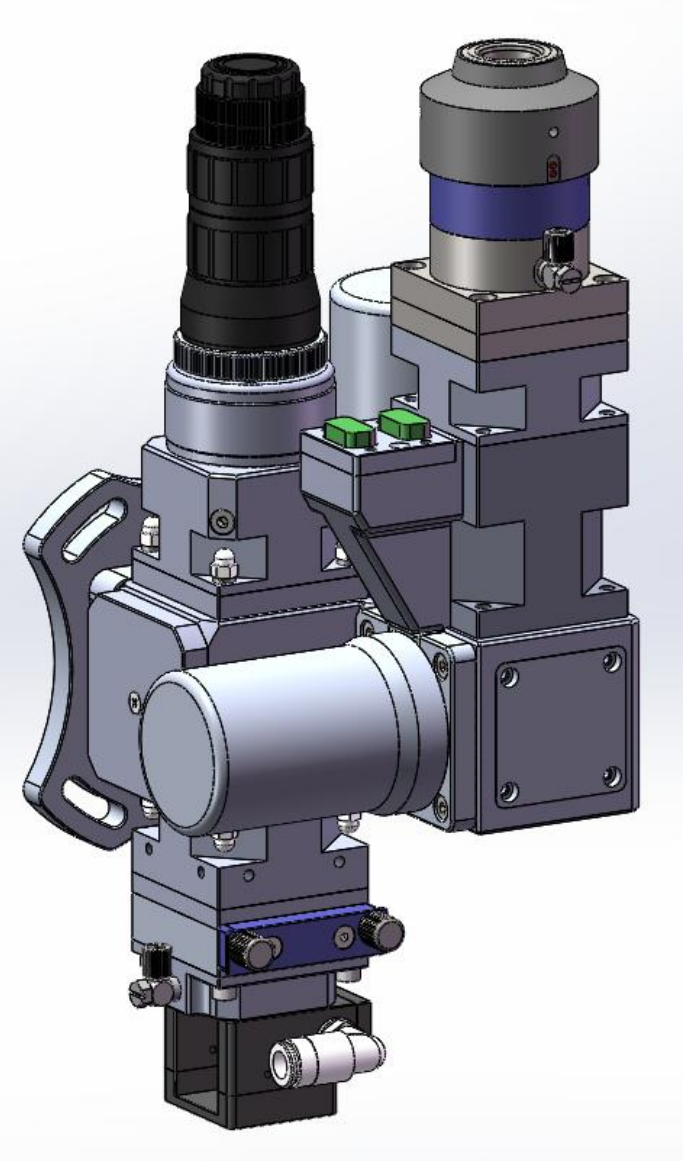
Wobble Welding Head
ND15



User Manual

Shenzhen Worthing Technology Co., Ltd.

Warm Tips

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.

Do not stare into beam!

Please wear goggles of DIN EN 207 and BGV B2 standard!

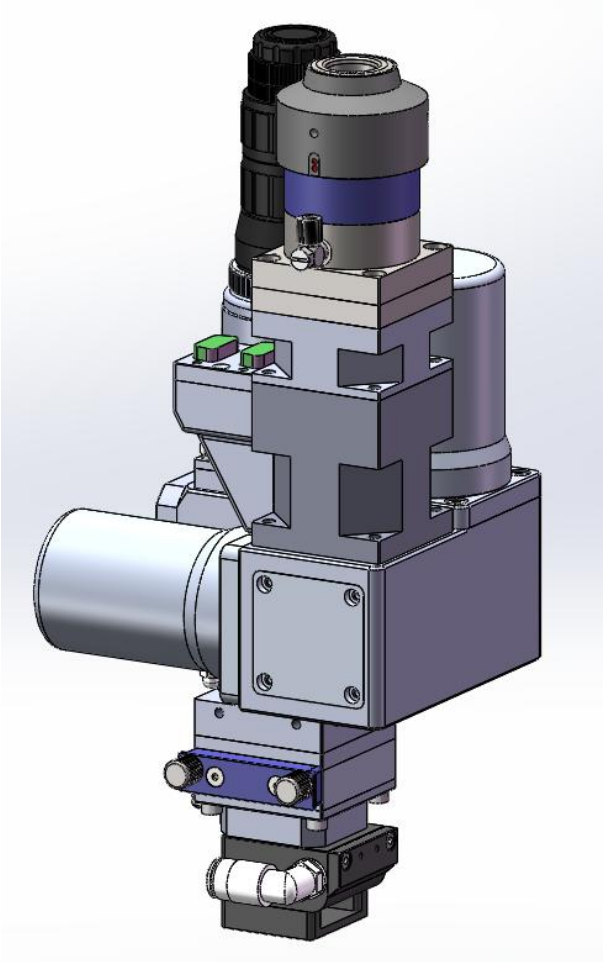
Do not touch the laser head with any body parts when it works!

Take care not to be burned by the remaining heat after welding!

Precision products. Do not strike it!

Product: Wobble Welding Head

Model: ND15



Product Features:

This welding head has strong advantages in aluminum alloy welding and low power welding. It is an economical and efficient welding head.

This welding head has motor driven X、Y axis wobble lens, which has a variety of wobble modes, suitable for irregular welding, large gap welding and other welding, which can significantly improve the welding quality.

The internal structure of this welding head is completely sealed to avoid dust contamination of the optical part.

This welding joint is equipped with air curtain and coaxial parts to reduce the contamination of the lens by welding smoke and spatter residue.

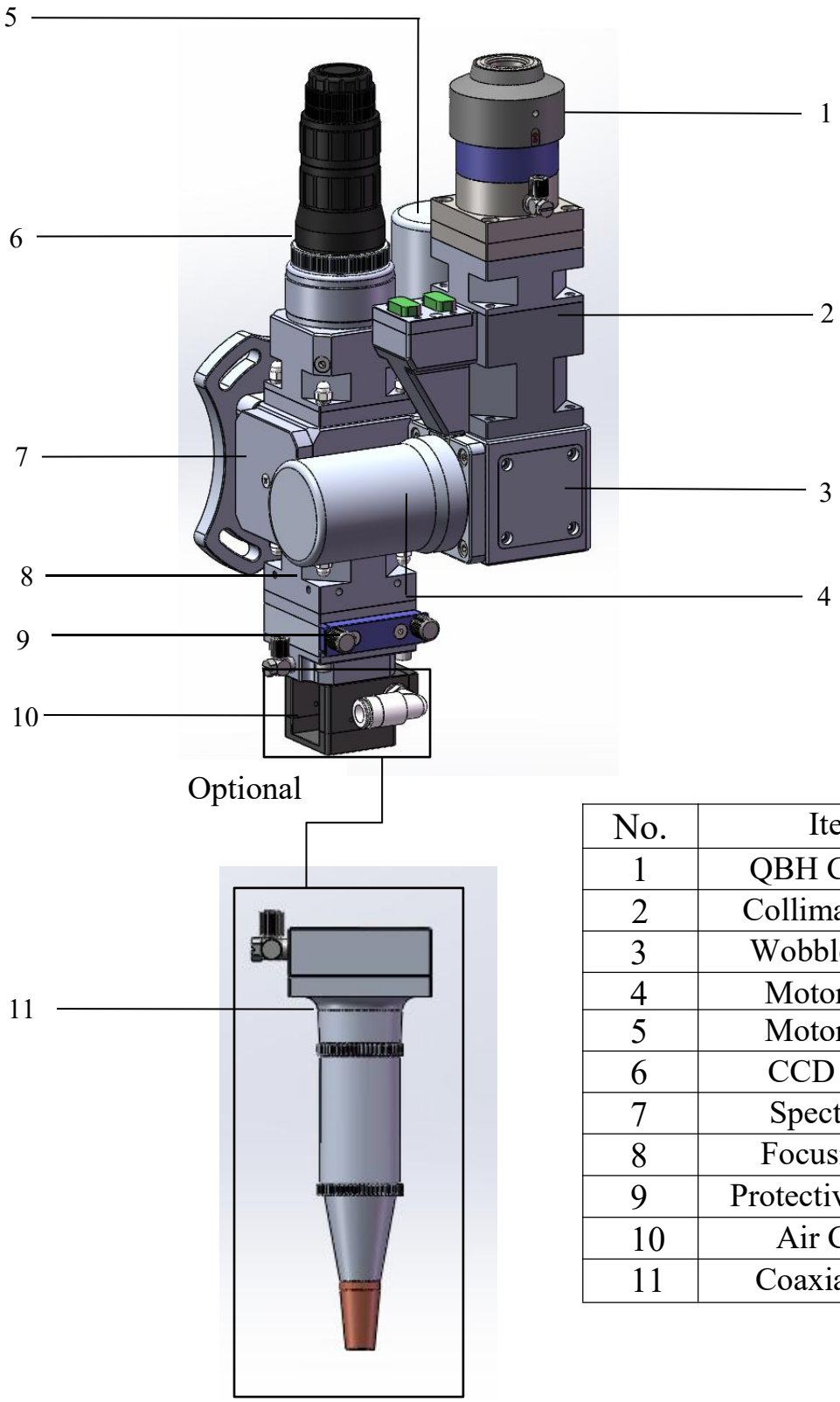
Protective window is drawer type and can be replace easily.

It can be equipped with variety of QBH laser source.

Contents

1. Product Description

1.1 Product Structure



No.	Item
1	QBH Connector
2	Collimating Lens
3	Wobble Module
4	Motor X Axis
5	Motor Y Axis
6	CCD Module
7	Spectroscope
8	Focusing Lens
9	Protective Window
10	Air Curtain
11	Coaxial Nozzle

1.2 Main Function

1.2.1 Component

※QBH Connector

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

※Collimating Lens Component

The collimating lens is assembled in the laser head and contains collimating lens cavity, double convex lens, washer and locking ring.

※Wobble Module

It adopts motor driven X、Y axis wobble lens, which has a variety of wobble modes, expands the area of the welding, suitable for irregular welding, large gap welding and other welding.

※CCD Module

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

※Spectroscope

Reflect the laser on the workpiece surface.

※Focusing Lens

The focusing module is assembled in the welding head, it contains the focusing lens group, focusing lens cavity, washer, locking ring and water cooling.

※Protective Window

It makes the welding slag not spatter directly on the focusing lens, and protects and prolongs the service time of the focusing lens.

※Air Curtain

It blows the rebound slag away to provide protection for the protective lens.

1.2.2 Design and 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

※Protective 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 parameters

Parameter	
Max Power	2000W
Collimating Length	100mm
Focusing Length	200mm
Weight	3.3 kg
Clear Aperture (mm)	¢26

Fit for various laser source.

3. Installation & Connection

3.1 Safety Instruction

Any maintenance or accident investigation requiring professional knowledge must be carried out by professionally trained personnel.

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

.

3.2 Unpacking Check

※Unpacking Check

1.Intact box;
2.The signage 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

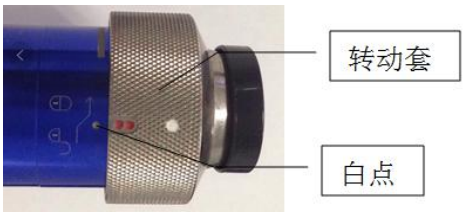
1.A set of metric hexagonal handle;
2.One bag of clean rod, one bottle of anhydrous ethanol(500ml), one package of clean gloves.
3.Clean and dust-free working environment.

※Preparation of installation personnel

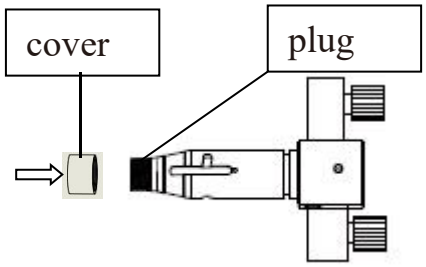
1.Read this manual carefully;
2.Wash hands with soap;
3.Wear dust-free gloves;
4.Wear a mask if necessary.(Note - Dust removal is of utmost importance)

3.4 QBH and Fiber Connection

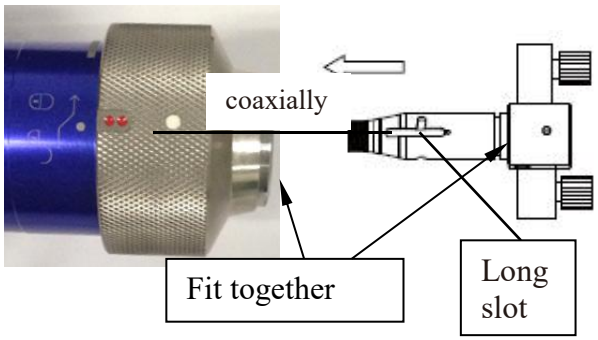
Step one： Before turning the rim as below, make sure the red marks are aligned to the white marks.



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.

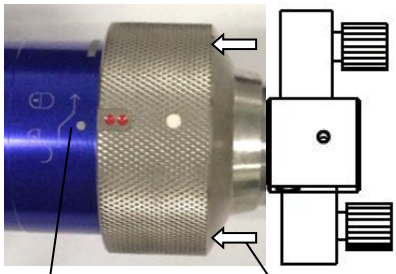


Step three： Remove the dust cover from QBH, place the clean fiber rod and the QBH coaxially, make sure the white mark on the QBH is aligned with the locating slot (long slot on fiber rod), insert the fiber rod into QBH gently, until the fiber rod joints the QBH contact surface.

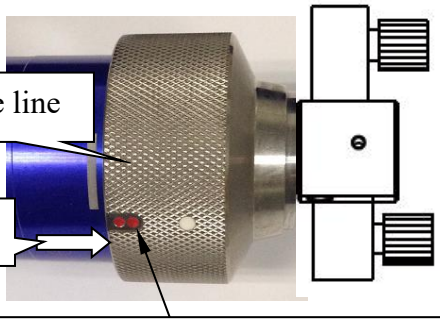


Step four： After inserting the fiber rod into QBH, press the rim gently and turn it about 15 degree along the arrow on the rim. Then pull the rim until its underside is parallel with the top of QBH, turn the rim at the same direction till the limit.

A

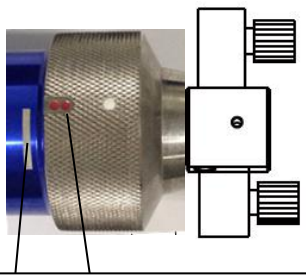


B



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

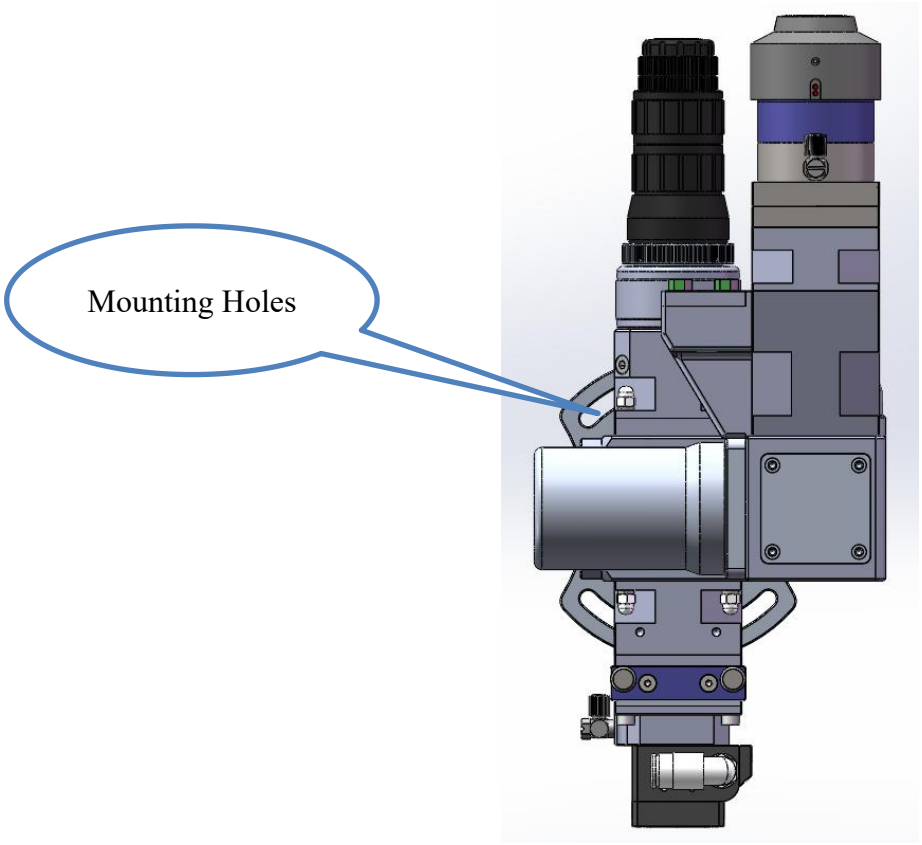
C

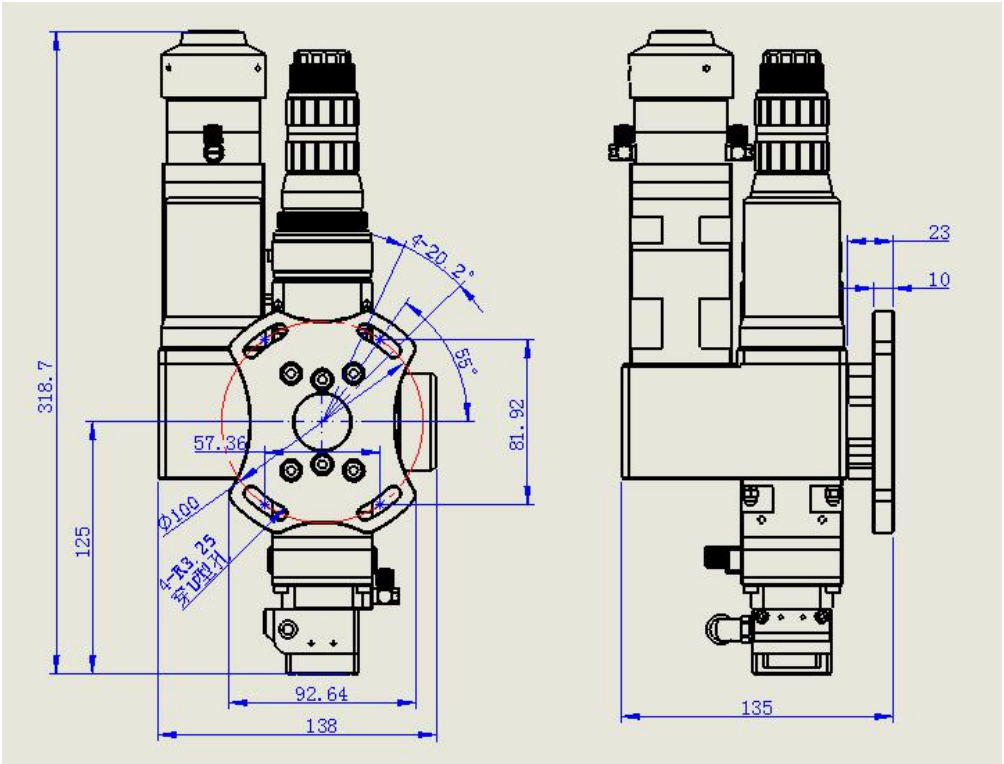


Pull the rim and continue turning, the red dot should be in the scope of the white line or close to the end of white line. The underside of rim

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

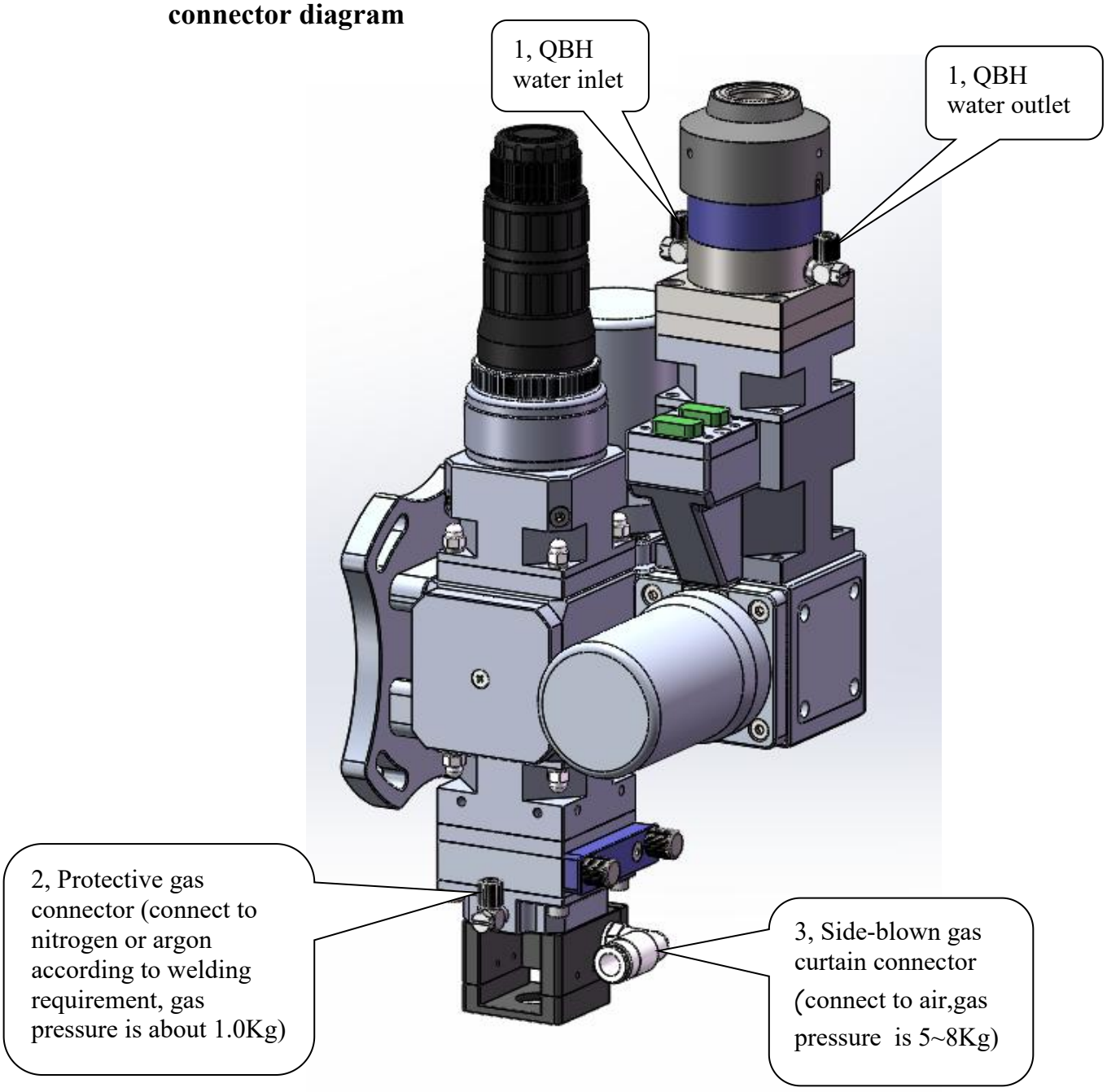




Installation of laser head should be solid and reliable.
The angle of laser head in the vertical direction can be set according to customer requirement.

3.6 Connection of water and gas

Water cooling connector & gas connector diagram



Note:

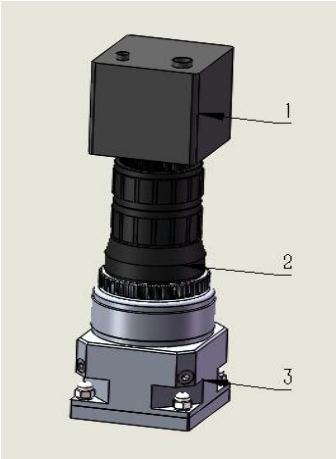
1、 #1 is Φ6 water pipe connector， when using must ensure the water quantity is sufficient, the water pressure should be above 0.4MPa；

2、# 2 is Φ6 gas pipe connector；

3、# 3 is Φ8 gas pipe connector

4、Please keep the bending radius of the connected pipeline not less than 30mm.

3.7 CCD Module



1, Camera
2, CCD connector
3, Mounting base

CCD Module

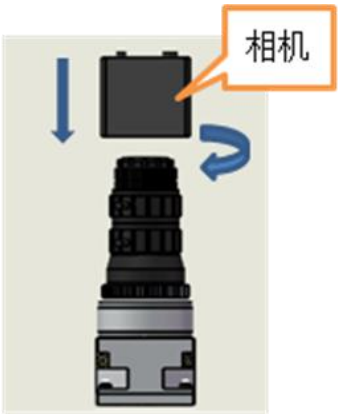
Installation steps of CCD Camera：

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

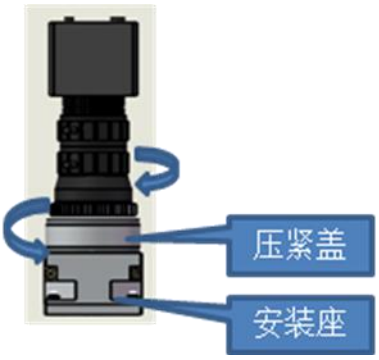
图三

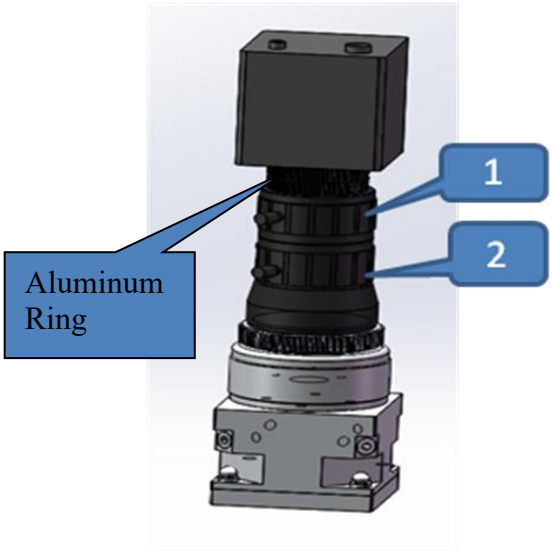
4. Debugging

4.1 CCD Definition Debugging

Camera angular adjustment：

If the camera is tightened at an angle to the mounting seat, loosen the compaction cover as the left picture, turn the lower part of the camera clockwise, make one of the vertical planes of the camera parallel to the mounting seat. (As shown on the right)





CCD definition debugging

Purpose：To make the image clear on the display, adjust as following steps.Adjustment steps（left picture）：

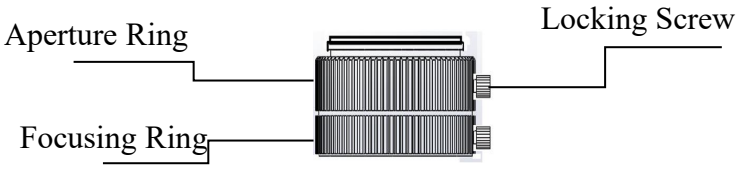
1 、Install industrial camera to the lens properly;

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

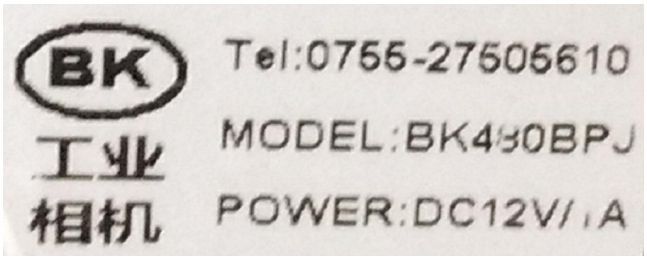
3 、Adjust Aperture Ring(1) to get a certain brightness; (image is clearly visible on the screen)

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.

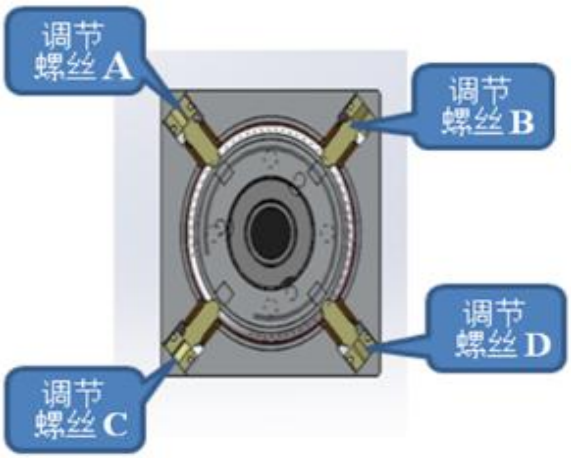
Note：This welding head is equipped with aluminium rings in two different specifications(5mm / 10mm). These are used to increase/decrease image distance. User can assemble or unassemble the aluminium rings to adjust the CCD focusing range according to actual screen display.



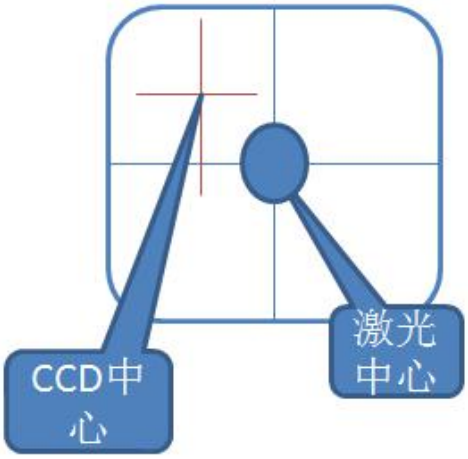
Note： It is recommended to use the CCC digital camera as shown below to make screen images clearer.



4.2 CCD image and laser center coincidence adjustment



Special attention: before using the adjustment screw, the diagonal screw must be released to make room for CCD component movement. Avoid blindly tightening adjustment screws and damage CCD component**s.**



In the process of welding, the CCD image center (cross intersection) must coincide with the laser center.

Adjustment method as follow：

As shown above, the cross point of the CCD on the screen is on the upper left of the laser center and can be adjusted with four adjustment screws mounted on the quadrangle of the seat in the left image.

1, Release D screw properly with hexagonal wrench to make room for CCD to move right down；

2, Tighten the A screw with a hexagonal wrench, forcing CCD to move right down until the intersection of the CCD cross coincides with the center of the laser；

3, If the above two steps fail to adjust the CCD cross intersection to the laser center point or the CCD cross crossing point to move below the laser center position, then use a hexagonal wrench to properly loosen the B screw to make room for the CCD cross crossing point to move up to the right, Then tighten the C screw with a hexagonal wrench, forcing the cross point of the CCD cross to move up to the right until the intersection of the CCD cross coincides with the center of the laser.

4, When the cross crossing of CCD deviates from other positions in the center of the laser, use the hexagonal wrench to adjust the cross point of the CCD cross by loosing the diagonal screw first and then tightening the adjusting screw to adjust the cross point of the CCD cross.

5. Maintenance

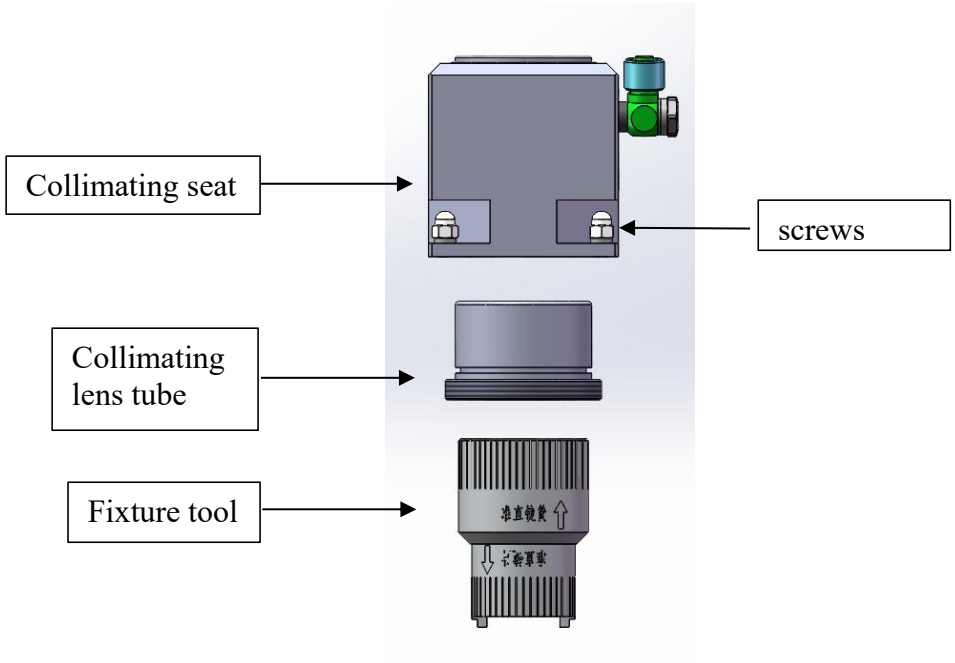
5.1 Maintenance of QBH and Fiber

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.

※ Removal and installation of lenses

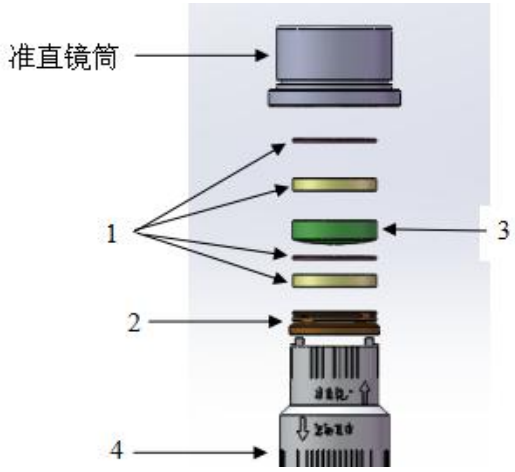
First clean the surface of the laser head with anhydrous ethanol, then loosen the four screws of the collimating seat, separate the whole collimating module, and then use a fixture tool to spin the collimating tube out of the collimating seat, as shown below:



The removal process of collimating lenses is as follows (with drawings):

1. Use fixture tool 4 to twist the spring ring 2 until the spring ring screw are completely removed.
2. Fasten the whole collimating lens tube upside down on a clean plane (keep the spring ring 2 in the collimating lens tube during this process), gently pull out the collimating lens tube upward, be careful not to let the collimating lens 3 fall.
3. After removing the gasket 1 placed on the lens and removing the lens, the lens can be replaced or maintained.
4. After repairing or replacing the lens, please reverse the installation in the order of disassembly, and lock the spring pressure ring to be lighter to avoid damage to the lens.
5. After the spring ring 2 is turned to the end, please retract 1/5 times to ensure that the spring ring 2 has a gap (0.1~0.15mm).

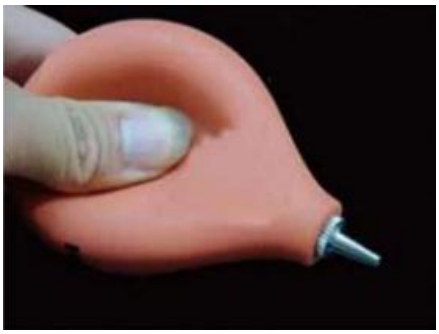
Note: Keep the original order between the parts, the lens should be the same direction as the original!



1 Gasket 2 Spring ring
3 Collimating lens 4 Fixture tool

Cleaning and installation of protective window

1. Use a dust-free clean rod dipped in isopropyl alcohol solvent to clean the lens;
2. Use a hand bellows to draw clean air and blow the attached granules or other foreign matters off the lens;
3. Repeat the above steps several times, until the lens is clean;
4. If the protective window can not be cleaned or it is damaged, user must change a new one.



5.3 The maintenance of the focusing module

Before disassembly, do remember the relative position sequence of each component to facilitate proper replacement of the components after the focus lens is maintenance.

※Disassembly and installation of focusing lens

Disassemble the focusing lens module process:

1、Remove 4 nuts and 4 studs for fixing focusing module with open wrench, rotate and remove focusing module;

1、Use a special tool to unscrew the locking ring 2 for fixing the focusing lens:

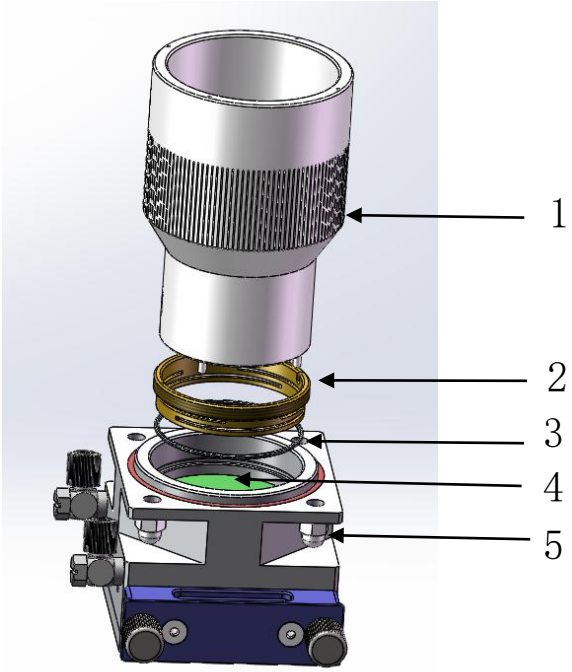
2、Remove focusing lens gasket 3;

4、Take out the double concave focusing lens group and clean or replace it;

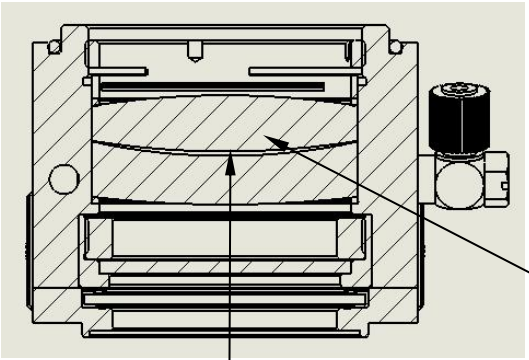
5、The installation of the focusing lens and the components are reversed according to the above process;

6、 During the installation of the focusing lens, when the locking ring is twisted to the end, it is necessary to twist 1/5 laps to keep the gap of 0.1~0.15 between the locking ring and the focusing lens;

7、When installing the focusing lens, the flat convex surface of the focusing lens should be downward, and keep the lens clean.



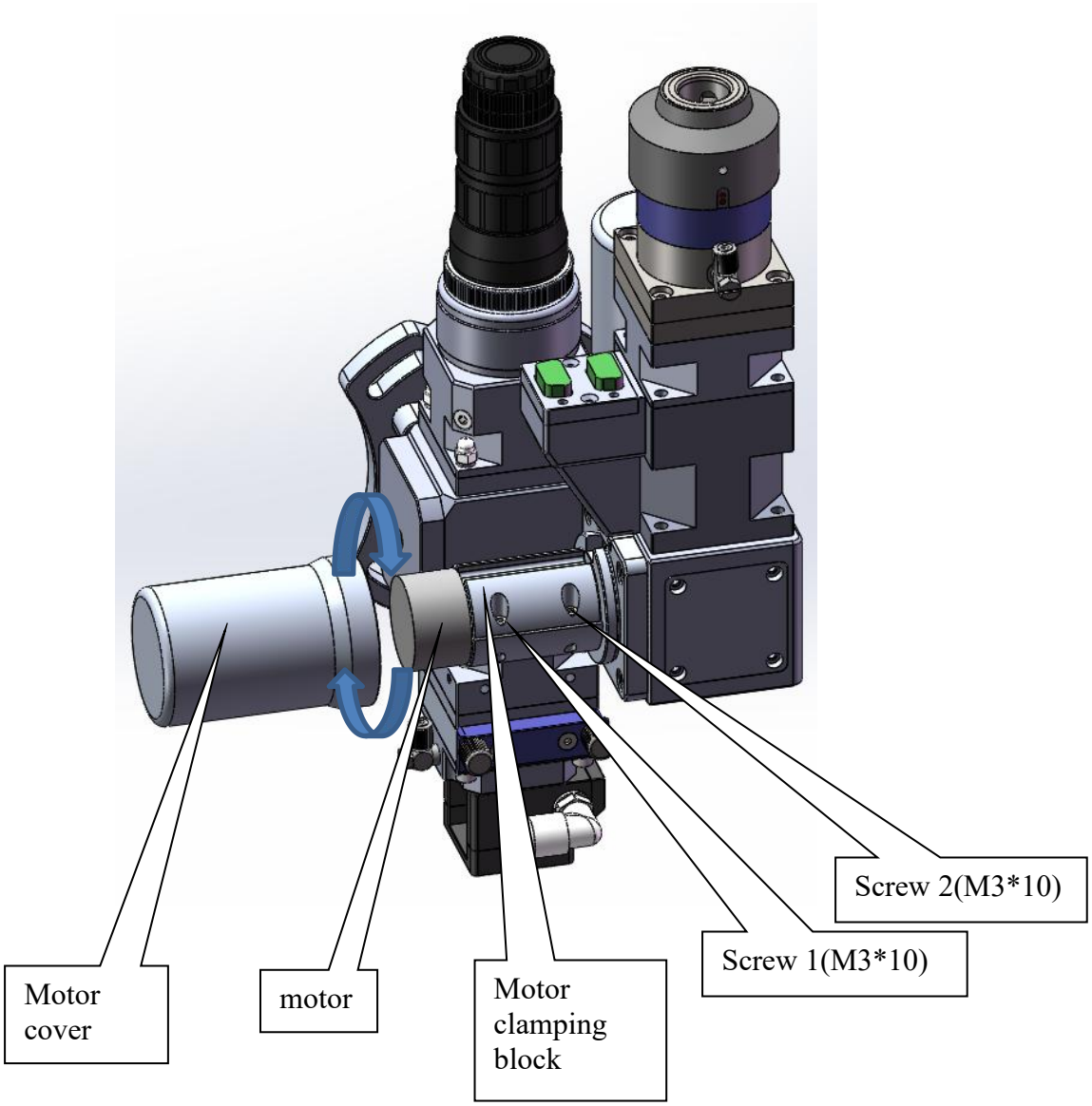
1, Fixture tool;
2, Locking ring;
3, Gasket;
4, Double concave focusing lens group;
5, Nuts



Focusing lens

Flat surface is downward

5.4 Reflector Angular Adjustment



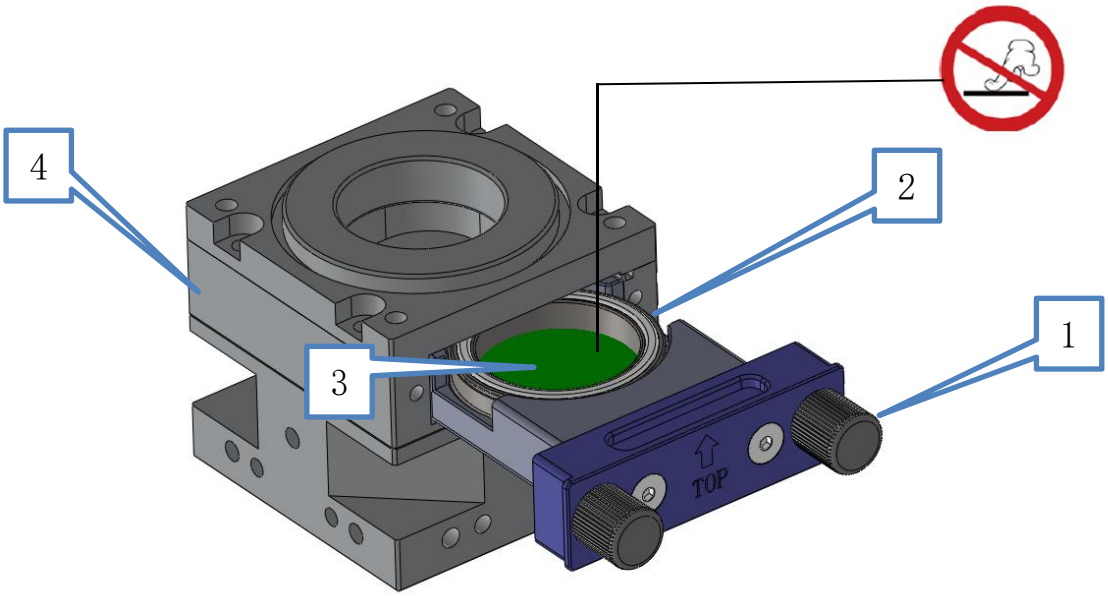
Reflector Angular Adjustment Steps:

1、Remove the motor cover;
2、Loosen screws 1 and 2 with an inner hexagonal wrench to loosen the motor clamping block;
3、Rotating motor, fine-tuning the reflection angle, so that the spot in the positive center, visual view welding dynamic effect is better
4、The angle adjustment method of X and Y axis is the same.

5.5 Cleaning of protective lenses

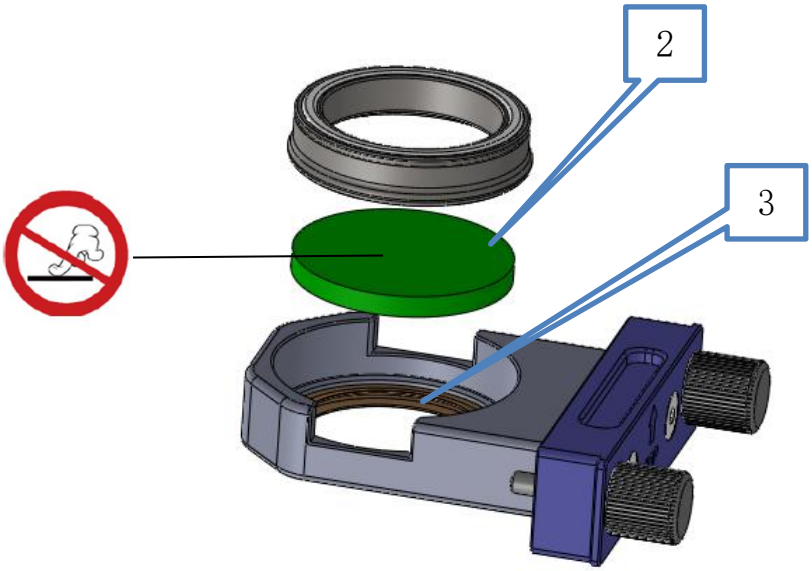
Protective lens maintenance:

1 Unscrew two locking studs 1 by hand and pull the protective window out of the protective lens seat 4;
2 Note: Quickly seal the lens opening after removal with a non-viscose protective film!
3 Maintain the protective lens in a clean environment;
4 Tear off the non-viscose protective film at the opening of the protective lens seat, insert the maintained protective window to the end, and tighten the two locking studs 1.
Note: check that the protective window is locked (no locked protective window can be pulled out).



1 Locking studs 2 Pressing ring 3 Protective lens 4 Protective lens seat

5.6 Protective Lens Replacement



Replacement of protective lens:

1 Remove the pressure ring 1, remove the lens 2 and put it in a clean container. The lens 2 is not in contact with non-gas;
2 Check sealing ring 3 for deformation or notch, if defective, replace it;
3 Ensure that the lens is clean, seal the ring and install the lens 2 in the original direction, press the pressure ring 1。

Note: during the operation, pay attention to keep the environment clean and parts clean, the protective lenses need to be installed in the direction, not in reverse.

Electric Chapter

One、Electrical components

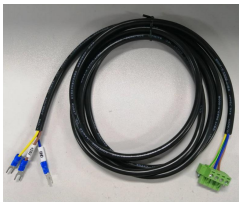



① ② ③ ④

①、Switching power and power cable
②、Motor cable
③、Marking card DA card connecting cable (galvo control signal cable)
④、Galvo control box

Two、 Electrical Components of Single Station Galvo Control System

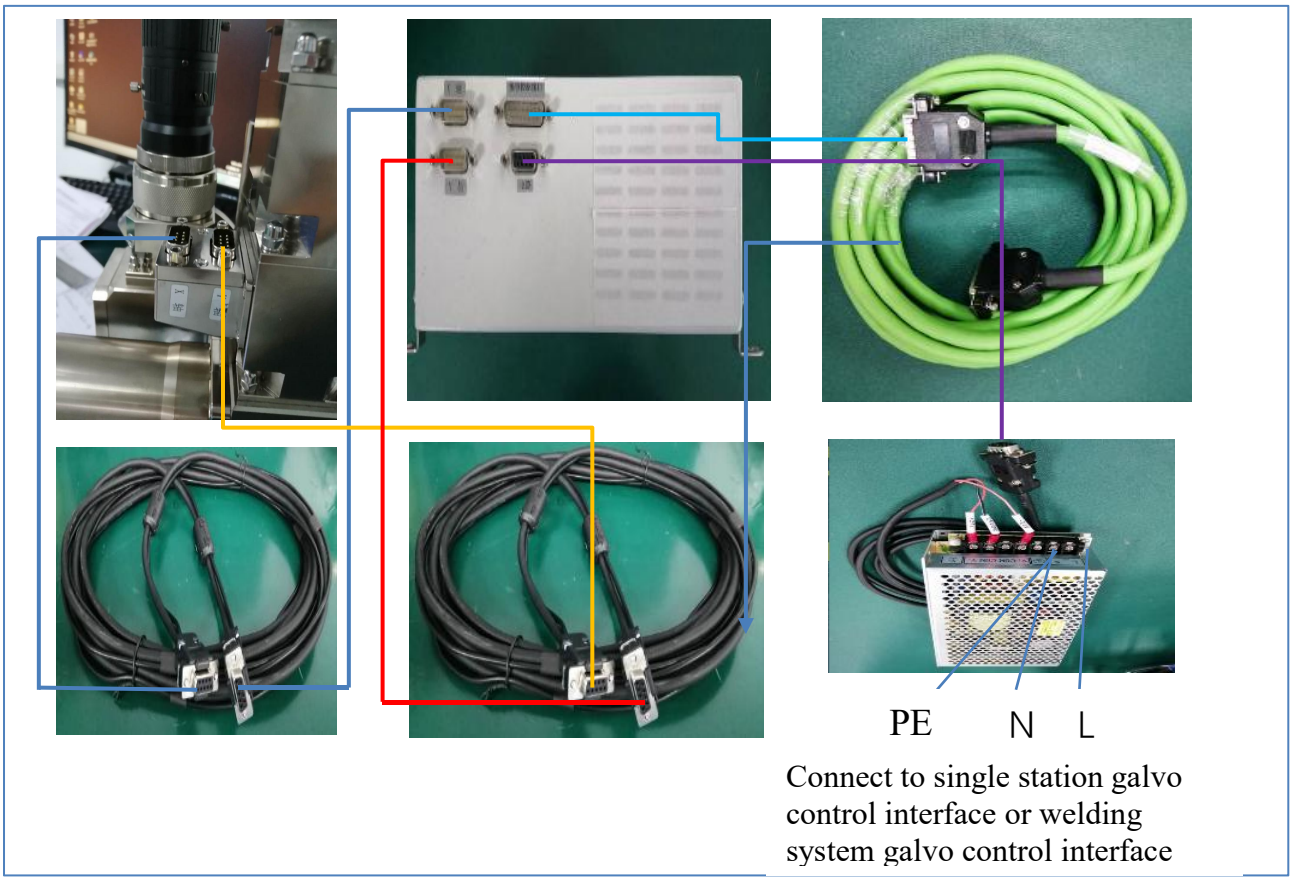


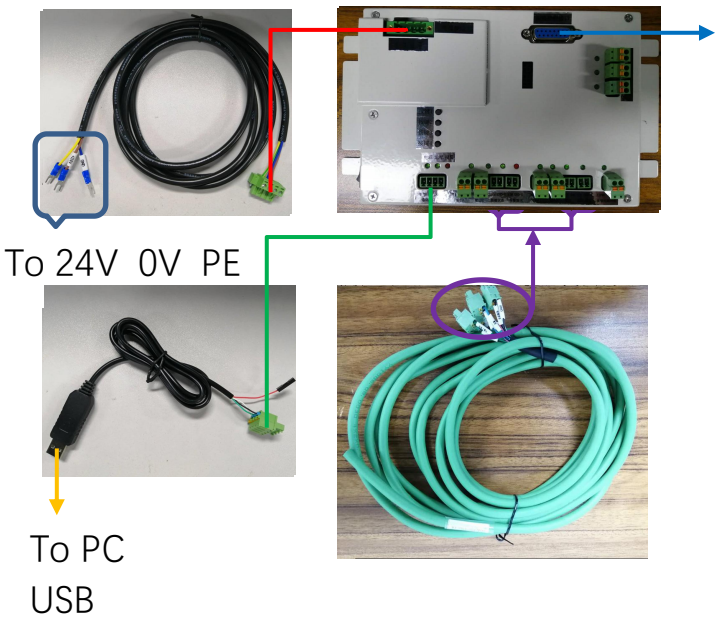



① ② ③ ④

①、Single station galvo controller
②、USB to TTL level serial line
③、Controller power cable
④、8 core control IO line

Three、 Electrical Connection Diagram





目录

Preface

Thank you very much for using our single position galvo driver! Before using, please read the instructions carefully to ensure the correct use of our equipment, please keep the instructions properly for reference at any time. Due to the different configuration, some models do not have some of the functions listed in this book, please refer to the actual product, due to the continuous upgrading and improvement of the product, part of this book may have some deviation from the actual product, please refer to the actual product.

This manual provides the user installation, parameter setting, processing

operation related instructions and notes, in order to ensure that the correct installation and operation of the system, please read this manual carefully before installation, and properly saved or handed over to the software user.

For the safety of operators and machinery, 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 willing to serve you!

Safety Precautions

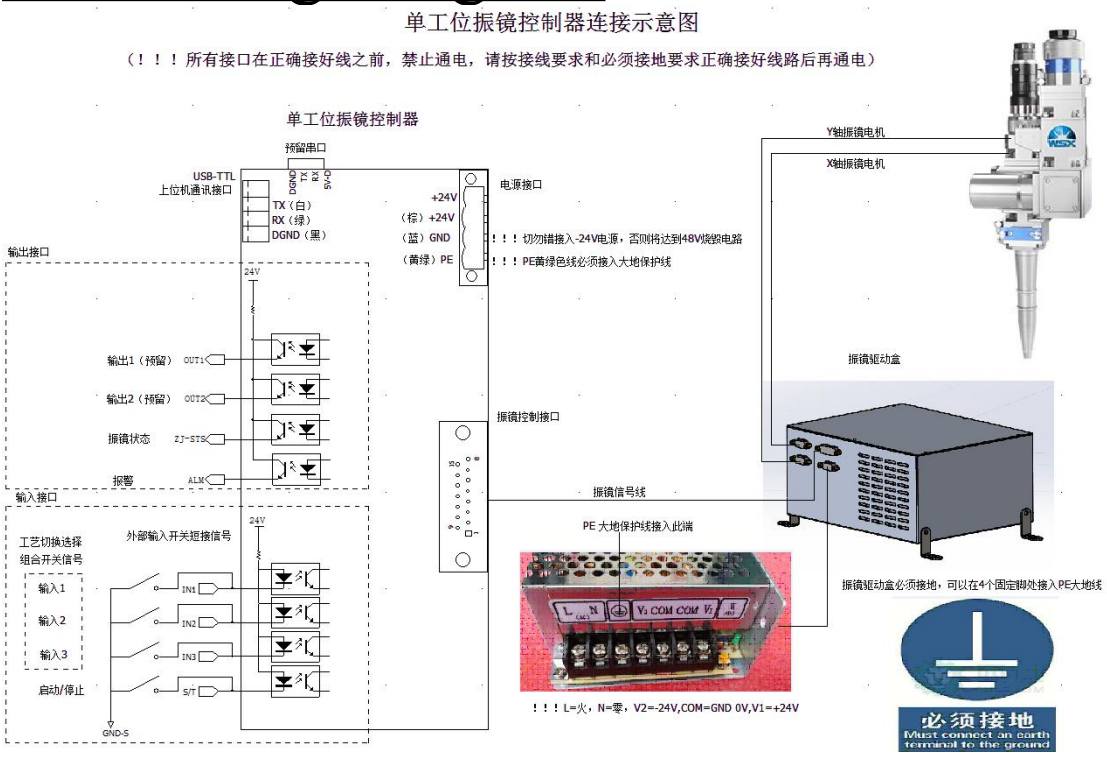
 注意	Before operating the equipment, the user must read this manual and related operation manual carefully, strictly abide by the operation rules, non-professional personnel are not allowed to boot, all connected equipment must be connected to the earth protection line.
 警告	The equipment uses four types of lasers (strong laser radiation), which may cause the following accidents: Lead the surrounding flammable substances; In the process of laser processing, other radiation and toxic and harmful gases may be produced due to the different processing objects; the direct irradiation of laser radiation will cause human injury. Therefore, the use of equipment must be equipped with fire fighting equipment, strictly prohibited to pile up flammable and explosive items around the worktable and equipment, and must maintain good ventilation, non-professional operators are prohibited from approaching the equipment.
 提示	Processing objects and emissions shall comply with local laws and regulations.
 警告	Laser processing may have risks, users should carefully consider whether the processed object is suitable for laser operation. Laser equipment has high voltage or other potential hazards, non-factory professionals are strictly prohibited to disassemble. The machine and other associated equipment must be safely grounded before starting operation. When the equipment is working, it is strictly forbidden to open any end cover. During the working process of the equipment, the operator must observe the working condition of the equipment at any time. In case of abnormal condition, all the power supply should be cut off immediately, and the corresponding measures should be taken actively. Equipment in the boot state, must have a special person on duty, no unauthorized departure. All power must be cut off before the personnel leave.
 注意	The safety rules section of this book contains more detailed safety instructions for the use of equipment. please read carefully and follow them

1.Product Overview

1.1 Part List

Single Station Galvo Driver (WSX-DGW-XT01)						
No.	**Item**	**Unit**	**Qty.**	**Signal Definition**		**Specifications**
1	Single Station Galvo Controller	pcs	1		standard	
2	3 core 24 V power cord + terminal + casing (2 m)	pcs	1	24V/GND/PE	standard	0.75 square line, pure copper. One end is equipped with UT1-4U type voltage terminal, the other end is equipped with 5.08 mm pull-in terminal, signal line end sleeve marking casing
3	Single station lens 12-core control line	pcs	1	1.Galvo state 2.GND_S 3.Alarm output 4.GND_S 5.Output 1 6.GND_S 7.Output 2 8.GND_s 9.Input 3 10.GND_s 11.Start/stop 12.GND_s	standard	DGW-ZJ12PINKZ-A-5M/T
4	USB to TTL level serial line	pcs	1	1.TX 2.RX 3.GND	standard	DPCKXZJ-001

1.2 Wiring Diagram



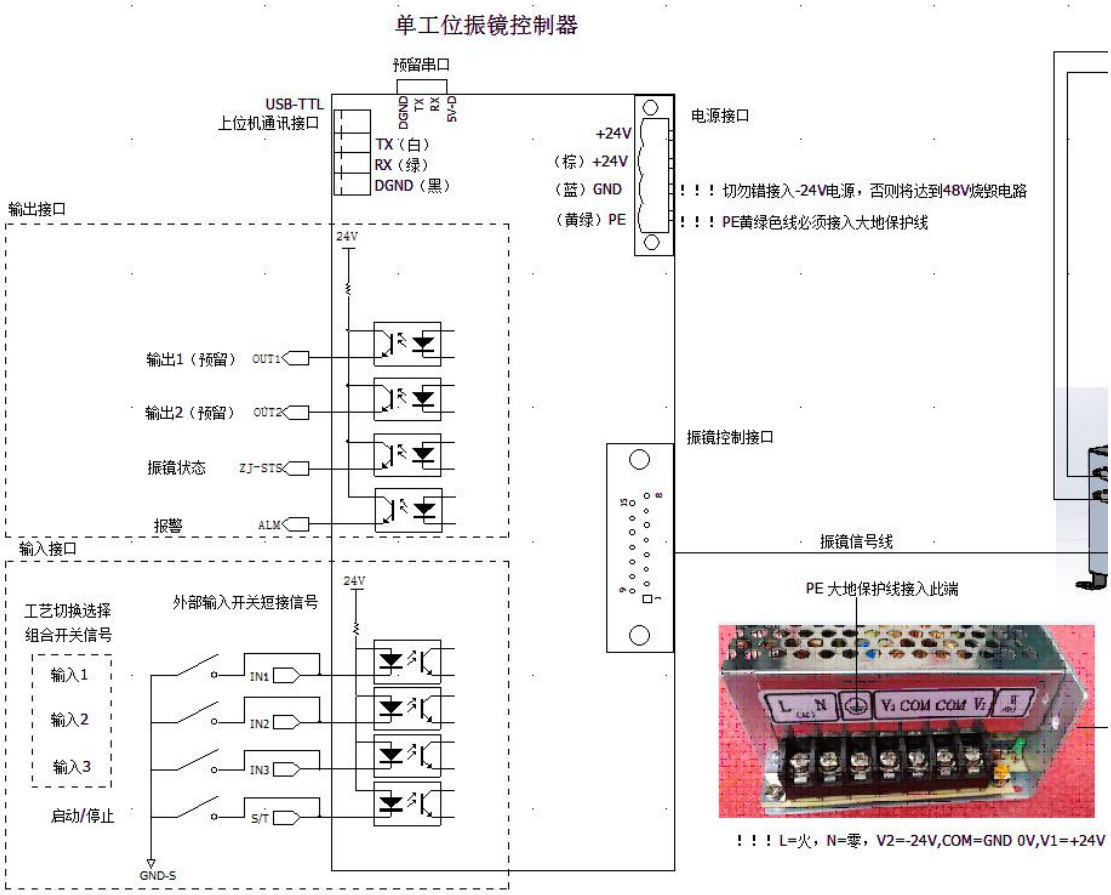
注意

Galvo controller housing and galvo driver box housing and switching power supply grounding terminal must be well connected to the PE earth protection line!

The "power interface" of the galvo controller is supplied by DC 24 V. The grounding terminal of the power supply must be well connected to the PE earth protection line! Must ensure that the access of the power supply with a multimeter measurement of 24 V in order to insert the terminal into the interface, so as not to mistakenly access other power sources higher than 24 V DC and cause the product to burn!

1.21Wiring Diagram Enlarged

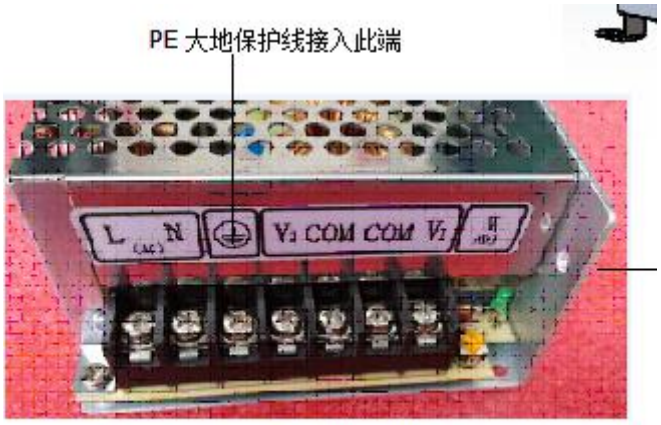
Controller



注意

Galvo controller housing and galvo driver box housing and switching power supply grounding terminal must be well connected to the PE earth protection line!

The "power interface" of the galvo controller is supplied by DC 24 V. The grounding terminal of the power supply must be well connected to the PE earth protection line! Must ensure that the access of the power supply with a multimeter measurement of 24 V in order to insert the terminal into the interface, so as not to mistakenly access other power sources higher than 24 V DC and cause the product to burn!



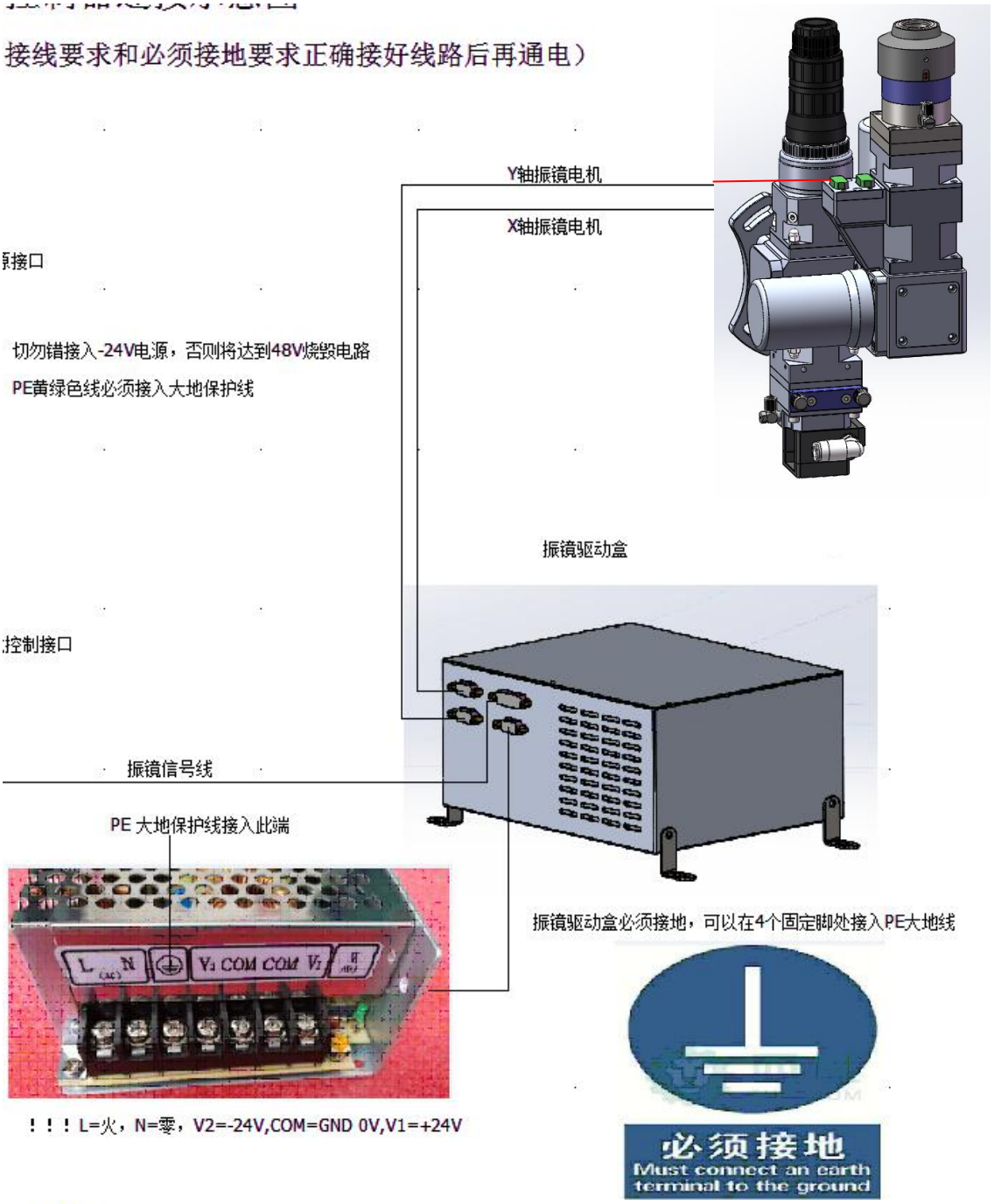
Switching Power ！！！L=火，N=零，V2=-24V,COM=GND 0V,V1=+24V

注意

Switching power grounding terminal must be well connected to the PE earth protection line!

Power supply has positive and negative 24 V two kinds of voltage, V2=-24 V,V1V2=24 end is GNDV2=0 connection, please pay attention to identify!

Laser head and drive box



注意

Galvo driver box housing and switching power supply grounding terminal must be well connected to the PE earth protection line!

The housing of the galvo driver box must be connected to the earth wire to avoid greater external interference and introduce the driver, resulting in abnormal signal and abnormal swing phenomenon! All wiring plugs must be fastened and screws locked to prevent abnormal swing!

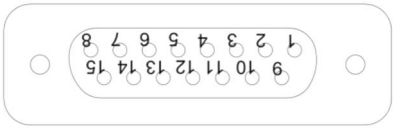
1.3Structure and Dimensions

1.4Interfaces and Definitions

Galvo control interface

Must ensure the galvo signal wire plug stable and reliable insertion, and lock the screw, to ensure that the signal terminal contact is good, to avoid the wire contact problems caused by the galvo lens does not swing!

15pin master interface definitions as follows:



CLK+	1	9	CLK-
SYNC+	2	10	SYNC-
XCH+	3	11	XCH-
YCH+	4	12	YCH-
NC	5	13	NC
NC	6	14	GND_S
NC	7	15	GND_S
NC	8		

CLK +/-:Clock signal of galvo signal

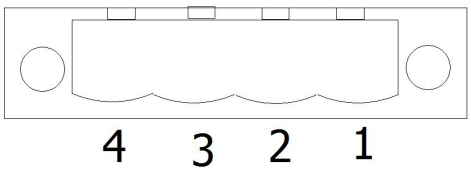
SYNC+/-:Synchronic signal of galvo signal

XCH+/-:Data signal of X axis of galvo signal

YCH+/-:Data signal of Y axis of galvo signal

GND-S:Optical Coupling External Signal

Power Interface



1	2	3	4
PE（earth protection）	GND(0V)	+24V	+24V

注意

The interface for DC 24 V power supply, power grounding terminal, must be well connected to the PE earth protection line! Must ensure that the access of the power supply with a multimeter measurement of 24 V in order to insert the terminal into the interface, so as not to mistakenly access other power sources higher than 24 V DC and cause the product to burn!

After the power supply is properly connected and can be turned on normally, be sure to lock the screws of this power interface to avoid poor contact with the terminal and cause the system to stop working!

Indicator Light

Indicator light	**Function**
Power light	+24V power supply is normal, this light is always on
Running light	The light flashes when there is a port output
Alarm light	When the internal communication of the chip is abnormal, the light will turn on (the chip pin is abnormal)
Output 1	Reserved, no function output
Output 2	Reserved, no function output
Galvo output indicator	When the galvo starts, the light will be on
Alarm output indicator	When the internal communication of the chip is abnormal, the light will turn on (the chip pin is abnormal)
Input 1 indicator	When the switch is short to input port 1, this light will turn on
Input 2 indicator	When the switch is short to input port 2, this light will turn on

Input 3 indicator	When the switch is short to input port 3, this light will turn on
Start/stop indicator	When the switch is short on the start / stop port, the light will turn on

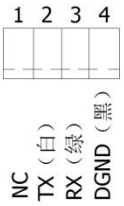
Output interface

Alarm output	When there is an alarm, this port outputs a high level. The high level is > V 20
GND_S	Optical coupling external signal ground
Galvo state output	When the galvo output starts, this port outputs a high level. The high level is > V 20
GND_S	Optical coupling external signal ground
Output 1/2	Reserved, no function output
GND_S	Optical coupling external signal ground

Input interface

Input 1	When this port is short to the GND_S, the signal input is realized. Input 1, input 2 and input 3 are used together to realize the process parameter switching corresponding to the upper computer. After each switch operation, you need to restart the galvo to take effect, please go to the "process switch combination signal operation table"
GND_S	Optical coupling external signal ground
Input 2	When this port is short to the GND_S, the signal input is realized. Input 1, input 2 and input 3 are used together to realize the process parameter switching corresponding to the upper computer. After each switch operation, you need to restart the galvo to take effect, please go to the "process switch combination signal operation table"
GND_S	Optical coupling external signal ground
Input 3	When this port is short to the GND_S, the signal input is realized. Input 1, input 2 and input 3 are used together to realize the process parameter switching corresponding to the upper computer. After each switch operation, you need to restart the galvo to take effect, please go to the "process switch combination signal operation table"
GND_S	Optical coupling external signal ground
Start/stop	When this port is short to the GND_S, the galvo starts to swing and the output port: the galvo state output is 20 V > high level
GND_S	Optical coupling external signal ground

PC communication interface (USB-TTL serial port)



1	2	3	4
NC（unused）	TX（white）	RX（green）	DGND（black）

The interface is a USB to TTL level communication interface. Please use a communication wire as short as possible. It is not recommended that the user extend the wire, to avoid interference caused by long wiring, affecting communication signals. If the user must change wiring, it is recommended not to use wire exceed 2 meters long.

1.5Button combination function

Button combination function operation

When using button operation, please pay attention to moderate force to avoid excessive force operation or collision caused by button breakage or loose damage!

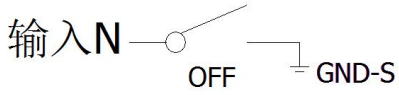
Spot size adjustment	1、Increase the spot size: first hold down "button 1" not to let go, then press "button 3" spot amplitude will increase 0.1 units, each press will increase in turn; 2、Reduce the spot size: first press "press 1" not to let go, then press" button 4" spot amplitude will reduce 0.1 units, each press will decline in turn.
Wobble frequency adjustment	1、Frequency acceleration: first hold down "press 2" do not let go, and then press" button 3" wobble frequency will increase 50 Hz, each press will increase in turn; 2、Frequency slowing down: first hold down "press 2" not to let go, then press" button 4" wobble frequency will reduce 50 Hz, each press will decline in turn.

Output graphics switching	Using button 2 can switch wobble graphics: straight-rectangle-circle-infinite（∞）
Galvo start / stop	Press buttons 3 and 4 at the same time to turn on or off the galvo
Reset system	In the shutdown state, press and hold down "button 1" and" button 2" at the same time, release after 1 second of boot, system will reset back to the factory default setting parameters.

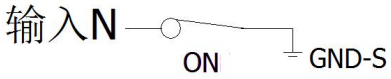
1.6Process switch combination signal operation table

Process switching, input combination signal operation
(！ ！ ！ Input 1、Input 2、Input 3 are external switch control), as below

OFF signal



ON signal



Process parameter switching operation			
Single station galvo controller input interface			Serial Number of Upper Machine Process Group
Input 1	Input 2	Input 3	
OFF	OFF	OFF	Process 0
ON	OFF	OFF	Process 1
OFF	ON	OFF	Process 2
ON	ON	OFF	Process 3
OFF	OFF	ON	Process 4
ON	OFF	ON	Process 5
OFF	ON	ON	Process 6
ON	ON	ON	Process 7

注意

After switching operation, it is necessary to restart the galvo interface to take effect, that is, after the switching signal, turn on the galvo interface (turn start / stop interface from OFF state to ON), then complete switching!

2、Upper computer operation

2.1Function & Feature

1. Convenient operation, improve work efficiency and avoid misoperation;
2. Simple installation interface, the control box can be directly installed on the guide rail, all with pluggable connection, easy wiring;
3. Offline work, import data can effectively improve the convenience;

2.2 Acquisition and installation of software

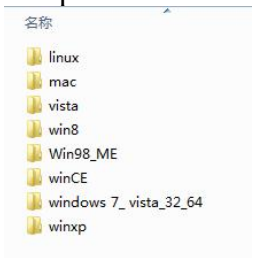
2.2.1Serial Drive Installation

1.Select the computer desktop "computer" icon, right-click, select "attribute" in the pop-up menu, click on the attribute, pop-up menu in the red box below, check the computer installed windows system version and the number of digits of the system, As shown below, the computer is win7 64-bit system:

2.Turn off computer antivirus software;

3.Switch directory to:..\\ Single station galvo host computer software V21_ serial port driver\\ Galvo host computer serial port driver

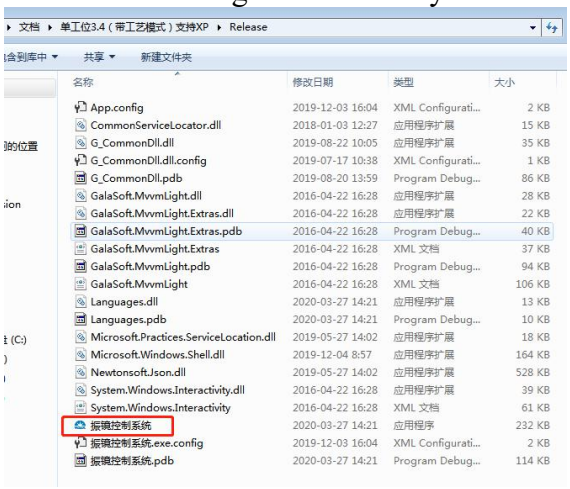
4.Unzip. NET_Framework4.5.zip, enter the decompression directory and double-click. NET_Framework4.5, enter the installation until its installation is complete. \PL2303HX Switch the directory to:.\\ single station galvo host computer software V21_ serial port driver\\ galvo host computer serial port driver PL2303HX, according to the windows system version confirmed in step 1, select the corresponding driver version (Follow step 1 and choose windows7_vista_32_64), enter the appropriate directory, double-click the executor, enter the installation until its installation is complete:



5.Connect the serial port between the computer USB port and the control panel as follows:

6.Directory switch to:.\\ single station galvo upper computer software V21_ serial port drive, according to the computer system confirmed in step 1, select the corresponding upper computer software (as shown below): single station upper computer 3.4(with process mode). zip.

Unzip the corresponding package, switch the directory into the pressurization folder, double-click the "galvo Control system" file



7.When the host computer software is executed, there will be the following interface. If the box behind the serial number in the successful interface is connected, there will be a specific com number, such as com1、com2. Connection failed, there will be no specific com number display

2.3Start Using

2.3.1User interface

2.3.2Overview of operations

Serial No.：	Displaying serial numbers	Equipment linking	Link to the control card via a peripheral computer
Output port	Displaying the currently used output port		
Shape	Select the shape of the wobble figure	Turn on galvo	Turn on galvo
Direction	Select the direction of the wobble figure		
Angle of rotation	Select angle	Read parameters	Read the parameters of the current device
Speed	Set wobble speed		
X axial compression ratio	Adjust the compression ratio of the X axis	Set parameters	Import the set parameters into the current device
Y axial compression ratio	Adjust the compression ratio of the Y axis		
Trapezoid Correction Ratio	Adjust trapezoid correction ratio	Import parameters	Import file parameters into software
Diamond correction ratio	Adjust diamond correction ratio		
Length	Set the length of the wobble figure	Export parameters	Export software-set files to folders
Width	Set the width of the wobble figure		

3、Appendix

3.1Questions & Checking

Question 1：Power indicator lights are not on or running lights are not on
Check：1、Is the power supply wiring correct and the wiring sequence in accordance with the power supply line sequence specification
2、Whether the power supply is misconnected to 24 V and -24 V, resulting in a total voltage of 48 V（Some switching sources have two types of power, positive and negative. Some switching power supplies, for example, has V1 positive 24 V, V2 negative 24 V, and GND 0V. Our controller only needs 24V power supply，so we can only take V 24 and GND 0V. Wrong access to positive 24 V and negative 24 V, is not 24V, but 48 V, far beyond the controller's normal power supply）
3、Whether the switching power output normally, whether there is a short circuit（disconnect the controller power line to check）
4、Whether the power switch button of controller is damaged or disconnection（Open the controller shell, short circuit the switch with jumper）
Question 2：After USB line connecting to the upper computer, upper computer

software unconnected or occasionally poorly connected

Check：1、Check if the USB line is broken. Disassemble the USB shell and use the multimeter to break the path at both ends of the line, whether the wiring sequence is correct, whether the wire at green terminal is loose and shedding causes poor contact.

2、Whether the upper computer software version is above V3.3 with process mode version, the main board version is the latest 2 C11 or upper.

Question 3：Galvo does not work

Check：1、Whether the galvo controller and driver box is connected by signal wire, whether the galvo output is on（Turn on galvo at upper computer, or short "start / stop" interface at controller）, whether the galvo indicator on controller is always on, whether the wiring of driver box is correct, whether the driver board indicator inside driver box is green.

2、After connecting the host computer software, read the parameters, check whether the length, width or diameter of figure is zero. Increase the width and diameter, turn on the galvo to see if the output is normal.

3、If there is a machine in normal use, the normally working drive box can be connected to the galvo controller of the problem. This operation can quickly eliminate whether it is a controller or a driving box or a galvo signal wire problem, and then eliminate the problem one by one.