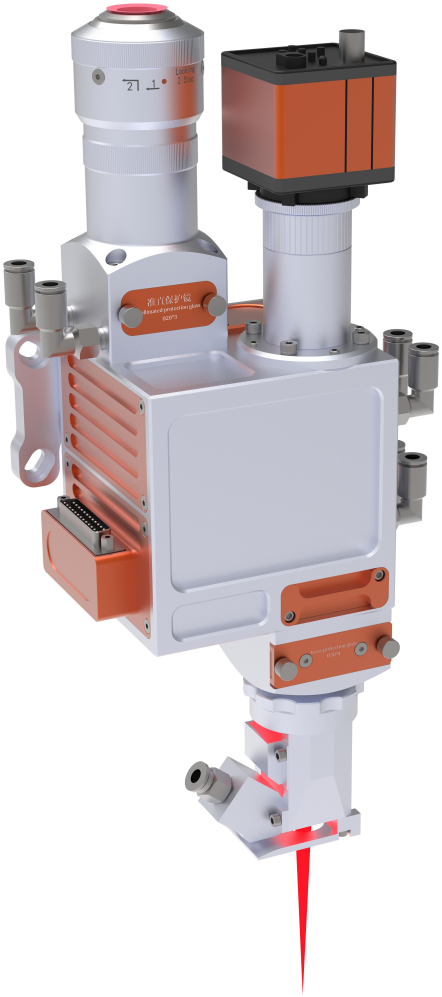
兴弘光电
XINGHONG OPTOELECTRONIC

HW series

HW20 Fiber Dual Axis Galvo Welding Head

An instruction manual



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Catalogue

Please read this product manual carefully after

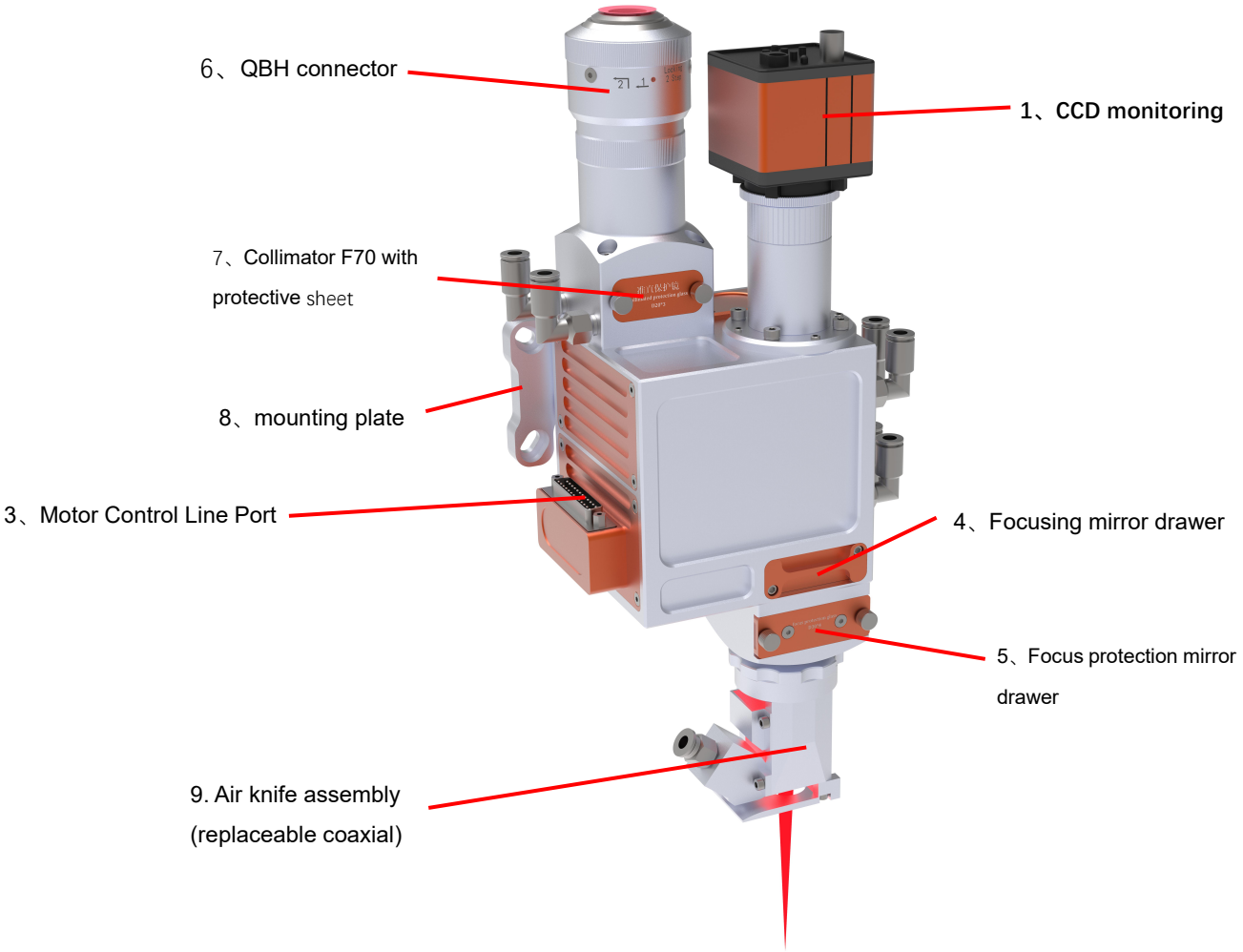
Then carry out the installation, debugging and use of the product

You must wear safety goggles when operating laser equipment. Safety glasses should be reasonably selected according to the wavelength of the laser emitted by the laser equipment. If the device is a laser tunable or Raman product, it will emit laser light beyond the normal output wavelength range of the device's laser, and corresponding safety protection should be taken against this phenomenon during protection. Laser safety goggles should be selected based on the ability to shield the entire wavelength range of laser light emitted by laser equipment.

Chapter I product introduction and display

1.Product introduction

"HW optical fiber double oscillating mirror welding head" is a dual-axis oscillating welding head independently developed by our company. It is composed of "optical fiber double oscillating mirror welding head" and "XZ laser welding control system". The welding head is collimated by QBH It consists of a module, a dual-axis galvanometer assembly, a focusing module and a CCD monitoring module. Equipped with dual galvanometer modules, it can realize "O, 8, ∞, —, | and other" irregular light spots to meet customer needs.

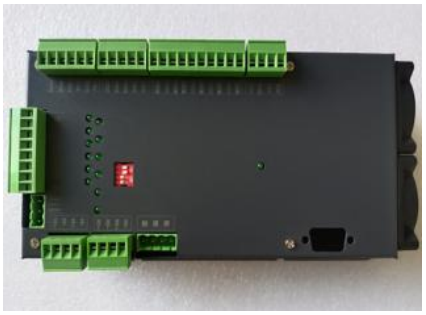


Optical fiber dual oscillating mirror welding head (sample picture)　Note: The driver is built-in, and the dual axis can be positive.

2. Accessories display

WD fiber dual-axis galvanometer welding head (sample picture)

Touch screen (sample image)



Control Box (Sample)

Serial port signal line (sample image)

8-inch display (sample image)

Connection line (sample image)

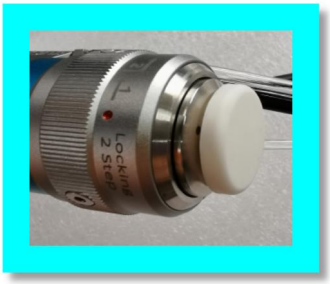
Blue light (sample image)

Protective lens (sample image)

3. Special attention: 5 steps for inserting and unplugging optical fiber

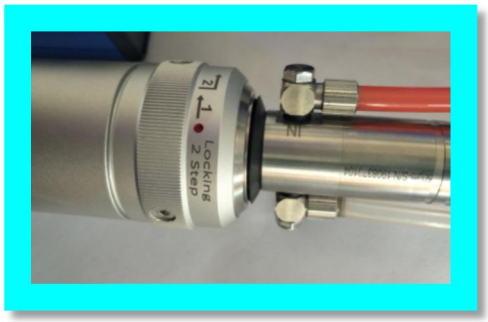
Note: when inserting optical fiber, the laser head shall be placed horizontally; Ensure that the optical fiber is inserted horizontally

3. 1 Check whether QBH connector and optical fiber plug are dirty, and wipe them with alcohol and cotton swab (cotton paper) in time



3.2 QBH homing "two points and one line" 3.3 alignment insertion of optical fiber plug

3.4 secondary locking clockwise 3.5 optical fiber protective jacket for complete protection



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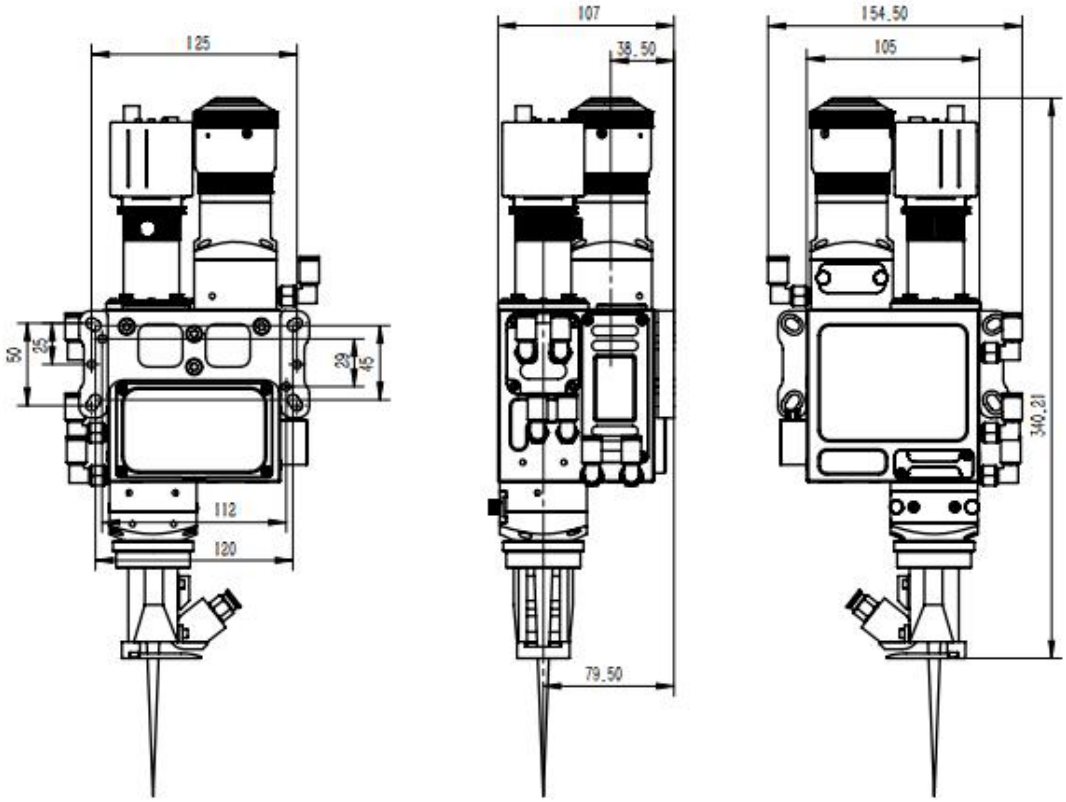
Chapter 1 Introduction to Product Functions and General Operations

1. Welding head installation dimension drawing



2. Defocus adjustment

Adjust the laser power to about 150W, the brightness of the laser beam is the strongest, and the sound of "chichi" is the loudest. When you hear only a sound, that is, the focus is just on the surface of the workpiece, which is zero defocus.

When the defocus is negative, a larger penetration depth can be obtained, and the internal power density of the material is higher than that of the surface, which is easy to form stronger melting and vaporization, so that the light energy can be transmitted to the material deeper. Therefore, in practical applications, when the penetration depth is required to be large, negative defocusing is used; when welding thin materials, positive defocusing should be used.

3、Replacing the cleaning protection sheet

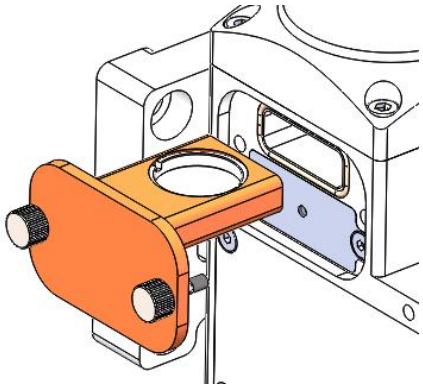
Important: When cleaning and replacing the protective sheet, you will need the following:

1. Powder-free rubber gloves or finger cots, lint-free cleaning wipes and cotton swabs

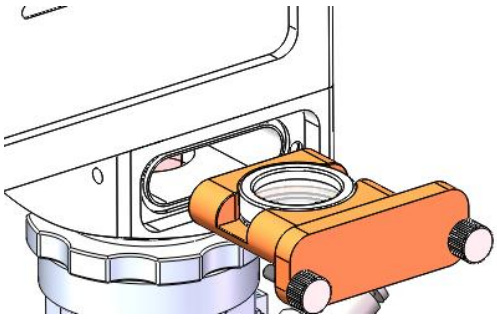
3. Isopropyl alcohol (optical grade, anhydrous), acetone (optical grade, anhydrous), ethanol

5. Compressed air (no oil, no water)

6. Light source



Collimation Mirror Drawer (Threaded Press Ring)



Focus protection mirror drawer (pan plug seal)

★Notice:

★ Do not go back and forth, use a lint-free cotton cloth or cotton swab to wipe the protective lens.

★ Do not touch the translucent surface of the protective lens with your fingers.

★ Do not blow directly with your mouth to protect the dirt on the surface of the lens, because it may bring new dirt.

★ Do not touch the tip of the cleaning swab with your fingers.

★ Don't forget to clean when replacing the mirror drawer.

★ When using compressed air, please do not blow the dirt directly from the front, and use the method of blowing from the side to prevent the dirt from sneaking into the surface.

★ Special instructions, powder-free gloves or finger cots must be worn when cleaning the product. It is now clear that if the damage is caused by, improper handling or the use of incorrect cleaning procedures or chemical use, damage due to such a cause is not covered by the warranty.

4、Laser control card connection diagram

◎ Precautions for laser connection: Some lasers need to short-circuit interlock and supply power to one of the external control lines when they emit light in the external control state. Please read the laser wiring instructions carefully.

◎Notes for conventional DC wire feeders: conventional wire feeders have their own drive and external power supply. It is only necessary to connect the two wires of the wire feeder to the relay normally open port of the controller and the corresponding common terminal, and the wire feeding and drawing processes are adjusted on the wire feeder. (Controller red dial: 1, 3 up, 2, 4 down)。

◎ Precautions for the power supply of the control card: the positive and negative 15V switching power supply for the control system and the 24V switching power supply for the laser enable, gas valve, etc. need a total of 0V, so the 0V of the two switching power supplies needs to be connected during installation and wiring. Short circuit, or connect the 0V of the 24V switching power supply to the GND of the output port.

◎ Axis motion port: There are X and Y axis motion wiring ports on the controller, which can be connected to stepper motors or servo motors. The two axes output pulse and direction signals at the same time. Interpolation motion is not allowed. walk distance.

5、Control interface description

★ **Home:** The home page is the work page, and all the contents of the system are displayed or entered on this page. The main display contents are:

(1) System name: The name of the system is displayed (as shown in the figure below: X-Z04 laser welding control system). This name can be customized before purchasing;

(2) Hardware version and software version: The hardware version is the version number of the internal program of the controller displayed, and the software version is the version number of the internal program of the touch screen displayed, (the upper right corner of the figure below);

(3)Laser power: Set according to the required power wattage. Before setting, you need to set the total laser power wattage in the setting interface;

⑷**Laser frequency:** the number of times the signal goes from high level to low level and back to high level per second;

⑸**Duty cycle:** the proportion of high level in the whole cycle in a pulse cycle;

⑹**Galvanometer frequency:** refers to the number of times the galvanometer motor vibrates per second;

⑺**Spot size:** refers to the size of the spot formed after the red light and the laser pass through the welding head;

⑻**Process serial number:** The controller supports multi-channel and multi-group process parameter configuration work. The process serial number corresponds to the port number, and the input port DI1 corresponds to the

process serial number 1-15. The process can be switched by + - on the touch screen. DI2 DI3 DI4 DI6 correspond to The output parameters are shown in the following table (there are many applications of this function in robot welding);

	DI2	DI3	DI4	DI6	
第1组	0	1	1	1	1为输入端口与GND断开 0为输入端口与GND闭合
第2组	1	0	1	1	
第3组	0	0	1	1	
第4组	1	1	0	1	
第5组	0	1	0	1	
第6组	1	0	0	1	
第7组	0	0	0	1	
第8组	1	1	1	0	
第9组	0	1	1	0	
第10组	1	0	1	0	
第11组	0	0	1	0	
第12组	1	1	0	0	
第13组	0	1	0	0	
第14组	1	0	0	0	
第15组	0	0	0	0	

Input port process serial number comparison table

⑼**Wire feeding speed, wire feeding switch, manual wire feeding, and manual wire drawing:** This function is a special function for a special custom wire feeder, and the set parameters are 0.5 to 0.5 meters per minute. Generally, the conventional wire feeder does not need to be set;

⑽**Working mode:** There are 4 modes to choose from, namely continuous mode, dot mode, pulse mode and QCW mode;

⑾ **Spot mode:** the shape of the spot when the laser and red light come out of the welding head;

⑿ **Galvanometer switch:** It is a switch to turn on the spot mode and turn off the off mode;

⒀ **Air valve switch:** It is a test switch for manually opening the air valve and closing the air valve. The air outlet during the working process is not affected by the switch;

⒁ **Laser enable:** manually turn on and off the laser enable switch, and it is turned on by default during the working process;

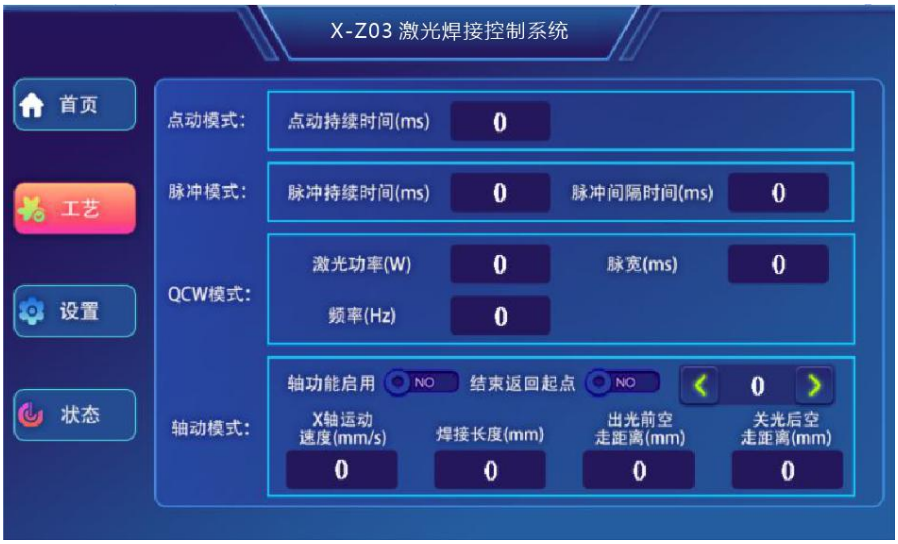
⒂ **Start, close:** When you are ready to start work, you need to click the start button, and the system will enter the standby state. After the work is over, click

the close button first, and the system will enter the stop state. At this time, the equipment cannot work normally.

⑯ **Safety protection warning light:** green when it is normally turned on, red when it is turned off or not turned on;

⑰ **Gas protection, water tank alarm:** green when not enabled, not red when not connected, green when connected normally.

★**Process:** This page is a page for setting 15 groups of parameters. This page is divided into upper and lower pages, and the second interface is entered through the next page in the lower right corner of the home page.



(1) Laser parameters group A and group B: X-Z04 laser welding control

system only supports group A setting parameters, X-Z04 laser welding control system supports both group A and group B to set light output, if you need to set two lasers at the same time with different parameters for light output Please ask the supplier;

(2) Ramp-up time and ramp-up start power: Ramp-up time is the time it takes for the laser duty cycle and laser power to go from 0% to the set value after triggering the working signal. If the ramp-up start power is set, it will start from ramp-up. The time it takes for the power to reach the set power value (when the red dial code 4 is dialed down, it is the PWM independent ramp up and down);

(3) Ramp down time and ramp down end power: ramp down time is the time it takes for the laser duty cycle and laser power to go from the set value to 0% after stopping the working signal. The time taken from the value to the end of the slow down power (when the red dial code 4 is dialed down, it is the PWM independent ramp up and down);

⑷ **Time before light emission and time after light off:** specify the blowing time before the light is emitted and the blowing time after the light is turned off;

⑸ **Jog mode:** The jog duration is the light-emitting time of the laser when the button is triggered each time, and the unit is milliseconds;

⑹ **Pulse mode:** The pulse time refers to the light-emitting time of the trigger start button laser, and the pulse interval time is the waiting time after the pulse-time light-emitting ends. If the trigger has not been turned off, it will enter the pulse time again, and cycle until the trigger signal is turned off, in units of for milliseconds;

⑺ **QCW mode:** the function used to connect the QCW laser, if necessary, please ask the supplier;

⑻ **Axis movement mode:** This function is the function of X-Z04 laser welding control system, X-Z03 laser welding control system does not support, if you need to ask the supplier.

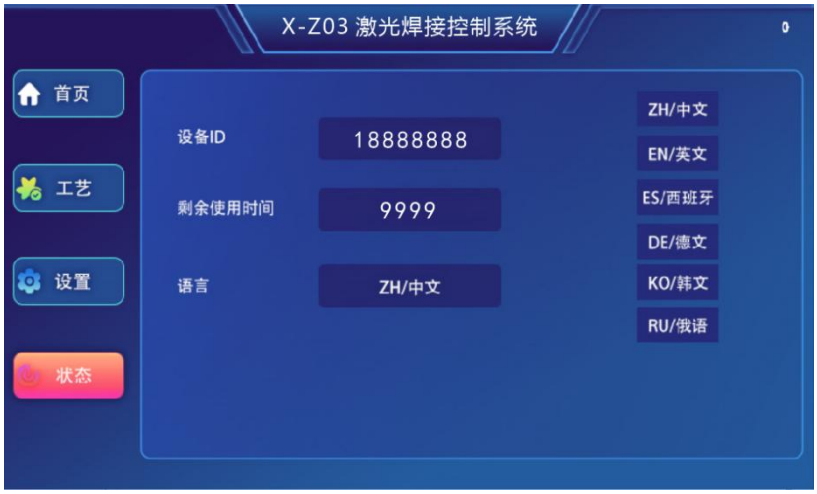
★ **Setting: This page only needs to set the maximum power value of the laser, the adjustment of the galvanometer function, and the pulse equivalent and pitch of the motion axis.**

⑴ **X-axis, Y-axis red light offset value:** X-Z04 laser welding control system supports both X-axis and Y-axis adjustment. The system supports adjustment in two states of galvanometer on or off, which can be selected according to customer habits. The reset button is the return button of the galvanometer motor.

⑵ **Proportional coefficient:** adjust the proportional coefficient according to the galvanometer motor and the internal lens of the welding head to ensure that the spot size on the process page is exactly the same as the actual value.

★ **Status: This page displays the system ID number and system**

language settings.



(1) Device ID, remaining days of use: Each system ID number is unique, and can be encrypted and decrypted through the ID number. If the device needs to be encrypted and decrypted, please send the ID number and the number of days to be activated to the supplier, and the supplier will provide as needed. The corresponding activation code, the customer can activate the operating days through the motor days window. If the following picture appears after booting, the software is about to be locked or locked, please contact the supplier to unlock it.

⑵ **Language:** The system temporarily provides 6 languages for customers to use, which can be set according to customer needs.