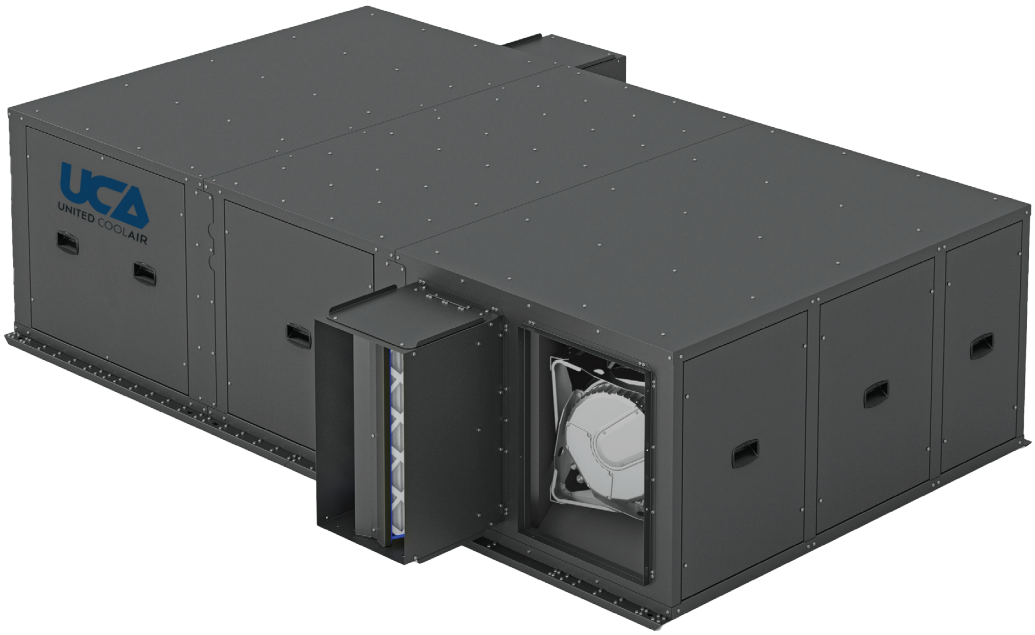
UNITED COOLAIR

Alpha Aire II

Dedicated Outdoor Air System, Air-Source Heat Pump with Energy Recovery

Installation, Operation and Maintenance Manual

Effective March 2024



Horizontal Air-Cooled

MEMBER AHRI AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE

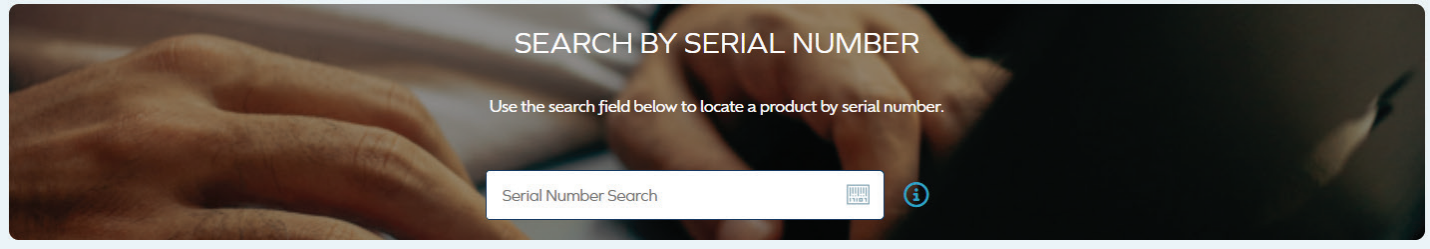
we make life better™

INTERTEK ETL LISTED C US

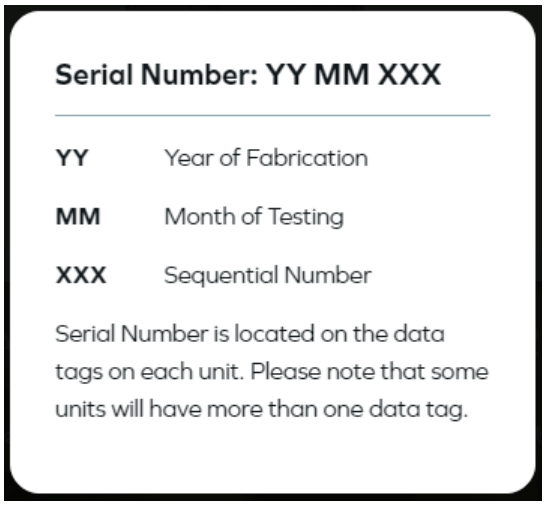
Contents

Electrical Diagram

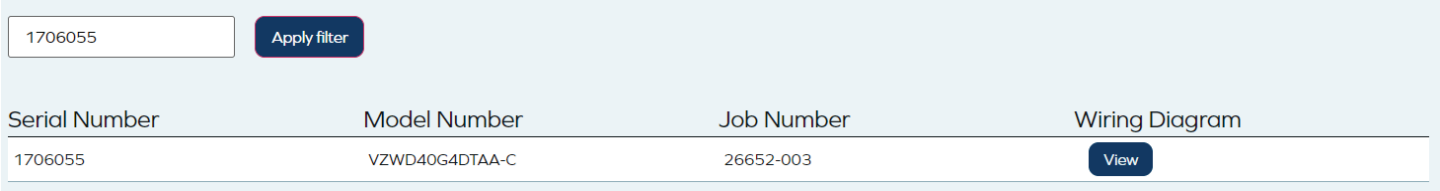
To retrieve the unit electrical diagram, scan the electrical diagram QR Code label affixed near the unit data tag. This will link to the www.unitedcoolair.com website. Scroll down to the Search By Serial Number box and enter the unit serial number.



The serial number is a combination of the year, month and sequential order of build date.



This will return the Model Number, Job Number and the Wiring Diagram for viewing as well as downloading.



Electrical diagrams are available for units shipped since November 2016. For older units, please contact the factory at www.unitedcoolair.com/general-inquiry/.

Safety Introduction and Labeling Guide

Your Safety is Important to Us!

Please follow and understand the rules and the instructions contained herein carefully. Failure to do so could cause a malfunction of the HVAC equipment, resulting in injury, death and/or property damage.

Throughout this manual, and in specific places on the unit itself, the signal words ELECTRICAL HAZARD, WARNING and CAUTION are used to identify levels of hazard seriousness. INFORMATION will be used in areas where there is important information but not hazard related.

ELECTRICAL HAZARD

The electrical hazard icon indicates the presence of an electrical hazard which could result in electrical shock or death.

WARNING

The warning icon indicates a potentially hazardous situation which could result in death or serious bodily injury if not avoided.

CAUTION

The caution icon indicates a potentially hazardous situation which may result in minor or moderate injury if not avoided.

INFORMATION

The information icon indicates a situation that may result in equipment or property damage. The information provided alerts the reader to relevant facts and/or conditions.

These instructions, local codes and ordinances and applicable standards that apply to piping, electrical wiring, ventilation, etc. must be thoroughly understood before proceeding with the installation.
Personal Protective Equipment (PPE) is to be worn during installation, operation and service in accordance to the Occupational Safety and Hazard Administration (OSHA). PPE must be in accordance to NFPA 70E, latest revision when working with electrical components. Thin sheet metal parts have sharp edges. To prevent injury, the use of work gloves is recommended.
This equipment must be applied and operated under the general concepts of reasonable use and installed using best building practices.

This equipment is not intended for use by persons with reduced physical, sensory or mental capabilities, lack of experience and knowledge, or children.

Additional copies of the Installation, Operation and Maintenance Manual, are available at www.unitedcoolair.com. For detailed information regarding specifications, dimensional drawings, and weight information, contact your local United CoolAir manufacturer's representative.

WARNING

Improper installation, service, or maintenance can result in death, injury, or property damage. Read this installation, operation, and maintenance manual thoroughly before installing or servicing this equipment.

Installation must be done by a registered installer/contractor qualified in the installation and service of HVAC equipment.

General Information

Equipment Description

The Alpha Aire II is a single package air source heat pump designed for 100% Outdoor Air applications with energy recovery, making it an environmentally friendly and forward-thinking choice for climate-conscious building projects.

Delivering exceptional performance over a wide range of outdoor air conditions, this high efficiency unit contains a total energy recovery wheel, ECM fans for both the supply and exhaust air as well as a variable capacity compressor. Installed indoors, the 30”H horizontal cabinet design fits above a drop ceiling or floor mounted on a mezzanine. During dehumidification, the outdoor air is tempered by the energy recovery wheel before feeding the evaporator coil. Low dewpoint air leaves the evaporator and is first reheated by the sub-cooling coil which boosts energy efficiency. Final reheat occurs through the modulating hot gas reheat coil and is supplied at a precise neutral air temperature.

Inspection of Equipment

All units undergo a complete factory run test and ship with a full operating amount of R-410A refrigerant charge. Upon receipt of the unit, inspect for visible or concealed interior / exterior damage. Report any damage to the carrier, and file a damage claim.

Inspect the unit data plate to verify the model unit that was ordered is what has been received. Check the data plate voltage and verify that it matches the electrical supply available.

Some options / accessory items may have been shipped loose in one or more boxes. These may have been delivered to another location, or possibly within the unit. If shipped with the unit there will be a sticker that identifies where in the unit the shipped loose items are located. Confirm that all of these options / accessory items are also available and that no damage has occurred.

Handling

To facilitate handling, the unit is set on a wooden skid so that it may be picked up with a two-wheel hand truck or fork lift. Under no circumstances should the unit or the skid be “walked” on the corners. Use dolly trucks, pipe rollers or suitable means to move the unit to its proper location.

If a crane, cables or slings are used to move a unit, spreader bars must be used to protect each section’s cabinet structure.

Mounting and Setting in Place

INFORMATION

Unit should not be located in space subject to freezing temperatures.

The Alpha Aire II unit has been designed as a horizontal self-contained ceiling or floor mounted cabinet.

Before the unit is installed, a thorough study should be made of the structure and proposed installation location. Careful consideration must be given to location of wiring, condensate disposal, ductwork and accessibility for maintenance or service. Refer to the section on Service Clearance. Sufficient clearance must be provided to slide the air filters out. Hinged filter access doors are located on the top side and bottom side of the filter rack. A minimum 25" clearance above or below the cabinet is recommended for filter replacement.
Consideration must be made for condensate removal, either with a trap or condensate pump. The condensate drain connection for both the evaporator and condenser drain pan is located on the bottom of the cabinet. Refer to "Condensate Drain Connection" section for installation details.

Ceiling Unit Mounting

Units may be suspended from the ceiling structure. When installing the unit on hanging rods (field supplied), use minimum 5/8" diameter threaded rods of the proper length with washers, lock washers, nuts and locking nuts. Observe proper service clearances for the unit.

1. Predetermine where the unit will be hung, checking the support structure for proper strength and stability.
2. Note the locations / dimensions of the holes for the hanging rods through multiple locations along the base rail.
3. Install the hanging rods at those dimensions in the support structure where the horizontal unit will be hung.

4. Using a support lift, carefully lift the unit to the location of installation positioning the pre-hung rods through the hanging rod holes in the base rails. Be certain to install field supplied vibration isolator-type mounts as required.
5. Tighten all mounting hardware and level as required.

WARNING

Be certain to completely tighten the hardware to the support structure.

Floor Mounting

Units may also be slab or floor mounted, however, attention must be given to floor loading limitations. Floor should be level in both horizontal planes.

Sufficient height elevation must be available to provide the required condensate traps which are located on the bottom side of the cabinets.

WARNING

Do not remove or puncture base rails. They contain high voltage wires.

Clearances

Clearances of 36" are required on all sides of the unit for service and maintenance access.

Filters can be accessed from either the bottom or top sides of the filter racks. Sufficient space must be provided for removal and replacement of all filters - minimum 25".

Some component replacements will require the entire unit to be lowered from the ceiling to remove the top panel of the cabinet. (ERW, blowers, coils, etc.).

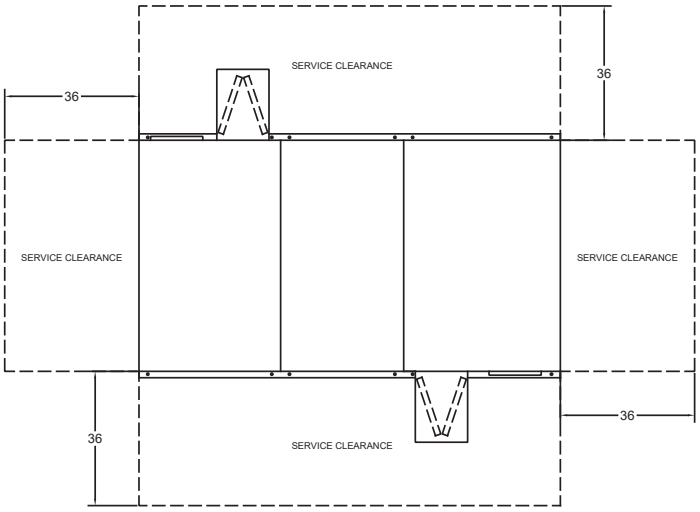
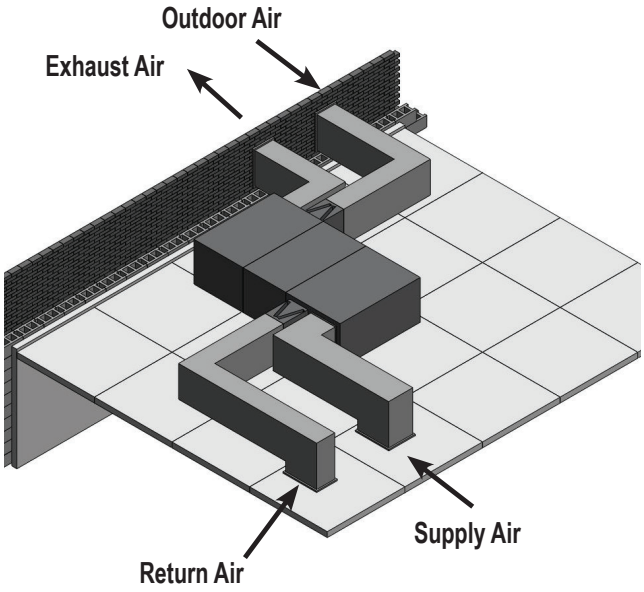


Figure 1 - Clearances

Ceiling Diagram



General Guidelines

Outdoor Air Quality

Outdoor air quality must be investigated and documented. Survey the building site and its immediate surroundings for any possible sources of contamination. This should be accomplished during the period(s) of time that the building is anticipated to be occupied.

Documentation of the possible contaminants, their source and strength should be made. The target concentration and anticipated exposure limits should also be documented.
Filters must be provided on all air inlet streams. Dependent upon the air quality there may also be other requirements for treatment of the incoming air, such as the ozone level. Local codes may also require other specific treatment(s).

Air Inlet Guidelines

Specific consideration must be exercised when choosing the location of outdoor air intakes in order to minimize indoor air quality problems and maximize the distance from contaminant sources. Minimum separation distances as listed in ASHRAE Standard 62.1—2016 “Ventilation for Acceptable Indoor Air Quality”, Table 5.5.1 “Air Intake Minimum Separation Distance” should be adhered to. Any local codes should also be addressed.

Some potential sources of air contaminants would include, but not be limited to, the following:

- Sewer Vents
- Building Exhaust Air
- Truck Loading Docks
- Bus Loading Areas
- High Traffic Volumes
- Cooling Tower Exhaust
- Vehicle Loading Zones

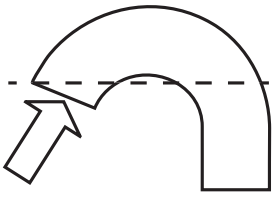
Document possible sources of contamination. Record concentration levels of CO2, VOC, etc for reference.

Air inlet velocities should be below 500 FPM to reduce the chance of water or snow penetration. ASHRAE Standard 62.1-2016, Section 5.5.2 provides guidelines for rain entrainment. This standard also points out that any water that does penetrate the inlet device needs to be managed by providing a drainage area and / or moisture removal device. Areas that have snow need to have the inlet placed or located above the anticipated snow level. Moisture from melting snow must be managed.

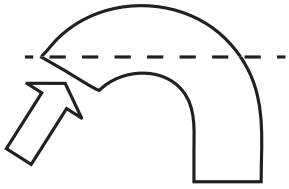
Bird screening should be provided that satisfies any applicable codes.

The outdoor air inlet device should not have any construction that would allow birds to nest.

Figure 2 below is an acceptable construction for an inlet hood, while Figure 3 is not acceptable.



Acceptable
Figure 2



Not Acceptable
Figure 3

Indoor Air Quality

Outside air units have been designed for treatment of the air being brought into the space. They are not intended to provide thermal comfort for the occupants.

Indoor contaminants and the diverse source of these, has an impact on the resulting indoor air quality. Appendix C of ASHRAE Standard 62.1-2016 states “At present, there is no quantitative definition of acceptable IAQ that can necessarily be met by measuring one or more contaminants.” However, it is incumbent that as many efforts as possible be made to help insure the best quality possible, based on today’s technology.

Duct Design

Ducting must be connected from the air inlet side of the unit to an outdoor air louver and from the exhaust outlet to a separate exhaust louver. Ducting must also be connected from the supply air blower outlet to the main supply air duct distribution system or terminal as well as a separate return air duct back to the unit. Provide a duct length that is 4 to 5 times the diameter of the blower wheel (14 inches) before making the first transition. Provide turning vanes when required.

On units, such as this 100% Outdoor Air System, it is critically important that the external static pressure (ESP) be determined prior to unit selection. Care must be made that the designed ESP is achieved for the application.
Ducts and louvers must be fabricated to meet the design ESP.

The duct design must be based on accepted industry practices. These can be found in SMACNA's HVAC Duct Construction Standards—Metal, Flexible and Fibrous. Additionally, standards NFPA 90A and 90B should be satisfied.

It is highly recommended that an air balance be documented for the system.

General Ductwork Recommendations

1. Please make sure that all field supplied ductwork is connected to the units.
2. Make sure that all ductwork is supported independently from the equipment.

These two installation requirements are meant to minimize or isolate any unit vibration to help assure that it is not transmitted into the ductwork, to the structure and/or out into the space.

All ductwork must be designed in accordance with industry accepted practices. Consult ASHRAE, AMCA or SMACNA guidelines or standards for details. Use of turning vanes is recommended.

Verify that the designed duct external static pressure is in line with the capability of the unit.

Ducts should be insulated in accordance with applicable industry standards or per local codes, particularly if the unit will be operated during cold weather. It is also best to design for sufficient clearances for servicing the blower motors, expansion valves, filters, and any additional accessories installed.

Louver and Ducting

Strategically located intake and exhaust louvers help to prevent recirculation of exhaust and contaminated air into the intake air stream. Airflow around a building and prevailing wind direction can adversely affect the potential for recirculation and should be factored into louver placement. In some areas, local codes dictate louver location. Maximize the distance of intake louvers from any exhaust outlet and other contaminants, people, property lines, etc. Avoid placing intakes near idling vehicles.

The bottom of the intake louver should be raised a minimum of 12" from a horizontal surface (roof, sidewalk, etc.) to prevent blockage from debris. If snow accumulations are expected to be greater than 12", raise the bottom of the louver above the average snowfall depth.

If more than one unit will be installed in the same area, then the minimum separation of one unit adjacent to another should be 6 feet. A 10 foot separation distance should be maintained where two units are installed one above the other. It is best to direct exhaust air up and away from pedestrian walkways as well.

We do not recommend multiple installations between closely situated buildings where exhaust air could collect and be directed back to the intake. Again, recirculation may cause units to trip on high head pressure.

Louver Selection

Carefully choosing the correct intake/exhaust louvers and determining the best location for them are critical components to a successful installation.

1. Select a louver design that will safely separate the exhaust from the intake air stream to ensure that air recirculation will not occur.
2. The intake louver should be designed to minimize and virtually eliminate water penetration at a reasonable face area velocity (fpm).
3. The discharge duct must be as short and straight as possible but of sufficient length to guarantee uniform airflow distribution through the louver for maximum velocity.
4. In most cases, the cross-sectional "free area" of the louver must be equal to or larger than the cross-sectional areas of the intake and/or exhaust unit openings to allow for optimum velocity and reasonable pressure drop across the louver.
5. Ducts should be insulated if the unit is installed and operating in cold climates.
6. Adequate access to the louver must be available for cleaning purposes.
7. All louver manufacturer instructions, local codes, and industry accepted guidelines must be followed for all installations.

Louvers should be inspected and cleaned on a regular basis. A bird screen is required to deter animals and debris from entering the duct system.

Physical Data

Physical Data

Nominal CFM		900 - 2,500
Supply Blower	Type	ECM
	Qty	1
Exhaust Blower	Type	ECM
	Qty	1
Outdoor Air Filter	Type	Pleated - Throwaway
	Qty	2
	Efficiency	MERV 13
	Size	16” x 24” x 2”
Return Air Filter	Type	Pleated - Throwaway
	Qty	2
	Efficiency	MERV 8
	Size	16” x 24” x 2”
Evaporator Coil	Rows	6
	FPI	14
Condenser Coil	Rows	6
	FPI	14
Sub-Cooling Coil	Rows	1
	FPI	14
Hot Gas Reheat Coil	Rows	1
	FPI	14
Compressor	Type	Variable Capacity Scroll
	Qty	1
Condensate Drain Connection	Size/Type	3/4" NPT
	Qty	2

Application Data

Voltage Variation	208/230	187/253
	460	414-520
Airflow – Outdoor Air and Return Air	CFM	900–2500
Outside Air	DB °F (Min. - Max.)	10–105
	RH % (Min. - Max.)	20.0 – 100.0
Return Air	DB °F (Min. - Max.)	60 – 80
	RH % (Min. - Max.)	20.0 – 100.0

INFORMATION

The maximum difference between outside air CFM and return air CFM can be no greater than 20%

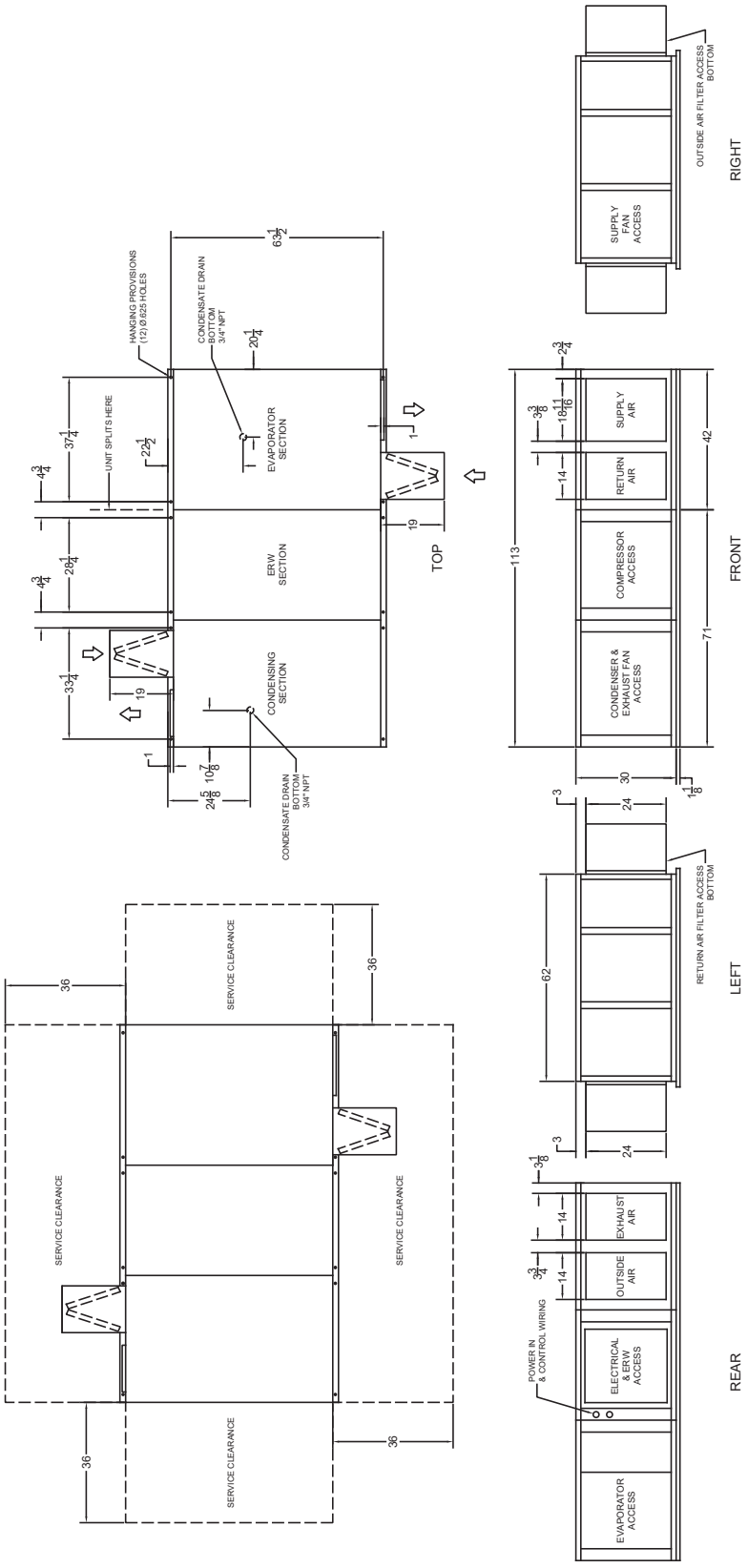
INFORMATION

Not all combinations of Outside Air and Return/Exhaust Air temperatures are valid. The actual range of operating conditions must be verified in UCA Select online selection software.

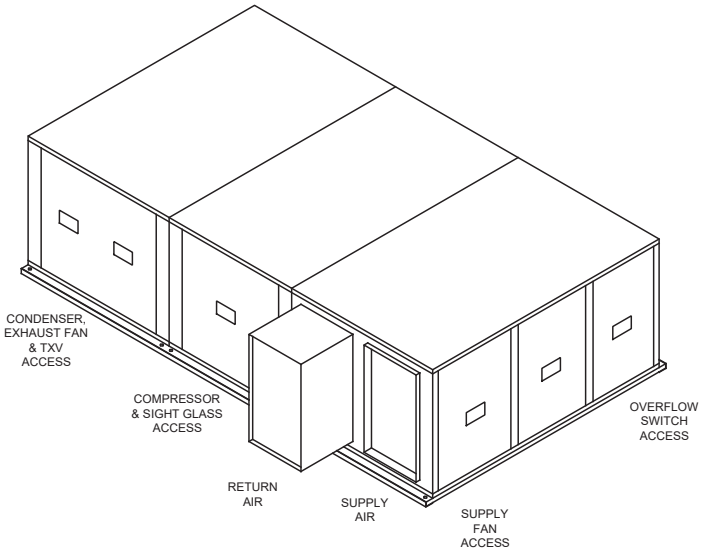
INFORMATION

In areas where the outside air temp will fall below 10°F, a field provided duct heater must be installed for preheat. The heater should be sized properly to provide a preheated air temperature range of 10°F (min.) up to 40°F (max.) to the Alpha Aire.

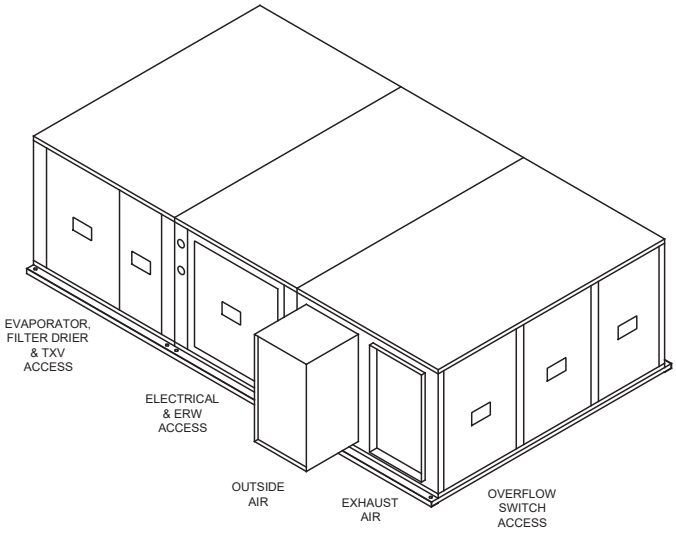
Dimensional Drawing



Isometric Views



FRONT



REAR

Installation

Suggested Assembly Sequence

1. The Alpha Aire II unit ships split in two sections on separate skids to be field assembled as a packaged unit.
2. Unit contains a full charge of R-410A refrigerant from the factory.
3. Line up evaporator and condenser sections. Secure sections to full length tie rails (factory provided) and ensure there are no gaps between cabinets.
4. Install patch panels (factory provided) on top and sides of cabinet to cover any gaps between sections .
5. Connect resealable refrigerant fittings between evaporator section and compressor compartment on front of unit. Reference Resealable Refrigerant Fittings section.
6. Connect low voltage wiring via factory installed wire-to-wire connectors between electrical compartment and evaporator sections.
7. Mount assembled unit. Reference Ceiling Mounting and Floor Mounting guidelines in the General Information section.
8. Maintain all service clearances and clearances required to replace filters.
9. Run field provided evaporator and condenser condensate drain lines. Reference Condensate Drain Connections section.
10. Connect field provided power wiring from the disconnect (field provided) to the unit power block inside electrical box. Reference Electrical Section.
11. Attach Outdoor Air and Return Air filter boxes to appropriate openings in Rear and Front of cabinet. The hinged access doors are located on top and bottom of filter box. Maintain appropriate clearance for filter replacement.
12. Connect factory provided plastic tubing from dirty filter switches to the pneumatic fitting located inside the filter box for both the Outdoor Air and Return Air filter boxes.
13. Install field provided ductwork.

Shipped Loose Items

- Tie Rails
- Patch Panels
- Filter Boxes

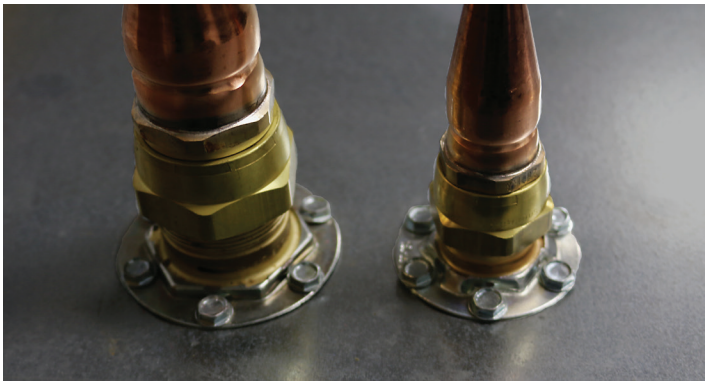
Resealable Refrigerant Fittings

All units are shipped from the factory with a full factory refrigerant charge. The resealable refrigerant fittings must be connected and properly tightened to facilitate refrigerant flow between the evaporator and compressor / condensing section.

For shipping purposes the refrigerant fittings are held in place to the cabinet using vinyl coated hangers and a mounting bracket. These are to be removed before the refrigerant fittings are connected.

1. On the refrigerant resealable fittings, apply a few drops (5 to 6 droplets are recommended) of refrigerant oil to the male coupling halves before starting the assembly (Ref. to Figure 4).
2. Align each resealable fitting and hand thread the female fitting onto the male fitting (Ref. to Figure 4). Continue to hand thread until resistance is observed.
3. Once slight resistance is evident, continue to tighten the fittings using the appropriate size wrenches listed in Table 1. Please note that it is important to support the male side of the fitting with a wrench when tightening the female side with a wrench.

Figure 4 - Resealable Fittings



4. If the resealable fittings still feel loose, tighten a bit more as required.

INFORMATION

Count the number of threaded rotations. Use Table 1 to determine how many total rotations are required for proper sealing of the fittings.

Size	Wrench	Full Turns Required
3/8"	1-3/16"	6
1/2"	1-3/16"	6
5/8"	1-5/8"	7-3/4
3/4"	1-5/8"	7-3/4
7/8"	1-5/8"	8
1-1/8"	2"	8

Table 1 - Resealable Fitting Turns

INFORMATION

If low refrigerant pressure is evident during the start-up process, check the tightness of all resealable fittings. A fitting that is not fully open will restrict refrigerant flow.

Condensate Drain Connections

Alpha Aire II evaporator and condenser sections both have a ¾" NPT condensate drain connection on the bottom of the unit. These each require a drain trap. The outlet of the drain traps can be tied together and piped into a condensate pump to be routed to a condensate disposal point.

These field-fabricated and installed condensate drain traps have the purpose of neutralizing the negative pressure at the evaporator and the positive pressure at the condenser.

These pressures will vary depending on the airflow and the external static pressure. The condensate trap must be of sufficient depth in water column to permit the condensate to flow from the drain pan. Failure to have a sufficient drain trap will cause the condensate to overflow the evaporator drain pan or to cause the unit to shut down on the drain pan overflow safety.

The "A" dimension (reference figure below) must equal or exceed the negative static pressure developed by the supply air blower. The "A" dimension will be unique for each unit application. Refer to UCA Select online selection software for assistance in determining the "A" value. The "U" of the trap must be 2 ½" deep to maintain a water seal under all operating conditions, especially during blower start-up.

It is highly recommended that the trap be primed with water prior to start-up.

Each trap must be piped to a suitable waste drain per the authority having jurisdiction.

Depending on the clearances and method for cleaning, consider extending the drain pipe out past the unit before placing the trap so the plug is accessible for cleaning.

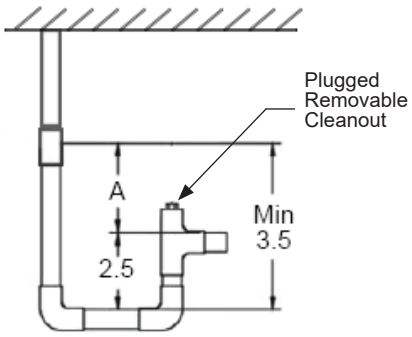


Figure 5 - Condensate Trap Dimensions

Electrical

ELECTRICAL HAZARD

Only a qualified licensed electrician or other individual that is properly trained in handling live electrical components should perform the wiring installation. Failure to follow all electrical safety precautions and industry accepted practices when exposed to live electrical components could result in death or serious injury.

CAUTION

Control Voltage primary tap MUST be adjusted to match field power supply.
Control transformer is factory wired for 208V (RED).
Change to 240V (ORANGE) tap if field power is greater than 220V.

INFORMATION

Use Copper Conductors Only. Failure to use copper conductors may result in equipment damage.

INFORMATION

All electrical wiring must be in accordance with NEC (National Electrical Code), NFPA (National Fire Protection Agency) most current versions as well as any applicable state or local codes.

INFORMATION

Confirm that the incoming power supply matches the unit data tag.

INFORMATION

Unit wiring and components have been designed for the specific unit application and factory assigned controls. Do not use the unit transformers or alter the unit wiring to interface any field supplied accessories or controls.

A factory provided power block is installed internal to the unit's electrical control panel. Route the main power wires in accordance with all codes from the disconnect to the unit power block.

A proper ground termination lug has been provided in the unit control panel.

ELECTRICAL HAZARD

Conduit is not an acceptable grounding source. A separate ground conductor must be connected from Earth Ground to the factory supplied grounding lug internal to the unit.

Transformer

Dual voltage units, 208/230, are wired from the factory for the 208 volt power supply. If the power supply will be consistently above 220 volts the transformer should be wired on the 230 volt tap or 240 volt tap.

Wiring

1. Reference the unit electrical diagram. To retrieve the electrical diagram from the UCA web site, scan the QR code near the unit data tag and reference Electrical Diagram section, page 4.
2. Units are completely internally wired at the factory.
3. All units are provided with terminal blocks.
4. Check the unit data tag for the information including:
   - Voltage, Phase, Frequency
   - Maximum operating current (MOC): input current of the evaporator motor drive or the condenser motor drive
   - Maximum rated current (MRC): input current of compressor drive
   - Minimum circuit ampacity (MCA) is used to determine the minimum conductor size required for a field wired unit
   - Maximum overcurrent protection (MOP) is used to determine the maximum circuit breaker or fuse size required to properly protect the unit under anticipated fault conditions
5. Route the power wiring through the hole near the electrical box on the rear of the unit.
6. Power wiring must comply with all National or Local codes. The power supply must be suitably fused for wire protection.
7. Use copper conductors only. The unit must be earth grounded using the ground lug provided in the electrical box.

Pressure Switches

High Pressure

This switch shuts down the compressor in the event of excessive high pressure (approx. 630 psig) in the discharge line. A manual reset is required at the high pressure switch.

Low Pressure

This switch shuts down the compressor in the event of low pressure (approx. 30 psig) in the suction line. This switch will auto-reset when the pressure rises above 60 psig.

Sequence of Operation

System Start/Stop

The system is on when all enable points are set to the on position:

System ON/OFF: section of the controller's Main Menu using the display terminal/user interface.

Remote ON/OFF: If Remote ON/OFF is field wired (requires voltage free dry contact by the field), closing the switch remotely starts the unit. Opening the switch remotely stops the unit. A jumper wire is installed in the field termination points that must be removed during installation and replaced with the field provided switch.

BMS ON/OFF: (Optional) System must be enabled through the BMS. The default enable point is on/true.

Damper Operation

During system startup, the optional outdoor damper control shall energize with a 120 second (adjustable) time delay standard. As an option proof by damper end switch shall prove damper is open. Once the damper delay has elapsed or optional end switch is closed, the supply fan is energized to provide air flow.

Supply and Exhaust Fan Operation

Airflow Setpoint: The desired CFM at each fan wheel can be adjusted individually under the setpoints menu. The ECM fans will adjust based on factory installed pressure sensors to maintain the airflow setpoint.

Modes of Operation

Dehumidification Mode

Dehumidification is based on the entering Outdoor Air Dew Point and Supply Air Dew Point Set Point. If the Outdoor Air Dewpoint is greater than the Supply Air Dew Point Set Point, Dehumidification Mode is active. During Dehumidification Mode, the variable capacity compressor will modulate based on total dehumidification demand. Total dehumidification demand is calculated based on the dew point at the outlet of the Evaporator Coil and the Supply Air Dew Point Set Point 55°F (adjustable). Dehumidification takes priority over cooling and heating modes.

Reheat Mode

During dehumidification mode, if the supply air temperature falls below the reheat set point, the hot gas reheat valve will modulate to maintain supply air temperature based on the reheat set point.

Cooling Mode

Cooling mode is active when there is no dehumidification demand, and the Supply Air Temperature is greater than the Supply Cooling Set Point. The variable capacity compressor will modulate based on cooling demand. Cooling demand is calculated based on the Supply Air Temperature and the Supply Cooling Set Point.

Heat Pump Mode

Heat pump mode is active when there is no dehumidification demand, and the supply air temperature falls below the supply heating set point. During heat pump mode, the compressor will modulate to maintain the adjustable supply heating set point.

Heat Pump Mode - Field Provided Duct Heater

In areas where the outside air temp will fall below 10°F, a field provided duct heater must be installed for preheat. The heater should be sized properly to provide a preheated air temperature range of 10°F (min.) up to 40°F (max.) to the unit.

Dry contacts for enabling a field provided and field powered duct heater are available (TB-AH). These contacts will be closed when the unit is in the heat pump mode.

Defrost Mode

When the low suction pressure switch remains open for 20 min. (adjustable) and the compressor is operating in the heat pump mode, the unit will enter the defrost mode. The supply blower and compressor will de-energize for 10 min (adjustable). The energy recovery wheel and exhaust blower will continue to run. The defrost timers are adjustable in the Factory Menu.

Energy Recovery Wheel

The energy recovery wheel will be energized anytime the compressor is on.

Factory Installed Sensors

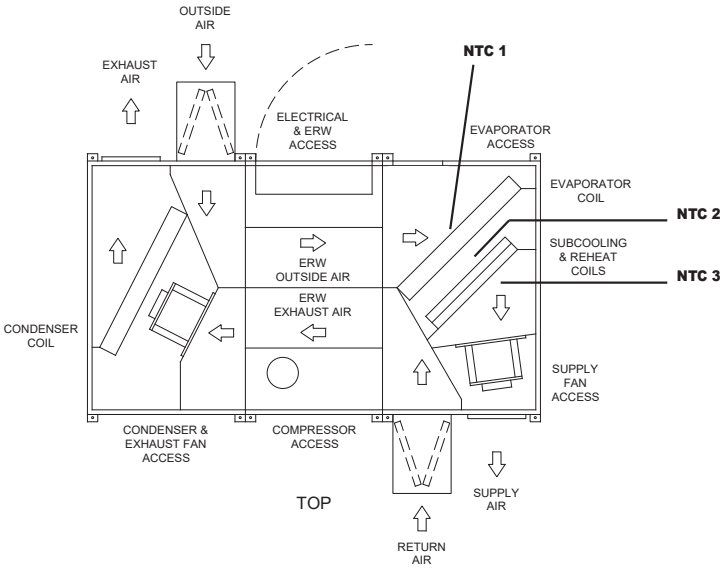


Figure 6 - Factory Installed Sensors

All sensors are factory installed.

NTC 1: Outdoor air temperature and humidity sensors used to calculate entering air dewpoint.

NTC 2: Evaporating leaving air temperature used to calculate dewpoint of leaving air temp.

NTC 3: Supply air temperature.

NTC 4: Liquid line temperature.

SFP: Supply fan pressure differential.

EFP: Exhaust fan pressure differential.

Safeties

- Compressor High Discharge Pressure
- Compressor Low Suction Pressure
- Condensate Overflow
- Dirty Filter Detection
- Loss of Airflow
- Fire/Smoke Detection (devices by others)

Controls Guide

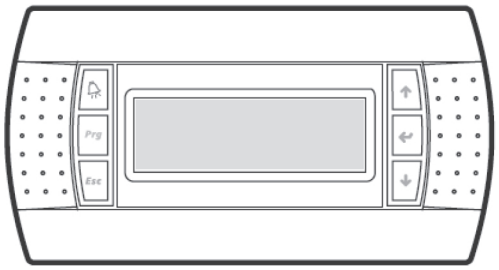


Figure 7 - Marvel Premium Wall Display

Using the Display Terminal

Alarm Key ⚠

Use the Alarm Key to access any active alarms. This button will illuminate red when an alarm is active.

Program Key ⊙

Use the Program Key to access the Main Menu.

Esc Key ⮌

Use the Esc Key to escape from sub-menus.

Up Key ↑

Use the up arrow key to view the next screens in a loop, cycle through menu options and increment changeable values.

Enter Key ↵

Use the Enter Key to enter sub-menus, move the cursor to the next changeable field, and save changed parameters.

Down Key ↓

Use the down arrow key to view the next screens in a loop, cycle through menu options and decrement changeable values.

Controls Quick Start

1. **Turn the system on:**
   a. Access the System On/Off section of the Main Menu and change the slider to the ON position. The N.O. outdoor damper contacts will close, and the outdoor damper end switch delay will begin. When the outdoor damper end switch closes, the supply and exhaust fans will start and ramp to meet the CFM set point.
2. **Adjust the set points:**
   a. All set points are found under the Set Points section of the Main Menu,
   b. Dew Point Set Point: The factory dew point set point is 55°F. If the outdoor air entering dew point is greater than the dew point set point and the compressor is enabled, the compressor will be staged on and control to the dew point set point.
   c. Heat Pump Set Point: If the outdoor air entering dewpoint is below the dew point set point, and the supply temperature is below the supply heating set point, the compressor will be staged on in heat pump mode and control to the supply heating set point.
   d. Reheat Set Point: The factory reheat set point is 70°F. Adjust the hot gas reheat set point based on desired supply air temperature.
   e. Airflow Set Point: Adjust the set point individually for each fan based on airflow across the fan.
3. **Check System Status**
   a. System status displays air temperatures, compressor demand, EEV position, superheat, subcooling, airflow. Access system status by pressing ESC to leave any menus or sub-menus, or by choosing System Status in the Main Menu.
4. **Compressor Disabled:**
   a. If a compressor becomes disabled by alarm, the system status screen will read “One Compr Disabled”. The compressor must be re-enabled under the System Enables section of the Main Menu.
5. **Alarms**
   a. If an alarm is present, the alarm LED at the wall display will illuminate red.
   b. To check active alarms, press the Alarm key. Use the down arrow key to move to the next active alarm.
   c. To reset active alarms, press the Alarm key and use the down arrow key to get to the alarm reset screen. Press and hold Alarm for 3 seconds to reset all alarms. If an alarm does not reset, the fault condition is still present.

Alarms

Global Alarm
When any alarm is present, the red LED will flash continuously. Hold the up arrow button to see active alarms. Move to the next active alarm with the right arrow button.

Compressor High Pressure
The high discharge pressure switch is a manual reset switch. The alarm must also be cleared at the controller before compressor operation will resume.

Compressor Low Pressure
The low suction pressure switch will reset automatically. The alarm must be cleared at the controller before compressor operation will resume.

Emergency Shutdown
Terminal blocks (TB-ES) are provided for emergency shut down that will stop all unit functions on open contact. The terminal blocks can be closed with a jumper if the function is not needed.

Loss of Airflow
If no Modbus activity is detected on a call for fans OR if fan RPM is lower than the minimum allowable RPM, then a loss of airflow alarm will be active after a 60 second delay. The alarm must be cleared before the unit will attempt to start again.

Drain Pan Overflow
Terminal blocks (TB-DP) are provided for an external condensate overflow switch. If these contacts are open, a drain pan overflow alarm will lock out compressor operation until the contacts are closed.

Dirty Air Filters
The alarm is active when the pressure drop across either air filter causes an open contact at the pressure switch. Check air filters and replace if necessary. This alarm will not lock out system functions.

Control Temperature Sensor Failure

The alarm is active when there is a problem with the control temperature sensor. This is a bulb style NTC sensor located in the supply air stream leaving the enthalpy wheel. This alarm will prevent compressor operation.

Clearing Active Alarms

To clear active alarms, hold the up arrow button to access the active alarm(s). Then use the right arrow button to navigate to the alarm reset screen. Press the OK button on the Reset Alarms button to reset active alarms. The cause of the active alarm must be resolved or the alarm will remain.

BACnet Setup

All BACnet MS/TP communication parameters are adjustable under the BMS Setup section of the Main Menu. BACnet IP requires additional IP address configuration.

To change the controller's IP address, hold the Alarm and Enter keys for ~3 seconds to access the operating system menu. Enter the SETTINGS sub-menu and select TCP/IPv4 SETTINGS.

BACnet Points List

Analog Values						
Index	**Variable/BACnet Name**	**Description**	**Access**	**Minimum**	**Maximum**	**Units**
1	OutdoorTemperature	Outdoor Temperature	R	-999.9	999.9	Degrees Fahrenheit
2	OutdoorHumidity	Outdoor Humidity	R	-999.9	999.9	Percent Relative Humidity
3	EvaporatorTemperature	Evaporator Air Temperature	R	-999.9	999.9	Degrees Fahrenheit
4	SupplyTemperature	Supply Temperature	R	-999.9	999.9	Degrees Fahrenheit
5	DischargeTemperature	Compressor Discharge Gas Temperature	R	-999.9	999.9	Degrees Fahrenheit
6	LiquidPressure_1	Liquid Pressure 1	R	-999.9	999.9	PSIG
7	LiquidTemperature_1	Liquid Temperature 1	R	-999.9	999.9	Degrees Fahrenheit
8	SuctionPressure_1	Suction Pressure 1 - Cooling Mode	R	-999.9	999.9	PSIG
9	SuctionPressure_2	Suction Pressure 2 - Heat Pump Mode	R	-999.9	999.9	PSIG
10	SuctionTemperature_1	Suction Temperature 1 - Cooling Mode	R	-999.9	999.9	Degrees Fahrenheit
11	SuctionTemperature_2	Suction Temperature 2 - Heat Pump Mode	R	-999.9	999.9	Degrees Fahrenheit
12	Compressor_1_Subcooling	Compressor 1 Subcooling	R	-999.9	999.9	Degrees Fahrenheit
13	SuctionSuperheat	Supply Temperature Proportional Band	R	-999.9	999.9	Degrees Fahrenheit
14	SupplyDewpoint_Setpoint	Supply Dewpoint Set Point	R/W	45.0	80.0	Degrees Fahrenheit
15	SupplyDewpoint_PropBand	Supply Dewpoint Proportional Band	R/W	1.0	40.0	Degrees Fahrenheit
16	SupplyCool_Setpoint	Supply Cooling Proportional Band	R/W	45.0	95.0	Degrees Fahrenheit
17	SupplyCool_PropBand	Supply Cooling Proportional Band	R/W	1.0	99.0	Degrees Fahrenheit
18	SupplyHeat_Setpoint	Supply Heating Set Point	R/W	45.0	140.0	Degrees Fahrenheit
19	SupplyHeat_PropBand	Supply Heating Proportional Band	R/W	1.0	50.0	Degrees Fahrenheit
20	Reheat_Setpoint	Hot Gas Reheat Set Point (Dehumidification Mode)	R/W	0.0	120.0	Degrees Fahrenheit
21	Reheat_PropBand	Hot Gas Reheat Proportional Band	R/W	1.0	25.0	Degrees Fahrenheit
22	CoolDemand	Cooling Demand	R	0.0	100.0	Percent
23	HeatPumpDemand	Heat Pump Demand	R	0.0	100.0	Percent
24	DehumidifyDemand	Dehumidify Demand	R	0.0	100.0	Percent
25	ReheatDemand	Reheat Demand	R	0.0	100.0	Percent
26	OA_Dewpoint	Outdoor Air Dewpoint	R	0.0	99.9	Degrees Fahrenheit
27	OA_Enthalpy	Outdoor Air Enthalpy	R	0.0	99.9	btu/lb
28	CompMtrAmps	Compressor Current (VFD Compressor Only)	R	0.0	99.9	A

Binary Values						
Index	**Variable/BACnet Name**	**Description**	**Access**	**Inactive Text**	**Active Text**	**Notes**
1	SystemOnOff	System ON/OFF	R/W	OFF	ON	
2	OutdoorAirDamper	Outdoor Air Damper Status	R	Closed	Open	
3	SupplyBlower	Supply Air Blower Status	R	OFF	ON	
4	Compressor_1	Compressor 1 ON/OFF Status	R	OFF	ON	
5	Heater_1	Heat 1 Status	R	OFF	ON	
6	ReversingValve_1_ON	Reversing Valve 1 ON/OFF Status	R	Heat Pump	Cooling	
7	ERW_ON	Energy Recovery Wheel Status	R	OFF	ON	
8	ExhaustFan_ON	Exhaust Fan Status	R	OFF	ON	
9	GlobalAlarm_ON	Global Alarm Status	R	OFF	ON	
10	Compressor_1_HP_Alarm	Alarm - Compressor 1 High Pressure	R	Normal	Alarm	
11	Compressor_1_LP_Alarm	Alarm - Compressor 1 Low Pressure	R	Normal	Alarm	
12	Airflow_Alarm	Alarm - Loss of Airflow	R	Normal	Alarm	

13	FireSmoke_Alarm	Alarm - Fire/Smoke Detected	R	Normal	Alarm	
14	DrainPan_Alarm	Alarm - Drain Pan	R	Normal	Alarm	
15	DirtyFilter_Alarm	Alarm - Dirty Air Filter(s)	R	Normal	Alarm	
16	OA_Damper_Alarm	Alarm - Outdoor Damper Failed to Open	R	Normal	Alarm	
17	AlarmSupplyHighTemp	Alarm - Supply Temperature High	R	Normal	Alarm	
18	AlarmSupplyLowTemp	Alarm - Supply Temperature Low	R	Normal	Alarm	
19	OutdoorTemperature_FAIL	Alarm - Outdoor Temperature Sensor Failure	R	Normal	Alarm	
20	OutdoorHumidity_FAIL	Alarm - Outdoor Humidity Sensor Failure	R	Normal	Alarm	
21	LiquidPressure_1_FAIL	Alarm - Liquid Pressure 1 Sensor Failure	R	Normal	Alarm	
22	SuctionPressure_1_FAIL	Alarm - Suction Pressure 1 Sensor Failure	R	Normal	Alarm	VFD Compressor Units Only
23	SuctionPressure_2_FAIL	Alarm - Suction Pressure 2 Sensor Failure	R	Normal	Alarm	VFD Compressor Units Only
24	LiquidTemperature_1_FAIL	Alarm - Liquid Temperature 1 Sensor Failure	R	Normal	Alarm	
25	SuctionTemperature_1_FAIL	Alarm - Suction Temperature 1 Sensor Failure	R	Normal	Alarm	VFD Compressor Units Only
26	SuctionTemperature_2_FAIL	Alarm - Suction Temperature 2 Sensor Failure	R	Normal	Alarm	VFD Compressor Units Only
27	AlarmReset_BMS	Reset Alarms by BMS	R/W	OFF	ON	
28	DefrostMode_ON	Defrost Mode Active	R	Defrost OFF	Defrost ON	
29	OA_Dewpoint_Mode	Supply Dewpoint Dehumidification Status	R	OFF	ON	
30	EnableCompressor_1	Compressor 1 Enable	R	Disabled	Enabled	

MultiState Values

Index	Variable/BACnet Name	Description	Access	Minimum	Maximum	MultiState Value	MultiState Status
1	BMS_ModeSelection	BMS Mode Input Selector	R/W	1	4	1	BMS - Mode Disabled/OFF
						2	BMS - Unit OFF
						3	BMS - Unit ON
						4	BMS - Emergency Stop
2	Compressor_1_Status	Compressor 1 Status	R	1	7	1	Compressor 1 - OFF
						2	Compressor 1 - High Pressure
						3	Compressor 1 - Low Pressure
						4	Compressor 1 - In Delay
						5	Compressor 1 - Compressor Module Alarm
						6	Compressor 1 - Cooling Mode ON
						7	Compressor 1 - Heat Pump Mode ON
3	SystemStatus	System Status	R	1	8	1	Unit OFF
						2	System Stand-By
						3	Unit ON
						4	Occupied
						5	Cooling ON
						6	Heat Pump ON
						7	Dehumidify ON
						8	Dehumidify & Reheat ON

Integer Values						
Index	**Variable/BACnet Name**	**Description**	**Access**	**Minimum**	**Maximum**	**Units**
1	SupplyAirflowSetpoint	Supply Airflow Setpoint	R/W	0	2500	CFM
2	ExhaustAirflowSetpoint	Exhaust Airflow Setpoint	R/W	0	2500	CFM
3	SupplyAirflow	Current Supply Airflow	R	0	9999	CFM
4	ExhaustAirflow	Current Exhaust Airflow	R	0	9999	CFM
5	UnitStartDelay	Unit Start Delay	R/W	5	180	Seconds
6	BlowerModeStart_Delay	Airflow Proving Delay	R/W	30	180	Seconds
7	OutdoorDamper_Delay	Outdoor Air Damper Delay	R/W	0	999	Seconds
8	Compressor_1_StartDelay	Compressor 1 Start Delay	R	0	999	Seconds
6	Comp_1_MinRUN	Compressor 1 Minimum Run Time Remaining	R	0	999	Seconds
7	Comp_1_MinOFF	Compressor 1 Minimum OFF Time Remaining	R	0	999	Seconds
8	CompMinRUN	Compressor Minimum Run Time	R/W	60	600	Seconds
9	CompMinOFF	Compressor Minimum OFF Time	R/W	90	900	Seconds
10	SupplyCool_Ti	Supply Cooling Integration Time	R/W	0	999	Seconds
11	SupplyHeat_Ti	Supply Heating Integration Time	R/W	0	999	Seconds
12	CompMtrSpeed_RPM	Compressor RPM (VFD Compressor Only)	R	0	7200	RPM
13	CompMtrVolts	Compressor Motor Voltage (VFD Compressor Only)	R	0	999	Volts

System Options

PAINTED CABINET (Exterior Only)

A Polyurethane Enamel electrostatically sprayed on heavy duty G60 steel components. It is a two component coating providing high gloss, excellent exterior durability with chemical resistance properties along with high volume solids and low VOC. A film thickness of 1.5 mil has a salt spray resistance of 300+ hours on a 1/8" vertical scribe in accordance with ASTM B117.

NON-FUSED DISCONNECT

A main non-fused disconnect that is shipped loose for field mounting.

CONDENSATE PUMP

If an optional condensate pump is to be used, it will be mounted external to the unit.
Follow pump manufacturer instructions.
A 115 volt power supply must be field supplied for the pump.
Refer to Figure 8 for the termination of the condensate tubing inside the pump.
Refer to Figure 9 for the inverted “U” trap that is to be installed for the condensate line.
Route the condensate disposal tubing to a suitable location.

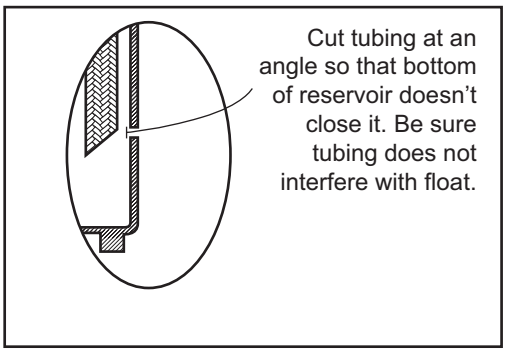


Figure 8

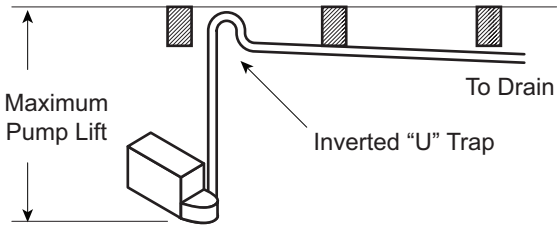


Figure 9

Refrigerant Circuit Components

SIGHT GLASS

A liquid sight glass is located in the liquid line between the outlet of the liquid receiver and the inlet of the thermostatic expansion valve. Flashing (bubbles) will appear in the sight glass during the first minute or two of operation until the expansion valve fully adjusts. If flashing is constant during the compressor operation, it may be an indication the unit is short of refrigerant.

THERMOSTATIC EXPANSION VALVE

The Maximum Operating Pressure (MOP) or pressure limiting thermal expansion valve provides several benefits and functions for 100% outside air applications. The units will see a wide variety of operating conditions. The TXV will open only slightly to maintain the pressure at 100 psig or less. This helps to keep the compressor operation stable and avoids the superheat from going too high and causing the compressor thermal overload from taking the system off line. After several minutes of operation the refrigerant circuit has stabilized and the valve will start to control based on the superheat setting.

HOT GAS REHEAT COIL

The hot gas reheat coil is used to maintain supply air or space air temperature at space neutral conditions. In order to do this, if the unit is operating in the dehumidification mode and the air temperature leaving the evaporator coil is less than the set point the control opens the hot gas reheat valve to reject heat energy back into the supply air through the hot gas reheat coil to try and maintain the temperature set point.

The modulating hot gas reheat valve is a balanced port design. This means that the valve will maintain equal pressure in both the condenser coil and reheat coil to maximize the reheat capability. This also provides more stability and closer control over the leaving air temperature. The reheat coil is mounted vertically in the cabinet with the manifold at the bottom so that the oil will drain out.

Additionally, the Marvel Premium controls will periodically provide a “flush” cycle to make sure no oil has accumulated in the reheat coil. All the refrigerant from the hot gas reheat coil is routed through the condenser coil to assure that it is all turned back into liquid refrigerant.

LIQUID SUBCOOLING COIL

Liquid Subcooling coil is used for additional reheat in the Dehumidification Mode for tempering air and increased efficiency.

Maintenance Procedures

ELECTRICAL HAZARD

Turn OFF power and lockout service before conducting any maintenance. Keep hands, clothing and tools clear of electrical terminals.

ENERGY RECOVERY WHEEL

See: MODEL ERC INSTALLATION, see page 27-35.

WARNING

Make sure to keep hands and clothing clear of any moving belts, blowers and motors while performing any maintenance. Failure to do so could result in death or serious bodily injury.

CAUTION

Any maintenance should be conducted by qualified HVAC service personnel only. Potentially hazardous situations which may result in personal injury, equipment or property damage.

FILTERS

Do NOT run unit without filters. Filters are accessed on the bottom or top of the filter box. Throwaway filters are supplied which are pleated extended surface type. Filters should be checked monthly for dirt accumulation and changed when necessary. Replacement filters must be the same type as originally supplied.

WARNING

Unit must be shut off at the disconnect switch before the filters are serviced. Be sure to check that the air flow direction arrows on the filters point in the correct direction of air flow.

BLOWERS

Disconnect power and lockout the service before doing any blower service or maintenance.

BLOWER MOTORS

All EC (Electronically Commutated) Motors have a built-in integrated frequency inverter. The combination of a motor, impeller, and integrated controller delivers maximum efficiency - especially at reduced operating speeds while minimizing the space needed for the system.

WARNING

Unit must be shut off at the disconnect switch before doing any service or maintenance.

REFRIGERANT SYSTEMS

The sight glass contains a moisture indicator which changes color when moisture is present in the refrigerant circuit. This indicator is the circular dot in the center of the sight glass. If the color of this indicator is blue, the refrigerant is okay. When the indicator is pink or purple, an abnormal condition exists, servicing is required.

INFORMATION

After installation and during equipment start-up, the sight glass may appear pink or purple. This occurs during prolonged periods of non-operation and should turn blue after several hours (up to 24) of operation.

EVAPORATOR AND CONDENSER COILS

The finned coils in a unit should be checked at least every six (6) months or more frequently based on experience of the specific application.

Evaporator finned coils can become “fouled” due to a build up of contaminants in the air path that are not caught or captured in the air filters. Over time this build up on the fin surface can reduce heat transfer and increase resistance to air flow. The end result might be higher operating costs or occupant discomfort.

A dirty condenser coil will cause high condensing pressures, resulting in higher power consumption and possibly system shut-down by high pressure safety control. A dirty evaporator coil will reduce unit capacity and eventually will cause system shut-down by the low pressure safety control.

FINNED COIL CLEANING

Before cleaning any finned coils, remove the filters. Remove any large debris or visible dirt accumulation.

WARNING

Make sure to follow all safety precautions when cleaning any coil with a commercially available coil cleaner. Follow all recommendations for safety clothing and gear. Failure to follow all safety instructions could result in death or serious injury.

CAUTION

Clean coils only with cold water and a suitable detergent or a commercially available coil cleaner. DO NOT use hot water or steam to clean a coil containing refrigerant as this may cause a high pressure situation that could damage the coil and associated safety devices or refrigerant components.

Rinse all coils thoroughly after any coil cleaning.
Use a suitable fin comb after the coil cleaning to straighten any bent fins.

CAUTION

Confirm that any coil cleaning agents, detergents or solutions are suitable for use on a copper tube/aluminum fin coil. If the cleaning agent is too acidic or alkaline, damage to the coil fins may result.

Energy Recovery Wheels

Product Overview

About Airxchange Energy Recovery Wheels

Unless noted, the information in this manual applies to all available models of Airxchange energy recovery wheels.

Energy recovery wheels rotate between the incoming outdoor air stream and the building exhaust air stream. As the wheel rotates, it transfers a percentage of the heat and moisture differential from one air stream to the other. Instead of wasting energy in the exhaust airstream, it is temporarily captured by the energy transfer media and then released to pre-heat, pre-cool, humidify, or dehumidify the incoming air, Figure 1.

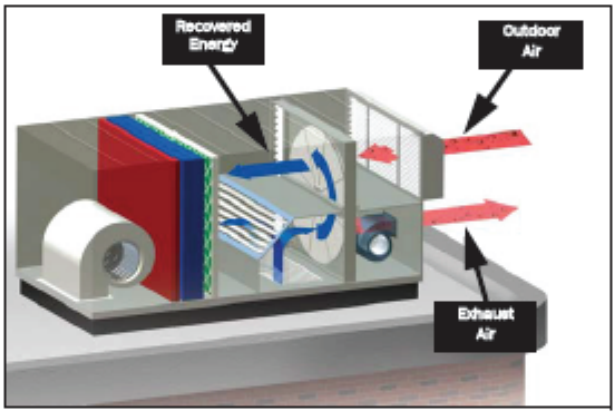


Figure 1 An ERV system pre-conditions outdoor air with recovered energy.

Airxchange wheels are designed with segmented energy transfer media. The segments are mounted in a stainless steel wheel, which then rotates within a galvanized metal cassette frame. The segmentation allows the transfer media to be easily removed for cleaning or replacement.

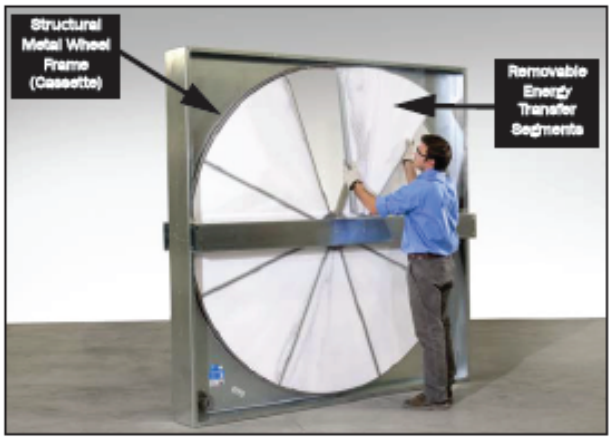


Figure 2 Airxchange structural metal wheel and frame assembly with removable polymer segments.

Moisture Transfer

Depending on the application, the energy recovery media may include a desiccant. Desiccants transfer water molecules between two air streams of different vapor pressures. The vapor pressure differential drives water molecules into/from desiccants to transfer moisture from the more humid air stream to the drier air stream as the wheel rotates.

UL Approved and AHRI Certified

- Airxchange energy recovery cassettes are UL Recognized Components under UL Standard 1812, Ducted Heat Recovery Ventilators.
- Airxchange recovery performance ratings are certified by the AHRI Air-to-Air Energy Recovery Ventilation Equipment Certification Program.

Figure 3 Airxchange wheels are UL and AHRI Certified.

Overview of Wheel Components

Refer to Figure 4 and the list below for the high level components in an Airxchange wheel.

For an Illustrated Parts Breakdown of a particular wheel, enter the serial number into the Parts Lookup tool at **Airxchange.com/Service**.

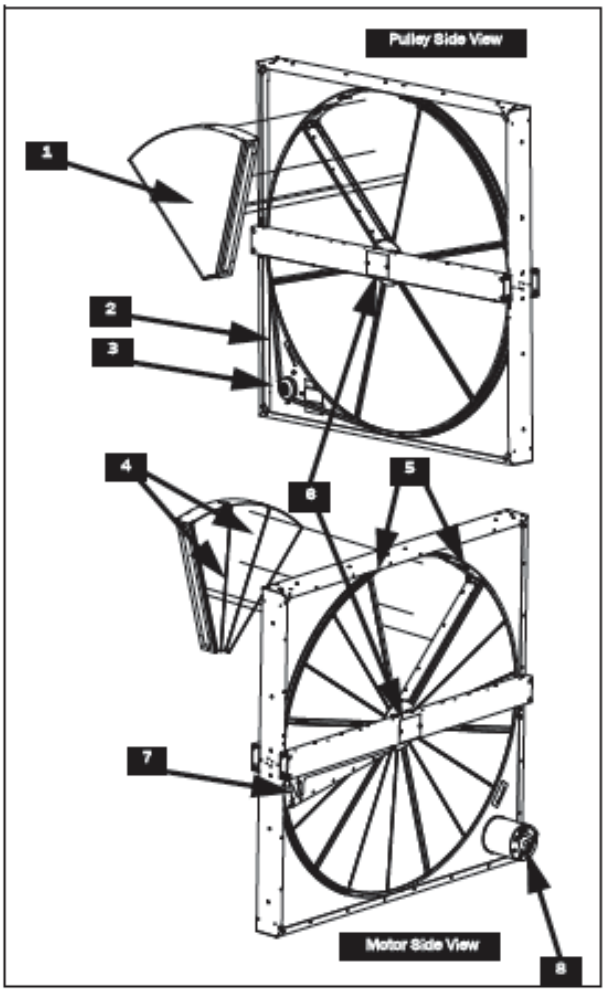


Figure 4 Exploded view of Typical Airxchange wheel.

- (1) Removable Segment (Also referred to as "Media")
- (2) Permanent Tension Belt
- (3) Pulley
- (4) Embedded Segment Stiffeners
- (5) Segment Retaining Latches
- (6) Bearing Beam and Bearing Access Cover Plate (Diameter Seals are behind Bearing Beam on both sides)
- (7) Adjustable Purge
- (8) Motor

Identify Cassettes With Serial Number

All Airxchange wheels are labeled with Model, Serial, and Part numbers. The label can be found on the sheet metal adjacent to the drive pulley, Figure 5. You should always have a serial number when contacting Airxchange for product support or when ordering replacement parts.

See *Record Product Information for Reference beginning on page 20* for a location to log the details about numerous wheels in a system.

For more details on the Airxchange Parts Lookup tool, see *Service Tools beginning on page 5*.

Figure 5 Product label (with serial number) on pulley corner of each wheel.

Operating Instructions

Pre-Startup

WARNING

Before servicing entire HVAC system, turn off the main disconnect to the unit. Use the site-specific Lockout-Tagout procedure.

Motor Guidelines

Note the following for proper motor function:

- Always follow motor manufacturer's wiring instructions.
- All wheels should rotate clockwise when viewed from the pulley side.
- On 3-phase motors, if the wheel does not rotate clockwise (when viewed from pulley side), shut off power to the system and interchange any two power supply leads to reverse rotation.
- Inverter duty motors should not exceed a 20:1 turn down ratio.

Inspect Diameter Seals

Diameter seals, Figure 7, are set at the factory, but should be inspected before operation.

To check the seal, slide a piece of paper ("feeler gauge") between the seal and the media at multiple locations on both sides of the bearing as you rotate the wheel slowly by hand (clockwise when viewed from the pulley side). Verify that the media slightly grabs the paper during the rotation.

If necessary, loosen adjusting screws along the bearing beam and re-set seal to a slight interference fit with the wheel media, Figure 7.

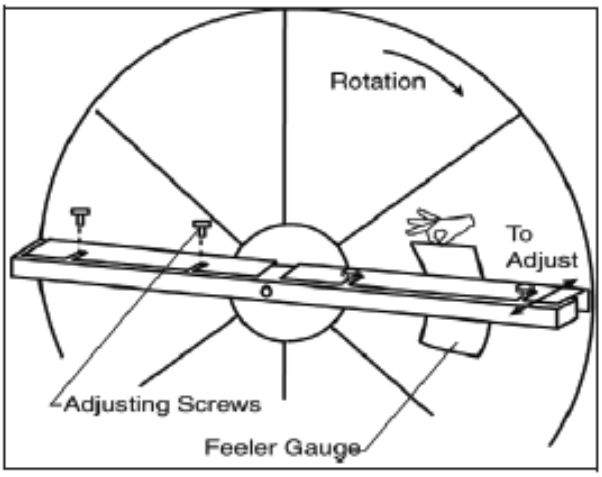


Figure 7 Setting diameter seals.

Inspection

Before starting the system, confirm the following:

WARNING

Before servicing entire HVAC system, turn off the main disconnect to the unit. Use the site-specific Lockout-Tagout out procedure.

- Wheel spins freely by hand in a clockwise direction, with no interference noise.
- Wheel is not "racked" (wheel rotates parallel to bearing beams).
- Belt tracks near middle of rim (not against rim support).
- Belt is not flipped (on a stretch belts for 36-inch wheels and above, the narrow face contacts the wheel rim; on a continuous link belt, small tabs contact wheel rim).
- All media segments are installed in the wheel and latches are closed. For instructions, see *Segment Removal/Installation beginning on page 12.*
- Diameter Seals are properly set and secured (seal is parallel to and just touching media surface). See *Inspect Diameter Seals beginning on page 6.*

Cleaning Airxchange Segments

All Airxchange wheels 25-inches in diameter and larger feature segmented energy transfer segments for easy removal and cleanings - per the application requirements. The polymer media segments are lightweight and can be lifted by a single person. This section briefly describes how to determine the need for cleaning and, if necessary, clean the Airxchange segments.

WARNING

When cleaning polymer media segments, **DO NOT** use acid based cleaners, aromatic solvents, temperatures in excess of 170-degrees Fahrenheit, or steam; damage to the media segments may result from improper cleaning.

Classes of Air

Cleaning the energy transfer media will help maintain optimal performance. The frequency of cleaning is largely dependent on the application and air quality. Using ASHRAE's Classes of Air categories, Table 2, is useful in understanding the application and creating a routine cleaning schedule.

Table 2 Classes of air.

Class 1 - *Clean Air*	Class 2 - Moderately Clean Air
Class 1 air has low contaminant concentration with inoffensive odor and sensory irritation intensity. Examples of *Class 1* air include: • office spaces • classrooms • assembly rooms • churches • corridors	*Class 2* air has moderate contaminant concentration, with mildly offensive odors or sensory-irritation intensity. Examples of Class 2 air include: • rest rooms • swimming pools • dining rooms • locker rooms • warehouses • Dorms.
Class 3 - *Dirty Air*	**Class 3 - *Dirty Air***
Class 3 air has significant contaminant concentration and significant offensive odor or sensory-irritation intensity. Examples of Class 3 air include: • kitchens • dry cleaners • beauty salons • laboratories • pet shops	*Class 4* air has highly objectionable fumes or gases and potentially contains dangerous particles, bio-aerosols, or gases at a concentration high enough to be considered harmful, not suitable for recirculation or transfer to any other space. Examples of Class 4 air include: • paint spray booths • laboratory fume exhaust • kitchen grease exhaust

Determine Cleaning Frequency

Airxchange offers the following general guidelines for removal and cleaning of the energy transfer media, Table 3, based on ASHRAE's Classes of Air categories, Table 2. Actual cleaning frequency should ultimately be determined based on the results of the annual inspection.

Table 3 Recommended cleaning frequency (based on class of air).

Class of Air	Cleaning Frequency
Class 1 - Clean Air	Every 8-10 years
Class 2 - Moderately Clean Air	Every 4-6 years
Class 3 - Dirty Air	Every 1-2 years
Class 4 - Contaminated Air	N/A

NOTE: When applied to smoking or industrial environments with visible airborne contaminants, Airxchange recommends inspection and cleaning once or twice per year to maintain optimal performance.

Cleaning Requirements Vary by Application

All surfaces exposed to an air stream will need to be cleaned over time. Generally, rotary energy recovery wheels self-clean when exposed to small amounts of dry dust and dirt as the wheel rotates between two counter flowing air streams.

However, when exposed to air streams containing oils, VOCs, aerosols, or smoke, these contaminants will build on the surface of the media to reduce its energy transfer effectiveness.

Visual Inspection

Annual inspection of the media surface during preventative maintenance checks is recommended. Check both sides of the wheel. Mild discoloration of the surface of the media is normal.

Cleaning Methods

To clean a buildup of dry contaminants on the media surface, brush or vacuum the surface on both sides to remove all debris, including between the layers of polymer. Clean, unobstructed passageways provide the maximum energy savings for the lowest operating cost.

To clean media surfaces that have a buildup of containments, Airxchange recommends soaking the segment overnight to effectively remove all contaminants and restore the heat/moisture transfer performance.

There are several methods to remove contaminant buildup:

- The best method of removing buildup is to soak the segment overnight in a five-percent solution of a non-acid based coil cleaner. ***WARNING: Monolithic wheels with internal bearings should not be soaked to avoid corroding bearing.***

  After soaking, rinse the segments until the water runs clear and then allow excess water to drain prior to reinstalling the segments. A small amount of moisture on the media will be dried out by the airflow.

- Another option is to run water from a hose through the removed media while brushing, though this method is not as effective as the overnight soak.

About Discoloration of Media Surface

Once clean, media segments may remain slightly discolored. Surface discoloration does not affect the performance of the wheel.

Optional Cleaning Methods

- If a tub is not available for soaking, a makeshift tub can be easily constructed out of wood boards and any waterproof material, such as a polyethylene sheet. The non-acid based coil cleaner is not corrosive to the polymer media or polyethylene sheet.
- For applications with multiple identical wheels, keeping a spare set of segments available can eliminate system disruptions during cleaning. Contact Airxchange for more information.

25 to 30 Inch Segmented Wheel

WARNING

An uneven number of segments in the wheel will cause the wheel to accelerate in rotation. Minimize wheel imbalance and unwanted rotation during service by installing or removing opposing segments for even weight distribution, Figure 15. Failure to maintain control of the wheel rotation while removing or installing segments could cause severe injury to fingers or hands.

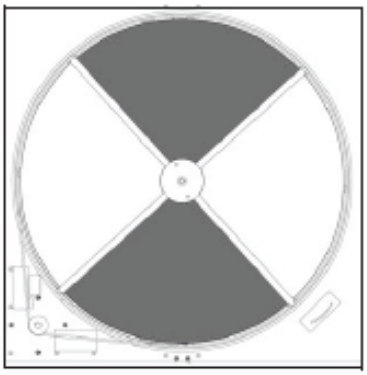


Figure 15 Remove or install opposing segments to minimize wheel imbalance.

WARNING

Before servicing entire HVAC system, turn off the main disconnect to the unit. Use the site-specific Lockout-Tagout out procedure.

Tools

- flathead screwdriver
- gloves

Removal

1 Disconnect power from wheel.

2 Remove cabinet covers to gain access and slide wheel frame out of cabinet (if applicable).

3 Position first segment to be removed at the top of the wheel, Figure 15.

4 From the pulley side, unhook the flexible retaining strap on each side of the segment from the wheel rim and then remove both straps, Figure 16.

Figure 16 Remove retainer straps.

5 Use hand pressure from the motor side to remove segment from the spokes while supporting front with your other hand (segment slides straight out), Figure 17.

If necessary, use a flathead screwdriver or pry-bar at the top corner of the segment. Be careful not to bend the segment frame or wheel rim.

Figure 17 Remove segment.

6 Rotate wheel and remove remaining two retaining straps, Figure 16.

7 Remove the remaining segments.

Installation

1 Ensure that power is disconnected from wheel.

2 From the pulley side, install each of the four segments by sliding them straight into the wheel opening, Figure 17.

NOTE:

The face of the segment with the embedded stiffener must face the motor side of the wheel, Figure 18.

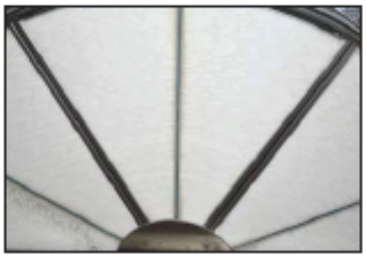


Figure 18 Embedded stiffener faces motor side.

3 Install the flexible retaining straps by inserting the ends under the hub plate and then into the slot on the rim at the end of the spoke, Figure 16.

4 Confirm that segments and straps are firmly retained in the wheel structure before applying power to the wheel.

Troubleshooting Guide

ELECTRICAL HAZARD

Turn OFF power to unit before conducting any troubleshooting, unless the tests you are performing require system operation. Keep hands, clothing and tools clear of electrical terminals.

WARNING

Make sure to keep hands and clothing clear of any moving belts, blowers and motors while performing any tests. Failure to do so could result in death or serious bodily injury.

CAUTION

Any troubleshooting or test procedures are to be conducted by qualified HVAC service personnel or electricians only. Potentially hazardous situations which may result in personal injury, equipment or property damage.

INFORMATION

For operating and troubleshooting instructions for microprocessor controller, refer to specific controller instructions that accompany the unit.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Control is erratic	**1.** Control wiring not installed correctly **2.** Loose control connections **3.** Broken wiring	**1.** Check wiring connections against schematic. **2.** Check all connections for tightness. **3.** Check wire continuity. **4.** Power Cycle and try again.
Blower fails to start	**1.** Controller not set properly **2.** Motor failure	**1.** Turn on and set controller for desired operation **2.** Check if wiring connection is loose and re-tighten. Power cycle and try again. If problem persists, replace motor.
Compressor fails to start	**1.** Controller not set properly **2.** Loss of refrigerant charge **3.** High head pressure **4.** Low line voltage	**1.** Turn on and set controller for desired operation **2.** Repair leak, evacuate and recharge refrigerant system **3.** See problem and possible solution for High Head Pressure in the table below. **4.** Check the line voltage at the circuit breaker with the compressor running. The voltage should be with 10% of the rated unit's voltage. Resolve incoming voltage issue. Power Cycle and try again. **[Note: Compressor internal overload may require an extended period of time (1 hour or more) to reset]**
Compressor short cycles	**1.** Reduced air flow **2.** Loss of refrigerant charge **3.** Short cycling of conditioned air **4.** Drain pan switch open	**1.** Check filters and coil for any blockages. Replace dirty filter. **2.** Repair leak, evacuate and recharge refrigerant system **3.** Make sure that supply air is not short cycling back into return air stream **4.** Confirm that unit condensate is draining properly.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Evaporator coil ices	**1.** Lack of air flow **2.** Low inlet air temperature **3.** Loss of refrigerant charge	**1.** Check filters and coil for any blockages **2.** Replace filters if dirty **3.** Repair leak, evacuate and recharge refrigerant system
Noisy compressor	**1.** Expansion valve stuck open **2.** Worn or scarred compressor bearings **3.** Excessive head pressure **4.** Broken compressor valve (compressor knocking) **5.** Liquid slugging	**1.** Ensure thermal expansion valve bulb is tight on suction line **2.** Confirm thermal expansion valve bulb is located properly on suction line **3.** Check superheat **4.** Replace compressor **5.** Reduce head pressure. System overcharged. Reclaim excess refrigerant from the high side of the system.
System short of capacity	**1.** Flash gas in liquid line **2.** Expansion valve stuck open or possibly obstructed **3.** Clogged filter drier **4.** Iced or clogged evaporator coil **5.** Condenser needs cleaned	**1.** Check for refrigerant leaks. Repair leak, evacuate and recharge refrigerant system. Check sub-cooling. **2.** Ensure thermal expansion valve bulb is tight on suction line. Confirm thermal expansion valve bulb is located properly on suction line. Replace thermal expansion valve. **3.** Replace filter drier **4.** Check filters and coil for any blockages. Replace filters if dirty. **5.** Clean condenser
Head pressure too high	**1.** Possible non-condensible in system **2.** Overcharge of refrigerant **3.** Condenser air intake, duct or coil blocked. **4.** High Ambient Temperature	**1.** Repair leak, evacuate and recharge refrigerant system. Install new filter drier. **2.** Check and adjust the refrigerant charge according to the unit's Data Tag. **3.** Clean away debris from condenser air circuit. **4.** Reset high pressure safety switch if tripped
Head pressure too low	**1.** Excessive air flow across condenser. **2.** Low refrigerant charge. **3.** Condenser air intake duct or coil blocked.	**1.** Confirm proper air flow amount. **2.** Check and adjust the refrigerant charge according to the unit's Data Tag. **3.** Clean away debris from the condenser air circuit.
Suction pressure too low	**1.** Flash gas in liquid line **2.** Obstructed expansion valve **3.** Loss of fluid in expansion valve bulb **4.** Clogged filter drier **5.** Lack of air flow **6.** Entering WB too low	**1.** Check for refrigerant leak. Repair leak, evacuate and recharge refrigerant system. **2.** Replace thermal expansion valve **3.** Replace thermal expansion valve. **4.** Replace filter drier. **5.** Check filters and coil for any blockages. **6.** Confirm that entering return air conditions fall within acceptable range. Reset low pressure safety switch if necessary.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
No dehumidification	**1.** Controller not set properly **2.** Control wiring issue **3.** Controls in an alarm condition **4.** High or low pressure switch open **5.** Compressor thermal overload open	**1.** Turn on and set controller for desired operation. **2.** Check wiring connections against schematic. Check all connections for tightness. Check wire continuity. **3.** Refer to controller troubleshooting. **4.** Reset high or low pressure switch. **5.** Compressor internal overload may require an extended period of time (1 hour or more) to reset.
Condensate carry over	**1.** Air flow too high	**1.** Reduce air flow
Condensate pump does not run	**1.** Check to see that power to the pump is present **2.** Confirm that float moves freely **3.** Confirm that dirt or algae is not interfering with float action	**1.** Locate and repair electric issue. **2.** Clean float and sump. **3.** Clean float and sump.
Condensate pump runs with no discharge	**1.** Tubing blocked or kinked **2.** Check valve blocked **3.** Impeller blocked **4.** Tubing elevation or run exceeds head capability.	**1.** Inspect, clean or straighten as necessary. **2.** Clean check valve. **3.** Remove debris from pump impeller. **4.** Verify tubing run is within pump head limitations.

Limited Warranty

The following is the Limited Warranty provided by United CoolAir (a trade name of United CoolAir LLC, herein “Seller”) to any customer (herein “Buyer”) for any goods and services (a “deliverable”):

1. Limited Warranty. Seller provides such warranty as set forth in any instruction manual provided with the deliverable, or if there is no such warranty or instruction manual, Seller warrants to Buyer that such deliverable will be free from defects in material and workmanship (in either case the "Limited Warranty"). Except as expressly set forth in this section or specifically authorized by an executive officer of Seller in writing, the Limited Warranty is not transferable or assignable and any such transfer or assignment is void. If Buyer is authorized by Seller to be a reseller of deliverables that are goods or an installing contractor, the Limited Warranty may be passed through to Buyer's customer, but Buyer shall not alter the Limited Warranty in any way. Notwithstanding the foregoing, if Buyer re-brands Seller's deliverable or Seller, at Buyer's request, brands the deliverable with a mark not owned by Seller, the Limited Warranty may not be transferred or assigned, and all claims under the Limited Warranty shall be made directly by Buyer to Seller and not by any customer of Buyer. The Limited Warranty applies only to products installed in the continental United States, Alaska, Hawaii, Puerto Rico and Canada.

EXCLUSIONS

The Limited Warranty does not cover service trips, service calls, costs of removing and reinstalling components and other labor charges or the cost of shipment of replacement parts.

The Limited Warranty excludes damages due to:

(i) failure to install, operate or maintain deliverables as directed in any instruction manual provided or under applicable law or regulation,
(ii) misuse, abuse, neglect or modification of a deliverable or any controls, in any way,
(iii) improper service, use of replacement parts or accessories that are not specified by Seller,
(iv) improper installation, or any relocation of a deliverable after initial installation,
(v) incorrect supply, accident, fire, flood, acts of God or another casualty,
(vi) use of a deliverable other than its intended purpose and normal usage,
(vii) use of a deliverable in a corrosive atmosphere or any atmosphere containing contaminants,
(viii) shipment of a deliverable (all claims must be filed with carrier),
(ix) use of a deliverable in the vicinity of combustible or explosive materials,
(x) any defect in a deliverable arising from a drawing, design, or specification supplied by or on behalf of Buyer,
(xi) failure of parts, components, services, accessories or hook-ups not supplied or approved by Seller,
(xii) incompatibility with items not supplied by Seller,
(xiii) a deliverable not properly installed by a qualified (licensed Commercial HVAC Contractor) contractor experienced in installing the deliverable,
(xiv) inadequacy or interruption of electrical service, improper voltage conditions, blown fuses, or other like circumstances
(xv) failure to properly and routinely clean air and/or water side of condenser and evaporator,
(xvi) improper sizing, application or lack of load in space,
(xvii) deliverable being allowed to exceed its proper temperature limits due to improper operation or maintenance of inadequate air over it,
(xviii) (I) freezing of the condenser water or condensate (II) use of corrosive water (III) fouling or restriction of the air/water circuit by foreign material or like causes,
(xix) improper or rapid cycling of the compressor.

This warranty does not apply to the installation, plumbing, wiring, ducting not integral to the product.

Limited Warranty

Wear items or consumables such as belts, filters, coolant, refrigerant, etc. are not included under the Limited Warranty. The Limited Warranty does not cover the equipment and materials not manufactured by Seller; the warranty for those items shall be limited to only such warranty as that furnished by the manufacturer thereof as may properly be assigned to Buyer.
No warranty coverage is applicable if Buyer cannot prove original purchase date and required annual maintenance history, provide factory start up report, air and/or water balance, the data plate and/or serial number on any deliverable is removed, defaced, modified, or altered in any way, or Seller is not permitted to inspect the damaged deliverable.
No person other than an executive officer of Seller has authority to change or extend the terms of the Limited Warranty, and Buyer confirms that no other warranty terms have been extended by Seller or are applicable to the deliverables. Change or extensions to the terms of the Limited Warranty are binding only if confirmed in writing by Seller's duly authorized executive officer.
2. Limitation on Warranties/Damages. Any claim under the Limited Warranty set forth in section 1 must be made within the following time periods or such claim is waived:

(a) for compressors, the claim must be made within sixty (60) months from the date of purchase by Buyer;
(b) for replacement parts, the claim must be made within the latter of twelve (12) months from the date of shipment of deliverable by Seller or any Limited Warranty period remaining on the deliverable with which the replacement part is used or is intended to be used;
(c) for all other deliverables, the claim must be made within twelve (12) months from the date of start-up or eighteen (18) months from the date of shipment of deliverable by Seller, whichever occurs first.

Except as set forth in these terms, Seller makes no representation or warranty of any type, express or implied, including any warranty of merchantability, warranty of fitness for a particular purpose or warranty of non-infringement or warranty arising from any course of dealing, course of performance or usage of trade.
Seller will not under any circumstances, be liable for any special, indirect, punitive, or consequential damages (even if Seller has been notified of the possibility of such damages) resulting from or related to a product including, without limitation, any loss of profits, or loss of opportunity. Some jurisdictions do not allow limitations on warranties or damages, so this limitation or exclusion may not apply to Buyer.
3. Remedy. Seller's sole obligation and Buyer's exclusive remedy with respect to any deliverable, whether arising in contract, tort (including negligence), strict liability, breach of warranty or otherwise, is limited to Seller, at its discretion, replacing or repairing the defective deliverable, providing replacement parts or issuing Buyer a credit equal to the price paid to Seller for such defective deliverable, and in no event will Seller's liability exceed the amounts actually received by Seller for any deliverable.
This exclusive remedy shall not be deemed to have failed its essential purpose so long as Seller is willing and able to repair or replace a defective deliverable or parts thereof or, also at Seller's option, to refund the price received by Seller for the defective deliverable, within a reasonable time after Buyer demonstrates that a defect exists in accordance with the terms and limitations of the Limited Warranty.

Start-Up Procedures

ELECTRICAL HAZARD

Make certain that all power is disconnected at the main power circuit breaker or service disconnect before starting any of this procedure.

Some of the numbered items below are referenced on the Start Up Form that needs to be completed.

1. Start up must be performed by a qualified HVAC Technician.
2. Check all electrical screw terminals and wiring lugs for tightness internal to the equipment. Components may have loosened due to vibration during transit or handling. Verify that the main power block lug connections made in the field are tight and secure.

WIRING

Follow the diagram to locate the main power connections for the unit and supply the 208/230-3-60 or 460-3-30 electrical power to the unit on the L1, L2 and L3 power lugs. Locate the ground lug in the top left corner for the ground connection.

3. Confirm that the voltage rating of the equipment data tag coincides with the power that will be delivered to the unit.
4. Verify that the circuit protection for the unit satisfies Local and National Codes according to the unit data tag Minimum Circuit Ampacity (MCA) and Maximum Overcurrent Protection (MOP).
5. Locate the unit controller and check all electrical terminations against the unit electrical diagram.

Some additional wiring for Dry Contacts from the field is required. There are Terminal Blocks provided listed below.

- TB-AH: Dry Contacts for Auxiliary Heat On
- TB-OAD: Dry Contacts for Outside Air Damper

If these options below are used, removing the jumper bars on these Terminal Blocks, preparing to interlock with field provided devices. Otherwise these terminal blocks must be jumped if no external interlocks are wired to the unit.

- TB-RS: Remote On/Off
- TB-ES: Emergency Shutdown (Smoke Detector)
- TB-DES: Outside Air Damper End Switch

6. Leak check the refrigerant system. While the unit was leak checked at the factory, leaks can develop during transit and / or handling.
7. Confirm that both condensate outlets have been adequately trapped and taken to a suitable point for disposal.
8. Verify that both sets of filters are in place, clean and usable.
9. If the unit is shipped split, connect all the correct Plugs and Receptacles together.
10. Apply power to the unit. Switch the circuit breaker or field supplied electrical service disconnect switch to the on position.
11. Turn the unit off at the controller. (see pg. 14)
12. Before conducting the following start up sections connect a suitable refrigerant gauge set to the unit Schrader connections. Install temperature sensors to record the appropriate refrigerant line temperatures. Service gauge access ports have been provided in the compressor compartment so that the gauge line hoses can be run outside the cabinet with the access panels installed.
13. Make sure all the unit access panels are in place when taking these readings.
14. While waiting for the compressor to stabilize, record the External Static Pressure (ESP) for both the supply and exhaust blowers.
15. Record the return air and supply air and evaporator temperatures. (The unit should have operated for at least 15 minutes before taking these readings).
16. Record the outdoor and exhaust air temperatures.
17. Record the suction line pressure and the suction line temperature near the compressor.
18. Using an appropriate pressure / temperature chart for R-410A refrigerant, look up and record the saturation temperature corresponding to the suction pressure.
19. Calculate and record the suction superheat by taking the difference between the suction line temperature and the saturation temperature corresponding to the suction pressure.
20. Record the liquid line pressure and the liquid line temperature.
21. Using an appropriate pressure / temperature chart for

Continued on next page

START-UP PROCEDURES (R-410A Systems) Continued:

R-410A refrigerant, look up and record the saturation temperature corresponding to the liquid line pressure.

22. Calculate and record the liquid sub-cooling by taking the difference between the liquid line temperature and the saturation temperature corresponding to the liquid line pressure.
23. Record the Amps for the evaporator blower motor, the compressor and the condenser blower motor.
    a. Make sure the pressures on the compressor circuit are within the proper limits:
    23.1.290 – 550 psig Discharge
    23.2.100 – 140 psig Suction
    b. Compressor Amperage is below the RLA Amps listed on the unit data tag.
    The maximum compressor operating current (amps) at start up depends a lot on the system loading. The lower the load, the less the current. The higher the load, the higher the current.
    c. The blower motor FLA value should never be exceeded.
    If the FLA value is exceeded, shut the unit off and check the duct design, sheave turns open or make sure there is no blockage / obstruction in the duct or filters.
24. Document any additional information deemed appropriate for the specific application or installation.
25. Shut the system down and remove all test instruments and test sensors.
26. Leave the system in the operating mode as appropriate for the customer and the application.

START-UP PROCEDURES

Complete the form by listing your name, company name, phone and fax number. Sign and date the form and provide a copy as required to all interested parties.

Job Name: _____ **Date:**_____
Address:_____
City:_____ **State:** _____**ZIP**_____
Country: _____
Unit Model No.: _____
Unit Serial No.:_____

Screw Lugs & Terminals OK?.....Yes _____ No _____
Describe any loose connections and action(s) taken:

_____

_____

Power Supply Correct Voltage and Phase? .....Yes _____ No _____

If not in agreement with unit data tag contact the Distributor.

Is the Circuit Protection the correct type and does it meet
the unit data tag requirements?.....Yes _____ No _____
If not correct describe what action(s) have been taken to correct:

_____

_____

Unit controller wiring verified? .....Yes _____ No _____
Unit leak checked OK?.....Yes _____ No _____
If leak was located describe where and how repaired:

_____

_____

Condensate trapped & run to a suitable disposal point?.....Yes _____ No _____
Filters are in place, clean & usable?.....Yes _____ No _____
Three Phase Unit
Measured Voltage.....L1-L2 _____ L2-L3_____ L1-L3 _____

Continued on Next Page

Outside Air External Static Pressure .....(ESP): _____ In. WG
Exhaust Air External Static Pressure.....(ESP): _____ In. WG

	Compressor
Suction Pressure: Suction Line Temperature:	psi _____ °F _____
Saturation Temperature:	°F _____
Suction Superheat:	° _____
Liquid Line Pressure:	psi _____
Saturation Temperature: Liquid Line Temperature:	°F _____ °F _____
Sub-cooling:	° _____

ELECTRICAL

Evap. Motor Amps ..... L1 _____ L2 _____ L3 _____
Compressor 1 Amps ..... L1 _____ L2 _____ L3 _____
Cond. Motor Amps..... L1 _____ L2 _____ L3 _____

HEAT PUMP MODE

System Air Temperatures .....Return: °F _____ Supply: °F_____
Outdoor: °F _____ Exhaust:°F _____

DEHUMIDIFICATION MODE

Air Temperatures .....Return: °F _____ Supply: °F_____
Outdoor: °F _____ Exhaust: °F_____

Notes: _____

_____

Technician (print name): _____

Company: _____

Phone: _____ Email: _____

Signature: _____ Date: _____

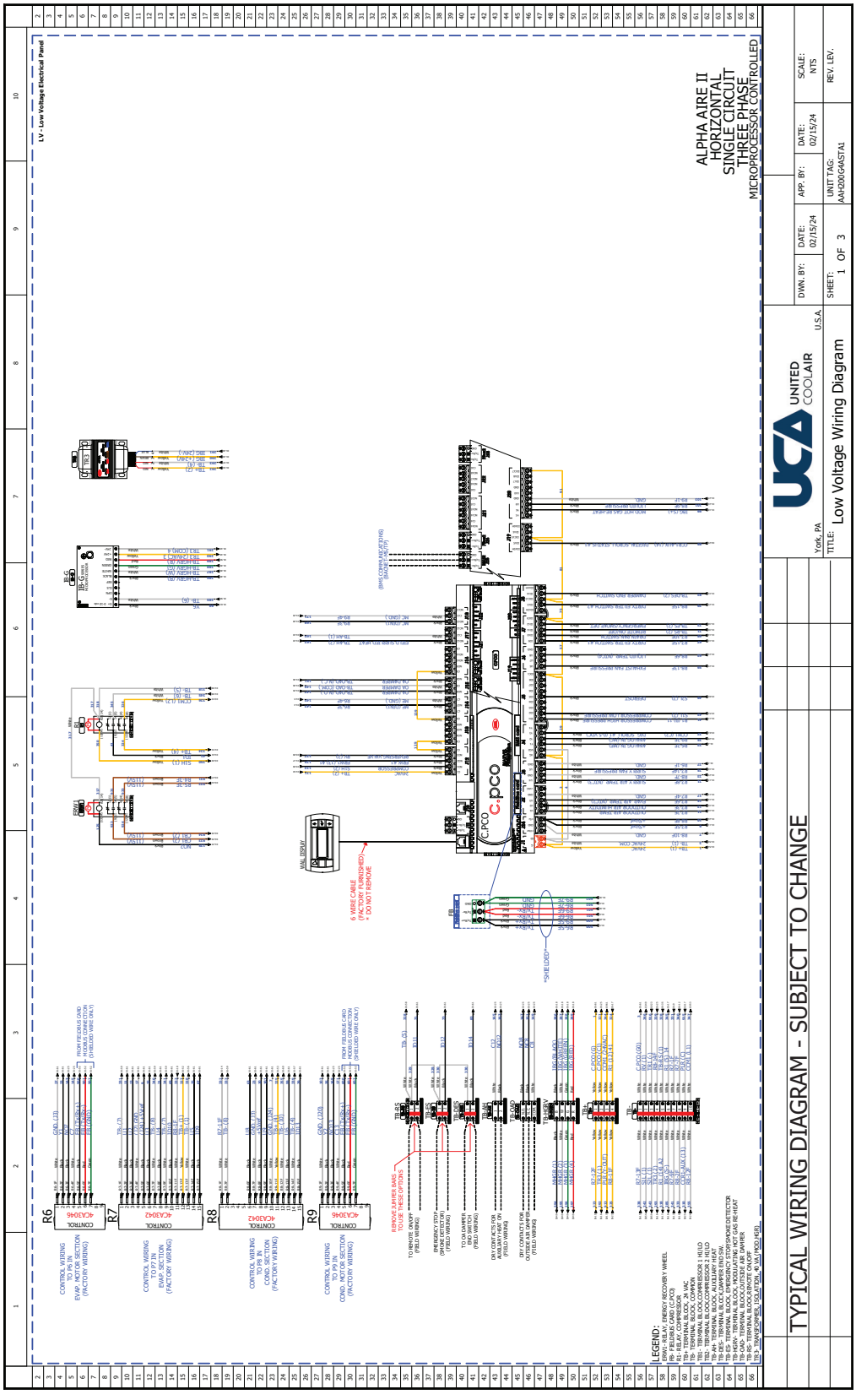
Product Nomenclature

EXAMPLE:	AA	H	200	G	3	AS	T	A	1	–	X
	1	2	3	4	5	6	7	8	9		10

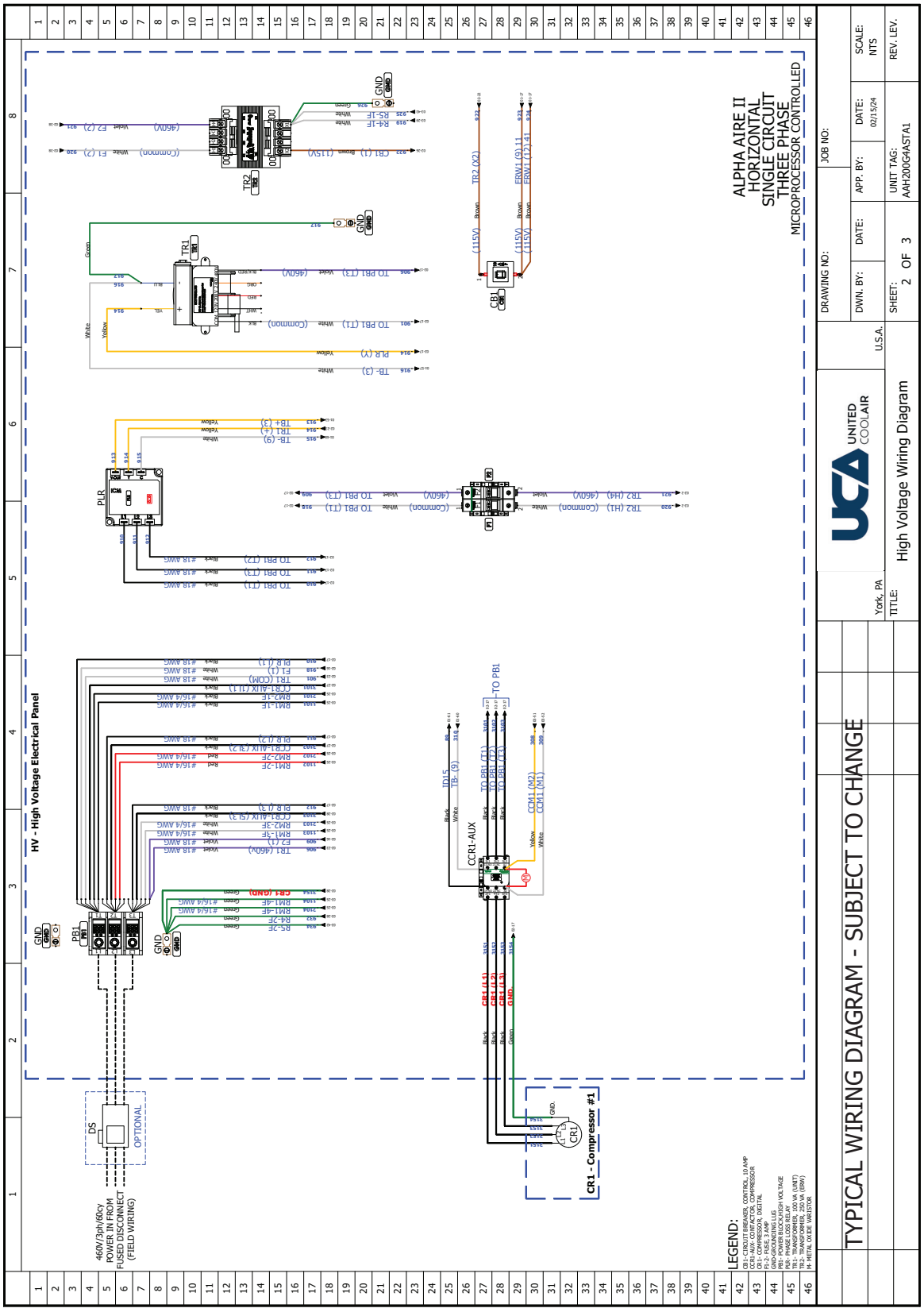
1.	“AA”	Alpha Aire II	
2.	“H”	Horizontal Configuration	
3.	“200”	II Series	
4.	“G”	Common to All	
5.	"3"	Voltage	3 = 208/230-3-60 4 = 460-3-60
6.	“AS”	Single Circuit Refrigerant	
7.	“T”	Traditional Cabinet	
8.	“A”	Refrigerant R-410A	
9.	"1", "2", etc.	Generation	
10.	“X”	Special Configuration	

Not all combinations of Product Nomenclature are valid. Check with the factory for correct model identification.

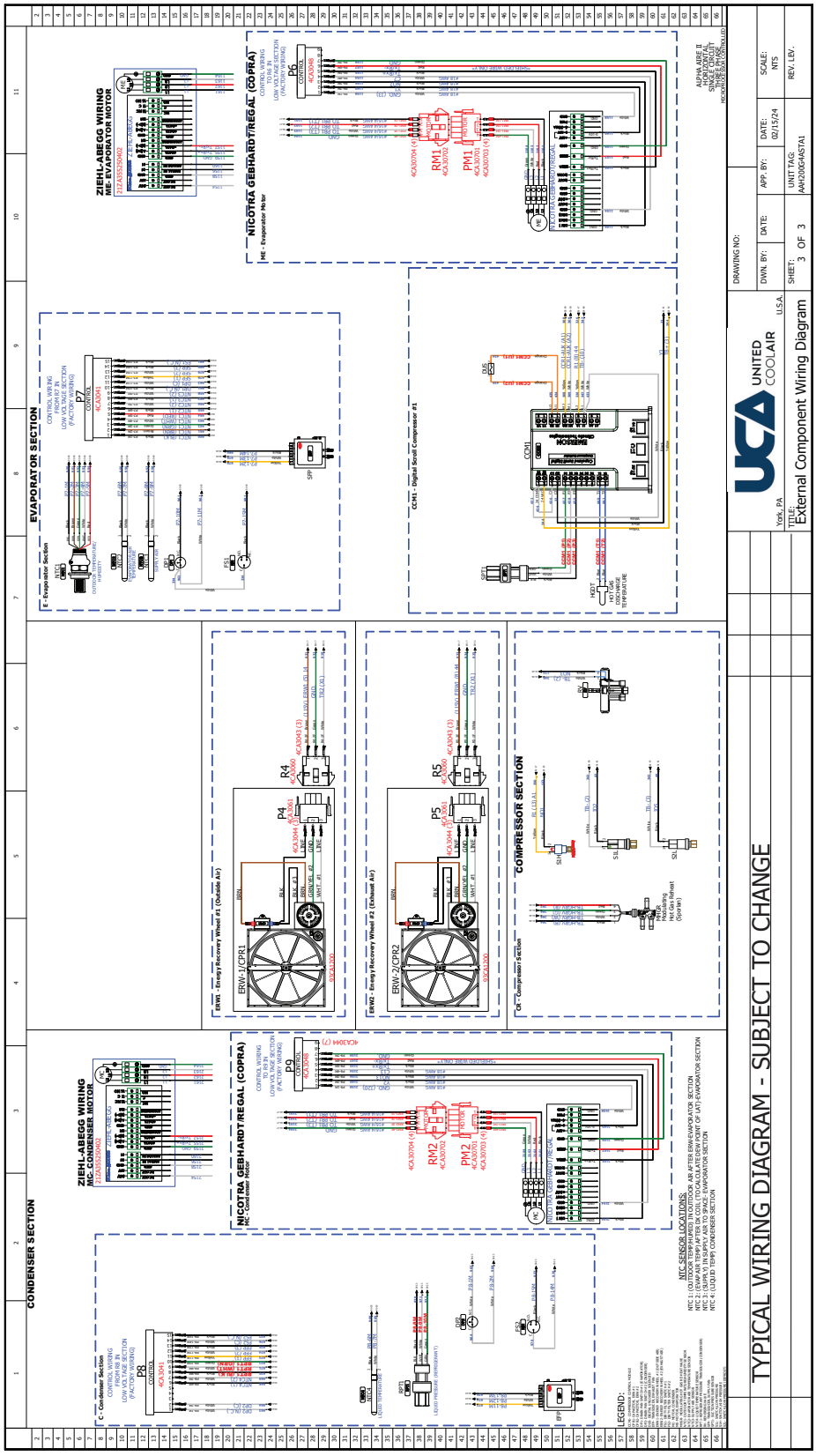
Typical Electrical Diagram



Typical Electrical Diagram



Typical Electrical Diagram



Maintenance Log

This log must be printed by installer and kept with the unit. It is the responsibility of the owner and/or maintenance/service contractor to document any service, repair or adjustments. United CoolAir Service and Warranty Departments are available to advise and provide phone help for proper operation and replacement parts. The responsibility for proper startup, maintenance and servicing of the equipment falls to the owner and qualified licensed HVAC technician.

Entry Date	Action Taken	Name/Tel.

Note: United CoolAir Service: Phone (717) 843-4311
Please have the serial number of the unit. Service team members are available Monday through Friday from 7:00 AM to 5:00 PM Eastern Standard Time.

After hours tech support available Monday — Friday until 7:00 PM Eastern Standard Time.
Saturday 8:00 AM — 1:00 PM
Call: (717) 676-6765

NOTES:

NOTES:

Authorized Distributor:

LIMITED WARRANTY

United CoolAir Units are backed by a 1 year limited warranty on parts and a 5 year limited warranty on the compressor (labor not included). Maintenance items such as filters and belts are excluded under this limited warranty.

FACTORY TESTED

All units are functionally run tested before shipment to ensure a trouble-free start-up and unit commissioning. Industry proven components are used throughout to enhance system reliability and peace of mind.

UNITED COOLAIR

491 East Princess Street, York, PA 17403 Phone: 717-843-4311
www.unitedcoolair.com

MEMBER AHRI AIR-CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
we make life better™