WSX Laser Drives the Future

ND60B Wobble Welding Head
User Manual

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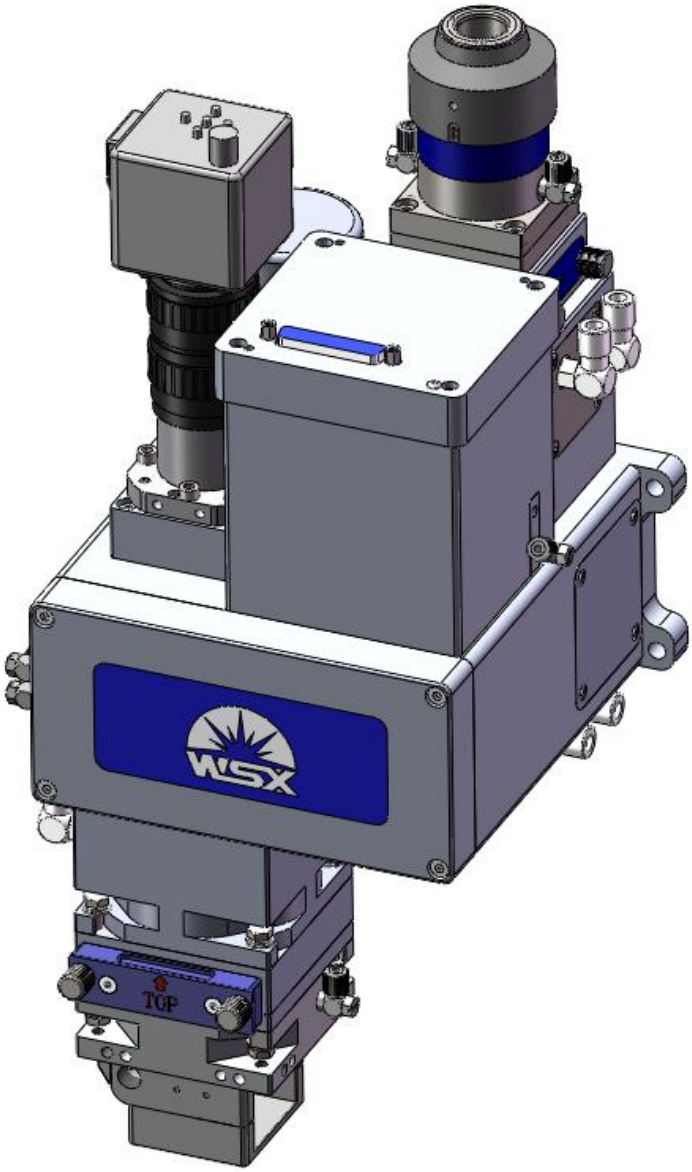
Contents



Product：Wobble Welding Head

Model No.： ND60B

Product Features : 1. Adopting the motor to drive the X, Y-axis galvanometer lens with a variety of wobbling modes.

2. It allows the work piece with irregular welds, and the larger clearance.

3. Processing parameters can significantly improve the quality

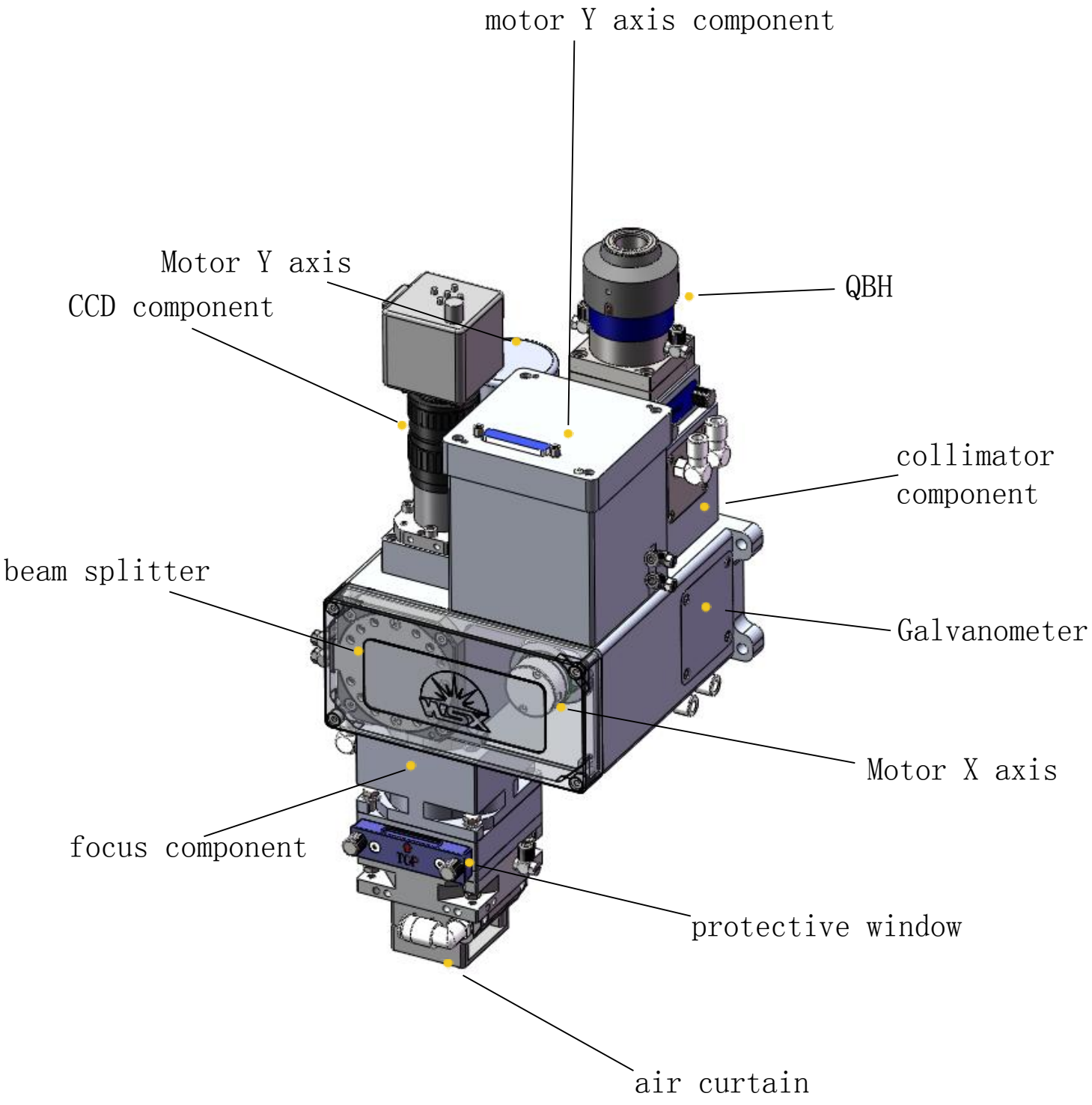
4. Greatly improve the finish.

5. Enhancing welding consistency of back reflection materials.

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.

1. Product Description

1.1 Structure Diagram



1.2 Main Function

1.2.1 Components Introduction

QBH Component

It is the core connector which connects to fiber laser and provides standard fiber access.

Collimator Lens Component

Collimator lens component is assembled inside the laser head; it contains collimator lens cavity and collimator lens group.

Beam Splitter

Motor-driven X, Y-axis lens have multiple wobble modes, enlarging the area of the welding seam and allowing the workpiece to have irregular welding seams and larger gaps.

CCD Component

Provide filtering, focusing function; provide safe, reliable and real light source to CCD.

Reflector

Reflect the laser to the workpiece surface.

Focusing Component

Focusing component is assembled inside the laser head. It contains adjustment structure, focusing locking device, focusing lens group, focusing lens cavity and water cooling system.

Protective Window

The welding slag can not directly splash on the focusing lens, which protects and prolongs the use time of the focusing lens.

Air Curtain

Blow away the bouncing welding slag, provide protection to the protective window.

1.2.2 Design & Function

This laser head uses fiber laser machine as light source and weld the metal on plain machine table in controlled distance. It features high welding precision, outstanding durability, ease maintenance and adjustment. All media connections are built inside the laser head.

1.2.3 Auxiliary Medium

Protection gas

In order to protect the welding position from oxidation, the protective gas should not have any harmful chemical reaction with welding material.

The protective gas must meet the Standard of ISO 8573-1:2010, Class 2.4.3 without impurity particles, water and oil. High purity protective gas will prolong the lifespan of protective window.

2 Technical Specification

Max Power：6000W

Collimating Length：100mm, 150mm

Focusing Length：200mm, 250mm

Weight：6.7 kg

Clear Aperture： ¢35

Fit for all famous laser soucres

3. Installation & 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.

Caution - High Pressure !

The gas pressure inside some laser head component can reach to 2.5MPa.

Caution - High Voltage !

Keep the power off during the maintenance and repair.

Caution - Pinching Hand !

During maintenance and repair, do not put hands or any other body parts under the laser head or forward direction of the moving axis!

Caution - Laser !

Keep the power off during the maintenance and repair. The laser machine will generate

level 4 laser while working.

Keep the eyes or skins from being directly shot or scattered by laser.

Do not look directly into the laser beam even if wearing eye protecting equipment.

Please wear the goggles which meet the standard of DIN EN 207 & BGV B2.

Caution - High Cleanliness Optical Lens

Do not touch the high cleanliness area of optical lens inside the laser head with bare hands.

Dust or dirt attached on the lens may cause scorch damage.

It is allowed to touch the nonsensitive area of lens only if wearing protective gloves.

3.2 Unpacking Check

Unpacking 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.

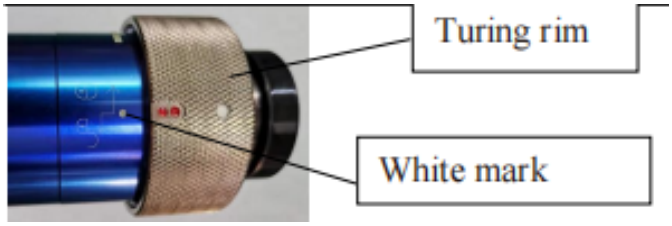
Open the box
1.The signage surface points to opening surface;
2.Open the box with a knife, and the depth of knifepoint cutting into the box shall not exceed 2mm.

3.3 Preparation for Installation
※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.

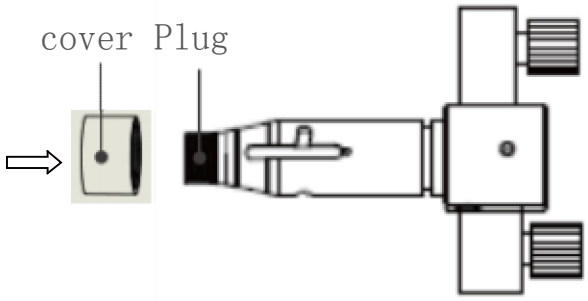
※Preparation of installation personnel
1.Read this manual carefully;
2.Wash hands with soap;
3.Wear dust-free gloves;
4.Wear a mask if necessary.(Note - Dust removal is of utmost importance)

3.4 QBH and Fiber Connection

Step one: Before turning the rim as below, make sure the red marks are aligned to the white marks.

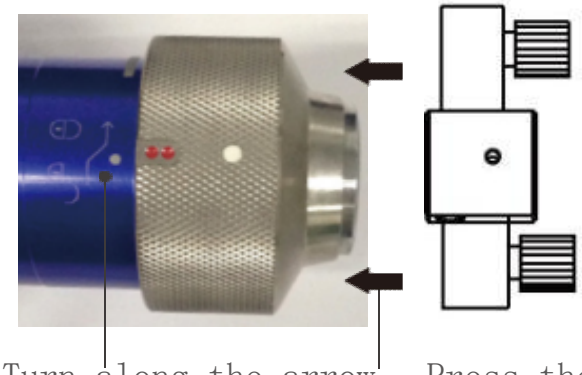


Step two: Remove the dust cover of fiber rod, clean the fiber rod with anhydrous ethanol. Before installing, check the protective cover of fiber plug to see if it is locked, avoid the cover from loosening and effecting the welding performance or burning the fiber and welding head.

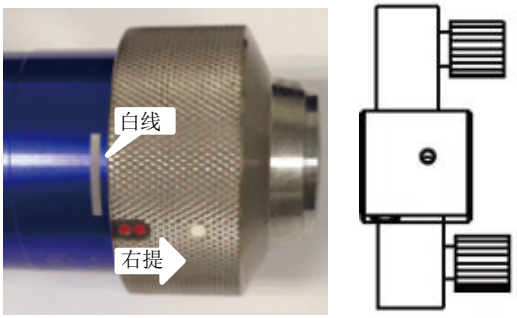


Step three: Remove the dust cover from QBH, place the clean fiber rod and the QBH coaxially, make sure the white mark on the QBH is aligned with the locating slot (long slot on fiber rod), insert the fiber rod into QBH gently, until the fiber rod joints the QBH contact surface.

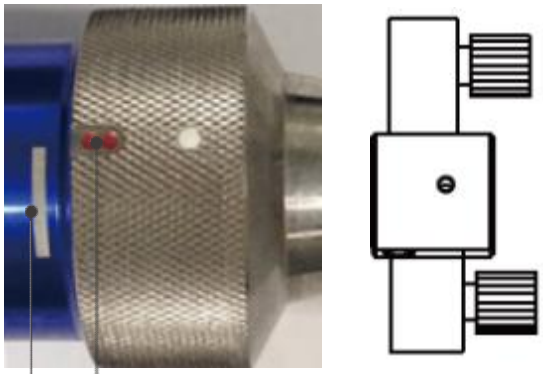
Step four: After inserting the fiber rod into QBH, press the rim gently and turn it about 15 degree along the arrow on the rim. Then pull the rim until its underside is parallel with the top of QBH, turn the rim at the same direction till the limit.



Turn along the arrow Press the rim



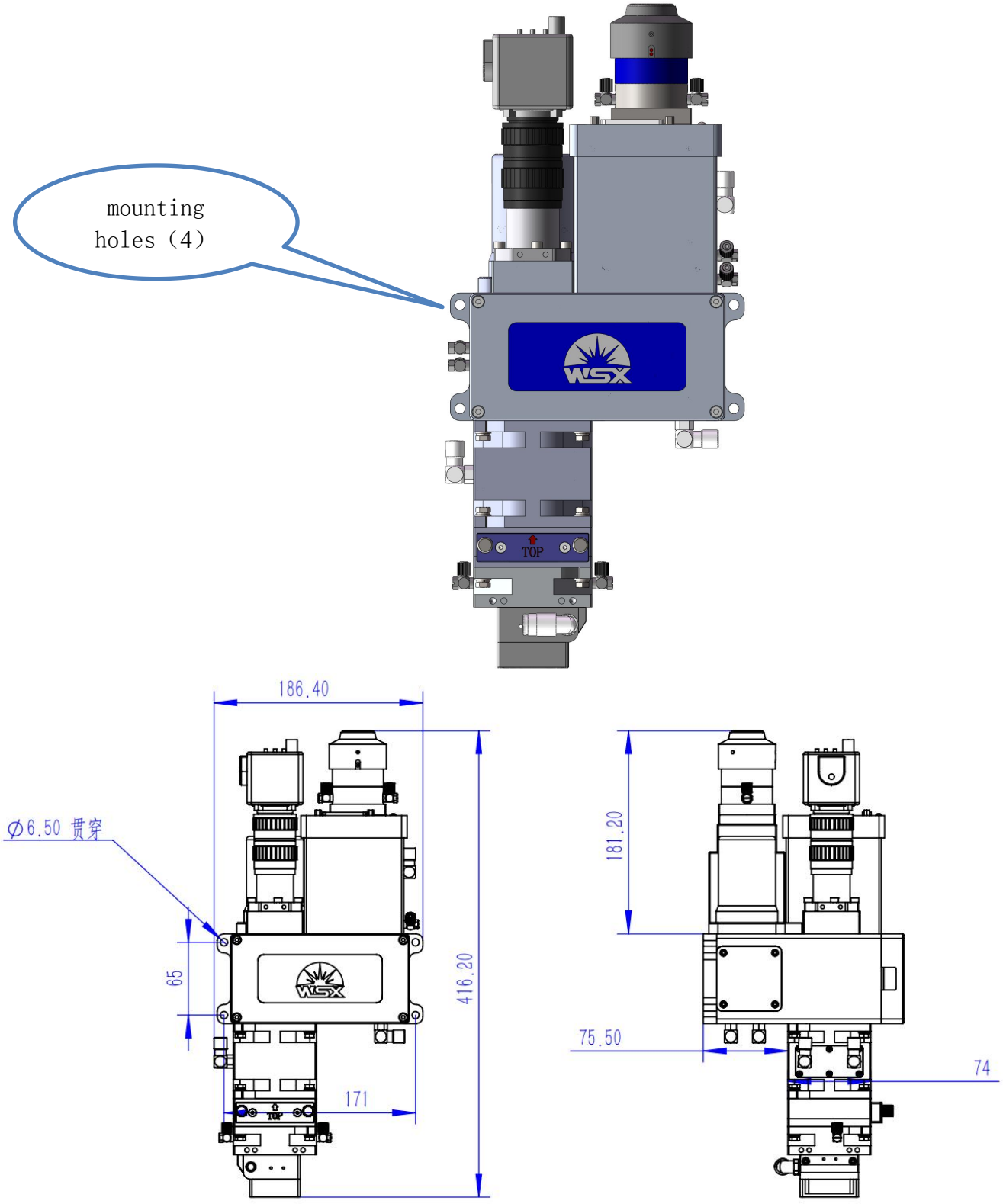
Turn the rim 15 degree, the red dot should be close to white line, pull the rim towards the right.



Pull the rim and continue turning, the red dot should be in the scope of the white line or close to the end of white line. The underside of rim

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.

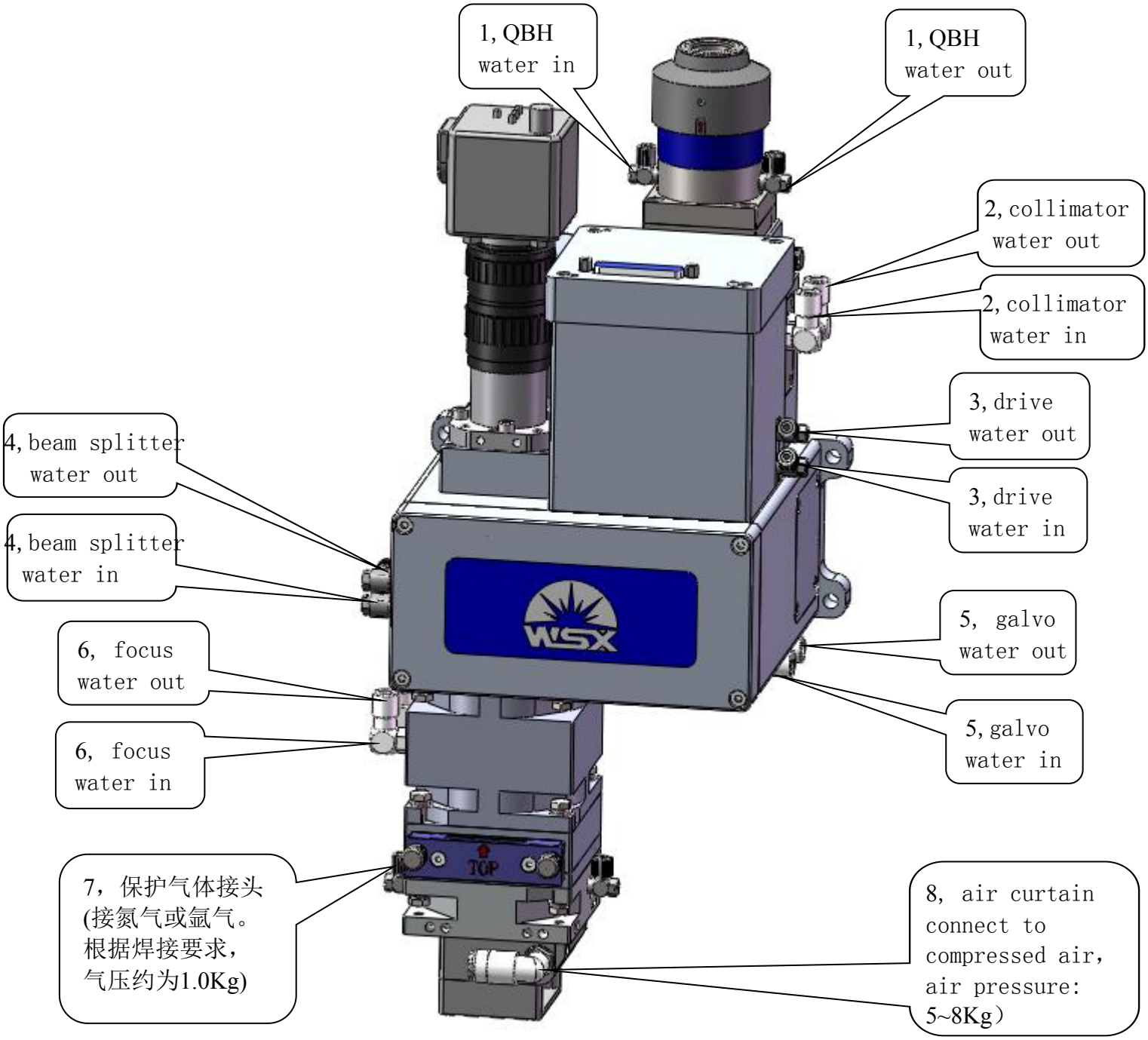
3.5 Installation and outside drawing



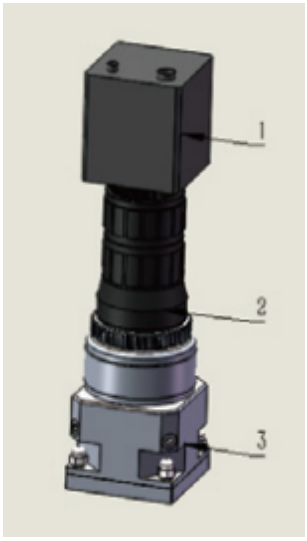
Installation of laser head should be solid and reliable.

The angle of laser head in the vertical direction can be set according to customer requirement.

3.6 Connection of water and gas



Note： 1） 1~4 and 6 is Φ6 water pipe connector，when using must ensure the water quantity is sufficient, the water pressure is above 0.4MPa；
2) 7 is Φ6 gas pipe connector；
3) 8 is Φ8 gas pipe connector;
4) Please keep the bending radius of the connected pipeline not less than 30mm.



1 Camera

2 CCD interface

3 Mounting base

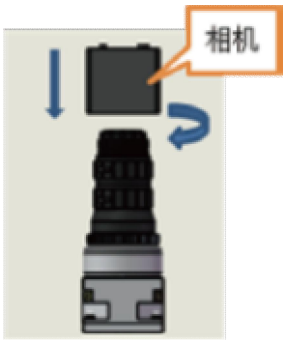
Installation steps of CCD Camera：

Step 1：Remove the protective cover as shown below;

Step 2：Tighten the camera to the lens after removing the cover, keep the camera and lens close.

Note：Tighten in moderate intensity, avoid loose or damage caused by improper force.

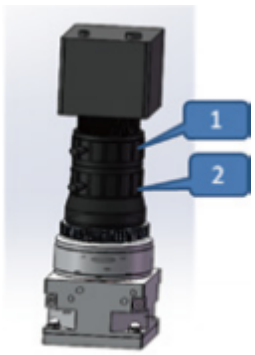
图一

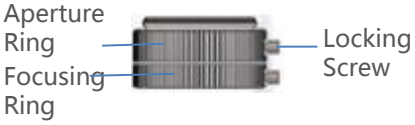


图二

图三

4. CCD Definition Debugging





CCD definition debugging

Purpose：To make the image clear on the display, adjust as following steps.

Adjustment steps（left picture）：

1、Install industrial camera to the lens properly;

2、Loosen locking screws on Aperture Ring(1) and Focusing Ring(2);

3、Adjust Aperture Ring(1) to get a certain brightness;(image is clearly visible on the screen)

4、Adjust image distance with Focusing Ring(2) to make the image clear;

If the image is not clear enough, repeat the above step 1,2,3, then tighten the locking screws on Aperture Ring and Focusing Ring.

Note：This welding head is equipped with aluminum rings in two different specifications(5mm / 10mm). These are used to increase/decrease image distance. User can assemble or unassemble the aluminum rings to adjust the CCD focusing range according to actual screen display.

5 Maintenance

5.1 Maintenance of QBH and Fiber

Clean and dust-free working environment is required!

Any laser circuit equipment fitted with a laser head must be carefully dedusted!

Assembly or replacement of lens or other components must be conducted in clean working environment!

Prepare new lens component before removing the old one!

Users could purchase spare lens components from us!

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.

Minimize the time of laser path being exposed to the air to prevent the dust and dirt entering into the laser head.

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.

Maintenance of QBH and Fiber Connector

1、Use self-adhesive paper to cover the junction of QBH and fiber connector to prevent dust from entering the gap.

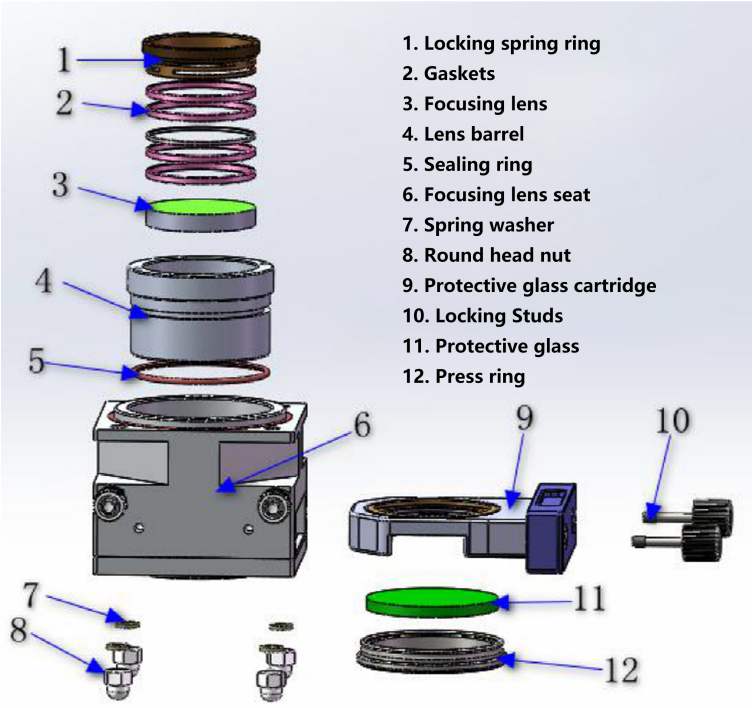
2、Fiber connector water cooling pipe must be connected well to prevent leaking. If QBH has water inside accidentally, please stop using immediately and send it to the factory to handle with.

5.2 Maintenance of focusing lens

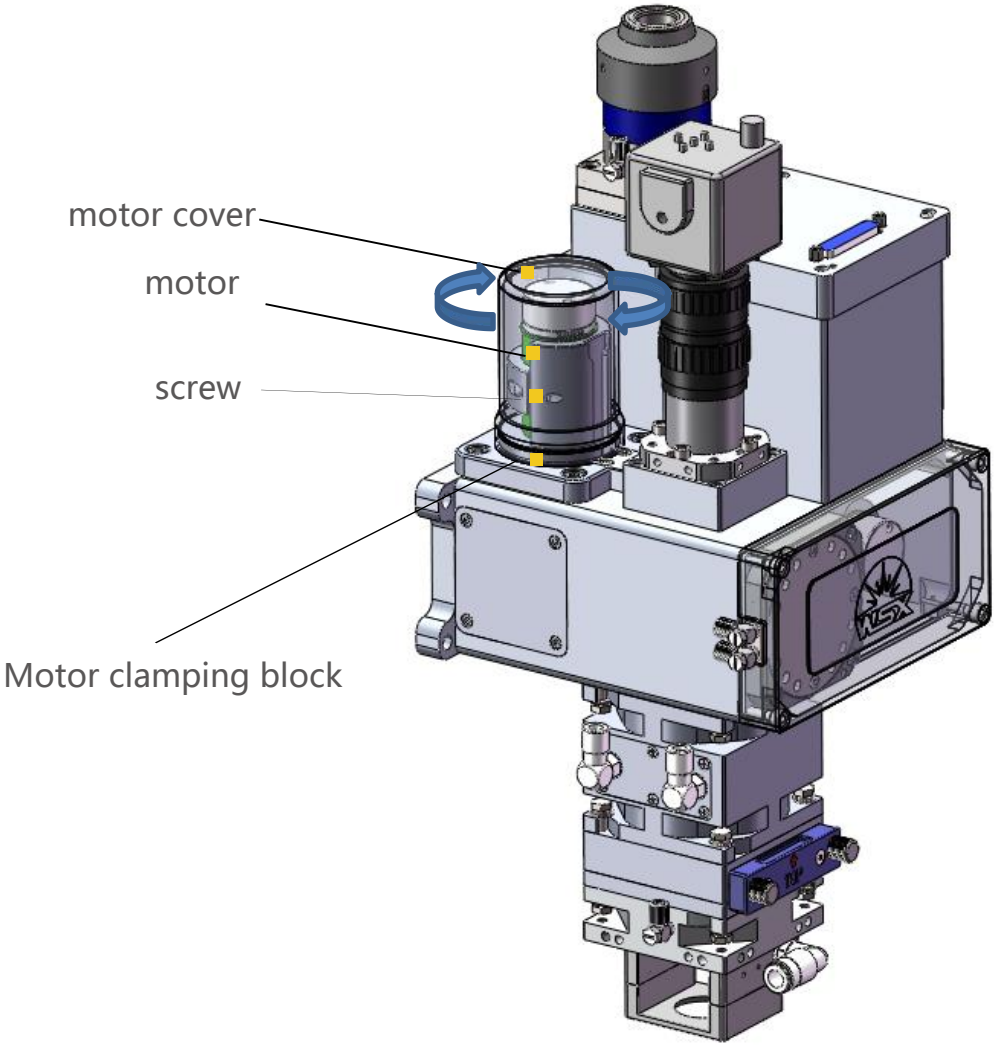
When disassembling, please record the relative position of the parts in order to facilitate the correct installation after maintenance.

Removal and installation of lens :

1. Use a wrench to loosen the 4 round head nuts and spring washers used to fix the focusing lens mount and remove the focusing assembly;
2. Use the fixture tools to clamp the locking elastic ring and turn it upside down to loosen the locking elastic ring;
3. Lift the focusing lens seat slowly, and take out the focusing lens and gasket;
4. Clean the focusing lens cavity seat, gasket and lens barrel;
5. Maintain or replace the focusing lens;
6. The installation of the focusing lens and components should be carried out in the reverse direction according to the above process;
7. When installing the focusing lens, after the locking spring ring is twisted to the end, it needs to be twisted back 1/5 turn to keep a gap of 0.1~0.15 between the locking spring ring and the focusing lens;
8. When installing the focusing lens, the flat convex surface of the focusing lens should be placed in the downward direction;



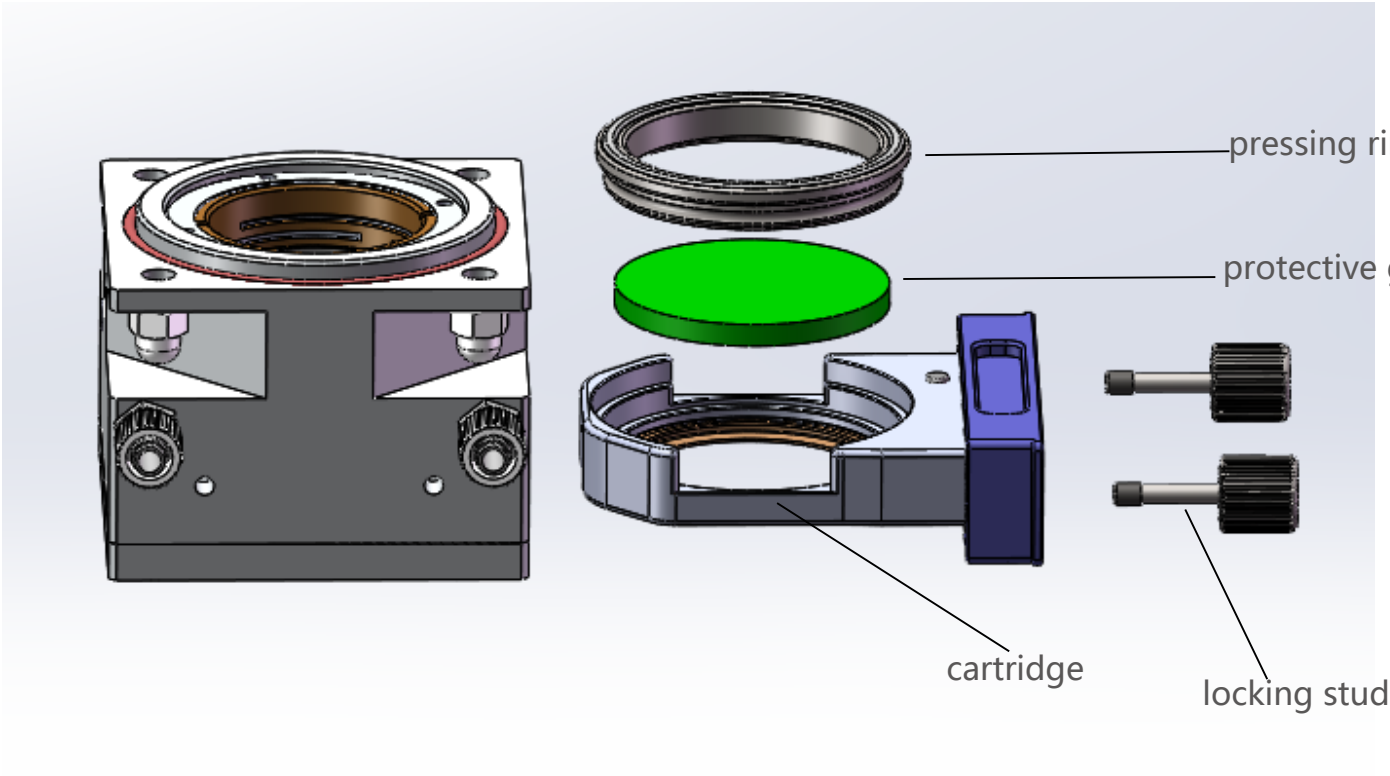
5.3 Angle Adjustment of Reflector



1. Rotate and remove the motor cover;
2. Loosen the screw with an Allen wrench so that the motor clamping block can be rotated;
3. Rotate the motor and fine-tune the reflection angle, so that the light spot is displayed in the center, and the dynamic effect of welding can be viewed more intuitively;
4. After the motor is adjusted, install the control box assembly.

6 . Maintenance of protective glass

1. Dip the isopropyl alcohol solvent with a dust-free cleaning stick to clean the glass,
2. Then use the skin tiger to suck clean air to blow off the attached particles and other foreign objects; 3. Repeat several times until the lens is clean;
4. If the protective lens is impossible to clean or damaged, it must be replaced with a new lens.



1. Unscrew the 2 locking studs, and pull out the protective glass cartridge;
2. Note: quickly seal the opening after the lens is removed with a non-adhesive protective film;
3. Put the cartridge (including protective glass) in a clean environment;
4. Remove the pressing ring and take out the protective glass for cleaning and maintenance.
5. Put the maintained protective glass into the cartridge and install the pressure ring, then insert the entire protective lens cartridge flat into the focusing assembly to lock;
6. Note: If the direction of the protective glass cartridge is reversed, it will not be inserted;

Electrical Articles

1、Accessories

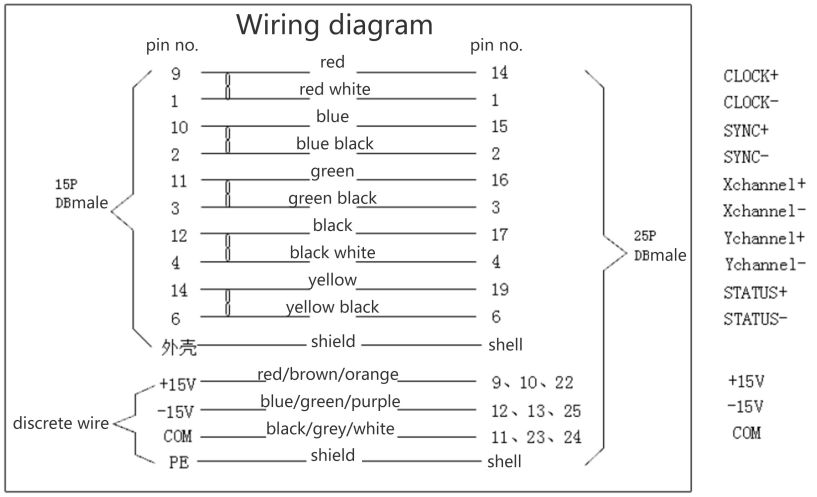


① ② ③

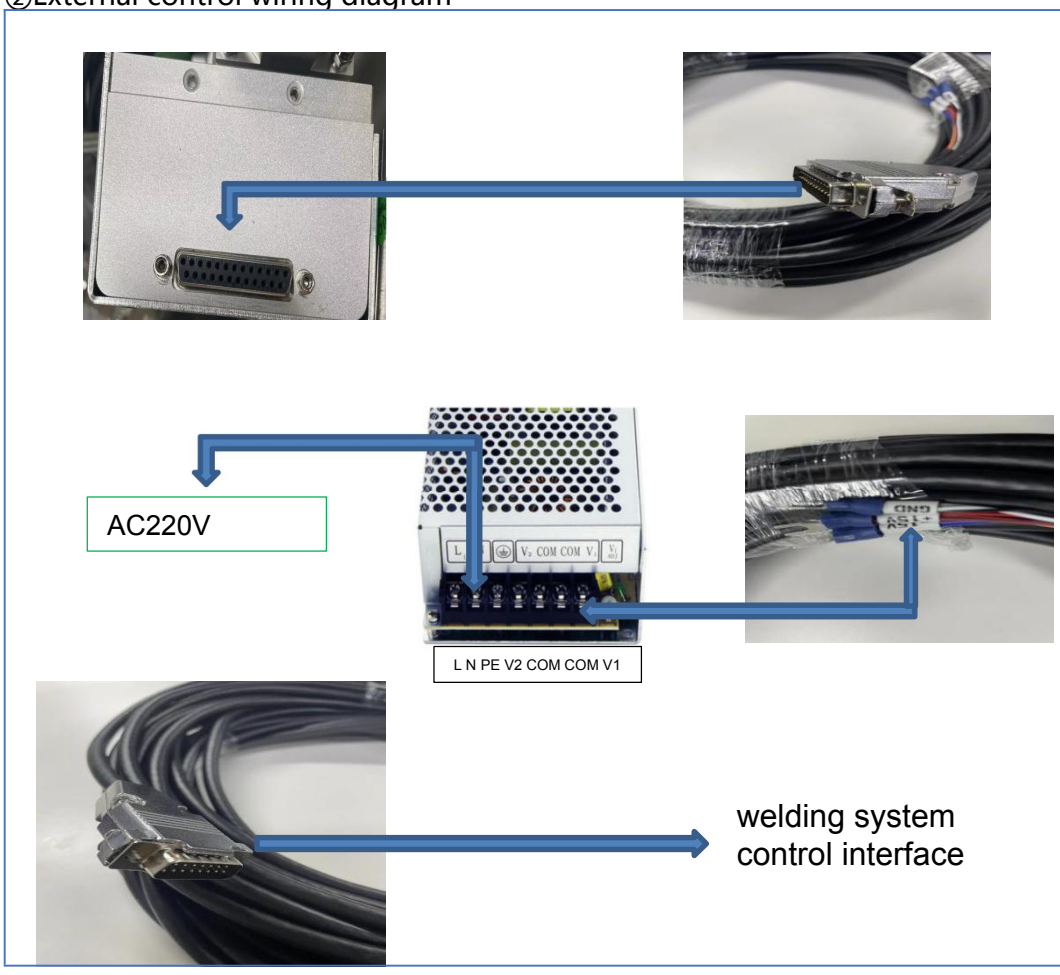
① ±15V switching power supply (It is recommended to use 6A and above) ② DA power & signal cable ③control interface

2 、Eletrical wiring diagram

①Control cable internal wiring diagram



②External control wiring diagram



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