CLASSROOM UNIT VENTILATORS

WITH SELF-CONTAINED AIR CONDITIONING

TEMSPEC INC.

MODELS VHC AND VLC

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.

TEMSPEC INC.

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 chilled water or split system DX cooling
- Hi-rise fan coil units for concealed application
- Hi-rise fan coil units for exposed application

Contents

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.

For representation in your area please visit our website

www.temspec.com

or call 1-888-836-7732

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	WALL PENETRATION LOCATION FOR CONDENSER AIR	SUPPLY AIR DISTRIBUTION	TEMSPEC UNIT MODEL
Average size classroom up to 1000 sq.ft. 3 tons	Above window sill height	Ducted	VHC 30 or 36
		Direct discharge	Supply air must be ducted
	No restriction	Ducted	VHC 30 or 36; VLC 24, 30 or 36
		Direct discharge	VLC 24, 30 or 36
Large classroom, Computer room, Library. over 1000 sq.ft. 4 or 5 tons	Above window sill height	Ducted	VHC 48 or 60
		Direct discharge	Supply air must be ducted
	No restriction	Ducted	VHC 48 or 60; VLC 48 or 60
		Direct discharge	VLC 48 or 60

Model numbers

XXX NN

Nominal cooling capacity in MBtuh.

VHC= Vertical unit ventilator with self-contained air conditioning and an elevated condensing section.

VLC= Vertical unit ventilator with self-contained air conditioning and a condensing section located low in the rear of the cabinet.

Typical Specification
for unit ventilator models VHC 30/36/48/60

1. The unit ventilator shall be model VHC 30/36/48/60 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 and a manual reset high limit shall be provided within the unit. 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. **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. An epoxy coated galvanized steel, pitched drain pan shall be provided. The pan shall have a 'P' trap.
5. **HOT GAS REHEAT (Optional)** A hot gas reheat coil shall be provided and a solenoid valve and hot gas bypass valve factory installed.
6. **COMPRESSOR** The compressor shall be a hermetic type, reciprocating for 3 and 4 ton units, a scroll type for 5 ton units. The compressor shall be rated for ____Volts ____ phase 60 Hz. The compressor shall be equipped with a low ambient cut out, low and high pressure controls. A crankcase heater shall be included on reciprocating compressors. The system shall be factory charged with refrigerant.
7. **HOT GAS BYPASS (Optional)** A hot gas bypass device shall be factory installed.
8. **THERMAL EXPANSION VALVE** A thermal expansion valve shall be factory installed at the evaporator coil in 4 and 5 ton capacity units.
9. **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. The unit shall have a draw through configuration.
10. **TOP EXTENSION (Optional)** The unit manufacturer shall provide a color matched top extension for the cabinet, size to suit the ceiling height.
11. **RAISED BASE (Optional)** The unit manufacturer shall provide a color matched raised base, height as shown on the plans.
12. **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.
13. **SUPPLY AIR FANS / MOTORS, CONDENSER FANS / MOTORS** The fan shall be a direct drive centrifugal type with a multi-speed PSC motor mounted on rubber isolation grommets. The motor voltage shall be ____V /1/ 60 Hz. All models shall have one or two supply air fans and two condenser fans.
14. **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.
15. **FILTERS** The filters shall be of the manufacturer's standard disposable type.
16. **EXTERIOR WALL LOUVER** The unit manufacturer shall provide the wall louver. The louver shall be of heavy gauge steel with 30 deg. blades. The louver shall have 1/2" birdscreen attached to the inner face. The finish on the louver shall be primer coat or a color as per the Architect's instruction. The manufacturer shall provide a wall sleeve to suit the wall thickness, including an air flow separator to prevent mixing of the condenser air intake and outflow.
17. **POWER EXHAUST (Optional)** An exhaust control damper shall be installed in the unit and shall modulate in tandem with the outdoor air damper. The condenser fan shall serve as an exhaust fan in the occupied mode.
18. **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.
19. **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.
20. **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.
21. **DDC CONTROLS** Control items shall be furnished by the controls contractor for factory mounting and shall function as described in the Controls Specification.
22. **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.

Typical Specification

For unit ventilator models VLC 24/30/36/48/60

1. The unit ventilator shall be model VLC 24/30/36/48/60 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 and a manual reset high limit shall be provided within the unit. 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. **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. An epoxy coated galvanized steel, pitched drain pan shall be provided. The pan shall have a 'P' trap.

5. **COMPRESSOR** The compressor shall be a hermetic type, reciprocating for 3 and 4 ton units, a scroll type for 5 ton units. The compressor shall be rated for ____Volts ____ phase 60 Hz. The compressor shall be equipped with a low ambient cut out, low and high pressure controls. A crankcase heater shall be included on reciprocating compressors. The system shall be factory charged with refrigerant.

6. **HOT GAS BYPASS (Optional)** A hot gas bypass device shall be factory installed.

7. **THERMAL EXPANSION VALVE** A thermal expansion valve shall be factory installed at the evaporator coil in 4 and 5 ton capacity units.

8. **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.

9. **TOP SUPPLY AIR PLEMUM FOR NON-DUCTED UNITS** The unit manufacturer shall provide a color matched top supply air plenum with supply air grilles (two or three way discharge). The plenum shall be acoustically lined.

10. **TOP EXTENSION FOR DUCTED UNITS (Optional)** The unit manufacturer shall provide a colour matched top extension for the cabinet, size to suit the ceiling height.

11. **RAISED BASE (Optional)** The unit manufacturer shall provide a colour matched raised base, height as shown on the plans.

12. **SIDE PIPE COVER (Optional)** The unit manufacturer shall provide a 5" wide pipe cover assembly, colour matched to the unit. The cover shall be the depth of the unit, height to suit.

13. **SUPPLY AIR FANS / MOTORS, CONDENSER FANS / MOTORS** The fan shall be a direct drive centrifugal type with a multi-speed PSC motor mounted on rubber isolation grommets. The motor voltage shall be _____ V / 1 / 60 Hz. Model VLC 24/30/36 shall have a single condenser fan. Model VLC 48/60 shall have two condenser fans. All models shall have two supply air fans.

14. **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.

15. **FILTERS** The filters shall be of the manufacturer's standard disposable type.

16. **EXTERIOR WALL LOUVER** The unit manufacturer shall provide the wall louver. The louver shall be of heavy gauge steel with 30 deg. blades. The louver shall have 1/2" birdscreen attached to the inner face. The finish on the louver shall be primer coat or a color as per the Architect's instruction. The manufacturer shall provide a wall sleeve to suite the wall thickness, including an air flow separator to prevent mixing of the condenser air intake and outflow.

17. **BAROMETRIC RELIEF (Optional)** A barometric relief damper shall be incorporated in the back of the unit. The manufacturer shall provide the wall louver and wall sleeve. Note that the barometric relief damper option is not available with the models VLC 48 and VLC 60 which have a 'blow through' configuration.

18. **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.

19. **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.

20. **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.

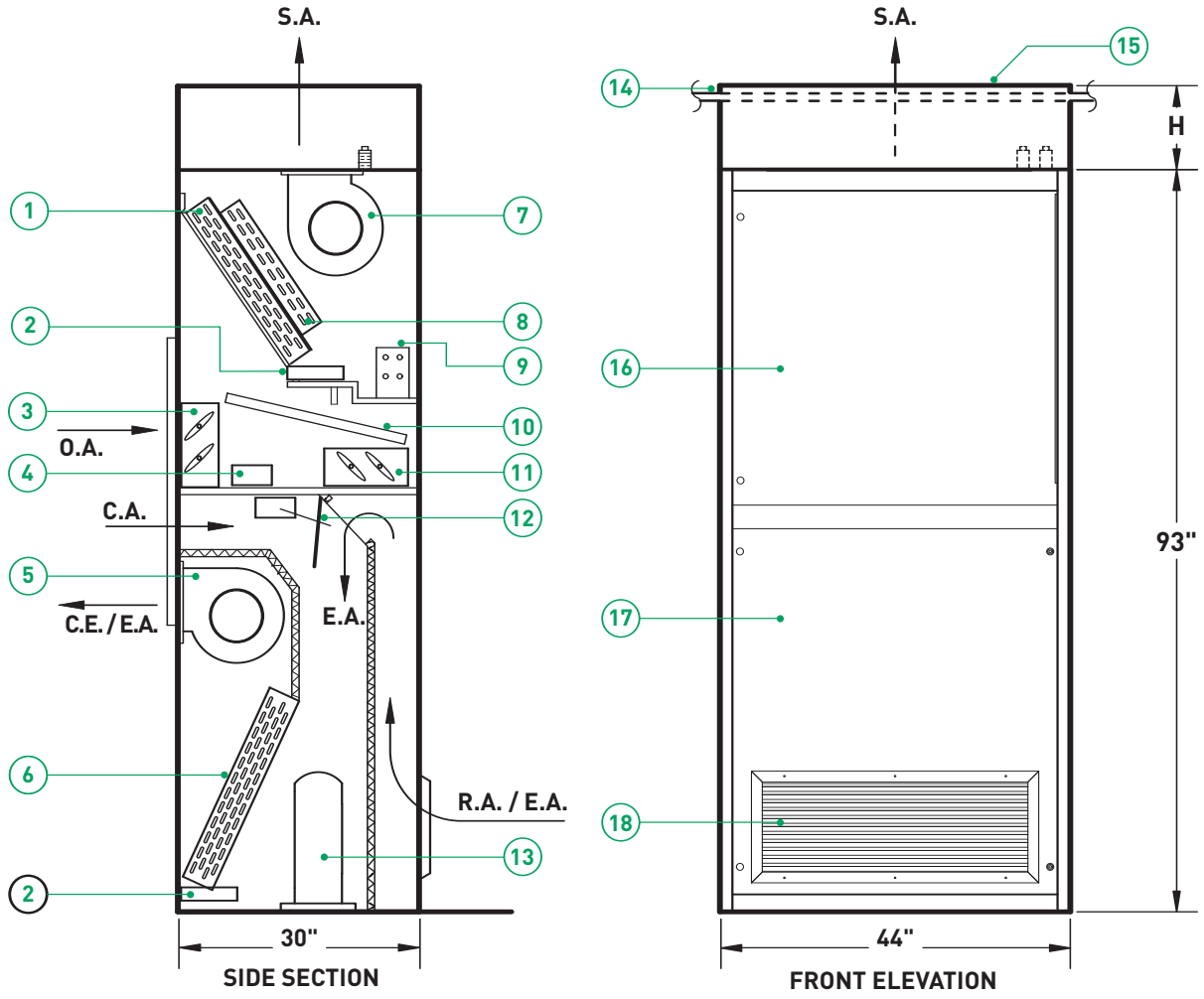
21. **DDC CONTROLS** Control items shall be furnished by the controls contractor for factory mounting and shall function as described in the Controls Specification.

22. **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.

Self-Contained Unit Ventilator

Models VHC 30, VHC 36, VHC 48, VHC 60

DRAW THROUGH CONFIGURATION (Hydronic Heating With Self-Contained DX Cooling)



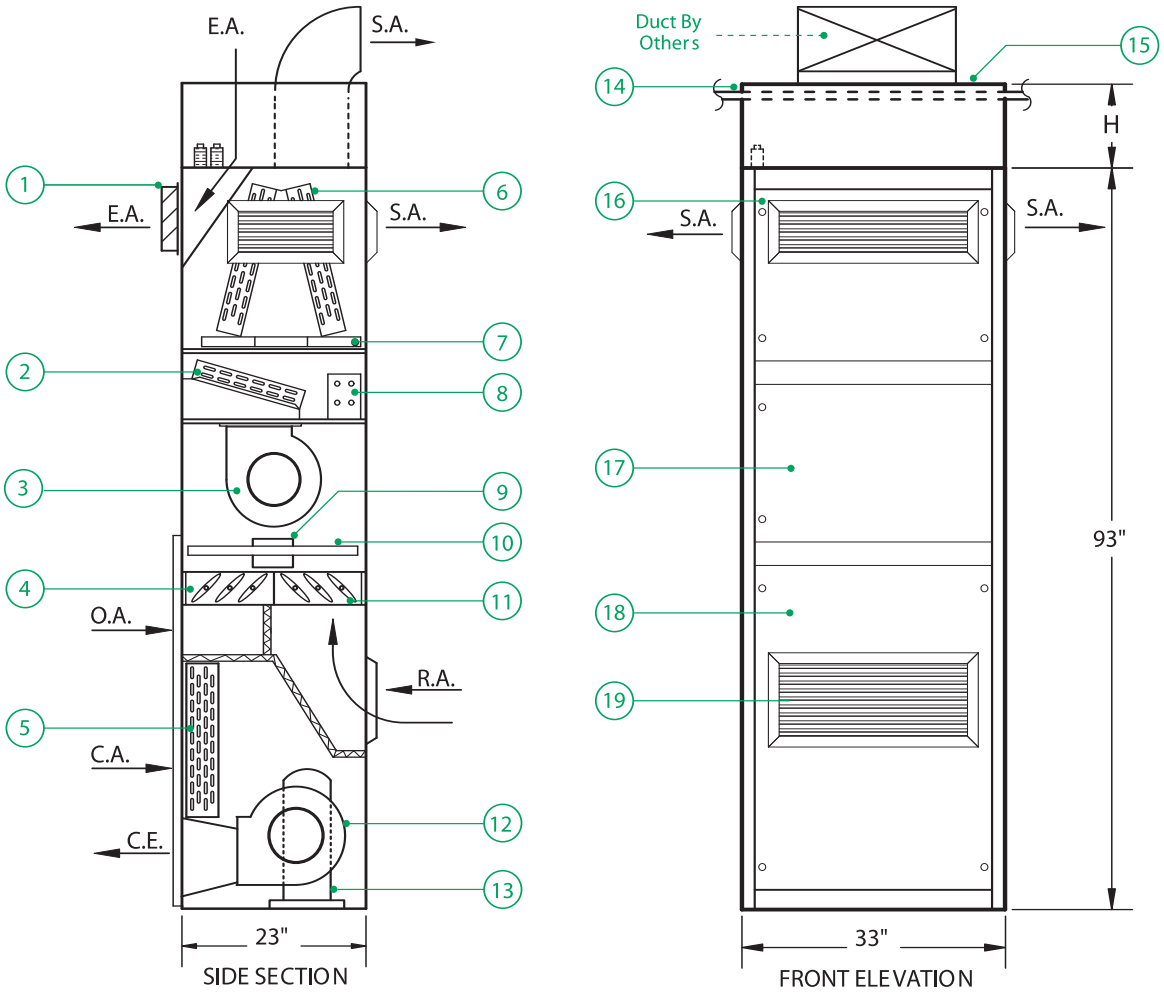
S.A.	Supply Air	O.A.	Outdoor Air	C.E.	Condenser Exhaust Air
R.A.	Return Air	C.A.	Condenser Intake Air	E.A.	Room Exhaust Air (optional)

1. DX cooling coil
2. Drain pan
3. Outdoor air damper
4. Mixed air damper actuator
5. Dual condenser exhaust / powered exhaust fans
6. Condenser coil
7. Supply air fan(s)
8. Hot Water Coil. Optional electric or steam coil available
9. Electrical box / controls enclosure
10. Filters
11. Return air damper
12. Powered exhaust damper and modulating actuator module (optional)
13. Compressor
14. Ceiling tile
15. Top extension / duct shroud to suit ceiling height (optional). Dimension “H” is variable
16. Filter/coil hinged access panel
17. Removable access panel
18. Heavy duty return air grille

Self-Contained Unit Ventilator

Models VLC 24, VLC 30, VLC 36

DUCTED OR FREEBLOW CONFIGURATION (Hydronic Heating With Self-Contained DX Cooling)



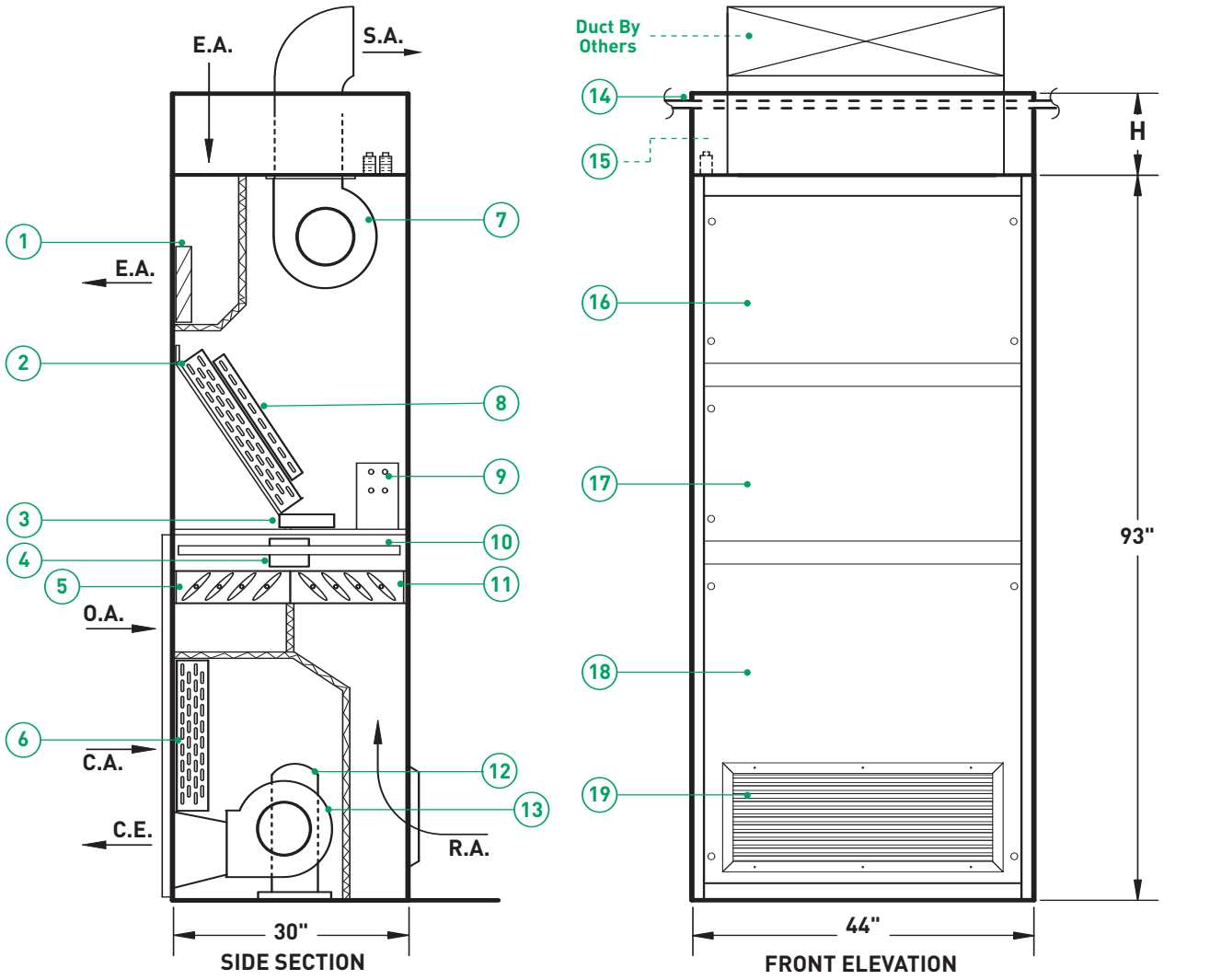
S.A.	Supply Air	**O.A.**	Outdoor Air	**C.E.**	Condenser Exhaust Air
R.A.	Return Air	**C.A.**	Condenser Intake Air	**E.A.**	Room Exhaust Air

1. Barometric relief damper assembly (optional)
2. Hot water coil. Optional electric or steam coil available
3. Dual supply air fans
4. Outdoor air damper
5. Condenser coil
6. DX cooling coil
7. Drain pan
8. Electrical box / controls enclosure
9. Mixed air damper actuator
10. Filter
11. Return air damper
12. Single condenser fan
13. Compressor
14. Ceiling tile
15. Top extension / duct shroud to suit ceiling height (optional). Dimension “H” is variable
16. Coil access panel (removable) with optional double deflection discharge grille
17. Filter access panel, hinged
18. Removable access panel
19. Heavy duty return air grille

Self-Contained Unit Ventilator

Models VLC 48, VLC 60

DRAW THROUGH CONFIGURATION (Hydronic Heating With Self-Contained DX Cooling)



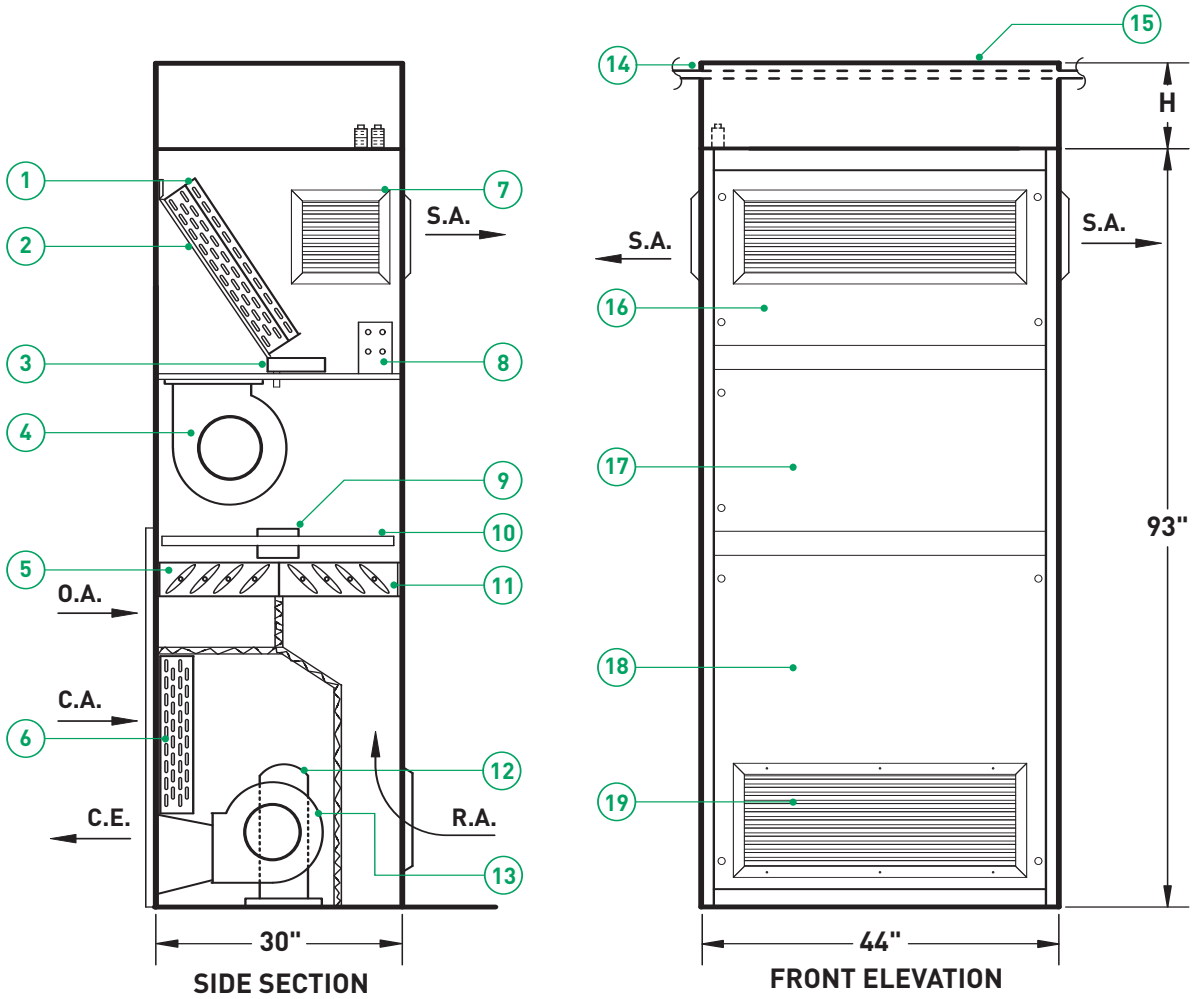
S.A.	Supply Air	O.A.	Outdoor Air	C.E.	Condenser Exhaust Air
R.A.	Return Air	C.A.	Condenser Intake Air	E.A.	Room Exhaust Air

1. Barometric relief damper assembly (optional)
2. DX cooling coil
3. Drain pan
4. Mixed air damper actuator
5. Outdoor air damper
6. Condenser coil
7. Dual supply air fans
8. Hot water coil. Optional electric or steam coil available
9. Electrical box / controls enclosure
10. Filters
11. Return air damper
12. Compressor
13. Dual condenser fans
14. Ceiling tile
15. Top extension / duct shroud to suit ceiling height (optional). Dimension “H” is variable
16. Coil access panel, removable
17. Filter access panel, hinged
18. Removable access panel
19. Heavy duty return air grille

Self-Contained Unit Ventilator

Models VLC 48, VLC 60

BLOW THROUGH CONFIGURATION (Hydronic Heating With Self-Contained DX Cooling)



S.A.	Supply Air	O.A.	Outdoor Air	C.E.	Condenser Exhaust Air
R.A.	Return Air	C.A.	Condenser Intake Air		

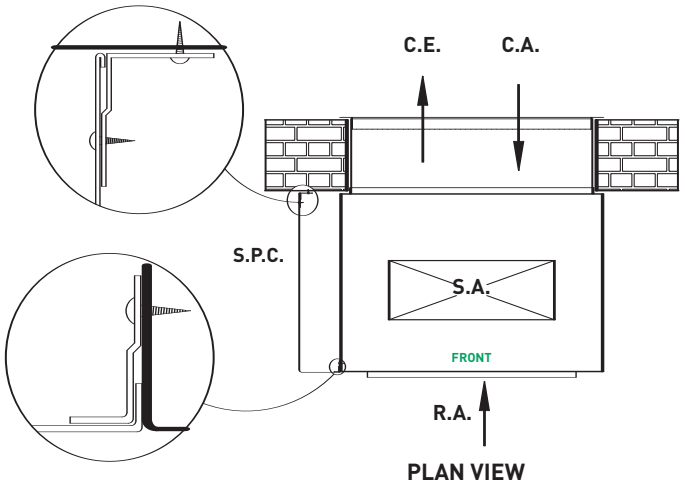
1. Hot water coil. Optional electric or steam coil available.
2. DX cooling coil
3. Drain pan
4. Dual supply air fans
5. Outdoor air damper
6. Condenser coil
7. Supply air grilles (double deflection)
8. Electrical box / controls enclosure
9. Mixed air damper actuator
10. Filters
11. Return air damper
12. Compressor
13. Dual condenser fans
14. Ceiling tile
15. Top extension to suit ceiling height (optional). Dimension "H" is variable
16. Coil access panel (removable) with front double deflection grille
17. Filter access panel, hinged
18. Removable access panel
19. Heavy duty return air grille

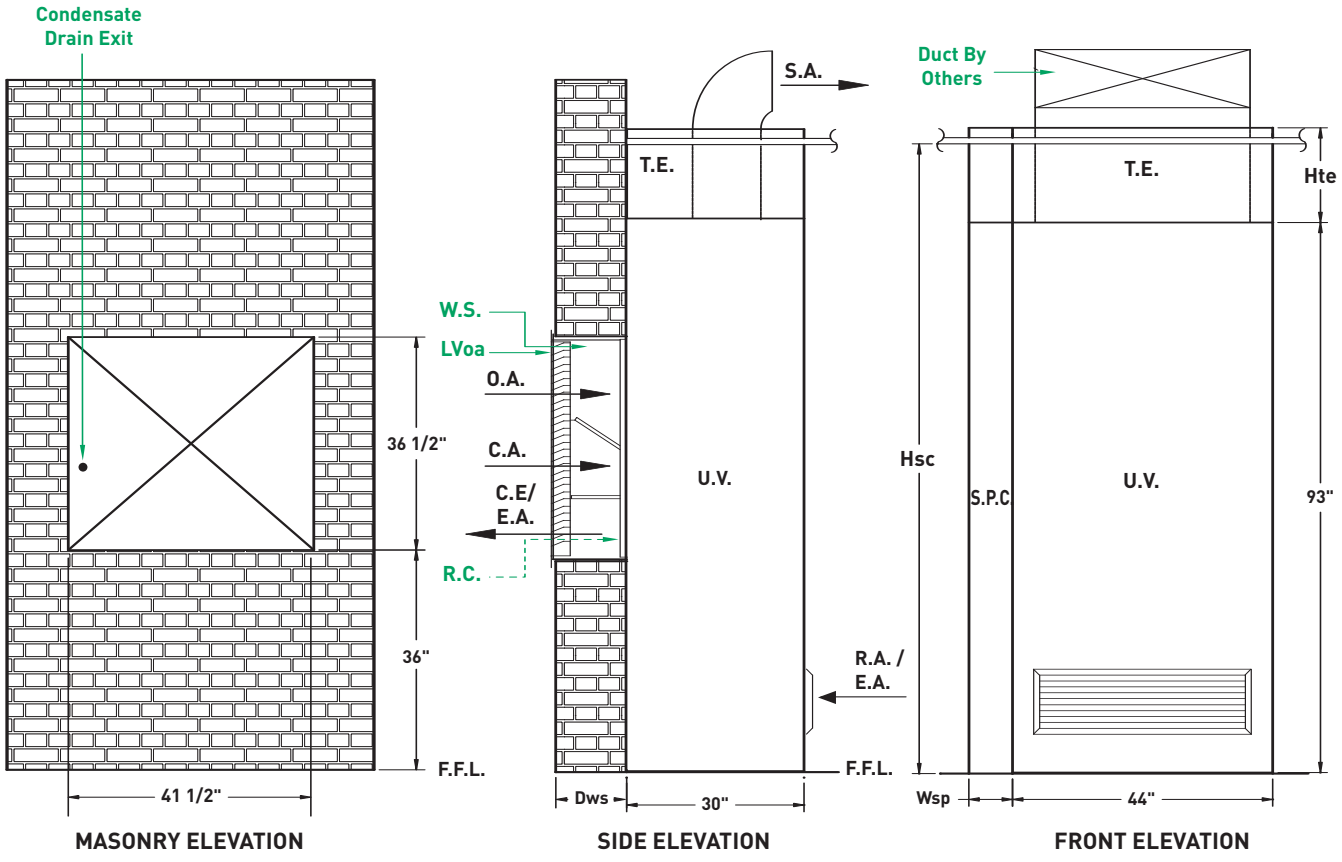
Application Layout
Models VHC 30/36/48/60

DUCTED CONFIGURATION

Not To Scale

U.V.	Unit ventilator
T.E.	Top extension/duct shroud (optional)
Hte	Height of top extension
S.P.C.	Side pipe cover (optional)
Wsp	Width of side pipe cover
LVoa	Outdoor air louver
W.S.	Wall sleeve with internal separators and pitched bottom
Dws	Depth of wall sleeve
R.C.	Rear 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
C.A.	Condenser air intake
C.E.	Condenser air exhaust
E.A.	Room exhaust air





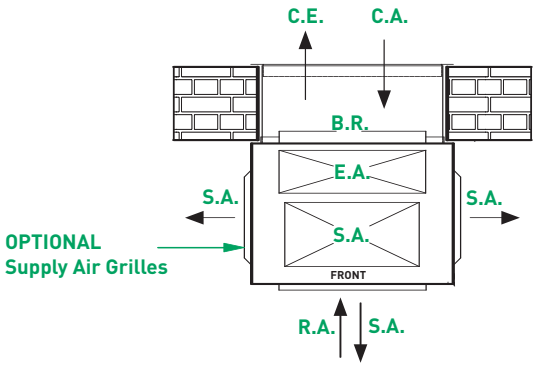
Application Layout
Models VLC 24/30/36

DUCTED / FREE BLOW CONFIGURATION

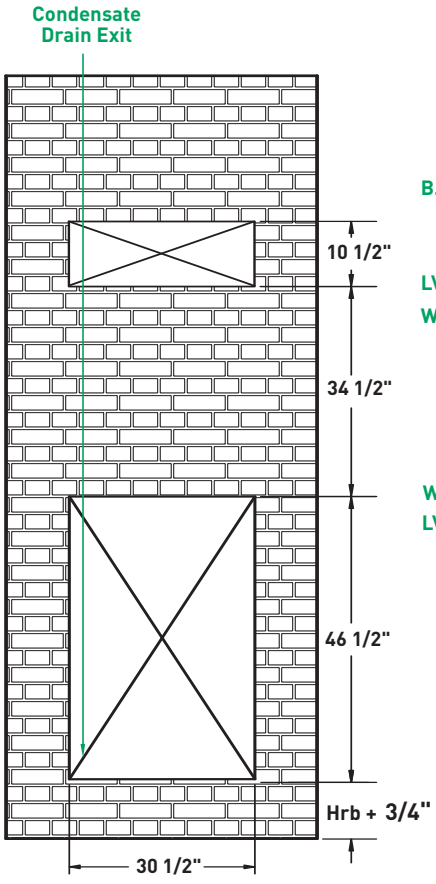
Not To Scale

U.V.	Unit ventilator
T.E.	Top extension/duct shroud (optional)
Hte	Height of top extension
R.B.	Raised base (optional)
Hrb	Height of raised base
LVoa	Outdoor air louver
LVea	Relief air louver (optional)
W.S.	Wall sleeve with internal separators and pitched bottom
Dws	Depth of wall sleeve
R.C.	Rear collar
B.R.	Barometric relief damper (optional)
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

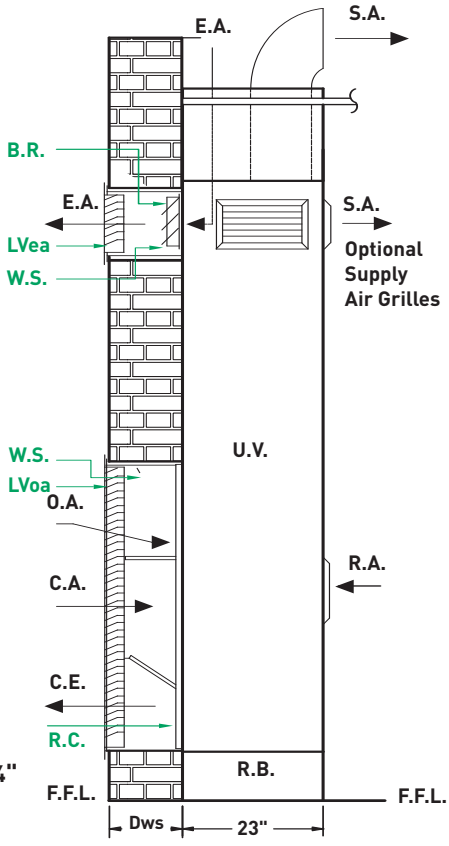
O.A.	Outdoor air intake
C.A.	Condenser air intake
C.E.	Condenser air exhaust
E.A.	Room exhaust air



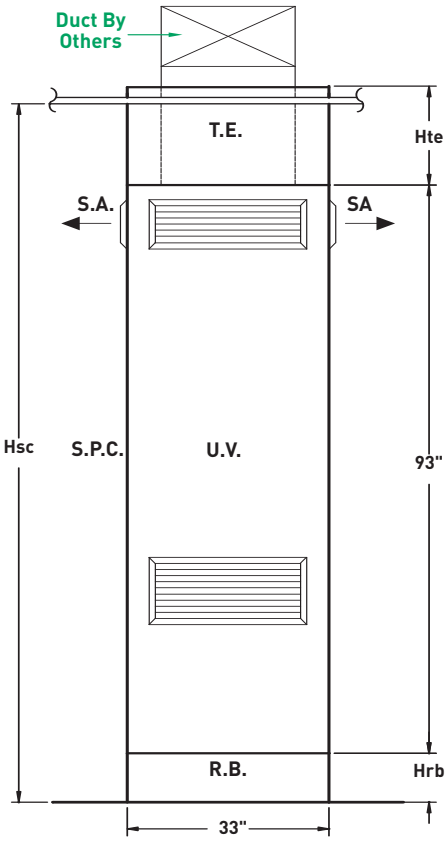
PLAN VIEW



MASONRY ELEVATION



SIDE ELEVATION



FRONT ELEVATION

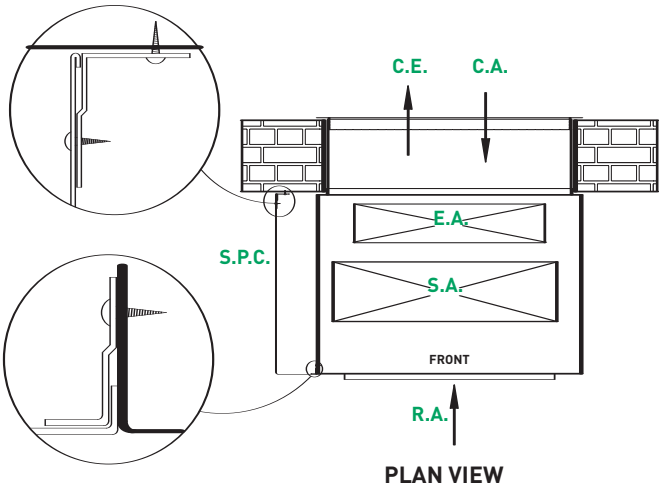
Application Layout
Models VLC 48/60

DUCTED CONFIGURATION

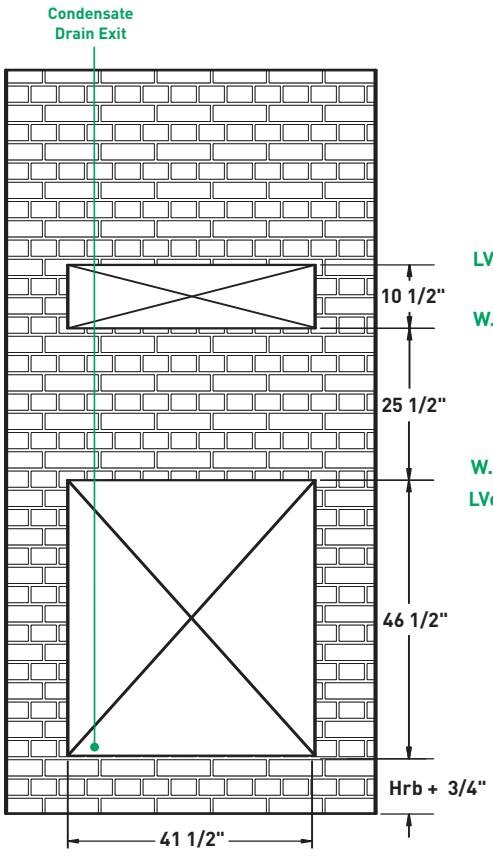
Not To Scale

U.V.	Unit ventilator
T.E.	Top extension/duct shroud (optional)
Hte	Height of top extension
R.B.	Raised base (optional)
Hrb	Height of raised base
S.P.C.	Side pipe cover (optional)
Wsp	Width of side pipe cover
LVoa	Outdoor air louver
LVea	Relief air louver (optional)
W.S.	Wall sleeve with internal separators and pitched bottom
Dws	Depth of wall sleeve
R.C.	Rear collar
B.R.	Barometric relief damper (optional)
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

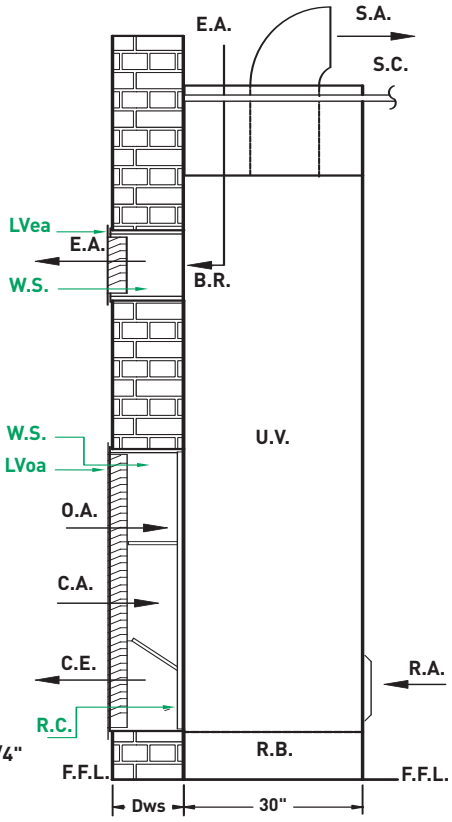
O.A.	Outdoor air intake
C.A.	Condenser air intake
C.E.	Condenser air exhaust
E.A.	Room exhaust air (barometric relief)



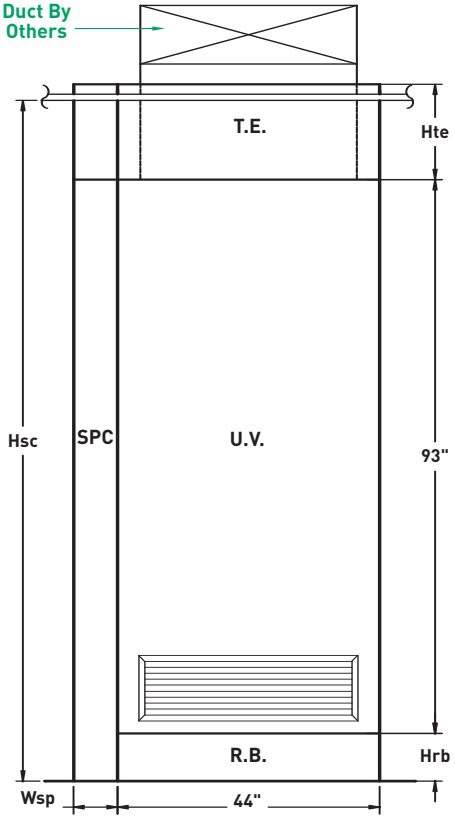
PLAN VIEW



MASONRY ELEVATION



SIDE ELEVATION



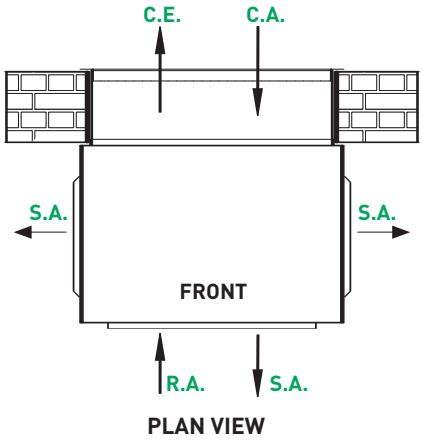
FRONT ELEVATION

Application Layout
Models VLC 48/60

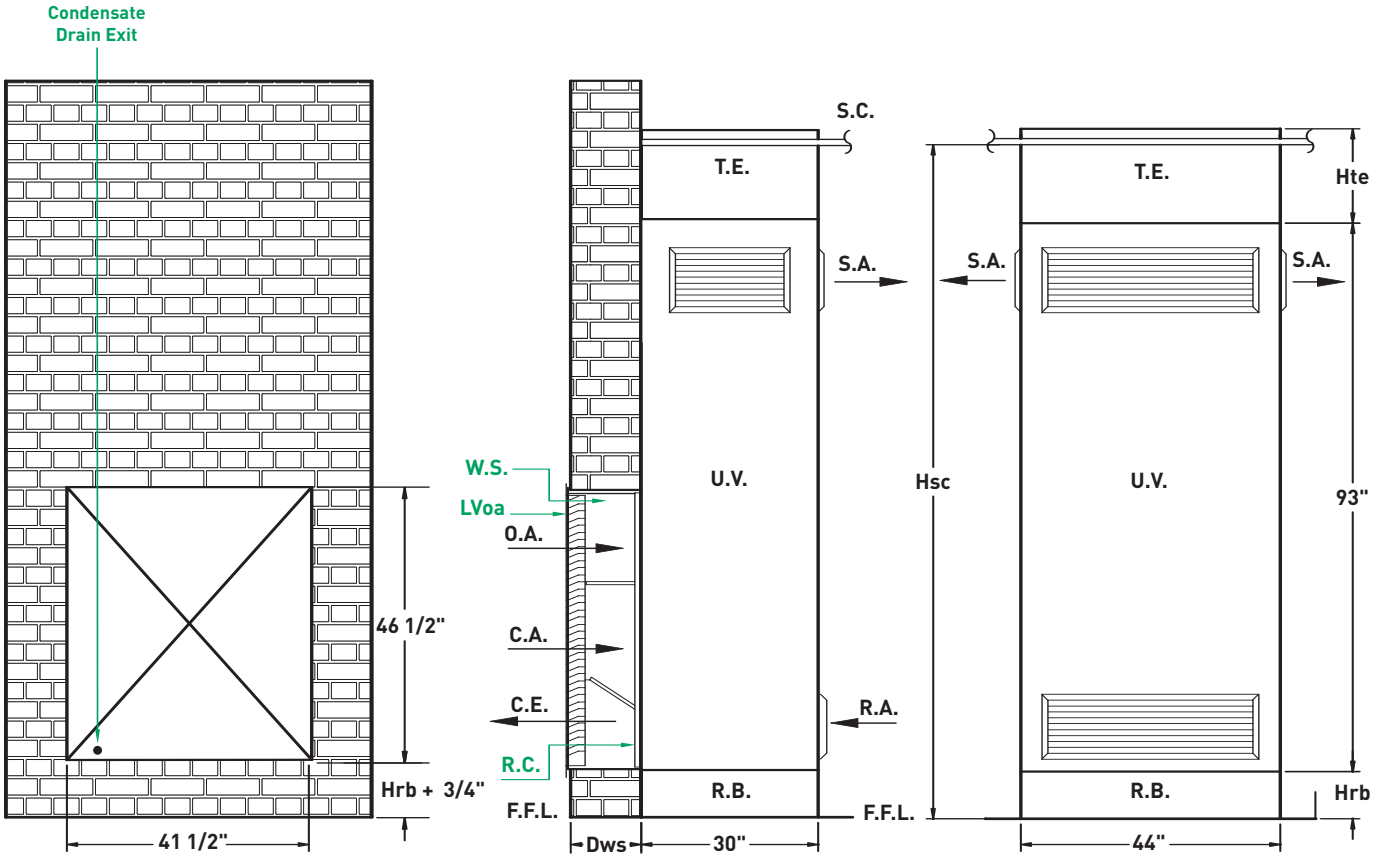
FREEBLOW CONFIGURATION

Not To Scale

U.V.	Unit ventilator
T.E.	Top extension/duct shroud (optional)
Hte	Height of top extension
R.B.	Raised base (optional)
Hrb	Height of raised base
LVoa	Outdoor air louver
W.S.	Wall sleeve with internal separators and pitched bottom
Dws	Depth of wall sleeve
R.C.	Rear 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
C.A.	Condenser air intake
C.E.	Condenser air exhaust



PLAN VIEW



MASONRY ELEVATION | SIDE ELEVATION | FRONT ELEVATION

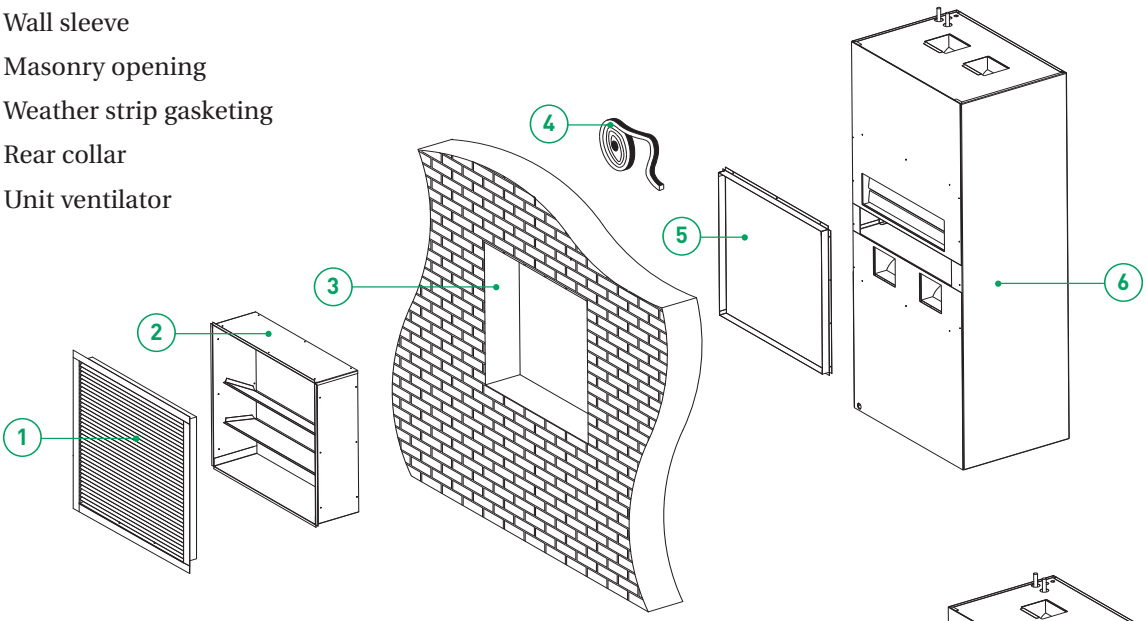
Wall Sleeve / Louver Installation

Models VHC 30/36/48/60

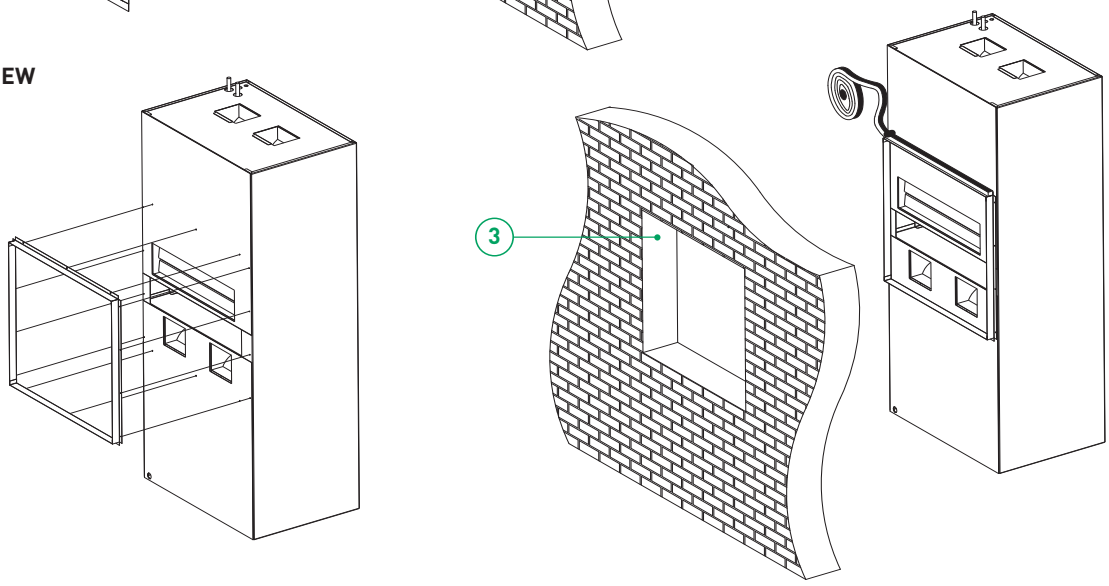
SELF-CONTAINED UNIT VENTILATOR

Installation screws & caulk not provided.

1. Steel louver
2. Wall sleeve
3. Masonry opening
4. Weather strip gasketing
5. Rear collar
6. Unit ventilator



EXPLODED VIEW



STEP 1

Attach the 2" deep collar to the back of the unit ventilator using the pre-drilled holes. The purpose of the collar is to provide an attachment for the wall sleeve.

STEP 2

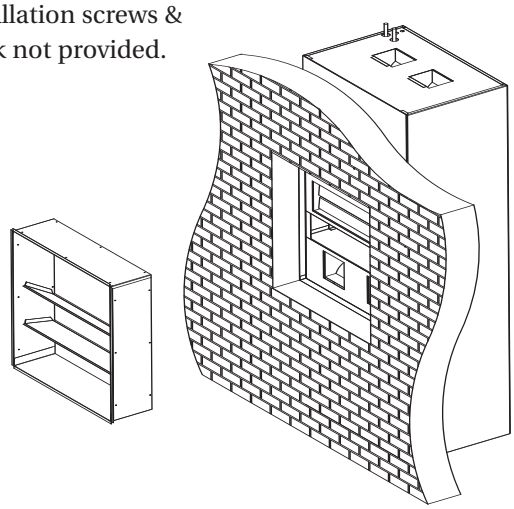
Apply self-adhesive 1" square foam weather strip around the outside of the collar. This is to prevent outdoor air leakage into the room from around the perimeter of the wall opening. Push the unit ventilator into position, with the collar penetrating the wall opening, compressing the foam strip. Plumb the unit using shims, if necessary.

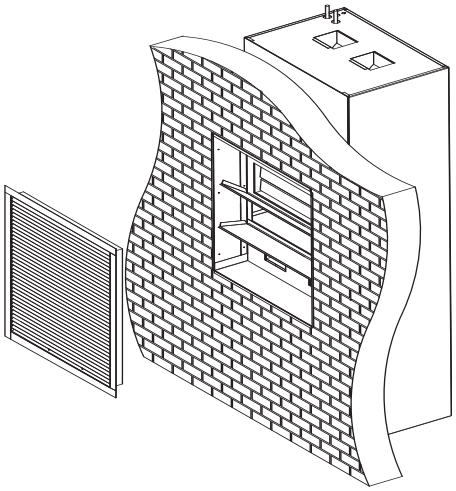
Wall Sleeve / Louver Installation

Models VHC 30/36/48/60

SELF-CONTAINED UNIT VENTILATOR

Installation screws & caulk not provided.



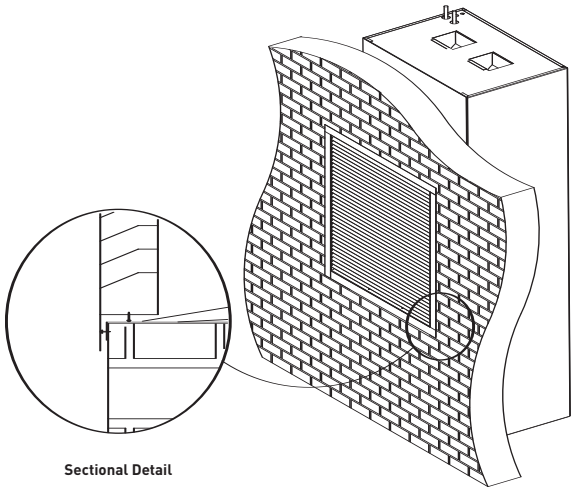


STEP 3

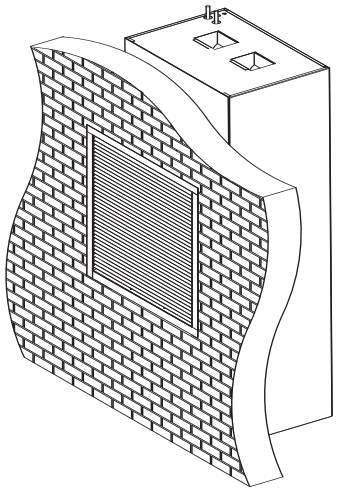
Insert the wall sleeve into wall opening from outside the building. The sleeve is an inside fit into the rear collar. The sloping bottom of the sleeve extends to the back panel of the unit ventilator. Using the pre-drilled holes, secure the sleeve into the side walls of the collar (NOT BOTTOM). Secure the sloping bottom to inside of unit ventilator, using sheet metal screws. Caulk all joints.

STEP 4

Position and clamp condensate tube to side wall sleeve by prying out two 1/2" slots, inserting tie-wrap and closing it around tube so that the tube end is positioned beyond the face of the louver or onto the sloping bottom of the wall sleeve.



Sectional Detail



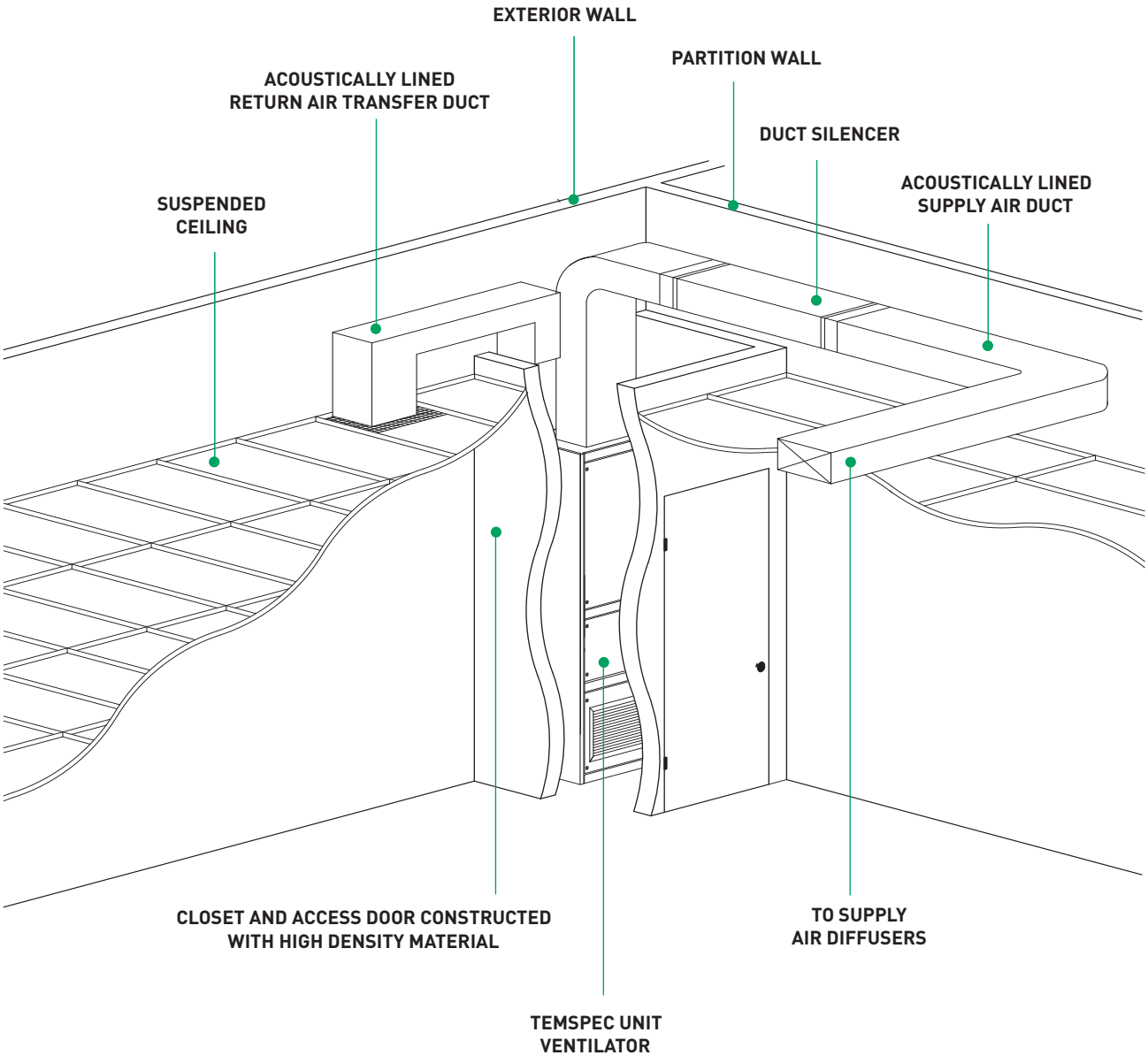
STEP 5

Fit louver into wall sleeve and secure to wall. If necessary, use spacers under the louver to allow proper drainage of condensate out of the wall sleeve. Attach spacer between louver flange and wall, to allow condensate to drain out.

STEP 6

Caulk the top horizontal edge of the louver and the two vertical edges **but not the bottom horizontal flange**.

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.

Cooling Capacities

VHC SERIES

Model no.	c.f.m.	OAT	EAT					
			75DB/63WB			80DB/67WB		
			Total	Sens.	LAT	Total	Sens.	LAT
VHC 30	900	95	29.1	21.2	54/52	33.0	22.5	57/55
		105	28.4	20.6	54/52	30.5	21.3	58/56
VHC 36	1100	95	32.1	23.8	55/51	36.0	25.2	58/56
		105	31.6	23.4	56/52	33.4	24.0	59/57
VHC 48	1400	95	45.4	33.4	54/52	48.7	34.5	57/55
		105	42.1	31.9	55/53	46.2	33.5	58/56
VHC 60	1600	95	52.7	39.5	53/52	56.8	41.0	56/55
		105	48.5	37.7	54/53	53.6	39.7	57/56

VLC SERIES

Model no.	c.f.m.	OAT	EAT					
			75DB/63WB			80DB/67WB		
			Total	Sens.	LAT	Total	Sens.	LAT
VLC 24	900	95	25	18	57 / 53	27	19	61 / 58
		105	24	17	58 / 54	26	18	62 / 58
VLC 30	1100	95	29	21	57 / 54	31	22	62 / 58
		105	28	20	58 / 54	30	21	62 / 58
VLC 36	1100	95	33	23	56 / 53	35	23	60 / 57
		105	32	22	57 / 54	34	23	61 / 58
VLC 48	1400	95	47	34	53 / 52	50	35	57 / 55
		105	45	33	54 / 52	48	34	57 / 56
VLC 60	1600	95	55	40	53 / 52	58	42	56 / 55
		105	52	39	53 / 52	55	40	57 / 56

Capacities for Optional Hot Gas Reheat Coil

VHC SERIES

Model	c.f.m.	53 EAT	
		Reheat capacity	LAT
VHC 30	900	20.6	73/60
VHC 36	1100	23.8	72/59
VHC 48	1400	28.0	71/59
VHC 60	1600	30.6	70/59

VLC SERIES Hot Gas Reheat: Not Offered

HOT GAS REHEAT MODE

53° F is the approximate leaving air temperature off the evaporator coil in sub cooling mode when the humidistat is over-riding the thermostatic control of the compressor.

EAT	entering air temperature at the coil °F
LAT	leaving air temperature at the coil °F
OAT	outdoor air temperature (EAT at the condenser coil) in ° F

Capacities are for a suction temperature of 45°F at the evaporator coil.

Total cooling, sensible cooling and hot gas reheat capacities are in MBtuh.

CORRECTION FOR ALTITUDE:

Please call the factory.

Hot Water Heating Capacities

VHC SERIES

Model no.	Coil type	c.f.m.	g.p.m.	WPD	40°F EAT, 180°F EWT		
					MBtuh	LAT	LWT
VHC 30	Standard	900	3.0	1.7	54	95	143
			4.0	2.8	56	98	151
			5.0	4.1	58	99	156
			6.0	5.6	59	101	160
VHC 36	Standard	1100	3.0	1.7	60	91	139
			4.0	2.8	63	93	148
			5.0	4.1	65	95	153
			6.0	5.6	67	96	157
VHC 48	Standard	1400	4.0	2.8	70	90	144
			5.0	4.1	72	91	150
			6.0	5.6	74	93	155
			7.0	7.3	75	94	158
VHC 60	Standard	1600	4.0	2.8	75	86	142
			5.0	4.1	78	88	148
			6.0	5.6	80	90	153
			7.0	7.3	82	91	156

VLC SERIES

Model no.	Coil type	c.f.m.	g.p.m.	WPD	40°F EAT, 180°F EWT		
					MBtuh	LAT	LWT
VLC 24	Medium capacity	900	2.0	0.4	37	78	142
			2.5	0.6	39	80	148
			3.0	0.8	41	82	152
			3.5	1.1	42	83	156
			4.0	1.4	43	84	158
VLC 24	High capacity	900	3.0	1.8	58	100	140
			4.0	2.9	61	103	149
			5.0	4.2	63	105	154
			6.0	5.8	65	106	158
			7.0	7.5	66	108	161
VLC 30/36	Medium capacity	1100	3.0	0.8	45	78	149
			3.5	1.1	46	79	153
			4.0	1.4	47	80	156
			4.5	1.7	48	81	158
			5.0	2.0	49	82	160
VLC 30/36	High capacity	1100	4.0	2.9	69	98	145
			5.0	4.2	71	100	151
			6.0	5.8	73	102	155
			7.0	7.5	74	103	158
VLC 48	Standard	1400	4.0	2.1	62	84	148
			5.0	3.1	64	86	154
			6.0	4.3	66	87	158
			7.0	5.6	67	88	160
VLC 60	Standard	1600	4.0	2.1	67	81	146
			5.0	3.1	69	83	152
			6.0	4.3	71	84	156
			7.0	5.6	73	85	159

EAT	Entering air temperature at the coil in °F
LAT	Leaving air temperature at the coil in °F
EWT	Entering water temperature in °F
LWT	Leaving water temperature in °F
WPD	Water pressure drop across the coil in ft. of water
c.f.m.	Air flow in cubic ft. per min. at 14.7 p.s.i. barometric pressure

For capacities different from 40°F EAT with 180°F EWT, multiply the capacity shown in the above chart by the correction factor from the chart below.

After using the correction factor the following may be calculated:

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

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

CORRECTION FACTORS

EWT	EAT				
	20	30	40	50	60
120	0.70	0.63	0.56	0.49	0.42
140	0.85	0.78	0.71	0.64	0.57
160	0.99	0.92	0.85	0.78	0.71
180	1.14	1.07	1.00	0.93	0.86
200	1.29	1.22	1.15	1.08	1.00

CORRECTION FOR ALTITUDE AND THE ADDITION OF GLYCOL:

Please call the factory.

Steam Heating Capacities

VHC SERIES

Model no.	c.f.m.	Steam p.s.i.g.	40°F EAT	
			MBtuh	LAT
VHC 30	900	2	75	117
		5	79	121
VHC 36	1100	2	83	110
		5	87	113
VHC 48	1400	2	89	104
		5	93	107
VHC 60	1600	2	95	99
		5	100	102

VLC SERIES

Model no.	c.f.m.	Steam p.s.i.g.	40°F EAT	
			MBtuh	LAT
VLC 24	900	2	66	108
		5	69	111
VLC 30/36	1100	2	72	101
		5	76	104
VLC 48	1400	2	107	116
		5	112	120
VLC 60	1600	2	115	111
		5	120	114

EAT	Entering air temperature at the coil in °F
LAT	Leaving air temperature at the coil in °F
c.f.m.	Air flow in cubic ft. per min. at 14.7 p.s.i. barometric pressure

For capacities different from 40°F EAT multiply the capacity shown in the above chart by the correction factor from the chart below.

After using the correction factor the following may be calculated:

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

CORRECTION FACTORS

EAT				
20	30	40	50	60
1.11	1.06	1.00	0.94	0.89

CORRECTION FOR ALTITUDE:

Please call the factory.

Electrical Data for Electric Heaters

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 the maximum current in any one conductor.

Units with electric heaters have an internal fuse to protect the wiring to the compressor. The fuse is rated in accordance with the MOCP data on the page in this catalog entitled "Electrical data for the compressor, condenser fan motors and supply air fan motors".

A remote circuit breaker should be provided, rated in accordance with the MCA calculated as shown below:

MCA	Minimum circuit ampacity
RLA	Running load Amps

MCA = (1.25 X Compressor RLA) + (1.25 X Electric heater Amps) + Total RLA of fan motors

Electric heater Amps are shown on this page.

Compressor RLA and fan motor RLA are shown on the page in this catalog entitled "Electrical data for the compressor, condenser fan motors and supply air fan motors".

Fan Motor H.P.

CONDENSER FAN MOTORS

Model	208V			277V			460V		
	h.p.	speed	Amps	h.p.	speed	Amps	h.p.	speed	Amps
VHC 30	2 x 1/3	med	4.4	2 x 1/3	med	3.8	2 x 1/3	med	2.4
VHC 36	2 x 1/3	med	4.4	2 x 1/3	med	3.8	2 x 1/3	med	2.4
VHC 48	2 x 1/3	high	4.4	2 x 1/3	high	3.8	2 x 1/3	high	2.4
VHC 60	2 x 1/3	high	4.4	2 x 1/3	high	3.8	2 x 1/3	high	2.4
VLC 24	1/2	med	3.1	1/2	med	2.5	1/2	low	1.9
VLC 30	1/2	high	3.1	1/2	high	2.5	1/2	high	1.9
VLC 36	3/4	med	4.6	3/4	med	3.9	3/4	low	2.2
VLC 48	2 x 1/3	med	4.4	2 x 1/3	med	3.8	2 x 1/3	low	2.4
VLC 60	2 x 1/3	med	4.4	2 x 1/3	med	3.8	2 x 1/3	low	2.4

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

Model	S.A. c.f.m.	208V			277V			460V		
		h.p.	speed	Amps	h.p.	speed	Amps	h.p.	speed	Amps
VLC 24	900	2 x 1/4	low	3.6	2 x 1/4	low	3.2	2 x 1/3	low	2.4
VLC 30/36	1100	2 x 1/4	med	3.6	2 x 1/4	med	3.2	2 x 1/3	low	2.4
VLC 48	1400	2 x 1/3	low	5.2	2 x 1/3	low	5.4	2 x 1/3	low	2.4
VLC 60	1660	2 x 1/3	med	5.2	2 x 1/3	med	5.4	2 x 1/3	low	2.4

SUPPLY AIR FAN MOTORS - UNITS WITH DUCTED SUPPLY AIR

Model	S.A. c.f.m. Note 1	208V			277V			460V		
		h.p.	speed	Amps	h.p.	speed	Amps	h.p.	speed	Amps
VHC 30	900	1/2	low	3.2	1/3	med	2.7	1/3	low	1.2
VHC 36	1100	1/2	med	3.2	1/3	high	2.7	1/3	high	1.2
VHC 48	1400	2 x 1/3	med	5.2	2 x 1/4	med	3.2	2 x 1/4	low	1.6
VHC 60	1600	2 x 1/3	high	5.2	2 x 1/4	high	3.2	2 x 1/4	high	1.6
VLC 24	900	2 x 1/3	low	5.2	2 x 1/3	low	5.4	2 x 1/3	low	2.4
VLC 30/36	1100	2 x 1/3	high	5.2	2 x 1/3	high	5.4	2 x 1/3	high	2.4
VLC 48	1400	2 x 1/3	low	5.2	2 x 1/4	med	3.2	2 x 1/3	low	2.4
VLC 60	1600	2 x 1/3	med	5.2	2 x 1/4	high	3.2	2 x 1/3	low	2.4

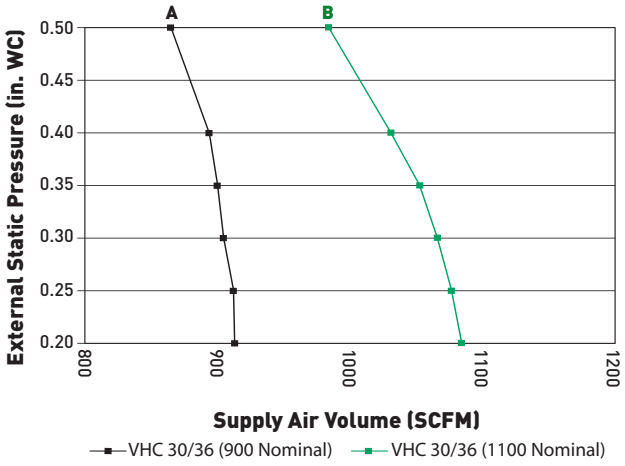
NOTES

1. c.f.m. is at 0.2" external static pressure for ducted units in the above chart.
2. For ducted units refer to the curves of c.f.m. versus external static pressure in this catalog.
3. All fan motors are single phase, 60Hz, P.S.C. type.
4. Where two motors are used (dual fans), Amp data is for the total of two motors.

Performance Curves for Ducted Units

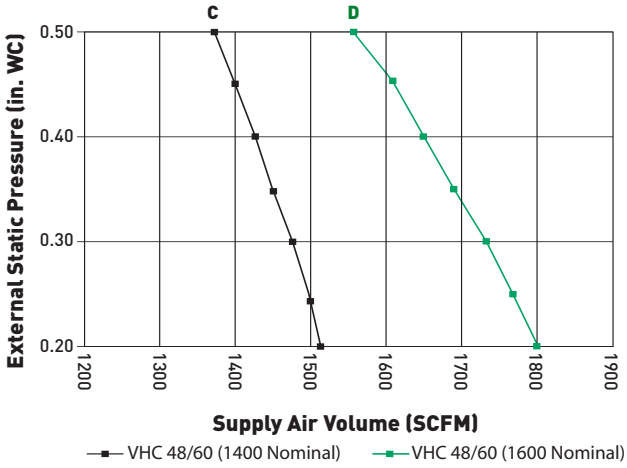
VHC 30/36

UNIT WITH SINGLE SUPPLY AIR BLOWER (208 V)



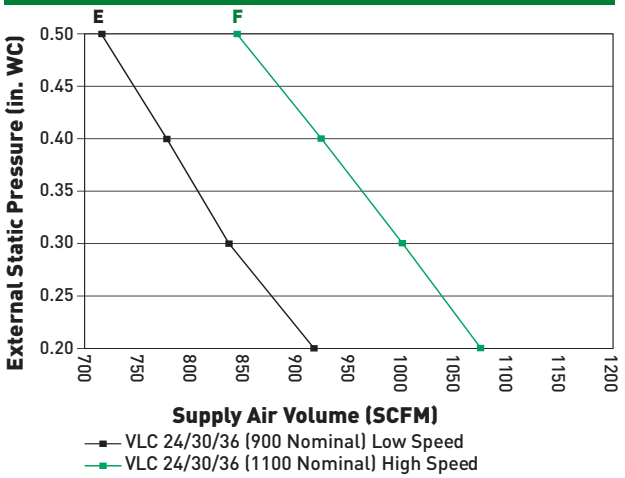
VHC 48/60

UNIT WITH TWO SUPPLY AIR BLOWERS (208 V)



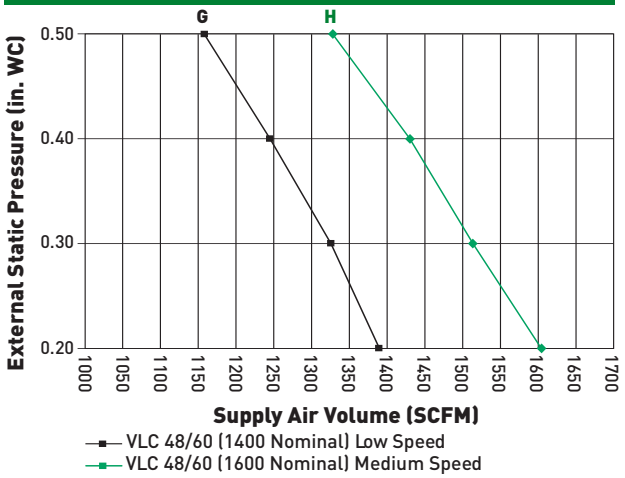
VLC 24/30/36

UNIT WITH TWO SUPPLY AIR BLOWERS (208 V)



VLC 48/60

UNIT WITH TWO SUPPLY AIR BLOWERS (208 V)



The following test conditions apply:

- The supply air is ducted off the top of the unit.
- Fan motors are 208V/1/60, 1075 r.p.m. synchronous speed, P.S.C. type.
- Fans are centrifugal, direct drive, double inlet with forward curved impeller.
- 1" filters are clean.

Fan curve	Model	Supply air fan motor H.P.	Speed	Supply air fan size
A	VHC 30	1/2	low	BCT 10080
B	VHC 36	1/2	med	BCT 10080
C	VHC 48	2 x 1/3	med	2 x BCT 10060
D	VHC 60	2 x 1/3	high	2 x BCT 10060
E	VLC 24	2 x 1/3	low	2 x BCT 10060
F	VLC 30/36	2 x 1/3	high	2 x BCT 10060
G	VLC 48	2 x 1/3	low	2 x BCT 10060
H	VLC 60	2 x 1/3	med	2 x BCT 10060

Electrical Data for the Compressor, Condenser Fan Motors and Supply Air Fan Motors

VHC SERIES

Model no.	Supply Voltage	Compressor		Fan motors total RLA	MCA	MOCP
		RLA	LRA			
VHC 30	208-230V/1/60	18.40	95.0	7.6	30.6	40
VHC 36	208-230V/1/60	20.00	104.0	7.6	32.6	45
VHC 48	208-230V/1/60	28.00	148.0	9.6	44.6	60
VHC 60	208-230V/1/60	32.10	148.0	9.6	49.7	70
VHC 30	208-230V/3/60	11.40	77.0	7.6	21.9	30
VHC 36	208-230V/3/60	13.90	88.0	7.6	25.0	35
VHC 48	208-230V/3/60	19.30	123.0	9.6	33.7	50
VHC 60	208-230V/3/60	19.30	137.0	9.6	33.7	50
VHC 30	460V/3/60 + N	5.70	39.0	6.5	10.9	15
VHC 36	460V/3/60 + N	6.42	44.0	6.5	11.8	15
VHC 48	460V/3/60 + N	7.50	49.5	7.0	13.2	20
VHC 60	460V/3/60 + N	9.10	62.0	7.0	15.2	20
VHC 30	460V/3/60	5.70	39.0	3.6	10.7	15
VHC 36	460V/3/60	6.42	44.0	3.6	11.6	15
VHC 48	460V/3/60	7.50	49.5	4.0	13.4	20
VHC 60	460V/3/60	9.10	62.0	4.0	15.4	20

VLC SERIES

Model no.	Supply Voltage	Compressor		Fan motors total RLA	MCA	MOCP
		RLA	LRA			
VLC 24	208-230V/1/60	15.00	73.0	8.3	27.1	40
VLC 30	208-230V/1/60	18.40	95.0	8.3	31.3	45
VLC 36	208-230V/1/60	20.00	104.0	9.8	34.8	50
VLC 48	208-230V/1/60	28.00	148.0	14.0	49.0	70
VLC 60	208-230V/1/60	32.10	148.0	14.0	54.1	80
VLC 24	208-230V/3/60	10.70	63.0	8.3	21.7	30
VLC 30	208-230V/3/60	11.40	77.0	8.3	22.6	30
VLC 36	208-230V/3/60	13.90	88.0	9.8	27.2	40
VLC 48	208-230V/3/60	19.30	123.0	14.0	38.1	55
VLC 60	208-230V/3/60	19.30	137.0	14.0	38.1	55
VLC 24	460V/3/60 + N	5.00	31.0	7.9	11.7	15
VLC 30	460V/3/60 + N	5.70	39.0	7.9	12.5	20
VLC 36	460V/3/60 + N	6.42	44.0	9.3	13.4	20
VLC 48	460V/3/60 + N	7.50	49.5	10.8	17.0	25
VLC 60	460V/3/60 + N	9.10	62.0	10.8	19.0	25
VLC 24	460V/3/60	5.00	31.0	6.7	13.0	20
VLC 30	460V/3/60	5.70	39.0	6.7	13.8	20
VLC 36	460V/3/60	6.42	44.0	7.0	15.0	20
VLC 48	460V/3/60	7.50	49.5	9.6	19.0	25
VLC 60	460V/3/60	9.10	62.0	9.6	21.0	30

MCA	Minimum circuit ampacity = (1.25 x Compressor RLA) + (total fan motor RLA).
MOCP	Amp rating of maximum overcurrent protection device
RLA	Running load Amps of compressor.
LRA	Locked rotor Amps.
+N	Condenser and Supply air fans are 277/1/60 and Neutral is required.

Units with electric heaters have an internal fuse to protect the wiring to the compressor. The fuse is rated in accordance with the MOCP data on this page. A remote circuit breaker should be provided, rated in accordance with the MCA data on the page in this catalog entitled "Electrical Data for Electric Heaters".

Units with hot water or steam heating should have a remote circuit breaker provided, rated in accordance with the MOCP data on this page.

The fan motor total RLA in the chart is the total for supply air fan(s) and condenser fan motors.

All fan motors are single phase, 60Hz, PSC type.

Amp ratings for three phase power are the maximum current in any one conductor.

Sound Data, Weight, Filter Sizes

SOUND DATA

Model	Ducted or non ducted	Nominal c.f.m.	Sound pressure level at 6ft.	
			dBA	NC
VHC 30	Ducted	900	42	36
VHC 36	Ducted	1100	43	37
VHC 48	Ducted	1400	45	39
VHC 60	Ducted	1600	47	41
VLC 24	Ducted	900	52	46
VLC 30	Ducted	1100	54	48
VLC 36	Ducted	1100	54	48
VLC 48	Ducted	1400	52	46
VLC 60	Ducted	1600	54	48
VLC 24	Non ducted	900	54	48
VLC 30	Non ducted	1100	55	49
VLC 36	Non ducted	1100	55	49
VLC 48	Non ducted	1400	54	48
VLC 60	Non ducted	1600	56	51

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.
- The compressor is operating

WEIGHTS

Model	Approx. unit weight	Approx weight of wall louver
VHC 30	800 lbs.	70 lbs.
VHC 36	820 lbs.	70 lbs.
VHC 48	860 lbs.	70 lbs.
VHC 60	900 lbs.	70 lbs.
VLC 24	750 lbs.	55 lbs.
VLC 30	750 lbs.	55 lbs.
VLC 36	750 lbs.	55 lbs.
VLC 48	800 lbs.	70 lbs.
VLC 60	800 lbs.	70 lbs.

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

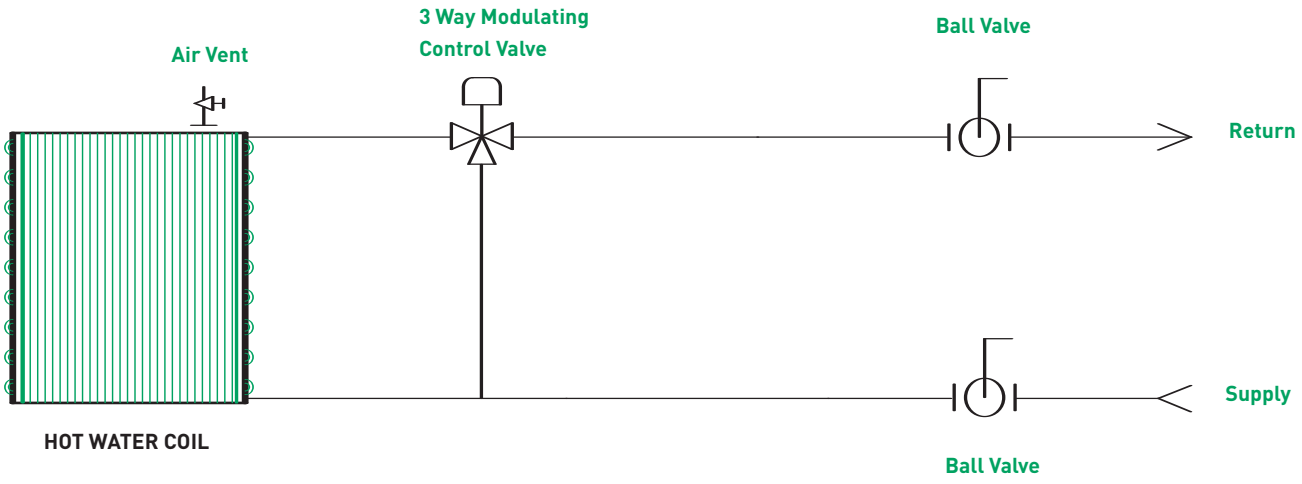
The louver weights are for Temspec heavy gauge steel louvers designed specifically for use with Temspec unit ventilators with self contained air conditioning.

FILTER SIZES

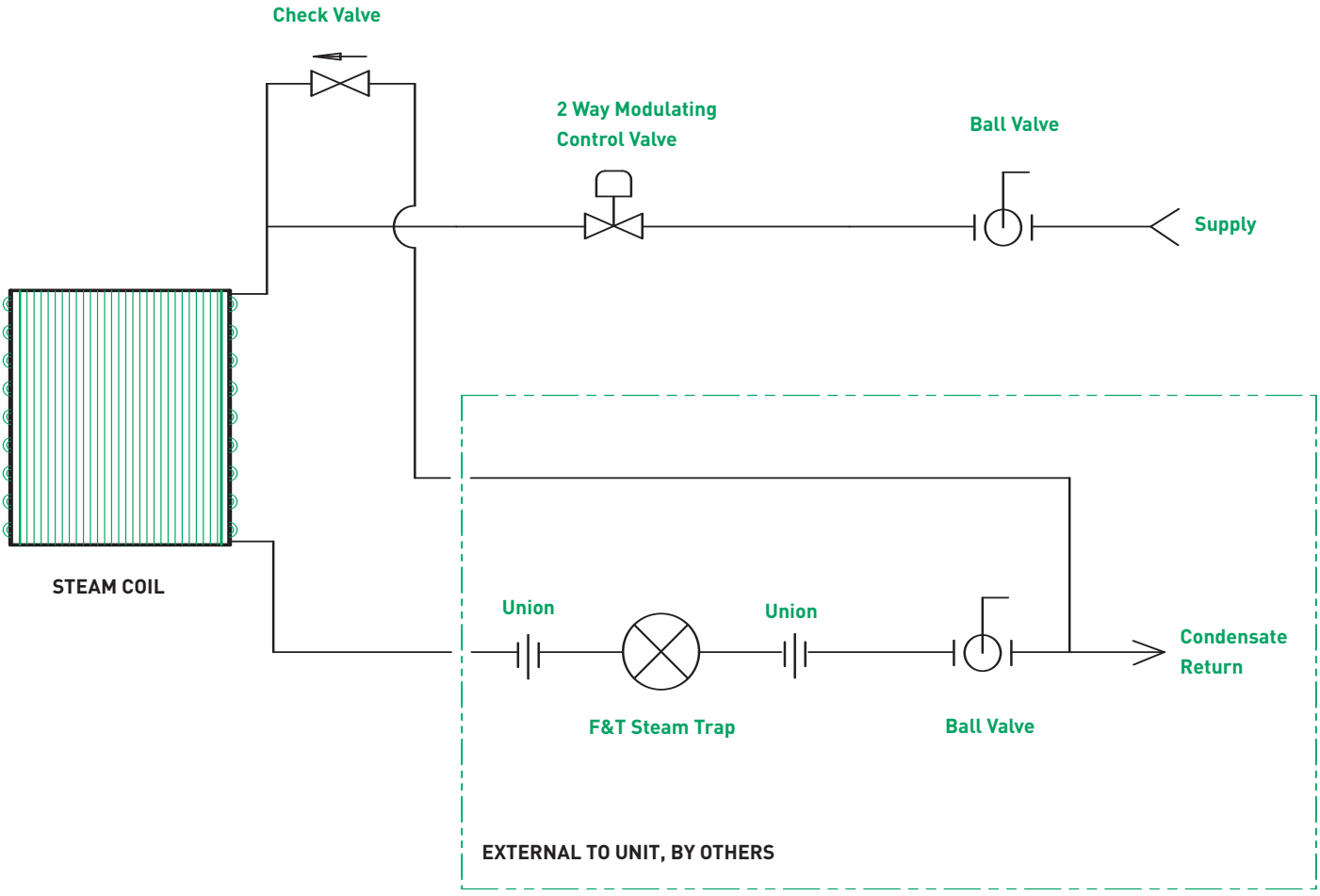
Model	Filter thickness	No. of filters	Type	Nominal size	Actual size	Part no. for standard filter
VHC 30/36/48/60	1"	2	Standard	20" x 25" x 1"	19.5" x 24.5" x 1"	FRX 20125
VHC 30/36/48/60	1"	2	Pleated	20" x 25" x 1"	19.25" x 24.25" x 0.75"	FPX 20125
VHC 30/36/48/60	2"	2	Pleated	20" x 25" x 2"	19.25" x 24.25" x 1.75"	FPX 20225
VLC 24/30/36	1"	1	Standard	20" x 24" x 1"	19.6" x 23.6" x 0.75"	FRX 20124
VLC 24/30/36	1"	1	Pleated	20" x 24" x 1"	19.4" x 23.6" x 0.75"	FPX 20124
VLC 24/30/36	2"	1	Pleated	20" x 24" x 2"	19.4" x 23.6" x 1.75"	FPX 20224
VLC 48/60	1"	2	Standard	16" x 24" x 1"	15.6" x 23.6" x 0.75"	FRX 16124
VLC 48/60	1"	2	Pleated	16" x 24" x 1"	15.4" x 23.4" x 0.75"	FPX 16124
VLC 48/60	2"	2	Pleated	16" x 24" x 2"	15.4" x 23.4" x 1.75"	FRX 16224

Outdoor and return air streams are filtered after mixing.

Typical Piping Package For Hot Water Coil

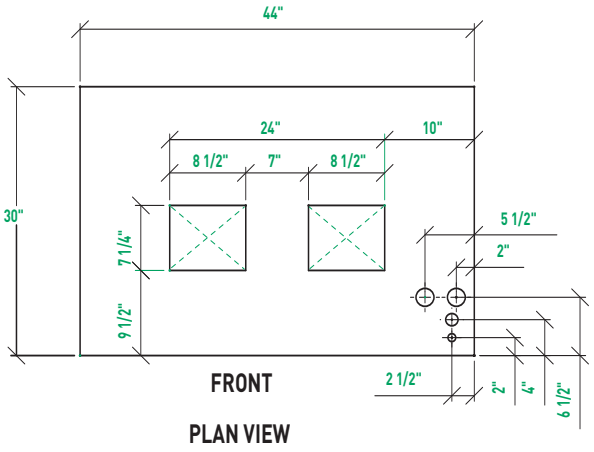


Typical Piping Package for Steam Coil

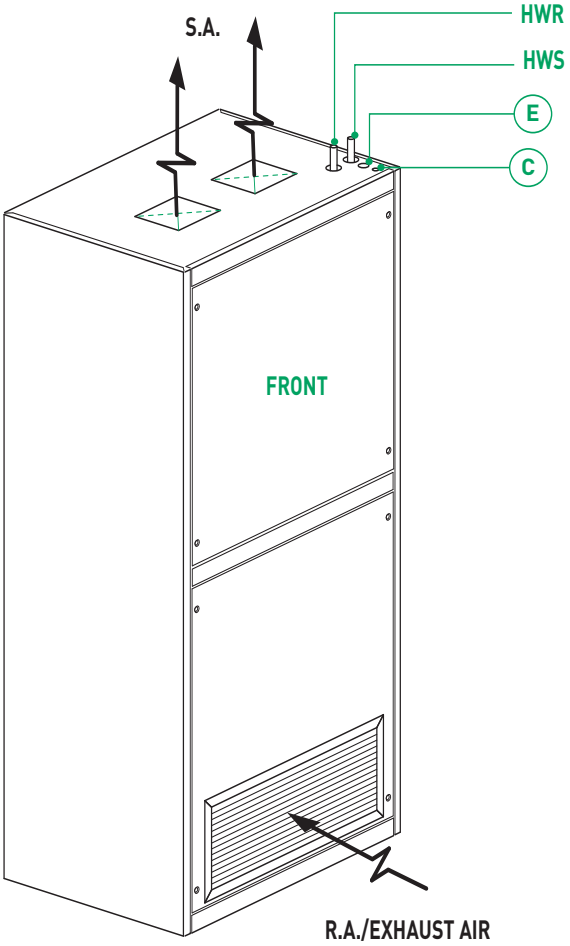


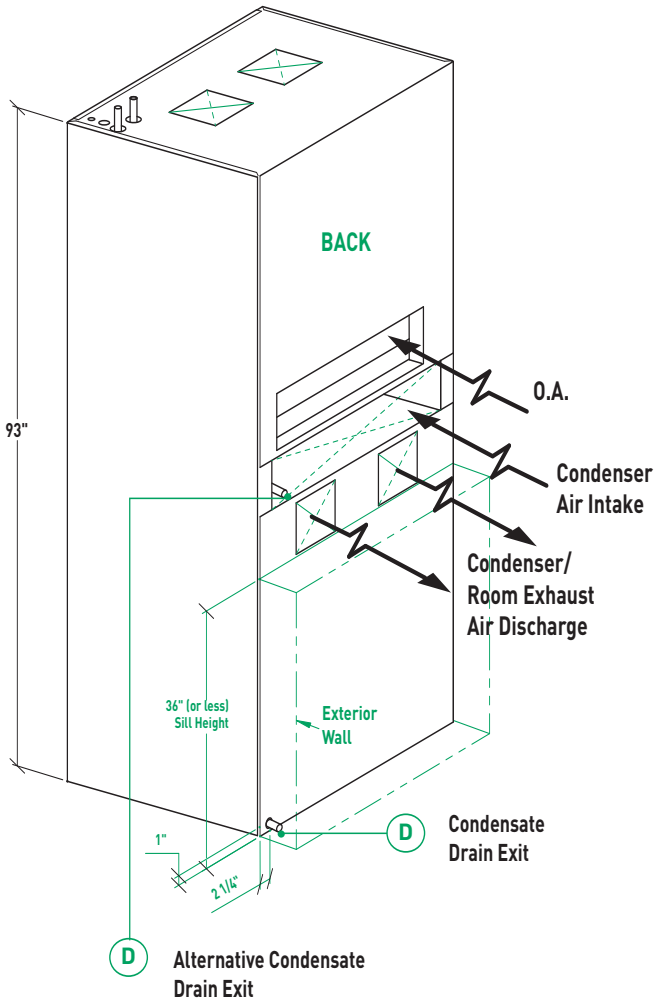
Utility Connection Locations

Models VHC 30/36/48/60



PLAN VIEW

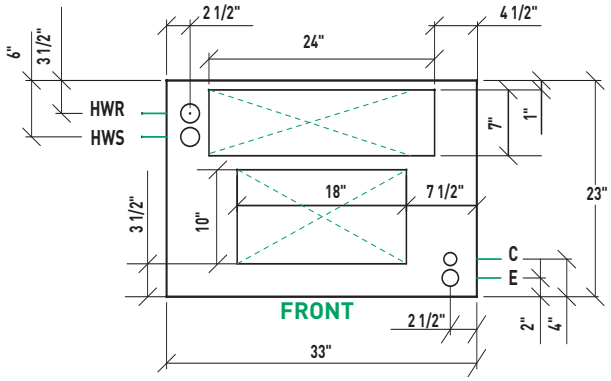




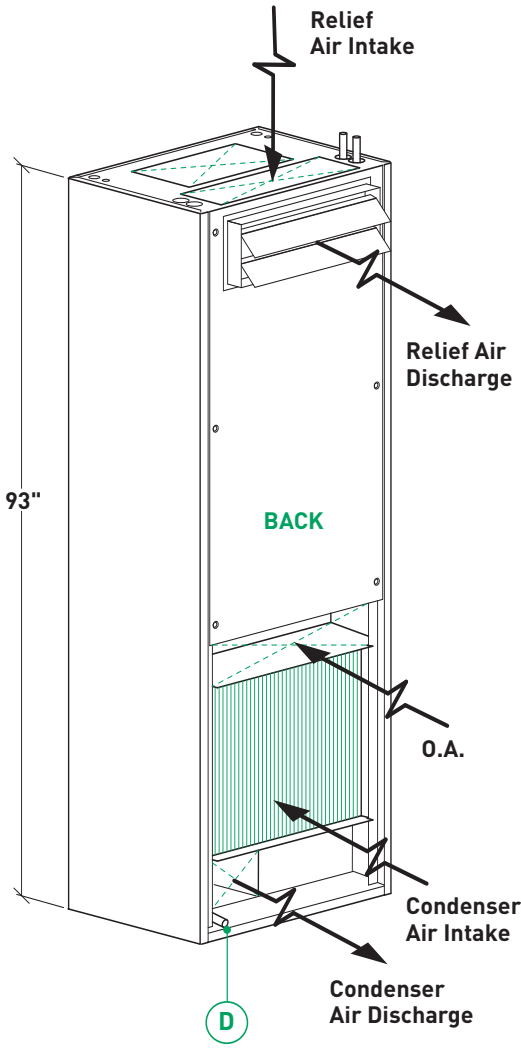
HWS	Hot Water Supply - 7/8" O.D. Sweat Connection
HWR	Hot Water Return - 7/8" O.D. Sweat Connection.
(C)	Entry Point for Control Cable
(D)	Exit Point of Condensate Drain Tube - 5/8" I.D. 7/8" O.D. Vinyl Tubing
(E)	Electrical Power Cable Entry Point

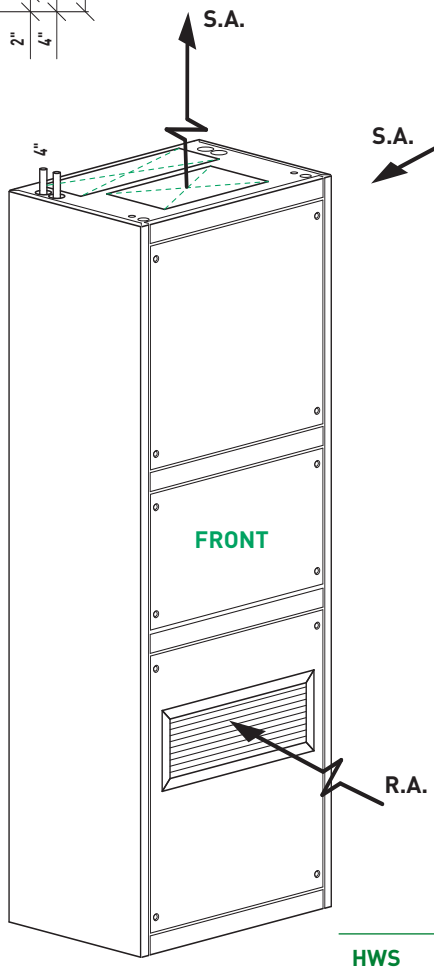
Utility Connection Locations

Models VLC 24/30/36 - ducted/non-ducted

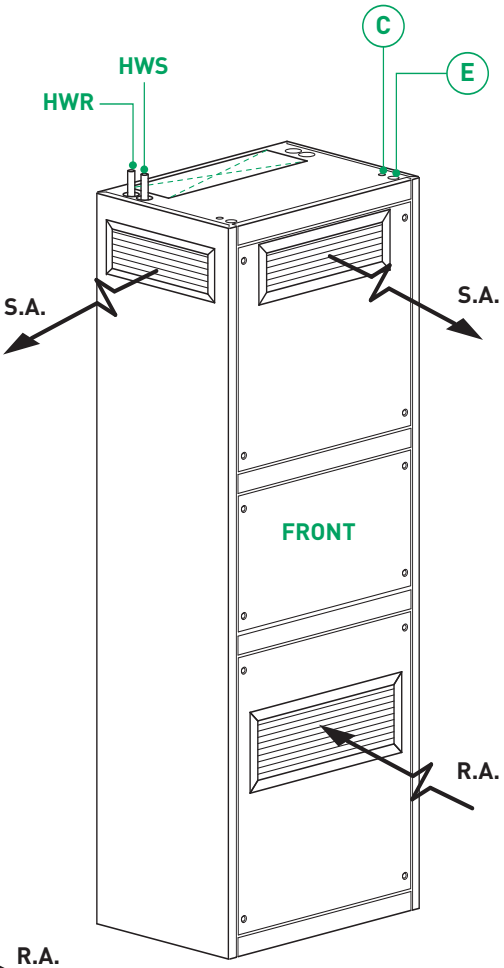


PLAN VIEW





DUCTED

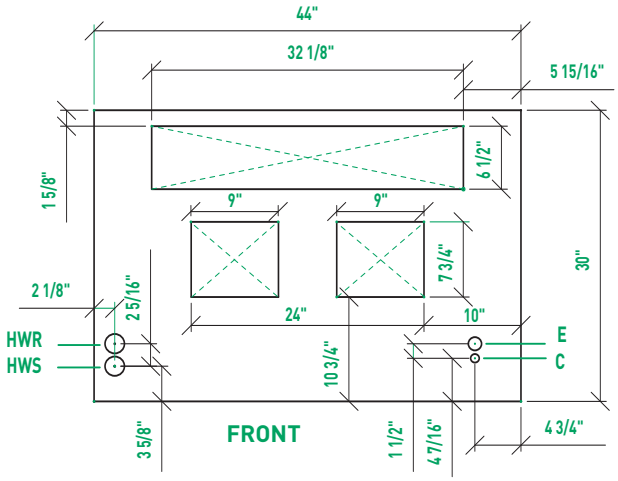


NON-DUCTED

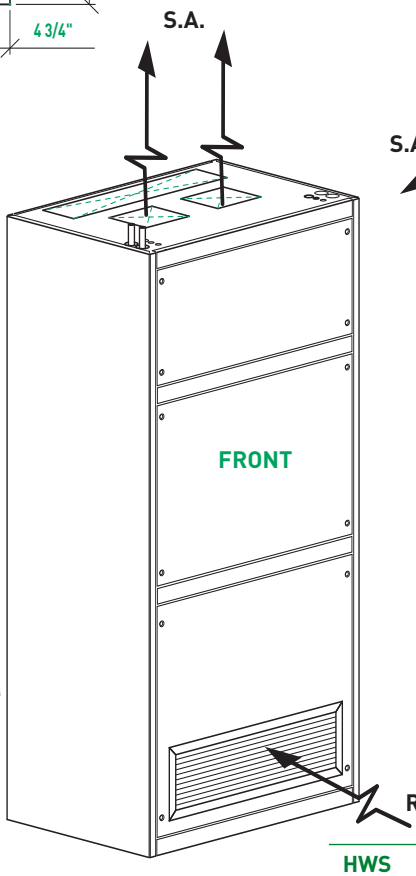
HWS	Hot Water Supply - 7/8" O.D. Sweat Connection
HWR	Hot Water Return - 7/8" O.D. Sweat Connection
C	Entry Point for Control Cable
D	Exit Point of Condensate Drain Tube - 5/8" I.D. 7/8" O.D. Vinyl Tubing
E	Electrical Power Cable Entry Point
Note:	The barometric relief damper is an optional feature.

Utility Connection Locations

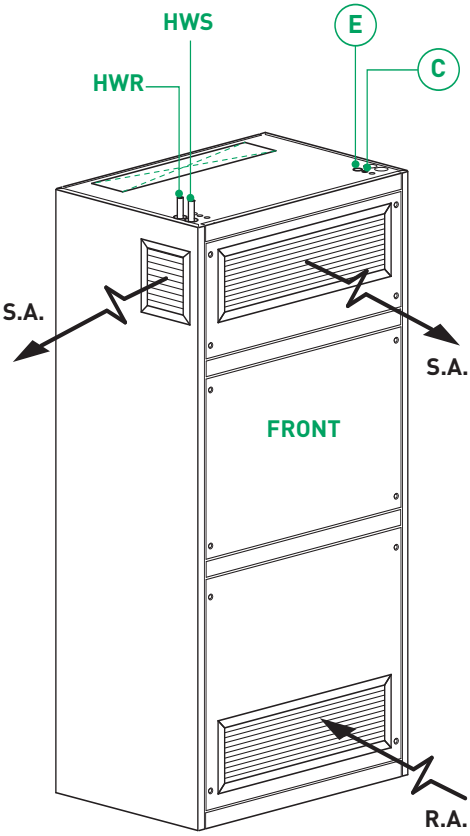
Models VLC 48/60 - ducted/non-ducted



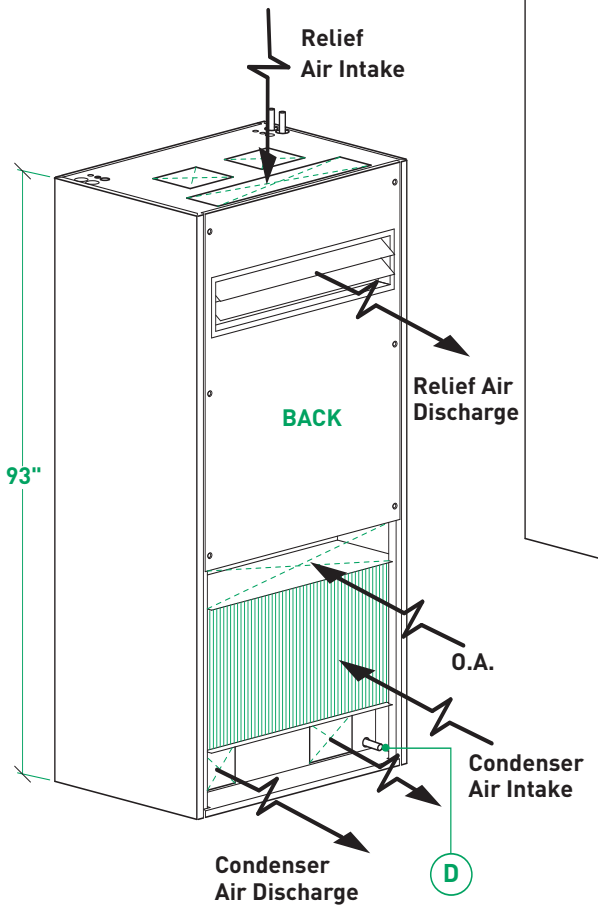
PLAN VIEW



DUCTED



NON-DUCTED



HWS	Hot Water Supply - 7/8" O.D. Sweat Connection
HWR	Hot Water Return - 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
Note:	The barometric relief damper is an optional feature for ducted units only.

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 and daylight savings time
- 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)

VLC SERIES

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 compressor shall cycle on until the cooling set point is reached. A five minute delay time shall prevent short cycling.
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.

VHC SERIES

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 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 compressor shall cycle on until the cooling set point is reached. A five minute delay time shall prevent short cycling.
4. **HEATING** On a call for space 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 close until the mixed air temperature rises to 70° F.
5. **EXHAUST FAN/DAMPER CONTROL (when condenser fan is being used for power exhaust)** In the unoccupied mode, the exhaust damper shall be closed. In the occupied mode, as the outdoor air damper modulates open the exhaust damper shall modulate open by the same percentage. Both exhaust (condenser) fans shall run at medium speed when the compressor is running or when the thermostat is calling for economizer cooling, independent of the time of day. One exhaust fan shall run at high speed and the second exhaust fan shall be stopped when the compressor is off and there is no call for economizer cooling, during the occupied mode only.
6. **HUMIDISTAT AND REHEAT (Optional) IN THE VHC SERIES UNIT** A room humidistat sensor shall be included in the return air stream. The humidistat shall have a typical set point of 55% R.H. (adjustable). When the room temperature falls to the cooling set point and the humidistat set point has not been satisfied, the hot gas reheat coil shall provide reheat to maintain the cooling temperature set point in the room (to avoid overcooling the space). The compressor shall be operating under this condition. When the humidity set point is satisfied, the reheat coil shall de-energize.

Control Type "V" (Temspec OC-3 thermostat)

"VHC" and "VLC" series classroom unit ventilators 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 daylight saving time changes and 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 night set-back mode. On Tuesday, the unit will again preheat the room, but if no movement is occurring at the start of time 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

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. The VDF 1200 unit has a down flow option for supply air distribution in a plenum behind casework such as bookshelves or using baseboard level duct.

The HCD 1200 and HCD 1600 units are installed horizontally above the ceiling tile. Heating is by hot water, steam or electric coil. Cooling is by a chilled water coil or split system DX coil.

VUD 1200

Cooling capacities:
Split system DX
2.0, 2.5, 3.0 tons

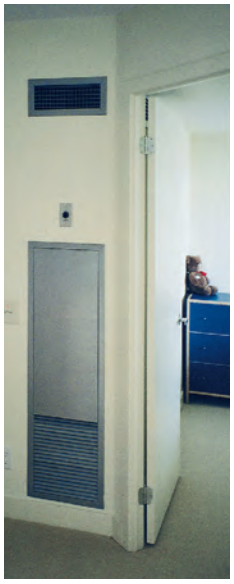
Chilled water (2 or 4 pipe)
Up to 3.5 tons

VUD 1600

Cooling capacities:
Split system DX
4.0 and 5.0 tons

Chilled water (2 or 4 pipe)
Up to 5 tons

Vertical fan coil units



TV Series

TV SERIES

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

Concealed installation

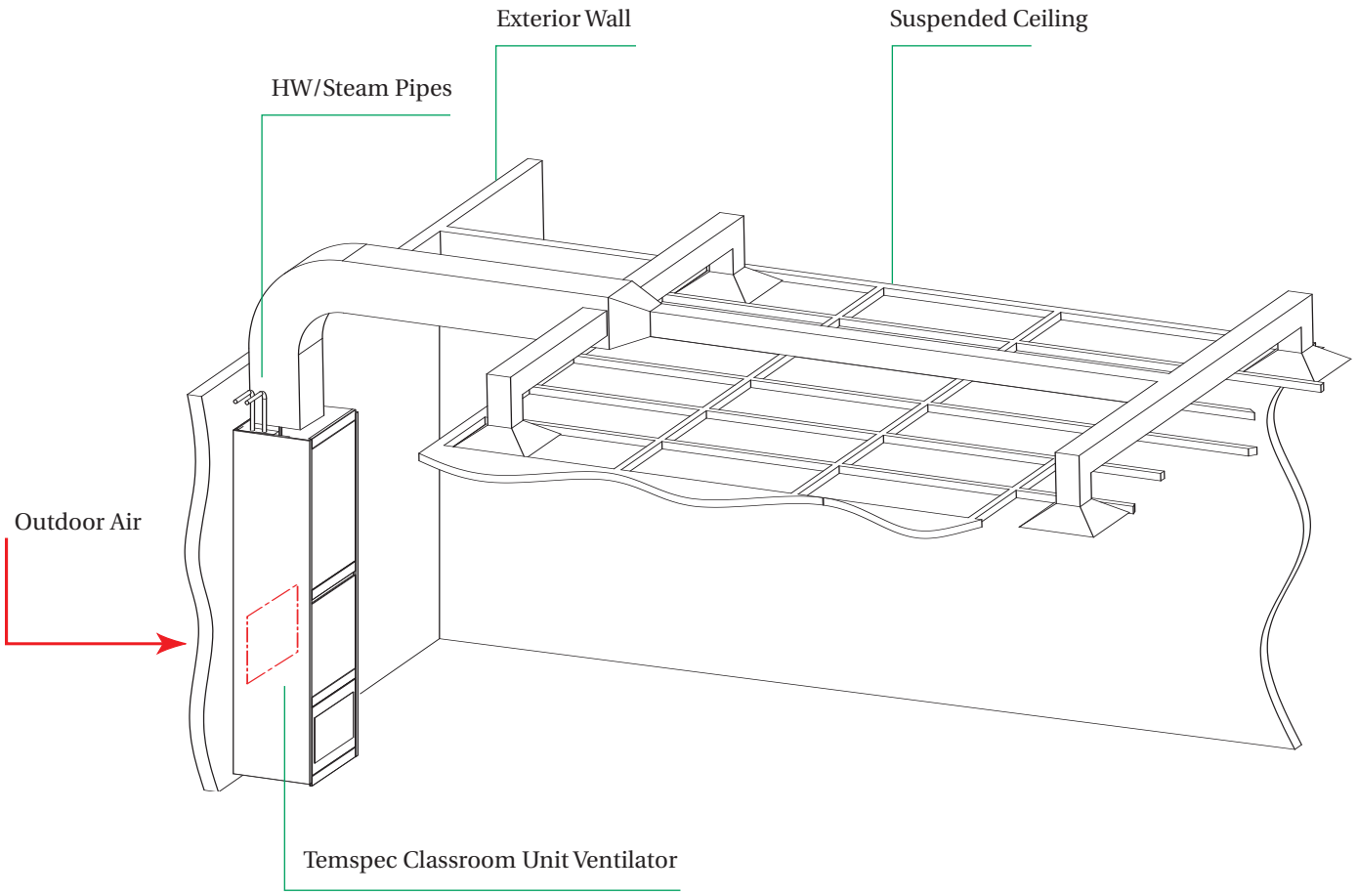
TF SERIES

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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01-2006