UNIMIG STEALTH

1200 2400 3000

ARCPATH

VERSION 1.2.1228.0

Operating Manual

Contents

1. Safety

Cutting equipment can be dangerous to both the operator and people in or near the surrounding working area if the equipment is not correctly operated. Equipment must only be used under the strict and comprehensive observance of all relevant safety regulations.

Read and understand this instruction manual carefully for all system components, especially the safety instructions and warning notices before the installation and operation of this equipment.

Note:

- Observe the accident prevention regulations and any regional regulations.
- Safety and warning labels on the machine indicate any possible risks.
- Keep these labels clean and legible at all times.
- Technical changes due to further development in machine technology may lead to different welding behaviour.

Items in the manual that require particular attention in order to minimise damage and harm are indicated with the below symbols. Read these sections carefully and follow their instructions.

Note: Gives the user a useful piece of information.

Caution: Describes a situation that may result in damage to the equipment or system.

Warning: Describes a potentially dangerous situation. If not avoided, it will result in personal damage or fatal injury.

Machine Operating Safety

- Do not switch the function modes while the machine is operating. Switching of the function modes during welding can damage the machine. Damage caused in this manner will not be covered under warranty.
- Only qualified persons should install, operate, maintain, and repair this equipment.
- During operation, keep everyone, especially children, away.

Electric Shock

Electric shock can kill. Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and internal machine circuits are also live when power is on. Do not operate with removed panels or exposed wiring. Incorrectly installed or improperly grounded equipment is dangerous.

- Connect the primary input cable according to Australian and New Zealand standards and regulations.
- Avoid all contact with live electrical parts of the cutting circuit, such as sockets, control box and electrodes, with bare hands.
- The operator must wear dry, hole-free welding gloves and body protection while they perform the cutting task.
- The operator should keep the workpiece insulated from themselves.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cable for wear and tear, and replace the cable immediately if damaged. Bare wiring is dangerous and can kill.
- Do not use damaged, undersized, or badly joined cables.
- Do not cut in the rain or in wet, moist, or damp areas.
- Do not drape cables over your body.
- Disconnect the power source before servicing or maintaining this equipment.
- We recommend an RCD safety switch is used with this equipment to detect any leakage of current to earth.

DC voltage remains in the inverter power source after the removal of input power.

Arc Rays

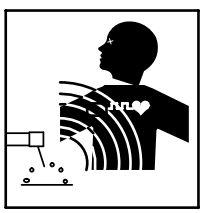
Arc rays are harmful to your eyes and skin. Arc rays from the cutting process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Always wear an approved welding helmet with the correct shade of filter lens and suitable protective clothing, including welding gloves, while the cutting operation is performed.

Recommended filter shades for plasma cutting

Less than 20A	Shade 4
20A to 40A	Shade 5
40A to 60A	Shade 6
60A to 80A	Shade 8
80A to 300A	Shade 8

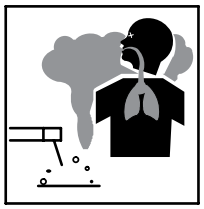
- Wear safety glasses under your helmet.
- Measures should be taken to protect people in or near the surrounding working area. Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear proper PPE and body protection made from durable, flame-resistant materials like leather.



Electro Magnetic Fields (EMF)

Magnetic fields can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near any plasma cutting.



Fumes & Gases

Fumes and gases are dangerous. Cutting produces fumes and gases and breathing these fumes and gases can be hazardous to your health.

- Do not breathe the smoke and gas generated while cutting. Keep your head out of the fumes.
- Keep the working area well-ventilated and use fume extraction or ventilation to remove cutting fumes and gases.
- In confined or heavy fume environments, always wear an approved air-supplied respirator.
- Cutting fumes and gases can displace air and lower the oxygen level, causing injury or death. Be sure the breathing air is safe.
- Do not cut in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Materials such as galvanised, lead, or cadmium-plated steel contain elements that can give off toxic fumes when cut. Do not cut these materials unless the coating is removed, or the area is very well-ventilated and/or you are wearing an air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.

Fire Hazard

Cutting on closed containers, such as tanks, drums, or pipes, can cause them to explode. Flying sparks from the cutting arc, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of the electrode with metal objects can cause sparks, explosions, overheating, or fire. Check and be sure the area is safe before doing any cutting.

- Remove any flammable materials well away from the working area. Cover flammable materials and containers with approved covers if they cannot be moved from the area.
- Do not cut on closed containers or containers that have held combustible materials, such as tanks, drums, or pipes, unless they are correctly prepared according to the required Safety Standards to ensure that flammable or toxic vapours and substances are totally removed, these can cause an explosion even though the vessel has been "cleaned".
- Vent hollow castings or containers before cutting. They may explode.
- Do not cut where the atmosphere may contain flammable dust, gas, or liquid vapours (such as petrol).
- Have a fire extinguisher nearby and know how to use it.
- Be alert that cutting sparks and hot materials from cutting can easily go through small cracks and openings to adjacent areas.
- Be aware that cutting on a ceiling, floor, bulkhead, or partition can cause a fire on the hidden side.
- Avoid cutting on tire rims or wheels, as heating can cause tires to explode and repaired rims may fail.
- Attach the earth clamp as close as possible to the cutting area to minimise the risk of electric shock, sparks, and fire hazards caused by the cutting current travelling through long or unknown paths.
- Before cutting, remove any combustible items, like butane lighters or matches, from your person.
- Post cutting, thoroughly inspect the area to ensure there are no lingering sparks, glowing embers, or flames.
- Always use the correct fuses or circuit breakers, and don't oversize or bypass them.
- Wear proper PPE and body protection made from durable, flame-resistant materials like leather.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.

Hot Parts

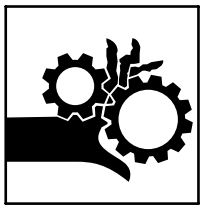
Hot parts can burn. Items being welded can generate and hold high heat and can cause severe burns.

- Do not touch hot parts with bare hands.
- Allow a cooling period before working on the cutting equipment.
- Use the proper tools and insulated welding gloves and clothing to handle hot parts and prevent burns.

Noise Hazards

The noise from some processes or equipment can damage hearing.

- Wear approved ear protection if the noise level is high.



Pinch Points

Pinch points can cause injury. Coming into contact with a pinch point can lead to the possibility of having a hand or finger being caught and injured.

- Be aware of pinch points that are present in your work environment
- Assure all covers and protective shields for equipment and machinery pinch point hazards are in place.
- Loose clothing, jewellery, and hair can be pulled into pinch points. Wear snug clothing, remove jewellery, and tie long hair back or secure under a cap before working in the vicinity of pinch point hazards.
- Place and maintain warning labels adjacent to pinch point hazards.
- Never place your hands near or reach across rotating mechanical parts.
- Be alert whenever you place your fingers or hands between any objects.
- Do not operate equipment or machinery without required guards or shields.
- Wear proper PPE and body protection to protect yourself.

Weight Capacity

DO NOT exceed the maximum table weight capacity. It is imperative that you do not exceed the stated weight limitations of the CNC table. Overloading the table can lead to permanent structural damage, compromising the integrity and functionality of the entire system. Additionally, exceeding the weight limit poses a significant risk of serious bodily harm, as the table may become unstable or collapse. Always adhere to the recommended weight capacities to ensure safe and effective operation. Your safety and the longevity of your equipment depend on following these guidelines strictly.

PLEASE NOTE that under no circumstances should any equipment or parts be altered or changed in any way from the standard specification without written permission given by UNIMIG.

To do so will void the warranty.

Flammability Hazard When Cutting Aluminium

Aluminium oxide is produced as a byproduct when cutting aluminium. The oxide settles at the bottom of the water table, where it absorbs oxygen from the water, releasing hydrogen in the process. This hydrogen rises to the surface and typically appears as small bubbles. Generally, the amount of hydrogen released is minimal and dissipates harmlessly into the air.

Caution is necessary in the rare case that the hydrogen becomes trapped and accumulates in a large pocket, such as beneath a warped sheet. A concave warp in the sheet will act as a collection point, and the hydrogen gas can pose a fire or explosion risk when introduced to the plasma arc or sparks.

There are several safety precautions you must take to prevent the risk of injury and damage to equipment and property when cutting aluminium with this product.

Ventilation: Ensure there is proper ventilation and airflow in the cutting area to facilitate the dispersion of hydrogen gas and prevent accumulation. Water aeration systems can also be introduced to ensure oxygen dissipates the hydrogen buildup.

Reduced Water Level: Reducing the water level to well below the material can help avoid hydrogen buildup under the sheet.

Sheet Handling: Avoid leaving full sheets on top of the table for extended periods of time, as this will increase the chance of hydrogen accumulation.

Starting & Stopping: Using the provided CNC control software, active cuts can be paused between parts. This does not interfere with cut quality and allows the user to ensure no gas pockets exist.

Dry Cutting: You can avoid hydrogen buildup altogether by not using water in the bed. However, aluminium powder and dust are still extremely flammable. If you wish to run this table dry, you must account for this by adding fume and particulate extraction to the table to avoid the ignition of aluminium powder or dust and frequently clean the cutting and surrounding area.

Water Table Maintenance: Regularly clean and maintain the water in the table to prevent aluminium oxide from settling and accumulating. Replace the water frequently to remove the contaminants which can cause this hazard.

Avoid Traps: Minimise the potential for hydrogen pockets by ensuring that sheets lay flat on the table. Avoid leaving large, warped, or irregularly shaped materials in the cutting area.

Training: Ensure all operators are trained to recognise the signs of potential hydrogen buildup and understand the importance of the aforementioned precautions.

Immediate Action: If hydrogen accumulation is suspected, stop the cutting operations immediately and address the buildup before resuming.

Check with your safety officer or local officials for more information regarding proper procedures and practices regarding the cutting and handling of aluminium.

Welding Guns of Australia Pty Ltd. assumes no liability or makes any claims to any methods or modifications outlined above to mitigate the risks presented in this message. These are recommendations as to how to potentially mitigate some of the risk factors of cutting aluminium. Welding Guns of Australia Pty Ltd. is not responsible for any damages or injuries resulting from failure to conform to the safety guidelines presented in this user manual. It is the user's responsibility to follow all instructions and safety precautions to ensure proper use table. Non-compliance with these guidelines may void any warranties and relieve Welding Guns of Australia Pty Ltd. of any liability.

2. Package Contents

2.1 STEALTH 1200 & 2400

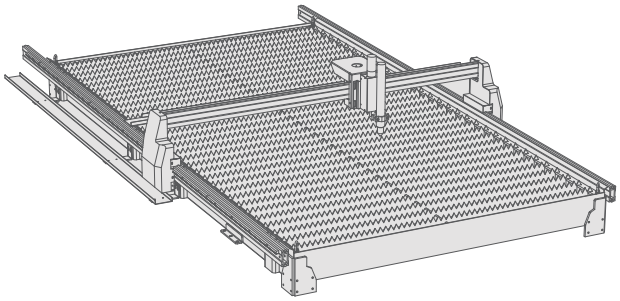


Table Body

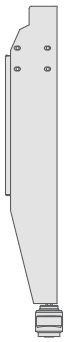
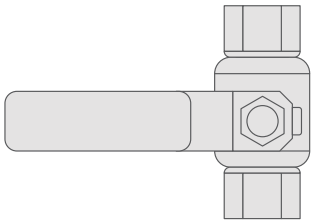
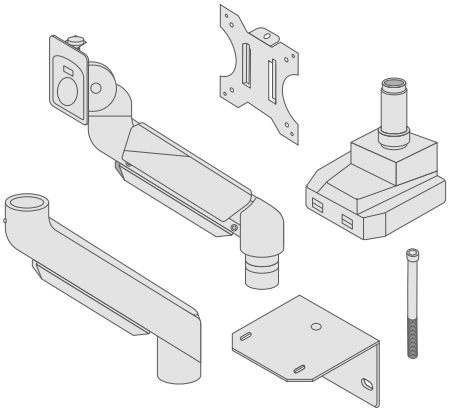


Table Legs x 4 (STEALTH 1200)
OR
Table Legs x 6 (STEALTH 2400)

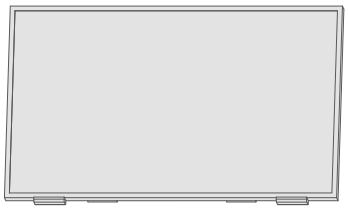


Ball Valve x 2

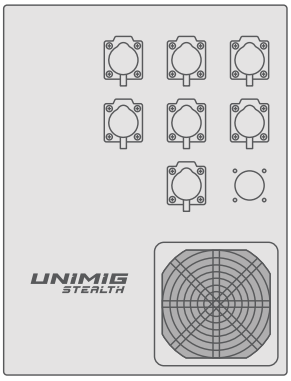
Table Slats



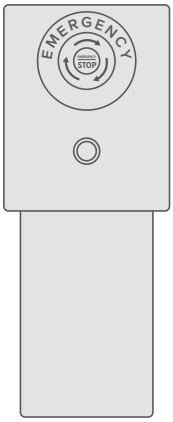
Computer Arm



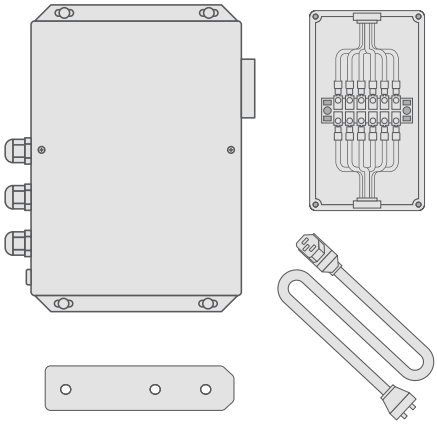
Control PC



Electrical Cabinet



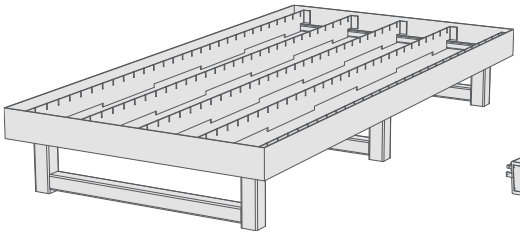
Emergency Stop (E-Stop) Plate & Button



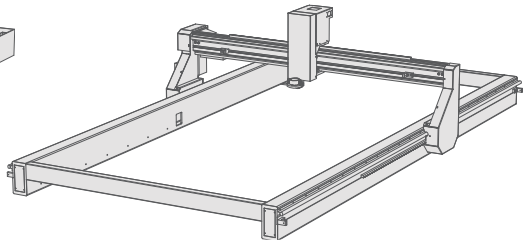
Accessories Box which includes:

THC, THC Divider & Arc Voltage Box, Power Cable, Earthing Plate

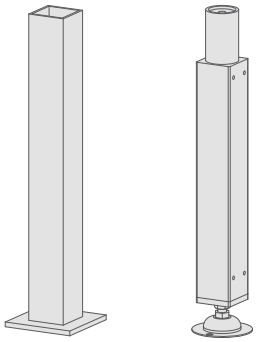
2.2 STEALTH 3000



Water Bed



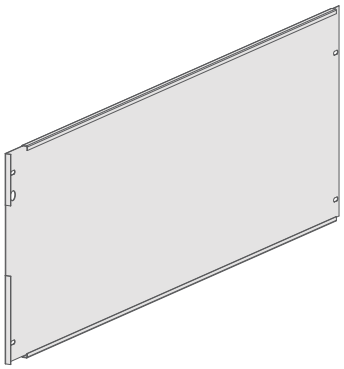
Gantry Frame



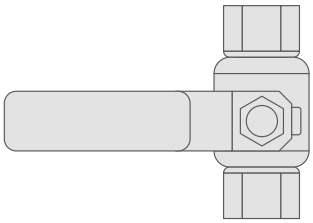
Water Bed Table Legs x 6
Gantry Frame Legs x 6

Gantry Rail

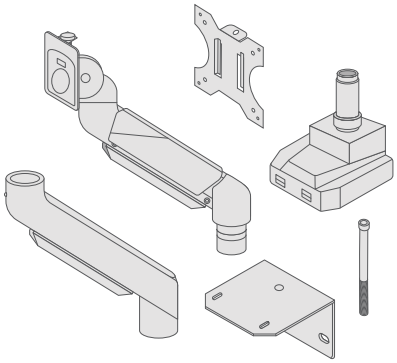
Table Slats



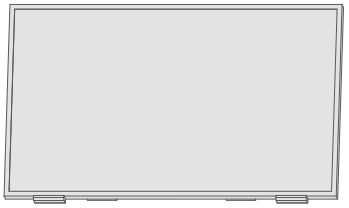
Wall x 6



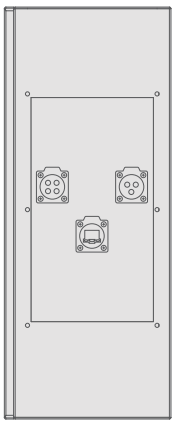
Ball Valve



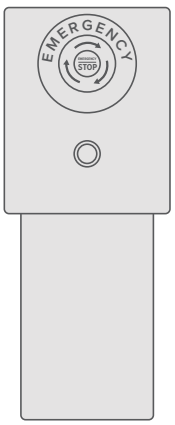
Computer Arm



Control PC



Electrical Cabinet



Emergency Stop (E-Stop)
Plate & Button

3. Technical Specifications

3.1 Machine Specifications

STEALTH 1200 Technical Data

Parameter	Values
SKU	U11097
Exterior Dimensions (cm)	160x170x110
Table Weight (kg)	200
Max Cut Dimensions (m)	1.23 x 1.22
Max Table Load (kg)	175
Water Bed Capacity (L)	175
Table Input Voltage	240V Single Phase
Axis Type	3 Axis (X/Y/Z)
Height Control	Automatic & Manual
Axis Limiter	Physical X/Y/Z Proximity Sensor Switches
Fume & Spark Management	Built-in Water Bed with Integrated Slat Slots
Maximum Jog Speed	8,000 mm/m
CNC Controller	Purpose Built Multi-Tool Controller
Control Interface	Windows 10 PC with 21” Touchscreen
Software	UNIMIG ArcPath CNC Control Software + CAM/Nesting Software Included

STEALTH 2400 Technical Data

Parameter	Values
SKU	U11098
Exterior Dimensions (cm)	280x170x110
Table Weight (kg)	340
Max Cut Dimensions (m)	1.23 x 2.44
Max Table Load (kg)	285
Water Bed Capacity (L)	350
Table Input Voltage	240V Single Phase
Axis Type	3 Axis (X/Y/Z)
Height Control	Automatic & Manual
Axis Limiter	Physical X/Y/Z Proximity Sensor Switches
Fume & Spark Management	Built-in Water Bed with Integrated Slat Slots
Maximum Jog Speed	8,000 mm/m
CNC Controller	Purpose Built Multi-Tool Controller
Control Interface	Windows 10 PC with 21” Touchscreen
Software	UNIMIG ArcPath CNC Control Software + CAM/Nesting Software Included

STEALTH 3000 Technical Data

Parameter	Values
SKU	U11206
Exterior Dimensions (cm)	220x385x145
Table Weight (kg)	750
Max Cut Dimensions (m)	1.54 x 3.04
Max Table Load (kg)	1420
Water Bed Capacity (L)	650
Table Input Voltage	240V Single-Phase
Axis Type	3 Axis (X/Y/Z)
Height Control	Automatic & Manual
Axis Limiter	Physical X/Y/Z Proximity Sensor Switches
Fume & Spark Management	Separated Water Bed with Slat Slots
Maximum Jog Speed	9000 mm/m
CNC Controller	Purpose Built Multi-Tool Controller
Control Interface	Windows 10 PC with 21” Touchscreen
Software	UNIMIG ARC PATH CNC Control Software + CAM/Nesting Software Included

Control PC Specifications

Parameter	Values
Operating System	Windows 10
Screen Panel	21” Touchscreen
Hardware	Intel Core i3, 8GB RAM, 128GB SSD
Networking	Ethernet, Wi-Fi, Bluetooth

4. STEALTH 1200 & 2400 Table Overview

4.1 Key Features

Minimal Assembly Required

The STEALTH CNC tables arrive almost fully assembled and pre-calibrated, unlike traditional CNC tables, which require extensive setup and calibration. You save time and effort and can get started cutting quickly.

Built-In Water Bed

The built-in water bed on the STEALTH CNC tables works to absorb fumes and sparks, giving you a cleaner workspace. With laser welded joints, the water bed is completely leak-free. It comes with two ball valve controlled drainage points with standard hose fittings for quick and easy draining.

Additionally, the tables come with laser-cut mild steel slats, and the slat slots mean you can easily replace slats that become warped or damaged.

Adjustable Sighting Laser

Each STEALTH CNC table is equipped with an adjustable offset sighting laser, ensuring precise alignment and eliminating the guesswork for pierce locations and plate alignment.

No need for expensive add-on accessories, the STEALTH CNC tables come fully equipped with all necessary features right from the start, providing you with a clear, constant visual of where the cut will start every time.

True Cut Size

Reduce material wasteage with a true 1.2x1.2m half-sheet or 1.2x2.4m full-sheet cut size. The gantry will travel 1.23x1.22m on the STEALTH 1200 CNC, and 1.23x2.44m on the STEALTH 2400 CNC, so you can guarantee you'll get the full size of the table to cut across.

Low Maintenance Rack & Pinion

The rack and pinion systems on the X & Y axes provide consistent and precise linear movement. Made from hardened steel, they're resistant to wear and deformity, prolonging their lifespan and minimising the need for maintenance.

The rack's teeth are straight cut, which distributes the load uniformly across the tooth face and contributes to their precision and reliability. Plus, their inverted position helps protect them from dust, chips, and other contaminants, preventing downtime.

Adjustable Level Caster Feet

Easily move the table using the swivel caster wheels and achieve easy and precise table level across most surfaces with the adjustable levelling feature on the wheels.

UNIMIG ArcPath CNC Control Software

The 21-inch touchscreen computer comes pre-installed with our in-house, custom-designed UNIMIG ArcPath CNC Control software. ArcPath accepts G-code design files, or alternatively, you can plug in a USB or a shared network folder and load your own files. We've also included CAM nesting software powered by FLCAM that accepts DXF files.

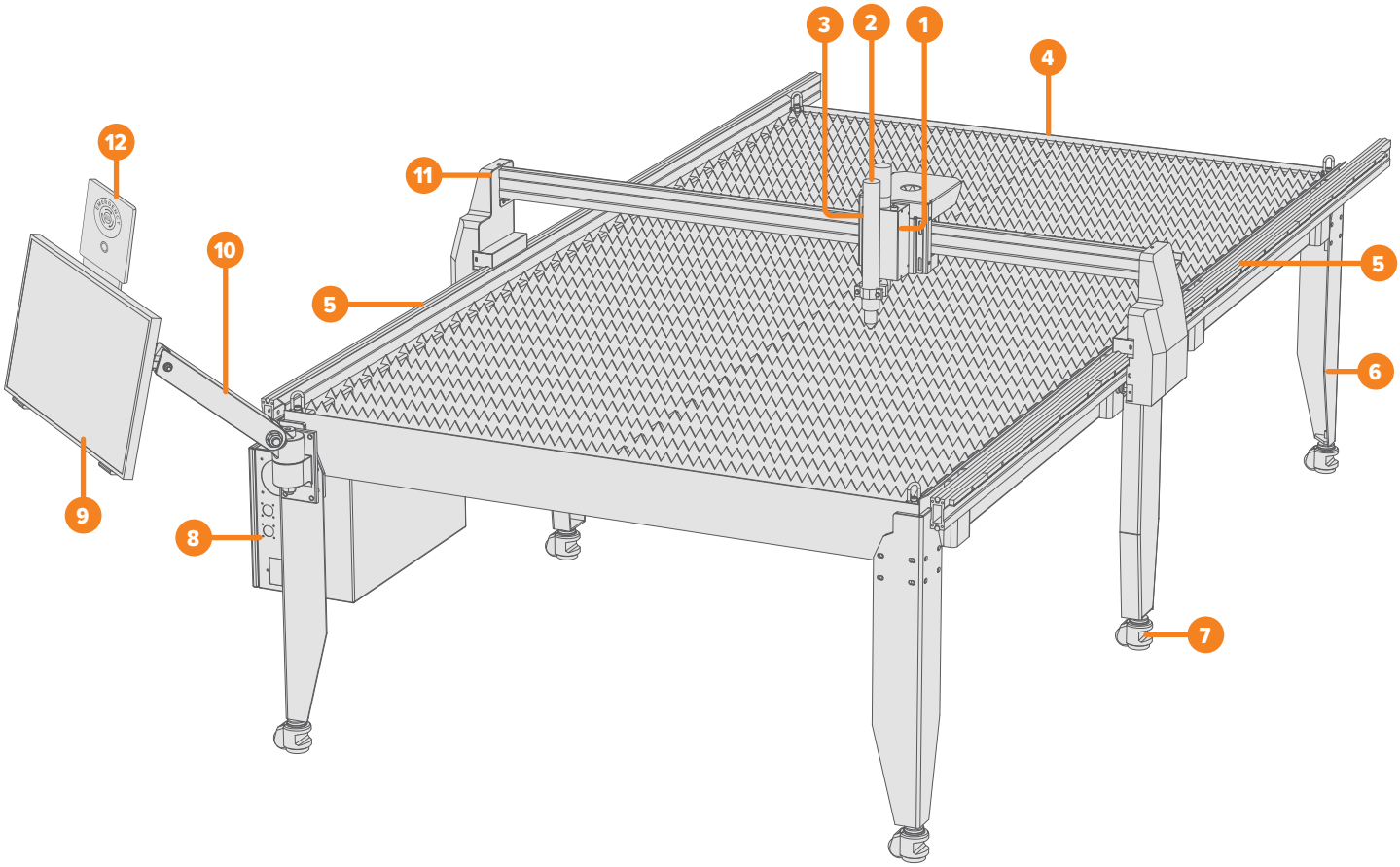
Automatic Collision Detection & Limiter Switches On All Axes

With limiter switches on all axes and an automatic collision detection system, the STEALTH CNC tables use sensors, software algorithms, and real-time data processing to detect and prevent potential collisions and stop them from exceeding their predefined range of motion.

Maximise Your Production

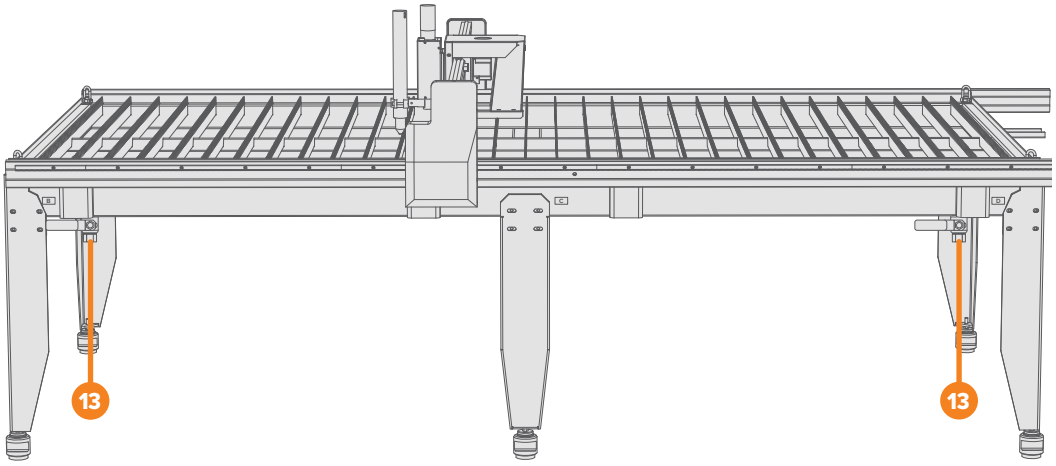
Let the STEALTH CNC tables handle the heavy lifting so you can increase your productivity. The STEALTH CNC tables allow you to produce more parts and projects efficiently. Optimise your cuts and nest parts on full sheets to minimise loading time and reduce material waste.

4.2 CNC Table Layout



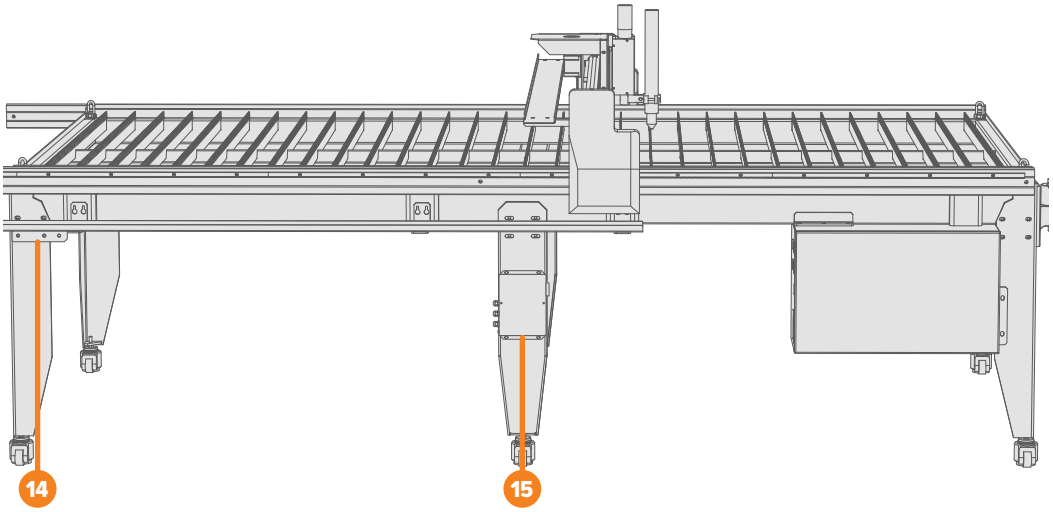
Top View Layout

1. THC
2. Laser
3. CNC Torch
4. Water Bed
5. Rail
6. Table Legs
7. Table Feet
8. Electrical Box
9. Control PC
10. Computer Arm
11. Gantry
12. Emergency Stop Button



Right Side View Layout

13. Water Bed Valves

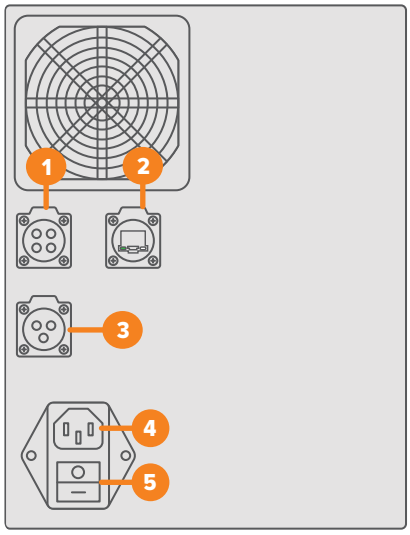


Left Side View Layout

14. Earthing Plate

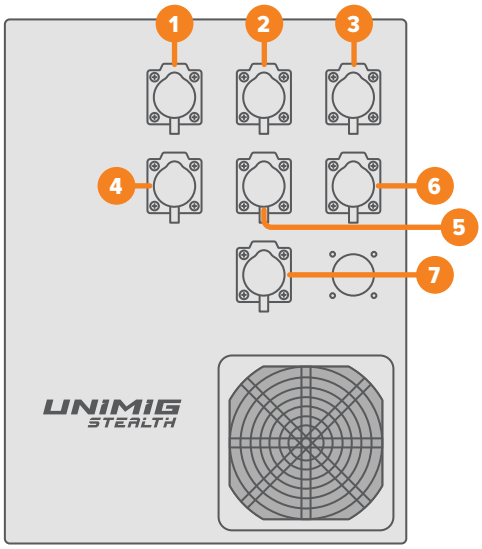
15. THC Divider

4.3 Electrical Cabinet Layout



Front Panel Layout

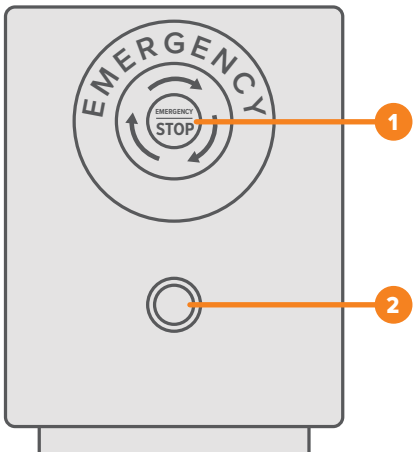
1. 4 Pin Cable
2. Ethernet Port
3. 3 Pin Cable
4. Power Plug
5. Power Switch



Back Panel Layout

1. X-axis
2. Y-axis Left
3. Y-axis Right
4. Z-axis
5. THC Divider
6. THC Arc Start & Feedback
7. Laser Point & Proximity Switches

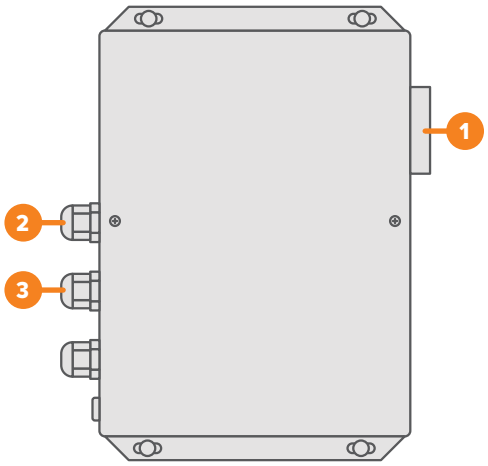
4.4 Emergency Stop Button Layout



1. Emergency Stop Button
2. Laser On/Off

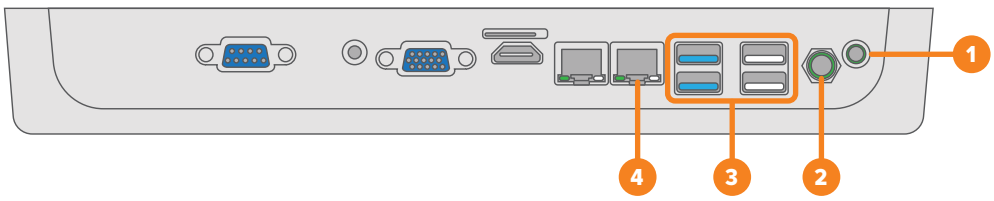
It is recommended to make yourself familiar with the location of the Emergency Stop button. This button should be used in the event of an emergency that requires the CNC table to cease operation immediately.

4.5 THC Divider Layout



1. Cable 5
2. Arc Voltage Box Connection
3. Ohmic Sensor (Not Used for UNIMIG STEALTH CNC Tables)

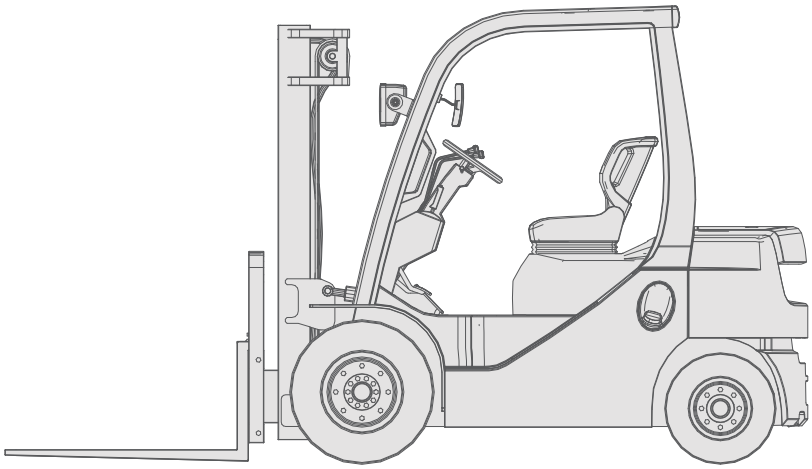
4.6 Control PC Layout

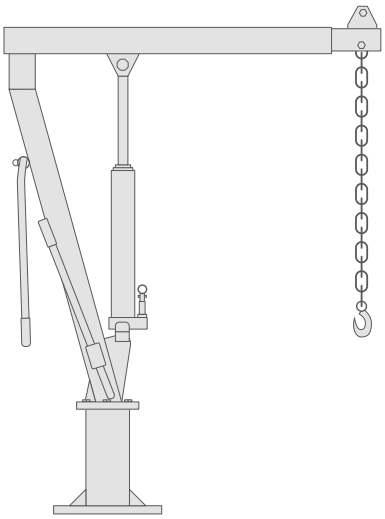


1. Power On/Off Button
2. Power Plug
3. USB Ports
4. Ethernet Port (LAN1)

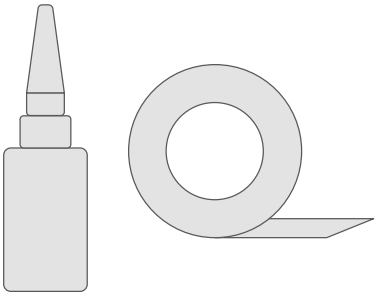
5. STEALTH 1200 & 2400 Installation

5.1 Tools Required

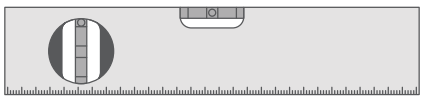




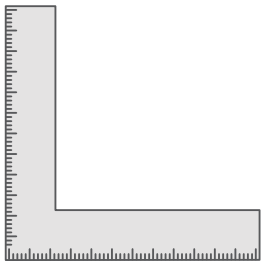
Forklift or Lifting Crane



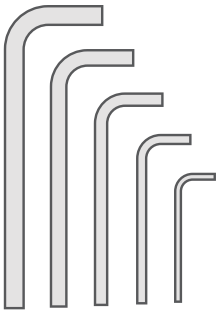
Thread Seal/PTFE Tape



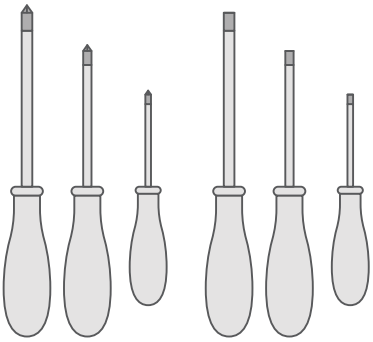
Leveller



Square Tool



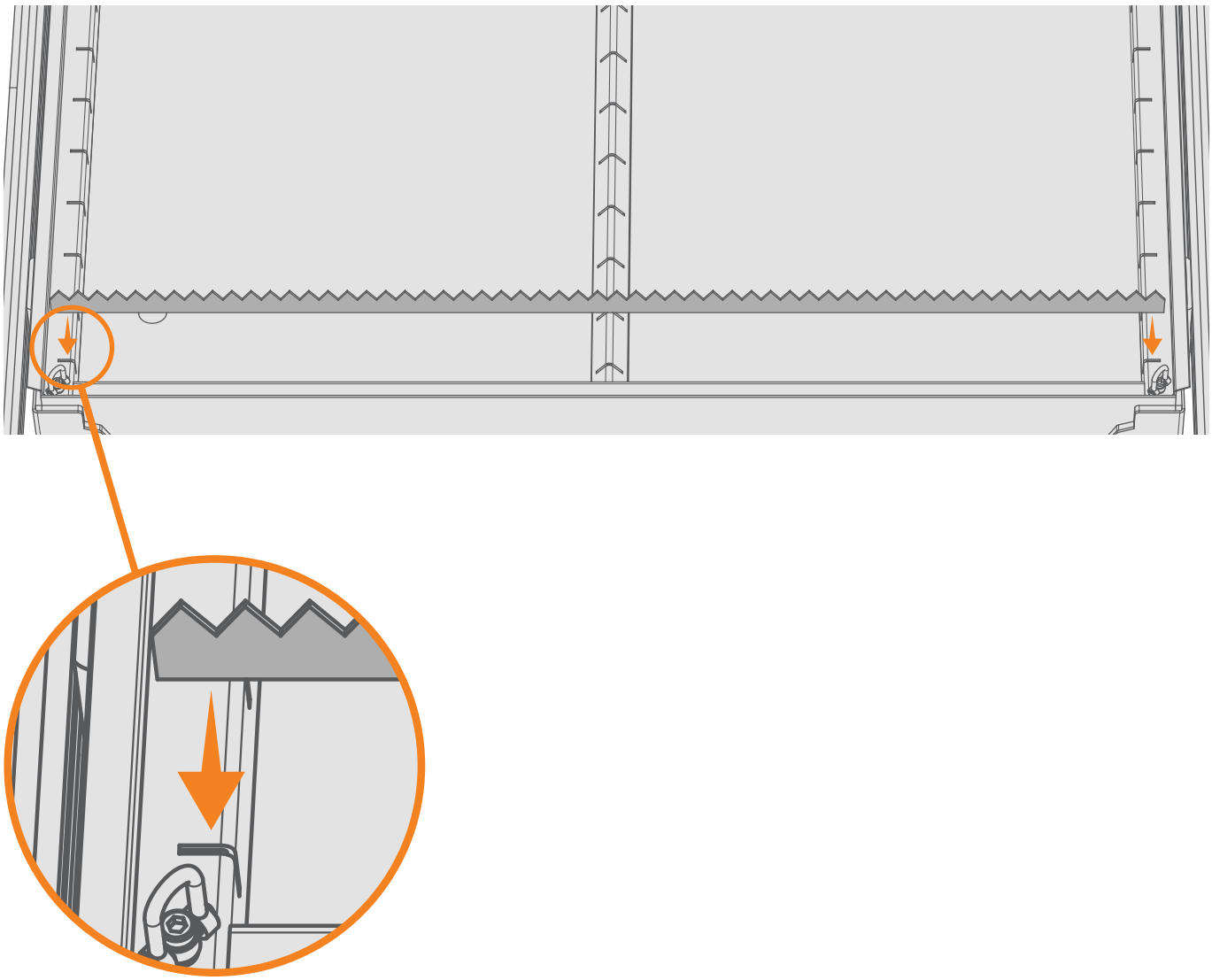
Allen Keys



Flat & Phillips Head Screwdrivers

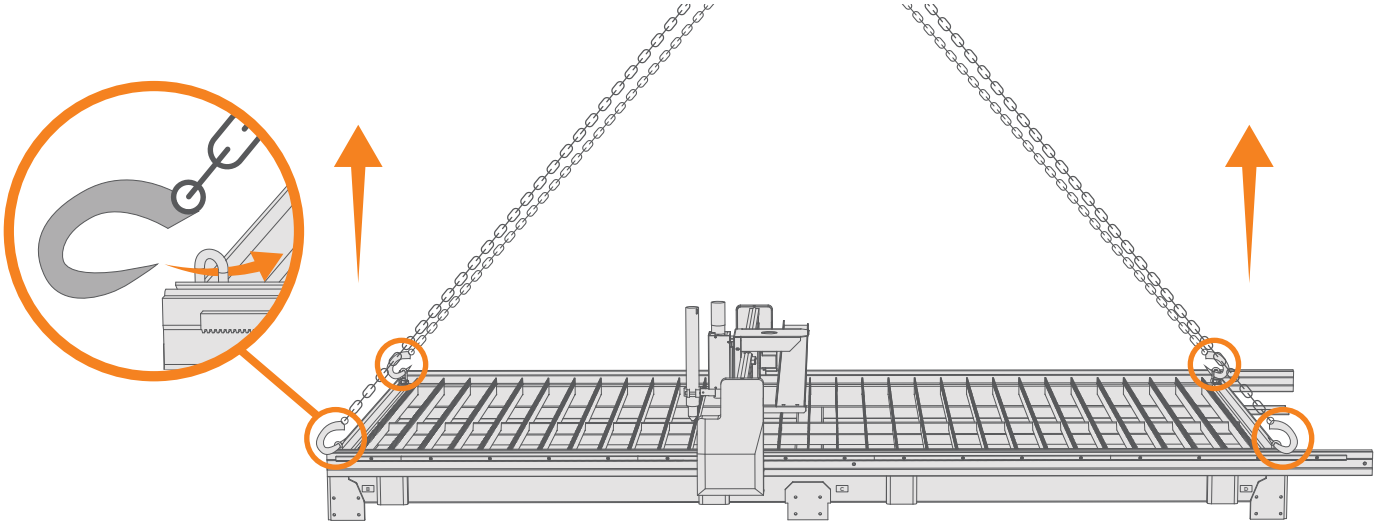
5.2 Installing the Table Slats

1. Slot the table slats into the pre-cut holes across the CNC table.

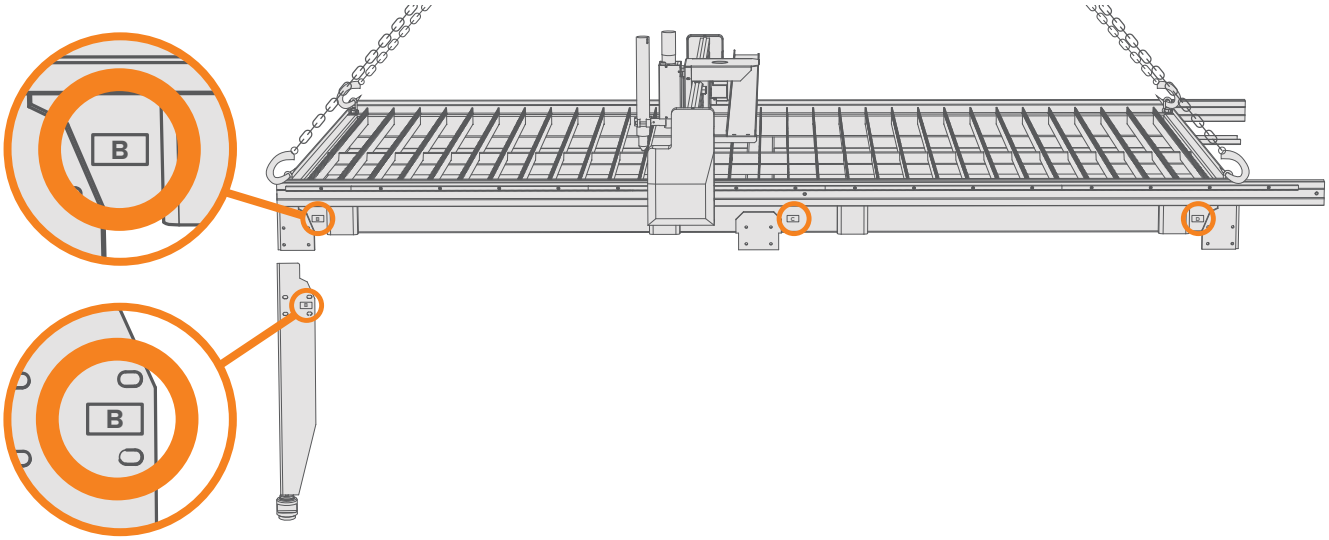


5.3 Installing the Table Legs

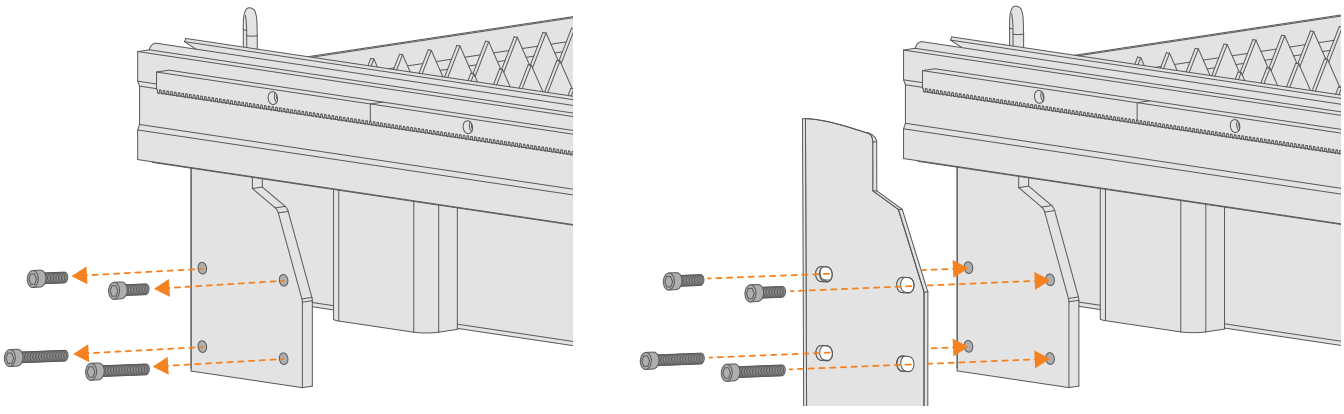
1. Lift the table bed up into the air via the anchor points using a forklift or lifting crane.



2. The corners of the table and the legs are labelled (A, B, C, etc.), match the corresponding legs to the correct position on the table.

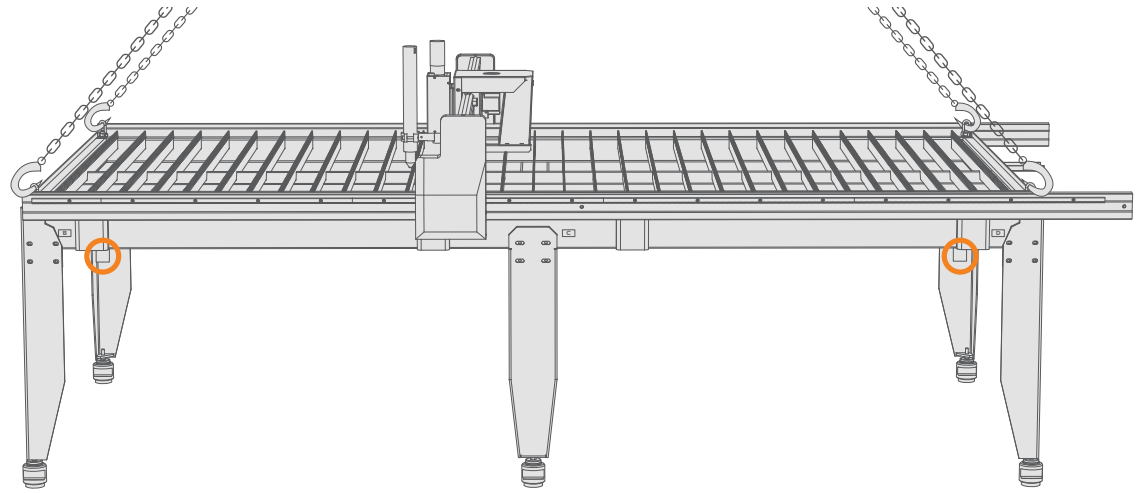


3. Undo the screws on the table and use these to screw the legs in. The shorter screws go in the top holes, and the longer screws go in the bottom holes.

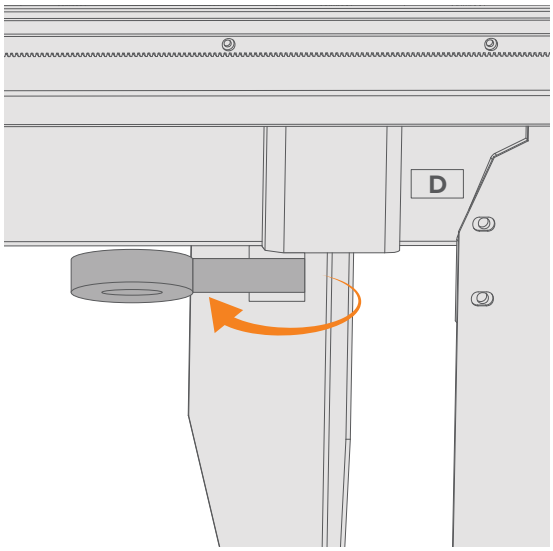


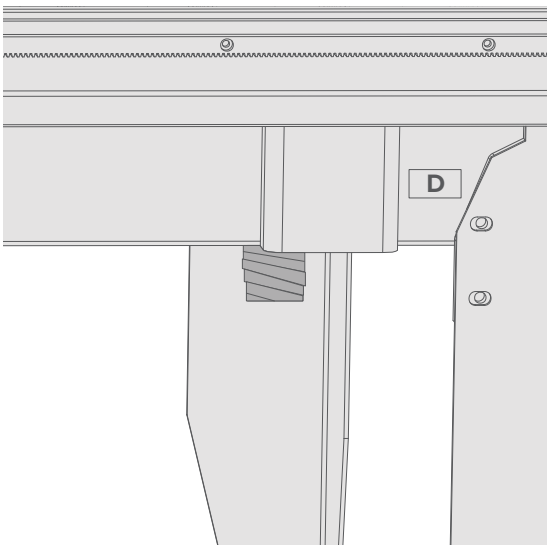
5.4 Installing the Water Bed Valves

While the table is in the air and it is easy to reach, install the valves for the water bed.

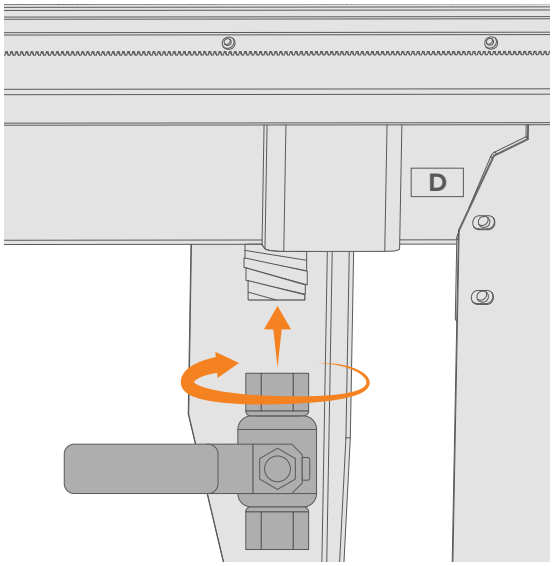


1. Use thread seal/PTFE tape to wrap the drainage pipe to create a leakproof seal.

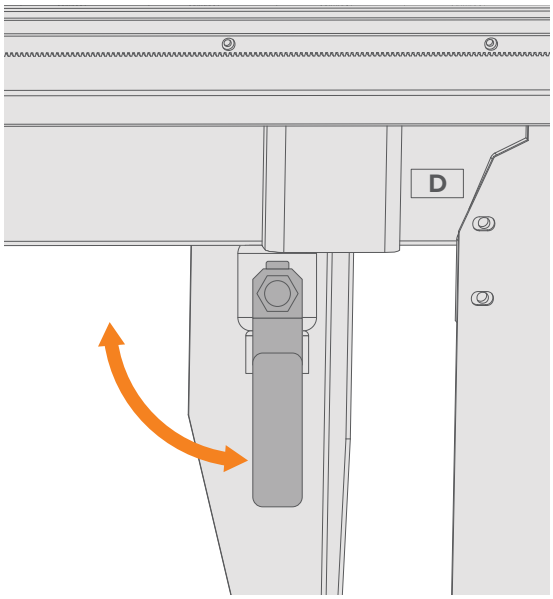




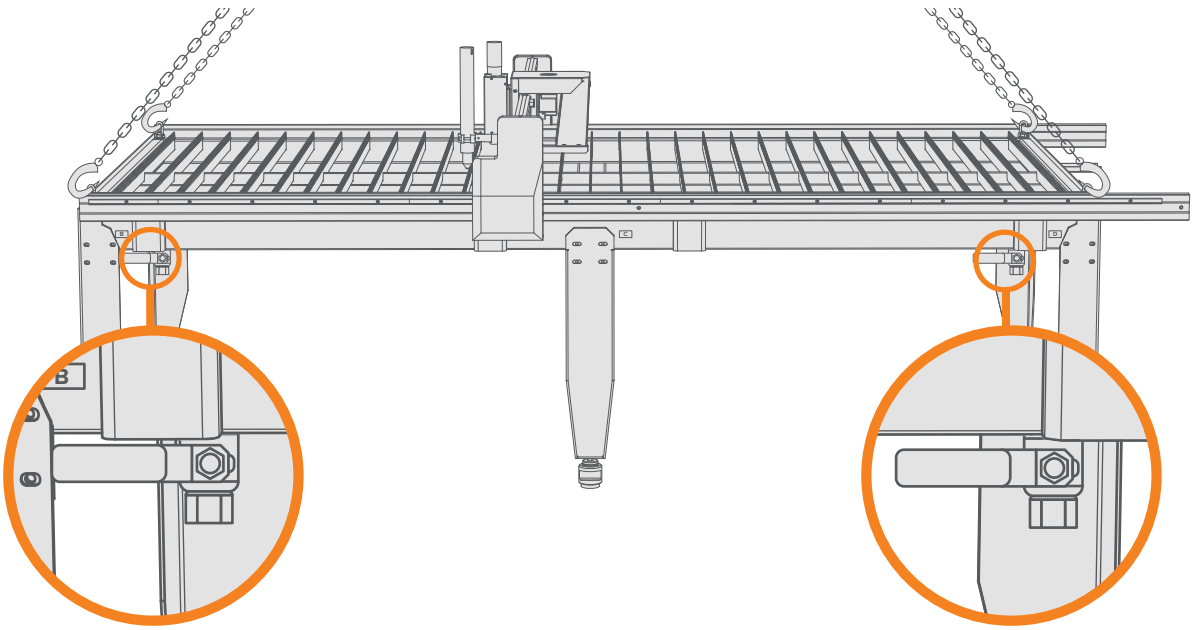
2. Screw on the ball valve.



3. Check that the valve is working correctly by opening and closing the valve lever.

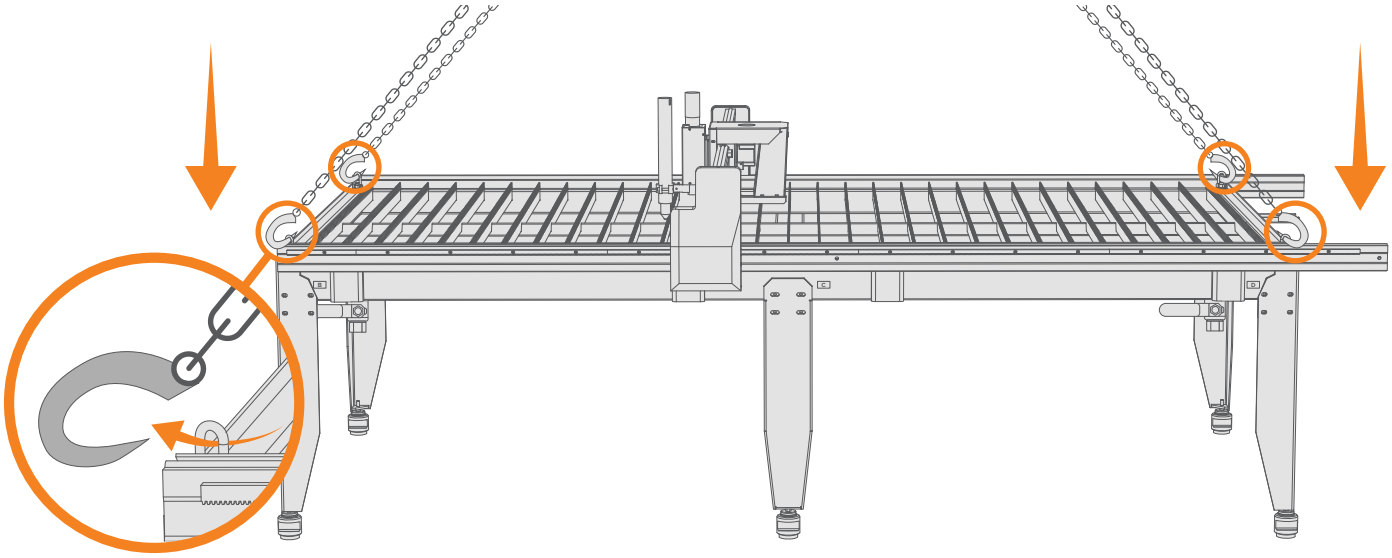


4. Do this on both drainage pipes.



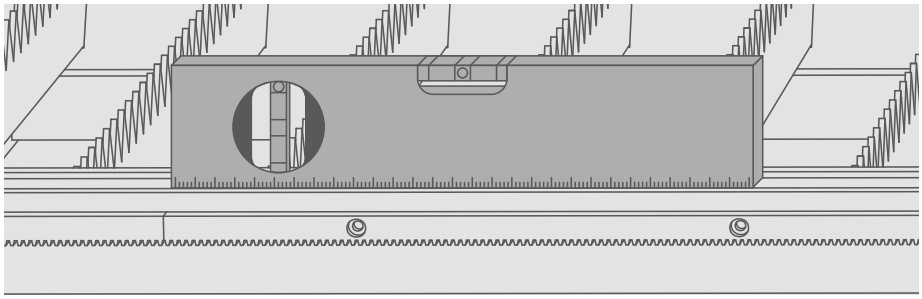
5.5 Levelling the Table Legs

1. Once the drainage valves are installed and the legs are on, lower the table back onto the ground. The anchor points can now be unscrewed and stored.

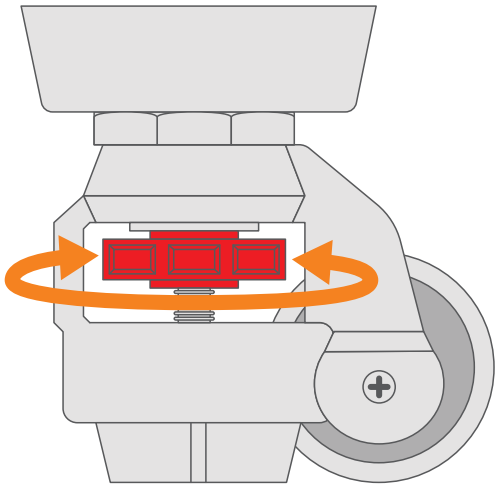


5.5.1 Levelling the Table

1. Place a levelling tool on the table to determine its level.

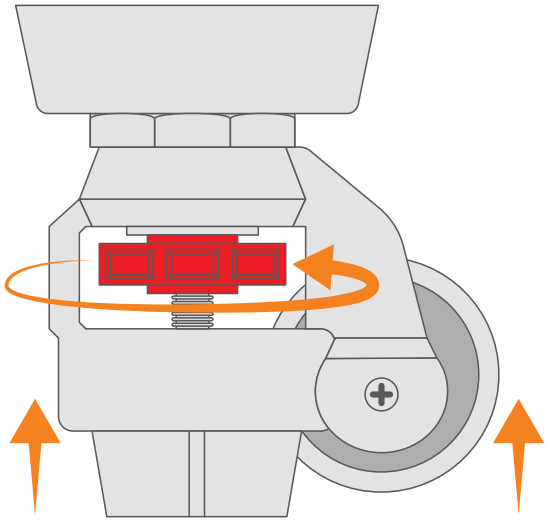


2. Raise or lower the wheels as needed using the levelling nut at the top of the wheels.



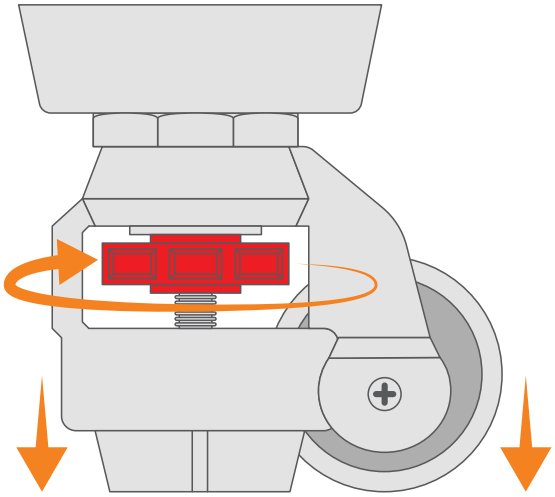
5.5.2 Locking the Wheels

Twist the red wheel lock nut counterclockwise to lower the stopper and lock the wheel.



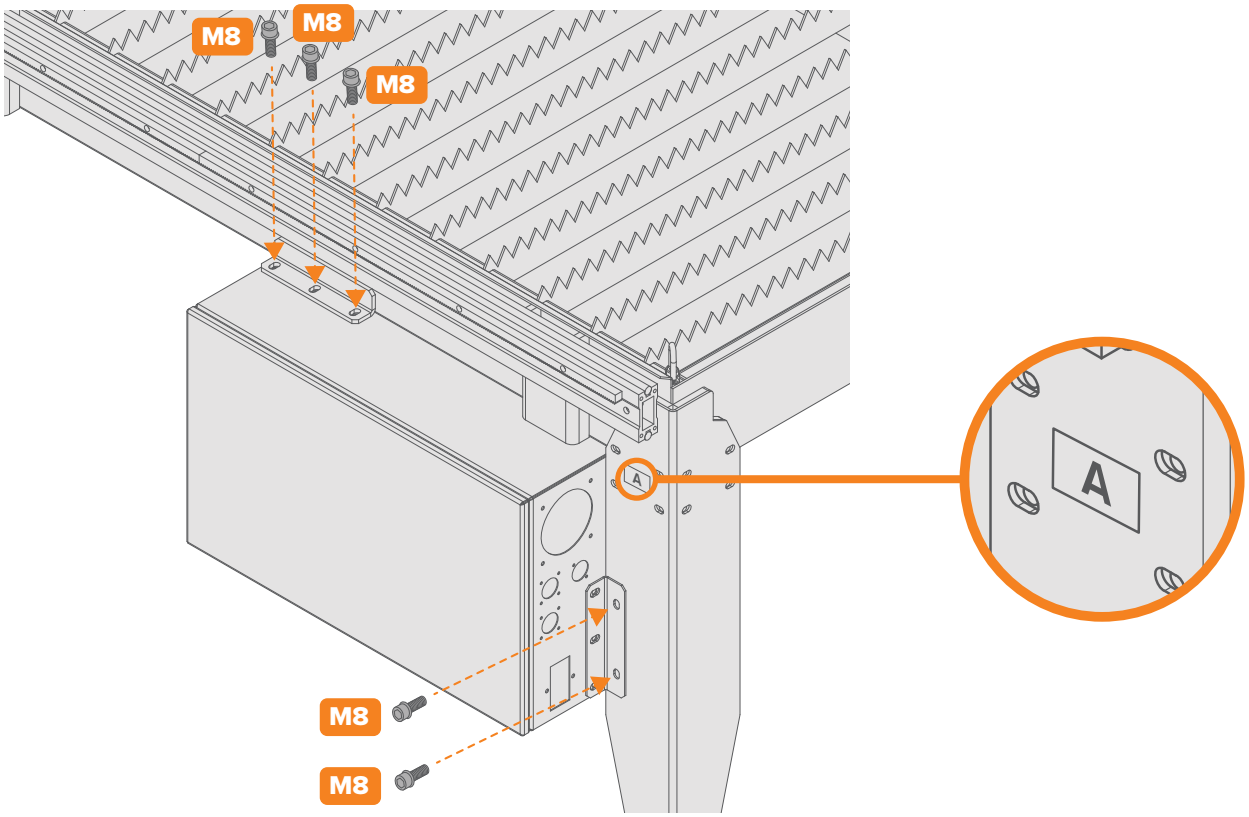
5.5.3 Unlocking the Wheels

Twist the red wheel lock nut clockwise to raise the stopper and unlock the wheel.

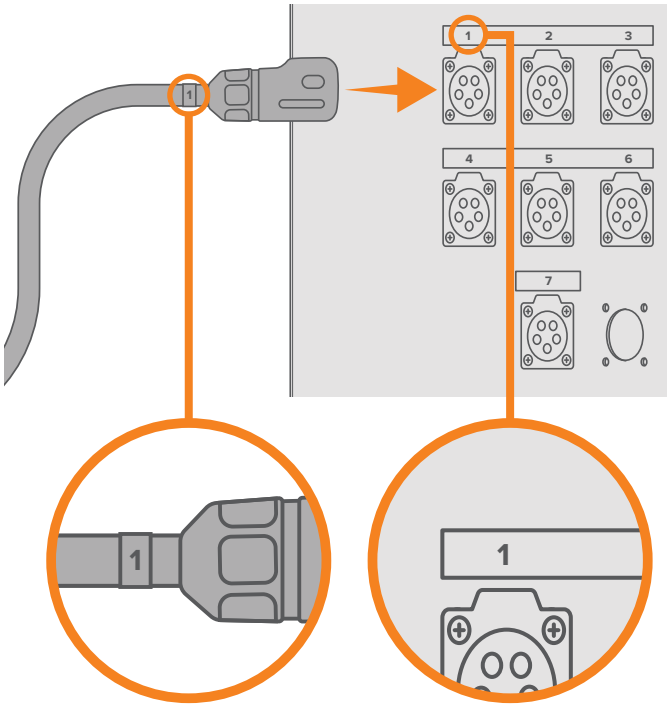


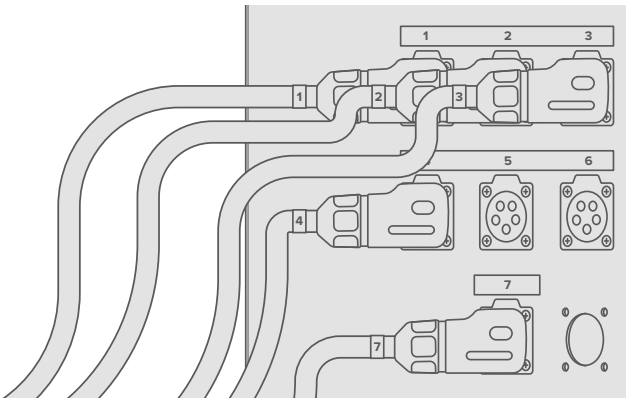
5.6 Installing the Electrical Cabinet

1. Mount the electrical cabinet to the table using the M8 hex screws to screw the mounting brackets onto the table and front leg.



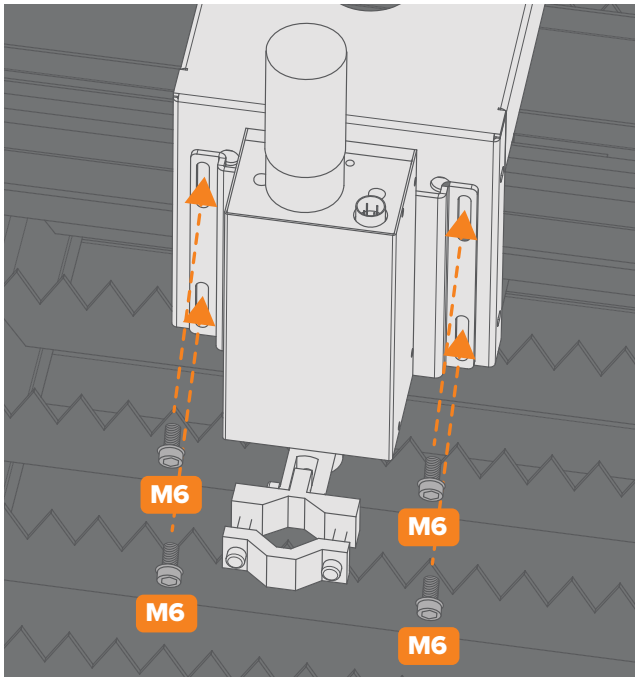
2. Plug the CNC connection cables that are attached to the gantry rail into the back of the electrical cabinet. These cables are labelled **1, 2, 3, 4** & **7**, plug cables **1** to **4** in from left to right, top to bottom, with **1** in the top left and **4** in the bottom left plugs. Cable **7** connects to the bottom middle plug.



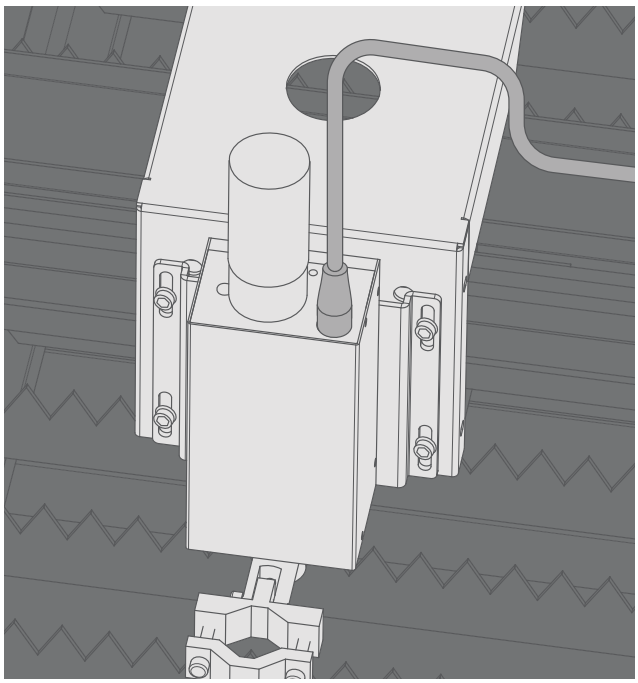


5.7 Installing the Torch Height Controller (THC)

1. Mount the Torch Height Controller (THC) to the gantry motor box using the M6 hex screws.



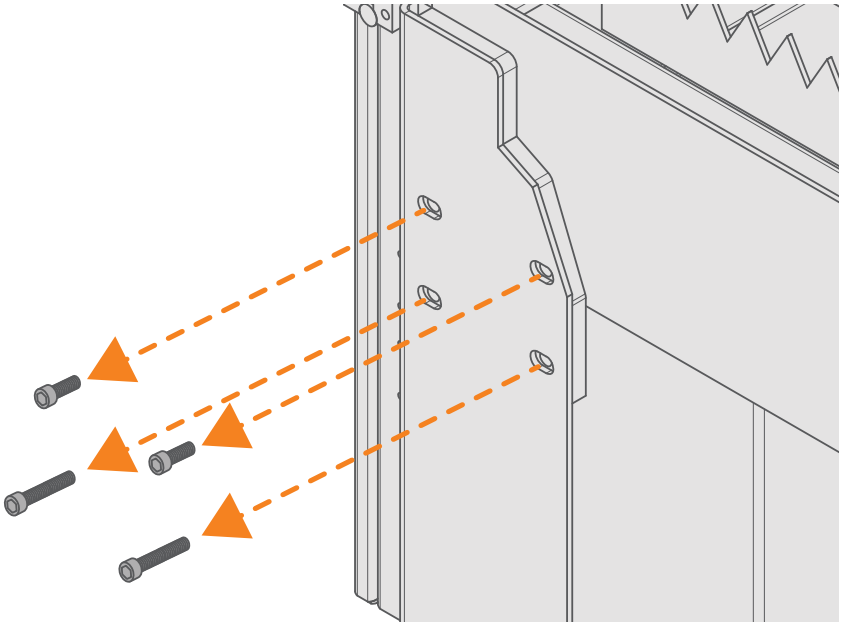
2. Plug in the 4-pin connection plug from the gantry rail into the top of the THC.

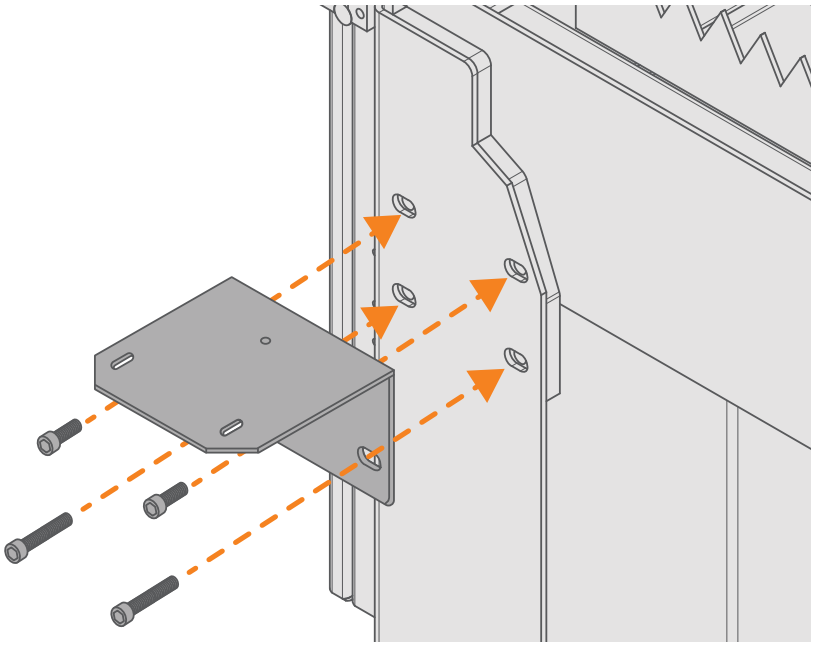


5.8 Installing the Computer Arm & Control PC

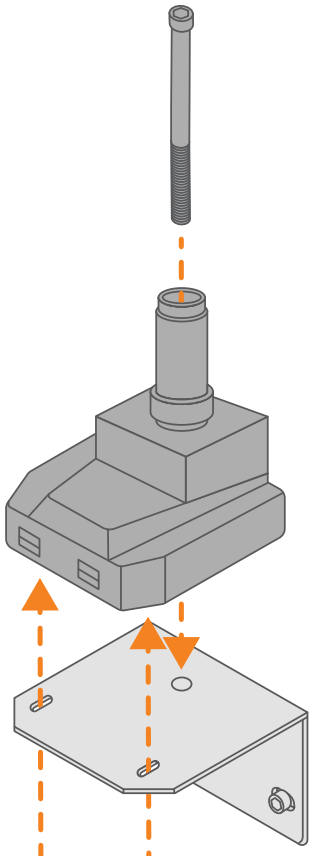
Installing the Computer Arm

1. Undo the screws on the front leg (A) of the short side of the table and attach the computer arm mounting bracket on the side of the table.

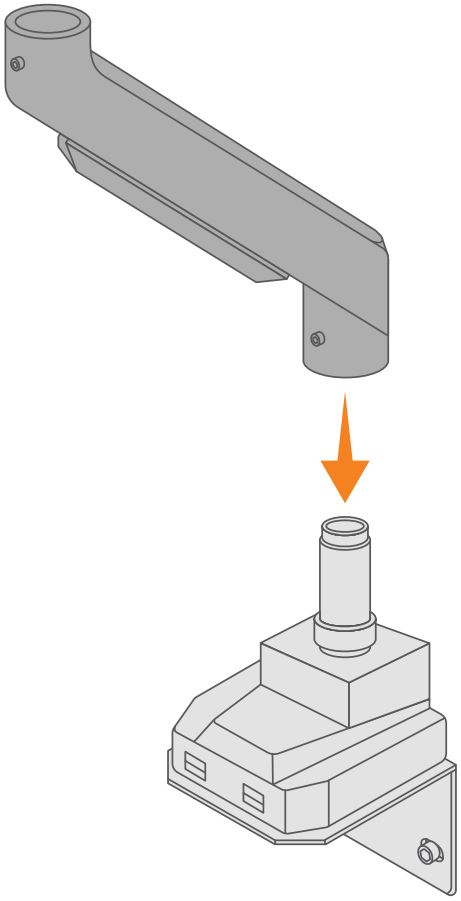




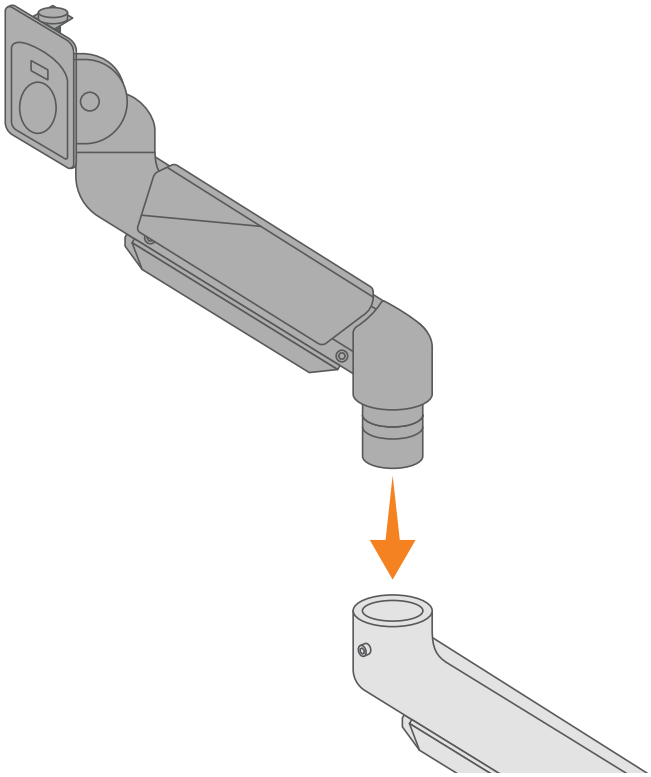
2. Place the base plate of the arm on the bracket and screw it in using the long hex screw inside the centre piece.



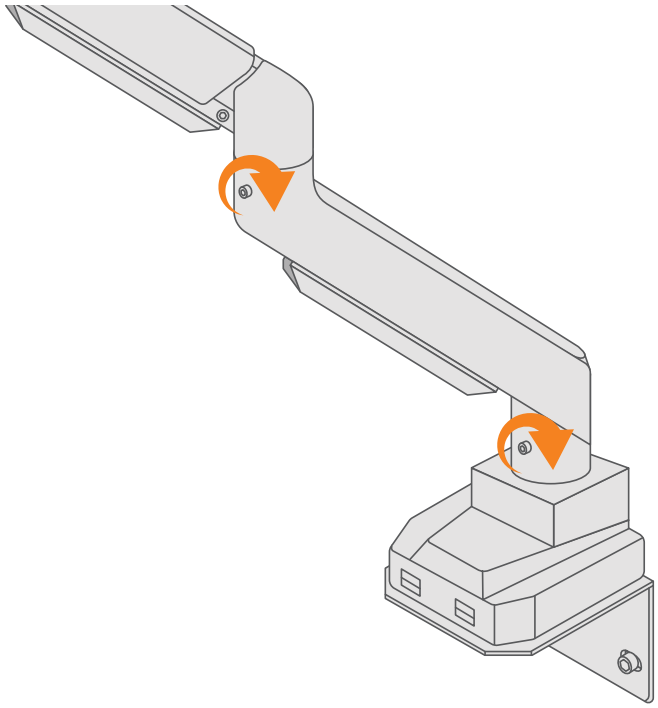
3. Take the lower arm segment (with the open ends) and place it onto the base plate so that the cable openings face downwards.



4. Take the upper arm segment and place it onto the lower arm.

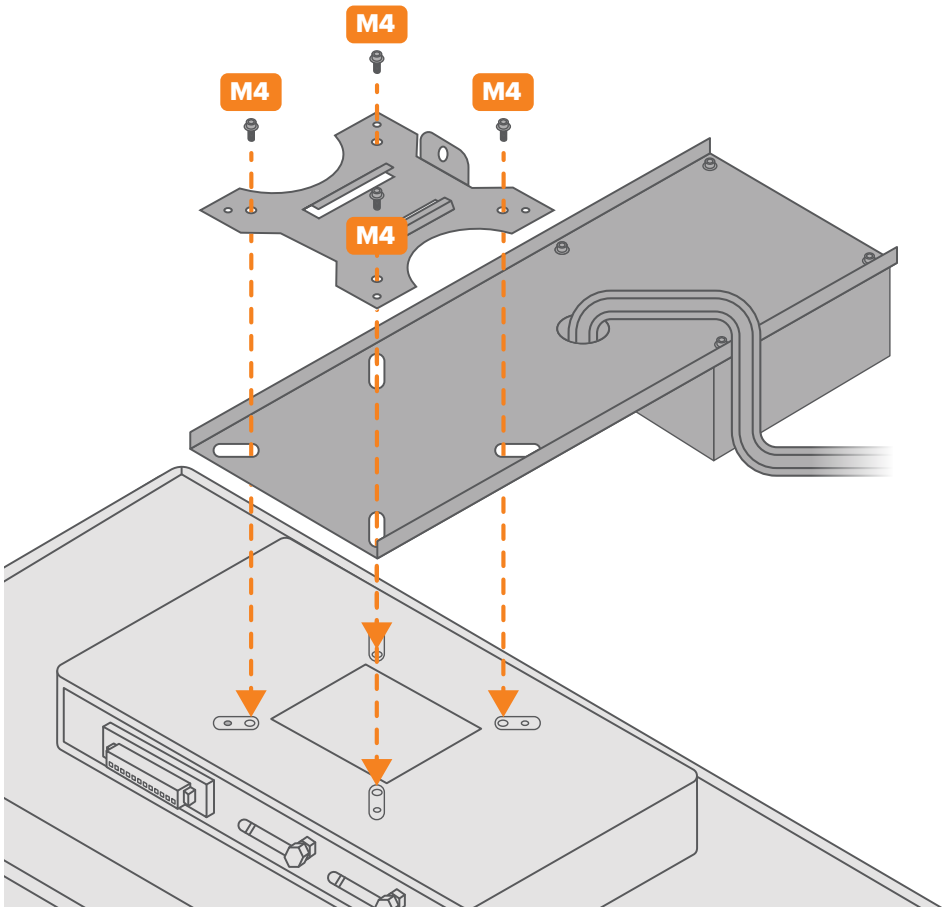


5. Tighten the two screws in the lower arm to ensure the arm is properly installed and tight.

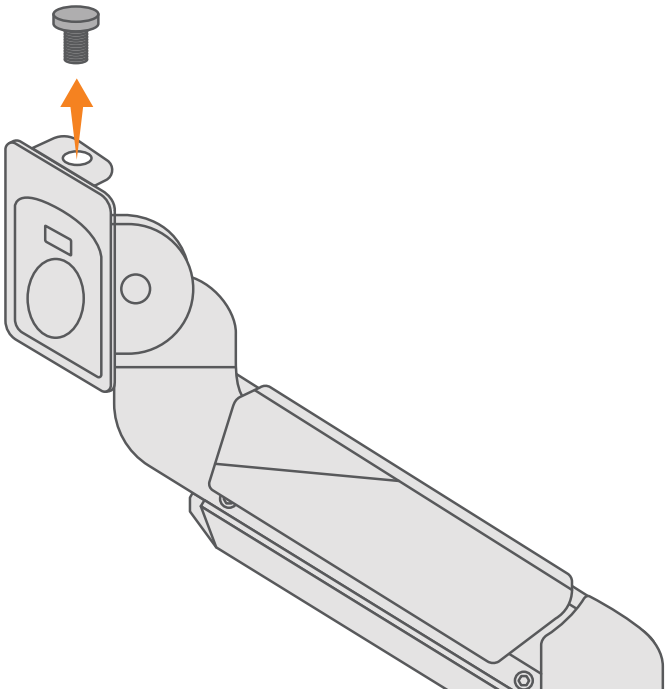


Installing the Control PC

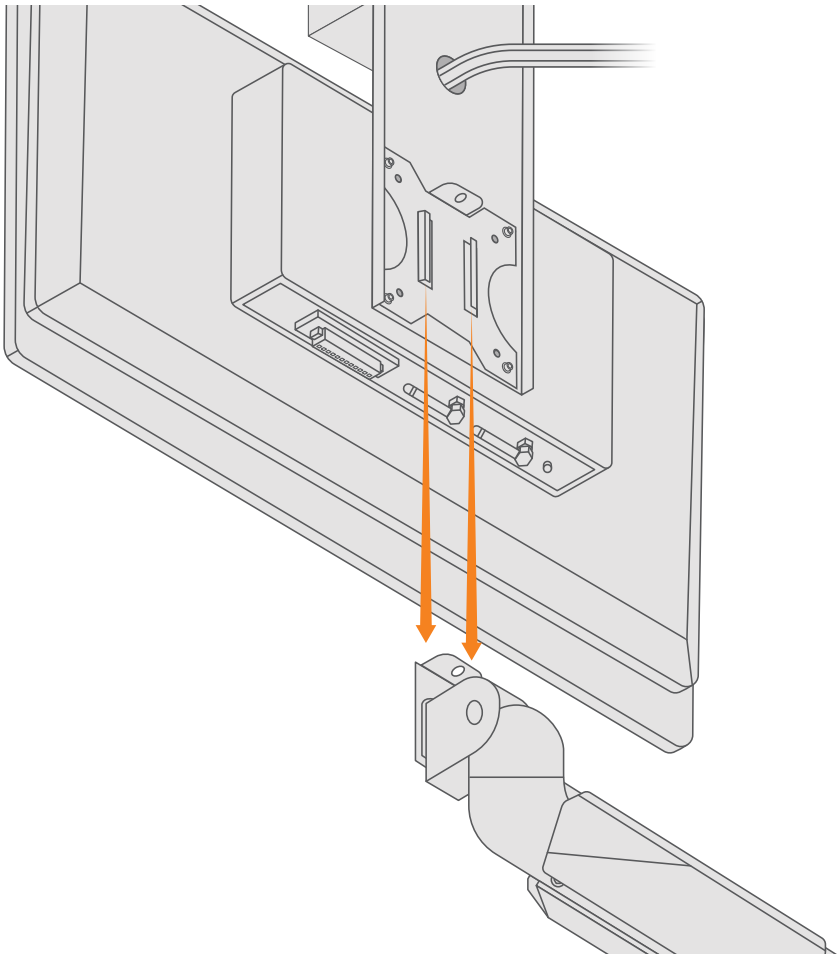
1. Lay the Control PC face down and place the Emergency Stop (E-Stop) plate on the back of the PC, so that the four holes line up. The E-Stop button should be situated at the top of the PC, facing the same direction as the screen.
2. With the E-Stop plate on the Control PC, take the X shaped PC mounting bracket and line it up with the E-Stop and Control PC. The L brackets should sit vertically, parallel with the E-Stop plate.
3. Screw the X mounting bracket and E-Stop plate into the back of the Control PC using the M4 hex screws.



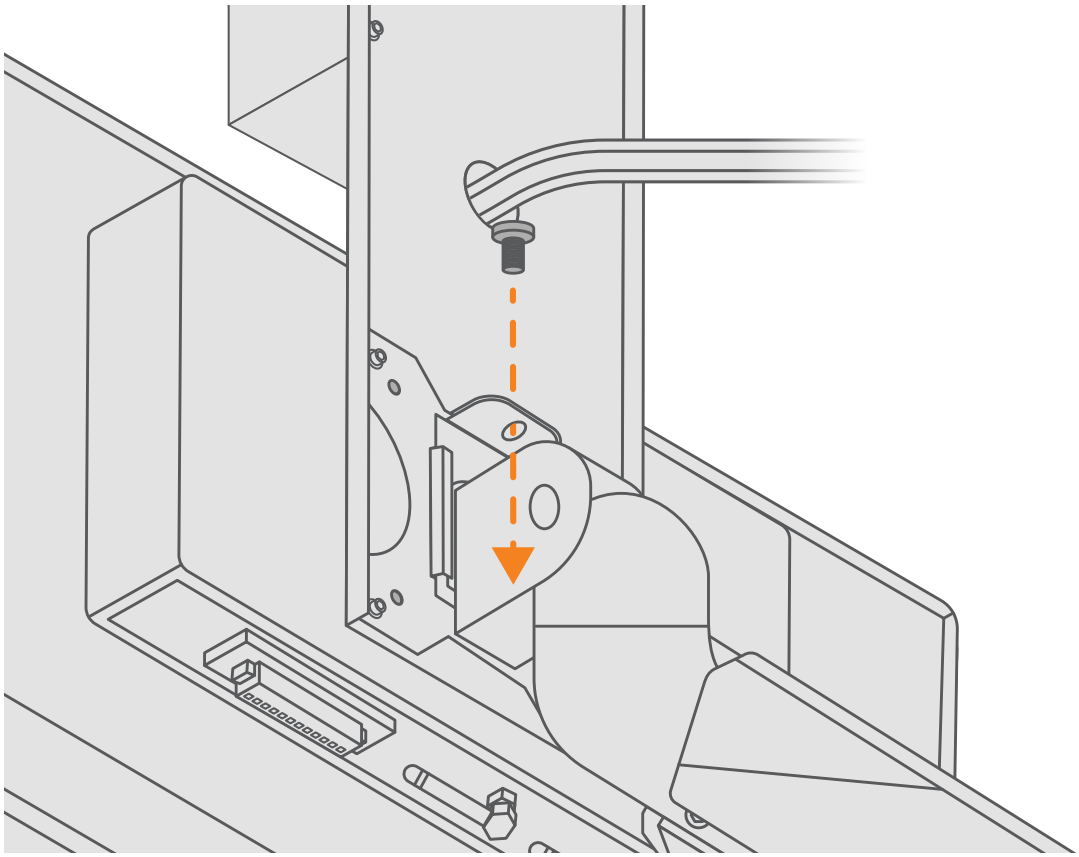
4. Remove the small nut from the top of the upper arm mounting point.



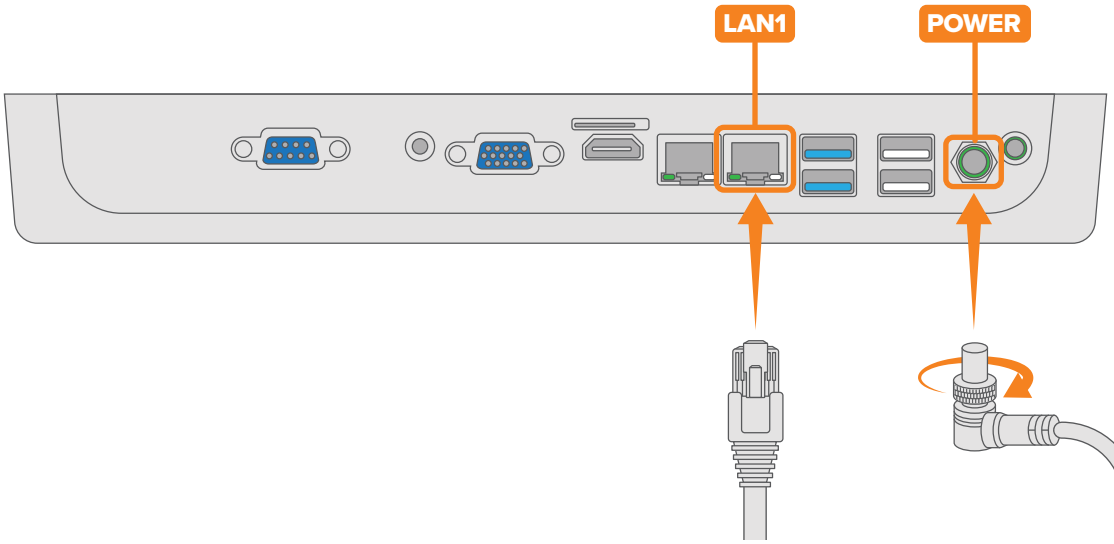
5. Lift the Control PC and slide it onto the mounting point on the upper arm, so the L brackets slide over the edges and the holes line up.



6. Screw the small nut back in to hold it in place.

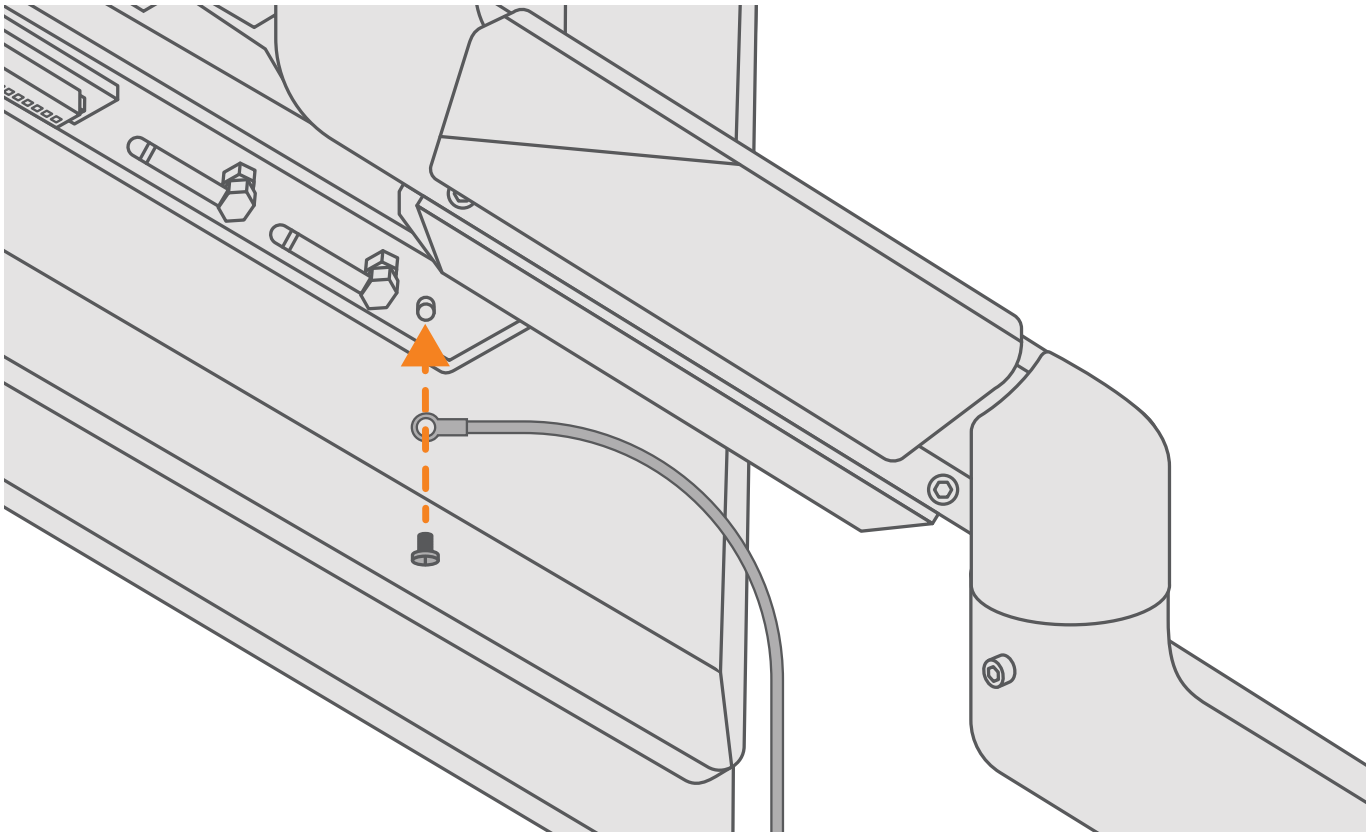


7. Plug the power cable into the Control PC, located on the top right side of the screen (facing the back of the PC), and fasten the screw to secure it.
8. Plug the ethernet cable into **LAN1** on the Control PC, located on the top right side of the screen (facing the back of the PC), above the power cable.

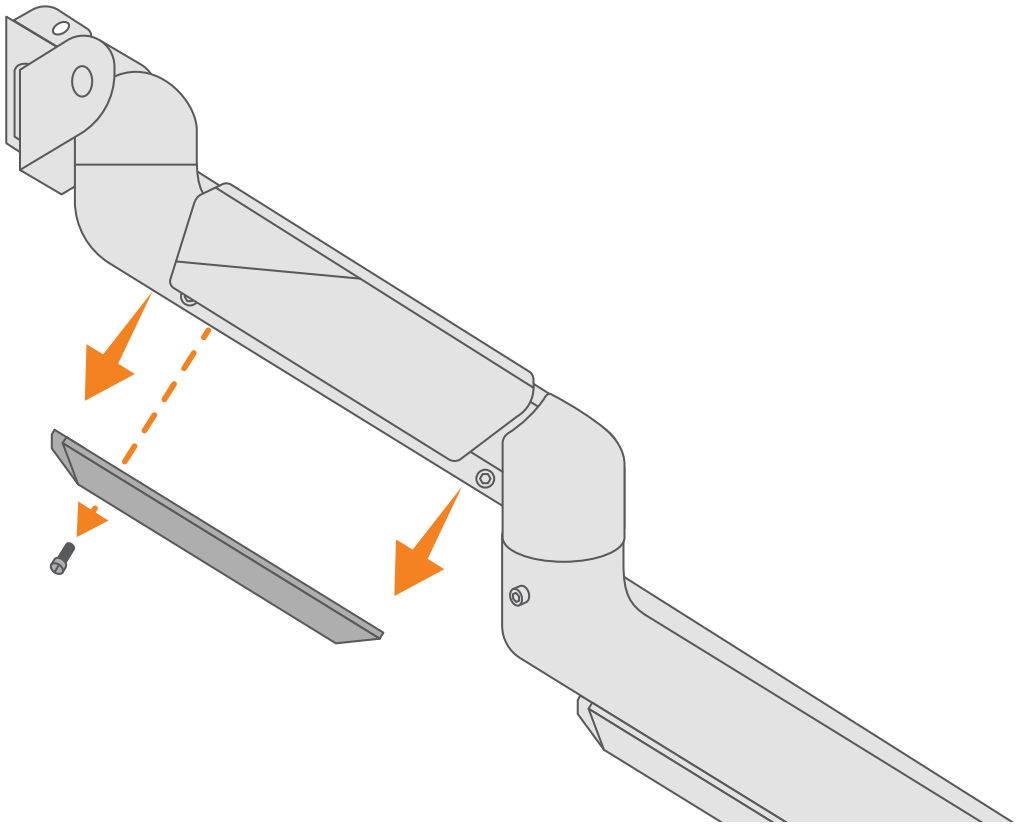


Plugging the ethernet cable into the LAN2 port will not work, the computer will not recognise it.

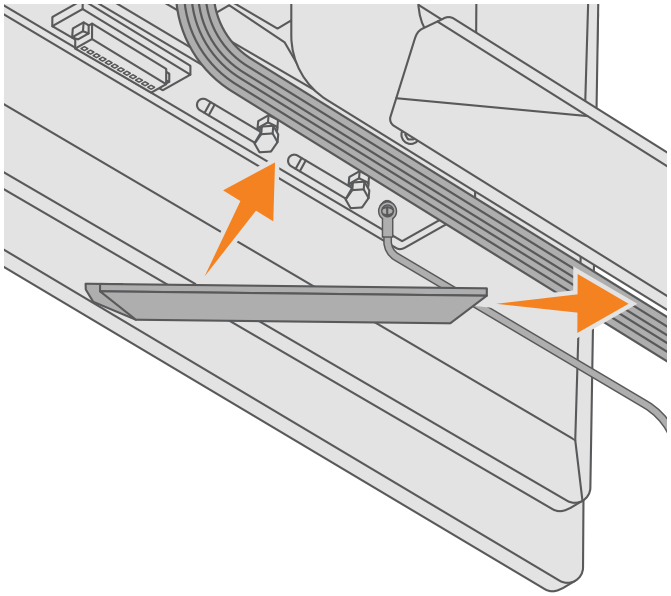
10. Screw the grounding cable into the grounding connection on the bottom right side of the screen (facing the back of the PC).

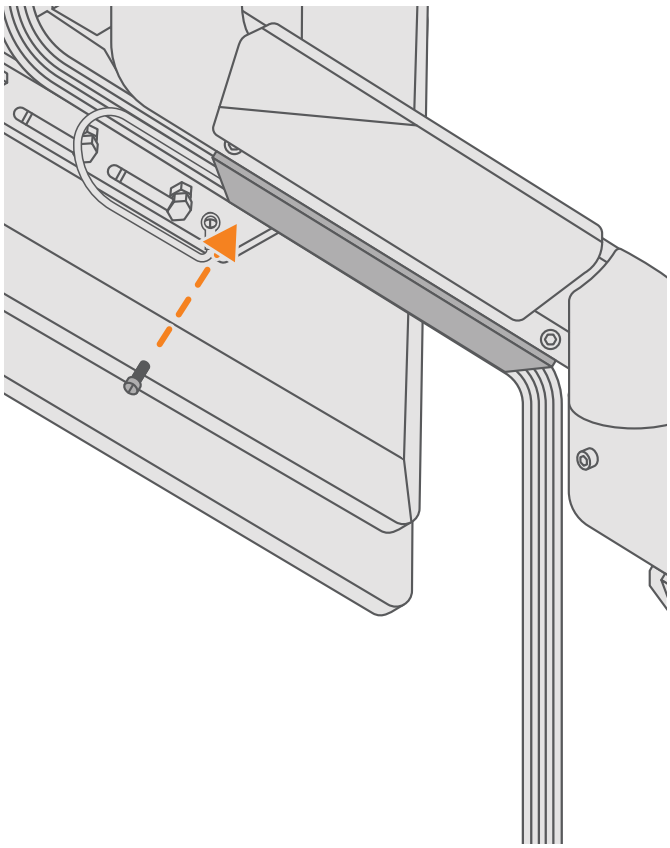


11. Undo the screw located on the upper half of the cap using a flat head screwdriver to remove the upper arm cable management cap.

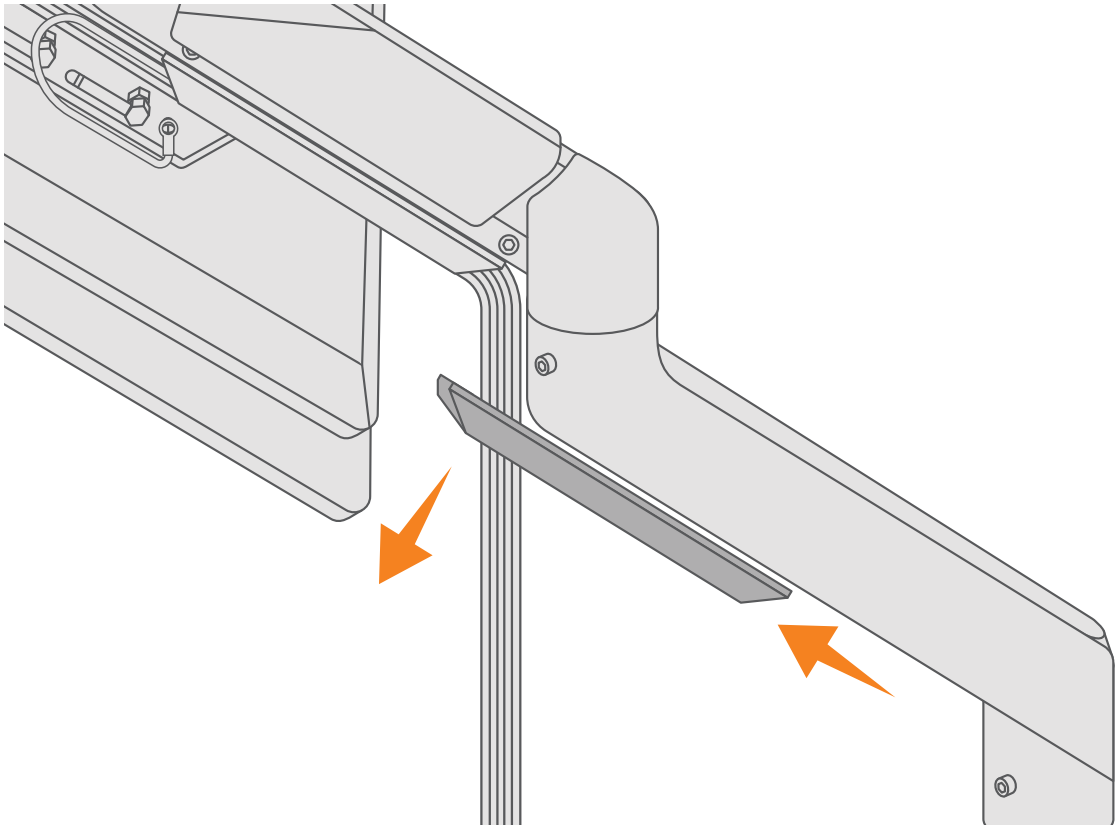


12. Hold the bundle of computer cables against the upper arm and replace the cap over the cables by lining up the bottom slots and locking it into place. Replace the screw in the upper part of the cap.

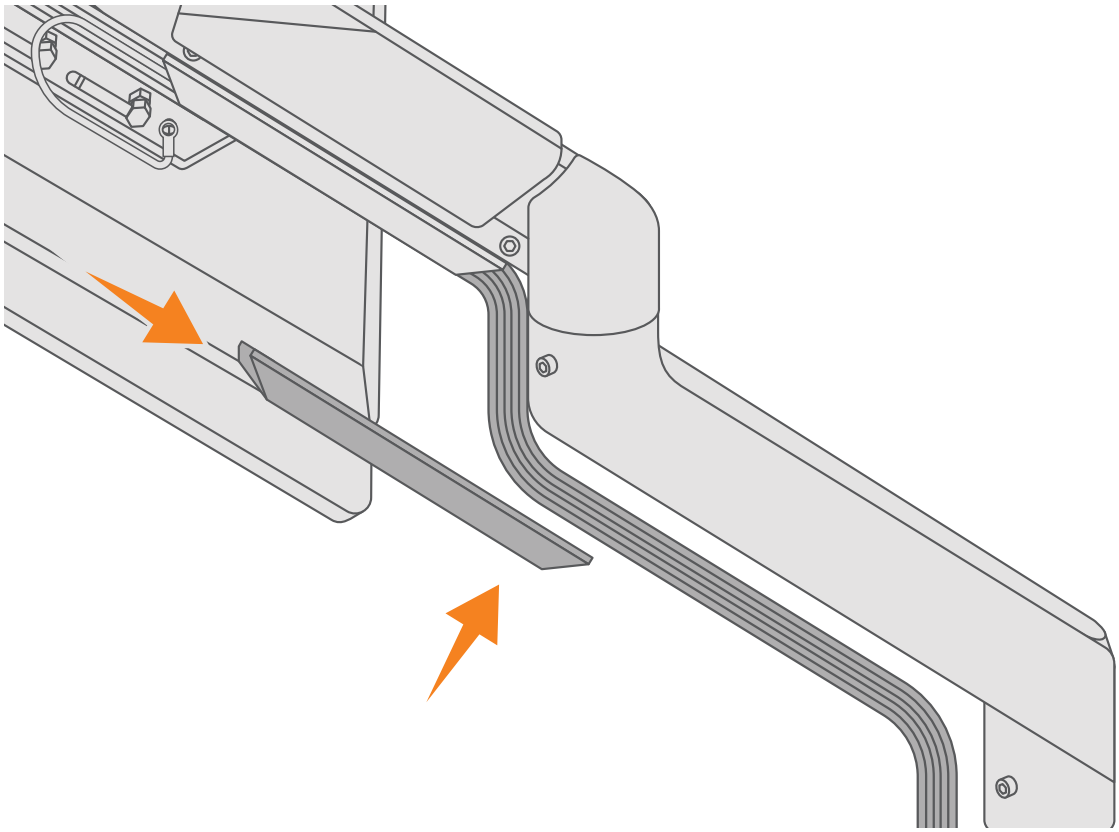




13. Remove the lower arm cable management cap by sliding it upwards and off.

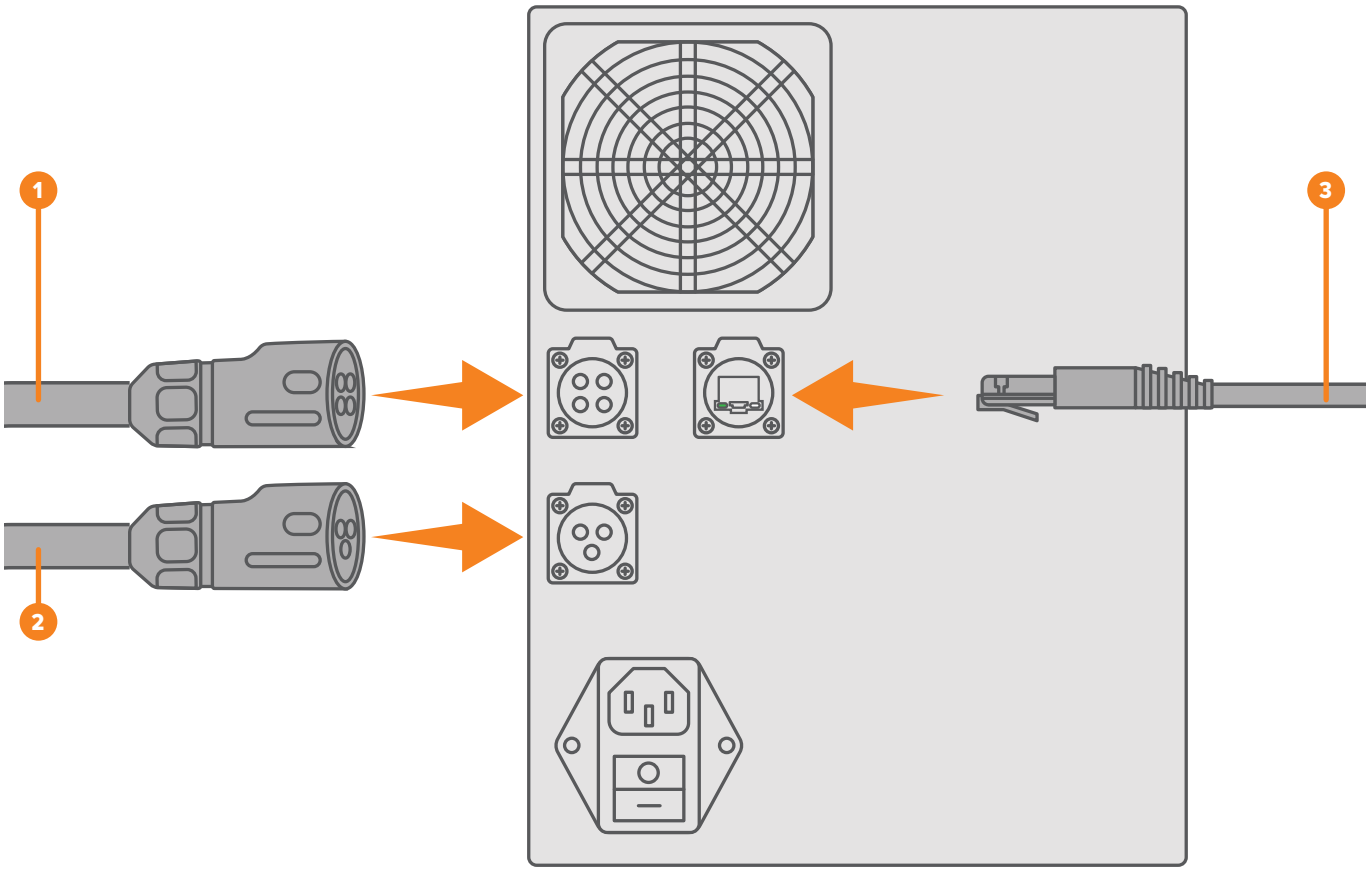


14. Hold the bundle of computer cables against the lower arm and replace the cap by sliding it back into place.



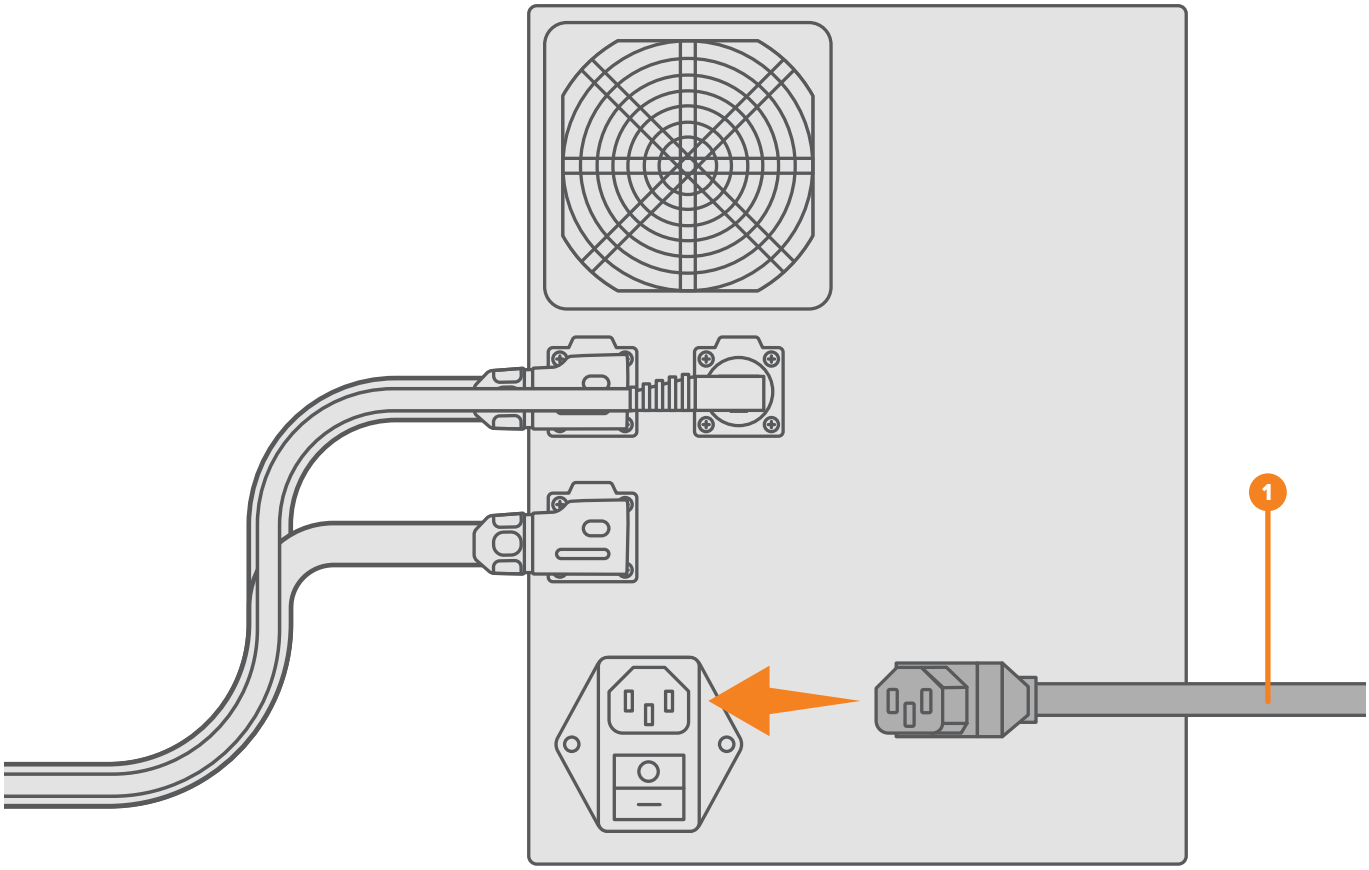
5.9 Connecting the Control PC to the Electrical Cabinet

1. Plug the 4-pin cable into the 4-pin connection on the front of the electrical cabinet.
2. Plug the 3-pin earth cable into the 3-pin connection on the front of the electrical cabinet.
3. Plug the ethernet cable into the ethernet port.



5.10 Connecting the Power Cable to the Electrical Cabinet

1. Plug the power cable into the front of the electrical cabinet.

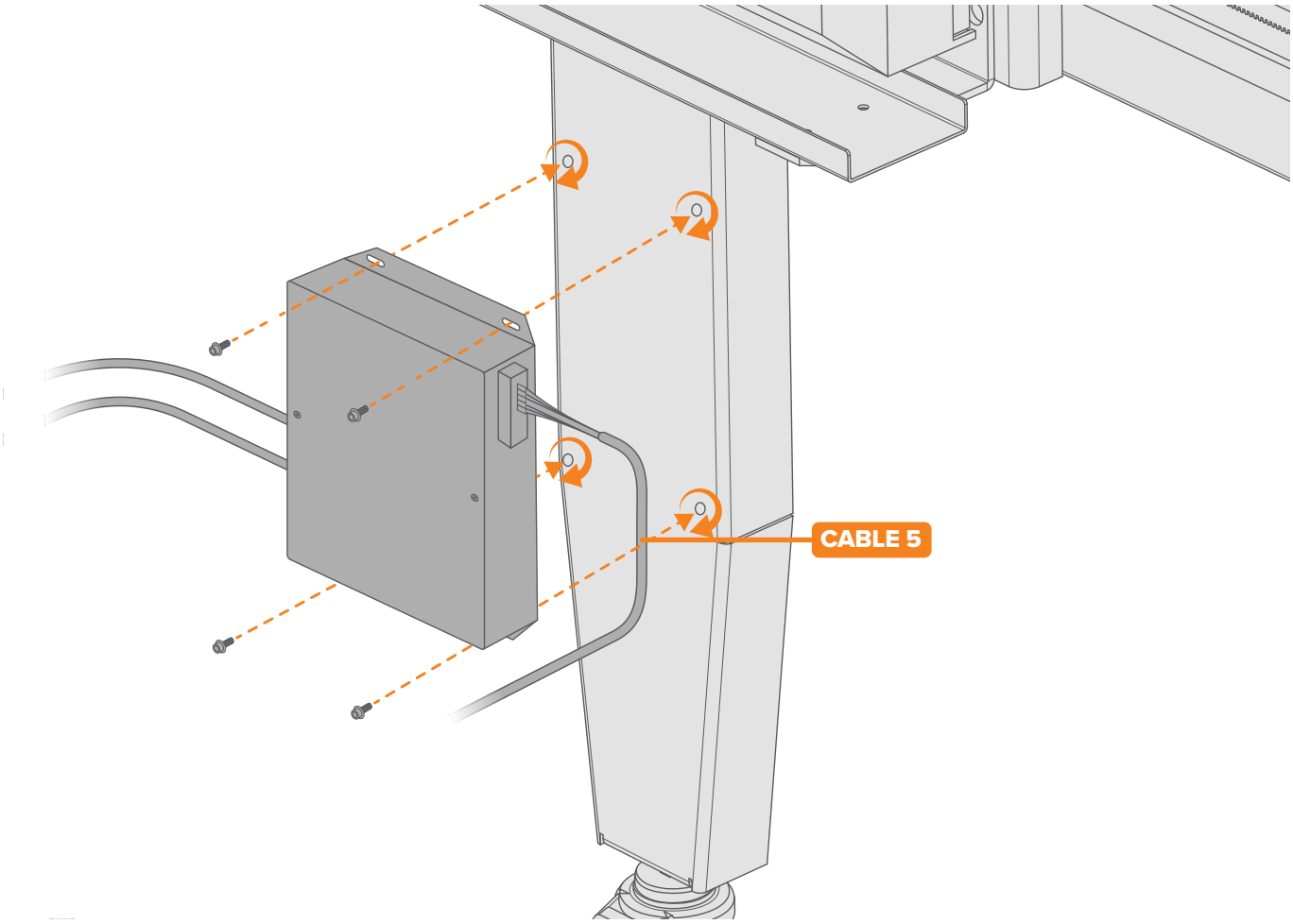


5.11 Installing the THC Divider

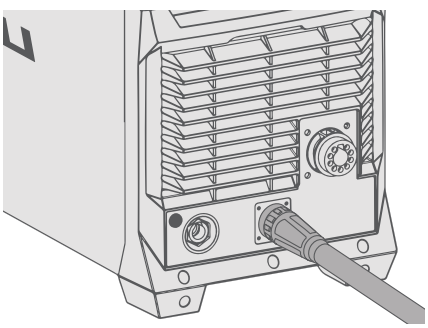
1. Screw the THC Divider into the leg directly behind the electrical cabinet. There are four screw holes on the leg, indicating the location the THC Divider mounts to.

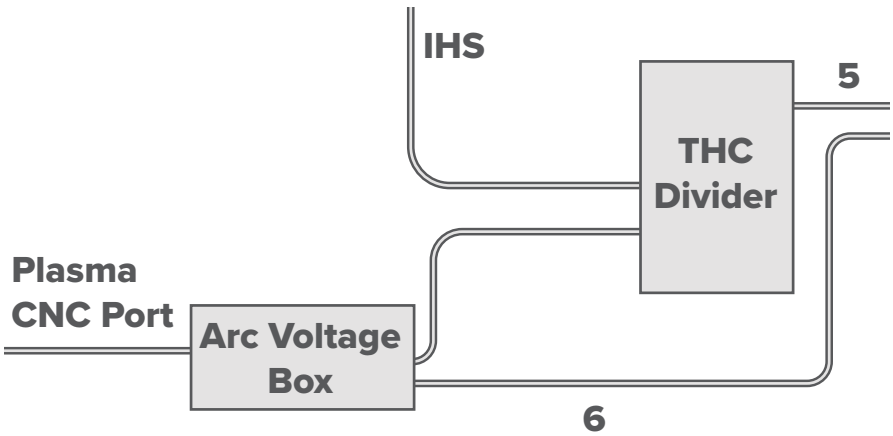
   On the 2400 model, this is the centre leg, on the 1200 model this is the back leg.

The THC Divider should be installed so that the green connection port is pointing towards the electrical cabinet.



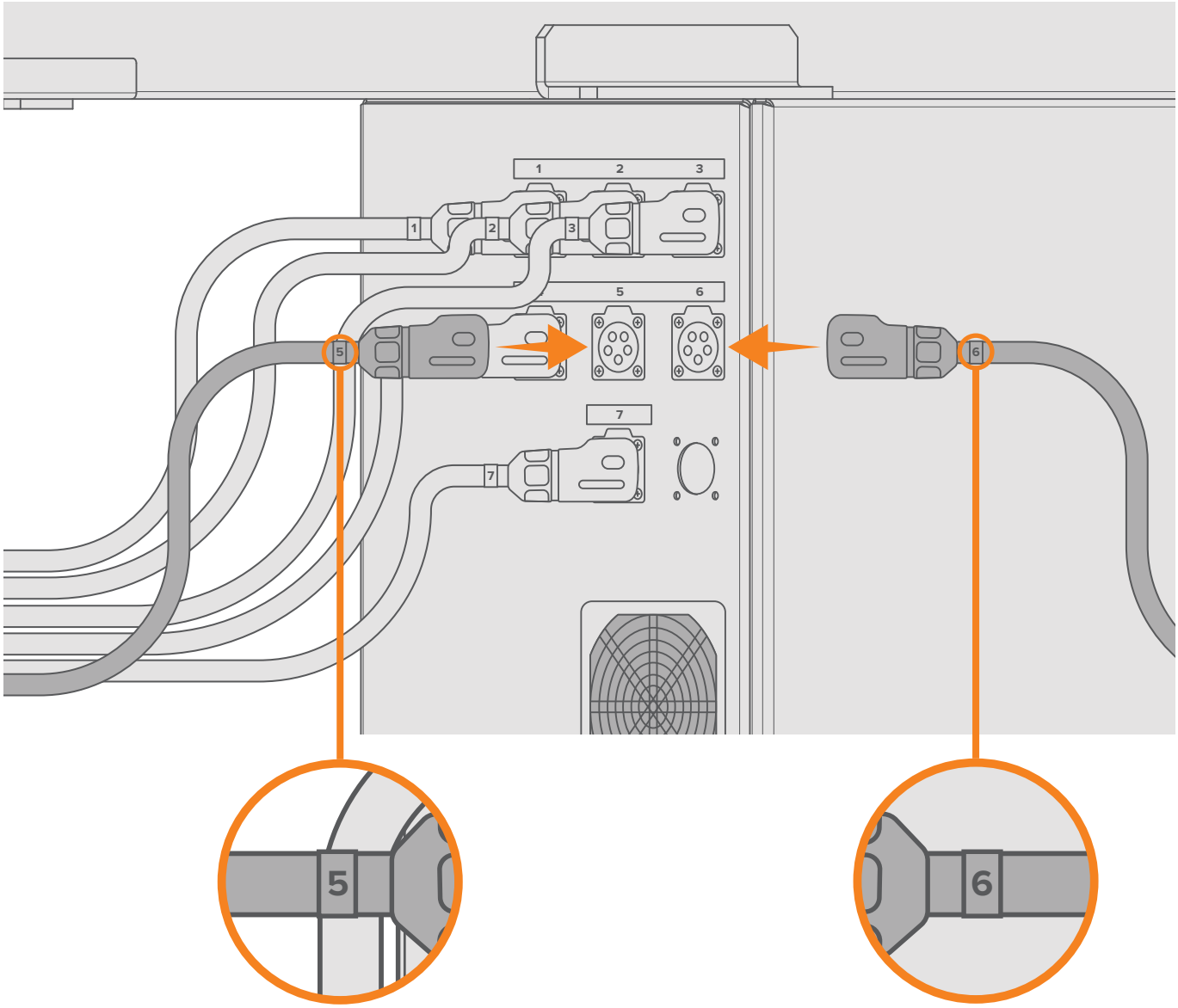
There are three cables on the THC divider.





2. Plug the cable labelled 5 into the back of the electrical cabinet.
3. A second cable connects to the Arc Voltage box, which controls the arc ignition and voltage, and another cable labelled 6 exits the Arc Voltage box. Plug the cable labelled 6 into the back of the electrical cabinet.

The third cable is used for ohmic IHS functions. UNIMIG plasma cutters do not have ohmic IHS capabilities, so this cable remains unplugged.



5.12 Connecting the Plasma Cutter to the CNC Table

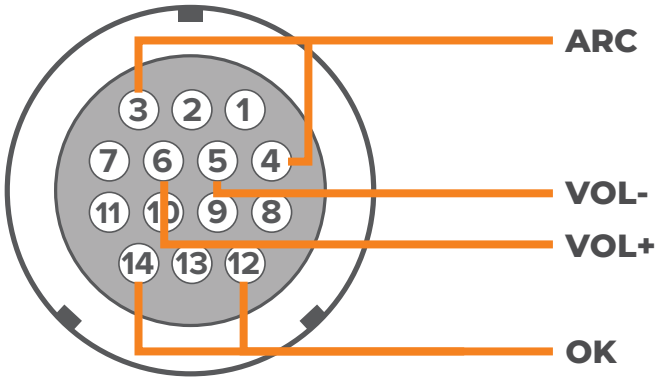
With the THC Divider installed, there should be a single remaining cable that connects to the Arc Voltage box.

This cable will need to be wired to suit the plasma cutter CNC connections being used with the STEALTH CNC table. To do this:

1. Connect the two ARC wires to the ON & OFF triggers pins on the CNC pinout.
2. Connect the VOL + & VOL - wires to the corresponding + and - torch height adjustment arc feedback pins on the CNC pinout.
3. Connect the two OK wires to the arc success signal pins on the CNC pinout.

For example, on the RAZOR CUT 45:

CNC Port Pinout (14 Pin)



Pin	Function	Voltage Box Connection
3, 4	Trigger ON/OFF signal	ARC
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.	VOL - and VOL +
12, 14	Arc success signal	OK

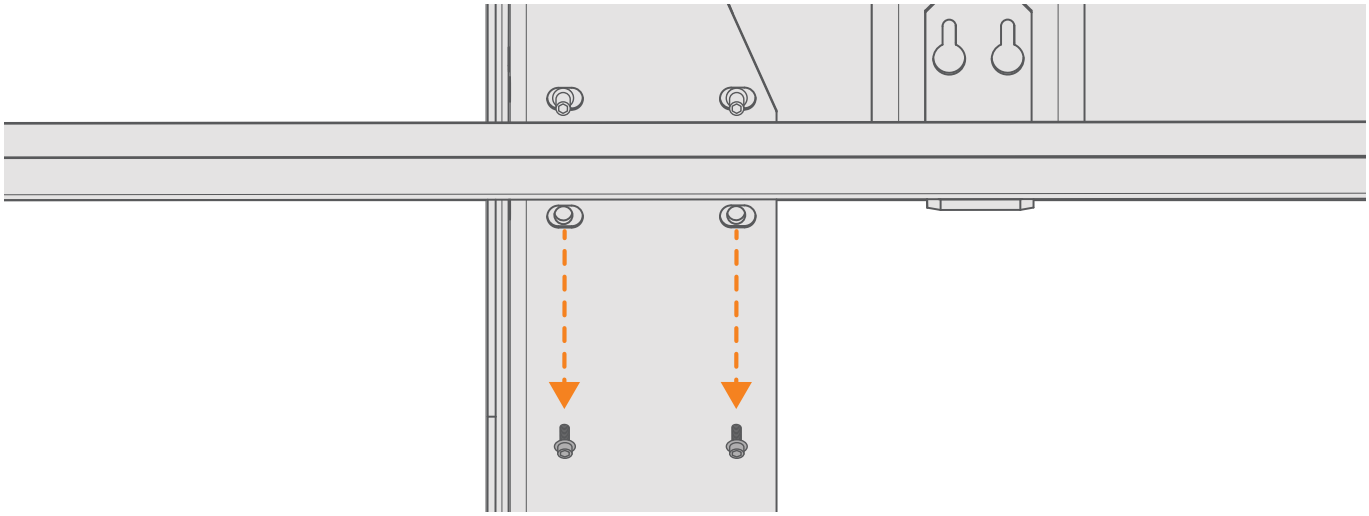
For all UNIMIG plasma cutter pinout connections *see "11. Pinout Guide" on page 164*.

For all non-UNIMIG plasma cutters, contact the manufacturer for pinout diagrams and instructions on the correct pinouts.

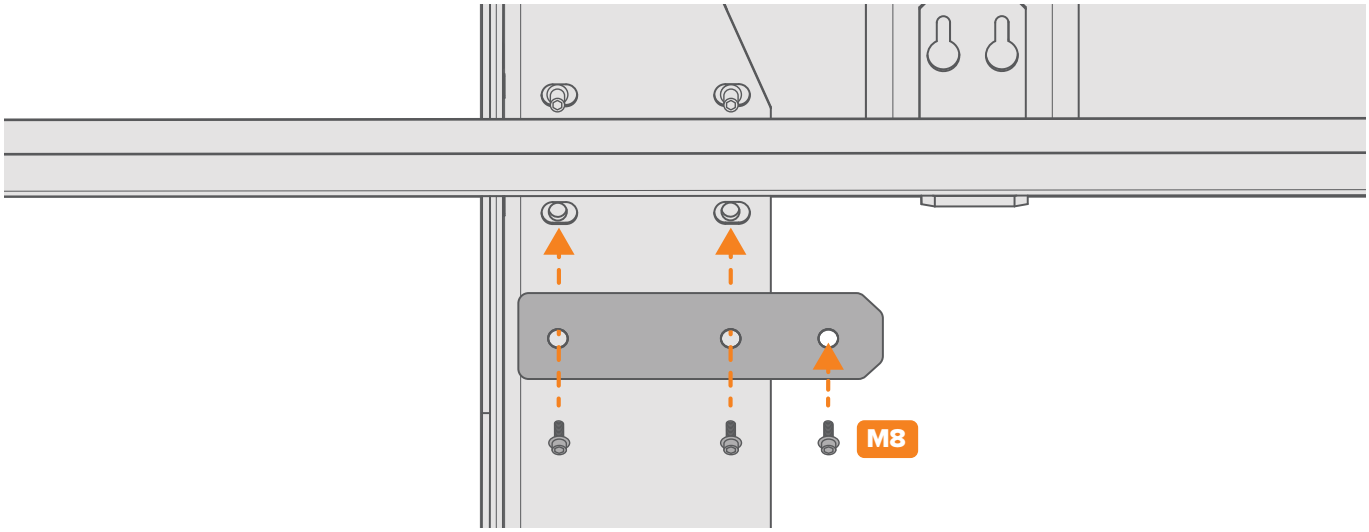
5.13 Connecting the Earthing Plate to the CNC Table

1. Undo the bottom two screws on the back leg of the table.

   On the 2400 model, this is the leg behind the THC Divider, on the 1200 model this is the same leg that the THC Divider is mounted to.



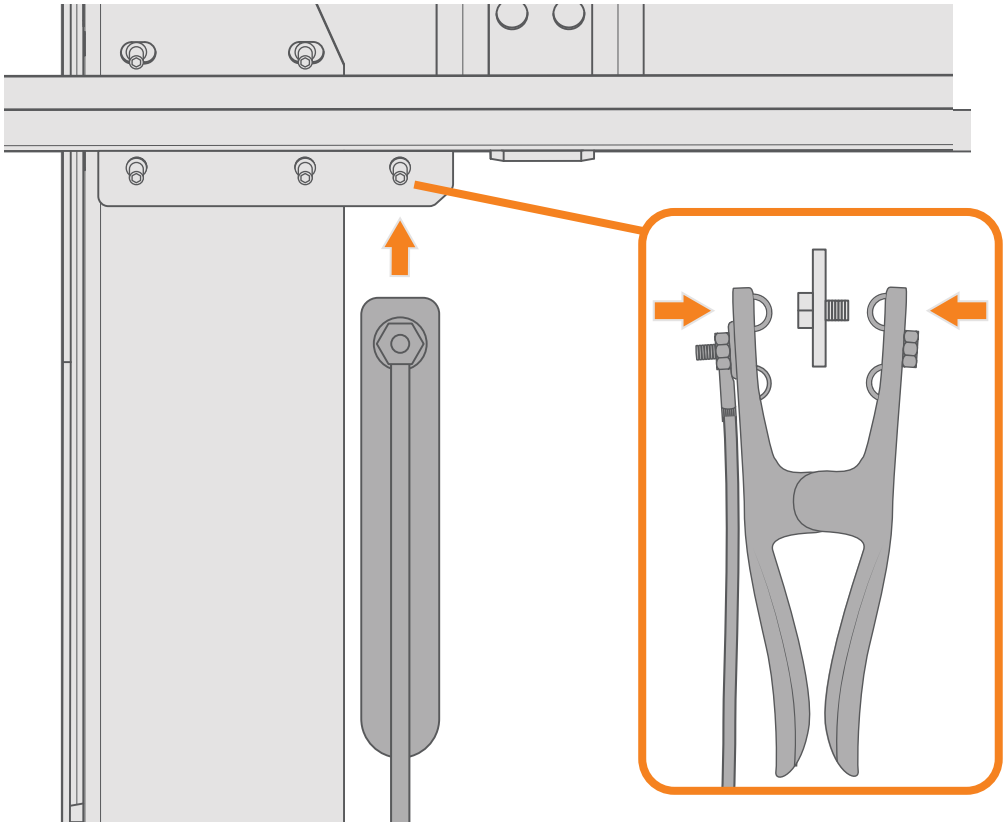
2. Screw the earthing plate into the leg through the leg holes via the left and centre holes, using the screws that were just removed. The earthing plate should overhang on the right side.
3. Screw an M8 screw into the remaining hole on the earthing plate.



5.14 Connecting the Earth Clamp

To the CNC Table

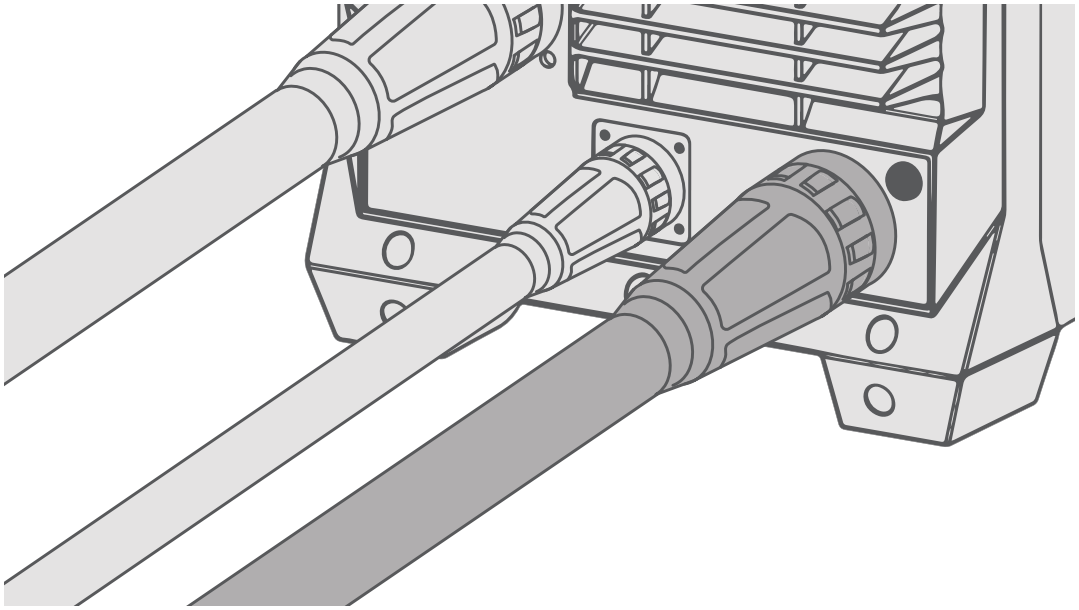
1. Connect the earth clamp over the screw on the earthing plate.



The earth clamp that connects the plasma cutter to the CNC table is the positive (+) terminal of the plasma cutter.

To the Plasma Cutter

1. Connect the earth clamp to the dinse connection on the plasma cutter.



5.15 Installing a Grounding Rod (optional)

If there is electromagnetic interference that is interrupting the proper functioning of the STEALTH CNC table, it is recommended to install a grounding rod.

The grounding rod needs to be installed within 6 metres of the table and should not be a part of any other electrical circuit. The resistance of the grounding rod to the earth should not exceed 3ohms.

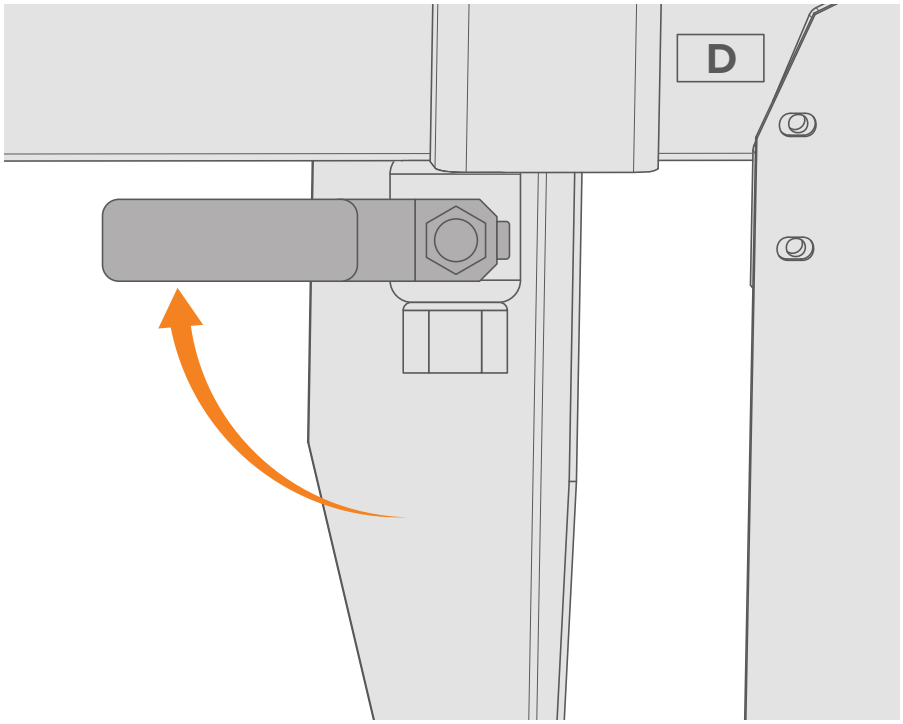
⚠ **The grounding rod works to eliminate any electrical interference produced by the plasma cutter and protects the CNC table from potential damage caused by this interference.**

ⓘ **A qualified electrician should be contacted to ensure proper installation of the grounding rod and earth leads.**

5.16 Filling & Emptying the Water Bed

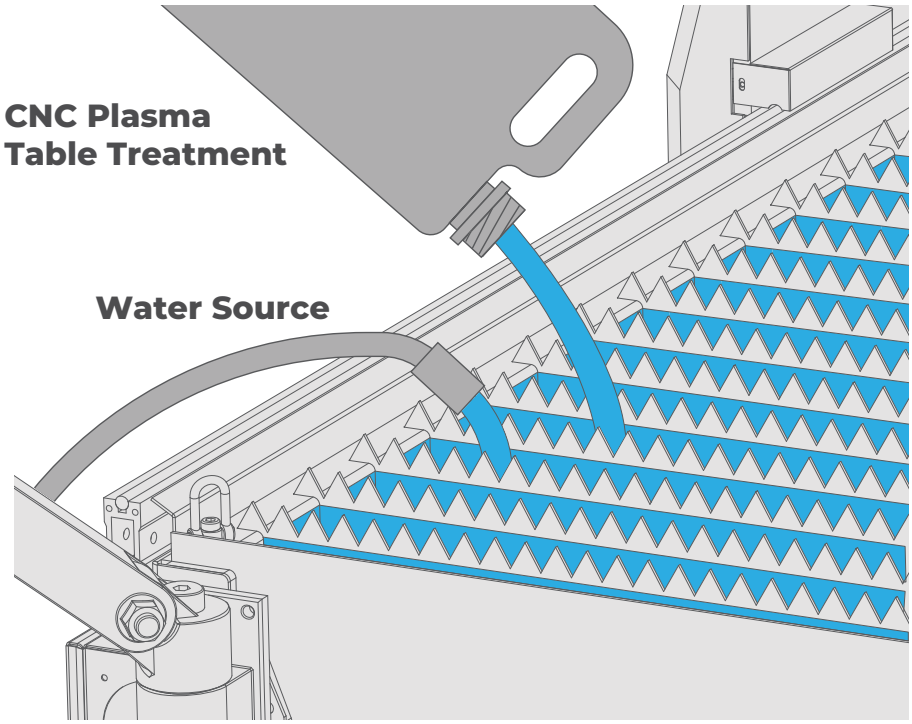
Filling the Water Bed

1. With the valves closed, fill the table with water.



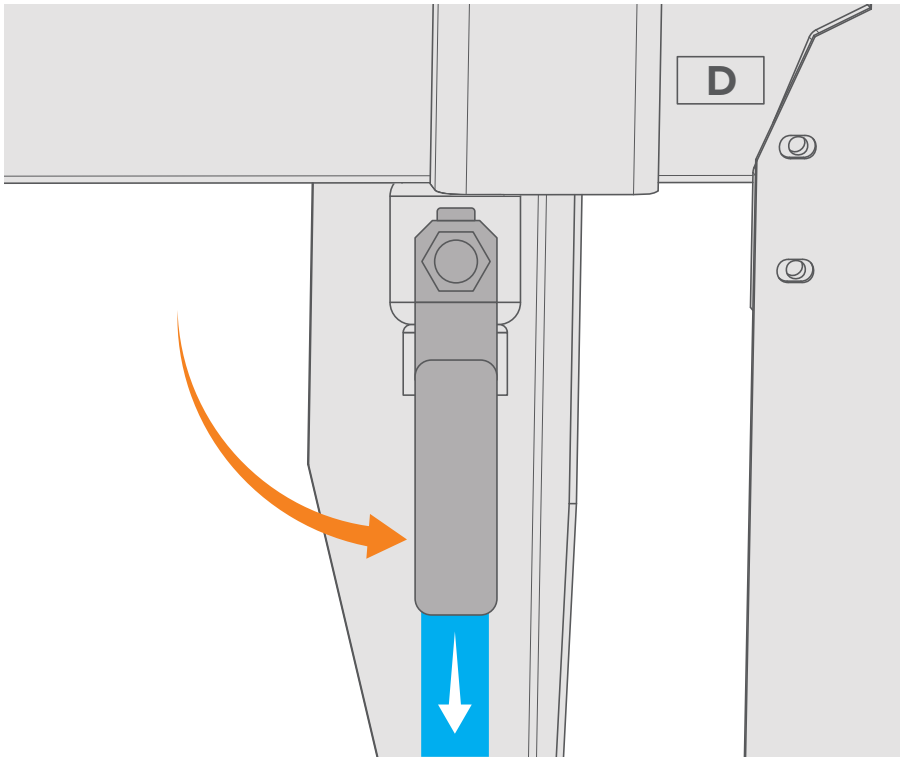
2. While the table is filling with water, add the Plasma Table Treatment as directed.

See "3. Technical Specifications" on page 11 **for the litre capacity of the table.**



Emptying the Water Bed

1. Open the valves on the bottom of the table to allow the table to drain.

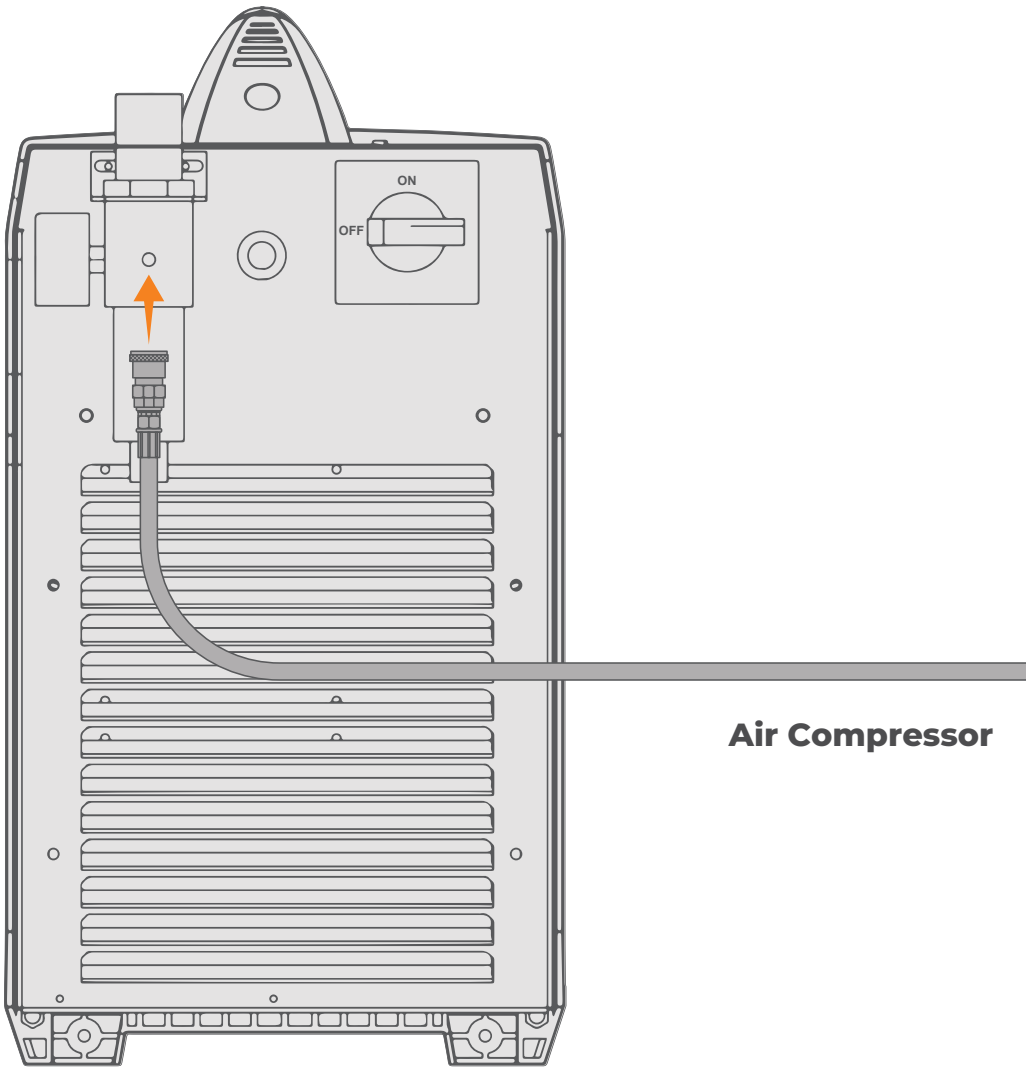


5.17 Connecting the Air Compressor

The air compressor will need to have a minimum airflow draw that matches the plasma cutter's. It is recommended to get an air compressor with an additional 20% capability to eliminate bottlenecking and airflow issues.

We recommend an air compressor with a minimum of a 250-290L/min airflow rate or FAD (Free Air Draw). This guarantees the air compressor will run continuously without failing during a cut.

1. Connect the air compressor to the back of the plasma cutter.
2. Set the air pressure on the compressor. It is recommended to set the air pressure slightly higher than the plasma cutter's, to allow for any drops in pressure depending on the hose length.



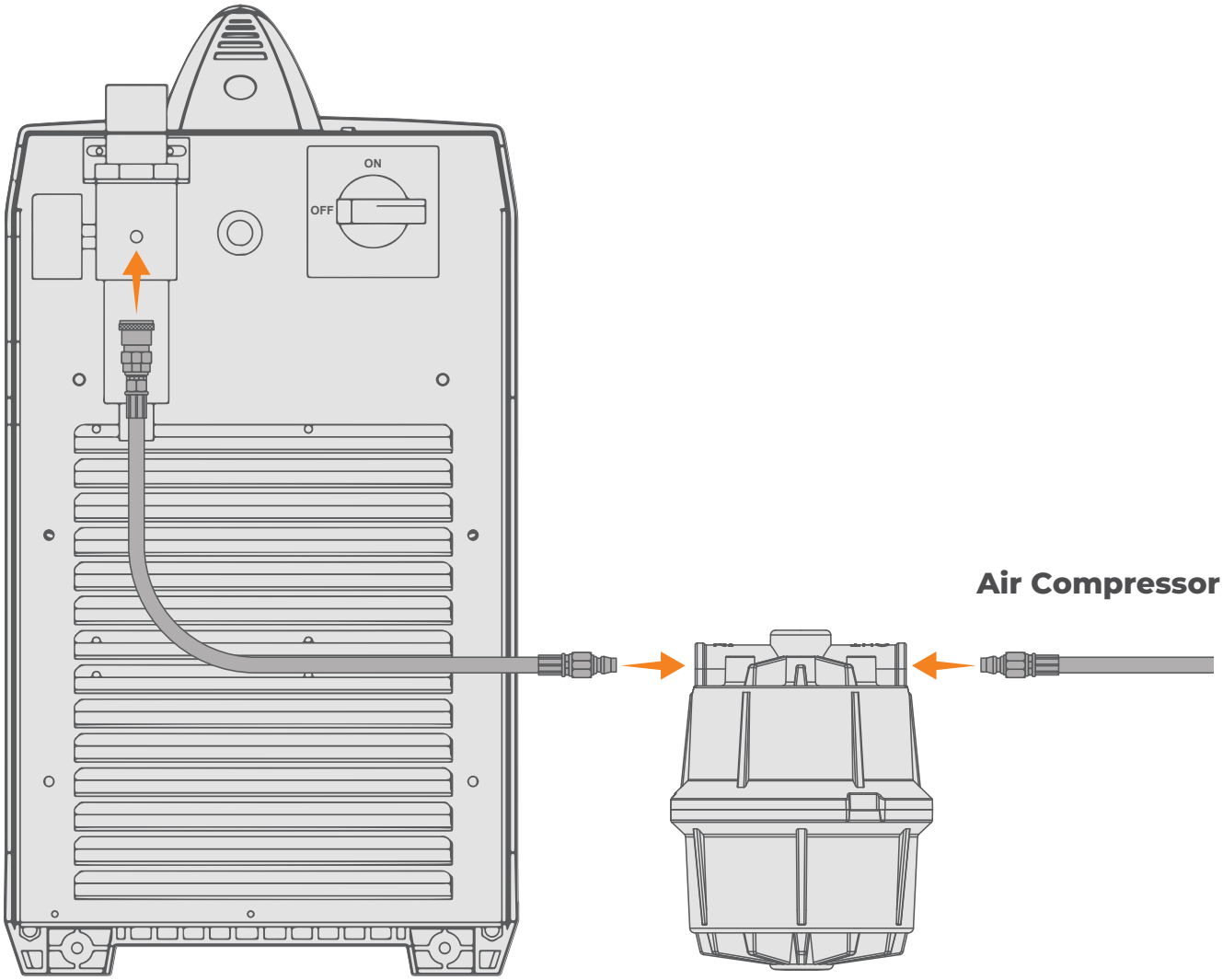
5.18 Installing Additional Air Filters

If the supplied air quality is poor or there is moisture present, the cut speeds, cut quality, and thickness capabilities all decrease, and the life of the consumables shortens. To avoid these issues, install an (optional) additional air filtration system.

Additional air filters should be installed between the air supply and the plasma cutter.

Compressed air needs to be oil and moisture free. Moisture can cause damage to the torch. Oil, when mixed with oxygen under pressure, can cause a flash fire in the torch.

1. Connect the filter to the air compressor.
2. Connect the filter to the plasma cutter via a second air hose.

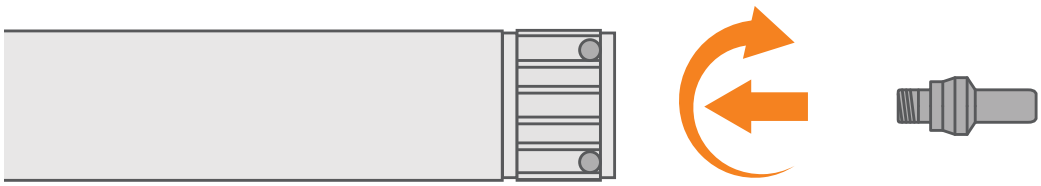


5.19 Setting the Voltage Divider

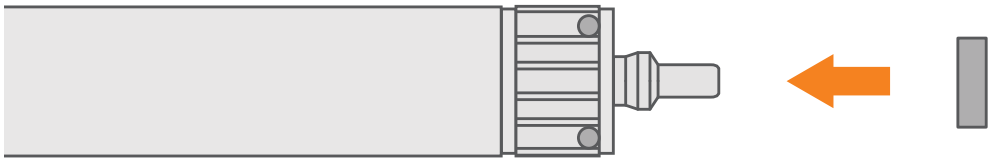
The STEALTH CNC tables require a voltage divider ratio of 1:1. To change the factory preset voltage divider from the default ratio to a 1:1 ratio, please refer to your plasma cutter's user manual, or contact the manufacturer for instructions.

5.20 Assembling the CNC Plasma Torch

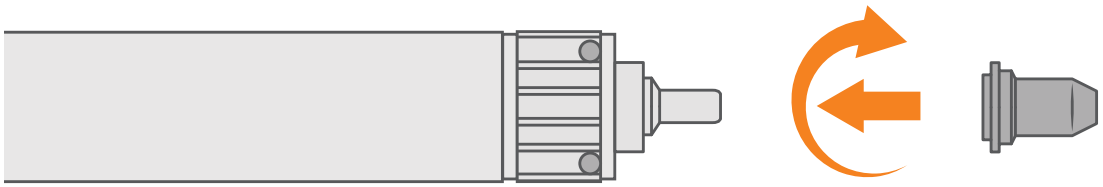
1. Screw the electrode into the torch head. Fasten securely.



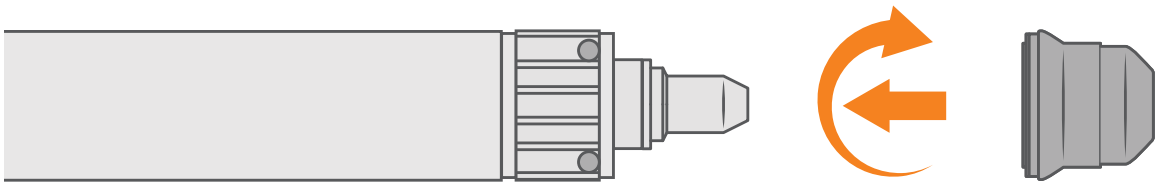
2. Place the swirl ring onto the electrode.



3. Screw the cutting tip into the torch head. Fasten securely.

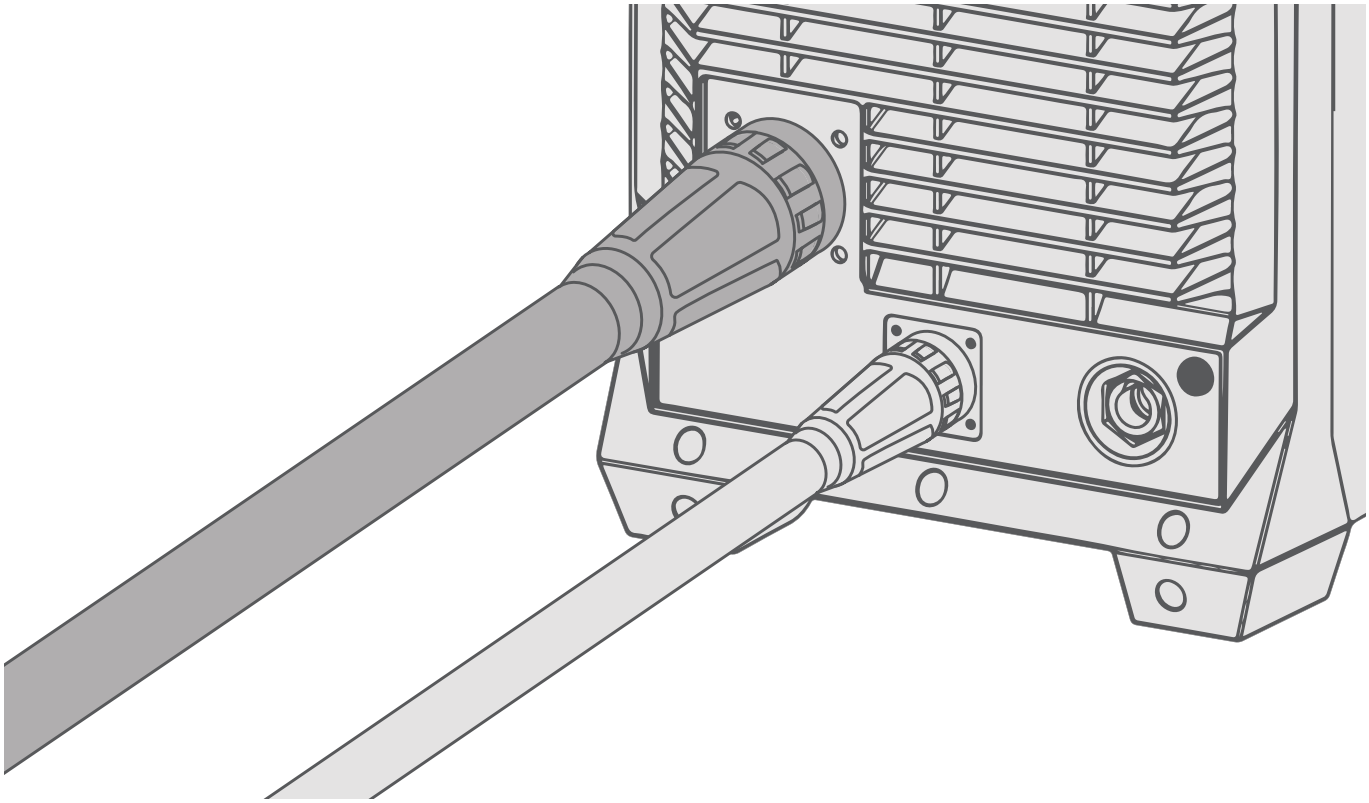


4. Screw the retaining cap into the torch head. Fasten securely.



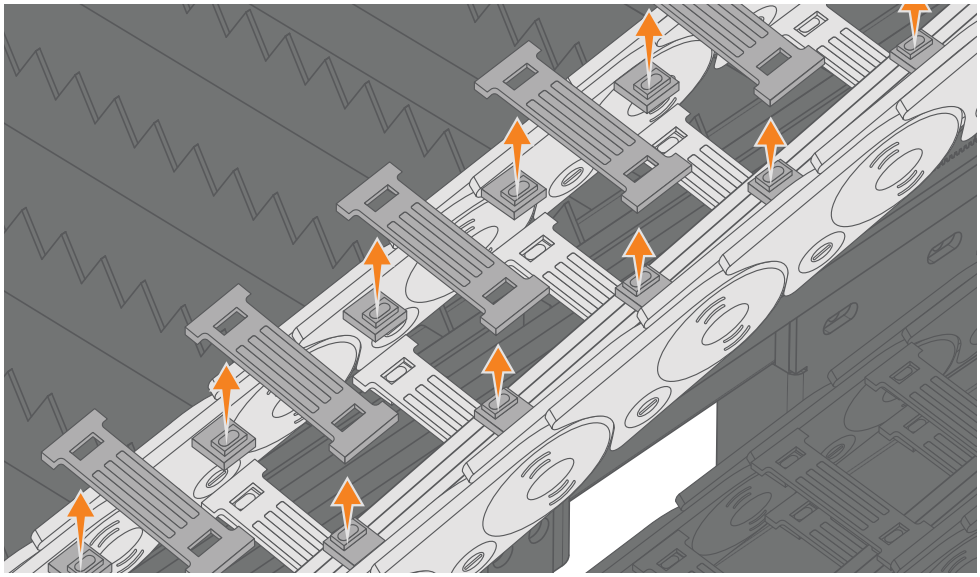
5.21 Connecting the CNC Torch

1. Assemble the CNC torch.
2. Connect the CNC torch into the Euro central connection.

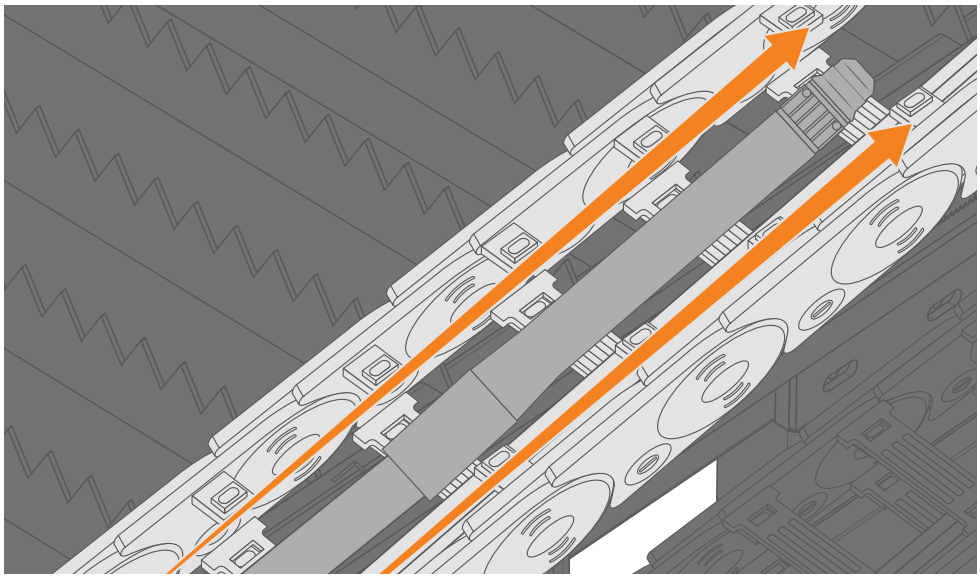


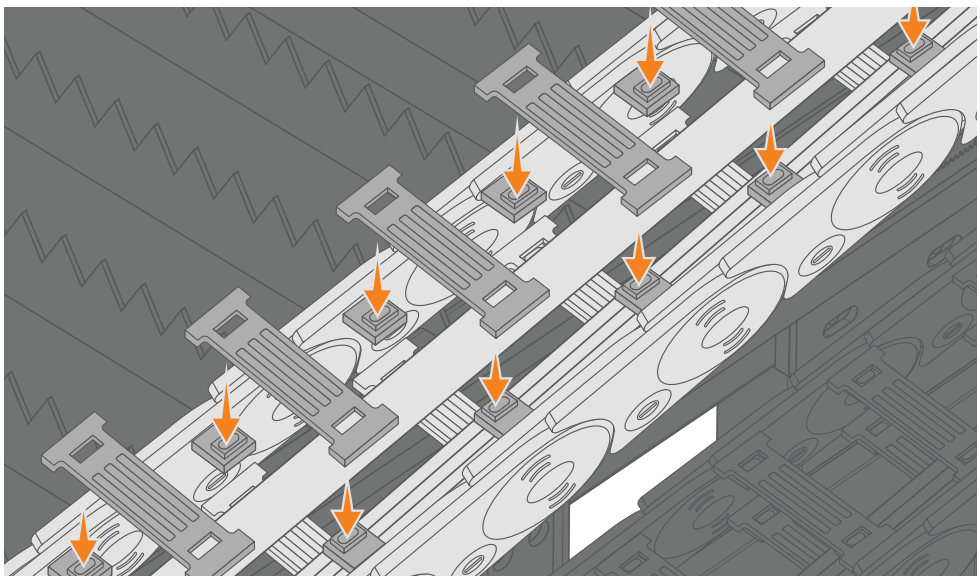
5.22 Mounting the CNC Torch to the Table

1. Remove the clips from the drive rail.

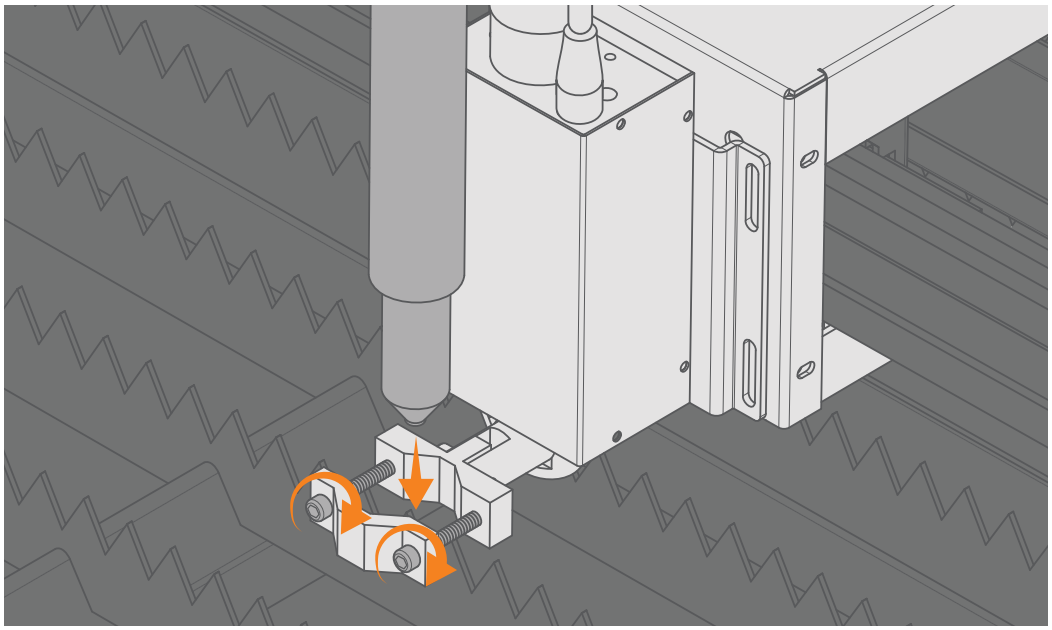


2. Feed the torch through the rail and replace the clips to hold it in place.



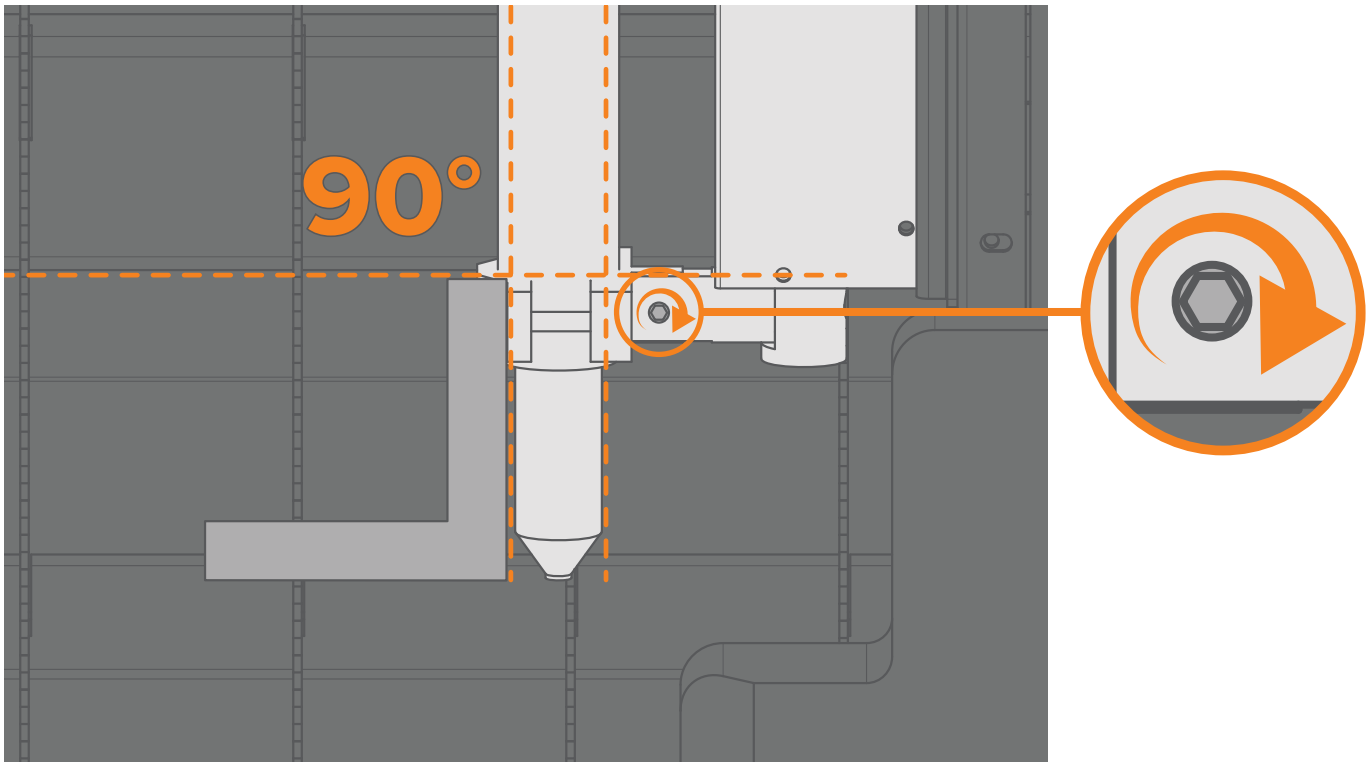


3. Place the torch head in the torch mount on the front of the THC.
4. Screw the front plate in to hold the torch head in place.



The CNC torch should be mounted above the workpiece at 90° in order to get a vertical cut.

5. Use a square to align the torch 90°.
6. If the torch needs to be adjusted, the back screw on the torch mount can be loosened and the angle adjusted.



Check that the CNC table's rails and drive system are clean and the torch travels smoothly. Unsteady machine motion can cause a regular, wavy pattern on the cut surface.

6. STEALTH 3000 Table Overview

6.1 Key Features

UNIMIG Arc Path CNC Control Software

Pre-installed on the touchscreen computer, we've custom-designed our very own CNC software in-house. This software is easy to learn and use, with an intuitive design that's simple to navigate. The UNIMIG Arc Path CNC Control software accepts G-Code Design files, or you can plug in a USB or a shared network folder and load your own files. We've also included CAM nesting software that accepts DXF files on the computers as well.

Water Bed With Slat Slots

The table's water bed absorbs the smoke and dust produced during the cutting process, which gives you a cleaner workspace and reduces the need for extra ventilation or filtration systems. It also helps to cool the material being cut and minimises the amount the plate warps. The slat slots mean you can easily replace slats that become warped or damaged over the table's lifetime.

Independent CNC Frame

The independent frame protects the motor and rails from warping or any damage that heavy workloads can cause. Plus, it allows for easy repair or replacement of the waterbed without needing to recalibrate the table.

3m x 1.5m Cut Size

A true 3 by 1.5 metre full commercial sheet cut size. The gantry will travel 3.04 by 1.54 metres, so you can guarantee you'll get the full size of the table to cut across. Its heavy-duty construction means it can handle full sheet loads of mild steel up to 40mm thick.

Industrial Servo Motors & Belt Transmission

The industrial servo motors deliver exceptional precision, responsiveness and reliability. Working in conjunction with a feedback system, the motor's position, speed, and torque can be adjusted based on real-time data. Paired with the belt-driven transmission system to drive the gantry, this high-performance motor ensures smooth, accurate motion control while maintaining durability under heavy loads.

Helical Rack & Pinion Drive

Comprised of hardened tool grade steel, the helical rack and pinion design offers smoother, quieter motion and minimises backlash, ensuring precise and consistent performance.

Adjustable Sighting Laser

An adjustable sighting laser is included, so you have a clear, constant visual of where the cut will start every time.

Automatic Torch Height Control

The Automatic Torch Height Control continuously monitors and adjusts the torch height in real time to maintain the optimal height while cutting. By maintaining the optimal torch height, you get a consistent cutting quality, minimal dross, increased consumable life and faster cutter speeds.

Adjustable Collision Detection Torch Holder

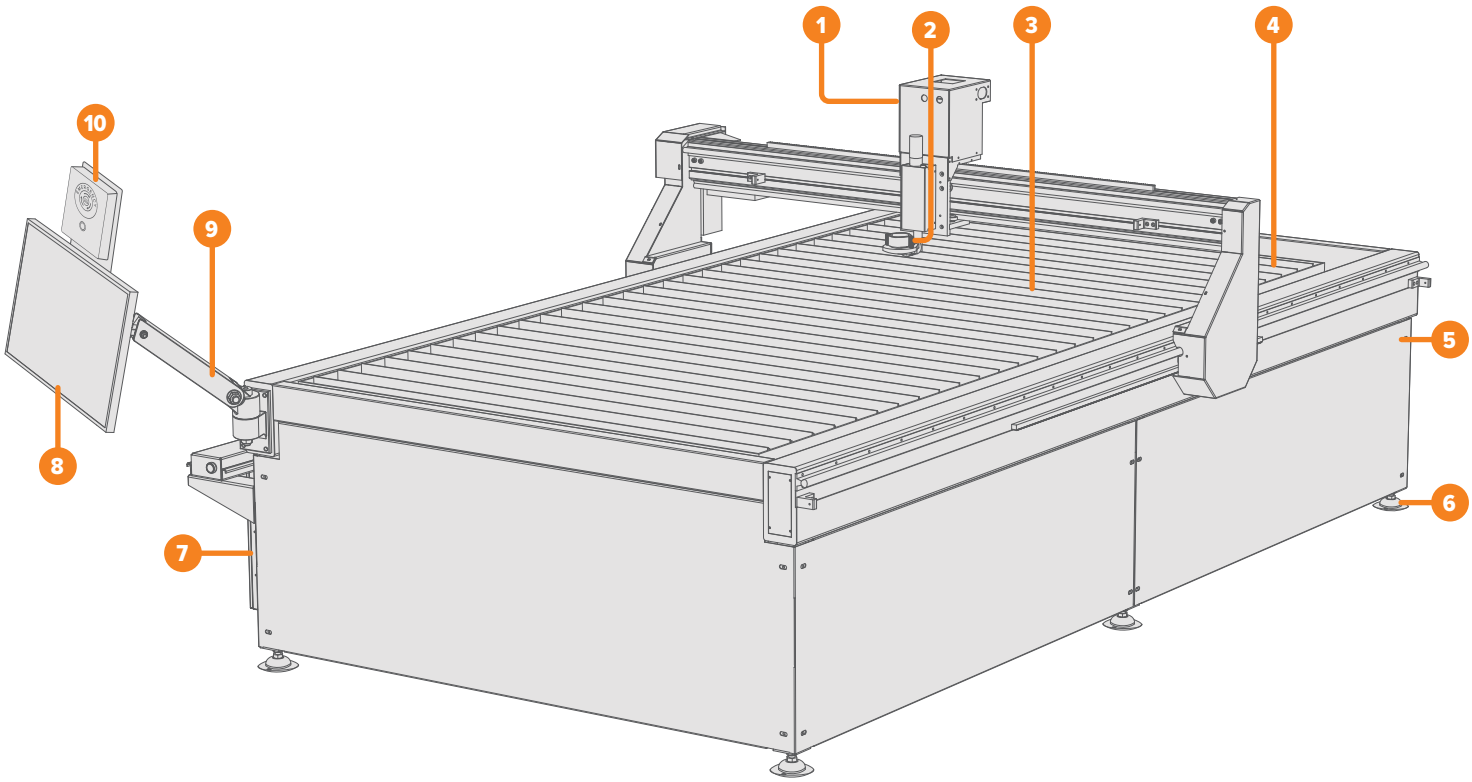
The collision detection torch holder comes with spring-loaded tensioners that give way on impact to protect your torch and dual proximity sensors that immediately halt operations to prevent further damage. The collision sensitivity can be fine-tuned with adjustable tension settings for a customised response to suit your needs.

Plus, the spring-loaded design resets your torch position automatically, so you don't need to recenter your torch each time there's a collision.

Heavy-Duty Steel Construction

Engineered with robust, high-performance components, it's built to withstand the rigours of heavy-duty production. The water bed features laser-welded seams, so there are no bolts or any silicon sealing, so it's completely leak-free.

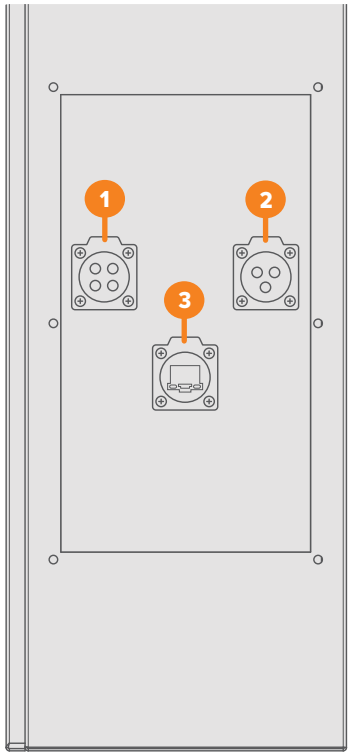
6.2 CNC Table Layout



Top View Layout

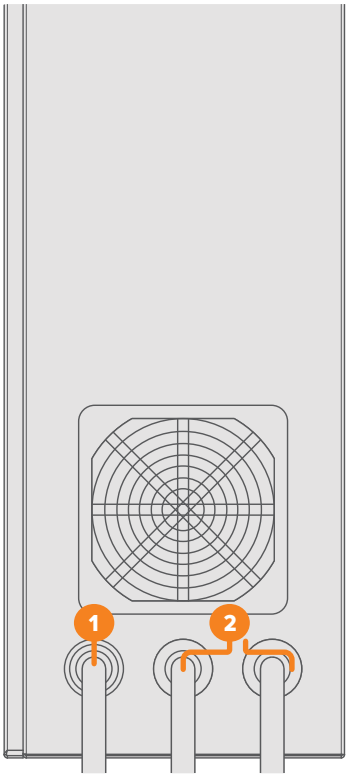
1. Laser
2. CNC Torch Holder
3. Water Bed
4. Gantry Rail
5. Table Walls
6. Table Feet
7. Electrical Box
8. Control PC
9. Computer Arm
10. Emergency Stop Button

6.3 Electrical Cabinet Layout



Front Panel Layout

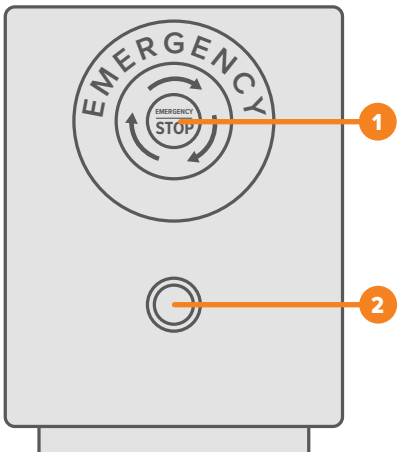
1. 4 Pin Cable
2. 3 Pin Cable
3. Ethernet Port



Back Panel Layout

1. Power Cable
2. Arc Voltage Box Cables

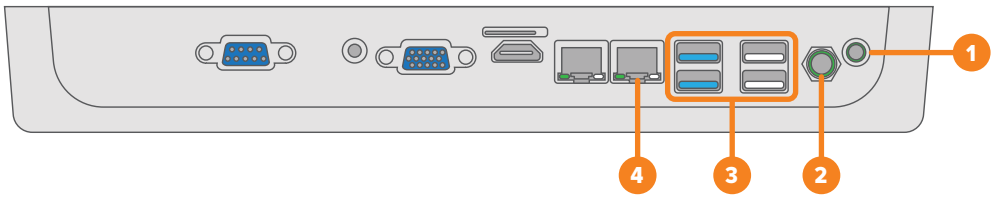
6.4 Emergency Stop Button Layout



1. Emergency Stop Button
2. Laser On/Off

It is recommended to make yourself familiar with the location of the Emergency Stop button. This button should be used in the event of an emergency that requires the CNC table to cease operation immediately.

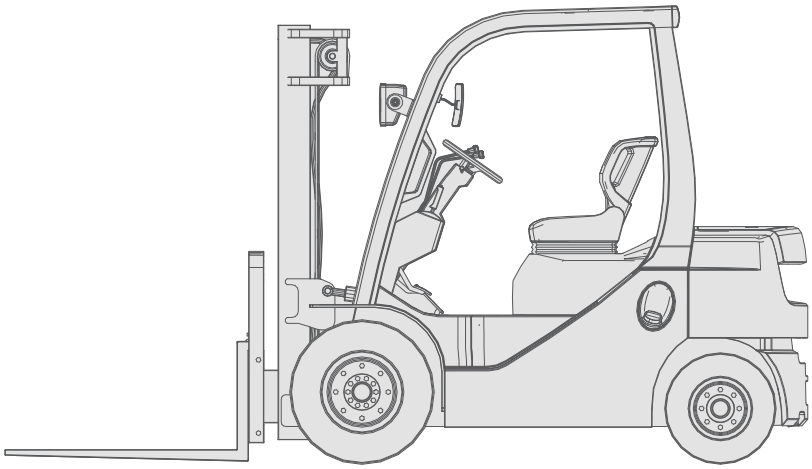
6.5 Control PC Layout

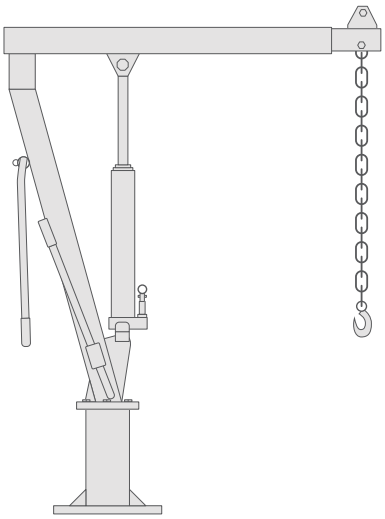


1. Power On/Off Button
2. Power Plug
3. USB Ports
4. Ethernet Port (LAN1)

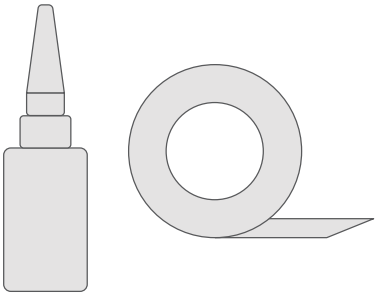
7. STEALTH 3000 Installation

7.1 Tools Required

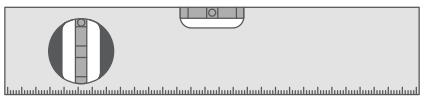




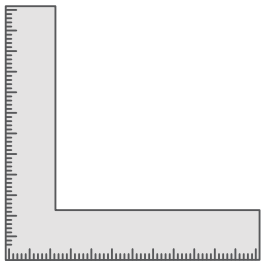
Forklift or Lifting Crane



Thread Seal/PTFE Tape

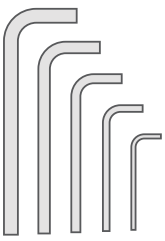


Leveller

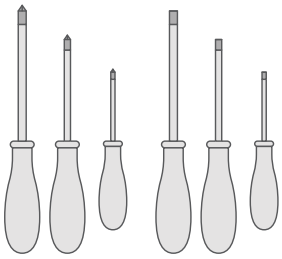


Square Tool

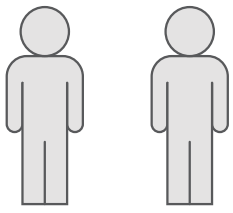
Spanner



Allen Keys



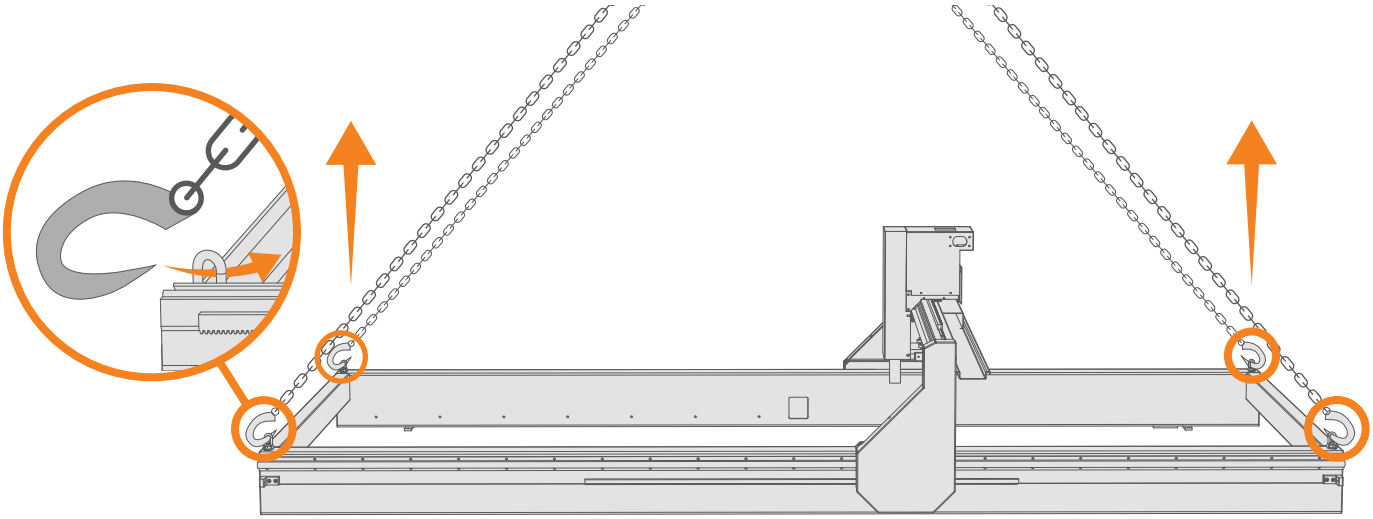
Flat & Phillips Head Screwdrivers



Two People

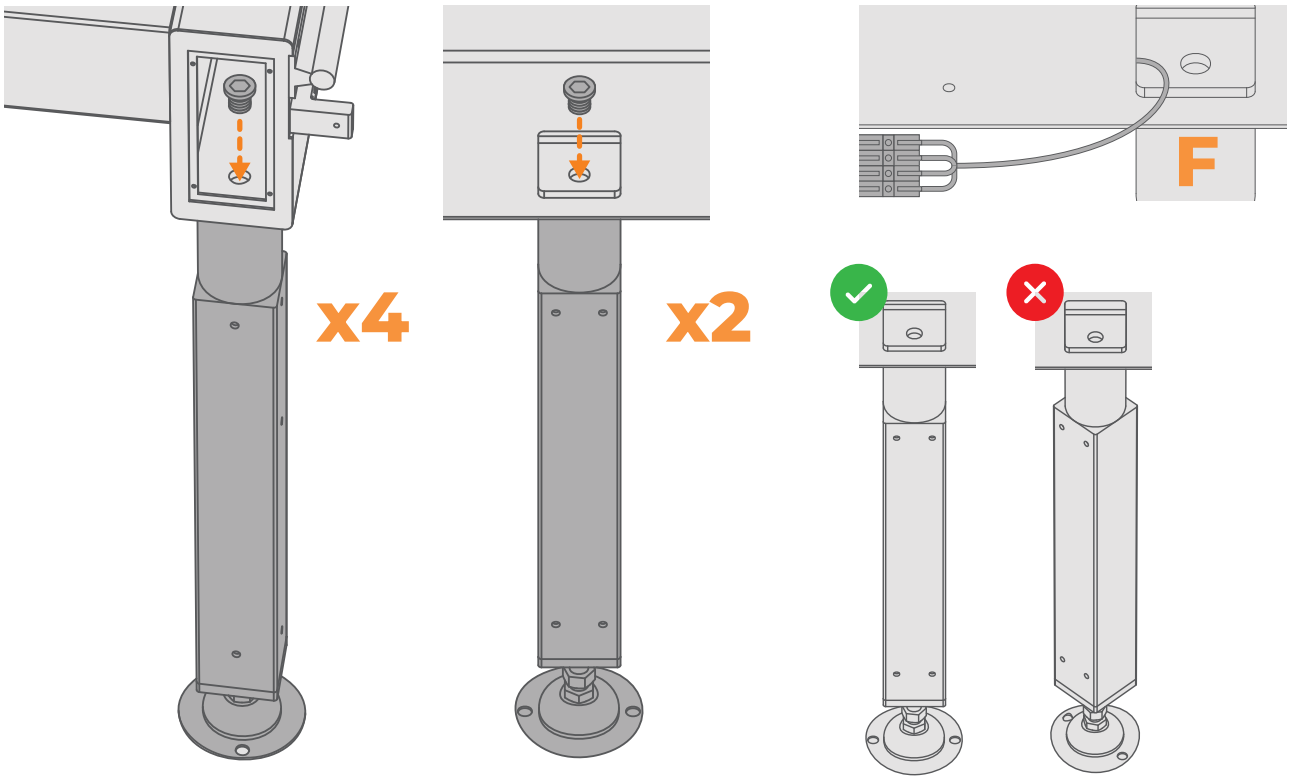
7.2 Installing the Gantry Legs

1. Lift the gantry frame up into the air via the anchor points using a forklift or lifting crane. The gantry itself may need to be moved to the middle of the frame to maintain proper balance.

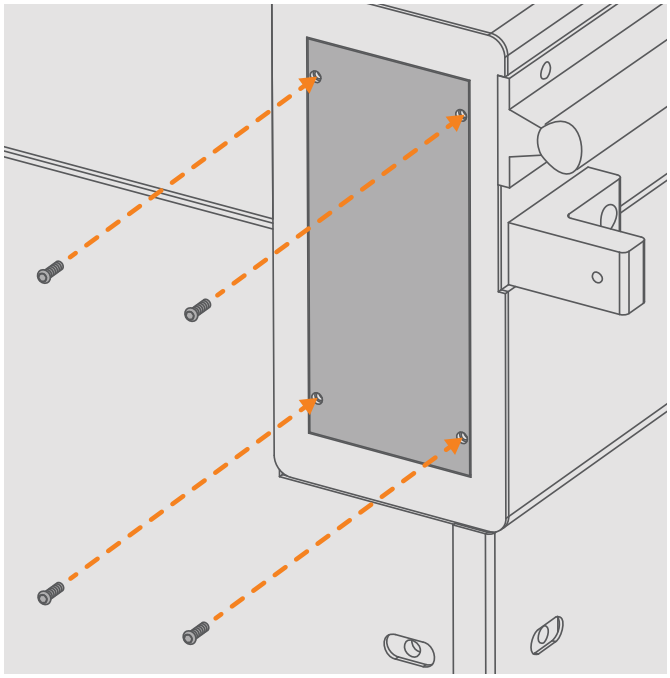


2. The corners of the frame and the legs are labelled (A, B, C, etc.), match the corresponding legs to the correct position on the gantry frame.
3. Undo the screws on the top of the gantry legs and use these to screw the legs in. The legs need to be parallel to the frame and not twisted when screwed in, otherwise, the side panels cannot be installed.

When installing leg F (a middle leg), there is a set of wires and a limit switch connection port that need to be moved out of the way so that you can access the bolt for the leg. These will need to be accessed later, so make sure to place them where they can be reached later.



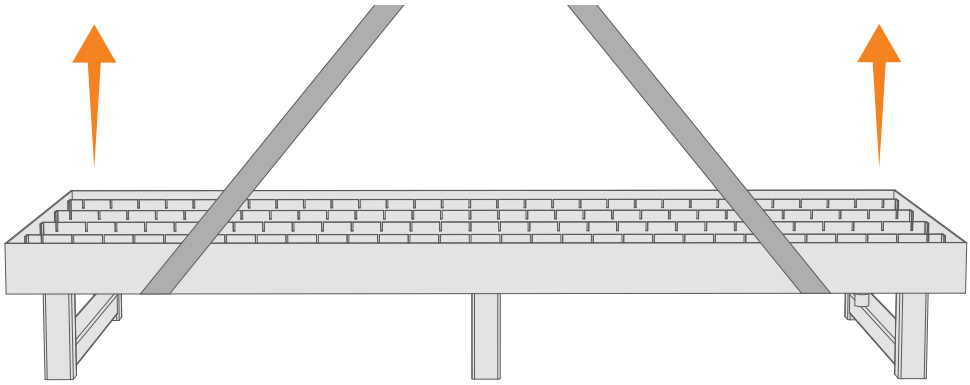
4. Screw the corner panel covers on.



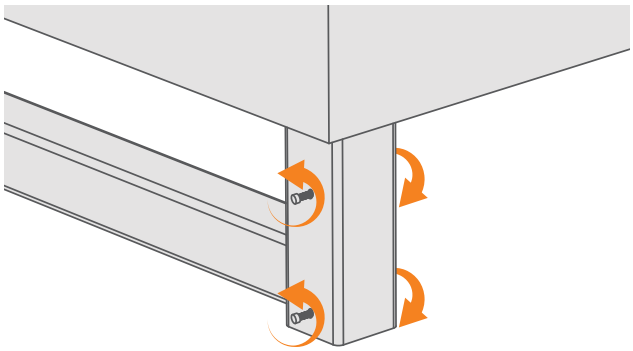
Set the gantry out of the way into a location other than the final table location after the legs have been installed. The frame can be repositioned once the water bed has been installed.

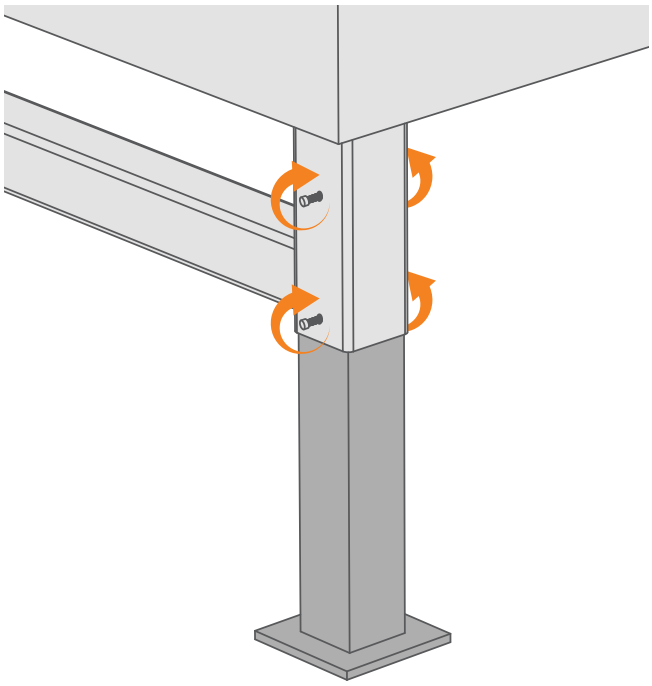
7.3 Installing the Water Bed Legs

1. Lift the water bed into the air using straps and a lifting crane or from the bottom with a forklift.



2. Loosen the screws on the water bed mounting points and slide in the water bed legs. Use the loosened screws to tighten the legs into place.

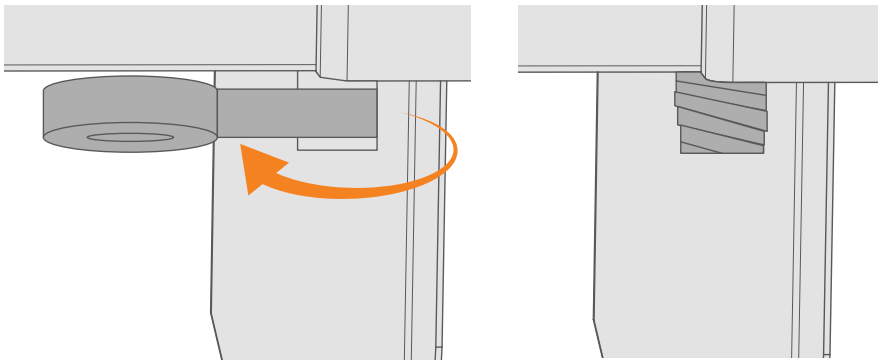




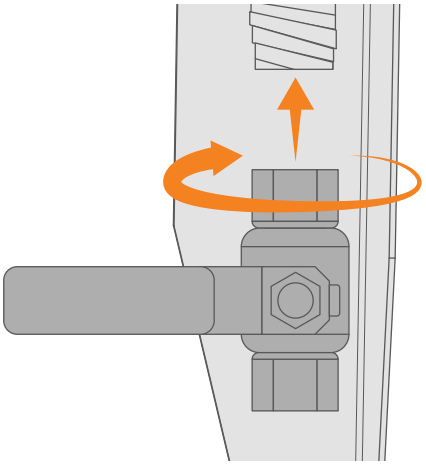
3. With the legs installed, set the water bed down where it is going to remain, in its final location.

7.4 Installing the Water Bed Valve

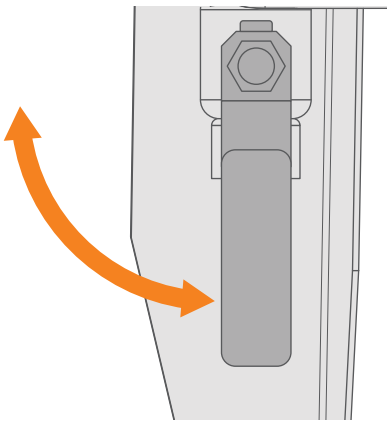
1. Use thread seal/PTFE tape to wrap the drainage pipe to create a leakproof seal.



2. Screw on the ball valve.



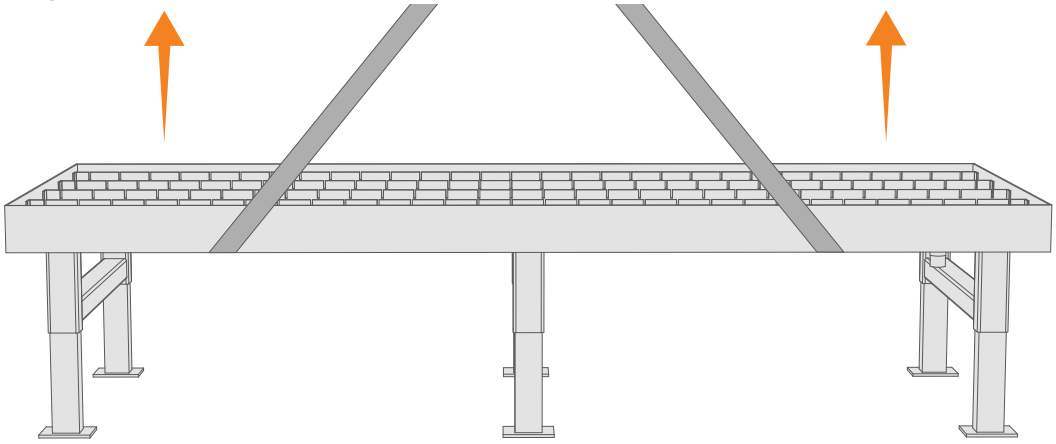
3. Check that the valve is working correctly by opening and closing the valve lever.



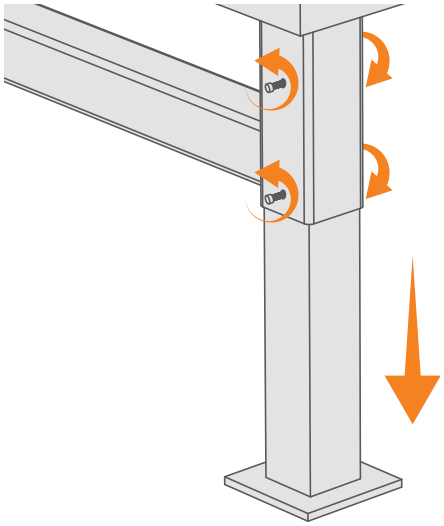
7.5 Levelling the Water Bed

The water bed needs to be level, especially if it is being set in an uneven area. To level the water bed:

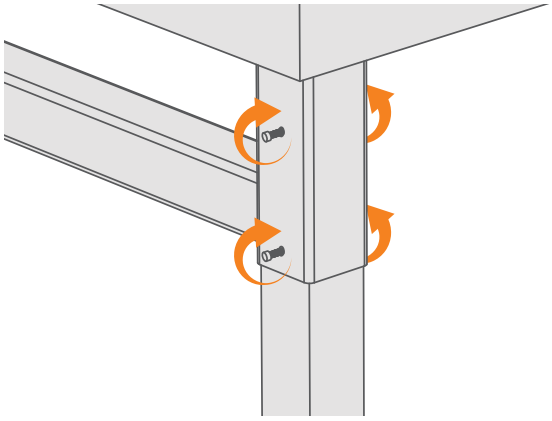
1. Lift the water bed so that the feet are just barely touching the ground and there is no weight being supported on the water bed's legs.

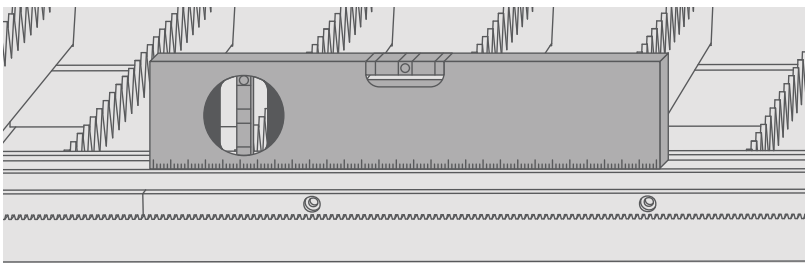


2. Loosen the screws holding the legs in place so that they drop to rest on the floor.



3. Retighten the screws on the table legs and place the water bed back down, so the legs are supporting its weight. Check the table is levelled.





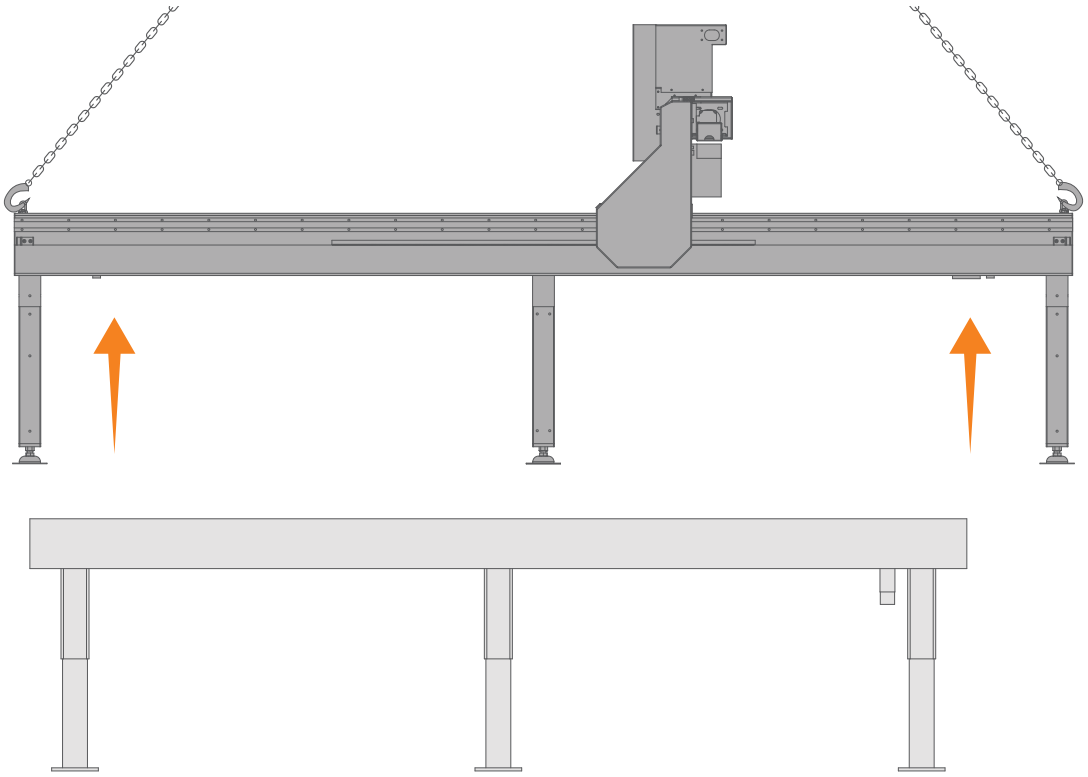
4. Repeat this process until the table is completely level.

Ensure all the water bed leg screws have been tightened firmly before moving on.

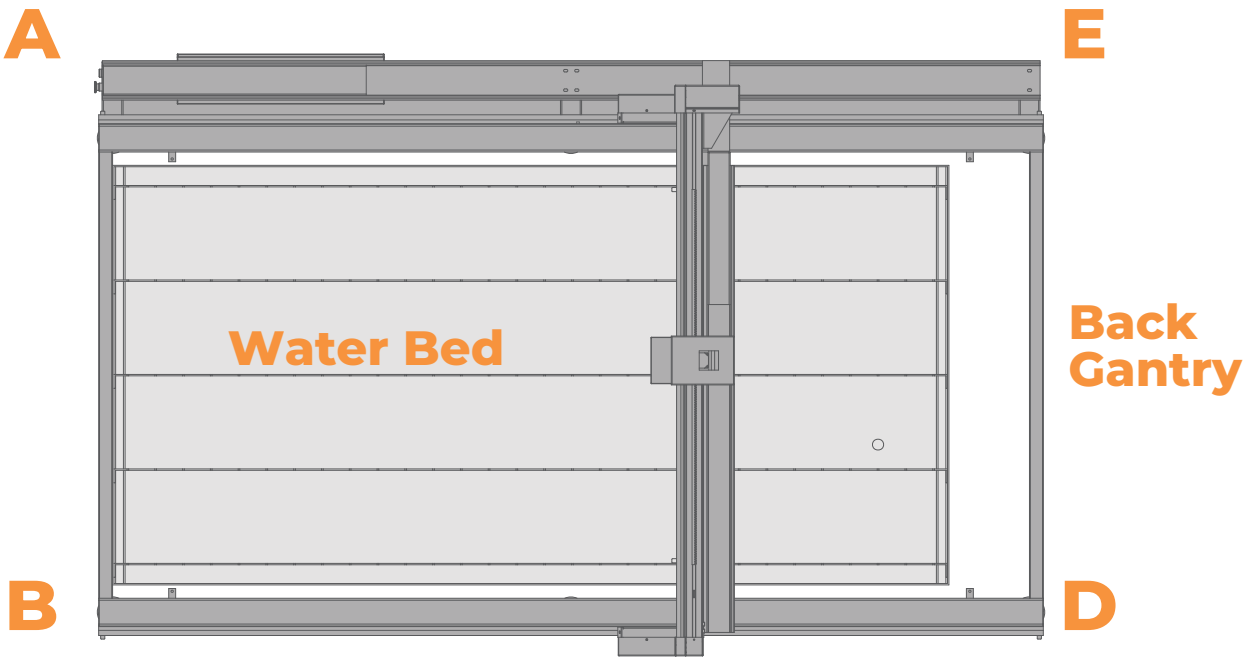
7.6 Installing the Gantry Frame Around the Water Bed

With the water bed installed and levelled in its final location, the gantry frame can now be placed around it.

1. Lift the gantry frame so that the legs are raised higher than the water bed.

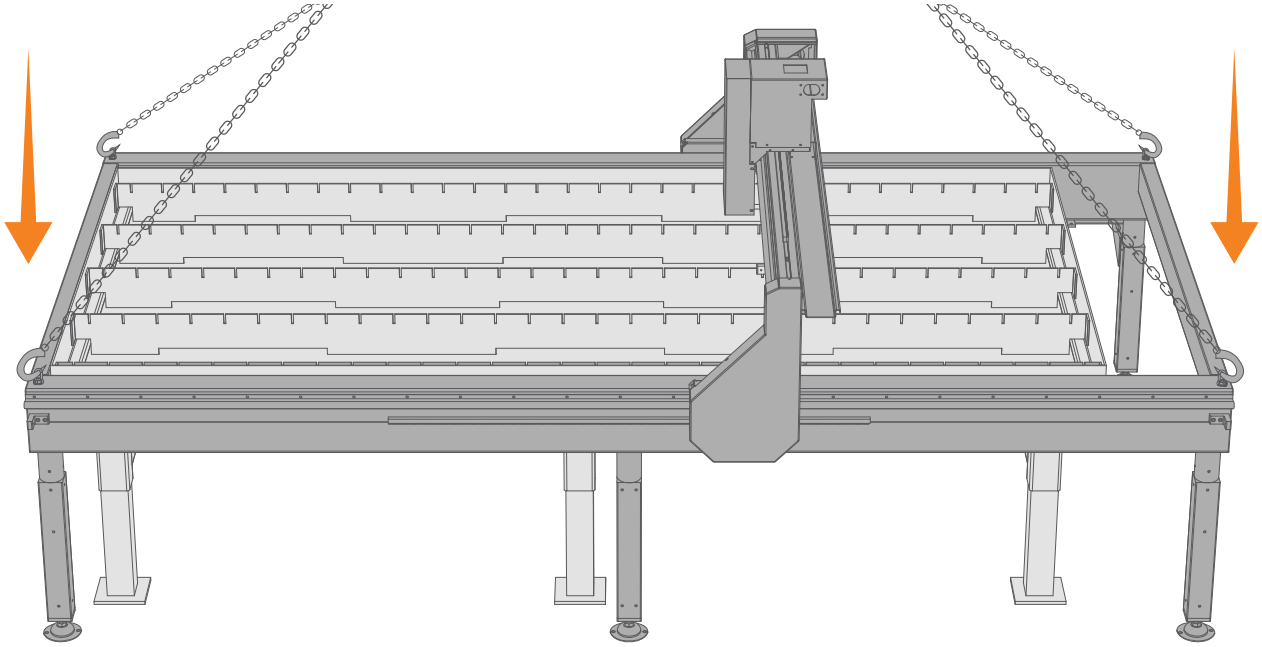


2. Move the gantry frame so that it sits around the water bed.

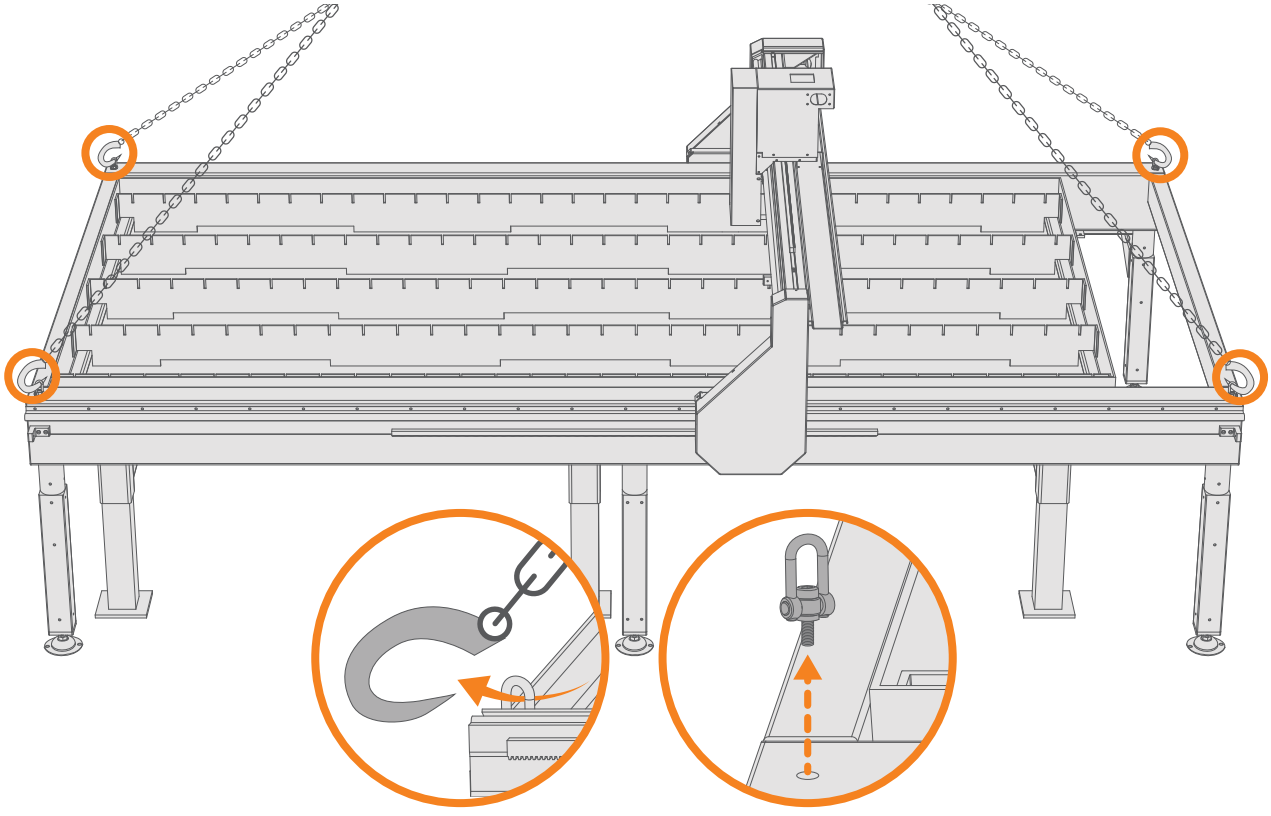


The gantry frame is longer than the water bed. This additional space allows the torch to be moved out of the way when sheets are loaded onto the table. The torch mount faces the front of the gantry (legs A and B), so the excess space should be placed at the back of the water bed.

3. Place the gantry frame down safely.

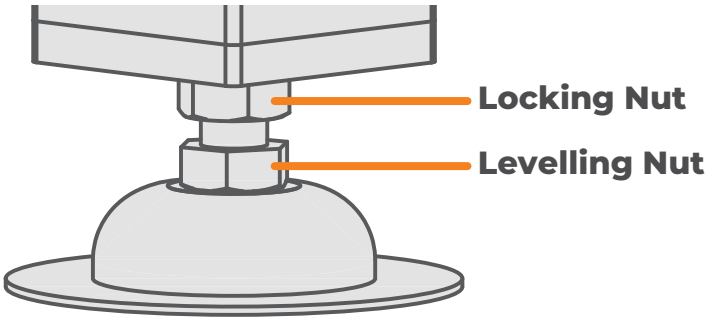


4. The anchor points can now be unscrewed and stored.



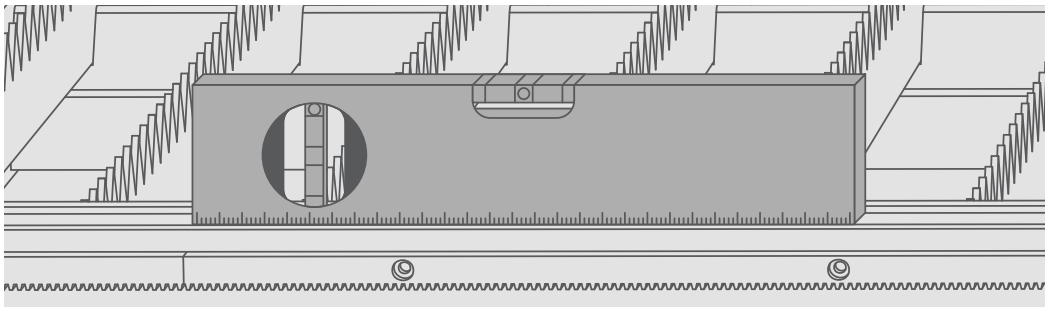
7.7 Levelling the Gantry Frame

The gantry frame should sit approximately 10-15mm below the water bed. This protects the frame from any potential damage that could be caused when loading material onto the water bed.

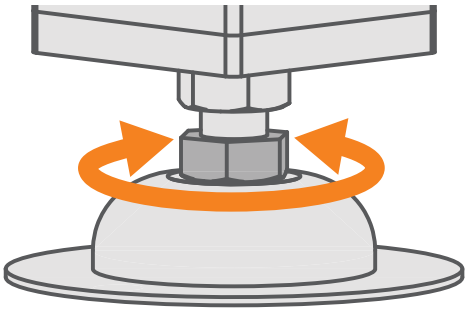


7.7.1 To Level the Table

1. Place a levelling tool on the table to determine its level.

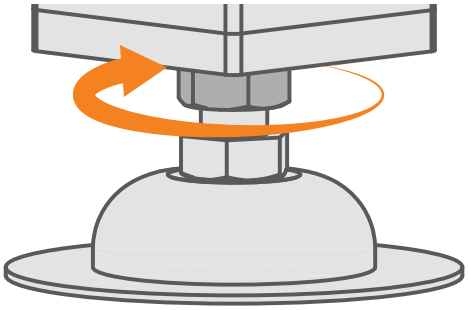


2. Raise or lower the feet as needed using the lower levelling nut on the feet.



7.7.2 To Lock the Feet

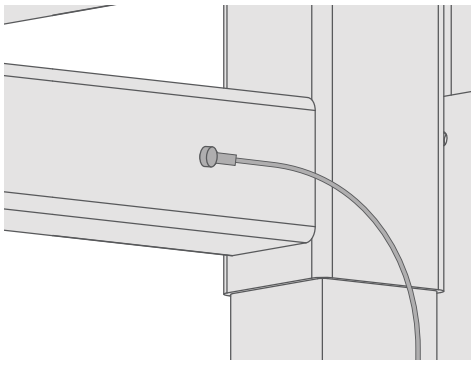
1. Twist the upper locking nut to lock the feet in place



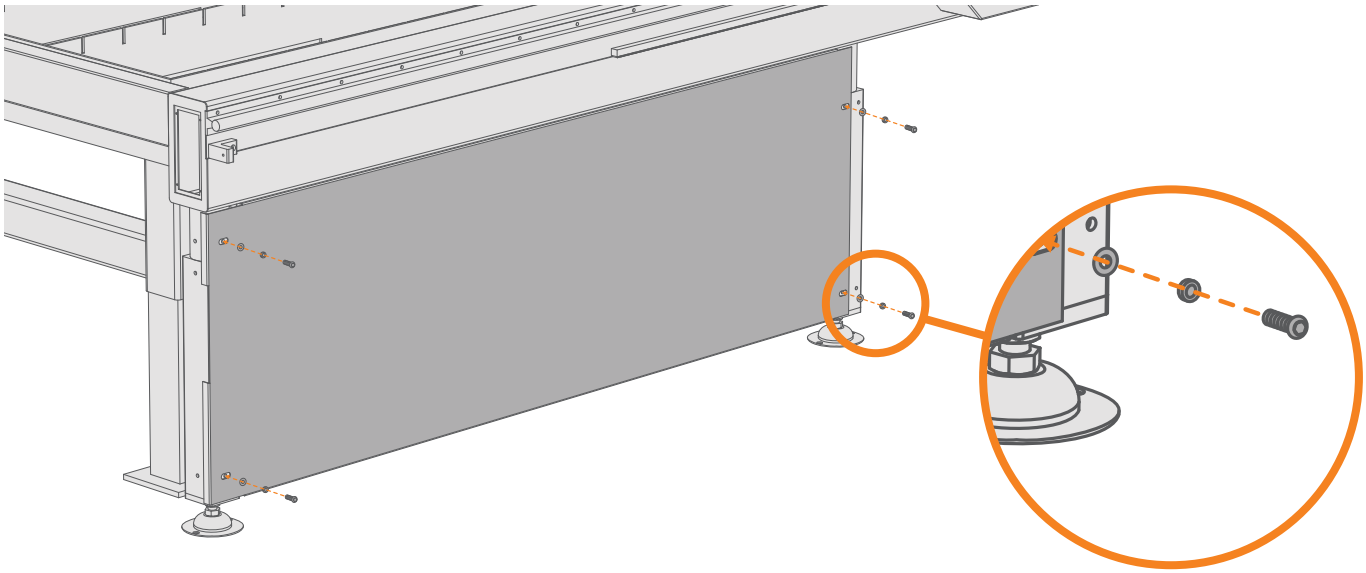
Both the levelling and locking nuts are 22mm in size.

7.8 Installing the Side Panels

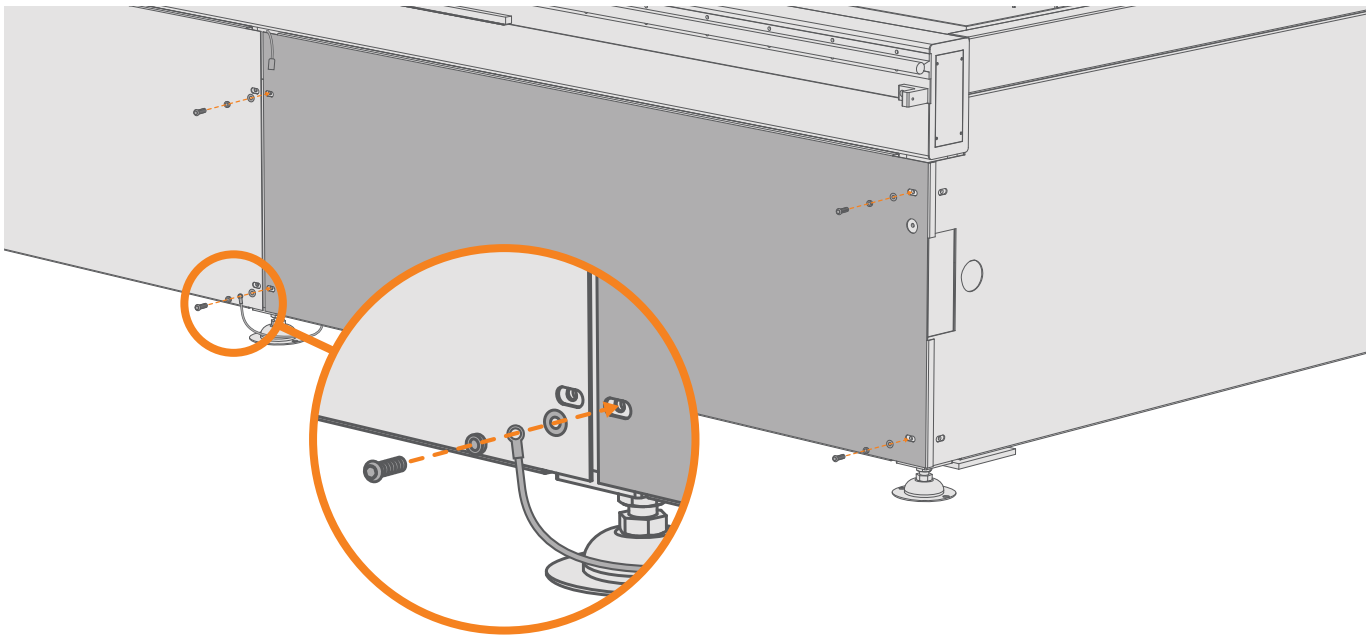
There is a grounding wire that comes attached to the bottom of the water bed. The zip tie holding this in place can be cut, and the wire pulled out so that it is accessible while the side panels are installed.



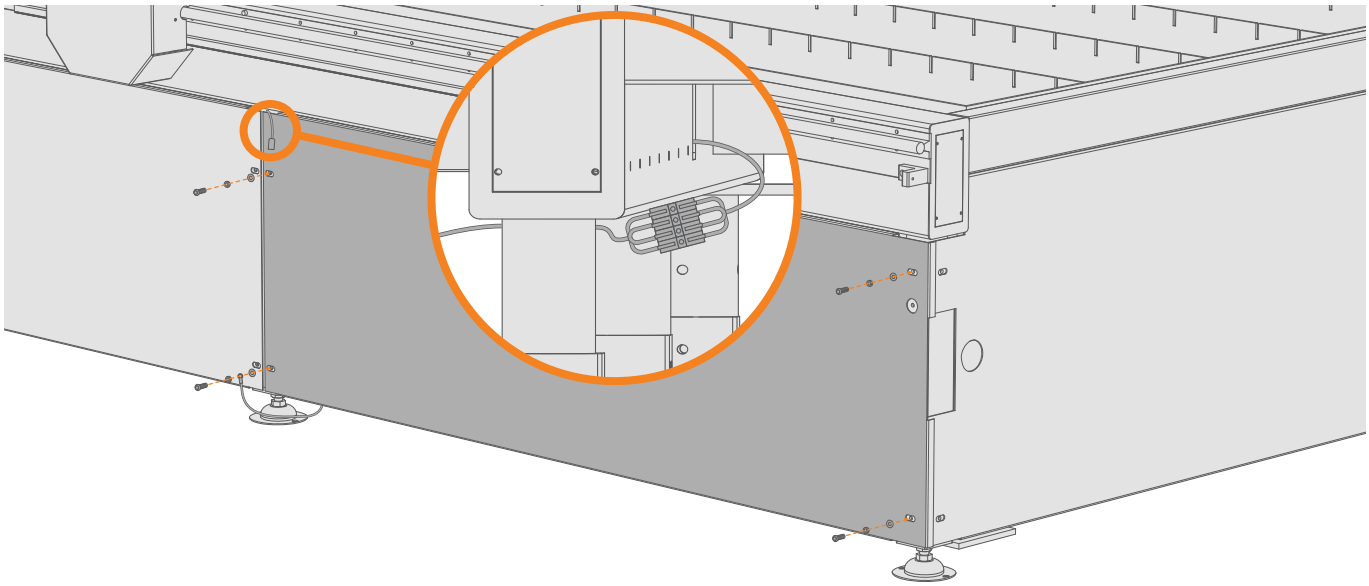
1. The side panels and the sides of the gantry frame are labelled (1-6), match the corresponding panels to the correct position on the gantry frame.
2. Each side panel requires four screws, and each screw requires a washer and spring washer.



3. When installing panels 5 or 6, make sure to connect the grounding wire to one of the bottom screws that hold the panel in place.

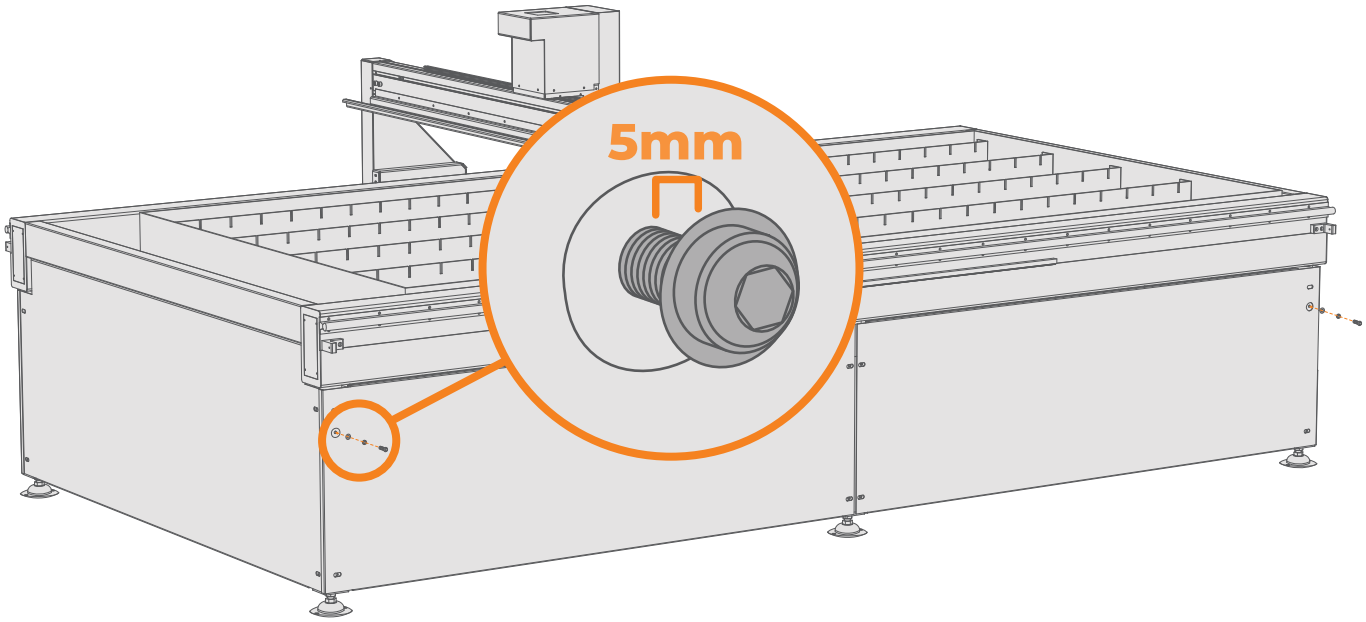


4. When installing panels 5 and 6, pull the limit switch connection port wire under the gantry frame and then over the top edge of the panels. This will need to be accessed later.

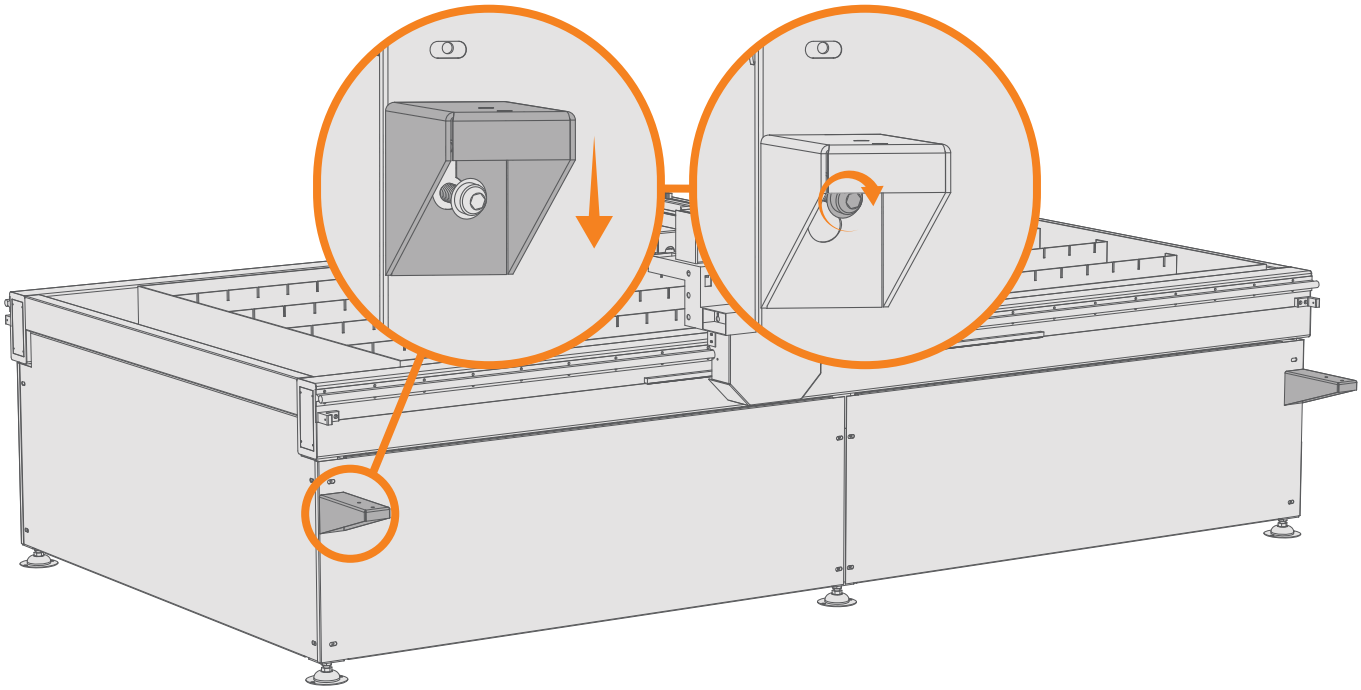


7.9 Installing the Drag Chain Raceway

1. Place a spring washer and flat washer onto the longer screws for the bracket and screw these three-quarters of the way into the gantry frame (on legs A and E). Leave about a 5mm gap between the screw and the gantry frame.

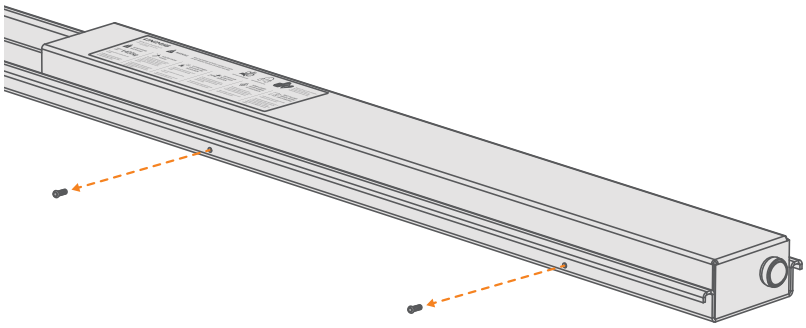


2. Slot the hole in the drag chain raceway bracket over the screw and then tighten the screw to hold the bracket in place. Repeat for both brackets.

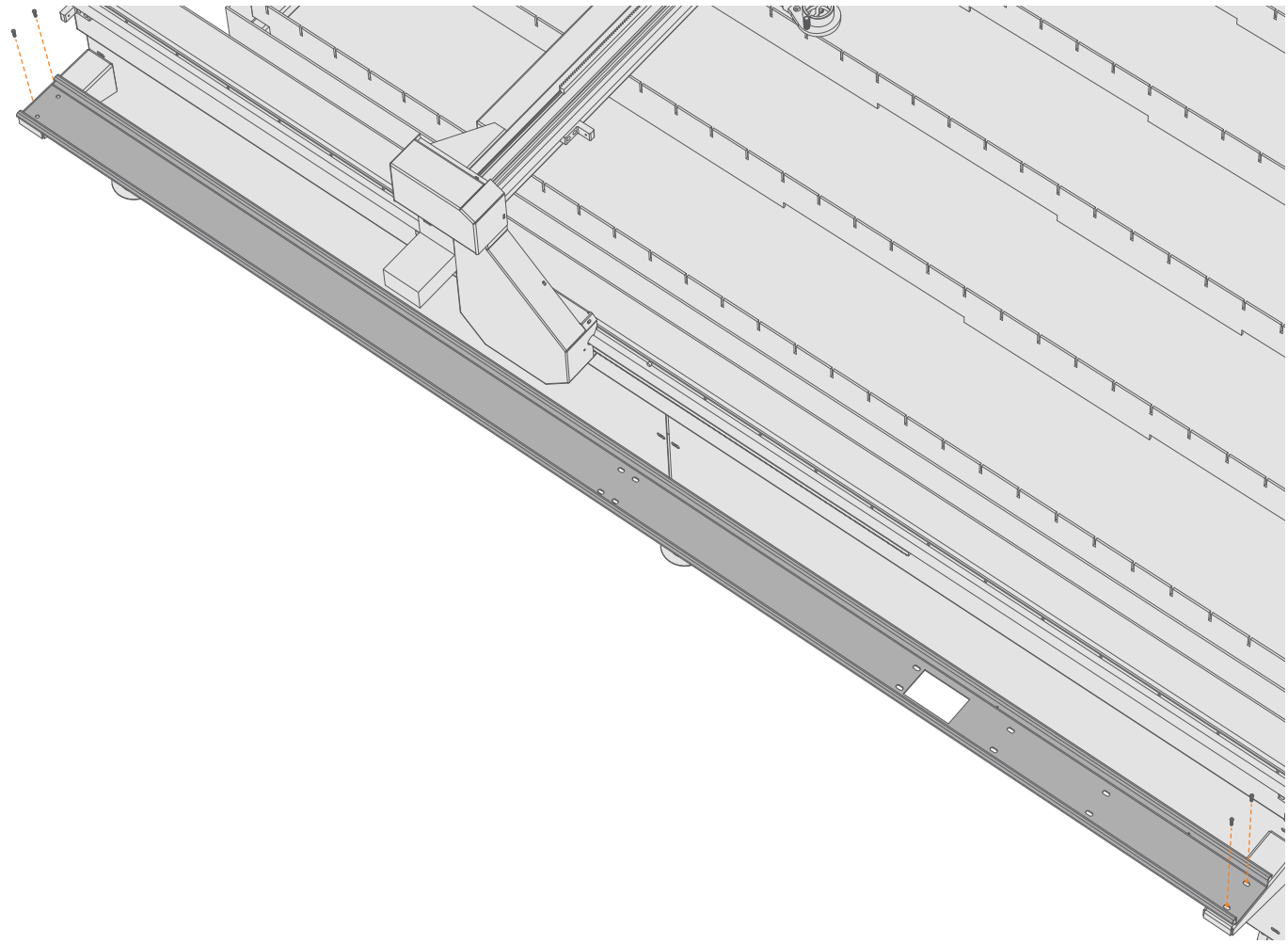


Do not tighten the bracket screws all the way, as adjustment may be needed to level the raceway once it's placed on top.

3. Cut the zip tie holding the drag chain to unfurl it. Move the drag chain out of the way with the cabling towards the back of the table.
4. Remove the cover with the warning label and power button from the end of the drag chain raceway.



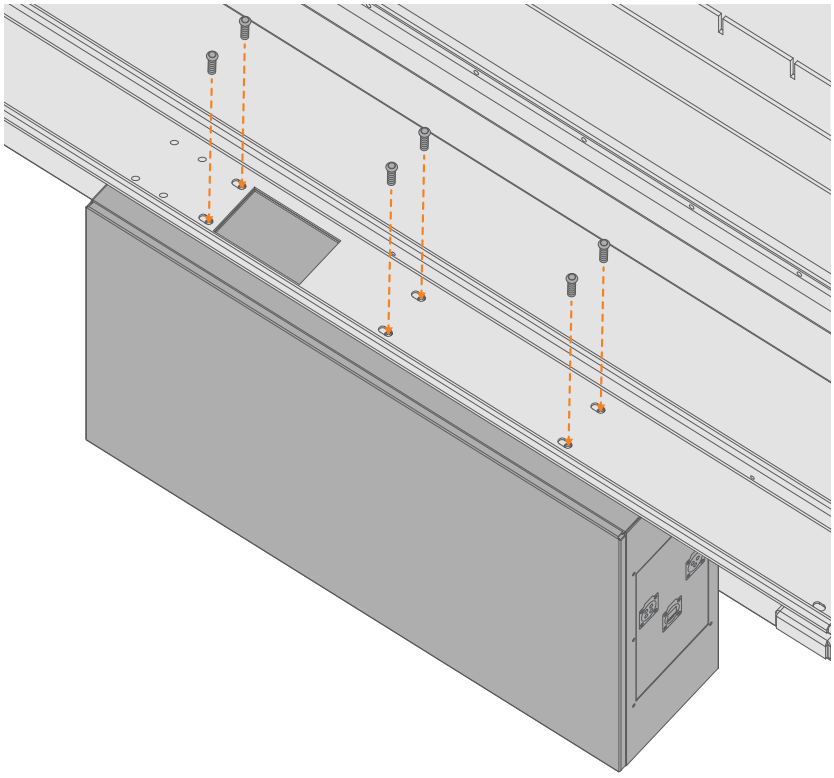
5. Set the drag chain raceway on top of the brackets so that the mounting points of the control box and drag chain are at the front of the table.
6. Screw the raceway in place loosely. Some adjustment may be needed to ensure it's straight and level.
7. Once straight and level, tighten the screws on the drag chain raceway and the brackets to finish installing the drag chain raceway.



7.10 Installing the Electrical Cabinet

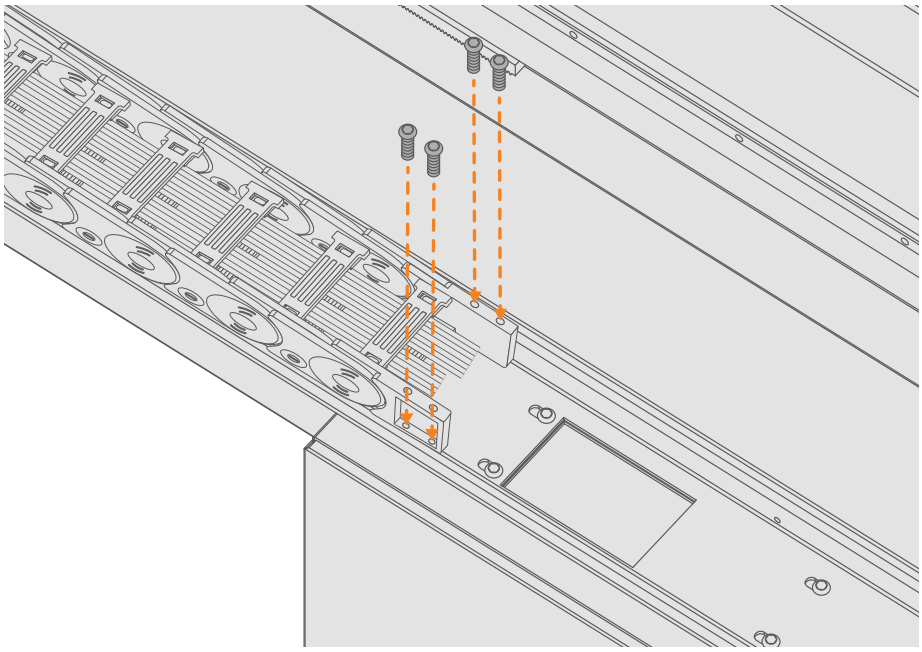
1. With the electrical cabinet facing forward (the ethernet port should be on the front), screw the cabinet onto the drag chain raceway.

The square access port in the electrical cabinet should line up with the square hole in the raceway.

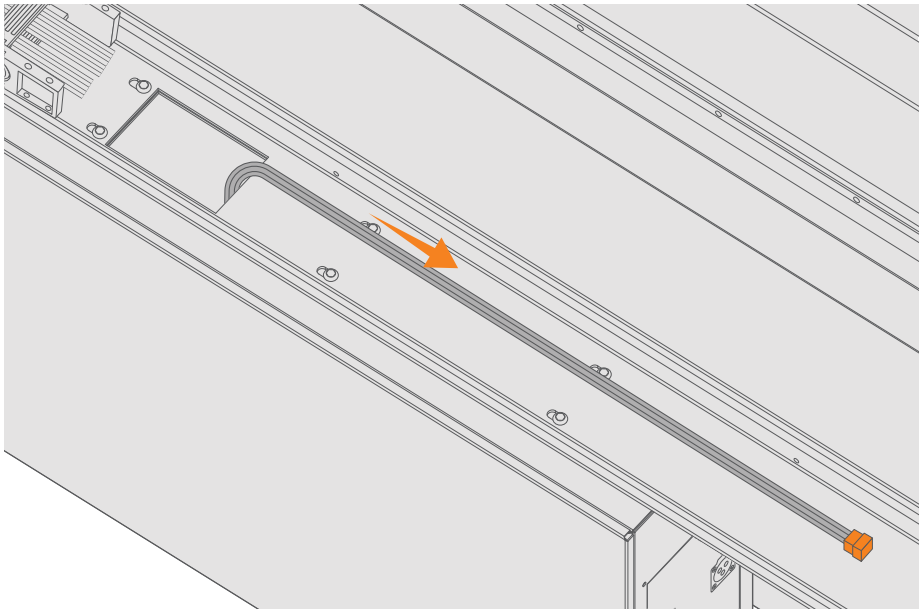


7.11 Installing the Drag Chain

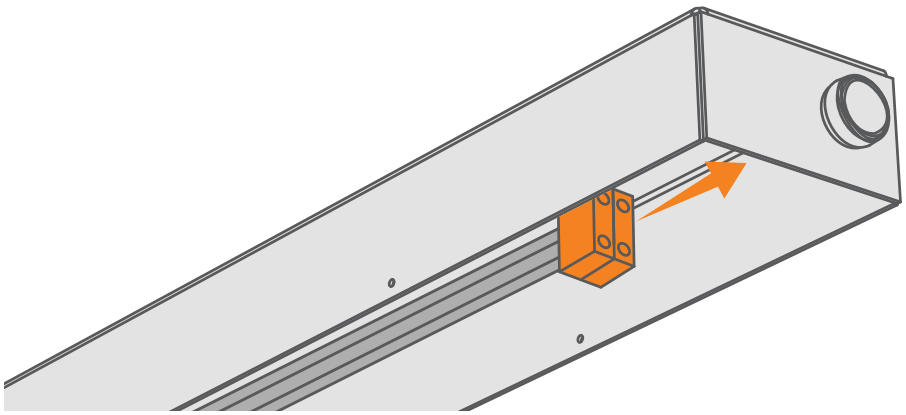
1. Carefully move the drag chain to sit it in the raceway. The end should sit just before the square hole. Screw it into place.



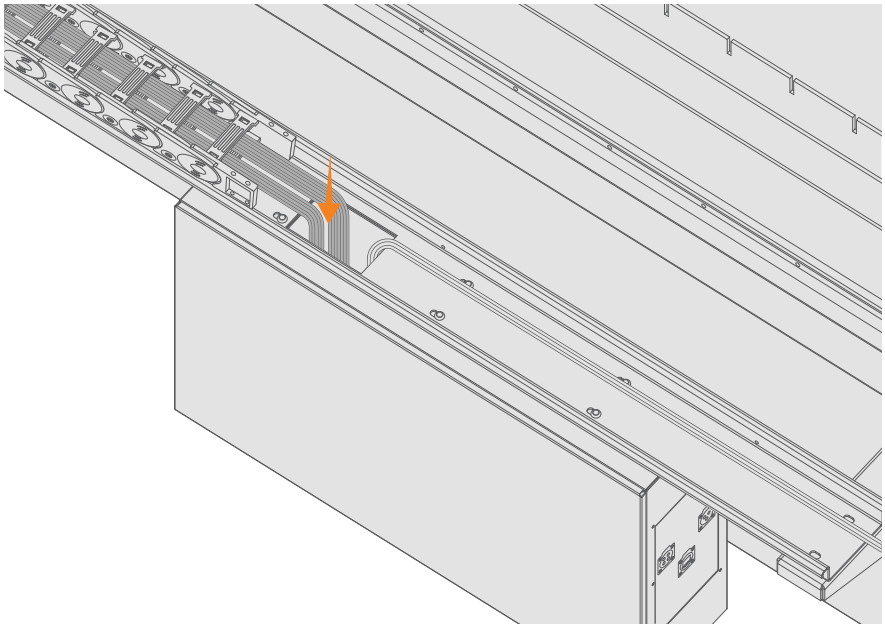
2. Open the electrical cabinet and feed the orange power plug through the square hole.



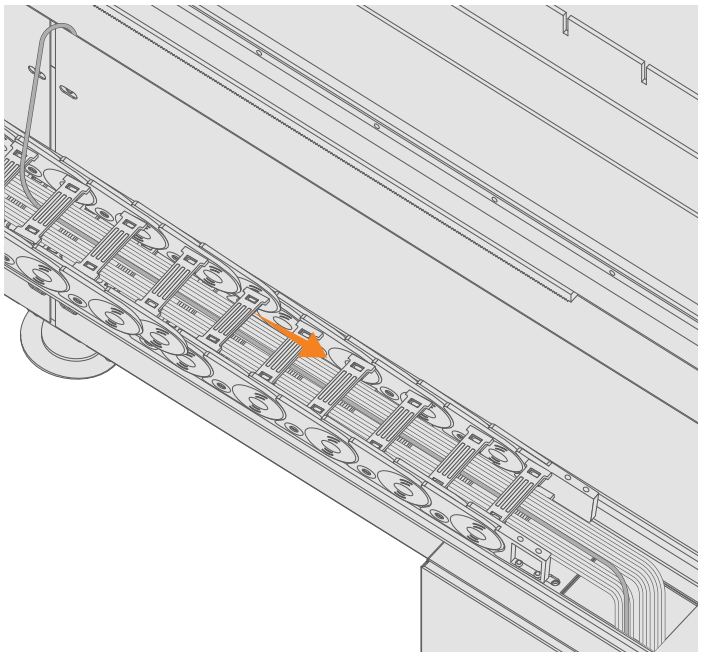
3. Plug it into the back of the power button on the cover that was removed from the raceway.



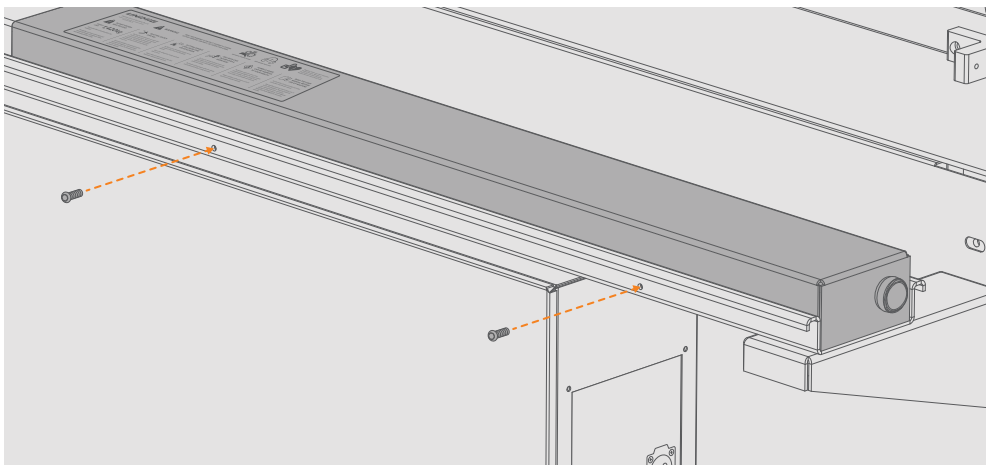
4. Feed the cables from the drag train into the electrical cabinet through the square hole.



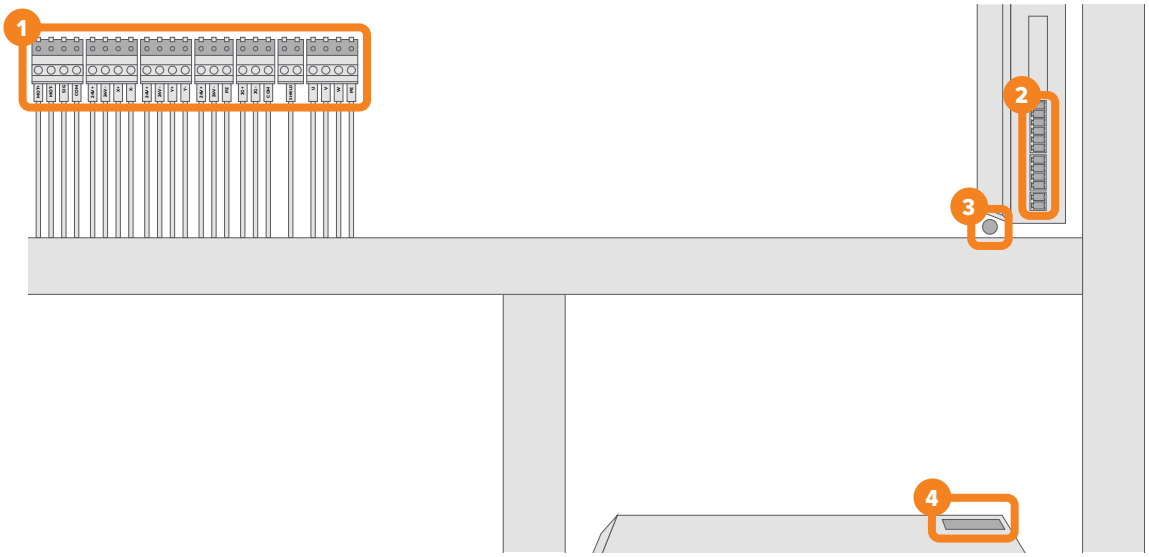
5. Feed the limit switch connection port wire from the side panel into the drag chain and through to the electrical cabinet.



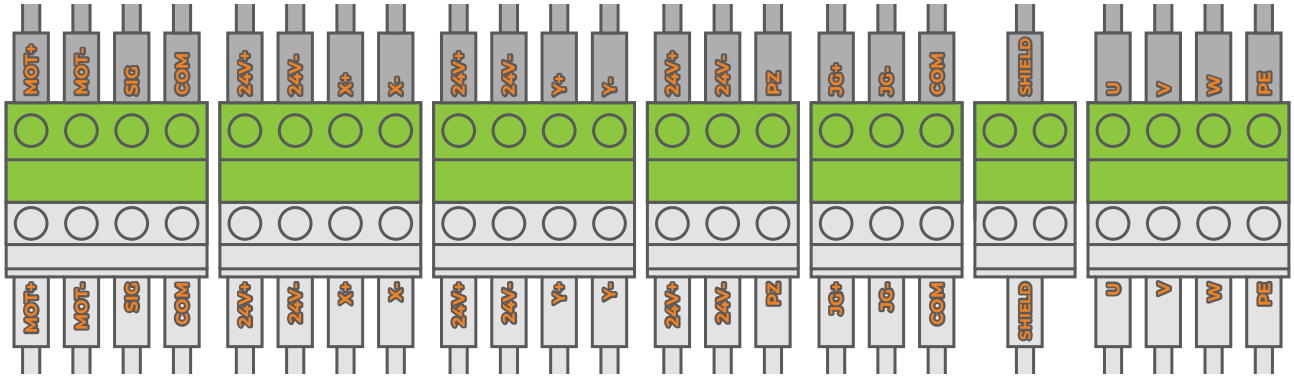
6. Screw the drag chain raceway cover back into place.



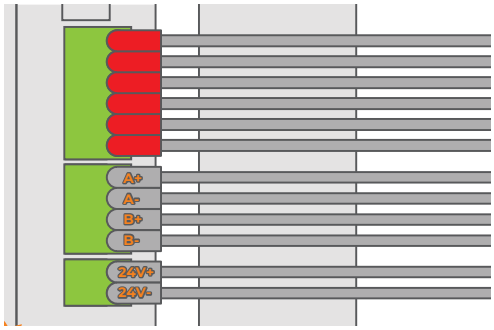
7.12 Connecting the Cables



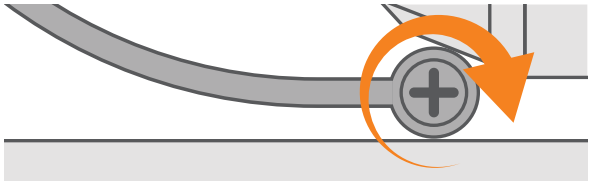
1. Plug in the torch connection cables along the top row of the connection ports on the left side. Match the labels on the wires to the plugs below.



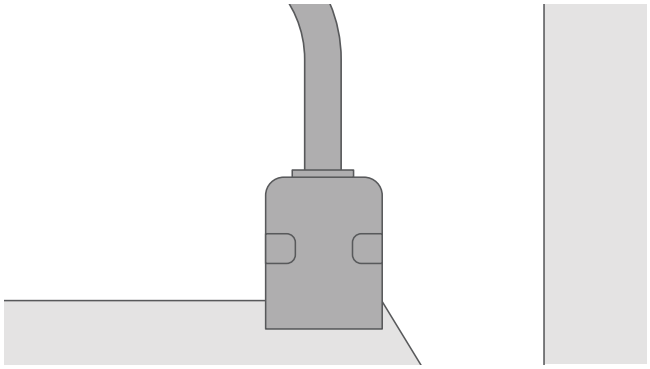
2. On the stepper drive board, plug in the set of red wires to the 'Feedback' port, the A/B cables into the 'Motor' port and the single 24V cable to the 'VDC' port. Match the labels on the wires to the labels on the board. The 'Signal' plugs should already be connected.



3. Screw in the ground wire that is attached to the set of red wires underneath the stepper drive box.

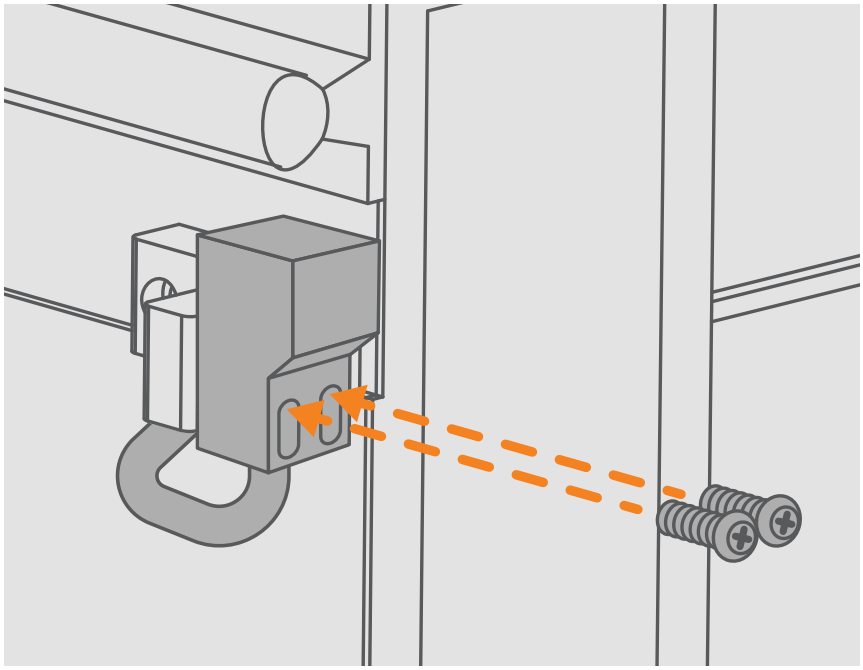


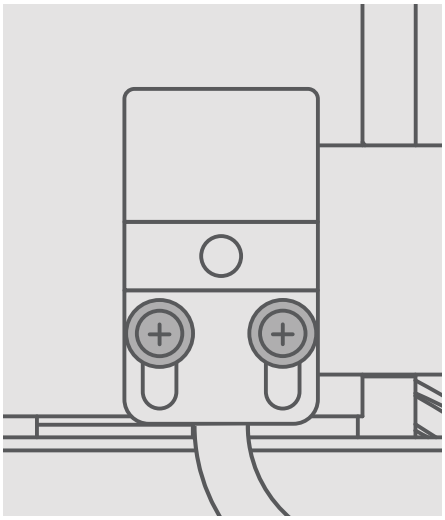
4. Plug the limit switch connection port wire into the top of the white cooling box at the bottom of the cabinet.



7.13 Installing the Limit Switches

1. Remove the limit switch and screws from the bag and screw the switch onto the back of the stopper bracket.





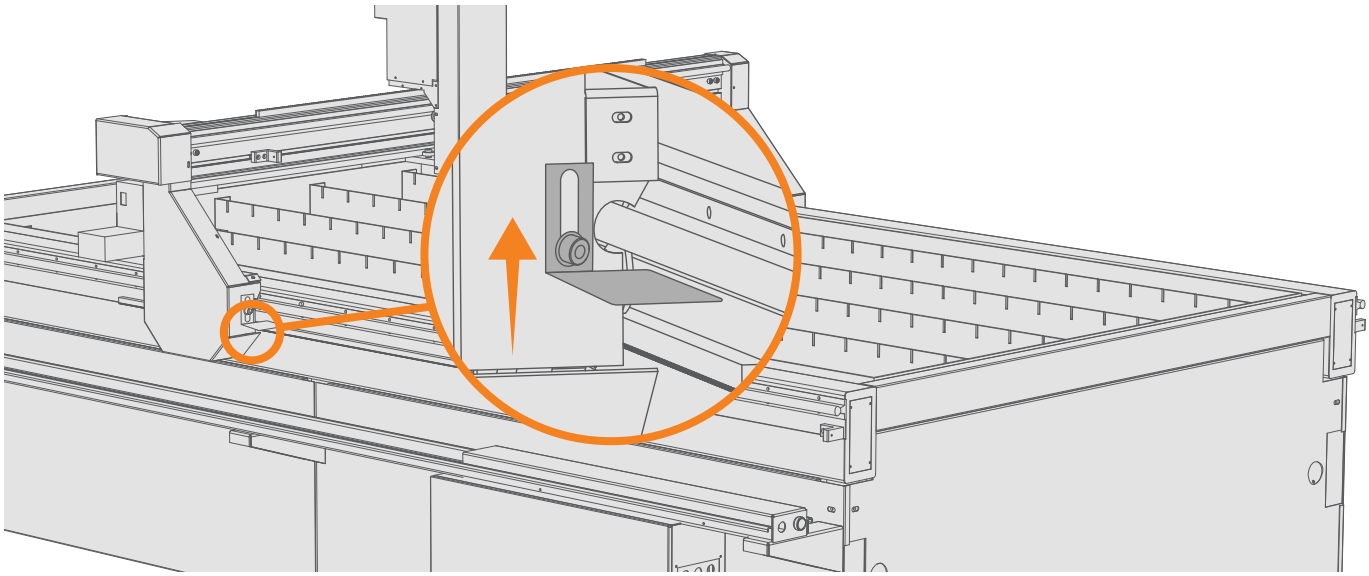
When installing the limit switches, make sure they sit as low as possible on the bracket, with the screws placed at the top of the hole.

2. Repeat on both the front and back limit switches.

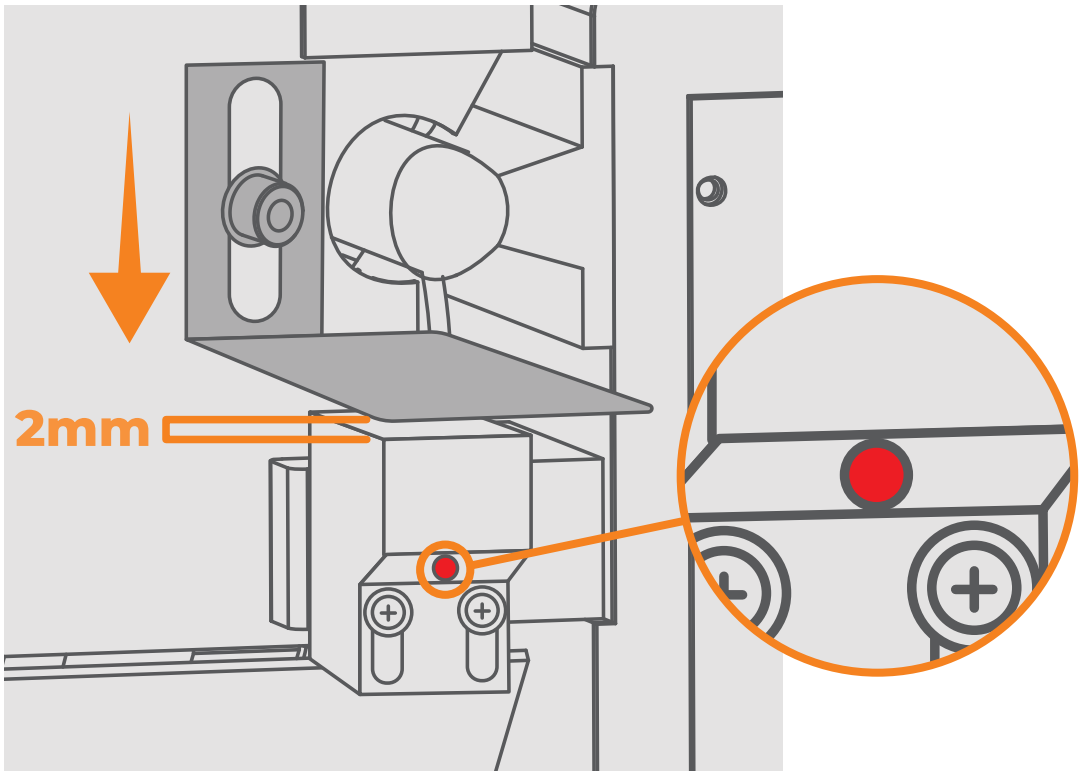
7.13.1 Calibrating the Limit Switches

Once installed, the limit switches must be calibrated to ensure they function properly and stop gantry collisions. The CNC table needs to be powered on to calibrate the limit switches.

1. Adjust the limit switch plate to the highest position.



2. Manually move the gantry so that the plate sits slightly over the limit switch, leaving 40mm from the rubber stop.
3. With the table powered on, slowly adjust the limit switch plate downwards until the red LED light on the limit switch turns on. The limit switch plate should be approximately 2mm above the limit switch.

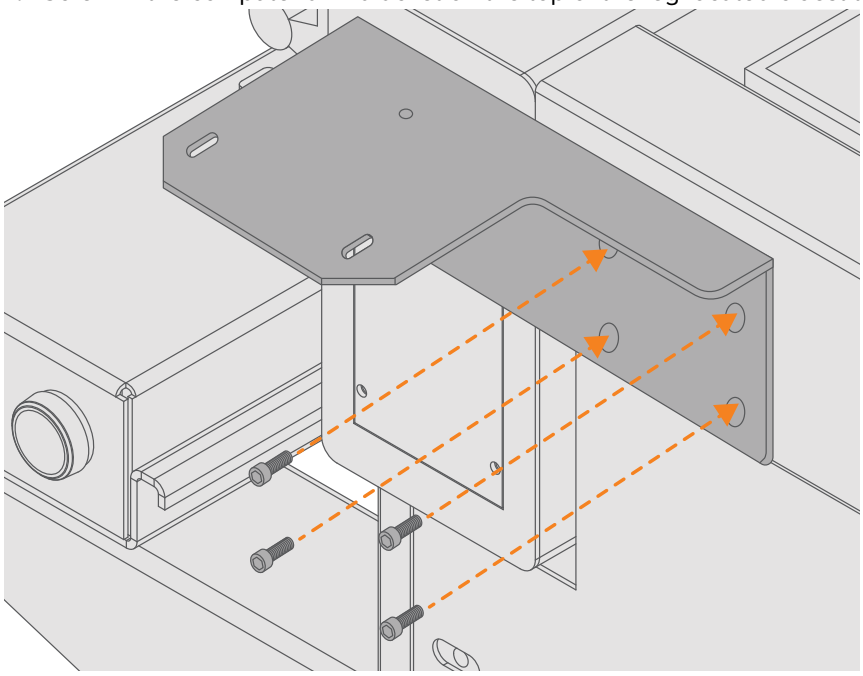


4. Repeat for both limit switch plates.

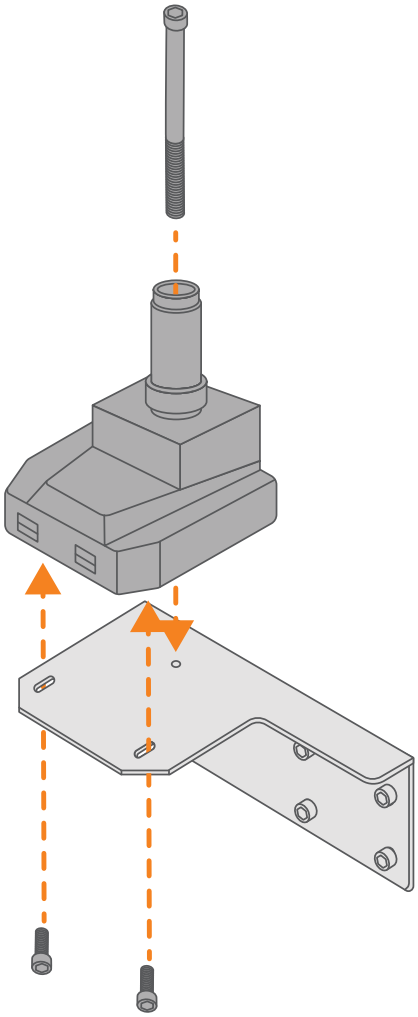
7.14 Installing the Computer Arm & Control PC

Installing the Computer Arm

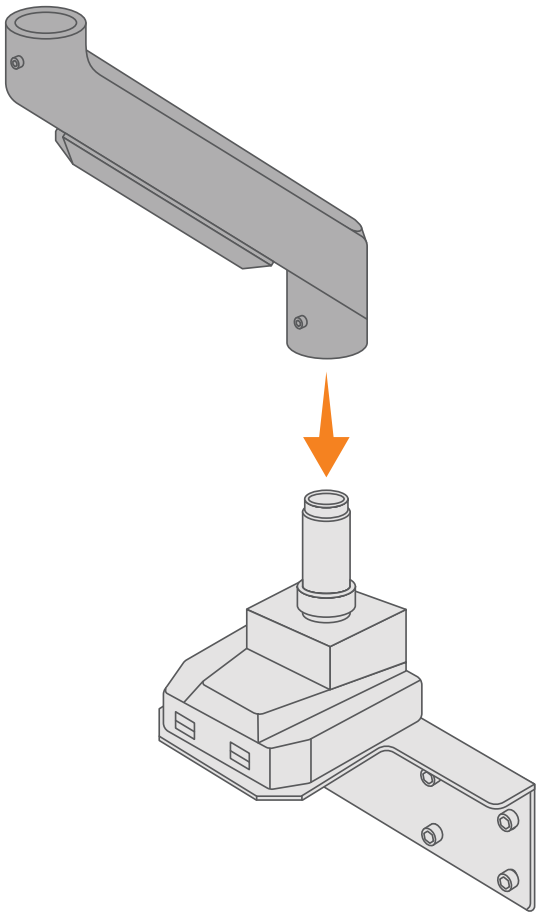
1. Screw in the computer arm bracket on the top of the leg located cloest to the power button.



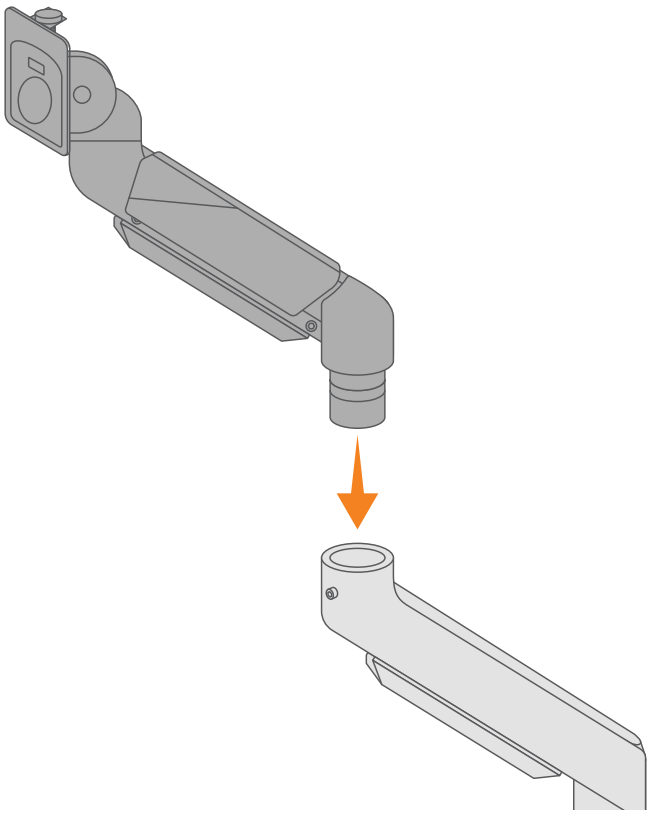
2. Place the base plate of the arm on the bracket and screw it in using the long hex screw inside the centre piece.



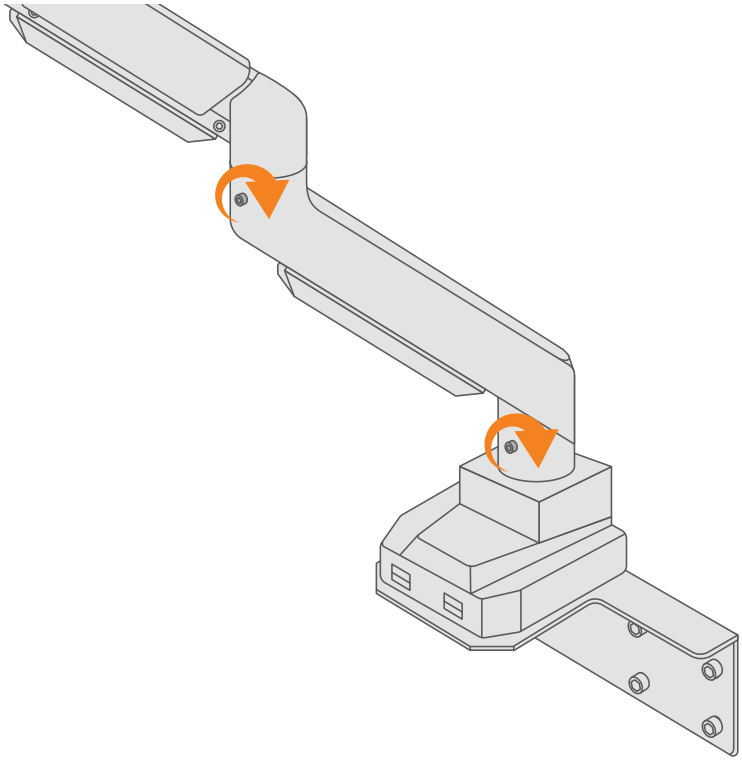
3. Take the lower arm segment (with the open ends) and place it onto the base plate so that the cable openings face downwards.



4. Take the upper arm segment and place it onto the lower arm.

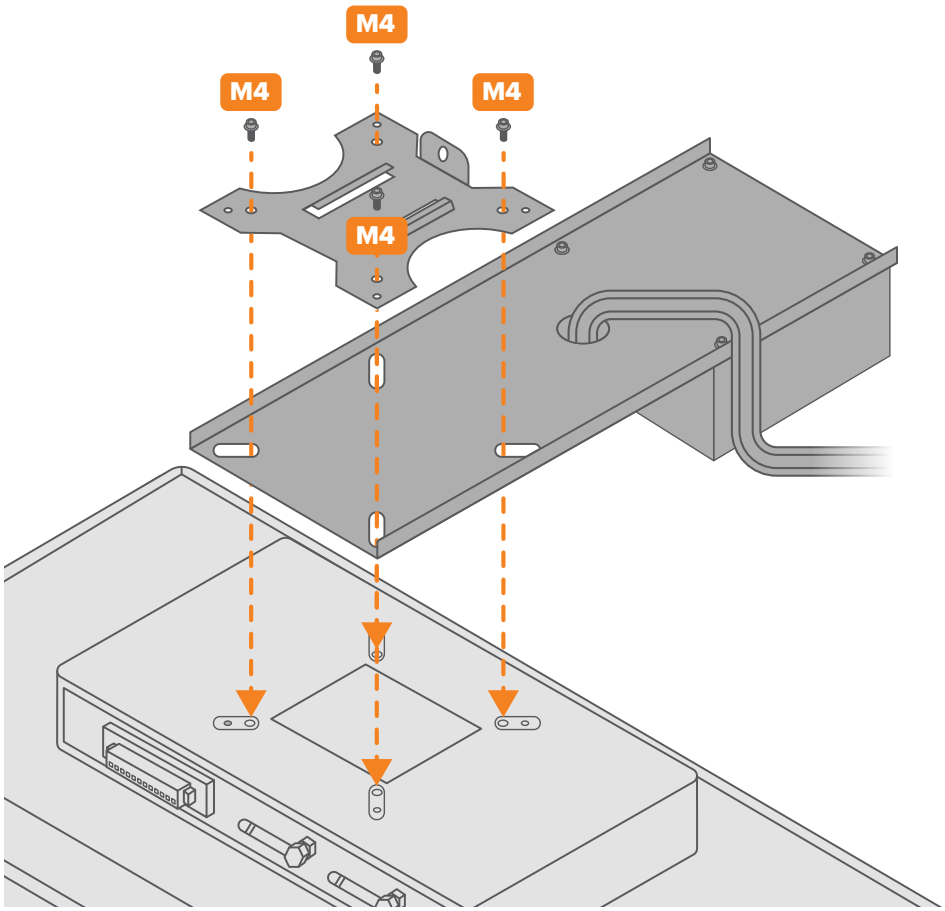


5. Tighten the two screws in the lower arm to ensure the arm is properly installed and tight.

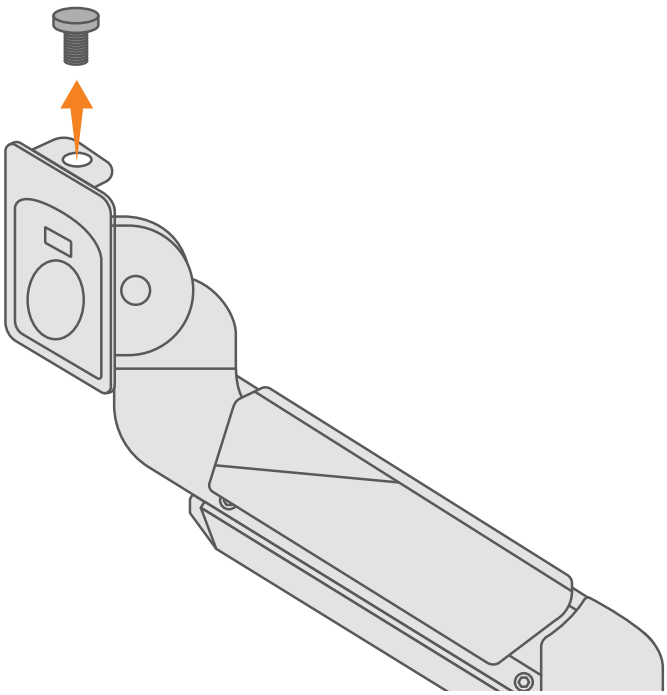


Installing the Control PC

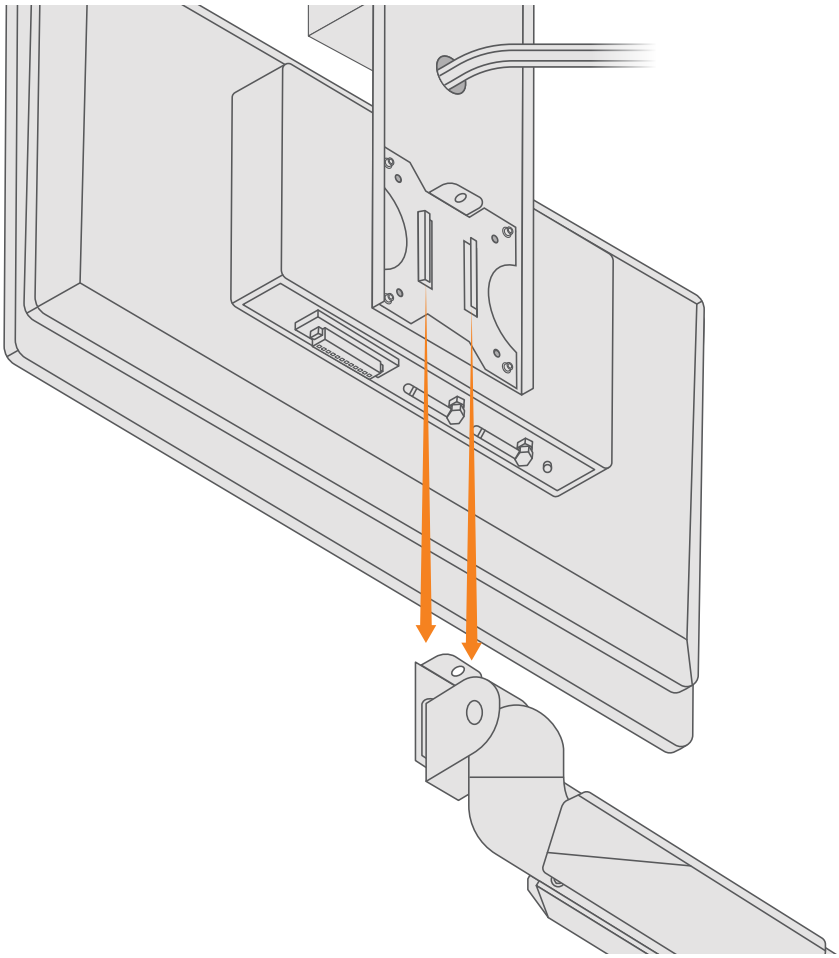
1. Lay the Control PC face down and place the Emergency Stop (E-Stop) plate on the back of the PC, so that the four holes line up. The E-Stop button should be situated at the top of the PC, facing the same direction as the screen.
2. With the E-Stop plate on the Control PC, take the X shaped PC mounting bracket and line it up with the E-Stop and Control PC. The L brackets should sit vertically, parallel with the E-Stop plate.
3. Screw the X mounting bracket and E-Stop plate into the back of the Control PC using the M4 hex screws.



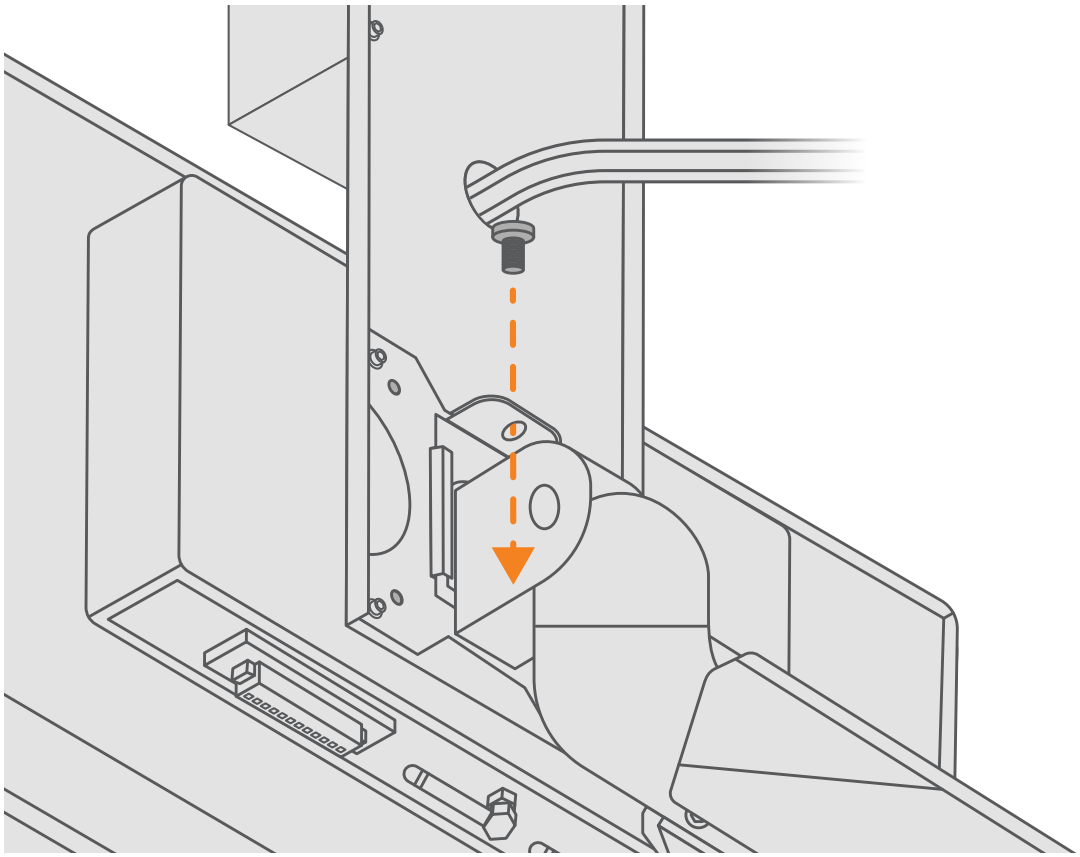
4. Remove the small nut from the top of the upper arm mounting point.



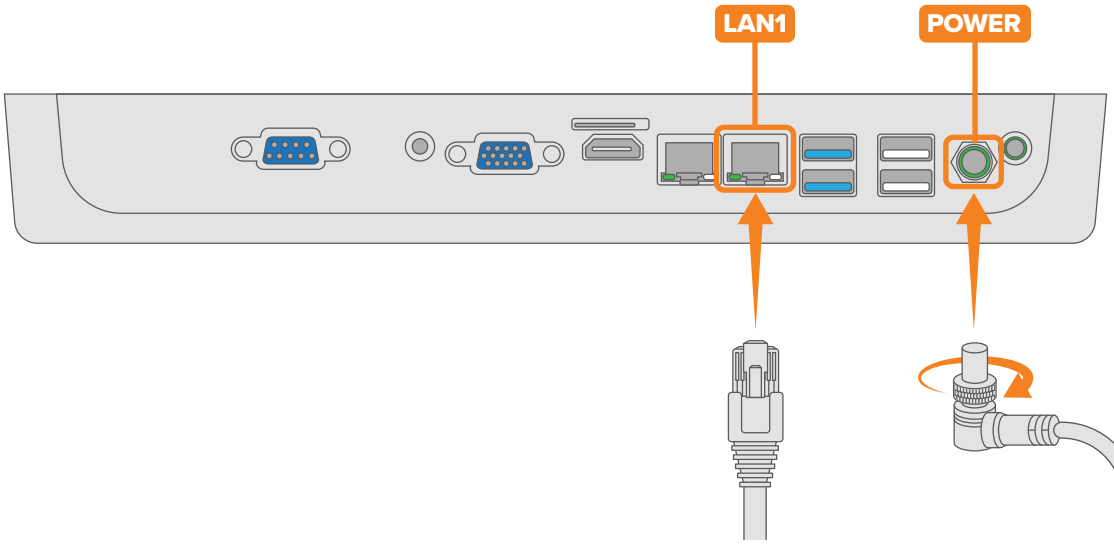
5. Lift the Control PC and slide it onto the mounting point on the upper arm, so the L brackets slide over the edges and the holes line up.



6. Screw the small nut back in to hold it in place.

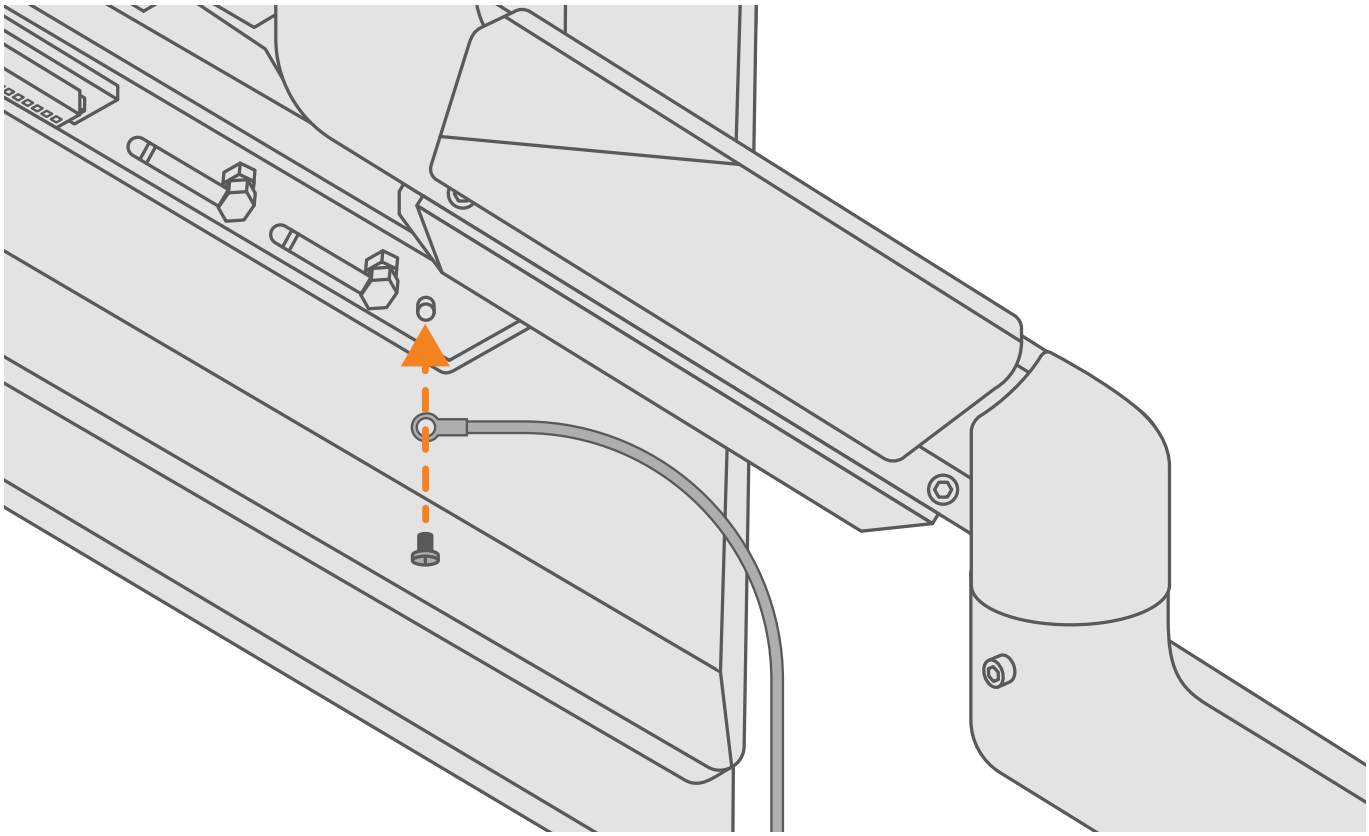


7. Plug the power cable into the Control PC, located on the top right side of the screen (facing the back of the PC), and fasten the screw to secure it.
8. Plug the ethernet cable into **LAN1** on the Control PC, located on the top right side of the screen (facing the back of the PC), above the power cable.

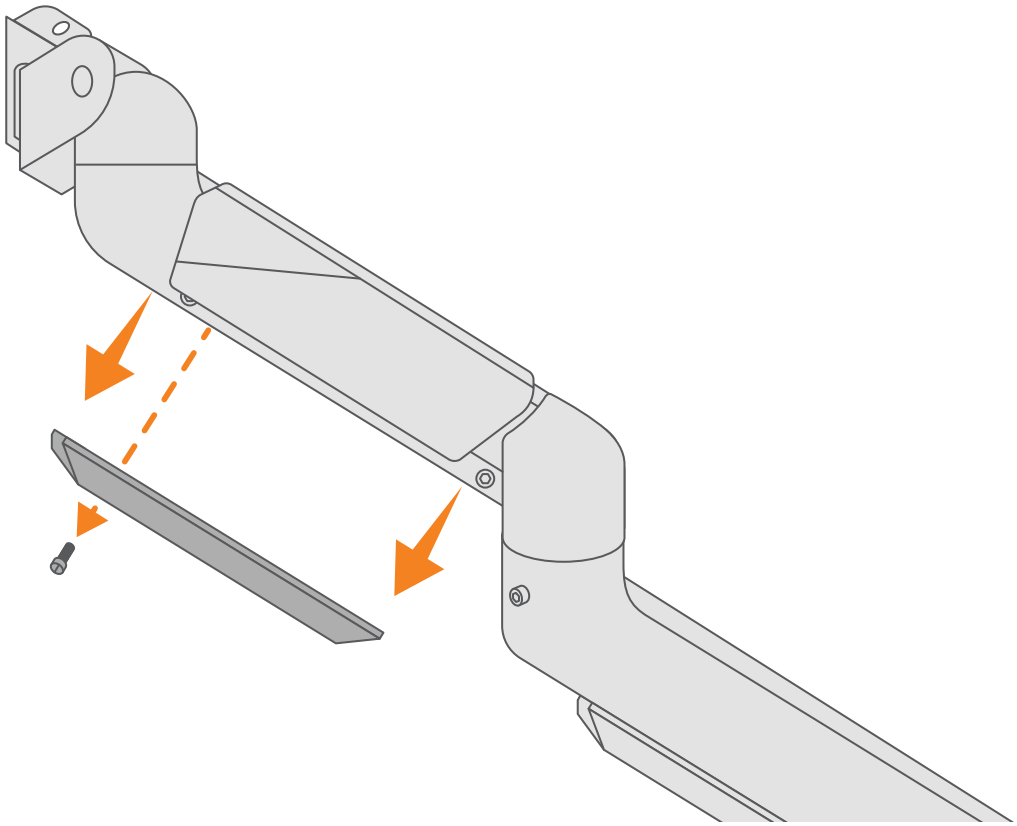


Plugging the ethernet cable into the LAN2 port will not work, the computer will not recognise it.

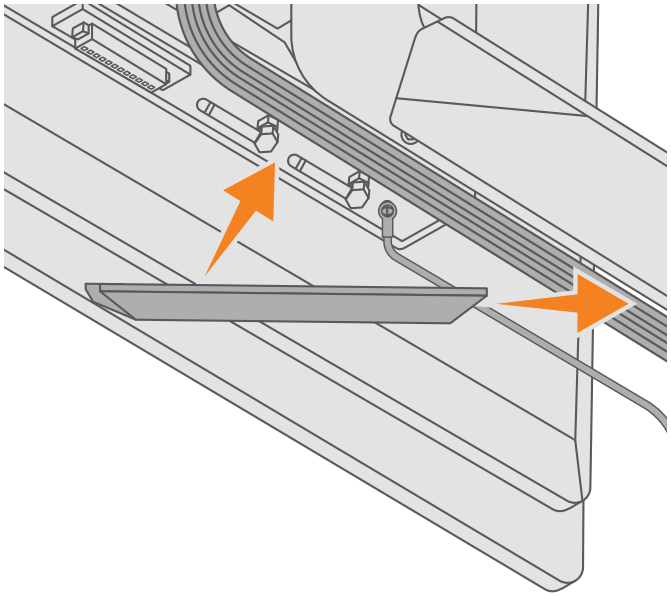
10. Screw the grounding cable into the grounding connection on the bottom right side of the screen (facing the back of the PC).

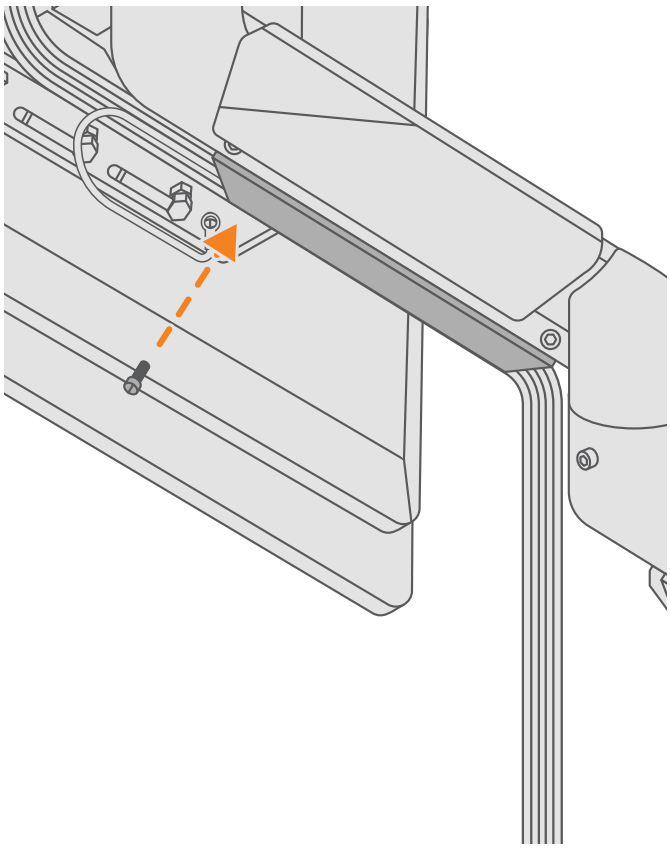


11. Undo the screw located on the upper half of the cap using a flat head screwdriver to remove the upper arm cable management cap.

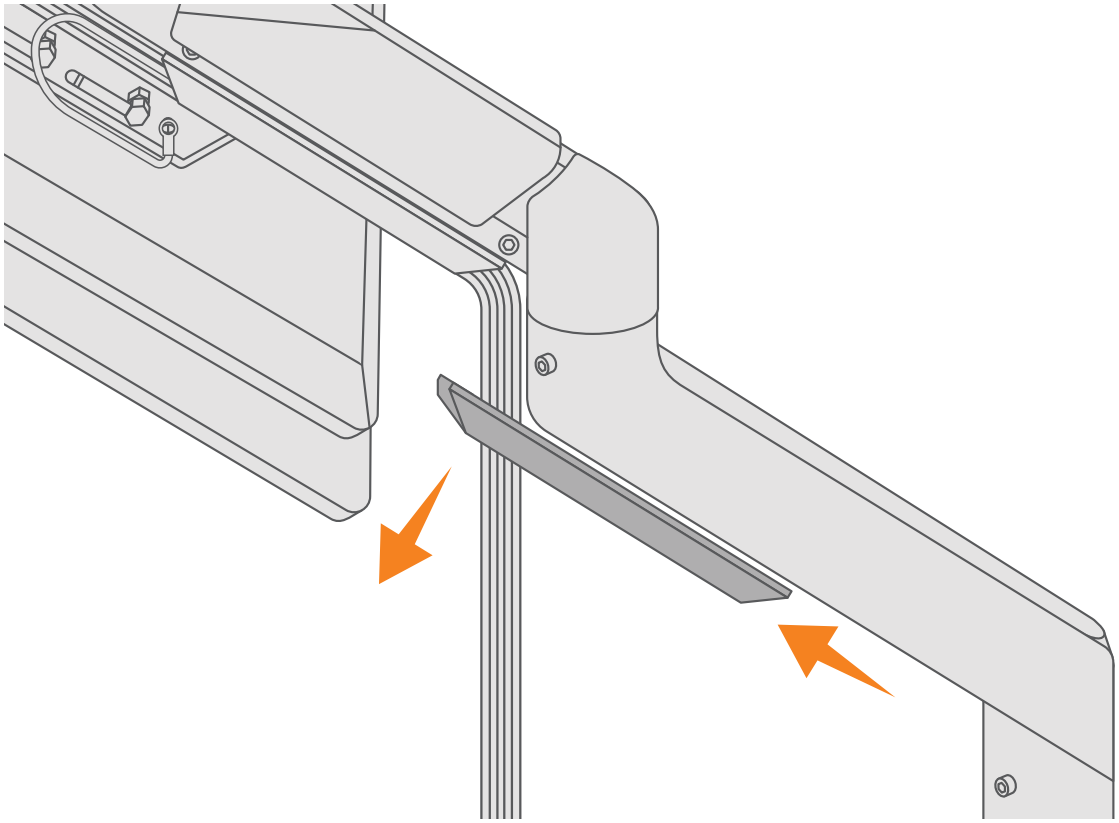


12. Hold the bundle of computer cables against the upper arm and replace the cap over the cables by lining up the bottom slots and locking it into place. Replace the screw in the upper part of the cap.

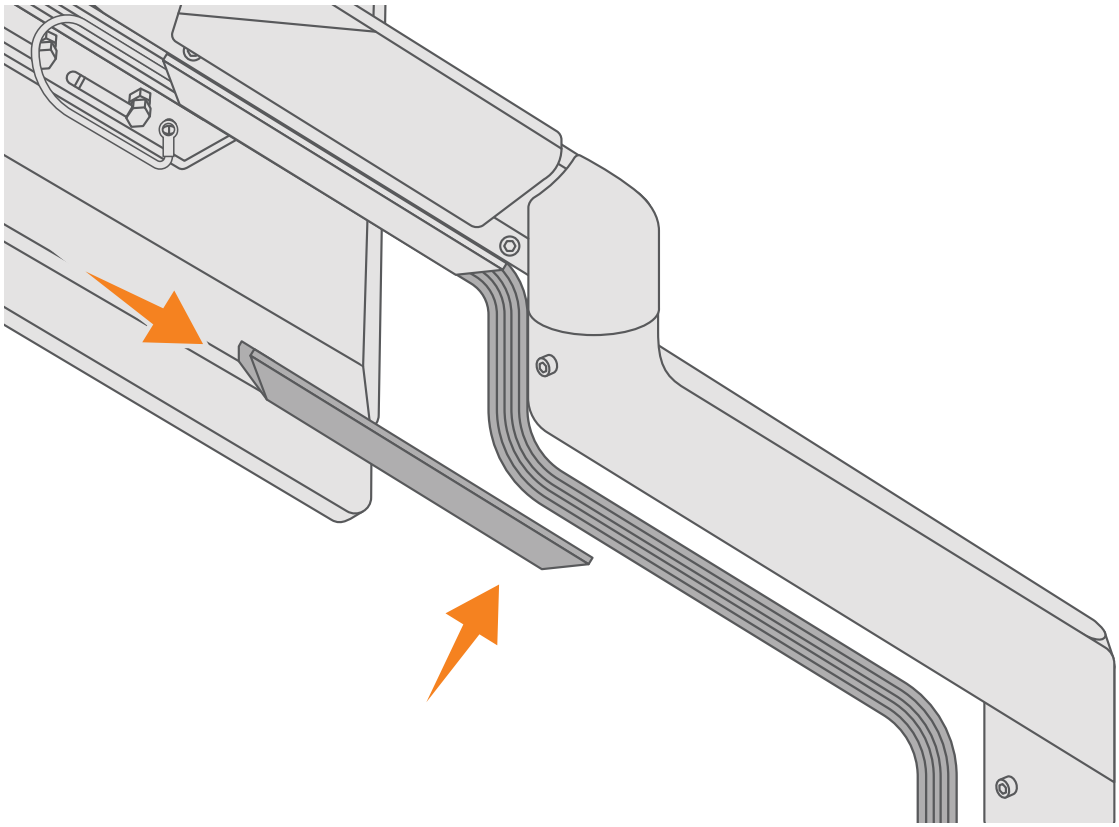




13. Remove the lower arm cable management cap by sliding it upwards and off.

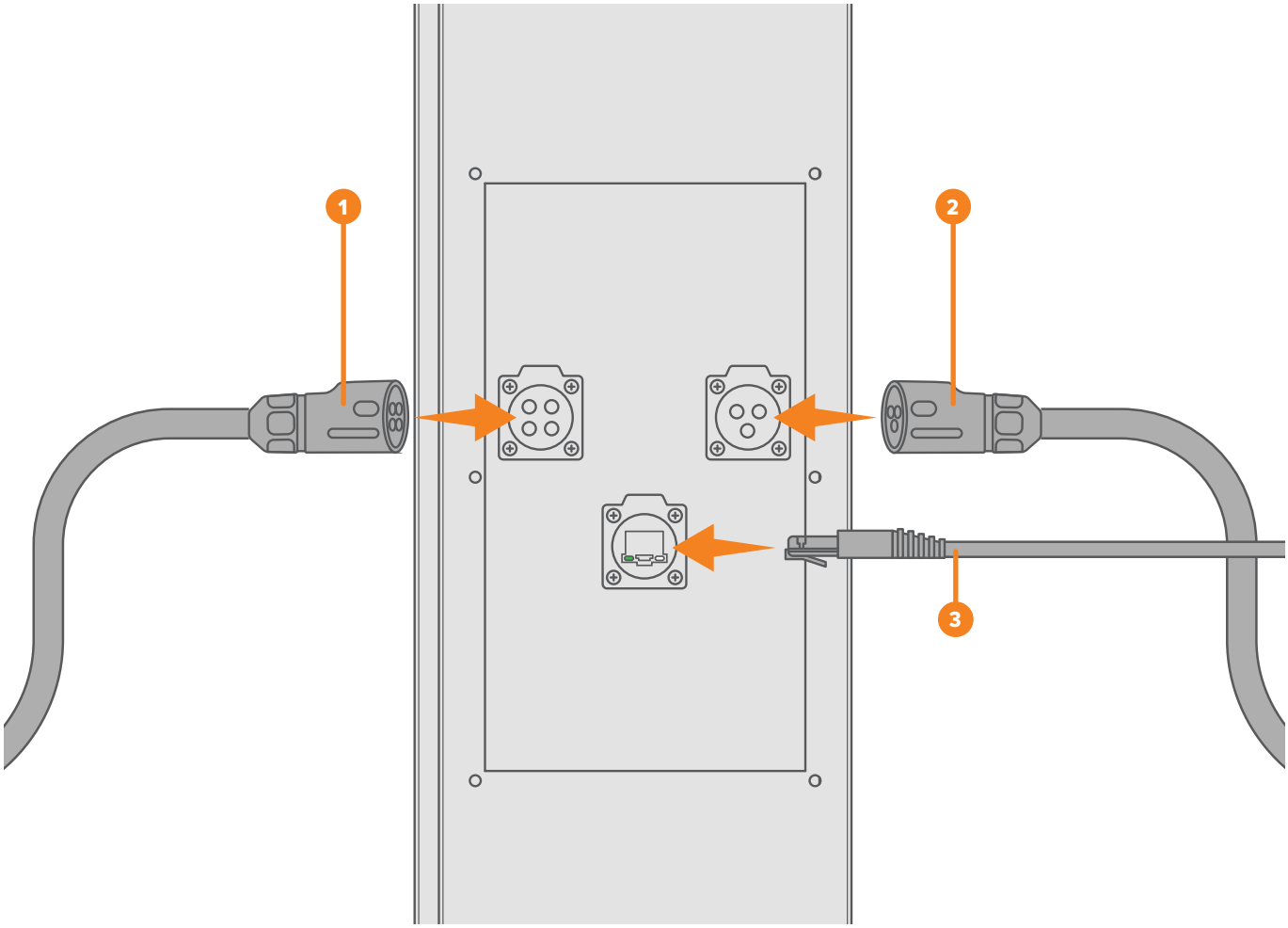


14. Hold the bundle of computer cables against the lower arm and replace the cap by sliding it back into place.



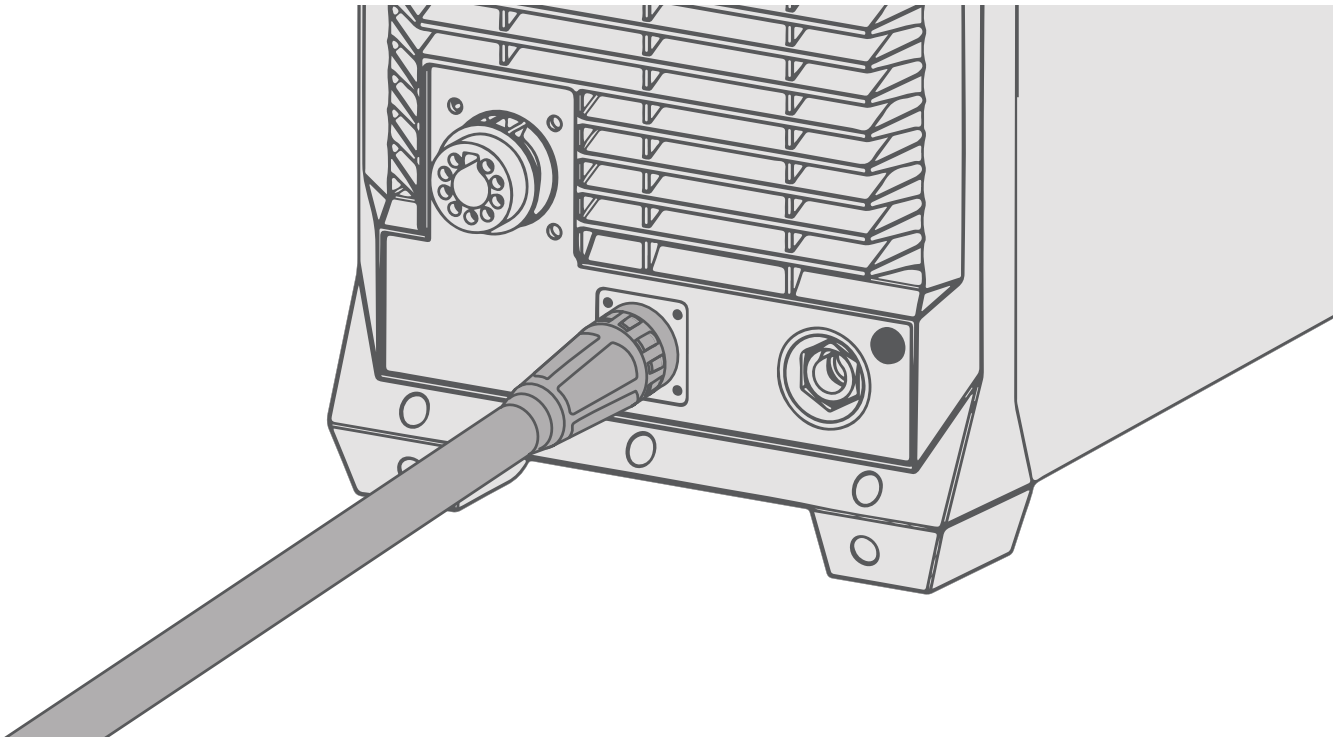
7.15 Connecting the Control PC to the Electrical Cabinet

1. Plug the 4-pin cable into the 4-pin connection on the front of the electrical cabinet.
2. Plug the 3-pin earth cable into the 3-pin connection on the front of the electrical cabinet.
3. Plug the ethernet cable into the ethernet port.



7.16 Connecting the Power Cable to the Electrical Cabinet

1. Plug the cable coming from the Arc Voltage Box into the CNC port on your plasma source.



7.17 Connecting the Plasma Cutter to the CNC Table

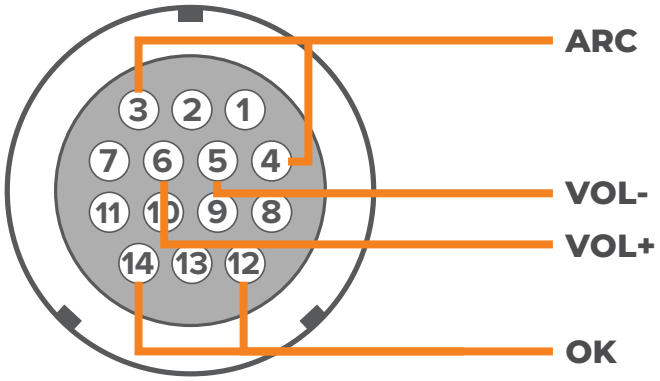
With the THC Divider installed, there should be a single remaining cable that connects to the Arc Voltage box.

This cable will need to be wired to suit the plasma cutter CNC connections being used with the STEALTH CNC table. To do this:

1. Connect the two ARC wires to the ON & OFF triggers pins on the CNC pinout.
2. Connect the VOL + & VOL - wires to the corresponding + and - torch height adjustment arc feedback pins on the CNC pinout.
3. Connect the two OK wires to the arc success signal pins on the CNC pinout.

For example, on the RAZOR CUT 45:

CNC Port Pinout (14 Pin)



Pin	Function	Voltage Box Connection
3, 4	Trigger ON/OFF signal	ARC
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.	VOL - and VOL +
12, 14	Arc success signal	OK

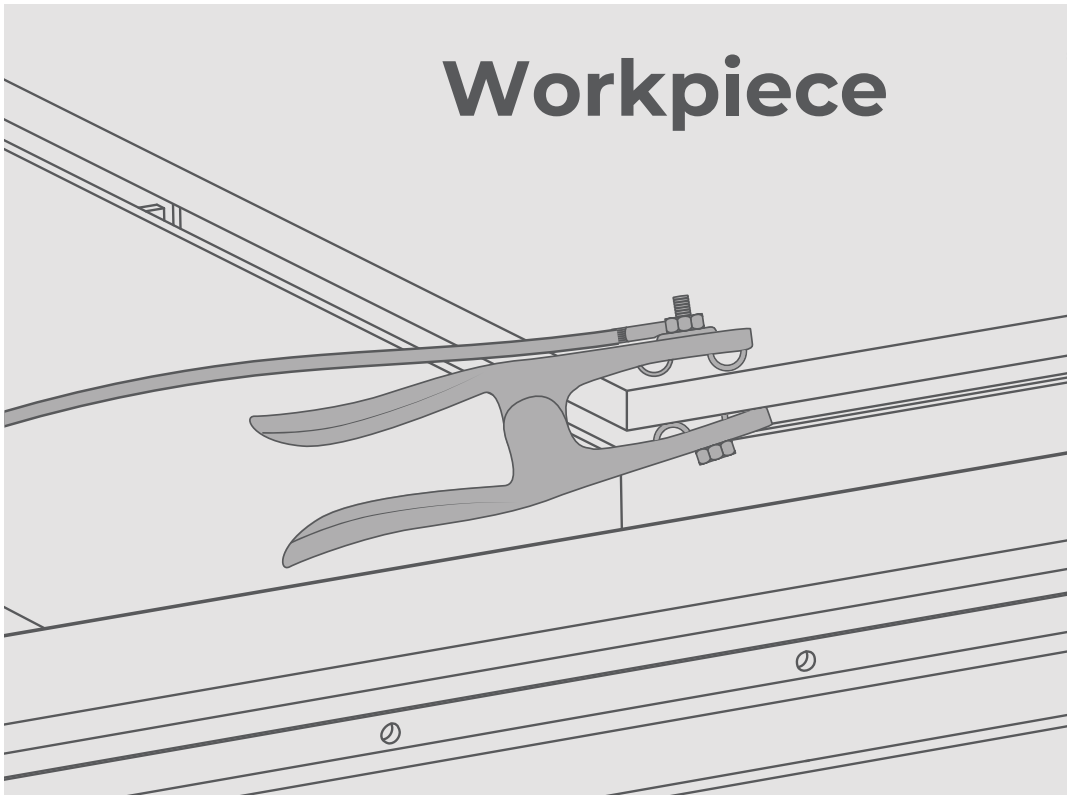
For all UNIMIG plasma cutter pinout connections *see "11. Pinout Guide" on page 164.*

For all non-UNIMIG plasma cutters, contact the manufacturer for pinout diagrams and instructions on the correct pinouts.

7.18 Connecting the Earth Clamp

To the CNC Table

1. Connect the earth clamp to a corner of your workpiece

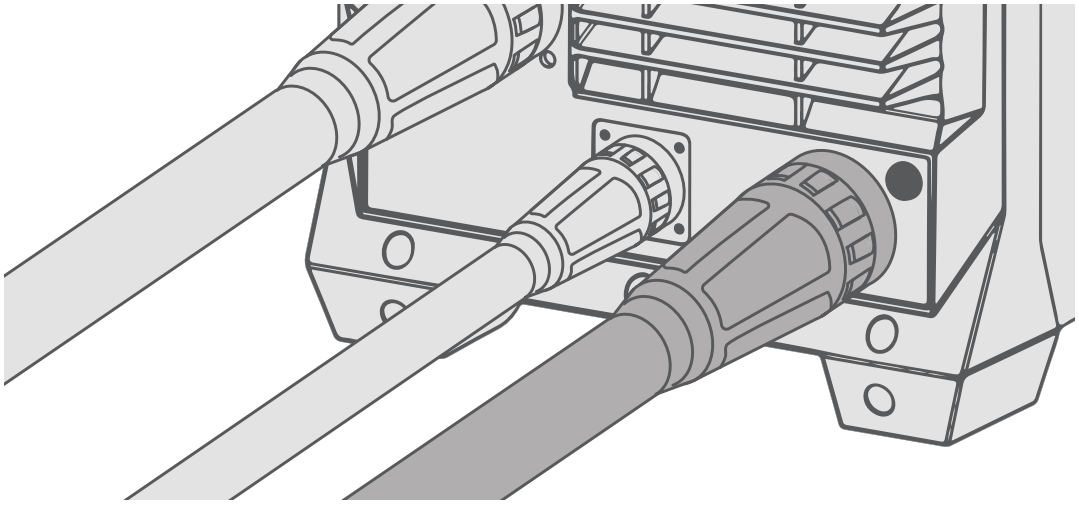


The earth clamp must remain attached to the workpiece for the entire duration of the cut. Make sure that the area that the earth clamp is attached to does not become severed from the rest of workpiece.

The earth clamp that connects the plasma cutter to the CNC table is the positive (+) terminal of the plasma cutter.

To the Plasma Cutter

1. Connect the earth clamp to the dinse connection on the plasma cutter.



7.19 Setting the Voltage Divider

The STEALTH CNC tables require a voltage divider ratio of 1:1. To change the factory preset voltage divider from the default ratio to a 1:1 ratio, please refer to your plasma cutter's user manual, or contact the manufacturer for instructions.

7.20 Installing a Grounding Rod (optional)

If there is electromagnetic interference that is interrupting the proper functioning of the STEALTH CNC table, it is recommended to install a grounding rod.

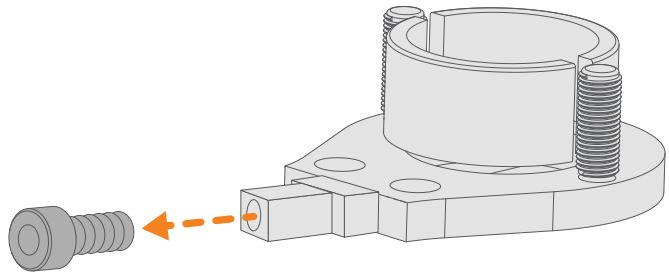
The grounding rod needs to be installed within 6 metres of the table and should not be a part of any other electrical circuit. The resistance of the grounding rod to the earth should not exceed 3ohms.

⚠ **The grounding rod works to eliminate any electrical interference produced by the plasma cutter and protects the CNC table from potential damage caused by this interference.**

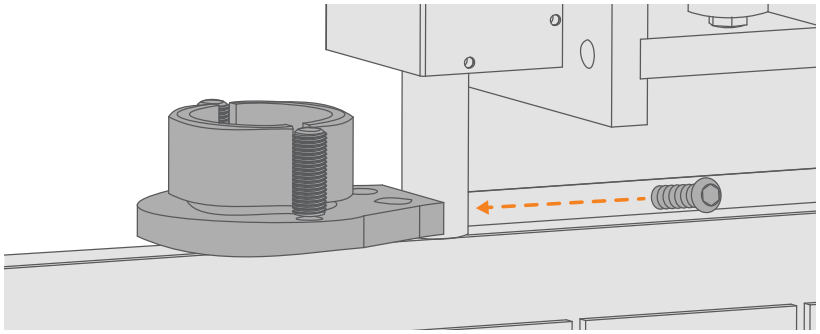
ⓘ **A qualified electrician should be contacted to ensure proper installation of the grounding rod and earth leads.**

7.21 Installing the Torch Holder

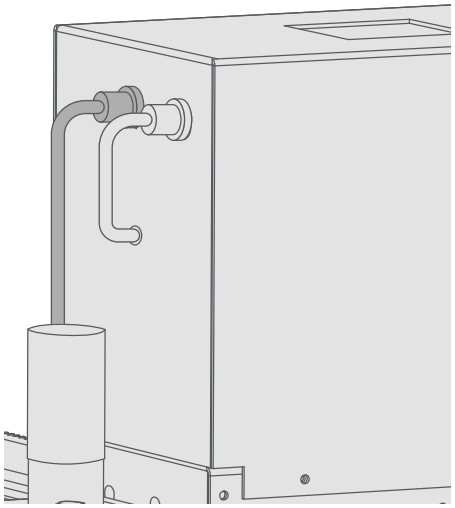
1. Unscrew the screw on the back of the torch mount and slide the back into the gantry torch mount.



2. Screw it into place using the screw that was removed.

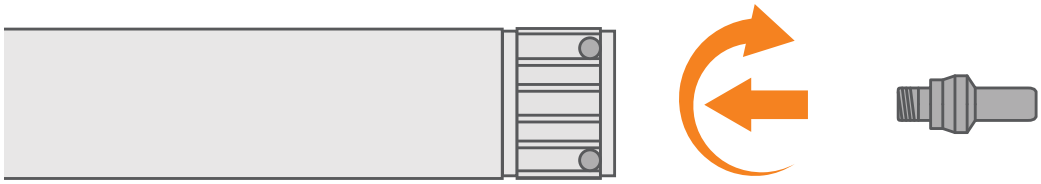


3. Plug the connection plug from the torch holder into the gantry box.

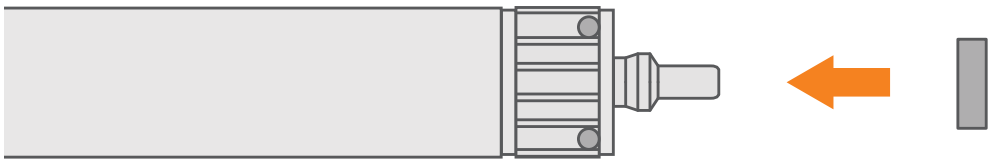


7.22 Assembling the CNC Plasma Torch

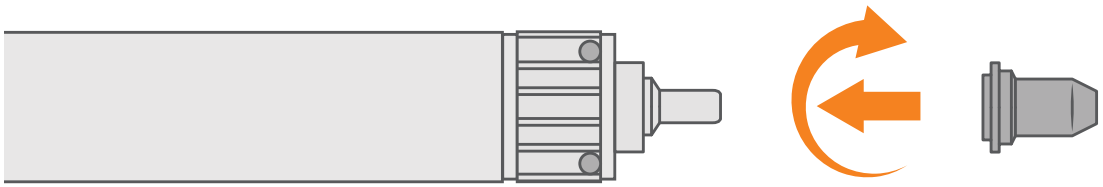
1. Screw the electrode into the torch head. Fasten securely.



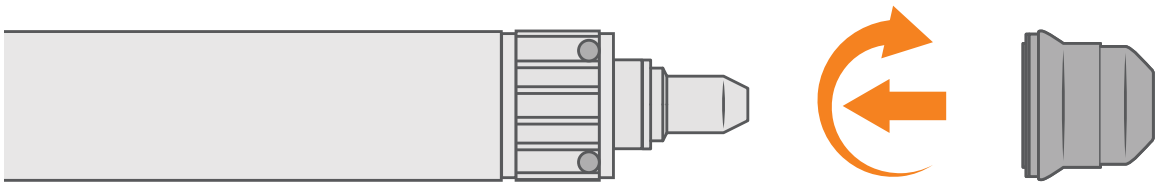
2. Place the swirl ring onto the electrode.



3. Screw the cutting tip into the torch head. Fasten securely.



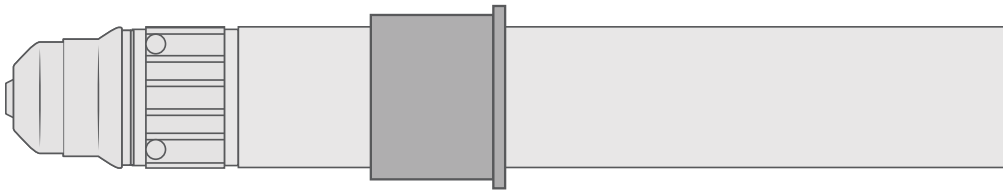
4. Screw the retaining cap into the torch head. Fasten securely.



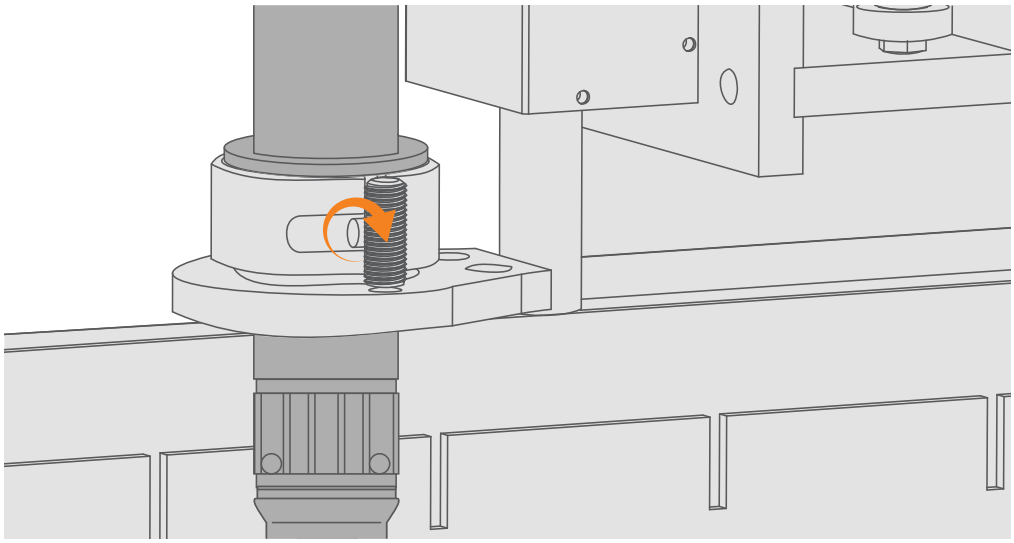
7.23 Mounting the CNC Torch to the Table

1. Place the included plastic fitting around the lower half of your torch.

If the plastic fitting by itself doesn't hold the torch tight enough, add a layer of tape around the torch

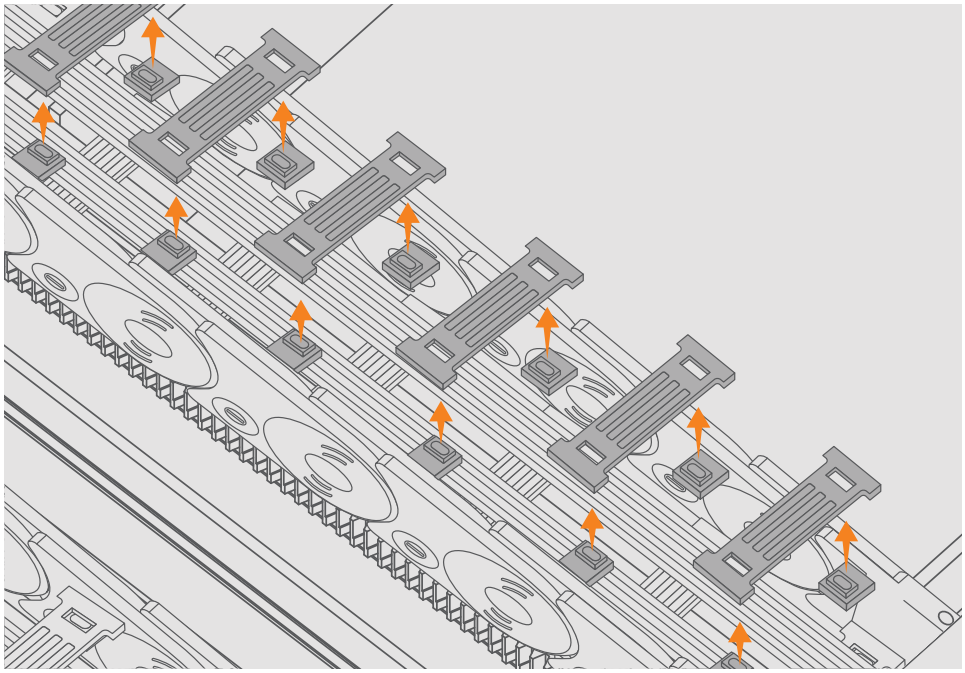


2. Place the torch into the torch holder and tighten the two screws to secure it.

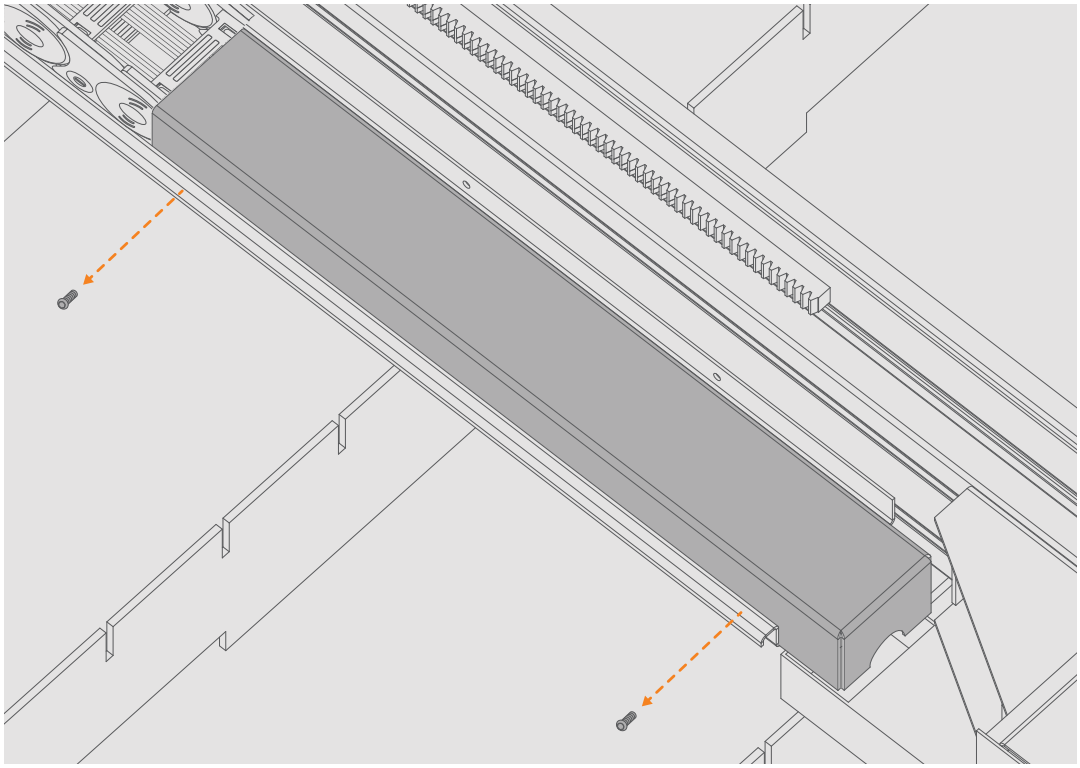


3. Remove the clips from both the raceway and gantry drag chains.

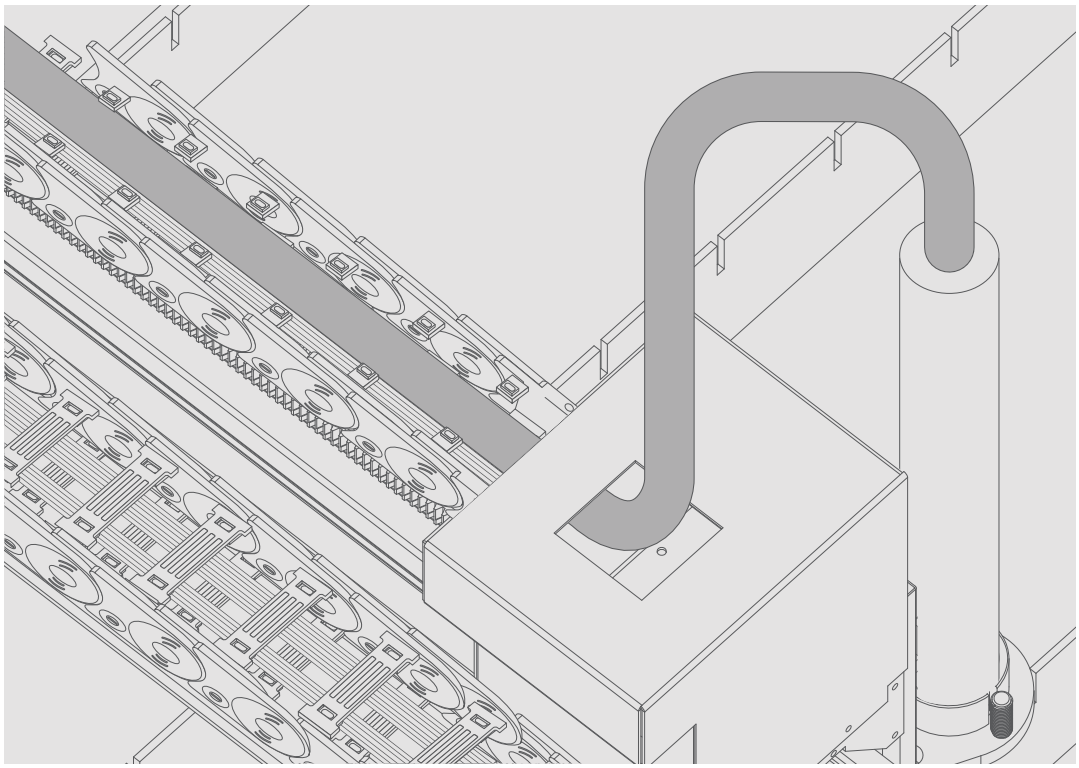
It is recommended that you use a pair of pliers to remove the cable clip sections.



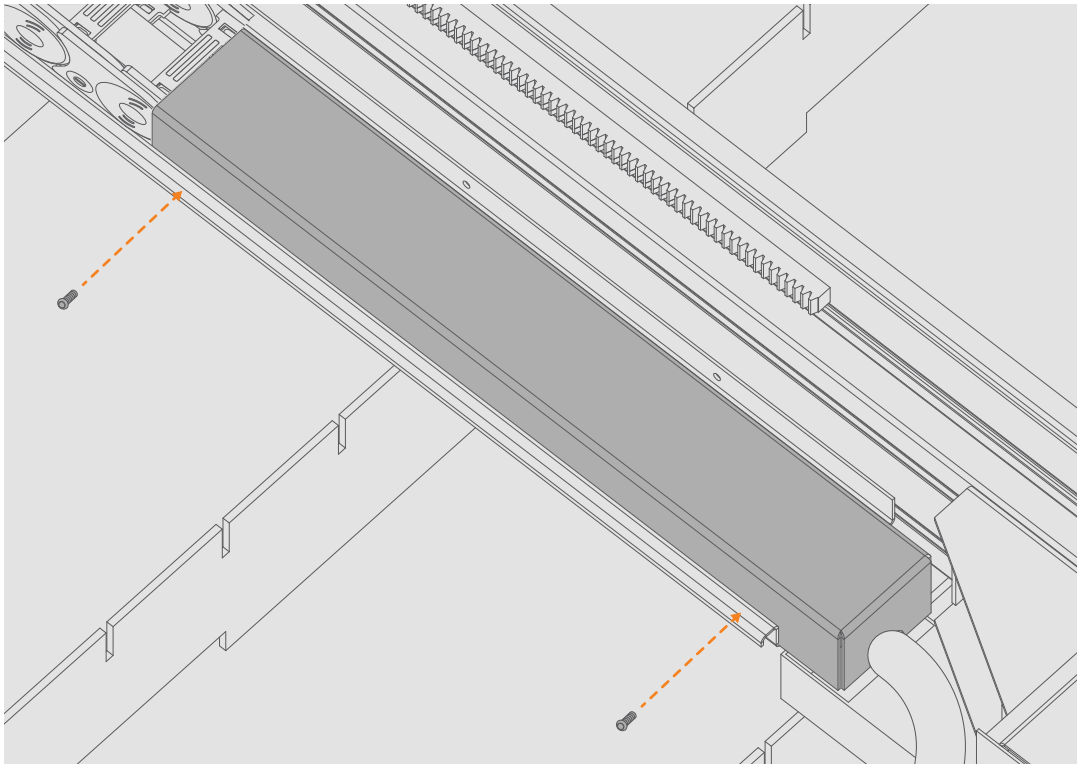
4. Unscrew and remove the cable cover from the gantry drag chain.



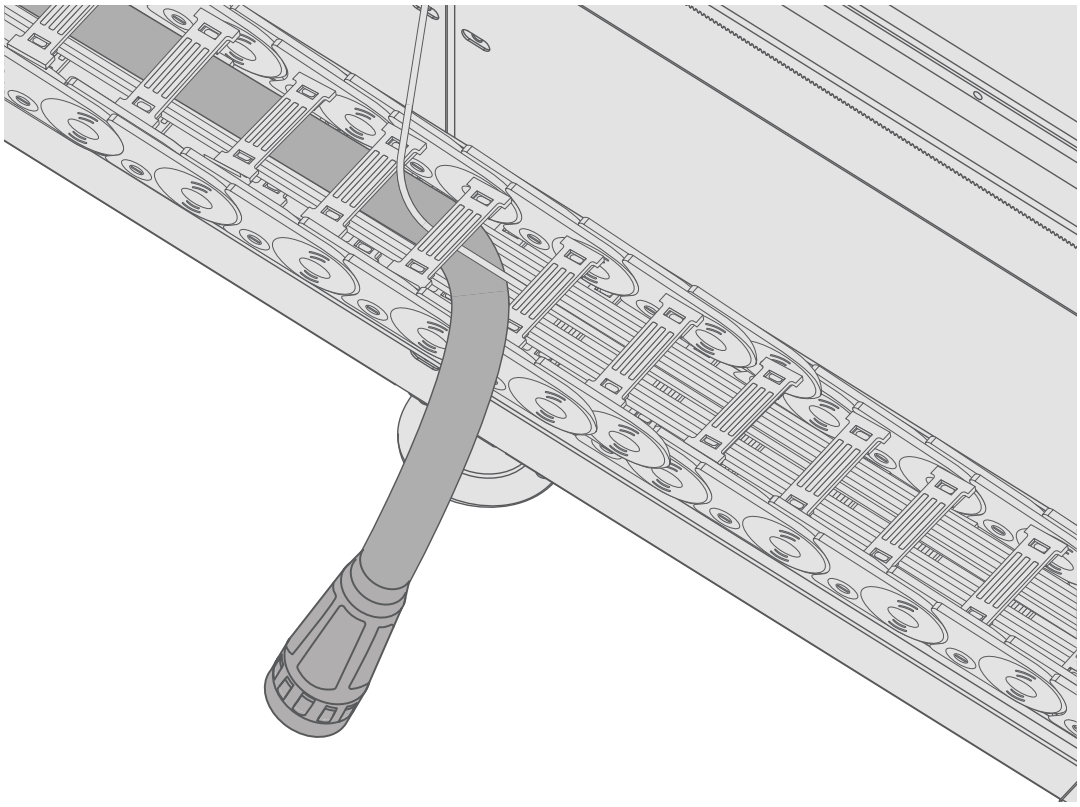
5. Feed the torch through the gantry drag chain and into the raceway drag chain.



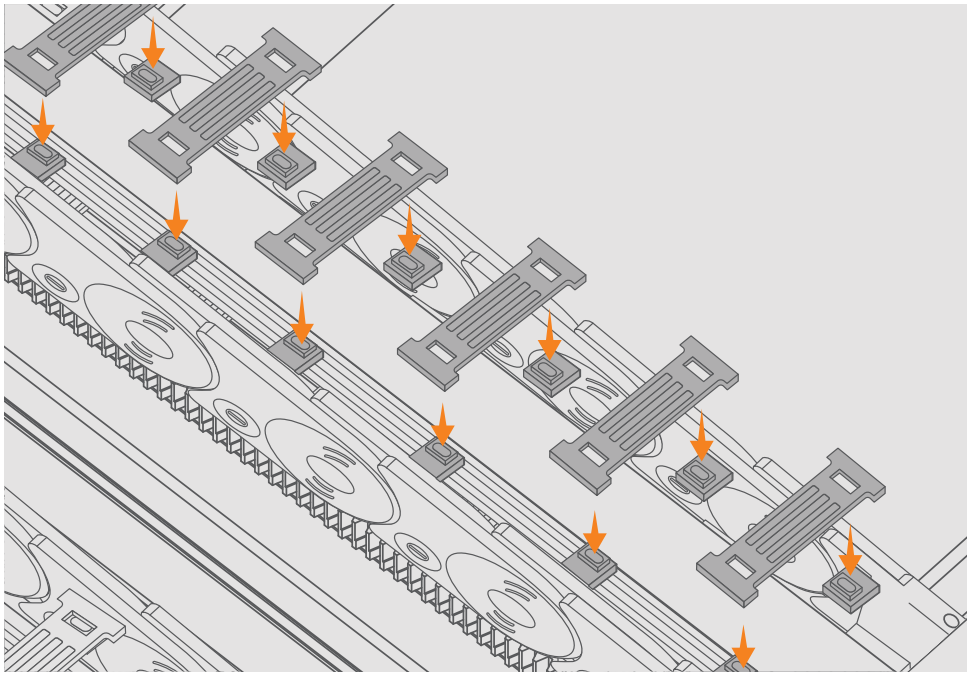
6. Once the cable has been fed through the gantry, replace the cable cover.



7. Feed the torch through the drag chain raceway to the middle of the side panels (in line with the limit switch connection port wire) and pull the end of the torch out.

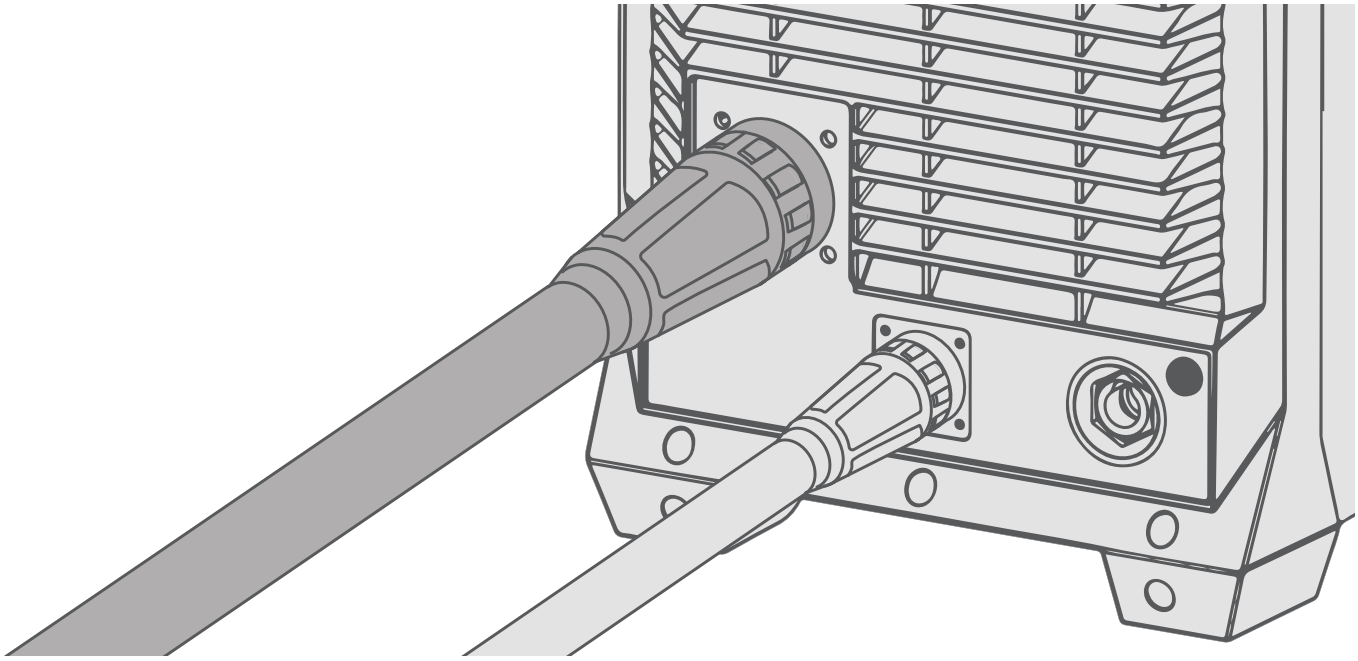


8. Replace the clips on the drag chains to hold the torch in place.



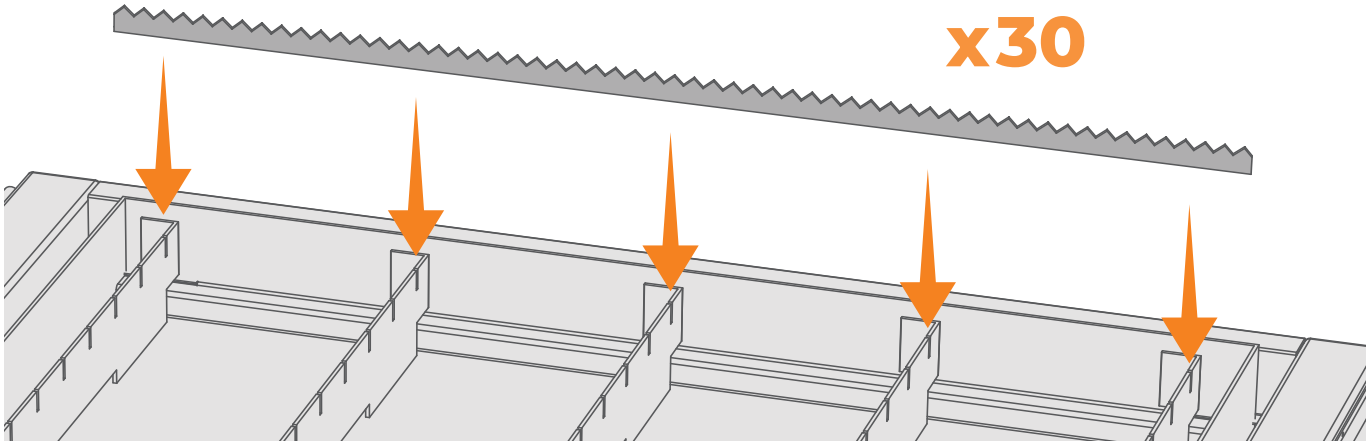
7.24 Connecting the CNC Torch

1. Assemble the CNC torch.
2. Connect the CNC torch into the Euro central connection.



7.25 Installing the Table Slats

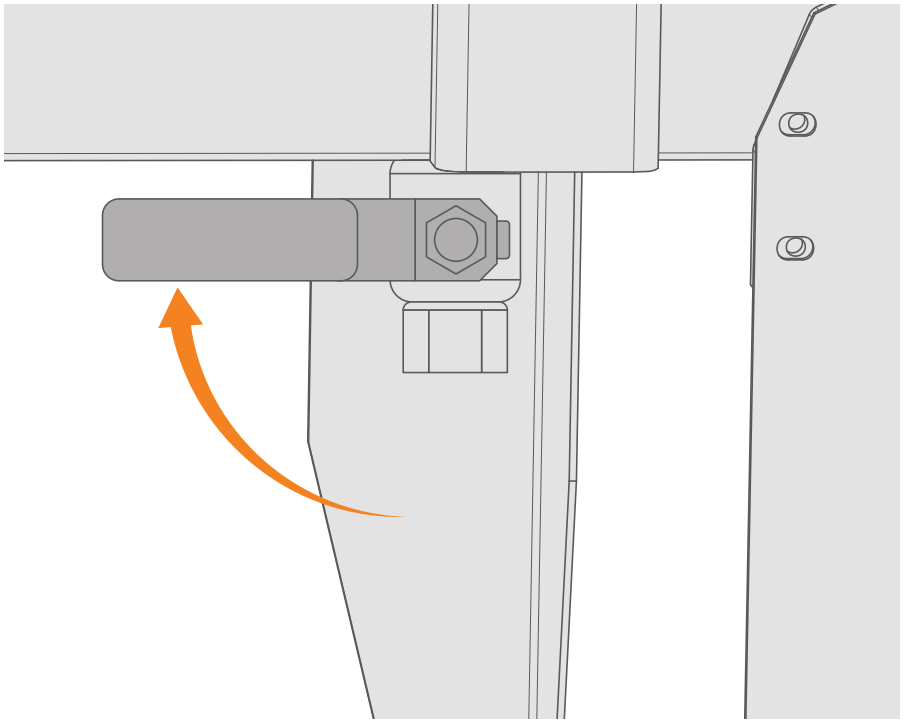
3. Slot the table slats into the pre-cut holes across the CNC table.



7.26 Filling & Emptying the Water Bed

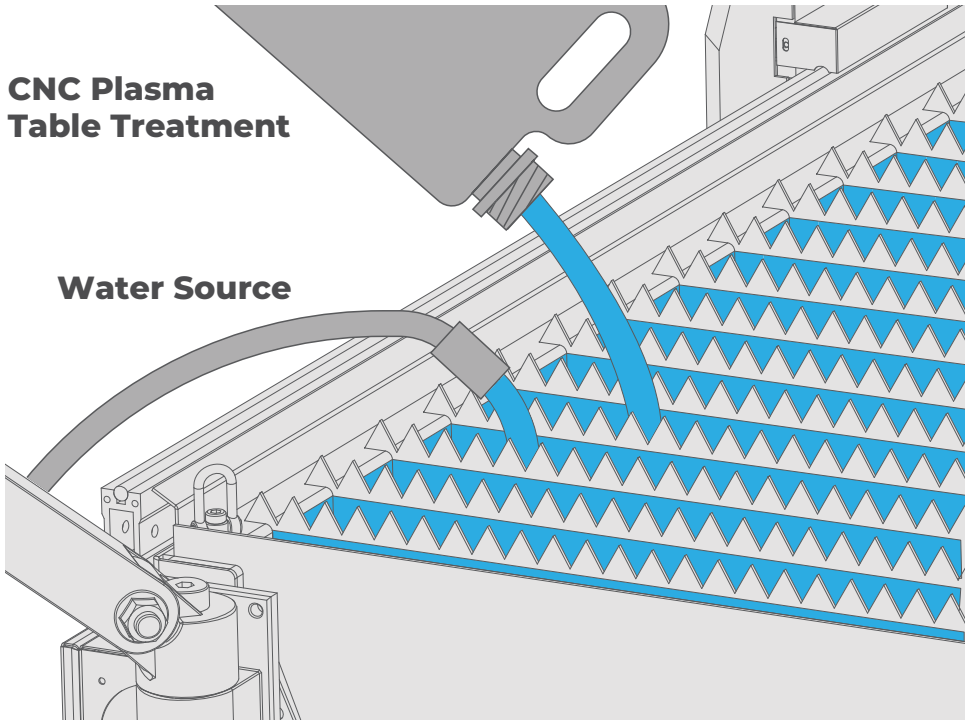
Filling the Water Bed

1. Remove wall 4 so you have access to the water valve.
2. With the valves closed, fill the table with water.



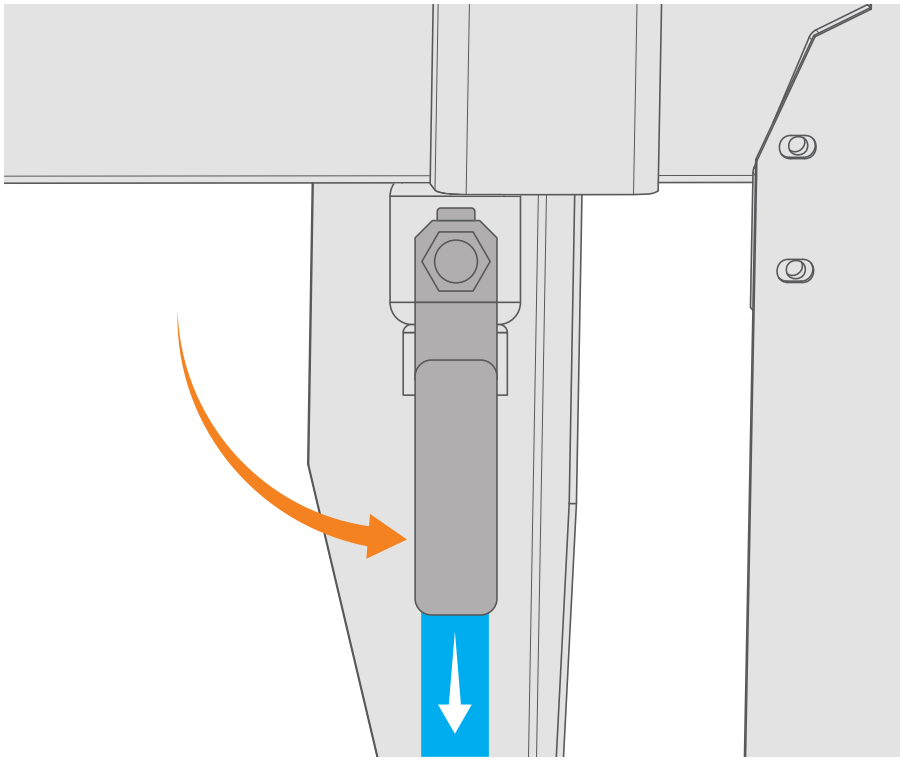
3. While the table is filling with water, add the Plasma Table Treatment as directed.

See *"3. Technical Specifications" on page 11* for the litre capacity of the table.



Emptying the Water Bed

1. Open the valve on the bottom of the table to allow the table to drain.

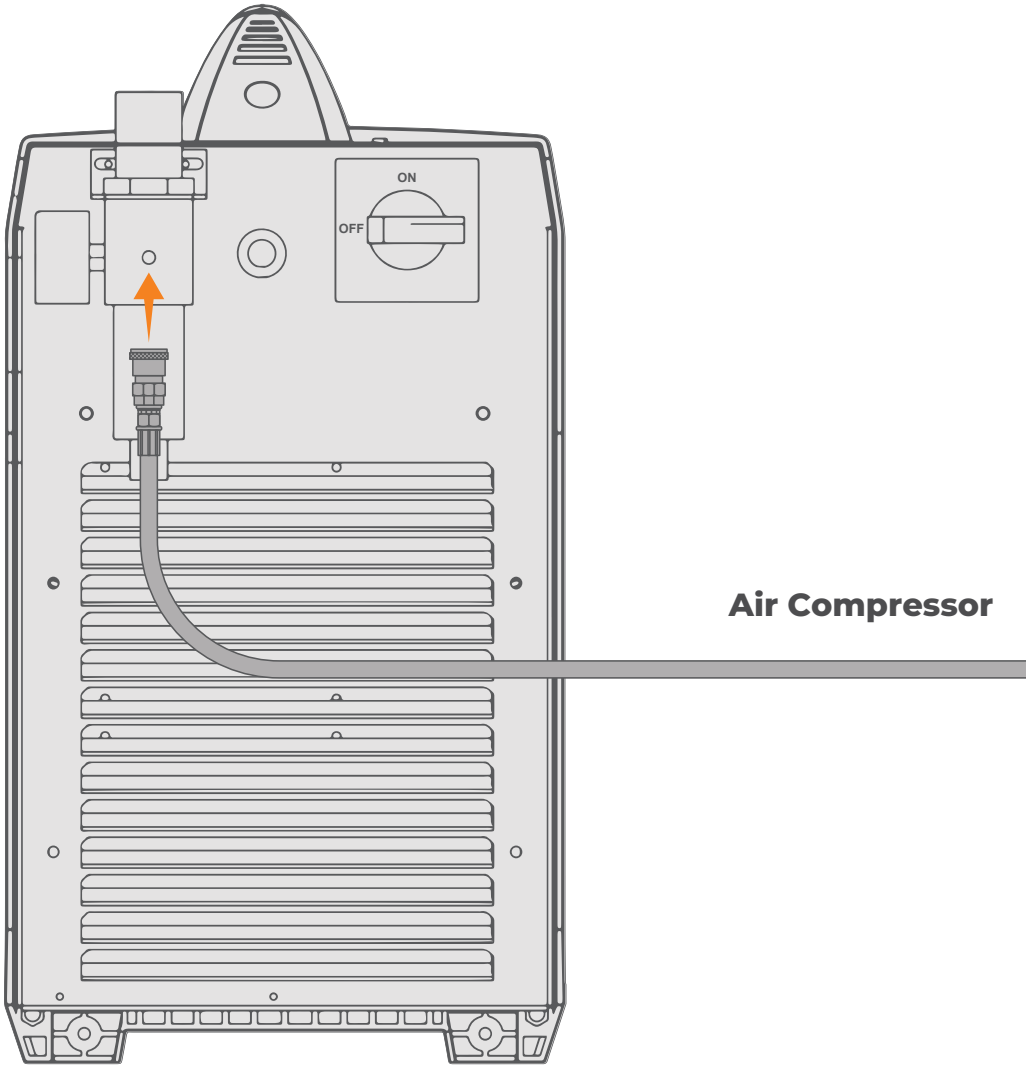


7.27 Connecting the Air Compressor

The air compressor will need to have a minimum airflow draw that matches the plasma cutter's. It is recommended to get an air compressor with an additional 20% capability to eliminate bottlenecking and airflow issues.

We recommend an air compressor with a minimum of a 250-290L/min airflow rate or FAD (Free Air Draw). This guarantees the air compressor will run continuously without failing during a cut.

1. Connect the air compressor to the back of the plasma cutter.
2. Set the air pressure on the compressor. It is recommended to set the air pressure slightly higher than the plasma cutter's, to allow for any drops in pressure depending on the hose length.



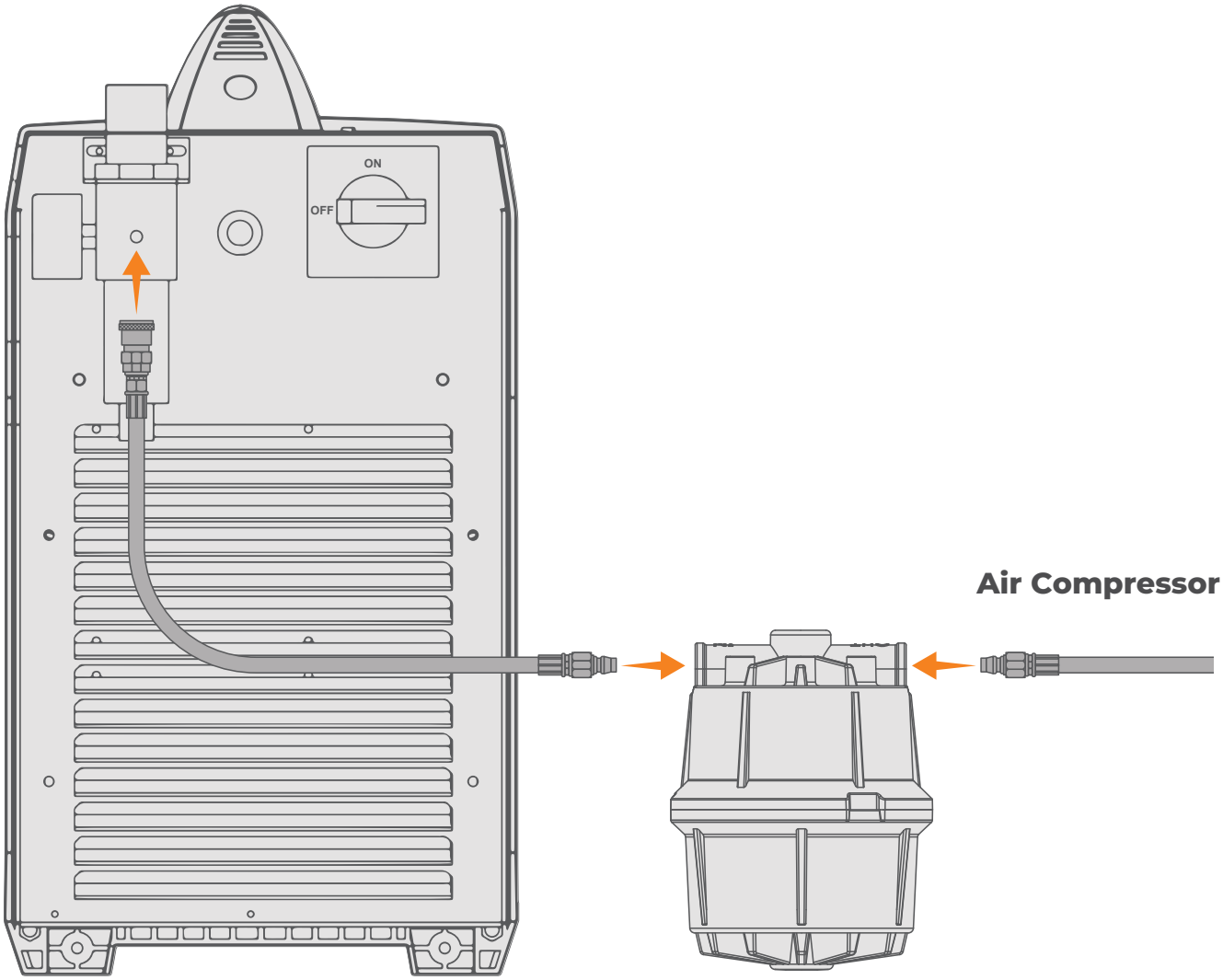
7.28 Installing Additional Air Filters

If the supplied air quality is poor or there is moisture present, the cut speeds, cut quality, and thickness capabilities all decrease, and the life of the consumables shortens. To avoid these issues, install an (optional) additional air filtration system.

Additional air filters should be installed between the air supply and the plasma cutter.

Compressed air needs to be oil and moisture free. Moisture can cause damage to the torch. Oil, when mixed with oxygen under pressure, can cause a flash fire in the torch.

1. Connect the filter to the air compressor.
2. Connect the filter to the plasma cutter via a second air hose.



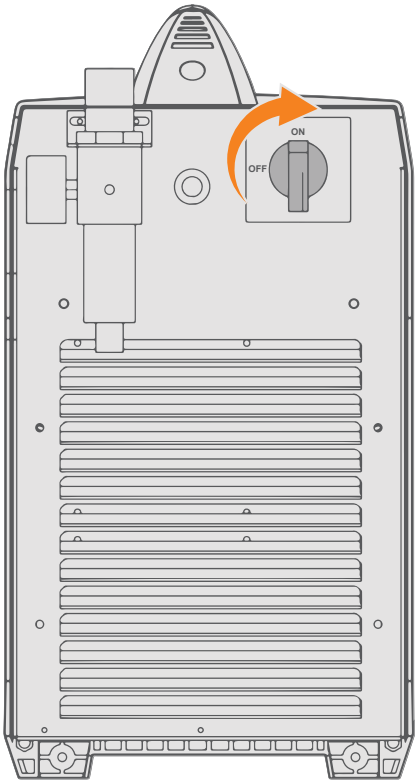
8. Operation

8.1 Preparing for Operation

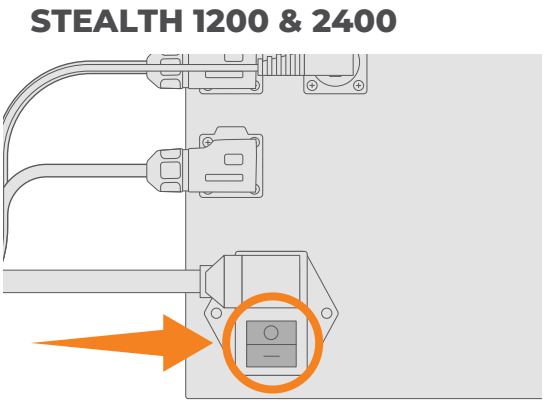
Before using the equipment, ensure that all the necessary installation actions have been completed according to your equipment setup and instructions.

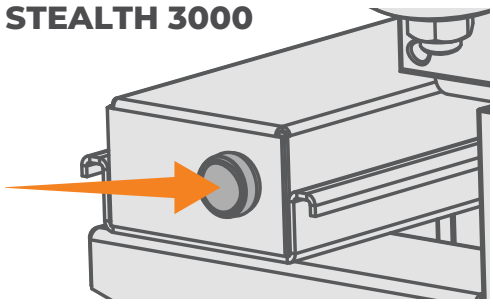
Always check before use that the torch cable, shielding gas hose, earth cable/clamp and power cable are in serviceable condition. Ensure that the connectors are correctly fastened. Loose connectors can impair welding performance and damage connectors.

Connect the table and machine plugs into the mains socket, then switch the Plasma Cutter, the Control PC and the CNC table ON.

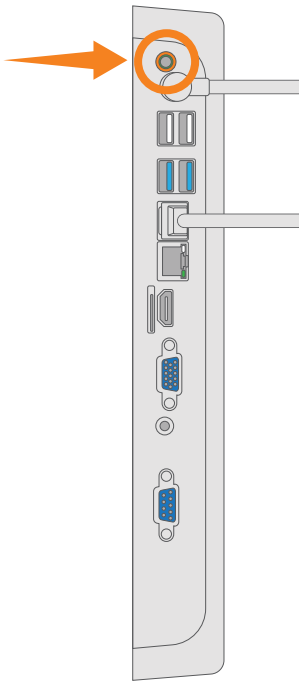


Plasma Cutter





Electrical Cabinet



Control PC

8.2 Operating the Software

Before you can begin cutting, there are several programs that you will need to use in order to create a successful cut. These programs are crucial for achieving precise, efficient cuts and reducing material and consumable wastage. Each program serves a specific purpose in the design and cutting process.

CAD (Computer Aided Design)

CAD software is a type of application used to create precise drawings or technical illustrations. It allows users to design and modify 2D or 3D models of physical components, which can then be used in various manufacturing processes.

In the context of CNC plasma cutting, CAD software is essential for drafting the initial design or pattern that will be cut. It provides tools for drawing, shaping, and detailing, ensuring that the final design meets the required specifications and is ready for the next steps in the design process.

The STEALTH CNC tables do not come with CAD software included. If you do not have previous experience with CAD software, we recommend looking at FreeCAD or LibreCAD. DXF files from both of these programs have been tested through FLCAM and function well.

CAM (Computer Aided Manufacturing)

CAM software is used to convert CAD designs into instructions that CNC machines can understand and execute. It takes the digital model created in the CAD software and generates the necessary toolpaths and G-code, which direct the CNC plasma cutter on how to move, where to cut, as well as other properties of the operation.

Some CAD programs have CAM capabilities, allowing them to output directly to G-code.

CAM software optimises these instructions to ensure efficient and precise machining, taking into account factors such as material properties and machine capabilities. This step is crucial for accurately transforming a design concept into a physical product.

A license of FLCAM is provided with the STEALTH CNC tables, which is pre-configured to work with ArcPath (the CNC software provided). FLCAM is used to convert DXF files into G-code. It also provides some basic nesting and lead-in/out alteration for your DXF files.

FLCAM is not touchscreen compatible, so adding a mouse and keyboard to the Control PC or installing this program to a different PC is recommended.

Not all G-codes are universal. Each different CNC tool may have different variables and, as such, use different codes inside the G-code language. In order to correctly output directly from a different CAM source, you may have to alter the G-code output.

CNC (Computer Numerical Control)

CNC Control software is the interface between the user and the CNC machine, interpreting the G-code generated by the CAM software to control the movements and operations of the machine.

This software manages the execution of the cutting process, directing the plasma cutter along the predefined toolpaths with precise speed and accuracy. It allows users to monitor and adjust the cutting operation in real time, providing features such as manual overrides, diagnostic tools, and machine status updates.

ArcPath is the CNC control program that UNIMIG has designed in-house to be a quick and easy-to-use control interface. It can be used via the touchscreen for quick and intuitive CNC control, or it can be used with a mouse and keyboard.

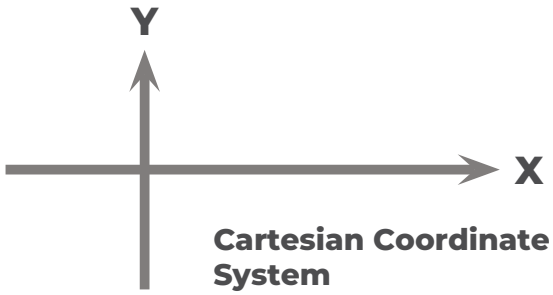
ArcPath includes a comprehensive shape library with many commonly used shapes and parts that can be configured to your specifications. The control software also offers tools such as resize, rotate, mirror, and pattern, which allows for quick and easy design modification. These features help reduce the time spent switching between diferent software.

To cut custom designs, you will need to provide ArcPath with an acceptable G-code file. This can be done via a USB stick, or if you have your Control PC setup on your network, you can share these files from PC to PC via Windows Network sharing.

ArcPath also features cut chart databases. Select your plasma cutter and torch setup first, then choose your material thickness and type. The program will load the relevant settings automatically. You can also alter these settings for fine tuning, and save these as your own cut charts.

8.2.1 Programming Codes & Instructions

The STEALTH CNC tables, by default, use the right-hand Cartesian coordinate system.



The defined coordinates can be changed manually *(see "6.5.1 System Settings" on page 105).*

8.2.1.1 Programming Symbols

Programming Symbol	Function	Description
N	Program segment serial number.	Assigns a unique identifier to each block of code. It helps with the organisation and troubleshooting of the program but does not affect the execution itself.
G	Prepare code.	Specifies various motion commands in the (X, Y, Z) cartesian coordinate system or preparatory functions (e.g., speed and angle in the rotational axis, tool length offset, start point, stop point) and is essential for defining the type of instruction needed for the operation.
M	Additional function.	Controls miscellaneous machine functions such as starting or stopping specific programs and actions. These are essential for controlling non-motion-related machine operations.
X	X-axis relative or absolute coordinates.	Defines movement or position along the X-axis, based on either absolute positioning (from the origin) or relative positioning (from the current position).
Y	Y-axis relative or absolute coordinates.	Defines movement or position along the Y-axis, based on either absolute positioning (from the origin) or relative positioning (from the current position).
U	X-axis relative coordinates.	Specifies relative movement or positioning along the X-axis when using incremental mode (where movement is described relative to the previous point rather than an absolute position).

Programming Symbol	Function	Description
V	Y-axis relative coordinates.	Specifies relative movement or positioning along the Y-axis when using incremental mode (where movement is described relative to the previous point rather than an absolute position).
I	X-axis coordinate difference of the center to the starting point of the arc.	Specifies the distance between the center of the arc and the starting point along the X-axis during arc programming.
J	Y-axis coordinate difference of the center to the starting point of the arc.	Specifies the distance between the center of the arc and the starting point along the Y-axis during arc programming.
R	Radius of the arc with a positive value less than 180° arc and a negative value greater than 180° arc.	Defines the radius of a circular or arc movement. A positive value is used for arcs less than 180°, while a negative value represents arcs greater than 180°.
F	Cutting speed - used for G-codes G01, G02, G03.	Specifies the feed rate, or cutting speed, indicating how fast the torch or table will move

8.2.1.2 G-codes

G-code	Parameter	Function	Description	Format
G00	X/U, Y/V	Torch movement with no cut	Commands the machine to make a rapid, non-cutting movement to a specified location. It is used to position the torch or tool quickly.	`G00 Xn Yn` (where n=coordinate value)
G01	X/U, Y/V	Straight line cutting	Commands the machine to move along a straight line while cutting. It is a slower, controlled movement compared to G00.	`G01 Xn Yn [Fn]` (where F=feed rate/speed and n=number/coordinate value)
G02	X/U, Y/V, I, J	Clockwise circular cutting	Commands the machine to cut along a clockwise arc. You can define the arc either using the radius or by specifying the center point with I and J coordinates.	`G02 Xn Yn In Jn [Fn] or G02 Xn Yn Rn [Fn]` (where Rn=radius value)
G03	X/U, Y/V, I, J	Anti/ Counterclockwise circular cutting	Commands the machine to cut along a counterclockwise arc. You can define the arc either using the radius or by specifying the center point with I and J coordinates.	`G02 Xn Yn In Jn [Fn] or G02 Xn Yn Rn [Fn]` (where Rn=radius value)
G04	P	Time delay	Commands the machine to pause for a specified amount of time.	`G04 Pn` (where Pn=time in seconds) (P100 = 1 second)
G20		Imperial unit measurement	Sets the table to use imperial units (inches).	

G-code	Parameter	Function	Description	Format
G21		Metric unit measurement	Sets the table to use metric units (millimeters).	
G40		Cancel kerf compensation	Commands the machine to cancel the kerf compensation that is active in the code. **If G40 is omitted and the kerf compensation isn't cancelled after applying it, the last kerf compensation (G41 or G42) will remain active by default for subsequent cuts.**	`G40`
G41		Left-side cutting kerf compensation	Commands the machine to compensate for kerf on the left-side of the cut. **If G41 or G42 is omitted, no compensation is applied, the system assumes that the kerf compensation is zero by default (no adjustment for the torch width).**	`G41`
G42		Right-side cutting kerf compensation	Commands the machine to compensate for kerf on the right-side of the cut. **If G41 or G42 is omitted, no compensation is applied, the system assumes that the kerf compensation is zero by default (no adjustment for the torch width).**	`G42`
G90		Absolute coordinates	Sets the machine to absolute positioning, where coordinates are measured from the reference point set by G92.	
G91		Relative coordinates	Sets the machine to relative positioning, where each movement is made from the current position.	
G92	X,Y	Reference point settings	Sets a specific reference point in the machine's coordinates. Once the G92 command is issued, all movements and operations will be referenced from this point. The coordinates can be reset manually by specifying new ones. **If no parameters are provided, the default is (0,0 or X0,Y0).**	`G92`

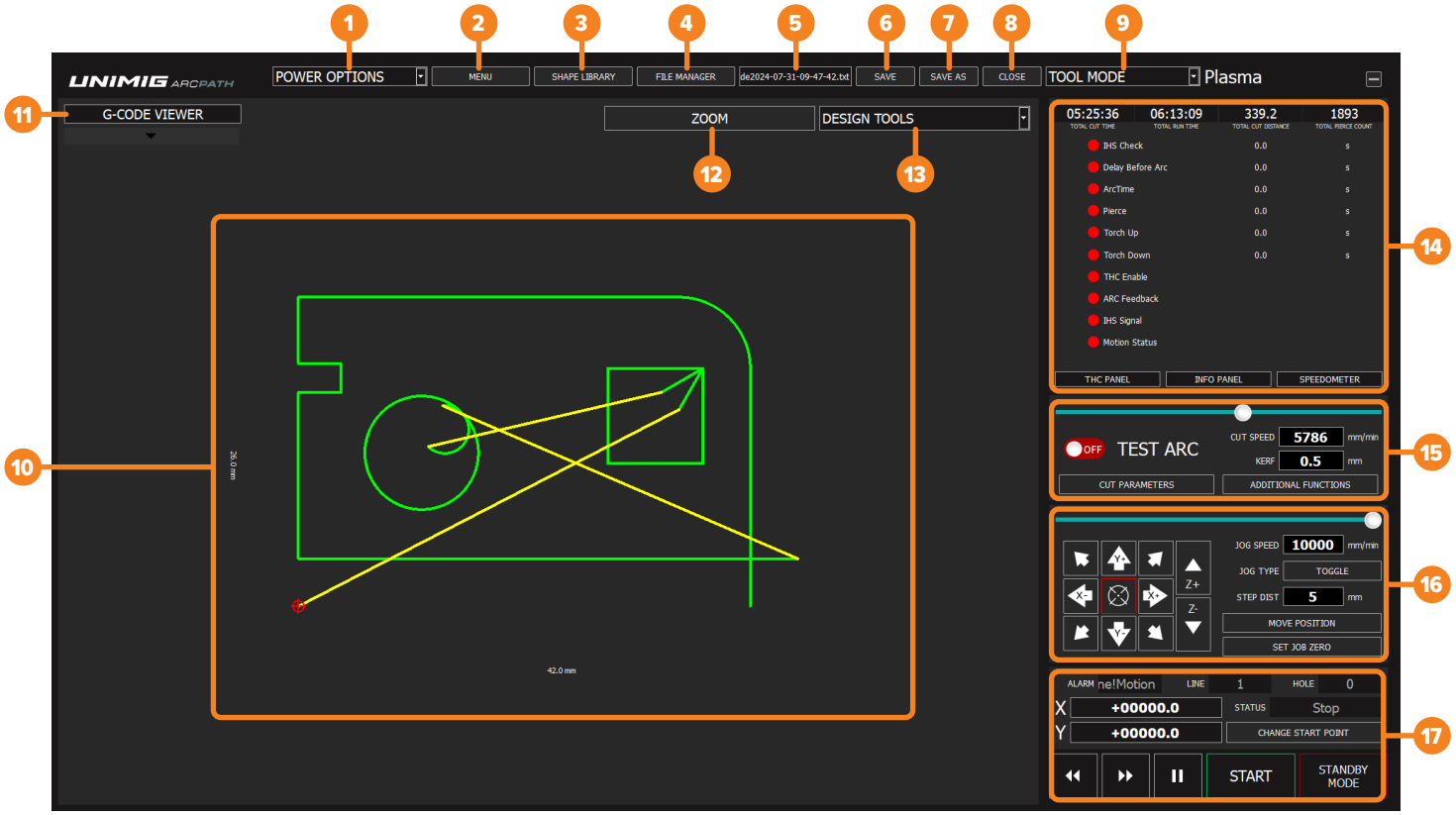
G-code	Parameter	Function	Description	Format
G99	X/U, Y/V, I, J	Scaling, rotation, mirror image	Commands the machine to modify the tool path in terms of scaling, rotating, or mirroring the original design. Xn: Refers to the scale factor along the X-axis. This value can be set between 0.001 and 1000, meaning the size of the X-axis movement can be increased (scaled up) or decreased (scaled down). Yn: Refers to the rotation angle. This value can range from -360° to 360°, allowing the part or path to be rotated clockwise (negative values) or counterclockwise (positive values) around the origin. In: This parameter controls whether the part will be mirrored along the X-axis. • If I = 1, the path or part is mirrored horizontally across the X-axis. • If I = 0, no mirroring along the X-axis is applied. Jn: This parameter controls whether the part will be mirrored along the Y-axis. • If J = 1, the path or part is mirrored vertically across the Y-axis. • If J = 0, no mirroring along the Y-axis is applied. **If a G99 code is included, all parameters (X, Y, I, J) must be included.** **Any rotation or mirroring is done with respect to the Cartesian coordinates origin (0, 0), meaning that the transformations are applied using the origin as the central point for these adjustments.**	`G99 Xn Yn In Jn` (where n = number)

8.2.1.3 M-codes

G-code	Function	Description
M00	Pause	Stops the machine and waits for further, manual instructions.
M02	Program end	Marks the end of the program and stops the machine but does not reset it or return it to the start position.
M07	Perforation cycle start	Initiates the perforation cycle and turns on the arc.
M08	End of perforation cycle	Ends the perforation cycle and turns off the arc.
M09	Turn on the spray powder	Starts the spray of powder, used for surface coating applications.

G-code	Function	Description
M10	Turn off the spray powder	Stops the spray of powder, used for surface coating applications.
M11	Establish spray offset	Applies the offset of the spray to ensure proper coating or surface modification is applied where needed.
M12	Remove spray offset	Removes the offset of the spray to ensure proper coating or surface modification is applied where needed.
M30	Program end with reset	Marks the end of the program and stops the machine. It also resets the machine settings to their initial state and rewinds the program to the beginning.

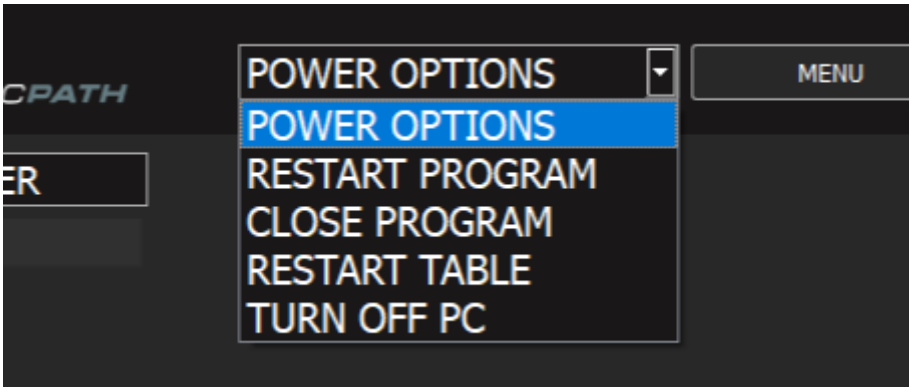
8.3 ArcPath Layout & Operation



The primary screen of ArcPath is known as the home screen.

Number	Function	Description
1	**Power Options**	Restart or close the ArcPath program, CNC controller or the Control PC.
2	**Menu**	The full list of settings and options for ArcPath.
3	**Shape Menu**	The complete library of predefined shapes. These can be configured to your size and angle specifications and saved as files if you wish to use them again.
4	**File Manager**	Access G-code files that are saved on the Control PC or a USB. The G-code will usually be read in the .nc or .txt file format. Files that have been altered in ArcPath are saved as a .nc file.
5	**File Name**	This displays the name of the G-code file that is currently loaded.
6	**Save**	Save the current G-code file.
7	**Save As**	Save the current G-code file as a new file. You will be prompted to name the new file and choose a location to save it. **Use Save As if you do not want to change the original G-code file.**
8	**Close**	Close the current G-code file.
9	**Tool Mode**	Choose the active tool (plasma torch or marker) or place the machine in Demo mode. Demo mode will move the torch head position but will not activate any tools.
10	**Design Panel**	Displays the active G-code design and the toolpath lines.
11	**G-code Viewer**	Displays the active G-code. While cutting, this will display a highlighted square which follows along with the cut.
12	**Zoom**	Zoom in and out and navigate left, right, up and down across the design panel and active design.
13	**Design Tools**	Make adjustments to the active G-code without needing to redesign the original file.
14	**Monitor Panel**	Monitor the status of the Torch Height Controller (THC), which systems are active and the speed the system is operating.
15	**Cut Panel**	Set the cut speed and cutting parameters.
16	**Jog Panel**	Manually control the movement of the torch head.
17	**Cut Status Panel**	Control the status and progress of the cut. The alarm status is also displayed here.

8.4 Power Options Menu

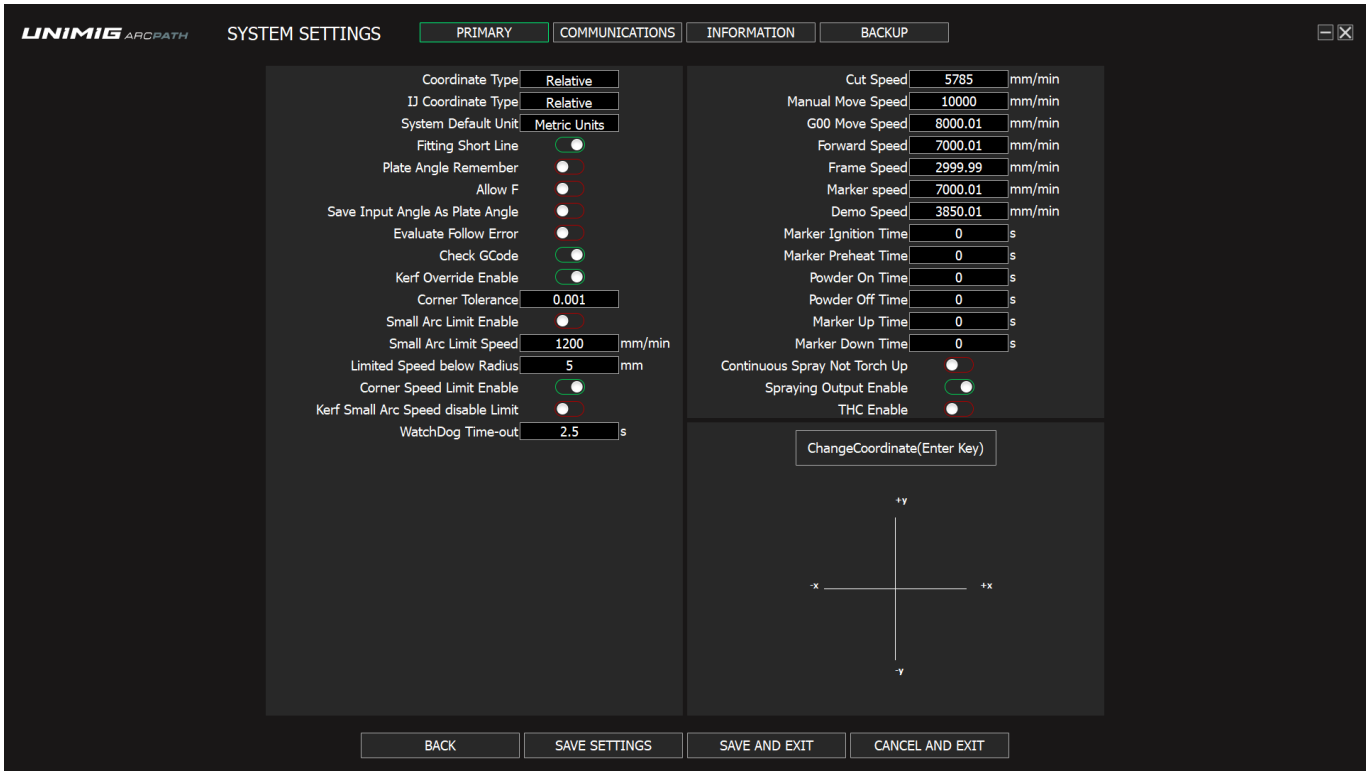


Function	Description
Restart Program	Restart the ArcPath program.
Close Program	Close the ArcPath program.
Restart Table	Restart the STEALTH CNC table.
Turn Off PC	Turn off the Control PC.

8.5 Main Menu

8.5.1 System Settings

Primary

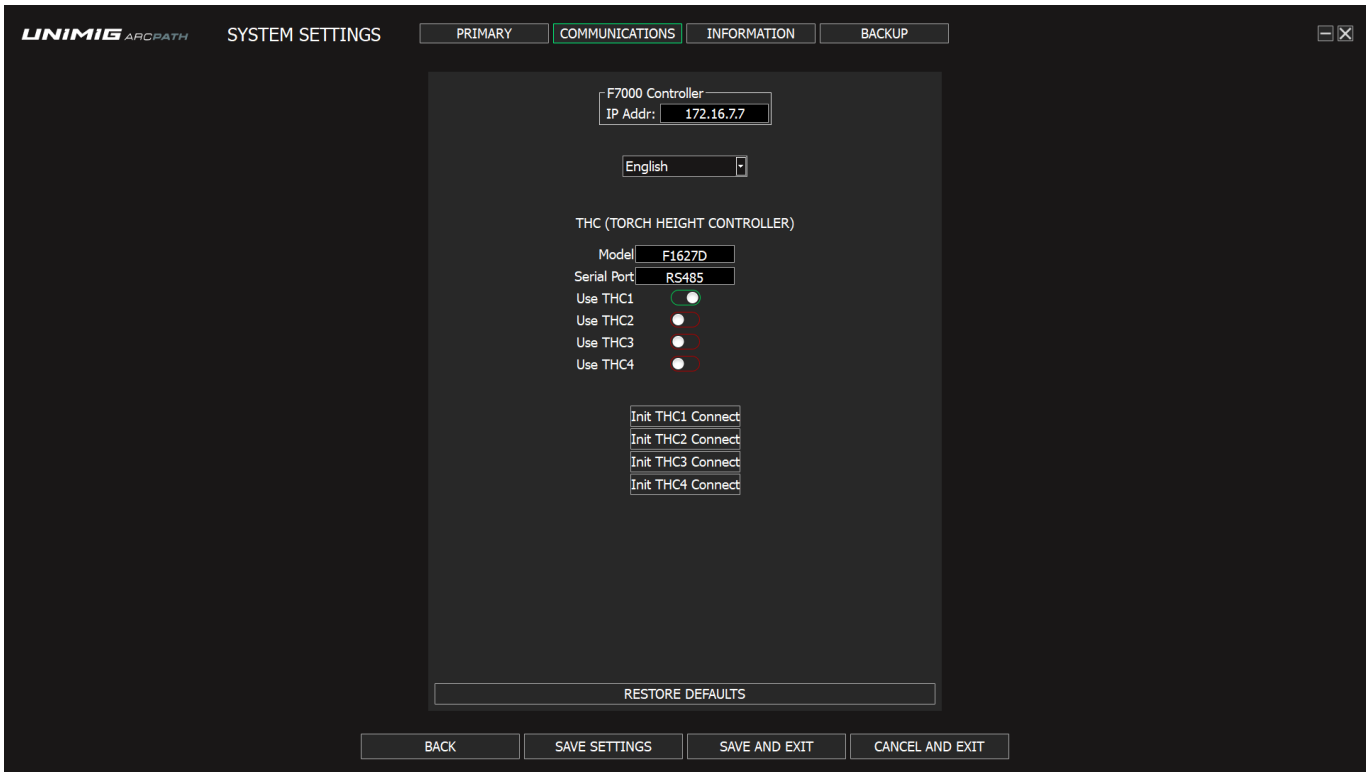


Function	Value	Description
Coordinate Type	Relative / Absolute	Sets where the coordinates are measured from. **Relative** The coordinates are measured from the current position of the torch/tool. **Absolute** The coordinates are measured from the fixed zero point of the table.
IJ Coordinate Type	Relative / Absolute	Sets where the I & J coordinates (G02 & G03 in the G-code) are measured from. **Relative** The coordinates are measured from the current position of the torch/tool. **Absolute** The coordinates are measured from the fixed zero point of the table.
System Default Unit	Imperial / Metric	Sets the unit of measurement. **ArcPath needs to be restarted for this change to take effect.**
Fitting Short Line	On / Off	Sets whether line segments that are too short to recreate will be ignored. Turning this setting on will smooth over these lines for better cutting accuracy.
Plate Angle Remember	On / Off	Sets whether the inputted angle settings will be remembered and loaded on system start up. Turning this setting off will set all angle values to 0° on start up.
Allow F	On / Off	Allows for the use of F-codes, which define the cutting speed, in G-code. F-codes will overrule the table's settings.
Save Input Angle As Plate Angle	On / Off	Rotates the G-code drawing on the home screen to reflect the inputted angle.
Evaluate Follow Error	On / Off	The system will check for any deviation (or error) between the programmed cutting path and the actual cutting path.
Check G-code	On / Off	The system will check the G-code for errors or inconsistencies before running it.
Kerf Override Enable	On / Off	The system will override the standard kerf width based on job-specific settings.
Corner Tolerance	0.001 - 1	Sets the allowable tolerance when cutting corners. A lower value provides more precision, but a higher value allows for faster cutting through sharp angles or corners.

Function	Value	Description
Small Arc Limit Enable	On / Off	Sets whether the cutting speed will be limited when cutting small arcs. A small arc is an arc with a small radius.
Small Arc Limit Speed	0 - 10000mm/min	Sets the maximum cutting speed the machine can move when cutting small arcs. A small arc is an arc with a small radius.
Limited Speed Below Radius	millimetres (no min/ max)	Limits the cutting speed of the cutting if the radius of the arc is below the set amount.
Corner Speed Limit Enable	On / Off	Sets whether the cutting speed will be limited when approaching corners.
Kerf Small Arc Speed Disable Limit	On / Off	Prevents the kerf speed adjustment from applying to small arc sections, keeping the table at a higher cutting speed. A small arc is an arc with a small radius.
WatchDog Timeout	1 - 10seconds	The WatchDog Timeout will trigger an alarm if there is an issue with connecting to the CNC table (the motion controller).
Cut Speed	5 - 10000mm/min	Sets the cutting speed.
Manual Move Speed	5 - 10000mm/min	Sets the jogging speed.
G00 Move Speed	5 - 10000mm/min	Sets the speed for rapid non-cutting movements. G00 refers to torch movement with no cutting in the G-code.
Forward Speed	5 - 10000mm/min	Sets the forward and backwards motion speed.
Frame Speed	10 - 10000mm/min	Sets the speed the table will move around the frame.
Marker Speed	5 - 10000mm/min	Sets the marker tools speed. **The marker tool is separate to the plasma torch.**
Demo Speed	5 - 10000mm/min	Sets the Demo Mode speed.
Marker Ignition Time	0 - 10seconds	Sets how long the marker will wait before igniting. 0 seconds will set no delay.
Marker Preheat Time	0 - 7200seconds	Sets how long the marker tool is allowed to preheat before starting marking operations.
Powder On Time	0 - 15seconds	Sets how long the powder applicator for the marker stays on.
Powder Off Time	0 - 15seconds	Sets the delay before the powder applicator stops.
Marker Up Time	0 - 30seconds	Sets the delay before raising the marker after completing an operation. 0 seconds will set no delay.
Marker Down Time	0 - 30seconds	Sets the delay before lowering the marker to start a marking operation. 0 seconds will set no delay.
Continuous Spray Not Torch Up	On / Off	Allows a continuous spray for marking processes that use spraying.
Spraying Output Enable	On / Off	Allows the spray output for marking processes that use spraying.

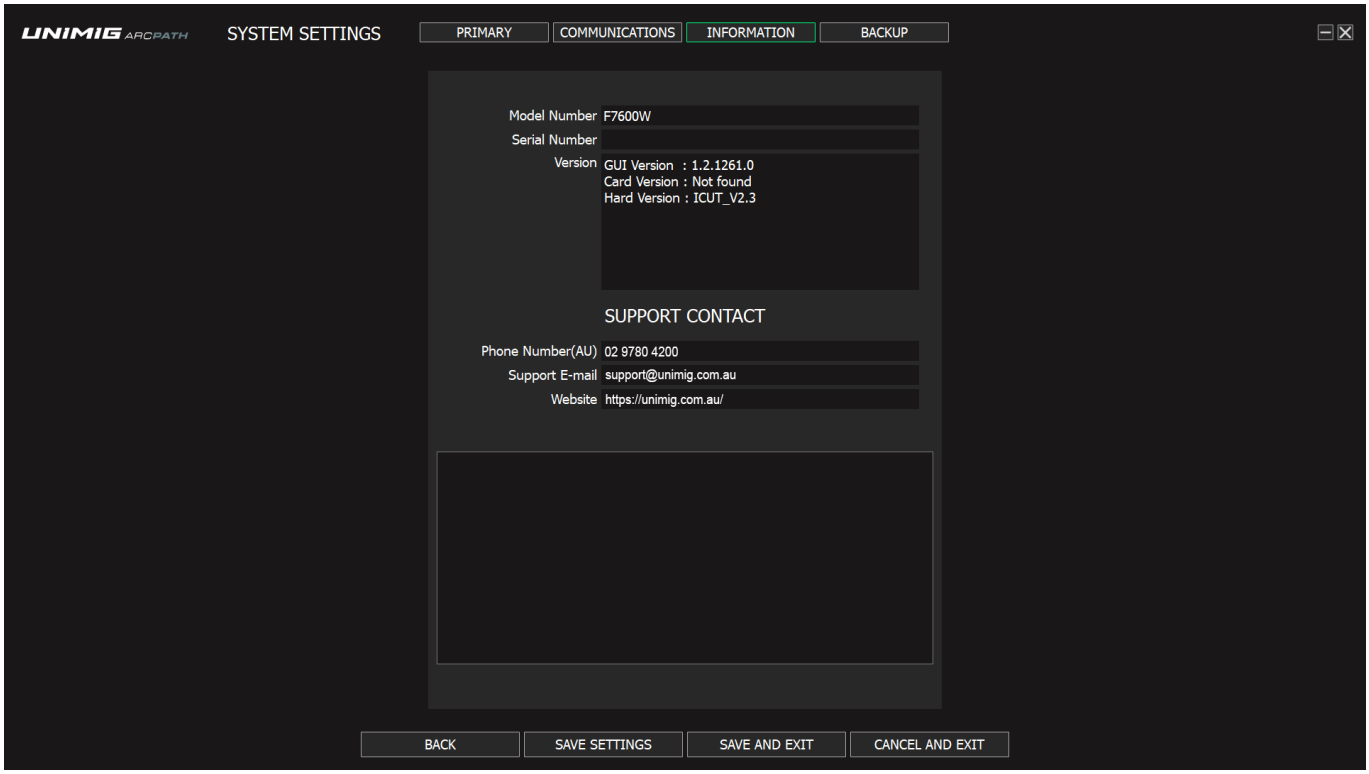
Function	Value	Description
THC Enable	On / Off	Turns the Torch Height Controller (THC) system on or off.
Change Coordinate Orientation (Enter Key)		Sets the orientation of the X and Y-axis of the table. This determines which direction the torch will travel when an axis movement is input.

Communications



Function	Value	Description
IP Address		The IP address the Control PC has connected to.
Language	English / Chinese Simplified / Chinese Traditional / French / Russian / Portuguese / Hungarian / Italian	Sets the preferred language.
Model	Common / F1627D / F1627S / F1650	Sets the model of the THC being used.
Serial Port	RS232 / RS485	Sets the serial port of the THC.
Use THC1	On / Off	Sets which THC is being used.
Use THC2	On / Off	Sets which THC is being used.
Use THC3	On / Off	Sets which THC is being used.
Use THC4	On / Off	Sets which THC is being used.
Init THC Connect	THC1 / THC2 / THC3 / THC4	Force a connection the the THC that has been set to On if the THC fails to connect automatically.
Restore Defaults		Restores all settings to their default value.

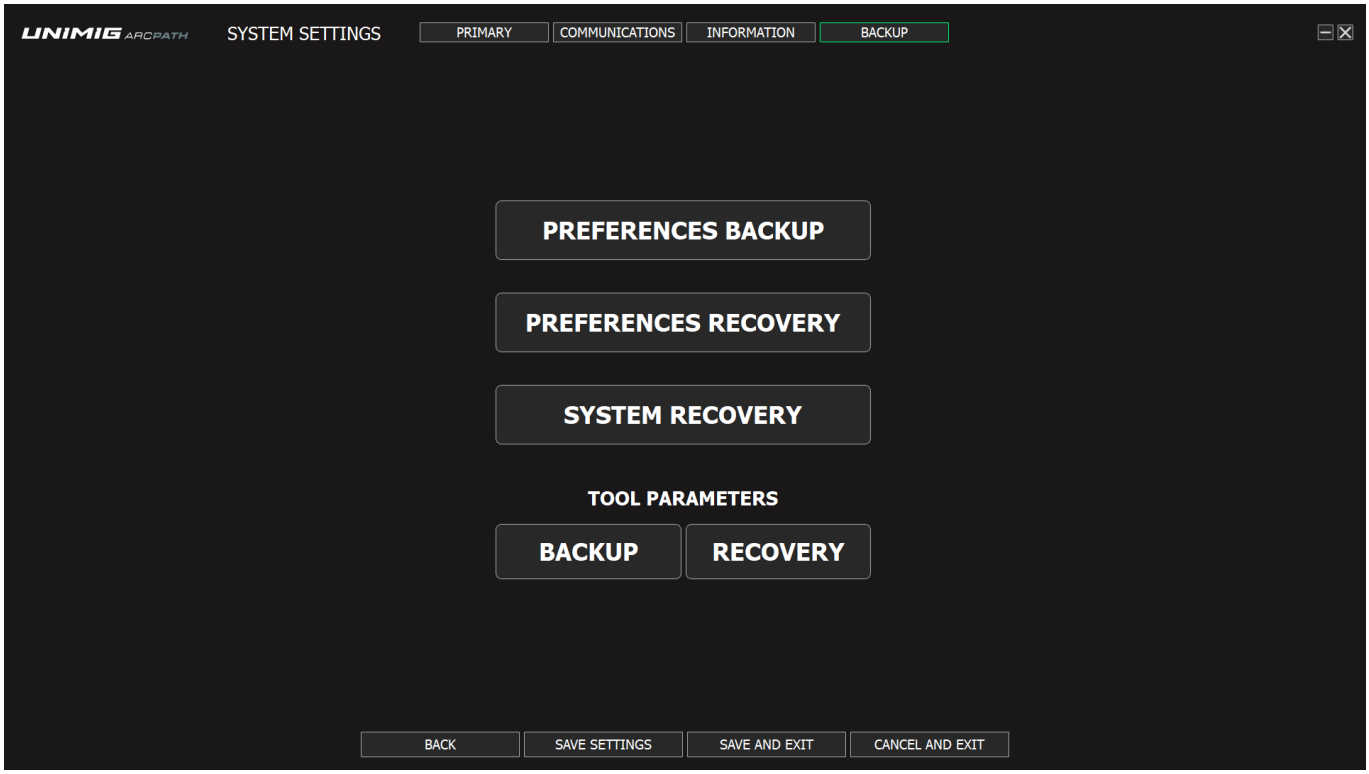
Information



The Information section of the System Settings menu displays the Model Number and Serial Number of the STEALTH CNC table, as well as the Version of software it's running.

It also displays the Support Contact details.

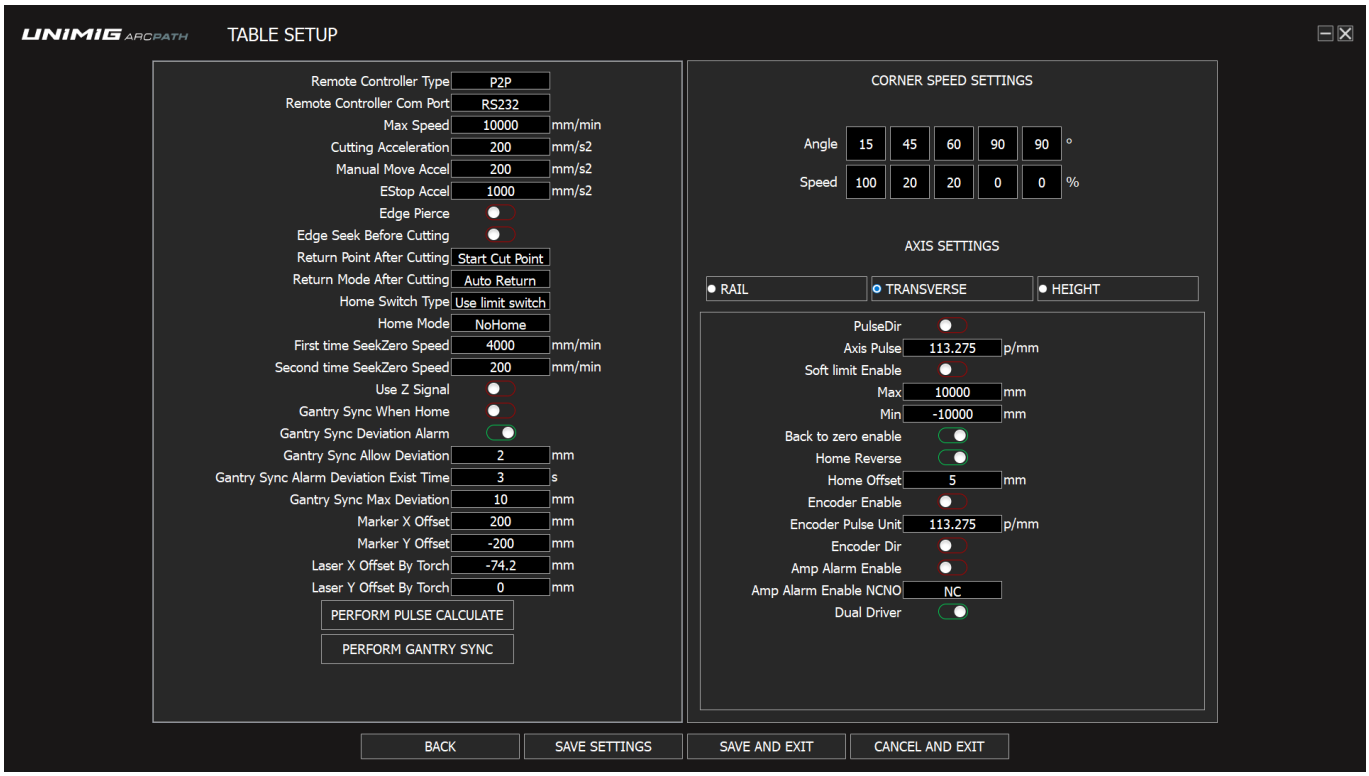
Backup



Function	Description
Preferences Backup	Saves the current ArcPath settings as the backup on the system. The Preferences Backup is password protected. The password is 1396.
Preferences Recovery	Recovers the last saved Preferences Backup to ArcPath. The Preferences Recovery is password protected. The password is 1396.
System Recovery	Restore ArcPath's factory system settings. The System Recovery is password protected. The password is 13966931.
Tool Parameters Backup	Saves the current ArcPath settings as a backup. Choose the location that the backup file will be saved to. The backup can be saved on a USB as well as the Control PC.
Tool Parameters Recovery	Restore a saved Tool Parameters Backup file by navigating to the file location and recovering it.

8.5.2 Tool+Table Setup Settings

Table Setup



Function	Value	Description
Remote Controller Type	No / P2P / 8421	Sets the type of remote controller interface.
Remote Controller Com Port	No / RS232	Sets the communication port used by the remote controller.
Max Speed	10 - 40000mm/min	Sets the maximum speed the table can move. All other set speeds cannot exceed this speed.
Cutting Acceleration	10 - 10000mm/s^2	Sets the rate of acceleration when starting and stopping.
Manual Move Acceleration	10 - 10000mm/s^2	Sets the rate of acceleration when starting and stopping while jogging.
E-Stop Acceleration	10 - 20000mm/s^2	Sets the rate of deceleration when the Emergency Stop (E-Stop) button is pressed.
Edge Pierce	On / Off	Set edge piercing on or off. When on, the torch will pause before each pierce command (M07) in the G-code. The torch can be moved to the edge of the plate to pierce or resume cutting.
Edge Seek Before Cutting	On / Off	Sets the edge seek on or off. When on, the table will seek the edge of the material before starting the cut. **A laser position sensor must be equipped to enable this setting.**
Return Point After Cutting	Finish Cut Point / Start Cut Point / Home	Sets where the torch will return after finishing a cut.
Return Mode After Cutting	Auto Return / Choose From Popup	Sets the torch movement behaviour after finishing a cut. **Auto Return** Automatically return the torch to the position set in Return Point After Cutting. **Choose From Popup** Displays a popup menu to select where the torch will return to.
Home Switch Type	Use Home Switch / Use Limit Switch	Sets which type of switch defines the home position.

Function	Value	Description
Home Mode	No Home / Home Once / Home Twice	Sets how the table handles homing operations. **No Home** The table will not automatically home after powering on or finishing a cut. **Home Once** The table will automatically home once after powering on or when reset. **Home Twice** The table will automatically home twice, once at a faster speed and a second time at a slower speed, after powering on or when reset.
First Time Seek Zero Speed	5 - 10000mm/min	Sets the speed the table will move when searching for the zero (home) position on the first pass. **This setting is only active when Home Once or Home Twice is set.**
Second Time Seek Zero Speed	5 - 10000mm/min	Sets the speed the table will move when searching for the zero (home) position on the second pass. **This setting is only active when Home Twice is set.**
Use Z Signal	On / Off	Sets whether the Z-axis will use a specific signal for positioning or homing.
Gantry Sync When Home	On / Off	Ensures that both sides of the gantry are synchronised when the table is homed. **Use Z Signal must be set to on in order to synch the gantry.**
Gantry Sync Deviation Alarm	On / Off	Enables an alarm if there is any deviation or misalignment between the two sides of the gantry.
Gantry Sync Allow Deviation	millimetres (no min/max)	Sets the maximum allowable deviation between both sides of the gantry before an alarm is triggered.
Gantry Sync Alarm Deviation Exist Time	0 - 10seconds	Sets the duration that the gantry can be out of sync before an alarm is triggered.
Gantry Sync Max Deviation	millimetres (no min/max)	The maximum deviation allowed for gantry synchronisation. If the deviation exceeds this, the system will stop and trigger an alarm.
Marker X Offset	-3000 - 3000mm	Sets the X-axis offset for the marker tool relative to the torch.
Marker Y Offset	-3000 - 3000mm	Sets the Y-axis offset for the marker tool relative to the torch.
Laser X Offset	-3000 - 3000mm	Sets the X-axis offset for the laser relative to the torch.
Laser Y Offset	-3000 - 3000mm	Sets the Y-axis offset for the laser relative to the torch.
Perform Pulse Calculate		Performs a pulse calculation, to ensure that pulse signals are properly calibrated for motion control.
Perform Gantry Sync		Performs a gantry synchronisation to ensure both sides of the gantry are aligned and moving together properly.

Corner Speed Settings

Function	Value	Description
Angle	Select up to five angles (°)	Sets the corner angles at which the machine will adjust the speed.
Speed	Select a speed (%)	Sets the cutting speed as a percentage of the maximum speed for the selected corner angles.

Axis Settings

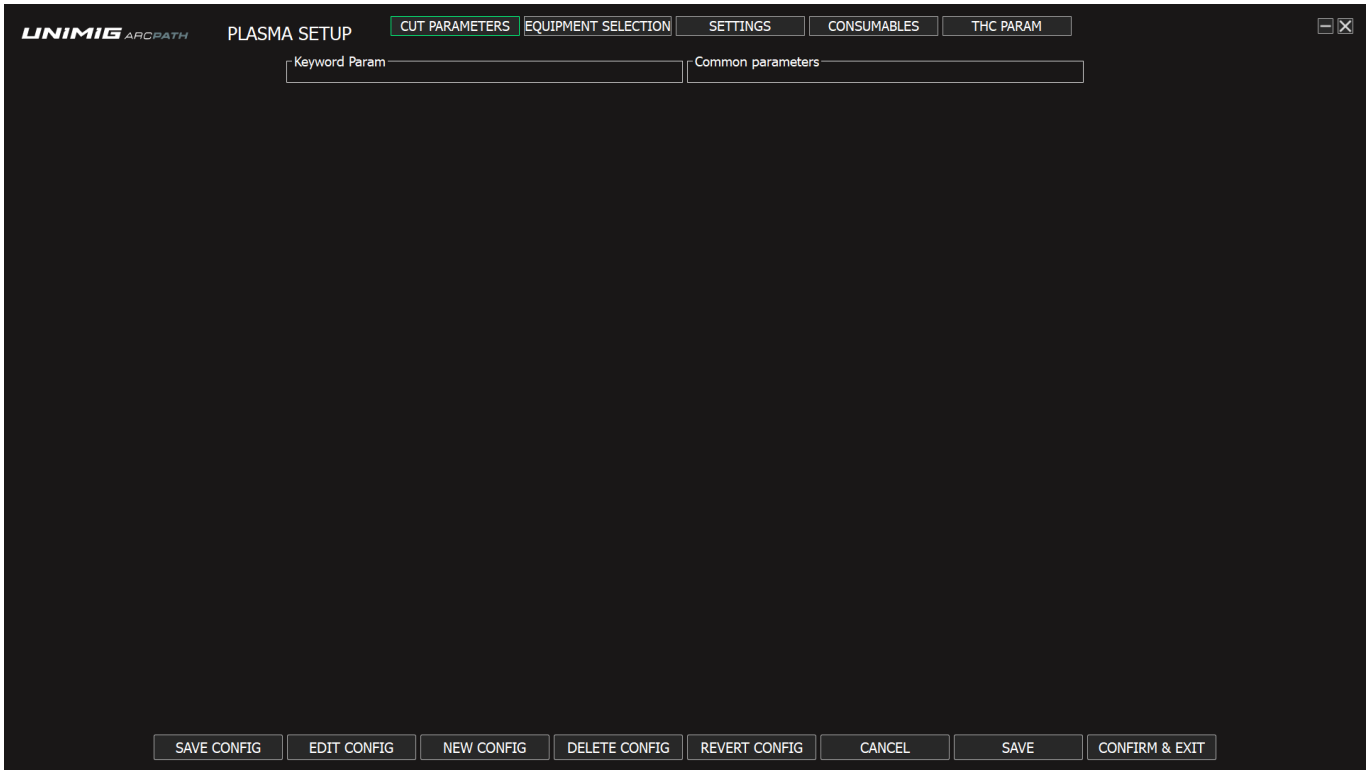
Function	Value	Description
Pulse Direction	**On / Off**	Sets the pulse direction. When on, the pulse direction is reversed.
Axis Pulse	**1 - 3000p/mm**	Sets the number of pulses per millimeter required to move the axis. This can be set to four decimal places.
Soft Limit Enable	**On / Off**	Enables software limits for the axis to prevent the machine from moving beyond a defined range, protecting against over-travel.
Max	**-99999.9 - 99999.9mm**	The upper Soft Limit of the axis, the axis cannot move beyond this limit in the positive direction. **This setting is only active when Soft Limit is enabled.**

Function	Value	Description
Min	-99999.9 - 99999.9mm	The lower Soft Limit of the axis, the axis cannot move beyond this limit in the negative direction. **This setting is only active when Soft Limit is enabled.**
Back To Zero Enable	On / Off	Sets whether the axis will return to zero after finishing a cut.
Home Reverse	On / Off	Enables the axis to move in the reverse direction to home.
Home Offset	0 - 99999mm	Sets the amount the table offsets the torch from the home position once homing is completed.
Encoder Enable	On / Off	Enables the use of an encoder as the motion controller.
Encoder Pulse Unit	0 - 3000p/mm	Sets the number of pulses per millimeter for the encoder.
Encoder Direction	On / Off	Sets the direction of the encoder feedback. When on, the feedback direction is reversed.
Amp Alarm Enable	On / Off	Enables the amplifier alarm, which monitors current levels to detect issues with the motors or motion systems.
Amp Alarm Enable NCNO	NC / NO	Sets whether the amplifier alarm is Normally Closed (NC) or Normally Open (NO).
Axis Move Config	Corresponding axis port(s)	Displays the port the corresponding axis has been connected to.
Dual Driver	On / Off	Enables the use of two motors for synchronised, precise control of the transverse axis.

The settings available on the Axis Settings panel will depend on the whether the Rail (X), Transverse (Y) or Height (Z) axis is selected.

Plasma Setup

Cut Parameters



Cut Parameters

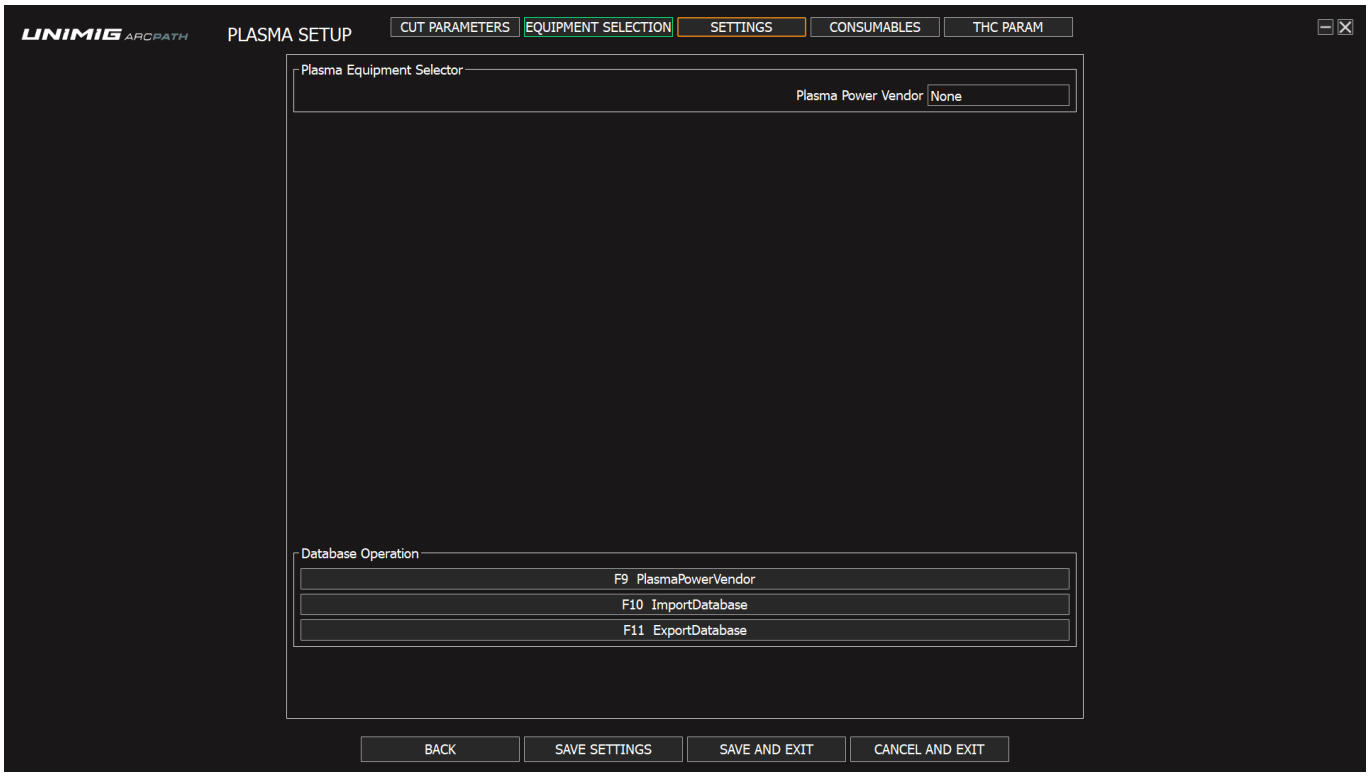
- Material Type
- Material Thickness
- Process Current
- Technology
- Torch Type
- Specific Material
- Plasma / Shield Gases
- Cutting Surface

Common Parameters

- Cut Speed
- Kerf
- Ignition Height
- Cut Height
- Pierce Height
- Pierce Time
- Set Arc Voltage
- Cut Speed Hole
- Cutting Height Hole
- Arc Closing Time In Advance
- Kerf Hole
- Cut Height Delay
- Creep Time
- Set Arc Current
- Advance Off

The settings available in the Cut Parameters will depend on the selected equipment vendor.

Equipment Selection



The equipment selection section allows for the selection of the brand of plasma cutter connected to the table. Selecting the connected equipment provides access to the cutting databases for the chosen brands/vendors.

ArcPath needs to be restarted for changes to the selected equipment vendor to take effect.

Plasma Equipment Selector

Displays the following information about the selected vendor:

Plasma Power Vendor

The selected vendor.

Plasma Power

The plasma cutters available for the selected vendor.

Gas Box

The gas connected to the plasma cutter.

Torch

The plasma torch attached to the plasma cutter.

File

The cutting database available.

Database Operation

Plasma Power Vendor (F9)

Select the vendor from the dropdown menu.

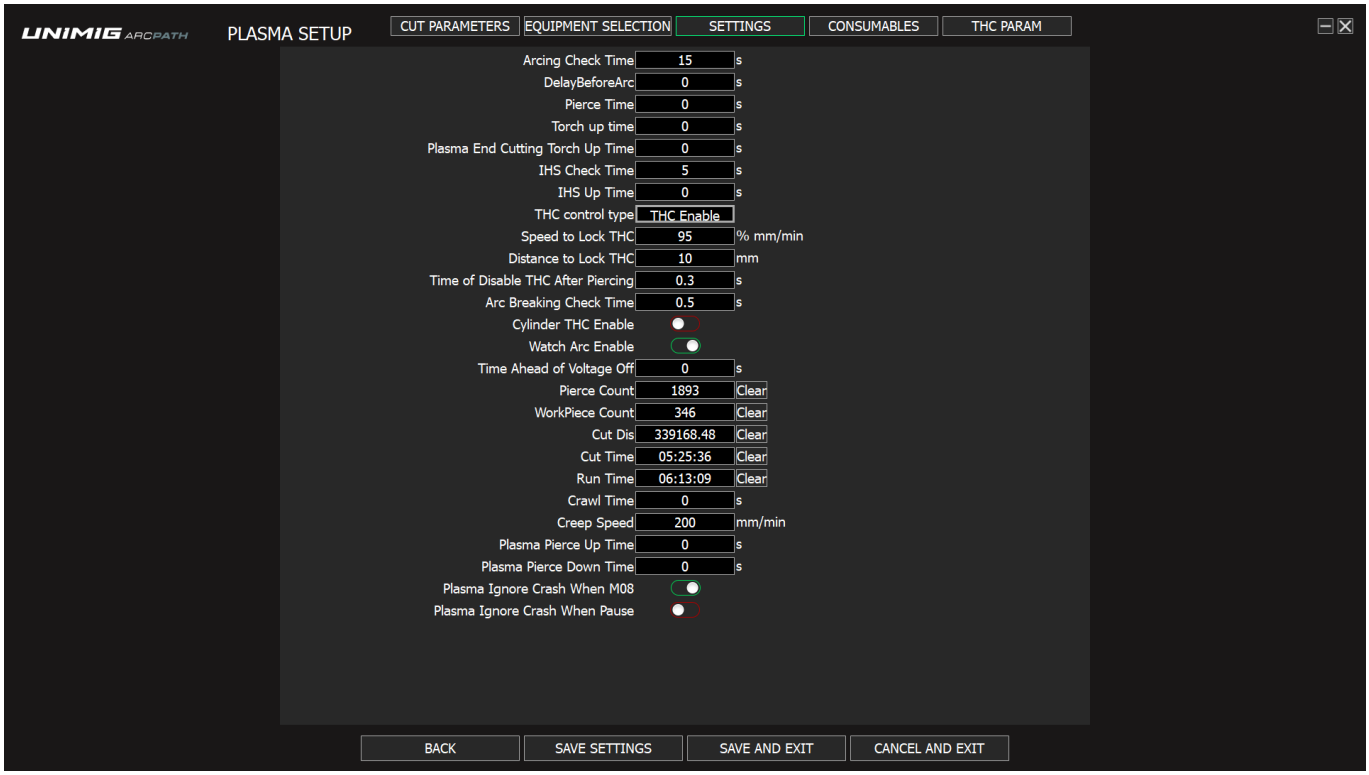
Import Database (F10)

Import the cutting databases available to the selected vendor.

Export Database (F11)

Export the cutting databases available to the selected vendor.

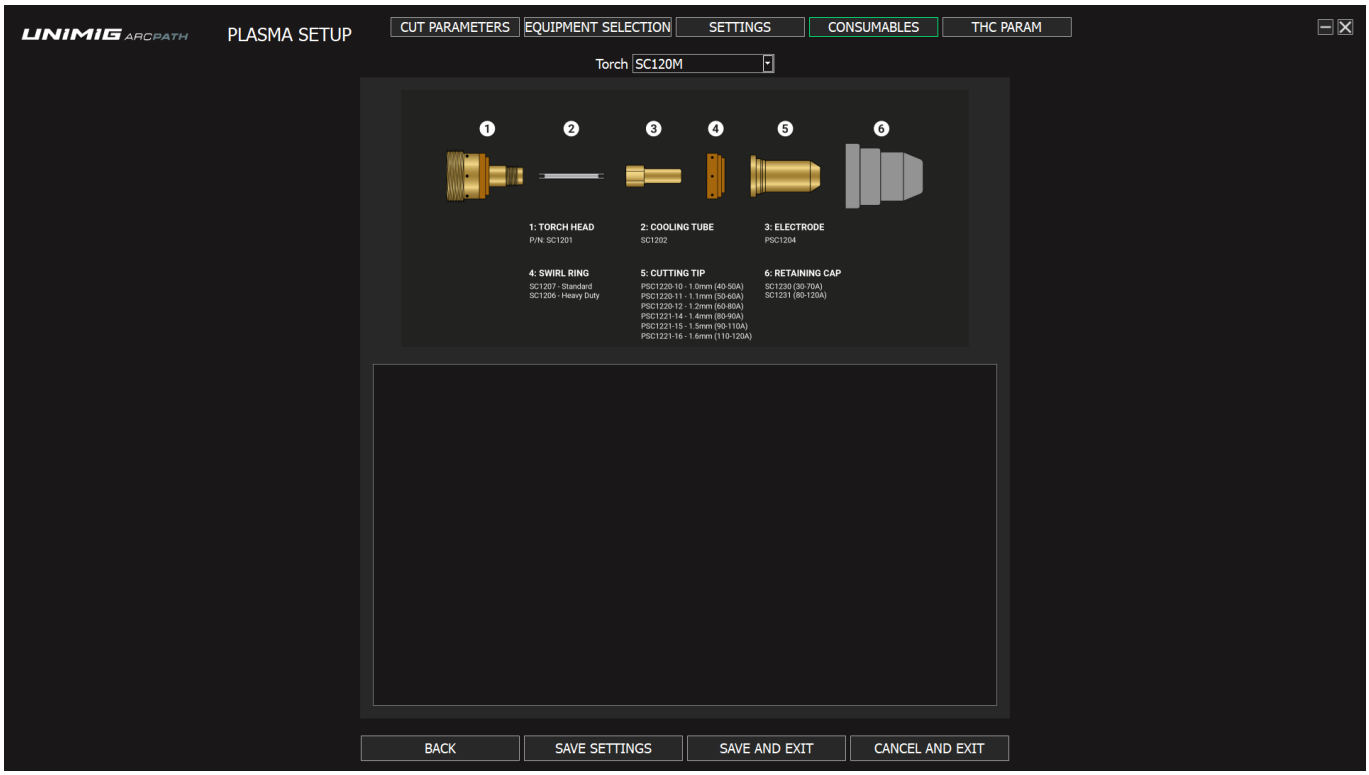
Settings



Setting	Value	Description
Arcing Check Time	0 - 60seconds	Sets the amount of time the system waits to check if the plasma arc has been established before triggering an alarm.
Delay Before Arc	0 - 60seconds	Sets the amount of time between the start signal and the arc ignition. *When set to 0, the system will skip this step.*
Pierce Time	0 - 60seconds	Sets the amount of time the torch will pierce for before moving to the cutting height. *When set to 0, the system will skip this step.* **This setting is only applicable when not using a THC system. With a THC installed, it can be set to 0.1.**
Torch Up Time	0 - 30seconds	Sets the amount of time the torch will rise for after an arc break.
Plasma End Cutting Torch Up Time	0 - 30seconds	Sets the amount of time the torch will rise for at the end of a cut.
IHS Check Time	0 - 60seconds	Sets the amount of time allowed for the Initial Height Sensing (IHS) system to detect the material surface before starting the cut. *When set to 0, the system will skip this step.*
IHS Up Time	0 - 60seconds	Sets the amount of time the torch rises back up after the IHS check has been completed before moving on. *When set to 0, the system will skip this step.*
THC Control Type	THC Enable / Close THC	Sets whether the Torch Height Control (THC) system is enabled. The THC automatically adjusts the torch height based on real-time voltage readings to maintain optimal cutting height.
Speed To Lock THC	1 - 100% mm/min	Sets the speed percentage value that the THC will lock its height. When the cutting speed is lower than the set value, the THC will lock to improve the cut quality. *A setting of 95% will lock the THC when the speed is 95% lower than the set cutting speed.*
Distance To Lock THC	0 - 50mm	Sets the distance that the THC will lock its height. If the length of the cut is shorter than the set distance, the THC will lock to improve the cut quality.
THC Disable Time After Piercing	0 - 30seconds	Sets the amount of time the THC system is disabled after the torch completes a pierce. This prevents unwanted torch movements while transitioning from pierce to cut.
Arc Breaking Check Time	0 - 10seconds	Sets the amount of time the system checks for an arc break before triggering an alarm.
Cylinder THC Enable	On / Off	Enables the use of a cylinder-based THC system which uses pneumatic mechanisms to control the torch height.
Watch Arc Enable	On / Off	Allows the system to actively monitor the plasma arc, checking for issues like arc loss or instability.

Setting	Value	Description
Time Ahead Of Voltage Off	-3 - 3seconds	Sets the amount of time before the system disables voltage to the plasma cutter and stops the arc if the M08 M-code is not set to 0.
Pierce Count		Displays the total number of pierces performed by the table. *Press "Clear" to reset the value counter to 0.*
Workpiece Count		Displays the total number of workpieces cut by the table. *Press "Clear" to reset the value counter to 0.*
Cut Distance		Displays the total distance the torch has traveled while cutting. *Press "Clear" to reset the value counter to 0.*
Cut Time		Displays the total time spent cutting. *Press "Clear" to reset the value counter to 0.*
Run Time		Displays the total time the table has been running. This includes cutting time, jogging time and M07 M-code time. *Press "Clear" to reset the value counter to 0.*
Crawl Time	0 - 10seconds	Sets the amount of time the table travels at the creep speed. The crawl time is necessary when there is an accumulation of slag at the pierce point and the torch is walked forward. The crawl time prohibits height adjustment for its duration to protect the torch and avoid collisions. *When set to 0, the system will skip this step.*
Creep Speed	5 - 6000mm/min	Sets the speed at which the table operates during the crawl time.
Plasma Pierce Up Time	0 - 15seconds	Sets the amount of time for raising the torch after a pierce is completed. **This setting is only applicable when not using a THC system. With a THC installed, it can be set to 0.**
Plasma Pierce Down Time	0 - 15seconds	Sets the amount of time for lowering the torch before initiating a pierce. *When set to 0, the system will skip this step.*
Plasma Ignore Crash When M08	On / Off	When enabled, the table will ignore torch crashes during the M08 command when enabled.
Plasma Ignore Crash When Pause	On / Off	When enabled, the table will ignore any torch crashes or issues that occur when the table is paused.

Consumables



Displays the list of consumable parts for the selected torch.

THC Param

The THC number selects the Torch Height Controller (THC) unit being configured. It is displayed and can be selected on every menu.

Common

Setting	Value	Description
Set Arc Voltage	30 - 300V (voltage)	Sets the target arc voltage that the THC will try to maintain during cutting. Higher arc voltages typically result in the torch being positioned farther from the material, while lower voltages bring the torch closer.
Pierce Delay	0 - 9.99seconds	Sets the amount of time the torch will pierce for before moving to the cutting height.
D C IHS Up Time	0 - 9.99seconds	Sets the amount of time after the Initial Height Sensing (IHS) detects the material to move the torch upwards to the pierce height.
Arc Moment Up Time (P19)	0 - 9.99seconds	Sets the amount of time for the torch to move up after the arc momentarily stops or if the system detects a potential issue with the arc.
Finish Cutting Up Gun Time	0 - 10seconds	Sets the amount of time for raising the torch after the cutting operation is completed.
IHS Height Speed Down Time (P20)	0 - 20seconds	Sets the amount of time allowed for the torch to move down to the material during the IHS process.
THC Sensitivity (P07)	0 - 50	Sets how sensitive the Torch Height Control (THC) system is to changes in arc voltage. Higher sensitivity means the system will adjust the torch height more rapidly when the arc voltage fluctuates.
Arc Dead Zone (P06)	0 - 10V (voltage)	Sets the dead zone for the arc. The dead zone is an arc voltage range where the THC does not make adjustments. If the arc voltage fluctuates within this range, the THC will not change the torch height.
Arc Protection Value (P05)	0 - 100V (voltage)	Sets the arc voltage limit for protection. If the arc voltage drops or rises beyond this value, the THC system will trigger a protective action, stopping the cut to prevent damage.
Allow Collide Times (P11)	0 - 5	Sets the number of times the system will allow the torch to collide with the material before stopping or triggering an alarm. 0 indicates that collisions are not allowed.
Locate Low Speed (P33)	0 - 50	Sets the speed at which the torch moves when it is in the locating phase (such as during homing).

System

Setting	Value	Description
Manual Up Speed (P01)	0 - 50	Sets the speed at which the torch moves upward when manually adjusting the height.
Manual Down Speed (P02)	0 - 50	Sets the speed at which the torch moves downward when manually adjusting the height.
Auto Up Speed (P03)	0 - 50	Sets the automatic upward speed when the THC system adjusts the torch height.
Auto Down Speed (P04)	0 - 50	Sets the automatic downward speed when the THC system adjusts the torch height.
No Cutting Collision Up Time (P08)	0 - 9.99seconds	Sets the amount of time the system allows the torch to move up without cutting, in case of a collision or near-miss, to avoid material damage or torch collision.
Started Up Time (P17)	0 - 9.99seconds	Sets the amount of time for the torch to move upward when the cutting process starts.
Arc Delay (P16)	0 - 9.99seconds	Sets the amount of time before the THC system engages after detecting the arc.
Arc Smart Adjust Enable (P10)	On / Off	Enables the automatic adjustment of the arc voltage in real-time based on cutting conditions.
Arc Smart Adjust Value (P09)	1 - 20V (voltage)	Sets the voltage range which the Arc Smart Adjust feature operates within. The torch height will automatically adjust when the arc voltage fluctuates by the set amount.
Motor Forward (P12)	On / Off	Enables the motor to move in the forward direction when needed during cutting or positioning.
Brake Speed (P14)	0 - 50	Sets the brake speed of the torch. When the torch reaches its desired position, this setting adjusts how quickly the movement stops.
Contrarotation Switch Speed (P15)	0 - 100	Sets the speed at which the torch switches direction when it is moving up or down and needs to reverse direction. A higher speed allows for quicker direction changes, while a lower speed provides more control.
Shield Collision Detect Enable (P21)	On / Off	Enables the system to monitor for collisions between the torch shield and the material and will stop or raise the torch if a collision is detected.
Proximity Switch Collision Detect Enable (P31)	On / Off	Enables the detection of collisions using a proximity switch. If the proximity sensor detects the torch is too close to the material, the system will take action to prevent a collision.
Arc On Pin Selection (P31)	0	Specifies which pin on the control board is responsible for sending the arc on signal.
THC Mode (P32)	Arc Mode	Sets the operational mode of the Torch Height Control (THC) system.

Setting	Value	Description
Arc Adjust		Corrects the voltage displayed by the THC if it does not match the actual voltage output.
Reset Params		Resets the THC settings to their default value.
THC Update		Applies updates to the THC configuration or settings.

Input Diagnose

CNC Auto
Displays whether the CNC table is in automatic mode. In automatic mode, the CNC machine follows predefined G-code commands for cutting operations. When green, the table is in Auto mode.

CNC THC Up
Displays whether the Torch Height Control (THC) is commanding the torch to move upward. When green, the torch is moving up.

CNC THC Down
Displays whether the Torch Height Control (THC) is commanding the torch to move downward. When green, the torch is moving down.

CNS IHS Arc On
Displays whether the Initial Height Sensing (IHS) system has detected the material and is ready for the arc to be turned on. When green, the IHS check has completed successfully.

CNC Direct Arc
Displays whether the plasma arc has been initiated directly by the CNC controller. When green, the arc is ignited.

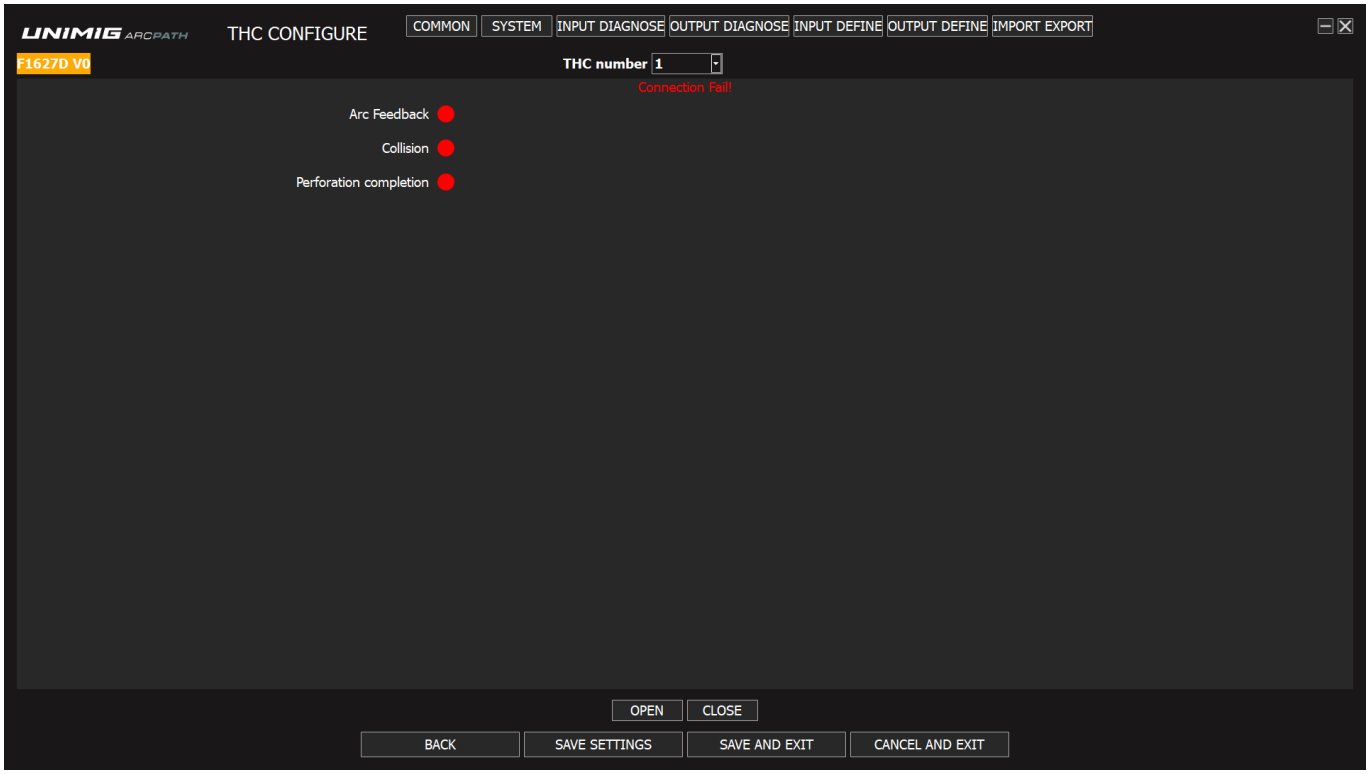
Motor Up Limit
Displays the status of the upper limit switch for the torch movement. When green, the upper limit has been reached.

Motor Down Limit
Displays the status of the lower limit switch for the torch movement. When green, the lower limit has been reached.

Shield Collision Detect
Displays whether the torch shield has collided with the material or any obstruction. When green, a collision has been detected.

Proximity Switch
Displays the status of the proximity switch, which detects whether the torch is approaching the material. When green, the proximity switch is operating normally.

Output Diagnose

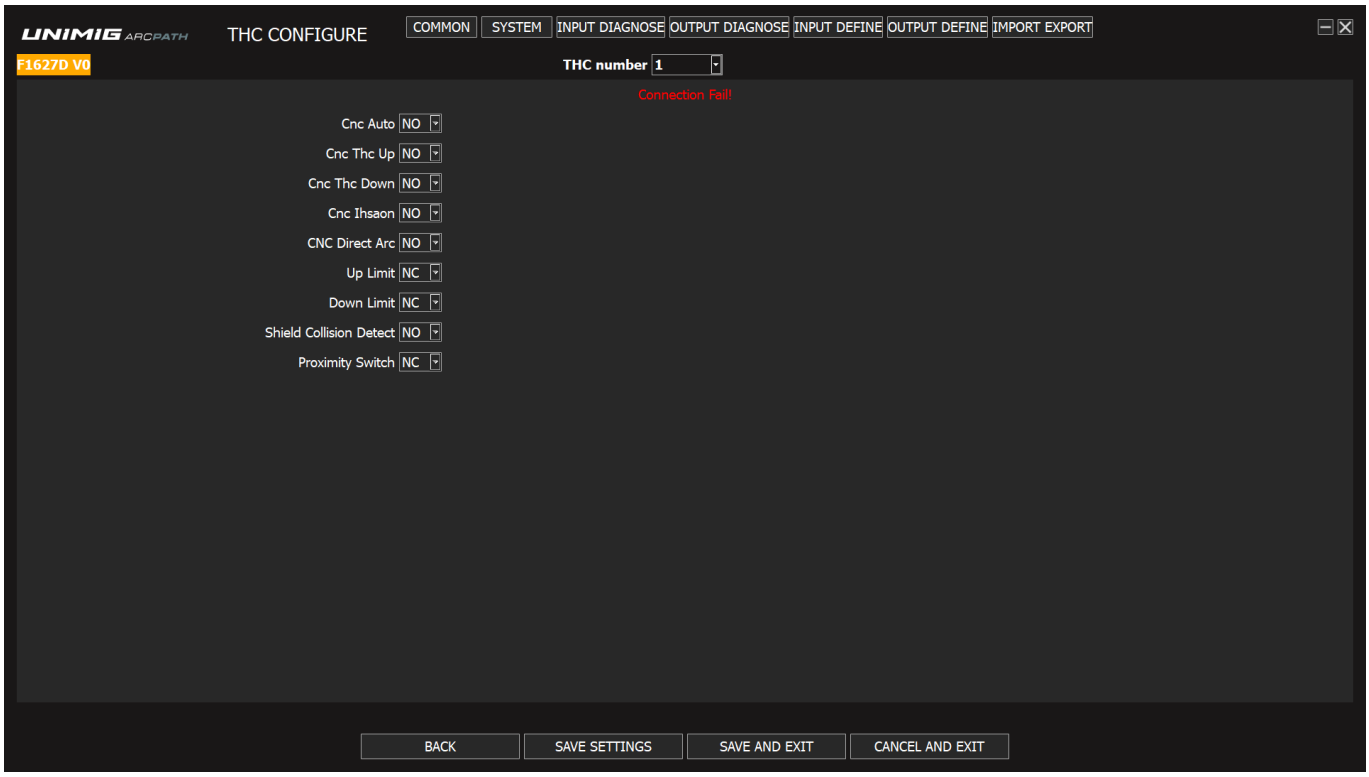


Arc Feedback
Displays the arc feedback signal is active. The arc feedback signal confirms that the plasma arc is present and stable. When green, the arc feedback is working.

Collision
Displays whether a collision has been detected between the torch and the material or an obstruction. When green, a collision has been detected.

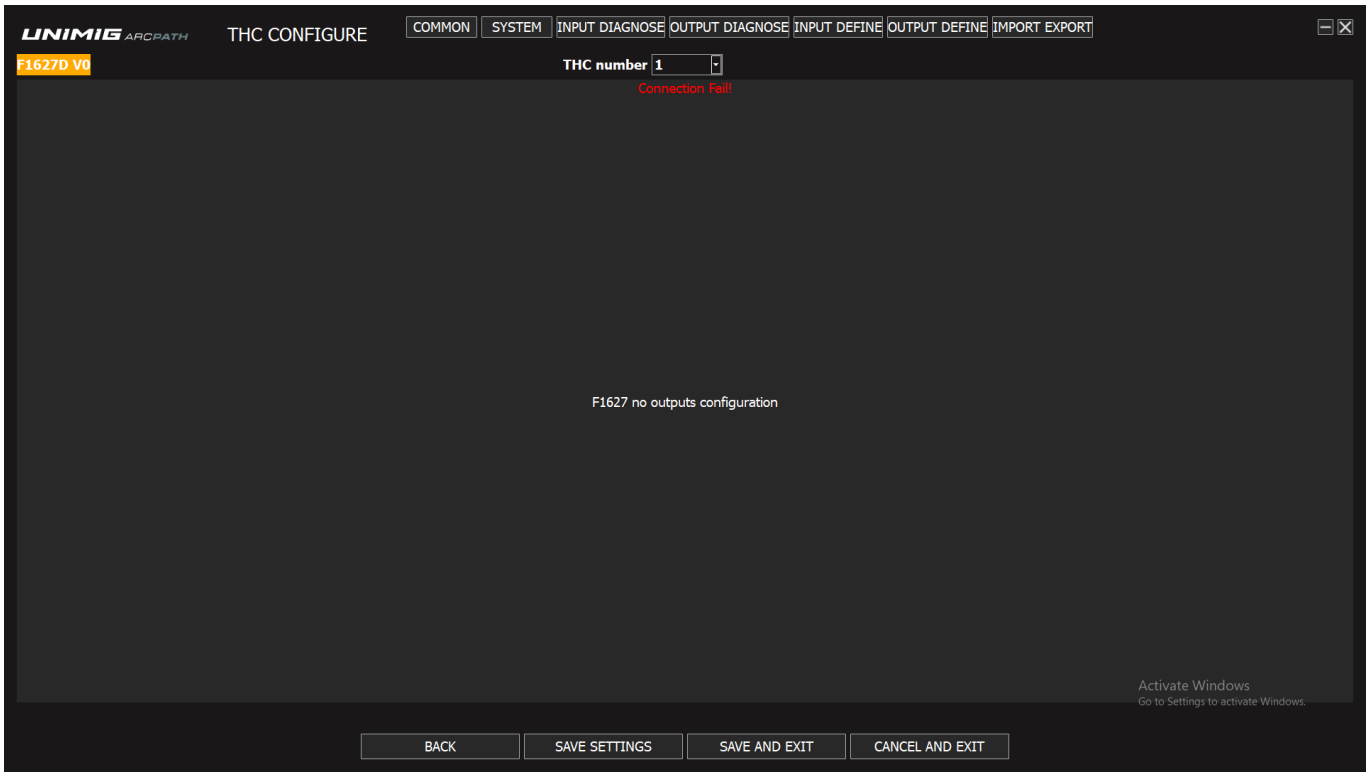
Perforation Completion
Displays whether the perforation (piercing) process has been completed. When green, the piercing process has finished.

Input Define



Setting	Value	Description
CNC Auto	NC / NO	Sets whether the CNC Auto is Normally Closed (NC) or Normally Open (NO). When set to NO, the system is not in automatic mode.
CNC THC Up	NC / NO	Sets whether the CNC THC Up is Normally Closed (NC) or Normally Open (NO). When set to NO, the torch will not automatically move up.
CNC THC Down	NC / NO	Sets whether the CNC THC Down is Normally Closed (NC) or Normally Open (NO). When set to NO, the torch will not automatically move down.
CNS IHS Arc On	NC / NO	Sets whether the CNS IHS Arc On is Normally Closed (NC) or Normally Open (NO). When set to NO, the arc won't automatically ignite after height sensing.
CNC Direct Arc	NC / NO	Sets whether the CNC Direct Arc is Normally Closed (NC) or Normally Open (NO). When set to NO, the arc won't ignite automatically.
Motor Up Limit	NC / NO	Sets whether the Motor Up Limit is Normally Closed (NC) or Normally Open (NO). When set to NC, the circuit is closed until the torch reaches the upper limit, at which point it opens, stopping further upward movement.
Motor Down Limit	NC / NO	Sets whether the Motor Down Limit is Normally Closed (NC) or Normally Open (NO). When set to NC, the circuit is closed until the torch reaches the lower limit, stopping further downward movement when it opens.
Shield Collision Detect	NC / NO	Sets whether the CNC Auto alarm is Normally Closed (NC) or Normally Open (NO). When set to NO, the system actively monitors for collisions. If the torch shield makes contact with an object or the material, the circuit closes, stopping the machine to avoid damage.
Proximity Switch	NC / NO	Sets whether the CNC Auto alarm is Normally Closed (NC) or Normally Open (NO). When set to NC, the proximity switch circuit is closed until the torch gets too close to the material, and then it opens, triggering a response to avoid a collision.

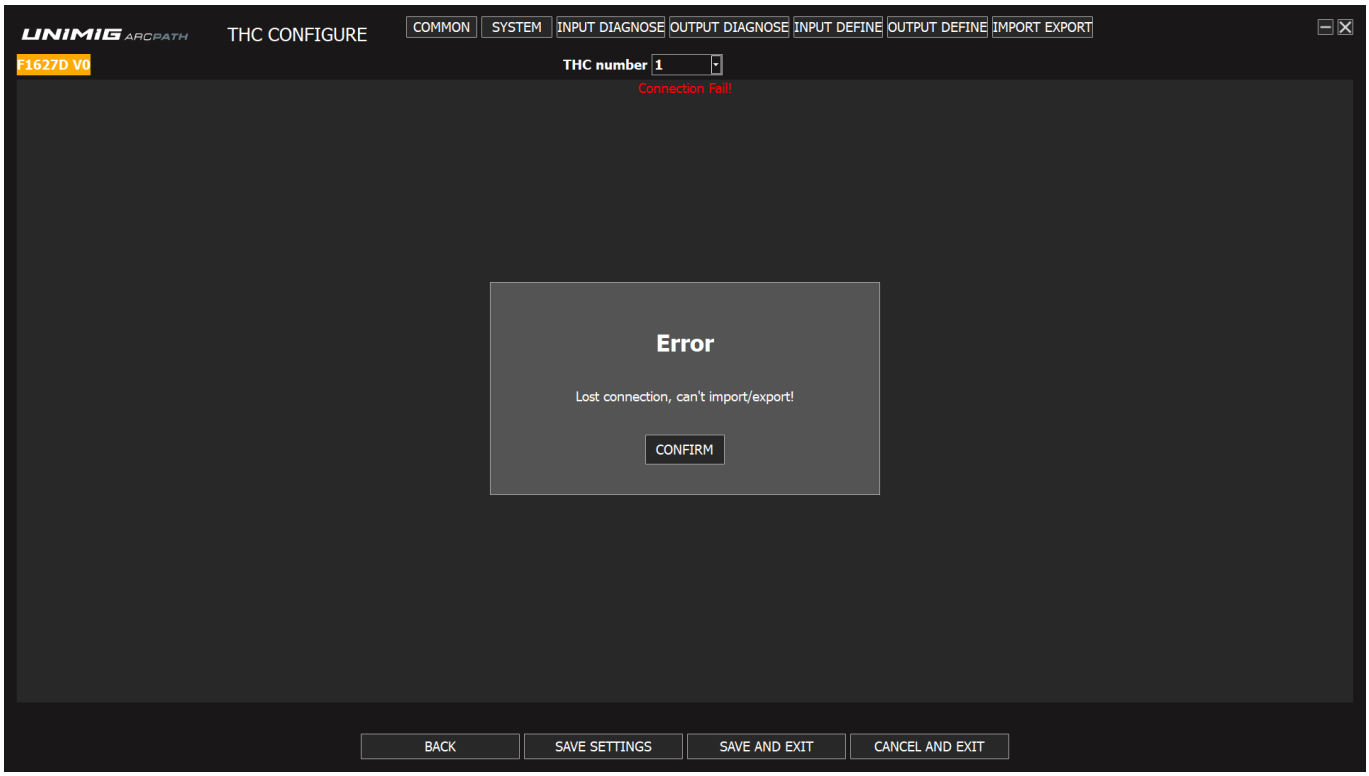
Output Define



The Output definition of the 1627 THC models is fixed, so there are no available outputs.

> ⚠ **It is not recommended to adjust these outputs, these are used to complete the activation and setup of the THC on the CNC table.**

Import/Export



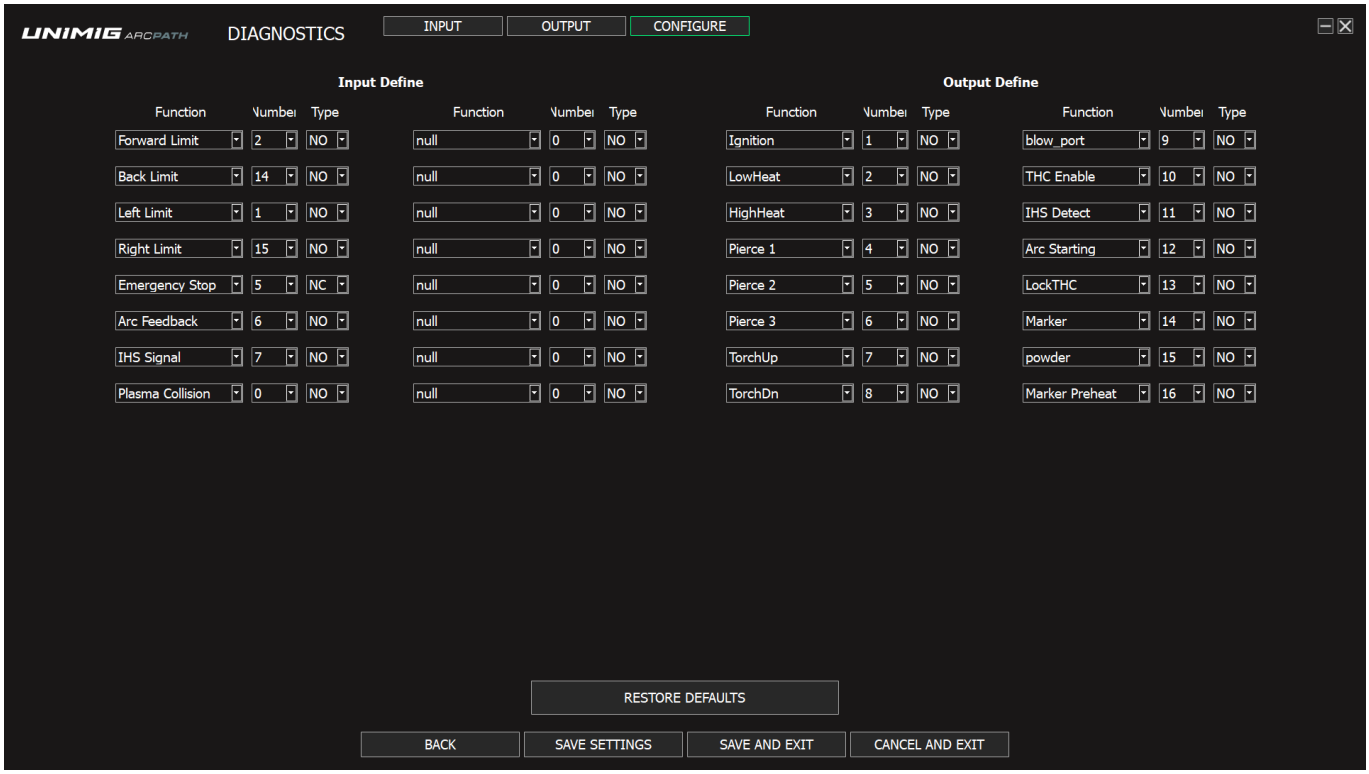
The THC parameters can be set up on one table, the data exported, and then imported onto a second table. After that, minor adjustments can be made based on the specific differences between tables. This significantly helps to increase production efficiency, rather than manually configuring all parameters for each machine.

> ⚠ **It is not recommended to adjust these outputs, these are used to complete the activation and setup of the THC on the CNC table.**

If there is no connection or the connection is lost, an error message will pop up “Lost connection, can’t import/export!”

8.5.3 Diagnostics

The Diagnostics menu lets you select the different functions to be tracked and monitored during operation of the table and whether they're Normally Open (NO) or Normlly Closed (NC).



Input Define Functions		Output Define Functions	
null	copy2_limit_p	null	spray_enable_thc
Forward Limit	copy2_limit_n	Ignition	spray_file_switch
Back Limit	copy3_limit_p	LowHeat	laser_on
Left Limit	copy3_limit_n	HighHeat	
Right Limit	copy4_limit_p	Pierce 1	
Emergency Stop	gantry2_limit_n	Pierce 2	
Arc Feedback	gantry2_limit_p	Pierce 3	
IHS Signal	x_home_switch	TorchUp	
Plasma Collision	y_home_switch	TorchDn	
Demo	gantry2_home_switch	blow_port	
Back	copy2_home_switch	THC Enable	
Move Left Input	copy3_home_switch	IHS Detect	
Move Right Input	copy4_home_switchv	Arc Starting	
Acceleration Input	8421 Bit0	LockTHC	
Deceleration Input	8421 Bit1	Marker	
torch_up_input	8421 Bit2	powder	
torch_down_input	8421 Bit3	Marker Preheat	
spray_torch_up_input	8421 Bit4	OpenDrillGun	
spray_torch_down_input	8421 Bit5	Open Drill Aircylinder	
advance_motion	8421 Bit6	Close Drill Aircylinder	
retreat_motion	8421 Bit7	Cut Mode	
z_limit_p		plasma_switch_gas	
z_limit_n		motion	
auto_start		spray_torch_up	
auto_stop		spray_torch_down	

Null indicates nothing has been selected.

Navigation Buttons

Back

Returns to the previous menu without saving any changes.

Save Settings

Saves the changes you have made to the settings.

Save and Exit

Saves the changes and exits the settings menu.

Cancel and Exit

Exits the settings menu without saving any changes.

Save Config

Saves the current set of cut parameters as a configuration.

Edit Config

Opens the configuration for editing.

New Config

Creates a new configuration for cut parameters.

Delete Config

Deletes the selected configuration.

Revert Config

Reverts the current configuration to its previous settings.

Cancel

Exits the menu without saving any changes.

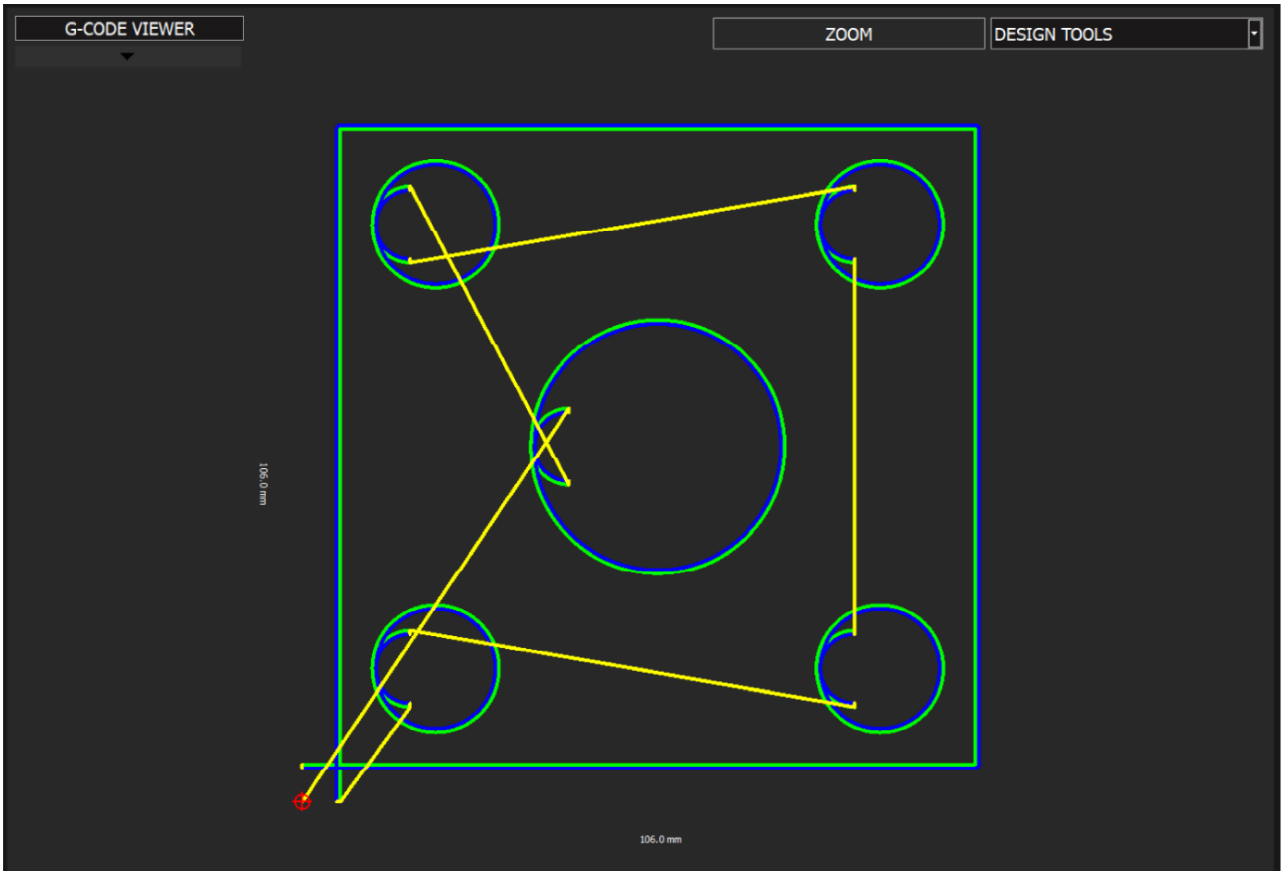
Save

Saves the changes made to the cut parameters.

Confirm & Exit

Saves the current settings and exits the menu.

8.6 Design Panel



The following is a colour breakdown of the various lines displayed on the design panel:

Design Path

The green lines indicate the drawn lines of the G-code design.

Kerf Offset

The blue lines indicate the kerf compensation and whether it will be on the inside or outside of the cut.

Tool Path

The yellow lines indicate the path the tool or torch will take.

Jog Path

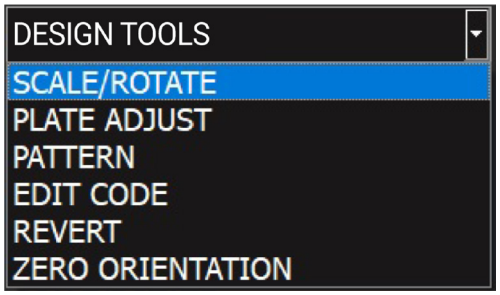
The purple lines indicate the path on which the torch has been jogged. Updating the Job Zero position removes this line.

The red crosshair indicates the current torch position.

The black crosshair indicates the Job Zero location.

The maximum dimensions of the design, which correspond to the X and Y dimensions, are displayed to the left and bottom of the design.

8.7 Design Tool Menu



8.7.1 Scale/Rotate

Adjust the scale, rotation, or mirroring of your design.

Scale

Factor
Scale the design by a factor. For example, a factor of 0.5 will half the size, while a factor of 3 will triple the size.

%
Scale the design by percentage.

X
Scale the design by the length of the X-axis.

Y
Scale the design by the length of the Y-axis.

Rotate

Rotate the design by inputting the angle.

Mirror

Select the X or Y toggles to mirror the design left/right or up/down.

8.7.2 Plate Adjust

Adjust the position and alignment of the plate on the display panel to align it with your desired cutting area and plate alignment on the table. This tool helps ensure that the workpiece is properly aligned with the cutting path. To manually adjust the plate angle:

1. Move the torch to the desired point along the edge or corner of the plate.
2. After positioning the torch, press “X-Start Point” to set the adjustment’s starting point.
3. Move the torch to a second point along the plate’s edge and press Y-ok. The system will calculate the offset angle automatically.

The end point (Y-ok) cannot be the same as the X-Start Point.

Based on the two points the selected, the system automatically adjusts the plate’s angle and corrects the graphical representation to reflect the alignment of the plate.

Once the adjustment is complete, the system will confirm whether to return to the original starting point or stay at the current position. This helps ensure that any further adjustments can be made from the same origin.

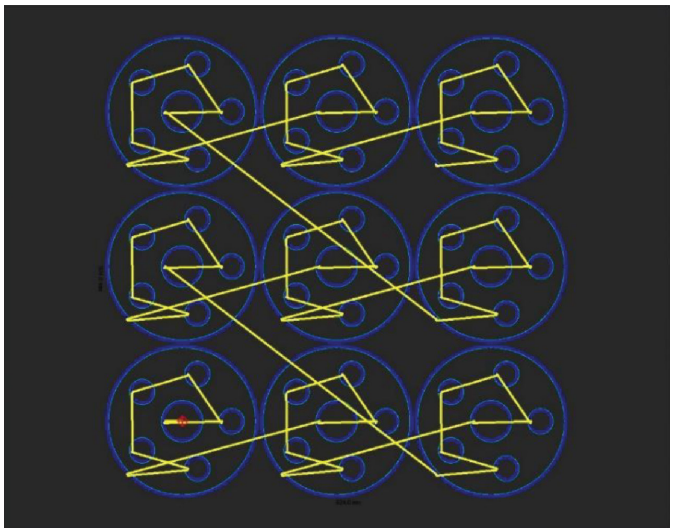
If you know the angle that the plate needs to be rotated by, it can be input manually. After confirming the angle, the system will rotate the design accordingly, where positive angles rotate counterclockwise, and negative angles rotate clockwise.

Adjusting the plate in this tool will reduce the cutting area.

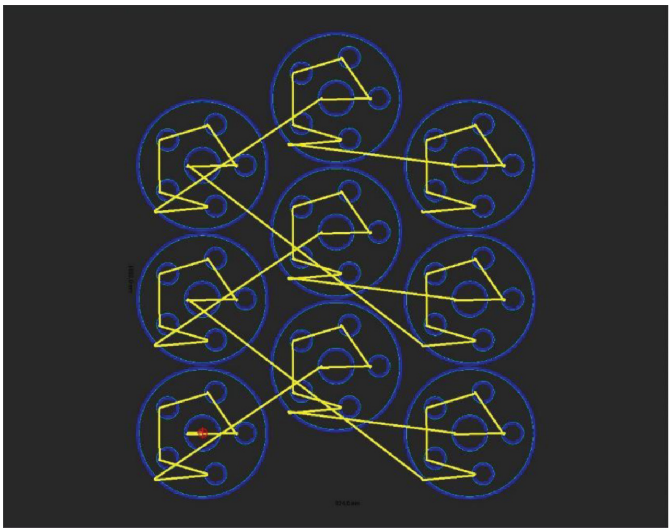
8.7.3 Pattern

Duplicate the same design in a pattern of rows and columns. There are three ways to set the pattern: straight, stagger, nest.

Straight patterns will sit directly in line with each other. Staggered patterns will shift the columns up and down, which can be used to more completely fill the empty spaces, especially with circular shapes.



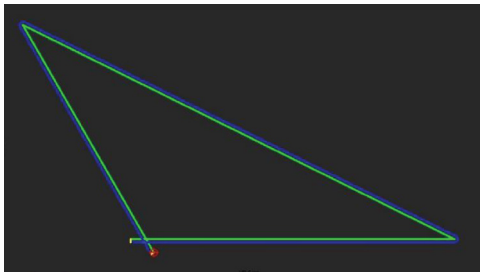
Straight



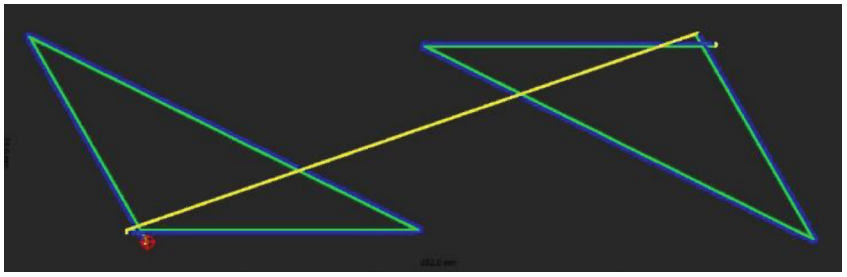
Staggered

Nested patterns create a 180° mirrored design and stacks the two together as a pair. Then, it takes the new paired design and arranges them in a matrix.

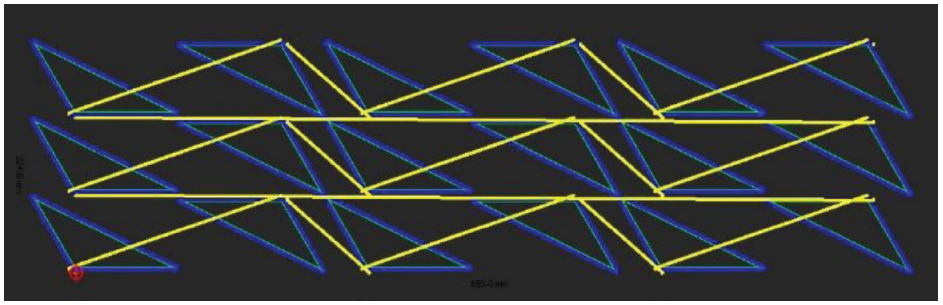
The nested pattern feature is mainly suited for certain shapes, including triangles, trapezoids, etc.



Original Design



Mirrored Pair



Nested Matrix

Set the number of rows and columns.

Set the margins between the duplications using the Y & X Pattern Offsets. These values can be negative.

Set the distance between the rows and columns in nested patterns using the Row & Column Distance.

8.7.4 Edit Code

Directly edit the G-code file. When a line of code is selected, the corresponding section on the displayed design will highlight.

8.7.5 Revert

Pressing “Revert” will revert the design to its original saved state.

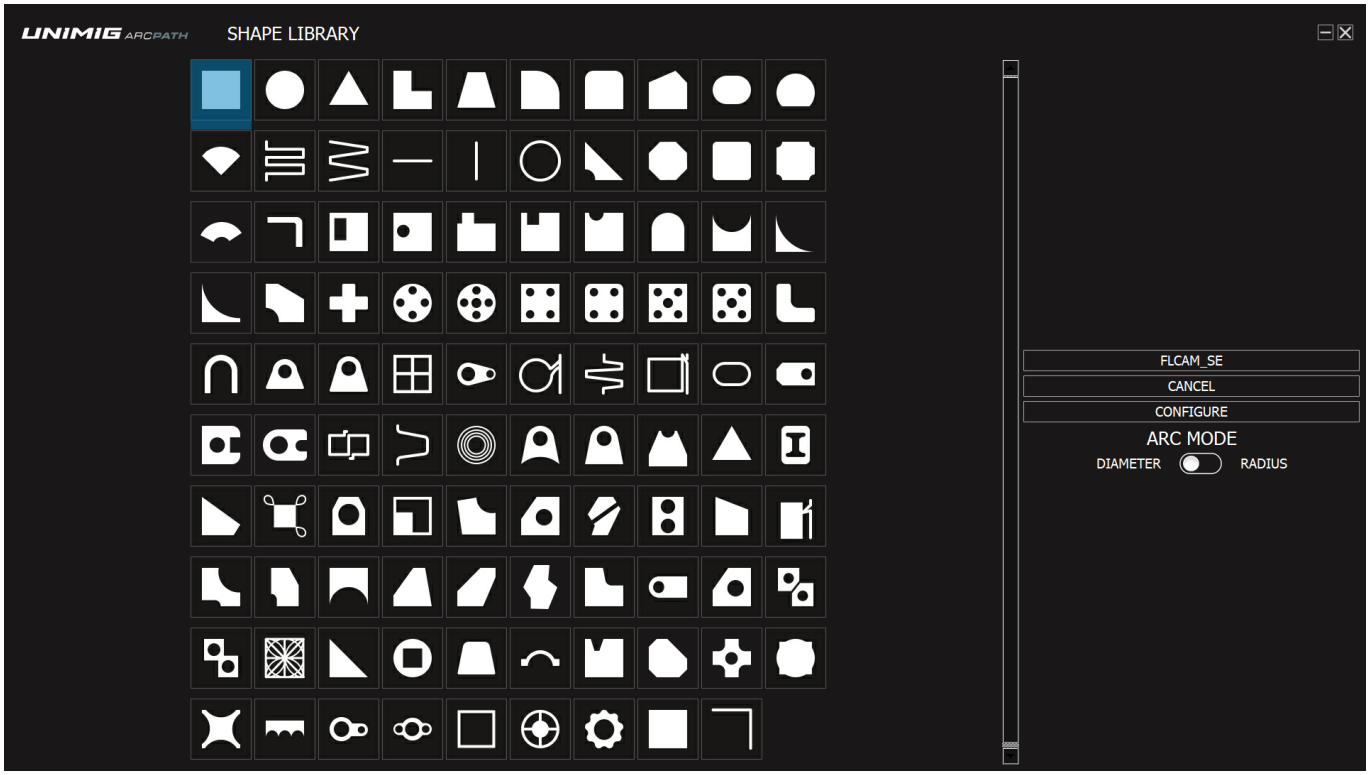
> **This cannot be undone.**

8.7.6 Zero Orientation

Sets the orientation of your design relative to the job zero position. Setting the zero orientation ensures that the design is accurately positioned on the material, and the machine will start cutting at the desired location.

- Centre
- Bottom left
- Top left
- Top right
- Bottom right

8.8 Shape Library



The shape library provides 99 pre-programmed shapes to choose from.

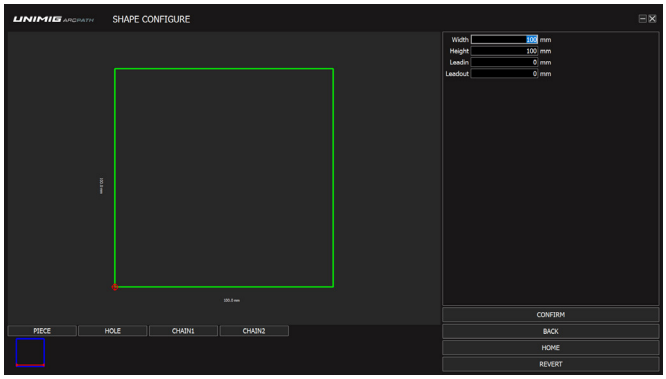
To load a shape for cutting, select the shape, press “Configure” and then press “Confirm.”

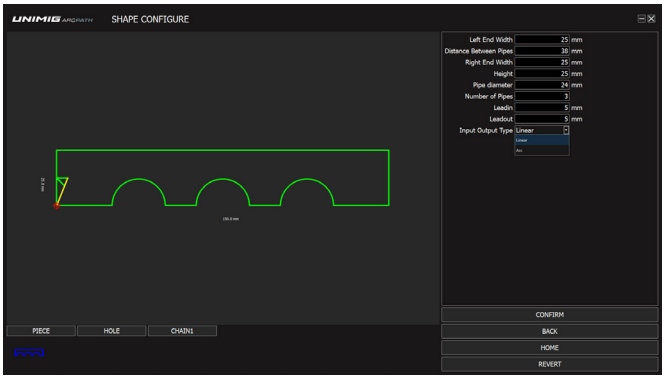
8.8.1 FLCAM SE

If the Control PC has the FLCAM software program installed, the FLCAM_SE menu option will appear. This will open a file directory, and the selected file will open in the CAM software to be edited.

See “6.2 Operating the Software” on page 97 **and the FLCAM software user manual for more information on using the program.**

8.8.2 Configure





A full list of available configuration options will be displayed on the right side menu. The shape selected will determine the adjustable options.

Complete List of Adjustable Parameters in the Configuration Menu			
Width	Angle2 (Options: No, Bevel, Fun, Arc)	Overburn Length	Rounded Diameter
Height	Angle3 (Options: No, Bevel, Fun, Arc)	Down External	Bottom Height
Hole Diameter	Angle4 (Options: No, Bevel, Fun, Arc)	Center Height	Cut In Height
Hole Offset	Outer Diameter	Hypotenuse Height	Tube Length
Hole Num	Inner Diameter	Up External Length	Hole To Sides
Part Width	Hub Diameter	Left End Width	Hole To Top/Bottom
Top Width	Spoke Width	Distance Between Pipes	Inner Circle Diameter
Part Height	Corner Diameter	Right End Width	Rectangular Hole Height
Side Height	Corner Number Of Spokes	Pipe Diameter	Beveled Corner Length
Elbow Diameter	Leadin	Number Of Pipes	Right Height
Chain Clearance	Leadout	Rollers Between Teeth	Down Width
Chain Number	Input Output Type (Options: Linear, Arc)	Number Of Teeth	Up Width
Bottom Width		Tooth Angle	Left Height
Overall Height		Tooth Corner Diameter	Hole To Down Distance
Angle1 (Options: No, Bevel, Fun, Arc)		Circle Hole Diameter	Hole To Right Distance
		Gap Length	Arc Hole Diameter

Piece

The Piece feature displays the adjustable configurations for the “piece” that is being cut out.

Hole

The Hole feature displays the adjustable configurations for the hole/circle that will be cut out of the workpiece.

Chain1 & Chain2

The Chain features allow for the same shape to be duplicated in a single or double column. It reduces the number of perforations to one and saves cutting time.

8.8.3 Arc Mode

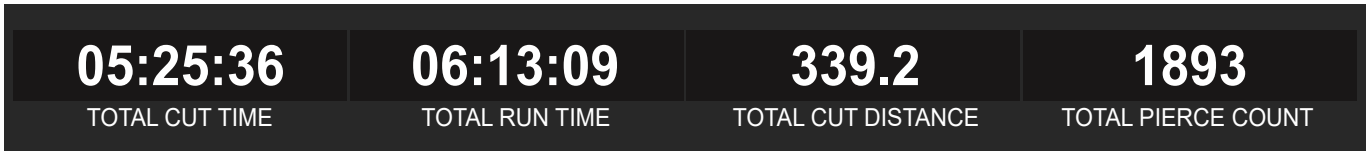
The Arc Mode toggle between Diameter and Radius determines how the measurements for arcs or circles within the shape are input or defined when configuring in the shape library.

In Diameter mode, the arc or circle will be defined by its diameter. The diameter is the total distance across the circle, passing through the centre. This mode requires inputting the full width of the circle from one side to the other.

In Radius mode, the arc or circle will be defined by its radius. The radius is the distance from the centre of the circle to any point on its edge, which is half the diameter. In this mode, only the distance from the centre to the perimeter of the circle is input.

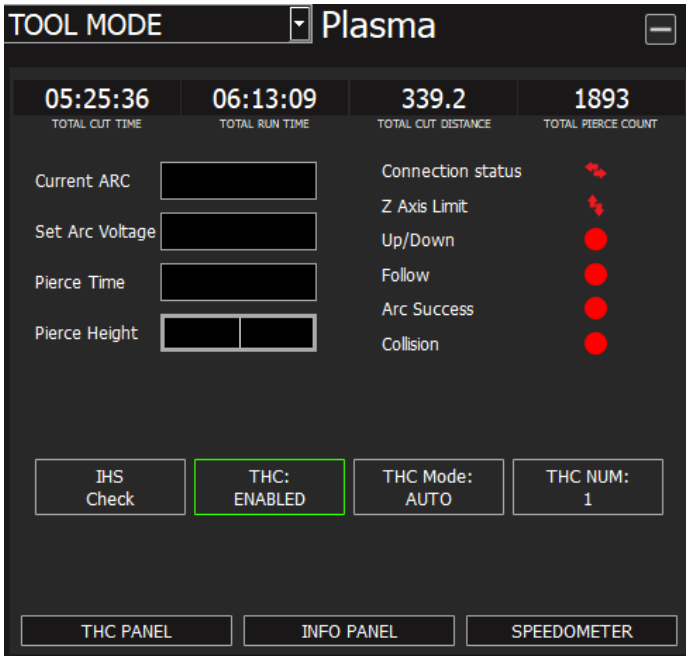
ArcPath needs to be restarted for this change to take effect.

8.9 Monitor Panel



The monitor panel is comprised of three different sub-panels: the THC panel, the Info panel and the Speedometer panel. All three panels display the same Cut Status information on top. The Cut Status counters can be reset by going to **Main Menu > Tool+Table Setup > Plasma Setup > Settings** *(see "Plasma Setup" on page 113).*

8.9.1 Torch Height Controller (THC) Panel



The THC Panel allows you to adjust the height and pierce settings of the torch and displays the status of the THC system.

Current Arc

Displays the real-time arc voltage read by the THC system while cutting.

Set Arc Voltage

Set the height distance between the torch and the material. A higher arc voltage will position the torch higher while a lower setting will lower the torch.

Pierce Time

Set how long the torch will remain at the pierce point before beginning the cut.

Pierce Height

Set the distance between the torch and the material at the beginning of the piercing process. The torch needs to start at an elevated height to prevent material blowback or damage to the torch during the initial pierce.

> **The Pierce Height can also be adjusted using the D C IHS Up Time in the THC Parameter menu *(Menu > Tool+Table Setup > Plasma Setup > THC Param > Common).***

IHS Check

Perform an Initial Height Sensing check. This check ensures that the system accurately detects the surface of the material before it begins cutting.

THC

Sets whether the THC system is on or off.

When Enabled, the THC actively monitors and adjusts the torch's height during the cutting process to maintain the optimal distance between the torch and the material based on the set arc voltage.

When Disabled, the THC is turned off, and the torch height will need to be manually controlled.

THC Mode

When in Auto, the THC automatically adjusts the torch height based on the real-time arc voltage while cutting to maintain the proper distance between the torch and the material after the pierce time has ended.

When in Manual, the THC will disable voltage reading and maintain the height of the pierce height.

THC Number

Indicates and sets the identification number of the THC unit in use. Multiple THC systems can be installed on the STEALTH CNC tables.

> **The full list of THC parameters can be found in the THC Param menu, go to *Main Menu > Tool+Table Setup > Plasma Setup > THC Param (see "THC Param" on page 117).***

The THC status indicators located on the right of the panel are used to diagnose potential issues.

Connection status

Indicates whether the THC is properly connected to the CNC system and communicating without issues.

Z Axis Limit

Indicates when the table has reached the Z-axis limit and the torch has reached the upper or lower boundary of its vertical travel.

Up/Down

Indicates that the torch height controller is actively adjusting the torch position either up or down to maintain the correct height.

Follow

Indicates that the THC is following the correct height profile based on the programmed cutting parameters.

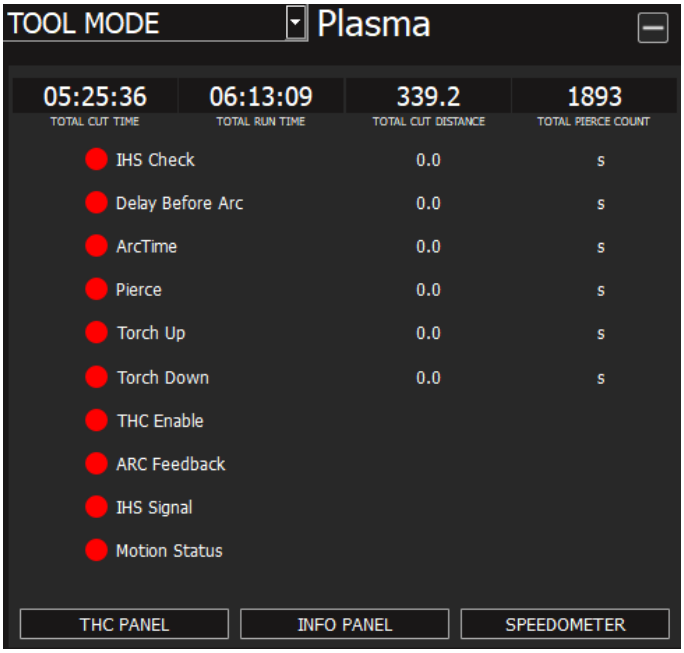
Arc Success

Indicates whether the plasma arc has been successfully established.

Collision

Indicates if the torch has collided with the material or if there is another type of mechanical interference. The collision sensor activates to prevent damage to the torch or material.

8.9.2 Info Panel



The Info panel displays a list of status indicators that will change from red to green when in active status.

IHS Check

Indicates that the Initial Height Sensing (IHS) system is checking the material surface to ensure the correct pierce height before cutting.

Delay Before Arc

Indicates the delay time before the plasma arc is initiated. When active, it means the system is waiting for the specified delay period before starting the arc. This delay allows for proper positioning or machine readiness.

ArcTime

Indicates the total time the plasma arc has been active. When active, the plasma arc is currently firing, and the cutting process is underway.

Pierce

Indicates that the machine is currently in the piercing process.

Torch Up

Indicates the torch is moving upwards to adjust its height.

Torch Down

Indicates the torch is moving downwards to adjust its height.

THC Enable

Indicates if the THC is enabled and currently operating.

Arc Feedback

Indicates whether the system is receiving feedback from the plasma arc, specifically monitoring the arc voltage. If active, the system is correctly reading the arc voltage to adjust the torch height as needed.

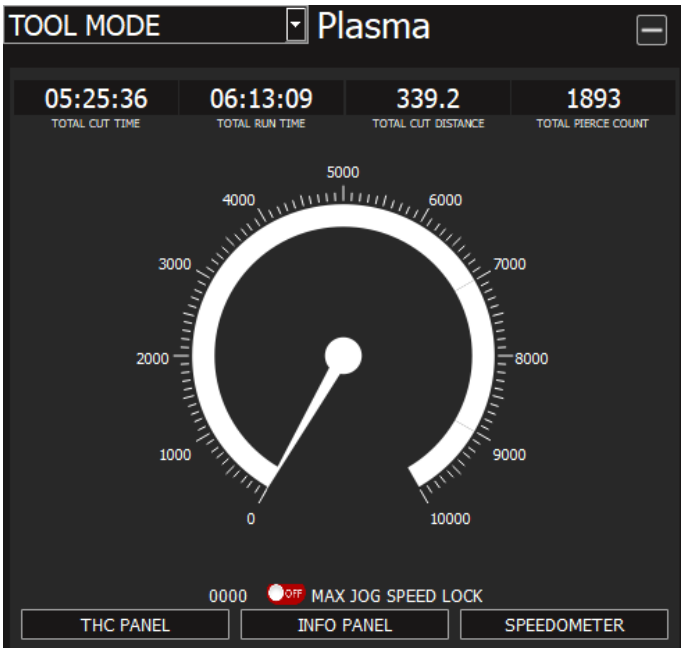
IHS Signal

Indicates whether the Initial Height Sensing (IHS) signal has been detected. When active, the IHS system has successfully detected the surface of the material and is ready to adjust the torch height for piercing.

Motion Status

Indicates whether there is motion on the table, such as gantry movement or torch head motion.

8.9.3 Speedometer Panel



The speedometer panel displays the real-time jogging or movement speed of the CNC table in millimetres per minute (mm/min). This shows how fast the machine is moving when positioning the torch or performing cutting operations.

The speedometer can be used to monitor the current speed during manual or automated movements and helps to ensure the torch or gantry is moving at the correct rate for precise operations.

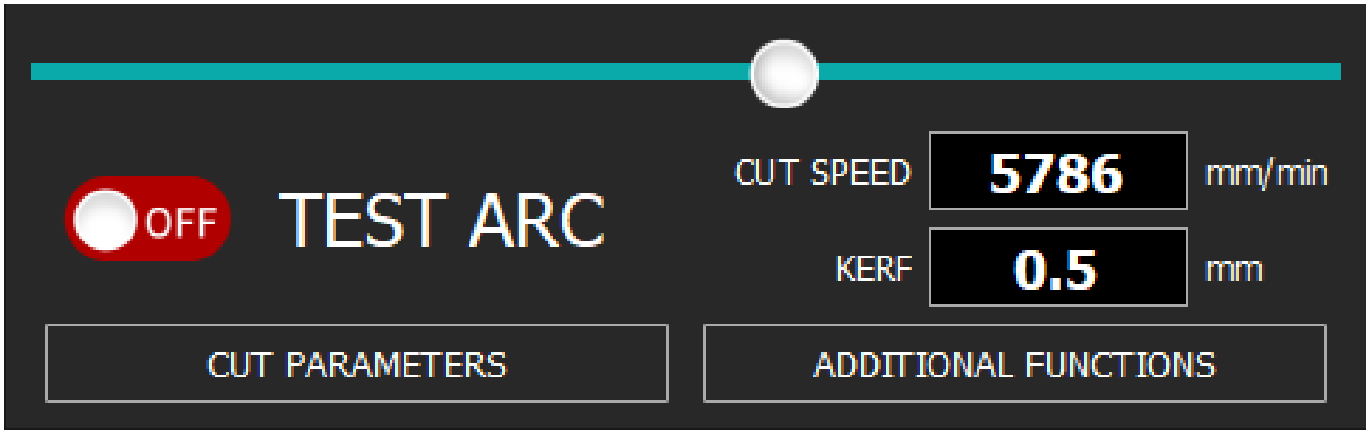
Max Jog Speed Lock

Set the maximum speed that the torch or gantry can move when manually jogging.

When off, there is no restriction on the movement speed.

When on, this lock restricts the jog speed to a preset maximum.

8.10 Cut Panel



The Cut panel allows you to quickly adjust the cut speed and other cut parameters on the main interface.

Cut Speed Slide Bar

The slide bar lets you quickly adjust and set the cut speed.

Cut Speed

Set the cut speed of the torch manually by typing in the exact value. The cut speed is measured in millimetres per minute (mm/min).

Kerf

Sets the amount of kerf offset. The kerf is the width of the material removed during the cutting process. The kerf setting lets the CNC system adjust the toolpath to account for the material lost and allows for accurate part dimensions.

> **The Kerf setting should be half the size of your cutting tip size, as it is offsetting from the centre of the arc. For example, if you have a 1.2mm cutting tip, your Kerf setting will be 0.6mm.**

Test Arc

The Test Arc toggle will fire the plasma torch when set to ON. Before igniting the torch, the system will perform an IHS check and then fire the torch until it is set to OFF. When the table is cutting, this will automatically set itself to ON.

Cut Parameters

Opens the Cut Parameters in the Plasma Setup menu (*see "Plasma Setup" on page 113)*.

Additional Functions

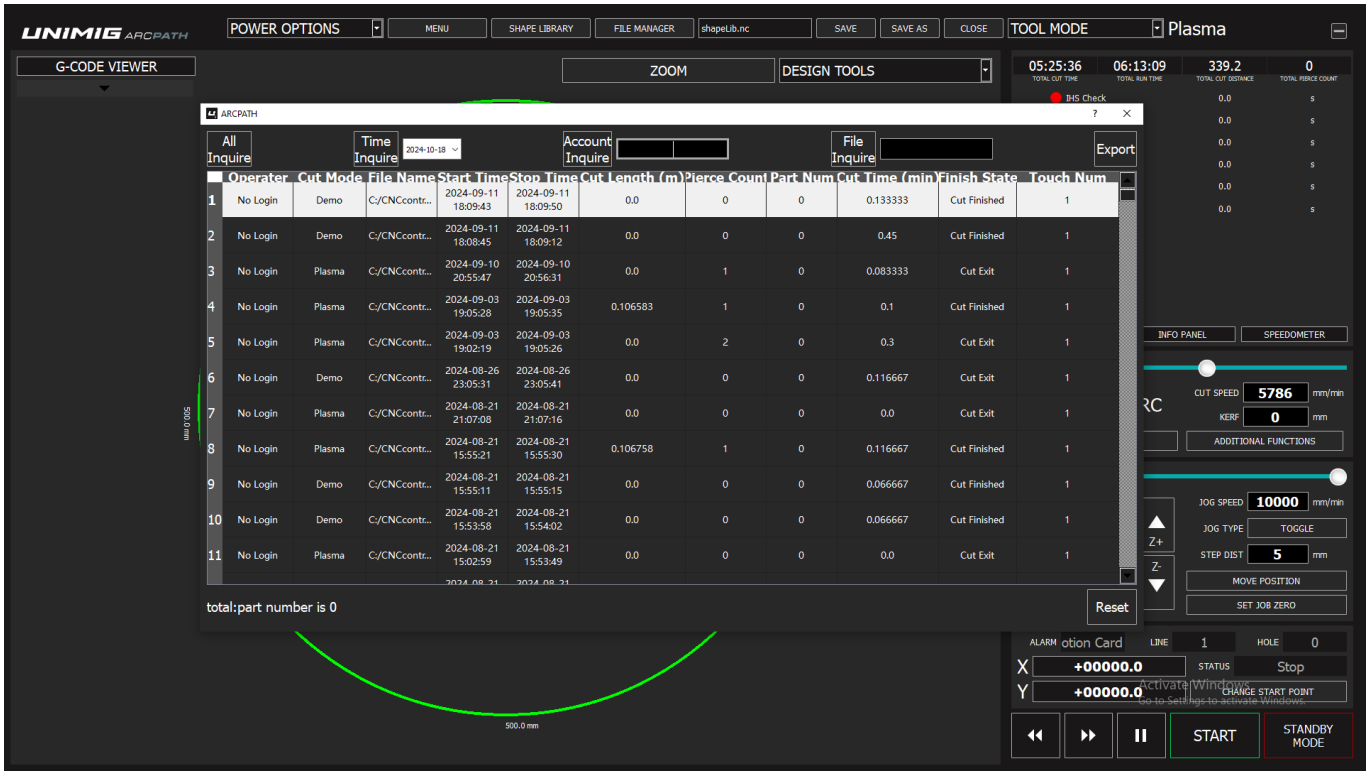
Save Cut Status

Save the current G-code settings and position coordinates. This is helpful if you need to shut down the system in the middle of a cut and save the position and cut progress.

Load Cut Status

This will load saved cut status files.

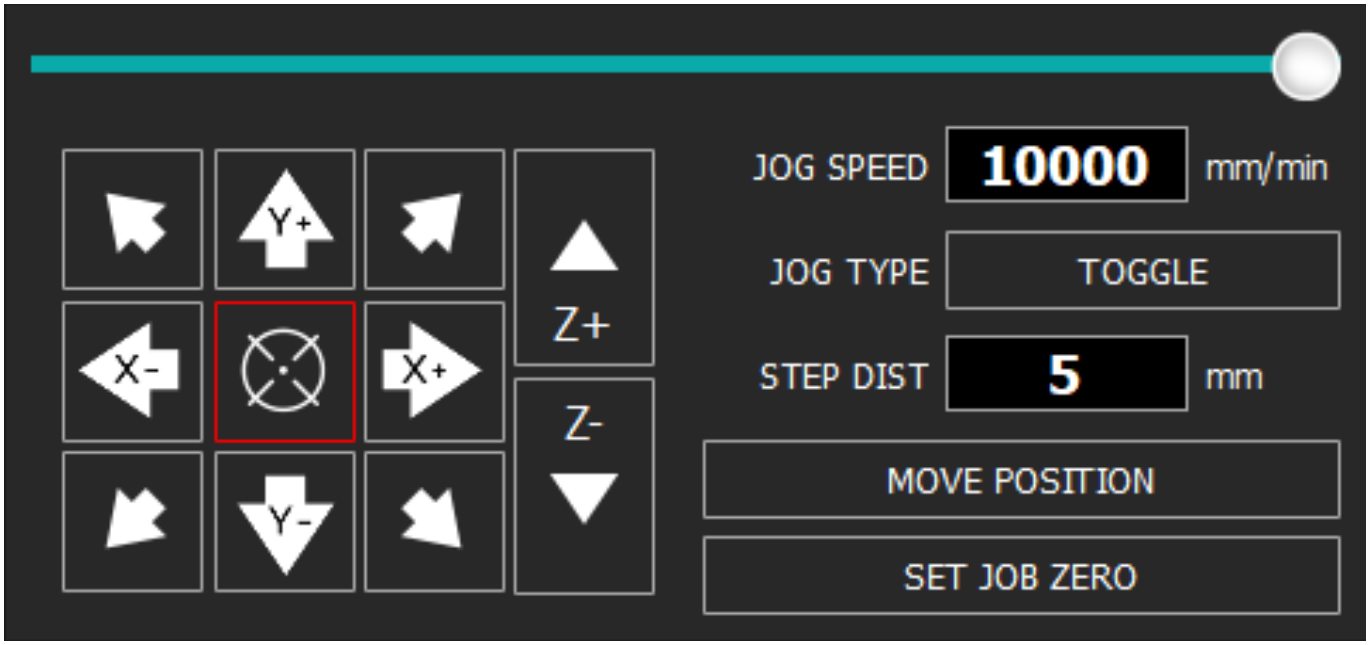
Cutting Data



Displays a complete list of data and statistics for each cut performed in a popup window that includes:

- Operator
- Cut Mode
- File Name
- Start Time
- Stop Time
- Cut Length (m)
- Pierce Count
- Part Number
- Cut Time (min)
- Finish State
- Touch Number

8.11 Jog Panel



The Jog panel displays the jogging parameters and lets you easily adjust these on the main interface. Jogging is the action of manually moving the torch head position.

8.11.1 Jog Speed Slide Bar

The slide bar lets you quickly adjust and set the jog speed.

8.11.2 Jog Speed

Set the jog speed of the torch manually by typing in the exact value. The jog speed is measured in millimetres per minute (mm/min).

The maximum speed that can be set on this panel will be determined by the maximum speed input in the *Main Menu > System Settings > Primary > Manual Move Speed (see "Manual Move Speed" on page 106).*

Do not exceed 8,000mm/min.

8.11.3 Jog Type

Cycle through the three different jog types.

Toggle

Press and hold the button to move the torch and release it to stop. This is the default jog type.

Continuous

Press and release the button to move the torch. The torch will continue to move until it is pressed again to stop.

Step

Press and release the button to move the torch a preset "step" distance.

8.11.4 Step Distance

Set the step distance that the torch will move when in the Step jog type.

> **Setting a step distance will automatically set the machine to the Step jog type.**

8.11.5 Move Position

Move the torch to the selected position.

Home

Move the torch to the home position. The home position is a predefined reference point where the axes (X, Y, and Z) are reset or “homed.” This position is used as a starting point for all movements and operations.

Zero

Move the torch to the Job Zero position. The Job Zero is the origin point (0,0,0) for the current cutting job. It serves as the coordinate reference for all programmed cutting movements.

Walk Frame

“Walk” or trace the outline of the cutting job without firing the torch. This is used to ensure that the entire job will fit within the material boundaries and that the torch path will not move beyond the edges of the material or collide with any obstacles.

Mark Pos

The Mark Position lets you save and recall specific positions on the CNC table. These positions can be used as reference points or checkpoints for future jobs. You can save and load up to five positions.

> **The marked positions that are saved are based on their relative distance from the Zero position. If the Zero position is moved, all the marked positions will shift accordingly.**

8.11.6 Set Job Zero

Set the reference point (0,0) for the cutting job to the current torch position. This is where the torch will start the cut. A popup will ask you to confirm that you want to reset the zero position.

> **The Zero Orientation of the G-code design will determine which direction the design will be placed in relation to the Job Zero position.**

8.11.7 Directional Jog Arrows

Move the torch manually based on the Jog Type selected. Take notice of the X, Y, and Z labels on these arrows. These determine which direction the torch will move.

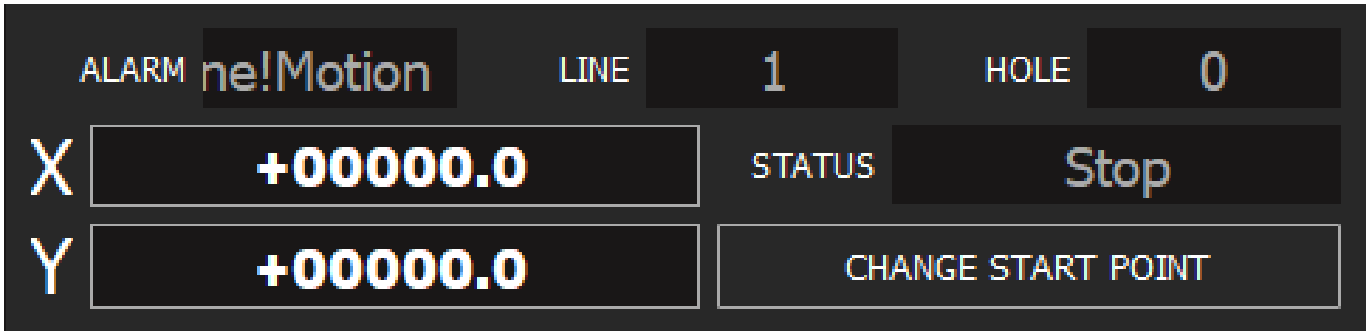
The orientation of these arrows can be changed, go to **Main Menu > System Settings > Primary > Change Coordinate** (*see “Change Coordinate Orientation (Enter Key)” on page 107*).

8.11.8 Laser Offset

Switch between the torch position and the laser offset position. A red square indicates the laser is off, a green square indicates the laser is on. To calibrate your laser, *see “6.17 Operating the Sighting Laser” on page 150*.

> **The laser offset can only be used in the Plasma Tool mode. To use it in Demo mode, select the laser offset while in Plasma mode and then switch to Demo mode.**

8.12 Cut Status Panel



The Cut Status panel displays the status of the cut, the position of the torch while cutting, and any active alarms.

Alarm

The alarm indicator displays any active alarms. If there are no active alarms this panel will read NULL. *SSee "8.5 Alarms" on page 157* for a full list of alarms.

Line & Hole

The line indicator displays the current line of G-code being executed.

The hole indicator displays the number of holes or piercing points that have been executed.

These indicators help track progress through the job and provide real-time feedback on which part is currently being cut.

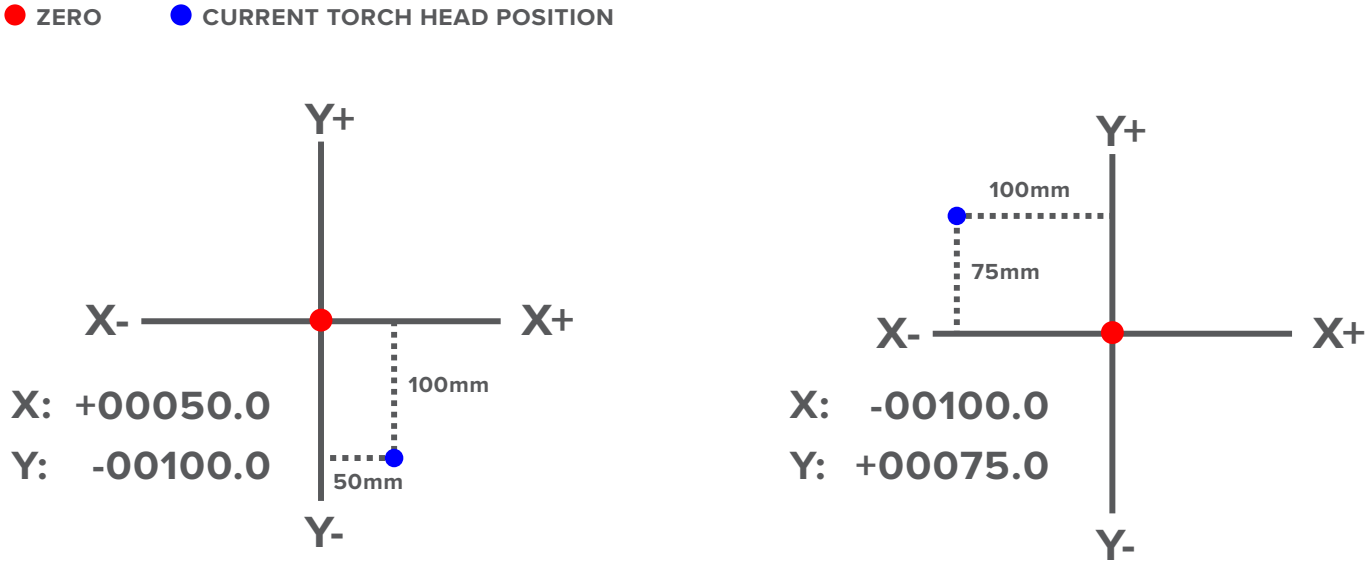
X & Y Position Display

The X & Y indicators display the coordinates of the torch or tool position.

The X indicator represents the horizontal movement. For example, if X = +00000.0, the torch is at the X-origin (or zero). If X is a positive value, the torch is to the right of zero, and if it's negative, the torch is to the left of zero.

The Y indicator represents the vertical movement. A positive Y-value means that the torch is above the Y-origin (or zero), while a negative Y-value means it's below zero.

These are relative to the Job Zero position or the Home position, depending on which was last set.



Change Start Point
Select a new position from where the torch will start or resume its cut.

Job Zero
Move the torch to the Job Zero position.

Choose Line
Select a specific line of the G-code file to start or resume cutting from.

Choose Hole
Select a specific hole in the program to start or resume cutting from.

Last Breakpoint
The last breakpoint is the location where the machine stopped or was interrupted. Resume cutting from the last recorded breakpoint.

> **Job Zero is the only option that won't place the machine into an active cut cycle.**

8.12.1 Forwards & Backwards
Navigate through the G-code and skip ahead or go back through the program. Move between lines or holes to select a specific point.

To adjust the forward speed, go to **Main Menu > System Settings > Primary > Forward Speed**.

Pause
Pause an active cut. When paused, the torch head can be moved, the forward/backward option can be used, and the Start position can be changed.

> **Pausing a cut does not exit the active cut cycle. The active cycle will need to be exited to access all table settings.**

If the torch head is moved while the active cut is paused, pressing start will produce a popup warning "Warning! Position has been moved away from the path." You'll be given three options to proceed:

Return to Path
Move the torch back to its last position on the cut path.

Confirm Move
Move and update the G-code to the new torch position.

Cut Return to Path
The torch will arc and return to its last cut position. Selecting "Cut Return to Path" allows you to manually produce a lead-in or edge cut, which reduces wear on the consumables.

Start
Start or resume the cut cycle.

Standby Mode
Exit out of the active cut cycle. Entering Standby Mode will update the Job Zero position to the current torch position. Standby Mode does not function as a stop button.

> **Use the Last Breakpoint to recover the previous Job Zero position.**

8.13 Calibrating the Table

When the table is first turned on, it is necessary to calibrate it and check that the torch and Torch Height Controller are operating as normal.

Home Command

A Home command instructs the table to move all its axes (X, Y & Z) to their predefined home position. Running a Home command sets the machine's internal coordinate system back to zero (0,0,0) and allows it to understand where all its parts are located.

To run a Home command, press the "Move Position" button on the Jog panel and select "Home."

A Home command should be run on startup to ensure that the CNC plasma table is properly calibrated and knows its exact position for precise and accurate cuts.

Initial Height Sensing (IHS) Check

The Initial Height Sensing (IHS) is a system that measures and adjusts the vertical distance between the plasma torch and the surface of the material being cut. It's a critical function on a CNC plasma table that ensures the plasma torch is positioned at the correct height before starting the cutting process.

To run an IHS check, open the THC section of the Monitor panel and select "IHS Check."

If the IHS check is successful, the torch will lower until it touches the material and stop. Then, it will lift upwards to the set Pierce Height position.

If the torch does not lift back up after touching the material, the IHS check was unsuccessful. This is often due to an inactive or unconnected THC or because the table is in Demo mode. *See "8.4 CNC Troubleshooting" on page 156* for all possible solutions.

An IHS check should be done at the beginning of each cut to detect the surface of the material and set the pierce height accurately. Running an IHS check also ensures that the Torch Height Controller is properly connected and active.

Testing the Arc

After a successful IHS check has been completed, the plasma torch can be tested. Before testing the torch, ensure that the plasma cutter is properly set up and assembled to suit the requirements of the cut.

- The amperage should be set to suit the material thickness being cut.
- The cutting tip on the torch is the correct size to suit the set amperage.

Cutting Tip Size	Amperage
0.9mm	30-40A
1.0mm	40-50A
1.1mm	50-60A
1.2mm	60-70A
1.3mm	70-80A
1.4mm	80-90A
1.5mm	100-110A
1.6mm	110-120A

- The plasma cutter is in 2T mode (4T torch mode will not work).
- The plasma cutter is in the standard cutting mode and NOT a perforated cut mode.
- The earth clamp needs to have proper metal-to-metal contact with the workpiece. Remove any rust, dirt, paint, or coatings to ensure a clean connection.

Once the plasma cutter has been checked, move the torch over the workpiece using the directional arrows on the Jog panel and turn the "Test Arc" button on the Cut panel to ON. To stop the arc, switch the button back to OFF.

It is recommended that the arc be tested on a piece of scrap metal.

See "8.2 Plasma Troubleshooting" on page 154 for all possible solutions if the torch does not arc.

8.14 Performing a Cut

8.14.1 Amperage

The amperage, which is set directly on the plasma cutter, will need to be set to suit the material thickness being cut. It will also determine the size of the cutting tip installed on the torch.

Cutting with the incorrect tip size for the set amperage can result in failed cuts, poor cut quality, and excessive consumable wear.

The size of the tip orifice impacts the kerf width; the higher the amperage and bigger the tip, the wider the kerf.

Higher amperages are needed for thicker materials, while lower amperages are recommended for thinner materials. The set amperage will also impact the speed of the cut.

8.14.2 Cut Speed

The cut speed is how fast the torch moves while cutting. The cut speed will be determined by the amperage set and the material thickness.

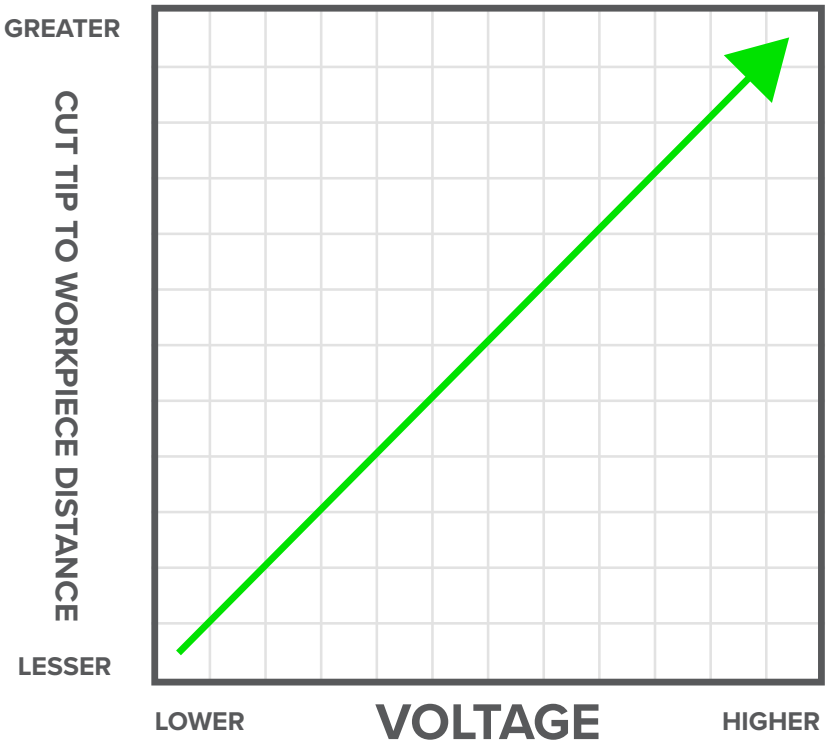
When travelling at the correct speed, the sparks should come out the bottom of the plate, lagging behind the torch at a slight angle (roughly 15° - 30° from vertical).

If the cut speed is too fast, the sparks will spray at a very steep angle in the opposite direction of the cut or spray out of the top. Sparks appearing from the top indicate that the plasma arc isn't cutting all the way through, and the sparks are bouncing off the part that is still joined together.

If the cut speed is too slow, sparks will come out straight down and get stuck in grooves. Cutting too slowly results in excessive dross (excess metal from the cut that hardens on the bottom of the piece and needs to be cleaned off) and a much harsher finish.

In extreme cases, cutting too slowly will result in the material being completely cut out from under the torch, and the system will register that it's no longer cutting the material and stop the arc. This can also result in damaged torch consumables.

8.14.3 Arc Voltage



The Arc Voltage determines the distance between the torch and the workpiece. The Torch Height Controller system continuously monitors the plasma's arc voltage during the cut and adjusts the torch height automatically to maintain a consistent voltage.

If the workpiece is not perfectly flat, as it senses the material getting closer to the torch tip, the voltage of the arc will rise, and the system will automatically lift the torch to maintain the set distance.

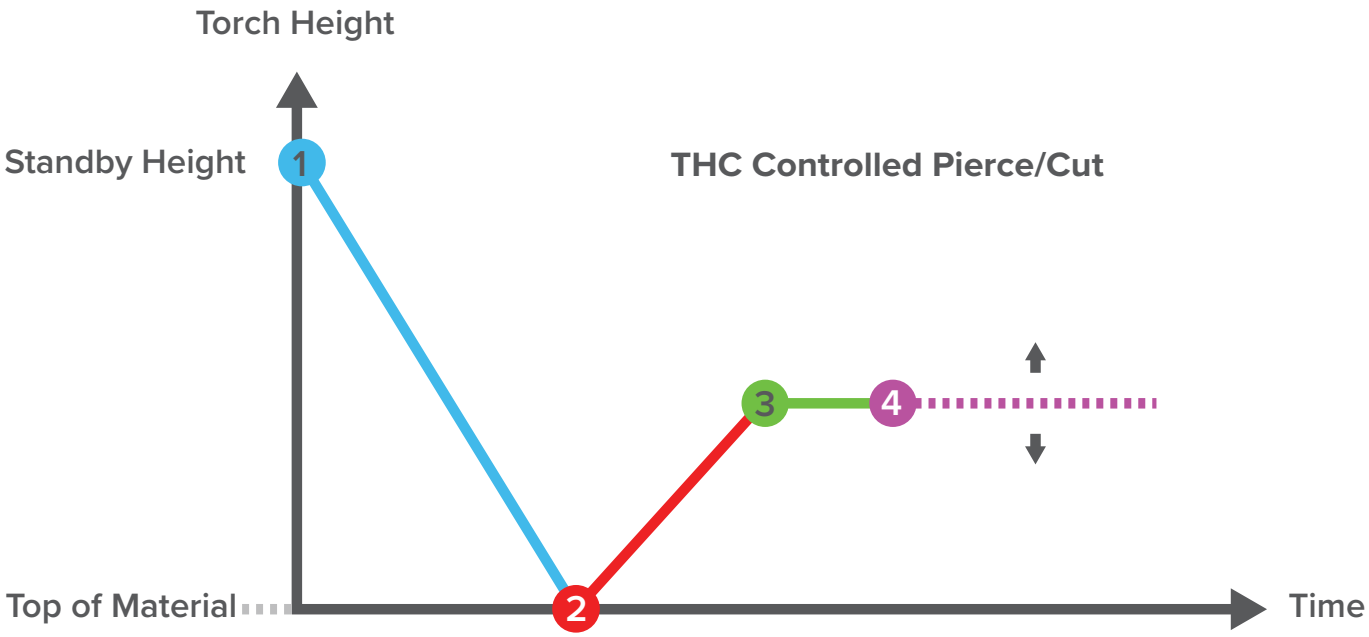
A higher voltage increases the torch to workpiece distance, while a lower voltage decreases the distance.

A higher arc voltage and height will result in a wider kerf.

The Arc Voltage dictates the height during the cut phase, not during the piercing process.

If Manual THC mode is selected, the system will use the Pierce Height setting as the cut height, and the Arc Voltage will be disabled.

8.14.4 Pierce Height & Time



1. Material Height Detection - IHS Check

When an Initial Height Sense (IHS) check is run, or a pierce process begins, the torch will lower from the standby height to the material. When the torch makes contact with the material, a physical switch inside the Z-axis drive assembly is depressed, and the torch reverses direction.

2. Pierce Height Timer

The torch will begin to rise after touching the metal for the set Pierce Height time.

If Manual THC mode is selected, the system will use the Pierce Height setting as the cut height, eliminating steps three and four.

3. Delay Timer Before Active THC

Pause the torch at the Pierce Height for a set amount of time. Delaying the start of the active cut by briefly disabling the THC can help stabilise the arc after the piercing process before it begins to read the voltage.

> **To set the amount of delay go to *Menu > Tool+Table Setup > Plasma Setup > Settings > THC Disable Time After Piercing*.**

4. Active Cutting

The torch enters the active cut and will follow the G-code design. The torch height is controlled by the Arc Voltage setting by default, but can be disabled by switching the THC to Manual mode.

To adjust the cutting height, use the “Set Arc Voltage” on the THC panel.

Height

The pierce height is the distance between the torch and the material at the beginning of the piercing process. The torch needs to start at an elevated height to achieve a clean pierce and prevent material blowback or damage to the torch during the initial pierce.

The pierce height uses a timer with a preset speed. For example, an 0.3 setting will lift the torch for 0.3 seconds. The speed that the torch rises can be adjusted, so that the same 0.3 setting can reduce or increase the height. The default speed is set to 50.

Time

The pierce time determines how long the torch will remain at the pierce point before beginning the cut. Once the pierce time has finished the torch will begin cutting.

The pierce time needs to be long enough that the plasma arc fully penetrates the metal before it begins moving for a clean cut.

A pierce time that is too short can result in the material not being properly pierced, which can lead to poor cut quality or even a failed cut.

A pierce time which is too long can result in damage to the torch consumables, excess dross, or even a failed arc as the system will no longer register material under the torch to be cut.

8.14.5 Positioning the Cut

Position the cut on the table where the cut will be done. If a full sheet is being cut, this position will be the entire table.

> **To get the most out of your consumables, it's recommended to start the cut from the edge of the workpiece. This may not always be possible depending on the cuts being made, as a lead-in cut will need to be added to the G-code design.**

To position a cut, the Job Zero location and Zero Orientation need to be altered.

To set the Job Zero:

1. Press the Jog arrows to move the torch to the location the design will start from.
2. Press the "Job Zero" button and confirm the updated location.

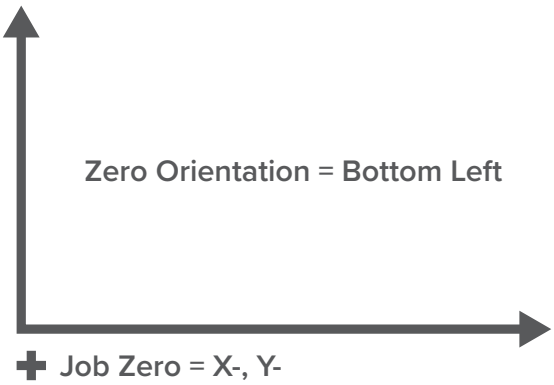
The Zero Orientation is dependent on the Job Zero location. If the Job Zero has been set on the bottom left (X-, Y-) of the table the Zero Orientation would be Bottom Left. This will place the G-code design above and to the right of the Job Zero location.

Checking the Cut Position

Run a perimeter test or demo cut to check that the position of the G-code is lined up and placed correctly.

To run a perimeter test go to **Move Position > Walk Frame** on the Jog panel. If the placement is incorrect, use the "Pause" button to end the perimeter test. To return the torch head to the Job Zero position go to **Move Position > Zero**.

To run a demo cut the table needs to be in Demo mode. Go to **Tool Mode > Demo** at the top of the home screen. When the CNC table in Demo mode you can **press** "Start" to begin the cut. Starting the cut will enter the CNC table into an active cut cycle, however the torch will not lower, raise or arc, it will only travel along the cut path.



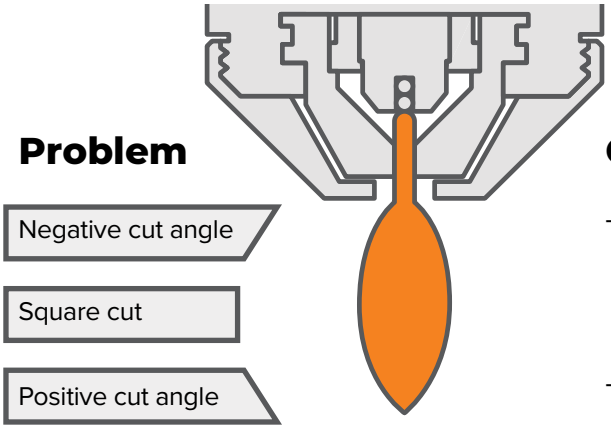
If the placement of the cut is incorrect, press "Pause" to stop the torch, then go to **Change Start Position > Zero** before pressing Stop to end the active cut cycle.

> **If you press "Stop" before moving your torch back to the Job Zero location, the Job Zero location will update to the current torch position.**

8.14.6 Cut Direction & Angle

The plasma stream swirls as it exits the tip of the torch, biting one side and finishing off on the other, leaving a bevelled edge and a straight edge.

The angle and amount of bevel is determined by the torch height, amperage and travel speed. The main cause of bevelling is the torch height, before making other adjustments, check the torch height first.



Problem	Cause	Solution
Negative cut angle	The torch is too low.	Raise the torch; or if you are using a torch height control, increase the arc voltage.
Square cut		
Positive cut angle	The torch is too high.	Lower the torch; or if you are using a torch height control, decrease the arc voltage.

Positive Bevel

A positive cut angle (bevel) occurs when more material is removed from the top of the cut than from the bottom.

This is caused by:

- The torch height is too high
- The amperage is too low
- The cut speed is too fast

Negative Bevel

A negative cut angle (bevel) occurs when more material is removed from the bottom of the cut.

This is caused by:

- The torch height is too low
- The amperage is too high
- The cut speed is too slow

Uneven Bevel

It's possible to encounter all three bevel types during a single cut. If this occurs at corners or direction changes, it may indicate that, although the settings are suitable for the material type and thickness, the design being cut has complex corners or arcs. In this case, adjusting the travel speed around corners may help manage these irregular bevels.

Go to *Main Menu > Tool+Table Setup Settings > Table Setup > Corner Speed Settings* to adjust the speeds set for different corner angles.

If the bevel change happens during a straight line, it may indicate that the torch head is lifting or lowering, which could be due to an unstable arc or interference with the THC system.

Low air pressure during the cut can also cause the bevel to change during a cut. Monitor the air pressure consistently throughout the cut.

The bevel-cut effect is more noticeable on thicker material and needs to be taken into consideration before starting the cut, as the straight side of the cut should be on the finished piece being kept.

The squarest cut angle will be on the right side in relation to the forward motion of the torch. The left side will always have some degree of bevel.

8.15 Active Cut Mode & Standby Mode

Standby Mode

Standby mode is the default CNC table mode. When the table is in standby mode, all of the settings are available to make adjustments to, and new G-code programs can be loaded or edited. Whenever the table is not actively cutting, it is in standby mode. The Status indicator on the cut panel will display “Stop.”

Active Cut Mode

The CNC table will enter the active cut mode or an active cutting cycle when the Start button is pressed. When the table is in an active cut cycle, the settings available to adjust will be limited. The Status indicator on the Cut panel will display “Pause” or a code (e.g. G0 or G1) to show that it is in an active cut.

8.16 Operating the Air Compressor

Air Pressure & Volume

The volume capacity of the air compressor is important. If it's a small compressor with precisely the same litres per minute (L/min) flow rating as the plasma cutter, then the compressor will run continuously while the plasma is cutting. A compressor with a L/min rating slightly higher than the plasma would be more than adequate.

If you are doing a lot of cutting or cutting thick plate (same air consumption but slower cut speeds, which means a longer cut time), then choose a compressor with 1.5x – 2x the plasma cutter's flow rate requirement. This ensures that there are no issues with the plasma cutter drawing more air than the compressor can provide.

The air pressure regulator, in general, can be found on the back of the machine above the air filter. The regulator will have a hose that runs in on one side and out on the other, with a twistable valve on top. This valve is how you change the plasma cutter's air pressure, which you can see on the pressure gauge. A good starting pressure regardless of the machine is 75psi.

The set amperage and air pressure work together, so if the amperage is all the way up, you'll want to increase the air pressure as well. You don't want one overpowering the other, as it'll give you a poor-quality cut.

The air pressure can also impact how much slag is produced during the cut.

If your air compressor has the option to set the air pressure directly on it, it's recommended to set it slightly higher than the pressure set on the plasma cutter.

If your plasma cutter has the option, perform an air test to check that active pressure and the set pressure are the same.

Air Quality & Filtration

Good air quality is essential to the quality of the cut and the torch consumable's life span.

Compressors take in air at atmospheric pressure, increase the pressure, and store it in a tank. The humidity in the air is condensed in the tank, and the airlines produce water, more so in humid environments.

Moisture that forms in the airlines tends to condense into larger drops when the air pressure decreases as it enters the plasma torch. When these droplets enter the high temperatures (as much as 11,000°C) in the torch, they immediately break down into oxygen and hydrogen, which alters the regular chemical content of the air in the torch.

These elements will then dramatically change the plasma arc, which causes the torch consumable parts to wear very quickly, and alters the shape of the tip opening, dramatically affecting the cut quality in terms of edge squareness, dross formation, and edge smoothness.

Minimising moisture in the air supply is absolutely critical to quality plasma cuts and the longevity of consumable parts. Be sure to drain the receiver (tank) on the air compressor at least daily.

Most air plasma systems have an onboard particulate filter and/or a coalescing filter with an auto drain that removes some moisture from the air supply. The onboard air filter is adequate for home workshops and light industrial users.

However, most situations will require additional filtration to prevent moisture from affecting the quality of the plasma cutter. In most cases, it is recommended at a minimum to install a submicronic particulate filter designed to trap water through absorption.

This style of filter should be installed as close as possible to the plasma cutter's air intake. It has a replaceable filter cartridge that absorbs water and must be changed after it's near saturation.

Due to the requirements of CNC cutting, including the amount and duration of the airflow, additional filtration systems, such as an air dryer or multi-stage filtration system will significantly reduce the amount of moisture that reaches the plasma cutter.

8.17 Operating the Sighting Laser

The sighting laser, which comes prefitted on the STEALTH CNC tables, provides a visual representation of the torch position on the workpiece. The laser can be used to:

- Accurately set the Job Zero position
- Verify that the workpiece is aligned by running the laser along an edge to check its straightness
- Preview the cut path in conjunction with the Demo mode
- Check the cut is positioned a safe distance from the edge
- Align multi-part layouts without resetting the machine

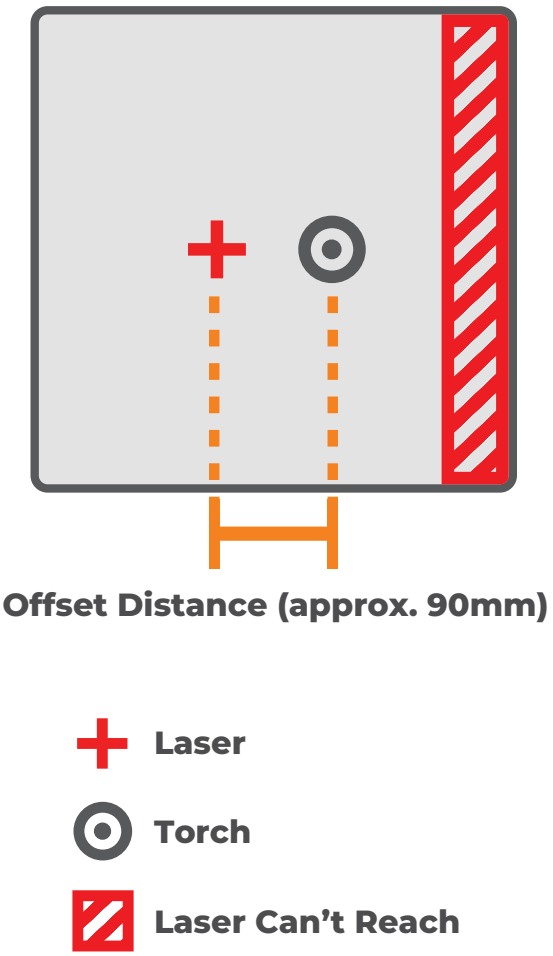
The laser can be aligned two ways: offset or direct.

8.17.1 Offset Position

In the Offset position the laser is aligned to point directly downward to the material.

The laser isn't in the same place as the torch, there is a small distance between the two. An offset value is input so that the machine can compensate for the distance between them. Although the laser points to one spot on the material, the machine automatically calculates where the torch will be, taking the offset distance into account.

The laser's usable area is reduced (approx. 90mm) due to the distance between the laser and torch on opposite side of where the laser is mounted.



Calibration

1. Check the laser is mounted properly and can be turned on/off using the silver button under the Control PC's emergency stop button.
2. Position the torch at least 200mm away from the edges of the table and set the Job Zero location.
3. The Laser Offset should be off.
4. In Plasma Mode, pierce the metal using the Test Arc toggle.
5. When a hole has been made, turn off the arc and raise the torch using the Z-axis jog button.
6. Use the jog arrows to move the torch head so that the laser aligns perfectly with the pierce hole.
7. Record the X and Y coordinates where the torch head has been moved, paying attention to the + and - signs of the X and Y positions, as these are necessary for successful calibration.

> **To keep the largest usable area of the laser, it is recommended to move the X-axis via the job arrows, and adjust the laser directly on the Y-axis, making the Y-axis coordinate value 0 (or as close to).**

8. Go to **Menu > Tool+Table Setup > Table Setup** and enter these coordinate values in the Laser X Offset and Laser Y Offset. Save these settings.

The CNC table will automatically use the saved offset values and display the laser's position as Zero.

8.17.2 Direct Position

In the Direct position the laser is aligned to point directly under the torch position. To do this:

1. Set the laser so that it is in line with the torch on the Y-axis (vertically)
2. Twist the laser pointer so that it points directly under the torch head

The laser and torch are not in the exact same position, so you need to adjust the laser's angle to ensure it points to where the torch will cut.

> **The laser will only be accurate so long as the Z-axis (the height) doesn't change. Placing a different thickness material on the table will throw off the calibration.**

Calibration

1. Check the laser is mounted properly and can be turned on/off using the silver button under the Control PC's emergency stop button.
2. Position the torch at least 200mm away from the edges of the table and set the Job Zero location.
3. The Laser Offset should be off.
4. In Plasma Mode, pierce the metal using the Test Arc toggle.
5. When a hole has been made, turn off the arc and raise the torch using the Z-axis jog button.
6. Turn the laser on using the Laser Offset button and adjust the laser so that it aligns perfectly with the pierce hole.

8.17.3 Laser Crosshair

The prefitted laser comes with a crosshair filter lens. However, depending on the lighting, this may make the laser difficult to see. The crosshair filter can be removed, increasing the brightness of the laser.

1. Unscrew the black end cap of the laser. The brass focus ring may also unscrew.
2. Unscrew the small spring inside the laser.
3. Remove the crosshair filter, the small clear piece of plastic inside the laser.
4. Replace the small spring, the focus ring (if it came undone), and the end cap on the laser.
5. Focus the laser to a point by twisting the brass coloured segment.

9. Maintenance

How often the CNC table is used and the working environment it is in should both be considered when planning the frequency of maintenance. In severe conditions, maintenance should occur more frequently.

Proper operation of the CNC table and regular preventive maintenance will help avoid equipment failure, increase the life-span and ensure problem-free cutting.

⚠ **Turn the machine and table off and unplug them from the mains before beginning any maintenance.**

Before each use, check your air hose, earth clamp and cable, and power cable are in good condition. Check that all connections are properly fastened. Any loose connections can inhibit cutting performance and cause damage.

- Check that all covers and components are intact.
- Check the consumables are installed properly and not worn.
- Check all electrical cables and connections every 6 months.
- Clean any oxidised connections and tighten them.
- Clean dirt and dust from the rails and racks.

ⓘ **Do not use any pressure-washing devices. Do not use compressed air, the pressure may pack the dirt even more tightly into components.**

⚠ **Only authorised electricians or service repair agents should carry out repairs and internal servicing.**

For repairs, contact UNIMIG at unimig.com.au or contact your local dealer.

9.1 Maintaining the CNC Table

To increase the longevity of the STEALTH CNC tables, a light machine oil, wax-based lubricant or a high-quality lithium-based grease can be used to lubricate the rack and pinions of the table.

⚠ **Do not use heavy oils or greases that can attract dust and debris, as this will cause damage to the table.**

Lubricating the moving parts of the table can help to protect against wear and friction and ensure smooth movement during operation.

A general guideline for lubricating the tables is to apply the lubricant after every 40-50 hours of operation. In dirty or dusty work environments the frequency can be increased.

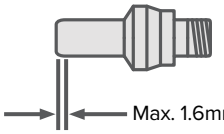
When lubricating the table:

1. Clean the rack and pinion system thoroughly before applying any lubricant.
2. Once the lubricant is applied, run the CNC table through its full range of motion to evenly distribute it across the table.
3. Wipe off any excess lubricant that may have accumulated.

9.2 Maintaining the Consumables

How often you need to change the consumables on your torch will depend on a number of factors:

- The material thickness.
- The average length of the cut.
- The air quality through the plasma cutter. The presence of oil, moisture, or other contaminants will cause more consumable wear.
- Whether the metal is being pierced or the cut starts from the edge.
- A proper torch-to-work distance when gouging or cutting with unshielded consumables.
- A proper piercing height.
- Whether it's cutting in perforated mode or normal mode. Cutting in perforated mode causes more consumable wear.

Part	Check	Recommended Action
 **Cutting Tip**	Check the centre hole is round.  **Good** **Worn**	Replace the cutting tip if the centre hole is no longer round.
 **Swirl Ring**	Check the surface inside the swirl ring for damage or wear, and check the gas holes for any blockages.	Replace the swirl ring if the surface is worn or damaged or if any of the gas holes are blocked.
 **Electrode**	Check the surface for wear, and that the pit depth on the electrode's tip isn't deeper than 1.6mm. 	Replace the electrode if the surface is worn or the pit depth is greater than 1.6mm.
 **Torch O-ring**	Check the surface for damage and wear.	Replace the O-ring if it's worn or damaged.

10. Troubleshooting

The issues and potential reasons outlined are not exhaustive but indicate common scenarios that might arise with regular use of the machine.

10.1 Plasma Cutter Troubleshooting

Problem	Recommended Actions
The machine does not power up	• Check that the power cable is plugged in properly. • Check that the mains switch of the power source is at the ON position. • Check that the mains power distribution is on. • Check the mains fuse and/or the circuit breaker.
The machine stops working	• The torch may have overheated. Wait for it to cool down. • Check that none of the cables are loose. • The power source may have overheated. Wait for it to cool down and see that the cooling fans work properly and the air flow is unobstructed.

10.2 Plasma Troubleshooting

Problem	Recommended Actions
The arc doesn't ignite	• The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check that the torch consumables are installed properly. • Check that the torch leads are correctly connected to the machine. • Check that the earth clamp is properly connected to a clean, dry area of the workpiece.
The temperature lamp is on, and the arc doesn't ignite	• The power source is overheated. Wait for it to cool down and see that the cooling fans work properly and the airflow is unobstructed.
The arc stops while cutting and won't restart	• The power source may have overheated. Wait for it to cool down and see that the cooling fans work properly and the airflow is unobstructed. • Check the torch consumables for wear and replace any that are worn.
The arc doesn't transfer to the workpiece	• Check that the earth clamp is properly connected to a clean, dry area of the workpiece and replace if damaged. • The pierce height distance may be too large. Move the torch closer to the workpiece and start the arc again.
The arc is hard to start	• Check the torch consumables for wear and replace any that are worn.
The arc sputters and hisses	• The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check that the torch consumables are installed properly. • Check the air hose line for moisture. Replace or install additional air filtration to the power source - *see "5.18 Installing Additional Air Filters" on page 45*.
The arc blows out but re-ignites when the torch trigger is pressed again	• Check the torch consumables for wear and replace any that are worn. • The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar).
Low cutting output	• The amperage may be incorrect, adjust the amperage.
No airflow	• Check that the air compressor is connected properly and that the air pressure is correct, adjust the air pressure to 75psi (0.5MPa/5bar).

Problem	Recommended Actions
The torch does not cut completely through the workpiece	• Check that gouging consumables aren't installed instead of cutting consumables. • The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Remove materials like paint, grease, oil, and dirt, including mill scale, from the base metal. • Check the torch consumables for wear and replace any that are worn. • Check that the earth clamp is properly connected to a clean, dry area of the workpiece and replace if damaged. • The amperage may be too low, increase the amperage. • The metal being cut is too thick for the maximum capacity of the machine. • The cut speed may be too fast. Reduce the cut speed.
Dross forms on the bottom of the cut	• The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check the torch consumables for wear and replace any that are worn. • The cut speed may be incorrect. Adjust the cut speed. • The amperage may be too low, increase the amperage.
The cut angle is not square	• The torch is not square to the workpiece. • The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check the torch consumables for wear and replace any that are worn. • The direction of travel may be incorrect. *See "6.14.6 Cut Direction & Angle" on page 147* for the proper technique. • The torch height from the workpiece may be incorrect. • The cut speed may be incorrect. Adjust the cut speed.
The cut is poor quality	• The amperage may be too low, increase the amperage. • The cut speed may be incorrect. Adjust the cut speed. • Check the air hose line for moisture. Replace or install additional air filtration to the power source - *see "5.18 Installing Additional Air Filters" on page 45*. • The metal being cut is too thick for the maximum capacity of the machine. • Check that gouging consumables aren't installed instead of cutting consumables. • Check the torch consumables for wear and replace any that are worn. • The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check the air hose line for moisture. Replace or install additional air filtration to the power source - *see "5.18 Installing Additional Air Filters" on page 45*. • Check that the machine in is the correct cutting mode (standard). • The torch cutting height may be too low, increase the height.
The consumable life is shorter than expected	• The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • The amperage, travel speed, and other variables may be incorrect for the material being cut. • The pierce height distance may be too large. Move the torch closer to the workpiece. • Check the air hose line for moisture. Replace or install additional air filtration to the power source - *see "5.18 Installing Additional Air Filters" on page 45*.

10.4 CNC Troubleshooting

Problem	Recommended Actions
The torch collides with the the workpiece	• The torch cutting height may be too low, increase the height.
The table won't perform an IHS check	• Check the machine is in the correct tool mode *see "6.3 ArcPath Layout & Operation" on page 103.* • Check that the Torch Height Controller (THC) is properly connected and operating. • Check that the G-code includes the necessary commands and plasma source connection.
The IHS check fails	• The torch is mounted to high in the torch holder, lower the torch. • A standard 90° plasma torch may be too short to detect, connect a CNC plasma torch. • The pierce height is set too low, increase the pierce height. • Check that the Torch Height Controller (THC) is properly connected and operating. • Check that the G-code includes the necessary commands and plasma source connection.
The THC doesn't connect	• Check the machine is in the Plasma tool mode - *see "6.3 ArcPath Layout & Operation" on page 103.* • Check that the Torch Height Controller (THC) is properly installed and connected. • Restart the CNC table and Control PC. • A forced connection may be attempted - *see "6.5.1 System Settings" on page 105.* • Check that the G-code includes the necessary commands and plasma source connection.
The torch doesn't move after piercing	• Check the plasma cutter has been configured to a 1:1 ratio - *see "5.19 Setting the Voltage Divider" on page 46* • The CNC connection port may be wired incorrectly. • Check that the earth clamp is properly connected to a clean, dry area of the workpiece and replace if damaged. • Check the torch consumables for wear and replace any that are worn.
The torch moves up and down erratically	• The amperage, travel speed, and other variables may be incorrect for the material being cut, causing an unstable arc. • There may be electrical interference from the plasma cutter or surrounding machinery and equipment. Check for potential grounding loops and if necessary, a grounding rod may need to be installed to properly earth the STEALTH CNC table. A grounding rod is a metal rod, typically 2.5-3m and made of copper or galvanized steel, driven into the ground vertically and connected to the CNC table using conductive wiring. An electrician may need to be contacted to ensure proper grounding. • The air pressure may be incorrect, check and adjust the air pressure to 75psi (0.5MPa/5bar). • Check the air hose line for moisture. Replace or install additional air filtration to the power source - *see "5.18 Installing Additional Air Filters" on page 45*.
The cut quality degrades during an extended cut	• The air compressor connected does not have the airflow necessary for the length of the cut. • Check the air hose line for moisture. Replace or install additional air filtration to the power source - see 'Installing Additional Air Filters'. • The metal being cut is too thick for the maximum capacity of the machine.
The Control PC does not connect	The ethernet cable may be plugged into the LAN2 port.

10.5 Alarms

The Alarm indicator on the cut panel will display any alarms present on the CNC table.

If NULL is displayed then there are no alarms present.

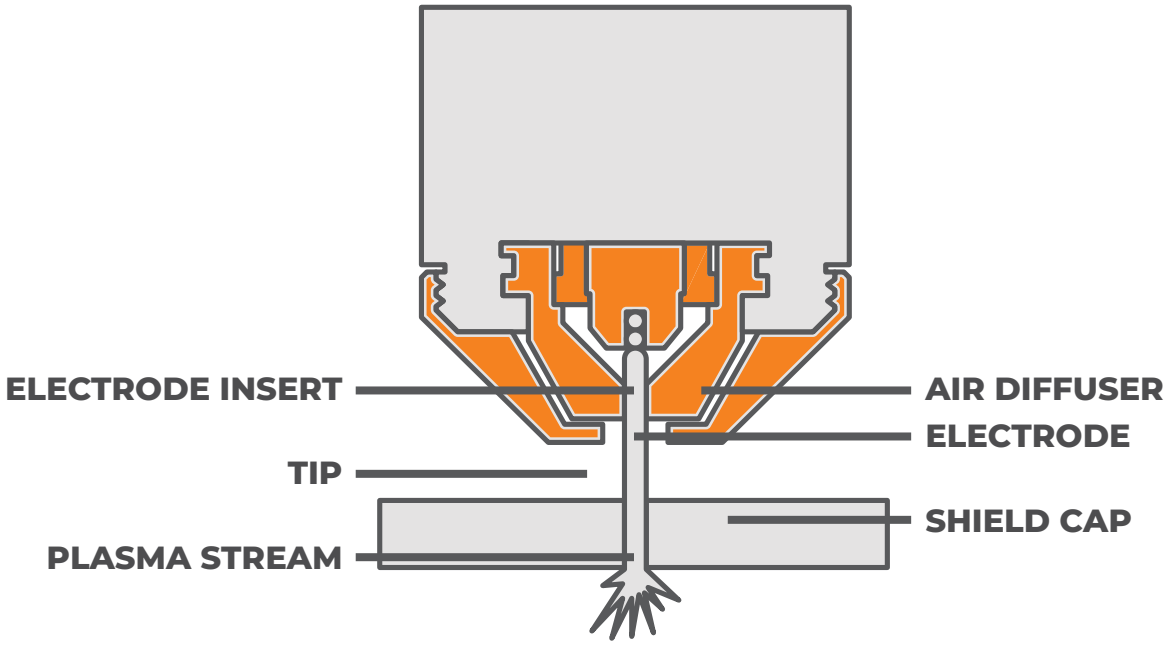
Alarm	Description	Potential Action
Motion Card Off Line!	The motion card is not connected.	The motion card may need to be restarted. Check that the ethernet cable is connected to the correct port, *see "5.8.2 Installing the Control PC" on page 29*
Motion Card Power Failure!	If the motion card is powered off, an alarm will appear when the system is powered on again. This alarm is meant to inform the user that a restart is necessary.	Restart the motion card.
Emergency Stop!	The physical Emergency Stop (E-Stop) button is triggered.	Check the button isn't pressed in. Release the Emergency Stop button by rotating it. Check the wiring to make sure that the wrong signal isn't being sent, *see "5.6 Installing the Electrical Cabinet" on page 24.*
Follow Error! Axis: XX	The corresponding axis's encoder feedback is different from the pulse's feedback.	Check the encoder and parameters. Check the axis hardware. Disable the encoder in setup directly, *see "6.5.2 Tool+Table Setup Settings" on page 110.*
Hard Limit! Axis: XX	The corresponding axis's hard limit has been reached.	Reverse the torch/tool movement to back off from and release the limit. Check the hard limit switches on the table have been triggered.
Soft Limit! Axis:%1%2	The corresponding axis's soft limit has been reached.	Reverse the torch/tool movement to back off from and release the limit. Set the soft limit to a higher value, expanding the range of travel for the gantry. Disable the soft limit, *see "6.5.2 Tool+Table Setup Settings" on page 110.*
Serve Fault! Axis:%1	The corresponding axis's servo driver triggers an alarm.	Check the driver and remove the alarm. Disable the servo alarm *see "Axis Settings" on page 111.*
Plasma Crash!	The plasma torch has touched the plate.	Raise the torch to remove it from touching the plate. Check the THC collision setup *see "THC Param" on page 117.*
THC Off Line!	The THC is not connected or has lost connection.	Check the status of the THC. Check the wiring to make sure it is properly connected, *see "5.7 Installing the Torch Height Controller (THC)" on page 25.* Try to initialise a connection to the THC, *see "THC Param" on page 117.*
Plasma Power Comm Off Line!	The plasma cutter is not connected or has lost connection.	Check the status of the plasma cutter and ensure it is operating normally. Check the wiring to make sure it is properly connected, *see "5.12 Connecting the Plasma Cutter to the CNC Table" on page 38.*
Not Have GCode!	There is no G-code loaded for cutting.	Import a G-code or select a shape from the shape library.
Not Home!	A Home command has not been run after startup.	Run a Home command on start up.

11. Plasma Cutting Guide

What is Plasma Cutting?

Plasma is a super-heated column of gas. It's formed when compressed air or compressed gases (like nitrogen or argon) make contact with the electrode (which is inside the torch) and ionise to create plasma.

Plasma cutting (plasma arc cutting), therefore, is a melting process that uses plasma and an outside power source to create an electric arc between the electrode and the metal being cut to melt and eject it from the cut.



How Plasma Cutting Works

Plasma cutting requires a compressed air supply and a constant voltage, direct current power source to operate. The plasma arc is created by electrically heating compressed air to a very high temperature, which ionises its atoms and makes them conductive.

When air from the plasma torch is forced through the swirl ring, a fixed gap is established between the electrode and the tip. The air becomes ionised by the electrical arc from the electrode, transforming into plasma, which flows from the torch to the workpiece.

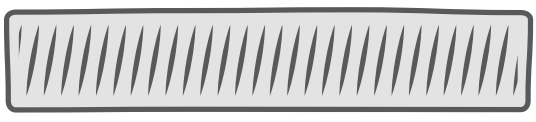
As the electricity from the torch travels through the plasma, it generates enough heat to melt the metal. The high-velocity plasma and compressed gas then blow the molten metal away.

What Materials Can Plasma Cut?

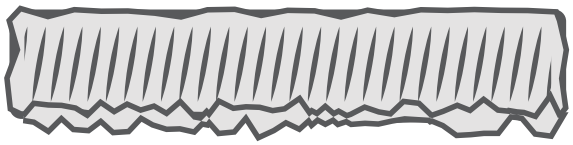
Plasma can cut through anything electrically conductive; steel, stainless steel and aluminium are all fair game. In comparison, oxy-cutting will only work on metals that contain iron, as it works through chemical reactions, such as oxidisation instead.

Clean Cut vs Severance Cut

You can get two types of cut with your plasma cutter: a clean cut or a severance.



CLEAN CUT



SEVERANCE

Clean cut: a smooth, clean cut on the metal.
Severance: a cut all the way through, but it won't be smooth, and it'll need to be cleaned up.

Every plasma machine has a maximum clean cut thickness and a maximum severance. These indicate how thick the metal can be to achieve a good-quality cut and how thick the metal can be if all you need is to get through it. The severance thickness will always be more than the clean cut thickness.

The cut thicknesses will vary depending on the type of metal. Aluminium and stainless steel have a higher viscosity (which is a fluid's resistance to flow) than mild steel, so their max cutting thickness is usually less than mild steel's max thickness because of their viscosity.

Plasma Cutting Basics

Amperage

The thicker the material, the more amperage required.

On thick material, set the machine to its maximum output and vary your travel speed. On thinner material, turn down the amperage and change to a lower-amperage tip to maintain a narrow kerf. The kerf is the width of the cut material that is removed during cutting.

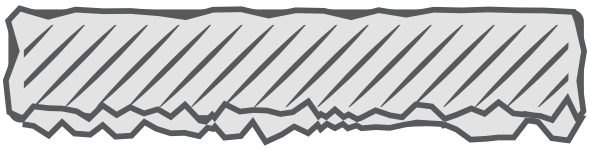
Make sure the torch's consumables can handle the amperage it's outputting. If the machine is set to 80A and the consumables can only handle 60A max, you'll burn through them.

Travel Speed

The travel speed will depend on the thickness of the material being cut. When travelling at the correct speed, the sparks should come out the bottom of the plate, lagging behind the torch at a slight angle (roughly 15° - 30° from vertical).

If you're cutting too fast, the sparks will spray at a very steep angle in the opposite direction than you're cutting. Some sparks might even fly out from the top. If they're flying out of the top, it means the plasma arc isn't cutting all the way through, and the sparks are bouncing off the part that is still joined together.

If they come out straight down and get stuck in grooves, you're cutting too slow. Cutting too slowly results in a wider kerf (the material lost due to the cutting process) and dross (excess metal from the cut that hardens on the bottom of the piece and needs to be cleaned off). Cutting too slow also makes the cut much harsher; it won't be as smooth as it could be.



✕ TOO FAST

Tip Size & Condition

The tip orifice focuses the plasma stream to the workpiece, which is why it's essential to use the correct size tip for the amperage being used.

A tip suited for lower amperages has a smaller orifice which maintains a narrow plasma stream for use on thin material. Using a 25A tip at a 60A setting will blow out and distort the tip orifice and require replacement. On the other hand, using an 80A tip on the lower settings will not allow you to focus the plasma stream as well and results in a wide kerf.

The condition of the tip orifice is critical to the quality of the cut result. A worn or damaged tip orifice will produce a distorted plasma stream, resulting in poor cut quality.

Dross

Some amount of dross is inevitable when plasma cutting, but you can minimise it by adjusting your settings to your specific application.

Excess dross appears on the top edge of both pieces of the plate when the torch height is too low. To reduce this, adjust the torch until the dross is minimised.

Low-Speed Dross

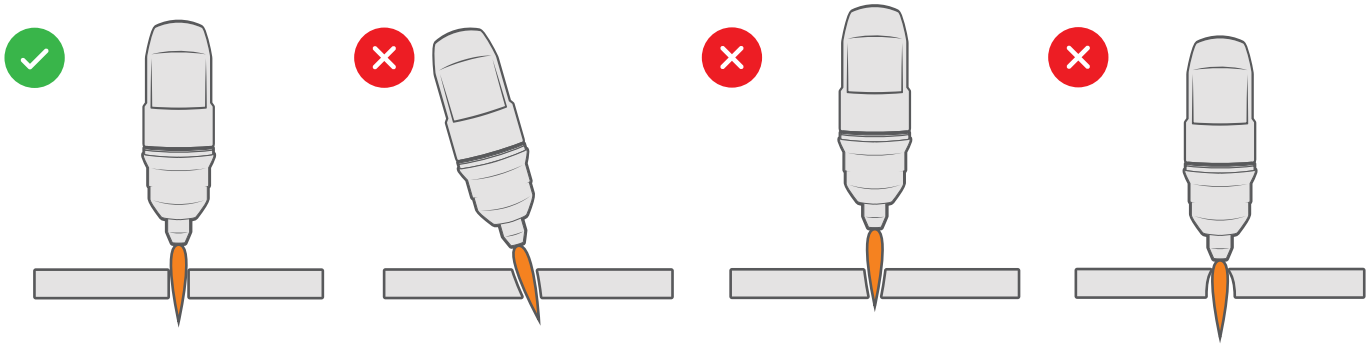
Low-speed dross forms when the cutting speed is too slow. It appears as a heavy, bubbly deposit at the bottom of the cut and can be easily removed. To reduce low-speed dross, increase the cutting speed.

High-Speed Dross

High-speed dross occurs when the cutting speed is too fast. It forms as a thin, linear bead of solid metal attached very close to the cut. This type of dross is more firmly attached to the bottom of the cut and is difficult to remove. To reduce high-speed dross, decrease the cutting speed and reduce the torch height.

Torch Height & Position

The distance and position of the plasma torch cutting tip from the workpiece affect the quality of the cut and the extent of the bevel. The easiest way to reduce the bevel is to cut at the proper speed and height for the material and amperage being cut.

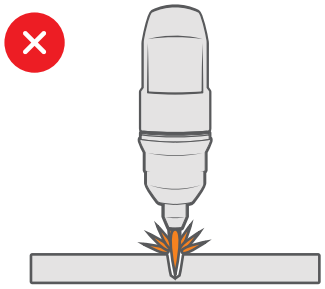


Correct torch height and square to the material. Minimum bevel & equal bevel Longest consumable life

Torch angled to the material. Unequal bevel, one side may be excessively bevelled.

Torch height too high. Excessive bevel, plasma stream may not cut all the way through the material.

Torch height too low. Reverse bevel. The tip may contact the work and short out or damage the tip.



If sparks are spraying up from the workpiece, you are moving the torch too fast, or you don't have enough amps set.

Add a piece of sheet metal to push the torch up against for extra accuracy on your cuts to keep your lines straight. You can also purchase circle cutting kits and cutting buggies for circles and curved lines.

Electrode Condition

A fixed gap is established between the electrode and the inside of the cutting tip. Electrons arc across the gap, ionising and superheating the air to create the plasma stream.

The electrode contains an insert at the end made of a highly conductive material called hafnium. This insert erodes with use and develops a pit at the end of the electrode. When the pit becomes too big, the quality of the cut becomes poor, and the electrode will need to be replaced.

12. Welding Processes & Features Index

13. Pinout Guide

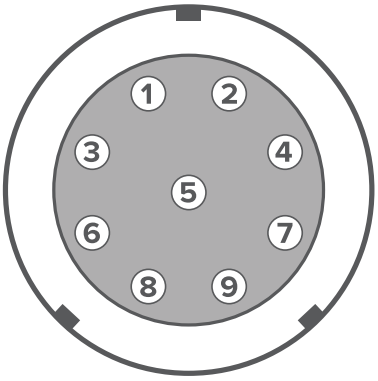
13.1 VIPER CUT 30 Mk II

SKU: U14005K (9 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (9 Pin)



Pin	Function
1, 2	Arc success signal
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.

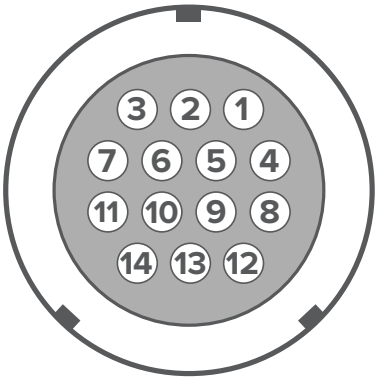
13.2 RAZOR CUT 45

SKU: U14006K (14 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (14 Pin)



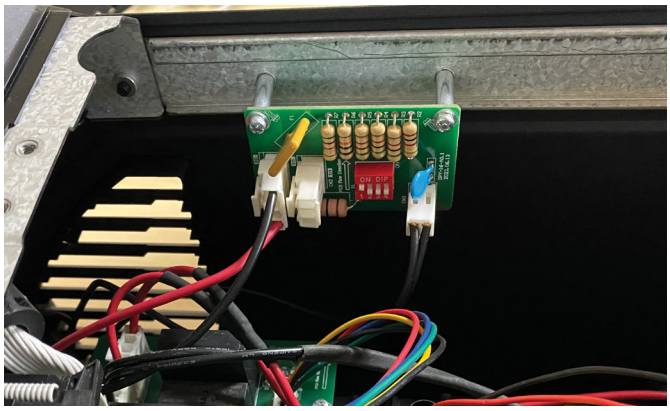
Pin	Function
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.
12, 14	Arc success signal

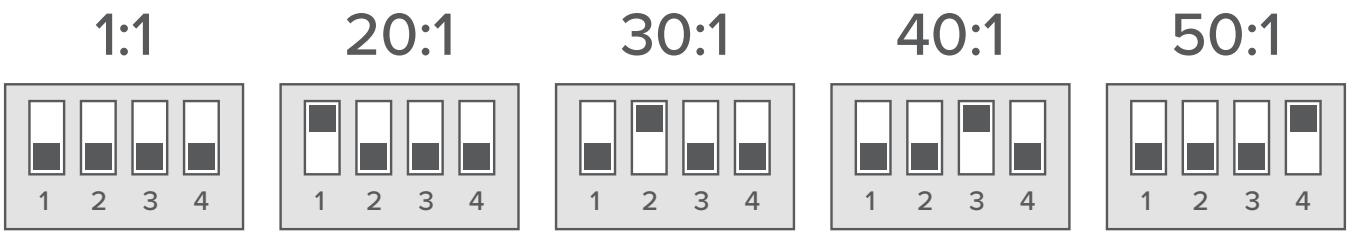
Voltage Ratio Adjustment Instructions

To adjust the voltage ratio, first locate the resistor board with the dipswitches. Begin by removing the carry handle and the top panel of the machine to access the board, which is positioned at the top of the unit (refer to the adjacent image for its exact location).

Below, you'll find the dipswitch configurations to set your desired voltage ratio.

Default Ratio: 20:1





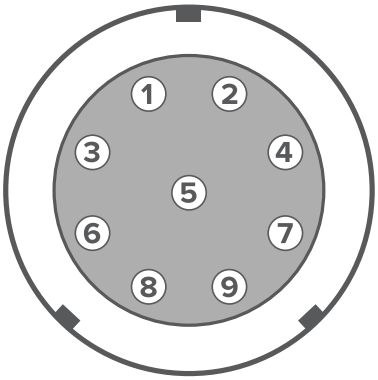
RAZOR CUT 45

SKU: U14006K (9 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (9 Pin)



Pin	Function
1, 2	Arc success signal
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.

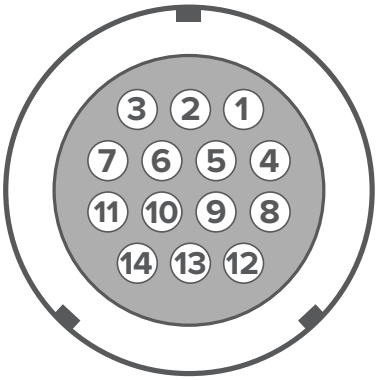
RAZOR CUT 45

SKU: KUPJRRW45 (14 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (14 Pin)



Pin	Function
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.
12, 14	Arc success signal

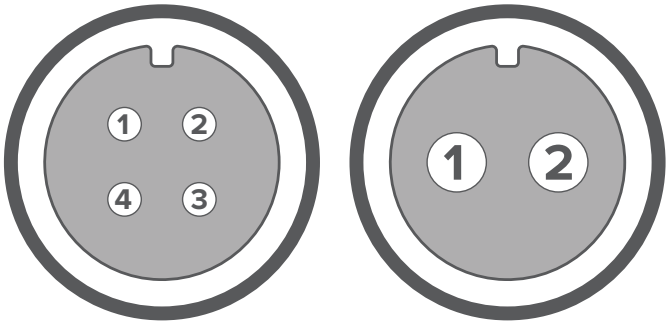
RAZOR CUT 45

SKU: KUPJRRW45 (4/2 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (4 Pin / 2 Pin)



4 Pin Outlet

Pin	Function
1, 2	Arc voltage feedback (+)
3, 4	Arc voltage feedback (-)

2 Pin Outlet

Pin	Function
1	Arc voltage feedback (+)
2	Arc voltage feedback (-)

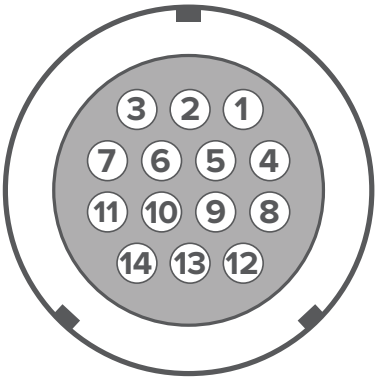
13.3 RAZOR CUT 80

SKU: KUPJRRW80 (14 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (14 Pin)

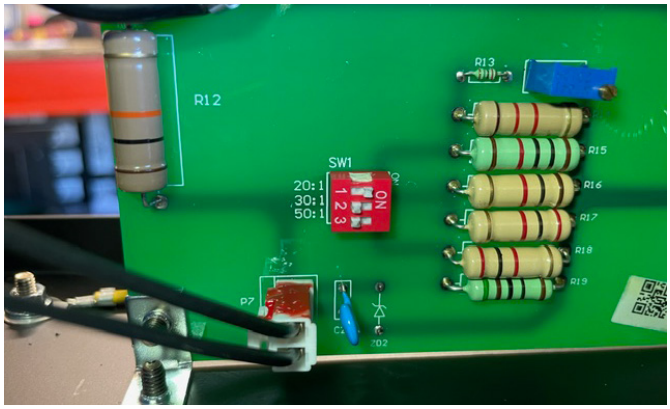


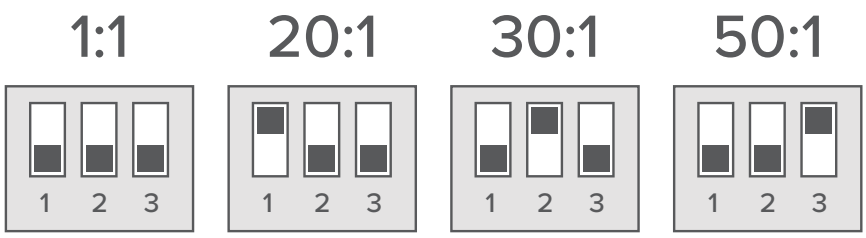
Pin	Function
1 (+), 2(-)	Torch height adjustment arc feedback (1:1 ratio only)
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.
12, 14	Arc success signal

Voltage Ratio Adjustment Instructions

To adjust the voltage ratio, first locate the resistor board with the dipswitches. Below, you'll find the dipswitch configurations to set your desired voltage ratio.

Default Ratio: 20:1





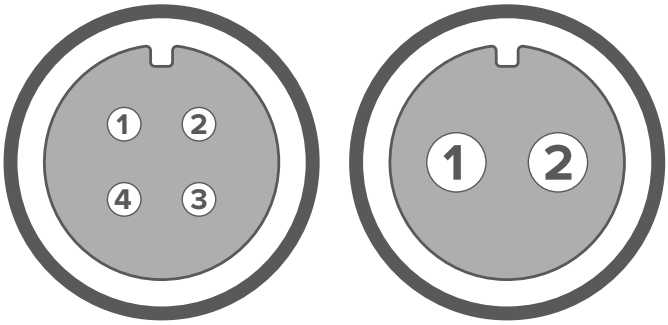
RAZOR CUT 80

SKU: KUPJRRW80 (4/2 Pin CNC Outlet)

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (4 Pin / 2 Pin)



4 Pin Outlet

Pin	Function
1, 2	Trigger On/Off
3, 4	Arc Success Signal

2 Pin Outlet

Pin	Function
1	Arc voltage feedback (+)
2	Arc voltage feedback (-)

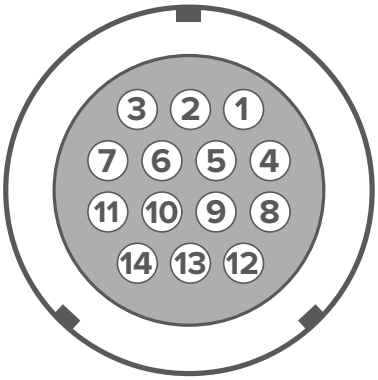
13.4 RAZOR CUT 120/160

SKU: U14002K / U14004K

Plasma Torch Pinout

Pin	Function
1, 2	Trigger
5, 6	Pilot Arc
8, 9	Safety

CNC Port Pinout (14 Pin)



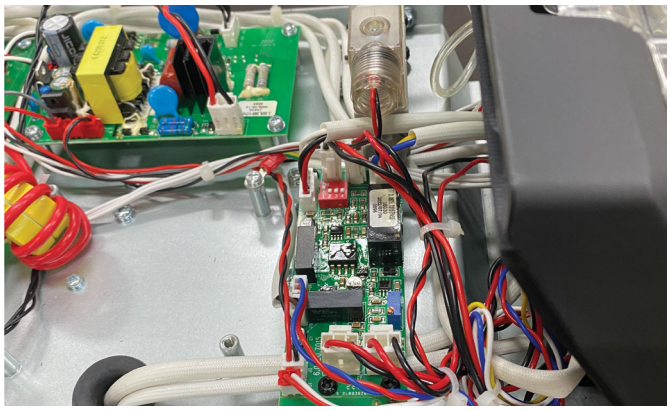
Pin	Function
1 (+), 2(-)	Torch height adjustment arc feedback (1:1 ratio only)
3, 4	Trigger ON/OFF signal
5 (-), 6(+)	Torch height adjustment arc feedback. Refer to the instructions below for selecting the ratio.
12, 14	Arc success signal

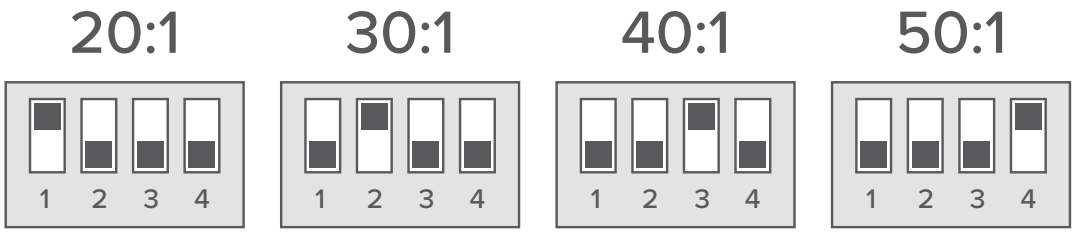
Voltage Ratio Adjustment Instructions

To adjust the voltage ratio, first locate the resistor board with the dipswitches. Begin by removing the carry handle and the top panel of the machine to access the board, which is positioned at the top of the unit (refer to the adjacent image for its exact location).

Below, you'll find the dipswitch configurations to set your desired voltage ratio. For 1:1 voltage ratio, use pins 1 & 2 on the CNC Port.

Default Ratio: 20:1





14. Recommended Accessories

RAZOR CUT 45 Plasma Cutter
U42006

RAZOR CUT 80 Plasma Cutter
U11023

RAZOR CUT 120 Plasma Cutter
U14002K

RAZOR CUT 160 Plasma Cutter
U14004K

SC80 CNC Plasma Torch
WG-SCM80R-40

SC120 CNC Plasma Torch
U43001

SC160 CNC Plasma Torch
U43011

Plasma Cutter Air Filter
50500-12

CNC Plasma Table Treatment
U11118 (5L)
U11156 (20L)

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