

Pool Room Design Summary

INTRODUCTION

An indoor pool environment is a very complex and in some cases, misunderstood area. It truly must involve many designers and trades: the architect for physical structure, pool builder for the pool details, mechanical engineer for proper air conditions and air movement and finally the customer because their usage will effect all of the above. This bulletin will provide an overview of the many interacting parameters of a pool facility which must be considered at the preliminary design stage.

Please refer to other Desert Aire technical bulletins which describe why dehumidification is needed, how a dehumidifier works and the cost associated with the operation of dehumidification equipment.

LOCATION AND SPACE REQUIREMENTS FOR A DEHUMIDIFIER

Every pool requires a pump and a filter, so the designer designates a location close to the pool to install these components. This location must have access for service. Using this same location for the dehumidifier is the logical choice, as it too needs to be close to the pool room and requires service.

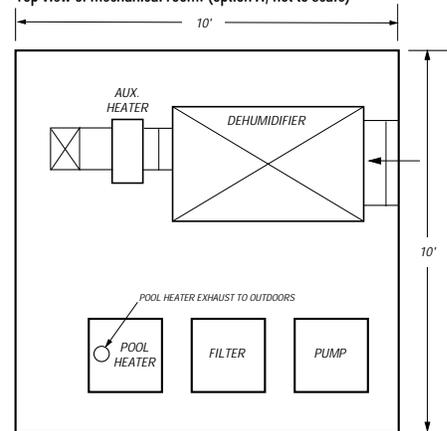
As a general rule, a 2, 3 or 5 Hp.dehumidifier for a residential or hotel pool should be installed in an area that is at minimum approximately 10 ft. long by 7 ft. wide by 5 ft. high. This gives the contractor enough room to install all of the duct work, heater, condensate piping and allow adequate room for service.

In some cases, the designer does not like to part with valuable floor space. However, the consequences of poor dehumidifier operation can be disastrous if it is installed incorrectly. Figures 1 and 2 give alternate mechanical room layout suggestions.

DUCT DESIGN

The alternatives illustrated are shown with high return duct work and below grade duct. The below grade duct uses PCD coated spiral galvanized duct. With the low discharge the air flow system makes the best use of thermodynamics in that the warm, dry air will purge the glass and continue to rise as it picks up moisture. A properly designed duct will keep the moist air from striking the outside wall surfaces, thus preventing condensation and damage.

Figure 1
Top view of mechanical room. (option A, not to scale)



Side view of mechanical room. (option A, not to scale)

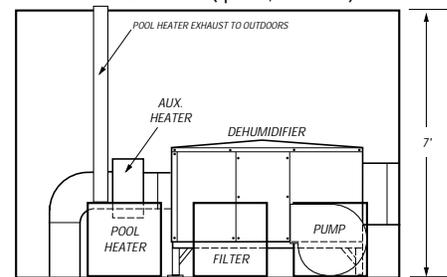
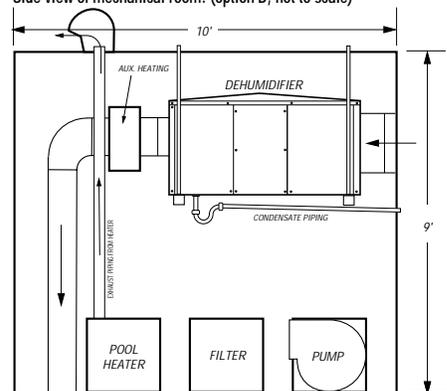
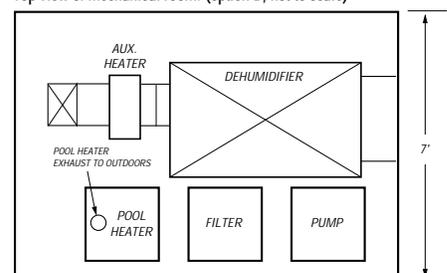
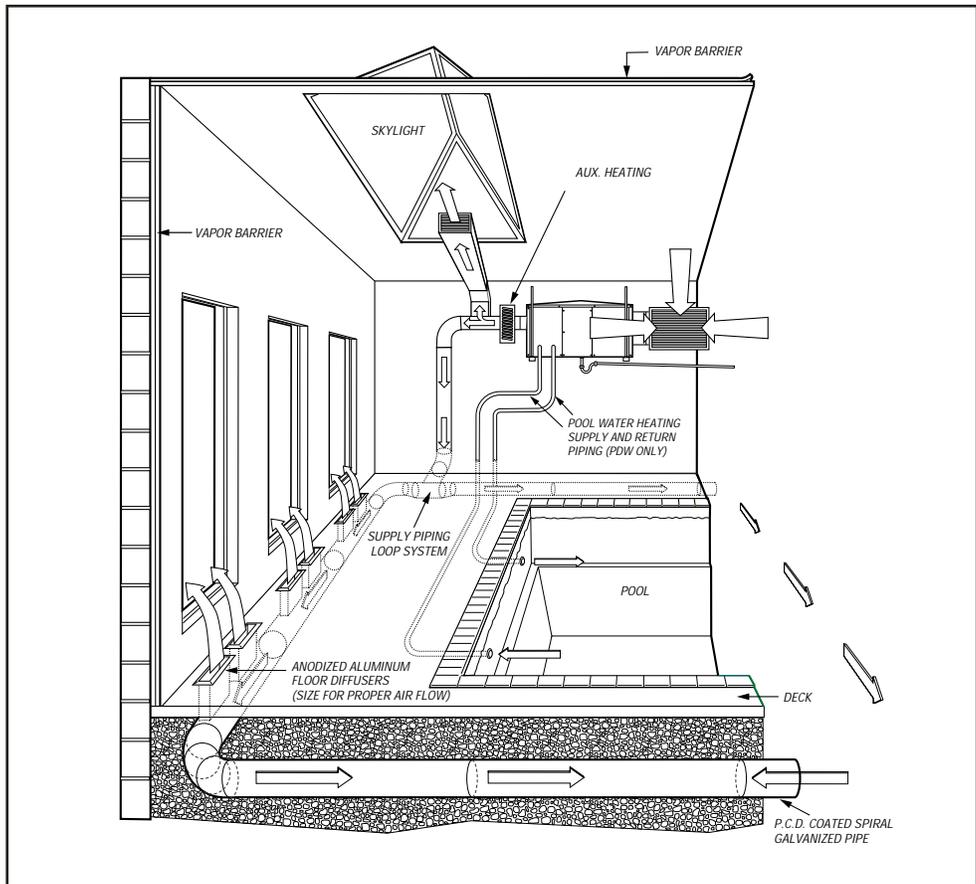


Figure 2
Side view of mechanical room. (option B, not to scale)



Top view of mechanical room. (option B, not to scale)





AUXILIARY HEATING

A dehumidifier recovers and returns heat to the conditioned space. However, during the winter months, the skin loss of the building may be too great. It is important for the designer to perform a heat loss calculation and select an auxiliary heater for full heating capacity.

There are several auxiliary heating methods to be considered. Electric or gas fired duct heaters, or a hot water coil that uses the pool water boiler (sized for pool & space loads) can be used effectively.

WATER HEATING

An optional feature of the dehumidifier is the ability to recover heat to the poolwater. Two important design characteristics must be considered.

First, in order for the recovery process to occur the pool pump must operate 24 hours per day. This essentially eliminates residential pools from using this option as the increased electrical cost of the pool pump will decrease the recovery impact.

Secondly, the climate should be considered, more specifically, what time of the year is heating required to maintain the 80° to 86° degree inside air temperature. The greater the need for air conditioning, the greater the economic impact of the water heating option will have on energy consumption.

CONDENSATE RETURN

A dehumidification system can recover between 15,000 and 25,000 gallons per year depending on the pool size. Condensate is considered soft water with some small traces of suspended dust. If your local code permits, this water can be returned to the pool by draining to the inlet skimmer. In this way the water can be filtered and chemically treated before re-entering the pool.



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