



Valedictorian® Vertical Unit Ventilator

Models VFV, VFF, VCV and VCF



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 temperature 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.

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MODINE HAS A CONTINUOUS PRODUCT IMPROVEMENT PROGRAM AND THEREFORE RESERVES THE RIGHT TO CHANGE DESIGN AND SPECIFICATIONS WITHOUT NOTICE.

Table 3.1 - Model Nomenclature

1	2	3	4-7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
PT	S	CC	US	IA	DA	CO	HO	CA	CP	OA	SV	MT	EC	C	DG	FL	PC	PH

1 - Product Type (PT)

V - Ventilator

2 - Style (S)

F - Floor Mounted

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)

Floor Mounted 16 5/8" Deep

A - Rear OA, Open Pipe Tunnel

B - Rear OA, Closed Pipe Tunnel

D - No OA, Open Pipe Tunnel

Floor Mounted 21 7/8" Deep

E - Rear OA, Open Pipe Tunnel

F - Rear OA, Closed Pipe Tunnel

J - No OA, Closed Back, Closed PT

K - Rear OA, 2" Step-Down, Open PT

L - Rear OA, 2" Step-Down, Closed PT

(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)

A - Floor Mounted Bar Grille with Screen

E - Ceiling Mounted Front Discharge with Duct Collar

F - Ceiling Mounted Front Disch. with Dbl. Defl. Grille

G - Ceiling Mounted Down Disch. with Dbl. Defl. Grille

10 - Cooling Option (CO)

0 - None

2 - 2-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 - Hot Water/Chilled Water 2-Pipe

1 - 1-Row Hot Water Coil

2 - 2-Row Hot Water Coil

3 - Steam Coil (1-Row)

N - None

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)

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)

2 - High Static, EC Motor, 3SS

3 - High Static, EC Motor, 0-10vDC

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 - Free Issue

19 - Design Generation (DG)

1 - First Generation

20 - Filters (FL)

A - 70-75% Arrestance (Standard)

B - MERV 10

C - MERV 13

21 - Cooling Pipe Package (PC) (Floor Mounted Unit Only)

D - 2-Way Valve, All Components

H - 3-Way Valve, All Components

N - None

22 -Heating Pipe Package (PH) (Floor Mounted Unit Only)

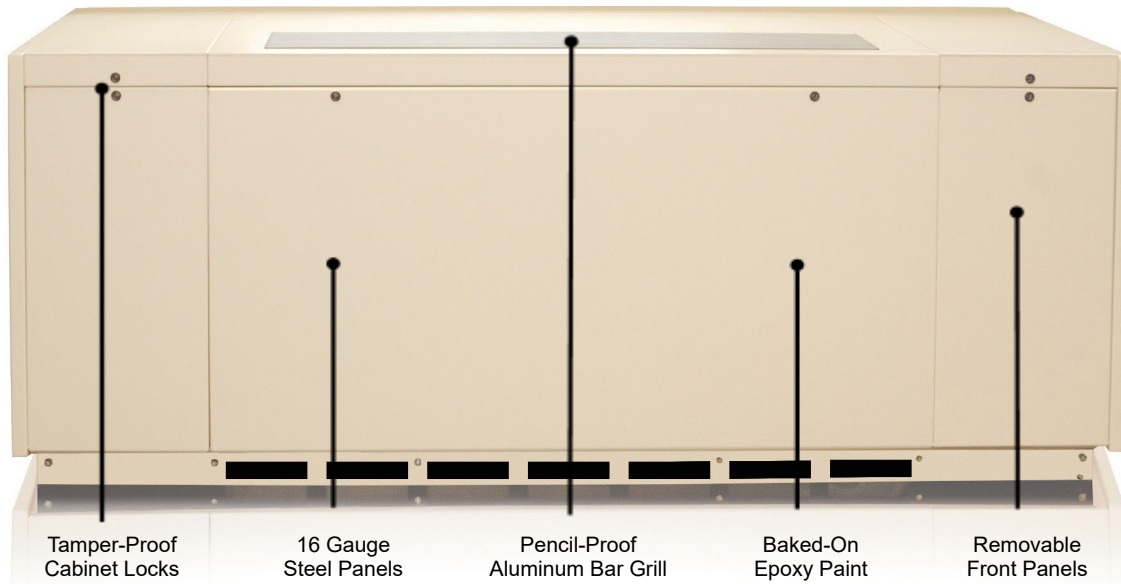
D - 2-Way Valve, All Components

H - 3-Way Valve, All Components

N - None

General Description – Valedictorian® Unit

Figure 4.1 - 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.

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 modulating actuator. The blowers will be located above the coil.

Digit 8: Inlet Air (IA)

Floor mounted and ceiling mounted units have a variety of inlet air configurations for outside and return air. Refer to Figure 16.1 and Figure 17.1 for images on the inlet air configurations available.

Floor mounted units (model digit 2=F) have a pipe tunnel built-in the rear of the unit. The pipe tunnel allows for field crossover of hot water and/or chilled water piping, electrical conduit, or refrigeration piping without increasing the depth of the unit.

Both open or closed pipe tunnels are available. The open tunnel provides more space for crossover piping compared to the closed pipe tunnel. The closed pipe tunnel includes an insulated back cover for additional insulation and can provide a finished look if the rear of the unit is visible from the exterior of the building.

Floor mounted units with 21 7/8" depth (model digit 8 = E,F,J,K,L) can be provided with a 2" step-down back adapter(see Figure 17.1). The 2" step-down allows for the unit to fit against the wall if there are any architectural obstructions below the standard 30" unit height.

Digit 9: Discharge Air (DA)

A = Floor mounted bar grille with screen

Floor mounted units (model digit 2=F) have a pencil-proof clear anodized aluminum supply bar grille and ¼" galvanized steel mesh mounted on the top panel. See Figure 18.1 and Figure 19.1 for images and dimensions of the top bar grille.

E = Ceiling Mounted Front Discharge with Duct Collar

The front discharge duct collar allows for connection to field installed ductwork supplied by others.

F = Ceiling Mounted Front Discharge with Double Deflection Grille

G = Ceiling Mounted Down Discharge with Double Deflection Grille

The double deflection grille is made of clear anodized aluminum and has adjustable horizontal and vertical louvers to direct air flow. See Figure 20.1 and Figure 21.1 for dimensions of the ceiling mounted discharge air options.

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.

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 = Hot Water/Chilled Water 2-Pipe

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.

N = None

Digit 12: Coil Access (CA)

Right hand and left hand coil access is available for both heating and cooling coils. For chilled water coils, the standard connection will be on the right hand side of the unit. If left hand cooling connections are required, the factory will bring crossover piping for left hand chilled water connections via the pipe tunnel. For hot water coils, the standard connection will be on the left hand side of the unit. If right hand heating connections are required, the factory will bring crossover piping for right hand hot water connections via the pipe tunnel.

For DX piping, the standard connections will be on the right hand side of the unit. If left hand DX connections are required, refrigerant piping will be routed to the left side of the unit via the pipe tunnel.

For steam piping, the standard connections are on the left hand side of the unit. If right hand steam connections are required, steam piping will be routed to the right hand side of the unit via the pipe tunnel.

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.

2 = Reheat

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

Digit 14: Damper Assembly (OA)

C = 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 16 = Motor Type (MT)

2 = High Static, EC Motor, Three Speed Switch

The fan motor shall be an electronically commutated motor (ECM). The ECM provides constant torque to minimize airflow changes with varying external static pressure changes, up to 0.25" W.C. The DC motor features a brushless, permanently lubricated ball bearing construction for maintenance free operation. The three speed selector switch enables adjustment of the supply air volume. Reduction in fan speed shall be achieved by a step down multi-tap transformer.

3 = High Static, EC Motor, 0-10 VDC

The fan motor shall be an electronically commutated motor (ECM). The ECM provides constant torque to minimize airflow changes with varying external static pressure changes, up to 0.25" W.C. The DC motor features a brushless, permanently lubricated ball bearing construction for maintenance free operation. The supply air volume will be adjusted via a 0-10 VDC signal.

Digit 17 = Electrical Connection (EC)

A = Left Hand Side

The electrical connections terminate on the left hand side of the unit. On ceiling mounted units (model digit 2=C), the electrical connections will always terminate on the left hand side.

B = Right Hand Side

The electrical connections terminate on the right hand side of the unit. Due to space constraints, floor mounted units (model digit 2=F) with a cooling piping package (model digit 21=D or H) will have the mains electrical box containing the disconnect switch, fuses, and other components on the left hand side. A junction box will be installed on the right hand side containing a terminal strip and mains ground lug for the electrical connections.

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.

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 10

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.

C = MERV 13

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.

Digit 21: Cooling Pipe Package (PC)**D = 2-Way Valve, All Components**

Factory assembled and installed piping package including a 2-way valve, strainer, circuit setter, and shut-off valves.

H = 3-Way Valve, All Components

Factory assembled and installed piping package including a 3-way valve, balancing valve, strainer, circuit setter, and shut-off valves.

N = None**Digit 22: Heating Pipe Package (PH)****D = 2-Way Valve, All Components**

Factory assembled and installed piping package including a 2-way valve, strainer, circuit setter, and shut-off valves.

H = 3-Way Valve, All Components

Factory assembled and installed piping package including a 3-way valve, balancing valve, strainer, circuit setter, and shut-off valves.

N = None**Standard Features****Cabinet**

Prior to assembly, the cabinet parts shall be degreased and coated with an electro-statically 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.

For floor mounted units, the exterior panels of the cabinet shall be constructed of 16 gauge sheet metal. For ceiling mounted units, the exterior panels of the cabinet shall be constructed of 18 gauge sheet metal.

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 splashguard over the drain port.

Supply Fan & Fan Motor

Supply airflow is provided by a double inlet, forward 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 integral automatic thermal overload protection. The fan and motor assembly shall be direct drive type with motor and bearings positioned outside of the air-stream.

The fan assembly shall be positioned 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.

Display Module

The user interface for Modine Control System displays status of controller inputs and outputs, allows for occupied/unoccupied setpoint changes, displays service 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 the supply fan from running.

CO₂ Sensor

The CO₂ 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 CO₂ 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 CO₂ levels from 0 to 2,000 ppm with an accuracy of +/- 40 ppm CO₂ +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.

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 conjunction 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 controlled by a 2-10VDC signal from the unit mounted controller.

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.

Balancing Valve

A heavy duty ball-valve construction balancing valve.

Circuit Setter

A manually adjustable ball-valve construction balancing valve with Schrader style pressure ports and drain port.

Shut-Off Valves

A set of two heavy duty ball valves, one for the supply and one for the return.

Strainer

A heavy duty cast iron strainer with screen, gasket and tapped retainer cap and blow-off outlet.

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 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.

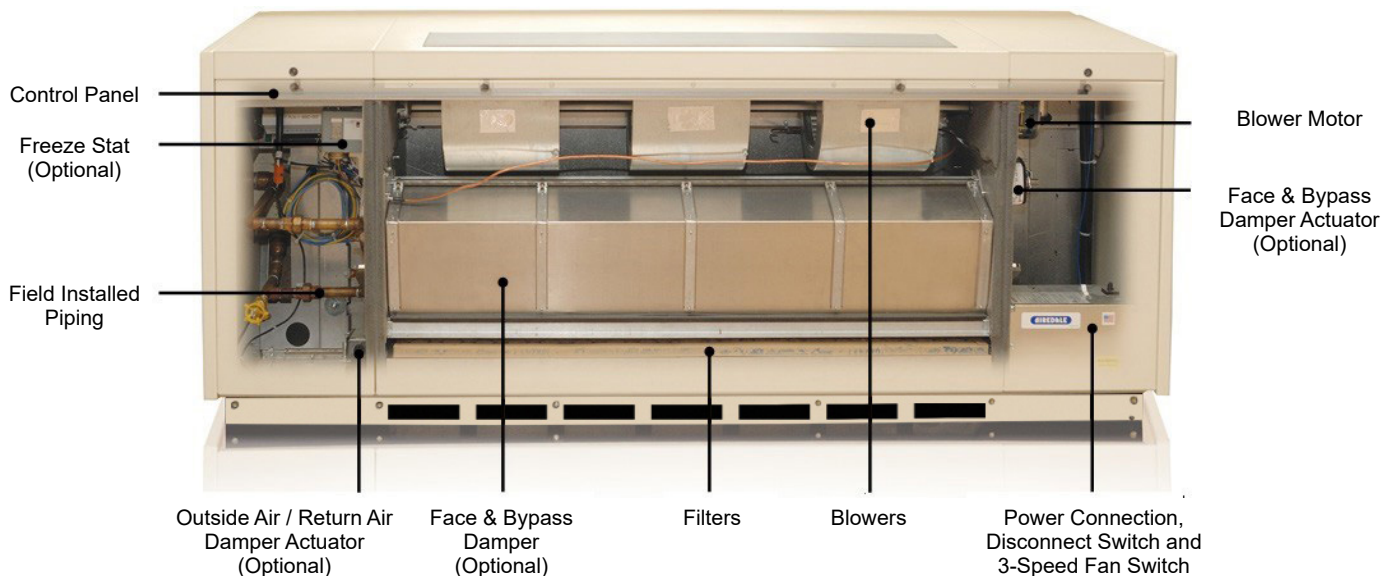
Louver

An outdoor louver shall be furnished by Modine and be suitable for masonry, glass or panel wall construction. Two louver styles are available: AMCA rated and non-AMCA rated. Louvers shall be made of aluminum with clear anodized finish.

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.

Figure 8.1 - Component Layout

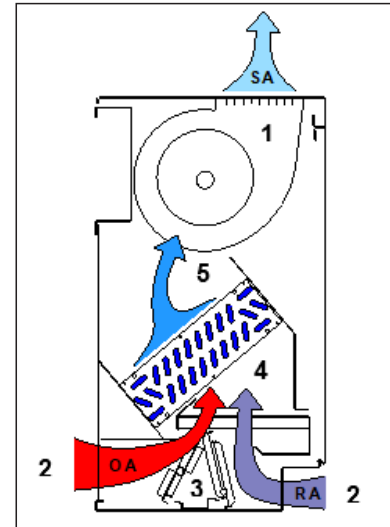


Valve Control Units

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 9.1 - Valve Control Units

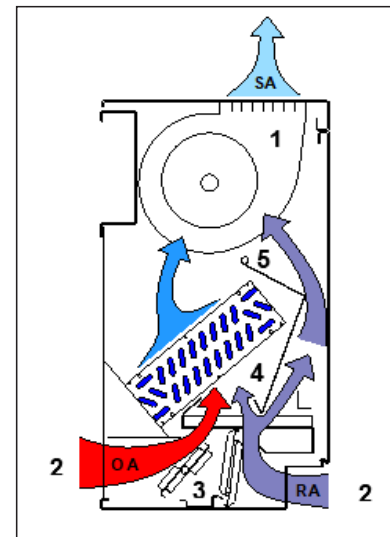


Face & Bypass Units

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. 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.

Figure 9.2 - Face & Bypass Unit



Additional Valve and F&B Control Information

DX Cooling F&B Operation

DX cooling units energize the outdoor condensing unit on a call for cooling. In DX cooling, the face and bypass damper must go to full face mode to maximize airflow through the coil. The face and bypass damper is modulated to maintain the room's set-point only in heating mode.

Chilled Water/Hot Water F&B Operation

For chilled water/hot water units, water flow and coil temperature remain constant to provide maximum dehumidification and low risk of coil freezing.

Dehumidification F&B and Valve Control Comparison

Face and bypass control is the preferred method for maintaining indoor humidity levels compared to valve control. Due to the constant water flowing through the cooling coil, the surface temperature of the coil will remain cold to improve latent cooling and dehumidification. On valve controlled units, the water flow is modulated causing the surface temperature of the coil to increase. As a result, the coil's ability to remove moisture and dehumidify is reduced.

Coil Freeze Protection F&B and Valve Control Comparison

Face and bypass control has a lower risk of coil freezing compared to valve control units. With face and bypass damper control, the water flow remains constant through the coil so the coil has a lower risk of freezing. With valve controlled units water can remain in the coil after the modulating control valve closes, which can freeze and damage the coil. A hot water coil freeze protection stat is recommended regardless of damper control type.

Table 10.1 - Unit Size 750 & 1000 Chilled Water Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	750						1000					
			PD (PSI)			Airflow CFM			PD (PSI)			Airflow CFM		
						750 (H)	650 (M)	500 (L)				1000 (H)	750 (M)	600 (L)
45	6	2	2.09	TC	Btu/Hr	18,312	17,071	14,694	2.58	TC	Btu/Hr	27,859	24,376	21,468
				SC		14,965	13,694	11,464		SC		22,876	19,163	16,439
				LDB	°F	62.0	61.0	59.3		LDB	°F	59.4	57.0	55.3
				LWB		59.5	58.8	57.8		LWB		58.3	56.7	55.3
		4	1.14	TC	Btu/Hr	27,520	25,656	22,083	1.35	TC	Btu/Hr	34,454	30,147	26,550
				SC		19,109	17,486	14,639		SC		24,461	20,490	17,578
				LDB	°F	57.0	55.8	53.6		LDB	°F	58.0	55.4	53.6
				LWB		55.2	54.2	52.4		LWB		56.0	53.9	52.4
	10	2	5.20	TC	Btu/Hr	21,297	19,255	16,392	6.40	TC	Btu/Hr	32,099	28,494	25,835
				SC		16,533	14,908	12,508		SC		25,955	21,442	19,026
				LDB	°F	60.1	59.3	57.5		LDB	°F	56.6	54.2	51.4
				LWB		58.1	57.7	56.6		LWB		56.6	54.2	51.4
		4	2.84	TC	Btu/Hr	32,066	28,938	24,634	3.35	TC	Btu/Hr	39,698	35,240	31,951
				SC		21,110	19,036	15,971		SC		27,752	22,927	20,344
				LDB	°F	54.6	53.6	51.2		LDB	°F	55.0	52.5	49.5
				LWB		53.0	52.3	50.4		LWB		54.1	51.3	48.8

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

② For additional capacity information, please consult Breeze AccuSpec.

Table 10.2 - Unit Size 1250 & 1500 Chilled Water Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	1250						1500					
			PD (PSI)			Airflow CFM			PD (PSI)			Airflow CFM		
						1250 (H)	900 (M)	750 (L)				1500 (H)	1100 (M)	900 (L)
45	6	2	3.40	TC	Btu/Hr	32,871	28,391	25,135	3.10	TC	Btu/Hr	37,455	32,871	29,721
				SC		27,608	22,624	19,635		SC		32,186	26,797	23,503
				LDB	°F	60.1	57.4	56.4		LDB	°F	60.7	58.1	56.5
				LWB		58.8	57.0	56.3		LWB		59.3	57.6	56.5
		4	1.38	TC	Btu/Hr	40,652	35,112	31,085	1.26	TC	Btu/Hr	49,356	40,683	36,784
				SC		29,520	24,191	20,995		SC		34,601	28,808	25,267
				LDB	°F	58.7	55.8	54.8		LDB	°F	59.2	56.4	54.7
				LWB		56.7	54.4	53.4		LWB		57.2	55.1	53.7
	10	2	8.30	TC	Btu/Hr	39,623	32,737	29,067	7.55	TC	Btu/Hr	45,709	38,736	34,125
				SC		30,868	24,748	21,672		SC		36,205	29,616	25,637
				LDB	°F	57.8	55.2	54.0		LDB	°F	58.3	55.7	54.3
				LWB		57.0	55.2	54.0		LWB		57.4	55.7	54.3
		4	3.43	TC	Btu/Hr	49,004	40,487	35,949	3.07	TC	Btu/Hr	56,572	47,942	42,235
				SC		33,006	26,462	23,173		SC		38,922	31,839	27,562
				LDB	°F	56.2	53.5	52.2		LDB	°F	56.6	53.9	52.4
				LWB		54.3	52.1	51.0		LWB		54.8	52.6	51.4

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

② For additional capacity information, please consult Breeze AccuSpec.

TC = Total Capacity

SC = Sensible Capacity

LDB = Leaving Dry Bulb

LWB = Leaving Wet Bulb

EWT = Entering Water Temperature

PD = Pressure Drop

Table 11.1 - Unit Size 750 Direct Expansion Performance Data

Evaporator Saturation Temperature (°F)	Airflow CFM		750 (H)			650 (M)			500 (L)		
	Entering Air DB/WB (°F)		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	Btu/Hr	34,325	28,463	23,036	30,940	25,669	20,786	26,407	21,928	17,782
	SC	Btu/Hr	19,042	16,960	14,849	17,163	15,294	13,396	14,644	13,059	11,451
	LDB	°F	62.1	59.6	57.2	61.2	58.8	56.4	58.6	56.5	54.4
	LWB	°F	57.3	54.8	52.4	56.6	54.2	51.9	54.8	52.6	50.5
45	TC	Btu/Hr	29,630	23,766	18,430	26,724	21,446	16,644	22,829	18,345	14,258
	SC	Btu/Hr	16,780	14,708	12,614	15,132	13,268	11,386	12,918	11,339	9,740
	LDB	°F	64.8	62.3	59.8	64.0	61.6	59.2	61.7	59.6	57.4
	LWB	°F	59.4	57.0	54.7	58.9	56.5	54.3	57.3	55.2	53.2
50	TC	Btu/Hr	24,542	18,802	13,605	22,147	16,981	12,296	18,944	14,547	10,546
	SC	Btu/Hr	14,563	12,510	10,432	13,137	11,291	9,421	11,223	9,657	8,066
	LDB	°F	67.5	65.0	62.5	66.8	64.4	61.9	64.8	62.6	60.5
	LWB	°F	61.6	59.3	57.0	61.2	58.9	56.7	59.9	57.9	56.0

① Performance based on 105°F Liquid Inlet Temperature.

Table 11.2 - Unit Size 1000 Direct Expansion Performance Data

Evaporator Saturation Temperature (°F)	Airflow CFM		1000 (H)			750 (M)			600 (L)		
	Entering Air DB/WB (°F)		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	Btu/Hr	46,343	37,911	30,215	38,144	31,142	24,804	32,848	26,875	21,463
	SC	Btu/Hr	25,801	22,727	19,661	21,237	18,671	16,132	18,291	16,116	13,953
	LDB	°F	61.8	59.5	57.3	59.5	57.6	55.6	57.5	55.8	54.0
	LWB	°F	57.1	54.8	52.6	55.5	53.4	51.5	54.0	52.2	50.4
45	TC	Btu/Hr	39,763	31,423	24,087	32,749	25,860	19,781	28,192	22,328	17,087
	SC	Btu/Hr	22,688	19,649	16,660	18,688	16,160	13,676	16,092	13,946	11,806
	LDB	°F	64.6	62.3	60.0	62.6	60.6	58.6	60.8	59.1	57.3
	LWB	°F	59.3	57.1	54.9	58.0	56.0	54.0	56.8	55.0	53.2
50	TC	Btu/Hr	32,716	24,757	17,677	26,996	20,380	14,494	23,246	17,559	12,483
	SC	Btu/Hr	19,634	16,669	13,698	16,189	13,706	11,232	13,934	11,802	9,675
	LDB	°F	67.3	65.0	62.7	65.6	63.5	61.5	64.1	62.3	60.5
	LWB	°F	61.6	59.4	57.2	60.5	58.6	56.6	59.6	57.8	56.1

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 1250 Direct Expansion Performance Data

Evaporator Saturation Temperature (°F)	Airflow CFM		1250 (H)			900 (M)			750 (L)		
	Entering Air DB/WB (°F)		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	Btu/Hr	62,055	50,784	40,492	49,872	40,756	32,468	43,540	35,633	28,453
	SC	Btu/Hr	34,494	30,368	26,263	27,729	24,385	21,063	24,212	21,326	18,455
	LDB	°F	60.1	58.1	56.1	57.2	55.6	53.9	55.9	54.4	52.8
	LWB	°F	55.9	53.8	51.8	53.8	52.0	50.3	52.8	51.1	49.5
45	TC	Btu/Hr	53,246	42,060	32,261	42,825	33,830	25,876	37,376	29,596	22,633
	SC	Btu/Hr	30,293	26,219	22,226	24,380	21,079	17,834	21,284	18,436	15,600
	LDB	°F	63.2	61.1	59.0	60.6	58.9	57.1	59.4	57.9	56.3
	LWB	°F	58.4	56.3	54.2	56.6	54.9	53.1	55.8	54.2	52.6
50	TC	Btu/Hr	43,777	33,135	23,674	35,296	26,613	18,942	30,791	23,255	16,537
	SC	Btu/Hr	26,181	22,224	18,271	21,096	17,848	14,631	18,405	15,588	12,778
	LDB	°F	66.1	64.0	61.8	63.9	62.1	60.4	62.9	61.3	59.7
	LWB	°F	60.9	58.8	56.7	59.5	57.7	56.0	58.9	57.2	55.6

Ⓢ Performance based on 105°F Liquid Inlet Temperature.

Table 12.2 - Unit Size 1500 Direct Expansion Performance Data

Evaporator Saturation Temperature (°F)	Airflow CFM		1500 (H)			1100 (M)			900 (L)		
	Entering Air DB/WB (°F)		85/71	80/67	75/63	85/71	80/67	75/63	85/71	80/67	75/63
40	TC	Btu/Hr	71,293	58,404	46,636	57,981	47,427	37,803	50,287	41,211	32,891
	SC	Btu/Hr	39,581	34,844	30,138	32,198	28,311	24,452	27,930	24,610	21,290
	LDB	°F	61.2	59.1	56.9	58.6	56.8	55.0	57.0	55.4	53.7
	LWB	°F	56.7	54.4	52.3	54.8	52.8	51.0	53.6	51.8	50.1
45	TC	Btu/Hr	61,240	48,405	37,142	49,855	39,329	30,174	43,229	34,188	26,276
	SC	Btu/Hr	34,743	30,066	25,490	28,303	24,455	20,712	24,552	21,257	18,037
	LDB	°F	64.1	61.9	59.7	61.8	60.0	58.0	60.4	58.7	56.9
	LWB	°F	59.0	56.8	54.6	57.4	55.6	53.6	56.5	54.7	53.0
50	TC	Btu/Hr	50,283	38,162	27,273	41,040	31,073	22,195	35,610	27,006	19,326
	SC	Btu/Hr	29,992	25,478	20,972	24,471	20,749	17,051	21,229	18,034	14,838
	LDB	°F	67.0	64.7	62.4	65.0	63.0	61.0	63.7	61.9	60.1
	LWB	°F	61.3	59.1	57.0	60.1	58.2	56.3	59.4	57.6	55.8

Ⓢ Performance based on 105°F Liquid Inlet Temperature.

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

Table 13.1 - Unit Size 750 & 1000 Hot Water Heating Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	750						1000					
			PD (PSI)			Airflow CFM			PD (PSI)			Airflow CFM		
						750 (H)	650 (M)	500 (L)				1000 (H)	750 (M)	600 (L)
160	6	1	0.88	TC	Btu/Hr	38,386	34,752	28,560	1.16	TC	Btu/Hr	49,804	40,803	34,395
				LAT	°F	106.4	108.5	111.8		LAT	°F	105.2	109.4	112.0
		2	1.78	TC	Btu/Hr	50,110	45,366	37,283	2.35	TC	Btu/Hr	62,381	51,107	43,080
				LAT	°F	120.6	123.3	127.7		LAT	°F	116.6	121.8	125.2
		4 ②	0.86	TC	Btu/Hr	61,152	55,363	45,499	1.14	TC	Btu/Hr	81,135	66,472	56,032
				LAT	°F	134.0	137.3	142.6		LAT	°F	133.6	140.4	144.7
	10	1	2.32	TC	Btu/Hr	41,823	37,438	30,477	3.07	TC	Btu/Hr	54,685	44,005	36,773
				LAT	°F	110.6	112.3	115.3		LAT	°F	109.6	113.2	115.6
		2	4.71	TC	Btu/Hr	54,596	48,872	39,786	6.20	TC	Btu/Hr	68,494	55,118	46,059
				LAT	°F	126.1	128.2	132.2		LAT	°F	122.2	126.7	129.7
		4 ②	2.28	TC	Btu/Hr	66,627	59,642	48,553	3.01	TC	Btu/Hr	89,086	71,689	59,906
				LAT	°F	140.6	143.3	148.1		LAT	°F	140.8	146.7	150.6

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 13.2 - Unit Size 1250 & 1500 Hot Water Heating Performance Data

EWT (°F)	Flow Rate (GPM)	Number of Rows	1250						1500					
			PD (PSI)			Airflow CFM			PD (PSI)			Airflow CFM		
						1250 (H)	900 (M)	750 (L)				1500 (H)	1100 (M)	900 (L)
160	6	1	1.45	TC	Btu/Hr	59,656	47,744	41,610	1.75	TC	Btu/Hr	70,109	57,236	49,403
				LAT	°F	103.3	108.1	110.3		LAT	°F	102.4	107.2	109.8
		2	2.93	TC	Btu/Hr	77,550	62,065	54,091	3.52	TC	Btu/Hr	92,625	75,619	65,269
				LAT	°F	116.3	122.6	125.5		LAT	°F	116.0	122.4	125.8
		4 ②	1.43	TC	Btu/Hr	99,226	79,413	69,210	1.71	TC	Btu/Hr	108,959	88,594	76,779
				LAT	°F	132.0	140.1	143.7		LAT	°F	125.9	133.4	137.4
	10	1	3.82	TC	Btu/Hr	66,035	51,738	44,724	4.58	TC	Btu/Hr	78,277	62,508	53,391
				LAT	°F	107.9	112.2	114.1		LAT	°F	107.4	111.6	113.8
		2	7.71	TC	Btu/Hr	85,843	67,258	58,139	9.24	TC	Btu/Hr	103,417	82,584	70,539
				LAT	°F	122.3	127.8	130.3		LAT	°F	122.6	128.1	131.1
		4 ②	3.75	TC	Btu/Hr	109,836	86,057	74,389	4.49	TC	Btu/Hr	121,653	97,146	82,978
				LAT	°F	139.7	146.8	150.0		LAT	°F	133.6	140.1	143.7

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.

TC = Total Capacity

LAT = Leaving Air Temperature

EWT = Entering Water Temperature

PD = Pressure Drop

Table 14.1 - Steam Heating Capacity at 2 lb. Steam

Size	Airflow CFM	Air on Coil Temperature (°F)									
		40		50		60		70		80	
		TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)
750	750 (H)	59.9	113.9	56.1	119.3	52.3	124.5	48.7	130.1	44.9	135.4
	650 (M)	54.8	118.1	51.4	123.2	47.9	128.2	44.5	133.5	41.1	138.6
	500 (L)	45.7	124.7	42.9	129.4	39.9	133.9	37.2	138.8	34.3	143.5
1000	1000 (H)	84.4	118.1	79.1	123.2	73.7	128.2	68.6	133.5	63.3	138.6
	750 (M)	63.3	118.1	59.3	123.2	55.2	128.2	51.4	133.5	47.4	138.6
	600 (L)	54.0	123.4	50.6	128.1	47.2	132.8	43.9	137.7	40.5	142.5
1250	1250 (H)	97.0	111.9	90.9	117.3	84.7	122.7	78.8	128.4	72.7	133.9
	900 (M)	74.3	116.4	69.6	121.6	64.8	126.7	60.3	132.1	55.7	137.3
	750 (L)	66.3	121.9	62.1	126.7	57.9	131.5	53.9	136.5	49.7	141.4
1500	1500 (H)	116.9	112.2	109.6	117.6	102.0	123.0	95.0	128.6	87.6	134.1
	1000 (M)	89.1	115.0	83.5	120.3	77.8	125.5	72.4	130.9	66.8	136.2
	900 (L)	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 2 psig steam.

Table 14.2 - Steam Heating and Leaving Air Temperature Correction Factors

Steam Pressure (psig)	Air on Coil Temperature (°F)									
	40		50		60		70		80	
	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)	TC (MBH)	LAT (°F)
0	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
5	1.04	1.05	1.05	1.05	1.05	1.06	1.05	1.06	1.06	1.07
10	1.10	1.12	1.11	1.13	1.12	1.14	1.13	1.15	1.14	1.15

TC = Total Capacity

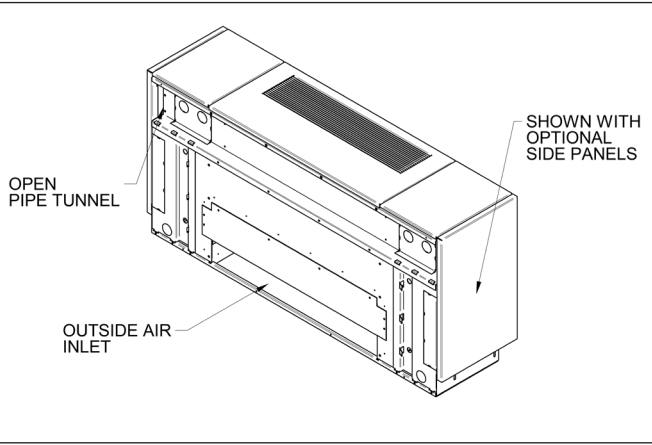
LAT = Leaving Air Temperature

Table 15.1 - Technical Data

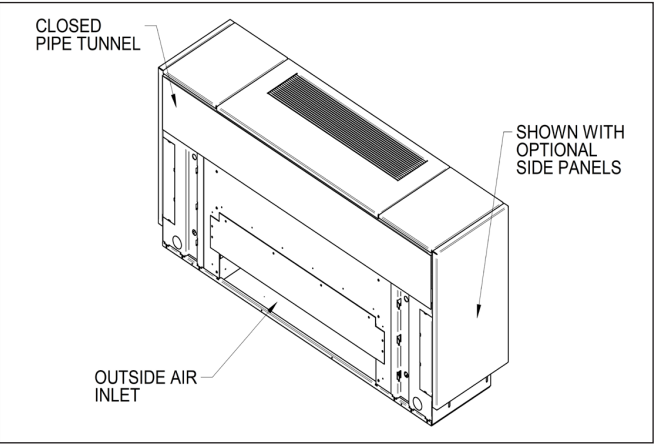
			Model Size			
DESCRIPTION		UNITS	750	1000	1250	1500
SUPPLY FAN	Fan Type		Direct Drive Centrifugal			
	Fan Quantity	Qty	2	3	4	4
	Fan Diameter	Inches	8.06	8.06	8.06	8.06
	Fan Width	Inches	7.15	7.15	7.15	7.15
	Airflow (High/Medium/Low)	cfm	750/650/500	1000/750/600	1250/900/750	1500/1100/900
SUPPLY FAN MOTOR	HIGH STATIC MOTOR (Digit 16=2 or 3)		ECM - Electronically Commutated Motor			
	Motor Type (Premium High Static)					
	Motor Size (Qty 1)	hp	1/2	1/2	1/2	1/2
	Max External Static Pressure	in.Wg	0.25	0.25	0.25	0.25
COIL WATER VOLUME	1 Row	gal	0.32	0.38	0.44	0.5
	2 Row	gal	0.51	0.63	0.76	0.88
	4 Row	gal	0.92	1.17	1.42	1.66
COIL CONNECTIONS	Water Coils - Standard Units	Inches	Unions with 3/4" female solder joint			
	Water Coils - Units with Piping Package	Inches	Chilled Water: 3/4" NPT drop ear, Hot Water: 1/2" NPT drop ear			
	Evaporator Coil	Inches	3/4" OD Suction, 1/2" OD Liquid			
	Steam Coil	Inches	1" NPT			
	Condensate Line	Inches	3/4" ID condensate line			
UNIT OPERATING WEIGHT (approximate)	Floor Mounted, 16 5/8" Units	lbs.	410	470	525	580
	Floor Mounted, 21 7/8" Units	lbs.	445	510	570	630
	Ceiling Mounted Units	lbs.	510	580	645	710
AIR FILTERS	Quantity	Qty	1	2	2	2
	Dimensions	Inches	10 X 36 X 1	10 X 24 X 1	10 X 30 X 1	10 X 36 X 1

Figure 16.1 - Inlet Air Arrangements - 16 5/8" Depth

Digit A = Rear Outside Air - Open Pipe Tunnel



Digit B = Rear Outside Air - Closed Pipe Tunnel



Digit D = No Outside Air - Open Pipe Tunnel

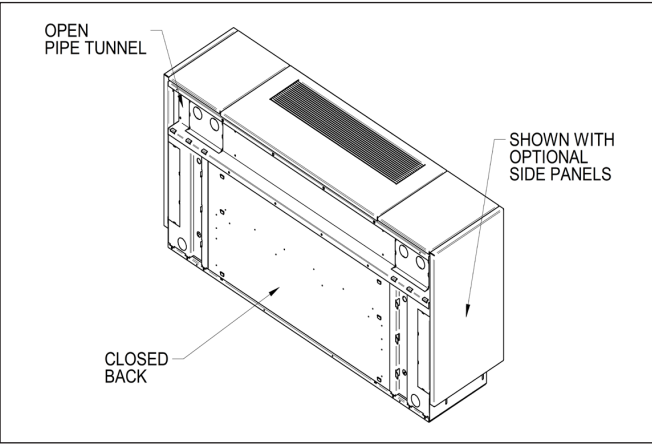
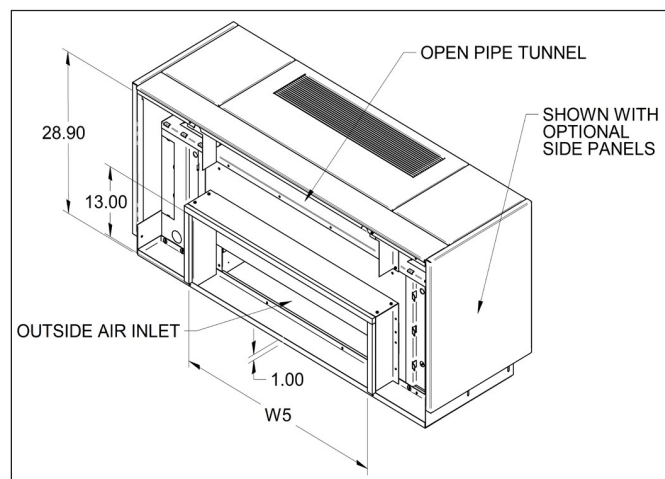
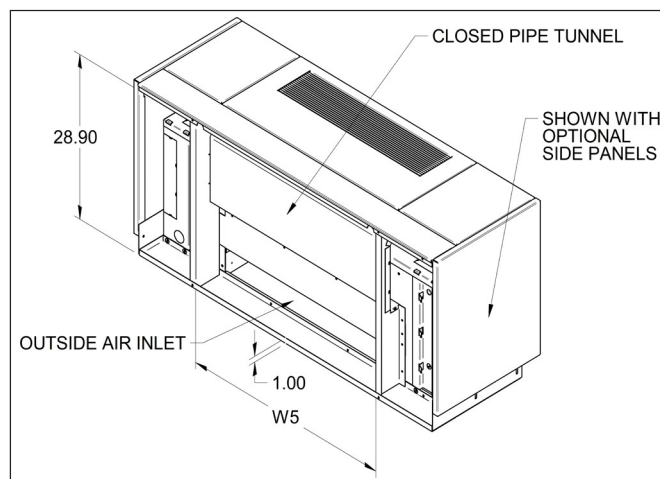


Figure 17.1 - Inlet Air Arrangements - 21 7/8" Depth

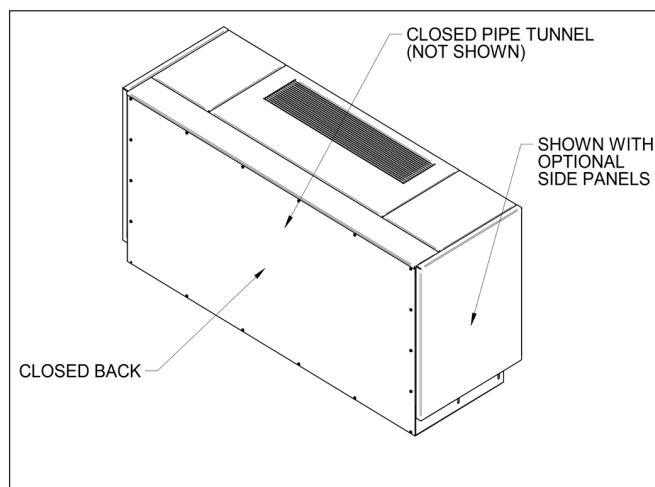
Digit E = Rear Outside Air - Open Pipe Tunnel



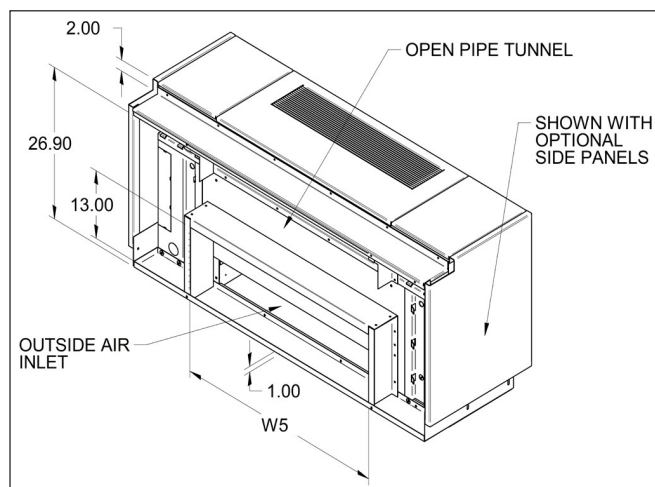
Digit F = Rear Outside Air - Closed Pipe Tunnel



Digit J = Closed Back - Closed Pipe Tunnel



Digit K = 2" Step-Down - Open Pipe Tunnel



Digit L = 2" Step-Down - Closed Pipe Tunnel

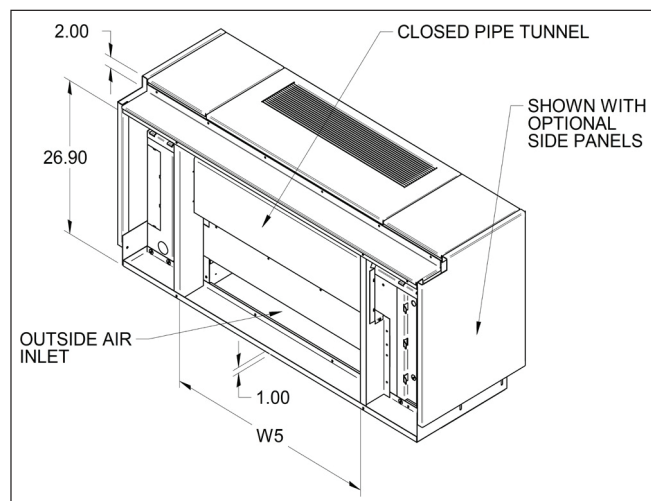


Table 17.1 - Unit Dimensions

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

Figure 18.1 - Dimensional Data - 16 5/8" Depth - Floor Mounted Unit

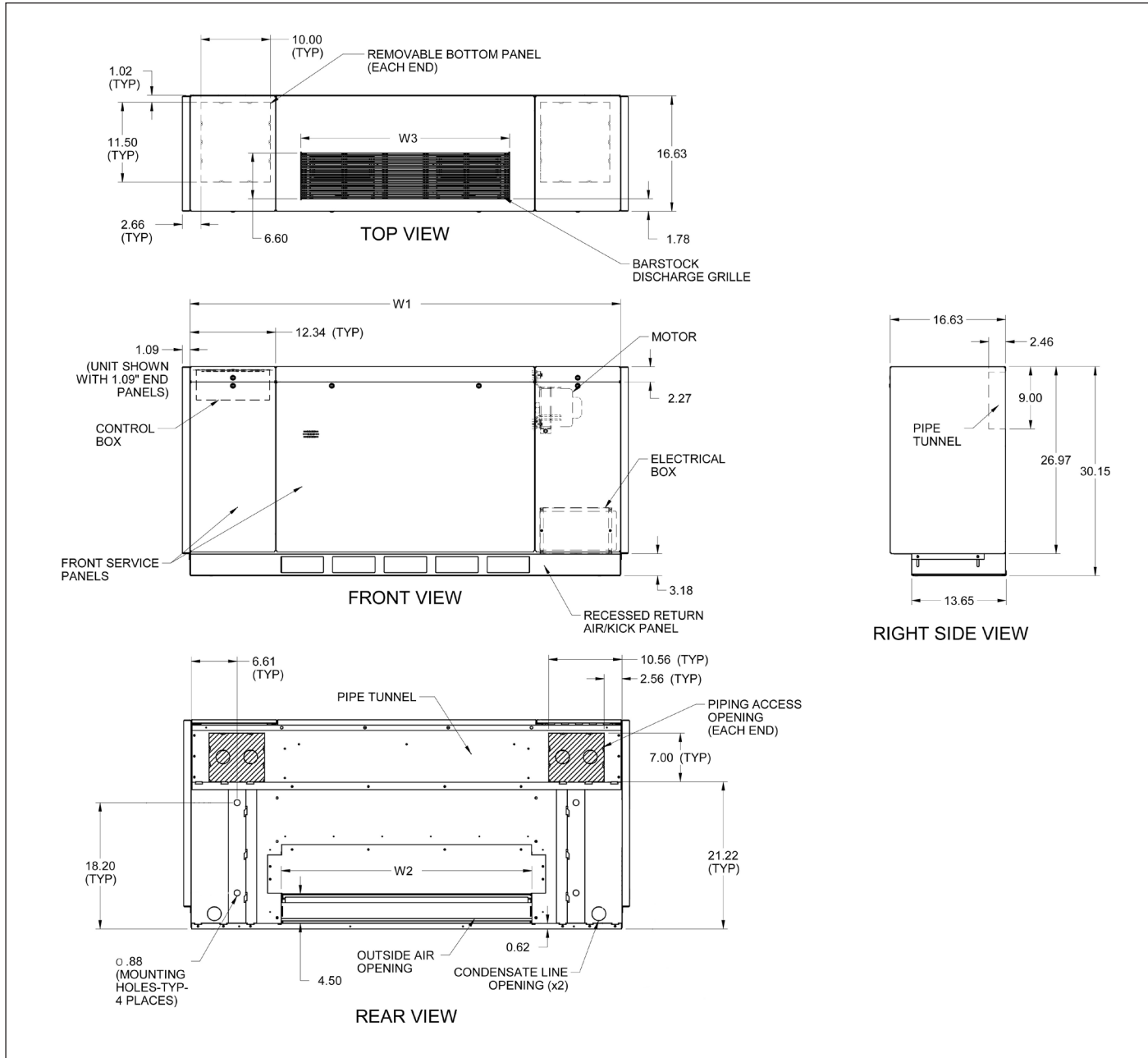


Table 18.1 - Unit Dimensions

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 - Floor Mounted Unit

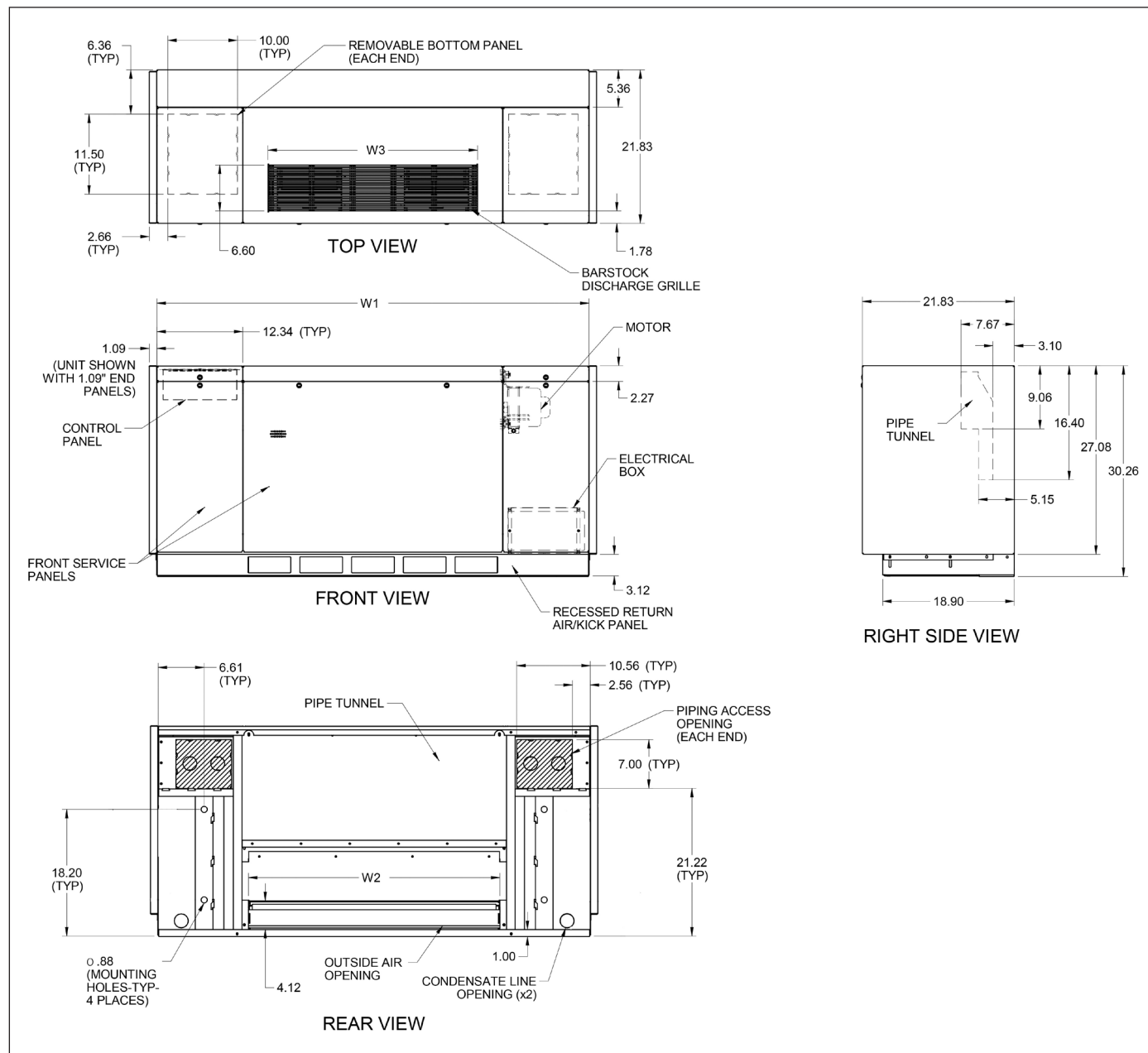


Table 19.1 - Unit Dimensions

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 - Ceiling Mounted Unit - Front Discharge

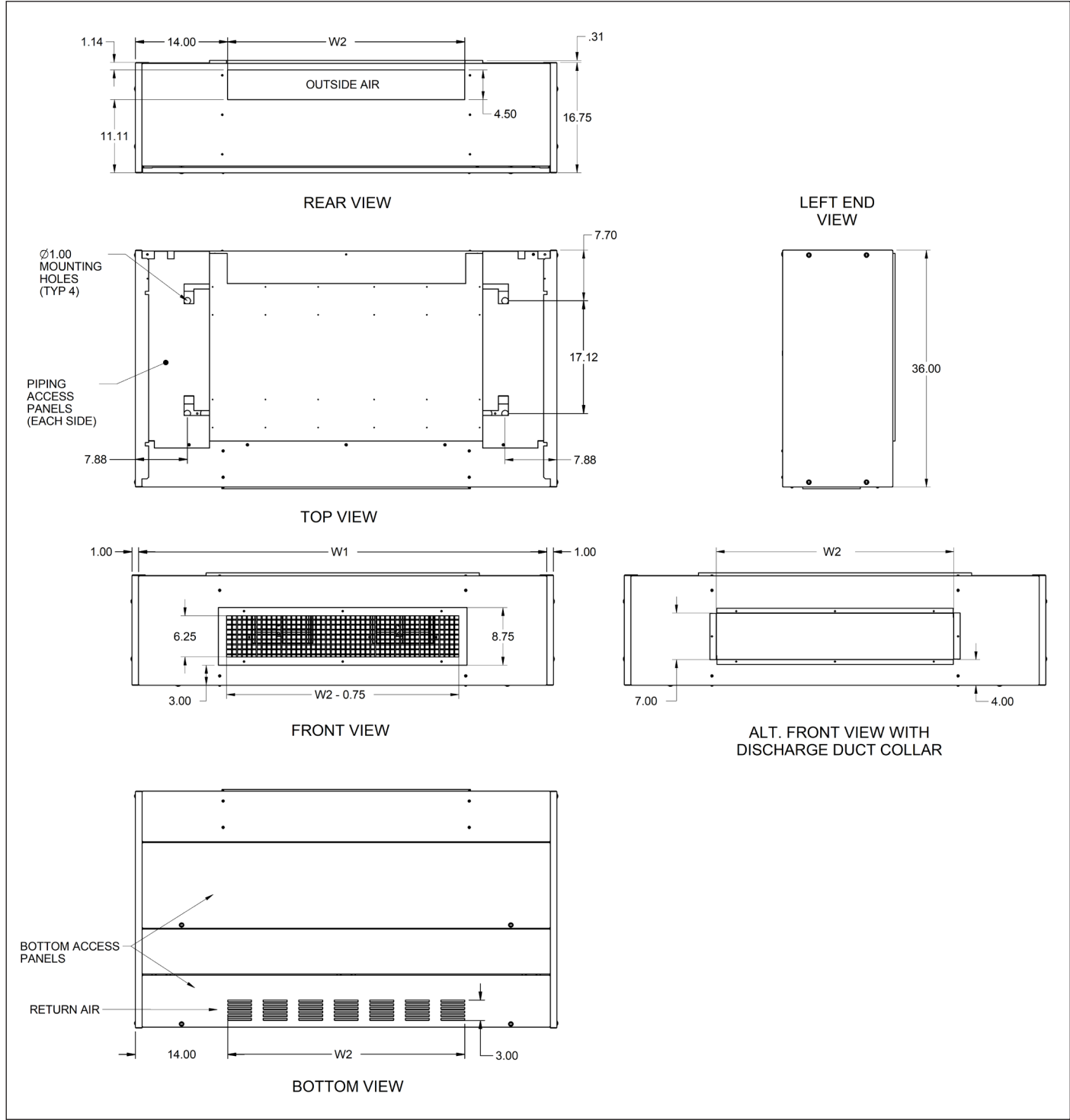


Table 20.1 - Unit Dimensions

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

Figure 21.1 - Dimensional Data - Ceiling Mounted Unit - Down Discharge

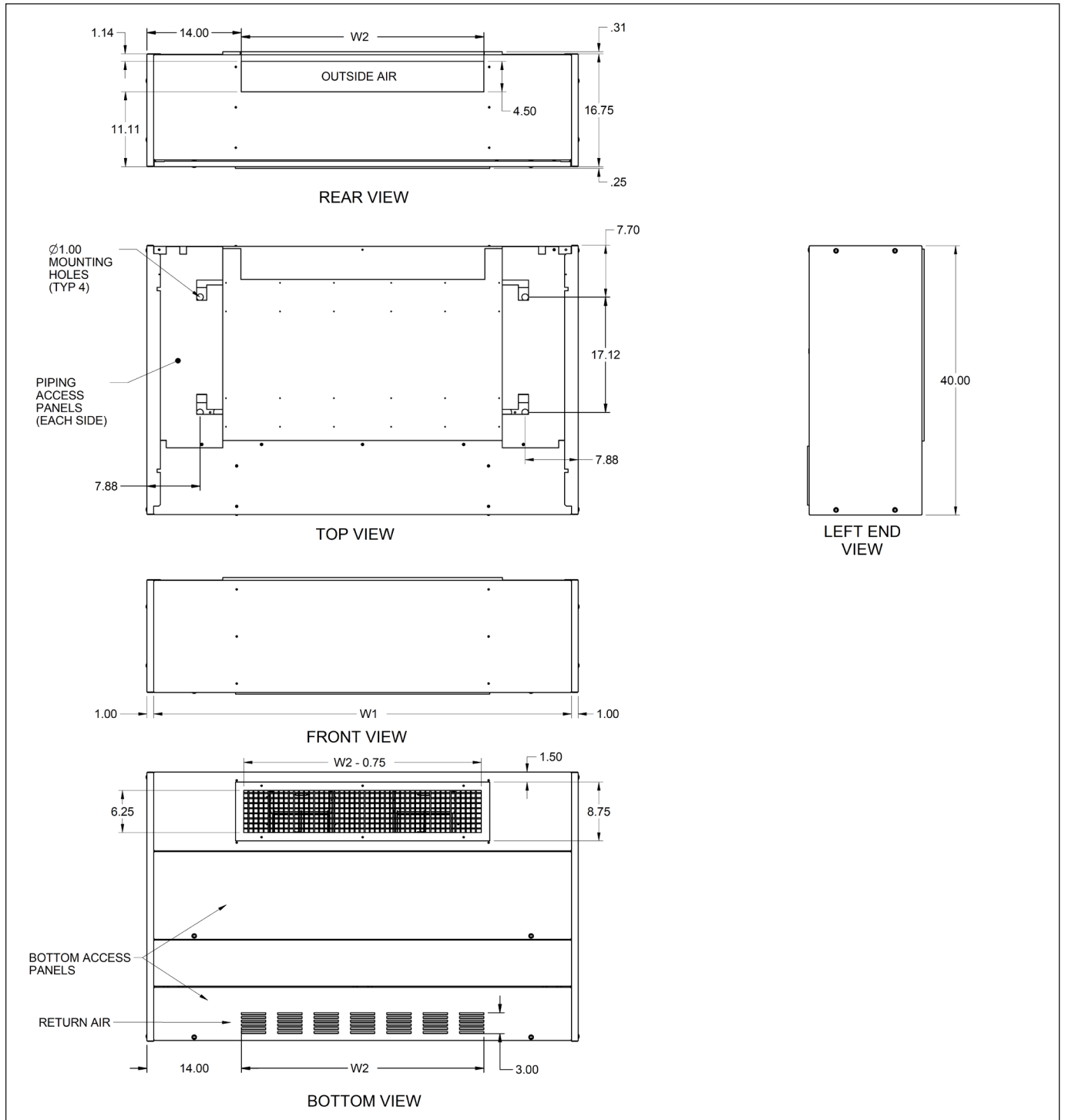


Table 21.1 - Unit Dimensions

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

Figure 22.1 - Side Panels - Floor Mounted Unit

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

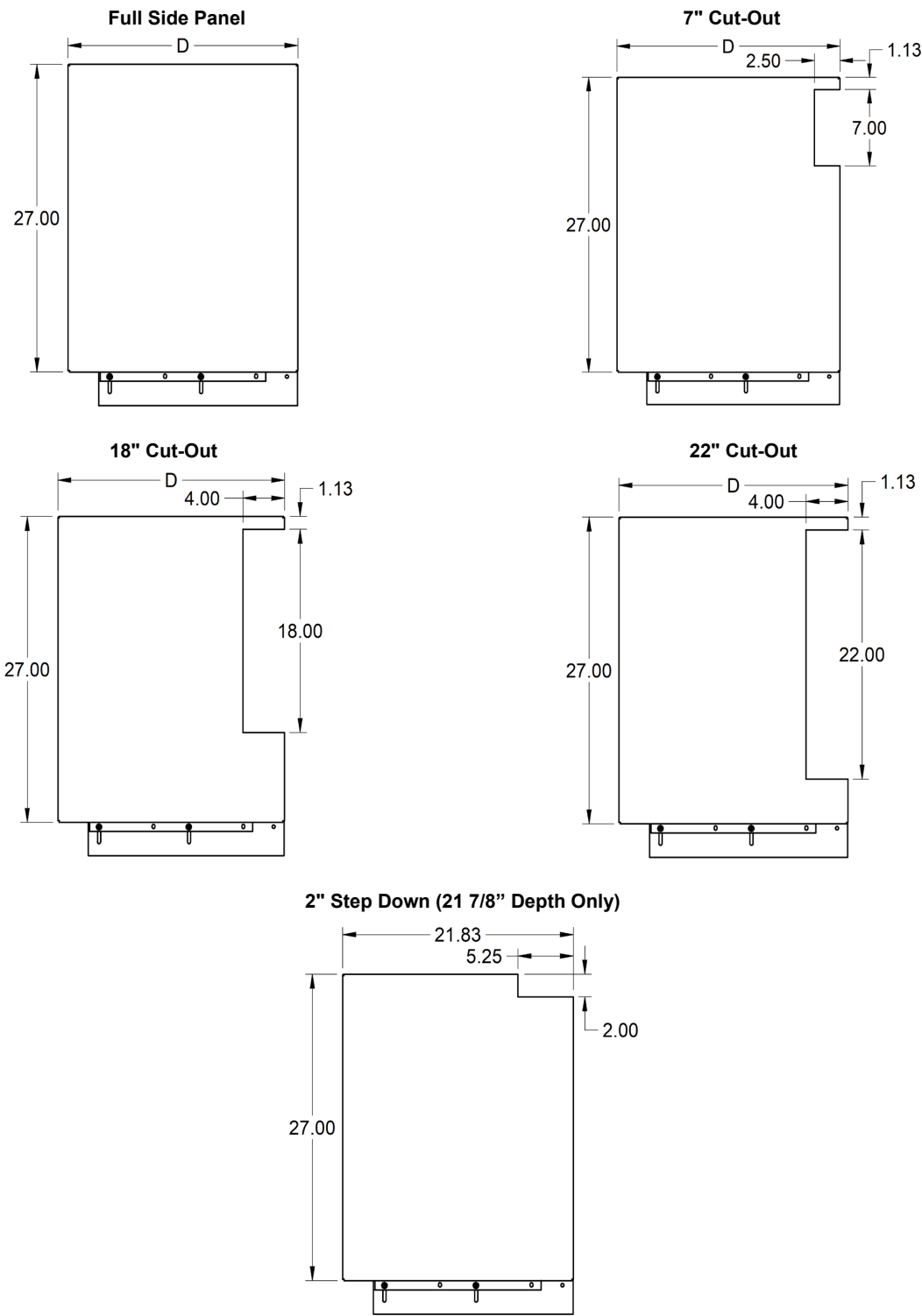
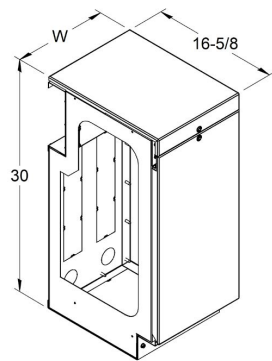


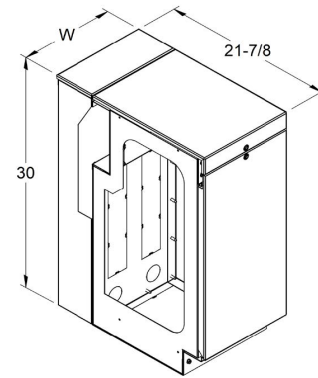
Figure 23.1 - Utility Compartments - Flat Top

W = 12, 18 or 24 Inches

16 5/8" Flat Top Utility Compartment



21 7/8" Flat Top Utility Compartment



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

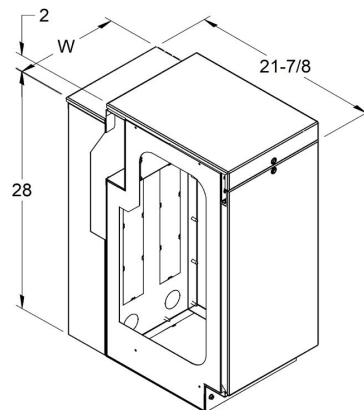


Figure 24.1 - Filler Sections

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

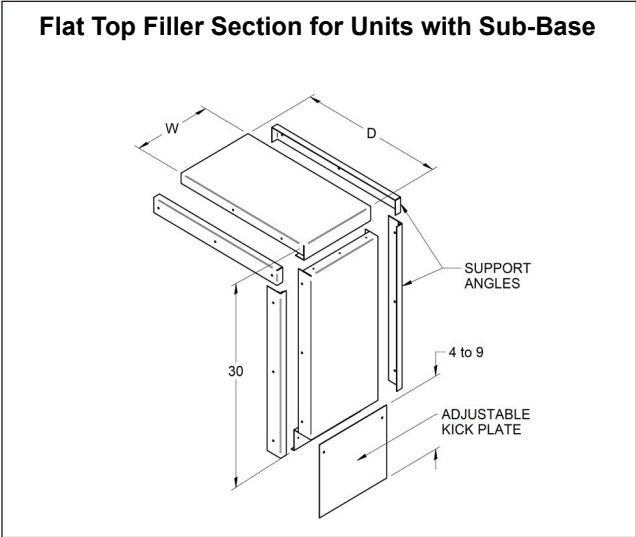
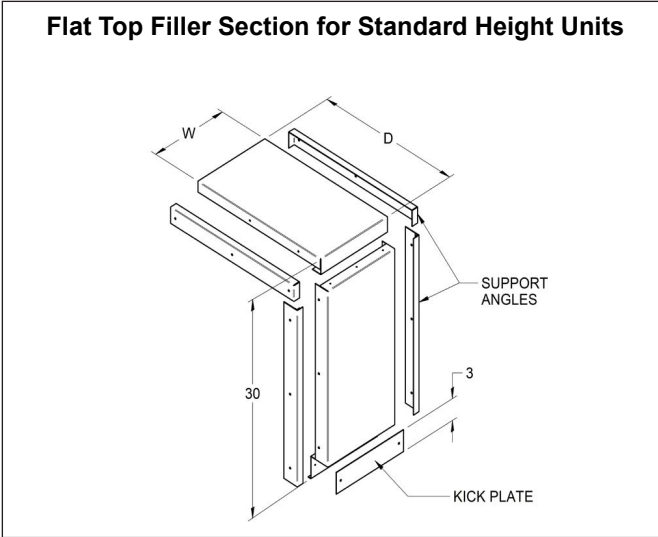


Table 24.1 - Unit Sub-Base Dimensions

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 24.2 - Unit Sub-Base

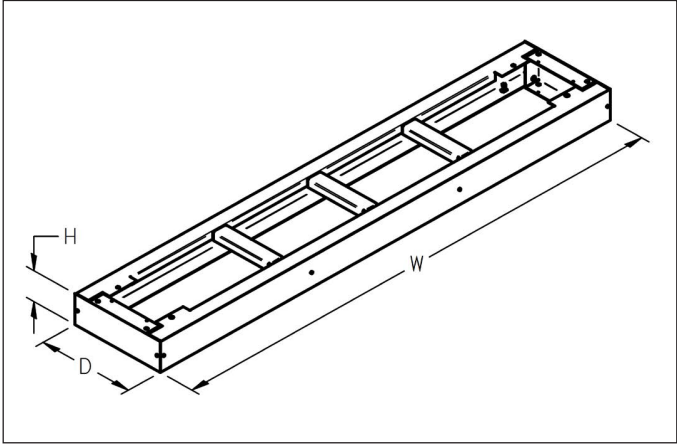


Figure 25.1 - Wall Sleeve

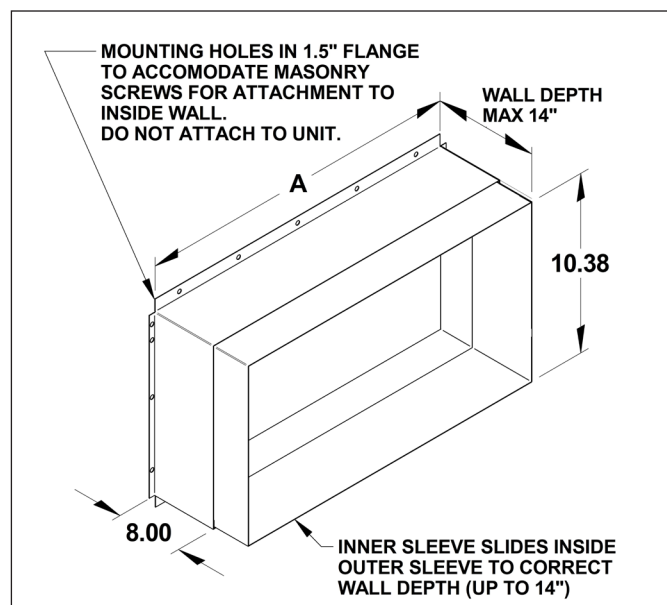


Figure 25.2 - Louver

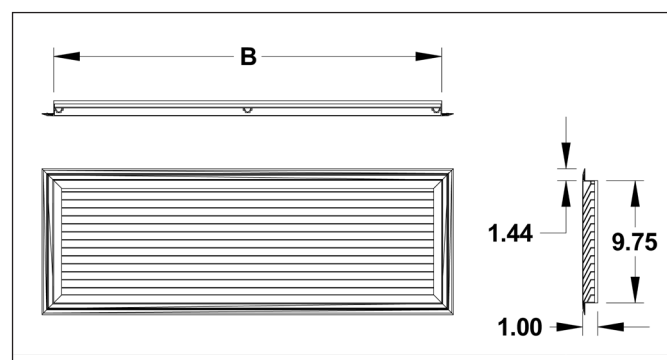


Table 25.1 - Wall Sleeve and Louver Dimensions

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 either be shipped loose for field installation or factory assembled and shipped installed to the unit. Shipped loose piping components are available in 1/2" and 3/4" sizes for chilled water units and 1/2" for hot water units. Piping components shipped installed to the unit are 3/4" for chilled water and 1/2" for hot water.

Figure 26.1 - Typical 2-Way Piping Diagram

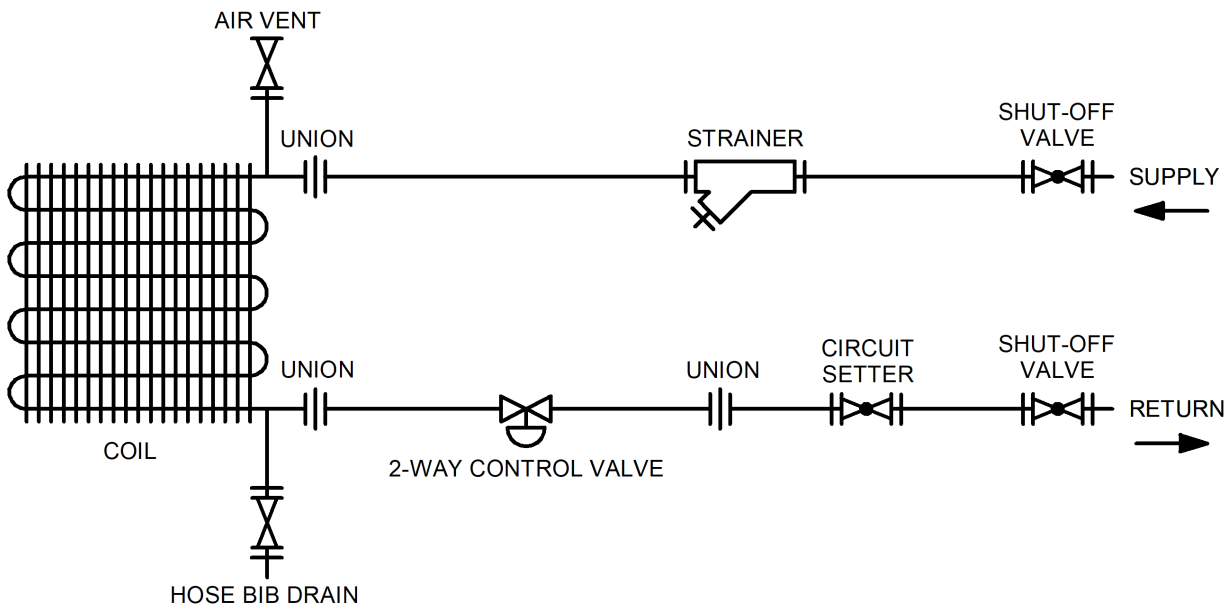
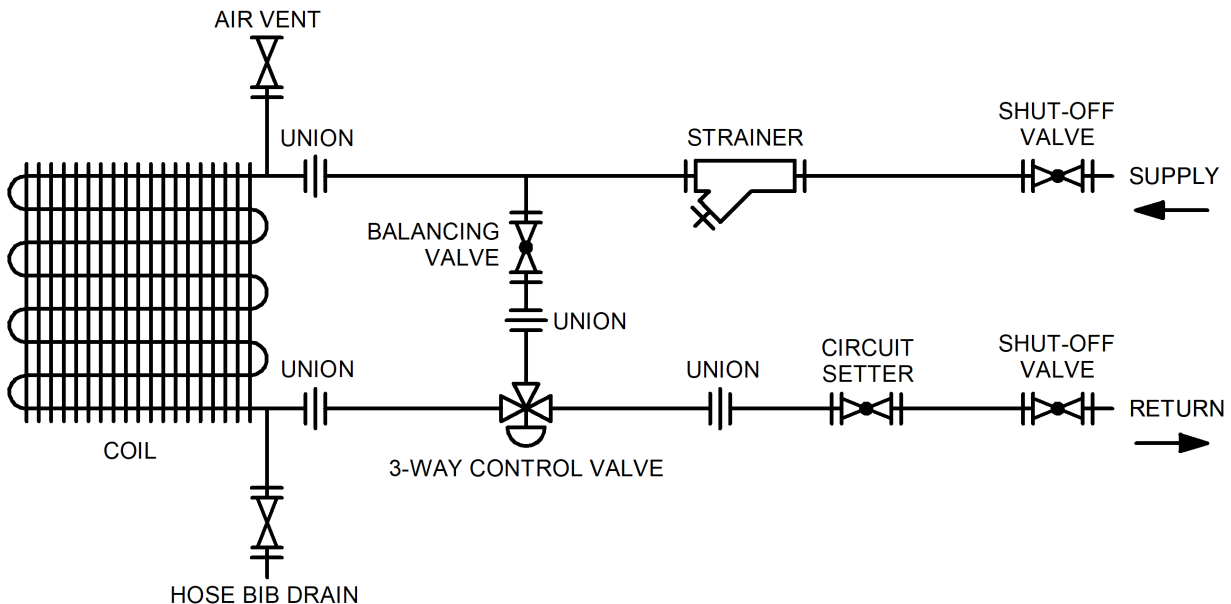


Figure 26.2 - Typical 3-Way Piping Diagram



CHILLED WATER - NO PIPING PACKAGE

Figure 27.1 - Chilled Water Coil with or without Optional Reheat Coil

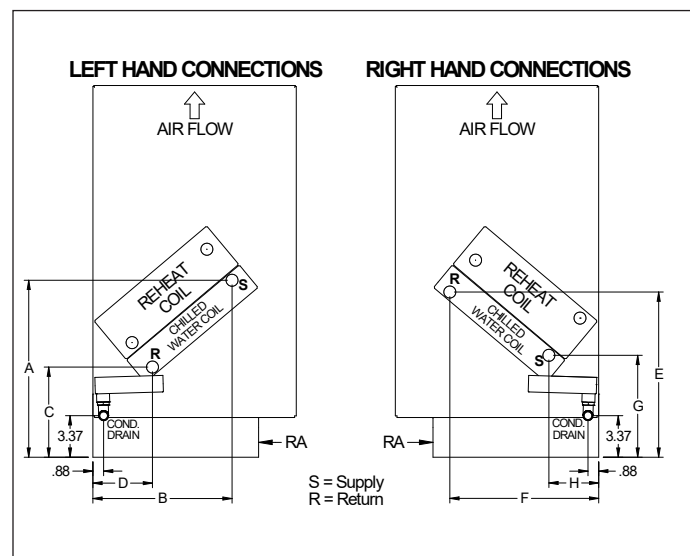
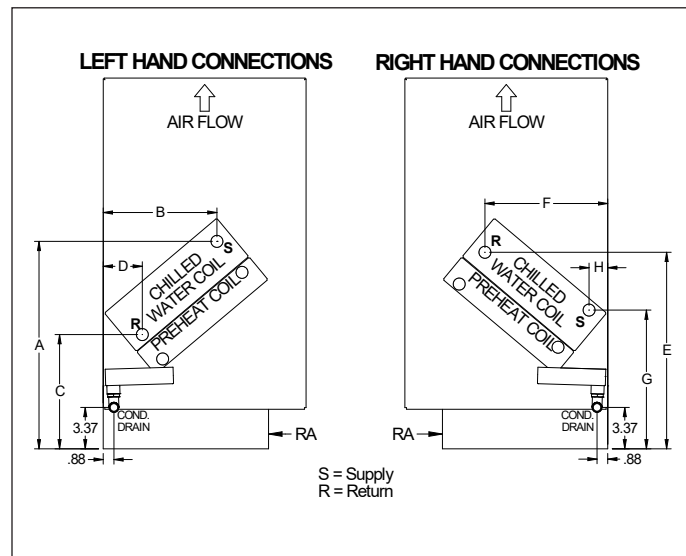


Figure 27.2 - Chilled Water Coil with Pre-Heat Coil



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

Table 27.1 - Piping Location Dimensions ①

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

① For Hot Water Reheat piping locations see Figure 29.2. For Steam Reheat piping locations see Figure 30.2.

Table 27.2 - Piping Location Dimensions ①

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

① For Hot Water Pre-Heat piping locations see Figure 29.1. For Steam Pre-Heat piping locations see Figure 30.1.

DIRECT EXPANSION (DX) SIZE 750 ONLY - NO PIPING PACKAGE

Figure 28.1 - DX Cooling (Size 750) with or without Optional Reheat Coil

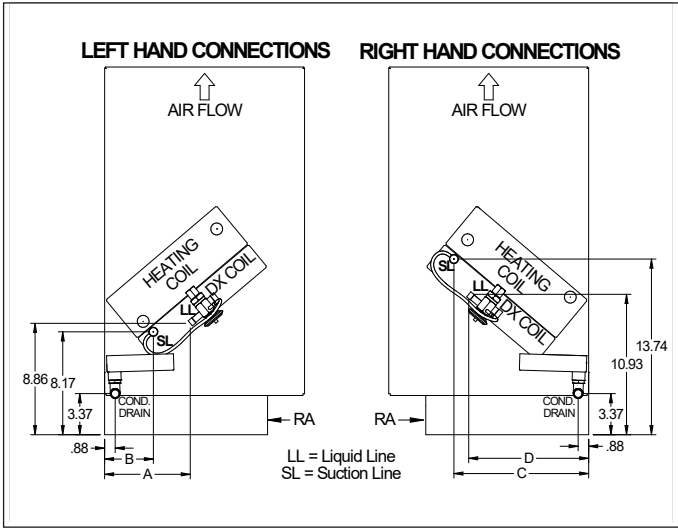


Figure 28.2 - DX Cooling (Size 750) with Pre-Heat Coil

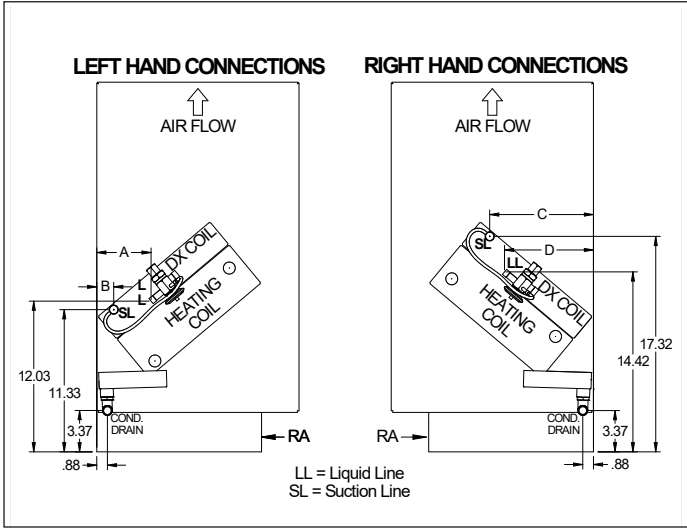


Table 28.1 - Piping Location Dimensions

Unit Depth	Model Size	Dimensions (in.)			
		A	B	C	D
16 5/8	750	14.25	11.25	7.25	4.75
21 7/8	750	14.25	16.50	7.25	10.00

① For Hot Water Reheat piping location see Figure 29.2. For Steam Reheat piping location see Figure 30.2.
For Hot Water Pre-Heat piping location see Figure 29.1. For Steam Pre-Heat piping location see Figure 30.1.

DIRECT EXPANSION (DX) SIZE 1000-1500 - NO PIPING PACKAGE DX

Figure 28.3 - DX Cooling (Size 1000-1500) with or without Optional Reheat Coil

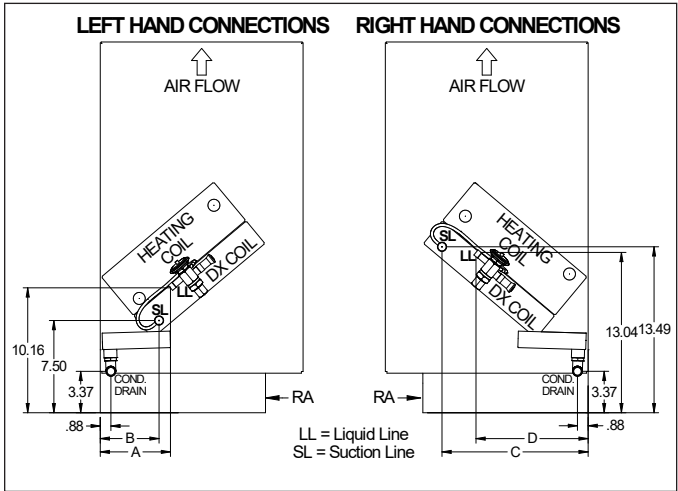


Figure 28.4 - DX Cooling (Size 1000-1500) with Pre-Heat Coil

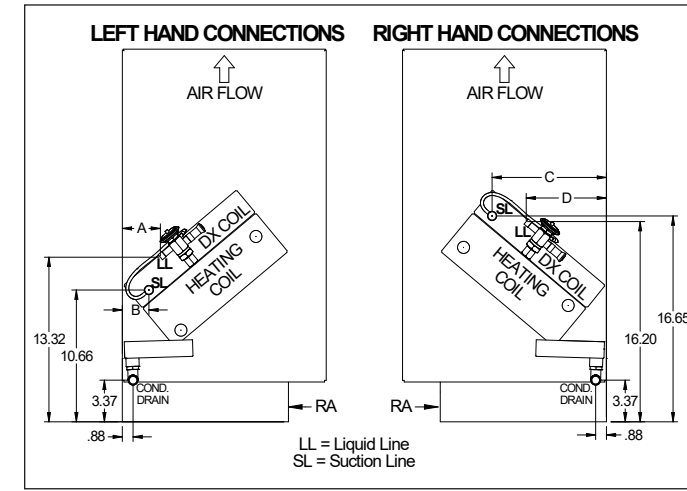


Table 28.2 - Piping Location Dimensions

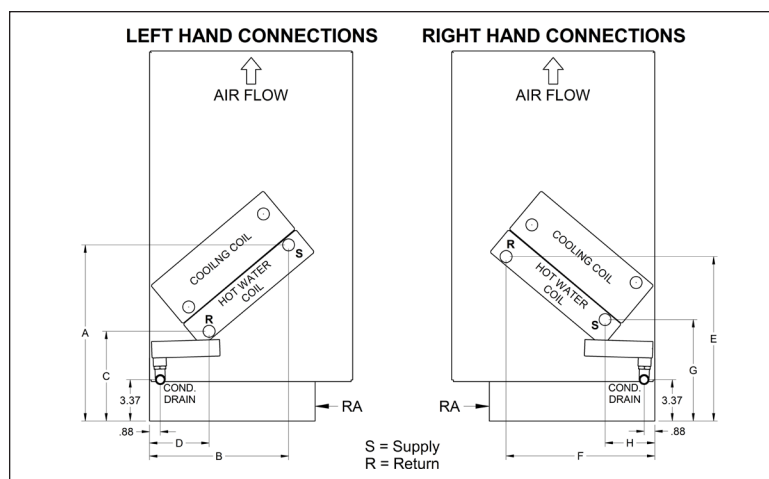
Unit Depth	Model Size	Dimensions (in.)			
		A	B	C	D
16 5/8	1000, 1250, 15000	7.50	4.50	11.75	10.50
21 7/8	1000, 1250, 15000	12.75	9.75	17.00	15.75

① For Hot Water Reheat piping locations see Figure 29.2. For Steam Reheat piping locations see Figure 30.2.

Table 28.3 - Piping Location Dimensions

Unit Depth	Model Size	Dimensions (in.)			
		A	B	C	D
16 5/8	1000, 1250, 15000	4.50	1.75	8.75	7.75
21 7/8	1000, 1250, 15000	9.75	7.00	14.00	13.00

① For Hot Water Pre-Heat piping locations see Figure 29.1. For Steam Pre-Heat piping locations see Figure 30.1.

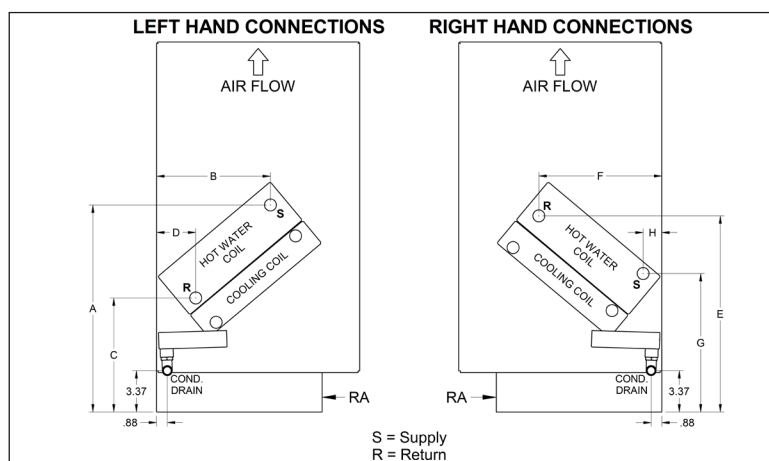
HOT WATER HEATING COIL - NO PIPING PACKAGE**Figure 29.1 - Hot Water Only or Chilled Water/DX Cooling Coil with Hot Water Pre-Heat Coil**

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

Table 29.1 - Hot Water Heating Coil Piping Locations ①

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

① For Chilled Water piping locations see Figure 27.2. For DX Cooling piping locations see Figure 28.2 & Figure 28.4.

Figure 29.2 - Hot Water Reheat Coil with Chilled Water/DX Cooling Coil

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

Table 29.2 - Hot Water Reheat Coil Piping Locations ①

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

① For Chilled Water piping locations see Figure 27.1. For DX Cooling piping locations see Figure 28.1 & Figure 28.3.

STEAM HEATING COIL - NO PIPING PACKAGE

Figure 30.1 - Steam Heating Coil Only or Chilled Water/DX Cooling Coil with Steam Pre-Heat Coil

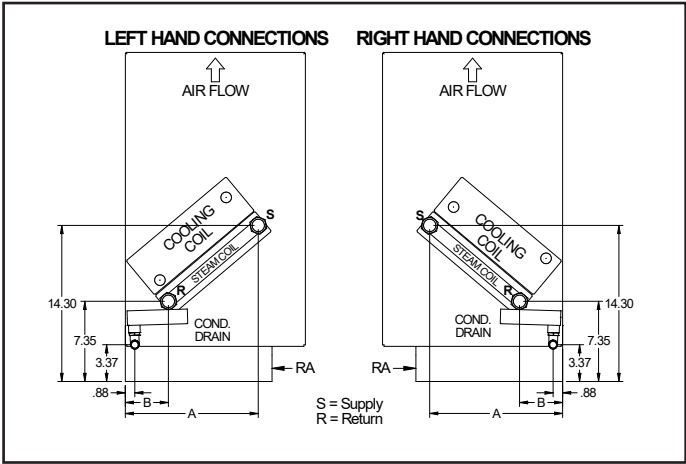


Table 30.1 - Steam Heating Coil Piping Locations ①

Unit Depth	Coil Rows	Dimensions (inches)	
		A	B
16 5/8	1-Row	12.25	4.00
21 7/8	1-Row	17.50	9.25

① For Chilled Water piping locations see Figure 27.2. For DX Cooling piping locations see Figure 28.2 & Figure 28.4.

Figure 30.2 - Steam Reheat Coil with Chilled Water/DX Cooling Coil

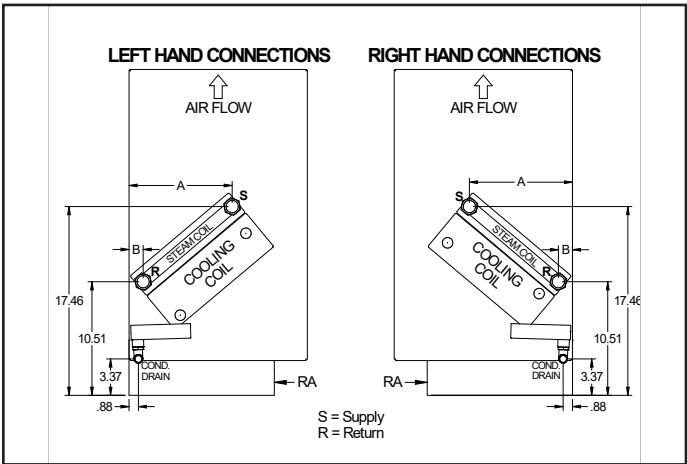


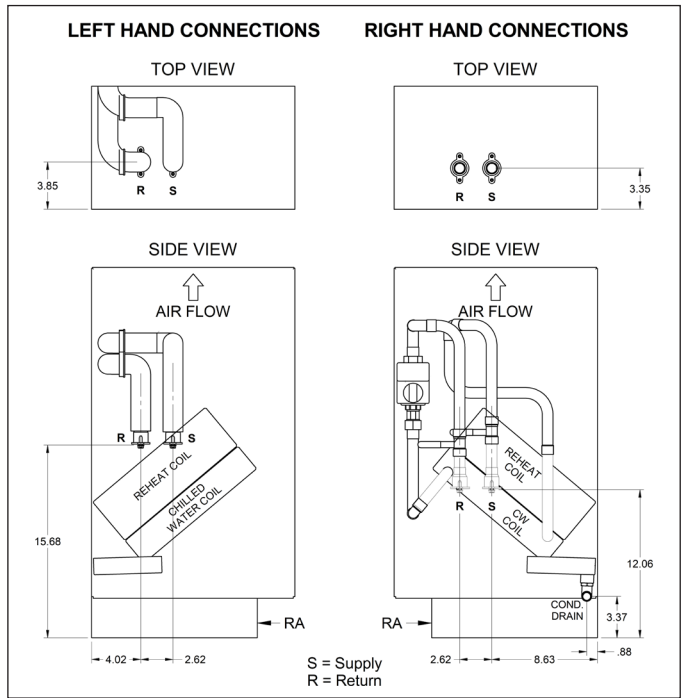
Table 30.2 - Steam Reheat Coil Piping Locations ①

Unit Depth	Coil Rows	Dimensions (inches)	
		A	B
16 5/8	1-Row	9.50	1.25
21 7/8	1-Row	14.75	6.50

① For Chilled Water piping locations see Figure 27.1. For DX Cooling piping locations see Figure 28.1 & Figure 28.3.

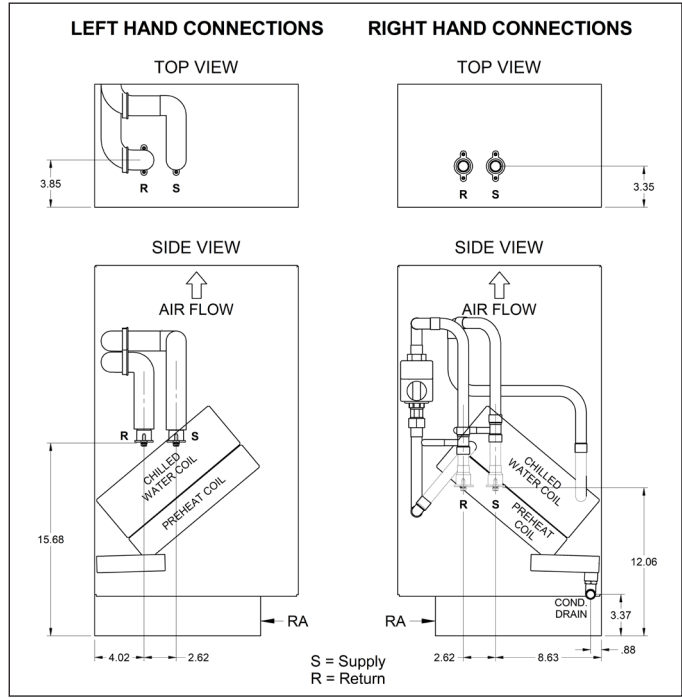
CHILLED WATER - WITH PIPING PACKAGE

Figure 31.1 - Chilled Water Coil with or without Optional Reheat Coil



① Condensate drain connection located in right end compartment.

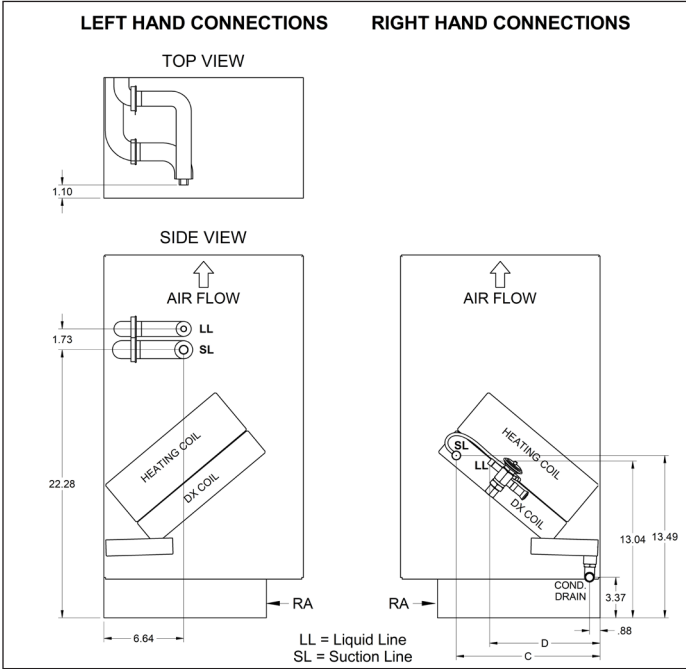
Figure 31.2 - Chilled Water Coil with Pre-Heat Coil



① Condensate drain connection located in right end compartment.

DIRECT EXPANSION (DX) SIZE 750 ONLY - WITH PIPING PACKAGE

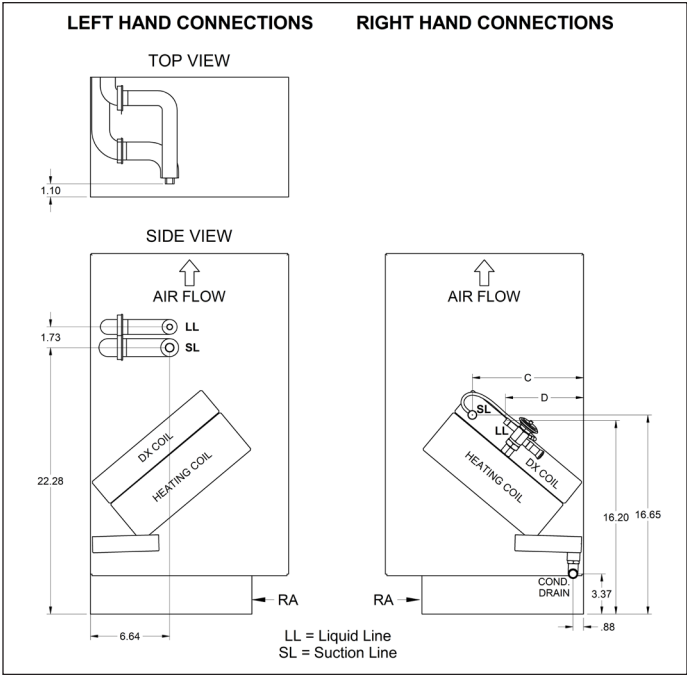
Figure 32.1 - DX Cooling Coil Only or DX Cooling with Reheat Coil



Unit Size: 750

- ① For Dimensions C and D refer to Table 28.1.
- ② Condensate drain connection located in right end compartment.

Figure 32.2 - DX Cooling Coil with Pre-Heat Coil Only

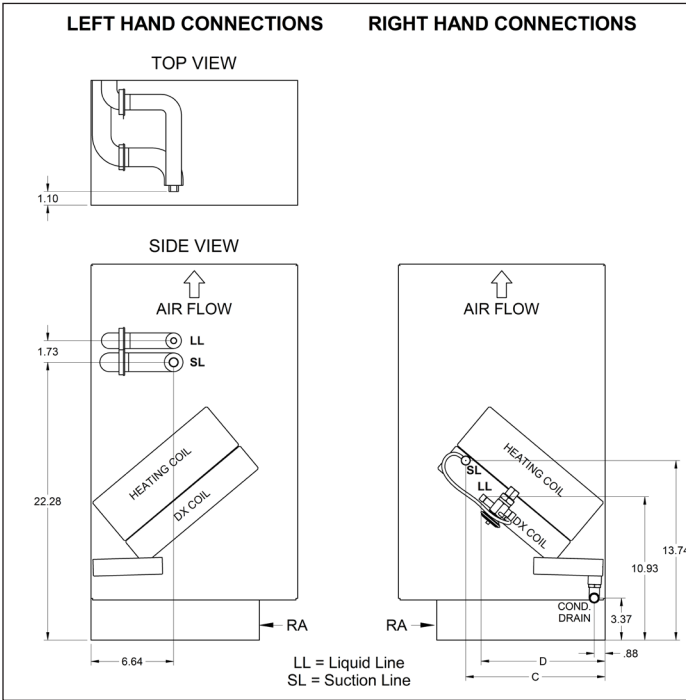


Unit Size: 750

- ① For Dimensions C and D refer to Table 28.1.
- ② Condensate drain connection located in right end compartment.

DIRECT EXPANSION (DX) SIZE 1000-1500 - WITH PIPING PACKAGE

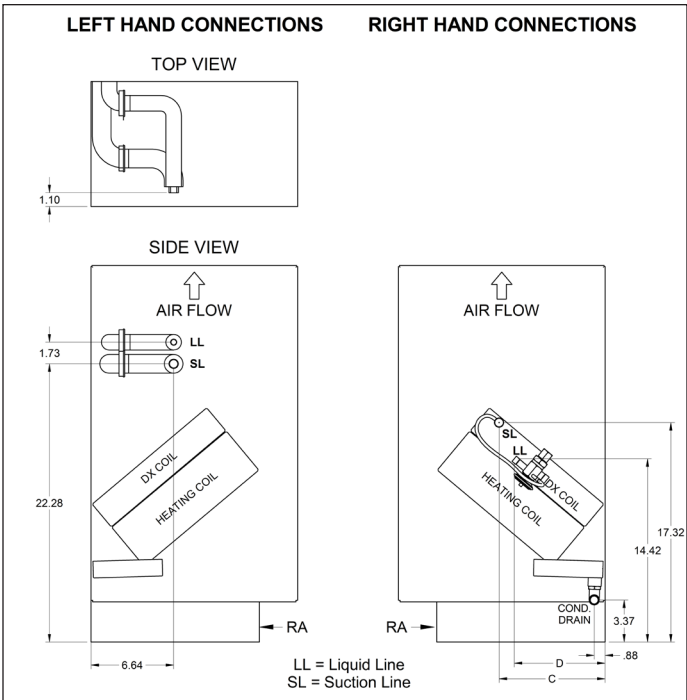
Figure 32.3 - DX Cooling Coil Only or DX Cooling with Reheat Coil



Unit Size: 1000 / 1250 / 1500

- ① For Dimensions C and D refer to Table 28.2.
- ② Condensate drain connection located in right end compartment.

Figure 32.4 - DX Cooling Coil with Pre-Heat Coil Only

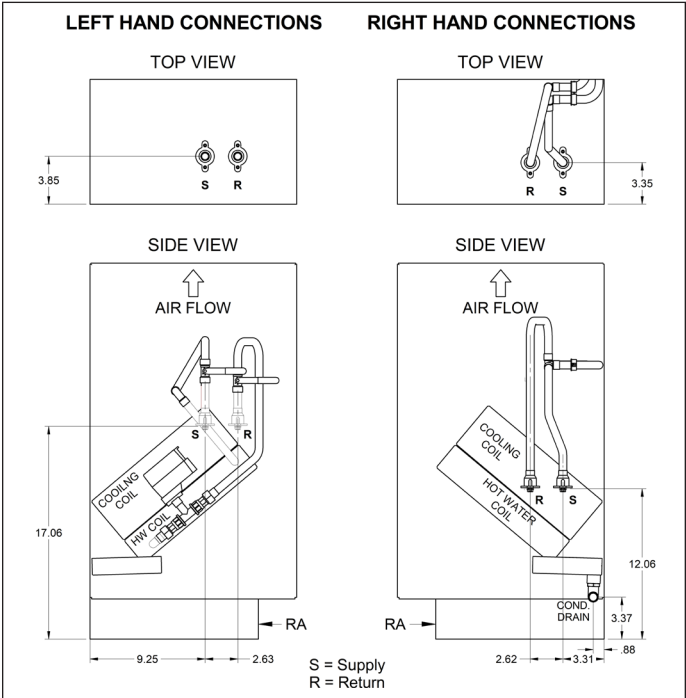


Unit Size: 1000 / 1250 / 1500

- ① For Dimensions C and D refer to Table 28.3.
- ② Condensate drain connection located in right end compartment.

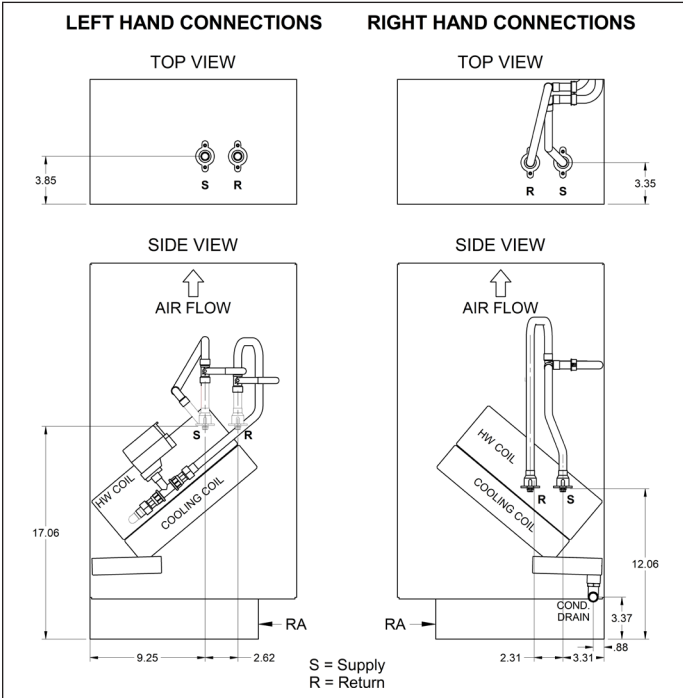
HOT WATER HEATING COIL - WITH PIPING PACKAGE

Figure 33.1 - Hot Water Heating Coil Only or Chilled Water/DX Cooling Coil with Hot Water Pre-Heat Coil



① Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.

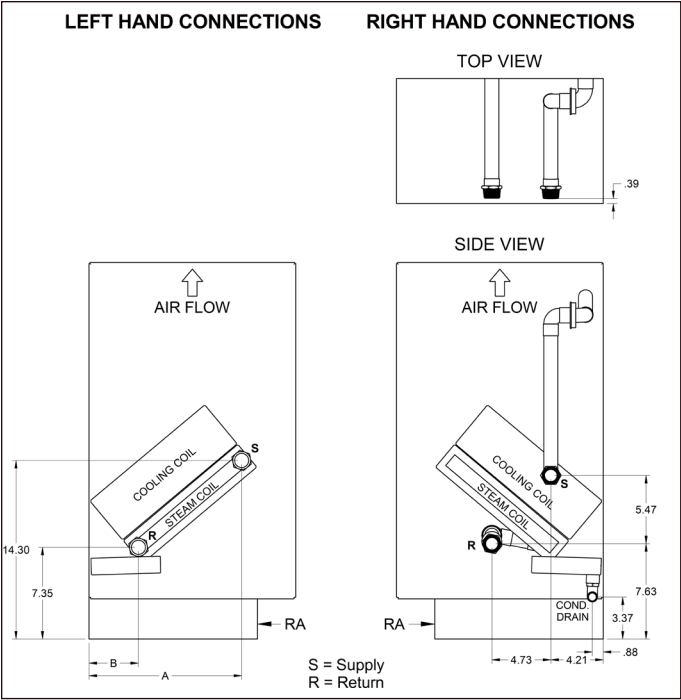
Figure 33.2 - Chilled Water/DX Cooling Coil with Hot Water Reheat Coil



① Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.

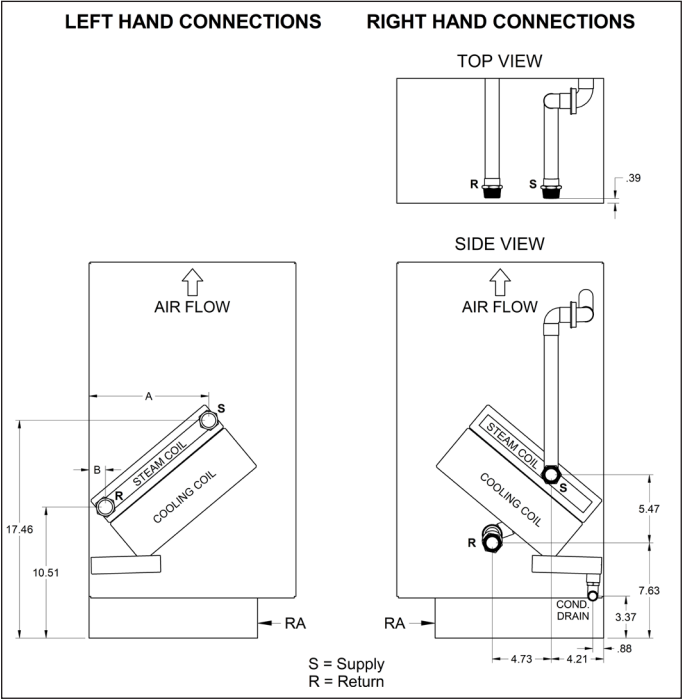
STEAM HEATING COIL - WITH PIPING PACKAGE

Figure 34.1 - Steam Heating Coil Only or Chilled Water/DX Cooling Coil with Steam Pre-Heat Coil



- ① For Dimensions A and B refer to Table 30.1.
- ② Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.

Figure 34.2 - Chilled Water/DX Cooling Coil with Steam Reheat Coil



- ① For Dimensions A and B refer to Table 30.2.
- ② Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.

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