MODINE®
Always Innovating. Always Improving.

Valedictorian® Vertical Unit Ventilator

Models VFV, VFF, VSV, VSF, VCV and VCF

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Modine is located in Racine, Wisconsin, and is one of the world's leading manufacturers of heat pump and air conditioning systems for schools. Our reputation for product excellence has been earned through innovative design, our use of the highest quality controls, engineering selections of component parts, and the highest quality manufacturing and assembly of all products.

State-of-the-art test facilities reflect Modine's commitment to the latest design and manufacturing technology to maintain leadership in the production of systems of unsurpassed quality and reliability.

In addition to creating a healthier and safer learning environment for our children, many of the features in Modine products are unique and the range of systems available offer schools a variety of options.

Overview

The supplied product has been designed to be tough, dependable, aesthetically pleasing, quiet, and easy to install. The unit is built with heavy duty construction and incorporates a draw-through design. The unit is able to be configured for direct expansion (DX) cooling, chilled water, hot water, steam, or a combination of both chilled and hot water (two pipe and four pipe configurations), chilled water and steam, DX and hot water, or DX and steam. Discharge temrpeature is controlled using either a face-and-bypass damper or modulating control valve. Available adapter backs in various configurations allow for easy upgrades to existing systems, and optional factory installed controls have been engineered to ease installation. All access and maintenance shall be through the front of the unit.

The unit shall be constructed in accordance with UL & CSA standards with a label affixed to the unit listing the product code under which it is registered. Unit performance shall be tested in accordance with AHRI 840.

Table of Contents

Model Nomenclature

1	2	3	4-7	8	9	10	11	12	13	14	15	16	17	18	19	20
PT	S	CC	US	IA	DA	CO	HO	CA	CP	OA	SV	MT	EC	C	CG	FL

1 - Product Type (PT)
V - Valedictorian® Unit Ventilator

2 - Style (S)
F - Floor Mounted Flat Top
S - Floor Mounted Slope Top
C - Ceiling Mounted

3 - Cooling Control (CC)
V - Valve Control
F - Face and Bypass

4,5,6,7 - Unit Size (US)
750 - 750 CFM
1000 - 1000 CFM
1250 - 1250 CFM
1500 - 1500 CFM

8 - Inlet Air (IA)
Flat Top or Slope Top, 16 5/8" Deep
A - Rear OA, Open Pipe Tunnel
B - Rear OA, Closed Pipe Tunnel
C - Bottom OA, Open Pipe Tunnel
D - No OA, Open Pipe Tunnel
Flat Top or Slope Top, 21 7/8" Deep
E - Rear OA, Open Pipe Tunnel
F - Rear OA, Closed Pipe Tunnel
G* - Top Window Intake, Closed PT
H - Bottom OA, Open Pipe Tunnel
J - Closed Back, Closed PT
K* - 2" Step-Down, Open PT
L* - 2" Step-Down, Closed PT

* = Not available on Slope Top unit
PT = Pipe Tunnel

Ceiling Mounted Units
M - Bottom Return Air, Rear Outside Air
N - Bottom Return Air, Top Outside Air
P - Rear Return Air, Top Outside Air
Q - Rear Return Air, Bottom Outside Air
R - Bottom Return Air, No Outside Air
S - Top Return Air, No Outside Air

9 - Discharge Air (DA)
Floor Mounted Units
A - Bar Grille with Screen
C - Opening Only (Field Duct Connection)
Ceiling Mounted Units
E - Front Discharge with Duct Collar
F - Front Disch. with Dbl. Defl. Grille
G - Down Disch. with Dbl. Defl. Grille

10 - Cooling Option (CO)
0 - None
2 - 2-Row Chilled Water/Hot Water 2-Pipe
3 - 3-Row Chilled Water/Hot Water 2-Pipe
4 - 4-Row Chilled Water/Hot Water 2-Pipe
5 - Direct Expansion (DX) Cooling Only

11 - Heating Option (HO)
0 - None
1 - 1-Row Hot Water Coil
2 - 2-Row Hot Water Coil
3 - Steam Coil (1-Row)

12 - Coil Access (CA)
A - Right Hand Coil(s)
B - Left Hand Coil(s)
C - RH Cooling, LH Heating
D - LH Cooling, RH Heating

13 - Coil Positions (CP)
0 - Units with One Coil
1 - Preheat: Pos 1 Heating, Pos 2 Cooling
2 - Reheat: Pos 1 Cooling, Pos 2 Heating

14 - Outside Air Damper Assembly (OA)
A - Standard Damper
C - Insulated Damper
E - No Damper (Recirculating Unit)

15 - Supply Voltage (SV)
A - 115/60/1 C - 230/60/1
B - 208/60/1 H - 277/60/1

16 - Motor Type (MT)
1 - Standard
2 - High Static, EC Motor

17 - Electrical Connection (EC)
A - Left Hand Side
B - Right Hand Side

18 - Control (C)
A - By Others, Field Installed
B - Factory DDC
C - Modine Controls System
D - Factory Installed Free Issue

19 - Case Gauge (CG)
A - Standard (16Ga Ext., 16Ga Int.)
B - Heavy Duty (14Ga Ext., 16Ga Int.)

20 - Filters (FL)
A - 70-75% Arrestance (Standard)
B - MERV 8

General Description – Valedictorian® Unit

Digit 2: Style (S)

F = Floor Mounted Flat Top
The unit shall be floor-mounted and horizontally configured with adjustable leg levelers. All access and maintenance shall be through the front and the top panels of the unit.

S = Floor Mounted Slope Top
The unit shall be floor-mounted and horizontally configured with adjustable leg levelers. All access and maintenance shall be through the front and the top panels of the unit.

C = Ceiling Mounted
The unit shall be ceiling-mounted using field supplied rods and fasteners. All access and maintenance shall be through the bottom access panels of the unit.

Digit 3: Cooling Control (CC)

V = Valve Control
The unit shall be furnished with a fixed plate directing 100% of the airflow across the coil(s). Full modulation allowing any mixture of outside air and return air shall be possible. Discharge air temperature is controlled by modulating the cooling and/or heating valve(s). The blowers will be located above the coil.

F= Face & Bypass
The unit shall be furnished with a face and bypass section including aluminum opposed blade face and bypass dampers with overlapping neoprene blade tips and jamb seals, and a spring return Belimo modulating actuator. The blowers will be located above the coil.

Digit 10: Cooling Option (CO)

0 = None

2 = 2 Row Chilled Water / Hot Water 2-Pipe
Two row slab coil assembly for chilled water only or 2-pipe chilled/hot water operation.

3 = 3 Row Chilled Water / Hot Water 2-Pipe
Three row slab coil assembly for chilled water only or 2-pipe chilled/hot water operation.

4 = 4 Row Chilled Water / Hot Water 2-Pipe
Four row slab coil assembly for chilled water only or 2-pipe chilled/hot water operation.

5 = Direct Expansion (DX) Cooling
Large surface area evaporator coil positioned to optimize heat transfer and airflow.

Digit 11: Heating Option (HO)

0 = None

1 = 1 Row Hot Water Coil
One row hot water heating slab coil assembly.

2 = 2 Row Hot Water Coil
Two row hot water heating slab coil assembly.

3 = 1 Row Steam Slab Coil
One row steam heating slab coil assembly.

Digit 13: Coil Positions (CP)

0 = Units with One Coil

1 = Preheat
Heating coil will be positioned in the preheat position when cooling is also selected.

1 = Reheat
Heating coil will be positioned in the reheat position when cooling is also selected.

Digit 14: Damper Assembly (OA)

A = Standard Damper

B = Insulated Damper
The outside air damper is insulated with 1/2" thick insulation to inhibit condensation on the damper surface.

E = No Damper (Recirculating Unit)

Digit 18: Control (C)

A = By Others - Field Installed
The unit will be provided without a controller or temperature sensors. The controller provided by others will be required to operate in a similar fashion to the Modine Control System (same inputs and outputs will be required). The controls contractor will be responsible for appropriate sequence of operations. A wiring diagram will be installed within the unit but will reflect a generic controller.

B = DDC Ready Controls
The unit is provided with a fan relay, disconnect switch, three speed switch, 24-volt control circuit transformer and terminal strip. All components located in the panel shall be clearly marked for easy identification. All terminal blocks and wires shall be individually numbered. The controls contractor will be responsible for appropriate sequence of operations. A wiring diagram will be installed within the unit but will reflect a generic controller.

C = Modine Control System
The unit is provided with the manufacturer's programmable microprocessor controller mounted outside of the air stream in the control panel. The controller is designed specifically for operating the unit in its most energy efficient manner using pre-engineered control strategies. The microprocessor determines mode of operation based on the factory installed return air, supply air, and outside air temperature sensors.

D = Factory Installed Free Issue
The unit is provided with a controller and temperature sensors that have been provided by others. The controller provided by others will be required to operate in a similar fashion to the Modine Control System (same inputs and outputs will be required). Modine will provide coordination with the controls contractor. The controls contractor will be responsible for appropriate sequence of operations. A wiring diagram agreed upon by Modine and the Controls Contractor will be required before the units can be released for production.

Digit 20: Filtration (FL)

A = 70-75% Arrestance (Standard)
1" thick throwaway filter provided and installed at the factory and located to provide filtration of both outdoor and return air prior to being conditioned.

B = MERV 8
1" thick radial pleated disposable filters provided and installed at the factory and located to provide filtration of both outdoor and return air prior to being conditioned.

Minimum Efficiency Reporting Value (MERV) corresponding to the MERV value shown below when evaluated per ASHRAE standard 52.2. Arrestance and Dust Spot Efficiency ratings are based on the ASHRAE 52.2 - 1992 test method.

Standard Features

Cabinet
Prior to assembly, the cabinet parts shall be degreased and coated with an electrostatically applied baked-on polyester powder paint and is insulated with acoustic foam containing no fibrous materials. The foam insulation shall have a fire rating of UL94 HF1.

The exterior panels of the cabinet shall be constructed of 16 gauge sheet metal. Internal sheet metal shall be galvanized 18 gauge. Heavy duty 14 gauge exterior panels are optional.

The front panel and compartment panels shall be easily removable with tamper-proof fasteners securing it to the rest of the unit cabinet. The back of the cabinet shall have an opening for connection to a wall sleeve and louver.

Control Panel
The control panel is located in the left-hand compartment. All components located in the panel shall be clearly marked for easy identification. All terminal blocks and wire shall be individually numbered. All electrical wires in the control panel shall be run in an enclosed trough. Wiring outside of the control panel shall be run in protective sleeves.

The unit will be provided with a power disconnect sized for the full load amperage of the unit to enable the unit to be disconnected from the power supply prior to any maintenance.

The 3-speed selector switch enables adjustment of the supply air volume. Reduction in fan speed shall be achieved by a step down multi-tap transformer.

Water / Steam Coils
Large surface area slab coils for optimal heat transfer and airflow.

Evaporator
All direct expansion units include a factory installed thermal expansion valve and utilize large surface area evaporator coils ideally positioned to optimize heat transfer and airflow. Each evaporator is manufactured from refrigeration quality copper tubes with mechanically bonded aluminum fins. Evaporator coils include a factory installed low limit stat.

Drain Pan
Each unit shall be fitted with a 20 gauge, 304 stainless steel welded construction drain pan sloped in 3 directions. The condensate drain pan connection will be located on the same side as the cooling coil connection and include a 3/4" reinforced condensate tubing and spashguard over the drain port.

Supply Fan & Fan Motor
Supply airflow is provided by a double inlet, forword curved, centrifugal type fan with offset aerodynamic blades. The assembly shall be statically and dynamically balanced to ensure smooth running and minimum noise levels. The fan motor is a permanent split capacitor type complete with intetgral automatic thermal overload protection. The fan and motor assembly shall be direct drive type with motor and bearings positioned outside of the airstream.

The fan assembly shall be possiitoned for a "draw through" configuration.

Factory Mounted Options

BACnet Network Card
The factory Microprocessor Control includes a plug-in card allowing for complete compatibility with an MS/TP BACnet control system.

LonWorks Network Card
The factory Microprocessor Control includes a plug-in card allowing for complete compatibility with FT-10 LonWorks control system.

Time / Clock Card
A time clock (card) shall be provided for "stand-alone" units where time functions, night and weekend setback, etc. are not transmitted from a building management system or remote central time clock. The time clock shall have a full 7 day schedule and calendar function incorporated. The 7 day schedule shall have two adjustable occupied/unoccupied periods per day. The calendar function shall allow 20 calendar periods (start date / stop date = 1 period).

Display Module
The user interface for Modine Control System displays status of controllers inputs and outputs, allows for occupied/unoccupied setpoint changes, displays servce settings, allows adjustment of control parameters, and is used for troubleshooting the unit. (This is required to change any factory setpoints if it is not receiving a signal from a BMS system).

Coil Freeze Protection
An automatic reset freeze protection bulb and capillary tube mounted on the discharge side of the first coil to prevent any freezing of the first coil assembly. When the sensor detects a freeze up condition it will force the damper to close off the outside air, force the flow control valve open and prevent theunit supply fan from running.

CO_2 Sensor
The CO_2 sensor shall be field mounted in the interior return air passage of the unit or remotely mounted to provide demand ventilation. When the level of CO_2 rises over a predetermined set point, the sensor shall proportionally adjust the minimum damper position to allow larger quantities of outside air into the room. The sensor shall have the capability of measuring CO_2 levels from 0 to 2,000 ppm with an accuracy of +/- 40 ppm CO_2 +3.0% of the reading.

Aquastat
An aquastat shall be fitted to two pipe systems to prevent changeover into a heating mode when cooling is required and vice-versa.

Condensate Pump
The unit shall be fitted with a condensate pump. The pump shall be equipped with an ABS plastic tank with built-in flow check valve and safety switch.

Condensate Pan Float Switch
The unit shall be fitted with a float switch mounted on the condensate pan to stop the cooling function should the condensate rise to a predetermined level.

Insulated Damper Assembly
1/2" thick insulation shall be added to the damper assembly to inhibit condensation on the damper surface.

EC Motor
The electronically commutated motor (ECM) provides constant airflow by automatically adjusting the speed if the external static pressure changes. The DC motor features a brushless, permanently lubricated ball bearing construction for maintenance free operation. The ECM is fully programmed to compensate for a wide variety of static pressures as well as lack of maintenance (dirty air filters).

Factory Assembled Valve Package
The selected piping components can be factory assembled, with all necessary piping and unions, and shipped fully supported and connected to the coil(s) with piping routed to selected Coil Access side. The valve package can include factory piped circuit setter and strainer (when selected, if applicable).

Field Installed Accessories

Room Sensor with Offset and Override
For units fitted with the Modine Control System, a stainless steel flush-mount thermistor sensor with insulated back provides for +/- 3° setpoint adjustment and momentary push button override. Sensor is wall mounted remote from the unit.

Digital Wallstat
Digital thermostat used in conjuction with the Modine Control System displays current room temperature, cooling/ heating setpoint, and current occupied mode. The display will also display a remote alarm from the Microprocessor Control. Thermostat allows for occupied temperature setpoint adjustment. The allowable setpoint adjustment range can be limited by the Microprocessor Control. Thermostat allows for occupied override activation allowing user to select the amount of time the unit is to remain in the override state. Thermostat is wall mounted remote from the unit.

Modulating Control Valve
Two-way or three-way modulating valve(s) shall be provided for precise capacity control of hot water and/or chilled water coil(s). The capacity control valve(s) shall be controled by a 2-10VDC or floating point signal from the unit mounted controller and shipped loose for field installation.

2-Position Spring Return Control Valve
Two-way or three-way 2-position spring return control valve(s) shall be provided for control of hot water and/or chilled water coil(s). The control valve(s) shall be controlled by a 24V signal from the units control panel and shipped loose for field installation.

Balancing Valve
A heavy duty ball-valve contruction balancing valve shall be supplied loose for field installation.

Circuit Setter
A manually adjustable ball-valve contruction balancing valve with Schrader style pressure ports and drain port shall be supplied loose for field installation.

Shut-Off Valves
A set of two heavy duty ball valves, one for the supply and one for the return, shall be supplied loose for field installation.

Strainer
A heavy duty cast iron strainer with screen, gasketed and tapped retainer cap and blow-off outlet shall be supplied loose for field installation.

Drain with Hose Bib
A blowdown valve with hose connector and cap shall be mounted on the coil.

Side Panels
Factory supplied side panels constructed of 14 or 16 gauge sheet steel and painted to match the unit shall be field mounted to the base unit. Side panels are available for both 16 5/8" and 21 7/8" deep units with or without pipe passage cutouts.

Utility Compartment
A factory supplied utility compartment with 14 gauge sheet steel front and top panels and painted to match the unit shall be field mounted to the base unit. Utility compartments are available for both 16 5/8" and 21 7/8" deep units in 12", 18" and 24" widths.

Filler Section
A factory supplied filler section constructed of 18 gauge sheet steel and painted to match the unit shall be field mounted. Filler sections are available in 6", 12" and 18" widths and can be field cut for custom widths.

Unit Sub-Base
Unit height adjustments can be made in increments of 1", 2", 4" and 6" with a sub-base field mounted under the standard unit. The sub-base is fully enclosed, constructed of heavy duty steel and painted to match the base of the standard unit.

Utility Compartment Sub-Base
Utility compartment height adjustments can be made in increments of 1", 2", 4" and 6" with a sub-base field mounted under the standard utility compartment. The sub-base is fully enclosed, constructed of heavy duty steel and painted to match the base of the standard utility compartment.

Wall Sleeve
The wall sleeve shall be constructed from galvanized steel. The sleeve shall be provided by Modine and insulated by the installing contractor with foil back insulation.

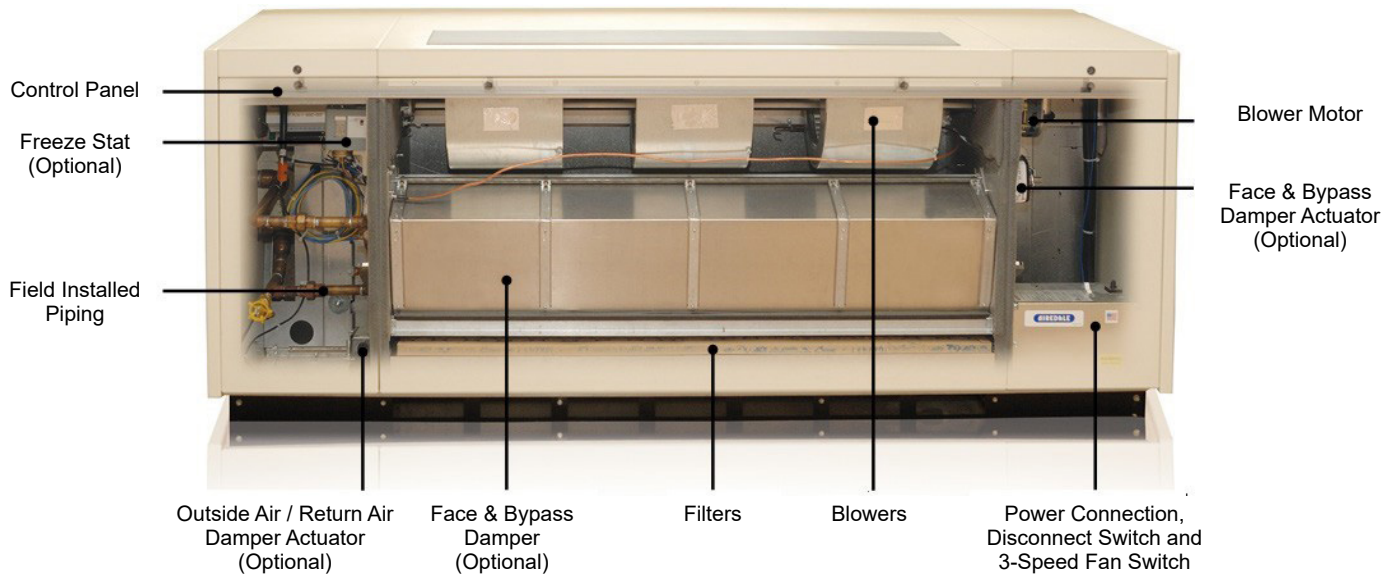
Louver
An outdoor louver shall be furnished by Modine and be suitable for masonry, glass or panel wall ocnstruction. Two louver styles are available: AMCA rated and non-AMCA rated. Louvers shall be availabe in the following materials:

- Aluminum with clear anodized finish
- Aluminum with baked enamel finish, customer selected from manufacturer's standard louver color chart

Duct Flange
A 1" duct flange shall be supplied and field installed to allow for easy installation of a supply air duct to the unit.

Spare Filters
Up to three spare sets of filters shall be supplied with the unit.

Figure 7.1 - Component Layout

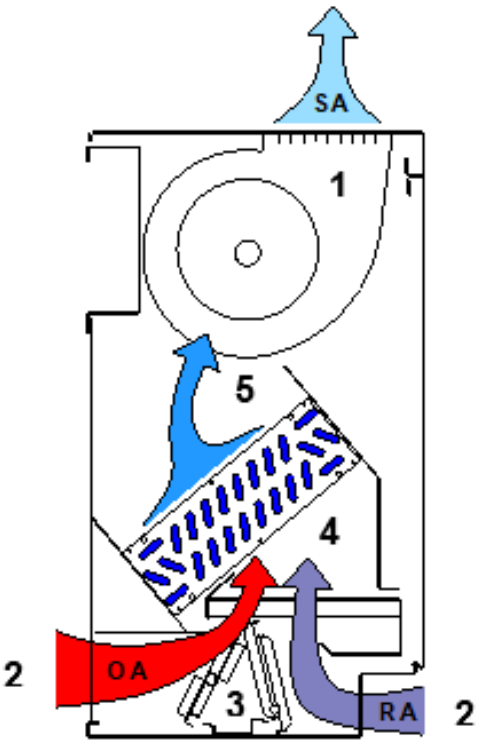


Valve Control Units

In a Valve Control Unit all of the air passes through the coil. The flow of water through the coil is modulated to maintain the set point temperature in the room.

1. Air is drawn through the unit by the blowers (draw-through design), conditioned and supplied to the room.
2. Return air enters through the lower front kick panel of the unit and outside air enters through the lower back panel of the unit.
3. The percentage of outside air and return air is controlled by the position of the outside air and return air dampers.
4. Air passes through the filters and then through the coil. The air is conditioned as it passes through the coil.
5. Cooling or heating capacity is controlled by adjusting the flow of water through the coil with a modulating valve. For units with DX cooling coils the outdoor condensing unit shall be energized on a call for cooling.

Figure 8.1 - Valve Control Unit



Face & Bypass Units

In a Face & Bypass Unit the outside air and return air can be separated, to condition only the outside air, or mixed before passing through the coil. Water flow and coil temperature remain constant to provide maximum dehumidification and low risk of coil freezing. The face & bypass damper is modulated to maintain the setpoint temperature in the room.

1. Air is drawn through the unit by the blowers (draw-through design), conditioned or bypassed and supplied to the room.
2. Return air enters through the lower front kick panel of the unit and outside air enters through the lower back panel of the unit.
3. The percentage of outside air and return air is controlled by the position of the outside air and return air dampers.
4. Air passes through the filters and then either passes through the coil or is diverted to bypass the coil. The air passing through the coil is conditioned. Bypassed air is mixed with the conditioned air and delivered to the room.
5. Cooling or heating capacity is controlled by adjusting the face & bypass damper. For units with DX cooling coils the outdoor condensing unit shall be energized on a call for cooling.

Figure 8.2 - Face & Bypass Unit

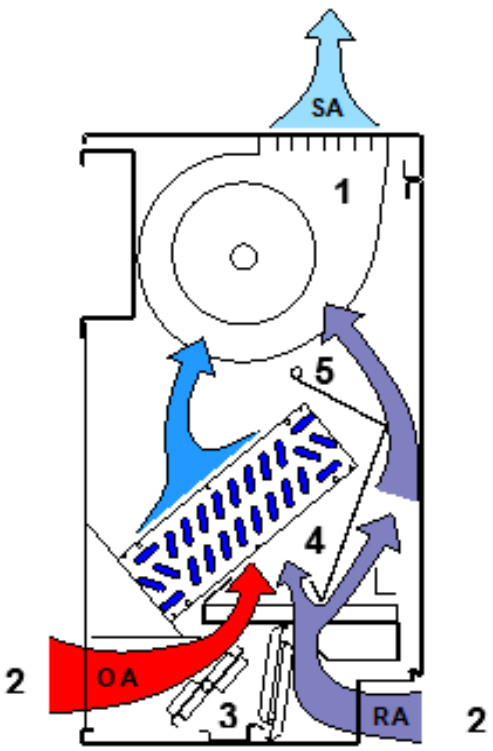


Table 9.1 - Unit Size 750 & 1000 Chilled Water Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	750					1000				
			PD (ft)	Capacity Type	Airflow CFM			PD (ft)	Capacity Type	Airflow CFM		
					High	Medium	Low			High	Medium	Low
45	6	2	2.09	Total	18,312	17,071	14,694	2.58	Total	27,859	24,376	21,468
				Sensible	14,965	13,694	11,464		Sensible	22,876	19,163	16,439
		3	1.03	Total	26,160	24,388	20,991	1.29	Total	32,775	28,678	25,256
				Sensible	18,707	17,118	14,330		Sensible	24,080	20,172	17,304
		4	1.14	Total	27,520	25,656	22,083	1.35	Total	34,454	30,147	26,550
				Sensible	19,109	17,486	14,639		Sensible	24,461	20,490	17,578
	10	2	5.20	Total	21,297	19,255	16,392	6.40	Total	32,099	28,494	25,835
				Sensible	16,533	14,908	12,508		Sensible	25,955	21,442	19,026
		3	2.57	Total	30,424	27,508	23,417	3.20	Total	37,763	33,523	30,394
				Sensible	20,665	18,635	15,635		Sensible	27,321	22,571	20,028
		4	2.84	Total	32,066	28,938	24,634	3.35	Total	39,698	35,240	31,951
				Sensible	21,110	19,036	15,971		Sensible	27,752	22,927	20,344

① Cooling Capacity based on Air On 80/67°F Dry/Web Bulb.

② For additional capacity information, please consult Breeze AccuSpec.

Table 9.2 - Unit Size 1250 & 1500 Chilled Water Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	1250					1500				
			PD (ft)	Capacity Type	Airflow CFM			PD (ft)	Capacity Type	Airflow CFM		
					High	Medium	Low			High	Medium	Low
45	6	2	3.40	Total	32,871	28,391	25,135	3.10	Total	37,455	32,871	29,721
				Sensible	27,608	22,624	19,635		Sensible	32,186	26,797	23,503
		3	1.68	Total	38,671	33,401	29,571	1.77	Total	44,064	38,672	34,966
				Sensible	29,061	23,814	20,668		Sensible	33,880	28,207	24,740
		4	1.38	Total	40,652	35,112	31,085	1.26	Total	49,356	40,683	36,784
				Sensible	29,520	24,191	20,995		Sensible	34,601	28,808	25,267
	10	2	8.30	Total	39,623	32,737	29,067	7.55	Total	45,709	38,736	34,125
				Sensible	30,868	24,748	21,672		Sensible	36,205	29,616	25,637
		3	4.09	Total	46,616	38,514	34,197	4.21	Total	53,775	45,572	40,147
				Sensible	32,493	26,050	22,813		Sensible	38,111	31,175	26,987
		4	3.43	Total	49,004	40,487	35,949	3.07	Total	56,572	47,942	42,235
				Sensible	33,006	26,462	23,173		Sensible	38,922	31,839	27,562

① Cooling Capacity based on Air On 80/67°F Dry/Web Bulb.

② For additional capacity information, please consult Breeze AccuSpec.

Table 10.1 - Unit Size 750 Direct Expansion Performance Data

Evaporator Saturation Temperature	Airflow CFM		750			650			500		
	Entering Air DB/WB		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	MBH	34,325	28,463	23,036	30,940	25,669	20,786	26,407	21,928	17,782
	SC	MBH	19,042	16,960	14,849	17,163	15,294	13,396	14,644	13,059	11,451
	LDB	°F	60.7	58.6	56.5	59.8	57.7	55.7	57.0	55.3	53.6
	LWB	°F	56.7	54.4	52.3	56.0	53.8	51.8	54.0	52.1	50.3
45	TC	MBH	29,630	23,766	18,430	26,724	21,446	16,644	22,829	18,345	14,258
	SC	MBH	16,780	14,708	12,614	15,132	13,268	11,386	12,918	11,339	9,740
	LDB	°F	63.6	61.5	59.3	62.8	60.7	58.6	60.3	58.6	56.8
	LWB	°F	58.9	56.7	54.6	58.4	56.3	54.2	56.7	54.9	53.1
50	TC	MBH	24,542	18,802	13,605	22,147	16,981	12,296	18,944	14,547	10,546
	SC	MBH	14,563	12,510	10,432	13,137	11,291	9,421	11,223	9,657	8,066
	LDB	°F	66.5	64.3	62.0	65.7	63.6	61.5	63.6	61.8	59.9
	LWB	°F	61.2	59.1	56.9	60.8	58.7	56.7	59.5	57.7	55.9

① Performance based on 105°F Liquid Inlet Temperature.

Table 10.2 - Unit Size 1000 Direct Expansion Performance Data

Evaporator Saturation Temperature	Airflow CFM		1000			750			600		
	Entering Air DB/WB		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	MBH	46,343	37,911	30,215	38,144	31,142	24,804	32,848	26,875	21,463
	SC	MBH	25,801	22,727	19,661	21,237	18,671	16,132	18,291	16,116	13,953
	LDB	°F	61.6	59.3	57.1	59.3	57.3	55.4	57.3	55.5	53.8
	LWB	°F	57.3	55.0	52.8	55.7	53.7	51.7	54.3	52.4	50.6
45	TC	MBH	39,763	31,423	24,087	32,749	25,860	19,781	28,192	22,328	17,087
	SC	MBH	22,688	19,649	16,660	18,688	16,160	13,676	16,092	13,946	11,806
	LDB	°F	64.4	62.1	59.8	62.4	60.4	58.4	60.6	58.9	57.1
	LWB	°F	59.5	57.3	55.0	58.2	56.2	54.2	57.1	55.2	53.4
50	TC	MBH	32,716	24,757	17,677	26,996	20,380	14,494	23,246	17,559	12,483
	SC	MBH	19,634	16,669	13,698	16,189	13,706	11,232	13,934	11,802	9,675
	LDB	°F	67.2	64.9	62.5	65.4	63.4	61.4	63.9	62.1	60.3
	LWB	°F	61.8	59.5	57.3	60.7	58.7	56.7	59.8	58.0	56.2

① Performance based on 105°F Liquid Inlet Temperature.

TC = Total Capacity
SC = Sensible Capacity
LDB = Leaving Dry Bulb
LWB = Leaving Wet Bulb

Table 11.1 - Unit Size 1250 Direct Expansion Performance Data

Evaporator Saturation Temperature	Airflow CFM		1250			900			750		
	Entering Air DB/WB		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	MBH	62,055	50,784	40,492	49,872	40,756	32,468	43,540	35,633	28,453
	SC	MBH	34,494	30,368	26,263	27,729	24,385	21,063	24,212	21,326	18,455
	LDB	°F	59.9	57.9	55.9	57.0	55.3	53.7	55.6	54.1	52.6
	LWB	°F	56.1	54.0	51.9	54.1	52.2	50.5	53.1	51.4	49.7
45	TC	MBH	53,246	42,060	32,261	42,825	33,830	25,876	37,376	29,596	22,633
	SC	MBH	30,293	26,219	22,226	24,380	21,079	17,834	21,284	18,436	15,600
	LDB	°F	63.0	60.9	58.8	60.4	58.7	57.0	59.2	57.6	56.1
	LWB	°F	58.6	56.5	54.4	56.9	55.1	53.3	56.1	54.4	52.8
50	TC	MBH	43,777	33,135	23,674	35,296	26,613	18,942	30,791	23,255	16,537
	SC	MBH	26,181	22,224	18,271	21,096	17,848	14,631	18,405	15,588	12,778
	LDB	°F	66.0	63.9	61.7	63.7	62.0	60.2	62.7	61.1	59.5
	LWB	°F	61.0	58.9	56.8	59.7	57.9	56.1	59.1	57.4	55.7

① Performance based on 105°F Liquid Inlet Temperature.

Table 11.2 - Unit Size 1500 Direct Expansion Performance Data

Evaporator Saturation Temperature	Airflow CFM		1500			1100			900		
	Entering Air DB/WB		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	MBH	71,293	58,404	46,636	57,981	47,427	37,803	50,287	41,211	32,891
	SC	MBH	39,581	34,844	30,138	32,198	28,311	24,452	27,930	24,610	21,290
	LDB	°F	61.0	58.9	56.7	58.4	56.6	54.7	56.8	55.1	53.4
	LWB	°F	56.9	54.6	52.4	55.1	53.1	51.2	53.9	52.0	50.3
45	TC	MBH	61,240	48,405	37,142	49,855	39,329	30,174	43,229	34,188	26,276
	SC	MBH	34,743	30,066	25,490	28,303	24,455	20,712	24,552	21,257	18,037
	LDB	°F	64.0	61.8	59.5	61.6	59.8	57.9	60.2	58.5	56.7
	LWB	°F	59.2	57.0	54.8	57.6	55.7	53.8	56.7	54.9	53.1
50	TC	MBH	50,283	38,162	27,273	41,040	31,073	22,195	35,610	27,006	19,326
	SC	MBH	29,992	25,478	20,972	24,471	20,749	17,051	21,229	18,034	14,838
	LDB	°F	66.9	64.6	62.3	64.8	62.9	60.9	63.6	61.8	60.0
	LWB	°F	61.5	59.3	57.1	60.3	58.3	56.4	59.6	57.7	55.9

① Performance based on 105°F Liquid Inlet Temperature.

TC = Total Capacity
SC = Sensible Capacity
LDB = Leaving Dry Bulb
LWB = Leaving Wet Bulb

Table 12.1 - Unit Size 750 & 1000 Hot Water Heating Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	750				1000			
			PD (ft)	Airflow CFM			PD (ft)	Airflow CFM		
				High	Medium	Low		High	Medium	Low
160	6	1	0.88	38,386	34,752	28,560	1.16	49,804	40,803	34,395
		2	1.78	50,110	45,366	37,283	2.35	62,381	51,107	43,080
		3 ②	0.82	57,261	51,840	42,604	1.09	72,442	59,350	50,029
		4 ②	0.86	61,152	55,363	45,499	1.14	81,135	66,472	56,032
	10	1	2.32	41,823	37,438	30,477	3.07	54,685	44,005	36,773
		2	4.71	54,596	48,872	39,786	6.2	68,494	55,118	46,059
		3 ②	2.17	62,388	55,847	45,463	2.87	79,541	64,008	53,488
		4 ②	2.28	66,627	59,642	48,553	3.01	89,086	71,689	59,906

① Performance based on Air On 60°F Dry Bulb.
② 2-pipe Chilled Water / Hot Water units.
③ For additional capacity information, please consult Breeze AccuSpec.

Table 12.2 - Unit Size 1250 & 1500 Hot Water Heating Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	1250				1500			
			PD (ft)	Airflow CFM			PD (ft)	Airflow CFM		
				High	Medium	Low		High	Medium	Low
160	6	1	1.45	59,656	47,744	41,610	1.75	70,109	57,236	49,403
		2	2.93	77,550	62,065	54,091	3.52	92,625	75,619	65,269
		3 ②	1.36	88,437	70,778	61,684	1.63	103,573	84,557	72,984
		4 ②	1.43	99,226	79,413	69,210	1.71	108,959	88,594	76,779
	10	1	3.82	66,035	51,738	44,724	4.58	78,277	62,508	53,391
		2	7.71	85,843	67,258	58,139	9.24	103,417	82,584	70,539
		3 ②	3.57	97,893	76,700	66,300	4.28	115,640	92,344	78,876
		4 ②	3.75	109,836	86,057	74,389	4.49	121,653	97,146	82,978

① Performance based on Air On 60°F Dry Bulb.
② 2-pipe Chilled Water / Hot Water units.
③ For additional capacity information, please consult Breeze AccuSpec.

Table 13.1 - Steam Heating Capacity at 2 lb. Steam

Size	Airflow CFM	Entering Air Temperature °F																					
		-20		-10		0		10		20		30		40		50		60		70		80	
		CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)
750	HIGH	84.6	84.4	80.1	88.9	75.8	93.5	71.6	98.4	67.6	103.5	63.7	108.6	59.9	113.9	56.1	119.3	52.3	124.5	48.7	130.1	44.9	135.4
	MED	77.4	90.3	73.3	94.4	69.4	98.8	65.6	103.4	61.9	108.1	58.3	113.1	54.8	118.1	51.4	123.2	47.9	128.2	44.5	133.5	41.1	138.6
	LOW	64.6	99.7	61.2	103.3	57.9	107.2	54.7	111.3	51.6	115.6	48.7	120.1	45.7	124.7	42.9	129.4	39.9	133.9	37.2	138.8	34.3	143.5
1000	HIGH	119.2	90.4	112.9	94.5	106.8	98.9	100.9	103.4	95.3	108.2	89.8	113.1	84.4	118.1	79.1	123.2	73.7	128.2	68.6	133.5	63.3	138.6
	MED	89.4	90.4	84.6	94.5	80.0	98.8	75.7	103.4	71.4	108.2	67.3	113.1	63.3	118.1	59.3	123.2	55.2	128.2	51.4	133.5	47.4	138.6
	LOW	76.3	97.8	72.2	101.5	68.3	105.4	64.6	109.7	61.0	114.1	57.5	118.7	54.0	123.4	50.6	128.1	47.2	132.8	43.9	137.7	40.5	142.5
1250	HIGH	137.0	81.5	129.7	86.1	122.7	90.9	116.0	95.9	109.5	101.1	103.2	106.4	97.0	111.9	90.9	117.3	84.7	122.7	78.8	128.4	72.7	133.9
	MED	104.9	87.9	99.3	92.2	93.9	96.6	88.8	101.4	83.8	106.2	79.0	111.3	74.3	116.4	69.6	121.6	64.8	126.7	60.3	132.1	55.7	137.3
	LOW	93.7	95.6	88.7	99.5	83.9	103.6	79.3	107.9	74.8	112.4	70.5	117.1	66.3	121.9	62.1	126.7	57.9	131.5	53.9	136.5	49.7	141.4
1500	HIGH	165.1	81.9	156.3	86.5	147.9	91.3	139.8	96.3	132.0	101.5	124.3	106.8	116.9	112.2	109.6	117.6	102.0	123.0	95.0	128.6	87.6	134.1
	MED	125.9	85.9	119.1	90.3	112.7	94.9	106.5	99.7	100.6	104.7	94.8	109.8	89.1	115.0	83.5	120.3	77.8	125.5	72.4	130.9	66.8	136.2
	LOW	113.7	97.0	107.7	100.8	101.8	104.8	96.3	109.0	90.9	113.5	85.6	118.1	80.5	122.8	75.5	127.6	70.3	132.3	65.4	137.3	60.4	142.1

① Steam heating performance based on 2psig steam.

14-100.3

Table 13.2 - Steam Heating and Leaving Air Temperature Correction Factors

Steam Pressure psig	Entering Air Temperature °F																						
	-20		-10		0		10		20		30		40		50		60		70		80		
	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	CAP (MBH)	LAT (°F)	
0	0.97	1.02	0.97	0.99	0.97	097	0.97	0.96	0.97	0.96	0.97	0.96	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.95	0.97	0.93	
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	1.03	1.05	1.03	1.04	1.03	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.05	1.05	1.05	1.06	1.05	1.06	1.06	1.07	
10	1.07	1.10	1.08	1.10	1.08	1.10	1.09	1.10	1.09	1.10	1.10	1.11	1.10	1.12	1.11	1.13	1.12	1.14	1.13	1.15	1.14	1.15	

Table 14.1 - Technical Data

			VFV, VFF, VSV, VSF				VCV, VCF			
			750	**1000**	**1250**	**1500**	**750**	**1000**	**1250**	**1500**
Supply Fan			Direct Drive Centrifugal				Direct Drive Centrifugal			
Fan Quantity			2	3	4	4	2	3	4	4
Fan Diameter			8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06
Fan Width			7.15	7.15	7.15	7.15	7.15	7.15	7.15	7.15
Standard Motor Size (Qty 1)		hp	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2
Standard Motor Type			PSC with Thermal Overload Protection				ECM - Electronically Commutated Motor			
Airflow	High	cfm	750	1000	1250	1500	750	1000	1250	1500
	Med	cfm	650	750	900	1100	650	850	1100	1250
	Low	cfm	500	600	750	900	500	750	1000	1000
Max External Static Pressure		in.Wg	0.05	0.05	0.05	0.05	0.25	0.25	0.25	0.25
Coil Water Volume										
1 Row		gal	0.32	0.38	0.44	0.50	0.32	0.38	0.44	0.50
2 Row		gal	0.51	0.63	0.76	0.88	0.51	0.63	0.76	0.88
3 Row		gal	0.72	0.91	1.10	1.28	0.72	0.91	1.10	1.28
4 Row		gal	0.92	1.17	1.42	1.66	0.92	1.17	1.42	1.66
Connections										
Water Coils			Unions with 3/4” female solder joint				Unions with 3/4” female solder joint			
Evaporator Coil			3/4” OD Suction, 1/2” OD Liquid				3/4” OD Suction, 1/2” OD Liquid			
Steam Coil			1” NPT				1” NPT			
Condensate Line			3/4” ID condensate line				3/4” ID condensate line			
Unit Weight (approximate)										
Shipping Weight – Std. Units		lbs.	465	525	585	650	665	785	905	980
Operating Weight – Std. Units		lbs.	410	470	525	580	610	730	845	910
Shipping Weight – 21 7/8” Units		lbs.	500	565	630	700	-	-	-	-
Operating Weight – 21 7/8” Units		lbs.	445	510	570	630	-	-	-	-
Filter			1” Woven Fiberglass, 70-75% Arrestance				1” Woven Fiberglass, 70-75% Arrestance			
Quantity			1	2	2	2	1	2	2	2
Dimensions		in.	10 X 36	10 X 24	10 X 30	10 X 36	10 X 36	10 X 24	10 X 30	10 X 36

Table 14.2 - Chilled Water Cooling Capacity (BTU/Hr)

	Coil Rows	**2**	**3**	**4**
750	Total	12,770	24,248	26,267
	Sensible	11,926	17,914	18,603
1000	Total	26,570	34,532	37,404
	Sensible	22,239	24,829	25,651
1250	Total	34,943	45,124	48,576
	Sensible	28,620	31,894	32,845
1500	Total	43,437	55,621	59,662
	Sensible	35,037	38,942	40,230

① Rated in accordance with AHRI Standard 840.
② Cooling Capacity based on Air On 80/67°F Dry/Wet Bulb, 45°F Entering Water, 55°F Leaving Water, High Fan Speed.
③ For additional capacity information, please consult Breeze AccuSpec.

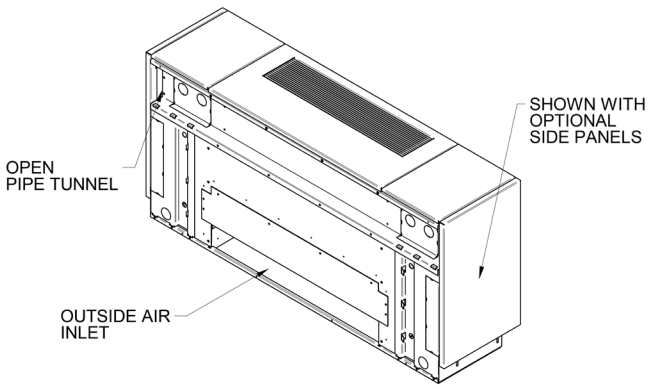
Table 14.3 - Hot Water Heating Capacity (BTU/Hr)

Coil Rows	**750**	**1000**	**1250**	**1500**
1	28,792	46,690	60,158	74,326
2	50,121	66,799	87,070	107,922
3	61,369	81,238	102,356	124,104
4	67,050	93,125	117,537	132,160

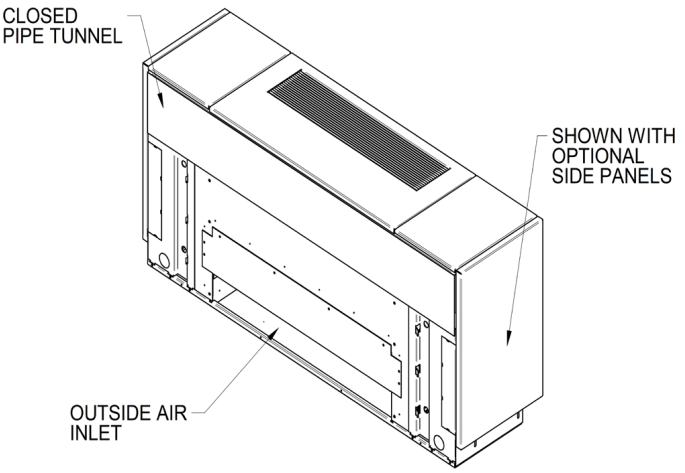
① Heating Capacity based on Air On 60°F Dry Bulb, 180°F Entering Water, 140°F Leaving Water, High Fan Speed
② For additional capacity information, please consult Breeze AccuSpec.

Figure 15.1 - Inlet Air Arrangements - 16 5/8" Depth

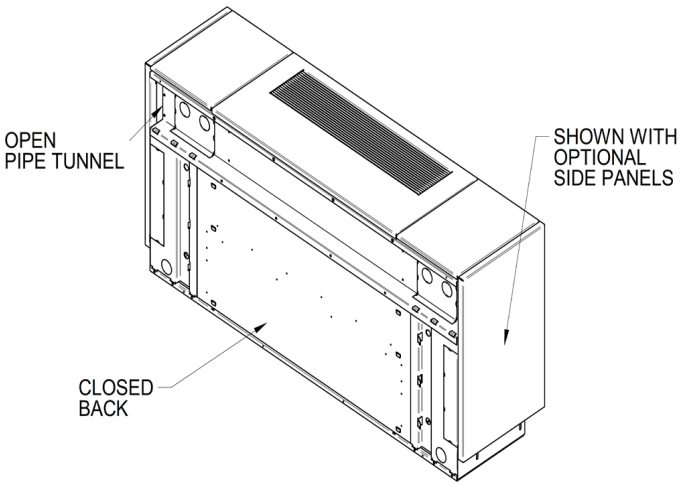
A. Rear Outside Air - Open Pipe Tunnel

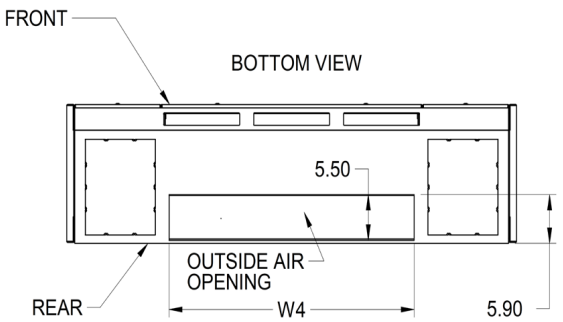


B. Rear Outside Air - Closed Pipe Tunnel



C. Bottom Outside Air - Open Pipe Tunnel





D. No Outside Air - Open Pipe Tunnel

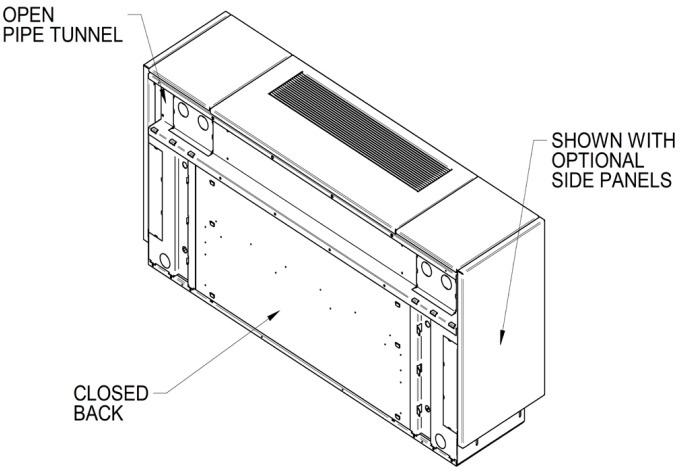
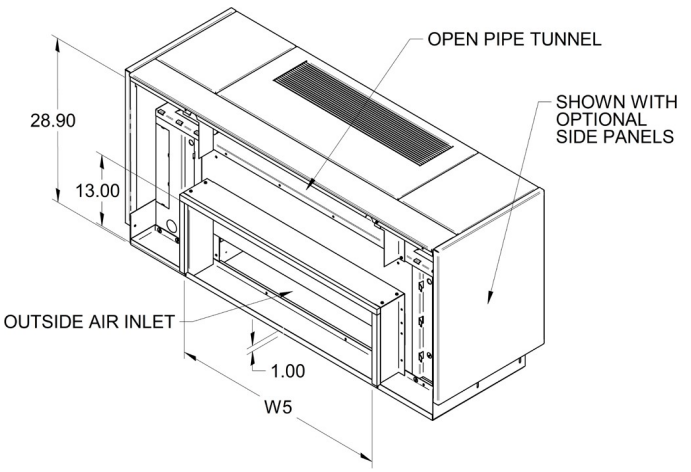


Table 15.1 - Unit Dimensions

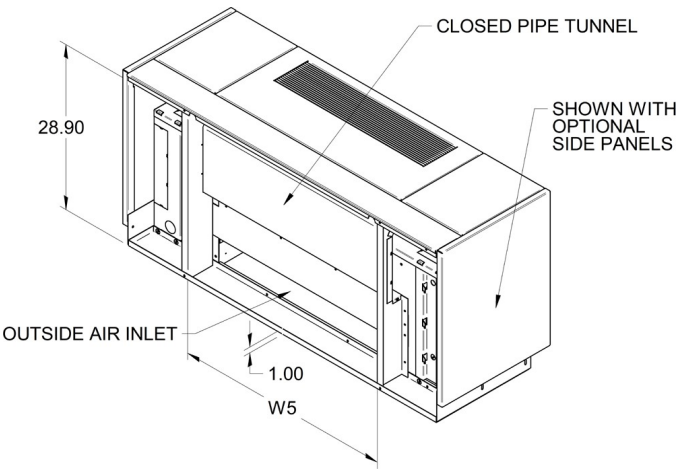
Model Size	Dimension (in.)
	W4
750	35
1000	47
1250	59
1500	71

Figure 16.1 - Inlet Air Arrangements - 21 7/8" Depth

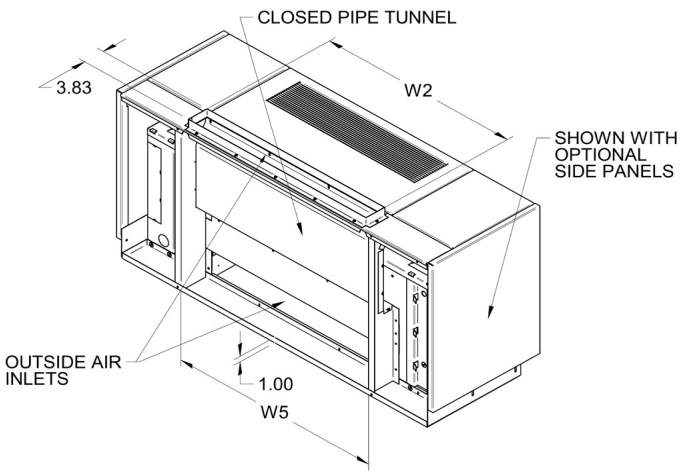
E. Rear Outside Air - Open Pipe Tunnel



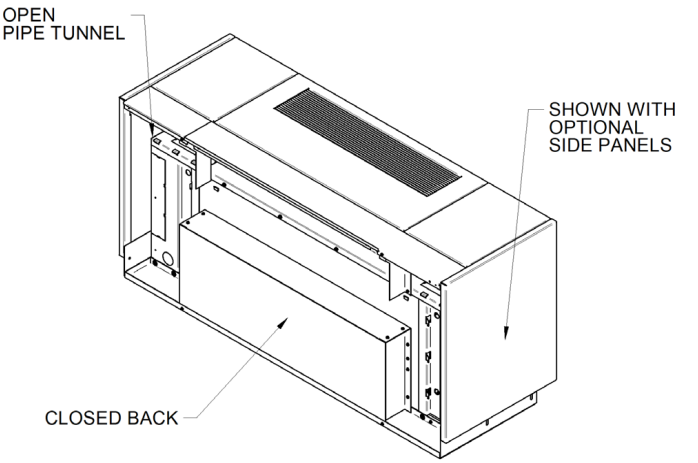
F. Rear Outside Air - Closed Pipe Tunnel



G. Top Window Intake - Closed Pipe Tunnel
(Flat Top Units Only)



H. No Outside Air - Open Pipe Tunnel



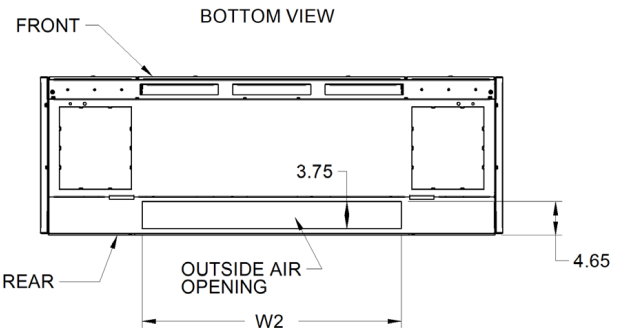
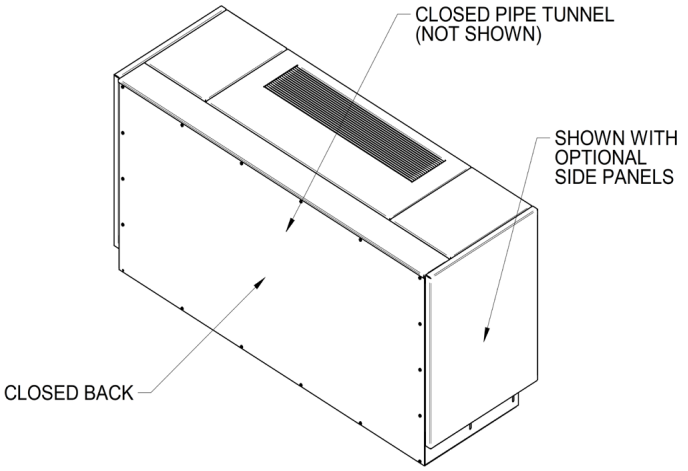


Table 16.1 - Unit Dimensions

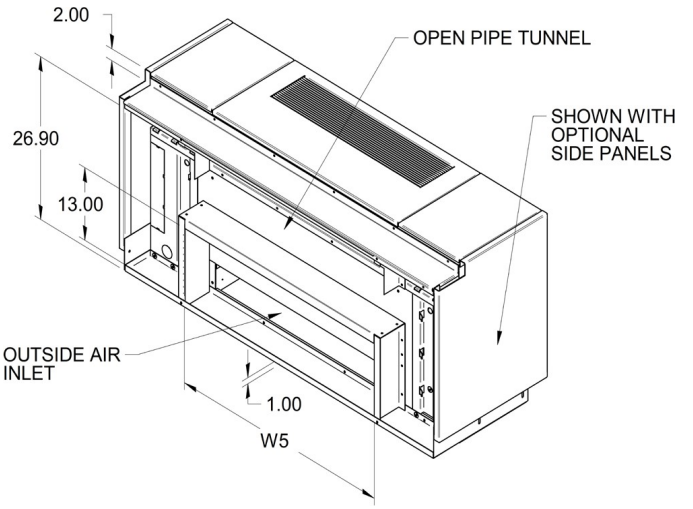
Model Size	Dimension (in.)	
	W2	W5
750	36	38
1000	48	50
1250	60	62
1500	72	74

Figure 17.1 - Inlet Air Arrangements - 21 7/8" Depth

J. Closed Back - Closed Pipe Tunnel



K. 2" Step-Down - Open Pipe Tunnel
(Flat Top Units Only)



L. 2" Step-Down - Closed Pipe Tunnel
(Flat Top Units Only)

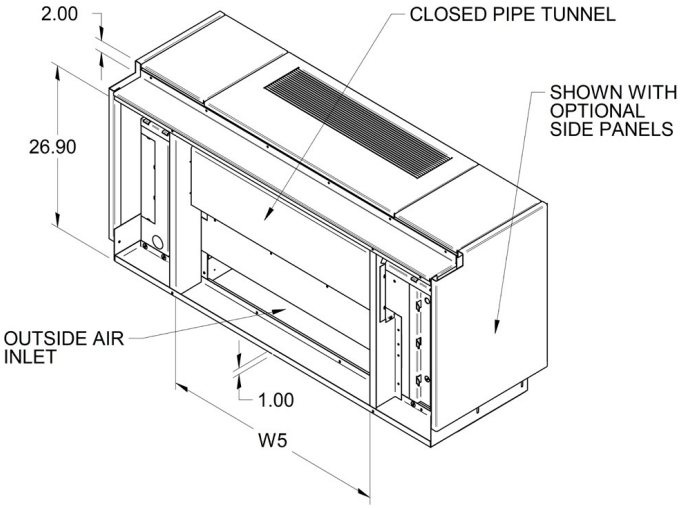


Table 17.1 - Unit Dimensions

Model Size	Dimension (in.)
	W5
750	38
1000	50
1250	62
1500	74

Figure 18.1 - Dimensional Data - 16 5/8" Depth - Flat Top Unit

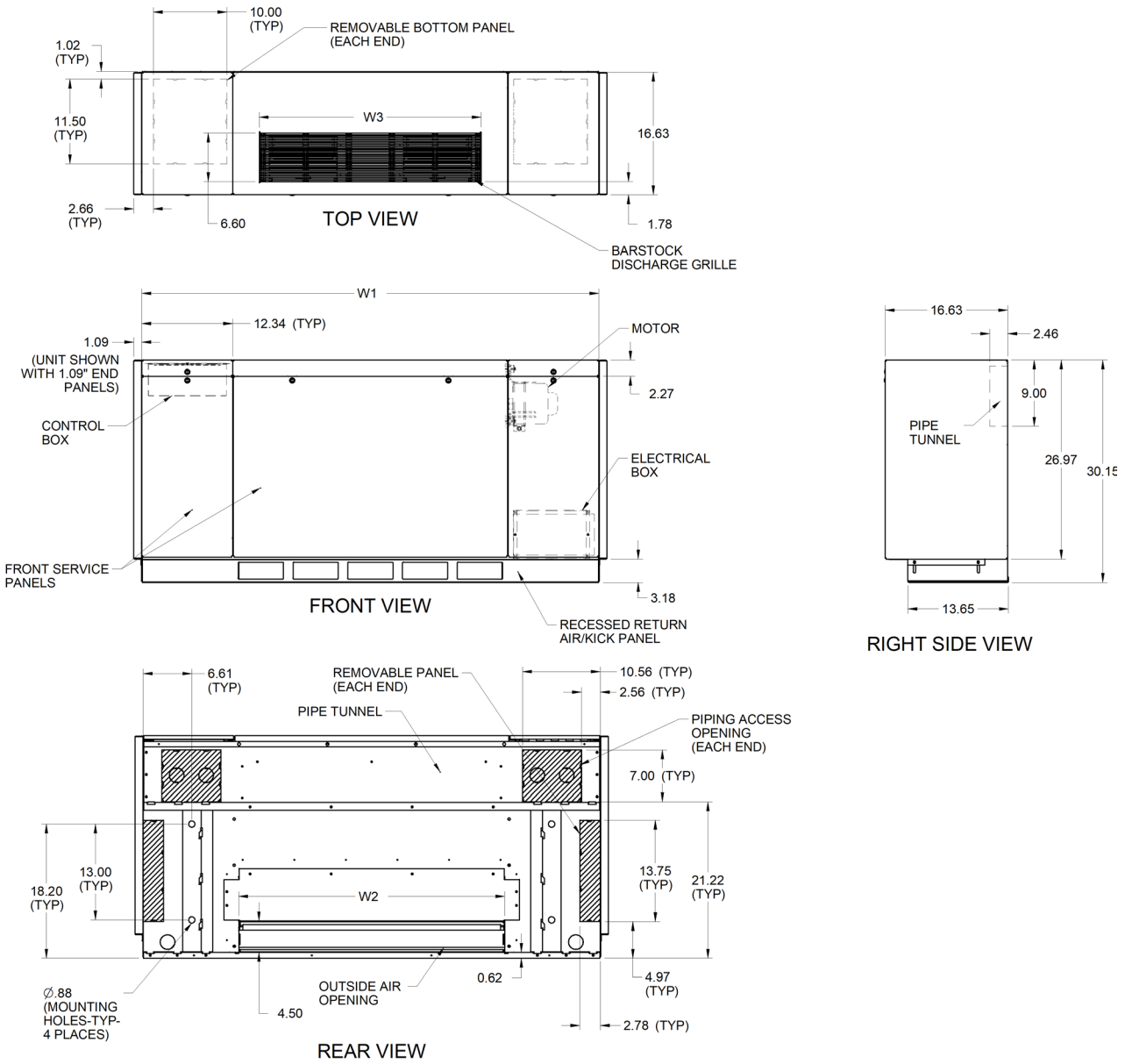


Table 18.1 - Unit Dimensions

Model Size	Dimension (in.)		
	W1	W2	W3
750	62	36	30
1000	74	48	42
1250	86	60	54
1500	98	72	66

Figure 19.1 - Dimensional Data - 21 7/8" Depth - Flat Top Unit

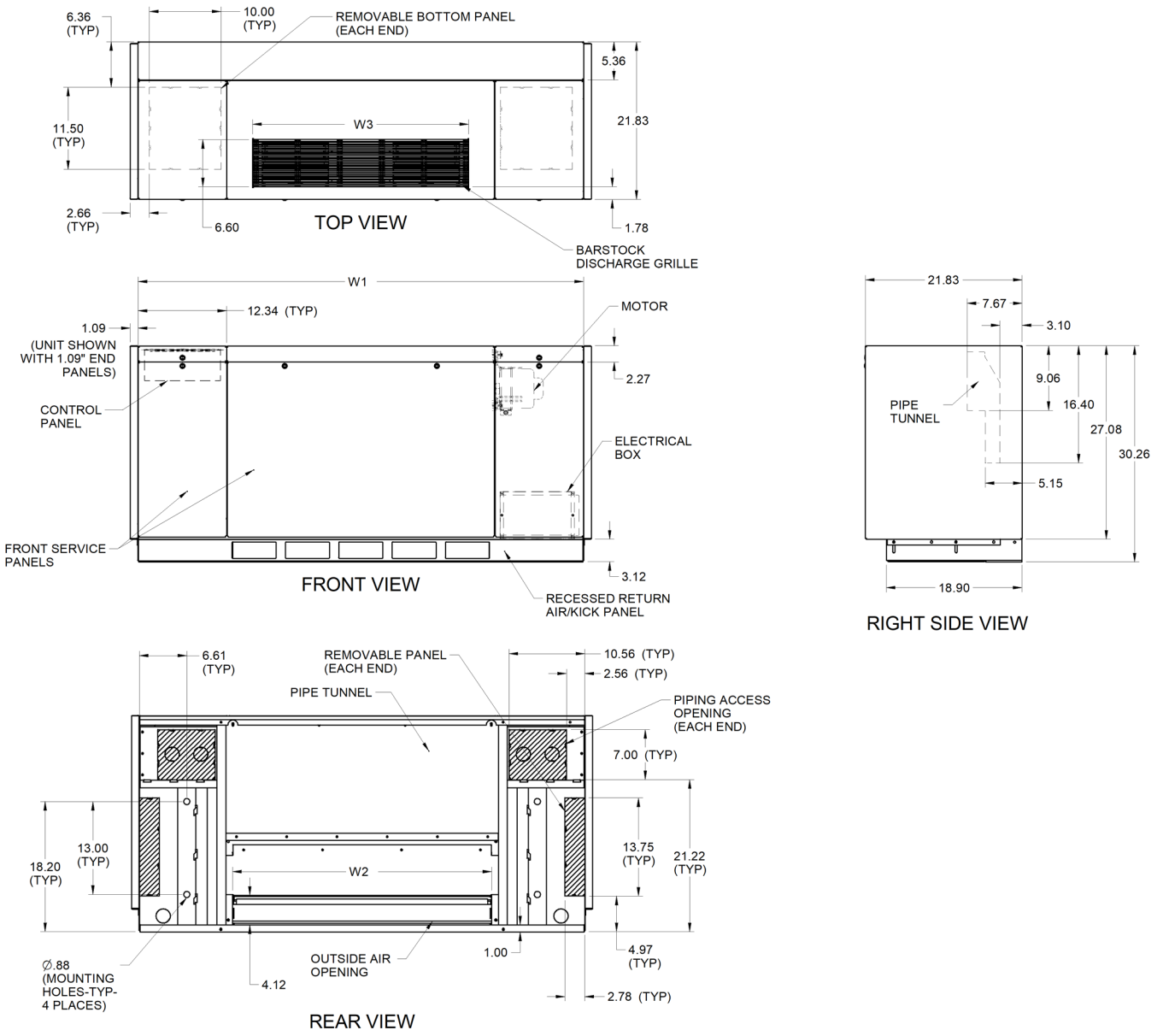


Table 19.1 - Unit Dimensions

Model Size	Dimension (in.)		
	W1	W2	W3
750	62	36	30
1000	74	48	42
1250	86	60	54
1500	98	72	66

Figure 20.1 - Dimensional Data - 16 5/8" Depth - Slope Top Unit

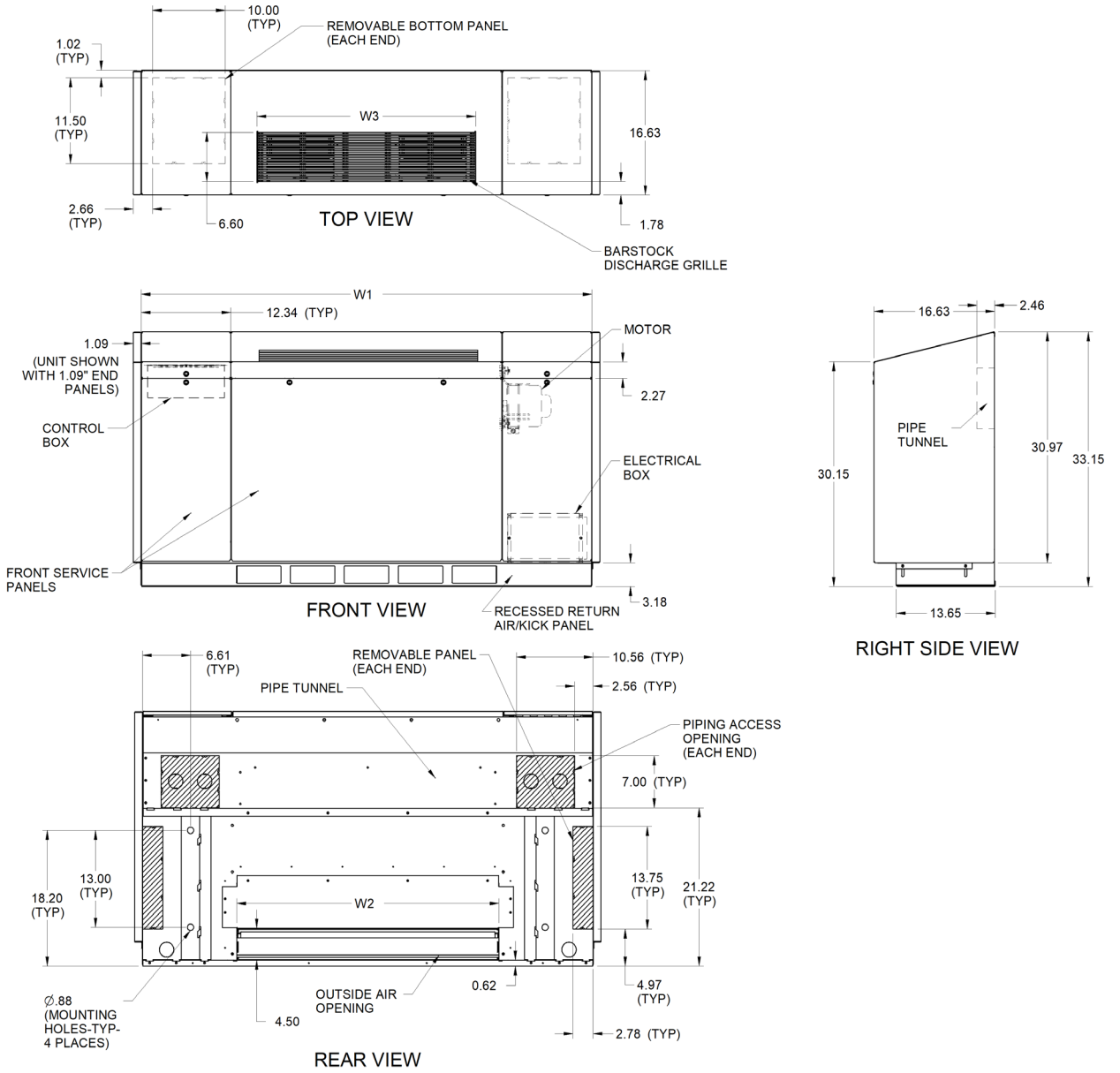


Table 20.1 - Unit Dimensions

Model Size	Dimension (in.)		
	W1	W2	W3
750	62	36	30
1000	74	48	42
1250	86	60	54
1500	98	72	66

Figure 21.1 - Dimensional Data - 21 7/8" Depth - Slope Top Unit

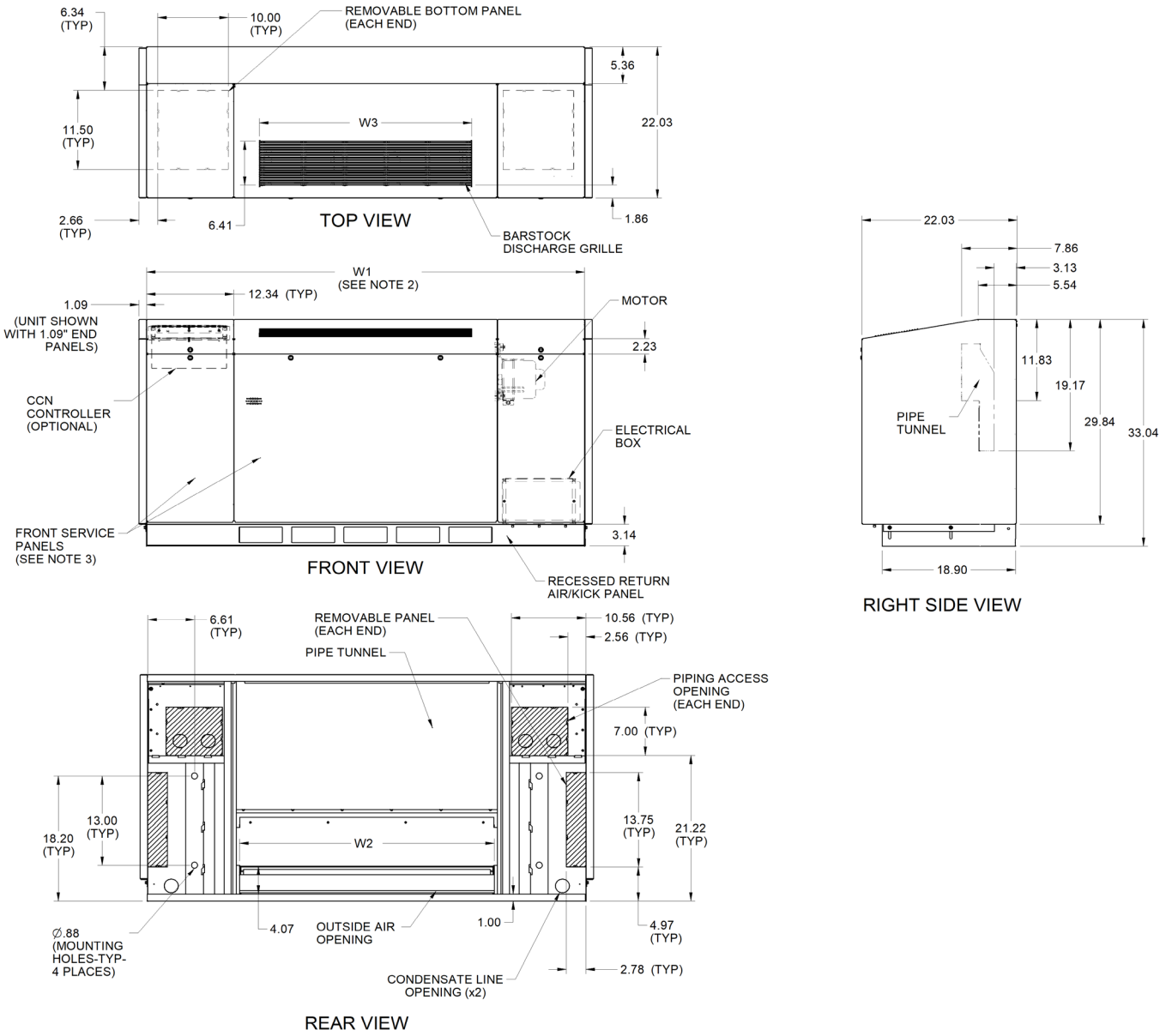


Table 21.1 - Unit Dimensions

Model Size	Dimension (in.)		
	W1	W2	W3
750	62	36	30
1000	74	48	42
1250	86	60	54
1500	98	72	66

Figure 22.1 - Dimensional Data - Ceiling Mounted Unit - Front Discharge

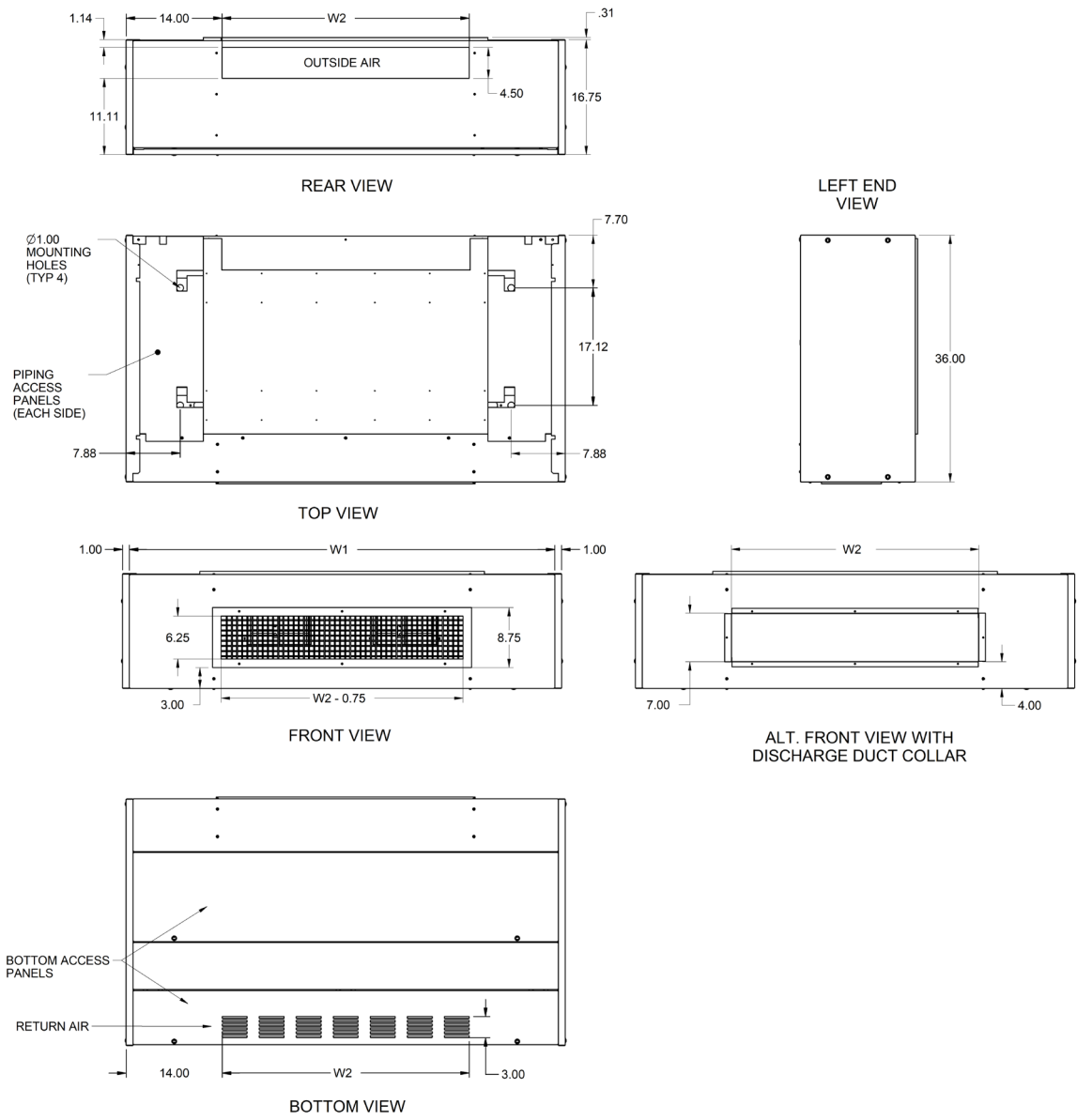


Table 22.1 - Unit Dimensions

Model Size	Dimension (in.)	
	W1	W2
750	62	36
1000	74	48
1250	86	60
1500	98	72

Figure 23.1 - Dimensional Data - Ceiling Mounted Unit - Down Discharge

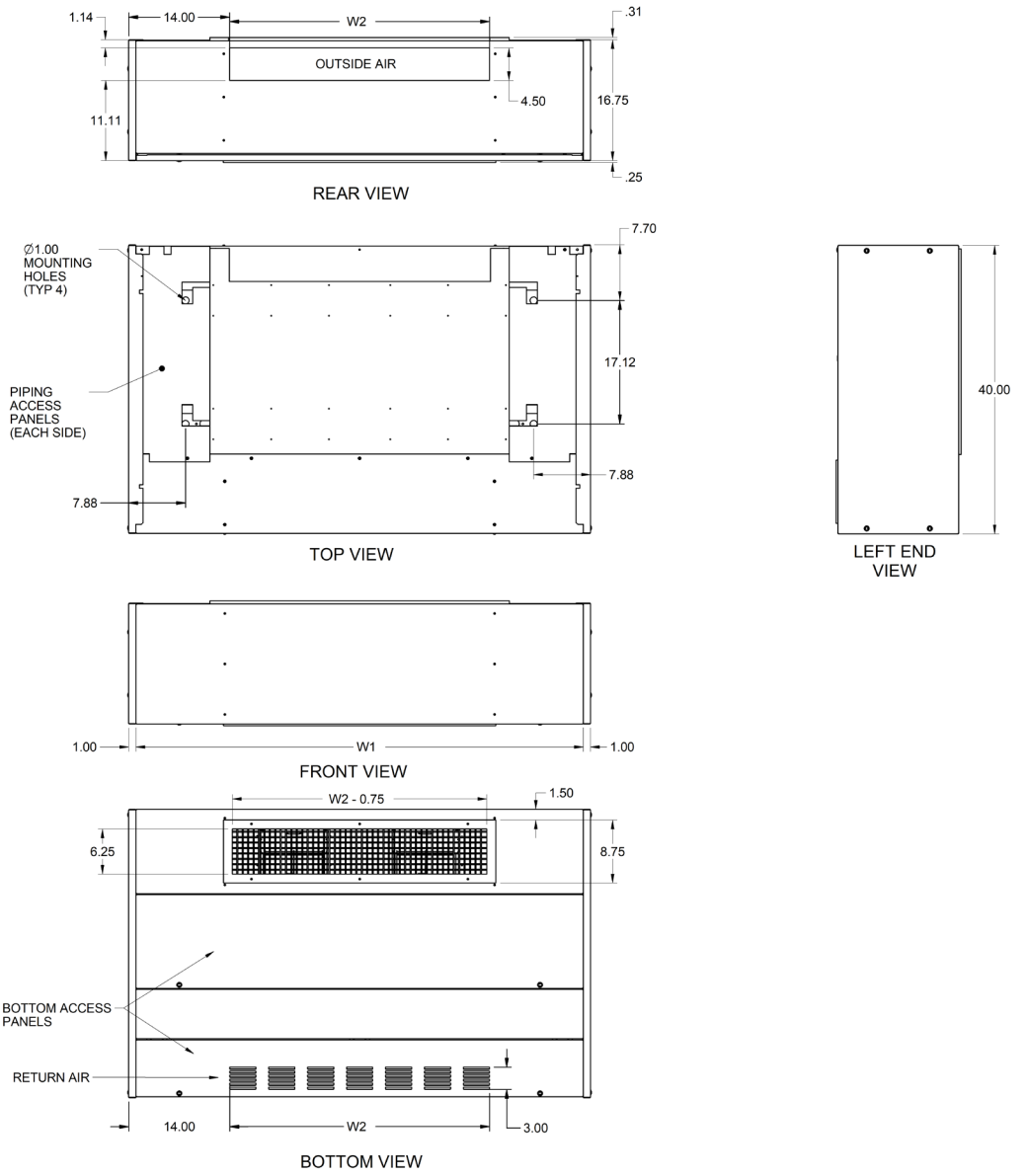


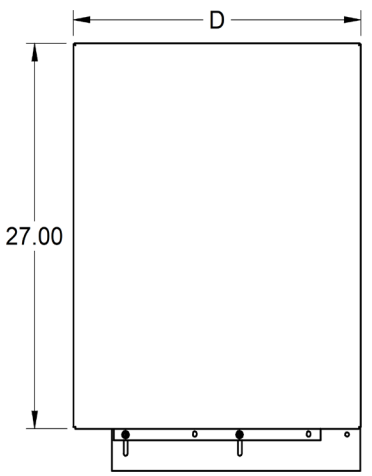
Table 23.1 - Unit Dimensions

Model Size	Dimension (in.)	
	W1	W2
750	62	36
1000	74	48
1250	86	60
1500	98	72

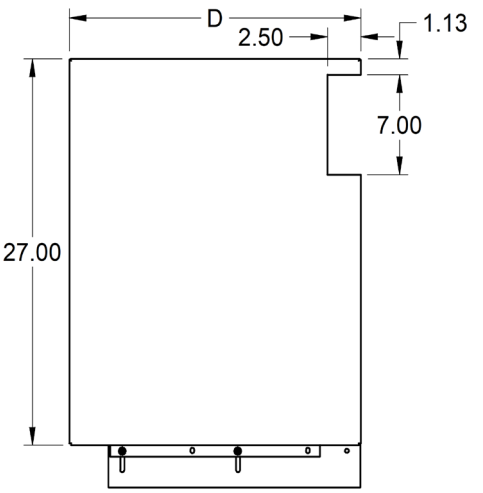
Figure 24.1 - Side Panels - Flat Top

D = 16 5/8 or 21 7/8 Inches

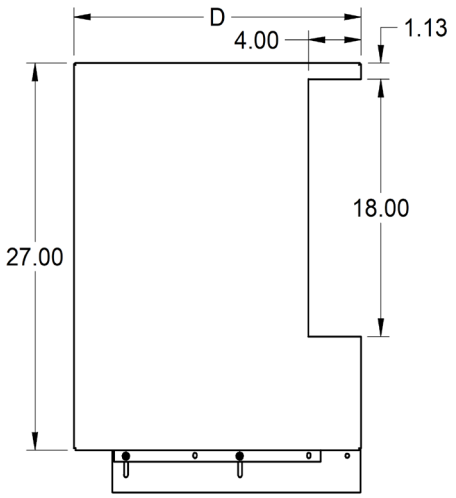
Full Side Panel



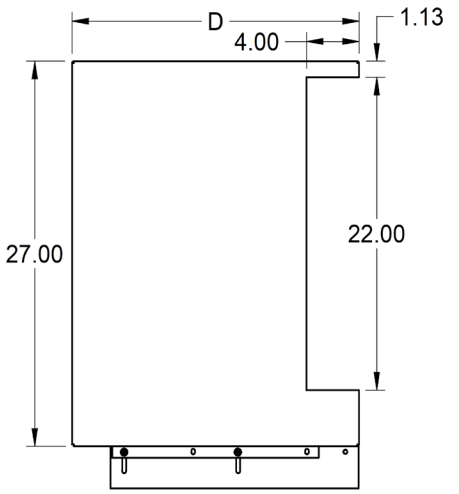
7" Cut-Out



18" Cut-Out



22" Cut-Out



2" Step Down (21 7/8" Depth Only)

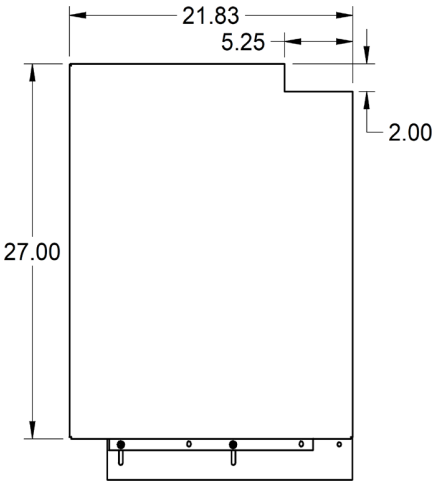
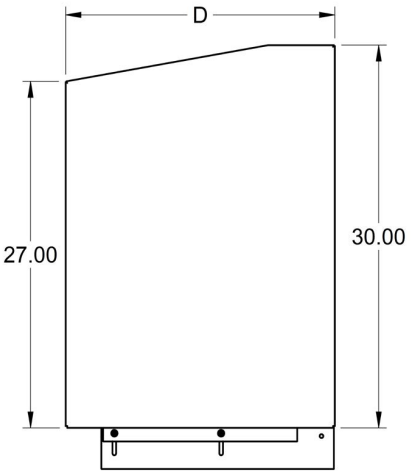


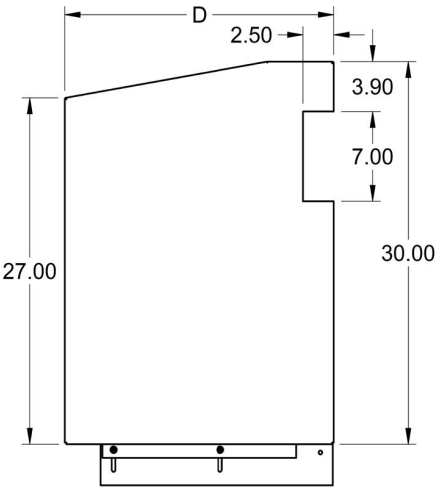
Figure 25.1 - Side Panels - Slope Top

D = 16 5/8 or 21 7/8 Inches

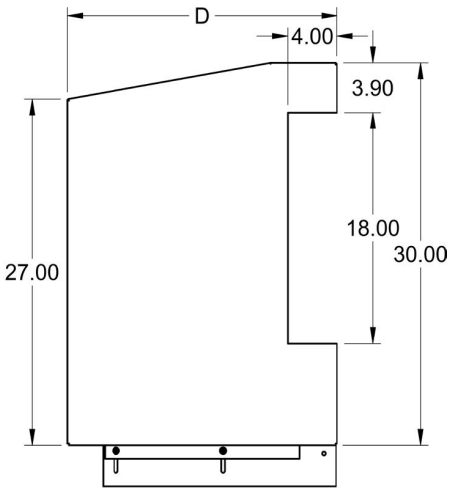
Full Side Panel



7" Cut-Out



18" Cut-Out



22" Cut-Out

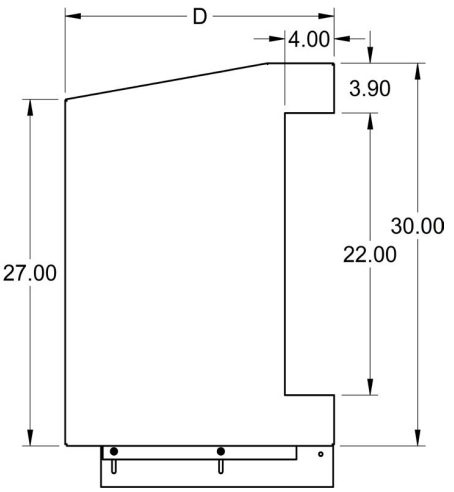
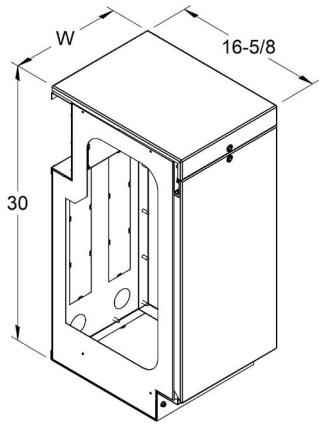


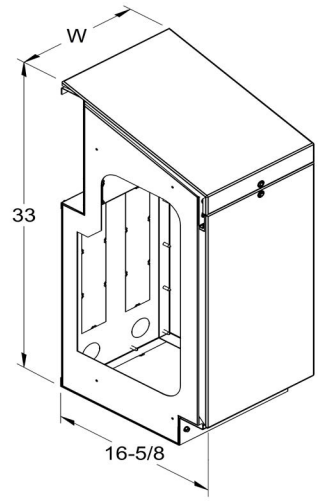
Figure 26.1 - Utility Compartments - Flat / Slope Top

W = 12, 18 or 24 Inches

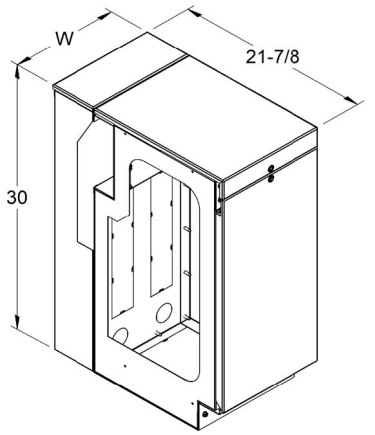
16 5/8" Flat Top Utility Compartment



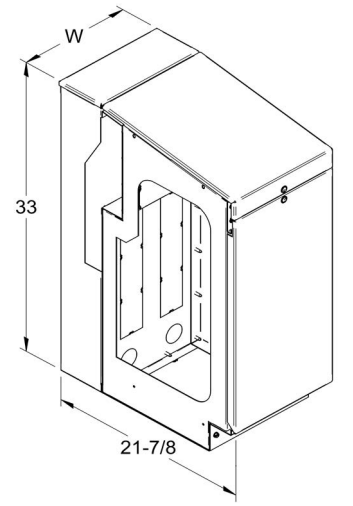
16 5/8" Slope Top Utility Compartment



21 7/8" Flat Top Utility Compartment



21 7/8" Slope Top Utility Compartment



2" Step Down Utility Compartment (21 7/8" Flat Top Units Only)

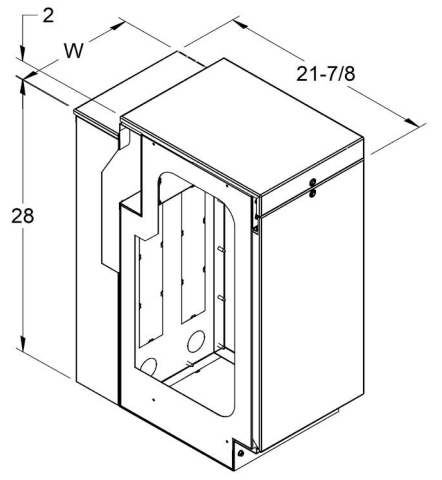
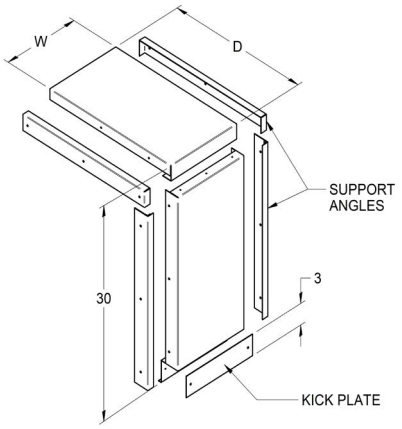


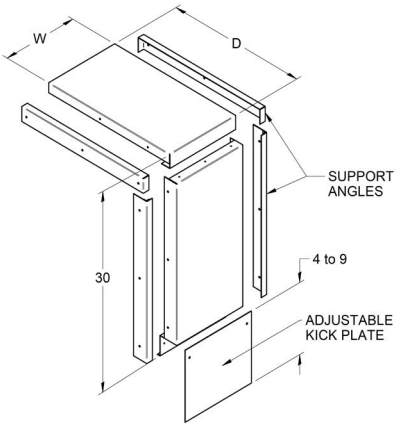
Figure 27.1 - Filler Sections

W = 6, 12 or 18 Inches D = 16 5/8 or 21 7/8 Inches

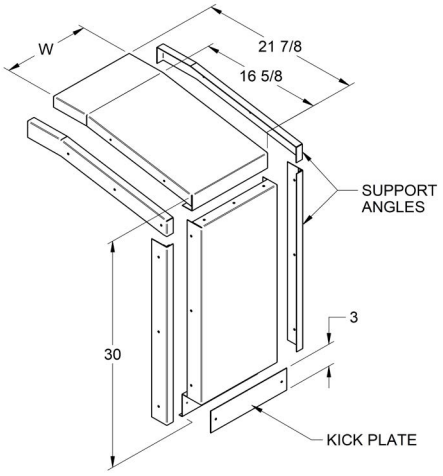
Flat Top Filler Section for Standard Height Units



Flat Top Filler Section for Units with Sub-Base



Slope Top Filler Section for Standard Height Units



Slope Top Filler Section for Units with Sub-Base

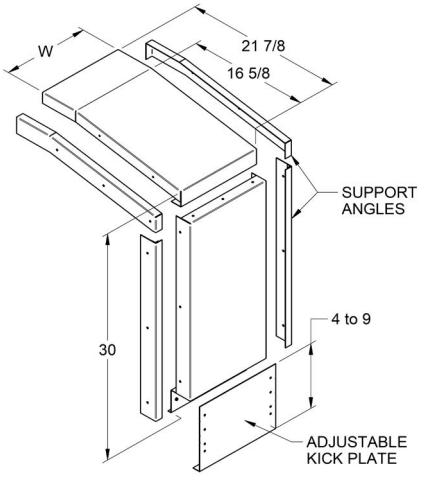


Table 27.1 - Unit Sub-Base Dimensions

Dimension (in.)	Model Size			
	750	1000	1250	1500
W	62	74	86	98
D (16 5/8" deep units)	13.65	13.65	13.65	13.65
D (21 7/8" deep units)	18.90	18.90	18.90	18.90
H	1", 2", 4" or 6"			

Figure 27.2 - Unit Sub-Base

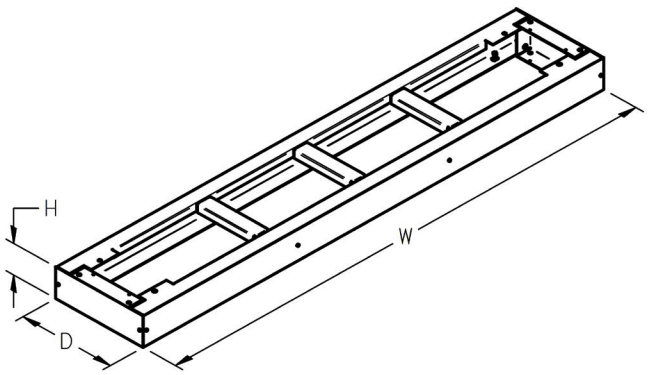


Figure 28.1 - Duct Flange

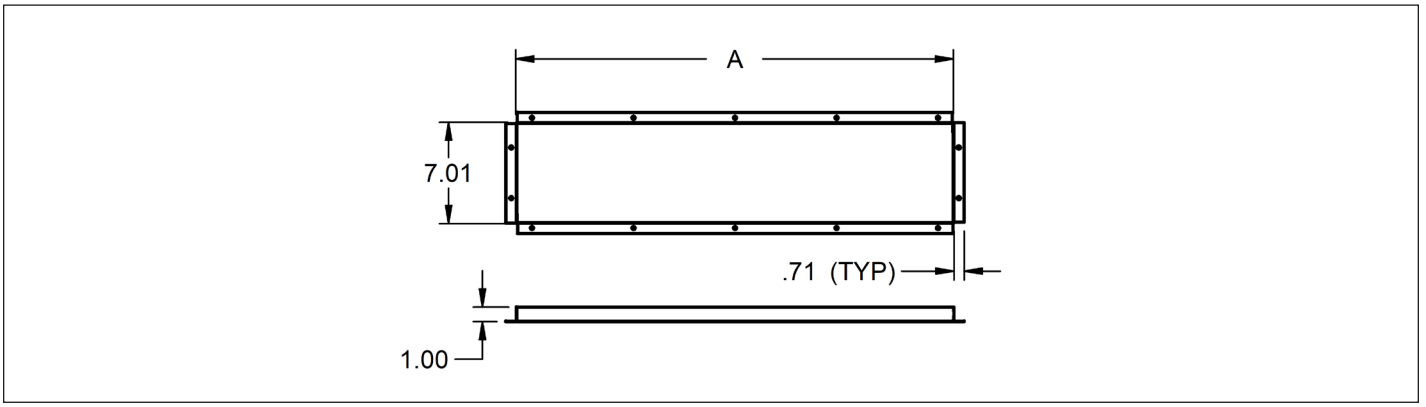


Table 28.1 - Duct Flange Dimensions

Dimension (in.)	Model Size			
	750	1000	1250	1500
A	30.19	42.19	54.19	66.19

Figure 28.2 - Wall Sleeve

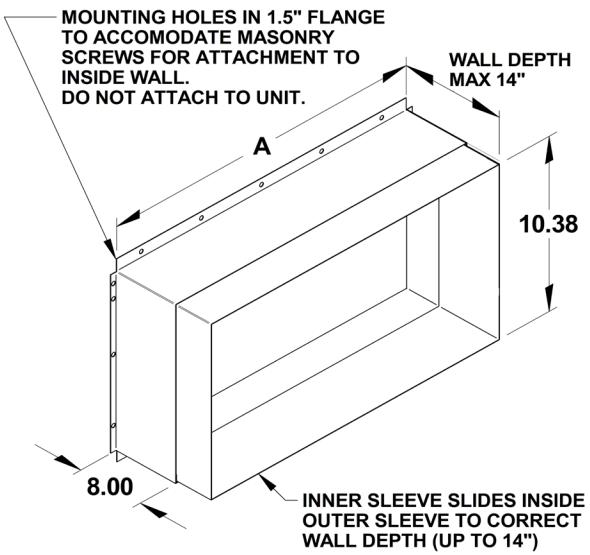


Figure 28.3 - Louver

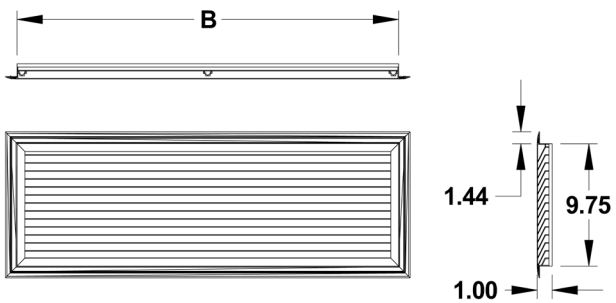


Table 28.2 - Wall Sleeve and Louver Dimensions

Dimension (in.)	Model Size			
	750	1000	1250	1500
A	36	48	60	72
B	35.5	47.5	59.5	71.5

Modine offers the following piping components:

Modulating Control Valve, 2-way or 3-way - for Valve Control units (Digit 3 = V)
2-Position Control Valve, 2-way or 3-way - for Face & Bypass units (Digit 3 = F)
Balancing Valve
Circuit Setter
Drain with Hose Bib
Shut Off Valves
Strainer

Piping components can be shipped loose for field installation and are available in ½" and ¾" sizes for chilled water units and ½" for hot water units.

Figure 29.1 - Typical 2-Way Piping Diagram

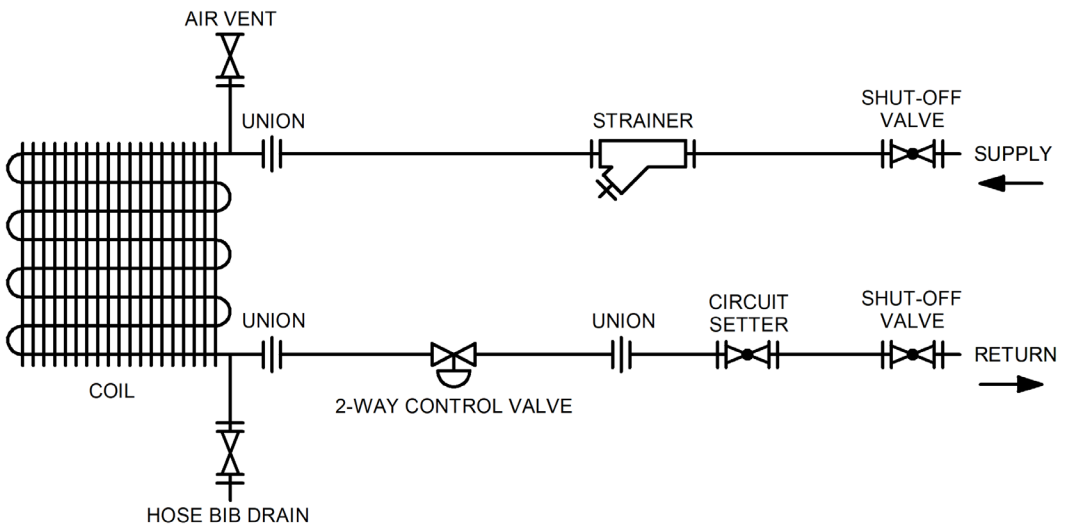


Figure 29.2 - Typical 3-Way Piping Diagram

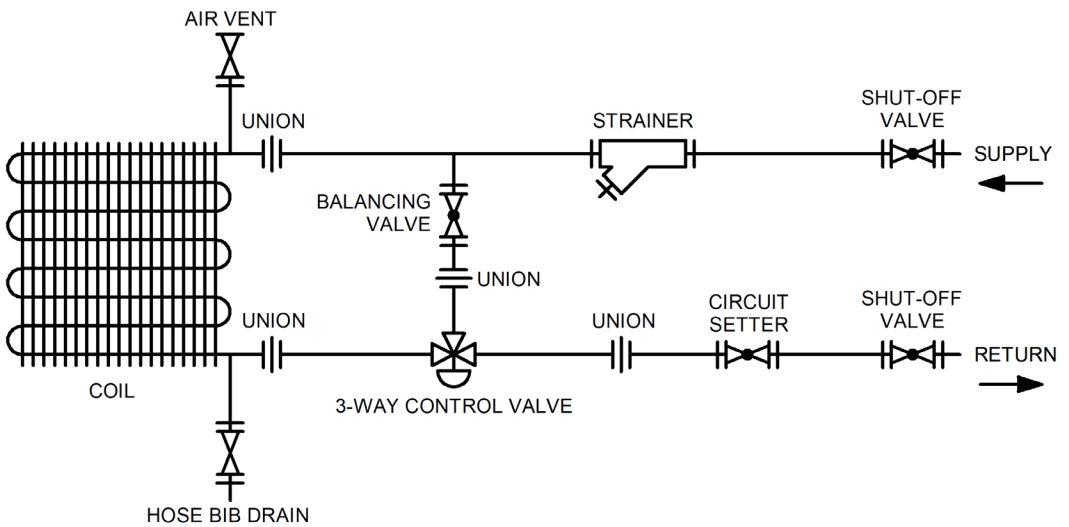


Figure 30.1 - Chilled Water Coil with Optional Reheat Piping Locations

Chilled Water Coil Only, 2-Pipe Chilled Water/Hot Water, or Chilled Water Coil with Reheat Coil

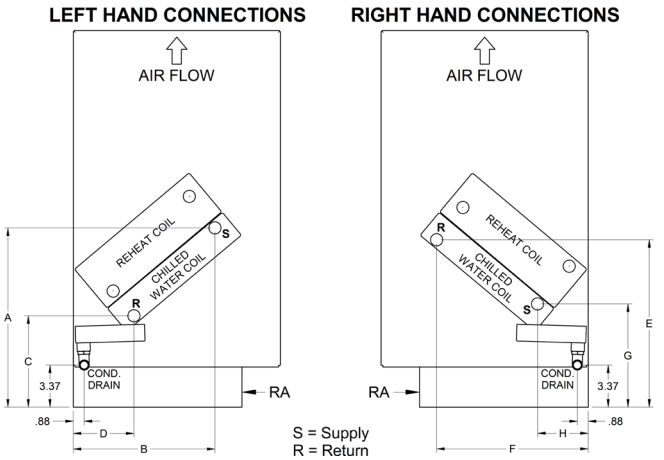


Figure 30.2 - Chilled Water Coil with Pre-Heat Piping Locations

Chilled Water Coil with Pre-Heat Coil Only

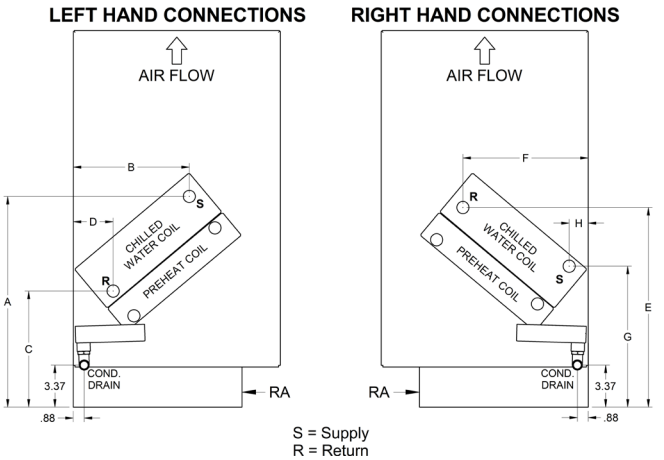


Table 30.1 - Piping Location Dimensions

Unit Depth		16 5/8			21 7/8		
Coil Rows		2	3	4	2	3	4
Dimensions (in.)	A	14.25	15.00	15.00	14.25	15.00	15.00
	B	11.25	11.00	11.00	16.50	16.25	16.25
	C	7.25	7.50	7.50	7.25	7.50	7.50
	D	4.75	4.75	4.75	10.00	10.00	10.00
	E	13.50	13.50	14.00	13.50	13.50	14.00
	F	12.25	12.00	11.75	17.50	17.25	17.00
	G	8.25	8.75	9.50	8.25	8.75	9.50
	H	4.00	3.50	3.00	10.00	8.75	8.25

① For Hot Water Reheat piping locations see Figure 32.2. For Steam Reheat piping locations see Figure 33.2.

Table 30.2 - Piping Location Dimensions

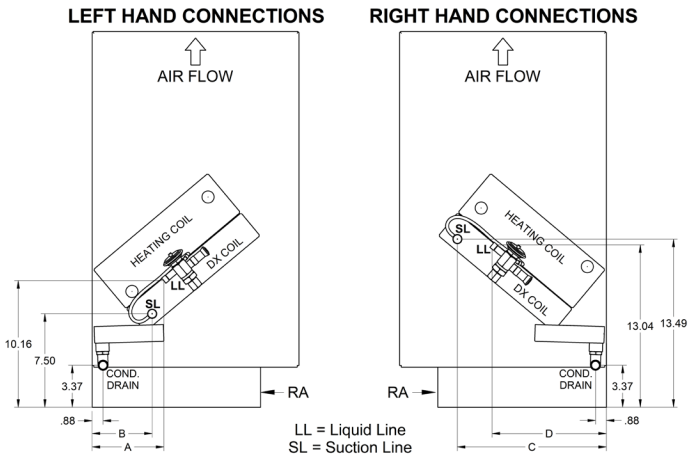
Unit Depth		16 5/8			21 7/8		
Coil Rows		2	3	4	2	3	4
Dimensions (in.)	A	17.50	17.50	16.75	17.50	17.50	16.75
	B	8.75	8.75	9.25	14.00	14.00	14.50
	C	10.50	10.00	9.25	10.50	10.00	9.25
	D	2.25	2.75	3.25	7.50	8.00	8.50
	E	16.50	16.00	16.00	16.50	16.00	16.00
	F	9.50	10.00	10.00	14.75	15.25	15.25
	G	11.50	11.25	11.25	11.50	11.25	11.25
	H	1.50	1.50	1.50	6.75	6.75	6.75

① For Hot Water Pre-Heat piping locations see Figure 32.1. For Steam Pre-Heat piping locations see Figure 33.1.

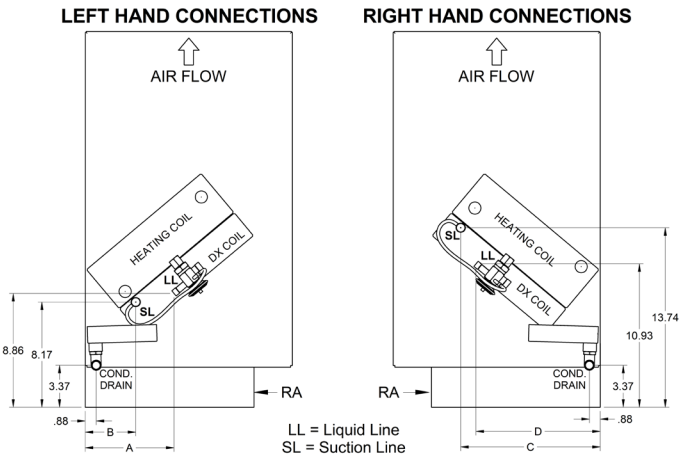
Note: Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped up in accordance with good plumbing practices.

Figures 31.1 & 31.2 - DX Cooling with Optional Reheat Piping Locations

DX Cooling Coil Only or DX Cooling with Reheat Coil



Unit Size: 750



Unit Size: 1000 / 1250 / 1500

Table 31.1 - Piping Location Dimensions

Unit Depth	Dimensions (in.)			
	A	B	C	D
16 5/8	5.75	4.75	12.00	9.25
21 7/8	11.00	10.00	17.25	14.50

① For Hot Water Reheat piping locations see Figure 32.2. For Steam Reheat piping locations see Figure 33.2.

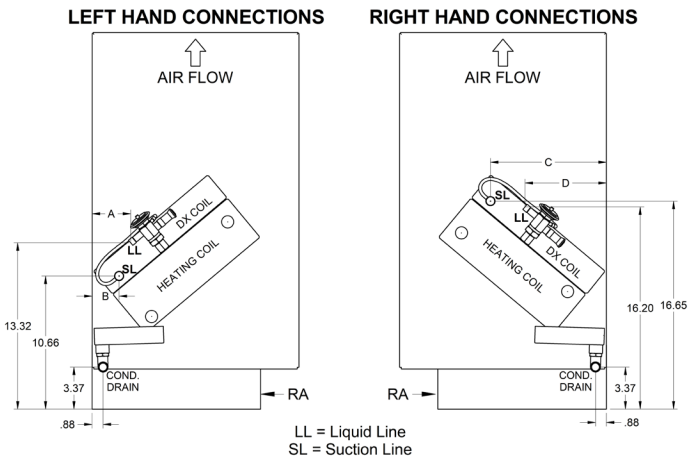
Table 31.2 - Piping Location Dimensions

Unit Depth	Dimensions (in.)			
	A	B	C	D
16 5/8	7.50	4.50	11.75	10.50
21 7/8	12.75	9.75	17.00	15.75

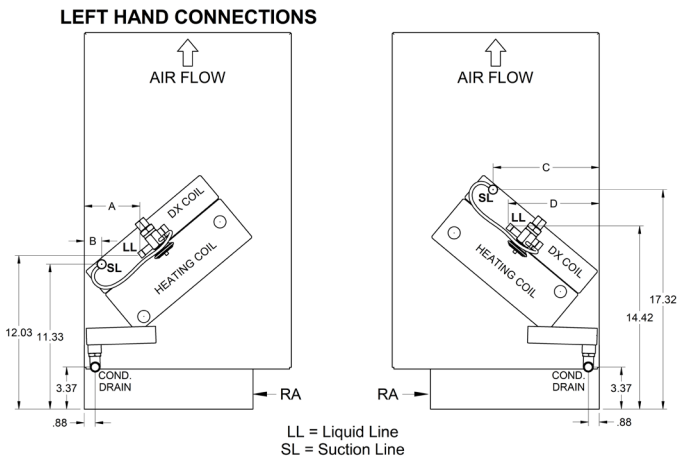
① For Hot Water Reheat piping locations see Figure 32.2. For Steam Reheat piping locations see Figure 33.2.

Figures 31.3 & 31.4 - DX Cooling with Pre-Heat Piping Locations

DX Cooling Coil with Pre-Heat Coil Only



Unit Size: 750



Unit Size: 1000 / 1250 / 1500

Table 31.3 - Piping Location Dimensions

Unit Depth	Dimensions (in.)			
	A	B	C	D
16 5/8	3.00	2.25	9.25	6.50
21 7/8	8.25	7.50	14.50	11.75

① For Hot Water Pre-Heat piping locations see Figure 32.1. For Steam Pre-Heat piping locations see Figure 33.1.

Table 31.4 - Piping Location Dimensions

Unit Depth	Dimensions (in.)			
	A	B	C	D
16 5/8	4.50	1.75	8.75	7.75
21 7/8	9.75	7.00	14.00	13.00

① For Hot Water Pre-Heat piping locations see Figure 32.1. For Steam Pre-Heat piping locations see Figure 33.1.

Figure 32.1 - Hot Water Heating Coil Piping Locations

Hot Water Heating Coil Only or Chilled Water/DX Cooling Coil with Hot Water Pre-Heat Coil

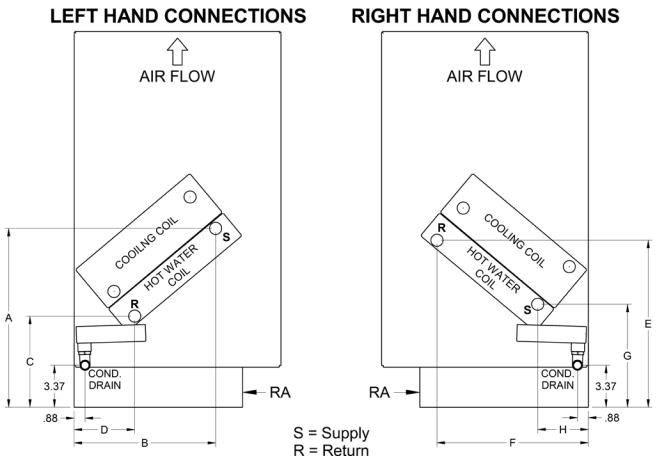


Figure 32.2 - Hot Water Reheat Coil Piping Locations

Chilled Water/DX Cooling Coil with Hot Water Reheat Coil

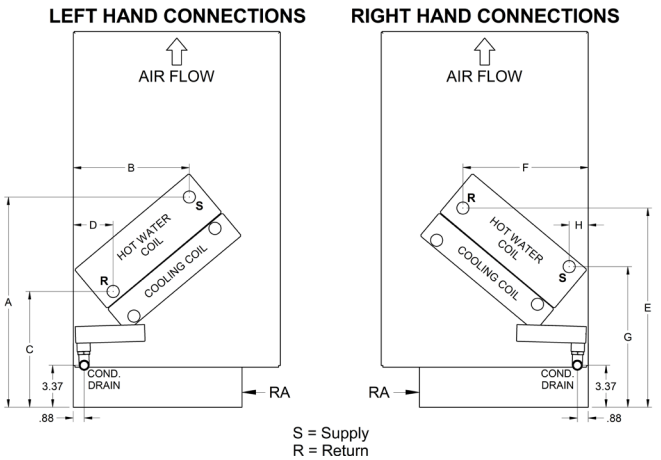


Table 32.1 - Piping Location Dimensions

Unit Depth		16 5/8		21 7/8	
Coil Rows		1	2	1	2
Dimensions (in.)	A	14.25	14.25	14.25	14.25
	B	11.50	11.25	16.75	16.50
	C	7.00	7.25	7.00	7.25
	D	5.00	4.75	10.25	10.00
	E	13.50	13.50	13.50	13.50
	F	12.00	12.25	17.25	17.50
	G	8.25	8.25	8.25	8.25
	H	4.00	4.00	9.25	9.25

① For Chilled Water piping locations see Figure 30.2. For DX Cooling piping locations see Figures 31.3 & 31.4.

Table 32.2 - Piping Location Dimensions

Unit Depth		16 5/8		21 7/8	
Coil Rows		1	2	1	2
Dimensions (in.)	A	17.50	17.50	17.50	17.50
	B	8.75	8.75	14.00	14.00
	C	10.25	10.50	10.25	10.50
	D	2.25	2.25	7.50	7.50
	E	16.75	16.50	16.75	16.50
	F	9.50	9.50	14.75	14.75
	G	11.50	11.50	11.50	11.50
	H	1.25	1.50	6.50	6.75

① For Chilled Water piping locations see Figure 30.1. For DX Cooling piping locations see Figures 31.1 & 31.2.

Note: Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped up in accordance with good plumbing practices.

Figure 33.1 - Steam Heating Coil Piping Locations

Steam Heating Coil Only or Chilled Water/DX Cooling Coil with Steam Pre-Heat Coil

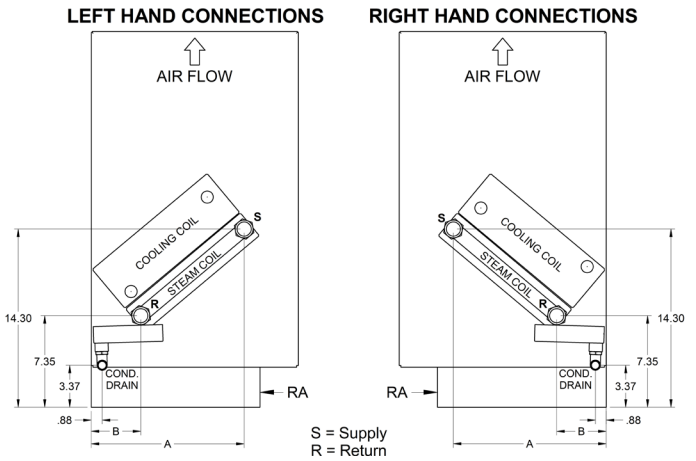


Table 33.1 - Piping Location Dimensions

Unit Depth	Coil Rows	Dimensions (in.)	
		A	B
16 5/8	**1**	12.25	4.00
21 7/8	**1**	17.50	9.25

① For Chilled Water piping locations see Figure 30.2. For DX Cooling piping locations see Figures 31.3 & 31.4.

Figure 33.2 - Steam Reheat Coil Piping Locations

Chilled Water/DX Cooling Coil with Steam Reheat Coil

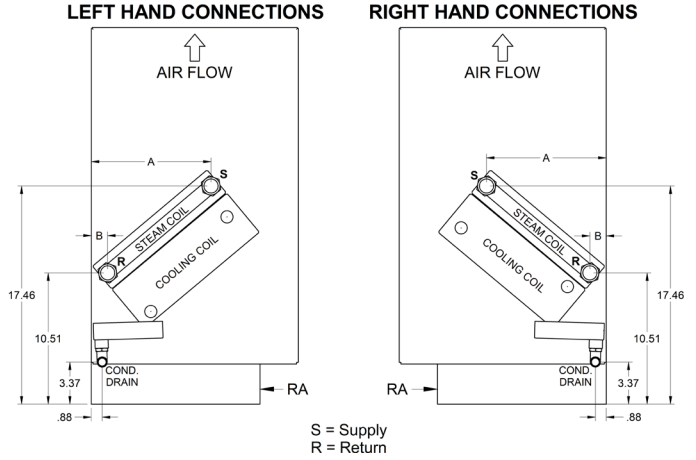


Table 33.2 - Piping Location Dimensions

Unit Depth	Coil Rows	Dimensions (in.)	
		A	B
16 5/8	**1**	9.50	1.25
21 7/8	**1**	14.75	6.50

① For Chilled Water piping locations see Figure 30.1. For DX Cooling piping locations see Figures 31.1 & 31.2.

Up Flow Condenser, Model: YCE18 through YCE36

Standard Features

- Quality Condenser Coils - The coil is constructed of aluminum microchannel tubing and enhanced aluminum fins for increased efficiency and corrosion protection
- Protected Compressor - The compressor is internally protected against high pressure, temperature, and externally by a factory installed high pressure switch. This is accomplished by simultaneous operation of high pressure relief valve and a temperature sensor which protects the compressor if undesirable operating conditions occur. A liquid line filter-drier further protects the compressor.
- Hard Start Kit - Provides increased starting torque for areas with low voltage.
- Durable Finish - The cabinet is made of pre-painted steel. The pre-treated galvanized steel provides a better paint to steel bond, which resists corrosion and rust creep. Special primer formulas and matted-textured finish ensure less fading when exposed to sunlight.
- Lower Installed Cost - Installation time and costs are reduced by easy power and control wiring connections. Available in sweat connect models only. The unit contains enough refrigerant for matching indoor coils and 15 feet of interconnecting piping. The small base dimension means less space is required on the ground or roof
- Top Dicharge - The warm air from the top mounted fan is blown up and away from the structure and any landscaping. This allows compact location on multi-unit applications.
- Low Operating Sound Level – The upward air flow carries the normal operating noise away from the living area. The rigid top panel effectively isolates any motor sound. Isolator mounted compressor and rippled fins of the condenser coil muffle the normal fan motor and compressor operating sounds.
- Low Maintenance – Long life permanently lubricated motor-bearings need no annual servicing.
- Easy Service Access – Fully exposed refrigerant connections and a single panel covering the electrical controls makes for easy servicing of the unit.
- Secured Service Valves – Secured re-usable service valves are provided on both the liquid and vapor sweat connections for ease of evacuating and charging.
- U.L. and C.U.L. Listed – Approved for outdoor application.

Field Installed Accessories

- Low Ambient Kit – Fan Cycle Kit for operation down to 0°F outside temperature.

Table 34.1 - Outdoor Condensing Unit Dimensions

Dimension (in.)	Condensing Unit Model			
	YCE18	YCE24	YCE30	YCE36
A = Height	30	26-3/4	26-3/4	30
B = Depth	24	29-1/4	29-1/4	29-1/4
C = Width	24	29-1/4	29-1/4	29-1/4

Figure 34.1 - Outdoor Condensing Unit

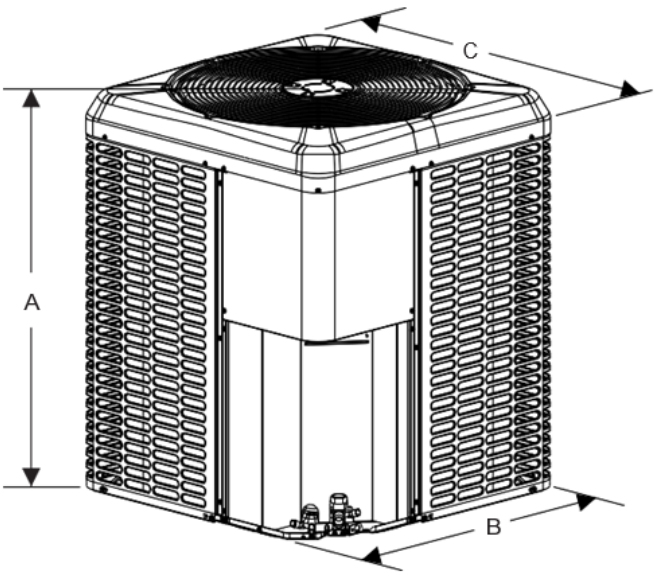


Table 35.1 - Technical, Electrical & Sound Data - Outdoor Condensing Unit

	Units	Condenser Model			
		YCE18	YCE24	YCE30	YCE36
Performance					
Nominal System Cooling Capacity	BTU/h	18,000	24,000	30,000	36,000
Nominal System SEER		14	14	14	14
Construction					
Material: Chassis		Pre-Treated Galvanized Painted Steel			
Color		Champagne			
Dimensions/Weights					
Height (includes Fan Guard)	in	30	26-3/4	26-3/4	30
Width	in	24	29-1/4	29-1/4	29-1/4
Depth	in	24	29-1/4	29-1/4	29-1/4
Weight	lb	125	135	140	145
Compressor					
Type		Recip	Recip	Recip	Recip
Crankcase Heater Fitted		No	No	No	No
Condenser					
Coil Construction		Plate Fin Microchannel	Plate Fin Microchannel	Plate Fin Microchannel	Plate Fin Microchannel
Connections ①					
Suction	in	3/4	3/4	3/4	3/4
Liquid	in	3/8	3/8	3/8	3/8
Refrigerant Charge					
Condenser-factory charge	lbs-oz	3 - 8	3 - 12	3 - 14	4 - 1
Charge Required-Per Foot of Pipework	oz	0.62	0.62	0.62	0.62
Electrical Data					
Power Supply		208-230V/1Ph/60Hz			
MCA	A	12.7	14.8	18.4	19.6
Maximum Overcurrent Device Amps ②	A	20	25	30	30
Minimum Overcurrent Device Amps ③	A	15	15	20	20
Compressor					
Rated Load Amps (RLA)	A	9.7	11.2	14.1	14.7
Locked Rotor Amps (LRA)	A	46.0	60.8	73.0	75.0
Condenser Fan					
Rated Load Amps (RLA)	A	0.64	0.80	0.80	1.30
Rated Horsepower	HP	1/12	1/8	1/8	1/4
Sound Data					
Sound Power Rating ④	dBA	73.0	74.0	74.0	74.0

① Refrigerant line sizes should always match condensing unit connection sizes.
② Dual element fuses or HACR circuit breakers. Maximum allowable overcurrent protection.
③ Dual element fuses or HACR circuit breakers. Minimum recommended overcurrent protection.
④ Rated in accordance with AHRI Standard 270.

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