



The BEST in Dehumidification

**INSTALLATION
&
OWNERS OPERATION MANUAL**

FOR

DRI-AIRE DEHUMIDIFICATION SYSTEMS

FOR INDOOR SWIMMING POOLS, HOT TUBS & MORE



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Made in the USA...



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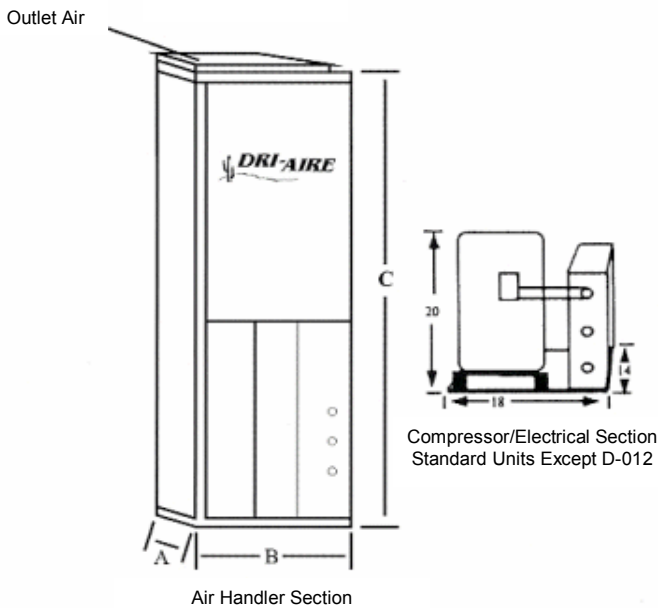
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GENERAL DESCRIPTION

- ◆ Steel cabinet is fully insulated, the insulation encases all air passages to insure quiet & efficient operation.
- ◆ Evaporator and condenser coils are constructed of copper tubes and aluminum fins mechanically bonded for maximum heat transfer efficiency and are Heresite coated for longer life.
- ◆ Systems are equipped with expansion valves, sight glasses and receivers
- ◆ Multi-speed direct drive motors are thermally protected against overload and provide a wide range of air flow and duct static capabilities.
- ◆ The *DRI-AIRE* units can be ordered in the up-flow, Horizontal Left to Right or the Horizontal Right to Left configurations. (Please specify configuration when ordering.)
- ◆ The *DRI-AIRE* unit can be ordered with optional Water Condenser or Out Door condenser options.
- ◆ The *DRI-AIRE* unit comes with a One year limited warranty and the compressor has an extended 4 year limited warranty.
- ◆ The *DRI-AIRE* unit is ETL approved.

DIMENSIONS IN INCHES



Note: The model D-012 units are packaged units and do not have a separate compressor/electrical section

Model Number	D-012	D-024	D-036	D-048
Compressor H.P./ Refrigerant type	1/R-410A	2/R-410A	3/R-410A	4/R-410A
Volts / Phase	120-1 / 240-1	240V - 1	240V - 1	240V - 1
Compressor RLA	13.6/7	13.4	22.5	30.7
Blower Motor H.P.	1/4	1/3	1/2	3/4
Volts / Phase	120-1 / 240-1	240V - 1	240V - 1	240V - 1
Blower FLA	4.2/2.0	2.7	4.3	5.0
Fuse Size Air Handler/Compressor	20	20/30	20/40	20/50
CFM @ .25 S.P.	600	1200	1600	2020
Weight: Airhandler / Compressor	170	145 / 70	195 / 75	240 / 110
Height (C)	46	60	60	60
Width (B)	22	24	24	24
Depth (A)	22	24	24	24
Intake Air Dimensions	20 x 20	22 x 22	22 x 22	22 x 22
Discharge Air Dimensions	9.25 x 10.25	12.5 x 13.5	12.5 x 13.5	12.5 x 13.5



MADE IN THE U.S.A....



The Dri-Aire system offers many important advantages to the indoor pool owner

- ◆ The Dri-Aire dehumidification system is designed for year round use to eliminate extreme humidity in indoor swimming pool and hot tub areas.
- ◆ The Dri-Aire system will remove unwanted humidity that will damage the pool building and at the same time heat the area, reducing the cost of operation up to 70%. Depending on the system you order it may also cool the space and add heat to the pool water making this investment even more attractive. This approach to controlling humidity will extend the life of the pool enclosure and make indoor swimming more enjoyable without the old problems.
- ◆ The humidity that is removed from the air can be drained outside or into a floor drain. The heat gain while dehumidifying in conjunction with the pool being heated in most cases will eliminate the need for re-heat. By maintaining the air temperature at or slightly above the pool temperature there will be less heat loss from the pool water therefore the pool heater can operate less to maintain the desired temperature.
- ◆ When the Dri-Aire system is operating, it will reduce the maintenance cost of the area being dehumidified, by reducing the formation of rust, corrosion, mildew, and preventing the loosening of plaster from the walls and ceilings.

The Dri-Aire system may not eliminate all of the condensation from forming on single pane glass windows on the outside walls of the area being dehumidified; therefore double pane windows should be installed.

**Cooling or heating of the room and or heating of the pool will only occur if there is a demand for dehumidification. This systems primary operation is for the dehumidification of the space, all other benefits achieved with either the standard configuration or with one or more of the optional accessories is secondary.



POOL ROOM CONSTRUCTION METHODS WHAT YOU SHOULD KNOW

Swimming pool buildings have a long history of deterioration caused from moisture penetration into the structure. The Dri-Aire dehumidification system will maintain moisture levels at 55 - 60% relative humidity and will help alleviate this problem. We recommend that all precautions be taken to prevent migration of moisture and resultant problems.

Wood Treatment

Treat all timber and wood supports with a quality wood preservative such as Thompson Water Seal or other similar product. This procedure can be accomplished with an airless spray gun, brush or roller. Two to three coats recommended.

Dry Wall

Dry wall material for ceilings and walls should be sealed with a primer to prevent moisture penetration. Paint with high gloss paint for durability. Consult a painting contractor or supplier for proper paint types. Caulk and seal all penetrations such as duct penetrations and electrical service boxes, etc.

Windows

It is extremely important to install insulated double pane windows in your pool room. Single pane windows will sweat severely during poor weather conditions and most likely not clear up even though all other construction methods had been followed. You may even consider installing low-e glass to help cut down on solar gain in the pool room.

Ventilation

Attic spaces or ceiling joists should be adequately ventilated. For the best protection, we prefer an exhaust fan which can be controlled by temperature and humidity controls.

Miscellaneous

It is also important to not cut any holes into the ceiling except where necessary for duct work and electrical penetrations. Holes in the ceiling may lead to moisture problems in the attic. Recessed vented can lights shall be avoided.

1. LOCATION OF DRI-AIRE

For the most efficiency, the following should be considered:

- 1.1 Shortest possible air distribution system with low air resistance.
- 1.2 Whenever possible, install the DRI-AIRE system in a room with at least 70 deg. ambient temperature.
- 1.3 Allow clearance for condensate, refrigeration & electrical lines. A minimum of 36" in front of unit is preferable for servicing.
- 1.4 Locate compressor section near DRI-AIRE unit. (within 50').
- 1.5 locate DRI-AIRE unit outside of the pool or hot tub room, such as in an equipment room.

2. AIR DISTRIBUTION

- 2.1 Air distribution duct systems shall be sized for nominal air volume as per conventional methods for low pressure, low velocity installations, such as air-conditioning systems. The supply air should not exceed .10 inches of water column or 900-1000 FPM velocity and the return air should not exceed .05 inches of water column or 600-700 FPM velocity.
- 2.2 Supply air shall be directed towards outside windows, doors and other building components which are more likely to develop condensation. **AVOID** airflow on water surface.
- 2.3 All elbows should be manufactured with turning vanes.
- 2.4 Supply air duct and diffusers can be located in the floor, wall, or ceiling.
- 2.5 One central return air should be satisfactory for most applications. A high return air close to the ceiling is preferable.
- 2.6 Ducts must be insulated if located in areas below normal room temperature, to prevent heat loss and condensation.
- 2.7 Grills & registers should be made of anodized aluminum like Shoemaker's 900 series or Hart & Cooley Royalaire brand.
- 2.8 Air flow should be directed onto any sky lights, if this is not possible, we recommend installation of paddle fans to provide air movement in these areas.

- 3 **OUTSIDE AIR:** Any outside air requirements shall be met through a separate blower and duct system. No outside air can be introduced through the DRI-AIRE unit.

4. **EXHAUST SYSTEM:** Since the DRI-AIRE system generates heat during its operation it may be necessary to exhaust extra heat during the summer months. An exhaust fan based upon .5 CFM per square foot of pool room area is recommended for all applications. It is also recommended that the exhaust fan be controlled by parallel manual and thermostatic (cooling) switches. This will also serve well as an emergency back up device in the case of system shut down or malfunction.

5. POWER AND CONTROL CONNECTIONS

5.1 Provide a main disconnect switch within the vicinity of the DRI-AIRE. Power wiring must be sized to no less than ampacity rating of the DRI-AIRE model you are using. See section 5.3 electrical data. Make sure the DRI-AIRE compressor section and the air handler section are connected to the ground terminal located in the electrical panel. The power supply must be sufficient for the DRI-AIRE, including the starting amperage of the compressor. Excessive voltage drop during start-up may prevent the compressor from starting. All wiring should be done as per wiring diagram supplied and as per National and Local electrical code. All 208/230 volt wiring MUST be NEC CLASS 1.

5.2 Control wiring should be done according to wiring diagram supplied.
(**Note:** Use shielded cable when wiring the sensor(s) to the controller(s), be sure to ground only one end of the shielding).

5.3 **ELECTRICAL DATA & SPECIFICATIONS:** Please see Diagrams 5.4, 5.5 and 5.6 on Page 6.

6 OPTIONAL ACCESSORIES, EQUIPMENT & SERVICES

6.1 ****WATER HEATING OPTION (WC) Water Condenser:** We offer as an option, a thermostat, three way heat reclaim valve and cupronickel coil unit which will return approximately 100% of the heat salvaged to the water in the swimming pool and in many cases this system will sustain most of the pool water heat needed, resulting in considerable savings in operating cost which makes the additional investment very attractive. This option is not available for the D-012 model. This option will also cool the room while heating the pool.

6.2 ****OUTDOOR CONDENSER SECTION (ODC):** This option will reject excess heat to the exterior when the room air temperature has been satisfied. This option will also cool the room while rejecting the heat outside. This option is not available with the D-012 models.

6.3 Digital display module for control system. This will allow for monitoring of the actual humidity or temperature of the space and is also a more accurate means for setting the desired temperature or humidity level to be maintained.

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DRI-AIRE PIPING, CHARGING & START-UP

The following should be performed only by a qualified refrigeration technician.

(**NOTE:** Air Handler, Compressor & Outdoor Condenser Sections are charged with Nitrogen.)

5.3 ELECTRICAL DATA & SPECIFICATIONS

Compressor Section

Model #	Voltage	Phase	RLA	LRA	MCA	Max Fuse or Breaker	Wire Size
D-024	208/230	1	13.4	59	16.75	30	#10
D-036	208/230	1	22.5	93	28.13	40	#8
D-036	208/230	3	13.1	88	17.88	30	#10
D-048	208/230	1	30.7	125	38.38	50	#6
D-048	208/230	3	19.5	103	24.38	30	#10

Diagram 5.4

Air Handler Section

Model #	Voltage	Phase	Drive Type	Horse Power	Speed	RPM	FLA	MCA	Max Fuse or Breaker	Wire Size
D-024	208/230	1	Direct	1/3	3	1075	2.7	3.38	20	#12
D-036	208/230	1	Direct	1/2	3	1075	4.3	5.38	20	#12
D-048	208/230	1	Direct	3/4	3	1075	5.0	6.25	20	#12

Diagram 5.5

Note: Both sections are combined in one unit for the D-012 only.

Compressor/Air Handler Section

Model #	Voltage	Phase	RLA	LRA	Drive Type	Horse Power	Speed	RPM	FLA	MCA	Max Fuse or Breaker	Wire Size
D-012	208/230	1	7	34.2	Direct	1/4	3	1075	2.0	11.25	20	#12
D-012	120	1	13.6	72.5	Direct	1/4	3	1075	4.2	22.25	30	#10

Diagram 5.6

7. PIPING (MODELS D-024 THRU D-048)

Model Number	Distance of Line 0 to 25 Feet		Distance of Line 25 to 50 feet	
	Suction	Discharge	Suction	Discharge
D-024	5/8"	1/2"	3/4"	1/2"
D-036	3/4"	1/2"	7/8"	1/2"
D-048	7/8"	5/8"	7/8"	5/8"

Figure 7.0

- 7.0 Size refrigerant lines according to the chart in Figure 7.0 above.
- 7.1 Leak test all refrigerant piping, and perform a thorough evacuation prior to start-up.
- 7.2 Check all wiring connections for proper connection.
- 7.3 Check condensate drain lines for leaks by pouring water into the drain pan, (this will also prime the p-trap). The access panel will need to be removed for this procedure. NOTE: be sure to install p-traps for each system where more than one system is involved and prime accordingly.
- 7.4 Check line voltage to be sure it matches DRI-AIRE specifications and check high voltage taps on control transformer in the air handler.
- 7.5 Check to see clean filter is in place before start-up.
- 7.6 Measure and balance air-circulating system. The total air volume is best measured at the return air grill. An excessive air volume reduces DRI-AIRE efficiency and wastes energy. Insufficient air volume will cause coil freeze up and cause system malfunction.
- 7.7 Check blower motor amperage and compare with specifications.
- 7.8 ** Check head pressure, should be appx. 375 - 425 PSI
- 7.9 ** Suction pressure should be appx. 110 - 125 PSI
- 7.10 The Fan Cycler, (if equipped) should be set to 400 PSI cut in and 325 PSI cut out.
- 7.11 Adjust humidistat to designed humidity level, 55-60% RH.
- 7.12 Check compressor amperage and compare with specifications. Check line voltage on compressor contactor with compressor running. Line voltage should be within 10% of rated voltage.
- 7.13 Pool water should be 80-82 deg. and Pool Room should be 82-84 deg. Never allow room temperature to fall below 70 deg., otherwise coil ice up will cause system malfunction.

**** Both the Pool and Pool Room must be up to normal operating temperatures for this system to be properly charged!**

Note: Charge the standard system to a full sight glass. To ensure a proper charge in the system when the optional Outdoor Condenser (ODC) option or the Water Condenser (WC) option are installed charge the system by switching back and forth between the heating & cooling modes several times. This will ensure that there is enough refrigerant for the system to function in either of the modes.

8. TROUBLE-SHOOTING

8.1 DRI-AIRE WILL NOT START

Check the following:

- a. 24v control transformer for the proper input voltage.
- b. Fuses
- c. loose control or power connections.
- d. Check compressor for open thermal protector or defective motor winding.
- e. Humidistat setting.
- f. Supply voltage. Low supply voltage may require hard start kit.
- g. Verify time delay time has elapsed.

8.2 UNIT TRIPS ON RESET

High head pressure or low suction pressure - check the following:

- a. Insufficient air flow, check grills & filter.
- b. Coil iced up. Check Pool & Room temperatures.

8.3 ICE BUILD-UP ON DEHUMIDIFIER COIL

check the following:

- a. Air flow restriction, check supply and return air grills and filter.
- b. Incorrect duct design.
- c. Refrigerant charge.
- d. room air temperature below 70 deg.

8.4 HIGH HUMIDITY

- a. Heavy pool activity with water turbulence and wet floor area will increase evaporation rate. This could exceed temporarily the rated unit capacity and, therefore, result in a higher than normal humidity level. The system will equalize after the heavy activity has stopped and, therefore, no control adjustments are required.
- b. Low room temperature or high water temperature. If room temperature is below system design (82-84 deg.) or water is heated above design temperature (pool 80-82 deg. /hot tub 104 deg.), evaporation rate may increase above system capacity. Re-adjust water and or room temperature to system design parameters.

9. MAINTENANCE

The DRI-AIRE dehumidifier is designed to require minimum maintenance as follows:

- 9.1 **FILTERS:** It is extremely important to have clean air filters! Therefore these must be checked regularly and cleaned when dirty.
- 9.2 **BLOWER:** The blower motor should be oiled at least once a year unless it is a sealed bearing motor. The blower wheel should also be cleaned at this time, if it appears to be dirty.
- 9.3 **CONDENSATE DRAIN:** The condensate drain & pan sometimes become dirty and therefore should be cleaned if algae is noticed. Treatment usually consists of pouring in a half cup of bleach.
- 9.4 **REFRIGERANT CHARGE:** The refrigerant charge should be checked by a qualified service technician annually.
- 9.5 **COMPRESSOR REPLACEMENT:** If a compressor replacement becomes necessary be sure to perform a thorough system clean-up to prevent future compressor burn-outs.



TIPS FOR TROUBLE FREE OPERATION

1. The water temperature should be set to 80°-82° for swimming pools and 104° for hot tubs.
2. The temperature of the room also makes a difference. The air temperature in the room should be 82°-84°. Temperatures below this will increase the heat loss and evaporation rate of the water and therefore increase the operating costs. If the room is too cold the system could ice up, fail to dehumidify and possibly damage the compressor.
3. The humidistat should be set at 55 - 60 percent humidity. This is the humidity level which is recommended for personal comfort and structure protection. A lower humidity setting will cause the system to operate longer than necessary, thereby increasing your cost of operation and may reduce the life of the equipment.
4. The filter in your system should be washed at least every month. Your system should also be checked out and serviced if necessary by a qualified licensed service technician at least once per year.
5. The chemicals in your pool should be maintained per your pool owners manual so as not to injure yourself or damage your equipment and/or building.

Summary of Operation

The Dri-Aire dehumidification system is designed to remove excess humidity while recovering the heat that is given up during the process. This is done by pulling the humid air into the system and as this warm moist air passes through the evaporator it condenses into a liquid form where it is collected in a drain pan and can then be drained outside or into a floor drain. From there the dry air will then pass through a hot condenser coil which is where it will be heated (by the heat given up through the evaporation process) and returned to the pool room at approximately 12 to 14 degrees warmer than when it started thereby **heating the pool room.

This heat can sometimes cause the room to get too warm. For this we offer two options, one is the water condenser (WC)** option, when the pool room temperature gets above the desired set point the heat that is generated will be diverted to the swimming pool saving the pool owner overall heating costs associated with heating the pool. The other option is our outdoor condenser(ODC)** option, where the heat will be sent to an outdoor condenser thereby rejecting the excess heat to the outdoors just like an air conditioner.

** Cooling or heating of the room and or heating of the pool will only occur if there is a demand for dehumidification. This systems primary operation is for the dehumidification of the space, all other benefits achieved with either the standard configuration or with one or more of the optional accessories is secondary. Only return air from the pool space may be circulated through the air handler. Any outside air required for the pool space shall be introduced through a separate blower/duct system.

Typical Operational guideline attached to unit

General Operating Guidelines

Humidity Settings: Humidistat should be set at 55 - 60%

Pool Temperature: Pool water should be 80° - 82° F

Room Temperature: Pool room should be 82° - 84° F
DO NOT GET BELOW 70° F

Filter: Should be washed monthly

Pressures: Low Side - Suction pressure should be approx. 110-125 PSI
High Side - Discharge should be approx. 375-425 PSI

Fan Cycler Settings: Set to 400 PSI cut in and 325 PSI cut out.
(if applicable)

Initial Start-up and Charging: PRIOR to Start-up and Charging, the pool water and room temperatures MUST be within the above parameters. If this system has the water and/or outdoor condenser options, switch the system in and out of the cooling mode several times while charging to insure the system is fully charges. Check system for proper operation after a day or two of running.

Notes: This system should be installed independently of any other equipment. The system should not be set up with a timer as the system needs to be able to do its job whenever necessary.

WARNING: Deviating from the above parameters will:

1. Reduce system efficiency and may cause system malfunction
2. In many cases, will not satisfy the requirements for which this system was installed.
3. Void the warranty.

Models D-024 - D-048

Figure 7.1

LIMITED WARRANTY



FIRST YEAR LIMITED WARRANTY

If any part of your new DRI-AIRE unit failed because of defective material or workmanship within twelve (12) months from the date of installation, Wilson's Air Technologies will furnish a replacement part. The compressor warranty is an additional 4 years. Any labor charges connected with the removal of the defective part and the installation of the replacement part are not included. Parts are available through Wilson's Air Technologies. Transportation charges, if any are not included. Filters and refrigerant are not included. A bill of sale, canceled check or payment record may be used by the customer to verify purchase and establish warranty period.

EXCLUSIONS

This warranty applies to Dri-Aire units sold and retained in the continental United States. This warranty does not apply to the product or parts that have been damaged by accident, abuse, lack of proper maintenance, improper installation, misapplication, unauthorized alterations, fire, flood or acts of God. In no case will Wilson's Air Technologies be responsible for incidental, special or consequential damages. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

GENERAL CONDITIONS

Furnishing parts as described above shall constitute fulfillment of all Wilson's Air Technologies obligations with respect to this warranty, and replacement parts will be warranted only for the UN-expired portion of the original warranty. Service of the products covered by this warranty is the responsibility of the dealer or contractor who installs the equipment, and the installing dealer or contractor should be contacted directly by the owner for service and/or in-warranty replacement parts.