

DESERT AIRE EXPERTAIRE™ SERIES

# DEHUMIDIFIERS FOR INDUSTRIAL, COMMERCIAL AND RESIDENTIAL APPLICATIONS



Industry, public works, municipal services and indoor pools are just a few of the many applications that our ExpertAire™ dehumidifiers effectively cover. ExpertAire™ is an enduring product line for Desert Aire that represents the culmination of our core expertise in dehumidification. The ability of these units to be applied to diverse applications combined with their flexibility to appropriately regulate the introduction of outdoor air to a facility makes them a true energy efficient workhorse that consistently performs time and again.



DEHUMIDIFY WITH THE EXPERTS ... 

# EXPERTAIRE™ SERIES FEATURES

## ARI STANDARD 910 – MOISTURE REMOVAL CAPACITY

The Air Conditioning and Refrigeration Institute (ARI) created Standard 910 as an industry-wide standard for manufacturers, engineers, installers, contractors and end users. The purpose of this standard was to establish, for indoor pool dehumidifiers: definitions; classifications; requirements for testing and rating; minimum data requirements for published ratings; operating requirements; marking and nameplate data; and conformance conditions.

Standard 910 has created new provisions to measure the capacity and effectiveness of pool dehumidifiers. For example, the standard defines Moisture Removal Capacity (MRC) as the amount of condensate a unit produces, as impacted by coils, circulating fans and other components in the air stream, excluding supplementary heating, cooling or outdoor air, and is expressed in lb/h (kg/h). Also, it defines Moisture Removal Efficiency (MRE) as a ratio of the MRC divided by the unit's power input at any given set of rating conditions, and is expressed in lbs of moisture/kWh (kgs of moisture/kWh).

### EXPERTAIRE™ MEETS ARI 910

Desert Aire's ExpertAire™ Series dehumidifiers have been designed with this standard in mind. First, we've used the latest coil design technology to increase evaporator and condenser capacity while simultaneously reducing their pressure drop. This combination yields the highest MRE available.

Secondly, the coils have been designed from the onset to use R410a refrigerant. Because pending refrigerant changeover will be implemented across the entire industry very soon, Desert Aire has elected to immediately introduce R410a in our ExpertAire™ Series, thus optimizing its design and performance.

Desert Aire has also submitted the ExpertAire™ Series to an independent testing laboratory for positive verification of its MRC's and MRE'S. The ARI Certified seal is your reassurance of our unit's design for your application.

### FEATURES

Many applications need the removal of unwanted moisture. If unchecked, this moisture causes condensation on walls, windows and floors. This can create problems with a building's structural integrity and consequently endanger customers and employees. In manufacturing, a humid

environment can also contribute to lowered productivity by damaging product or increasing cycle times.

Desert Aire's ExpertAire™ Series products are designed for applications with air temperatures between 65° and 95°F (18° and 35°C) that require moisture removal between 4 and 100 lbs (2 and 45 kg) per hour.

An ExpertAire™ dehumidifier optimizes moisture removal by using a specially designed coil to maximize the system's latent capability, thus yielding 3 to 4 times the moisture removal capacity over a standard air conditioning system. Each system also includes a hot gas reheat coil that is sized for 100% rejection of the recovered energy. This coil allows the unit to continue to dehumidify without over-cooling the space.

These systems also feature an optional capacity control design which protects the coil from freezing up during low temperature/low load operation. In addition, the system helps to eliminate high load nuisance service trips by re-balancing the refrigerant system. ExpertAire™ models are fully protected with IEC starters, overloads and refrigerant switches.

ExpertAire™ features scroll compressors for high efficiency and long life. Other components are also designed for longevity such as our cabinet which is manufactured from galvalume with a high impact, powder coat textured paint finish.

A distinct feature of these dehumidifiers is that they can be equipped with an outdoor air intake connection to help meet ASHRAE 62 standards. Outdoor air is introduced after the evaporator coil but prior to the reheat condenser to guarantee moisture removal capacities. In addition, the units are equipped with an evaporator bypass damper. This feature automatically adjusts the air volume that passes across the evaporator when outdoor air is introduced by an occupancy timer.

Our ExpertAire™ units also offer a control that enables the unit to completely close the outdoor air damper when a facility is in a non-occupied mode. Because no outdoor air is being introduced for dehumidification, this feature eliminates the need to further condition the outdoor air (heating or dehumidification) and, in return, helps save energy.

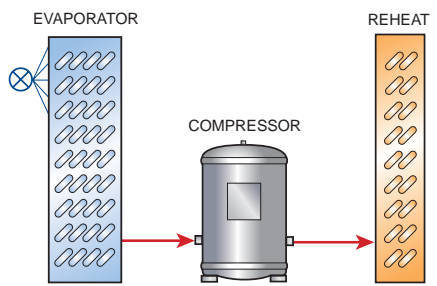
With the addition of this option, highly efficient moisture removal is maintained. The system is also protected from failure due to low airflow, while allowing the owner to reduce the costs of heating the outdoor air that is drawn through the dehumidifier.

# CHOICE OF DESIGN OPTIONS

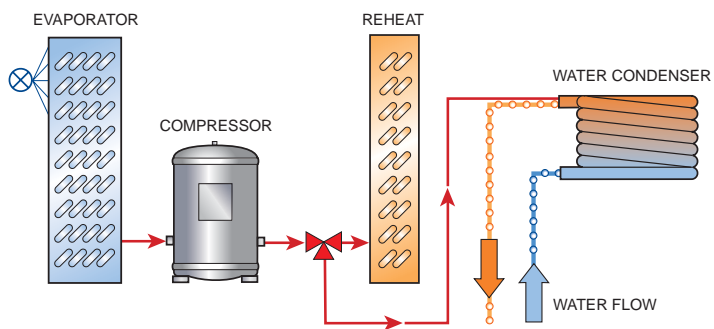
## MODES OF OPERATION

ExpertAire™ is available in one of the following six configurations. Review the options below to understand which heat sinks apply to your application

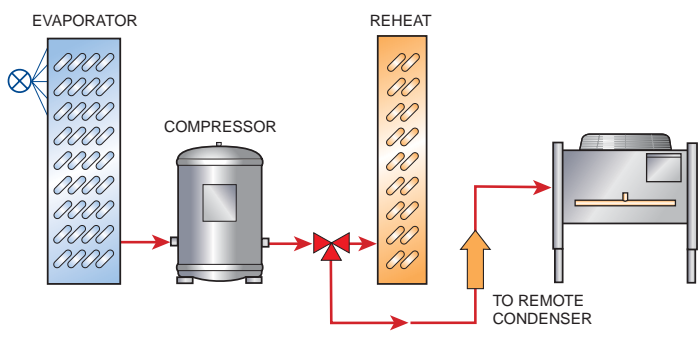
**REHEAT ONLY...** This is the standard design that removes moisture from the air at the evaporator coil and reheats the dehumidified air before returning it to the space.



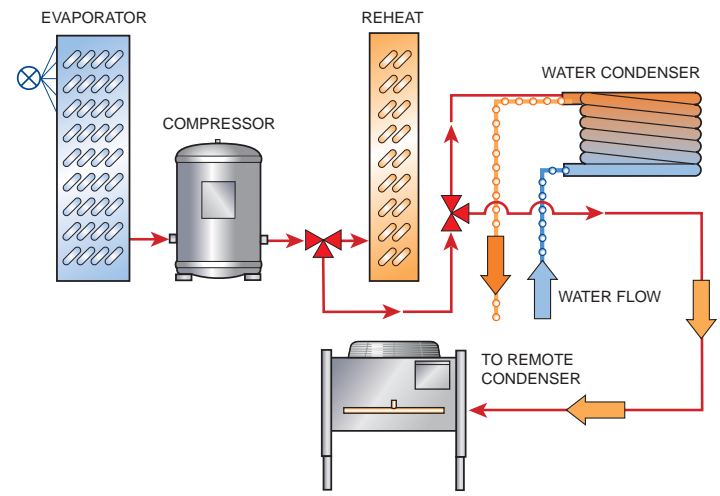
**REHEAT & WATER ...** In addition to the reheat coil, a water condensing coil is added to the circuit. Either circuit can become the primary heat sink allowing the circuit's latent and sensible energy to be directed to a water source or returned to the air. This mode applies to water coil models only.



**REHEAT & REMOTE CONDENSER READY ...** This is very similar to our second option listed above, except that instead of recovering energy to a water heat sink, the energy is rejected to an outdoor condenser.

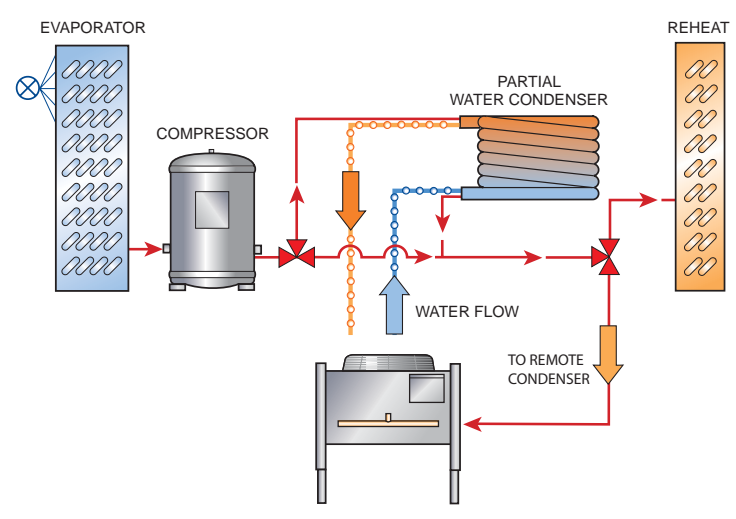


**REHEAT & WATER & REMOTE CONDENSER READY...** This is a combination of all heat sink options available. This option is chosen when only a partial water heat sink is available but full capacity dehumidification will be required continuously regardless of season. This mode applies to water coil models only.



**REHEAT & PARTIAL WATER & REMOTE CONDENSER READY...**

Comprised of a partially sized water coil, a reheat coil, a remote condenser and two three-way valves, this circuit provides the most flexibility in heat rejection. The first three-way valve always provides the option to send refrigerant to the water condenser. After leaving the water condenser, the refrigerant is then sent to a second three-way valve which can transfer the remaining heat to either a reheat coil or remote condenser. However, if there is no call for water heating, the first three-way valve delivers the refrigerant to the second three-way valve which can then reject all energy either to the reheat coil or remote condenser.



# OPTIONS AND APPLICATIONS

## AUXILIARY HEATING

A dehumidifier is typically the only air handler used in pool room or industrial applications. Even though recovered energy is sent to the space during the dehumidification process, the heat loss of the space can exceed the energy recovered. Auxiliary heating may be required. This can be added to the dehumidifier to provide *complete environmental control* in one package. Several types of auxiliary heaters are available on ExpertAire™ units depending on availability of local utilities.

**HOT WATER COIL ...** Specify the required heat output, water temperature and flow rate. The dehumidifier controller will send a 4-20 MA (or other variable control voltage) to a modulating control valve. The valve is sized and provided by others. If the ventilation air option is selected, a freeze-stat is added to protect the coil.

**STEAM COIL ...** Specify the required heat output and steam pressure. The dehumidifier controller will modulate the steam in the same manner as the hot water coil described above. The control valve is supplied by others for field installation.

**ELECTRIC COIL ...** Specify the required heat output and how many stages the coil is to be designed for. ExpertAire™ controllers will provide contact output signals for each stage.

## ABOUT REMOTE CONDENSERS

Desert Aire's ExpertAire™ Series dehumidifiers can also simultaneously perform as air-conditioning units. Dehumidify, then heat or cool the air as called for at about the same cost of dehumidifying only. Our high efficiency remote condensers are specifically designed to match your ExpertAire™ dehumidifier. Available as an option, the addition of a remote condenser will automatically supplement desired temperature levels within the conditioned environment.

Controlled by a wall or duct mounted thermostat, ExpertAire™'s controls energize the appropriate condenser to alternate from the heating mode to the air conditioning mode.

Normally located outdoors, these air-cooled units reject unwanted indoor hot air to the outdoors much like home air conditioners. These specially designed condensers can also be located inside a building that's not being conditioned to provide supplemental heating if desired.

## APPLICATIONS

Our ExpertAire™ units are designed to solve many dehumidification needs where moisture can do damage to buildings, products or processes. Applications include:

- ◆ Indoor Swimming Pools and Spas
- ◆ Industrial & Commercial Storage
- ◆ Water & Wastewater Treatment Plants
- ◆ Manufacturing and Processing Facilities
- ◆ Fire & Flood Restoration

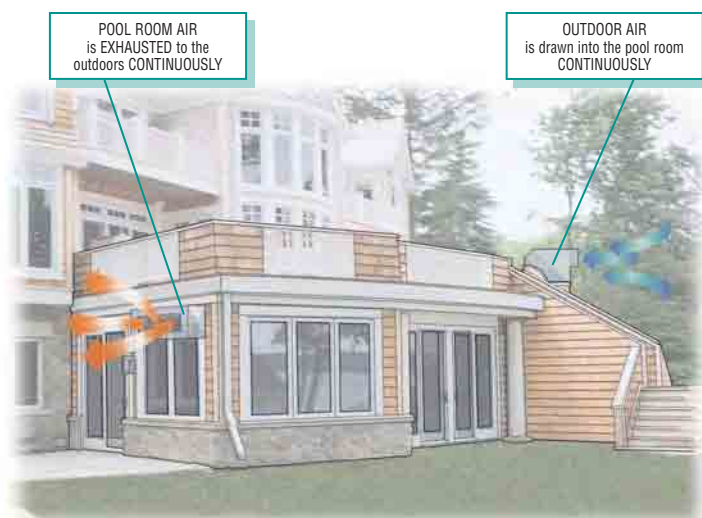


Organized electrical cabinet provides easy service and maintenance.



Remote Outdoor Condenser (ROC) piped to unit located inside facility.

# EXPERT HELP WITH YOUR POOL ROOM



## Conventional Ventilation

### Cold Outdoor Air

- ◆ Huge bills for heating outdoor air while previously warmed air is exhausted outdoors.

### Hot Outdoor Air

- ◆ Space is overheated when outdoor air is warmer than inside. Creates uncomfortable environment.

### Humid Outdoor Air

- ◆ Pool room humidity cannot be controlled.

## With A Desert Aire Dehumidifier

### Cold Outdoor Air

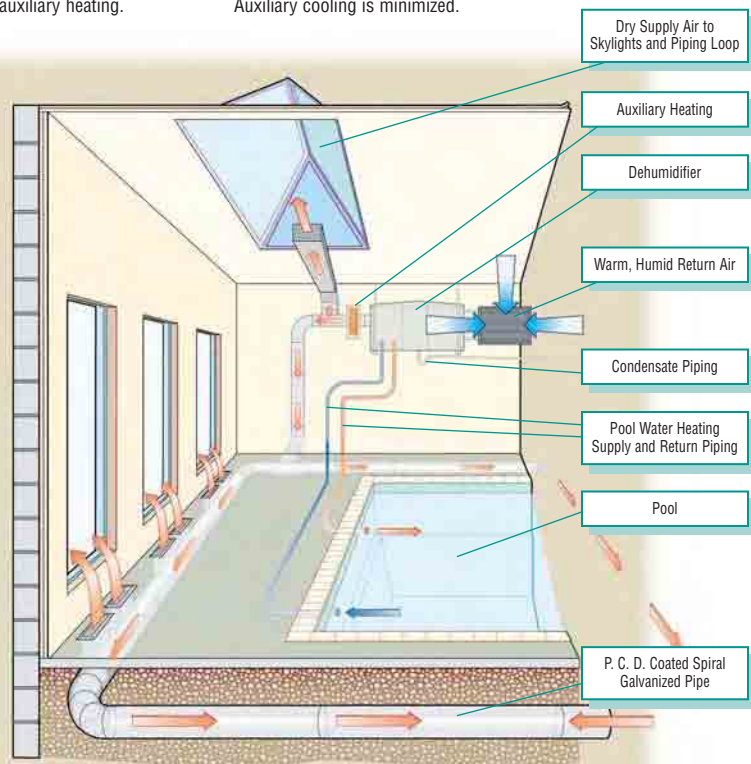
- ◆ Captured heat is released into recirculating air to minimize auxiliary heating.

### Hot Outdoor Air

- ◆ Dehumidifier cools by sending captured heat outdoors to remote condenser. Auxiliary cooling is minimized.

### Humid Outdoor Air

- ◆ Pool room humidity is carefully controlled.



## Dehumidification Protects Your Investment

Don't jeopardize your investment in an indoor pool by allowing excessive moisture to condense on and inside walls, ceilings, and floors. Dehumidification controls humidity levels which can contribute to condensation and the growth of mold and mildew.

## Dehumidification Saves Energy Over Conventional Ventilation

Conventional ventilation systems attempt to control pool room humidity by exhausting warm, moist air and bringing in outdoor air. The result is huge annual energy expenses. As dehumidifiers dry the pool room air, they capture heat energy from warm air and the moisture in it. By carefully choosing where to release that energy, dehumidifiers give you big savings on energy bills.

## Moisture Load Calculations

With thousands of successful installations in reliable operation, Desert Aire has the experience to provide the right dehumidification solution for your pool room. The key to proper moisture control is to understand how much moisture will be in the pool room air under various conditions. Desert Aire representatives use advanced software to calculate moisture loads and select the right dehumidifier quickly and accurately. *Application Note 10: Swimming Pool Dehumidifier Sizing* explains the theory behind the calculations.

## HVAC System Design Information

Your contractor is responsible for understanding the heating and cooling loads for pool room air, and the heating requirements for the pool water. You will need to agree on acceptable pool room air and water temperatures. Auxiliary heating and cooling needs beyond what can be supplied by the dehumidifier should be addressed by your contractor.

## Installation and Operation Support

Desert Aire's knowledgeable service personnel, plus a network of factory-trained refrigeration contractors, ensure excellent installation and service support. The most comprehensive warranty in the industry protects our dehumidifiers, remote condensers and controls.

## STANDARD EXPERTAIRE™ SERIES FEATURES

### FILTERS - TWO OPTIONS

- 4" MERV 8 filters
- 2" MERV 6 filters with 2" chlorine deactivator filters

### EVAPORATION COIL

- R410a standard refrigerant
- standard rifled tube, lanced fin coils
- die-formed, aluminum, extruded fins are damage-resistant

### DRAIN PAN

- stainless steel pan minimizes corrosion
- sloped design avoids hazardous puddling

### REFRIGERANT REHEAT COIL

- R410a standard refrigerant
- die-formed, aluminum fins are damage-resistant
- adequate coil separation avoids re-hydration

### STANDARD AUXILIARY HEAT OPTIONS

- all auxiliary heat options are internal to unit
  - electric heat
  - hot water coil
  - steam coil

### ELECTRICAL SERVICE

- single point connection

### CABINET CONSTRUCTION

- panels constructed of sturdy 16-gauge galvalume steel
- removable side panels provide easy access to all serviceable elements
- panels coated with high-yield polyester, textured, fingerprint-resistant powder-coat paint
- paint meets:
  - 1000-hour salt spray test
  - 160 in-lb direct impact resistance
  - 1000-hour humidity resistance

### INSULATION

- closed cell foam insulation superior to fiberglass insulation – eliminates fiber-release into air
- insulation meets:
  - ASTM mold, mildew, moisture resistance specifications
  - NFPA fire specifications
  - UL specifications

### AIR- OR WATER-COOLED OR REHEAT OR COMBINATIONS (SEE PG. 3)

- reheat only
- reheat and water-cooled
- reheat and remote condenser ready
- reheat and water-cooled and remote condenser ready
- reheat and partial water-cooled and remote condenser ready

### ADDITIONAL OPTIONS INCREASE FLEXIBILITY

- R22 available upon request
- optional Electrofin E-coating coil coating available for corrosive environments
- single phase available on 1- to 10-ton units
- unit-mounted optional power disconnects (fused and non-fused)
- contact factory for non-standard options
- units available in 1 to 15 tons



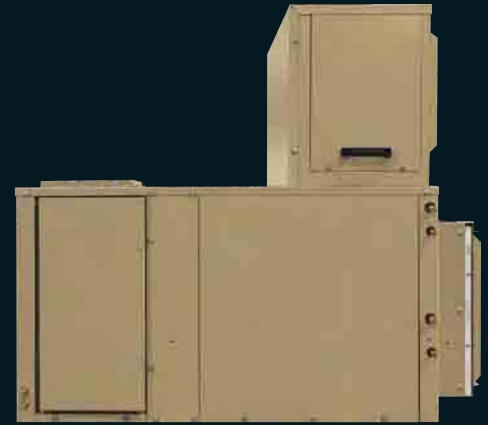
DEHUMIDIFY  
WITH THE EXPERTS!

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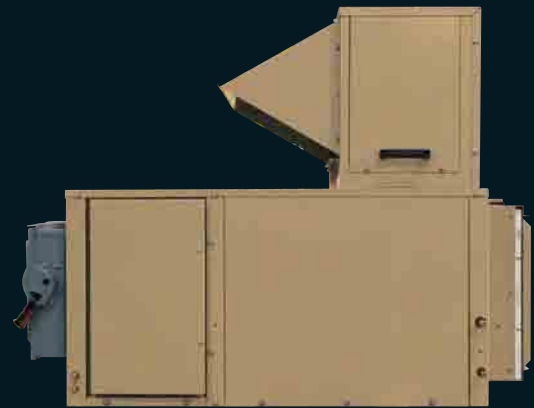
**PH: (262) 946-7400 FAX: (262) 946-7401**

www.desert-aire.com • E-mail: info@desert-aire.com

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Standard ExpertAire™ Unit with Optional Outdoor Air Box



ExpertAire™ Unit with Quick Disconnect™ and Protective Hood on Outdoor Air Box

All referenced publications are available as PDF files at [www.desert-aire.com](http://www.desert-aire.com).  
Supportive literature includes:

- ◆ **Technical Bulletin 5**  
- Ventilation Air for Indoor Pools
- ◆ **Technical Bulletin 7**  
- Indoor Pool Dehumidification
- ◆ **Technical Bulletin 8**  
- Pool Room Design Summary
- ◆ **Application Note 10**  
- Swimming Pool Dehumidifier Sizing
- ◆ **Application Note 11**  
- Industrial Dehumidifier Sizing
- ◆ **Application Note 12**  
- Water Treatment Plant and Pumping Station Dehumidifier Sizing