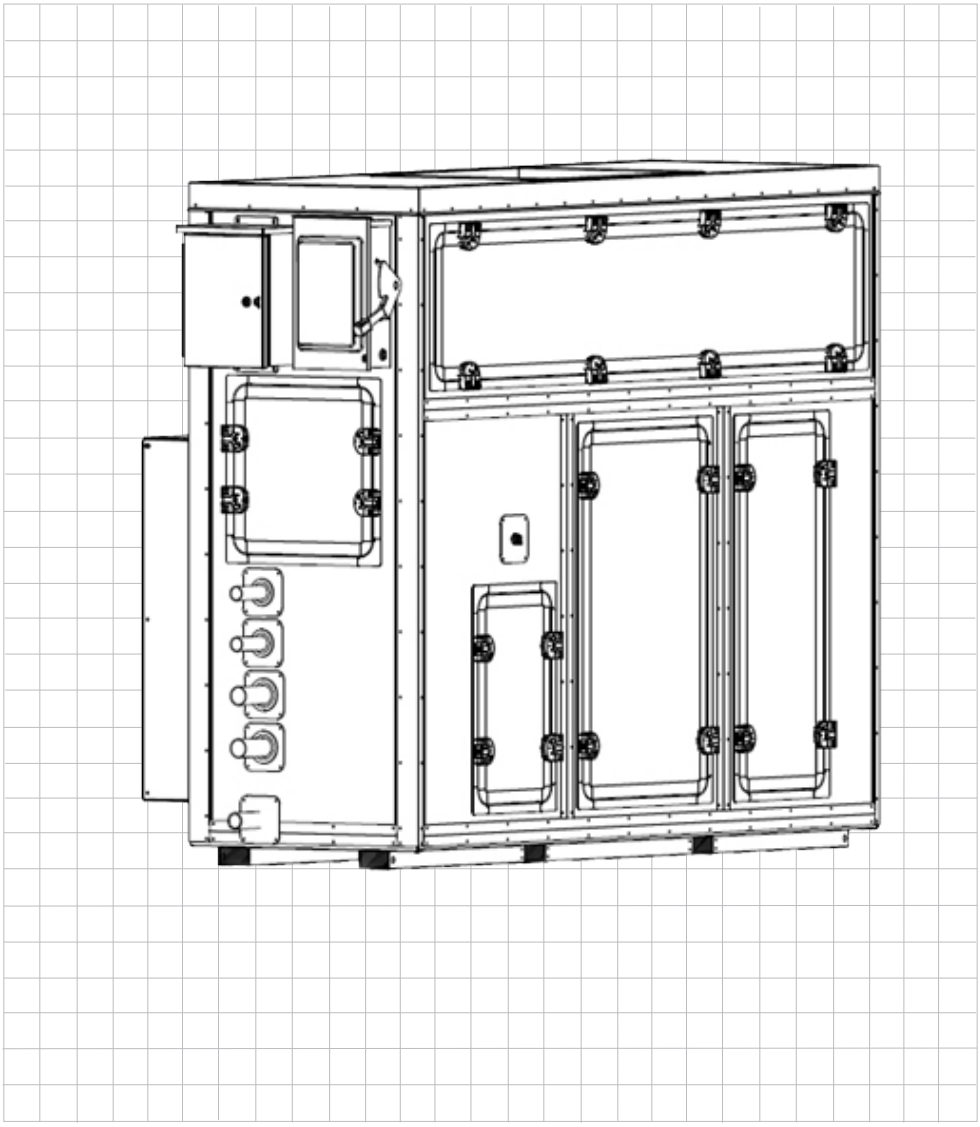
GreenAire™
Climate Control Systems

Installation and Operation Manual

- Water system for use with chilled/hot water
- CEA specific controls
- Unique control over internal water flow and temperature
- Internal chilled water recirculation pump
- Internal chilled water and hot water valves



⚠ 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.

⚠ DANGER

For any unit labeled Class 1, Group D, Division 2, all wiring must be in accordance to Class 1, Group D, Division 2 requirements. Insure that all local, state, national and any other applicable codes are adhered to when connecting any device to this equipment. All electrical connections to units labeled Class 1, Group D, Division 2 must be done with a conduit seal.

Desert Aire
Climate Control Equipment Standard Limited Warranty

Desert Aire warrants the climate control 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. **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.

5. Coils or other components that corrode due to 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 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 USA
PH: 1(262) 946-7400 • FAX: 1(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.

Product Warning for the State of California

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

TABLE OF CONTENTS

1. Introduction

Desert Aire climate control units are designed to provide years of reliable service when installed properly. Read these instructions carefully before you install the unit.

1.1. Inspection

Desert Aire inspects and tests each climate control unit before it leaves the factory so that you receive a quality piece of equipment. Unfortunately, equipment may become damaged in transit. Inspect the unit 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 fluid leaking from the unit should be documented upon delivery.

1.2. Freight Damage Claims

Freight is shipped FOB, if damage is noted, the BOL must be marked damaged to process a claim - Failure to do so will void any future claims

If the unit has been damaged, document the extent of the damage. Take pictures if possible. 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. Damaged units must have signed documents at the time of delivery to be eligible for a freight claim.

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 equipment is 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 Unit

Depending upon the unit type, various rigging methods are used to best lift the equipment. Please reference the applicable sections below:

- **GreenAire™ Products (GR)**

  -Vertical Cabinet Models (GRAV,GRBV,GRCV,GRDV)

  Personnel should avoid stepping on the top of the unit. Desert Aire air handlers 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. If you must walk on the top panels, carefully walk on the edges where structural integrity is greatest.

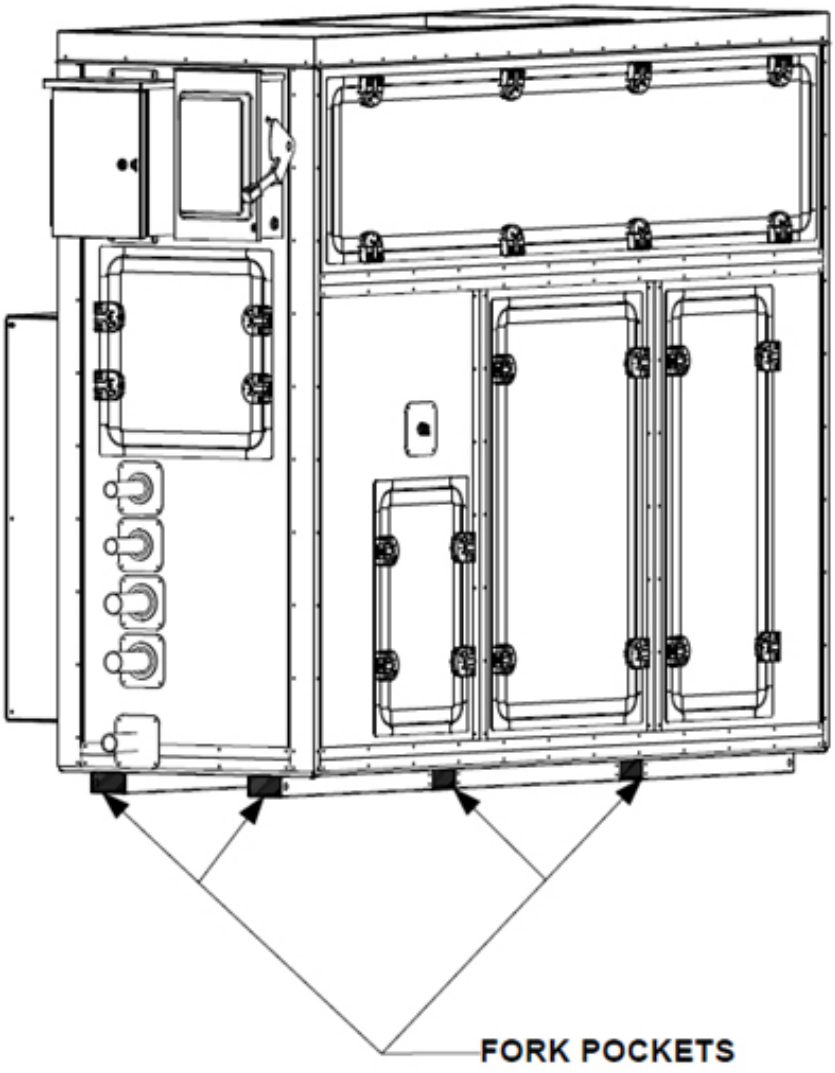


Figure 1 - Fork Pocket Locations

Move the unit to the desired installation location with the unit still on the wood pallet. To remove the unit from pallet, position fork lift parallel to the fork pockets in the bottom of the unit and found at each end and in the middle of the unit. Use only the fork pockets to avoid damage. The unit will have to be carefully removed from the fork lift and placed into the desired location using hand truck equipment dollies or pipe rollers. Use caution to not damage the unit with the fork lift or tip the unit over ensuring it is kept as level as possible. The Vertical Cabinet GR unit is designed to fit through a standard size door (the door itself may need to be removed temporarily) but will require that the air filter box be removed or not installed until after the unit is in the final location. The unit should be assembled as close to the location of installation as possible. Use caution when moving the unit through a doorway to not catch the hinges on the door frame. It may be necessary to remove the wood pallet to get the unit through the doorway.

⚠ CAUTION

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

2 Installation

Manual applies to standard unit configurations only.

2.1 Location and Access

Desert Aire GreenAire™ air handlers are configured to allow access from the rear and the sides. This means you can make your service connections and perform routine maintenance when you must install one side of the air handler close to a wall or other restriction. The “access side” is the long side with the access doors. The shorter sides also have access doors. It is recommended that clearance be provided for all of these doors to allow for ease of service ability in the event large components require replacement. Allow a minimum of 36 inches of clearance around the shorter sides of the air handler for piping, electrical connections, and service access. Refer to the general arrangement drawing for further details.

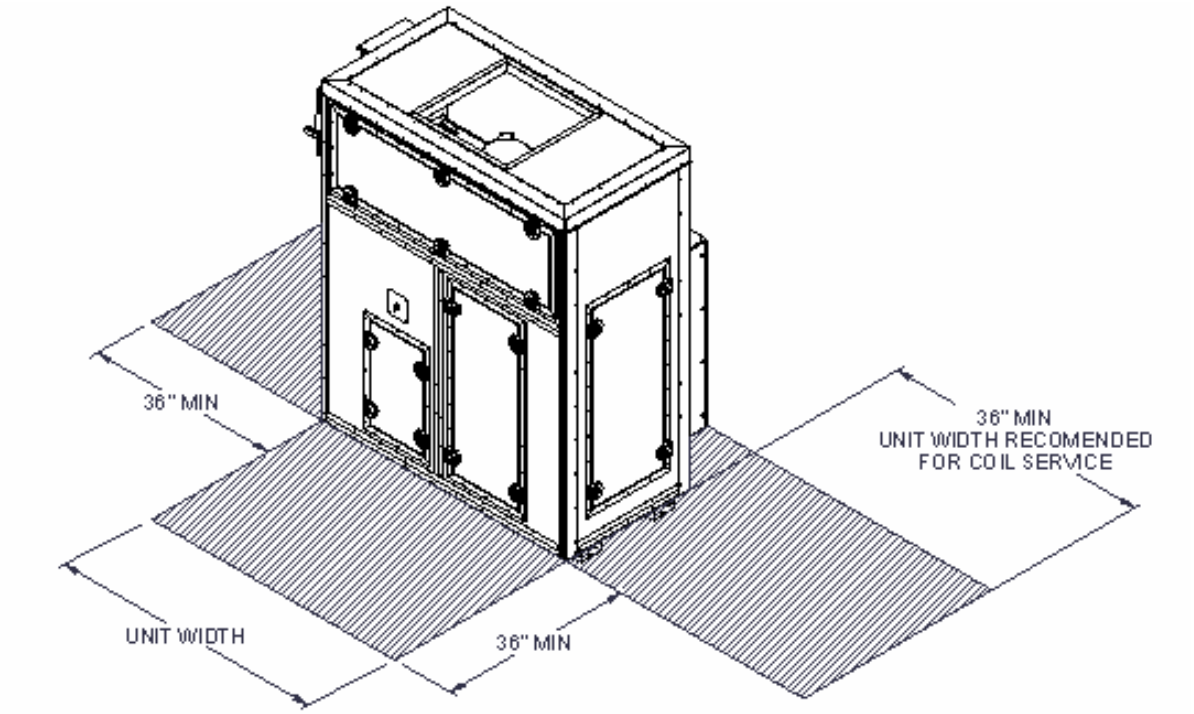


Figure 2 - Required Clearance for Working and Safety

Install the unit on a sturdy, level mounting base or platform that will prevent vibration and sound transmission. Never install the air handler on a wooden or metal platform without consulting the design engineer for isolation requirements and / or sound control materials. Do not install the unit near occupied rooms such as offices or guest rooms. 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 air handler. See section 2.2 or 5.1 for detailed duct installation instructions.

Units located in unconditioned spaces may form condensation on the exterior of the cabinet as well as in the interior surfaces. Precautions should be taken for indoor units located within unconditioned spaces to prevent damage resulting from condensation. When the unit is exposed to low temperatures, the interior surfaces may become cold enough to drop below the dewpoint. Condensation may then form on the cold interior surfaces and result in water collecting; this result could be especially problematic in the electrical box. If the unit is located in either an outdoor space or in a location that is near a doorway or window which may lead to humid air entering the air handler unit, condensation is possible. In a unit located outdoors, some condensation will collect on exterior panels.

Do not install an indoor-rated air handler in an outdoor or a wet environment.

If you must install an air handler outdoors you must use an outdoor-rated air handler. Desert Aire seals and weatherproofs outdoor air handlers to help prevent water infiltration. You can determine whether your air handler is outdoor-rated by inspecting the unit rating plate. See section 5.5 for details.

2.2 Duct Installation

Duct design and installation should conform to the latest ASHRAE and SMACNA low velocity duct standards. See section 5.1 for details. Undersized, restrictive ductwork with abrupt turns or transitions, can decrease the efficiency and the moisture removal capacity of your unit. Size the ductwork for an acceptable air pressure drop at the airflow volume of your unit. Use neoprene flex connectors when you attach ductwork to the unit to prevent transmission of excess vibration and noise.

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.

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 unit, depending on the size and style of the cabinet used.

Note: While the supply fan runs, the drain pan area inside the air handler operates at a negative pressure. Your unit requires a waterless trap or P-trap in the condensate drain pipe to prevent condensate from being drawn into the cabinet of the air handler.

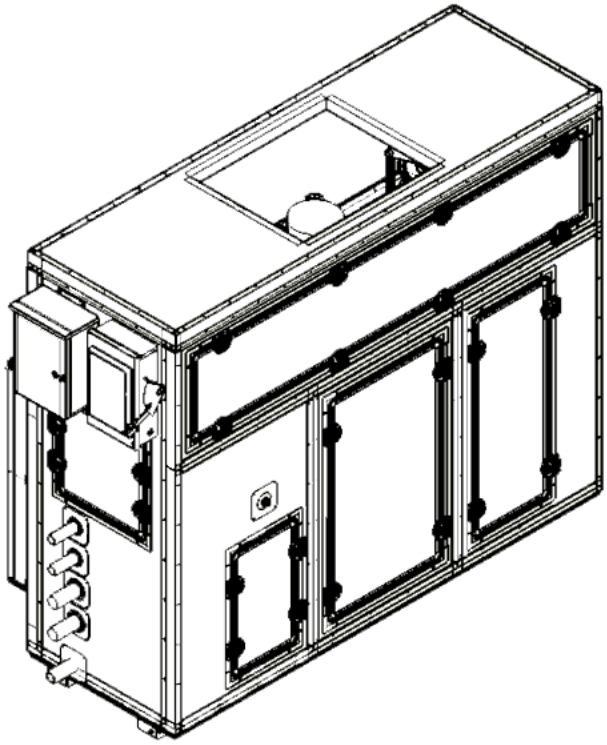


Figure 3 - Condensate Piping (Side-Mounted Drain Shown)

Waterless Trap Option

A waterless trap may have been included on your GreenAire™ order. This type of trap is highly recommended in the application. When units are installed outdoors in freezing conditions, the waterless trap reduces risk of freezing of the trap should there be prolonged periods of shut down. It also eliminates the need to ensure that the trap is pre-primed on initial start. It can assist where there is limited height available on higher negative static pressure return ducts or when indoor units are not placed on a housekeeping pad.

When condensation is not present, the negative pressure within the plenum draws the internal mechanism against the valve seat preventing air from entering the AHU through the drainpipe.

As condensate forms, water builds up in the vertical pipe. When the water pressure equals the negative air pressure in inches of water column, the force of the water head becomes equal or greater than the negative pressure and the internal mechanism moves to the right, and water flows.

When there is no longer a requirement to remove condensation, the negative pressure returns the ball to the valve seat and prevents airflow to the unit plenum. The internal rails aid in returning the ball to the seat.

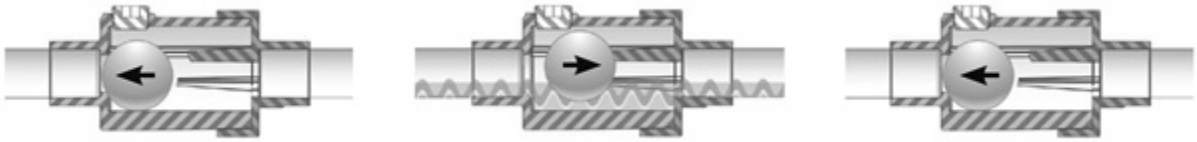


Figure 4 - Waterless trap ball valve

The column of liquid within the GreenAire™ unit is adequate for moving the ball from the valve seat. No additional drop of the condensate line is required outside of the unit for external static pressures up to 2” w.c.

Condensate lines operating in freezing temperatures will still require heat trace and insulation to prevent freezing in operation.

If waterless traps are needed, these can be purchased by contacting Desert Aire Service department. If a P-trap is used, it should be of adequate depth to prevent water from drawing into the cabinet on startup and to hold enough water when the fan is off such that the trap will not lose the prime on the next start. The depth of each leg and the ratio between these is important.

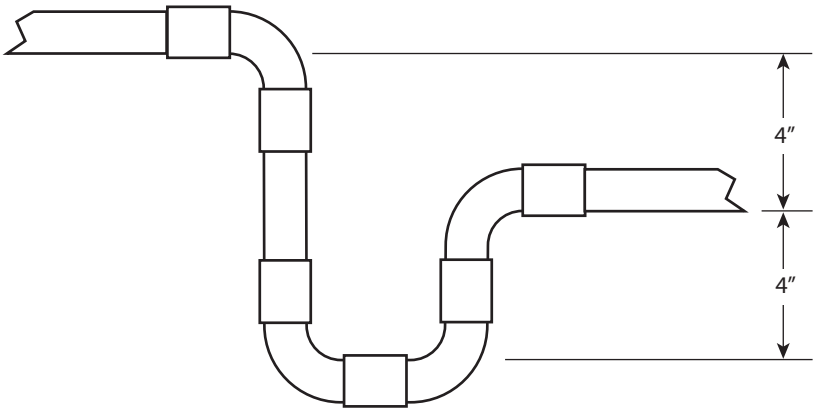


Figure 5 - Sectional View of Condensate Trap Requirements

Trap the condensate as shown in Figure 5. The P-trap dimensions in Figure 5 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 air handler.

2.4 Unit Door Access and Lock

The doors are removable to allow for access in close spaces. To open the doors, grasp the latch by the rounded section on the door and pull outward (see photo below). When the latch handles are rotated 90 degrees, they can be pulled outward and disengage from the door frame (see photo below). To reattach the handles, push the door closed and rotate the latches shut.

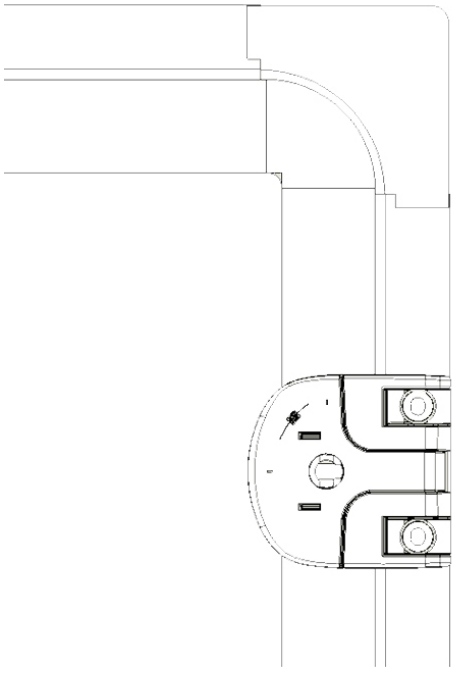


Figure 6 - Door hinge/latch in closed position

By opening all four latches, the door may be pulled off the unit for better accessibility. Grasp the latch by the protruding T-shaped section and pull outward to remove the hinged section.

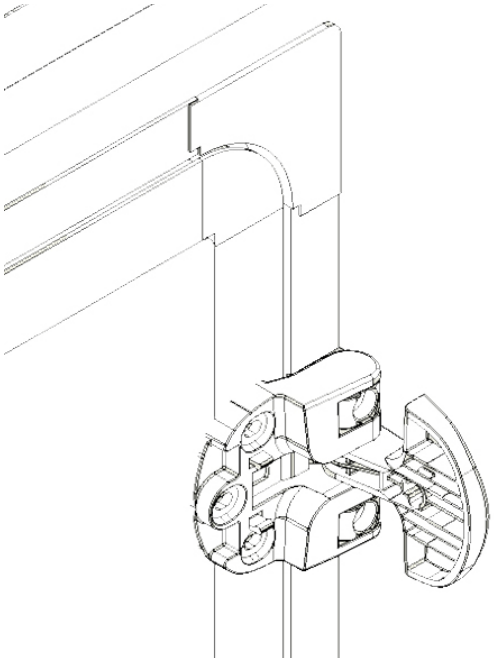


Figure 7 - Door hinge/latch in open position

The latch has a hex head shaped key slot that is used to lock the latch and prevent opening and removal of the door. There is a ridge next to the slot that indicates whether the latch is locked or unlocked. If the latch is open, the ridge is horizontal. To lock the latch, rotate the hex head with an Allen wrench 90° until the ridge is vertical. The ridge next to the slot on the unlocked latch will align with a similar ridge in the middle of the body of the latch handle. There is a second ridge that aligns with the locked position. There is a raised line that says “OPEN” which leads from the locked ridge to the unlocked ridge.

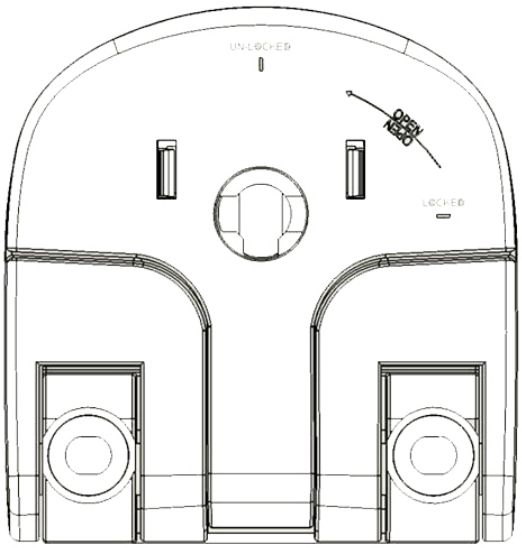


Figure 8 - Latch, note positions of the ridges

2.5 Water Piping Installation

The air handler may be connected with a water tower or a chilled water unit. Use industry standard piping practices when connecting to such a unit. Connections are copper stubs. Refer to submittal documentation for specific size per model.

Water Quality and General System Design

A 60 mesh or finer strainer must be installed in the water inlet line. Flush field-installed piping thoroughly before you put the air handler into service. A piping system not properly flushed or filtered will cause the water flow control valves or heat exchanger to lose efficiency or fail prematurely due to clogging and/or fouling.

To prevent premature failure of the system, maintain the water at a pH of 7.4, but never below 6.0. Do not use water with high concentration of sulfur, chlorine, or sodium chloride.

See specific Flow Rate section for the required water flow rate and head for your application.

Install an air eliminator at any high point in the water piping. Air trapped in the water circuit of the air handler can lead to poor system performance, unexpected service calls, and decreased equipment life.

⚠ CAUTION

Do not exceed these guidelines as excessive flow rates will erode the condenser and piping.

GreenAire™ Products Flow Rate

The flow rate, pressure, and glycol concentration (if used) will depend on the installation. If any part of the system is to be installed outdoors, the system must be protected by antifreeze at an adequate concentration to prevent freezing. For purposes of burst protection during system idle times and during storage, a minimum of 30% ethylene glycol or 35% propylene glycol is recommended if any part of the system is installed in locations subject to freezing conditions. This concentration will prevent system damage. Note that damage to heat ex changers or piping due to freezing conditions is not covered under warranty.

For units that are required to start at very low ambient temperatures, higher antifreeze concentrations may be required. If units installed outdoors are to be idle and will be required to start at low temperatures, review low temperature starting concentrations in Figure X. Note that the fluid will warm rapidly after starting, but it is critical that the loop be insulated to protect from significant condensation and freezing when the water is cold.

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Minimum Temperature (°F)	Minimum Concentration (%)	
	Ethylene Glycol	Propylene Glycol
20	17	19
10	26	31
0	34	38
-10	41	45
-20	46	49
-30	50	53

Figure 9 - Antifreeze Concentrations for Low Ambient Starts

Solutions less than 30% or fluids without inhibitor packages may require additional inhibitors to prevent corrosion and avoid risk of bacterial contamination. Consult the antifreeze fluid supplier for additional information on inhibitors and water quality in loops.

Note that chiller manufacturers, particularly those that utilize a plate heat exchanger, may require freeze protection fluids at low temperatures to prevent freezing of fluids in heat ex changers even if the loop is fully indoors. Consult the chiller manufacturer for recommendations concerning antifreeze to ensure that minimum requirements are also maintained for chiller operation.

Chilled Water Flow and Pressure

The chilled water loop in the equipment includes a circulation pump and a valves that modulates the temperature and flow rate through the system. The system is intended to be used with a variable speed primary loop.

It may be noted that the flow through the system varies depending on the load. Testing during startup should be done at maximum cooling capability to ensure that enough flow is available for specified unit performance. See Figure 10 for the flow rate specification at maximum cooling.

A minimum pressure is required at the inlet of the unit to protect the internal pump from cavitation and damage. This minimum pressure is the Net Positive Suction Head Required (NPSHr). Units that are on the same level as the primary pump or lower typically do not have issues with this requirement. Should the unit be installed above the primary pump, ensure that the Net Positive Suction Head available is greater than the requirements shown in the chart. It should be noted that these values are shown in absolute pressure rather than gauge pressure.

Model Size	Fluid Flow Rate	NPSHr
	(GPM)	(psia)
GRAV	18.9	6.1
GRBV	35.0	6.2
GRCV	5.18	6.6
GRDV	61	7.1

Figure 10 - Chilled Water Flow Rate

Hot Water Flow and Pressure

Hot water is provided to the GreenAire™ units to reheat or heat the air. The hot water system in the GreenAire™ unit includes a valve to vary the flow. There are two options. The unit can be configured with a two-way valve or a three-way valve. Two-way valves are typically used on systems with modulating pumps. Three-way valves are typically used with systems with fixed speed primary pumps.

It should be noted that the pressure drop shown is for water only (0% antifreeze). For units with antifreeze, refer to the submitted specifications or the equipment label for the pressure drop at the specific antifreeze type and concentration.

Model Size	Fluid Flow Rate	Pressure Drop (Water)
	(GPM)	(ft w.c.)
GRAV	9.6	8.1
GRBV	14.1	16.6
GRCV	18.0	17.5
GRDV	24.7	25.8

Figure 11 - Hot Water Flow Rate

Specified Fluid Flow Rates and Temperatures

Performance in the application has been determined based on the flow rates and temperatures given in specifications by the design professional. The expected flow rate and temperature for both the hot water system and the chilled water system are shown on the unit labels. At the time of startup, place the unit in a maximum cooling condition and a maximum heating condition to ensure that temperature and flow rate is as expected. The unit

performance is highly dependent on these inputs. Running at lower water flow rates, higher chilled water temperature, or lower hot water temperatures will affect unit dehumidification, cooling, and heating capacity.

Cooling and dehumidification capacity can be increased by running lower chilled water temperatures. Running at a lower water temperature for the chilled water than necessary is not recommended due to additional energy required. Running chiller loops below 25°F fluid temperature is not recommended due to the potential for frost and ice buildup on the outside of the chilled water coil.

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 unit may create the possibility of shock and can lead to premature system failure.**

⚠ DANGER

For any unit labeled Class 1, Group D, Division 2, all wiring must be in accordance to Class 1, Group D, Division 2 requirements. Insure that all local, state, national and any other applicable codes are adhered to when connecting any device to this equipment. All electrical connections to units labeled Class 1, Group D, Division 2 must be done with a conduit seal.

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.

2.6.1 High Voltage Connections

On three phase units the power supply must have 4 connections (3 phase wires and 1 ground wire). Connect the power supply and ground wiring to the customer power connection box located on the water connection side of the unit. This customer power connection box will either be a disconnect switch, or side mounted box containing a power block. This box has been located on the exterior of the unit for your convenience and avoids having to make connections within the unit.

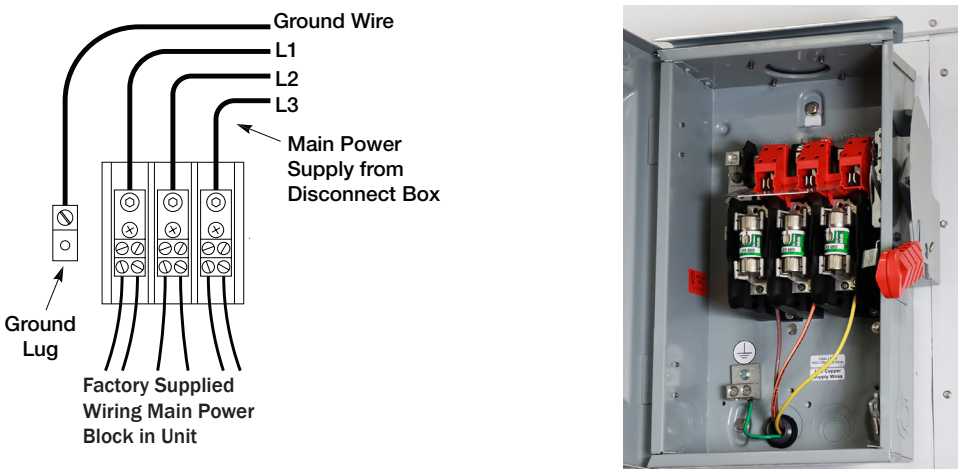


Figure 12 - Three-Phase System Power Connection

2.6.2 Wire and Fuse Sizing

The field-installed power supply wires must be sized to handle the Minimum Circuit Ampacity of the air handler. The overcurrent device must be sized exactly to the Maximum Overcurrent Protective Device size. Both of these values are printed on the Unit Rating Plate.

2.7 Controls and Sensors

⚠ DANGER

For any with Intrinsically Safe circuits, wiring to these devices must be done only to Intrinsically Safe terminal strip. Refer to the wiring schematic for details of these devices and wiring parameters. The length, capacitance, resistance, and inductance of the cable used to connect the field wiring of the Intrinsically Safe circuit shall not overload the rating of the Intrinsically Safe barrier.

The standard Desert Aire air handlers are controlled by a microprocessor controller. This controller is designed for precise monitoring and control of air temperature and relative humidity (RH) within a conditioned environment. A separate controls manual has been provided. Refer to this separate manual for controller and sensor specifications, operation, and options. The microprocessor has the option for a remote display, field installed zone sensor, field installed photocell sensor, or field installed CO_2 sensor.

Sensors or display must be installed and wired prior to unit startup. Please refer to the following for general sensor information in addition to the separate controller manual. A general example of sensor location and wiring has been provided below in Figure 13.

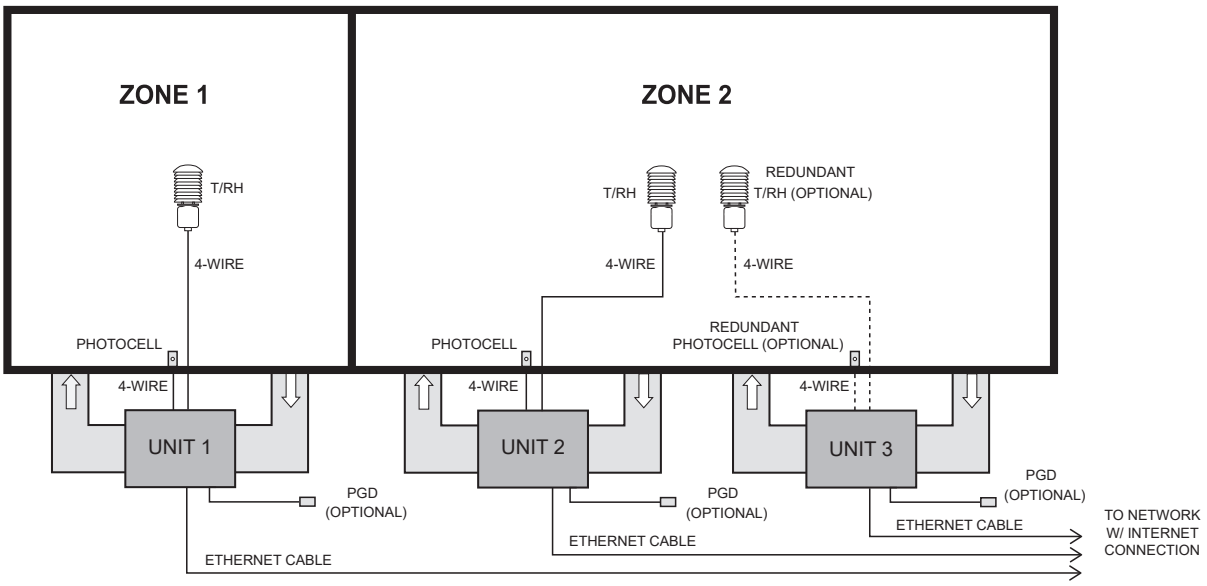


Figure 13 - Wiring and Location of Field Installed Sensors

The air handlers are equipped with an internal display terminal (IDT), as part of the controller.

2.7.1 Zone Sensor

A temperature and humidity sensor is supplied for each room. This will be connected to the unit or one of the units servicing that room.
Some applications may desire redundant sensors. In this case, a room may have multiple sensors located within it (maximum of one sensor for each unit).
Note that only one sensor is active at any time. To activate a different sensor, each unit needs to be reconfigured to respond to the alternate sensor. Rather than installation of additional sensors immediately, it is recommended that these additional sensors are placed in a secure location as spares and field wiring is made conducive for quick and easy replacement should this become necessary. See GreenAire™ Users Manual for recommended practices for regular calibration. If additional zone sensors are required, please consult the factory.

Select a representative location for the sensor close to the plants where you would like the temperature and humidity to be maintained. For example, this may be at the leaves of the plant if that is the most critical and represents the area that your desired settings should control to, but should not be located under the plant canopy. If redundant sensors are used, mount all sensors in similar locations.

CAUTION: Do not mount the sensor in a location where false readings may occur due to dead air regions, radiant heat gain from the lighting, location too close to supply air diffuser, or thermal losses in winter.

Mount the T/RH sensor(s) within the radiant shields(s) per the manufacturer's instructions. Please note the sensor clamp is separate with the packaging and must be installed within the shield.

The temperature/humidity sensor operates on the Modbus platform and comes with 5 meters of cable. If extra length is required, install four conductor shielded cable of a minimum of 24 gauge to allow a maximum run of 1000 meters from the sensor to the labeled terminal strip in the control panel of the unit. Wire the space temperature/ humidity sensor per the supplied wiring diagram to one of the units serving the space. Do not run sensor wiring adjacent to, OR in the same conduit as, wires carrying more than 24 VAC.

Ensure the room has sufficient circulation to minimize micro-climates. Verify temperature reading is consistent through the space and close to that being read by the temperature/humidity sensor.

Figure 14 - Zone Sensor

2.7.2 Photo Sensor(s)

Photo sensor to be installed within the space and wired per the supplied unit wiring diagram. The photo sensor should be located in close proximity to the grow lights. The purpose of this sensor is to detect when the grow lights are operating. The sensor can be programmed to allow the unit to use separate room temperature and humidity setpoints for lights-on and lights-off modes, the unit can be programmed to use alternate setpoints.

Additionally, the unit will respond more quickly to changes in inputs immediately after the transition from lights-on to lights-off or vice versa. Since the load changes rapidly on these transitions, the quicker response allows for better control in the room during this transition, limiting the amount of temperature fluctuation.

Install four, 18 gauge (0-500 feet) OR four, 24 gauge (0-100 feet) wires from the sensor to the labeled terminal strip in the control panel of the unit. (See your wiring schematic for connections details.) This sensor comes with a 2 1/8” x 4” junction box. Some applications may require redundant sensors. In this case, a room may have multiple sensors located within it and wired one per unit. Note that only one sensor is active at any time. To activate a different sensor, each unit control needs to be recon figured to look at the alternate sensor. Rather than installation of additional sensors immediately, it is recommended that these additional sensors are placed in a secure location as spares and field wiring is made conducive to quick and easy replacement should this become necessary.

Figure 15 - Photo Sensor

2.7.3 Remote Display Terminal (Optional)

The remote display terminal (RDT) is the optional remote mounted interface with the unit controller. The GreenAire™ units are equipped with an internal display terminal (IDT), as part of the controller, and an optional wall-mountable RDT, in cases where the controller mounted display or IDT would prove hard to view or use. The RDT is also available as an option for applications desiring remote access to the unit(s). See the controller manual for details on wiring and environmental limits.

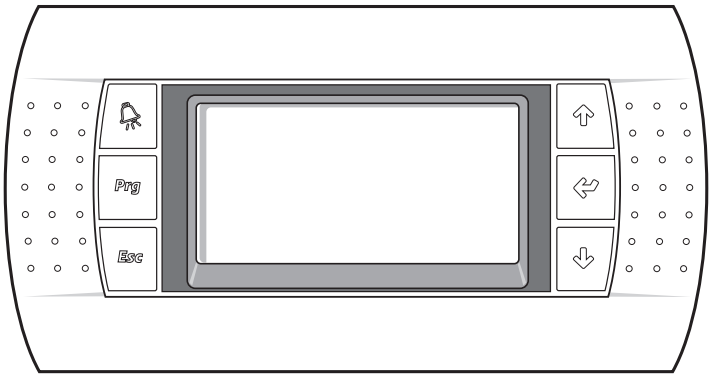


Figure 16 - Remote Terminal Display

2.7.4 CO_2 Sensors (Optional)

A carbon dioxide zone sensor is supplied to monitor the level of CO_2 within the grow space. This sensor uses single beam dual wavelength sensor technology to measure CO_2 levels from 0 to 5000 ppm. This needs to be installed on a designated wall within the plant room, roughly 3'-5' in height above the ground.

Figure 17 - CO_2 Sensor

The unit is supplied with controls to inject CO_2 into your grow room space. When optioned, a bulkhead fitting ⑤ (Figure 18) is installed on the Desert Aire unit. In addition, Desert Aire provides the following for field installation: a pressure and gas flow regulator ② (Figure 18), hose for connection to the CO_2 container ④ (Figure 18) and a wall mount CO_2 sensor. Please note the CO_2 and CO_2 tank ① (Figure 18) are supplied by the customer.

Desert Aire has provided a gas flow regulator ② ③(Figure 18). This needs to be installed in the field on the customer supplied CO_2 tank ① (Figure 18). Install supplied plastic washer into fitting and thread onto tank. Note that additional washers are included in the package. Use only one washer and retain additional washers for later use if the original becomes worn or damaged.

Desert Aire has provided a connection hose ④ (Figure 18). This needs to be installed in the field to connect the customer supplied CO_2 tank ① (Figure 18) to the Desert Aire unit at the label "CO2 Connection" ⑤ (Figure 18). Note for GR Series units the connection can be found on a spacer panel just upstream nearest the fan on the opposite side of the electrical section. This allows for the connection hose to either be routed through the cabinet sidewall or through the bottom of the unit depending upon the application.

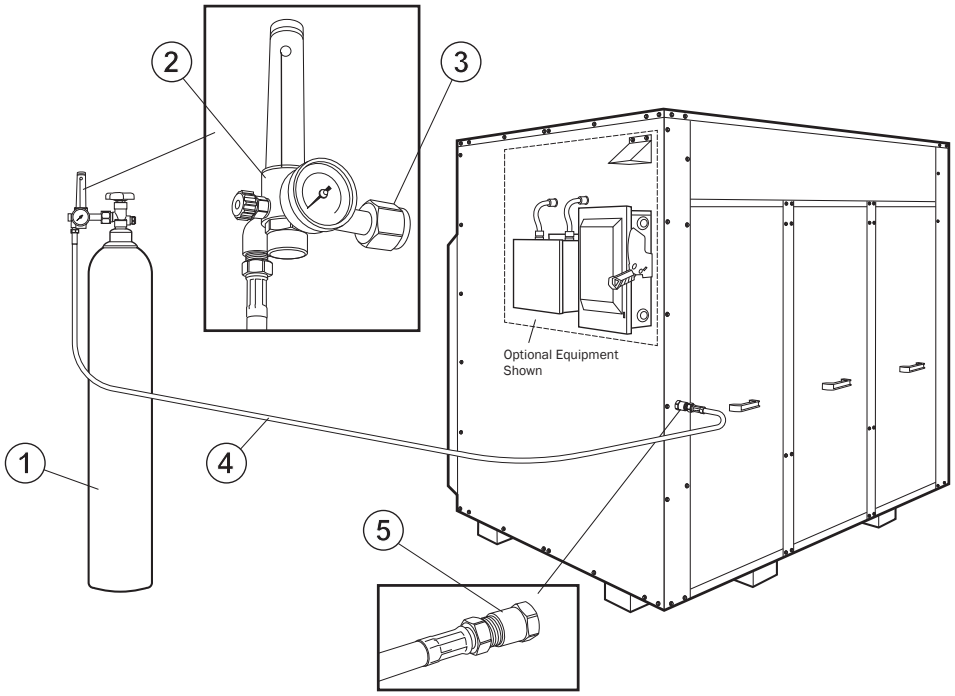


Figure 18 - CO_2 Enrichment Option When Used With Tank

The customer is responsible for the proper levels of CO_2 going into the space. The customer is also responsible for any room or building warning alarms to notify appropriate personnel if/when CO_2 levels become dangerous.

⚠ WARNING

The DesertAire GrowAire® CO_2 control option is intended to control equipment under normal operating conditions. Where failure or malfunction of system components could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn or protect against failure or malfunction must be incorporated into and maintained as part of the installation.

Local and national codes and workplace health and safety standards may require additional equipment, warning signs and placards, and handling procedures. Consult your design professional and/or local authority having jurisdiction to ensure that all installation requirements are in place before operating the system. To ensure safety, follow all directions indicated by the supplier of the CO_2 and storage container manufacturer.

As CO_2 gas is “heavier” than air, it will accumulate or remain at the lowest levels in a higher concentration.

3 Start-Up Procedure

Read this section thoroughly before attempting to commission the Desert Aire air handler. 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.

3.1 Preliminary Inspection

Verify that all contractors have completed their work. Find the Desert Aire Start-Up Report for GR Models, which is near the end of this manual. You must fill out the start-up report to validate the air handler warranty. Check the following items:

- 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 air handler. The available power supply voltage must be within ±10% of the voltage printed on the rating plate.
- With the power supply disconnected and locked, tighten all field and factory electrical connections. This includes all connections in the motors.
- 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 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.

3.2 Principle of Operation

The air handler unit operates in tandem with the chiller section that drives the water flow throughout the entire system. The pump within the GreenAire™ unit moves the water only within the unit and is intended to maintain the flow through the unit. Each GreenAire™ unit operates independently.

Chilled water enters from the chiller and passes through the mixing valve and then the water pump. It then goes through a tee connected to a mixing valve which may divert a portion of the water flow around the chilled water coil. The flow then proceeds through the chilled water coil

and dehumidifies the airflow. The water then exits the chilled water coil and passes through another mixing valve connected by a tee to the incoming water line. Then the water flow goes through a check valve and exits the unit.

Similarly, warm water enters the unit and passes through a tee and then enters the hot water coil. The hot water coil heats up the dehumidified air to an appropriate temperature for the supply airflow. The water flow leaves the hot water coil and passes through a mixing valve and leaves the unit to return to the source of warm water.

The airflow enters the unit through the return ducting and passes through the bank of air filters and then the chilled water coil for dehumidification. The air then goes through the piping section and cools the pump motor and then enters the hot water coil where the airflow is warmed up to the required supply air temperature. The airflow then is drawn through the EC fans and forced into the supply ductwork leaving the GreenAire™ unit.

It is assumed that the incoming chilled water and warm water flow will be at a nearly constant temperature. The unit capacity is modulated by the airflow and the mixing of the chilled and warmed water flows within the unit.

Sensors monitor the temperatures of the air and water flows and the relative humidity and make adjustments to the water and air flows as necessary to maintain the desired output conditions. The controller unit operates each of the valves.

In each circuit, hot and chilled, the temperature is controlled by the modulation of the mixing valves that divert flow from the heat exchanger coil. Similarly, the demand sensed by the sensors can modulate the airflow produced by the fans.

3.3 Airflow Balancing

To ensure code compliance and long equipment service life, proper airflow must be verified by a qualified air balancer.

The unit controller modulates airflow and is self-balancing. Set unit to full cooling mode of operation which will increase the speed of the fan to the maximum. Review the target CFM and the actual CFM. Ensure unit is able to reach the maximum CFM as indicated in the chart below. Record the static pressure in the return air duct and the supply air duct.

Model Size	Maximum Airflow Rate
	(ACFM)
GRAV	2500
GRBV	5000
GRCV	7500
GRDV	10,000

3.3.1 Blower Adjustment Procedure

⚠ WARNING

Disconnect power to the unit before you adjust the fan.

Units with an EC Fan(s)

GreenAire™ units use electronically commutated (EC) fans. The speed of these fans are controlled by a Modbus network. Airflow monitoring is achieved within the unit based on differential pressure measured by a transducer. Using the airflow sensor the CFM is calculated and is maintained by a control loop which varies the signal to the fan in order to achieve the CFM associated with the required airflow.

Once the airflow is adjusted, review the fan current draw. If the fan current draw is in excess of the current rating listed on the unit nameplate or the fans are 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 System Testing

The GreenAire™ water-based system uses a remote chiller to provide the cooling for the air handler. Each GreenAire™ unit has a pump that provides the circulation for within the unit but the pumping power for the entire system comes from external pumps. The GreenAire™ pump operates at a continuous flow rate and inlet temperature.

Some Desert Aire systems are shipped in sections to allow for installation of some of the sections in several locations. An example is a chiller unit with several remote air handler units.

The air handler may be installed indoors near the conditioned space while the remote chiller used to reject waste heat is located far from the conditioned spaces. The piping of the system between the chiller and the air handlers 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 chiller 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 chilled water system. Special care must be taken to ensure that the system is returned to service without contamination.

Whenever servicing Desert Aire chiller connected equipment, observe the following:

- Make certain to torque the bolts to the proper rating.
- Use only the proper rated bolts, flanges, gaskets and associated hardware.
- Use only original equipment parts or factory approved equivalent for servicing.
- Use appropriate glycol inhibitor.
- Purge air from the system before operating.

3.4.1 Dehumidification / Cooling Mode

For GreenAire™ Products
Ensure all pipes are connected, unit is connected to power, and airflow is running at the target setpoint as shown in the Commissioning menu of the controller display. Enable the pump using the controller display. Turn the unit Enable switch to the “ON” position. Ensure the unit is in the “Lights On” mode.

Ensure the water temperature supplied to the unit is at the design condition. This is generally 36°F to 42°F, but may be higher or lower depending on the anticipated loads in the space. The loop temperature anticipated has been programmed into the controller. Check to ensure that this value and the actual loop temperature match.

Lower the air temperature setpoint to approximately 5°F below the current space temperature and the RH setpoint to 10% above the current space RH. The target coil LAT and the SAT will recalculate to a lower value.

The internal unit pump will start. The unit will start to increase water flow through the chilled water coil. As the internal flow control valve reaches the maximum position, the temperature

control valve will open further until the water temperature entering the coil is at the loop temperature. As the entering temperature of the coil approaches the loop, the airflow will start to increase from the minimum flow rate to the maximum flow rate programmed. During this mode, the hot water coil valve will remain closed or very close to the closed position.

Raise the air temperature setpoint to approximately 5°F above the current space temperature and the RH setpoint to 10% below the current space RH. The internal pump may shut off briefly. The target coil LAT will recalculate to a lower value and the target SAT will recalculate to a higher value.

The internal unit pump will run. The temperature control valve will open until the water temperature entering the coil is at the loop temperature. As the entering fluid temperature to the coil approaches the loop temperature, the water flow valve will start to open further. As the coil flow control valve opens to the maximum position, the airflow will start to increase from the minimum flow rate to the maximum flow rate programmed. During this mode, the hot water coil valve will modulate to maintain the target SAT from the unit.

During the first Preventative Maintenance visit that is recommended during spring and fall, the contractor should complete the Dehumidification/Cooling Mode section of the startup report.

3.5 General Testing

After you balance the airflow and test the chilled water circuits, verify that the other equipment and accessories connected to the air handler work properly. Although this may be difficult, since the air handler 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 issues are caused by improper interlocks between these devices. Make sure you check the following:

- 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 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.

3.6 Routine Maintenance Schedule

3.6.1 Service Every Month

- Check the air filters and replace them if necessary.

- Check the coils in the air handler. Use compressed air or a commercial coil cleaner if they are dirty or plugged.
- Check for accumulated water from leaks or that the drain pan is unable to drain properly.

3.6.2 Service Every Six Months

- Check and tighten all field and factory electrical connections.
- Check for dirty coils in the air handler.
- Check and clean the drain pans and blow out the condensate drain line. If the drain is plugged, water will back up into the air handler 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 unit for evidence of water leaks.
- Check the current draw of each fan motor.
- Check the current draw of the water pump.

3.6.3 Service Every Year

3.6.3.1

Note that equipment used to dehumidify areas with significant particulates should be inspected and cleaned every two to three months to ensure high operating efficiency.

3.6.3.2

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
- Water Flow Rate
- Inlet Water Temperature
- Fan Motor Current
- Pump Motor Current

4 Troubleshooting

Although Desert Aire air handlers 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 air handler. 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 air handler 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 Fan Does Not Run

POSSIBLE CAUSES	REMEDY
Fan overload has tripped	Correct cause and reset controller.
Loss of main power	Check for tripped circuit breaker or blown fuses
Faulty control wiring	Check for loose or incorrect wires on system and controller

4.2 The Pump Does Not Run

POSSIBLE CAUSES	REMEDY
Pump overload has tripped	Correct cause and reset overload
Loss of main power	Check for tripped circuit breaker or blown fuses
Faulty control wiring	Check for loose or incorrect wires on system and controller
Blocked impeller	Clean out impeller and pump
Low flow or pressure	Air leaking in to the system, find the point of entry

5 Appendix

5.1 Recommended Duct Design

You must use proper duct design to ensure that the air handler 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.

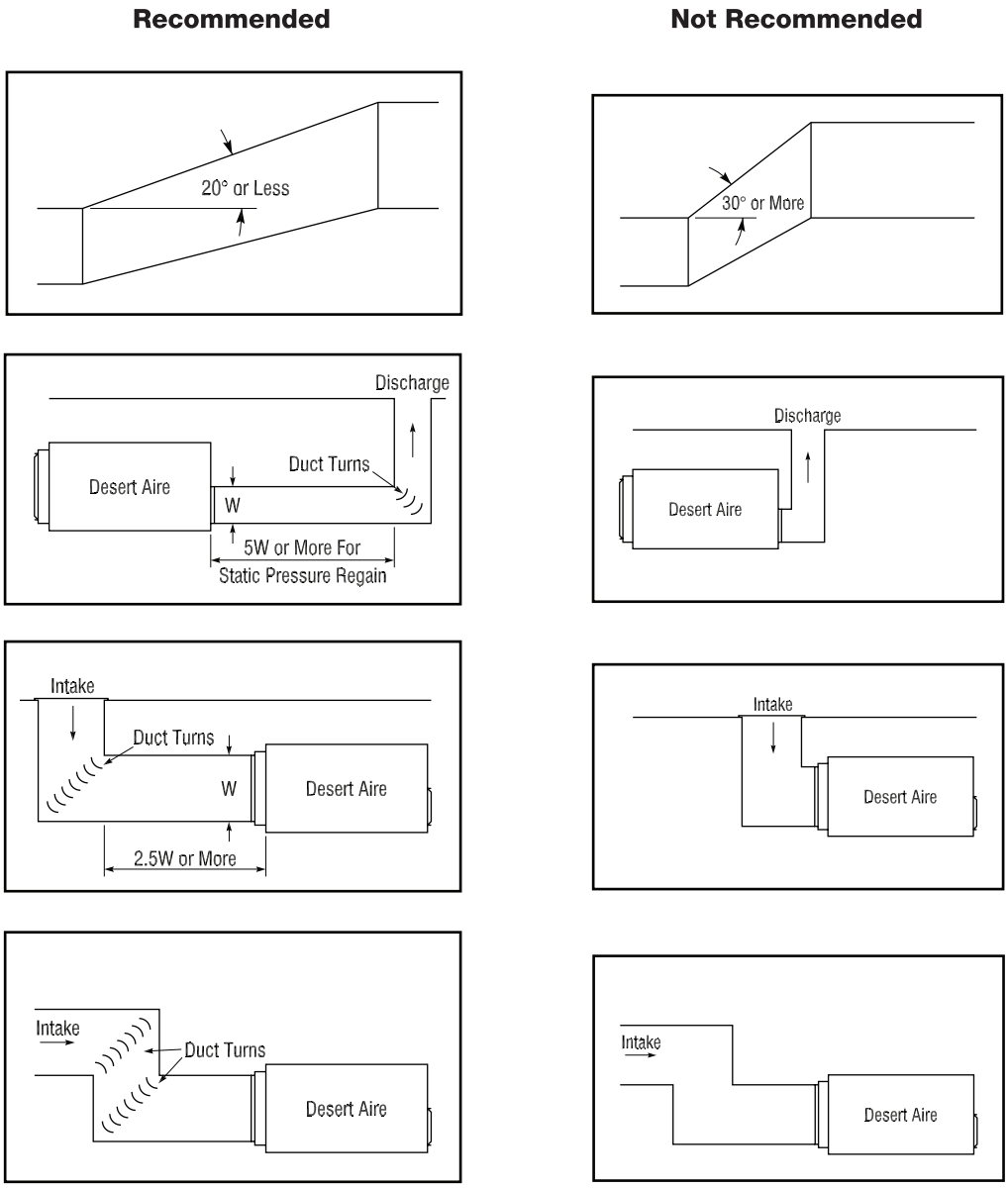


Figure 19 - Recommended Duct Designs for Desert Aire Units

5.2 Recommended Controller Settings

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

RECOMMENDED SETPOINT:

Plants typically respond to the highest growth rates in relatively warm temperatures during the photoperiod when lights are on. Generally, this is between 76°F and 80°F and 55% RH to 70% RH. When HID lights are used, the growth response is optimized at temperatures of 81°F to 88°F.

In the dark period when the lights are off, the temperature setpoint can be set lower. Typical setpoints are 66°F to 75°F. It is not recommended that the temperature be set lower than 66°F as energy efficiency and stability may be impacted. Generally, when using lower temperatures, it is recommended RH should be set no lower than 55% RH for energy efficiency.

It is important to note that the design professional that preformed the calculations for the room load and selected the equipment did so with specific lighting type, plant load, stage of growth, and an estimated climate control system capacity at these conditions. The original design data should include these target room conditions. If the rooms load is higher than the calculations or the zone temperature or RH are lower, the climate control system may not be able to achieve the setpoints.

5.3 GreenAire™ Sequence of Operation

5.3.1 Basic Sequence

The GreenAire™ unit is designed to be mated with a chilled water system either as a single unit or as part of a system with multiple GreenAire™ units, possibly of varying sizes. The units are linked together via an Ethernet network. There is a lead unit that commands all other units serving that room to provide similar supply air temperature and humidity.

Each unit is connected to a chilled water supply system and a hot water supply system. The chilled water system should contain variable speed pumps to supply water to the climate control system. The hot water system can be ordered with provisions for connection to a system with a variable speed pump or a fixed speed pump.

The chilled water circuit internal to the climate control system is unique. The circuit

has a circulating pump and two three-way water valves. These are installed such that the controller in the unit is able to adjust both the flow rate and the temperature of the fluid through the chilled water coil. **Although these are three-way valves that are often used on systems with a fixed speed pump, they are arranged such that the water entering the system is restricted at low loads. The primary pumping system supplying the chilled water should be able to accommodate this. This typically means a variable speed pump on the main loop.**

The chilled water is allowed into the system by a 3-way valve that is called the temperature control valve. It then passes though the pump and is directed either through the chilled water coil or bypassing the chilled water coil. The fluid then is directed back through the temperature control valve and/or back to the primary loop.

In this application the ability to recirculate the water enhances the ability to control the temperature and dehumidification, particularly as loads decrease and typical systems would have very little water flow through the chilled water coil. Allowing the water to warm within the climate control system and maintaining a minimum flow rate through the coil allows for high stability. The control sequence also uses the water temperature and flow rate to help control how much dehumidification occurs when the air is close to saturation.

The hot water circuit in the system includes a valve. Two options are available. A three-way valve is typically used in conjunction with a primary pumping system with fixed speed pumps. A two-way valve is included where the unit is to be connected to a system that has variable speed pumps.

The air flow rate is also controlled to optimize the energy efficiency. In a water based system, lower airflow rates will significantly reduce the energy consumption when the temperature and humidity load is low such as in the dark period. When loads increases, greater capacity can be achieved by increasing the airflow rate.

Zone Control of Temperature Demand - Cooling

As the temperature in the space rises above setpoint, the Temperature Demand increases. On increasing Temperature Demand, the first step increases the water flow rate diverted though the chilled water coil. Once the coil flow control valve fully open to the chilled water coil and closes the bypass, the temperature control valve start to open. Once the temperature control valve is fully open, the airflow through the unit will start to increase to increase the capacity. The airflow will modulate from the minimum CFM setting to the maximum CFM setting.

The reheat coil will be inactive when there is a Temperature Demand for Cooling is the only call.

Zone Control of Dehumidification

As the humidity rises above setpoint, the Dehumidification Demand increases. On increasing Dehumidification Demand, the first step decreases the water temperature through the chilled water coil by opening the Temperature Control Valve. Once the Temperature Control Valve fully opens, the flow control valve starts to open. Once the flow control valve is fully open, the airflow through the unit will start to increase to increase the capacity. The airflow will modulate from the minimum CFM setting to the maximum CFM setting.

There are two items that can control the dehumidification demand. The primary method is the dew point of the space. In the controls, the temperature and humidity setpoints for the room are translated into a dew point setpoint for the room. This is due to the fact that dew point represents the total moisture content of the room and is independent of the temperature. Using a target dew point under normal operation provides more stability for the system since fluctuations in temperature will not affect the dehumidification demand.

The secondary function that can affect the dehumidification demand is the relative humidity (RH). The RH is used as a backup function in case the temperature drops dramatically. Even though the root of the issue may be that the temperature has dropped in the space, this function helps avoid situations where the RH is very high and near saturation within the room.

During dehumidification, the hot water coil valve will modulate to allow more hot water into the hot water coil.

Simultaneous Calls for Cooling and Dehumidification

Each unit serving a room is connected through the Ethernet network to share the same target Cooling Demand, Dehumidification Demand, and supply air temperature target. When there are simultaneous calls for dehumidification and cooling, both the temperature control valve and the coil flow control valve may modulate simultaneously.

Zone Control of Temperature Demand – Reheating/Heating

As the temperature in the space falls below the setpoint, the target supply air temperature increases. The hot water coil valve will open to allow water flow through the hot water coil. The unit uses a zone reset of supply air temperature control to ad just the target supply air temperature. The supply air is then modulated by opening and closing the hot water coil valve in order to achieve the target value.

The unit can be in dehumidification mode and allow for reheating of the air to maintain zone temperature setpoint. On a quick change of setpoint or a large change in space

temperature, the unit may be in Reheating/Heating mode for a short period, but the target air temperature will decrease rapidly.

5.4 Component Replacement, Drain & Leak Instructions

Repair / Component Replacement

- To replace any component in the piping system or a coil, first shut off the water to the unit. Drain the unit of all water. The coils have drain plugs in the headers.

- It is preferred that components are removed by cutting the part out of the piping before the press fit connection. It is then necessary to fit a piece of piping to fill the void with a new press fit.

- Repairs can be made either by copper press fittings or by solder connection.
  - o If repairs are made with press fittings, refer to the manufacturer's instructions regarding the minimum spacing between joints. Ensure that no distortion will be introduced at the existing fittings within the unit. The spacing should be no less than shown in the chart below and may need to be greater depending on the design of the equipment and fittings selected in the field.

Fitting Size	Minimum Spacing
1/2"	0"
3/4"	0"
1"	0"
1 1/4"	1/2"
1 1/2"	5/8"
2"	3/4"
2 1/2"	5/8"
3"	5/8"
4"	5/8"

  - o If repairs are made by soldering fittings, a minimum distance should be maintained as shown in the table below. Protect all existing joints from excessive heat by using one or more of the following methods.
    - Wrap all adjacent joints with a cold wet rag. Ensure the rag is kept wet throughout the process of soldering.
    - Use a spray or gel type spot freezing product. Products should not be introduced directly into the existing joint.
    - Solder a portion of the repair as an assembly and use press fittings to fit this assembly into the unit after the joints of the assembly have cooled.

Fitting Size	Minimum Distance
1/2"	1 1/2"
3/4"	2 3/4"
1"	3"
1 1/4"	3 3/4"
1 1/2"	4 1/2"
2"	6"
2 1/2"	7 1/2"
3"	9"
4"	12"

o Repairs made by brazing are not recommended due to the high heat involved. If a braze joint is required, stay 12” away from any pressed connections and use one of the methods indicated in the soldering section above to keep the joint cool.

- Use K, L, or M tube for any repairs. Type K is used in the factory assembly.

- Cap sections of tube and components that are not actively being installed to prevent infiltration of contaminants.

- Use 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.

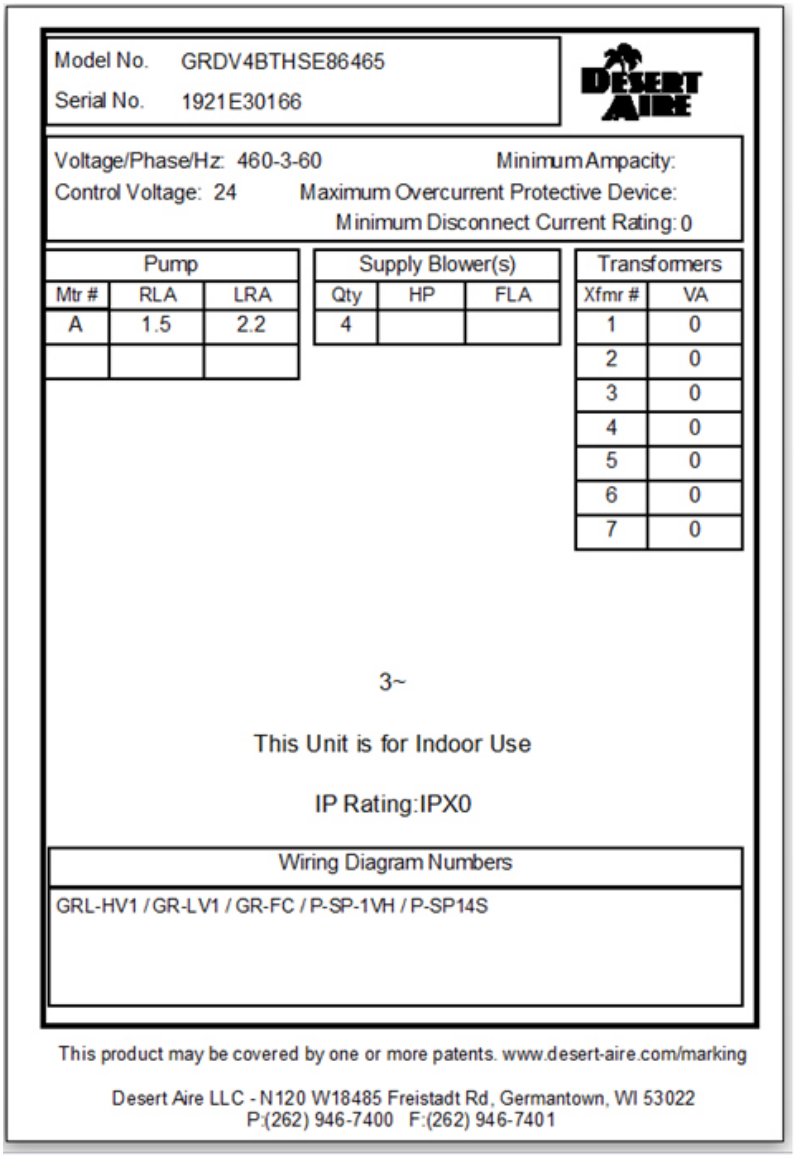
WARNING: Unit should not be tested with full pressures by running the system.

- 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.

- After completion of all repairs, pressure test system using nitrogen pressure decay test or nitrogen with tracer gas and appropriate leak detector. Test pressure of 25 psi is recommended. Do not exceed 200 psi.

5.5 System Rating Plate

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



Model No. GRDV4BTHSE86465
Serial No. 1921E30166

Voltage/Phase/Hz: 460-3-60 Minimum Ampacity:
Control Voltage: 24 Maximum Overcurrent Protective Device:
Minimum Disconnect Current Rating: 0

Pump		
Mtr #	RLA	LRA
A	1.5	2.2

Supply Blower(s)		
Qty	HP	FLA
4		

Transformers	
Xfmr #	VA
1	0
2	0
3	0
4	0
5	0
6	0
7	0

3~

This Unit is for Indoor Use

IP Rating:IPX0

Wiring Diagram Numbers
GRL-HV1 / GR-LV1 / GR-FC / P-SP-1VH / P-SP14S

This product may be covered by one or more patents. www.desert-aire.com/marking

Desert Aire LLC - N120 W18485 Freistadt Rd, Germantown, WI 53022
P:(262) 946-7400 F:(262) 946-7401

Figure 20 - System Rating Plate

5.6 Start-Up Supervision Supplemental Information

A Desert Aire factory start-up is an option which is normally purchased with the equipment. A factory start-up includes several key services:

- The expertise of an accomplished, factory-trained mechanic who will supervise the commissioning of the equipment.
- This 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 air handler 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 representative arrives.

When the installing contractor is confident the system will be ready, he should contact the Desert Aire Sales representative to schedule the start-up.

5.7 System Start-Up Report

A copy of the system “Start-Up Report” can be found on the following pages. 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.

N120 W18485 Freistadt Road
Germantown, WI 53022
(262) 946-7400 Fax: (262) 946-7401
www.desert-aire.com

Start-up request form for GreenAire units Model GR

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 air handler'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:

- ❑ Air handler 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
- ❑ Air handler leveled and properly supported per the installation manuals recommendations.
- ❑ Condensate P Trap installed with heat trace for winter operation.
- ❑ All electrical connections terminated and verified for proper voltage at the unit and the condenser (if applicable)
- ❑ All field controls, sensors and actuators installed and circuits verified that they are wired correctly. If you have questions, contact Desert Aire for instructions (800) 443-5276.
- ❑ Inspect all water lines for leaks and purge air from lines. (If applicable)

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

- ❑ Equipped service vehicle and service technician – Technician will be trained.
- ❑ Water pressure measurement device
- ❑ Air balancing equipment (magnehelic or manometer differential pressure gauge – one inch scale)
- ❑ Volt/Amp/OHM meters in working order.
- ❑ Digital thermometer with sensors.

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) 946-7401 Email: service@desert-aire.com

Signature of responsible party: _____(print) _____(sign)

Company Name:_____ Phone #:_____

N120 W18485 Freistadt Road
Germantown, WI 53022
(262) 946-7400 Fax: (262) 946-7401
www.desert-aire.com

Start-up request form for GreenAire units
Models GR

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: _____

Contact: _____ Cell# _____

GR 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
(800) 443-5276

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: _____

Installation Address: _____

Desert Aire Representative: _____

Air handler Model #: _____ Serial #: _____

Remote Condenser Model #: _____ Serial #: _____

Form Completed By (Print): _____ Signed: _____

Company Name: _____ Date: _____

Company Address: _____ Telephone #: (____) _____

_____

Application: _____

Air Flow readings: Refer to Installation and Operations Manual for correct balancing procedures

Airflow at Maximum Airflow Rate (CFM)			
Supply Duct Pressure at Maximum Airflow (" w.c.)			
Return Duct Static Pressure at Maximum Airflow Rate (" w.c.)			
Fan speed command Maximum Airflow Rate (%)			
	L1-L2	L2-L3	L1-L3
Unit Supply Voltage at Maximum Airflow (VAC)			

	Motor Number		
Motor Namepate	**1**	**2**	**3**
	Amps	Amps	Amps
Motor Current at Maximum Airflow Rate	L1	L1	L1
Motor Current at Maximum Airflow Rate	L2	L2	L2
Motor Current at Maximum Airflow Rate	L3	L3	L3
	4	**5**	**6**
Motor Current at Maximum Airflow Rate	L1	L1	L1
Motor Current at Maximum Airflow Rate	L2	L2	L2
Motor Current at Maximum Airflow Rate	L3	L3	L3

Water Flow Information	**Reading**	**Design**
Chilled water antifreeze type (PG/EG/Other) and concentration (%)		
Chilled Water Inlet Connection Water Pressure at Maximum Cooling (PSIG)		
Chilled Water Flow Rate at Maximum Cooling (GPM)		
Chilled Water Inlet Temperature (°F)		
Chilled Water Outlet Temperature at Maximum Cooling (°F)		
Chilled Water Pump Current at Maximum Cooling (A)		
Hot water antifreeze type (PG/EG/Other) and concentration (%)		
Hot Water Flow Rate at Maximum Heating (GPM)		
Hot Water Inlet Temperature (°F)		
Hot Water Outlet Temperature at Maximum Heating (°F)		

Heat Exchanger Readings	**Reading**	**Design**
Unit Entering Air Temperature (°F)		
Unit Entering Air Humidity (%RH)		
Supply Air Temperature in Maximum Cooling (°F)		
Supply Air Temperature in Maximum Dehumidification and Heating (°F)		
Supply Air Temperature in Maximum Heating without Dehumidification (°F)		

Field Wiring and Components	Confirmed	N/A
Photocell and input respond properly to lighting		
CO2 Sensor connected and valve operates when commanded by controls		
Desert Aire zone sensor connected and operates upon failure of network		
Lag unit responds to lead unit commands		
Lead-Lag Setup per Addressing Form or Modified Form Submitted		
Unit visible on AireGuard system		
Unit Reviewed for leaks, gasket integrety, door operation, etc.		

Unit Configuration and Final Setup	Photocell	Contact	Network
Lights on operation command(s) configured	☐	☐	☐
	Desert Aire	Network	
Primary Zone Sensor	☐	☐	
	Yes	**No**	**N/A**
Network heartbeat enabled	☐	☐	☐
Unit Tag			
Program version Installed			
	Yes	**No**	
Owner Training Completed	☐	☐	
Names of Owner Training Participants			

Additional Comments:

Additional Comments:

OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY

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

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