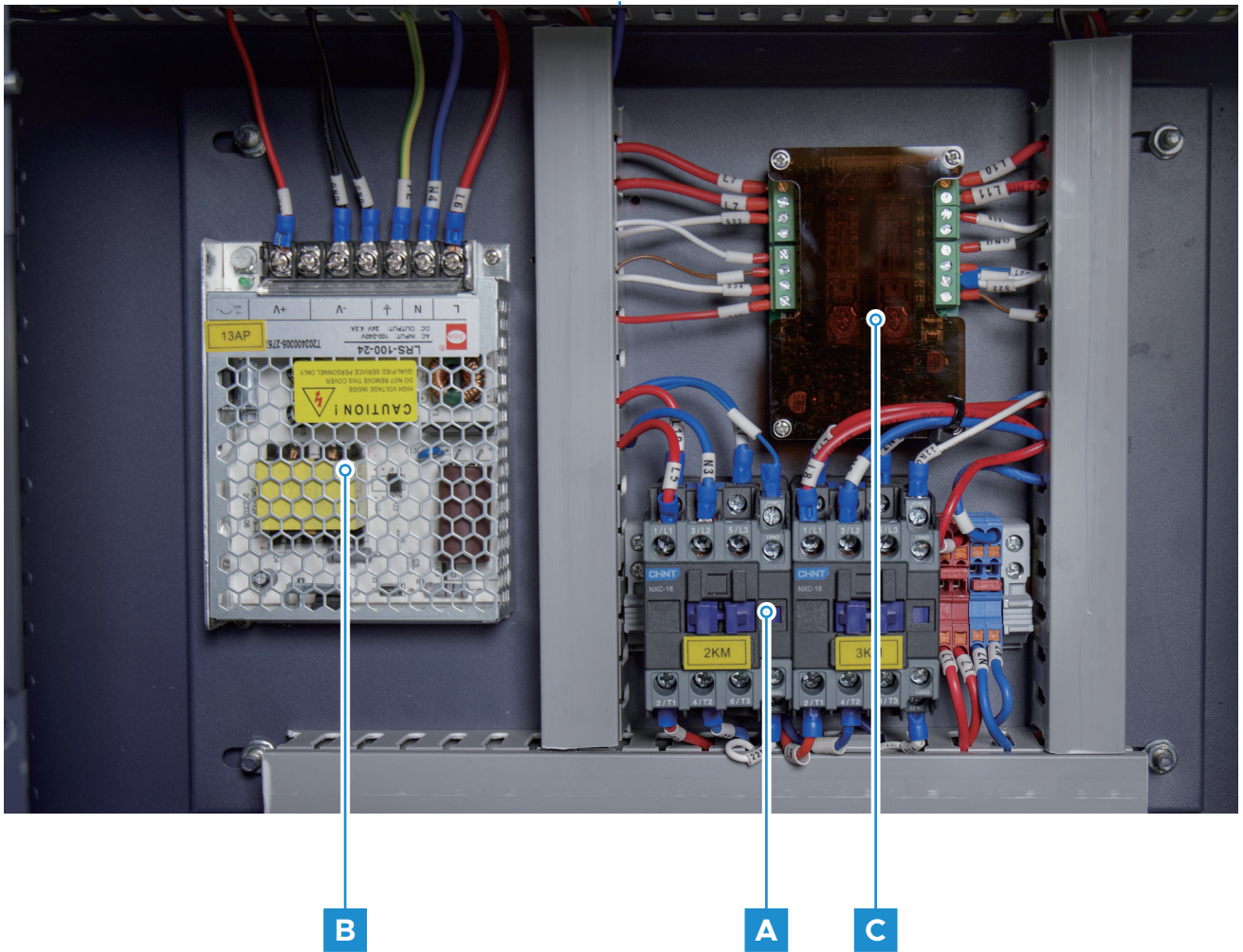
A	<b>Graphic Display Area</b>	Traces the processed file image during file preview display and processing.
B	<b>Parameter Display Area</b>	Displays the file number, speed, and maximum power of the current processing file.
C	<b>Coordinate Display Area</b>	Displays the coordinate values of the current position of the laser head.
D	<b>Layer Display Area</b>	Displays the layer parameters of the current processing file or the layer parameters of the preview file. The parameters from left to right are layer, color, layer speed, and layer maximum power.
E	<b>Progress Bar</b>	Displays the current processing progress.
F	<b>System Status</b>	Displays the current working status of the system, which are idle, paused, completed, or running. The working time is displayed on the right.
G	<b>Batch Process Number</b>	Displays the processed quantity of the current processing file.
H	<b>File Dimensions:</b>	Displays the dimensions of the current file.
I	<b>Network Status</b>	<p>Displays the status of the connection to the Internet. When the network connection is successful, <b>connect</b> is displayed. Otherwise, <b>Lan OFF</b> is displayed. Usually, you do not need an internet connection to use this machine.</p> <p>When the system is running or paused, some buttons on the control panel will not work, for example, Origin and Frame.</p> <p>When the system is idle or the work is finished, all the buttons can be used. For example, you can process the file, set the parameters, preview your file, and so on.</p>

# 2 Introduction

## 2.3.7 Back Left Access Door

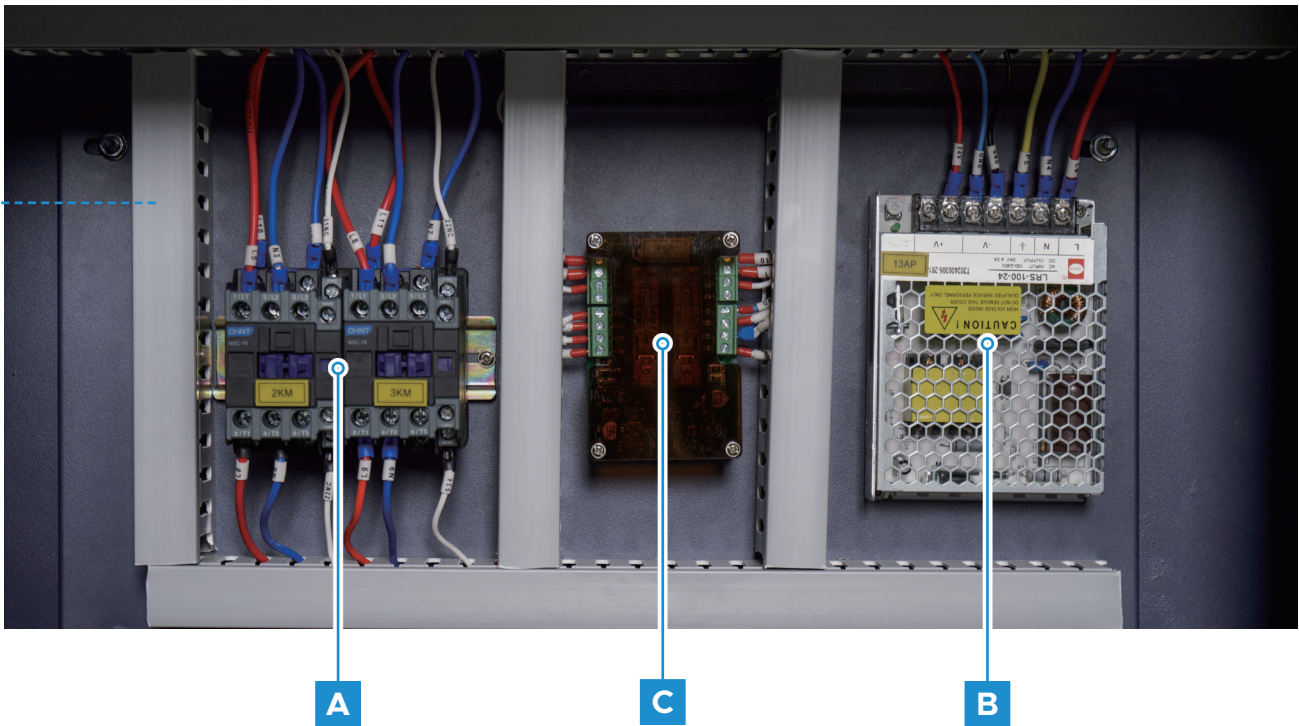


PRONTO 40





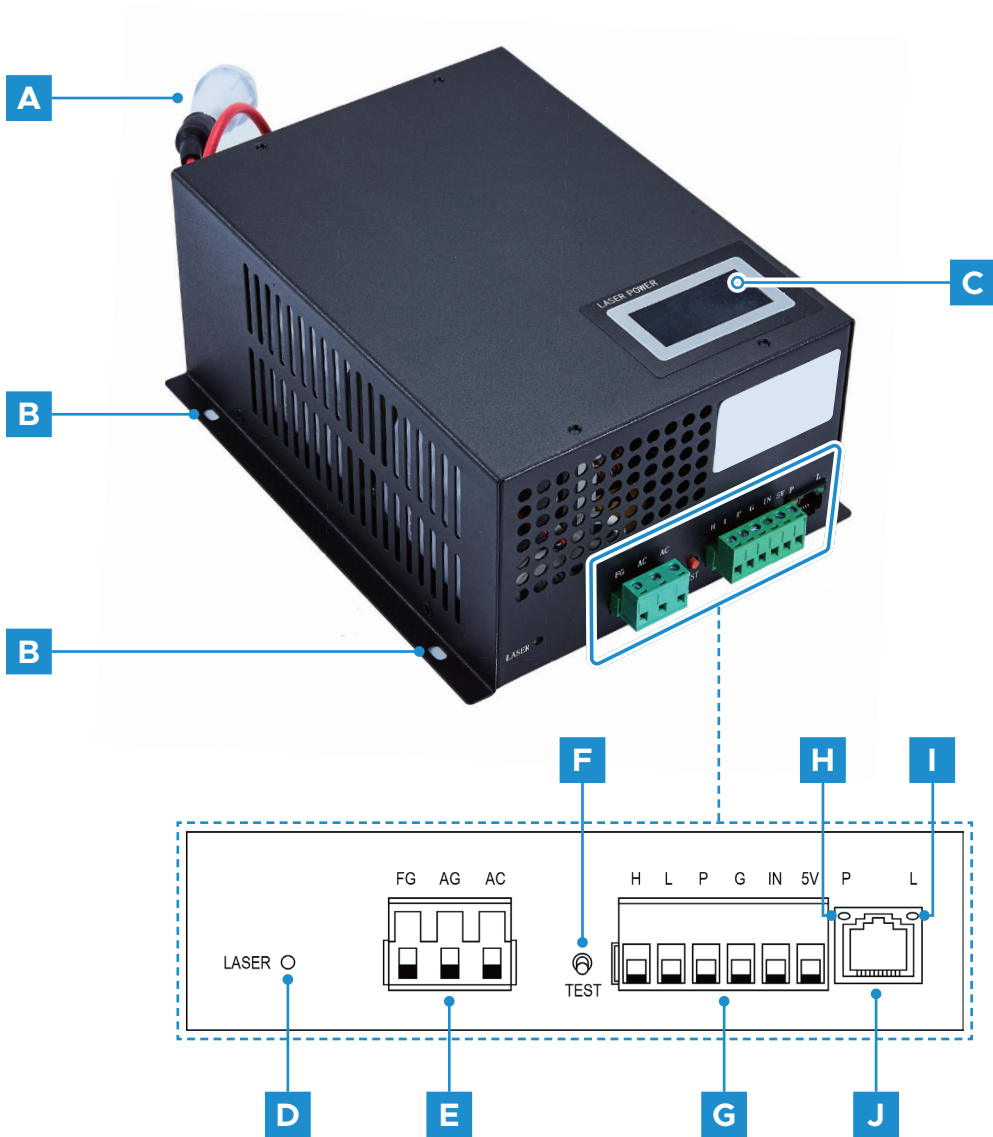
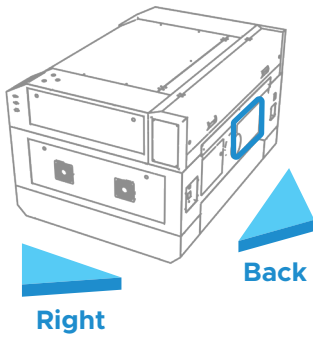
PRONTO 60



A	<b>Alternating Current Contactor</b>	Forms a safety dual circuit with the safety relay by making and breaking electrical connections between the laser and the laser power supply.
B	<b>Safety Power Supply</b>	Powers the machine's safety relay, indicator lights, and alternating current contactors.
C	<b>Safety Relay</b>	Shuts off the laser's power when either the cover or the front access door is opened during use or when the emergency shutoff button is pressed.

# 2 Introduction

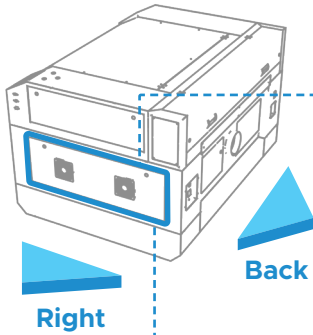
## 2.3.8 Back Right Access Door (Laser Power Supply)



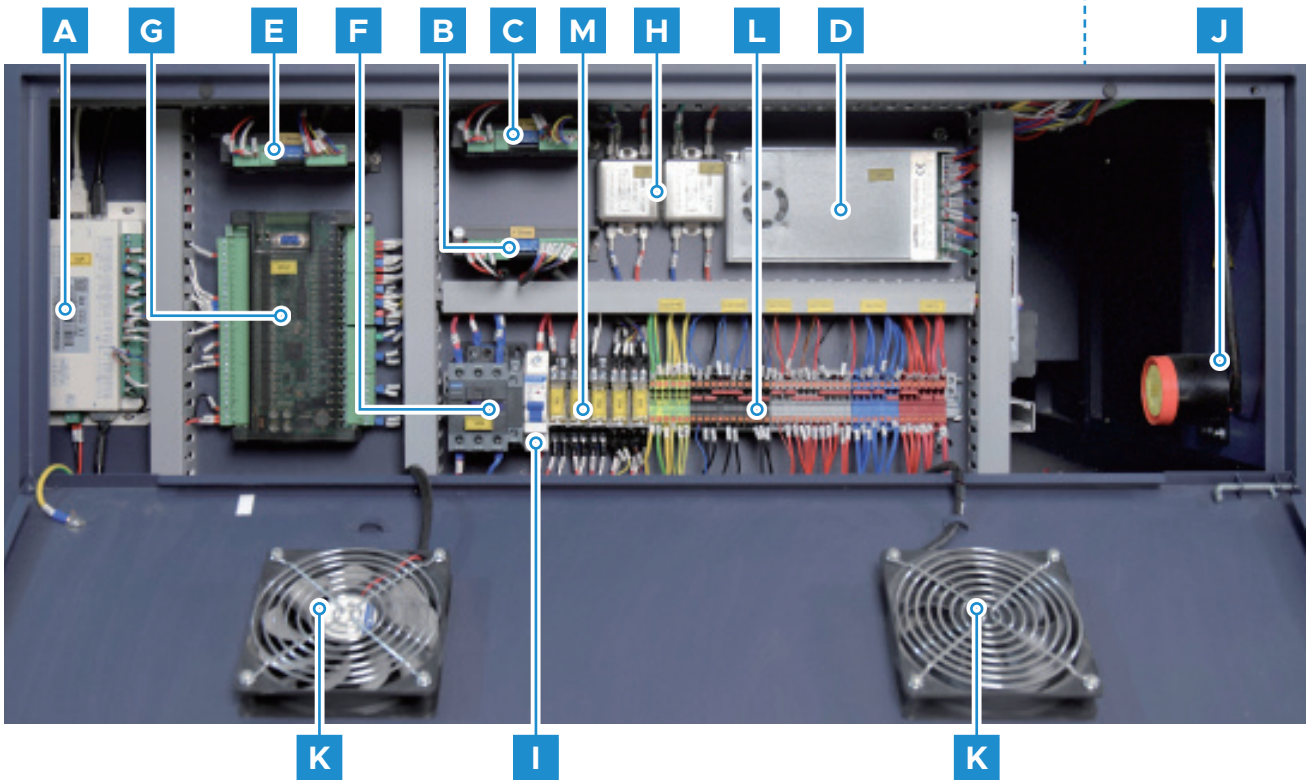
A	<b>High-Voltage Wire</b>	Connects to the laser tube's anode or positive end, providing high-voltage current to power the laser.
B	<b>Mounting Holes</b>	Allows simple installation and removal.
C	<b>Digital Display</b>	Provides the real-time current value to the laser tube in milliamps.
D	<b>Laser Indicator Light</b>	Illuminates when current is being sent to the laser tube.
E	<b>Main Power Terminal</b>	Holds the power supply's connection to the engraver's grounding (FG) and to the main power supply (AC).
F	<b>Test Button</b>	Tests fire the laser when troubleshooting problems. If the laser fires successfully, the problem will usually be with the control panel or its connections.
G	<b>Connection Terminal</b>	Holds the connections to the high (H) and low level output (L), the water protection switch (P), another ground (G), and two laser signal controls (IN & 5V).
H	<b>Water Indicator Light</b>	Illuminates the water cooling system is operating when connected.
I	<b>Laser Signal Indicator Light</b>	Illuminates when the laser tube is in operation.
J	<b>Ethernet Port</b>	Allows you to connect the laser power supply to an external ammeter.

# 2 Introduction

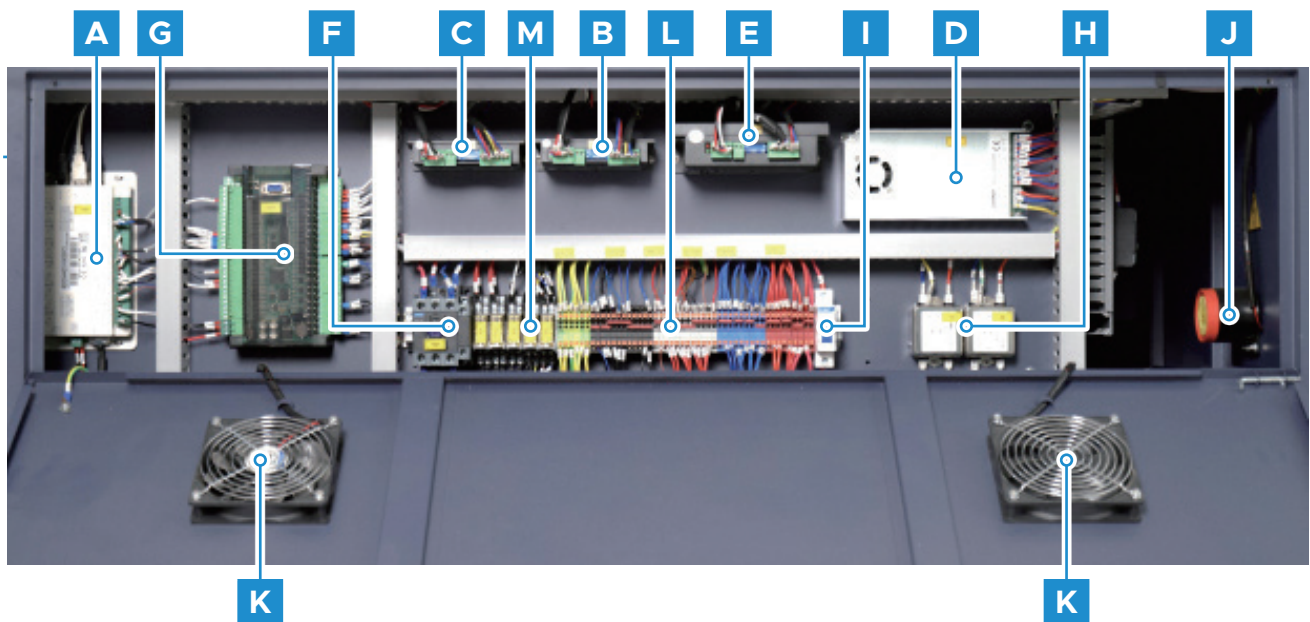
## 2.3.9 Right Bottom Access Door



PRONTO 40



## PRONTO 60



A	<b>Mainboard</b>	Controls the engraving process, responding to commands from your engraving software or the machine's control panel.
B	<b>Y-Axis Driver</b>	Moves the X rail along the Y rail.
C	<b>X-Axis Driver</b>	Moves the laser head along the X rail.
D	<b>Control Power Supply</b>	Powers the machine's control panel.
E	<b>Z-Axis Driver</b>	Moves the workbed up and down.
F	<b>Alternating Current Contactors</b>	Controls the flow of electricity to a load by making and breaking electrical connections between the load and the power source.
G	<b>Smart Card</b>	Automatically controls the exhaust fan (will be turned off 10s after powering off) and air assist (will be turned off 10s after powering off), featuring energy saving; also controls the temperature sensor to realize the temperature alarm.
H	<b>EMI Filter</b>	Helps protect the sensitive electronics in the mainboard from interference from the power supply.
I	<b>Circuit Breaker</b>	Controls the whole power supply.
J	<b>Buzzer</b>	Emits a continuous alarm sound when the temperature sensor detects a temperature exceeding 55°C .
K	<b>Cooling Fans</b>	Cools electrical components inside the cabinet.
L	<b>Terminal Block</b>	Provides convenient connection for multiple circuit wires for easy detection and maintenance.
M	<b>Relays</b>	Transmit control signals.

# 3 Installation

For all connections made during installation, you can apply the provided silicone sealant to ensure a secure connection afterward.

## 3.1 Selecting a Location

The location should meet all of the following requirements:

- The location meets all of the requirements mentioned in [§1 Safety Information](#) on Page 1.
- The location should be stable, level, dry, and climate-controlled to ensure an ambient temperature of 40°F–95°F and an ambient humidity under 70%. In particular, the temperature and humidity together should not be close to the dew point.
- The location should be free of dust and other airborne pollutants and well-ventilated enough to process any fumes produced by the engraving process in accordance with all applicable laws and regulations.
- Depending on the materials to be processed, this may require the construction of a dedicated ventilation system.
- The location should be away from children; combustible, flammable, explosive, or corrosive materials; and sensitive EMI machines.
- The main power cable should be plugged into a compatible and stable power source via a grounded 3-prong outlet. No other item should be drawing current from the same fuse.
- The location has fire-fighting equipment nearby and the local fire department's phone number clearly displayed.
- It is recommended to use a windowless room or to use blinds and/or curtains to avoid exposure to the potential additional heat of direct sunlight.
- It is highly recommended to have an extra work table nearby to avoid placing objects on or directly adjacent to the machine, which could become a fire or laser hazard.

## 3.2 Grounding the Machine

This machine employs a **CLASS 4** laser which is extremely high voltage and potentially dangerous. Therefore, users **MUST** securely ground it to avoid the buildup of static electricity.

Execute one of the following depending on your situation:



If applicable, execute both grounding methods.

- Connect the main power cable to a standard 3-prong outlet firmly.
- Connect the grounding cable (not included) from the grounding port on the machine to a dedicated grounding cable.

The far end of the dedicated grounding cable should be securely connected to a metal rod driven at least 8 feet (3 m) deep into soil located at least 5 feet (1.5 m) from the machine. The resistance along the line should be no greater than 5 $\Omega$ .



- Do not use with an ungrounded 3-to-2 prong adapter. The machine's grounding should be checked regularly for any damage to the line or loose connections.
- Poor grounding **WILL** cause equipment failure and create a serious electrical shock hazard. The manufacturer and/or seller bear(s) no responsibility and assume(s) no liability for any damage, accidents, or injuries caused by bad grounding connections.

# 3 Installation

## 3.3 Installing the Machine



Make sure that you understand all the instructions before installation to execute a proper setup and achieve safe laser performance. If you have any installation questions or problems, contact our technicians and customer support team.

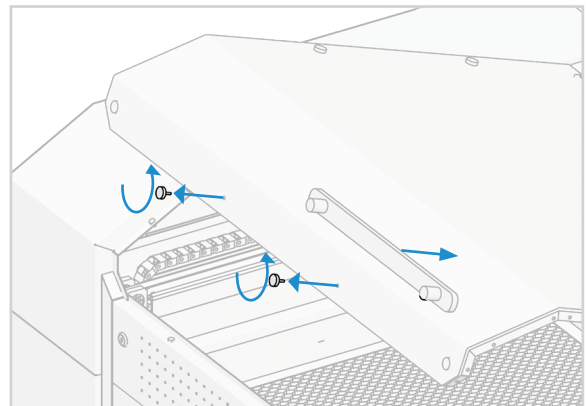
A complete working system consists of the laser engraving cabinet, an exhaust system, a water cooling system (not included), all applicable connection cables, and the laser and access keys.

You can also configure other additional accessories, such as an industrial water chiller, purifier, or rotary axis, to suit your needs. But exercise caution to use only the hardware, wiring, and power sources that came with or are compatible with this device. Installing equipment that your device is not designed to work with can lead to poor performance, shortened service time, increased maintenance costs, property damage, and personal injury.

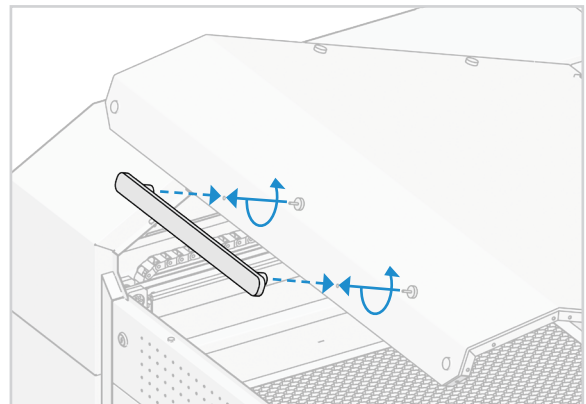
### 3.3.1 Installing the Door Handle

To save room for packaging, the door handle was installed oppositely, you need to reinstall it correctly.

1. Remove the handle by turning the screws counterclockwise.



2. Attach the door handle as below and lock it by using the screws.





### 3.3.2 Installing the Water Cooling System (Not Included)

A water cooling system—typically a water pump or chiller—**MUST** be used with this engraver to absorb the heat produced by the laser tube. The water cooling system is essential to your engraver’s performance and longevity. Without a properly maintained cooling system, the glass laser tube **WILL** explode from excess heat.

For an engraver with such high power, it is recommended to use an industrial water chiller for better cooling performance, especially when you are using the machine for a long time.

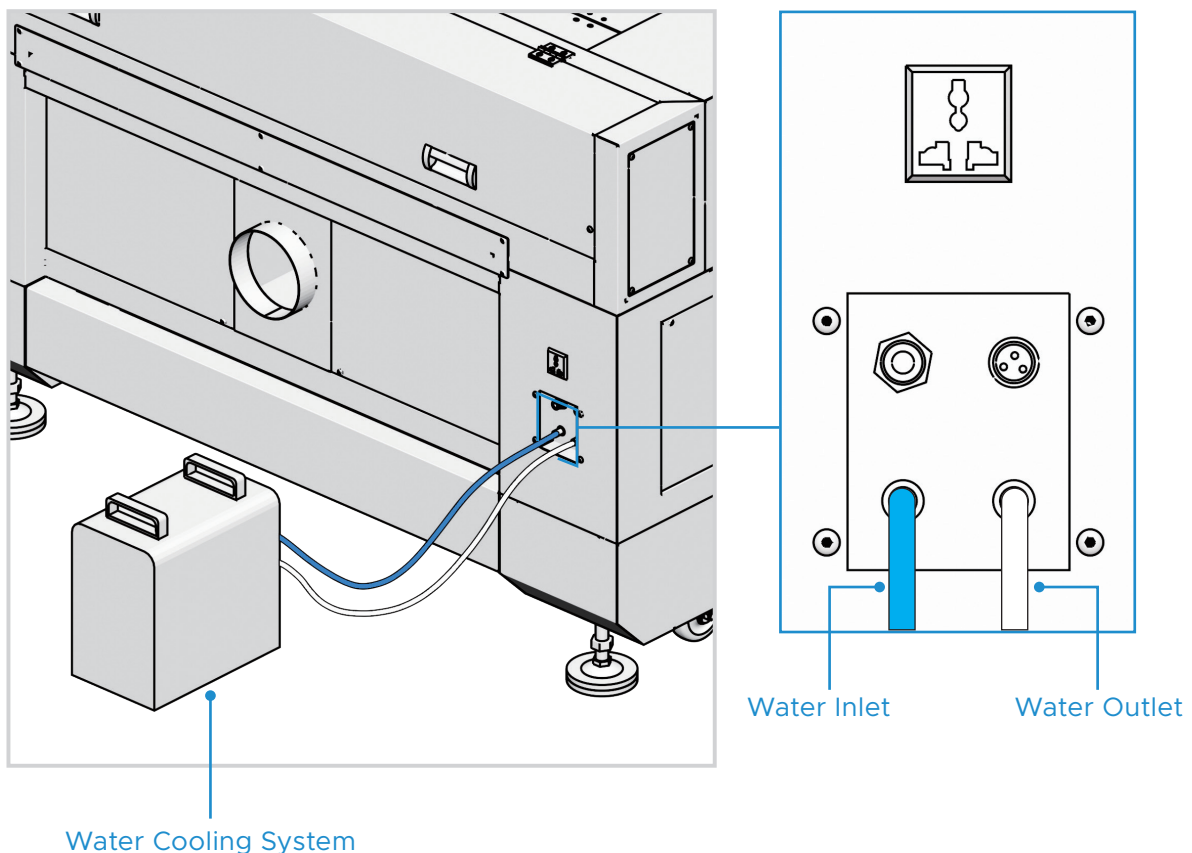
Though the power sockets on the back of the machine look luring, do not use them for powering your water chiller. They can’t handle the electric draw of your chiller or pump.

For instructions on installing the water cooling system, see the manual of your water cooling system. But keep in mind:

- Connect the water **OUTLET** of your water cooling system to the water **INLET** of the engraver.
- Connect the water **INLET** of your water cooling system to the water **OUTLET** of the engraver.



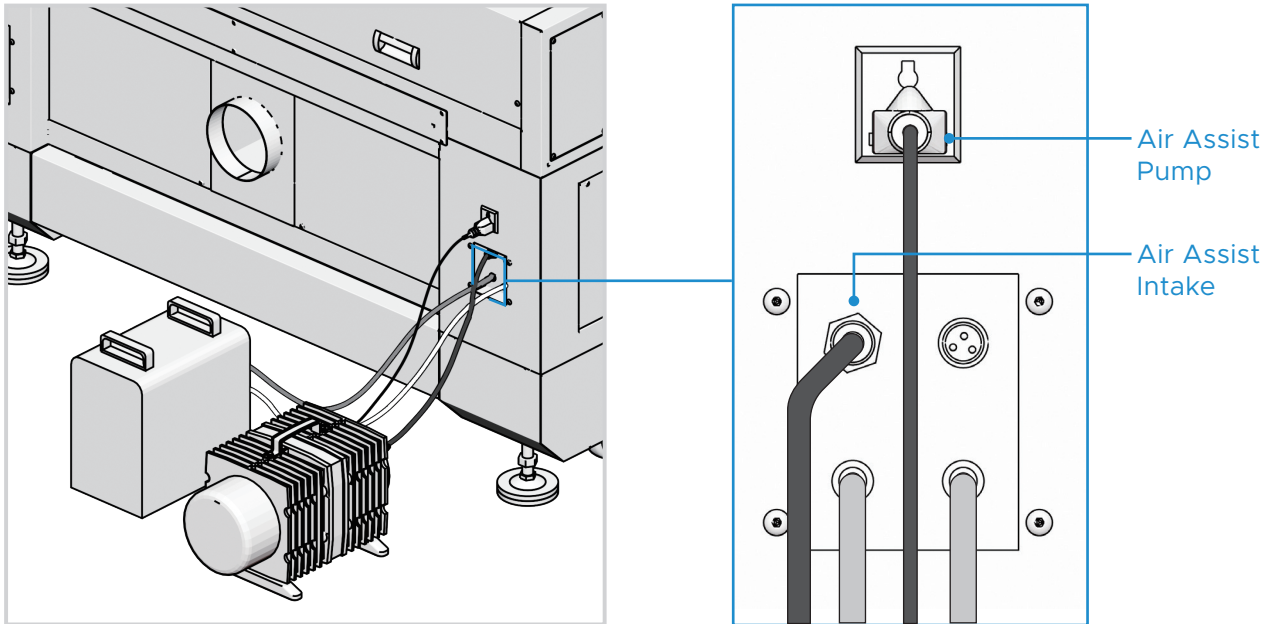
You can use the provided water hose clamps to seal the ports.



# 3 Installation

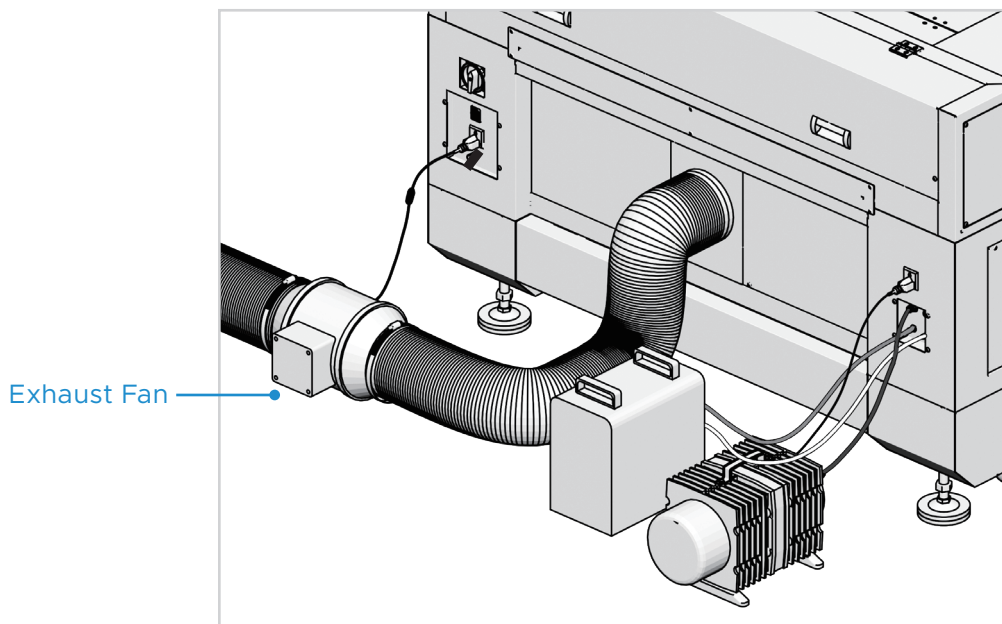
## 3.3.3 Installing the Air Assist Pump

1. Connect the power cable of your air assist pump to the air assist pump port on the machine.
2. Connect your air assist outtake port on the air assist pump to the air assist intake port on the machine via a hose.

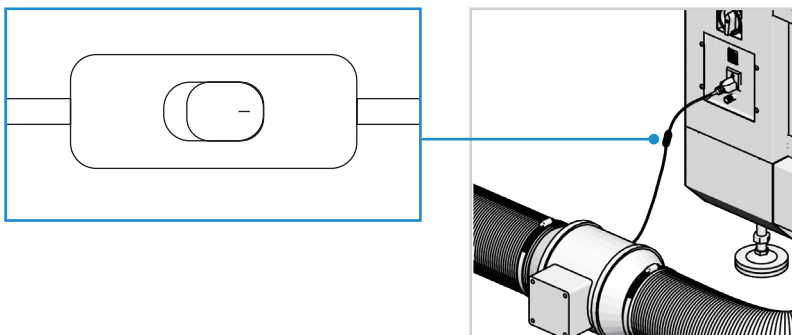


## 3.3.4 Installing the Exhaust System

An exhaust system—typically either an external vent or a dedicated air purifier—**MUST** be used to remove the dust and gases produced by the engraving process.

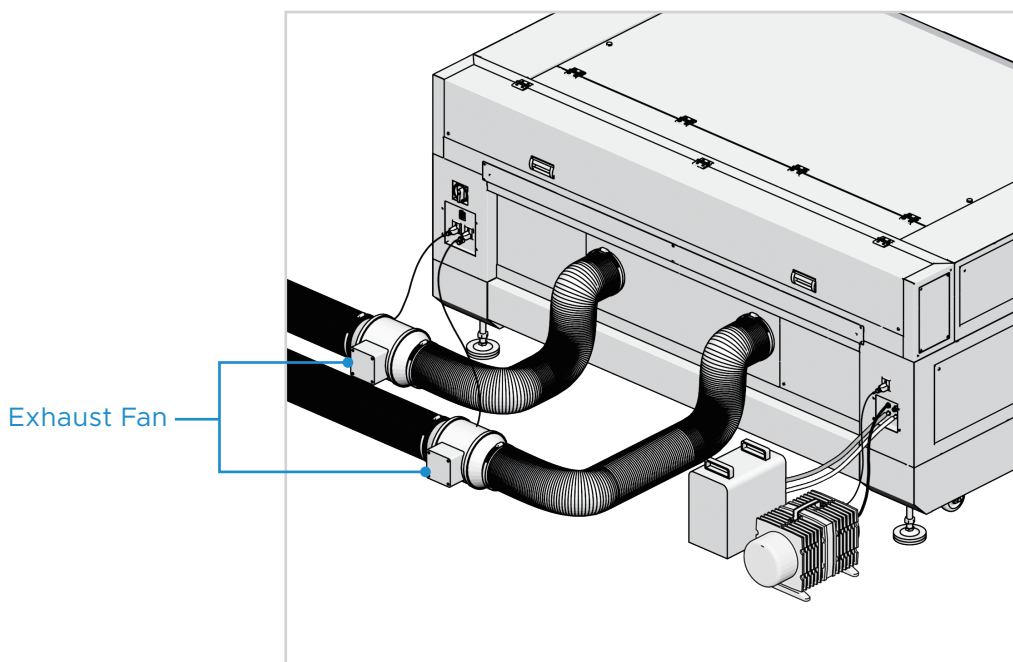


1. Connect one of the provided exhaust pipes between the machine and the inlet port of the exhaust fan by using pipe clamps. The pipe can be expanded to a full length of about 5 feet (1.5 m).
2. Connect the other exhaust pipe between the outlet port of the exhaust fan and a dedicated purifier by using pipe clamps.
3. Insert the power cable of the exhaust fan into the exhaust fan port on the machine.
4. Press the switch to — position.



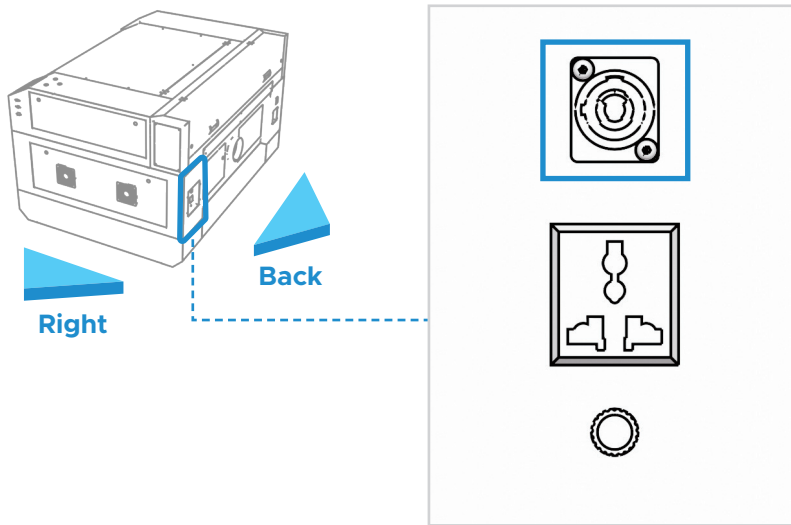
**NEVER** operate the laser if the exhaust is not purified or removed.

For PRONTO 75, two exhaust fans need to be installed.



# 3 Installation

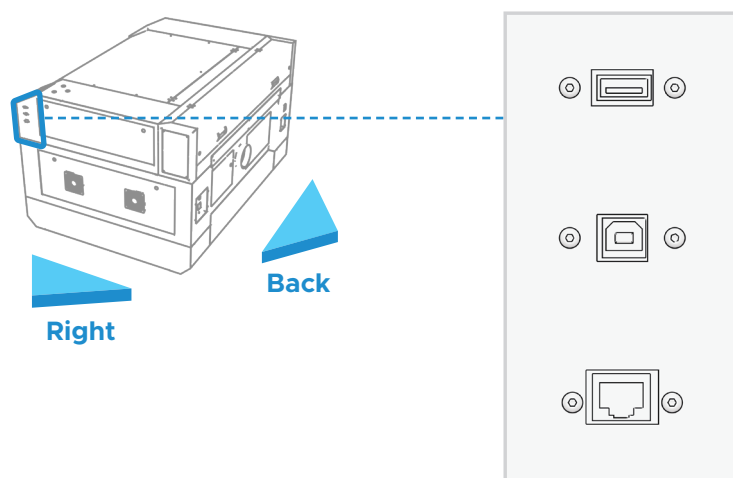
## 3.3.5 Connecting to Power Supply



- Use a dedicated circuit for the engraver. Make sure the circuit has an easily accessible circuit breaker.
- The circuit **MUST** be 3-core, with each wire being at least 14 AWG.
- Under **NO** circumstances should you switch on the device if the voltages do not correspond.

1. Confirm that the label beside the connection socket on the machine matches your power supply.
2. Connect one end of the power cord to the socket on the machine and the other end into a compatible and stable power source via a grounded 3-prong outlet.

### 3.3.6 Connecting to Your Control Computer



The control computer can be connected in any of the two ways:

- Via the provided USB cable (via the port marked “USB Cable”).

In this way, the control computer is directly connected to the engraver, so it should not be placed more than 15 feet (4.5 m) away in order to avoid possible interference to the signal on its line.

- Via the provided Ethernet cable (“Ethernet Cable”) using the internet.

The cabinet can use designs provided by the enclosed engraving software by direct or internet connection with your computer; it can also engrave designs loaded directly from a flash drive.

Familiarize yourself with the software’s image design features and laser control settings before using it to operate the laser. For details on the requirements for the control computer, see the software manual.

# 4 Initial Testing

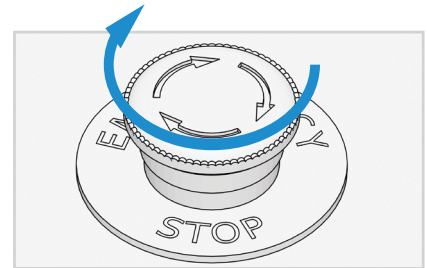
You should start your machine and test the functions below before conducting **ANY** other work with your machine for safety.

## 4.1 Starting the Machine




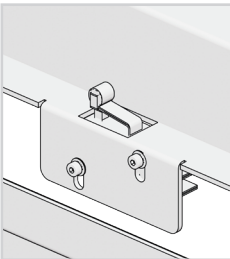

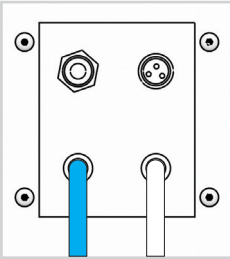

Make sure your water cooling system, air assist pump, and exhaust system have been installed.

1. Flip your circuit breaker up.
2. Turn on your water cooling system.
3. (Optional) Turn on your additional ventilation system (such as a dedicated purifier).
4. Turn on the control panel by flipping the main power switch on the back of the machine to its **ON** position.
5. On the control panel, turn on the laser by inserting and rotating the laser key.
6. On the control panel, slightly rotate the emergency stop button clockwise until it pops up. The laser head should start to move to its origin automatically.
7. On the control panel, press the reset button.
8. Wait until the engraver is in standby mode and ready to use.
9. Place a piece of laserable scrap material on the workbed.
10. Close the cover.



## 4.2 Pre-use Testing

Do the following tests to ensure your engraver is working properly. If any function is not working, the related part must be replaced or repaired before further use.

No.	Test Functions	Location	Test method	Desired Effects
1	Emergency Shutoff		<ol style="list-style-type: none"> <li>1. Follow the steps above to fire the laser.</li> <li>2. Press the button down.</li> </ol>	The laser beam stops immediately.
2	Cover Shutoff (Interlock)		<ol style="list-style-type: none"> <li>1. Follow the steps above to fire the laser.</li> <li>2. Open the cover.</li> </ol> <div style="border: 1px solid blue; border-radius: 15px; padding: 10px; margin-top: 10px;">  <p>Take care not to expose yourself to seeing or being hit by any possible reflected laser light.</p> </div>	The laser beam stops immediately.
3	Water Shutoff		<ol style="list-style-type: none"> <li>1. Follow the steps above to fire the laser.</li> <li>2. Cut off the flow of water (for example by crimping or tying the two hoses).</li> </ol> <div style="border: 1px solid blue; border-radius: 15px; padding: 10px; margin-top: 10px;">  <p>Take care not to damage the hoses.</p> </div>	The laser beam stops immediately.

# 4 Initial Testing

No.	Test Functions	Test method	Desired Effects
4	Calibrate the Laser Path	<ol style="list-style-type: none"><li>1. Attach a piece of the provided tape around the laser aperture, pressing so that a circular mark is left on the tape.</li><li>2. Lay the tape right under the laser aperture and on top of the laserable scrap.</li><li>3. Follow the steps above to fire the laser.</li></ol>	<p>A tiny hole has formed at the perfect center of the circular mark.</p> <p>If not right at the center, see <a href="#">§7.3 Laser Path Alignment</a> to calibrate the laser path.</p>
5	Air Assist Pump	<p>Check that it is correctly configured and connected.</p> <p>If any tubing or wiring needs to be reconnected, shut off all power to the machine (including by pressing the emergency stop) before adjusting anything.</p>	<p>A failed air assist can result in poor engraving quality, overheating, fire hazards, damage to the laser components, and safety risks.</p>

## 4.3 Turning Off the Machine

When you have completed all tests, turn off the machine as below and contact customer service for assistance if any:

1. Close your engraving software, and unplug the USB cable or ethernet cable.
2. Press the emergency stop button.
3. Turn and remove your laser key.
4. Allow time for the ventilation and cooling systems to continue running, cooling the laser and removing any remaining fumes or dust.
5. Turn off the control system power by flipping the main power switch on the back of the machine to its **OFF** position.
6. Turn off the water cooling system.
7. (Optional) Turn off your additional ventilation system (such as a dedicated purifier).
8. Flip down the circuit breaker that you've prepared for the engraver.



# 5 Typical Operation Sequence



## 5.1 Operation Overview







Operate this laser engraver only in accordance with all the instructions provided in this manual. Failure to follow the guidelines detailed here can result in property damage and personal injury.

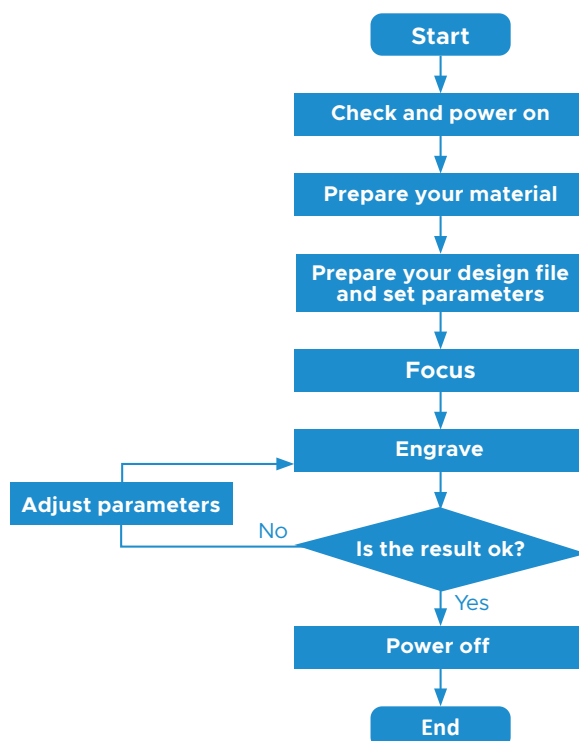
The engraver is operable either through:

- The built-in control panel
- Your control computer

Most of the operations are automated. The     icons in the control panel can be used to move the laser head along the X and Y-axis guide rails and the   can be used to raise or lower the workbed.

More often, you will create designs as graphic files on the control computer, load them on the engraver, and then engrave them. The software can be used to create different layers with different power settings, speeds, and other parameters.

Once everything is perfect, press  to autofocus the laser head, press  to preview the size of a preset frame around your engraving design, press  to begin engraving, and press  to stop and reset the laser head back to the origin.



# 5 Typical Operation Sequence

## 5.2 Pre-Operation Preparation

### 5.2.1 Checking

1. Make sure the power supply is ok.
2. Ensure proper ventilation.
  - a. Turn on the exhaust system and check its functionality.
  - b. Make sure that any back-up ventilation systems are in place and running smoothly.

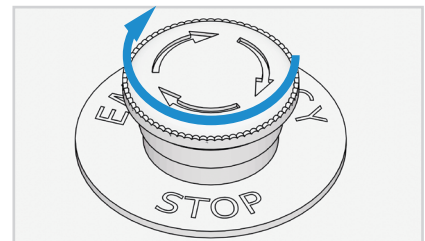


**NEVER** operate the laser if the fan and pipes are not working to purify or remove the fumes produced by the target material. Research materials before use and never operate the laser on any (such as PVC, teflon, and other halogen-containing substances) that can produce corrosive, hazardous, or even deadly fumes.

3. Open the engraver's cover, and confirm the air assist is working well, blowing air through the nozzle.

### 5.2.2 Powering on

1. Flip your circuit breaker up.
2. Turn on your water cooling system.
3. (Optional) Turn on your additional ventilation system (such as a dedicated purifier).
4. Turn on the control panel by flipping the main power switch on the back of the machine to its **ON** position.
5. On the control panel, turn on the laser by inserting and rotating the laser key.
6. On the control panel, slightly rotate the emergency stop button clockwise until it pops up. The laser head should start to move to its origin automatically.
7. On the control panel, press the reset button.
8. Wait until the engraver is in standby mode and ready to use.



### 5.2.3 Preparing Material

1. Open the engraver's cover.
2. Place a sample piece of your material on the workbed.

The default location of the laser head's zero position is at the top left corner of the workbed. This can be changed by moving either your design or the engraver's origin position using the control panel or your engraving software.

For instructions on material safety, see [§1.7 Material Safety Instructions](#) on Page 8.



- **DO NOT** insert anything through the pass-through doors other than the material once the laser is active. Pay special attention to the fumes and dust that may be released through these doors. Be sure that your ventilation system is strong enough to pull in all of the byproducts or wear the necessary PPE to ensure the health of users and passersby.
- For heavier pieces of material, be careful to distribute its weight as evenly as possible across reinforced supports. For larger pieces of material, you may open the front and rear pass-through doors.

3. Close the engraver's cover.



Exercise caution with your hands when closing the cover.

# 5 Typical Operation Sequence

## 5.2.4 Preparing the Engraving Pattern

1. Create the design.

You can do this directly in your engraving software or use any other graphics program, saving or converting the file to a format compatible with the engraver. See the full list of acceptable file types in [§2.2 Technical Specifications](#) on Page 12.

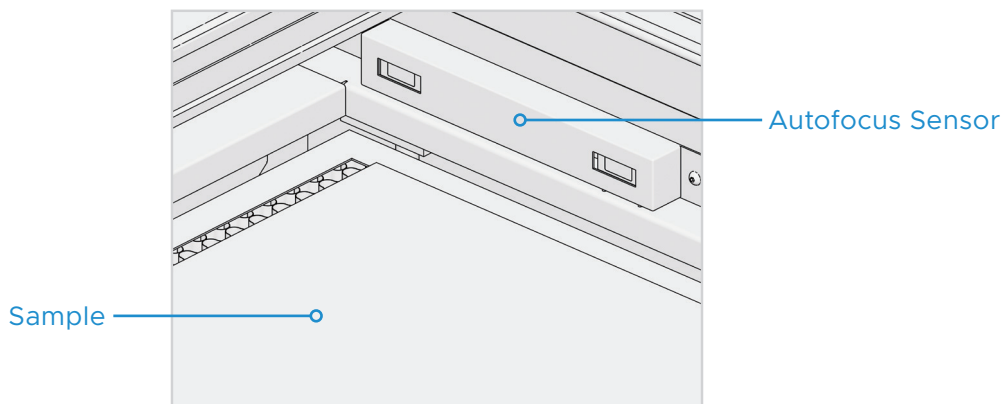
2. Customize your design's contrast and engraving depth by adjusting the parameters in your engraving software or directly through the control panel.

- To increase engraving depth, increase the amount of energy per unit area by increasing the laser's power or the number of loops or by slowing down the speed parameter. Engraving too deep, however, reduces image quality, especially for coated materials.
- When working with new materials, remember that you should always start on the low end of likely settings. If the effect is not yet strong enough, you can always rerun the design loop several times or rerun it with more powerful settings until you create the effect that you want.
- Resolution should usually be set to 500 dots per inch. Reducing your image resolution can be helpful in some cases, reducing flaming and increasing the energy of the pulse in a way that improves the quality of the resultant image in some materials such as some plastics.

3. Close the cover.

## 5.2.5 Autofocusing

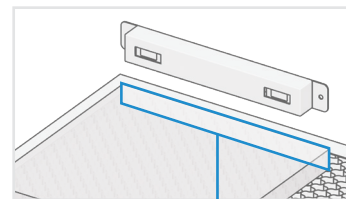
1. Move your laser head to the original place, the top left corner of the workbed.
2. Open the cover.
3. Place your sample material close to the autofocus sensor to the right.



4. Lower the workbed until it is lower than the sensor.
5. Autofocus your laser by pressing **Focus** and **Enter** on the control panel.



If your sample material is transparent, the sensor cannot detect it. To ensure proper detection, it is **IMPERATIVE** to affix non-transparent masking tape along the entire side of the material close to the sensor before initiating autofocus. **FAILURE TO DO SO COULD RESULT IN DAMAGE TO THE MACHINE.**



Non-transparent Masking Tape

6. Place your sample material and laser head to your desired location.
7. Close the cover.





You can also focus the laser manually by placing the focal length ruler on top of the material and carefully raising the workbed when the autofocusing feature is not available.

The laser head should barely touch the top of the focal length ruler without applying any pressure, ensuring the engraving distance is correct. Never attempt to focus the laser either way without some material on the workbed.


# 5 Typical Operation Sequence

## 5.3 Engraving Proper

1. Press the reset button to turn on the laser.
2. Press  to engrave your design.  
Again, do not stare continuously at the laser even through the protective polycarbonate window. Watch for possible issues like sparks or fires, however, and be prepared to quickly extinguish a fire if necessary.
3. Once the laser has stopped, press  to completely stop work, return to the beginning of the design, and reset the laser head back to its origin.
4. Open the cover and check that the engraved pattern is desired. If not, adjust the parameters as needed. For parameter reference, see [§5.6 Instructions for Specific Materials](#) on Page 49.



Remember to press the reset button after temporarily opening and closing the cover.

5. Remove the sample material and place the actual material for engraving.
6. Press  to engrave your design.

## 5.4 Wrapping-up

1. Once you have finished engraving, close your software and then turn off your machine in the following order:
  - a. Close your engraving software, and unplug the USB cable or ethernet cable.
  - b. Press the emergency stop button.
  - c. Turn and remove your laser key.
  - d. Allow time for the ventilation and cooling systems to continue running, cooling the laser and removing any remaining fumes or dust.
  - e. Turn off the control system power by flipping the main power switch on the back of the machine to its OFF position.
  - f. Turn off the water cooling system.
  - g. (Optional) Turn off your additional ventilation system (such as a dedicated purifier).
  - h. Flip down the circuit breaker that you've prepared for the engraver.
2. Fully clean the workbed and check if the lens or any mirrors require cleaning. Use the bottom left access panel to remove, empty, clean, and replace the debris tray. Store everything neatly away.
3. For best results, lock and disconnect your laser engraver from its power supply between uses.

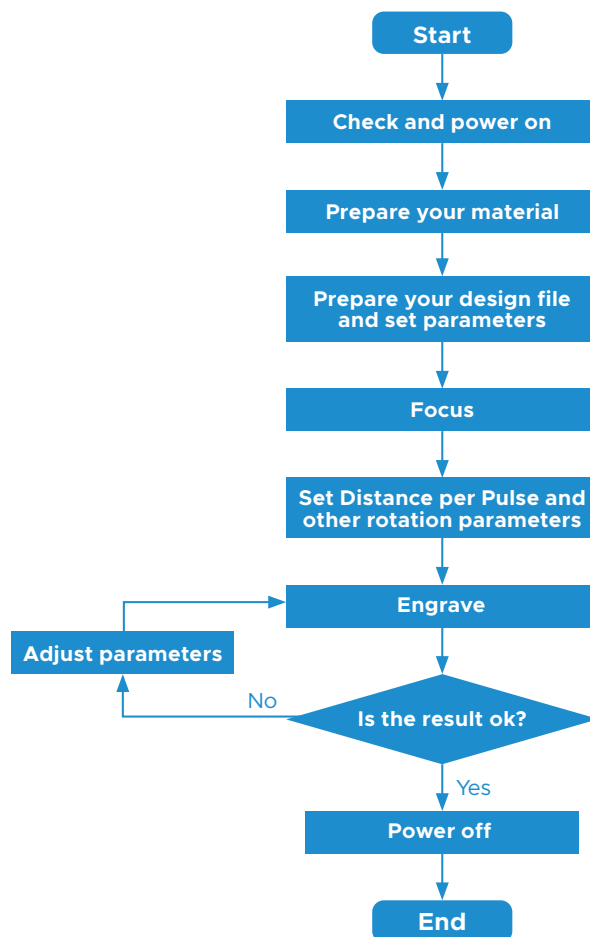
## 5.5 Rotary Operation (Optional)

### 5.5.1 Installing a Rotary Attachment

1. Remove the steel saw bed or the aluminum knife bed and the support bar of the blade.
2. Place your rotary axis in an open area.
3. Put the material and adjust the position using the rotary axis' knobs.
4. Check the height of the workbed is appropriate. If necessary, lower the workbed to provide room for the laser head to pass over your axis and material.
5. Connect the rotary axis cord to the rotary port at the back of the main bay.

### 5.5.2 Engraving Procedures with a Rotary Attachment

In typical workflows, designs are created by using graphic files on a control computer, and then transferred to the engraver for execution. Here are the main operation steps:



# 5 Typical Operation Sequence

## 5.5.3 Engraving Procedures Proper

1. Prepare your engraved material according to the instructions in [§5.2. Pre-Operation Preparation](#) on Page 43.
2. Turn on the switch of your rotary attachment. The rotation of the rotary attachment will be controlled by the engraver's Y axis settings.
3. Follow instructions in [§5.3 Engraving Proper](#) on Page 47 and [§5.4 Wrapping-up](#) on Page 47 for the rest of the engraving process.

## 5.6 Instructions for Specific Materials

The following instructions are suggestions to help speed safe work with a range of materials. The user should research the specific safety and engraving requirements of their specific material to avoid the risk of fire, hazardous dust, corrosive and poisonous fumes, and other potential problems. Once the product is known to be safe or appropriate protective equipment has been set up, it can be helpful to engrave a test matrix of small boxes produced at various speed and power settings to discover the ideal settings for your design. Alternatively, start with low power and fast speed settings and rerun your design as many times as needed, using progressively greater laser intensity.

Description		Acrylic	Glass	Leather		Stone/Tile	Wood
				Natural	Artificial		
80 W	Power (%)	18	18	16	15	18	19
	Speed (mm/s)	325	225	400	425	145	200
100 W	Power (%)	15	18	18	16	15	18
	Speed (mm/s)	350	200	250	425	450	165
130 W	Power (%)	15	16	16	15	18	19
	Speed (mm/s)	375	275	450	475	185	225
150 W	Power (%)	15	16	16	15	18	18
	Speed (mm/s)	375	275	450	475	185	225

### 5.6.1 Ceramics

When engraving on ceramics, generally use moderate to high power. Using more loops rather than higher power and lower speed can help avoid cracking the material during work. Be mindful of the health risk posed by dust generated from ceramic engraving, especially for repetitive industrial applications. Depending on the material and the amount of work, a fan or even full ventilation system may be required to address the problem. Similarly, operators and others in the work area may need to use breathing PPE such as masks and respirators.



## 5.6.2 Glass

When engraving glass, generally use high power and low speed. As with ceramics, it can be helpful to run more loops at lower settings to avoid cracks. Care must be taken when engraving fiberglass and carbon fiber to avoid combinations of settings that produce a laser intensity great enough to damage the structural integrity of its component fibers, producing blurry marking. PPE should be worn to avoid exposure of the eyes, nose, mouth, and skin to the dust produced by working with either material, especially for repetitive industrial applications. Clothing worn while working with fiberglass should be washed separately afterwards.

## 5.6.3 Leather

When engraving leather products, generally use low to moderate power at high speed. Be especially attentive to the possibility of fire, as well as the dust produced in repetitive applications.

Description		Thickness			
		1/16 in.	1/8 in.	1/4 in.	1/2 in.
<b>80 W</b>	<b>Power (%)</b>	18	28	32	40
	<b>Speed (mm/s)</b>	25	18	6	4
<b>100 W</b>	<b>Power (%)</b>	18	25	30	38
	<b>Speed (mm/s)</b>	35	23	8	5
<b>130 W</b>	<b>Power (%)</b>	17	24	28	37
	<b>Speed (mm/s)</b>	40	25	9	6
<b>150 W</b>	<b>Power (%)</b>	17	23	27	35
	<b>Speed (mm/s)</b>	45	26	10	7

## 5.6.4 Metal

CO<sub>2</sub> laser engravers should not be used for marking, engraving, or cutting metal. They are best suited for working on coatings applied to a metal base, and care must be taken not to attempt to work on the underlying metal itself. A variety of coatings specialized for CO<sub>2</sub> engraving are available, and the user should follow the instructions provided as the parameters vary from product to product and metal to metal. Generally, work on aluminum coatings should be done more quickly at lower power and work on steel coatings can be done more slowly at higher power.

## 5.6.5 Paper and Cardboard

When engraving various paper products, generally use low to moderate power and fast speed. Test samples from each batch, as only small parameter differences can separate effects that are too light from those that burn through the substrate. As with leather, be especially attentive of the possibility of fire, as well as the dust produced in repetitive applications.

# 5 Typical Operation Sequence

## 5.6.6 Plastics

Plastics for engraving are available in many different colors and thicknesses and with many different coatings and surfaces. The majority of available plastics can be well engraved and cut with the laser. Plastics with a microporous surface seem to give the best result, because less surface material needs to be removed. When engraving plastics, generally use low power and high speed settings. Marking and engraving with too much power or at too low a speed can concentrate too much energy at the point of contact, causing the plastic to melt. Among other problems, this may produce poor engraving quality, noxious fumes, and even fires. High resolution engraving can cause the same problem, so medium to low resolution designs should be preferred for most plastics.

Description		Thickness of Acrylic						
		1/16 in.	1/8 in.	1/4 in.	1/2 in.	3/4 in.	1 in.	1-1/8 in.
80 W	Speed (mm/s)	25	12	6	4	3	1	-
	Power (%)	18	25	35	45	55	60	-
100 W	Speed (mm/s)	25	14	6	5	4	1	
	Power (%)	18	25	33	43	53	58	-
130 W	Speed (mm/s)	30	15	7	6	5	2	1
	Power (%)	17	25	30	37	42	55	58
150 W	Speed (mm/s)	35	16	8	7	6	3	-
	Power (%)	16	24	30	35	40	53	-

## 5.6.7 Rubber

The various compositions and densities of rubber cause slightly varying engraving depths. Testing various settings on sample pieces of your specific rubber is highly recommended for best results. When engraving rubber, generally use a consistent high-power setting and create your effects by varying the laser's speed. Microporous rubber materials require a significantly higher speed than standard rubber. Engraving any kind of rubber produces a considerable amount of dust and gas. Depending on the amount of work, breathing PPE and/or a full ventilation system may be required to address the problem.

## 5.6.8 Stone

When engraving various kinds of stone, generally use moderate power and moderate to fast speed. As with ceramics and glass, be mindful of the dust created (especially for repetitive industrial applications) and take similar measures to ensure the safety of users and others in the work area.

## 5.6.9 Textiles

When engraving textiles like cloth and fleece, generally use low power and fast speed. As with leather, be especially attentive to the possibility of fire and dust.

## 5.6.10 Wood

As with rubber, there is a huge variety of woods and testing your specific material is essential to get the best results. In general, wood with consistent grain and coloring engraves more evenly. Knotted wood produces uneven effects, while resinous wood produces greater edge contrast. Some soft woods like balsa, cork, and pine engrave well (albeit with low contrast) at low or moderate power settings and high speed. Others like fir suffer from uneven fibers that usually produce a poor effect no matter what you do. Hard woods like cherry and oak engrave well at high power settings and low speed. Manufactured wood products can vary from brand to brand, mostly based on their glue composition and abundance. MDF works well but creates dark edges when cut.

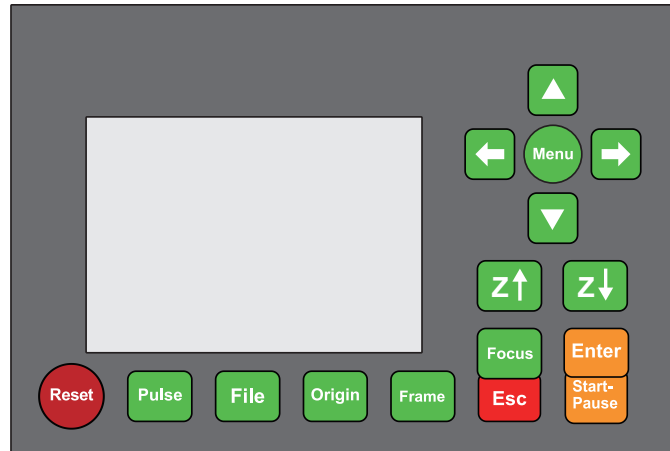
In addition to the risk of fire with any wood product, extra care must be taken with the fumes from the glue used in plywood and other manufactured woods. Some are too dangerous to work with at all, while others require careful ventilation and the use of breathing PPE for repetitive industrial applications. Wood toxicity should also be examined, as the dust from some natural woods including oleander and yew can also cause nausea and cardiac problems in high enough amounts.

Description		Thickness of Baltic Birch Plywood							
		1/16 in.	1/8 in.	1/4 in.	1/2 in.	3/4 in.	1 in.	1-1/8 in.	1-1/4 in.
<b>80 W</b>	<b>Speed (mm/s)</b>	25	12	7	5	4	3	-	-
	<b>Power (%)</b>	20	25	30	35	43	47	-	-
<b>100 W</b>	<b>Speed (mm/s)</b>	30	15	7	6	5	4	-	2
	<b>Power (%)</b>	20	25	28	35	40	45	-	55
<b>130 W</b>	<b>Speed (mm/s)</b>	35	16	8	7	6	5	3	2
	<b>Power (%)</b>	18	25	27	32	37	42	47	55
<b>150 W</b>	<b>Speed (mm/s)</b>	40	17	9	8	7	6	-	4
	<b>Power (%)</b>	18	24	26	30	35	40	-	45

# 6 Control Panel Instructions

## 6.1 Overview

You can control your engraver directly from the built-in control panel, through a direct connection with your computer, or over the internet. For details on operating your engraving software, see its separate manual. The built-in control panel can operate the laser manually or engrave designs loaded onto flash drives and external hard drives connected to the USB port on the right side of the cabinet.




For manual operation, the arrow keys can be used to move the laser head along the X and Y-axis guide rails and the **Pulse** button can be used to fire the laser. The laser head can be set to tab over a set distance each time the arrow buttons are pressed by hitting **Menu** and adjusting the parameters under Manual Set+. The laser can be set to fire for a fixed period by pressing **Menu** and adjusting the parameters under Laser Set+. All of the buttons and menus should be labelled in English. If they are not, press **Menu** and go to the top button in the right column to change the console's language settings.

To load a design from a FAT16 or FAT32 formatted flash disk or external hard drive, press **File** and then select Udisk+ and Copy to Memory. Select the design in the File menu and then select Run. Various parameters can be adjusted using the console's menus and submenus, including setting multiple origin points to engrave the design on your material four times in a single session.

The screenshot shows a control console interface. On the left, there is a design preview area with a red circle and a blue rectangle. On the right, there is a table of settings:

File:	01	
Speed:	300mm/s	
MaxPow:	30.0%/30.0%	
X:	150.2	mm
Y:	153.5	mm
Z:	3000	mm
01	400	25.0
02	200	29.1
03	100	29.1

At the bottom, there is a status bar with the text: Idle 00.00.00 Count: 99 X: 180.5 mm Y: 235.6 mm connect

When running a design from the control console, this will be the main display. The design should appear in the top left corner and its name and the current speed and power settings on the top right. The position of the laser head relative to the workbed appears as the X (horizontal) and Y (vertical) coordinates. The Z coordinate shows the elevation of the workbed itself although it can only be automatically adjusted if a motorized lift is installed. The U coordinate can be configured to control rotary axes or an automatic feed if either is installed. Below them are the layers with notes about their separate speeds in mm/s and their maximum power as a % of your machine's rated power. The batch count on the lower left keeps track of the number of times the current design has been engraved in a single session. Like the button says, press  to start engraving your loaded pattern and to pause engraving when needed.

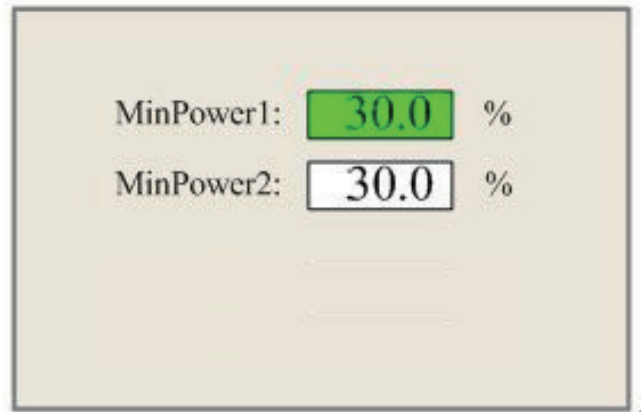
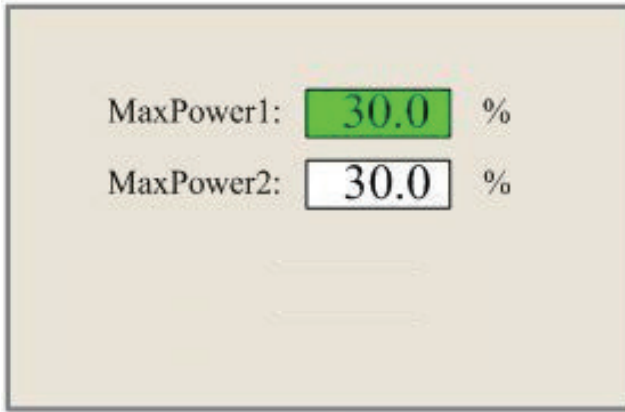


If there is ever an emergency situation such as a fire, do not use the control panel to pause or stop the engraving. Hit the emergency stop button immediately.

# 6 Control Panel Instructions

## 6.2 Setting the Laser Power

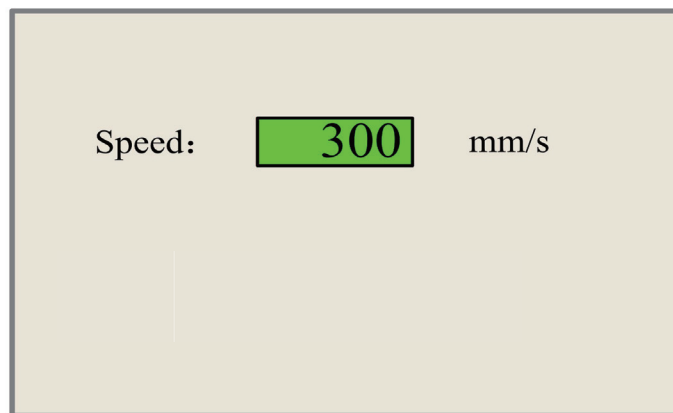
Select **Max-Power** or **Min-Power** on the main interface, and the following displays will appear.



When **Menu** is pushed, the green block can move up and down to denote the changing item. Then **▲** or **▼** and **◀** or **▶** can be used to change the value. Press **Enter** to save the change. Press **Esc** to invalidate the change and return to the main interface.


## 6.3 Setting the Laser Speed

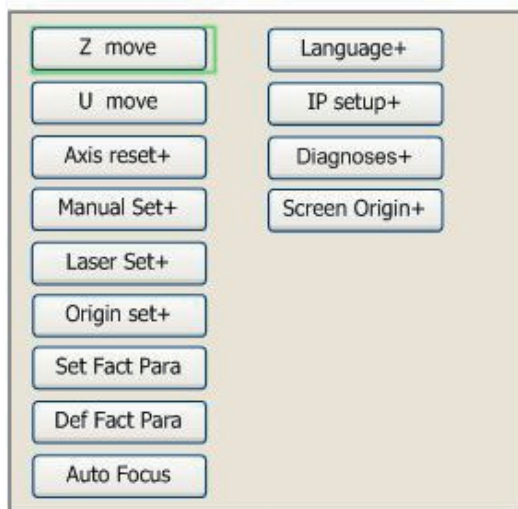
Select **SPEED** on the main interface, and the following dialogue box will appear:




A cursor will appear when pushing **◀** or **▶**. Move the cursor to the numeral area and push **▲** or **▼** to change the value. Press **Enter** to save the change. Press **Esc** to invalidate the change and return to the main interface.

## 6.4 Function Menu

Press  on the main interface to enter the Function interface, as shown below:





Push  or  to select an item, and then push  to enter the corresponding submenu.

## 6.5 Adjusting the Z Axis

When Z Move is selected, push  or  to control the movement of the Z axis when a motorized workbed (sold separately) is installed.

## 6.6 Adjusting the U Axis

When U Move is selected, push  or  to control the movement of the U axis. This can be used to control the rotational position of a rotary axis or the linear position of an automatic feed (both sold separately) if either is installed.

# 6 Control Panel Instructions

## 6.7 Resetting the Axes

When Axis Reset+ is selected, push **Enter** and the display will show:

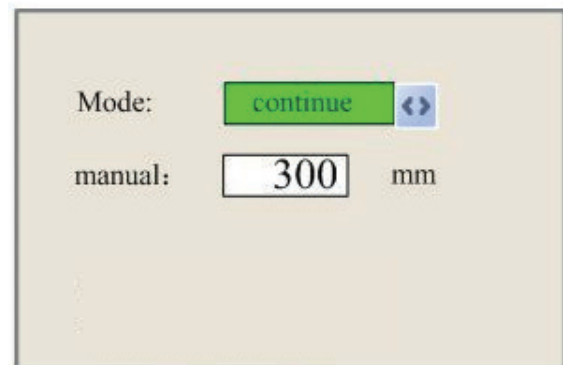
Push **▲** or **▼** to select an item. Press **Enter** to start the resetting of the selected axis, and the message “Resetting Is Underway” will show on the screen. Upon completion, the message will automatically disappear and the system will return to the main interface.



## 6.8 Adjusting the Laser Movement Mode

When Manual Set+ is selected, press **Enter** and the following will be displayed:

When Mode is selected, push **←** or **→** to choose between the two modes Continue and Manual. Push **Menu** to move the cursor. When the cursor is on Manual, push **←** or **→** and **▲** or **▼** to change the parameters. If the continuous mode is selected, release this button and the laser stops. If the continuous mode is selected when **Pulse** is pressed, the laser head will move continuously as long as the direction arrows are held down. If the manual mode is selected, each time the direction arrows are pressed, the laser head will move by precisely the distance shown beside Manual in this screen.







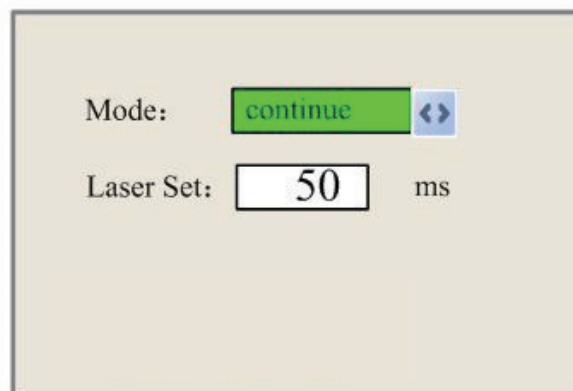
## 6.9 Adjusting the Laser Pulse Mode

When Laser Set+ is selected, press  and the display will show:

The operation method is the same as the previous setting. When Continue is selected,



press  to fire the laser, and release the key to finish firing. When Manual is selected, pushing

 will fire the laser for precisely the period shown beside Laser Set in this screen.



## 6.10 Setting the Origin

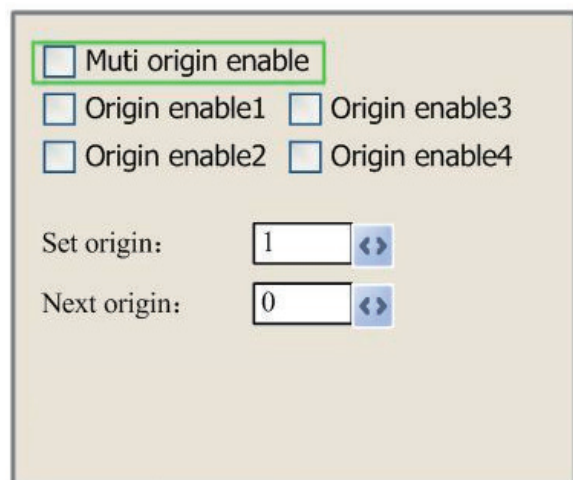
When Origin Set+ is selected, press  and the display will show:

Press  to select an item. When Multi Origin Enable is selected, press  to enable or disable the item. When enabled, the small box will be red and, when disabled, the small box will be gray. When selecting Set Origin or Next

Origin, push  or  to select the value. When changing the parameters of Set Origin,





remember to press  to validate the change.

Parameters will be saved automatically when the interface is closed.



# 6 Control Panel Instructions

Details of each item are shown below:






- **Multiple Origins Enable:** Yes or No can be selected. If you select No, the system will use single-origin settings. You can press  and set the origin. If you select Yes, the system will use the multiple-origin settings and  on the keyboard becomes invalid. In this case, the parameter of each origin must be set in the menu as follows.
- **Set Origin 1/2/3/4:** After the multiple-origin setting is enabled, put the cursor on Set as Origin 1/2/3/4. Press  on the keyboard and the system will take the coordinates as the corresponding ones of the origin 1/2/3/4.
- **Next Origin:** Users can choose from 0–4, which represent the origins to be used for the next figure. Origin 0 refers to the origin set by  under the single-origin setting. 1–4 represent the origins under the multiple-origin setting. The next origin can be chosen from origin 1–4 so as to control the starting point of the next job. However, it cannot be changed to origin 0.
- **Origin Enable 1/2/3/4:** After the multiple-origin setting is enabled, the four origins can also be individually disabled and enabled.

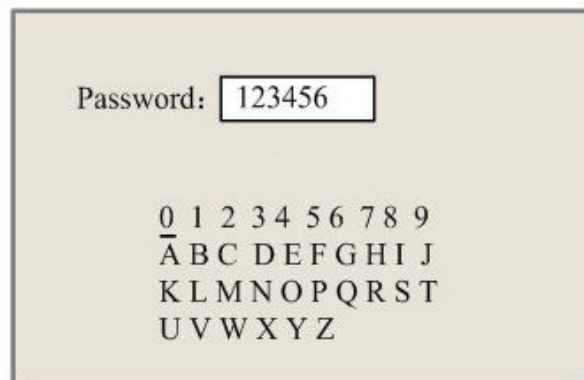


The system can use multiple different origins. If you select Take the Original Origin as the Origin, the work started for each time will use different origins. The rotation order of origin is 1→2→3→4→1→2... If the processing file is uploaded to the PC and this file selects Take the Current Origin as the Origin, the system will always use the current origin.

## 6.11 Setting Default Parameters

When Set Fact. Para. is selected, the following interface will be displayed:

Push  or  and  or  to select a password and press  to save it. The current parameters of the machine will be stored as its defaults. They can then be retrieved by using the Restore Default Parameters command. It is recommended that you save your machine's actual factory default settings, so they can be easily restored when need be.




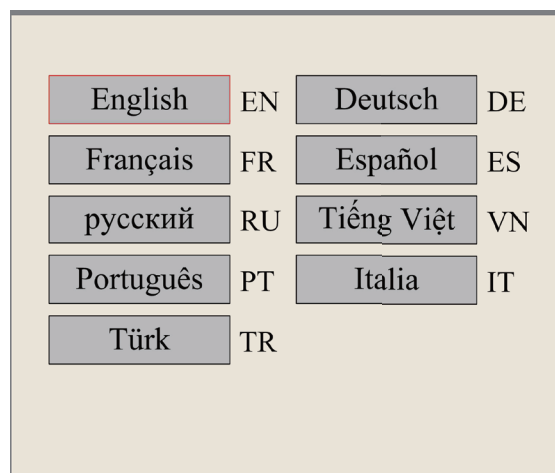
## 6.12 Restoring Default Parameters

When Def. Fact. Para. is selected, the system will replace all current parameters with the saved default factory parameters. The operation method is the same as setting the default parameters.

## 6.13 Setting the Interface Language

When Language+ is selected, press  and the display will show:

The operation method is the same as those described above. Press  when the desired language is selected, and then return to the main interface.



# 6 Control Panel Instructions

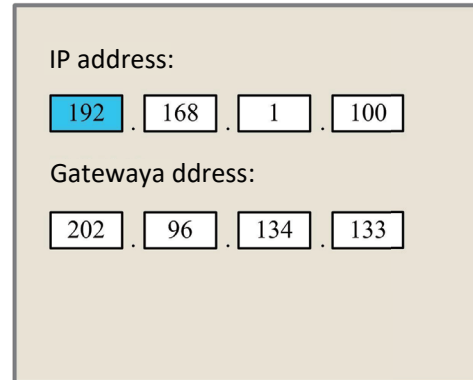
## 6.14 Setting the Machine's IP Address

When IP Setup+ is selected, press **Enter** and the display will show:

Press **Menu** to select an item, and push **←** or **→** and **▲** or **▼** to change the parameters.

The default address of the engraver is 192.168.1.100. If this is already in use on your local network, use 192.168.1 for the first three sections and choose a unique value for the last section. Typically, any value from 2–252 except 47 should be OK but avoid values already being used by your other networked devices. Direct connection of the machine to the public internet risks unauthorized use and is not recommended. If you wish to provide it anyway, you will need to register and use a unique public TCP/IP address.

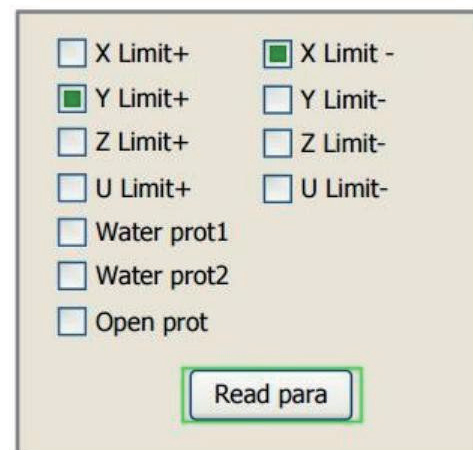
Press **Enter** to save the changes or **Esc** to discard changes and return to the previous menu.



## 6.15 Diagnostic Tools

When Diagnoses is selected, press **Enter** and the display will show:

This interface contains input/output information of the system's hardware. Press Read Para. to access hardware information. When the hardware signal is triggered, the small box to the left of the corresponding item will be displayed in green, otherwise it will be gray. Press **Esc** to return to the previous menu.



## 6.16 Setting the Screen Reference


When Screen Origin is selected, press  and the display will show:

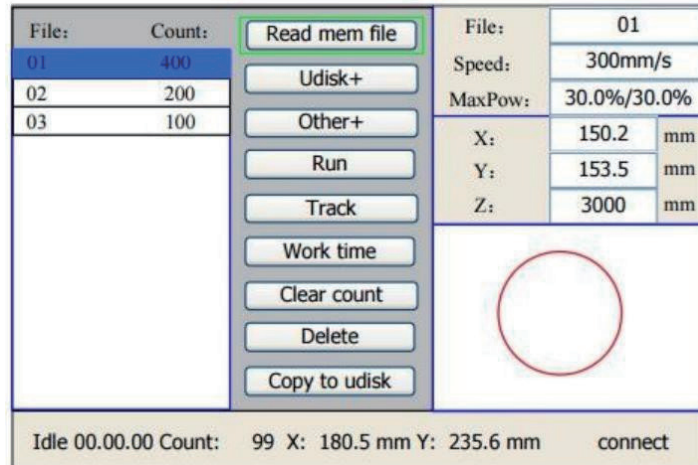
This interface sets the relative position of the origin. Different origin positions can generate different reflections of the graph over the X/Y axis. The operation method is the same as those described above.













# 6 Control Panel Instructions

## 6.17 File Management

Select  on the main interface, and the following dialogue box will appear:



The system will automatically read the memory files. The file name and the work times will be listed and the selected file will be previewed in the upper right corner. Different memory files can be selected by using  or . Press  to preview the selected file on the main interface. Press  to close the preview.

Push  or , and the light blue cursor can be moved left and right to switch between file column in the left and item column in the middle. If the file is being previewed, the preview will be closed when switching to the item column. When the light blue cursor is on the item column, push  or  to select the item and press  to activate the item. Press  to return to the main interface.

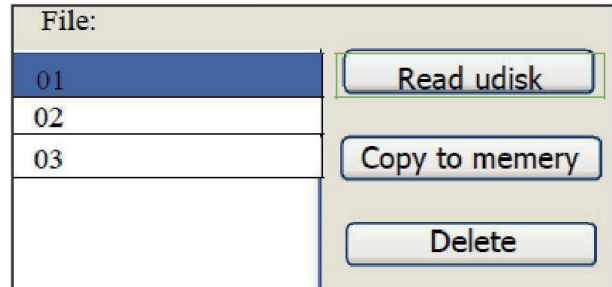
Items in the item column are as follows:

- **Read Mem File:** Reads the list of files in the system's memory.
- **Udisk+:** Reads the file list of an inserted USB drive.
- **Other+:** Other operations involving the files in the system's memory.
- **Run:** Runs the selected file.
- **Track:** Tracks the selected file, and the track mode is optional.
- **Work Time:** Forecasts the running time of the selected file.
- **Clear Count:** Clears the running times of the selected file.
- **Delete:** Deletes the selected file.
- **Copy to Udisk:** Copies the selected file to an inserted USB drive.

## 6.18 Reading USB Files

If Udisk+ is pressed, the display will show:

- **Read Udisk:** Reads the file list in the inserted USB drive.
- **Copy to Memory:** Copies the target file to the system.
- **Delete:** Deletes the selected file from the USB drive.

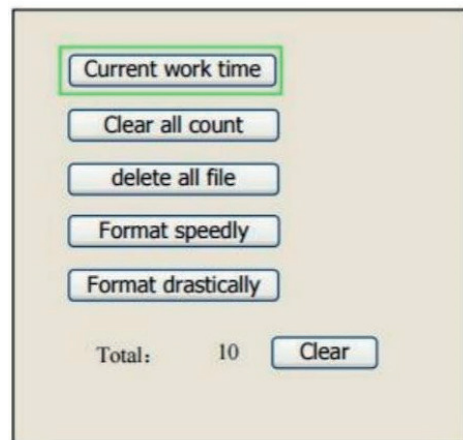


The system supports FAT16 and FAT32 formats, but files can only be identified when placed in the root directory of the flash drive. File names with more than 8 characters will be automatically truncated. File names containing characters other than English letters and numbers cannot be shown by the display. Files copied from the system to the flash drive will be placed in the root directory of the USB drive.

## 6.19 System Memory Management

If Other+ is pressed, the display will show:

- **Current Work Time:** Previews the running time of the current file.
- **Clear All Count:** Clears the count of every file in the memory.
- **Delete All Files:** Deletes all memory files.
- **Format Speedily:** Deletes all files in memory but allows them to be retrieved by using Restore Factory Parameters (under Menu) if they have previously been backed up.
- **Format Drastically:** Reformats the memory, **IRRETRIEVABLY** deleting all files in memory.
- **Total:** The total count of all the files.



# 7 Maintenance

## 7.1 Maintenance Overview



- The use of procedures other than those specified herein may result in hazardous laser radiation exposure.
- Before any cleaning or maintenance work, always switch off the device and disconnect it from its power supply.
- Always keep the system clean, as flammable debris in the working and exhaust areas constitutes a fire hazard.
- **ONLY** allow trained and skilled professionals to modify or disassemble this device.

- Clean and cool water must be provided to the system at all times.
- The working table must be cleaned on a daily basis.
- Mirror 3 and the focus lens must be checked every day and cleaned if required.
- The other mirrors, exhaust system, and air assist intake filter must be checked every week and cleaned if required.
- The beam alignment should be checked weekly.
- The wiring should be checked every week for loose connections, especially the wiring for the laser tube power supply.
- The guide rails should be cleaned and lubricated at least twice a month.
- The air assist must be checked every month and cleaned if required.
- The whole laser machine including the other components such as the water cooling system must be checked every month and cleaned where required.



## 7.2 Cleaning

### 7.2.1 Cleaning the Main Bay and Engraver

**Cleaning Frequency:** After each use



- Disconnect the engraver from power before cleaning.
- Completely wipe dry the surfaces after cleaning.
- **NEVER** allow water to come into contact with the electronic elements.



\*Depending on what you've been engraving, you might need to clean the engraver more or less often. However, we suggest cleaning it after each use for the best results.

#### **Tools Needed:**

- Paper towel
- Mild detergent

#### **Viewing Window**

Clean with mild cleansers and a lens or cotton cloth. **DO NOT** use paper towels as they can scratch the acrylic and reduce the cover's ability to protect you from laser radiation.

#### **Main Bay Interior**

Clean thoroughly with paper towels, removing any debris or deposits.

#### **Debris Tray**

1. Turn off and unplug the engraver.
2. Slide out the tray.
3. Empty loose waste, rinse dust and fine debris off, dry, and replace the tray.

#### **Other Surfaces**

Dust the other surfaces with a soft cloth or clean them using a mild detergent and then wipe clean before further use.

# 7 Maintenance

## 7.2.2 Cleaning the Water System

See your water system's manual for reference to ensure that the water used remains cool, clean, and pure.

## 7.2.3 Cleaning the Focus Lens

The lens has a durable coating and won't be damaged by correct and careful cleaning. If not clean, your laser will be less efficient and heat buildup on the oil or dust itself can damage the lens.

**Cleaning Frequency:** After each use

**Tools Needed:**

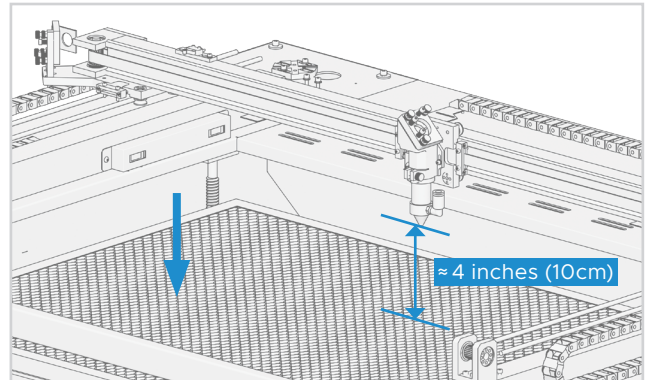
- Lens-cleaning liquid
- Lens tissue or cloth
- The focus lens repair tool (J)



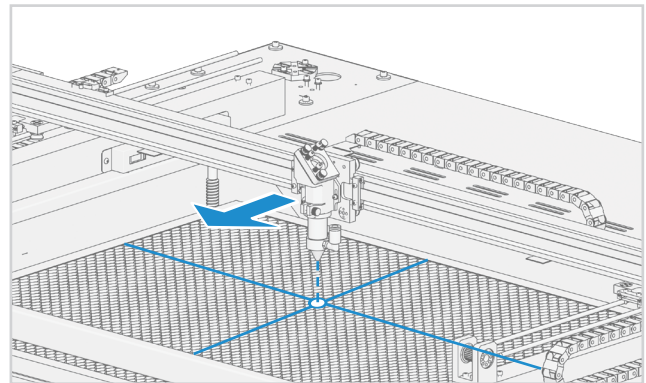
- Disconnect the engraver from power before cleaning.
- Completely wipe dry the surfaces after cleaning.
- **NEVER** allow water to come into contact with the electronic elements.
- Be careful in all of the following steps not to directly touch the lens surface with your hands or any dirty, oily, or abrasive surface. Use lens-safe gloves or cloths only.

## Detaching the Focus Lens

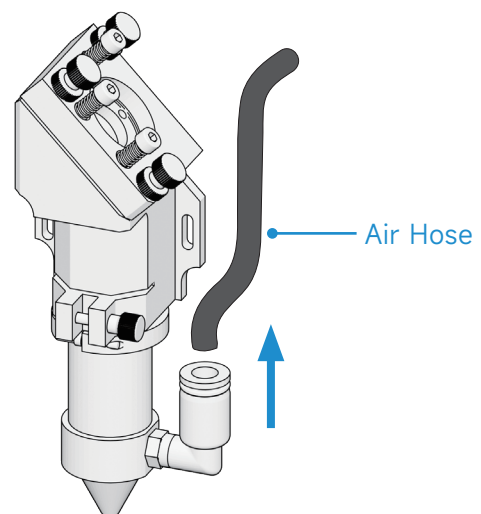
1. Move the engraving table to a distance of approximately 4 inches (10 cm) under the lens holder.



2. Move the laser head into the center of the workbed and put a cloth under the lens holder so that the lens will not be damaged if it accidentally falls from its holder.

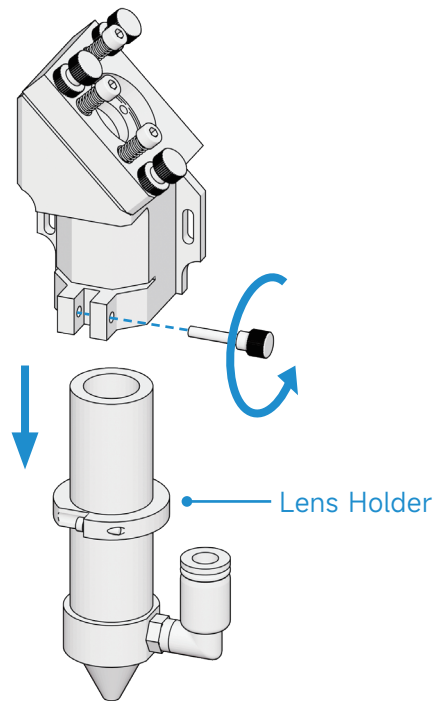


3. Remove the pressurized air hose by pulling it out.

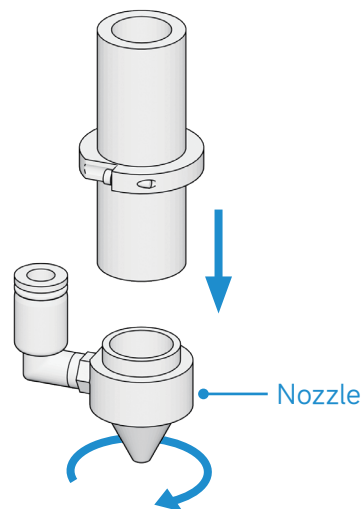


# 7 Maintenance

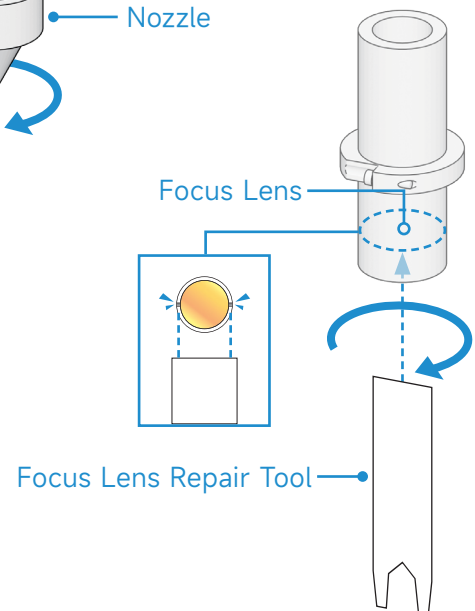
4. Remove the laser guide connection by rotating it toward you and loosen it. The lens holder should be detached.



5. Remove the nozzle by rotating it toward you.



6. Remove the lens from the lens holder by turning the lens holder lock ring counterclockwise with the focus lens repair tool (J) and letting the lens and its O-ring drop onto the cleaning cloth.



### Cleaning the Focus Lens and Its O-Ring

1. Examine the lens surface, remove coarse dust as well as possible by blowing air onto the lens surface and, if necessary, clean it with the lens cleaning liquid and lens tissue or cloth as below.
  - a. Put the lens on a clean lens-cleaning tissue.
  - b. Put some lens-cleaning liquid on one side of the lens.
  - c. Leave the liquid to take effect for approximately one minute.
  - d. Gently wipe the liquid away with lens-cleaning tissues soaked with lens-cleaning liquid.
  - e. Dry this side of the lens with dry lens-cleaning tissues/cloth.
2. Repeat the same cleaning process on the other side of the lens.



**NEVER** use a cleaning tissue twice. Dust accumulated in the cleaning tissue could scratch the lens surface.

3. Examine the O-ring and, if necessary, clean it with a cotton bud and a lens-cleaning tissue or cloth.
4. Examine the O-ring and lens to ensure they are clean. If any dirt remains, repeat the cleaning process until both are thoroughly clean.



Do not touch the surface of the lens after cleaning.

### Reattaching the Focus Lens

1. Carefully insert the lens into the lens holder, ensuring that its rounded convex side is facing upwards.
2. Put the O-ring on top of the lens.
3. Carefully reassemble the lens lock ring, the laser guide connection, and the pressurized air hose in reverse order.

# 7 Maintenance

## 7.2.4 Cleaning the Mirrors and Beam Combiner Lens

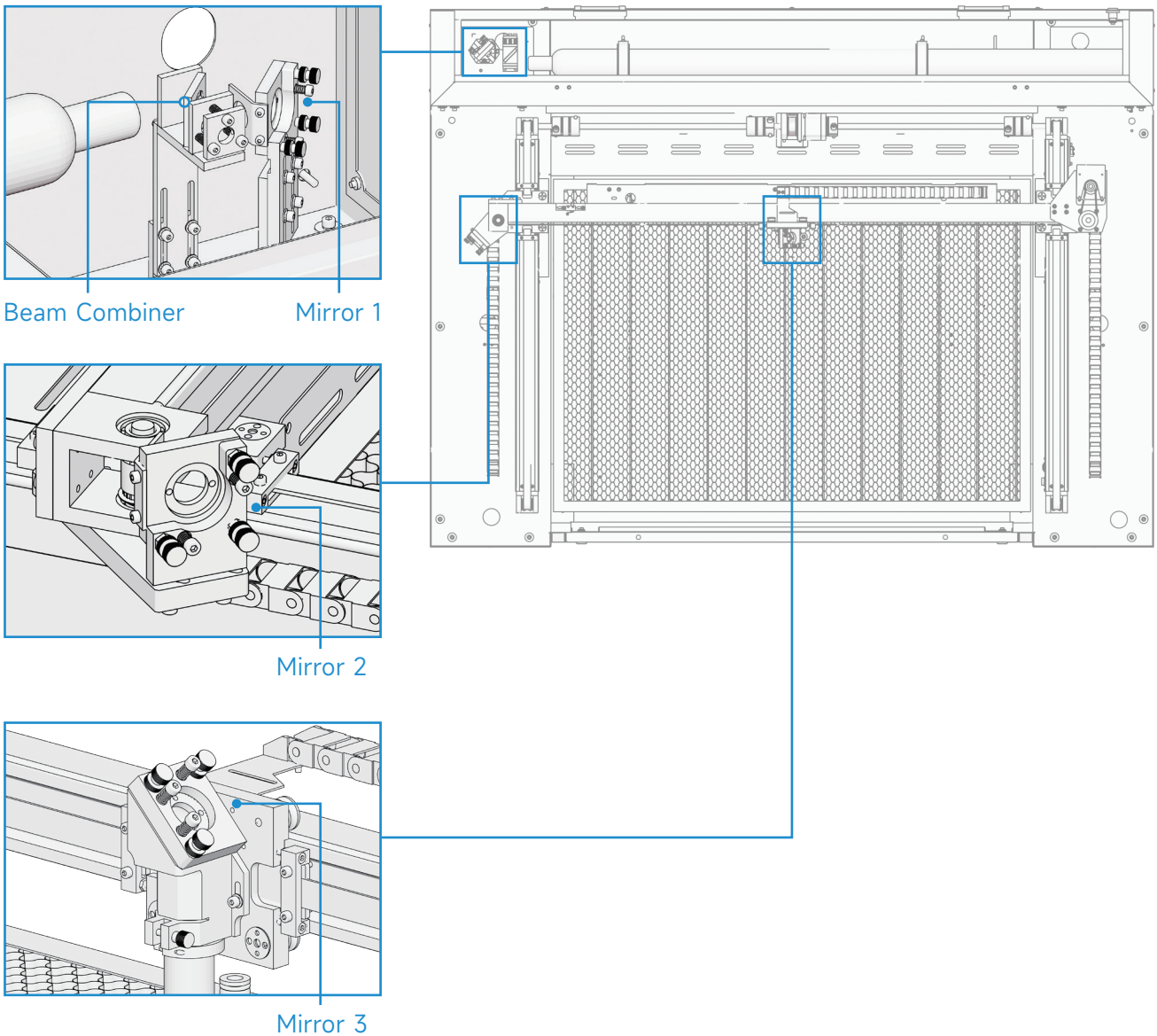
The mirrors should be similarly cleaned if there is any debris or haze on their surface. Otherwise, your laser will be less efficient and could have permanent damage on the mirrors.

**Cleaning Frequency:** Once a week, after each use

**Tools Needed:**

- Lens-cleaning liquid
- Lens tissue or cloth

This machine has 3 mirrors and one beam combiner lens used during working, for their locations and cleaning methods, see below:



Mirror Name	Mirror Location	Cleaning Method
Mirror 1	In the back left of the machine beyond the far end of the Y axis	<div style="border: 2px solid #0070C0; border-radius: 15px; padding: 10px;"> <ul style="list-style-type: none"> <li>Avoid press hard enough to grind any debris or cause scratching.</li> <li>The semitransparent mirror at the end of the laser tube should only be cleaned when the engraver is fully disconnected from power and the tube is fully cooled.</li> <li>Take care not to touch the surface of any mirror directly.</li> </ul> </div>
Beam Combiner Lens	The end of the laser tube closest to Mirror 1	
Mirror 2	On the Y axis at the left end of the X axis	
Mirror 3	On top of the laser head on the X axis	



Clean with lens-cleaning tissue or with cotton wetted with lens-cleaning liquid or isopropyl alcohol in gentle circular motions.

The 3 positioning mirrors can be cleaned in place or removed for cleaning by turning them counterclockwise.

If any mirrors are removed for cleaning, reinstall them by turning them into place clockwise carefully.

# 7 Maintenance

## 7.2.5 Cleaning the Exhaust System

Check and clean the exhaust pipes and fans. The rate of dust accumulation on the exhaust fan and pipe will vary depending on the materials processed and the working environment's air quality.

**Cleaning Frequency:** Weekly

**Tools Needed:**

- Dust brush
- Mild cleanser
- Vacuum
- Soft cloth
- Water
- Caulk



- Disconnect the engraver from power before cleaning.
- Allow the fluid used for cleaning to dry completely before reusing.

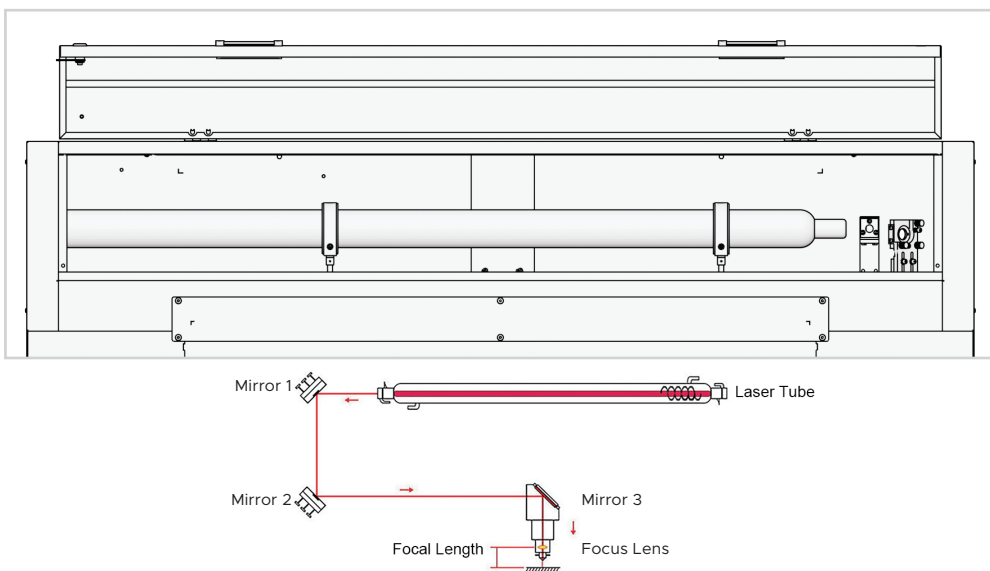
1. Check the exhaust fan and surrounding pipes for excessive accumulation of dust and debris.
  - a. Use a brush, vacuum, or compressed air to remove large accumulation of dust and debris.
  - b. Use mild cleansers and soft rags or paper towels to fully clean the fan and its blades.
2. Check the seams and joints of the pipes for any damage or leaks. If any found, immediately repair them. Caulk or special-purpose aluminum foil tape generally works best if available; standard duct tape can deteriorate over time, especially near heated components.

## 7.3 Laser Path Alignment

Having a perfectly aligned laser path is paramount to your engraver's overall performance. Each of the pro-line series went through a complete beam alignment before shipping. Upon first arrival and about once a week during normal operation, however, it is recommended that the alignment be checked. Refer to the diagram below for the basics of the alignment.



This machine went through a complete beam alignment before shipping. However, when the engraver first arrives and about once a week during normal operation, it is recommended that users confirm that alignment is still at acceptable levels and that the mirrors and focus lens have not shifted due to the movement of the machine. Refer to the diagram below for the basics of the alignment



The normal alignment procedures are as below:



Performing a beam alignment can expose the operator to small amounts of radiation if performed carelessly. Follow these procedures correctly and always take caution when performing a beam alignment.

1. Place a piece of tape at each stage of the laser path. **DO NOT** place the tape directly onto the mirror.
2. Turn on the machine.
3. Set the Max. Power (not Min.) parameter to 15% or lower. Any higher percentage will cause the laser to ignite the testing tape instead of marking it.
4. Press **Pulse** to manually fire the laser and confirm that the stages remain correctly aligned.

When it is not, use the laser tube's brackets or the setscrews on the back of the misaligned mirror to correct the problem.



Once the provided tape runs out, we recommend masking tape as it is easy to manage and use.

# 7 Maintenance

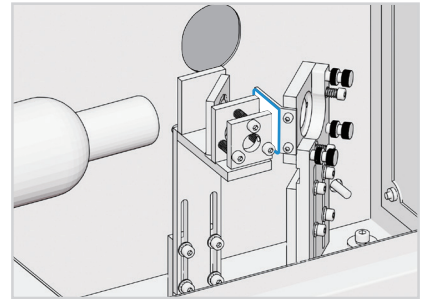
## 7.3.1 Laser Tube Alignment

The laser tube is where the laser beam is generated. Once emitted from the tube, the laser hits Mirror 1 first. Follow the steps below to check the laser hits Mirror 1 right in the center.



- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to any of the mirrors.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always make sure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

1. Cut out a piece of masking tape and place it on the mirror's frame. **DO NOT** place the tape directly onto the mirror.
2. Turn on the machine.
3. Set the Max. Power (not Min.) parameter to 15% or lower.



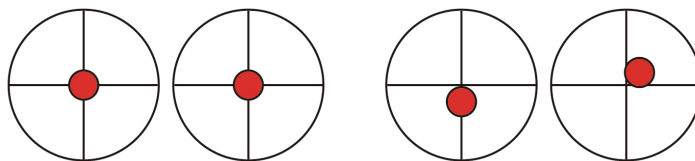
4. Press **Pulse** to manually fire the laser and observe if the laser mark is centered on the tape as below. If so, then the laser tube is aligned with Mirror 1; if not, continue to step 5.



You should be able to see a small mark on the tape. If it is not noticeable, press Pulse again.



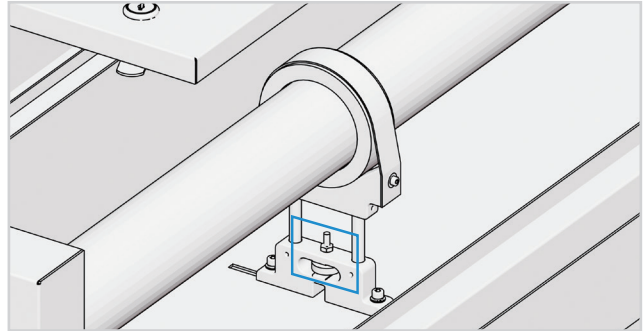
Pressing **Pulse** activates the laser. Always make sure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Take care not to leave any part of your body in the laser path while pressing the Pulse button.



These marks are OK.

These marks require adjustment.

5. Cut the power to your laser.
6. Loosen the setscrews on its stand to adjust the laser tube in its brackets. Be careful not to over-loosen the setscrews and not to overtighten them. Only adjust one stand at a time.



7. Repeat steps 1, 2, 4, 5, and 6 until the burnt hole is at the perfect center of the masking tape.
8. Retighten the setscrews.

### 7.3.2 Mirror 1 Alignment



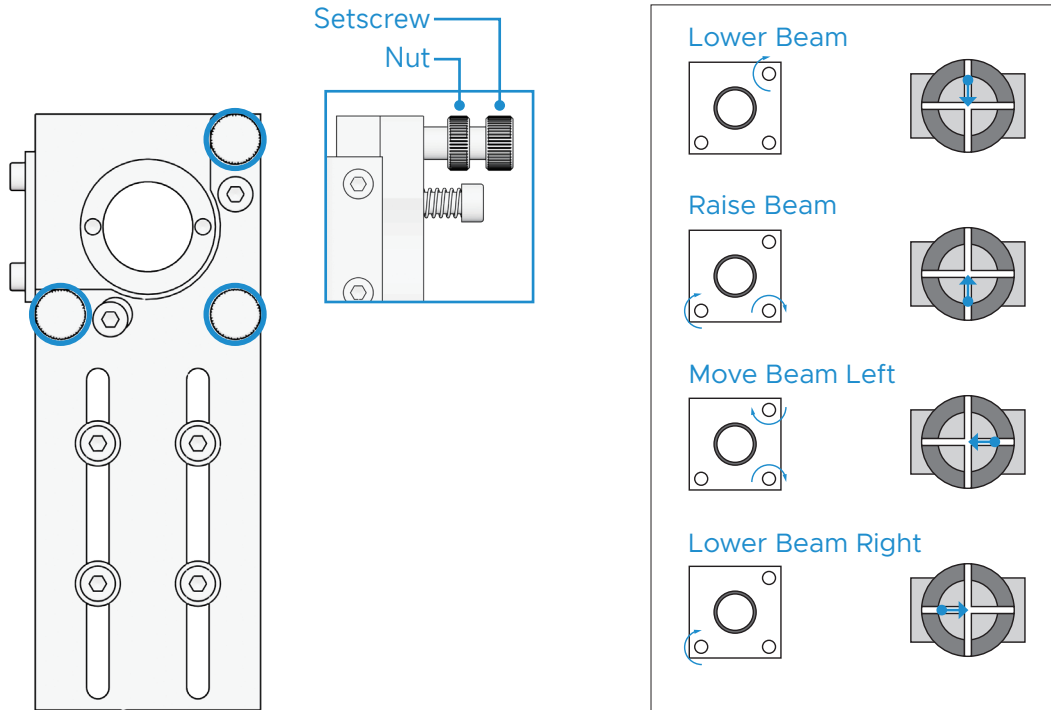
- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to any of the mirrors.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always make sure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

After ensuring the laser is well aligned between the laser tube and Mirror 1, check the alignment between Mirror 1 and Mirror 2.

1. Use the direction arrows on the control panel to send Mirror 2 to the **BACK** of the bed along the Y axis.
2. Place a piece of masking tape on Mirror 2's frame. **DO NOT** place the tape directly onto the mirror.
3. Press **Pulse** to manually fire the laser and observe if the burnt hole is at the center of the masking tape on Mirror 2. If so, Mirror 1 and Mirror 2 are aligned; if not, continue to step 4.

# 7 Maintenance

4. Adjust Mirror 1's set setscrews accordingly.
  - a. Loosen the nut on the setscrew.
  - b. Slightly turn the setscrew either clockwise or counterclockwise.



- Each screw adjusts a different position or angle.
- Keep track of which screw you are adjusting and the direction of adjustment.
- Do not turn the screw more than  $\frac{1}{4}$  turn at a time and, especially at first, test the position of the laser after each adjustment so that you learn the effect of each change.

5. Use the direction arrows on the control panel to send Mirror 2 to the **FRONT** of the bed along the Y axis.
6. Repeat steps 3 and 4 until the beam is well aligned. Replace the tape when necessary.
7. Retighten the nuts on the setscrews.

### 7.3.3 Mirror 2 Alignment



- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to the mirror.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always make sure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

After ensuring the laser is well aligned between Mirror 1 and Mirror 2, check the alignment between the Mirror 2 and Mirror 3.

1. Use the direction arrows on the control panel to send Mirror 3 to the **LEFT** of the bed along the X axis.
2. Place a piece of tape on Mirror 3's frame. **DO NOT** place the tape directly onto the mirror.
3. Press **Pulse** to manually fire the laser and observe if the burnt hole is at the center of the tape on Mirror 3. If so, Mirror 2 and Mirror 3 are aligned; if not, continue to step 4.
4. Adjust Mirror 2's set setscrews accordingly as in [§7.3.2 Mirror 1 Alignment](#) on page 76.
5. Use the direction arrows on the control panel to send Mirror 3 to the **RIGHT** of the bed along the X axis.
6. Repeat steps 3 and 4 until the beam is well aligned. Replace the tape when necessary.
7. Retighten the nuts on the setscrews.

# 7 Maintenance

## 7.3.4 Mirror 3 Alignment



- Wear safety goggles during the entire aligning process.
- Avoid attaching the tape directly to the mirror.
- Less than 15% of the maximum power (not Min.) should be sufficient to leave a clear mark without setting the testing tape on fire.
- Always make sure the path is clear between the laser and its target. Never allow foreign objects between the laser and its target. Always close the cover before firing the laser. Do not look directly at the active laser through the cover during this procedure.

After ensuring the laser is well aligned between Mirror 2 and Mirror 3, check the alignment between Mirror 3 and the workbed.

1. Unplug the air assist hose from the laser head.
2. Place a piece of masking tape across the bottom of the laser head and press it onto the nozzle with some force. This will leave a ring mark that can help you check the accuracy.
3. Lay the tape right under the laser aperture and on top of the laserable scrap.
4. Press **Pulse** to manually fire the laser. You should be able to see a small mark on the tape. If it is not noticeable, press **Pulse** again.

If the burnt hole is at the center of the masking tape, Mirror 3 and the workbed are aligned; if not, continue to step 4.

5. Adjust Mirror 3's setscrews accordingly as in [§7.3.2 Mirror 1 Alignment](#) on Page 76.
6. Repeat steps 2, 3, and 4 until the hole is at the center of the masking tape.
7. Retighten the nuts on the setscrews.
8. Replug the air assist hose to the laser head.
9. Turn off the machine.

## 7.4 Lubrication

### 7.4.1 Rail

**Lubrication Frequency:** Every two weeks

**Tools Needed:**

- Cotton cloth
  - White lithium grease
1. Disconnect the engraver from power.
  2. Gently move the laser head out of the way.
  3. Wipe away all dust and debris along the X and Y axis rails with a dry cotton cloth until they are shiny and clean. Do the same to the Z axis screws.
  4. Lubricate both the rails and screws with white lithium grease.
  5. Gently move the laser head and X axis to coat the lubricant evenly along both rails.
  6. Raise and lower the workbed to distribute the lubricant evenly along the screws.

### 7.4.2 Workbed Elevation Bolts

**Lubrication Frequency:** Every two weeks

**Tools Needed:**

- Cotton cloth
- White lithium grease



**KEEP YOUR HAND CLEAR OF THE MOVING WORKBED WHILE APPLYING GREASE.**

1. Disconnect the engraver from power.
2. Open the rear access door to access the ball screws.
3. Clean any contaminated grease off the ball screws using a piece of cloth.
4. Apply some new lithium grease at the middle of the ball screws.
5. Move the workbed along its full stroke of motion along the ball screws to distribute the lubricant evenly along the ball screws.

# 7 Maintenance

## 7.5 Parts Replacement



- Be sure only to use identical or compatible replacement parts with this engraver. Contact your vendor or our technicians if you have any questions about fitment. Using incompatible components is highly dangerous and waives all the manufacturer's liability for any damage or injury caused.
- **ALWAYS** completely disconnect the engraver from its power supply before replacing any parts.

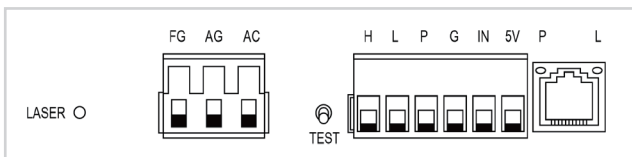
The engraver should not be modified or disassembled by anyone except trained and skilled professionals, but some consumable parts may require replacement after prolonged use.

Take special care when replacing the laser tube or its power supply, as both have extremely high voltage connections.

If you replace the power supply with an identical model, you will be able to use the same screw terminal blocks as a unit. If you change to a different laser power supply, refer to the following diagram:



- FG:** Ground Wire for the Mains and Case
- AC<sub>1</sub>:** Neutral Wire to the Main Power
- AC<sub>2</sub>:** Live Input from the Main Power
- H:** Connection for Active-High Devices
- L:** Connection for Active-Low Devices (like this machine)
- P:** Line to the Trigger, Water, & Other Systems (like the door switch)
- G:** Ground Wire for the Control System, PWM Level Shifters, Potentiometers, &c.
- IN:** Input Power for PWM Level Shifters or Potentiometers
- 5V:** 5V Connection for Digital Signals





## 7.6 Reverse Compensation Settings

If the default data for the reverse compensation settings in the engraving software are accidentally lost, refer to the reverse compensation card (Q) for instructions on configuring the reverse compensation values.

## 7.7 Disposal Instructions

Electrical products should not be disposed of with household products. In the EU and UK, according to the European Directive 2012/19/EU for the disposal of electrical and electronic equipment and its implementation in national laws, used electrical products must be collected separately and disposed of at the collection points provided for this purpose. Locations in Australia, Canada, and the United States may have similar regulations.



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## **PRONTO 40/45/60/75 Cabinet Laser Engraver** User Manual

USB-V139-UK USB-V690-UK USB-V106-UK USB-V161-UK  
Rev. 14 Nov. 2024