

ENGINEERING GUIDE

# Vertical Stacked Water Source Heat Pumps



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## INTRODUCTION

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### Performance, value and sustainability in a labor-saving package.

The Vertical Stacked Water Source Heat Pumps (VSCS) from Johnson Controls offer the ultimate in multi-story HVAC design flexibility. The VSCS Series is a compact, concealed system, capable of providing total heating and cooling functions for a single zone or multiple rooms. These units offer the flexibility of a four-pipe fan coil system at the cost of a two-pipe system, with the added flexibility of individual tenant metering. VSCS Series units are ideally suited for the total heating and cooling needs of any two-plus story building with a consistent floor plan.

- Hotels
- High-Rise Apartments / Condominiums
- Hospitals / Nursing homes
- Dormitories
- Renovated office space

The space saving VSCS unit is a two-part system featuring a self-supporting, pre-piped cabinet, and a removable heat pump chassis. The cabinet, complete with supply/return/drain risers, is installed during the intermediate phase of building construction. The cabinet is framed-in, and covered with drywall, as part of the interior wall structure. The finished equipment installation is hidden from view, blending with the decor of the room. Access to the mechanical components of the unit can be made entirely through the front/return air panel.

The provision for as many as three cabinet supply air outlets allows for maximum design flexibility and cost savings. One strategically located unit can serve up to three separate rooms without the need for ductwork. The ease of removal and replacement of the heat pump chassis offers enhanced serviceability. A chassis that requires service may be quickly removed, replaced with a back-up chassis, and serviced at a more convenient time or place.

All units are tested and certified by AHRI / ISO 13256-1 and ETL for United States and Canada. Johnson Controls stacked heat pump design exceeds ASHRAE 90.1 requirements at all rating conditions, making the VSCS series an excellent choice for water-loop and geothermal applications.

### Listings / Certifications



## PRODUCT OVERVIEW

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**Refrigerant**  
R-410A

**Sizes**  
0.75 – 3 Tons (2.6 – 10.6 kW)

### Models Available

#### Cabinets:

VB	Standard Assembly
VM	Master Assembly
VS	Slave Assembly

#### Chassis:

VSCS	Heat Pump Assembly
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# SPECIFICATIONS

## GENERAL

All VSCS-series models ship as factory-charged packages, complete with R-410A refrigerant. All units from 3/4 to 3 tons shall be tested and certified by AHRI / ISO 13256-1 and ETL listed for United States and Canada. AHRI / ISO and ETL labels shall be applied prior to leaving the factory. All units are test operated at the factory. Both cabinets and refrigeration chassis are completely factory wired and pre-piped.

## CABINET / RISER ASSEMBLY

The self-supporting cabinet assembly is constructed of heavy gauge corrosion-resistant coated steel (minimum 20-gauge thickness for exterior panels). The entire cabinet interior is insulated with 1/2" thick, high-density thermal and acoustic insulation. Insulation shall meet NFPA 90, UL-181, and ASTM-C1071 standards, and have a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723. A removable inner service panel seals the fan and compressor compartment during operation.

The cabinet base section contains a 14 gauge galvanized steel drain pan, with integral guide rails for the slide-in heat-pump chassis. The drain pan outlet is readily accessible for cleaning (removal of inner service panel required). The drain pan outlet, incorporating a P-trap, is factory connected to the condensate riser.

Full-length supply, return, and condensate risers are factory assembled onto the cabinet. Maximum factory installed riser length is 120 inches. When the slab-to-slab dimension for a given floor is in excess of 118 inches, separate riser extension pieces can be factory provided to reach the required total riser length (riser extensions are field installed). The top of all risers and riser extensions is internally expanded (3" depth) to allow connection of each subsequent riser section without the use of couplings. Type 'M' copper for risers is standard.

- Optional Type 'L' copper risers.

Riser placement may be on any of three sides of the cabinet (right, left, or back). Risers are internally piped into the cabinet assembly, including ball shut-off valves, and threaded hose connection stubs. The condensate drain riser is insulated with 3/8" wall thickness closed-cell foam insulation.

- Optional protective risers cover to prevent riser damage during shipping, handling and installation.

The removable fan and motor assembly is suspended horizontally from an 18-gauge blower mounting deck, which creates an insulated discharge plenum in the upper section of the cabinet. Up to 3 supply air openings are provided. A noise attenuating insulated air baffle is provided for each supply air opening. All cabinet openings are provided with drywall flanges around the full opening perimeter.

- Optional surface-mount connection box. Allows mounting of the space thermostat directly above the unit's return air panel. Electrical connection to the thermostat is by a plug-in Molex connector. The connection box is insulated where it projects into the upper plenum section of the unit, to prevent discharge air temperature from affecting the thermostat reading.

## REFRIGERATION CHASSIS

Each removable heat-pump chassis assembly includes an air-to-refrigerant coil, a water-to-refrigerant coil, a primary condensate collection pan with condensate overflow switch, and features a high efficiency rotary or scroll compressor. The chassis base is fabricated from heavy gauge galvanized steel (14 Ga). A metal enclosure isolates the compressor from the moving air stream in the lower fan compartment. The compressor enclosure is insulated with 1/2 inch thick, 2-pound density insulation. Insulation shall meet NFPA 90, UL-181, and ASTM-C1071 standards, and have a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

Electrical connection between the cabinet and the chassis is by locking quick-connect plugs (separate high voltage and low voltage plugs).

Rotary and scroll compressors are mounted on rubber vibration isolators. Compressor motors are provided with internal overload protection. Each refrigeration circuit is thoroughly evacuated, and fully charged with R-410A refrigerant before shipment. An external high-pressure switch and a low-suction temperature switch are included in each compressor control circuit. The sealed refrigeration circuit includes an adjustable bi-flow thermal expansion valve, with external equalizer. Service gauge ports are provided for field diagnosis and service.

The 4-way reversing valve is a pilot operated, sliding piston type with a replaceable magnetic solenoid coil.

Refrigerant-to-air heat transfer coils are constructed of internally enhanced copper tubes; mechanically bonded to enhanced aluminum plate fins. The coaxial refrigerant-to-water heat exchangers feature a convoluted inner tube design for high heat transfer efficiency. Standard models feature a copper inner tube surrounded by a steel outer tube, and carry a 400-psig waterside working pressure rating. Units shall be capable of operation with an entering fluid temperature range of 20°F to 110°F.

- Optional automatic water flow regulator, factory installed as an integral part of the refrigeration chassis. The automatic flow control valve shall be selected for the nominal rated flow rate, and provides constant flow over a 2-80 psi differential pressure range.
- Optional water control valve. A factory installed 2-way motorized valve is wired in parallel with the compressor control circuit, to shut-off water flow to the unit when the compressor is off. This feature can significantly reduce power consumption in variable speed, or staged, pumping applications. The valve is rated for a 60 psi operating pressure differential. The actuator is of a slow-closing design, to eliminate hydraulic shock.

## INDOOR FAN

Forward curved, double inlet and double width, direct-drive centrifugal blowers are used for air movement. Large diameter blower wheels are employed to provide required airflow performance at minimum noise levels. Fan motors are PSC types, and feature permanently lubricated bearings and internal ther-

## SPECIFICATIONS

mal overload protection. The fan motors are attached to the blower housings by means of an integral 'flex-mount' system, with additional vibration isolation provided by rubber mounting grommets. A manual selector switch is accessible through the hinged return air panel, allowing switching between the two available fan speeds (Hi – Low).

- Optional Hi-Static motor and blower assembly, for applications with extended ductwork layout.

### ELECTRICAL/CONTROLS

All units are completely factory wired with all necessary operating controls.

- Optional non-fused electrical disconnect for service convenience and maintenance.
- Optional non-fused electrical disconnect with fusing added to the internal line voltage switch circuit for service convenience and maintenance.

Standard unit control consists of a 24-volt electromechanical relay package. The cabinet mounted electrical box contains a 50VA Class II transformer for field connection. The reversing valve solenoid coil shall be energized in cooling mode only.

Unit shall have a microprocessor-based control system with the following:

- Unit shall operate with conventional thermostat designs.
- Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat, base unit, or by interrupting service power, should any of the following standard safety devices trip and shut off the compressor.
  - Loss-of-charge/Low-pressure switch
  - High-pressure switch
  - Control board shall monitor each refrigerant safety switch independently.
  - Low water temperature protection
  - Condensate overflow protection
  - Low voltage (brown-out) protection
  - Anti-short cycle timer (ASCT)
  - Random start
  - Should the high-pressure or low-pressure safeties open three times within two hours of operation (1 hour for low-pressure safety), then lockout requiring manual reset will occur.
  - Should the low water temperature or condensate overflow safeties trip 3 times sequentially, then lockout requiring manual reset will occur.
  - The low-pressure switch shall not be monitored during the initial 30 seconds of a cooling system's operation to prevent nuisance trips.
  - Unit shall have capability to defeat time delays for servicing.
  - Unit control board shall have on-board diagnostics and fault code display.
  - Control board shall retain last 5 fault codes in non volatile memory which will not be lost in the event of a power loss.

- Unit shall have an automated sequence used after installation that quickly tests cooling and heating modes.

The unit's thermostat wire leads will terminate in a 6-pin Molex plug for direct surface mount thermostat application. The control leads are spliced to field supplied cable for remote thermostat applications.

### ACOUSTIC RETURN AIR PANEL

The flush-mounted return air panel is designed to minimize line-of-sight noise transmission. The panel assembly is fabricated from heavy gauge steel. An insulated, hinged center section allows convenient user access to the unit control panel and filter.

The perimeter frame of the panel is mounted to the drywall/framing opening at the front of the cabinet. The heat-pump chassis is fully accessible and removable through the hinged door section. The panel is supplied pre-primed, ready for painting.

### SUPPLY AIR GRILLES

Supply air grilles shall be supplied for each free discharge outlet directly from the cabinet (non-ducted outlets). All unit mounted supply grilles will be supplied as double deflection type. Grilles for unequal airflow applications shall be provided with integral opposed blade dampers. Grilles will be supplied in standard 'Appliance White' painted finish.

### FILTERS

All units are supplied with a 1-inch thick throwaway filter. Filters are accessible through the hinged return air panel, without removing the inner service panel.

### UNIT TAGGING

Each unit shall be individually tagged with factory and customer supplied information. Units can be tagged with specific room number, riser number, or any other special requirement of the project.

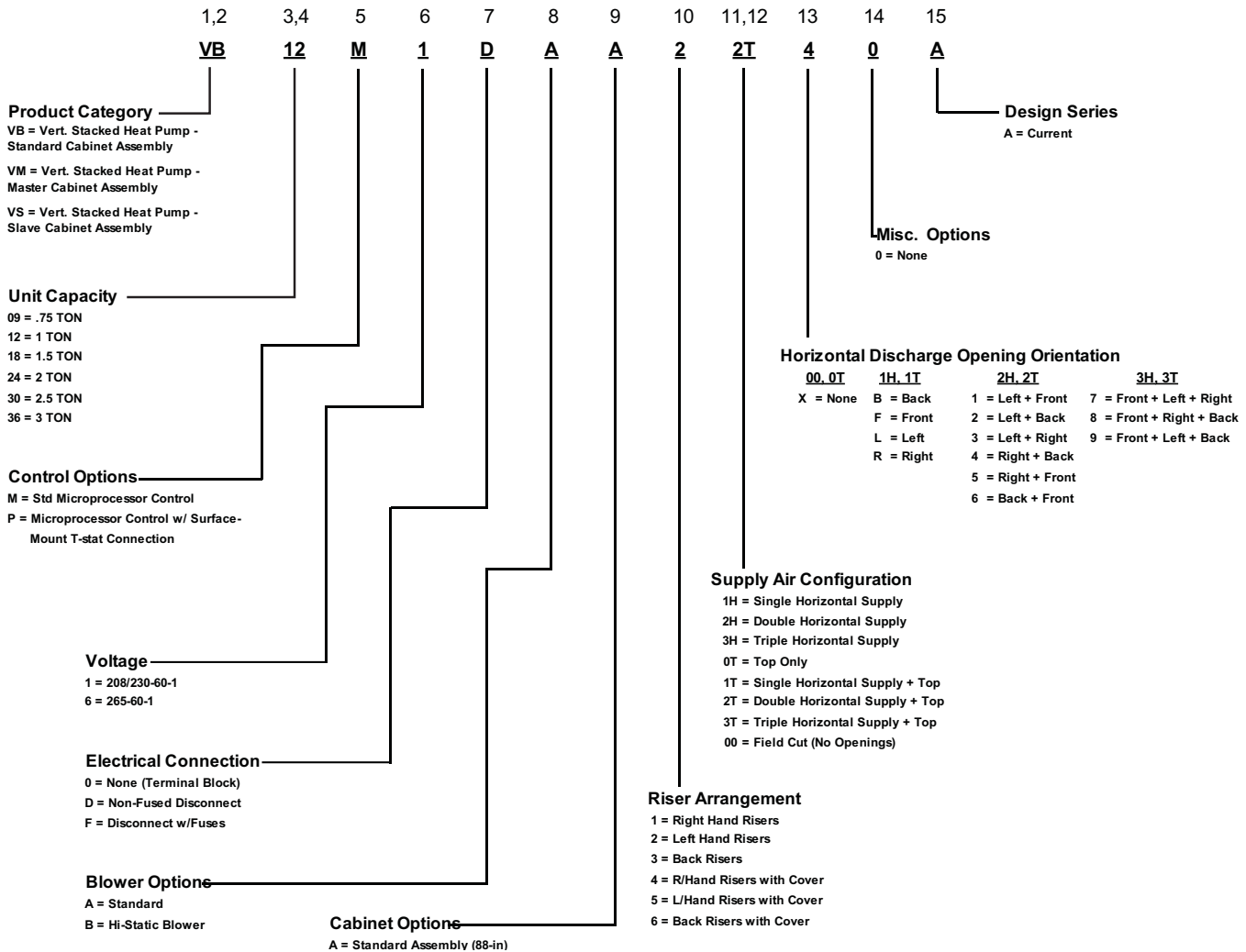
### FIELD INSTALLED ACCESSORIES

The following options are available field installation:

- Hoses: high-pressure flexible hoses, with quick-sealing swivel couplings, provide supply and return water connections to the chassis. Hose material is fire-rated (UL-94 VO) thermoplastic inner tube, reinforced by a stainless steel wire outer braid. The hose assemblies are rated for a minimum 350 psig working pressure.
- Electronic Thermostats
  - Programmable (7-day), 1 Ht / 1 Cl, back-lit display. The thermostat shall be supplied with an occupancy sensing cover (or be capable of being retrofitted on site for future occupancy sensing).
  - Non-programmable, 1 Ht / 1 Cl, back-lit display. The thermostat shall be supplied with an occupancy sensing cover (or be capable of being retrofitted on site for future occupancy sensing).

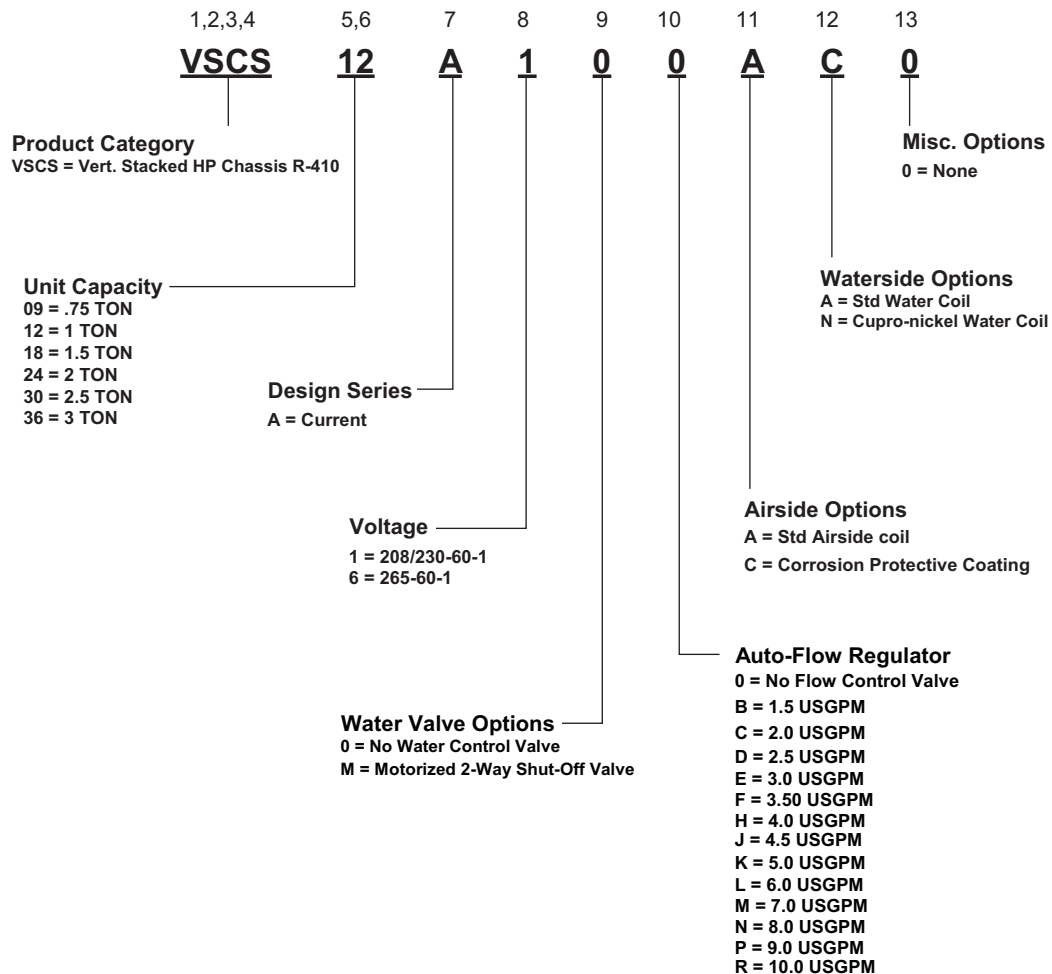
# NOMENCLATURE

## VERTICAL STACKED WATER SOURCE HEAT PUMP - CABINET



# NOMENCLATURE

## VERTICAL STACKED WATER SOURCE HEAT PUMP - CHASSIS



# PHYSICAL DATA

## VSCS SERIES

<b>Model Series</b>	09	12	18	24	30	36
Nominal Cooling (Ton) <sup>1</sup>	0.75	1.0	1.5	2.0	2.5	3.0
<b>Compressor-Type</b>	Rotary			Scroll		
R-410A Refrigerant Charge (oz)	22	26	38	42	49	52
<b>Air Coil-Type</b>	Enhanced Copper tubes, Enhanced Aluminum Fins					
Face Area(sq ft)	1.46	1.56	2.35	2.63	3.33	3.33
Rows/FPI	2/16	3/14	3/14	3/14	3/14	3/14
<b>Water Coil-Type</b>	Enhanced Surface Co-Axial					
Chassis Connection Size (in)	1/2	1/2	1/2	3/4	3/4	3/4
<b>Standard Blower / Motor</b>	DWDI Forward-Curved Centrifugal / PSC Direct-Drive					
Diameter x Width (in)	9x4T	9x4T	9x7T	9x7	9x8	9x8
Motor HP	0.10	0.10	0.17	0.25	0.33	0.50
<b>HI-Static Blower / Motor</b>	DWDI Forward-Curved Centrifugal / PSC Direct-Drive					
Diameter x Width (in)	9x4T	9x4T	9x7T	10x7T	10x8T	10x8T
Motor HP	0.10	0.17	0.25	0.33	0.33	0.50
<b>Filter</b> Quantity-Size (in)	1-14x25x1	1-14x25x1	1-16x30x1	1-16x30x1	1-20x30x1	1-20x30x1
<b>Cabinet Weight (lb)<sup>2</sup></b>	130	130	145	150	175	175
<b>Chassis Weight (lb)</b>	70	75	100	140	155	160

### NOTE:

- Nominal Capacity calculated in accordance with AHRI / ISO Standard 13256-1 for Water Loop Application
- Cabinet weight is approximate and does not include weight of risers

### OPERATING LIMITS\*

	COOLING	HEATING
Min. Entering Water	30°F	20°F
Max. Entering Water	110°F	90°F

\*Units are capable of operation with an entering fluid temperature range of 20°F to 110°F

## AHRI/ISO PERFORMANCE DATA

### AHRI/ISO 13256-1 WATER LOOP CONDITIONS\*

Model	Rated Flow Rate (USGPM)	Rated Air Flow (SCFM)	Cooling Capacity (Btuh)	Sensible Capacity (Btuh)	EER	Heating Capacity (Btuh)	COP
09	2.6	340	8,900	7,200	13.0	11,800	4.7
12	3.2	430	12,200	9,400	13.0	14,900	4.4
18	4.8	685	18,100	14,300	13.2	22,300	4.6
24	6.2	850	24,400	18,600	13.4	30,200	4.6
30	7.8	1075	29,700	22,900	13.3	33,900	4.4
36	9.5	1220	34,900	26,600	12.8	36,400	4.3

\*Water Loop capacities are rated at 86°F EWT Cooling, 68°F EWT Heating.

### AHRI/ISO 13256-1 GROUND WATER CONDITIONS\*

Model	Rated Flow Rate (USGPM)	Rated Air Flow (SCFM)	Cooling Capacity (Btuh)	Sensible Capacity (Btuh)	EER	Heating Capacity (Btuh)	COP
09	2.6	340	10,100	7,600	19.5	9,300	3.9
12	3.2	430	14,400	10,600	19.8	12,200	3.6
18	4.8	685	20,900	15,500	20.6	17,900	4.0
24	6.2	850	27,600	20,300	21.5	23,800	3.8
30	7.8	1075	33,500	24,800	20.5	27,500	3.6
36	9.5	1220	39,200	28,800	19.4	29,100	3.6

\*Ground Water capacities are rated at 59°F EWT Cooling, 50°F EWT Heating.

### AHRI/ISO 13256-1 GROUND LOOP CONDITIONS\*

Model	Rated Flow Rate (USGPM)	Rated Air Flow (SCFM)	Cooling Capacity (Btuh)	Sensible Capacity (Btuh)	EER	Heating Capacity (Btuh)	COP
09	2.6	340	9,300	7,300	14.2	7,000	3.1
12	3.2	430	13,100	9,800	14.5	9,600	3.1
18	4.8	685	18,800	14,500	15.2	14,000	3.1
24	6.2	850	25,900	19,200	15.7	18,100	3.1
30	7.8	1075	31,800	24,200	15.2	20,500	3.1
36	9.5	1220	36,400	27,200	14.0	22,900	3.1

\*Ground Loop capacities are rated at 77°F EFT Cooling, 32°F EFT Heating.

#### NOTE:

1. All Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature.
2. All Heating capacities based upon 68°F DB, 59°F WB entering air temperature.

# PERFORMANCE DATA

## VSCS09 — 340 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	2.6	6.8	15.7						5.3	0.59	3.3	84.7	2.6
30	1.3	1.8	4.2	11.1	7.3	0.46	12.7	24.4	6.4	0.61	4.3	88.0	3.1
	2.0	4.1	9.4	11.4	7.6	0.43	12.9	26.7	6.8	0.62	4.7	89.1	3.2
	2.6	6.7	15.3	11.7	8.1	0.41	13.1	28.3	7.0	0.65	4.8	89.6	3.2
40	1.3	1.7	3.8	10.4	7.1	0.51	12.2	20.4	7.4	0.63	5.2	90.4	3.4
	2.0	3.7	8.5	10.5	7.3	0.48	12.2	21.7	7.7	0.66	5.4	91.8	3.4
	2.6	6.0	13.9	10.9	7.7	0.46	12.5	23.5	8.1	0.67	5.8	92.3	3.5
50	1.3	1.5	3.4	10.0	7.0	0.57	11.9	17.7	8.5	0.67	6.2	93.1	3.7
	2.0	3.3	7.6	10.1	7.2	0.54	12.0	18.7	9.0	0.69	6.6	94.8	3.8
	2.6	5.4	12.4	10.4	7.6	0.52	12.2	20.2	9.3	0.70	6.9	95.3	3.9
60	1.3	1.4	3.3	9.6	7.0	0.65	11.8	14.8	9.7	0.69	7.3	96.3	4.1
	2.0	3.1	7.3	9.8	7.2	0.63	11.9	15.5	10.2	0.71	7.7	97.8	4.2
	2.6	5.1	11.8	10.1	7.6	0.56	12.0	18.2	10.7	0.72	8.2	98.8	4.3
70	1.3	1.3	3.1	9.2	6.7	0.73	11.7	12.6	10.7	0.69	8.3	99.1	4.5
	2.0	3.0	6.9	9.3	6.9	0.72	11.7	13.0	11.2	0.71	8.8	100.5	4.6
	2.6	4.9	11.2	9.6	7.3	0.61	11.7	15.9	11.9	0.73	9.4	101.9	4.8
80	1.3	1.3	2.9	8.8	6.7	0.80	11.6	11.0	12.4	0.72	10.0	103.8	5.1
	2.0	2.8	6.5	8.9	6.9	0.77	11.6	11.6	12.7	0.72	10.2	104.6	5.2
	2.6	4.6	10.6	9.2	7.1	0.67	11.5	13.8	13.1	0.73	10.6	105.7	5.3
90	1.3	1.2	2.8	8.5	6.4	0.88	11.4	9.7	13.8	0.74	11.3	107.6	5.5
	2.0	2.7	6.2	8.5	6.5	0.83	11.3	10.2	14.5	0.75	11.9	109.5	5.7
	2.6	4.4	10.1	8.7	6.7	0.70	11.0	12.4	14.8	0.76	12.2	110.3	5.7
100	1.3	1.1	2.5	8.1	6.2	0.97	11.4	8.4					
	2.0	2.6	6.0	8.2	6.4	0.92	11.4	8.9					
	2.6	4.3	9.9	8.4	6.6	0.86	11.3	9.7					
110	1.3	1.1	2.5	7.8	6.1	1.06	11.4	7.3					
	2.0	2.5	5.8	8.0	6.3	1.02	11.5	7.9					
	2.6	4.2	9.7	8.1	6.5	0.99	11.5	8.2					

## VSCS12 — 430 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	3.2	6.5	15.0						7.9	0.82	5.1	87.0	2.8
30	1.6	1.7	4.0	15.3	10.4	0.66	17.5	23.2	9.1	0.90	6.0	89.8	3.0
	2.4	3.7	8.5	15.6	10.7	0.62	17.7	25.3	9.3	0.91	6.2	90.9	3.0
	3.2	6.3	14.5	16.0	11.2	0.60	18.0	26.9	9.5	0.92	6.4	91.3	3.1
40	1.6	1.6	3.7	14.9	10.6	0.72	17.3	20.6	10.2	0.90	7.1	92.3	3.3
	2.4	3.4	7.9	15.3	10.9	0.68	17.6	22.5	10.6	0.91	7.5	93.4	3.4
	3.2	5.9	13.5	15.5	11.2	0.64	17.7	24.2	10.9	0.92	7.7	93.8	3.5
50	1.6	1.5	3.5	13.9	9.9	0.78	16.6	17.7	11.5	0.96	8.2	94.8	3.5
	2.4	3.2	7.3	14.3	10.3	0.72	16.8	19.9	11.9	0.98	8.6	95.8	3.6
	3.2	5.4	12.5	14.8	10.8	0.70	17.2	21.2	12.2	0.99	8.8	96.3	3.6
60	1.6	1.4	3.3	13.2	9.5	0.86	16.1	15.4	12.7	0.95	9.5	97.3	3.9
	2.4	3.0	6.9	13.5	9.9	0.80	16.3	16.8	13.2	0.96	9.9	98.5	4.0
	3.2	5.1	11.8	14.3	10.6	0.73	16.8	19.6	13.6	0.96	10.3	99.3	4.2
70	1.6	1.3	3.0	12.4	9.1	0.99	15.8	12.6	13.9	0.97	10.6	99.9	4.2
	2.4	2.8	6.5	12.8	9.4	0.92	15.9	13.9	14.5	0.98	11.2	101.2	4.3
	3.2	4.9	11.3	12.9	9.7	0.86	15.9	15.1	15.0	0.98	11.7	102.3	4.5
80	1.6	1.3	3.0	11.5	8.6	1.04	15.0	11.1	15.4	0.99	12.0	102.9	4.6
	2.4	2.7	6.2	11.7	9.0	0.96	15.0	12.3	16.0	1.01	12.6	104.6	4.6
	3.2	4.7	10.8	12.4	9.8	0.87	15.4	14.3	16.5	1.01	13.0	105.5	4.8
90	1.6	1.2	2.9	11.0	8.3	1.16	14.9	9.5	16.9	1.03	13.4	106.0	4.8
	2.4	2.6	6.1	11.3	8.7	1.07	15.0	10.6	17.6	1.04	14.1	107.9	5.0
	3.2	4.5	10.4	11.8	9.3	0.98	15.1	12.1	18.1	1.04	14.5	108.8	5.1
100	1.6	1.2	2.7	10.0	7.7	1.24	14.3	8.1					
	2.4	2.5	5.8	10.5	8.2	1.18	14.5	8.9					
	3.2	4.4	10.2	10.6	8.4	1.12	14.4	9.4					
110	1.6	1.1	2.5	9.5	7.4	1.35	14.1	7.0					
	2.4	2.4	5.5	9.9	7.7	1.30	14.3	7.6					
	3.2	4.3	9.9	10.1	7.9	1.25	14.3	8.0					

- Cooling Performance is tabulated at 80.6 F DB and 66.2 F WB entering air. Heating performance tabulated at 68 F EAT
- Tabulated data does not include AHRM/ISO corrections for fan and pump power.
- All capacities are expressed in MBH.
- Insulated water circuit is recommended for operation below 60F EWT.
- See performance correction tables for conditions beyond what is listed.
- Extrapolation is not permissible.
- Shaded areas indicate conditions where operation is not recommended.

# PERFORMANCE DATA

## VSCS18 — 685 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	4.8	7.5	17.3						11.4	1.29	7.0	85.4	2.6
30	2.4	2.0	4.7	22.2	15.1	0.75	24.7	29.7	13.0	1.30	8.6	87.6	2.9
	3.6	4.3	9.9	22.3	15.2	0.72	24.7	31.1	13.5	1.30	9.1	88.5	3.1
	4.8	7.3	16.8	22.6	15.6	0.69	25.0	33.0	13.9	1.32	9.4	88.9	3.1
40	2.4	1.9	4.5	21.3	14.9	0.88	24.3	24.2	14.6	1.30	10.2	90.0	3.3
	3.6	4.1	9.5	21.5	15.3	0.83	24.4	25.9	14.9	1.31	10.5	91.0	3.4
	4.8	7.0	16.1	21.9	15.8	0.80	24.6	27.5	15.5	1.33	10.9	91.6	3.4
50	2.4	1.9	4.3	20.5	14.8	0.98	23.9	20.9	16.6	1.31	12.1	92.4	3.7
	3.6	3.9	9.1	21.5	15.7	0.91	24.6	23.5	17.3	1.32	12.8	93.5	3.8
	4.8	6.7	15.5	21.3	15.5	0.88	24.2	24.3	18.0	1.33	13.4	94.2	4.0
60	2.4	1.6	3.8	19.7	14.4	1.14	23.6	17.3	19.0	1.32	14.4	95.6	4.2
	3.6	3.5	8.0	20.5	14.9	1.07	24.1	19.2	19.8	1.34	15.2	96.7	4.3
	4.8	5.9	13.6	20.8	15.4	1.02	24.3	20.4	20.3	1.37	15.7	97.4	4.4
70	2.4	1.5	3.5	18.9	14.1	1.29	23.3	14.6	21.2	1.34	16.6	98.8	4.6
	3.6	3.2	7.3	19.1	14.5	1.22	23.3	15.7	22.1	1.36	17.5	99.9	4.8
	4.8	5.4	12.5	19.4	14.9	1.18	23.4	16.4	22.8	1.39	18.1	100.5	4.8
80	2.4	1.4	3.3	17.8	13.4	1.45	22.7	12.3	23.2	1.35	18.6	101.1	5.0
	3.6	3.0	7.0	18.2	14.0	1.36	22.8	13.3	24.2	1.38	19.5	102.7	5.2
	4.8	5.2	11.9	18.6	14.7	1.27	22.9	14.7	25.2	1.40	20.5	103.5	5.3
90	2.4	1.4	3.1	17.0	13.1	1.64	22.6	10.4	24.9	1.37	20.2	103.3	5.3
	3.6	2.9	6.6	17.4	13.6	1.55	22.7	11.3	25.8	1.39	21.1	104.5	5.4
	4.8	4.9	11.3	17.8	14.1	1.46	22.8	12.2	27.7	1.41	22.8	105.6	5.7
100	2.4	1.3	3.0	15.8	12.3	1.82	22.0	8.6					
	3.6	2.8	6.5	16.3	12.7	1.72	22.1	9.4					
	4.8	4.8	11.1	17.0	13.4	1.67	22.7	10.2					
110	2.4	1.2	2.8	14.9	11.6	2.08	22.0	7.2					
	3.6	2.7	6.2	15.4	12.2	1.96	22.1	7.9					
	4.8	4.7	10.8	16.2	13.0	1.90	22.7	8.5					

## VSCS24 — 850 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	6.2	6.6	15.2						13.9	1.64	8.3	85.3	2.5
30	3.1	1.7	4.0	29.2	19.3	1.12	33.0	26.1	15.7	1.65	10.1	87.1	2.8
	4.6	3.6	8.3	29.4	20.0	1.08	33.1	27.2	17.2	1.66	11.5	89.0	3.0
	6.2	6.3	14.4	29.6	20.4	1.05	33.2	28.3	17.5	1.67	11.8	89.7	3.1
40	3.1	1.6	3.6	29.0	19.7	1.23	33.2	23.5	18.8	1.68	13.1	90.5	3.3
	4.6	3.3	7.5	29.1	20.1	1.18	33.1	24.8	20.2	1.71	14.4	92.0	3.5
	6.2	5.6	13.0	29.2	20.5	1.12	33.0	26.2	20.7	1.73	14.8	92.7	3.5
50	3.1	1.4	3.2	28.1	19.4	1.33	32.6	21.1	21.9	1.73	16.0	93.9	3.7
	4.6	2.9	6.7	28.3	19.8	1.26	32.6	22.5	23.0	1.80	16.9	95.1	3.8
	6.2	5.0	11.6	28.5	20.2	1.20	32.5	23.8	23.8	1.82	17.6	95.6	3.8
60	3.1	1.3	3.0	27.0	19.2	1.52	32.2	17.8	24.7	1.80	18.6	96.9	4.0
	4.6	2.7	6.2	27.3	19.6	1.40	32.1	19.5	26.1	1.81	19.9	98.4	4.2
	6.2	4.7	10.8	27.6	20.1	1.29	32.0	21.3	27.4	1.85	21.1	99.3	4.3
70	3.1	1.3	2.9	26.0	18.7	1.71	31.8	15.2	27.5	1.83	21.3	100.0	4.4
	4.6	2.6	6.0	26.4	19.0	1.60	31.9	16.5	29.2	1.84	22.9	101.8	4.6
	6.2	4.5	10.4	26.8	19.9	1.50	32.0	17.9	30.8	1.88	24.3	103.0	4.8
80	3.1	1.2	2.8	24.3	17.7	1.91	30.8	12.7	30.2	1.87	23.8	102.9	4.7
	4.6	2.5	5.8	25.0	18.2	1.80	31.1	13.8	32.3	1.90	25.8	105.2	5.0
	6.2	4.3	10.0	25.6	18.9	1.74	31.5	14.7	33.6	1.95	26.9	106.6	5.0
90	3.1	1.1	2.5	22.7	16.6	2.14	30.0	10.6	33.8	1.95	27.1	106.8	5.1
	4.6	2.4	5.5	23.2	17.1	2.02	30.0	11.5	35.6	2.04	28.6	108.8	5.1
	6.2	4.2	9.7	23.7	18.0	1.89	30.1	12.5	36.8	2.08	29.7	110.1	5.2
100	3.1	1.1	2.5	21.2	16.1	2.42	29.4	8.8					
	4.6	2.3	5.3	21.7	16.5	2.28	29.4	9.5					
	6.2	4.2	9.7	22.1	17.0	2.17	29.5	10.2					
110	3.1	1.0	2.3	19.8	15.2	2.70	29.0	7.3					
	4.6	2.3	5.3	20.3	15.6	2.57	29.1	7.9					
	6.2	4.1	9.5	20.6	16.1	2.44	28.9	8.4					

- Cooling Performance is tabulated at 80.6 F DB and 66.2 F WB entering air. Heating performance tabulated at 68 F EAT
- Tabulated data does not include AHRI/ISO corrections for fan and pump power.
- All capacities are expressed in MBH.
- Insulated water circuit is recommended for operation below 60F EWT.
- See performance correction tables for conditions beyond what is listed.
- Extrapolation is not permissible.
- Shaded areas indicate conditions where operation is not recommended.

# PERFORMANCE DATA

## VSCS30 — 1075 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	3.9	5.6	12.9						17.4	1.89	10.9	84.6	2.7
30	3.9	1.5	3.5	34.8	23.7	1.37	39.5	25.4	20.4	1.92	13.8	87.3	3.1
	5.8	3.1	7.2	35.3	24.4	1.35	39.9	26.2	21.1	1.95	14.5	88.1	3.2
	7.8	5.4	12.5	35.6	24.9	1.33	40.1	26.8	21.9	1.96	15.2	89.3	3.3
40	3.9	1.4	3.2	35.3	24.3	1.45	40.2	24.3	21.9	1.98	15.2	90.2	3.2
	5.8	2.9	6.6	35.7	25.4	1.41	40.6	25.3	22.9	2.04	15.9	91.1	3.3
	7.8	5.0	11.4	35.8	25.8	1.37	40.5	26.1	23.8	2.09	16.7	92.2	3.3
50	3.9	1.2	2.9	34.0	24.5	1.52	39.2	22.4	25.3	2.08	18.2	93.1	3.6
	5.8	2.6	6.0	34.4	25.1	1.48	39.4	23.3	26.5	2.16	19.2	94.2	3.6
	7.8	4.5	10.4	34.5	25.5	1.46	39.5	23.7	28.6	2.21	21.1	95.1	3.8
60	3.9	1.2	2.8	32.9	24.0	1.72	38.8	19.2	29.5	2.14	22.2	95.9	4.0
	5.8	2.5	5.8	33.4	24.7	1.68	39.1	19.9	31.1	2.20	23.6	97.1	4.1
	7.8	4.3	10.0	33.4	24.7	1.64	39.0	20.3	32.3	2.24	24.7	97.9	4.2
70	3.9	1.2	2.7	31.2	22.8	1.91	37.7	16.4	32.8	2.19	25.3	98.8	4.4
	5.8	2.4	5.6	31.7	23.5	1.83	38.0	17.3	34.5	2.24	26.9	100.0	4.5
	7.8	4.2	9.6	32.3	24.3	1.90	38.8	17.0	35.8	2.25	28.1	100.7	4.7
80	3.9	1.1	2.6	29.7	21.9	2.14	37.0	13.8	34.9	2.20	27.4	100.7	4.6
	5.8	2.3	5.4	30.2	22.7	2.06	37.2	14.7	36.1	2.25	28.4	101.5	4.7
	7.8	4.0	9.3	31.0	23.6	2.15	38.3	14.5	36.9	2.26	29.2	101.9	4.8
90	3.9	1.0	2.4	28.1	21.1	2.38	36.2	11.8	36.4	2.22	28.8	101.9	4.8
	5.8	2.2	5.0	28.7	21.8	2.35	36.7	12.2	37.3	2.26	29.5	102.2	4.8
	7.8	3.8	8.7	28.8	22.2	2.30	36.6	12.5	37.7	2.27	30.0	102.5	4.9
100	3.9	1.3	3.0	25.2	19.2	2.67	34.3	9.5					
	5.8	2.1	4.8	26.2	20.2	2.56	35.0	10.3					
	7.8	3.7	8.5	26.6	20.8	2.49	35.1	10.7					
110	3.9	1.2	2.8	23.1	16.6	3.02	33.4	7.7					
	5.8	2.0	4.6	24.5	17.4	2.89	34.4	8.5					
	7.8	3.6	8.3	24.7	19.5	2.82	34.3	8.8					

## VSCS36 — 1220 CFM

EWT (F)	GPM	WPD		COOLING					HEATING				
		PSI	FT	TC	SC	kW	HR	EER	HTG	kW	HE	LAT (F)	COP
20	9.5	9.1	21.0						18.3	1.99	11.5	81.9	2.7
30	4.8	2.6	6.0	42.4	29.3	1.68	48.1	25.2	20.7	2.08	13.7	83.7	2.9
	7.2	5.4	12.5	42.6	29.0	1.60	48.1	26.6	21.5	2.09	14.3	84.3	3.0
	9.5	8.5	19.6	42.8	28.6	1.58	48.1	27.1	22.0	2.10	14.8	84.7	3.1
40	4.8	2.5	5.8	41.2	30.0	1.81	47.4	22.7	24.2	2.10	17.0	86.4	3.4
	7.2	5.0	11.5	41.6	29.9	1.72	47.5	24.1	25.2	2.12	17.9	87.1	3.5
	9.5	8.0	18.5	42.0	29.4	1.68	47.7	25.0	26.0	2.13	18.7	87.8	3.6
50	4.8	2.3	5.3	39.2	29.0	1.91	45.8	20.5	27.6	2.14	20.3	88.9	3.8
	7.2	4.6	10.6	40.0	29.2	1.82	46.2	22.0	28.8	2.17	21.3	89.8	3.9
	9.5	7.4	17.1	40.5	29.1	1.77	46.5	22.9	29.2	2.34	21.2	90.2	3.7
60	4.8	2.1	4.8	37.3	27.6	2.18	44.7	17.1	30.2	2.39	22.1	90.9	3.7
	7.2	4.3	9.9	38.5	28.1	2.06	45.5	18.7	31.9	2.40	23.8	92.2	3.9
	9.5	6.9	15.9	39.1	28.5	2.00	45.9	19.6	33.3	2.41	25.1	93.3	4.0
70	4.8	2.0	4.6	35.0	26.6	2.44	43.3	14.3	34.2	2.42	26.0	94.0	4.1
	7.2	4.1	9.5	36.7	27.5	2.38	44.8	15.4	36.1	2.46	27.7	95.4	4.3
	9.5	6.6	15.2	37.5	27.7	2.30	45.3	16.3	36.9	2.47	28.5	96.0	4.4
80	4.8	1.8	4.2	33.5	26.1	2.80	43.0	12.0	36.9	2.52	28.3	96.0	4.3
	7.2	3.9	9.0	35.0	27.0	2.74	44.3	12.8	38.9	2.54	30.2	97.5	4.5
	9.5	6.3	14.5	35.9	27.1	2.60	44.7	13.8	39.8	2.55	31.1	98.2	4.6
90	4.8	1.7	3.9	31.9	25.2	3.14	42.6	10.2	39.7	2.57	30.9	98.1	4.5
	7.2	3.7	8.5	33.2	25.6	2.89	43.1	11.5	41.3	2.60	32.4	99.4	4.7
	9.5	6.0	13.8	34.2	26.1	2.78	43.7	12.3	42.1	2.62	33.2	100.0	4.7
100	4.8	1.6	3.7	29.5	23.3	3.31	40.8	8.9					
	7.2	3.8	8.8	30.9	24.1	3.11	41.5	9.9					
	9.5	5.8	13.4	31.8	24.8	3.00	42.0	10.6					
110	4.8	1.6	3.7	26.9	21.8	3.72	39.6	7.2					
	7.2	3.7	8.5	28.2	22.5	3.42	39.8	8.2					
	9.5	5.7	13.1	28.9	22.8	3.35	40.3	8.6					

- Cooling Performance is tabulated at 80.6 F DB and 66.2 F WB entering air. Heating performance tabulated at 68 F EAT
- Tabulated data does not include AHRM/ISO corrections for fan and pump power.
- All capacities are expressed in MBH.
- Insulated water circuit is recommended for operation below 60F EWT.
- See performance correction tables for conditions beyond what is listed.
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- Shaded areas indicate conditions where operation is not recommended.

# PERFORMANCE DATA

## ANTIFREEZE CORRECTION TABLE

		Antifreeze Concentration						
		5%	10%	15%	20%	25%	30%	40%
Ethylene Glycol	TC, SC	0.998	0.995	0.993	0.991	0.989	0.987	0.984
	HTG	0.995	0.990	0.985	0.980	0.974	0.969	0.964
	WPD	1.040	1.055	1.080	1.105	1.135	1.165	1.210
Propylene Glycol	TC, SC	0.995	0.992	0.987	0.983	0.979	0.975	0.970
	HTG	0.989	0.982	0.975	0.967	0.958	0.951	0.943
	WPD	1.035	1.055	1.100	1.145	1.200	1.260	1.320
Methanol	TC, SC	0.999	0.995	0.990	0.986	0.982	0.980	0.978
	HTG	0.989	0.985	0.979	0.971	0.963	0.954	0.946
	WPD	1.050	1.072	1.094	1.116	1.140	1.165	1.196

## AIRFLOW CORRECTION TABLE

Airflow %	Cooling				Heating		
	TC	SC	kW	HR	HTG	kW	HE
70	0.931	0.847	0.964	0.946	0.942	1.075	0.940
75	0.941	0.872	0.969	0.956	0.953	1.059	0.949
80	0.950	0.896	0.979	0.961	0.960	1.039	0.958
85	0.966	0.923	0.983	0.971	0.970	1.023	0.969
90	0.977	0.948	0.989	0.981	0.979	1.015	0.979
95	0.989	0.974	0.995	0.990	0.989	1.007	0.989
100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
105	1.008	1.025	1.006	1.010	1.009	0.994	1.010
110	1.018	1.048	1.013	1.017	1.019	0.992	1.018
115	1.026	1.070	1.019	1.026	1.029	0.991	1.028

## COOLING PERFORMANCE CORRECTION TABLE

EAT WB (F)	TC	EAT DB (F) - SC						HR
		70	75	80.6	85	90	95	
60	0.845	0.86	1.1	1.305	S	S	S	0.904
65	0.948	0.628	0.865	1.082	1.312	S	S	0.979
66.2	1	0.539	0.777	1	1.22	1.475	S	1
70	1.061		0.631	0.855	1.081	1.331	1.543	1.039
75	1.162			0.618	0.848	1.09	1.296	1.107

S = Sensible cooling is equal to Total Cooling

## HEATING PERFORMANCE CORRECTION TABLE

EAT DB (F)	HTG	kW	HE
45	1.101	0.785	1.162
50	1.080	0.832	1.125
55	1.059	0.878	1.079
60	1.039	0.926	1.064
65	1.019	0.960	1.023
68	1.000	1.000	1.000
70	0.990	1.028	0.983
75	0.974	1.064	0.957
80	0.951	1.111	0.918

# BLOWER PERFORMANCE

## STANDARD BLOWER PERFORMANCE (CFM)

Unit Size	Rated CFM	Min. CFM	Max. CFM	Motor Speed	External Static Pressure (in w.g.)										
					0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
09	340	238	345	HIGH	345	335	325	315	305	290	275	255	235	-	-
		240	310	LOW	310	300	285	270	255	240	-	-	-	-	-
12	430	301	435	HIGH	435	425	415	400	385	370	355	340	320	295	-
		301	345	LOW	345	335	325	315	305	300	-	-	-	-	-
18	685	479.5	690	HIGH	690	675	660	635	615	595	575	550	525	495	460
		480	500	LOW	500	495	490	485	480	-	-	-	-	-	-
24	850	595	855	HIGH	855	835	815	795	770	740	710	680	650	615	595
		605	710	LOW	710	705	690	670	650	630	605	-	-	-	-
30	1075	752.5	1075	HIGH	1075	1050	1020	990	960	930	895	850	800	750	-
		755	950	LOW	950	935	915	890	865	835	795	755	-	-	-
36	1220	870	1230	HIGH	1230	1200	1170	1140	1110	1075	1040	1000	960	915	870
		855	1115	LOW	1115	1100	1075	1050	1020	990	960	930	895	855	-

## HIGH STATIC BLOWER PERFORMANCE (CFM)

Unit Size	Rated CFM	Min. CFM	Max. CFM	Motor Speed	External Static Pressure (in w.g.)														
					0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7
09	340	238	350	HIGH	-	-	-	350	340	330	315	300	285	265	245	235	-	-	-
		240	330	LOW	330	320	310	300	290	280	270	255	240	-	-	-	-	-	-
12	430	315	455	HIGH	-	-	-	455	440	425	410	395	380	360	340	315	-	-	-
		305	390	LOW	390	385	380	370	360	350	335	320	305	-	-	-	-	-	-
18	685	480	695	HIGH	-	-	-	695	675	655	635	615	590	565	540	510	480	-	-
		480	670	LOW	670	660	650	635	620	605	590	570	550	530	505	480	-	-	-
24	850	650	865	HIGH	-	-	-	-	-	-	865	845	820	795	770	740	710	680	650
		605	795	LOW	795	785	775	760	745	730	715	695	675	655	630	605	-	-	-
30	1075	875	1090	HIGH	-	-	-	-	-	-	1090	1070	1050	1025	1000	970	940	910	875
		795	985	LOW	985	980	975	970	960	950	940	935	920	905	895	875	850	825	795
36	1220	945	1245	HIGH	-	-	-	-	1245	1220	1190	1160	1130	1100	1070	1040	1010	980	945
		875	1180	LOW	1180	1170	1160	1145	1130	1110	1090	1070	1050	1025	1000	970	940	910	875

## ELECTRICAL DATA - STANDARD BLOWER

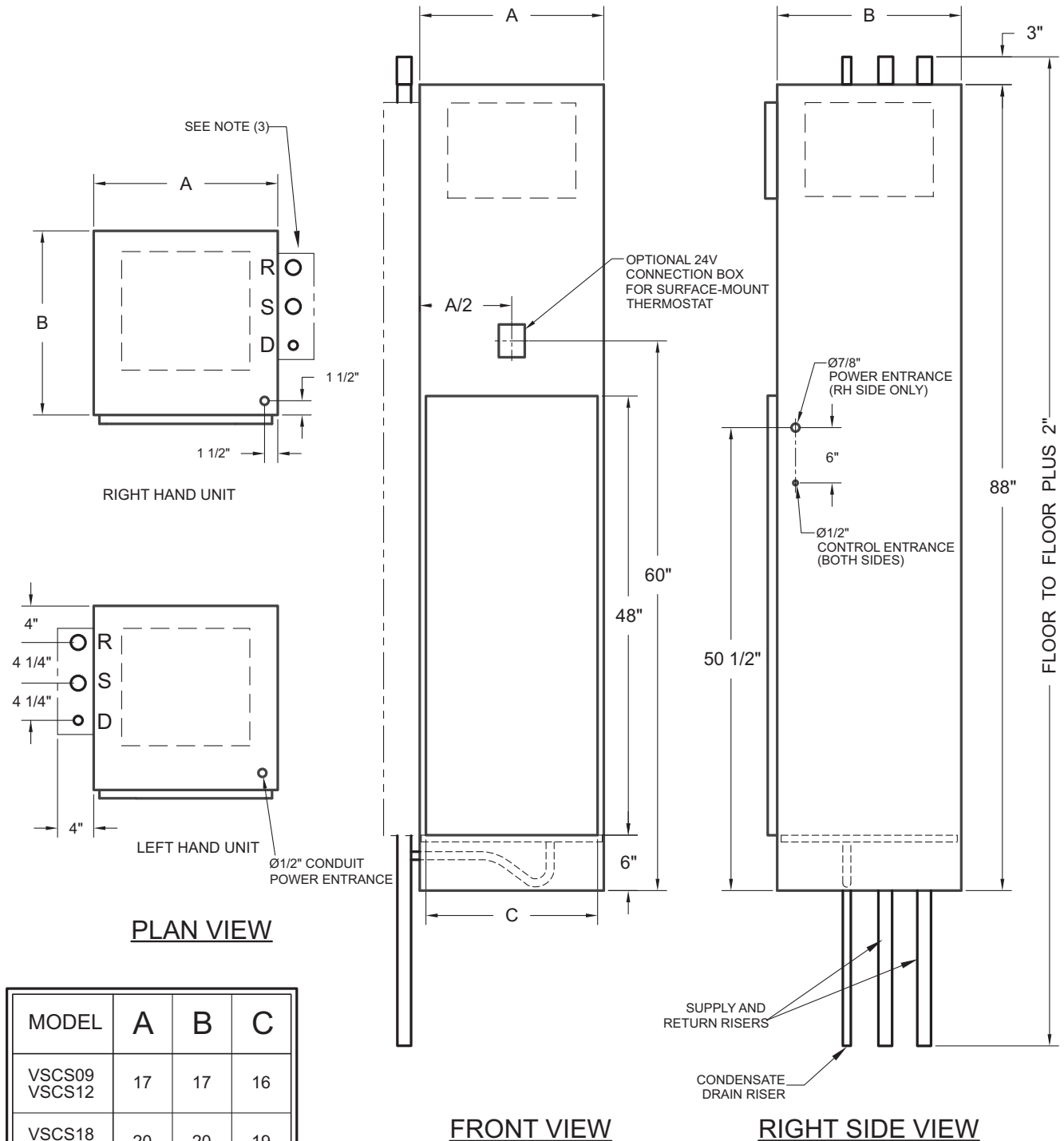
Unit Size	SUPPLY VOLTAGE	COMPRESSOR			BLOWER		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA			
09	208-230/1/60	1	@	4.8	22.2	0.10	0.8	6.80	15
12	208-230/1/60	1	@	6.7	32.5	0.10	0.8	9.18	15
	265/1/60	1	@	4.6	20.0	0.10	0.7	6.45	15
18	208-230/1/60	1	@	9.0	48.0	0.17	1.2	12.45	20
	265/1/60	1	@	7.1	43.0	0.17	0.8	9.68	15
24	208-230/1/60	1	@	12.8	58.3	0.25	1.5	17.50	30
	265/1/60	1	@	9.6	54.0	0.25	1.3	13.30	20
30	208-230/1/60	1	@	14.1	73.0	0.33	2.1	19.73	30
	265/1/60	1	@	11.2	60.0	0.33	1.9	15.90	25
36	208-230/1/60	1	@	16.7	79.0	0.50	2.7	23.58	40
	265/1/60	1	@	13.5	72.0	0.50	2.2	19.08	30

## ELECTRICAL DATA - HIGH STATIC BLOWER

Unit Size	SUPPLY VOLTAGE	COMPRESSOR			BLOWER		MIN. CCT. AMPACITY	MAX FUSE / CCT. BKR. AMP	
		QTY	RLA	LRA	HP	FLA			
09	208-230/1/60	1	@	4.8	22.2	0.10	0.8	6.80	15
12	208-230/1/60	1	@	6.7	32.5	0.17	1.2	9.58	15
	265/1/60	1	@	4.6	20.0	0.17	0.8	6.55	15
18	208-230/1/60	1	@	9.0	48.0	0.25	1.5	12.75	20
	265/1/60	1	@	7.1	43.0	0.25	1.3	10.18	15
24	208-230/1/60	1	@	12.8	58.3	0.33	2.1	18.10	30
	265/1/60	1	@	9.6	54.0	0.33	1.9	13.90	20
30	208-230/1/60	1	@	14.1	73.0	0.33	2.1	19.73	30
	265/1/60	1	@	11.2	60.0	0.33	1.9	15.90	25
36	208-230/1/60	1	@	16.7	79.0	0.50	2.7	23.58	40
	265/1/60	1	@	13.5	72.0	0.50	2.2	19.08	30

# DIMENSIONAL DATA

## SIDE RISER UNITS



MODEL	A	B	C
VSCS09 VSCS12	17	17	16
VSCS18 VSCS24	20	20	19
VSCS30 VSCS36	24	24	22

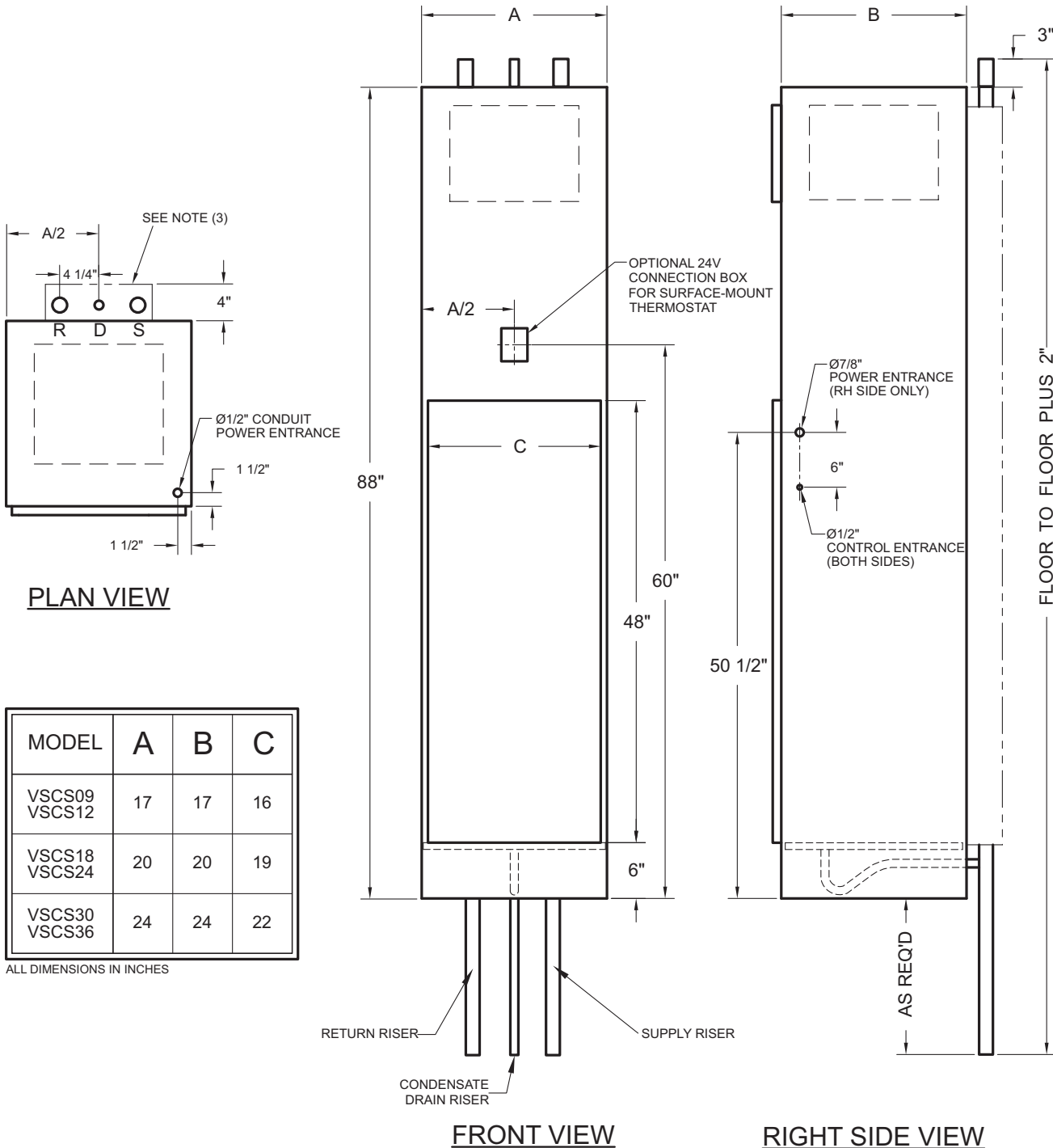
ALL DIMENSIONS IN INCHES

NOTES:

- 1) RETURN AIR OPENING SHALL BE ON FRONT OF UNIT.
- 2) CUSTOMER SELECTABLE DISCHARGE ARRANGEMENTS SHALL BE AVAILABLE FOR SINGLE OR MULTI-DUCT INSTALLATIONS. ALL FACTORY CUT CABINET OPENINGS ARE FINISHED WITH A 1-INCH DRYWALL/PLASTER FLANGE.
- 3) RISER COVER IS OPTIONAL

# DIMENSIONAL DATA

## REAR RISER UNITS



MODEL	A	B	C
VSCS09 VSCS12	17	17	16
VSCS18 VSCS24	20	20	19
VSCS30 VSCS36	24	24	22

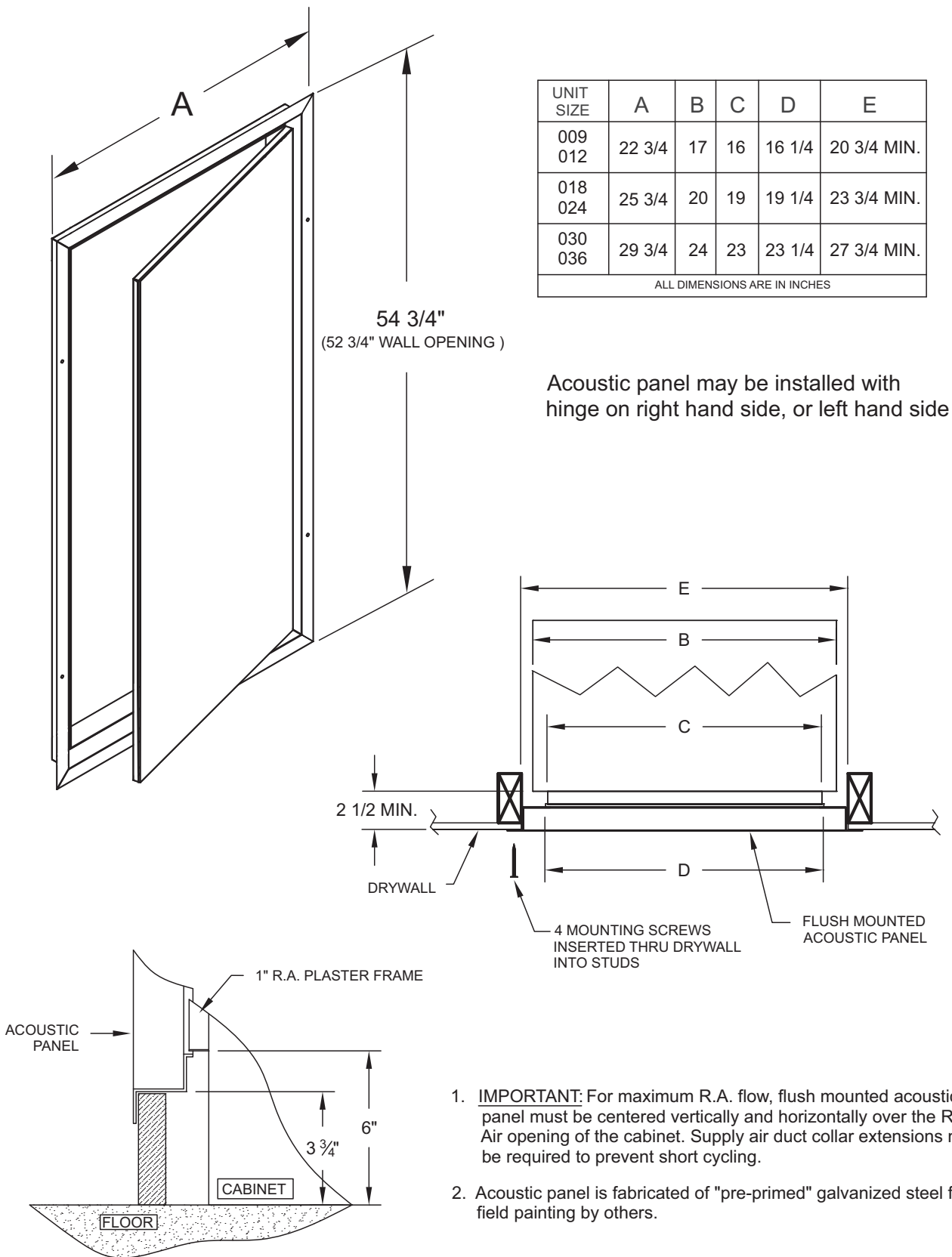
ALL DIMENSIONS IN INCHES

**NOTES:**

- 1) RETURN AIR OPENING SHALL BE ON FRONT OF UNIT.
- 2) CUSTOMER SELECTABLE DISCHARGE ARRANGEMENTS SHALL BE AVAILABLE FOR SINGLE OR MULTI-DUCT INSTALLATIONS. ALL FACTORY CUT CABINET OPENINGS ARE FINISHED WITH A 1-INCH DRYWALL/PLASTER FLANGE.
- 3) RISER COVER IS OPTIONAL

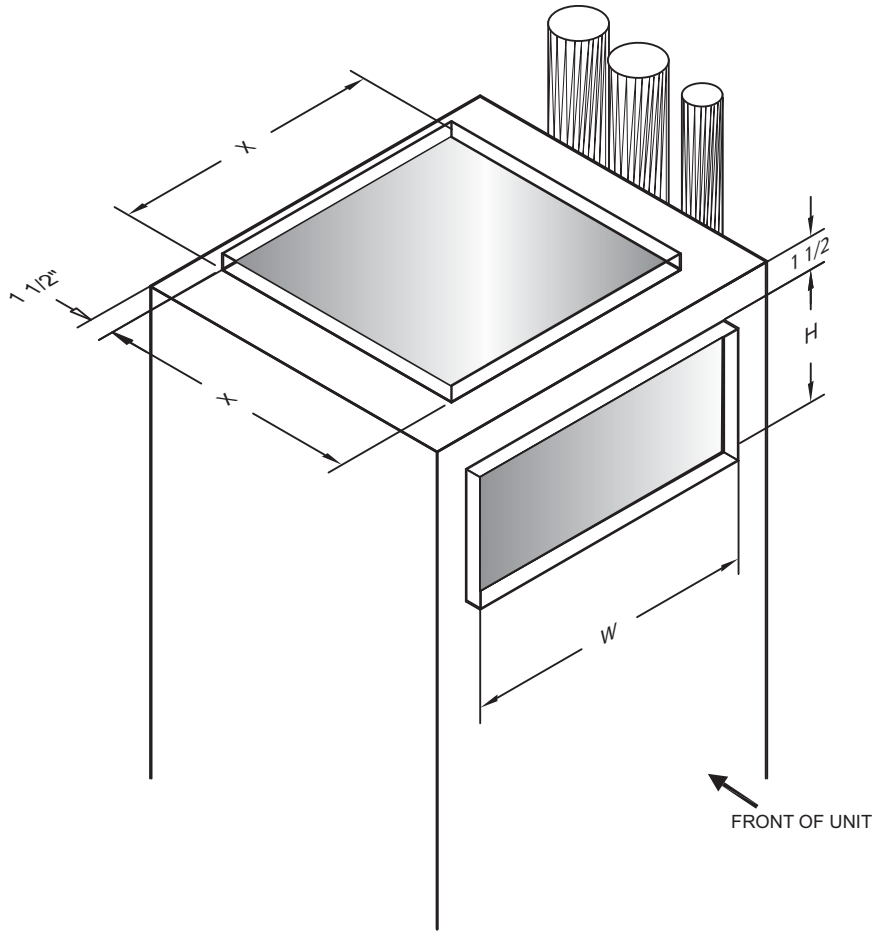
# DIMENSIONAL DATA

## ACOUSTIC RETURN AIR PANEL



# DIMENSIONAL DATA

## DISCHARGE GRILLE



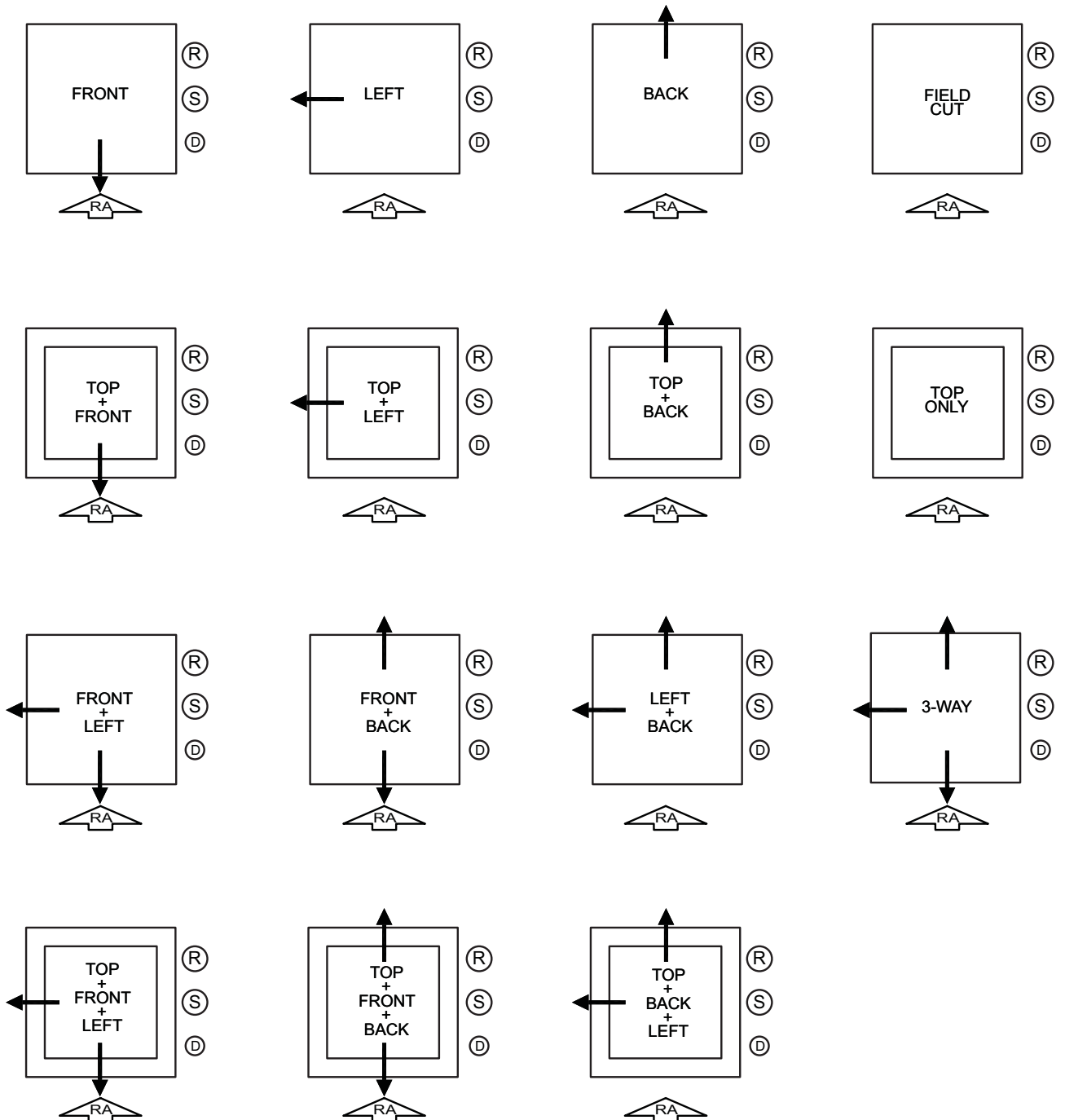
**Recommended Supply Grille Dimensions**

MODEL Series	Single Grille 100% CFM	Double Grille 50% CFM	Triple Grille 33% CFM	Top Discharge Up to 100% CFM
009	14W x 8H	10W x 6H	Not Recommended	12 x 12
012	14W x 10H	10W x 8H	Not Recommended	12 x 12
018	16W x 12H	14W x 8H	14W x 6H	14 x 14
024	16W x 14H	14W x 12H	14W x 8H	14 x 14
030	Not Recommended	16W x 12H	14W x 10H	17 x 17
036	Not Recommended	16W x 14H	14W x 12H	17 x 17

- 1) Unit mounted supply grilles will be supplied as double-deflection type.
- 2) Grilles for unequal airflow applications (unit-mounted plus ducted supply) shall be provided with integral opposed-blade dampers.
- 3) All grilles will be supplied in standard 'Appliance White' painted finish
- 4) Grilles are shipped loose, for field installation upon completion of cabinet / ductwork / drywall installation.
- 5) Top discharge, when combined with any other discharge arrangement, shall be included in determining grille size (i.e. Top + Front arrangement – Front grille selected from 'Double Grille' column).

# DISCHARGE CONFIGURATIONS

## RIGHT HAND RISER

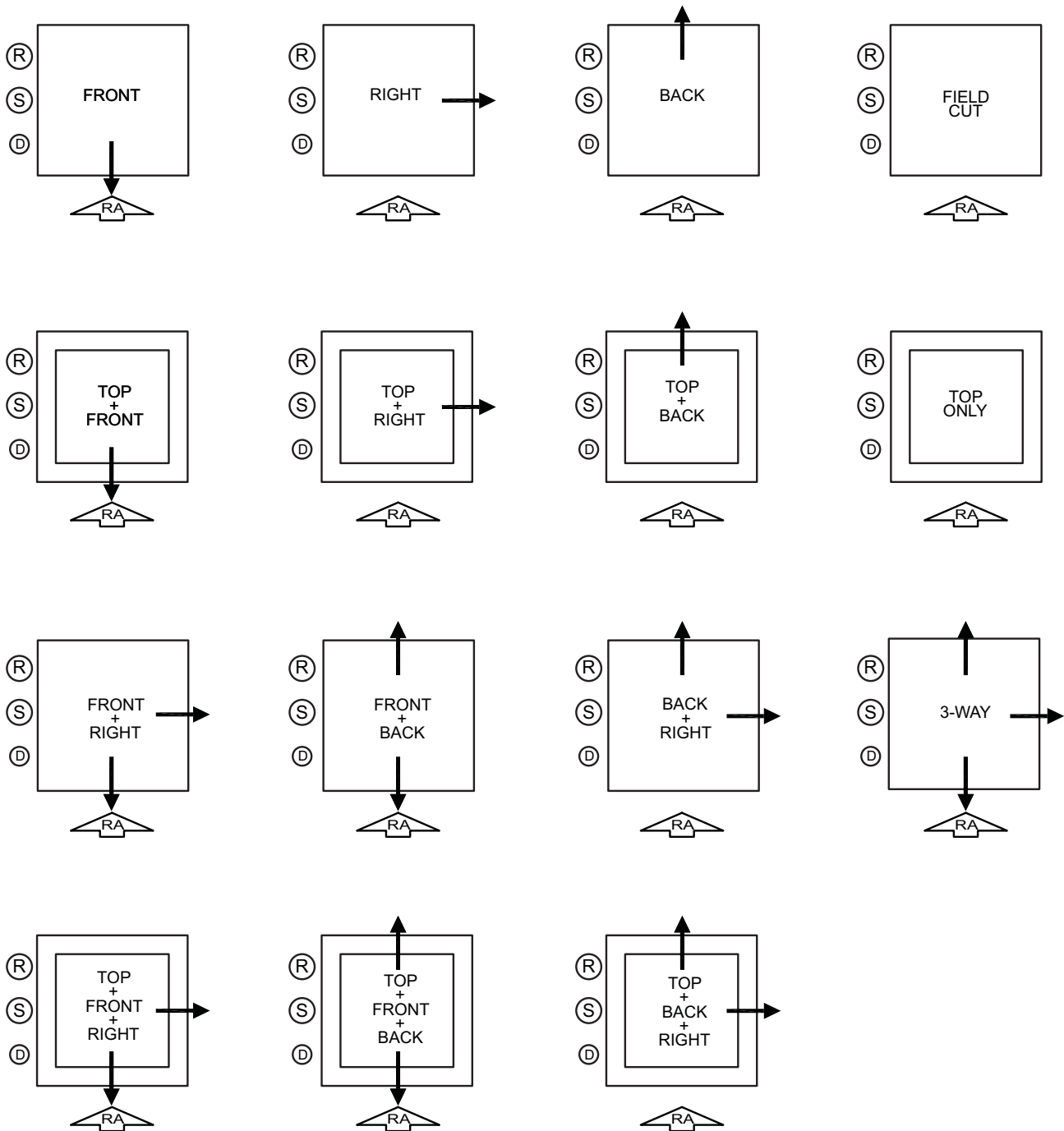


**NOTES:**

- 1) RETURN AIR OPENING SIDE IS DEFINED AS FRONT OF UNIT (CHASSIS AND CONTROL SERVICE ACCESS).
- 2) 3-WAY DISCHARGE ARRANGEMENT IS NOT RECOMMENDED FOR UNIT SIZES 009, 012
- 3) SINGLE DISCHARGE OPENING (EXCEPT TOP DISCHARGE) IS NOT RECOMMENDED FOR UNIT SIZES 030, 036

# DISCHARGE CONFIGURATIONS

## LEFT HAND RISER

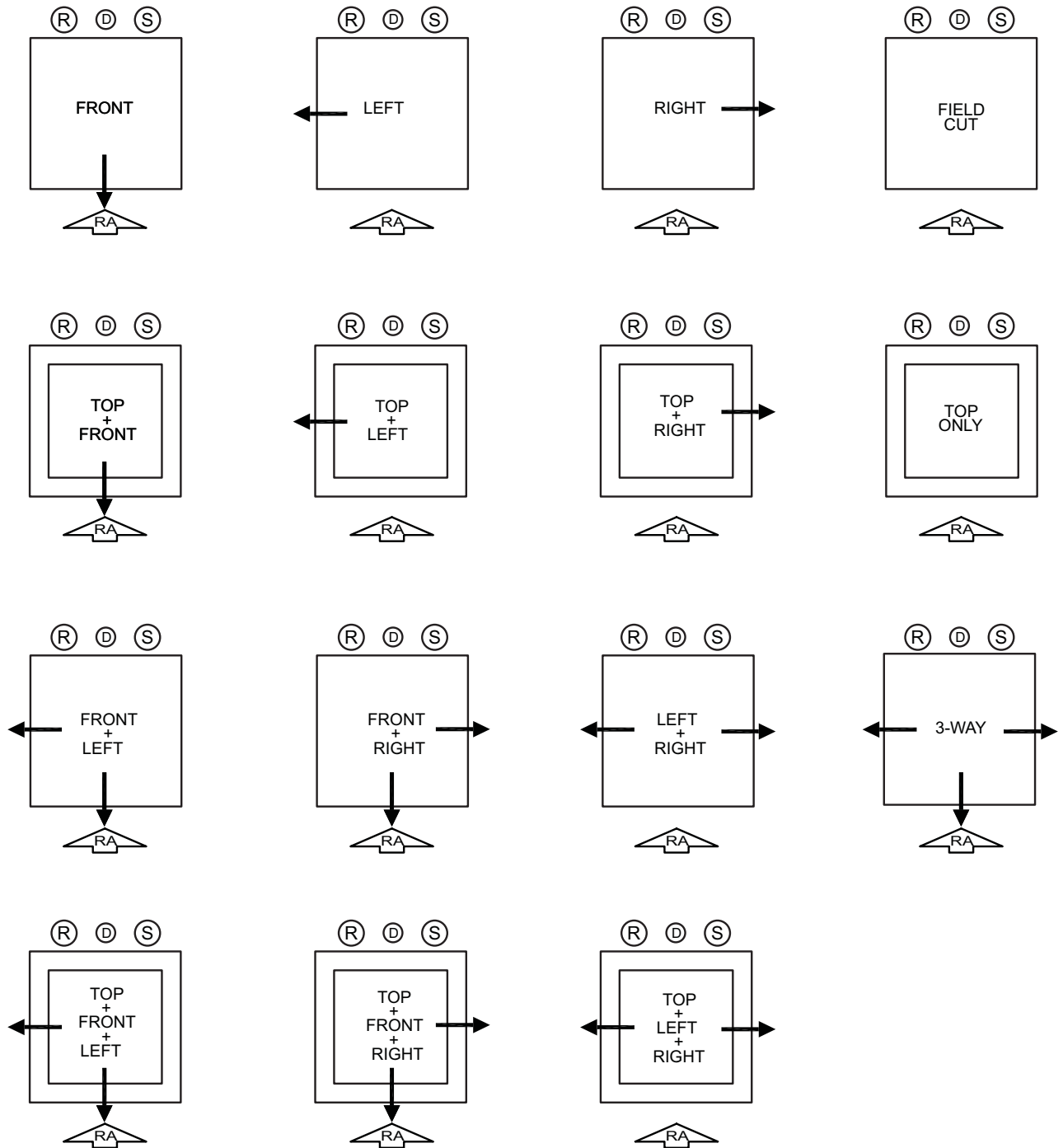


**NOTES:**

- 1) RETURN AIR OPENING SIDE IS DEFINED AS FRONT OF UNIT (CHASSIS AND CONTROL SERVICE ACCESS).
- 2) 3-WAY DISCHARGE ARRANGEMENT IS NOT RECOMMENDED FOR UNIT SIZES 009, 012
- 3) SINGLE DISCHARGE OPENING (EXCEPT TOP DISCHARGE) IS NOT RECOMMENDED FOR UNIT SIZES 030, 036

# DISCHARGE CONFIGURATIONS

## REAR RISER

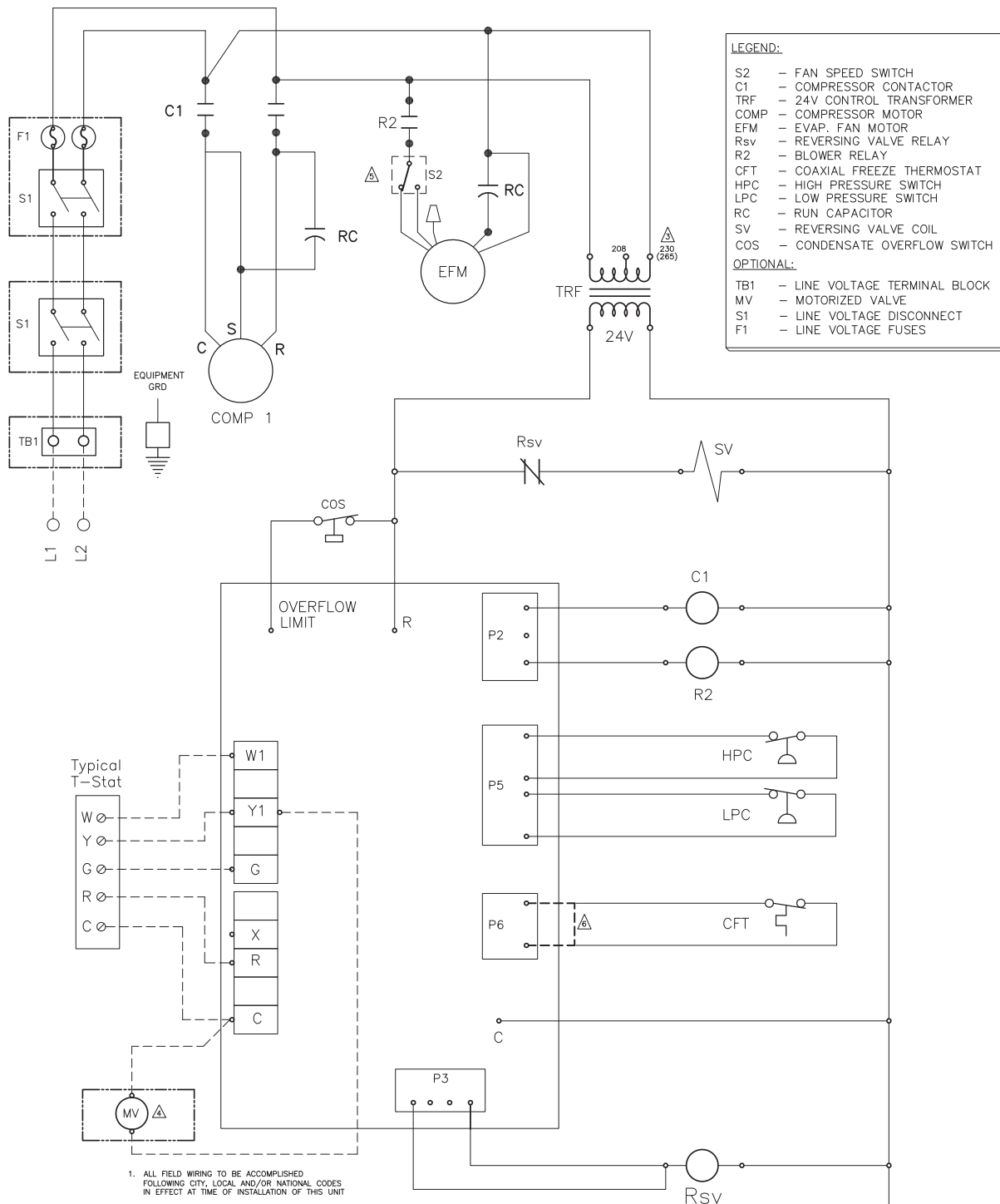


**NOTES:**

- 1) RETURN AIR OPENING SIDE IS DEFINED AS FRONT OF UNIT (CHASSIS AND CONTROL SERVICE ACCESS).
- 2) 3-WAY DISCHARGE ARRANGEMENT IS NOT RECOMMENDED FOR UNIT SIZES 009, 012
- 3) SINGLE DISCHARGE OPENING (EXCEPT TOP DISCHARGE) IS NOT RECOMMENDED FOR UNIT SIZES 030, 036

# WIRING DIAGRAM

VSCS SERIES; 208-230V/1Ph/60Hz  
265V/1Ph/60Hz



**LEGEND:**

- S2 - FAN SPEED SWITCH
- C1 - COMPRESSOR CONTACTOR
- TRF - 24V CONTROL TRANSFORMER
- COMP - COMPRESSOR MOTOR
- EFM - EVAP. FAN MOTOR
- Rsv - REVERSING VALVE RELAY
- R2 - BLOWER RELAY
- CFT - COAXIAL FREEZE THERMOSTAT
- HPC - HIGH PRESSURE SWITCH
- LPC - LOW PRESSURE SWITCH
- RC - RUN CAPACITOR
- SV - REVERSING VALVE COIL
- COS - CONDENSATE OVERFLOW SWITCH

**OPTIONAL:**

- TB1 - LINE VOLTAGE TERMINAL BLOCK
- MV - MOTORIZED VALVE
- S1 - LINE VOLTAGE DISCONNECT
- F1 - LINE VOLTAGE FUSES

1. ALL FIELD WIRING TO BE ACCOMPLISHED FOLLOWING CITY, LOCAL AND/OR NATIONAL CODES IN EFFECT AT TIME OF INSTALLATION OF THIS UNIT
  2. SEE UNIT NAMEPLATE FOR MAXIMUM FUSE AND/OR CIRCUIT BREAKER SIZE AND MINIMUM CIRCUIT AMPACITY
- ⚠️ FACTORY WIRED FOR 230 VOLT OPERATION. FOR 208 VOLT, CONNECT HIGH VOLTAGE TO 208V TERMINAL ON TRANSFORMER
  - ⚠️ FIELD INSTALLED SOLENOID VALVE CAN BE WIRED BETWEEN TERMINALS Y1 AND C TO HAVE IT ENERGIZE WITH THE COMPRESSOR RUN SIGNAL
  - ⚠️ REFER TO INSTALLATION MANUAL FOR UNIT-SPECIFIC FACTORY BLOWER SPEED CONNECTIONS
  - ⚠️ FOR LOW TEMPERATURE OPERATION, DISCONNECT CFT, AND INSTALL JUMPER PLUG.

----- FIELD WIRING  
- - - - - OPTIONAL

DWG: VSCS-UEI-12MP-1  
DATE: JUNE 12, 2009

NOTES

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