



# Alpha Aire

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

## Engineering Guide

Effective February 2018



we make life better™



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## PRODUCT FEATURES

United CoolAir uses high-density **2" thermal/acoustic insulation Solid Double Wall** along with low airflow to greatly reduce noise for near occupant operation. Critical components are isolated out of the air stream for longer life. Single point electrical power

- Single Cabinet Design
- 2" Solid Double Wall
- Variable Air Volume Capable (Through BMS)
- Up to 1" of ESP
- Air Source Heat Pump
- ECM Fans
- BMS Capable
- Auxiliary Reheat Coil
- Stainless Steel Drain Pan
- 2" MERV 8 Pleated Throwaway Filters

and 8" flex duct make for a low cost installation. The sheet metal is G90 galvanized steel with optional wet paint finish for durability and long life.

- Dual Energy Recovery Devices
- Field Convertible Supply and Exhaust/Return Ducts
- Filter Drier (Suction Line)
- Isolated Electrical/Control Box
- 8" Duct Collar Connections
- Built In Pressure Transducers for Airflow Measurement
- Quick Compressor Change Out
- No brazing or Hot Work permit required for compressor changeout
- 100–500 CFM

## OPTIONS

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Painted Cabinet (Wet paint)</li> <li>• Non-Fused Disconnect</li> <li>• Coated Coils</li> <li>• Buck Boost Transformer</li> <li>• External Condensate Pump</li> <li>• Multiple 2" / 4" MERV 8, 11 or 13 filters</li> <li>• CO<sub>2</sub> Switch</li> </ul> | <ul style="list-style-type: none"> <li>• VOC Switch</li> <li>• Occupancy Switch</li> <li>• Compressor Acoustic Cover</li> <li>• Smoke Detector</li> <li>• Floor Stand</li> <li>• Trap / Switch Combo</li> </ul> |
|---|---|

# Psychrometric Chart



## PSYCHROMETRIC CHART

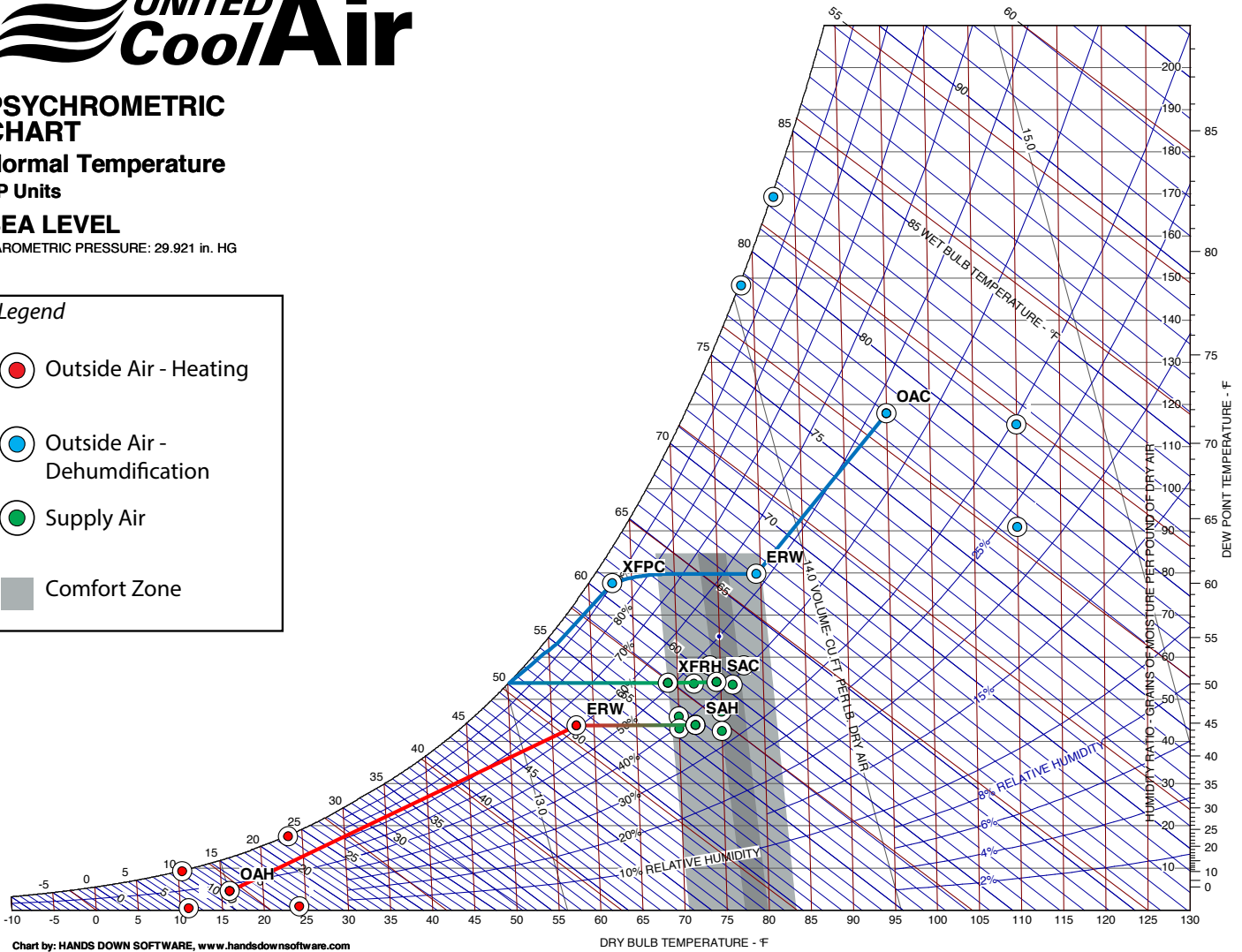
Normal Temperature  
I-P Units

SEA LEVEL

BAROMETRIC PRESSURE: 29.921 in. HG

**Legend**

- Outside Air - Heating
- Outside Air - Dehumidification
- Supply Air
- Comfort Zone

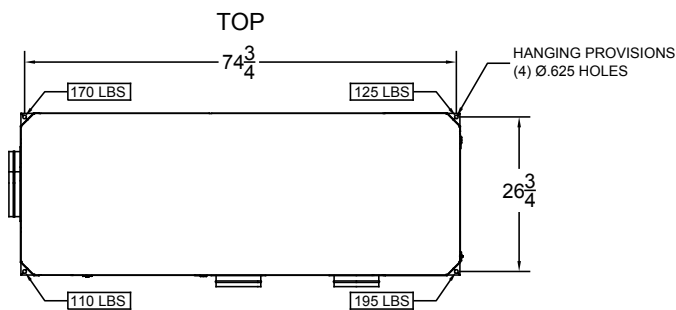


## Physical Data - Alpha Aire

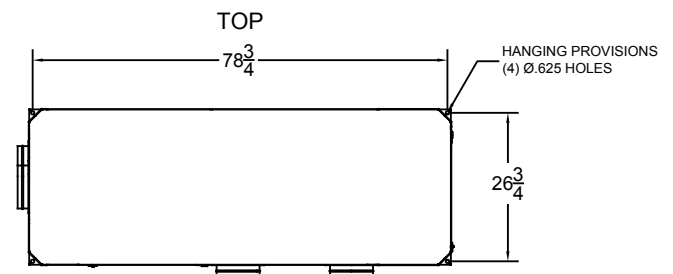
Evaporator Supply Air	CFM Range	100-500
Evaporator Fans	Type	ECM
	Qty	2
<b>COIL MATERIALS:</b>		Aluminum Fins / Copper Tubes
Indoor Coil Rows / FPI		6 / 13
Indoor Coil Face Area	Ft <sup>2</sup>	1.0
Outdoor Coil Rows / FPI		4 / 18
Outdoor Coil Face Area	Ft <sup>2</sup>	1.0
Reheat Coil Rows / FPI		1 / 13
Reheat Coil Face Area	Ft <sup>2</sup>	0.85
Wheel Type		Enthalpy
Wheel Diameter	In	19.7
Plate Type		Sensible
<b>ELECTRICAL DATA:</b>		
Motor Power / FLA	kW / Amps	0.4 / 2.3
Motor Qty		2
Compressor Qty / Type		1 / Recip.
Compressor LRA / RLA	Amps / Amps	45 / 4.5
Unit MCA	Amps	10.2
Unit MOP	Amps	15
<b>AIR FILTERS:</b>		
Type	Pleated Throwaway	
Qty / Size	2 / 12 x 24 x 2	
Efficiency	MERV 8	
Weight (Net Operating)	600 lbs*	

\*Approximate net operating weight of standard unit, additional options may change overall weight

### Corner Weights



**100 Series**



**200 Series**

## Alpha Aire Performance Data

### Typical Design Conditions

<b>DEHUMIDIFICATION</b>		
Outside Air / Return Air CFM	SCFM	500 / 500
Outside Air Temp. DB / WB / RH / DP	°F / °F / % / °F	95.0 / 80.0 / 52.5 / 74.9
Return Air Temp. DB / WB / RH / DP	°F / °F / % / °F	75.0 / 62.5 / 49.8 / 55.0
Supply Air Temp. DB / WB / RH / DP	°F / °F / % / °F	75.2 / 60.7 / 43.0 / 51.2
Total Cooling Capacity (less motor heat)	BTUH	37,400
Sensible Cooling Capacity (less motor heat)	BTUH	10,700
<b>HEATING</b>		
Outside Air / Return Air CFM	SCFM	500 / 500
Outside Air Temp. DB / WB / RH / DP	°F / °F / % / °F	10.0 / 9.0 / 80.1 / 5.6
Return Air Temp. DB / WB / RH / DP	°F / °F / % / °F	70.0 / 58.5 / 50.2 / 50.6
Supply Air Temp. DB / WB / RH / DP	°F / °F / % / °F	69.8 / 56.1 / 41.8 / 45.5
Total Heating Capacity (less motor heat)	BTUH	45,600
Sensible Heating Capacity (less motor heat)	BTUH	32,300

<b>DEHUMIDIFICATION</b>		
Outside Air / Return Air CFM	SCFM	500 / 500
Outside Air Temp. DB / WB / RH / DP	°F / °F / % / °F	95.0 / 78.0 / 47.3 / 71.8
Return Air Temp. DB / WB / RH / DP	°F / °F / % / °F	75.0 / 62.5 / 49.8 / 55.0
Supply Air Temp. DB / WB / RH / DP	°F / °F / % / °F	74.5 / 60.0 / 42.4 / 50.2
Total Cooling Capacity (less motor heat)	BTUH	33,700
Sensible Cooling Capacity (less motor heat)	BTUH	11,100
<b>HEATING</b>		
Outside Air / Return Air CFM	SCFM	500 / 500
Outside Air Temp. DB / WB / RH / DP	°F / °F / % / °F	16.0 / 12.0 / 37.5 / -3.3
Return Air Temp. DB / WB / RH / DP	°F / °F / % / °F	70.0 / 58.5 / 50.2 / 50.6
Supply Air Temp. DB / WB / RH / DP	°F / °F / % / °F	71.9 / 56.6 / 37.6 / 44.7
Total Heating Capacity (less motor heat)	BTUH	44,000
Sensible Heating Capacity (less motor heat)	BTUH	30,200

### Alpha Aire Control Sequence

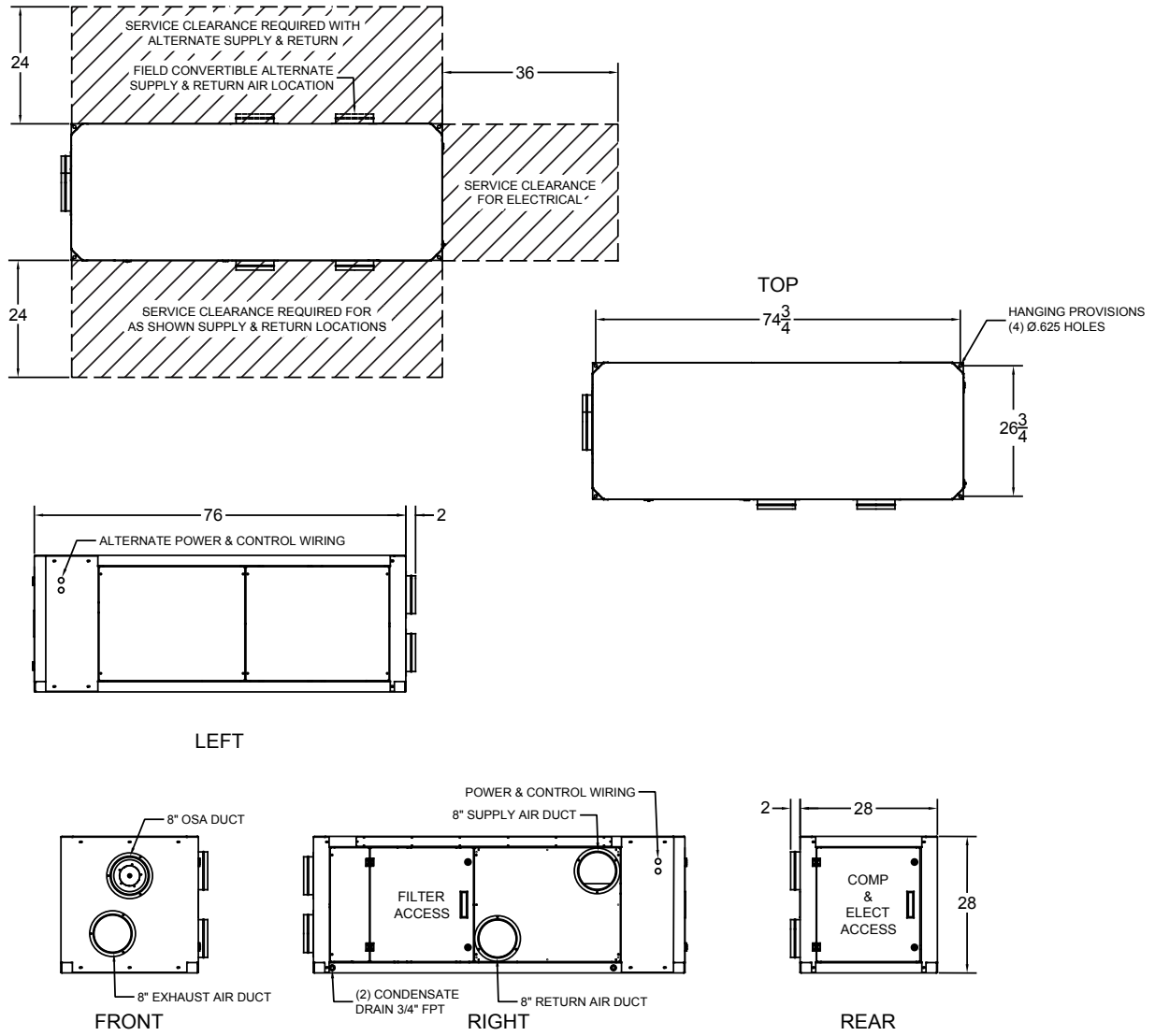
When the dry bulb at the unit's temperature sensor exceeds the dehumidification (cooling) set point, the compressor will be turned on with the reversing valve set in the dehumidification (cooling) position. The supply air will be conditioned by the enthalpy wheel and the refrigeration system.

When the dry bulb at the unit's temperature sensor 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.

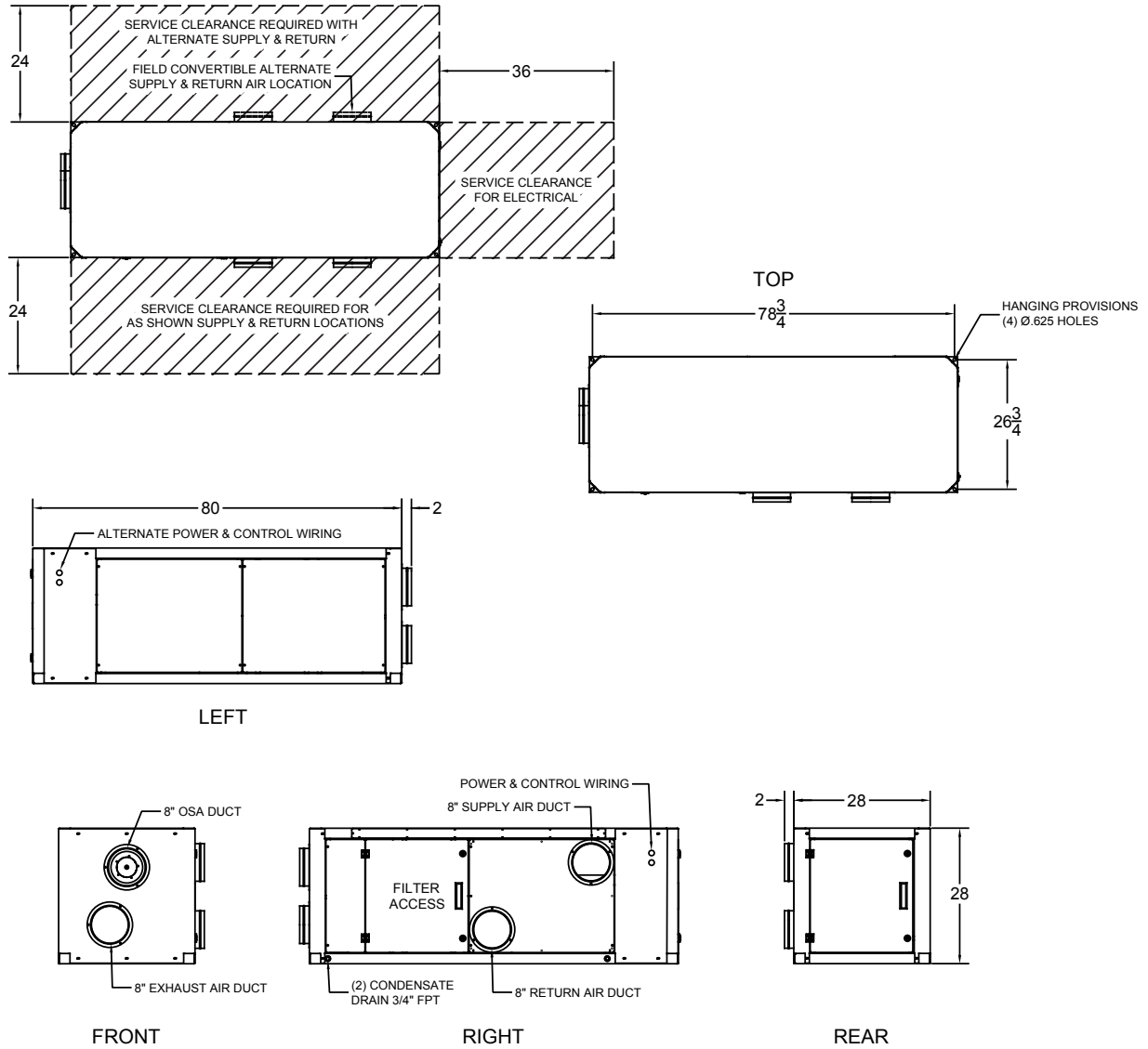
When the dry bulb at the unit's temperature sensor is between the dehumidification (cooling) and heating set points, the compressor will be turned off. The supply air will be conditioned only by the enthalpy wheel.

## Alpha Aire Drawing 100 Series



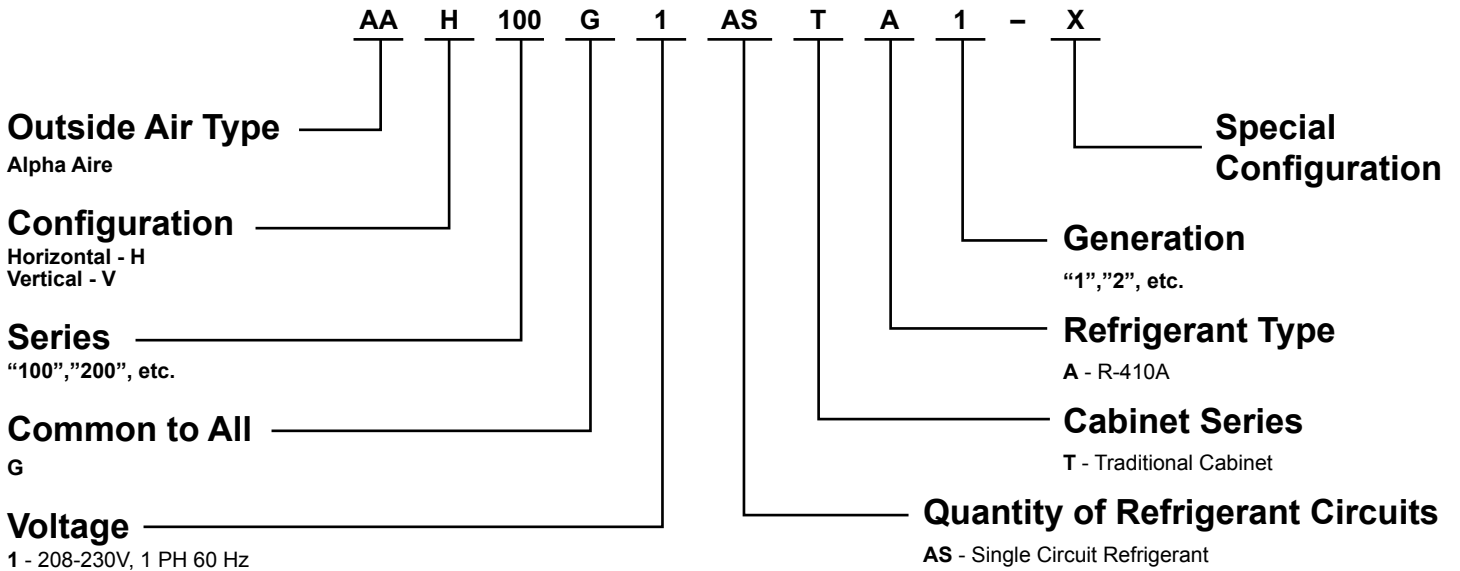
NOTES:  
UNIT MUST BE DROPPED TO REPLACE  
FANS, ERW & HEAT PLATE

## Alpha Aire Drawing 200 Series



NOTES:  
UNIT MUST BE DROPPED TO REPLACE  
FANS, ERW & HEAT PLATE  
200 SERIES DIMENSIONS

## Alpha Aire Basic Model Designation



### Noise Criterion Octave Band Center Frequency (Hz)

Noise Criterion	63	125	250	500	1000	2000	4000	8000
	Sound Pressure Levels (dB)							
NC-15	47	36	29	22	17	14	12	11
NC-20	51	40	33	26	22	19	17	16
NC-25	54	44	37	31	27	24	22	21
NC-30	57	48	41	35	31	29	28	27
NC-35	60	52	45	40	36	34	33	32
<b>Alpha Aire*</b>	<b>62.9</b>	<b>49.8</b>	<b>45.1</b>	<b>38</b>	<b>36.9</b>	<b>31.9</b>	<b>26.9</b>	<b>23.4</b>
NC-40	64	56	50	45	41	39	38	37
NC-45	67	60	54	49	46	44	43	42
NC-50	71	64	58	54	51	49	48	47
NC-55	74	67	62	58	56	54	53	52
NC-60	77	71	67	63	61	59	58	57
NC-65	80	75	71	68	66	64	63	62
NC-70	83	79	75	72	71	70	69	68

\*The sound pressure levels are calculated from tested sound power for Alpha Aire unit on a floor in a room with 15 foot critical absorption distance. Installation above an acoustic ceiling will cause actual and perceived sound levels to be different.





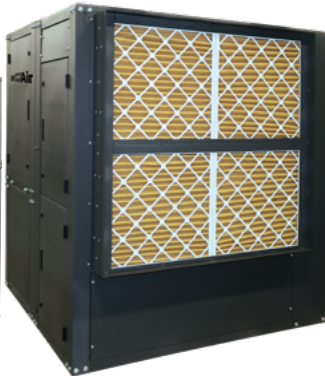
# Unique Solutions for All-Indoor HVAC Projects



**VertiCool Classic**  
Vertical, 3 - 30 Ton



**VertiCool Aurora**  
Vertical, 3 - 35 Tons



**VariCool®**  
VAV, 9 - 70 Tons



**VariCool® EZ-Fit**  
VAV, 12 - 90 Tons



**Alpha Aire**  
100 - 500 CFM



**Portable Cooling and Heating Units**  
3-30 Tons



**C13-Series Horizontal**  
2 - 10 Tons



**C-Series Horizontal**  
1 - 15 Tons  
Special Configuration  
Engineered to Order



**OmegaAir Horizontal and Vertical**  
100% Outside Air  
150 - 3000 CFM

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.



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