Marvair®
An ACS Brand



VANGUARD

AIR CONDITIONER & HEAT PUMP

PRODUCT DATA SHEET

2.5 to 5 Ton Cooling Capacity with 2-Stage Compressors

The Next Generation Vanguard air conditioners and heat pumps from Marvair are modular HVAC systems designed to provide heating, cooling, and outside fresh air for school classrooms. The units are installed in the classroom against an exterior wall. The vertical configuration minimizes the floor space occupied by the HVAC unit. This unique design makes it ideal for both new schools and for renovation of existing classrooms.

A full range of ventilation options – from the GreenWheel® ERV, to a ventilation damper - are offered to meet any climate or budget. A wide selection of architectural louvers provides the designer with unlimited styles and configurations to compliment the exterior of the school. The Vanguard unit can be controlled by a wall mounted thermostat or interfaced with an energy management system.

Vanguard air conditioners and heat pumps are available in cooling capacities from 2.5 to 5 tons with a 2-stage compressor (cooling only) as standard. Electric resistance or hot water is available as primary heat on the air conditioners and as second stage heat on the heat pump. All sizes are available for operation on 208/230 V. 1Ø or 3Ø and 460 V. 3Ø electrical supply. All models conform to UL/CSA standard 60335-1 and 60335-2-40 and listed by ETL.

Vanguard models are not intended for residential applications.

Features and Benefits

Ease of Installation

- *Modular construction for ease of upper floor installs*
- *Air box height clears window sills*
- *Can be installed as free blow or ducted*
- *No clearance needed for corner installation*
- *Internal Electric Heat*

Next Generation R-454B Refrigerant

- *78% Lower GWP than R-410A*
- *Non-Ozone Depleting Refrigerant*
- *Synthetic Lubricant*
- *Reduced Compressor Wear*

Rugged Cabinet Construction

- *Front doors constructed of double-wall 20 gauge galvanized steel*
- *Hinged doors with tamper resistant locks*
- *Non-Corrosive drain pans*

GreenWheel® Energy Recovery Ventilators (ERV)

- *Removes Both Moisture and Heat from the Incoming Air Stream*
- *Optimized for Hot Gas Reheat*

Intertek AHRI CERTIFIED® www.ahridirectory.org Designed, Engineered & Assembled In the USA

Service and Maintenance

All service and maintenance is performed from the front or side of the unit – there is no need to slide the unit away from the wall. The heavy duty hinged front panels open 180° to facilitate access to parts, air filters and controls. Both the indoor and outdoor coils are easily accessible for cleaning. All Vanguard classroom air conditioners and heat pumps are equipped with factory installed disconnects.

Rugged Cabinet Construction

The Vanguard internal structure consists of 16 gauge galvanized steel and the exterior cabinet is constructed of 20 gauge galvanized steel with a mark and scratch resistant finish. A corrosion-resistant drain pan is standard in all Vanguard units. Gray is the standard cabinet color, but other colors are available.

The hinged doors permit easy access to the filters and components for service and maintenance. Tamper resistant locks which require a special tool are standard.

Dehumidification Options

➤ Reheat Dehumidification

Vanguard heat pumps and air conditioners with hot gas reheat are complete factory assembled units designed to provide dehumidification of fresh air and room air. Hot gas reheat can be used with all configurations.

Hot gas reheat is controlled by an external humidity controller or BAS control. For optimum performance, hot gas reheat should be used in conjunction with the GreenWheel® ERV. When used with the motorized damper, hot gas reheat alone may not maintain satisfactory control of the humidity in the classroom over all outdoor conditions.

Operation - If the humidity rises above the set point on the dehumidistat and the temperature in the classroom is satisfied, both mechanical cooling and the HGR coil operate to temper the air and lower the humidity. If the temperature in the classroom rises above (or falls below) the set point of the thermostat and the unit is operating in the dehumidification mode, the call for cooling (or heating) will override the call for dehumidification and the reheat coil is disengaged until the thermostat is satisfied. This assures the environment temperature is maintained as first priority and humidity control is second. Note: Vanguard units with the hot gas reheat coil require a dehumidistat for proper operation. (See Optional Controls.)

Heat Options

Electric resistance or hot water heat is used as heat on air conditioners and to supplement the heat pump cycle when required.

➤ Electric Resistance Heat

Installs above the indoor air blowers inside the cabinet and is an integral part of the packaged unit. Refer to Model Identification table for available heat options.

➤ Hot Water Heat

Hot Water Heat Installed above the indoor air blowers inside the plenum. Hot water coil capacities for the Vanguard models are shown in the Hot Water Output data table. Hot water plenum ships loose. *See Field Installed Accessories*.

Corrosion Protection Options

➤ Coastal Installations

For installation in coastal areas where salt corrosion may be a problem, the Vanguard heat pumps and air conditioners may be ordered with a corrosion resistant coating on the outdoor coils or the entire outdoor section.

A Marvair® First – Factory Installed Economizer

Here's how the economizer works: On a signal from the wall mounted indoor thermostat that cooling is required, either mechanical cooling with the compressor or free cooling with the optional economizer is provided. A factory installed enthalpy controller determines whether the outside air is sufficiently cool and dry to be used for cooling. If suitable, the compressor is locked out and the economizer damper opens to bring in outside air. Integral pressure relief allows the interior air to exit the classroom, permitting outside air to enter the classroom. The temperature at which the economizer opens is adjustable from 63°F (17°C) at 50% Relative Humidity to 73°F (23°C) at 50% Relative Humidity. After the enthalpy control has activated and outside air is being brought into the building, the mixed air sensor measures the temperature of the air leaving the indoor blower and then modulates the economizer damper to mix the right proportion of cool outside air with warm indoor air to maintain 50-63°F (10 - 17°C) air being delivered to the building. The compressor is not permitted to operate when the economizer is functioning.

If the outside air becomes too hot or humid, the economizer damper closes completely, or to a field selectable minimum open position, and mechanical cooling is activated.

Ventilation Options

VANGUARD VENTILATION OPTIONS						
Model ID Pos. 13	**Intake Motor**	**Exhaust Motor**	**Intake Damper**	**Exhaust Damper**	**Intake Filter**	**Exhaust Filter**
A						
C	Variable Speed	Variable Speed	Actuator (On/Off)	Actuator (On/Off)	Washable	Washable
E	Variable Speed	Variable Speed	Actuator (On/Off)	Actuator (On/Off)	Washable	Washable
H	Variable Speed	Variable Speed	Actuator (On/Off)	Actuator (On/Off)	Washable	Washable

➤ Configuration "A": Blank-Off Plate

No ventilation. No introduction of outside air.

➤ Configuration "C": Economizer

The economizer reduces the cost of air conditioning by using outside air when acceptable to cool the room (Free Cooling). The factory installed Marvair® economizer has integral pressure relief. When used with minimum position potentiometer (optional), the Marvair® economizer can meet requirements of ASHRAE Std. 62.1.

➤ Configuration "E": Motorized Fresh Air Damper w/Pressure Relief & Independent Control

This ventilation option allows the user to set the desired outside air intake from fully closed to fully open with independently adjusting intake and exhaust air movers and positive shut off with spring return dampers." The PLC allows the position of the "E" damper to be set for desired outside air intake from fully closed to fully open. Setting 15 of the control board configuration menu allows the user to set the position from 20 (2VDC / Closed) to 100 (10VDC 100% open). The damper position can be adjusted in 1VDC increments to any position from closed to 100% open as required. *Operation:* Upon a "Call for Motorized damper" via a 24V signal from an external user-installed device, the motorized damper opens to the position selected in the PLC configuration menu setting 15 and the indoor blower operates. A 24VAC signal {sourced from LVTB 24VAC "R" and supplied through a user-provided Normally Open (NO) contact} activates (opens) the Motorized Damper and connected Relief Damper. When the 24VAC signal is removed, the motorized damper spring returns to the fully closed position and the indoor blower stops operation. The motorized damper Does NOT open when there is a call for the indoor fan (G). This operation can be automatically controlled or manually controlled by a 24v AC signal."

Note: This circuit does not interrupt the compressor or heater operation.

➤ Configuration "H": GreenWheel® ERV Energy Recovery Ventilator

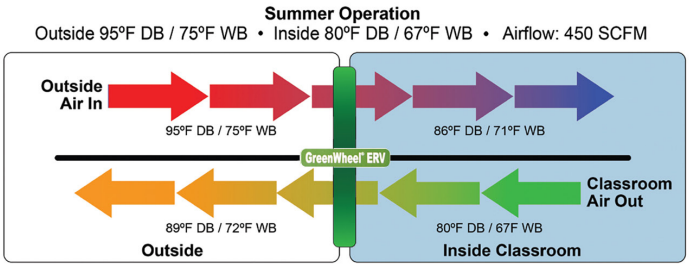
Allows independent control of the exhaust and intake blowers. When used, the standard speed controller operates the intake blower and the optional second controller, the exhaust blower. Individual blower control allows positive pressurization of the classroom. Field or factory installed.

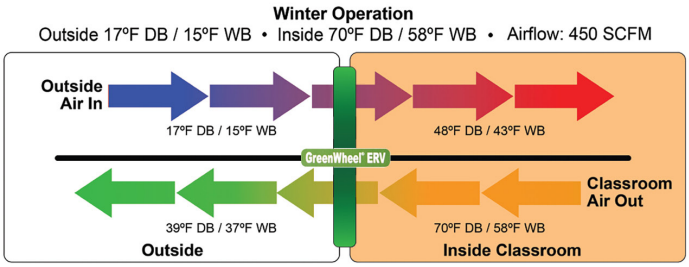
The Marvair GreenWheel® ERV is a total energy (both sensible and latent) wheel that reduces both construction and operating cost while ventilating the classroom to ASHRAE 62-1999 requirements. The use of the GreenWheel ERV reduces the energy load of the outside air. Exhausting stale, inside air keeps indoor pollutants and harmful gases to a minimum. The Marvair GreenWheel ERV has been tested and certified according to ARI Standard 1060.

How It Works - During the summer, cool dry air from the classroom is exhausted through the GreenWheel ERV to the outside. As the air passes through the rotating wheel, the desiccant becomes cooler and drier. Simultaneously, hot humid air is being pulled across the rotating wheel. The cool, dry desiccant absorbs moisture and heat from the incoming air. The cooler, drier air is mixed with the return air from the classroom and distributed throughout the room.

In the winter, warm moist air is exhausted through the GreenWheel ERV to the outside. As the air passes through the rotating wheel, the desiccant becomes warmer and absorbs moisture. Simultaneously, cold dry air is being pulled across the rotating wheel. The cold, dry air absorbs heat and moisture from the desiccant. The warmed air is mixed with the return air from the classroom and distributed throughout the room.

Quality Components - The GreenWheel ERV Ventilation package consists of the GreenWheel cassette, an incoming air blower, an exhaust air blower, an air filter for the incoming air and one fan speed controller that controls the speed of both blower motors simultaneously. As an option, a second fan speed controller can be factory installed for independent control of the exhaust air motor and positive pressurization of the classroom. Also, an optional filter on the exhaust air is available on selected models. Please consult your Marvair representative for details. The two blowers simultaneously pull fresh air from outside and exhaust air from the classroom through the rotating wheel. The air streams are separated by an insulated partition so that the incoming fresh air is not mixed with the exhaust air. Two variable speed blowers ensure that up to 450 CFM of outside air can be brought into the room and the indoor air is properly exhausted. Variable speed blowers permit that the desired quantity of outside air is delivered into the room. Optional independent exhaust air blower control allows positive pressurization of the classroom, i.e., more outside air can be introduced through the GreenWheel ERV than is exhausted.





GreenWheel® Energy Recovery Ventilator Performance

SCFM* of Outside Air	Energy Conserved, BTUH					
	95° DB/73° WB Outside • 80° DB/67° WB Inside			95° DB/80° WB Outside • 80° DB/67° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total
225	2,900	1,100	4,000	2,900	6,400	9,300
250	3,100	1,200	4,300	3,100	6,900	10,000
325	3,700	1,400	5,100	3,700	8,100	11,800
400	4,200	1,500	5,700	4,200	9,100	13,300
450	4,500	1,600	6,100	4,500	9,700	14,200

SCFM* of Outside Air	Energy Conserved, BTUH								
	90° DB/74° WB Outside • 75° DB/64° WB Inside			80° DB/70° WB Outside • 75° DB/64° WB Inside			60° DB/54° WB Outside • 70° DB/58° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
225	2800	3600	6400	900	2800	2700	1900	200	2100
250	3000	3800	6800	1000	3000	4000	2000	200	2200
325	3600	4500	8100	1200	3500	4700	2400	200	2600
400	4100	4900	9000	1400	3800	5200	2700	300	3000
450	4300	5200	9500	1400	4000	5400	2900	300	3200

SCFM* of Outside Air	Energy Conserved, BTUH								
	40° DB/36° WB Outside • 70° DB/58° WB Inside			20° DB/18° WB Outside • 70° DB/58° WB Inside			0° DB/7° WB Outside • 70° DB/58° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
225	5600	3300	8900	9300	4900	14200	13000	5700	18700
250	6000	3600	9600	10000	5300	15300	14000	6100	14100
325	7200	4200	11400	12000	6200	18200	16700	7100	23800
400	8100	4600	12700	13500	6800	20300	18900	7900	26800
450	8600	4800	13400	14400	7100	21500	20100	8200	28300

*SCFM = Standard Cubic Feet per Minute
For performance of the GreenWheel® ERV at conditions other than those shown, please contact your Marvair® representative or the factory.

For performance of the GreenWheel ERV at conditions other than those shown, please contact your Marvair representative or the factory.

A2L Mitigation

Room Size Limit

Vanguard Heat Pumps	VAH2030 (Std.)	VAH2030 (HGR)	VDH2036 (Std.)	VDH2036 (HGR)	VDH2040 (All)	VDH2048 (All)	VAH2060 (All)
Refrigerant Charge (oz.)	190	212	190	212	190	190	190
Minimum Room Size (ft²)	186.5	208.1	186.5	208.1	186.5	186.5	186.5
Minimum Supply Height (ft)	6.9	6.9	6.9	6.9	6.9	6.9	6.9
HGR = Hot Gas Reheat							

Due to the mildly flammable classification of R454B it is important to verify that the room exceeds the minimum room size. See chart on pages 9 and 14. If the unit is ducted and supplies multiple rooms then the total area of all rooms being supplied is used. In addition to the room area restrictions, every unit is equipped with an R454B refrigerant leak detection system.. Once the unit is installed it must be powered, at all times, except for service. During normal operation the leak detection system has no impact on the operation of the unit, however upon detection of R-454B refrigerant all operations are stopped except for the indoor blower. The unit will then re-circulate air in the room for a minimum of 5 minutes. Once the 5 minutes have expired and the concentration of the refrigerant is below 10 percent of the Lower Flammability Limit (LFL) the unit will be allowed to operate as normal. If the concentration of the refrigerant remains above 10 percent of the LFL the unit will remain in re-circulation mode. To verify actuation of mitigation simply unplug one of the sensors and the system should stop all operation except for the indoor blower. There is no need to calibrate or service the sensor. The sensor will provide an alarm upon failure or end of life. The sensor must be replaced with an identical sensor, or a manufacturer approved alternative.

Thermostat/Controllers

➤ **Thermostats and Controllers for Marvair Vanguard Heat Pumps and Air Conditioners**
See the *Marvair Thermostats and Controllers Product Data Sheet* for more information.

Vanguard Standard Controls

➤ **High Pressure and Loss of Charge (HP) or Low Pressure (A/C) Switches**
Includes a lockout relay.

➤ **PLC Controller**
The PLC is a factory installed Programmable Logic Controller. LED indicator lights show operational status and provide assistance with diagnosis if troubleshooting is ever required. The controller can perform extensive self diagnosis to assess the operational status and indicate a fault when detected. The controller can be programmed remotely or with a removable program storage device.
The controller in the Vanguard heat pumps and air conditioners improves reliability due to a reduction of components and simplification of control panel wiring and can interface with a Building Automation System (BAS) and various ventilation operations.

➤ **Defrost Cycle - Based Upon Time and Temperature**
The time interval can be adjustable from 30 to 90 minutes in one minute increments. The control system initiates a defrost cycle only if the outdoor coil temperature is 28°F or below. (heat pump only) Based upon time and temperature.

➤ **Anti-short Cycle Timer**
Prevents the compressor's motor windings and starting controls from destructive overheating. The time interval is adjustable from three to eight minutes.

➤ **EMS Control Relay (24V only)**
Provides a 24 VAC coil to control operation from a Building Automation System.
Note: An additional EMS control relay can be added when 120 or 240 VAC coils are required.

➤ **Outdoor Thermostat**
Prevents second stage heat (electric or hot water) from operating above desired outdoor temperature set point and can be set to activate second stage heat while disabling the compressor below desired outdoor temperature. (heat pump only)

➤ **Electric Heat Control**
Controls operation of electric heat and allows either simultaneous or non-simultaneous operation of electric heat and the compressor (heat pump only).

➤ **Ventilation Control**
QUIET ZONE
The fresh air damper with PowerVent and GreenWheel® ERV ventilation options are equipped with a Fresh Air Fan Speed Control. The fresh air fan controls the ventilation intake blower together, supplying up to 450 CFM of outside air if/when desired.

➤ **Indoor Blower Fan Speed Controller**
Allows field calibration of the indoor blower to minimize sound levels for specific installations.

➤ **Phase Monitor**
Monitors 3ø power supply and will not allow the unit to operate if the power supply is not properly phased. Not available on 1ø units.

➤ **Condensate Float Switch**
Shuts down the Vanguard unit in the event of a clogged condensate drain.

Other Options

➤ **Anti-Microbial Light**
A germicidal UV light destroys toxic bacteria, viruses and mold on the indoor air coil.



Bi-Polar Ionization

➤ **Bi-Polar Ionization**
Installed inside the Vanguard unit, this device neutralizes odors, kills mold, bacteria and viruses. It also helps to control allergens*, asthma*, smoke and airborne particles.
*These statements are based on customer testimonials and have not been evaluated by the FDA.

➤ **MERV 11 or 13 Return Air Filters**
Factory installed two inch (51 cm) MERV 11 or 13 filters. Ultra high filtration material that removes most airborne mold, spores and dust. Replaces standard MERV 8 return air filters.

➤ **Condensate Pan Heater**
To be ordered when outdoor temperatures get below freezing, and unit will be in operation.

➤ Protective Coating Packages

Coated Coils: Either the condenser or evaporator coil can be coated. For harsh conditions where the unit will be exposed to salt water, the coils should be coated.

Coastal Environmental Package: This package includes:

- Corrosion resistant fasteners,
- Coated condenser motor, motor bracket and condenser fan,
- Insitu coating applied to all exposed internal copper and metal in the in the condenser section, and
- A protective coating on the condenser coil.

Field Installed Accessories

Note: Color must be specified when ordering certain accessories. "*-XXX*" in the Part Number indicates color.
100 = Marvair Beige | *200* = Gray | *400* = White

➤ Trim Piece

The trim piece provides a color coordinated panel between the cabinet and the wall and is used to conceal a gap when the Vanguard unit with the minimum depth Wall Sleeve is deeper than the wall. Built in the same color as the cabinet and in various widths. Trim pieces provide a finished appearance and cover any space between the back of the cabinet and the wall. Each Trim Piece is 5 feet long and each Vanguard unit requires 4 kits per unit for a 10 foot ceiling. See Dimensional Drawings.

Description	Part Number
6" Trim Piece Kit	M/06662-XXX
8" Trim Piece Kit	M/04054-XXX
9" Trim Piece Kit	M/04055-XXX
12" Trim Piece Kit	M/04056-XXX
15" Trim Piece Kit	M/04057-XXX

Contact your Marvair sales representative if special dimensions are required

➤ Base Stand

A Base Stand matches the Vanguard cabinet and raises it off the floor to align the wall sleeve to different window sill heights. The Base Stand is available in several colors to match the color of the unit.

Description	Part Number
2" Base Stand	S/12822-XXX
3" Base Stand	S/13330-XXX
4" Base Stand	S/12792-XXX
5" Base Stand	S/12793-XXX

➤ Condensate Pan Freeze Protection

To prevent freezing of water in the condensate lines and in the drain pans, this kit should be installed in locales subject to freezing temperatures. The kit includes a heater for the outdoor condensate pan..... K/40184

➤ Wall Sleeve

Sheet metal panel assembly to transition from Vanguard unit and outdoor louver.

Description	Part Number
46"H x 44"W x 7-13"D	S/13328-XXX
46"H x 36"W x 8-13"D	S/13340-XXX
44"H x 44"W x 7-13"D	S/13343-XXX

➤ Outdoor Louver

Aluminum louver for covering the outside wall opening. Available in dark bronze or clear anodized. Exterior louver includes 1/2" x 1/2" bird screen. Standard offering is clear anodized; for dark bronze add "-BRZ" to the end of the part number. See Dimensional Drawings.

Description	Part Number
46"H x 44"W Outdoor Louver	93206
44"H x 44"W Outdoor Louver	93611

➤ Add-On Louver

To be used with 5" deep wall sleeve. Outdoor louver (above) must also be ordered for new installations, or if the existing louver is going to be replaced (Field installed - does not include actual louver)..... 93615

➤ Plenum Options

Freeblow Plenum: Mounts to the top of the Vanguard unit to direct airflow into the classroom when a ducted installation is not required. Freeblow plenum is of double wall construction with a perforated inner panel. Insulation is sandwiched between the two panels. The front grille has individually adjustable louvers which provide a full range of airflow direction. Two side supply grilles with louvers enhance the air flow in the classroom. All grilles have a clear brushed aluminum finish to be used with Vanguard units with no heat or electric resistance heat. Grills are to be ordered separately. See Dimensional Drawings.

Description	Part Number
8" Freeblow Plenum (Insulated With Double Wall and Solid Inner Panel)	S/13307-XXX
10" Freeblow Plenum (Insulated With Double Wall and Solid Inner Panel)	S/13309-XXX
12.5" Freeblow Plenum (Insulated with Double Wall and Perforated Inner Panel)	S/12772-XXX

Ducted Plenum: Ducted plenum mounts to the top of the Vanguard unit. They allow for ductwork to be connected directly to the Ducted Plenum. This Allows for easy installation of duct work using a flanged rectangular opening on the top of the plenum. They are of a double wall construction, with the inner panel being a solid sheet of galvanized. Insulation is sandwiched between the two panels.

Description	Part Number
8" Ducted Plenum	S/13306-XXX
10" Ducted Plenum	S/13308-XXX
12.5" Ducted Plenum	S/13310-XXX

➤ Freeblow Plenum Supply Grilles

The frame and blades are 6063 extruded aluminum alloy with a 2000-R1 satin anodized finish. To eliminate corrosion and vibration, the frame is separated from the blade with injection molded bushings. All blades are air foil in design and are individually adjustable. A specially engineered channel on the outside of the frame holds an extruded flexible vinyl bulb gasket that produces a positive air seal at the mounting surface.

Plenums include grilles. Grilles are not to be ordered separately.

➤ Hot Water Plenum Supply Grilles

Included with the optional Hot Water Plenum.

➤ Freeblow and Ducted Plenum Extender

A Freeblow Plenum Extender is used when the Vanguard unit and Freeblow Plenum combination doesn't reach the ceiling height of the classroom and a "column" floor to ceiling appearance is desired.

Description	Part Number
2" Freeblow Plenum Extender	S/12850-XXX
5" Freeblow Plenum Extender	S/12807-XXX
6" Freeblow Plenum Extender	S/12773-XXX
7" Freeblow Plenum Extender	S/12809-XXX
8" Freeblow Plenum Extender	S/12810-XXX
9" Freeblow Plenum Extender	S/12811-XXX
10" Freeblow Plenum Extender	S/12812-XXX
11" Freeblow Plenum Extender	S/12813-XXX
12" Freeblow Plenum Extender	S/12814-XXX
13" Freeblow Plenum Extender	S/12815-XXX
16" Freeblow Plenum Extender	S/12816-XXX

Model Identification

Example	V	D	H	2	0	4	8	A	D	0	5	0	H	G	+	+	+	F	C	A	+	E	1	1	2	A	+	+	A	+
Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

1	Unit Designation/Family	**V** = Marvair Vanguard Classroom Unit
2	Energy Efficiency Ratio (EER)	**A** = 11 EER **D** = 12+ EER
3	Refrigerant Type	**H** = R-454B
4	Compressor Type/Quantity	**2** = Staged/Step
5 **6** **7**	Unit Capacity/Nominal Cooling (BTUH)	**030** = 30,000 **048** = 48,000 **036** = 36,000 **060** = 60,000 **040** = 40,000
8	System Type	**A** = Air Conditioner **H** = Heat Pump
9	Power Supply (Volts-Hz-Phase)	**A** = 208/230-60-1 **C** = 208/230-60-3 **D** = 460-60-3
10 **11** **12**	Heat Designation @ Rated Voltage **KW** = Kilowatt	**000** = No Heat **100** = 10KW **045** = 4.5KW **120** = 12KW **050** = 5KW **150** = 15KW **060** = 6KW **990** = Hot Water Plenum **080** = 8KW **090** = 9KW
13	Ventilation Configuration	**A** = No Ventilation **C** = Economizer **E** = Adjustable Fresh-Air w/Powered Pressure Relief & Independent Control **H** = GreenWheel® ERV
14	Dehumidification	**G** = Hot Gas Reheat **R** = Electric Reheat **+** = None
15	Controls	**H** = PLC w/BACnet (STD)
16	Operating Condition	**Z** = Low Ambient w/CCH & EFS **+** = None
17	Indoor Air Quality Features	**A** = UV Light **D** = Dry Bulb Sensor **E** = Dry Bulb Sensor w/Dirty Filter **G** = Dirty Filter Sensor **K** = Bi-Polar Ionization **N** = Condenser Drain Pan Heater **+** = None
18	Air Flow	**C** = Top Supply/Front Door Return **F** = Top Supply/Side Return (STD)
19	Compressor Location	**C** = Center
20	Filter Option	**A** = 2" Pleated (MERV 8, AC/HP-C) **C** = 2" Charcoal **D** = MERV 11 High Filtration Package **E** = MERV 13 High Filtration Package **+** = None
21	Corrosion Protection	**A** = Condenser Coil Only **C** = Evaporator Coil Only **D** = Both Coils Condenser & Evaporator **E** = All Coils Cond/Evap/Reheat **F** = Coat All **G** = Coastal Package & Evaporator Coil **K** = Coastal Package **+** = None **$** = Special
22 **23**	Engineering Revision Level	**E1** = Vanguard
24	Cabinet Color	**1** = Marvair Beige **2** = Gray (STD) **4** = White **$** = Custom Color (Powder Coat)
25	Sound Attenuation	**2** = Compressor Blanket
26	Security Option	**A** = Lockable Access Plate/Tamper Proof
27	Fastener/Drain Pan Option	**+** = None **$** = Special
28	Miscellaneous	**+** = To be used when 44x46 Wall Sleeve is used (S/13328-COLOR) **%** = To be Used When 44x36 Wall Sleeve ils Used (Part # TBD) **$** = To be Used When 46x34 Wall Sleeve is Used (Part # TBD) **/** = To be Used When Offset Wall Sleeve is Used (Part # TBD)
29	Miscellaneous II	**B** = Ball Valves **$** = Special
30	Special Variation	**+** = None **$** = Special Configuration Not Covered by Model Nomenclature

Note: Not all options are available with all configurations. Contact your Marvair sales representative for configuration details and feature compatibility.

VANGUARD VAH/VDH HEAT PUMPS WITH 2-STAGE COMPRESSOR

Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390

Model Number	VAH2030H			VDH2036H			VDH2040H			VDH2048H			VAH2060H		
	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D
Cooling BTUH[1] - 2nd Stage	30,000			36,000			42,000			48,000			57,000		
EER[2] - 2nd Stage	11			11			13			13			11.5		
Integrated Part Load Value[3]	14			15.5			16.4			15.5			14.2		
High Temperature Heating[4]	25,000			32,000			36,000			42,000			50,000		
High Temperature COP[5]	3.3			3.3			3.3			3.3			3.3		
Rated Indoor Air Flow (CFM[6,7])	1,025			1,200			1,300			1,525			1,700		
Rated Outdoor Air Flow[7]	2,800			2,800			2,800			2,800			3,000		

[1]Cooling rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air. [2]EER=Energy Efficiency Ratio [3]Integrated Part Load Value is an integrated efficiency measure from 1st and 2nd stage capacity modulation. [4]High Temperature Heating & [5]COP is rated at 47°F DB/43°F WB (8.3°C DB/6.1°C WB) outdoor and 70°F (21.1°C) return air. [5]COP=Coefficient of Performance [6]CFM=Cubic Feet per Minute [7]ECM Motor Set Point Ratings are at 230 volts for 208/230 volt units ("A" & "C" models) and 460 volts for "D" models. Operation of units at a different voltage from that of the rating point will affect performance and air flow.

Sensible Total Heat Ratio @ 95ºF (35ºC) Outside Air DB

Model Number	VAH2030H			VDH2036H			VDH2040H			VDH2048H			VAH2060H		
	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D
Total Capacity	30,000			36,000			42,000			48,000			57,000		
Sensible Heat Ratio	0.72			0.72			0.69			0.71			0.68		
Sensible Capacity	21,500			26,000			28,800			34,100			38,600		
Rated Air Flow (CFM[1])	1,025			1,200			1,300			1,525			1,700		

[1]CFM=Cubic Feet per Minute
Sensible Heat Ratios based upon ANSI/AHRI std. 390 outdoor conditions of 95°F (35°C) outdoor and 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air.

Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature								
	75ºF (24ºC)	80ºF (27ºC)	85ºF (30ºC)	90ºF (32ºC)	95ºF (35ºC)	100ºF (38ºC)	105ºF (41ºC)	110ºF (43ºC)	115ºF (46ºC)
VAH2030H	34,800	33,600	32,400	31,200	30,000	28,800	27,600	26,400	25,800
VDH2036H	41,760	40,320	38,880	37,440	36,000	34,560	33,120	31,680	30,960
VDH2040H	48,720	47,040	45,360	43,680	42,000	40,320	38,640	36,960	36,120
VDH2048H	55,680	53,760	51,840	49,920	48,000	46,080	44,160	42,240	41,280
VAH2060H	66,120	63,840	61,560	59,280	57,000	54,720	52,440	50,160	49,020

Based upon ANSI/AHRI std. 390 return air conditions of 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air at rated air flow.

Heating Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature													
	0ºF (-17.8ºC)	5ºF (-15ºC)	10ºF (-12.2ºC)	15ºF (-9.4ºC)	20ºF (-6.7ºC)	25ºF (-3.9ºC)	30ºF (-1.1ºC)	35ºF (1.7ºC)	40ºF (4.4ºC)	45ºF (7.2ºC)	47ºF (8.3ºC)	50ºF (10ºC)	55ºF (12.8ºC)	60ºF (15.6ºC)
VAH2030H	10,500	12,000	13,500	15,000	16,500	18,000	19,500	21,000	22,500	24,000	25,000	25,500	27,000	28,500
VDH2036H	13,440	15,360	17,280	19,200	21,120	23,040	24,960	26,880	28,800	30,720	32,000	32,640	34,560	36,480
VDH2040H	15,120	17,280	19,440	21,600	23,760	25,920	28,080	30,240	32,400	34,560	36,000	36,720	38,880	41,040
VDH2048H	17,640	20,160	22,680	25,200	27,720	30,240	32,760	35,280	37,800	40,320	42,000	42,840	45,360	47,880
VAH2060H	21,000	24,000	27,000	30,000	33,000	36,000	39,000	42,000	45,000	48,000	50,000	51,000	54,000	57,000

Based upon AHRI 390 Return Air of 70°F (21.1°C) Dry Bulb / 60°F (15.6°C) Wet Bulb.

Electrical Characteristics -
Compressor, Fan, Ventilation & Blower Motors - VAH/VDH Heat Pumps

Basic Model Number	Compressor			Other Motors	Outdoor Fan			Indoor Blower (ECM)			Energy Recovery Ventilator	
											GreenWheel	
	Volts-Hz-Ph	RLA[1]	LRA[2]	Volts-Hz-Ph	RPM[3]	FLA[4]	HP[5]	RPM[3]	FLA[4]	HP[5]	Amps	
											OAM[6]	EXM[7]
VAH2030HA	208/230-60-1	14.6	82.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036HA	208/230-60-1	14.6	90.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040HA	208/230-60-1	18.2	106.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048HA	208/230-60-1	20.1	141.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060HA	208/230-60-1	25.2	147.3	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2030HC	208/230-60-3	7.9	66.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036HC	208/230-60-3	9.9	82.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040HC	208/230-60-3	11.5	114.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048HC	208/230-60-3	11.1	117.7	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060HC	208/230-60-3	13.8	150.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2030HD	460-60-3	4.8	39.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036HD	460-60-3	4.8	44.3	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040HD	460-60-3	6.5	56.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048HD	460-60-3	6.6	51.5	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060HD	460-60-3	6.9	58.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8

[1]RLA = Rated Load Amps [2]LRA = Locked Rotor Amps [3]RPM = Revolutions per Minute [4]FLA = Full Load Amps
[5]HP = Horsepower [6]OAM - Outside Air Motor [7]EXM-Exhaust Air Motor
The 460 volt units have a step down transformer for the 230 volt motors.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) VAA/VDA Heat Pumps with 2-Stage Compressor & Ventilation Configurations - ("A") No Ventilation

Electric Heat		0 kW	0 kW	4.5 kW	4.5 kW	5.0 kW	5.0 kW	6.0 kW	6.0 kW	8.0 kW	8.0 kW	9.0 kW	9.0 kW	10.0 kW	10.0 kW	12.0 kW	12.0 kW	15.0 kW	15.0 kW
Basic Model	Volts-Hz-Ph	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
VAH2030HA	208/230-60-1	24.3	35			50.3	60			65.9	70			76.3	80				
VDH2036HA	208/230-60-1	24.3	35			50.3	60			65.9	70			76.3	80				
VDH2040HA	208/230-60-1	36.3	50			62.3	70			77.9	80			88.3	90				
VDH2048HA	208/230-60-1	38.6	50			64.7	70			80.3	90			90.7	100				
VAH2060HA	208/230-60-1	45.0	70			71.0	90			86.7	100			97.1	110				
VAH2030HC	208/230-60-3	15.9	20	29.4	30			33.9	35			42.9	45			52.0	60	61.0	70
VDH2036HC	208/230-60-3	18.4	25	31.9	35			36.4	40			45.4	50			54.5	60	63.5	70
VDH2040HC	208/230-60-3	27.9	35	41.4	50			45.9	50			54.9	60			64.0	70	73.0	80
VDH2048HC	208/230-60-3	27.4	35	40.9	45			45.4	50			54.4	60			63.5	70	72.5	80
VAH2060HC	208/230-60-3	30.8	40	44.3	50			48.8	50			57.8	60			66.8	70	75.9	80
VAH2030HD	460-60-3	9.0	15	15.8	20			18.0	20			22.5	25			27.0	30	31.6	35
VDH2036HD	460-60-3	9.0	15	15.8	20			18.0	20			22.5	25			27.0	30	31.6	35
VDH2040HD	460-60-3	14.9	20	21.6	25			23.9	25			28.4	30			32.9	35	37.4	40
VDH2048HD	460-60-3	15.0	20	21.8	25			24.0	25			28.5	30			33.0	35	37.6	40
VAH2060HD	460-60-3	15.4	20	22.1	25			24.4	25			28.9	30			33.4	35	37.9	40

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry MCA & MFS are calculated at 230 volts on the "A" & "C" models. The 460 volts "D" models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

1. MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.
3. While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) – VAA/VDA Heat Pumps with 2-Stage Compressors & Ventilation Configurations -

("C") Economizer

("E") Adjustable Fresh-Air w/Powered Pressure Relief & Independent Control

("H") GreenWheel® Energy Recovery Ventilator

Electric Heat		0 kW	0 kW	4.5 kW	4.5 kW	5.0 kW	5.0 kW	6.0 kW	6.0 kW	8.0 kW	8.0 kW	9.0 kW	9.0 kW	10.0 kW	10.0 kW	12.0 kW	12.0 kW	15.0 kW	15.0 kW
Basic Model	Volts-Hz-Ph	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
VAH2030HA	208/230-60-1	29.9	40			55.9	60			71.5	80			81.9	90				
VDH2036HA	208/230-60-1	29.9	40			55.9	60			71.5	80			81.9	90				
VDH2040HA	208/230-60-1	41.9	60			67.9	80			83.5	90			93.9	100				
VDH2048HA	208/230-60-1	44.2	60			70.3	80			85.9	90			96.3	100				
VAH2060HA	208/230-60-1	50.6	70			76.6	90			92.3	100			102.7	110				
VAH2030HC	208/230-60-3	21.5	25	35.0	40			39.5	40			48.5	50			57.6	60	66.6	70
VDH2036HC	208/230-60-3	24.0	30	37.5	40			42.0	45			51.0	60			60.1	70	69.1	70
VDH2040HC	208/230-60-3	33.5	40	47.0	50			51.5	60			60.5	70			69.6	70	78.6	80
VDH2048HC	208/230-60-3	33.0	40	46.5	50			51.0	60			60.0	60			69.1	70	78.1	80
VAH2060HC	208/230-60-3	36.4	50	49.9	60			54.4	60			63.4	70			72.4	80	81.5	90
VAH2030HD	460-60-3	11.8	15	18.6	20			20.8	25			25.3	30			29.8	30	34.4	35
VDH2036HD	460-60-3	11.8	15	18.6	20			20.8	25			25.3	30			29.8	30	34.4	35
VDH2040HD	460-60-3	17.7	20	24.4	25			26.7	30			31.2	35			35.7	40	40.2	45
VDH2048HD	460-60-3	17.8	20	24.6	25			26.8	30			31.3	35			35.8	40	40.4	45
VAH2060HD	460-60-3	18.2	25	24.9	30			27.2	30			31.7	35			36.2	40	40.7	45

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the "A" & "C" models. The 460 volts "D" models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

1. MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.
3. While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

Unit Load Amps (Heating) - VAH/VDH Heat Pumps

Electric Heat				Heat Pumps[1] (Amps)		Load Of Resistive Heating Element								Total Maximum Heating[2] (Electrical)													
														Ventilaiton Configuration “A”								Ventilation Configuration “C, E, H”							
				Ventilation Configuration		Heating Element (kW)								Heating Element (kW)								Heating Element (kW)							
Model	RLA	ID MTR	OTD MTR	A	C, E, H	4.5	5	6	8	9	10	12	15	4.5	5	6	8	9	10	12	15	4.5	5	6	8	9	10	12	15
VAH2030HA	14.6	2.5	3.5	20.6	26.2		20.8		33.3		41.7				41.4		53.9		62.3				47.0		59.5		67.9		
VDH2036HA	14.6	2.5	3.5	20.6	26.2		20.8		33.3		41.7				41.4		53.9		62.3				47.0		59.5		67.9		
VDH2040HA	18.2	5.0	3.5	26.7	32.3		20.8		33.3		41.7				47.5		60.0		68.4				53.1		65.6		74.0		
VDH2048HA	20.1	5.0	3.5	28.6	34.2		20.8		33.3		41.7				49.4		61.9		70.3				55.0		67.5		75.9		
VAH2060HA	25.2	5.0	3.5	33.7	39.3		20.8		33.3		41.7				54.5		67.0		75.4				60.1		72.6		81.0		
VAH2030HC	7.9	2.5	3.5	13.9	19.5	10.8		14.4		21.7		28.9	36.1	24.7		28.3		35.6		42.8	50.0	30.3		33.9		41.2		48.4	55.6
VDH2036HC	9.9	2.5	3.5	15.9	21.5	10.8		14.4		21.7		28.9	36.1	26.7		30.3		37.6		44.8	52.0	32.3		35.9		43.2		50.4	57.6
VDH2040HC	11.5	5.0	3.5	20.0	25.6	10.8		14.4		21.7		28.9	36.1	30.8		34.4		41.7		48.9	56.1	36.4		40.0		47.3		54.5	61.7
VDH2048HC	11.1	5.0	3.5	19.6	25.2	10.8		14.4		21.7		28.9	36.1	30.4		34.0		41.3		48.5	55.7	36.0		39.6		46.9		54.1	61.3
VAH2060HC	13.8	5.0	3.5	22.3	27.9	10.8		14.4		21.7		28.9	36.1	33.1		36.7		44.0		51.2	58.4	38.7		42.3		49.6		56.8	64.0
VAH2030HD	4.8	1.3	1.8	7.8	10.6	5.4		7.2		10.8		14.4	18.0	13.2		15.0		18.6		22.2	25.8	16.0		17.8		21.4		25.0	28.6
VDH2036HD	4.8	1.3	1.8	7.8	10.6	5.4		7.2		10.8		14.4	18.0	13.2		15.0		18.6		22.2	25.8	16.0		17.8		21.4		25.0	28.6
VDH2040HD	6.5	2.5	1.8	10.8	13.6	5.4		7.2		10.8		14.4	18.0	16.2		18.0		21.6		25.2	28.8	19.0		20.8		24.4		28.0	31.6
VDH2048HD	6.6	2.5	1.8	10.9	13.7	5.4		7.2		10.8		14.4	18.0	16.3		18.1		21.7		25.3	28.9	19.1		20.9		24.5		28.1	31.7
VAH2060HD	6.9	2.5	1.8	11.2	14.0	5.4		7.2		10.8		14.4	18.0	16.6		18.4		22.0		25.6	29.2	19.4		21.2		24.8		28.4	32.0

[1]Heat Pump = Total Heat Pump Unit Amps (Electric Heat is not Operating)
[2]Total Maximum Heating Amps = Total Amps with the Compressor, Motors, and Electric Heat Operating at the same time.
Heating kW is rated at 240 volts on the 208-230v (“A” and “C”) models. Derate heater output by 25% for operation at 208 volts. Heating kW is rated at 480 volts on the “D” modles. Three phase models contain single phase motor loads. Values shown are maximum phase loads. Loads are not equally balanced on each phase.

VANGUARD VAH/VDH AIR CONDITIONERS WITH 2-STAGE COMPRESSOR

Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390

Model Number	VAH2030A			VDH2036A			VDH2040A			VDH2048A			VAH2060A		
	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D
Cooling BTUH[1] - 2nd Stage	30,000			36,000			42,000			48,000			57,000		
EER[2] - 2nd Stage	11			11			13			13			11.5		
Integrated Part Load Value[3]	14			15.5			16.4			15.5			14.2		
Rated Indoor Air Flow (CFM[4])	1,025			1,200			1,300			1,525			1,700		
Rated Outdoor Air Flow[5]	2,800			2,800			2,800			2,800			3,000		

[1]Cooling rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air. [2]EER=Energy Efficiency Ratio
[3]Integrated Part Load Value is an integrated efficiency measure from 1st and 2nd stage capacity modulation. [4]CFM=Cubic Feet per Minute [5]ECM Motor Set Point Ratings are at 230 volts for 208/230 volt units ("A" & "C" models) and 460 volts for "D" models. Operation of units at a different voltage from that of the rating point will affect performance and air flow.

Sensible Total Heat Ratio @ 95°F (35°C) Outside Air DB

Model Number	VAH2030A			VDH2036A			VDH2040A			VDH2048A			VAH2060A		
	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D
Total Capacity	30,000			36,000			42,000			48,000			57,000		
Sensible Heat Ratio	0.72			0.72			0.69			0.71			0.68		
Sensible Capacity	21,500			26,000			28,800			34,100			38,600		
Rated Air Flow (CFM[1])	1,025			1,200			1,300			1,525			1,700		

[1]CFM=Cubic Feet per Minute
Sensible Heat Ratios based upon ANSI/AHRI std. 390 outdoor conditions of 95°F (35°C) outdoor and 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air.

Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature								
	75°F (24°C)	80°F (27°C)	85°F (30°C)	90°F (32°C)	95°F (35°C)	100°F (38°C)	105°F (41°C)	110°F (43°C)	115°F (46°C)
VAH2030A	34,800	33,600	32,400	31,200	30,000	28,800	27,600	26,400	25,800
VDH2036A	41,760	40,320	38,880	37,440	36,000	34,560	33,120	31,680	30,960
VDH2040A	48,720	47,040	45,360	43,680	42,000	40,320	38,640	36,960	36,120
VDH2048A	55,680	53,760	51,840	49,920	48,000	46,080	44,160	42,240	41,280
VAH2060A	66,120	63,840	61,560	59,280	57,000	54,720	52,440	50,160	49,020

Based upon ANSI/AHRI std. 390 return air conditions of 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air at rated air flow.

Electrical Characteristics -
Compressor, Fan, Ventilation, & Blower Motors - VAH/VDH Heat Pumps

Model Number	Compressor			Other Motors	Outdoor Fan			Indoor Blower (Ecm)			Energy Recovery Ventilator	
											GreenWheel	
											Amps	
	Volts-Hz-PH	RLA[1]	LRA[2]	Volts-Hz-PH	RPM[3]	FLA[4]	HP[5]	RPM[3]	FLA[4]	HP[5]	OAM[6]	EXM[7]
VAH2030AA	208/230-60-1	14.6	82.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036AA	208/230-60-1	14.6	90.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040AA	208/230-60-1	18.2	106.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048AA	208/230-60-1	20.1	141.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060AA	208/230-60-1	25.2	147.3	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2030AC	208/230-60-3	7.9	66.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036AC	208/230-60-3	9.9	82.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040AC	208/230-60-3	11.5	114.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048AC	208/230-60-3	11.1	117.7	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060AC	208/230-60-3	13.8	150.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2030AD	460-60-3	4.8	39.0	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2036AD	460-60-3	4.8	44.3	208/230-60-1	1200	3.5	1/3	1500	2.5	1/2	2.8	2.8
VDH2040AD	460-60-3	6.5	56.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VDH2048AD	460-60-3	6.6	51.5	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8
VAH2060AD	460-60-3	6.9	58.0	208/230-60-1	1200	3.5	1/3	1500	2.5 (5.0)	1/2	2.8	2.8

[1]RLA = Rated Load Amps [2]LRA = Locked Rotor Amps [3]RPM = Revolutions Per Minute [4]FLA = Full Load Amps [5]HP = Horsepower
[6]OAM = Outsidse Air Motor [7]EXM = Exhaust Air Motor [8]PVM = Power Vent Motor
The 460 volt units will have a step down transformer for the 230 volt motors.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing)
VAA/VDA Air Conditioners with 2-Stage Compressor & Ventilation
("A") No Ventilation

Electric Heat		0 kW	0 kW	4.5 kW	4.5 kW	5.0 kW	5.0 kW	6.0 kW	6.0 kW	8.0 kW	8.0 kW	9.0 kW	9.0 kW	10.0 kW	10.0 kW	12.0 kW	12.0 kW	15.0 kW	15.0 kW
Basic Model	Volts-Hz-Ph	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
VAH2030AA	208/230-60-1	24.3	35			28.5	35			44.2	45			54.6	60				
VDH2036AA	208/230-60-1	24.3	35			28.5	35			44.2	45			54.6	60				
VDH2040AA	208/230-60-1	36.3	50			36.3	50			46.7	50			57.1	60				
VDH2048AA	208/230-60-1	38.6	50			38.6	50			46.7	50			57.1	60				
VAH2060AA	208/230-60-1	45.0	70			45.0	70			46.7	70			57.1	70				
VAH2030AC	208/230-60-3	15.9	20	16.0	20			20.5	25			29.6	30			38.6	40	47.6	50
VDH2036AC	208/230-60-3	18.4	25	18.4	25			20.5	25			29.6	30			38.6	40	47.6	50
VDH2040AC	208/230-60-3	27.9	35	27.9	35			27.9	35			32.1	35			41.1	45	50.1	60
VDH2048AC	208/230-60-3	27.4	35	27.4	35			27.4	35			32.1	35			41.1	45	50.1	60
VAH2060AC	208/230-60-3	30.8	40	30.8	40			30.8	40			32.1	40			41.1	45	50.1	60
VAH2030AD	460-60-3	9.0	15	9.0	15			10.3	15			14.8	15			19.3	20	23.8	25
VDH2036AD	460-60-3	9.0	15	9.0	15			10.3	15			14.8	15			19.3	20	23.8	25
VDH2040AD	460-60-3	14.9	20	14.9	20			14.9	20			16.0	20			20.5	25	25.1	30
VDH2048AD	460-60-3	15.0	20	15.0	20			15.0	20			16.0	20			20.5	25	25.1	30
VAH2060AD	460-60-3	15.4	20	15.4	20			15.4	20			16.0	20			20.5	25	25.1	30

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry
MCA & MFS are calculated at 240 volts on the "A" & "C" models. The 480 volts "D" models are calculated at 480 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

1. MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.
3. While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VAA/VDA Air Conditioners with 2-Stage Compressor & Ventilation Configurations

("C") Economizer

("E") Adjustable Fresh-Air w/Powered Pressure Relief & Independent Control

("H") GreenWheel® Energy Recovery Ventilator

Electric Heat		0 kW	0 kW	4.5 kW	4.5 kW	5.0 kW	5.0 kW	6.0 kW	6.0 kW	8.0 kW	8.0 kW	9.0 kW	9.0 kW	10.0 kW	10.0 kW	12.0 kW	12.0 kW	15.0 kW	15.0 kW
Basic Model	Volts-Hz-Ph	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
VAH2030AA	208/230-60-1	29.9	40			29.9	40			44.2	45			54.6	60				
VDH2036AA	208/230-60-1	29.9	40			29.9	40			44.2	45			54.6	60				
VDH2040AA	208/230-60-1	41.9	60			41.9	60			46.7	60			57.1	60				
VDH2048AA	208/230-60-1	44.2	60			44.2	60			46.7	60			57.1	60				
VAH2060AA	208/230-60-1	50.6	70			50.6	70			50.6	70			57.1	70				
VAH2030AC	208/230-60-3	21.5	25	21.5	25			21.5	25			29.6	30			38.6	40	47.6	50
VDH2036AC	208/230-60-3	24.0	30	24.0	30			24.0	30			29.6	30			38.6	40	47.6	50
VDH2040AC	208/230-60-3	33.5	40	33.5	40			33.5	40			33.5	40			41.1	45	50.1	60
VDH2048AC	208/230-60-3	33.0	40	33.0	40			33.0	40			33.0	40			41.1	45	50.1	60
VAH2060AC	208/230-60-3	36.4	50	36.4	50			36.4	50			36.4	50			41.1	50	50.1	60
VAH2030AD	460-60-3	11.8	15	11.8	15			11.8	15			14.8	15			19.3	20	23.8	25
VDH2036AD	460-60-3	11.8	15	11.8	15			11.8	15			14.8	15			19.3	20	23.8	25
VDH2040AD	460-60-3	17.7	20	17.7	20			17.7	20			17.7	20			20.5	25	25.1	30
VDH2048AD	460-60-3	17.8	20	17.8	20			17.8	20			17.8	20			20.5	25	25.1	30
VAH2060AD	460-60-3	18.2	25	18.2	25			18.2	25			18.2	25			20.5	25	25.1	30

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry

MCA & MFS are calculated at 240 volts on the "A" & "C" models. The 480 volts "D" models are calculated at 480 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

1. MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.

While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

Unit Load Amps (Heating) - VAA/VDA Heat Pumps

Electric Heat				Heat Pumps[1] (Amps)		Load Of Resistive Heating Element								Total Maximum Heating[2] (Electrical)													
														Ventilaiton Configuration "A"								Ventilation Configuration "C, E, H"							
				Ventilation Configuration		Heating Element (kW)								Heating Element (kW)								Heating Element (kW)							
Model	RLA	ID MTR	OTD MTR	A	C, E, H	4.5	5	6	8	9	10	12	15	4.5	5	6	8	9	10	12	15	4.5	5	6	8	9	10	12	15
VAH2030AA	14.6	2.5	3.5	20.6	22.4		20.8		33.3		41.7				41.4		53.9		62.3				43.2		55.7		64.1		
VDH2036AA	14.6	2.5	3.5	20.6	22.4		20.8		33.3		41.7				41.4		53.9		62.3				43.2		55.7		64.1		
VDH2040AA	18.2	5.0	3.5	26.7	28.5		20.8		33.3		41.7				47.5		60.0		68.4				49.3		61.8		70.2		
VDH2048AA	20.1	5.0	3.5	28.6	30.4		20.8		33.3		41.7				49.4		61.9		70.3				51.2		63.7		72.1		
VAH2060AA	25.2	5.0	3.5	33.7	35.5		20.8		33.3		41.7				54.5		67.0		75.4				56.3		68.8		77.2		
VAH2030AC	7.9	2.5	3.5	13.9	15.7	10.8		14.4		21.7		28.9	36.1	24.7		28.3		35.6		42.8	50.0	26.5		30.1		37.4		44.6	51.8
VDH2036AC	9.9	2.5	3.5	15.9	17.7	10.8		14.4		21.7		28.9	36.1	26.7		30.3		37.6		44.8	52.0	28.5		32.1		39.4		46.6	53.8
VDH2040AC	11.5	5.0	3.5	20.0	21.8	10.8		14.4		21.7		28.9	36.1	30.8		34.4		41.7		48.9	56.1	32.6		36.2		43.5		50.7	57.9
VDH2048AC	11.1	5.0	3.5	19.6	21.4	10.8		14.4		21.7		28.9	36.1	30.4		34.0		41.3		48.5	55.7	32.2		35.8		43.1		50.3	57.5
VAH2060AC	13.8	5.0	3.5	22.3	24.1	10.8		14.4		21.7		28.9	36.1	33.1		36.7		44.0		51.2	58.4	34.9		38.5		45.8		53.0	60.2
VAH2030AD	4.8	1.3	1.8	7.8	8.7	5.4		7.2		10.8		14.4	18.0	13.2		15.0		18.6		22.2	25.8	14.1		15.9		19.5		23.1	26.7
VDH2036AD	4.8	1.3	1.8	7.8	8.7	5.4		7.2		10.8		14.4	18.0	13.2		15.0		18.6		22.2	25.8	14.1		15.9		19.5		23.1	26.7
VDH2040AD	6.5	2.5	1.8	10.8	11.6	5.4		7.2		10.8		14.4	18.0	16.2		18.0		21.6		25.2	28.8	17.0		18.8		22.4		26.0	29.6
VDH2048AD	6.6	2.5	1.8	10.9	11.7	5.4		7.2		10.8		14.4	18.0	16.3		18.1		21.7		25.3	28.9	17.1		18.9		22.5		26.1	29.7
VAH2060AD	6.9	2.5	1.8	11.2	12.0	5.4		7.2		10.8		14.4	18.0	16.6		18.4		22.0		25.6	29.2	17.4		19.2		22.8		26.4	30.0

[1]Heat Pump = Total Heat Pump Unit Amps (Electric Heat is not Operating)
[2]Total Maximum Heating Amps = Total Amps with the Compressor, Motors, and Electric Heat Operating at the same time.
Heating kW is rated at 240 volts on the 208-230v (“A” and “C”) models. Derate heater output by 25% foroperation at 208 volts. Heating kW is rated at 480 volts on the “D” modles. Three phase models contain single phase motor loads. Values shown are maximum phase loads. Loads are not equally balanced on each phase.

Hot Water Output - Heat Pumps & Air Conditioners

Model	Entering Air Temperature 70°F DB, 60°F WB		HOT WATER HEAT 180°F Entering Water Temperature - Water Flow (GPM)									
			2	4	6	8	10	12	14	16	18	20
VDH2030	Indoor Air Flow	(CFM)	1,000									
	Total Capacity	(Btu/Hr)	47,529	62,536	69,762	74,030	76,863	78,887	80,408	81,595	82,549	83,333
	Leaving Air - DB	(°F)	113.3	126.9	133.5	137.4	140.0	141.8	143.2	144.3	145.1	145.8
	Leaving Air - WB	(°F)	73.2	76.7	78.3	79.2	79.8	80.2	80.5	80.8	80.9	81.1
	Leaving Fluid Temp.	(°F)	131.2	147.9	156.1	161.0	164.2	166.5	168.2	169.5	170.6	171.4
	Fluid Delta T	(°F)	48.8	32.1	23.9	19.0	15.8	13.5	11.8	10.5	9.4	8.6
	Water Press. Drop	(Ft - H_2O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VDH2036	Indoor Air Flow	(CFM)	1,200									
	Total Capacity	(Btu/Hr)	49,916	67,067	75,662	80,826	84,297	86,800	88,693	90,179	91,378	92,367
	Leaving Air - DB	(°F)	107.9	120.9	127.4	131.3	133.9	135.8	137.3	138.4	139.3	140.1
	Leaving Air - WB	(°F)	71.8	75.2	76.8	77.8	78.4	78.8	79.2	79.4	79.6	79.8
	Leaving Fluid Temp.	(°F)	128.7	145.6	154.1	159.2	162.7	165.1	167.0	168.4	169.6	170.5
	Fluid Delta T	(°F)	51.3	34.4	25.9	20.8	17.3	14.9	13.0	11.6	10.4	9.5
	Water Press. Drop	(Ft - H_2O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VDH2040	Indoor Air Flow	(CFM)	1,300									
	Total Capacity	(Btu/Hr)	50,903	69,001	78,218	83,797	87,569	90,297	92,368	93,977	95,313	96,401
	Leaving Air - DB	(°F)	105.6	118.3	124.8	128.7	131.3	133.2	134.7	135.8	136.7	142.8
	Leaving Air - WB	(°F)	71.2	74.5	76.2	77.1	77.8	78.2	78.6	78.8	79.1	80.4
	Leaving Fluid Temp.	(°F)	127.7	144.6	153.2	158.5	162.0	164.5	166.4	167.9	169.1	171.0
	Fluid Delta T	(°F)	52.3	35.4	26.8	21.5	18.0	15.5	13.6	12.1	10.9	9.0
	Water Press. Drop	(Ft - H_2O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VDH2048	Indoor Air Flow	(CFM)	1,500									
	Total Capacity	(Btu/Hr)	52,575	72,363	82,703	89,070	93,405	96,561	98,969	100,870	102,412	103,688
	Leaving Air - DB	(°F)	101.9	113.9	120.2	124.0	126.7	128.6	130.1	131.2	132.1	132.9
	Leaving Air - WB	(°F)	70.1	73.4	75.0	76.0	76.7	77.1	77.5	77.8	78.0	78.2
	Leaving Fluid Temp.	(°F)	126.0	142.8	151.7	157.1	160.8	163.5	165.5	167.1	168.3	169.4
	Fluid Delta T	(°F)	54.0	37.2	28.3	22.9	19.2	16.5	14.5	12.9	11.7	10.6
	Water Press. Drop	(Ft - H_2O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VAH2060	Indoor Air Flow	(CFM)	1,500									
	Total Capacity	(Btu/Hr)	53,944	75,197	86,539	93,624	98,477	102,031	104,753	106,909	108,663	110,118
	Leaving Air - DB	(°F)	98.9	110.3	116.3	120.1	122.7	124.6	126.1	127.2	128.2	129.0
	Leaving Air - WB	(°F)	69.2	72.4	74.0	75.0	75.7	76.2	76.5	76.8	77.0	77.2
	Leaving Fluid Temp.	(°F)	124.5	141.4	150.4	156.0	159.8	162.5	164.6	166.3	167.6	168.7
	Fluid Delta T	(°F)	55.5	38.6	29.6	24.0	20.2	17.5	15.4	13.7	12.4	11.3
	Water Press. Drop	(Ft - H_2O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4

Dehumidification Charts

Full Capacity Dehumidification - Vanguard Model VAH2030H/VAH2030A with Hot Gas Reheat

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	30,994	23,698	7,296	1,050	51.7	6.9	6.6	Cooling
75 / 62.5	50	75	7,296	0	7,296	1,050	73.6	6.9	6.6	Dehumid.
75 / 65.5	60	75	32,748	20,687	12,061	1,050	54.8	11.4	10.9	Cooling
75 / 65.5	60	75	12,061	0	12,061	1,050	74.0	11.4	10.9	Dehumid.
75 / 68	70	75	34,235	18,134	16,101	1,050	57.4	15.2	14.6	Cooling
75 / 68	70	75	16,101	0	16,101	1,050	74.2	15.2	14.6	Dehumid.
65 / 63	90	75	31,291	13,485	17,806	1,050	52.3	16.8	16.1	Cooling
65 / 63	90	75	17,806	0	17,806	1,050	64.8	16.8	16.1	Dehumid.
80 / 67	50	95	29,000	21,632	7,368	1,050	57.9	6.3	6.0	Cooling
80 / 67	50	95	7,368	0	7,368	1,050	78.5	6.3	6.0	Dehumid.

Full Capacity Dehumidification - Vanguard Model VDH2036H/VDH2036A with Hot Gas Reheat

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	37,406	26,904	10,502	1,200	51.6	9.9	9.5	Cooling
75 / 62.5	50	75	10,502	0	10,502	1,200	72.4	9.9	9.5	Dehumid.
75 / 65.5	60	75	39,524	23,680	15,844	1,200	54.7	15.0	14.3	Cooling
75 / 65.5	60	75	15,844	0	15,844	1,200	73.0	15.0	14.3	Dehumid.
75 / 68	70	75	41,318	20,411	20,907	1,200	57.3	19.7	18.9	Cooling
75 / 68	70	75	20,907	0	20,907	1,200	73.0	19.7	18.9	Dehumid.
65 / 63	90	75	37,765	16,028	21,737	1,200	57.2	20.5	19.7	Cooling
65 / 63	90	75	21,737	0	21,737	1,200	64.6	20.5	19.7	Dehumid.
80 / 67	50	95	35,000	25,148	9,852	1,200	57.9	9.3	8.9	Cooling
80 / 67	50	95	9,852	0	9,852	1,200	77.3	9.3	8.9	Dehumid.

Full Capacity Dehumidification - Vanguard Model VDH2040H/VDH2040A with Hot Gas Reheat

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	43,819	32,539	11,280	1,300	50.7	10.7	10.2	Cooling
75 / 62.5	50	75	11,280	0	11,280	1,300	73.4	10.7	10.2	Dehumid.
75 / 65.5	60	75	46,299	28,561	17,738	1,300	53.8	16.8	16.1	Cooling
75 / 65.5	60	75	17,738	0	17,738	1,300	73.8	16.8	16.1	Dehumid.
75 / 68	70	75	48,400	25,186	23,214	1,300	56.5	22.0	21.1	Cooling
75 / 68	70	75	23,214	0	23,214	1,300	74.1	22.0	21.1	Dehumid.
65 / 63	90	75	44,239	19,025	25,214	1,300	51.3	23.8	22.9	Cooling
65 / 63	90	75	25,214	0	25,214	1,300	67.8	23.8	22.9	Dehumid.
80 / 67	50	95	41,000	30,501	10,499	1,300	57.1	9.9	9.5	Cooling
80 / 67	50	95	10,499	0	10,499	1,300	78.4	9.9	9.5	Dehumid.

Full Capacity Dehumidification - Vanguard Model VDH2048H/VDH2048A with Hot Gas Reheat

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	52,369	37,675	14,694	1,550	50.7	13.9	13.3	Cooling
75 / 62.5	50	75	14,694	0	14,694	1,550	73.3	13.9	13.3	Dehumid.
75 / 65.5	60	75	55,333	33,215	22,118	1,550	53.7	20.9	20.0	Cooling
75 / 65.5	60	75	22,118	0	22,118	1,550	73.5	20.9	20.0	Dehumid.
75 / 68	70	75	57,845	29,424	28,421	1,550	56.3	26.8	25.7	Cooling
75 / 68	70	75	28,421	0	28,421	1,550	73.9	26.8	25.7	Dehumid.
65 / 63	90	75	52,871	25,548	27,323	1,550	51.2	25.8	24.7	Cooling
65 / 63	90	75	27,323	0	27,323	1,550	66.5	25.8	24.7	Dehumid.
80 / 67	50	95	49,000	35,191	13,809	1,550	56.9	13.0	12.5	Cooling
80 / 67	50	95	13,809	0	13,809	1,550	77.9	13.0	12.5	Dehumid.

Full Capacity Dehumidification - Vanguard Model/VAH2060A with Hot Gas Reheat

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	61,988	42,727	19,261	1,650	50.2	18.2	17.4	Cooling
75 / 62.5	50	75	19,261	0	19,261	1,650	74.2	18.2	17.4	Dehumid.
75 / 65.5	60	75	65,497	37,989	27,508	1,650	53.2	26.0	24.9	Cooling
75 / 65.5	60	75	27,508	0	27,508	1,650	74.5	26.0	24.9	Dehumid.
75 / 68	70	75	68,469	33,954	34,515	1,650	55.7	32.6	31.2	Cooling
75 / 68	70	75	34,515	0	34,515	1,650	74.8	32.6	31.2	Dehumid.
65 / 63	90	75	62,582	26,627	35,955	1,650	51.1	33.9	32.5	Cooling
65 / 63	90	75	35,955	0	35,955	1,650	66.0	33.9	32.5	Dehumid.
80 / 67	50	95	58,000	39,659	18,341	1,650	56.1	17.3	16.6	Cooling
80 / 67	50	95	18,341	0	18,341	1,650	78.4	17.3	16.6	Dehumid.

The Dehumidification Operating Mode is with Hot Gas Reheat.

Installed Weight

Model	Base	w/GreenWheel	460Vac	w/ GreenWheel & 460Vac
VAH2030	1385	1435	1410	1460
VDH2036	1385	1435	1410	1460
VDH2040	1405	1455	1430	1480
VDH2048	1405	1455	1430	1480
VAH2060	1405	1455	1430	1480

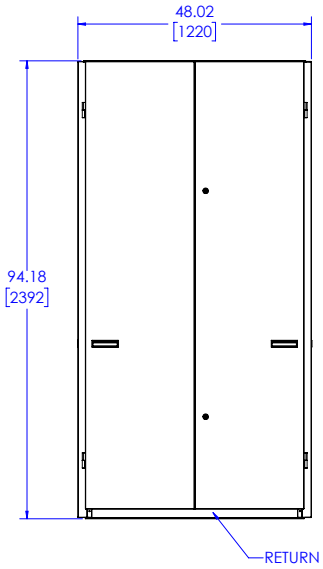
Air Filters

	Qty per Unit	Part Number	Size	Type	MERV[1] Rating
Return Air Filter	2	93267	20.5” x 22.75” x 2”	Pleated, disposable	8[2]
Fresh Air Ventilation Filter	1	93259	11.75” x 26” x 0.875”	Metal, washable	N/A
Exhaust Air Ventilation Filter	1	93259	11.75” x 26” x 0.875”	Metal, washable	N/A

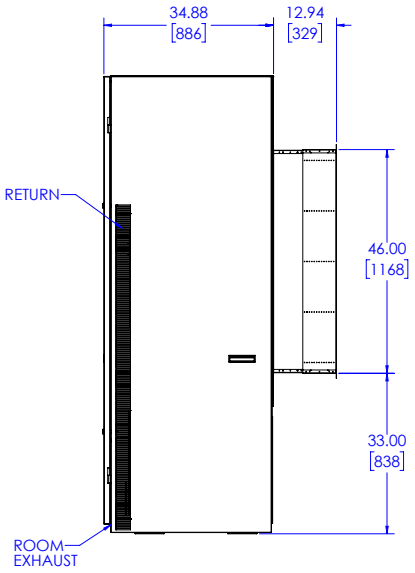
[1]MERV = Minimum Efficiency Reporting Value
[2]Optional filters are available with MERV ratings of 11 and 13.

Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 w/Doors Attached

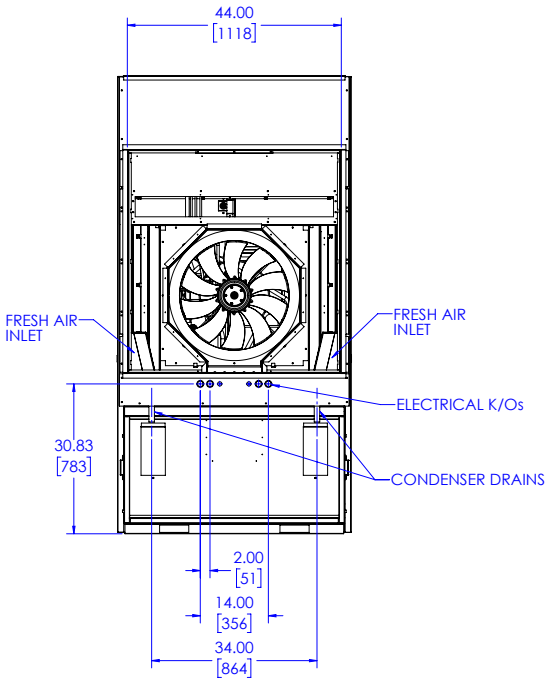
Engineering Revision "E"



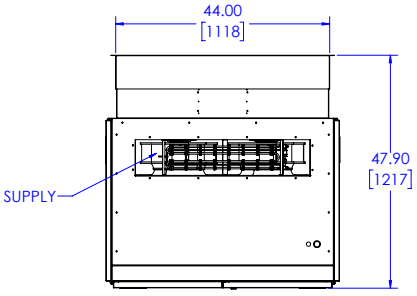
FRONT VIEW



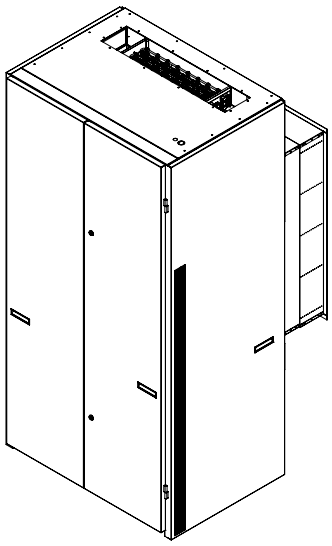
RIGHT VIEW



REAR VIEW



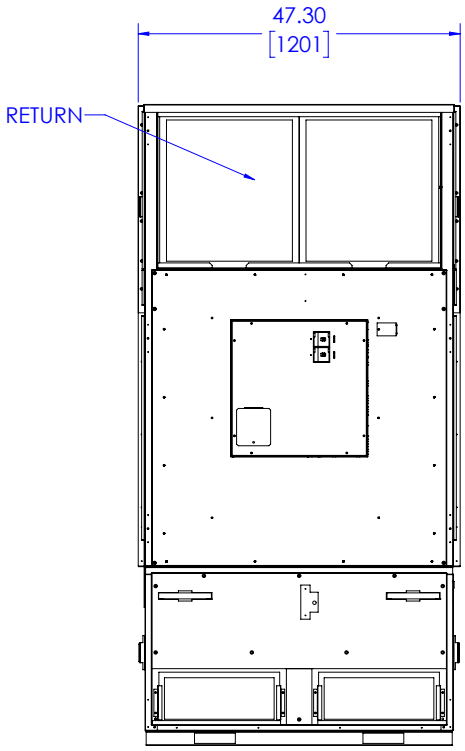
TOP VIEW



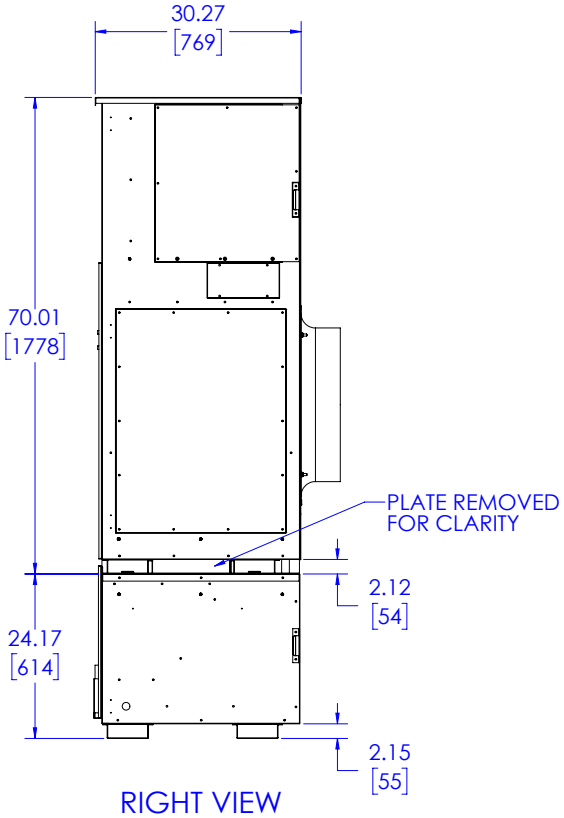
Note: All overall outside dimensions are given with +/- .250" (6mm) tolerance.

Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 w/Side Panels Removed

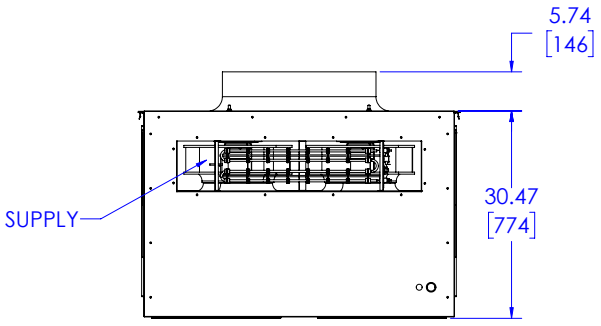
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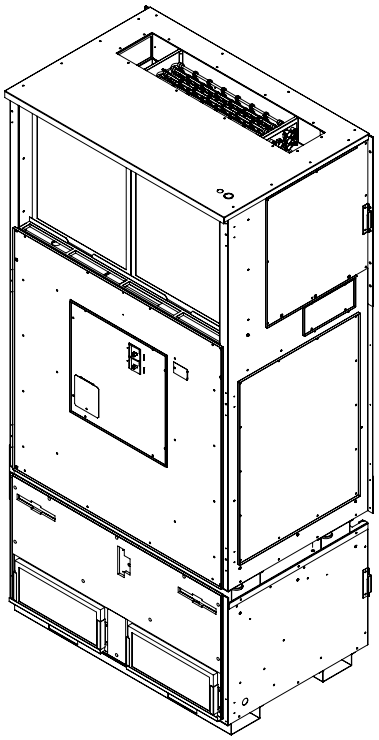
FRONT VIEW



RIGHT VIEW



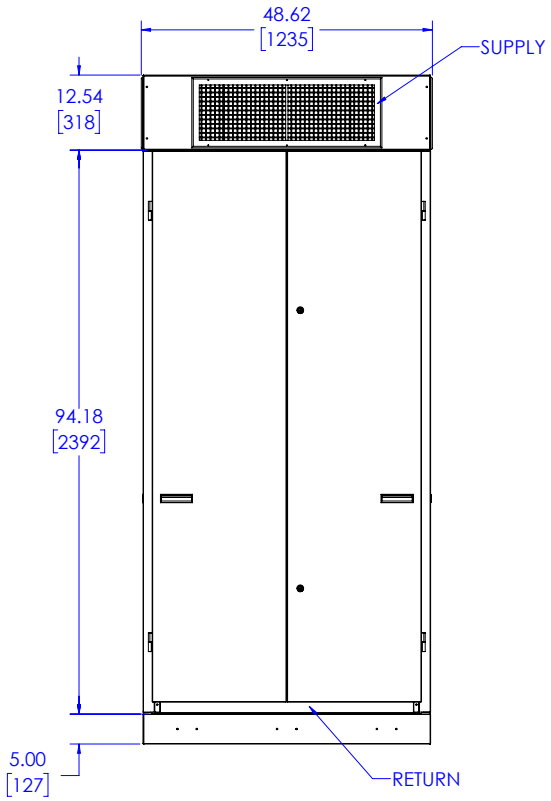
TOP VIEW



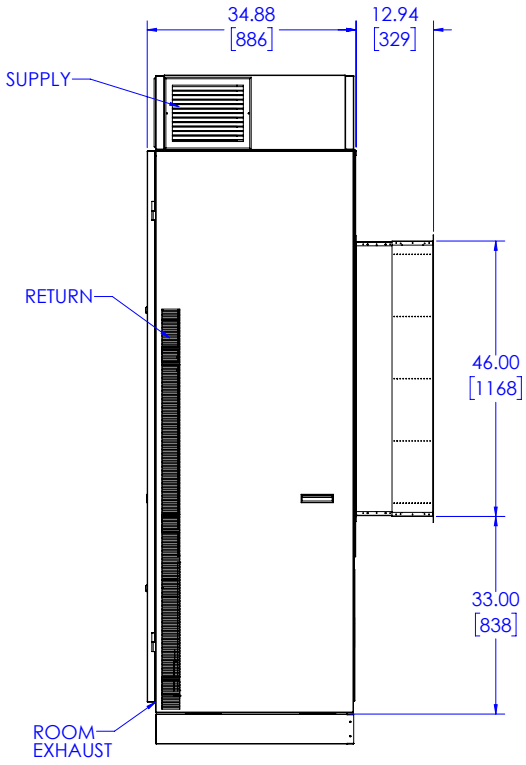
Note: All overall outside dimensions are given with +/- .250" (6mm) tolerance.

Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 w/Plenum & Base

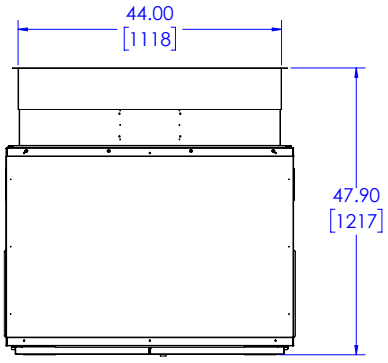
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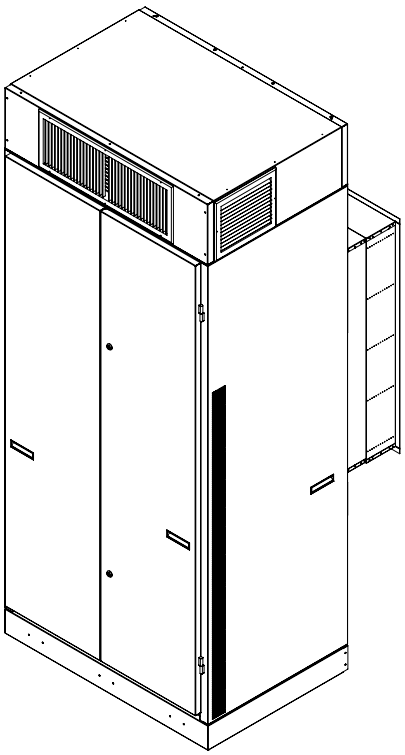
FRONT VIEW



RIGHT VIEW

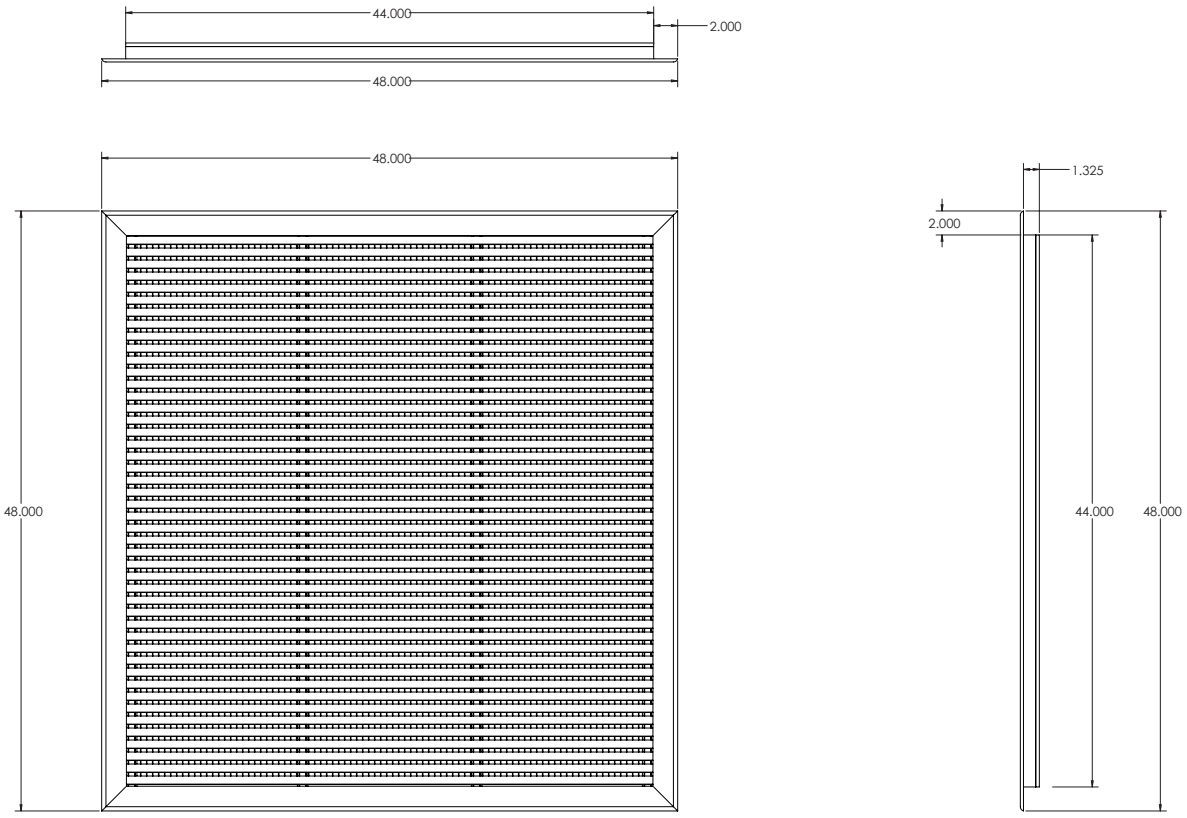


TOP VIEW

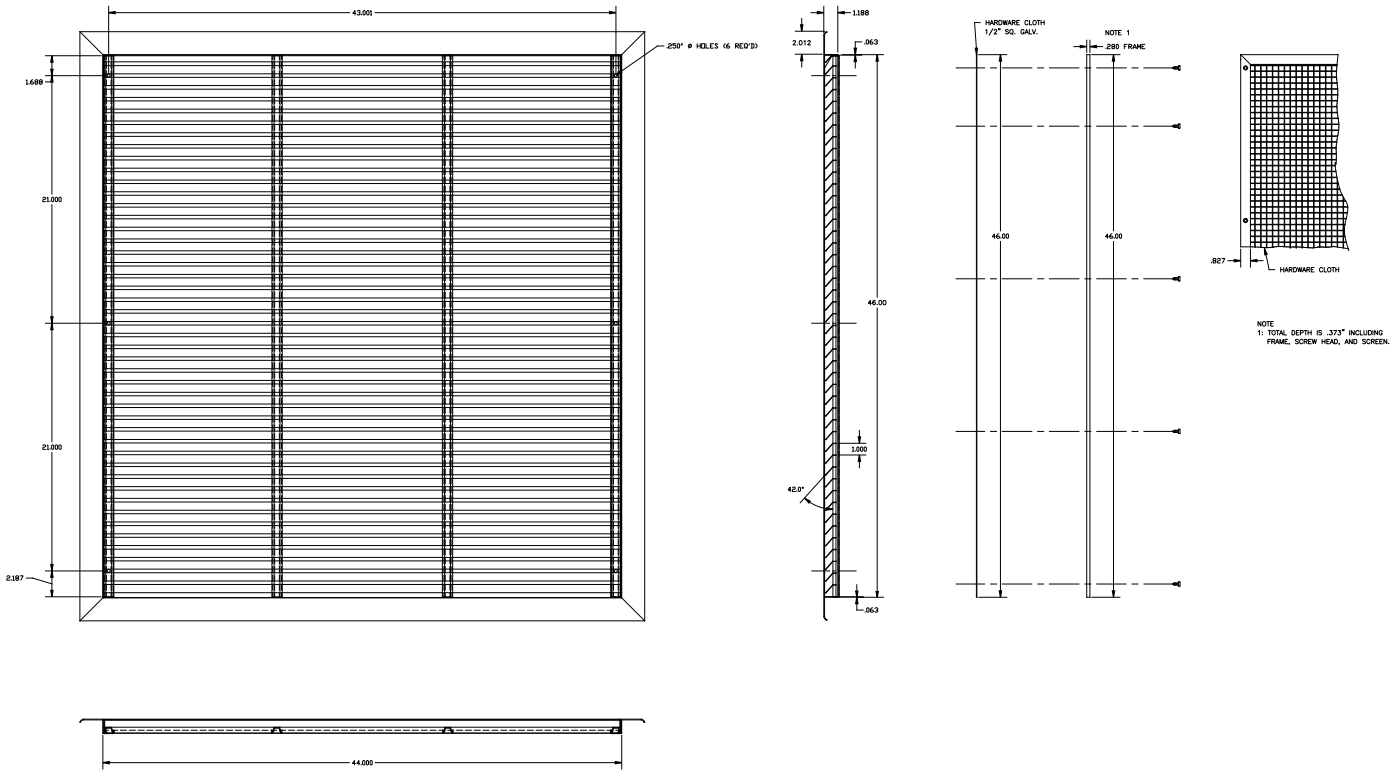


Note: All overall outside dimensions are given with +/- .250" (6mm) tolerance.

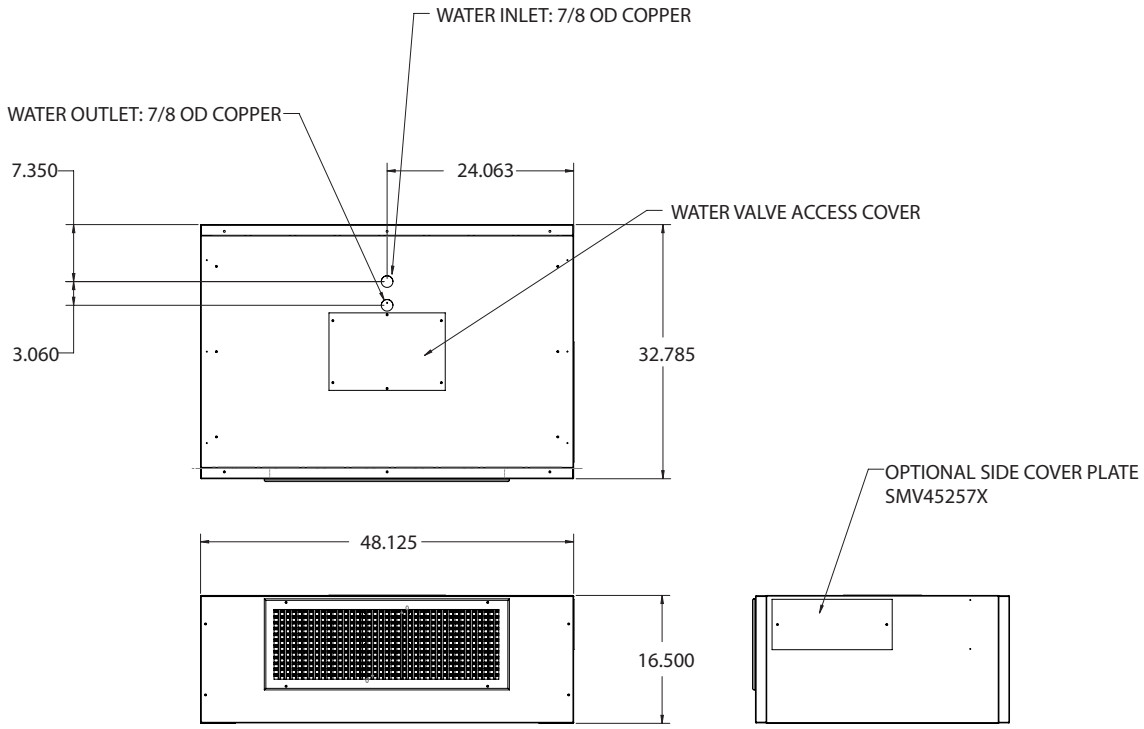
Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 44”x44” Outdoor Louver



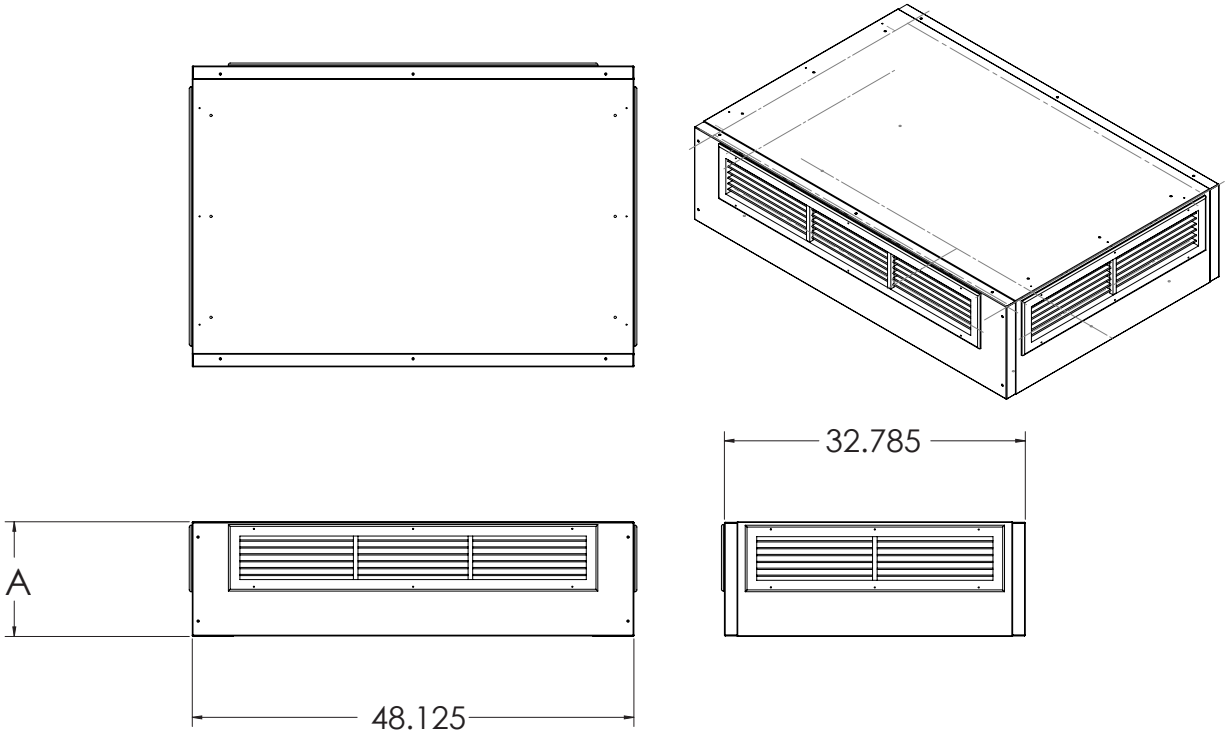
Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 46”x44” Outdoor Louver



Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 Hot Water Plenum

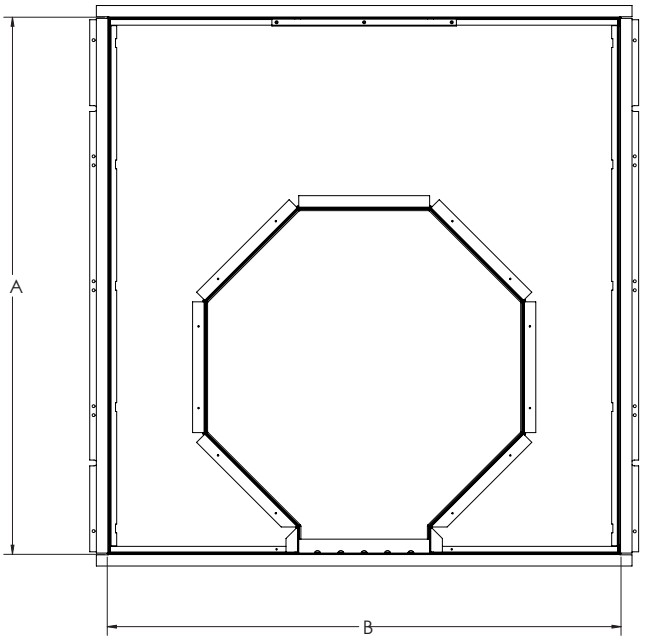


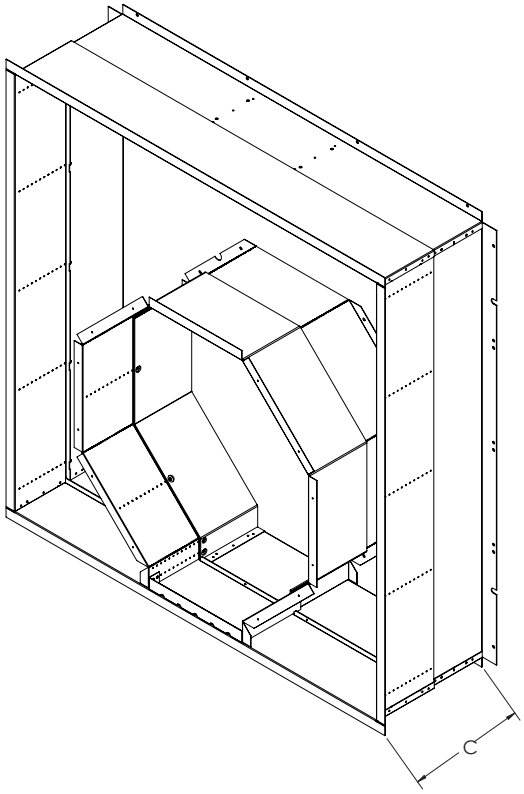
Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 Freeblow Plenum



Dimension	Plenum Height (in)	Part Number
A	10”	S/13112-XXX
	10.5”	S/13034-XXX
	12.5”	S/12772-XXX

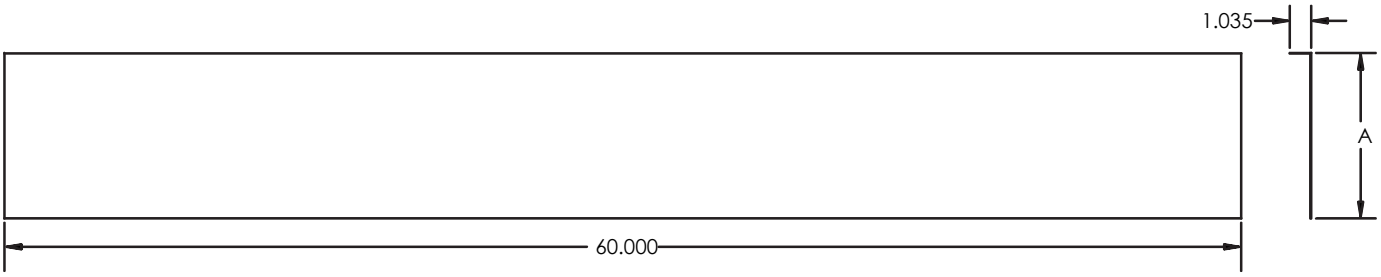
Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 Wall Sleeve





Part Number	Wall Sleeve Height (A)	Wall Sleeve Width (B)	Wall Sleeve Depth (C)
S/13328-XXX	46”	44”	7-13”
S/13340-XXX	46”	36”	8-13”
S/13343-XXX	44”	44”	7-13”

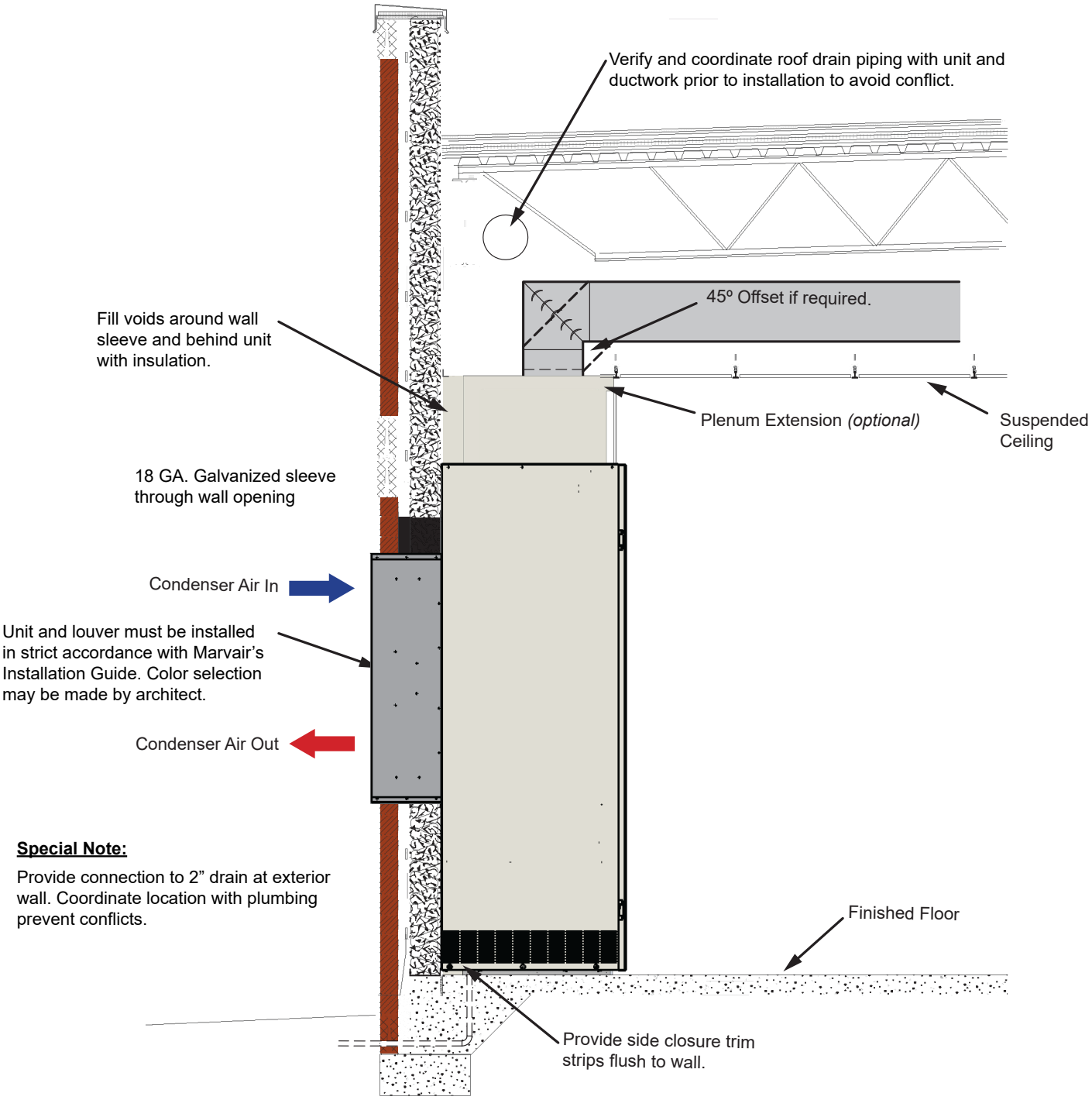
Dimensional Data for VDH2036/2040/2048 & VAH2030/2060 Trim Piece



Dimension	Trim Piece Width (in)	Part Number
A	6	M/06662-XXX
	8	M/04054-XXX
	9	M/04055-XXX
	12	M/04056-XXX
	15	M/04057-XXX

Contact your Marvair sales representative if special dimensions are required

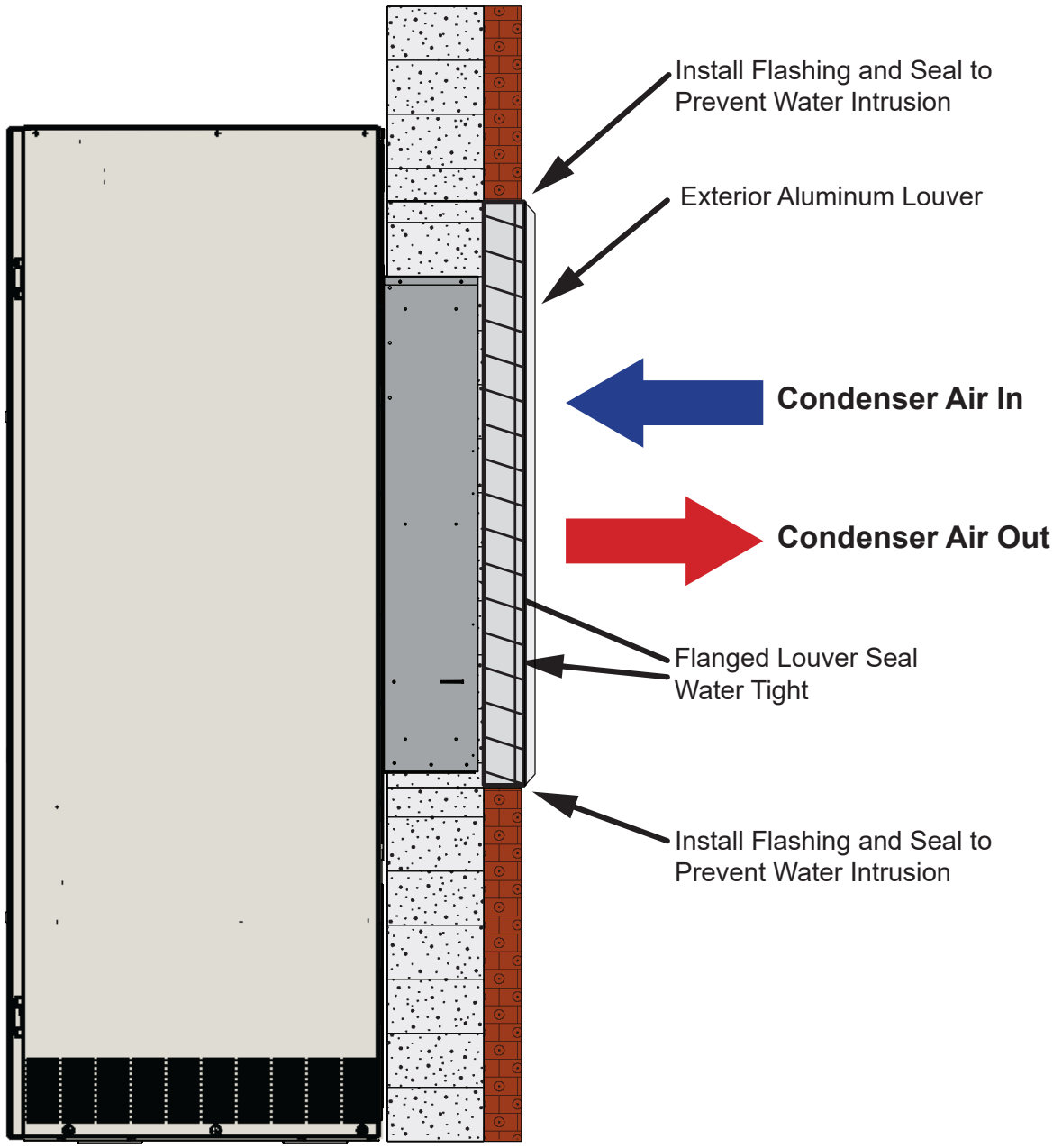
Typical Installation Detail



Note:

1. Coordinate installation of unit with general contractor for a complete and airtight installation. Caulk unit casing to wall.
2. Installation of the louver must be performed by the mechanical contractor and caulked by the general contractor
3. Provide blank off panel on rear of louver to seal off unused portion of louver.

Wall Mounted Louver Detail



Notes

Please consult the Marvair® website at www.marvair.com for the latest product literature. Detailed dimensional data is available upon request. A complete warranty statement can be found in each product's Installation/Operation Manual, on our website or by contacting Marvair at 229-2733636. As part of the Marvair continuous improvement program, specifications are subject to change without notice.

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