LWD03B-H02 User Manual

Product Description

Shenzhen Ospri Intelligent Technology Co., LTD

Foreword

Dear Users:

Welcome to use the LWD03B0-H02 new lightweight swing welding joint products produced by Shenzhen Ospri Intelligent Technology Co., LTD. We are honored to have your confidence in our products.

In order to make you have an overall view of the product, convenient for your use, we specifically provide the user manual for you, including product characteristics, structural feature, technical feature, direction for use, maintenance, etc. It's an essential guide when you use this product.

Please read the user manual carefully before use. I'm sure it will be helpful for you to use this product. In addition, if you have any questions during use, please contact us, and we will serve you wholeheartedly.

Declaration:

In order to ensure your safety and the product works normally, please read the guide book carefully before using.

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Appendix A

Chapter 1: Overview

1.1 Product Parameter

Parameter	Specifications
Optical Fiber Connector	QBH
Laser power	3000W
Collimating Focal Length	100 mm
Focal length	200mm/250mm/300 mm
Focal Scanning Range	X：0~5 mm/Y:0~5 mm
Protection method	Coaxial/paraxial
Monitoring Mode	Coaxial CCD
Cooling methods	Water cooling
Gas Pressure	<1.0Mpa
Oscillation Speed	＜4000mm/s
Overall weight	2.9kg

1.2 Precautions

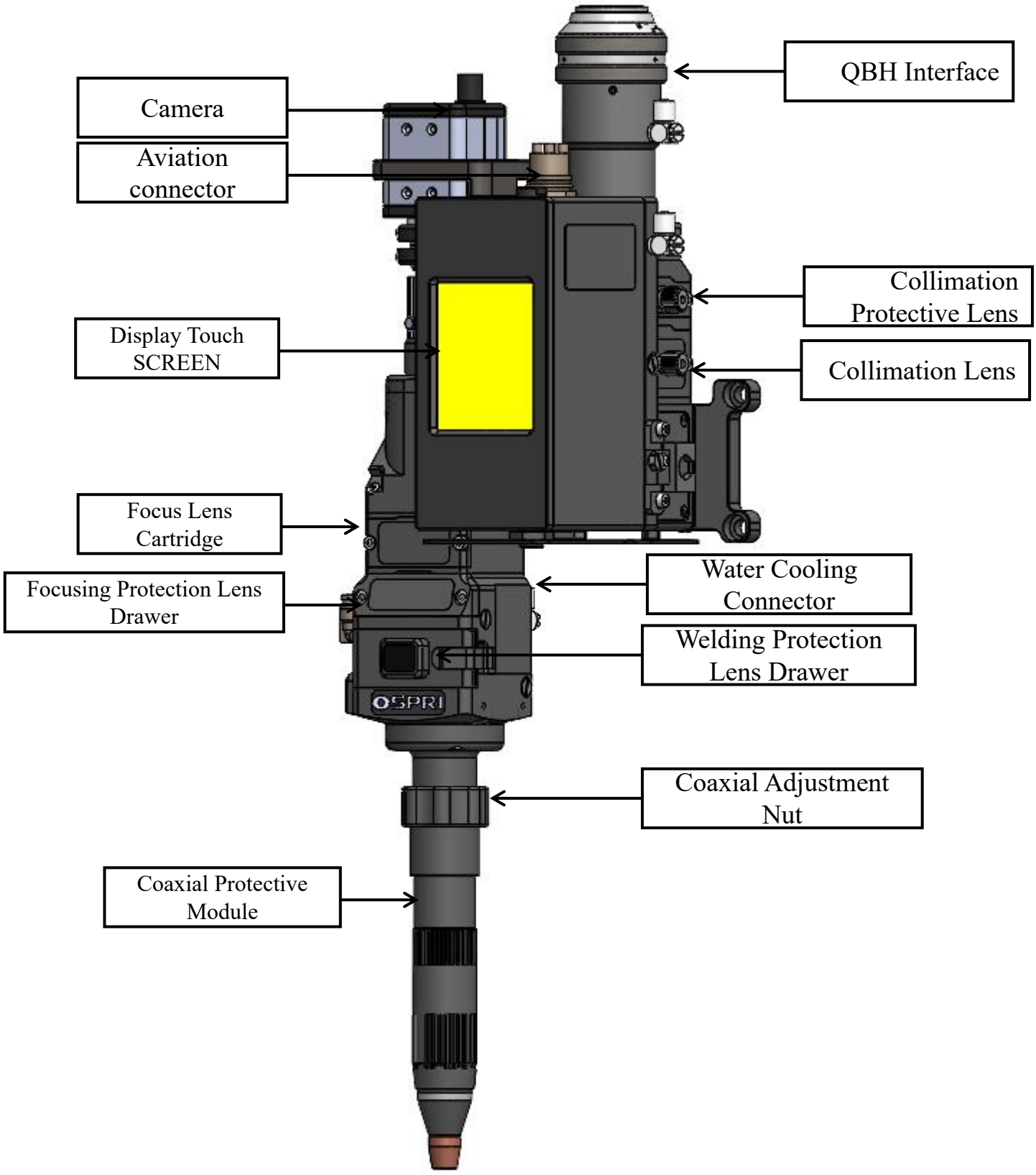
① To ensure personal safety, when the welding head is used in conjunction with a laser, please take adequate precautions against sputtering by keeping personnel away from the welding point and adding shielding materials.

② Precautions and standard operations should be taken to prevent iron filings from splashing during welding due to high temperature;

③ When using laser processing products, please utilize protective devices to prevent the laser beam from causing harm to the human body.

Chapter 2 Structural Characteristics

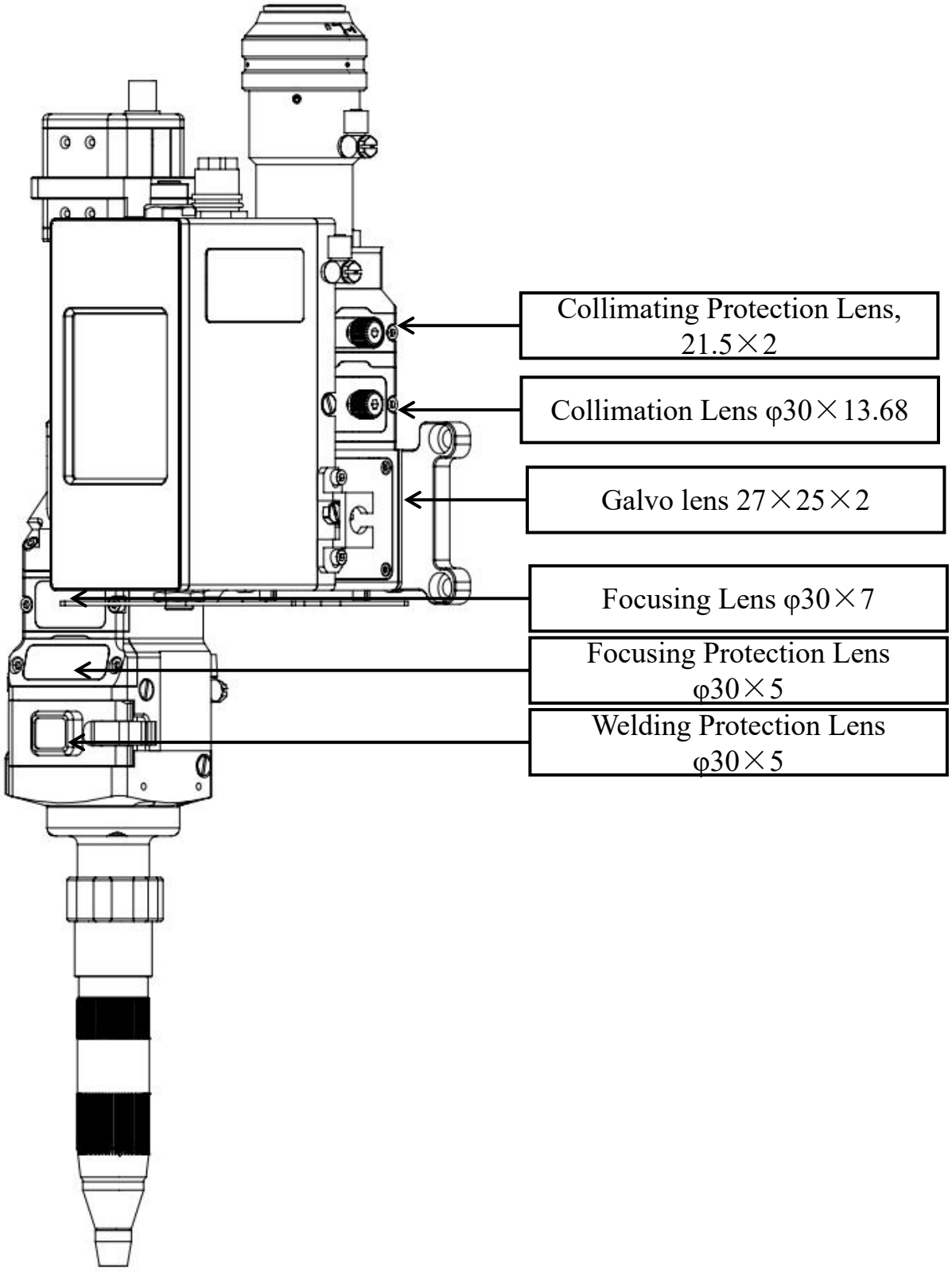
2.1 Brief Description of Product Structure



2.2 Brief Description of Product Components

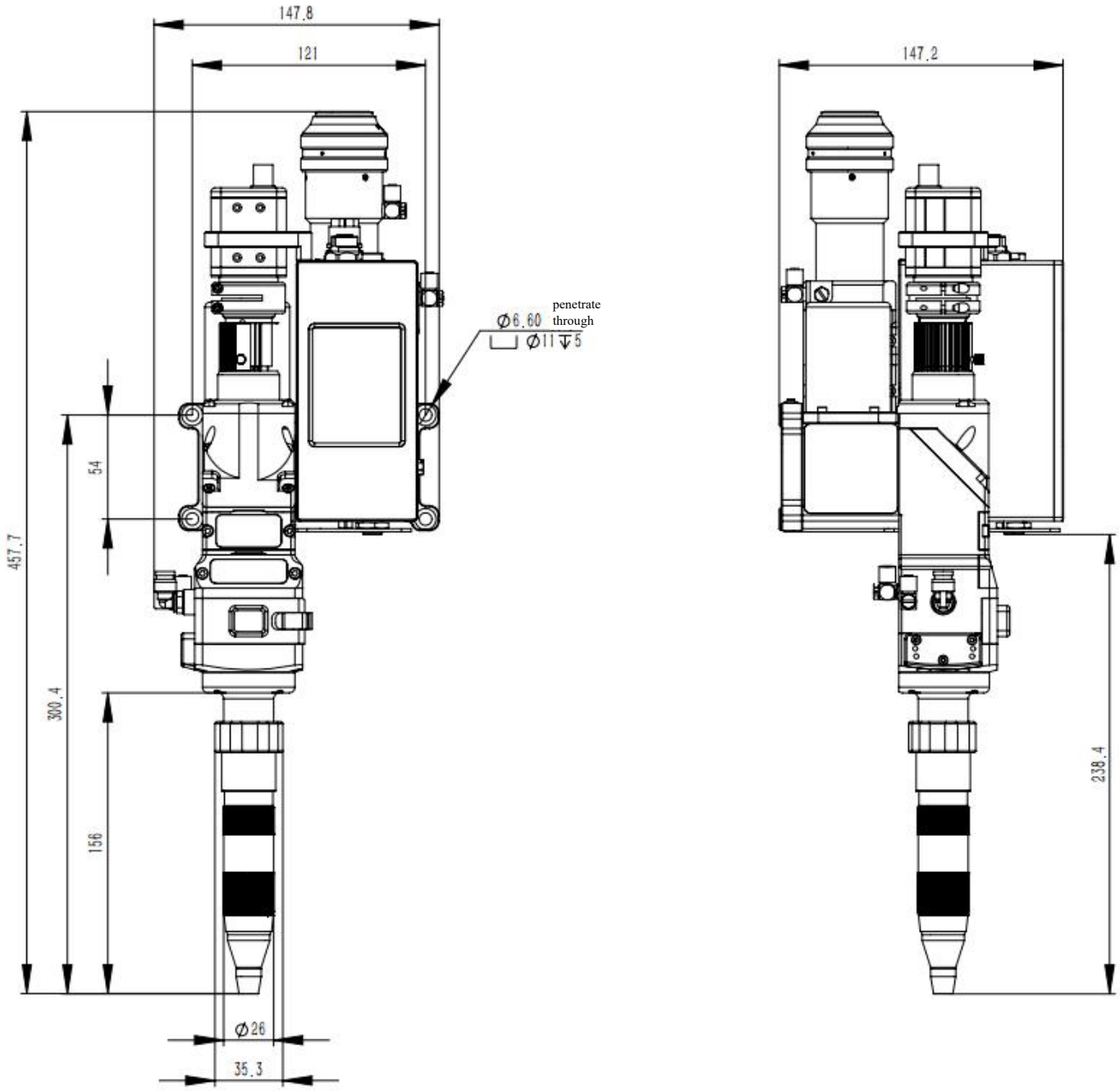
1. Water Cooling Interface: Primarily used for cooling the galvanometer motor driver card.
2. Aviation Plug Interface: Power cord interface for supplying power to the product.
3. Collimating Protection Lens Module: When inserting or removing the fiber optic head, it isolates dust from entering the cutting head interior and protects the collimating lens.
4. Collimation lens cartridge module: For replacing and maintaining the collimation lens easily, and centering the laser beam spot;
5. Focus protective lens cartridge: Protect the focus lens for fast replacement.
6. Coaxial Gas Blowing Component for Protection: During laser welding, it disrupts the ionized layer formed on the workpiece surface by the laser, isolating the workpiece from air contact to prevent oxidation.
7. Camera Module: Displays the working status of laser welding on a screen, allowing staff to observe the real-time welding status conveniently.
8. Display Touch Screen: Displays the working status of laser welding on the screen and allows for adjustment of welding width and height through the touch screen.

2.2.1 Brief Description of Product Parts (Lens Size)



Chapter 3 Product Installation

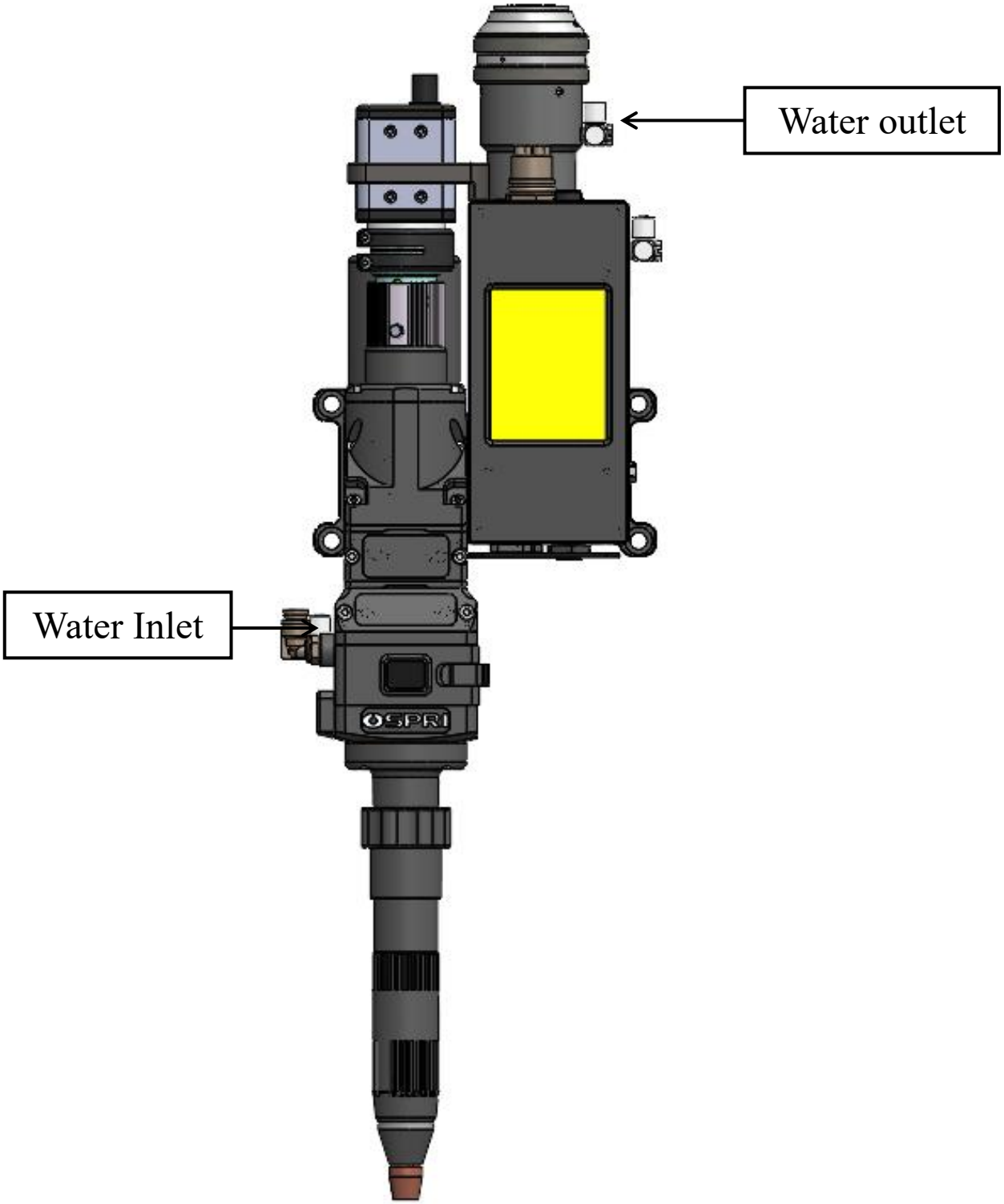
3.1 Welding Joint Installation



Dimensional Diagram for Welding Head Installation (Collimation F100 Focusing F250)

3.2 Cutting Head Connection

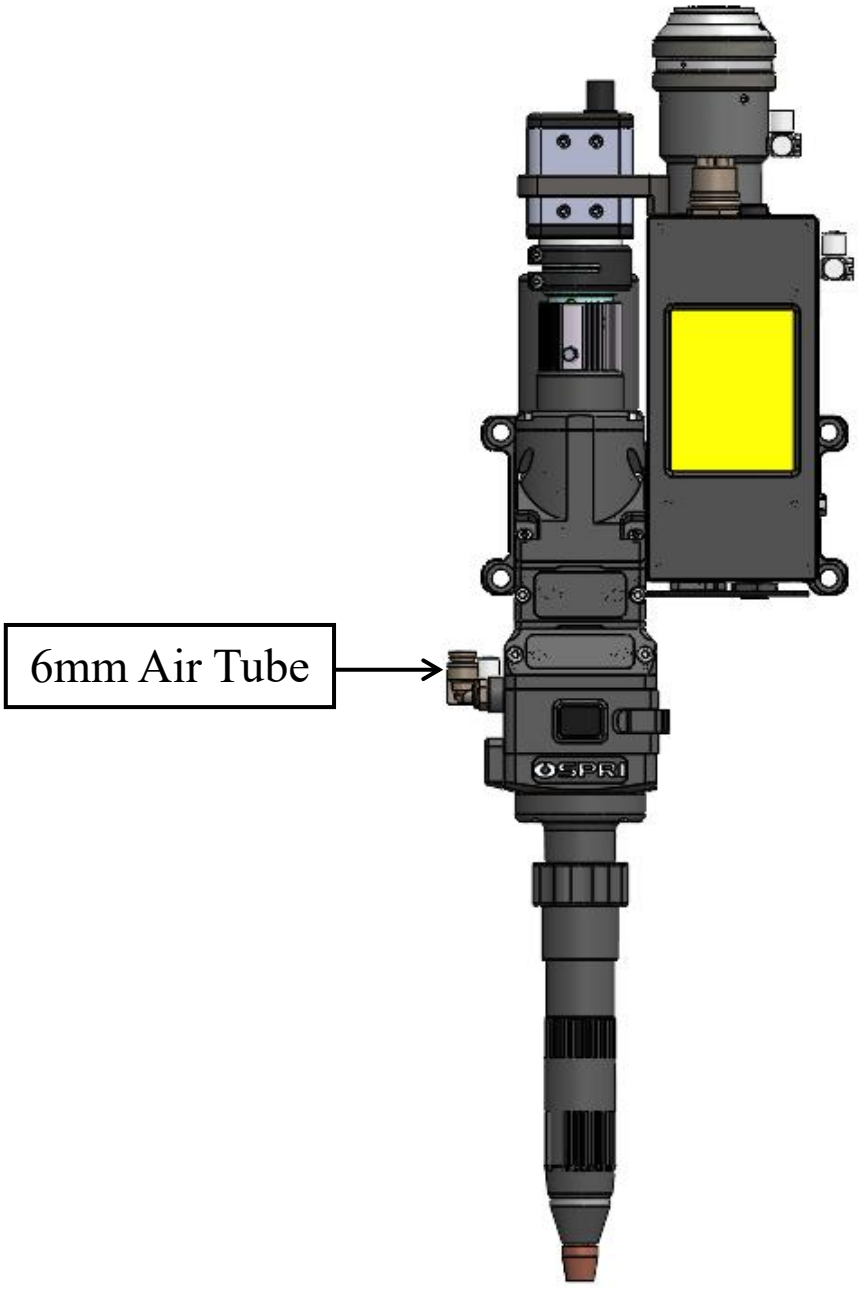
3.2.1 Cooling Pipeline



For cooling the welding head, with 1 inlet and 1 outlet cooling pipeline.

3.2.2 Gas Connection

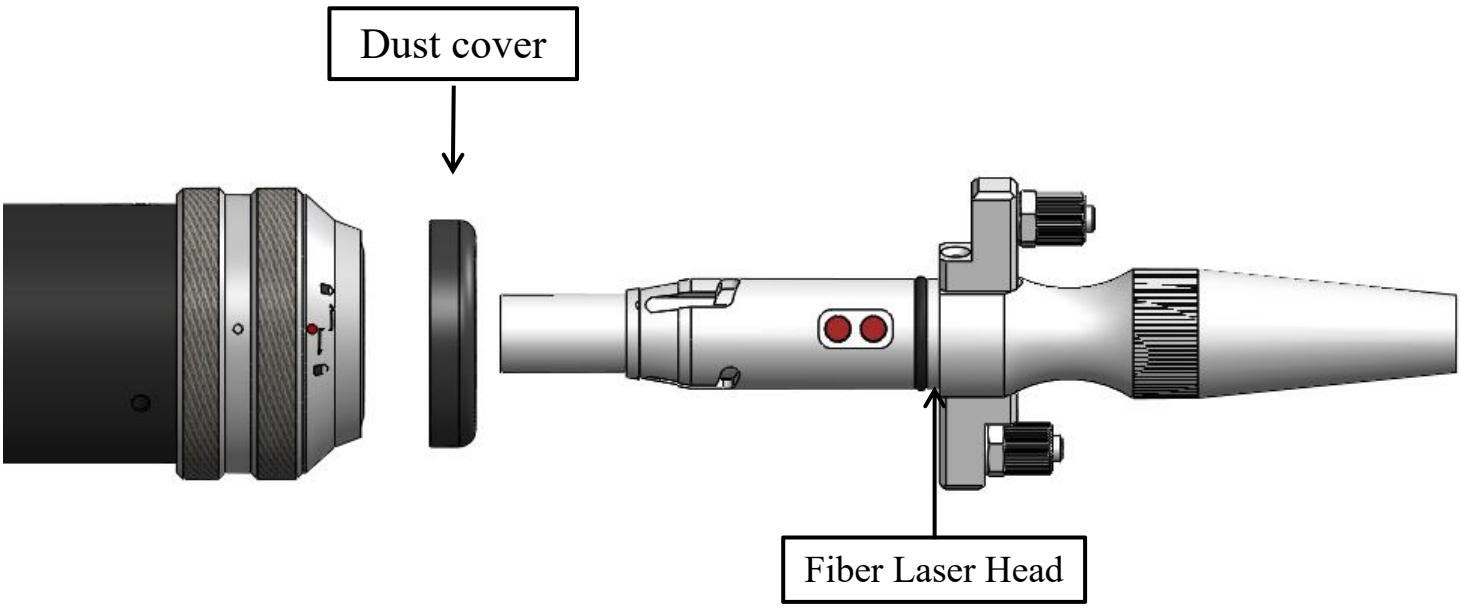
1. Connect the 6mm air duct to the input port for cooling gas docking, input pressure <1.0Mpa. Inert Gas: Compressed Air



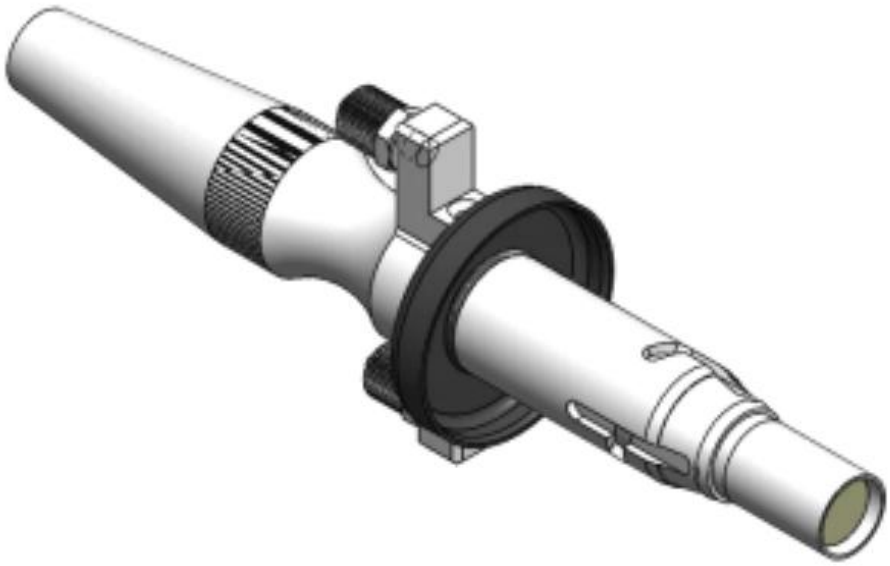
Note: The gas entering the auxiliary pipeline must be filtered and dried, otherwise it may contaminate and damage the protective lens. At the same time, the welding area is prone to oxidation, which can affect the appearance of the welded product.

3.3 QBH Fiber Connection

① Secure the welding joint and remove the dust seal plug and dust cover.

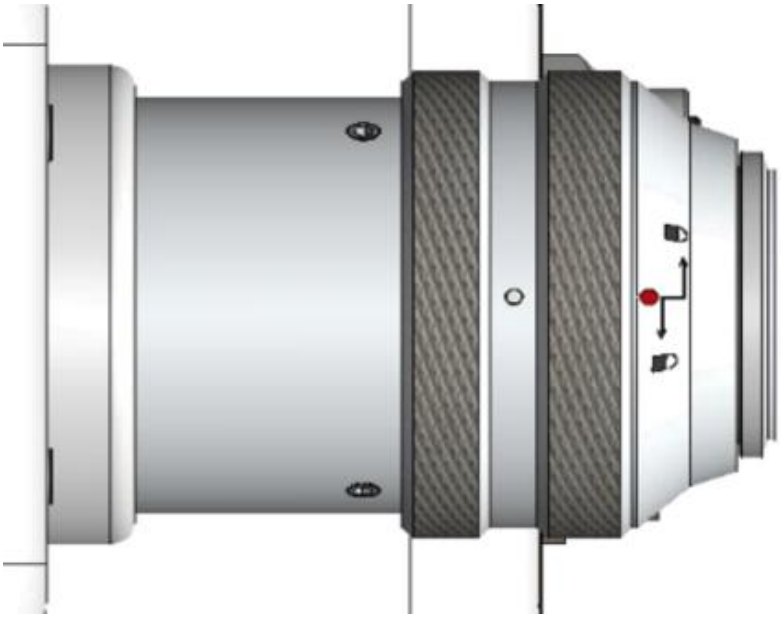


② Cover the dust-proof cover which is in the white accessory box, onto the fiber laser tip, as shown in the figure below:

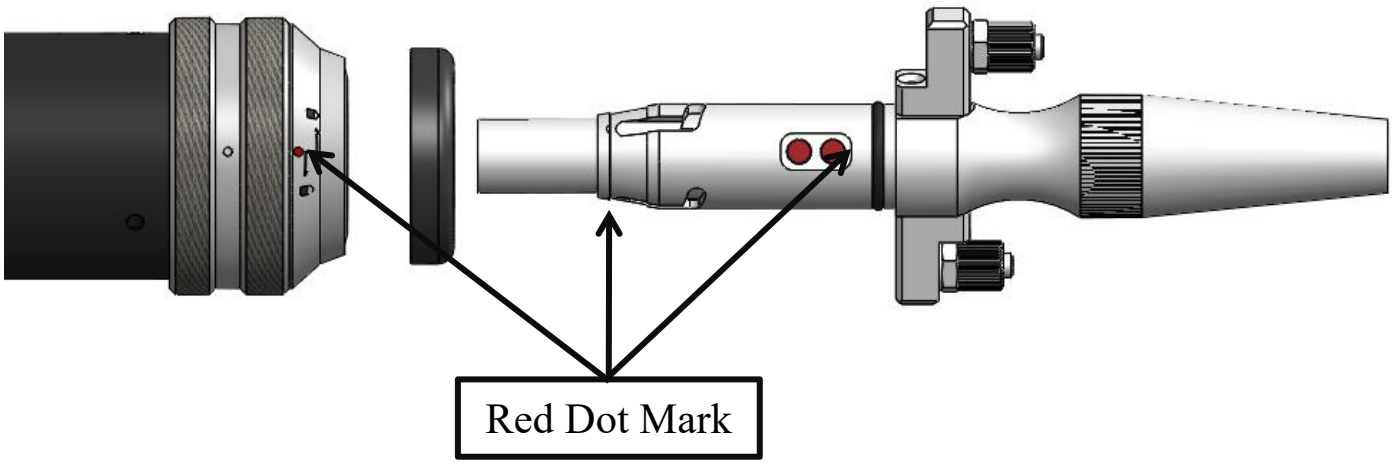


Note: If the laser head is originally equipped with a dust cover, you can choose whether to install an additional dust cover based on actual conditions during the installation process.

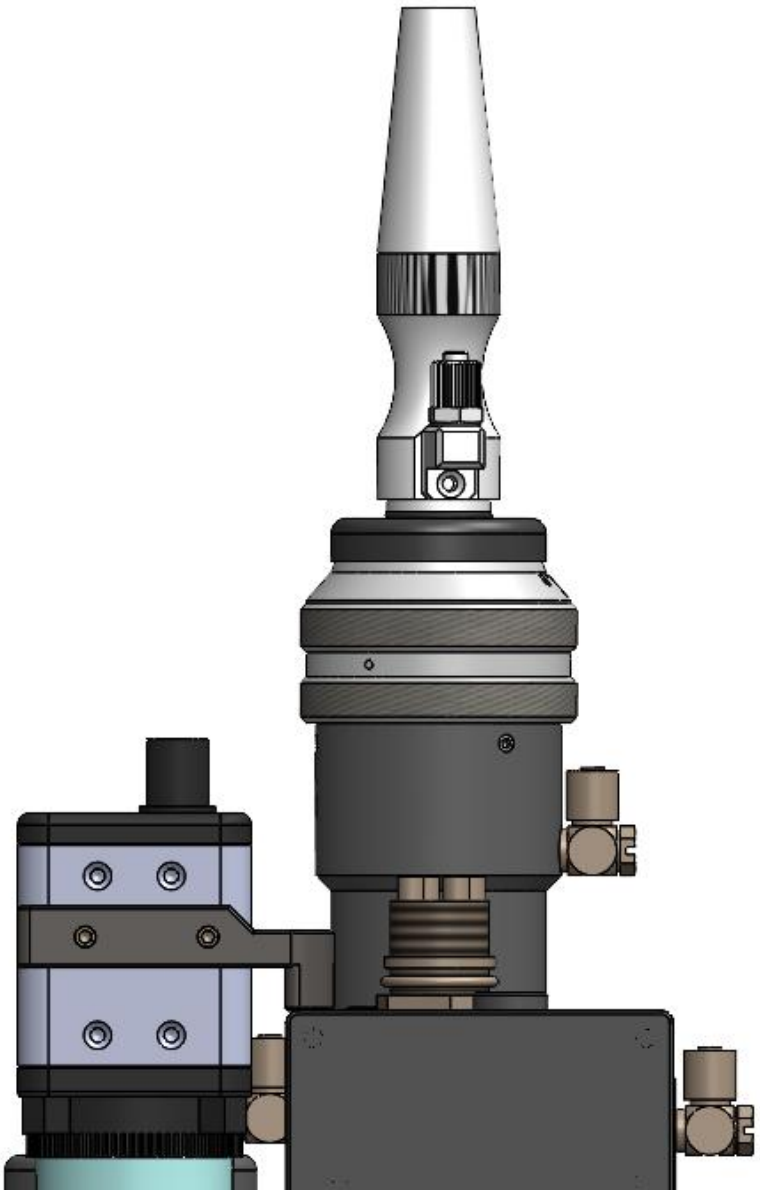
③ Turn the QBH connector to the open position: Rotate it counterclockwise to the extreme position (you can feel a "click" sound). Be careful to only turn it until it's in place; do not force it, as this may cause damage. The internal structure of QBH.



④ Align the red dot on the fiber optic head with the red dot on the QBH connector, and slowly insert the fiber optic head into the QBH connector, as shown in the diagram below:

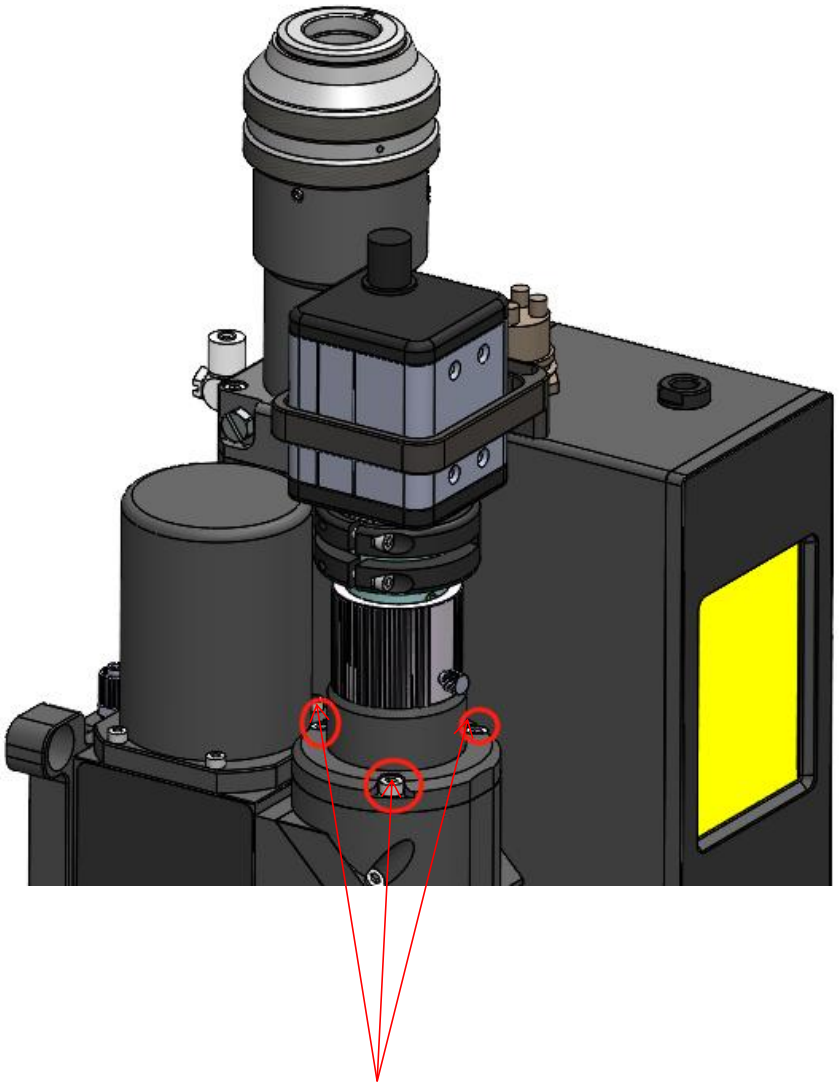


⑤ Turn the QBH connector into the lock state, that is, screw it to the limit position clockwise (a "thump" sound can be heard). Then lift up the rotating nut and then rotate it clockwise again until it is tightly secured. Fiber Optic Head (Note: Only turn it until it's in place; do not force it, as this may damage the internal structure of the QBH.)



Attention: Wrap with masking tape after plugging fiber.

3.4 Camera Adjustment



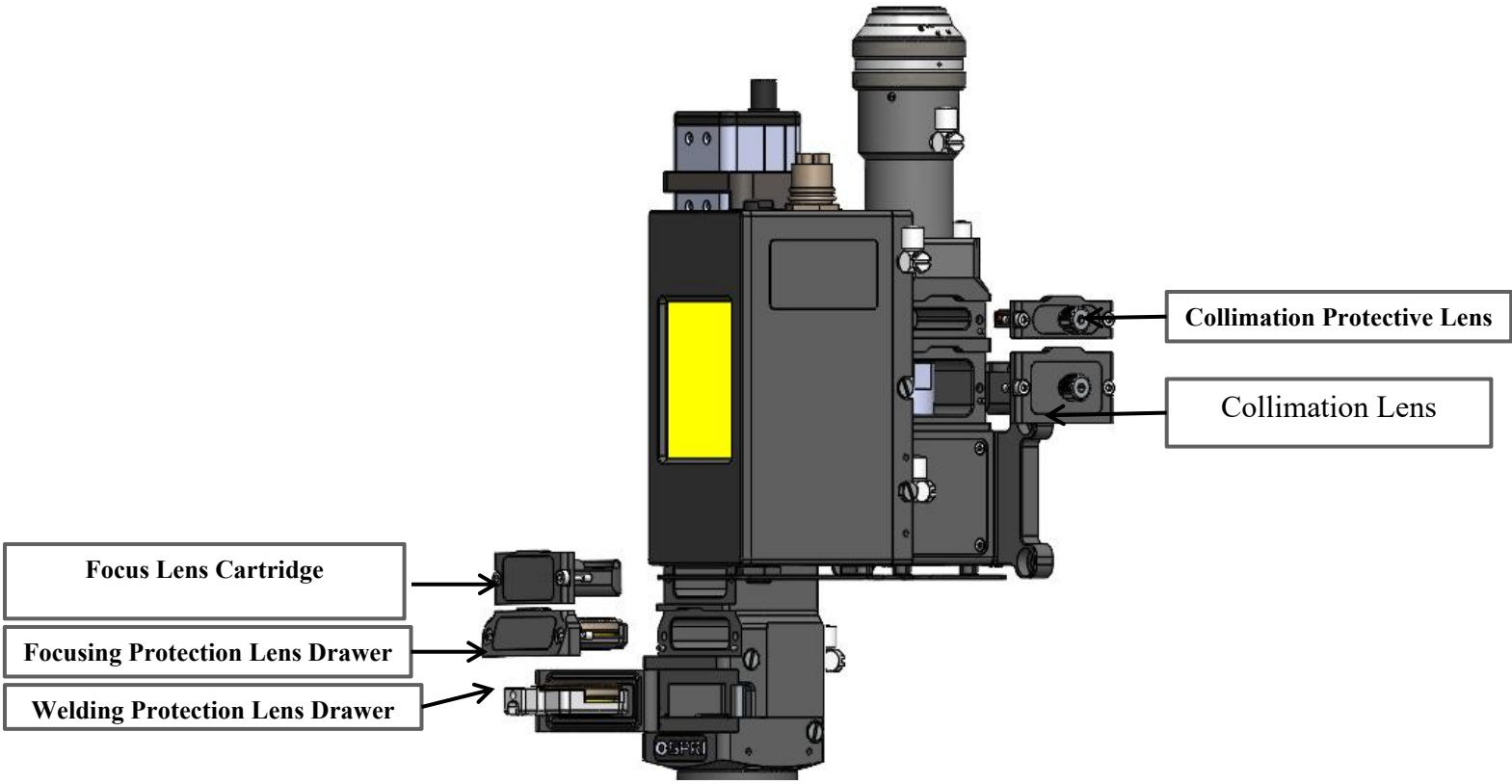
M3×10 screw

Adjustment Method: Adjust using the three M3×10 screws. During adjustment, switch to the screw that needs adjustment based on the dynamic movement of the camera center displayed on the camera screen after adjusting the screw.

Chapter 4 Maintenance and Servicing

4.1 Maintenance and Care for Different Lenses

As shown in the diagram below, the collimating protection lens, collimating lens, focusing lens, focusing protection lens, and welding protection lens are located within the lens drawer and can be maintained regularly. It is recommended to clean them once every 1 to 2 months. Please ensure that the operating space is clean and dust-free during cleaning and replacement to avoid contaminating the lenses.



Remove the hand-operated screws, then remove the cartridge and replace or maintain the lenses.

Note: Extract the drawer and focusing lens in a clean, dust-free environment.

Cleaning of Collimating and Focusing Lenses:

1. Tools: Dust-free wiping swabs, isopropyl alcohol, and rubber air blower.
2. Spray isopropyl alcohol onto the dust-free wiping swabs.
3. Gently pinch the both sides of the collimation lens with the left thumb and index finger.
4. Hold a dust-free swab in your right hand and gently wipe the front and back surfaces of the lens in a single direction, either from bottom to top or from left to right. Use a rubber bulb blower to blow on the lens surface to ensure that there are no foreign objects on the lens after cleaning.
5. After cleaning, the collimating lens should be installed into the collimating lens drawer assembly and inserted into the welding head as soon as possible, or stored in another clean, sealed container.

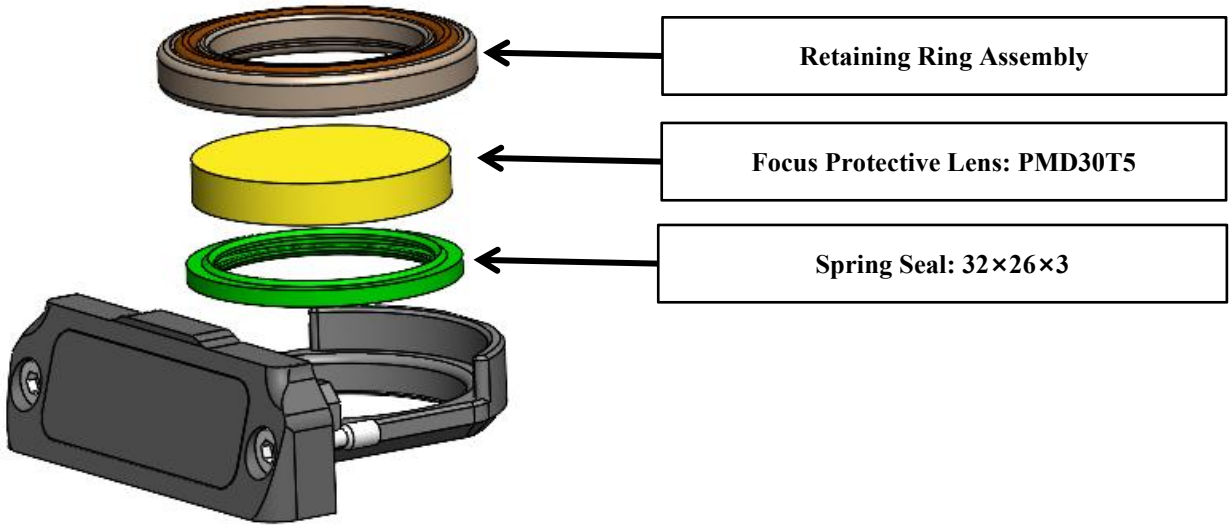
Maintenance and Replacement of Protective Lens:

The protective lens is located below the focusing drawer assembly. When impurities or foreign objects adhere to the protective lens, they can absorb laser heat and cause damage to the lens. Therefore, it is necessary to clean the protective lens regularly, with a recommended cleaning cycle of once a week. Besides, the protective lens is a wearing part and should be replaced in time if damaged.

Note: When cleaning or replacing the protective lens, avoid contaminating it with oil from your hands or dust from the environment.

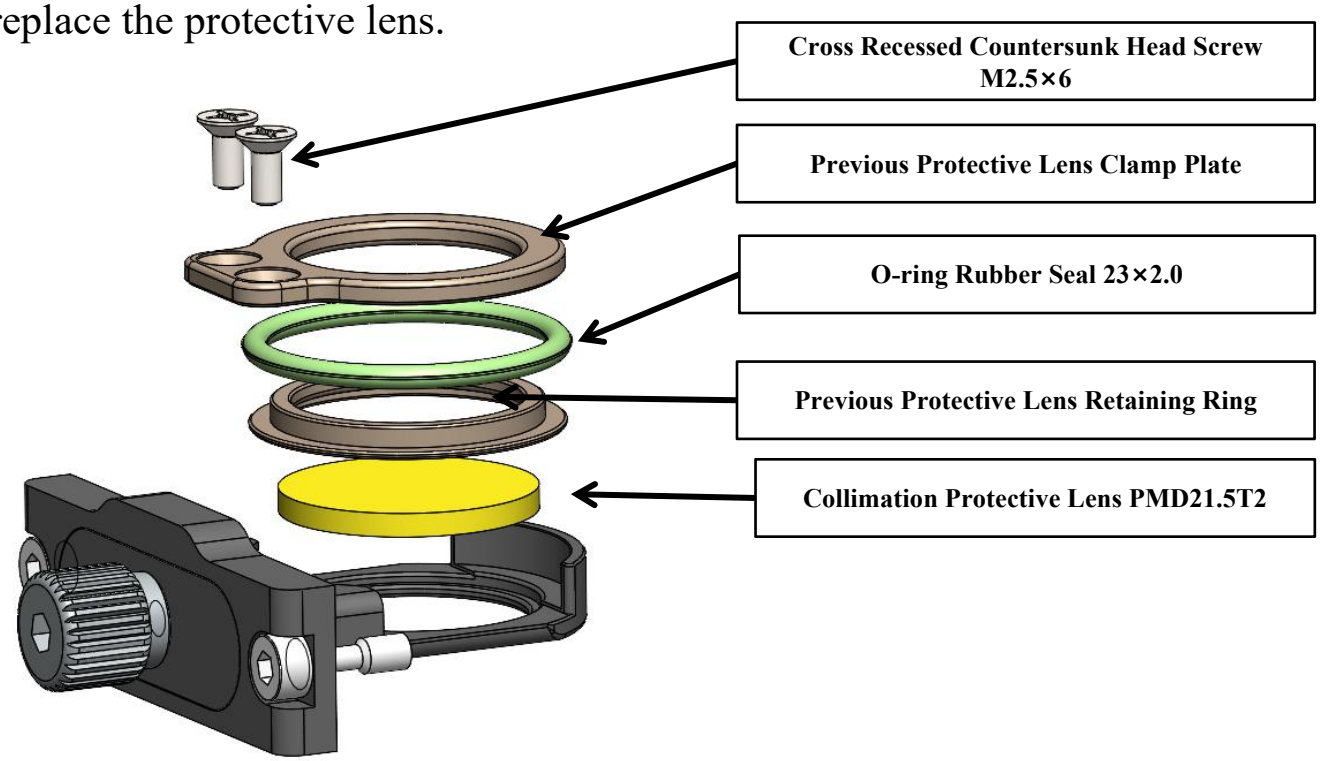
4.2 Disassembly and Maintenance of Protective Lens

1. Release the screw by hand to remove the focus protective lens component and move it to a clean and dust-free environment.



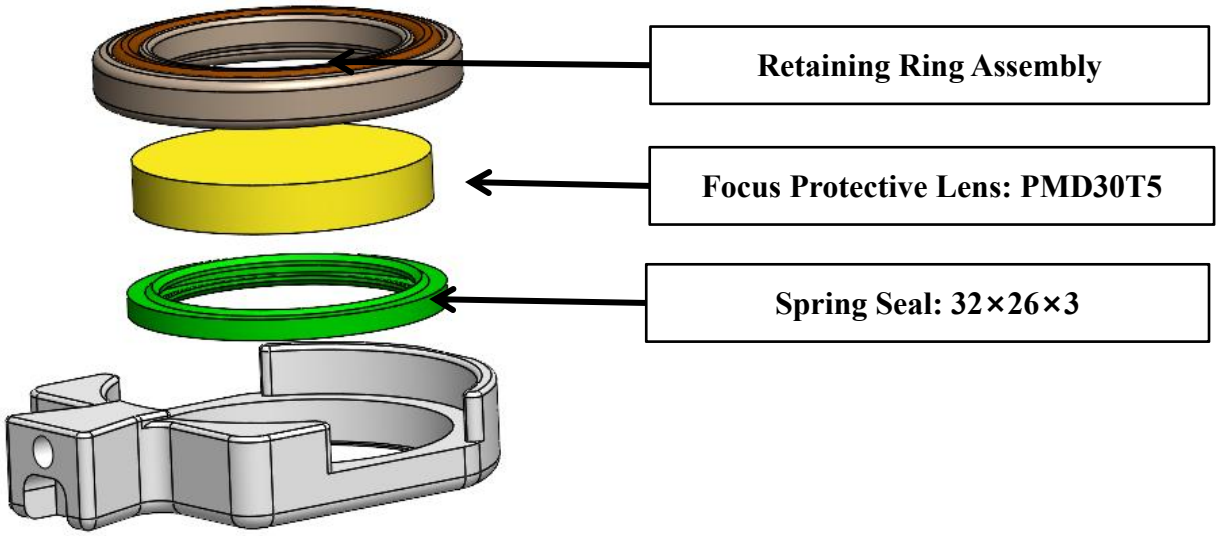
(focus protective lens)

2. Use an Allen wrench to loosen the screw, remove the clamp ring, and replace the protective lens.



(collimation protective lens)

3. Loosen the hand screw by hand to remove the welding protection lens assembly, and then move it to a clean, dust-free environment.

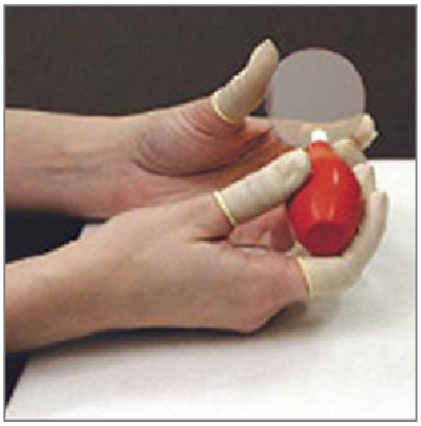


(Welding Protection Lens)

Note: When cleaning or replacing the protective lens, avoid contaminating it with oil from your hands or dust from the environment. During routine inspection of the protective lenses, it is recommended to first check the welding protection lens, then the focusing protection lens, and finally the collimating protection lens. This order can effectively prevent dust from falling onto the core lenses.

4.3 Cleaning of Protective Lens

1. Release the screw by hand to remove the focus protective lens component and move it to a clean and dust-free environment.



① Tools to Use: Dust-free swab, isopropyl alcohol, and canned dry, purified compressed air.

② Spray isopropyl alcohol onto the dust-free swab.

③ Gently pinch the both sides of the lens with the left thumb and index finger.

④ With the dust-free swab in your right hand, gently wipe the front and back surfaces of the lens in a single direction, either from bottom to top or from left to right. Use canned dry, purified compressed air to blow on the lens surface and confirm that there are no foreign objects on the lens after cleaning.

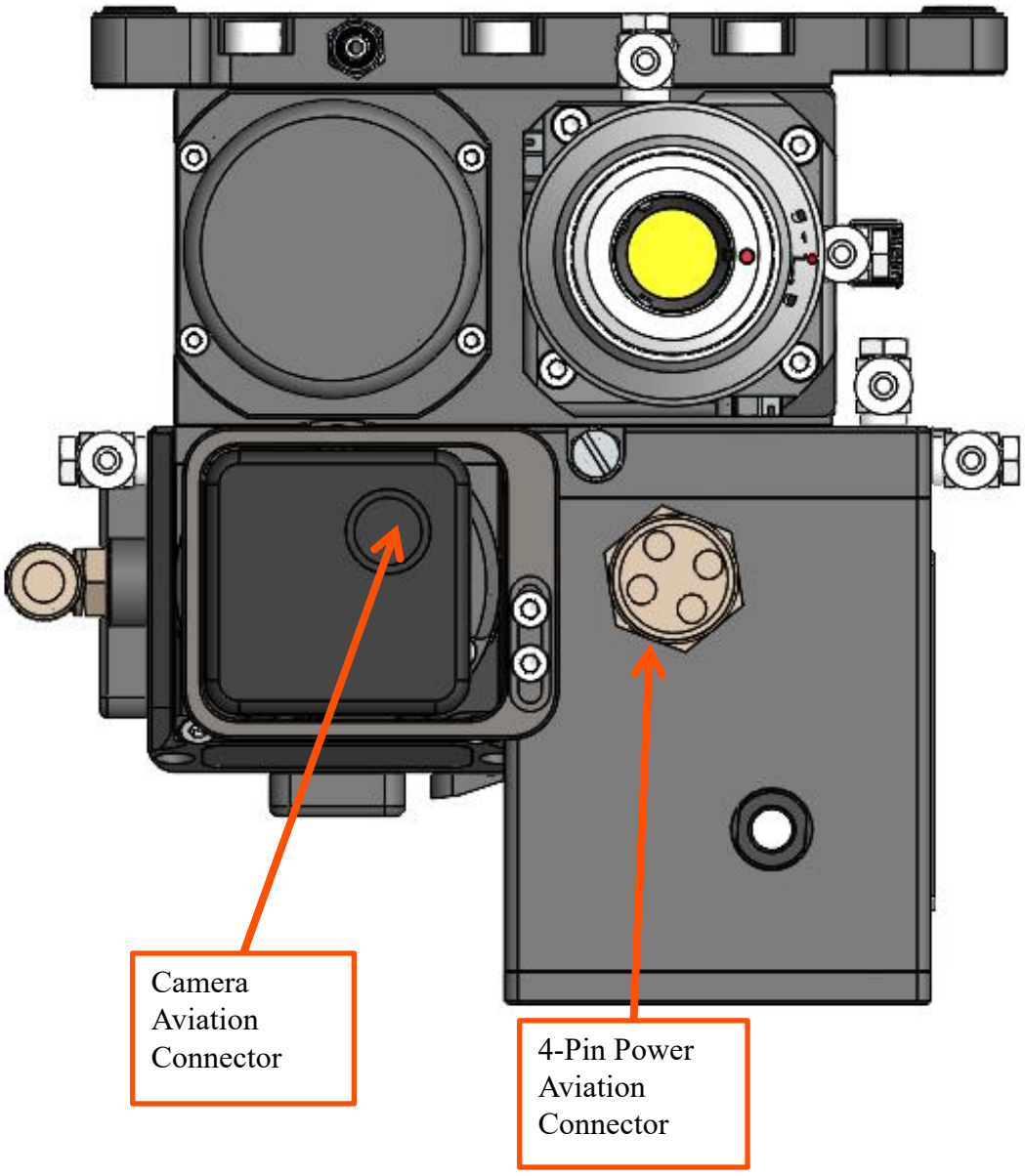
⑤ The cleaned protective lens should be installed in the protective lens holder as soon as possible and inserted into the welding joint.

Attention: When cleaning and replacing the protective lens, avoid the grease on hands or dust in the environment from contaminating the protective lens. In principle, the focusing lens, collimating lens, and cutting lens should not be disassembled and reassembled. If you suspect contamination on the lenses, you can first use an optometrist's lens to test them. If necessary, please contact our technical staff.

Chapter 5 Wiring Definitions and Requirements

5.1 Definition of Wiring Without IO

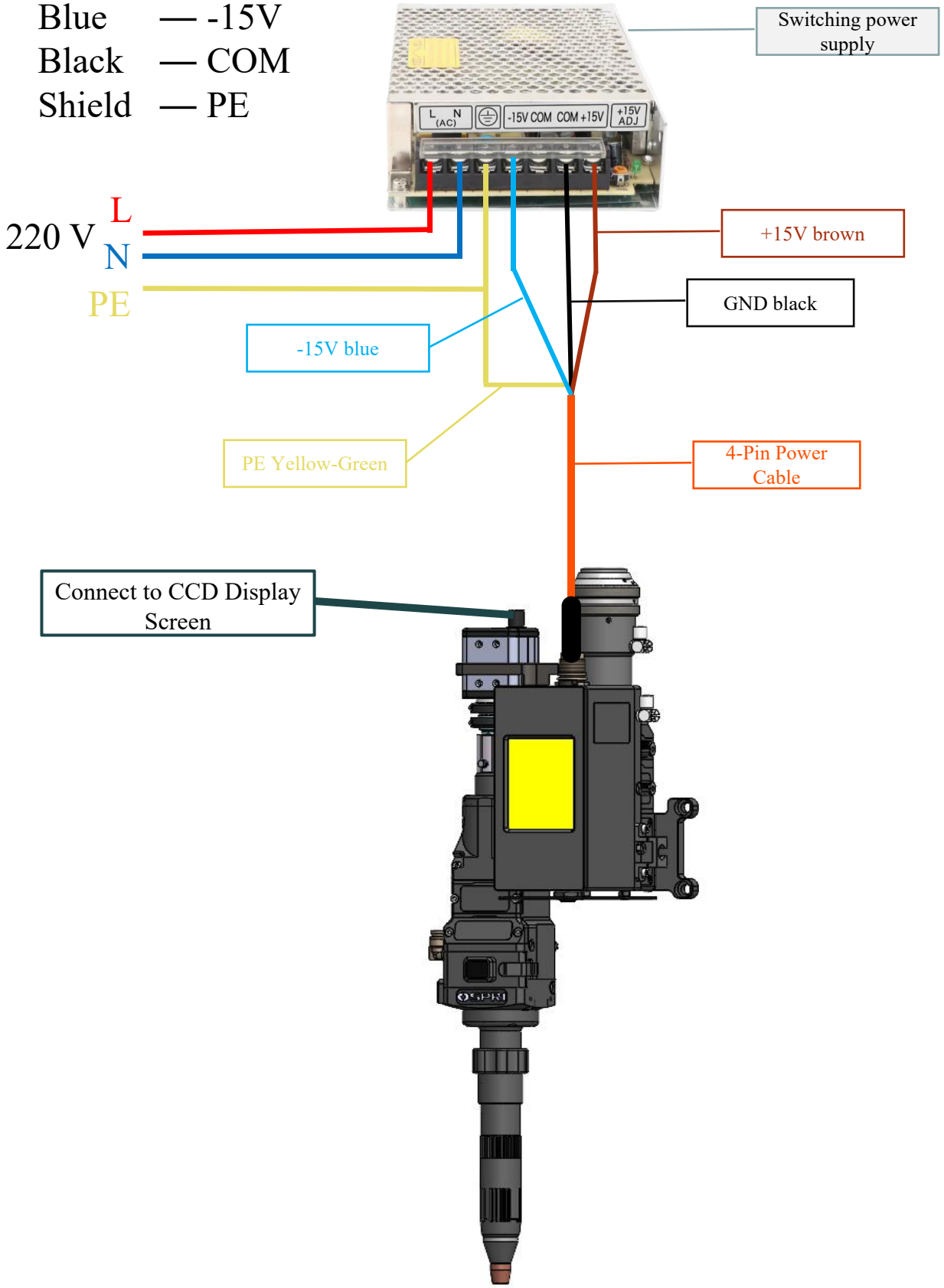
5.1.1 Aviation Plug Interface



Caution: Power off when plugging or unplugging the aviation plugs, otherwise the servo motor drive board card will be burned inside.

5.2 Wiring Definition

Brown — +15V
Blue — -15V
Black — COM
Shield — PE

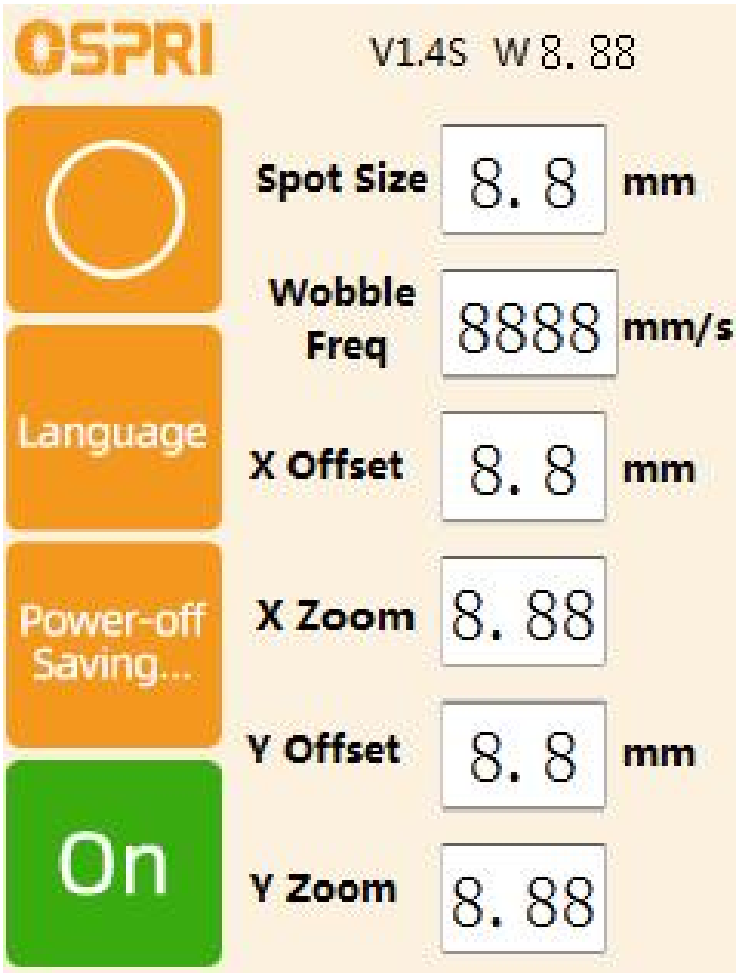


5.2 Introduction to Operation Interface of Touch Screen Without IO

Main Interface (Chinese)

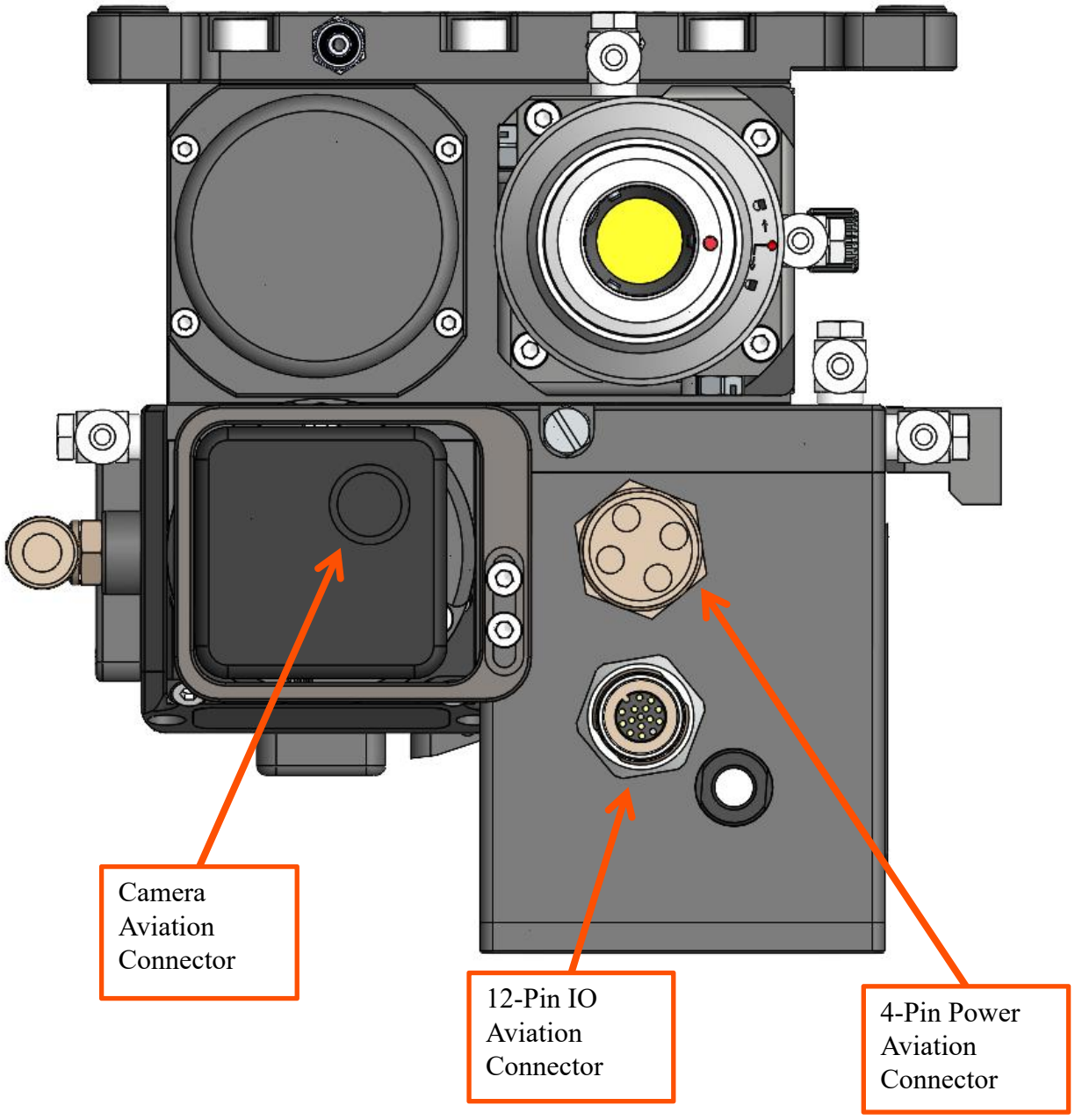
On/Off:	Click to start/stop the preset spot pattern.
Power off save:	Click to save the laser beam spot data parameters which have been set;
Spot Pattern:	Click to adjust different welding patterns, such as circle, line, triangle, square, etc.
Laser beam spot size:	It can set the output diameter of 0 to 5mm for laser beam spot.
Wobble Frequency:	This field is used to set the wobble frequency of galvo motor, with the setting range of ≤350 Hz.
Laser beam spot offset:	It can adjust the position of the focus center;
X/Y Magnification:	This option is for adjusting the spot size.
Language Switch:	This option is for adjusting the language mode of the main interface. Currently, this product only supports Chinese, English, and Korean language interfaces.

Main Interface (English+Korean)



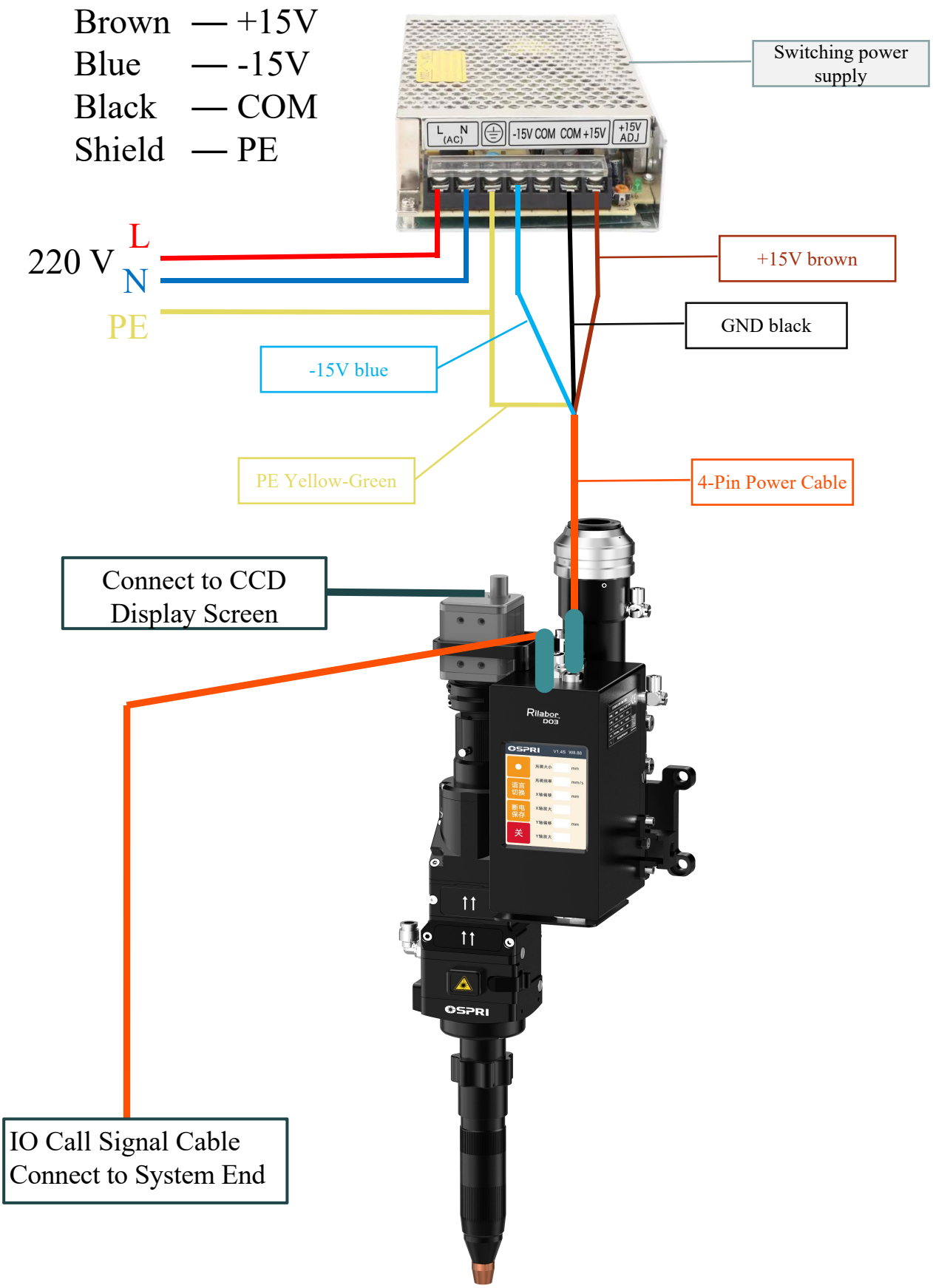
5.3. Definition of Wiring With IO

5.3.1 Aviation Plug Interface

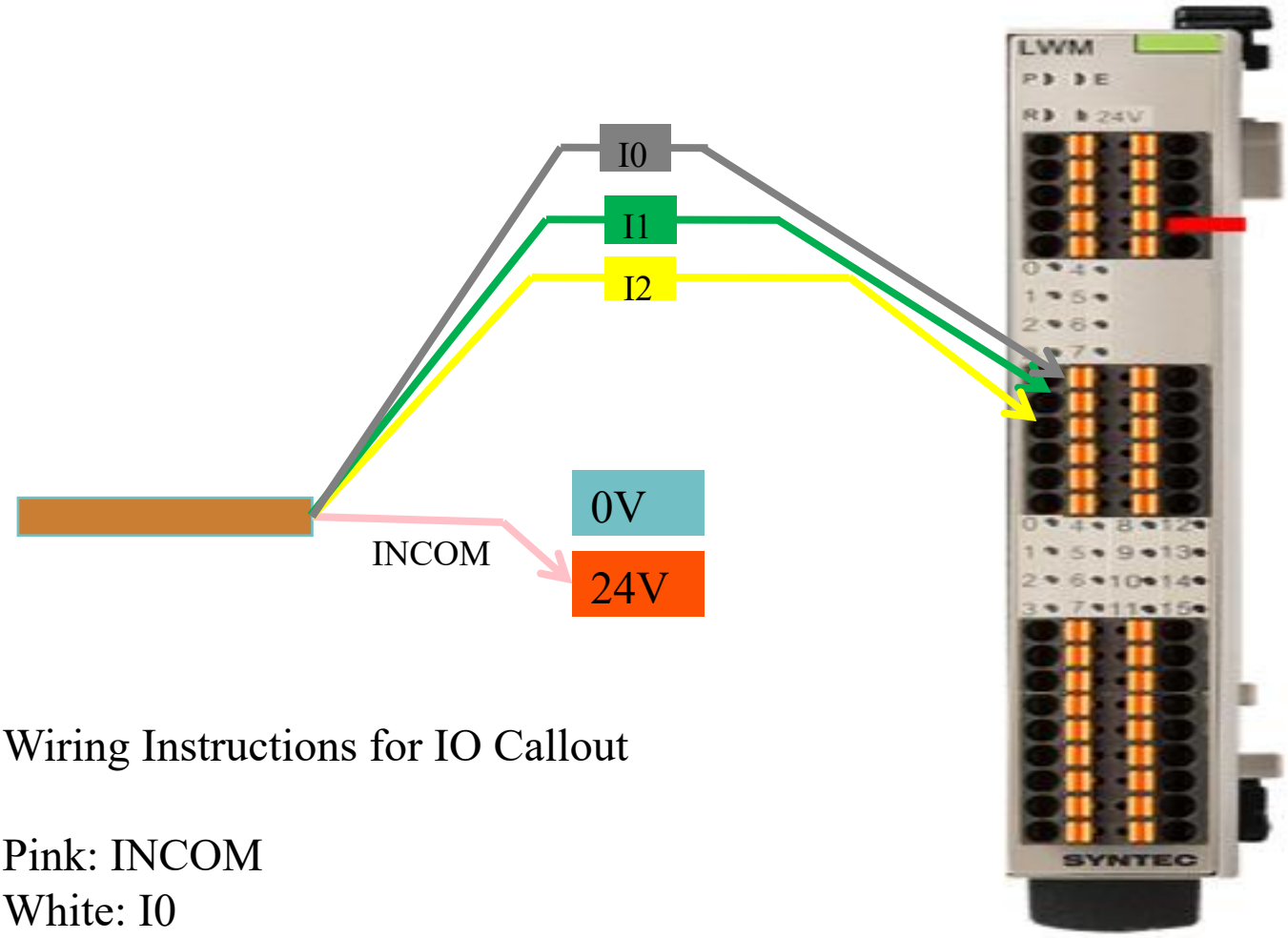


Caution: Power off when plugging or unplugging the aviation plugs, otherwise the servo motor drive board card will be burned inside.

5.4.2 Wiring Definition for IO Built-in Screen



5.4.3 Instructions for Using IO Built-in Screen



Wiring Instructions for IO Callout

Pink: INCOM
White: I0
Green： I1
Yellow:12
If INCOM is connected to 24V, the input IO signal shall be connected to low level; and if INCOM is connected to 0V, Then connect the IO signal to a high level. Currently, only the three input points I0, I1, and I2 are being used.

When the input IO is not connected, the program number corresponds to 0, and the initial pattern is " . " which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When I0 is connected alone, the program number corresponds to 1, and the initial pattern is "—" (a horizontal line). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When I1 is connected alone, the program number corresponds to 2, and the initial pattern is "| " (a vertical line). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When connected solely to 12, the program number corresponds to 4, and the initial pattern is "∞". which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When both I0 and I1 are connected simultaneously, the program number corresponds to 3, and the initial pattern is "□" (a square). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When both I0 and I2 are connected simultaneously, the program number corresponds to 5, and the initial pattern is "8" (the numeral eight). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When both I1 and I2 are connected simultaneously, the program number corresponds to 6, and the initial pattern is "○" (a circle). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

When all three, I0, I1, and I2, are connected simultaneously, the program number corresponds to 7, and the initial pattern is "△" (a triangle). which can be changed as required by touching the pattern on the touch screen, and click "Power-off Save".

5.4 Introduction to Operation Interface of Touch Screen With IO

Main Interface (Chinese)

On/Off: Click to start/close the set laser beam spot graphics;

IO switching: Switching process group under external control, saving parameters under internal control, and direct calling under external control

Power off save: Click to save the laser beam spot data parameters which have been set;

Spot Pattern: Click to adjust different welding patterns, such as circle, line, triangle, square, etc.

Laser beam spot size: It can set the output diameter of 0 to 5mm for laser beam spot.

Wobble Frequency: This field is used to set the wobble frequency of galvo motor, with the setting range of ≤350 Hz.

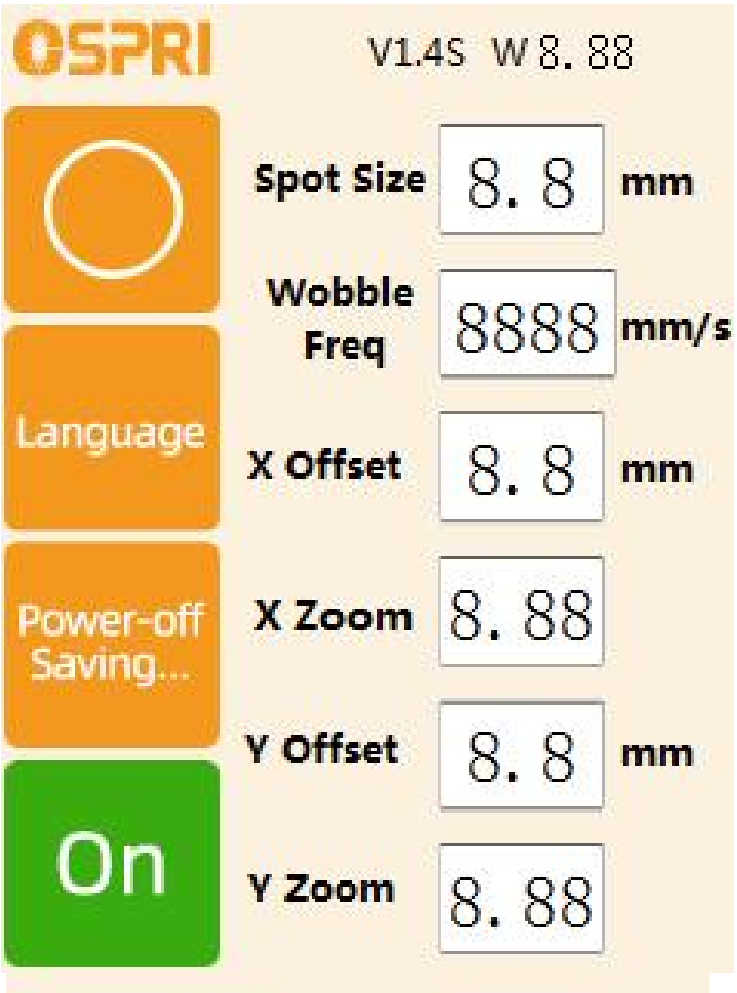
Laser beam spot offset: It can adjust the position of the focus center;

Program number: Process group number, one includes 8 groups;

X/Y Magnification: This option is for adjusting the spot size.

Language Switch: This option is for adjusting the language mode of the main interface. Currently, this product only supports Chinese, English, and Korean language interfaces.

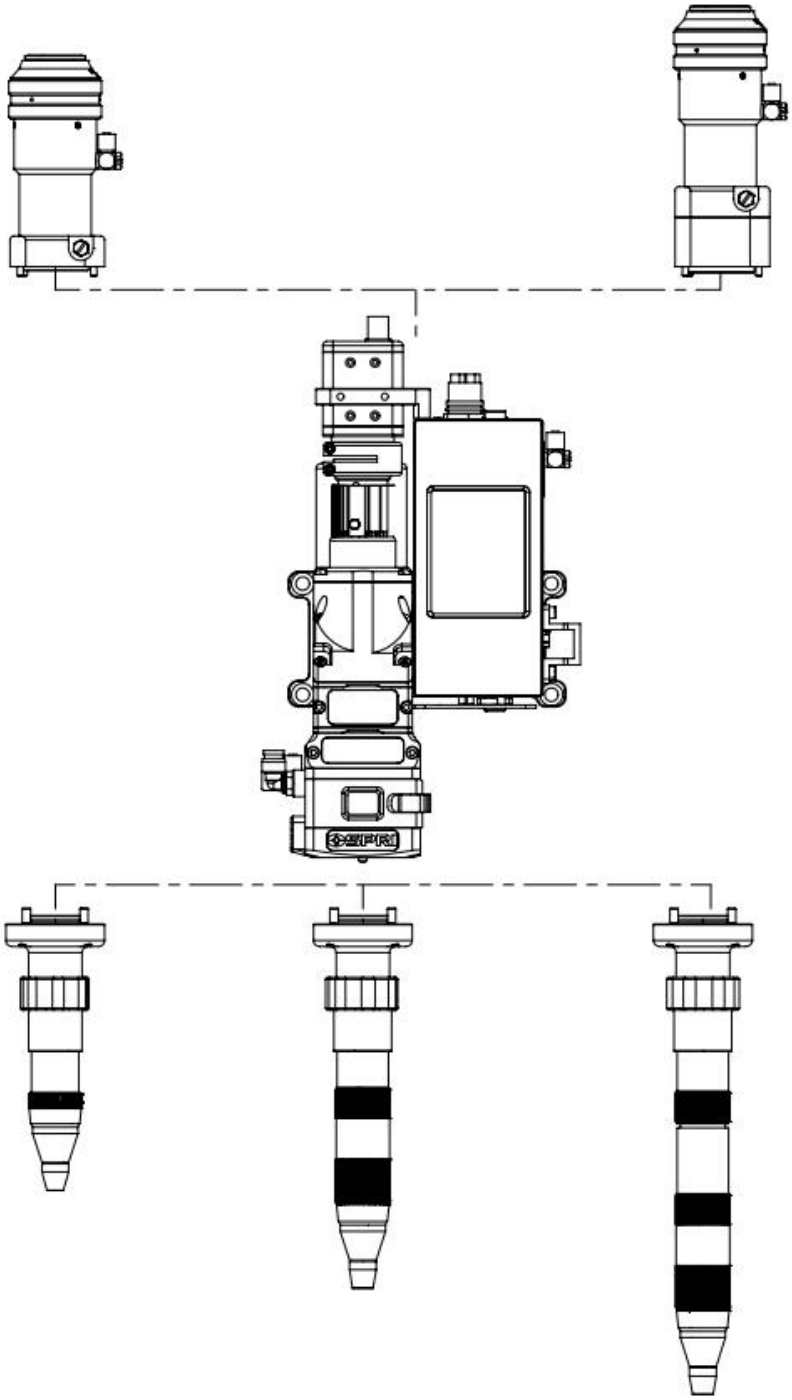
Main Interface (English+Korean)



Appendix A

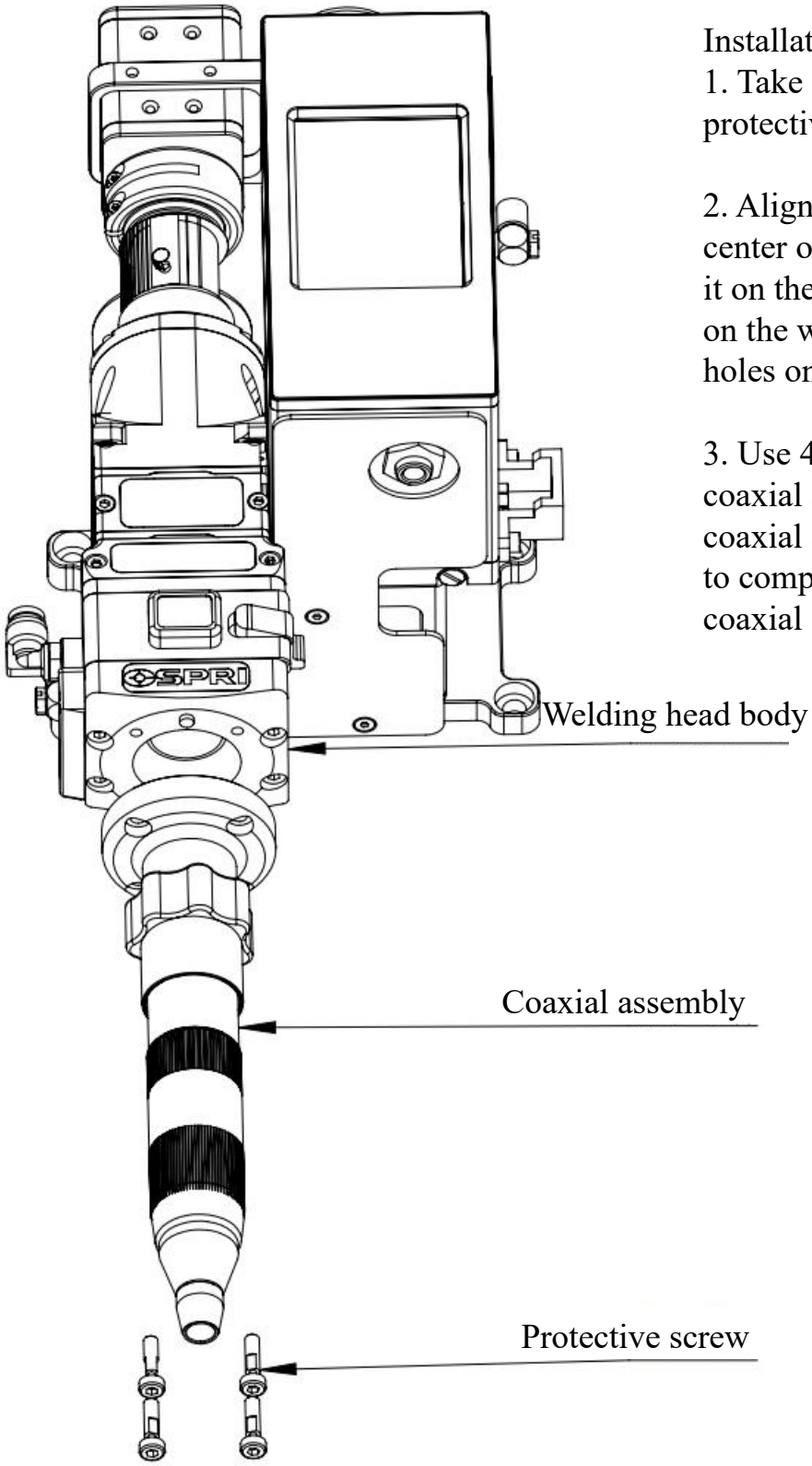
1. Introduction to Collimation and Coaxial Selection

F100 collimation F125 collimation



F200 coaxial F250 coaxial F300 coaxial

2. Introduction to Coaxial Replacement



Installation method:
1. Take out the coaxial assembly and protective screws.

2. Align the coaxial assembly with the center of the welding body and install it on the welding body. Align the pins on the welding body with the pin holes on the coaxial assembly.

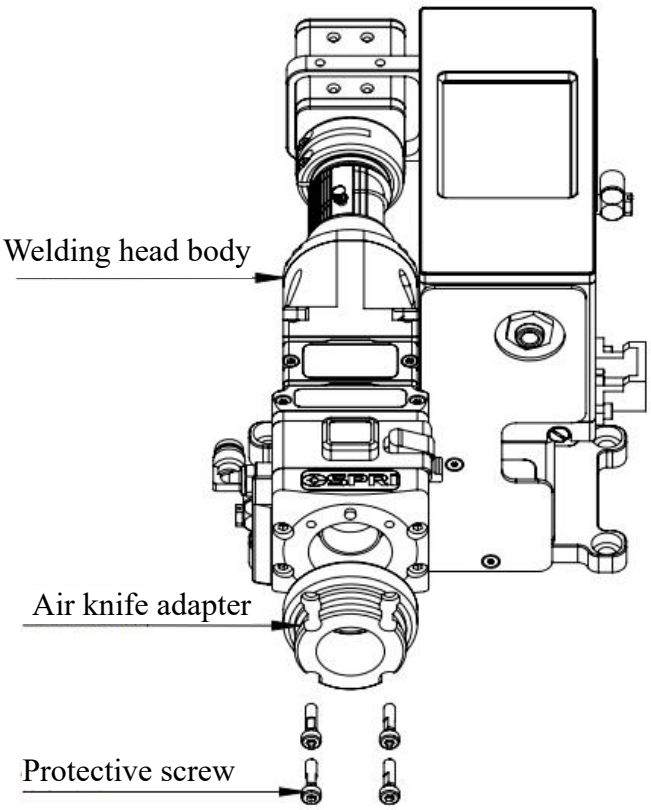
3. Use 4 protective screws to lock the coaxial assembly and install the coaxial assembly on the welding body to complete the installation of the coaxial assembly.

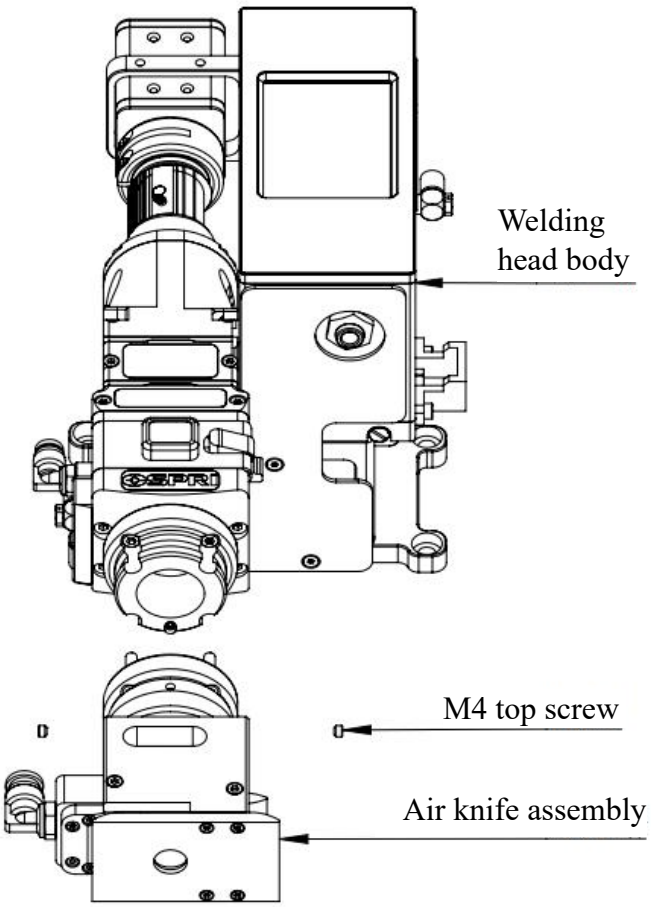
3. Introduction to Air Knife Installation

Installation method:
1. Take out the air knife adapter, air knife assembly and protective screws.

2. Align the air knife adapter with the center of the welding body and install it on the welding body. Align the pin on the welding body with the pin hole on the air knife adapter.

3. Use 4 protective screws to lock the air knife adapter and install the air knife adapter on the welding body.
4. Loosen the 4 top screws, install the air knife assembly on the air knife adapter as shown in the figure, lock the 4 top screws, and complete the installation of the air duct.





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