Laguna Tools

X/Series CO2 Laser

Owner's Manual

MX: MCNCLTLCO2MU2012-40W, EX: MCNCLTLCO2EC2436-80W, EX-C: MCNCLTLCO2EC3652-150W
Precision CO2 Laser Engraving & Cutting Machines

SMARTSHOP® LASER|MX

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EN 2072- Laguna Tools: 744 Refuge Way
Grand Prairie, TX U.S.A. Service: +1 (800) 234-1976 or
email: customerservice@lagunatools.com


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1.) Laser Safety Policies

BE CAREFUL when operating this machine. Lasers are high-power tools, and precautions should be taken as with any other machinery. Laser machines use highly focused heat and can be hazardous.

Never leave your machine unattended while in operation, and do not allow untrained or unfamiliar individuals to use it.

Always keep access covers on and keep the top lid closed while operating. Avoid direct exposure to the laser beam and review all warning labels on your machine.

The following safety measures are critical and should be followed at all times:

1. NEVER operate without proper training.
2. ALWAYS use protective eyewear or keep the lid closed.
3. ALWAYS keep the exhaust fan running during use.
4. NEVER set anything on top of or inside the machine while not in use.
5. NEVER leave the laser unattended while running to monitor for hazards.
6. MAINTAIN a pollution-free environment around the machine, avoiding strong magnetic or electrical interference.
7. DO NOT use unapproved materials, such as polyvinyl chloride (PVC) or chlorine-based materials, as they emit harmful gases.
8. DO NOT operate near flammable or explosive substances, as the laser beam poses a fire risk.
9. NEVER lift the lid while the machine is running.


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Laser Safety Policies Cont'd

10. AVOID reflective materials that could cause laser deflection.
11. DO NOT manually adjust the laser head while in operation.
12. DO NOT dismantle the machine, as this disrupts sensitive parts and may lead to injury.
13. KEEP the collection tray(s) clean to avoid hazards.

In Case of a Fire:

1. Press the EMERGENCY STOP button located above the LED Panel.
2. Lift the lid.
3. Extinguish any flames, using a CO2 fire extinguisher if needed.


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1.1) Fire & Hazardous Materials

WARNING

This machine uses high heat to engrave, etch, and cut material. It should never be left unsupervised while in operation, as unattended use can result in fire and significant damage to both the machine and the building it is in.

Any fire-related damage not caused by defects in workmanship or the machine itself will NOT be covered by the Laguna Tools Limited Warranty.

WARNING

Materials hazardous to the machine’s health or to the individuals operating or near it are NOT recommended for etching, cutting, or engraving. Some materials emit toxic fumes or may cause the machine to malfunction, requiring replacement parts.


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1.2) Materials not Recommended for Cutting, Ethcing, or Engraving

The following materials are not permitted to be used with any CO2 laser processing machine. This list is not a complete list and there may be other materials that can harm the operator and the machine.

NOTE

Most materials have a “Material Safety Data Sheet” (MSDS) that indicates whether they are safe to expose to high heat. Materials containing chlorine are unsafe for the laser and for anyone exposed to the fumes.

Contact Laguna Tools if you need help identifying whether a material is safe to laser.

Table 1-1: Prohibited Materials

Material	Danger
Metals (some exceptions for engraving with specific agents)	Fumes can irritate the eyes, skin, and respiratory tract. Reflective metal can reduce laser power and damage lens and machine components
PVC (Polyvinyl Chloride) PVC Compounds Vinyl Vinyl with Chlorine Artificial Leather	Fumes from polyvinyl chloride can irritate eyes, skin, and respiratory tract. Do not expose to high temperatures. Toxic gas is harmful to the operator and bystanders. Chlorine-based fumes can irritate eyes, skin, and respiratory tract. Do not expose to high temperatures. Acidic byproduct is harmful to the lens and machine components.

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Materials not Recommended for Cutting, Ethcing, or Engraving Cont'd

Polycarbonate (Lexan) Polycarbonate Epoxy Fiberglass Resin	Fumes can irritate eyes, skin, and respiratory tract Toxic gas is harmful to the operator and bystanders. Acidic byproduct is harmful to the lens and machine components. Material Properties resist laser cutting/engraving.
ABS	Fumes can irritate the eyes, skin, and respiratory tract. Do not expose to high temperatures Toxic gas is harmful to the operator and bystanders. Acidic byproduct is harmful to the lens and machine components. Material properties resist laser cutting/engraving.
HDPE	Fumes can irritate the eyes, skin, and respiratory tract. Do not expose to high temperatures Highly flammable. Acidic byproduct is harmful to the lens and machine components.
Polystyrene (Styrofoam) EPS Polyurethane Foam Polypropylene Foam	Fumes can irritate the eyes, skin, and respiratory tract. Do not expose to high temperatures Extremely Flammable. Acidic byproduct is harmful to the lens and machine components. These materials have been reported to cause several fires by processing with a laser machine.


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1.3) Laser Safe Materials

Lasers use heat to cut and etch materials, and different materials respond uniquely to this method. Below is a guide for safe materials, but always double-check the properties of new materials to ensure they're suitable for laser processing.

Table 1-2: Safe Materials

Class of Material	Material
Plastics	Acrylic, Delrin, Polyethylene Terephthalate Glycol (PETG)
Foam	Ethylene Vinyl Acetate (EVA)
Textiles & Other Materials	Cloth, leather, felt, paper, wood


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Machine Briefing:

2.) The machine comes as assembled as possible without impacting shipping costs and the possibility of damage. Because of this, there will always be some setup procedures and adjustments that the craftsman must perform prior to using the machine. Those setup sections that must be done to complete the assembly of the machine are in the Machine Setup sub-section. Those help topics for making operational changes to the machine in order to set up for a different function are in the Functional Setup Section. All help topic pertaining to the proper set-up of Accessories and Auxiliary Equipment are in the respective categories.

WARNING!
WARNING! Never perform any setup, maintenance or adjustments with the machine connected to the power source!
WARNING! If you have any doubt about the described procedure, seek professional assistance. Do not attempt any procedure that you feel is unsafe, or that you do not have the physical capability of achieving.
WARNING! Only operate the Laser machine after proper installation of the Chiller, Air Pump, & Exhaust System. Never operate machine without all systems running.
WARNING! When removing packaging banding, extreme caution must be used as the banding will spring when cut.
CAUTION! The machine is heavy. Ensure that you have enough people to do the job safely.
CAUTION! Use extreme caution when handling the fragile glass laser tube.
NOTE: There may be sawdust in or around your new machine as a result of thorough testing before shipping.

If you are looking for adjustments, like how to replace belts or align the mirrors, please navigate to the Maintenance Sections .


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Set-Up (Cont'd.):

3.) Setup Preparation & Contents:
3.1.) Preparing For Setup-Receiving, Damage Notifications, Machine Placement, Open Crate (Unboxing).
3.2.) Inventory.
3.3.) Connection Diagrams.
3.4.) Machine Set-Up.
3.5.) Auxiliary Equipment Set-Up Exhaust Ventilation Water Chiller & Pump Air Compressor.
3.6) Software Set-Up & Installation.

3.1.) Preparing For Setup-Receiving.

3.1.1.) When the Crate containing your newly purchased X/Series CO2 Laser Machine is delivered, it will be delivered "Curbside", in other words the Machine will be delivered in front of the Driveway of ones Garage/Shop or Workspace.
(****It is the Purchasers responsibility of moving the Machine into His or Hers Garage/Shop or Workspace.****)

3.1.2.) When moving the Crate one can use a "Floor Jack" (See Picture Fig. 1), one can rent a "Floor Jack" from any Hardware Store/Equipment Rental Facility or utilize several people to move the Crate into your Garage/Shop or Workspace.


Fig. 1-Floor Jack


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X/Series CO2 Laser Machine Series Damage Notification-

3.1.3) The Machines are thoroughly tested before leaving any or our Laguna Tools Facilities, but that does not mean the Machines would not experience any damage in transit.

Before one Signs the Bill of Lading (See Example Below) when the Trucking Company drops off the Machine, **visually inspect the entire crate and check for any damage.**

[Click to select date] BILL OF LADING – SHORT FORM – NOT NEGOTIABLE Page 1 of 1

SHIP FROM	Bill of Lading Number:
Laguna Tools 744 Refuge Way Suite #200 Grand Prairie, TX 75050 SID No.:	BAR CODE SPACE
SHIP TO	**Carrier Name:**
[Name] [Street Address] [City, ST, ZIP Code] CID No.:	Trailer number: Serial number(s):
THIRD PARTY FREIGHT CHARGES BILL TO	**SCAC:**
[Name] [Street Address] [City, ST, ZIP Code]	Pro Number: BAR CODE SPACE
Special Instructions:	**Freight Charge Terms** (Freight charges are prepaid unless marked otherwise): Prepaid ☐ Collect ☐ 3rd Party ☐
	☐ Master bill of lading with attached underlying bills of lading.

CUSTOMER ORDER INFORMATION

Customer Order No.	# of Packages	Weight	Pallet/Slip (circle one)		Additional Shipper Information
			Y	N	
			Y	N	
			Y	N	
			Y	N	
Grand Total					

CARRIER INFORMATION

Handling Unit		Package					LTL Only	
Qty	Type	Qty	Type	Weight	HM (X)	Commodity Description Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation with ordinary care. See Section 2(a) of NMFC item 360	NMFC No.	Class

Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows: "The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____."	**COD Amount: $** Fee terms: Collect ☐ Prepaid ☐ Customer check acceptable ☐

Note: Liability limitation for loss or damage in this shipment may be applicable. See 49 USC § 14706(c)(1)(A) and (B).

Received, subject to individually determined rates or contracts that have been agreed upon in writing between the carrier and shipper, if applicable, otherwise to the rates, classifications, and rules that have been established by the carrier and are available to the shipper, on request, and to all applicable state and federal regulations.	The carrier shall not make delivery of this shipment without payment of charges and all other lawful fees. **Shipper Signature**

Shipper Signature/Date	Trailer Loaded:	Freight Counted:	Carrier Signature/Pickup Date
This is to certify that the above-named materials are properly classified, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT.	☐ By shipper ☐ By driver	☐ By shipper ☐ By driver/pallets said to contain ☐ By driver/pieces	Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent documentation in the vehicle. Property described above is received in good order, except as noted.


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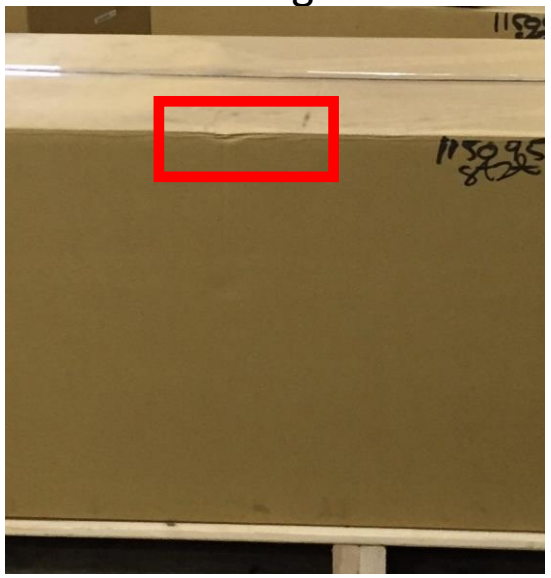
X/Series CO2 Laser Machine Series Damage Notification-

3.1.4.) If one finds any shipping damage to the Crate (See Example Pictures Below.), report the damage to the Trucking Company, Note the Damage on the Bill of Lading & attach back on to the Crate **(DO NOT ACCEPT THE CRATE IN ANY DAMAGED CONDITION!)**. If possible, take Photos of the Damage and send to Laguna Tools Customer Service.



3.1.5.) If YOU OPENED THE CRATE and found shipping damage to Machine, **Note that on the Bill of Lading as well.**

3.1.6.) **NOTIFY LAGUNA TOOLS WITHIN 24 HOURS AFTER RECEIVING CRATE WITH SHIPPING or any other type of DAMAGE**. We ask customers to notify us within 24 hours of any damage sustained to the packaging and or products. Customers can contact us at **customerservice@lagunatools.com or call 855-989-9731**.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Placement of Machine-

3.1.7.) Placement Prior to removing the machine from the packaging, decide the operating location of the machine. The dimensions and floor space can be found here: Dimensions.

- There should be sufficient area at the front of the machine to allow you to work on it comfortably.
- There should be sufficient area at the back of the machine to allow access for adjustments and maintenance to be conducted.
- Adequate lighting. The better the lighting the more accurately and safely you will be able to work.
- Solid Floor. You should select a solid flat floor, preferably one made of concrete or something similar.
- Locate it close to a power source and dust collection or fume extraction.


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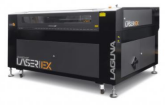
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X/Series CO2 Laser Machine Series Open Crate (Unboxing)-

3.1.8.) Acquire some standard tools for taking apart the Crate.

a.) Hammer.

b.) Pry Bar.

c.) Wire Cutters.

d.) Cordless Drill.


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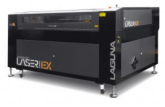
SMARTSHOP® LASER|EX


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X/Series CO2 Laser Machine Series Open Crate (Unboxing)-

3.1.9.) Cut all straps on the Crate.

3.1.10.) Unscrew a series of Screws at the Base of Crate using a Cordless

3.1.11.) Visually inspect the entire X/Series CO2 Laser Machine and check for any damage to the crate. We ask customers to NOTIFY LAGUNA TOOLS WITHIN 24 HOURS AFTER RECEIVING NEW X/Series CO2 Laser Machine WITH SHIPPING DAMAGE. Customers can contact us at **customerservice@lagunatools.com or call 855-989-9731**.


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3.2.) Inventory-

3.2.) Do not unpack the laser tube until prompted in the setup procedures. Again, Per 2.1.3) The Machines are thoroughly tested before leaving any or our Laguna Tools Facilities, but that does not mean the Machines would not experience any damage in transit. Before one Signs the Bill of Lading (See Example Below) when the Trucking Company drops off the Machine, **visually inspect the entire crate and check for any damage.**

Verify the following Items before unpacking items from crate unpacking
MX (MLTX6011) Receiving:

- Laser Tube Cover.
- Right Side Upper Panel.
- Exhaust Tubing.
- **VERY FRAGILE!** C02 Glass Laser Tube.
- Water Chiller.
- Exhaust Fan.
- Small Parts Box.
- Air Pump.

Laser Tube Cover-

Right Side Upper Panel- Panel will be removed & separated. Area to store Laser Tube & Accessories.


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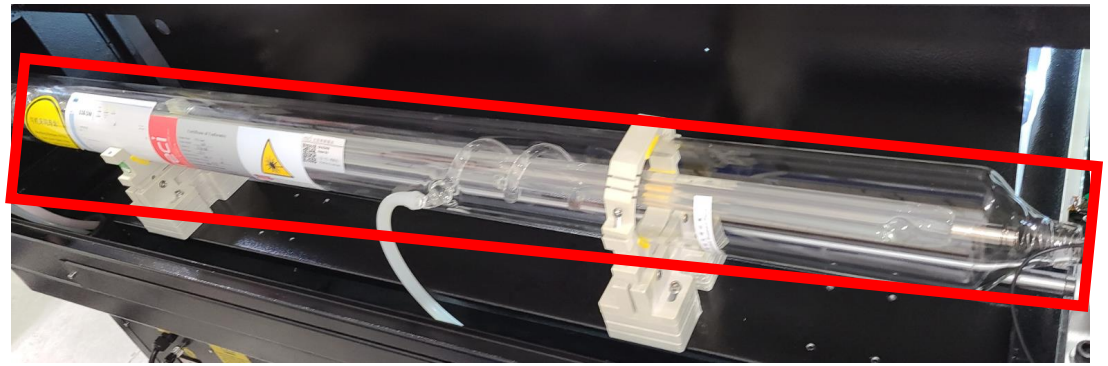
3.2.) Inventory (Cont'd.)-

(Cont'd.) Verify the following Items before unpacking items from crate unpacking the MX (MLTX6011) Receiving:

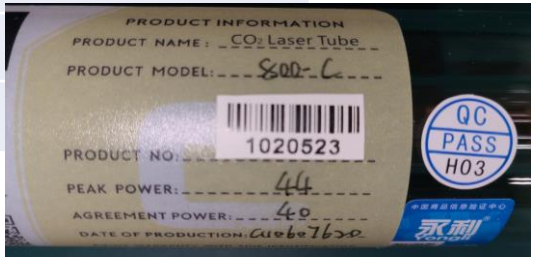
- Laser Tube Cover.
- Right Side Upper Panel.
- Exhaust Tubing.
- **VERY FRAGILE!** C02 Glass Laser Tube.
- Water Chiller.
- Exhaust Fan.
- Small Parts Box.
- Air Pump.

Exhaust Tubing-

- **VERY FRAGILE!** C02 Glass Laser Tube-



Laser Tube Guide		
Laser Tubes Size/Length depends on Wattage		
Type of Wattage	**Machine Types**	**Comments**
40W	Smartshop MX	Laser Tube Info.-
100W	Smartshop EX	
150W	Smartshop EX-C	

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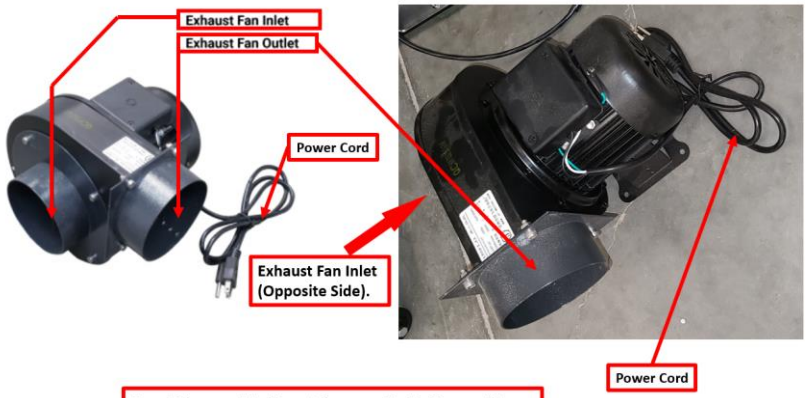
3.2.) Inventory (Cont'd.)-

(Cont'd.) Verify the following Items before unpacking items from crate unpacking the MX (MLTX6011) Receiving:

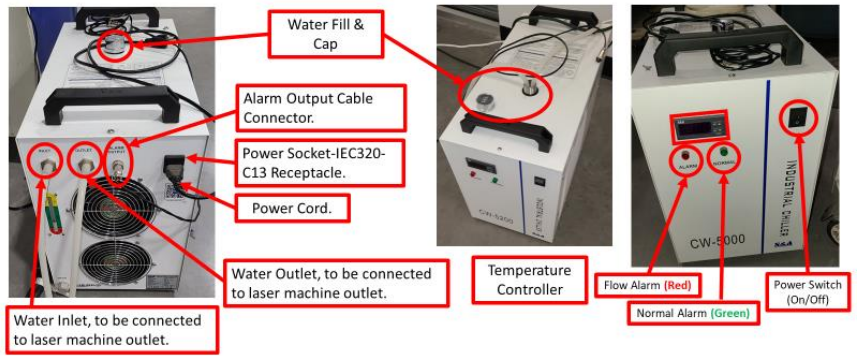
- Laser Tube Cover.
- Right Side Upper Panel.
- Exhaust Tubing.
- **VERY FRAGILE!** C02 Glass Laser Tube.
- Water Chiller.
- Exhaust Fan.
- Small Parts Box.
- Air Pump.

Exhaust Fan-



Fan Blower Unit or Blower Unit Operations

Water Chiller-



S&W CW-5000DG Industrial Chiller Machine Basic Operations

Toolbox or Small Parts Box-

Air Pump-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3.3.) Inventory (Cont'd.)- Complete Inventory of Laser Machine

3.3.) After visually inspecting the entire crate and check for any damage to the main components, do a physical inventory of all parts. Here is a Inventory of all Parts utilized to Build Laser Machines and Parts in the Small Parts Box/To

Number	Name	Description
1	**Smartshop MX CO2 Laser Machine**	
2	Laser Tube Cover	Provides an enclosure for the extended length laser tube.
3	Right Side Upper Panel	Encloses Machine - must be installed to operate laser machine.
4	Exhaust Tubing	Used in Exhaust System.
5	FRAGILE! C02 Glass Laser Tube	USE EXTREME CAUTION WHEN HANDLING. The glass laser tube transfers electrical energy into a light source that is concentrated and then directed through the mirror assemblies to cut, engrave, or sinter materials.
6	Honeycomb Table	The honeycomb table will arrive pre-installed and is used as a platform for work pieces.
7	Water Chiller	Chills and pumps water through the glass laser tube to effectively cool the machine.
8	Water Tubing (2)	Connect Chiller to Laser Machine through inlet and outlet ports on rear of laser machine.
9	Power Cable	Power connection for Water Chiller.
10	Connection Cable	Connection Cable From Laser Machine to Water Chiller, AKA "Alarm Cable".
11	Exhaust Fan	Pulls fumes and polluted air from the laser machine to a safe location.
12	Metal Expanding Exhaust Ducting	Used from Exhaust fan outlet to direct polluted air away from operator.


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3.3.) Inventory (Cont'd.)- Complete Inventory of Laser Machine

2.) Laser Tube Cover-

3.)

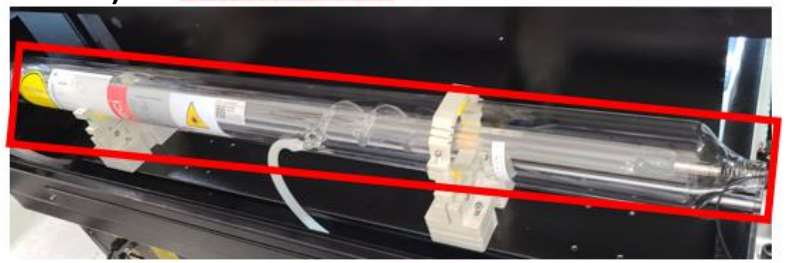
Right Side Upper Panel- Panel will be removed & separated. Area to store Laser Tube & Accessories.

4.) Exhaust Tubing-

7.) Water Chiller-

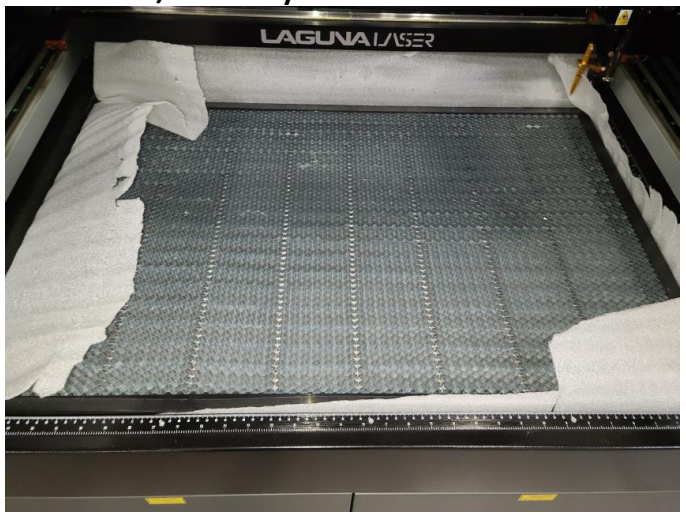
S&W CW-5000DG Industrial Chiller Machine Basic Operations

5.) • VERY FRAGILE! C02 Glass Laser Tube-

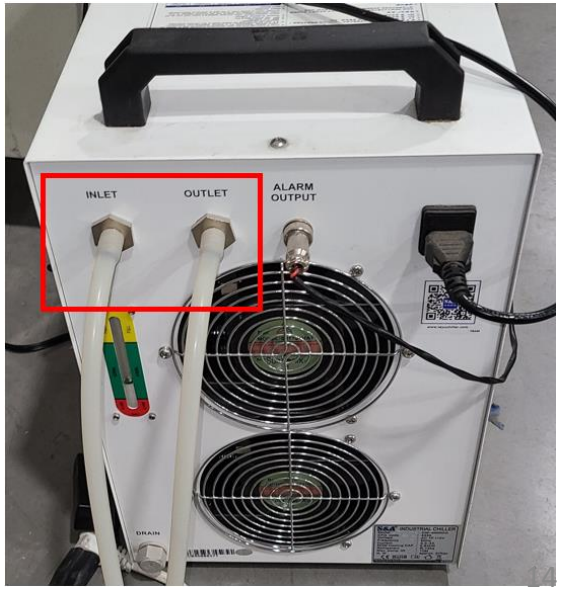


Laser Tube Guide		
Laser Tubes Size/Length depends on Wattage		
Type of Wattage	Machine Types	Comments
40W	Smartshop MX	Laser Tube Info.-
100W	Smartshop EX	
150W	Smartshop EX-C	

6.) Honeycomb Table-



8.) Water Tubing (2)-

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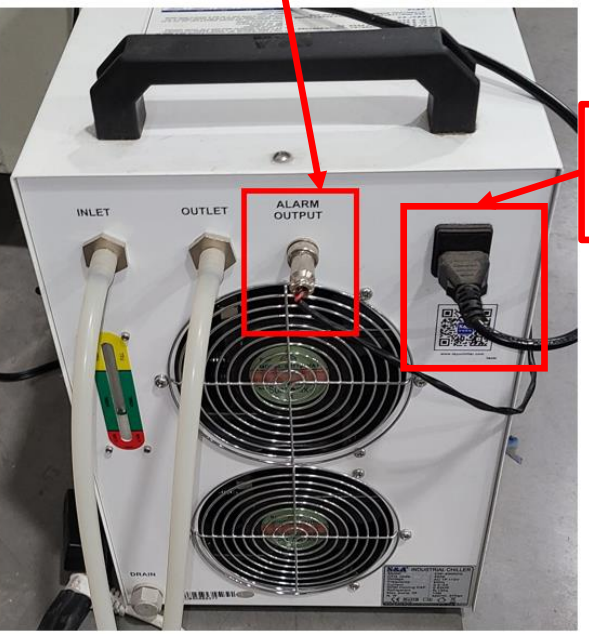
3.3.) Inventory (Cont'd.)- Complete Inventory of Laser Machine

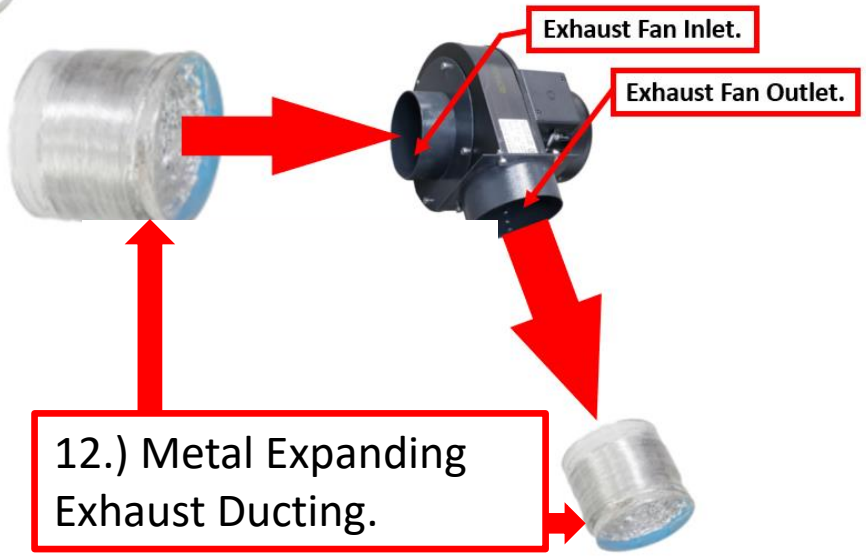
10.) Connection Cable (Alarm)-



9.) Power Cable-

Connect the Exhaust Intake, Secure with (1) Band Clamp.

11.) Exhaust Fan Unit or Blower Unit



12.) Metal Expanding Exhaust Ducting.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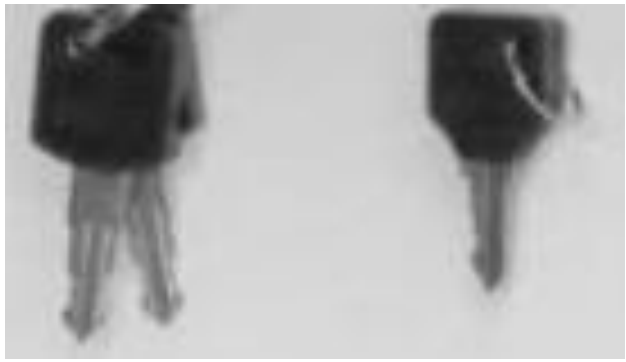
3.4.) Inventory –Toolbox/Small Box of Parts:

Number	Name	Description-Accessories
	Toolbox/Small Box Parts	
12	Toolbox/Small Box Parts	Contains all smart parts, including adjustment tools, spare parts, and software installers.
13	Ignition Keys - smaller of the three sets.	Starts or stops the laser machine through the ignition switch.
14	Locking Keys	All four keys lock or unlock each panel on the laser machine.
15	USB Thumb Drive	Contains Ruida/Lightburn Laser Works Software package installer, Owner's Manuals, and Setup Videos.
16	Tools	Setup and Adjustment Tools.
17	Air Valve	Used to regulate air flow form the air pump.
18	Universal Connector	Used with the purchase of rotary adapter accessory.
19	Spare Limit Switch	To repair a faulty limit switch in the x or y limit of the drive system.
20	Alignment Crosshair	Used in alignment procedure to help align laser beam to mirror center.
21	Water Hose Clamps	Used to fasten tubing to the chiller inlet and outlet.
22	Exhaust Hose Clamps	Used to fasten tubing to exhaust ports.
23	Compressor	Supplies compressed air through the laser head assembly to prevent fire and damage to laser lens.
24	Air Hose Fitting	**NOT SHOWN:** Screws into the compressor and allows for air hose attachments.
25	Air Hose	**NOT SHOWN:** Used to connect the compressor and the Air Inlet on Laser machine.

Toolbox or Small Parts Box-

13.) & 14.) Ignition Locking Keys



15.) Thumb Drive

16.) Tools

17.) Air Valve

18.) Universal Connector

19.) Spare Limit Switch

20.) Alignment Crosshair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3.3.) Connection Diagrams:

Smartshop Laser/MX Series CO2 Laser Machine (MCNCLTLCO2MU2012-40W)

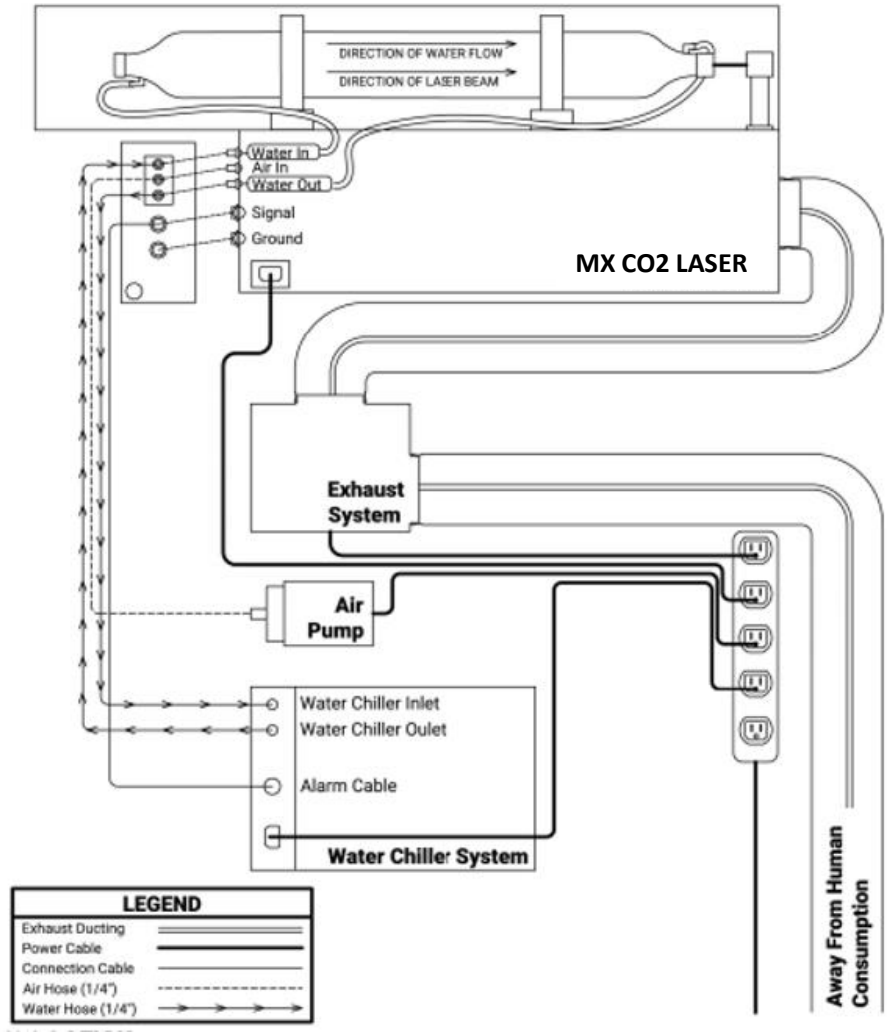

Fig. 1: Smartshop Laser/MX Series CO2 Laser Machine.


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3.3.) Connection Diagrams (cont'd.):

Smartshop Laser/EX/EX-C Series CO2 Laser Machine (MCNCLTLCO2EC2436-80W, MCNCLTLCO2EC3652-150W)

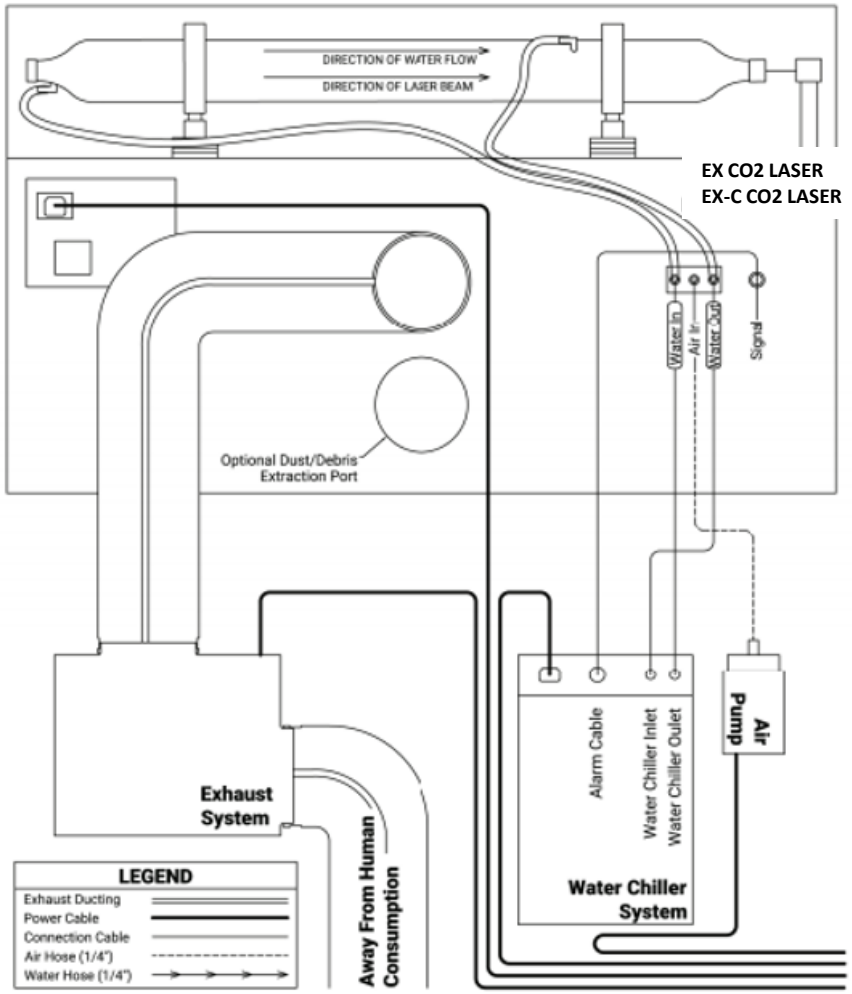

Fig. 2: Smartshop Laser/EX/EX-C Series CO2 Laser Machine.


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SMARTSHOP® LASER|EX-C

3.4.) Inventory –Toolbox/Small Box of Parts (Cont'd.):

Number	Name	Description-Accessories
		Toolbox/Small Box Parts
12	Toolbox/Small Box Parts	Contains all smart parts, including adjustment tools, spare parts, and software installers.
13	Ignition Keys - smaller of the three sets.	Starts or stops the laser machine through the ignition switch.
14	Locking Keys	All four keys lock or unlock each panel on the laser machine.
15	USB Thumb Drive	Contains Ruida/Lightburn Laser Works Software package installer, Owner's Manuals, and Setup Videos.
16	Tools	Setup and Adjustment Tools.
17	Air Valve	Used to regulate air flow form the air pump.
18	Universal Connector	Used with the purchase of rotary adapter accessory.
19	Spare Limit Switch	To repair a faulty limit switch in the x or y limit of the drive system.
20	Alignment Crosshair	Used in alignment procedure to help align laser beam to mirror center.
21	Water Hose Clamps	Used to fasten tubing to the chiller inlet and outlet.
22	Exhaust Hose Clamps	Used to fasten tubing to exhaust ports.
23	Compressor	Supplies compressed air through the laser head assembly to prevent fire and damage to laser lens.
24	Air Hose Fitting	**NOT SHOWN:** Screws into the compressor and allows for air hose attachments.
25	Air Hose	**NOT SHOWN:** Used to connect the compressor and the Air Inlet on Laser machine.

Toolbox or Small Parts Box-

21.) Water Hose Clamps (2)-

22.) Exhaust Hose Clamps-

23.) Compressor **(Not Supplied)-**

24.) Air Hose Fitting **(Not Supplied)-**

25.) Air Hose **(Not Supplied)-**


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3.5.) Machine Set-Up:

The following sections should be followed exactly in order to properly set-up the machine.

Removing Zip Ties and Shipping Devices-

DANGER Make sure that the machine is not connected to the power source during laser tube installation.

WARNING Do not plug in machine or connect anything to a power source until prompted to do so.

NOTICE Use caution when removing zip ties to avoid damaging the belts.

NOTICE Use extreme caution when handling the laser tube as it is fragile.


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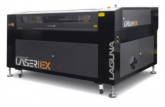
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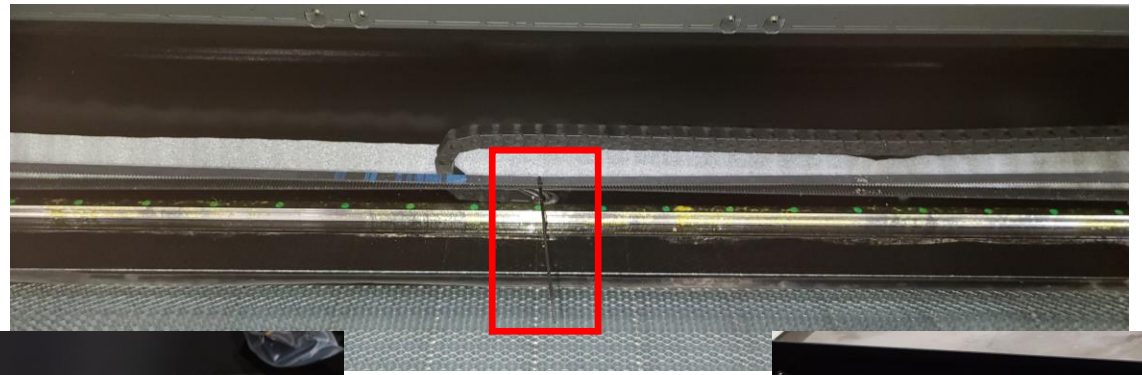
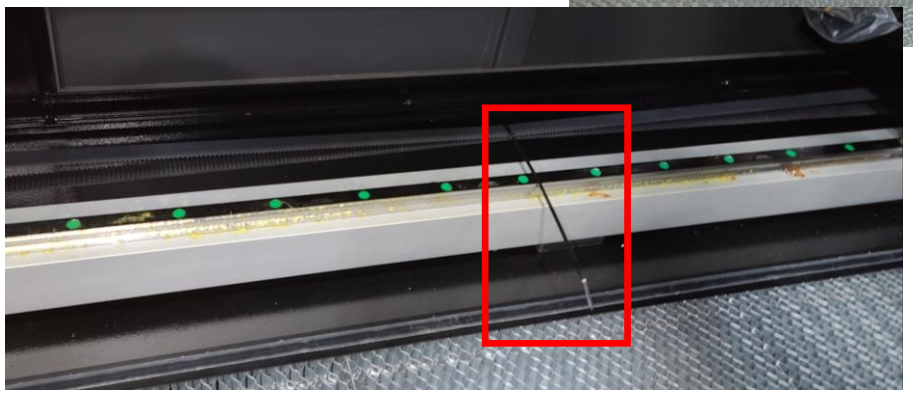
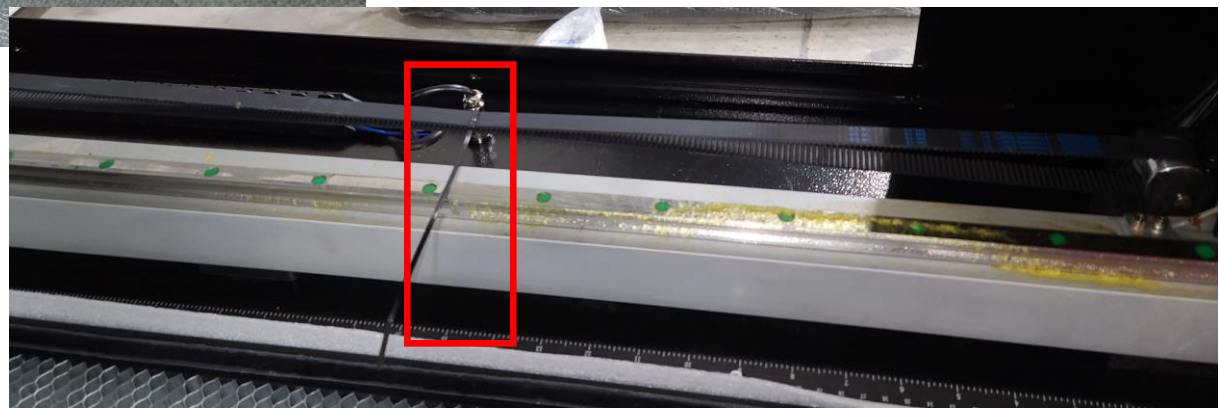
3.5.) Machine Set-Up: Cutting Zip Ties.







Inner Laser Machine Chamber-Removing Zip Ties and Shipping Devices:

(1) Remove packaging zip ties with scissors or pliers.

(2) Remove (2) belt zip ties with scissors or pliers.

The machine is shipped such that nothing can move in transit. Use a pair of scissors or pliers to remove all zip ties as described.

Avoid using a razor blade or knife when remove the zip ties on belts to avoid damaging the belts.

Tools Needed: Scissors/Pliers.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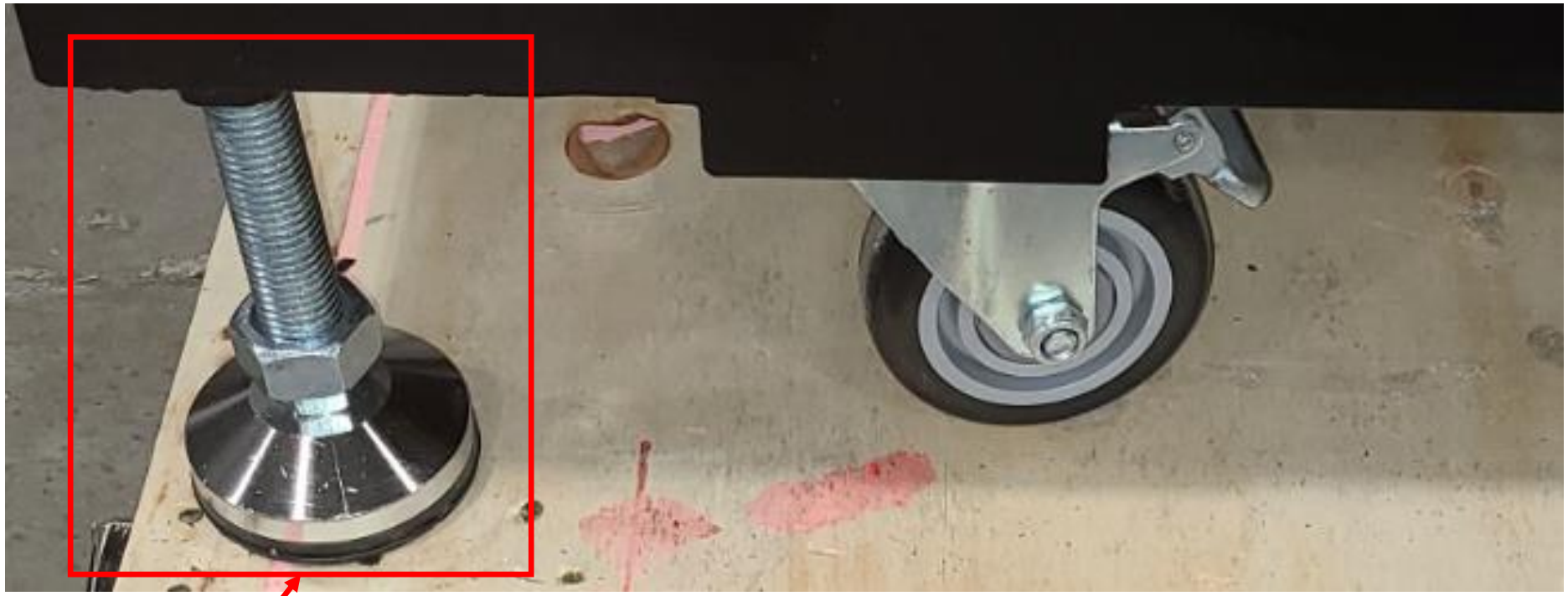
3.5.) Machine Set-Up (Cont'd.)-

Leveling the Machine: Leveling the machine is important to ensure the flatness of the work area and the alignment of the laser mirrors. Make certain to position the laser machine on a flat solid surface and level the machine by adjusting each of the 4 casters. **Perform this step prior to installing the laser tube to reduce the risk of breaking the laser tube.**

NOTICE You will need 2 persons and a level to complete this setup section.

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3.5.) Machine Set-Up (Cont'd.)-

Installing Panels and Laser Tube Cover-

Installing Panels and Laser Tube Cover Note: This section is similar for all Laguna laser machines.

Laser Tube Cover-

Right Side Upper Panel-

These panels are located inside the bottom of the laser machine upon shipment. Remove them and follow the procedure exactly to properly install the panels.

Tools Needed: Allen Wrenches. 

1.) Install the (2) right side panel by pulling down the quick release pin and positioning the pins in the pin holes of the laser machine door frame.
2.) Remove the (3) four screws on the (1) Laser Tube Cover.
3.) Position the Laser tube cover and re-install the screws..


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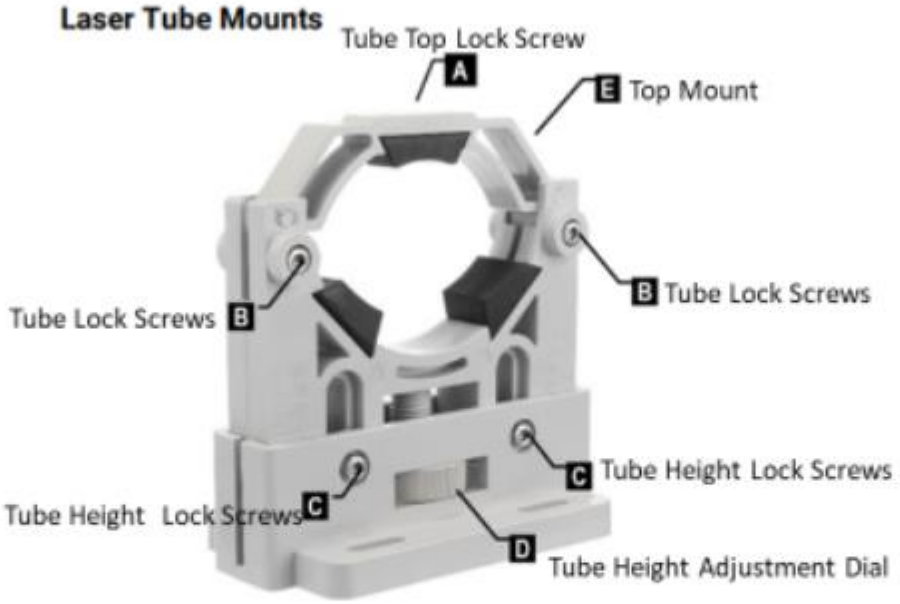
3.6.) Machine Set-Up: Laser Tube Installation- Note: This section is similar for all Laguna Laser Machines.

Laser Tube Mounts-



A Tube Top Lock Screw
B Tube Lock Screws
C Tube Height Lock Screws
D Tube Height Adjustment Dial
E Top Mount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3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

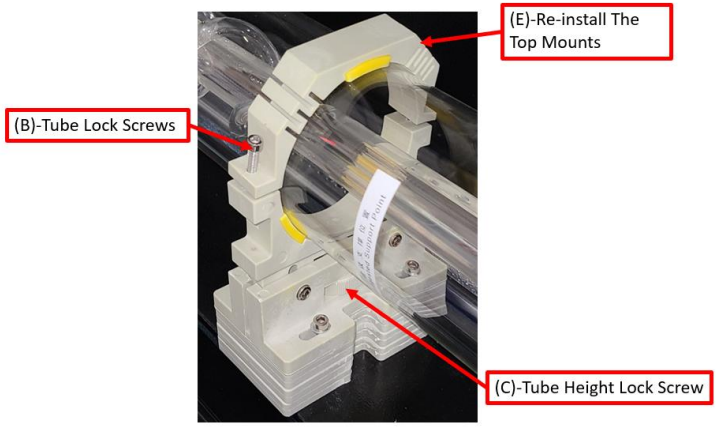
Installing the Laser Tube:

NOTICE ! Please reference the connections diagram when installing.

1.) Unplug the laser machine and all components. **⚠ CAUTION** Avoid electrical shock.

2.) Open the Laser Tube Cover or Rear Panel of the Laser Machine.

3.) Remove the top mounts (E) from each mount by removing the Tube Lock Screws (B). Now is a good time to loosen the Tube Height Lock Screws (C).

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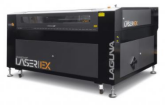
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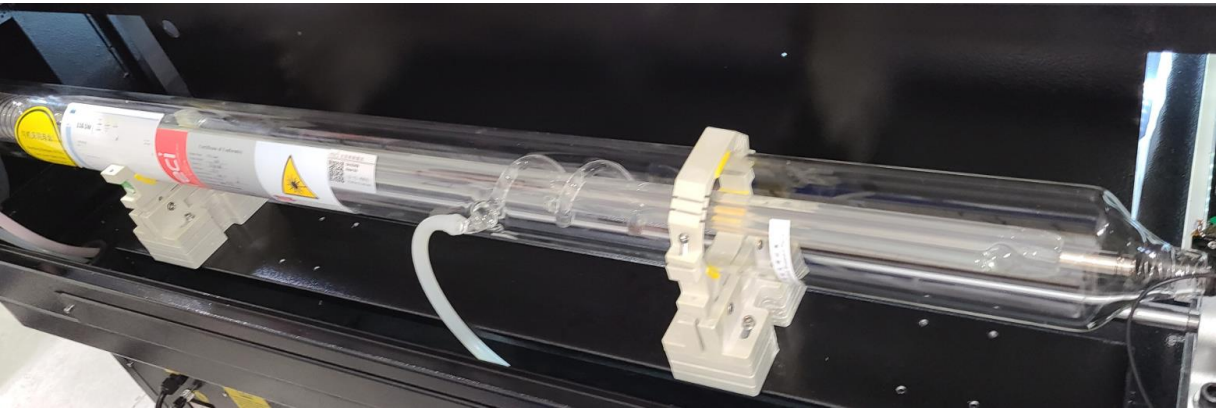
3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

4.) Carefully place the new, unconnected, laser tube inside the mounts. **The Laser Tube is very fragile**.



5.) Carefully connect a water tube between the inlet on the rear of the connection panel and the water inlet on the laser tube (left side, cathode side).

Connect a water tube between the inlet on the rear of the connection panel.

Ground Inlet on the rear of the connection panel.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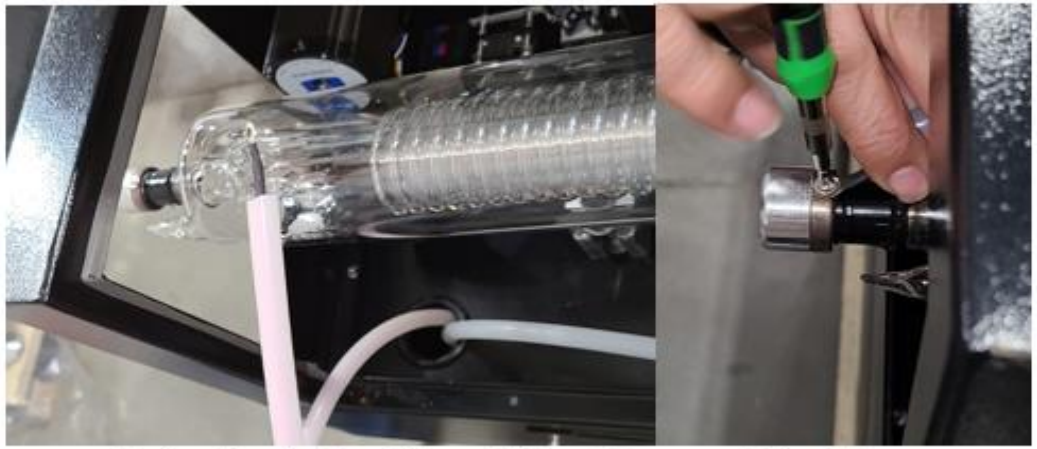
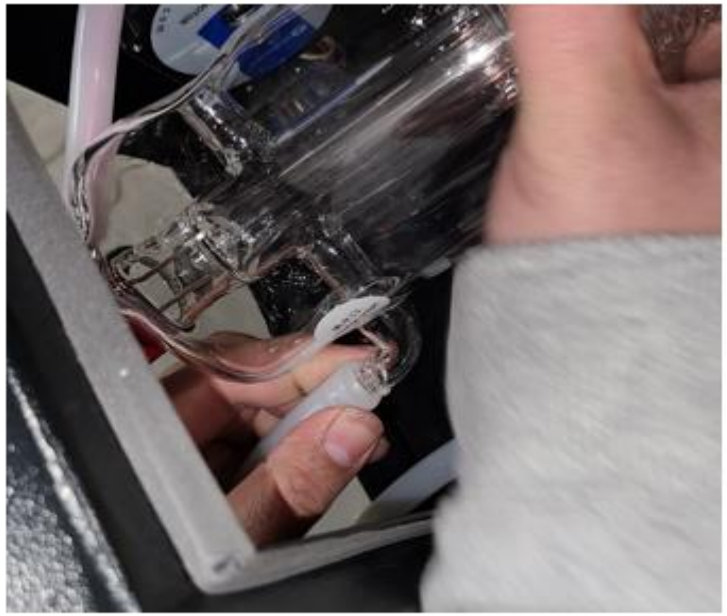
3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

6.) Carefully connect a water tube between the outlet on the rear of the connection panel and the water outlet on the laser tube (right side, anode side).


Remove Red Sleeve


Take Red Positive Wire Connect to the rear of the connection panel


Replace Red Sleeve


Connect Water Inlet.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3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

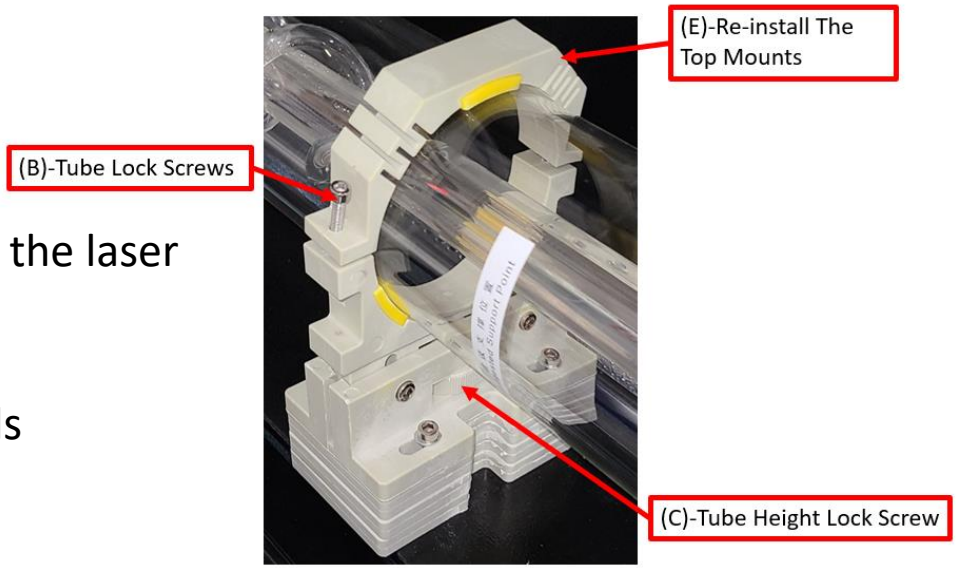
7.) Connect the high voltage (+) terminal (cathode) to the power supply according to the wiring diagram in this manual. Use the wire insulated with the rubber sleeve.

NOTICE ! The connection should be from (+) to (-) the same direction that the laser is firing; towards the first mirror.

There is a Liberec small set screw on the end of the cathode terminal. Please be sure to loosen and tighten, do not break off.

8.) Connect the low voltage (-) terminal (anode) to the power supply according to the wiring diagram in this manual. Use the wire with the alligator clip.

9.) Re-install the top mounts (E) and fasten the laser tube in place.



10.) Slightly tighten the tube top lock screw to give slight pressure to the laser tube.

11.) Make measurements and adjust the tube height adjustment dials (D) Until the laser tube is firing perfectly straight.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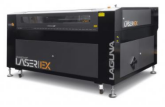
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3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

⚠ CAUTION Ensure the Tube Height Lock Screws (C) are loose.

NOTICE! If using a level, make sure that the laser machine is on a level surface. Note that it is crucial that the laser tube is parallel to the chassis of the machine. The first step of mirror alignment is to make certain that the tube is parallel to the chassis of the machine such that the mirrors can then be aligned to that plane.

12.) Tighten the Tube Height Lock Screws.


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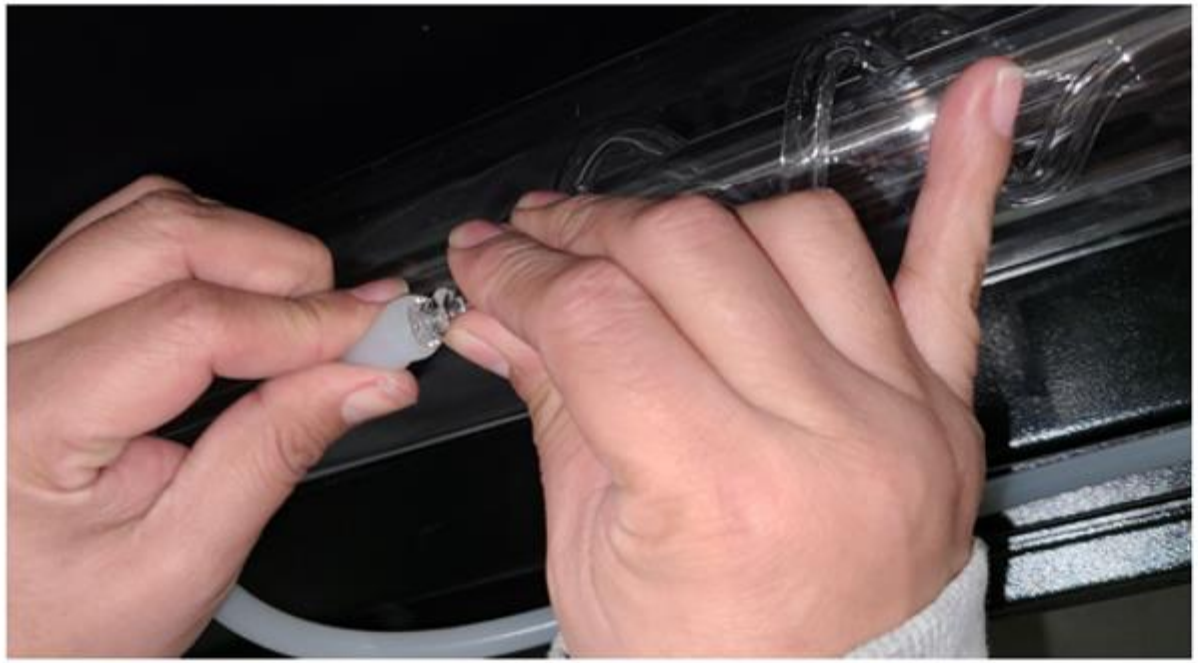
3.6.) Machine Set-Up: Laser Tube Installation (Cont'd.)-

13.) Do not worry about testing the laser for alignment at this point as we need to install all other systems prior.

Connect a Water tube between the inlet on the rear of the connection.



Connect Water Inlet.

NOTICE The Chiller, Air Pump, Exhaust fan, and software need to be properly installed prior to running and testing the function of the laser tube.

Do not test the laser tube or pulse the laser machine until the setup instructs you to do so.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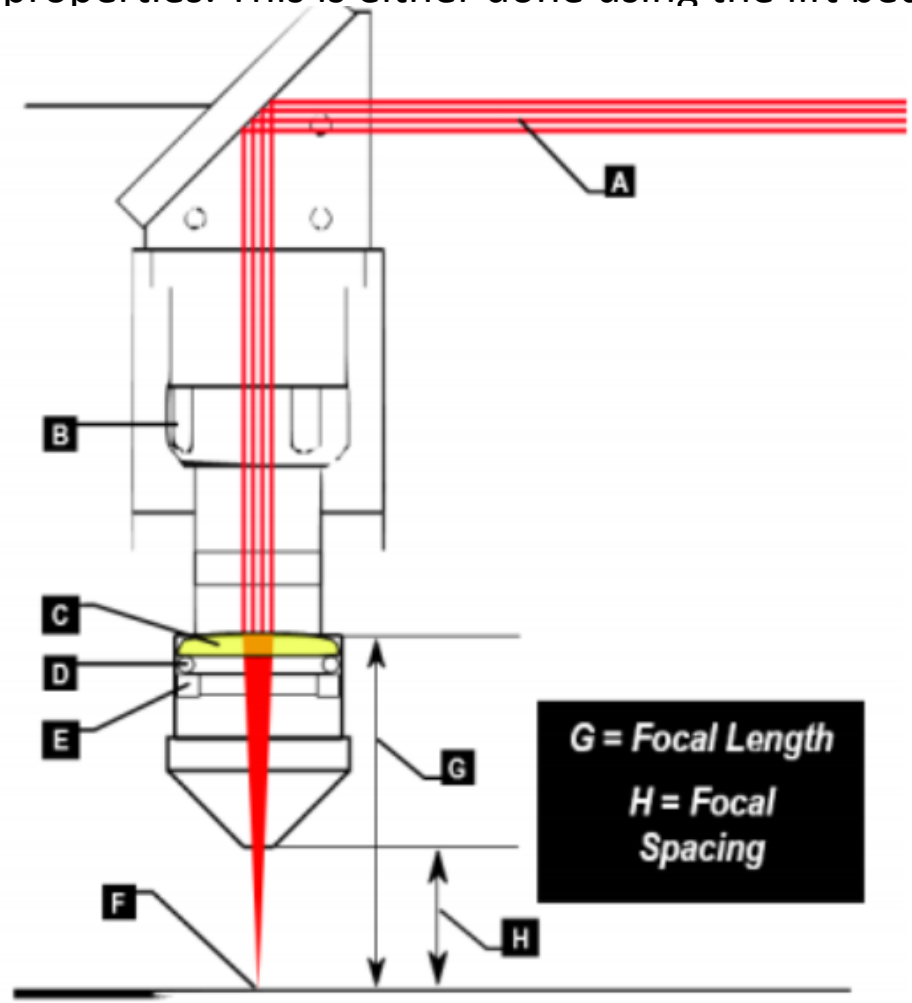
3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

Focal Lens Adjustments-

To make cuts and engravings on different materials, the operator will need to adjust the focal length according to the material's properties. This is either done using the lift bed and the focal length sensor, or by adjusting manually.



A.) Incoming, Unfocused IR Laser Beam
B.) Height Adjustment Clamp
C.) Focal Lens (Standard is 50.8mm length, 20mm diameter)
D.) Rubber Seal
E.) Lock Ring
F.) Focused IR Laser Beam
G.) Focal Distance
H.) Focal Spacing

The laser will enter the head assembly and concentrate via the focal lens. Making sure that the laser has a correct (F) Focal Spacing, is extremely important to the quality of the process. This is done automatically via the Automatic Focusing Focus Focal Sensor.
The pre-installed lens is 20mm in diameter, made of ZnSe through the partical vaper deposition process (PVD), and has a focal length of 50.8mm. The lens should be checked often for cleanliness and can be changed for lenses of different purpose.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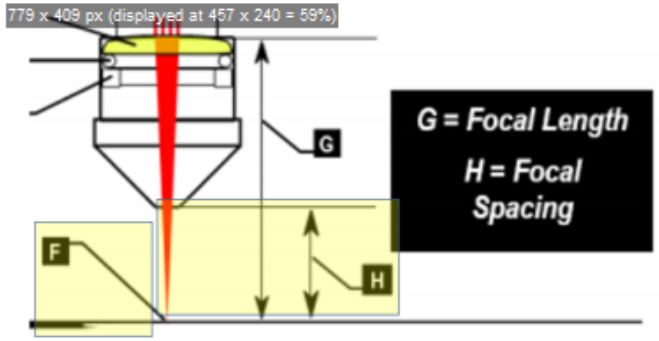
3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

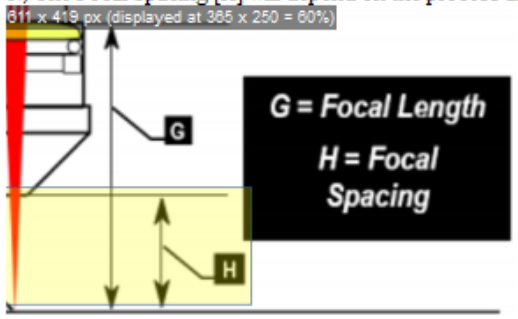
Adjustment Procedures-

1.) Unscrew the height adjustment clamp [B].

2.) Adjust the height of the laser tube such that the focused beam [F] is in contact with the work surface.
This can be achieved by setting the focal spacing [H] to a distance between 7 and 9 mm (Specification: 7mm-9mm).



3.) The Focal Spacing [H] will depend on the process and the material, but it is generally between 7 mm and 9 mm (Specification: 7mm-9mm).



NOTICE **Never use the laser machine without the focal lens in place.**

Diameter / Material / Focal Length	Purpose
20mm / PVD ZnSe / 25.4mm	Optimized for engraving
20mm / PVD ZnSe / 50.8mm	General Use (Standard Lens)
20mm / PVD ZnSe / 101mm	Optimized for cutting or on round surfaces without Rotary attachment.

Installing/Removing Focal Lens Tools Need: N/A

1.) Unscrew the assembly by loosening the (3) head assembly set and remove from the Laser head. You may need to move the Z-axis down for clearance.
2.) Unscrew the lens removal set(4) from (8) nozzle to expose the (7) locking nut.
3.) Carefully remove the lock ring with a small rod (a screwdriver will work).
4.) Change or clean the focal lens as needed. To clean: a) Using a microfiber cloth and alcohol or appropriate glass lens cleaner, gently wipe the surface. To clean the mirrors, the same method is advised.
5.) Re-assembly the assembly as shown. Note that the convex side of the lens is facing up.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3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

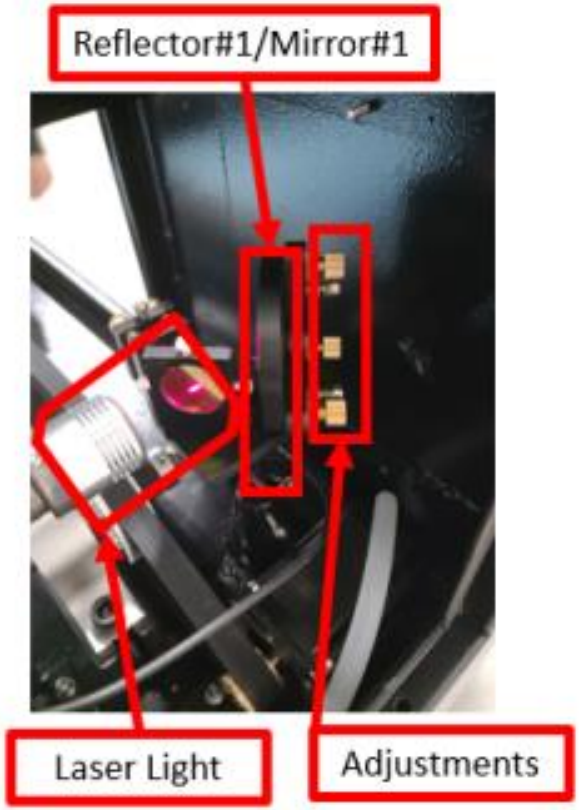
Optical Mirror Laser Adjustment Procedures-

- **Steps of Optical Path Adjustment-**

The optical path structure diagram is shown in the following figure

1.) First Reflector (Mirror).

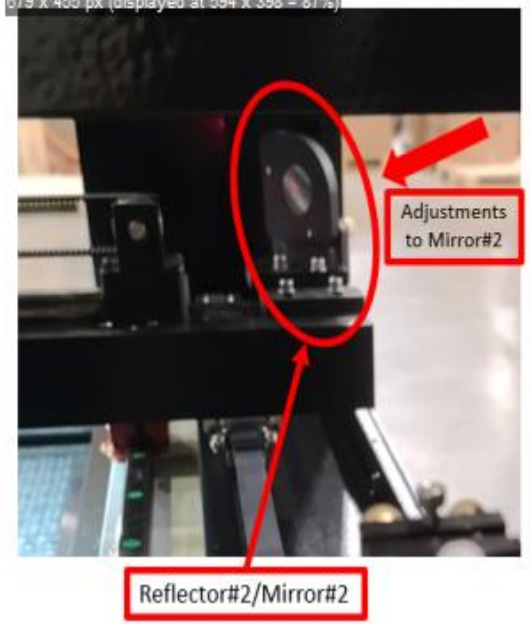
The first reflective lens can be cleaned with wine glasses and lens paper.



2.) Second Reflector (Mirror).

Make sure the laser power is turned off when cleaning the lens. The Second Mirror is mounted on the left side of the X-Axis and can also be cleaned directly.

679 x 455 px (displayed at 594 x 398 = 87%)

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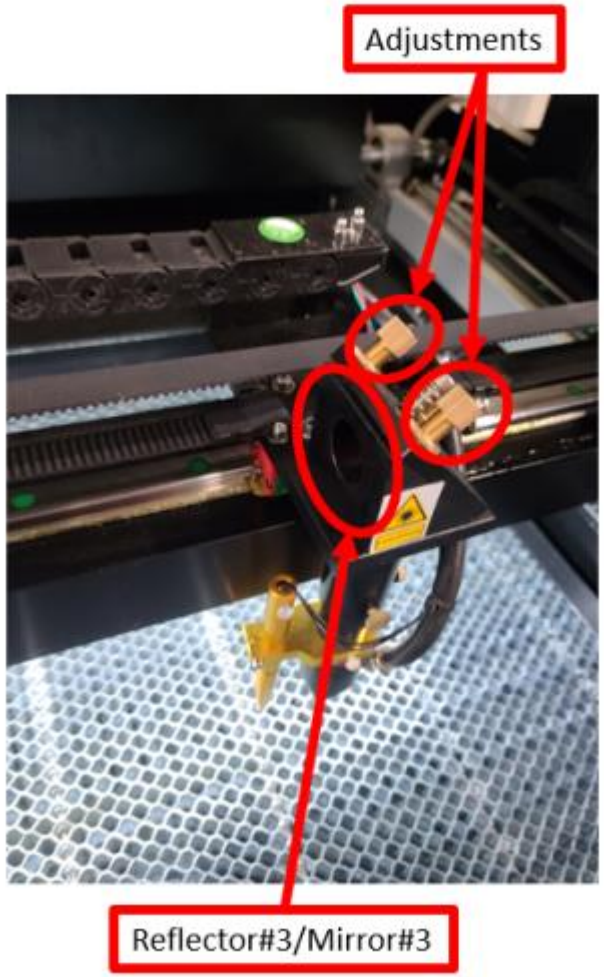
3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

3.) Third Reflector (Mirror).

Clean lenses must be wiped with lens paper or skim cotton swabs and glasses without water to avoid scratching the surface of the lens.

⚠ CAUTION Do Not Touch Lenses after wiping.

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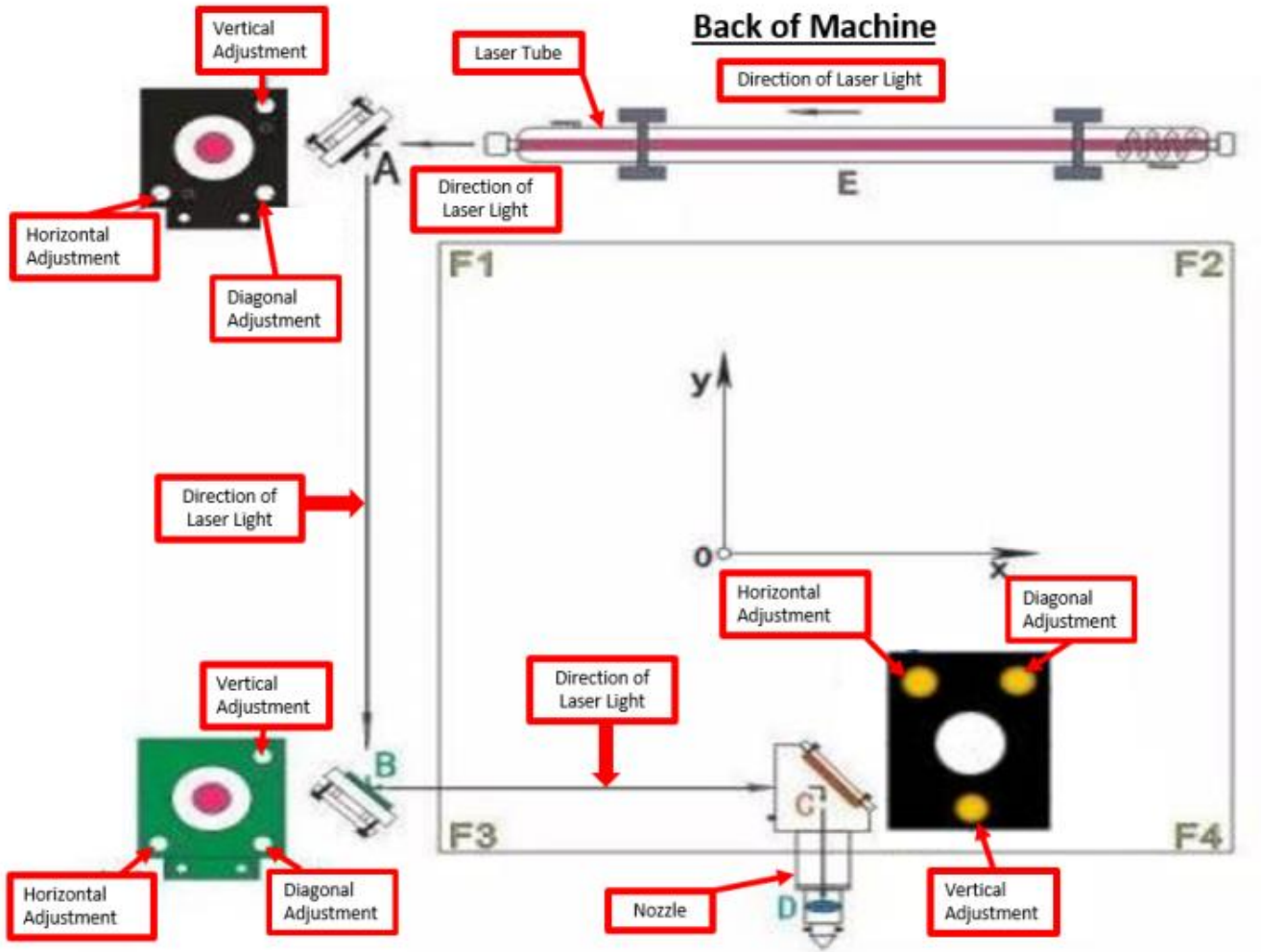
3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

- **Check the optical path**

After a period of use, the laser path may be abnormal, which will reduce the laser efficiency, at this time you need to readjust the optical path.

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3.6.) Machine Set-Up: Laser Tube Installation & Adjustments (Cont'd.)-

M1 up and down, M2 around, M3 Angle, three screws, through the three screws to determine the Angle of the mirror. When adjusting the optical path, the laser reflection Angle can be changed by adjusting the three screws to realize the purpose of optical path adjustment. As shown in the figure below, adjust the reflected Angle of the screw. By adjusting the angles of the three mirrors so that the light path is finally parallel, the laser head is hit at the same point in any position and finally focused at the center of the focusing lens.

Method of adjusting optical path (Adjust the current to 4-5mA）

1E Laser Tube----A First Mirror: The light spot must be completely shot to the right of the center of the A reflective lens.

2.A First mirror----B Second mirror: Prepare a roll of wide transparent tape to stick at the entrance of the B frame. Make a spot at F1,Then move to the F3 position and put another piece of tape on the first piece of tape See if the first spot and the second spot coincide, If it is offset, please adjust the up, down, left and right, angle and three screws on the A frame to adjust, bring the second spot close to and coincide with the first spot. If it has overlapped and the light is not hitting the frame, the Y-axis optical path adjustment is completed. Remember: The light spot does not necessarily hit the center of the frame, only the two light spots of F1 and F3 need to coincide.

3.B Second mirror---C Third mirror ； Remove the tape on the second reflector and install the reflective lens, and then apply a piece of transparent tape to the entrance of C light inlet, and then move the laser head to the F1 position to hit the first spot, and then move the laser head to F2 Position another piece of tape and hit the second spot, then move the laser head to the F4 position and cover a piece of tape to hit the third spot, and finally move the laser head to the F3 position and cover a piece of tape to hit the fourth spot. The positions of the four light spots are all in the same position and in the vertical center position of the laser head. If the spots do not coincide, move from the second, third, and fourth spots to the first spot until the four spots coincide and hit the center of the laser head.

4.C Third mirror---D Focusing lens After adjusting F1\F2\F3\F4\, the last step is to adjust the vertical of the laser beam. Unlike the A and B reflectors, the three adjustment screws on the laser head are only divided into front, rear, and left and right, so it is much simpler to adjust the verticality than A and B.

The beam after focusing is about 0.5mm--1mm,So first dim all the laser ports and not be blocked. If there is obstruction, adjust the front, rear, left and right screws. Finally, after adjusting the focal length, use the thick acrylic board as the test board to shoot light vertically, and then see from all sides of the acrylic whether the line is vertical.

NOTICE : When adjusting the optical path, the M1, M2, and M3 screws that adjust the angle of the frame are very small. Pay attention to the changes in the optical path


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3.6.) Machine Set-Up: Exhaust Ventilation/Fan Blower Operations-

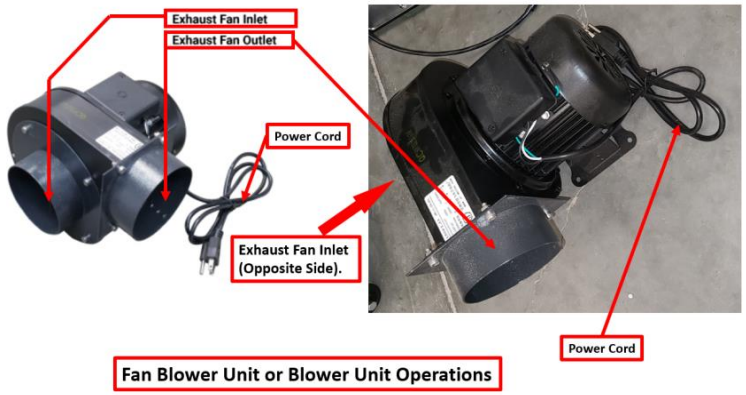
Exhaust Ventilation-

WARNING! Do not connect to a power supply until the set-up is complete. Do not perform any of the following steps, installations, or adjustments with the machine connected to a power source unless directed to do so.

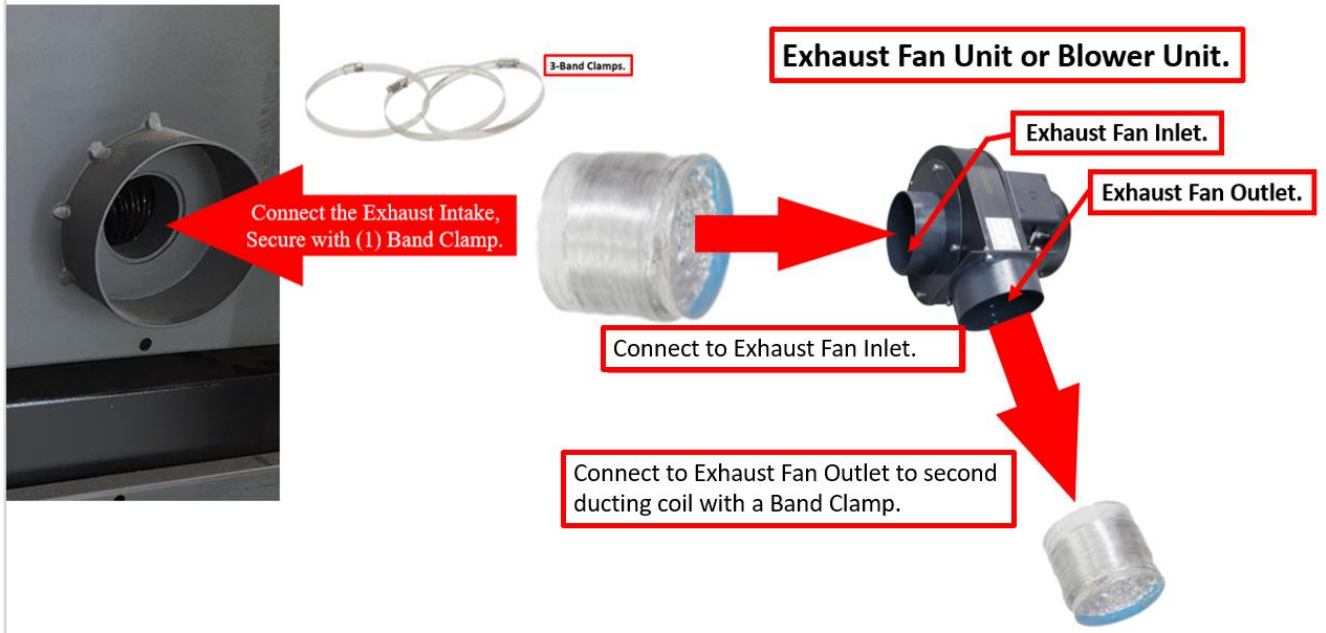
WARNING! The fan can tip over if not fastened to a base.

NOTICE: It is a good idea to use a power strip with an on/off switch to give power to all components at the same time, and to turn the machine (systems) on and off easily.

NOTICE: The use of an indoor fume extractor can be very helpful in isolating and controlling the fumes emitted from laser cutting and engraving. The machine must be ventilated during operation. You will need 3 band clamps. 2 ducting coils or other duct-work. the blower unit. and a flat-head screwdriver to fasten the clamps.



Fan Blower Unit or Blower Unit Operations

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3.6.) Machine Set-Up: Exhaust Ventilation/Fan Blower Operations-

Exhaust Blowing unit for laser machines:
(1) Positive Pressure output (air comes out here).
(2) Negative pressure input (air is sucked in here).
(3) Mounting Bolt Holes.
(4) TEFC AC Induction Motor.

SKU: N/A included with laser machine Fits: All CO2 and Fiber Laser machines < 100Watt.

The purpose of the exhaust blower is to pull harmful gasses away from the machine and operator and direct them to a safe location through the included duct-work. The exhaust system must be set up such that it is in compliance with all local safety and environmental codes. Laguna Strongly recommends purchasing a fume extractor or filter stack to protect people from the toxic fumes produced in some laser cutting applications/procedures.

Q: Can I use a different blower than the one included?
A: The unit was chosen because it is best suited for the operating conditions of the Laser Machine. It is our recommendation to use the included auxiliary machines.


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3.6.) Machine Set-Up: Exhaust Ventilation/Fan Blower Operations-

Q: I am not getting enough suction with the included blower to pull the dirty air through a filter arrangement like the in-line filter.
A: Because of the higher pressure needed to force air through the filters, the included fan may not be sufficient - if this is the case then attach the filter stack to the output of the exhaust blower. If still not efficient, a higher-powered blower is required.

Set-up Tools Needed: Allan Wrenches, Phillips Head Screwdriver.

1. Connect the exhaust intake (2) to the rear of the laser machine with 1 (of 2) ducting coils.

2. Fasten the ducting coils together with the included band clamps.

3. Connect the exhaust outlet (1) to the second ducting coil with a band clamp.

4. Fasten the fan to the floor to prevent it from tipping under centrifugal load.

5. The exhaust must, safely and legally, take the fumes from the laser machine away from any individuals who could inhale the fumes


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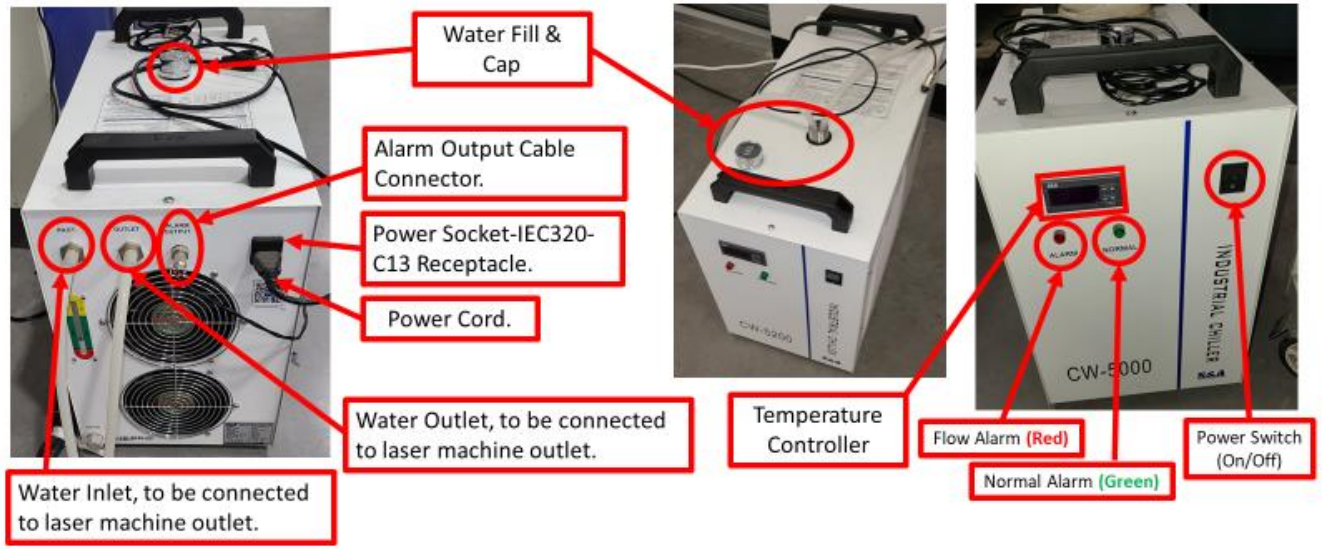
3.6.) Machine Set-Up: Water Chiller- A Water Chiller must be used to operate the Laser Tube!

WARNING! Do not connect to a power supply until the set-up is complete.
Do not perform any of the following steps, installations, or adjustments with the machine connected to a power source unless directed to do so.

⚠ CAUTION **! Only use Deionized or Distilled Water.** (Tap water or bottled water has minerals in it that will affect the performance and life of the laser tube.)

DO NOT USE ANY TYPE OF CHEMICAL COOLANT. NOTICE The chiller will leak water out the inlet and outlet ports, so use caution when moving the machine. **You will need 7 liters of Distilled or Deionized Water**, the water chiller tubing, the alarm cable, and one of the power cables.



S&W CW-5000DG Industrial Chiller Machine Basic Operations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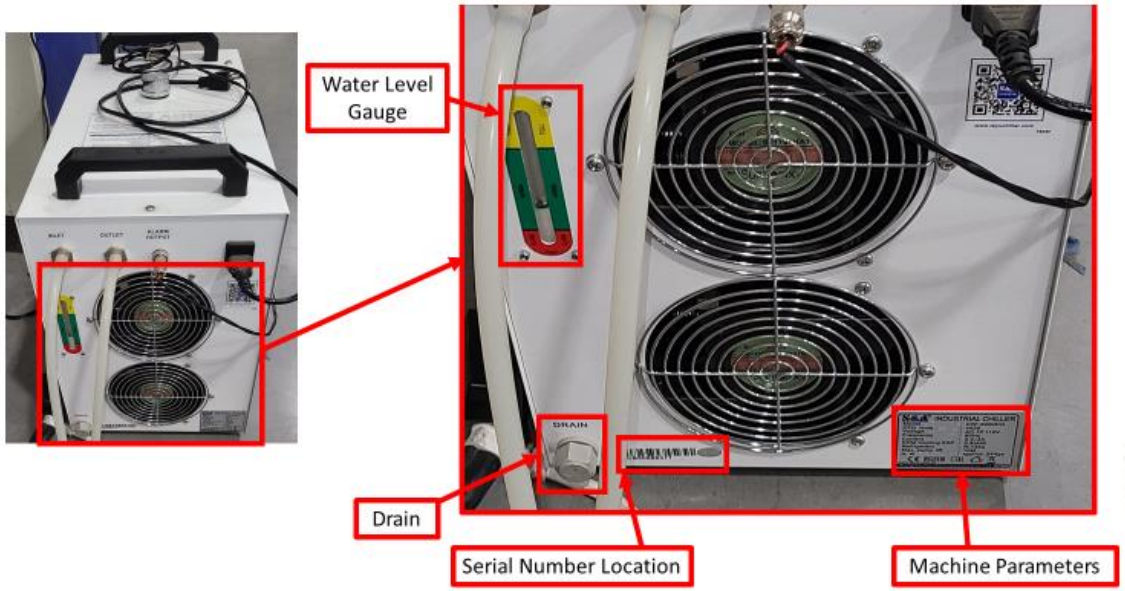
3.6.) Machine Set-Up: Water Chiller & Pump (Cont'd.)-



S&W CW-5000DG Industrial Chiller Machine Basic Operations

S&W CW-5000DG Industrial Chiller Machine Basic Operations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3.6.) Machine Set-Up: Water Chiller Specifications-

The MX Laser uses the CW-5000 Chiller

S&W CW-5000DG Industrial Chiller Machine Specifications

CW-5000

MODEL	CW-5000AG	CW-5000BG	CW-5000DG	CW-5000TG	CW-5000AI	CW-5000BI	CW-5000DI	CW-5000TI
Voltage	AC 1P 220V	AC 1P 220V	AC 1P 110V	AC 1P 220V	AC 1P 220V	AC 1P 220V	AC 1P 110V	AC 1P 220V
Frequency	50Hz	60Hz	60Hz	50/60Hz	50Hz	60Hz	60Hz	50/60Hz
Current	0.15A~2.2A	0.15~2.3A	0.3~4.7A	0.15~2.3A	0.7~2.75A		1~5A	0.7~2.75A
Machine power	0.41kW	0.46kW	0.47kW	0.46kW	0.48kW	0.53kW	0.54kW	0.53kW
Compressor power	0.32kW	0.37kW	0.38kW	0.34/0.37kW	0.32kW	0.37kW	0.38kW	0.34/0.37kW
	0.43HP	0.50HP	0.51HP	0.46/0.50HP	0.43HP	0.50HP	0.51HP	0.46/0.50HP
Nominal cooling capacity	2763Btu/h	2883Btu/h	2893Btu/h	2935/3481Btu/h	2763Btu/h	2883Btu/h	2893Btu/h	2935/3481Btu/h
	0.81kW	0.85kW	0.85kW	0.86/1.02kW	0.81kW	0.85kW	0.85kW	0.86/1.02kW
	696Kcal/h	727Kcal/h	729Kcal/h	740/877Kcal/h	696Kcal/h	727Kcal/h	729Kcal/h	740/877Kcal/h
Refrigerant charge	300g	320g	280g	300g	300g	320g	280g	300g
Pump power	0.03kW				0.1kW			
Max.lift	10M				25M			
Max.flow	10L/min				16L/min			
N.W.	24Kgs							
G.W.	27Kgs							
Refrigerant	R-134a							
Precision	±0.3℃							
Reducer	Capillary							
Tank capacity	6L							
Inlet and outlet	OD 10mm barbed connector				10mm fast connector			
Dimension	58 X 29 X 47 cm (L X W X H)							
Package dimension	70 X 43 X 58 cm (L X W X H)							


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3.6.) Machine Set-Up: Water Chiller Specifications-

The EX AND EX-C Laser uses the CW-5200 Chiller

CW-5200

MODEL	CW-5200AH	CW-5200BH	CW-5200DH	CW-5200TH	CW-5200AI	CW-5200BI	CW-5200DI	CW-5200TI
Voltage	AC 1P 220V	AC 1P 220V	AC 1P 110V	AC 1P 220V	AC 1P 220V	AC 1P 220V	AC 1P 110V	AC 1P 220V
Frequency	50Hz	60Hz	60Hz	50/60Hz	50Hz	60Hz	60Hz	50/60Hz
Current	0.25~3.9A	0.25~4.1A	0.45~7.5A	0.25~3.9A	0.7~4.35A	0.7~4.55A	1~8.2A	0.7~4.35A
Machine power	0.70kW	0.78kW	0.71kW	0.86kW	0.75kW	0.83kW	0.76kW	0.73kW
Compressor power	0.59kW	0.67kW	0.60kW	0.49/0.57kW	0.59kW	0.67kW	0.60kW	0.49/0.57kW
	0.80HP	0.91HP	0.81HP	0.67/0.78HP	0.80HP	0.91HP	0.81HP	0.67/0.78HP
Nominal cooling capacity	5783Btu/h	6978Btu/h	5596Btu/h	4828/5783Btu/h	5783Btu/h	6978Btu/h	5596Btu/h	4828/5783Btu/h
	1.70kW	2.05kW	1.64kW	1.42/1.70kW	1.70kW	2.05kW	1.64kW	1.42/1.70kW
	1457Kcal/h	1758Kcal/h	1410Kcal/h	1221/1462Kcal/h	1457Kcal/h	1758Kcal/h	1410Kcal/h	1221/1462Kcal/h
Refrigerant charge	360g	380g	350g	480g	360g	380g	350g	480g
Pump power	0.05kW				0.1kW			
Max.lift	12M				25M			
Max.flow	13L/min				16L/min			
N.W.	26Kgs							
G.W.	29Kgs							
Refrigerant	R-407c							
Precision	±0.3℃							
Reducer	Capillary							
Tank capacity	6L							
Inlet and outlet	OD 10mm barbed connector				10mm fast connector			
Dimension	58 X 29 X 47 cm (L X W X H)							
Package dimension	70 X 43 X 58 cm (L X W X H)							


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3.6.) Machine Set-Up: Water Chiller & Pump (Cont'd.)-

Only use 7 liters or 1.85 gallons of Distilled or Deionized Water, the water chiller tubing, the alarm cable, and one of the power cables.

1.) Place the chiller in its location.

2.) Unscrew the cap and fill the unit with 7 liters or 1.85 gallons of distilled or deionized water. There is no fill limit, so measure it out before filling.

3.) Connect the **Water Inlet** to the machine outlet according to the connection diagram.

4.) Connect the **Water Outlet** to the machine inlet according to the connection diagram.

5.) Connect the **Alarm Cable** to the laser machine.

6.) **⚠ CAUTION** Do not connect to **Power** until set-up is complete.


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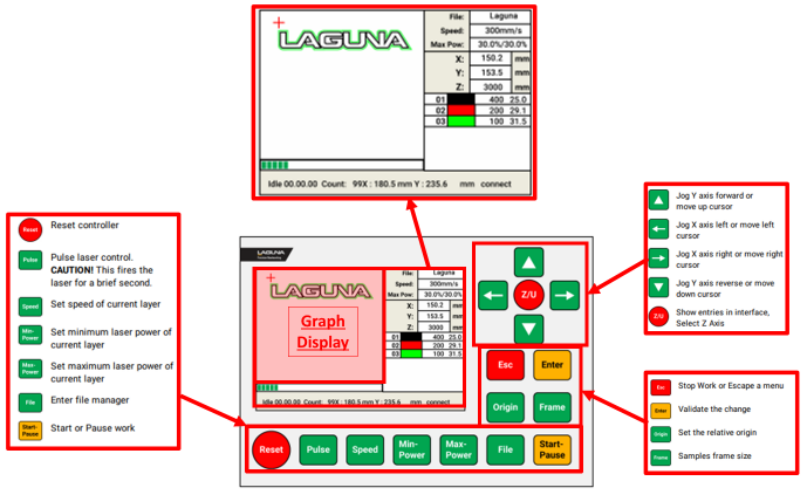
3.6.) Machine Set-Up: Water Chiller & Pump (Cont'd.)-



The Ruida Controller has several safety features; one of those features detects when water is not in circulation. When this is detected the laser beam is shut off and an alarm sounds until the water can pass through. It is a good idea to test this by pinching the lines of a properly installed chiller.

Q: What type of water should be used?
A: It is important to only used deionized or distilled water. The purer the water (the less minerals and contaminants) the better.

Q: Can I use a different chiller than the one included?
A: The unit was chosen because it is best suited for the operating conditions of the Laser Machine. It is our recommendation to use the included auxiliary equipment.

Setup Tools Needed: None needed.


SMARTSHOP® LASER|MX


SMARTSHOP® LASER|EX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3.6.) Machine Set-Up: Air Compressor (Air Pump)-

⚠ WARNING ! Do not connect to a power supply until the set-up is complete. Do not perform any of the following steps, installations, or adjustments with the machine connected to a power source unless directed to do so.

NOTICE: Make sure the air hose fits all the way into the adapter. The connection should leak very slightly – this is normal.

NOTICE: It is a good idea to use a power strip with an on/off switch to give power to all components at the same time, and to turn the machine (systems) on and off easily.

The air pump needs to supply air to the nozzle to direct fumes away from the focal lens. To install, you will need the air pump, the quick set adapter, and a ¼" air hose.

Air compressing unit for C02 laser machines.
(1) Threaded nozzle insert. SKU: N/A included with laser machine.
(2) Fits: All CO2 and Fiber Laser machines less than (<) 100Watts.


SMARTSHOP® LASER|MX


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SMARTSHOP® LASER|EX-C

3.6.) Machine Set-Up: Air Compressor (Air Pump) Cont'd.-

The **Air Compressor** supplies a continuous air supply 5-6 through the laser head assembly so that fumes and debris cannot obstruct the laser pathway. The air compressor must be used in operation with the CO2 Laser machine.

Q: Can I use a different air compressor than the one included?
A: The unit was chosen because it is best suited for the operating conditions of the Laser Machine. An alternative air compressor can be used at a set 5-6 PSI constant flow, and the appropriate fittings are installed. It is our recommendation to use the included compressor with the machine.

Set-Up Tools Needed: N/A

1. Screw the quick set adapter into the air pump adapter insert.
2. Press in the ¼" air hose.
3. Do not connect to power until set-up is complete.


SMARTSHOP® LASER|MX


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3.6.) Machine Set-Up: Software Set-Up & Installation-

To configure the included Software, please refer to the Software Owner's Manual: Laser Engraving & Cutting Software User Manual-RDWorks V8.0 & Lightburn:

Software available @ http//: RDWorks 8.0 Download (Free) - RDWorks.exe (informer.com)

Software available @ https://lightburnsoftware.com


SMARTSHOP® LASER|MX


SMARTSHOP® LASER|EX


SMARTSHOP® LASER|EX-C

4.) Reference Information-

LAGUNA LASER - Precision Cutting & Engraving CO2 laser machines function by essentially bouncing light emissions between mirrors until the beam is strong enough to penetrate a partially transparent mirror at the tip of the router head. These lasers are capable of cutting most polymeric and composite materials. These machines need auxiliary equipment to function properly. At Laguna, we have bundled all the necessary auxiliary equipment with each laser machine that we sell. Each Laser sale will include: Water chiller/circulator unit, Air blower and ducting, air compressor, honeycomb table, and all connecting tubes and cables. This ensures that you are up and running with precision equipment in the shortest time possible.

LASER|MX (MCNCLTLCO2MU2012-40W) The Laguna Smartshop® Laser|MX is a small profile CO2 laser on a precision drive system with automatic focusing, controlled by a universally acclaimed and user friendly control system. The MX makes alignment simple with the red dot beam combiner technology that puts a red dot down the same line as the high-powered cutting beam. In addition, we packed a 50W laser tube in this small body which gives a 75% increase in cutting capability than other machines of this size.

LASER|EX 100W (MCNCLTLCO2EC2436-80W) The Laguna Smartshop® Laser|EX comes equipped with a RECI laser tube offering high output power with incredible resolution. The MX series uniquely features dual dust and fume extraction for harmful chemicals and debris making this machine a standout for high volume cutting use. In addition, convenient WiFi controls, automatic focusing, precision linear guide rails, and more features come together to create a user-friendly CO2 laser cutter capable of both incredible power and fine detail.

LASER|EX-C 150W (MCNCLTLCO2EC3652-150W) The Laguna Smartshop® Laser|EX-C is a powerful CO2 laser cutter and engraver that comes packed with user-friendly features to make operation a breeze . The EX_C comes with a specialized linear guide rail system for increased accuracy and longevity, an automatic focusing head, and a very large work area. With a 130W laser tube packed inside, this machine has no trouble with thick acrylic or other materials.

SMARTSHOP® LASER|MX

SMARTSHOP® LASER|EX

SMARTSHOP® LASER|EX-C

4.) Reference Information (Cont'd.)- CO2 Laser Dimensional Specifications-

CO2 Laser Specifications			
Models	**Laser-MX**	**Laser-EX**	**Laser EX-C**
Shipping Weight	950 Lbs.	1725 Lbs.	1730 Lbs.
Shipping Dimensions (L x W x H)	2 x 1.44 x 1.27	1.78 x 1.14 x 1.26	2 x 1.44 x 1.27
Overall Size (L x W x H)	L53.5" W39.8" H42.1" (L1.36m x W1.0m x H1.0m)	L71.7" W51.6" H42.1" (L1.82m x W1.31m x H1.07m)	L71.7" W51.6" H42.1" (L1.82m x W1.31m x H1.07m))
1.1.3 Machine Type: CO2 Laser NOTE: W - width (front to back). L - length (left to right)			
Laser Type	Sealed Water Cooled CO2 Laser Tube		
Laser Power	100W	150W	150W
Work Envelope (fit a work peice in)	16" x 23"	24" x 36"	36" x 51"
X-Axis Range (limit)	Data not available yet.	51"	Data not available yet.
Y-Axis Range (limit)	Data not available yet.	36"	Data not available yet.
Z-Axis Range (limit)	Data not available yet.	10.5"	Data not available yet.
Process Speed*	0-2125 in/min (0 - 54,000mm/min)	0-2350 in/min (0 - 60,000mm/min)	
Resetting Position Accuracy	±0.02" (0.05mm)		
Controlling Software	Ruida		
Design Software Integration (not included)	CorelDraw, AutoCAD, Adobe, and more..		
Graphic Format Supported	BMP, PLT, DST, DXF, AI, and more..		
Color Separation	Yes		
Working Environment	33-112 Fahrenheit (1-45 Celsius)		

SMARTSHOP® LASER|MX

SMARTSHOP® LASER|EX

SMARTSHOP® LASER|EX-C

4.) Reference Information (Cont'd.)- CO2 Laser Dimensional Specifications-

1.1.4 Dimensions See Dimensions sections for Diagrams. NOTE: W - width (front to back). L - length (left to right)			
Overall Size	1.85L x 1.3W x 1.12H (70.9 In.x 51.2 In. x 44.1 In.)	1.63L x 1W x 1.12H (64.2 In. x 39.4 In. x 44.1 In.)	1.85L x 1.3W x 1.12H (70.9 In.x 51.2 In. x 44.1 In.)
Work Envelope (fit a work peice in)	16" x 23"	24" x 36"	36" x 51"
X-Axis Range (limit)	Data not available yet.	51"	Data not available yet.
Y-Axis Range (limit)	Data not available yet.	36"	Data not available yet.
Z-Axis Range (limit)	Data not available yet.	10.5"	Data not available yet.
Focal Lens Diameter	20 mm	20 mm	20 mm
1.1.5 Fume Extraction			
Dust Port Outer Diameter	3.95" (100mm)	2x 5.95 (150mm)	5.95 (150mm)
CFM Requirement (Cubic Feet per Minute)	400CFM	400CFM Fume 600CFM Debris (lower)	600CFM

SMARTSHOP® LASER|MX

SMARTSHOP® LASER|EX

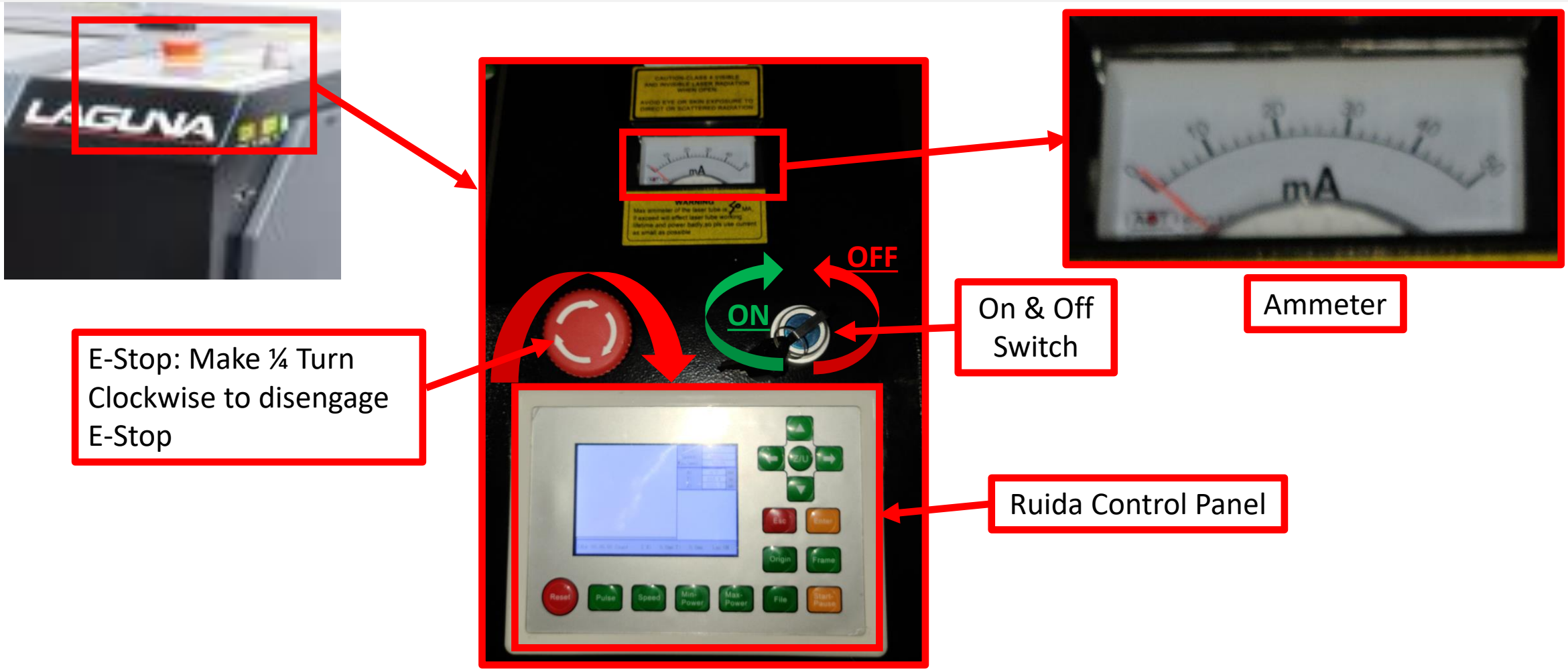
SMARTSHOP® LASER|EX-C

4.) Reference Information (Cont'd.)- CO2 Laser Dimensional Specifications-

CO2 Laser Specifications			
Models	**Laser-MX**	**Laser-EX**	**Laser EX-C**
1.1.6 Materials			
Cabinet	Sheet Steel		
Optical Lens	Zinc Selenide (ZnSe)		
Linear Rails	Low Friction Stainless Steel		
Laser Head Assembly	Aluminum		
1.1.7 Features			
Automatic Focusing	✓	✓	✓
Precision Linear Guide Rail	✓	✓	✓
Z Axis Control	✓	✓	✓
Dust Debris Extraction in addition to fume extraction	**NO**	**NO**	**NO**
Beam Combiner Red Dot Sight	✓	✓	✓
Head Assembly Red dot sight	✓	✓	✓
U.S II-VI Optical Lenses	✓	✓	✓
Honeycomb Table	✓	✓	✓
Wifi Control	✓	✓	✓
Integrated HEPA Filtration	**NO**	**NO**	**NO**
Auxiliary Exhaust Fan	✓	✓	✓
Auxiliary Chiller System	✓	✓	✓
Auxiliary Air Pump	✓	✓	✓
1.1.8 Accessories & Options			
Rotary 4th Axis	**SKU: 3 Jaw Rotary 80mm Dia 480mm Length**	**SKU: 3 Jaw Rotary 80mm Dia 480mm Length** **SKU: 3 Jaw Rotary 80mm Dia 600mm Length** **SKU: 3 Jaw Rotary 120mm Dia 600mm Length**	

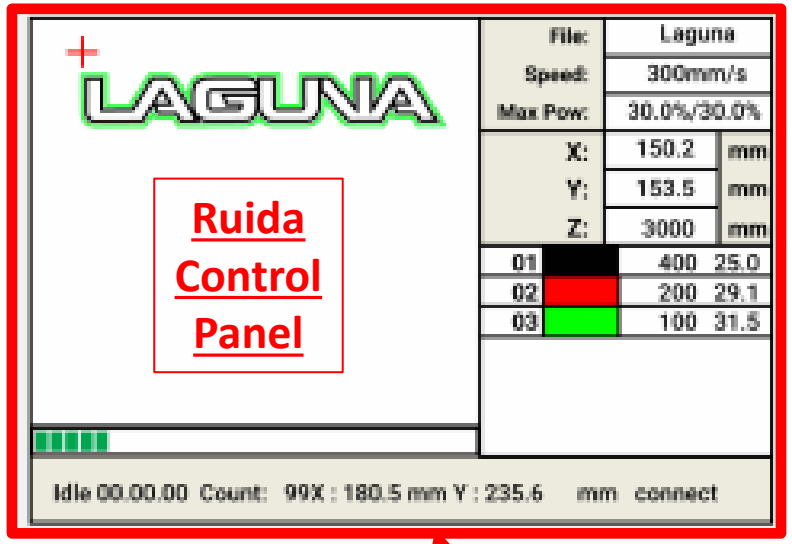
Key: V - voltage. PH - phase. HZ - hertz. FLA - full load amperage. HP - horsepower. kW - kilo watt. AMP - amperage. L - length (left to right). W - width (front to back). H - height (bottom to top). M - meter. Ft - foot. MM - millimeter. (") or IN - inch. MPA -mega pascals. PSI - pounds per square inch. LB - Pound. Kg - Kilogram. CFM - cubic feet per minute.

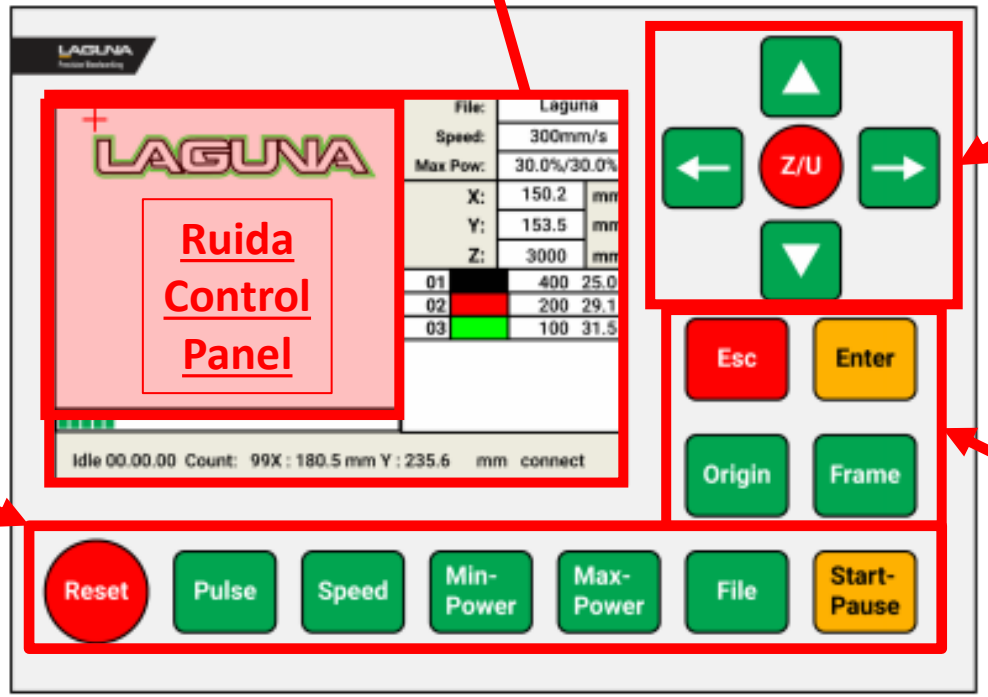
4.) Reference Information (Cont'd.)-



Smartshop MX/EX/EX-C Laser AMMETER/Machine E-Stop & On/Off Switch

4.) Reference Information (Cont'd.)-



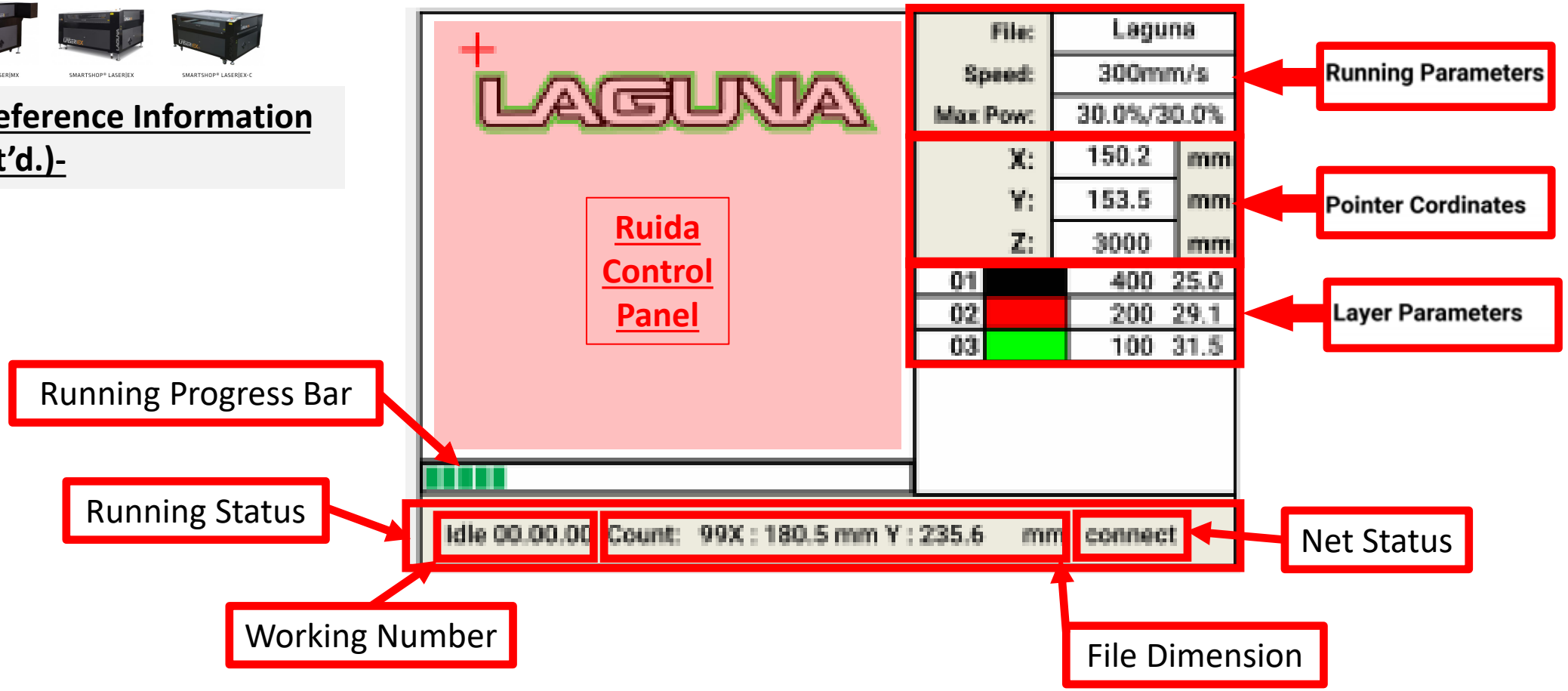


- Reset — Reset controller
- Pulse — Pulse laser control. **CAUTION!** This fires the laser for a brief second.
- Speed — Set speed of current layer
- Min-Power — Set minimum laser power of current layer
- Max-Power — Set maximum laser power of current layer
- File — Enter file manager
- Start-Pause — Start or Pause work

- Jog Y axis forward or move up cursor
- Jog X axis left or move left cursor
- Jog X axis right or move right cursor
- Jog Y axis reverse or move down cursor
- Z/U — Show entries in interface, Select Z Axis

- Esc — Stop Work or Escape a menu
- Enter — Validate the change
- Origin — Set the relative origin
- Frame — Samples frame size

4.) Reference Information (Cont'd.)-



Graph Display Area: To display the whole file's track and display the running track.
Running Parameters: To display the running file's file number, speed, max power, etc.
Coordinates: To display the current coordinate of X, Y and Z axes.
Graph Layer Parameters: To display the layers' information of the current file, such as max or min power, speed, etc. When system is idle, double click the layer. Then users can change the layer's parameters and the changes will be saved.
Running Progress Bar: To display the progress bar of the current running file.
Running Status: To display the current status of the machine, such as Idle, Run, Pause, Finish, etc.
Working Number: To accumulate the work number of the current file.
File Destination: To display the dimension of the current file.
Net Status: To display the connecting status of the Ethernet.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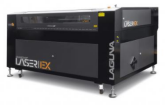
SMARTSHOP® LASER|EX


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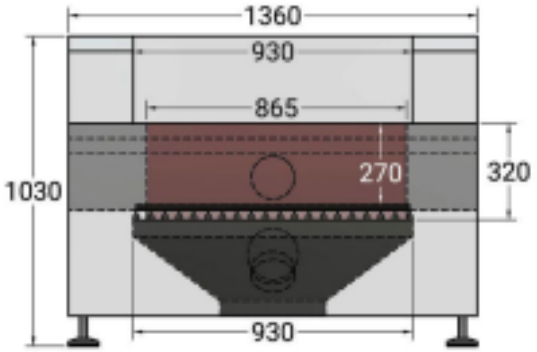
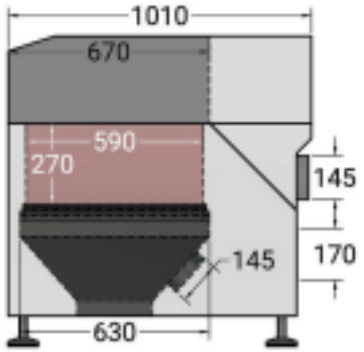
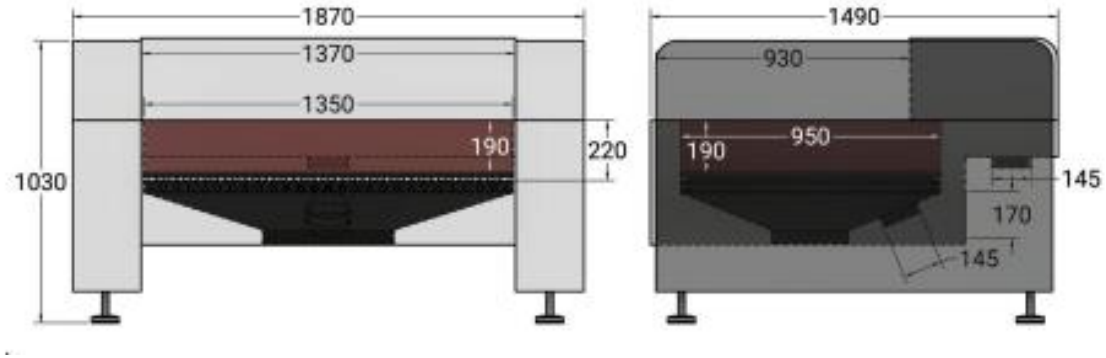
4.) Reference Information: Dimensions-

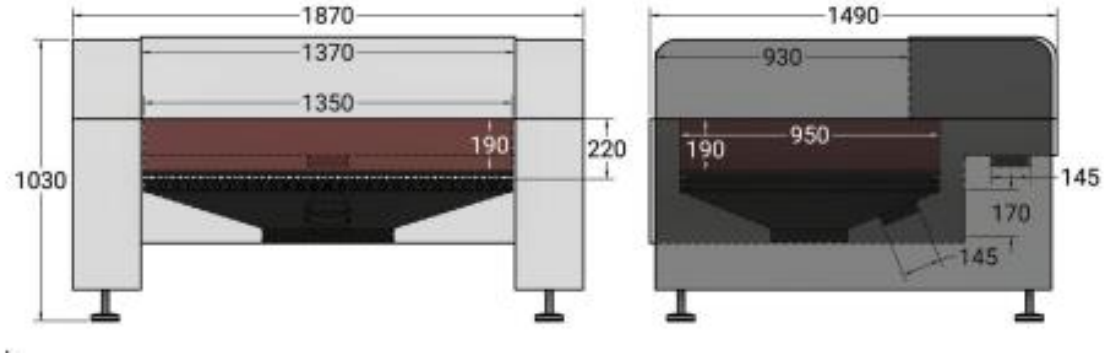




Smartshop MX



Smartshop EX



Smartshop EX-C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SMARTSHOP® LASER|EX


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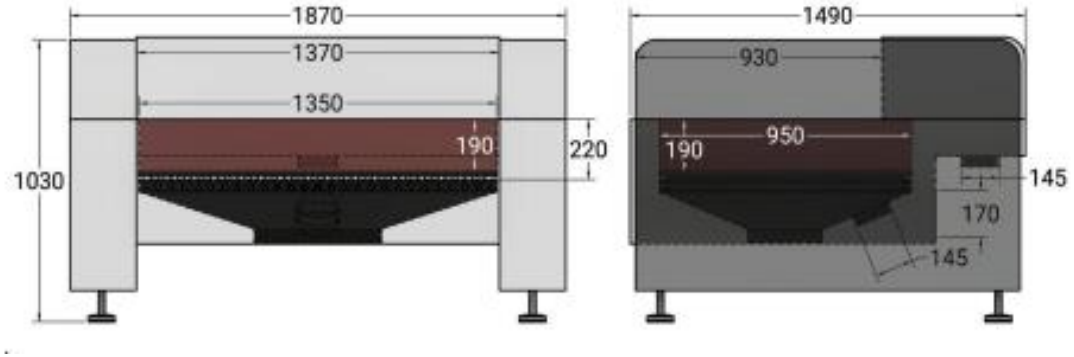
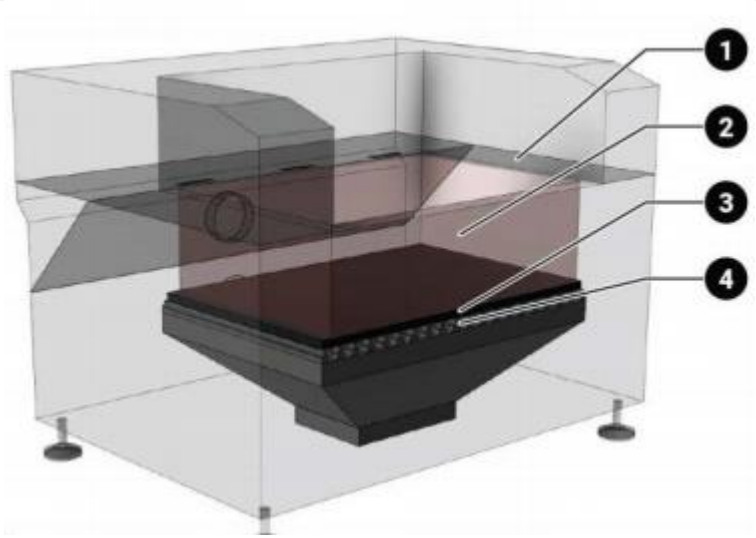
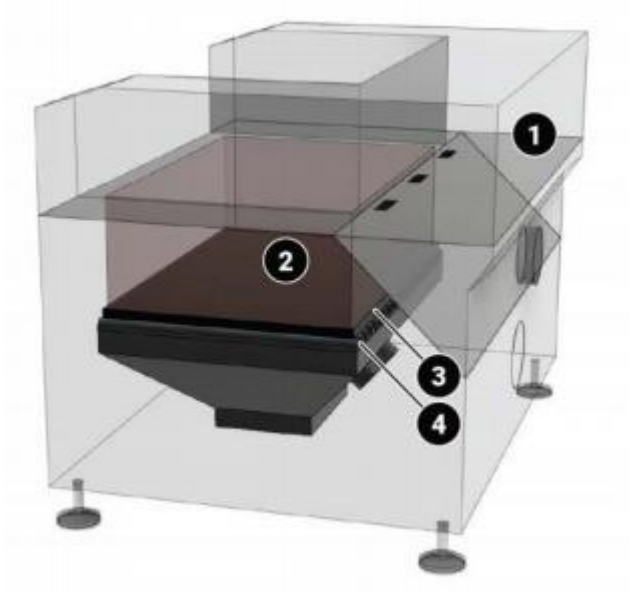
4.) Reference Information: Laser Machine Capacities and Effective Volume-





Smartshop EX-(Example)



1	Zero Level Plane	This is the relative plane that the drive system is mounted to. It serves as a "reference" plane to the z axis range of the laser- "able" volume. The laser head assembly has a small range of adjust-ability that will allow it to go a 1-3" from this plane in the z direction.
2	Laser-"able" Volume	This is the area that can be processed by the drive system. The edges are defined by the X,Y, and Z limits of the laser machine (see below). Both (2) Honeycomb Table and (3) Material Ribs can be removed for additional Z-axis range.
3	Honeycomb Table	The honeycomb table is ideal because it is not damaged ruined by the laser beam and will remain flat. This table can be removed to allow for additional Z-axis range.
4	Material Ribs	The metal ribs are used as effectively as the honeycomb table for larger materials. Like the honeycomb table, the laser does not harm the build materials and ribs will remain flat. The ribs can also be removed and replaced.


SMARTSHOP® LASER|MX


SMARTSHOP® LASER|EX


SMARTSHOP® LASER|EX-C

5.) Accessories-

Accessories & Options-

The following accessories are designed for the X-Series CO2 Laser Machines. These instructions should be followed exactly to properly set up the equipment. Some of these accessories are designed to fit multiple machines offered by Laguna Tools.

Fume Extraction Machine:

Features

- Models: 3HP – 1683CFM – 31.5m² Filter SA | 7.5HP – 3628CFM – 42m² Filter SA
- Tetrix HEPA Certified Filters & Jet Pulse Cleaning
- Smart Interface through Delta VFD

Fits: All CO2 and Fiber Laser Machines.

Fume Extraction units are used to control the toxic gasses emitted by some materials upon melting. It is important to know the process you will use and materials you are processing prior to selecting a fume extractor. The laser machine also matters, for example, the Laser | MX allow for dust and debris extraction in addition to fume extraction. You will find two ports on the rear of the machine. Please go to lagunatools.com or give us a call at +1 (800) 234-1976.


SMARTSHOP® LASER|MX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SMARTSHOP® LASER|EX-C

5.) Accessories-

Accessories & Options-

Q: How does a fume extractor differ from a dust collector?

A: A fume extractor consists of up to 4 layers of filtration: as the waste goes into the machine it crosses a material catch, a Prefilter (10 micron) layer, a HEPA (0.2 micron) layer, and an activated charcoal (adsorption) layer. This ensure that the fumes are isolated and stay inside the machine. A dust collector focuses on separation of the dust (large particles) and air. This is usually done with a large 1-micron (or HEPA 0.2 micron) filter.

Q: How do I use the in-line model?

A: Each laser machine that Laguna Tools sells comes with an auxiliary blower. If the machine does not have a fume extractor, the blower is used to move the fumes to a location away from the machine and operators. With a filter stack (in line model) the blower is still used but the filter stack is then attached in-between the CO2 machine and the axillary blower.


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5.) Accessories-

Accessories & Options-

3 Jaw Rotary Attachment For Lasers

SKU: N/A

Categories: 4th Axis Turners, CNC Attachments, CNC Parts & Accessories

Description:

- **The 3 Jaw Rotary Attachment goes on Laguna Lasers to allow 4th axis laser engraving and cutting. Start engraving cups, bottles, and anything you can turn!**
- **For Smartshop® Laser EX & MX.**

3-Jaw Rotary Accessories for Lasers	
Diameter	**Length**
120 mm Dia.	600 mm
80 mm Dia.	480 mm
80 mm Dia.	600 mm


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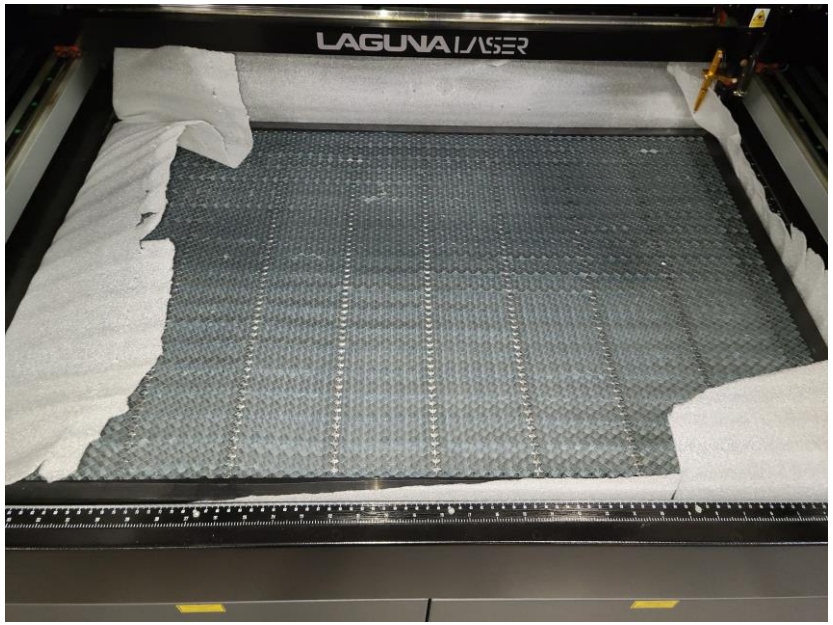
5.) Accessories-

Accessories & Options-

Honeycomb Table SKU: N/A included with Laser Machine.
Fits: All CO2 and Fiber Laser Machines, depending on work area.



Our Honeycomb tables are great for mounting and positioning work pieces. These tables allow for repeated use without damage and allow the debris to fall through and not interfere with the laser process. The tables also allow for strong magnets to be used as clamps to hold down papers and fabrics.

Q: Is this a consumable product? In other words, does the laser ruin the honeycomb?
A: A mark will be left as the laser passes through, but each side will last for a very long time.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6.) Maintenance-

Service Schedule Many laser engraving/cutting machines are sold under a service contract - a document outlining servicing tasks that must be completed and verified on a regular basis.

These machines are not under a binding contract but it is in the owner's best interest to follow this schedule as closely as possible. The quality and speed of cut and, more importantly, length of machine life will be maximized if this scheduled maintenance is followed. Most importantly, the risk of personnel injury and damage to the machine is greatly minimized under strict compliance with this schedule.

WARNING!
WARNING! Never perform any setup, maintenance or adjustments with the machine connected to the power source!
WARNING! If you have any doubt about the described procedure, seek professional assistance. Do not attempt any procedure that you feel is unsafe, or that you do not have the physical capability of achieving.
WARNING! When removing banding, extreme caution must be used as the banding will spring when cut.
CAUTION! The machine is heavy. Ensure that you have enough people to do the job safely.
NOTE: There may be sawdust in or around your new machine as a result of thorough testing prior to shipment.

	Clean	Lubricate	Check/Replace
Before Every Use	Exhaust Pathway Debris		Exhaust Pathway Mirror Alignment Chiller Water Level Air Supply
Weekly	Guide Rails Honeycomb Table / Work Surface	X,Y,Z Guide Rails	Focal Lens Belts Water Connections Laser Tube Connections
As Needed	Focal Lens (only when dirty) Mirrors (only when dirty)	X,Y,Z Guide Rails	


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6.) Maintenance-

Cleaning - Cleaning metal parts (guide rails) is often best done with isopropyl alcohol, a lubricant, or mineral oil. Special care must be taken not to scratch or damage sensitive coatings applied to the optics - a microfiber cloth, cotton swab, and glass cleaning solution is adequate.

Cleaning the Exhaust Pathway and debris around the vector grid (Work Surface)- is critical to prevent fire. Prior to every use, empty the collection bin and vacuum out any debris accumulated around or on the work area. On a weekly basis, take out the honeycomb table and clean it with compressed air and a wire brush.

Lubrication - The only lubrication needed is directly applied to the linear rails. The number one lubrication mistake is not whether to use grease or oil but rather not lubricating the machine often enough (or not lubricating it at all). A general purpose grease is adequate and recommended. Oil will also work if the grease already on the linear rails is removed before applying the oil. Apply the lubricant and cycle the drive system limits to distribute the lubricant to the bearings.

Replacement Parts - Many of the replacement parts can be purchased from several different sources. There are no components in the machine that are proprietary to Laguna Tools - making it easier for the service technician to find replacement parts like belts, motors, mirrors, mounts, and electronics.

If Focal Lens is Dirty - Check the air supply, air valves, and all air connections. Many times the focal lens is contaminated by the evolution of gasses in the process. The air supply is designed to prevent those gasses from rising to and contaminating the focal lens.


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6.) Maintenance-

If Mirrors are Dirty - Check the exhaust system connections and CFM requirement of the machine. Often the mirrors are contaminated by fumes or particulate matter in circulation around the work area. It is the exhaust systems primary function to direct these contaminants away from sensitive components like the mirrors. If the process is generating a high volume of smoke/fumes - ensure that the Material Parameters are correct (not overpowered), and that the exhaust system is properly suited to capture the high volume.

7.) Troubleshooting-

Behavior	Possible Causes	Possible Solutions
Laser machine will not turn on	1. Breaker is on defeated position 2. Improper input power	1. Flip Breaker Switch 2. Confirm Power supply meets Machine Specifications
All systems are powered but Laser will not fire	1. Interlock Switch (door sensor) defeated 2. Chiller Alarm defeated 3. Water is flowing in the wrong direction	1. Close door, inspect switch 2. Troubleshoot Chiller Unit 3. Confirm direction of water flow (should be with direction of laser beam, towards first mirror)
Laser fires but does not process work surface or quality of process is poor	1. Mirror is not aligned 2. Focal distance is not set correctly 3. Incorrect Focal Lens 4. Focal Lens is dirty 5. Non-compatible material	1. Perform mirror alignment procedure 2. Adjust focal spacing to 7mm from work surface. 3. Use lens with 50.8mm focal length 4. Clean focal lens and ensure that the Air Assist System is working. 5. No soln.

Q: What materials can the CO2 Laser machine cut/engrave?

A: The processing capabilities of laser machines are distinguished by the wavelength of the laser beam and the power output of the laser tube. CO2 Lasers can cut and engrave most materials other than metals. By contrast, Fiber Lasers are engineered to produce a laser beam that can process metals. The 40watt CO2 laser can cut and engrave most polymers and polymer composites: plastics, woods, leathers, fabrics, papers, etc. It can also engrave several surfaces that it cannot cut, including anodized or coated metals, glass and stone. Please see Appendix 4, CO2 Laser Machine Single Pass Parameters for Rework's, for a sample of what this machine can process. The operator must consider hazardous and problematic byproducts o some of these polymers. For example, polycarbonate should not be cut because it produces a toxic gas that can be harmful to the operator and will damage components of the laser machine. See the safety section for other hazardous materials and always check the Material Safety Data Sheet (MSDS) prior to cutting any questionable materials.


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7.) Troubleshooting (Cont'd.)-

Q: How often do I need to change the Laser Tube?

A: The Laser Tube is classified as a consumable part and has a rated lifespan of 5000 hours of use. However, several variables affect the lifespan of the laser tube, like the power setting used and the quality of water coolant used.

NOTICE: **Only Deionized or Distilled Water should be used with the Chiller/Laser Tube Cooling System.**

Q: How often do I need to change the water in the chiller unit, and can I leave the water in the laser tube when not in use?

A: The water should be changed on a monthly (30 days) basis. The water can be left in the tube as long as the water cannot freeze. If you are operating this laser in temperatures where the water can freeze overnight, there is a high likelihood that the expanded frozen water will break the laser tube.

Q: Can I use a different Focal Length than the included 50.8mm focal length?

A: All focal lenses must be 20mm in diameter to fit the laser tube assembly. The shortest focal length that can be used is the 50.8mm, constraint by the laser assembly mounting tube. A longer focal length can be used by removing the removable bottom of the PL1220 and resting the machine on riser blocks to accommodate the larger focal spacing needed.


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7.) Troubleshooting (Cont'd.)-

Q: What type of lubricant should I use for the linear bearings?

A: White lithium (PTFE) grease is recommended.

Q: Do I need to use a Fume Extractor with a CO2 laser cutting machine?

A: You must vent the machine to a safe location that will not harm yourself as the operator or any bystanders. This is most easily done with the use of a fume extractor machine. The use of a Fume Extractor is beneficial to the safety of the operator and bystanders as it filters the harmful byproduct away. This does not make it OK to use harmful materials as the fumes must still travel through the venting and parts of the machine that could be irreversible damaged.


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8.) Material Laser Parameters-

WARNING!
It is the operators responsibility to understand the material properties and safety precautions peculiar to those materials. The Material Saftey Data Sheet (MSDS) will always be available through the material manufacture.
NOTICE!
UNITS - These results were achieved using metric units – mm/s. Make sure that these settings are not inputted as inch/s. The max power is 100%. The max speed is 500mm/s. The default interval is 0.1mm.
THIS CHART MAY NOT BE ACCURATE! Because every laser machine is unique, it is difficult to produce a finite cut chart for reference. This chart should be used as a baseline for the operator to adjust the RDWorks parameters to perform a proper cut or engraving on the work material. It is highly advised that the operator save working parameters in the RDWorks Parameter Library. Feedback and suggestions will help us to further develop these parameters and are highly appreciated. Please email us at manuals@lagunatools.com
MULTIPLE PASSES - Start with low settings and gradually increase them. If the workpiece does not move, the work file can be run multiple times to complete a cut or further detail an engraving. This strategy can be used to cut thicker workpieces.

Use the following tables and select the material closest in material properties to the workpiece to be cut or engraved.

	Laser Tube Wattage
Material	Examples or sub categories of material.
Process	Speed (mm/s) – Min Power%


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8.) Material Laser Parameters (Cont'd.)-

	40 Watt	60 Watt	80 Watt	120 Watt
Hard Plastics	Acrylic (Lucite, Plexiglass, PMMA), Delrin®, Polyethylene film (Mylar®),			
Engrave	450 - 50%	450 - 40%	450 - 35%	450 - 25%
Cut 1/8" (3.2mm)	25 - 100%	35 - 100%	50 - 100%	60 - 100%
Cut 1/4" (6.4mm)	10 - 100%	15 - 100%	20 - 100%	35 - 100%
Cut 3/8" (9.5mm)	-	-	5 - 100%	15 - 100%
Cut 1/2" (12.7mm)	-	-	-	5 - 100%
There are commonly two types of acrylic. Casted acrylic produces a frosted-look engraving. Extruded Acrylic (the cheaper of the two) is best for cutting and produces a clear engraving.				
Wood	Hardwoods, Plywoods, MDF, Particle Boards			
Engrave	150 - 100%	200 - 100%	300 - 100%	450 - 100%
Deep Engrave	75 - 100%	100 - 100%	175 - 100%	300 - 100%
Cut Veneer	150 - 80%	200 - 80%	250 - 80%	300 - 80%
Cut 1/8" (3.2mm)	25 - 100%	50 - 100%	100 - 100%	200 - 100%
Cut 1/4" (6.4mm)	5 - 100%	15 - 100%	25 - 100%	50 - 100%
Cut 3/8" (9.5mm)	-	-	5 - 100%	40 - 100%
Cut 1/2" (12.7mm)	-	-	-	5 - 100%

	40 Watt	60 Watt	80 Watt	120 Watt
Cut with the grain when possible. Consider that the density and water content of the wood will play a role in the above parameters. Do not process woods with flammable surface finishes like lacquer or varnish.				
Rubber	Silicone, Vulcanized Rubber, Polyurethane, Neoprene, Gaskets, Rubber vibration mats, Rubber stamps			
Engrave	100 - 80%	200 - 80%	325 – 80%	400 – 80%
Cut	50 - 100%	80 - 100%	120 – 100%	150 – 100%
Fabric	Polyester, Nylon, Leather, Denim, Netting, Neoprene, Cotton.			
Cut/Engrave	450 - 20%	450 - 20%	450 - 15%	450 - 15%
Paper (thin materials)				
Cut/Engrave	500 - 10%	500 - 10%	500 - 10%	500 - 10%
When cutting paper, be very cautious of the fire danger. Achieve laser settings such that the laser cuts the material as quickly as possible without leaving burn marks.				


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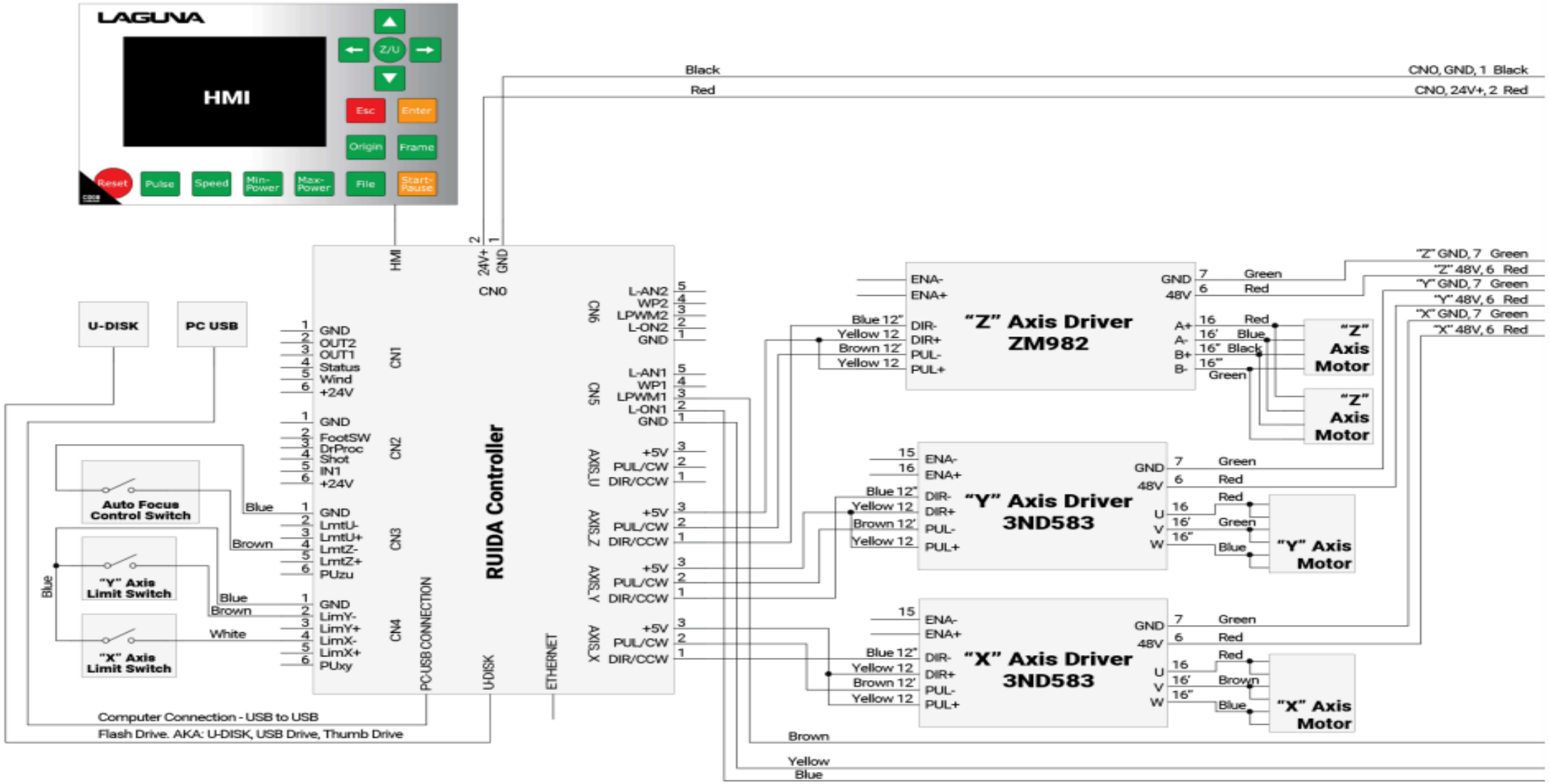
9.) Wiring-

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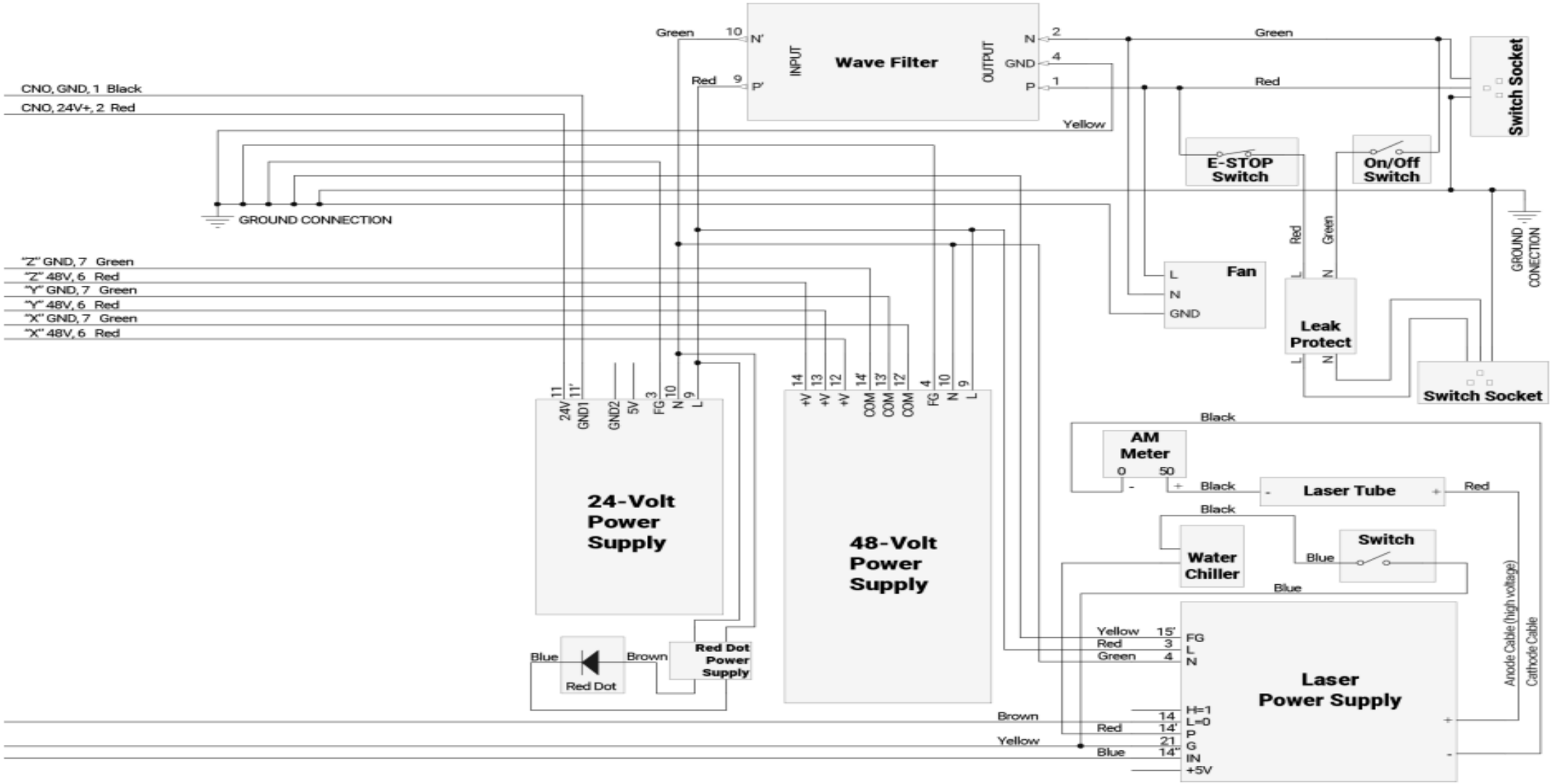
9.) Wiring (Cont'd.)-



10.) Laguna Tools Warranty-

Dealer Machinery Warranty

New woodworking machines sold by Laguna Tools carry a two-year warranty effective from the date of dealer invoice to customer/end-user. Machines sold through dealers must be registered with Laguna Tools within 30 days of purchase to be covered by this warranty. Laguna Tools guarantees all new machine sold to be free of manufacturers' defective workmanship, parts and materials. We will repair or replace, without charge, any parts determined by Laguna Tools, Inc. to be a manufacturer's defect. We require that the defective item/part be returned to Laguna Tools with the complaint. The end-user must request an RMA (return material authorization) number from Customer Service and include the (RMA) number with any and all returned parts/components requesting warranty coverage.* Any machines returned to Laguna Tools must be returned with packaging in the same manner in which it was received. If a part or blade is being returned it must have adequate packaging to ensure no damage is received during shipping. In the event the item/part is determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges. This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, lack of or inadequate dust collection, misuse/abuse or damage caused where repair or alterations have been made or attempted by others.

NOTE: Issuing an RMA number is for referencing materials and issues, it does NOT indicate warranty acceptance/conformity.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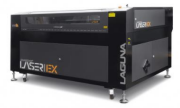
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10.) Laguna Tools Warranty-

CNC Limited Warranty

New CNC machines sold by Laguna Tools carry a one-year warranty effective from the date of shipping. Laguna Tools guarantees all new machine sold to be free of manufacturers' defective workmanship, parts, and materials. We will repair or replace without charge, any parts determined by Laguna Tools, Inc. to be a manufacturer's defect. We require that the defective item/part is determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges. This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, lack of or inadequate dust collection, misuse/abuse or damage caused where repair or alterations have been made or attempted by others.

Laguna Tools, Inc. is not responsible for additional tools or modifications sold or performed (other than from/by Laguna Tools, Inc.) on any Laguna Tools, Inc. woodworking machine. Warranty maybe voided upon the addition of such described tools and/or modifications, determined on a case-by-case basis. Software purchased through Laguna Tools, Inc., is not covered under this warranty and all technical support must be managed through the software provider. Normal user alignment, adjustment, tuning and machine settings are not covered by this warranty. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided by the manufacturer.

Parts under warranty are shipped at Laguna Tools, Inc.'s cost either by common carrier, FEDEX ground service or a similar method. Technical support to install replacement parts is primarily provided by phone, fax, e-mail or Laguna Tools Customer Support Website. The labor required to install replacement parts is the responsibility of the user. Laguna Tools is not responsible for damage or loss caused by a freight company or other circumstances not in our control. All claims for loss or damaged goods must be notified to Laguna Tools within twenty-four hours of delivery.

****Please contact our Customer Service Department for more information. Only NEW machines sold to the original owner are covered by this warranty. For warranty repair information, call 1-800-234-1976. Copyright 2013 Laguna Tools, Inc.

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10.) Laguna Tools Warranty-

WARRANTY & REGISTRATION

THANK YOU!

Welcome to the Laguna Tools® group of discriminating woodworkers. We understand that you have a choice of where to purchase your machines and appreciate the confidence you have in the Laguna Tools® brand.

Through hands-on experience, Laguna Tools® is constantly working hard to make innovative, precision products. Products that inspire you to create works of art, are a joy to operate, and encourage your best work.

Laguna Tools®
Imagination, Innovation, and Invention at Work

WARRANTY & REGISTRATION

Every product sold is warranted to be free of manufacturers' defective workmanship, parts, and materials. For any questions about this product, the intended use or what it was designed for, customer service, or replacement parts, please contact our customer service department:

Laguna Tools® Customer Service
2072 Alton Parkway, Irvine, California 92606, USA
1-800-332-4049
customerservice@lagunatools.com
www.lagunatools.com/why/customer-service/
8AM. to 5PM PST, Monday through Friday

For warranty claims or to report damage upon receiving – please reach out to our warranty department:

Laguna Tools® Warranty Service
2072 Alton Parkway, Irvine, California 92606, USA
1-949-474-1200
customerservice@lagunatools.com
www.lagunatools.com/rpolicies/warranty
8AM to 5PM PST, Monday through Friday

REGISTRATION

To prevent voiding this warranty, all products sold must be registered within thirty (30) days of receiving the product. Registering the product will enable the original purchaser to receive notifications about important product changes, receive customer service, and be able to file a warranty claim against defective workmanship, parts, or materials.

REGISTER HERE!

https://lagunatools.com/policies/warranty/

WHO IS COVERED

The applicable warranty covers only the initial purchaser of the product from the date of receiving the product. To file such claims, the original purchaser must present the original receipt as proof of purchase.

WHAT IS COVERED

The warranty covers any defects in the workmanship of all parts and materials that make up the machine unless otherwise specified. Any part, determined by Laguna Tools®, to have a defect will be repaired or replaced (and shipped), without charge. The defective item/part must be returned to Laguna Tools® with the complaint and proof of purchase in the original packaging that it was received in. In the event the item/part is determined to be not covered by this warranty, the customer will be responsible for the cost to replace the item/part and all related shipping charges.

WARRANTY LIMITATIONS

This limited warranty does not apply to natural disasters, acts of terrorism, normal wear and tear, product failure due to lack of maintenance or cleaning, damage caused by accident, neglect, or lack-of inadequate dust collection. The warranty may be voided against proof of misuse/abuse, damage caused where repair or alterations have been made or attempted by others, using the product for purposes other than those described as intended use (unless with consent by Laguna Tools®), modification to the product, or use with an accessory that was not designed for the product. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided in this manual.

LENGTH OF WARRANTY

All new machines and optional accessories sold through an authorized dealer carry a two-year warranty effective the date of receiving the product. Machines sold for either commercial or industrial use have a one-year warranty. Wearable parts like throat plates, bandsaw guides, etc., have a ninety-day warranty.

Table A-1 Warranty Lengths

2 Year – New Machines Sold Through an Authorized Dealer
2 Year – Accessories Sold as Machine Options (excluding blades)
1 Year – Machines Sold for Commercial or Industrial Use
1 Year – Blades and Accessories outside of Machine Options
90 Days – Wearable Parts

Aside from being free of defects upon receiving, consumable parts, like cutters and abrasives, are not covered by this warranty unless otherwise stated by Laguna Tools®. These parts are designed to be used at the expense of the operator and are available for replacement or inventory purchase. The determination of a consumable part will be made on a case-by-case basis by Laguna Tools®.

SHIPPING DAMAGE

Laguna Tools® is not responsible for damage or loss caused by a freight company or other circumstances not in the direct control of Laguna Tools®. All shipping-related claims for loss or damage goods must be made to Laguna Tools within twenty-four hours of delivery.

HOW TO RECEIVE SUPPORT

To file a warranty-claim please contact the warranty department at 1-949-474-1200. To receive customer service or technical support please contact the customer service department at 1-800-332-4094. Parts, under warranty, are shipped at the expense of Laguna Tools® either by common carrier, FedEx ground services or similar method. Technical support to install replacement parts is primarily provided by phone, fax, email, or the Laguna Tools Customer Support Website.

LAGUNA


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10.) Laguna Tools Warranty-

No Modifications Allowed or Sold.

Laguna Tools, Inc. is not responsible for additional tools or modifications sold or performed (other than from/by Laguna Tools, Inc.) on any Laguna Tools, Inc. woodworking machine. Warranty maybe voided upon the addition of such described tools and/or modifications, determined on a case-by-case basis. Normal user alignment, adjustment, tuning and machine settings are not covered by this warranty. It is the responsibility of the user to understand basic woodworking machinery settings and procedures and to properly maintain the equipment in accordance with the standards provided by the manufacturer. Parts, under warranty, are shipped at Laguna Tools, Inc.'s cost either by common carrier, FEDEX ground service or a similar method. Technical support to install replacement parts is primarily provided by phone, fax, e-mail or Laguna Tools Customer Support Website. The labor required to install replacement parts is the responsibility of the user. Laguna Tools is not responsible for damage or loss caused by a freight company or other circumstances not in our control. All claims for loss or damaged goods must be notified to Laguna Tools within twenty-four hours of delivery. Please contact our Customer Service Department for more information. Only new machines sold to the original owner are covered by this warranty. **For warranty repair information, call 1-800-332-4094.**


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10.) Laguna Tools Packaging/RMA Procedures-

Dealer Machinery Warranty

****Any machines returned to Laguna Tools must be returned with packaging in the same manner in which it was received. If a part or blade is being returned it must have adequate packaging to ensure no damage is received during shipping. In the event the item/part is determined to be damaged due to lack of maintenance, cleaning or misuse/abuse, the customer will be responsible for the cost to replace the item/part, plus all related shipping charges.**

We require that the defective item/part be returned to Laguna Tools with the complaint. The end-user must request an **RMA (Return Material Authorization) Number** from Customer Service and include the (RMA) number with any and all returned parts/components requesting warranty coverage.

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10.) Laguna Tools Packaging/Laguna Tools RMA Example-

RMA #

RTN. AUTH. #
CR10979

12/1/2020 Return Authorization - NetSuite (Laguna Tools, Inc)

Return Authorization

CR10979

PENDING RECEIPT

Edit Back Receive Close Actions

CUSTOMER

DATE
11/5/2020

CURRENCY

SUBSIDIARY
Laguna Tools, Inc

RTN. AUTH. #
CR10979

DEPARTMENT
Sales : Wholesale

PRODUCT LINE

LOCATION
Laguna Texas Demo / Returns

SALES REP
Benjamin Helshoj

PARTNER

LEAD SOURCE

PO #
PO-981

MEMO

CREATED FROM

SALES EFFECTIVE DATE
11/5/2020

EST. EXTENDED COST

EST. GROSS PROFIT

EST. GROSS PROFIT PERCENT

PROMISE DATE
5/12/2020

DEPOSIT RECEIVED

ACCOUNTING APPROVAL

COMMENTS
Customer's bandsaw cast iron at the bottom is bent the customer can't insert bolts to stand. No shipping damage machine arrived in excellent condition do damage to packaging.
PO 981

RETURN REASON
Manufacturers Warranty Defect

SHIP IMMEDIATE
SPLIT SHIP

REVISED INVOICE

ORDER HOLD REASON

Summary
SUBTOTAL
DISCOUNT
GST/HST
PST
TOTAL

SHIPPING COMMENTS

Items Promotions Address Messages History Workflow Custom Partners Sales Team Additional Information OzLINK Pacejet SPS

EXCHANGE RATE RATE

DISCOUNT

ITEM	RETURNED	REFUNDED	QUANTITY	UNITS	INVENTORY DETAIL	DESCRIPTION	PRICE LEVEL	UNIT PRICE	AMOUNT	TAX CODE	TAX RATE	PST	OPTIONS	GIFT CERTIFICATE	CLOSED	DROP SHIPMENT	CO EST TYP
Machine : Bandsaw : MBAND1412-175 14|12 Bandsaw 110V 1.75HP	0	0	1	Each		14-12 110 VOLT BANDSAW	Retail Price			CA-GST only	5.0%	0.0%					Ite De Co

Edit Back Receive Close Actions


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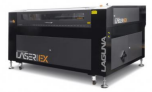
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SMARTSHOP® LASER|EX-C

10.) Laguna Tools Packaging/Laguna Tools BILL of LADING Example-

Date: 12/02/2020 **BILL OF LADING**

SHIP FROM

Name:
Address:

FOB: ☐

Bill of Lading Number : 145787446
Carrier Name: Estes Express

SCAC: EXLA
Pro number:

Name: Laguna Tools TX Location#
Address: 744 Refuge Way
Suite 200
City/State/Zip: GRAND PRAIRIE,TX 75050
Ph: 9494741200 Contact: Vince (ZM) RMACR11096 FOB: ☐

Freight Charge Terms: (*freight charges are prepaid by Worldwide Express unless indicated otherwise*)

FREIGHT CHARGES BILL TO

Name: Worldwide Express
Address: 2828 Routh Street Suite 400
City/State/Zip: Dallas, TX 75201

☐ Master Bill of Lading: with attached underlying Bill Of Lading

WWE Number: W709699351

SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP
Handling Instructions: RMACR11096
Pickup Instructions:
Delivery Instructions: RMACR11096
Pickup Service(s): Liftgate Pickup, Residential Pickup

REFERENCE NUMBER INFORMATION

REFERENCE	# PKGS	REFERENCE	# PKGS	Total # of Pkgs

CARRIER INFORMATION

HANDLING UNITS QTY	HANDLING UNITS TYPE	PIECES QTY	PIECES TYPE	WEIGHT	H.M. X	COMMODITY DESCRIPTION Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged to ensure safe transportation with ordinary care. See section 2(e) of NMFC Item 360	LTL ONLY NMFC#	LTL ONLY CLASS
1	PLT			385		machine, 48(L) x 48(W) x (H) DO NOT STACK		77.5
1				385		**Grand Total**		

Where the rate is dependent on value , shippers are required to state specifically in writing the agreed or declared value of property as follows: The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____

Note: Liability limitation for loss or damage in this shipment may be applicable. See 49 U.S.C. B14706(c)(1)(A) and (B)

RECEIVED, subject to individually determined rates or contracts that have been agreed upon in writing between the carried and Worldwide Express Operations, LLC. a registered motor carried broker, pursuant to 49 USC 14101(b) and all applicable state and federal regulations.

COD Amount: $
Fee Terms: 3rd Party WWE
Remit Address:

Acceptable Forms of Payment:
Bank Certified Check ☐
Customer Check ☐
Personal Check ☐
Money Order ☐

SHIPPER'S SIGNATURE / DATE
This is to certify that the above-named materials are properly classified, described, packaged marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

(Signature) (Date)

Trailer Loaded:
☐ By Shipper
☐ By Driver

Freight Counted:
☐ By Shipper
☐ By Driver/pallet said to contain
☐ By Driver/Pieces

CARRIER SIGNATURE /PICKUP DATE
Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and /or carrier has DOT emergency response guidebook or equivalent documentation in vehicle. Property described above is received in good order, except as noted.

(Signature) (Date)

Bill of Lading Number : 145787446

SPECIAL INSTRUCTIONS: For assistance, please call 833-8WE-SHIP
Handling Instructions: RMACR11096
Pickup Instructions:
Delivery Instructions: RMACR11096
Pickup Service(s): Liftgate Pickup, Residential Pickup