



CO2激光打标机使用手册

CO2 Laser Marking Machine User Manual

CO2-30-CR/CO2-60-CR/CO2-100-CR

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Shenzhen dapeng laser Technology CO., LTD.



一：安全注意事项 Safety Precautions

1.1 激光安全知识 Laser Safety knowledge

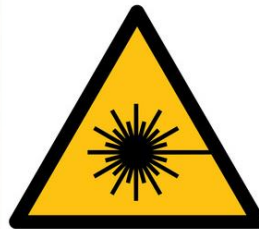
辐射强度等级为第四类(CLASS-IV)激光产品的激光操作安全须知：Safety Notes for laser operation of CLASS IV laser products:

- 1.遵守一切安全操作规程,要严格按激光器的启动程序启动激光器； Comply with all safety operating procedures, to strictly start the laser according to the starting procedure;
- 2.操作者需要经过培训,熟悉设备的结构、性能,掌握操作系统有关知识。The operator needs to be trained, familiar with the structure and performance of the equipment, and master the knowledge related to the operating system.
- 3.避免直视激光器的输出光束,反射光与散射光也同样有害。Avoid looking directly at the output beam of the laser. The reflected light and scattered light are also harmful.
- 4.使用激光的过程中禁止佩戴珠宝首饰。Do not wear jewelry when using laser.
- 5.使用激光过程中必须佩戴防护性眼罩。Wear a protective eye mask when using the laser.
- 6.操作台面禁止放置易燃易挥发性物质,严禁在工作台前边镭射产品边用有机溶剂擦拭产品。It is forbidden to place inflammable and volatile substances on the operating table, and it is forbidden to wipe the products with organic solvent while laser products are in front of the table.
- 7.使用过程中必须遵循一条原则：光路不能与人的眼睛处于相同高度 !!!One principle must be followed in the process of use: the light path should not be at the same height as human eyes!!
- 8.在没有弄清楚其某一材料特性的时候,是否能使用激光照射或者加热前,不要对其加工,以

免产生烟雾和蒸气的潜在危险。 Do not process it before you can use laser irradiation or heating before you do not know the characteristics of a certain material, so as to avoid the potential danger of smoke and steam.

9.激光设备在进行开动的时候，操作人员不得擅自离开岗位或者托人待管，如的确需要离开时应停机或切断电源开关。 When the laser equipment is started, the operator shall not leave the post or ask someone to take care of it. If it is necessary to leave, the machine shall be shut down or the power switch shall be cut off.

10.在进行加工的时候，如果发现有异常的情况的时候，应立即停机，及时排除故障或上报。 When processing, if there is an abnormal situation, it should be stopped immediately, troubleshooting or reporting in time.



1.2 安全指示标识

为避免激光对眼睛的伤害,请误

直视激光头,严禁将激光头对对准人或动物，或易燃易爆物品。 To avoid eye damage, look directly at the laser head. Do not aim the laser head at people, animals, or flammable



or explosive objects.

为了以防万一,工作场所放置灭火器。 Keep fire

extinguishers in the workplace just in case.



1.3 现场使用注意事项 Precautions for site use

配置专人负责:要求配备人员必须要有激光和打标相关知识和经验的人员。并在移交其他人员操作时必须对其进行安全操作相关培训。做到安全第一！

Assign a person to be responsible for: the personnel must have laser and marking related knowledge and experience. And when handing over other personnel to operate, it must carry out safety operation related training. Do safety first!

二：机器规格

2.1 设备原理概述:CO₂ 激光打标机即二氧化碳激光打标机(CO₂ 就是二氧化碳),是利用 CO₂ 气体为工作介质的激光振镜打标机。CO₂ 激光器是一种气体激光器,其产生的波长为 10.6 μ m,属于中红外频段,CO₂ 激光器有比较大的功率和比较高的电光转换效率。CO₂ 激光器以 CO₂ 气体为介质,将 CO₂ 和其它辅助气体充入放电管在电极上加高压,放电管中产生辉光放电,使气体释放出波长为 10.6 μ m 激光,将激光能量放大后,经振镜扫描和 F-Theta 镜聚焦后,在电脑和激光打标控制卡的控制下,可在工件上根据用户的要求进行图像、文字、数字、线条的标刻。

Machine specifications

CO₂ laser marking machine is a carbon dioxide laser marking machine (CO₂ is carbon dioxide), which is a laser galvanometer marking machine that uses CO₂ gas as the working medium. The CO₂ laser is a gas laser with a wavelength of 10.6 μ m, which belongs to the mid-infrared frequency band. The CO₂ laser has relatively large power and relatively high electro-optical conversion efficiency. The CO₂ laser uses CO₂ gas as the medium. CO₂ and other auxiliary gases are charged into the discharge tube and high voltage is applied to the electrodes. Glow discharge is generated in the discharge tube, so that the gas emits a laser with a wavelength of 10.6 μ m. After the laser energy is amplified, it is vibrated After mirror scanning and F-Theta mirror focusing, under the control of computer and laser marking control card, images, characters, numbers and lines can be marked on the workpiece according to the user's requirements.



2.2 机器组成部份:

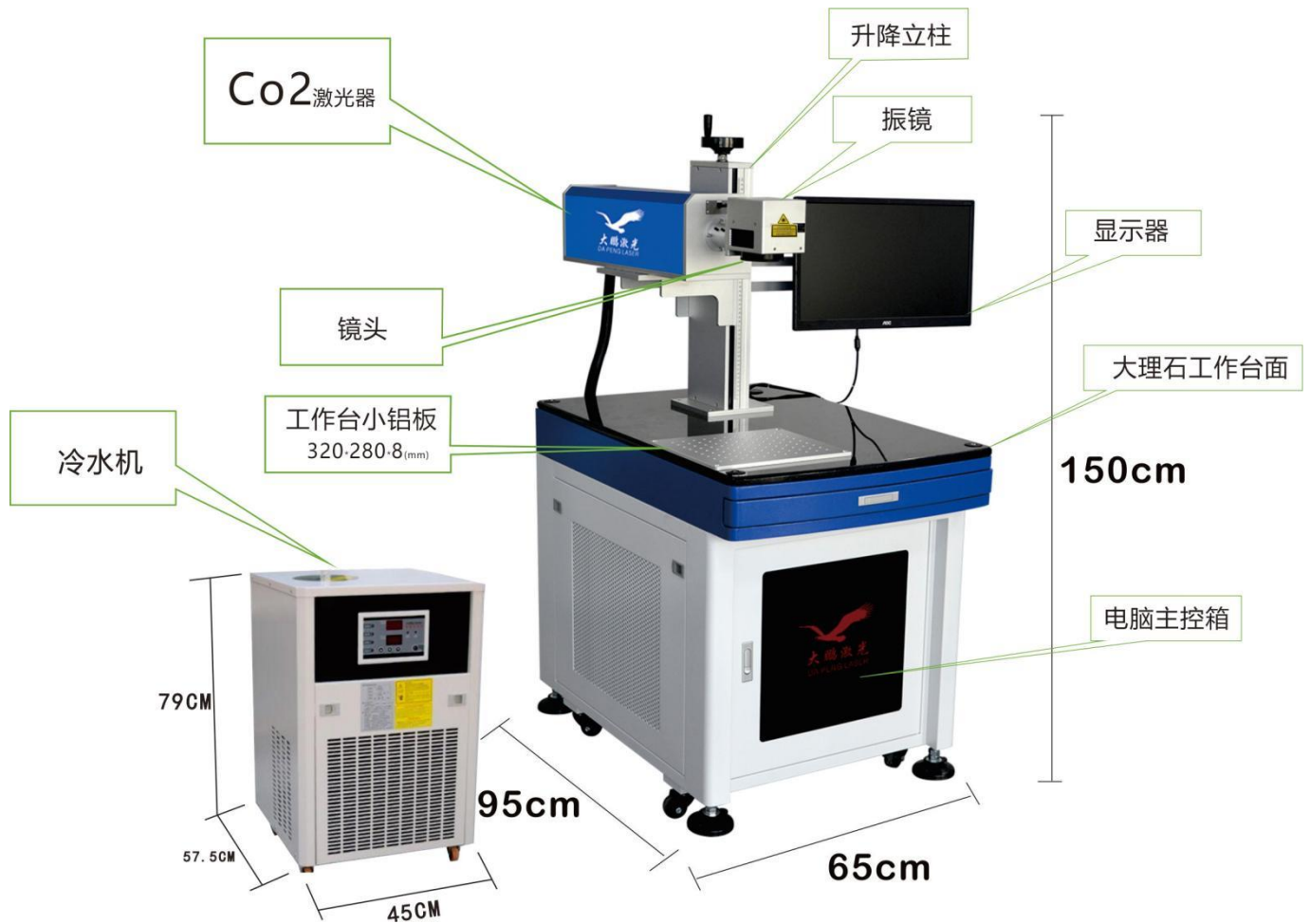
Machine components:

类别 category	器件名称 Device Name	规格 Specifications	单位 Unit	单套数量 quantity	总数量 Quantity Total
光学系统 Optical system	激光器 laser	DP-CR 激光器 30 瓦/ 60 瓦 /100 瓦 ($\lambda=9.3\mu\text{m}/10.6\mu\text{m}$)	台 table	1	1
	扫描振镜 Scanning galvanometer	ScanQuick3 $\lambda=9.3\mu\text{m}/10.6\mu\text{m}$	台 table	1	1
	镜头 Lens	100mmX100mm focusing lens	个 PCS	1	1
控制系统 Control system	控制软件 Control software	DP EzCAD	套 set	1	1
	电脑 computer	工控 I3/19 寸液显 Industrial control I3/19 inch liquid display	套 set	1	1
	冷水机 chiller	DP-KLD (60 瓦以上)(above 60 watts)	套 set	1	1
机械系统 Mechanic al systems	控制机柜 The control cabinet	DP-大理石款台面钣金柜 950*650 DP-Marble Countertop Sheet Metal Cabinet 950*650	台 table	1	1
	升降机构 Lifting mechanism	170 型升降,行程 S=550mm,手动调焦 170 type lift, stroke S=550mm, manual focus	套 set	1	1



注：图片尺寸外观会根据公司设备更新会有所差异，具体以实物为主

Note: The size and appearance of the picture will vary according to the update of the company's equipment





1.PC keyboard & Mouse

2. Workbench

3. Scan Head

4. PC Monitor

5. Stander

6.Main Switch

7. PC Switch

8.Start

9.E-Stop

10.Pilot Lamp

11.Power Input

12.Water Tank Power

13.The Turntable Output

14.Foot Plate

(Above 60 watts)

产品优点：

- ◎光束质量好精度高、寿命长，无耗材加工成本低廉。
- ◎加工过程非接触，打标效果永久性，标记清晰，雕刻及切割效率高、环保、节能。
- ◎激光功率大，能适用于多种非金属产品进行雕刻及切割雕刻，深浅随意控制。
- ◎使用二氧化碳激光器，属通用机型，后聚焦方式，光学系统可自由升降，设备性能稳定。

product advantages:



- ⊙ Good beam quality, high precision, long life, no consumables and low processing cost.
- ⊙ The processing process is non-contact, the marking effect is permanent, the marking is clear, the engraving and cutting efficiency is high, environmental protection and energy saving.
- ⊙ The laser power is large, which can be applied to engraving and cutting engraving of various non-metal products, and the depth can be controlled at will.
- ⊙ Using carbon dioxide laser, which is a general-purpose model, rear focusing method, the optical system can be raised and lowered freely, and the equipment performance is stable.

行业运用：CO₂ 激光打标机可雕刻多种非金属材料，广泛应用于陶瓷、PVC、ABC、亚克力、环氧树脂、玻璃、木材、纸等、广泛应用于、工艺礼品、电子原件、服装、皮革、纸张、食品、包装、皮料、竹木、手机套、钮扣、电容、电阻、眼镜、布料、图文、防伪、镭射打标等。

Industry use:

CO₂ laser marking machine can engrave a variety of non-metallic materials, widely used in ceramics, PVC, ABC, acrylic, epoxy resin, glass, wood, paper, etc., widely used in, craft gifts, electronic originals, clothing, leather, paper, food, packaging, leather, bamboo, mobile phone sets, buttons, capacitors, resistors, glasses, fabrics, graphics, anti-counterfeiting, laser marking, etc.

软件功能：

- ⊙ 操作过程人性化，设备运行稳定性好;专用控制软件可兼容 AutoCAD、CorelDRAW、Photoshop 等多种软件输出
- ⊙ 能接收各种 BMP、JPG、DXF、PLT、AI 等格式文件
- ⊙ 自动生成各种序列号，生产日期，一维码，二维码
- ⊙ 支持飞行打标
- ⊙ 支持旋转打标

Software features:

- ⊙ The operation process is user-friendly, and the equipment is stable; the special control software is compatible with AutoCAD, CorelDRAW, Photoshop and other software output
- ⊙ Can receive various BMP, JPG, DXF, PLT, AI and other format files



- ⊙ Automatically generate various serial numbers, production dates, one-dimensional codes, two-dimensional codes
- ⊙ Support flight marking
- ⊙ Support rotary marking

工作环境要求：

- ⊙ 环境温度要求在 10-35°C 之间，要求装空调；
- ⊙ $30\% \leq RH \leq 85\%$ (RH 相对湿度：指某湿空气中所含水蒸气的质量与同温度和气压下饱和空气中所含水蒸气的质量之比，这个比值用百分数表示。) 超出湿度范围设备有结露风险，使用时需安装空调；
- ⊙ 供电电网要求：220V；50HZ/60HZ；
- ⊙ 供电电网波动： $\pm 15\%$ ，电网地线符合国际要求。电压振幅 15% 以上的地区，应加装电子式自动稳压、稳流装置；
- ⊙ 安装设备附近应无强烈电磁信号干扰。安装地周围避免有无线电发射站（或中继站）；
- ⊙ 地基振幅：小于 50Um；振动加速度：小于 0.05g。避免有大量冲压等机床设备在附近；
- ⊙ 设备空间要求要保证无烟无尘，避免金属抛光研磨等粉尘严重的工作环境；
- ⊙ **气压：86-106kpa**
- ⊙ **某些环境应装防静电地板，加强屏蔽等；**
- ⊙ **工作冷却循环水的水质有严格要求，要求使用纯净水、去离子水或蒸馏水，不可以使用自来水、矿泉水等含有较高金属离子或其它矿物质的液体。**

Working environment requirements:

- ⊙ The ambient temperature is required to be between 10-35°C, and air conditioners are required;
- ⊙ $30\% \leq RH \leq 85\%$ (RH relative humidity: refers to the ratio of the mass of water vapor contained in a humid air to the mass of water vapor contained in saturated air at the same temperature and pressure, this ratio is expressed as a percentage.) There is a risk of condensation on the device in the humidity range, and an air conditioner needs to be installed when using it;
- ⊙ Power supply grid requirements: 220V; 50HZ/60HZ;
- ⊙ Power supply grid fluctuation: $\pm 15\%$, the grid ground wire meets international requirements. In areas where the voltage amplitude is more than 15%, electronic automatic voltage stabilization and current stabilization devices should be installed;
- ⊙ There should be no strong electromagnetic signal interference near the installation equipment. Avoid radio transmitting stations (or relay stations) around the installation site;



- ◎ Foundation amplitude: less than 50Um; vibration acceleration: less than 0.05g. Avoid a large number of punching and other machine tools nearby;
- ◎ The equipment space is required to be smoke-free and dust-free, and avoid the working environment with serious dust such as metal polishing and grinding;
- ◎ **Air pressure: 86-106kpa**
- ◎ **In some environments, anti-static floors should be installed, and shielding should be strengthened;**
- ◎ **There are strict requirements on the water quality of the working cooling circulating water. It is required to use pure water, deionized water or distilled water. Liquids containing high metal ions or other minerals such as tap water and mineral water cannot be used.**

行业样品图示:

Industry sample illustration:





整机技术参数:Machine technical parameters:

类别 Category	型号规格 Model Specifications	CO2-30-CR CO2-60-CR CO2-100-CR
激光特性 The laser characteristics	中心波长 Center wavelength	9.3um/10.6um
	激光功率 Laser power	30W/60W/100W
	重复频率 Repetition rate	0-25KHz
	光束质量 Beam mass	M2<1.2
	激光器输入电压 Laser input voltage	48VDC±2%
	光斑直径 Spot diameter	2±0.2mm
	安全等级 Safety Class	Class IV
标记参数 Marking Parameters	标记速度 Marking speed	≤8000mm 实际使用打标速度视材料而定 The actual marking speed depends on materials
	重复精度 Repetition accuracy	±0.001mm
	最小字符 The minimum character	0.5mm
	最小标记线宽 Minimum mark line width	≤0.06mm
	标记范围 Mark range	70mmx70mm/100mm*100mm
其它参数 Other parameters	冷却方式 cooling mode	风冷/水冷 Air-cooled/Water-cooled
	系统防护等级 System protection level	IP54
	运行环境要求 Operating environment Requirements	环境温度 10-35℃，相对湿度 30% ≤RH≤85%，无油雾，无凝结 Ambient temperature 10-35 °C, relative humidity 30%≤RH 85%, no oil mist, and no



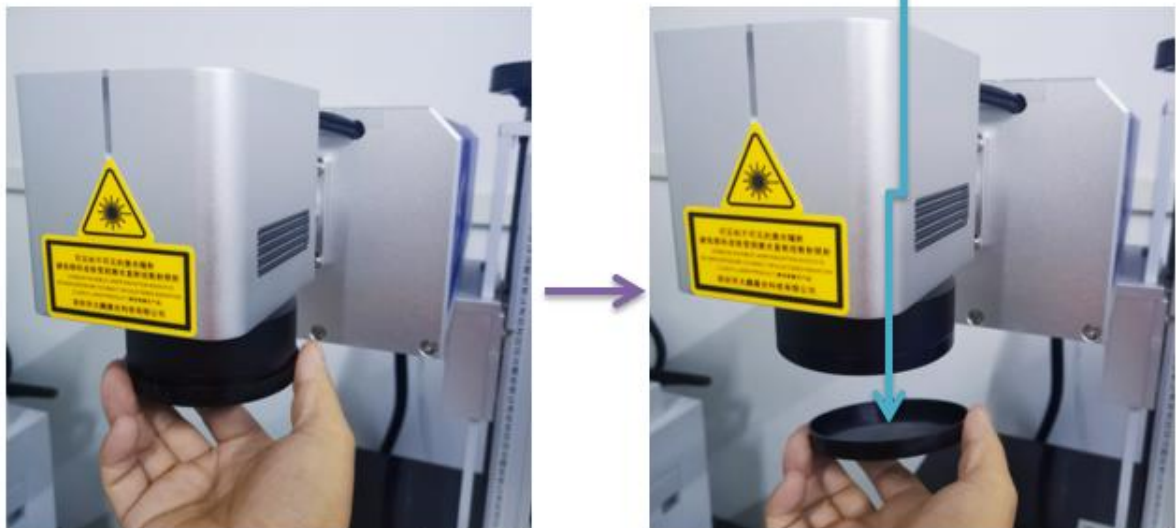
		condensation
	电力要求 Power requirements	AC220V±5%,50HZ/60HZ,5Amp
	整机功耗 Total power consumption	<1.6KW
	整机重量 Machine weight	约 170~180kg (不含包装) About 170~180kg (without packaging)
	整机外形尺寸 Machine dimensions (length X width X height) mm	950x650x1500 (dimensions for reference)

三：设备简单操作 Simple operation of equipment

3.1 设备开机 powered *.**请确保机器在启动前连接到 220V±10% 电源。***

Device powered on*.Please make sure the machine is connected to 220V±10% power supply before starting. *

1. Take off the lens cap

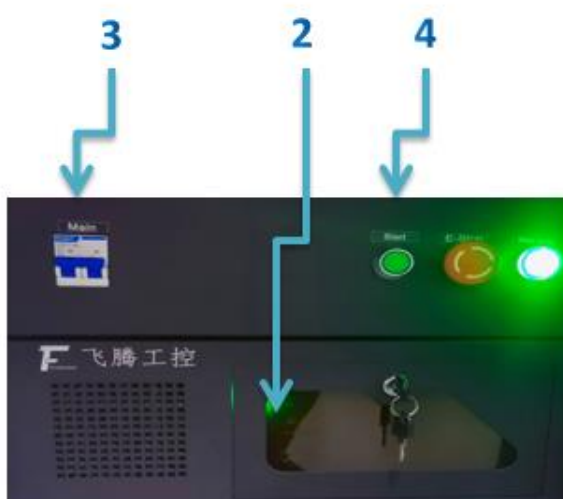


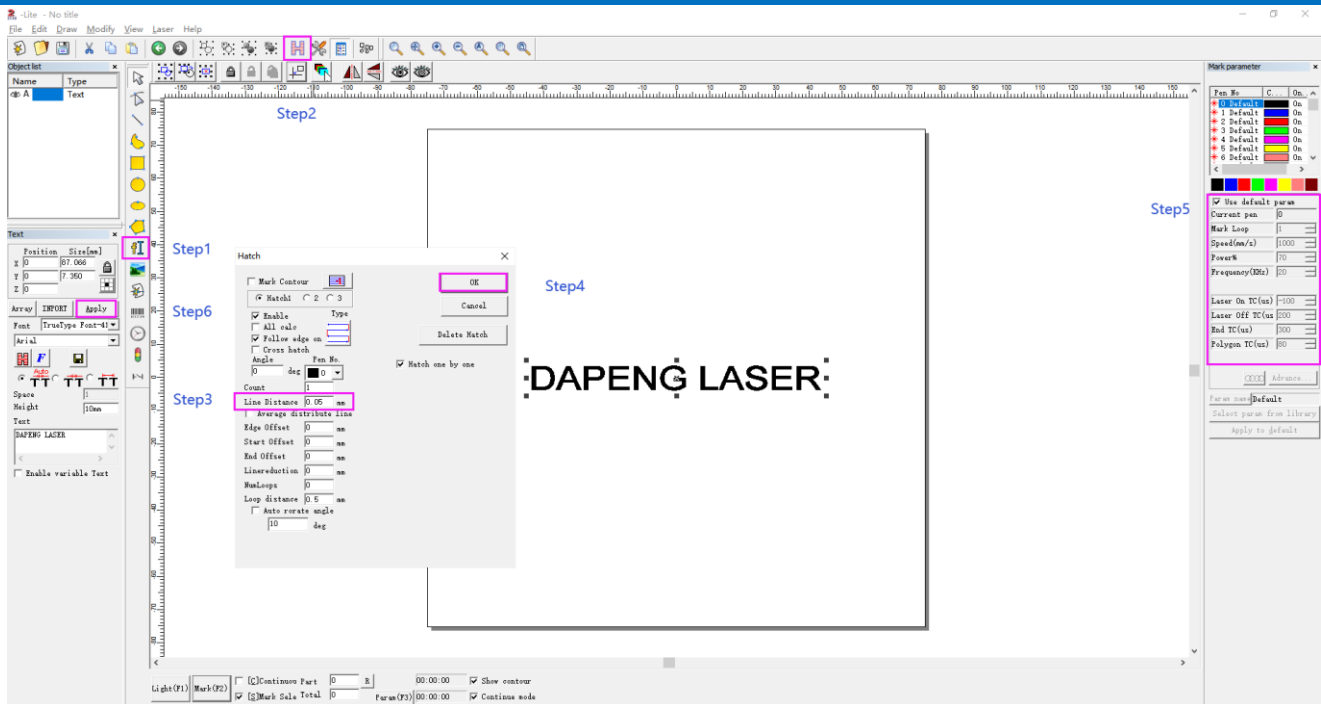
2.PC Switch

3.Main Switch

4.Start

5.Open the software





3.2 设备关机

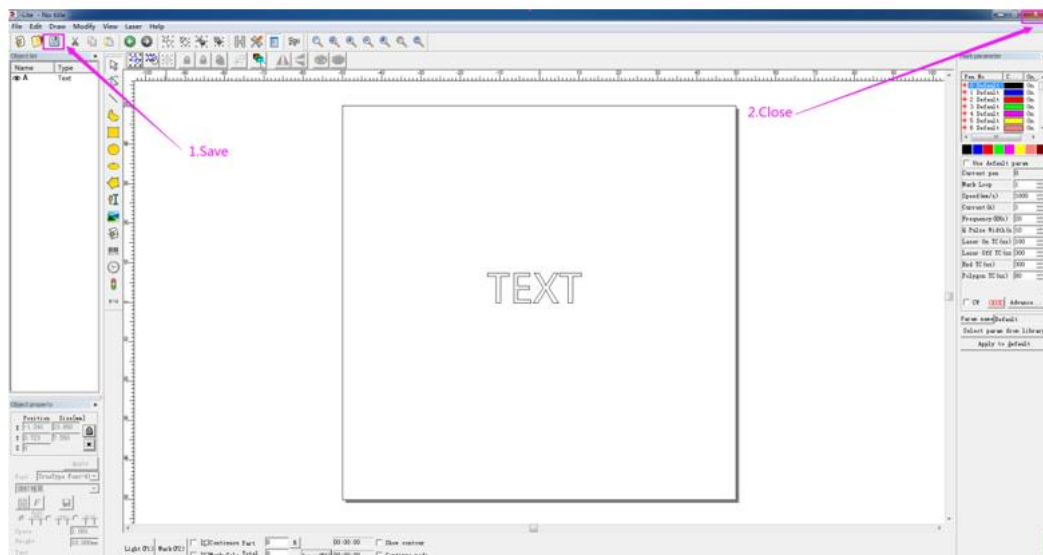
开机顺序相反，在软件上保存打标参数，再关总开关，盖上场镜防尘盖。

Equipment shutdown

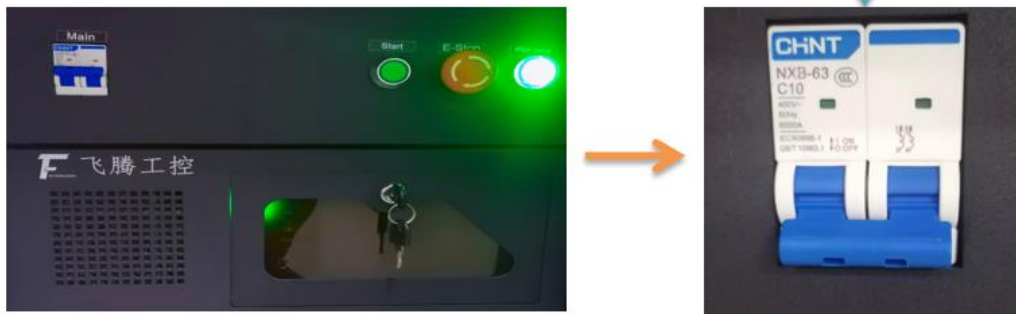
The power-on sequence is reversed, save the marking parameters on the software, turn off the main switch, and cover the field lens dust cover.

C. How does it end

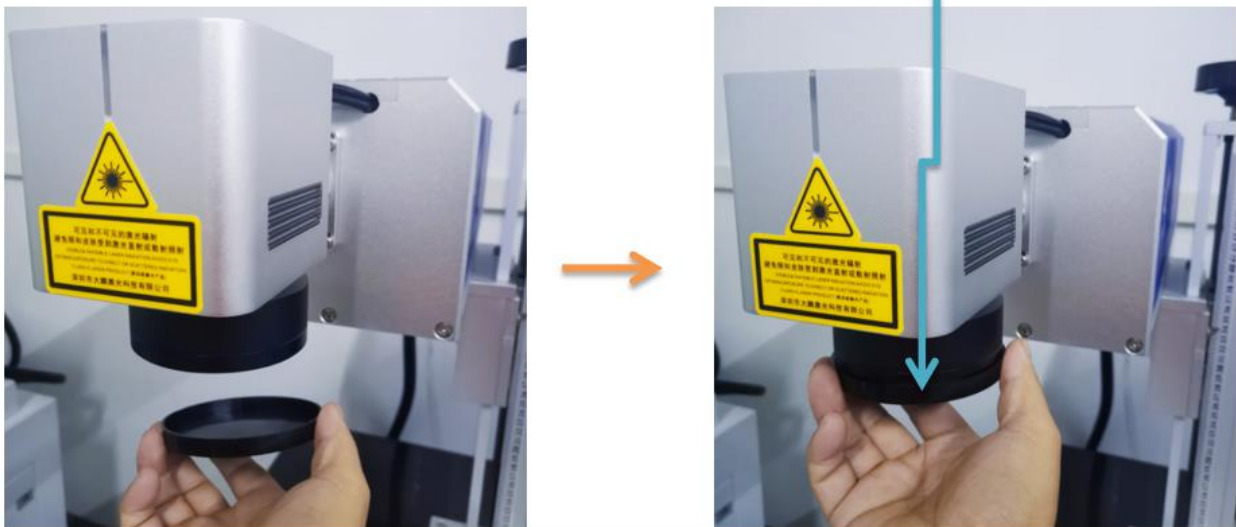
1. Shut down the software



2. Off Main switch



3. Put the lens cap back on



四：维护及保养 Maintenance and maintenance

4.1 机器使用温度要求

机器所在的环境温度要求为：10°C以上,35°C以下

Indoor temperature requirement of the machine

The indoor temperature of the machine is as follows: Above 10°C-Below 35°C

4.2 机器清洁、保养 Machine cleaning and maintenance

1)定期（一个月）给机器内部清理灰尘，保证机器内部清洁。也可根据机器所在环境更改清理



频率

Clean the dust inside the machine regularly(one time per month),ensure the internal cleaning of the machine,Also you could change the frequency of cleaning the machine according to the environment.

2)机器加工最大功率需控制在 90%以下，长时间超 90%功率工作会导致激光器功率过快衰减，降低使用寿命

The maximum power of the machine should be controlled under 90%, the laser power could lead to decay too fast if it processes over 90% power for a long time,also it will reduce the service life.

3)潮湿环境下使用机器有可能引起机器内部电路短路及损坏部件。

The use of machines in a humid environment is likely to cause short circuit and damage to the internal circuit of the machine.

4) 为保证系统的正常使用，必须对设备进行日常清洁和维护，本机属精密设备，在维护时需格外细心。每次工作完之后，首先作好环境的清洁，使工作环境无尘、洁净，然后作好设备的清洁，包括主机的外表面，主控柜的外表面，光学系统罩壳、工作台面等要无杂物、无尘、洁净。

In order to ensure the normal use of the system, the equipment must be cleaned and maintained on a daily basis. This machine is a precision equipment, and special care should be taken during maintenance. After each work, first clean the environment to make the working environment dust-free and clean, and then clean the equipment, including the outer surface of the host, the outer surface of the main control cabinet, the optical system cover, the work surface, etc. No debris, no dust, clean.

5) 配冷水机必须用纯净水、蒸馏水或者是去离子水,每 30 天换水一次；溶液 PH 值要求：



6.5~7.5 冬天，水温过低，低于 0°C 时，水系统结冰，为防止冻裂管道，损坏设备，在条件允许情况下可往水系统加防冻液，某些类型激光器对于防冻液会有一些要求，添加防冻液前建议先咨询激光器厂家。举例，在最低气温为 -3.5°C 的地区，可以使用体积浓度为 9.1% 的乙二醇防冻液，比例大约可调为 1 : 9 【1 成乙二醇，9 成纯净水】；2、在最低气温为 -15°C 的地区，可以使用体积浓度为 28% 的乙二醇防冻液，比例大约可调为 3 : 7 【3 成乙二醇，7 成纯净水】，长期停机可断电并把机器内部水完全排出，保持干燥，覆盖防尘罩。

The chiller must be equipped with pure water, distilled water or deionized water, and the water should be changed every 30 days; the PH value of the solution is required: 6.5~7.5 In winter, when the water temperature is too low, when it is lower than 0 °C, the water system will freeze. If the pipeline is cracked and the equipment is damaged, antifreeze can be added to the water system if conditions permit. Certain types of lasers have certain requirements for antifreeze. It is recommended to consult the laser manufacturer before adding antifreeze. For example, in an area where the minimum temperature is -3.5°C, ethylene glycol antifreeze with a volume concentration of 9.1% can be used, and the ratio can be adjusted to about 1:9 [1 into ethylene glycol, 9 into pure water]; 2. In In areas where the minimum temperature is -15°C, ethylene glycol antifreeze with a volume concentration of 28% can be used, and the ratio can be adjusted to about 3:7 [30% ethylene glycol, 70% pure water]. Drain the water inside the machine completely, keep it dry, and cover it with a dust cover.

6) 镜片不能用手指摸，不能用酒精或其它溶剂擦拭，可用无尘纸擦拭。

The lens cannot be touched with fingers, and cannot be wiped with alcohol or other solvents. It can be wiped with dust-free paper.



五：电气安全与保修事项 Electrical safety and warranty matters

5.1 电气安全 Electrical safety

只有经过正式训练以及具有专业知识之人员才可以进行电气维修和故障排除 Only formally trained and knowledgeable personnel can perform electrical maintenance and troubleshooting

1)启动之前，请详细阅看说明书并熟知安全操作规程 Before starting, please read the instructions carefully and be familiar with the safety operation procedures

2)排除故障前，必须切断电源 Before troubleshooting, the power must be cut off

3)注意地面是否有水或潮湿，防止触电 Pay attention to whether there is water or moisture on the ground to prevent electric shock

4)检查地线是否安全接地 Check whether the ground cable is securely grounded

5)不得修改电路或拆自拆开电器部件，除非经我司专业人员授权 Do not modify the circuit or disassemble the electrical parts, unless authorized by our professional staff

5.2 保修事项 The warranty issues

1)未经我司允许私自更改外观、结构、电气线路或拆装核心部件如激光器光学部件等不在公司保修范围，如因此造成间接方面损失，我司将不承担任何相关责任 It is not within the warranty scope of the company to change the appearance, structure, electrical circuit or disassemble core components such as laser optical components without the permission of our company. In case of indirect losses caused by this, our company will not bear any relevant liabilities

2)违规操作而造成的人为损坏将不在保修范围内 Man-made damage caused by illegal operation will not be covered by the warranty



3)本打标头内的光学场镜镜片与平板电脑屏属于易碎产品,请避免与尖锐钝物撞击,如有损坏恕不保修, 本公司承诺易损件的产品维修请寄回 The optical field mirror lens and tablet computer screen in this marking head are fragile products, please avoid collision with sharp blunt objects, if there is damage, the warranty is not guaranteed, the company promises to wear parts of the product repair, please send back

4)本打标机的平板电脑屏属于易碎产品,移动设备或不使用时请轻合上平板电脑盖板,请避免与尖锐钝物撞击,如有损坏恕不保修, 本公司承诺易损件的产品维修请寄回 The tablet computer screen of this marking machine belongs to fragile products. Please close the cover plate of the tablet gently when mobile devices or not in use. Please avoid collision with sharp blunt objects

5)手持振镜头有内置可供使用的零件,所有维修应由本公司专业人员进行维修,请不要损坏标签和揭开手持头盖子,不使用时请将手持振镜头悬挂于机身后部的卡扣中,请勿随意置放工作场所,避免碰接,否则产品的任何损坏本公司不予保修 portable vibration lens has a built-in parts that can be used, all maintenance shall be conducted by the company professional maintenance, please don't damage the label and uncovered the handheld head cap, when not in use, please hang the handheld vibration lens in the back of card buckle, please do not arbitrarily placed the workplace, to avoid collision, or any damage to the product the company shall not be warranty

5.3 售前、售中、售后服务 Pre-sale, in-sale and after-sales services

1)售前服务 Pre-sales service

签订合同前,公司可免费为客户产品试样及技术和价格咨询解答。Before signing the contract, the company can provide free product samples and technical and price consultation for customers.

2) 售中服务 In-sale services

产品在安装过程中有出现任何技术难题可随时联系当地区域经理或售后技术人员,如需要进行现场技术支持可与当地的销售经理沟通由本公司协调安排。If there is any technical problem during the product installation, please contact the local regional manager or after-sale technical



personnel at any time. If you need on-site technical support, please contact the local sales manager for coordination and arrangement by the company.

3) 售后服务 After-sales service

在合同期限的保修范围内，客户服务的响应时间在 24 小时内，Customer service response time is within 24 hours within the warranty period of the contract,

保修期内免费为客户提供高效的技术服务支持，保修期满后仍然提供软硬件的支持，终身享受软件系统的免费升级服务。During the warranty period, we will provide customers with efficient technical service support. After the warranty expires, we will still provide software and hardware support and enjoy free upgrade service of software system for life.

5.4 附件为重要配件说明书（供参考） Attached is the manual of important accessories (for your reference)

1) [软件说明书](#) Software specification

声明：Statement:

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在使用我司设备前必须仔细阅读安全使用注意事项并经我司人员培训后方可上岗操作。Before using our equipment, you must read the safety precautions carefully and be trained by our staff before operating.本说明手册如有变更，不另行通知。This instruction manual is subject to change without prior notice.

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