

# User Manual

## 1. Check items before installation

- a. After receiving the laser tube, please check the package, to see whether there is any damage or impact etc. If you find any damage to the laser tube (usually water input, water output, water pipe, discharge tube, return-air duct, charging connector), please contact us as soon as possible.
- b. Remove the protective film of the lens before use. The single tube is a blue protective film (Figure 1), and the bundle (200-350 watts) is a yellow protective film (Figure 2).

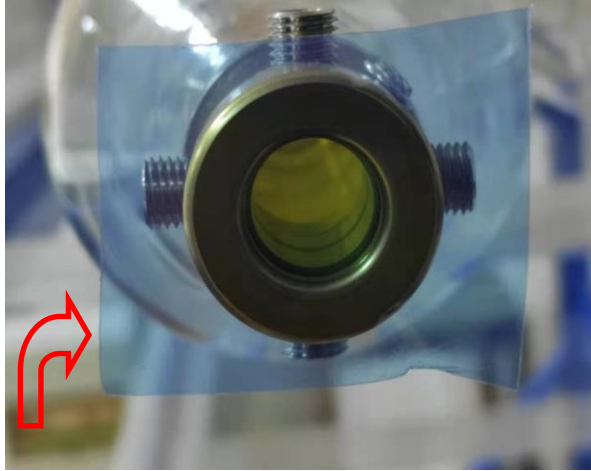


Figure 1

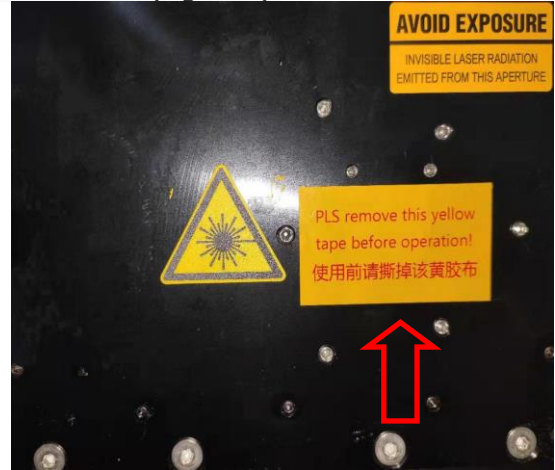


Figure 2

## 2. Installation position

- a. The distance between two brackets for single tube installation is 1/2 (tube length-50mm), for example: 130-watt tube length is 1700mm, and the distance between the two brackets is roughly  $1/2 \times (1700-50) = 825\text{mm}$ . The position of the bracket is just near the front and back supporting points of the water tube and the discharge tube in the laser tube (see Figure 3). The water output is positioned vertically upwards (as shown in Figure 4) to ensure better spot quality.

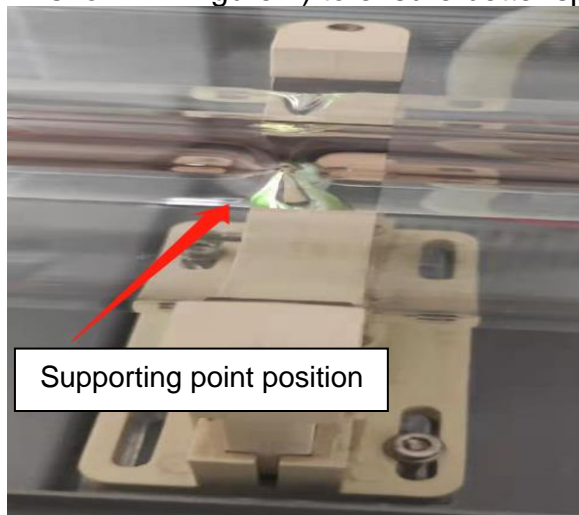


Figure 3 (Supporting point position)

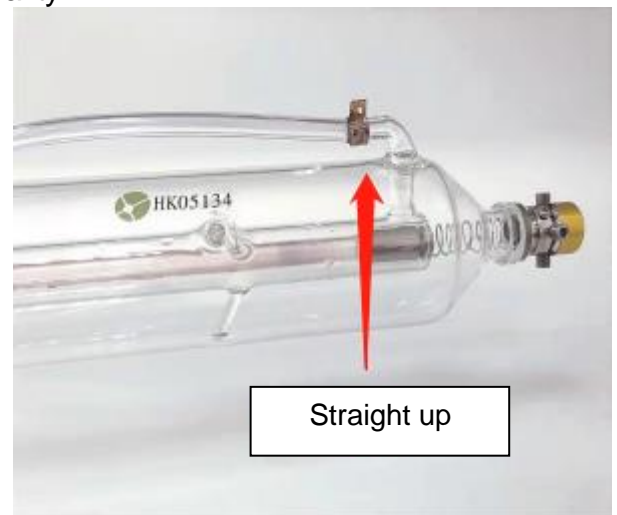


Figure 4 (Straight up)

- b. When installing the beam combiner, ensure that the installation platform is level to ensure that the laser will not be deformed and cause spot changes.

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Page 1 / 5

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## 3. Connection of waterway and circuit

a. For single tubes, the water input is at the side of high pressure, the water output is at the laser output side. The combined beam system can be connected according to instructions.

(Cooling water should use deionized water or purified water)

b. The output side of single tube is loop line, the other side is the high voltage side, the positive and negative high voltage connections are the same, but with different power supply

The difference is: positive uses a positive high voltage power supply, and negative uses a negative high voltage power supply. Mixed connection is prohibited (Figure 5 and 6)

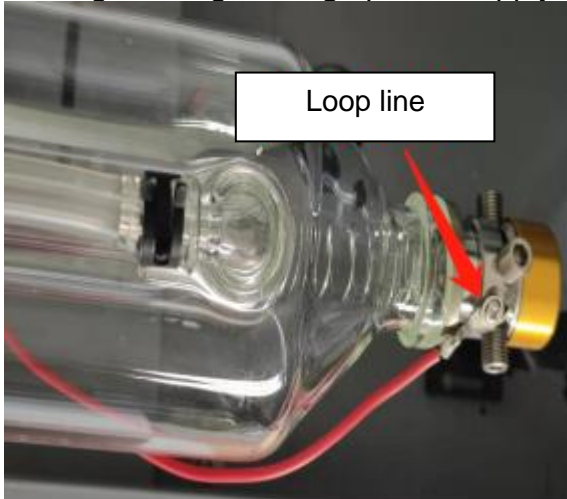


Figure 5 (Loop line)

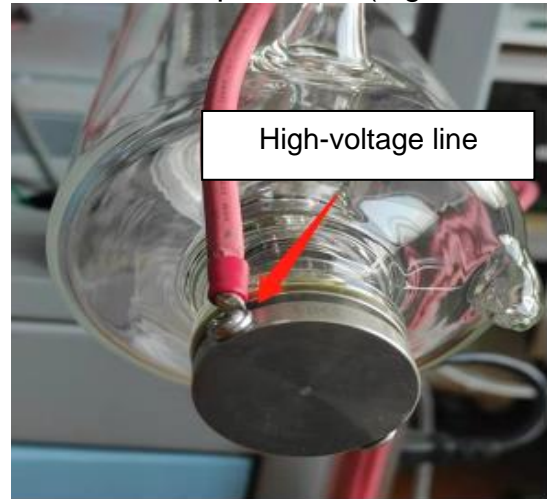


Figure 6 (High-voltage line)

C. The left side of the combined high-voltage block is the high-voltage line of tube B, and the right side is the high-voltage line of tube A (as shown in Figure 7).

The yellow line in the black aerial plug on the laser shell is the loop line of the B tube, which is connect to the same power supply with B tube high-voltage line;

The purple color is the loop line of the A tube, which is connect to the same power supply with A tube high-voltage line (as shown in Figure 8).

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Page 2 / 5

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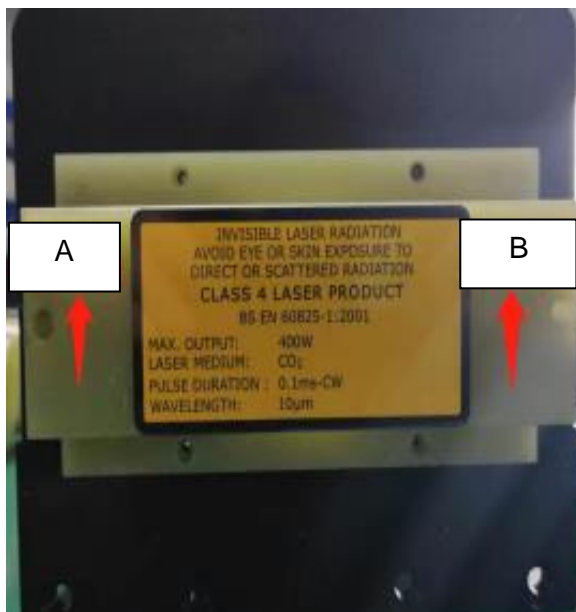


Figure 7 High voltage wire



Figure 8

## 4. Precautions for high voltage connection

a. After the single-tube high-voltage line is connected, a red high-voltage cap should be installed (as shown in Figure 9), and the high-voltage cap should be filled with glass glue or sealed with insulating tape to prevent dust and moisture from entering the air causing high-voltage discharge to the machine shell (such as Figure 10).

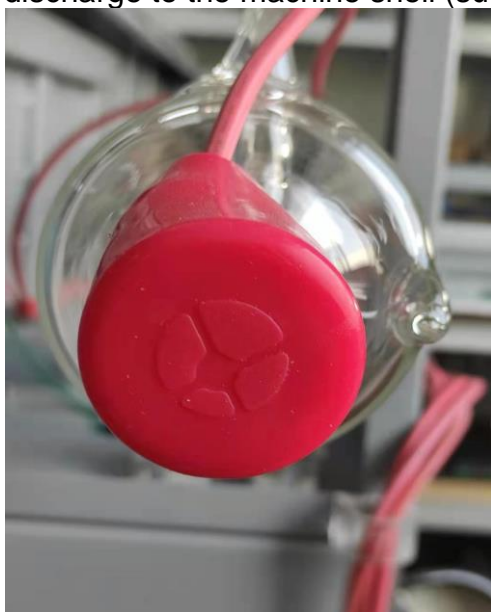


Figure 9



Figure 10

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				Drawing:		Page 3 / 5

# User Manual

## 5. Signal line connection

- a. 6P type laser control board, low-level is active as an example (as shown in Figure 11); 25P type (except for Dingxin power supply connected to the Ruida board) is connected to the laser control board (as shown in Figure 12), and 25P needs to be set Active high.

4

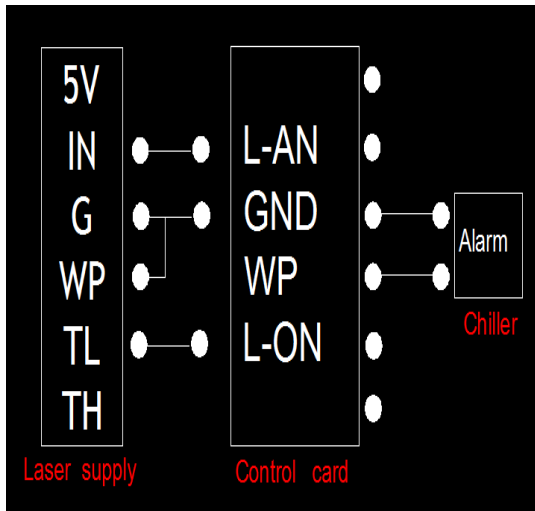


Figure 11

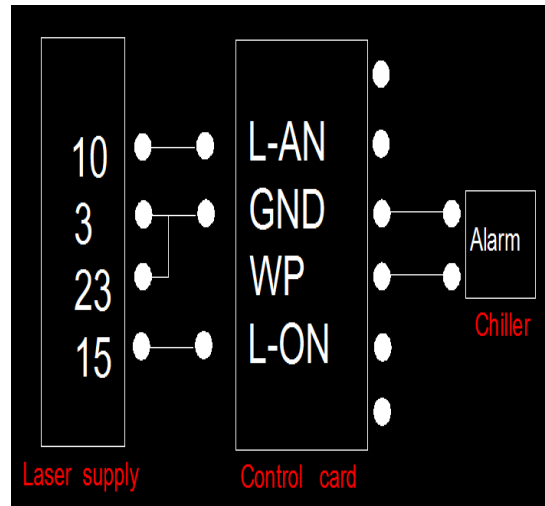


Figure 12

- b. 25P type Dingxin power supply is connected to the Ruida laser control board (only high-level active can be used). Need to install optocoupler relay such as (Figure 13).

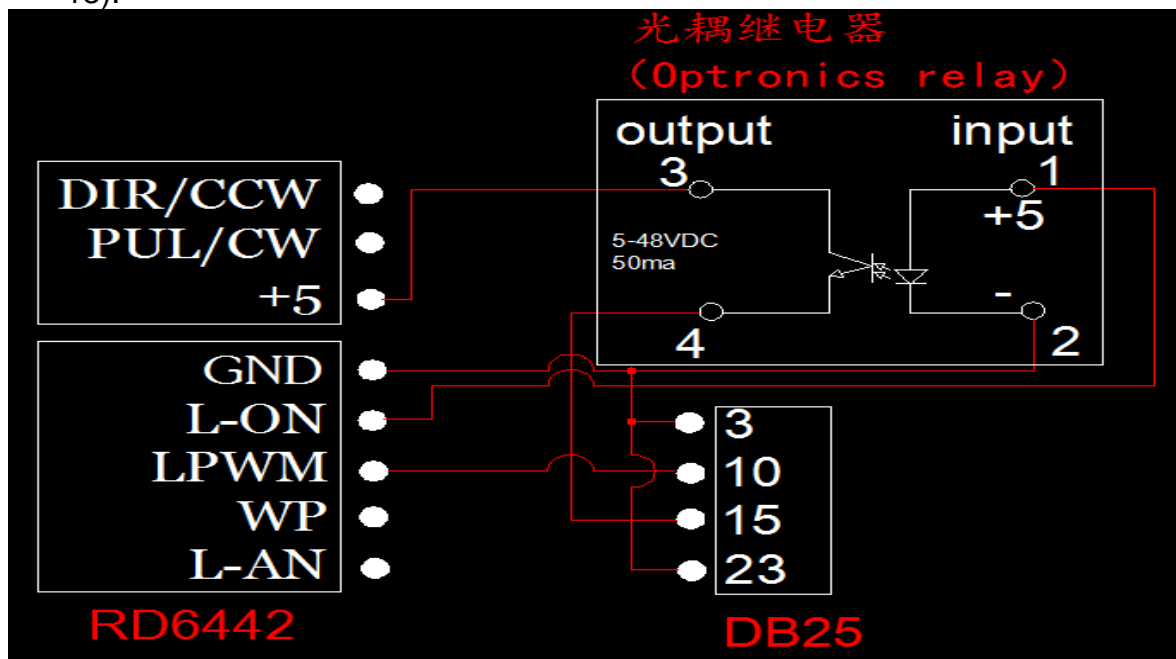



Figure 13

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				Date: 2018-05-01	Page 4 / 5
			Drawing:		


# User Manual

## 6. Laser tube test

- a. Before the light emission test, confirm that the line connection is ok and the cooling water is connected.
- b. It is forbidden to test the laser spot within 150mm of the laser output lens (the dust produced by the test will cause irreparable pollution of the output lens). If it is necessary to adjust the light spot at 50mm, the power should be set within 15% and the firing time is 15ms, and no light spot is allowed within 50mm.

## 7. Usage of laser tube

- a. The maximum current used for normal cutting of all models is 35 mA, and the recommended current is 20-32ma (the room temperature is lower than 15 degrees and the current is increased by 3-5ma).
- b. The cooling water flow rate of single pipe is 4L/min, combined is 8L/min, and the water temperature is 20-30°C.
- c. The single tube needs to check the laser output mirror of the laser tube regularly to observe whether it is polluted (according to the on-site environment within 1-7 days). To clean the lens, remove the dust cap and use lens cleaning paper dipped in a small amount of absolute ethanol to wipe it in one direction.
- d. Ensure that the machine has sufficient exhaust air volume during use, otherwise the cutting dust will easily catch fire at the bottom of the plate, and the dust entering the cutting light path will also reduce the quality of the laser beam, which will seriously affect the work effect.
- e. When the room temperature is lower than 0°C, add antifreeze solution or drain the cooling water from the laser tube after stopping use.

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							Date: 2018-05-01	Page 5 / 5
							Drawing:	
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