

T6 干冰清洗机

T6 Dry Ice Cleaning Machine

使用说明书 User Manual

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前 言

Preface

欢迎您使用湃清干冰清洗机，在此感谢您对东莞湃清低温设备有限公司产品的支持！使用前请务必认真阅读此说明书。

本手册包含了操作和维护人员进行日常工作和日常维护所需的信息。如有任何疑问，请联系我们。

干冰清洗机保留在没有事先通知的情况下修改和改进产品的权利，没有义务对以前销售的机器进行同样的修改和改进。

用户应了解当地有关干冰清洗机的安装和使用的法律、法规，并予以遵守。操作人员有责任确保机器在安全的条件下运行。如果认为机器存在安全隐患，应及时检修。

干冰清洗机无法预见每一种可能的用途和工作条件。对用户使用的劣质部件和附件造成的干冰清洗机无法控制的危险情况不承担任何责任。

Welcome to use the PAIQING dry ice cleaner, and thank you for your support of the products of DONGGUAN PAIQING CRYOGENIC EQUIPMENT CO., LTD! Please be sure to read this manual carefully before use. This manual contains the information required by the operating and maintenance personnel for daily work and routine maintenance. If you have any comment, please contact us.

Dry Ice Cleaner reserves the right to modify and improve its products without prior notice and is under no obligation to make the same modifications and improvements to previously sold machines. Users should be aware of local laws and regulations regarding the installation and use of dry ice cleaners and comply with them. It is the operator's responsibility to ensure that the machine is operated in safe conditions. If the machine is deemed to be a safety hazard, it should be serviced promptly.

Dry ice cleaners cannot anticipate every possible use and operating condition. No responsibility can be accepted for dangerous situations beyond the control of the dry ice cleaner caused by the use of inferior parts and accessories by the user.

1、安全注意事项/Safety Precautions

使用前，请熟读此使用说明书，以便安全、正确地使用本产品。本注意事项的目的是为防止因错误使用而引起伤害事故，请在正确理解所有内容后使用。

Before use, please read this instruction manual thoroughly so that you can use this product safely and correctly. The purpose of this caution is to prevent injury accidents caused by incorrect use, so please use it after understanding all the contents correctly.

1.1 一般安全要求/General safety requirements

- 操作人员必须佩戴防护用品进行操作（包括安全眼镜，手套，耳塞等）。
Operators must wear protective equipment for operation (including safety glasses, gloves, ear plugs, etc.).
- 喷射过程中有一定的冲击力，请勿将喷枪对准自己或他人，防止受伤。
There is a certain impact during the dry ice blasting process, please do not point the gun at yourself or others for prevent injury.
- 请勿在无人看管设备的情况下运行。
Please do not run the equipment unattended.
- 请将设备置于通风环境中使用。
Please use the equipment in the ventilated environment.
- 勿于易燃易爆气体环境、腐蚀性环境、易沾水环境及易燃物附近使用。否则有火灾、触电、受伤的可能。
Do not use in flammable and explosive gas environment, corrosive environment, water-prone environment and near flammable materials. Otherwise, there is a possibility of fire, electric shock and injury.
- 安装、接线、运转、操作、检点、故障分析等作业须由专业技术人员实行，否则有火灾、触电、受伤的可能。
Installation, wiring, running, checkpoint, fault analysis and other operations must be carried out by professional and technical personnel, otherwise there is the possibility of fire, electric shock and injury.
- 勿在通电状态下进行移动、安装、接线、检点等作业（务必在切断电源后方可实施），否则有触电的可能。
Do not move, install, wire, check points and other operations in the energized state (be sure to implement only after the power is cut off), otherwise there is a possibility of electric shock.
- 请连接带有接地标志的 220V 电压供电，务请遵守电源输入电压的额定范围，否则有触电、受伤的可能。
Please connect the 220V power supply with grounding mark, please observe the rated range of power input voltage, otherwise there is the possibility of electric shock and injury.

- 由于二氧化碳会带来窒息的危险，请将设备置于通风环境中使用。
Because CO2 poses a risk of asphyxiation, so please use the equipment in the ventilated environment.
- 由于飞溅的干冰会带来受伤的危险，切勿直接用喷枪直接喷人。
Because splashing dry ice poses a risk of injury, so do not spray people directly with the gun.
- 当操作区域内有人员时，要特别小心地进行操作。
When there are people in the operating area, proceed with special care.
- 在拆卸爆破软管之前，请务必关闭主电源并拔下电缆接头。
Be sure to turn off the main power and unplug the cable connector before removing the burst hose.

1.2 加入干冰要求/Add dry ice requirements

- 干冰温度是零下 78.5℃，易低温冻伤，在没有适当保护的情况下，切勿用手接触干冰。
- Dry ice temperature is -78.5 °C, Cryogenic frostbite can easily result, so dry ice should never be touched with hands without proper protection.
- 打开干冰仓盖板检查干冰仓内是否有异物，若有，请将其清除后加入干冰，并盖上干冰仓盖。
Open the hopper' s cover to check if there are any foreign objects inner, if so, please remove them, Then add dry ice pellet and cover the hopper.
- 加入干冰后请尽快使用。
Please use as soon as possible after adding dry ice.
- 不要使用粉状或凝聚的干冰。
Do not use powdered or coagulated dry ice.
- 不要允许干冰包装上的碎片进入料斗。
Do not allow debris from the dry ice package to enter the hopper.
- 拆箱后，请尽快用完干冰。
After unpacking, please use up the dry ice as soon as possible.

1.3 通道/Thoroughfare

在系统周围应有足够的通道、照明和通风顺畅，以便安全的操作设备。

There should be adequate access, lighting and smooth ventilation around the system for safe operation of the equipment.

2、设备简介及原理

Equipment Introduction and Principle

2.1 设备简介/Equipment Introduction

产品适用场景:

汽车后市场、EVA 模具、石油化工业、铸造业、硫化模具、电机电力、印刷业、航空航天业、热力业、金属表面除锈除漆、风机叶轮件表面涂覆层、电子行业、模塑产品去毛刺、二手设备翻新、工业清洗服务、食品业、火损消防、船舶业、环保清洗工艺、注塑模具、涂覆机保养、焊锡机及治具保养等其它工业产品的除油除垢除尘工艺。

环境要求:

温度: $-10\sim 40^{\circ}\text{C}$ 湿度: $<75\%$

Product application scene:

Automotive aftermarket, EVA mold, petrochemical industry, foundry industry, vulcanization mold, motor power, printing industry, aerospace industry, thermal industry, metal surface rust and paint removal, fan impeller surface coating layer, electronics industry, molded products deburring, used equipment refurbishment, industrial cleaning services, food industry, fire damage fire, marine industry, environmental protection cleaning process, injection mold, coating machine maintenance. The process of degreasing and dust removal for other industrial products, such as soldering machines and jig maintenance.

Environmental requirements:

Temperature: $-10\sim 40^{\circ}\text{C}$ Humidity: $<75\%$

2.2 工作原理/Working Principle

设备工作时干冰在漏斗下料口调入混冰腔内部,混冰腔内部切冰轮周圈带有凹槽,凹槽可容下干冰颗粒,混冰棍被电机带动旋转,通过旋转运动干冰被带入到相对密闭的空间与高压气流混合后被气流推动经过输冰管经手柄喷枪被约束至特定气流束喷射而出撞击至污垢表面并瞬间膨胀约 800 倍自身体积将污垢剥离物体表面后被气流带走的一种物理清洗原理,达到清洗目的。根据污垢附着

力度强度调节合适的出冰量。

Equipment work dry ice in the funnel under the mouth of the transfer into the ice mixing cavity inside, ice mixing cavity inside the ice wheel circumference with grooves, grooves can accommodate dry ice particles, ice mixing stick is driven by the motor rotation, through the rotating movement of dry ice is brought into a relatively confined space and high pressure airflow mixing after being pushed by airflow through the ice tube by the handle gun is bound to a specific airflow beam jet out to hit the surface of the dirt and instantly expand about 800 times Self-volume will be stripped of the surface of the object dirt after the airflow away from a physical cleaning principle, to achieve the purpose of cleaning. According to the strength of dirt adhesion to adjust the appropriate amount of ice.

3、设备结构以及控制系统

Equipment structure and control system

3.1 设备组成及配套/Equipment composition and supporting

此设备由电气系统、送冰系统、储冰室、喷射系统组成。

This equipment consists of an electrical system, Dry ice delivery system, dry ice storage chamber, and blasting system.

3.2 控制系统/Control System

需要 7.5KW 的空压机支持，空压机应距离清洗现场少于 50 米，距离越长所需空压机功率越大。

7.5KW air compressor is needed to support, the air compressor should be less than 50 meters away from the cleaning site, the longer the distance the greater the power of the air compressor required.

设备规格

Equipment specifications

功率 Power	0.28KW
电压 Voltage	AC220V/50-60HZ/Single phase

耗气量 Air consumption	0.8-4.0m ³ /min
供气压力 Air supply pressure	0.1-0.8Mpa (可调/adjustable)
送冰速度 Ice delivery speed	0-0.55KG/min (可调/adjustable)
料斗容量 Hopper capacity	10KG
净重 Weight	55KG
原料 Raw material	块状干冰/Dry ice block
干冰块尺寸 Block size	120*120*250MM(约 5KG/about 5kg)
驱动方式 Drive mode	直联 Direct link
外形尺寸 Dimensions	95*72*116 (CM)

4、操作说明 Operating Instructions





4.1 操作步骤/Operation steps

4.1.1 设备启动准备步骤/Device startup preparation step

- ①连接进气管；
Connect to the air intake pipe.
- ②连接出冰管；
Connect the ice outlet pipe
- ③将控制电缆连接到设备上；
Connecting the control cable to the equipment.
- ④连接喷枪，确保喷嘴牢固地安装在喷枪上；
Connect the gun, ensuring that the nozzle is securely mounted to the gun.
- ⑤打开料斗盖，确认料斗是否干燥、干净、无残留物，关闭料斗盖；
Open the hopper cover, confirm that the hopper is dry, clean and free of residues, then close the hopper cover.
- ⑥将地线连接到要清洁的物体或其导电支架上；
Connecting the ground wire to the object to be cleaned or to its conductive support.
- ⑦打开供气装置，让供气软管加压，检查是否有漏气现象；
Open the air supply unit, allow the air supply hose to pressurize and check for air leaks.
- ⑧将电源线插入到电源插座上。如果需要一根延长线，它必须符合机器的要求和所有的安全规定；
Plug the power cord into an electrical outlet. If an extension cord is required, it must meet the requirements of the machine and all

safety regulations.

- ⑨戴好防护用具；
Wearing protective gear.
- ⑩打开电源开关；
Turning on the power switch.

4.1.2 设备启动后/After the device started

- 喷射压缩空气一分钟，以净化系统；
Spraying compressed air for one minute to purify the system.
- 清除步骤：转动出冰的调节旋钮，将出冰量调节到最大，按下喷枪启动按钮。
吹扫后，将出冰量调整到适当的值；
Clearance procedure: Turn the adjustment knob of the ice output, adjust the ice output to the maximum, and press the gun start button.
After blowing, adjust the ice output to the appropriate value.
- 打开料斗盖；
Opening the hopper lid.
- 将块状干冰放入冰仓，关闭料斗仓；
Place block dry ice in the hopper then close.
- 按下喷枪启动按钮，开始进行干冰清洗；
Press the gun start button to begin dry ice cleaning.

4.1.3 设备关闭/Device shutdown

- 将料斗里所有干冰全部吹出；
Blow out all the dry ice in the hopper.
- 清除出冰管和喷嘴上的霜冻；
Removal of frost from ice dispensing tubes and nozzles.
- 关闭喷枪按钮，停止出冰/出气；
Close the gun button to stop ice/air dispensing.
- 关闭设备电源开关；
Turning off the power switch of the equipment.
- 关闭空压机总阀门；
Closing the main air compressor valve.
- 打开过滤器的排气阀，以完全释放管道的压力；
Opening the filter vent valve to completely relieve the pressure in the pipeline.
- 压力完全释放后，断开电缆，关闭料斗舱盖，拔下软管，并将其挂在设备上。
Once the pressure is fully relieved, disconnect the cable, close the hopper hatch, unplug the hose, and hang it from the unit.

4.2 操作要点/Operation points

- 绝不允许异物进入冰舱料斗；
Never allow foreign objects to enter the hopper.
- 请使用厂家配置的喷枪和电缆；
Use the gun and cable as configured by the manufacturer.
- 平稳地拉伸扭曲的出冰管及进气管；
Smooth stretching of twisted ice outlet and air intake pipes.
- 使用时请锁定设备的脚轮(如有脚轮请锁定)；
Lock the casters of the equipment when in use. (Please lock the casters if available)
- 当压缩空气压力低于 4Mpa，请停止喷冰；
Stop ice blasting when the compressed air pressure < 4 Mpa.
- 降低出冰速率，然后逐步提高，以找到满足清洗要求的最佳出冰速率；
Reduce the ice discharge rate and then gradually increase it to find the optimum ice discharge rate to meet the cleaning requirements.
- 当操作中断时，请清空料斗；
Emptying the hopper when operation is interrupted.
- 反复、间歇性地按下爆破枪的触发器，粉碎凝结的干冰；
Repeatedly and intermittently pressing the trigger of the blasting gun to crush the condensed dry ice.
- 操作结束后，料斗没有干冰的情况下，空喷 1 分钟；
After the operation, the hopper is blasted empty for 1 minute without dry ice.
- 在使用前，放置出冰管以达到最大的机动性。
Place ice out tube for maximum mobility before use.

4.3 技术支持 Technical Support

- 喷嘴保持垂直于表面，以实现最快的清洁
Nozzle remains perpendicular to the surface for fastest cleaning
- 大多数喷嘴的最佳距离为 5 厘米；
Optimal distance of 5 cm for most nozzles.
- 使用喷枪的反冲力来支撑你的身体，而不是故意抵抗它。
Use the recoil of the gun to support your body, rather than intentionally resisting it.

5、人员培训 Personnel Training

- 在启动和维护机器之前，必须对操作人员进行培训；

Operators must be trained prior to starting and maintaining the machines.

- 培训对象：由客户指定的工人，有工作能力的健康人员，必须具备基本的电气知识。

Training targets: Workers designated by the customer, healthy people who are capable of working and must have basic electrical knowledge.

- 培训内容：干冰机指派技术人员对工人使用客户指定的设备或人员进行培训，包括学员的设备使用、维护和测试。通过测试的人可以进行清洗作业。

Training content: The dry ice machine assigns technicians to train workers to use the equipment or personnel specified by the customer, including the use, maintenance and testing of the equipment by the trainees. Those who pass the test can carry out cleaning operations.

6、设备故障排除/Equipment Troubleshooting

6.1 按下开关按钮，料斗舱内刀盘不转动/Press the switch button,

the blade in the bucket cabin will not rotate;



- (1) 观察下料口下方刀盘是否有异物卡住；

Observe whether there is a foreign object stuck in the mixed popsicle below the downcomer.

- (2) 检查插设备是否通电，急停按钮是否打开，变频器显示屏是否亮起正常数据显示；（解决办法：如果刀盘有异物卡住则需要将异物清出再尝试启动设备或联系设备供应商）

Check whether the plug-in device is energized, whether the emergency stop button is open, whether the inverter display lights up normal data display; (Solution: if there is a foreign object stuck in the cutter, you need to clear the foreign object and then try to start the equipment or contact the equipment supplier)

6.2 刀盘转动，喷枪不喷射/The blade rotates, the spray gun does not spray

- ①检查气源接口是否正常连接设备；

Check whether the gas source interface is connected normally;

- ②检查空压机是否打开；

Check whether the air compressor is opened;

6.3 设备正常运转，喷枪口只喷气不喷冰；

Normal operation of the equipment, the nozzle mouth only spraying air and not ice.

打开盖板查看料斗仓干冰是否已用完，并观察刀盘是否正常旋转，

- ①如果刀盘正常旋转，则加入干冰继续使用。

- ②如果刀盘无法正常旋转. 联系厂家提供备用解决方案。

Open the cover board to check whether the Hopper bin dry ice has been used up and observe whether the blade is rotated normally.

- ① If the blade rotates normally, add dry ice to continue to use.

- ② If the blade cannot rotate normally, contact the manufacturer to provide a spare solution.

7、设备维护注意事项

Equipment maintenance precautions

- (1) 定期检查进气管和干冰输送管是否龟裂，接头是否漏气；
Periodically inspect the air inlet and dry ice delivery tubes for cracks and joints for leaks.
- (2) 设备使用后可从加冰漏斗中加入适量润滑油，保持设备润滑并防止生锈；
After the equipment is used, you can add an appropriate amount of lubricating oil from the Ice Dominance to keep the equipment lubricating and prevent rust;
- (3) 设备禁止私自拆卸，如需拆卸，请在技术人员的指导下进行拆卸；否则导致设备故障概不负责。
The device is prohibited from disassembling privately. If you need to disassemble, please disassemble under the guidance of the technical personnel; otherwise the equipment failure will not be responsible.

干冰清洗机装箱清单

Packing list of dry ice cleaning machine

Model: PQ-T6

序号 Number	名称 Name	规格 Spce	数量 Quantity	单位 Unit	备注 Note
1	干冰清洗机 Dry ice cleaning machine	PQ-T6	1	PCS	
2	进气管 Air inlet pipe	DN15	1	PCS	长度: 10m
3	出冰管 Ice outlet pipe	DN15	1	PCS	长度: 3m
4	手柄喷枪 Handle Gun	PQ-T03	1	PCS	
5	喷枪 Guns	PQ-T04	1	PCS	
6	喷枪 Guns	PQ-T20	1	PCS	
7	耐低温手套 Gloves	/	1	PCS	
8	防护头盔 Protective helmet	/	1	PCS	
9	降噪耳罩 Noise cancelling earmuffs	/	1	PCS	
10	按钮开关 Push Button Switch	/	1	PCS	
11	电源线 Power cord	/	1	PCS	
12	地线夹 Ground clamp	/	1	PCS	