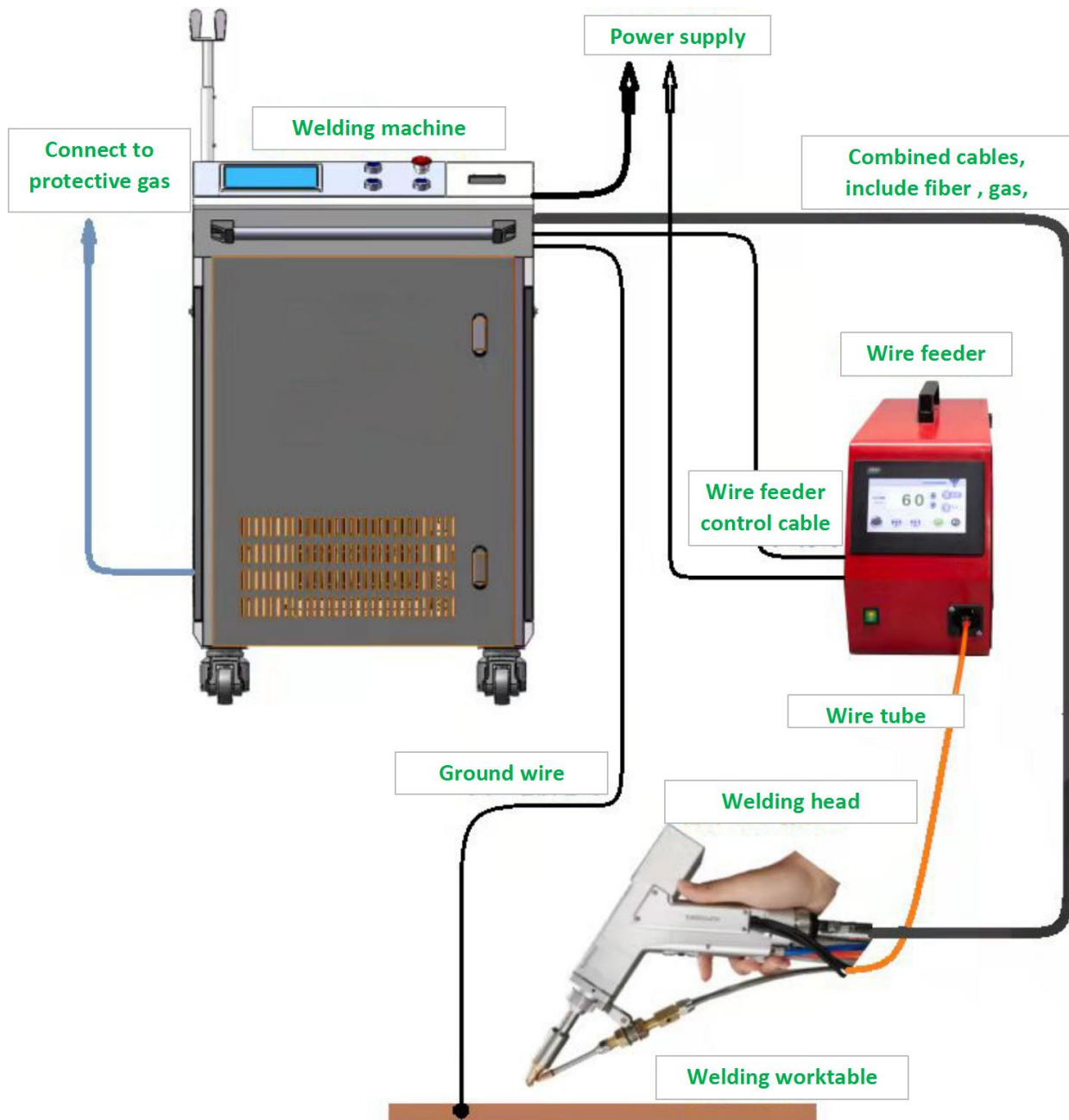


Hand-held Welding Operation Introduction

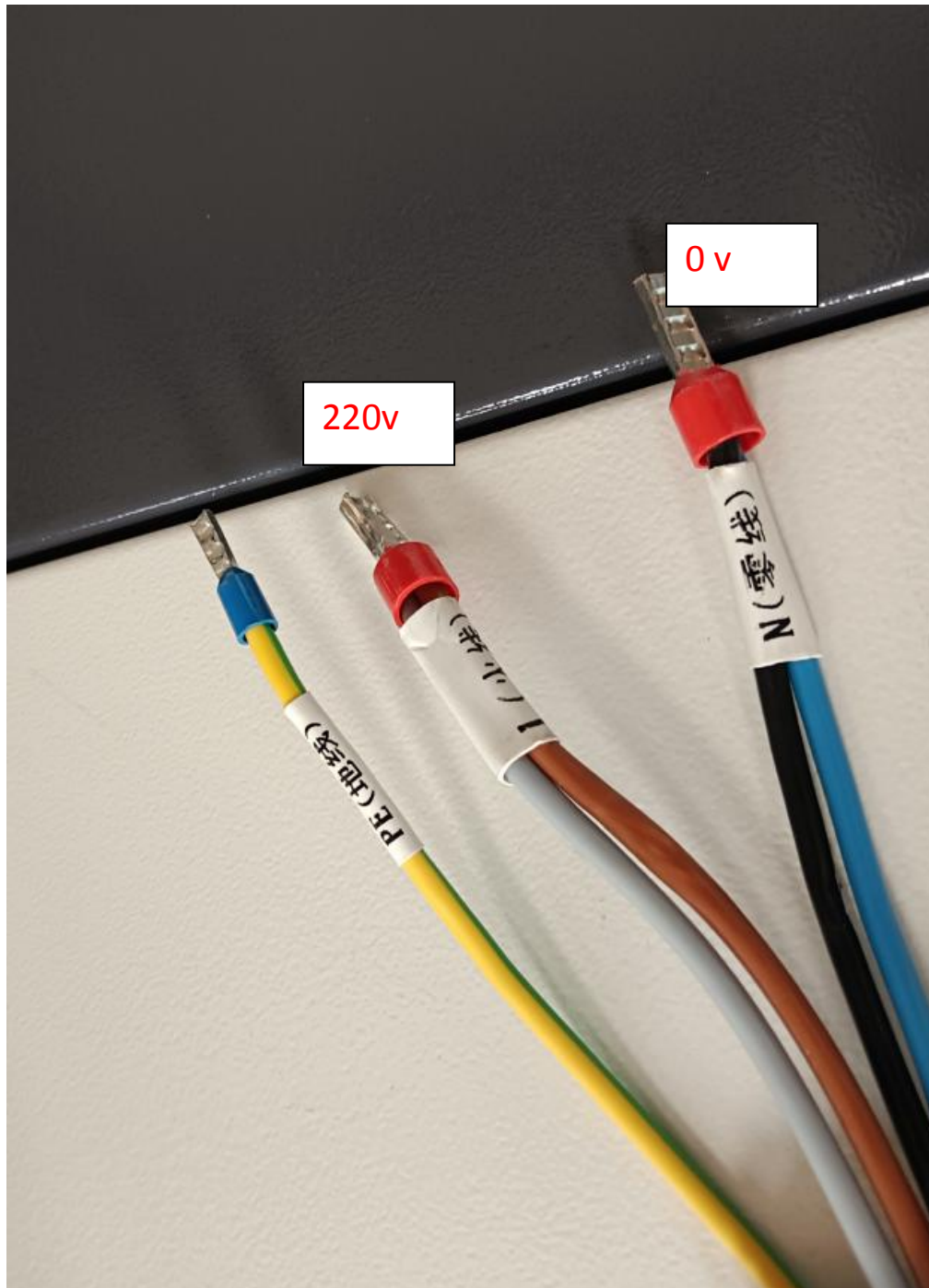
Overall diagram of the equipment



Precautions

1. The use of laser welding system with laser welding machine includes a laser, water-cooled machine, laser welding system, laser welding head multiple control module, to avoid interference, ensure from argon arc welding machine two protect welder and interfere with the larger related equipment, to ensure a safe distance in 5 meters above conditions allow independent space to ensure that the laser welding machine
2. In order to reduce equipment leakage or static electricity, ensure that handheld laser welding equipment use effective ground wire.
3. Please confirm again whether the bushing joint is properly connected and locked, and wrap it with insulation tape after locking.
4. Check whether the laser head and optical fiber are tightly connected. After confirming that the connection is normal, you can use adhesive tape to seal and wrap it to ensure that dust does not enter the laser head cavity.
5. To check whether there is water seepage phenomenon, cavity cavity in the body in water, without professional training may not loose screws, prevent water from entering the chamber internal protection lens drawer is normal examination.
6. Make sure that the seal properly, protect the lens replaced to ensure the alcohol to clean laser external besmirch, at least more than five times, make sure that the replacement lenses environment clean without wind can change lenses.
7. The inside of the laser head is very complicated. In order to avoid short circuit, please stay away from water and ensure that no liquid can be sprayed on the laser head.
8. Laser head refuse to use strong wind to blow and clean the laser head, only use alcohol and dust-free cloth to wipe.
9. The laser head is installed with a digital motor, must be used gently, to prevent motor failure.
10. When the laser head is not in use, please repeatedly use the system gas to blow air, so that the dust is discharged, and remove the copper nozzle, seal with sealing tape, install the copper nozzle to blow air more than 2 times before using.
11. Continuous interruption of power supply will damage the welding control system, please provide continuous and reliable power supply!
12. The external safety lock is at a high level of 24V. Do not short-connect it with the GND housing of the aviation plug of the system cable, or do not collide with each other during installation, otherwise the short circuit may burn the power supply or the main control board.

Electricity cable connection



Note: The first wire is ground wire, and connect to ground or not. Both are ok. The second wire is **LIVE wire , voltage 220v**. The third wire is **NULL wire, which voltage 0V**.



Note:

1. Wire feeder, the port connect to wire feeder cable which is the power supply port to wire feeder.
2. Air inlet, this port connect to protective gas supply. (See page 5)
3. Input, this is power supply cable of machine, inside are Live、Null、Ground wire. The end connect to Isolation transformer. Just like Page 2 picture showed.
4. PE port, this connect to ground. **This is MUST.** With below ground wire.



Water chiller part



1. Open the drain first.



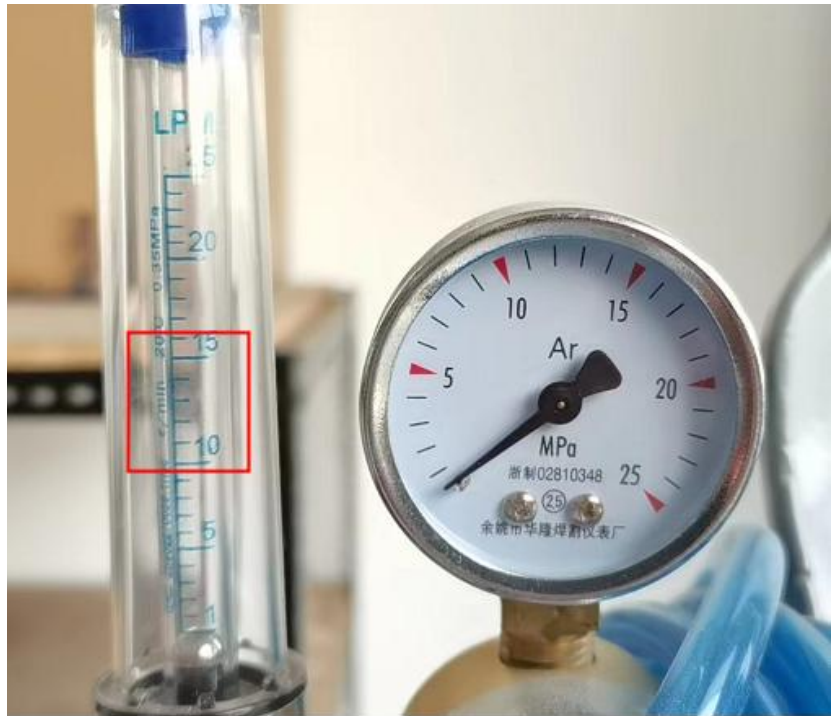
2. Fill in pure water and after a few seconds, the drain switch can be closed.



3. Make sure the water level during the green area. No need to set chiller, the temperature setting already done before machine ship out.



Protective Gas



Note:

1. The protective gas is needed for laser welder.
2. There are two function, one is for protecting welding joint surface. The other function is to cooling mirrors inside welding head.
3. Normally the protective gas is Argon gas, N2 also can be the protective gas.
4. The rate of protective gas flow is about **10-15**

Machine turn on and off steps



Turn on steps: Air switch--System host--Water chiller---Laser power.

Turn off steps: System host--Laser power--water chiller--Air switch

Software operate part



FGAP Gas Fillings Welding Connect Motor

The signal status is displayed in the page:

FGAP : Control of laser switch. When in normal use, turn on FGAP button to connect laser light signal. (Connection of laser source will be cut down after 15 minutes of no working). **If not press this button on, will not output laser.**

Gas: For gas control, install proportional valve, effective percentage control.

Fillings: Control of feeder feeding, switch of feeding function.

Welding: The display of the trigger button of welding head.

The WELDING button is on when the trigger button pressed by user.

Connect : It is the indicating of loop signal of head to the metal.

When the gun head touches the metal plate which with alligator clip, the CONNECT button is on. This button is for protective of laser light. Short connection is prohibited.

Motor: Refers to the state of the laser head motor.

The light is on when the motor is normally connected, and when the motor is not working, the MOTOR button is off and the LCD screen of welding head shows the alarm signal E, it means the laser light signal is locked and the trigger button of welding is invalid.

Control Section for Screen:

Laser Control

Motor Control

Gas Control



1. Laser Control

Power(0-100%): Choose appropriate percentage according to different materials.

Frequency (50-30000HZ)

The frequency is suggested at 3000-5000 HZ.

Duty Cycle(1-100%): According to the requirements of the welding surface

2. Motor Control

- **Working Mode:** 
- **Frequency:** Refers to the adjustable motor speed (2-46hzms), 1HZ=10 laps,
Not set over 30 Hz
- **Width:** Wobble size, (0.2-5mm) adjustable.

Tips:

- 1) ● mode: refers to the state when the motor does not swing and the spot is minimal.
Strong penetration, can be used for penetration welding, overlap welding or thick materials.
- 2) — mode: it means to swing a motor, connect the points into a line.
Can adjust the width of the mark, concentrate the energy density, also can have a certain penetration of the thick plate, the use of positive fillet welding.
- 3)  mode: they are the welding of swinging 2 motors, forming the point into different beam shapes. Can adjust the diameter. Uniform energy density, obvious advantages of thin plate welding, the minimum 0.3mm materials, for the use of butt welding, Yin fillet welding.

3. **Gas Control**

- **Gas advance//delay:**

It is recommended to set it around 150ms to protect the welding dust from polluting the protective lens.

- **Proportional valve:**

when the proportional valve is connected, the gas can be controlled 100% effectively.

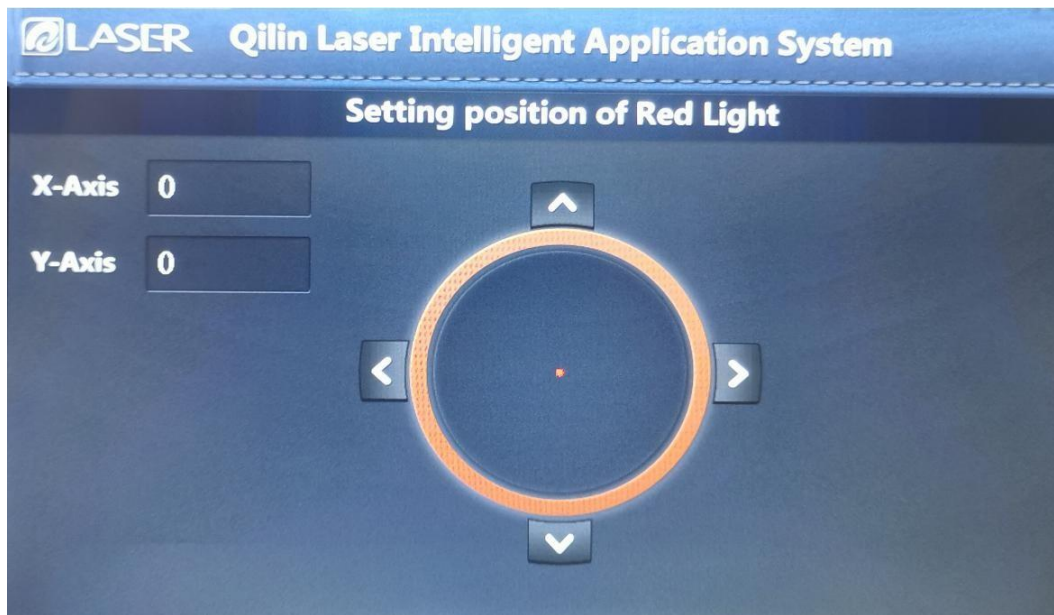
Power Setting for slowly rising & falling

(These parameters already set before machine ship out. No need to change)



1. These parameters already set before shipment, do not change unless special requirement.
2. Control laser power slowly rise and fall to protect protective lens and better welding effective.
3. Rising to full power in the time you set slowly.
4. Falling to 0 power in the time slowly.

Position Setting for Red Light



1. Adjust the Axis of X and Y motor reflecting lens to change the red light offset position. **(The red light dot should be at center position, like below the most the right side picture showed)**



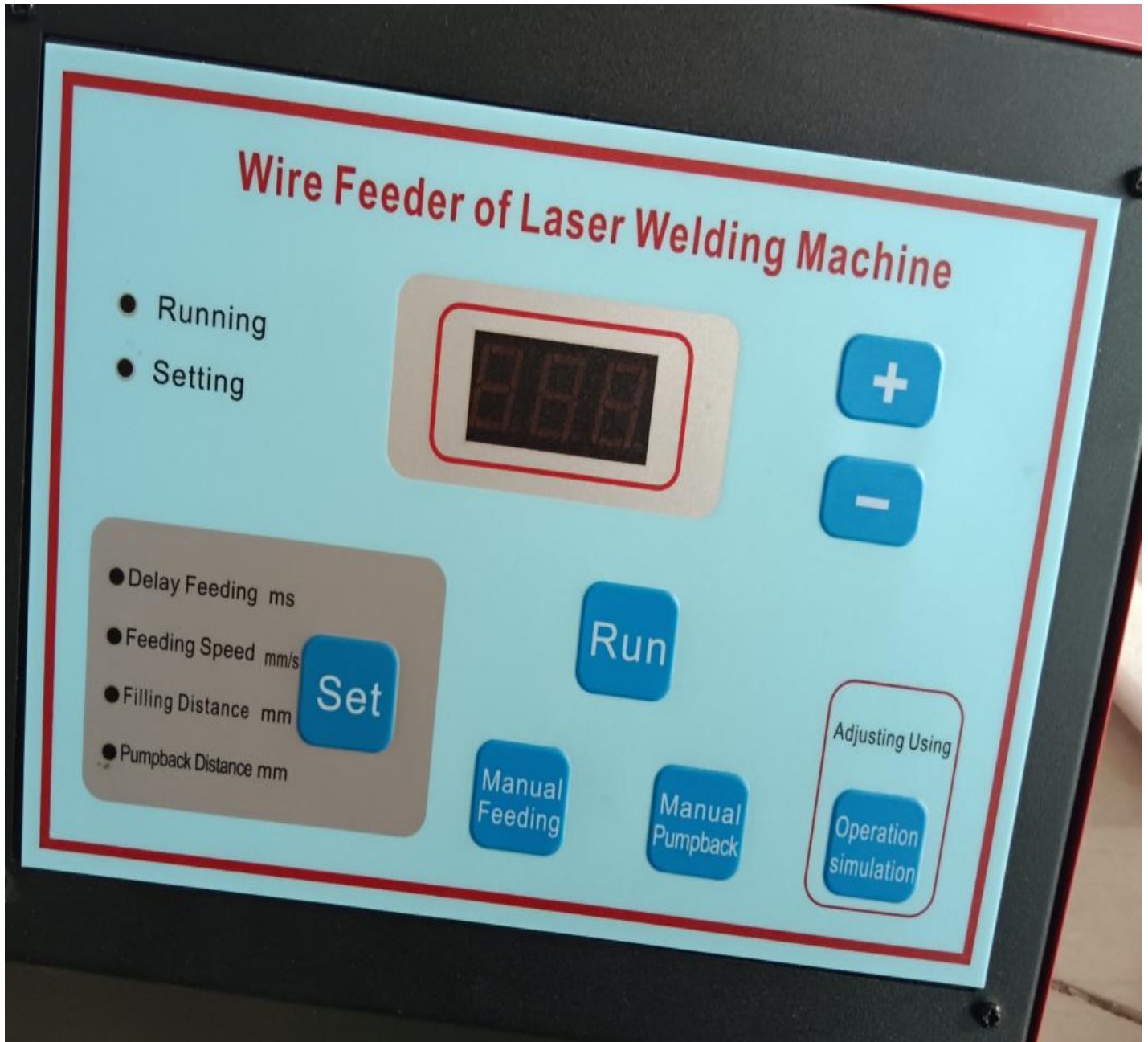
2. The adjustment radius of the laser center point is 5mm.
3. Make sure all motor circuit are normal before adjustment to avoid wrong operation.

Multi-language and Lock Settings



- **Muti-language:** Chinese-English-Russian-Korean-Vietnamese
- **S/N:** Serial Number of Machine
- **Version:** Controller version of system
- **Available life:** Valid use time (when (-) shows mean a permanent use permission)
- **License:** the License number if needs to be entered when lock or unlock machine

Wire feeder

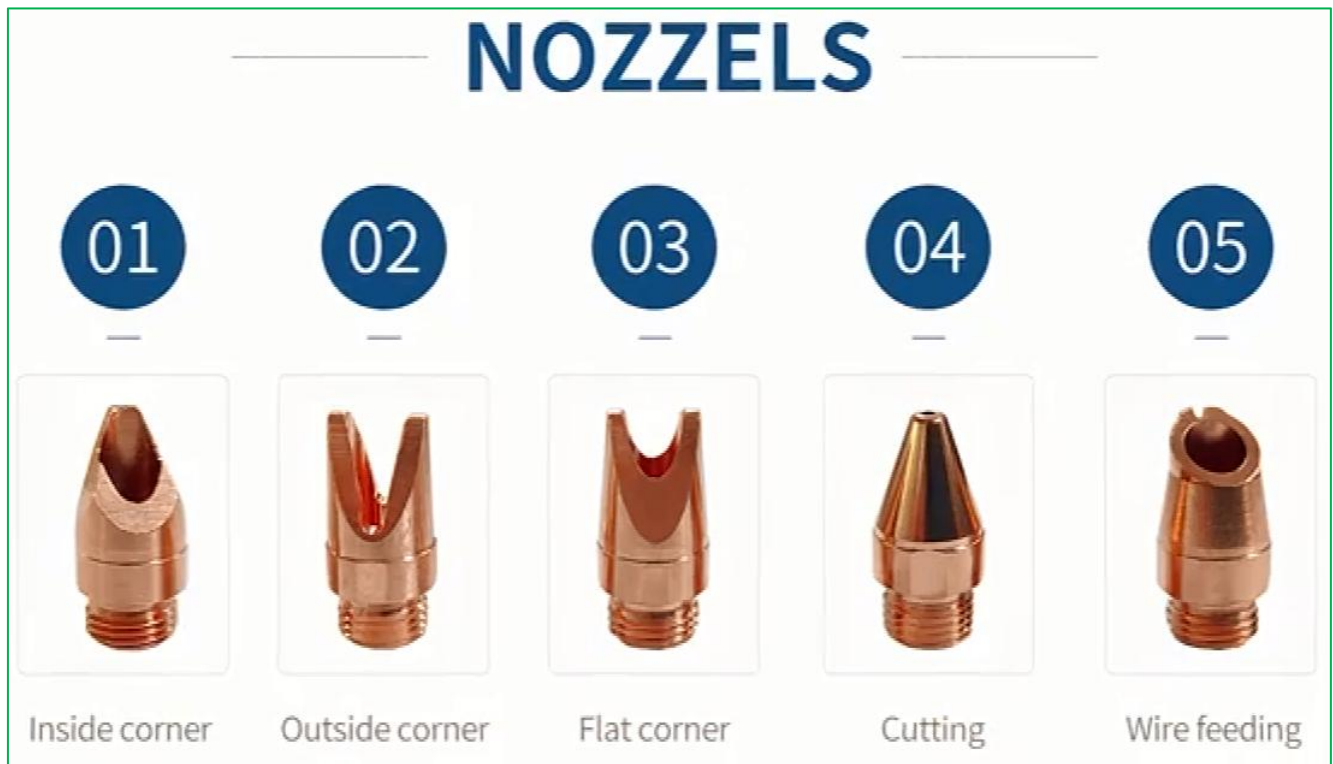


Note:

1. The wire feeder electricity was supplied by laser machine. The connect port at laser machine back, the bottom left position. (Check right side picture).
2. The Adjusting Using button, no need to press.
3. After all parameters set, press Run button.



Nozzle choosing item



No.1, the nozzle for inside corner welding.

No.2, the nozzle for outside corner welding.

No.3, the nozzle for flat corner welding.

No.4, the nozzle for cutting.

No.5, the nozzle for wire feed welding.

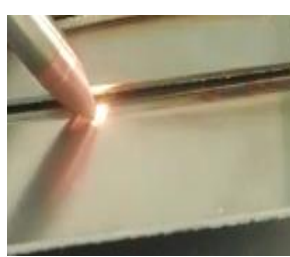
No.1



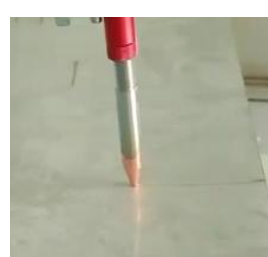
No.2



No.3



No.4



No.5



Note: When use No.5 nozzle for wire feeding welding, Make sure the wire passes through the notch of the wire feed nozzle. Just like below.

