

CLASSROOM UNIT VENTILATORS

WITH SPLIT SYSTEM DX AIR CONDITIONING
OR CHILLED WATER COOLING



MODELS VUD, VDF, VUF AND HCD
2 THROUGH 5 TONS CAPACITY

Temperature, Humidity, Air Quality and Sound Level

The four parameters which define comfort in the classroom.

Providing our children with conditions in the classroom which promote alertness and good health is a vital part of a successful educational facility. It is more than just temperature control.

Humidity control is necessary for comfort and for ensuring that the conditions for mold growth are eliminated.

Ventilation rates should not only meet code requirements but ventilation air must be effectively distributed within the space.

Free cooling by the ability of the HVAC equipment to fully utilize cool outdoor air is essential for economy of operation.

The Temspec classroom unit ventilator will give you precise control of these conditions. Quiet operation, uniform air distribution in the room and an architecturally pleasing appearance are fundamental to the design and construction of the Temspec units.



This catalog describes the performance and application data.



Company Profile

Temspec designs and manufactures unit ventilators and fan coils for school classrooms and vertical stack fan coil units for high-rise hotels and condominiums.

The company was established in 1971 and has gained a reputation in the HVAC industry for on-time delivery of high quality equipment.

We specialize in flexible response to customers' needs, often customizing the units to suit specific application requirements. We work closely with engineers at the design stage to ensure optimum use of the units within the HVAC system.

Since 1971 Temspec has produced over 250,000 fan coil units and over 10,000 unit ventilators. Our market encompasses the whole of the U.S.A. and Canada through a network of experienced sales representatives.

Our client portfolio includes such prestigious companies as Hilton hotels, Marriott, Embassy Suites, Sheraton, Novotel, Skydome hotel, Royal York hotel, Intercontinental, Red Lion Inns, Fairmont, Tridel, Bally's, Harvey's Casino, Omni, Ramada, Belterra Casino Resort and Mandarin Oriental Hotel.



Other product catalogs from Temspec are:

- Classroom unit ventilators with self-contained air conditioning
- Hi-rise fan coil units for concealed application
- Hi-rise fan coil units for exposed application

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A Climate For Learning

Classroom unit ventilator design and application has progressed significantly in recent years. The under-the-window type of unit commonly used in schoolrooms for the past fifty years has several deficiencies well known to school designers and operators. The points of comparison shown below highlight the important advantages of the Temspec design.

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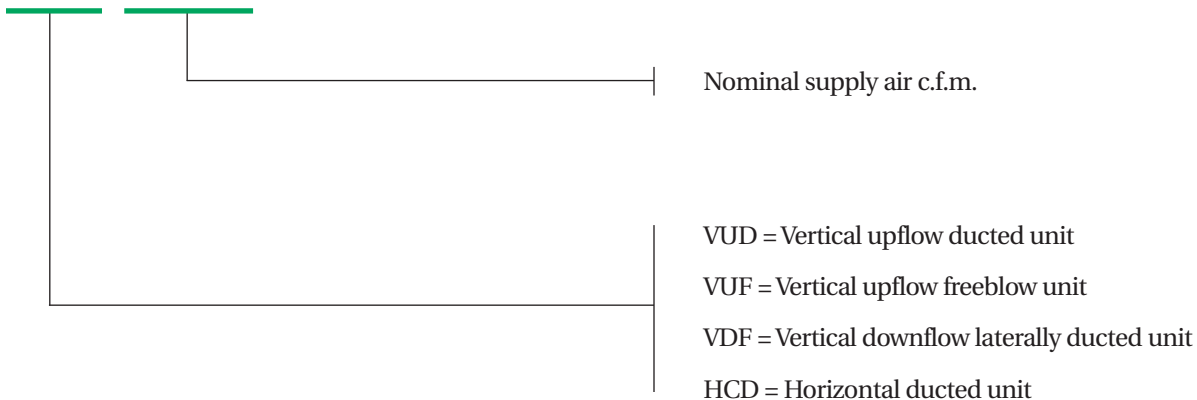
UNDER-THE-WINDOW UNIT VENTILATOR	TEMSPEC UNIT VENTILATOR
High operating noise level	Low sound level, particularly when the supply air is ducted
Poor air distribution in the classroom. Air discharge at counter top level	Excellent distribution of the cooling and ventilation air at a high level by duct work and diffusers or grilles in the unit casing
Short cycling of the supply air into the return air, particularly in cooling mode	No short cycling
Takes a large amount of valuable floor space	Small footprint
Books can block the supply air grille in the top of the unit leading to DX coil freeze-up	Supply air cannot easily be blocked
Infiltration of outdoor air at night caused by poorly constructed dampers results in excessive energy bills and sometimes water coil freeze-up	Opposed blade outdoor and return air dampers with neoprene blade and jamb seals for tight close off. Blade length is short, airfoil cross section, nylon bearings
Outdoor air intake is very close to the ground. Blockage by snow drifts and intake of dust and mold spores are common problems	Outdoor air intake is 2 feet or more above the ground
Maintenance is difficult	All components are readily accessible and no expensive OEM special parts are used

Selection Guide

ROOM TYPE AND COOLING LOAD	SUPPLY AIR DISTRIBUTION	TEMSPEC UNIT MODEL
Average size classroom up to 1000 sq.ft. 3 tons	Ducted upflow	VUD 1200
	Ducted downflow	VDF 1200
	Ducted horizontal	HCD 1200
	Direct discharge	VUF 1200
Large classroom, Computer room, Library. over 1000 sq.ft. 4 or 5 tons	Ducted upflow	VUD 1600 or VUD 2000
	Ducted downflow	VDF 1200 (2 units)
	Ducted horizontal	HCD 1600
	Direct discharge	VUF 1500

Model Numbers

XXX NNNN



Typical Specification

for unit ventilator model VUD 1200

1. The unit ventilator shall be manufactured by Temspec Inc.
2. **ELECTRIC COIL** The electric heating coil shall have wire nickel-chrome elements carried in floating ceramic bushings. Auto-reset high limit switches shall be factory installed in the coil frame. The coil shall be rated for ____kW at a supply voltage ____Volts ____phase 60 Hz. Each coil stage shall have an electromagnetic contactor to energize the coil.
3. **HOT WATER HEATING COIL** The coil shall have 1/2" copper tube of minimum wall thickness 0.016" and shall have aluminum fins. The coil supply and return headers shall be copper pipe, stubbed out for sweat connection. The coil shall be factory pressure tested at not less than 350 p.s.i. . A manual air vent shall be factory installed and ball valves fitted. The coil capacity shall be as shown in the schedule.
4. **CHILLED WATER COOLING COIL** The coil shall have 1/2" copper tube of minimum wall thickness 0.016" and shall have aluminum fins. The coil supply and return headers shall be copper pipe, stubbed out for sweat connection. The coil shall be factory pressure tested at not less than 350 p.s.i. . A manual air vent shall be factory installed and ball valves fitted. The coil capacity shall be as shown in the schedule. A galvanized steel pitched drain pan shall be provided. The pan shall have a 'P' trap.
5. **DIRECT EXPANSION EVAPORATOR COIL** The coil shall have 3/8" copper tube and aluminum fins. The coil capacities shall be as shown in the schedule. A galvanized steel pitched drain pan shall be provided. The pan shall have a 'P' trap.
6. **CABINET** The unit cabinet shall be 18ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1/2" coated glass fiber insulation. The return air grille shall be heavy duty steel.
7. **TOP EXTENSION (Optional)** The unit manufacturer shall provide a color matched top extension for the cabinet, of size to suit the ceiling height.
8. **RAISED BASE (Optional)** The unit manufacturer shall provide a color matched raised base, height as shown on the plans.
9. **SIDE PIPE COVER (Optional)** The unit manufacturer shall provide a 5" wide pipe cover assembly, color matched to the unit. The cover shall be the depth of the unit, height to suit.
10. **SUPPLY AIR FAN/MOTOR** The fan shall be a direct drive centrifugal type with a three speed PSC motor mounted on rubber isolation grommets. The motor voltage shall be ____ V/1/60Hz.
11. **OUTDOOR/RETURN AIR MIXING DAMPERS** The outdoor and return air dampers shall have airfoil section aluminum extruded blades. The dampers shall have neoprene blade tip and jamb seals. Leakage shall not exceed 4 c.f.m. per sq. ft. at 3" W.G. differential pressure, as determined by a recognized testing laboratory.
12. **FILTERS** The filters shall be of the manufacturer's standard disposable type.
13. **EXTERIOR WALL LOUVER** The louver shall have aluminum extruded 45 degree blades. The louver shall have 1/2" birdscreen attached to the inner face. The finish on the louver shall be mill finish or a color as per the Architect's instruction. The contractor shall provide a wall sleeve to suit the wall thickness.
14. **BAROMETRIC RELIEF (Optional)** A barometric relief damper shall be incorporated in the back of the unit. The manufacturer shall provide the wall louver.
15. **CONDENSATE PUMP (Optional)** A condensate pump shall be factory installed within the unit, behind the return air grille. The head capacity of the pump shall be a minimum of ____ft.
16. **LINE VOLTAGE WIRING** All internal line voltage wiring shall be by the unit manufacturer. A suitably rated remote circuit breaker shall be provided and installed by the electrical contractor.
17. **INSTALLATION** The unit ventilator shall be installed plumb. Foam sealing tape shall be installed around the perimeter of the opening in the back of the unit before moving the unit into position against the wall. The exterior louver shall be caulked.
18. **DDC CONTROLS** Control items shall be furnished by the contractor for factory mounting and shall function as described in the Controls Specification.
19. **STAND-ALONE CONTROLS** The control system shall be Temspec type "V" incorporating an OC-3 model, seven day programmable thermostat with integral "smart occupancy" sensor.

The typical specifications for Temspec unit models listed below are the same as that shown on the previous page for VUD 1200, with the following differences:

VUD 1600

- 6. CABINET** The unit cabinet shall be 14ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1" coated glass fiber insulation. The return air grille shall be heavy duty steel.

ADD: TOP ACOUSTICAL PLENUM/ELBOW (optional) The unit manufacturer shall provide a color matched top plenum extension for the unit, size to suit the ceiling height. The plenum shall have an internal perforated elbow and shall be acoustically lined.

DELETE: BAROMETRIC RELIEF

VUD 2000

- 6. CABINET** The unit cabinet shall be 14ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1" coated glass fiber insulation. The return air grille shall be heavy duty steel.

ADD: TOP ACOUSTICAL PLENUM/ELBOW (optional) The unit manufacturer shall provide a color matched top plenum extension for the unit, size to suit the ceiling height. The plenum shall have an internal perforated elbow and shall be acoustically lined.

SUPPLY AIR FANS/MOTORS The dual fans shall be a direct drive centrifugal type each with a three speed PSC motor mounted on rubber isolation grommets. The motor voltage shall be ____ V/1/60Hz.

DELETE: BAROMETRIC RELIEF

VUF 1200

ADD: TOP SUPPLY AIR PLENUM The unit manufacturer shall provide a color matched top supply air plenum with double deflection supply air grilles (two or three way discharge). The plenum shall be acoustically lined.

VUF 1500

- 6. CABINET** The unit cabinet shall be 14ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1" coated glass fiber insulation. The return air grille shall be heavy duty steel.

ADD: SUPPLY AIR GRILLES Double deflection supply air grilles (two or three way discharge) shall be factory mounted on the cabinet front and side.

- 10. SUPPLY AIR FANS/MOTORS** The dual fans shall be a direct drive centrifugal type each with a three speed PSC motor mounted on rubber isolation grommets. The motor voltage shall be ____ V/1/60Hz.

VDF 1200

- 6. CABINET** The unit shall have a down flow configuration with side supply air discharge into lateral duct at baseboard level. The unit cabinet shall be 18ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1/2" coated glass fiber insulation. The return air grille shall be heavy duty steel.

DELETE: RAISED BASE and CONDENSATE PUMP

HCD 1200

- 6. CABINET** The unit shall have a horizontal configuration with supply air discharge into high level duct work. The unit cabinet shall be 18ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1/2" coated glass fiber insulation.

ADD: ACCESS PANELS Hinged panels shall be incorporated in one side of the unit to allow full access to all internal components.

DELETE: TOP EXTENSION, RAISED BASE, SIDE PIPE COVER, EXTERNAL WALL LOUVER, BAROMETRIC RELIEF, CONDENSATE PUMP.

- 17. INSTALLATION** Supporting steelwork and hanger rods shall be by the contractor. The unit shall be equipped with brackets at each corner for the support rods.

HCD 1600

- 6. CABINET** The unit shall have a horizontal configuration with supply air discharge into high level duct work. The unit cabinet shall be 14ga corrosion resistant steel, braced and reinforced for rigidity. The finish shall be textured powder coat, color as per the Architect's instruction. The cabinet shall be fully lined with 1" coated glass fiber insulation.

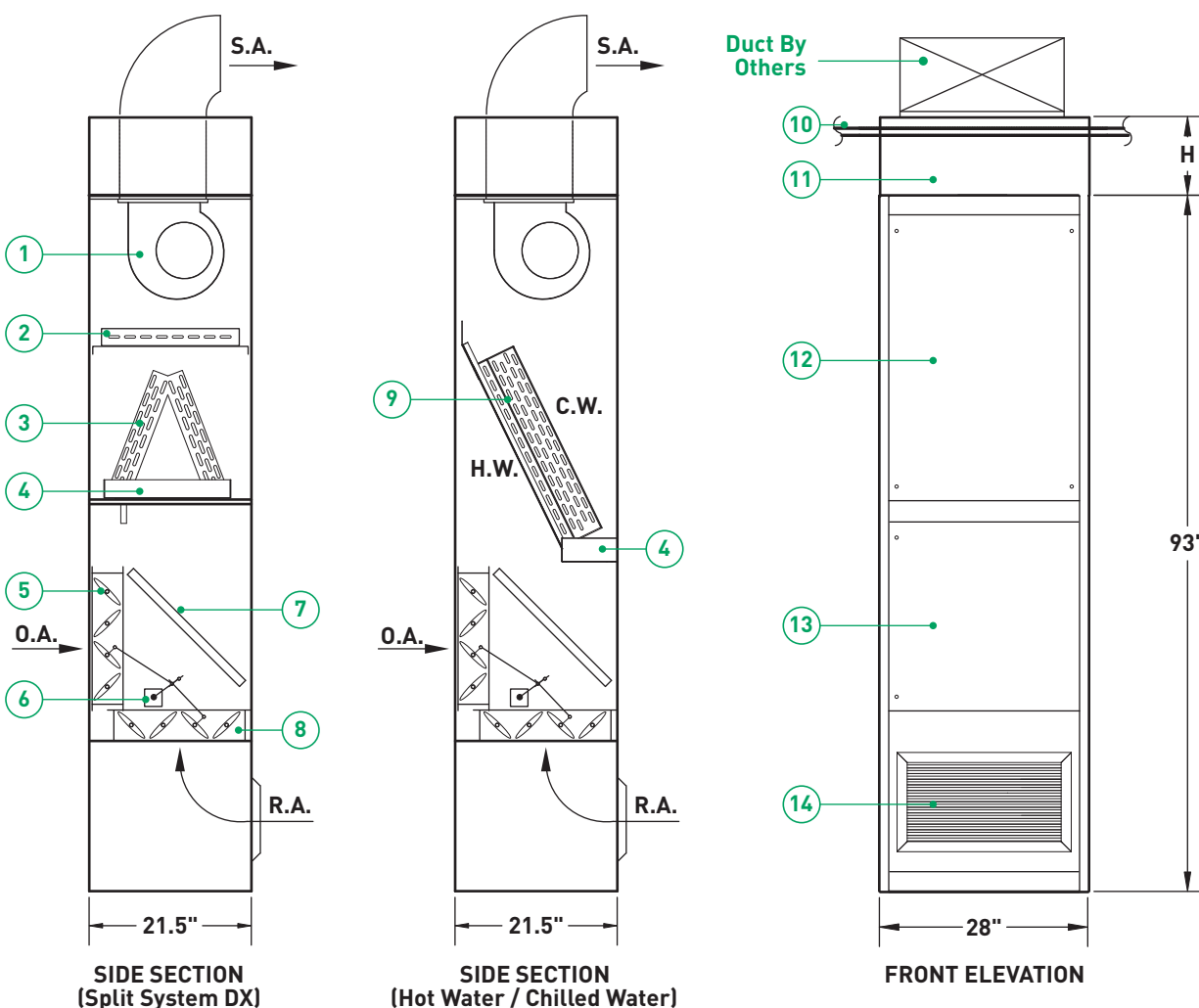
ADD: ACCESS PANELS Hinged panels shall be incorporated in one side of the unit to allow full access to all internal components.

DELETE: TOP EXTENSION, RAISED BASE, SIDE PIPE COVER, EXTERIOR WALL LOUVER, BAROMETRIC RELIEF, CONDENSATE PUMP.

- 17. INSTALLATION** Supporting steelwork and hanger rods shall be by the contractor. The unit shall be equipped with brackets at each corner for the support rods.

2 Pipe, 4 Pipe or Split System DX Unit Ventilator Model VUD 1200

DUCTED CONFIGURATION



S.A. Supply Air

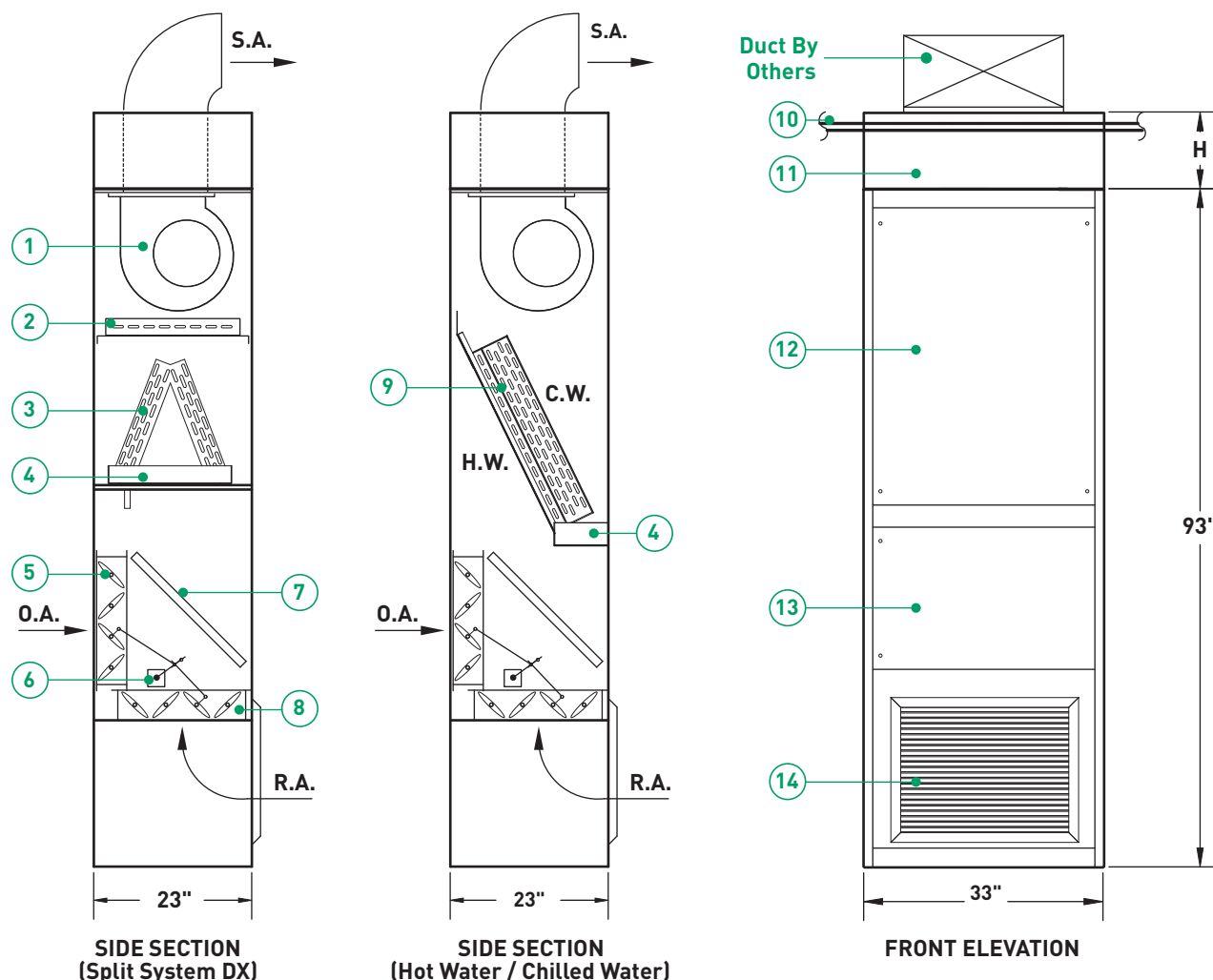
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| ① Supply air fan. | ⑧ Return air damper. |
| ② Hot water coil. Optional electric or steam coil available. | ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). |
| ③ DX cooling coil. | ⑩ Ceiling tile. |
| ④ Drain pan. | ⑪ Top extension (optional). |
| ⑤ Outdoor air damper. | ⑫ Coil access panel. |
| ⑥ Spring return mixed air damper actuator. | ⑬ Hinged filter access panel. |
| ⑦ Filters. | ⑭ Heavy duty return air grille. |

2 pipe, 4 pipe or Split System DX Unit Ventilator Model VUD 1600

DUCTED CONFIGURATION



S.A. Supply Air

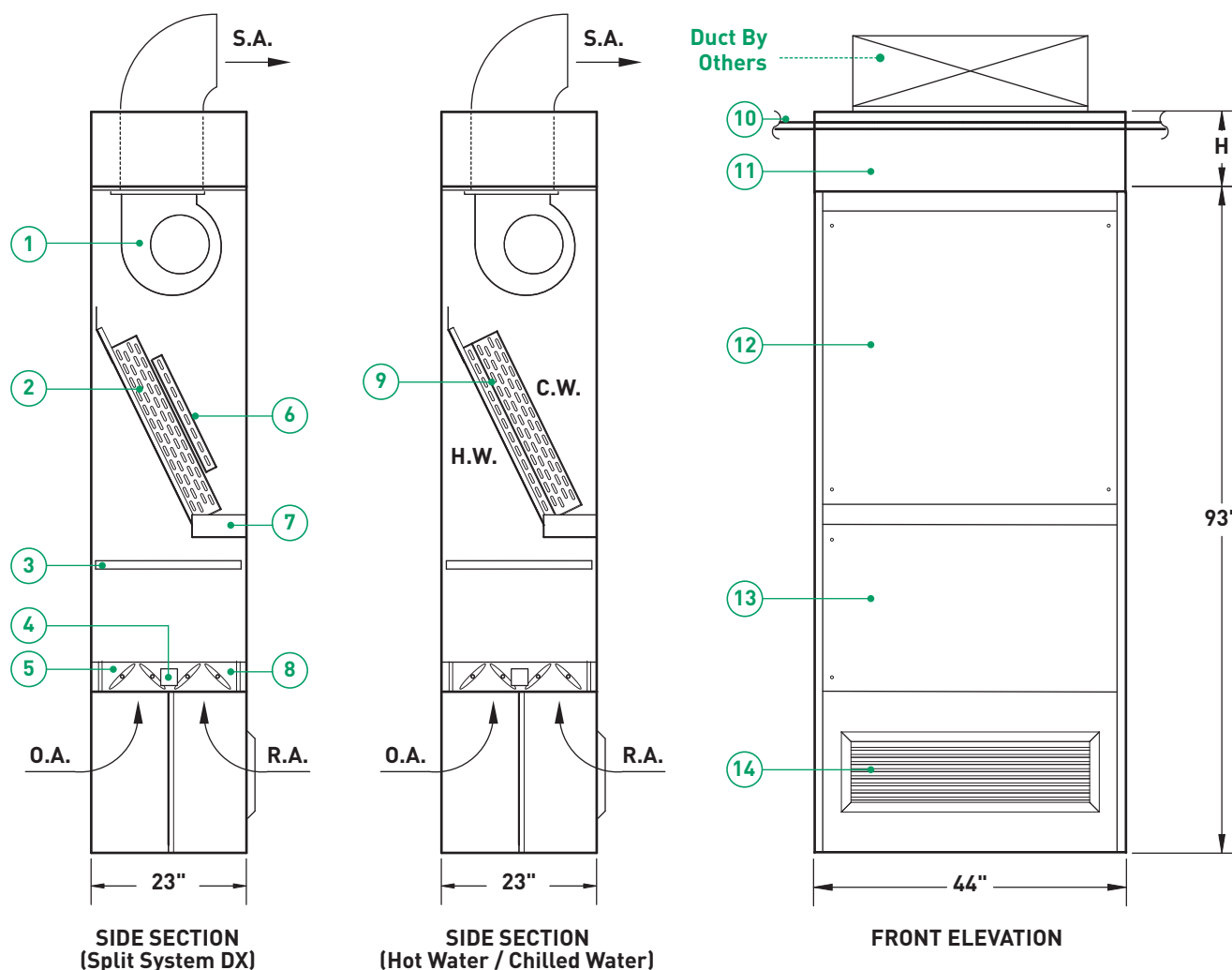
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| ① Supply air fan. | ⑧ Return air damper. |
| ② Hot water coil. Optional electric or steam coil available. | ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). |
| ③ DX cooling coil. | ⑩ Ceiling tile. |
| ④ Drain pan. | ⑪ Top extension (optional). |
| ⑤ Outdoor air damper. | ⑫ Coil access panel. |
| ⑥ Spring return mixed air damper actuator. | ⑬ Hinged filter access panel. |
| ⑦ Filters. | ⑭ Heavy duty return air grille |

2 pipe, 4 pipe or Split System DX Unit Ventilator Model VUD 2000

DUCTED CONFIGURATION



S.A. Supply Air

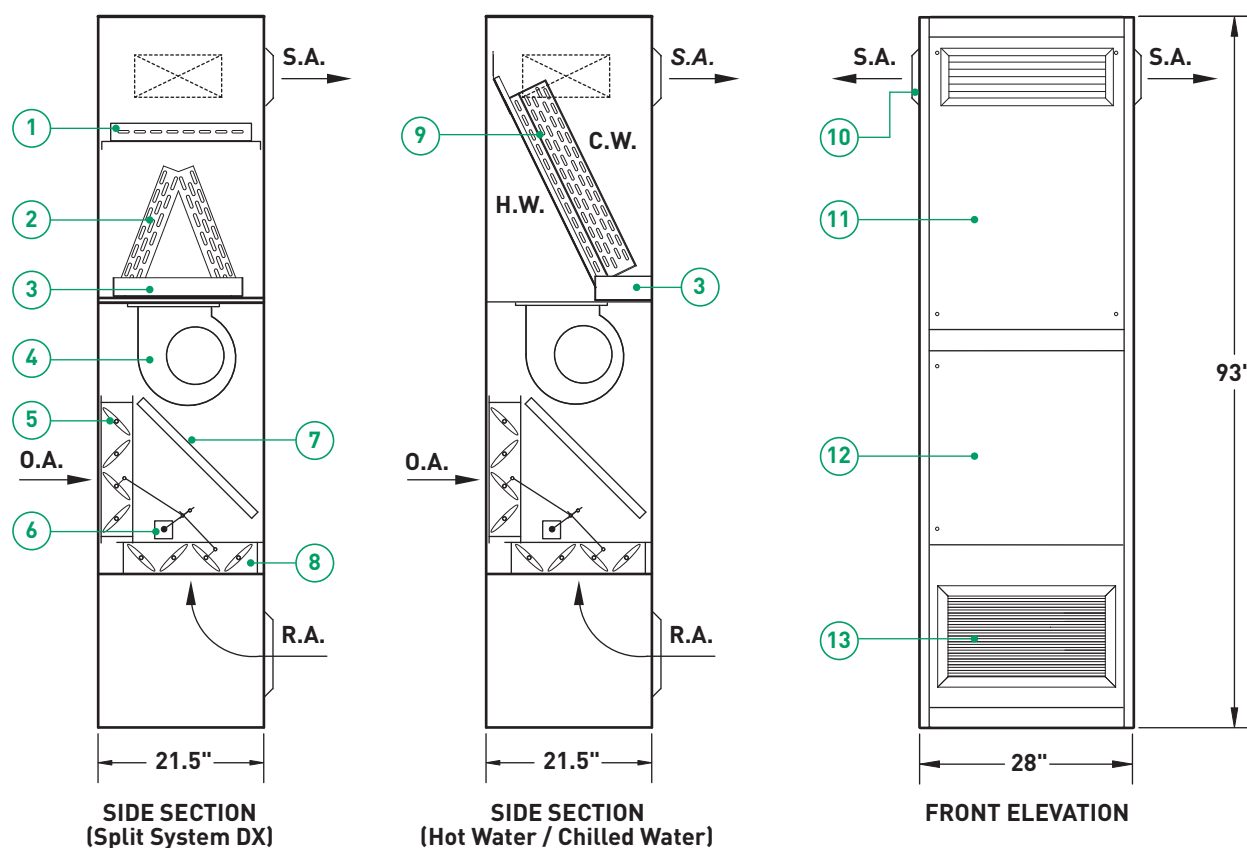
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| ① Dual supply air fans. | ⑧ Return air damper. |
| ② DX cooling coil. | ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). |
| ③ Filters. | ⑩ Ceiling tile. |
| ④ Spring return mixed air damper actuator. | ⑪ Top extension (optional). |
| ⑤ Outdoor air damper. | ⑫ Coil access panel. |
| ⑥ Hot water coil. Optional electric or steam coil available. | ⑬ Hinged filter access panel. |
| ⑦ Drain pan. | ⑭ Heavy duty return air grille. |

2 pipe, 4 pipe or Split System DX Unit Ventilator Model VUF 1200

FREEBLOW CONFIGURATION



S.A. Supply Air

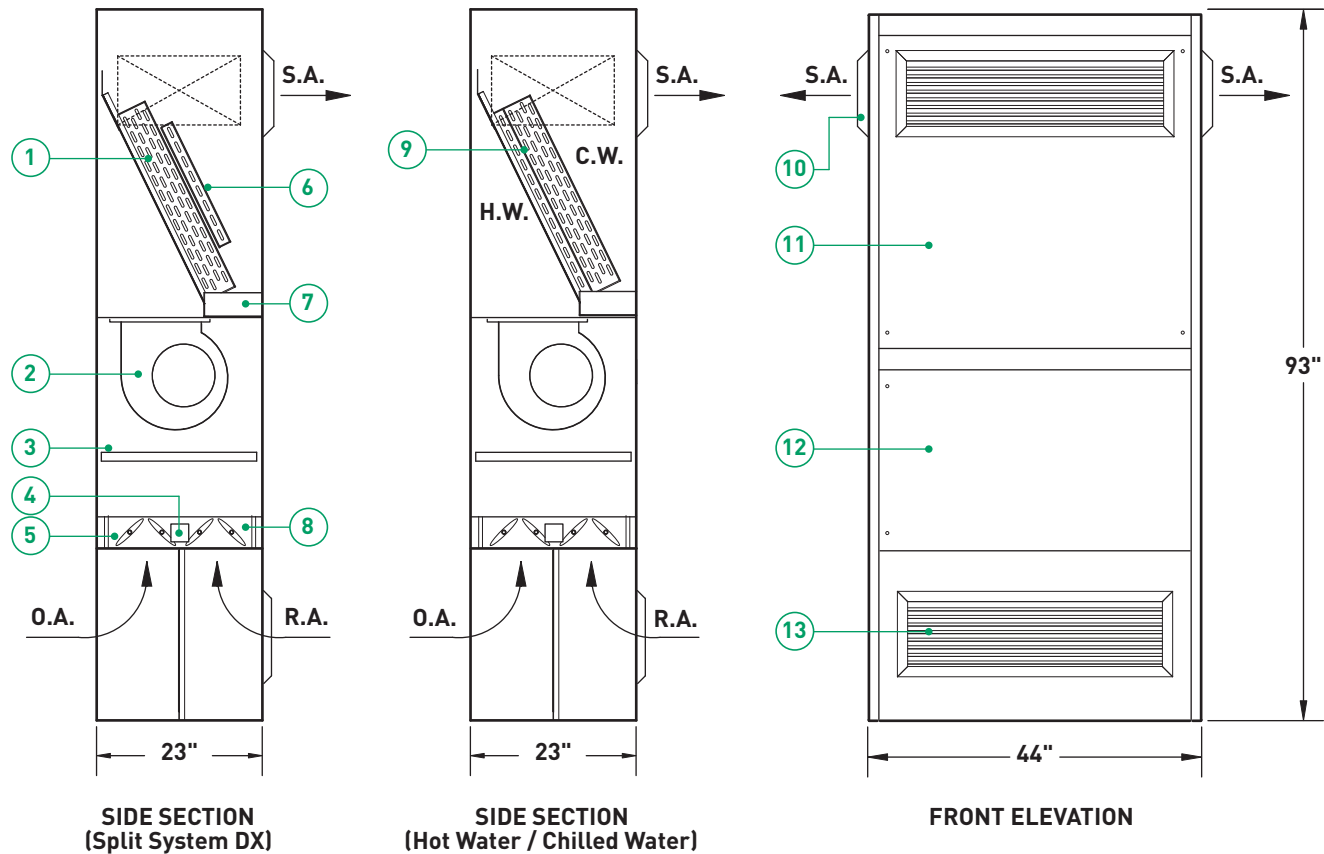
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| <ul style="list-style-type: none"> ① Hot water coil. Optional electric or steam coil available. ② DX cooling coil. ③ Drain pan. ④ Supply air fan. ⑤ Outdoor air damper. ⑥ Spring return mixed air damper actuator. ⑦ Filters. | <ul style="list-style-type: none"> ⑧ Return air damper. ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). ⑩ Double deflection supply air grille. ⑪ Coil access panel. ⑫ Hinged filter access panel. ⑬ Heavy duty return air grille. |
|--|--|

2 pipe, 4 pipe or Split System DX Unit Ventilator Model VUF 1500

FREEBLOW CONFIGURATION



S.A. Supply Air

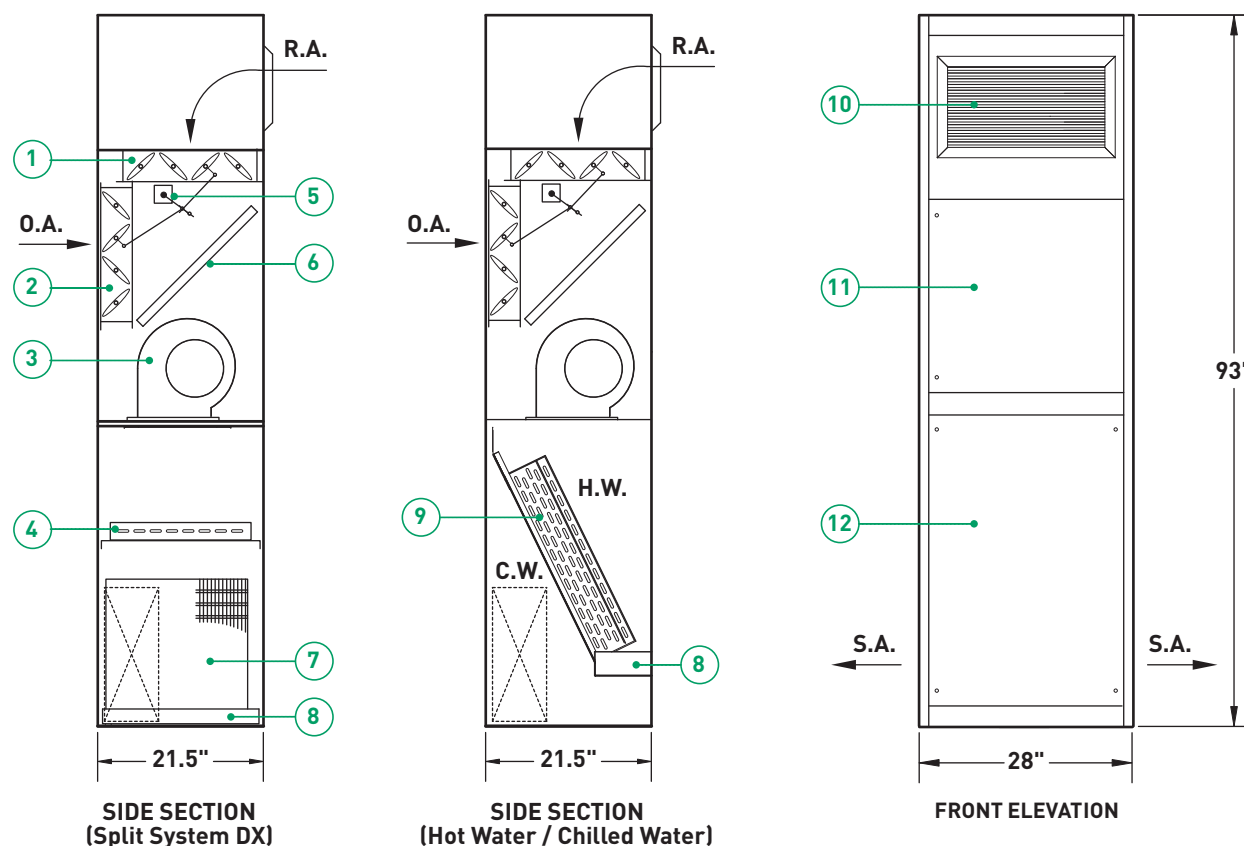
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| ① DX cooling coil. | ⑧ Return air damper. |
| ② Dual supply air fans. | ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). |
| ③ Filters. | ⑩ Double deflection grilles. |
| ④ Spring return mixed air damper actuator. | ⑪ Coil access panel. |
| ⑤ Outdoor air damper. | ⑫ Hinged filter access panel. |
| ⑥ Hot water coil. Optional electric or steam coil available. | ⑬ Heavy duty return air grille. |
| ⑦ Drain pan. | |

2 pipe, 4 pipe or Split System DX Unit Ventilator Model VDF 1200

DOWNFLOW CONFIGURATION



S.A. Supply Air

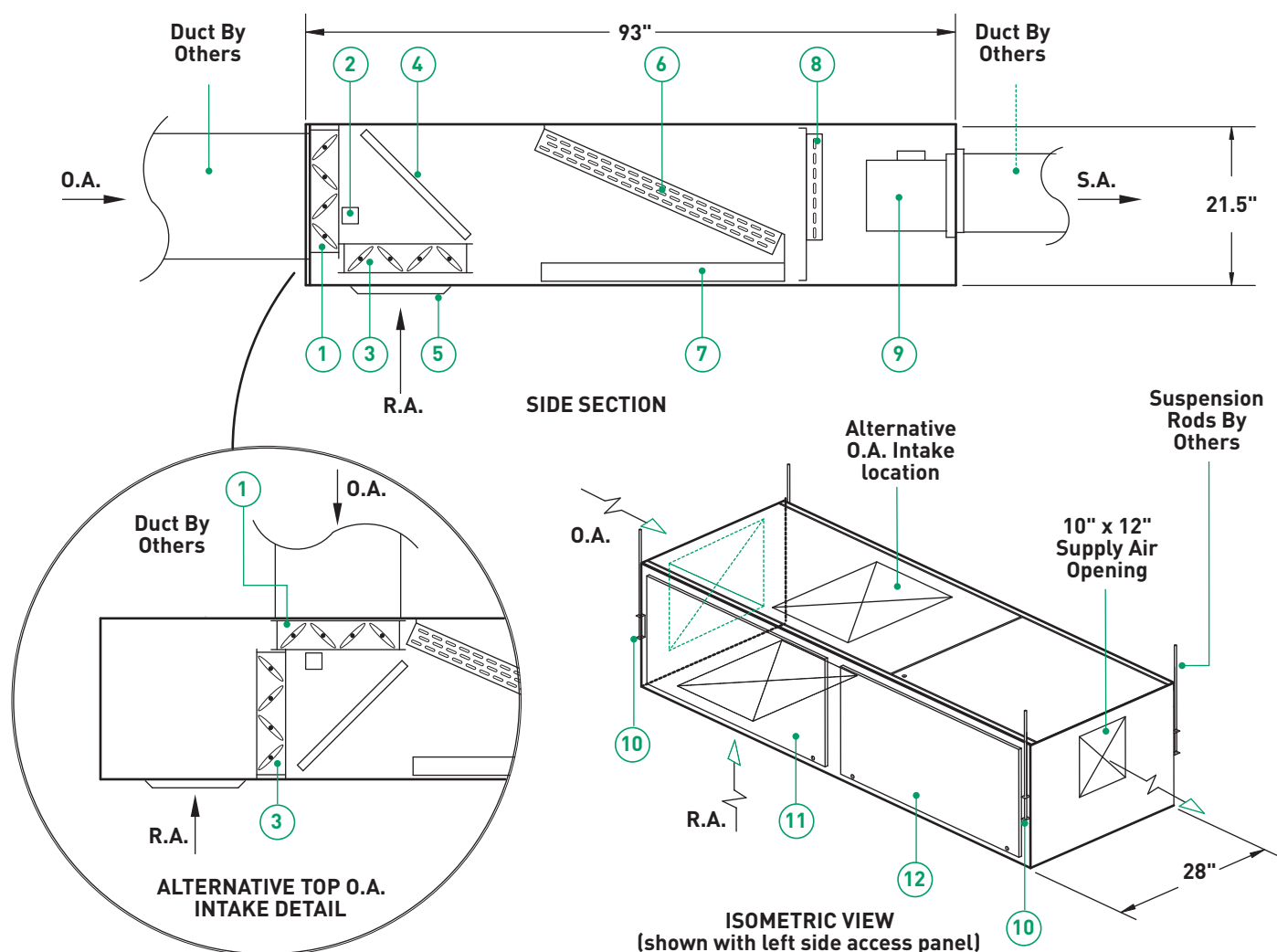
O.A. Outdoor Air

R.A. Return Air

- | | |
|--|--|
| ① Return air damper. | ⑦ Slab type DX cooling coil. |
| ② Outdoor air damper. | ⑧ Drain pan. |
| ③ Supply air fan. | ⑨ 2 pipe or 4 pipe (hot water coil can be in the reheat position). |
| ④ Hot water coil. Optional electric or steam coil available. | ⑩ Heavy duty return air grille. |
| ⑤ Spring return mixed air damper actuator. | ⑪ Hinged filter access panel. |
| ⑥ Filters. | ⑫ Coil access panel. |

2 pipe, 4 pipe or Split System DX Unit Ventilator Model HCD 1200

HORIZONTAL, DRAW THROUGH CONFIGURATION



S.A. Supply Air

O.A. Outdoor Air

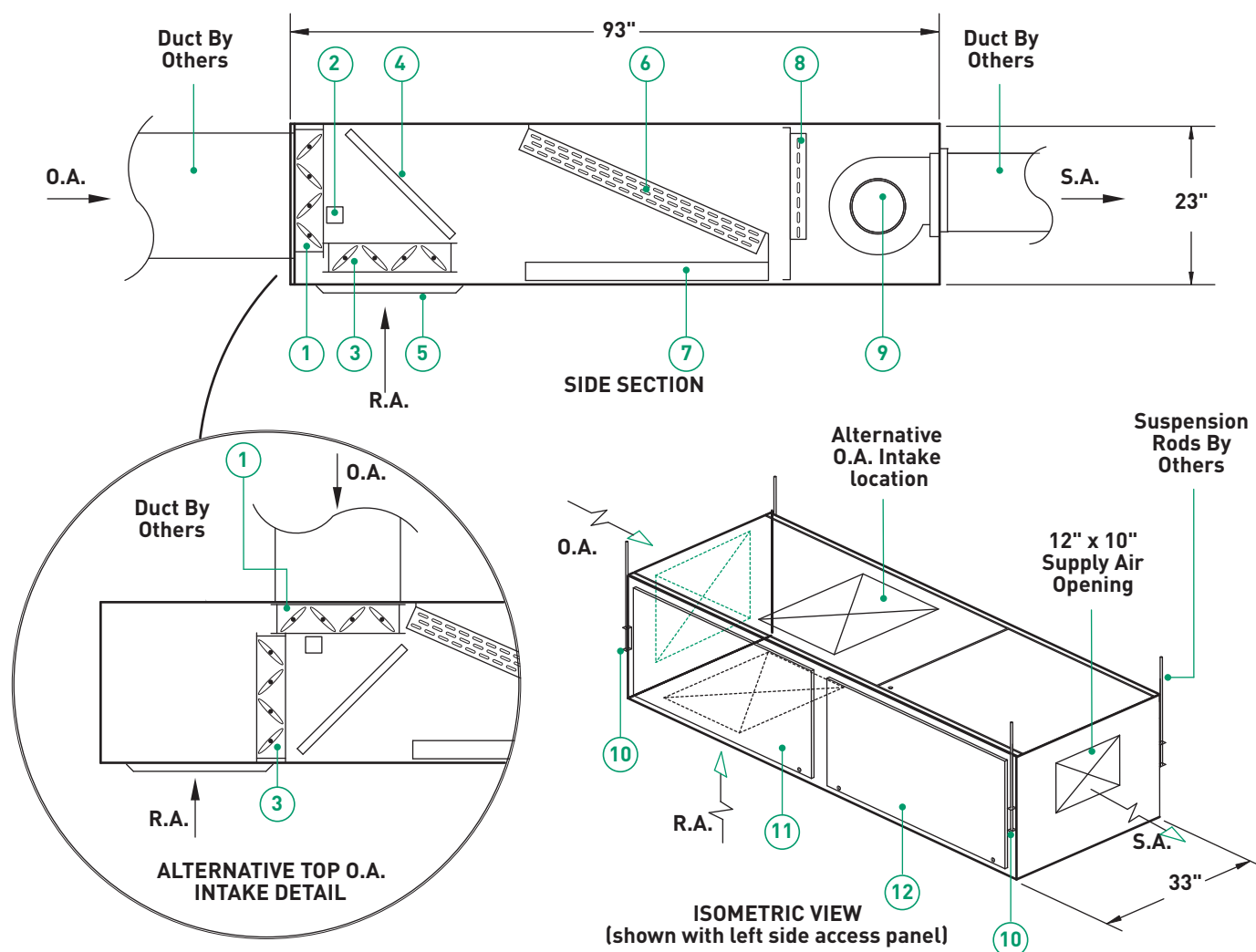
R.A. Return Air

- ① Outdoor air damper.
- ② Spring return mixed air damper actuator.
- ③ Return air damper.
- ④ Filters.
- ⑤ Heavy duty return air grille or duct collar.
- ⑥ Split DX or hot water/chilled water coil (2 pipe or 4 pipe).
- ⑦ Drain pan. Drain pan is removable when option for bottom access panels is selected.

- ⑧ Hot water coil for split system DX or heating only units. Optional steam and electric heater also available.
- ⑨ Supply air fan.
- ⑩ Mounting brackets (4 per unit).
- ⑪ Left or Right side hinged filter access panel. Bottom hinged access panel also available.
- ⑫ Left or Right side hinged coil access panel. Bottom hinged access panel also available.

2 pipe, 4 pipe or Split System DX Unit Ventilator Model HCD 1600

HORIZONTAL, DRAW THROUGH CONFIGURATION



S.A. Supply Air

O.A. Outdoor Air

R.A. Return Air

- ① Outdoor air damper.
- ② Spring return mixed air damper actuator.
- ③ Return air damper.
- ④ Filters.
- ⑤ Heavy duty return air grille or duct collar.
- ⑥ Split DX or hot water/chilled water coil (2 pipe or 4 pipe).
- ⑦ Drain pan. Drain pan is removable when option for bottom access panels is selected.

- ⑧ Hot water coil for split system DX or heating only units. Optional steam and electric heater also available.
- ⑨ Supply air fan.
- ⑩ Mounting brackets (4 per unit).
- ⑪ Left or Right side hinged filter access panel. Bottom hinged access panel also available.
- ⑫ Left or Right side hinged coil access panel. Bottom hinged access panel also available.

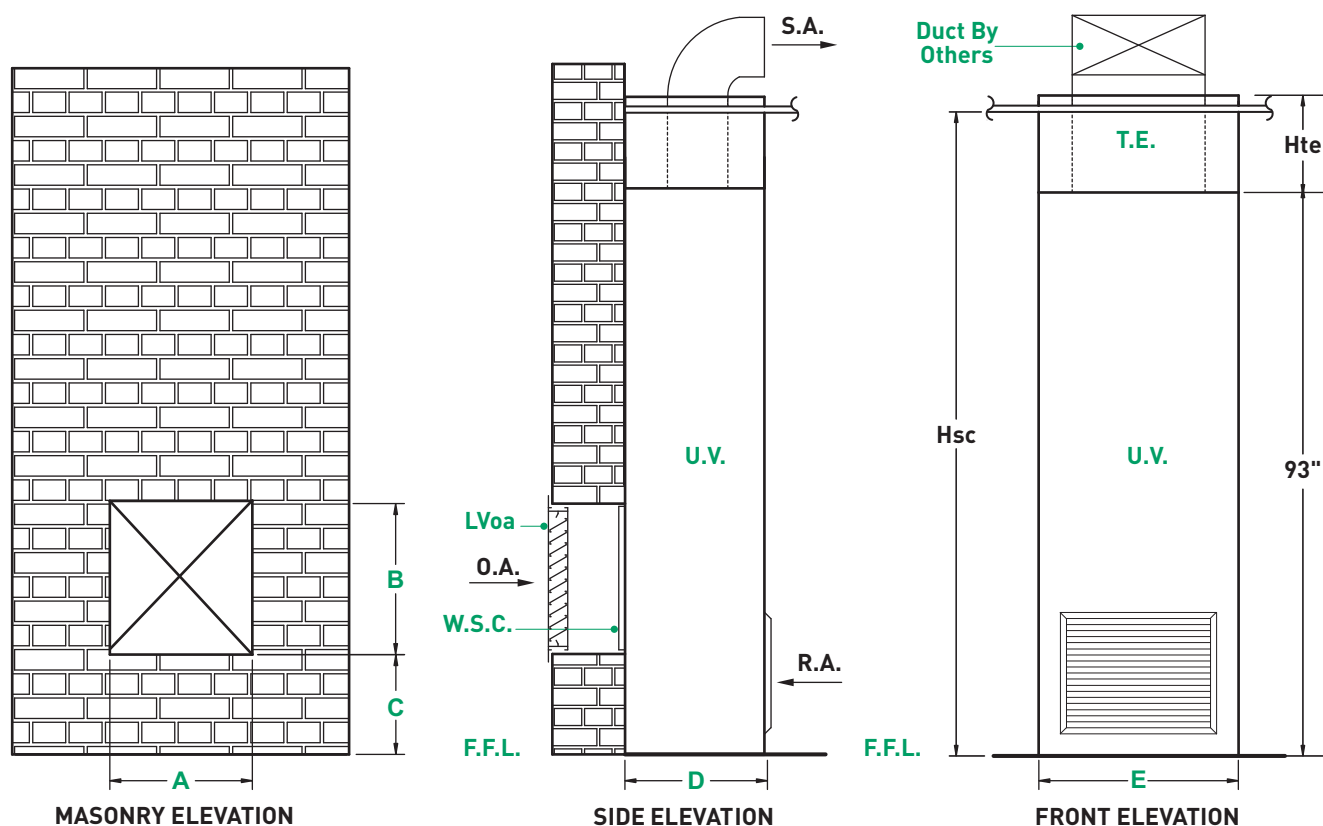
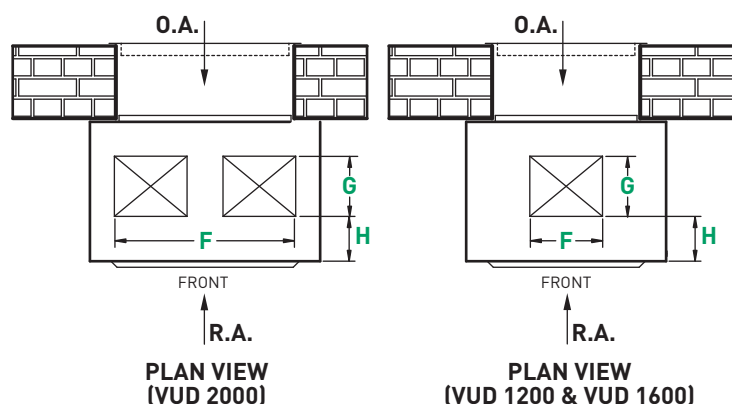
Application Layout

Models VUD 1200, VUD 1600, VUD 2000

DUCTED CONFIGURATION

Not To Scale

U.V.	Unit ventilator
T.E.	Top extension/duct shroud (optional)
Hte	Height of top extension
LVoa	Outdoor air louver
W.S.C.	Wall sleeve collar
S.C.	Suspended ceiling
Hsc	Height from F.F.L. to suspended ceiling
F.F.L.	Finished floor level
S.A.	Supply air
R.A.	Return air
O.A.	Outdoor air intake



Model No.	DIMENSIONS							
	A	B	C	D	E	F	G	H
VUD 1200	22.5"	21"	16"	21.5"	28"	12"	10"	9.5"
VUD 1600	23.5"	26"	16"	23"	33"	12"	10"	11"
VUD 2000	36.5"	16.5"	4"	23"	44"	36"	12"	2.75"

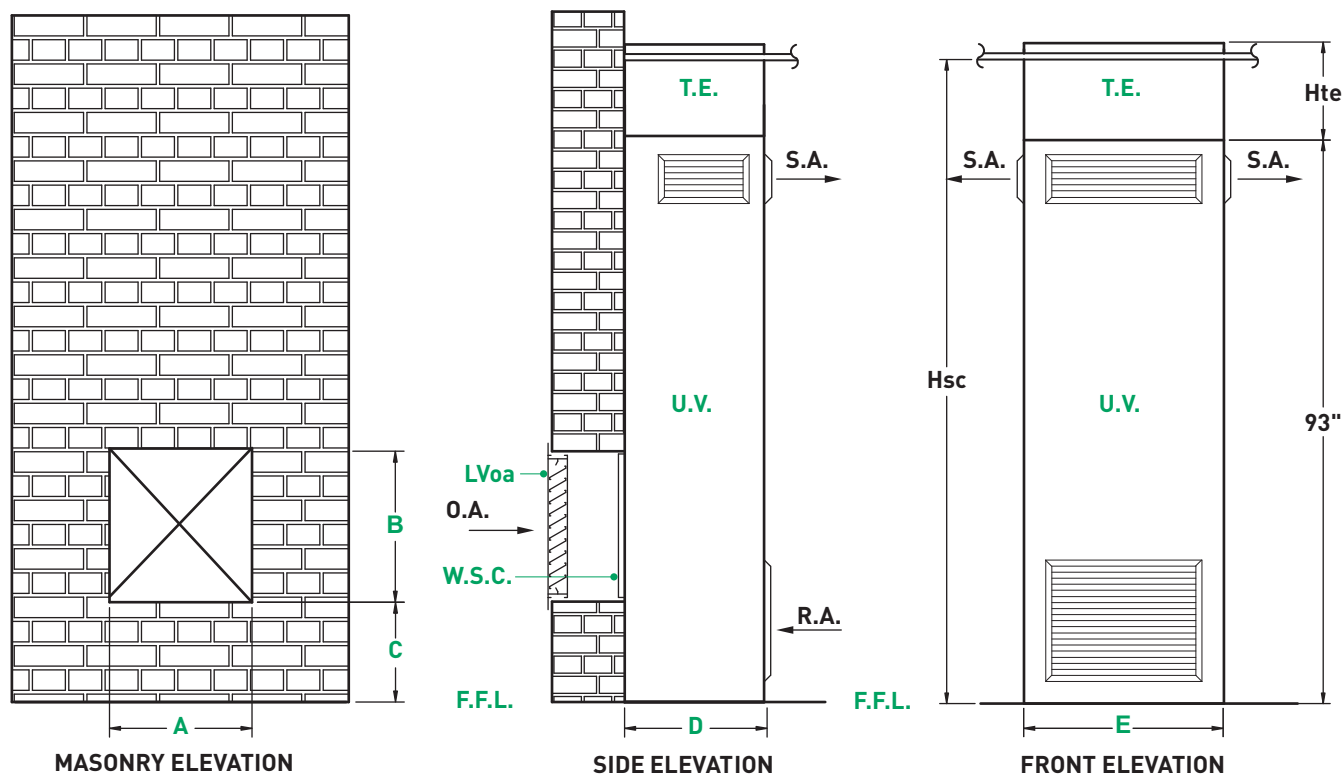
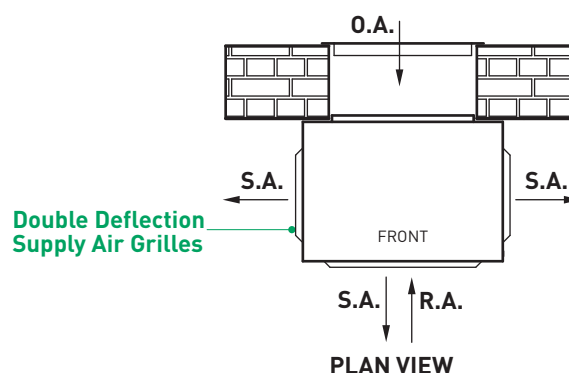
Application Layout

Models VUF 1200, VUF 1500

freeblow configuration

Not To Scale

U.V.	Unit ventilator
T.E.	Top extension (optional)
Hte	Height of top extension
LVoa	Outdoor air louver
W.S.C.	Wall sleeve collar
S.C.	Suspended ceiling
Hsc	Height from F.F.L. to suspended ceiling
F.F.L.	Finished floor level
S.A.	Supply air
R.A.	Return air
O.A.	Outdoor air intake



Model No.	DIMENSION				
	A	B	C	D	E
VUF 1200	22.5"	21"	16"	21.5"	28"
VUF 1500	36.5"	16.5"	4"	23"	44"

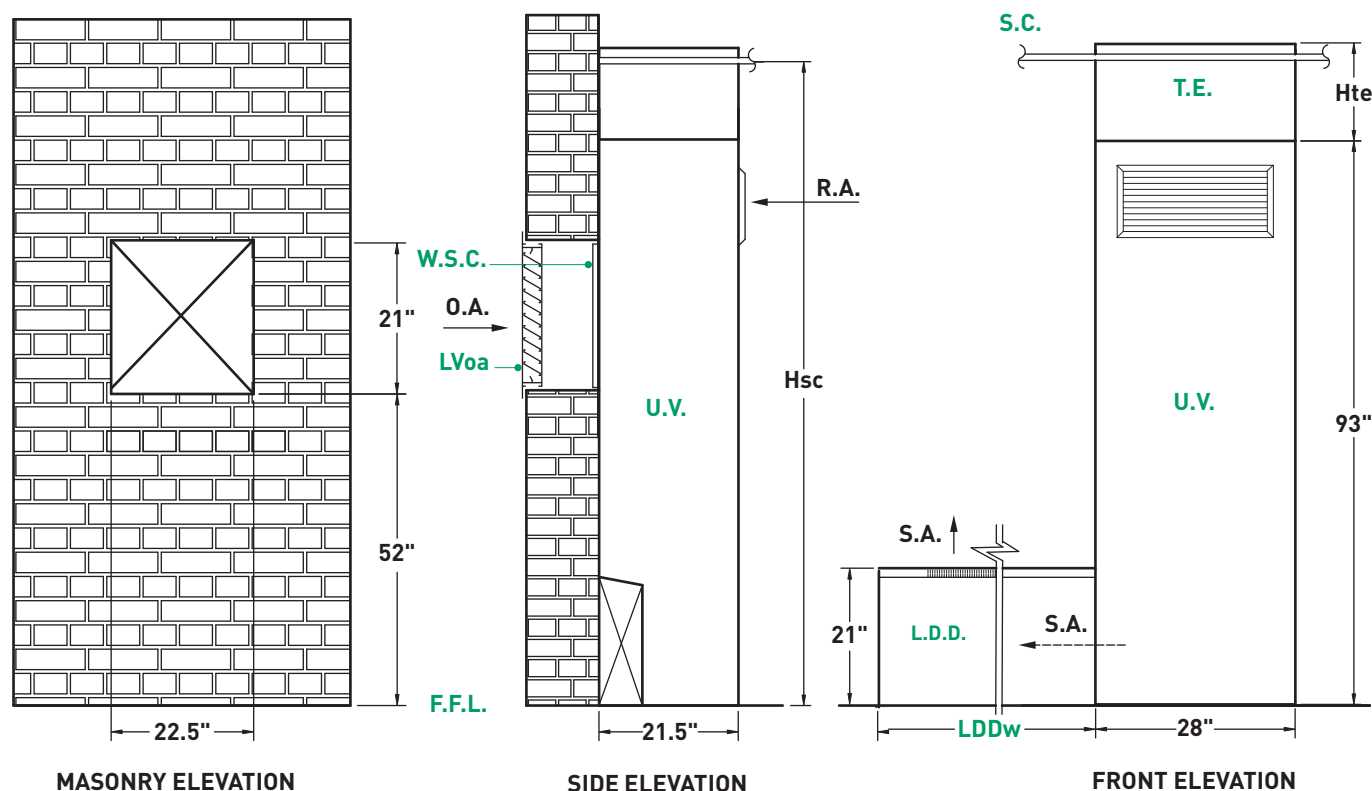
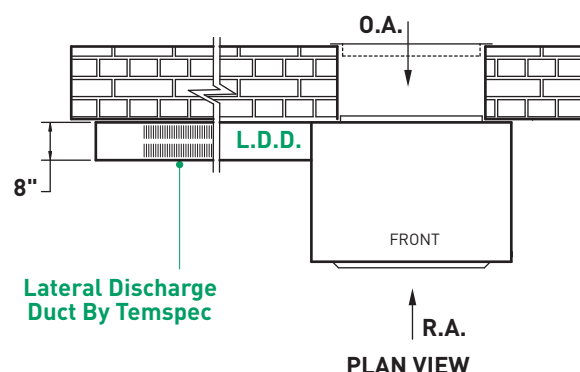
Application Layout

Models VDF 1200

LATERALLY DUCTED CONFIGURATION

Not To Scale

U.V.	Unit ventilator
T.E.	Top extension (optional)
Hte	Height of top extension
L.D.D.	Lateral Discharge Duct
LDDw	Length of lateral duct (refer to note below)
LVoa	Outdoor air louver
W.S.C.	Wall sleeve collar
S.C.	Suspended ceiling
Hsc	Height from F.F.L. to suspended ceiling
F.F.L.	Finished floor level
S.A.	Supply air
R.A.	Return air
O.A.	Outdoor air intake



NOTE:

The lateral discharge duct (L.D.D.) is available in lengths of 3ft, 4ft and 6ft sections. Use these increments when sizing the length of the duct.

As an alternative to the Temspec L.D.D., a plenum space behind bookshelves can be used for supply air distribution.

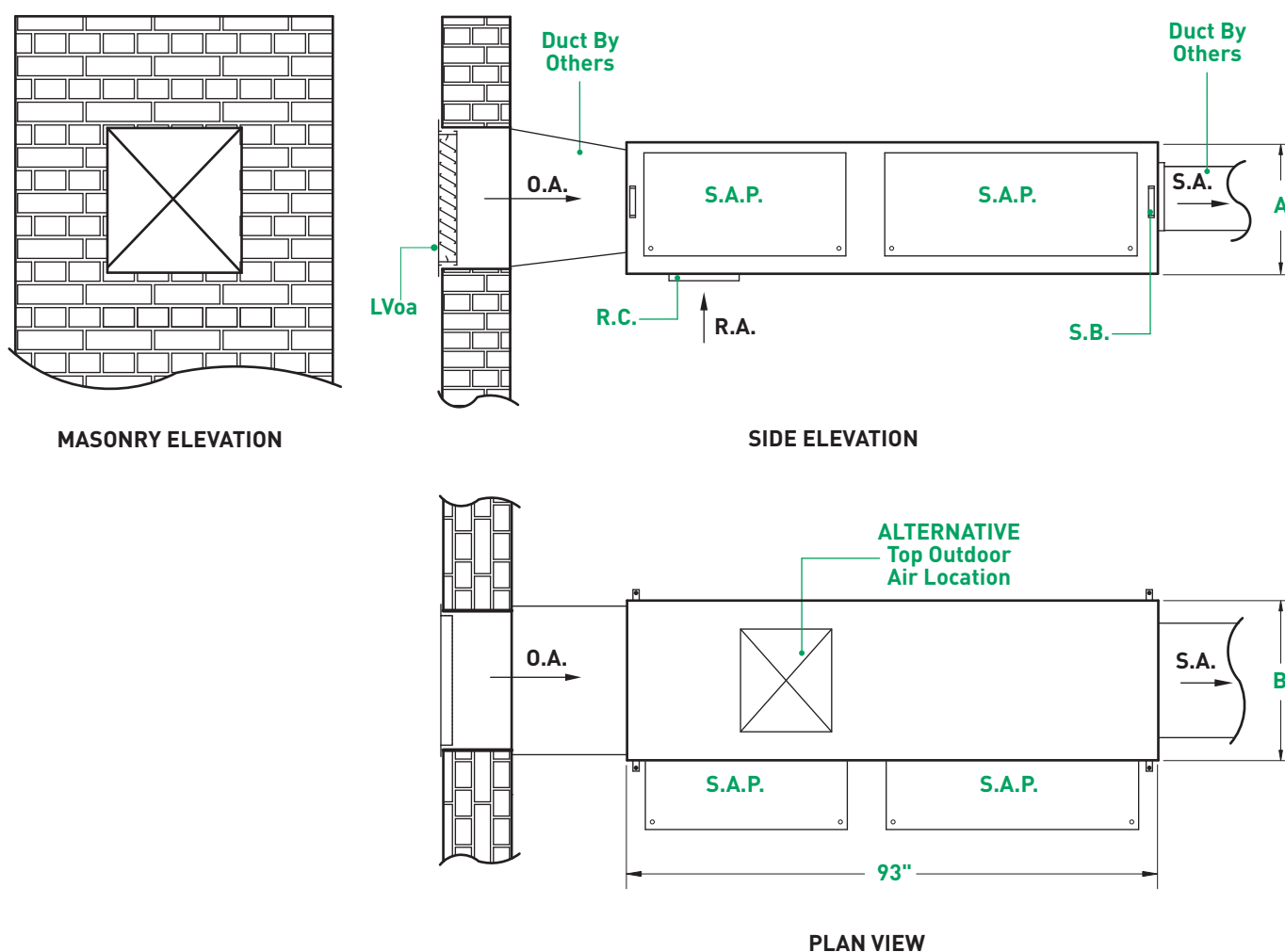
Application Layout

Models HCD 1200, HCD 1600

Ducted configuration

Not To Scale

S.A.P	Hinged side access panel (see note below)
LVoa	Outdoor air louver (provided by others)
S.A.	Supply air
R.A.	Return air
O.A.	Outdoor air intake
S.B.	Support bracket
R.C.	Return air collar or grille



NOTE:

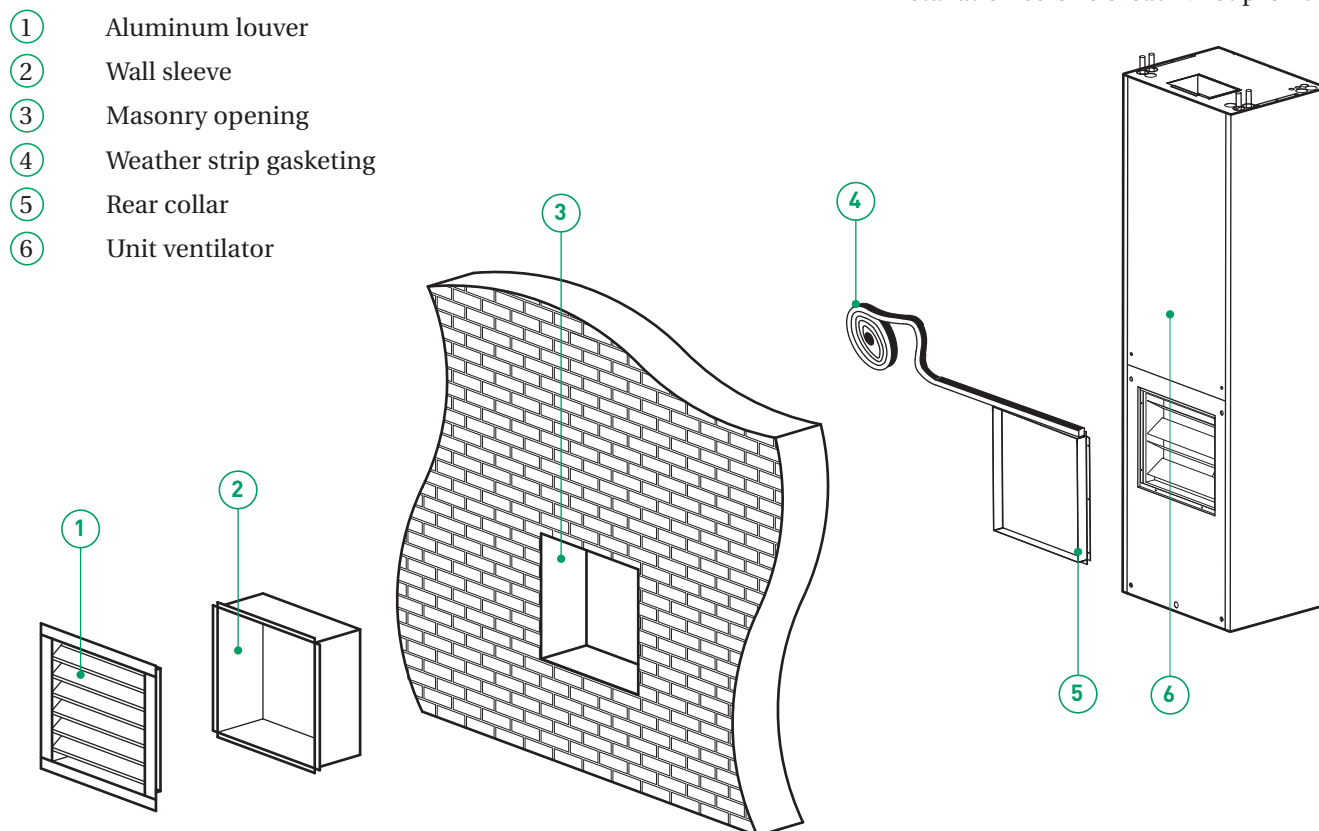
The side access panels can be located on the left side (as shown) or on the right side.

Model No.	DIMENSION	
	A	B
HCD 1200	21.5"	28"
HCD 1600	23"	33"

Wall Sleeve / Louver Installation

Models VUD / VUF / VDF Series

Installation screws & caulk not provided.



STEP 1

Attach the 2" deep collar to the back of the unit ventilator using the pre-drilled holes.

STEP 2

Apply self-adhesive 1" square foam weather strip around the outside of the collar. This is to prevent outdoor air leakage into the room from around the perimeter of the wall opening.

STEP 3

For units with a cooling coil, 5/8" I.D. vinyl condensate tubing is provided. The tubing is attached to the drain pan and left coiled in the return air section of the unit for field installation. Before proceeding to step 4, determine where the condensate line will drain out. If the condensate line is to run through the wall, then refer to the unit ventilator shop drawings for condensate opening locations.

STEP 4

Push the unit ventilator into position, with the collar penetrating the wall opening, compressing the foam strip. Plumb the unit using shims, if necessary.

STEP 5

Insert the wall sleeve into the wall opening from outside the building. The sleeve is an inside fit into the rear collar. Secure the sleeve to the side flange of the collar (NOT BOTTOM). Caulk all joints.

STEP 6

Fit the louver into the wall sleeve and secure to the wall. Caulk the top horizontal edge of the louver and the two vertical edges **but not the bottom horizontal flange**.

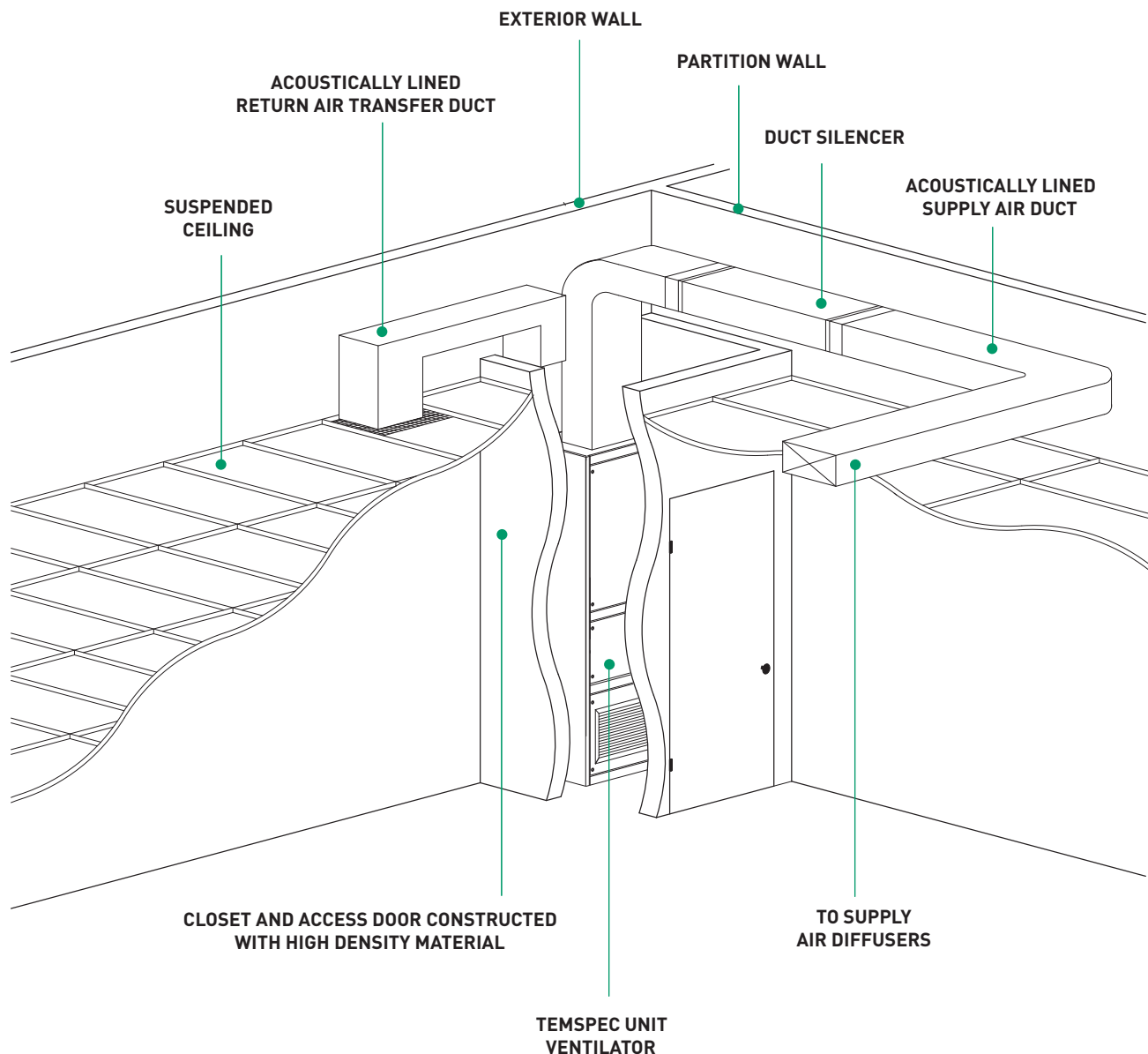
Temspec Customization

The design of the Temspec unit ventilator allows for many customized or special features to be incorporated in its application.

The following pages illustrate some of the adaptations which are offered with this equipment.

Please call your local representative or the factory to enquire about modifications and accessories to suit your specific needs. Our designers and sales technicians are knowledgeable in configuring the unit construction which is best suited to meet particular architectural, mechanical or control specifications or constraints.

Designing for ANSI Standard S12.60

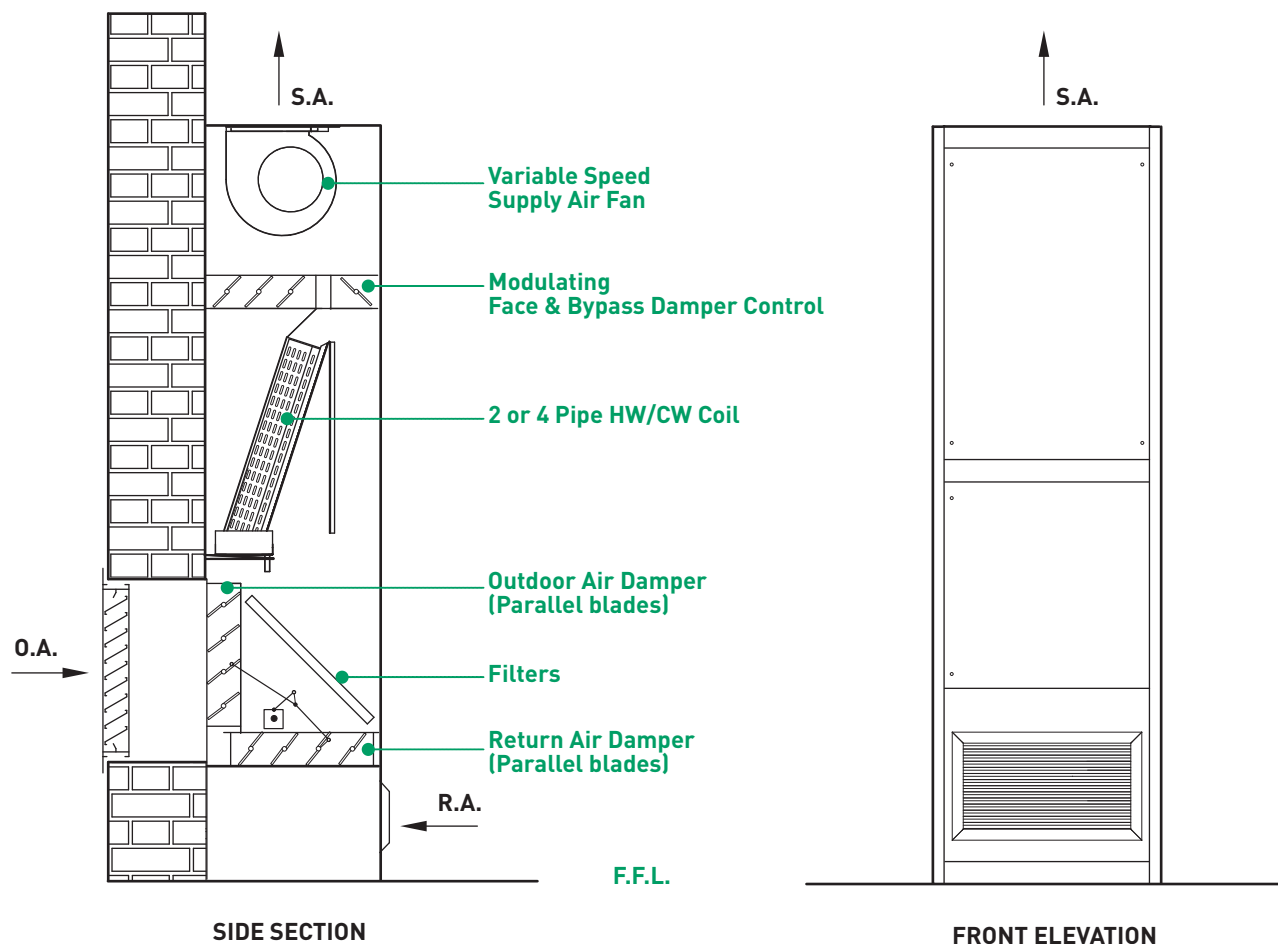


The ANSI S12.60 standard is a guide to acoustical performance criteria for schools. The standard covers noise transmission into the room from external sources, reverberation times and noise generated within the room. It recommends a maximum background sound level of 35dBA. Annex B of the standard discusses HVAC

noise control. Clearly traditional under-the-window non-ducted unit ventilators or fan coil units will not meet the criteria given in ANSI S12.60. The illustration above shows a method of utilizing a Temspec ducted unit ventilator within an acoustical corner closet to achieve an exceptionally quiet installation.

Variable Air Volume Unit Ventilator (VAV)

Model VUD 1200, VUD 1600, VUD 2000



S.A. Supply Air

O.A. Outdoor Air

R.A. Return Air

Effective humidity control is achieved by the use of face & bypass dampers and a full-flow chilled water coil.

The use of modulating chilled water valves in humid climates is not recommended.

Operation

- The face & bypass dampers modulate by thermostatic control.
- The fan speed ramps down to 60% of full speed as the room temperature approaches set point.
- As the fan speed reduces, the outdoor air damper is controlled to maintain the required ventilation rate.

This is accomplished by one or two methods:

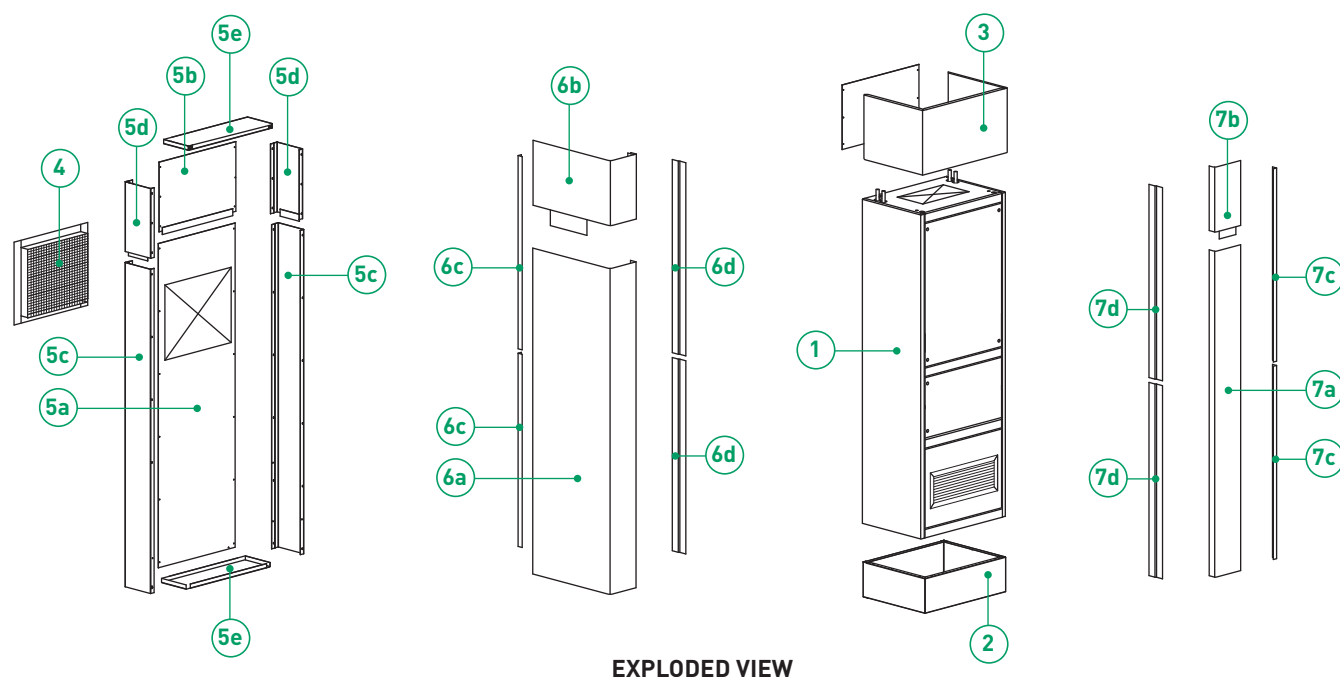
METHOD 1: Demand control ventilation by a carbon dioxide (CO₂) sensor.

METHOD 2: An algorithm incorporated into the control program incrementally and proportionally opens the outdoor air damper as the fan speed reduces. The algorithm which is provided to the controls contractor by Temspec is derived from empirical data.

- The VAV unit can be two pipe or four pipe. When the system is four pipe, end-of-cycle valves are added.

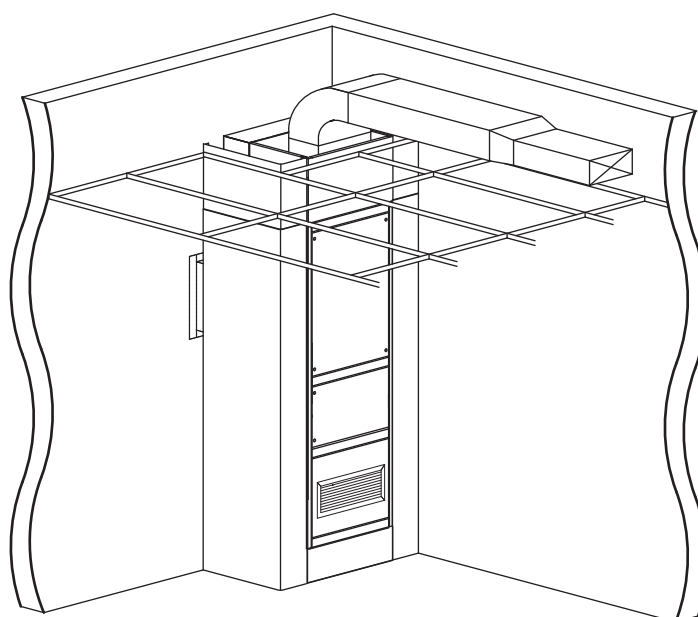
Sheet Metal Accessories

Raised Base, Top Extension, Rear Outdoor Air Intake Plenum,
Side Pipe Cover, Side Wall Block-Off Panel



EXPLODED VIEW

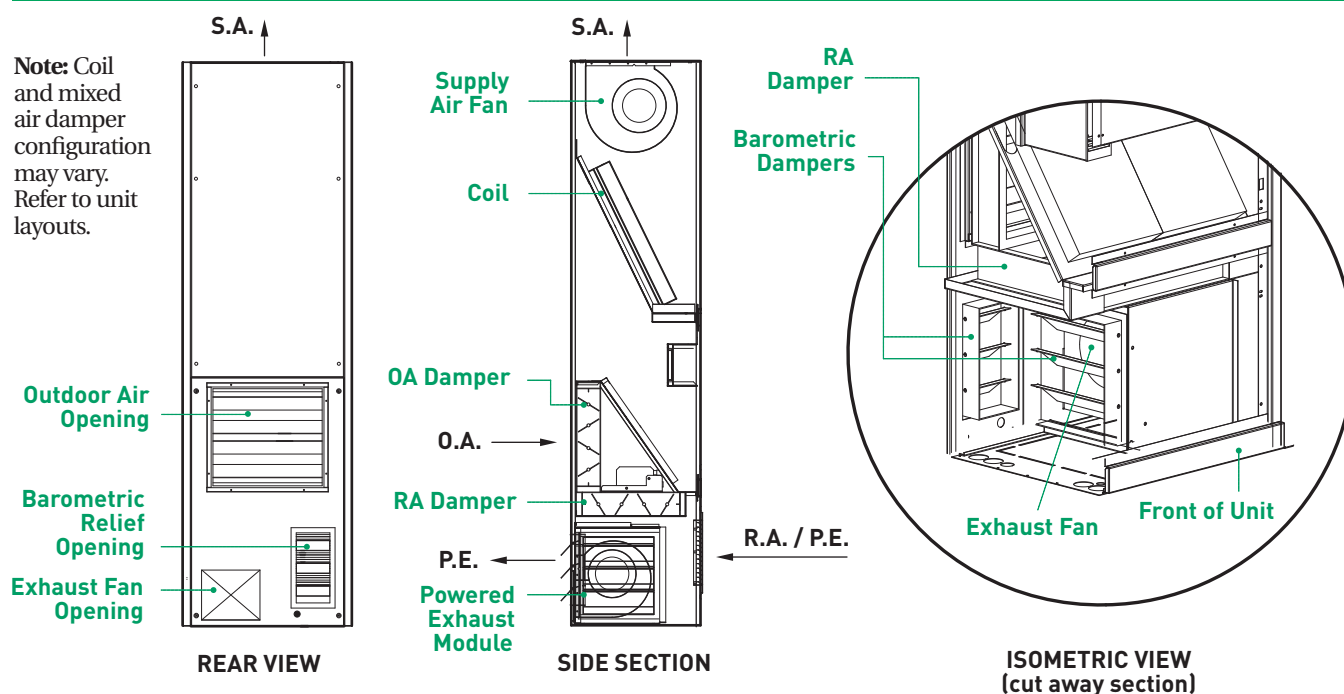
- ① Unit ventilator
- ② Raised base
- ③ Top extension (duct shroud)
- ④ Outdoor air intake louver
- REAR OUTDOOR AIR INTAKE PLENUM (assembled on site):**
- ⑤a Back panel
- ⑤b Back panel extension (if required)
- ⑤c Side panel
- ⑤d Side panel extension (if required)
- ⑤e Top / bottom panel
- SIDE PIPE COVER:**
- ⑥a Side pipe cover
- ⑥b Pipe cover extension (if required)
- ⑥c Wall bracket
- ⑥d Cover support
- SIDE WALL BLOCK-OFF PANEL:**
- ⑦a Block-off panel
- ⑦b Block-off extension (if required)
- ⑦c Wall bracket
- ⑦d Block-off support



FINAL ASSEMBLY VIEW

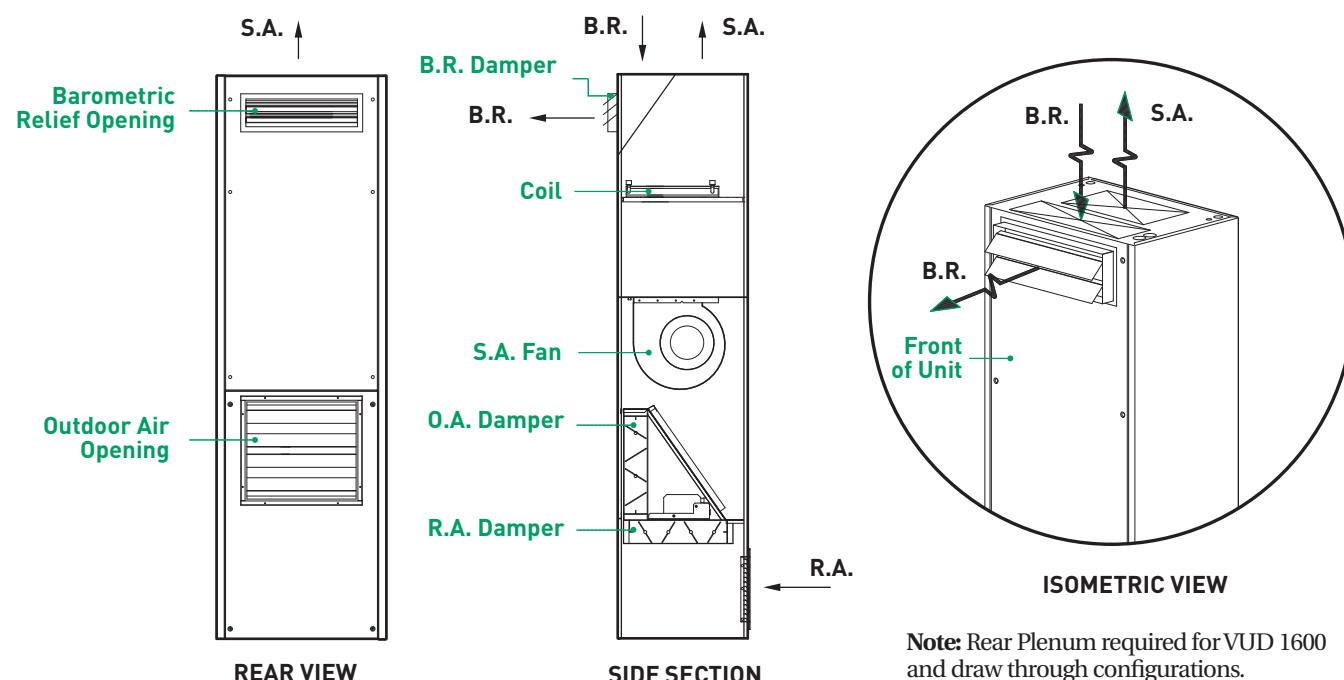
Unit Ventilator with Powered Exhaust

MODELS VUD 1200, VUD 1600, VUD 2000



Unit Ventilator with Barometric Relief

MODELS VUD 1200, VUD 2000 Blow Through



S.A. Supply Air
O.A. Outdoor Air

R.A. Return Air
P.E.. Powered Exhaust

B.R. Barometric Relief

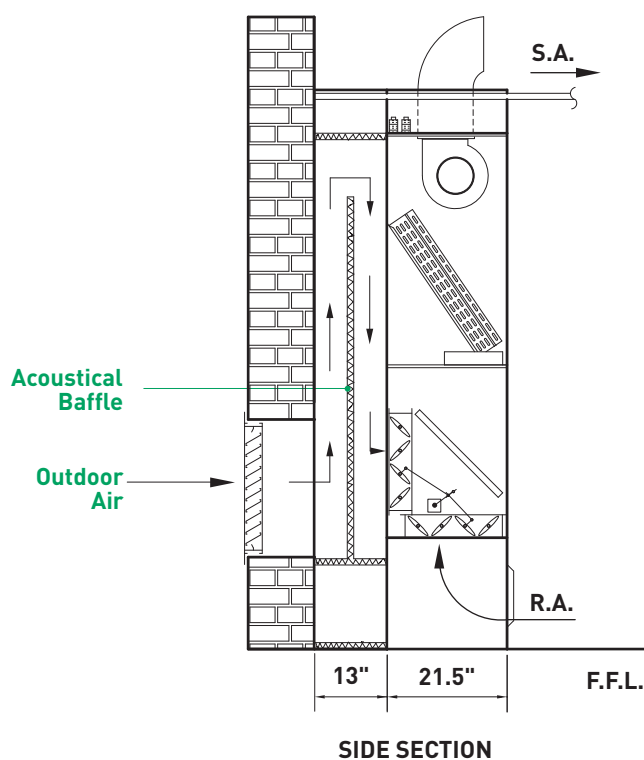
EDPAC Conversion



- The internal components of the old EDPAC unit are removed leaving the cabinet, wall louver and supply air duct in place.
- A TEMSPEC chilled water unit with a customized shortened cabinet is mounted inside the EDPAC unit.

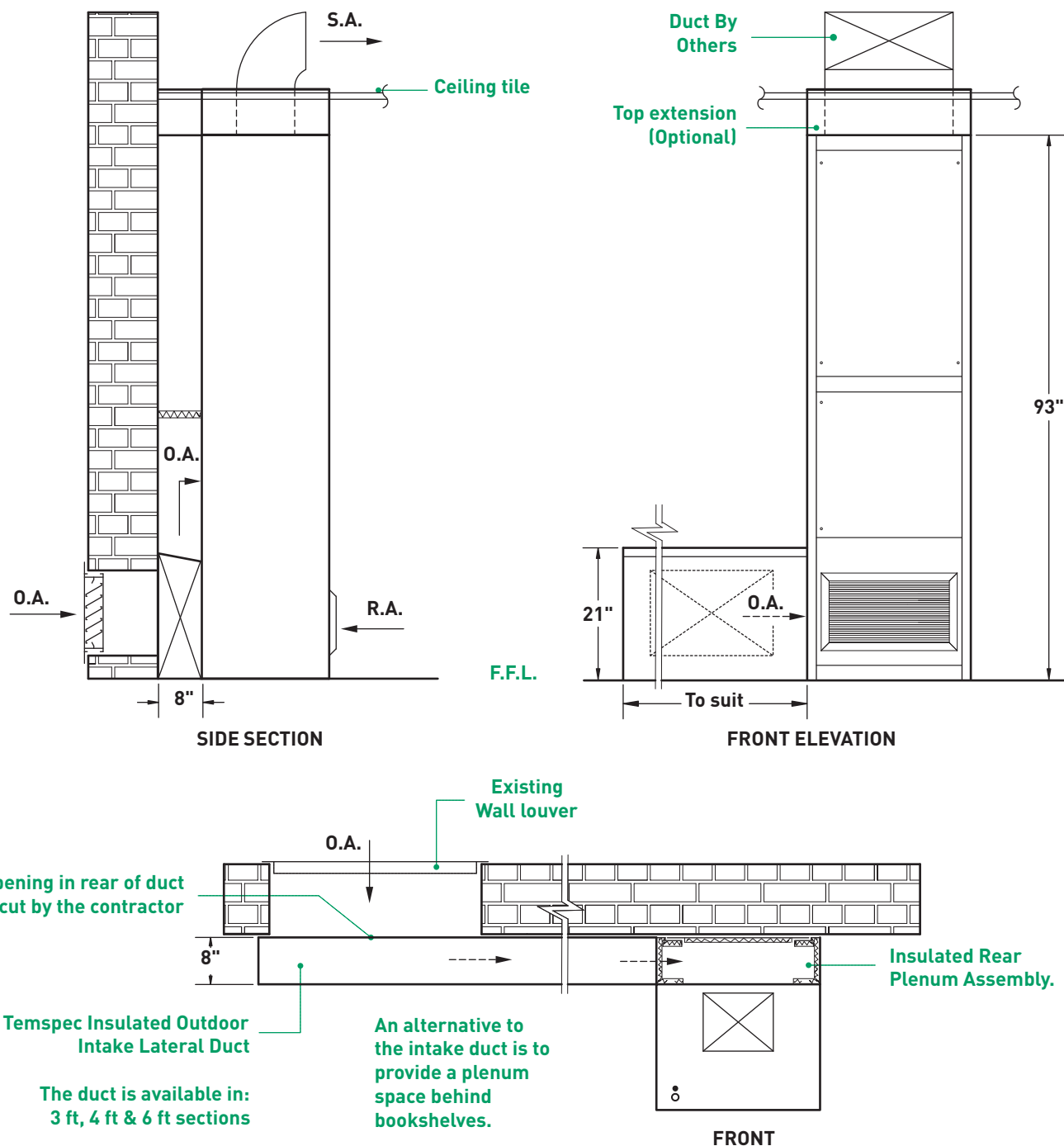
Rear Plenum For FAA Funded Projects

The rear plenum is designed specifically to reduce the transmission of noise from the exterior of the building to the interior. This is particularly important when the school is in the vicinity of an airport or air force base. FAA funded projects require a sound transmission class of not less than STC 39. The Temspec FAA rear plenum has been laboratory tested in accordance with ASTM E90 and was rated at STC 41. This exceeds the criteria required by the FAA.



Installation of a Temspec Unit After Removal of an Under-the-Window Type Unit Ventilator

Models vud 1200, vud 1600, vud 2000 with lateral outdoor air intake duct



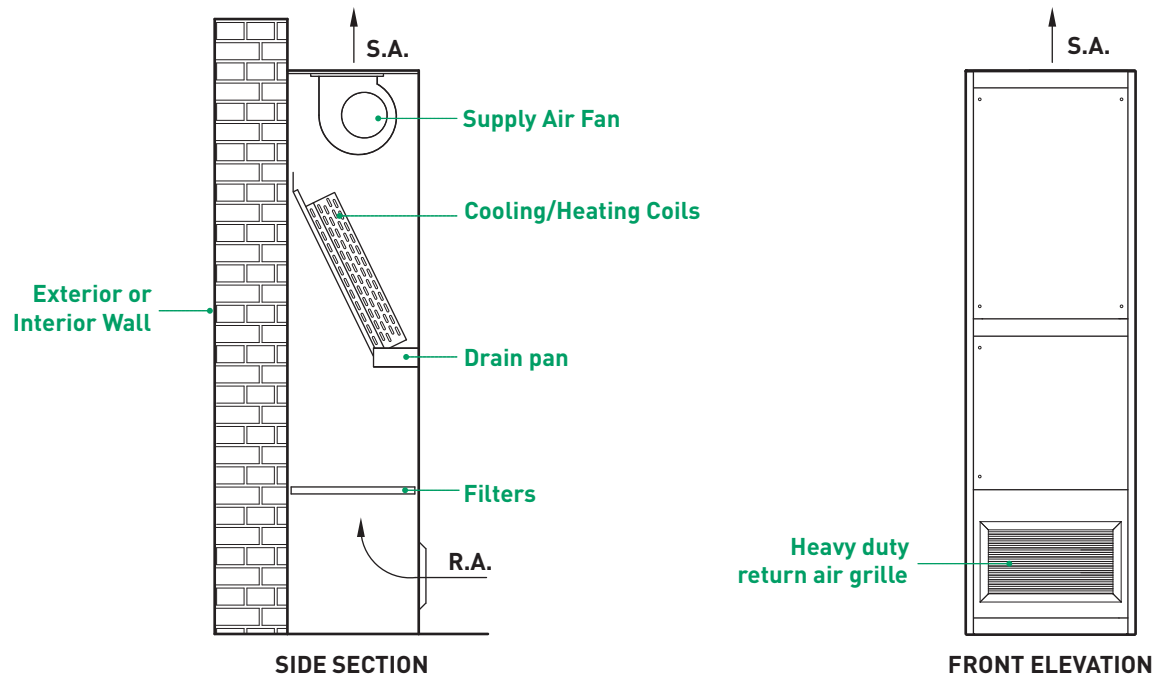
S.A. Supply Air

O.A. Outdoor Air

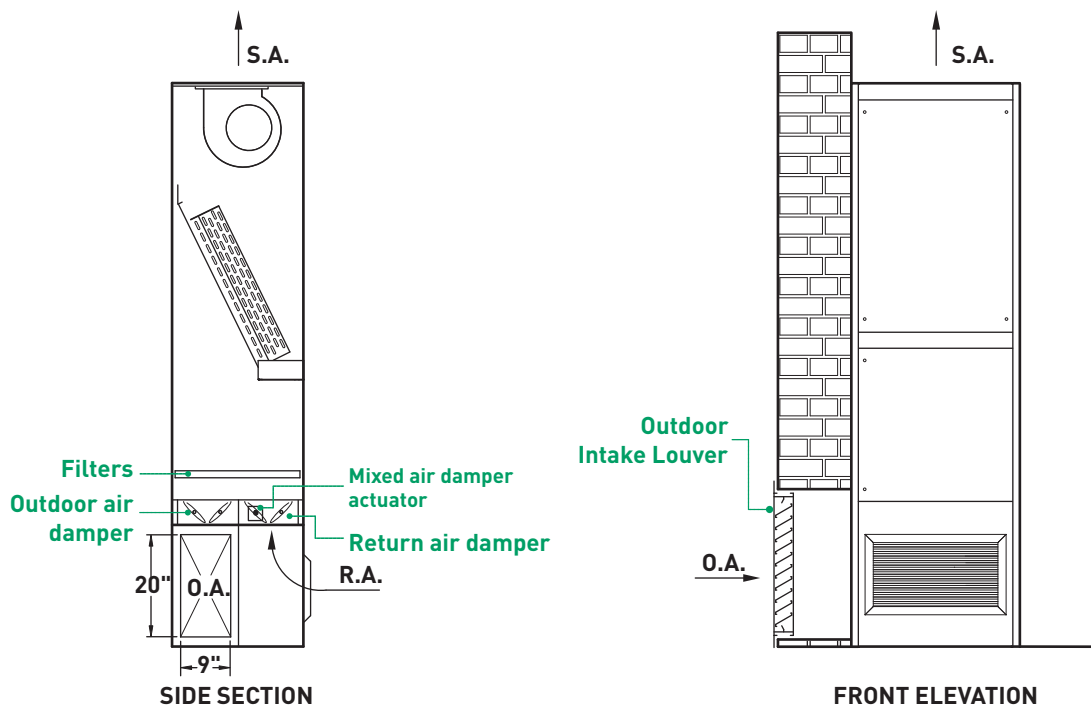
R.A. Return Air

Unit Ventilator Converted to a Fan Coil Unit

[Mixing dampers deleted]

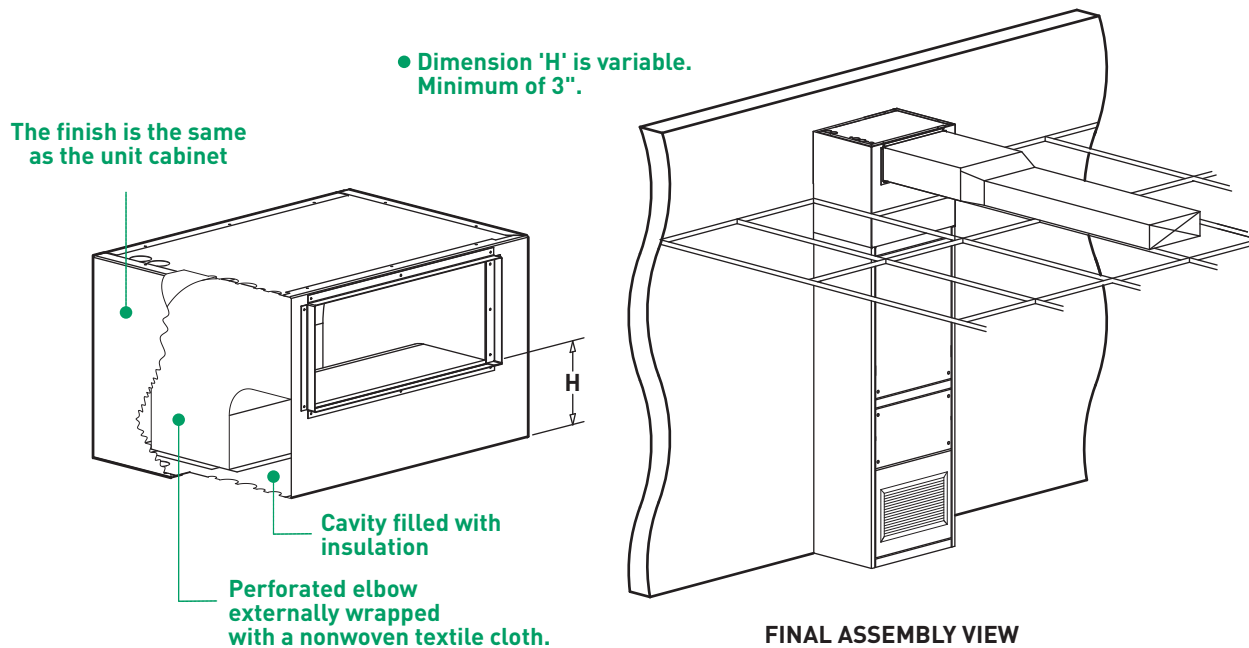


Unit Ventilator with Side Outdoor Air Opening

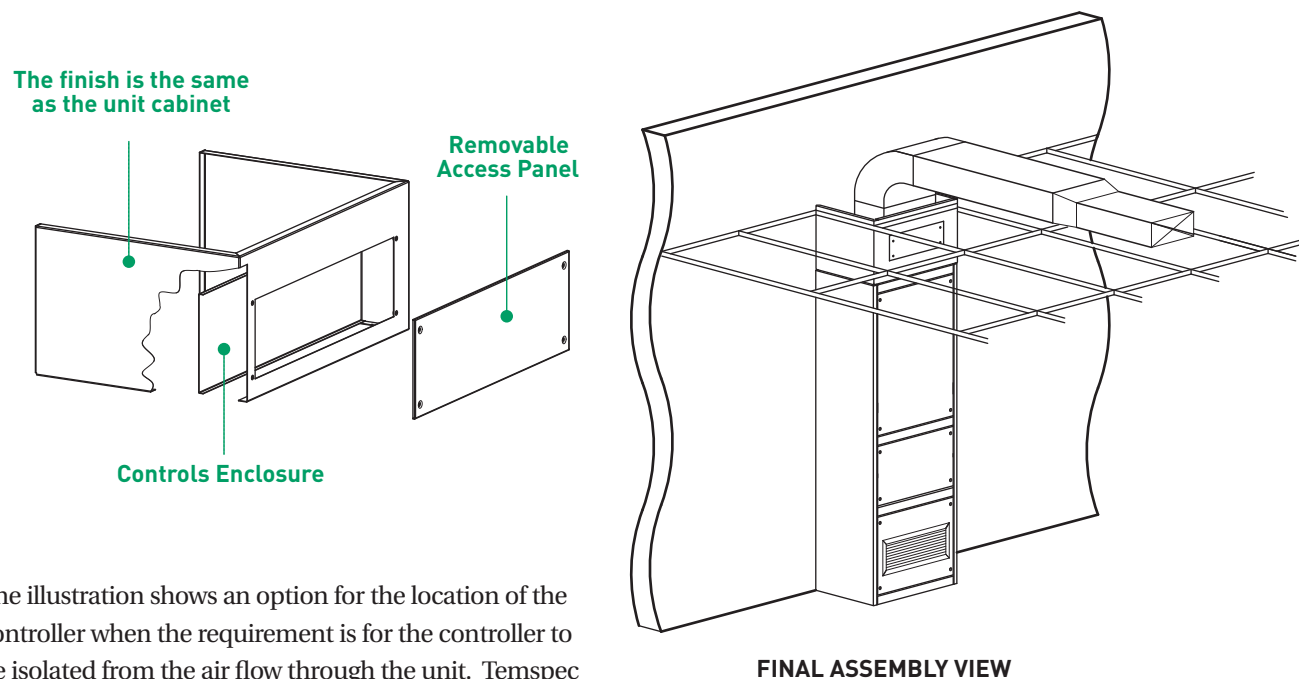


Top Acoustical Plenum

Used for VUD 1600 and VUD 2000



Top Extension with Controls Enclosure



The illustration shows an option for the location of the controller when the requirement is for the controller to be isolated from the air flow through the unit. Temspec provides quick connect plugs for the wire harness.

Cooling Capacities - Chilled Water Coils

2 pipe and 4 pipe systems

MODELS VUD 1200, VUF 1200 AND VDF 1200

c.f.m	3 ROW COIL						4 ROW COIL					
	g.p.m	TOTAL	SENS.	LAT	LWT	WPD	g.p.m	TOTAL	SENS.	LAT	LWT	WPD
800	6.0	31.2	21.0	55.7/54.6	55	6.2	7.0	35.7	23.3	53.0/52.5	55	4.9
1000	7.0	36.6	25.0	56.8/55.4	55	8.1	8.0	42.1	28.0	54.1/53.4	56	6.2
1200	8.0	41.9	29.0	57.6/56.0	56	10	9.0	47.9	32.4	55.0/54.2	56	7.6

MODEL HCD 1200

c.f.m	3 ROW COIL						4 ROW COIL					
	g.p.m	TOTAL	SENS.	LAT	LWT	WPD	g.p.m	TOTAL	SENS.	LAT	LWT	WPD
800	6.0	31.1	20.9	55.8/54.6	55	6.4	7.0	35.6	23.3	53.0/52.5	55	5.1
1000	7.0	36.5	25.0	56.9/55.5	55	8.4	8.0	42.1	28.0	54.1/53.4	56	6.4
1200	8.0	41.0	29.0	57.7/56.1	56	11	9.0	47.8	32.4	55.0/54.2	56	7.9

MODEL VUF 1500

c.f.m	3 ROW COIL						4 ROW COIL					
	g.p.m	TOTAL	SENS.	LAT	LWT	WPD	g.p.m	TOTAL	SENS.	LAT	LWT	WPD
1300	8.0	46.0	32.0	57.2/55.9	56	5.3	10.0	54.8	36.5	54.0/53.4	56	5.3
1400	9.0	49.5	34.2	57.4/55.9	56	6.5	11.0	58.3	38.9	54.3/53.6	56	6.3
1500	10.0	52.9	36.6	57.4/55.9	55	7.8	12.0	62.3	41.5	54.4/53.6	55	7.3

MODELS VUD 1600 AND HCD 1600

c.f.m	3 ROW COIL						4 ROW COIL					
	g.p.m	TOTAL	SENS.	LAT	LWT	WPD	g.p.m	TOTAL	SENS.	LAT	LWT	WPD
1300	9.0	45.8	31.8	57.5/55.9	55	3.7	10.0	52.6	35.6	54.7/54.0	56	3.5
1400	10.0	49.1	34.1	57.4/56.0	55	4.4	11.0	56.8	38.3	54.7/54.0	55	4.1
1600	11.0	53.7	37.8	58.1/56.5	55	5.2	12.0	62.5	42.6	55.2/54.5	55	4.8

MODEL VUD 2000

c.f.m	3 ROW COIL						4 ROW COIL					
	g.p.m	TOTAL	SENS.	LAT	LWT	WPD	g.p.m	TOTAL	SENS.	LAT	LWT	WPD
1800	10.0	57.6	41.3	58.8/57.1	56	7.8	13.0	70.4	47.9	55.4/54.5	56	5.4
1900	10.0	59.0	42.8	59.1/57.4	57	7.8	13.0	72.4	49.7	55.8/54.9	56	8.4
2000	10.0	60.3	44.2	59.5/57.7	57	7.8	13.0	74.2	51.4	56.2/55.6	56	8.4

WPD water pressure drop across coil in ft. of water

LWT leaving water temperature in ° F

LAT leaving air temperature in ° F (db/wb)

Total and sensible cooling capacities are in MBtuh

Entering water temperature (EWT) = 45°F

Entering air temperature (EAT) = 80/67°F db/wb

For the following, please call the factory:

- c.f.m. different from those shown in the tabulation
- EWT other than 45°F
- EAT other than 80/67°F
- Addition of glycol
- Altitude correction

Cooling Capacities

Split System DX Units

MODEL VUD 1200				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
800	2.5	25.9	17.7	59/56
1000	3	30.7	21.1	60/57
1200	3.5	33.5	23.5	61/58

MODEL VUF 1200				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
800	2.5	25.9	17.7	59/56
1000	3	30.7	21.1	60/57
1200	3.5	33.5	23.5	61/58

MODEL VDF 1200				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
800	2.5	25.8	17.5	59/56
1000	3	30.5	20.8	60/56
1200	3.5	35.5	26.2	60/57

MODEL HCD 1200				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
800	2.5	26.1	19.0	58/56
1000	3	31.1	22.8	59/57
1200	3.5	35.7	26.4	60/57

MODEL VUF 1500				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
1300	4	41.9	29.0	59/56
1400	5	53.2	36.1	56/55
1500	5	55.1	38.0	57/55

MODEL VUD 1600				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
1300	4	41.7	28.2	60/56
1400	4	42.5	29.0	61/57
1600	5	57.9	39.8	58/56

MODEL HCD 1600				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
1300	4	44.5	31.3	58/56
1400	4	45.4	32.2	59/57
1600	5	56.2	38.5	58/56

MODEL VUD 2000				
c.f.m.	Nominal Capacity of Condensing Unit	MBtuh		LAT (db/wb)
		TOTAL	SENS.	
1800	4	48.9	38.1	60/58
1900	5	60.3	45.4	58/56
2000	5	60.9	46.6	59/57

EAT entering air temperature

LAT leaving air temperature

The data in charts are for 80/67 °F (db/wb) EAT at the coil.

For the following, please call the factory:

- c.f.m. different to those shown in the tabulation
- EAT other than 80/67°F
- Altitude correction

Temspec Inc. does not manufacture split system air cooled condensing units. Most ACCU as manufactured by a recognized North American company are suitable for use with the Temspec unit ventilator. For a classroom application the high internal heat gain from occupants, lights and solar result in a call for mechanical cooling at relatively low ambient temperatures. For this reason it is recommended that consideration be given to installing a capacity control device on the condensing unit to avoid the risk of evaporator coil freezing. An adiabatic proportional control (APR) valve as made by Rawal Devices Inc., or equal, provides effective control.

Heating Capacities

Hot Water Coils for Units With Two Pipe
and Four Pipe Changeover Systems

MODELS VUD 1200, VUF 1200 AND VDF 1200

c.f.m.	1 ROW COIL					2 ROW COIL					3 ROW COIL					4 ROW COIL				
	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
800	4.0	51	99	154	2.2	4.0	77	129	161	4.5	6.0	96	148	147	4.5	7.0	105	162	149	3.6
1000	4.5	59	95	153	2.7	4.5	91	124	139	5.6	7.0	115	146	147	5.9	8.0	128	158	147	4.5
1200	5.0	67	92	153	3.2	5.0	100	120	138	6.7	8.0	133	142	146	7.4	9.0	149	155	146	5.5

MODEL HCD 1200

c.f.m.	1 ROW COIL					2 ROW COIL					3 ROW COIL					4 ROW COIL				
	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
800	4.0	51	99	154	2.3	4.0	77	129	141	4.7	6.0	95	151	147	4.6	7.0	105	162	149	3.7
1000	4.5	59	95	153	2.8	4.5	91	124	139	5.8	7.0	114	146	147	6.1	8.0	127	158	147	4.6
1200	5.0	66	91	153	3.3	5.0	103	120	138	6.9	8.0	133	142	146	7.7	9.0	148	155	146	5.7

MODEL VUF 1500

c.f.m.	1 ROW COIL					2 ROW COIL					3 ROW COIL					4 ROW COIL				
	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1300	4.0	74	93	142	2.5	5.0	117	123	132	7.7	8.0	147	145	142	3.9	10.0	166	158	146	3.8
1400	4.5	79	92	144	3.1	5.0	122	121	130	7.7	9.0	158	144	144	4.7	11.0	178	158	147	4.5
1500	5.0	83	91	146	3.7	5.0	127	118	128	7.7	10.0	168	144	146	5.7	12.0	189	157	148	5.3

MODELS VUD 1600 AND HCD 1600

c.f.m.	1 ROW COIL					2 ROW COIL					3 ROW COIL					4 ROW COIL				
	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1300	4.0	73	92	143	2.7	6.0	115	122	141	1.6	9.0	147	145	147	2.7	10.0	164	157	146	2.5
1400	4.5	76	91	145	3.3	6.0	120	119	139	1.6	10.0	157	144	148	3.2	11.0	175	156	147	3.0
1600	5.0	85	89	145	4.0	6.0	130	115	136	1.6	11.0	174	141	148	3.8	12.0	196	153	147	3.5

MODEL VUD 2000

c.f.m.	1 ROW COIL					2 ROW COIL					3 ROW COIL					4 ROW COIL				
	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1800	5.0	92	87	142	3.8	7.5	150	117	139	4.7	10.0	190	138	141	5.7	13.0	219	153	146	6.1
1900	5.0	94	86	141	3.8	7.5	155	115	138	4.7	10.0	197	136	140	5.7	13.0	228	151	144	6.1
2000	5.0	97	85	140	3.8	7.5	159	114	137	4.7	10.0	204	134	138	5.7	13.0	237	150	143	6.1

COIL TYPE	APPLICATION
1 Row	In conjunction with a 3 or 4 row chilled water coil in a four pipe system
2 Rows	In conjunction with a 3 row chilled water coil in a four pipe system
3 Rows	Two pipe changeover system
4 Rows	Two pipe changeover system

WPD water pressure drop across
coil in ft. of water

LWT leaving water temperature
in ° F

$$LWT = EWT - \frac{2 \times MBtuh}{g.p.m.}$$

EAT entering air
temperature in ° F

LAT leaving air temperature
in ° F

$$LAT = EAT + \frac{MBtuh \times 926}{c.f.m.}$$

CORRECTION FACTOR CHART

EWT	EAT				
	20°F	30°F	40°F	50°F	60°F
120°F	0.7	0.63	0.56	0.49	0.42
140°F	0.85	0.78	0.71	0.64	0.57
160°F	0.99	0.92	0.85	0.78	0.71
180°F	1.14	1.07	1.00	0.93	0.86
200°F	1.29	1.22	1.15	1.08	1.00

The g.p.m. shown for 3 and 4 row coils in the above table are the same as those used for 3 and 4 row chilled water coils on page 29. The true heating effect in a two pipe system is significantly less than that shown in the table, as hot water flow control is by modulation of the control valve from the thermostat signal.

The above data are for 180°F EWT and 40°F EAT at the coil. If other entering conditions apply, use the correction factor chart (bottom left). Multiply the heating capacity in the table above by the factor from the correction factor chart.

For the following, please call the factory:

- c.f.m. different from those shown in the tabulation
- Addition of glycol
- Altitude correction

Heating Capacities

Hot Water Coils for “Heating Only” Units
and Units with Split System DX Cooling

MODELS VUD 1200, VUF 1200, VDF 1200 and HCD 1200

1 Row Coil						2 Row Coil				
c.f.m.	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
800	4.0	41	87	159	1.4	3.0	55	104	143	1.8
1000	4.5	46	83	160	1.7	3.5	64	99	143	2.3
1200	5.0	52	80	159	2.1	4.0	72	96	143	2.9

MODEL VUF 1500

1 Row Coil						2 Row Coil				
c.f.m.	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1300	4.0	67	88	146	2.5	5.0	97	109	140	7.6
1400	4.5	71	87	148	3.1	5.0	101	107	139	7.6
1500	5.0	75	86	149	3.7	5.0	105	105	137	7.6

MODELS VUD 1600 and HCD 1600

1 Row Coil						2 Row Coil				
c.f.m.	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1300	4.0	62	84	148	2.1	5.0	95	103	141	6.5
1400	4.5	66	83	150	2.6	5.0	99	101	140	6.5
1600	5.0	69	82	152	3.1	5.0	102	99	138	6.5

MODEL VUD 2000

1 Row Coil						2 Row Coil				
c.f.m.	g.p.m.	MBtuh	LAT	LWT	WPD	g.p.m.	MBtuh	LAT	LWT	WPD
1800	4.0	79	81	140	2.5	6.0	116	100	140	1.5
1900	4.5	83	81	142	3.1	6.5	122	99	142	1.8
2000	5.0	87	80	144	3.7	7.0	127	99	143	2.0

WPD water pressure drop across
coil in ft. of water

LWT leaving water temperature
in ° F

$$LWT = EWT - \frac{2 \times MBtuh}{g.p.m.}$$

EAT entering air temperature
in ° F

LAT leaving air temperature
in ° F

$$LAT = EAT + \frac{MBtuh \times 926}{c.f.m.}$$

For the following, please call
the factory:

- c.f.m. different from those shown in the tabulation
- Addition of glycol
- Altitude correction

The above data are for 180°F EWT and 40°F EAT at the coil. If other entering conditions apply, use the correction factor chart below. Multiply the heating capacity in the table above by the correction factor from the table below.

CORRECTION FACTOR CHART

EWT	EAT				
	20°F	30°F	40°F	50°F	60°F
120°F	0.7	0.63	0.56	0.49	0.42
140°F	0.85	0.78	0.71	0.64	0.57
160°F	0.99	0.92	0.85	0.78	0.71
180°F	1.14	1.07	1.00	0.93	0.86
200°F	1.29	1.22	1.15	1.08	1.00

Heating Capacities

Low Pressure Steam Coils for “Heating Only” Units
and Units with Split System DX Cooling

MODELS VUD 1200, VUF 1200, VDF 1200 and HCD 1200

c.f.m.	Steam pressure 2 p.s.i.g.		Steam pressure 5 p.s.i.g.	
	MBtuh	LAT	MBtuh	LAT
800	63	113	66	117
1000	70	105	74	108
1200	76	99	80	102

MODEL VUF 1500

c.f.m.	Steam pressure 2 p.s.i.g.		Steam pressure 5 p.s.i.g.	
	MBtuh	LAT	MBtuh	LAT
1300	87	102	91	105
1400	90	100	95	103
1500	93	98	98	100

MODELS VUD 1600 and HCD 1600

c.f.m.	Steam pressure 2 p.s.i.g.		Steam pressure 5 p.s.i.g.	
	MBtuh	LAT	MBtuh	LAT
1300	93	106	98	110
1400	96	104	101	107
1600	102	99	107	102

MODEL VUD 2000

c.f.m.	Steam pressure 2 p.s.i.g.		Steam pressure 5 p.s.i.g.	
	MBtuh	LAT	MBtuh	LAT
1800	101	92	106	95
1900	104	91	109	93
2000	106	90	111	91

EAT entering air
temperature in ° F

LAT leaving air temperature
in ° F

$$LAT = EAT + \frac{MBtuh \times 926}{c.f.m.}$$

For the following, please call
the factory:

- c.f.m. different from those shown in the tabulation
- Altitude correction

The above data are for 40°F EAT at the coil.
For other EAT, use the correction factor chart below.

Multiply the heating capacity in the table above
by the correction factor from the table below.

EAT	Correction Factor
20°F	1.11
30°F	1.06
40°F	1.00
50°F	0.94
60°F	0.89

Supply Air Fan Motor Data

SUPPLY AIR FAN MOTORS - FREE DISCHARGE UNITS (NON-DUCTED)

Model	S.A. c.f.m.	120V			208V			277V		
		High	Selected	High Speed	High	Selected	High Speed	High	Selected	High Speed
		Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps
VUF 1200	800	1/8	1/8	2.5A	1/8	1/8	1.4A	1/5	1/8	1.3A
VUF 1200	1000	1/3	1/4	4.9A	1/4	1/4	2.0A	1/5	1/5	1.3A
VUF 1200	1200	1/2	1/3	6.5A	1/3	1/3	2.3A	1/3	1/4	2.7A
VUF 1500	1300	2 x 1/6	2 x 1/10	5.0A	2 x 1/6	2 x 1/10	2.8A	2 x 1/5	2 x 1/8	2.6A
VUF 1500	1400	2 x 1/6	2 x 1/8	5.0A	2 x 1/6	2 x 1/8	2.8A	2 x 1/5	2 x 1/6	2.6A
VUF 1500	1500	2 x 1/6	2 x 1/6	5.0A	2 x 1/6	2 x 1/6	2.8A	2 x 1/5	2 x 1/5	2.6A

SUPPLY AIR FAN MOTORS - UNITS WITH DUCTED SUPPLY AIR

Model	S.A. c.f.m.	120V			208V			277V		
		High	Selected	High Speed	High	Selected	High Speed	High	Selected	High Speed
		Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps
VUD, VDF & HCD 1200	800	1/4	1/6	3.5A	1/4	1/6	1.8A	1/4	1/6	1.6A
VUD, VDF & HCD 1200	1000	1/2	1/3	6.5A	1/2	1/3	3.2A	1/3	1/4	2.7A
VUD, VDF & HCD 1200	1200	1/2	1/2	6.5A	1/2	1/2	3.2A	1/2	1/3	3.6A
VUD & HCD 1600	1300	1/2	1/3	6.5A	1/2	1/3	3.2A	1/2	1/3	3.6A
VUD & HCD 1600	1400	3/4	1/2	8.9A	3/4	1/2	4.0A	1/2	1/2	3.6A
VUD & HCD 1600	1600	3/4	3/4	8.9A	3/4	3/4	4.0A	3/4	3/4	5.0A
VUD 2000	1800	2 x 1/3	2 x 1/4	9.8A	2 x 1/3	2 x 1/4	5.2A	2 x 1/4	2 x 1/6	3.2A
VUD 2000	1900	2 x 1/3	2 x 1/3	9.8A	2 x 1/3	2 x 1/3	5.2A	2 x 1/4	2 x 1/4	3.2A
VUD 2000	2000	2 x 1/3	2 x 1/3	9.8A	2 x 1/3	2 x 1/3	5.2A	2 x 1/4	2 x 1/4	3.2A

EXHAUST FAN MOTOR DATA

Exhaust c.f.m.	120V			208V			277V		
	High	Selected	High Speed	High	Selected	High Speed	High	Selected	High Speed
	Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps	Speed h.p.	Speed h.p.	Amps
450	1/6	1/8	2.5A	1/6	1/8	1.4A	1/6	1/10	0.9A
1000	1/2	1/3	6.5A	1/2	1/3	3.2A	1/2	1/3	3.6A

Notes:

1. Fan motors generally have three speeds, each represented by a decreasing H.P. from the maximum nameplate H.P. The amp draws shown in the charts above are the nameplate motor amps or Rated Load Amps. This is the high speed amp rating of the motor, not necessarily the draw for the selected speed.

- Where two motors are used (dual fans), the amp data shown is the RLA sum of both motors.
- All fan motors are single phase, 60Hz, P.S.C. type.
- For ducted units refer to the curves of c.f.m. versus E.S.P. in this catalog.

ESP	External static pressure (inches w.g.)
MCA	Minimum Circuit Ampacity
RLA	Rated Load Amps
MCA	(1.25 x (Electric Heater Amps + RLA of largest motor load)) + (sum of any other loads ≥ 1 amp)

ELECTRIC HEATER DATA

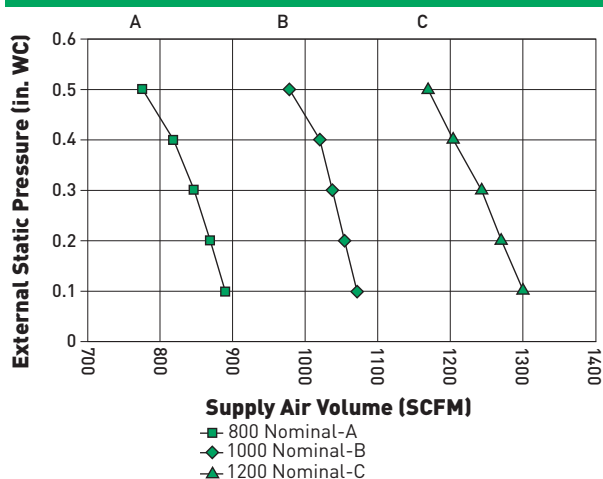
Coil kW	Amps			
	208V/1/60	208V/3/60	277V/1/60	460V/3/60
10	48	28	36	12
12	58	33	43	15
15	72	42	54	19
18	87	50	65	23

Amp ratings for three phase power are based on the maximum current in any one conductor. A remote circuit breaker should be provided, rated in accordance with the MCA information and data provided above.

Performance Curves for Ducted Units

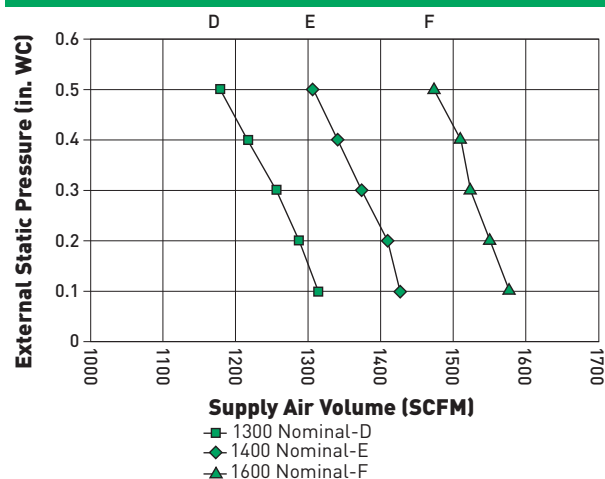
VUD/HCD 1200

UNIT WITH SINGLE SUPPLY AIR FAN



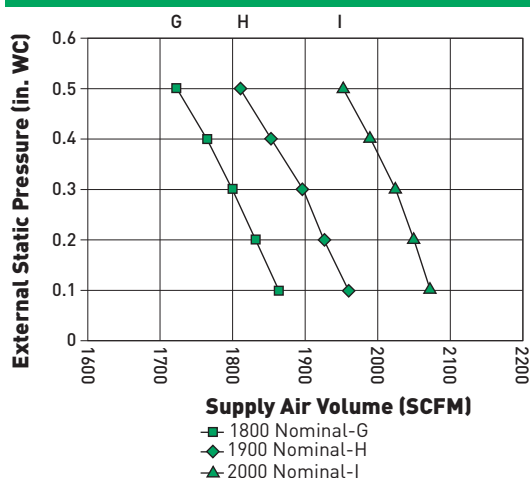
VUD/HCD 1600

UNIT WITH SINGLE SUPPLY AIR FAN



VUD 2000

UNIT WITH TWO SUPPLY AIR FANS



The following test conditions apply:

- The supply air is ducted off the top of the unit.
- Fan motors are 120 Volts, single phase, 60 Hz, 1075 r.p.m.
- Fans are centrifugal, direct drive, double inlet with forward curved impeller.
- 1" filters are clean.

Fan curve	Model	Supply air fan selected speed h.p.	Supply air fan model
A	VUD/HCD 1200	1/6	09070
B	VUD/HCD 1200	1/3	10060
C	VUD/HCD 1200	1/2	10060
D	VUD/HCD 1600	1/3	10080
E	VUD/HCD 1600	1/2	10080
F	VUD/HCD 1600	3/4	10080
G	VUD 2000	2 x 1/4	2 x 10060
H	VUD 2000	2 x 1/3	2 x 10060
I	VUD 2000	2 x 1/3	2 x 10080

Sound Data, Weights, Filter Sizes

SOUND DATA

Model	Ducted or non ducted	Nominal c.f.m.	Sound pressure level at 6ft.	
			dBA	NC
VUD 1200	Ducted	1000	43	37
VUF 1200	Freeblow	1000	51	45
VDF 1200	Ducted	1000	47	41
HCD 1200	Ducted	1000	43	37
VUD 1600	Ducted	1400	48	42
VUF 1500	Freeblow	1500	52	46
HCD 1600	Ducted	1400	48	42
VUD 2000	Ducted	2000	51	45

The following test conditions apply:

- The microphone of the sound meter is located at a distance of 6 ft. from the unit and 4 ft. above the floor.
- Non ducted units have a free supply air discharge through unit mounted double deflection grilles.
- Filters (1") are clean.
- The room has a medium hardness.

WEIGHTS

Model	Approx. unit weight
VUD 1200	300 lbs.
VUF 1200	300 lbs.
VDF 1200	300 lbs.
HCD 1200	300 lbs.
VUD 1600	600 lbs.
VUF 1500	700 lbs.
HCD 1600	500 lbs.
VUD 2000	700 lbs.

The unit weight excludes the sheet metal accessories such as top plenum, pipe covers and louvers.

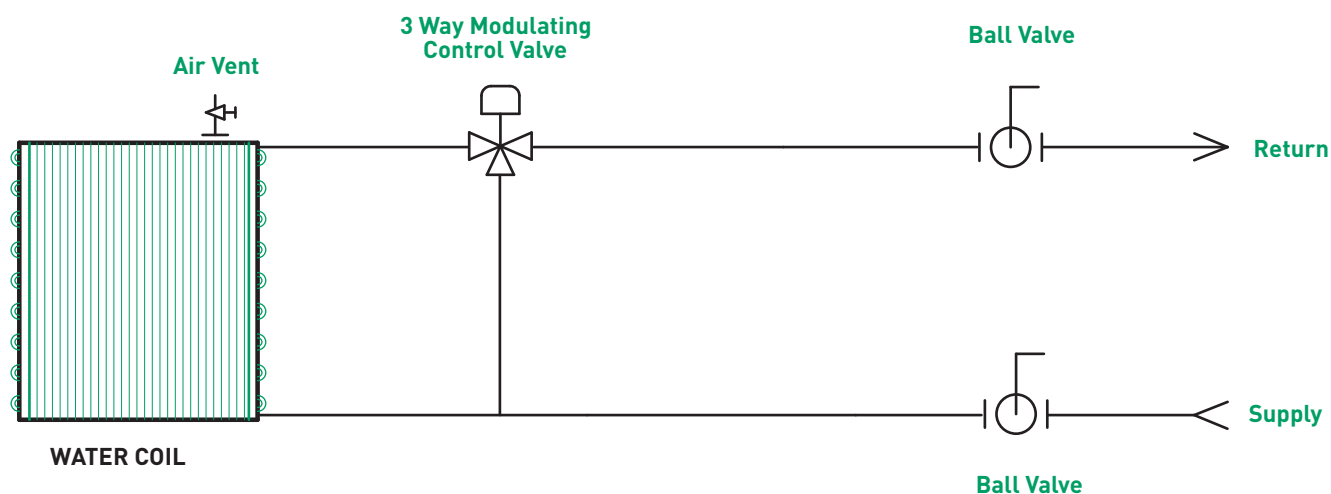
Note:

Face and by-pass control will add approximately 125 lbs to a unit weight.

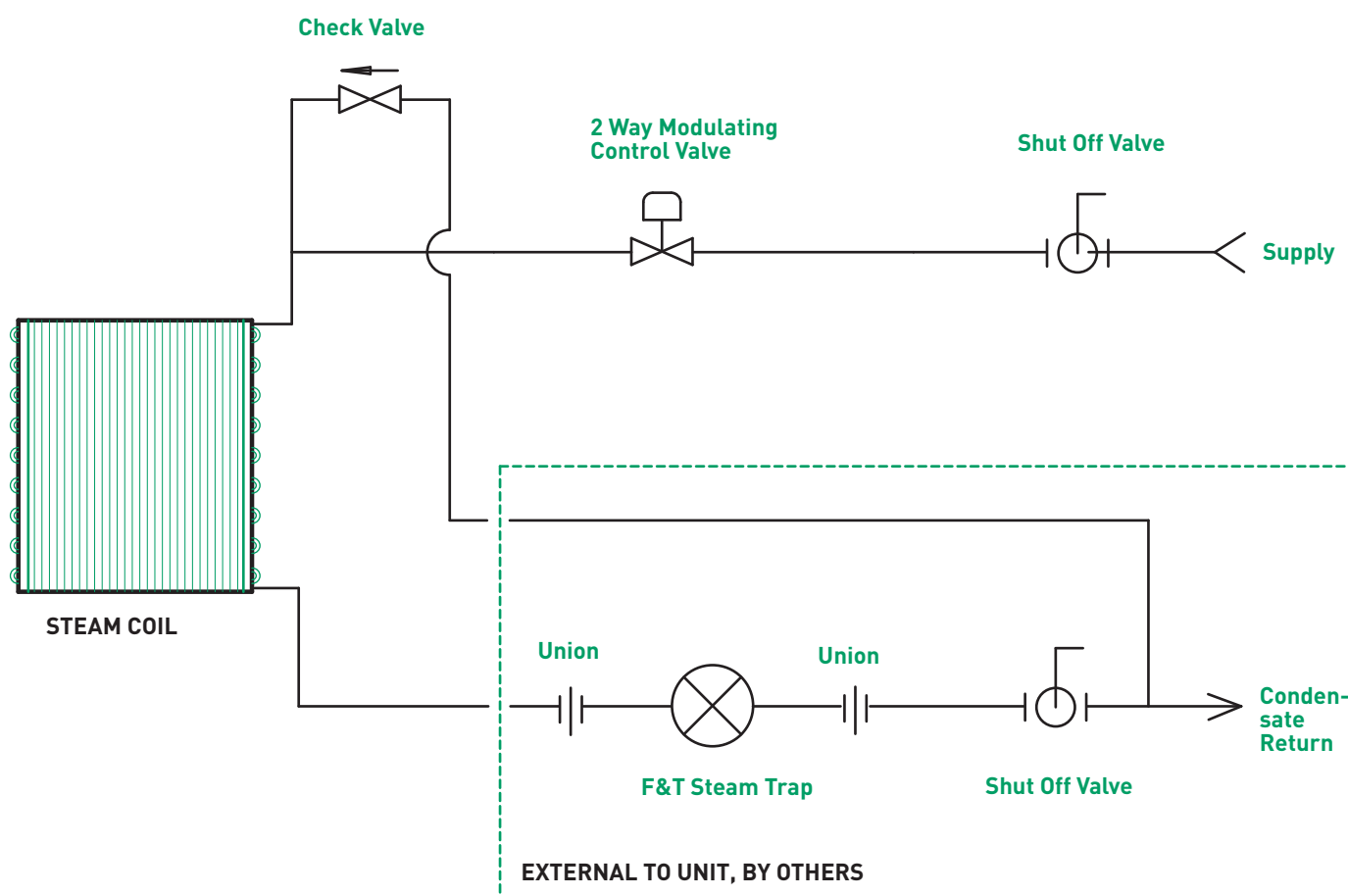
FILTER SIZES

Model	Filter thickness	No. of filters	Type	Nominal size	Actual size	Part no. for standard filter
VUD 1200	1"	2	Standard	12" x 20"	11 5/8" x 19 5/8" x 3/4"	FRX 12120B
VUD 1200	1"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 3/4"	FPX 12120
VUD 1200	2"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 1 3/4"	FPX 12220
VUF 1200	1"	2	Standard	12" x 20"	11 5/8" x 19 5/8" x 3/4"	FRX 12120B
VUF 1200	1"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 3/4"	FPX 12120
VUF 1200	2"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 1 3/4"	FPX 12220
VDF 1200	1"	2	Standard	12" x 20"	11 5/8" x 19 5/8" x 3/4"	FRX 12120B
VDF 1200	1"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 3/4"	FPX 12120
VDF 1200	2"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 1 3/4"	FPX 12220
HCD 1200	1"	2	Standard	12" x 20"	11 5/8" x 19 5/8" x 3/4"	FRX 12120B
HCD 1200	1"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 3/4"	FPX 12120
HCD 1200	2"	2	Pleated	12" x 20"	11 3/4" x 19 3/4" x 1 3/4"	FPX 12220
VUD 1600	1"	2	Standard	12" x 24"	11 5/8" x 23 5/8" x 3/4"	FRX 12124
VUD 1600	1"	2	Pleated	12" x 24"	11 3/4" x 23 3/8" x 3/4"	FPX 12124
VUD 1600	2"	2	Pleated	12" x 24"	11 3/8" x 23 3/8" x 1 3/4"	FPX 12224
VUF 1500	1"	2	Standard	15 3/4" x 21"	15 3/4" x 20 1/2" x 3/4"	FRX 16121
VUF 1500	1"	2	Pleated	15 3/4" x 21"	15 3/4" x 20 1/2" x 3/4"	FPX 16121
VUF 1500	2"	2	Pleated	15 3/4" x 21"	15 3/4" x 20 1/2" x 1 3/4"	FPX 16221
HCD 1600	1"	2	Standard	12" x 24"	11 5/8" x 23 5/8" x 3/4"	FRX 12124
HCD 1600	1"	2	Pleated	12" x 24"	11 3/4" x 23 3/8" x 3/4"	FPX 12124
HCD 1600	2"	2	Pleated	12" x 24"	11 3/8" x 23 3/8" x 1 3/4"	FPX 12224
VUD 2000	1"	2	Standard	15 3/4" x 21"	15 3/4" x 20 1/2" x 3/4"	FRX 16121
VUD 2000	1"	2	Pleated	15 3/4" x 21"	15 3/4" x 20 1/2" x 3/4"	FPX 16121
VUD 2000	2"	2	Pleated	15 3/4" x 21"	15 3/4" x 20 1/2" x 1 3/4"	FPX 16221

Typical Piping Package for Chilled Water and Hot Water Coil

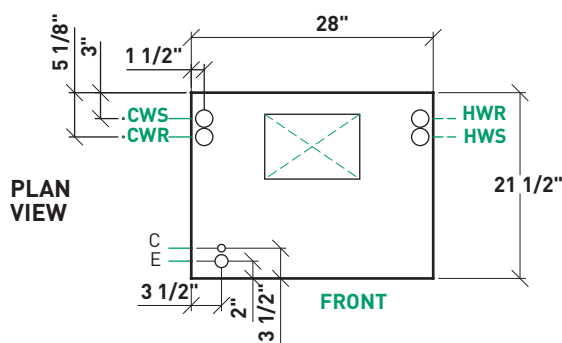


Typical Piping Package for Steam Coil

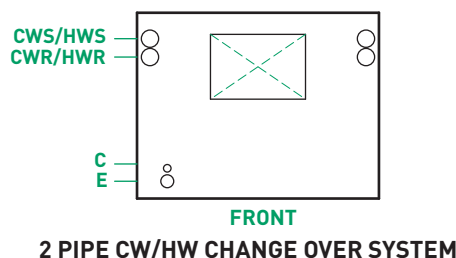


Utility Connections

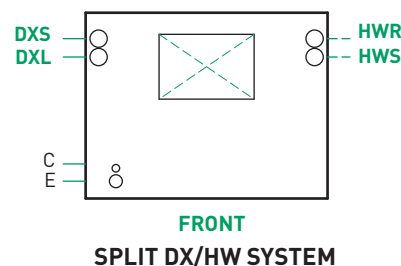
Models VUD 1200 / VUF 1200 / VDF 1200



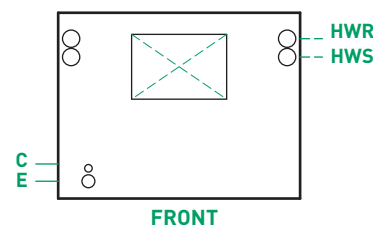
4 PIPE CW/HW SYSTEM



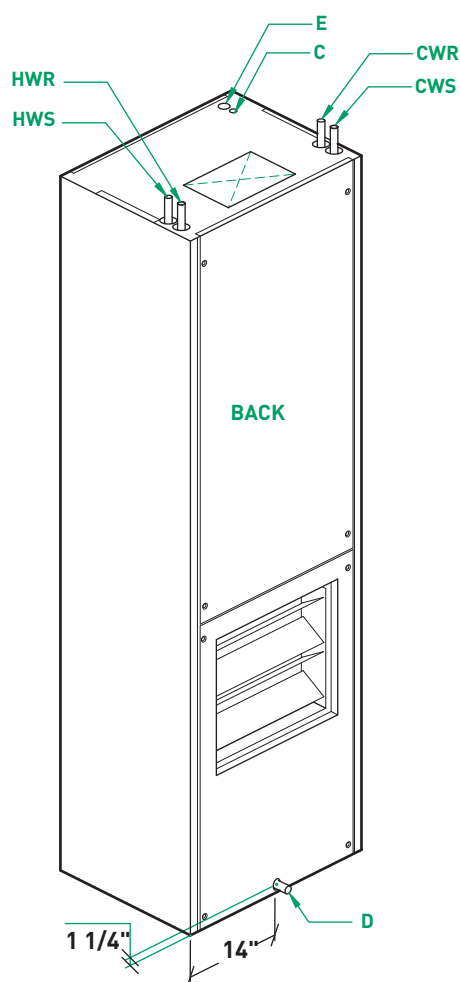
2 PIPE CW/HW CHANGE OVER SYSTEM



SPLIT DX/HW SYSTEM



2 PIPE HW SYSTEM



CWS: Chilled Water Supply - 7/8" O.D. Sweat Connection

CWR: Chilled Water Return - 7/8" O.D. Sweat Connection

HWS: Hot Water Supply - 7/8" O.D. Sweat Connection

HWR: Hot Water Return - 7/8" O.D. Sweat Connection

DXL: DX Liquid Line - 1/2" O.D. Sweat Connection

DXS: DX Suction Line - 7/8" O.D. Sweat Connection

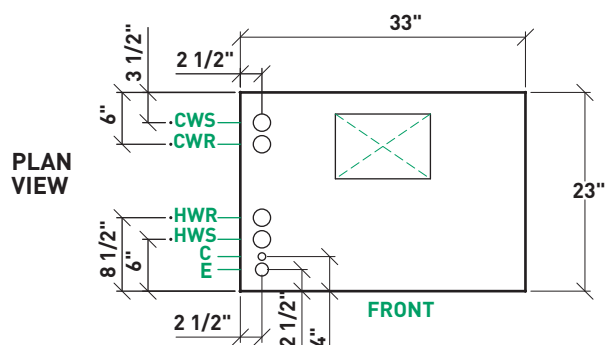
(C) Entry Point for Control Cable

(D) Exit Point of Condensate Drain Tube - 5/8" I.D. 7/8" O.D. Vinyl Tubing

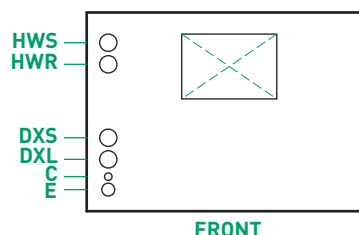
(E) Electrical Power Cable Entry Point

Utility Connections

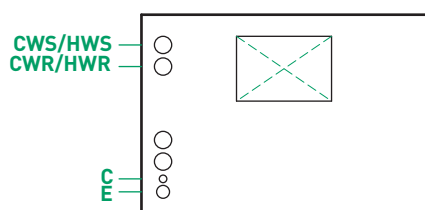
Model VUD 1600



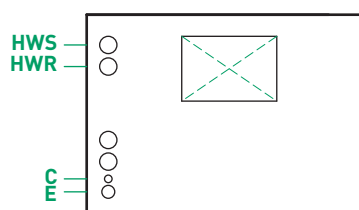
4 PIPE CW/HW SYSTEM



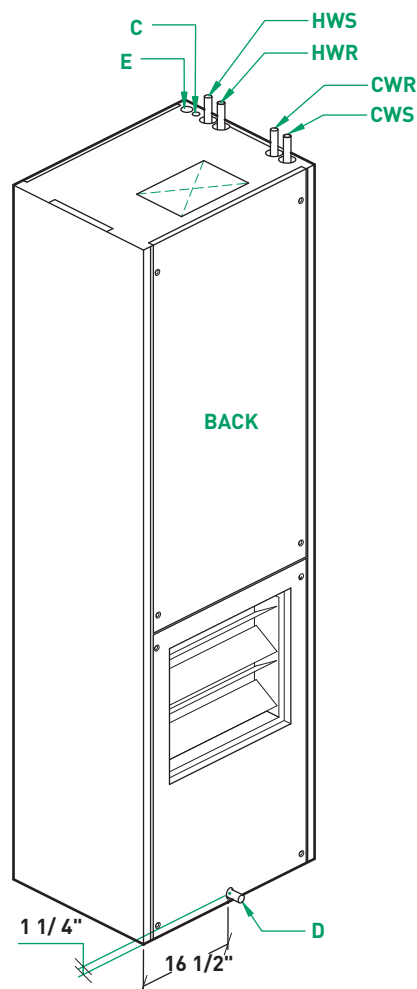
SPLIT DX/HW SYSTEM



2 PIPE CW/HW CHANGE OVER SYSTEM



2 PIPE HW SYSTEM



CWS: Chilled Water Supply - 7/8" O.D.
Sweat Connection

CWR: Chilled Water Return - 7/8" O.D.
Sweat Connection

HWS: Hot Water Supply - 7/8" O.D.
Sweat Connection

HWR: Hot Water Return - 7/8" O.D.
Sweat Connection

DXL: DX Liquid Line - 1/2" O.D.
Sweat Connection

DXS: DX Suction Line - 7/8" O.D.
Sweat Connection

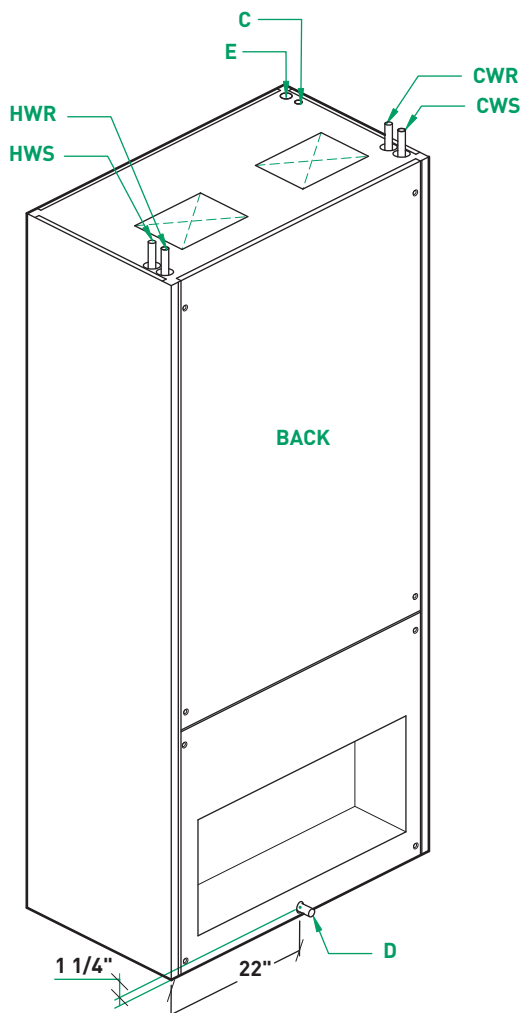
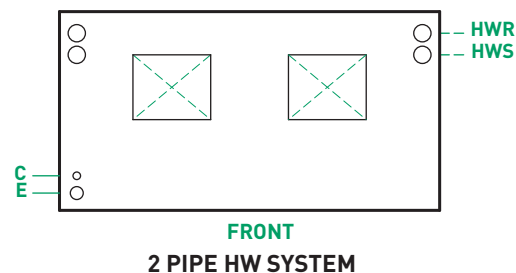
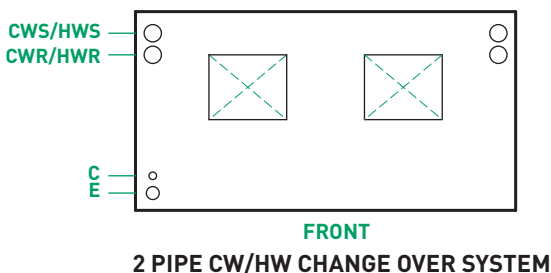
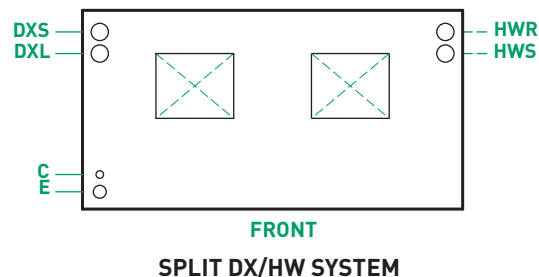
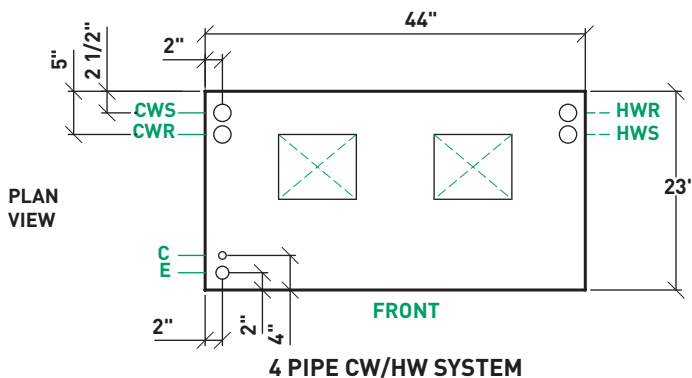
C Entry Point for Control Cable

D Exit Point of Condensate Drain Tube
- 5/8" I.D. 7/8" O.D. Vinyl Tubing

E Electrical Power Cable Entry Point

Utility Connections

Models VUD 2000 / VUF 1500



CWS: Chilled Water Supply - 7/8" O.D. Sweat Connection

CWR: Chilled Water Return - 7/8" O.D. Sweat Connection

HWS: Hot Water Supply - 7/8" O.D. Sweat Connection

HWR: Hot Water Return - 7/8" O.D. Sweat Connection

DXL: DX Liquid Line - 1/2" O.D. Sweat Connection

DXS: DX Suction Line - 7/8" O.D. Sweat Connection

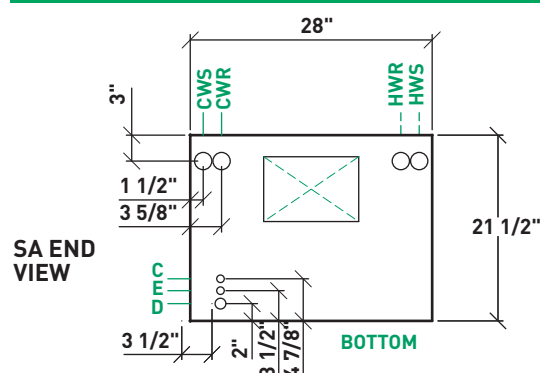
(C) Entry Point for Control Cable

(D) Exit Point of Condensate Drain Tube - 5/8" I.D. 7/8" O.D. Vinyl Tubing

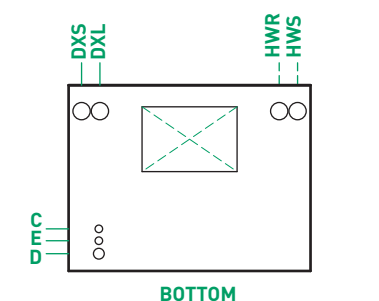
(E) Electrical Power Cable Entry Point

Utility Connections

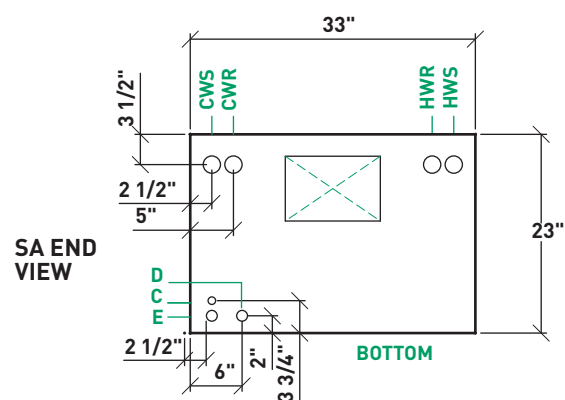
Models HCD 1200 / HCD 1600



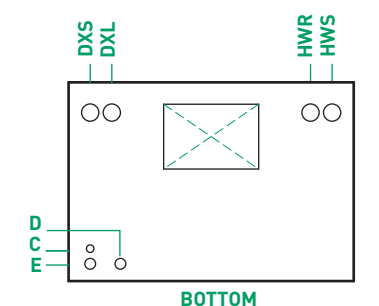
4 PIPE CW/HW SYSTEM - HCD 1200



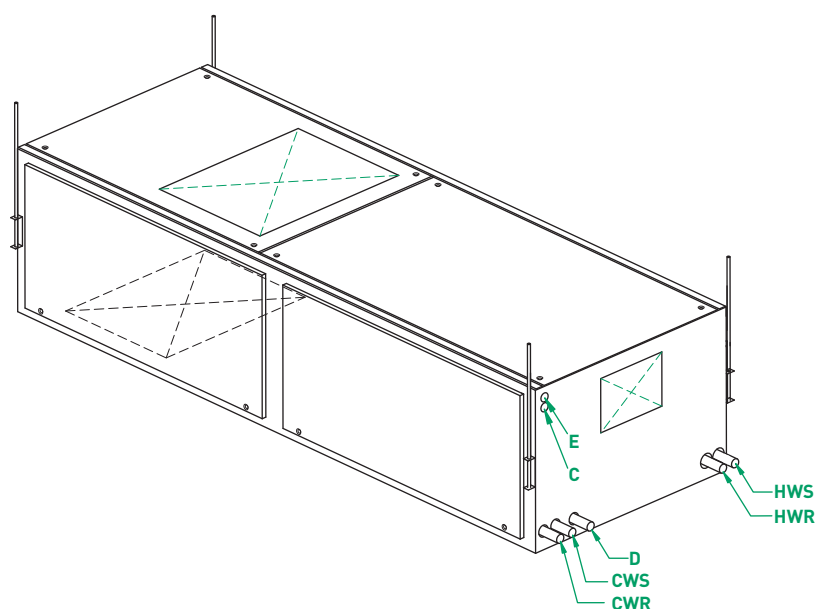
SPLIT DX/HW SYSTEM - HCD 1200



4 PIPE CW/HW SYSTEM - HCD 1600



SPLIT DX/HW SYSTEM - HCD 1600



CWS: Chilled Water Supply - 7/8" O.D. Sweat Connection

CWR: Chilled Water Return - 7/8" O.D. Sweat Connection

HWS: Hot Water Supply - 7/8" O.D. Sweat Connection

HWR: Hot Water Return - 7/8" O.D. Sweat Connection

DXL: DX Liquid Line - 1/2" O.D. Sweat Connection

DXS: DX Suction Line - 7/8" O.D. Sweat Connection

(C) Entry Point for Control Cable

(D) Exit Point of Condensate Drain Tube - 5/8" I.D. 7/8" O.D. Vinyl Tubing

(E) Electrical Power Cable Entry Point

Control Options

DIRECT DIGITAL CONTROLS

Temspec offers factory mounting of a wide range of control types. Often a building owner has a preference for the controls of a particular energy management system contractor or manufacturer.

We work closely with the selected contractor to ensure economical and error free factory mounting of the control components and associated wiring.

TEMSPec TYPE "V" STAND ALONE CONTROLS



Thermostat model OC-3

ASHRAE cycle II control strategy

Seven day programmability

Modulating heating control

100% economizer cooling

Precise control by P & I logic

Outdoor air damper is closed during unoccupied mode (at night)

Rugged steel casing, size 6" x 4"

Up to 20 vacation periods are programmable. Automatic compensation for leap years

No batteries, schedule retention for up to 3 months is by a capacitor

Intelligent morning warm up

Optional humidistat input for use in a humidity control strategy using reheat

Room temperature set points can be locked to prevent tampering

Passive infrared motion sensor maximizes the energy savings by automatically closing the outdoor air damper when occupants vacate the room during the day.

Control Strategy

For a Temspec Classroom Unit Ventilator with type “V” Stand Alone Control Package (Thermostat Model OC-3)

1. Supply Air Fan Control

The fan shall run continuously when the unit is operating in the occupied mode. The fan shall run only on a call for heating or cooling in the unoccupied (night setback) mode.

2. Damper Control

The outdoor air damper shall be open to a pre-set minimum position (adjustable) during the occupied mode when motion is sensed. When motion ceases to be sensed after a timeout delay period, the outdoor air damper shall close until motion is next sensed. During unoccupied mode, the outdoor air damper shall be closed. The outdoor air and the return air dampers shall operate in tandem with opposite action.

3. Cooling

On a call for economizer cooling by the thermostat, the outdoor air damper shall modulate open, up to 100%. When the outdoor air temperature is too high to provide full economizer cooling, the outdoor air damper shall return to minimum position and the chilled water valve shall open or the compressor shall cycle on until the cooling set point is reached. A five minute delay time shall prevent short cycling if the system has DX cooling.

4. Heating

On a call for heating by the thermostat, the electric coil shall pulse (by an SCR) or the hot water/steam valve modulate (0-10 Vdc) to maintain the occupied heating set point (typically 72°F). If the room temperature falls 2°F below set point and the mixed air temperature is below 60°F, the outdoor air damper shall modulate towards closed until the mixed air temperature rises to 70°F.

Control Type “V” (Temspec OC-3 thermostat)

Occupancy based energy saving strategy

Smart occupancy function

Motion is detected by a passive infrared motion sensor incorporated into the front face of the thermostat. Time-out delay (T.O.D.) is the period of delay allowed after the last motion was detected. The motion sensor can be disabled by jumper selection in the OC-3 thermostat.

Unoccupied mode (night)

The unoccupied period is set on the thermostat. Typically unoccupied mode starts at 4:00 p.m. and ends at 7:30 a.m. at which time the room is normally unoccupied. The night ‘heating set-back’ and ‘cooling set-up’ temperatures are programmed using the hand held OC-3P programmer.

CONDITION - NO MOVEMENT

Unit switches to night set-back after expiry of the T.O.D.

CONDITION - MOVEMENT SENSED

Unit switches to daytime operation, which continues for a period equal to the T.O.D. Each time movement is sensed, the daytime operation mode is triggered for a further period equal to the T.O.D.

MORNING WARM UP / COOL DOWN

The start of morning warm up / cool down is determined by the thermostat, using continuously updated historical data to modify the time required to complete the process. This action optimizes energy savings. At the end of the unoccupied period, the room will have attained set temperature. The outdoor air damper remains closed throughout the unoccupied and warm up / cool down period.

Occupied mode (day)

CONDITION - NO MOVEMENT SENSED

The morning warm up / cool down occurs, but the unit reverts to night setback commencing one hour after the timed occupied start.

CONDITION - MOVEMENT SENSED

The morning warm up / cool down occurs and daytime operation is maintained until the end of the occupied time, as pre-programmed on the thermostat clock. If no movement is sensed for a period equal to the T.O.D., the outdoor air damper will fully close (but room temperature is not set-back / set-up) until movement is again detected during the occupied mode. This is an energy saving function.

Weekends

Saturday and Sunday can be selected for programming as weekdays using the hand-held programmer. If not programmed, the room is maintained in the unoccupied mode throughout the weekend.

Holiday periods

The user schedules holiday dates using the hand-held programmer. Up to twenty events can be programmed. The OC-3 thermostat automatically compensates for leap years. If the user does not program a holiday schedule, for example the Christmas period, the OC-3 thermostat error-traps this condition. On the first Monday of this period the OC-3 thermostat is searching for motion and if none is sensed after one hour of the timed start of occupancy, the unit is put into the night set-back mode. On Tuesday, the unit will again preheat the room, but if no movement is sensed at the start of timed occupancy, the night set-back /set-up is triggered immediately. On Wednesday, the unit does not preheat the room, but holds it in set-back / set-up mode until occupancy is next sensed. The energy savings are significant.

Other Temspec HVAC Products

Unit ventilators with self-contained air conditioning

All units have 100% economizer cooling and are available in an upflow draw through configuration for ducted supply air systems or upflow blow through for non-ducted units.



VHC and VLC SERIES

Cooling capacities:
Self contained DX
2 through 5 tons

Vertical fan coil units



TV Series



TV SERIES

Chilled water (2 or 4 pipe)
Up to 4 tons
Concealed installation

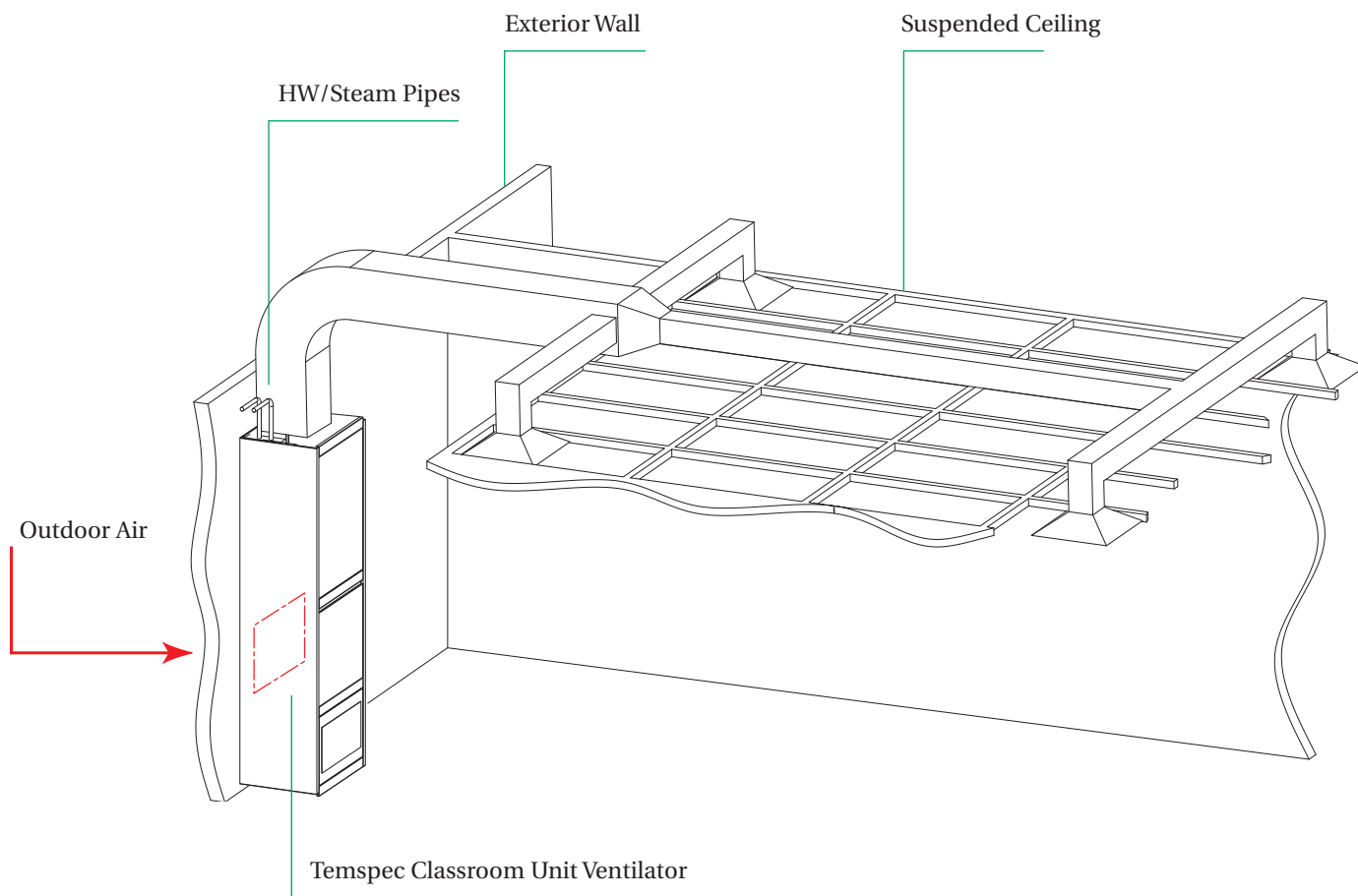
TF SERIES

Chilled water (2 or 4 pipe)
Up to 4 tons
Powder coat finished cabinet for exposed installation. We can color match to your specification.



TF Series

TEMSPEC DUCTED CLASSROOM UNIT VENTILATOR



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