6kW Auto Focus Laser Cutting Head - User Manual

BM06K 6kW 2D Auto Focus

- 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.

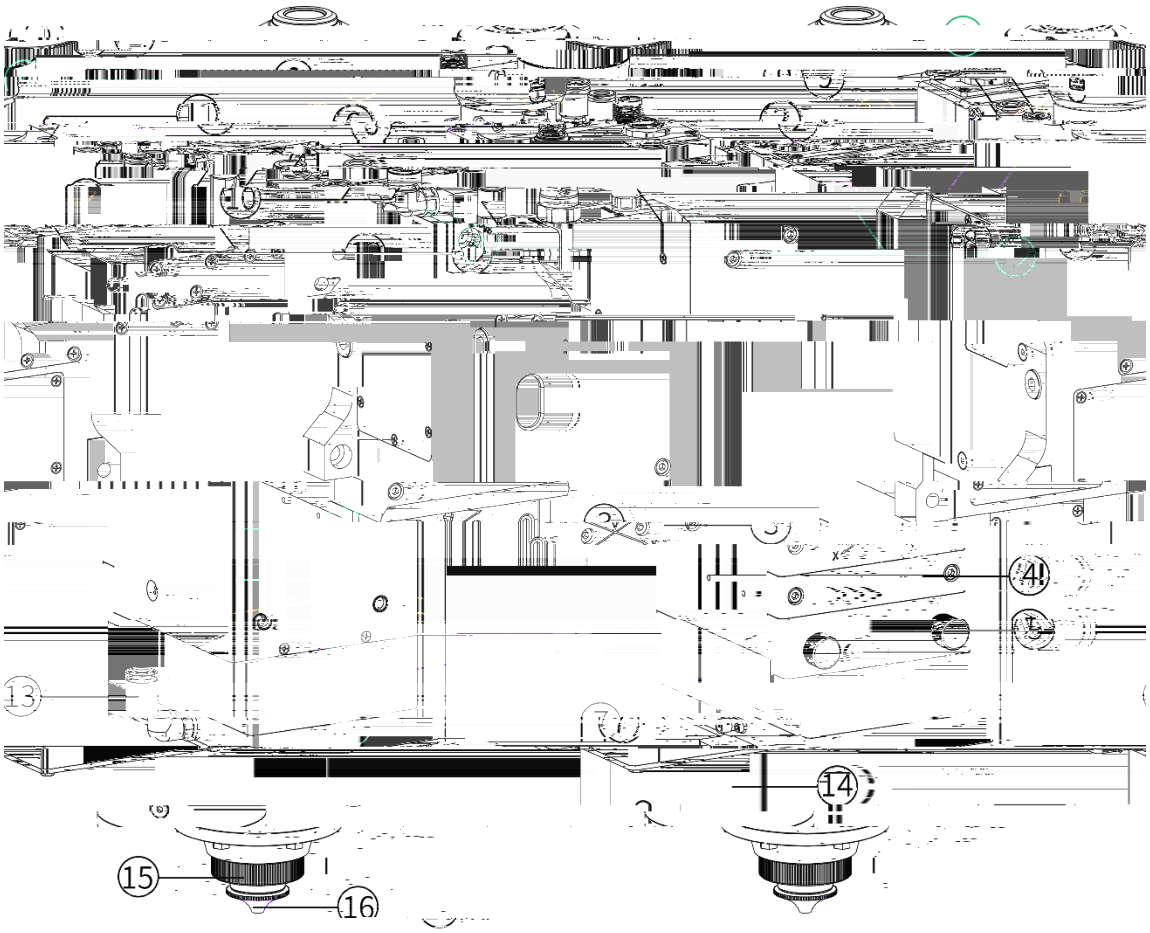
- Never put your hands or other body under the laser head.
- Repair and maintenance work can only be carried out after the power is turned off.
- Do not exceed the specified maximum pressure.
- It must be ensured that the laser head is in normal condition at all times.
- All fasteners such as bolts and nuts must be tightened.

- Avoid direct laser radiation or scattering to the skin.
- Do not stare at the laser beam even when wearing optical equipment.
- Use special laser protective eyeglasses that meet the requirements of safety standards IEC 60825-1.

- In order to avoid corrosion, use the specified coolant and comply with relevant requirements and specified maintenance intervals.

- The corresponding measures shall be specified or explained and observed in order to prevent personnel from being harmed by noise when the cutting air pressure is high.

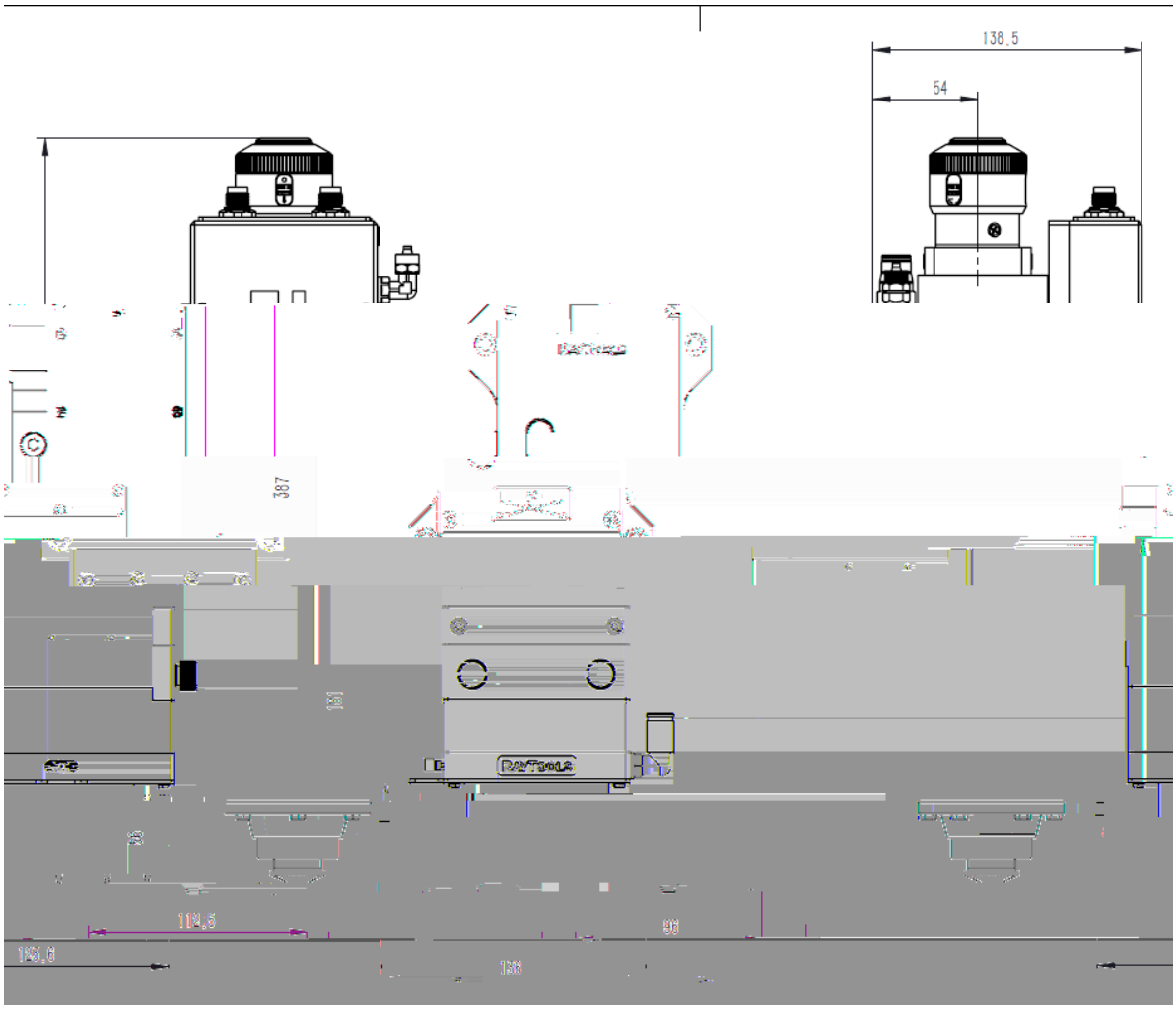
- Observe the storage temperature range allowed by the technical data.
- Take reasonable measures to prevent fire, vibration o Ğ M 6



01 Fiber Interface
02 Control Interface (12-pin)
03 Focus Module / XY Alignment
04 Middle Cover Glass Assy
05 Bottom Cover Glass Assy
06 Encoder Wiring Interface (8-pin)
07 Preamplifier Interface
08 Top Cover Glass
09 Water Cooling Interface (6)
10 Water Cooling Interface (6)
11 Cutting Gas Interface (10)
12 Water Cooling Interface (6)
13 Gas Cooling Interface (8)
14 TRA (Nozzle Assy)
15 Retaining Ring
16 Ceramic Body & Nozzle

- Temperature monitoring to bottom cover glass
- Dual cover glass of collimation lens

- Compati L t



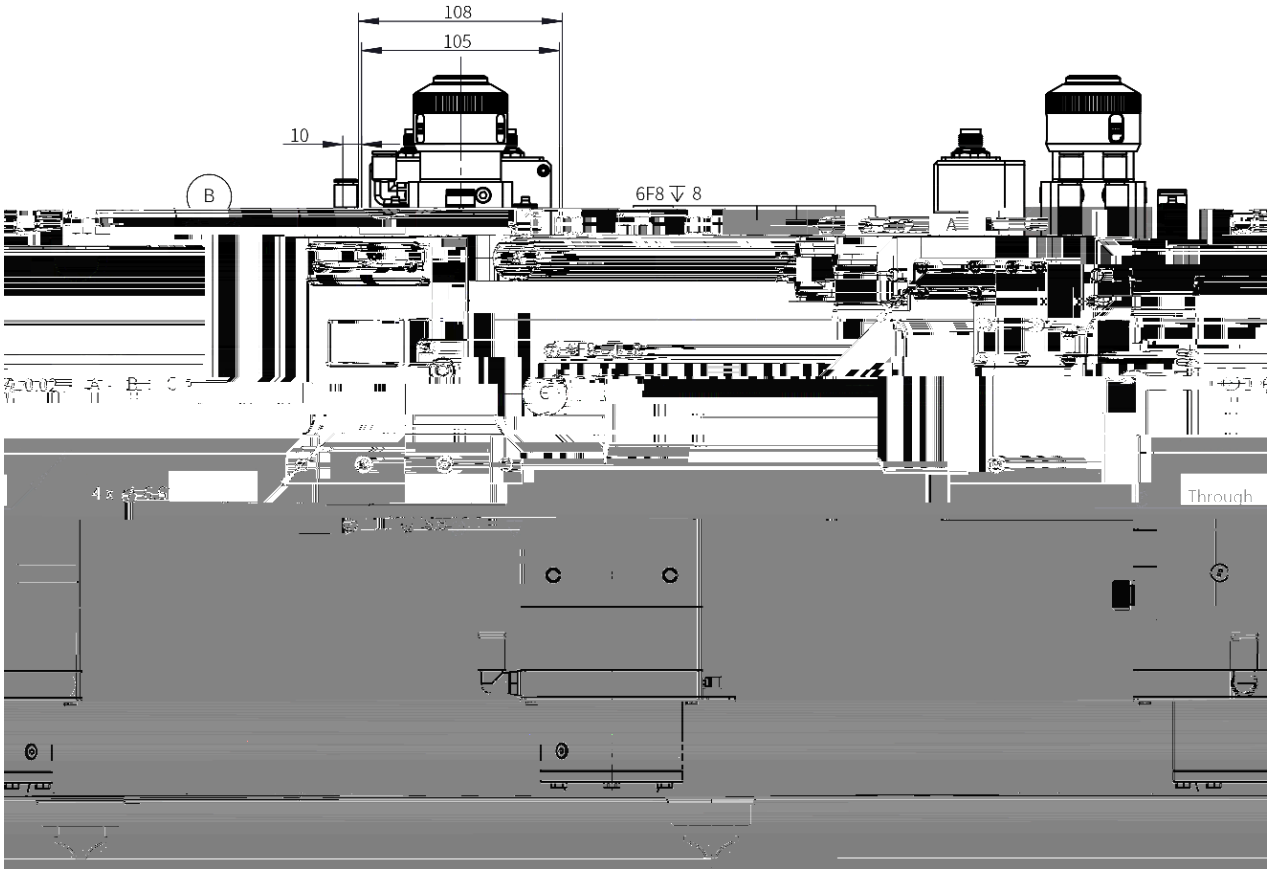
No. 1	Cutting gas (10)	No. 4	Cooling water (6)
No. 2	Cooling water (6)	No. 5	Nozzle cooling gas (8)
No. 3	Cooling water (6)	No. 6	Preamplifier interface (SMA)

Please note the connector size and the maximum load capacity of interfaces.

BM06K 6kW 2D Auto Focus Laser

- Remove the dust cover of G5 adaptor.
- Align the locating pin holes of the fiber end and the laser head.
- Lock the fiber end and the laser head with locking screws tightened to the corresponding screw holes.
- Shake the fiber gently after locked, to confirm it is tightened prior to use.

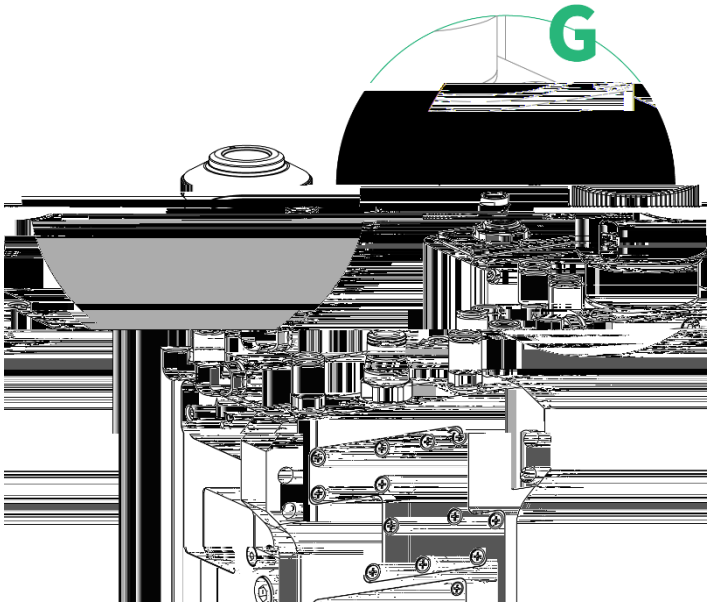
It is recommended to use insulating tape to seal the connection of female and male fiber interface after the installation is finished in order to prevent from dust as much as possible in critical dusty environment.



It is advised to Install the laser head perpendicular to the machined surface as requested and make sure the laser head is locked, which is one of the premises to ensure the stable cutting effect.

The shaking or vibration of cutting head due to incorrect earthing will cause damage to sensor mechanism and machine.

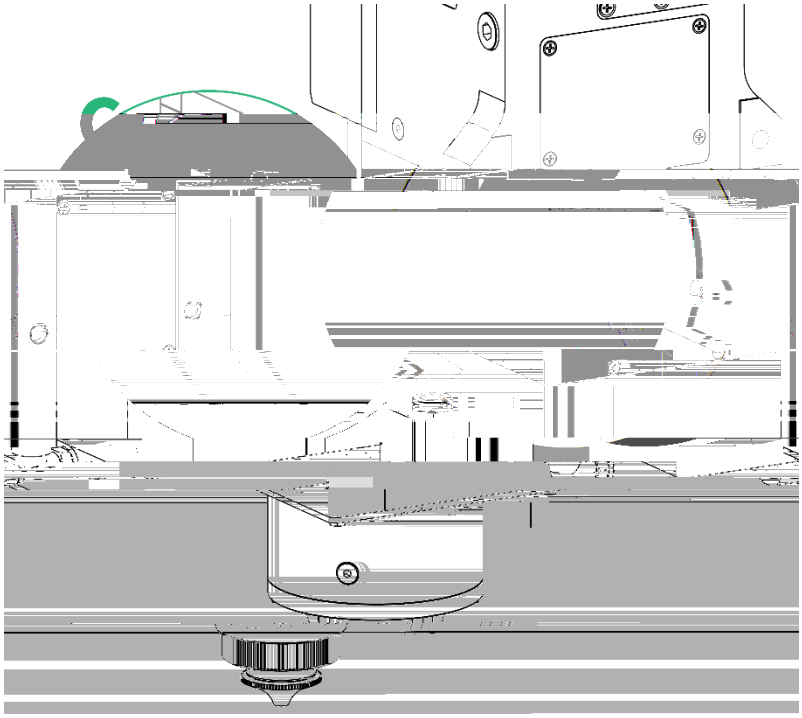
BM06K 6kW 2D Auto Focus La



The impurity in cutting gas such as hydrocarbon and steam will damage the lens and cause cutting power fluctuation as well as inconsistencies between the sections of the work piece. The table below is the recommended cutting gas specification. The higher the purity of the gas, the better the quality of the cutting section.

		( )	( )
Oxygen	99.5%	<5 ppm	<1 ppm
Nitrogen	99.95%	<5 ppm	<1 ppm

- Connect the gas to the 10 interface (G).



- Connect the gas to the 8 interface (C).

The recommended cooling water connection is shown in the above figure.

- Connect the cooling water to the

Take system as an example below.

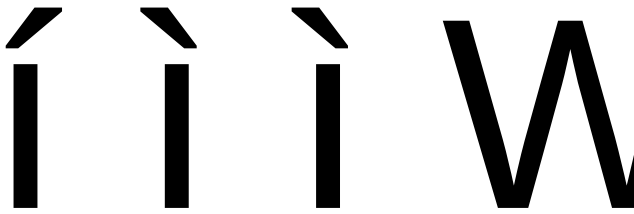
Vdc, GND, and PE on the drive shall be respectively connected with 24V, 0V, and ground wires. A+, A-, B+, and B- are the power lines of the stepper motor. Please complete the wiring according to the schematic diagram. (24V power supply is needed to be self-provided.)

Limit signal:

White	Red	Pink	Blue
+24V			

Optical configuration:

Optical configuration:



· Start the app and complete the connection according to the instruction.

· Complete setting manually bases on actual needs.

Example:

Smart inspection data setting	Remark	Setting value
Bottom cover glass-Temp	Alarm threshold 45	45

Lens alignment of the laser cutting head can be finished by adjusting the focus lens, X-Y direction. The X/Y adjusting knob is located above the bottom cover glass as shown above. Adjusting the 2 knobs until the beam is located in the middle of the nozzle. Make sure the laser beam output from the center of the nozzle. The tape dotting method as below is commonly used:

1. Fix the cutting head with a big size nozzle (tip size shall be larger than beam size) or adjust to nearly zero focus.
2. Pick a scotch tape, flatten it and stick it to the nozzle tip.
3. Open the red light of the laser. Find and observe the position of red light in the scotch tape.
4. Shoot the laser at low power to check beam penetration size. Beam penetration shall be circular and located in the nozzle tip center.
5. Adjust the 2 X/Y adjusting knobs to get the beam aligned. The max

Laser cutting head is equipped with automated focusing system. But it is required to dot manually to redefine the zero focus position when it is initially set or lenses and lasers are replaced. For details about operating system parameters, please refer to the system instructions. Manual dot can refer to the following steps:

- Attach one textured tape on nozzle tip. Set laser power to 80-100W.
- While moving each 0.5mm focus (as small as possible), shot a hole on the textured tape.
- Dotting several times to find out the focus corresponding to the smallest hole which is supposed to be real zero focus. The zero focus is just at the tip of the nozzle.

It's necessary to maintain lenses regularly because of the characteristic of laser cutting process. Cleaning to the cover glass once a week is recommended. The collimating lenses and focusing lenses are recommended to be cleaned once every 2~3 months. In order to facilitate the maintenance of the cover glass, the cover glass holder adopts a drawer type structure.

- To put fingertip onto left thumb and index finger.
- Spray absolute ethanol onto the polyester swab.
- Hold the edge of the lens with left thumb and index finger gently. (note: avoid touching the surface of the lens by fingertip in case of trace)
- Hold the lens to face eyes by left hand and hold the polyester swab by right hand. Wipe the lens gently in single direction, from bottom to top or from left to right (Should not wipe back and forth in case of secondary pollution to lens) and use rubber blow (purely compressed air) to blow the surface of the lens. Both surfaces should be cleaned. After cleaning, make sure that there is no residual like detergent, floating ash, foreign matters and impurities.

Name	Technical Data	Material Code
Fiber Interface	QBH	211FIA3003
Lens 100:150	Meniscus spherical lens F100-D37	3250010323
	Biconvex spherical lens F100-D37	3250010322
	Biconvex spherical lens F150-D37	3250010324
	Meniscus spherical lens F150-D37	3250010325
Lens 100:200	Biconvex spherical lens F100-D37	3250010440
	Meniscus spherical lens F100-D37	3250010442
	Biconvex spherical lens F190.5-D37	3250010352
	Meniscus spherical lens F190.5-D37	3250010353
Cover Glass	D24.9x1.5	211LCG0086
	D37x7	211LCG0078
Nozzle	2D Single layer 1.2	120GJT7112
	2D Single layer 1.3	120GJT7113
	2D Single layer 1.4	120GJT7114
	2D Single layer 1.5	120GJT7115
	2D Single layer 1.6	120GJT7116
	2D Single layer 1.7	120GJT7117
	2D Single layer 1.8	120GJT7118
	2D Single layer 2.0	120GJT4520
	2D Single layer 2.5	120GJT4525
	2D Single layer 3.0	120GJT4530
	2D Single layer 3.5	120GJT4535
	2D Single layer 4.0	120GJT4540
	2D Single layer 4.5	120GJT4545
	2D Single layer 5.0	120GJT4550
	2D Double layer 1.2	120GJT7212
	2D Double layer 1.3	120GJT7213
	2D Double layer 1.4	120GJT7214
	Double layer 1.6	120GJT7216
	Double layer 1.7	120GJT7217
	Double layer 1.8	120GJT7218
Ceramic Body	D28-M11	120515099A