EV-30 Fiber Laser Cutting System

Owner's Manual
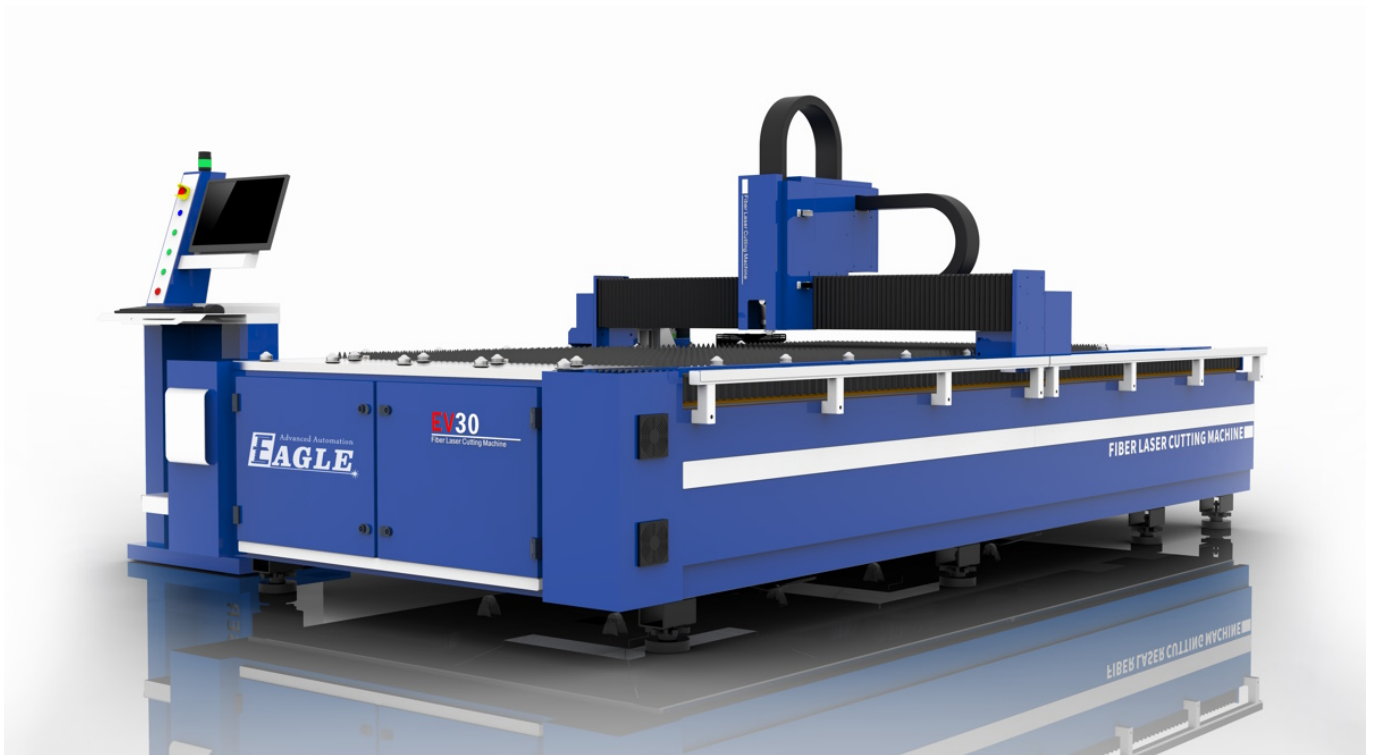
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If any details in this manual is unclear or if you need additional assistance setting up your machine, please feel free to call us at +1 (626) 671-4014 or email at service@gueagle.com.

Introduction

How to Use This Owner's Manual

Thank you for purchasing a GU Eagle EV-30 fiber laser cutting system. This laser system has been designed to be easy to operate, but you will utilize it to its fullest potential by taking some time to read this owner's manual prior to use. You will be ready to use the laser system as soon as you read the first few sections. Then you can refer to topics in the remaining sections, as you work.

Notes Used in This Manual

Look for these kinds of notes to help you find valuable information throughout the text:

> **NOTE**
>
> Helpful notes to keep in mind while running the laser!

> **IMPORTANT**
>
> Important instructions you should always follow.

> **WARNING**
>
> Warnings and cautions to keep in mind while running the laser.

Safety

Laser Safety

Lasers use intense beams of light to create heat and fire as a normal part of their operation, and depending on the laser, the light might not be visible to you. If the proper safety measures are ignored, you could burn or blind yourself or someone else, or start a fire that could damage or destroy the building in which the laser system is housed.

> **IMPORTANT**
>
> **ALWAYS** wear protecting glasses while doing laser processing.

> **WARNING**
>
> **DO NOT** aim and fire laser on anything but the workpieces you want to process.

> **WARNING**
>
> **DO NOT** leave a running laser unattended.

The visible output beam of the Laser Diode Pointer (Red Dot Pointer) is accessible to the operator. While this device employs the same technology as the familiar laser pen-pointers, like them it is potentially hazardous if its beam is directed into the eye.

> **WARNING**
>
> **DO NOT** view directly into the beam of the Laser Diode Pointer (Red Dot Pointer).

Electrical Safety

The AC input power to the machine is potentially lethal and is fully contained within the cabinet.

> **WARNING**
>
> **DO NOT** open any of the machine's access panels while the unit is plugged in. Opening a panel may expose the operator to the unit's AC input power.

> **WARNING**
>
> **DO NOT** make or break any electrical connections to the machine while the unit is turned on.

Installation and Training

Follow the sections in this chapter to install and set up your EV-30 laser system, and get ready to start.

- Get to Know the Components of the Laser System
- Get Prepared for the Installation
- Unpacking the Laser System
- Set up the CNC Machine
- (For Low Power Configurations Only) Set up the Control Console
- (For High Power Configurations Only) Set up the Control Console
- (For High Power Lasers Only) Install the Fiber Laser
- Connecting the Chiller
- Connecting the Exhaust
- Connecting the Voltage Regulator
- Connecting the Transformer
- Connecting the Assist Gas
- Get Prepared for the Training

Get to Know the Components of the Laser System

The EV-30 fiber laser cutting system is composed of a CNC machine, a control console, a fiber laser (pre-installed inside the machine for low power models), a chiller, an exhaust, a voltage regulator, a transformer, and a set of appropriate assist gas (prepared by customers).
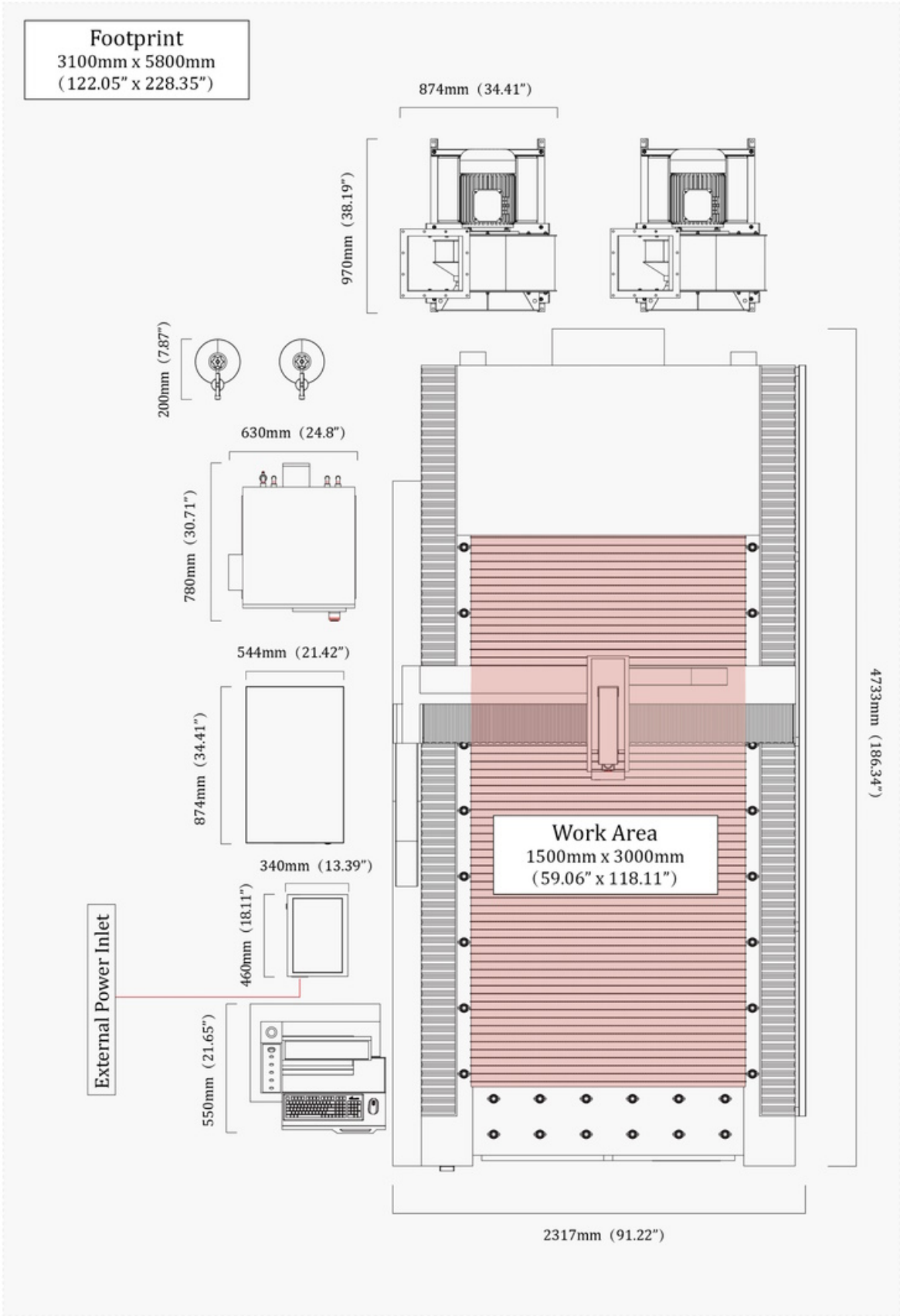
The picture below shows the schema of the laser system in the recommended footprint configuration for 3kW lasers. For some high power configurations, the fiber laser may stand alone in front of the chiller.

| Exhaust Fan | N₂ (O₂) Cylinder | Water Chiller | Voltage Regulator | Transformer | Control Console |
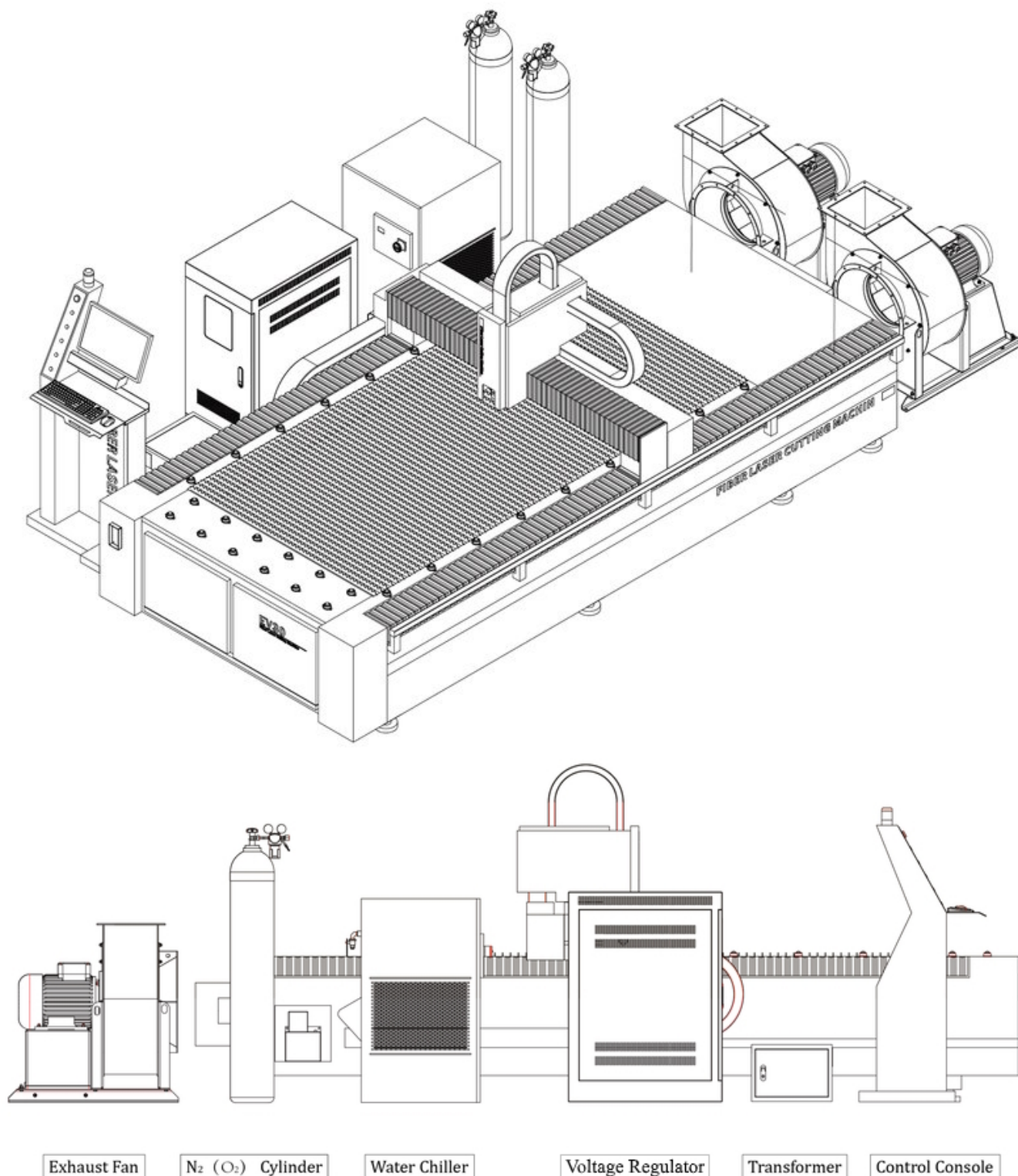
Get Prepared for the Installation

We would recommend to get your facilities prepared before shipping. That will save a lot of time during the installation, especially for the customers who are far from our service agencies.

1. The Recommended Footprint Configuration of the EV-30 Laser System

Footprint
3100mm x 5800mm
(122.05" x 228.35")

874mm (34.41")

970mm (38.19")

200mm (7.87")

630mm (24.8")

780mm (30.71")

544mm (21.42")

874mm (34.41")

340mm (13.39")

460mm (18.11")

External Power Inlet

550mm (21.65")

4733mm (186.34")

Work Area
1500mm x 3000mm
(59.06" x 118.11")

2317mm (91.22")

The weight of the CNC machine is around 4500lbs, 2000kg. Precise leveling of the ground is not necessary, but it should be basically flat and sturdy enough to support the machine well.

The laser system comes with a 16ft/5m power cord, prepare the electrical power interface in a reachable position according to the transformer in the footprint.

The assist gas system should be set according to the gas cylinder in the footprint.

The duct work should be set close to the exhaust if there is such a system in your facility.

There should be enough space to load sheets onto the cutting bed from the front and the right side of the machine.

2. Electrical Power Requirements
The EV-30 laser system requires 3-phase 380-volt electrical power. The overall power consumption will differ according to the laser configuration of your system.

Laser Configuration	Overall Power Consumption
3 kW	40 kW
6 kW	60 kW

> **NOTE**
>
> It is not required but recommended that a dedicated circuit being used if available.

3. Cooling Requirements
Laser technology is such that the laser units generate a lot of excess heat and the units must be cooled for proper operation. The EV-30 laser system comes with a chiller to do this job, which needs to be filled up with appropriate water.

Water Type	Water Consumption
Purified / Distilled	60-80 L (15.9-21.1 gal)

> **IMPORTANT**
>
> Other types of water may corrode the pipeline inside the fiber laser, and weaken the cooling effects.

> **IMPORTANT**
>
> Add antifreeze to cooling water to protect the fiber laser from freezing if the ambient temperature could be below 5°C (41°F). Otherwise, it may cause ***SEVERE DAMAGE*** to the core components of the laser.

4. Assist Gas for Cutting

During the laser cutting process, a laser is used as a heat source to melt or vaporize materials. To cut the materials with a high-quality edge, an assist gas blows through a cutting nozzle on the laser head. The right assist gas can improve the edge quality and can increase the cutting speeds substantially for certain materials.

Gas	Purity	Pressure
Nitrogen (N_2)	≥ 99.99%	15-20 bar
Oxygen (O_2)	≥ 99.99%	5-10 bar
Compressed Air	Water free, oil free	15-20 bar

> **IMPORTANT**
>
> If compressed air is used as the assist gas, make sure it is **WATER FREE AND OIL FREE**. Otherwise, the protective lens in the laser head will get dirty and wet, and will be broken by the laser while cutting.

5. Operating Environment

The EV-30 laser system should be operated in an environment with appropriate ambient temperature and humidity.

Ambient Temperature	Humidity
10-40 °C (50-104 °F)	10-80%

> **IMPORTANT**
>
> The laser system must not operate at temperatures below the respective ambient dew point.

> **IMPORTANT**
>
> Use heating equipment to keep the ambient temperature of the working area where the laser is located above 0°C (32°F) if there is no antifreeze in cooling water. Generally, it is more appropriate to set the temperature above 5°C (41°F).

Unpacking the Laser System

Follow the steps below to unpack and secure all the components of an EV-30 laser system in place, refer to The Recommended Footprint Configuration of the EV-30 Laser System for more details.

1. Remove all the protective films and the packing materials on the machine, set it in place, and set all the accessory packs to the back side.
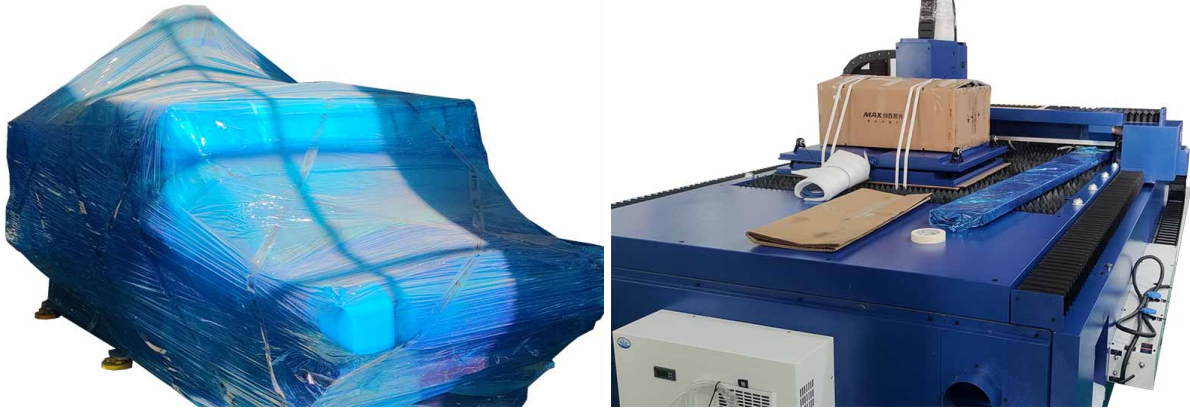
2. Remove the packing materials on the control console, and set it to the front of the left side.

   The control console for low power configurations.

The control console for high power configurations.

3. Remove the packing materials on the transformer, and set it to the middle of the left side.

4. Remove the packing materials on the voltage regulator, and set it to the back side of the transformer.

5. (For high power lasers only) Remove the packing materials on the fiber laser, and set it to the back side of the voltage regulator.

6. Remove the packing materials on the chiller, and set it to the rear of the left side.

7. Remove the packing materials on the exhaust, and set it to the back side of the machine.

Set up the CNC Machine

1. Secure the CNC machine in place.

   After positioning, secure the machine in place by screwing the feet down until they are in firm contact with the ground.

   > **NOTE**
   >
   > Precise leveling of the machine is not necessary, but it should be basically flat and well-supported with roughly equal pressure on all feet.

2. (For high power configurations only) Set the Y axis drag chain and its related parts in place.
   The Y axis drag chain and its related parts are removed and put on the cutting bed during shipping.

   First, assemble the base of the Y axis drag chain on the left side of the machine, put the drag chain on it, and fix the end of the drag chain. Second, assemble the X-Y intersection part on the left end of the gantry, and fix the other end of the drag chain on it. Finally, tighten the cables, and pack up the section of the cables out of the drag chain.

   IMPORTANT

   The cables are pre-set through inside the drag chain and the parts, which should be set up carefully and gently to avoid damaging the cables.
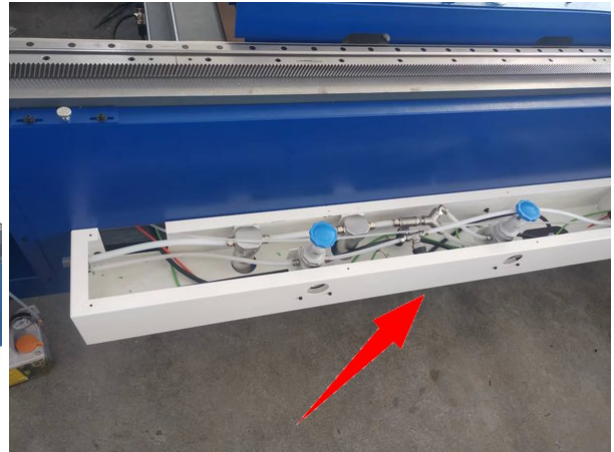
3. Remove the gantry locking blocks.

The gantry of the machine is locked up with three locking blocks to avoid damage during shipment. Make sure to remove them before powering on the machine.

> **IMPORTANT**
>
> The machine will **DAMAGE** itself if the laser head starts moving while the locking blocks are still in place.

> **NOTE**
>
> Make sure to save all the locking blocks in case you need to move the machine in the future.

#3 Locking Blocks

#1, #2 Locking Blocks

Guard Rails

#1

#2

#3
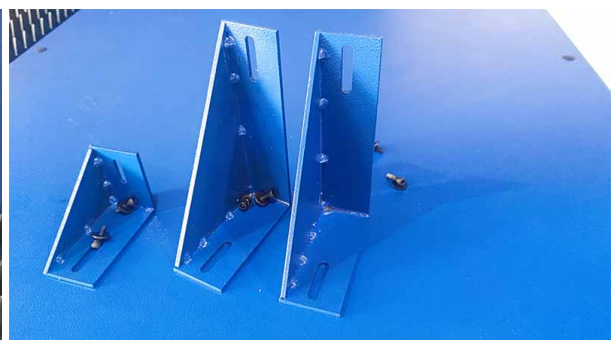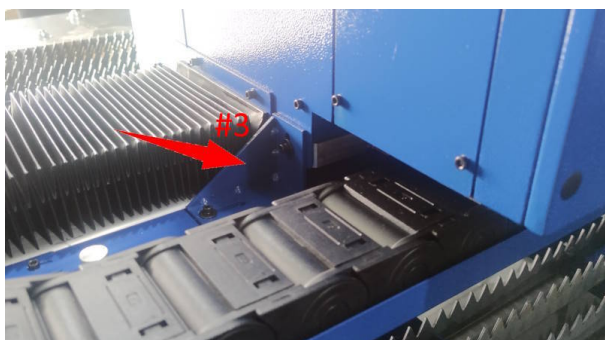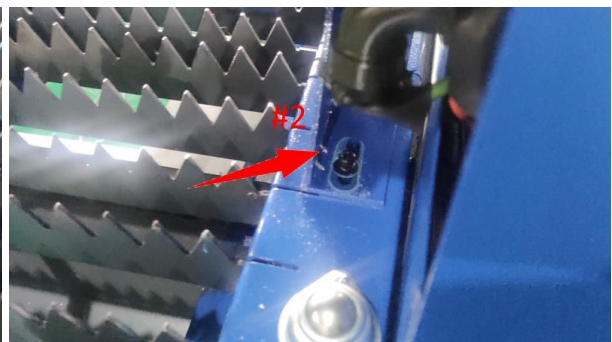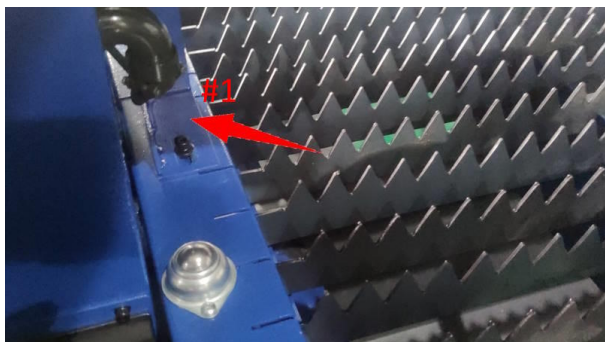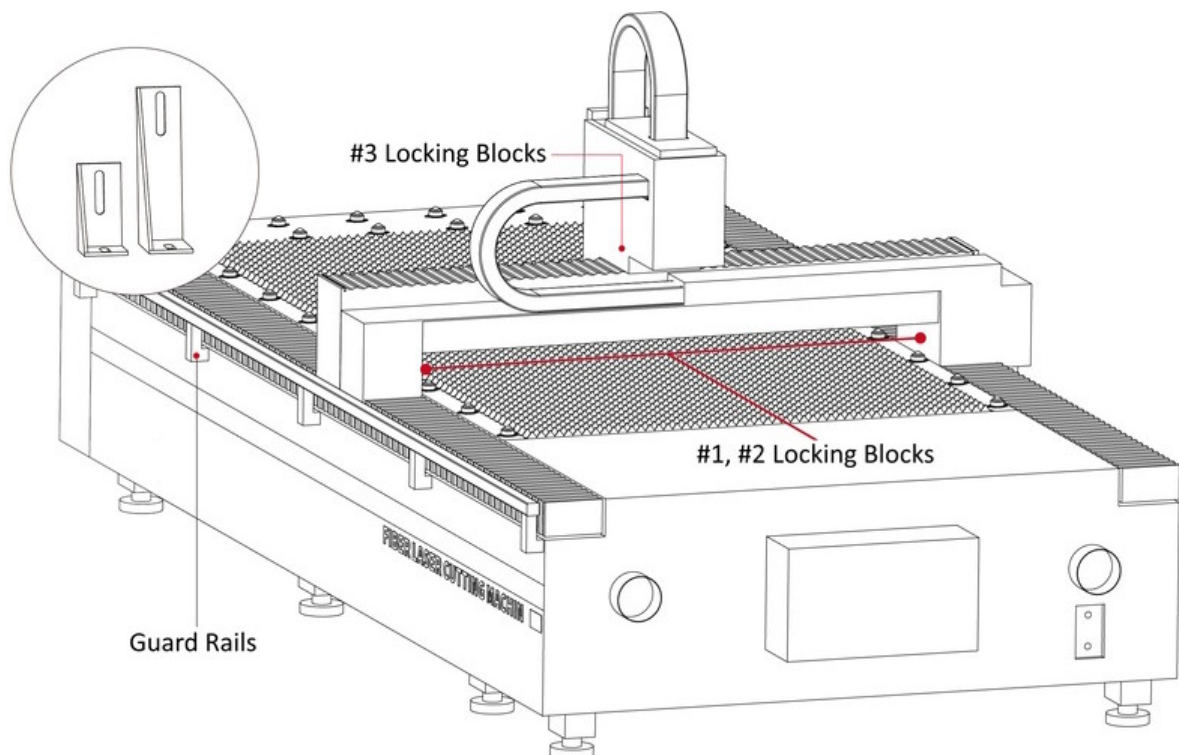
4. (For low power configurations only) Assemble the guard rails.

The guard rails are meant to keep people from getting too close to the potentially dangerous cutting area while the machine is in operation.

5. Set the pick-up drawers.

The machine comes with two pick-up drawers, which to be placed under the front half and the rear half of the cutting bed.

After processing, parts small enough to fit through the strip cutting bed will drop down to deep collecting bays, avoiding damage by the laser during subsequent cutting operations. They can be retrieved simply by pulling out the drawers after cutting is complete.

(For Low Power Configurations Only) Set up the Control Console

1. Assemble the monitor.
   Take out the monitor from the accessories pack, assemble it onto the control console frame, and connect the cables.

2. Put the keyboard, mouse and the handheld remote on the console.

3. Assemble the alarm indicator.
   Remove the back cover of the panel box, assemble the alarm indicator, connect the wires, and then put the cover back.

4. Connect the computer.
   Open the left access panel on the front of the machine, take out the computer from the package, connect the cables, and then close the panel.

(For High Power Configurations Only) Set up the Control Console

1. Assemble the monitor.
   Take out the monitor from the console cabinet, assemble it in place, and connect the cables.

2. Put the keyboard, mouse and the handheld remote on the console.

3. Assemble the alarm indicator.
   Assemble the alarm indicator on the top of the console cabinet, and connect the wires.

4. Connect the cables.
   Connect the cables from the machine to the console.
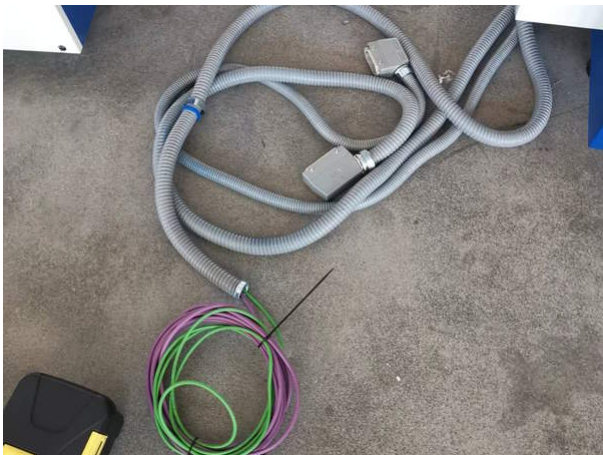
(For High Power Lasers Only) Install the Fiber Laser

We will partner with you to complete the fiber laser installation on your EV-30 laser system.

> **WARNING**
>
> ***ONLY QUALIFIED TECHNICIANS ARE ALLOWED*** to install the high power fiber laser. Unauthorized installation will break the warranty and is on your own risk.

Connecting the Chiller

1. Connect the water hoses.
   Connect the low temperature water hoses to the fiber laser (pre-installed inside the machine for low power models, stand outside alone for high power ones), and connect the high temperature water hoses to the CNC machine.
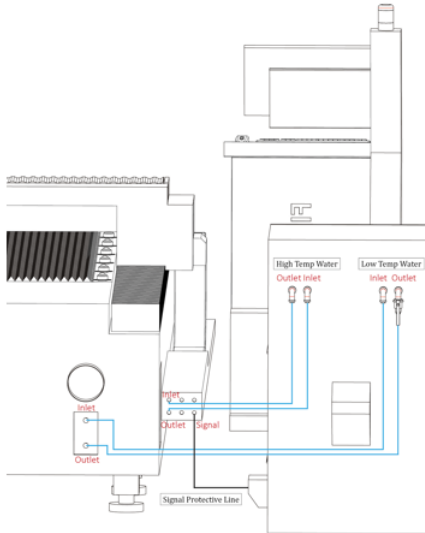
2. Fill up the chiller.

   Only purified or distilled water is allowed. And the chiller should be filled up to the green range of the water gauge.

   > **IMPORTANT**
   >
   > Other types of water may corrode the pipeline inside the fiber laser, weakening the cooling effects.

   > **IMPORTANT**
   >
   > Add antifreeze to cooling water to protect the fiber laser from freezing if the ambient temperature could be below 5°C (41°F). Otherwise, it may cause ***SEVERE DAMAGE*** to the core components of the laser.

3. Connect the alarm signal to the machine.

Connecting the Exhaust

Connect duct from the inlet to the machine, and connect duct from the outlet to the duct work if there is such a system in your facility.
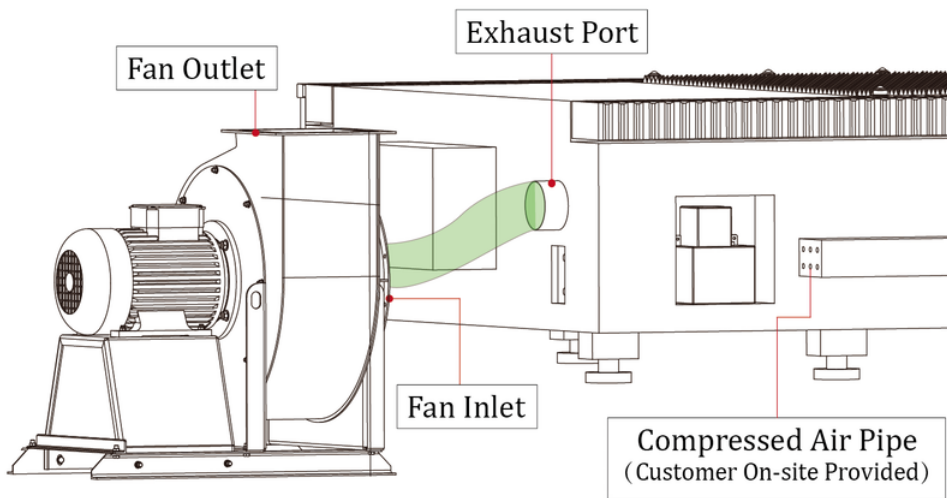
Connecting the Voltage Regulator

    1. Connect the power cord of the machine to a free output of the regulator.

    2. (For high power lasers only) Connect the power cord of the fiber laser to a free output of the regulator.

    3. Connect the power cord of the chiller to a free output of the regulator.

    4. Connect the power cord of the exhaust to a free output of the regulator.

    5. Connect the input of the regulator to the output of the transformer.

Connecting the Transformer

Connect the input of the transformer to the electrical power interface. GU Eagle supplies the appropriate power cord for the system you ordered.

> **IMPORTANT**
>
> Make sure the transformer is connected to a correct electrical power.

Connecting the Assist Gas

Connect the appropriate assist gas to the machine. The laser can cut stainless steel, aluminum, copper and brass with nitrogen (N_2), cut mild steel with oxygen (O_2), and cut thin stainless steel, aluminum and mild steel, in alternative, with compressed air.

> **IMPORTANT**
>
> If compressed air is used as the assist gas, make sure it is ***WATER FREE AND OIL FREE***. Otherwise, the protective lens in the laser head will get dirty and wet, and will be broken by the laser while cutting.
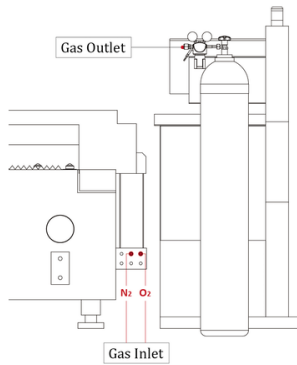
Get Prepared for the Training

1. Review the training materials.
   Familiarize yourself with the user manual, training videos, and any other resources provided prior to the training session.

2. Prepare all the samples.
   If possible, bring along all the sample materials (e.g. mild steel, stainless steel, aluminum, etc.) you want to cut, and a few files or projects that you would like to work on during the testing.

3. Confirm attendance.
   Make sure all participants are aware of the training schedule and have confirmed their attendance.

4. Prepare questions.
   Write down any questions or topics you would like to discuss during the training session.

5. Production test.
   If possible, perform a production test run before finishing the training program to identify any specific issues or areas where you still need assistance.

Getting Started

We will walk you through the basic operations of the EV-30 laser system, including how to turn on and turn off the laser system, how to use the handheld remote, and the basics of the CAD/CAM software.

Depending on the configuration, the EV-30 laser system may come with either CypCut of BOCHU or 2DCutAhead of RAYTOOLS, refer to the corresponding section for details.

- Turn on the Laser System
- Turn off the Laser System
- CypCut Basics
- 2DCutAhead Basics

Turn on the Laser System

Follow the steps below to turn on the EV-30 laser system.

1. Switch on the electrical power.

2. Turn on the voltage regulator.

3. Turn on the chiller.
   Please wait for the water pump to start after turning on the chiller.

> **IMPORTANT**
>
> The fiber laser will **NOT** work if the water temperature is below 20°C (68°F). Turn on the chiller in advance to warm up if the ambient temperature is low.

4. (For high power lasers only) Turn on the fiber laser.
   Turn on the main switch, turn on the key switch, and wait for the ready beep then press the green button to get the fiber laser ready.

5. Switch on the assist gas.

6. Turn on the main switch.

7. Release the emergency button.

8. Turn on the machine.

9. (For low power lasers only) Turn on the fiber laser.

10. Turn on the computer.

11. Launch the CAD/CAM software and complete the homing process.

> **IMPORTANT**
>
> The laser head will move to its home position (the front left corner of the cutting bed), make sure there is nothing blocking the way of the laser head and the gantry.

> **IMPORTANT**
>
> Cancel the homing process if there is any warning reported in the software.
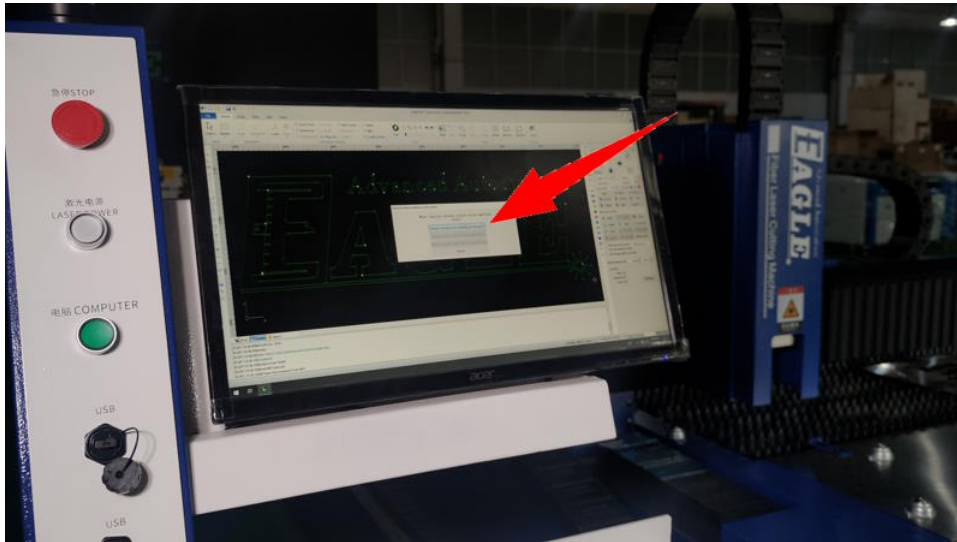
Now the laser system is ready for machining.

Turn off the Laser System

Follow the steps below to turn off the EV-30 laser system, refer to Turn on the Laser System for more operating details.

1. Close the CAD/CAM software.
2. Turn off the computer.
3. (For low power lasers only) Turn off the fiber laser.
4. Turn off the machine.
5. Turn off the main switch.
6. Switch off the assist gas.
7. (For high power lasers only) Turn off the fiber laser.
8. Turn off the chiller.
9. Turn off the voltage regulator.
10. Switch off the electrical power.

CypCut Basics

The CypCut software is your portal between your parts files and the laser system. We will go through the basic workflow in this section, refer to CypCut CAD/CAM User's Manual for more details.

> **NOTE**
>
> We recommend to install CypCut on your office computers. It will work in the "demo" mode without talking to the laser control system, but still can help you prepare cutting jobs, or just learn how to use it.

> **NOTE**
>
> The CypCut CAD/CAM comes with only entry-level nesting functions, we recommend to buy our CypNest software for more advanced nesting functions if big volume productions are your major machining scenario.

Workflow

1. Import or construct parts.
2. Set technology.
3. Nest parts.
4. Check technology.
5. Machining.

Import or Construct Parts

If you construct your parts in another CAD-system (e.g. AutoCAD), just import them into CypCut.

In the menu **File**, click **Import** and then the sub-item according to the format of the parts file to import.
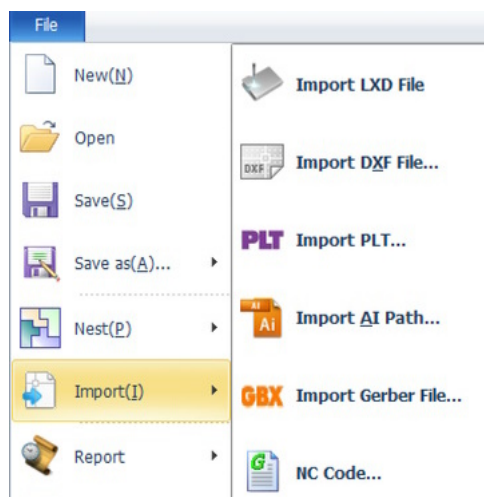
We recommend to use the part library and the nesting function to manage your job and improve machining efficiency for big volume productions. Select a part, right-click to bring up the context menu, click **Add to Part Lib** to add it to the library.
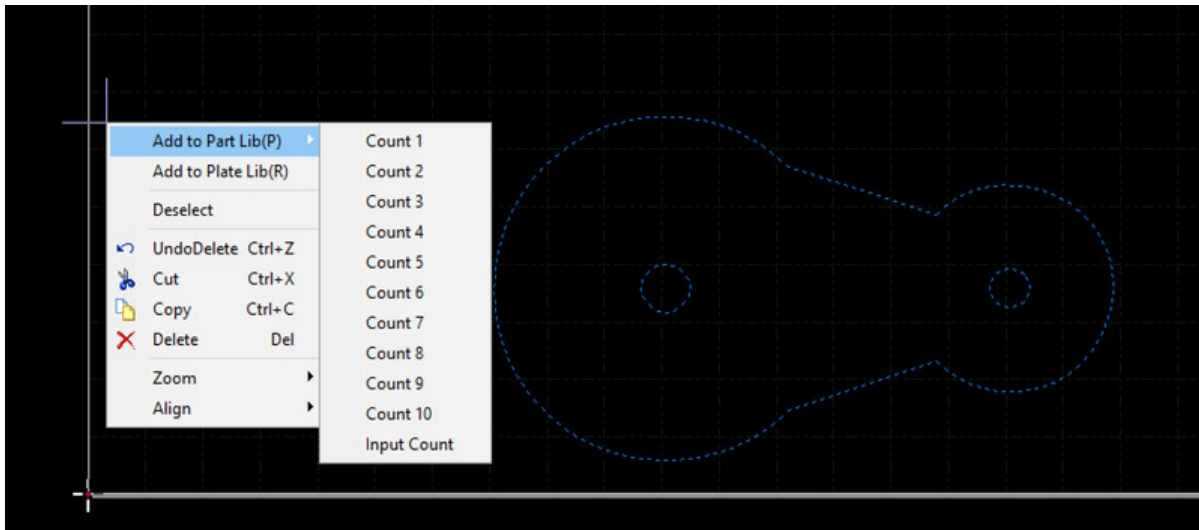
Or, you can import parts directly into the library. In the menu **Nest**, click **Part** and then **Import Parts**.
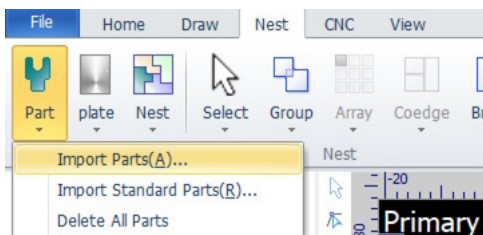
You can also construct simple parts in CypCut, add them to the library if you want to do nesting.

Set Technology

The cutting path will be prepared after setting technology, include leads, micro joints, tool corrections, processing sequence and cutting parameters, etc.

This operation can be done on both the free drawing outlines and the parts in the library.
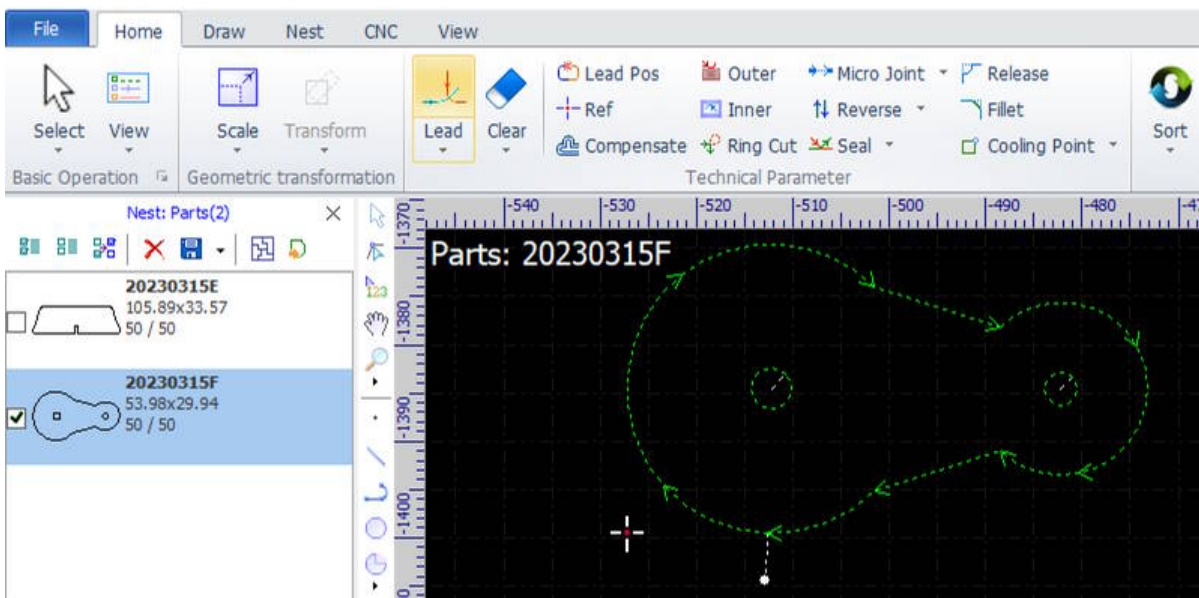
Nest Parts

In the menu **Nest**, click **Nest** and fill out the settings in the popup dialog, then the parts will be optimally nested onto the raw material sheets.

Check Technology

We recommend to simulate the process in the software before machining to make sure everything is correct.

Machining

Set the system ready and start machining.
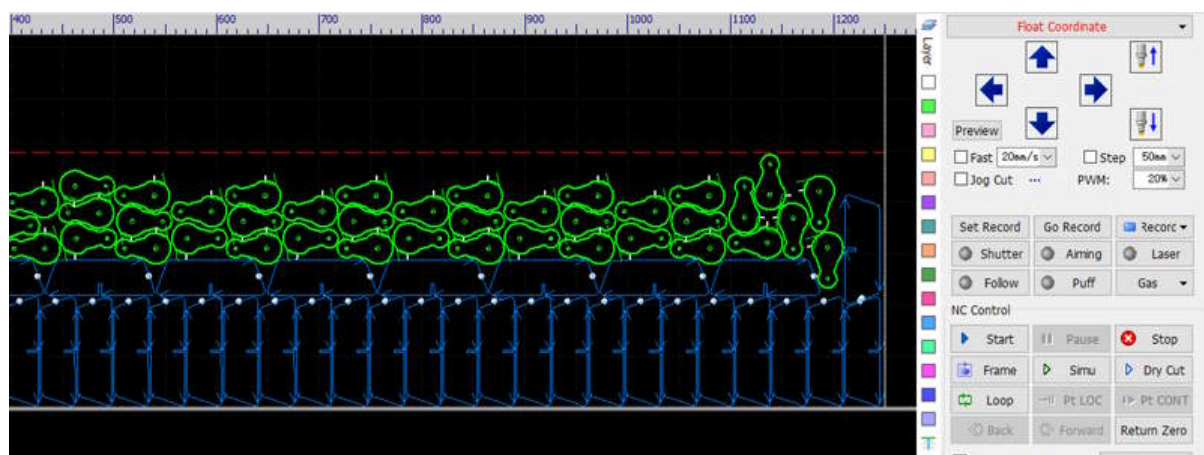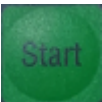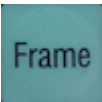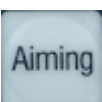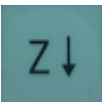
Handheld Remote

CypCut comes with a handheld remote for your convenience, which integrates the most common operations, such as jogging, framing, starting and pausing a job, etc.

With the remote, you can keep your eyes on the machine when moving the laser head, or controlling the machining process, avoid making mistakes or operation delays when switching back and forth between the software and the machine.

Button	Label	Function
	Start	To start or resume a job.
	Pause	To pause a job.
	Dry Cut	To simulate a job, without firing laser and blowing gas, and the laser head will not move down following along the sheet unless being enabled in CypCut.
	Stop	To stop a job.
	Frame	To preview the placement of the parts on the sheet before machining. The laser head will trace the bounding rectangle of the job.

Button	Label	Function
PT LOC	**PT LOC**	If the job was interrupted accidentally, such as by a power failure, you can use this function to bring the laser head back to the position where the job stopped after the laser system is up and running again, and press the **Start** button to resume the job.
Back ← / Foward →	**Back** / **Forward**	After the job was paused, you can use these functions to move the laser head backward or forward along the cutting path.
Blow	**Blow**	A toggle switch to test whether the assist gas is working properly.
Follow	**Follow**	A toggle switch to test whether the laser head can follow the sheet properly.
Shutter	**Shutter**	A toggle switch to activate or deactivate the fiber laser's internal main power supply. The internal main power supply must be activated before firing laser.
Aiming	**Aiming**	A toggle switch to turns the fiber laser's red dot pointer on and off. (On some fiber laser models, the red dot pointer is turned on and off automatically associate with the status of shutter.)
Laser	**Laser**	A toggle switch to start firing laser, and stop firing laser automatically when the button is released.
⬆ / ⬇ / ⬅ / ➡	⇧ / ⇩ / ⇦ / ⇨	To jog the laser head around the cutting bed. To make it easier to use, turn on the red dot pointer for a visual indicator of where the laser head is moving.
Z↑ / Z↓	**Z↑** / **Z↓**	To move the laser head up or down. It is usually used when doing laser head maintenance.

Button	Label	Function
Fast	**Fast**	Press and hold the **Fast** button down first, then press the jog buttons (the **Fast** button can be released then) to move the laser head in a faster speed, which is set in CypCut.
Step	**Step**	Press and hold the **Step** button down first, then press the jog buttons (the **Step** button can be released then) to move the laser head in a fixed distance, which is set in CypCut.
Zero Fn	**Zero** Fn	To move the laser head back to its zero reference position.
Edge Seek Fn	**Edge Seek** Fn	To start the edge seeking process.
Fn	**Fn**	The **Fn** button, short form for function, is a modifier button.
K1 K2 K3 K4 K5 K6	**K1** / **K2** / **K3** / **K4** / **K5** / **K6**	User defined buttons.

2DCutAhead Basics

The 2DCutAhead software is like a sibling of CypCut, with similar design, user interface and features. We will go through the basic workflow in this section.

> **NOTE**
>
> We recommend to install 2DCutAhead on your office computers. It will work in the "demo" mode without talking to the laser control system, but still can help you prepare cutting jobs, or just learn how to use it.

> **NOTE**
>
> 2DCutAhead comes with only entry-level nesting functions, we recommend to use a more advanced nesting software if big volume productions are your major machining scenario.

Workflow

1. Import or construct parts.
2. Set technology.
3. Nest parts.
4. Check technology.
5. Machining.

Import or Construct Parts

If you construct your parts with another CAD-system (e.g. AutoCAD), just import them into 2DCutAhead.

In the menu **File**, click **Import** and then select a parts file to import.
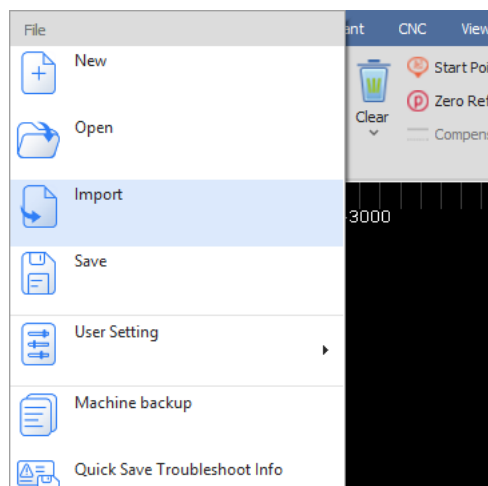
We recommend to use the part library and the nesting function to manage your job and improve machining efficiency for big volume productions. Select a part, right-click to bring up the context menu, click **Add to Part List** to add it to the library.
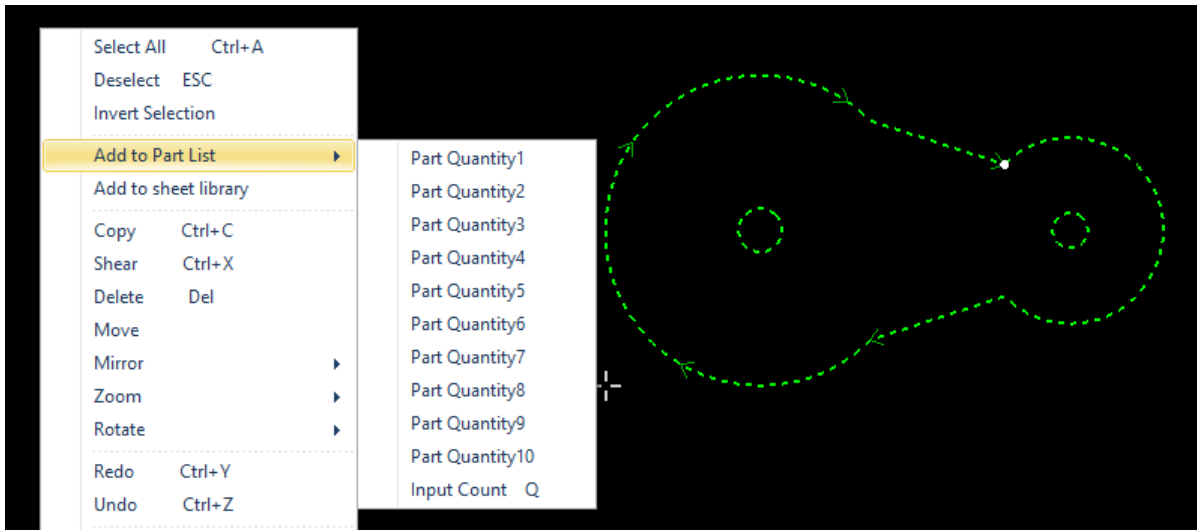
Or, you can import parts directly into the library. In the menu **Nest**, click **Part** and then **Add Parts**.
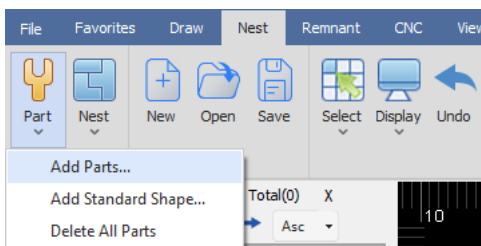
You can also construct simple parts in 2DCutAhead, add them to the library if you want to do nesting.

Set Technology

The cutting path will be prepared after setting technology, include leads, micro joints, tool corrections, processing sequence and cutting parameters, etc.

This operation can be done on both the free drawing outlines and the parts in the library.
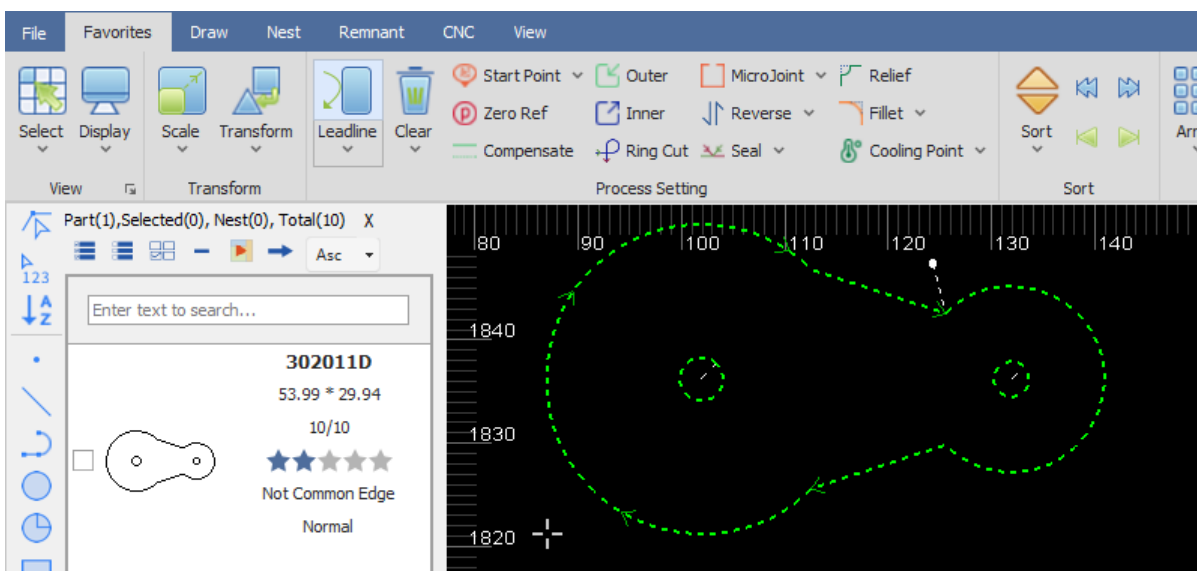
Nest Parts

In the menu **Nest**, click **Nest** and fill out the settings in the popup dialog, then the parts will be optimally nested onto the raw material sheets.

Check Technology

We recommend to simulate the process in the software before machining to make sure everything is correct.
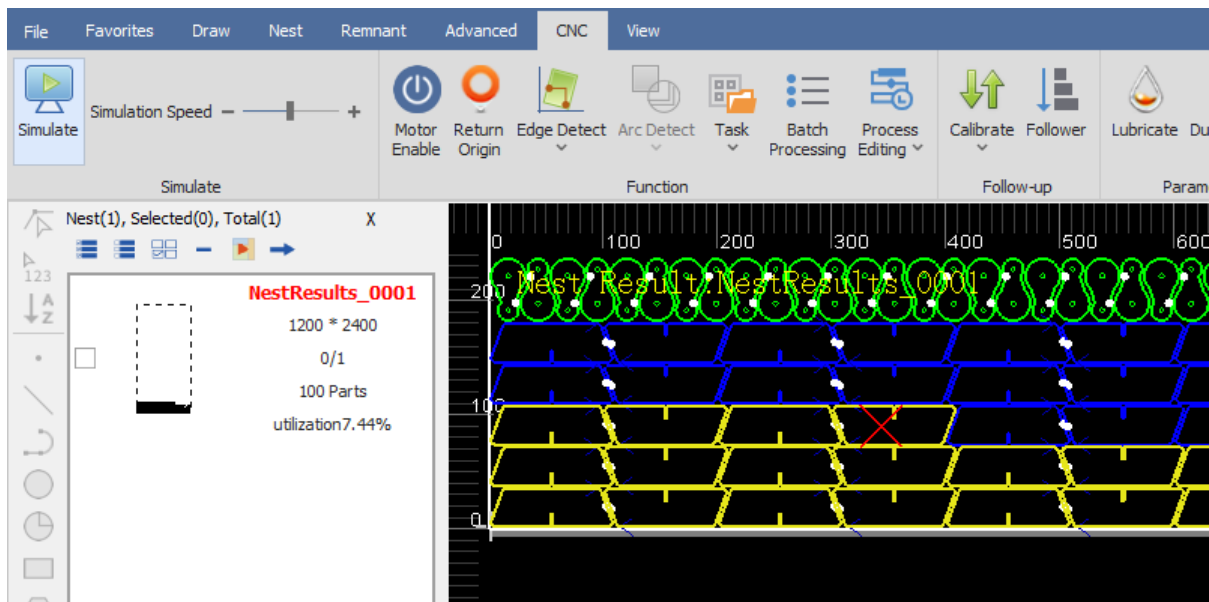
Machining

Set the system ready and start machining.
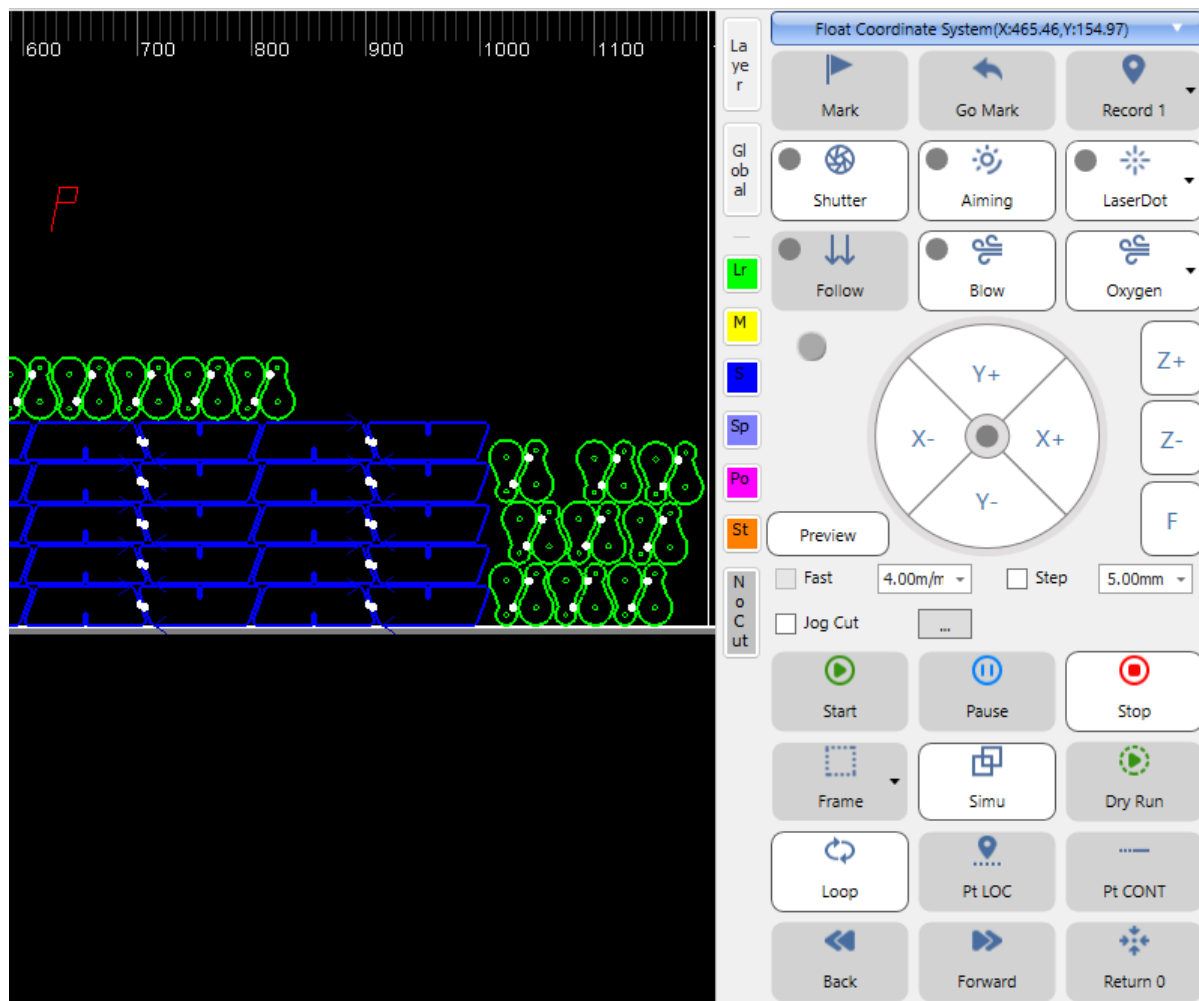
Handheld Remote

2DCutAhead also comes with a handheld remote for your convenience, which is very similar to the one comes with CypCut, integrates the most common operations, such as jogging, framing, starting and pausing a job, etc. Refer to CypCut Handheld Remote for more details.

With the remote, you can keep your eyes on the machine when moving the laser head, or controlling the machining process, avoid making mistakes or operation delays when switching back and forth between the software and the machine.

Machining

- The First Job

The First Job

After getting familiar with the basic operations and the CAD/CAM software, you are ready to do your first job on the EV-30 laser system. We will walk you through the progress step by step.

1. Turn on the system

    1. switch on the electrical power,
    2. turn on the voltage regulator,
    3. turn on the chiller,
    4. (for high power lasers only) turn on the fiber laser,
    5. switch on the assist gas,
    6. turn on the main switch,
    7. release the emergency button,
    8. turn on the machine,
    9. (for low power lasers only) turn on the fiber laser,
    10. turn on the computer, and
    11. launch the CAD/CAM software and complete the homing process.

    Refer to Turn on the Laser System for detailed instructions.

    > **IMPORTANT**
    >
    > Make sure the water temperature is above 20°C (68°F) before turning on the laser, otherwise, you will get a warning from the laser source. You can turn the laser source off and on again to recover from the warning once the water temperature is back to normal.

    > **IMPORTANT**
    >
    > Do origin after turning on the system to ensure the machine knows where it is.

    > **IMPORTANT**
    >
    > Turn on the laser in the software if the laser source is installed inside the machine on your system.

2. Import the design

We're using CpyCut in this example, but the steps are similar if you are using other CypCut variants or 2DCutAhead.

In the menu **File**, click **Import** and then **Import DXF File...** to open the import dialog.
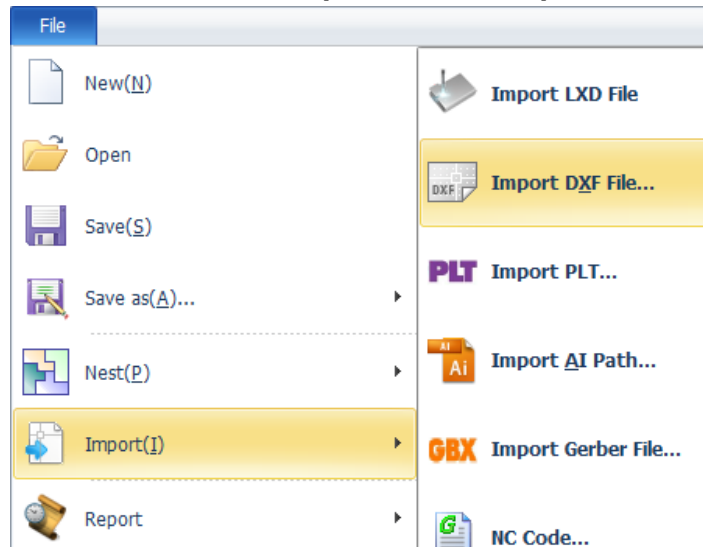
> **NOTE**
>
> We recommend to import DXF files for the best compatibility.

Select the file, the shapes and the dimension of the bounding rectangle will show up in the preview area. Click **Open** to import the file.
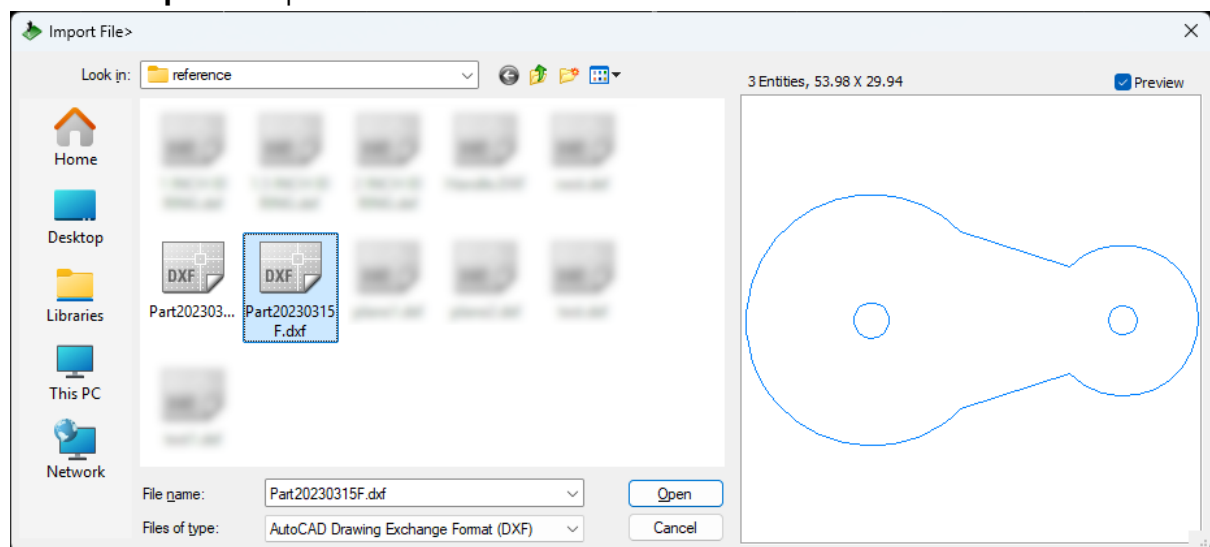
> **NOTE**
>
> The first thing after importing is to make sure the design is scaled correctly. The software will try to recognize the length unit from DXF file if it is set up to import **Depends on DXF**. You can also tell the software to use a specific unit (metric/inch) if that does not work for you.

Refer to Import Parts in CypCut User's Manual for more details.

3. Check the design

   After importing, check the design for any errors or issues.

   In the section **View** of the menu **Home**, click **Display** and then **Display Open Figure in Red** to highlight any open figures in red.
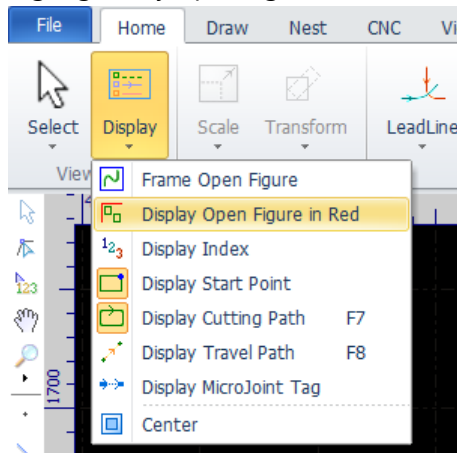
   In the section **Simulate** of the menu **CNC**, click **Simulate** to run a simulation and check if there are any things wrong with the cutting paths.
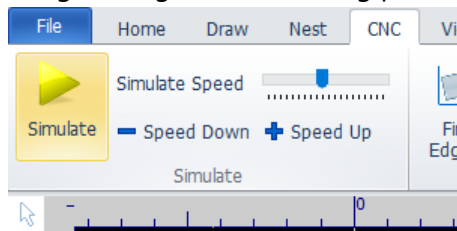
   > **NOTE**
   >
   > It is a good practice to turn on display assistant options, e.g. **Display Open Figure in Red**, and to do a brief simulation to ensure there are no unwanted artifacts or missing elements.

   Use the corresponding functions under **Optimize** in the section **Tools** of the menu **Home** to solve any issues found. For example, you can use **Join Segment** to close any open figures automatically.
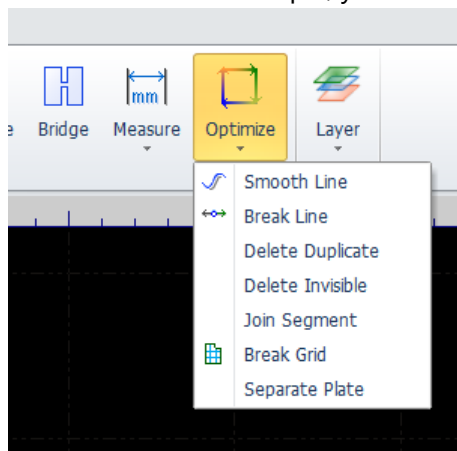
   Refer to Object View Functions, Check Technology and Drawing Optimizations in CypCut User's Manual for more details.

4. Set technology

Set common technologies, e.g. lead lines, micro joints, and cutting parameters, then sort the processing order.

Select all the shapes, in the section **Technique** of the menu **Home**, click **LeadLine** to open the lead line settings dialog.
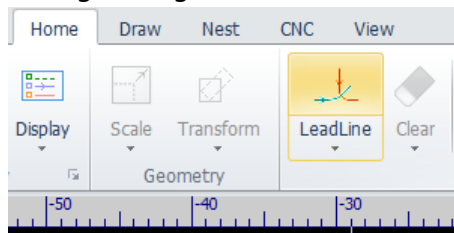
Set lead-in parameters, check **Introduce from long edge**, and check **Closed figure only**, then click **OK** to generate lead lines automatically.
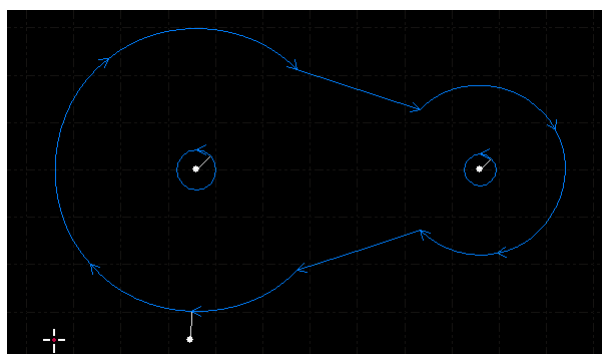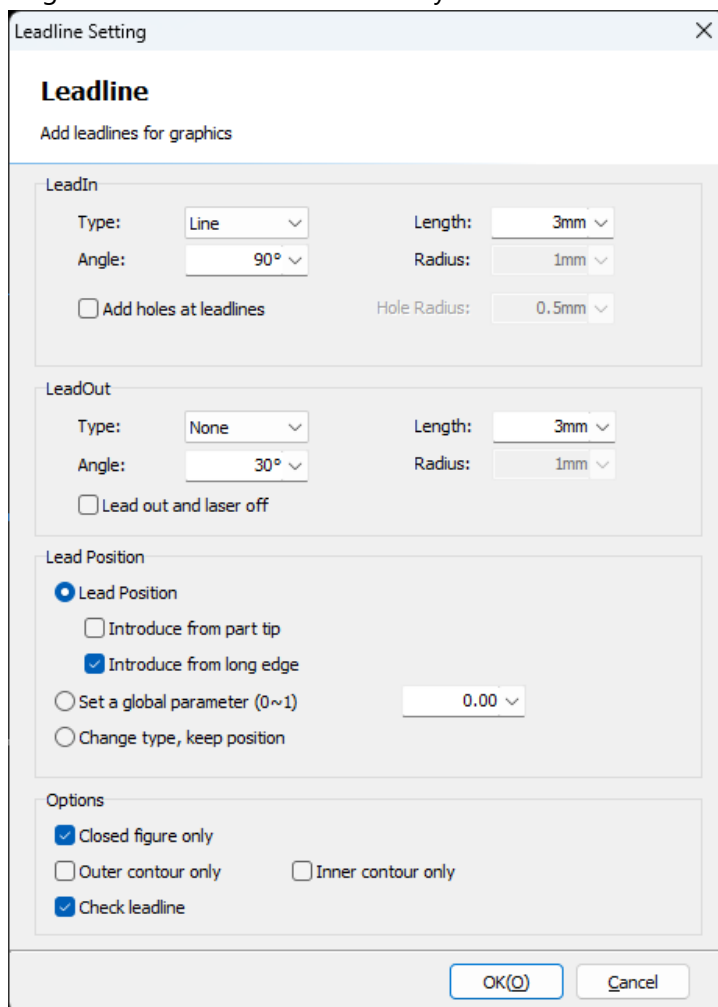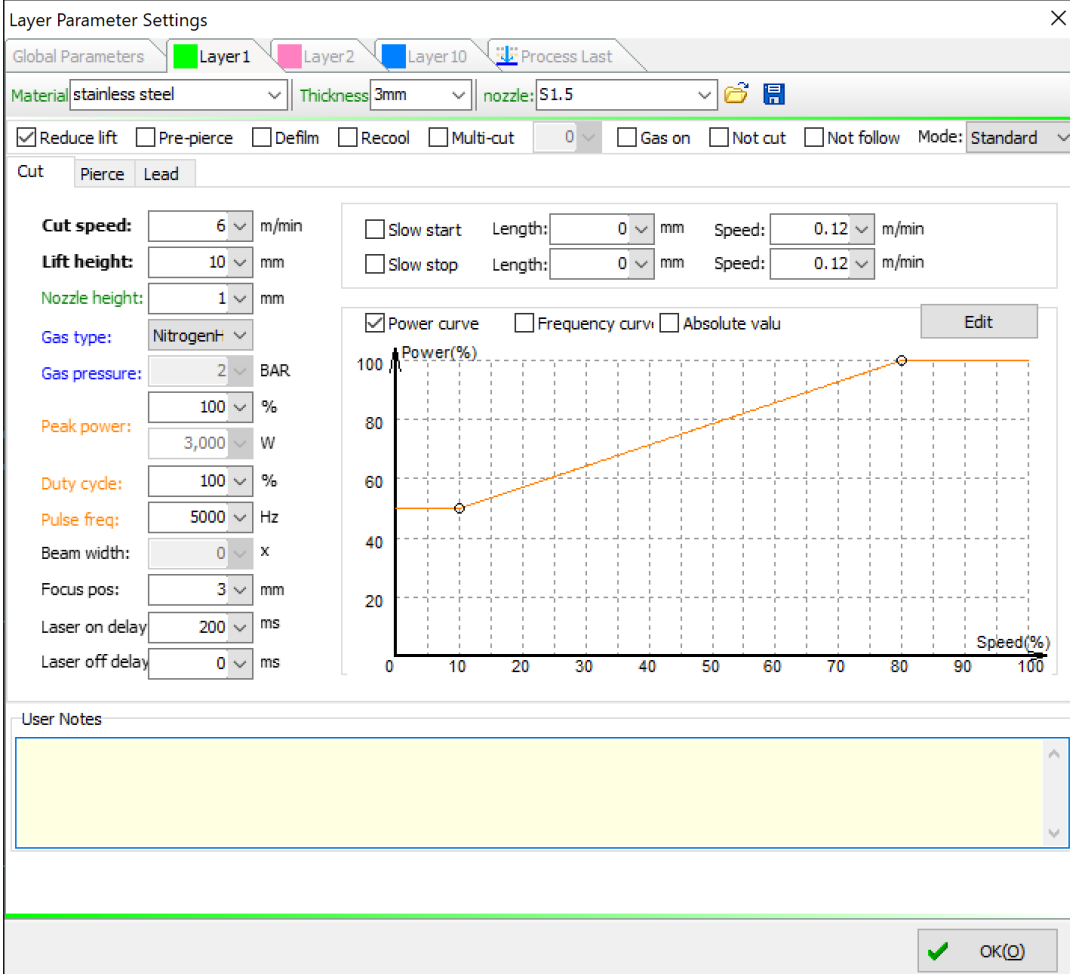
Select the outer shape, in the section **Technique** of the menu **Home**, click **Gap** to open the gap settings dialog.
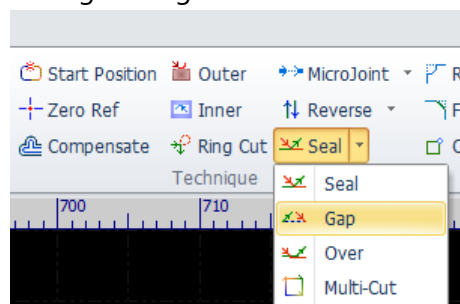
Set the gap value to `0.5`mm, then click **OK** to apply the gap.
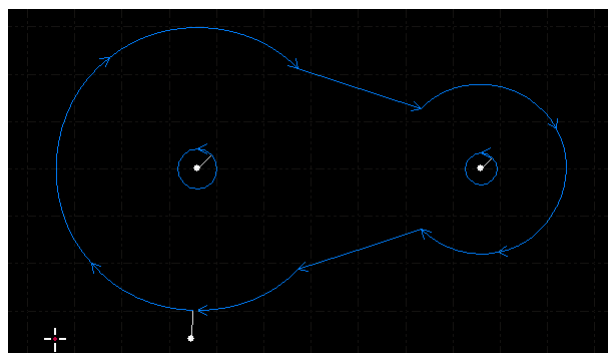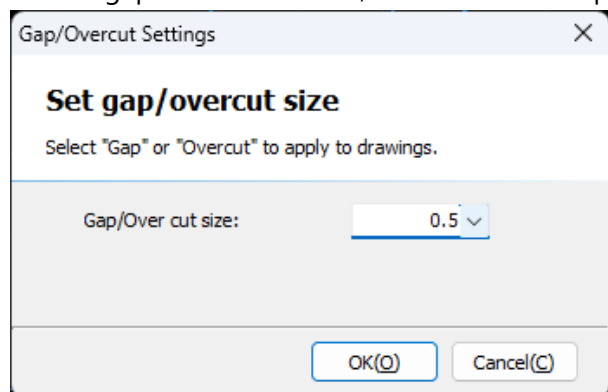
Select all the shapes, click ⬜ to set them to the layer green. In the section **Params** of the menu **Home**, click **Layer** to open the cutting parameters dialog.

Click 📂 to open the cutting parameters library, select a preset according to your material. Double check the settings and click **OK** to apply.

> **NOTE**
>
> There should be a cutting parameters library set up for your machine during installation and training. You can just import a preset according to your material.

In the section **Sort** of the menu **Home**, click **Sort** to set the processing order automatically.
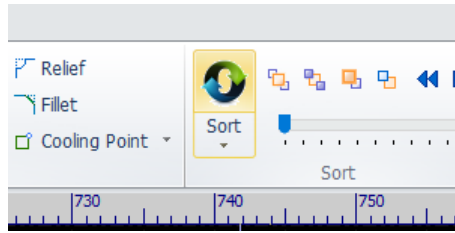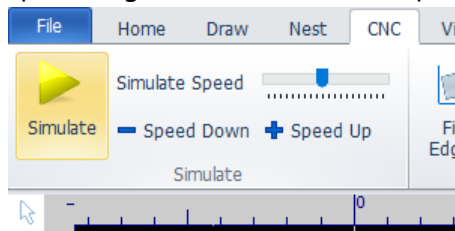

Refer to Technology in CypCut in CypCut User's Manual for more details.

5. Check technology
   Run a final simulation to ensure everything is set up correctly. This will help you identify any potential issues.

   In the section **Simulate** of the menu **CNC**, click **Simulate** to do the simulation. And you can adjust the speed to get a better look at the processing details.


   Refer to Check Technology in CypCut User's Manual for more details.

6. Prepare for machining

Place the material on the machine bed and secure it properly. Set the nozzle according to the cutting parameters.

We're using CpyCutE in this example, but the steps are similar if you are using other CypCut variants or 2DCutAhead.
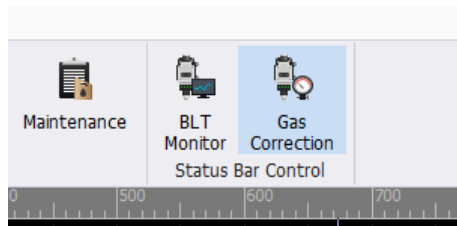
Jog the laser head onto the top of the material. In the section **Custom** of the menu **CNC**, click **Calibrate** and then **Calibrate** to open the calibration dialog.
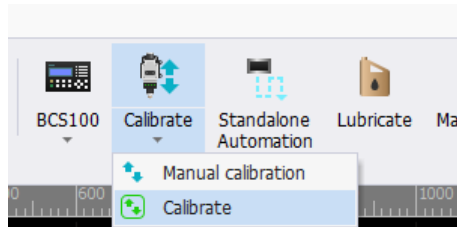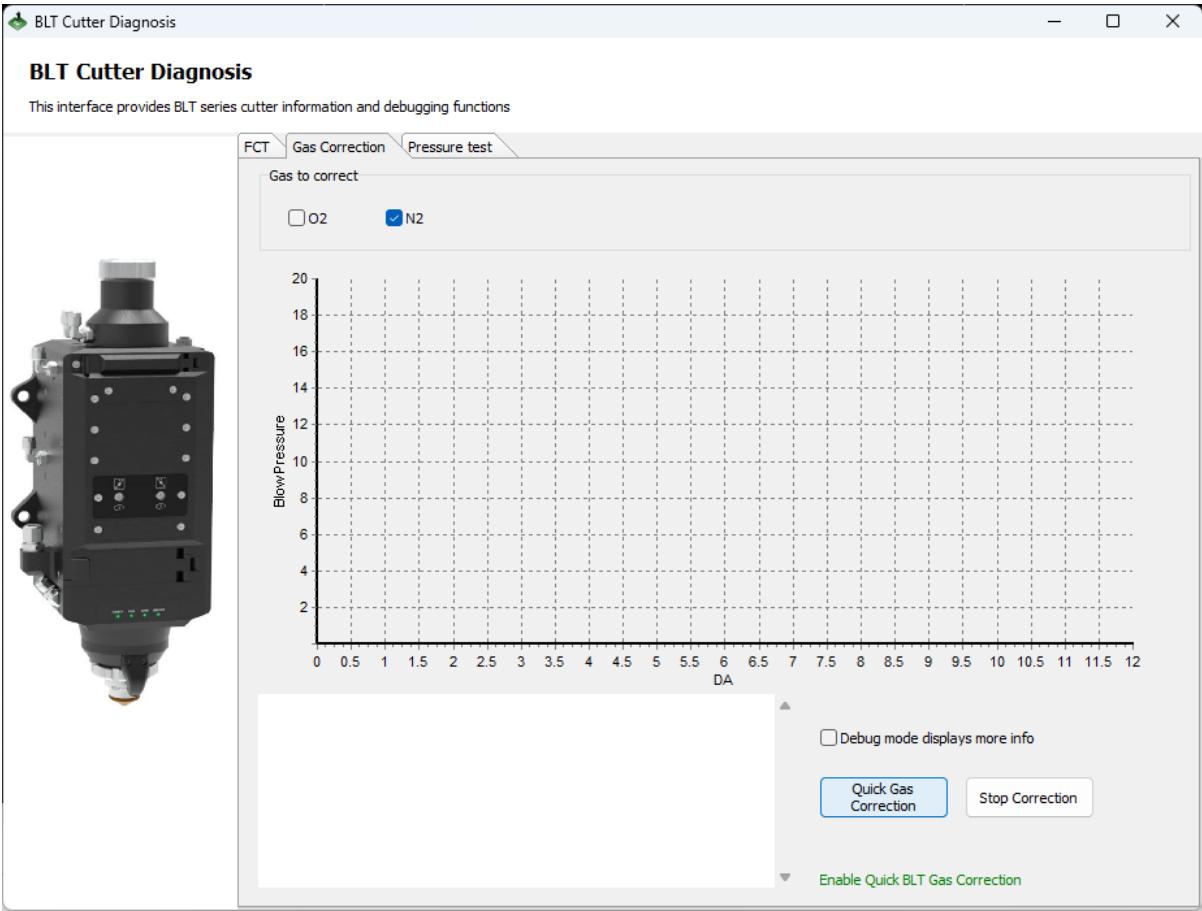

Click **Auto calibrate** to start the calibration process.
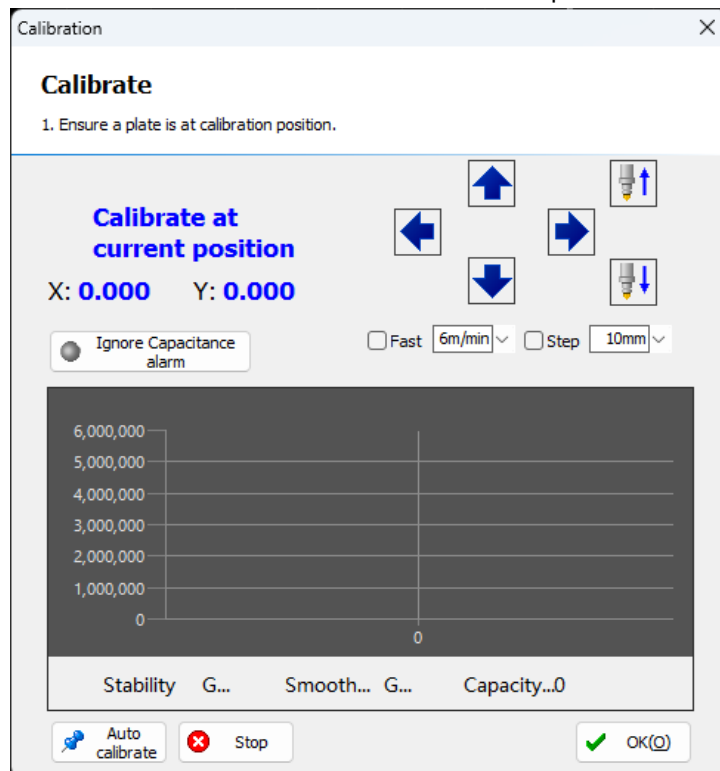
You should also do a gas correction if the laser head supports it. In the section **Status Bar Control** of the menu **CNC**, click **Gas Correction** to open the dialog.

In the tab **Gas Correction**, check the gas type according to the cutting parameters, and then click **Quick Gas Correction** to start the correction process.

If the laser head does not support the gas correction, you should still do a gas blowing test to ensure the gas flow is normal. Make sure the correct gas type is selected in the software.
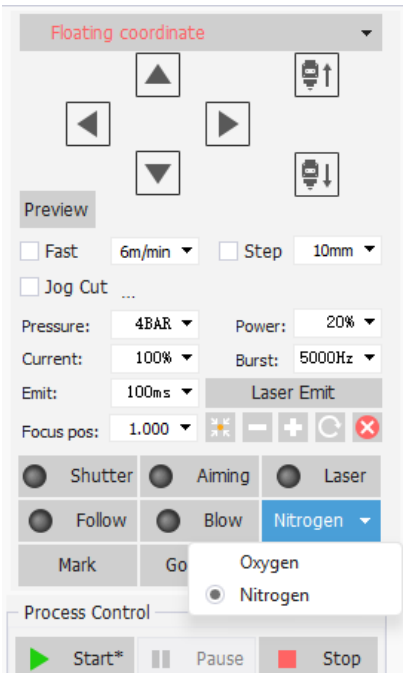
7. Start machining

Jog the laser head to the starting position of the job, frame to confirm if the shapes can fit in the material, and open the laser shutter, then start the machining process.

> **IMPORTANT**
>
> Always keep an eye on the machining process closely to ensure safety and quality. Pause or stop the job immediately if you get a bad cut or any other issues.

8. Post-processing

After machining, carefully remove the material from the machine bed. Perform any necessary post-processing steps such as cleaning or finishing.

By following these steps, you will successfully complete your first job on the EV-30 laser system.
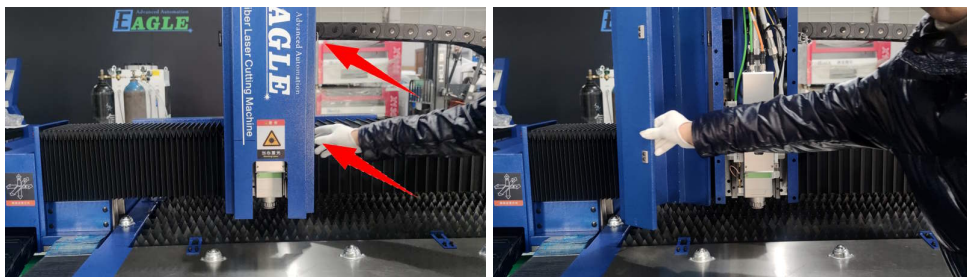
Appendices

- [Appendix A - (For High Power Lasers Only) Install the Fiber Laser](#)

Appendix A - (For High Power Lasers Only) Install the Fiber Laser

1. Prepare the CNC machine to set the fiber.

    1. Open the access panel of the laser head.

    2. Remove the covers of the Z axis drag chain.

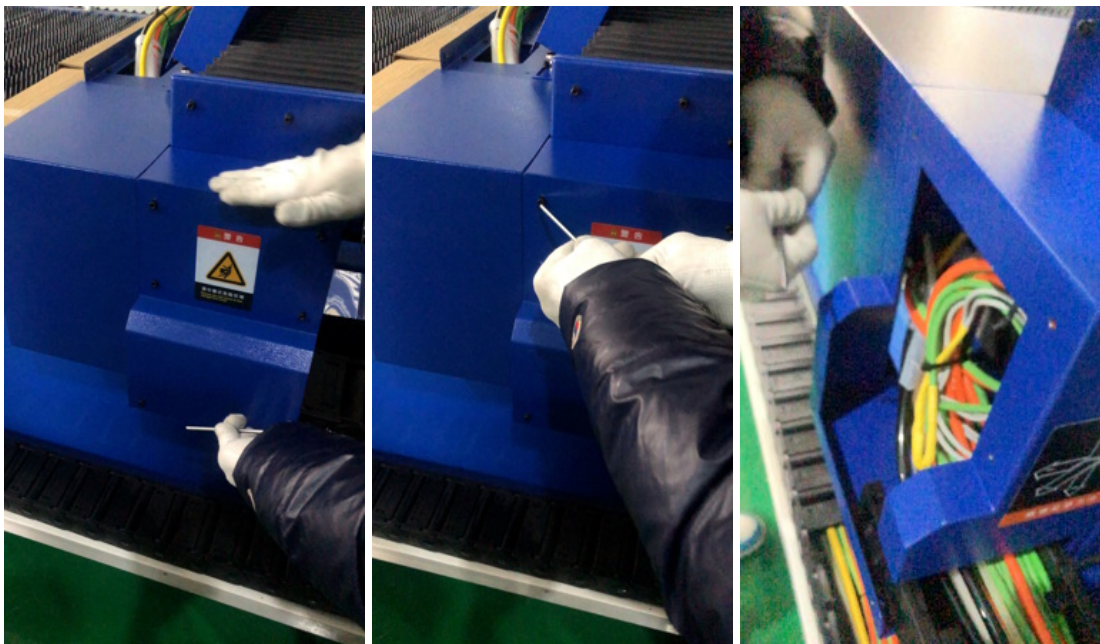   3. Remove the access panel on top of the Z axis.
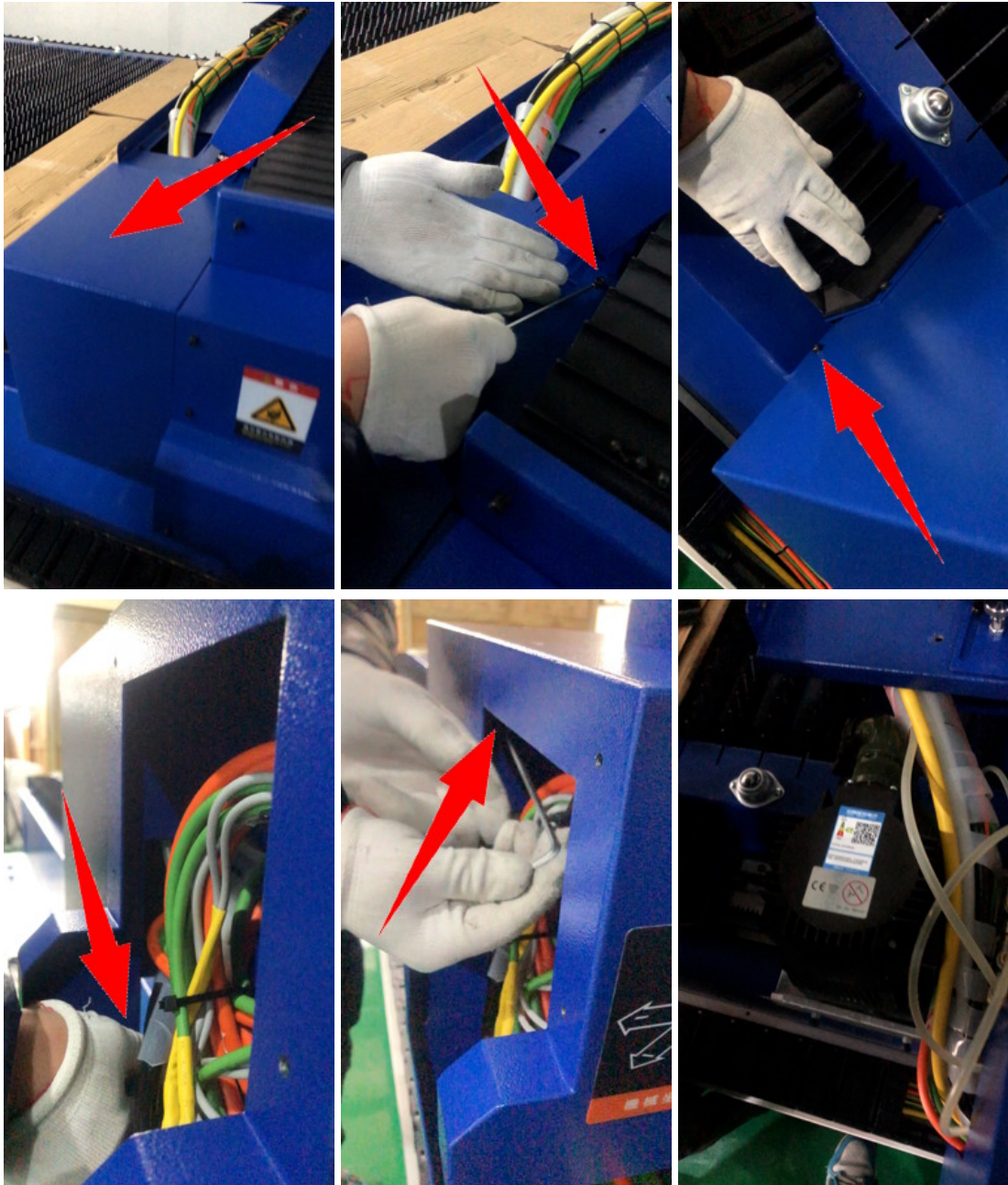
4. Remove the covers of the X axis drag chain.

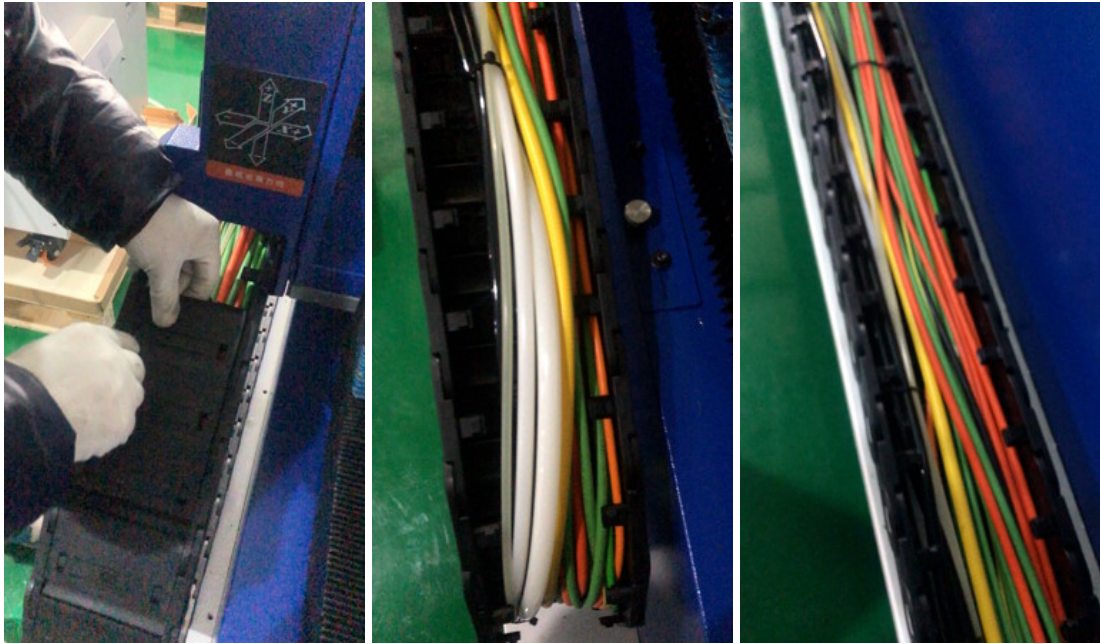5. Remove the access panel at the end of the X axis drag chain.

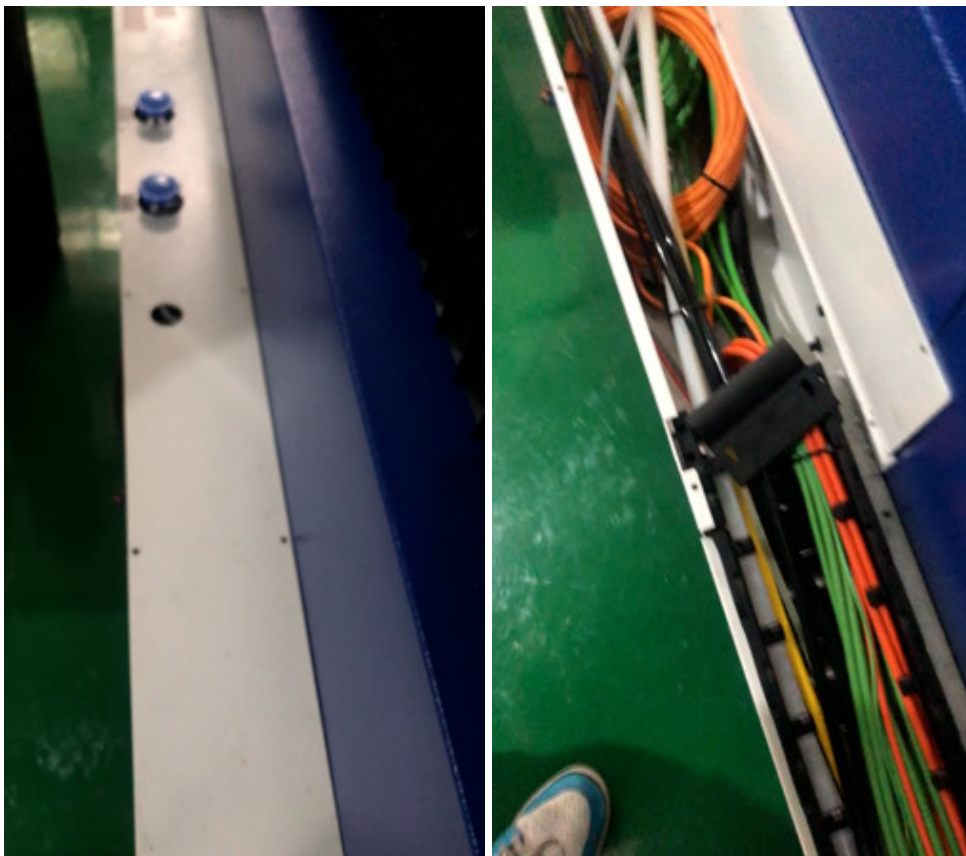6. Remove the side access panel of the X-Y intersection.

7. Remove the corner access panel of the X-Y intersection.

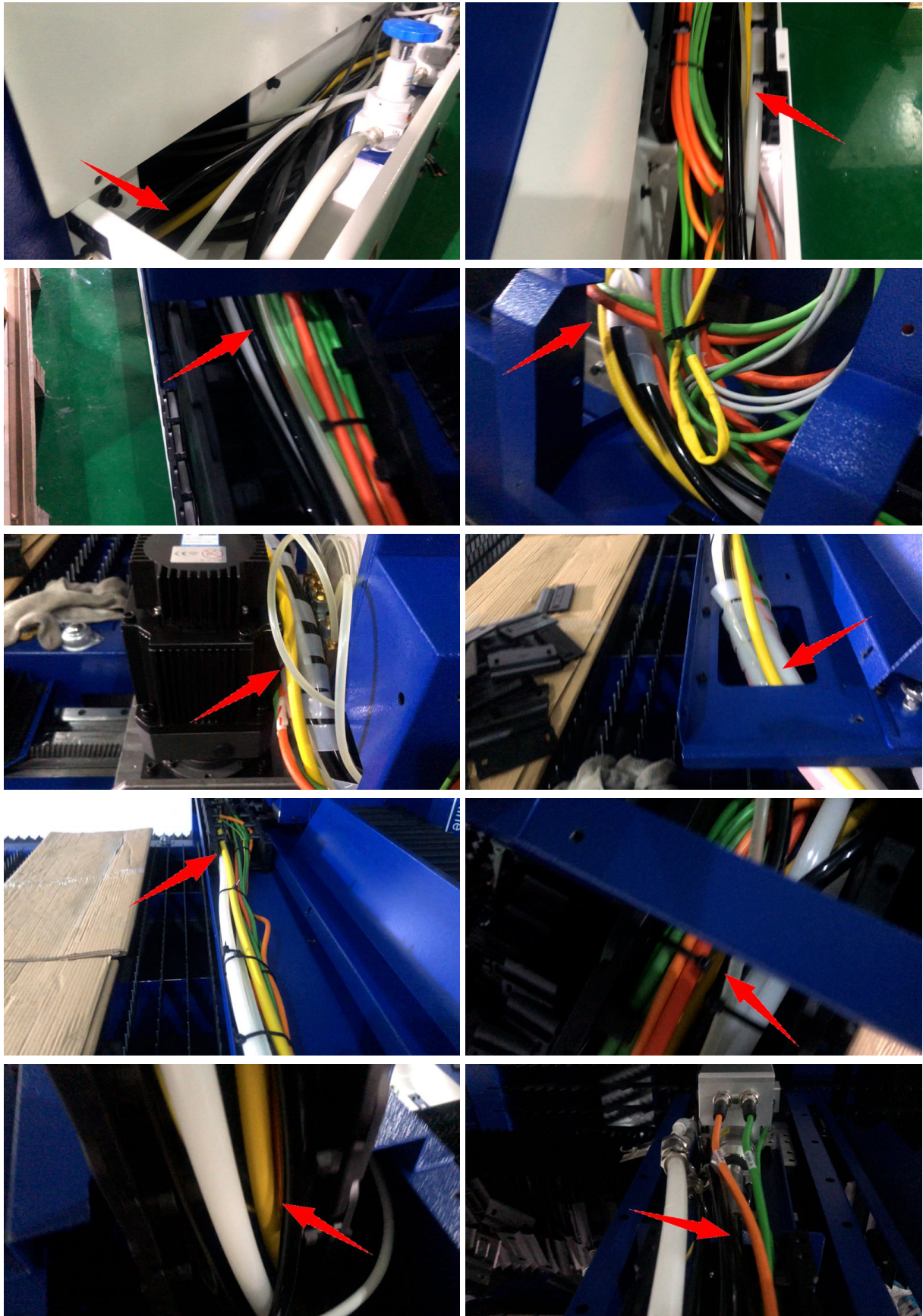8. Remove the covers of the Y axis drag chain.

9. Remove the access panel at the end of the Y axis drag chain.

2. Set the fiber through to the laser head.

Set the fiber through the Y axis drag chain, the X axis drag chain, and the Z axis drag chain to the laser head.

> **IMPORTANT**
>
> The fiber optic cable must be laid straight, without twisting. It must not be uncoiled from the top of the spool. And it is important to prevent it from tangling with other cables and hoses in the drag chains.
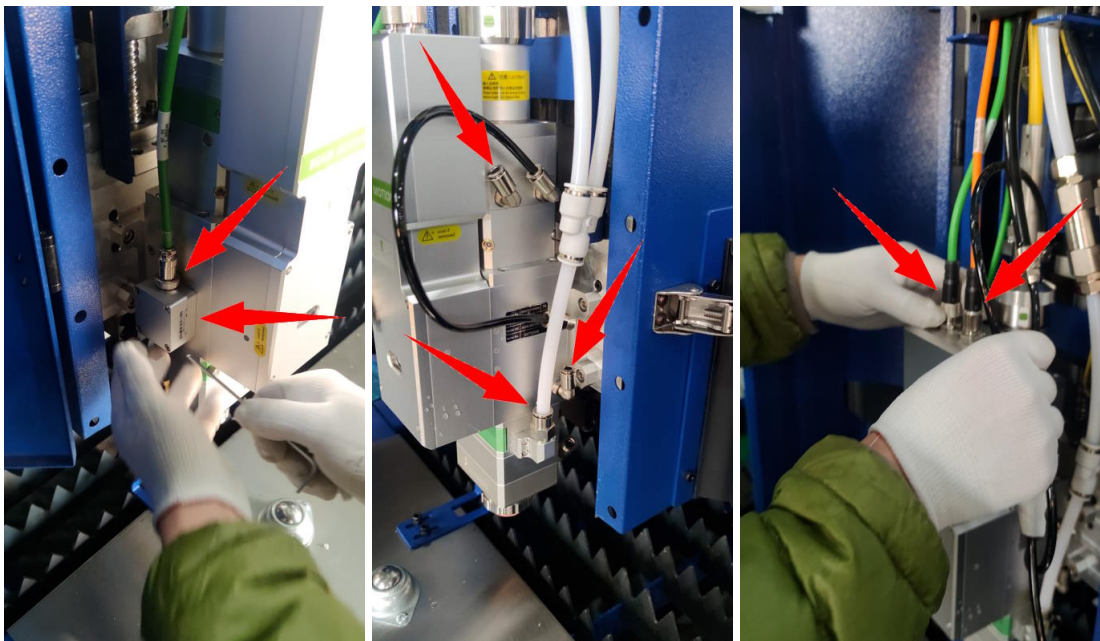>
>
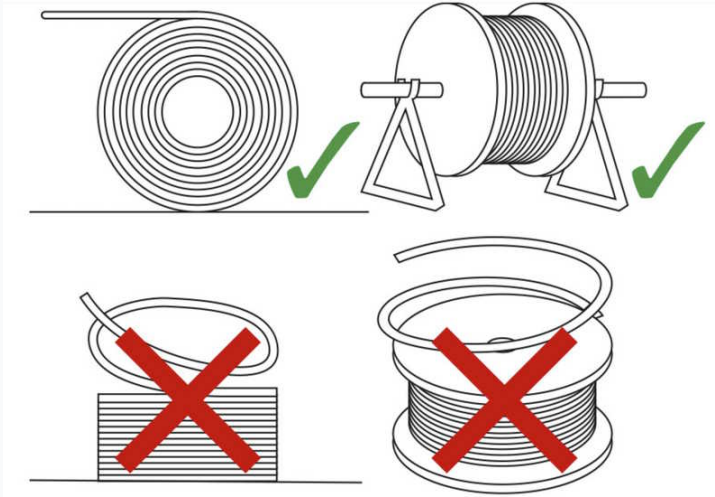
3. Connect the fiber to the laser head.

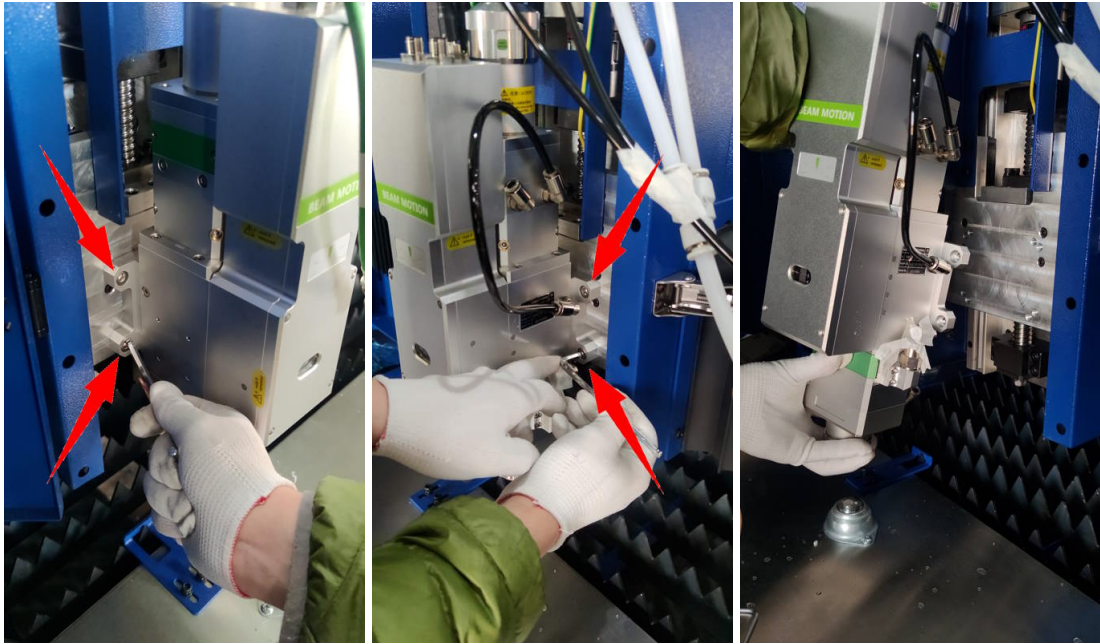   1. Remove the connections on the laser head.
      Remove the green signal line on the left, and remove the signal box if there is no room for tools.
      Remove the water hoses on the right, and remove the gas pipe.
      Remove the servo cables on the top.

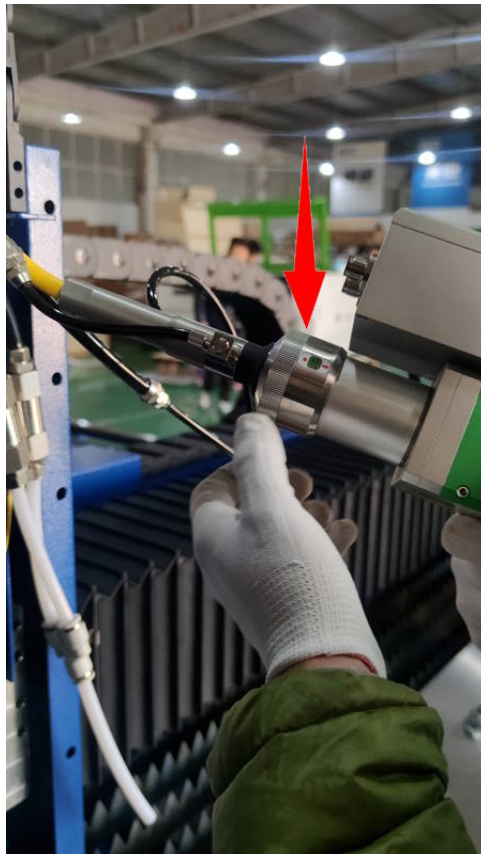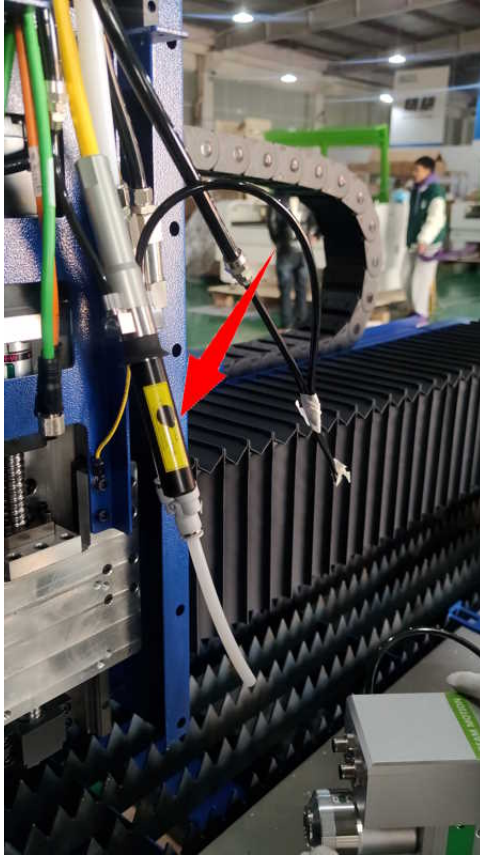2. Remove the laser head from the Z axis slider.

3. Connect the fiber to the laser head.

　Remove the protective cap from the end connector of the fiber.

　Remove the protective cap from the QBH interface of the laser head.

　Hold the laser head in horizontal, aim and set the connector into the QBH interface, and lock it tightly.

> **IMPORTANT**
>
> This step must be done in a **CLEAN** environment, and the laser head must be held in **HORIZONTAL** while connecting. Otherwise, there might be dust going into the laser head, and the upper protective lens might get dirty and would be broken by the laser while cutting.

    4. Set the laser head back onto the Z axis slider.

    5. Set the connections back on the laser head.

    6. Close the access panel of the laser head.

4. Set the covers of the drag chains and the access panels back on the machine.

5. Connect the cables to the fiber laser.