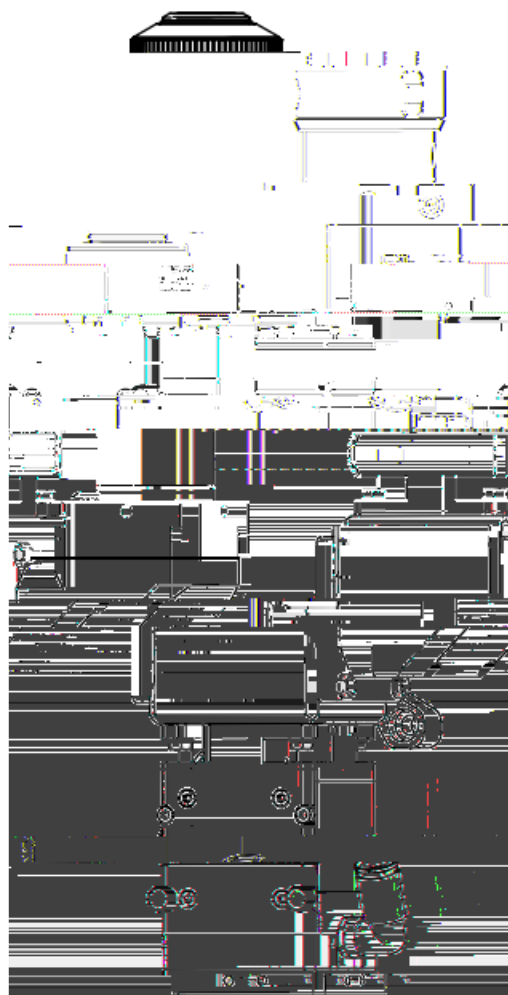


BW03K

3KW Laser Welding Head - User Manual



Document History

Edit date	Version	Topic, revision, action taken
2025/7/1	V1.0	First edition

Thank you for choosing our product!

This manual describes the installation and commissioning of laser welding head in details so that you can use this product quickly. You can consult us directly for more details.

Due to the continuous updating of product functions, the product you receive may differ from the introduction in this manual in some aspects.

We reserve all rights in this document including the issued patents and other registered commercial ownership related to this document. It is strictly prohibited to use this document in an improper way especially to copy and disseminate it to third parties.

If you find any errors in this document, please inform us as soon as possible. The data contained in this manual is only used to describe the product and shall not be regarded as a statement of security interest.

For the benefit of our customers, we will constantly try to ensure that the products we develop comply with the latest technology.

Raytools AG

Email: sales@raytools.com

Website: www.raytools.ch

Disclaimer

We reserve the right to change the design in order to improve the quality or expand the application or comply to manufacturing workmanship.

We will not bear any responsibility for losses and accidents caused by wrong operation or improper handling of our products.

Dismantling of product will lose all warranty claims excluding the normal replacement of worn parts and components required for maintenance or commissioning operations.

Unauthorized modification of products or use of non-original spare parts will directly lead to the invalidation of warranty and liability exemption.

It is recommended to only use the spare parts provided by us or submit them to us or the designated professional team for installation.

Use Regulations

Ensure that the product is used in a dry environment.

Ensure that the product is used in the environment required by EMC standards.

The product is only allowed to run within the parameters specified in the technical data.

Personnel Responsibilities

Be familiar with the basic provisions of work safety & accident prevention and have received equipment operation guidance.

Read and understand basic safety instructions and operations.

You must have studied the relevant regulations and safety instructions and understand the possible hazards.

Comply with relevant regulations and implement corresponding protective measures.

Safety Instructions

Prevent Electric Shock

Parts of the laser head such as nozzle, sensor, sensor interface and attached fasteners may not be fully protected by the ground wire due to function fault. These parts may have low voltage. When installing electrical equipment, please pay attention to taking anti electric shock measures for relevant personnel.

Note that the equipment shall be grounded as specified.

Guard against Danger

Never put your hands or other body under the laser head.

Repair and maintenance work can only be carried out after the power is turned off.

Do not

Contents

1 Product Summary	1
1.1 Structure (with QBH Interface)	1
1.2 Technical Datasheet	2
1.3 Mechanical Size	3
1.4 Connection of Assist Gas.....	4
1.5 Wiring.....	5
1.6 HMI Panel and Camera Interface.....	6
1.7 Field Center	7
2 Mechanical Installation.....	8
2.1 QBH Fiber Insertion.....	10
2.2 Wrap with Protective Film	10
2.3 Mounting of Laser Welding Head	11
2.4 Mounting of Tip Assembly (Optional).....	12
3 Maintenance.....	13
3.1 Removal and Installation of Lenses	13
3.2 Removal and Installation of Top Cover Glass/Protection Glass	13
4 Appendix	15
4.1 Mechanical Size.....	15

1 Product Summary

1.1 Structure (with QBH Interface)

1 Fiber Interface

1.3 Mechanical Size

Collimation F100 (0°):

(Other specifications refer to appendix)

thru

Collimation F100 (90°):

1.4 Connection of Assist Gas

Gas requirements:

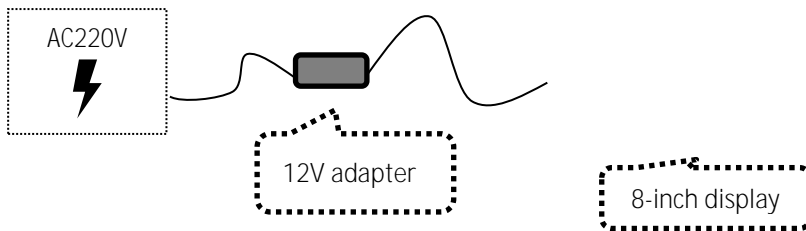
Compressed air pressure: 0.4-0.6MPa

Nitrogen/Argon gas flow: 8-25L/min



1.5 Wiring

1.5.1 Connection of Display and Camera



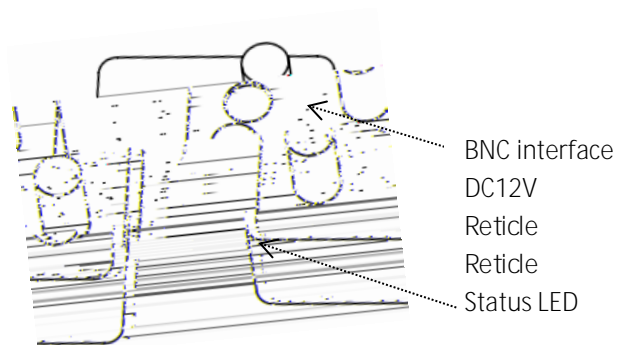
Display Size

1.6 HMI Panel and Camera Interface

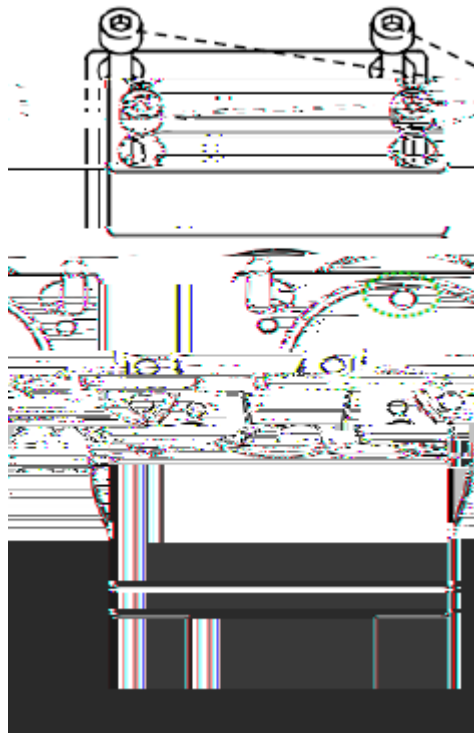
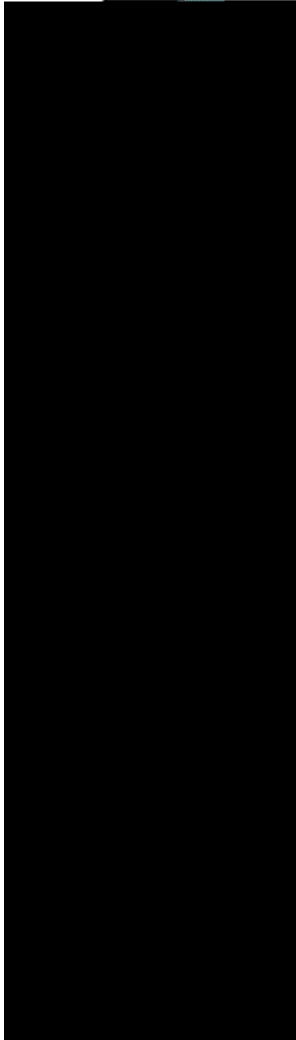
Lens interface:



Camera interface:



1.7 Field Center

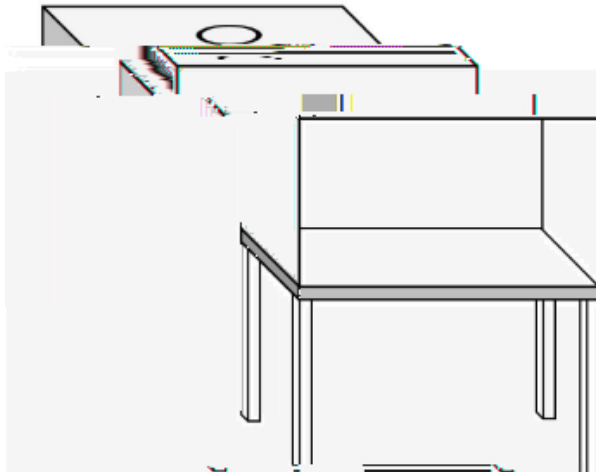


Remove 4 bolts



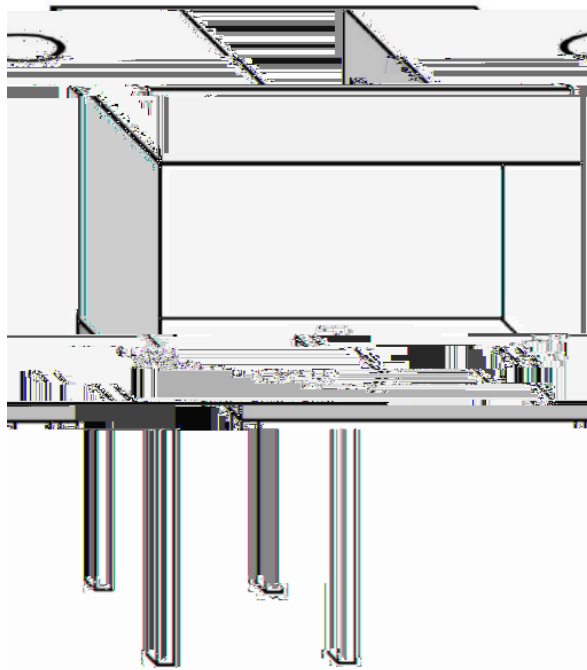
2 Mechanical Installation

1. Prepare the clean bench:
Turn on the clean bench.
Clean the surface of the clean bench.
Lower the glass door, leaving a 10 cm gap.
Run the device for 30 minutes

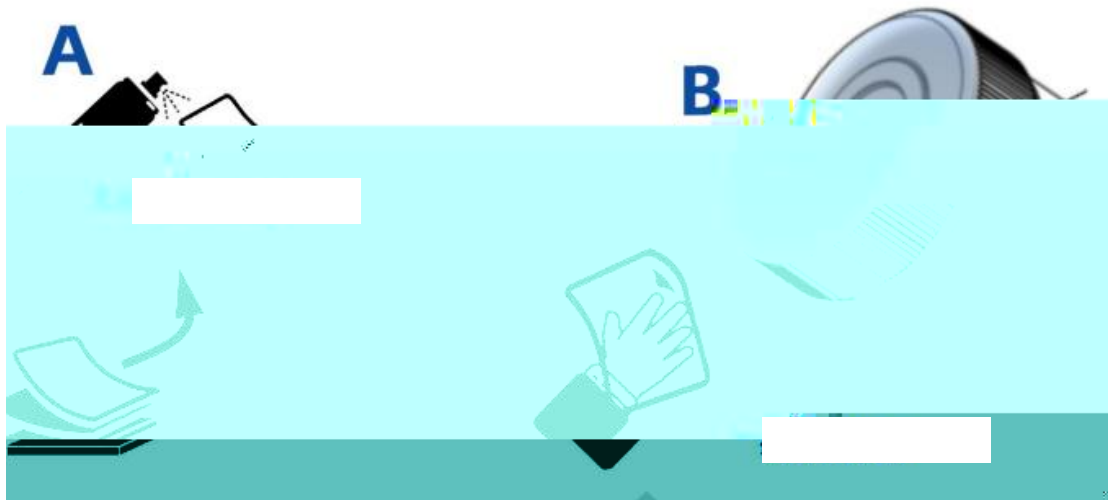


Type: Vertical Laminar Flow
Cleanliness Class: ISO Class 5 / Class 100
Average Air Velocity: 0.4 m/s

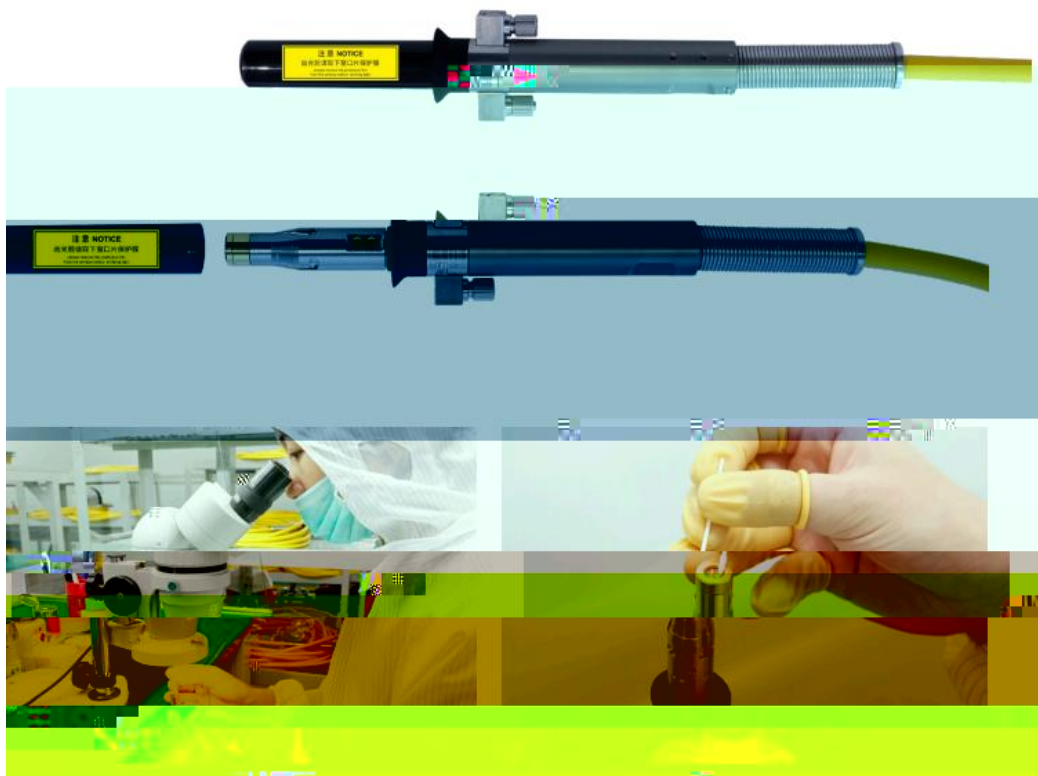
2. Place the laser head on the clean bench horizontally.



3. Wipe with a dust-free cloth moistened with absolute ethanol.



4. Check the cleanliness of the fiber.



Mount the fiber connector onto the microscope Use a clean cotton swab to wipe the cover glass

2.3 Mounting of Laser Welding Head

Mount the laser head using 4× M6×16 bolts (1-4) on the machine base or robot back panel. Ensure that the head is firmly locked in place with no vibration before use.

Make sure there is good electrical insulation between the machine and the laser head, to prevent electrical interference, short circuits, or signal transmission issues.

Insulating pad/washer

Use insulating pads made of high-temperature and corrosion-resistant materials such as ceramics, PTFE (Teflon), mica, or special engineering plastics, placed between the contact surfaces of the laser head and the machine.

2.4 Mounting of Tip Assembly (Optional)

Before installation, confirm that coaxial air-blow assembly, side-blow assembly and wire feeding assembly are complete.

From left to right: F300 coaxial air-blow assembly, air knife assembly, side-blow assembly and wire feeding assembly.



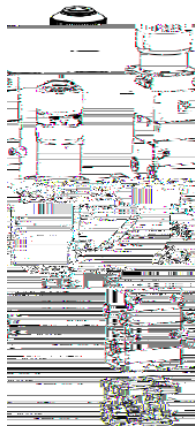
Installation method:



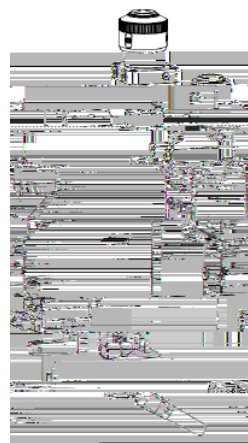
F300 coaxial air-blow assembly



F30 coaxial air-blow + wire feeding assembly



air knife assembly



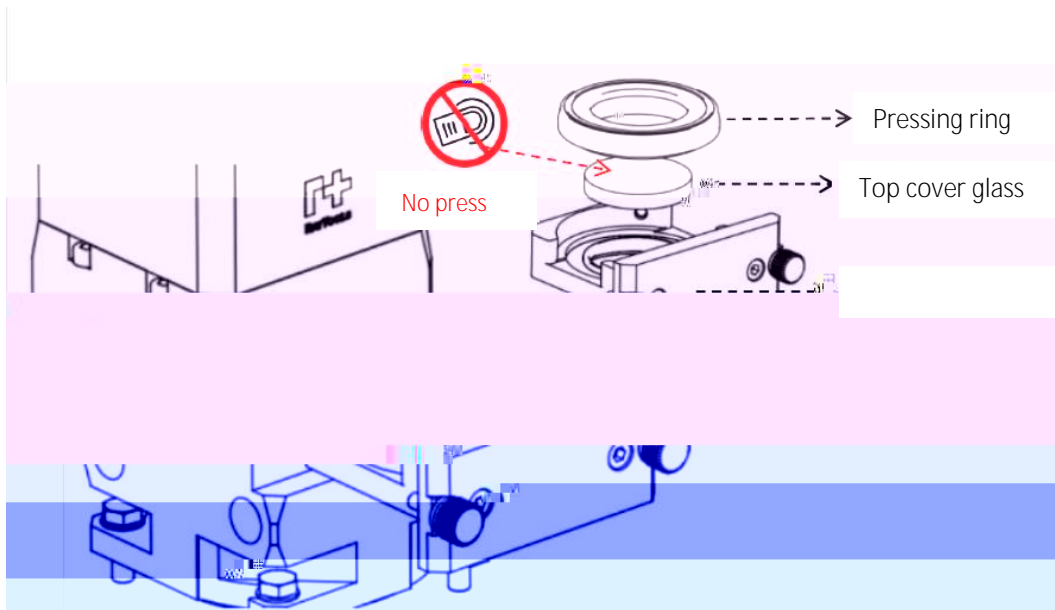
air knife + side-blow assembly

3 Maintenance

3.1 Removal and Installation of Lenses

The whole process needs to be completed in a dust free room. Wear dust-proof gloves or fingertips when removing or installing the lenses.

3.2 Removal and Installation of Top Cover Glass/Protection Glass

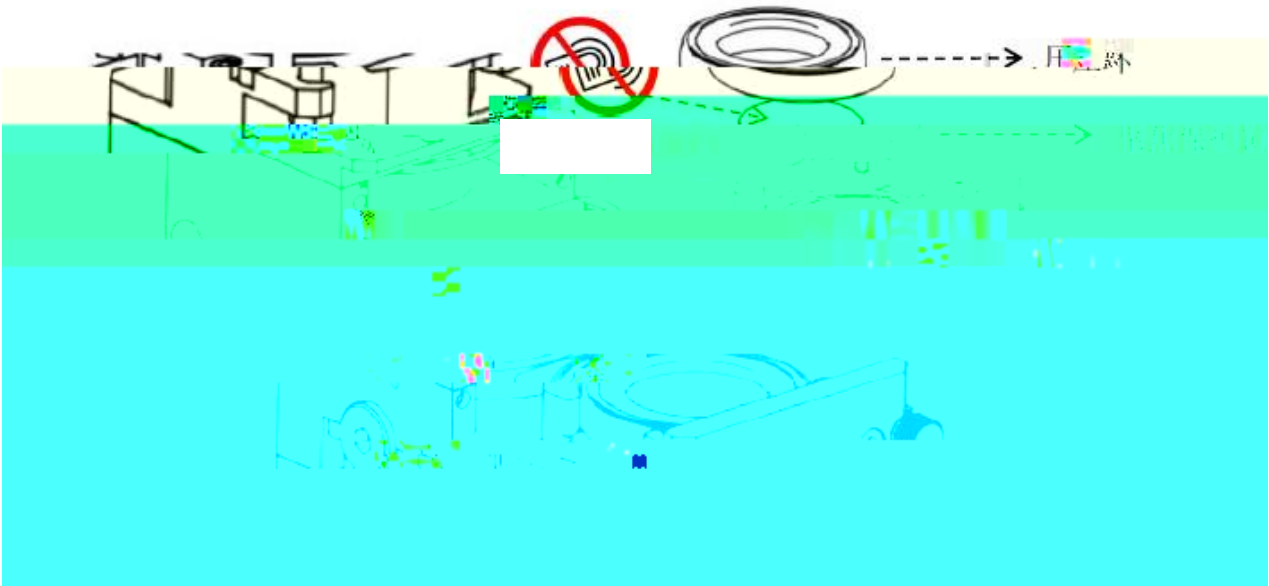


- As shown above, loose the bolts to pull out cover glass holder by pinching 2 edges of drawer type holder.
- Seal the mounting openings by textured tape immediately.
- Remove the pressing ring and cover glass after wearing fingertips
- Clean the cover glass holder.
- Install the cleaned or nres079}hr glass (regardless of front or back surface) into the holder of cover glass.
- Install the pressing ring.
- Insert the cover glass holder back to the laser head and tighten bolts.



It is not allowed to pull 1 hut the edge of al ring directly as it is very easy to damage the seal ring.
Please wear the clean gloves or fingertips.

3.2.1 Removal and Installation of Bottom Cover Glass/Protection Glass



- As shown above, loose the bolts to pull out cover glass holder by pinching 2 edges of drawer type holder.
- Seal the mounting openings by textured tape immediately.
- Remove the pressing ring and cover glass after wearing fingertips
- Clean the cover glass holder.
- Install the cleaned or new cover glass (regardless of the front or back surface) into the holder of cover glass.
- Install the pressing ring.
- Insert the cover glass holder back to the laser head and tighten the bolts.

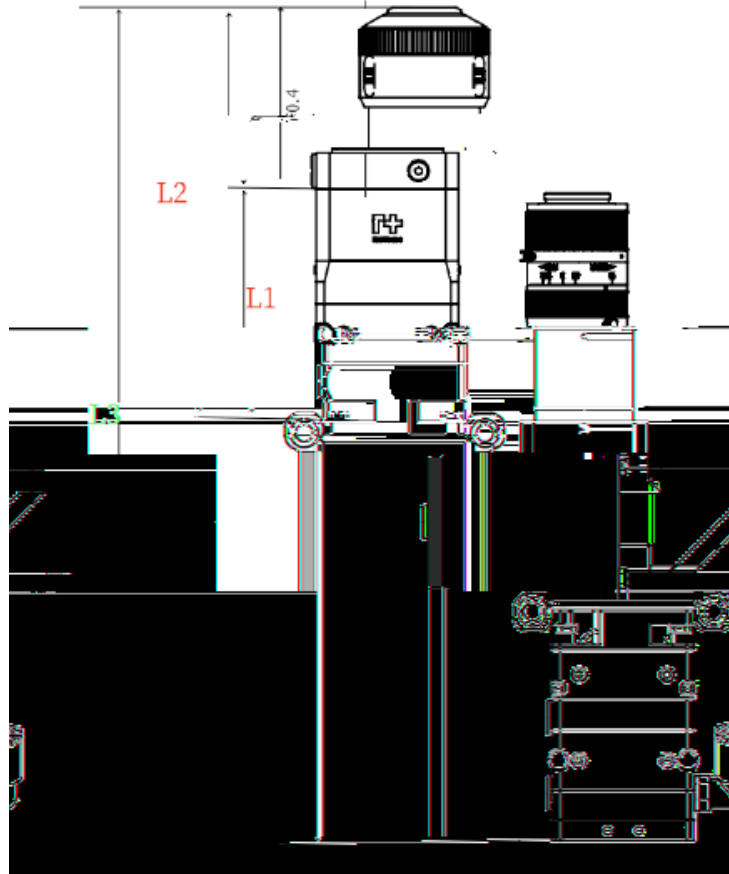


It is not allowed to pull out the edge of seal ring directly as it is very easy to damage the seal ring. Please wear the clean gloves or fingertips.

4 Appendix

4.1 Mechanical Size

QBH with vision (0°):



Collimation Length (fC)	L1(mm)	L2(mm)	L3(mm)
F100	94.9		323.3
F125	119.4	189.8	341.9
F150	145.6	216	374

QBH excluding (0°):

Collimation

QBH excluding vision (90°):

Collimation Length (fC)	L1(mm)	L2(mm)	L3(mm)
F100	94.9	165.3	254.8
F125	119.4	189.8	279.3
F150	145.6		