



Techno CNC Laser Manual with RDWorks v8



29 Trade Zone Drive, Ronkonkoma, NY 11779

Phone: 631-648-7481

Website: support.technocnc.com

Disclaimer: Techno CNC Systems, LLC, is not responsible for any loss due to improper operation or violation against the items contained in this manual herein.

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IN CASE OF FIRE:

1. Press the **EMERGENCY STOP** button located on the side of the machine next to LED Panel
2. Lift the lid
3. Quickly blow out the flame (or use a CO2 fire extinguisher for serious flames)



This machine is a Class 4 Laser Device. This is the MOST Hazardous Laser Classification.

Permanent eye damage will result from direct, diffuse or indirect viewing of the laser beam with the potential for fire hazard and skin hazard (serious burns)

Use great caution to control the path of the beam as these dangers are present even from apparent matte surfaces; although they appear non-shiny, may reflect the laserbeam.



WARNING: DO NOT OPERATE THIS MACHINE WITHOUT PROPER TRAINING!
 Improper or unsafe operation of the machine will result in personal injury and/or damage to the equipment. It is the user's responsibility for proper operation of the laser machine and must not violate the following instructions.

General Guidelines

- Before operating, ensure proper ventilation.
- Before servicing, disconnect all power sources.
- Before using, check for damaged parts. An authorized technician should perform all repairs. Only identical or authorized replacement parts should be used.
- DO NOT operate this machine without proper training.
- DO NOT attempt to exceed the limits of machine.
- DO NOT attempt to use machine for purposes other than what is intended.
- DO NOT operate unattended.
- DO NOT wear jewelry or loose clothing when operating machine.
- DO NOT loosen, remove, or adjust machine parts or cables while power is on.
- Wear proper laser eye protection.
- Wear proper protective clothing.
- Stay alert at all times when operating the machine.
- Maintain proper balance and footing when working around the machine.
- Make sure voltage supplied is appropriate to the specifications of the components
- Keep fingers, hands, and all other objects away from machine while power is on.
- Use proper fixtures and clamps to secure work. Never use your hands to secure work.
- Use machine only in clean, well-lit areas free from excessive moisture.
- Keep all areas around the equipment free of flammable materials, including but not limited to wood, material scraps, clothing, cleaning solvents, plastic and more.

In case of emergency, have fire extinguishing equipment available.

SAFETY INFORMATION! DANGER: CLASS 4 LASER PRODUCT

Read these instructions thoroughly before operating machine. **DO NOT** operate machine if you are unfamiliar with these safe operating instructions. **DO NOT** operate machine without knowing where the Emergency Stop switch is located.



- **DANGER:** Visible and / or invisible laser radiation.
- Avoid eye or skin exposure.
- Avoid direct or reflected exposure to the beam from glass and shiny surfaces.
- **DO NOT STARE INTO BEAM** or view directly with optical instruments.
- Laser protective eyewear is required.
- Laser radiation may cause the following:
 - 1) **MATERIALS DAMAGE AND BURNING:** Keep the beam moving to avoid burning materials at close range. Dark materials which absorb heat, and lightweight materials such as paper and fabric, are most easily burned by visible laser beams.
 - 2) **SKIN INJURY (BURN) HAZARD:** Avoid skin exposure, especially at close range. The burning can be severe and cause permanent scars.
 - (3) **TOXIC, HARMFUL GASES MAY APPEAR:** Fire extinguishing equipment must be available by the machine. It is strictly forbidden to put flammable, explosive articles around the table and equipment and proper ventilation be maintained at all times.
- Manufacturing objects and emissions should be in accordance with local laws and regulations. In addition to federal laws, some states and jurisdictions also regulate laser equipment and/or usage.
- Laser processing may cause risks. Users should carefully consider whether processed object is suitable for laser operation.
- **POWER OFF THE EQUIPMENT BEFORE YOU LEAVE: DO NOT** operate unattended.
- When equipment is processing, it's strictly forbidden to open any end covers.
- It is strictly prohibited to place any irrelevant total reflection or diffuse reflection object near the equipment to prevent the laser reflection from doing harm to the body or flammable items.
- When the operation is in process, the operator must watch the status of the equipment at all times. If an abnormal condition occurs, the power supply of the machine should be cut off immediately and corresponding measures should be taken to correct the problem.
- This equipment may produce electromagnetic interference and should be positioned far away from electrical-sensitive equipment.
- Vibration and strong magnetic interference will affect the laser operation and must not be present.
- Working temperature must not exceed 5-40 °C, humidity 5-95% (No condensation must be present).
- Working voltage: AC220V, 50HZ. When the voltage is not stable or does not match the machine, it is strictly prohibited to run the equipment.
- Machine must be plugged into a four-pronged grounded outlet. Do not remove the grounding plug or connect into an ungrounded extension cord.
- High voltage or other potential dangers may be inside the laser equipment. We insist you assemble it under the guidance of factory trained professionals.
- **WARNING:** Ensure that all electrical connections are carried out by a qualified electrician. Improper electrical connections can result in damage to the equipment, fire and death.

Setting up the Laser for first time

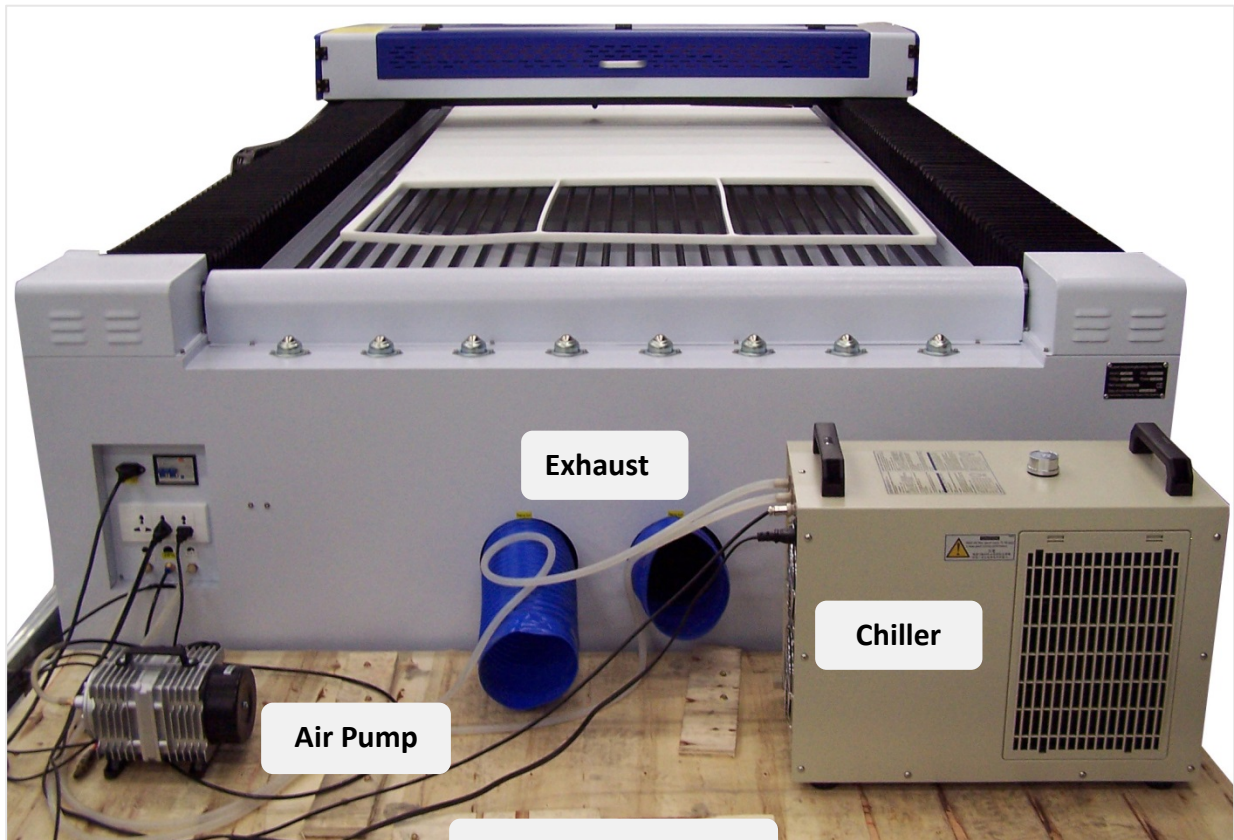


Figure 1

Make sure to remove any foam material from inside of cabinet. Remove any plastic ties used for securing laser head from moving on x or y axis during shipping. Check for any loose nuts or bolts that may have come off during shipping in the bottom of cabinet.

Depending on what options purchased with your laser, there will be boxes outside of the laser cabinet. Additionally, some units will have accessories taped to the working table inside the cabinet. Locate and identify each of these. You should see the common items listed below and possibly some additional accessories:

- Vacuum Blower with 4 inch duct flanges
- Water Chiller for tube cooling
- Air pump with tubing
- Tool box containing necessary software and hardware components.
- Additional accessories such as rotary attachment, cutting table, custom jig, etc. (According to purchasing order).

The exhaust (Labeled in Figure 1) requires the most effort and its importance can't be overstated. The laser vaporizes material as it moves along its axis, generating large amounts of smoke. Some materials like leather or wood generate much more. The exhaust is necessary to remove this byproduct to the outside, away from any area where coworkers may congregate. Correctly ducted, a laser can easily be placed in an office or spare room.

Larger machines have two exhaust ports. Figure 1 and Figure 2 show the typical exhaust outlets on all of the larger Techno Lasers. Both ports are designed to remove air from above the material, during engraving/etching for example.



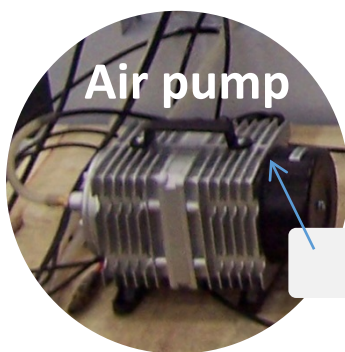
Figure 2

The water chiller (Figure 1 and Figure 3) requires two lines; one to the water inlet and one to the water outlet barbed fixture. All Techno Laser tubes are water cooled and the laser machine will not fire if water is not moving through tube. The chiller is capable of holding 4-5 gallons of deionized water. A simple method to add/remove water is to use a 5 gallon bucket and a funnel.

The air pump (Figure 1 and Figure 4) needs to be attached to the air inlet fixture on the machine. The purpose of the air pump is to blow air through the laser head, therefore, blowing debris and smoke away from the beam, while allowing for cleaner cuts and protecting the lens. The air pump will turn on and off with the laser.



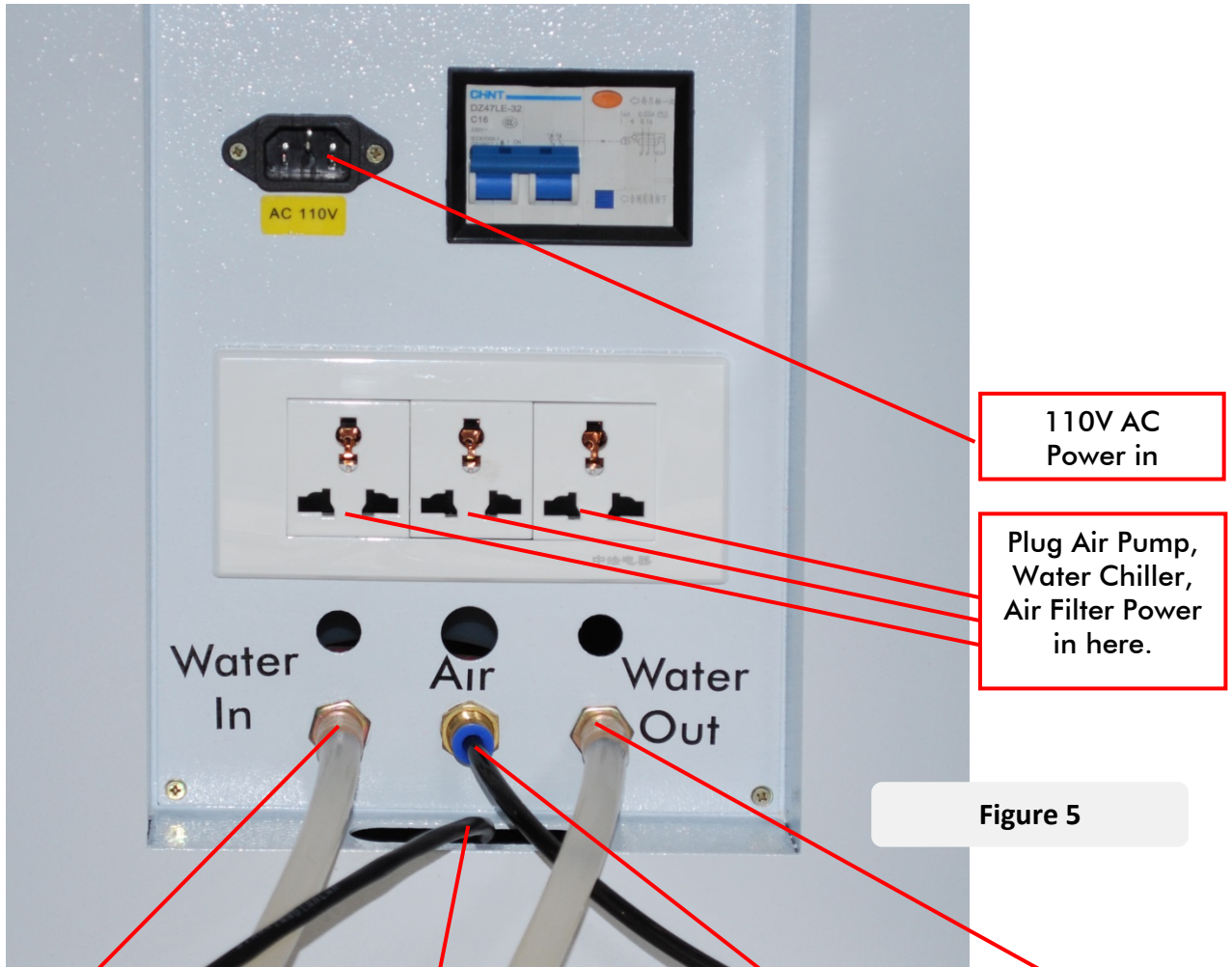
Figure 3



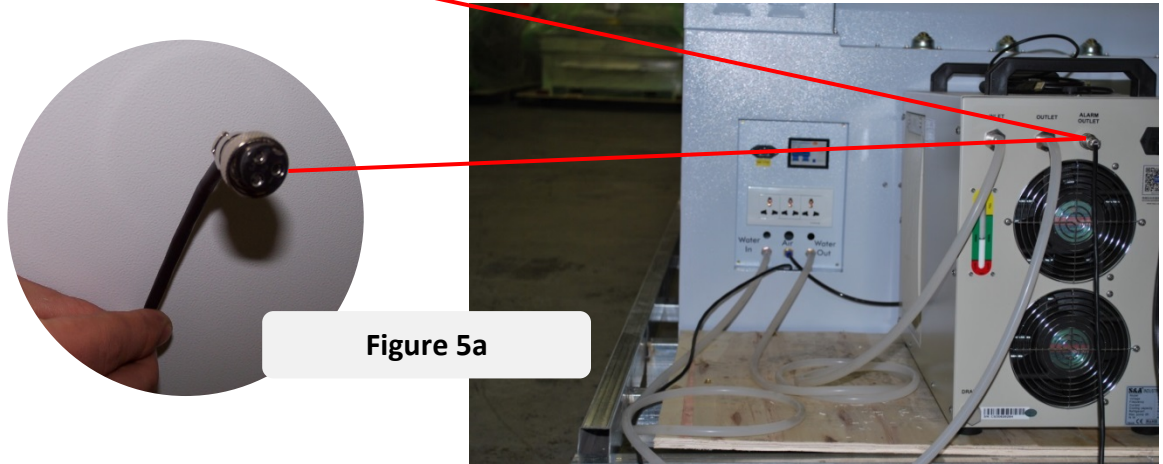
Air pump

Figure 4

Machine Connections



- Connects to "Outlet" on Water Chiller
- Cable connects to "Alarm Outlet" on Water Chiller
- Air Connection
- Connects to "Inlet" on Water Chiller



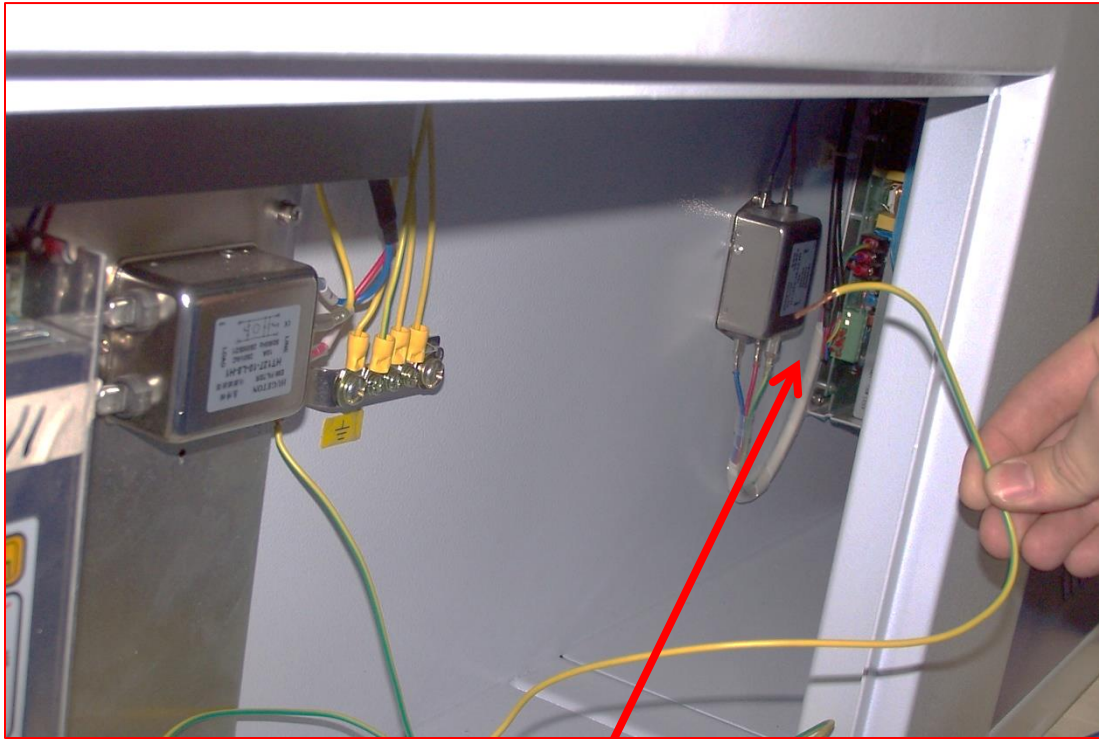
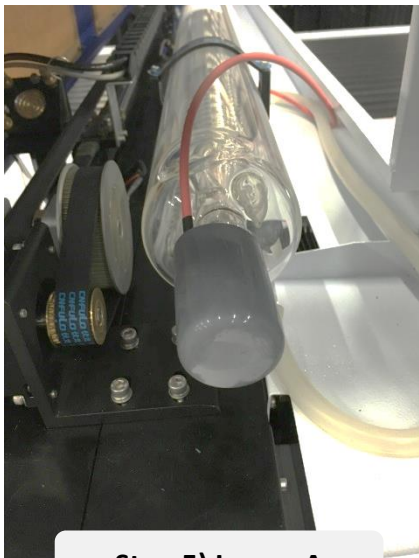


Figure 5b

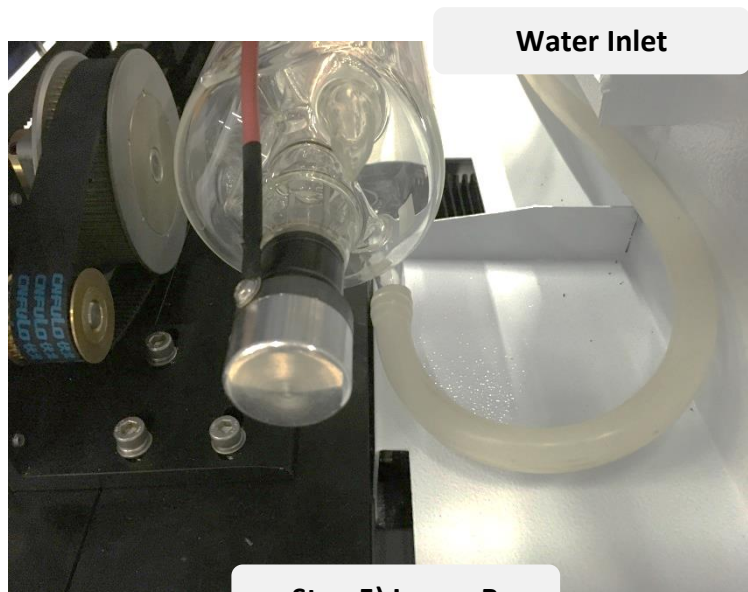
Notice the ground connector wire located on the left side of the machine inside the cabinet. Use the black keys to open and retrieve the ground wire. This is an external ground designed to help eliminate static electricity. Just run the included ground wire from the connection to any grounded outlet or direct to earth. This step is not always necessary, but if you live in an area with low humidity it's a good idea. **(Figure 5b)**

Installation of the CO2 Laser tube.

- 1) Push the gantry to the rear of the machine and open the rear access door. Make sure the tube clamps are loose, the two wires (one black and one red) are free and the two water hoses are out of the way for installation of the CO2 Laser tube.
- 2) Carefully unpack the Laser tube.
- 3) Using two people, carefully place the laser tube into the laser tube clamps. One person should hold the tube steady as the other person guides it into position. Make sure the end with the rubber cap is on the left side and the end with the crystal lens is pointing toward mirror A. You will need to move the laser tube at an angle in order to fit it inside the gantry.
- 4) Once in position, tighten the tube clamps snug so the tube cannot move and the water inlet and outlet ports can be easily accessed.
- 5) Remove the rubber cap and connect the red wire to the cathode terminal. Make sure the wire points toward the middle of the tube as the rubber cap will be put back onto the terminal.
(See Image A and Image B below.)
- 6) Connect the water inlet hose (comes from same location as the red wire) to the water inlet nipple on the end of the tube. **(See Image B below.)**

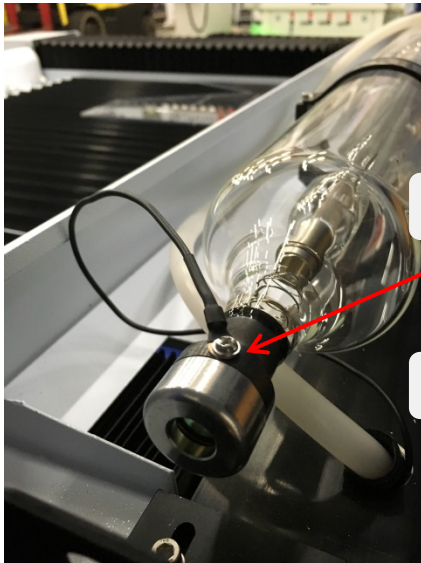


Step 5) Image A



Step 5) Image B

- 7) Moving to the other side of the laser tube, connect the black wire to the screw point on the anode of the tube. (See Image 7C below.)



Black wire connects here.

Step 7) Image 7C

- 8) Connect the water outlet hose (comes from same location as the black wire) to the water outlet nipple located toward the middle of the tube. (See Image 8D below.)



Water Outlet

Step 8) Image 7d

- 9) Make sure all screws are tight (clamps and wires) and that the tube **CANNOT** move.