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USER MANUAL

CUTTERS DJTOL

R Series DC CO2 Laser Tube

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1 Safety

1.1 General

Only authorized personnel who have been instructed in and fully understand the necessary safety procedures must use this laser or get in the vicinity. Access to the laser should be restricted to authorized personnel. Suitable warnings signs should be placed around the area where it is operating Any local safety requirements for the operation of this equipment must be complied with.

1.2 Optical Safety

This is a high-power Class 4 CO2 laser system.

WARNING: This is a class 4 laser product; the laser radiation can cause serious eye damage - including blindness. Never look directly into either the CO2 laser beam. Injury to the eyes and skin can result from direct exposure to CO2 laser radiation.

When the laser is operating, all personnel must at all times wear approved laser goggles. It is vital that these are effective at the wavelength(s) emitted by this laser! The wavelength of the main infrared beam is 10.6μm.

Never look directly into the main beam or any reflected laser beams - even when wearing eye protection - or blindness may occur.

Ensure the beam is never reflected outside of vicinity, nor to reflective object, nor doors or windows to prevent injuries of human body or damage of objects.

Ensure that the beam is never reflected - even partially - back along its path into the laser head, as this will result in optical damage to its components.

Interaction of the beam with certain materials can cause potentially harmful levels of visible radiation to be emitted that may cause hazards like fire or smoke. Appropriate protective

measures must be taken in this case.

1.3 Electrical Safety

The power supply of this system is high voltage power supplies (DC 0-38Ma, 10kV-30Kv DC high voltage power supply) that should be installed and operated under the professional technicians' instructions.

WARNING: This equipment contains lethal AC and DC voltages. These may still be present even when the power is disconnected

No electrical hazard exists if the system is operated normally. But this requires: ①Connection wire are connected correctly, wires are intact. ②LASER equipment and power supplies are installed in appropriate location. ③LASER equipment is properly grounded. When the LASER equipment is operating, personnel in the vicinity should wear insulated clothing and remove conductive clothing as instructed.

WARNING: High voltages exist in LASER equipment, inside power supplies and connection wires

1.4 Others

Safety beam stop devices are not equipped on this LASER equipment; operating conditions are controlled by the control systems of LASER machines.

1.5 Declarations

If you have any doubts while operating the laser, try to contact us first to avoid unexpected irrevocable damage.

Laser Tube is a complex and fragile glass product, please keep it in a safe place, do not adjust any parts on the laser, man-made damage to our company will not be returned or warranty!

2.Safety Marks

2.1 Laser Warning Sign

Stick on the output end of laser tube, please take it off before emitting the laser.

3 Preparations and Installation

3.1 Products Introduction

R series laser tubes are our own patented technology, using physical methods to effectively optimize the output spot diameter, to improve the output power. And also, resolve the problem of spot modes altering. The resonator optics are from US II-VI Infrared, with a good spot pattern. New international catalytic technology is used to enhance the discharge coating layer and catalytic reduction performance, resulting in stable output and longer life.

R-series laser parameter table is shown in Table 1.

Model	Length (mm)	Dia. (mm)	Rated Pwr (W)	Peak Pwr (W)	Recom. Working Current (mA)	Stability (%)	Cooling Speed (L/min)
R1	1050	Φ80±2	65	80	16	≤±5	3
R3	1250	Φ80±2	80	100	21	≤±5	5
R5	1450	Φ80±2	100	120	24	≤±5	7
R7	1650	Φ80±2	130	150	26	≤±5	7
R9	1850	Φ80±2	140	160	28	≤±5	10

3.2 Electrical requirements

Input power requirements: 20A/220~240V/50Hz AC
(Contact us for other electrical requirements are optional)

3.3Coolant requirements

The R series lasers require an industrial water chiller with distilled water, or preferably, deionized water
Water Cooling Machine Requirement:
Water Temperature: 20℃～30℃；
Lift: 10m～15m；
Waterflow: 3L/min～13L/min.

3.4 Environmental Requirements

The R series lasers should be operated or stored in a dust-free condition the working or storage condition please refer to the Table 2. Below. The lasers PSU should be operated in a well-ventilated condition. The working area must comply with the local operation safety standards.

Environment requirements	Operation	Storage
Temperature	15～32℃	-10～35℃
Humidity	30～60%RH	20～80%RH

Warning: While the temperature of storage environment underneath 0℃, the coolant (Water)inside the lasers must be drain out completely.

3.5 Packaging

Please check the packaging to ensure there is no damages, when you receive the laser. If any damages determined at delivery, please contact our sales persons immediately. If the package is intact, please take the laser out and check if it's bumped or damaged and have the test only after ensuring the laser is good and intact. Please contact our sales persons should there be any anomaly. The packaging should be retained for any future storage or shipment of the laser.

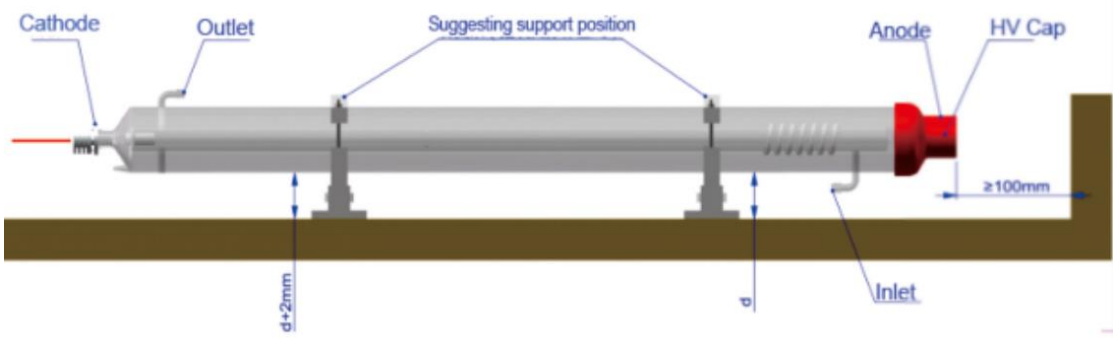
Return and repair of the laser tube: If the lasers should be returned, please use the original packaging and contact us in advance for authorized return.

Warning: All coolant should be drained out completely before shipping (an air pump could be useful for an aid)

3.6 Installation Procedure

(1) Please install laser tube according to the marking on the laser, connect the wires of positive and negative terminal, inlet pipe and outlet pipe of the laser correctly.
(2) Turn on the chiller, adjust the laser direction, and ensure that the coolant is full of water jacket tube and there is no blockage.
(3) Remove the window label and turn on the laser power supply to adjust the optical path.

Remarking: During the adjustment process, please make sure that the laser does not impact, knock and do not contaminate the laser lens.



4 Operating Procedure

4.1 Start-up procedure Please switch on the laser in below sequence:

（1）Turn on the water chiller.
（2）Turn on the power to the PSUs
（3）Set the correlative operation parameters to work.

4.2 Shutdown procedure

Please shutdown the laser in below sequence.
（1）Shutdown the PSU.
（2）Shutdown the water chiller

5 Maintenance

5.1 Maintenance Schedule

Frequency	Maintenance Content
1 Week	Check the coolant level of the water chiller.
1 Month	Change the coolant. Check the condenser of the water chiller
3 Months	Change the deionizer cartridge and coolant filter. Remove excess dust and debris of the PSU, laser and the water chiller.

6 Troubleshooting

Some basic trouble shooting steps are given below. Please contact us if the issues are not resolved or recurring.

6.1 Issue: The LASER always come with max. output, or the current could not be adjusted.

Possible reasons and solutions

（1） Incorrect control terminal connections of the PSU.

Please properly check the pin connections on the PSU control terminal.

（2） PSU failure.

Please try to replace the failure PSU with a new one and take another test.

（3） Control board failure of the laser machine, in such case

please contact the laser machine manufacturer.

6.2 Problem: No laser output.

Possible reasons and solutions

（1）Incorrect control terminal connections of the PSU or broken connection of control wiring.

Please properly check the wires and the connections.

（2）Failure of the water chiller, insufficient coolant in the water chiller reservoir.

Please repair or change a new the water chiller or replace the coolant.

（3）Failure of the PSU or AC failure.

Please replace the PSU or wires of main power.

（4）Control board failure of the laser machine.

Please contact the machine manufacturer for the inspections.

（5）Laser failure.

Please contact our Sales Rep. or After Sales Engineers for a proper inspection.

6.3 Problem: HV-End Sparks

Possible reasons and solutions

（1）Damage or broken circuit of the interconnection between the laser and PSU.

Please replace the connecting wires between laser and PSU.

（2）Laser failure

Please contact our Sales Rep. or After Sales Engineers for a proper inspection.

（3）Improper or Non GND connection.

Please make sure the DLT laser's ground wire are connected properly.

6.4 Problem: Coolant temperate continues to rise.

Possible reasons and solutions

（1）Refrigerating capacity too small.

Please replace the water chiller with better refrigerating capacity.

（2）Poor ventilation of the water chiller.

Please move the water chiller to a better ventilation area.

（3）Contamination of condenser of water-cooling machine.

Please clean the condenser or replace a new one.

（4）Lack of coolant.

Please add coolant according to the chiller instructions.

（5）Contamination of coolant

Please replace coolant: stilled water or deionized water.

8 (800) 555-63-74 бесплатные звонки по РФ
+7 (473) 204-51-56 Воронеж
+7 (495) 505-63-74 Москва
www.purelogic.ru
info@purelogic.ru
394033, Россия, г. Воронеж,
Ленинский пр-т, 160, офис 149

Пн	Вт	Ср	Чт	Пт	Сб	Вс
	8^{00}-17^{00}			8^{00}-16^{00}	выходной	