

## LARGE CAPACITY DEHUMIDIFICATION SYSTEMS

# Dehumidifiers for Large Capacity Applications



Natatoriums



Hotel / Motel Poolrooms



Water Parks



School Aquatic Facilities



Warehousing



Desert Aire's SA Series dehumidifiers offer you complete humidity control solutions for large indoor pool applications, water parks, warehouse, and other large moisture removal applications. Our many options allow you to control temperature and humidity while conserving energy for significant operational savings. Rely on Desert Aire for expert solutions to large capacity humidity problems.

**OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY**

## DEHUMIDIFICATION OPTIONS

### LARGE SELECTION

Desert Aire has a complete line of large commercial and industrial dehumidification systems designed to solve the toughest humidity and moisture problems. These systems remove between 55 and 340 Lb/Hr (25 to 155 Kg/Hr) of moisture.

### DUAL CIRCUIT DESIGN

The SelectAire™ Series is a dual refrigerant circuit, packaged dehumidification system that is carefully designed and manufactured for commercial natatoriums, such as: high school and university indoor pools, YMCA/YWCA, JCC and municipal natatoriums. The SA Series can also be used for other applications requiring large amounts of moisture removal.

SelectAire™ (SA) Series equipment features an exclusive exhaust air heat recovery system and patented air flow balancing. The SA system effectively addresses exhaust air energy loss in a natatorium and recovers it more efficiently than any other heat recovery method including economizer systems.

This dehumidification system features a unique dual refrigerant circuit design which allows staging to minimize energy consumption and optimize energy recovery by using different condensing elements, for the appropriate heat sinks.

At the heart of each circuit is a scroll compressor providing high performance and long life. The dehumidification section features an 8-row evaporator coil for high moisture removal capacity. The energy recovery section can have a combination of air reheat coils, water (pool or domestic) condensers or remote condensers. Auxiliary heat and a fresh air module can also be incorporated to complete a total system design.

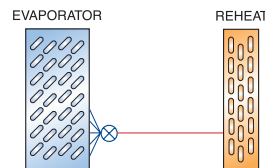
All metal frame and panels use a special corrosion resistant galvaneal metal with a powder coat finish, a tough coating that resists rusting. This process meets a corrosion resistance specification of 1,000 hours of salt spray.

SelectAire™ dehumidifiers can be installed either indoors or outdoors. Units intended for outdoor installation are factory equipped with additional insulation, heavy duty weather sealing and special rainhoods mounted on the ventilation air intake. They can also be installed on roof curbs (supplied by others) which permit bottom return and supply air to meet HVAC design specifications when required.

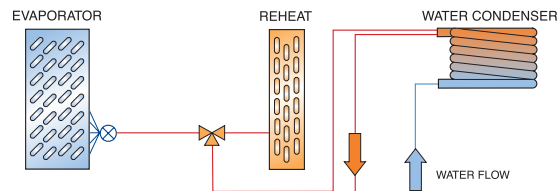
### FEATURES

Desert Aire's commercial dehumidifier systems are flexible in their design options. This modular concept allows each system to be customized for specific dehumidification applications. Each module type is described below.

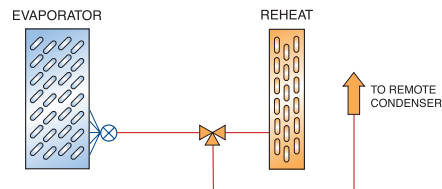
**REHEAT ONLY ...** This is the basic option which removes moisture from the air at the evaporator coil and reheats it before returning to the space as dehumidified air.



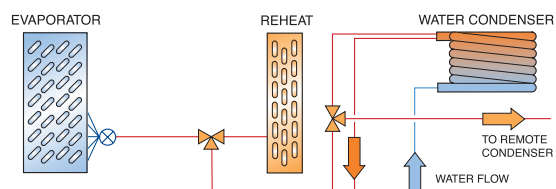
**REHEAT & WATER...** In addition to the reheat coil, a water condensing coil is added to the circuit. Either circuit can become the primary heat sink allowing the circuit's latent and sensible heat to be directed to a water source or returned to the air.



**REHEAT & AIR REMOTE CONDENSER READY...** This option offers a reheat coil and an air cooled remote condenser connection.



**REHEAT & WATER & AIR COOLED REMOTE CONDENSER READY...** This is the combination of all heat sink options. It is used when only a partial water heat sink is available but full capacity dehumidification is required continuously, regardless of season.



## CONTROLS

Each circuit is controlled by the integral microprocessor-based controller. This system includes an easy-to-read user interface. A Remote Display Terminal (RDT) may be ordered separately for remote mounting.

The use of the basic control and staging sequences provides great flexibility in optimizing dehumidification and energy recovery capacity.

The system features control of all of the dehumidification functions including auxiliary heating, occupancy schedules and ventilation air. It also provides diagnostic readouts and alarms.

Optional communication cards are offered that allow the system controller to be connected to building automation system. Communication cards are offered for BACnet MS/TP, BACnet Ethernet, Lonworks, and Modbus.

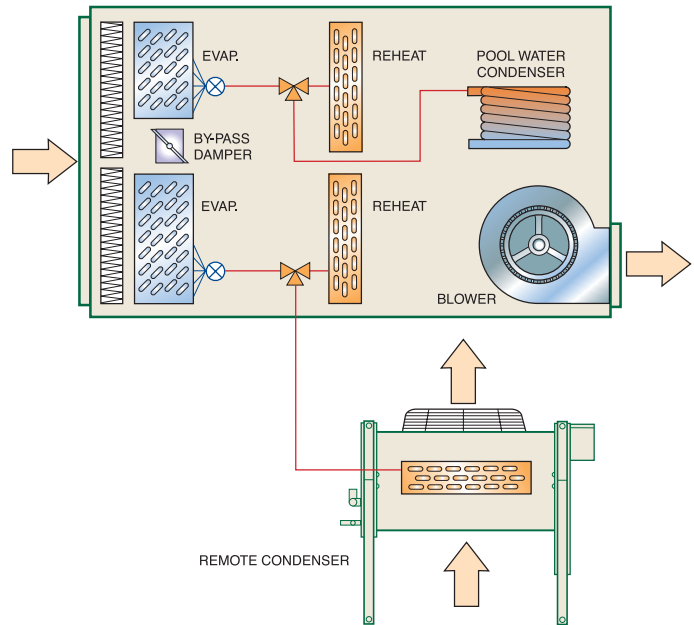
## LOWEST OPERATIONAL COSTS

There are several methods of reducing operating costs of a natatorium dehumidifier. In standard A/C applications, the use of an economizer cycle is implemented to lower operating costs. However this method does not actually achieve its objectives because it raises the initial capital costs and has hidden operational costs of the 2 fan system that is required to achieve its objectives.

Desert Aire's energy recovery system achieves the highest energy recovery of any pool dehumidifier. It uses a heat pump concept to maximize both the sensible and latent recovery. In addition it does



SelectAire™ System with Multiple Circuits



not waste conditioned air in the cooling mode like the economizer method does. Please refer to Desert Aire Application Note # 7 for additional details of the energy savings.

## TYPICAL CIRCUIT ARRANGEMENT

A typical arrangement for an Olympic-size natatorium pool is illustrated in the figure above.

One circuit either recovers the energy to the air or water. Only one circuit is generally required to replace the heat loss of the pool water.

The second circuit allows the system to recover energy and return it to the space in the winter but reject the heat for cooling in the summer.

## EXAMPLE

Through the use of dual circuiting, Desert Aire can better control the recovery of energy and optimize compressor run time. The dual circuit design also allows simultaneous rejection of heat to water and air to provide zero reheat. It also allows full heat recovery through its respective and dedicated condensers that are "independent." In other words, Desert Aire's exclusive dual refrigeration circuits offer you the best of both worlds – simultaneous or independent heat rejection capability for unsurpassed versatility for any operational sequence. Other circuiting options are used to obtain different results.

For more information visit [www.desert-aire.com](http://www.desert-aire.com)



## STANDARD SA SERIES FEATURES

### REFRIGERATION DESIGN

- Dual, independent refrigeration circuits operate independently or simultaneously
- Heavy-duty scroll compressors
- Maximum of 38" coil height maximizes moisture removal
- Sloped, stainless steel drain pan for each circuit
- Minimum of 8" separation between evaporator and condenser coils prevents re-evaporation
- Coils are designed for maximized latent removal
- R-410A refrigerant

### CABINET AND CONSTRUCTION

- Base rails and supports constructed of 12-gauge steel channels
- Cabinet made of 16-gauge Galvanneal steel with powder-coat paint
- Removable side panels made of 16 gauge
- Rated for 1000-hour salt spray
- Thermal and sound insulation made of engineered polymer cell foam (EPFI)

### BLOWER

- Galvanized steel mounted on pillow block bearings with grease fittings
- ODP motors

### FILTERS

- Return Air: 4" MERV 8, pleated filters
- Outdoor Air:
  - \*SA18-30: 2" MERV 8
  - \*SA35-60: 4" MERV 8

### ELECTRICAL SERVICE

- Hinged electrical panel on single side access of unit
- Single-point power connection for all units

### CONTROLS

- Duct or wall mount temperature and humidity sensors
- Integrated Display with an optional remote display terminal
- BAS communication options
- Built-in time clock for standalone operation

### WARRANTY

- 2 Year parts warranty
- Coated coils include (5) year parts warranty

## SA SERIES OPTIONS

### COATINGS

- Coated coil to resist chemicals and corrosion

### AUXILIARY HEAT

- Hot water coil supplied downstream from hot gas reheat coil
- Steam coil supplied downstream from hot gas reheat coil
- Electric SCR heat supplied downstream from hot gas reheat coil
- Control outputs for field supplied auxiliary heating devices

### INSTALLATION LOCATION

- Indoor
- Outdoor
- Rooftop (for downflow applications)

### CONDENSER (CHOOSE PER CIRCUIT)

- Air-cooled remote condenser rejects excess heat to the outdoors (full THR - Total Heat of Rejection)
- Water condenser for chiller or fluid cooler

### POOL WATER HEAT

- Coaxial heat exchanger for recovery of heat to pool water

## OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY

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## BASIC OUTDOOR AIR BOX SYSTEM

### Basic Outdoor Air Box w/no Energy Recovery

Every commercial pool requires the introduction of outdoor ventilation air during occupied times. The rate of introduction is dependent on the pool size, deck space, and occupancy. The introduction of this ventilation air helps to maintain air quality in the space. Refer to Desert Aire Technical Bulletin #5 for a detailed summary of the requirements in current standards.

Desert Aire offers an outdoor air box system option to integrate ventilation air into its dehumidification package. The dehumidifier blower will act as the ventilation fan and supply air blower. The exhaust air blower (by others) removes the air to establish a negative pressure in the space to prevent moisture migration to other parts of the building.

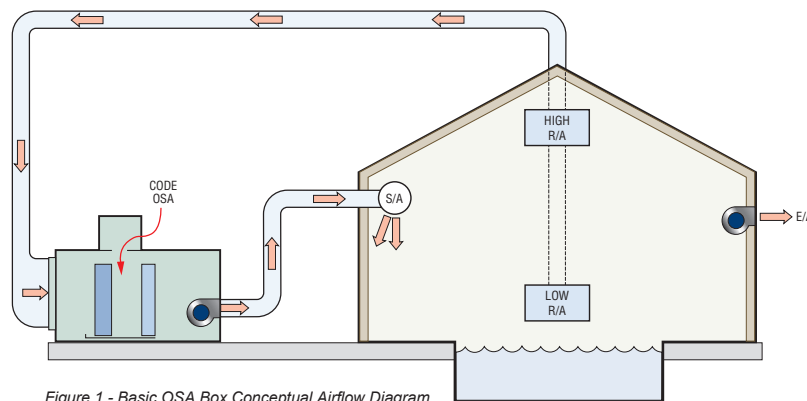


Figure 1 - Basic OSA Box Conceptual Airflow Diagram

There are two options for the introduction of basic ventilation air:

**Duct Connection Only** - This option is only used on indoor applications and requires the installing contractor to provide the isolation damper, actuator and filtration elsewhere in the outdoor air ductwork.

**Outdoor Air Box** - Desert Aire adds a modulating damper and filtration to the dehumidification system which is factory installed. For outdoor units the assembly includes a rain hood. The sequence is as follows:

- **O/A PER CODE (OCCUPIED)**  
The system brings in the design code minimum ventilation air volume between the evaporator and reheat coils
- **CLOSED (NON OCCUPIED)**  
The ventilation air is turned off to save energy.

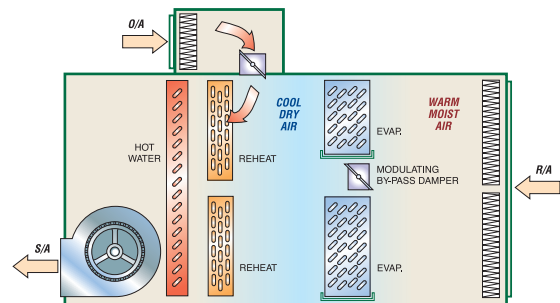


Figure 2 - Basic Outdoor Air System

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### Basic Outdoor Air Energy Recovery System

Every commercial pool requires the introduction of outdoor ventilation air during occupied times. The rate of introduction is dependent on the pool size, deck space, and occupancy. The introduction of this ventilation air helps to maintain air quality in the space. Refer to Desert Aire Technical Bulletin #5 for a detailed summary of the requirements in current standards.

Desert Aire offers its basic outdoor air energy recovery system option to integrate ventilation air into the dehumidification package. The dehumidifier blower will act as the ventilation fan and supply air blower. The integral exhaust air blower removes the air to establish a negative pressure in the space to prevent moisture migration to other parts of the building.

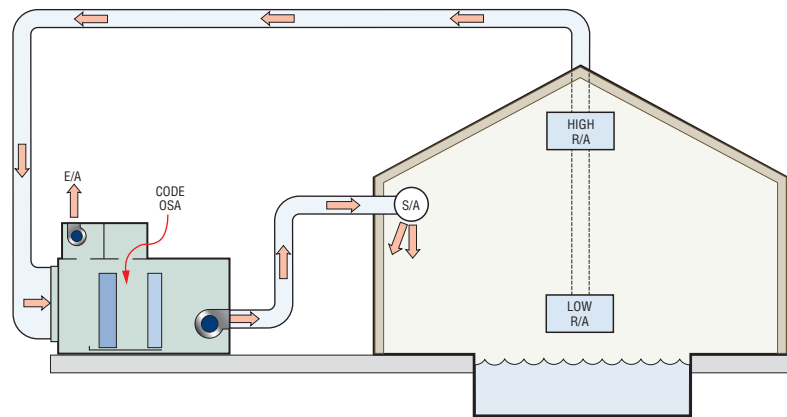


Figure 1 - Basic Outdoor Air Energy Recovery System Conceptual Airflow Diagram

The SelectAire™ control system simplifies air balancing while maintaining the correct proportions of return air, supply air, exhaust air and outdoor air. The system works by monitoring and controlling the static pressure difference at three areas: the outdoor air intake, evaporator coil, and the zone/ambient. The pressure difference at the specially designed orifice in the outdoor air flow path controls the outdoor airflow.

Monitoring the pressure drop through the evaporator and controlling the evaporator bypass damper maintains the flow rate through the evaporator and optimizing the moisture removal. Monitoring the difference between the zone pressure and ambient pressure controls the exhaust fan and helps to guarantee the negative static pressure within the space so critical to the building envelope. The control system then modulates the respective damper in response to the pressure readings to achieve the desired airflow.

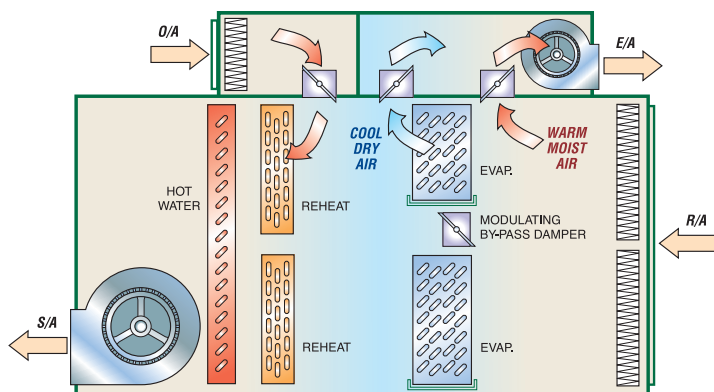


Figure 2 - Schematic for Outdoor Air

The Desert Aire SelectAir™ dehumidifier includes a modulating damper to divert a specific flow rate of air through the evaporator coil. This automatically provides a constant airflow and load for the evaporator coil and optimizes the moisture removal efficiency of the system. Similarly, even if outdoor air is preheated, it should always be introduced downstream of the evaporator coil. Cold and dry air introduced before the evaporator coil will lower the unit's dehumidification capacity.

In the SelectAir™ system outdoor air is filtered and a modulating motorized damper controls the introduction of outdoor air as follows:

#### Unoccupied Mode

OSA damper is closed. Unit will be in recirculation mode. The exhaust air fan will be adjusted to maintain a small negative air balance in the pool room.

#### Occupied Mode

Code ventilation is maintained. Volume is established in the field by a qualified test and balance technician. Outdoor air is preheated as required to provide mixed air temperature at or above the space dewpoint. The preheater uses a feedback modulating control algorithm. The auxiliary heater is controlled based on zone sensors. Compressors are activated as required by the SelectAir™ standard sequence.

#### Heating Mode

For all integral heating elements the controller shall use a zone reset of supply air temperature sequence instead of an on/off method. The proportional plus integral loop will calculate a supply air temperature that maintains the pool air temperature in all modes defined above. The auxiliary heat must be sized for the maximum purge air volume at the local winter design condition.

#### Energy Recovery

SelectAir™ systems have two exhaust air dampers. One is upstream of the evaporator coil and one is downstream. This special design of the SelectAir™ option allows the system to take advantage of basic thermodynamic principles while not impacting the unit's sensible cooling capacity.

- When the space requires heating, air is exhausted after the evaporator coil which recovers the energy contained in the exhaust air prior to its discharge.  
**Principle # 1:** Exhaust air at its coldest point.
- In the cooling mode, air is exhausted before the evaporator coil which is warm and humid.  
**Principle # 2:** Exhaust air at its warmest point.

# DESIGN FEATURES

The SelectAire™ system uses the principle of a heat pump to recover energy in the heating mode by operating one of the two circuits in conjunction with exhaust air. Exhaust air consists of two energy components: sensible and latent. The cold evaporator coil absorbs both of these components. In addition to this energy the energy required to operate the compressors is returned in the form of heat. This option provides high COP efficiency to the exhaust air recovery cycle.

The SelectAire™ is the most efficient method to recover the total energy of the exhaust air. Since the airflows and loads are maintained through the special airflow control sequence the amount of recovery can be optimized. Other systems that use passive heat exchangers cannot recover latent energy during the majority of the operation and the amount of sensible recovery is dependent on the outdoor temperature. In addition, their actual recovery effectiveness is variable as it changes based on the temperature differential. Passive heat exchangers require additional fan energy and cannot take full advantage of free outdoor air cooling unless bypass dampers and controls are installed. The SelectAire™ has a constant rate of energy recovery because it is using the heat pump principle when activated and is always controlled automatically based on the zone condition.

Additional design features of the SelectAire™ System are:

- VFD for exhaust air  
A room pressurization scheme maintains a negative pressure in the space. A unit mounted pressure transducer is provided by Desert Aire. 1/8" pressure tubing is run to the space and to the outdoor air by the installing contractor. Suitable terminations are provided by Desert Aire.
- Outdoor Air Balance Plate calibrated by Desert Aire to control outdoor air damper
- Exhaust Air Balance Plate  
Calibrated by Desert Aire, installed between the cold air and warm air dampers to maintain the proper ratio of exhaust air from these two locations to ensure a building negative pressure
- Return air static pressures up to 1.5 inch WC and supply air static can be up to 2.0 inch WC

For a more detailed analysis, please refer to Desert Aire Technical Bulletin 6 - SelectAire™ Heat Recovery System.

Covered by Desert Aire United States Patent # 5,682,754

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## OUTDOOR AIR SYSTEM WITH PURGE

## Extended Outdoor Air System with Energy Recovery

Every commercial pool requires the introduction of outdoor ventilation air during occupied times. The rate of introduction is dependent on the pool size, deck space, and occupancy. The introduction of this ventilation air helps to maintain air quality in the space. Refer to Desert Aire Technical Bulletin #5 for a detailed summary of the requirements in current standards.

Desert Aire offers its SelectAire™ with Extended Outdoor Air system option to integrate ventilation air into the dehumidification package when there is the need for higher airflow or purge capability. The return air is brought back to the dehumidifier where the air is exhausted to meet the design intent of the facility. The dehumidifier blower will act as the ventilation fan and supply air blower to provide all of the required ventilation air for the pool room. The integral exhaust air blower is balanced to establish and maintain a negative pressure in the space. It is important that the return air duct system be designed to meet the design supply air volume.

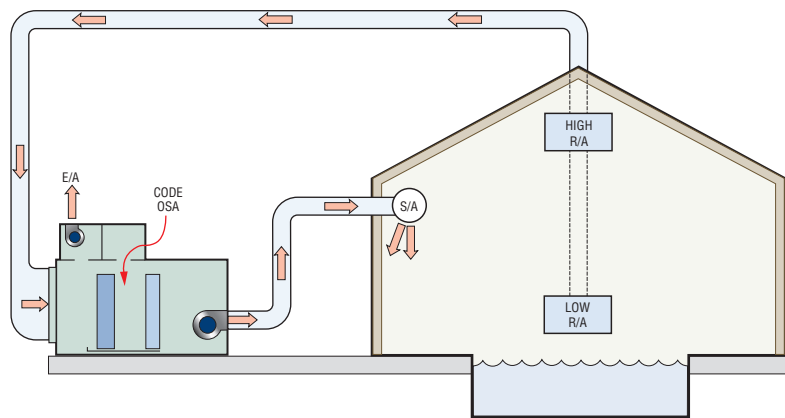


Figure 1 - Extended Outdoor Air System Conceptual Airflow Diagram

The SelectAir™ control system simplifies air balancing while maintaining the correct proportions of return air, supply air, exhaust air and outdoor air. The system works by monitoring and controlling the static pressure difference at three areas: the outdoor air intake, evaporator coil, and the zone/ambient. The pressure difference at the specially designed orifice in the outdoor air flow path controls the outdoor airflow.

Monitoring the pressure drop through the evaporator and controlling the evaporator bypass damper maintains the flow rate through the evaporator and optimizing the moisture removal. Monitoring the difference between the zone pressure and ambient pressure controls the exhaust fan and helps to guarantee the negative static pressure within the space so critical to the building envelope. The control system then modulates the respective damper in response to the pressure readings to achieve the desired airflow.

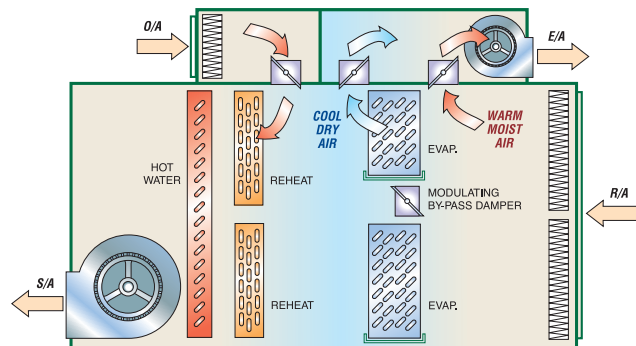


Figure 2 - Schematic for Outdoor Air

The Desert Aire SelectAire™ dehumidifier includes a modulating damper to divert a specific flow rate of air through the evaporator coil. This automatically provides a constant airflow and load for the evaporator coil and optimizes the moisture removal efficiency of the system. Similarly, even if outdoor air is preheated, it should always be introduced downstream of the evaporator coil. Cold and dry air introduced before the evaporator coil will lower the unit's dehumidification capacity.

In the SelectAire™ system outdoor air is filtered and a modulating motorized damper controls the introduction of outdoor air as follows:

#### **Unoccupied Mode**

OSA damper is closed. Unit will be in recirculation mode. The exhaust air fan will be adjusted to maintain a small negative air balance in the pool room.

#### **Occupied Mode**

Outdoor air volume is established in the field during startup. The OA volume will be established between 0 and 50% of the supply air volume. Outdoor air is preheated as required to provide mixed air temperature at or above the space dewpoint. The preheater uses a feedback modulating control algorithm. The space auxiliary heater is controlled based on zone sensors. Compressors are activated as required by the SelectAire™ standard sequence.

#### **Event Mode**

The event mode outside air volume is established in the field between 0 to 50% of supply air volume. This is a higher rate than the Occupied Mode setting. The auxiliary heater is controlled based on zone sensors. Compressors are activated as required by the SelectAire™ standard sequence.

#### **Purge Mode**

A purge air is established at 50% of supply air volume. The auxiliary heater in this mode is controlled based on a leaving air temperature sensor located in the blower section, not on the zone sensors. Compressors are deactivated during purge mode and will remain off during the Purge Mode. Supply air temperature is heated as required to maintain a minimum temperature above the space dewpoint. This helps to prevent condensation on ducts and interior surfaces.

#### **Heating Mode**

For all integral heating elements the controller shall use a zone reset of supply air temperature sequence instead of an on/off method. The proportional plus integral loop will calculate a supply air temperature that maintains the pool air temperature in all modes defined above. The auxiliary heat must be sized for the maximum purge air volume at the local winter design condition.

#### **Energy Recovery**

SelectAire™ systems have two exhaust air dampers. One is upstream of the evaporator coil and one is downstream. This special design of the Select Aire option allows the system to take advantage of basic thermodynamic principles while not impacting the unit's sensible cooling capacity.

- When the space requires heating, air is exhausted after the evaporator coil which recovers the energy contained in the exhaust air prior to its discharge.  
**Principle # 1:** Exhaust air at its coldest point.
- In the cooling mode, air is exhausted before the evaporator coil which is warm and humid.  
**Principle # 2:** Exhaust air at its warmest point.

The SelectAire™ system uses the principle of a heat pump to recover energy in the heating mode by operating one of the two circuits in conjunction with exhaust air. Exhaust air consists of two energy components: sensible and latent. The cold evaporator coil absorbs both of these components. In addition to this energy the energy required to operate the compressors is returned in the form of heat. This option provides high COP efficiency to the exhaust air recovery cycle.

The SelectAire™ is the most efficient method to recover the total energy of the exhaust air. Since the airflows and loads are maintained through the special airflow control sequence the amount of recovery can be optimized. Other systems that use passive heat exchangers cannot recover latent energy during the majority of the operation and the amount of sensible recovery is dependent on the outdoor temperature. In addition, their actual recovery effectiveness is variable as it changes based on the temperature differential. Passive heat exchangers require additional fan energy and cannot take full advantage of free outdoor air cooling unless bypass dampers and controls are installed. The Select Aire has a constant rate of energy recovery when activated and is always controlled automatically based on the zone condition.

The following table is an example of how the airflow ranges can be maintained in the extended outdoor options.

#### Dehumidification/Clg

	% of Supply Air			
	OSA	Cool Exh.	Warm Exh.	Compressor
Unoccupied	0%	0%	VFD maintains a Neg. Pres. In all modes	Enabled as required
Occupied	0 to 50%	0%		Enabled as required
Event	0 to 50%	0%		Enabled as required
Purge	50%	0%		Locked out

#### Energy Recovery / Heat Mode

	% of Supply Air			
	OSA	Cool Exh.	Warm Exh.	Compressor
Unoccupied	0%	0%	VFD maintains a Neg. Pres. In all modes	Enabled as required
Occupied	20% to 50%	20%		Enabled as required
Event	20% to 50%	20%		Enabled as required
Purge	50%	0%		Locked out

Additional design features of the SelectAire™ System with Extended Outdoor Air are:

- VFD for exhaust air  
A room pressurization scheme maintains a negative pressure in the space. A unit mounted pressure transducer is provided by Desert Aire. 1/8" pressure tubing is run to the space and to the outdoor air by the installing contractor. Suitable terminations are provided by Desert Aire.
- Outdoor Air Balance Plate  
Calibrated by Desert Aire to control outdoor air damper.
- Exhaust Air Balance Plate  
Calibrated by Desert Aire, installed between the cold air and warm air dampers to maintain the proper ratio of exhaust air from these two locations to ensure a building negative pressure.
- Return air static pressures up to 1.5 inch WC and supply air static can be up to 2.0 inch WC

For a more detailed analysis, please refer to Desert Aire Technical Bulletin 6 - SelectAire™ Heat Recovery System.

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## DUAL EXHAUST SYSTEM WITH PURGE

### Extended Outdoor Air System with Energy Recovery and Source Capture Exhaust

Every commercial pool requires the introduction of outdoor ventilation air during occupied times. The rate of introduction is dependent on the pool size, deck space, and occupancy. The introduction of this ventilation air helps to maintain air quality in the space. Refer to Desert Aire Technical Bulletin #5 for a detailed summary of the requirements in current standards.

Desert Aire offers its SelectAire™ Dual Exhaust system option to integrate ventilation air into the dehumidification package when the facility has two exhaust duct systems. The first exhaust captures the exhaust air at the low pool level and removes this air to outdoor the building without a chance for recirculation. The first exhaust blower is provided by others. The high return air is brought back to the dehumidifier where the remainder of the air is exhausted to meet the design intent of the facility. The dehumidifier blower will act as the ventilation fan and supply air blower to provide all of the required ventilation air for the pool room. The integral exhaust air blower is balanced to establish and maintain a negative pressure in the space.

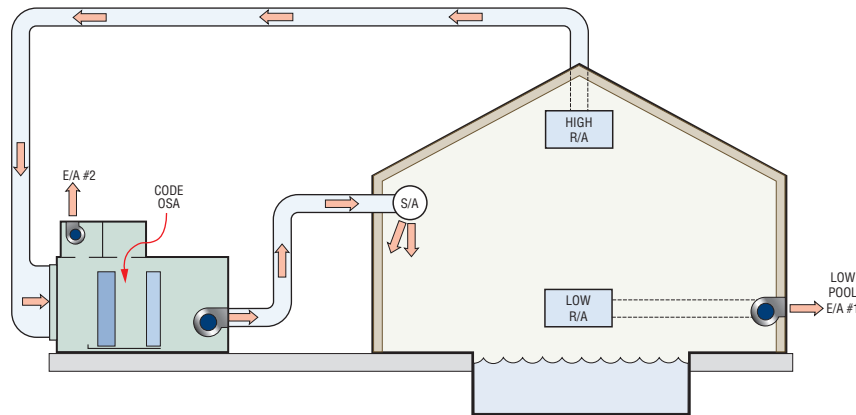


Figure 1 - SelectAire™ Dual Exhaust conceptual airflow diagram

The SelectAire™ control system simplifies air balancing while maintaining the correct proportions of return air, supply air, exhaust air and outdoor air. The system works by monitoring and controlling the static pressure difference at three areas: the outdoor air intake, evaporator coil, and the zone/ambient. The pressure difference at the specially designed orifice in the outdoor air flow path controls the outdoor airflow. Monitoring the pressure drop through the evaporator and controlling the evaporator bypass damper maintains the flow rate through the evaporator and optimizing the moisture removal. Monitoring the difference between the zone pressure and ambient pressure controls the exhaust fan and helps to guarantee the negative static pressure within the space so critical to the building envelope. The control system then modulates the respective damper in response to the pressure readings to achieve the desired airflow.

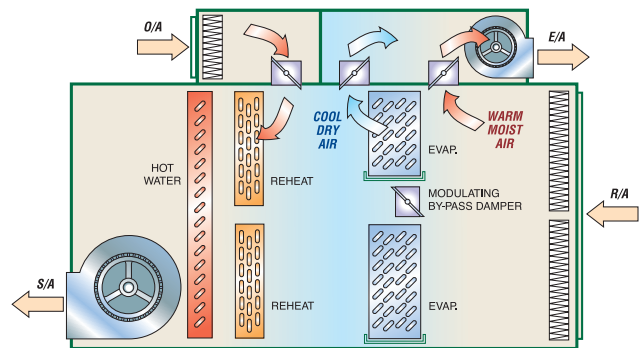


Figure 2 - Schematic for Outdoor Air



The Desert Aire SelectAire™ dehumidifier includes a modulating damper to divert a specific flow rate of air through the evaporator coil. This automatically provides a constant airflow and load for the evaporator coil and optimizes the moisture removal efficiency of the system. Similarly, even if outdoor air is preheated, it should always be introduced downstream of the evaporator coil. Cold and dry air introduced before the evaporator coil will lower the unit's dehumidification capacity.

In the SelectAire™ system outdoor air is filtered and a modulating motorized damper controls the introduction of outdoor air as follows:

#### **Unoccupied Mode**

Outdoor air volume is established in the field during startup at a level approximately equal to ½ of the ASHRAE recommended code. Exhaust air is removed by the source capture exhaust fan. Dehumidifier will be in recirculation mode. The dehumidifier exhaust air fan will be adjusted to maintain a small negative air balance in the pool room.

#### **Occupied Mode**

Outdoor air volume is established in the field during startup at a level equal to the ASHRAE recommended code. Exhaust air is removed by the source capture exhaust fan and the balance by the dehumidification system exhaust fan. The OA volume will be established between 0 and 50% of the supply air volume. Compressors are activated as required by the SelectAire™ standard sequence.

#### **Event Mode**

The event mode outdoor air volume is established in the field between 0 to 50% of supply air volume. This is a higher rate than the Occupied Mode setting and represents the required volume for pool plus spectators. Compressors are activated as required by the SelectAire™ standard sequence.

#### **Alarm Mode**

The alarm mode is initiated when the duct mounted VOC sensor detects a high level chloramine condition. This establishes an outdoor air rate that is two times higher than the ASHRAE 62 ventilation rate. Compressors are activated as required by the SelectAire™ standard sequence.

#### **Purge Mode**

A purge air is established at 50% of supply air volume. The auxiliary heater in this mode is controlled based on a leaving air temperature sensor located in the blower section, not on the zone sensors. Compressors are deactivated during purge mode and will remain off during the Purge Mode. Supply air temperature is heated as required to maintain a minimum temperature above the space dewpoint. This helps to prevent condensation on ducts and interior surfaces.

#### **Heating Mode**

For all integral heating elements the controller shall use a zone reset of supply air temperature sequence instead of an on/off method. The proportional plus integral loop will calculate a supply air temperature that maintains the pool air temperature in all modes defined above. The auxiliary heat must be sized for the maximum purge air volume at the local winter design condition.

Outdoor air is preheated as required to provide mixed air temperature at or above the space dewpoint. The preheater uses a feedback modulating control algorithm.

#### **Energy Recovery**

SelectAire™ systems have two exhaust air dampers. One is upstream of the evaporator coil and one is downstream while not impacting the unit's sensible cooling capacity. The special design of the SelectAire™ option allows the controller to follow basic thermodynamic principles:

- When the space requires heating, air is exhausted after the evaporator coil which recovers the energy contained in the exhaust air prior to its discharge.  
**Principle # 1:** Exhaust air at its coldest point.
- In the cooling mode, air is exhausted before the evaporator coil which is warm and humid.  
**Principle # 2:** Exhaust air at its warmest point.

The SelectAire™ system uses the principle of a heat pump to recover energy in the heating mode by operating one of the dual compressors in conjunction with exhaust air. Exhaust air consists of two energy components: sensible and latent. The cold evaporator coil absorbs both of these components and adds the heat of compression of the single compressor. This option provides high COP efficiency to the exhaust air recovery cycle.

The SelectAir™ is the most efficient method to recover the total energy of the exhaust air. Since the airflows and loads are maintained through the special airflow control sequence the amount of recovery can be optimized. Other systems that use passive heat exchangers cannot recover latent energy during the majority of the operation and the amount of sensible recovery is dependent on the outdoor temperature. Passive heat exchangers require additional fan energy and cannot take full advantage of free outdoor air cooling unless bypass dampers and controls are installed. The SelectAir™ has a constant rate of energy recovery when activated and is always controlled automatically based on the zone condition.

The following tables are examples of how the airflow could be established in the field if the ASHRAE 62 ventilation code volume was equal to 20% of the dehumidifier's supply air value.

Dehumidification/Cooling Example

	% of Supply Air				
	OSA	Cool Exh.	Warm Exh.	Compressor	Low Pool Exh.
Unoccupied	10%	0%	VFD maintains a Neg. Pres. In all modes	Enabled as required	10%
Occupied	20%	0%		Enabled as required	10%
Event	30%	0%		Enabled as required	10%
Alarm	40%	0%		Enabled as required	20%
Purge	50%	0%		Locked out	20%

Energy Recovery Mode Example

	% of Supply Air				
	OSA	Cool Exh.	Warm Exh.	Compressor	Low Pool Exh.
Unoccupied	10%	0%	VFD maintains a Neg. Pres. In all modes	Enabled as required	10%
Occupied	20%	10%		Enabled as required	10%
Event	30%	20%		Enabled as required	10%
Alarm	40%	20%		Enabled as required	20%
Purge	50%	20%		Locked out	20%

Additional design features of the SelectAir™ System with Extended Outdoor Air and Source Capture Exhaust:

- VFD for exhaust air  
A room pressurization scheme maintains a negative pressure in the space. A unit mounted pressure transducer is provided by Desert Aire. 1/8" pressure tubing is run to the space and to the outdoor air by the installing contractor. Suitable terminations are provided by Desert Aire.
- Outdoor Air Balance Plate  
Calibrated by Desert Aire to control outdoor air damper.
- Exhaust Air Balance Plate  
Calibrated by Desert Aire, installed between the cold air and warm air dampers to maintain the proper ratio of exhaust air from these two locations to ensure a building negative pressure.
- Return air static pressures up to 1.5 inch WC and supply air static can be up to 2.0 inch WC

For a more detailed analysis, please refer to Desert Aire Technical Bulletin 6 - SelectAir™ Heat Recovery System.

Covered by Desert Aire United States Patent # 5,682,754

## OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY

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## AUXILIARY ELECTRIC HEAT

### OPTIONAL AUXILIARY ELECTRIC HEATING OPTIONS

Desert Aire provides auxiliary electric heating options for the SelectAire™ Series that are sized to meet the winter heating requirements of the outside air.

These heating elements are utilized when the air temperature in the zone drops below the customer set point.

Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the units microprocessor to maintain zone temperature. An SCR controller is used for the electric heat option to vary the heat output.

### Design Specifications

The following list highlights the noteworthy features of the SelectAire™ Series electric heaters:

- System Single Point Power to Dehumidifier
- NiCr 60 Corrosion-Resistant Element
- Welded Construction Using 20 MSG Galvanized Steel
- Automatic Reset High Temperature Limit Safety Switch
- Manual Reset High Maximum Temperature Limit Safety Switch
- Air Flow Pressure Switch
- Fusing as Required for Each 48 Amp Circuit
- Fused Circuits per N.E.C., UL, and CSA
- SCR modulation

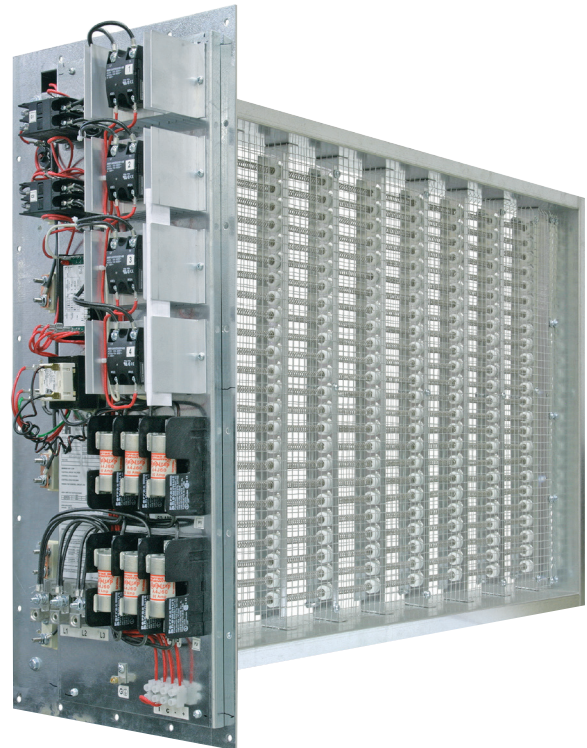


Figure 1 - Detail of Electric Heating Element for SelectAire™ Series Unit

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## AUXILIARY GAS HEATER

### Optional Gas Heating Module

Desert Aire provides auxiliary heating options for its SelectAire™ Series product line that are available in several capacities to meet the winter specified heating requirements of the space.

These heating elements are utilized when the air temperature in the space drops below the customer set point. Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the unit's microprocessor to maintain an exact leaving air temperature. Desert Aire controls the heater output with a 0-10VDC control signal from the dehumidifier's operating controller. The control signal is reverse acting meaning that as the temperature in the space drops then the control signal output is increased.

### Gas Heater Design Specifications

Desert Aire's 80% efficient design gas-fired duct furnace module has been sized to interface with our SelectAire series dehumidifier dimensions and air volume. They are sized for high capacity applications as found in typical pool natatoriums. The module features a 409 SS heat exchanger with a modulating 10:1 turndown ratio burner. Heat exchanger is comprised of a primary combustion chamber (drum) with a tubular secondary section. The heater uses a forced-draft fired system with a nozzle mix power gas burner.

The module includes an air flow proving switch as well as a high temperature limit sensor. The heater assembly includes internal baffles to match each dehumidifier's individual air volume and insure proper air flow distribution across the drum and tubes.

The gas module allows for easy installation for indoor or outdoor applications. Gas inlet pressure limits with the furnace operating are:

- Min Input pressure 7.0" w.c.
- Max Inlet pressure 13.5" w.c.

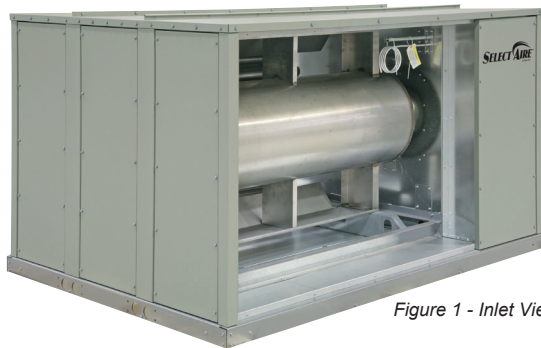


Figure 1 - Inlet View

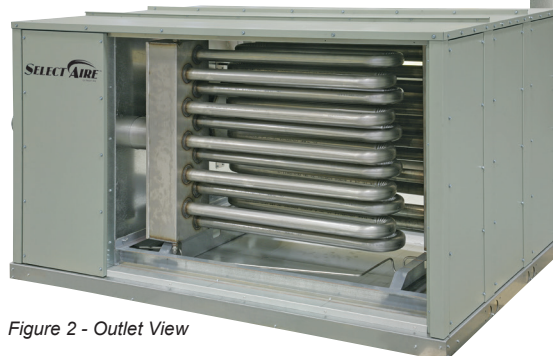


Figure 2 - Outlet View



Figure 3 - Gas Burner



## Unit Construction

The heater module enclosure is double-wall G90 galvanized steel coated with 0.20 - 0.30 mm urethane primer and 0.70 - 0.80 mm textured top coat on exterior surfaces. Interior surfaces coated with 0.20 - 0.30 mm urethane primer and 0.20 - 0.30 mm top coat. All surfaces pre-treated with zinc phosphate pre-treatment before coating. The unit is provided with a flue gas stack when specified for outdoor installation to meet building code venting requirements.

Desert Aire shall provide dimension drawings for the field supplied and installed transition ducts. If a roof curb is provided by Desert Aire, it shall include the appropriate curb cap.

## Module Sizes

Input/Output Capacity								
Heater Model Code	400	550	750	1000	1250	1500	1750	2000
Max. MBH Input	550	700	925	1,250	1,550	1,875	2,250	2 500
Max. MBH Output	440	560	740	1,000	1,240	1,500	1,800	2,000
Dehumidifier Size	SA18	✓	✓	✓	N/A	N/A	N/A	N/A
	SA20	✓	✓	✓	N/A	N/A	N/A	N/A
	SA24	✓	✓	✓	✓	N/A	N/A	N/A
	SA30	✓	✓	✓	✓	✓	N/A	N/A
	SA35	✓	✓	✓	✓	✓	✓	N/A
	SA40	✓	✓	✓	✓	✓	✓	✓
	SA45	N/A	✓	✓	✓	✓	✓	✓
	SA50	N/A	✓	✓	✓	✓	✓	✓
	SA60	N/A	✓	✓	✓	✓	✓	✓
Weights (lbs.)	732	881	1,138	1,244	1,369	1,529	1,707	2,063

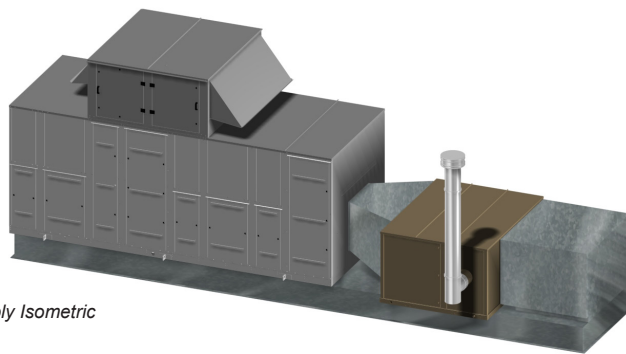


Figure 4 - Curb Assembly Isometric

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430-K 2019/01



AUXILIARY GAS HEAT

## AUXILIARY HOT WATER HEAT

### OPTIONAL HOT WATER HEATING OPTIONS

Desert Aire provides auxiliary heating options for its SelectAire™ Series product line that are sized to meet the winter heating requirements of the space.

These heating elements are utilized when the air temperature in the zone drops below the customer set point. Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the unit's microprocessor to maintain an exact leaving air temperature. A customer supplied hot water control valve is modulated from the controller with a 0 to 10 VDC direct acting signal. Please refer to figure 1 for a typical installation.

### HWC Design Inputs

The coil is selected for each customer's particular application based on the following criteria:

- Entering water temperature (EWT), typically between 140°F and 180°F
- Leaving water temperature (LWT), typically 20 degrees less than the EWT
- Customer specified capacity required (MBH)
- Entering air temperature (EAT), (the mix temperature of outdoor air at winter design with return air)
- Specify fluid pressure drop maximum
- Type and concentration of glycol used, if applicable

For freeze protection Desert Aire uses a capillary type temperature sensor which is attached across the downstream face of the coil. Freezestat is set at 38°F with an auto reset switch. If engaged the unit controls would respond by closing the outdoor air damper, wait 5 minutes and if not reset, de-energize the fan, open the hot water coil valve 100%, and log the alarm on the controller.

To size the control valve, please provide a qualified vendor the water temperature, flow rate (gpm) and the requirement for a 0 to 10VDC signal and they will select the appropriate valve to purchase.

Desert Aire offers HW valve/actuators as an option. Please consult with your Desert Aire sales representative if you wish for Desert Aire to supply this component.

Optional e-coat coil coating for pool environments is available.

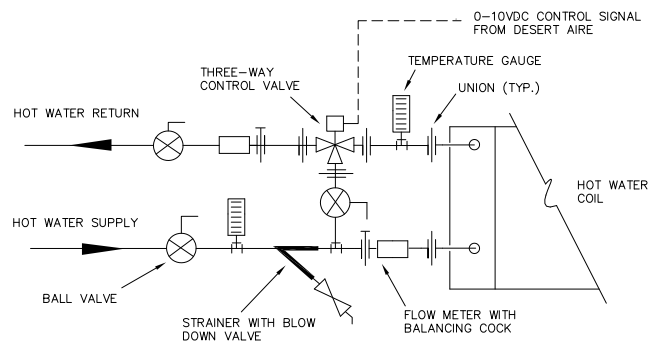



Figure 1 - Hot Water Piping Detail

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### Outdoor Air Preheat

In pool rooms, the ASHRAE 62 ventilation code defines a specific volume of outdoor air that must be introduced into the indoor facility. The design professionals have also started to require high ventilation rates for Purge cycles and Event Modes. This greater amount of outdoor air can present several design problems for the dehumidifier in cold climates. When ultra-cold air is introduced into the top section of a dehumidifier several issues can happen that must be taken into consideration.

- The mixed air temperature can drop below the room's dewpoint causing condensation on the grills and ducts.
- Creation of fog in the pool room.
- Frost and ice build up on the condenser reheat coil or other surfaces within the dehumidifier.

The following two design philosophies must be utilized to prevent any of the problems in list above from occurring in the pool facility.

Desert Aire's first equipment design philosophy is that the mixed air temperature entering the internal condenser reheat coil must be maintained at or above 45°F in order for the refrigeration system to work properly. The equipment must be evaluated to determine if a preheater is needed to maintain a 45°F mixed air condition before the internal condenser reheat coil.

Our second design philosophy is that equipment must deliver at all times a supply air condition at or above the space dew point. This is normally obtained through our standard refrigeration system design however when more outside air is being introduced other options must be considered. To maintain this dewpoint temperature for the 50% purge option, the equipment will utilize the auxiliary heater which must have the capacity to heat the outside air at its winter design condition up to at least 65°F (the space dewpoint). The system uses a zone reset control algorithm to achieve this temperature.

#### Occupied Time Calculation: (Compressors ON)

A preheater must be included when design mixed air is expected to go below 45°F to ensure proper refrigeration system operation.

OSA%	Lowest OSA Temperature 83°F ret. air w/o Preheat
35%	-24 °F
40%	-12
45%	-1
50%	7

Table 1 - Mixed Air Minimum OSA Temperature with Varying Outside Air Volumes

Please refer to Figure 1 for a plot of the maximum outside air (as a percent of supply air volume) that can be introduced into a dehumidifier before the resultant mixed air condition reaches 45°F. For example, if the outdoor air design temperature is minus 5, the maximum outdoor air percentage would be 43%. If more outdoor air is required, then preheat would need to be added to the dehumidifier.

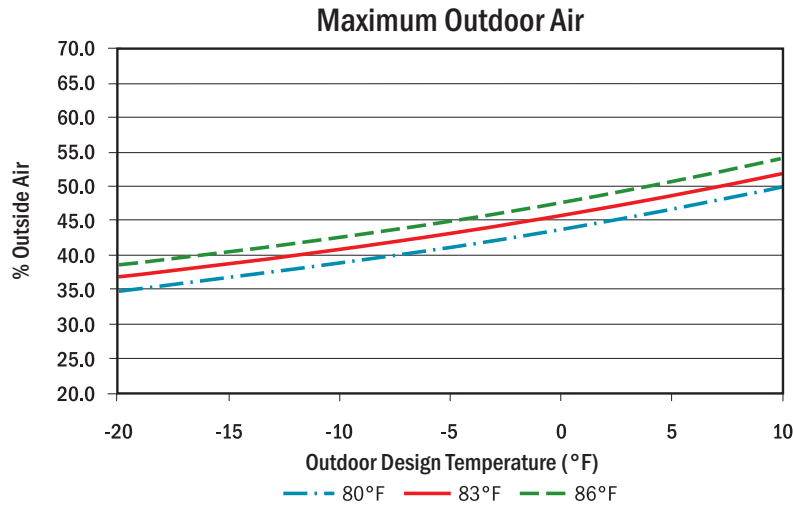


Figure 1 - Maximum Outdoor Air as a Percent of Supply Air Volume

#### Purge Only Operation Calculation: (Compressors Off)

Either a preheater or a properly sized auxiliary space heating coil will be required to raise the outside air temperature to a value where the mixed air condition is maintained above space dew point. This is typically between 64°F and 70°F. Since the purge operation is for a very short duration (typically less than 2 hours), the space heat loss of the building is ignored for this sequence. The calculation for the amount of auxiliary heat is:

$$\text{Btu Heat} = \text{Mixed Air Temp} \times \text{Supply Air Volume} \times \Delta T$$

If the auxiliary heater has this capacity, no preheat is required. If not, a preheater must be included into the dehumidifiers design specification.

OUTDOOR AIR PREHEAT DATA

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## COIL COATING

Desert Aire recommends the use of coil coating in applications that are in harsh environments such as indoor pools and for seacoast installations because of its superior performance in preventing corrosion and fin deterioration. Our coating is a water-based, low VOC coating process engineered specifically for HVAC/R heat transfer coils.

## CORROSION RESISTANCE

In the coating process, the entire coil assembly is protected. This includes the coil fins, end plates, copper tubing and copper return bends. The coating covers the entire coil assembly. The result is a finish which provides excellent resistance to pool chemical, coastal marine (salt-air), industrial and urban environments. When properly maintained, you can expect the coated coils to provide protection for years. Desert Aire provides a 5-year coil parts warranty as evidence of its superior protection.

## RESISTANCE To UV DEGRADATION

When coils are to be subjected to ultraviolet exposure such as the remote condenser, they receive a spray-applied, UV-resistant urethane mastic topcoat. As a result, UV degradation of the coating polymer molecules is eliminated, and the film integrity is maintained. The UV topcoat is included on all ROC Series condensers that are ordered with coil coating option.

## PROVEN EFFECTIVE

The process is the most automatic, controllable, and efficient method for applying a corrosion inhibiting coating to a metallic work piece. The process dictates that all metal surfaces are coated in an even, uniform finish. All coil surfaces reach an average dry film thickness of 1 mil (0.001"). It meets the 5B rating crosshatch adhesion per ASTM B3359-93. Corrosion durability is confirmed through testing to no less than 15,000 hours salt spray resistance per ASTM B117-90 using scribed aluminum test coupons.

## COMPARISON To FIN STOCK COATINGS

Not all coil coatings are the same. Many dehumidifier companies use a fin stock coating that is applied to the aluminum stock before the coil is manufactured. This means the edges of the fin; the copper tubes and the steel header remain uncoated.

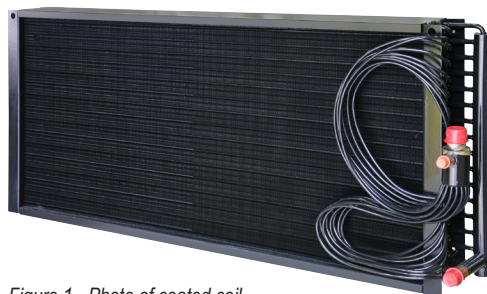


Figure 1 - Photo of coated coil

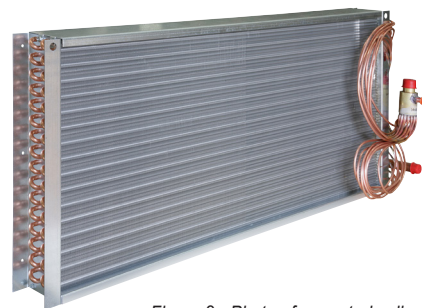


Figure 2 - Photo of uncoated coil

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Est. 1978

430-j 2024/04

### Exhaust Air Integration - Duct Mount

Desert Aire's SelectAire™ natatorium dehumidifier can vary the volume of outside air and exhaust air based on the level of contaminants within the pool room. The key to this integration is the use of a Volatile Organic Compounds (VOC) sensing element that can detect when interior levels of chemicals are present such as chloramines. This provides a similar methodology as the use of CO<sub>2</sub> sensors in general ventilation applications for the pool environment. Now there is the ability to optimize the volume of exhaust air required with the energy cost of doing so and insure a suitable pool environment for the occupants.

The VOC duct sensor samples duct air using an aspiration tube. Moving air from the duct enters the tube, is forced into the enclosure and exits through the other half of the tube. As long as there is air movement in the duct, air is continuously exchanged.

#### Sensor Specifications

Power: 15 to 35 VDC @ 50 mA

Power Sensing Element: VOCs: Micro-machined Metal Oxide Quick Response Sensor through Aspiration Tube

Analog Outputs: 0 to 10VDC, (>10KΩ impedance)

VOC Contaminants: 0 to 2,000 PPM CO<sub>2</sub> Equivalent

VOC Detection Range: 0 to 100%

Response Time: Less Than 60 Seconds

Start-Up Time: 15 minutes

Operating Environment: 32 to 122°F (0 to 50°C)  
0 to 95%RH non-condensing

Dimension: 4.91"H x 3.21"W x 1.20"D  
(124.6 x 81.5 x 30.5 mm)

Enclosure Rating: NEMA 4

Enclosure Material: Polycarbonate, UL94 V-0

VOC Duct Sensor

Certifications: RoHS

Warranty Period: Two years from manufacture date



Figure 1 - Duct Mounted VOC Sensor

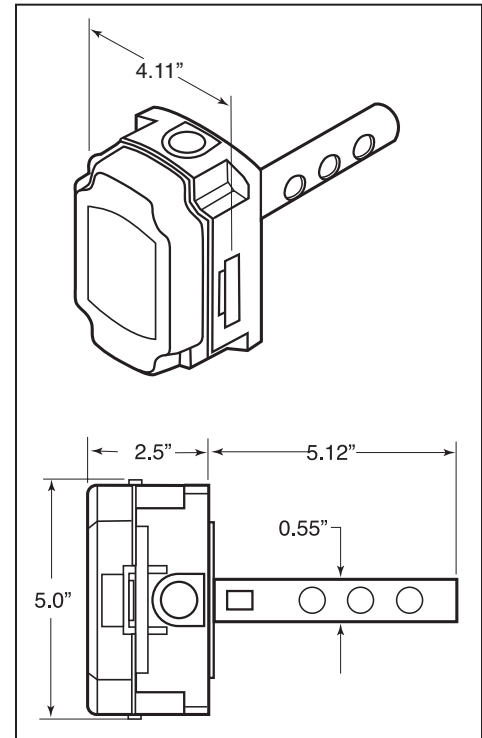


Figure 2 - Duct Sensor Dimensions

**Exhaust Air Integration - Wall Mount**

Desert Aire's SelectAire™ natatorium dehumidifier can vary the volume of outside air and exhaust air based on the level of contaminants within the pool room. The key to this integration is the use of a Volatile Organic Compounds (VOC) sensing element that can detect when interior levels of chemicals are present such as chloramines. This provides a similar methodology as the use of CO<sub>2</sub> sensors in general ventilation applications for the pool environment. Now there is the ability to optimize the volume of exhaust air required with the energy cost of doing so and insure a suitable pool environment for the occupants.

**Sensor Specifications**

Power: 15 to 35 VDC @ 50 mA

Power Sensing Element: VOCs: Micro-machined Metal Oxide

Analog Outputs: 0 to 10VDC, (>10KΩ impedance)

VOC Contaminants: 0 to 2,000 PPM CO<sub>2</sub> Equivalent

VOC Detection Range: 0 to 100%

Response Time: Less Than 2 Minutes

Start-Up Time: 15 minutes

Operating Environment: 32 to 122°F (0 to 50°C)

0 to 95%RH non-condensing

Dimension: 4.50"H x 2.86"W x 1.06"D

(114.3 x 72.7 x 26.9 mm)

Enclosure Material: ABS Plastic, UL94 V-0

Certifications: RoHS

Warranty Period: Two years from manufacture date



Figure 1 - Wall Mounted VOC Sensor

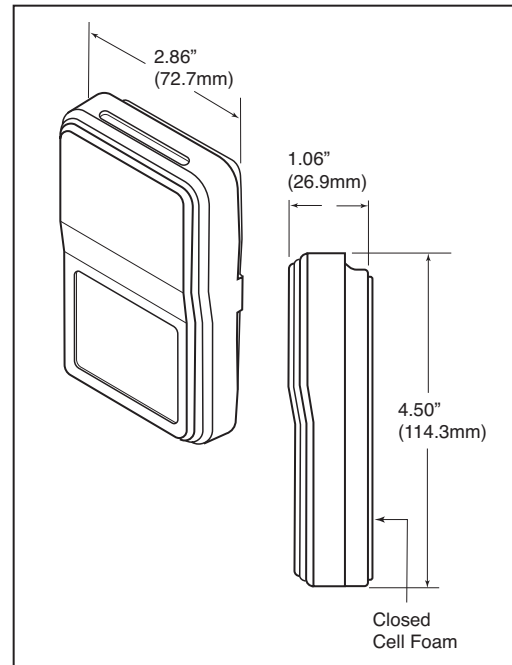


Figure 2 - Wall Sensor Dimensions

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## NATATORIUM INSTALLATION SUMMARY

Date: \_\_\_\_\_

### Facility

Facility Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Owner: \_\_\_\_\_

Address: \_\_\_\_\_

Facility General Manager: \_\_\_\_\_

Phone / Email: \_\_\_\_\_

Facility Maintenance Manager: \_\_\_\_\_

Phone / Email: \_\_\_\_\_

### Pool

Describe facility (Use grid on other side for drawing): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Dehumidifier / Air Handler

Manufacturer Name: \_\_\_\_\_

Model No: \_\_\_\_\_ Year Installed: \_\_\_\_\_

Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Other Information

Who performs quarterly maintenance? \_\_\_\_\_

What mechanical contractor services this facility? \_\_\_\_\_

Other comments (include any operational issues and if chemical smell present): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Pool Room Design Detail**

Pool #1 \_\_\_\_\_ sq ft  
 Water Temp. 1st Pool \_\_\_\_\_ °F  
 Describe type of use of pool: \_\_\_\_\_  
 \_\_\_\_\_

**Pool Room Design Detail**

Pool #2 \_\_\_\_\_ sq ft  
 Water Temp. 1st Pool \_\_\_\_\_ °F  
 Describe type of use of pool: \_\_\_\_\_  
 \_\_\_\_\_

**Pool Room Design Detail**

Pool #3 \_\_\_\_\_ sq ft  
 Water Temp. 1st Pool \_\_\_\_\_ °F  
 Describe type of use of pool: \_\_\_\_\_  
 \_\_\_\_\_

**Indoor Air Design Details**

Room Design Temp \_\_\_\_\_ °F  
 Is there a separate spectator area? \_\_\_\_\_ (Y/N)  
 If yes, \_\_\_\_\_ sq/ft or #pp

**Outdoor Air Design Details**

Gross Room volume: \_\_\_\_\_ cu ft  
 Design Code Ventilation: \_\_\_\_\_ cfm  
 Design Spectator Ventilation: \_\_\_\_\_ cfm

Sketch layout w/supply duct and return locations

## Locker Room DOAS

### Locker Room Dimensions

	Lg	Wt	Sq Ft	# Toilets
Mens				
Womens				
Totals				

### Auxiliary Heat

- ☐ Electric  
☐ HWC  
☐ Gas  
☐ Geothermal  
 \_\_\_\_\_ °F water temp

### Ventilation Calculation

	Sq ft x 0.5 cfm/sq ft =		cfm
	# Toilets x 50 cfm/toilet =		cfm
	% Pressurization (typical 10%) =		cfm
	OAS Total		cfm

### Return Air

- ☐ Available to DOAS  
☐ Cannot return to DOAS  
☐ Gravity dampers

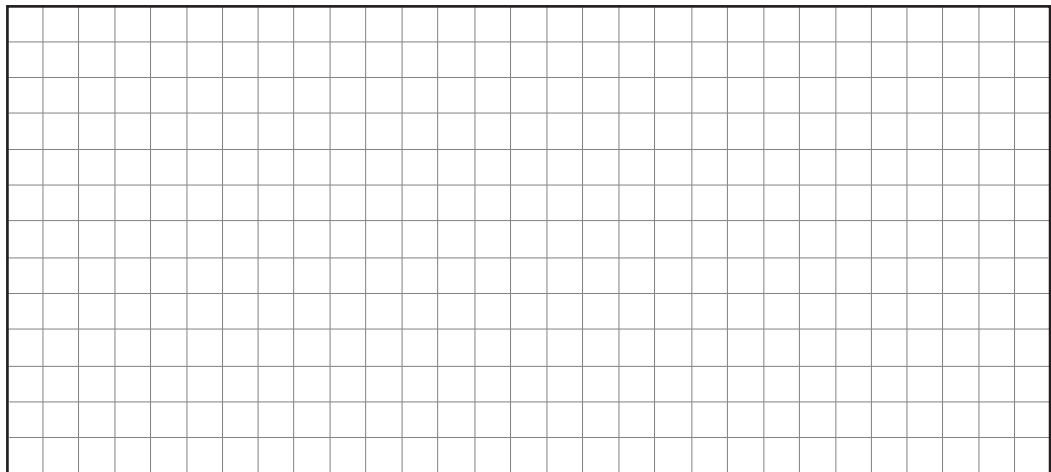
### Existing System

Type of DOAS: \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_  
 Model: \_\_\_\_\_  
 Air Volume cfm: \_\_\_\_\_

Description:

1. Installation Date of existing locker room system \_\_\_\_\_
2. Any operational issues with the current system \_\_\_\_\_
3. Has the current system maintained a dry and comfortable environment in the locker rooms? Yes No
4. Any Mold or Mildew problems in the space? Yes No
  - a. If so does this coincide with specific outdoor air conditions? \_\_\_\_\_

### Sketch layout w/supply duct and return locations



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### Building Pressure Control

Natatoriums should be maintained at a negative air pressure (0.05 to 0.15 in. of water) relative to the outdoors and adjacent areas of the building to prevent the forming of condensation in the wall and ceiling interstitial spaces; and to prevent the dispersal of chloramines, other noxious fumes and moisture to other occupied spaces in the building. The space pressurization scheme must be maintained during every hour of the year and for all possible operating conditions

Desert Aire's SelectAire™ natatorium dehumidifier uses an active method of pressure control that regulates an Electronically Commutated Motor (ECM) in the exhaust air stream to maintain the desired negative pressure. This method will reduce or increase the speed of fan to match the load and real-time needs of the natatorium's negative pressure requirements.

### Transducer Features

The CA500 series pressure sensors incorporate a silicon capacitive sensing element in a compact package. Internal temperature compensation provides an accurate, easy to use device. The transducer provides a proportional signal to control the exhaust fan to maintain building pressurization.

The innovative design eliminates mounting position effects found on other low pressure differential sensors currently available in the market.

- Rugged Package
- Amplified Temperature Compensated Linear Output
- No Position Sensitivity
- EMI/RFI & ESD Protected
- Superior Output Signal Stability

### Indoor Sensor

The indoor static pressure sensor should be mounted in a location not subject to damage from occupants. Place the sensor as far as practical from doors, grilles, and operable windows that may cause pressure fluctuations. Locate a minimum of 3' above the floor level in the pool area.



Figure 1 - Indoor Static Pressure Sensor (front and rear view)

### Outdoor Sensor

A complication in measuring the building static pressure is the dynamic action of the wind. Measuring the wind's pressure instead of the true outdoor static pressure will alter the actual static pressure reading. Proper mounting of the outdoor static sensor will help ensure accurate readings.

The outdoor air static pressure sensor should be mounted at least 12 inches above surrounding obstacles and a minimum of 24 inches from a wall or Air Handling Unit. 50 feet of 1/8" clear pressure tubing is supplied with the sensor.

This package includes two sets of 1/8" pressure tubing each that are 50 feet in length. The tubing is installed in the field by the contractor and connected to the static pressure differential transducer in the dehumidifier.



Figure 3 - Pressure Transducer in Electrical Box

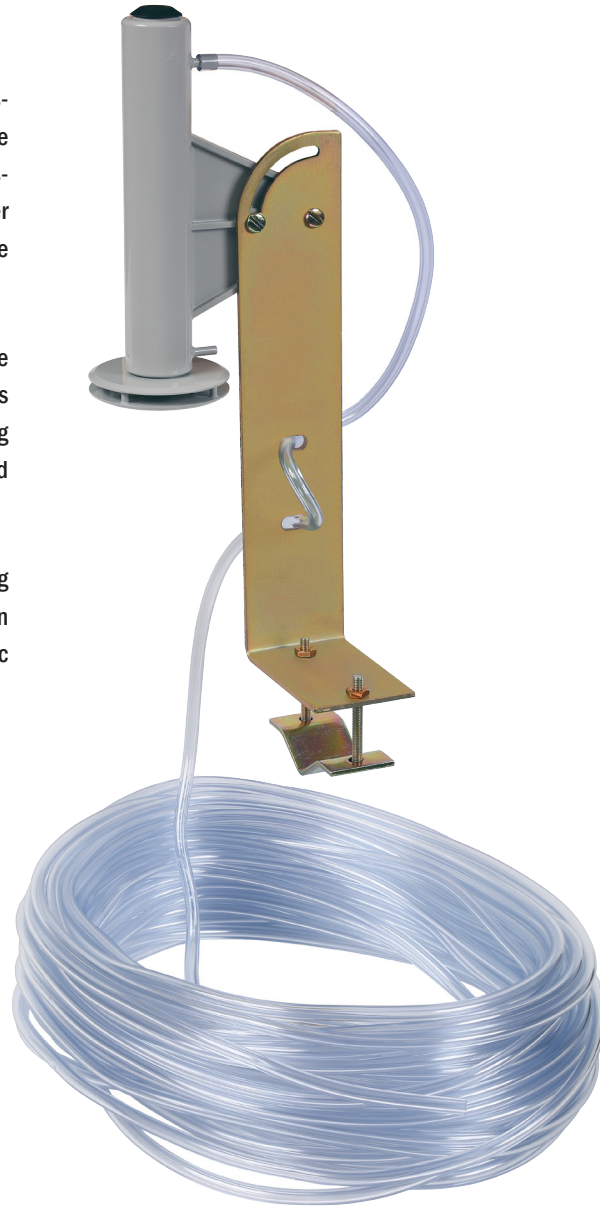


Figure 2 - Outdoor Static Pressure Sensor

**OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY**

N120 W18485 Friestadt Road, Germantown, WI 53022 sales@desert-aire.com

**Ph: (262) 946-7400 - [www.desert-aire.com](http://www.desert-aire.com)**



 **WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## Introduction

Many older natatoriums with indoor mechanical rooms did not take into consideration that the dehumidification system would need to be replaced during the life of the facility. The removal of the failed system is the easiest part of the retrofit project while moving the new dehumidifier into the mechanical room can be quite challenging. Desert Aire offers a solution to this problem through the sectioning of our SA Series dehumidifiers.

## Design

Desert Aire works with the customer to determine the maximum size and weight of the largest section that can be moved into the mechanical room. This information is used by Desert Aire engineering to create a sectioned SA Series unit that meets the performance needs of the natatorium while taking into consideration the logistical problems caused by mechanical room access.

Key features of Desert Aire Sectioned Units:

- Refrigeration Valves provided when sectioning of refrigeration circuits is required
- Wiring harnesses with labeled leads and terminal strips to distribute power through the unit
- Flanged edges and gaskets for sealing sections



Figure 1a - Refrigeration Section #1

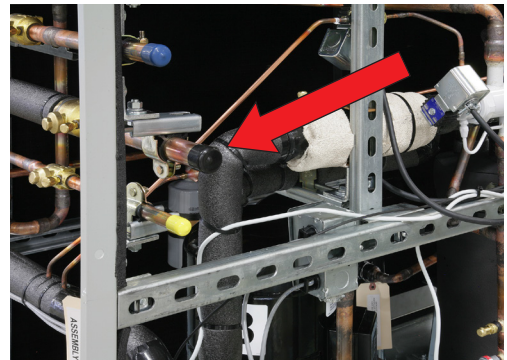


Figure 2 - Refrigeration isolation



Figure 1b - Refrigeration Section #2



Figure 3 - Blower Section

## Contract Document

Desert Aire utilizes a contract document to define the design requirements of each job and to define what will be the required action of the contractor once the segments are delivered to the jobsite.

### Procedure

- Size and select dehumidifier using existing tools. Performance of the SA unit is not affected by the sectioning of the cabinet.
- Establish maximum dimension and weight of largest section that can be transported into the mechanical room.
- Submit request for sectioned unit evaluation to Desert Aire.

### Desert Aire will provide the following:

- A design summary with approximate number of sections, their size and weights
- A formal price quote for the sectioning of the unit
- Detail drawings to be provided after purchase order. This “as built” drawing will include dimensions, weights, wiring harness detail, refrigeration valve details, wiring diagrams, and points list.
- Reassembly instructions will be provided with the delivery of the unit.
- Factory assisted start-up after installation



Figure 4 - Ready for Shipment

#### Notes:

- 18-30 ton units cannot have a sectioned outdoor air box.
- 30 to 60 ton units with sectioned outdoor air box only available on specific request.



Figure 5 - Assembled After Installation

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