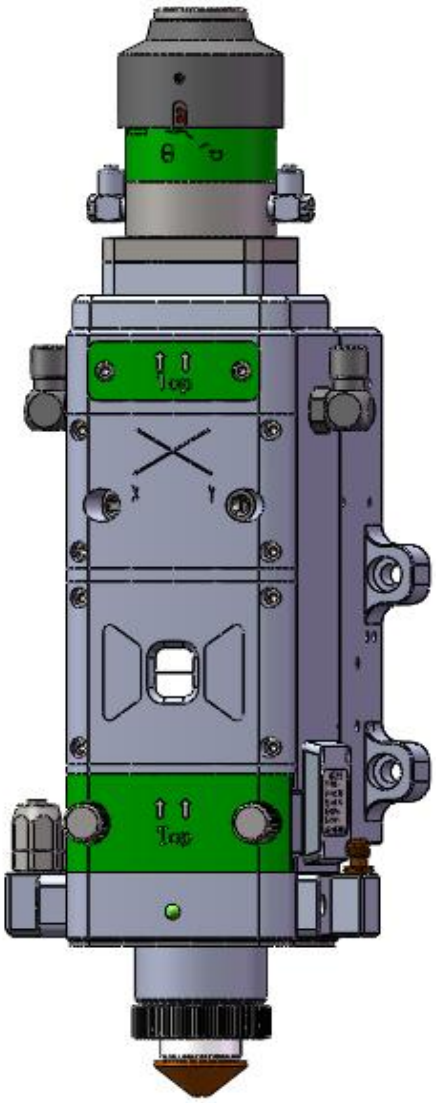
Shenzhen RelFar Intelligent Technology Co., Ltd.

FCP30-M10 automatic focusing cutting head



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Foreword

Thank you for choosing our products!

To enable you to have an overall understanding of our company, there is a detailed introduction regarding features, structural features, technical parameters, instructions for use and maintenance of the product in the Manual. Carefully read the Manual to help you better us it before the product is used.

Due to constant update of product functions, the product you received may differ from the description in the manual. We hereby express our deep sorry for this matter! In case of any question in the use process, timely call us for consultation, and we will offer dedicated service to you wholeheartedly.

Contents

Contents

Chapter I Overview

1.1 Product parameters

Fiber interface	QBH
Wavelength scope	1,070±20nm
Rated power	≦3, 000W
Collimation focal length	100mm
Focus focal length	125mm/150mm
Horizontal adjustment range	±1.5mm
Vertical adjustment range	±10mm
Auxiliary gas pressure	≤25 bar
Effective clear aperture	25mm
Weight	3.8KG

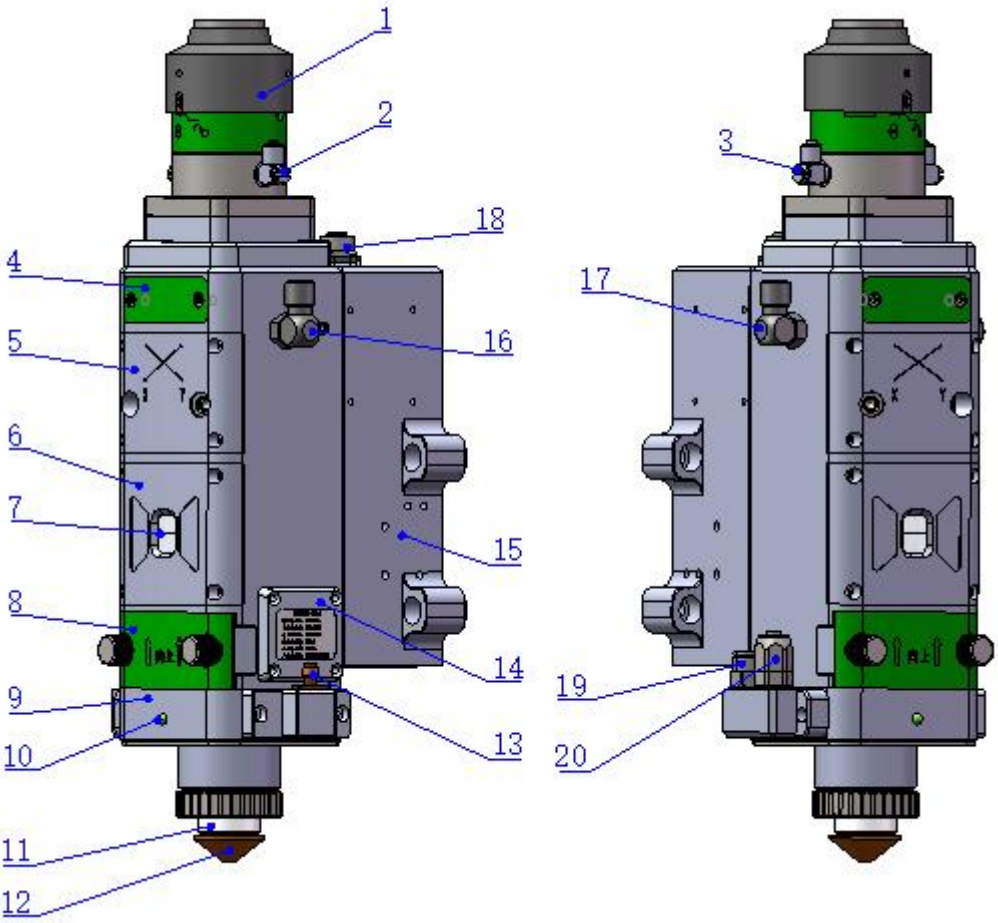
1.2 Precautions

※ To ensure personal safety, wear the special fiber laser protective glasses before operation.

※ It's necessary to keep the product clean and prevent the cooling liquid, condensate water or other foreign matter from intruding into the cavity, or the functional contamination and functional impact of related parts will be incurred.

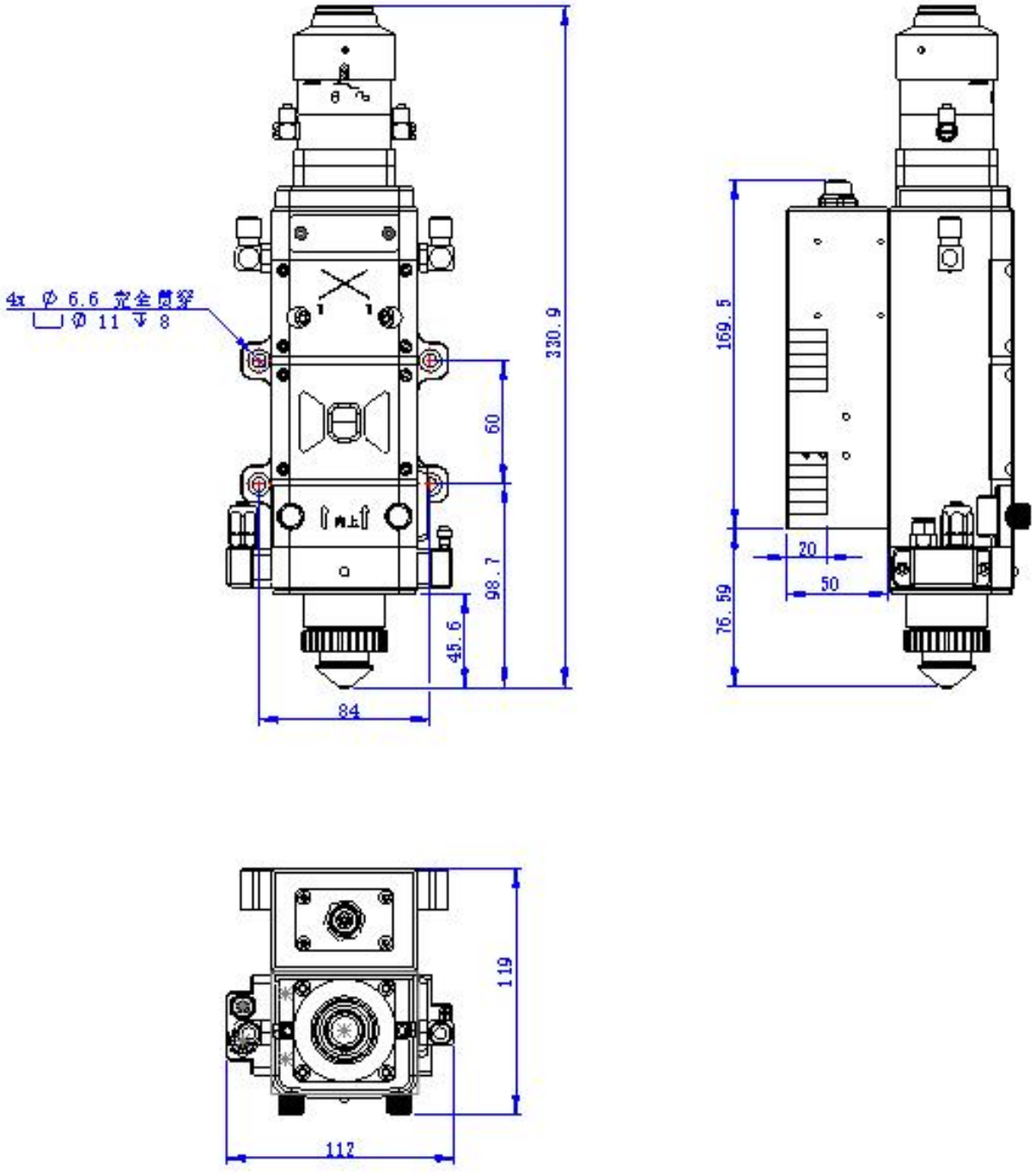
Chapter II Structural Characteristics

2.1 Product structure



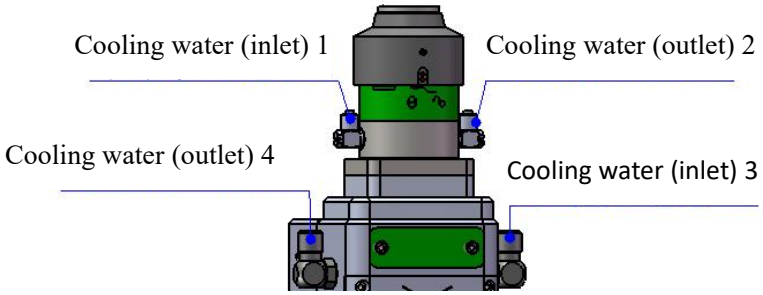
1	QBH interface	11	Ceramic body
2	Inlet of cooling water 1	12	Nozzle
3	Outlet of cooling water 2	13	Amplifier interface
4	Collimation lens protective glass module	14	Temperature protection device
5	Collimation module	15	Motor assembly module
6	Focus module	16	Inlet of cooling water 3
7	Focal point calibration window	17	Outlet of cooling water 4
8	Focus protective glass module	18	Aviation plug interface of power supply
9	Sensor base	19	Cooling gas interface
10	Temperature control indicator	20	Cutting gas interface

2.2 Installation dimension

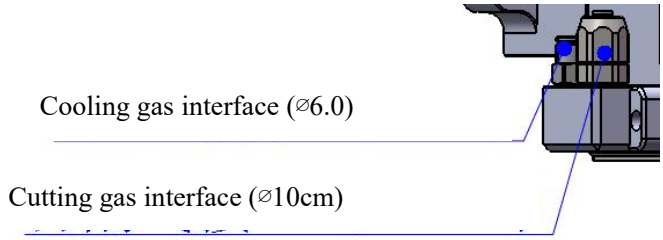


3.1 Pipe connection

Cooling water channel connection (use Ø6.0 water pipe)



Gas interface



Connection of cooling water and cutting gas and usage requirements:

Notes: Gas for regular use: Compressed air (oil-water filtration required)

Gas for regular use: argon, nitrogen, compressed air and oxygen (oil-water filtration required).

3.1.1 Cooling water:

The 6mm air tube is connected. The main function is that the excess heat is taken away by cooling through the internal structural member water route when the heat is produced by the light path in the cavity to ensure the cutting performance. The

series connection of cooling water pipeline is required, with one-in and one-out water circulation connected.

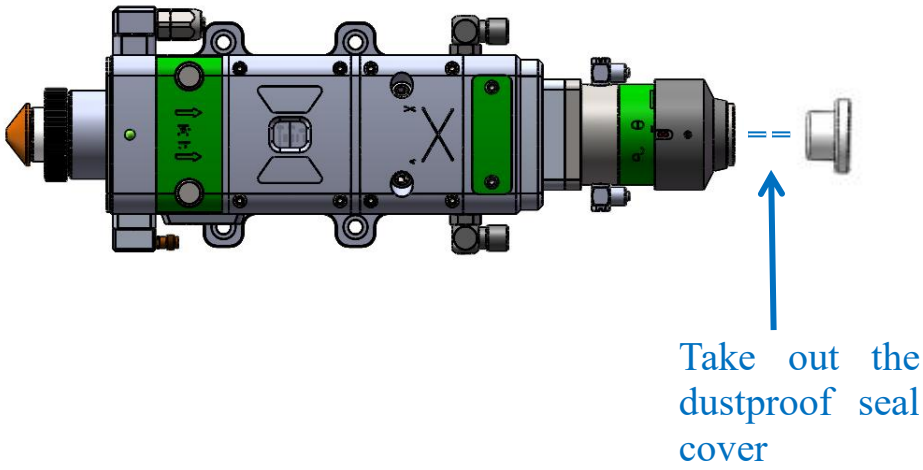
3.1.2 Cutting gas:

Connect to a 10mm gas pipe to assist in cutting products, and the gas pressure output is ≤25Bar.

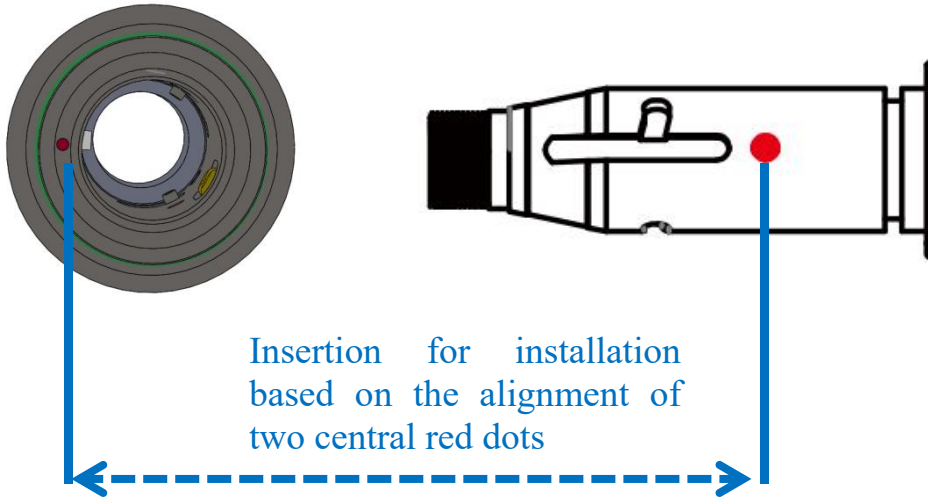
3.1.3 Cooling gas interface: Cool and cutting that cop nozzle while blowing off the slag hanging on the surface of the copper nozzle.

3.2 Optical fiber input installation

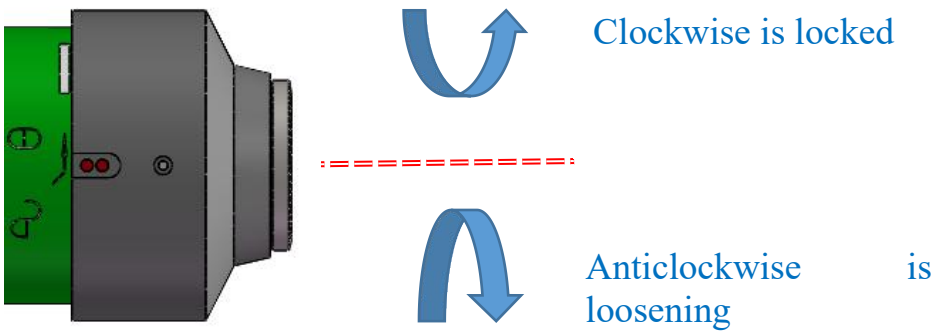
※ The QBH is a horizontal arrangement to take out the dustproof seal cover.



※ Align the red dot on the fiber optic head with the QBH red dot, and slowly insert the fiber optic head into the QBH.



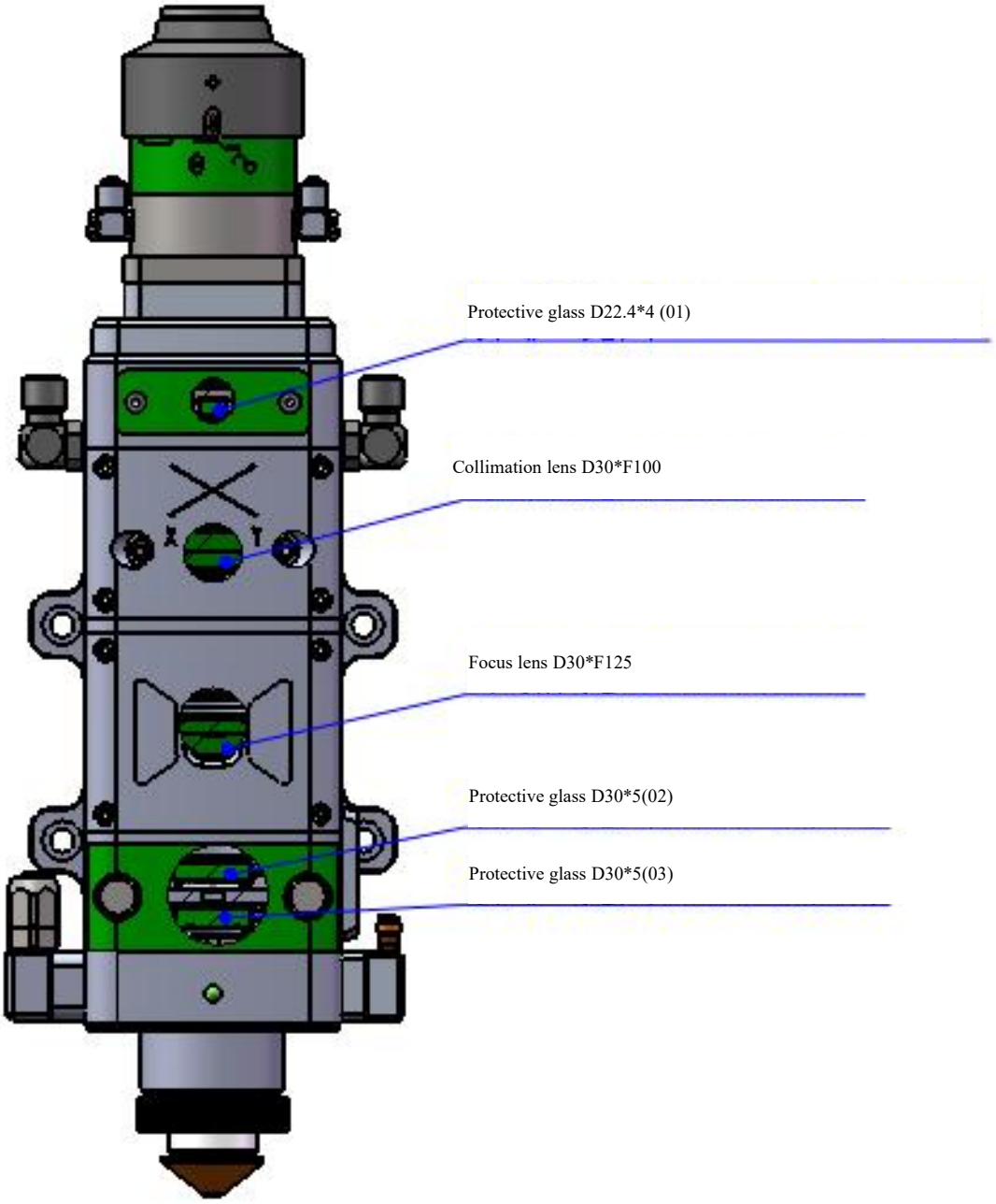
※ The QHB is screwed to the locking state: Rotate it to the limiting position clockwise (hearing the "click"), lift up the rotating mantle, and clockwise rotate the mantle until the head of optical fiber is compressed.



Chapter IV Maintenance

4.1 Structure of optics lens

※ The assembly is completed in the dust-free plant at the time of replacement of parts. In principle, other modules are forbidden to be dismounted except that the protective glass drawer can be disassembled and assembled. If it is necessary to check the collimation lens and focus lens, the product shall be put into a clean environment for disassembly.

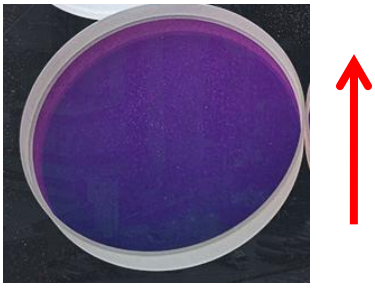


4.2 Cleaning of optics lens

※ When the optics lens are cleaned, the operation method and attention points are as follows:

※ Tools: dust-free gloves or dust-free fingerstall, dust-free wiping cotton swab, isopropyl alcohol, and caned dry and pure compressed air.

※ Spray the isopropyl alcohol onto the dust-free cotton swab, align the lens to eyes, gently pinch the side edge of the lens with left thumb and index finger and hold the dust-free cotton swab with right hand to gently wipe the front and back of the lens in a single direction from bottom to top or from left to right (avoid wiping back and forth to avert the secondary contamination of lens), blow the surface of the lens with filling dry and pure compressed air and confirm the surface of lens is free from foreign matters after cleaning.



4.3 Disassembly and assembly of optics lens

4.3.1 Disassembly and assembly of collimation lens

Tools: 2.5mm hexagon key wrench, special fixture, dust-free cotton swab and alcohol

※ The disassembly and assembly shall be completed in a clean place. When the lens are dismounted, the dust-free gloves or dust-free fingerstall.

※ Disassembly and assembly steps:

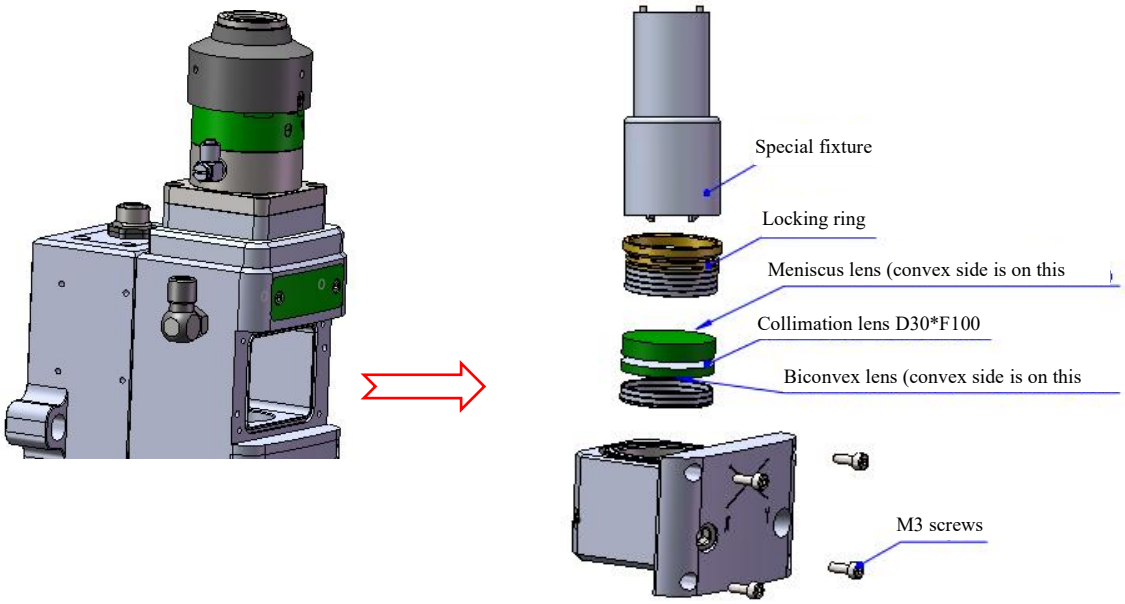
Step I: Clean up all the dust on the surface of the laser head firstly.

Step II: Loosen M3 screws in sequence with a 2.5mm hex wrench.

Step III: Take out the component module and seal the port with textured paper to prevent the dust from entering the cavity.

Step IV: Use the special disassembly lens cone fixture to loosen the locking ring by anticlockwise rotation to slowly take down the lens. And seal the port with textured paper to prevent the dust from entering the cavity to replace the collimation lens. (Note: as for the gasket placement location and thickness, the

gasket will influence the light path. After the dismantling, the gasket thickness shall be recorded.)



4.3.2 Disassembly and assembly of focus lens

Tools: 2.5mm hexagon key wrench, special fixture, dust-free cotton swab and alcohol

※ The disassembly and assembly shall be completed in a clean place. When the lens are dismounted, the dust-free gloves or dust-free fingerstall.

※ Disassembly and assembly steps:

Step I: Clean up all the dust on the surface of the laser head firstly.

Step II: Use a 2.5mm hexagon key wrench to loosen the M3 screws in sequence 1, 2 and 3, take out the cover plate, shown as Figure 1, then, loosen the M3 screws on the graduated

lens cone, shown as Figure 2, and connect the left and right tooth holes with this screw, shown as Figure 3, and take out the lens cone component module.

Step III: After the component modules are assembled, seal the exposed sealing surface on the cavity with textured paper to prevent dust from entering.

Step IV: Use a special lens cone disassembly & assembly fixture to rotate counterclockwise to loosen the locking ring, and slowly take out the focus lens upside down, and replace the focus lens. (Note: as for the gasket placement location and thickness, the gasket will influence the light path. After the dismantling, the gasket thickness shall be recorded.)

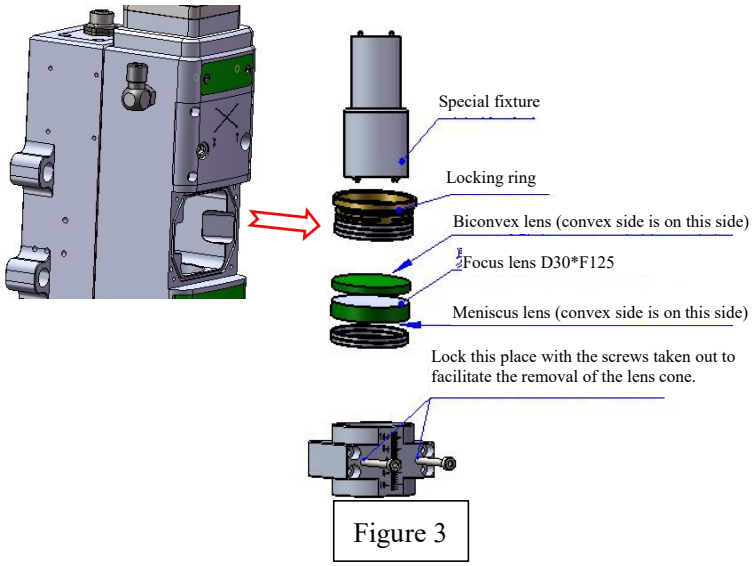


Figure 3

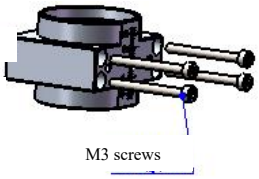


Figure 2

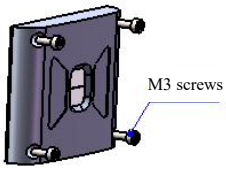


Figure 1

4.3.3 Disassembly and assembly of protective glass 01

※ The disassembly and assembly shall be completed in a clean place. When the lens are dismounted, the dust-free gloves or dust-free fingerstall.

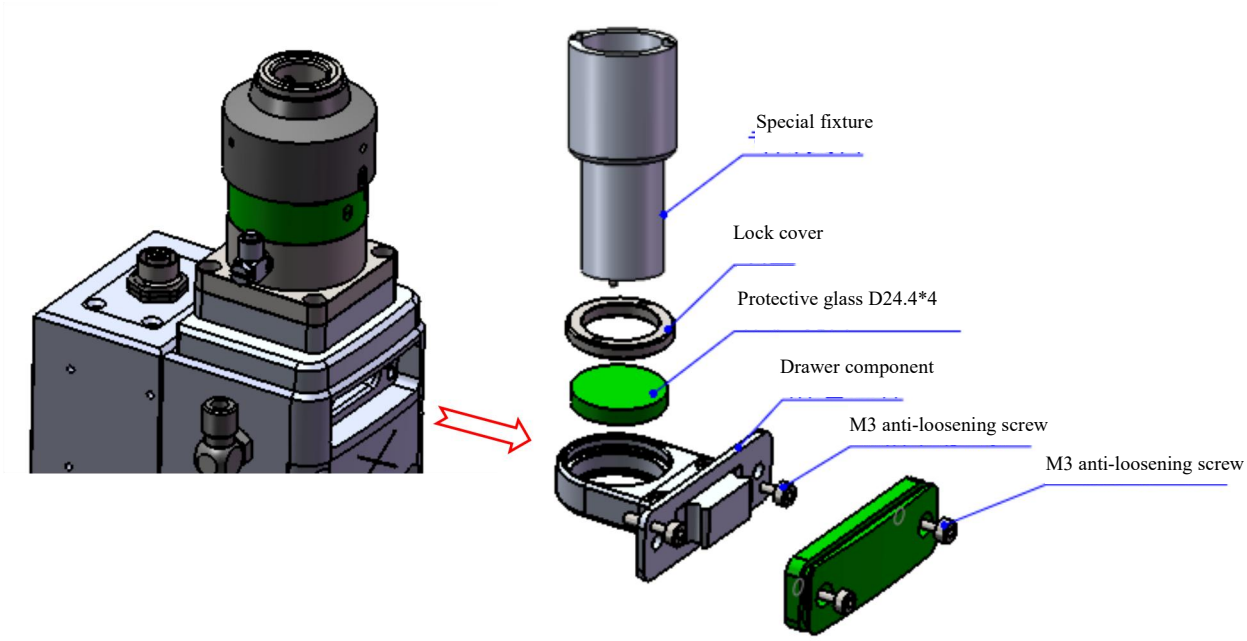
Operation method:

Step I, loosen M3 screw and take out the green dust handle.

Step II, loosen M3 screw and take out the drawer component module horizontally.

Step III, during replacement of the protective lens, seal the exposed window on the cavity with textured paper to prevent dust from entering.

Step IV: Use a special fixture to rotate counterclockwise to take out gland and replace protective lens.



4.3.4 Disassembly and assembly of protective glass 02

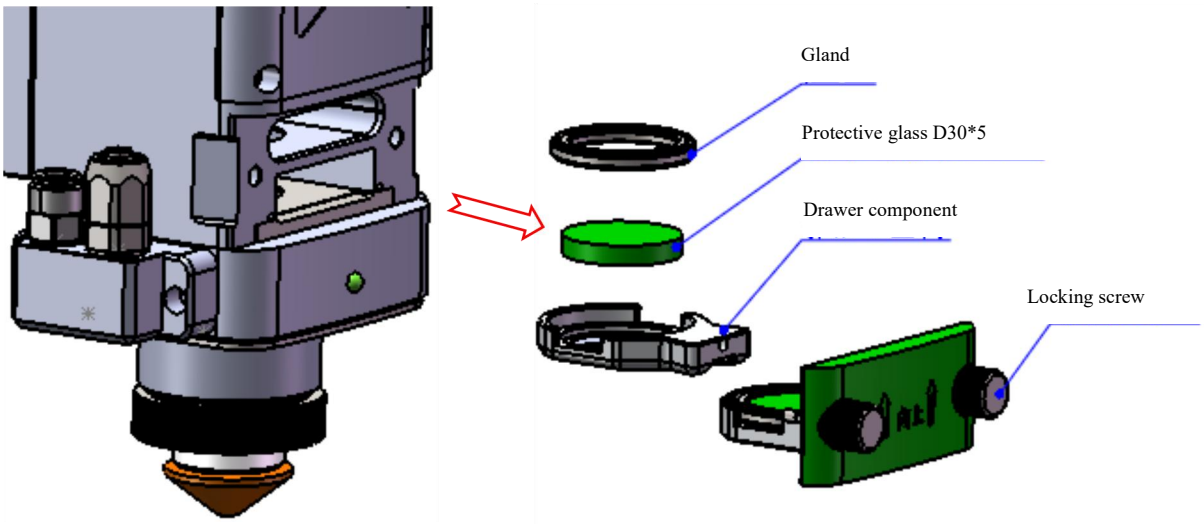
※ The disassembly and assembly shall be completed in a clean place. When the lens are dismounted, the dust-free gloves or dust-free fingerstall.

Operation method:

Step I, loosen the locking screws on both sides of the green handle, take out the green drawer module with both sides in hand, and put it aside for dust protection.

Step II, draw out the drawer component module directly, and seal the exposed window on the cavity with textured paper to prevent dust from entering.

Step III, take out the gland and replace the protective lens.

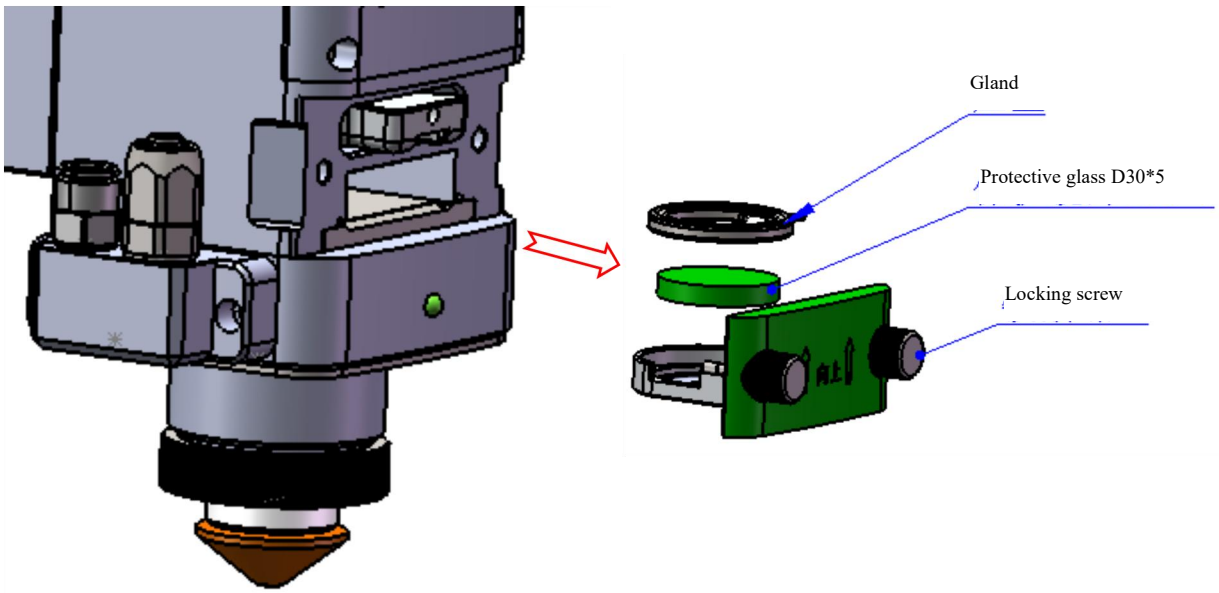


4.3.5 Disassembly and assembly of protective glass 03

※ The disassembly and assembly shall be completed in a clean place. When the lens are dismounted, the dust-free gloves or dust-free fingerstall.

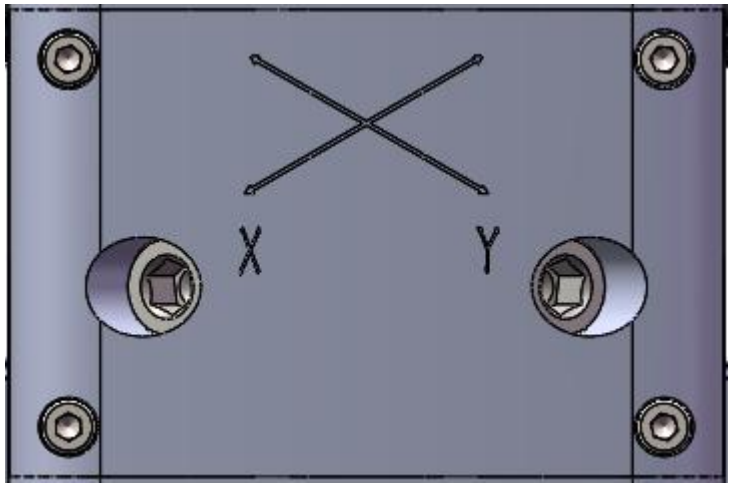
Step I, loosen the locking screws on both sides of the green handle, take out the green drawer module with both sides in hand, and take it out horizontally. For example, during replacement of the protective lens, seal the exposed window on the cavity with textured paper to prevent dust from entering.

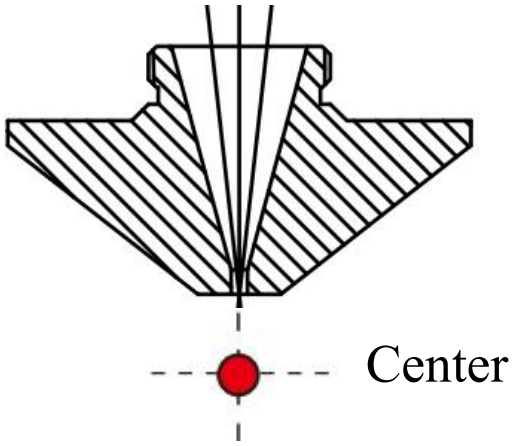
Step II: Take out the gland and replace the protective lens.



4.3.6 Centering

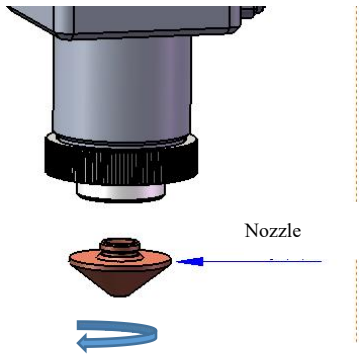
1. Turn the screws on the left and right sides of X and Y to adjust the optical center and the nozzle to be concentric at the center point, so as to avoid light hitting the inner wall of the nozzle.





4.3.7 Replacement of nozzle

1. Turn counterclockwise, loosen the nozzle and replace.



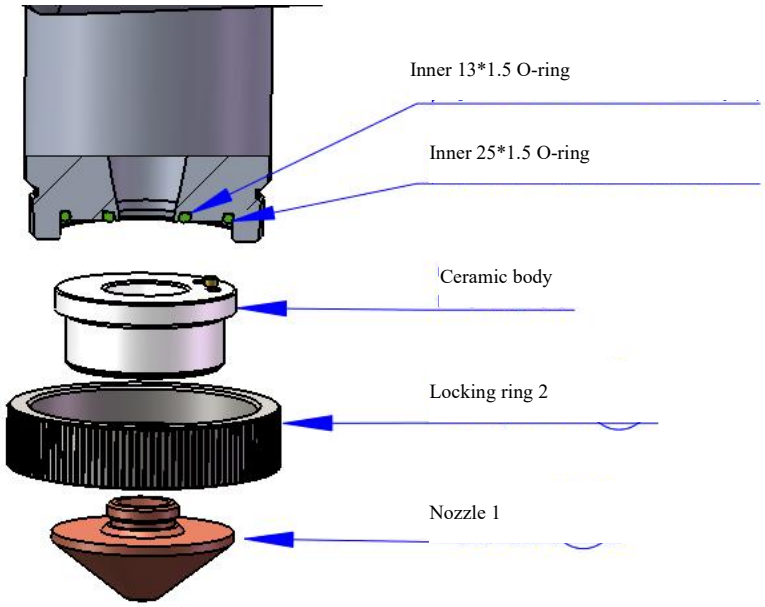
4.3.8 Replacement of ceramic body

Operation method:

Step I: Turn counterclockwise, loosen the nozzle ① and take it out.

Step II: Turn counterclockwise, loosen the locking ring ② and take it out.

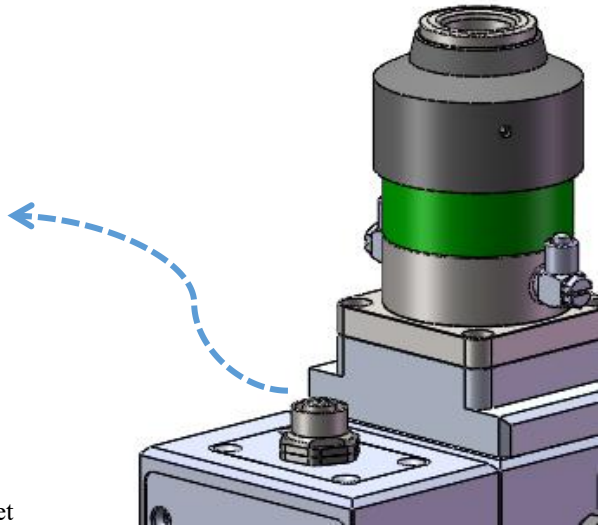
Step III: Replace the ceramic body and take it out (note that the O-ring will be attached to the structure during taking out the ceramic body, and be careful, not to fall it off, please fix it. Install and align the pinhole direction at 2 places.

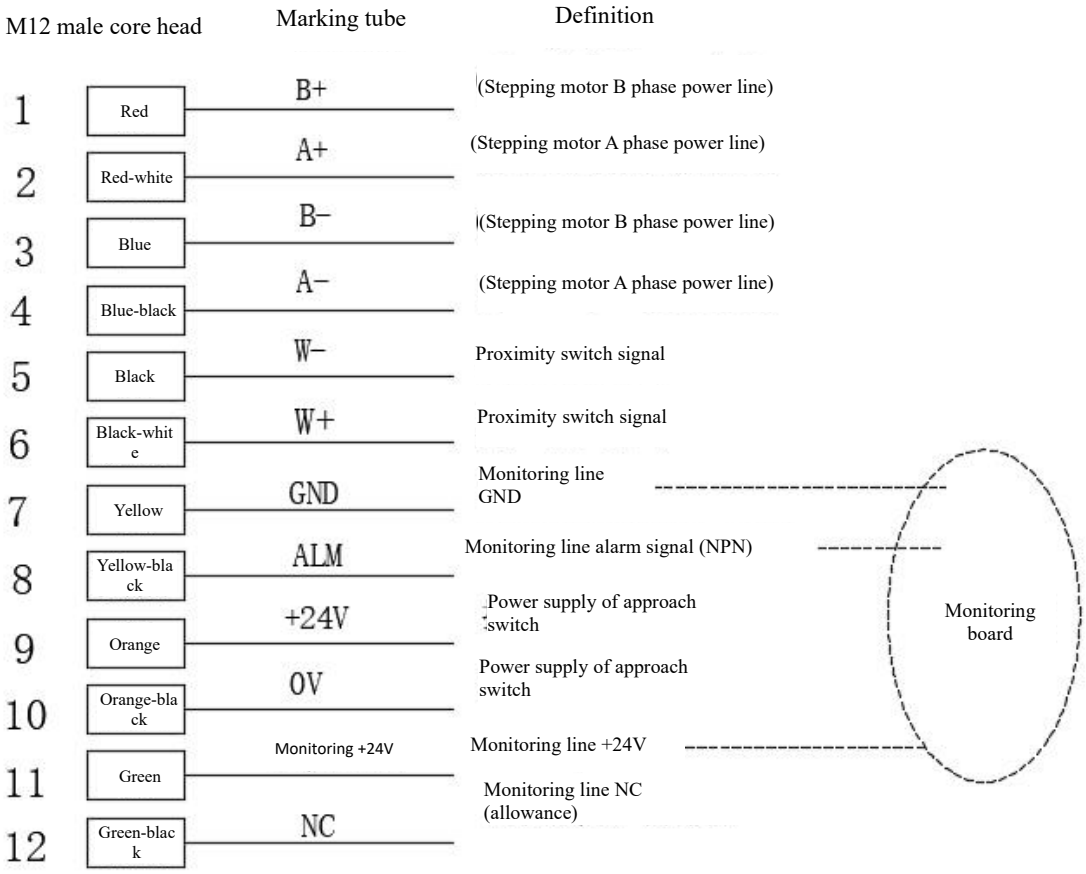


Electrical engineering

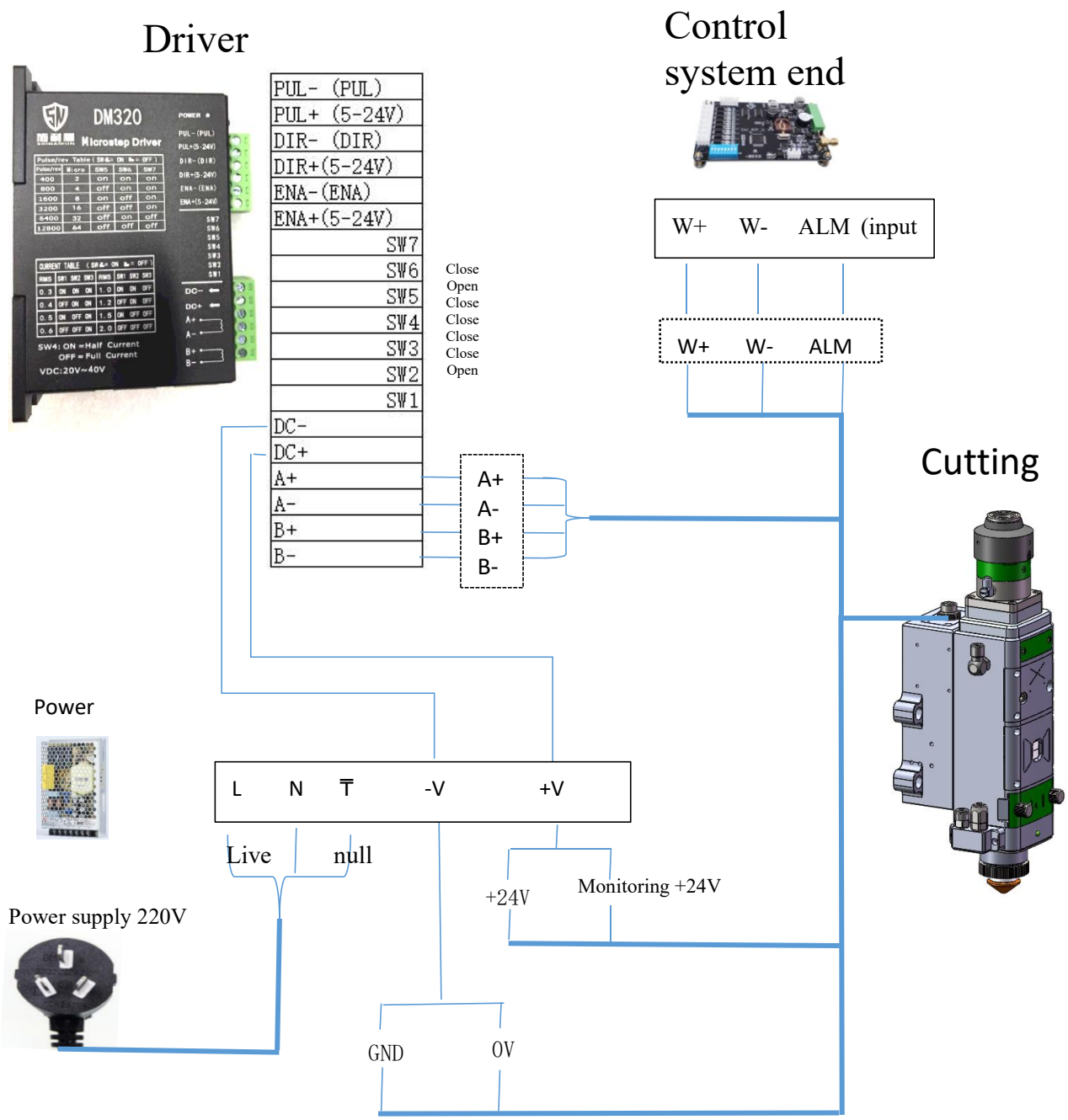
5.1 Electrical interface and definition

M12 12P male aviation plug socket





5.2 Schematic of control wiring;



5.3 System control signal wiring

Shanghai Friendess

Shanghai Friendess DB15 | Servo control interface | Driver

Signal name	Pin	Signal name
PUL+	1	PUL+(CW+)
PUL-	9	PUL-(CW-)
DIR+	2	DIR+(CW+)
DIR-	10	DIR-(CW-)
A+	3	空
A-	11	空
B+	4	空
B-	12	空
Z+	5	空
Z-	13	空
24V	8	空
SON	6	空
CLR	7	空
ALM	14	空
0V	15	GND

Shanghai Friendess

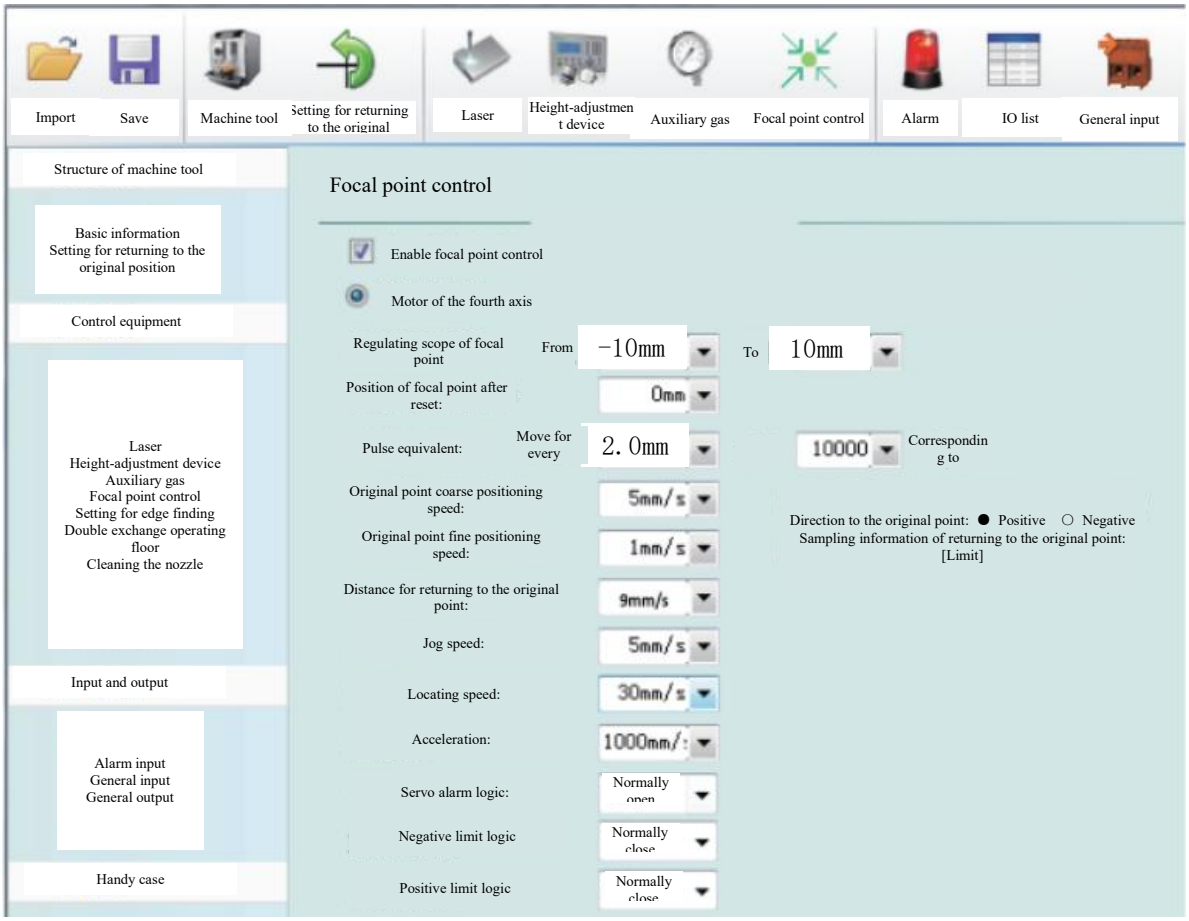
Shanghai Friendess DB15 | Servo control interface | Electric control box

Signal name	Pin	Signal name
PUL+	11	PUL+(CW+)
PUL-	12	PUL-(CW-)
DIR+	13	DIR+(CW+)
DIR-	14	DIR-(CW-)
A+	1	空
A-	2	空
B+	3	空
B-	4	空
Z+	5	空
Z-	7	空
24V	6	空
SON	9	空
CLK	10	空
ALM	10	空
0V	15	GND

5.4 Friendess platform configuration tool

Notes: Please contact the technicians for the combined parameters of different lens configurations.

The screw rod pitch of the stepping motor is 2.0mm.



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Thank you for using the intelligent technology product of Shenzhen RelFar!

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