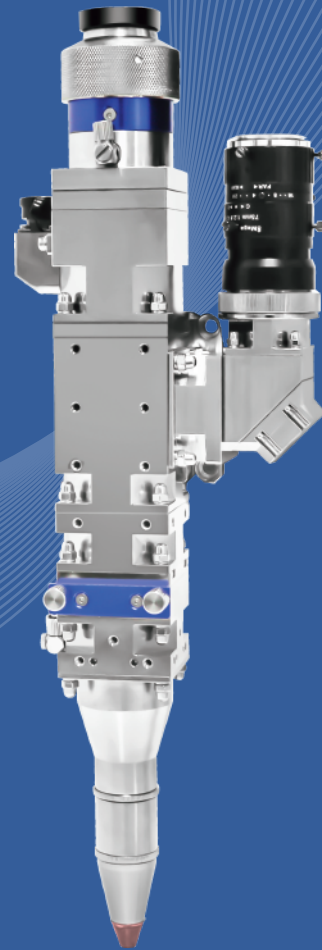


# PRODUCT INSTRUCTION MANUAL



## ND20A

### Wobble Welding Head User Manual



# PREFACE

Thank you very much for using our company's single station galvanometer driver! Before use, please read the equipment manual carefully to ensure that the company's equipment is used correctly. Please keep the manual properly for reference at any time. Due to different configurations, some models do not have some of the functions listed in this book. Please refer to the actual product. Due to continuous product upgrades and improvements, some content in this book may differ slightly from the actual product. Please refer to the actual product.

This manual provides users with instructions and precautions for installation, parameter setting, and processing operations. In order to ensure the correct installation and operation of the system, please read this manual carefully before installation, and save or hand it over to The user of the software.

For the safety of operators and mechanical equipment, please be sure to install and operate the equipment by professional process engineers. If you have any questions, please contact us in time, our professionals will be happy to serve you!

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# Safety Precautions



Before operating the equipment, the user must carefully read this manual and related operating manuals, and strictly abide by the operating procedures. Non-professionals are not allowed to switch on, and all connected equipment must be connected to the earth protection line.



This equipment uses forth grade of lasers (strong laser radiation), which may cause the following accidents:  
Lead surrounding combustibles;  
During laser processing, other radiation and toxic and harmful gases may be generated due to different processing objects;  
Direct exposure of laser radiation can cause human injury. Therefore, the place where the equipment is used must be equipped with fire-fighting equipment. It is strictly forbidden to stack flammable and explosive materials on the workbench and around the equipment. At the same time, it must be well ventilated. Non-professional operators are prohibited from approaching the equipment.



The processed objects and emissions shall comply with local laws and regulations.



Laser processing may have risks, and users should carefully consider whether the processed object is suitable for laser processing. There are high voltages or other potential dangers inside the laser equipment. Non-manufacturers must not disassemble it. The machine and other related equipment must be safely grounded before it can be turned on. It is strictly forbidden to open any end cover when the equipment is working. During the working process of the equipment, the operator must observe the working conditions of the equipment at any time. If an abnormal situation occurs, immediately cut off all power supplies and actively take corresponding measures. When the equipment is turned on, there must be someone on duty, and it is strictly forbidden to leave without authorization. All power must be cut off before personnel leave.



There are more detailed equipment safety instructions in the "Safety Rules" chapter of this book, please read them carefully and follow them.





### Kind Reminder

Please read this manual carefully and make sure you understand its contents before using the laser head.

Please keep this manual for future operation and maintenance.



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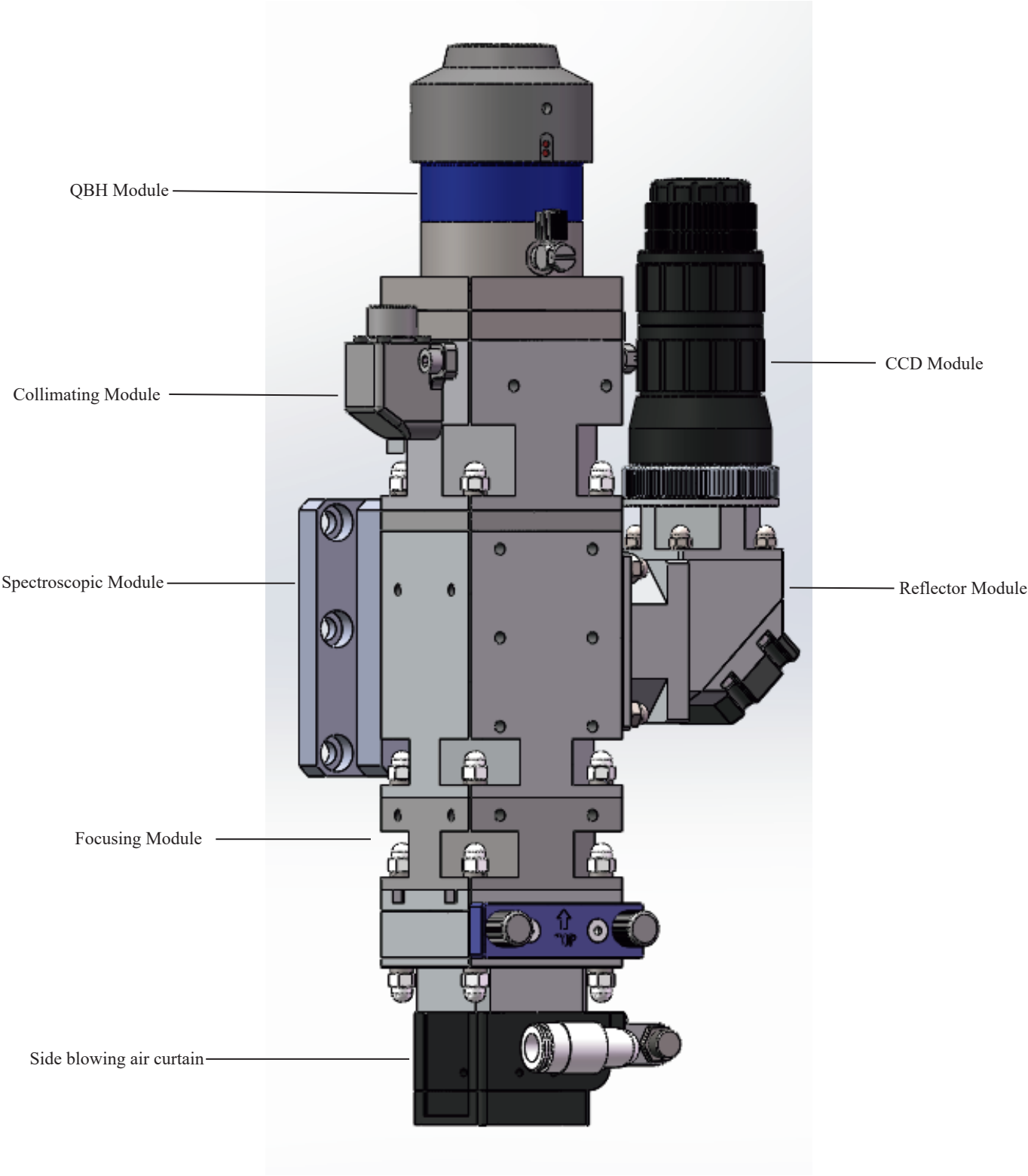
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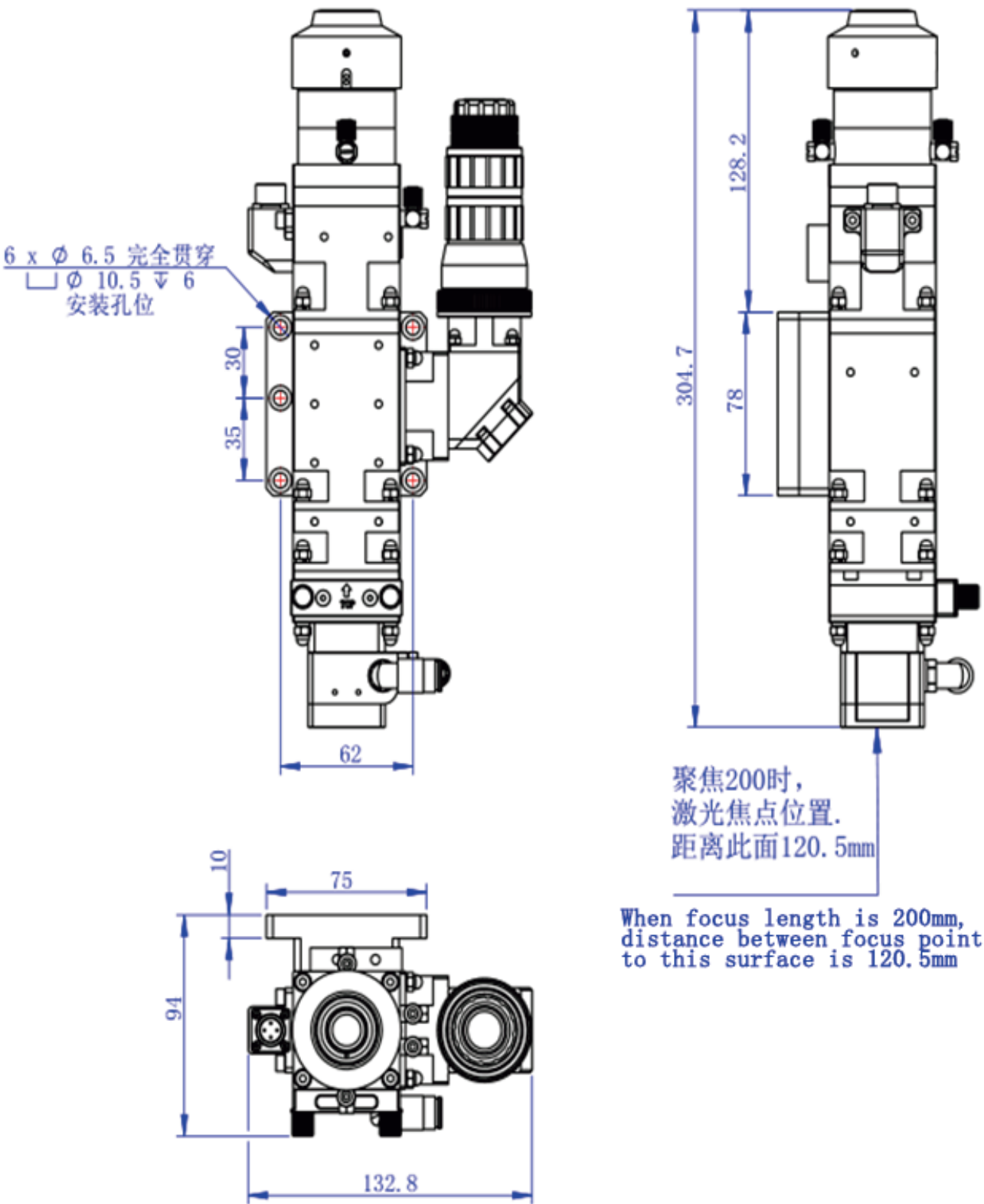
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# 01. Product Description

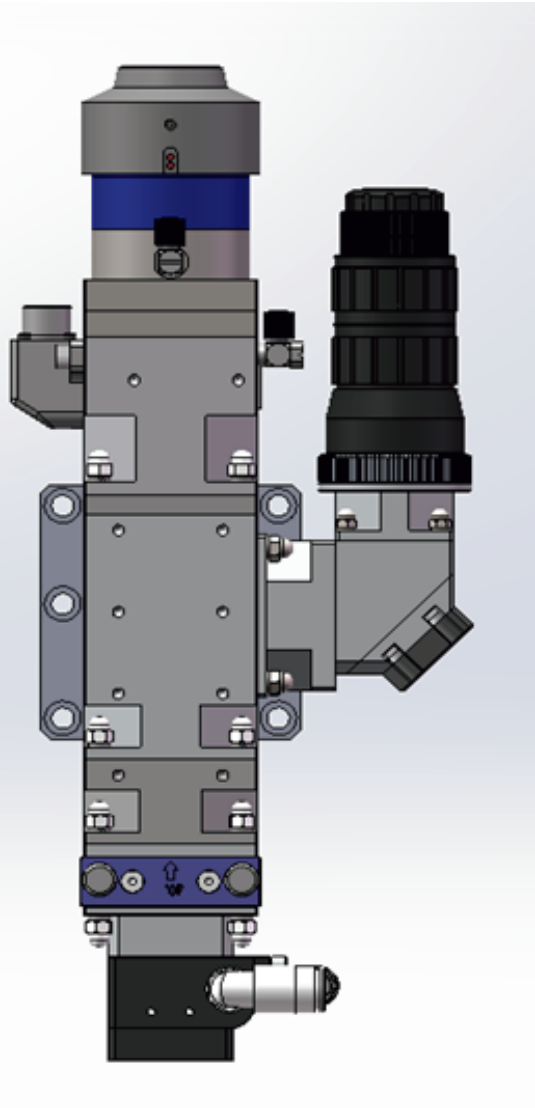
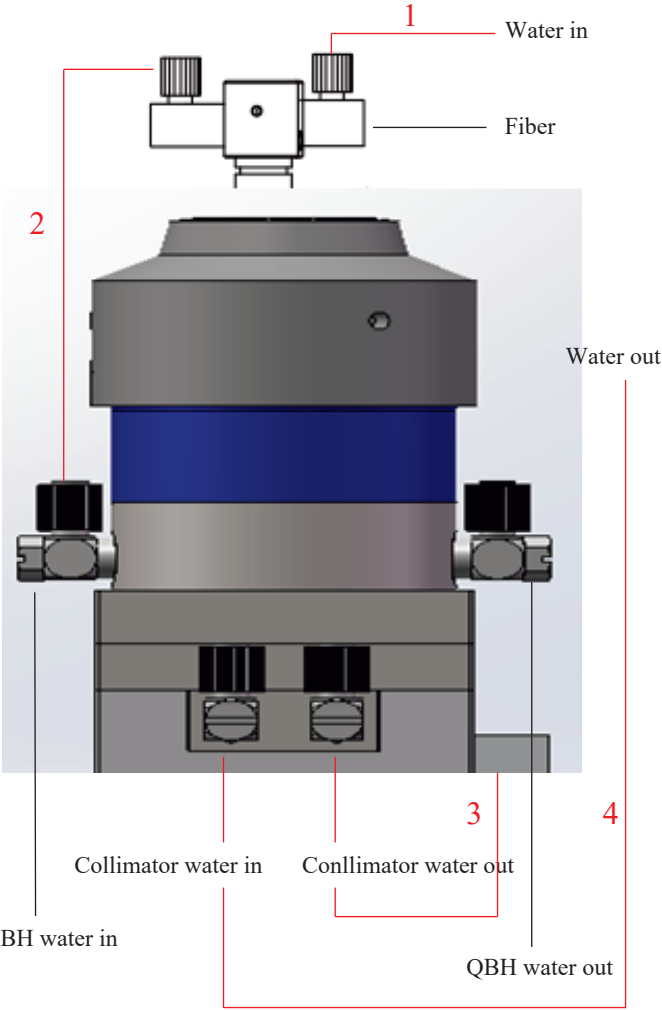
## 1.1 Product Structure



1.2 Installation Position and Outline Drawing



1.3 Diagram of Water and Gas Installation

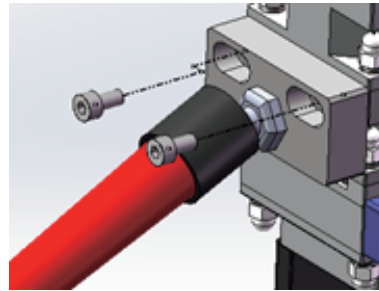
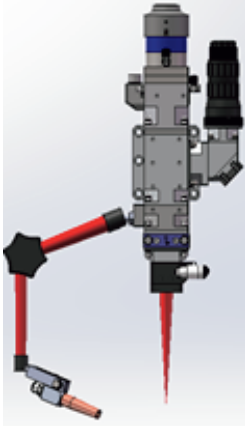
<div data-bbox="154 332 685 1441"></div> <div data-bbox="272 1460 490 1487"><p>Air Curtain Connector</p></div>	<div data-bbox="824 401 1481 1412"></div>
<div data-bbox="154 1556 610 1660"><p>Description:</p><p>1. Air curtain horizontal blowing, <b>connected with oil-free dry compressed air, air pressure 5-8kg.</b></p></div>	<div data-bbox="776 1556 1429 1740"><p>Description:</p><p>1.1. When connecting the water pipe, ensure that the water volume is sufficient and the water pressure is above 0.4MPa;</p><p>2. The water pipes are connected in series, just 1-4 in sequence.</p><p>3. For the air pipe connection, please keep the bending radius of the connected pipeline not less than 30mm.</p></div>

Note: 1. In order to protect the welded joints from oxidation and make the welded joints well protected, the protective gas used should have chemical characteristics that do not cause harmful chemical reactions with the welded material.

2. The quality of the protective gas must meet the ISO 8573-1:2010 Class 2.4.3 standard, and there must be no impurities, water, or oil. The higher the purity of the protective gas, the longer the life of the protective lens.

## 1.4 Replacement of Universal Shaft, Air Curtain, Coaxial Nozzle

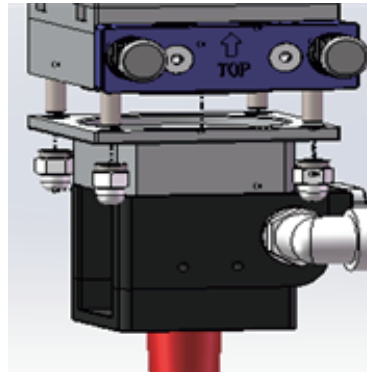
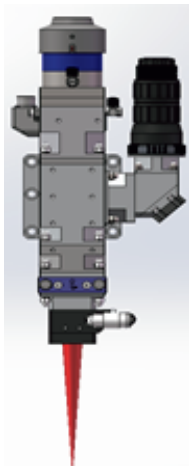
### Replacement of Universal Shaft



Description:

1. Loosen the 2-M4 inner hexagonal thread, take it out and replace it.
2. When using, adjust the outlet end of the copper nozzle to keep the distance from the workpiece according to different defocusing conditions.

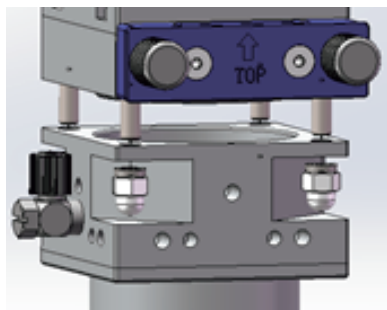
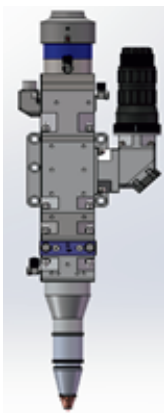
### Replacement of Air Curtain



Description:

Loosen the 4-M4 external hexagonal thread, take it out and replace it.

### Replacement of Coaxial Nozzle



Description:

Loosen the 4-M4 external hexagonal thread, take it out and replace it.

1.5 Main Function Introduction

The laser head welding head can withstand power 2KW, welding is accurate, durable, easy to maintain and easy to adjust.

02. Technical Parameter


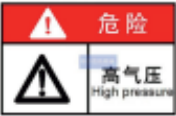


Connector: QBH	Laser Emission Method: Coaxial
Max Power: 2000W	Laser Wavelength Range: 1064±20
Collimating Length: 75mm	Focusing Length: 200mm or 250mm
Protective Gas: Nitrogen	Weight: 1.45kg
Circle Diameter: 1.5mm or 2.0mm	

03. Installation and connection

3.1 Safety Instructions

Any maintenance or fault survey should be conducted by professional trained personnel who must have got safety training and be aware of the possible danger and safety measure.

Users should learn the related safety knowledge and prepare necessary safety devices before using.

	<p>Caution - High Pressure !</p> <p>The gas pressure inside some laser head component can reach to 2.5MPa.</p>
	<p>Caution - Pinching Hand!</p> <p>During maintenance and repair, do not put hands or any other body parts under the laser head or forward direction of the moving axis!</p>
	<p>Danger - Laser!</p> <p>Keep the power off during the maintenance and repair. The laser machine will generate level 4 laser while working.</p>
	<p>Keep the eyes or skins from being directly shot or scattered by laser.</p> <p>Do not look directly into the laser beam even if wearing eye protecting equipment.</p> <p>Please wear the goggles which meet the standard of DIN EN 207 &amp; BGV B2.</p>

3.2 Unboxing Check




- 1.Intact box;
- 2.The label should be clear with conformity mark and accord with the purchased models;
- 3.The upper and lower opening tear-proof seals are not broken or disassembled;
- 4.If the above does not match, contact the seller.

3.3 Packing List



No.	Item	Model	Qty.	Picture	Standard
1	Wobble Welding Head	ND20A	1		√
2	Screen	DVS-C,700-CA	1		√
3	Switch Power	HF150W-SE-24	1		√
4	CCD Camera	BK480BPJ-S	1		√
5	Blue LED	LED, 24V, 5W	1		√
6	ND20A Motor Extension Cable	ND20A-DJYCX-A-10M/T	1		√
7	ND20A DC Power Cable	ND20A-DCPOWER-A-2M/T	1		√
8	ND19 Speed Control Cable	ND19-SDKZ-A-0.5M/T	1		√
9	Brushless Motor Driver	LK3625	1		√
10	Coaxial Nozzle	ND20A-TZ-001	1		√
11	Side Blowing Universal Shaft	ND20-WYZJ-001	1		√



### 3.4 Material List for Welding System

No.	Item	Model	Qty.	Picture	Note
1	Welding System Control Card	HJXT-KZBZJ-002	1		
2	Welding System Extension Card	HJXT-KZB-002	1		
3	Welding System Cables	HJXT-DN60X CPJ-001	1		

### 3.4 Material List for Adjustable Voltage Signal Generator (Optional)

No.	Item	Model	Qty.	Picture	Note
1	Adjustable Voltage Signal Generator	24V input 0-10V adjustable (to 0-3V)	1		
2	Potentiometer DC Power Supply Cable	DWQ-DCPOW ER-A-2M/T	1		

## 3.6 Preparation before Installation

### 3.6.1 Tools

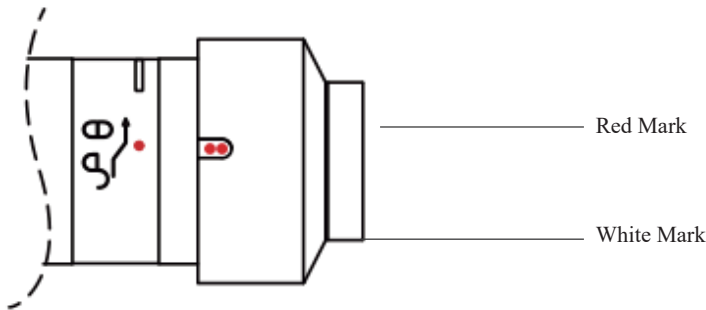
- 1.A set of metric hexagonal handle;
- 2.One bag of clean rod, one bottle of anhydrous ethanol(500ml), one package of clean gloves.
- 3.Clean and dust-free working environment.

### 3.6.2 Installer Preparation

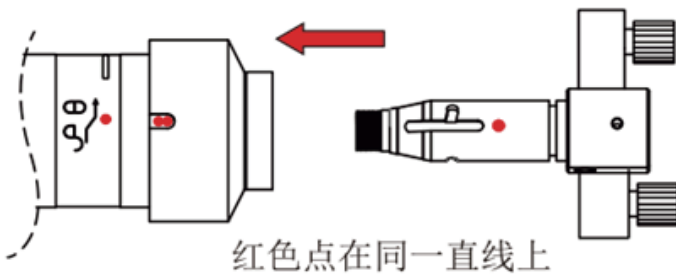
- 1.Read this manual carefully;
- 2.Wash hands with soap;
- 3.Wear dust-free gloves;
- 4.Wear a mask if necessary.(Note - Dust removal is of utmost importance)

## 3.7 QBH and Fiber Connection

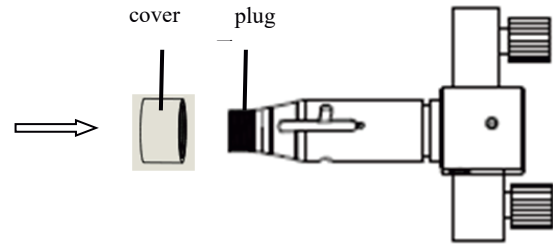
Step 1: Before rotating the rotating sleeve as shown in the figure below, make sure that the red dot on the side of the rotating sleeve and the white dot on the outer sleeve are in line.



Step three: Remove the dust cover from QBH, place the clean fiber rod and the QBH coaxially, make sure the white mark on the QBH is aligned with the locating slot (long slot on fiber rod), insert the fiber rod into QBH gently, until the fiber rod joints the QBH contact surface.

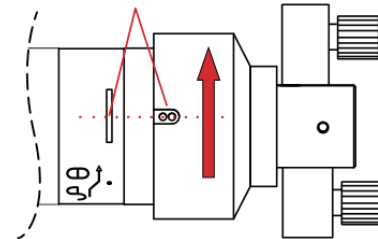


Step two: Remove the dust cover of fiber rod, clean the fiber rod with anhydrous ethanol. Before installing, check the protective cover of fiber plug to see if it is locked, avoid the cover from loosening and effecting the welding performance or burning the fiber and welding head.



Step four: After inserting the fiber rod into QBH, press the rim gently and turn it about 15 degree along the arrow on the rim. Then pull the rim until its underside is parallel with the top of QBH, turn the rim at the same direction till the limit.

对齐或超过中间都可以，但要注意到位就不要再扭动



- Note: 1. Insert or pull out the fiber rod gently;  
2. When inserting or pulling out, QBH and fiber rod should be coaxially;  
3. The operation should be kept as dust-free as possible.

## 04. Maintenance of QBH and Fiber Connector

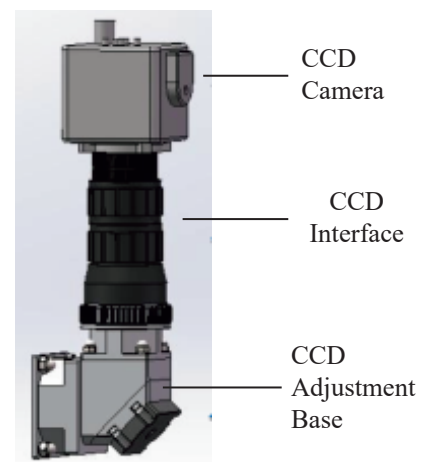
- 1、Clean and dust-free working environment is required!
- 2、Any laser circuit equipment fitted with a laser head must be carefully dedusted!
- 3、Assembly or replacement of lens or other components must be conducted in clean working environment!
- 4、Prepare new lens component before removing the old one!
- 5、In case that user could not meet the above requirements, it is advised to use nonstick protective film to seal the opening after the removing of the lens immediately.
- 6、If any safety or protection device has been removed, it must be reinstalled before the equipment being operated or debugged and checked whether the device could run well.
- 7、Use self-adhesive paper to cover the junction of QBH and fiber connector to prevent dust from entering the gap.
- 8、Fiber connector water cooling pipe must be connected well to prevent leaking. If QBH has water inside accidentally, please stop using immediately and send it to the factory to handle with.

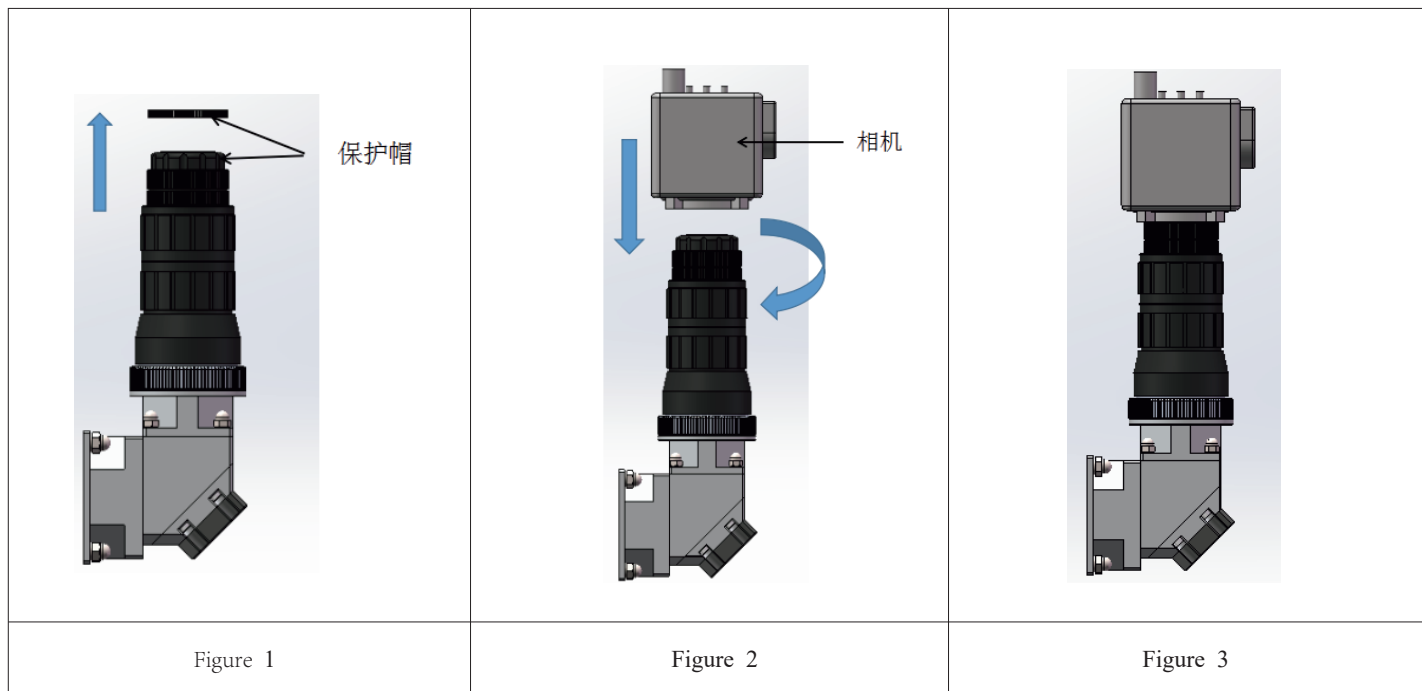
## 05. CCD Module

### 5.1 CCD Camera installation steps

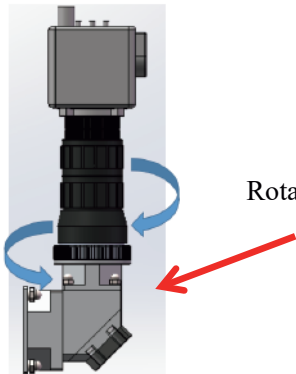
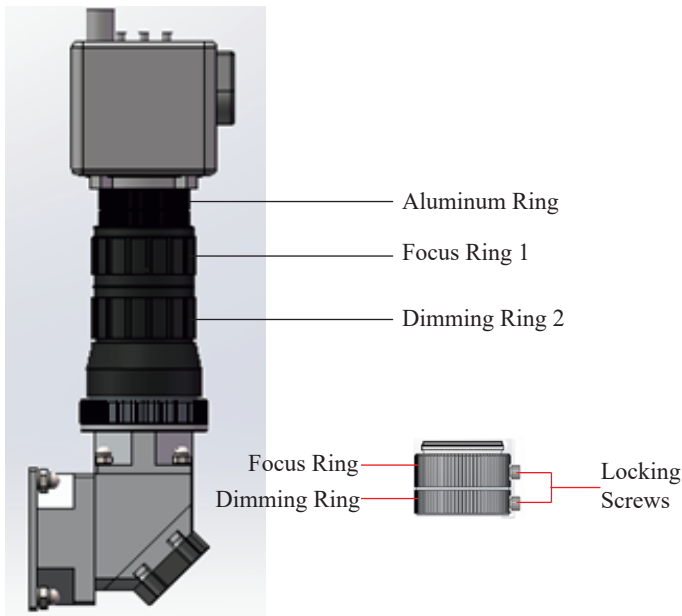
Step 1: Remove the protective cover from the lens as shown in Figure 1 below.

Step 2: As shown in Figure 2 below, tighten the camera to the lens with the protective cover removed, so that the camera and the lens are in close contact (Figure 3). Note: The camera is tightened with moderate force to avoid loosening and tightening of the camera due to a small tightening force Major damage to the camera.

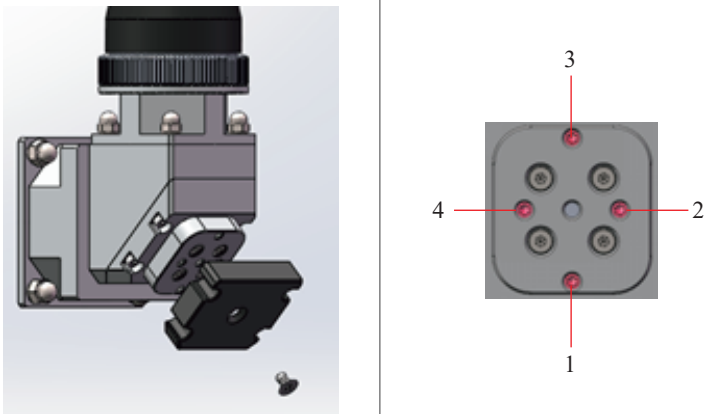
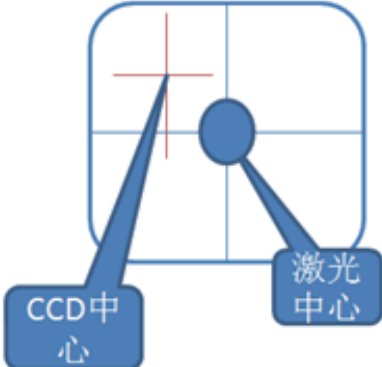




## 5.2 CCD Image and Laser Center Coincide Adjustment

<p><b>Camera angle adjustment:</b></p> <p>If the camera is at an angle to the mount after being tightened, loosen the compression cap in the right picture, and then turn the lower part of the lens clockwise so that one of the vertical planes of the camera is parallel to the mount. (As shown on the right)</p>	
<p>Camera angle adjustment:</p> <p>Purpose: To make the image on the monitor clear, you need to adjust it according to the following steps.</p> <p>Adjustment steps (right picture):</p> <ol style="list-style-type: none"> <li>1. Install the industrial camera to the upper lens correctly;</li> <li>2. Loosen the locking screws on the focusing ring 1 and the light adjusting ring 2;</li> <li>3. Adjust the lens dimming ring 2 to a certain brightness (see the image clearly on the screen);</li> <li>4. Adjust the image distance by adjusting the focus ring 1 to make the image on the screen clear;</li> </ol> <p>If it is not clear, repeat the above steps 1, 2 and 3; finally tighten the locking screws of the aperture ring and focus ring to lock the aperture and focus ring in place.</p> <p><b>Note: When this welding head is shipped, two specifications of aluminum rings (5mm ring, 10mm ring) are included, and the purpose is to increase or decrease the image distance. When the CCD focusing range is not enough, the user can add or remove the aluminum ring according to the actual screen display condition to make the screen image clearer. )</b></p>	

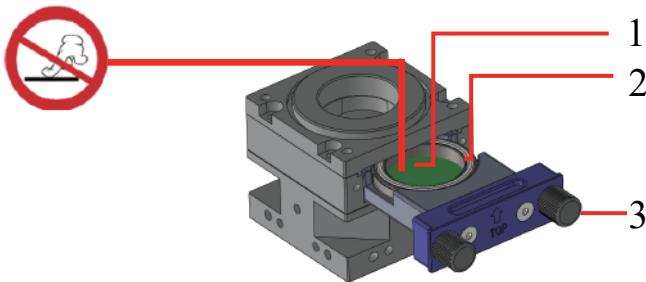
5.3 CCD Image and Laser Center Coincide Adjustment

<p>During the work, the CCD image center (cross point) must coincide with the laser center.</p> <p>The adjustment method is as follows:</p> <p>As shown in the figure above, the intersection of the CCD cross on the screen is at the upper left of the laser center, and can be adjusted with the four adjustment screws A, B, C, and D on the four corners of the mounting seat in the figure on the left.</p> <p>1, Use a hexagonal wrench to properly loosen the D screw to make room for the CCD to move to the right and down;</p> <p>2, Tighten the A screw with a hexagonal wrench to force the CCD to move down to the right until the cross point of the CCD coincides with the laser center;</p> <p>3. If the above two parts fail to adjust the CCD cross intersection point to the laser center point or move the CCD cross intersection point below the laser center position, use a hexagonal wrench to loosen the B screw appropriately to move the CCD cross intersection point to the right and upward Make room, and then tighten the C screw with a hex wrench to force the CCD cross point to move right and upward until the CCD cross point coincides with the laser center.</p> <p>4. When the cross point of the CCD cross deviates from other positions of the laser center, you can follow the above method to adjust the cross point of the CCD cross by first loosening the diagonal screw and then tightening the adjustment screw with a hexagonal wrench.</p>	Adjustment Steps	
	Description	<p>Loosen the M3 screw and remove the cover</p> <p>Loosen the 4 screws as shown in the figure and adjust</p>
	 <p>Center point position</p>	

06. Replacement of Protective Window

6.1 Protective Lens Removal Method

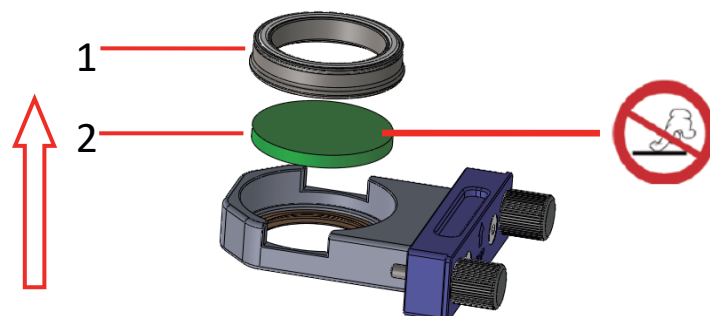
- 1.Loosen the protective lens drawer screws (Figure 1) and take out the protective lens drawer assembly;
- 2. Take out the lens pressure ring (Figure 2) (the side with the white slip ring faces up);
- 3.Take out the protective lens (D30\*2) and replace it with a new one
- 4.Note: When replacing the lens on site, you can use masking tape to seal the window to prevent dust from entering the interior and causing pollution.



1. Locking screw 2. Lens pressure ring 3. Protective lens

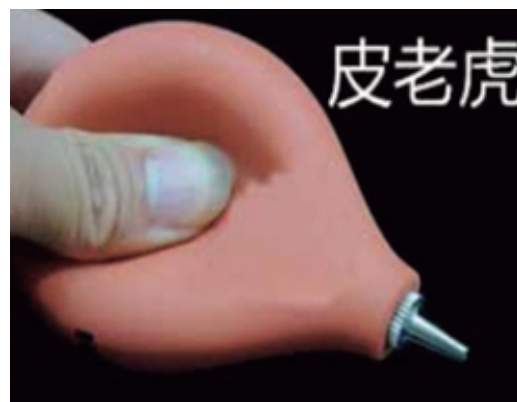
## 6.2 Protective Lens Replacement

1. Take out the lens pressure ring (picture 1) (the side with the white slip ring is facing up);
2. Take out the protective lens (D30\*2) (picture 2) and replace it with a new one.
3. Check (picture 3) whether the sealing ring is deformed or notched. If it is defective, replace it;



## 6.3 Clean the Protective Lens

1. Dip a dust-free cleaning stick into propanol solvent, clean the lens, and then use the hand bellows (As shown in the picture) to draw clean air to blow off the attached particles and foreign objects.
2. Repeat several times until the lens is clean.
3. If it is impossible to clean the protective lens or damaged, it must be changed. Replace with new lenses.



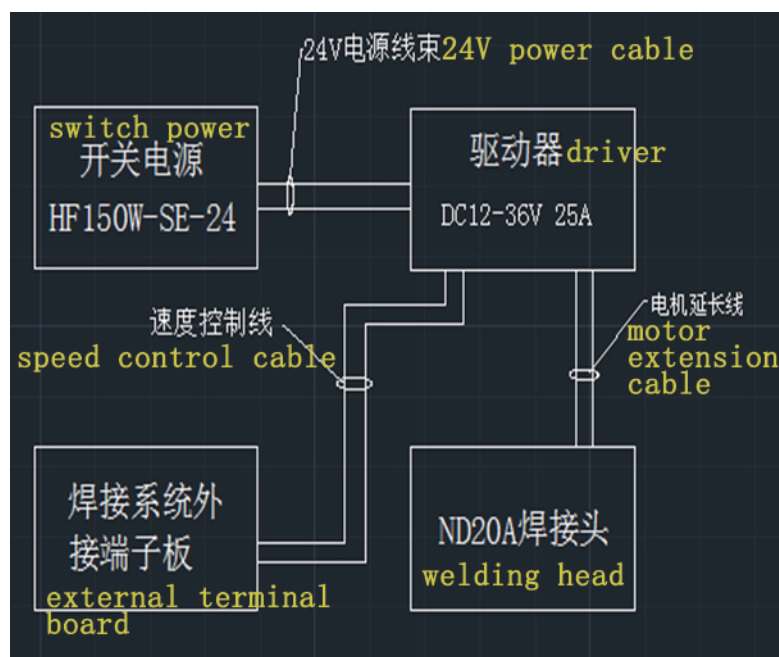
# 07. Electrical Chapter

## 7.1 Power installation

This type of welding head power cable is single-phase wire: L live wire, N neutral wire, PE ground wire.

Note: The ground wire of the AC socket must be connected to the ground of the AC power grid and connected to the ground terminal of the power supply.

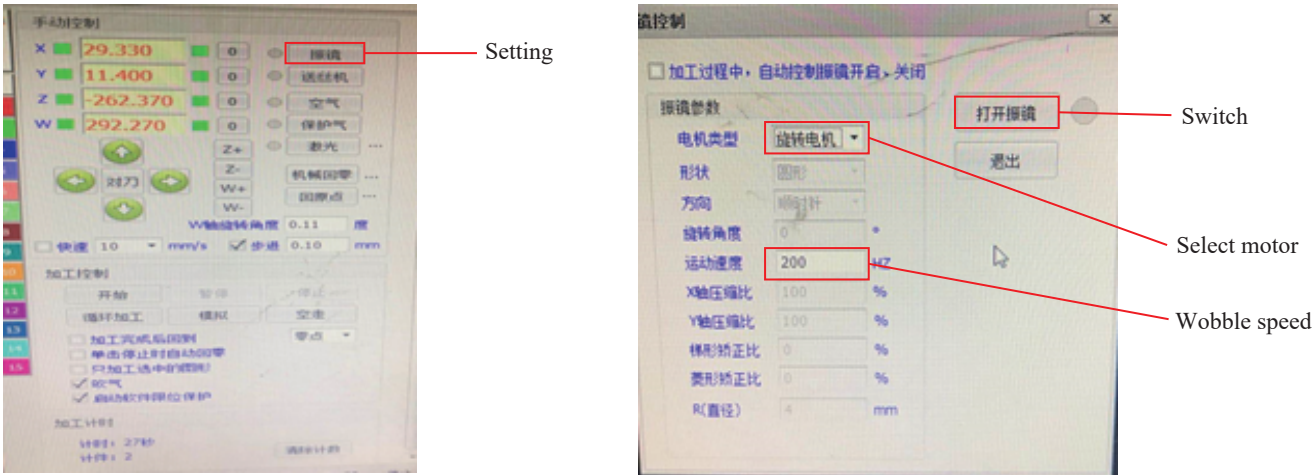
## 7.2 Wiring diagram of welding system



7.2.1 Set ting Motor Wobble Frequency







1. The motor start should not be less than 100Hz, and the maximum is 300Hz. The wobble speed can be adjusted according to the application process.
2. Note: the motor starts to work, and the rotation of the optical shift is counterclockwise by visual inspection.

No.	Hertz (Hz)	Voltage (V)
1	100	1.5
2	150	2.3
3	200	3






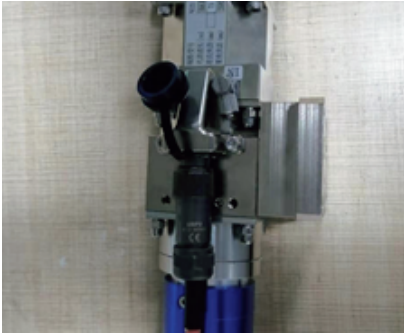
Description: Open the welding system operation page, click as in the figure-Galvanometer control settings-select the motor type (rotating motor)-set the wobble speed (set the wobble speed according to the application process)-click OK to turn on the galvanometer start switch, and finally exit .

7.2.2 System Supporting Electrical Objects

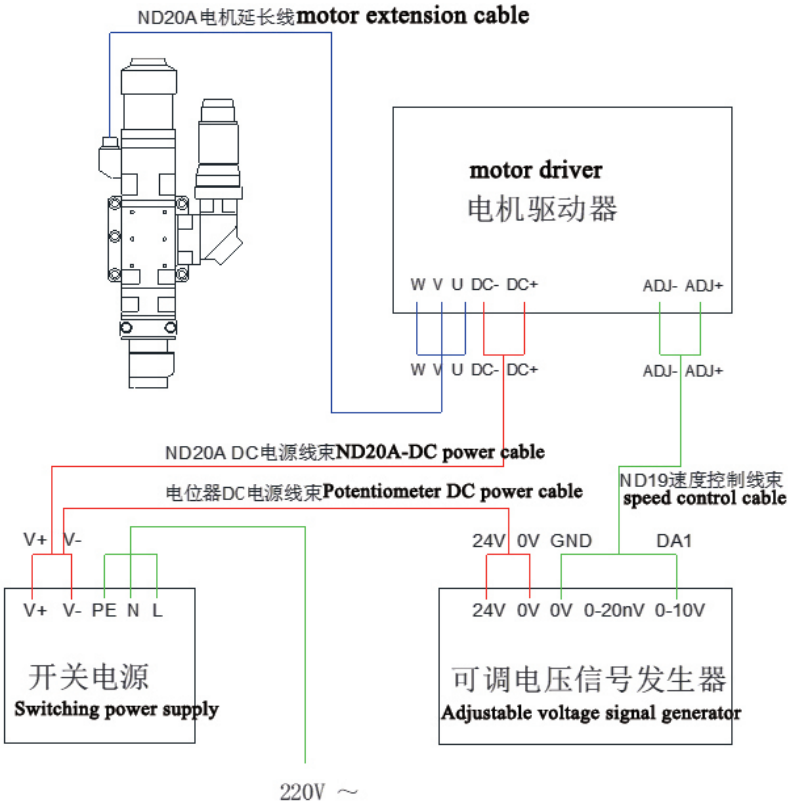
		
Switching power supply & power cable	Driver	External terminal board for welding system
		
Motor extension cable	ND20A welding head	Speed control cable



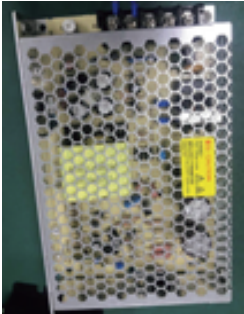





7.2.3 Electrical Wiring

	
Switching power supply wiring	Welding system terminal board wiring
	
Driver wiring	Motor extension cable connection

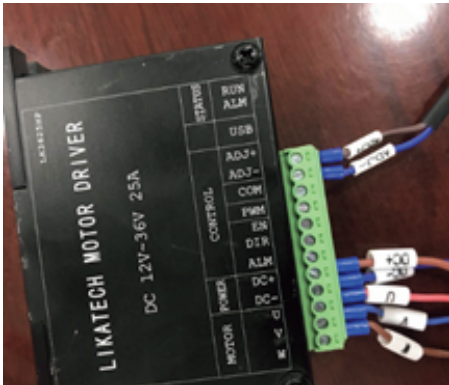

7.3 Wiring Diagram of Adjustable Voltage Signal Generator



7.3.1 Electrical Object of Adjustable Voltage Signal Generator

		
Switching power supply wiring	Adjustable voltage signal generator	Motor driver
		
ND19 speed control cable	Potentiometer DC power cable	ND20A-DC power cable

7.3.2 Electrical Wiring

		
Switching power supply wiring	Driver wiring	Adjustable voltage signal generator

7.3.3 Corresponding Motor Wobble Frequency



- 1. The motor start should not be less than 0.6V, and the maximum is 3.0V. The wobble speed can be adjusted according to the application process.
- 2. Note: the motor starts to work, and the rotation of the optical shift is counterclockwise by visual inspection.

No.	Voltage (V)	Hertz (Hz)
1	1.5	100
2	2.3	150
3	3	200



## Shenzhen Worthing Technology Co., Ltd.

Tel: 400-836-8816 Web: [www.wsxlaser.com](http://www.wsxlaser.com) Email: [info@wsxlaser.com](mailto:info@wsxlaser.com)

Adress: Building 3, Youth Dream Factory, Langkou Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Province (Shenzhen Headquarters)

301, Building 2, No. 432, Fengyang Road, Qiangtang Village, Yangchenghu Town, Xiangcheng District, Suzhou City, Jiangsu Province (Suzhou Branch)

401, Jiuyang Science and Technology Park, 108 Guanggu Avenue, Hongshan District, Wuhan (Wuhan Branch)