UNITED COOLAIR

Alpha Aire - Gen V

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

Installation, Operation and Maintenance Manual

Effective April 2022

Horizontal and Vertical Air-Cooled

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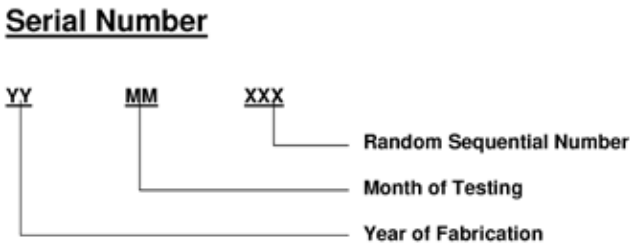
CONTENTS

Wiring Diagram

United CoolAir provides a wiring schematic for each unit produced. To retrieve the diagram for your unit please visit **www.unitedcoolair.com**, on your computer or mobile device, scroll to the footer section click on Serial Search, enter your serial number in the **Serial Search** field and press return to retrieve your product-wiring diagram.

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



This action will return the Model number, Job Number and the wiring diagram for viewing as well as downloading.

1 results

Serial Number	Model Number	Job Number	Wiring Diagram
1802030	B2G3ASHA	28168-002	View

NOTE: Only wiring diagrams for units shipped since November 2016 are available on the site, for older units please contact the factory directly at 717-843-4311.

IMPORTANT NOTICE

This manual is the property of the owner.

Please be sure to leave it with the owner when you leave the job.

USE OF SYMBOLS

This publication includes warnings, cautions and information icons that point out safety related issues or conditions as well as other pertinent information relative to a safe installation, service or maintenance situation. The following icons should be interpreted as follows:

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.

GENERAL INFORMATION

INSPECTION OF EQUIPMENT

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.
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 or 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 unit has been designed as a horizontal ceiling or vertical floor mounted cabinet. As a packaged air-cooled system the unit is self contained in either configuration.
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, either the left or right side.

Consideration must be made for condensate removal, either with a trap or condensate pump.

NOTE: The vertical cabinet has an internal condensate trap factory installed.

CEILING UNIT MOUNTING

Typically the horizontal cabinets are suspended from the unit structure. When installing the unit on hanging rods (field supplied), use minimum 1/2" 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 the corners of the unit.
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 unit. Be certain to install vibration isolator-type mounts if 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. 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 trap (horizontal cabinet only).

NOTE: The vertical cabinet has an internal condensate trap factory installed.

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. United CoolAir recommends a MERV 8 or better filter be utilized.
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).

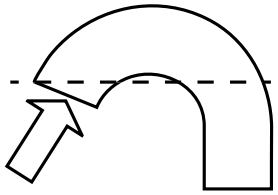
AIR INLET GUIDELINES

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:

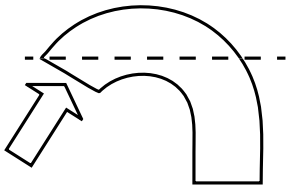
- Sewer Vents
- Building Exhaust Air
- Truck Loading Docks
- Bus Loading Areas
- High Traffic Volumes
- Cooling Tower Exhaust
- Vehicle Loading Zones

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



Acceptable
Figure 1



Not Acceptable
Figure 2

INDOOR AIR QUALITY

Outside air units have been designed for treatment of the air being brought into the space. They are typically not intended to provide thermal comfort for the occupants. However, under some conditions this may be possible.
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 grille. Ducting must also be connected from the supply air blower outlet to the main supply air duct distribution system or terminal. Provide a duct length that is 4 to 5 times the diameter of the blower wheel before making the first transition. Provide turning vanes when required.
On units, such as this 100% Outside 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 ductwork is connected to the units using field supplied flexible duct connectors.
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.

CLEARANCE

Clearance of 36" is required on the front side of all units for service and maintenance access.
Filters can be accessed from either side of the unit. Sufficient space must be provided for removal and replacement of all filters. This can be from one side only or from both sides.

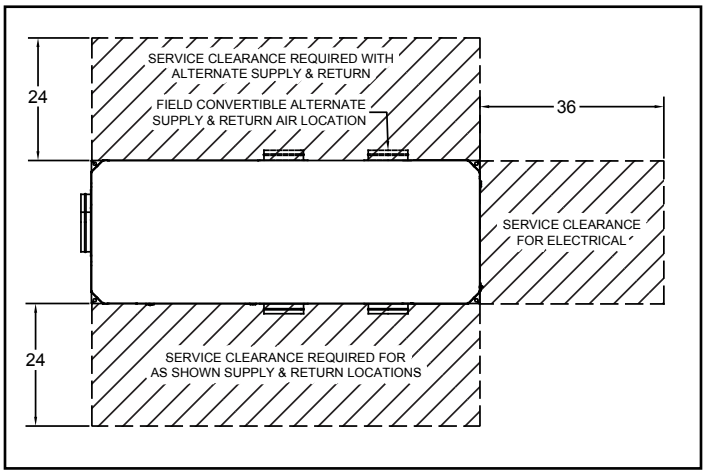


Figure 3 Horizontal Clearance

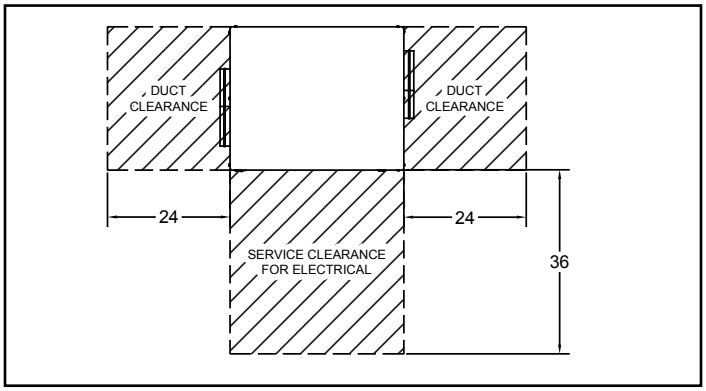
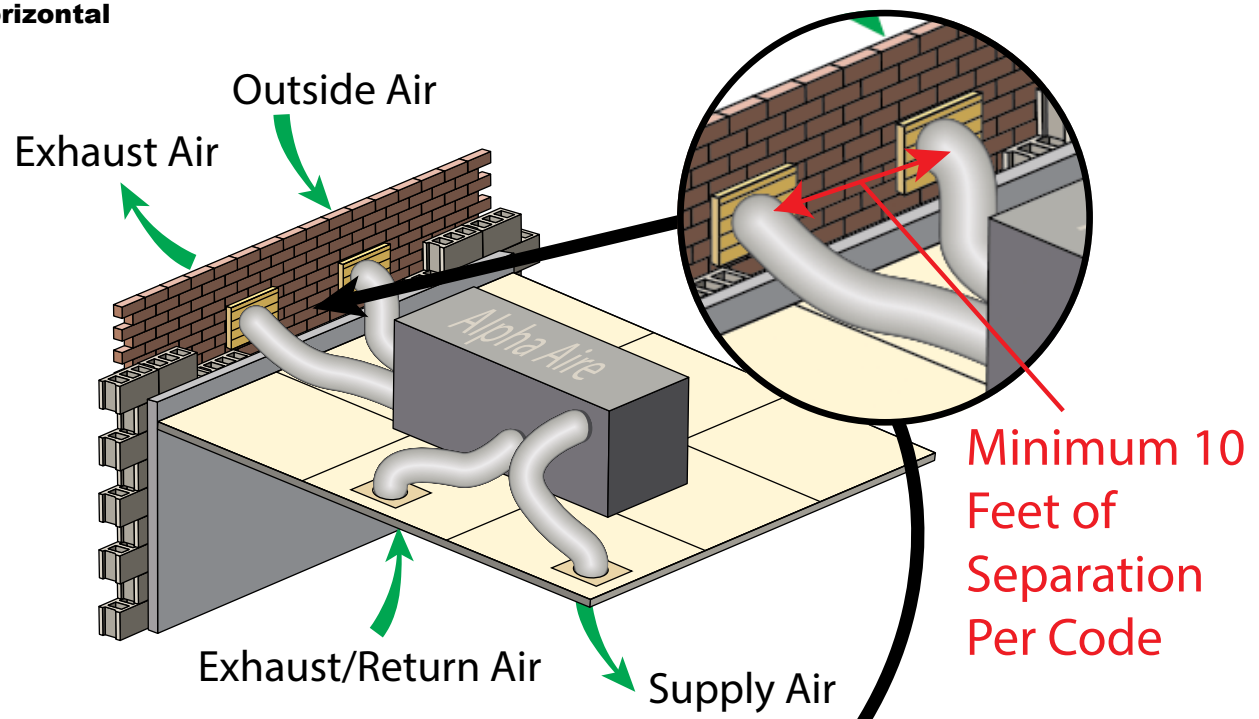


Figure 4 Vertical Clearance

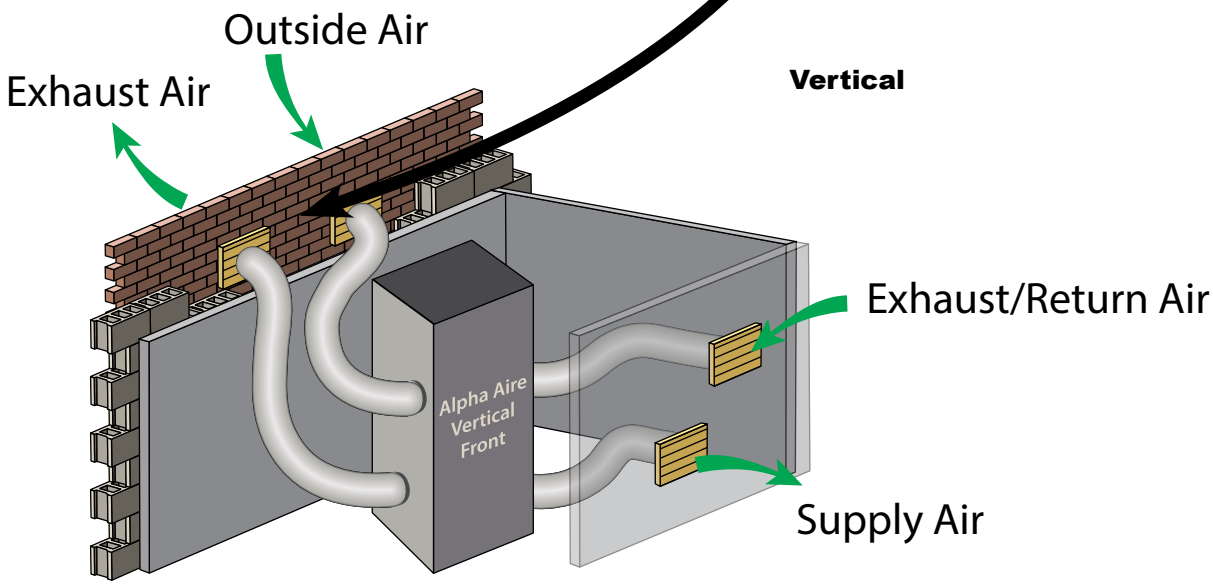
LOUVER AND DUCTING

Strategically located intake and discharge louvers help to prevent recirculation of discharge 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. When installing any floor mounted unit, it is generally not necessary to provide any unit vibration isolation. However, some form of vibration isolation may be requested.
If spring mounts on Waffle pad or other similar sound vibration materials are going to be used (field supplied). Allow sufficient clearance for any door or panel access that is required to provide field service or maintenance on the unit.
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 discharge air up and away from pedestrian walkways as well.
We do not recommend multiple installations between closely situated buildings where discharge air could collect and be directed back to the intake. Again, recirculation will cause units to trip on high head pressure.

Horizontal



Vertical



LOUVER SELECTION

Carefully choosing the right 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 discharge 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 discharge 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.

The intake and discharge louver can be in separate frames or combined in one frame.
Louvers may be manufactured of aluminum (14 gauge) or steel (18 gauge). Louver widths of 30 inches or more should have additional bracing midway along the blades to maintain proper blade separation. If the louvers are to be installed in a coastal application or any location with environmental concerns, then the louvers should be treated.
It is also beneficial to angle the bottom of the intake ductwork up from the louver toward the unit opening to minimize the possibility of water carryover reaching the unit and allow for proper drainage (Figure 8).
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.

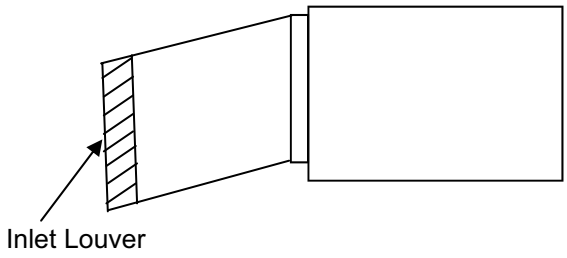


Figure 5 Inlet Louver

APPLICATION DATA

Voltage Variation	208/230	187/253
Airflow – Outside Air and Return Air	CFM	200–500
NOTE: The maximum difference between outside air CFM and return air CFM can be no greater than 20%		
Outside Air	DB °F (Min. - Max.)	0–105
	RH % (Min. - Max.)	20.0 – 100.0
Return Air	DB °F (Min. - Max.)	60–80
	RH % (Min. - Max.)	20.0 – 100.0
NOTE: 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

Upon startup unit will run in diagnostic/ purge/defrost mode. Do not adjust any parameters until unit has finished cycle.

INSTALLATION

SUPPLY AND RETURN DUCT PANEL

The horizontal Alpha Aire DOAS supply and return paths can be configured on the right or left side of the unit. This video describes how the shipped loose panels and duct collars can be easily installed on the unit to change the air path configuration.

https://youtu.be/FgwYz9tDuFc

CONDENSATE DRAIN CONNECTION

Horizontal units require two external condensate traps and are equipped with two 3/4" FPT connections.

NOTE: The vertical cabinet has an internal condensate trap factory installed, and does NOT require an external trap.

The drain line must be trapped because the coils are located on the positive side of the blower. The purpose of the condensate trap is to neutralize the positive pressure created within the cabinet by the blower.

This positive pressure can vary. The condensate trap must be of sufficient depth in water column to permit the condensate to flow from the drain pan. See (Figure 6)

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

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

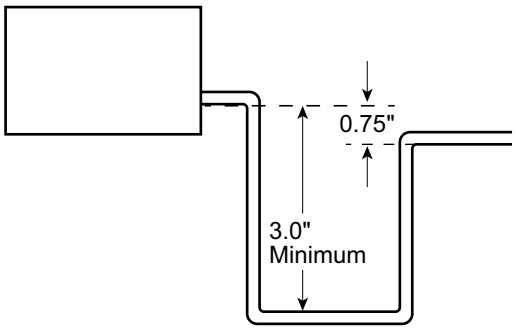
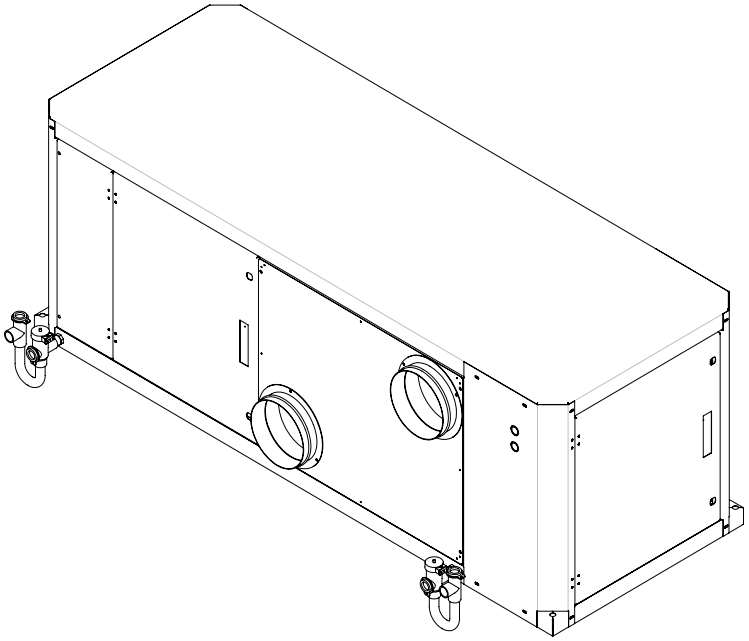


Figure 6

INFORMATION

The condensate line out of the unit (horizontal cabinets only) must be trapped before going into the condensate pump.



Non-exhaustive representative trap / float switch installation example shown with factory supplied trap / float switch option (horizontal cabinets only). Actual installation may vary. Float switch installed near electrical panel for compressor interlock wiring. Install and wire according to all applicable codes.

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.

WIRING

1. Refer to the wiring diagram that was included with the unit.
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 required voltage, minimum circuit ampacity and maximum fuse size.
5. Route the power wiring through one of the holes provided in the cabinet.
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.

NOTE: To access wiring diagram, visit www.unitedcoolair.com and scroll to the bottom of the home page. Enter your serial number in the Serial Search field.

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.

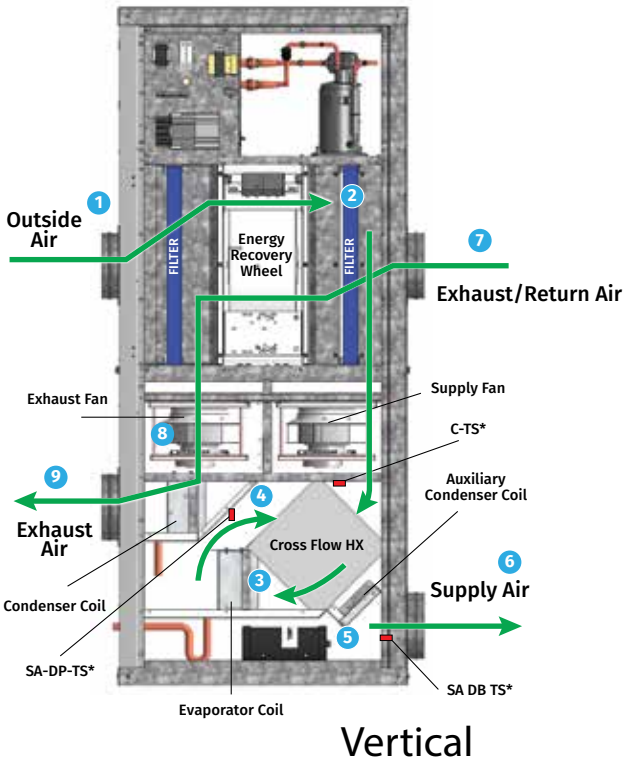
ALPHA AIRE CONTROL SEQUENCE

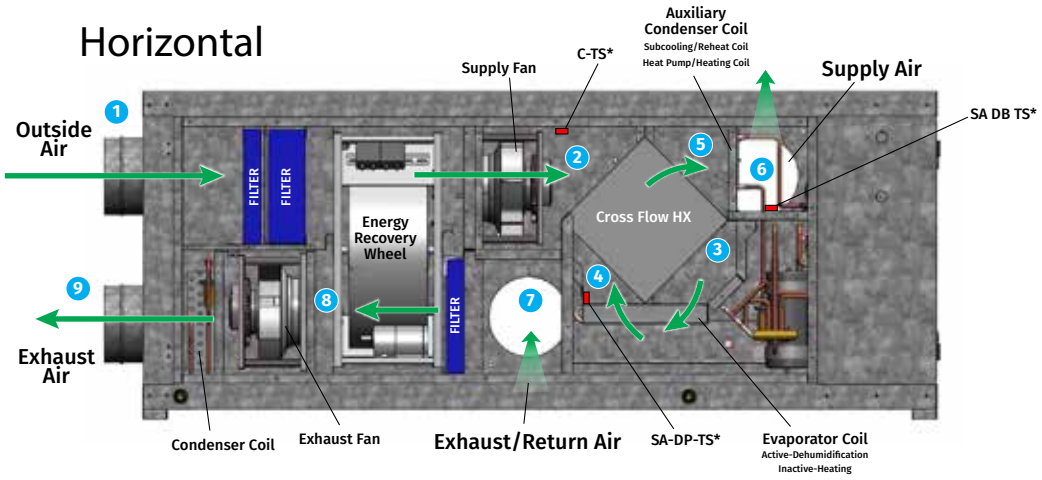
Dehumidification Mode: When the dry bulb at the unit's control temperature sensor (located after the wheel), C-TS, exceeds the dehumidification set point, the compressor will be turned on with the reversing valve set in the dehumidification position. The supply air will be conditioned by the enthalpy wheel and the refrigeration system.

Heating Mode: When the dry bulb at the unit's control temperature sensor, C-TS, falls below the heating set point, the compressor will be turned on with the reversing valve in the heating position. The supply air will be conditioned by the enthalpy wheel and the refrigeration system.

Airside Economizer Mode: When the dry bulb at the unit's control temperature sensor, C-TS, is between the dehumidification and heating set points, the compressor will be turned off. The supply air will be conditioned only by the enthalpy wheel.

Defrost Mode: When the low suction pressure switch remains open for 20 min. (adjustable) and the compressor is operating in heat pump mode, the unit will enter the Defrost Mode. The supply blower and compressor will de-energize for 10 min. The enthalpy wheel and exhaust blower will continue to run. The defrost timers can be adjusted in the System Settings menu. When defrost cycle is complete, the unit resumes normal operation.





Alpha Aire Gen. 5 Sensor Diagram

***C-TS: Control Temp Sensor**
***SA-DP-TS: Supply Air Dew Point Temp Sensor**
***SA-DB-TS: Supply Air Dry Bulb Temp Sensor**

Any field installed sensors are required to be installed prior to startup of the unit. Field installed sensors are VOC, Occupancy and CO_2.

CONTROLS QUICK START GUIDE

USING THE DISPLAY TERMINAL

OK BUTTON

Hold the OK button to access the Main Menu.

Press the OK button to enter sub menus or to enter edit mode to change parameter values.

UP BUTTON

Press the Up-Arrow button to move to the previous selectable field. In edit mode, use up to increment parameter values.

Hold the up arrow button to see any active alarms.

DOWN BUTTON

Press the down arrow button to move to the next selectable field. In edit mode, use to decrement parameter values.

LEFT BUTTON

Press the left arrow button to move to the previous screen. In edit mode, use it to move the edit cursor one character to the left.

Hold the left arrow button to close an open sub-menu.

DOWN BUTTON

Press the down arrow button to view the next screen(s) within a loop, cycle through menu options, and decrement parameter values.

SYSTEM STARTUP

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

System On/Off: System enable point found in System On/Off section of the Main Menu using the unit's display terminal.

Remote On/Off: If remote start option is used, this contact must be closed to start unit operation.

BMS On/Off: System must be enabled through the BMS. Default is ON position to accommodate units without BMS control.

SYSTEM STATUS

The system status can be accessed through the Main Menu option labeled System Status or by holding the left button to return to previous pages. Use the up/down or left/right buttons to navigate through four screens detailing sensor readings, compressor status, and fan status.

```
Thu   15:42      11/11/20

Control Temp  >   74.5°F
SA Dewpoint   >   57.0°F
SA Dry Bulb   >   71.1°F

System Status:
COOL
```

↑↓

```
        Compressor Status

Compressor       >    OFF
Start Delay      >  05sec
Min Run Time     > 120sec
Min Off Time     > 180sec
```

↑↓

```
      Supply Fan Status

Supply Fan     >  Online
Motor Temp     >   74.8°F
Motor Power    >      21W
Ref Speed      > 2980rpm
Actual Speed   > 2963rpm
Airflow        >  500cfm
```

↑↓

```
Exhaust Fan Status

Fan Status     >  Online
Motor Temp     >   76.3°F
Motor Power    >      98W
Ref Speed      > 2840rpm
Actual Speed   > 2836rpm
Airflow        >  402cfm
```

BLOWER CONTROL

The blowers are controlled via Modbus command.

When all system enable points are in the on position, the blowers are energized.

The speed of the blowers is determined by an adjustable CFM set point found in the Set Points section of the Main Menu. The supply blower can be set for 100 to 500 CFM. The exhaust blower set point is limited to +/- 20% of the supply blower set point.

Each blower has a status screen in System Status.

COOLING MODE

When the dry bulb temperature of the supply air leaving the enthalpy wheel is greater than the cooling set point plus the proportional band, the unit will enter the mechanical cooling mode. The compressor will be staged on until the control temperature falls below the cooling set point. This sensor is labeled Control Temp on the System Status screen.

HEATING MODE

When the dry bulb temperature of the supply air leaving the enthalpy wheel is less than the heating set point minus the proportional band, the unit will enter the mechanical heating mode. The compressor will be staged on in heat pump mode until the control temperature rises above the heating set point. This sensor is labeled Control Temp on the System Status screen.

FIELD PROVIDED DUCT HEATER – HEAT PUMP MODE

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.

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.

ECONOMIZER MODE

When the dry bulb temperature of the supply air leaving the enthalpy wheel is between the heating and cooling set points the unit shall run in the economizer mode. The compressor will remain off and the air will be conditioned by the enthalpy wheel only. This sensor is labeled Control Temp on the System Status screen.

DEFROST MODE

When the low suction pressure switch remains open for 20 min. (adjustable) and the compressor is operating in heat pump mode, the unit will enter the Defrost Mode. The supply blower and compressor will de-energize for 10 min. The enthalpy wheel and exhaust blower will continue to run. The defrost timers can be adjusted in the System Settings sub-menu.

OCCUPANCY CONTROL

The unit control can be set for one of three modes:

1. Built-in schedule
2. Occupancy Sensor (Remote On/Off)
3. Constant Operation

This selection is found in the Main Menu under Occupancy Control.

SET POINTS

System set points are accessed through the Main Menu option labeled Set Points. Hold the OK button to access the Main Menu.

```
Main Menu
1. System On/Off
2. System Status
3. Set Points
```

Use the down arrow to select Set Points and press OK

.

```
Setpoints 1/2
Cooling>  74.0°F
Heating>  62.0°F
```

Use the right and left arrows to change between temperature and airflow set point screens.

```
Setpoints 2/2
Supply>   500 CFM
Exhaust>  400 CFM
```

SENSORS

CONTROL TEMPERATURE

This sensor is located in the supply air leaving the enthalpy wheel. It is used to stage the compressor for both cooling and heating modes.

SUPPLY AIR DEW POINT TEMPERATURE

This sensor is located in the supply air leaving the evaporator coil. It provides information only and is not part of the control sequence.

SUPPLY AIR DRY BULB TEMPERATURE

This sensor is located in the supply air leaving the unit. It provides information only and is not part of the control sequence.

SCHEDULE

The system can utilize the built-in schedule if Occupancy Control is set to the schedule option. The schedule provides four events per day, seven days per week. Each event has separate heating and cooling set points. The scheduled set points can be overridden at any time by adjusting the set point in the set points screen. The system will return to the scheduled set point at the start of the next event.

```
          Tuesday Schedule
           Start   H    C
Event 1    06:00   62   76
Event 2    12:30   64   72
Event 3    16:30   64   72
Event 4    19:00   58   78
```

PASSWORD PROTECTION

The controller provides two levels of password protection. By default, the user level password is disabled and can be enabled under the Passwords option in the Advanced Menu. Once enabled, all options in the Advanced Menu except System On/Off and System Status will require the user level password.

The service level password protects system settings and is enabled at the factory. The default password is 9995. Selecting the Passwords option in the Advanced Menu will display both user and service level passwords.

MAIN MENU STRUCTURE

The Main Menu is accessible at any time by briefly holding the OK button.

This menu contains sub-menus:

1. **System On/Off**
   - 1.1. Enable unit operation.
2. **System Status**
   - 2.1. Return to System Status.
3. **Set Points**
   - 3.1. Access unit set points.
4. **Schedule**
   - 4.1. Enable schedule, constant operation, or occupied/unoccupied unit control.
   - 4.2. Set schedule times and set points if schedule is enabled.
5. **Date/Time**
   - 5.1. Set the time and date.
6. **Advanced Menu**
   - 6.1. Access Advanced Menu. Requires service level password.

ADVANCED MENU STRUCTURE

The Advanced Menu is password protected by the service level password. Factory default is 9995.

This menu contains:

1. **System Settings**
   - 1.1. Compressor Delays.
   - 1.2. Defrost Timers.
   - 1.3. Proportional Band and set point limits.
2. **Fan Control**
   - 2.1. Access to stepper function that controls the ramping of the fans. This does not normally need changed.
   - 2.2. One page with all communication parameters.
3. **Sensors**
   - 3.1. Ability to offset sensors for calibration or testing purposes.
4. **Digital Inputs**
   - 4.1. Displays the open or closed state of all digital inputs.
5. **BMS Setup**
   - 5.1. One page with all communication parameters
6. **Passwords**
   - 6.1. Change passwords and enable user level password option.
7. **Run Hours**
8. **Software Version**

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 OVERVIEW

The Alpha Aire controller is a BACnet Advanced Application Controller. This section provides a basic overview of the integration of the controller to an existing BACnet network.

HARDWARE

Available BMS protocols are BACnet MS/TP or BACnet IP.

Terminal blocks are provided in the control panel for BACnet MS/TP communications termination. Shielded cable is recommended.

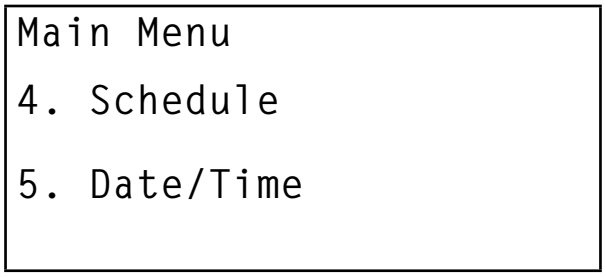
For Bacnet IP, the Ethernet port is CN20, located on the top of the controller.

SOFTWARE

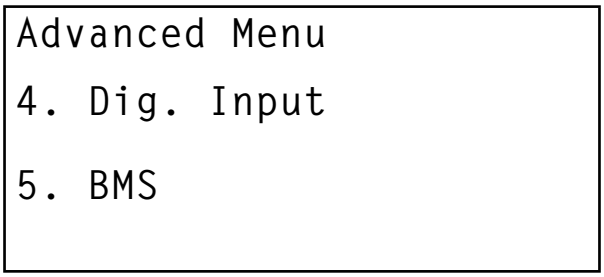
After communication is established, the building management system can monitor sensor readings, unit status, and start and stop the unit. If building management requires control of set points, the option must be enabled in the BMS Setup section of the software.

INITIAL BACNET SETUP USING THE ALPHA AIRE DISPLAY

Hold the OK button to enter the Main Menu and use the down arrow to scroll through the Main Menu options. Navigate to the Advanced Menu option. Enter the appropriate Advanced Menu password (factory default 9995) when prompted.

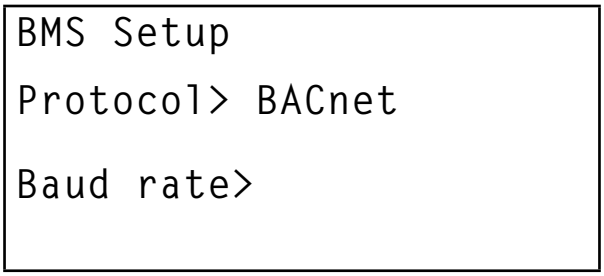


In the Advanced Menu, navigate to the BMS Setup sub-menu, pictured below.



In the BMS Setup menu are fields to adjust the BMS communication parameters, pictured below. The Device ID and Device Subnet parameters combine to form the Device Instance. Each Device Subnet contains 65535 Device ID numbers.

Device Instance = (65536 * Device Subnet) + Device_ID.



NOTE: When changing the baud rate you must cycle power to the controller to implement the new baud rate setting!

ALPHA AIRE BACnet POINTS LIST – Gen. 5

Binary Values						
Index	**Type**	**Variable Name**	**Description**	**Access**	**Inactive**	**Active**
1	BV	UnitOn	Turn unit off/on by BMS	R/W	0	1
2	BV	SupplyFan_On	Status - Supply blower on by Modbus	R	0	1
3	BV	ExhaustFan_On	Status - Exhaust blower on by Modbus	R	0	1
4	BV	Compressor_On	Status - Compressor relay output energized	R	0	1
5	BV	EnthalpyWheel_On	Status - Enthalpy wheel relay output energized	R	0	1
6	BV	CoolMode	Status - Cooling mode	R	0	1
7	BV	HeatMode	Status - Heating Mode	R	0	1
8	BV	EconMode	Status - Econ Mode	R	0	1
9	BV	DefrostMode	Status - Defrost Mode	R	0	1
10	BV	Alarm_Global	Active when any alarm is active	R	0	1
11	BV	Alarm_Airflow	Alarm - Loss of Airflow or ECM Communications	R	0	1
12	BV	Alarm_DrainPan	Alarm - Drain Pan Overflow	R	0	1
13	BV	Alarm_FireSmoke	Alarm - Fire or Smoke Detected	R	0	1
14	BV	Alarm_DirtyAirFilter	Alarm - Dirty Air Filters	R	0	1
15	BV	Alarm_CompressorHighPressure	Alarm - Compressor High Pressure	R	0	1
16	BV	Alarm_CompressorLowPressure	Alarm - Compressor Low Pressure	R	0	1
17	BV	Alarm_ControlTempSensorFailure	Alarm - Control Temperature Sensor Failure	R	0	1
18	BV	ResetAlarms	Reset alarms if alarm conditions are resolved	R/W	0	1
19	BV	BACnetSetpoints_en	Enable to allow BMS control of set points	R/W	0	1
Analog Inputs						
Index	**Type**	**Variable Name**	**Description**	**Access**	**Min**	**Max**
1	AI	ControlTemperature	Control Temperature - Air leaving enthalpy wheel	R	-58 F	221 F
2	AI	SupplyDewpointTemperature	Supply Air Dewpoint Temperature - Air leaving dx coil	R	-58 F	221 F
3	AI	SupplyDryBulbTemperature	Supply Air Dry Bulb Temperature - Air leaving the unit	R	-58 F	221 F
Analog Values						
Index	**Type**	**Variable Name**	**Description**	**Access**	**Min**	**Max**
1	AV	CoolingSetPoint	Cooling set point	R/W	40.0 F	99.0 F
2	AV	HeatingSetPoint	Heating set point	R/W	0.0 F	99.0 F
3	AV	SupplyAirflowSetPoint	Supply Air CFM set point	R/W	100 cfm	500 cfm
4	AV	ExhaustAirflowSetPoint	Exhaust Air CFM setpoint	R/W	100 cfm	500 cfm
5	AV	SupplyAirflow	Supply Air CFM Delivered	R	0 cfm	500 cfm
6	AV	ExhaustAirflow	Exhaust Air CFM Delivered	R	0 cfm	500 cfm
7	AV	RunHours_Compressor	Compressor Lifetime Run Hours	R	0h	200000h
8	AV	RunHours_SupplyFan	Supply Fan Lifetime Run Hours	R	0h	200000h
9	AV	RunHours_ExhaustFan	Exhaust Fan Lifetime Run Hours	R	0h	200000h
10	AV	RunHours_EnthalpyWheel	Enthalphy Wheel Lifetime Run Hours	R	0h	200000h

REMOTE Wi-Fi MANAGEMENT OPTION

The Alpha Aire controller provides remote web management through the factory provided TP-Link WiFi access point. The TP-Link access point will be installed in the controller's Ethernet port prior to unit shipment. The access point is used to remotely access unit status and change settings using the built-in webpages.

Wi-Fi ACCESS POINT

To connect to the access point a WiFi capable device is required and the unit must be powered on.

1. Search for available WiFi networks using your device.
2. Connect to the default WiFi name (SSID) and password printed on the back of the TP-Link module.
3. Launch a web browser and type http://tplinkwifi.net in the address bar.
4. Create a password to login.
5. Click Next to start the Quick Setup procedure.
6. Select **Access Point** and click Next.
7. Keep the default Wireless Network Name and Wireless Password or customize them, and then click Next.
8. Select **Smart IP** and click Next.
9. Click Finish to complete the configuration.

The controller will have a default IP address of 192.168.0.2. To access the controller's web page, enter the IP address into your Internet browser.
For further information regarding the WiFi Access Point, please see the link below:
https://www.tp-link.com/us/support/download/tl-wr802n/

USING THE WEBSITE

The site will require login credentials upon first connection. The default **username** is **administrator**. The default **password** is **admin-UCA**. Select the **Security** option in the navigation bar after logging in to change the username and password. The controller's username and password can be reset to factory default under the Network section of the Advanced Menu.

The Alpha Aire's web pages provide the same capabilities as the built-in display. Use the navigation bar at the top of the webpage to access system setpoints and settings, and to view and control the operating status of the unit.

SYSTEM OPTIONS

BUCK BOOST TRANSFORMER

Small single phase transformer designed to reduce (buck) or raise (boost) line voltage from 5 to 20%. Used with United CoolAir units where 277 volts need to be reduced to 230 volts.

PAINTED CABINET (Exterior Only)

A Polyurethane Enamel electrostatically sprayed on heavy duty G90 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 7 for the termination of the condensate tubing inside the pump.
Refer to Figure 8 for the inverted “U” trap that is to be installed for the condensate line.
Route the condensate disposal tubing to a suitable location.

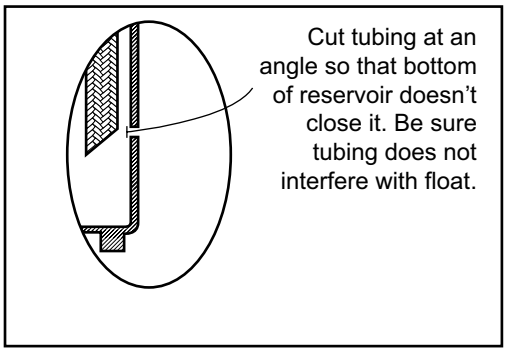


Figure 7

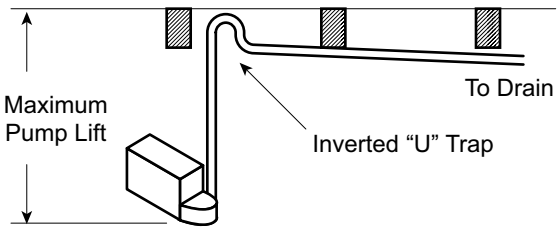


Figure 8

TRAP / FLOAT SWITCH COMBO — HORIZONTAL ONLY

A field configured and assembled kit including plastic cleanout tees, cleanout brush, clear trap and float activated switch that can be field wired to provide a high water alarm when required. Horizontal units require two kits.

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 100% outside air systems utilize an MOP type thermal expansion valve. The Maximum Operating Pressure (MOP) or pressure limiting 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.

LIQUID SUBCOOLING COIL

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

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 H INSTALLATION, see page 25

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.
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 blower motors are equipped with thermal overload protectors.

WARNING

Open disconnects to unit before doing any service or maintenance. A motor that is off on thermal overload can start any time when the automatic thermal overload resets.

PLATE HEAT EXCHANGER

See: MODEL E INSTALLATION, see page 31

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 12) 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 to acidic or alkaline, damage to the coil fins may result.

HARD START KIT

A start assist device is utilized on all single phase units. The purpose of this device is to assist the compressor in starting under low voltage conditions.

A capacitor in conjunction with a Positive Temperature Coefficient (PTC) relay is installed across the run and start windings of the motor. The PTC device utilizes a ceramic element with a predictable thermal response to the introduction of electric current. When the compressor is called upon to start, the start capacitor provides a voltage boost to the start winding of the motor and causes the motor to turn. As the starting current is introduced across the start windings, the PTC element begins to warm. When the PTC device reaches approximately 250° F (corresponding to 0.6 - 0.8 seconds), the resistance in the element increases and creates an open switch that releases the start winding from the circuit and the motor continues to run. If the compressor does not start before the device heats to 250° F, it will not start until the PTC device cycles through a cool-down period (usually 2 - 3 minutes). A compressor off-cycle timer is included in the electrical circuit for this purpose.

The time delay also helps the refrigerant system pressures to equalize at the end of the run cycle. This helps the compressor during the starting process in that it is not attempting to start against a high discharge pressure.

INFORMATION

Verify that this timer is set for 3 or more minutes.

MODEL H INSTALLATION & MAINTENANCE FOR ALPHA AIRE UNITS

NORTH AMERICAN ADDRESS AND CONTACT DATA

Mailing Address:
Heatex INC.
P.O. Box 254
Natural Bridge Station, VA 24579
USA

PHYSICAL ADDRESS:

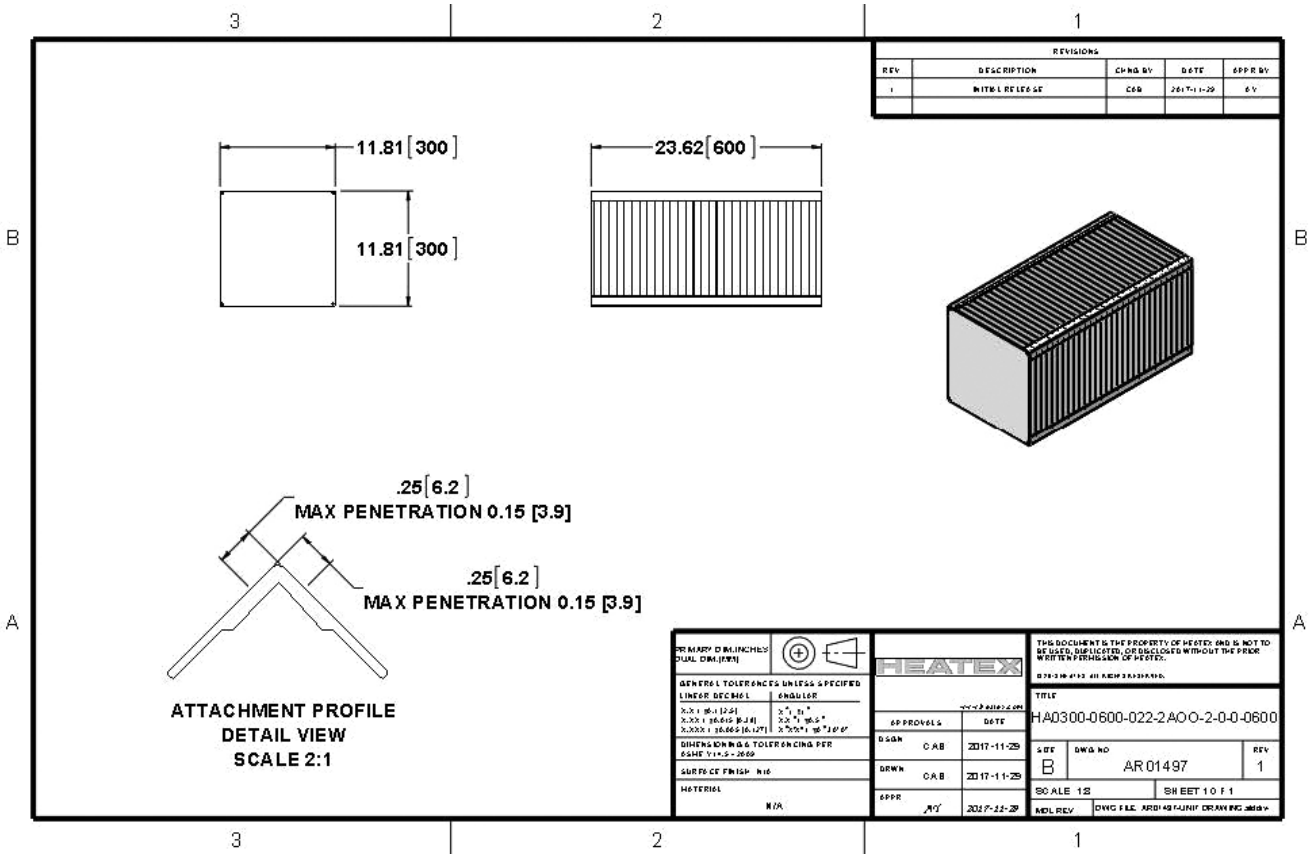
Heatex INC.
70 Douglas Way
Natural Bridge Station, VA 24579
USA
Telephone: +1 540-291-4001
info.northamerica@heatex.com
www.heatex.com

DISCLAIMER, COPYRIGHT NOTICE, AND DECLARATION OF INCORPORTATION

This is information is available upon request from Heatex Inc., or via the complete Heatex General Design Information for AHU Manufacturers Manual, available on Heatex's website. The herein manual is tailored to only include information pertinent to the Model H plate exchanger included in this Alpha Aire Unit.

GENERAL

The model H plate heat exchanger included in this Alpha Aire product is as follows, and pictured in picture 1:
Product Code: AR01497
Model Code: HA0300-0600-022-2AOO-2-0-0-0600



Picture 1. Plate exchanger unit drawing

ALLOWED PRESSURE DIFFERENCE

The following maximum allowed pressure differences apply to H300 heat exchanger is 700 Pa (2.8" WC). The listed pressure difference is the maximum values the heat exchanger can manage without permanent deformation of the channels. The pressure drop in the channels will however be influenced by pressure differences below these values. Heatex Select can calculate this effect if the differential pressure is entered.

MATERIALS AND CORROSION RESISTANCE

Heatex heat exchangers of type H are manufactured in aluminum. The aluminum material standard is listed below:

Alloy	8006/8009/8011/8111/1200
Temper	H00/H19

The aluminum plate heat exchangers have end plates made of aluminum. Corner profiles are made of aluminum.
Standard sealant material on all aluminum heat exchangers is a silicone free sealant. This can be used for air temperatures up to 90°C (190°F). The physical and chemical properties of non-silicone sealant are listed below:

Type:	MS-hybrid polymer, 1-component	MS-hybrid polymer, 2-component
Colors:	Grey	Grey
Contains fungicide:	No	No
Consistency	Paste, thixotropic	Paste, thixotropic
Specific gravity:	approx. 1.50 kg/liter (12.52 lb/gal)	approx. 1.49 kg/liter (12.43 lb/gal)

Corrosion Resistance

Table 4 is a guide for choosing material when different substances are present in the airstream. We recommend that when possible actual tests are made to verify that the chosen material will work in the real application.
The information in Table 4 is accurate to the best of our knowledge and experience but no guarantee is expressed nor implied in application or services over which we have no control.

Resistance to Fumes at Normal Temperatures				
A = Excellent	B = Good	C = Fair	D = Poor	*= No Information

Substance	Formula	Aluminum	MS Polymer
Acetic Acid	CH_3COOH	A	C
Acetone	C_3HO_3	A	C
Ammonium Hydroxide	NH_4OH	D	B
Ammonium Sulfate	$(NH_4)2SO_4$	C	B
Bakery Vapors		A	A
Beer		A	C
Benzene	C_6H_6	A	*
Boric Acid	H_3BO_3	A	*
Calcium Chloride	$CaCl_2$	B	B
Carbon Dioxide	CO_2	A	A
Carbon Tetrachloride	CCl	B	D
Carbonic Acid	H_2CO_3	A	*
Chlorine, water		C	B
Chloroform	$CHCl_3$	*	D
Chromic Acid	CrO_3	B	D
Citric Acid	$C_6H_8O_7$	B	*
Copper Cyanide	CuCN	D	*
Creosote		*	*
Diesel Oil		A	D
Ethyl Alcohol	C_2H_5OH	A	D
Ethylene Dichloride	$C_2H_4Cl_2$	*	*
Fatty Acids		B	*
Ferric Chloride	$FeCl_3$	D	*
Fluorine Gas	F_2	D	*
Formaldehyde	CHO_2	*	*
Fruit Vapors		A	A
Fuel Oil		A	B
Gasoline		A	*
Glycerin	$C_3H_8O_3$	A	C
Glycol	$C_2H_6O_2$	A	*
Hydrochloric Acid	HCl	D	D
Hydrocyanic Acid	HCN	*	*
Hydrofluoric Acid	HF	D	*
Hydrogen Peroxide	H_2O_2	C	D
Hydrogen Sulfide	H_2S	D	D
Jet Fuel		A	D
Kerosene		A	D

Substance	Formula	Aluminum	MS Polymer
Lactic Acid	$CH_3CHOHCOOH$	C	C
Lube Oils		A	*
Mercury	Hg	*	*
Milk		A	B
Mineral Thinner		A	*
Molasses		A	*
Nitric Acid	HNO_3	B	D
Oils & Fats		B	B
Oleic Acid	$CH_3(CH_2)_7CHCH(CH_2)_7COOH$	B	*
Oxalic Acid	$C_2Cl_2O_2$	C	D
Petroleum Oils		A	C
Phosphoric Acid	H_3PO_4	*	B
Photographic Chemicals		*	*
Potassium Permanganate	$KMnO_4$	*	*
Silver Cyanide	AgCN	*	*
Soaps		C	B
Sodium Hydroxide	NaOH	D	D
Sodium Hypochlorite	ClONa	D	D
Stearic acid	$C1_8H_{36}O_2$	B	*
Sulfur Dioxide	SO_2	D	*
Sulfuric Acid	H_2SO_4	C	D
Sulfurous Acid	H_3SO_3	C	*
Syrups		A	B
Tannic Acid	$C_{76}H_{52}O_{46}$	C	*
Tetrahydrofuran	C_4H_8O	*	*
Toluene	C_7H_8	A	*
Tricresyl phosphate	$(CH_3C_6H_4O)_3PO$	B	*
Turpentine		A	*
Urine		D	C
Vegetable Oils		A	B
Vegetable Vapors		A	A
Vinegar		D	*
Vinyl Acetate	$C_4H_6O_2$	*	*
Water, Fresh		A	B
Water, salt		D	B
Whiskey		A	C
Wine		*	C
Xylene	C_8H_{10}	A	*
Zinc Sulfate	$ZnSO_4$	D	*

Table 1. Corrosion resistance table.

4. HANDLING INSTRUCTIONS FOR PLATE HEAT EXCHANGERS

4.1. LIFTING

Heat exchangers from Heatex are designed for an optimal function with a frame that allows high performance. Heat exchangers with a size that makes it necessary to use some kind of lifting device must be handled according to the picture below.

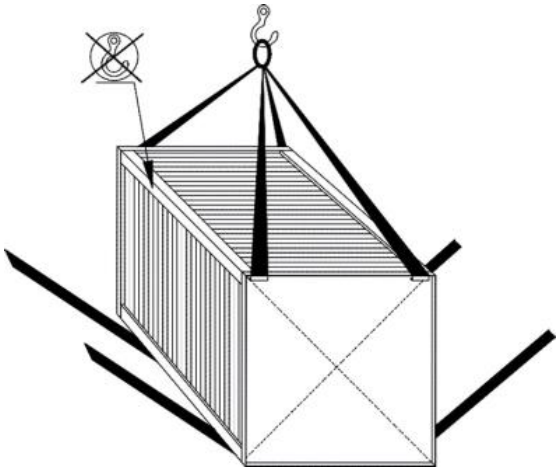


Figure 2. Recommended placement of slings.

4.1. TRANSPORTATION

The heat exchangers should preferably be transported with the plates oriented in a vertical position. The plates are to be protected by cardboard or plastic wrapping during transportation. Make sure not to top-load in a way that can damage the plates and/or deform the framework.

4.2. DEFORMATION

A framework that is not straight, irregular channels or any other deformation to the heat exchanger may seriously influence the performance of the heat exchanger.

4.3. INSTALLATION

If ducts shall be directly connected to the heat exchanger it is recommended that self-tapping screws or pop rivets are used. Make sure that the length is chosen so that the fastener does not penetrate the heat exchanger channels. In case of welding care must be taken not to melt or damage the sealant. The aluminum heat exchangers must never be submitted to larger pressure differences than those allowed during start-up or normal running.

5. MAINTENANCE AND CLEANING

5.1. GENERAL

All Heatex plate heat exchangers have been designed to prevent dirt from coming into contact with the heat transfer surfaces. Most of the dirt and pollutants in the air will just pass through the heat exchanger. Substances which have the highest risk of fouling the exchanger are sticky substances that condense on surfaces and fibers from, for example, dry tumblers.

From the heat exchanger point of view it is preferable to use a filter before the exchanger to prevent dirt from depositing, but it is however not necessary except in a few special applications. The disadvantage of using filters is that they need to be changed regularly. There is also a hygienic risk because the filters will collect particles, which otherwise would leave the building (or process) with the exhaust airstream.

Experience has shown that the buildup of dirt in a heat exchanger is often limited to the first 50 mm (1.97”) in the exchanger, which simplifies cleaning. For normal ventilation applications, it is most of the time sufficient to clean the inlet and outlet with a brush.

For dirtier applications, compressed air or high pressure water cleaning and disinfection may be necessary. For instructions regarding cleaning and disinfection, see below. Please observe that high pressure cleaning must not be made directly against the plates and the pressure must be kept below 100 bar. Make sure that the plates do not deform or brake when removing dirt mechanically.

5.2. RECOMMENDED CLEANING PRODUCTS

The detergent recommended for cleaning is a standard mild dish detergent such as Dawn, YES, or Fairy. The detergent shall be sprayed on the heat exchanger with a low pressure sprayer. The detergent can be diluted with up to 75% water. The disinfectant recommended for disinfection is 45% Concentration Isopropyl Alcohol. Please note that Isopropyl Alcohol contains alcohol which is flammable. Take precaution to avoid ignition.

Figure 6. Dawn / YES / Fairy detergent.

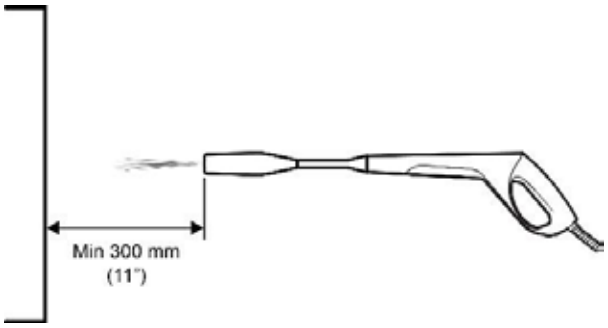
Figure 7. LIV +45 or similar disinfectant

5.3. CLEANING

The cleaning process consists of three steps. First, rinse the heat exchanger with water using a high pressure cleaner to remove dust, particles, deposits etc. Then, use detergent to clean the heat exchanger. As a third step, remove the detergent with water. Make sure that the nozzle of the high pressure cleaner is adjusted to a plain jet.

PLATE HEAT EXCHANGER CLEANING PROCEDURE:

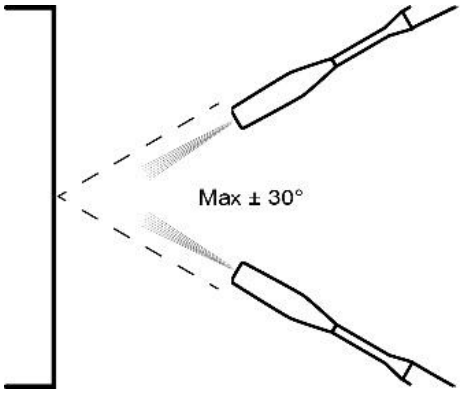
1. Place the nozzle at a distance of approximate 300 mm (11”) from the heat exchanger to not damage the plates.



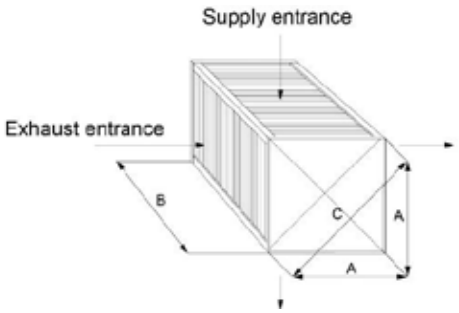
2. Have the nozzle adjusted to plane jet.

3. Clean the heat exchanger plates by spraying water into the area between the plates.

4. Vary the spray angle between + 30 and - 30 degrees from the openings at a distance of 300 mm (11”) from the entrance.



5. Repeat point 3 and 4 on one of each entrance.



6. Spray the heat exchanger with detergent with a low pressure sprayer.
7. Repeat point 1-5 in order to remove all detergent.
8. Let the heat exchanger air dry.

5.4. DISINFECTION

Heatex recommends undiluted 45% Isopropyl Alcohol for disinfection. First, spray the heat exchanger with disinfectant 45% Concentration Isopropyl Alcohol and leave to dry. Then, rinse the heat exchanger with water using a high-pressure water cleaner. The disinfectant is used on both the plate and rotary heat exchangers. LIV +45 is used undiluted.

PLATE HEAT EXCHANGER DISINFECTION PROCEDURE:

1. Spray generous of disinfectant into the heat exchanger at a distance of 50-100 mm (1.97-3.94”). Utilize a standard spray bottle.
2. Spray both plates in every channel and spray into all four sides of the heat exchanger.
3. Let the heat exchanger air dry for 30 minutes.
4. Clean the heat exchanger in the same way as before (but without detergent) to assure all disinfectant has been removed.

6. DISPOSAL

Plate heat exchangers can consist of up to 98 % aluminum.

6.1. ALUMINUM PLATE MATERIAL

Heatex heat exchangers consist of pure aluminum and should be disposed as metal. Local country regulations apply.

6.2. GABLES

Gables consist of aluminum and should be disposed as metal. Local country regulations apply.

6.3. GLUE

The glue used to hold the aluminum plates to the gable and corner profiles comply with combustible waste and can be sent with the aluminum waste and removed during fragmentation if needed.

7 SUPPORT

For questions or information, please state order number, product name and message. Heatex is available for support during office hours, 8 am – 4.30 pm (EST) on weekdays.

MODEL E INSTALLATION & MAINTENANCE FOR ALPHA AIRE UNITS

NORTH AMERICAN ADDRESS AND CONTACT DATA

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DISCLAIMER, COPYRIGHT NOTICE, AND DECLARATION OF INCORPORTATION

This is information is available upon request from Heatex Inc., or via the complete Model E. Installation and Maintenance Manual, available on Heatex's website. The herein manual is tailored to only include information pertinent to the Model E Rotary wheels included in this Alpha Aire Unit.

1. GENERAL

The rotary heat exchanger included in this Alpha Aire product is as follows, and pictured in Picture 1:
Product Code: AF01466
Rotor Model: EM0600X0600-0500V-020-2D0CI-6BR0-A
Drive Model: Brother Gear Motors - GL15N007-BMRE5N – 220V/1Phase/60Hz

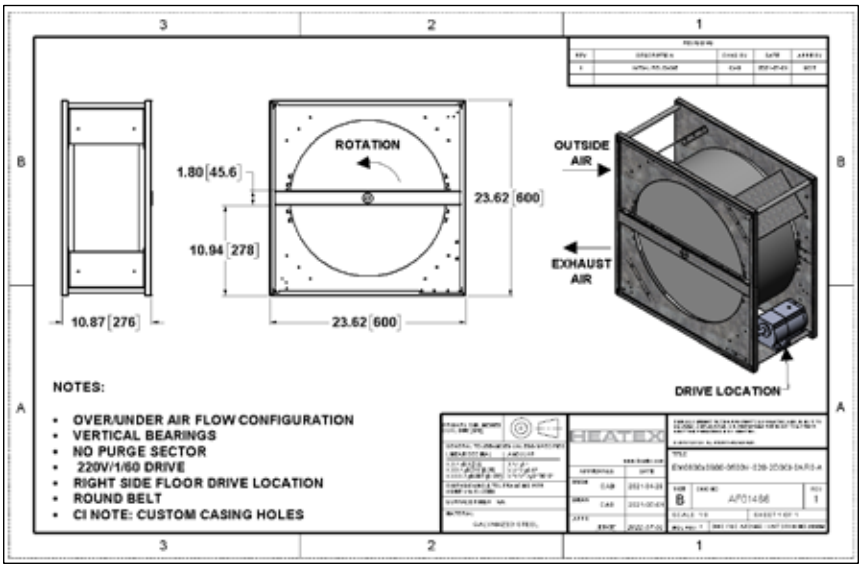


Figure 1. Rotor unit drawing.

A rotary heat exchanger with casing and drive is "partly completed machinery" as defined in Directive 2006/42/EC. This product is delivered in compliance with the Directive 2006/42/EC but when installed in the complete machinery it is up to the installer to make sure that the final product complies with the directive.

Special attention should be paid to sharp edges (risk of cuts) and that when the wheel is rotating the rotating parts may cause injuries.
The surfaces of the drive motor and gear can be hot and attention should be paid to the risk of burn injuries.
The sound level from the heat exchanger is less than 70 dB (A).

2. TRANSPORT

- Always transport the exchanger vertically.
- Lift the exchanger in the upper two corner distance pipes according to Figure 1.

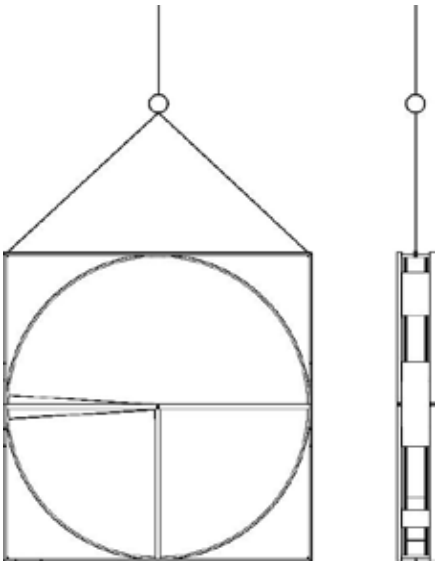


Figure 2. Lift the casing at the corner distance pipes.

- It is important that all transport and handling is carried out by qualified staff.

CAUTION

All transport and handling shall be carried out by qualified staff.

3. STORAGE

Adsorption wheels are sensitive to moisture. Please make sure that you store the wheels to avoid the conditions described above.
Furthermore, the unit is to be placed on a horizontal and even surface. Please note that an uneven surface can warp the rotor and affect the factory adjustments.

CAUTION

Placing the unit on an uneven surface may warp the rotor.

Always make sure that the heat exchanger is supported and secured during transport, handling, storage and installation so it cannot fall over and cause damage or injuries.

CAUTION

Heat exchanger may fall over if not secured.

Please observe that there may be sharp edges and a risk for cuts so we recommend that gloves should be used when the heat exchanger is handled.

CAUTION

Use gloves when handling the heat exchanger.

Always make sure that the storage temperature is kept above 0°C (32°F).

4. INSTALLATION

- Prior to initial operation, please make sure no objects are blocking the rotors movement. The rotor should move evenly and smoothly around its shaft.
- Pressure difference and pressure drop should under no circumstances exceed the limits. Please refer to Application Limits for further information.

Pressure difference and pressure drop should under no circumstances exceed the limits. Please refer to Application Limits for further information.

5. ADJUSTMENTS

- If necessary, adjust the brush sealing to minimize leakage.
- If the belt slides adjust belt tension.
- The round belt should have a tension of 3%. For adjustments, see maintenance instructions below.

6. MAINTENANCE

6.1. MATRIX

To secure the function and performance, the face of the rotor has to be inspected regularly for dust and dirt. In most cases, the rotor is self-cleaning due to counter flow and rotation of the matrix and this makes manual cleaning unnecessary. If the self-cleaning is insufficient dirt or/and dust can appear in the matrix.
Depending on the degree of soiling it is recommended to use following cleaning:

1. For only a small amount of easily removable dirt, Heatex recommends to use a vacuum cleaner.
2. For heavier dirt it is also possible to use compressed air but with caution.
3. Firmly attached dirt in the rotor is easiest removed by using hot water and a mild dish detergent such as Dawn, Yes, or Fairy. The mild detergent may be removed with high-pressure water cleaner with the nozzle placed 300mm (11.8”) from the matrix, detailed in section 6.7.
4. If required, Heatex recommends 45% Isopropyl Alcohol for disinfection, detailed in section 6.8.

6.2. ADSORPTION AND ENTHALPY WHEELS

The adsorption material is aluminum coated with molecular sieve 3Å coating. There is a small amount of surplus material that might leave the matrix during the first usage. This will NOT affect the hygroscopic properties. The excess powder is harmless and easy to remove using a vacuum cleaner. Just as for the adsorption wheel, a small amount of surplus material might leave the matrix during the first usage.

6.3. ROUND BELT

In addition, the round belt may need adjustment during its lifetime. When delivered from the factory the belt is welded together. If adjustment is needed the belt must be cut, shortened, and joined together again with a joining pin (included with the unit). Belt tension should be 4-6%.

6.4. BRUSH SEALINGS

Tightness between brush sealings and casing has to be checked during inspection. The brush sealings are easily adjusted by unscrewing the screws and moving the brush sealing into the right position.

6.5. APPLICATION LIMITS

Recommended temperature limits for rotary heat exchanger Model E are -40°C (-40°F) to +65°C (149°F).
It is however important not to exceed the temperature limits on mounted components:

Component	Min	Max
Bearings	-40°C (-40°F)	110°C (230°F)
Yellow belt	-30°C (-22°F)	66°C (150°F)
Constant motor	-10°C (14°F)	40°C (104°F)
Standard seals	-25°C (13°F)	90°C (190°F)

Maximum and recommended pressure drop as well as differential pressure for rotary heat exchanger:

- Pressure drop max 300 Pa (1.2” WC) up to outer diameter 1600 mm (62.99”), even during start up and maintenance.
- Recommended pressure drop 100-200 Pa (0.4-0.8” WC) (normal operation).
- Differential pressure max 600 Pa (2.4” WC).

INFORMATION

NOTE! The temperature inside the casing is approximately the mean temperature of supply and exhaust air temperatures.

- Table 1 is a guide for choosing material when different substances are present in the airstream. We recommend that when possible actual tests are made to verify that the chosen material will work in the real application. The information in Table 1 is accurate to the best of our knowledge and experience but no guarantee is expressed nor implied in application or services over which we have no control.

Resistance to Fumes at Normal Temperatures				
A = Excellent	B = Good	C = Fair	D = Poor	*= No Information

See page 26 and 27 for Table 1. Corrosion resistance table

6.6. TROUBLESHOOTING

If the rotary heat exchanger does not rotate properly, please follow these steps to solve/locate the problem.

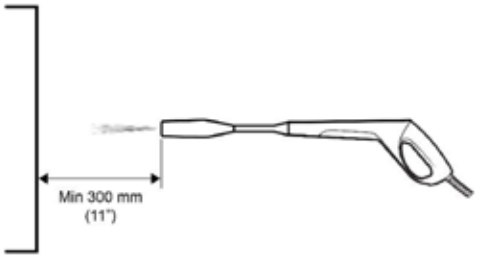
1. If the motor runs properly, please jump to step 5.
2. If there is a controller installed, please check controller technical specifications, chapter trouble shooting. Note that all electrical maintenance and installation must be performed by qualified personal.
3. The position of the pulley should be placed as near the center of the rotor as possible.
4. Disconnect the belt. Is the motor running correctly?
5. If the belt is sliding, please tighten the belt according to maintenance instruction.
6. Rotate the wheel by hand in the indicated direction (belt disconnected from the motor). Is it possible to smoothly rotate the wheel or does the wheel interact with the casing? If there is excessive friction between the wheel and the casing (making it hard to rotate), please locate the position.
7. Make sure the connected ducts do not press on the casing making it squeeze against the wheel. Make sure the diagonal measures of the casing side where the motor is positioned are equal.

6.7. CLEANING

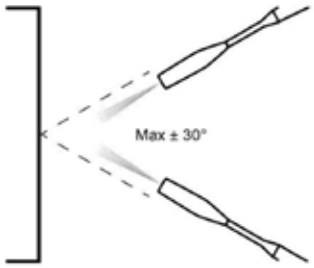
The cleaning process consists of three steps. First, rinse the heat exchanger with water using a high-pressure cleaner to remove dust, particles, deposits etc. Then, use detergent to clean the heat exchanger. As a third step, remove the detergent with water. Make sure that the nozzle of the high-pressure cleaner is adjusted to a plain jet.

ROTARY HEAT EXCHANGER CLEANING PROCEDURE:

1. Place the nozzle at a distance of approximate 300 mm (11”) from the heat exchanger.



2. Have the nozzle adjusted to plane jet.
3. Vary the spray angle between + 30 and - 30 degrees from the openings at a distance of 300 mm (11.81”)from the entrance.



4. Spray the whole wheel. Do not forget to rotate the wheel to clean the parts hidden behind the framework.

5. Let the heat exchanger air-dry.
6. Spray the heat exchanger with detergent with a low-pressure sprayer.
7. Repeat point 1-5 to remove all detergent.

6.8. DISINFECTION

Heatex recommends undiluted 45% Isopropyl Alcohol for disinfection. Please note that 45% Isopropyl Alcohol contains alcohol which is flammable, and precaution should be taken to avoid ignition.
The disinfection process consists of two steps. First, spray the heat exchanger with the disinfectant and leave to dry. Then, rinse the heat exchanger with water using a high-pressure water cleaner.

ROTARY HEAT EXCHANGER DISINFECTION PROCEDURE:

1. Spray generous of disinfectant into the heat exchanger at a distance of 50-100 mm (1.97-3.94”). Utilize a standard spray bottle.
2. Spray the entire wheel and do not forget to rotate the wheel to clean hidden parts behind the framework. Spray the wheel from both sides.
3. Let the heat exchanger air-dry for 30 minutes.
4. Clean the heat exchanger in the same way as before (but without detergent) to assure all disinfectant has been removed.

6.9. DISPOSAL

The disposal of each component should be according to the regulations in the country where the dismantle of the product is made.
A rotary heat exchanger´s weight consists of around 50 % aluminum, 45 % galvanized carbon steel sheet metal and 5 % other materials (electrical motor, belt, brush seal, non-silicone sealant, pop rivets and screws).

The wheel is, except for the center shaft and bearings, made of molecular sieve coated aluminum.
The casing should be treated as metal and therefore be properly disposed as such according to regulations in each country.
Motor should be treated as electrical waste.
For questions Belt and brush seals are normally treated as combustible waste, but local country regulations apply.
Products from Heatex do not contain minerals known as conflict minerals.
As rotary heat exchangers contain a lot of thin cut metal, appropriate safety equipment should be used to secure the health of the personnel during the disposal procedure.

SUPPORT

For questions or information regarding this product, please communicate your order number and product code along with your message.
Heatex is available for support during office hours: 8 am – 4.30 pm (EST) on weekdays.

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.
Blower fails to start	**1.** Controller not set properly **2.** Motor failure **3.** Defective contactor	**1.** Turn on and set controller for desired operation **2.** Replace motor **3.** Replace contactor
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.** Resolve incoming voltage issue **[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 **2.** Replace filters if dirty **3.** Repair leak, evacuate and recharge refrigerant system **4.** Make sure that supply air is not short cycling back into return air stream **5.** 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 **6.** 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.** Head pressure control valve not operating properly **6.** Condenser needs cleaned	**1.** Check for refrigerant leaks **2.** Repair leak, evacuate and recharge refrigerant system **3.** Check sub-cooling **4.** Ensure thermal expansion valve bulb is tight on suction line **5.** Confirm thermal expansion valve bulb is located properly on suction line **6.** Replace thermal expansion valve **7.** Replace filter drier **8.** Check filters and coil for any blockages **9.** Replace filters if dirty **10.** Confirm proper fluid flow quantity through condenser **11.** Clean condenser
Head pressure too high	**1.** Possible non-condensable in system **2.** Overcharge of refrigerant **3.** Condenser entering fluid temperature too hot **4.** Condenser air intake, duct or coil blocked.	**1.** Repair leak, evacuate and recharge refrigerant system. Install new filter drier. **2.** Reclaim excess refrigerant from high side of system **3.** Confirm acceptable fluid temperatures entering the condenser **4.** Verify that head pressure control valve is operational **5.** Reset high pressure safety switch if tripped **6.** Clean away debris from condenser air circuit.
Head pressure too low	**1.** Excessive air flow across condenser.	**1.** Confirm proper air flow amount.
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 **2.** Repair leak, evacuate and recharge refrigerant system. **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 **7.** 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. **3.** Check all connections for tightness. **4.** Check wire continuity. **5.** Refer to controller troubleshooting **6.** Reset high or low pressure switch **7.** 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 is 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
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

IMPORTANT NOTICE!

This Limited Warranty specifically provides that all installation, operation and repairs of product and parts covered under this limited warranty must be made with authorized parts and by a licensed HVAC service provider. The product(s) must be properly installed, and maintained by a licensed HVAC service provider in accordance with the installation, operation, and maintenance instructions provided by United CoolAir Corporation. Failure to conform to such specifications and/or instructions shall void this limited warranty. United CoolAir may request written documentation showing the proper preventative maintenance.

United CoolAir warrants this product to be free from defects in factory workmanship and material under normal use and service and will, at its option, repair or replace any parts that prove to have such defects within a period of one (1) year from the date of product installation, to begin no later than six (6) months after product shipment from the factory. This warranty extends only to the original consumer purchaser in accordance with the then current Terms and Conditions and is non-transferable.

For this warranty to apply, the product must be installed according to United CoolAir recommendations and specifications, and in accordance with all local, state, national and provincial codes. The product must not be moved from its original place of installation. The replacement part assumes the unused portion of this warranty.

This limited warranty applies only to products installed in the continental United States, Alaska, Hawaii, Puerto Rico and Canada.

EXCLUSIONS

This Limited Warranty does not cover any:

1. Shipping, labor or material charges.
2. Damages resulting from transportation, installation or servicing.
3. Damages resulting from accident, abuse, fire, flood, alteration or acts of God.
4. Tampering with, altering, defacing or removing the product serial number will serve to void this warranty.
5. Damages resulting from use of the product in a corrosive atmosphere (such as concentrations of acids or halogenated hydrocarbons).
6. Damages resulting from inadequacy or interruption of electrical service, improper voltage conditions, blown fuses, or other like circumstances.
7. Cleaning or replacement of filters or belts.
8. Damages resulting from failure to properly and regularly clean air and/or water side of condenser and evaporator.
9. Damages resulting from: (I) freezing of condenser water or condensate; (II) use of corrosive water; (III) fouling or restriction of the air/water circuit by foreign material or like causes.
10. Damages resulting from operation with inadequate or interrupted supply of air or water.
11. Damages resulting from use of components or accessories not approved by United CoolAir.
12. This warranty does not apply to the installation, plumbing and wiring not integral to the product.
13. Damages resulting from improper application or sizing of unit.
14. In the event that the refrigerant type is changed, as a result of a compressor failure and the same type of compressor is not available, any subsequent refrigerant circuit component failures will not covered under Limited Warranty.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose.

Some states (provinces) do not allow the disclaimer of implied warranty, so that the above disclaimer may not apply to you.

Some states (provinces) allow only a partial limitation on implied warranties to limit the duration of implied warranties to the duration of the express warranty. In such states (provinces), the duration of implied warranties is hereby expressly limited to the duration of the express warranty on the face hereof.

In no event, whether as a result of breach of warranty or contract, tort (including negligence) strict liability or otherwise, shall United CoolAir be liable for special, incidental, or consequential damages, including but not limited to loss of use of the equipment or associated equipment, lost revenues or profits, cost of substitute equipment or cost of fuel or electricity. The above limitations shall inure to the benefit of United CoolAir's suppliers and subcontractors. The above limitation on consequential damages shall not apply to injuries to persons in the case of consumer goods.

Some states (provinces) do not allow the exclusion or limitation of liability for consequential damages, or for strict liability in tort, so that the above exclusions and limitations may not apply to you.

United CoolAir does not assume, or authorize any other person to assume for United CoolAir, any other liability for the sale of this product.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state (province to province).

TO OBTAIN WARRANTY SERVICE

Contact the installing or servicing contractor with the details of the problem. Provide the model number, serial number and date of installation. Warranty requests directed to the factory will be referred back through the local distribution network.

Model: _____ Serial Number: _____ Date of Installation: _____

LIMITED WARRANTY FOR HERMETIC COMPRESSORS

United CoolAir warrants the hermetic compressor in this product to be free from defects in factory workmanship and material under normal use and service and will, at its option, repair or replace the hermetic compressor if it proves to have such defects within a period of five (5) years from the date of product installation, to begin no later than six (6) months after product shipment from the factory. This warranty extends only to the original consumer purchaser in accordance with the then current Terms and Conditions and is non-transferable. If a United CoolAir unit is matched with another manufacturers unit the compressor warranty is limited to 1 year from the date of product installation.

For this warranty to apply, the product must be installed according to United CoolAir recommendations and specifications, and in accordance with all local, state, national and provincial codes. The product must not be moved from its original place of installation. A second compressor failure in the same refrigerant circuit is indicative of an application issue and will not be covered under the Limited Warranty The replacement part assumes the unused portion of this warranty.

This limited warranty applies only to products installed in the continental United States, Alaska, Hawaii, Puerto Rico and Canada.

EXCLUSIONS

This Limited Warranty does not cover any:

1. Shipping, labor or material charges.
2. Damages resulting from transportation, installation or servicing.
3. Damages resulting from accident, abuse, fire, flood, alteration or acts of God.
4. Tampering with, altering, defacing or removing the product serial number will serve to void this warranty.
5. Damages resulting from use of the product in a corrosive atmosphere (such as concentrations of acids or halogenated hydrocarbons).
6. Damages resulting from inadequacy or interruption of electrical service, improper voltage conditions, blown fuses, or other like circumstances.
7. Cleaning or replacement of filters or belts.
8. Damages resulting from failure to properly and regularly clean air and/or water side of condenser and evaporator.
9. Damages resulting from: (I) freezing of condenser water or condensate; (II) use of corrosive water; (III) fouling or restriction of the air/water circuit by foreign material or like causes.
10. Damages resulting from operation with inadequate or interrupted supply of air or water.
11. Damages resulting from use of components or accessories not approved by United CoolAir.
12. This warranty does not apply to the installation, plumbing and wiring not integral to the product.
13. Damages resulting from improper application or sizing.
14. Discharge air temperature control, if not provided by the factory, will void the compressor Limited Warranty.
15. In the event that the refrigerant type is changed, as a result of a compressor failure and the same type of compressor is not available, any subsequent compressor failures will not be covered under the Limited Warranty.

This warranty is in lieu of all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose.

Some states (provinces) do not allow the disclaimer of implied warranty, so that the above disclaimer may not apply to you.

Some states (provinces) allow only a partial limitation on implied warranties to limit the duration of implied warranties to the duration of the express warranty. In such states (provinces), the duration of implied warranties is hereby expressly limited to the duration of the express warranty on the face hereof.

In no event, whether as a result of breach of warranty or contract, tort (including negligence) strict liability or otherwise, shall United CoolAir be liable for special, incidental, or consequential damages, including but not limited to loss of use of the equipment or associated equipment, lost revenues or profits, cost of substitute equipment or cost of fuel or electricity. The above limitations shall inure to the benefit of United CoolAir's suppliers and subcontractors. The above limitation on consequential damages shall not apply to injuries to persons in the case of consumer goods.

Some states (provinces) do not allow the exclusion or limitation of liability for consequential damages, or for strict liability in tort, so that the above exclusions and limitations may not apply to you.

United CoolAir does not assume, or authorize any other person to assume for United CoolAir, any other liability for the sale of this product.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state (province to province).

TO OBTAIN WARRANTY SERVICE

Contact the installing or servicing contractor with the details of the problem. Provide the model number, serial number and date of installation. Warranty requests directed to the factory will be referred back through the local distribution network.

Model: _____ Serial Number: _____ Date of Installation: _____

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 208/230-1-60 electrical power to the unit on the L1 and L2. 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 or Overcurrent Protection (MOP).
5. Locate the unit controller and check all electrical terminations against the unit electrical diagram.

No additional wiring from the field is required, however, there are Terminal Blocks provided, with jumpers installed, prepared to interlock with field provided devices:

- TB-RMTO – Remote On/Off
- TB-ES – Emergency Shutdown
- TB-DP – External Drain Pan Overflow Switch

Terminal Blocks must be jumped if no external interlocks are wired to the unit.

6. Leak check the refrigerant system. While the unit was leak checked at the factory, leaks can develop during transit and / or handling.
7. Horizontal units – Confirm that both condensate outlets have been adequately trapped and taken to a suitable point for disposal.

NOTE: The vertical cabinet has an internal condensate trap factory installed.

8. Verify that both sets of filters are in place, clean and usable.
9. Apply power to the unit. Switch the circuit breaker or field supplied electrical service disconnect switch to the on position.
10. Turn the unit off at the controller. (see pg. 14)
11. 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.
12. Make sure all the unit access panels are in place when taking these readings.
13. While waiting for the compressor to stabilize, record the External Static Pressure (ESP) for both the evaporator and condenser blowers.
14. Record the return air and supply air temperatures. (The unit should have operated for at least 15 minutes before taking these readings).
15. Record the outdoor and exhaust air temperatures.
16. Record the suction line pressure and the suction line temperature near the compressor.
17. Using an appropriate pressure / temperature chart for R-410A refrigerant, look up and record the saturation temperature corresponding to the suction pressure.
18. Calculate and record the suction superheat by taking the difference between the suction line temperature and the saturation temperature corresponding to the suction pressure.

Continued on next page

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

19. Record the liquid line pressure and the liquid line temperature.

20. Using an appropriate pressure / temperature chart for R-410A refrigerant, look up and record the saturation temperature corresponding to the liquid line pressure.

21. 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.

22. 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:
22.1.290 – 550 psig Discharge
22.2.100 – 140 psig Suction

b. Compressor Amperage is below the RLA Amps listed on the unit data tag.

22.3. 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 values should never be exceeded.

22.4. If the FLA value is exceeded, shut the unit off and check the duct design, or make sure there is no blockage / obstruction in the duct or filters.

23. Document any additional information deemed appropriate for the specific application or installation.

24. Shut the system down and remove all test instruments and test sensors.

25. 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 _____
Single Phase Unit
Measured Voltage.....L1-L2 _____ L1-GND_____ L2-GND _____

***NOTE: The vertical cabinet has an internal condensate trap factory installed.**

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 _____
Compressor Amps..... L1 _____
Cond. Motor Amps..... L1 _____

HEAT PUMP MODE

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

DEHUMIDIFICATION MODE

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

Notes: _____

_____

Technician (print name): _____

Company: _____

Phone: _____ Email: _____

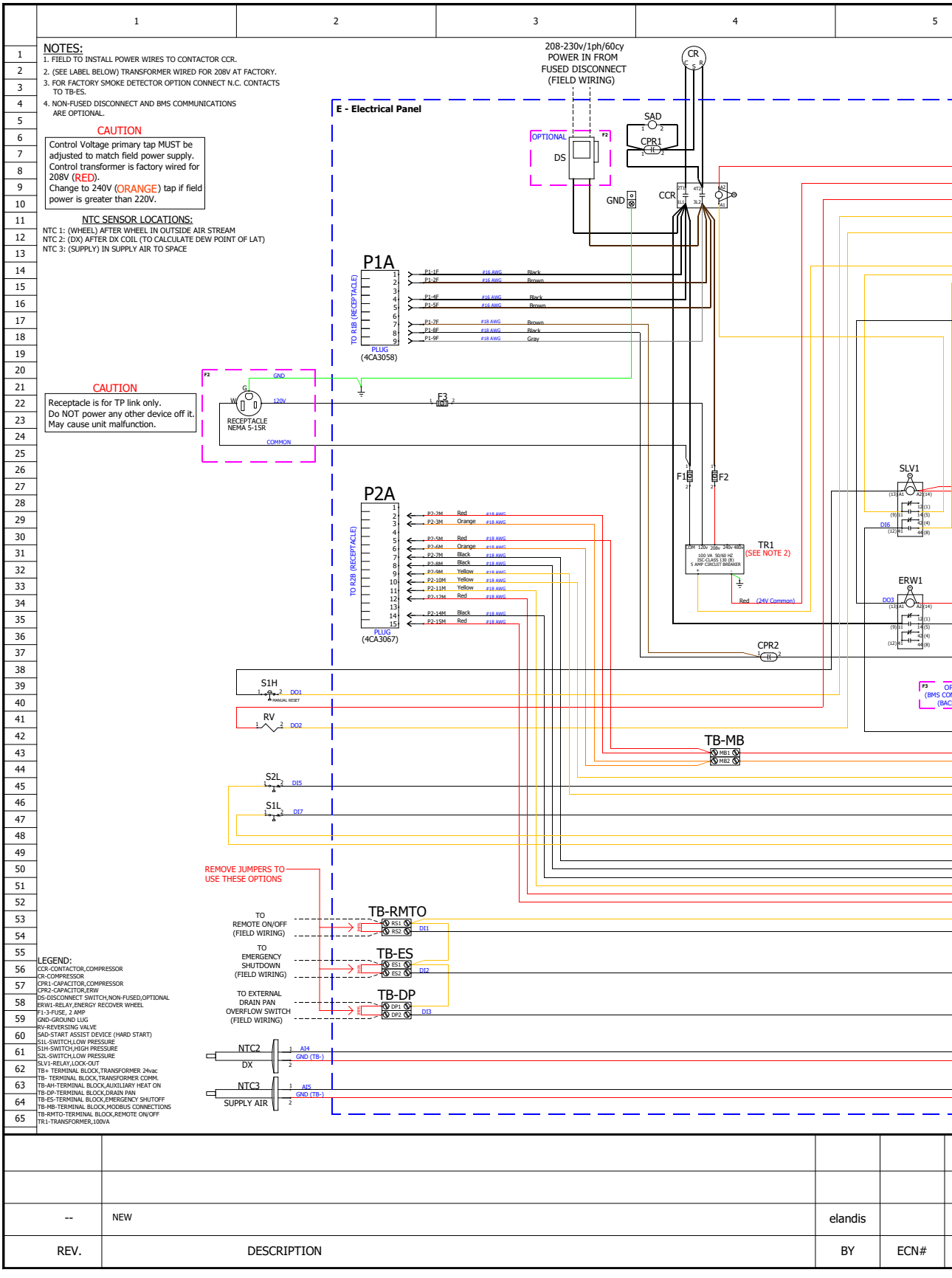
Signature: _____ Date: _____

PRODUCT NOMENCLATURE

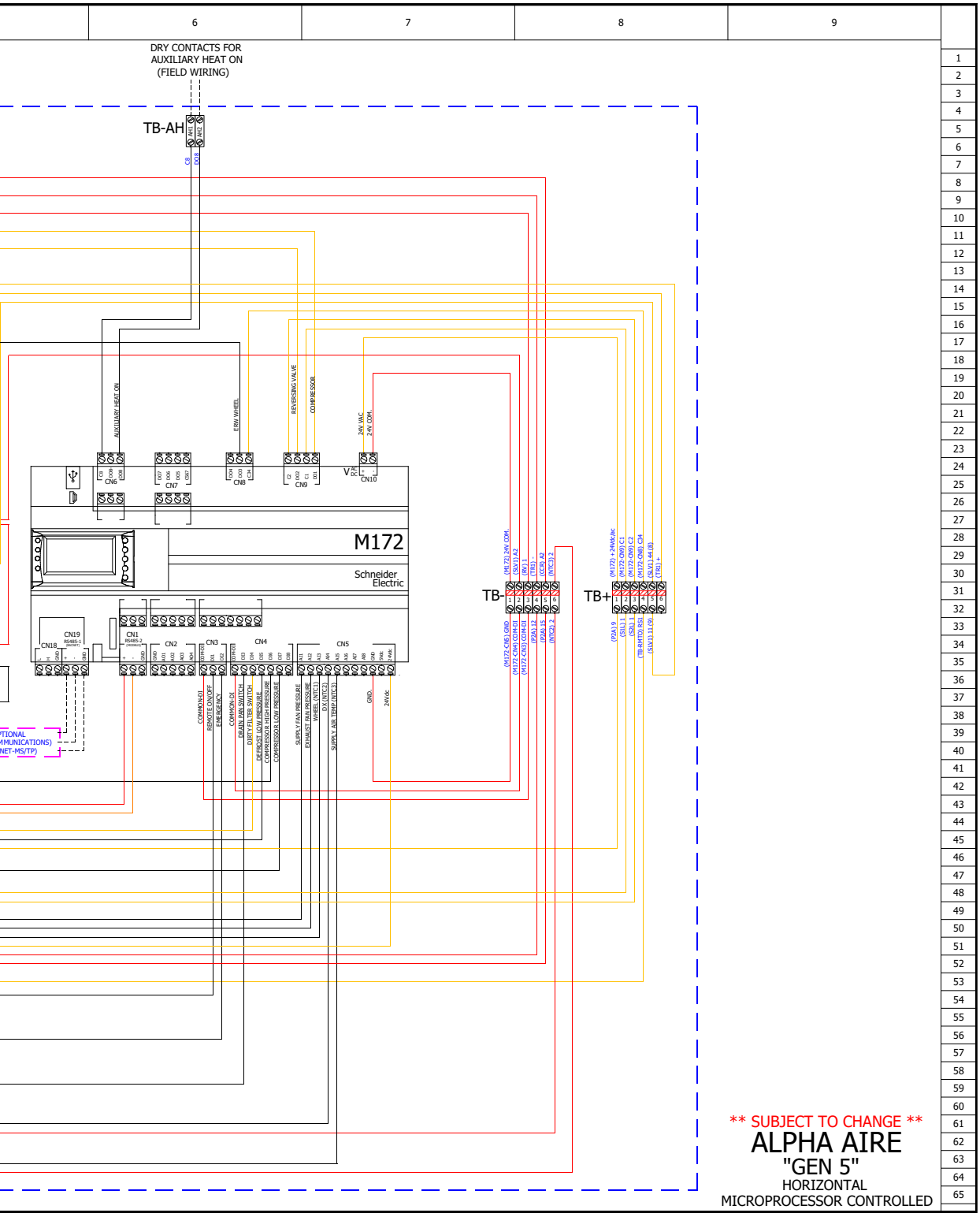
EXAMPLE:	**AA**	**H**	**100**	**G1**	**AS**	**T**	**A**	**5**	_	**X**
	1	**2**	**3**	**4**	**6**	**7**	**8**	**9**		**10**

1.	“AA”	Alpha Aire	
2.	“H” or “V”	Horizontal or Vertical Configuration	
3.	“100”	Series	
4.	“G1”	Common to All	208/230V, 1 PH,60 Hz
6.	“AS”	Single Circuit Refrigerant	
7.	“T”	Traditional Cabinet	
8.	“A”	Refrigerant R-410a	
9.	“5”,“4”,“3”, etc.	Generation	
10.	“X”	Special Configuration	

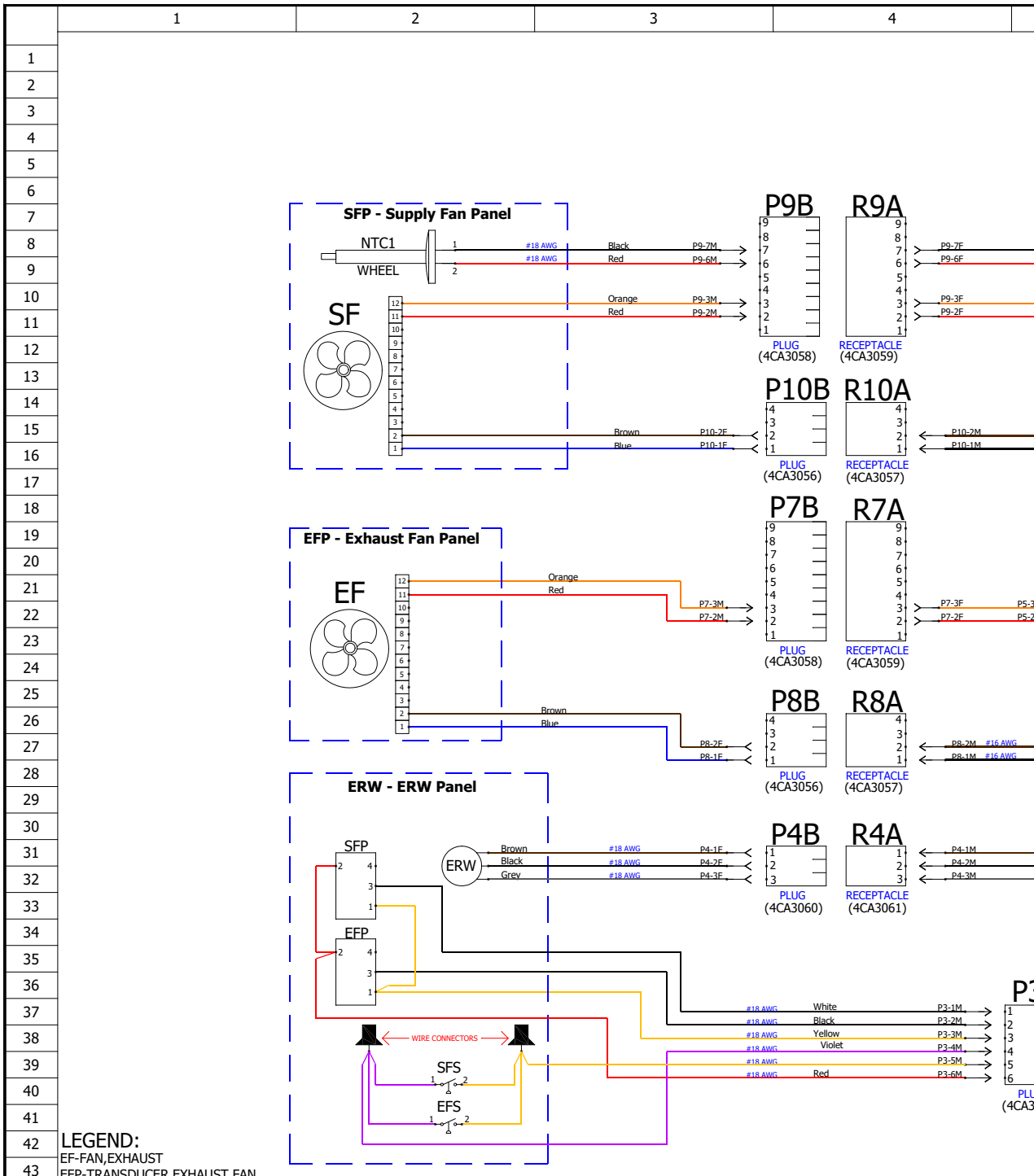
Not all combinations of Product Nomenclature are valid. Check with the factory for correct model identification.



REV.	DESCRIPTION	BY	ECN#
--	NEW	elandis	

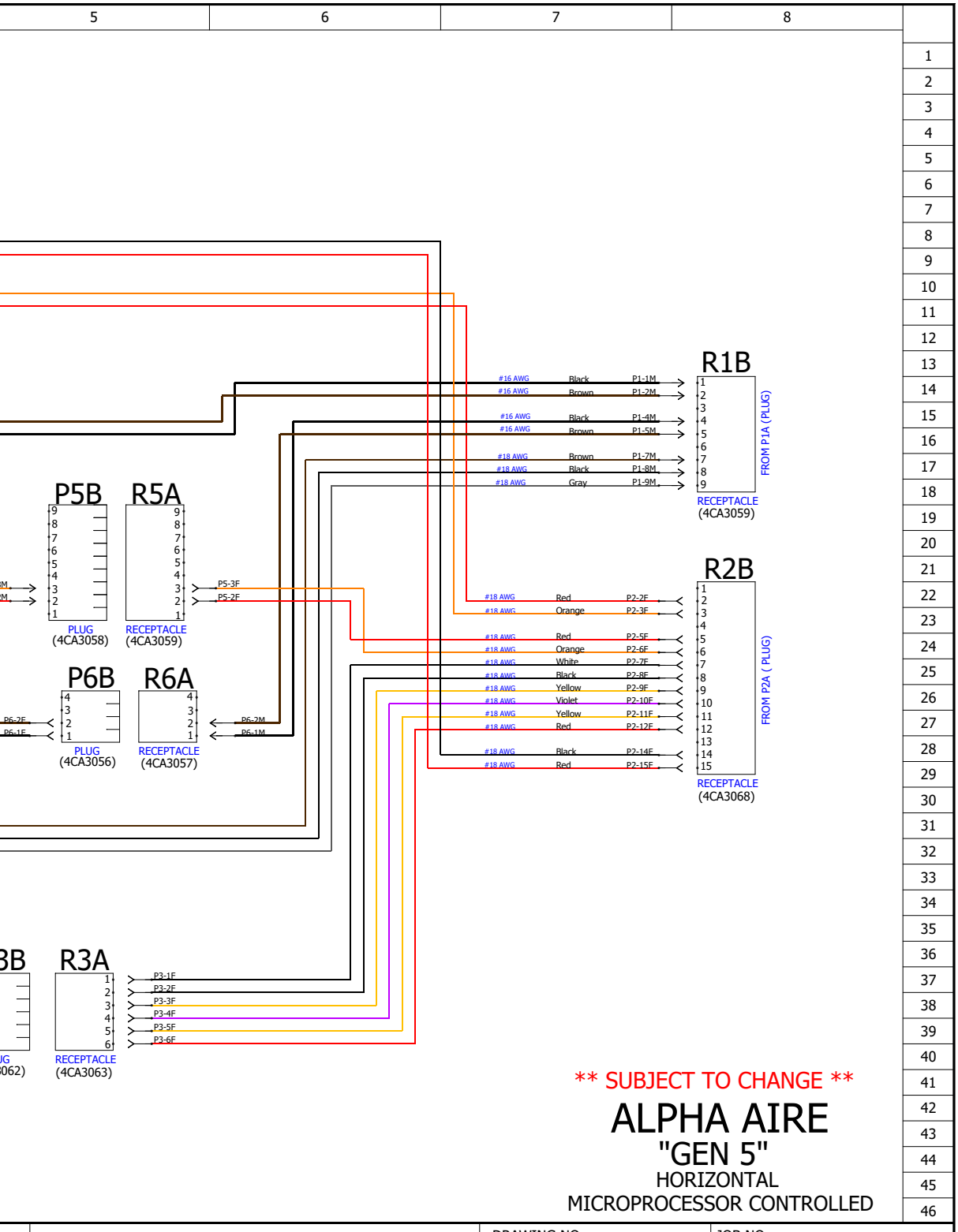


	UNITED CoolAir All-Indoor Solutions	DRAWING NO: ED-AAH100-5	JOB NO: Standard Template		
08/20/21	York, PA U.S.A.	DWN. BY: elandis	DATE: 08/20/21	APP. BY:	DATE:	SCALE: NTS
DATE	TITLE: Electrical Panel	SHEET: 1 OF 2	UNIT TAG: AAH100G1ASTA5			REV. LEV. --



LEGEND:
EF-FAN,EXHAUST
EFP-TRANSDUCER,EXHAUST FAN
EFS-PRESSURE SWITCH,EXHAUST FILTER
ERW-ENERGY RECOVER WHEEL
SF-FAN,SUPPLY
SFS-PRESSURE SWITCH,SUPPLY FILTER
SFP-TRANSDUCER,SUPPLY FAN

REV.	DESCRIPTION	BY	ECN#	DAT
--		elandis		08/20



UNITED Cool Air All-Indoor Solutions	DRAWING NO: ED-AAH100-5		JOB NO: Standard Template		
York, PA U.S.A.	DWN. BY: elandis	DATE: 08/20/21	APP. BY:	DATE:	SCALE: NTS
TITLE: Supply/Exhaust/ERW Panel	SHEET: 2 OF 2		UNIT TAG: AAH100G1ASTA5		REV. LEV. --

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

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web: www.unitedcoolair.com

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