



MOPA Fiber Laser Marking Machine User Manual

YXF30 YXF60 YXF100

Read Carefully Before Use.
Keep Well for Future Reference.

PREFACE

Thank you for selecting our laser equipment.

This fiber laser marking machine is designed for both personal and professional applications. Prior to operation, please read this manual thoroughly. It encompasses precise installation, adjustment, maintenance, and, above all, safe operation procedures of your new laser device.

This manual should be utilized alongside the engraving software manual, as the software not only provides image design but also serves as the main interface for laser settings and machine controls. You and any other users of this device should comprehensively understand **BOTH** manuals before attempting to operate the laser.

If this device is transferred to a third party, ensure that both manuals are included. For any inquiries after reading these manuals, please reach out to us, and our support department will promptly address your concerns.

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1. Introduction

1.1 General Information

This manual is the designated user guide to the installation, setup, safe operation, and maintenance of your fiber laser marking machine. It is divided into six chapters covering Introduction, Safety Information, Installation, Operation, Maintenance, and Contact Information.

All personnel involved in the installation, setup, operation, maintenance, and repair of this machine should read and understand this manual, especially its Safety Information. Failure to know and follow these instructions may result in substandard performance and longevity, property damage and personal injury.

Your fiber laser marker works by emitting a powerful laser beam from its fiber laser source, sending the beam through a fiber optic cable, focusing its power through the galvanometer lens, and using this focused light to etch designs onto certain substrates.

This fiber laser marking machine uses a nanoscale fiber laser source. Its single-mode output, good heat dissipation, high efficiency, and compact structure make it ideal for high-precision laser marking. In typical use, this device has an average lifespan of around 100,000 hours. However, continuous operation of your laser above 80% of its maximum rated power can significantly shorten its service life. It is recommended to use settings between 10% and 75% of the maximum rated power for optimal performance and longevity.

Note that this is a high-voltage device and, for safety precaution, it is recommended to only touch its components with one hand at a time during use.

Also note that this device does not have a protective casing. Therefore, it is recommended to use a special room or to erect protective screens around the working area. The active laser is invisible to the human eye, and anyone in or near the working area **MUST** wear special protective eyewear when the laser is in use to avoid potentially permanent injury.

1.2 Symbol Guide

The following symbols are used on the labeling of this machine or in this manual:



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



These items address similarly serious concerns with regard to the laser beam.



These items address similarly serious concerns with regard to electrical components.



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



This product is sold in compliance with applicable EU regulations.



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

1.3 Designated Use

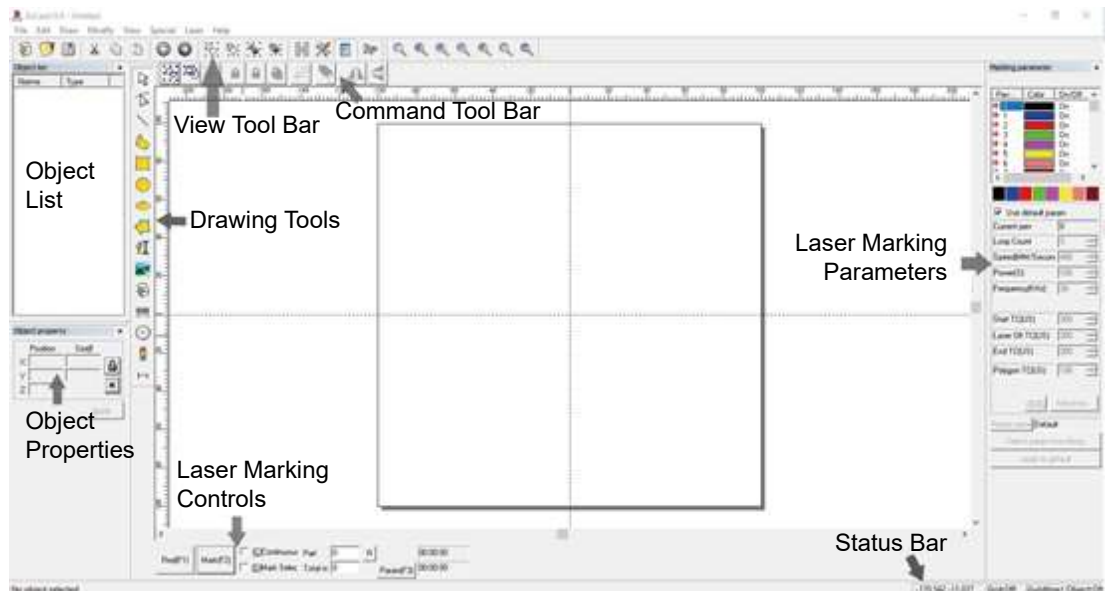
This machine is designed for engraving signs and other consumer products on applicable substrates. Its laser can process a wide variety of metals, including steel, aluminum, titanium, brass, copper, tungsten, carbide, and chrome. It can also be used with stone and some hard plastics like acrylic. (See §§2.5 & 4.3 for further details.) Use of this system for non-designated purposes or materials is not permitted.

The system must be operated, maintained, and repaired by personnel who are familiar with the field of use, the dangers of the machine and the material to be engraved, including its reflectivity, conductivity, potential to produce harmful or combustible fumes, etc.

Laser beams are dangerous. The manufacturer and/or seller assume(s) no responsibility or liability for any improper use of this device or for any damage or injury resulting from such use. The operator is obligated to use this fiber laser marker only in accordance with its designated use, the other instructions on the device and in its manuals, and all applicable local and national laws and regulations.

1.4 Technical Specifications

Model	YXF30	YXF60	YXF100
Input Voltage	110-120V 60Hz		
Rated Power	30W	60W	100W
Expected Service Life	100,000 hrs		
Central Wavelength	1064nm		
Laser Frequency	1-4000kHz		
Pulse Width	2-500ns		
Beam Diameter	7 ± 0.5mm		
Beam Quality M²	<1.4	<1.5	<1.6
Max. Pulse Energy	0.8	2	1.5
Processing Area	6.9x6.9in (175x175mm)		
Max. Marking Speed	275.6ips (7000mm/s)		
Min. Marking Depth	0.0002in (0.005mm)		
Max. Marking Depth on a Single Pass	0.003in (0.07mm)		
Min. Line Width	0.006in (0.15mm)		
Precision	±0.1µm		
Required Operating Environment	Max. Humidity	<70%	
	Temp. Range	32-104°F (0-40°C)	
Provided Operating Software	EZCad		



Control Computer

This fiber laser marker is controlled by the supplied EZCad software, which must be installed on a compatible computer to control the laser. See its separate manual for full details of its components and use. Some features which are particularly important to note include the following parameters and controls:

- **Loop Count** - Specifies how many times the laser beam will repeat its path, creating greater contrast in the marked image.
- **Speed** - Specifies the speed of the beam in millimeters per second, with greater speed creating less contrast in the marked image.
- **Power** - Specifies the percentage (%) of the machine's rated power that will be used, with greater power creating greater contrast. Again, note that running the machine at more than 80% power will shorten its service life, and 10-75% is recommended for most applications.
- **Frequency** - Specifies the frequency of the laser in kilohertz (kHz), with a higher frequency producing a denser laser marking and darker engraving.
- **Red (F1)** - Instructs the laser guidance to illuminate the current laser path.
- **Mark (F2)** - Fires the laser beam for testing and focus improvement.

2. Safety Information

2.1 Disclaimer

Your engraver may differ slightly from those shown in this manual due to options, updates, etc. Please contact us if your marking machine was supplied with an outdated manual or if you have any other questions.

2.2 General Safety Instructions

- Use this laser marking device only in accordance with all applicable local and national laws and regulations.
- Use this device only in accordance with this manual and the supplied manual for the engraving software. Only allow this device to be installed, operated, maintained, repaired, etc. by others who have also read and understood both manuals. Ensure that both manuals are included with this device if it is ever given or sold to a third party.
- **DO NOT** operate this device continuously for more than 5 hours. Stop for at least ½ hour every 5 hours.
- **DO NOT** leave this device unattended during operation. Observe the device throughout its operation and, 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. Also ensure that the device is **FULLY** turned off in the correct order after each use.
- **DO NOT** allow minors, untrained personnel, or personnel with physical or mental impairments that would affect their ability to follow this manual and the software manual to install, operate, maintain, or repair this device.
- Any untrained personnel who might be near the device during operation **MUST** be informed of its potential danger and fully instructed in how to avoid injury during use.
- Always keep a fire extinguisher, water hose, or other flame retardant system nearby in case of accidents. Ensure that the phone number of the local fire station is clearly displayed nearby. In case of a fire, disconnect the electrical power before extinguishing the flame. Familiarize yourself with the correct range for your fire extinguisher before use. Be careful not to use your fire extinguisher too close to the flame, as its high pressure can cause blowback.



2.3 Laser Safety Instructions

This machine uses an invisible **CLASS 4 LASER**, the most powerful and dangerous class of laser available for public use. If used carelessly, it 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 personal injury, including severe burns and irreparable eye damage

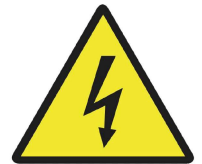
As such,

- **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.
- **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 prevent anyone without protective eyewear from observing the machine during operation. **EVEN WITH** protective eyewear, do not stare or allow others to stare continuously at the laser beam during operation.
- **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 that the area around the laser is free of strong electromagnetic interference during use.
- **ONLY** use this machine as described in the Material Safety Instructions of this manual. The laser settings and engraving processes must be properly adjusted for specific materials.
- Ensure that the area is kept free of airborne pollutants, as these might pose a similar risk of reflection, combustion, etc.
- **NEVER** use this marking machine with the fiber source casing open, as the closed laser light path is necessary to prevent laser radiation leakage.
- **DO NOT** modify or disassemble the laser, and do not use the laser if it has been modified or disassembled by anyone other than trained and qualified personnel. Dangerous radiation exposure and other injuries may result from the use of adjusted, modified, or otherwise incompatible equipment.

2.4 Electrical Safety Instructions

- **ONLY** use this device with a compatible and stable power supply with a voltage fluctuation of less than 5%.
- **DO NOT** connect other devices to the same fuse, as the laser system will require its full amperage. Do not use with standard extension cords or power strips. Only use surge protectors rated over 2000J.
- **ONLY** turn on the power to this device when it is properly grounded, either by a firm connection to a 3-prong outlet or by a dedicated grounding cable firmly connected to the proper slot on the back of the main tower. Do not use with an ungrounded 3 to 2 prong adapter. The grounding of the device should be checked regularly for any damage to the cable or loose connections.
- Turn on or off the device using its power buttons in the correct order. The laser has a separate power supply that is separately grounded. Pressing all the buttons at once, too quickly, or in the wrong order may send electrical current to an ungrounded component, causing short circuits and other electrical hazards.
- Use this device with **ONLY** one hand at a time. The laser is powered by an extremely high voltage, and placing two hands on the machine at the same time during operation may create a closed circuit with the human body, resulting in electric shock.
- The area around this laser marking device should be kept dry and well ventilated, keeping environment temperature between 40-95°F (5-35°C) and humidity not exceeding 70%.
- Adjustment, maintenance, and repair of the electrical components of this device must be done **ONLY** by trained and qualified personnel to avoid fire and other malfunctions, including potential radiation exposure from damaged laser components. Because specialized techniques are required for testing the electrical components of this marking system, it is recommended such testing be done only by the manufacturer, seller, or repair service.
- Unless otherwise specified, adjustment, maintenance, and repair should **ONLY** be done when the device is turned off and disconnected from the power supply.



2.5 Material Safety Instructions

- Users of this fiber marking machine are responsible for confirming that materials to be processed can withstand the heat of the laser and will not produce any emissions or by-products either harmful to people nearby or in violation of any local or national laws or regulations. In particular, do not use this device to process polyvinyl chloride (PVC), Teflon, or other materials containing halogen under any circumstances.
- Users of this fiber laser are responsible for ensuring that every person present during operation has sufficient PPE to avoid any injury from emissions or by-products of the materials being processed. In addition to the protective laser eyewear discussed above, this may require goggles, masks or respirators, gloves, and other protective outer clothing.
- Special caution must be taken by users 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.

This machine can be safely used with the following materials:

- Aluminum
- Brass
- Carbide
- Gold
- Silver
- Steel
- Stone, including Granite, Marble, etc.
- Titanium
- Tungsten

This machine can be used with some other metals, hard plastics, and other materials with some care. For other materials, if you are unsure of their safety or laserability with this device, consult their Material Safety Data Sheet (MSDS). Pay particular attention to information on safety, toxicity, corrosivity, reflectivity, and reaction(s) to high heat. Alternatively, contact our support department for further guidance.

See §4.3 for the recommended parameters for the most commonly engraved materials.

This machine **CANNOT** be used with the following materials or with any materials containing 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
- Paper and Paperboard, due to their high flammability when exposed to the concentrated laser
- Phenolic Resins, including various forms of Epoxy, due to their toxic fumes
- Wood, including MDF, Plywood, Balsa, Birch, Cherry, Oak, Poplar, etc., due to its high flammability

3. Installation

3.1 Installation Overview

A complete working system consists of the fiber laser source, a laser arm with galvanometer lens, a computer (not included) with engraving software (included), and all applicable connecting cables. A support column and workbed are included to assist with your work. Users can also configure other accessories (like a rotary axis) to suit their needs.



Use only the hardware, wiring, and power sources that are included or 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.

Please note the specific requirements for the installation of your system. Each customer must understand these notes prior to installation to ensure proper setup and safe laser performance. If you have any questions or problems with the installation, please contact our technicians and customer support team.

Any auxiliary equipment must be adjusted to the base machine. Queries may be directed to the dealer or manufacturer of such equipment.

3.2 Location Selection

Prior to assembling your fiber laser marker, select an appropriate location for its use.

Be sure that it meets all of the requirements discussed in the Safety Information above. The location should be stable, level, dry, and climate-controlled to ensure an ambient temperature of 40-95°F (5-35°C) and humidity below 70%. In particular, both the temperature and humidity should not be close to the dew point. It is also advisable to use a windowless room or to use blinds and/or curtains to avoid exposure to the potential additional heat of direct sunlight. The location should be free of dust and other airborne pollutants, and well ventilated enough so that any fumes produced by the engraving process can be handled 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 machine should be kept away from children; combustible, flammable, explosive, or corrosive materials; and sensitive EMI devices. The power cord should be connected to a compatible and stable power source via a grounded 3-prong outlet. No other item should draw current from the same fuse. There should be fire-fighting equipment nearby and the phone number of the local fire station should be clearly displayed.

It is strongly recommended to have an extra work table nearby to avoid placing objects on or near the machine which could cause a fire or laser hazard.

3.3 Electrical Grounding

This device uses a powerful laser. As discussed in the Safety Information above, it is extremely high-voltage and potentially dangerous, so users must ground it securely to avoid the buildup of static electricity. Using a standard 3-prong outlet will provide sufficient grounding. If you do not have access to a 3-prong outlet, you **MUST** use the grounding cable and ensure its proper connection. The far end of the cable should be securely connected to a metal rod driven at least 8 feet (3 m) deep into the ground located at least 5 feet (1.5 m) from the machine. The resistance along the cable should not exceed 5Ω.




Poor grounding **WILL** cause equipment failure and create a serious electrical shock hazard. The manufacturer and/or seller assume(s) no responsibility or liability for any damage, accidents, or injuries caused by improper grounding connections.

3.4 Control Computer Installation

See the separate engraving software manual for details of the requirements for the control computer. The control computer should not be placed more than 15 feet (4.5 m) away from the fiber laser marker in order to avoid possible interference with the signal in its line. Familiarize yourself with the image design features and laser control settings of your software before operating the laser itself.

4. Operation

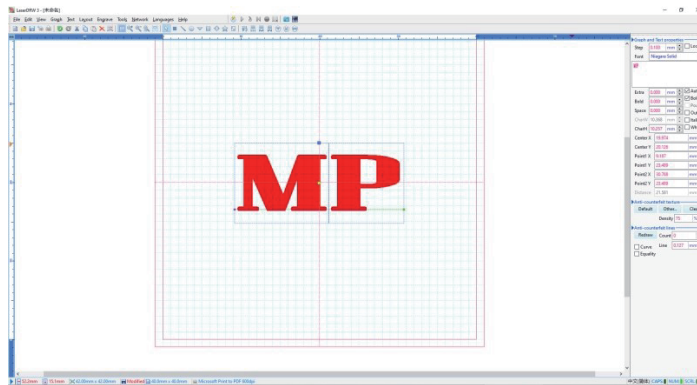
4.1 Operation Overview


 Operate this laser marking machine only in accordance with all the instructions in this manual. Failure to follow the proper guidelines detailed here may result in property damage and personal injury.

This section will address only some of the options and features provided by the operating software. Before using the machine, make sure that you have read this entire manual (especially the Safety Information above), the separate software manual, and all warnings on the machine itself.


4.2 General Operation Instructions

Step 1. Load or create a design in EZCad.



Step 2. Put on your protective eyewear. Ensure that anyone else who might be exposed to direct or reflected laser beams also wears protective eyewear as described in §2.4. 

Step 3. Turn on the laser marker using your passkey, and connect the laser power supply.

Activating them out of order may cause electrical hazards as the separate power supplies are grounded in order. Do not press the buttons too quickly. Give each power supply time to come on the line, activating its fans. 3 seconds is sufficient. 

To reduce the risk of electric shock, once the engraver is on, try to touch its components with only one hand at a time. 

Step 4. If you have previously disconnected the control computer, reconnect it using the USB cable now. If your computer is already connected and EZCad is already running, restart it now to establish a connection between the computer and the laser's control board.

Step 5. Customize your contrast and engraving depth by adjusting the engraving parameters in EZCad.

To darken an image, use a higher frequency setting. To lighten it, use a lower one. To increase the engraving depth, increase the amount of energy per unit area by reducing the speed parameter or increasing the laser power or number of loops. Engraving too deep, however, will reduce image quality, especially on coated materials. Again, constant use of settings over 80% will shorten the expected service life of your laser.

The resolution should usually be set at 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 like some plastics.

Step 6. Activate the laser guidance system by pressing **Red** or hitting **F1** in EZCad. The design should be displayed in red light on the work table, showing where the laser will fire.

Step 7. Place an expendable piece of the material to be engraved in the location shown by the laser guidance. Do not use a different target as the galvanometer lens automatically focuses at different heights for different materials. Be careful that no part of your body is near the work table or laser path, press **Mark** or hit **F2** in EZCad to fire the test laser. Alternatively, you can activate the laser using the foot pad.

- Step 8.** The laser is invisible but will make a buzzing noise and emit sparks, and begin engraving when it is correctly focused on your test material. If no sparks are emitted, the laser is out of focus. Continue to fire it while adjusting the laser arm up or down using the height adjustment knob on the support column. Small, consistent sparks will be emitted at the marking point when the beam is correctly in focus. Make a note of the correct height on the scale of the support column for future reference.
- Step 9.** Replace the test material with the actual material. Use the foot pad, or press **Mark** or hit **F2** in EZCad to engrave your pattern. Again, do not stare at the laser during operation even with protective eyewear. Be aware of possible issues such as sparks or fire, and be prepared to quickly extinguish a fire if necessary.
- Step 10.** Examine the quality of your first run and adjust the laser parameters in EZCad as necessary to achieve your desired effect. The foot pedal is particularly useful for continuous or repeated operation of the laser once you've settled on your design and its ideal parameter settings. You can also achieve more control over the marking process by reducing the laser speed and using the foot pad.
- Step 11.** When you have finished engraving your design, close EZCad and then turn off the laser marking machine by deactivating the systems in order (the laser power supply first and then the main switch).
- Step 12.** Cover the galvanometer lens and thoroughly clean the workbed. For best results, disconnect your fiber marking machine from its power supply between uses. Unplug it or turn off its intermediate surge protector.

4.3 Instructions for Specific Materials

When engraving a new material, it can be helpful to create a test matrix of small boxes engraved at various speed, power, and frequency settings to get the exact effect that you are looking for. To speed up the process, here are some general guidelines for commonly engraved materials. Again, however, these are only guidelines for your convenience and it is the user's responsibility to consult Material Safety Data Sheets and other sources to ensure the safety of working with various materials and setups. Some of the materials listed will require additional workspace and personal protective equipment in addition to this engraver:

Metals

When engraving metals, generally use high power, a low frequency, and low to medium speed settings. To avoid using your marker at more than 80% power for extended periods, you can also achieve similar effects by reducing the power slightly while increasing the number of passes or decreasing the engraving speed. Be mindful that some metals will produce conductive, reflective, and/or toxic dust. Softer metals will naturally produce more dust during engraving, while harder metals can require higher power settings that also produce more dust. In addition to the risk to the user's skin and eyes, there may be enough dust produced (especially in repetitive industrial applications) so that a full ventilation system is required to address the problem. Similarly, operators and others in the working area may need to use respiratory PPE such as masks and respirators.

Aluminum: Bare aluminum requires a slightly higher frequency than other metals and will never produce a strong black mark similar to those created by engraving steel. When darker marking is required, consider employing anodization or producing a deep engraving that can be darkened by using black epoxy or other filler. Anodized aluminum requires a slightly higher speed but a very low frequency.

Powder Coated Metals: Metals with a powder coating usually require a very high frequency and, for best results, at least 3 passes to remove the coating and polish the bare undercoat.

Precious Metals: Gold and similarly soft metals should be engraved at lower power but a moderate speed. Silver and other semi-durable metals are best engraved at slightly higher power and slightly slower speed, but still not at the same power and speed as steel or aluminum.

Plastics

When engraving plastics, low power and high speed settings should generally be used. Marking and engraving at too high power or too low speed can concentrate too much energy at the point of contact, causing the plastic to melt. Among other problems, this may result in poor engraving quality, noxious fumes, and even fire.

Stone

When engraving various kinds of stone, moderate power and speed at low frequency should generally be used. As with ceramics and metals, be aware of the dust created (especially in repetitive industrial applications) and take similar measures to ensure the safety of users and others in the working area.

5. Maintenance

5.1 Maintenance Overview



Unless otherwise specified, adjustment and maintenance should **ONLY** be done when the device is turned off and disconnected from the power supply. **ONLY** allow trained and qualified personnel to modify or disassemble this device.

5.2 Regular Maintenance Procedures

- Keep the working area clean and dust-free at all times.
- Ensure that the device is completely powered off when not in use.
- Cover the galvanometric lens when it is not in use.
- Clean the work table after use with a cloth moistened with more than 75% rubbing alcohol. **NEVER** clean this device with abrasive or corrosive cleansers, aerosol sprays, or excessive water, to prevent them from entering any electrical component. Always allow surfaces to dry completely before further use.
- When using a vacuum cleaner to remove dust from the device's vents, **ONLY** use the lowest power setting to avoid damage to internal components.

 No other servicing should be done by the operator. Do not attempt to service or replace any parts yourself.

5.3 Troubleshooting Guidance

Potential Problems	Possible Solutions
No Laser Output	Correct the focus by adjusting the height of the laser arm.
	Correct the software parameters if they are invalid or incorrect.
	Have a technician repair or establish the connection between the laser and the main board.
	Have a technician repair or establish the connection between the laser and its power supply.
	If either the fiber laser source or its power supply is worn out, have it replaced by a technician.
No Engraving despite Laser Output	Confirm that the material can be safely engraved with this device.
	Correct the focus by adjusting the height of the laser arm.
	Adjust the software parameters to create greater intensity.
	Have a technician check the control panel, the scanning lens, and its power supply. Correct any problems or replace the part.
Other Laser Errors	Have a technician check the fiber laser source and the main board. Correct any problems or replace the part.

5.4 Disposal Instructions



Electrical products should not be disposed of with household waste. In the EU and the 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 Canada and the US may have similar regulations. Contact your local authorities or dealer for advice on disposal and recycling.

Contact Us

Thank you again for choosing our laser equipment for your needs!

If you are satisfied with the performance of the machines, please help to leave a positive review on the website where you made your purchase. If you have any problems regarding this engraver, please contact us (at MP Customer Support Email: support@monportlaser.com and Amazon/eBay Customer Support Email: support@monportlaser.com) with your order ID. Our Customer Service team will respond within 24 hours.

Thank you, and we hope you will choose us again for your next purchase!

