

Auxiliary Pool Water Heaters

TB-002

PoolPak International recommends that all natatoriums be equipped with supplemental dedicated pool water heater.

Natatoriums mechanical systems that depend on dehumidification for 100% of the pool water heating will be less efficient, less reliable provide poorer quality control of the room environment, and pool water temperature than dehumidifier based mechanical systems with pool water heaters.

The PoolPak SWHP unit is only able to heat pool water from available heat (sensible or latent) that is recovered from the natatorium air. When the natatorium air temperature and relative humidity are satisfied, the SWHP unit is idle with respect to any ability to heat the pool water. Further, during this satisfied condition, the only way to “force” heat into the pool water through the PoolPak unit would be to falsely overheat the natatorium air temperature above setpoint in order to generate heat to recover and direct into the pool water. During this hypothetical process of overheating and cooling (heat recovery) of the natatorium air, the following negative conditions will result:

Loss of Natatorium Space Temperature Setpoint

The heat needed to heat the pool water must first be added to the natatorium air before this heat can be recovered by the SWHP unit and then redirected into the pool water. This process will result in frequently overheating the natatorium air temperature above setpoint. This condition could be very unpleasant especially during any special events with fully clothed spectators in attendance.

Loss of Natatorium Relative Humidity Setpoint

While the SWHP unit is recovering heat from the falsely heated natatorium air, this same airflow is being dehumidified through the direct expansion evaporator coil. Prolonged water heating under these circumstances will result in drop in natatorium relative humidity below setpoint. While this may not seem significant, a drop in natatorium relative humidity below setpoint creates a chill effect on the skin surfaces of bathers as they leave the water. For this reason, the optimum natatorium relative humidity setpoint is 60%.

Waste of Heated Natatorium Air through Normal Ventilation

The ventilation cycle of the natatorium system includes exhausting a certain volume of natatorium air in order to maintain the natatorium under negative room pressure. Once the pool water temperature is finally satisfied, overheated natatorium air (air that was only overheated to create the heat source to heat the pool water) continues to be exhausted. This exhaust of overheated natatorium air is completely wasted.

In contrast a dedicated pool water heater uses only the needed amount of heat to satisfy the pool water temperature setpoint. Once the pool water temperature is satisfied, the heater cycles off with no waste of generated heat.



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Pool System Reliability

If the dehumidification system's compressor or any of its other major components fail it will be impossible to maintain the pool water's temperature. An example of an auxiliary pool water heater coming to the rescue of a failed dehumidifier is a recreation center in Prince Georges County, Maryland. This facility was equipped with three dehumidifiers. The manufacture of these dehumidifiers claimed the dehumidifiers would do 100% of the pool water. The compressors failed in two of these dehumidifiers and could not be repaired for weeks. Fortunately, the engineer that designed this job included auxiliary pool water heaters in his design. Thanks to these heaters, the recreation center was able to stay in operation.

Pool Pool Water Temperature Control

Pool dehumidifiers are fundamentally ineffective pool water heaters and take an extremely long time to heat a Pool. When a pool is filled with fresh water usually the temperature is about 55 degrees F. to 60 degrees F., an auxiliary pool heater can bring the water to an operating temperature in about 30 hours. A pool dehumidifier will take about 7-10 days to accomplish the same heating task.

In conclusion, the minor savings associated with deleting a dedicated auxiliary pool water heater do not outweigh the loss in natatorium comfort level, as well as, the loss in pool water heating operating efficiency.