

1. Product Overview

✦ Key Features

- ⚡ 15-Second Rapid Ice Making: No waiting — make dry ice pellets anytime, anywhere, meeting instant needs at bars and restaurants
- 🔧 Precision Manufacturing: CNC precision-machined, industrial-grade internal components for long-term stability and reliability
- 🌐 Global Compatibility: AC 100-240V wide voltage design for use worldwide
- 🏆 Professional Certifications: CE, FCC and multiple international certifications — quality assured
- 💎 Compact Design: 3.8 kg lightweight body, 168×168×135 mm compact size — saves space

1.1 Technical Specifications

Item	Specification
Model	DM-2503 / DM-2504
Working Principle	Liquid CO2throttling expansion refrigeration
Connection Standard	G5/8 female connector (universal)
Operating Temperature Range	≤ 28°C (officially recommended), 31.1°C physical critical temperature
Single Cycle Duration	1-20 seconds adjustable
Body Material	Oxidation-resistant aluminum alloy + 304 stainless steel
Warranty Period	1 year full machine warranty
Power Supply	AC 100-240V, 50/60Hz

2. Quick Installation Guide

💡 Before You Begin Ensure you have: a food-grade liquid CO2 cylinder with a dip tube (syphon tube), a high-pressure connecting hose, and a well-ventilated operating environment (≤ 25°C).

2.1 Three-Step Installation

- ⚠ Cylinder Usage Precautions
 - Must use a liquid CO2 cylinder with a dip tube (syphon tube)
 - Cylinder must be kept upright — do not tilt or invert
 - Ensure the cylinder valve is intact with no leaks

1. Install the Dry Ice Cup: Align the dry ice cup with the slot, screw it in clockwise, and ensure it is firmly installed with no looseness.
2. Connect the Cylinder: Connect one end of the high-pressure hose to the cylinder valve and the other end to the device inlet, then tighten the nut.
3. Connect Power: Plug the power adapter into the device and connect the other end to a power outlet.

3. Operation Instructions

3.1 Making Dry Ice

1. Open the cylinder valve: Slowly turn the cylinder valve counterclockwise to fully open, then turn back half a turn.
2. Select the working mode: Press the mode button on the device to select dry ice mode.
3. Start ice making: Press and hold the working button for 3-15 seconds (adjust based on the amount of dry ice needed).
4. Collect the dry ice: Release the button, wait 2-3 seconds, then remove the dry ice cup and pour the dry ice pellets into an insulated container.
5. Close the valve: After use, fully close the cylinder valve and vent any residual gas from the hose.

3.2 Time Setting Instructions

Operation Tips

For first use, start with a 10-15 second test and adjust based on ice output; 25-30 seconds is the standard working duration, producing approximately 25 g of dry ice pellets; it is not recommended to set a single cycle beyond 30 seconds to avoid overheating.

[Automatic Mode]

- Enter time-setting mode: Double-press the START/STOP button on the panel. Wait for the display digits to start flashing — this indicates successful entry into time-setting mode
- Adjust working time: Long-press the START/STOP button; the display digits will change accordingly. Set the desired working time

(Note: Display showing "15" means the working time is set to 15 seconds)

- Confirm time setting: Release the START/STOP button. Wait for the display digits to stop flashing — the working time is now set, parameters are auto-saved, and the device returns to standby mode
- Start operation: To make dry ice again with the same time setting, double-press the START/STOP button to start

[Manual Mode]

- Switch the manual/auto mode selector switch on the bottom of the dry ice machine to manual mode (factory default is auto mode)
- Long-press the START/STOP button on the panel; the device will start and enter manual operation
- Release the START/STOP button; the device will stop immediately

3.3 Cylinder Specifications & Output Reference

Cylinder Size	Fill Capacity	Estimated Output (25g/pellet)
4L (Portable)	2.0-2.4 kg	Approx. 20-24 pellets
10L (Medium)	5.0-6.0 kg	Approx. 50-60 pellets
40L (Standard Industrial)	20-24 kg	Approx. 200-240 pellets

* Actual output is affected by ambient temperature, usage intervals, and other factors. The above data is for reference only.

4. ⚠ Ambient Temperature & Important Usage Notes

🔥 Critical Temperature Warning

The physical critical point of CO₂ is 31.1°C. Above this temperature, CO₂ enters a supercritical state and no longer exists as a liquid, making it impossible for the machine to produce dry ice. This is a law of physics, not a machine malfunction — applies to all brands worldwide.

Data sources: Asia Industrial Gases Association (AIGA) & National Institute of Standards and Technology (NIST)

4.1 Temperature Range Reference Table

Temperature Range	CO ₂ Physical State	Usage Recommendations & Official Guidance
≤ 25°C	Stable liquid (density 0.77 kg/L)	✓ Optimal working temperature — best cooling performance, stable operation, highest conversion efficiency. Always operate within this range.
25°C - 28°C	Primarily liquid, density begins to drop	⚠ Usable — ventilate the cylinder for cooling; output may decrease by 5-10%. This is our recommended upper temperature limit.
28°C - 30°C	Approaching critical state, liquid unstable	⚠ Use with caution — output significantly drops by 15-20%. Air conditioning cooling is essential.
≥ 31.1°C	Supercritical state (neither liquid nor gas)	✗ Do not use — CO ₂ has no liquid phase. Dry ice cannot be produced through throttling expansion. This is a physical property of CO ₂ , not a machine malfunction.

4.2 Practical Tips to Maximize Output

#	Recommendation	Principle
1	Place the cylinder in an air-conditioned room or shaded area (≤ 25°C)	Maintains high density of liquid CO ₂ for stable output
2	After making 3-5 pellets consecutively, let the cylinder rest for 2-3 minutes	Continuous use causes excessive temperature drop in the cylinder, reducing internal pressure; resting restores pressure
3	Ensure you use a cylinder with a dip tube	Draws liquid CO ₂ from the bottom for maximum ice-making efficiency
4	Refill when cylinder content drops below 30%	Excessive gas space reduces liquid extraction efficiency
5	Let a new cylinder rest for 2 hours before first use	Allows gas and liquid to re-stabilize after transport agitation

5. Routine Maintenance & Care

✓ Regular maintenance extends equipment lifespan by 30% or more, full inspection every month is recommended to keep the device in optimal working condition.

5.1 Daily Checks

- Connections Check: Inspect all connection interfaces for tightness and signs of leakage
- Seal Check: Inspect the dry ice cup sealing ring for damage, aging, or deformation
- Cleaning: Wipe the device exterior with a clean soft cloth to remove dust and stains

5.2 Monthly Maintenance

⚠ Important Notes

- All maintenance must be performed with the power disconnected, the cylinder valve closed, and residual gas vented
 - Use only food-grade lubricants — do not use ordinary oil or grease
 - If any component is found damaged or abnormal, contact after-sales service immediately — do not disassemble the device yourself

1. Nozzle Cleaning: Use compressed air to clean the nozzle and ensure no blockages for smooth discharge.
2. Valve Lubrication: Apply a small amount of food-grade silicone oil to moving valve parts to keep operation smooth.
3. Electrical Check: Inspect the power cord for damage and ensure the plug connection is secure.
4. Leak Test: After connecting the cylinder, apply soapy water to all connection points and check for bubbles.

5.3 Operating Guidelines

Before connecting or disconnecting any gas line, the cylinder valve must be closed and residual gas in the device must be vented. Failure to do so may prevent the gas line from being disconnected due to residual pressure, or may loosen internal fittings through forced handling, creating a leak risk.

- Keep all body parts away from the outlet during operation
- Wear protective gloves when handling dry ice
- Ensure good ventilation in the operating environment
- The cylinder must be kept upright and secured to prevent tipping

6. Frequently Asked Questions (FAQ)

6.1 Common Issues Reference Table

Issue	Diagnosis	Solution
No dry ice or very little output	Cylinder has no dip tube	Replace with a liquid CO ₂ cylinder equipped with a dip tube (syphon tube).
Output noticeably reduced in summer	Ambient temperature > 28°C	Move the cylinder to an air-conditioned room ($\leq 25^{\circ}\text{C}$) and let it rest for 30 minutes before retrying. If temperature $\geq 31.1^{\circ}\text{C}$, CO ₂ enters a supercritical state and cannot produce dry ice (this is a physical law, not a machine malfunction).
Pressure gauge shows reading but no ice output	Liquid CO ₂ depleted	The cylinder still has gas pressure but liquid CO ₂ is exhausted. Refill with fresh liquid CO ₂ .
Output decreases with continuous use	Cylinder temperature too low	Continuous use causes evaporative cooling inside the cylinder, reducing internal pressure. Pause for 2-3 minutes to let the cylinder warm up before resuming.
Dry ice produces heavy "smoke"	Normal phenomenon	This is normal! Dry ice at -78.5°C causes water vapor in the air to condense into fog, appearing as white smoke. Real CO ₂ gas is colorless and odorless — this proves the machine is working correctly.
Faint hissing sound at connection	Loose connection or worn seal	1. Close cylinder valve, vent residual gas 2. Re-tighten the connecting nut 3. If leak persists, replace the sealing ring
Inconsistent performance across multiple units in the same environment?	This is a normal physical phenomenon caused by manufacturing tolerances in precision electronic components, not a product quality defect.	When ambient temperature approaches the working critical limit ($\approx 28^{\circ}\text{C}$), temperature sensitivity of internal components may vary between units. Recommendations: • Move all units to a lower temperature environment ($\leq 25^{\circ}\text{C}$) • Verify all cylinders are equipped with dip tubes • Units showing abnormal performance can be prioritized for use in room-temperature environments
Gas is expelled but no dry ice is produced	Ambient temperature too high Cylinder has no dip tube Liquid CO ₂ insufficient	• Move to air-conditioned room ($\leq 25^{\circ}\text{C}$), let rest, then retry • Replace with a cylinder equipped with a dip tube • Replace with a fresh cylinder

6.2 Physics Principles Explained

 Why can't a dry ice machine achieve 100% conversion?

When liquid CO₂ expands, a portion must vaporize to provide the cooling energy (latent heat of vaporization = the cooling source), and only the remainder can solidify into dry ice. Small portable devices achieve approximately 25% conversion efficiency — this is determined by the laws of thermodynamics, not a machine malfunction.

Analogy: Like an air conditioner — the heat an AC expels is far greater than the cool air it produces. This is dictated by the Second Law of Thermodynamics, applying to all refrigeration equipment.

7. After-Sales Service Process

🔧 Service Commitment • Response to after-sales requests within 24 hours / Technical solution within 72 hours / 1-year full machine warranty, lifetime technical support

7.1 Four-Step After-Sales Service Process

1. Fault Confirmation & Information Submission: Contact customer service with a detailed fault description, clear photos/videos, and the machine serial number (S/N).
2. Remote Technical Diagnosis: Our after-sales engineer will guide you through on-site inspection and basic testing via phone, instant messaging, or video conference.
3. Repair Return & Factory Inspection: If repair is needed, we will issue a formal RMA authorization. Upon receiving the device, our factory will conduct a full inspection and issue a quality analysis report.
4. Repair & Return: After repair or replacement, the device undergoes comprehensive re-testing and is safely shipped back to you. The maintenance record is updated.

8. Precautions

🚫 Strict Prohibitions

1. ✖ Do not disassemble, repair, or modify the device without authorization
2. ✖ Do not operate the device without a filter element installed
3. ✖ Do not use in flammable or explosive environments
4. ✖ Do not put dry ice in your mouth or consume it directly
5. ✖ Do not store dry ice in a refrigerator or sealed container

🚫 Disclaimer (Not Covered by Warranty)

1. Damage caused by unauthorized disassembly, modification, or repair
2. Damage caused by improper use, abuse, or negligence
3. Normal wear and tear of consumable parts (sealing rings, nozzles, etc.)

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