SmartShop CBX Fiber Laser

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Laguna Tools

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Grand Prairie, TX

lagunatools.com

Scope of This Manual

This manual outlines the basic procedures for unpacking, installing, and operating the SmartShop CBX Fiber Laser.

For detailed instructions and video(s), please go to www.lagunatools.com.

Customer Service

For technical support, please contact Laguna Tools:

Call Customer Service at 1-800-332-4094 or email customer_service@lagunatools.com. Please note the machine type in the subject line.

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1.0 General Information and Safety

1.1 Overview

Please read and understand all warnings and operation instructions before using any tool or equipment. Always follow basic safety precautions to reduce the risk of personal injury. Improper operation, maintenance, or modification of tools or equipment could result in serious injury or property damage. Laguna Tools equipment is designed for specific and limited applications. This product should neither be modified nor used for any application other than those for which it was designed.

1.2 Safety Signs and Call-Outs

⚠ DANGER

An imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

A potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION

A potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE

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A helpful tip from Laguna Tools staff.

1.3   Safety Warnings

1. Failure to comply with safety instructions may lead to personal injury and/or damage to the equipment. Do not operate the machine unless familiar with all safety instructions, warnings, and signs.

2. Do not operate the machine with the electrical cabinet door open–High Voltage Supply Inside.

3. The machine must be properly electrically grounded. The power supply must be connected with a permanently fixed electrical wire.

4. Keep children and non-operators away from the machine.

5. Operators must be familiar with the installation, operation, and service of the machine. Only proper operation can ensure the safe and smooth running of the machine.

⚠**WARNING**

Automated machinery involves moving parts which pose a potential hazard to personnel. Always be aware of machine movement at all times.

⚠**WARNING**

Only allow qualified service personnel to do electrical installation or repair work, and always disconnect power before accessing or exposing electrical equipment to reduce risks.

⚠**CAUTION**

Machine bits are sharp and pose a cutting hazard. Do not handle without gloves or while the machine is in operation.

1.4 Additional Safety Information

1. All motion parameters have been set up by Laguna Tools. If any modifications are required, please have a professional operator perform the changes.

2. Safety Signs should be attached to places that are easy to spot.

3. Use the machine only in clean areas free from excessive moisture or flammable objects.

4. The machine must be level. Level the machine if the ground is uneven.

5. Keep the machine, electrical cabinet, and surrounding area clear of obstructions and free from excessive moisture.

6. Keep the machine, electrical cabinet, and cables away from excessive heat, flammable substances, and sharp objects.

7. Do not attempt to exceed the limits of the machine.

8. Disconnect power to all system components when not in use, when changing accessories, and before servicing. Remove the switch keys or lock-out the machine to prevent unauthorized use and child-proof the workshop.

9. Exercise care with machine controls and around keypad to avoid unintentional start-up.

10. Keep cutting tools clean and sharp.

11. Lubricate and change accessories when necessary.

12. Cables and cords should be inspected regularly.

13. Keep controls clean and dry.

14. Keep a copy of this manual for future reference.

15. Perform daily inspection of the machine for damaged, loose, or improperly adjusted parts or any condition that could affect safe operation. For your own safety, do not operate the machine with damaged parts.

16. Stay alert at all times while operating the machine.

17. Always wear safety glasses and hearing protection.

18. Know where the emergency stop switch is located.

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19. Never operate machinery under the influence of drugs or alcohol, when tired, or when distracted.

20. Do not wear clothing, apparel, or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to reduce the risk of slipping and losing control or accidentally contacting cutting tool or moving parts.

21. Never stand on the machine. Serious injury may occur if the machine is tipped or if the cutting tool is unintentionally contacted.

22. Consult the Owner's Manual or Laguna Tools for recommended accessories. Using improper accessories will increase the risk of serious injury or damage.

2.0 Electrical and Gas Safety

2.1 Electrical

<div style="background-color:red">⚠ **DANGER**</div>

Before connecting the machine to the power source, verify that the correct electrical requirements are met.

Consult a qualified electrician if you are unsure of proper setup.

The CBX requires permanent, direct power installed by a qualified electrician familiar with industrial best practices. Ensure that all power cords are protected from traffic, moisture, chemicals, or other hazards. For safety, always have a qualified electrician assess grounding and any further electrical needs

This CBX machine **requires** a 220V, 3 phase, 40 Amp outlet. Verify that the required connection is available before setup. Consult a qualified electrician if for further electrical needs.

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2.2 Gas

<div style="background-color:red">⚠ **DANGER**</div>

Improper use of gas can cause death or serious injury.

Consult a professional if you are unsure of proper gas safety.

This machine requires the use of Oxygen (O2) and Nitrogen (N2) gas for proper use. We recommend having a six (6) pack of each tank.

If you decide to use liquid O2 (Oxygen) or liquid N2 (Nitrogen) you will need a vaporizer as well.

- Gas Regulators (single stage regulator required, dual-stage optional)
    - o Oxygen needs to be capable of 150 PSI
    - o Nitrogen needs to be capable of 300 PSI

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3.0 Receiving the Machine

Following delivery and before the driver and riggers have left, inspect the packing, invoice, and shipping documents. Next, ensure there is no visible damage to the packaging or the machine. All damage must be noted on the delivery documents and signed by the receiver and the delivery driver. Contact Laguna Tools Customer Service as soon as possible in case of damage. It is advisable to photograph and document any shipping damage. The original packaging is required to return damaged equipment to Laguna Tools.

NOTE

Sawdust may be found in the machine upon arrival. This is because the machine has been tested prior to shipment from the factory and/or Laguna Tools. Laguna Tools tests all machines prior to shipping, but some adjustments may have to be undertaken by the customer. These adjustments are covered in the various sections of this manual.

Most large machinery will be delivered on a tractor trailer 48 to 53 feet long. Please notify a Sales Representative with any Delivery Restrictions. The customer is required to have a forklift (6000 lbs. or larger is recommended) with 72-inch forks or fork extensions.

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4.0   SmartShop CBX Overview

The Laguna Tools Smartshop® Laser/CBX is equipped with an enclosed working area preventing dust and eliminating light pollution. It also comes with a casting beam for increased rigidity and stability. For smooth operation, the CBX uses water/forced air cooling, a dust prevention system, and an automatic lubrication system to ensure longevity and consistency. The Smartshop® Laser/CBX Fiber Laser cutting Machine is special for high precision machinery parts & microelectronics Industry. This machine is faster speed & high precision is professional for cutting thin metal sheets as Stainless Steel, Carbon Steel, Galvanized Steel, etc.

Technical Parameter	
Machine Model	Smartshop Fiber Laser CBX
Laser Power	1 kW, 2kW, 3kW
Dimension	2210mm X 2160mm X 1630mm 87.0 In. X 85.0 In. X 64.17 In.
Working Area	1300mm X 900mm or 51.18 In. X 35.43 In.
Repeat Positioning Accuracy	+/-0.01mm or .0004in
Specified Voltage & Frequency	220V/480V/50Hz/60Hz/60A

4.1   Features

- Working area 3.25 ft x 4.9 ft
- Laser power starting at 1kW up to 3kW
- Rapid Travel Speed: 1,200 in/min.
- Drive method ball screw
- Reposition accuracy ±0.02 mm
- Minimum line width 0.01 m

4.2   Components

- Two (2) airline tubes. One for nitrogen and one for oxygen
- One (1) chiller inlet/outlet tubing
- One (1) chiller machine
- One (1) clear chiller coolant line
- One (1) assortment of chiller fittings and shutoff valves

- One (1) large diameter chiller tubing
- One (1) alarm cable
- One (1) monitor swivel bracket
- One (1) display monitor
- One (1) laser head with mounting screws
- One (1) status light
- One (1) laser head controller
- One (1) P.C
- One (1) set of keys
- One (1) toolbox containing various nozzles, lenses, and safety glasses
- One (1) handheld controller
- One (1) box of sample cuts
- One (1) Wi-Fi antenna
- One (1) keyboard and mouse combo
- One (1) Ethernet cable
- One (1) PWM harness
- One (1) laser power cord
- One (1) laser power plug
- One (1) IPG specification sheet
- One (1) laser lead cable (yellow)
- One (1) IPG power supply
- One (1) display mount/keyboard stand
- One (1) pair of overhead LED light fixtures
- One (1) SmartShop CBX laser machine

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5.0 Machine Placement

When unpacking the SmartShop CBX Fiber Laser, separate all enclosed items from the packing materials and inspect each for damage. Save the packaging materials until all issues concerning missing or damaged items have been resolved.

5.1 Placement

Select the area where the SmartShop CBX Fiber Laser will be operated. The physical environment where the SmartShop CBX is located is important to safe assembly and operation. Before removing the SmartShop CBX from its packaging, consider the weight load, electrical installation requirements, lighting, dust collection, and space allocation available for the machine and accompanying materials.

Guidelines for properly placing the machine follow:

1. There should be a **minimum of a 4ft area around all sides of the machine.** If you cannot fully open all the doors around the machine, it cannot be installed or serviced in the future if need be. Make sure you leave room for the chiller and gases (Oxygen and Nitrogen)

   There should be a sufficient area around the machine to facilitate easy access to the workpiece, perform maintenance, and provide safe egress in the event of an emergency.

2. Select a solid level floor rated to hold the weight of the and workpieces under both static and dynamic loads. Laguna Tools recommends concrete flooring. Consult a licensed and experienced professional if in doubt.

3. Position the SmartShop CBX close to a power source and dust collection.

4. Allow an area for the storage of workpiece materials, finished products, and tools.

5. Leave ample space around the machine for the operator to handle both the equipment and the materials being cut.

6. Leave enough space around the machine to open or remove doors/covers as required by the maintenance described in the Owner's Manual.

5.2 Lighting

Ensure that the lighting your machine is placed under is sufficient to safely perform regular operation and maintenance. Any glares, shadows, or strobe lighting which may distract or prevent the operator from safely operating the machinery should be removed from the working area.

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6.0 Setup & Assembly

> ⚠️ **WARNING**
>
> *To avoid and prevent injury, setup problems, and potential damage to the machine, read through the entire setup section prior to proceeding.*

> **NOTE**
>
> *It is highly recommended that two (2) people assemble the machine.*

6.1 Electrical Requirements

> ⚠️ **DANGER**
>
> *Before connecting the machine to the power source, verify that the correct electrical requirements are met.*
>
> *Consult a qualified electrician if you are unsure of proper setup.*

The CBX requires permanent, direct power installed by a qualified electrician familiar with industrial best practices. Ensure that all power cords are protected from traffic, moisture, chemicals, or other hazards. For safety, always have a qualified electrician assess grounding and any further electrical needs.

This CBX machine **requires** a 220V, 3 phase, 40 Amp outlet. Verify that the required connection is available before setup. Consult a qualified electrician if for further electrical needs.

6.2   Gas Requirements

<div style="background-color:red">

⚠ **DANGER**

</div>

Improper use of gas can cause death or serious injury.

Consult a professional if you are unsure of proper gas safety.

This machine requires the use of Oxygen (O2) and Nitrogen (N2) gas for proper use. We recommend having a six (6) pack of each tank.

6.2.1 Liquid Gas

If you decide to use liquid O2 (Oxygen) or liquid N2 (Nitrogen) you will need a vaporizer as well.

- With liquid oxygen, a vaporizer must be added to heat the liquid to a normal temperature gaseous state. The high-pressure liquid bottle withstands 4.5MPA, the vaporizer withstands 4.5MPA, flow rate: 1.0m3 / min, output pressure: 2.0MPA.
- With liquid nitrogen, a vaporizer must be added to heat the liquid to a normal temperature gaseous state. High pressure liquid bottle withstands 4.5MPA, vaporizer withstands 4.5MPA, flow rate: 1.0 cubic meters / minute, output pressure: 3.0MPA.

6.2.2 Gas Regulators

- Gas Regulators (single stage regulator required, dual-stage optional)
    - Oxygen needs to be capable of 150 PSI
    - Nitrogen needs to be capable of 300 PSI

6.3   Tools Needed

The tools needed for setup and assembly are:

- Crowbar
- Forklift or floor jack
- Short 5mm Allen key
- Long 5mm Allen key
- Crescent wrench
- Scissors or cutting tool
- Six (6) gallons (23 liters) of **distilled water**
- Zip ties

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- Two (2) pieces of stiff wire (3-5ft each)
- 220V, 3 phase, 40-amp outlet
- Oxygen tank(s)
- Nitrogen tank(s)
- Single stage gas regulators
- Tape
- Flathead screwdriver
- Philips head screwdriver
- Sheets of cutting material to perform test cuts (4x4 or smaller)

6.4   Unpacking the Machine

⚠ **WARNING**

This machine is heavy. Seek assistance from an experienced professional if you have any doubt about the following unboxing or set up procedures.

DO NOT attempt any procedure that you feel is unsafe or you believe you do not have the physical capability of achieving.

⚠ **CAUTION**

When determining location, the machine needs to have at least 4 feet of clearance around all sides. If you cannot fully open all the doors around the machine, it cannot be installed or serviced in the future if necessary.

Verify that you leave room for the chiller, gases (Oxygen and Nitrogen), and a fume extractor if applicable.

Tools needed:

- *Crowbar or prybar*
- *Forklift or pallet truck*

Before moving the CBX machine to a desired location, verify that there is **4 feet of clearance on all sides** of the machine.

1. After unloading the machine off the deliver trailer, move it to the desired location.

    a. Verify there is **4 feet of clearance on all sides** of the machine.

2. Use the pry bar to remove the wood surrounding the machine.

3. Use a forklift or pallet truck to carefully move the machine off the pallet.

4. Use the pry bar to remove the wood surrounding the chiller and components.

5. Remove the chiller and all components from the pallet and set to the side.

6. Remove the tape and protective film from the front window on the CBX machine.

7. Open the CBX front window and remove the components sitting inside the machine.

    a. Set these components to the side.

6.5   Leveling the Machine

Tools needed:

- *Crescent wrench*
- *Level*

The machine will need to be leveled once it is in place. The machine has leveling feet and wheels that lock down.

8. Use the crescent wrench to turn the nut clockwise/counterclockwise to raise or lower the foot to the desired level.

    a. Use the wrench to lock the desired level in place.

    b. Do this on all four feet.

9. Place the level on top of the machine to check for levelness.

    a. Adjust feet if needed.

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6.6   Power Supply Installation

<div align="center">

⚠ DANGER

</div>

DO NOT plug in the machine until setup and assembly is complete.

<div align="center">

NOTE

</div>

It is recommended that two (2) people assemble the machine.

Tools needed:

- *Short 5mm Allen key*
- *Long 5mm Allen key*
- *Small flathead screwdriver*
- *Small Phillips head screwdriver*
- *Zip ties*
- *Tape*
- *Cutting tool*
- *Two (2) stiff wires (each 3-5 ft)*

1. Remove the cover on the back of the machine using the Allen key to remove the screws.

Figure 6–1

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2. Open the control panel door, which is the lower door on the right side of the machine.

Figure 6–2

3. Find the green Molex style plug and the serial plug.

   a. Cut the zip ties with the cutting tool and stretch out the cables.

Figure 6–3

4. "Feed" the stretched-out cables through the opening
   near the back of the machine.

    a. Set them down once they are pulled
   through.
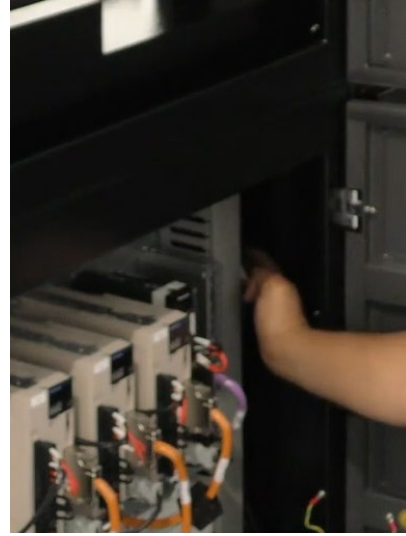
Figure 6–4

Figure 6–5

5. Locate the

- PWM cable
- Large diameter chiller tubing
- Laser power plug,
- Ethernet cable

Zip tie all these components together in a bundle.
(this will make it easier to handle the cables during
installation).
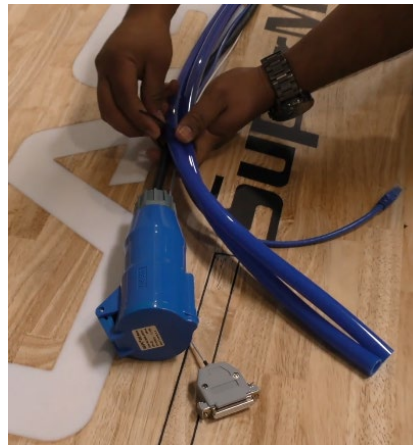
Figure 6–6
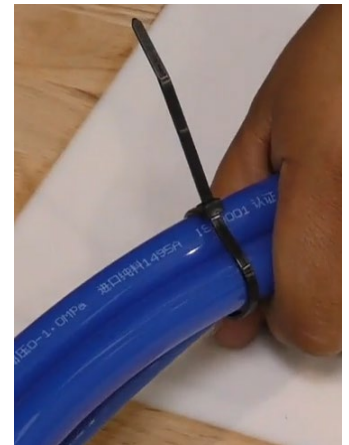
Figure 6–7

6. Open and remove the power supply door, located on the back of the machine in the bottom left. (This will help clear the work area).

   a. Remove the door by pulling down and holding the top pin and moving away from the hole.

7. "Feed" the zip tied cables through the power supply cavity and pull through the backside.

Figure 6–8

   a. Set the excess down in the cavity.

Figure 6–9

   b. The connection ends should be slightly outside the opening for ease of connection to the power supply.

Figure 6–10

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8. "Feed" the excess cables behind the control panel.
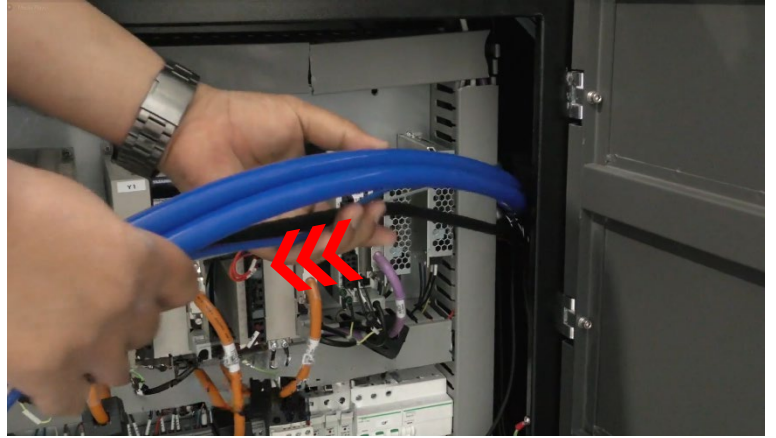
Figure 6–11

9. "Feed" the stiff wires through the holes that are
   below the blue chiller connectors. Pull them
   behind the control panel, near the excess cables.
   a. The stiff wires will be used to help "fish"
      the chiller tubes through the holes.

Figure 6–12

Figure 6–13

10. Once the wires are "fished" through, use a cutting
    tool to cut the zip ties from the tubing bundle.

11. Insert the two stiff wires into both blue tubes.
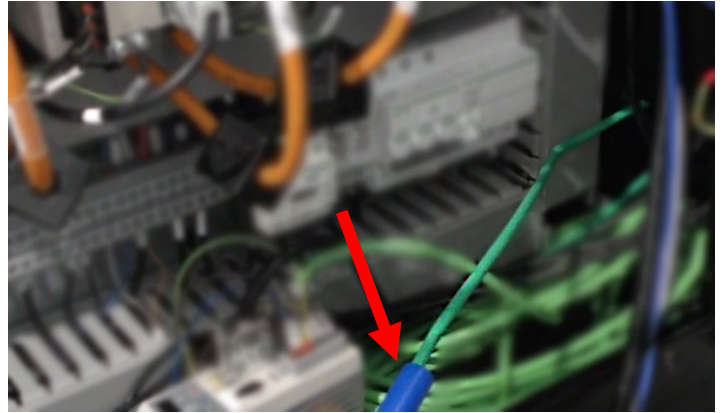
Figure 6–14

12. Tape both tubes to the wires. This will act as a "snake"

Figure 6–15

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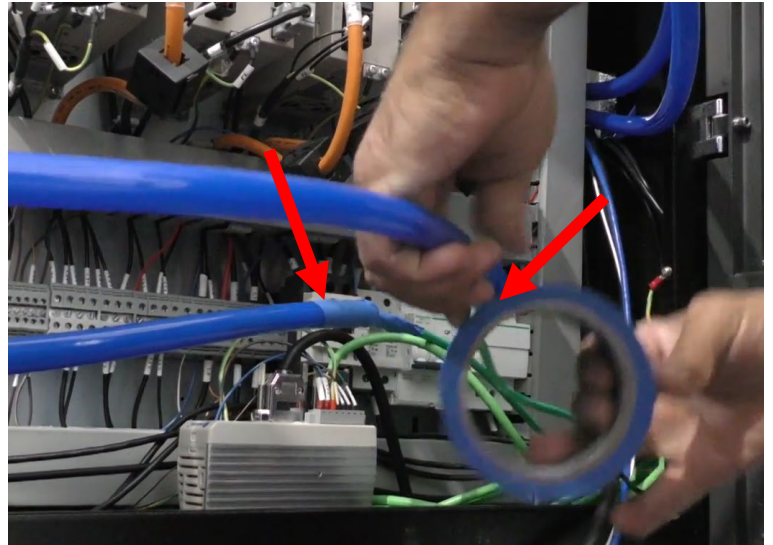
13. Pull the tubes through the holes.

Figure 6–16

Figure 6–17

14. Remove the tape from the leads.

15. On the chiller, you will find two hose clamps. Cut
the zip tie and remove the clamps.

16. Place a hose clamp on each tube.

    a. To avoid confusion later, label one tube, "inlet" and the other "outlet". To help identify each tube, blow into one end of tube while feeling the air come out the other end.
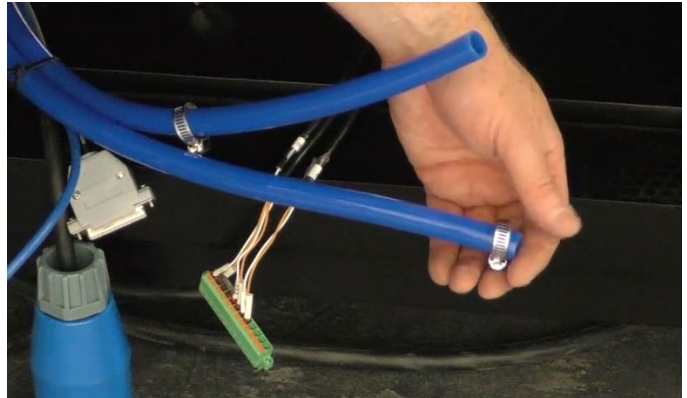
Figure 6–18

Figure 6–19

17. Remove any remaining zip ties.

18. Move the power supply to the back of the machine near the power supply cavity.

⚠ **CAUTION**
The power supply is heavy. It is highly recommended to use a pallet truck or two (2) people to move it.
The yellow laser lead cable is attached to the power supply. DO NOT break it.

Figure 6–20

19. Connect the plug to the power supply.
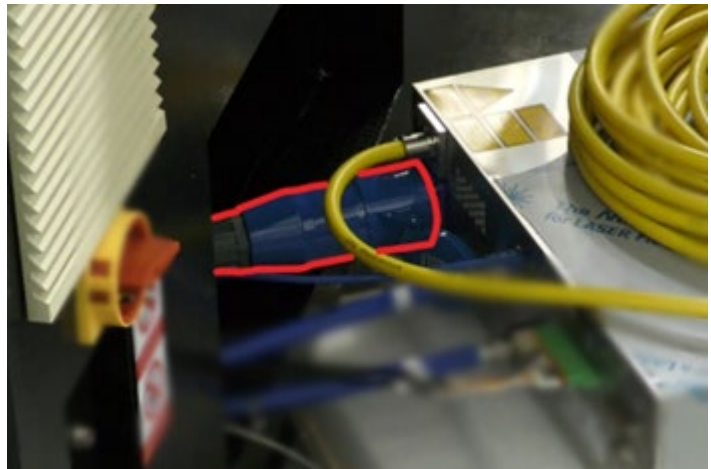
Figure 6–21

20. Press fit the water **INLET** tube to the power supply **OUTLET** connection.
    a. Verify the tube is tight and fasten the hose clamp on the connection.
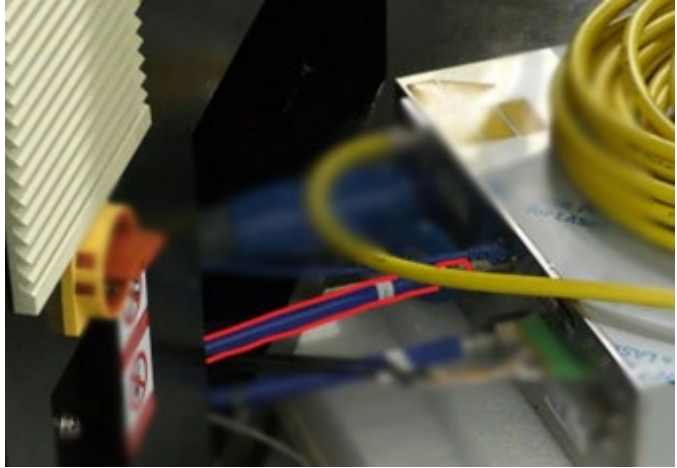
Figure 6–22

21. Press fit the water **OUTLET** tube to the power supply **INLET** connection.
    a. Verify the tube is tight and fasten the hose clamp on the connection.

Figure 6–23

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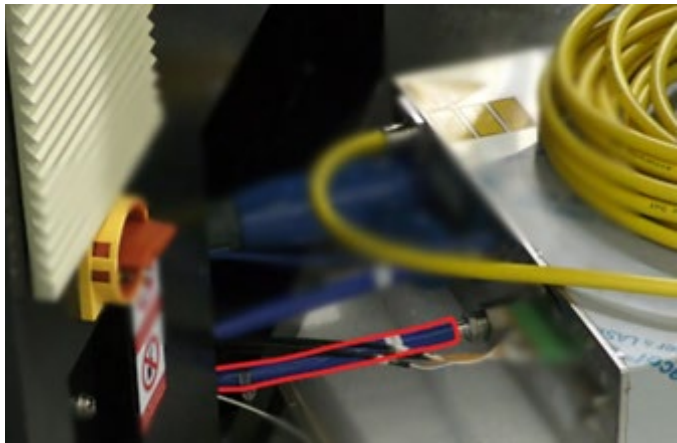
22. Connect the Ethernet cable to the power supply.
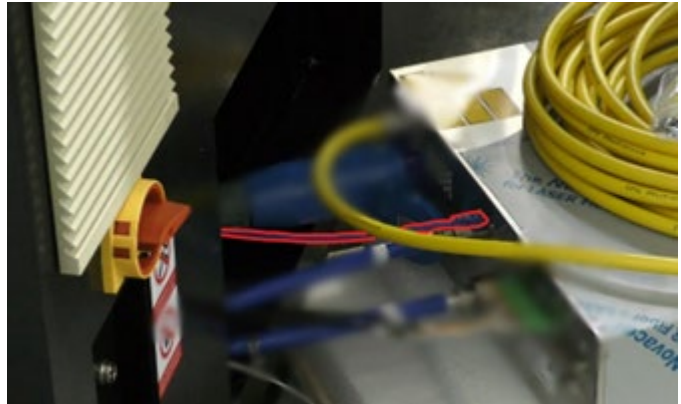
Figure 6–24

23. Connect the green Molex style plug to the power supply.
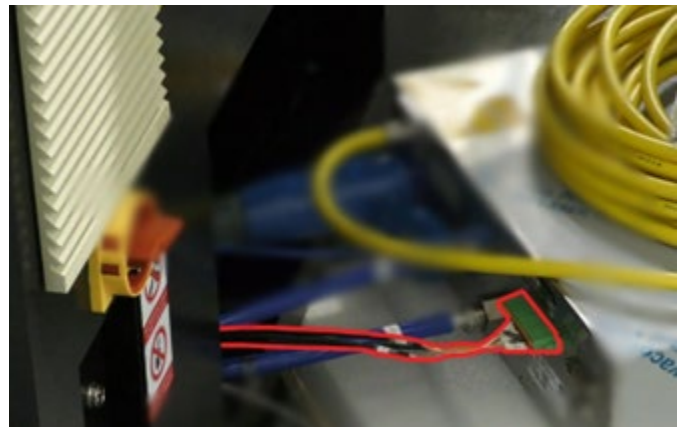
Figure 6–25

    a. Verify the plug is in all the way and secure it by tightening the screws on either side with a small flathead screwdriver.
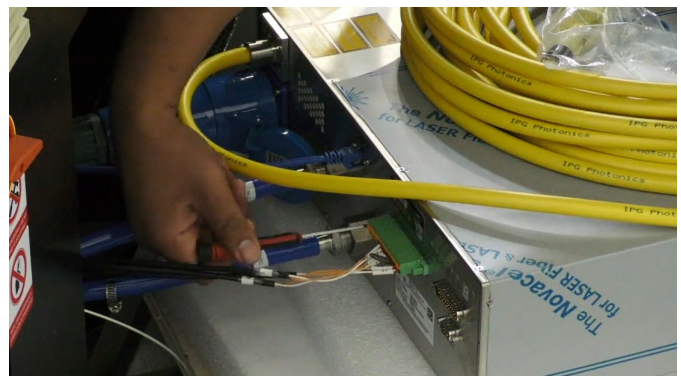
Figure 6–26
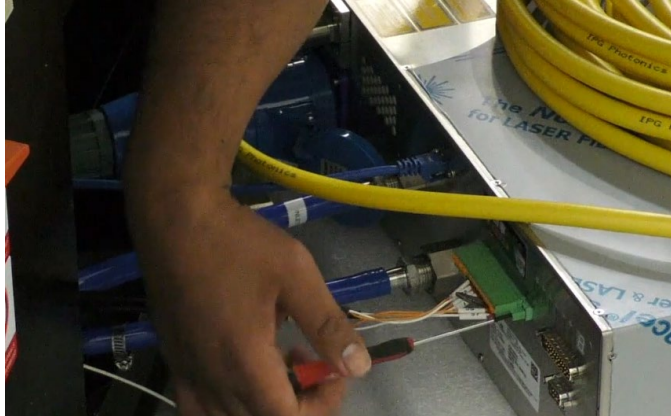
Figure 6–27

24. Connect the PWM cable to the power supply.
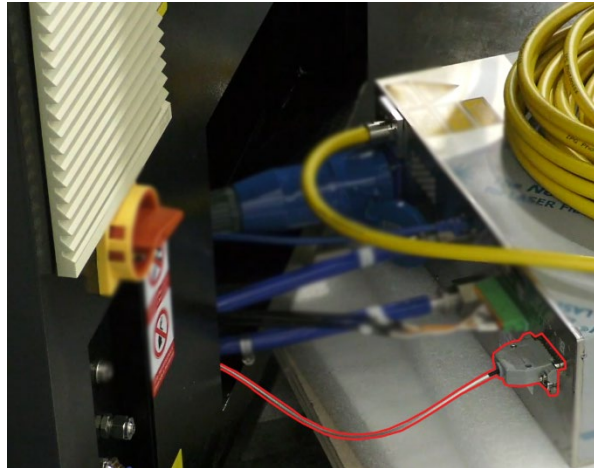
Figure 6–28

   a. Verify the cable is fully inserted.

   b. Use a small flathead screwdriver to tighten the screws on either side of the cable.

Figure 6–29

25. Carefully insert the yellow laser lead cable into the cavity and pull through the backside opening and place on top of the cavity.

Figure 6–30

Figure 6–31

26. Slide the power supply into the cavity.

> ⚠️**CAUTION**
>
> *The power supply is heavy. It is highly recommended to have two (2) people slide the machine in.*

Figure 6–32

Figure 6–33

Figure 6–34

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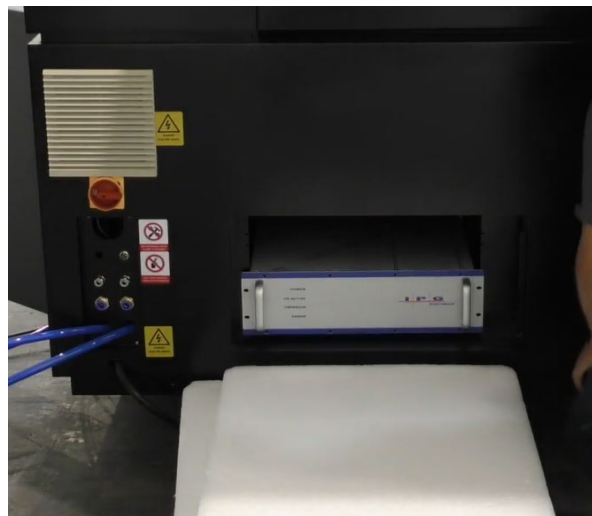
27. Once the power supply is in place, connect the serial cable to the power supply. (You may have to get inside the machine and reach through the cavity.)

    a. Verify the cable is fully inserted.
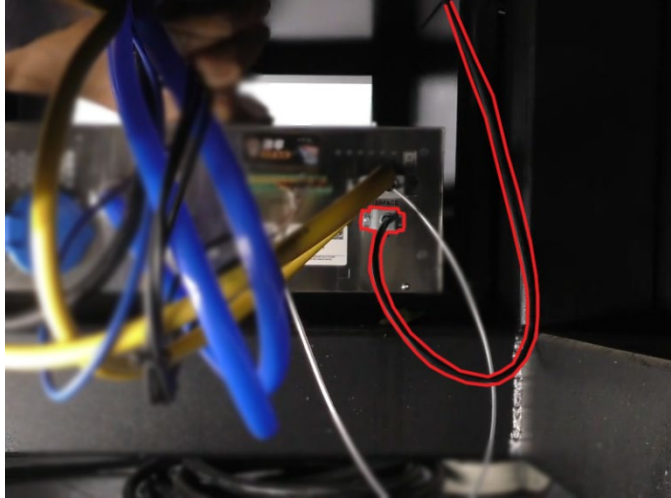
Figure 6–35

    b. Use a flathead screwdriver to tighten the screws on either side of the cable.
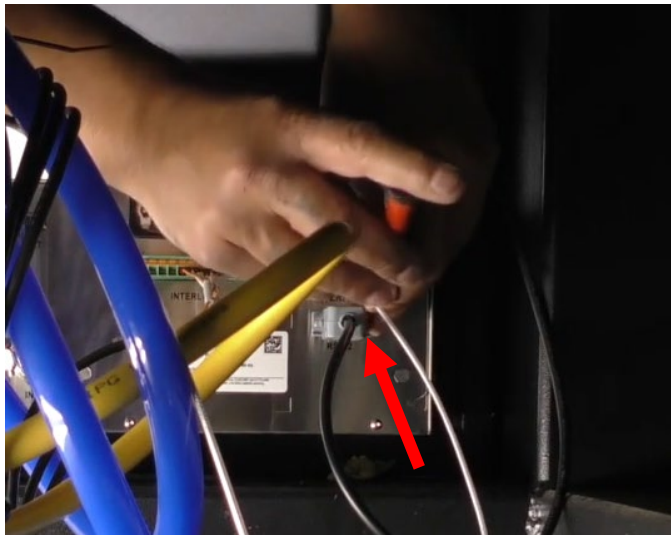
Figure 6–36

6.7   Laser Head Installation

28. Use an Allen key to remove the screws on the gantry cover.

Figure 6–37

a. Remove the laser lead line cover.

Figure 6–38

Figure 6–39

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29. Insert the cable through the hole
    form the bottom.
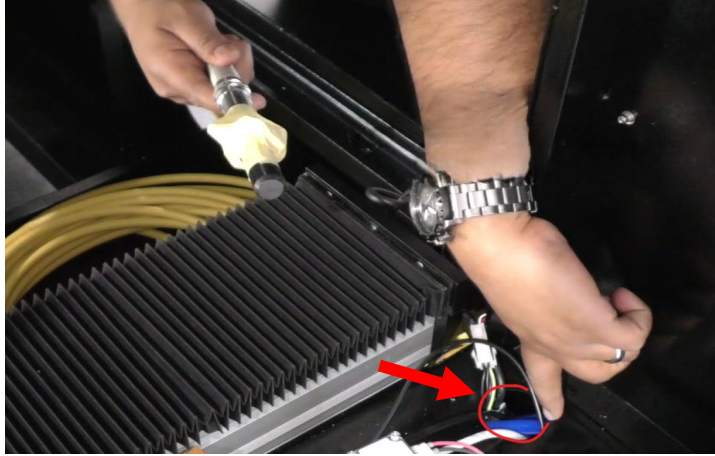
Figure 6–40
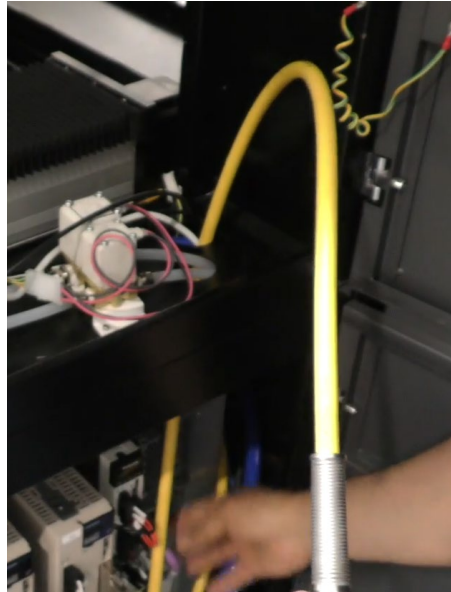
Figure 6–41

30. Pull through enough laser lead line so that it can reach the laser head. This line will be placed into the tracks.

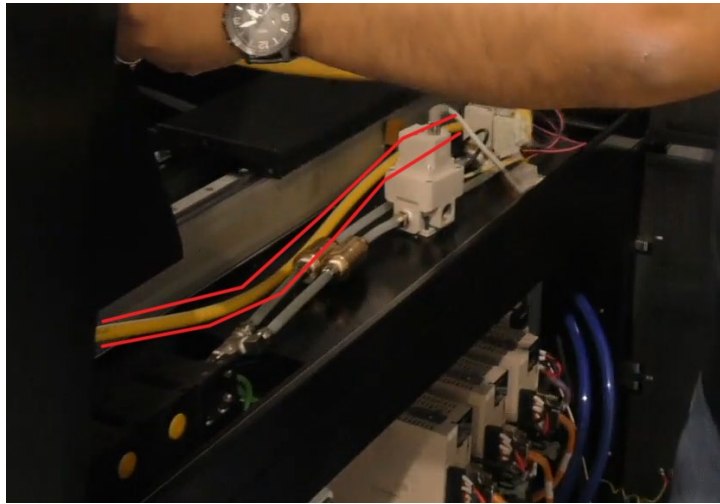*Figure 6–42*

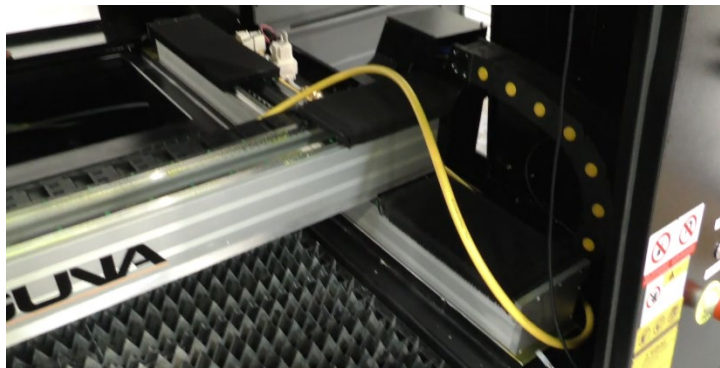31. Place the lead line along the gantry and track as shown in figures *6-44* and *6-45*.

Figure 6–43

Figure 6–44

32. Place the cable along the track as shown in figure *6-45* and *6-46*. (This is the general area the wire will be placed in the track).
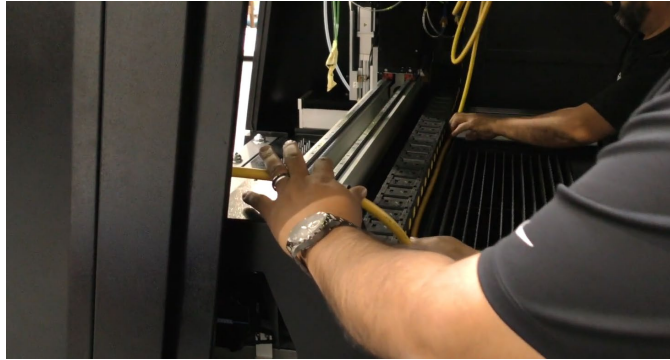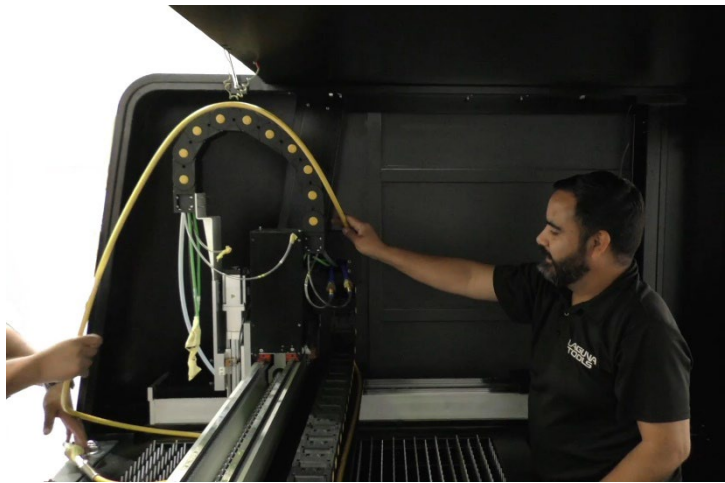

Figure 6–45

Figure 6–46

33. Use an Allen key to remove the screws on the cover over the gantry.

Figure 6–47
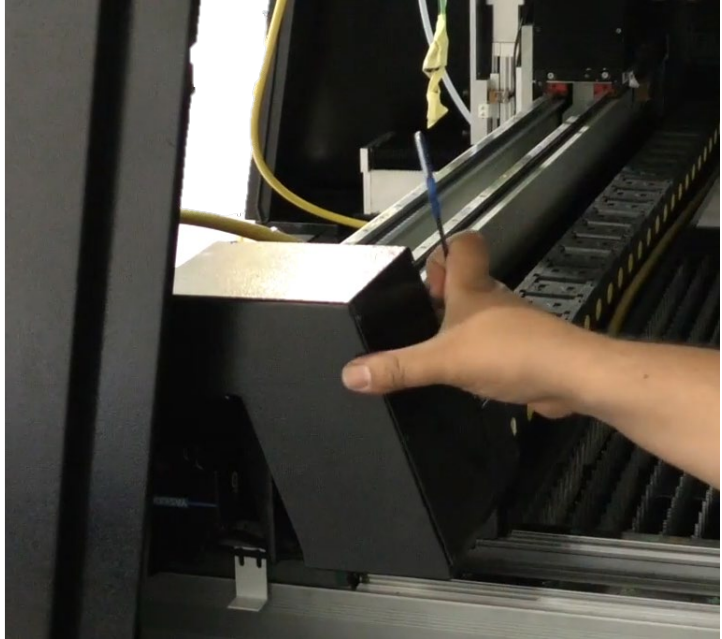
a. Remove the cover

Figure 6–48

34. On the cable track covers, insert a small flathead screwdriver into the hole on the cover.

   a. Use the screwdriver to pry the covers off.

> ⚠️ **CAUTION**
>
> *DO NOT break the covers.*
>
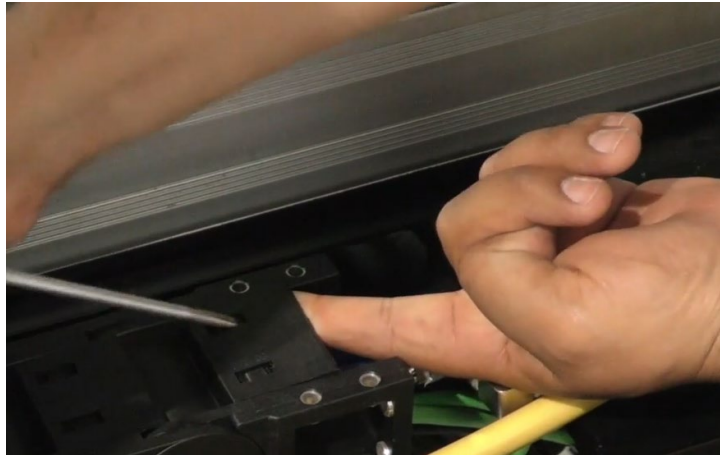> *DO NOT cut/nick the cable under the covers.*

Figure 6–49

35. Remove **all** the cable track covers.

   a. Do not forget about the covers near the laser head.

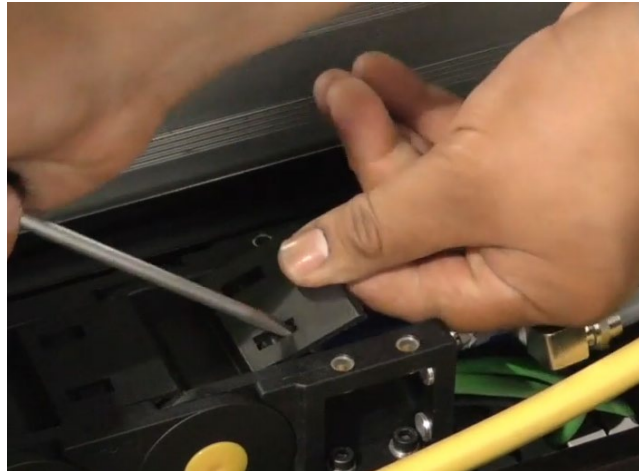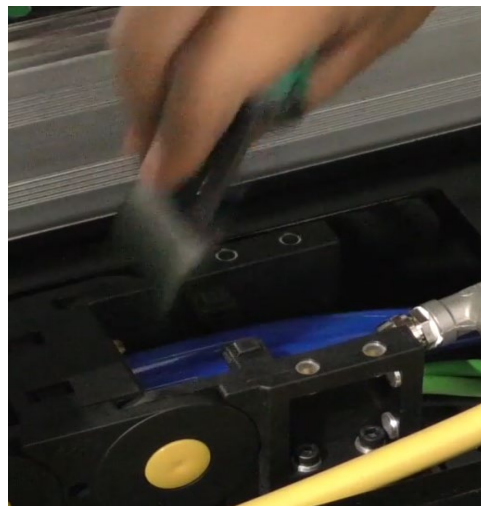   b. There are a lot of covers, this may take a while.

Figure 6–50

Figure 6–51

36. Once the covers are removed, position the laser lead line into the track.

    a. Place the end of the laser lead in the position shown in figure *6-53*.
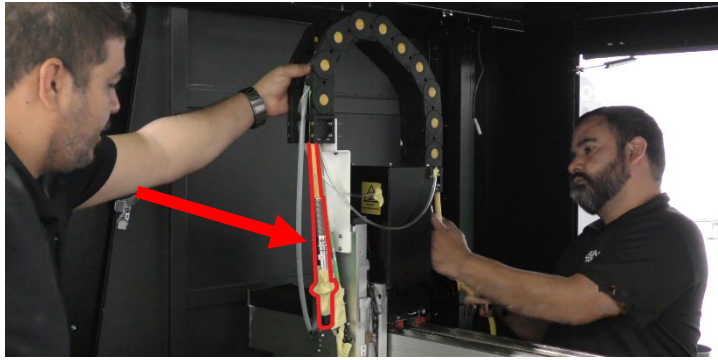

Figure 6–52

37. Push the gantry forward for better access for laser head installation.

Figure 6–53

38. Grab the laser head and remove the covers.

39. Blow compressed air into the connections and replace the covers. (this cleans out the connections)

LAGUNA

40. Align the laser head holes to the four outer bracket holes.

Figure 6–54
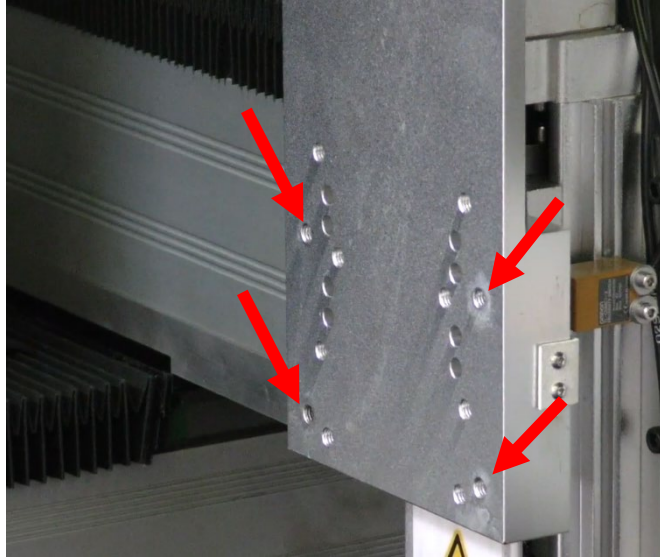
41. Use an Allen key to tighten the screws.
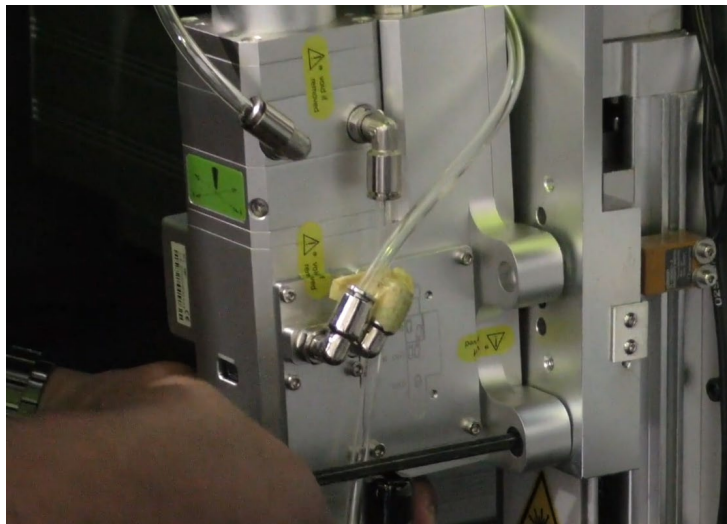
Figure 6–55

42. Remove the tape and black cover on the laser head and laser lead.

    a. Save the covers. Use them whenever the components are not in use.

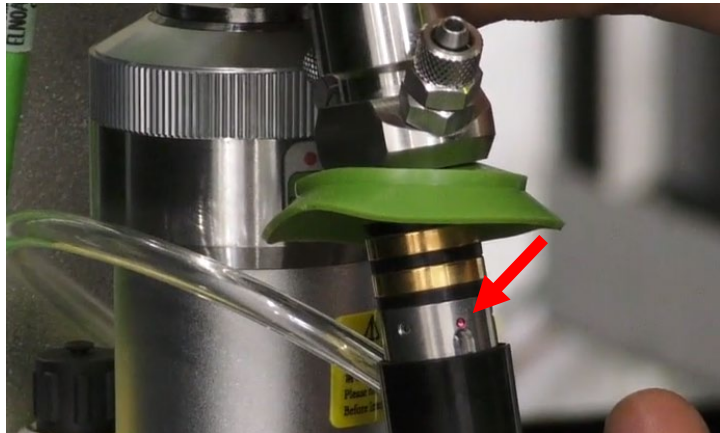   b. Take note of the red dot position on the laser lead.

Figure 6–56

43. Align the red dot and insert the laser lead into the laser head.

    a. Push and hold the laser lead down and twist the interlock clockwise to lock in place.

Figure 6–57

LAGUNA

44. Locate the green and black line.

    a. The green line (12 hole) is for the auto focus sensors.

    b. The black line (8 hole) is for the autofocus motor.
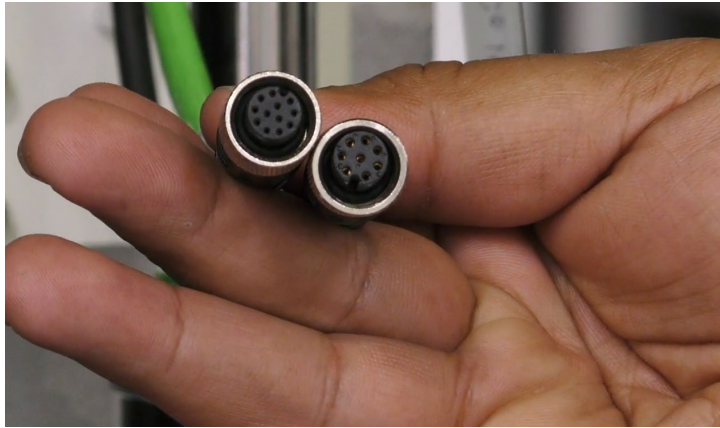
Figure 6–58

45. Remove the connector cover and insert the green line (12 hole) into the left-side connection.

    a. Turn the metal end clockwise to fasten it to the connection.

Figure 6–59

46. Remove the connector covers and insert the black line (8 hole) into the right-side connection.

    a. Turn the metal end clockwise to fasten it to the connection.

Figure 6–60

47. Locate the other green line (4 hole)

    a.   This line is for the crash and capacitance sensor.

Figure 6–61

48. Insert this green line (4 hole) into
the connection shown in Figure
6-62.
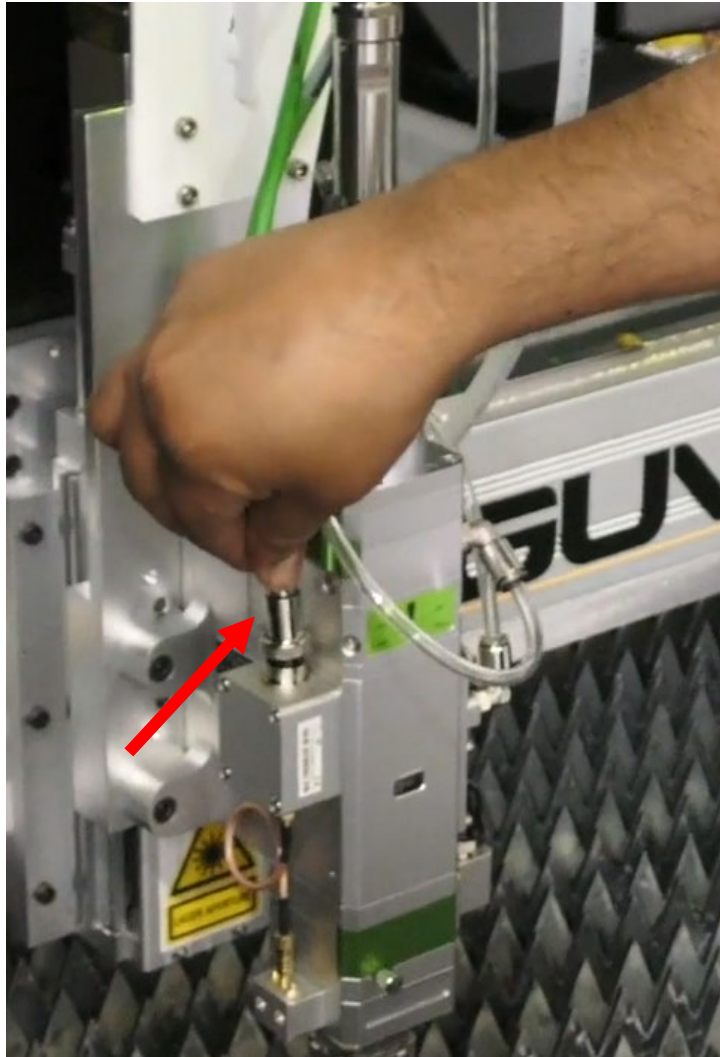
Figure 6–62

49. Locate the longer clear tube on
the laser head.

50. Insert this tube into the lower compression fitting shown if Figure 6-63

Figure 6–63

51. Locate the two short clear tubes.
    a. Locate their connections as well.

Figure 6–64

LAGUNA

52. Turn the metal end of the connection counterclockwise and pull it off.
HOLD ON TO THE METAL END. DO NOT LOSE THIS PIECE.

Figure 6–65

a. Slide this piece on the tube as shown in Figure 6-66.

Figure 6–66
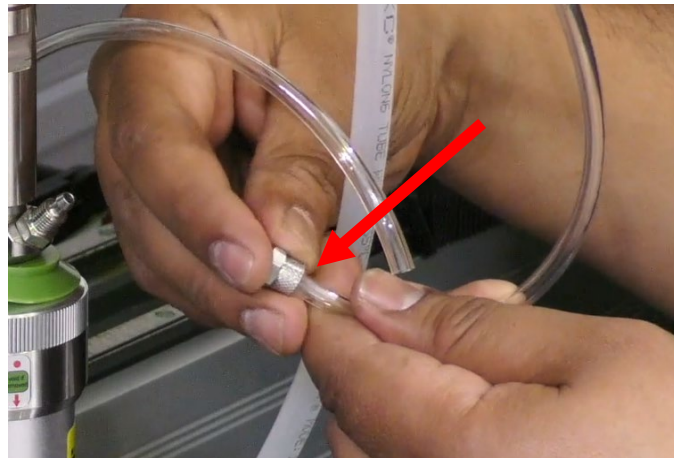
Figure 6–67

a. Press fit the tube on the connection port (It does not matter which tube goes where; the tubes form a loop.)

Figure 6–68

53. Slide the metal end down and turn clockwise to tighten.

Figure 6–69

54. Do this to the other side as well.

   a. Verify the connections are fully tightened. **Do not overtighten them.**

Figure 6–70

55. Locate the gas air assist line.
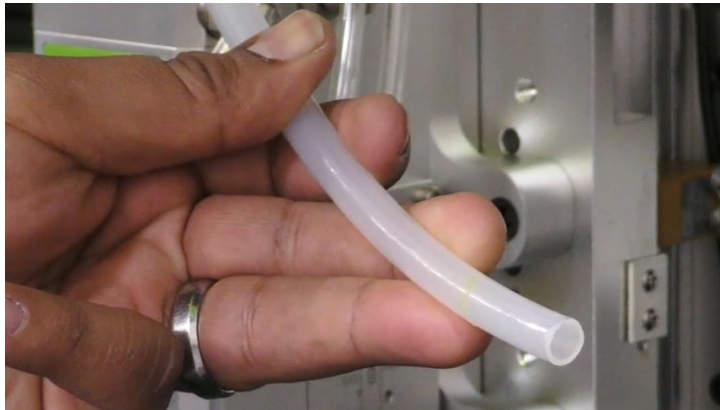
Figure 6–71

   a. The connection is made at the lower part of the laser head.
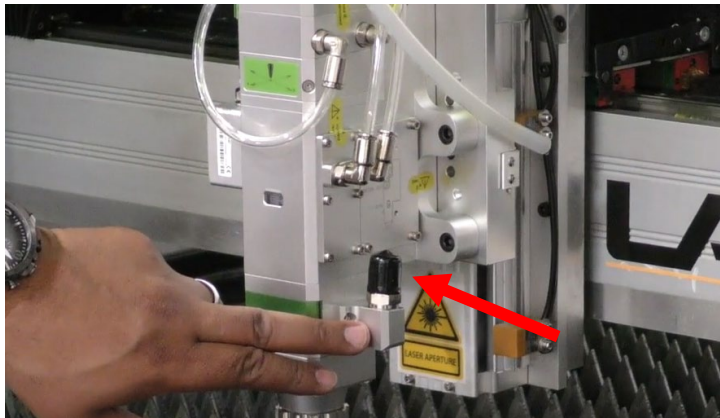
Figure 6–72

56. Remove the black cover and insert the air assist line into the connection fitting shown in Figure 6-73

   a. Verify the air assist line is fully inserted.

Figure 6–73

57. Slide the gantry cover back.

Figure 6–74

LAGUNA

58. With a clean rag, wipe off all the cosmoline lubricant that is on the metal below. (the lubricant helps prevent corrosion during shipping).

Figure 6–75

Figure 6–76

59. Do this to the laser head gantry rail as well.

Figure 6–77

60. On the front of the machine, place the laser lead line cable inside the track.
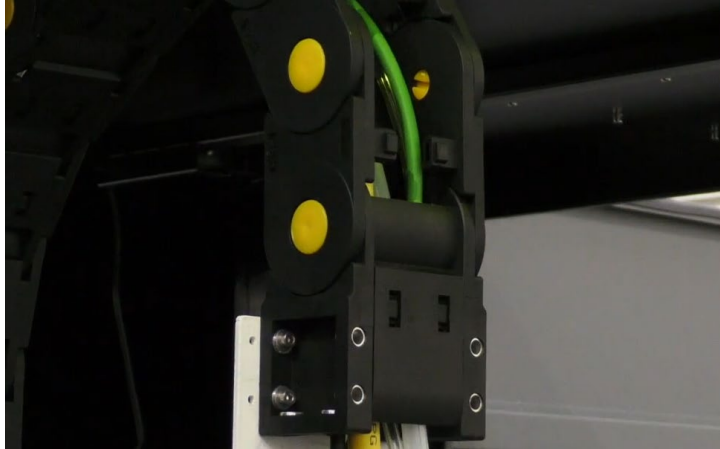
61. In this area, replace the covers by press fitting them onto the track.
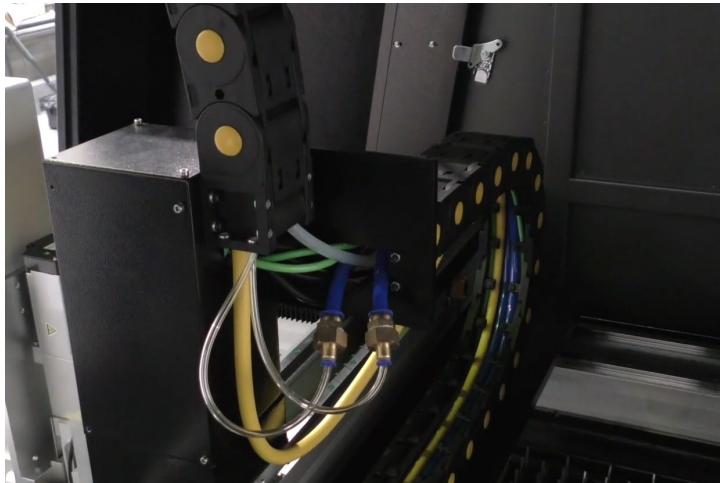
Figure 6–78

Figure 6–79

62. Push the gantry to the back of the machine

Figure 6–80

You will now need to take apart a track link to slide the laser lead line cable into the track.

63. Using a flathead screwdriver, pop out two or three yellow pins to free one of the links.
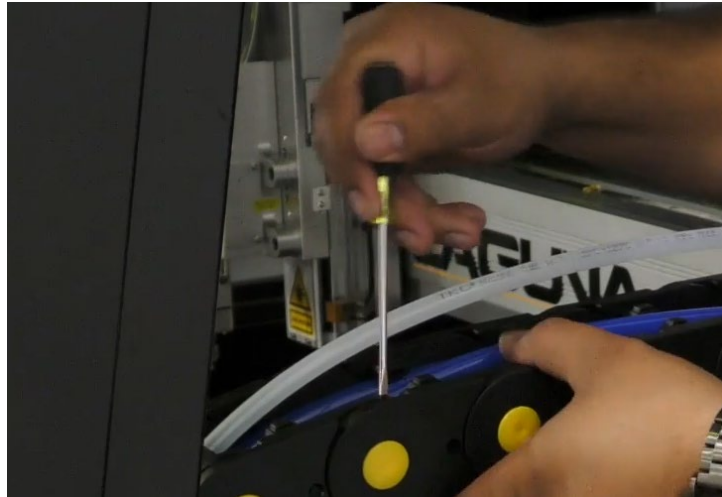
Figure 6–81
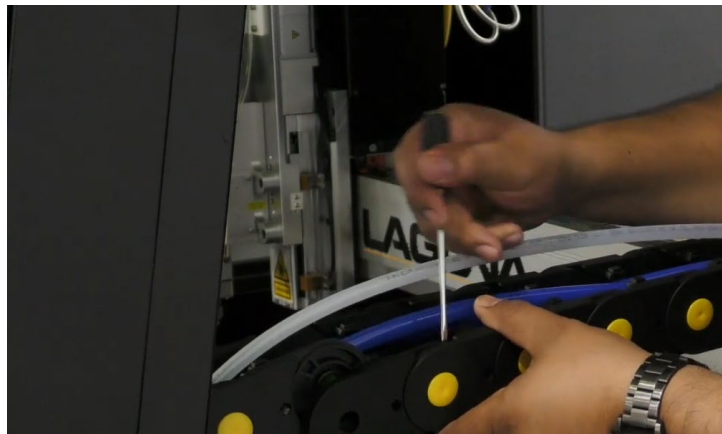
Figure 6–82
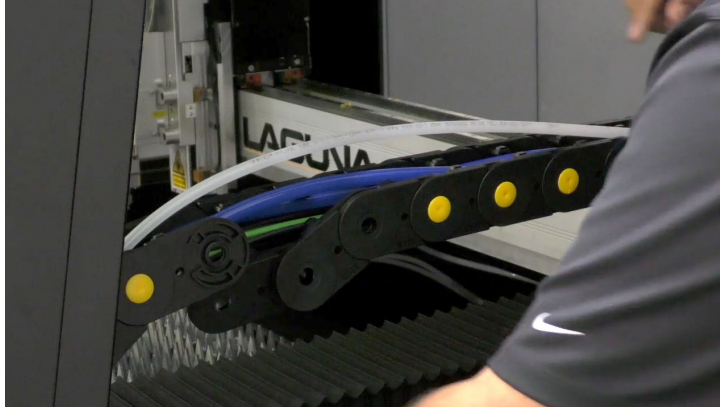
Figure 6–83

64. Once a link is free, place the laser lead line into the cable channel.
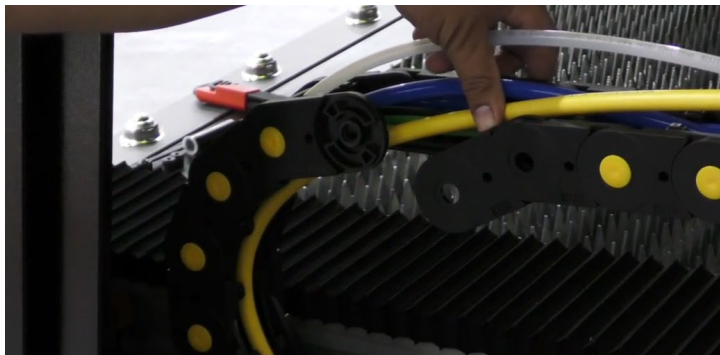
Figure 6–84

65. Replace the links and reinsert the yellow pins.
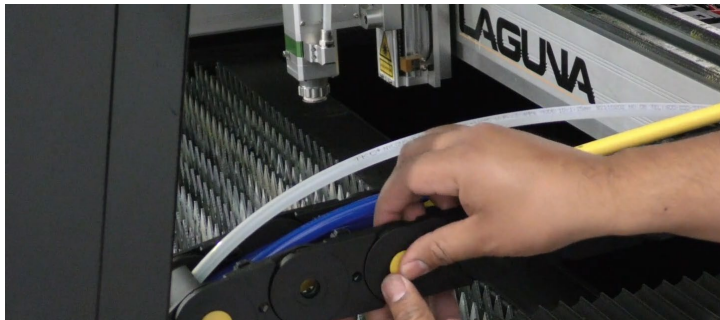
Figure 6–85

66. Position the laser lead line into the rest of the track.
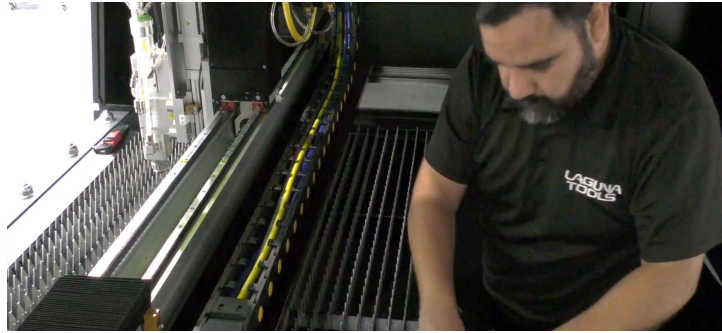
Figure 6–86

67. Verify that the laser lead line is correctly positioned inside the full length of the track and replace **all** the track covers by push fitting them into position.

Figure 6–87

68. Verify that all covers are correctly placed.

69. Pull the excess slack back through the hole.

Figure 6–88

70. Coil the cable into the top compartment.

Figure 6–89

71. Replace both gantry covers.
    a. Tighten the screws with an Allen key.
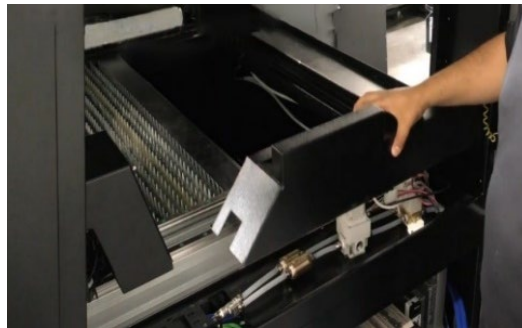
Figure 6–90

Figure 6–91

LAGUNA

72. Reinstall the power supply cavity
    cover.
    a. Tighten the screws with
       an Allen key.

Figure 6–92

73. Reinstall the rear machine cover.
    a. Tighten the screws with
       an Allen key.
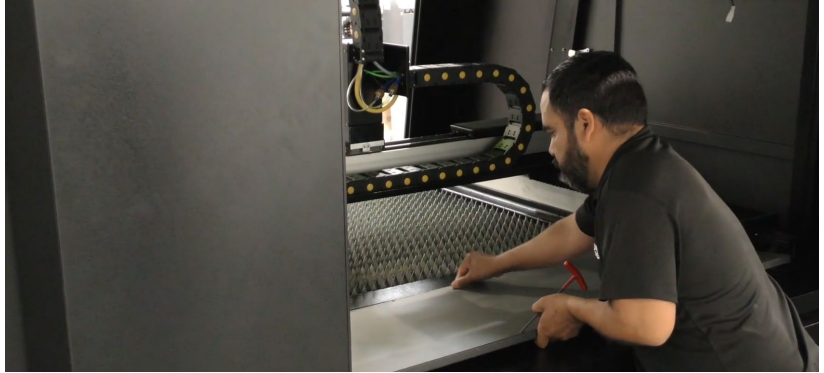
Figure 6–93

Figure 6–94

74. Put the power supply cavity door
    back on and close the door.

Figure 6–95

6.8   Display Swivel Arm

NOTE

It is recommended to use two people to install the swivel arm.

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75. On the inside of the machine, use an Allen key to remove the screws on swivel arm mount cover.

Figure 6–96

76. The swivel arm will be placed on the machine wall here and mounted with Allen screws.

Figure 6–97

77. Use an Allen key to remove the screws from the swivel arm. (hold on to the screws)

Figure 6–98

78. Align the holes and hold the swivel flat against the machine wall.

Figure 6–99

79. Use an Allen key to tighten the screws from the back side.

Figure 6–100

80. Locate the HDMI and power cable that came with the swivel arm.

81. "Feed" these cables through the center hole of the swivel arm.

Figure 6–101

82. Use a Phillips screwdriver to remove the four mounting screws. (hold on to these screws)

Figure 6–102

83. Align the mount screw holes to the swivel arm and use a Phillips screwdriver to tighten the screws in place.

Figure 6–103

84. Locate the monitor and use an Allen key to remove the screws on the back. (hold on to these screws)
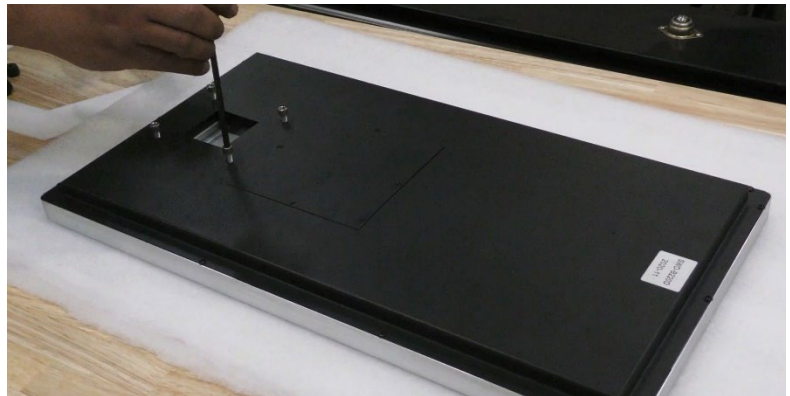
Figure 6–104

85. Align the monitor screw holes to the mount and use an Allen key to tighten the screws in place.

Figure 6–105

LAGUNA

86. Use a Philips screwdriver to remove the screws on the back of the monitor cover.
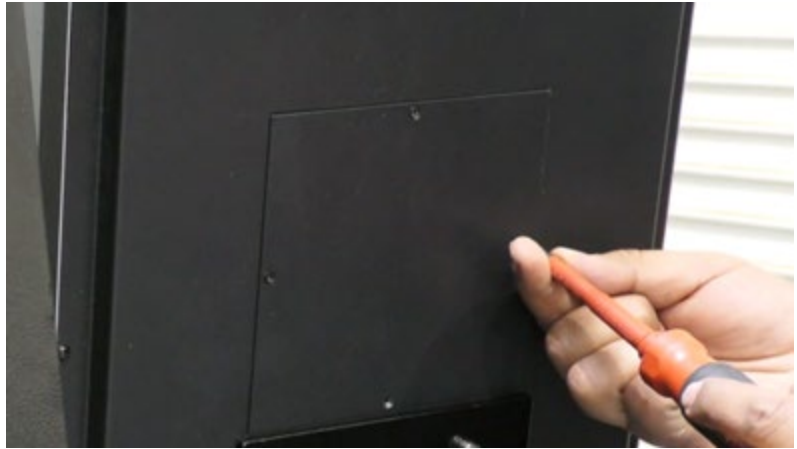
Figure 6–106

87. "Feed" the cables through the center hole and plug in the HDMI and connection cables to the monitor as shown in Figures 6-107 and 6-108

Figure 6–107

Figure 6–108

88. Replace the cover

    a. Use a Phillips screwdriver to replace the screws.

89. Locate the keyboard and mouse and retrieve the USB dongle from the bottom of the mouse.

Figure 6–109

LAGUNA

90. Insert the dongle into one of the machine's USB ports.

Figure 6–110

91. In the front of the electrical compartment, you'll find a bundle of wires which is shown in Figure 6-111.

92. Remove the wires from the machine and extend and place them on the ground.
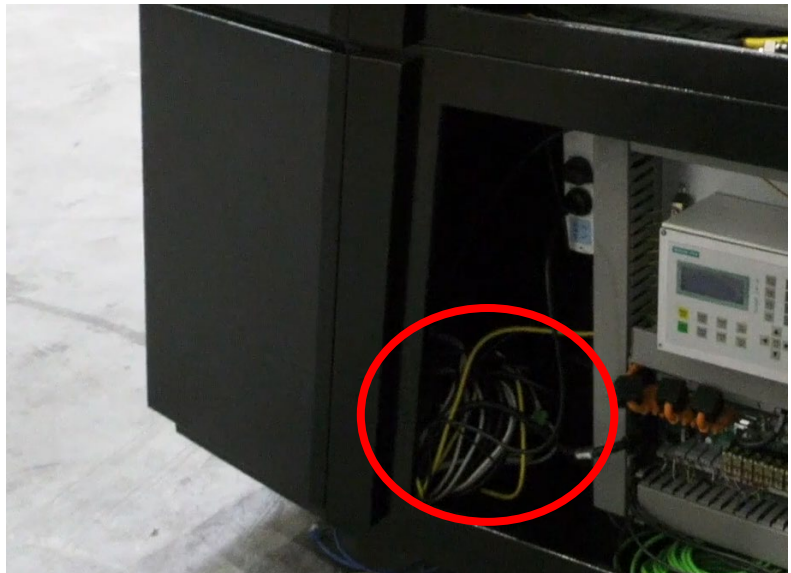
Figure 6–111
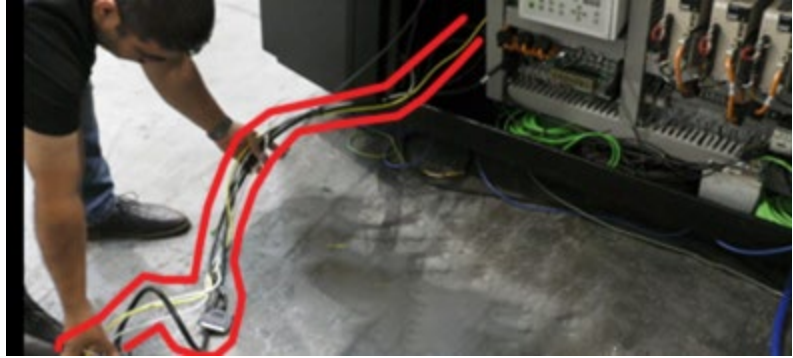
Figure 6–112

93. Place the PC in the machine.

Figure 6–113

Figure 6–114

LAGUNA

94. Insert the SCSI Plug 1 into the port.

    a. Fully tighten by turning the knobs clockwise on either side.
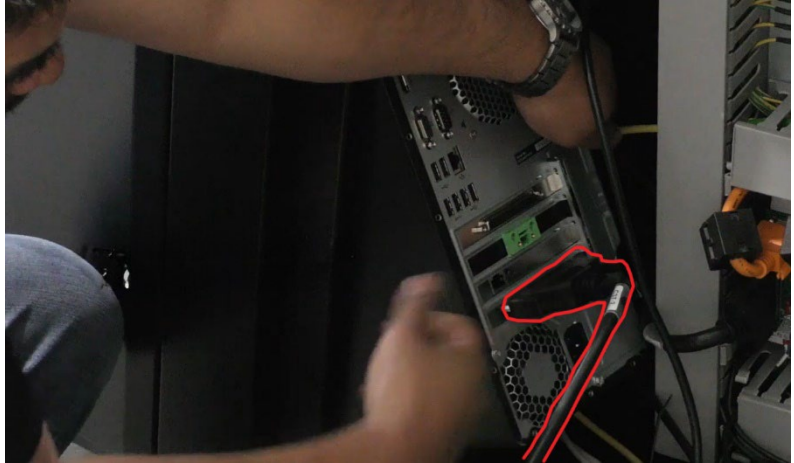
Figure 6–115

1. Insert the Remote ON/OFF plug into the port.
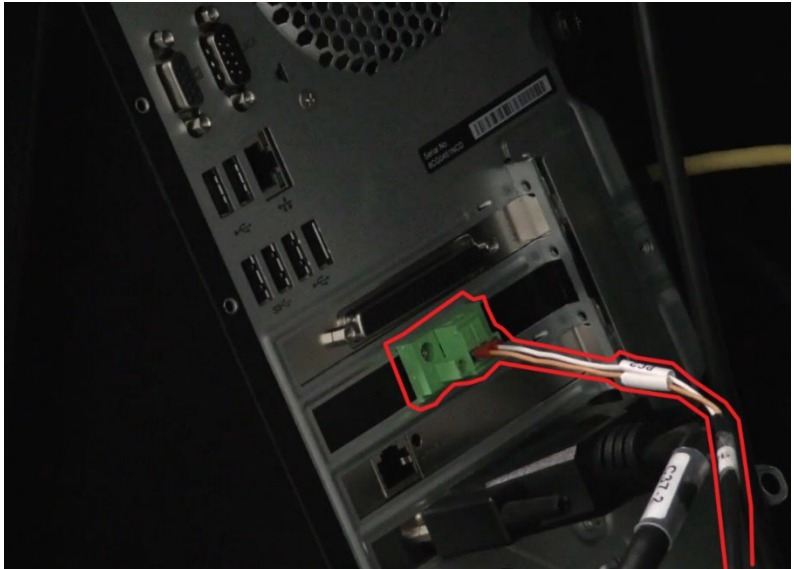
Figure 6–116

2. Insert the SCSI plug 2 into the port.

   a. Fully tighten by turning the knobs clockwise on either side.

Figure 6–117

3. Insert the Ethernet cable into the port.

Figure 6–118

LAGUNA

4. Insert USB 1 and USB 2 into both ports.
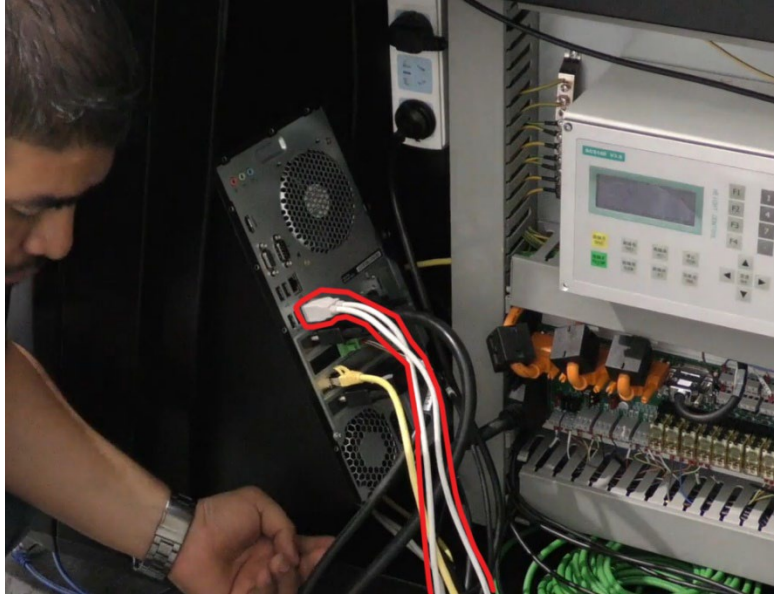
Figure 6–119

95. Insert the machine communication plug into the port.

   a. Use a small flathead screwdriver to tighten the screws on either side.
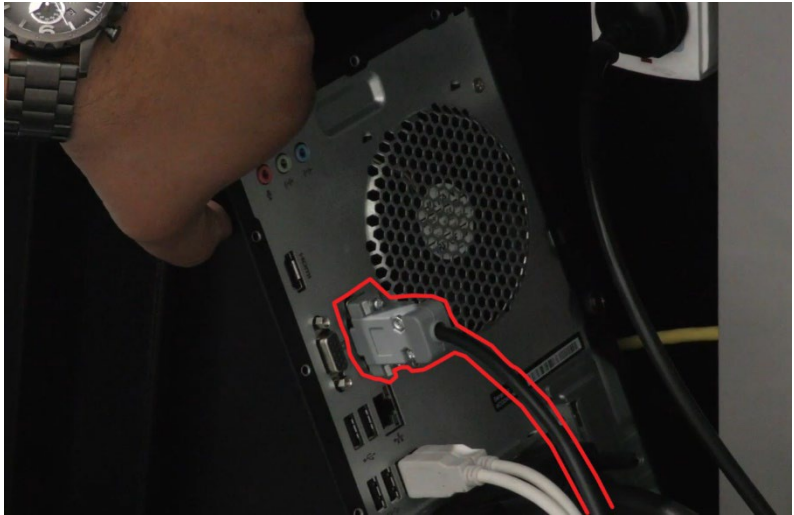
Figure 6–120

5. Insert the HDMI cable into the
    port.
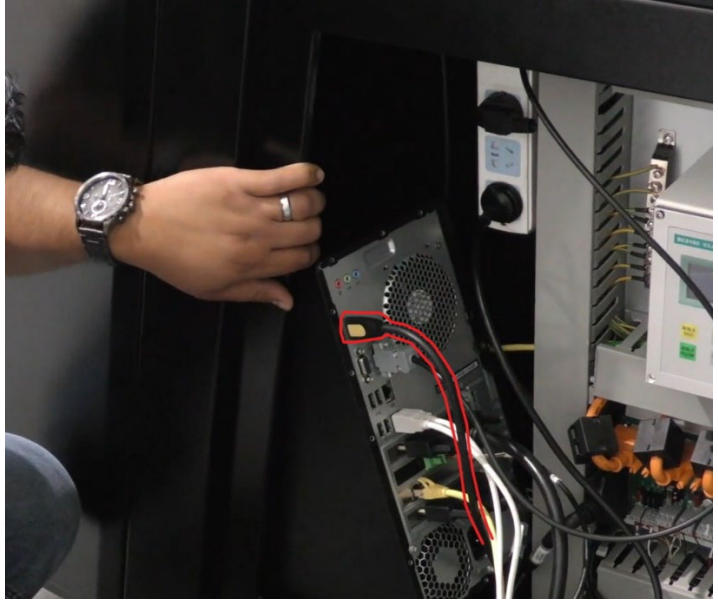
Figure 6–121

6. Insert the power cable into the
    port.
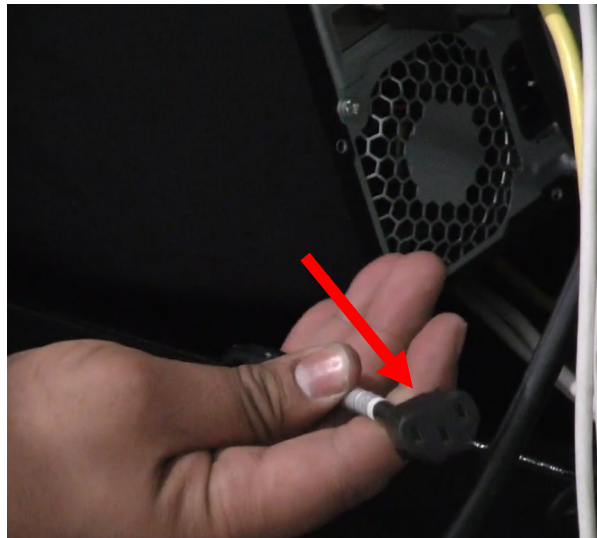
Figure 6–122

Figure 6–123

7. Move the PC to the front of the cavity.

Figure 6–124

8. Replace the swivel arm mount cover.
    a. Use the Allen key to tighten the screws.

Figure 6–125

9. Locate the table cabinet LED lights.

Figure 6–126

10. There are two electrical plugs on each side. Plug these into the ends of the light.

Figure 6–127

Figure 6–128

LAGUNA

11. Press the light fixture into the light mount brackets

Figure 6–129

12. Do this to the other side as well. (one side has only one plug)
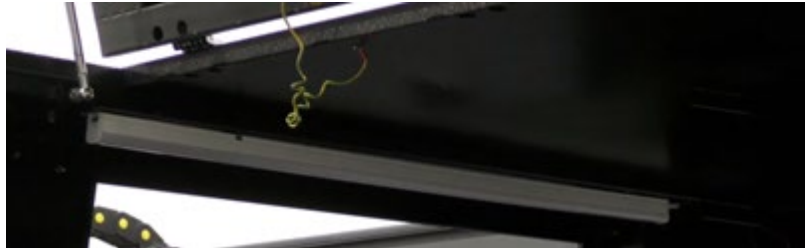
Figure 6–130

13. To mount the status light, use an Allen key to remove the screws on top of the machine. (hold on to these screws)
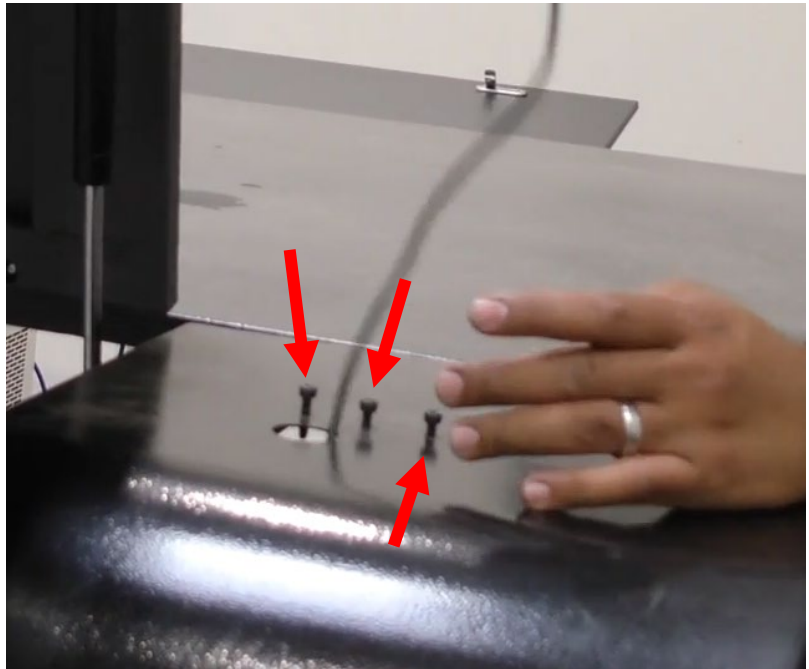
Figure 6–131

14. Insert the connection cable down through the hole.

Figure 6–132

15. Use an Allen key to tighten down the screws on the status light.
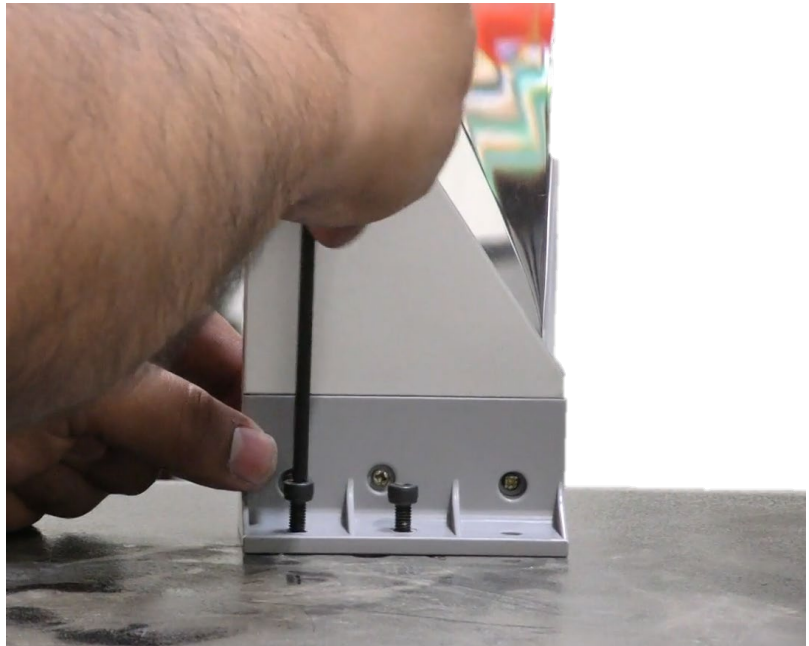
Figure 6–133

16. Inside the cabinet, locate the 4-pin connection plug and connect them together. (these are for the status light)

Figure 6–134
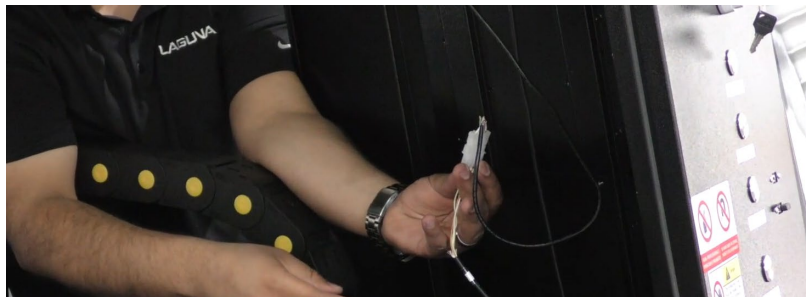
Figure 6–135

17. Once connected place down the side of the machine.

Figure 6–136
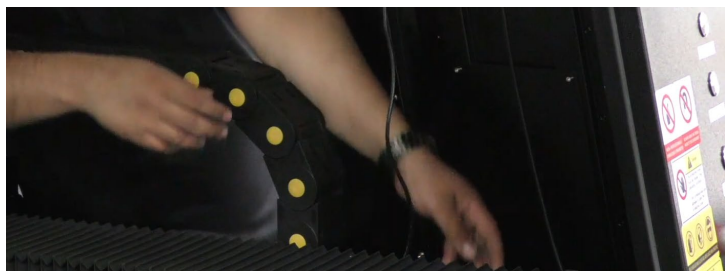
Figure 6–137

6.9   Chiller Installation

1. Move the chiller to the back of the machine.

2. The low side indicated with the letter "L" will cool the power supply.

Figure 6–138

3. The high side indicated by the letter "H" will cool the optic system.

Figure 6–139

4. Locate the machine water **OUTLET** hose and connect it to the chiller **INLET (L)** connector.

Figure 6–140

5. Locate the machine water **INLET** hose and connect it to the chiller **OUTLET (L)** connector.
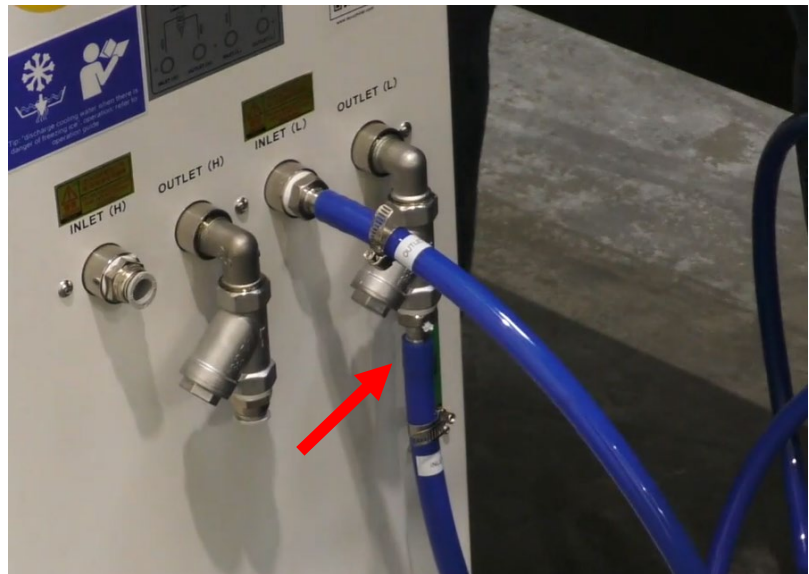
Figure 6–141

6. Use a small Phillips screwdriver to tighten the hose clamp screws and secure both hose clamps.

Figure 6–142

7. Locate the optic cooling lines (smaller blue tubes) and insert them into the machine.
   a. These form a loop with the laser head, so it does not matter which tube goes where.

Figure 6–143

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8. Connect the other ends to inlet (H) and outlet (H) chiller machine.

    a. These form a loop with the laser head, so it does not matter which hose goes where.

9. Locate the chiller alarm cable.

Figure 6–144

10. Connect the 4-prong end of the alarm cable to the machine.
    a. Rotate the metal end clockwise to tighten.
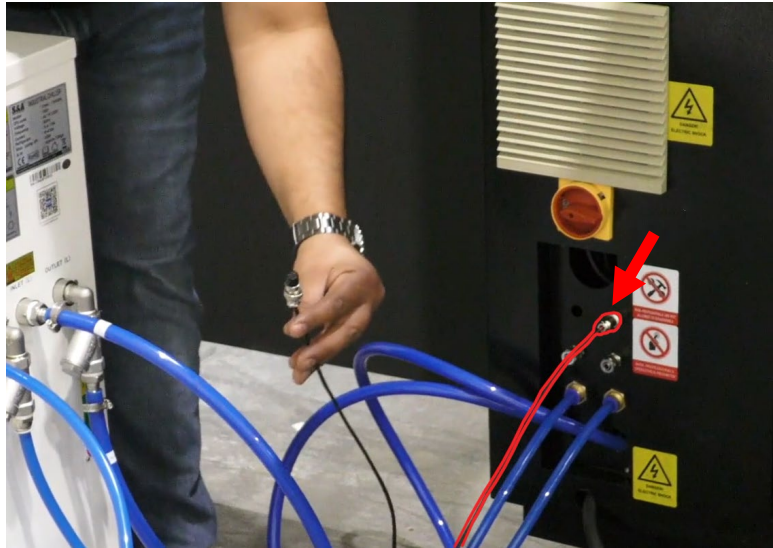
Figure 6–145

11. Connect the 3-prong end to the chiller.
    a. Rotate the metal end clockwise to tighten.

Figure 6–146

LAGUNA

6.9.1 Chiller Power Cable

1. From the control panel side, "feed" a stiff wire through the back hole that is next to the alarm cable.
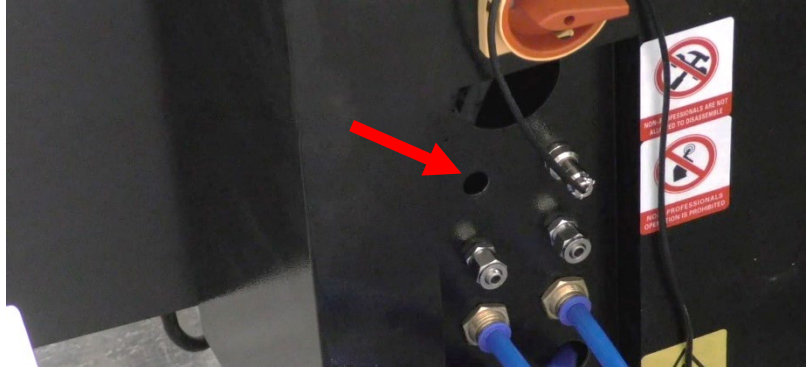
Figure 6–147

Figure 6–148

2. Tape the chiller power cable to the stiff wire. This will act as a "snake" to help "fish" the wire through.

Figure 6–149

3. "Feed" the chiller power cable through.

    a. Remove the tape
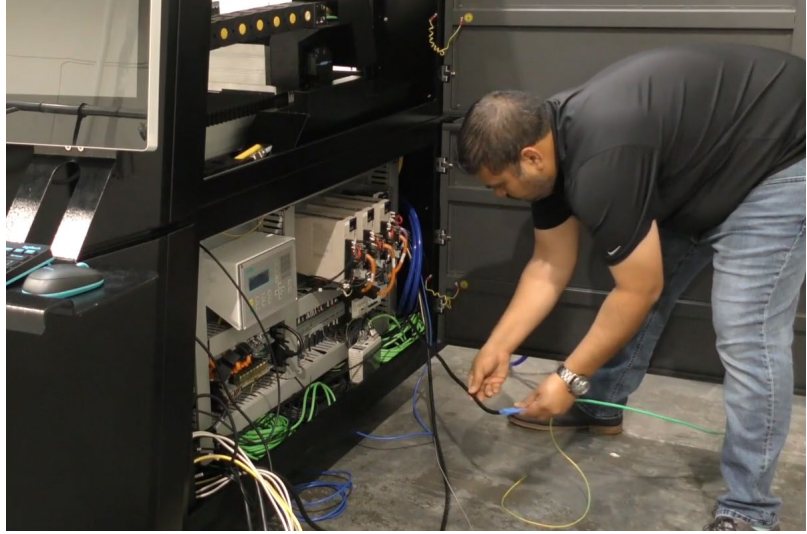
Figure 6–150

4. Locate the power cord for the chiller the tape was removed from.

    a. It's a 220 volt single phase connection.

Figure 6–151

LAGUNA
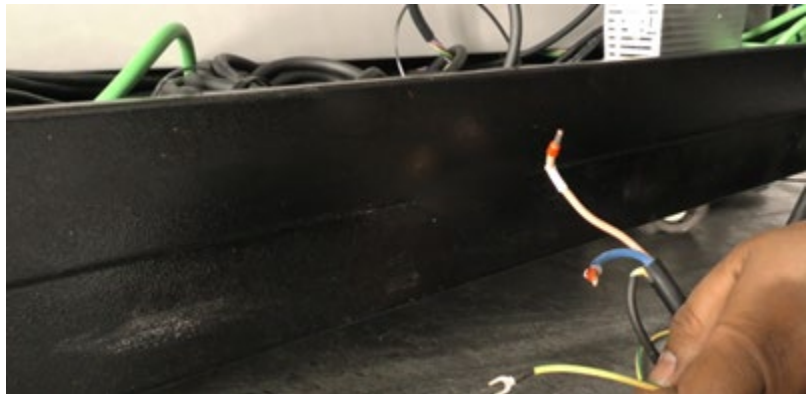
Close up of terminals.
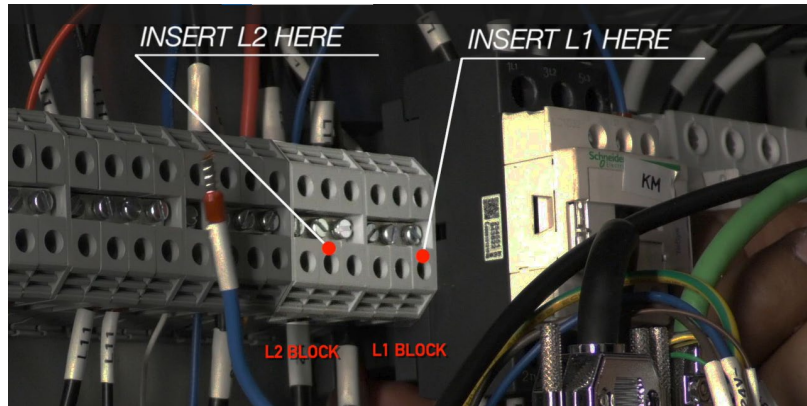
Figure 6–152

5. Insert the tan wire into the L1 block terminal and use a small Phillips head screwdriver to tighten the lead.
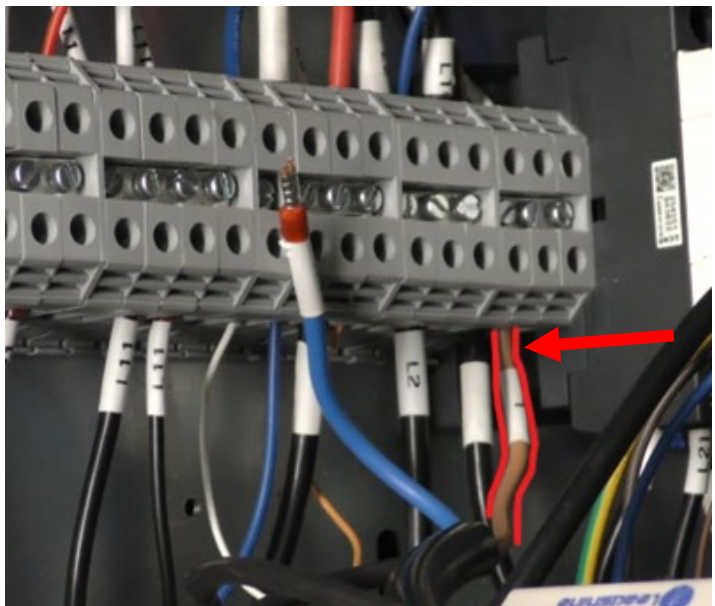
Figure 6–153
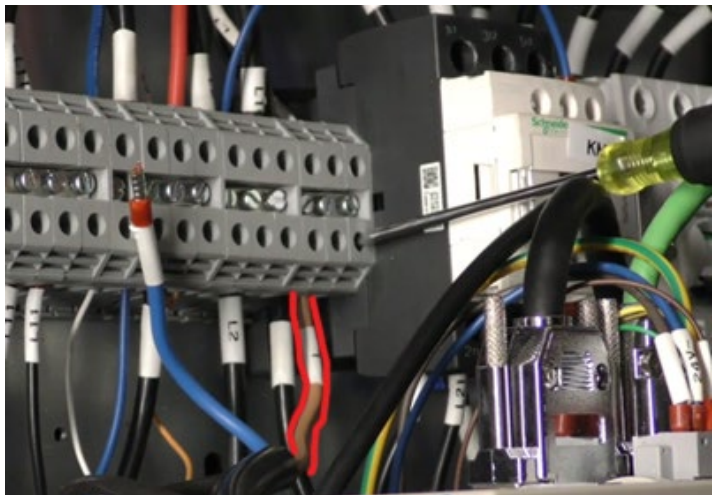
Figure 6–154

6. Insert the blue wire into the L2 block terminal and use a small flathead screwdriver to tighten the lead.
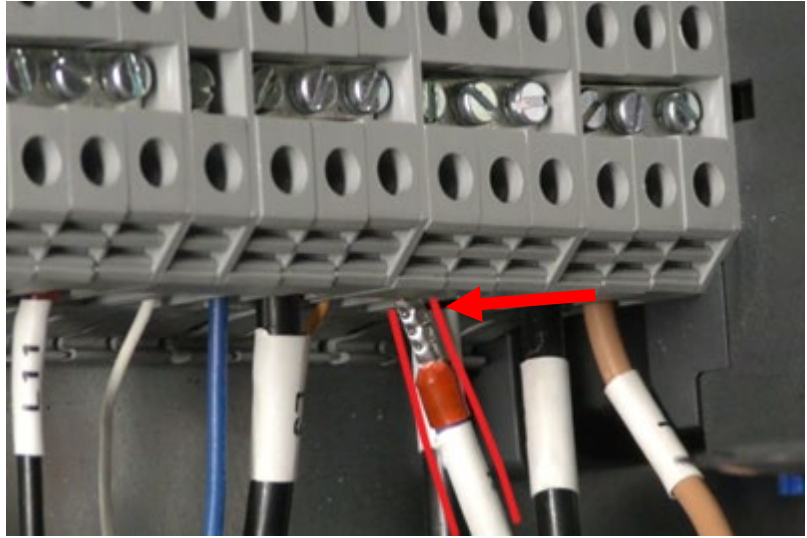
Figure 6–155

Figure 6–156

96. Locate the control panel ground wire and pair it with the chiller ground wire.

    a.   The ends have a u-shape

Figure 6–157
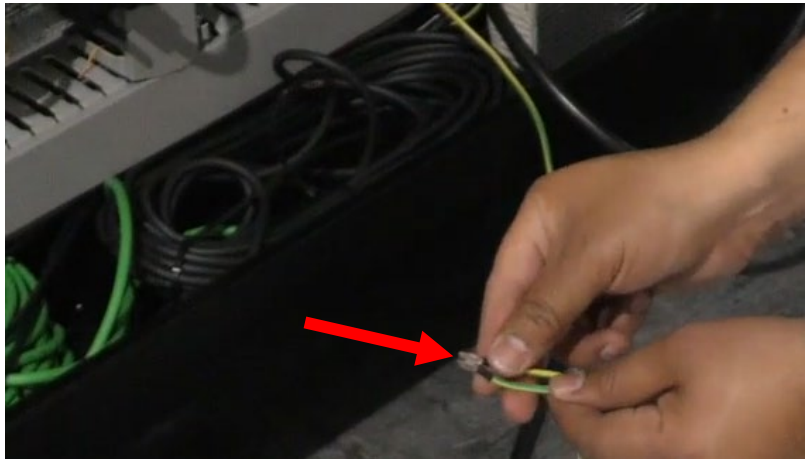
Figure 6–158

7. Connect both wires to the same ground wire terminal.

    a.   Use a small Philips screwdriver to tighten the wires into the terminal.
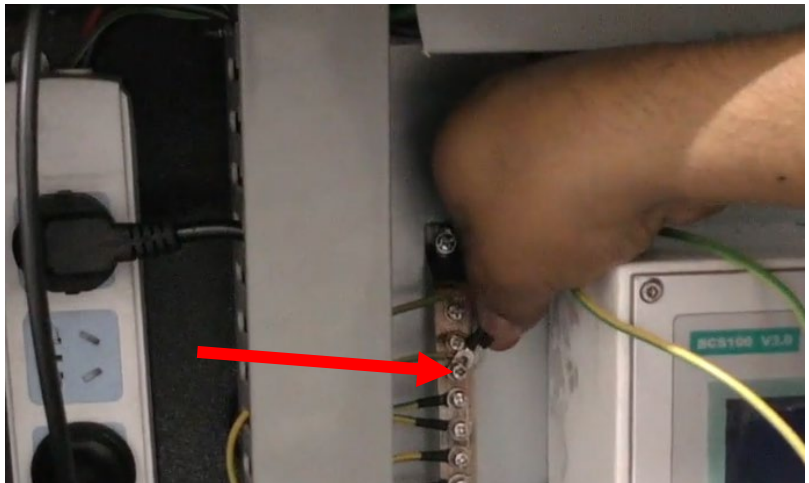
Figure 6–159
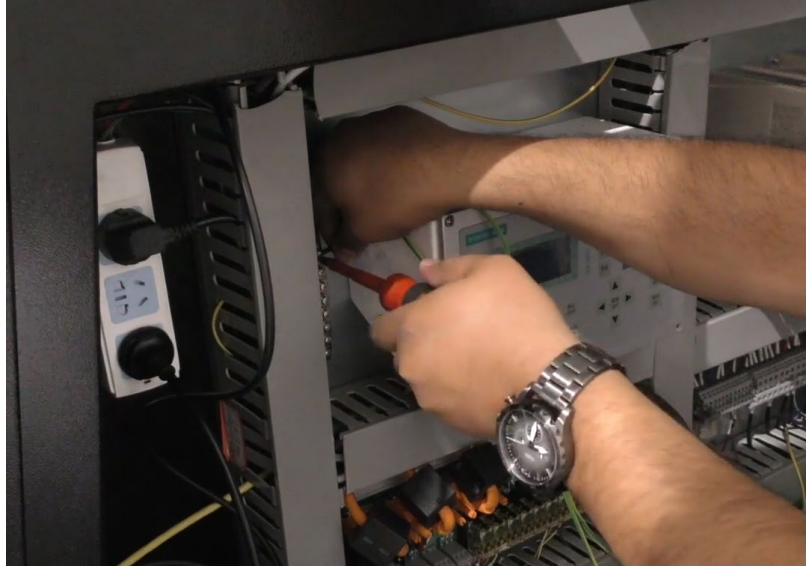
Figure 6–160
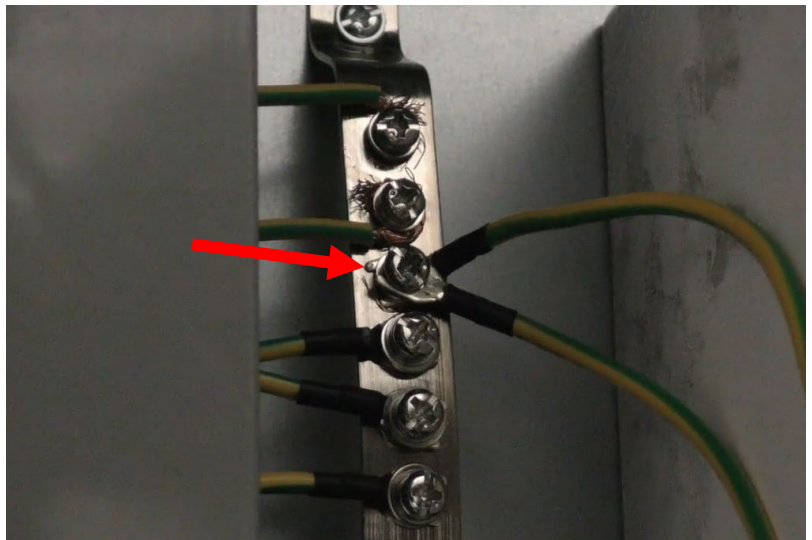
Figure 6–161

8. Locate the PWM connection cable which is marked with a P+ and P-.

    a. They are going to be lying in the cabinet.
    b. These leads will be plugged into the terminals in the control panel.

Figure 6–162

Enhanced view of the terminals.
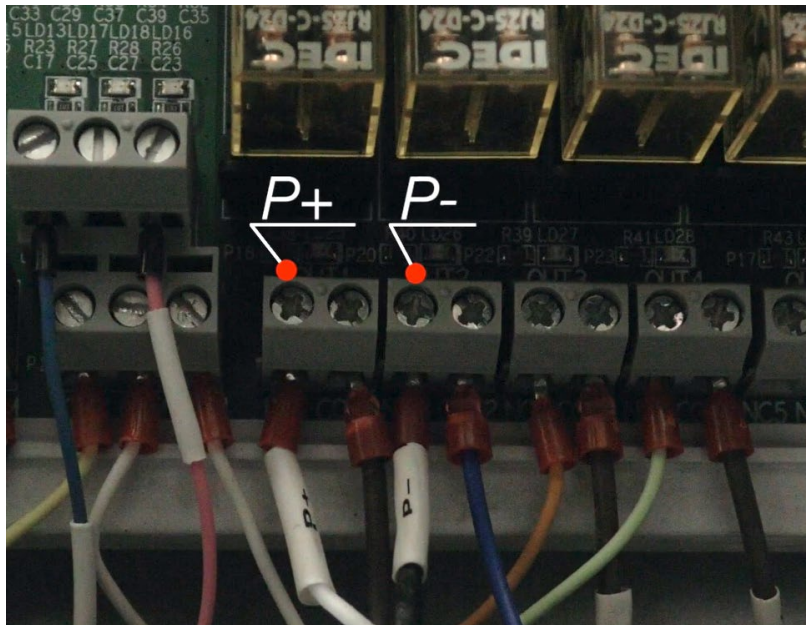
Figure 6–163

9. Insert the P+ (positive) lead into the terminal shown in Figure 6-165

    a. Use a small flathead screwdriver to tighten the lead into the terminal.
    b. Verify the lead is secure in the terminal.
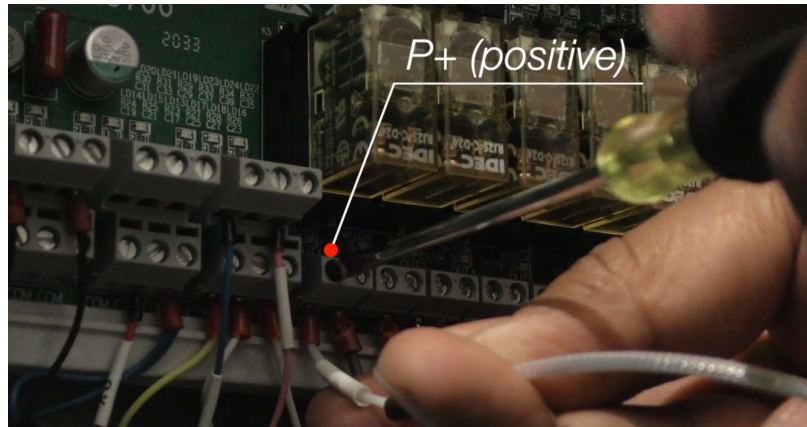
Figure 6–164

10. Insert the P- (negative) lead into the terminal shown in Figure 6-166

    a. Use a small flathead screwdriver to tighten the lead into the terminal.
    b. Verify the lead is secure in the terminal.
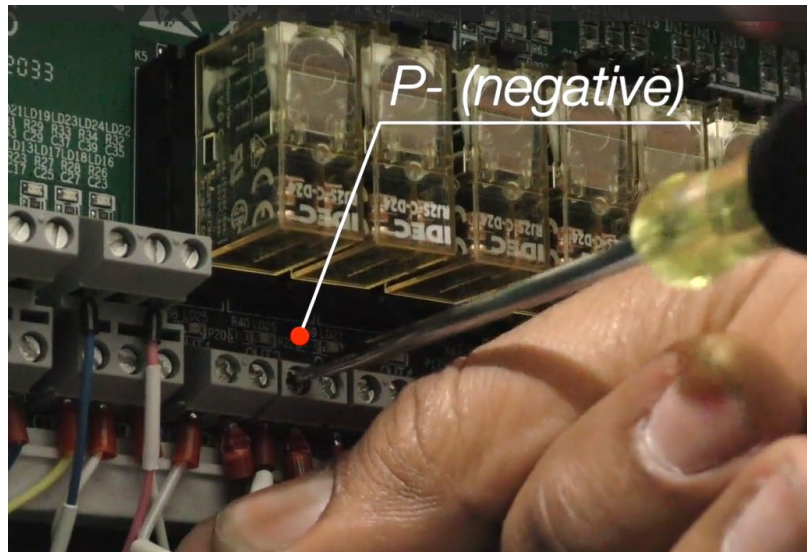
Figure 6–165

11. Place the PWM cable inside the cabinet.

Figure 6–166

LAGUNA
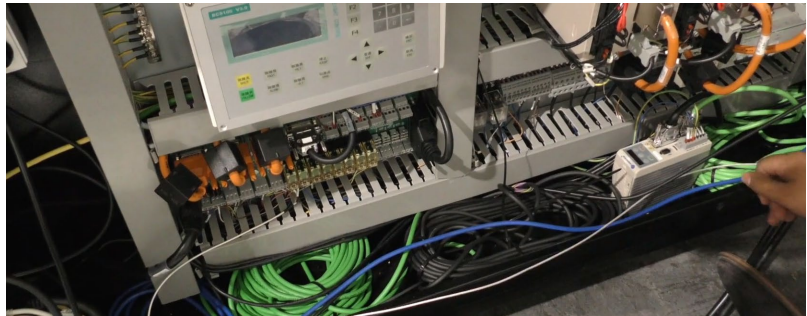
12. Coil up the blue Ethernet cable
and place it inside the cabinet.

    a.   This cable is for
diagnostic use.
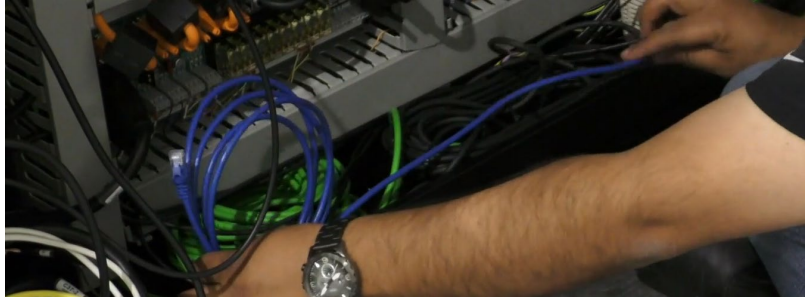
Figure 6–167
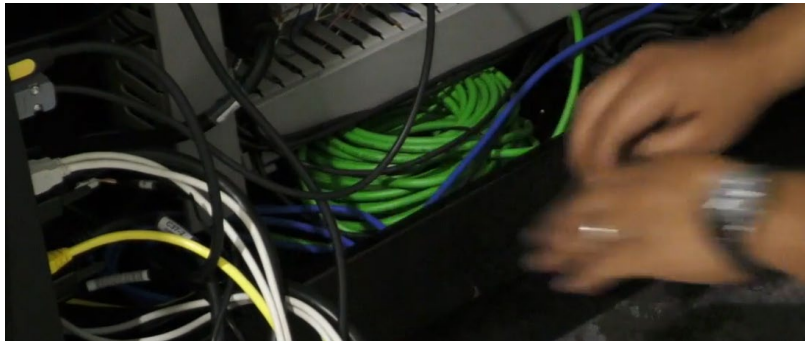
Figure 6–168

6.10 Connecting the Main Power Supply

1. Locate the main power supply
wires. One is blue and one is
brown.

    a.   The wires will be in the
machine.

2. Insert the brown wire into the L2 block terminal.

   a. Use a small flathead screwdriver to tighten the lead.
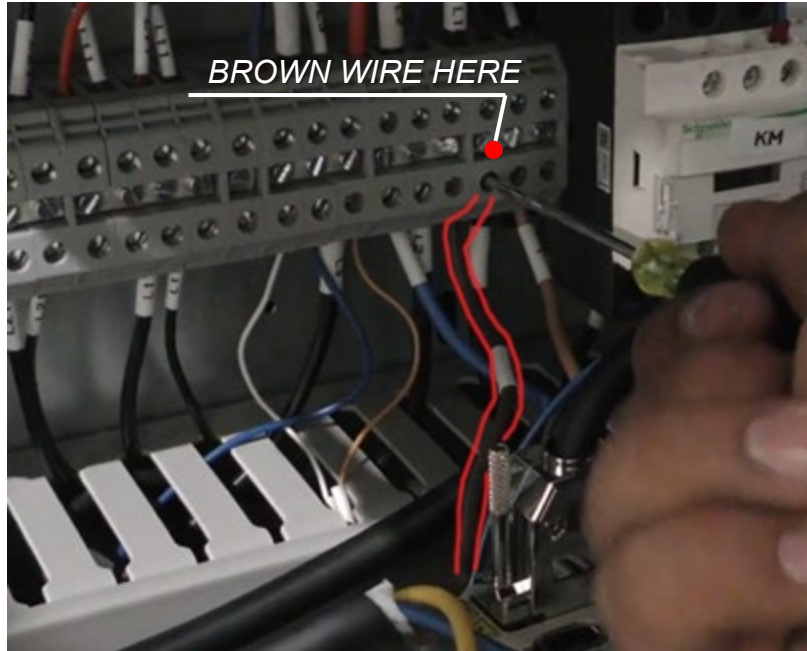
Figure 6–169

3. Insert the blue wire into the in the area shown in Figure 6-171.

   a. Use a small flathead screwdriver to tighten the lead.

Figure 6–170

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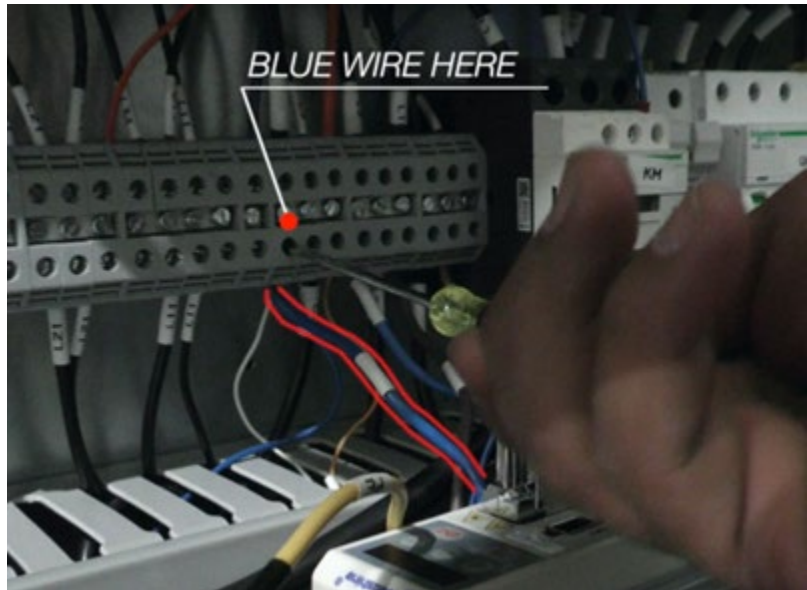
Verify all the electrical
connections are secure.

4. Tuck away all the cords inside
    the cabinet.

Figure 6–171

Figure 6–172

6.11 Handheld Controller

5. Attach the controller to the front of the machine.

    a. It is magnetic

Figure 6–173

6. Plug the antenna USB into the USB port on the PC.
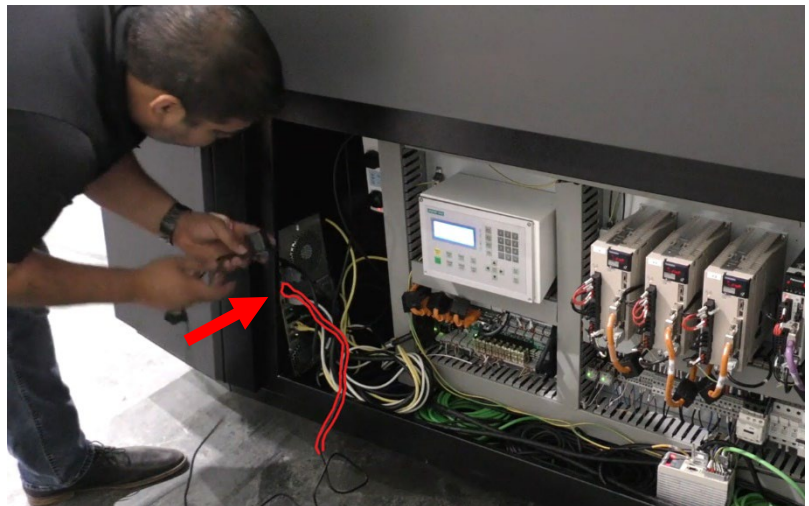
Figure 6–174

7. Attach the antenna to the inside of the cabinet.

    a. The antenna is magnetic
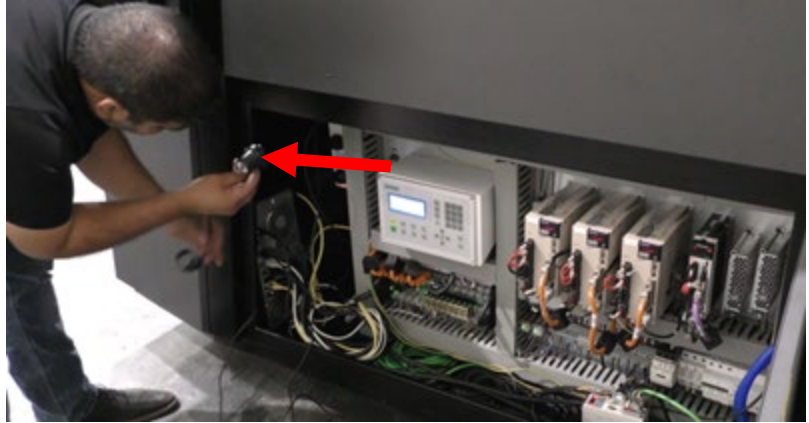
Figure 6–175

Figure 6–176
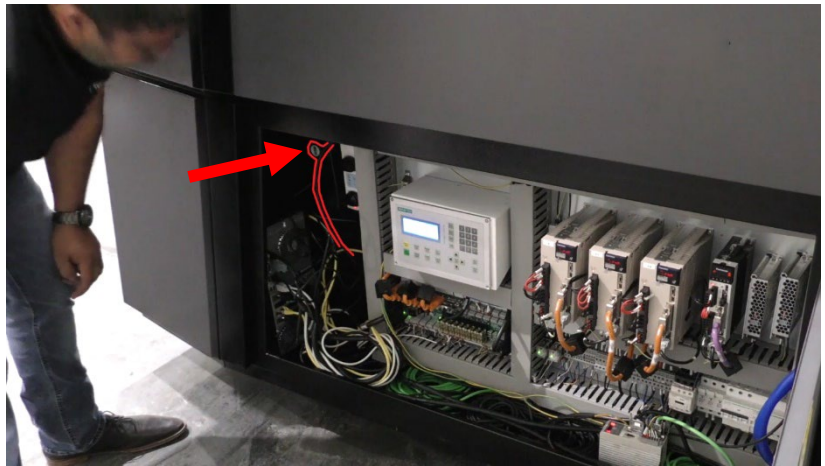
Figure 6–177

8. Close the control panel door.

Figure 6–178

6.12 Gas Connection and hookup

Connect the gas hoses to the gas ports on the back of the machine.
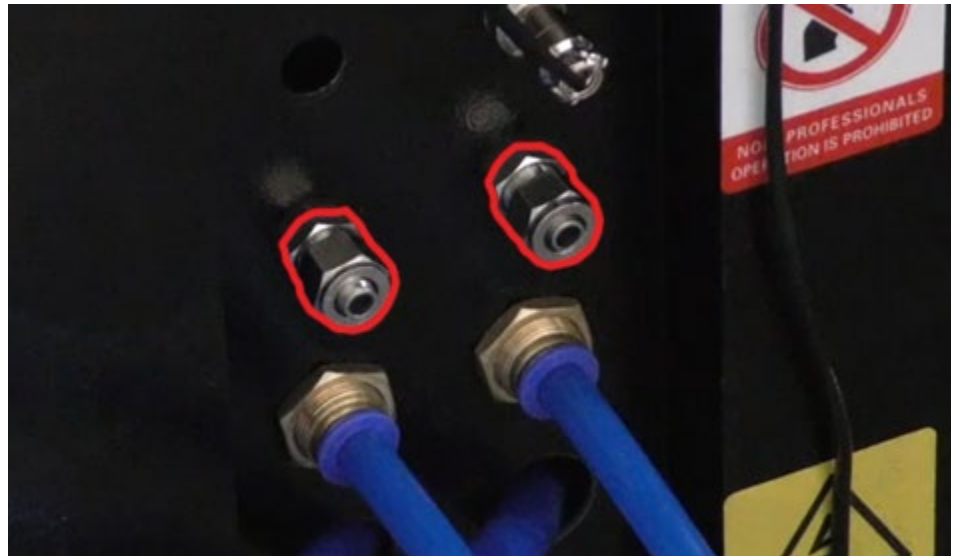
Press fit the hoses and then use a crescent wrench to turn the nut clockwise to tighten.

Connect the hoses to ports on the regulators. (verify that the hoses match up to their respected ports on the machine and regulators)

⚠️**DANGER**

DO NOT open the open the gas at this time. Only open the gas when setup is complete and a cut is ready to be made.
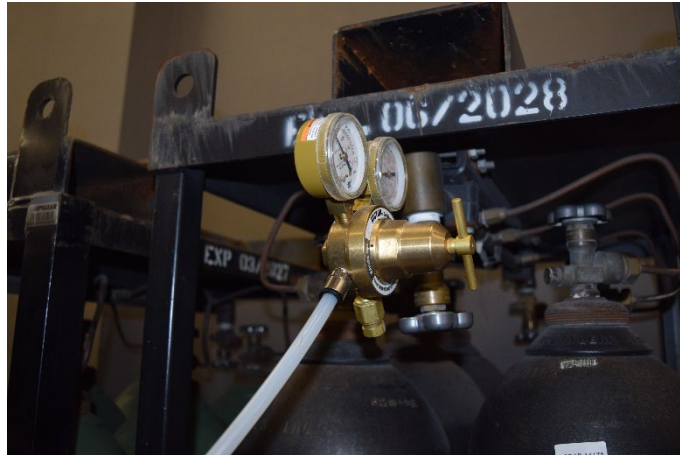
Figure 6–179

Figure 6–180

9. Fill the chiller with 4 gallons (15 Liters) of distilled water or until the full level is reached.

Figure 6–181

Figure 6–182

LAGUNA
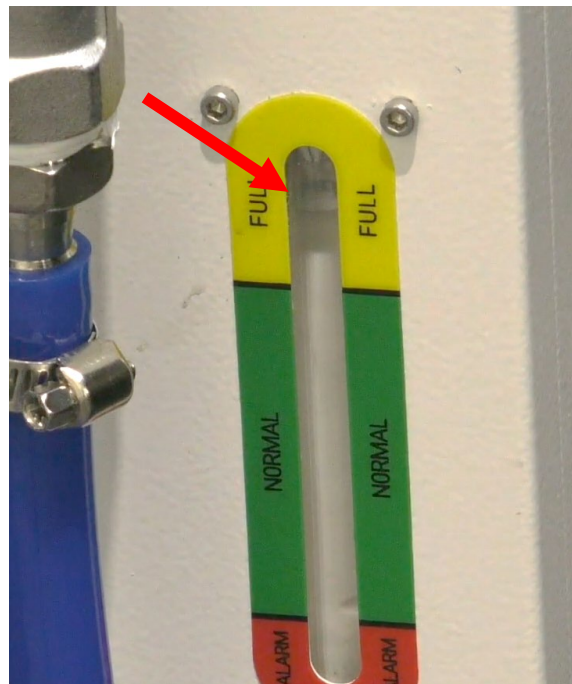
10. Connect the machine power lines to a triple phase 220 Volt outlet.

Figure 6–183

11. After connected to power, turn the main power switch clockwise to where the switch is vertical.

    a. The machine should now have power engaged.
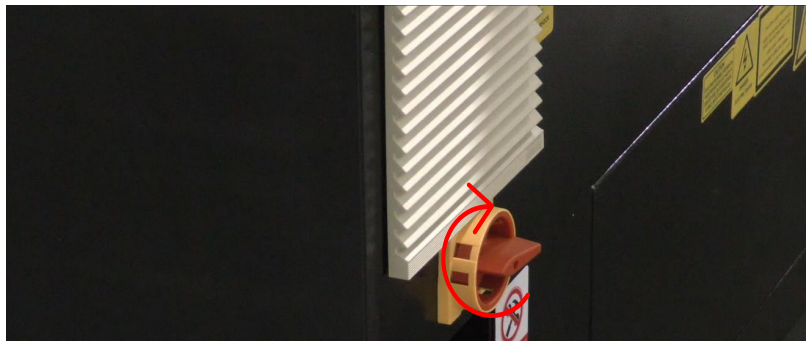
Figure 6–184

Figure 6–185

12. Turn the chiller power switch clockwise to turn it on.

    a. The machine will make a series of beeps. This is normal. It is the alarm. The beeps will stop once water has circulated through the machine.

Figure 6–186

Figure 6–187

13. Verify the emergency stop is disengaged.

   a. Pull and turn the knob clockwise to verify it is in the "out" position.
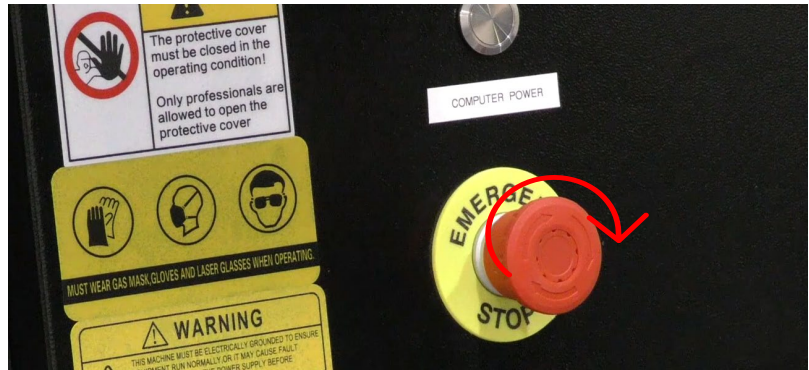
Figure 6–188

Figure 6–189

14. Turn the power key clockwise to engage the power to the machine.

    a. The status light will illuminate to indicate the machine is receiving power.
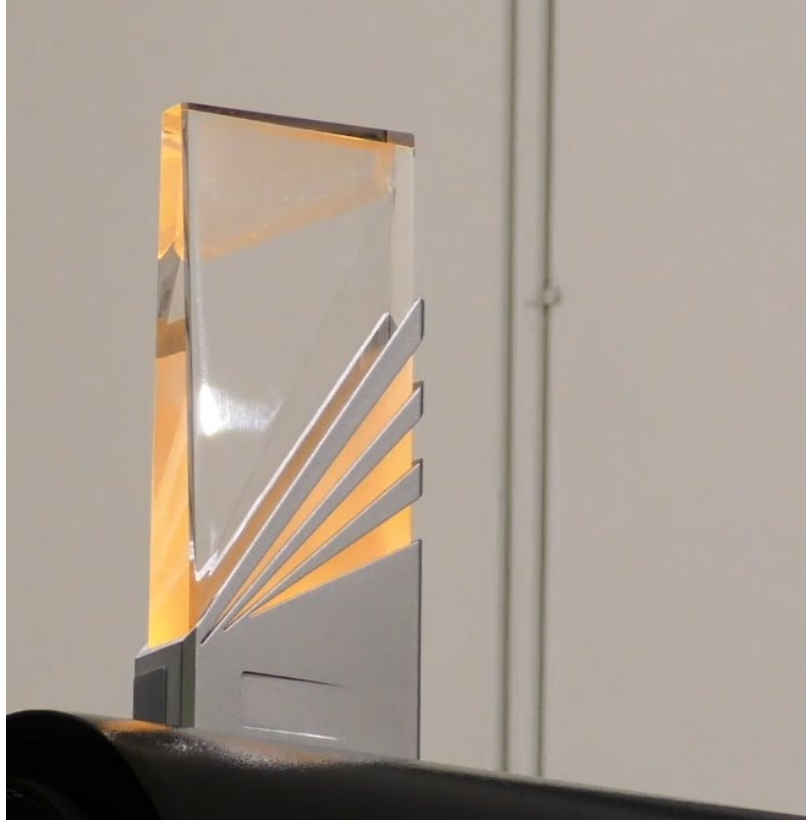
Figure 6–190

15. Press the PC button.

    a. The PC will boot up and the display screen will engage.

Figure 6–191

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16. Press the "light" button to verify the light is working.
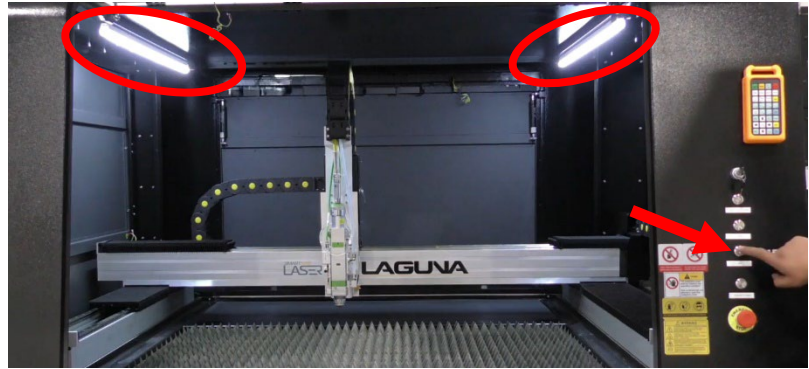
Figure 6–192

17. Close and secure all doors.
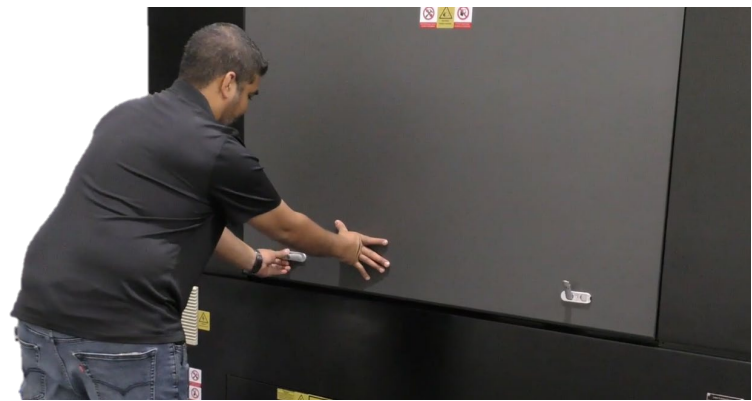
Figure 6–193

7.0 Remote Control Interface

Start–The machine starts the laser cutting process.

Pause- Pauses the laser cutting process.

Dry Cut – Starts the laser process without the laser light (idle). Traces the design

Stop– Stops and turns off the process completely.

Blow– Blows air from nozzle. This can be used to check for leaks in the gas line and to blow dust off the nozzle.

Follow–Lowers the laser head to the material. Make sure the material is directly under laser nozzle or damage may occur.

Shutter– Switches the machine's laser source on and off.

Aiming – Switches the laser pointer (red dot) on/off. Allowing the laser head to be positioned correctly.

PT LOC – Returns to the cutting point if STOP is accidentally pressed. If you move the working head after stopping PT LOC will not work.

Back– Moves the laser head back a step

Foward– Moves the laser head forward a step.

Laser – Pulses the laser once.

K1– Command button. The user can set any command to this button.

K2– Command button. The user can set any command to this button.

K3– Command button. The user can set any command to this button.

K4– Command button. The user can set any command to this button.

K5– Command button. The user can set any command to this button.

K6– Command button. The user can set any command to this button.

Edge Seek– Identifies the position of the sheet on the work area. Must be pressed simultaneously with the Fn key.

Function Key– Safety button. Must be pressed simultaneously with other buttons to perform a certain function.

W counterclockwise– Rotates the rotary axis counterclockwise.

Up arrow– Moves the laser head up along the y-axis.

Z up arrow– Raises the laser head height along the z axis.

Frame– Shows the boundaries of the layout you are working with.

Left arrow – Moves the laser head to the left along the x-axis.

Zero button – Move the laser to (0,0,0) axis point. Must be pressed simultaneously with the Fn key.

Right arrow– Moves the laser head to the right along the x axis.

Fast– Commands buttons the move quickly.

W clockwise– Rotates the rotary axis clockwise.

Down arrow– Moves the laser head down along the y-axis.

Z down arrow– Lowers the laser head height.

Step –Gently to moves the laser head in steps. Opposite of the fas button.

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7.1 Other Remote Control Functions

Fast + Z↓ =	Quickly lowers the laser head height along the z-axis.	Zero Fn + Fn = Move the laser to (0,0,0) axis point.
Fast + Z↑ =	Quickly raises the laser head height along the z-axis.	Edge Seek Fn + Fn = Identifies the position of the sheet on the work area.
Fast + ↑ =	Quickly moves the laser head up, along the y-axis.	Fast + WC↻ = Quickly rotates the rotary axis clockwise.
Fast + ↓ =	Quickly moves the laser head down, along the y-axis.	Fast + W↺ = Quickly rotates the rotary axis counterclockwise.
Fast + ← =	Quickly moves the laser head to the left, along the x-axis.	
Fast + → =	Quickly moves the laser head to the right, along the x-axis.	Step + ↓ = Gently moves the laser head down, along the y-axis.
Step + ↑ =	Gently moves the laser head up, along the y-axis.	Step + ← = Gently moves the laser head to the left, along the x-axis.
		Step + → = Gently moves the laser head to the right, along the x-axis.

NOTES:

8.0 Specifications

500 W (1/2 kilowatt) Cutting Specifications							
Material	**Thickness (mm)**	**Speed (m/min)**	**Power (W)**	**Focus**	**Gas**	**Pressure (bar)**	**Cutting height (mm)**	**Nozzle**
Stainless steel	1	13~14	500	0~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	2.6~2.9	500	-1.5~-2	N2	20.00	0.5	Single layer: 1.5/2.0
	3	0.9~1.1	500	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
	4	0.5~0.6	500	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
Aluminum	1	2.5~2.7	500	-0.5~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
Brass	1	2.3~2.5	500	0~-0.5	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
Carbon steel	1	15~16	500	0~-1	N2	20.00	0.5	Single layer: 1.0
	2	3.5~4.5	500	2~3	O2	0.6~0.9	1.5	Double layer: 2.0
	3	2.0~2.2	500	2~3	O2	0.6~0.9	1.5	Double layer: 2.0
	4	1.5~1.6	500	2~3	O2	0.6~0.9	1.5	Double layer: 2.5
	5	0.9~1.1	500	2~3	O2	0.6~0.9	1.5	Double layer: 2.5
	6	0.6~0.7	500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0

"Remarks:

1. In the cutting data, the 500W laser output fiber core diameter is 50 microns;

2. The optical ratio is 100/125 (collimation/focus lens focal length);

3. This data is for reference only due to the differences in various equipment configurations and cutting processes (machine tools, water cooling, environment, cutting nozzles, gas pressure, etc.) used by different customers. "

1000 W (1 kilowatt) Cutting Specifications

Materials	Thickness (mm)	Speed (m/min)	Power (W)	Focus	Gas	Pressure (bar)	Cutting Parameter (mm)	Nozzle
Stainless Steel	1	21~23	1000	0~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	6.5~7	1000	-1.5~-2	N2	20.00	0.5	Single layer: 1.5/2.0
	3	2.3~2.5	1000	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
	4	0.8~1	1000	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
	5	0.6~0.7	1000	-3.5~-4	N2	20.00	0.5	Single layer: 3.5/4.0
	6	0.5~0.6	1000	-5~-5.5	N2	20.00	0.5	Single layer: 3.5/4.0
Aluminum	1	19~21	1000	-0.5~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	4.5~5	1000	-1~-1.5	N2	20.00	0.5	Single layer: 1.5/2.0
	3	1.8~2	1000	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
Brass	1	16~18	1000	0~-0.5	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	3~3.5	1000	-1~-1.5	N2	20.00	0.5	Single layer: 1.5/2.0
	3	1.1~1.3	1000	-2~-2.5	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
Carbon steel	1	24~26	1000	0~-1	N2	20.00	0.5	Single layer: 1.0
	2	8~9	1000	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
	3	2.8~3	1000	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
	4	2.2~2.4	1000	2~3	O2	0.6~0.9	1.5	Double layer: 2.5
	5	1.5~1.7	1000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	6	1.2~1.4	1000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	8	1.0~1.1	1000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	10	0.75~0.85	1000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	12	0.6~0.65	1000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0

"Remarks:

1. In the cutting data, the 1000W laser output fiber core diameter is 50 microns;

2. The optical ratio is 100/125 (collimation/focus lens focal length);

3. This data is for reference only due to the differences in various equipment configurations and cutting processes (machine tools, water cooling, environment, cutting nozzles, gas pressure, etc.) used by different customers. "

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1500 Watt (1.5 kilowatt) Cutting Specifications

Materials	Thickness (mm)	Speed (m/min)	Power (W)	Focus	Gas	Pressure (bar)	Cutting Height (mm)	Nozzle
Stainless steel	1	32~35	1500	0~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	9~10	1500	-1.5~-2	N2	20.00	0.5	Single layer: 1.5/2.0
	3	4.2~4.5	1500	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
	4	2.1~2.3	1500	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
	5	1.6~1.8	1500	-3.5~-4	N2	20.00	0.5	Single layer: 3.5/4.0
	6	1.0~1.2	1500	-5~-5.5	N2	20.00	0.5	Single layer: 3.5/4.0
	8	0.5~0.6	1500	-6~-7	N2	20.00	0.5	Single layer: 4.0
Aluminum	1	30~32	1500	-0.5~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	8~9	1500	-1~-1.5	N2	20.00	0.5	Single layer: 1.5/2.0
	3	3.8~4.2	1500	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
	4	2~2.2	1500	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
	5	0.8~1.0	1500	-3.5~-4	N2	20.00	0.5	Single layer: 3.5/4.0
Brass	1	25~27	1500	0~-0.5	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
	2	7~8	1500	-1~-1.5	N2	20.00	0.5	Single layer: 1.5/2.0
	3	2.7~3	1500	-2~-2.5	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
	4	1.5~1.7	1500	-3~-3.5	N2	20.00	0.5	Single layer: 3.0
Carbon Steel	1	34~37	1500	0~-1	N2	20.00	0.5	Single layer: 1.0
	2	12~14	1500	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
	3	2.9~3.2	1500	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
	4	2.4~2.6	1500	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
	5	1.8~2.0	1500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	6	1.6~1.8	1500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	8	1.1~1.3	1500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	10	0.9~1.0	1500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	12	0.8~0.9	1500	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
	14	0.6~0.7	1500	2~3	O2	0.6~0.9	1.5	Double layer: 4.0
	16	0.5~0.6	1500	2~3	O2	0.6~0.9	1.5	Double layer: 4.0

"Remarks:
1. In the cutting data, the core diameter of the 1500W laser output fiber is 50 microns;
2. The optical ratio is 100/125 (collimation/focus lens focal length);
3. This data is for reference only due to the differences in various equipment configurations and cutting processes (machine tools, water cooling, environment, cutting nozzles, gas pressure, etc.) used by different customers. "

Material	Thickness (mm)	Speed (m/min)	Power (W)	Focus	Gas	Pressure (bar)	Cutting height (mm)	Nozzle
2000 Watt (1 kilowatt) Cutting Specifications								
Stainless steel	1	30~32	2000	0~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
		45~48	2000	0~-0.5	N2	20.00	0.5	Single layer: 1.0/1.2
	2	10~11	2000	-1.5~-2	N2	20.00	0.5	Single layer: 1.5/2.0
		14~15	2000	-1~-1.5	N2	20.00	0.5	Single layer: 1.5
	3	5~6	2000	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
		6.5~7	2000	-2.5~-3	N2	20.00	0.5	Single layer: 2.0
	4	3~3.5	2000	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
		3.5~4	2000	-3.5~-4	N2	20.00	0.5	Single layer: 2.5
	5	2~2.2	2000	-5.5~-6	N2	20.00	0.5	Single layer: 3.0
	6	1.3~1.5	2000	-5~-5.5	N2	20.00	0.5	Single layer: 3.5/4.0
		1.3~1.5	2000	-8~-9	N2	20.00	0.5	Single layer: 3.5
	8	0.5~0.6	2000	-6~-7	N2	20.00	0.5	Single layer: 4.0
		0.7~0.8	2000	-12~-13	N2	20.00	0.5	Single layer: 4.0
Aluminum	1	18~20	2000	-0.5~-1	N2	20.00	0.5	Single layer: 1.0/1.2/1.5
		40~42	2000	0~-0.5	N2	20.00	0.5	Single layer: 1.0/1.2
	2	6~7	2000	-1~-1.5	N2	20.00	0.5	Single layer: 1.5/2.0
		15~16	2000	0~-0.5	N2	20.00	0.5	Single layer: 1.5
	3	3~4	2000	-2.5~-3	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
		7.5~8	2000	-2~-2.5	N2	20.00	0.5	Single layer: 2.0
	4	1.6~1.9	2000	-3.5~-4	N2	20.00	0.5	Single layer: 3.0
		3.5~3.8	2000	-3~-3.5	N2	20.00	0.5	Single layer: 2.5
	6	0.5~0.6	2000	-5~-5.5	N2	20.00	0.5	Single layer: 3.5/4.0
		1.3~1.4	2000	-5~-5.5	N2	20.00	0.5	Single layer: 3.5
Brass	3	2.8~3.2	2000	-2~-2.5	N2	20.00	0.5	Single layer: 2.0/2.5/3.0
		7~7.2	2000	-2~-2.5	N2	20.00	0.5	Single layer: 2.0/2.5
	4	1.5~1.7	2000	-3~-3.5	N2	20.00	0.5	Single layer: 3.0
		3.5~3.7	2000	-3~-3.5	N2	20.00	0.5	Single layer: 3.0
	6	1~1.3	2000	-3.5~-4	N2	20.00	0.5	Single layer: 3.5

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	1	45~47	2000	0~-0.5	N2	20.00	0.5	Single layer: 1.0
	2	16~17	2000	-1~-1.5	N2	20.00	0.5	Single layer: 1.0
	3	3~3.2	2000	4.5~5.5	O2	0.6~0.9	0.8	Double layer: 1.0
		3.4~3.6	2000	8.5~9	O2	0.6~0.9	0.8	Double layer: 1.0
	4	3.1~3.2	2000	9~9.5	O2	0.6~0.9	0.8	Double layer: 1.0
	6	2~2.2	2000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
		2~2.2	2000	12~13	O2	0.6~0.9	0.8	Double layer: 1.0
	8	1.3~1.5	2000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
		1.5~1.7	2000	7.5~8	O2	0.6~0.9	1.5	Double layer: 3.0
Carbon steel	10	0.9~1.0	2000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
		1.2~1.4	2000	7.5~8	O2	0.6~0.9	1.5	Double layer: 3.0
	12	0.8~0.9	2000	2~3	O2	0.6~0.9	1.5	Double layer: 3.0
		1~1.1	2000	7.5~8	O2	0.6~0.9	1.5	Double layer: 3.0
	14	0.7~0.8	2000	2~3	O2	0.6~0.9	1.5	Double layer: 4.0
		0.9~1.0	2000	7.5~8	O2	0.6~0.9	1.5	Double layer: 4.0
	16	0.6~0.7	2000	2~3	O2	0.6~0.9	1.5	Double layer: 4.0
		0.8~0.85	2000	7~7.5	O2	0.6~0.9	1.5	Double layer: 4.0
	18	0.5~0.6	2000	2~3	O2	0.6~0.9	1.5	Double layer: 4.0
		0.7~0.75	2000	7~7.5	O2	0.6~0.9	1.5	Double layer: 4.0
	20	0.4~0.5	2000	2~3.5	O2	0.6~0.9	1.2~1.5	Double layer: 4.0
		0.55~0.6	2000	7~7.5	O2	0.6~0.9	1.5	Double layer: 4.0

"Remarks:

1. In the cutting data, the 2000W laser output fiber core diameter is 50 microns;

2. The cutting data adopts a common radium cutting head with an optical ratio of 100/200 (collimation/focus lens focal length);

The optical ratio is 100/125 (collimation/focus lens focal length);

3. This data is for reference only due to the differences in various equipment configurations and cutting processes (machine tools, water cooling, environment, cutting nozzles, gas pressure, etc.) used by different customers. "

SmartShop CBX Fiber Laser

3000 Watt (1.5 kilowatt) Cutting Parameter

Materials	Thickness (mm)	Speed (Inch/min)	Power (W)	Focus	Pressure	Gas (bar)	Cutting height (Inch)	Nozzle
Stainless Steel	1	1378.0~1456.7	3000	0~-1	N2	20.00	0.02	Single layer: 1.0/1.2/1.5
	2	511.8~590.6	3000	-1.5~-2	N2	20.00	0.02	Single layer: 1.5/2.0
	3	275.6~315.0	3000	-2.5~-3	N2	20.00	0.02	Single layer: 2.0/2.5/3.0
	4	177.2~216.5	3000	-3.5~-4	N2	20.00	0.02	Single layer: 3.0
	6	66.9~74.8	3000	-5~-5.5	N2	20.00	0.02	Single layer: 3.5/4.0
	8	31.5~39.4	3000	-6~-7	N2	20.00	0.02	Single layer: 4.0
	10	23.6~27.6	3000	-7.5~-8.5	N2	20.00	0.02	Single layer: 4.0
Aluminum	1	1181.1~1299.2	3000	-0.5~-1	N2	20.00	0.02	Single layer: 1.0/1.2/1.5
	2	393.7~472.4	3000	-1~-1.5	N2	20.00	0.02	Single layer: 1.5/2.0
	3	216.5~232.3	3000	-2.5~-3	N2	20.00	0.02	Single layer: 2.0/2.5/3.0
	4	110.2~126.0	3000	-3.5~-4	N2	20.00	0.02	Single layer: 3.0
	6	27.6~31.5	3000	-5~-5.5	N2	20.00	0.02	Single layer: 3.5/4.0
	8	19.7~23.6	3000	-6~-7	N2	20.00	0.02	Single layer: 4.0
Brass	3	177.2~196.9	3000	-2~-2.5	N2	20.00	0.02	Single layer: 2.0/2.5/3.0
	4	118.1~137.8	3000	-3~-3.5	N2	20.00	0.02	Single layer: 3.0
	6	39.4~47.3	3000	-5~-5.5	N2	20.00	0.02	Single layer: 3.5/4.0
Carbon steel	3	137.8~145.7	3000	4.5~5.5	O2	0.6~0.9	0.03	Double layer: 1.0
	6	90.6~98.4	3000	4.5~5.5	O2	0.6~0.9	0.03	Double layer: 1.2
	8	70.9~78.7	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 3.0
	10	59.1~66.9	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 3.0
	12	47.2~55.1	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 3.0
	14	39.4~43.3	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 4.0
	16	33.5~35.4	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 4.0
	18	27.6~29.5	2200~2400	2~3	O2	0.6~0.9	0.06	Double layer: 4.0
	20	23.6~25.6	2200~2400	2~3.5	O2	0.6~0.9	0.047~0.059	Double layer: 4.0

"Remarks:
1. In the cutting data, the output core diameter of the 3000W laser output fiber is 100 microns;
2. The optical ratio is 100/125 (collimation/focus lens focal length);
3. This data is for reference only due to the differences in various equipment configurations and cutting processes (machine tools, water cooling, environment, cutting nozzles, gas pressure, etc.) used by different customers. "

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9.0 Maintenance

Fiber laser cutting machine needs to do the basic daily maintenance and maintenance to ensure the normal operation of the equipment, reduce possible failures, and prolong the service life of the equipment. Follow this maintenance table to ensure proper use of the machine.

Table 1: Maintenance Schedule

Daily	Weekly	Every three Months	Every six Months	Yearly	Every two Years	Every Three years
Clean the cutting head, protect lens, nozzle.	Clean the x and y-axis rack rails and the z-axis screw guides.	Check the connection of the cutting head	Check that the components in the cabinet are working properly and clean the dust.	Clean water pipe or replace	Replace air filter	Check if ball screw guide rail needs to be replaced
Make sure the machine is at origin	Check if the exchange workbench chain is loose	Adjust the temperature of the chiller water. (winter 20,25℃, summer 25,28℃)	Check the dustproof cloth of each shaft for damage.	Check relay usage if needed and replace	Replace chiller water filter	Check if you need to change the chain
Check laser and nozzle concentricity	Check the filter for undischarged water	Check the connection of the servo driver cables	Check whether there is looseness in the rear door panel fixing screw of the exchange table	Clean the dust in the electrical cabinet	Replace the aging pipe	Check if you need to change the gear.
Check operation panel button, emergency stop button.	Check the exchange table proximity switch and bracket impact block	Check that the air compressor is working properly	If you need an air compressor for maintenance	Clean the laser	Check if ball screw guide rail needs to be replaced	Check whether it is necessary to replace the high-pressure gas pipe

Check the cutting pressure	Check the surface of each proximity switch for foreign objects	Change the chiller water and the filter	Check if the air filter is dirty. Clean or replace if dirty.	Check the cable contact of each line ensure they are tight.	Check whether the photoelectric switch and proximity switch need to be replaced	Check if safety relay needs to be replaced

Daily	Weekly	Every three Months	Every six Months	Yearly	Every two Years	Every Three years
Check the gas supply, Check for gas leaks and pressure	Clean up slag drawer		Check focus lens, collimate lens if you need to replace	Check cutting blade if needed and replace		Check if you need to replace the computer host
Check the chiller system, check for water leaks	Clean up foreign objects on the exchange guide and machine tool			Check focus lens, collimate lens if you need to replace		
Check for water leakage	In summer, the chiller is replaced with pure water in time					
Check the machine for abnormal noise						
Z-axis screw guide manual oil injection 2 times						

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9.1   Cleaning the Helical Racks

The helical racks on the machine may collect dust and debris which can interfere with the smooth operation of the gantry and spindle. Clean with a plastic brush following the angle of the grooves. Lubricate with a thin layer of lithium grease; gently wipe away excess.

9.2   Lubrication

The pneumatic system does not need any type of lubricant. Some types of lubricant can damage the machine and compromise its functionality.

9.3   Daily Maintenance Checks

1. Clean the machine and lubricate unpainted surfaces with a 30wt oil lubricant. Wipe off excess oil and buff the surface dry with a soft rag. Regular cleaning and lubrication will reduce the likelihood of rust forming on the machine.

2. Check the tool blades for chips and dullness.

3. Inspect the overall machine for damage and loose or worn parts.

4. Regularly clean the collets and spindle holes. Uncleaned spindle holes may affect cut quality and may pose a safety hazard if significantly dirty.

5. Clean the router bits.

6. Inspect the tool blades for chips and dullness.

9.4   Weekly Maintenance Checks

1. Inspect the overall machine for damage and loose or worn parts.

2. Check the dust extraction for blockages as large pieces could cause blockages.

3. Verify the electrical connectors are fitted tightly and correctly.

10.0 Troubleshooting

Problem	Causes	Solution
Slag or dross on backside of cut	Not enough gas pressure	Increase gas pressure
Striations on cuts	Too much gas pressure	Decrease gas pressure
Nozzle is hot	• Beam is unaligned • Cutting material is highly reflective	• Align the laser beam • Cut less reflective materal

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11.0 Warranties

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 thirty (30) days of purchase to be covered by this warranty. Laguna Tools guarantees all new machines 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 a Return Material Authorization (RMA) number from Customer Service. 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. A part or blade is being returned must have adequate packaging to ensure it is not damaged 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.

* The issue of an RMA number is for reference only; it DOES NOT indicate acceptance of the warranty claim.

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 machines 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. If 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 may be 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 (24) 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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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 may be 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

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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 (24) 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.

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
> 744 Refuge Way, Grand Prairie, Texas 75050, USA
> 1-800-234-1976
> 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
> 744 Refuge Way, Grand Prairie, Texas 75050, USA
> 1-800-332-4049
> 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 1-800-234-1976. To receive customer service or technical support please contact the customer service department at 1-800-332-4049. 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.

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