Hand-held Welding Head Manual

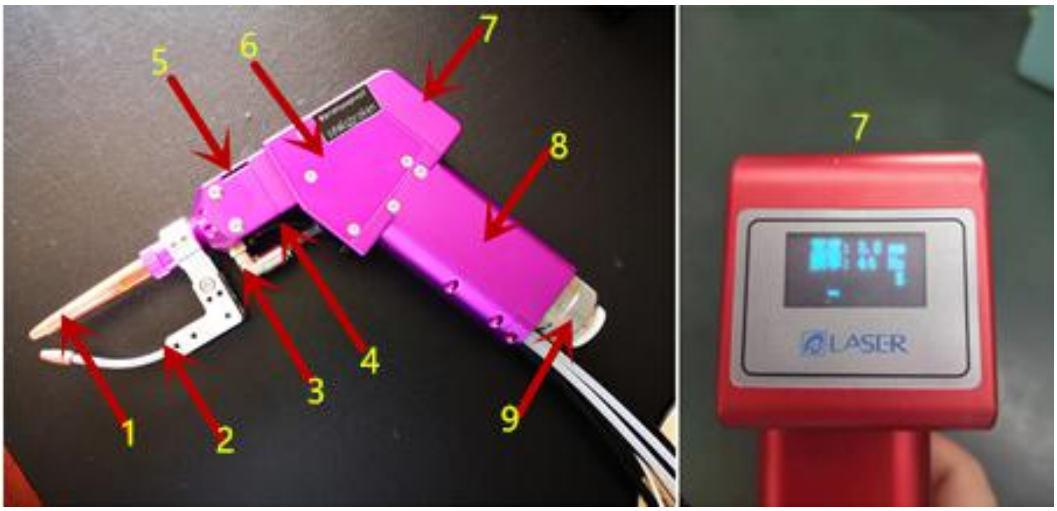
Model No.：BWT15

Declaration

1. Shenzhen qilin laser application co., ltd. may update the operating instructions at any time due to software or hardware upgrades. These updates will be included in the new version of the operating instructions.Read the instructions carefully before using the welding system !

2. Purchase Qilin laser handheld welding system to enjoy a lifetime of software upgrade service, in the stipulated warranty scope, shenzhen qilin laser to fulfill the promise of warranty service.It is strictly prohibited to disassemble or repair this product by personnel other than our company without permission. In case of any damage caused by the above factors, our company will not provide any free warranty service.The company shall not be liable for any loss which may result from the use of the product.The contents contained in the operating instructions shall not be modified or reproduced by any organization or individual by any means. Shenzhen Qilin Laser Application Technology Co., LTD has the right to interpret the product description.

Introduction of parts of welding head



Shown as above pic:

1. **Nozzle:** Customer can change the corresponding nozzle according to different welding processes, and can twist the copper nozzle to adjust the focal length, and the adjustable range of the focal position is ±15mm.

2. **Wire feeding device:** lightweight bend wire feeding structure, wire feeding Angle position can be adjusted conveniently.

3. **Trachea interface:** protective gas inlet.

4. **Lead signal line:** it is communicated with copper nozzles. When welding, contact with iron plate ground wire will produce a circuit, which plays a role of safety protection.

5. **Protective lens mounting port:** the protective lens is equipped with water-cooled structure, so the protective lens can last longer. It is recommended to wipe the dust of protective lens once a day with alcohol-free cotton swab.

6. **Circulating water channel:** cold water circulating structure is used to cool the reflector and gun body.

7. **LCD:** used to show whether the parameters and signal state set by the system are normal.

8. **Gun handle:** aluminum a process, light and light grip comfortable.
   After changing the structure of head and the position of the trigger button, it can be used for both left and right hands.

9. **QBH protective cover:** connect with the laser end, pay attention to cleaning during installation to avoid dust entering the gun body.

Technical parameters	
Interface type	QBH
Power Range	2000W
Laser Wavelength	1064-1080
Mark Width	0.2-5.0 mm
Collimatinglength	50
focal length	120/150
Protective lens	D20X2
Cooling Way	Water
Weight	1.2 kg
Working Mode	·、—、○、◎、△、⋈

Operating instruction

The signal status is displayed in the page:

FGAP **Gas** **Welding** **Connect** **Motor**

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)

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

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 triggle 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.
The frequency is suggested at 3000-5000hz.
Frequency (50-30000HZ)
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
- **Width:** Mark size, (0.2-5mm) adjustable.

Tips:

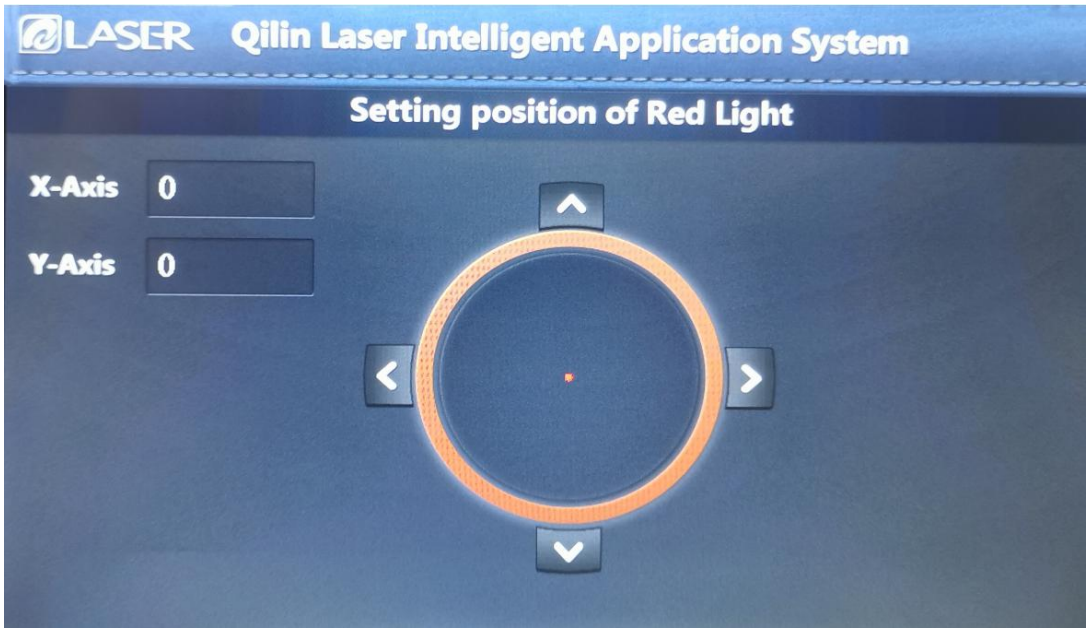
1) ● mode: refers to the state when the motor does not swing and the spot is minimal.
Strong penetration, can be used for penetration welding, overlap welding or thick materials.
2) —mode: it means to swing a motor, connect the points into a line.
Can adjust the width of the mark, concentrate the energy 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 ene6rgy 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.

Position Setting for Red Light

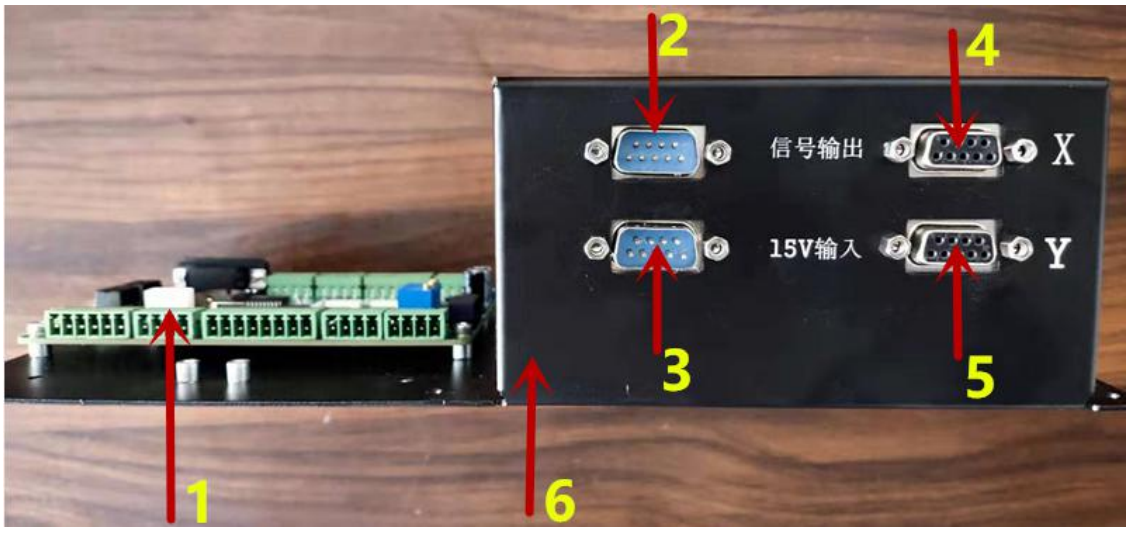


1. Adjust the Axis of X and Y motor reflecting lens to change the red light offset position.
2. The adjustment radius of the laser center point is 5mm.
3. Make sure all motor circruit are normal before adjustment to avoid wrong operation.

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

System Controller



Shown as above pic:

1. **Main control card**: controls spec of head and laser source signal.
2. **Signal output**: cartoon message with laser control, signal feedback to LCD.
3. **15V input**: Feed the power supply port to the mirror motor, and access the ±15 negative power supply.
4. **X**：Connect the X-axis motor communication line.
5. **Y**：Connect the Y-axis motor communication line.
6. **Control box housing**: aluminum oxide housing shielding anti-interference.

Note: the control circuit should pay attention to the fact that 24V input and 15V input must be supplied to the welding system at the same time, otherwise the signal transmission error may occur.The aviation plug and socket terminal must be wrapped with insulating tape after docking.

Protective Function

1. **Laser head protection:** when the laser head appears (E) signal or no data output, the system detects the motor fault, the laser head status light goes out, and the system stops sending out the light signal.Torch status can be lit, but trigger is not valid.
2. **On-state protection:** the on-state signal is controlled by an independent 24V voltage. When receiving an interference signal or a non-self-owned 24V voltage, the state is turned off and the system stops sending optical signals.Torch status can be lit, but trigger is not valid.
3. **State protection of the welding gun:** when the welding gun receives the conduction state and the laser head state are all normal, that is, the circuit with an independent 24V communication signal and an independent 15V laser head, the system normally sends out the optical signal.Press the button to emit light.
4. **Trigger button protection:** this button sets multiple independent circuits, that is, if any protection function is disturbed or disabled, releasing the trigger button can force the system to stop the connection with the laser, effectively preventing the laser emission.
5. **System leakage protection:** multiple isolation protection is added to the main board to prevent power leakage in the chassis, lightning and other factors from burning the main board or interference to the main board.
6. Enclosure protection: the main board and drive are protected by the metal enclosure, which can better shield the external interference.

Laser control card wiring definition

Function definition-V0.5			
No.	**Port No.**	**PCB silk printing**	**Function**
1	GND.+24V.	GND	Connect 24V power supply to negative pole
2		GND	Power supply 24V negative pole
3		.+24V	Power supply 24V positive pole
4		.+24V	Connect positive pole of 24V power supply
5	IN2	CF1	Trigger switch positive connection CF1
6		CF2	Trigger switch negative connection CF2
7		DT1	The on switch is connected to DT1
8		DT2	On switch negative DT2
9	CON2	TX	Connect touch screen (TX)
10		RX	Connect touch screen (RX)
11		GND	Connect touch screen G(GND)
12		24V	Connect touch screen V(24V)
13	RS232	标准 RS232	spare
14	GAS	GAS1+	Gas switch positive
15		GAS1-	Gas switch negative
16		SS+	Wire feeder switch positive
17		SS-	Wire feeder switch negative
18	OUT	NC-	Reserved output interface
19		NC+	Reserved output interface
20		RED-	Laser red control, high level =24V
21		RED+	
22		NE-	Laser enable control, high level =24V
23		NE+	
24		PWM-	Laser modulation control, high level =24V, modulation frequency 50-30000hz
25		PWM+	
26	DA1 DA2	DA1-	Laser power control, analog output 0-10v or 0-4v
27		DA1+	
28		DA2-	Gas proportional valve control, analog output 0-10v
29		DA2+	
30	24V GND	GND	Reserve 24V output
31		GND	
32		24V	
33		24V	
34	adjustable Trim port	VR1	Adjust the analog voltage from 0 to 10V
35		VR2	Adjust the gas proportional valve 0-10v
36		VR3	Adjust the analog voltage from 0 to 10V
37	switch	SW	Laser power control, analog output switching 10V or 4V

Laser connection definition

Board Port	FEIBO	LIANPIN	MAX	Raycus		JPT
				1000X/24 pin	1000W/25 pin	
PWM+	GATE	PWM+	调制+	15 调制+	MOD+	PWM+
PWM-		PWM-	调制-	16 调制-	MOD-	MWM-
EN+	EX-EN	EN+	外部出光+	18 使能+	6 使能+	EN+
EN-	GDA-IO	EN-	外部出光-	20 使能-	9 使能-	EN-
DA1+	IFWD-SET	DA+	DA0-10V+	模拟量 0-10V	22 模拟量+0-10V	DA+
DA1-	CASE	DA-	GDN		25 模拟量-	DA-
RED+	RED-EN					
RED-	GND-IO					
24V					7 外部模式	

Service

1. Pre-sale Service

Before signing the contract, the company is free of charge for the customer product samples and technical and price consultation.

2. On-sale Service

If there is any technical problem in the process of product installation, you can contact the local regional manager or after-sales technical personnel at any time. If you need on-site technical support, you can communicate with the local sales manager and the company will coordinate and arrange.

3. After-sale Service

Within the scope of the warranty period of the contract, the response time of customer service is within 24 hours. During the warranty period, we will provide free and efficient technical service support for customers. After the warranty period, we will provide hardware and software support and enjoy free upgrade service of the software system for life.

FAQ and troubleshooting

1. **The state of the laser head is not displayed:** X.Y motor cable is loose, or 15V power input is interrupted, or the motor is damaged.

2. **No on state display or intermittent light output during welding:** it may be that the communication signal is not connected or the wire is loose and not plugged tightly, and the crocodile clamp does not form a loop with the X5 signal.Intermittent light may be due to the shaking of the nozzle during the welding process, or the plate rusted, not connected with the clamp.

3. **The status of the welding torch is not displayed:** it may be that the switch button of the welding torch tip is loose, the terminals are loose or the interface is unwelded.

4. **Uncontrollable gas:** the gas button on the touch screen is not closed, or the gas delay is set too high, or the positive and negative terminals of the air valve are connected in reverse.

5. **The parameters of the handheld head LCD screen and the setting parameters of the touch screen are out of sync:** the power supply input of the system 24V and the power supply input of the galvanometer 15V cannot be powered on at the same time, resulting in out-of-sync parameters and unable to update data.

6. **Easy to burn the protective lens:** the gas is not pure or no air pressure, the working environment is bad, the focus is off, the water cooling system is damaged, and other factors.During welding, the start and end delay of gas is set at about 150ms, and the focus position should be slightly off the positive focus, welding at about 2MM of negative defocus.

7. **Overheat of welding torch head:** the protective lens burns or the water circulation of chiller fails to pass or is caused by water fault.

NOTICE

1. There are no built-in parts available for use. All repairs shall be made by our professional staff. Please do not damage the label and remove the lid of the welding gun, otherwise the company will not guarantee any damage to the product!

2. Please do not look directly at the welding head outlet, and you must wear professional laser glasses during the operation!

3. Continuous power interruption will cause damage to the welding control system, please provide continuous and reliable power supply!

4. The external safety lock is 24V high level. Please do not make short connection with the GND shell of the aviation plug of the system sheath, or pay no attention to the collision during installation, otherwise the short circuit may burn the power supply or the main control board. After butt butt with the aviation plug, the insulation tape shall be used to wrap the insulation.

5. The control circuit should pay attention to the fact that 24V input and 15V input must be supplied to the welding system at the same time, otherwise the signal transmission error may be caused.

6. Please pay attention to the cleanliness of the surrounding environment when installing QBH, turn off the fan, no flying dust is allowed, QBH must be wiped clean before inserting into the gun body, otherwise it will burn the collimating lens!

7. The optical lenses in this double-pendulum welding joint belong to consumables (collimating, focusing and protecting lenses). In case of any damage, there is no warranty.For the parts that are not wearing parts and are not damaged by human, the company shall bear all the maintenance expenses during the warranty period.(if it is necessary to carry out repairs abroad, the travelling expenses shall be paid by the customer)