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Suggested Winter Operation – For Outdoor Fountains

The best solution to cold weather operation is to close down the fountain for the season. Static water can freeze very early in the season, and even agitated water will freeze at a low temperature.

During freezing weather, there is extreme risk of water freezing in piping. When water freezes it expands by 9%, which can cause ruptures in the pool structure, pipe lines and control valves. The fountain lights can be damaged in the same manner.

We recommend the following fountain shut-down procedure be followed prior to the onset of cold weather:

1. Drain **all** water from the pool, piping and any container with water. 'Blowing out' lines with compressed air, is a common method used to purge water from piping and equipment.

2. Drain all spray rings in the pool by removing the flush-out plugs located on the bottom of the ring.

3. Remove all fountain lighting fixtures and store to prevent damage to lenses and to electrical cable. Do not cut the lighting cables. Disconnect wire splices inside the junction box to remove cable.

4. Remove junction box cord seals and secure junction box covers. Use PVC threaded plugs to plug cord seal openings.

5. Remove all jets, rings, nozzles, and submersible pumps and store in a protected area.

6. Drain any and all suction sumps, skimmers, strainers, and return fittings. A 'shop vac' can be used for this purpose.

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Year-round fountain operation can be achieved in modern fountain design. When designing a fountain in an area frequently subjected to temperatures below freezing, important consideration should be given to winter fountain operation. Precautions must be taken to protect the pool, fountain equipment and piping from damage caused by freezing water. Freeze damage is not covered under our warranty under any circumstances whatsoever.

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***Corporate Office:* P.O. Drawer 10190 • Albuquerque, NM 87184 • 1-800-794-1801 • FAX: 505-343-8086**
***Eastern Sales Office:* 3070 Business Park Dr., Suite K • Norcross, GA 30071 • 1-877-794-1802 • FAX: 770-300-0074**
***Western Sales Office:* 24680 Corte Delgado• Murrieta, CA 92562 • 1-888-803-1803 • FAX: 951-600-8322**

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WINTER OPERATION: If winter fountain operation is desired, heat must be added to the pool water. To determine the amount of heat required, first establish the following four values:

1. The lowest expected temperature and duration (low temperatures of only short duration are generally not used for these calculations).

2. Temperature difference. The difference between the lowest expected temperature and 32 degrees Fahrenheit.

3. Surface area of the pool in square feet.

4. Average wind velocity in miles per hour.

Once the pool water temperature has been brought to the desired level, the estimated heat loss from the pool surface is equal to 10.5 BTU per square foot, per hour, per degree of temperature difference, based on a wind velocity of 3.5 mph. For a 5 mph wind velocity, multiply by 1.25. For a 10 mph wind velocity, multiply by 2.

EXAMPLE:

1. Lowest expected temperature	-10° Fahrenheit
2. Temperature difference from 32° F	42 degrees
3. Surface area of pool	500 square feet
4. Wind Velocity	5 mile per hour

Total estimated heat loss (BTU per hour) = 10.5 x 42 x 500 x 1.25
Total estimated heat loss 275,625 BTU per hour.

Provisions should be made to insure that at least this amount of heat can be added to the pool when required. It may also be advisable to allow for a safety factor. The most effective and reliable method of adding heat to the pool is to use a gas fired or electric swimming pool heater. A determination as to which type and method to use depends on a number of factors, including: available space, availability of energy source, cost of energy source, and cost of heater system installation.

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There are a few methods which can prove useful in reducing heater size/BTU requirements established above:

1. Locate the fountain in an area protected from the wind to lower heat loss. This will reduce the wind velocity factor used in the above calculations. Particular attention should be given to the prevailing wind direction.

2. Provide for maximum pool water circulation to help maintain above freezing water temperatures at even lower air temperatures. This is accomplished with a bypass system which diverts water normally used for the fountain effects back to the pool. Temperature sensing devices and solenoid valves are available for automatic control of the operation. This will reduce the temperature difference value used in the above calculations.

3. Consider installing an 'in-floor' radiant heating system beneath the fountain pool, and installing heat-trace tape on all critical re-circulation piping and valves.

4. Remember, pump motors and controls dissipate waste heat which is transferred to re-circulation piping in the pump room. Consider insulating the pump room and installing a space heater to raise room temperature.

5. Incandescent fountain lighting is typically 'water cooled' because it generates so much waste heat. Consider operating the fountain lights during especially cold temperatures to warm the pool water.

CAUTION: Water effects should never be turned off entirely during freezing weather if the intent is to operate them in freezing conditions. Flow must be maintained at all times to prevent freezing in the piping system and certain equipment.

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