

# **SS6000**

## **DRY ICE FOGGER**

### **INSTRUCTION MANUAL**

**CITY**  

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**THEATRICAL**  

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# SPECIFICATIONS

## **TANK:**

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Material:	.062" stainless steel, TIG welded, black texture paint outside.
Dimensions:	24" X 23" X 42" (tank only) 24 ½" X 33" (OD of dolly) X 55" (floor to top of tank)
Water capacity:	52 gallons
Fill Door:	16" X 10" fully gasketed

## **PLUMBING:**

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Material:	All 1 ¼" brass pipe, fittings and valves
Pump:	Stainless steel 19GPM

## **ELECTRICAL:**

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Heating elements-Type:	240V, 3000W, two per tank and one spare built in to tank
Access:	Screw in, easily accessible through lower electrical box
Thermostat:	Adjustable automatic control
Circuit breakers:	20 amperes
Fuses:	6 amperes on pump and fan circuits.
Low water cut out:	Turns off heaters when water is low.

# CONTROL PANEL

The SS6000 DRY ICE FOGGER utilizes a sophisticated temperature control system. Once you set your operating temperature it will be held at that level throughout your entire day of rehearsals and performances. Please refer to the control panel for the location of the following controls:

**MAIN CIRCUIT BREAKERS:** Control power to heating elements and temperature control system. Note: The power to Element "A" also feeds the temperature control system.

**READY LIGHT:** This light is green when operating water temperature has been reached.

**HEATING LIGHT:** This light is yellow when elements are on and water temperature is rising to the level set with temperature selector knob.

**LOW WATER LIGHT:** This light is red when the water level of the tank is below the minimum operating level. The heating elements will not operate. To add water, open fill door, open observation door on ice shelf, and fill with water level is about three inches above the (blue) low water cut out switch.

**ELEMENT "A" LIGHT:** This light is red if no power is sensed passing through Element "A". The most likely cause is that Element "A" has burned out and needs replacement.

**ELEMENT "B" LIGHT:** This light is red if no power is sensed passing through Element "B". Either the element is burned out, the power cord for Element "B" is not connected, or the power source has been lost (check circuit breaker).

**OVER-TEMPERATURE LIGHT:** This light is red if there has been a thermostat failure and the backup over-temperature thermostat has been activated. **DO NOT ATTEMPT TO OPERATE THE MACHINE IN THIS CONDITION. OPERATION OF THE MACHINE WITHOUT TEMPERATURE CONTROL CAN LEAD TO THE DESTRUCTION OF THE HEATING ELEMENTS AND POSSIBLE DANGER OF FIRE.**

**TEMPERATURE SELECTOR KNOB:** The operating temperature selected will be maintained by the temperature control system.

# OPERATING INSTRUCTIONS

*The SS6000 DRY ICE FOGGER uses dry ice to produce a thick low-lying fog. The durable stainless steel tank holds water that is heated by two 3000-watt heating elements. When the water has reached operating temperature, it is pumped via a plumbing system up into a chamber that holds dry ice. The reaction between the hot water and dry ice immediately forms a thick fog. A fan then blows the fog out to the stage through a duct hose.*

**HEALTH WARNING: DRY ICE FOG CAN CAUSE ASPHYXIATION BY DISPLACING OXYGEN. NEVER BREATHE DRY ICE FOG. READ THE FULL “DRY ICE SAFETY” SECTION IN THIS MANUAL BEFORE OPERATING. THIS MACHINE USES ELECTRICAL POWER AT COMMERCIALY AVAILABLE VOLTAGES. THESE VOLTAGES ARE HAZARDOUS TO HUMAN LIFE WHEN DIRECTLY CONTACTED. ONLY TRAINED PERSONNEL SHOULD SERVICE THIS MACHINE. DISCONNECT ALL POWER BEFORE OPENING ANY ELECTRICAL PANELS. THIS MACHINE MUST BE GROUNDED. ONLY GROUNDED EXTENSION CORDS MAY BE USED. OPERATION WITHOUT A GROUNDED SYSTEM MAY RESULT IN A HAZARDOUS ELECTRICAL SHOCK.**

1. Read all operating and safety instructions before using this machine. The operator of this machine is responsible for the safety of the actors, technicians, audience members, and any other people in the area of use. **FAILURE TO PROPERLY FOLLOW THESE PRECAUTIONS MAY LEAD TO SERIOUS INJURY.**
2. Place machine where it will be used. Be sure it is on a level spot and block the wheels so that it will not roll when in use.
3. Close the drain valve on the bottom of the tank. Open the circulating valve. Valves are open when parallel to the pipe they are mounted on, and closed when they are perpendicular to it.
4. Open the fill door on top of the machine. Open the inspection door on the ice shelf. Fill the machine with plain tap water until the water level is 3" above the low water cut out switch. **DO NOT ROLL THE MACHINE WHEN IT IS FULL OF WATER.**
5. Connect 7" flexible duct hose, or 6" PVC pipe to the hose vent on top of the tank.
6. Plug heating element “A” and heating element “B” into separate 20 ampere circuits. If extension cords must be used, be sure they are rated 20 amperes (#12AWG) and no more than 50 feet in length. **IF YOUR EXTENSION CORDS BECOME HOT TO THE TOUCH, DISCONTINUE USE IMMEDIATELY.**
7. Turn on the heating element circuit breakers. The yellow “HEATING” light will come on and the water will start to heat. Set the temperature control knob to the desired setting between 100 and 180 degrees. When the water reaches its operating temperature the elements will turn off and the green “WATER READY” light will light. The machine is now ready to operate.

# OPERATING INSTRUCTIONS

(continued)

8. Open the fill door and fill the stainless steel ice shelf with up to 150 lbs. of dry ice (see dry ice safety section of this manual). Break up large blocks of dry ice into smaller cube-sized blocks (wear gloves and safety glasses). Do not overfill with dry ice. Close the lid and latch it tightly.
9. When you are ready to make fog, supply power to the pump. A few seconds later, supply power to the fan and fog will be blown out to the stage via your duct hose. When you want to stop making fog, turn off the fan and pump.
10. Check water fill line daily and add water as needed. Change water in your **SS6000** once per week. **ALLOW TANK TO COOL BEFORE DRAINING.** To drain, first disconnect all electrical cables, then drain the tank by closing the circulating valve and opening the drain valve at the bottom of the tank. A garden hose may be attached to the drain valve, and the pump may be used to assist in emptying the tank. **NEVER ATTEMPT TO DRAIN A TANK BY TIPPING IT OVER. SERIOUS INJURY, AND DAMAGE TO THE TANK AND ITS ELECTRICAL COMPONENTS MAY OCCUR.** Rinse out the inside of the tank with fresh water and allow to dry when not in use.
11. If the machine is to be stored in an unheated area or transported in freezing weather, blow the pump and plumbing lines out with compressed air to assure that no water will freeze in them and cause damage to the pump, valves, or plumbing.

# DRY ICE SAFETY

1. Read the “Material Safety Data Sheet” for Carbon Dioxide, and the Compressed Gas Association “Guidelines for Oxygen Deficient Atmospheres” and the ESTA “Guide to Modern Atmospheric Effects”.
2. Dry ice is extremely cold, -109 degrees F (-78 degrees C). Avoid contact with skin and eyes; use gloves and safety glasses in handling. Do not ingest. Keep away from children.
3. Dry ice expands as it changes from a solid to a gas. Do not keep in stoppered or tightly closed containers. Store in a safe place away from people. Be sure storage area has adequate ventilation.
4. Dry ice is the solid form of carbon dioxide. Carbon dioxide is 1.5 times as heavy as air and can collect in low-lying areas. Carbon dioxide can cause asphyxiation due to lack of oxygen, and in sufficient concentrations is toxic. Never lay down in dry ice fog or any other fog. Always provide adequate ventilation to low-lying areas such as basements, trap rooms, and orchestra pits. Provide adequate ventilation in automobiles during transport.
5. People walking in dry ice fog must be instructed to be aware of stairs, obstructions, openings in the stage, etc., which may be obscured by thick fog. Be careful of water vapor condensing on the stage floor.

# MAINTENANCE

1. **WARNING: DISCONNECT POWER BEFORE ATTEMPTING ANY MAINTENANCE ON THIS MACHINE. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK. ELECTRICAL PARTS MUST BE SERVICED ONLY BY TRAINED PERSONEL.**
2. Allow water to cool and drain machine before attempting any maintenance.
3. Keep the interior of the machine clean. Wipe with a soft, clean cloth. Do not use solvents or chemicals for cleaning.
4. After each use, clean the stainless steel ice shelf. Remove any bits of debris, paper etc.
5. Rinse the interior of the machine after use and allow to dry. Flush out any small particles that could make their way into the pump.
6. If the machine is to be used for an extended period of time, drain, rinse and refill the tank once each week.
7. If the machine is not to be used for a length of time, drain the tank and allow to dry.
8. Protect pump from freezing in cold weather by blowing out piping with compressed air.

# PRODUCTION NOTES

The process of making fog is dependent on many factors including temperature, humidity, and air currents. In general, the more dry ice you use and the more hot water, the more fog you will create. Fog created this way may tend to be wet and carry excess condensation to the stage. Always test your fog effects under show conditions, and experiment with different temperatures to achieve the effect you desire.

# FREQUENTLY ASKED QUESTIONS

Q What is dry ice?

*A Dry ice is the solid form of carbon dioxide.*

Q Where can I get dry ice?

*A Look I the Yellow Pages under "Ice" or "Dry Ice". Many companies will deliver ice to you each day as needed. Ask your dealer to cut your dry ice into 2" cubes if possible.*

Q How can I store dry ice?

*A Dry ice can be stored in a cooler or ice chest. Stored ice will evaporate relatively quickly, usually within 48 hours. Do not buy your ice more than one day in advance, and preferably on the day of use.*

Q How much ice do I need?

*A 50 lbs. of dry ice will produce about 10 minutes of fog.*

Q Can I run my "SS6000" remotely?

*A Yes. The simplest way is to run the pump and fan leads to a remote switch box. Also, some dimmers are capable of controlling the pump and fan; consult you dimmer manufacturer.*

Q What effect does the temperature of the water have on the fog I make?

*A Higher water temperatures will tend to make more fog, but use the ice faster.*

Q How long does the water take to heat up?

*A Cold water will take about four hours to reach operating temperature. This time can be shortened by filling the tank with hot water.*

A Can I operate the machine with only one heating element?

*A Yes, but it must be element "A", since its power cord also powers the temperature control system.*

Q Can fog be produced in different colors?

*A Yes, by using different color filters in your lighting instruments. Never add any foreign substances to your water.*