

Operation Instructions for Laser Welding Machine

1. Preparation before operation

1.1 Safety Protection

Radiation resistant glasses must be worn, work clothes must be worn, and direct laser exposure to the skin or eyes is prohibited. In case of emergency, press the emergency stop button immediately.

1.2 Environmental and Equipment Inspection

1.2.1. Confirm that the power supply is stable, the water circulation system is normal, and the water temperature is controlled at 22-30°C.

1.2.2 Check whether the pressure of the gas device (such as argon or nitrogen) is appropriate, and the surface of the device should be clean and free of oil stains. For the first use, pure water or distilled water should be added to above the green mark of the water tank.

1.3 Start-Up process

Firstly open the gas valve, then start the main power supply, turn the key to turn on the system, finally press the laser power button, wait for 20 seconds for standby, and finally turn on the laser enable button.

2. Cautions during welding process

2.1. Handle the welding torch with care, thus to avoid bending the fiber optic cable, to avoid severe vibrations that may cause translocation or damage to the internal optical components.

2.2. The welding torch should maintain an angle of about 45 degrees with the workpiece to avoid laser reflection burning the lens. Move the welding torch at a constant speed to ensure even welding seams.

2.3. During the welding process, it is necessary to closely observe the changes of the laser output. If laser energy decrease or lens coating damage is found, the protective lens, focusing lens, etc. should be immediately inspected or replaced; If a significant laser energy decrease is found, further inspection of the collimating or reflecting lenses and fiber window mirrors is required; It is strictly prohibited to continue welding by increasing power constantly without conducting the above tests, which may result in serious situations where the fiber window mirror or fiber optic cable is further burned due to laser reflection.

2.4 The ground clamp should be connected to the welding platform. it is strictly prohibited to directly connect the ground clamp to the welding torch to avoid electric leakage or accidental laser exposure.

3. Shutdown steps

Stop welding → Turn off laser power → Close gas valve → Disconnect main power supply

4. Daily maintenance of lenses

4.1 Lens Types and Selection

Material requirements: It's suggested to use original lenses to ensure stable energy output

Layered protection: The protective lens is a vulnerable component and requires protection lens inspection as priority; Damage to focusing/collimating lenses is often caused by improper operation or dust intrusion.

4.2. Regularly inspect/replace protective lenses and focusing lenses

4.2.1. Lens cleaning method: Use a cotton swab dipped in alcohol to gently wipe the dust around the lens to avoid scratching it.

4.2.2 Key points for lens replacement operation

When replacing, keep the environment clean and tidy.

Dustproof treatment: Seal the window with masking paper before replacement to prevent dust from entering the torch body.

Lens touch: Only touch the edge of the lens and do not directly touch the surface of the lens to prevent fingerprints or stains from affecting the transmittance.

Installation alignment: Ensure that the convex surface of the lens is facing upwards (collimating lens), fix the collar in place, and avoid loosening.