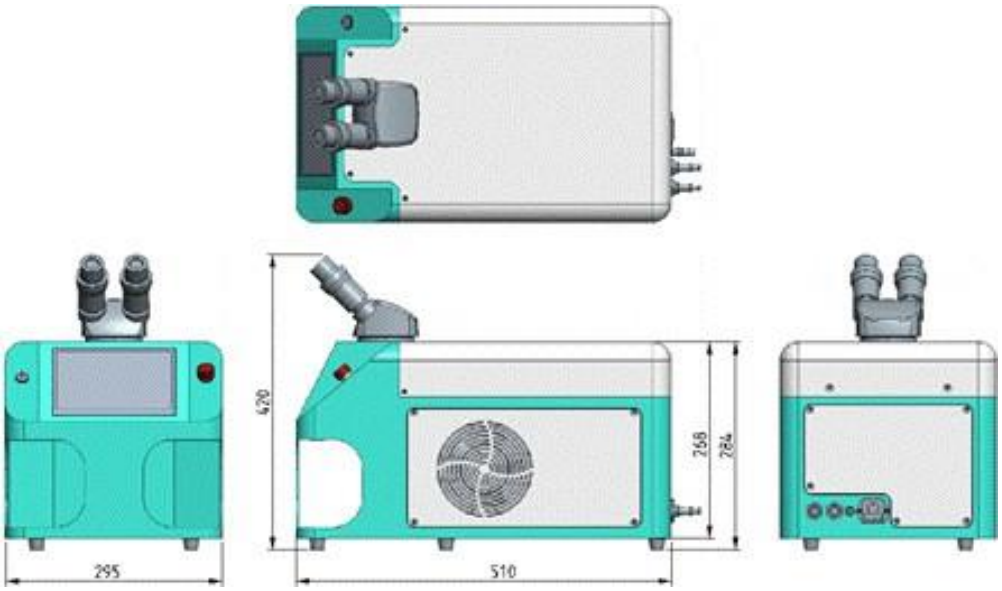
HS WALSH & SONS

SERVING JEWELLERS & HOROLOGISTS SINCE 1947

User Guide



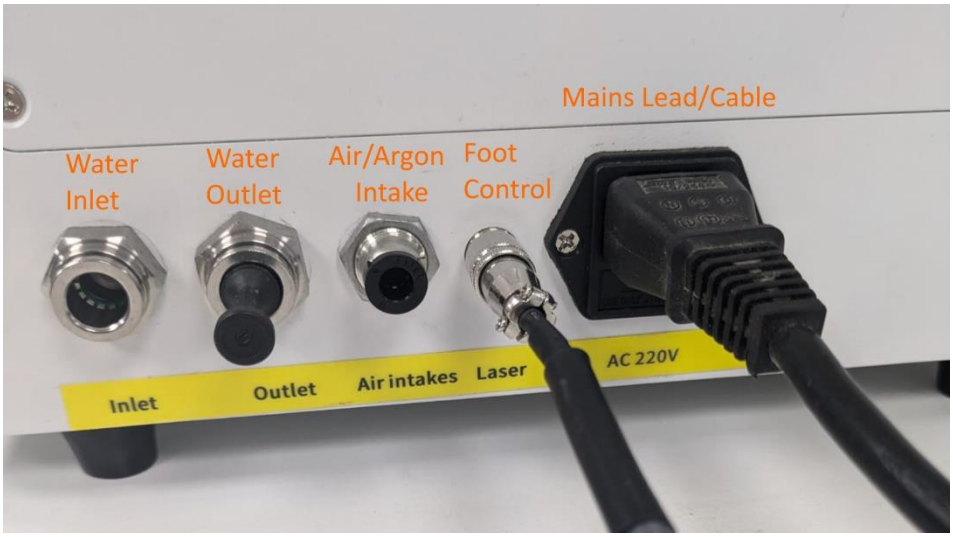
Product Specifications

wavelength	1064nm
maximum(power)output	100W
Maximum pulse energy	60J
Lamp source	single lamp
pulse width	0.1-15ms
impulse frequency	1-20HZA Adjustable fluid level
Aim and locate	microscope + CCD
application	Welding, repairing metal jewellery & watches
power consumption	≤2KW
Electricity demand	220V±5%,50HZ .110V±5%,60HZ
coolant system	air cooling
dimension	L：510mm, W：295mm, H：420mm

To Start

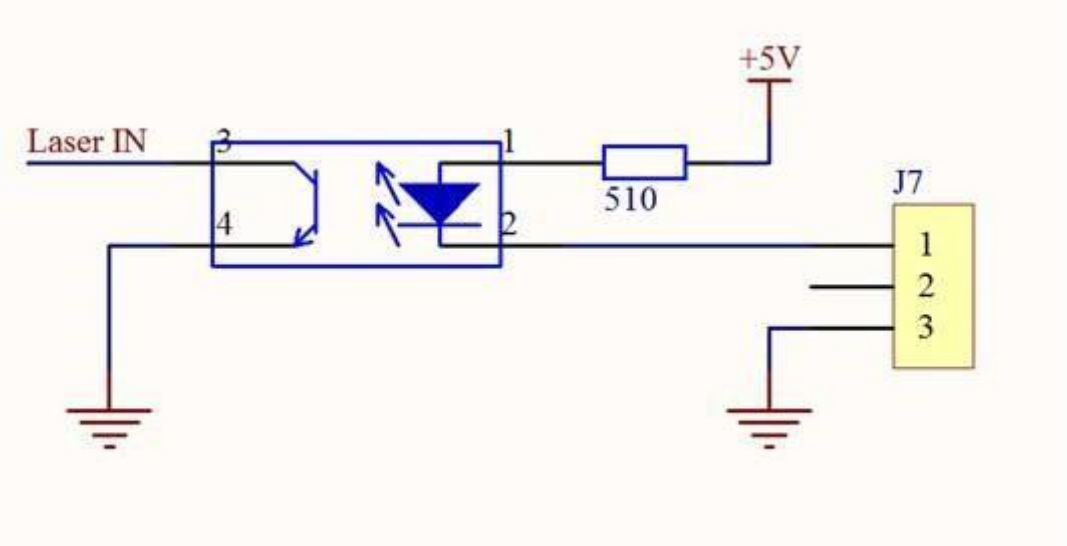
1. Ensure that the input supply voltage meets the company's laser supply requirements （AC220V±5%60HZ)

2. Plug the mains power cable into the AC220V socket, and connect it to the power supply.



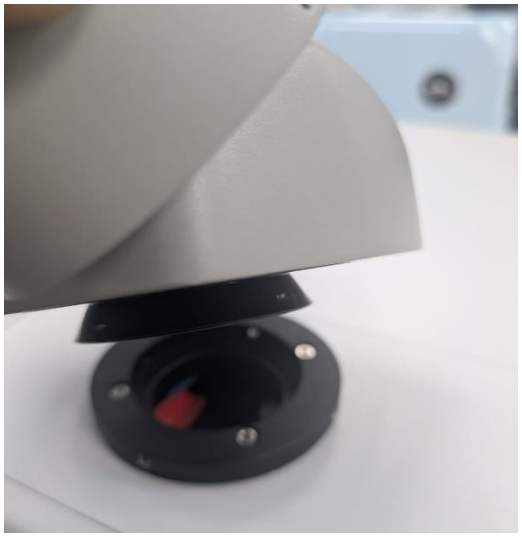
3. Connect the foot control.

Internal schematic diagram of the control signal.



4. Insert the supplied water hose into the machine's water **inlet** nozzle, and put the other end into a purified water container, to prepare for water injection (filling).

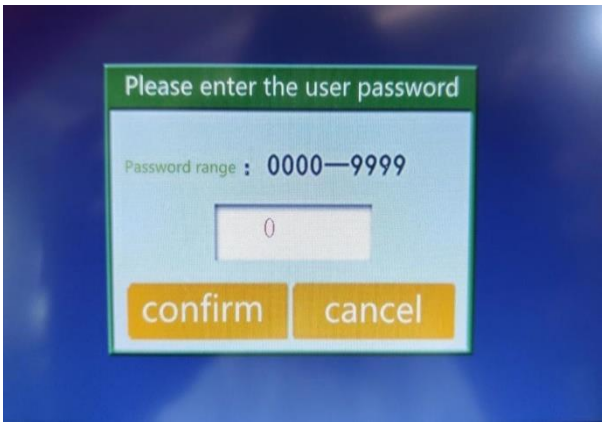
5. Assemble the microscope by removing the protective caps and placing the two 10x eyepieces in position. Loosen 4 x grub screws to allow for the correct placement of the microscope onto the laser welder. Tighten grub screws to secure the microscope.



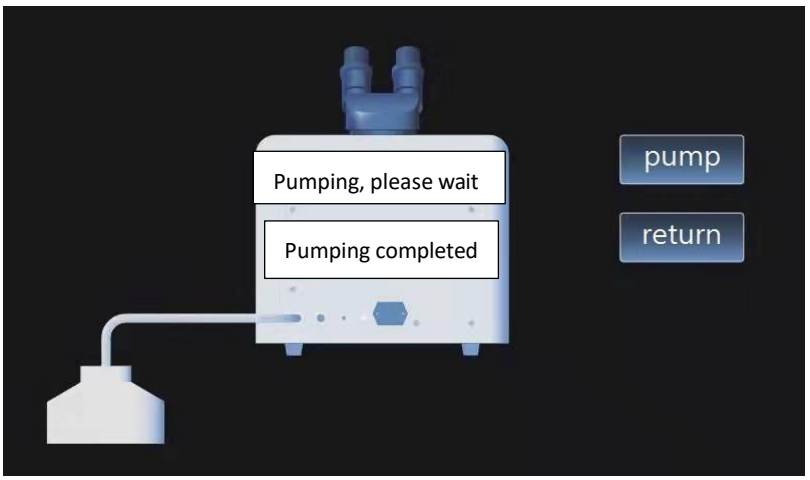
6. Ensure the **Emergency Stop Switch** is turned clockwise and open to enable the safety shut down option in any emergency.

7. Turn the **off/on** switch clockwise to the **ON** position. The display will now light up.

8. Water injection operation (filling laser welder). Press '**set**' (settings) on the touchscreen. In the green pop-up input box, enter the password **999999** and click **confirm**.



9. On the following parameters screen click the **pump** button (bottom right) and on entering the pumping interface click 'pump' to start the water injection operation (filling). After the water filling is completed the display will show 'pumping completed' and the machine will automatically stop pumping.



10. Now click **return** to go back to the main screen and then press '**ON**' to initiate the laser welder.

Software operation:

1. The lower right corner of the touchscreen indicates the various statuses of components within the welder.

Power / Water Temperature / Xenon (flash) Lamp / Water Level / Water Flow / Water Temperature / Actual Temperature / Shot Count

2. The mode settings in the blue table to the left of the touchscreen are as follows:

NO - For saving of certain 'favourite' settings of Curr/Freq/Puls/Spot (15 saves in total)
Curr (%) – Current power setting as a percentage of total power
Freq (Hz) - Total weld/hits per second 1 = 1 weld/hit per second 2 = 2 weld/hits per second etc. Max frequency 200Hz
Puls (ms) - Laser beam width in milliseconds. Range 0.1ms-10ms
Spot (mm) - Weld spot size (in mm) between 0.3 – 3mm, with 0.1mm increments.

To modify any parameters of each mode setting:

Press on the box/mode that needs to be modified. A green pop-up screen will display where you can select and change to your required setting, and then press OK. Alternatively, the corresponding +/- symbols next to each mode will allow smaller changes to each setting without the need to bring up the green pop-up screen.

3. Top right corner: lighting, save, set, ON.

Lighting: Use left and right arrows to increase or decrease the light brightness.

Save: Varied combinations settings of **Curr**/**Freq**/**Puls**/**Spot** parameters can be saved after modification.

Set (settings): On pressing set, the password screen will pop up. Enter the **password 999999** and the advanced parameter settings page will display.

Air valve advance: To be used with protective gas (argon) for pre gas before welding. For welds that require an oxide free welding environment (ie titanium)

Air valve delay: For setting the air valve delay time, press foot control, laser and gas will output at the same time. After the foot pedal is released, the laser output stops and the valve delays the set time before closing the valve.

LCD lock: Designed to protect operators eyes from the laser flash when using the microscope.

Over temperature protection value: Temperature at which the water cooling fans will be working on full power to cool the welder. i.e. when the ambient temperature is greater than the set temperature of the water tank of 30℃. The cooling fan will start at full speed when the temperature protection value of the water tank is over 30c. The water cooler fan will operate at low speed when the ambient temperature is lower than 30c.

Electronic gear molecules and denominator: Adjusts the function of the motor torque, which is generally used for the optical beam mirror automatic adjustment i.e laser spot size adjustment. Its minimum value is -3.0, the maximum value can be adjusted to 3.0. The electronic gear molecules and denominator ratio is directly related to the machine in the spot size adjustment. Users can set their own ideal molecular denominator parameters according to their own needs and requirements. Number of pulses emitted in a single step by molecule / denominator = 0.1mm (the specific spot single-step change is related to drive segmentation and beam expansion).

Clear out light: Click this to make the laser count reset and to start recount. This function is used only after replacing the xenon lamp to determine the service life of the xenon lamp.

Language: Click to enter the Select language interface

Using Laser Welder:

1. Wear suitable protective clothing and gloves
2. Ensure laser is ON
3. Select Curr (%) setting (recommended starting point of 30%)
4. Select Freq (Hz) setting (recommended starting point of 1.0)
5. Select Puls (ms) setting (recommended starting point 1.0)
6. Select Spot (mm) setting (recommended starting point 1.0)

Move item to be welded into clear focus through either the LCD camera screen or microscope.

Ensure item/part to be welded is in view and at the intersection of the vertical and horizontal lines (the crosshairs)

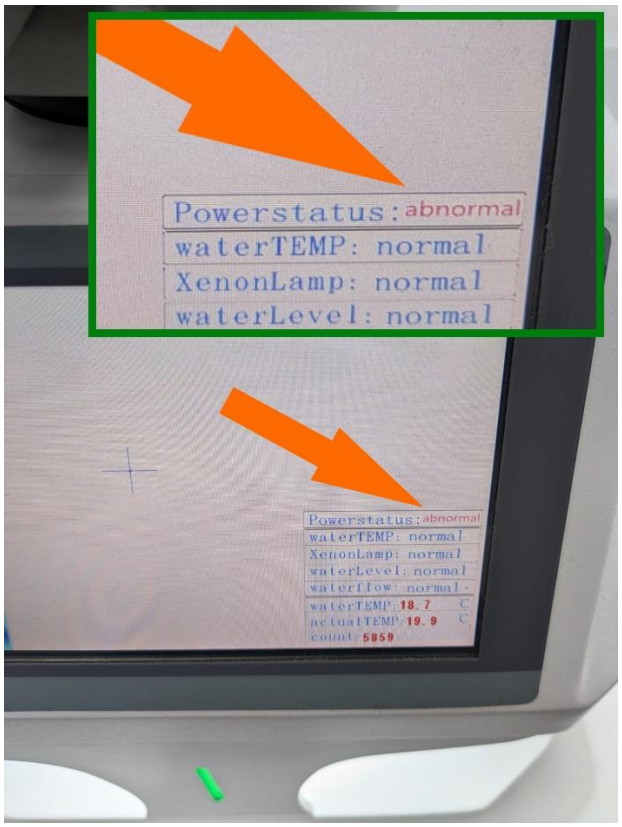
Keep item in position and press foot control. Welding action will commence each second at one weld per second until your foot is removed from the foot control.

Welding example

Alter the **Curr/Freq/Puls/Spot** parameters to create a suitable and effective weld depending on your needs.

Due to the variety of setting options on each parameter, it is possible to select a combination of settings that may be outside the capabilities of the welder i.e 100% Current with 50 Freq

When this occurs, a warning beep will be heard and an 'abnormal' reading will display on the touchscreen power status.



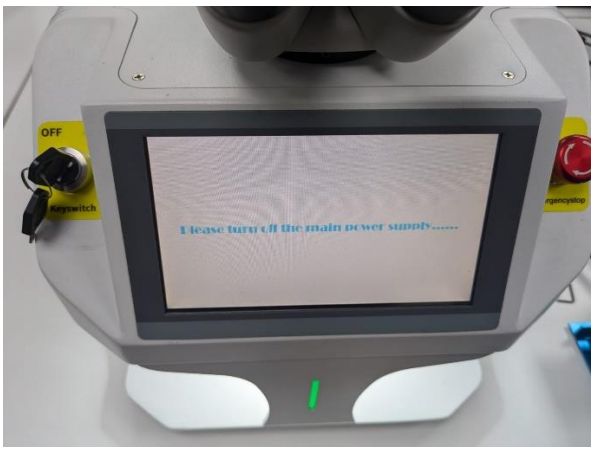
Adjustment of the settings will be required until the warning beep stops and the 'abnormal' sign returns to 'normal'.

Turning laser welder off:

Press the off button in the upper right corner of the touchscreen

Two further screens will display.

Firstly the ‘bus discharge’ screen and then finally the ‘please turn off mains power’ screen.



At this point the welder can be turned off at the key switch.

Welding Guide:

1. **Observation system:**
The jewellery spot welder observing system consists of a microscope and a built-in HD ccd camera. For clear observation of the welding position the work piece, and easy welding.

2. **CCD Cross Hair adjustment:**
On the touchscreen, if the weld spot is not in the center of the crosshair, the crosshair position can be moved by tapping on the middle of the four edges of the touchscreen to reposition the crosshair accordingly.

3. **Welding operation:**
First, ensure that the machine has started on normally i.e. normal working mode. Place the workpiece in the line of sight of the observation system, and then slowly focus for the clearest position, align the crosshair with the welding position and gently press the foot switch, and the set laser beam will fire.

4. **Weld size and adjustment of its parameters:**
After the first weld, if the welding effect does not meet the weld size selected you can change the parameters / settings as follows.

a) Find spot size setting (mm) which gives the smallest weld.
b) Enter the settings screen, record the ‘electronic gear molecular’ and ‘electronic gear denomination’ settings and then change both to numbers to 1. Press OK.

c) Go to weld screen and adjust the spot size to zero (0.0mm)
d) Return to the settings screen, and restore ‘electronic gear molecular’ and ‘electronic gear molecular’ to their original recorded settings. Press OK.

5. **Note**: Selections over the capability of the laser welder will result in a warning beep and an ‘abnormal’ reading on the touchscreen power status. Reduce settings until welder is back within normal power status and the warning beep has ceased.