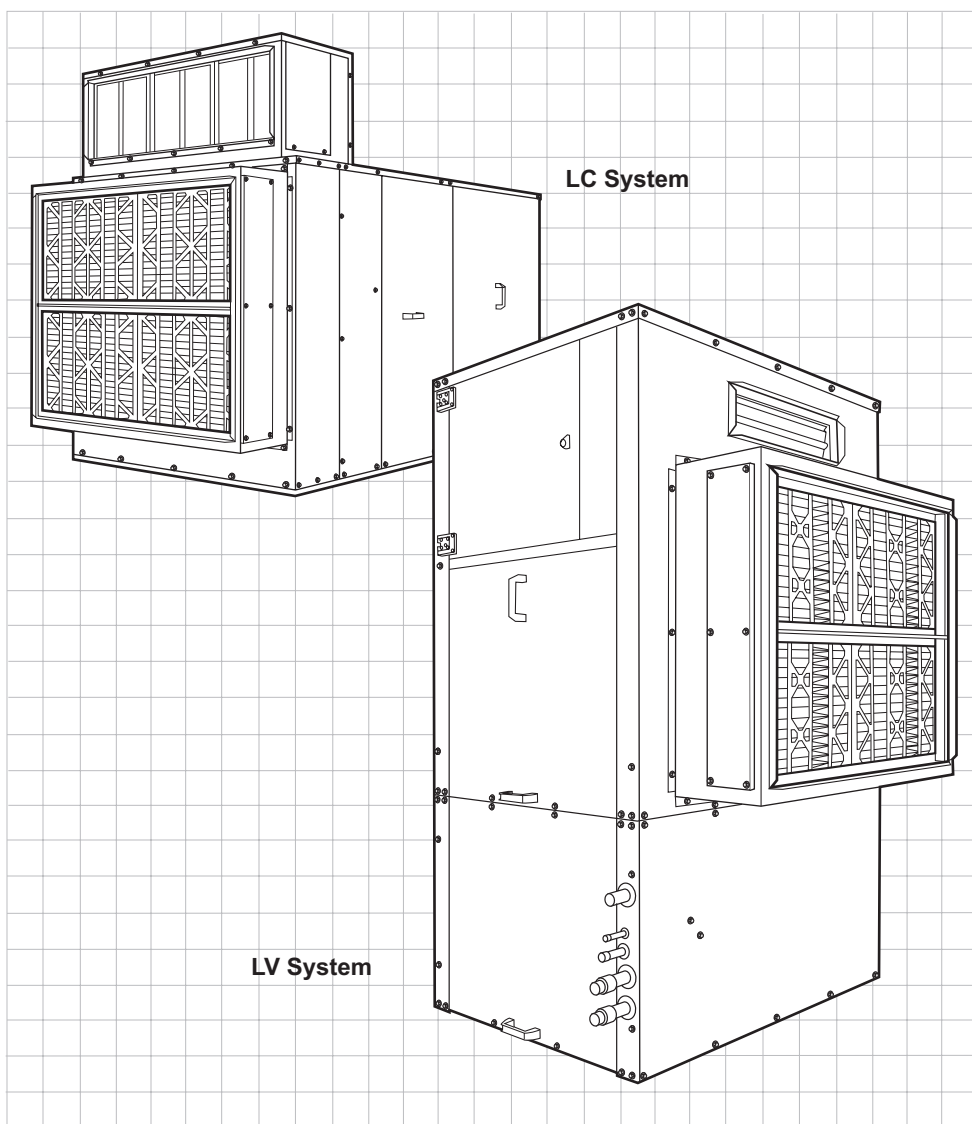




LC and LV (ExpertAire™) Series Dehumidifiers

- Meets AHRI Standard 910.
- Effective humidity control: 4 to 100 lbs per hour.
- Wide range of ambient temperatures: 65° to 95° F.
- Air conditioning option.
- Optional outdoor air intake to help meet ASHRAE 62 ventilation requirements.
- Multiple heat sink options including pool water heating.
- Scroll compressors for high efficiency and longevity.
- Galvanneal cabinet with high impact, powder coat textured paint.
- Auxiliary heat including hot water and electric coils.

Installation and Operation Manual



DANGER

ONLY TRAINED, QUALIFIED PERSONNEL SHOULD INSTALL AND/OR SERVICE DESERT AIRE EQUIPMENT. SERIOUS INJURY, DEATH AND PROPERTY DAMAGE CAN RESULT FROM IMPROPER INSTALLATION/SERVICE OF THIS EQUIPMENT. HIGH VOLTAGE ELECTRICAL COMPONENTS AND REFRIGERANT UNDER PRESSURE ARE PRESENT.

Desert Aire Dehumidification Equipment Standard Limited Warranty

Desert Aire warrants the dehumidifying unit to be free from defects in materials and workmanship subject to the terms, conditions and limitations stated herein.

TERMS

Desert Aire warrants all components (except as noted) for a period of one (1) year from the date of shipment contingent on validation of unit startup by Desert Aire Service. Upon connection of the unit to Desert Aire's AireGuard™ remote access system via onboard Ethernet connection the warranty is extended one additional year for a total warranty period of two (2) years from date of shipment. This requires validation of unit start up by Desert Aire Service. This warranty shall be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost of labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period.

CONDITIONS

The warranty is subject to the following conditions:

1. The unit must be properly installed and maintained in accordance with the Desert Aire "Installation and Operation Manual" provided with each unit and/or other documentation provided.
2. **The Start-Up Report must be completed and returned to Desert Aire Service for evaluation. If no deficiencies are identified a Warranty Validation Letter will be issued that provides all warranty dates and coverage. If installation or start-up deficiencies are present, these must be corrected and communicated to Desert Aire in order to activate warranty.**
3. This warranty shall not apply to any part that has been tampered with, or has been subject to misuse, negligence or accident. A warranty can be obtained for altered equipment but only with written consent from Desert Aire.
4. The following parts and components are excluded from the warranty: belts, filters, driers, fuses and refrigerant.
5. Refrigerant coils or other components that corrode due to improperly balanced pool chemistry or corrosive air quality will not be warranted.
6. All replacements or repairs will be FOB Germantown, WI.
7. This warranty shall be null and void if defects or damages result from unauthorized opening of the refrigerant circuit, tampering with factory set controls, or operating outside the original design conditions.

8. Desert Aire shall not be liable for labor costs incurred in diagnosing the problem, or the removal or replacement of the part or parts being repaired.
9. Desert Aire must preauthorize all warranty coverage described herein.

Extended Warranty:

Your Desert Aire unit may have extended warranties beyond this Standard Limited Warranty document. Extended warranties are only available at the time of the purchase of the original equipment. These extended warranties are covered under a separate document and their terms and conditions are separate from this document. It is mentioned in this document for informational purposes only. Any Extended Warranties will be identified on the Warranty Validation Letter.

Any and all incidental or consequential damages are expressly excluded from this warranty. Some states do not allow the exclusion of incidental or consequential damages for personal injury, so the above limitations may not apply to you for certain damages. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. No person or representative is authorized to make any warranty or assume any liability not strictly in accordance with the aforementioned.

Inquiries regarding warranty matters should be addressed to:

Desert Aire Corp
c/o Service Manager
N120 W18485 Freistadt Road
Germantown, WI 53022
PH: (262) 946-7400
E-MAIL: service@desert-aire.com

Additional copies of this manual can be purchased for a nominal fee from Desert Aire. Desert Aire also posts the most current revision of our I/O Manuals on our website. For a digital copy of the I/O Manual for your unit revision, please submit request to the contact information listed above.

Gas Heat Exchanger Ten (10)-Year Prorated Warranty Terms

Desert Aire offers an extended prorated eight (8)-year warranty for gas heat exchanger. All other heater components are covered under the initial 2 year warranty.

For Your Safety Read Before Operating

WARNING: If you do not follow these instructions exactly a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance does not have a pilot. It is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
- B. **BEFORE OPERATING** smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

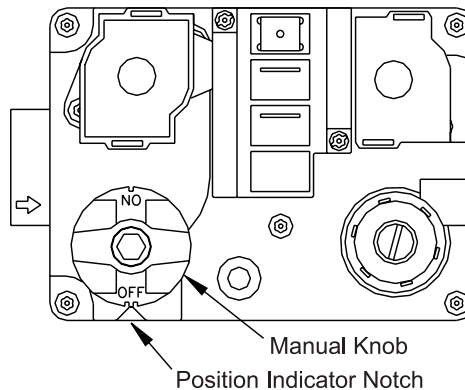
WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building. Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control that has been under water.

OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
5. Turn gas control knob clockwise ↻ to "OFF" position.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to next step.
7. Turn gas control knob ↺ counterclockwise to "ON" position.
8. Turn on all electric power to unit.
9. Set thermostat to desired setting.
10. If appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



TO TURN OFF GAS TO APPLIANCE

1. Set thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Turn gas control knob clockwise ↻ to "OFF" position.

Safety Labels are used throughout this manual. They comply with the ANSI Z535.4 Standard. Please be familiar with the following labels and their definitions.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



Caution used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

Product Warning for the State of California



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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1. Introduction

Desert Aire dehumidifiers are designed to provide years of reliable service when installed properly. Read these instructions carefully before you install the dehumidifier.

1.1 Inspection

Desert Aire inspects and tests each dehumidifier before it leaves the factory so that you receive a quality piece of equipment. Unfortunately, equipment may become damaged in transit. Inspect the dehumidifier carefully before signing the receiving papers. Check for both visible and concealed damage. Remove crating and inspect the exterior cabinet for damage. Dented panels, broken crating or any fluids leaking from the unit should be documented upon delivery.

1.2 Freight Damage Claims

If the dehumidifier has been damaged, document the extent of the damage. Take pictures. Next, obtain a claim form from the carrier. Promptly fill out and return the form. Carriers may deny claims that you have not filled out within a week of delivery. Notify Desert Aire of any damage.

1.3 Rigging

WARNING

1. **Failure to observe rigging instructions may lead to equipment damage, personal injury, or death.**
2. **Lifting method and procedure must comply with all local and national codes and regulations.**
3. **The use of safety slings in addition to lifting lugs is required.**
4. **Do not lift the dehumidifier in high winds or above people.**

Desert Aire dehumidifiers are solidly built and can be very heavy. Avoid personal injury and damaging the equipment by planning the installation carefully. Use moving equipment whenever possible.

1.3.1 Rigging the Dehumidifier

Depending upon the unit type, various rigging methods are used to best lift the equipment. Personnel should avoid stepping on the top of the unit. Desert Aire dehumidifiers are not designed to support the weight of a person on all portions of the roof. Damage incurred through caved or distorted top panels will not be covered under warranty.

Packaged dehumidifiers are equipped with four or more lifting points. Use spreader bars and safety straps when you rig the equipment.

- Utilize all of the lifting lugs provided when hoisting the unit.
- Test-lift the dehumidifier to verify that it is properly balanced.
- Refer to diagram below for additional lifting instructions.

Large System Rigging

Notes:

1. The number of lifting points will vary between units. All lifting points must be used to lift unit.
2. Spreader bar must be used. Unit top panel is not designed to handle loading.
3. Lifting method/procedure to comply with all local and national regulations.
4. Use safety slings (not shown) in addition to lifting lugs.
5. Be sure that the lifting hooks do not contact the sides of the unit.
6. Use appropriate lifting strategy for unit. Examples:

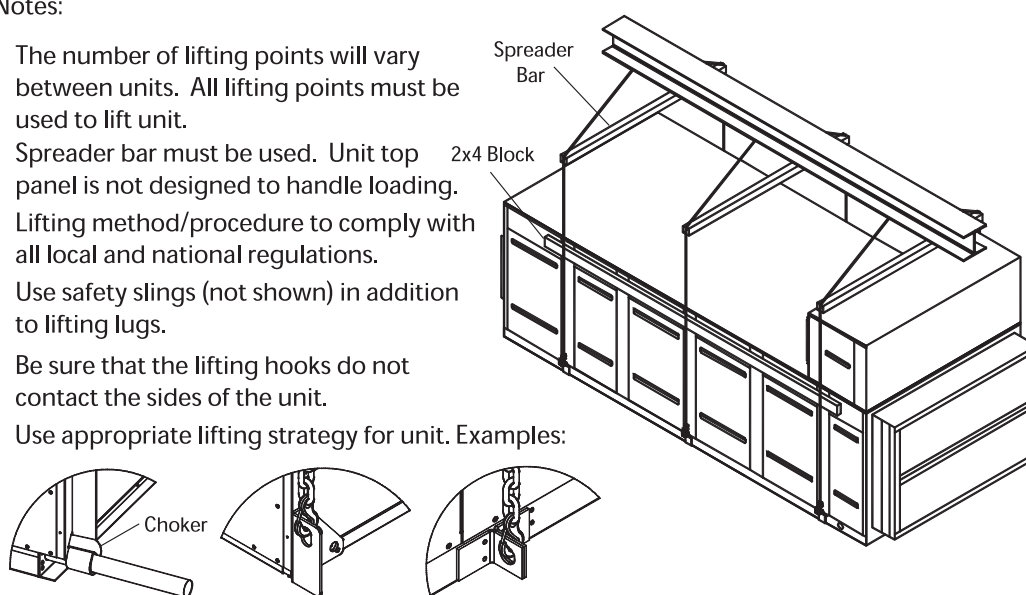


Figure 1 - Typical Rigging for Large Systems

CAUTION

1. Do not tip the dehumidifier on its side.
2. Avoid dropping the unit down stairways or subjecting it to severe mechanical shock.

1.3.2 Rigging the Remote Condenser

The optional remote condensers are equipped with four or more lifting eyes. Test-lift the remote condenser to verify that it is properly balanced.

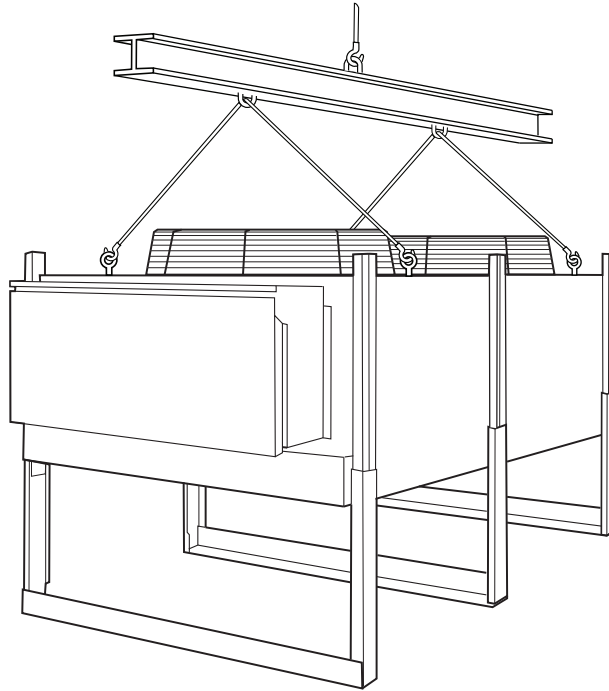


Figure 2 - Typical Rigging for an Optional Remote Condenser

CAUTION

1. Do not lift the remote condenser by its refrigeration headers or return bends.

2 Installation

Manual applies to standard unit configurations only.

2.1 Location of Dehumidifier

Desert Aire LC dehumidifiers require both left and right side service access to the unit for service. The LV dehumidifiers require service access to the left side and end opposite the return air connection. Allow a minimum of 36 inches of clearance around the service sides of the dehumidifier for piping, electrical connections, and service access. The non-access sides of the unit should have a minimum of 12 inches of clearance. A minimum one unit width clearance shall be maintained in all directions of outside air intake hood on outdoor units to allow for un-obstructed airflow into the unit. For packaged units, ensure a minimum of one unit width of clearance is maintained to allow for proper airflow through the condensing section. If three or more walls surround the unit consult the factory for proper unit location to allow for adequate airflow through the condenser section. Consult local, state, and national electric codes for other minimum service clearances.

Install the unit on a sturdy, level mounting surface or platform that will prevent vibration and sound transmission. Never install the dehumidifier on a wooden platform without consulting the design engineer for spring isolation requirements and sound control materials. Do not install the unit near occupied rooms such as offices or guestrooms. Do not attempt to conserve installation space by fabricating restrictive ductwork with abrupt bends. You may reduce the operating efficiency and the moisture removal capacity of the dehumidifier. See section 5.2 for detailed duct installation instructions.

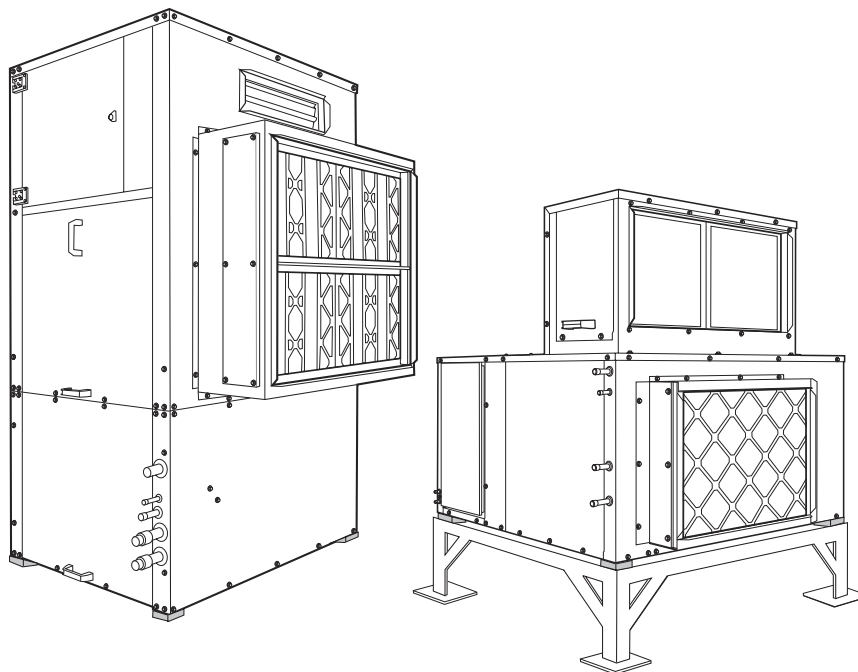


Figure 3 - Typical Floor Installation

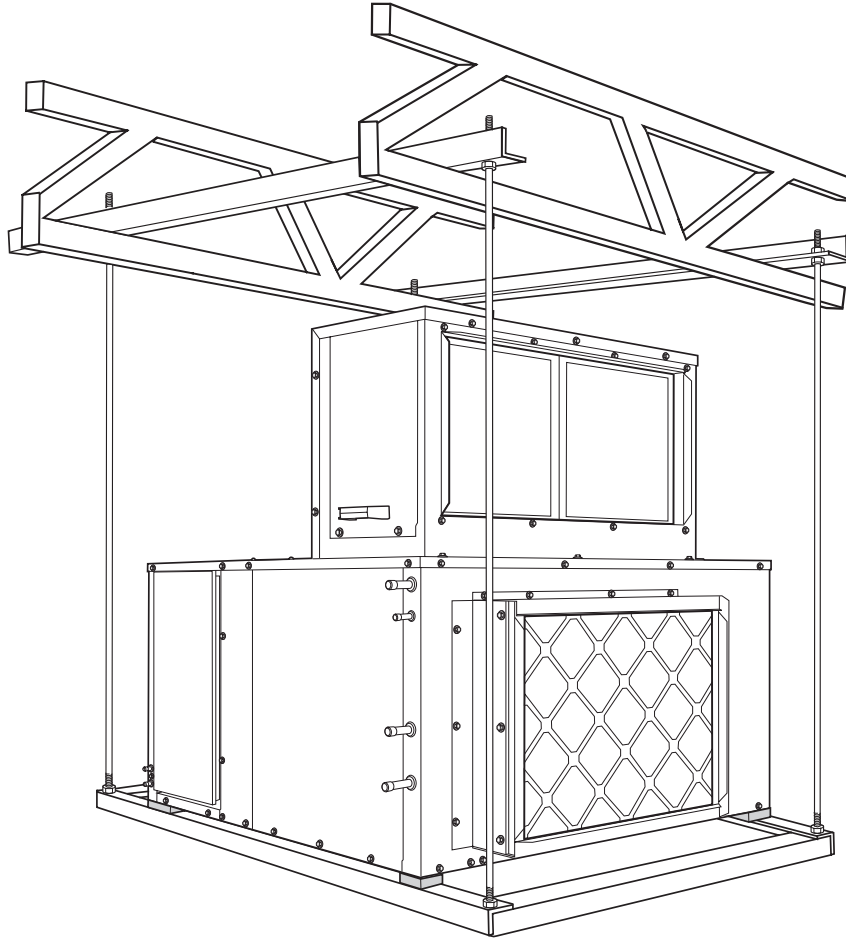


Figure 4 - Typical Suspended Installation - LC Only (LV Units are floor units only)

LV Only - Do not install an indoor-rated dehumidifier in an outdoor or a wet environment.

You must not install a standard dehumidifier in an unconditioned space or where ambient temperatures can fall below 45°F. If you must install the dehumidifier outside or in an unconditioned space, such as an attic, you must use an outdoor-rated dehumidifier. Desert Aire equips outdoor-rated dehumidifiers with weatherproofing and thicker insulation. You can determine whether your dehumidifier is outdoor rated by inspecting the unit rating plate. See section 5.6 for details.

2.2 Duct Installation

Duct design and installation should conform to the latest ASHRAE and SMACNA low velocity duct standards. See section 5.2 for details. Undersized restrictive ductwork with abrupt turns or transitions can decrease the efficiency and the moisture removal capacity of your dehumidifier and may lead to unit failure. Size the ductwork for an acceptable air pressure drop at the airflow volume of your dehumidifier. Use neoprene flex connectors when you attach ductwork to the dehumidifier to prevent transmission of excess vibration and noise.

Model Size	Airflow Rate (CFM) (LC Only)	Airflow Rate (CFM) (LV Only)	External Static Pressure (ESP) digit 9 for LC non-packaged (A, B, C, K, L, M); digit 10 for LV (A, D)	External Static Pressure (ESP) digit 9 for LC non-packaged (D, E, F, N, P, R); digit 10 for LV (B, F)	External Static Pressure (ESP) digit 9 for LC non-packaged (G, H, J, S, T, U); digit 10 for LV (C, G)
01 (LC Only)	540	-	0.5" WC	1.0" WC	1.5" WC
02 (LC Only)	950	-			
03	1400	1400			
04	1900	2100			
05	2300	3000			
06	3000	3400			
08	3500	3800			
10 (LC Only)	4100	-			
12 (LC Only)	5500	-			
15 (LC Only)	8000	-			

Figure 5 - LC and LV Series Standard Unit Airflow Specifications

Select the grilles, registers and diffusers for low static pressure loss, required throw distance, and the specified CFM rating. You can find this information in most grille manufacturer's catalogs. If you are installing the grilles in a corrosive environment, choose components made from anodized aluminum.

If you must install ductwork in an unconditioned area, use fiberglass duct wrap with vapor barrier facing. You must install the outdoor air intake away from all sources of airborne contamination such as exhaust fans or plumbing vents. You can use galvanized sheet metal ducts for most applications. However, you should use aluminum or stainless steel ducts for extreme applications such as chemical-laden environments.

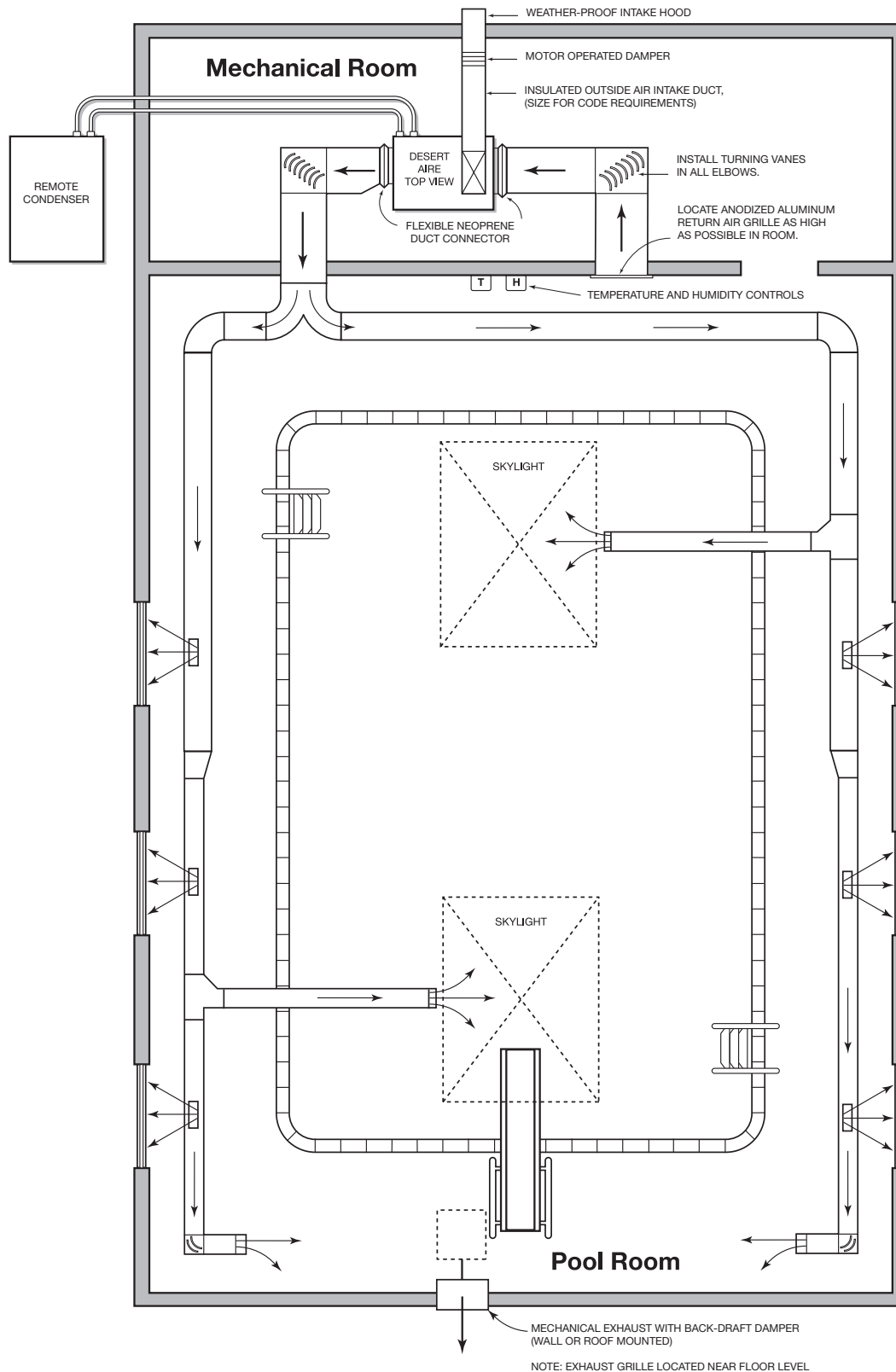


Figure 6 - Basic Pool Room Layout

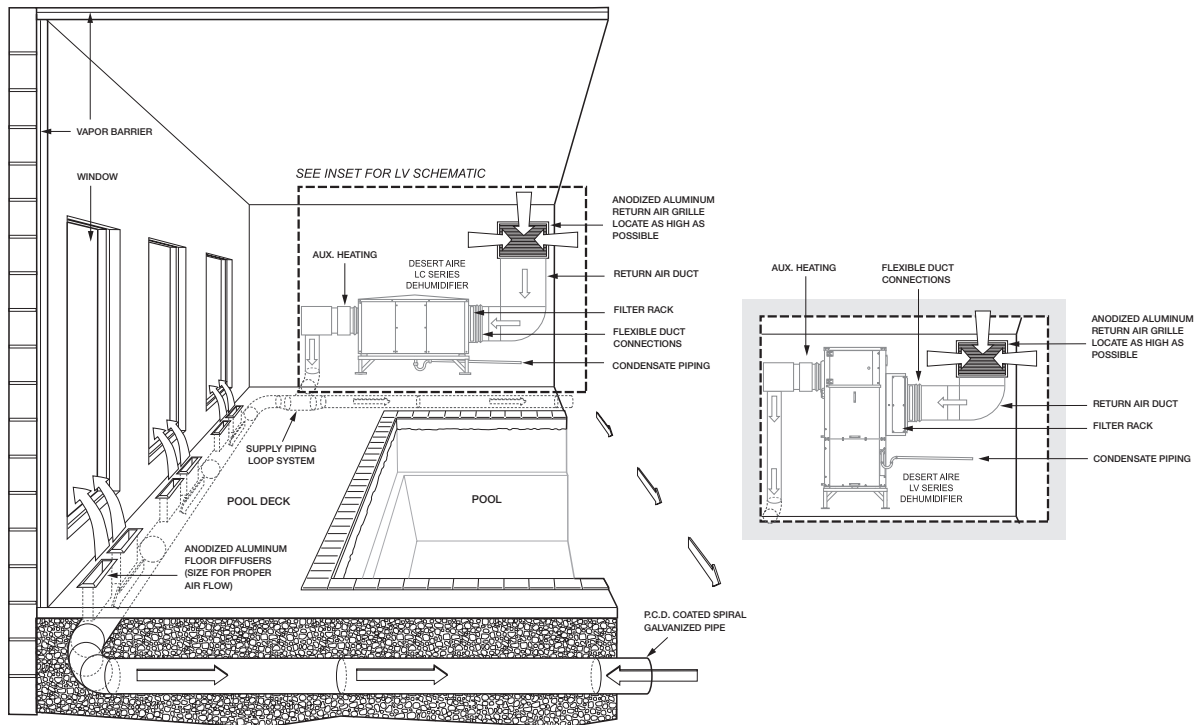


Figure 8 - Under-Floor Duct Layout

2.3 Condensate Drain Piping

! CAUTION

Condensate drain lines installed in an unconditioned space must be heat taped to prevent freezing. Check the heat tape yearly before winter operation.

The condensate drain connection may be on the side or the bottom of the dehumidifier, depending on the size and style of cabinet used. Use concrete blocks or steel dunnage to raise the dehumidifier high enough above the floor to provide clearance for the field-supplied condensate drain trap.

Note: Dehumidifiers with gas heating option may have condensate form inside the furnace heat exchanger since it is located downstream from the cooling coil.

Note: While the supply blower runs, the drain pan area inside the dehumidifier operates at a negative pressure. Your unit requires a p-trap in the condensate drain pipe to prevent condensate from being drawn into the cabinet of the dehumidifier.

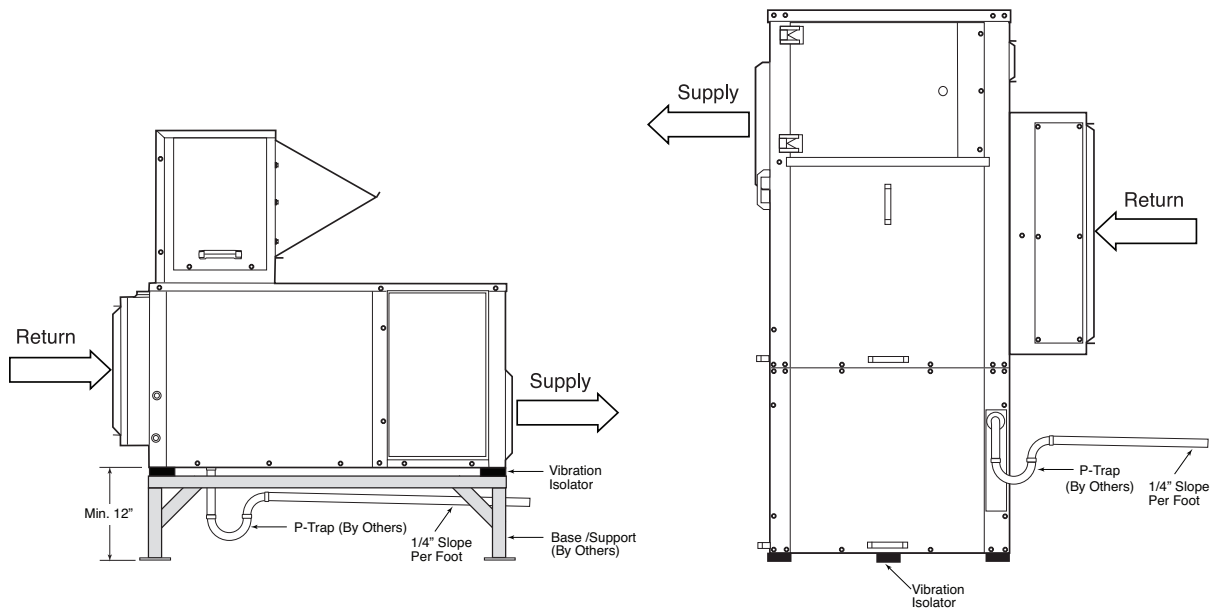


Figure 9 - Condensate Piping

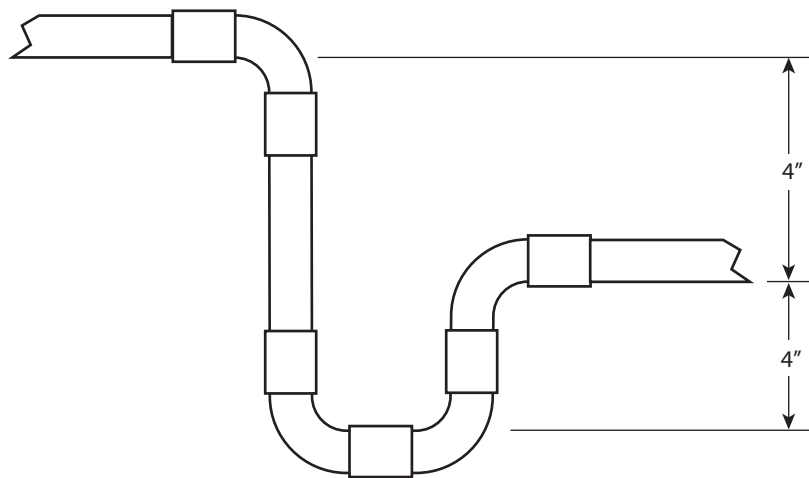


Figure 10 - Sectional View of Condensate Trap Requirements

Trap the condensate as shown in Figure 9. The P-trap dimensions in Figure 10 are sized for a maximum return air static of 2.0" of water. If your return air static exceeds this specification, consult Desert Aire for help in resizing the P-trap.

You may also need to install a cleanout tee or plug near the trap. Note that the drain opening in the drain pan is off-center to simplify its cleaning and servicing. Once you have designed and installed the trap, follow this sequence:

1. Connect the trap to a main drain line with 1/4" of downward pitch per linear foot of run.
2. Support the drain pipe every five feet to prevent sagging.
3. After you install the drain piping, prime the trap by pouring water into the drain pan of the dehumidifier.

! CAUTION

Condensate drain lines installed in an unconditioned space must be heat taped to prevent freezing. Check the heat tape yearly before winter operation.

2.4 Water Heating Applications

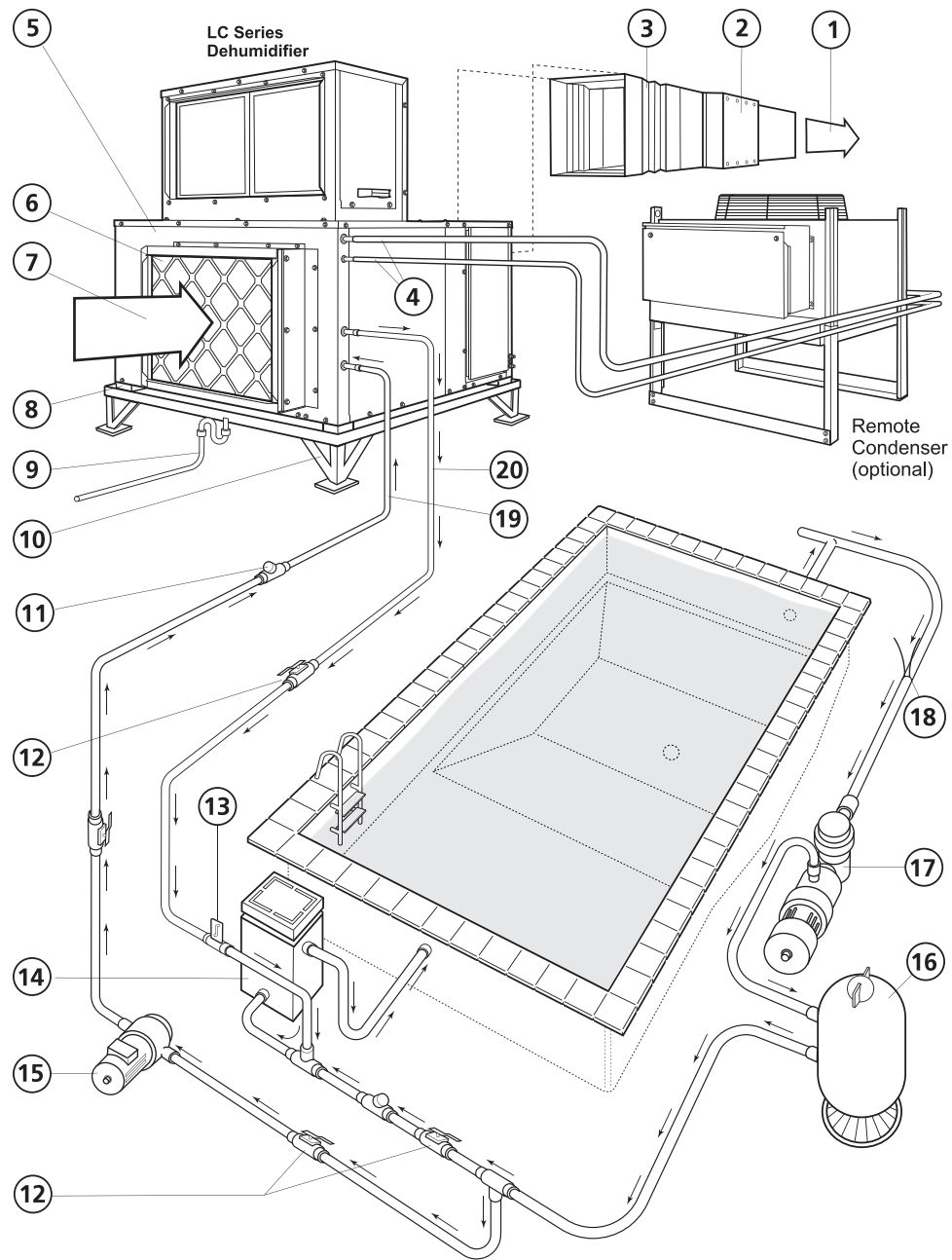
2.4.1 Water Piping Connections

Desert Aire LC and LV Series dehumidifiers equipped with pool water heating condensers must be connected to pool water filtration lines to operate as intended. The dehumidifier water supply circuit must tap into the main pool water line downstream from the main filter. If the main pool circulating pump is large enough, you can use a manual throttling valve to divert a portion of the water to the dehumidifier. Normally, you must size and install an auxiliary water pump which can handle the unit's required water flow rate, which is listed in Figure 11. If you are using a water source other than a pool or a spa (such as a chilled water loop), the required flow rate has been printed on a label affixed near the water line stubs of the dehumidifier.

Model Size	Water Flow Rate and Pressure Drop Pool Application	Water Flow Rate and Pressure Drop Spa Application	Water Flow Rate and Pressure Drop Partial Pool/Spa Application
01 (LC Only)	2 GPM @ 5.5 ft W.C.	3 GPM @ 10.6 ft W.C.	1 GPM @ 1.8 ft W.C.
02 (LC Only)	4 GPM @ 6.9 ft W.C.	5 GPM @ 9.9 ft W.C.	1 GPM @ 1.8 ft W.C.
03	6 GPM @ 5.3 ft W.C.	8 GPM @ 8.5 ft W.C.	2 GPM @ 2.3 ft W.C.
04	8 GPM @ 6.1 ft W.C.	11 GPM @ 9.1 ft W.C.	2 GPM @ 2.3 ft W.C.
05	10 GPM @ 5.7 ft W.C.	13 GPM @ 8.3 ft W.C.	5 GPM @ 3.9 ft W.C.
06	12 GPM @ 9.2 ft W.C.	16 GPM @ 14.8 ft W.C.	5 GPM @ 3.9 ft W.C.
08	16 GPM @ 9.0 ft W.C.	18 GPM @ 10.8 ft W.C.	9 GPM @ 4.8 ft W.C.
10 (LC Only)	20 GPM @ 5.7 ft W.C.	26 GPM @ 8.3 ft W.C.	9 GPM @ 4.8 ft W.C.
12 (LC Only)	24 GPM @ 7.4 ft W.C.	31 GPM @ 9.7 ft W.C.	10 GPM @ 6.9 ft W.C.
15 (LC Only)	30 GPM @ 5.7 ft W.C.	39 GPM @ 8.3 ft W.C.	14 GPM @ 7.2 ft W.C.

Figure 11 - Standard Unit Water Flow Rates for LC and LV Units

A typical water circuit arrangement is shown in Figure 12. To simplify the commissioning and servicing of this job, you should install a flow meter and isolation valves in the pool water lines which feed the dehumidifier.



LEGEND

1	Supply Air
2	Duct Heater (Gas, Electric, Etc.)
3	Flex Duct Connector
4	Piping to Remote Condenser
5	Desert Aire LC Dehumidifier
6	Filter Rack Assembly with Filters
7	Return Air
8	Vibration Isolators
9	P-Trap
10	Base (If Required)

11	Check Valve
12	Ball Valve
13	Flow Meter
14	Main Pool Heater
15	Auxiliary Pump
16	Filter Assembly
17	Main Pool Pump
18	Water Temp Sensor (Dry Well)
19	Water Inlet
20	Water Outlet

Figure 12 - Proper Pool Water Heating Installation for Desert Aire LC and LV dehumidifiers

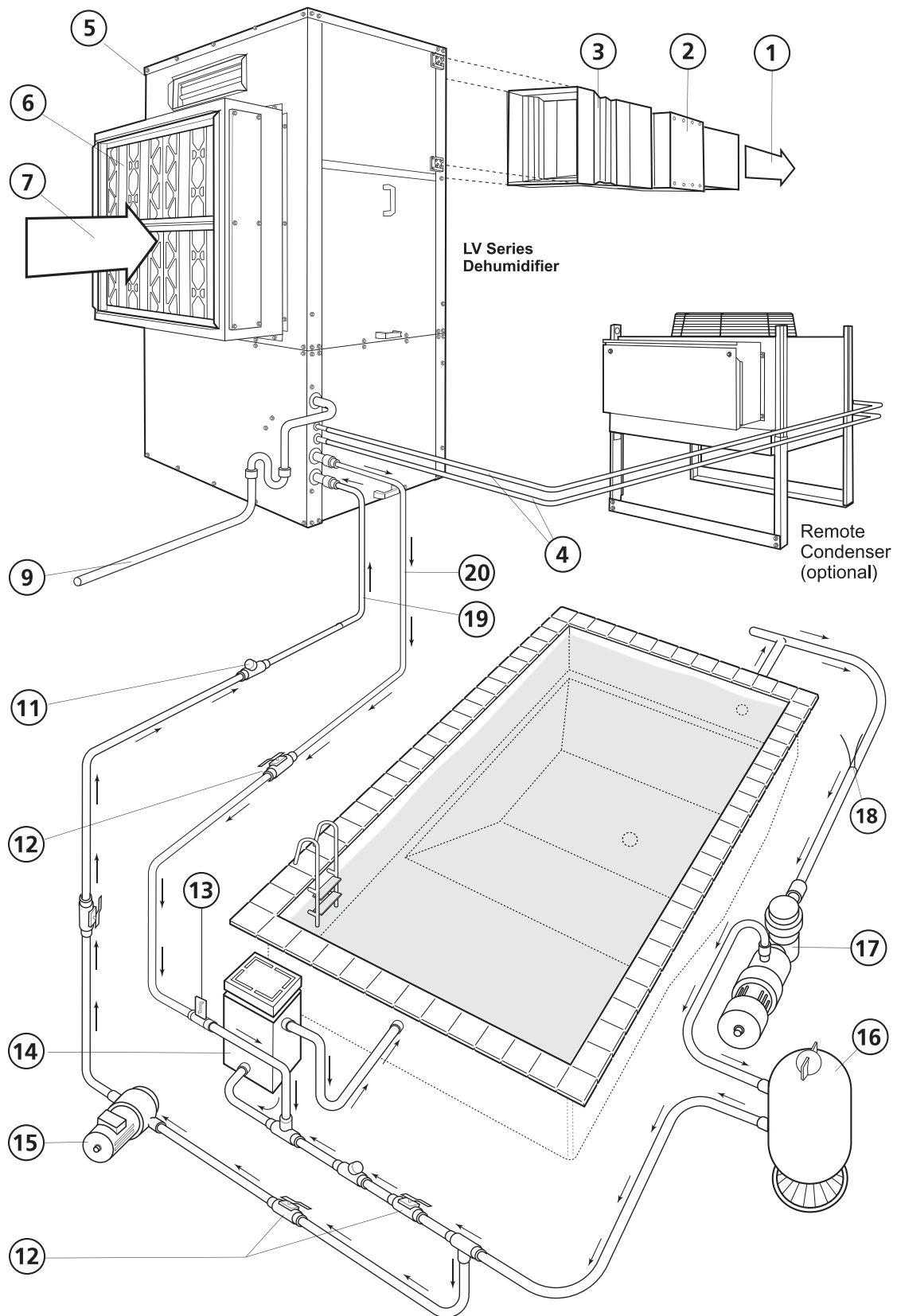


Figure 13 - Proper Pool Water Heating Installation for Desert Aire LV dehumidifiers

2.4.2 Low Water Flow Protection

Desert Aire LC and LV Series dehumidifiers are equipped with a factory-installed water flow switch. This switch prevents the unit from running in the water heating mode if there is a loss of water flow. Desert Aire recommends continuous water flow to the unit to prevent vapor lock, pump cavitations, and nuisance head pressure trips.

2.5 Remote Condenser (Optional)

Important: Refer to the separate Air Cooled Condensers Installation and Operation manual for additional details on line design, traps, clamping, and other condenser installation requirements.

LC and LV dehumidifiers installed with remote condensers may require additional oil and refrigerant charge at the time of field installation. For reference, the factory charge of the dehumidifier is shown in Figure 14. Additional field installed charge is shown for each unit size, allowable line length, and remote condenser for standard units are shown in Figures 15 and 16. Note that custom systems or non-standard line configurations may have been specified. Refer to the submittal documentation or label adjacent to the remote condenser connections to confirm the charge and lines for those systems.

Unit Factory Refrigerant Charge (Lbs.)

Unit Size	R-410A Refrigerant (Lbs.)
01	9
02	14
03	16
04	19
05	22
06	26
08	26
10	44
12	44
15	70

Figure 14 - Unit Factory Charge

Standard Remote Condenser (RCS) Line Sizes and Additional Charge

	Line Length (ft.)	Line Diameter (In. OD)		R-410A Charge (lbs.)									
		Discharge Line	Liquid Line	RC5S008CXXXXXXX	RC5S013CXXXXXXX	RC5S018CXXXXXXX	RC5S024CXXXXXXX	RC5S032CXXXXXXX	RC5S039CXXXXXXX	RC5S046CXXXXXXX	RC5S053CXXXXXXX	RC5S060CXXXXXXX	***ALL (ONLY AVAILABLE IN 1-PHASE)
LC01	0 < 25	1/2	1/2	4.9	7.6	10.4	13.3	16.2	19.1	22.0	24.9	27.8	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	1/2	1/2	7.0	9.8	12.5	15.6	18.4	21.3	24.2	27.1	30.0	
	51 < 75	5/8	1/2	9.4	12.1	14.9	17.8	20.6	23.5	26.4	29.3	32.2	
	76 < 100	5/8	1/2	11.6	14.3	17.1	20.0	22.8	25.7	28.6	31.5	34.4	
LC02	0 < 25	1/2	1/2	4.9	7.6	10.4	13.3	16.2	19.1	22.0	24.9	27.8	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	5/8	1/2	7.0	9.8	12.5	15.6	18.4	21.3	24.2	27.1	30.0	
	51 < 75	5/8	1/2	9.4	12.1	14.9	17.8	20.6	23.5	26.4	29.3	32.2	
	76 < 100	5/8	1/2	11.6	14.3	17.1	20.0	22.8	25.7	28.6	31.5	34.4	
LC03 / LV03	0 < 25	5/8	1/2	10.5	13.4	16.3	19.2	22.1	25.0	27.9	30.8	33.7	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	5/8	1/2	12.7	15.6	18.5	21.4	24.3	27.2	30.1	33.0	35.9	
	51 < 75	3/4	1/2	15.2	18.1	21.0	23.9	26.8	29.7	32.6	35.5	38.4	
	76 < 100	3/4	1/2	17.6	20.5	23.4	26.3	29.2	32.1	35.0	37.9	40.8	
LC04 / LV04	0 < 25	5/8	1/2	9.6	13.4	17.2	21.0	24.8	28.6	32.4	36.2	40.0	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	3/4	1/2	12.1	15.8	19.5	23.2	26.9	30.6	34.3	38.0	41.7	
	51 < 75	7/8	5/8	18.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	76 < 100	7/8	5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LC05 / LV05	0 < 25	3/4	1/2	9.8	13.5	17.2	21.0	24.8	28.6	32.4	36.2	40.0	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	7/8	5/8	14.7	18.5	22.2	26.0	29.8	33.6	37.4	41.2	45.0	
	51 < 75	7/8	5/8	18.4	22.1	25.8	29.5	33.2	36.9	40.6	44.3	48.0	
	76 < 100	7/8	5/8	22.0	25.7	29.5	33.2	36.9	40.6	44.3	48.0	51.7	
LC06 / LV06	0 < 25	3/4	1/2	13.5	17.2	21.0	24.8	28.6	32.4	36.2	40.0	43.8	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	7/8	5/8	18.5	22.2	26.0	29.8	33.6	37.4	41.2	45.0	48.8	
	51 < 75	7/8	5/8	22.1	25.8	29.5	33.2	36.9	40.6	44.3	48.0	51.7	
	76 < 100	7/8	5/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
LC08 / LV08	0 < 25	7/8	5/8	18.5	19.8	21.1	22.4	23.7	25.0	26.3	27.6	28.9	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	7/8	5/8	22.2	23.5	24.8	26.1	27.4	28.7	30.0	31.3	32.6	
	51 < 75	1 1/8	3/4	31.5	32.8	34.1	35.4	36.7	38.0	39.3	40.6	41.9	
	76 < 100	1 1/8	3/4	37.1	38.4	39.7	41.0	42.3	43.6	44.9	46.2	47.5	
LC10	0 < 25	7/8	5/8	18.5	19.8	21.1	22.4	23.7	25.0	26.3	27.6	28.9	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	1 1/8	5/8	22.9	24.1	25.4	26.7	28.0	29.3	30.6	31.9	33.2	
	51 < 75	1 1/8	3/4	31.5	32.8	34.1	35.4	36.7	38.0	39.3	40.6	41.9	
	76 < 100	1 1/8	3/4	37.1	38.4	39.7	41.0	42.3	43.6	44.9	46.2	47.5	
LC12	0 < 25	7/8	5/8	19.8	25.2	26.6	28.0	29.4	30.8	32.2	33.6	35.0	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	1 1/8	3/4	32.7	32.7	34.1	35.5	36.9	38.3	39.7	41.1	42.5	
	51 < 75	1 1/8	3/4	38.2	38.2	39.6	40.0	41.4	41.8	43.2	43.6	45.0	
	76 < 100	1 1/8	3/4	38.4	43.7	45.1	46.5	47.9	49.3	50.7	52.1	53.5	
LC15	0 < 25	1 1/8	5/8	25.5	34.6	33.0	34.4	35.8	37.2	38.6	40.0	41.4	***ALL (ONLY AVAILABLE IN 1-PHASE)
	26 < 50	1 1/8	3/4	32.7	41.7	40.1	43.1	42.5	45.5	44.9	47.9	47.3	
	51 < 75	1 3/8	7/8	45.0	54.0	52.4	55.4	54.8	57.8	57.2	60.2	59.6	
	76 < 100	1 3/8	7/8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Figure 15 - Standard Remote Condenser (RCS) Line Sizes and Additional Charge

Quiet Series Remote Condenser (RCU) Line Sizes and Additional Charge

	Line Length (ft.)	Line Diameter (In. OD)		R-410A Charge (lbs.)		
		Discharge Line	Liquid Line			
LC01	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC02	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC03 / LV03	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC04 / LV04	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC05 / LV05	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC06 / LV06	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC08 / LV08	0 < 25			NOT AVAILABLE		
	26 < 50					
	51 < 75					
	76 < 100					
LC10				RCUS005CXXXXXX	RCUS006CXXXXXX	RCUS008CXXXXXX
	0 < 25	7/8	5/8	27.3	35.2	32.6
	26 < 50	1 1/8	5/8	31.7	39.6	37.0
	51 < 75	1 1/8	3/4	40.3	N/A	N/A
	76 < 100	1 1/8	3/4	N/A	N/A	N/A
LC12				RCUS005CXXXXXX	RCUS006CXXXXXX	RCUS008CXXXXXX
	0 < 25	7/8	5/8	27.3	35.2	32.6
	26 < 50	1 1/8	3/4	34.8	42.7	40.1
	51 < 75	1 1/8	3/4	40.3	48.2	45.6
	76 < 100	1 1/8	3/4	45.9	53.8	51.2
LC15				RCUS008CXXXXXX	RCUS010CXXXXXX	
	0 < 25	1 1/8	5/8	33.0	47.5	
	26 < 50	1 1/8	3/4	40.1	54.6	
	51 < 75	1 3/8	7/8	52.4	N/A	
	76 < 100	1 3/8	7/8	N/A	N/A	

Figure 16 - Quiet Series Remote Condenser (RCU) Line Sizes and Additional Charge

2.6 High Voltage Wiring

WARNING

1. **Disconnect power before servicing. The unit contains high voltage wiring and moving parts which may cause serious injury or death.**
2. **Failure to properly wire the dehumidifier may create the possibility of shock and can lead to premature system failure.**

Electrical wiring must comply with all national, state, and local codes. Refer to the wiring diagram located inside the electrical section for all wiring connections. To connect main power, attach the supply wires to the three-pole power block for three phase or two-pole power block for single phase units mounted on the electrical panel. Test the phasing of the three phase unit by “bumping” the blower contactor. Verify that the blower rotates in the proper direction. If it rotates the wrong direction, switch any two of the three wires at the power block. For a single phase unit the motors must be re-wired according to the wiring diagrams included with the motor.

To assist in compliance with NEC and local codes, a second lug connected to the service panel in equipment with pool water condensers is provided. This lug is intended to be connected to the pool equipotential bonding grid in the field when required by code. This also removes the possibility of differences in potential between metals in the pool water and the water condenser that may accelerate corrosion. The bonding lug should be connected to the equipotential grid with 8 AWG or larger solid copper conductor.

2.6.1 High Voltage Connections

On single phase units the power supply must have 3 connections (2 power and 1 ground). On three phase units the power supply must have 4 connections (3 power and 1 ground). Connect the power supply wires to the main power block located in the upper section of the electrical compartment.

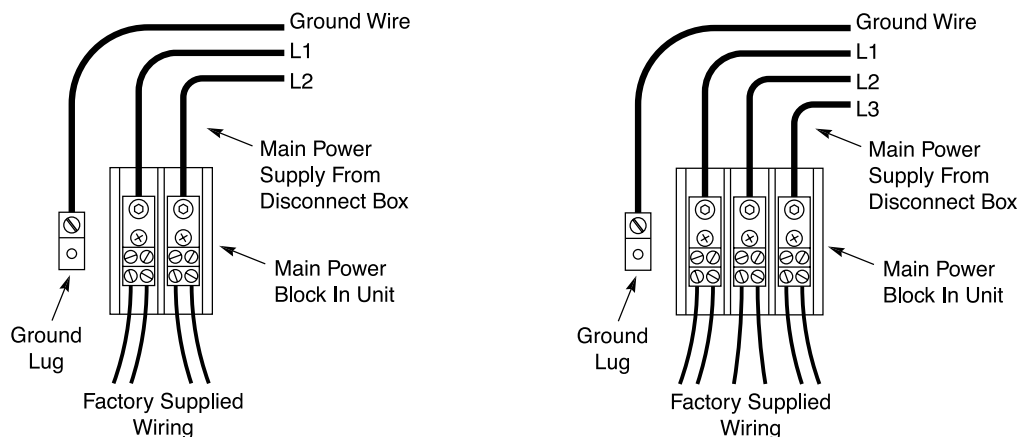


Figure 17 - Single-Phase and Three-Phase System Power Connection

2.6.2 Wire and Fuse Sizing

The field-installed power supply wires and over current protection devices must be sized to handle the minimum amperage of the dehumidifier without exceeding the maximum fuse size rating. Both the minimum ampacity and the maximum fuse size are printed on the unit rating plate.

2.7 Controls and Sensors

The standard Desert Aire LC and LV Series dehumidifiers are controlled by the CM3530 microprocessor controller. This controller is designed for precise monitoring and control of air temperature and relative humidity (RH) within a conditioned environment. The microprocessor has the option for a wall mount sensor or an optional factory mounted return air sensor. A separate controls manual has been provided. Refer to this separate manual for controller and sensor specifications, operation, and options.

2.7.1 Wall Mount Sensor

If your dehumidifier was ordered with a wall-mount humidity and temperature sensor, mount the sensor about five feet above the pool deck on an interior wall with natural air circulation. Avoid the following locations:

- Hot spots near concealed heating pipes, warm air ducts, supply register outlets, or solar radiation.
- Cold spots due to a cold wall or drafts from stairwells, doors, windows, or supply register outlets.
- Dead spots such as behind doors or in corners where room air cannot circulate freely.

2.7.2 Return Air Sensor

The return air sensor is normally used in applications where continuous blower operation is desired. A return air sensor helps ensure consistent conditions throughout the space. A drawback to this sensor is that it relies on a continuous stream of air moving past it. Using a return air sensor with a non-continuous blower may lead to short-cycling of the refrigeration compressor or loss of T/RH control in the space.

2.8 Auxiliary Heating Control Wiring

Note: You must use the Desert Aire control system to control or interlock with the room heating system. This prevents wide fluctuations in room air temperature. It also prevents the heater from trying to heat the room while the dehumidifier is running in cooling.

2.8.1 Auxiliary Heating – Dry Contact Closure

Desert Aire provides a dry contact closure to interlock with the building heating system. This contact closure is normally used to interlock with a gas or electric duct heater which has its own power supply transformer. When the room air temperature

drops below the set point, the dry contact will close to energize the auxiliary heater. See the dehumidifier wiring diagram for details.

2.8.2 Auxiliary Heating – Proportional Signal

Desert Aire provides a proportional signal to modulate a heating coil control valve on units equipped with an integral heating coil.

This signal is reverse acting or direct acting depending on the settings in the controller. It is critical that units with hot water or steam coils be set properly for freeze protection. See controller manual for details on the settings and outputs.

Most proportional valves have either three or four terminals for field-installed wiring.

- Four-terminal valves have two terminals for 24 VAC power and two terminals for the signal input.
- Three-terminal valves have one terminal for the “hot” 24 VAC input, a second terminal for the “positive” signal input, and a third, common terminal for the “neutral” 24 VAC input and the “negative” signal input.

You must follow the instructions included from the valve manufacturer. Observe the proper polarity, or you may damage both the valve and the Desert Aire controller. See the unit wiring schematic for information on signal wire connection points.

2.9 Smoke Alarm Interlock

Desert Aire LC/LV dehumidifiers are equipped with a set of terminal blocks for interlocking with a smoke alarm (alarm provided and installed by others). The contacts must break when smoke is present. This will shut off the blower and compressors. See the dehumidification wiring diagram for connection details.

2.10 Gas Heater (Optional)

Several optional gas heater sizes and configurations are available to provide for heating of the outdoor air during cold conditions. Several sizes, heat exchanger designs, and combinations of capacities are available in natural gas or liquid propane fuel. Additionally, custom configurations can be specified. Installation instructions below are guidelines for installation. Refer to the separate gas heat instruction manual for additional instructions.

2.10.1 Gas Heater Installation

The Desert Aire dehumidifier may be equipped with an optional Category III gas-fired heater to provide air heating during the winter months. You must read and understand the following guidelines and warnings before you connect the heating section. Failure

to follow these guidelines can result in improper and unsafe operation of this equipment, which can cause severe personal injury, death, or substantial property damage. Observe the following precautions:

- Follow all appropriate national and local codes and guidelines when installing gas-heating equipment. Failure to follow CGA, NFPA, and/or ANSI standards may cause equipment damage, personal injury, or death.
- Corrosive environments may reduce heater service life. This furnace is not to be used for temporary heating of buildings or structure under construction. Many of the chemicals used during construction form acid-bearing condensate when burned. This can substantially reduce the life of the heat exchanger.
- Gas heating equipment located indoors requires adequate combustion air. If you install the equipment inside a penthouse or mechanical room, an indoor unit heater and terminal kit must be used.
- Connect this furnace to an approved vent system only. Combustion products must be vented outdoors.
- Use a soap-bubble solution or an electronic detector to check for gas leaks. Never use a lighter or open flame to find leaks.
- The return air duct of the furnace must be sealed air tight to prevent starvation of the combustion air, especially if the furnace is located in a closet or confined area.
- Because of the potential of odorant fade, a gas leak may not be detected by smell. If this equipment is installed below grade, contact your gas supplier for a gas detector.
- Maximum gross stack temperature must not exceed 480°F (249°C) under any circumstances.
- Care must be taken not to wet electronic components during leak test. Wetting the electronic components may damage circuitry and cause a hazardous situation. Dry moisture from all leads and terminals if minor wetting occurs. Wait at least 24 hours for the circuit to fully dry before energizing the burner circuit.
- The gas burner and its individual gas shutoff valve must be disconnected from the gas supply during pressure testing of the gas supply system at pressures in excess of 0.5 psig (14.0" wc).
- Copper and brass tubing and fittings (except tin lined) shall not be used if the gas contains more than a trace (0.3 grains per 100 cubic ft.) of hydrogen sulfide gas. Check with your gas supplier.

- For initial start-up of the furnace after installation, it may be necessary to purge the air out of the gas line. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because it is heavier than air and may accumulate to a dangerous concentration at the floor level.

2.10.2 Gas Piping

Gas supply piping installation should conform with good practice and to national and local codes. The orifice for the burners are sized for either natural gas (having a heating value of 1025 BTU per cubic foot and a specific gravity of 0.60) or for liquefied propane gas (with a heating value of 2500 BTU per cubic foot and a specific gravity of 1.53). If the gas at the installation does not meet this specification, consult the factory for proper orificing.

Seal the opening for the gas supply pipe with the grommet provided.

Gas piping must be large enough to provide adequate gas with minimal pressure drop. Use the table below as a guide to capacity. Packaged units have a single gas heat connection. Ensure that any branch connection is also properly sized for a minimal pressure drop.

Capacity of Piping						
Cubic Feet per Hour based on 0.3" w.c. Pressure Drop						
Specific Gravity for Natural Gas - 0.6 (Natural Gas - 1000BTU/Cubic Ft.)						
Specific Gravity for Propane Gas - 1.6 (Propane Gas - 2550BTU/Cubic Ft.)						
Length of Pipe	Diameter of Piping					
	1/2"		3/4"		1"	
	Natural	Propane	Natural	Propane	Natural	Propane
20'	92	56	190	116	350	214
30'	73	45	152	93	285	174
40'	63	38	130	79	245	149
50'	56	34	115	70	215	131
60'	50	31	105	64	195	119
70'	46	28	96	59	180	110
80'	43	26	90	55	170	104
90'	40	24	84	51	160	98
100'	38	23	79	48	150	92
125'	34	21	72	44	130	79
150'	31	19	64	39	120	73
175'	28	17	59	36	110	67
200'	26	16	55	34	100	61
Length of Pipe	Diameter of Piping					
	1-1/4"		1-1/2"		2"	
	Natural	Propane	Natural	Propane	Natural	Propane
20'	730	445	1100	671	2100	1281
30'	590	360	890	543	1650	1007
40'	500	305	760	464	1450	885
50'	440	268	670	409	1270	775
60'	400	244	610	372	1105	674
70'	370	226	560	342	1050	641
80'	350	214	530	323	990	604
90'	320	195	490	299	930	567
100'	305	186	460	281	870	531
125'	275	168	410	250	780	476
150'	250	153	380	232	710	433
175'	225	137	350	214	650	397
200'	210	128	320	195	610	372
Note: When sizing supply lines, consider possibilities of future expansion and increased requirements.						
Refer to National Fuel Gas Code for additional information on line sizing.						

Figure 18 - Gas Pipe Capacity in Cubic Feet per Hour

Gas connection sizes are shown in Figure 18. Note that these are connection sizes only. Supply lines must be sized based on pressure drop and capacity as indicated in Figure 19.

Model Size	100 - 250	300 - 400
Natural Gas	1/2"	3/4"
Propane Gas	1/2"	1/2"

Figure 19 - Gas Connection Sizes

Gas piping must conform to all applicable codes and standards. Follow standard gas piping practices, including:

- Pitch gas piping downward in the direction of flow so condensed moisture can drain freely.
- Install a drip leg at the lowest point in the gas line to prevent moisture and debris from clogging the gas train. The National Fuel Gas Code requires the installation of a trap with a minimum of 3" drip leg. Local codes may require a longer drip leg, typically 6".
- Install a ground joint union and manual shutoff valve in an accessible position close to the equipment.
- Ensure that the pipe and fittings are free from chips and debris. Make sure that the threads are clean and properly cut.
- Seal pipe threads with pipe dope or a suitable joint compound that is compatible with the gas you are using. Do not use Teflon tape to seal gas pipe joints.
- Support gas piping using suitable straps or hangers to avoid stressing the gas valve or manifold.
- Use a backup wrench when you tighten gas pipe and fittings.
- Piping from the natural gas meter to the furnace shall be in accordance with requirements of the local utility. Piping from the LP tank to the furnace must follow the recommendations of the gas supplier.
- A readily accessible, certified manual shut off valve with a non-displaceable rotor member should be installed within six feet of the gas equipment it serves.

A union or flanged connection shall be provided downstream from the manual valve to permit removal of controls. Provide a 1/8" N.P.T. plugged tapping at the inlet of the gas control for connection of a test gauge to check gas supply pressure to the furnace. Unions must be a ground joint type or flanged-jointed using a gasket resistant to LP gas. Pipe dope or sealant certified to be resistant to the action of liquefied petroleum gases should be used on all threaded joints.

- A drip leg must be used on both LP and natural gas installations prior to the furnace to trap oil, condensate and other impurities which might otherwise lodge in the gas valve or plug the burner orifice. When there is excessive condensation between the gas meter and the furnace, a drip leg shall be provided at the outlet of the gas meter. Failure to install a drip leg may void the warranty on the dehumidifier.
- High fire manifold gas pressure is regulated by the combination valve to 3.5" wc. Inlet pressure to the valve must be a minimum 5" wc or as noted on the rating plate and maximum of 14" wc for natural gas. **Note:** Always check the rating plate for minimum gas supply pressure. Minimum supply pressure requirements vary based on size of burner and gas control option. Most units require a minimum of 5" wc as stated above, but Sizes 350 and 400 with electronic modulation require a minimum of 6" wc natural gas supply pressure.
- **LP Only:** Experience has proved that the pressure drop in the gas line running from the outside propane gas tank to the gas appliances inside is the most frequent cause of equipment malfunctions. A single pressure regulator, located at the tank, will not reliably regulate the high tank pressures (up to 200 psi) down to 11" wc. Varying pressures will occur at the appliances as outside temperatures and usage demands vary. Two-stage regulation is the only effective method of controlling these variables.

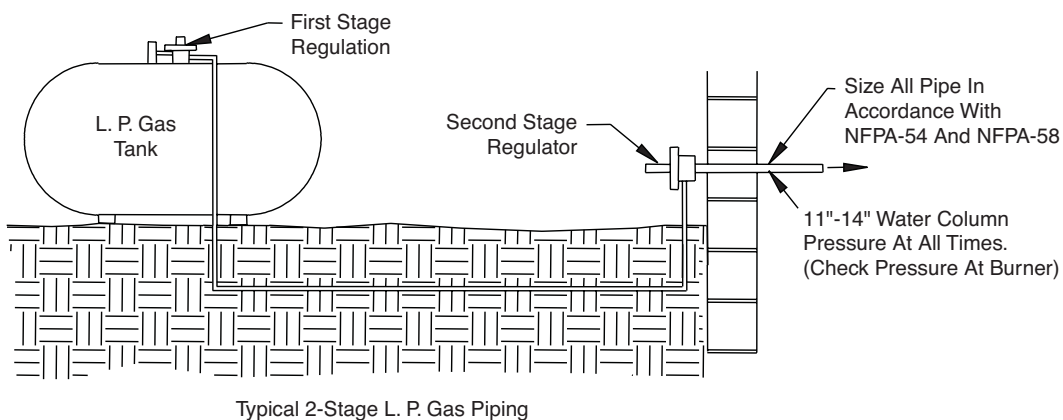


Figure 20 - Recommended LP Gas Piping Method

- **LP Only:** Use the following line size chart to size the gas piping or tubing between the LP tank and the second-stage regulator:

Section 1						Section 2						
	If the length of line between regulators (tank to building) is this long.						If the length of line between second-stage regulator and furnace is this long.					
Use this size tubing to keep pressure drop below 2 lbs. for maximum flow shown.	Total input load (Btu/h) on line	25'	50'	75'	100'	Use this size tubing or pipe to keep pressure drop below 1/2" water column for maximum flow shown.	Total input load (Btu/h) on line	10'	20'	30'	40'	50'
	125,000	3/8" O. D. Copper					75,000	5/8" O. D. Copper				
	250,000	3/8" O. D. Copper		1/2" O. D. Copper			125,000	5/8" O. D. Copper		3/4" Black Pipe		
	375,000	1/2" O. D. Copper					187,500	3/4" Black Pipe				
	500,000	1/2" O. D. Copper					250,000	3/4" Black Pipe				
							375,000	3/4" Black Pipe		1" Black Pipe		
						500,000	1" Black Pipe					

Figure 21- LP Gas Pipe Sizing Information

- **LP Only:** Seamless copper tubing may only be used with gases that are not corrosive to it. See the note below to check with your LP gas supplier before using copper. Seamless copper tubing must comply with standard type K or L for seamless copper water tube, ASTM B 88; or seamless copper tube for air conditioning field service, ASTM B 280.
- **LP Only:** Copper and brass tubing and fittings (except tin lined) shall not be used if the gas contains more than a trace (0.3 grains per cubic ft.) of hydrogen sulfide gas. Check with your gas supplier.
- **LP Only:** Maximum supply pressure for liquefied petroleum (LP) gas is 13.5" wc and minimum supply for purpose of input adjustment is 11" wc.

Before attempting to measure or adjust high fire manifold gas pressure, the inlet (supply) pressure must be within the specified range for the gas being both used when the heater is in operation and on standby. Incorrect inlet pressure could cause excessive manifold gas pressure immediately or at some future time. With the manual valve, on the combination valve, positioned to prevent flow to the main burners, connect a manometer to the 1/8" pipe outlet pressure tap on the valve. Open the valve and operate the heater to measure the manifold gas pressure. **Note:** A manometer (fluid filled gauge) is recommended rather than a spring type gauge due to the difficulty of maintaining calibration of a spring type gauge. Normally adjustments should not be necessary to the factory present regulator. If adjustment is necessary, set pressures to above settings by turning regulator screw IN (clockwise) to

increase pressure. Turn regulator screw OUT (counter clockwise) to decrease pressure. Consult the valve manufacturer's literature provided with the heater for more detailed information.

2.10.3 Gas Heater Location

The following items must be considered when choosing the size and location of the furnace. Note that dehumidifiers designed for outdoor use are already equipped with combustion air intakes and venting means.

- All local codes and/or regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform to these instructions, regulations of the National Fire Protection Association, provisions of National Electrical Code (ANSI/NFPA70 latest edition), and the National Fuel Gas Code (ANSI Z223.1 latest edition).
- Definitions of "combustible material" and "non-combustible material" as issued by ANSI Z223.1 are as follows:
 - Combustible Material: Material made of or surfaced with wood, compressed paper, plant fibers, plastics or other material that will ignite and burn whether flameproof or not or whether plastered or not.
 - Non-Combustible Material: Material which will not ignite and burn; such materials consisting entirely of steel, iron, brick, concrete, slate, glass, plaster, or combination thereof.
- Measures should be taken to prevent the entry of corrosive chemicals or vapors to the combustion and ventilation air supply. Such chemicals include but are not limited to chlorinated and/or fluorinated hydrocarbons such as found in refrigerants, aerosol propellants, dry cleaning fluids, degreasers, and removers. Other harmful compounds may come from bleaches, air fresheners or mastics. Vapors from such products can form acid compounds when burned in a gas flame. Should acid compounds form in your furnace; it may reduce the life of the furnace. Please follow these guidelines for providing outside air directly to the appliance to avoid this problem.
- The return air duct of the dehumidifier must be sealed air tight to prevent starvation of the combustion air, especially if the burner is located in a confined area.

Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this separated combustion system is responsible for the installation.

Hazards of Chlorine – The presence of chlorine vapors in the combustion air of gas-fired heating equipment presents a potential corrosive hazard. Chlorine, found usually in the form of Freon or degreaser vapors, when exposed to flame, will precipitate from the compound, and go into solution with any condensation that is present in the heat exchanger or associated parts. The result is hydrochloric acid which readily attacks all metal including 300 grade stainless steel. Care should be taken to separate these vapors from the combustion process. This may be done by wise location of unit vent terminal and combustion air inlet with regard to exhausters or prevailing wind directions. Remember, chlorine is heavier than air. This fact should be kept in mind when determining installation location of these heaters and building exhaust systems.

WARNING

Desert Aire units are not designed or approved for use in atmospheres containing flammable vapors or atmospheres highly laden with chlorinated vapors.

The addition to following the requirements outlined by local codes, follow the guidelines below when locating the vent terminal to help ensure trouble-free operation of your horizontally vented burner:

- Avoid locating the vent terminal on a wall facing the prevailing winds or wide-open areas. When this is not practical, choose locations that protect the vent from strong wind, such as behind a fence or a hedge. (**Note:** The vent terminal must be located sufficiently distant from bushes, shrubs and vegetation so as not to have the flue products restricted or blocked by such vegetation.).
- In areas with considerable snowfall, locate the vent terminal higher than the recommended minimum 12 inches above the ground as protection from blockage by snow accumulation or drifting.
- Locating the vent terminal as close as possible to the outside corner of a building rather than centered on an open wall will also minimize the effect of direct winds. Avoid alcoves and similar areas that may increase wind loading of the vent termination.

Follow these steps outlined in the National Fuel Gas Code, NFPA 54/ANSI Z223.1 – latest edition to resize the vent system to approach the minimum size using the appropriate tables in the Appendix of that code. The National Fuel Gas Code may be obtained by writing the American Gas Association Laboratories, 8501 East Pleasant Valley Road, Cleveland, OH 44131 or the National Fire Protection Association, Batterymarch Park, Quincy, PA 02269.

Refer to the documents located in the heater module for more detail instructions on installation on your specific terminal unit.

2.11 Electric Heater (Optional) For Packaged Products

In order to keep the controls of the electrical heater cool, there are two openings in the panel adjacent to the heater. The hoods for rain protection of these openings are shipped with the unit, and the mounting hardware is already in place. Mount the hoods over the heater cooling openings using this hardware.

2.12 Auxiliary Heat Coil Piping (Optional)

The Desert Aire dehumidifier may be equipped with an optional hot water or steam air heating coil. This coil, when properly sized, will provide space heating during the winter months. Use proper practice when designing and installing the coil piping to prevent poor coil performance, shortened service life, or damage to the coil.

- The supply connections must not be supported by the coil headers.
- The control valve should be sized according to the pressure and flow rate requirements not by the coil connection size.
- On steam systems, use strainer, dirt pockets, and isolation valves to prevent clogging the control valve and to simplify service.
- Install swing joints in the connection piping to prevent damage to the coil header from thermal expansion.
- Use a backup wrench on the pipe stubs when attaching connections to prevent damage to the header.

2.13 Roof Curb w/ Wood Nailer (if applicable)

Certain options for curbs shipped with the packaged units include a treated wood nailer and flashing installed on the side of the curb. This allows for draining of the pan installed under the condenser section. The nailer and flashing should be carefully inspected on final installation of the roof material. Any separation of the flashing from the curb due to transportation and lifting will cause water to penetrate behind the flashing and past the roof materials. Re-caulk as required to close any gaps that may have occurred.

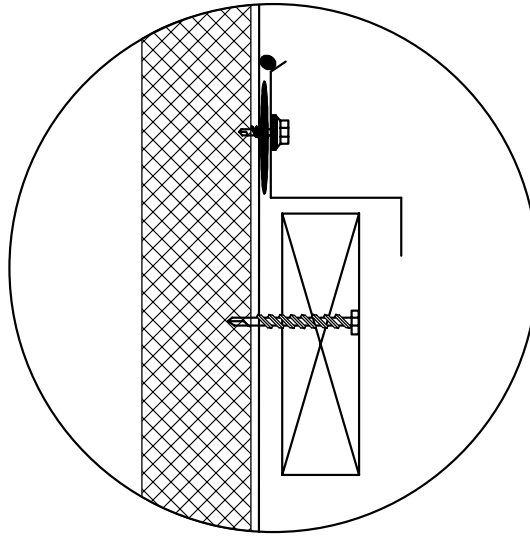


Figure 22 - Wood Nailer

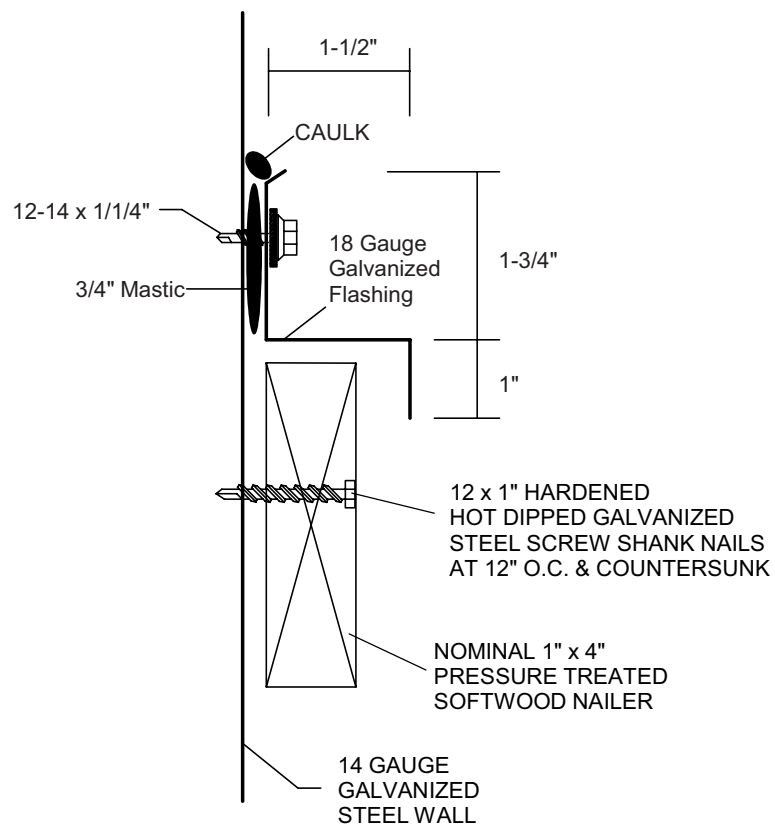


Figure 23 - Wood Nailer Detailed

3. Start-up Procedure

Read this section thoroughly before attempting to commission the Desert Aire dehumidifier. A complete start-up will minimize operational problems and expensive callbacks. The start-up will be quicker and easier if there is a heat and humidity load present in the space. Energize any auxiliary heaters before start-up so that the air is at the design temperature.

3.1 Preliminary Inspection

Verify that all contractors have completed their work. Find the Desert Aire “LC and LV Start-Up Report,” which is normally placed inside this manual within the electrical compartment of the dehumidifier. You must fill out the start-up report to validate the dehumidifier warranty.

Check the following items:

- Before starting unit, remove wooden shipping blocks found beneath compressor(s).
- Before starting unit, remove shipping restraining brackets on supply blower equipped with a spring isolation base, if applicable.
- Make sure that the unit is level and securely mounted so that it cannot shift or transmit vibration to the building.
- Verify that the incoming power supply matches the rating plate of the dehumidifier. The available power supply voltage must be within $\pm 5\%$ of the voltage printed on the rating plate.
- With the power supply disconnected and locked, tighten all field and factory electrical connections.
- Check and adjust the belt tension for proper deflection at the mid-point of the blower belt(s).
- The deflection is based on the belt length. The belt length can be found on the belt itself. Determine the force using the Belt Deflection Force table below.

Specified Belt Deflection	
Belt Length	Deflection
25" to 50"	0.25"
51" to 70"	0.375"
71" to 110"	0.625"

Figure 24 - Specified Belt Deflection Table

Belt Deflection Force						
HP	New Belt Force (lbs.)			Used Belt Force (lbs.)		
	1 Belt	2 Belts	3 Belts	1 Belt	2 Belts	3 Belts
0.5	3			2 - 2.5		
1						
1.5						
2						
3	7			5 - 6		
5						
7.5						
10	12	7		9 - 10	5 - 6	
15						
20		12			8 - 9	
25						
30		12	12		8 - 9	
40						

Figure 25 - Belt Deflection Force Table

- Inspect the air filters and coils to assure they are clean. If necessary, clean the coils and install new filters.
- Check the field and factory piping for leaks. The internal piping may have been damaged during shipping.
- Purge any air, dirt, or debris from water lines (if used) to avoid clogging the internal passages of optional heating coils or water side heat exchangers.
- Check the drain pan and the condensate piping. Test the drain and prime the p-trap by pouring water into the drain pan.
- Verify that all service valves in the refrigeration lines are fully open.

3.2 Gas Heater Start-Up (Optional)

This optional furnace does not have a pilot. It is equipped with an igniter that automatically lights the burner. Do not attempt to light the burner by hand. Check the following items before the initial start-up:

- Check all wiring for loose connections and proper hookup. Leak test the gas piping connections.
- Check the rubber tubing to the inducer fan pressure switch to make sure it is pushed firmly onto the pressure tap

It may be necessary to purge the air out of the gas line for initial start-up of the furnace after installation. This should be done by a qualified heating contractor. If excessive gas escapes when purging the gas supply at the union, allow the area to ventilate for at least 15 minutes before attempting to start the furnace. LP gas is especially dangerous because it is heavier than air and can accumulate to dangerous concentrations at floor level. Heat exchanger oil will burn off on initial firing creating an unpleasant odor. To prevent this odor from occurring more than once, open doors and windows and run the blower for at least 30 minutes or until odor disappears.

The orifice for the burners was sized for either natural gas (having a heating value of 1025 BTU per cubic foot and a specific gravity of 0.60) or for liquefied propane gas (with a heating value of 2500 BTU per cubic foot and a specific gravity of 1.53). See the rating plate of your dehumidifier to determine which type of fuel the heater is configured for.

To verify the actual input of your natural gas burner, proceed as follows:

- Call your gas supplier and ask for the BTU content (heating value) of one cubic foot of the gas supplied to the installation area. An alternate approach is to assume a value of 1025 BTU/ft³, which is the national average.
- With all other gas appliances turned off, operate the burner for at least ten minutes. After the equipment has warmed up, use a stop watch to clock the time required for the small dial on the gas meter to make one full revolution. A label on the meter will state how many cubic feet have flowed per revolution (usually one, two or five).

$$\text{Input BTU/hour} = (\text{BTU/ft}^3 \times \text{ft}^3 \times 3600 \text{ seconds}) / (\text{seconds} / \text{revolution})$$

$$\text{EXAMPLE: } (1025 \text{ BTU/ft}^3 \times 2 \text{ ft}^3 \times 3600) / 74.8 \text{ seconds} = 98,663 \text{ BTU Input}$$

Check for the input of the burner, the type of gas, and the required manifold pressure on the rating plate located on the exterior of the dehumidifier.

Make sure that the gas supply pressure to the furnace falls within the maximum range of 6" to 14" wc pressure for natural gas and 11.0" to 14.0" wc for LP gas. The pressure to the furnace must be checked while the furnace burner and any other gas appliances on the same supply system are operating.

The burners are equipped with fixed orifices sized for the manifold pressure shown on the rating plate. The input can only be increased or decreased by adjusting the manifold pressure. Remove the 1/8" threaded pipe plug located on the top right side of the gas valve.

Use a U tube manometer or a pressure gauge to measure the pressure. To adjust the pressure, remove the screw from the regulator on the outlet side of the gas valve. Turn the adjustment screw counterclockwise to decrease the pressure or clockwise to increase the

pressure. ADJUSTMENTS TO THE LISTED PRESSURE MUST NOT EXCEED 0.3" wc. A 0.3" wc adjustment will increase or decrease the input approximately 0.4%. Replace the screw cap when the adjustment is complete.

Shut off the gas supply to the furnace. Remove the pressure gauge and re-install the pipe plug using a threaded compound resistant to the action of LP gases.

If the rated input cannot be obtained with the present orifice at the correct pressure, your local gas supplier will assist in sizing the proper orifice. The Desert Aire Service Department will gladly help you size the orifice if you provide them with the heating value in BTU per cubic foot and the specific gravity of the gas.

3.2.1 Burner Adjustment

Burner air shutters are not normally required on natural gas furnaces. Air shutters are required on propane gas units and may require adjustment. Before making any adjustments to the air shutters, allow the heater to operate for about fifteen minutes with the air shutters open. The slotted screw on the end manifold bracket moves the air shutters and adjusts all burners simultaneously. Turning the screw clockwise opens the shutters; counterclockwise closes the shutters. After the furnace has been in operation for 15 minutes, close the air shutters observing the flame for yellow-tipping. Open the shutters until the yellow disappears. A limited amount of yellow tipping is permissible for liquefied petroleum gases. Natural gas should not display any yellow-tipping. When making the adjustment, close the air shutters no more than is necessary to eliminate the problem condition.

After 15 – 20 minutes of continuous operation, the air temperature rise across the burner must be no higher than 85°F. If the outlet or supply duct temperature is too high, you must balance the supply airflow.

3.3 Outdoor Air Application

3.3.1 Outdoor Air Option Equipped Units

Construction codes often require you to introduce outdoor air into a commercial building while it is occupied. Desert Aire dehumidifiers can be factory-configured to help you comply with these codes. Several factory-installed options, which are available by special order, can include flanging for an outdoor air duct connection and a fresh air intake box with air filters and a damper.

The CM3530 microprocessor controller can be programmed to set occupied and unoccupied operation times on LC and LV Series dehumidifiers. LC and LV units ordered with the outdoor air intake option are provided with an automatically controlled outdoor air intake damper.

When ordered with an outdoor air intake option, refer to the Desert Aire LC/LV control schematic. NOTE: You must provide a transformer or a power source for the relay R2 and the outdoor air damper and the exhaust blower contactor. An outdoor air intake damper can be factory installed and powered by the unit as well.

You must install an exhaust blower whenever you bring outdoor air into a dehumidified room. Without the exhaust fan, the room would be at a positive pressure. This increased room pressure can drive moisture and chlorine odors into insulation, building materials, and adjacent rooms. Size the exhaust blower to maintain the dehumidified room at a neutral or slightly negative pressure.

You must install the outdoor air intake away from any sources of airborne contamination such as exhaust fans or plumbing vents. You must also filter the outdoor air before it comes in contact with any coils. Insects and debris in the unfiltered air will rapidly clog the dehumidifier's reheat condenser coil, which will lead to repeated service calls and eventually equipment damage.

If mixed air temperatures in the system's blower compartment falls below 45°F an internal safety thermostat will de-energize and override a call for outdoor air. This safety mode will remain active until mixed air temperatures in the blower compartment rise above 55°F. **IF OUTDOOR TEMPERATURES IN CONJUNCTION WITH YOUR OUTDOOR AIRFLOW RATE ARE CAPABLE OF TRIPPING THE SAFETY THERMOSTAT, YOU MUST INSTALL AN OUTDOOR AIR PRE-HEATING COIL.** Refer to section 3.3.4 to determine if the pre-heating of outdoor air is required for your application. An example of proper outdoor air installation is shown in Figure 20.

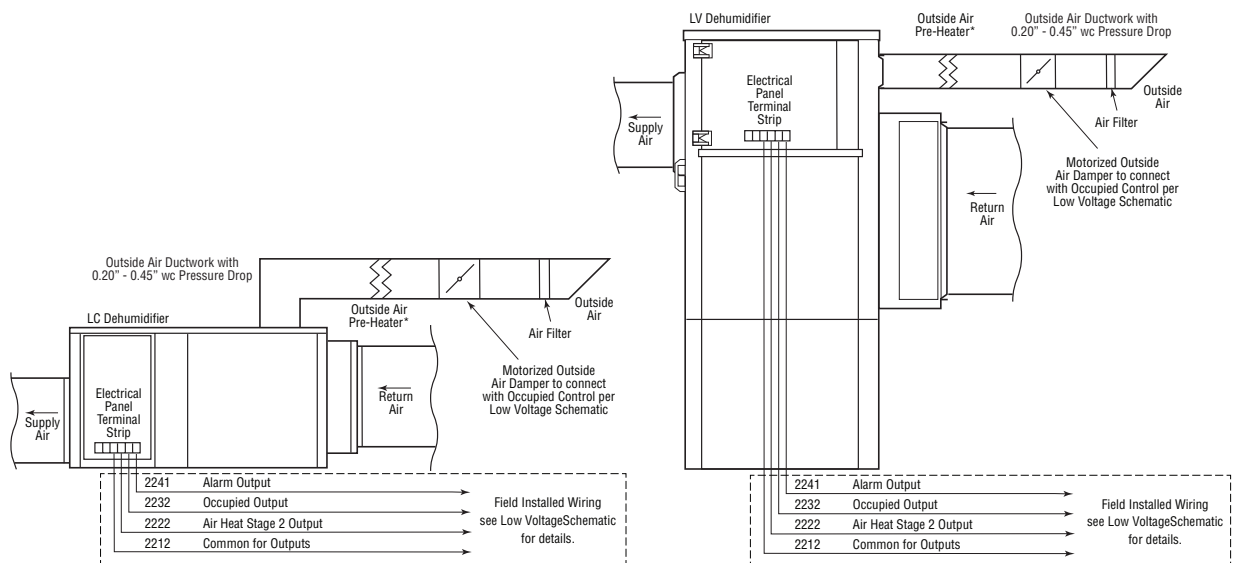


Figure 26 - Proper Installation for an Outdoor Air Application

NOTE: Desert Aire LC and LV Series dehumidifiers are designed to handle a range of external static pressures. In applications where strict outdoor air code compliance is required, proper system airflow must be determined by a professional balancing contractor. When an approximation of outdoor air volume is all that is necessary, the procedures detailed in section 3.3.5 can be used.

3.3.2 Standard Systems in Conjunction with Outdoor Air

The introduction of outdoor air into the return air duct can lead to a number of problems. This is not recommended and will void the warranty in most instances. Contact the Desert Aire Service Department before proceeding with such an installation. If outdoor air must be added to satisfy code requirements on a non-outdoor air equipped system, it is advised that the intake and exhaust be connected directly to the space being conditioned. **SYSTEM FAILURES CAUSE BY IMPROPER OUTDOOR AIR INSTALLATIONS ARE NOT COVERED BY WARRANTY.**

3.3.3 Outdoor Air Supplemental Information

3.3.3.1 LC and LV Operation Modes

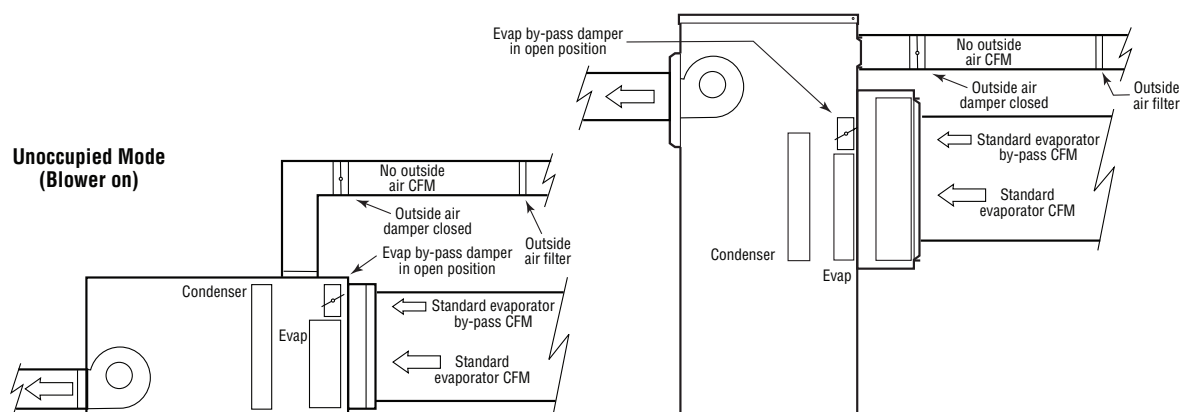


Figure 27- LC Models left; LV Models right - Unoccupied Mode Operation

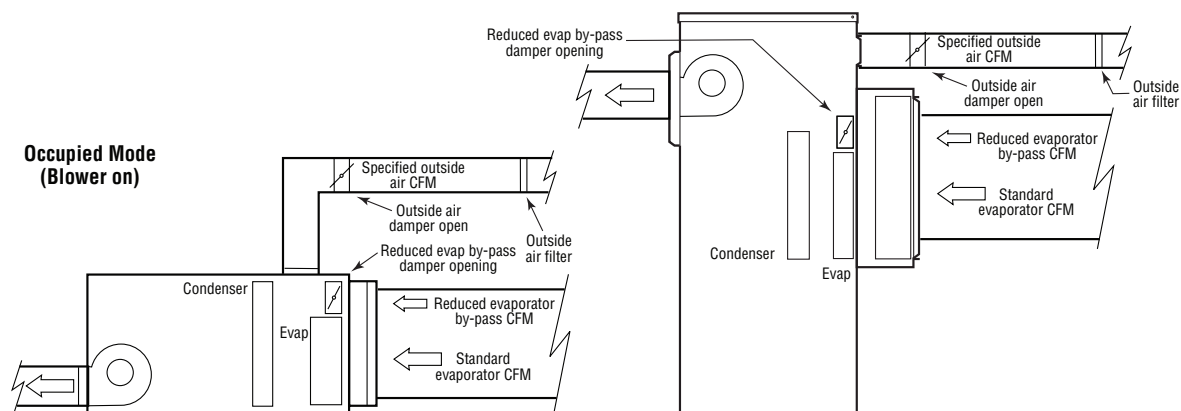


Figure 28 - LC Models left; LV Models right - Occupied Mode Operation

3.3.4 Determining if Outdoor Air Pre-Heating is Required

Desert Aire systems require that outdoor air be pre-heated if mixed air temperatures inside the unit may fall below 45°F. To determine if an application requires outdoor air pre-heating, the following study needs to be conducted:

1. Determine the following:
 - Design return air temperature. For pool rooms, typically 82°F
 - Outdoor air winter design temperature. Use values as specified by design engineer or ASHRAE tables
 - Total system CFM and required outdoor air CFM
2. Determine worst case Mixed Air Temperature (MAT) using the following equation:

$$\text{MAT} = \frac{(\text{winter temp } ^\circ\text{F}) \times (\text{OA CFM}) + (\text{return air temp } ^\circ\text{F}) \times (\text{system CFM} - \text{OA CFM})}{(\text{system CFM})}$$

3. If MAT is less than 45°F, then the pre-heating of outdoor air is required

NOTE:

- Proper system airflow and outdoor air CFM must be confirmed at the time of installation
- Outdoor air duct must be equipped with filters and a motorized damper provided by installing contractor or as optional equipment on Desert Aire dehumidifiers
- Outdoor air duct must be insulated to prevent condensation which may form on the exterior of the duct during winter months

LC EXAMPLE: LC05 (2300 system CFM), pool room application, 500 CFM of outdoor air. Location: Minneapolis, Minnesota. Winter Temp: -16°F

$$MAT = \frac{(-16^{\circ}\text{F}) \times 500}{2300} + \frac{82^{\circ}\text{F} \times (2300 - 500)}{2300} = 60.7^{\circ}\text{F}$$

CONCLUSION: No need for outdoor air pre-heat

LV EXAMPLE: LV05 (3000 system CFM), pool room application, 500 CFM of outdoor air. Location: Minneapolis, Minnesota. Winter Temp: -16°F

$$MAT = \frac{(-16^{\circ}\text{F}) \times 500}{3000} + \frac{82^{\circ}\text{F} \times (3000 - 500)}{3000} = 65.7^{\circ}\text{F}$$

CONCLUSION: No need for outdoor air pre-heat

3.3.5 Approximating Outdoor Air Volume

When servicing or installing a Desert Aire unit, it may be necessary to determine and/or set the amount of outdoor air CFM entering the unit. Proper outdoor air CFM settings can be approximated using two simple equations as follows:

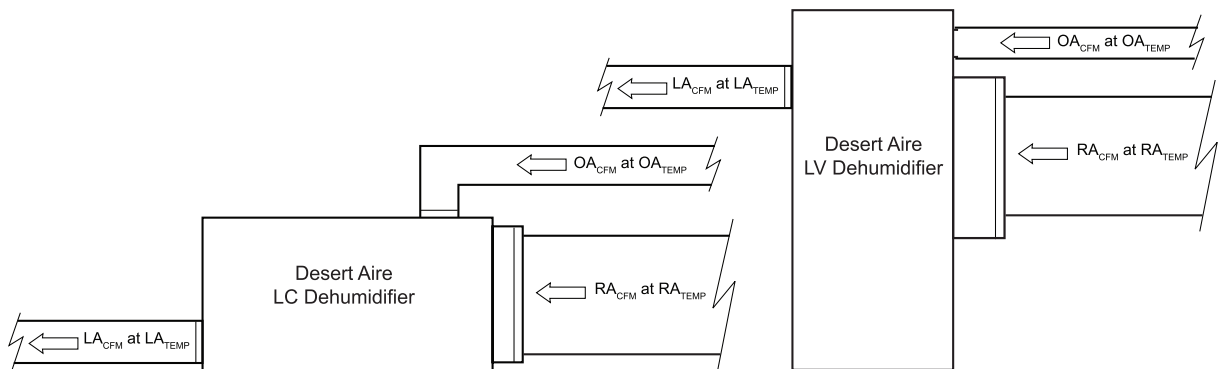


Figure 29 - Approximating Outdoor Air CFM

$$OA_{CFM} = LA_{CFM} \times (LA_{TEMP} - RA_{TEMP}) / (OA_{TEMP} - RA_{TEMP})$$

$$LA_{TEMP} = (OA_{CFM} \times (OA_{TEMP} - RA_{TEMP}) / LA_{CFM}) + RA_{TEMP}$$

NOTE:

- This method is just an approximation! In applications where strict code compliance is required, proper airflow must be determined by a professional testing and balancing contractor.
- Refrigeration circuit must remain inactive during this procedure (blower on only).
- When measuring air temperatures, several readings must be taken across a duct and averaged.

- Proper LA_{CFM} (total system airflow) must be confirmed prior to this procedure. This is done by achieving specified airflow pressure drop across the reheat coil. See section 3.3 for details.

EXAMPLE 1: Determine how much OA_{CFM} is entering an LC05

Measured: $LA_{CFM} = 2300$, $LA_{TEMP} = 73^{\circ}F$, $RA_{TEMP} = 82^{\circ}F$, $OA_{TEMP} = 40^{\circ}F$

Solution: $OA_{CFM} = 2300 \times (73^{\circ}F - 82^{\circ}F) / (40^{\circ}F - 82^{\circ}F) = 490 \text{ CFM}$

3.4 Airflow Balancing

To ensure code compliance and long equipment service life, proper airflow must be verified by a qualified air balancer. Shut off the compressor to prevent the refrigeration system from running while you balance the air.

3.4.1 Units with an EC Blower

The speed of these blowers is controlled by a -10 V signal from the controller. Airflow monitoring is achieved within the unit based on differential pressure measured by a transducer. Airflow rate is maintained by a control loop which varies the signal to the blower in order to achieve the differential pressure as associated with the required airflow.

Once the airflow is adjusted, review the motor current draw. If the current draw is in excess of the current rating listed on the unit nameplate or the drive is unable to achieve the airflow at the maximum setting, the unit may be experiencing external static pressure in excess of the design condition. Check the external static of the ducting to/from the unit and reduce it until it is equal to or less than the design condition indicated on the rating plate. If issues persist, consult the Desert Aire Service Department 262-946-7400. Prior to any calls to the Desert Aire Service Department please have the unit serial number and model number available.

3.4.2 Blower Adjustment Procedure For Non-EC Blower Units

WARNING

Disconnect Power to the Unit before you adjust the Blower.

Change the blower speed by adjusting the motor pulley. To adjust the variable pitch pulley, first loosen the set screw. To slow down the blower, turn the outer pulley face counterclockwise (to decrease its pitch diameter). To speed up the blower, turn the outer pulley face clockwise (to increase its pitch diameter).

After every adjustment be sure to:

- Tighten the set screw against the flat spot on the pulley hub so you don't damage any threads.
- Adjust the belt tension if needed.
- Check to assure that the blower motor current draw does not exceed the rating printed on the rating plate.

If the blower motor current draw exceeds its rating but your airflow is still too low, the static pressure losses in the ductwork and grilles may be higher than the unit was designed for. If this happens, consult the Desert Aire Service Department 262-946-7400. Prior to any call to the Desert Aire Service Department please have the unit serial number and model number.

3.4.3 Airflow Balancing for LC Dehumidifiers Without EC Blower

The total airflow of a Desert Aire LC system can be checked by measuring the static pressure drop across the reheat condensers and the evaporator coils. The dehumidifier features an adjustable blower sheave to simplify air balancing.

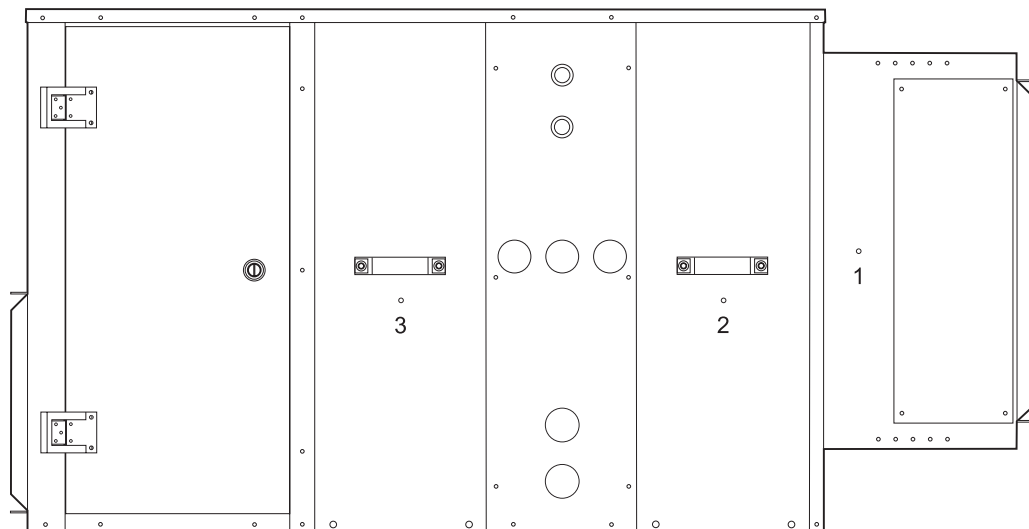


Figure 30 - LC air balance ports

Procedure:

1. Check condition of the air filter(s) to assure that they are clean.
2. Check for any obvious restrictions in the ductwork.
3. Start the supply air blower.

4. Index unit to unoccupied mode. This can be done by setting the number of active occupied schedules to "0" AND ensuring the occupancy jumper is not installed. Building management system network occupancy signal should be indexed to "Off" if equipped. All three methods of occupancy command must be in the unoccupied position. Check the unit display STATUS screen to ensure unit is in the unoccupied mode.
5. Confirm outdoor air damper is closed.
6. Use a manometer or magnehelic pressure gauge to measure the static air pressure differential across the reheat condenser (ports #2 and #3 above). Reading should be within limits indicated in Figure 32. Adjust the fan speed as required to achieve the indicated pressure differential.
7. Use the manometer or magnehelic pressure gauge to measure the static pressure differential across the evaporator coil (ports #1 and #2 above). Reading should be within limits indicated in Figure 33. Adjust the evaporator bypass damper opening by using the control interface to adjust the "Evap" "Unocc" damper setting. This is located in the DAMPER SETTINGS menu under the SERVICE MENU. Adjusting the value to a greater percentage will open the damper and decrease the pressure differential. Adjusting the value to a lower percentage will close the damper and increase the pressure differential. Use only the controls to adjust the damper position. Do not manually limit the stroke of the damper by using mechanical stops.
8. Use a manometer or magnehelic pressure gauge to re-check the static air pressure differential across the reheat condenser (ports #2 and #3 above). Adjust the fan speed as required to achieve the indicated pressure differential.
9. Index unit to occupied mode. This can be done by setting the number of active occupied schedules to "1" and ensuring that the current time is within the occupancy time of the first schedule. Alternatively, the occupancy jumper can be installed or the building management system can be connected and the network occupancy signal should be indexed to "On". Any one of the three methods can be used, but it is recommended that the method that will be used in normal unit operation be tested during this step. Check the unit display STATUS screen to ensure unit is in the occupied mode.
10. Confirm outdoor air damper opens and exhaust fan (by others) is energized.
11. Measure outdoor air flow rate with hood, duct traverse, or other measurement method appropriate for the installation. Airflow rate can be adjusted by the "OA" "Occ" damper setting in the DAMPER SETTINGS menu of the controls.

Note that the flow rates for outdoor air are application specific. Refer to the mechanical equipment schedule or other indication from the building designer for required flow rates.

12. Use the manometer or magnehelic pressure gauge to measure the static pressure differential across the evaporator coil (ports #1 and #2 above). Reading should be within limits indicated in Figure 33. Adjust the evaporator bypass damper opening by using the control interface to adjust the “Evap” “Occ” damper setting.
13. Measure exhaust system air flow rate at the fans or blowers by others with hood, duct traverse, or other measurement method appropriate for the installation. Note that the flow rates for exhaust air are application specific. Refer to the mechanical equipment schedule or other indication from the building designer for required flow rates. Poolroom applications will require the exhaust air flow rate to be greater than the outdoor air to maintain a negative static pressure in the space.

3.4.4 Airflow Balancing for LV Dehumidifiers

The LV series has static pressure sensors up and down stream of the reheat condenser. The hose barb connections (for 3/16 or 1/8” I.D. tubing) of the sensors are accessible in the lower compartment on the LH side of the unit. The sensors are mounted toward the return end through the mid cap/pan. The static pressure sensors are used together with a manometer to measure the static pressure differential across the heat exchanger. Connect the sensors to a manometer with appropriate hoses to measure the pressure drop (in inches of water column) of the airflow through the reheat condenser. The design pressure drop of the airflow is listed on a label on the compartment door. The static pressure sensors should be covered when not in use to prevent dirt from clogging the orifices. These sensors may be used with the electric heat airflow interlock for proof of flow.

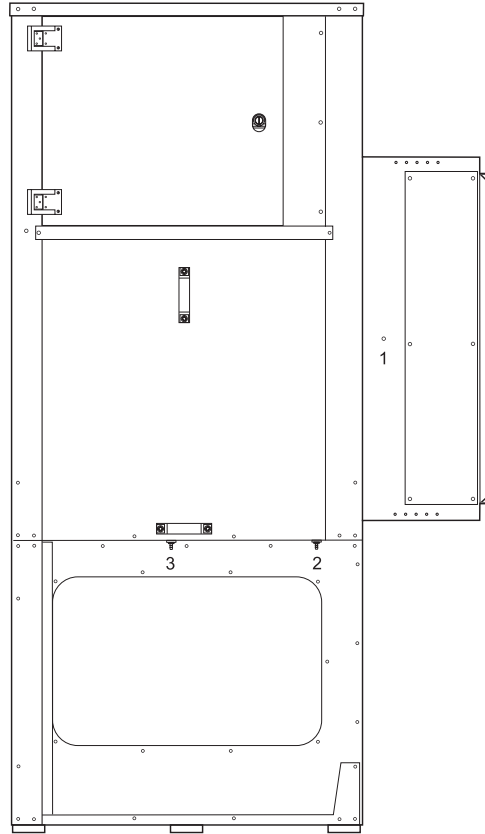


Figure 31 - LV air balance ports

Model (LC Only)	Total System CFM	Condenser Coil Pressure Drop Range (Inches W.C.)	Condenser Coil + Hot Water Coil Pressure Drop Range (Inches W.C.)
01	540	0.10" - 0.12"	0.25" - 0.27"
02	950	0.25" - 0.27"	0.43" - 0.45"
03	1400	0.24" - 0.26"	0.34" - 0.36"
04	1900	0.15" - 0.17"	0.24" - 0.26"
05	2300	0.21" - 0.23"	0.31" - 0.33"
06	3000	0.30" - 0.32"	0.44" - 0.46"
08	3500	0.38" - 0.40"	0.57" - 0.59"
10	4100	0.27" - 0.29"	0.39" - 0.41"
12	5500	0.43" - 0.45"	0.71" - 0.73"
15	8000	0.40" - 0.42"	0.69" - 0.71"

Model (LV Only)	Total System CFM	Condenser Coil Pressure Drop Range (Inches W.C.)	Condenser Coil + Hot Water Coil Pressure Drop Range (Inches W.C.)
03	1500	0.24" - 0.26"	N/A
04	2100	0.18" - 0.20"	N/A
05	3000	0.32" - 0.34"	N/A
06	3400	0.37" - 0.39"	N/A
08	3800	0.44" - 0.46"	N/A

Figure 32 - Standard Reheat Coil Pressure Drops

Evaporator Pressure Drop

Tons	pD Dry	pD Wet
01	0.14	0.21
02	0.19	0.30
03	0.24	0.42
04	0.12	0.20
05	0.18	0.29
06	0.21	0.36
08	0.24	0.43
10	0.23	0.42
12	0.20	0.31
15	0.20	0.32

Figure 33 - Evaporator Pressure Drop

3.5 Refrigeration Testing

Refrigeration based cooling systems are sometimes referred to as “sealed systems”. This is in reference to the refrigeration system being hermetically sealed, no refrigerant can leave the system and no contaminants are allowed inside. Factory equipment and procedures ensure a clean and tight refrigeration system where only the specified refrigerant and oil are in the system. This is a critical component to the longevity of the system.

Some Desert Aire systems are shipped in sections to allow for installation of some of the sections in a location much different than another. An example is a unit with a remote condenser ready circuit. The dehumidifier may be installed indoors near the conditioned space while the remote condenser used to reject waste heat is located outdoors. The piping of the condenser is completed in the field before the unit is commissioned. The design and processing of the field piping is just as important as the factory piping in ensuring the longevity of the system.

Selection of quality components, quality procedures, and full testing help to ensure the sealed system failures are minimized wherever possible. Nonetheless, the mechanical nature of many components creates some unforeseen wear and failure in certain instances. Some units may need service at a point in the life of the product that requires opening of the hermetic refrigeration system. Special care must be taken to ensure that the system is returned to service without contamination.

Whenever servicing Desert Aire equipment, observe the following:

- Use only equipment rated for the pressures of the refrigerant being serviced.
- Use only equipment dedicated to service of the refrigerant in the system. Do not use equipment to service multiple refrigerant types.
- Purge all hoses and equipment of non-condensable gasses before connecting to the sealed system.
- Use only original equipment parts or factory approved equivalent for servicing.

- Oil added to the system should be from new, sealed containers. New systems with R-410A or R-407C should use only the following oils:
 - Copeland® Ultra 32-3MAF
 - Lubrizol Emkarate RL 32-3MAF
 - Parker Emkarate RL 32-3MAF
 - Nu Calgon 4314-66 (RL 32-3MAF). SCA
- Minimize the time the system is open to atmosphere while servicing. Cap all connections when there is no active service work on the system. This is particularly important with units that contain POE oils as moisture will be absorbed quickly and cannot be removed with a vacuum.
- Never open the system while under a vacuum. Should the system require opening to repair a leak or other service when in a vacuum, fill with dry nitrogen to atmospheric pressure before opening.
- Have a Schrader core replacement tool available when servicing the refrigeration system. Although rare, defective or damaged Schrader valve cores can contribute to refrigerant loss.
- Charge systems only by weight after servicing. Review the rating plate and any field charge labels.
- When servicing, additional liquid line filter dryers and suction filters may be required. This does not apply to installation of remote condensers.
- Charge refrigerant blends, including R-410A and R-407C, with liquid only. Charging should be done into the high side of the system whenever possible. Refer to section 5.5 for additional procedures related to charging.

Note that the superheat should be stable and within 4 degrees of fluctuation. Minimum value for superheat at compressor in all modes:

Superheat Minimum Values Chart Temp (°F)							
Relative Air Temperature (°F)		65.0 - 70.0	70.1 - 75.0	75.1 - 80.0	80.1 - 85.0	85.1 - 90.0	90.1 - 95.0
Relative Air Humidity (%RH)	30.0 - 40.0	12	13	14	14	15	15
	40.1 - 50.0	13	13	14	15	15	16
	50.1 - 60.0	14	14	15	15	16	16
	60.1 - 70.0	14	15	15	16	16	17
	70.1 - 80.0	15	15	15	16	17	18
	80.1 - 90.0	15	16	16	17	18	

Figure 34 - Superheat Minimum Values Chart

3.6 General Testing

After you balance the airflow and test the refrigeration circuits, verify that the other equipment and accessories connected to the dehumidifier work properly. Although this may be difficult, since the dehumidifier is usually interlocked with a variety of equipment installed by different contractors, you must not skip this step.

Each of these devices (which may include auxiliary air and water heaters, smoke alarms, circulating pumps, and a building management system) is vital in maintaining the performance of the unit. Many customer complaints are caused by improper interlocks between these devices. Make sure you check the following:

- Check the outdoor air and exhaust devices. The outdoor air and exhaust dampers must open when they receive an “occupied” signal from the dehumidifier. If you have installed an exhaust blower, make sure that it is interlocked with the “occupied” signal or with an end switch on the outdoor air damper actuator.
- Check the condensate drain to make sure it has been trapped and primed with water. Verify that it drains freely, with no leaks. If the drain is outside or in an unconditioned space, make sure it has been heat traced. If you installed a condensate pump, make sure it operates properly.
- Check the operation of the remote condenser (on units equipped with this option). Make sure that the fans cycling switches, which are mounted on the condenser, are correctly piped and have been set according to the Desert Aire condenser wiring diagram. Verify that the fans are blowing air vertically upward when they run.
- Check the temperature and humidity readings displayed on the controller. If you think the values are incorrect, check the sensor or its field-installed wiring for damage.
- Check the operation of the auxiliary heaters by temporarily raising the air temperature set point on the Desert Aire controller. The duct heater(s) or heating valve should energize.

3.7 Routine Maintenance Schedule

3.7.1 Service Every Month

- Check the air filters and replace them if necessary.
- Check the coils in the dehumidifier and the remote condenser. Use compressed air or a commercial coil cleaner if they are dirty or plugged.
- Verify that the air flow around the remote condenser remains unobstructed.

3.7.2 Service Every Six Months

- Check the blower belts for wear or glazing. Tighten or replace them if necessary. Do not use the belt dressing compound.
- Check and tighten all field and factory electrical connections.
- Check for dirty coils in the dehumidifier and the optional remote condenser.
- Check and clean the drain pans and blow out the condensate drain line. If the drain is plugged, water will back up into the dehumidifier and flood the mechanical room.
- Check and adjust the air flow per specifications. Dirty ducts, filters, and coils may have reduced the total air volume.
- Check the operating pressures of the refrigeration circuits.
- Check the current draw of each blower motor.
- Check the current draw of each compressor.
- Lubricate the blower motor(s), if applicable.
- Lubricate the blower bearings, if applicable.

Supplier	Type	Base	Range temperature (min-max)
FINA	Marson HTL 3	Lithium	-30°C / +120°C
SHELL	Alvania Fett 3	Lithium	-20°C / +130°C
ESSO	Beacon 3	Lithium	-20°C / +130°C
MOBIL	Mobilux EP3	Lithium	-30°C / +130°C

Figure 35 - Grease suggested brands and types

3.7.3 Gas Heater (Optional)

Dehumidifiers equipped with optional gas heating should be inspected annually before each heating season. Check the following items:

- Ensure that the vents and air intakes are clean and unobstructed.
- Clean the vent and condensate drain line if necessary. Repair any damaged sections of the vent.
- Inspect the pressure switch tubing connections. Verify that the inducer fan is free of corrosion, warp-age, deterioration, and carbon

buildup. If necessary, clean the housing and the blower wheel with a damp cloth. Vacuum any lint or dust from the inducer motor assembly.

See the separate gas heater manual for detailed service information.

Note: Please have the following information available if you need to call the Desert Aire Service Department:

- Model Number
- Serial Number
- Room Temperature
- Relative Humidity
- Operating Refrigeration Pressures
- Water Temperature
- Compressor Amperage
- Blower Motor Amperage(s)

3.7.4 Pool Water Chemistry

Pool chemistry must be maintained to ensure the proper pH, total alkalinity, calcium hardness and free chlorine. NSPI recommends the following levels for pool chemistry:

pH	7.4 – 7.6
Total Alkalinity	100 – 150 ppm
Calcium Hardness	200 – 250 ppm (Plaster Pool) 175 – 225 ppm (Vinyl or Painted Pool)
Free Chlorine	1.0 – 3.0 ppm

Excessive chemical levels in the pool can be dangerous to users and can damage pool hardware, including the dehumidification system. **SERVICE PROBLEMS CAUSED BY EXCESSIVE CHEMICAL LEVELS ARE NOT COVERED UNDER WARRANTY.**

4. Troubleshooting

Although Desert Aire dehumidifiers have been designed for reliable and trouble-free operation, you may occasionally encounter a service-related problem. If you cannot immediately diagnose and fix the problem, do not be intimidated by the apparent complexity of the dehumidifier. Your common sense and experience can help you solve the majority of these problems.

These problems or complaints are frequently caused by improper interlocks between the dehumidifier and the other equipment and accessories at the jobsite. You may need to consult with other contractors who have worked on different portions of this project.

The following list will help you diagnose some of the most obvious symptoms of a system which does not work properly.

4.1 The Blower Does Not Run

POSSIBLE CAUSE	REMEDY
System terminal switch in open position	Close system terminal switch.
Loss of main power	Check for tripped circuit breaker or blown fuses.
Blower overload has tripped	Correct cause and reset overload.
Faulty control wiring	Check for loose or incorrect wires on system and controller.

4.2 The Compressor Does Not Run

NOTE: Under some circumstances the compressor will not run even though the humidity in the room may be too high. See section 5.4 for more information on the control sequence for the dehumidifier.

POSSIBLE CAUSE	REMEDY
Control logic	A) Adjust controller set points. B) On RR/ER models with a remote condenser installed, verify that the RC jumper has been installed in dehumidifier and the ROC is enabled in the service menu
Loss of main power	Check for tripped circuit breaker or blown fuse(s)
Blower overload has tripped	Correct cause and reset overload
Faulty wiring	Check for loose or faulty wiring on system and controller.
Compressor overload has tripped	Correct cause and reset overload.
Comp. failure may have occurred if: A) Comp. draws locked rotor amps B) Comp. starts but does not pump C) Motor windings have shorted	A) Replace compressor (or check fuses on three-phase units). B or C) Replace Compressor.
Compressor delay-timer	Wait 6 minutes for timer.
Verify "Low Airflow" is not displayed on the control	Verify airflow across reheat coil

4.3 Evaporator Coil Ices Up

POSSIBLE CAUSE	REMEDY
Entering air below 70°F	Raise entering air temperature
Faulty or improperly set hot-gas bypass valve	1) Set hot-gas valve to maintain 32°F suction. 2) Replace if defective. 3) Open hot-gas isolation valve.
Insufficient evaporator airflow rate	1) Evaluate system airflow. 2) Check for dirty filters or restricted ductwork. 3) Assure coils are clean.
Lack of refrigerant	Re-evaluate system charge.
Restrictive filter drier	Evaluate filter pressure drop and replace if necessary.
Defective expansion valve	Evaluate expansion valve performance and replace if necessary.
Restriction in refrigeration piping	1) Check coil for kinks in tubing. 2) Evaluate debris in distributor.

4.4 Head Pressure is Too High

POSSIBLE CAUSE	REMEDY
Insufficient system airflow	1) Evaluate system airflow 2) Check for dirty filters or restricted ductwork. 3) Verify that coils are clean.
Excessive refrigerant charge	Re-evaluate system charge.
Non-condensables in system	Evaluate or purge system.
Defective refrigeration valves	Check 3-way, flooding, solenoid and check valves for sticking.
Restriction in refrigeration piping	1) Check coil and tubing for kinks. 2) Replace dirty drier filter.
Refrigeration system is overloaded	1) Reduce entering air temperature or relative humidity. 2) Check register locations for short cycling of air.
Low water flow	Evaluate water flow rate for your application.
REMOTE CONDENSER PROBLEMS WHICH CAUSE EXCESSIVE PRESSURES	
Lack of airflow	Assure coil is clean and no airflow restrictions exist around unit
Remote condenser fan troubleshooting	
1) Faulty Contactor	1) Replace contactor.
2) Fan cycling on internal protection	2) Verify motor voltage & ensure free spinning motor shaft.
3) Remote condenser jumper missing at dehumidifier	3) Add necessary jumper in dehumidifier.
4) Pressure control inactive	4) Verify pressure control cut-in and differential settings.
Service valves closed or not fully open	Fully open service valves.
Excessive pressure drop in line sets	Re-evaluate remote condenser installation

4.5 Unit Runs but Excess Condensation on Walls and Windows

POSSIBLE CAUSE	REMEDY
Air and pool water temperature imbalance	Adjust set points so that air temperature is 2°F above water temperature. 80°F water and 82°F air recommended for most jobs.
Poor air distribution	Evaluate duct design and dehumidifier location.
Unit airflow is too high	Evaluate system airflow.
Unit is undersized	Re-evaluate unit sizing. Check for initially neglected sources of heat or humidity.
UNITS EQUIPPED WITH WALL-MOUNTED SENSOR OPTION:	
1) Controller installation	1) Assure that sensors are NOT located near supply registers, windows, heaters, saunas, etc.
2) Air stratification	2) Consider continuous blower operation.

4.6 Pool Water Heating Problems (Water-Cooled Units Only)

NOTE:

1. Water-cooled models include a water proving switch to confirm water flow before the water heating mode can be activated.
 2. Lack of water heating may be a symptom of another refrigeration or controls problem not related to the water circuit.
 3. Under normal conditions the water temperature rise across the dehumidifier should be between 4° and 15°F.
- LOW TEMPERATURE INCREASE OF WATER is a symptom of excessive water flow rate. Excessive water flow can erode the water condenser and cause premature equipment failure.
 - HIGH TEMPERATURE INCREASE OF WATER is a symptom of insufficient water flow. This can be caused by an undersized pump, insufficient water diversion or restrictions in the water piping such as dirty filter(s). This would also lead to high refrigerant discharge operating pressures in the water heating mode.

5. Appendix

5.1 Compressor Failure

Although some compressors fail because they are mechanically flawed, most failures are due to system-related problems. Compressor failure can be caused by liquid flood back, air/moisture in the refrigeration system, solid contaminants, excessive heat or electrical service malfunctions. To avoid repeated callbacks, you must determine the cause of the failure and then correct it.

If the compressor has failed because its motor has burned out, the refrigerant, oil, and piping may have become severely contaminated. If a burnout has occurred, use the following procedures to replace the compressor and clean the refrigerant system. Use an oil test kit to determine the severity of the burnout. Make sure you use rubber gloves and eye protection, as contaminated refrigerant and oil can cause severe burns!

CAUTION

You must clean the system thoroughly to prevent repeated compressor burnouts.

5.1.1 Compressor Replacement

Desert Aire dehumidifiers are designed with scroll compressors. Scroll compressors are known for operating more reliably than other compressors in air conditioning and dehumidification applications due to their ability to cope with occasional periods of liquid refrigerant return. There are fewer moving parts in a scroll compressor subject to wear compared to alternative compressor designs. Nonetheless, there are still many mechanical and electrical parts with close tolerances. Replacement of the compressor may be required during the normal service life of the dehumidifier.

Inspection and Initial Diagnosis

Generally, the compressor will have two basic failure modes, mechanical or electrical. The compressors are a hermetic design, meaning all components, including the motor, are in a sealed shell. It can be very difficult to determine which issue was the root cause of the failure in the field by inspection of the damaged compressor. For example, an initial bearing failure inside the compressor may create debris that contaminates motor windings. High current draw may be related to a bearing issue or a motor winding issue. The initial inspection must be combined with a final analysis of the machine when returned to working order to confirm diagnosis.

Specific items should be noted before the replacement to give the best indications of the failure and complete the diagnosis as the new compressor is installed.

The following data should be taken to assist in diagnosis:

- Current draw for each leg of power (if the compressor will run and pump).
- High side and low side pressure (if the compressor will run and pump).
- Resistance of each leg to leg on three phase compressor or each leg to neutral on single phase compressors.
- Check of continuity from each leg to ground.
- Review of all system alarms including the relative timing of the alarms and mode of operation.

It is important to note that other components or lines may have been damaged if the compressor has failed. At times the internal damage to a compressor creates extreme levels of vibration before complete failure. Refrigerant lines and connections may be damaged before the compressor stops. Inspect tubing and components of the system before completing the compressor replacement.

Compressor Replacement

- Refrigeration oil must be tested for acid and particulate during any compressor replacement. For the initial testing, the compressor sump should be used to sample the oil. Oil can be recovered through the Schrader port on the low point compressor shell or through the suction line connection after the compressor has been removed.
- Use Virginia KMP, New-Calgon Phase III, Sporlan Test-All, or equivalent oil test where oil is sampled into a container. Vapor sampling methods may not show particulate and should not be used.
- Read the oil test kit manufacturer's instructions to determine if there is acid present in the oil. Determine if there are other contaminants by viewing the samples for darkness, cloudiness, or particulate.

The following procedures must be used depending on the results of the test above:

Any Compressor Service

- A new filter dryer must be installed when the system has been opened. If there is no acid or particulates indicated, the new compressor can be installed and run. Proceed to Testing and Final Diagnosis.

Acid Indicated

- Install a suction line filter shell and charcoal activated core such as a Sporlan or Emerson HH core type or equivalent. The acid levels will be monitored and several core changes may be required. Install ball valves on either side of the suction filter to facilitate these changes. Note that larger Desert Aire systems will have suction filter shells installed from the factory. The shell can be used with charcoal activated cores. Note that a “safety screen” may be required with some manufacturer’s cores to prevent small pieces of the core from dislodging and finding their way to the compressor. Follow filter shell and core manufacturer’s instructions.
- Review compressor and suction line for area where future oil samples can be taken from the system. If an access fitting exists on the compressor shell below the oil level, no further action is needed. If this is not available, an access fitting can be located at the bottom of a trap in the suction line. Braze in a fitting as required to be able to remove an oil sample.
Note: It is acceptable to use acid test kits that sample the refrigerant and connect to Schrader fittings.
- Ensure there are access fittings directly upstream and downstream of the suction filter. There is typically one fitting installed on the suction filter. There may be a bulkhead fitting attached to the compressor suction side.
- Do not use acid neutralizing additives or other chemicals for acid removal. The refrigeration system must contain only oil and refrigerant. Precipitates of additives and acids may be considered contamination in the refrigeration system. Other compounds may be present in additives as carriers. Long-term effects of specific additives or compounds with a particular system or design are unknown without significant controlled testing.

Particulate Indicated

- Install a replaceable core liquid line filter shell. Note that larger Desert Aire systems will have replaceable core liquid line filter shells installed from the factory. The pressure drop levels will be monitored and several core changes may be required. Install ball valves on either side of the filter shell to facilitate these changes.
- Install a secondary filter such as Sporlan FS-series or equivalent 20 micron filter in the replaceable core.
- Ensure there are access fittings directly upstream and downstream of the liquid filter. There is typically one fitting installed on the filter shell. There is typically a fitting installed on the outlet side of the receiver.

Returning to Service

- See section 5.5 for evacuation and charging.
- Restart unit and set unit to run compressors.
- Record the pressure drop across the suction filter and liquid line filter dryer.
- Check sight glass indicator for moisture level.
- Monitor pressure drop across the liquid and suction filters during the first hour of operation. Compare the reading taken earlier. If the pressure differential across the filters is 5 PSI or greater, isolate the filters using the valves installed and recover the refrigerant from the filters. Replace cores. If activated carbon filters were installed in the suction side to remove acid, replace with similar cores. If a secondary filter was installed in the liquid line core to remove particulate, install cores and secondary filter in this location.
- Run unit for 24 hours and review acid levels (if found previously) and pressure differentials.
 - If acid is found, replace with activated charcoal cores and test at 24 hour intervals until acids are at acceptable levels. Once acid is no longer detected, replace cores with standard filter elements. Remove outlet screens if they were required by filter manufacturer.
 - If the pressure differential across the liquid line filter is 5 PSI or greater, replace cores and secondary filter with new components and test at 24 hour intervals until pressure drop is at acceptable levels. Once pressure differential is less than 5 PSI, remove secondary filter and replace cores.

Testing and Final Diagnosis

It is of critical importance to ensure that the system is operating as expected before unit is returned to normal service. Complete a LC-LV Series Compressor Replacement Form located in the Installation and Operation Manual. Validation of this report allows for the continued coverage of the compressor under the original warranty.

It is possible that there was an internal defect in the compressor or normal mechanical wear occurred over time. Compressor longevity generally is a function of load, lubrication, electrical input conditions, and temperatures.

The cause for the compressor failure must be identified before unit is placed back into full service. Both the identification of the cause of compressor failure and the proper cleanup of the system must be addressed to avoid repeat compressor damage.

5.2 Recommended Duct Design

You must use proper duct design to ensure that the dehumidifier operates efficiently and without problems. Undersized or restrictive ducts reduce the system airflow, which can cause premature compressor failure. Use the following diagrams as a guide when you design the duct system.

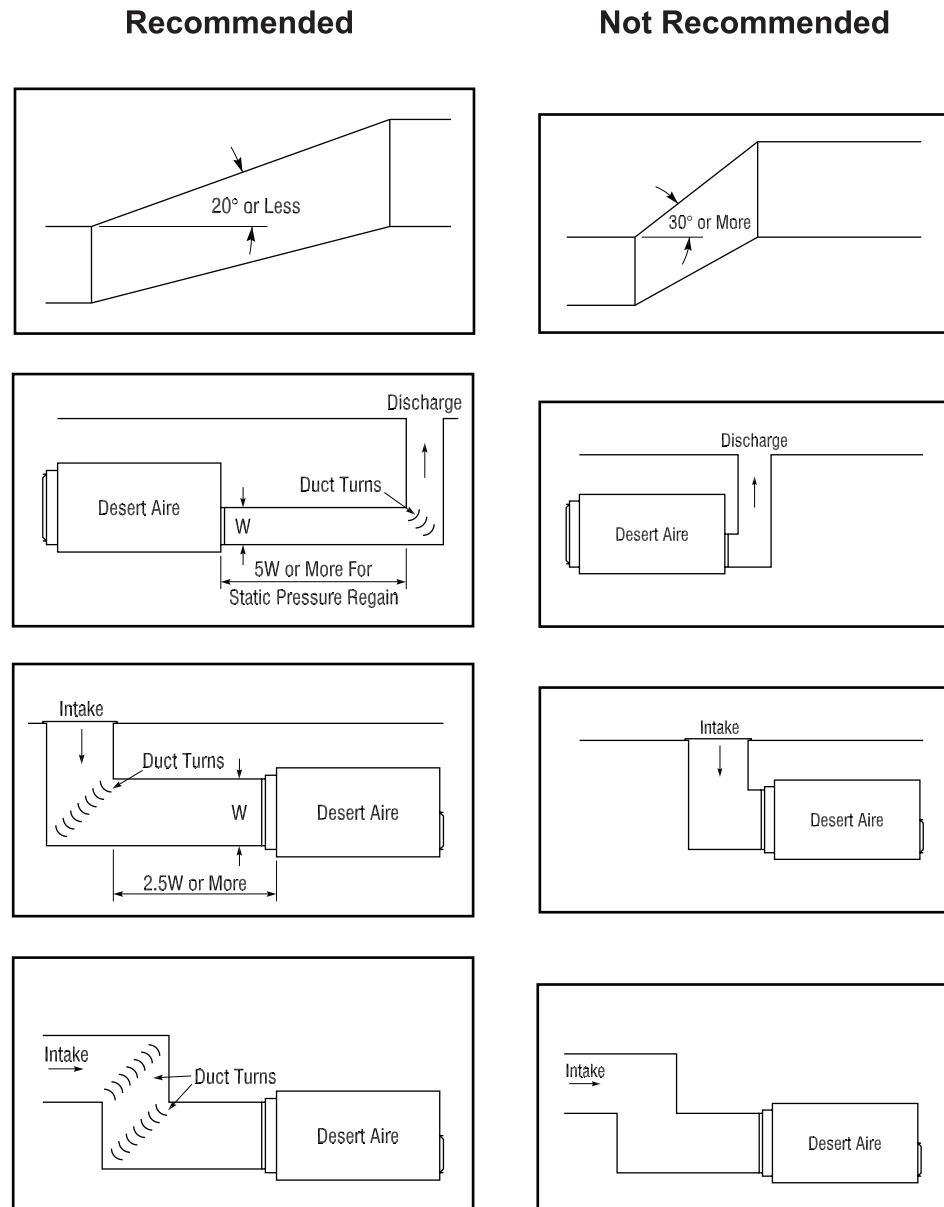


Figure 36 - Recommended Duct Designs for Desert Aire dehumidifiers

5.3 System Guidelines

5.3.1 Recommended Controller Settings

It is important to determine your comfort set points and to avoid further controller adjustments. It takes time for the unit to establish equilibrium at a given set point. Therefore, continued set point adjustments will lead to high energy consumption and user discomfort. Continuous blower operation is recommended. This will reduce air stratification and assure that the refrigeration circuit is activated only when it is necessary.

RECOMMENDED SET POINTS:

- Humidity 50% to 60% RH
- Air Temperature 2° to 4°F above the pool water temperature

WARNING: Never disable a dehumidifier in a pool / spa room application unless the pool / spa has been drained. Even when a pool / spa is not in use, the pool / spa water continues to evaporate and add moisture to the air. During these periods of high humidity, moisture will seep into walls, ceilings, furniture, etc. Although the dehumidifier may be capable of regaining control of pool / spa room conditions after re-start, moisture damage to the pool / spa room may result from the period when the dehumidifier was disabled.

5.3.2 Refrigeration System Pressures

Many factors affect refrigeration pressures on a given day. Such factors include ambient temperature, water temperature, airflow volume and relative humidity. Directly measured suction / discharge temperatures will differ due to suction / discharge superheat. However, for the sake of troubleshooting:

- Normal Suction Temperature Range 32° to 40°F
- Normal Discharge Temperature Range 95° to 130°F

5.3.3 Temperature Rise or Drop Across Unit

- Typical air temperature rise across unit (reheat mode) 10° to 15°F
- Typical air temperature drop across unit (air conditioning or water heating mode) 10° to 15°F

NOTE:

- If your unit does not meet these temperature ranges, check the system airflow
- These guidelines do not apply to dehumidifiers with outdoor air intakes when they are in the “occupied” mode.

5.4 Sequence of Operation

The standard sequence of operation for a Desert Aire dehumidifier is relatively simple. Whenever the compressors run, refrigerant flows through the evaporator coil where it absorbs heat from the warm, humid air stream. This heat must be rejected to one of three heat sinks; room air, pool water, or a separate air stream (remote condenser). The dehumidifier will direct the heat where it is needed (or not wanted) as determined by the controller set points.

5.4.1 Dehumidification and Air Reheat

When the room air requires dehumidification and no cooling is required, the dehumidifier runs in the “reheat” mode. The hot refrigerant is discharged to the reheat condenser which warms the dehumidified air. The air which is discharged from the unit is drier and about 10°F warmer than when it entered.

5.4.2 Dehumidification and Air Cooling

When the room air requires cooling, or dehumidification and cooling, the dehumidifier attempts to run in the air cooling mode. The hot refrigerant must be discharged to a condenser other than the reheat coil. The refrigerant can be discharged to an optional pool water condenser or an optional remote outdoor condenser (if so equipped). The air which is discharged from the unit is drier and about 10°F cooler than when it entered. Should there be no available heat sink (i.e. no remote condenser is equipped and pool water temperature is greater than set point), the unit will not energize the compressors. This prevents the space from significantly overheating. Unit will energize the compressors once the space cools below the cooling set point or a heat sink becomes available.

5.4.3 Cooling and Water Heating (Water Cooled Unit Only)

When the room air requires cooling and the pool water requires heating, a dehumidifier equipped with a pool water condenser will run in the air cooling / pool water heating mode. The hot refrigerant will be discharged to the pool water condenser if the water flow proving switch shows that water is flowing through the condenser. The air which is discharged from the unit is drier and about 10°F cooler than when it entered.

5.4.4 Dehumidification and Water Heating (Water Cooled Units Only)

When the pool water requires heating and the room air requires only dehumidification without cooling, a dehumidifier equipped with a pool water condenser will run in the air reheat mode. This is referred to as “Air Heat Priority” since both the air and the pool water require energy. This is the default setting as the unit is shipped from the factory.

It is possible to set the unit to “Water Heat Priority” to have this mode of operation divert the energy to the pool water rather than the air for reheating. This should be done with caution as there must be sufficient capacity of auxiliary heating to overcome the cooling of the air. If set for Water Heat Priority the air which is discharged from the unit is drier and about 10°F cooler than when it entered even though cooling of the space is not required.

Adjustments between “Air Heat Priority” and “Water Heat Priority” can be made through the unit display. Refer to the Controls User Manual for adjustment instructions.

5.4.5 Partial Pool or Spa Water Heating

If the dehumidifier has been equipped with Partial Pool or Spa Water Heating, a portion of the heating energy will be routed to the water when there is a call for water heating and dehumidification or cooling of the space. If the unit is in cooling mode the air which is discharged from the dehumidifier is drier and about 10°F cooler than when it entered. If the unit is in dehumidification mode, the air which is discharged from the dehumidifier is drier and about the same temperature as when it entered.

5.4.6 Operation of Water Condensers and Optional Pump Starts

The LC and LV units have options for water condensers that heat pool water or reject energy to a water loop. The command for pool water heating is described in the sections above. A water cooled condenser can also be installed that takes the place of a remote condenser as described in the above sequence. The temperature of the water is not monitored by the controller when the unit is configured with a water cooled condenser intended for use on a water loop.

Units containing either pool water heating option or water cooled condenser option can be configured to create a dry contact closure when water should be flowing through the condenser. If the controller has been configured this way, the contact to the remote pump will close. After flow is established as sensed by the water flow switch, the unit will then shift to the appropriate condenser. Should flow not be established, the unit will shift to the next available condenser having priority. If no other condensers are available the compressor will not energize (or de-energize if previously operating) until flow is established or requirements change.

Refer to the Controls User Manual and electrical schematic for instructions on programming pump start command(s) if required.

5.4.7 Blower Operation

Units have been factory wired for continuous blower operation. This helps prevent air stagnation and stratification. Continuous blower operation is also required on units with the return air sensor option. If the blower shuts off, the sensors cannot read the actual room temperature and humidity. Refer to the system wiring diagram and the controller documentation for the possible blower operation options.

5.4.8 Air Heat (Optional)

LC Only – If so equipped, a standard dehumidifier can activate an internal auxiliary air heater when the room temperature drops below the set point. The supply air blower of the dehumidifier must run whenever there is a demand for air heating. You must verify this when installing an auxiliary heater.

LV Only – The DHLV series electric duct heaters for LV units are externally mounted to the supply air connection. The heaters are designed to be electrically connected to the dehumidifier for single point power connection.

The DHLV heater is shipped independently of the dehumidifier. In most cases it is desirable to locate the electric box of the heater on the same side as the dehumidifier electrical panel. The heater has been designed to allow airflow in either direction such that it is possible to position the electric box for the heater on the opposite side, however, the elements of the heater must be located in the “blast” area of the blower. This is the area where the blower wheel is visible.

Power and control wiring for the electric heater protrudes from the top of the dehumidifier and must be securely connected to the electric heater terminals before providing power to the unit.

A differential pressure switch is used as a safety interlock for proof of airflow. It is located in the lower section of the LV. It is connected to static pressure sensors using the pressure drop of the reheat condenser of the dehumidifier as proof of airflow. If the airflow drops below the set point, the switch will open and prevent the heater from operating.

The static pressure sensors also allow an easy way to balance the airflow by using a manometer to measure the static pressure drop of the reheat condenser. Refer to section 3.4 on air balancing for further details regarding the balance procedure. Be sure to replace the heater differential pressure switch tube connections to these sensors when finished to permit heater operation. The higher pressure is between the heat exchangers and the lower pressure is in the blower compartment. The switch has an indication for high and low at the tube ports.

5.4.9 Outdoor Air (Outdoor Air Equipped Models Only)

During the “occupied” mode the dehumidifier will energize the outdoor air damper and exhaust fan terminal contacts. Desert Aire LC and LV Series dehumidifiers will operate in the occupied mode only if the occupancy timer is set accordingly. See section 3.3 for further outdoor air operation mode details.

5.5 Component Replacement, Charge, Evacuation, & Leak Instructions

Note that a new liquid line filter dryer will be required any time a refrigeration system is opened for servicing. New dryer should be of the same capacity as the original or larger.

Recovery

When there has not been a major refrigeration system leak, the system will contain refrigerant. This refrigerant must be either recovered to separate cylinders appropriate for the refrigerant type or isolated in a portion of the refrigeration system that will not be open for service. In all cases you must comply with Section 608 Refrigerant Recycling Rule of the Clean Air Act.

Recovery of Systems with a Refrigeration System Leak

As much refrigerant as possible must be recovered into separate refrigerant cylinders appropriate for the refrigerant being serviced. System pressure near the leak site should be monitored closely to ensure this area is not pulled to a vacuum. Isolated sections of the system as required and recover independently to avoid refrigerant contamination. Uncontaminated refrigerant can be reused in the refrigeration system it was recovered from.

Recovery of Systems without a Leak

System that do not have leaks, but still require refrigeration system service, may have charge isolated in receivers and condensers if these particular components do not require direct service.

Desert Aire dehumidifiers have different receiver sizes depending on the model and size. Condenser sizes and configurations may also vary. In general, larger receivers will come equipped with isolation valves that will allow for a portion of the charge to be contained in the receiver during servicing. Units equipped with remote condensers will have isolation valves located inside the unit cabinet near the area where the connections are made.

The compressor can be used to move refrigerant to the system components that will be used to temporarily hold the charge. Note that cooling a condenser by running as many fans as possible and/or cooling the coil surface with a stream of water can assist in storing charge.

The low side pressure should be monitored closely while using this procedure to store charge. Under no circumstances should a compressor be allowed to run in a vacuum. When most of the refrigerant is isolated in the receiver and/or condensers, recover remaining charge into separate refrigerant cylinders appropriate for the refrigerant being serviced. Carefully track the amount of refrigerant charge removed as this exact amount should be placed into the units when re-charging.

Repair / Component Replacement

- If any portion of the system was at a vacuum, place dry nitrogen in the system until atmospheric pressure is reached.
- It is preferred that components are removed by heating the braze alloy to the re-melt temperature and mechanically moving the component. When this is not possible due to proximity of cabinet structure or other components, a tubing cutter can be used to remove sections of piping. Where new tube is required for replacement, use dehydrated tube where possible. Use the same type of fittings as original. Route the pipe in the exact manner as originally routed.

- Use Type K per ASTM B 88 or ASTM B 819 or Type ACR per ASTM B 280 copper tubing or for all tubes 1 1/8" and smaller.
- Tubes 1 3/8" and larger shall use Type K per ASTM B 88 or ASTM B 819.
- Cap sections of tube and components that are not actively being installed to prevent infiltration of moisture and contaminants.
- Use only braze alloy to join tube.
 - The selection of filler metals is highly dependent on the tube fit, clearance, and operator preference for flow. When flux is to be used, care should be taken to ensure that the flux is not introduced to the inside of the tube. It is recommended that phosphorous bearing alloys be considered for copper to copper connections due to their self-fluxing on copper to copper joints. Refer to alloy manufacturer's guidelines for details on compatibility.
- Flow nitrogen into tubing to prevent the formation of copper oxides.
 - Copper oxides form rapidly when copper is heated to temperatures required by the brazing process and exposed to oxygen in the air. Copper oxides flake easily on the inside of the tubing and dislodge easily when the system is filled with refrigerant and oil. The particulate can move throughout the system and cause contamination on valves and other critical components. System filters may become fouled.
 - Flowing nitrogen into the system and ensuring that the inside of the tube is significantly free from oxygen while brazing ensures that oxides do not form. As the last joints of a system are made, additional thought must be made on the location where the nitrogen can escape. Schrader valves are placed throughout the system. These valves can be opened to allow for nitrogen to flow without generating pressure behind the braze joint that is being created.
- See Section 5.1.1 for special procedures related to compressor replacements.
- Replace liquid line filter dryer as last step in system repair. Note that the dryer will readily absorb moisture from the ambient air and must be open only for as long as required for installation.
- After completion of all repairs, pressure test system using nitrogen pressure decay test or nitrogen with tracer gas and appropriate leak detector.

Evacuation

- Carefully inspect pump and related equipment before connecting to system. Ensuring gaskets are in good condition and pump is capable of low vacuum levels can save time. Connect pump(s) to as many locations as possible ensuring all locations are well sealed. Recommended recovery / evacuation points are at each condenser, and both sides of the compressor. If a field charge will be required, connecting a refrigerant tank to the system with a good valve is recommended. Any hose connections requiring purging of non-condensable can be done at this point.
- Evacuate the line and remote condenser to 400 microns measured at a point on the system furthest away from the pump.
 - Note that a gauge installed on the pump or in close proximity will give a lower reading while the unit is being evacuated.
 - A deep vacuum gauge should be used to evaluate the pressure. Compound manifold gauges do not allow for enough accuracy at the pressures required.
 - The system should be able to hold a vacuum under 500 microns for more than 10 minutes.
 - If pressure continuously rises at a rapid rate there is likely a system leak. Review all piping connections and correct before continuing evacuation.
 - Pressure rising above 500 microns and tending to stabilize at a higher pressure indicates the system has moisture above specifications. Continue evacuation until 500 microns or lower can be held for a minimum of 10 minutes.

Alternative Evacuation Specified by Process

After components have been repaired or replaced evacuation procedure should take place. Very small amounts of refrigerant may still be mixed with the oil in the system. Out-gassing of this refrigerant may interfere with the evacuation and vacuum decay testing.

IF, AND ONLY IF, a unit has been previously charged with refrigerant, and standard evacuation method has not been successful after 24 hours minimum using the standard procedure, the following alternative method should be used.

1. Check vacuum level. It should be a maximum of 1,500 microns absolute pressure. If this is not the case, review system for leaks and continue evacuation process until 1,500 microns is achieved.
2. Purge system with nitrogen to atmospheric pressure (0 gauge pressure). Ensure all portions of systems are at this pressure. Seal system and wait 10 minutes.

3. Start vacuum pump and draw system to 1,500 microns or less.
4. Purge system with nitrogen to atmospheric pressure (0 gauge pressure). Ensure all portions of systems are at this pressure. Seal system and wait 10 minutes.
5. Start vacuum pump and draw system to 500 microns. Seal system. System may rise to higher level, but should not rise above 1000 microns in 10 minutes timeframe.
If unsuccessful, continue evacuation or check for leaks.

It is anticipated that the system was clean and tight from the original process and refrigerant only is mixed with oil. Alternative process should not be considered if there is chance of free water entering the system or the system was open for any significant time.

Charging

- Charge should be weighed into the system using a scale. In cases where the full charge was recovered, weigh in the charge with the recovered refrigerant and add the appropriate amount to meet the rating plate and field charge (if applicable). This should be placed in the high side of the system at the receiver.
- In cases where the full charge cannot be added to the system high side, the charge can be added to the low side of the system only when compressors are energized. If this is required, the compressors should be energized and the charge should be slowly metered into the suction line as far as possible upstream of the compressor. If the unit is equipped with an accumulator, the charge needs to be added to the port upstream of this location. The bulkhead fittings on the side of the unit should not be used for charge addition. Monitor superheat at the compressor suction inlet using the bulkhead fitting and a temperature sensor on the suction line near the compressor. Superheat should not drop below 10 degrees during the process of adding charge.

Testing and Final Diagnosis

Check the oil level in the compressor after the system has been running for 24 hours. Oil may have been contained in the liquid refrigerant when recovered from the system. Most of this oil will be returned if the recovered refrigerant is used. If new refrigerant is added, additional oil should be added based on the following ratio:


New Refrigerant Charge Added, lbs. x 0.352 = Oil charge, oz.

It is of critical importance to ensure that the system is operating as expected before unit is returned to normal service. Test component replaced and function of the system. Many times a separate component in the system may have set a condition that causes a failure of another. Thoroughly test systems to ensure repeat failures do not occur.

Note: Compressors supplied with an oil sight glass should be viewed and filled to 75% capacity.

5.6 Rating Plate

The system rating plate is attached near the electrical enclosure of the dehumidifier.

Model No. LC01R2NABNLLBEB Serial No. 3720D27460								
Voltage/Phase/Hz: 230-1-60 Control Voltage: 24						Minimum Ampacity: 17 Maximum Overcurrent Protective Device: 25		
Compressors			Supply Blower(s)			Transformers		
Mtr #	RLA	LRA	Qty	HP	FLA	Xfmr #	VA	
2	9	48	1	0.8	5.4	1	150	
3	N/A	N/A	Exhaust Blower(s)			2	0	
4	N/A	N/A				Qty	HP	FLA
5	N/A	N/A	0	N/A	N/A	4	0	
Condenser Fans			Electric Heater			5	0	
						6	0	
Qty	HP	FLA	kW	N/A	FLA	N/A	7	0
0	N/A	N/A			0	0		
Heat Wheel Motor					Motors powered by VFDs or 3 phase transformers use line-side current for MCA/MOPD calculation. Load-side FLA shown per UL1995.			
Mtr #	HP	FLA						
11	N/A	N/A						
This Unit is for Indoor Use								
Maximum Design Pressures (psig)						Wiring Diagram Numbers		
650 High Side			250 Low Side			LC3-HV-106-4, LC3-LV1NP, LC3-LV2NP		
R-410A Factory Charge (lbs)								
Circuit A	9	Circuit B						

Independent Powered Electric Heater	
Voltage/Phase/Hz: N/A Control Voltage: 0	Minimum Ampacity: N/A Maximum Overcurrent Protective Device: N/A

Figure 37 - System Rating Plate

5.7 Start-Up Supervision Supplemental Information (Optional)

A Desert Aire factory start-up is an option as well as CST or Remote Startup Assistance which can be purchased with the equipment. A factory start-up includes several key services:

- The expertise of an accomplished, factory-trained technician who will supervise the commissioning of the equipment.
- The Desert Aire representative will assist the installing contractor with filling out the Start-Up Report.
- He will also inspect the installation to make sure that the dehumidifier has been properly integrated with the rest of the equipment on the jobsite.
- Finally, he can train the maintenance personnel to operate and service the equipment if necessary.

A factory start-up does not include installation assistance. The installing contractor is responsible for ensuring that the system is ready for start-up when the Desert Aire technician arrives.

When the installing contractor is confident the system will be ready, they should contact the Desert Aire Sales representative to schedule the start-up. Please call at least two weeks before the desired start-up date to help prevent scheduling conflicts.

5.8 System Start-Up Report

A copy of the system "Start-Up Report" can be found on the following page. This report needs to be filled out thoroughly by a qualified service technician and returned to Desert Aire for warranty validation. Please ensure that the model and serial number of the unit are noted on this form. The model and serial number can be found on the system's rating plate located on or near the electrical compartment service door. Failure to complete and return this form will void the unit's warranty. These reports are also helpful when trying to correct existing problems. Should you need system diagnosis help, fax the completed worksheet to Desert Aire's Service Department using the number provided. Be sure to include your name and a telephone number where you can be reached.



LC/LV/SA Startup Request Form

Factory Assisted Start-Up consists of a Desert Aire Service Department Technician to visit the job-site and provide supervisory experience to installing contractors as they perform the required procedures as outlined in our warranty activation start-up report. The company technician will also present an educational review of the dehumidifier's operating and maintenance requirements. **Factory Assisted Start-Up is not an installation bid & therefore the system must be ready to run before scheduling.**

CST Start-Up is performed by a local Certified Service Technician who has been trained by Desert Aire. The CST performs all duties listed above. In addition they will supply the "items to be supplied for start-up" as listed below. Please note charges for refrigerant will apply if refrigerant is necessary to complete the start up.

Items to be completed by the installing contractor before any Start-Up can be scheduled:

- ☐ Dehumidifier leak checked and inspected for internal concealed damage – remove access panels and inspect the interior of the unit for transit damage. Contact Desert Aire immediately if damage is noted **(262)946-7400**
- ☐ Dehumidifier leveled and properly supported per the installation manuals recommendations. **See section 2.1 of the LC/LV I&O manual for details**
- ☐ Outside air duct filters and damper installed (if applicable) – **See LC/LV I&O manual section 2.2 for details**
- ☐ Condensate P Trap installed with heat trace for winter operation. **See LC/LV I&O manual section 2.3 for details**
- ☐ Remote condenser plumbed per **Air Cooled I&O manual section 2.4**, check valve installed in the hot gas discharge line (**this valve is shipped separately with other controls**) , leak checked, evacuated, and charged if necessary. LC and LV Units require additional field charging. **Refer to the charge label affixed to the unit for details.** Refrigerant added _____ lbs.(if applicable)
- ☐ Gas heater lines plumbed and purged / Record gas pressure entering the unit - _____ 'wc (if applicable)
- ☐ Refrigeration line set is clamped and the header supported per the **Air Cooled I&O manual sec 2.3**
- ☐ Pressure transducer and cord sent with the remote condenser installed on the liquid line header and wired to the Johnson 450 controller. **See section 2.7 of the Air Cooled I&O manual for wiring details.** (if applicable)
- ☐ All electrical connections terminated and verified for proper voltage at the unit and the condenser (if applicable)
- ☐ All field controls, sensors - duct or wall sensor installed per the **LC/LV I&O manual Section 2.7**, (This sensor is shipped separately with other components) actuators installed and circuits verified that they are wired correctly. If you have questions, contact Desert Aire for instructions **(262)946-7400**.
- ☐ Water condenser circuit connected to dehumidifier with flow meter and balancing valves installed in circuit (if applicable)
- ☐ Water temp sensor well and temp sensor installed per **I&O manual section 2.4** (This sensor is shipped separately with other components)
- ☐ Water flow verified and air purged from water the lines. (If applicable)
- ☐ Remove shipping blocks from under the compressor.

Items to be supplied by the installing contractor (Factory Assisted Start-Up only)

- ☐ Equipped service vehicle and service technician – Technician will be trained.
- ☐ Volt/Amp/OHM meters. / Refrigerant Manifold Gauges
- ☐ Combustion Analyzer (SA Units only supplied with factory gas heating option)
- ☐ Air balancing equipment (magnehelic or manometer differential pressure gauge – one inch scale preferred)
- ☐ 50# of the appropriate refrigerant & scale.
- ☐ Hand pump for adding oil to compressors and 1 gallon of one of the following oils:
Copeland Ultra 32-3MAF
Lubrizol Emkarate RL32-3MAF
Park Emkarate RL32-3MAF
Nu Calgon 4314-66 (RL32-3MAF
(This is required on split systems based on line set calculations and trapping)

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LC/LV/SA Startup Request Form

Unit Information

Model # _____

Serial # _____

Jobsite Information

Job site name _____

Job Site Address _____

Contractor Information

Installing Contractor: _____

Manager's Name : _____ Phone #: _____

Job Site Contact: _____ Cell # _____

Controls Company Name: _____

Controls Contact: _____ Cell# _____

Test and Balance Company: _____

If you are unable to supply any of the required equipment you must contact Desert Aire before returning this document.

I agree that all of the above has been completed as of _____ (Date) If a return trip must be scheduled due to insufficient job-site preparation an additional purchase order must be issued to Desert Aire for re-scheduling. **A two week minimum is needed to schedule start-up.** Once the form is completed please fax or email both pages to the Desert Aire service department. Fax (262) 946-7400 Email: service@desert-aire.com

Signature of project manager: _____ (print) _____ (sign)

Company Name: _____ Phone #: _____

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LC/LV AireGuard Remote Startup Assistance

AireGuard Assisted Start Up consists of a Desert Aire factory technician remotely assisting a job-site technician to complete the commissioning process of the dehumidifier. Using a field installed Ethernet connection, Desert Aire will be able to navigate the controller and verify critical set up details to ensure proper equipment operation. The field technician will work under the guidance of Desert Aire to make any mechanical adjustments identified by Desert Aire to complete the commissioning process.

Prior to scheduling start-up with Desert Aire, the site must be fully prepared for commissioning with the following items completed.

Job Site Preparation - Items completed by the installing contractor before Start-Up can be scheduled:

- ☐ Dehumidifier leak checked and inspected for internal concealed damage – remove access panels and inspect the interior of the unit for transit damage. Contact Desert Aire immediately if damage is noted **(262)946-7400**
- ☐ Dehumidifier leveled and properly supported per the installation manuals recommendations. **See section 2.1 of the LC/LV I&O manual for details**
- ☐ Outside air duct filters and damper installed (if applicable) – **See LC/LV I&O manual section 2.2 for details**
- ☐ Condensate P Trap installed with heat trace for winter operation. **See LC/LV I&O manual section 2.3 for details**
- ☐ Remote condenser plumbed per **Air Cooled I&O manual section 2.4**, check valve installed in the hot gas discharge line, leak checked, evacuated, and charged if necessary. LC and LV Units require additional field charging. **Refer to the charge label affixed to the unit for details.** Please verify and document the Refrigerant volume added to the Remote Condenser _____ lbs.(if applicable)
- ☐ Gas heater lines plumbed and purged / Record gas pressure entering the unit - _____ 'wc (if applicable)
- ☐ Refrigeration line set is clamped and the header supported per the **Air Cooled I&O manual sec 2.3**
- ☐ Pressure transducer and cord sent with the remote condenser installed on the liquid line header and wired to the Johnson 450 controller. **See section 2.7 of the Air Cooled I&O manual for wiring details.** (if applicable)
- ☐ All electrical connections terminated and verified for proper voltage at the Dehumidifier and the Remote Condenser (if applicable)
- ☐ Temperature / RH sensors – (wall mount applications only) installed per the **LC/LV I&O manual Section 2.7**,
- ☐ Optional Water Condenser circuit connected to dehumidifier with flow meter, balancing valves and temperature sensors installed in circuit.
- ☐ Remove shipping blocks from compressors and blowers.
- ☐ Ethernet Connection – Verify the RJ-45 Ethernet connection is installed and active.
- ☐ Photo Document the ductwork and refrigerant line sets used for the remote condensers, be specific with photos showing oil recovery traps and the method of securing the refrigerant lines.

Tool Requirements – These items are required to make adjustments to the system

- ☐ Volt/Amp/OHM meters. / Refrigerant Manifold Gauges
- ☐ Hand Tools – Refrigeration Service Wrenches, Allen Wrenches, Assorted Screwdrivers & Crescent Wrenches
- ☐ Air Balancing Equipment (Magnehelic or Manometer differential pressure gauge – one inch scale is preferred)
- ☐ 25 # cylinder of the appropriate refrigerant & scale.
- ☐ Hand pump for adding oil to compressors and 1 gallon of one of the following POE oils:
Copeland Ultra 32-3MAF
Lubrizol Emkarate RL32-3MAF
Park Emkarate RL32-3MAF



LC/LV AireGuard Remote Startup Assistance

Nu Calgon 4314-66 (RL32-3MAF

(This is required on split systems based on line set calculations and oil recovery traps)

Unit Information

Model # _____

Serial # _____

Jobsite Information

Job site name _____

Job Site Address _____

Contractor Information

Installing Contractor: _____

Manager's Name : _____ Phone #: _____

Field Technicians Name : _____ Cell # _____

If you are unable to supply any of the required equipment you must contact Desert Aire before returning this document.

I agree that the items listed above have been completed as of _____ (Date) Once this form is completed please fax or email both pages to the Desert Aire Service Department.

Fax (262) 946-7400 Email: service@desert-aire.com

Desert Aire will schedule an appointment within 7 Business Days to commission the unit and will contact the Field Technician directly. The Field Technician will be expected to be onsite at the scheduled time to begin the commissioning process.

If rescheduling is required – Please contact Desert Aire immediately for availability

Signature Project Manager: _____ (print) _____ (sign)

Company

Name: _____ Phone #: _____

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LC/LV Series Start up Report

Important – To ensure warranty validation and continued customer satisfaction, complete this form and return it to Desert Aire immediately after start-up. Validation of this report activates the warranty.

Desert Aire Corporation
c/o Service and Warranty Department
N120W18485 Freistadt Road
Germantown, WI 53022
Phone: (262) 946-7400 service@desert-aire.com

Instructions

- **Warning** – Only trained, qualified personnel should install and service Desert Aire equipment. Serious Injury or death can result from improper handling of this equipment. High voltage electrical components and refrigeration under pressure are present.
- Before continuing, read the Installation and Operations manual. If you do not fully understand the manual contact the Desert Aire Service Department. Please be prepared with the model and serial numbers located on the rating plate of the unit.
- Use one start up report per unit. Print or type all information. If there is not enough space available for readings or comments please attach additional pages directly to the start up report.

Location and Unit Information			
Installation Name:		Date:	
Installation Address:			
Dehumidifier Model #:		Serial #:	
Remote Condenser Model #:		Serial #:	
Form Completed By (Print):		Signed:	
Company Name:		Phone #:	
Company Address:			

Factory Use Only			
Reviewed By:		Date:	
		Report is:	<input type="checkbox"/> Approved <input type="checkbox"/> Denied
AireGuard Connection Verified:		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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**Denotes that this is a model dependent item*

Proper Installation Checklist- Refer to the LC/LV I&O manual for items label "Sec"		
<input type="checkbox"/> Installation manual read and understood	<input type="checkbox"/> Tighten all field and factory wiring	<input type="checkbox"/> Open all refrigeration service valves and tighten packing nuts
<input type="checkbox"/> Dehumidifier installed and leveled properly. Sec 2.1	<input type="checkbox"/> Adjust and tighten blower belts if necessary. Sec 3.1	<input type="checkbox"/> Check field and factory piping for leaks
<input type="checkbox"/> Condensate drain trapped and primed. Sec 2.3	<input type="checkbox"/> Check rotation of blower on 3 phase units	<input type="checkbox"/> Inspect air filters. Clean or replace as necessary
<input type="checkbox"/> Verify that the power supply matches the rating plate	<input type="checkbox"/> Check rotation of remote condenser fans	<input type="checkbox"/> 120 volt circuit run to heat trace and powered up

Unit Power Supply – Wire transformers 240 volt for 240 volt applications. Unit leaves factory wired 208 or 460			
Voltage at power block - No motors running	L1-L2	L2-L3	L1-L3
Control Voltage - No motors running	Transformer 1	VA Rating	

Line-set Installation* See label affixed to the unit for pipe sizes, charge and additional oil charge. See section 2.3 and 2.4 of the Air Cooled I&O for pipe design, support and trapping details				
Line Sizes	Hot Gas		Liquid Return	
Lineset Length		Elevation Change	<input type="checkbox"/> Above <input type="checkbox"/> Level <input type="checkbox"/> Below	
Hot gas line trapped at every riser	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Inverted traps at top of risers	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Check valve installed	<input type="checkbox"/> Yes <input type="checkbox"/> No	Line-set Clamped per I/O Manual	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Additional R410A Added	LBS	Additional Oil Added	OZS	

Fan Cycle Controller Settings* – See sec 4.0 of the Air Cooled I&O manual for programming details. Insure the sensor wiring and jumpers positions are correct per sec 2.7-2.8								
Voltage	L1-L2		L2-L3		L1-L3			
Amps - Motor 1	L1		L2		L3			
Amps - Motor 2	L1		L2		L3			
SENS	SN-1							
OUTR ¹	ON ¹	OFF ¹	OND ¹	OFFD ¹	ONT ¹	OFT ¹	SNF ¹	SENS ¹
OUTR ²	ON ²	OFF ²	OND ²	OFFD ²	ONT ²	OFT ²	SNF ²	SENS ²

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Air Flow Readings: See sec 3.3.3 of the LC/LV I&O manual for airflow instruction and specs					
		Unoccupied Mode		Occupied Mode*	
Evaporator Static Pressure Drop		"wc		"wc	
Reheat Condenser Static Pressure Drop		"wc		"wc	
Supply Duct Static Pressure		"wc			
Return Duct Static Pressure		"wc			
OA Damper Setpoint		%		%	
Blower FLA (off nameplate)	amps	Actual	L1	L2	L3

Temperature Readings- Testing should be done with at a minimum of 70deg			
Room Air Temperature	°F	Room Relative Humidity	%
Outdoor Air Temperature	°F	Outdoor Relative Humidity	%
Water Temp (main pool)	°F	Water temp (spa or other)*	°F

Compressors and Refrigeration in Reheat Mode- Superheat values can be found using the Carel display module and navigating to the analog output page. See section 3.4 figure 29 for proper superheat values. Sub cooling pressure and temp readings are taken between the receiver outlet and the liquid filter.					
Motor #			(8 Ton Only)		
Compressor RLA off nameplate	amps		amps		
Amperage	L1		L1		
	L2		L2		
	L3		L3		
Head Pressure	Psig				
Suction Pressure	Psig				
Refrigerant Sight Glass Clear	<input type="checkbox"/> Yes <input type="checkbox"/> No	Oil Sight Glass	<input type="checkbox"/> N/A	<input type="checkbox"/> 1/2	<input type="checkbox"/> 3/4 <input type="checkbox"/> F
Suction temp / Superheat	°F / °F				
Liquid Temp / Sub-cooling	°F / °F				

Compressors and Refrigeration in Pool Water Heating Mode* - See section 2.4.1 of the LC/LV I&O manual for pool water setup and specs. Note information in section 4.6			
Head Pressure	Psig	Suction Pressure	Psig
Water Inlet Temperature	°F	Water Outlet Temperature	°F
Suction temp/Superheat	°F / °F		

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Compressors and Refrigeration in Cooling Mode* Superheat values can be found using the Carel display module and navigating to the analog output page. See section 3.4 figure 29 for proper superheat values. Sub cooling pressure and temp readings are taken between the receiver outlet and the liquid filter.

Head Pressure	Psig	Suction Pressure	Psig
Refrigerant Sight Glass Clear	<input type="checkbox"/> Yes <input type="checkbox"/> No	Oil Sight Glass	<input type="checkbox"/> N/A <input type="checkbox"/> 1/2 <input type="checkbox"/> 3/4 <input type="checkbox"/> F
Suction temp / Superheat	°F / °F	Liquid Temp / Sub-cooling	°F / °F

Auxiliary Water / Steam Coil Information*

	Signal	Inlet Temp	Outlet Temp	Discharge Air Temp
Water Coil		°F	°F	°F

Auxiliary Electric Heater Information*

	Signal	L1 Amps	L2 Amps	L3 Amps	Discharge Air Temp
Electric Heater					°F

Remote Start Up

Tech Onsite Name:		Company	
Email Address:		Phone #:	

AireGuard and Owner Info

Application (Pool, Spa, etc.):		Software Rev:	
Type of Start-Up:	<input type="checkbox"/> Onsite <input type="checkbox"/> Remote	AireGuard Connection:	<input type="checkbox"/> Inactive <input type="checkbox"/> Active
Owner's Name:		Owner's Email Address:	
Owner's Mailing Address:			

Additional Comments:

•

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N120 W18485 Freistadt Road • Germantown, WI 53022 • E-mail: info@desert-aire.com
 PH: (262) 946-7400 • Fax: (262) 946-7401 • Website: www.desert-aire.com

Compressor Replacement Form

Location and Unit Information

Installation Name:			
Dehumidifier Model #:		Serial #:	
Form Completed By (Print):		Signed:	
Company Name:		Date:	
Company Address:		Phone #:	
		Fax #:	
Defective Comp. Model #:		Serial#:	
(If Tandem Set – Only list the specific failed compressor)			
New Compressor Model #:		Serial#:	

Compressor Condition at Time of Initial Review

Continuity (0 resistance) to Ground on one or more legs	<input type="checkbox"/>	Compressor drawing higher current than design	<input type="checkbox"/>
Continuity (0 resistance) between two or more legs (3 phase units)	<input type="checkbox"/>	Compressor drawing locked rotor current	<input type="checkbox"/>
Other (describe):	<input type="checkbox"/>	Runs without pumping: Pressures: ____ / ____	<input type="checkbox"/>

Continuity (0 resistance) to Ground on one or more legs	<input type="checkbox"/>	Compressor drawing higher current than design	<input type="checkbox"/>
Continuity (0 resistance) between two or more legs (3 phase units)	<input type="checkbox"/>	Compressor drawing locked rotor current	<input type="checkbox"/>
Other (describe):	<input type="checkbox"/>	Runs without pumping: Pressures: ____ / ____	<input type="checkbox"/>

Final Determination of Failure

Liquid Floodback	<input type="checkbox"/>	Low Superheat	<input type="checkbox"/>	Debris	<input type="checkbox"/>	Defective Expansion Valve	<input type="checkbox"/>
Low Sump Oil	<input type="checkbox"/>	Insufficient Motor Cooling	<input type="checkbox"/>	Other (Describe):	<input type="checkbox"/>		

Diagnostic/Corrective Action Summary

Describe what corrective action was taken to prevent a repeat failure.

Compressor Replacement Checklist

Required		Choose One		For Test Results Showing Acid or Particulate	
Acid and particulate test completed	<input type="checkbox"/>	Unit Evacuated to 500 microns absolute and vacuum decay passed	<input type="checkbox"/>	HH Cores used – Acid Core	<input type="checkbox"/>
Liquid Line Filter Replaced	<input type="checkbox"/>	Alternate triple evacuation process used	<input type="checkbox"/>	SF filter used	<input type="checkbox"/>

Air Flow Readings: Refer to Installation and Operations manual for correct balancing procedures.

Evaporator Static Pressure Drop	"wc	Supply Duct Static Pressure Drop	"wc
Reheat Condenser Static Pressure Drop	"wc	Return Duct Static Pressure Drop	"wc

Temperature Readings

Room Air Temperature	°F	Water Temp (Circle: Pool / Tower)	°F	Room Relative Humidity	%
Outdoor Air Temperature	°F	Water Temp (Circle: Pool / Tower)*	°F	Outdoor Relative Humidity	%

Compressors and Refrigeration in Reheat Mode

	Circuit A – Use both sides for tandem set					
Motor # (See wiring schematic for details)						
Discharge Pressure			PSIG			PSIG
Liquid Line Pressure (At access fitting nearest TXV)			PSIG			PSIG
Suction Pressure (At compressor)			PSIG			PSIG
Liquid Line Temperature (At access fitting nearest TXV)			°F			°F
Suction Temperature (At Compressor)			°F			°F
Refrigerant Sight Glass Condition (Clear, Intermittent Vapor, Flashing)						
Comp. Oil Level Sight Glass (Shut down comps., wait 5 minutes)	½	¾	F	½	¾	F

Compressors and Refrigeration in Cooling Mode

	Circuit A – Use both sides for tandem set					
Motor # (See wiring schematic for details)						
Discharge Pressure			PSIG			PSIG
Liquid Line Pressure (At access fitting nearest TXV)			PSIG			PSIG
Suction Pressure (At compressor)			PSIG			PSIG
Liquid Line Temperature (At access fitting nearest TXV)			°F			°F
Suction Temperature (At Compressor)			°F			°F
Refrigerant Sight Glass Condition (Clear, Intermittent Vapor, Flashing)						
Comp. Oil Level Sight Glass (Shut down comps., wait 5 minutes)	½	¾	F	½	¾	F



OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY

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