DF18/DF22
DC CO_2 LASER
User Manual

Brief Introduction

Beijing EFR Laser S&T Co., Ltd. is a modern enterprise specializing in the research, development and sales of carbon dioxide lasers and series of products. Beijing EFR Laser S&T Co., Ltd. is committed to the research and experiment of carbon dioxide lasers for 20 years, with a research team that has mastered the industry's leading technology, the company has rich practical experience, and has a research and development center and manufacturing base in Beijing.

The manufacturing base of EFR brand, equipped with a group of exquisite technicians, ultra-clean optical workshop, a number of conventional laser tube production lines, has a strong manufacturing strength, is a national high-tech enterprise and a national specialized special new enterprise, and has obtained nearly 30 carbon dioxide laser technology patent certificates in China.

Please prepare these information before contact our after sales or technical support:

- CO_2 Laser Model
- CO_2 Laser Serial Number
- Any helpful information for trouble shooting.

Please read this manual carefully, it includes installation information for technician and operation information for user, and the maintain information to keep the laser working fine.

Attention:

Warning:: before power on the laser, please learn safety notes and maintains notes.

Warning:: please do not adjust or amend the laser, it could a danger and hurt people.

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1 . Safety

1.1. Basic Information

It's totally prohibited to use this laser without training, permission, or learning safety notes.

It's totally prohibited to approaching the laser without permission.

There must be DANGER signs in the laser working area.

1.2. Optical Safety

This CO_2 laser grade is Class IV: high power laser. Both the laser direct beam & mirror-reflected beam could injure eye and skin HEAVILY. Even if the diffuse laser could injure eye.

During laser working, the operator or any body around should wear certificated protection glasses that the wage length is same as the CO_2 laser: 10.6μm. Do not expose the eyes onto the laser beam even if wearing protection glasses.

Make sure the laser beam is not reflected back to the CO_2 laser, or it will damage the CO_2 laser itself.

1.3. Electrical Safety

Warning: the power supply of the laser inputs AC and outputs 40KV high voltage DC, there could be electricity remained even if powered off.

Do not open the power supply shell.

Warning: when the power supply is powered on, please do not touch the laser tube body, do not approaching the end of the laser tube (the high voltage side).

2. Preparation & Installation

2.1. Coolant Requirement

The CO_2 laser requires for chiller with cooling function. The chiller should use pure water. Recommended Model:5200

The chiller should be able to control temperature between 15-25℃, and the flow should be more than 3-5L/min, refrigeration capacity should be more than 3.0KW.

2.2. Environment Requirement

The laser working environment should be temperature 15-30℃, humidity 30-60%. For power supply cooling, there should be enough air flow. And the environment should be clean, no dust which pollutes the laser and the power supply.

2.3. Package

If the CO_2 laser package was damaged when you got it, please do note down the extent of damage on the waybill;

For stock or transportation requirement, please keep the original package carefully.

2.4. Return to Us

If the CO_2 laser has to be sent back to us, please contact us for permission before sending back, and use the original good package.

Note：before packing, please empty the water inside the laser tube.

2.5. Installation Procedure

Warning: before install the laser tube and , please wear the protection glasses first.

There should be enough space for power supply and chiller for air flow cooling purpose.

Connect the first group of wires of the laser power supply to the first group of positi ve and negative poles of the laser, respectively; the laser output terminal is the negative p ole (tube 1), connected to the negative pole line (V-1) of the end of the laser is Positive pole (tube 1+), connected to the positive pole line (V+ 1) of the laser power supply;

tive and negative poles of the laser, respectively; the laser output terminal is the ne gative pole (tube 2-), connected to the negative pole line (V-2) of the laser power supply; the other end of the laser is Positive pole (tube 2+), connected to the positive pol e line (V+ 2) of the laser power supply;

Two power supplies with two set wires, they should be connected to front and rear l aser tube seperately. DO NOT Cross connection!

Connect the chiller and laser tube. The chiller inlets is connected to laser tube output side (cathode), the chiller outlets is connected to the other side of laser tube (anode); power on the chiller and makes sure cooling water is full of cooling tube of the laser, and NO BUBBLE inside the water!

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Warning: if the laser tube is powered on without circling cooling water, it will break immediately. In thiscondition, the laser tube will have no warranty.

3. Operation Procedure

3.1. Working Current

If the working current is less than 10mA, the electrical-discharge will be unstable, and the laser output will be also unstable, the beam spot mode will be poor.

The recommended working current is 35mA.

Under recommended working current, the laser will output the rated power; over the recommended working current, the laser tube working life will be reduced; over the max current, the laser tube working life will be very short.

4. Specification

4.1. Laser Tube

Model	Length（mm）	Diamet（mm）	N.W（Kg）	Output watts(w)	Max watts (w)
DF18	1850±20	φ80±2	4	170	190
DF22	2250±20	φ80±2	5	200	220

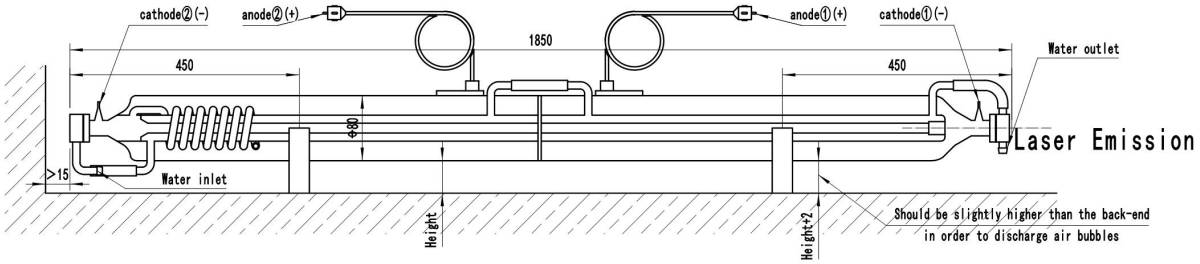
Model	Maximum output current	Maximum input current	withstand voltage	responding speed	L*W*H (mm)	weight Kilogram (kg)
PS-100A	35mA	45kV	Input-Output, input-shell: AC1500V 10mA 60s ;output negative connected to the laser tube	≤1mS (the time from when the switch signal is given to when the output current rises to 90% of the set current)	295*200*97	2.7

4.2. High Voltage Power Supply

Environment	Using	Storage
Temperature	15-30℃	-10-35℃
Humidity	30-60% RH	20-80% RH

5.InstallationDiagram

INSTALLATION DIAGRAM OF CO2 LASER TUBE MODEL DF18



INSTALLATION DIAGRAM OF CO2 LASER TUBE MODEL DF22