

Be sure to read the manual before using the system

- This manual is the user manual of double swing handheld laser welding system
- Read the manual carefully first to ensure the correct electrical connectio

# BWH60

Qilin double pendulum industrial independent welding head user manual



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— The loss caused by natural force makes the machine in the movement dangerous, the user has the responsibility to design an effective error handling and safety protection mechanism in the machine, and Qilin laser has no obligation or responsibility to be responsible for the incidental or corresponding losses caused thereby.

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## Certification statement

### The CE Certification Statement

This product has passed the European Union CE (Communate Euoppene) safety, certification, has passed the corresponding conformity assessment procedures and the manufacturer's declaration of conformity, in accordance with the relevant EU directives.

### ROHS, the certification statement

This product has been approved by the European Union legislation on restricting the use of certain Hazardous ingredients in electronic and Electrical Equipment (Restriction of Hazardous Substances) safety certification, in accordance with the relevant environmental regulations of the European Union.

### FCC Certification statement

This product has been certified by the Federal Communications Commission (Federal Communications Commission) and complies with the relevant safety regulations of American electronic products.

## security information

When using the system, please ensure that the operation is correct and safe. Some signs or words will be used to remind you of dangerous matters and some important information.



### **danger:**

Represents a serious danger. In the process of use, if the operation is improper or the use method is wrong, it may lead to serious injury or even death, please users and related personnel do not operate easily, until to ensure that the operation method and the correct way of use.



### **warn:**

Indicates that a danger exists. In the process of use, if the operation is improper or the use method is wrong, which may cause injury to the personnel, please do not operate easily, until you ensure that the operation method is correct and the use method is correct.



### **prudent:**

Represents a product potential risk. During use, if the use method is wrong or improper operation, the product or some parts may be damaged. Please users and related personnel do not operate easily until the operation method is correct and the use method is correct.



### **important:**

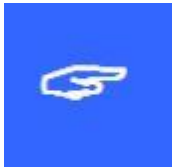
Represents an important information to note during the product. Please do not ignore this information, which provides effective operational help.



This label indicates laser radiation, which will generally be affixed to the product output of laser. Please, be careful of laser and safety when using such equipment.

## Receiving goods, unpacking and inspection

The product uses shock-proof soft packaging. If the package has any external damage marks, please check the damage to the equipment and notify the carrier and the carrier of the damage in written documents.



### important:

**After receiving the product, please check whether the outer package is in good condition, and check whether the products are complete and all parts are intact after unpacking. If any damage is found, please contact the Qilin Laser immediately.**

Remove all the goods from the packaging and keep the packaging materials and wiring spare parts. When disassembling the package and removing the goods, please be careful that the goods are safe. After removing the goods, please check whether the parts are complete and intact. If a lack of parts or parts is found

If it is damaged, please contact the Qilin laser immediately. If any obvious damage to the equipment, do not install or debug the equipment.

BW H 60 Qilin double pendulum industrial independent welding hair goods list is shown in the following table: (because the product is constantly updated, the content is subject to the actual delivery list. )

	component	quantity	explain
1	BWH 60 Welding head	1	
2	monitor	1	
3	Video line	1	
4	Power signal line	1	
5	Plus or minus 15V power supply	1	
6	Blu-ray adjustable focus for 12V	1	
7	The DC12V power supply	1	
8	One point and two DC lines	1	
9	Power extension line	1	
10	Blu-ray light transfer wiring	1	
11	Coaxial components	1	
12	protective glass	5	
13	Blu-ray lamp clip block	1	
14	laser goggles	1	

# catalogue

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# An Overview of Chapter 1

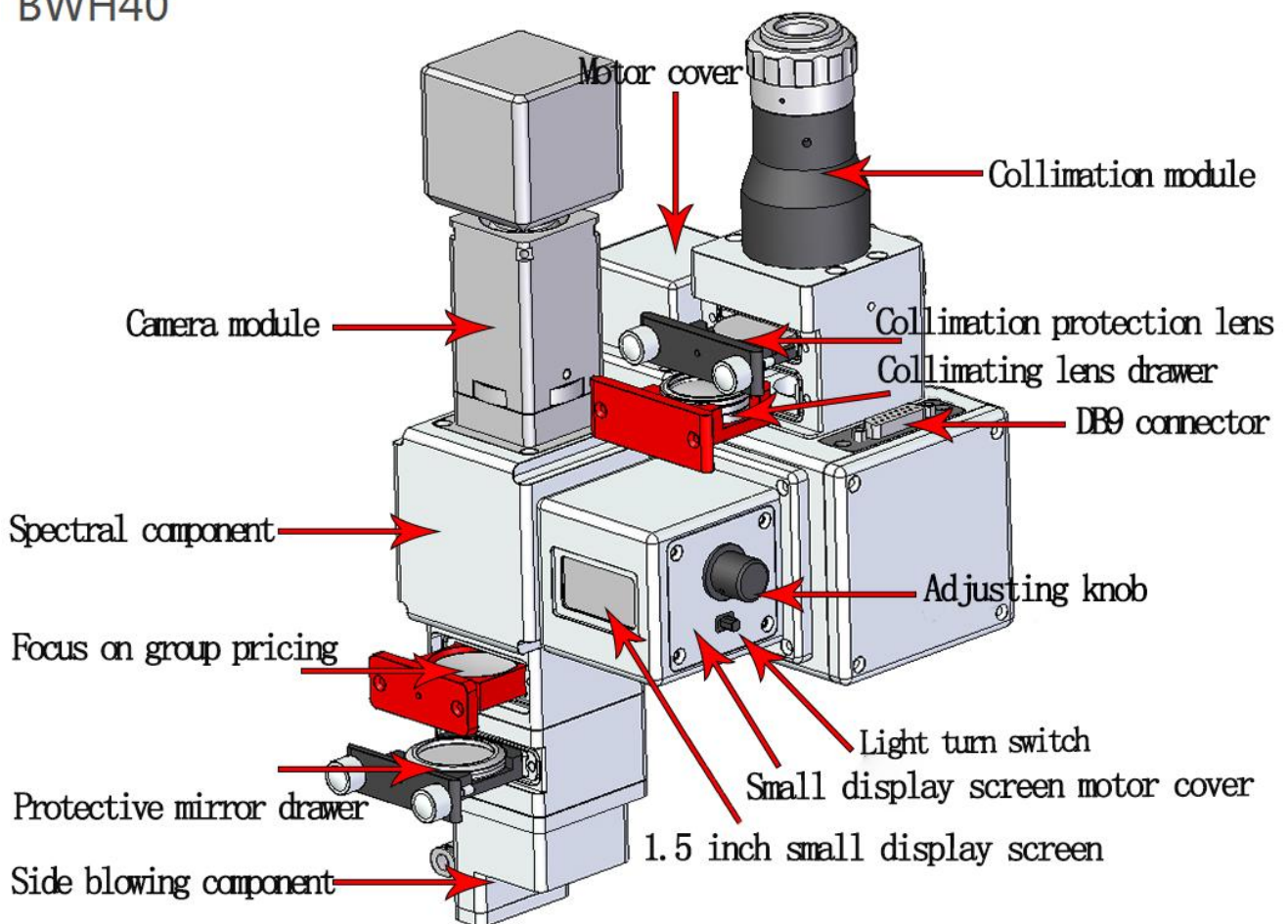
The main contents of this section are as follows:

- Double pendulum industrial independent welding head brief introduction
- Product installation size Drawing

## 1.1 Qilin double pendulum industrial independent welding head brief introduction

Qilin double pendulum industrial independent welding head is a welding head specially used for platform and robot fiber laser welding developed by Qilin laser. Double vibration lens motor control, there are seven swing modes: point, line, ring, oval, triangle, eight characters, semicircle. The side panel of the welding head has a knob control, which can adjust the swing mode of the motor, swing frequency, swing width, red light position, rotation angle, XY axis coefficient and other functions, and the welding head OLED shows the motor fault E signal alarm function.

### BWH40





**Product Parameter:**

parameter	scope
interface type	QBH
laser power	6000W
Collar focal length	100
Focus focal length	300
hunting range	The 0- -5mm is adjustable
cooling-down method	hydrocooling
Applicable wavelength	1064-1080nm
Collimine lens	D37F 100
Focus on the lens	D37F 300
Reflective mirror	60*40*6
Protection mirror specifications	D37T5
Maximum air pressure support	0.6Mpa
Focus of vertical adjustment range	±15mm
TBM	7. 1KG
Surveillance mode	CCD

## 1.2 Product installation dimension drawing

### 1.2.1 Installation dimension of the welding head

The installation size of the welding head is shown in Figure 1.21 below, and the mounting screw hole position is 6-M6 depth 10.

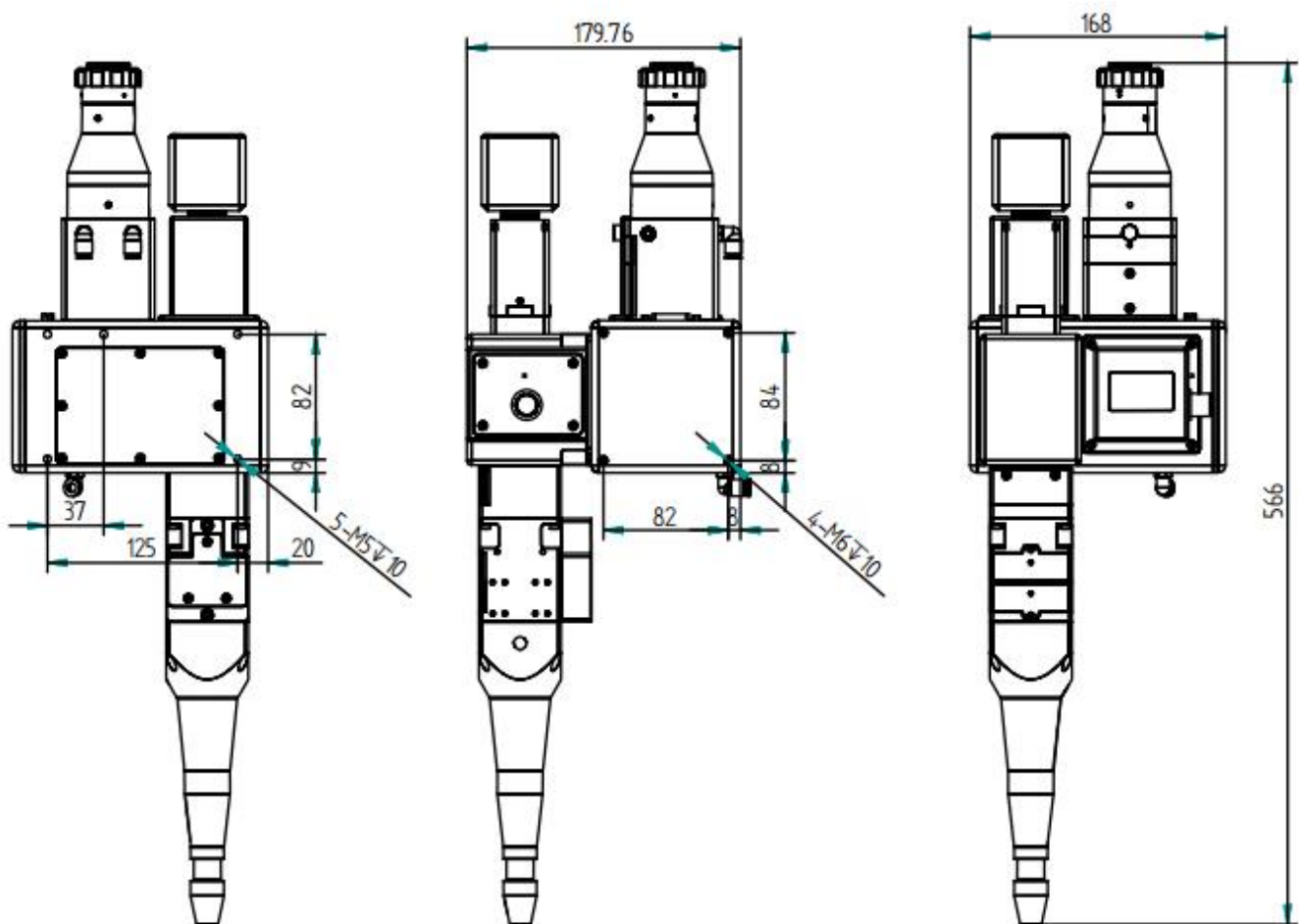


Figure 1.21 Installation dimension drawing of the welding head

## 1.2.2 Installation size of the monitor

The monitor installation dimensions are shown in Figure 1.2.2 below:

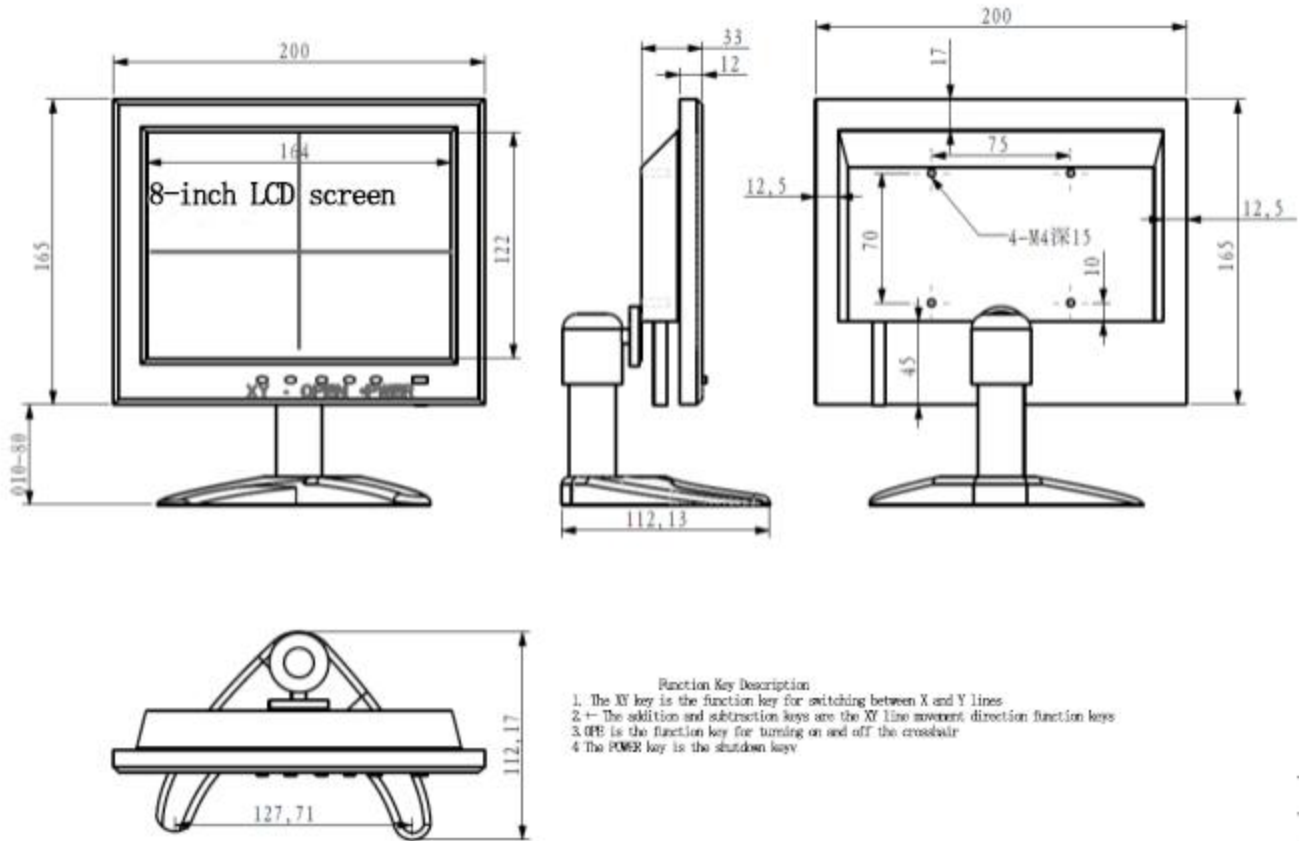


Figure 1.2.2 Diagram of monitor installation size

# Chapter 2. System Wiring

**The main contents of this section are as follows:**

- Welding head wiring diagram
- Monitor wiring

## 2.1 Wiring diagram of the welding head

Figure 2.1 shows the wiring diagram of the whole welding head, and the system wiring can refer to the schematic diagram.

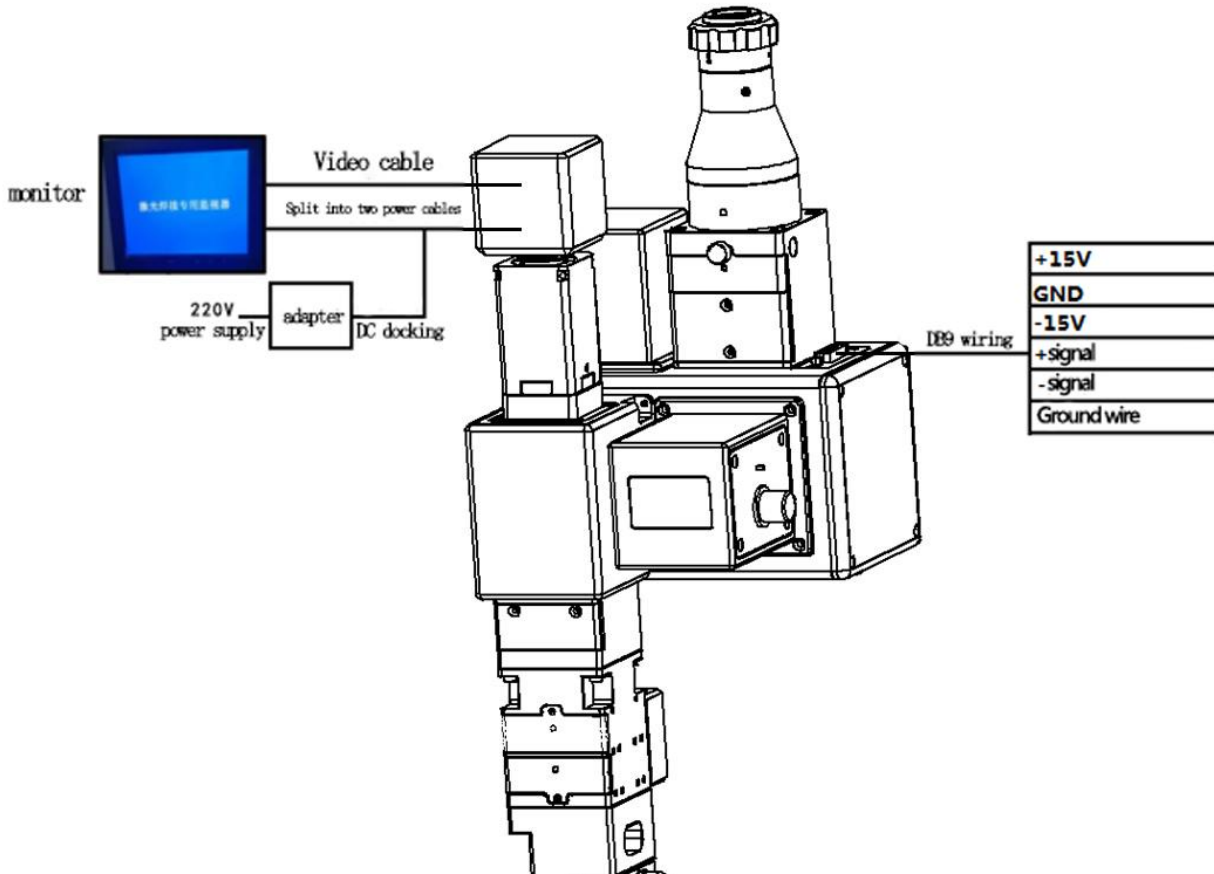


Figure 2.1 Schematic diagram of welding head wiring

Table 2.1 Definition of DB 9-line sets

order number	Line order	Corresponding line logo	remarks
1	1	+15V	Power supply cord (GND)
2	3	GND / ( Status - )	
3	5	-15V	
4	6	signal 1	Swing signal line
5	9	signal 2	
6	7	Status +	State alarm signal
7	shielding layer	shield line	

**Special attention:**

- ① Wmode: + 15V power supply V1 port, GND power supply COM port, -15V power supply V2 port.
- ② State + (status +), state- (status-), E signal alarm, the state + -10V voltage output will change to 0V.
- ③ Shield ded grounding wire.

## 2.2 Monitor wiring

The monitor is used with the CCD camera with the wiring mode as shown in Figure 2.1. The adapter passes through a 1-minute 2DC power interface, one end is connected to the CCD and the other end to the monitor power interface to supply power to the CCD and the monitor respectively. The video line connects to the CCD at one end and the other to the monitor, transmitting the image model and being displayed on the monitor.

**Special attention:**

The power supply of CCD and monitor must be connected from the adapter. If it leads from other switching power supply, the monitor may appear ripples and affect the imaging effect.

# Chapter 3: Introduction of welding head use and related welding mode

The main contents of this section are as follows:

- Introduction to panel parameters
- Parameter adjustment introduction
- CCD camera adjustment introduction

### 3.1 Introduction of the panel parameters



Figure 3.1 Schematic diagram of the panel interface

Qilin double pendulum industrial independent welding head is an independent welding head. On the panel of the welding head, you can control the swing width, swing frequency, swing mode, rotation Angle, XY coefficient adjustment, red light position and language setting parameters. Welding head parameter adjustment control is independent of laser light output control and platform motion control. Therefore, customers need to bring their own laser control system and the platform motion control system.

#### Introduction of the parameters of the main panel:

Width: Swing amplitude at the focus (0.2-5mm range adjustable).

Frequency: number of swing circles in 1 second (2-30Hz range adjustable, with 1Hz motor turning about 9 turns).

R: The swing signal enables the display.

⚡: Shake stop signal enables display (if displayed, stop swing, swing enable does not work).

**E: Abnormal display of swing system (no light during E signal).**

Swing mode: welding head can choose swing mode common point, line, circle, ellipse, triangle, eight characters, half circle seven swing mode.

Point mode: the motor does not swing, the spot density is strong, often used for equipment focus, spot welding, penetration welding



Line mode: a motor swings, the light spot into a linear shape, the energy density distribution is more uniform, often used for medium and thick plate welding,

Laser wire filling and welding, etc.

Round mode: two motors swing, round light spot, small energy density, often used for thin plate welding; small swing amplitude, swing

The parameter with low dynamic frequency can also be used for medium thickness plate welding.

Elliptical mode: two motors swing, elliptical spot, energy density is slightly larger than the circle, commonly used to weld with aluminum plate; in the swing

The parameters of small movement amplitude and low swing frequency can also be used for medium thickness plate welding.

Triangle mode: two motors swing, triangular spot, energy density distribution is concentrated than circular mode, often used in laser wire filling welding come into contact with.

8-word mode: two motors swing, 8-word spot, the weld is scaly.


Semi cle mode: two motors swing, showing semicircle light spot, welding uniform and does not accumulate, commonly used in laser wire filling welding come into contact with.

**Note: The above welding modes are only for reference, and shall be used flexibly, according to the actual welding requirements on site.**

## 3.2 Introduction of system parameter adjustment




Figure 3.2 Schematic diagram of the panel interface


At the main interface , at the adjustment knob time, enter the coefficient parameter adjustment interface:


X-axis coordinate: the knob can adjust the red light position of the motor X-axis, and adjust the red light center, range-127 to 127.

X-axis coordinate: the knob can adjust the red light position of the motor X-axis, and adjust the red light center, range-127 to 127.

Language selection: the knob can set the language, optional Chinese, Japanese, English, Russian four languages.

 Angle rotation: the knob can set the Angle, make the shape change the direction, can be set: 0-90-180-270 Angle change;

 X coefficient adjustment: the knob can set the motor swing X-axis zoom coefficient, adjust the size of the figure, the range of 0.5-1.5 times adjustable;

 Y coefficient adjustment: the knob can set the motor swing X-axis zoom coefficient, adjust the size of the figure, the range of 0.5-1.5 times adjustable.

### 3.3 CCD lens adjustment mode

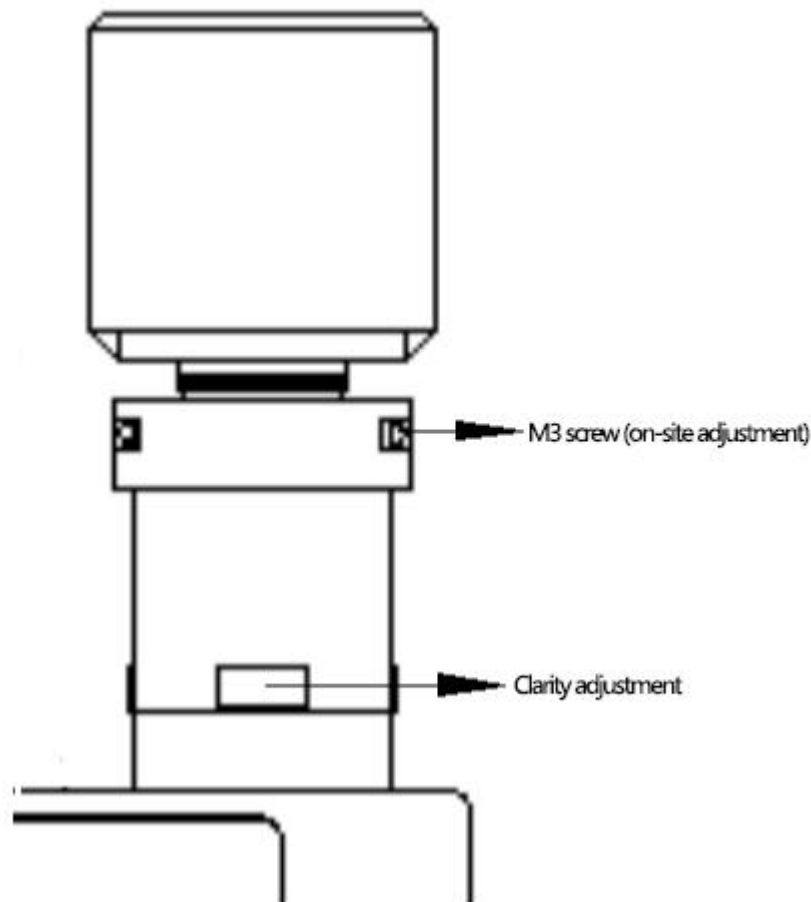


Figure 3.3 Schematic diagram of the CCD lens adjustment mode

Clarity adjustment: it can be achieved by adjusting the convex cylindrical structure at the upper end of the box in the right figure.

Field adjustment: Field adjustment can be achieved by tightening / releasing the two M3 adjustment screws in front of the large triangle block.

Note: when the definition adjustment, should not be too hard to ensure that the adjustment does not exceed the internal travel, all anti-disassembly labels without permission

The condition cannot be removed

## Process Package of Reference Parameters:

order number	6000W laser control				Laser head control		
	Material and thickness	power	frequency	duty cycle	pattern	frequency	width
1	Stainless Steel1.0	15%	3000HZ	100%	○	10hz	1.2mm
	Stainless Steel1.5	22%	3000HZ	100%	○	10hz	1.6mm
	Stainless Steel2.0	28%	3000HZ	100%	△	10hz	2.6mm
	Stainless Steel2.5	32%	3000HZ	100%	△	10hz	3mm
	Stainless Steel3.0	38%	3000HZ	100%	⊠	10hz	3.2mm
	Stainless Steel3.5	46%	3000HZ	100%	⊠	10hz	3.6mm
	Stainless Steel4.0	52%	3000HZ	100%	⊠	10hz	3.8mm
2	Carbon steel1.0	15%	3000HZ	100%	○	10hz	1.2mm
	Carbon steel1.5	22%	3000HZ	100%	○	10hz	1.6mm
	Carbon steel2.0	28%	3000HZ	100%	△	10hz	2.6mm
	Carbon steel2.5	32%	3000HZ	100%	△	10hz	3mm
	Carbon steel3.0	38%	3000HZ	100%	⊠	10hz	3.2mm
	Carbon steel3.5	46%	3000HZ	100%	⊠	10hz	3.6mm
	Carbon steel4.0	52%	3000HZ	100%	⊠	10hz	3.8mm
3	Galvanized plate1.0	15%	3000HZ	100%	○	10hz	1.2mm
	Galvanized plate1.5	22%	3000HZ	100%	○	10hz	1.6mm
	Galvanized plate2.0	28%	3000HZ	100%	△	10hz	2.6mm
	Galvanized plate2.5	32%	3000HZ	100%	△	10hz	3mm
	Galvanized plate3.0	38%	3000HZ	100%	⊠	10hz	3.2mm
	Galvanized plate3.5	46%	3000HZ	100%	⊠	10hz	3.6mm
	Galvanized plate4.0	52%	3000HZ	100%	⊠	10hz	3.8mm
4	Aluminum plate1.0	15%	3000HZ	100%	○	10hz	1.2mm
	Aluminum plate1.5	22%	3000HZ	100%	○	10hz	1.6mm
	Aluminum plate2.0	28%	3000HZ	100%	△	10hz	2.6mm
	Aluminum plate2.5	32%	3000HZ	100%	△	10hz	3mm
	Aluminum plate3.0	38%	3000HZ	100%	⊠	10hz	3.2mm
	Aluminum plate3.5	46%	3000HZ	100%	⊠	10hz	3.6mm
	Aluminum plate4.0	52%	3000HZ	100%	⊠	10hz	3.8mm

The above parameters are provided for the reference purposes only

Description: For different lasers, other parameters in the process package parameters remain unchanged, only the power modification, can be set according to this formula:

When selecting 1000W laser:  $P (1000W \text{ laser}) = P (1500W \text{ laser}) * (1000 / 1500)$

When selecting 2000W laser:  $P (2000W \text{ laser}) = P (1500W \text{ laser}) * (2000 / 1500)$

When selecting 3000W laser:  $P (3000W \text{ laser}) = P (1500W \text{ laser}) * (3000 / 1500)$

When selecting 6000W laser:  $P (6000W \text{ laser}) = P (1500W \text{ laser}) * (6000 / 1500)$

## Use the laser welding system precautions

1. The light double pendulum industrial welding independent joint includes laser, water cooler, laser welding system and laser welding head. In order to avoid interference, ensure away from the argon arc welding machine and related equipment with large interference, and ensure that the safe distance is kept at more than 5 meters. Ensure that the laser welding machine has independent space when conditions permit.
2. In order to reduce equipment leakage or static electricity, ensure the use of light double pendulum industrial welding head equipment.
3. Please repeatedly confirm whether the cable joint is connected and locked normally. After locking, it can be wrapped with insulation tape.
4. Check whether the laser head and the optical fiber are locked and connected. After confirming that it is normal, the beautiful strip tape can be sealed and wound to ensure that the dust does not enter the laser head cavity.
5. Check whether there is water seepage in the cavity and many waterways in the cavity. Do not loosen screws without professional training to prevent water droplets from entering the cavity.
6. Check whether the protective lens drawer is normal, ensure that the sealing ring is normal and effective, when replacing the protective lens, ensure that the alcohol wipes the external stains of the laser head, at least 5 times, and ensure that the lens environment is clean and clean before the lens is replaced.

7. The laser head is so complex. To avoid short circuit, stay away from the water source and make sure that no liquid can be sprayed on the laser head.
8. Laser head refuses to use strong wind to blow and clean the laser head, and can only be wiped with alcohol and dust-free cloth.
9. The laser head is installed with a digital motor. When used, it must be put gently to prevent motor failure.
10. When the laser head is not used, please use the system gas blowing air for many times to discharge the dust, and remove the copper nozzle, use the sealing tape to seal, and use the copper nozzle to blow air more than 2 times before using.
11. Continuous interruption of power supply will cause damage to the welding control system, if the external wire transmitter, 24V power supply, please provide 200W (power voltage 24V, output current is equal to or greater than 8A) above the reliable power supply!
12. The external safety lock is 24V high level, do not short connect with the aviation plug GND shell of the system cable cable, or do not pay attention to the installation Collision with each other, otherwise the short circuit may burn down the power supply or the main control board.

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**Quality assurance description:**

The warranty period of this product is 12 months, starting from the date of factory. If the product is faulty during the warranty period, it can be sent back

Our company, free maintenance, free of labor costs. All lens categories (e. g. collimated lens, focusing lens, mirror, cover

Protection lens, motor lens, etc.), appearance parts (cavity and handle, etc.) and consumables (copper nozzle, stainless steel pipe, and other easy to lose

Product) is not in the warranty scope.

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