SA LASER

SAN ANTONIO LASER

THE SABER™

LASER WELDING MACHINE

WELD
3 IN 1
CUT
CLEAN

OWNER'S MANUAL

CONTENTS

1. INTRODUCTION

1.1 INTRODUCTION

Laser welding is a high-energy-density laser beam as a heat source, which locally heats the material in a small area and melts the material to form a specific molten pool to achieve the effect of welding.

Laser welding is mainly used for welding of thin-wall materials, precision parts, etc., which can realize spot welding, splicing welding, seal welding, overlap welding, etc. The heat distortion is small, the weld seam is beautiful and smooth, and the weld seam quality is high, and no secondary grinding treatment is required.

In recent years, laser welding has been widely used for welding stainless steel, carbon steel, galvanized sheet, copper, aluminum and other products.

The hand-held laser welding machine uses a hand-held swing welding head, which is flexible and simple to operate without the need for professional welder technology, Suitable for small batch and large batch production.
Widely used in sheet metal processing, kitchen cabinets, cabinets, stair handrails, elevator escalators, display shelves, doors and windows, advertising models, stainless steel products and many other industries.

Process Comparison		
	Traditional Welding	Laser Welding
Heat On Workpiece	High	Low
Deformation Of Workpiece, Undercut	High	Low
Bonding Strength With Base Material	Standard	Meets or Exceeds
Follow-Up Process	Heavy Grinding	Minimum to no grinding required
Welding Speed	Based On Skill	2-4x Faster
Applicable Material	Stainless Steel, Carbon Steel, Galvanized Sheet	Stainless Steel, Carbon Steel, Galvanized Sheet, Aluminum Alloy, Copper
Operating	Highly Skilled	Easy
Welding Fault Tolerance	Good	Good
Spot Width Adjustable	No	Yes
Power Consumption	High	Low
Cost Consumables	High	Low

Traditional Welding Machine

1. High labor costs: Traditional welders have high wages and difficult recruitment.
2. The head width can be inconstant & splatter leads to long secondary processes
3. Poor safety: sparks splash, safety cannot be guaranteed.
4. High cost of use: requires high power consumption

VS

Hand-Held Laser Welding Machine

1. Simple and easy to operate, no professional welding technician required.
2. Consistent weld beam / little to no post process
3. Low power consumption leads to increased power savings

1. INTRODUCTION ...CONT

1.2 WHAT'S INCLUDED

- Owner's Manual
- Safety Glasses
- Safety Interlock Bypass
- Toolbox
- Power Switch Keys
- Hose Clamps x2 Gas Line 10ft
- Allen Wrench Set (Metric)
- Philips screwdriver
- Flathead screwdriver
- Clear Tape
- Hose Stand
- 600mm Cleaning Laser Kit
- Standard Wire Spool
- Wire feeder rollers
- Wire Feed Hose
- Wire feed copper tips x3
- Copper Tip Set x4
- Protective Lens x10
- Cable Protection 30ft

1.3 UNCRATING

- Remove all screws from crate and discard packing materials.
- Review and confirm you have received all components on your packing list.
- Remove any packing materials from around the unit.
- Ensure that the system is installed in a location free from the following:
  - Dust
  - Strong electromagnetic fields
  - Oil
  - Smoke
- Prohibit exposing the machine to acid steam or other corrosive gases.
- Make sure to perform GND Wiring as it is necessary

2. SAFETY

2.1 INTRODUCTON

With a Class-4 laser safety is crucial due to the potential danger of invisible radiation emitted during laser machine operation. This radiation can be harmful to both workers' eyes and skin.

Sub-shot radiation and reflections are also hazardous. When red radiation refracts in the eyes, it can focus on the retina, posing a significant risk to eye safety.

In summary, it is essential to always wear protective glasses during machine operation or maintenance, even with the use of a welding hood.

2.2. PROTECTIVE GLASSES/GOGGLES

Protective glasses serve as a protective barrier against direct radiation, reflected radiation, and scattered radiation. Nevertheless, even when operators wear goggles, they should exercise caution and avoid directing the laser head towards people's eyes. Intense laser radiation can still potentially damage the protective equipment.

Please Follow these guidelines for protective glasses/goggles:

- Inspect the glasses to ensure they are not damaged.
- All eyewear should have an Optical Density 5 (OD5) or greater)

2.3 CLOTHING/GEAR

Standard nonflammable clothing & protective gear is recommended

2.4 FIRE HAZARD

- When operating the laser, entry into the working area is strictly prohibited for workers without safety training.
- In the laser system operating area, it is strictly forbidden to store flammable, explosive, or volatile substances like gasoline and alcohol.
- Ensure that the operating area is well-ventilated and consider installing an exhaust system or fume purifier for improved safety.

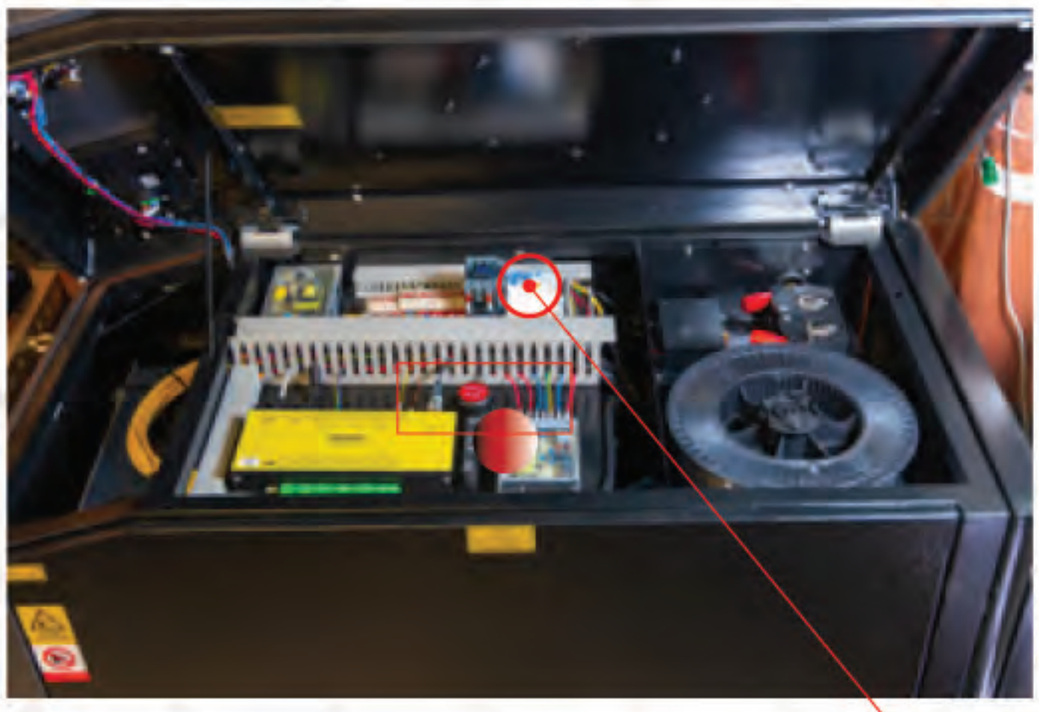
2.5 EXTENDED SAFETY PRECAUTIONS

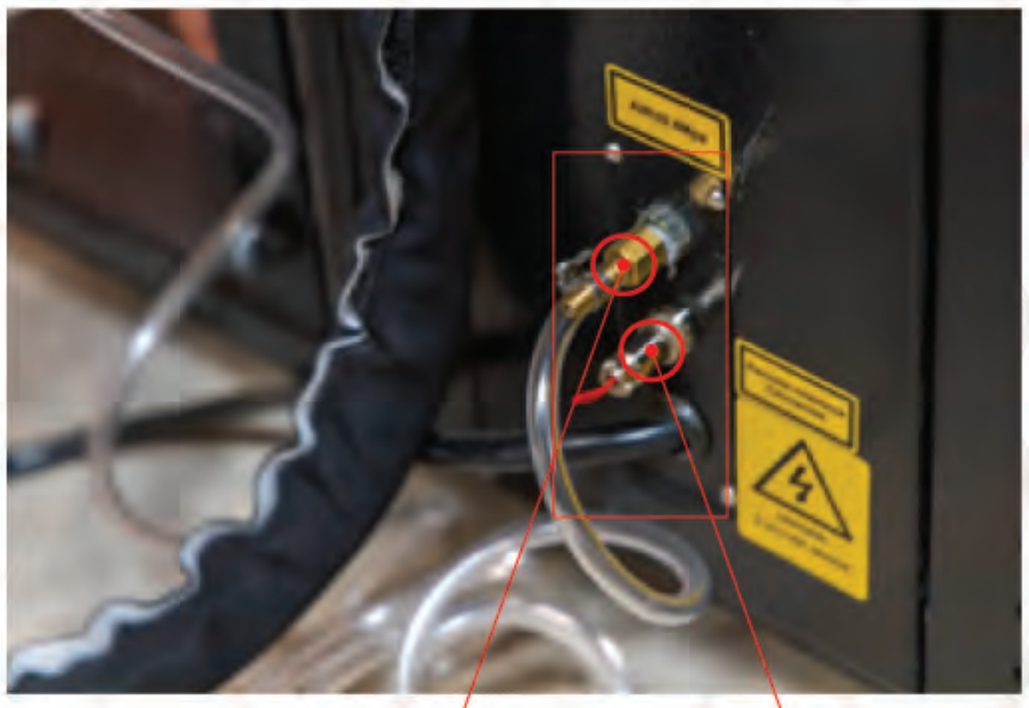
- Follow all OHSA safety guidelines for safe use of a Class 4 Laser.
- Consult your site laser safety officer for potential area hazards.

3. MACHINE SETUP

3.1 SABER BREAKDOWN

SABER EXPLODED VIEWS





3. MACHINE SETUP... CONT

3.2 POWER REQUIRMENTS & TURNING ON

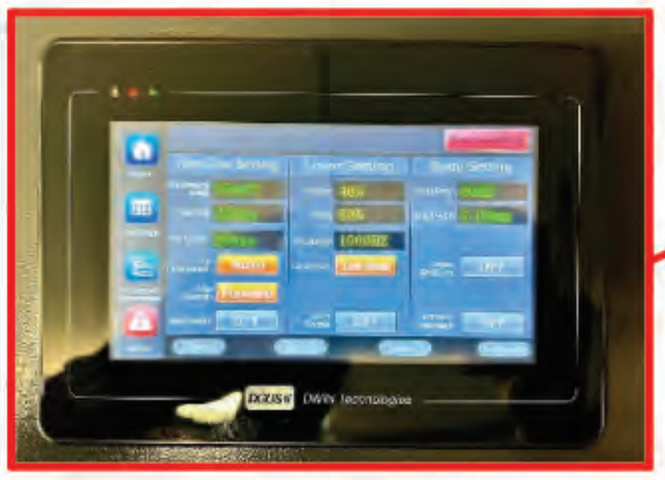
The SABER fiber laser welder has a power requirement of 220v/60hz AC outlet and will need a 30amp single phase/double throw breaker. If you do not have this connection in your breaker panel, you will need to have these components installed by a qualified electrician and they will need to be installed according to your local ordinances and building codes.
(Please note: This may also require building permits and/or inspection by your local municipality.)

Once you have either confirmed or installed these components, please follow these next steps to get your SABER powered on.

STEP ONE:
Connect the power cord to the 200v/60hz AC outlet

STEP TWO:
Open lid to turn on the circuit breaker inside.

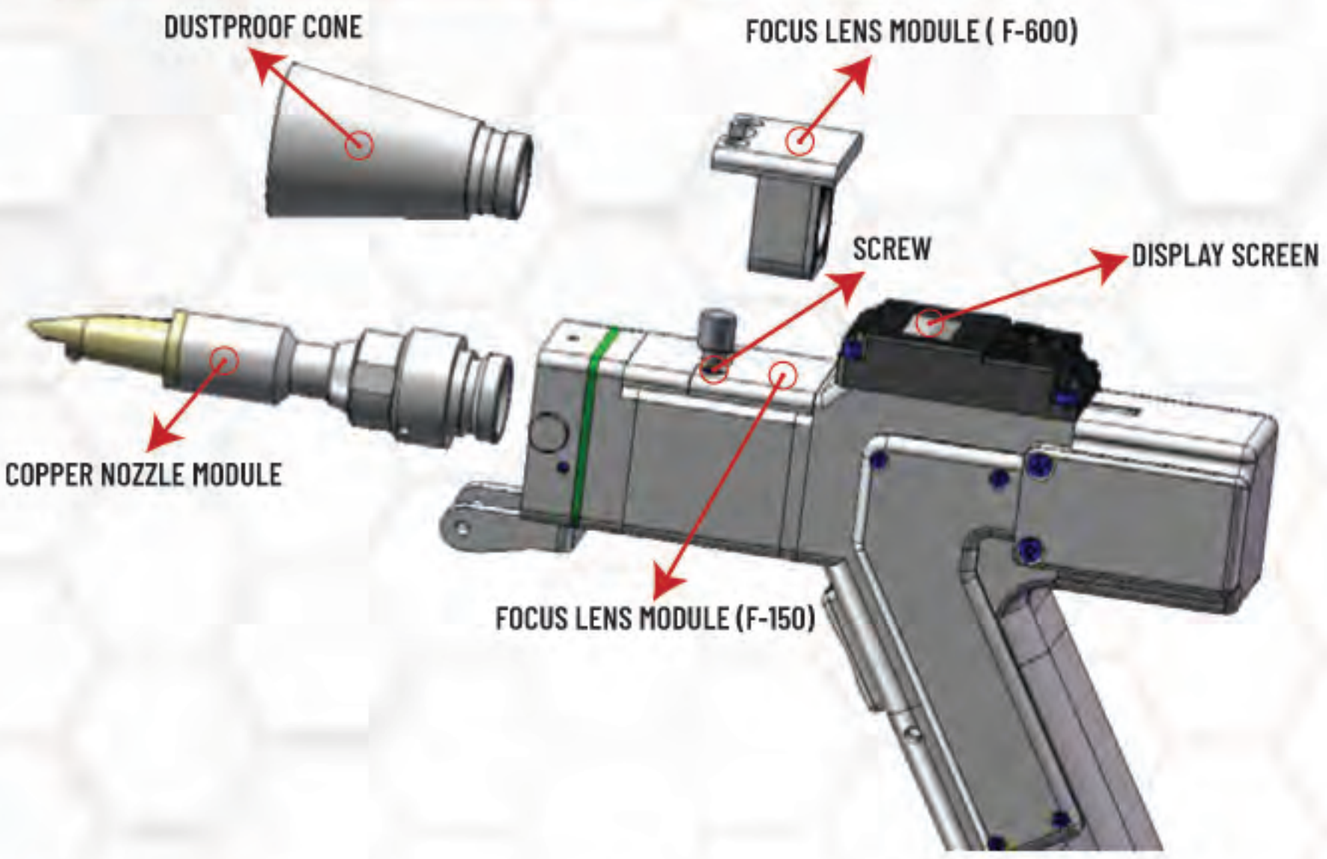
STEP THREE:
Turn the release the “E-stop” switch and turn the power switch key to the right for the “ On” position.



STEP FOUR:
Once the unit powers on, press start button to enter the home screen.

3.3 WIRELESS CONTROL MODULE

INDENTIFICATION & MOUNTING

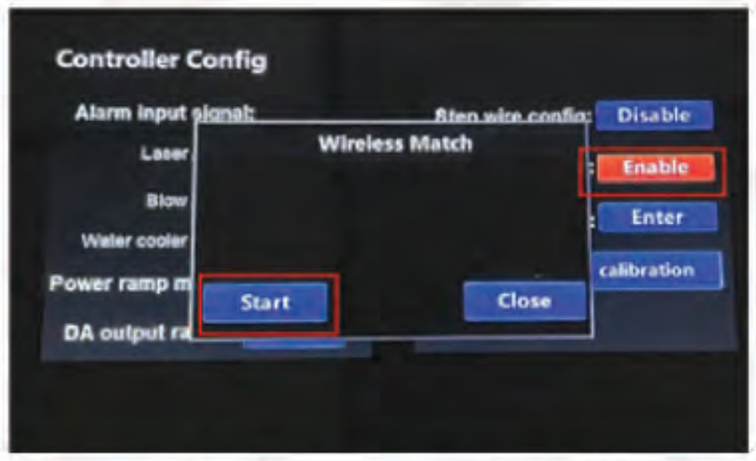


The wireless receiving module is inserted into the DB9 female socket of the HWS5000 controller. Once connected, place the round receiver into the upper cabinet, route the exposed wires into the cable track, and place the bluetooth module in conspicuous place.

Once the connector, cable, and module is install and secured, please go to the SABER control screen and perform the following functions:

Press the Home button

Press Controller Config



Press Enable then press Start

The Laserhead module should now be installed and ready for use.

3.3 WIRELESS CONTROL MODULE... CONT

CONTROL MODULE

1. Display Screen:

- This is the primary interface for user interaction with the machine, where all the operational parameters and functions are displayed. It allows the operator to monitor and adjust settings in real time, ensuring optimal performance of the laser welding system.

2. OK Key:

- Short Press: Enters the parameter editing mode, allowing the operator to cycle through available parameters for adjustment. The currently selected parameter will flash, indicating it can be modified using the left or right buttons. This feature facilitates quick adjustments to adapt to different welding requirements.
- No Action Within 5 Seconds or After Setting: Automatically exits the editing mode to prevent unintended changes, enhancing the system's usability and safety.
- Long Press (Non-Editing State): Activates the power slow-down function, which can be crucial for gradually reducing the intensity of the laser, possibly at the end or beginning of a weld, to prevent material damage. Releasing the button stops the power reduction, allowing for precise control over the welding process.

3. Left Button:

- Short Press (Editing State): Decreases the value of the selected parameter or changes the state of a function, providing a simple means to fine-tune welding settings.
- Long Press (Non-Editing State): Initiates wire feeding, which is essential for continuous welding operations or when starting a new weld. Releasing the button stops the wire feed, allowing for on-the-fly adjustments to the welding wire supply.

4. Right Key:

- Short Press (Editing State): Increases the value of the selected parameter or changes the function state, enabling the operator to quickly adjust settings to match welding conditions or materials.
- Long Press (Non-Editing State): Starts the thread rewinding function, useful for retracting excess wire and maintaining optimal wire length for welding. Releasing the button stops the rewinding, ensuring precise control over the wire's position and length.

IMPORTANT CONSIDERATIONS

1. Avoiding Interference: Ensure that the wireless controller is used in environments free from obstructions or sources of interference to maintain optimal connectivity and performance.
2. Handling the Wireless Control Receiver: The wireless control receiver should never be connected or disconnected while power is supplied to the system. Always ensure the system is powered off before making any adjustments to the receiver to prevent damage or malfunctions.

3.3 WIRELESS CONTROL MODULE... CONT

FUNCTION INTRODUCTION

This function introduction will provide basic details of various features of a sophisticated laser welding system. We aim to highlight its versatility and adaptability to diferent welding disciplines. Please review this breakdown of each feature for clarity:

1. Communication Status:
Indicates the status of the wireless connection between the welding machine and its controller or other connected devices. A "normal" status signifies a successful connection, whereas "disconnected" indicates a lack of communication, which is crucial for remote monitoring or control of the welding process.

2. Light Emitting Mode:
Offers two modes for laser emission - "spot shooting" for precise, localized welding and "continuous" for sustained, linear welding operations. This adjustability allows for flexibility in welding applications, catering to both detailed and extensive welding tasks.

3. Laser Power:
Adjustable from 0% to 100%, this setting controls the intensity of the laser beam, directly in uencing the depth and strength of the weld. This feature allows the operator to match the laser power to the material's properties and thickness, optimizing weld quality and e ciency.

4. Scanning Width:
With a range from 0mm to 4mm, this parameter sets the width over which the laser beam oscillates or scans during welding. This capability is essential for creating welds of speci c widths, adapting to the joint's geometry, and distributing the heat input more evenly.

5. Spot Enable:
This toggle turns the spot welding function on or off, providing control over whether the welding is performed as a series of spots or a continuous seam. Spot welding is particularly useful for delicate operations or when welding thin materials that might warp under continuous heat.

6. Spotting Time:
Defines the duration of laser emission in spot mode, adjustable from 0 seconds to 1.0 seconds.
This precision control over the spot welding time allows for the fine-tuning of weld penetration and heat affected zone, optimizing the welding outcome for different materials and thicknesses.

7. Wire Feeding Speed:
The speed at which welding wire is fed into the weld pool can be adjusted between 0% and 100%, correlating to the demand of the welding task. Proper adjustment of wire feeding speed is crucial for achieving consistent weld quality and preventing defects such as porosity or lack of fusion.

8. Wireless Pairing:
This function facilitates the wireless connection setup with compatible devices or controllers, enhancing the exibility and ease of use of the welding system, especially in complex or constrained work environments.

9. Language Switching:
Supports interface language customization, including Simplified Chinese, English, and Traditional Chinese. This feature makes the system accessible to a broader range of operators, reducing the risk of misinterpretation of commands and settings due to language barriers.

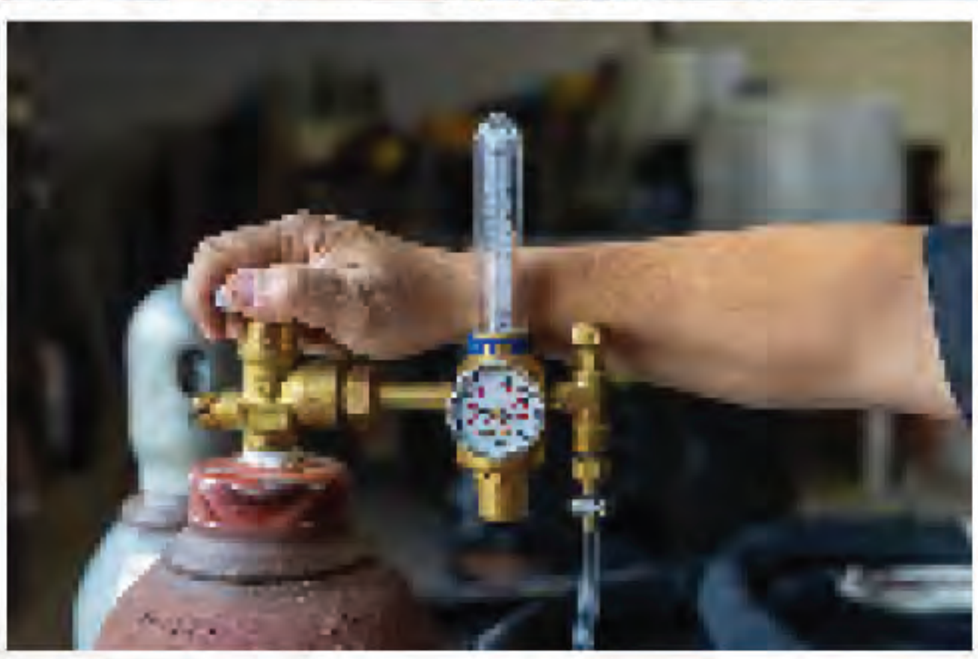
These features collectively enhance the laser welding system's functionality, making it adaptable to a wide range of welding tasks while ensuring high-quality results. The system's user-friendly interface and comprehensive control options significantly contribute to its operational effciency and precision.

3.4 INTERLOCK & GAS LINE INSTALLATION

Setting Up the Gas

- Place the gas bottle on the cart located on the back of the machine
- Secure the bottle with straps.

- Connect the hose from the gas fitting to the gas bottle regulator
- Secure with straps
- Secure with hose clamps..



Turn on the gas at the bottle.

3.4 INTERLOCK & GAS LINE INSTALLATION...CONT

On the touch screen go to the home screen (a), advanced settings (b), enter password (2000) (c), turn blow switch on (d), gas will be activated and you should hear it coming out of the nozzle.

a)

b)

c)

d)

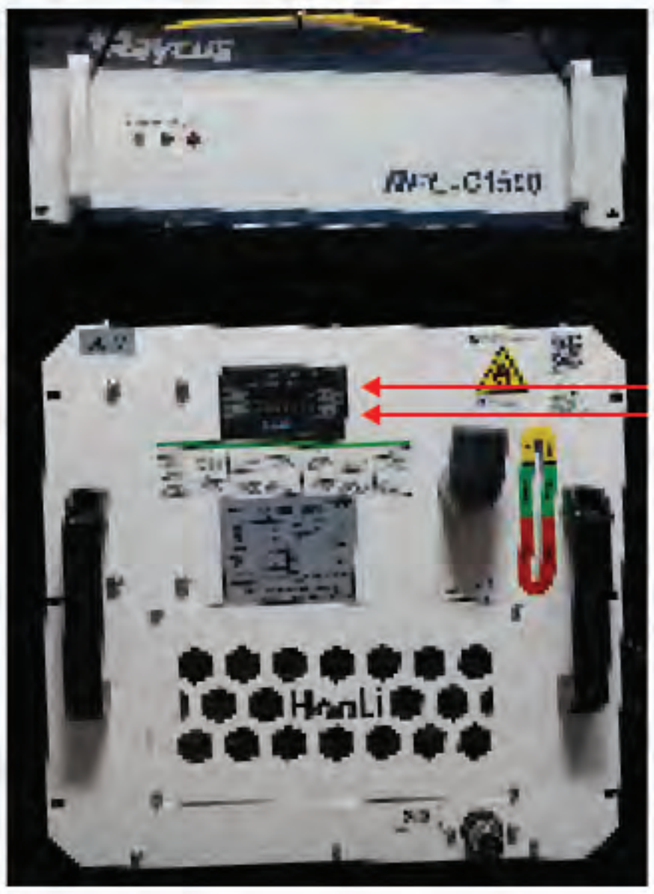
REGULATOR RECOMMENDED SETTINGS:

- **30 psi for welding**
- **100 psi for cutting.**

Once set turn off blow switch button and exit to home screen

3.5 CHILLER

Check Water-Cooling System and Add Water



The fiber laser employs a water-cooling system, ensure that the temperature is maintained between 21 C and 24 C.

Maintain the temperature below a maximum of 50 C to 60 C for the laser head. A temperature range of 30 C to 40 C is ideal for proper laser head operation.

To setup and prepare the chiller for use follow the next series of steps

Take off cover and pour in the clean water

Loosen the water cover, open it, and pour in approximately 2 gal. of clean Distilled/RO water

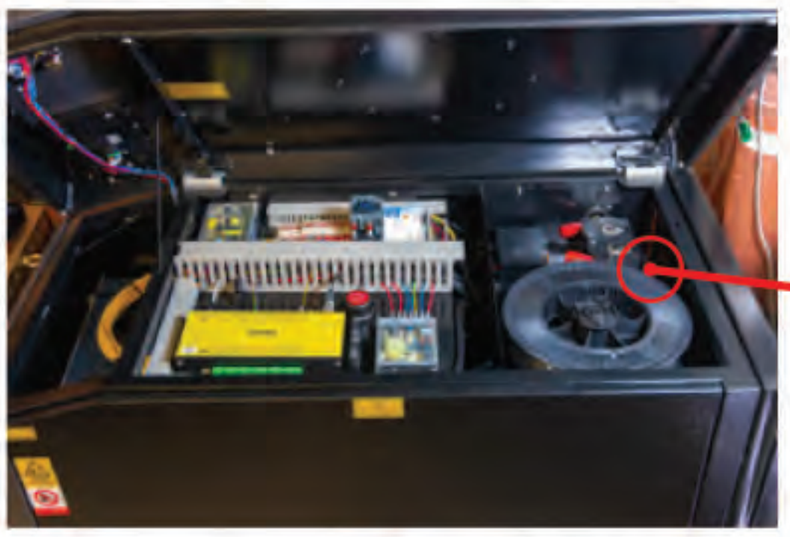
PRO TIPS:

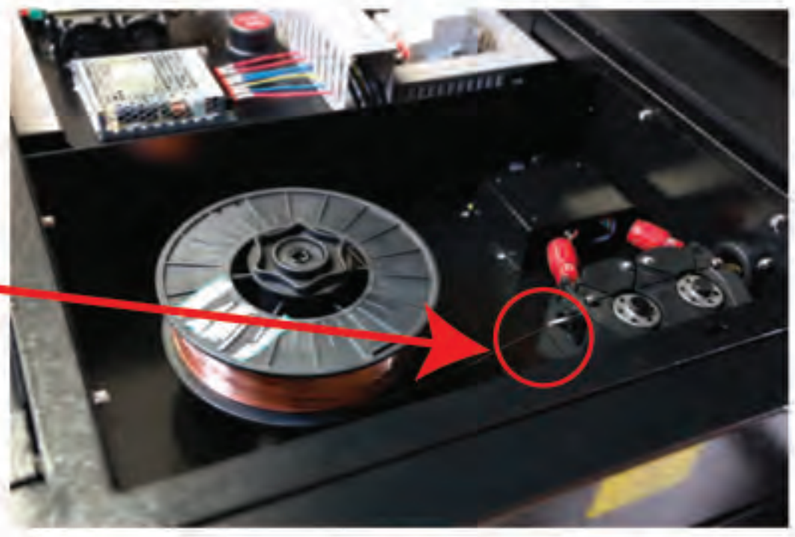
If possible, use RV/Marine Anti-Freeze instead of water.
If you, be sure to fully drain the chiller using the drain plug.

3.6 WIRE FEED SETUP

Wire feed welding is the most common use for the fiber Laser Welder. It resembles the function of MIG Welding. The difference is you do not have to swing the gun back and forth. This is done internally and controlled by the software. You only need to drag the welding tip along the beam to create an even consistent weld

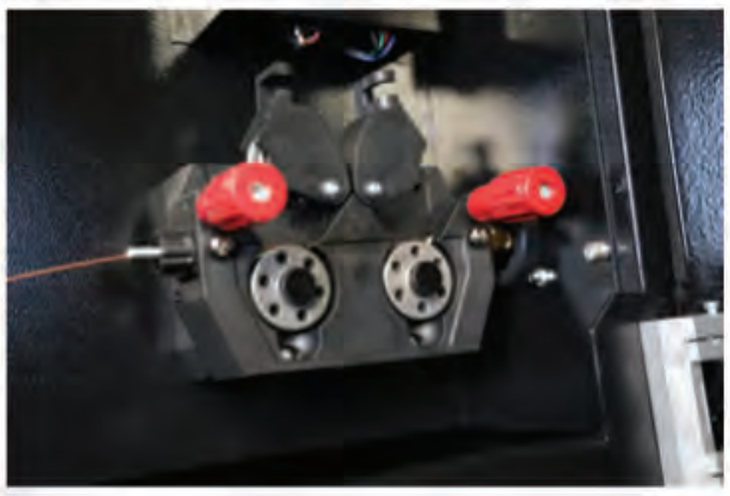
1. **Insert wire feed hose into the wire feeder and secure with tightening screw**

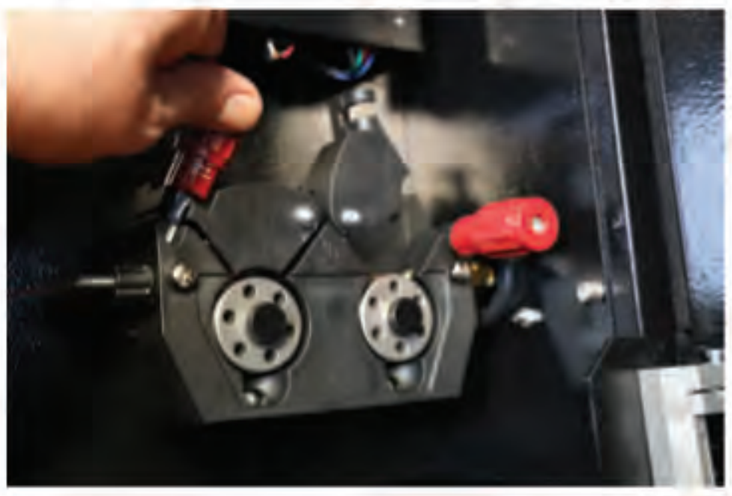




2. **Install the welding wire into the holder. With the wire line facing the feeding rollers.**

3. **Release the wire clamps fixed device to insert the welding wire into the track, and then lock the wire clamps once inserted.**





4. **Attach the wire feeding hose to the welding gun. Then press the manual feed button (forward) until the wire comes out of the feeder and clip to length.**

Please note: The wire should ride in the notch of the welding tip.

3.7 CALIBRATION & SETTING FOCUS

CALIBRATION

Nozzle Centering Adjustment. To Align the laser spot to the center of the nozzle, follow these precise steps to ensure the laser beam is optimally positioned for accurate and efficient welding

1. **Remove nozzle an place clear tape over opening**
2. **Power on the system**
3. **On the touchscreen set "width" to 0 mm**
4. **Select advanced parameters**
5. **Enter password "2000"**
6. **Press "Log In"**
7. **In advanced parameters adjust optical core "offset"**

This adjustment allows you to shift the optical core horizontally within the nozzle.

- **To move it right - Decreased the number**
- **To move it left - Increase the number**

This setting can also be manipulated to ensure perfect alignment on your welding wire when wire feeding is in use. Having this centered on your feeding wire will give the most even results for your finished bead.

For adjusting the laser spot up and down your must remove the square cover on the back if the gun and adjust the 2 mechanical adjustment screws. This align the beam on the vertical axis.

FIND FOCUS

The welding has an adjustable scale tube this is used to set the focus of the laser. To adjust the nozzle loosen the locking ring and you can slide the tube in and out of the gun to set focus. the lens is 150mm focal length. This is the zero point on the scale. For most fusion and wire feeding weld it shout be set to zero

3.8 TIP APPLICATION & INTERCHANGE

TIP TYPES

- Cutting Tips

- Wire Feeding
- 1.0 - 1.6mm

- Outside Corner

- Flat Surface

- Cleaning Cone

The tips provided can all be screwed to the adjustment tube except the cleaning nozzle. You must remove the welding tube attach the cleaning cone.

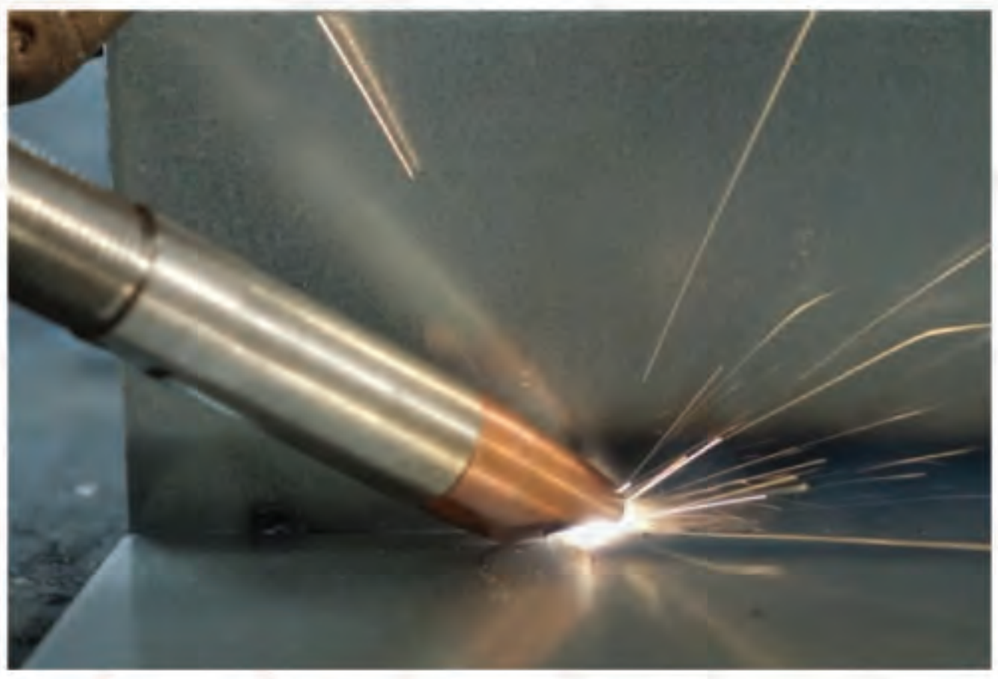
4. FUSION WELDING

THEORY

This type of weld process is best suited for tight tolerance welds. You are joining / fusing 2 bases materials together, so the closer these substrates are the cleaner and stronger the finished weld will be. No beveling is necessary and is completed without the assistance of wire feeding.

Quick tips:
You can adjust the power to achieve the desired penetration and for more secure welds, you can also fusion weld the opposite side. If that is not possible, make sure to do a destruct P and ensure suitable weld depth.

EXAMPLES



5. WELDING

5.1 SHIELDING GAS

Shield gas or "cover gas" plays an important role in the laser weld process and can affect the weld by influencing weld speed, microstructure, and shape.

Shielding gas plays three roles in the laser weld process:

1. To disperse the plasma shield produced by high-power laser welding.
2. To protect the workpiece from oxidation during the welding process
3. Protect the focusing lens from metal vapor pollution and liquid droplet splattering.

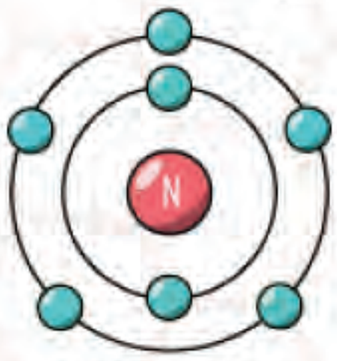
Moreover, the type of shield gas can influence the manufacture of weld defects, such as porosity.
The type of shield gas affects porosity primarily through the stability of the molten pool and the solubility of the shield gas within the molten metal of the weld so choosing the right gas for the desired outcome is vital for strength in the weld pool.

MAIN GAS TYPES

Argon (Ar):
Is more expensive than nitrogen, but it provides excellent protection against oxidation and contamination. Argon can also reduce spatter and produce smooth and uniform weld surfaces. However, argon can also ionize easily, which can reduce the effective laser power and welding speed. Argon can also produce wide welds with low penetration.

Bohr Models

Nitrogen (N2):
Is the cheapest and most abundant gas, but it is not suitable for welding some types of stainless steel, as it can cause embrittlement and porosity in the weld. Nitrogen can also ionize easily, which can interfere with the laser beam. However, nitrogen can provide good protection against oxidation and produce deep penetration in the weld.



Bohr Models

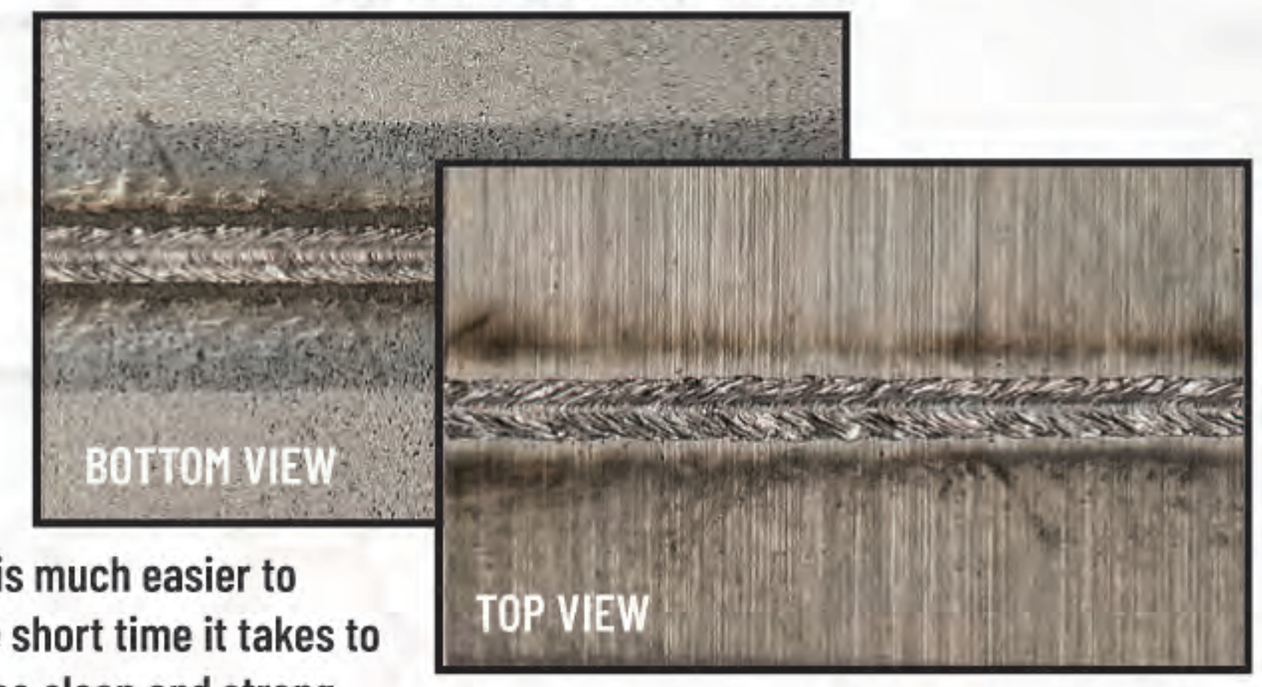
Helium (He):
Is the most expensive gas, but it has the highest ionization energy, which means it can transmit the laser beam without interference. Helium can also increase the laser power and welding speed and produce deep penetration in the weld. However, helium has a low density and a high thermal conductivity, which means it requires a higher flow rate and a more precise blowing mode to achieve effective protection.

Bohr Models

5. WELDING... CONT

5.2 MIXED METALS

STAINLESS / ZINC COATED STEEL



The process of laser welding dissimilar metals is much easier to achieve due to the intensity of the weld and the short time it takes to create the weld. This Laser process can produce clean and strong results. Special attention is needed to find the correct setting and material for a successful, and strong weld.

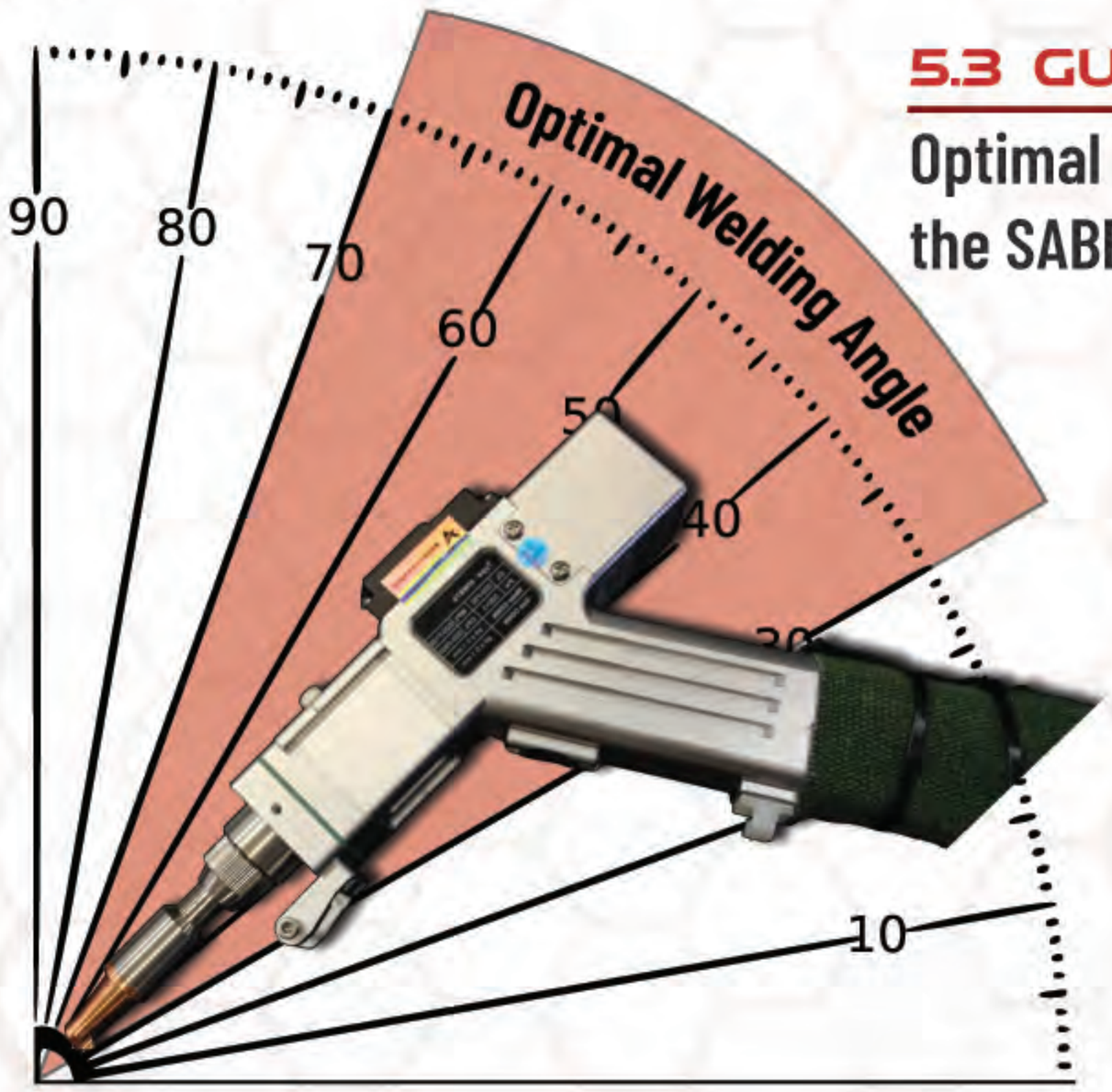
This is important because different metals have different melting points. Copper will melt at a different temperature than aluminum or even carbon steel. There can even be different melt points amongst aluminum base material.

7075 aluminum melts at approximately 890 degrees whereas 5051 melts at almost 1200 degrees. The laser achieves those melting points so fast it's easier to create the puddle and produce a clean consistent weld. The laser also does not rely on the conductivity of the ground to provide a clean arc.

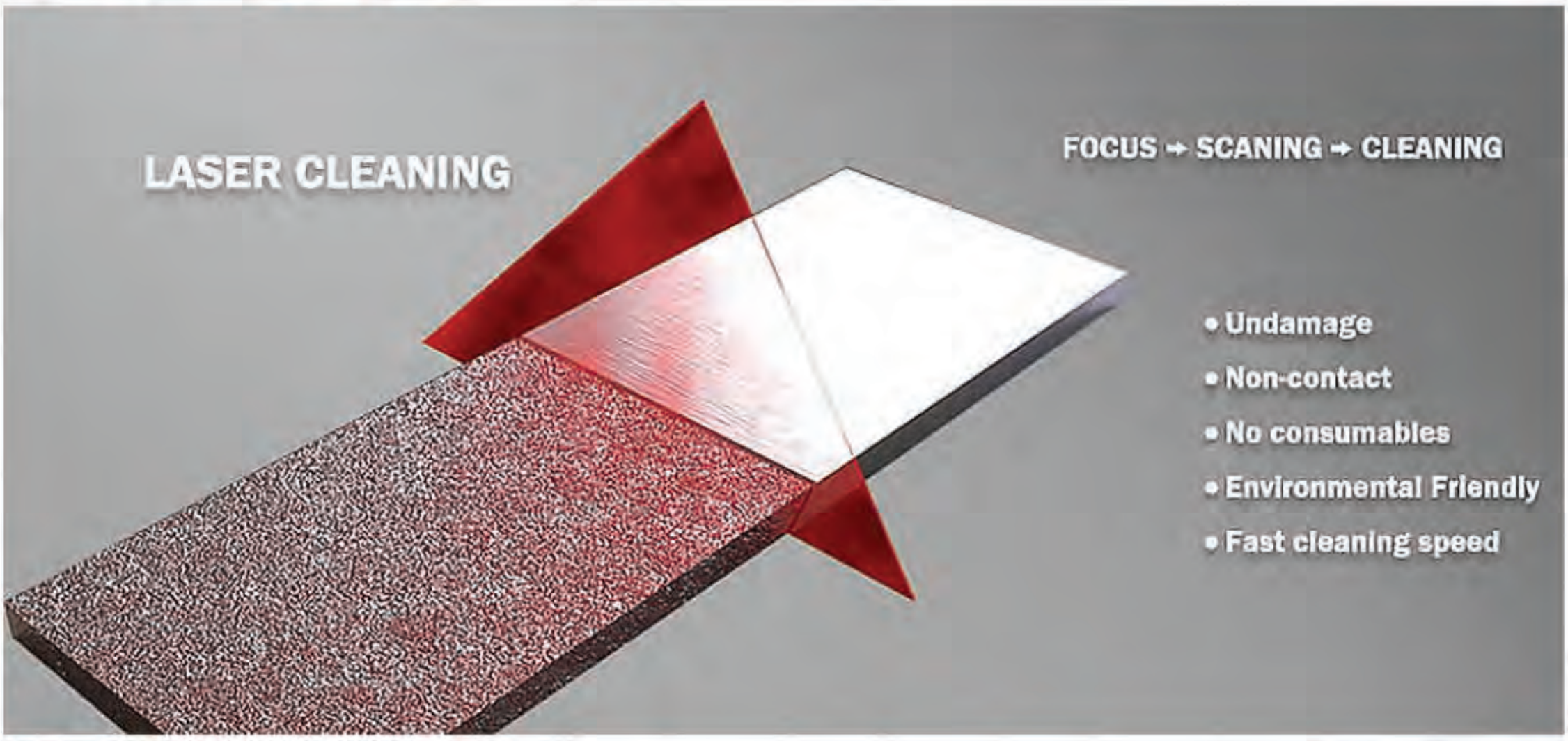
It will simply start to melt the metals present at the focal point. When choosing which type of wire to use for different metals its important to run some samples and conduct destruct to ensure the strength of the hold between your materials. Aluminum and copper as an example, aluminum alloy wire may not hold as strong as a copper clad wire feed.

5.3 GUN ANGLE

Optimal Welding Angle for the SABER is 30^0 - 70^0



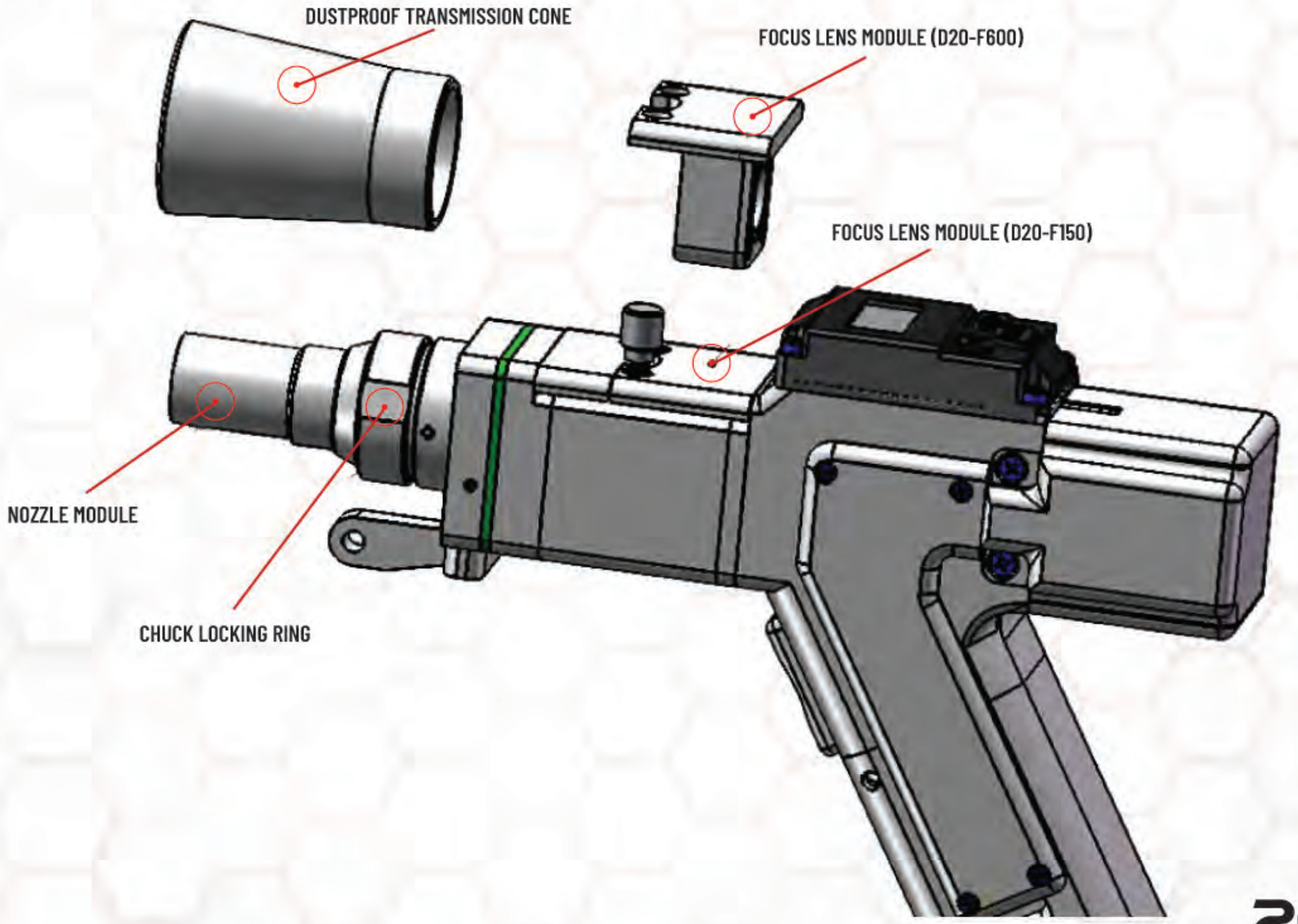
6. CLEANING



6.1 CLEANING MODE

Before entering cleaning mode, there are a few parts that must be replaced. These include the following.

- Replace the nozzle module and chuck locking ring with the Dustproof transmission cone
- Replace the focus lens module (D20-F150) with the focus lens module (D20-F600)



6. CLEANING... CONT

Enter the cleaning mode via the touch screen

Click the red button "Switch to cleaning mode" on the upper right of the welding interface.

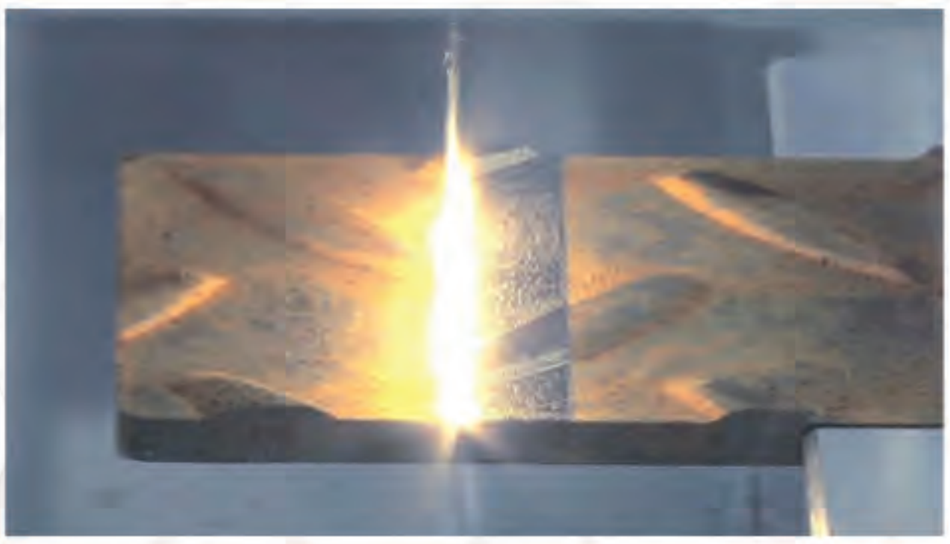
Enter the password “5000” in the pop-up window and press “enter.”

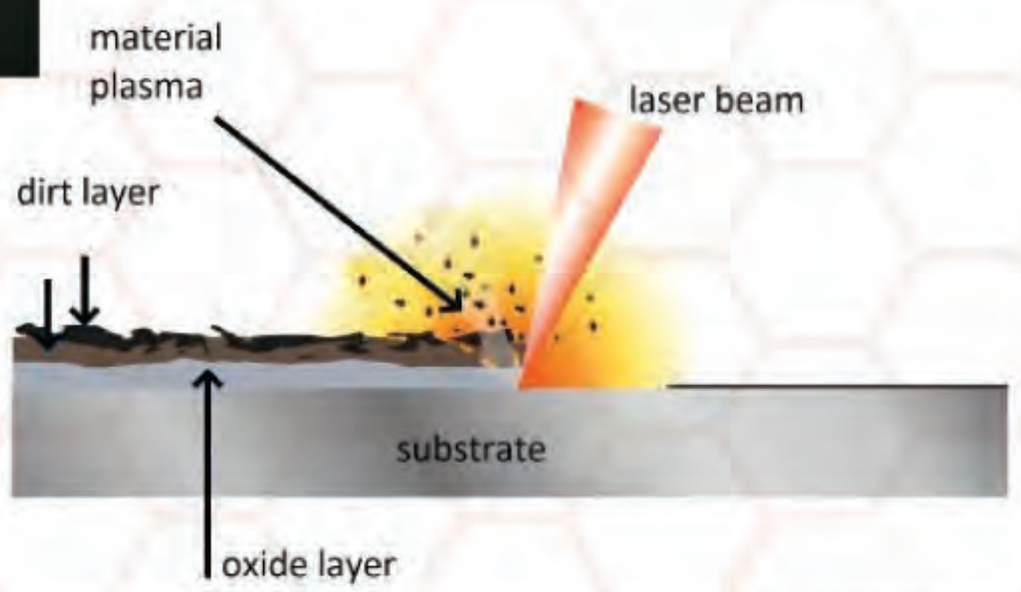
Click "switch to welding mode" in the upper right corner of the cleaning interface to switch to the welding interface.

***Please note: After switching to the cleaning mode, the light can be emitted only when the ground wire clamp is clamped on the wire feeding assembly.**

(Optimal focus is approximately 24” from the end of the cone)

6.2 APPLICATIONS AND USE





7. CUT

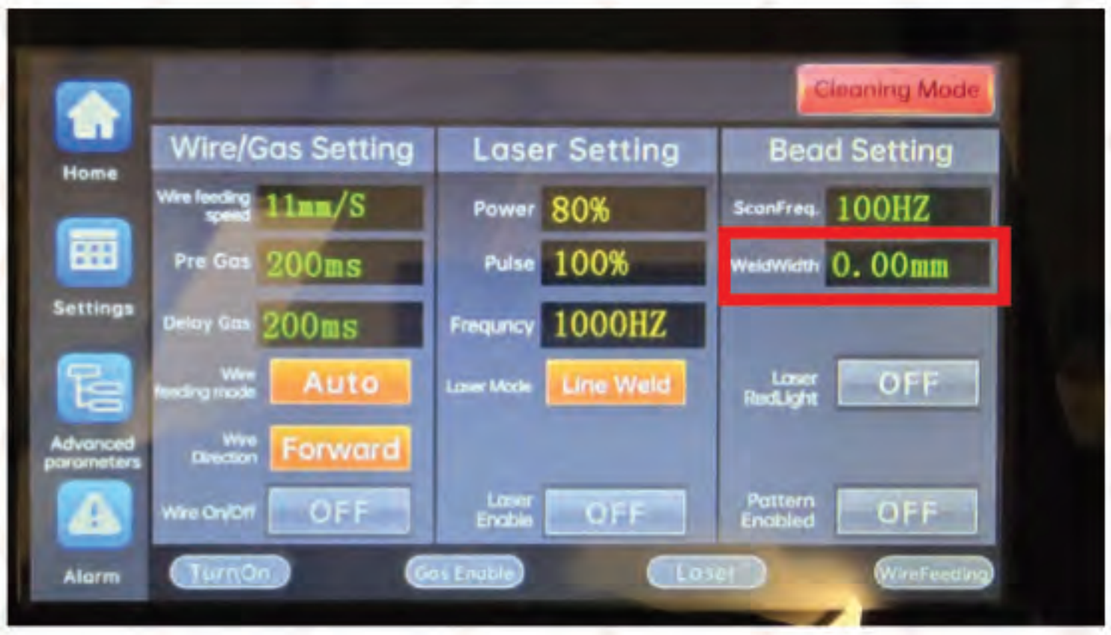
7.1 SETUP

To set up the laser in cutting mode, first replace the copper tip with the cutting tip. For settings selection, choose a thickness twice your actual material. Change the laser mode to "Line Weld." Now set the "Weld Width" on the home screen to 0.0.

Next, change your gas pressure based on the material thickness you will be cutting. For example, for 1-2mm steel set your pressure to a minimum 100 PSI. Also, make sure you are using the F150 focal lens. Hold the welding gun at a 90-degree angle from your material to be cut. Pull the trigger and drag along the base material. Using a guide can help give a straighter cut.

***Please note: When using the cutting tip, for optimal cutting effectiveness, please keep the laserhead and tip at 90⁰ angle.**

(Set Focal length to 0 on the focus tube scale.)



8. GENERAL CARE & MAINTENANCE

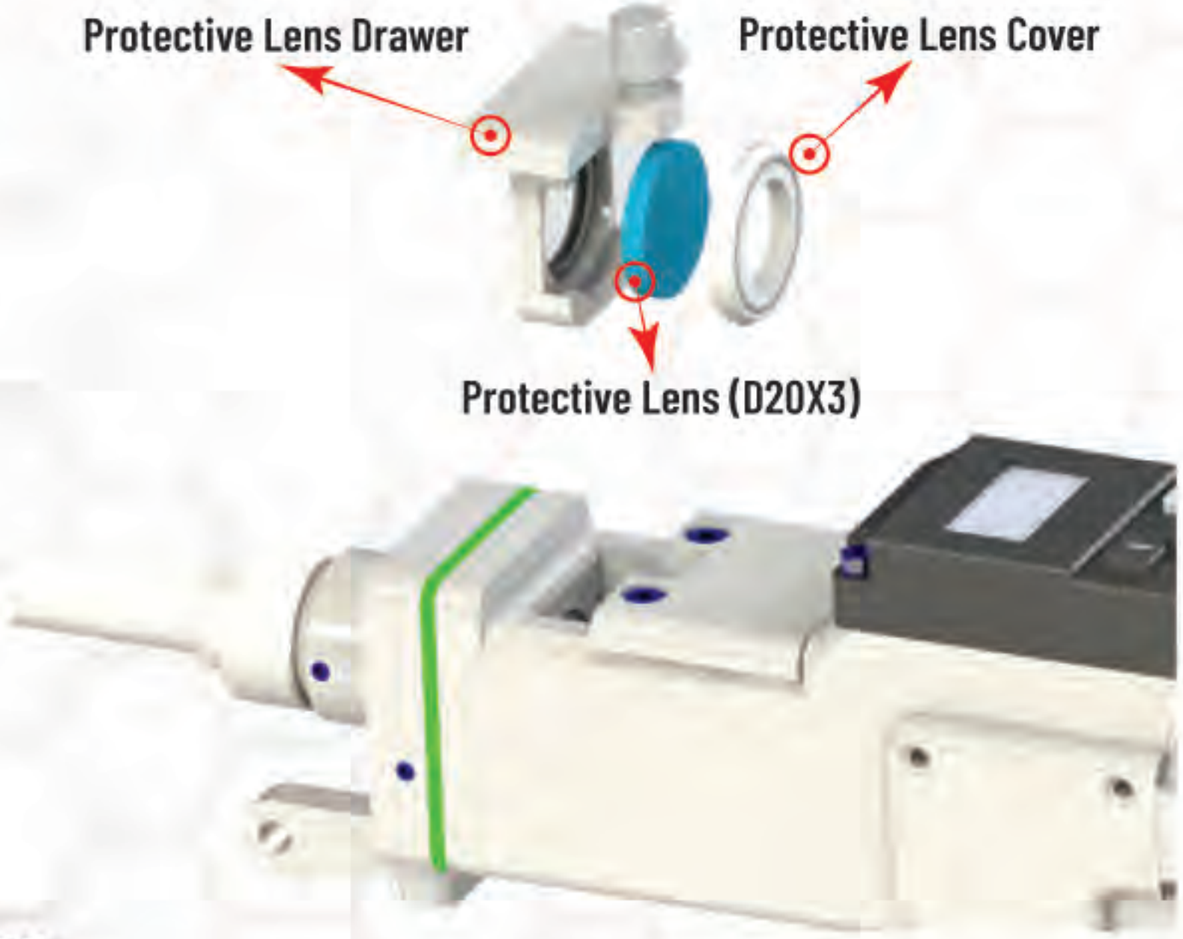
8.1 CHECKING/CHANGING PROTECTIVE LENSES

INSTALLATION AND REMOVAL

To maintain the performance of your welding equipment, handling the protective lens with care is crucial. The protective lens acts as a shield for your welding head's focusing lens, safeguarding it from debris and damage during operation. Over time, exposure to intense welding processes can compromise the lens's integrity, necessitating a replacement to ensure optimal functionality and safety.

PROCESS OVERVIEW FOR PROTECTIVE LENS MAINTENANCE:

1. **Preparation:**
   - Conduct all maintenance activities in a dust-free environment. Wear dust-proof gloves or finger cots to avoid contaminating the lens.
2. **Disassembly:**
   - Unlocking: Begin by loosening the locking screws on the drawer-type lens holder. This step requires careful handling to prevent any damage.
   - Removing the Lens Holder: Gently pinch the sides of the lens holder and pull out the protective lens drawer. This action should be smooth to avoid jarring the lens.
   - Lens Cover Removal: Rotate the protective lens cover by 90 degrees to detach it. Carefully lift the lens out from its position.
3. **Cleaning and Inspection:**
   - Examine the Lens: Check the lens for any signs of wear or damage. It's also a good time to inspect the protective lens drawer and sealing ring for any defects.
   - Cleaning: Use appropriate cleaning solutions and techniques to clean the lens and drawer. If the sealing ring is damaged, it should be replaced to maintain the integrity of the lens assembly.
4. **Reassembly:**
   - Installing the Lens: Place the cleaned or new lens back into the drawer. Orientation (front or back) is not a concern, but ensure it sits flush and secure.
   - Cover Reinstallation: Put the protective lens cover back and secure it by rotating it to its original position.
   - Securing the Lens Holder: Slide the protective lens drawer back into the welding head. Tighten the locking screws to secure the assembly in place.



Important Notes:

1. Always use clean, dedicated tools for lens cleaning to prevent introducing more contaminants.
2. Inspect the lens under a light source to ensure all dirt, dust, and fingerprints are removed.
3. Handle lenses and cleaning tools with care to avoid any accidental damage.
4. Reinstall the protective lens cover
5. Reinsert the protective lens

8. GENERAL CARE & MAINTENANCE... CONT

8.1 CHECKING/CHANGING PROTECTIVE LENSES

DISASSEMBLY

1. Accessing the Lens Holder:
- Start by loosening the two M3X8 hexagon socket screws as indicated in your equipment's manual. This step allows access to the lens holder.
- Gently pinch both sides of the drawer-type lens holder and carefully pull out the focusing lens drawer to avoid any damage.

2. Removing the Focusing Lens:
- Use a small cross screwdriver to loosen the four M2X5 Phillips screws. These screws secure the focusing lens cover.
- Remove the focusing lens cover to expose the focusing lens (D20-F150). Handle the lens carefully to prevent scratches or other damage.

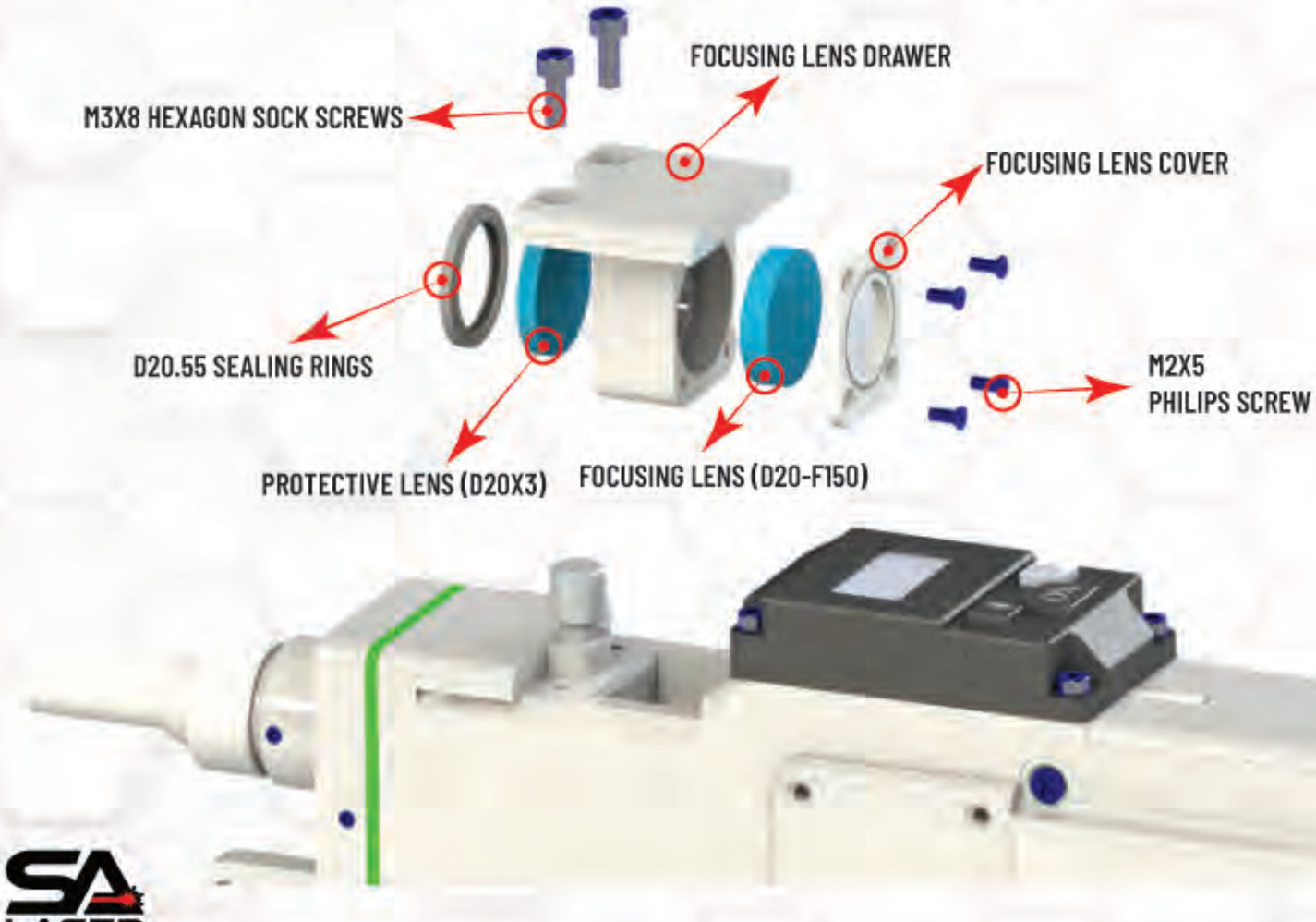
3. Removing the Protective Lens:
- Carefully remove the D20.55 sealing ring. This step requires delicacy to avoid damaging the ring, which is crucial for a proper seal.
- • Take out the protective lens (D20X3), ensuring not to touch the lens surfaces with bare fingers to prevent smudges or contamination.

ASSEMBLY

1. Installing the Lenses:
- Place the cleaned or new protective lens (D20X3) and focusing lens (D20-F150) back into the focus lens drawer.
- Ensure that the lenses are free of dust, fingerprints, or any debris before installation.

2. Reinstalling the Lens Cover and Sealing Ring:
- Reattach the focusing lens cover, ensuring it sits properly over the lenses.
- Carefully place the D20.55 sealing ring back to its position to maintain the integrity of the assembly.

3. Removing the Protective Lens:
- Slide the focusing lens drawer back into its slot within the welding head. Make sure it aligns correctly to void any misalignment.
- Tighten the previously loosened M3X8 hexagon socket screws to secure the lens holder in place.



Final Checks:

- After reassembly, it's crucial to inspect the alignment and cleanliness of the lenses. Any misalignment or residue on the lens can affect the welding performance.
- Test the welding head in a controlled environment to ensure that the optical path is clear and the focus is accurate.

8. GENERAL CARE & MAINTENANCE... CONT

8.2 CABLE MANAGEMENT

- The Welder comes with a cable reel located at the top of the machine.
- When not in use wrap and store the cable as well as the laser gun.
- Don't use welding cable in or across high traffic areas. Use caution around moving equipment and forklift.
- Don't kink the cable. It can damage the fiber optic cable located inside, as well as water chill lines.

8.3 CONSUMABLES

During the welding process there are some consumables to consider.

1. Shielding gas or "cover gas". Make sure your gas levels match your welding results. Too much or too little gas can affect the desired outcome. When cutting you use much more gas so be conservative with the amount of gas you store. Make sure to turn off the valves after use to prevent leakage. Some processes use nitrogen, and if you have a heavy volume, it may be worth the cost to invest in a nitrogen generator instead of buying bottles.
2. Lenses: Checking your protective lens daily should be part of your welding processes. If the lens has even a slight mark it can obstruct the laser path and greatly affect the welding process. If you notice your welds don't look as clean or consistent or if the gun is giving a temperature alarm, check the protective lens. If there is a strike back on the protective lens, as a precaution, also remove the focal lens module and ensure the focal lens was not damaged.
3. Wire Spools: This wire spool should marry up with the processed base material. Ensure that you are selecting the correct wire feed for your substrate. A good comparison would be whatever spool you use for MIG welding should also transfer to the laser welder. They are the same process of adding material to the weld.

9. SABER MATERIAL PARAMETERS

MATERIAL	THICKNESS (mm)	POWER	FREQUENCY	DUTY	WOBBE FREQUENCY	WOBBLE LENGTH	FEEDING SPEED
CARBON STEEL	0.5	350	3000	100	35	2.0	12.0
	0.8	450	3000	100	35	2.0	12.0
	0.9	475	3000	100	35	2.0	12.0
	1.0	500	3000	100	35	2.0	12.0
	1.2	530	3000	100	35	2.0	12.0
	1.5	550	3000	100	35	2.0	12.0
	1.8	650	3000	100	35	2.0	12.0
	2.0	700	3000	100	35	2.5	12.0
	2.3	800	3000	100	35	3.0	12.0
	2.5	850	3000	100	35	2.5	12.0
	3.0	1200	3000	100	35	3.0	12.0
	3.2	1300	3000	100	35	3.0	12.0
	3.5	1500	3000	100	35	3.0	12.0
	4.0	1500	3000	100	35	3.5	12.0
	4.5	1500	3000	100	35	3.5	10.0

MATERIAL	THICKNESS	POWER	FREQUENCY	DUTY	WOBBE FREQUENCY	WOBBLE LENGTH	FEEDING SPEED
STAINLESS STEEL	0.5	350	3000	100	35	2.0	12.0
	0.8	450	3000	100	35	2.0	12.0
	0.9	475	3000	100	35	2.0	12.0
	1.0	500	3000	100	35	2.0	12.0
	1.2	520	3000	100	35	2.5	12.0
	1.5	550	3000	100	35	2.0	12.0
	1.8	800	3000	100	35	2.0	12.0
	2.0	1000	3000	100	35	2.5	12.0
	2.3	1100	3000	100	35	2.5	12.0
	2.5	1200	3000	100	35	2.5	12.0
	3.0	1500	3000	100	35	3.0	12.0
	3.2	1500	3000	100	35	2.5	12.0
	3.5	1500	3000	100	35	3.5	12.0
	4.0	1500	3000	100	35	3.5	12.0
	4.5	1500	3000	100	35	3.5	10.0

9. SABER MATERIAL PARAMETERS... CONT

MATERIAL	THICKNESS (mm)	POWER	FREQUENCY	DUTY	WOBBE FREQUENCY	WOBBLE LENGTH	FEEDING SPEED
ALUMINUM	0.5	400	5000	100	35	2.0	12.0
	0.8	500	5000	100	35	2.0	12.0
	0.9	550	5000	100	35	2.0	12.0
	1.0	600	5000	100	35	2.0	12.0
	1.2	650	5000	100	35	2.0	12.0
	1.5	750	5000	100	35	2.5	12.0
	1.8	1000	5000	100	35	2.5	12.0
	2.0	1050	5000	100	35	2.5	12.0
	2.3	1200	5000	100	35	2.5	12.0
	2.5	1260	5000	100	35	2.5	12.0
	3.0	1300	5000	100	35	3.0	12.0
	3.2	1350	5000	100	35	3.0	12.0
	3.5	1500	5000	100	35	3.0	12.0
	4.0	1500	5000	100	35	3.5	12.0
	4.5	1500	5000	100	35	3.5	10.0

MATERIAL	THICKNESS	POWER	FREQUENCY	DUTY	WOBBE FREQUENCY	WOBBLE LENGTH	FEEDING SPEED
COPPER	0.5	400	5000	100	35	2.0	12.0
	0.8	500	5000	100	35	2.0	12.0
	0.9	550	5000	100	35	2.0	12.0
	1.0	600	5000	100	35	2.0	12.0
	1.2	650	5000	100	35	2.0	12.0
	1.5	750	5000	100	35	2.5	12.0
	1.8	900	5000	100	35	2.5	12.0
	2.0	1050	5000	100	35	2.5	12.0
	2.3	1200	5000	100	35	2.5	12.0
	2.5	1260	5000	100	35	2.5	12.0
	3.0	1300	5000	100	35	3.0	12.0
	3.2	1350	5000	100	35	3.0	12.0
	3.5	1500	5000	100	35	3.0	12.0
	4.0	1500	5000	100	35	3.5	12.0
	4.5	1500	5000	100	35	3.5	10.0

9. SABER MATERIAL PARAMETERS... CONT

MATERIAL	THICKNESS (mm)	POWER	FREQUENCY	DUTY	WOBBE FREQUENCY	WOBBLE LENGTH	FEEDING SPEED
OTHER METALS	0.5	350	3000	100	35	2.0	12.0
	0.8	450	3000	100	35	2.5	12.0
	0.9	475	3000	100	35	2.0	12.0
	1.0	500	3000	100	35	2.0	12.0
	1.2	550	3000	100	35	2.0	12.0
	1.5	650	3000	100	35	2.0	12.0
	1.8	680	3000	100	35	2.5	12.0
	2.0	700	3000	100	35	2.5	12.0
	2.3	900	3000	100	35	2.5	12.0
	2.5	1000	3000	100	35	2.5	12.0
	3.0	1200	3000	100	35	3.0	12.0
	3.2	1300	3000	100	35	3.0	12.0
	3.5	1500	3000	100	35	3.0	12.0
	4.0	1500	3000	100	35	3.5	12.0
	4.5	1500	3000	100	35	3.5	10.0

Technical Parameters	
Model	MY-W1000H / MY-W1500H / MY-W2000H
Laser Power	1000W / 1500W / 2000W
Welding Bead Thickness	≦5MM
Laser Wavelength	1080±5nm
Fiber Laser Source	Raycus
Scan Head	Galvanometer
Controller	Dual Controller (Touchscreen & Gun Mount Pendant)
Life-Span Of Laser Source	100,000 Hours
Cooling Mode	Active Chill Cooling
Operation Environment	5°C ~ 40°C
Power Input	220V/50 - 60HZ/1P
Power Consumption	8~13KW/H (6.6-18.4 Amps)
Welding Cable Length	10 Meters
Dimension (L*W*H)	24.5*49.25*55in (Welder) 27.5*7.75*17.5in (Wire Feeder)
Net Weight	260kg (573lbs)

WELD

3 IN 1

CUT

CLEAN

THE SABER™

LASER WELDING MACHINE

SA LASER