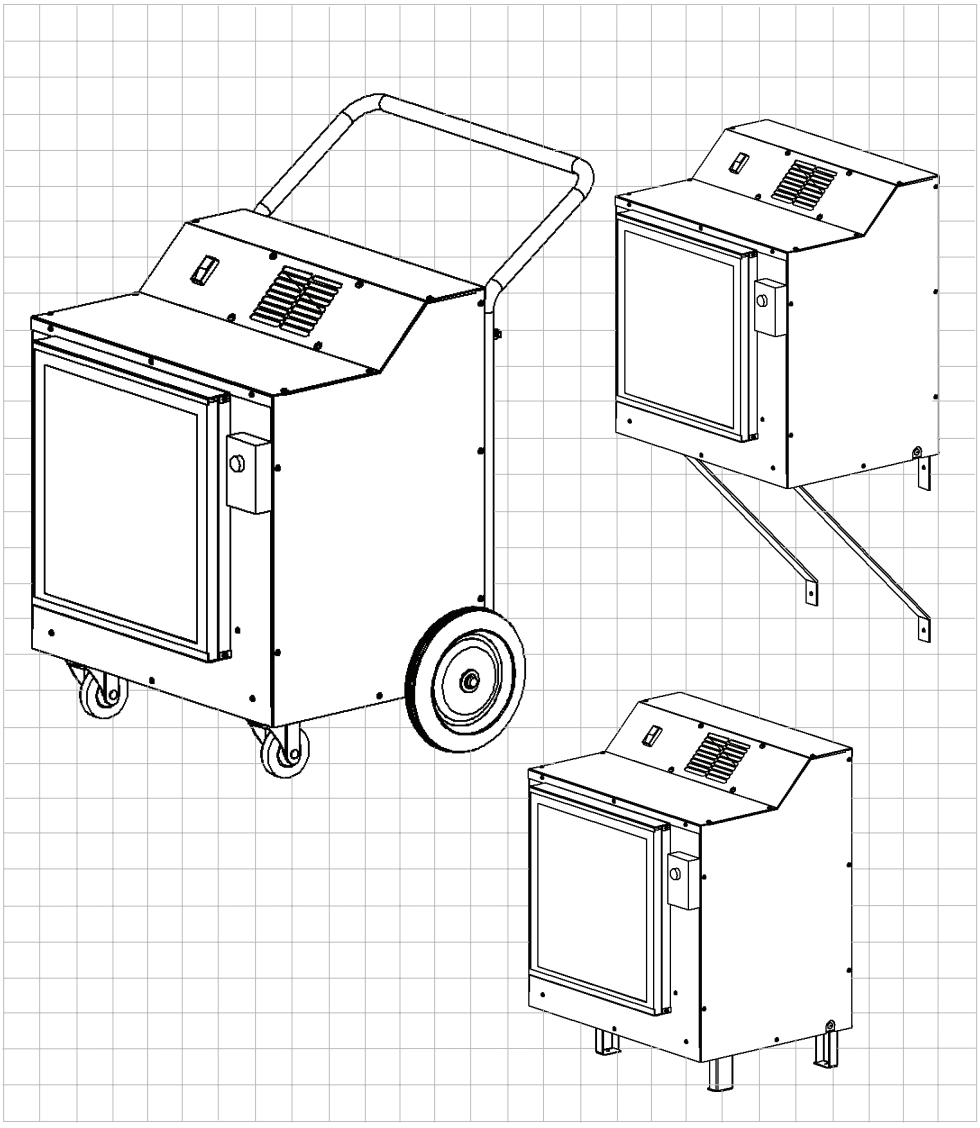
DESERT AIRE
POOL DEHUMIDIFICATION
DEDICATED OUTDOOR AIR SYSTEMS

HPR 120 R-410A Series Dehumidifier

Installation and Operation Manual

- Removes between 2.5 lbs to 12 lbs of moisture per hour
- Low temp model offers demand defrost option to operate down to 32° F ambient
- Manual control or automatic by humidistat
- Installation Options:
  - Portable with Wheels
  - Wall Mount
  - Floor Mount
- Compact design serves diverse applications - rent-a-centers, WTP/WWTP, storage areas, residential, grow rooms, etc.



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⚠ 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 two (2) years from the date of shipment. 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 for 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. 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.
3. The following parts and components are excluded from the warranty: belts, filters, driers, fuses and refrigerant.
4. Refrigerant coils or other components that corrode due to improperly balanced pool chemistry or corrosive air quality will not be warranted.
5. All replacements or repairs will be FOB Germantown, WI.
6. 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.
7. 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.
8. Desert Aire must preauthorize all warranty coverage described herein.

Extended Warranty:

Desert Aire does not provide any extended warranties for the HPR Series dehumidifiers.

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
FAX: (262) 946-7401
E-MAIL: service@desert-aire.com

Additional copies of this manual can be purchased for a nominal fee from Desert Aire. Submit requests to the contact information listed above.

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.

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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. This will entail taking photos of the damage and completing a freight carrier damage claim. It is imperative that any freight damage be documented with the carrier as soon as possible. Notify Desert Aire of any damages.

1.3 Handling and Moving the HPR Dehumidifier

⚠ CAUTION

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

Certain precautions must be taken when handling the HPR dehumidifier. If this happens, oil may drain out of the compressor and cause compressor failure. Although portable models have handles for tipping, we recommend that you utilize all four wheels for normal horizontal movement. Only tip units a maximum of 20 degrees when it is absolutely necessary.

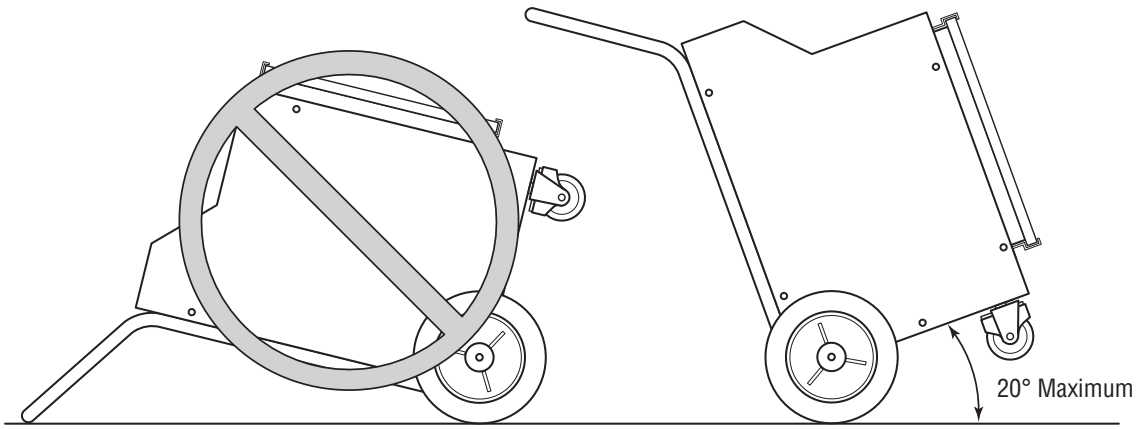

Figure 1 - Handling the HPR

2. Installation

Manual applies to standard unit configurations only.

2.1 Location of Dehumidifier

Desert Aire HPR Series dehumidifiers are designed for indoor applications only. Position the dehumidifier so that air circulation is maximized in the conditioned area. Assure that air intake and discharge areas remain unobstructed. Remove any obstacles that may redirect discharge air toward the intake. If the conditioned area has relatively tall ceilings, the use of circulating fans is strongly recommended.

2.2 Assembly

Some assembly may be necessary depending on the model of your dehumidifier. The following sections detail component assembly.

2.2.1 Attaching the Handle to the Portable Unit

Attach the handle to the back of the unit using the (4) 5/16” bolts and washers provided. Thread the bolts through the handle and into the nutserts on the back of the unit.

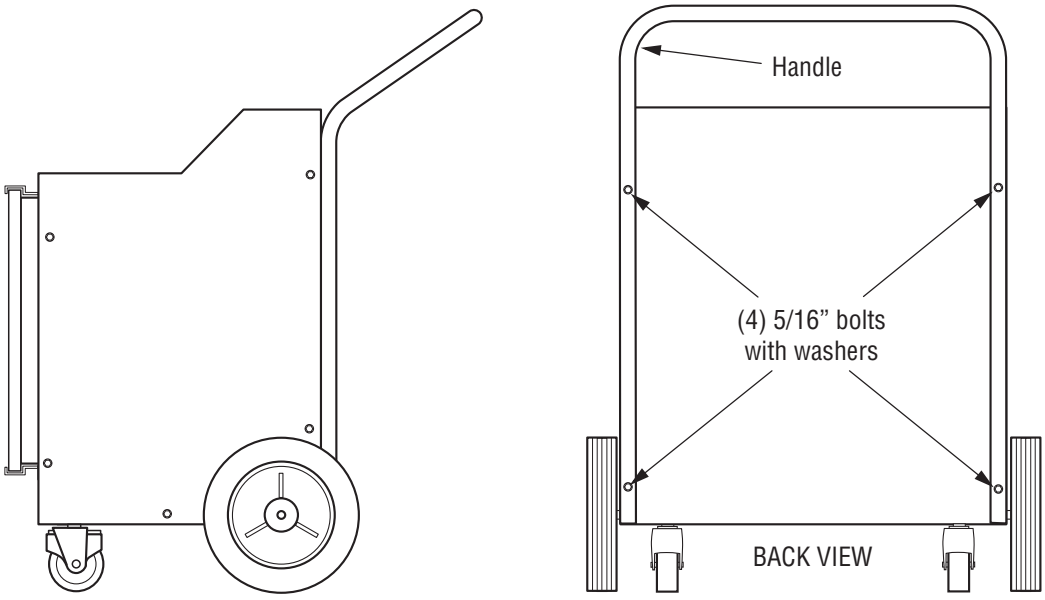

Figure 2 - Attaching the Handle

2.2.2 Wall Mounting of Unit

1. Select a location where the intake and discharge will not be obstructed. Assure that the unit is not positioned so that any hazard may exist.
2. Attach brackets to wall 16” on center. **Assure that wall brackets are firmly attached to wall studs.**
3. Lift the unit onto the wall brackets.
4. Secure in place with the four (4) 5/16” bolts and washers provided. Thread bolts through brackets and into the nutserts on the bottom of the unit.

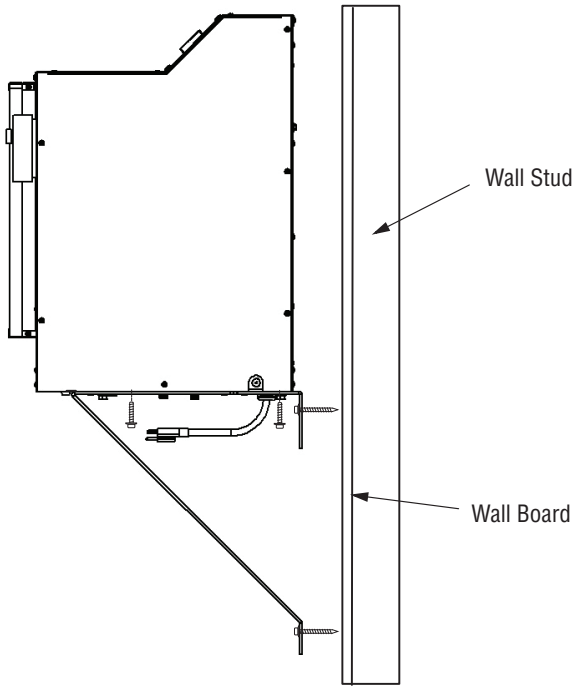

Figure 3 - Wall Mounting Unit

2.2.3 Floor Mount Kit Assembly

Raise unit 6”. Attach the four (4) feet with the 5/16” bolts and washers provided. Thread bolts through brackets and into nutserts in bottom of the unit.

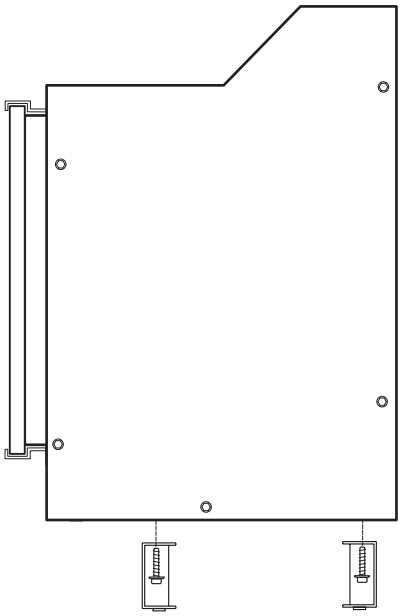

Figure 4 - Attaching the Feet

2.3 Electrical Connections

⚠ 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.**

2.3.1 Standard Extension Cord Application

Some HPR models are equipped with special electrical plugs. These plugs are provided to guarantee that units are not powered by standard household circuits which are usually only rated for 115 volts and 15 amps. All HPR models utilize plugs with grounding.

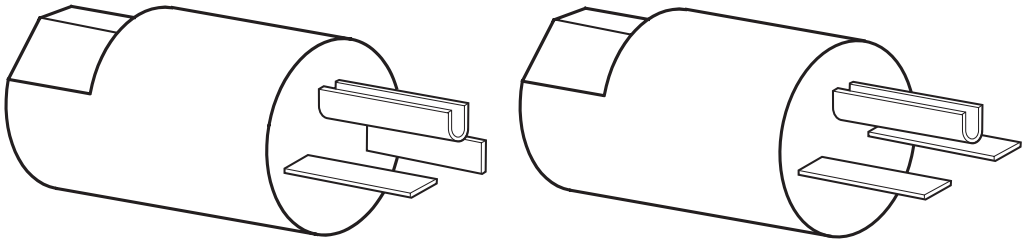

Figure 5 – Typical 115 Volt 20 Amp Plug (left) and Typical 230 Volt 15 Amp plug (right)

2.3.2 Hard Wiring Applications

Screws on the exterior of the cabinet are T25 bit.
If your application includes hard wiring your system:

- Remove side panel to gain access to the electrical panel.
- Disconnect cord from contactor and grounding lug.
- Remove plug and run wires through existing hole in base of unit. Connect power wires to contactor and grounding wire to the grounding lug provided.

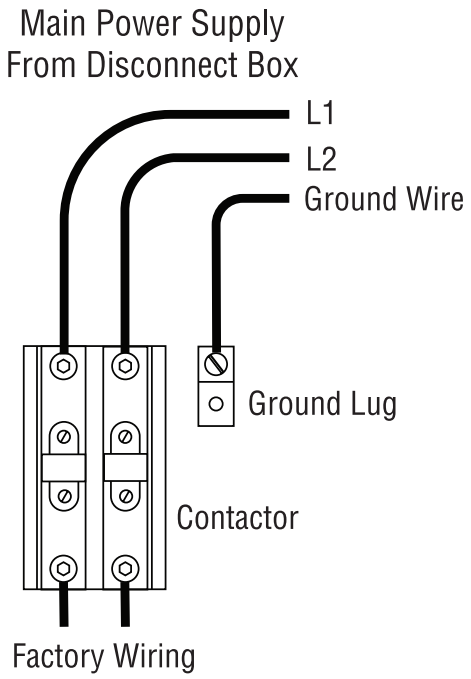

Figure 6 - Hard Wiring Connections

2.4 System Control

Standard HPR models are controlled by an on/off switch located on the unit. This switch energizes the blower and the compressor. **NOTE:** HPR's are equipped with a timer which delays system re-starts for 5 minutes.

If your application includes controlling the unit with a humidistat, an isolated binary contact must be provided (open/system off, closed/system on).

CAUTION

Failure to provide an isolated non-powered contact may result in damage to the dehumidified and the auxiliary device.

Install this device between the contacts provided on your unit's electrical panel. Refer to the electrical diagram which is isolated on the inside of the side panel for further details.
NOTE: The unit's on/off switch must be set to ON for the humidistat to work properly.

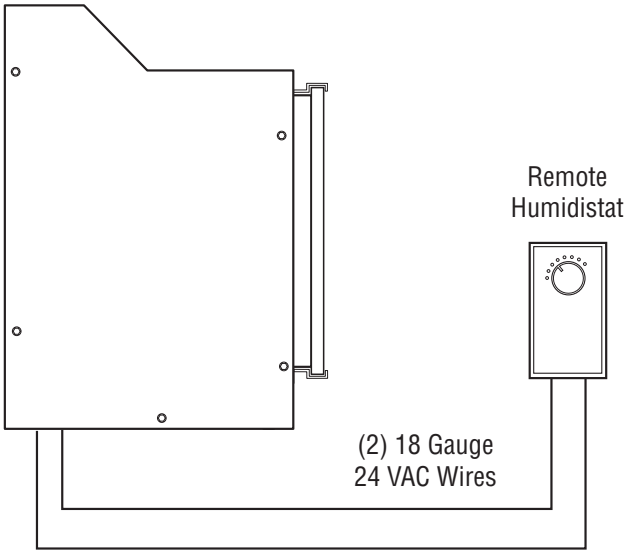

Figure 7 - Remote Humidistat Control Wiring

2.5 Condensate Drain

⚠ CAUTION

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

2.5.1 Condensate Pump Equipped Units

If in doubt, see Section 5.5.2 to determine if your unit is equipped with this option. These units are equipped with an internal pump that comes with a 10 foot hose. However, the pump is capable of pumping up to 20 feet if needed. Install hose so that condensate is pumped to a code approved drain. Cut off any unused length and assure that no kinks exist in the hose. **NOTE:** Condensate pumps are equipped with a switch which will prevent the dehumidifier from running should the pump fail.

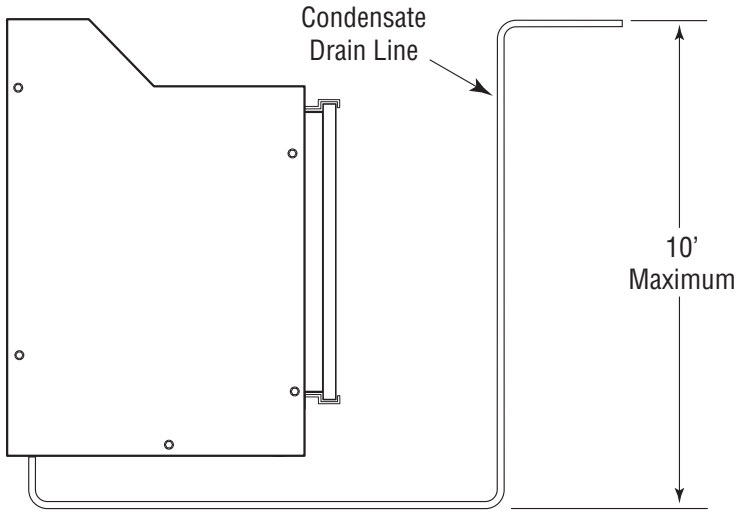

Figure 8 - Condensate Piping (models equipped with pump)

2.5.2 Non-pump Units

Install hose so that condensate can freely drain via gravity to a code approved drain. Cut off any unused length and assure that no kinks exist in the hose. If gravity disposal is not possible, you will have to install a condensate pump in the hose. Follow the pump manufacturer’s installation instructions.

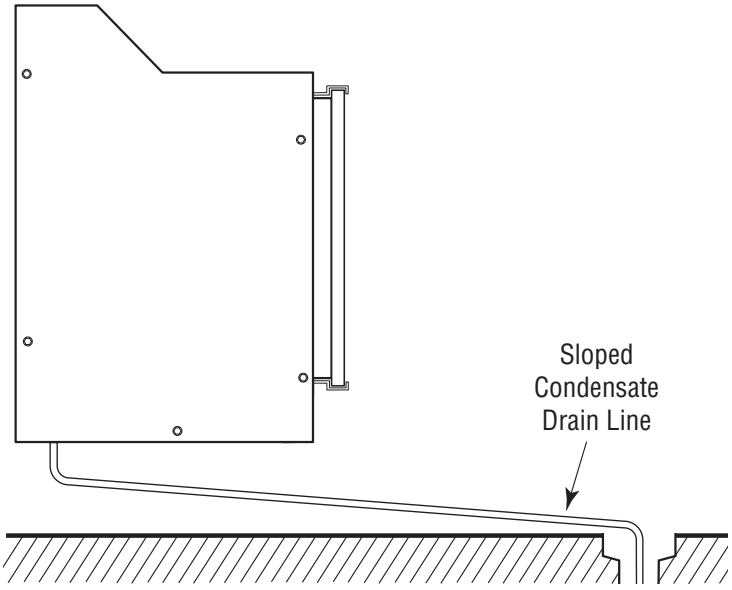

Figure 9 - Condensate Piping (non-pump models)

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 Routine Maintenance Schedule

3.1.1 Service Every Month

- Check the air filters and replace them if necessary.
- Check the coils in the dehumidifier. Use compressed air or a commercial coil cleaner if they are dirty or plugged.

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

- Model Number
- Serial Number
- Room Temp
- Relative Humidity

4. Troubleshooting

4.1 System Does Not Start Promptly

HPR's are equipped with a timer which delays system re-starts for 5 minutes. This feature was added to prevent breaker trips which may occur when the unit is cycled too quickly.

4.2 Supply Blower Will Not Run

POSSIBLE CAUSE	REMEDY
Control logic	Assure switch is in ON position or adjust controller setpoints.
Internal protection has tripped	Blowers are equipped with auto-reset thermal overloads which will prevent them from running if motor temperatures exceed specification. If this persists replace blower.
Loss of main power	Assure unit is plugged in. Check for tripped circuit breaker or blown fuses.
Condensate pump failure (if so equipped) Note: Condensate pump failure will keep blower & compressor from actuating.	Inspect condensate pump for proper operation: 1. Assume unit is powered and unit switch is set to OFF. 2. Pour water into drain pan. 3. Pump should discharge water through hose.

4.3 Compressor Will Not Run

POSSIBLE CAUSE	REMEDY
Control logic	Assure switch is in ON position. adjust controller setpoints.
Internal protection has tripped	Compressors are equipped with auto-reset thermal overloads which will prevent the compressor from running if motor temperatures exceed specification. Allow adequate time for thermal overload to reset.
Loss of main power	Check for tripped circuit breaker or blown fuses.
Condensate pump failure (if so equipped) Note: Condensate pump failure will keep blower & compressor from actuating.	Inspect condensate pump for proper operation: 1. Assure unit is powered and unit switch is set to OFF. 2. Pour water into drain pan. 3. Pump should discharge water through hose.
Faulty wiring	Check for loose or faulty wiring on system and controller.
Compressor failure may have occurred if: 1. Compressor draws locked rotor amps 2. Compressor starts but does not pump 3. Motor windings have shorted	See Section 5.1.1 for compressor replacement procedure.

4.4 Evaporator Coil Does Not Fully Thaw (Low Temperature Models Only)

POSSIBLE CAUSE	REMEDY
Defrost cycle not working properly	See Section 5.3.2
Faulty or improperly set hot-gas bypass valve	1. Adjust hot-gas valve to maintain higher suction temperature and pressures. 2. Replace if defective.
Insufficient evaporator airflow rate	1. Check for dirty filters or other possible airflow restrictions. 2. Assure coils are clean.
Lack of refrigerant	Reevaluate 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.

4.5 Head Pressure is Too High (Above 475 psig)

POSSIBLE CAUSE	REMEDY
Insufficient system airflow	1. Check for dirty filters or other possible airflow restrictions. 2. Verify that reheat coil is clean.
Excessive refrigerant charge	Reevaluate system charge.
Non-condensables in system	Evacuate or purge system.
Restriction in refrigeration piping	1. Check coil and tubing for kinks. 2. Replace dirty drier filter.
Refrigeration system is overloaded **NOTE:** THE HPR SERIES DEHUMIDIFIER IS DESIGNED FOR A MAXIMUM AIR TEMPERATURE OF 90° F.	1. Reduce entering air temperature and/or reduce humidity load. 2. Assure that discharge air is not being redirected toward the intake.

4.6 Unit Operates Properly but Condensation Continues to Form

POSSIBLE CAUSE	REMEDY
Poor air distribution	1. Evaluate conditioned room for air circulation and dehumidifier location. Modify as needed to assure maximum airflow circulation. 2. Add additional circulation fans to the conditioned space.
Unit is undersized	Reevaluate unit sizing. Check for initially neglected sources of heat or humidity.

4.7 Frost Build-up on the Compressor or Suction Line

CAUTION

Frost build-up on the compressor or the suction line can indicate lack of superheat. Lack of superheat will create the damaging possibility of liquid flood back to the compressor which will accelerate failure.

Standard HPR's are designed for a 20° superheat and low temperature HPR's utilize 10° when measured at the evaporator header. Superheat has been factory set and should not require field adjusting.

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

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.

Acids 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

- 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 5.4 for evacuation and charging.

- Restart unit and set unit to run compressors.

- Record the pressure drop across the liquid line filter dryer.

- Monitor pressure drop across the liquid filter 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 Compressor Replacement Form. To get a form, contact the service department at (262) 946-7400. 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 System Guidelines

5.2.1 Ambient Conditions

- Standard HPR Models:
  Entering Air 65° - 90°F and 50 – 100% RH
- Low Temperature HPR Models:
  Entering Air 40° - 90°F and 50 – 100% RH

NOTE: Operating a standard HPR unit between 40° - 65°F or any HPR below 50% RH will not damage the system. However, the unit will probably balance with evaporating temperatures at or above the entering air dew point. i.e. **LITTLE OR NO MOISTURE REMOVAL WILL TAKE PLACE.**

5.2.2 Refrigeration System Pressures

Many factors affect refrigeration pressures on a given day. Such factors include ambient temperature, airflow volume, and relative humidity. However, for the sake of troubleshooting:

- Normal suction pressure range: 95 to 145 psig
- Normal discharge pressure range: 320 to 465 psig
- Defrost mode suction pressure range: 125 to 175 psig (Low Temperature HPR's only)
- Defrost mode discharge pressure range: 260 to 370 psig (Low Temperature HPR's only)

NOTE: Always assure that system problems are not caused by restricted air flow before you troubleshoot the refrigeration circuit.

5.3 Sequence of Operation

5.3.1 Dehumidification / Air Reheat

When the unit is activated, the dehumidifier runs in the "reheat" mode. Entering air is dehumidified as it passes over the evaporator coil. The energy absorbed at the evaporator is rejected at the reheat condenser, which warms the dehumidified air. The air which is discharged from the unit is drier and warmer than when it entered.

5.3.2 Evaporator Defrost Mode (Low Temperature Models Only)

If you specified a low temperature application (down to 40°F conditioned air temperature), your unit is equipped with an evaporator defrost system. If in doubt, see Section 5.5.2 to determine if your unit is equipped with this option. Under normal conditions, evaporating temperatures may fall below 32°F causing frost to form on the coil. Every 60 minutes a timer will initiate the defrost cycle if it is needed. The need to initiate a defrost cycle is determined by an evaporator thermostat which has been factory set. The defrost cycle is terminated automatically when the coil has thawed. During a defrost cycle, there is little difference between entering and leaving air conditions. NOTE: The unit's defrost timer resets itself every time power to the unit is cut. If you unplug the unit, remove the air filter and inspect the evaporator coil for ice build-up. Assure that the coil is fully thawed before commissioning once again.

5.4 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. Isolate 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

Systems 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 B280 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 alloys to join tube.

    - The selection of filler metals is highly dependent on the tube fit, clearance, and operator preferences 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 values 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. 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 Specification by Process

After components have been repaired or replaced evacuation procedures 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 alternate 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. Alternate process should not be considered if there is a 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 bulk head 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 removed 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 the failure of another. Thoroughly test systems to ensure repeat failures do not occur.

5.5 Model Number Matrix

5.5.1 Serial Number Code

FORMAT	0	2	9	4	D	5	4	3	2
Unit Data Code	0	2	9	4					
System Identification [D]Standard System, [E]Engineered System					D				
Production Sequence Number						5	4	3	2

Figure 10 – Serial Number Code

5.5.2 Dehumidifier Model Number

	FORMAT:	H	P	R	1	2	0	X	X	X	X	X	X	X
DESCRIPTION	**OPTIONS**													
Model Type	HPR	H	P	R										
Nominal Tons	120				1	2	0							
System Voltage [1]115-1-60, [2]208/230-1-60	1,2							1						
Temperature [L]Low Temp, [N]Normal Temp	L,N								N					
Configuration [N]Fixed, [P]Portable	N,P									P				
Pump [C]Condensate Pump, [N]No Pump (STD)	C,N										C			
GFI [G]GFI, [N]No GFI (STD)	G,N											N		
Control [H]Humidistat Factory Installed [N]Standard On/Off Switch	H,N												H	
Coil Coating [N]None, STD Coating, [E]ElectroFin Coating	E,N													N

Figure 11 – HPR 120 Dehumidifier Model Number Matrix

5.6 System Rating Plate

The system rating plate is attached to an external panel on the dehumidifier.

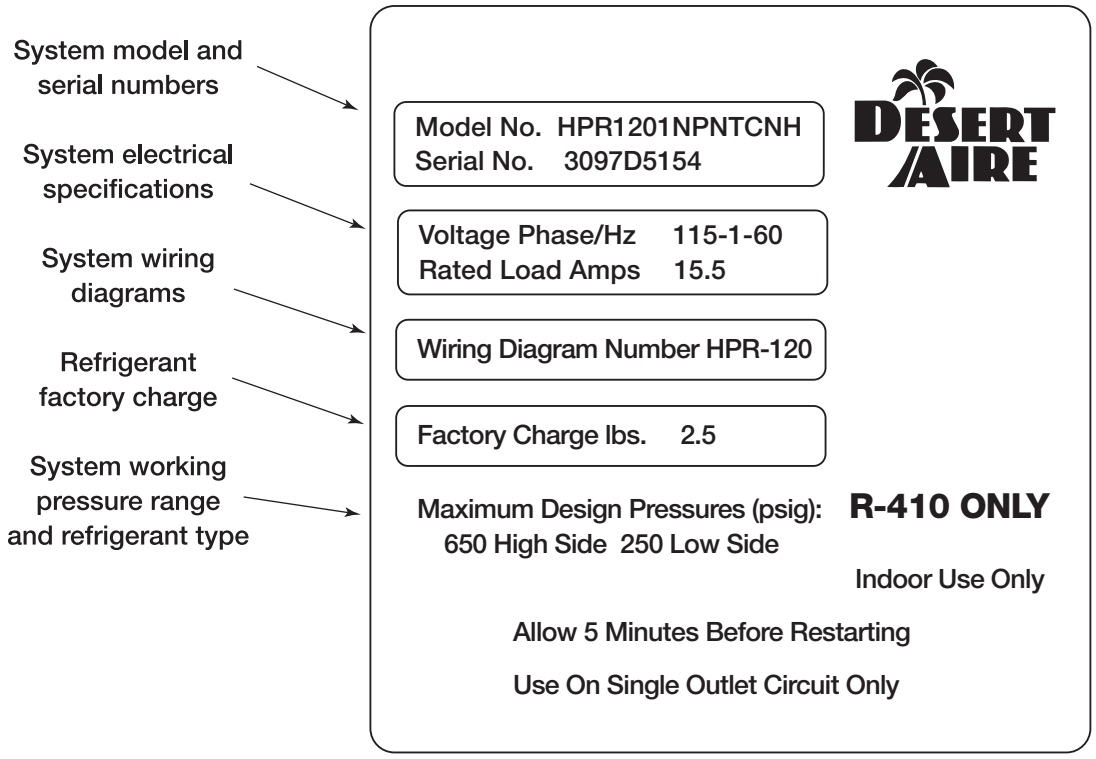

Figure 12 – System Rating Plate

5.7 System Performance Audit

Part of a good preventive maintenance program involves conducting system performance audits. These audits are also helpful when trying to correct existing problems. A complete worksheet is provided on the next page. Should you need system diagnosis help, send the completed worksheet to the Desert Aire Service Department using the number provided. Be sure to include your name and a telephone number where you can be reached.

HPR System Performance Audit

WARNING — Only trained, qualified personal should service Desert Aire equipment. Serious injury and/or death can result from improper service of this equipment. High voltage electrical components and refrigerant under pressure are present.

Rating Plate Information

Model Number _____ Serial Number _____

Voltage _____ Phase _____ Hz _____

Compressor RLA _____ Blower FLA _____ Blower HP _____

Actual Readings Taken by Qualified Technician

Compressor Amp. Draw _____ Blower Amp. Draw _____ Supply Voltage _____

Relative Humidity _____

Mode of Operation	Low Pressure	High Pressure	Supply Air Temp	Return Air Temp
Dehumidification				
Defrost Mode (LT only)				

Defrost Timer Setting (Minutes) _____ Defrost Thermostat Setting _____

Humidistat Setpoint _____

Comments:

Submitted by: _____ Phone No. _____

Please Mail, Fax or E-mail to: Desert Aire Service Department
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Ph: (262) 946-7400 Fax: (262) 946-7401 E-mail: service@desert-aire.com

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