



SM2000 Dry Ice Cleaning Machine



User Manual and Maintenance Guide

Warning: Do not use before thoroughly reading this guide.

Dear User,

Thank you for choosing Sanitmax SM2000 Dry Ice Cleaning Machine (hereinafter referred to as "SM2000"). Before using the machine, please read the user manual carefully and strictly follow the safety regulations to prevent accidents and unnecessary losses. We hope you can use the equipment safely, reasonably, and efficiently to maintain its optimal performance and extend its service life.

This product complies with the standard “JB/T 6284-2007 Adjustable Cleaning Machine” and includes relevant technical content based on the product's functionality and performance requirements.

For after-sale customer service and maintenance, please contact the authorized dealer in your area or our Quality Department.

We are committed to continuously improving and optimizing the product design. We apologize for not providing a separate notification if there are any slight discrepancies between the technical parameters listed in this manual and the actual product.

Best regards,
Sanitmax

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Cautions

- Before use, verifying the machine's power supply is necessary. The power line's current carrying capacity should be more significant than 10A. The power supply must be adequately grounded and equipped with a leakage protection device and a fuse. The power connection should be performed by a professional.
- Users cannot modify the "non-reconnectable plug" on the original product.
- The machine should be kept away from flammable and explosive materials.
- During routine maintenance, the power supply must be disconnected. In case of any malfunction, users should seek assistance from professional repair personnel at authorized service centers. Do not attempt to repair the machine on your own to avoid potential dangers.
- Please ensure that the voltage and frequency indicated on the power supply and the machine nameplate are consistent. Follow local electrical regulations to complete the wiring and install grounding wires or residual current devices to prevent electric shock hazards.
- To ensure smooth operation, ensure the machine is securely fixed during use.
- Note: The dry ice pellets added to the dry ice hopper should be used up completely and not left inside the hopper to prevent melting and water accumulation. The interior of the hopper should always be kept dry. Only dry ice particles that meet the requirements should be placed in the hopper, and no other substances should be introduced.
- Pipeline connections must be adequately sealed.

Overview

Section 1: Product Application

The SM2000 Dry Ice Cleaning Machine is suitable for cleaning carbon deposits in automobile engine combustion chambers, intake valves, throttle bodies, brake discs, wheel hubs, turbochargers, and grease and dirt on the engine compartment.

Section 2: Product Features

- Clean and hygienic, low noise, zero emissions
- Easy operation, user-friendly
- Compact design, space-saving storage
- Equipped with leakage protection device for safe, stable, and reliable operation
- No residue or waste material, energy-saving and environmentally friendly

Section 3: Main Technical Specifications

- Model: SM2000
- Product Name: Dry Ice Cleaning Machine
- Voltage/Frequency: 120 VAC/60Hz ($\pm 10\%$)
- Dry Ice Hopper Capacity: 44 Lbs (20 kg)
- Dry Ice Output: 0.66 lb/min ~ 1.32 lb/min (0.3 kg/min ~ 0.6 kg/min)
- Compressed Air Input Pressure: 87 ~116 psi (0.6 MPa ~ 0.8 MPa) (Adjustable)
- Compressed Air Input Flow Rate: 35 ~145 CFM (1 m³/min ~ 4 m³/min) (Ensure air pressure of above 45 psi (0.3MPa) for continuous operation)
- Allowable Dry Ice Pellets Diameter: 3 mm and below
- Dimensions (L*W*H): 25*27*35 inches (640 × 690 × 890 mm)
- Weight: 133 Lbs (60 kg)

Working Principle

Dry ice cleaning technology is a relatively advanced cleaning method in the cleaning industry and has been widely used worldwide.

Working Principle: Dry ice particles are accelerated by high-pressure airflow and are propelled at high speed onto the surface to be cleaned using a specially designed blasting gun. Upon impact with the surface, the dry ice particles undergo rapid surface heat exchange, causing the solid CO₂ to sublime rapidly into gas. Within a fraction of a second, the volume of the dry ice particles expands by 800 times, amplified by the impact force of high-pressure air, resulting in a "micro-explosion" on the object's surface. The gaseous CO₂ produced by the "micro-explosion" dissipates, leaving no secondary residue. The remaining dirt, affected by the low temperature, becomes brittle and is directly dispersed by the high-pressure airflow.

Unpacking and Preparation

Unpacking

Remove the fastening screws and remove the machine from the wooden box. Check the accessories against the packing list to ensure everything is complete.

Preparation

Due to the high noise level of 75dB or above generated during machine operation, wearing protective earmuffs, goggles, and gloves in advance is necessary.

Connecting the Air Hose

Connect one end of the hose to the machine and the other end to the air compressor.

Connecting the Dry Ice Hose

Connect one end of the hose to the machine.

Assemble the Dry Ice Blasting Gun

First, assemble the gun handle.

Then, choose the appropriate nozzle and install it on the gun handle according to your cleaning needs.

Finally, attach the ice shield to the handle.

Connect the Dry Ice Gun Handle to the Dry Ice Hose

Open the waterproof cover of the leakage protection switch on the side of the machine. Check if the leakage switch is in the closed state. Then, ensure that all switches on the control panel

are in the closed position.

Power Connection

Open the hopper cover of the machine and slowly pour dry ice pellets into the hopper using an ice shovel (fill the dry ice pellets to about 3 cm from the top of the hopper, do not overfill to prevent vibration during operation). Then, close the cover.

Cleaning Operation

Power On Operation

1. Hold the dry ice gun handle with one hand and close the leakage switch on the side of the machine.
2. Turn on the "Air" button and wait for stable compressed air to be released.
3. Turn on the "Ice" button and then the "Ice Output Adjustment" button. After a moment, a high-pressure airflow mixed with dry ice particles will be emitted.
4. The "Ice Output Adjustment" button can adjust dry ice output. Turn it clockwise to increase the output and counterclockwise to decrease it.
5. The machine also has a remote control that allows remote start/stop control: Press the "A" button to activate high-pressure air output and press it again to stop the high-pressure air. Press the "B" button to start the dry ice output and press it again to stop the dry ice output.
6. Press the handheld dry ice gun trigger to start the operation. For continuous operation, press the black button on the handle.

Power Off Operation

When the cleaning operation is complete, you need to shut down the machine:

1. Turn off the "Ice" button to allow the high-pressure air to blow away any remaining dry ice particles in the pipes.
2. Turn off the "Air" button to stop the output of high-pressure air.
3. Disconnect the power supply and unplug the power plug.
4. Remove the dry ice hose and air hose, and insert the dry ice gun into the gun holder on the side of the machine.

Cleaning Procedures for Different Objects

Cleaning of Combustion Chamber Carbon Deposits

1. Waits for the engine to reach operating temperature. Remove the spark plug.
2. Choose an appropriate nozzle for the dry ice gun handle and insert it directly into the combustion chamber.
3. Start the dry ice cleaning machine and begin the cleaning process.
4. While the piston is at the bottom dead center, rapidly move the nozzle up and down and slowly rotate the gun handle.
5. Repeat the process for approximately 1-2 minutes to clean one cylinder. Then, proceed to clean the next cylinder.

Cleaning of Intake Valve Carbon Deposits

1. Disassemble the engine intake manifold and close the intake valves.
2. Use the appropriate nozzle to directly spray and clean the intake valve chamber.

Cleaning of Throttle Body Carbon Deposits

1. Use the appropriate nozzle to clean the throttle body directly.
2. Usually, it takes about 2 minutes to complete the cleaning.

Cleaning of Engine and Turbocharger

1. Use the nozzle to spray and clean the contaminated surfaces of the engine and turbocharger.
2. Maintain a distance of approximately 1-2 inches (3-6 cm) between the nozzle and the surface for optimal results.

Troubleshooting

	Fault	Reasons	Troubleshooting Steps
1	No Dry Ice Output	1. Check if the compressed air is properly turned on.	Open the air valve switch.
		2. Check if the air solenoid valve is open.	Inspect and replace if necessary
		3. Verify if the dry ice delivery system is running.	Check if the motor operates correctly.
2	Remote Control Doesn't Work	1. Confirm if the remote control has sufficient battery power	Check and replace the batteries if needed
		2. Check if the wiring of the remote control receiver module is correct or loose.	Inspect, repair, or replace the wiring
		3. Incorrect pairing between the receiver module and the remote control.	Re-pair the devices.
		4. Control circuit malfunction	Test the control circuit and resolve any issues.

Maintenance and Care

After one month of use, remove the filter from the gun handle for cleaning. Remove any debris from the filter and gently wash it with a soft brush to prevent clogging and ensure proper dry ice output.

After completing each cleaning operation, do not immediately turn off the machine. Use up the remaining dry ice particles in the machine's hopper before shutting it down. Then unplug the power.

After each use, remove the dry ice hose and air hose and place them in a well-ventilated area away from direct light to dry and remove any condensed water vapor inside the hoses.

Regular maintenance and care will help ensure the optimal performance and longevity of the dry ice cleaning machine. Additionally, please refer to the product manual for specific maintenance instructions provided by the manufacturer.

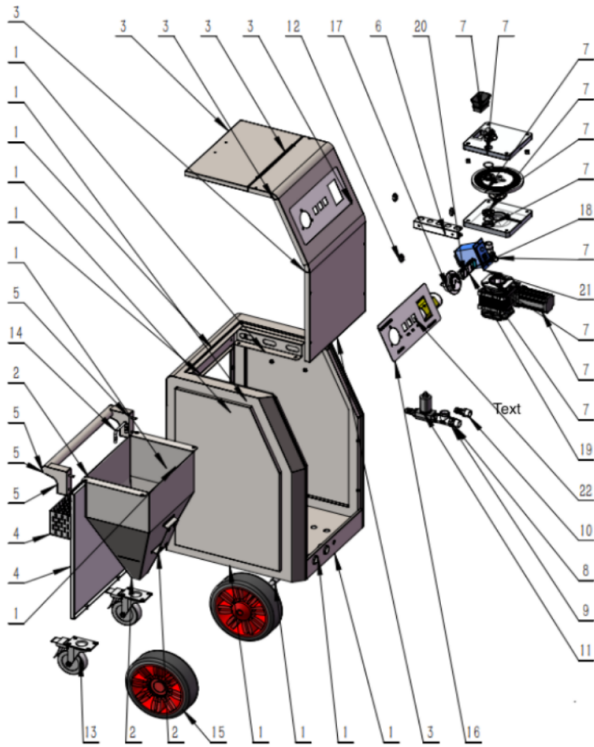
Packing List

Packing List for SM2000 Dry Ice Cleaning Machine				
	Name	Specifications	Quantity	Notes
1	SM2000 Main Equipment		1	Includes frame, ice delivery system, etc.
2	Intake Air Hose	16 ft (5m)	1	
3	Low-Temperature Dry Ice Hose	13 ft (4m)	1	
4	Straight Blast Spray Nozzle	0.28”(7mm)	1	
5	30° Access Blast Spray Nozzle	0.28”(7mm)	1	
6	Soft Endoscopes Blast Spray Nozzle	0.28”(7mm)	1	
7	Blast Swath Spray Nozzle	1”(26 mm)	1	
8	Blast Swath Spray Nozzle	1.7”(45mm)	1	
9	Dry ice Spray Gun Kit with Controller		1	
10	Ice Shovel	0.66 Lbs(0.3L)	1	
11	Handheld Gun Handle Control Wire		1	
12	Anti-static Wire	9.8 ft (3m)	1	
13	Goggle Acoustic Earmuffs Anti-static Gloves		1 each	
14	User Manual		1	

Packing, Transportation, and Storage

- Before packing, drain any accumulated water from the machine. Cover the machine with protective covers and ensure secure fastening to the bottom of the box.
- Spare parts, accessories, tools, and documents should also be properly packed.
- The packaging and transportation of the equipment should comply with the requirements of the “GB/T 13384-2008 General Technical Conditions for Mechanical and Electrical Product Packaging” standard.
- The packaged equipment can be transported by land, sea, or air, and appropriate covering should be used during transportation.
- Avoid exposure to sunlight, rain, snow, wind, and sand when storing the equipment. Do not store it together with flammable, explosive, corrosive substances, or materials.

Exploded View Diagram



1. Chassis Welding Assembly
2. Dry Ice Hopper Welding Assembly
3. Electrical Control Panel Welding Assembly
4. Chassis Rear Panel Welding Assembly
5. Handle Welding Assembly
6. SM2000 - Spray Bar Storage Board
7. Mixed Ice Mixer Assembly
8. W6N Hex Threaded Short Joint (W6N-3-4) * 2
9. WT Three-Way Joint (WT-3-4)
10. WHN, WCH Water Pipe Joint (WCH-3-4X19) * 2
11. Solenoid Valve
12. Buffer Pad * 4
13. Medium-duty Steel Twin Brake Type Casters * 2
14. GY-AA1-SUS02-80 Round Handle (GY-AA1-SUS02-80)
15. Wheels * 2
16. Control Panel Overlay
17. YN Series Shock-resistant Pressure Gauge - Type III (Axial Front) (YN60-III)
18. Ice Output Switch
19. Air Blow Switch
20. Power Switch
21. Combination Speed Controller
22. Vibration Motor