The Whalen Company

PRODUCT DESIGN GUIDE

Whisperline® VD Series
Two-Stage Vertical Stack

February 2021

Two-Stage Vertical Stack

Category	Position	Option Digit and Description
Product Family	1	V = Vertical Stack Water Source Heat Pump
Drain Type	2	I = Internal Whalen Drain
		P = P-trap Internal Drain
System Configuration	3	A = Heat Pump
		A1 = Heat Pump and Electric Heat
		B = Air Conditioning and Electric Heat
		C = Air Conditioning and Hydronic Heat
		D = Cooling Only
		E = Heating Only
		F = Heat Pump and Electric Heat
Unit Capacity	4	02 = 200 CFM (0.5-ton)
		03 = 300 CFM (0.75-ton)
		04 = 400 CFM (1.0-ton)
		05 = 500 CFM (1.25-ton)
		06 = 600 CFM (1.5-ton)
		08 = 800 CFM (2.0-ton)
		10 = 1000 CFM (2.5-ton)
		12 = 1200 CFM (3.0-ton)
Heat Exchanger / Cabinet	5	0 = Standard
		1 = Oversized
Revision (Major)	6	4 = 4th Generation
Voltage	7	A = 115-60-3
		B = 208/230-60-1
		D = 265-60-1
Fan	8	S = PSC - Standard Motor
		H = PC - High Static Motor
		D = ECM - Constant Torque Motor
		E = ECM - Constant Air Volume Motor
		F = ECM - Constant Torque Motor, Compressor Control Voltage
Revision (Minor)	9	- = Original
		B = 1st Revision
		C = 2nd Revision
		D = 3rd Revision
Sound Attenuation	10	- = Standard Quiet Construction
		B = Whalen Drain / Sound Package
		D = P-trap Drain / Sound Package

Category	Position	Option Digit and Description
Product Family	1	W = Vertical Stack Water Source Heat Pump
System Configuration	2	A = Heat Pump (Cooling default)
		B = Cooling Only
		C = Air Conditioning and Hydronic Heat
		E = Heating Only
		F = Heat Pump and Hydronic Heat (heating default)
		G = Heat Pump (heating default)
Unit Capacity	3	02 = 200 CFM (0.5-ton)
		03 = 300 CFM (0.75-ton)
		04 = 400 CFM (1.0-ton)
		05 = 500 CFM (1.25-ton)
		06 = 600 CFM (1.5-ton)
		08 = 800 CFM (2.0-ton)
		10 = 1000 CFM (2.5-ton)
		12 = 1200 CFM (3.0-ton)
Heat Exchanger / Cabinet	4	0 = Standard
		1 = Oversized
Revision (Major)	5	4 = 4th Generation
Voltage	7	A = 115-60-3
		B = 208/230-60-1
		D = 265-60-1
Compressor	8	C = Copeland
		B = Bristol
		T = Tecumseh
		M = Matsushita
		L = LG
Distributor Options	9	X = Extended Range (TXV)
		Y = Standard (TXV)
		I = Boilerless (TXV - Must be type A)
Revision (Minor)	10	- = Original
		B = 1st Revision
		C = 2nd Revision
		D = 3rd Revision
Option Style	11	A = Whalen Drain / Standard Rails / 22ga. Compressor Box
		B = Whalen Drain / Silver Rails / 18ga. Compressor Box
		C = P-trap Drain / Standard Rails / 22ga. Compressor Box
		D = P-trap Drain / Silver Rails / 18ga. Compressor Box

Table 1: AHRI Performance Ratings – ASHRAE / ANSI / AHRI / ISO Standard 13256-1

			Water Loop Heat Pump				Ground Loop Heat Pump			
			Cooling 86°F		Heating 68°F		Cooling 77°F		Heating 32°F	
Model Full Load	CFM	GPM	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP
VDA0801A**	850	8.0	23,500	16.0	29,600	5.6	24,500	17.5	17,000	4.0
VDA1001A**	1170	9.0	30,300	15.8	41,000	5.7	31,300	16.9	22,200	3.8
VDA1201A**	1250	10.0	36,000	16.0	46,400	5.7	37,000	16.9	25,800	3.8

Cooling based upon 80.6°F DB, 66.2°F WB entering air temperature

Heating based upon 68°F DB, 59°F WB entering air temperature

			Water Loop Heat Pump				Ground Loop Heat Pump			
			Cooling 86°F		Heating 68°F		Cooling 68°F		Heating 41°F	
Model Part Load	CFM	GPM	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP
VDA0801A**	750	7.0	18,700	17.6	22,600	6.6	19,300	18.5	12,200	4.2
VDA1001A**	1000	8.0	22,700	17.5	29,500	6.2	23,400	18.0	17,600	4.2
VDA1201A**	1030	9.0	26,300	17.3	32,600	6.3	27,500	18.3	19,600	4.2

Cooling based upon 80.6°F DB, 66.2°F WB entering air temperature

Heating based upon 68°F DB, 59°F WB entering air temperature

Performance based upon 208/60/1 voltage

Features & Benefits

Electric Heat Factory installed electric heaters are available on vertical units. Unit controls are available for boilerless, supplemental, primary or emergency electric heat to serve several different application needs. Boilerless electric heat will be energized when the entering water temperature falls below set point. This will allow electric heat to function while ensuring the compressor remains off. With supplemental electric heat control, the wall thermostat will activate the compressor and heater simultaneously if necessary to maintain room heating conditions.

Internal Pump Internal pump is optional on all size units but cannot be used in conjunction with the two-way solenoid valve. The internal pump is an internally mounted ON/OFF circulating pump for use with our single riser applications.

Tin Dipped Coil Optional tin electro-plated copper tubing protect the air coil from many corrosive elements in the air stream. Corrosion often referred to as Formicary Corrosion occurs due to the presence of dissimilar metals such as copper and aluminum in conjunction with water causes results in refrigerant leaks and eventual failure of the air coil costing hundreds of dollars to replace. Studies have also shown that isolating the copper from the aluminum greatly reduces or eliminates the corrosion thereby increasing the life of the air coil.

Constant Torque EC Motor Are standard on size 0800 and 1200 units; they are optional on size 800 and smaller and provide the efficiency and operability of an ECM at a lower cost than a constant airflow ECM. Constant torque ECMs provide 5 available motor speed settings and will maintain a constant motor torque as external static pressure in the system increases. As the system static pressure increases, reduction in fan airflow with a constant torque ECM is minor.

Constant Air Volume EC Motor Are optional on size 0400 – 1200 units and will maintain a constant unit airflow as the static pressure in the system increases. Constant airflow ECMs provide only single speed settings.

PSC (Permanent Split Capacitor) Are standard on size 0600 and smaller units. Our PSC motor is available in standard static range as well as high static applications. The supplied motor is available in single or two-speed configurations (two manual two-speed fan switch, control based fan relay, or two-speed thermostat.

Supply Air Grille Diffusers are constructed of aluminum with a mill finish or an optional painted finish, available in three variations: single deflection, double deflection, double deflection with opposed blade damper. Damper blades are positioned vertically and adjust easily for directing the unit discharge air.

Flush Mounted Return Air Panel Constructed of heavy gauge steel, lined with insulation to help attenuate sound from the compressor and fan assembly. Mechanical latching clips ensure the panel door stays closed during operation. Panels are available in chassis accessible version to allow removal of refrigerant chassis without removing the return air panel.

Painted Flush Mounted Return Air Panel Constructed of heavy gauge painted steel, lined with insulation to help attenuate sound from the compressor and fan assembly. Mechanical latching clips ensure the panel door stays closed during operation. Panels are available in chassis accessible version to allow removal of refrigerant chassis without removing the return air panel.

Telescoping SA Extension Collar A canvas duct connector to connect the WSHP discharge to the downstream duct system. This reduces vibration-induced noise.

Cabinet Stand An optional cabinet stand is available in heights ranging from 2” up to 14” to accommodate interiors with higher baseboard mouldings.

Unfused Disconnect Units are available with an optional non-fused disconnect switch, located on the unit front behind the return air panel. The disconnect switch is used to break power to the unit for safety and ease of service.

Circuit Breaker Units are available with an optional circuit breaker (Magnetic Hydraulic breaker). The circuit breaker is used to break power to the unit for safety and ease of service.

T-stat extension Low voltage wire harness ranging from 5 to 20 foot ending with 6-P-in Molex quick connector. The extension can exit cabinet on the top, front, or either side depending on the riser location.

Condensate pump The internal condensate pump allows the unit to be located virtually wherever desired. The internal condensate pump serves as an effective means for disposing of condensate generated during heat pump operation. A condensate pump should be designed and installed at the unit to pump condensate to a building drain.

Vibration Isolation Pad Vibration isolator pads dampen vibration from the compressor and fan motors. The 1/2" thick isolation pads are composed of closed cell insulation and are attached to the bottom of the cabinet at the factory eliminating any additional field labor.

2-Way Valve 2-way valves are used for a variety of pumping applications when more than one unit is installed on a common loop. These valves are also used to shut off flow when the unit is not operating. On a call for cooling or heating the valve opens providing full water flow prior to compressor operation. A 24 volt control wire harness is included with the factory provided control valve option.

Automatic Flow Control An automatic flow control device includes a ball valve cast in the valve body and is located on the return water pipe. The flow control valve consists of a stainless steel/brass flow cartridge and a contoured orifice plate. As the pressure drop increases, the flow cartridge will move into the contoured orifice plate to decrease the flow. This flexing action provides a constant flow, independent of pressure (2-80 psi), makes it difficult to clog and resistant to cavitation damage. This valve sets flow through the coil without any action required by a system balancer.

Manual Flow Control A manual flow control valve, acts as both a flow setting device and a stop valve, taking the place of a ball valve. This valve allows water flow through the unit and can be set quickly and accurately.

Ball Valve Ball valves allow the unit to be shut off for servicing purposes. They have a low resistance to water flow, operate easily. These valves have a compact handle that rotates 90 degrees to a fully open position. The valve body is forged brass and the ball is polished brass with Teflon seats and seals. Ball valves are included on both the supply and return risers.

Memory Stop Adjustable Memory Stop provides both balancing and shutoff in one valve. With the memory stop locked in place, the valve can be closed and then reopened to the same balanced position.

P/T Port An accessible port where pressure and temperature can be measured. Accepts standard 1/8" gauge adapter or thermometer stem.

Strainer The Y-type strainer body is constructed of brass with a 20 mesh 304 stainless steel screen. Used for removal of small particles from the water supply pipe during normal system operation. The strainer helps protect the coil and minimizes the chance of control valves clogging. Screens should be regularly removed and cleaned as part of a routine maintenance schedule.

Stainless Steel Hoses Flexible 302/304 stainless steel hose with EPTF inner tube and JIC flare connections. Meets UL-94 VO fire rating.

O.A. Internal Duct A 4" round internal duct is factory installed to provide outside air to the return side of the air coil. By introducing the outside air to the return side of the coil, the outside is conditioned prior to entering the occupied space. The O.A. Internal Duct is insulated when internal to cabinet.

O.A. Motorized O.A. Damper The control can be configured to operate as a ventilation damper in a 2-position ventilation mode to provide the minimum ventilation requirements during occupied periods. This control operation still utilizes the modulating damper actuator. Note that the motorized O.A. damper cannot be used with the internal O.A. duct.

Filter Units come standard with a one-inch glass fiber throwaway filter. High efficiency MERV 4, MERV 8, MERV 11, and MERV 13 pleated filters as well as a washable aluminum mesh filter are also available as an option.

Cu-Ni Coaxial Heat Exchanger The optional cupronickel tube-in-tube coaxial heat exchanger used in vertical stack water source heat pumps is designed for maximum heat transfer at normal and low water flow rates with minimum pressure drop. The inside tube is deeply fluted to enhance heat transfer and minimize fouling. All coaxial coils are tested to 400 psig on the water side and 600 psig on the refrigerant side. The extended range chassis has coil and piping insulation to protect against condensation in low-temperature geothermal applications.

Silver Rail Package The silver rail sound package further attenuates the sounds levels of our standard unit by adding a set of rubber in shear isolators under the compressor chassis rails in lieu of our standard rubber in shear isolators to enhance the dual-level vibration isolation.

Table 2: Whisperline® Thermostat for Two Stage Operation

Feature		SCI SC5211
Mounting Style	Electrical Box	
	Drywall	•
Display	Backlit LCD	•
	Temperature & Setpoint	•
	Operating Mode	•
	Fan Status	•
	Remote Setback	•
Operation	Non-programmable	
	Programmable	•
	Sensing	Local or Remote
	Setpoint Range	45°F to 90°F
	Changeover	Manual or Auto
Operating Modes	System Settings	Heat - Cool - Off
	Fan Settings	On - Auto
	Fan Speeds	1
Stages	Heating	1
	Cooling	1
Voltage	Operating Voltage	18 - 30 VAC

Unit Protections & LED Fault Status Annunciation

Refrigerant Circuit High Pressure Protection

A normally closed high (compressor discharge) pressure switch is used to help protect the refrigerant circuit from excessively high pressure. If the high pressure switch opens twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Refrigerant Circuit Low Pressure Protection

A normally closed low (compressor suction) refrigerant pressure switch is used to help protect the refrigerant circuit from excessively low refrigerant pressure. If the low pressure switch opens twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Condensate Overflow Sensor

The control is designed to sense when condensate water levels in the drain pan become excessively high. When high condensate water levels are detected, the controller will go into condensate overflow warning mode. If the condensate overflow sensor detects liquid twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Heat Exchanger Low Temperature Protection

The control is designed to sense when the refrigerant temperature drops to a temperature where it is possible to freeze the air coil or the coaxial heat exchanger. The threshold temperature is field selectable for 10°, 20°, or 32°F. If the Freeze Sensor drops below the set temperature twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Low water temperature

The control is designed to sense when the leaving water temperature drops to a temperature where it is possible to freeze the coaxial heat exchanger or raises to a temperature high enough to cause possible damage to the compressor. The threshold

temperature is field selectable for 0°, 10°, 20°, 36°, or 125°F. If the sensor drops below (or above 125°) the set temperature twice within 1 hour, the control board will initiate a hard lockout and the alarm contact will energize.

Low Voltage (Brownout) Protection

The solid state control will monitor the 24 volt power input supplied to the board. If the supply voltage drops below 18 VAC, the control module will shut down the unit to protect electrical components from low line voltage conditions.

Soft Lockout Reset

This feature is used to minimize nuisance trips of safeties caused by temporary conditions that might inhibit the unit from performing normal functions. When a safety trip occurs, it is counted and the alarm is cleared when the condition returns to normal. If the alarm occurs two times within a 1-hour period, the heat pump remains off (locked out) until the unit is checked and the alarm is manually cleared.

Multi-Protocol DDC Controller

The Whalen Company water source heat pumps are available with a factory installed multi-protocol communication module that is designed to communicate with a building automation system (BAS). The I/O Zone 560 DDC controller is designed to allow the integration of Whalen water source heat pump equipment into DDC systems. The I/O Zone 560 DDC controller has the ability to communicate through a choice of three widely used protocols: BACnet MS/TP, Johnson Controls N2, and Modbus. The protocol of choice for the particular system is selected by simply configuring DIP switches on the DDC control. This flexibility allows one controller to be used in a multitude of buildings which use any of these three common protocols. The control serves as a node of information processing between the Whalen heat pump and the DDC network.

Features & Benefits

- Multi-Protocol communications provides DDC system flexibility.
- Supports native BACnet MS/TP communications – the ASHRAE standard protocol for interoperability.
- Supports Johnson Controls N2 communications – for integration into Johnson Controls Metasys DDC systems.
- Supports Modbus communications for integration into Modbus DDC networks.
- Four baud rate levels offer flexible communications speeds of 9600, 19.2k, 38.4k, or 76.8k baud. Enables building operators to easily upgrade firmware in the future.
- Removable field wiring connectors for ease of field service.
- Five (5) digital outputs.
- Six (6) inputs.
- Stand-alone or BAS integrated operational modes.

Hardware Specification

Power:	24Vac +-10%, 50 or 60Hz, 18VA power consumption, 26Vdc, Single Class 2 source only, 100 VA or less.
Physical size:	5-1/16” [129mm] width x 5-11/16” [144mm] height x 1-1/2” [38mm] (minimum panel depth).
Housing material:	Rugged GE C2905HG Cycoloy plastic housing – complies with UL 94 V-O.
Environmental:	0 to 130 degrees F, 10% to 95% non-condensing.
Protection:	Built-in surge transient protection circuitry. Module protected by Internal solid state Polyswitches on incoming power and network connections.
Digital Outputs:	5 digital outputs, relay contacts rated at 1 A resistive @ 24 Vac, configured as dry contact, normally open.
Universal inputs:	6 universal inputs. Inputs 1-6 configurable as thermistor or dry contact; inputs 1 and 2 also configurable as 0-5 Vdc type inputs.
Communication ports:	*Port 1:* Jumper configurable for ARCNET or EIA-485 communication. In ARCNET mode, the port speaks BACnet (at 156k bps). In EIA-485 mode, the communication protocol and baud rate desired are DIP switch selectable between BACnet MS/TP, Modbus RTU, or N2. *Rnet port:* Interface with a BACview5, BACview6 , RS sensors, or local laptop.
Optional card port:	LonWorks Option Card for connection to Free Topology LON networks (TP/FT-10 Channel).

Table 3: Physical Data Table

Component	Models		
	VDA0801**A	VDA1001**A	VDA1201**A
Nominal Tonnage	**2**	**2.5**	**3.0**
COOLING PERFORMANCE (Full Load)			
Capacity (MBTUH), ECM fan	23500.0	30300.0	36000.0
EER (Btuh/W), ECM fan	16.0	15.8	16.0
Entering Water Temp (°F)	86	86	86
Water Flow (GPM)	8.0	9.0	10.0
Rated CFM	850	1170	1250
COOLING PERFORMANCE (Part Load)			
Capacity (MBTUH), ECM fan	18700	22700	26300
EER (Btuh/W), ECM fan	17.6	17.5	17.3
Entering Water Temp (°F)	86	86	86
Water Flow (GPM)	7.0	8.0	9.0
Rated CFM	750	1000	1030
Refrigerant type	R410A	R410A	R410A
Refrigerant charge (oz)	24.0	48.0	54.0
HEATING PERFORMANCE (Full Load)			
Capacity (MBTUH), ECM fan	29600.0	41000.0	46400.0
COP, ECM fan	5.6	5.7	5.7
Entering Water Temp (°F)	68	68	68
Water Flow (GPM)	1.5	7.5	9.0
HEATING PERFORMANCE (Full Load)			
Capacity (MBTUH), ECM fan	22600.0	29500.0	32600.0
COP, ECM fan	6.6	6.2	6.3
Entering Water Temp (°F)	68	68	68
Water Flow (GPM)	7.0	8.0	9.0
DIMENSIONS (inches)			
Width (in.)	25.5	25.5	25.5
Depth (in.)	25	25	25
Height (in.)	88	88	88
OPERATING WEIGHT (lbs.)			
Chassis	190	209	209
Cabinet	186	194	194
SHIPPING WEIGHT (lbs.)			
Chassis	194	209	209
Cabinet	186	194	194
COMPRESSORS			
Type	Scroll	Scroll	Scroll
Quantity	1	1	1
EVAPORATOR COIL DATA			
Rows	4	4	4
Refrigerant control	TXV	TXV	TXV
SUPPLY FAN DATA			
Quantity	1	1	1
Fan Size (D x W)	9.5 x 7.8	10.7 x 10.5	10.7 x 10.5
Fan type	Centrifugal	Centrifugal	Centrifugal
Maximum E.S.P.			
ECM Motor - Constant Torque	0.5	0.75	0.75
ECM Motor - Constant Volume	0.5	0.75	0.75
CONSTANT TORQUE ECM HP			
Voltage - 208-230/60/1	1/2	1/2	1/2
Voltage - 265/60/1	1/2	1/2	1/2
CONSTANT VOLUME ECM HP			
Voltage - 208-230/60/1	1/2	1/2	1/2
Voltage - 265/60/1	1/2	1/2	1/2
ACOUSTICAL RETURN AIR PANEL			
Chassis Accessable Flush Mounted	31 x 66	31 x 66	31 x 66
SUPPLY GRILLE			
Top Duct (W x H)	16 x 14	16 x 14	16 x 14
FILTERS			
Size	22.5 x 32 x 1	22.5 x 32 x 1	22.5 x 32 x 1
Quantity	1	1	1

Table 4: Unit Voltage Limitations

Voltage	Minimum	Maximum
208/230-60-1	197	252
265-60-1	239	292

Table 5: VD Continuous Operating Limits

Mode	Ambient Air °F		Entering Air °F				Entering Fluid °F			
	Minimum	Maximum	Minimum		Maximum		Standard Range		Extended Range	
	DB	DB	DB	WB	DB	WB	Min	Max	Min	Max
Cooling	60	100	75	63	100	83	60	120	30	120
Heating	60	80	60	–	80	–	60	90	20	90

Note: Extended Range **requires insulated risers, correct control jumper setting, and design condition antifreeze solution**

Table 6: VD Start-up Operating Limits

Mode	Ambient Air °F		Entering Air °F				Entering Fluid °F			
	Minimum	Maximum	Minimum		Maximum		Standard Range		Extended Range	
	DB	DB	DB	WB	DB	WB	Min	Max	Min	Max
Cooling	50	100	50	42	100	83	50	120	30	120
Heating	50	80	50	–	80	–	50	90	20	90

Note: Extended Range **requires insulated risers, correct control jumper setting, and design condition antifreeze solution**

Standard Range Units:

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 50°F (10°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in heating and cooling mode.

Note: This is not a normal or continuous operating condition. It is assumed that such start-up is for the purpose of bringing the building space up to occupancy temperature and operating for extended periods of time.

Extended Range Units:

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 20°F (-7°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in heating.

Units are designed to start in an ambient of 50°F (10°C) with entering air at 50°F (10°C), with entering water at 30°F (-1°C), with nominal air flow and water flow (3.0 GPM/Ton), for initial start-up in cooling.

Note: This is not a normal or continuous operating condition. It is assumed that such start-up is for the purpose of bringing the building space up to occupancy temperature and operating for extended periods of time.

Environment

This equipment is designed for indoor installation only. Unconditioned locations such as attics, garages, etc., generally will not provide sufficient protection against extremes in temperature and/or humidity, and equipment performance, reliability, and service life may be adversely affected.

Power supply

A voltage variation of +/-10% of nameplate voltage is acceptable.

Cooling Performance

Size (Tons)	EWT (°F)	Full / Part Load	GPM	Cooling Performance														
				Entering Air - 80°F / 67°F					Entering Air - 78°F / 65°F					Entering Air - 75°F / 63°F				
				TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)	TC (Btu/hr)	SC (Btu/hr)	kW	HR (Btu/hr)	Liquid Temp Rise (°F)
VDA0801**A (2.0)	86	Full	4.00	23.60	17.63	1.70	29.42	14.71	23.45	17.95	1.70	29.26	14.63	23.28	16.93	1.70	29.08	14.54
			5.00	23.65	18.02	1.68	29.37	11.75	23.50	18.34	1.67	29.21	11.69	23.33	17.30	1.67	29.04	11.61
			8.00	23.98	18.33	1.60	29.44	7.36	23.82	18.66	1.60	29.28	7.32	23.65	17.60	1.60	29.10	7.28
		Part	4.00	17.55	14.81	1.21	21.68	10.84	17.43	15.33	1.21	21.56	10.78	17.35	14.11	1.21	21.46	10.73
			5.00	17.81	14.56	1.19	21.87	8.75	17.69	15.07	1.19	21.74	8.70	17.60	13.86	1.19	21.65	8.66
			7.00	18.04	15.17	1.15	21.98	6.28	17.92	15.70	1.15	21.85	6.24	17.83	14.44	1.15	21.76	6.22
VDA1001**A (2.5)	86	Full	5.00	30.63	23.85	2.21	38.16	15.26	30.06	23.17	2.20	37.58	15.03	29.33	19.95	2.20	36.84	14.74
			6.25	30.24	23.68	2.16	37.62	12.04	29.68	23.01	2.16	37.05	11.86	28.96	19.81	2.16	36.32	11.62
			9.00	30.59	23.81	2.10	37.75	8.39	30.02	23.14	2.10	37.18	8.26	29.29	19.92	2.09	36.44	8.10
		Part	5.00	22.52	19.45	1.53	27.76	11.10	22.20	18.97	1.54	27.45	10.98	21.82	17.56	1.55	27.10	10.84
			6.25	22.08	19.09	1.50	27.20	8.70	21.77	18.61	1.51	26.91	8.61	21.40	17.23	1.51	26.55	8.50
			8.00	22.07	18.87	1.47	27.09	6.77	21.75	18.40	1.48	26.80	6.70	21.38	17.03	1.48	26.44	6.61
VDA1201**A (3.0)	86	Full	6.00	35.03	25.86	2.45	43.39	14.46	34.54	26.89	2.45	42.88	14.29	33.98	24.87	2.44	42.30	14.10
			7.50	36.02	26.75	2.38	44.14	11.77	35.51	27.82	2.38	43.62	11.63	34.94	25.73	2.37	43.02	11.47
			10.00	35.53	26.15	2.33	43.49	8.70	35.03	27.19	2.33	42.98	8.60	34.46	25.15	2.32	42.39	8.48
		Part	6.00	25.25	20.54	1.67	30.96	10.32	24.92	20.78	1.68	30.67	10.22	24.60	18.43	1.70	30.39	10.13
			7.50	25.62	20.63	1.63	31.19	8.32	25.29	20.87	1.64	30.89	8.24	24.96	18.52	1.65	30.61	8.16
			9.00	24.86	20.24	1.61	30.37	6.75	24.54	20.47	1.62	30.08	6.69	24.22	18.16	1.64	29.81	6.62

Heating Performance

Size (Tons)	EWT (°F)	Full / Part Load	GPM	Heating Performance											
				Entering Air - 65°F db				Entering Air - 70°F db				Entering Air - 75°F db			
				HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)	HC (Btu/hr)	kW	HE (Btu/hr)	Liquid Temp Drop (°F)
VDA0801**A (2.0)	68	Full	4.00	29.85	1.55	24.55	12.28	30.01	1.61	24.53	12.26	30.18	1.66	24.51	12.25
			5.00	30.77	1.56	25.44	10.17	30.93	1.62	25.42	10.17	31.11	1.67	25.40	10.16
			8.00	31.68	1.59	26.24	6.56	31.85	1.65	26.22	6.56	32.03	1.71	26.21	6.55
		Part	4.00	22.62	1.08	18.92	9.46	22.60	1.12	18.78	9.39	22.57	1.16	18.62	9.31
			5.00	22.77	1.08	19.08	7.63	22.75	1.12	18.94	7.57	22.72	1.15	18.78	7.51
			7.00	23.85	1.08	20.18	5.76	23.83	1.11	20.03	5.72	23.80	1.15	19.87	5.68
VDA1001**A (2.5)	68	Full	5.00	41.44	2.05	34.43	13.77	41.48	2.09	34.35	13.74	41.53	2.13	34.27	13.71
			6.25	41.76	2.07	34.70	11.10	41.81	2.11	34.62	11.08	41.86	2.15	34.54	11.05
			9.00	43.36	2.10	36.21	8.05	43.41	2.13	36.13	8.03	43.46	2.17	36.04	8.01
		Part	5.00	31.12	1.38	26.42	10.57	30.89	1.42	26.05	10.42	30.65	1.46	25.65	10.26
			6.25	31.42	1.38	26.71	8.55	31.19	1.42	26.34	8.43	30.94	1.47	25.94	8.30
			8.00	32.00	1.38	27.28	6.82	31.76	1.42	26.91	6.73	31.51	1.47	26.50	6.63
VDA1201**A (3.0)	68	Full	6.00	48.35	2.39	40.18	13.39	48.48	2.44	40.16	13.39	48.63	2.48	40.15	13.38
			7.50	48.77	2.39	40.62	10.83	48.91	2.43	40.61	10.83	49.05	2.48	40.59	10.82
			10.00	49.49	2.43	41.19	8.24	49.63	2.48	41.17	8.23	49.77	2.53	41.15	8.23
		Part	6.00	35.00	1.56	29.66	9.89	35.25	1.61	29.76	9.92	35.51	1.66	29.86	9.95
			7.50	35.52	1.55	30.23	8.06	35.78	1.60	30.33	8.09	36.05	1.65	30.43	8.12
			9.00	36.38	1.58	31.00	6.89	36.64	1.62	31.11	6.91	36.91	1.67	31.22	6.94

Table 8: VP Blower EC Constant Torque Performance Table

Unit	Rated CFM	Min. CFM	Fan Option		CFM at External Static Pressure (in wg.)											
			Option	Speed	0.00	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
VDA0801A (2.0)**	850	580	EC Constant Torque	HI	1091	1075	1059	1028	997	967	937	907	907	877	848	820
				MED HI[1]	998	985	970	940	908	873	837	798	798	758	715	671
				MED	902	881	861	819	779	739	699	660	660	622	585	
				MED LO[2]	871	844	817	766	718	672	628	587	587			
				LOW	797	770	743	692	643	597						
VDA1001A (2.5)**	970	650	EC Constant Torque	HI	1384	1359	1334	1284	1234	1184	1134	1085	1085	1035	985	936
				MED HI[1]	1335	1307	1279	1223	1168	1113	1059	1005	1005	951	898	845
				MED	1226	1193	1160	1096	1033	972	913	856	856	800	745	693
				MED LO[2]	1167	1135	1103	1040	979	920	863	808	808	755	703	654
				LOW	996	964	932	868	806	744	682					
VDA1201A (3.0)**	1170	750	EC Constant Torque	HI	1509	1489	1469	1429	1389	1349	1310	1270	1270	1231	1191	1152
				MED HI[1]	1416	1393	1370	1325	1278	1232	1185	1138	1138	1090	1043	995
				MED	1232	1212	1190	1145	1097	1045	989	930	930	867	801	
				MED LO[2]	1191	1170	1149	1104	1056	1006	953	897	897	839	777	
				LOW	1059	1038	1017	972	924	874	821	765	765			

[1] - Indicates full speed factory default setting

[2] - Indicates part speed factory default setting

Table 9: VD Electrical Data - CV Motor

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power		Dual Point Power			
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD	Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
VDA0801*EA	208-230/1/60	10.9	62.9	1	208-230/1/60	3.9	1/2	208/1/60	0.0	0.0	17.5	25	NA	NA	NA	NA
									1.0	4.8	23.5	30	17.5	25	6.0	15
									1.5	7.2	26.5	35	17.5	25	9.0	15
									2.0	9.6	29.5	35	17.5	25	12.0	15
									2.5	12.0	NA	NA	17.5	25	15.0	20
									3.0	14.4	NA	NA	17.5	25	18.0	20
									3.5	16.8	NA	NA	17.5	25	21.0	25
									4.0	19.2	NA	NA	17.5	25	24.0	25
									4.5	21.6	NA	NA	17.5	25	27.0	30
									5.0	24.0	NA	NA	17.5	25	30.0	35
									5.5	26.4	NA	NA	17.5	25	33.1	35
									6.0	28.8	NA	NA	17.5	25	36.1	40
									6.5	31.3	NA	NA	17.5	25	39.1	40
									7.0	33.7	NA	NA	17.5	25	42.1	45
									7.5	36.1	NA	NA	17.5	25	45.1	50
									8.0	38.5	NA	NA	17.5	25	48.1	50
								230/1/60	0.0	0.0	17.5	25	NA	NA	NA	NA
									1.0	4.3	23.0	30	17.5	25	5.4	15
									1.5	6.5	25.7	30	17.5	25	8.2	15
									2.0	8.7	28.4	35	17.5	25	10.9	15
									2.5	10.9	NA	NA	17.5	25	13.6	15
									3.0	13.0	NA	NA	17.5	25	16.3	20
									3.5	15.2	NA	NA	17.5	25	19.0	20
									4.0	17.4	NA	NA	17.5	25	21.7	25
									4.5	19.6	NA	NA	17.5	25	24.5	25
									5.0	21.7	NA	NA	17.5	25	27.2	30
									5.5	23.9	NA	NA	17.5	25	29.9	30
									6.0	26.1	NA	NA	17.5	25	32.6	35
									6.5	28.3	NA	NA	17.5	25	35.3	40
									7.0	30.4	NA	NA	17.5	25	38.0	40
									7.5	32.6	NA	NA	17.5	25	40.8	45
									8.0	34.8	NA	NA	17.5	25	43.5	45
	265/1/60	9.1	54.0	1	265/1/60	3.2	1/2	265/1/60	0.0	0.0	14.6	20	NA	NA	NA	NA
									1.0	3.8	19.3	25	14.6	20	4.7	15
									1.5	5.7	21.7	25	14.6	20	7.1	15
									2.0	7.5	24.0	30	14.6	20	9.4	15
									2.5	9.4	26.4	30	14.6	20	11.8	15
									3.0	11.3	28.7	35	14.6	20	14.2	15
									3.5	13.2	NA	NA	14.6	20	16.5	20
									4.0	15.1	NA	NA	14.6	20	18.9	20
									4.5	17.0	NA	NA	14.6	20	21.2	25
									5.0	18.9	NA	NA	14.6	20	23.6	25
									5.5	20.8	NA	NA	14.6	20	25.9	30
									6.0	22.6	NA	NA	14.6	20	28.3	30
									6.5	24.5	NA	NA	14.6	20	30.7	35
									7.0	26.4	NA	NA	14.6	20	33.0	35
									7.5	28.3	NA	NA	14.6	20	35.4	40
									8.0	30.2	NA	NA	14.6	20	37.7	40

VD Electrical Data - CV Motor (cont'd.)

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power		Dual Point Power			
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD	Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
VDA1001*EA	208-230/1/60	12.8	70.7	1	208-230/1/60	3.9	1/2	208/1/60	0.0	0.0	19.9	30	NA	NA	NA	NA
									1.0	4.8	25.9	35	19.9	30	6.0	15
									1.5	7.2	28.9	35	19.9	30	9.0	15
									2.0	9.6	NA	NA	19.9	30	12.0	15
									2.5	12.0	NA	NA	19.9	30	15.0	20
									3.0	14.4	NA	NA	19.9	30	18.0	20
									3.5	16.8	NA	NA	19.9	30	21.0	25
									4.0	19.2	NA	NA	19.9	30	24.0	25
									4.5	21.6	NA	NA	19.9	30	27.0	30
									5.0	24.0	NA	NA	19.9	30	30.0	35
									5.5	26.4	NA	NA	19.9	30	33.1	35
									6.0	28.8	NA	NA	19.9	30	36.1	40
									6.5	31.3	NA	NA	19.9	30	39.1	40
									7.0	33.7	NA	NA	19.9	30	42.1	45
									7.5	36.1	NA	NA	19.9	30	45.1	50
									8.0	38.5	NA	NA	19.9	30	48.1	50
									8.5	40.9	NA	NA	19.9	30	51.1	55
									9.0	43.3	NA	NA	19.9	30	54.1	55
									9.5	45.7	NA	NA	19.9	30	57.1	60
									10.0	48.1	NA	NA	19.9	30	60.1	65
								230/1/60	0.0	0.0	19.9	30	NA	NA	NA	NA
									1.0	4.3	25.4	35	19.9	30	5.4	15
									1.5	6.5	28.1	35	19.9	30	8.2	15
									2.0	8.7	NA	NA	19.9	30	10.9	15
									2.5	10.9	NA	NA	19.9	30	13.6	15
									3.0	13.0	NA	NA	19.9	30	16.3	20
									3.5	15.2	NA	NA	19.9	30	19.0	20
									4.0	17.4	NA	NA	19.9	30	21.7	25
									4.5	19.6	NA	NA	19.9	30	24.5	25
									5.0	21.7	NA	NA	19.9	30	27.2	30
									5.5	23.9	NA	NA	19.9	30	29.9	30
									6.0	26.1	NA	NA	19.9	30	32.6	35
									6.5	28.3	NA	NA	19.9	30	35.3	40
									7.0	30.4	NA	NA	19.9	30	38.0	40
									7.5	32.6	NA	NA	19.9	30	40.8	45
									8.0	34.8	NA	NA	19.9	30	43.5	45
									8.5	37.0	NA	NA	19.9	30	46.2	50
									9.0	39.1	NA	NA	19.9	30	48.9	50
									9.5	41.3	NA	NA	19.9	30	51.6	55
									10.0	43.5	NA	NA	19.9	30	54.3	55
	265/1/60	10.2	60.0	1	265/1/60	3.2	1/2	265/1/60	0.0	0.0	15.9	25	NA	NA	NA	NA
									1.0	3.8	20.7	25	15.9	25	4.7	15
									1.5	5.7	23.0	30	15.9	25	7.1	15
									2.0	7.5	25.4	30	15.9	25	9.4	15
									2.5	9.4	27.7	35	15.9	25	11.8	15
									3.0	11.3	NA	NA	15.9	25	14.2	15
									3.5	13.2	NA	NA	15.9	25	16.5	20
									4.0	15.1	NA	NA	15.9	25	18.9	20
									4.5	17.0	NA	NA	15.9	25	21.2	25
									5.0	18.9	NA	NA	15.9	25	23.6	25
									5.5	20.8	NA	NA	15.9	25	25.9	30
									6.0	22.6	NA	NA	15.9	25	28.3	30
									6.5	24.5	NA	NA	15.9	25	30.7	35
									7.0	26.4	NA	NA	15.9	25	33.0	35
									7.5	28.3	NA	NA	15.9	25	35.4	40
									8.0	30.2	NA	NA	15.9	25	37.7	40
									8.5	32.1	NA	NA	15.9	25	40.1	45
									9.0	34.0	NA	NA	15.9	25	42.5	45
									9.5	35.8	NA	NA	15.9	25	44.8	45
									10.0	37.7	NA	NA	15.9	25	47.2	50

VD Electrical Data - CV Motor (cont'd.)

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power		Dual Point Power			
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD	Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
VDA1201*EA	208-230/1/60	14.1	84.2	1	208-230/1/60	3.9	1/2	208/1/60	0.0	0.0	21.5	35	NA	NA	NA	NA
									1.0	4.8	27.5	40	21.5	35	6.0	15
									1.5	7.2	NA	NA	21.5	35	9.0	15
									2.0	9.6	NA	NA	21.5	35	12.0	15
									2.5	12.0	NA	NA	21.5	35	15.0	20
									3.0	14.4	NA	NA	21.5	35	18.0	20
									3.5	16.8	NA	NA	21.5	35	21.0	25
									4.0	19.2	NA	NA	21.5	35	24.0	25
									4.5	21.6	NA	NA	21.5	35	27.0	30
									5.0	24.0	NA	NA	21.5	35	30.0	35
									5.5	26.4	NA	NA	21.5	35	33.1	35
									6.0	28.8	NA	NA	21.5	35	36.1	40
									6.5	31.3	NA	NA	21.5	35	39.1	40
									7.0	33.7	NA	NA	21.5	35	42.1	45
									7.5	36.1	NA	NA	21.5	35	45.1	50
									8.0	38.5	NA	NA	21.5	35	48.1	50
									8.5	40.9	NA	NA	21.5	35	51.1	55
									9.0	43.3	NA	NA	21.5	35	54.1	55
									9.5	45.7	NA	NA	21.5	35	57.1	60
									10.0	48.1	NA	NA	21.5	35	60.1	65
								230/1/60	0.0	0.0	21.5	35	NA	NA	NA	NA
									1.0	4.3	27.0	35	21.5	35	5.4	15
									1.5	6.5	29.7	40	21.5	35	8.2	15
									2.0	8.7	NA	NA	21.5	35	10.9	15
									2.5	10.9	NA	NA	21.5	35	13.6	15
									3.0	13.0	NA	NA	21.5	35	16.3	20
									3.5	15.2	NA	NA	21.5	35	19.0	20
									4.0	17.4	NA	NA	21.5	35	21.7	25
									4.5	19.6	NA	NA	21.5	35	24.5	25
									5.0	21.7	NA	NA	21.5	35	27.2	30
									5.5	23.9	NA	NA	21.5	35	29.9	30
									6.0	26.1	NA	NA	21.5	35	32.6	35
									6.5	28.3	NA	NA	21.5	35	35.3	40
									7.0	30.4	NA	NA	21.5	35	38.0	40
									7.5	32.6	NA	NA	21.5	35	40.8	45
									8.0	34.8	NA	NA	21.5	35	43.5	45
									8.5	37.0	NA	NA	21.5	35	46.2	50
									9.0	39.1	NA	NA	21.5	35	48.9	50
									9.5	41.3	NA	NA	21.5	35	51.6	55
									10.0	43.5	NA	NA	21.5	35	54.3	55
	265/1/60	13.0	72.0	1	265/1/60	3.2	1/2	265/1/60	0.0	0.0	19.5	30	NA	NA	NA	NA
									1.0	3.8	24.2	35	19.5	30	4.7	15
									1.5	5.7	26.5	35	19.5	30	7.1	15
									2.0	7.5	28.9	40	19.5	30	9.4	15
									2.5	9.4	NA	NA	19.5	30	11.8	15
									3.0	11.3	NA	NA	19.5	30	14.2	15
									3.5	13.2	NA	NA	19.5	30	16.5	20
									4.0	15.1	NA	NA	19.5	30	18.9	20
									4.5	17.0	NA	NA	19.5	30	21.2	25
									5.0	18.9	NA	NA	19.5	30	23.6	25
									5.5	20.8	NA	NA	19.5	30	25.9	30
									6.0	22.6	NA	NA	19.5	30	28.3	30
									6.5	24.5	NA	NA	19.5	30	30.7	35
									7.0	26.4	NA	NA	19.5	30	33.0	35
									7.5	28.3	NA	NA	19.5	30	35.4	40
									8.0	30.2	NA	NA	19.5	30	37.7	40
									8.5	32.1	NA	NA	19.5	30	40.1	45
									9.0	34.0	NA	NA	19.5	30	42.5	45
									9.5	35.8	NA	NA	19.5	30	44.8	45
									10.0	37.7	NA	NA	19.5	30	47.2	50

Table 10: VD Electrical Data – Constant Torque EC Motor

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power		Dual Point Power			
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD	Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
VDA0801*DA	208-230/1/60	10.9	62.9	1	208-230/1/60	4.6	1/2	208/1/60	0.0	0.0	18.2	25	NA	NA	NA	NA
									1.0	4.8	24.2	30	18.2	25	6.0	15
									1.5	7.2	27.2	35	18.2	25	9.0	15
									2.0	9.6	NA	NA	18.2	25	12.0	15
									2.5	12.0	NA	NA	18.2	25	15.0	20
									3.0	14.4	NA	NA	18.2	25	18.0	20
									3.5	16.8	NA	NA	18.2	25	21.0	25
									4.0	19.2	NA	NA	18.2	25	24.0	25
									4.5	21.6	NA	NA	18.2	25	27.0	30
									5.0	24.0	NA	NA	18.2	25	30.0	35
									5.5	26.4	NA	NA	18.2	25	33.1	35
									6.0	28.8	NA	NA	18.2	25	36.1	40
									6.5	31.3	NA	NA	18.2	25	39.1	40
									7.0	33.7	NA	NA	18.2	25	42.1	45
									7.5	36.1	NA	NA	18.2	25	45.1	50
									8.0	38.5	NA	NA	18.2	25	48.1	50
								230/1/60	0.0	0.0	18.2	25	NA	NA	NA	NA
									1.0	4.3	23.7	30	18.2	25	5.4	15
									1.5	6.5	26.4	35	18.2	25	8.2	15
									2.0	8.7	29.1	35	18.2	25	10.9	15
									2.5	10.9	NA	NA	18.2	25	13.6	15
									3.0	13.0	NA	NA	18.2	25	16.3	20
									3.5	15.2	NA	NA	18.2	25	19.0	20
									4.0	17.4	NA	NA	18.2	25	21.7	25
									4.5	19.6	NA	NA	18.2	25	24.5	25
									5.0	21.7	NA	NA	18.2	25	27.2	30
									5.5	23.9	NA	NA	18.2	25	29.9	30
									6.0	26.1	NA	NA	18.2	25	32.6	35
									6.5	28.3	NA	NA	18.2	25	35.3	40
									7.0	30.4	NA	NA	18.2	25	38.0	40
									7.5	32.6	NA	NA	18.2	25	40.8	45
									8.0	34.8	NA	NA	18.2	25	43.5	45
	265/1/60	9.1	54.0	1	265/1/60	3.2	1/2	265/1/60	0.0	0.0	14.6	20	NA	NA	NA	NA
									1.0	3.8	19.3	25	14.6	20	4.7	15
									1.5	5.7	21.7	25	14.6	20	7.1	15
									2.0	7.5	24.0	30	14.6	20	9.4	15
									2.5	9.4	26.4	30	14.6	20	11.8	15
									3.0	11.3	28.7	35	14.6	20	14.2	15
									3.5	13.2	NA	NA	14.6	20	16.5	20
									4.0	15.1	NA	NA	14.6	20	18.9	20
									4.5	17.0	NA	NA	14.6	20	21.2	25
									5.0	18.9	NA	NA	14.6	20	23.6	25
									5.5	20.8	NA	NA	14.6	20	25.9	30
									6.0	22.6	NA	NA	14.6	20	28.3	30
									6.5	24.5	NA	NA	14.6	20	30.7	35
									7.0	26.4	NA	NA	14.6	20	33.0	35
									7.5	28.3	NA	NA	14.6	20	35.4	40
									8.0	30.2	NA	NA	14.6	20	37.7	40

VD Electrical Data – Constant Torque EC Motor (cont'd.)

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power		Dual Point Power			
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD	Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
VDA1001*DA	208-230/1/60	12.8	70.7	1	208-230/1/60	4.6	1/2	208/1/60	0.0	0.0	20.6	30	NA	NA	NA	NA
									1.0	4.8	26.6	35	20.6	30	6.0	15
									1.5	7.2	29.6	40	20.6	30	9.0	15
									2.0	9.6	NA	NA	20.6	30	12.0	15
									2.5	12.0	NA	NA	20.6	30	15.0	20
									3.0	14.4	NA	NA	20.6	30	18.0	20
									3.5	16.8	NA	NA	20.6	30	21.0	25
									4.0	19.2	NA	NA	20.6	30	24.0	25
									4.5	21.6	NA	NA	20.6	30	27.0	30
									5.0	24.0	NA	NA	20.6	30	30.0	35
									5.5	26.4	NA	NA	20.6	30	33.1	35
									6.0	28.8	NA	NA	20.6	30	36.1	40
									6.5	31.3	NA	NA	20.6	30	39.1	40
									7.0	33.7	NA	NA	20.6	30	42.1	45
									7.5	36.1	NA	NA	20.6	30	45.1	50
									8.0	38.5	NA	NA	20.6	30	48.1	50
									8.5	40.9	NA	NA	20.6	30	51.1	55
									9.0	43.3	NA	NA	20.6	30	54.1	55
									9.5	45.7	NA	NA	20.6	30	57.1	60
									10.0	48.1	NA	NA	20.6	30	60.1	65
								230/1/60	0.0	0.0	20.6	30	NA	NA	NA	NA
									1.0	4.3	26.1	35	20.6	30	5.4	15
									1.5	6.5	28.8	35	20.6	30	8.2	15
									2.0	8.7	NA	NA	20.6	30	10.9	15
									2.5	10.9	NA	NA	20.6	30	13.6	15
									3.0	13.0	NA	NA	20.6	30	16.3	20
									3.5	15.2	NA	NA	20.6	30	19.0	20
									4.0	17.4	NA	NA	20.6	30	21.7	25
									4.5	19.6	NA	NA	20.6	30	24.5	25
									5.0	21.7	NA	NA	20.6	30	27.2	30
									5.5	23.9	NA	NA	20.6	30	29.9	30
									6.0	26.1	NA	NA	20.6	30	32.6	35
									6.5	28.3	NA	NA	20.6	30	35.3	40
									7.0	30.4	NA	NA	20.6	30	38.0	40
									7.5	32.6	NA	NA	20.6	30	40.8	45
									8.0	34.8	NA	NA	20.6	30	43.5	45
									8.5	37.0	NA	NA	20.6	30	46.2	50
									9.0	39.1	NA	NA	20.6	30	48.9	50
									9.5	41.3	NA	NA	20.6	30	51.6	55
									10.0	43.5	NA	NA	20.6	30	54.3	55
	265/1/60	10.2	60.0	1	265/1/60	3.2	1/2	265/1/60	0.0	0.0	15.9	25	NA	NA	NA	NA
									1.0	3.8	20.7	25	15.9	25	4.7	15
									1.5	5.7	23.0	30	15.9	25	7.1	15
									2.0	7.5	25.4	30	15.9	25	9.4	15
									2.5	9.4	27.7	35	15.9	25	11.8	15
									3.0	11.3	NA	NA	15.9	25	14.2	15
									3.5	13.2	NA	NA	15.9	25	16.5	20
									4.0	15.1	NA	NA	15.9	25	18.9	20
									4.5	17.0	NA	NA	15.9	25	21.2	25
									5.0	18.9	NA	NA	15.9	25	23.6	25
									5.5	20.8	NA	NA	15.9	25	25.9	30
									6.0	22.6	NA	NA	15.9	25	28.3	30
									6.5	24.5	NA	NA	15.9	25	30.7	35
									7.0	26.4	NA	NA	15.9	25	33.0	35
									7.5	28.3	NA	NA	15.9	25	35.4	40
									8.0	30.2	NA	NA	15.9	25	37.7	40
									8.5	32.1	NA	NA	15.9	25	40.1	45
									9.0	34.0	NA	NA	15.9	25	42.5	45
									9.5	35.8	NA	NA	15.9	25	44.8	45
									10.0	37.7	NA	NA	15.9	25	47.2	50

VD Electrical Data – Constant Torque EC Motor (cont'd.)

Size (Tons)	Compressor				Supply Blower Motor			Electric Heat			Single Point Power	
	Voltage	RLA	LRA	QTY	Voltage	FLA	HP	Voltage	kW	Amps	MCA	MOPD
VDA1201*DA	208-230/1/60	14.1	84.2	1	208-230/1/60	4.6	1/2	208/1/60	0.0	0.0	22.2	35
									1.0	4.8	28.2	40
									1.5	7.2	NA	NA
									2.0	9.6	NA	NA
									2.5	12.0	NA	NA
									3.0	14.4	NA	NA
									3.5	16.8	NA	NA
									4.0	19.2	NA	NA
									4.5	21.6	NA	NA
									5.0	24.0	NA	NA
									5.5	26.4	NA	NA
									6.0	28.8	NA	NA
									6.5	31.3	NA	NA
									7.0	33.7	NA	NA
									7.5	36.1	NA	NA
									8.0	38.5	NA	NA
									8.5	40.9	NA	NA
									9.0	43.3	NA	NA
									9.5	45.7	NA	NA
									10.0	48.1	NA	NA

Dual Point Power			
Unit MCA	Unit MOPD	E-Heat MCA	E-Heat MOPD
NA	NA	NA	NA
22.2	35	6.0	15
22.2	35	9.0	15
22.2	35	12.0	15
22.2	35	15.0	20
22.2	35	18.0	20
22.2	35	21.0	25
22.2	35	24.0	25
22.2	35	27.0	30
22.2	35	30.0	35
22.2	35	33.1	35
22.2	35	36.1	40
22.2	35	39.1	40
22.2	35	42.1	45
22.2	35	45.1	50
22.2	35	48.1	50
22.2	35	51.1	55
22.2	35	54.1	55
22.2	35	57.1	60
22.2	35	60.1	65

Table 11: Additional Static Resistance - Units of Measurement in Inches W.G.

Size (Tons)	Model	Fan Speed	Filter[1]				
			MERV 4 (Fiberglass)	MERV 4 (Poly)	MERV 8	MERV 11	MERV 13
VDA0801**A (2.0)	VI VP	High	0.05	0.08	0.11	0.10	0.18
		Low	0.05	0.08	0.11	0.08	0.18
VDA1001**A (2.5)		High	0.05	0.08	0.11	0.13	0.19
		Low	0.05	0.08	0.11	0.11	0.19
VDA1201**A (3.0)		High	0.05	0.09	0.12	0.15	0.20
		Low	0.05	0.08	0.11	0.12	0.19

1. Deduct these values from the available external static pressure shown in the respective Blower Performance Tables.

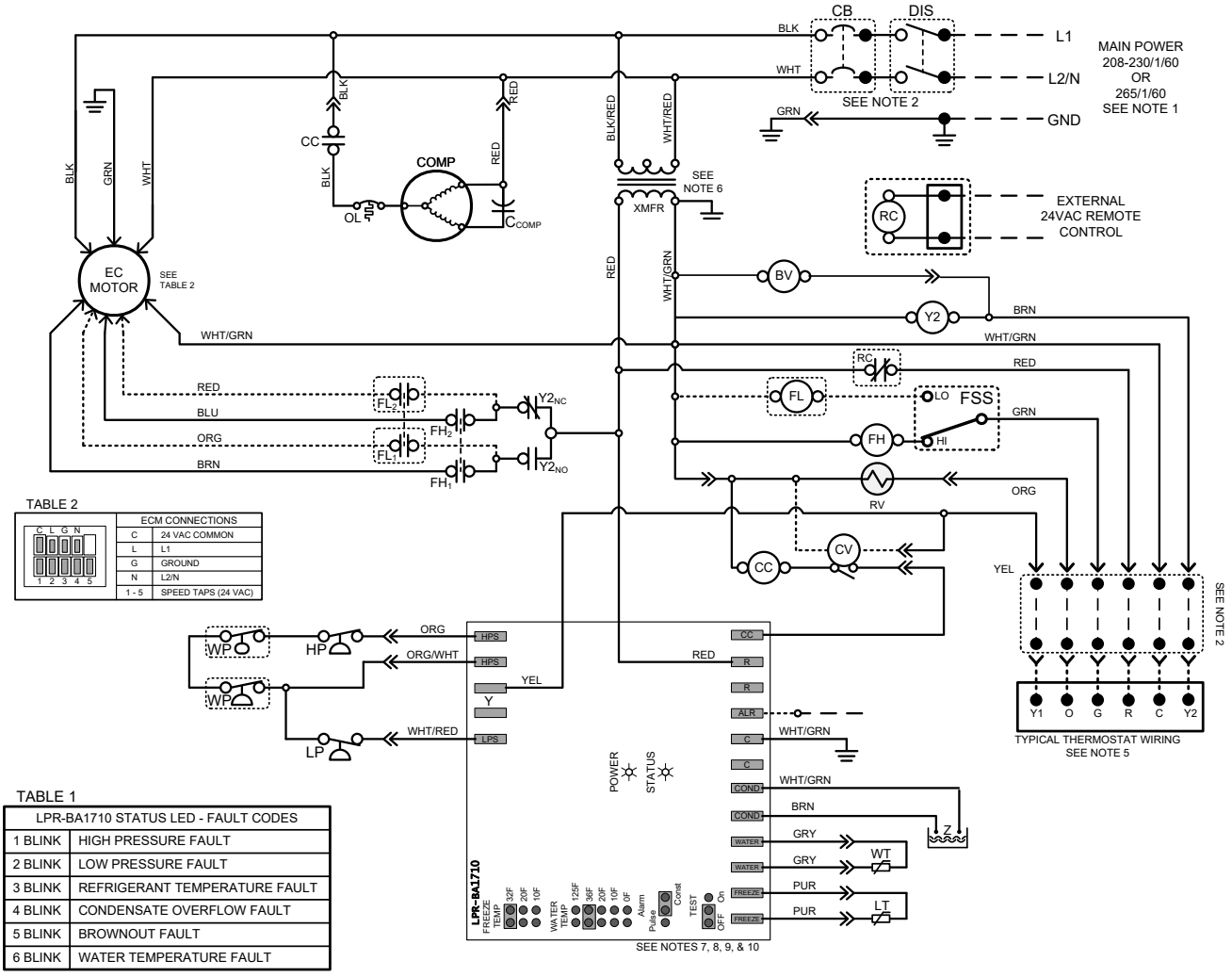


TABLE 2

ECM CONNECTIONS	
C	24 VAC COMMON
L	L1
G	GROUND
N	L2/N
1 - 5	SPEED TAPS (24 VAC)

TABLE 1

LPR-BA1710 STATUS LED - FAULT CODES	
1 BLINK	HIGH PRESSURE FAULT
2 BLINK	LOW PRESSURE FAULT
3 BLINK	REFRIGERANT TEMPERATURE FAULT
4 BLINK	CONDENSATE OVERFLOW FAULT
5 BLINK	BROWNOUT FAULT
6 BLINK	WATER TEMPERATURE FAULT

LEGEND:

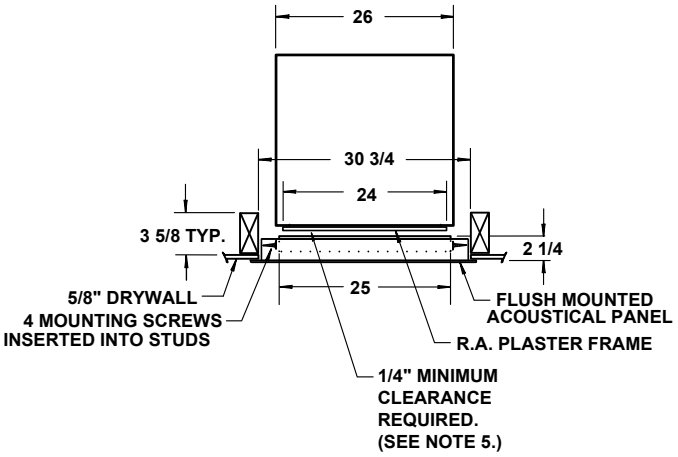
- CC - COMPRESSOR CONTACTOR
- C_{COMP} - COMPRESSOR CAPACITOR
- MCU - FAN MOTOR CONTROLLER
- RV - REVERSING VALVE
- HP - HIGH PRESSURE LIMIT
- LT - LOW TEMPERATURE LIMIT
- XFMR - 24VAC TRANSFORMER; 40 VA
- OL - COMPRESSOR OVERLOAD (See Note 4)
- CV - COOLING WATER CONTROL VALVE (NC)
- BV - BYPASS WATER VALVE (NO)
- WT - WATER TEMPERATURE LIMIT
- Y2 - 2 STAGE FAN RELAY
- LP - LOW PRESSURE LIMIT
- ☐ WP - WATER PRESSURE LIMIT
- Z - CONDENSATE OVERFLOW SENSOR
- ☐ RC - REMOTE CONTROL RELAY
- ☐ DIS - DISCONNECT SWITCH
- ☐ CB - CIRCUIT BREAKER (See Note 3)
- ☐ FSS - FAN SPPEED SWITCH

- FH_1,FH_2 - HIGH FAN SPEED RELAY; POLES: 1 & 2
- FL_1,FL_2 - LOW FAN SPEED RELAY; POLES: 1 & 2
- ——— - FACTORY WIRING
- — — - FIELD WIRING
- ------ - OPTIONAL WIRING/ACCESSORY
- - QUICK CONNECTION
- ○ - FACTORY CONNECTION
- ● - FIELD CONNECTION
- - LIGHT EMITTING DIODE INDICATOR
- - HIGH PRESSURE SWITCH
- - LOW PRESSURE SWITCH
- - THERMISTOR
- - CONDENSATE DRAIN PAN
- - RELAY COIL
- - NORMALLY OPEN RELAY CONTACTS
- - NORMALLY CLOSED RELAY CONTACTS
- - SOLENOID COIL
- - GROUND CONNECTION
- - CONTROL VALVE END SWITCH

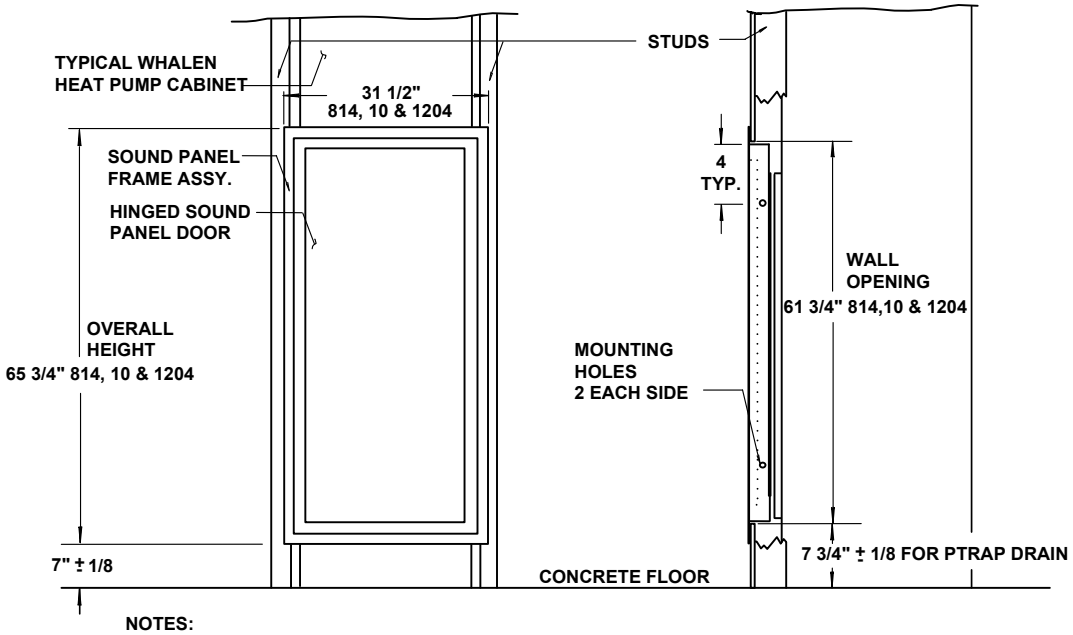
NOTES:

1. Use copper conductors only.
2. DPST switch for 208V applications only.
3. If used, CB replaces DIS
4. OL may be internal or external to compressor depending on unit size.
5. Thermostat is field installed and may be remote mounted.
6. For 208-230V units, transformer is factory wired for operation at 230V. For 208V operation, move lead to 208V terminal.
7. STATUS LED blinks to indicate fault; reference Table 1 for fault condition
8. FREEZE TEMP jumper shown in default location. When using antifreeze fluid mixture, refer to IOM for correct setting.
9. WATER TEMP jumper set for cooling mode high fluid temperature protection.
10. TEST mode is for diagnostic purposes only. When ON, anti-short cycle protection is reduced from 300 seconds to 5 seconds. After board has been powered for 60 minutes in TEST mode, normal operation is resumed; regardless of jumper position. Cycling unit power will reset operation.

62S11DS1a
14 February, 2020



All dimensions in inches.

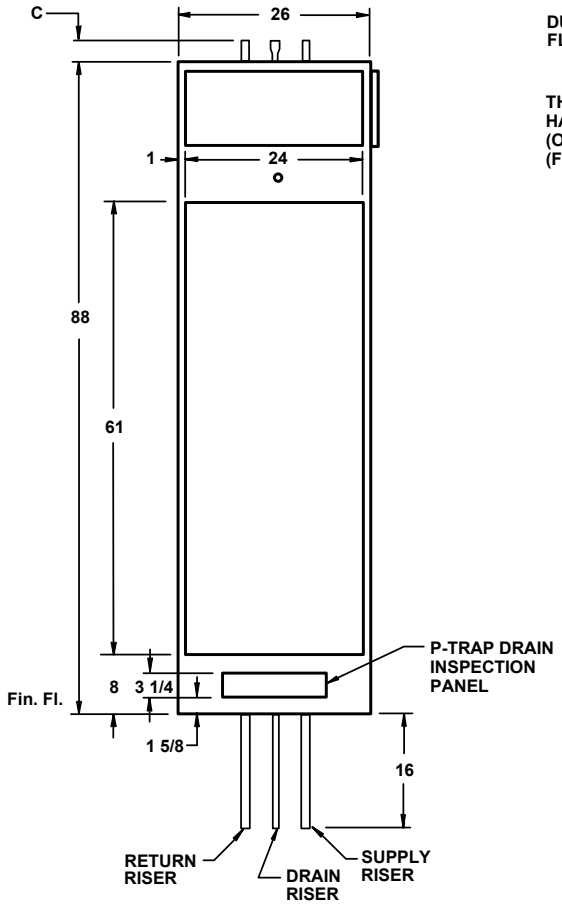


NOTES:

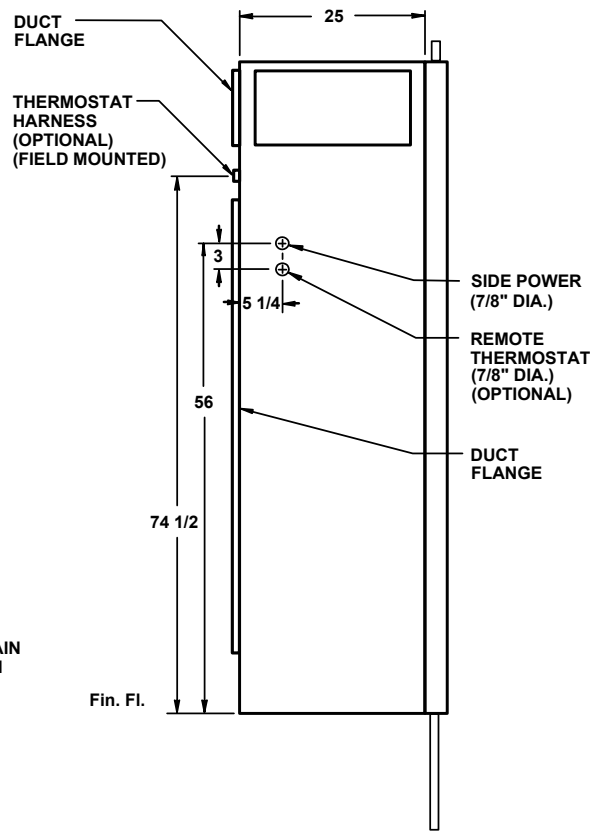
1. **CUT OPENING IN WALL: 814/1004/1204 - 30 3/4 X 61 3/4**
2. **Panel is wider than unit.**
3. **<u>IMPORTANT:</u> For maximum R.A. flow, flush mounted acoustical panel must be centered in front of R.A. opening in cabinet for proper access and chassis removal.**
4. **Acoustical panel may be fabricated of "paintgrip" galvanized steel for field painting by others or fabricated of galvanized steel and painted factory white.**
5. **Flexible tape such as NASHUA 367-17 may be used to seal the clearance between the panel and the unit front. Otherwise, a sleeve is recommended along with the flexible tape. A sleeve must not have a hard connection at both ends.**

DRAWING NUMBER: WAFP-CA-2STG
NOVEMBER 2018

Whisperline® Two-Stage Units with Internal Drain Rear Risers



FRONT VIEW
REAR RISERS SHOWN



RIGHT SIDE VIEW

Notes:

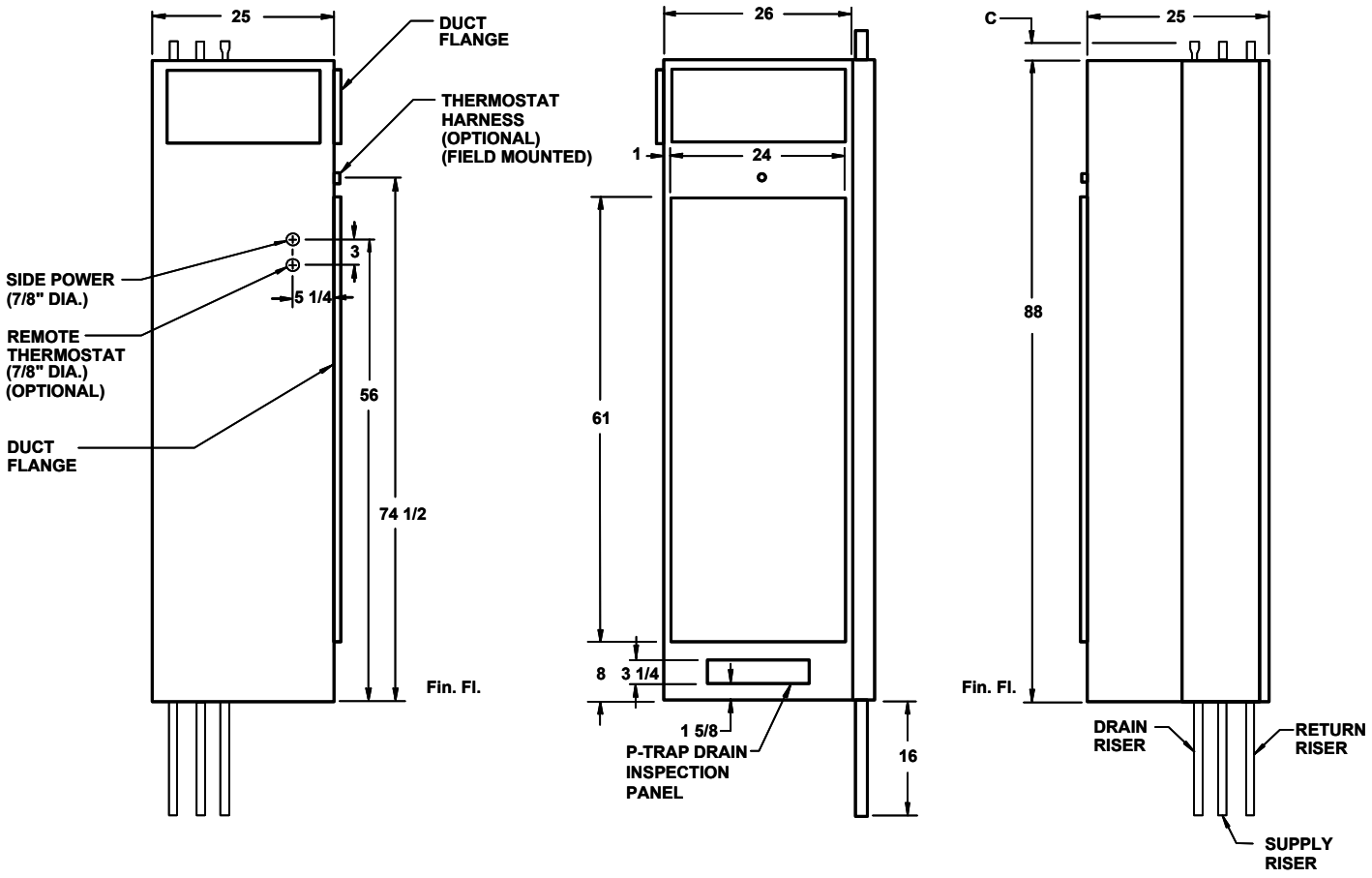
1. **The return air opening is always on the front of the unit.**
2. **Cabinet is acoustically and thermally insulated and is fabricated of continuous galvanized steel.**
3. **Supply, return, and drain risers are copper (see notes page for copper type). Riser assemblies include two shut off valves inside the cabinet. Standard units include high-pressure hose kits for connection of the refrigeration chassis.**
4. **For plan views, see drawing 609-PT.**
5. **Unit power and remote thermostat connections are located on right side on rear riser units.**
6. **Supply air options on 801, 1001 & 1201 models are specified on drawing 651, minimum of two discharges.**

RISER LENGTH	C
9 FOOT	4
10 FOOT	16

All dimensions in inches.

DRAWING NUMBER: 650a-R
NOVEMBER 2019

Whisperline® Two-Stage Units with Internal Drain Pan Side Risers



LEFT SIDE VIEW
RH SIDE RISERS SHOWN
LH SIDE RISERS OPPOSITE

FRONT VIEW

RIGHT SIDE VIEW
RH SIDE RISERS SHOWN
LH SIDE RISERS OPPOSITE

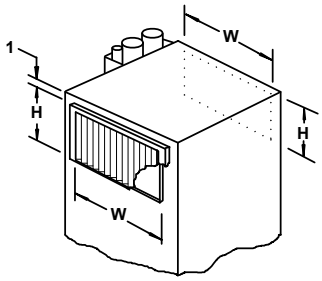
Notes:

1. The return air opening is always on the front of the unit.
2. Cabinet is acoustically and thermally insulated and is fabricated of continuous galvanized steel.
3. Supply, return, and drain risers are copper (see notes page for copper type). Riser assemblies include two shut off valves inside the cabinet. Standard units include high-pressure hose kits for connection of the refrigeration chassis.
4. For plan views, see drawing 609-PT.
5. Unit power and remote thermostat connections are located on side opposite risers on side riser units.
6. Supply air options on 801, 1001 & 1201 models are specified on drawing 651, minimum of two discharges.

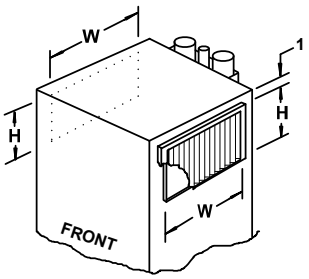
RISER LENGTH	C
9 FOOT	4
10 FOOT	16

All dimensions in inches.

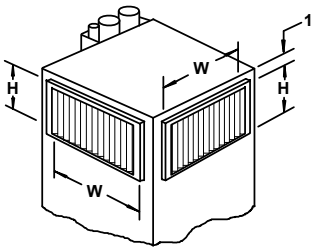
DRAWING NUMBER: 650a-S
NOVEMBER 2019



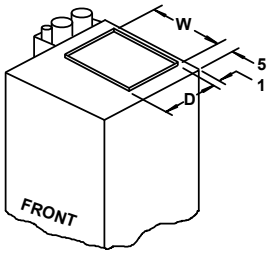
TYPE F-B
(FRONT & BACK)
SINGLE DEFLECTION
DOUBLE DEFLECTION
(DIMENSION W CENTERED)



TYPE L-R
(LEFT-RIGHT)
SINGLE DEFLECTION
DOUBLE DEFLECTION
(DIMENSION W CENTERED)



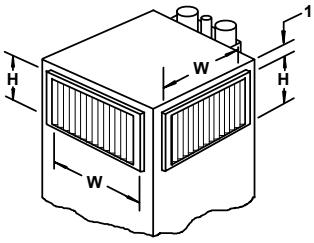
TYPE F-R
(FRONT & RIGHT)



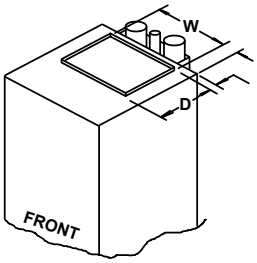
TYPE T
(TOP DUCTED)

SINGLE DEFLECTION
DOUBLE DEFLECTION
(DIMENSION W CENTERED)

LH SIDE RISER UNITS SHOWN ABOVE
RH SIDE RISER UNITS OPPOSITE
See Drawing No. 651PVS for plan views.



TYPE F-R
(FRONT & RIGHT)



TYPE T
(TOP DUCTED)

SINGLE DEFLECTION
DOUBLE DEFLECTION
(DIMENSION W CENTERED)

REAR RISER UNITS SHOWN ABOVE
See Drawing No. 651PVR for plan views.

Notes:

1. **All standard Whalen supply grilles and registers are fabricated of clear anodized aluminum.**
2. **See unit schedule for discharge types. Optional supply registers are available with either parallel or opposed blade dampers at extra cost.**
3. **Supply and return air grilles are shipped loose, for installation after drywall installation is complete.**
4. **Listed grille and register dimensions are for the grille opening**
5. **Unless otherwise noted, the front grille blades will be vertical, as drawn.**
6. **Registers should be avoided whenever possible, as restriction of airflow may lead to lockout of the compressor. Avoid combining ducted (Type T) discharge with unit mounted registers. This combination can increase the noise level at the unit.**
7. **Where Type T is combined with Type F, B, L or R, grille height will be that of a two-grille discharge.**

UNIT SIZE	1 Grille Type (F, B, L, R)	2 Grille Type (F-B, F-L, F-R, L-R, B-L, B-R)			2 Grille Corner-stone Type (C/F-L, C/F-R)	3 Grille Type (F-L-R, F-B-L, F-B-R)			Top Ducted Type (T)	
		Grille	W	H		Grille	W	H	W	D
0801	Not Available	F	24	7	Not Available	F	24	7	16	14
		B,R,L	22	7		B,R,L	22	7		
1001	Not Available	F	24	8	Not Available	F	24	8	16	14
		B,R,L	22	8		B,R,L	22	8		
1201	Not Available	F	24	9	Not Available	F	24	9	16	14
		B,R,L	22	9		B,R,L	22	9		

All dimensions in inches.

DRAWING NUMBER: 651a
NOVEMBER 2019

Mechanical Specifications

WHISPERLINE® (WATER SOURCE) (GROUND SOURCE) HEAT PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vertical Stack Water Source Heat Pumps

1.02 RELATED SECTIONS

1.03 REFERENCES

A. ETL Listed under Underwriters Laboratories Standard for Safety UL1995 for heat pumps.

B. AHRI ISO Standard 13256-1

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site, store and protect from the weather and construction debris. Heat pump cabinets and refrigeration chassis must be individually packaged and be tagged with site location, model number and configuration.

1.05 ENVIROMENTAL REQUIREMENTS

A. Protect units from construction debris by covering all openings prior to start-up of the equipment. Units must not be used for heating, cooling, or ventilation prior to the start-up of equipment for permanent use. Use of the equipment for the temporary heating, cooling or ventilation is prohibited.

1.06 FACTORY TESTING

A. All units shall be factory tested at normal operating conditions. Cabinets and fans shall be tested to verify proper fan and control operation. Refrigeration chassis shall be factory tested with cataloged water flow rates and sequenced to verify the proper operation of safety controls. Testing without utilizing cataloged water flow rates is unacceptable. All factory risers shall be pressure tested for leaks.

1.07 SUBMITTAL DOCUMENTATION

A. Standard submittals shall include capacities, drawings, electrical data, installation, operation and maintenance manuals and other details.

PART 2 PRODUCTS

2.01 TYPE

A. Vertical Stack (Water Source) (Ground Source) Heat Pump with integral risers, discharge arrangements, hose kits, and all accessories (ADD SPECIFIC OPTIONS HERE). Units shall be (standard range 60°F to 95°F (15.6°C to 35°C)) (extended range 20°F to 120°F (-6.7°C to 48.9°C)) entering fluid temperature for (water source) (ground source) heat pump applications.

2.02 CAPACITY

A. Shall be as indicated on the drawings, which are based on Whalen units. Capacities shall be certified under AHRI ISO Standard 13256-1.

2.03 CABINETS

A. The one-piece unit cabinet shall be fabricated of reinforced 22-gauge continuous G60 galvanized steel. All internal assemblies shall be welded and treated to prevent corrosion.

B. The cabinet shall be insulated with 1/2-inch thick 2-pound density thermal and acoustical fiberglass insulation meeting material standard ASTM-C1071 and have an integral water repellent. The insulation shall have a fungi and bacteria resistant barrier with no growth conforming to ASTM-C1338, ASTM G21 and ASTM G22 and meet fire safety standards under NFPA90A and NFPA90B. (OPTION) 1-inch thick 1-1/2-pound density thermal and acoustical fiberglass insulated discharge plenum.

C. The cabinet shall allow the placement of vertical risers on any side not being used for service access or discharge air openings.

D. The cabinet will have slots with edge protectors to accommodate movement of the risers with the isolation valves affixed (see 2.05 B). The slots shall remain covered with insulation to minimize air infiltration.

E. Cabinet return and discharge air openings shall be factory cut and flanged on all sides. All insulation located behind cabinet openings must be removed by the unit manufacturer prior to shipment. Knockouts for field cutting are unacceptable.

F. Cabinet design shall allow a minimum 5-inches below the chassis access opening to allow for full height baseboard.

G. (OPTION) A factory installed vibration isolation pad shall be installed on the bottom of the unit.

H. The heat pump cabinets shall be shipped separately from, and prior to the refrigeration chassis for early installation at the jobsite.

2.04 REFRIGERATION CHASSIS

A. The refrigeration chassis consisting of the compressor, air coil, water coil, reversing valve, expansion device, receiver, filter-drier, and safety controls shall be slide-rail base mounted in the cabinet, and shall be designed for easy removal after disconnecting the two hoses and a polarized electrical power plug.

B. The compressor shall be the sealed hermetic type approved and tested for reverse cycle operation. Internal thermal overload protection shall be provided. The compressor shall be internally isolated and externally hard rubber mounted to the floating chassis. Compressor motors shall be permanent split capacitor (PSC) type.

C. The air coils shall be copper tubes mechanically bonded to aluminum fins, multi-circuited to insure maximum coil distribution and effectiveness, and a minimum of three rows deep. The coil shall be rated to withstand 600 psig refrigerant working pressure. Face velocity shall not exceed 400 feet per minute to insure quiet operation and positive condensate drainage.

D. The water coils shall incorporate an electro-coated steel outer tube and a copper inner tube. The inner tube shall be spirally fluted and bonded to the outer tube to insure controlled refrigerant velocity and distribution. The coil shall be rated to withstand 650 psig refrigerant and 400 psig fluid working pressures. (OPTION) Provide Cupro-nickel COAX coil.

E. The reversing valve shall be 4-way electric type, pilot operated for quiet reversal.

F. (OPTION) Automatic flow control valve – An automatic flow control valve shall be provided with each chassis and be factory preset for a fixed flow rate regardless of system pressure. Each automatic balancing valve shall be capable of operation over a pressure differential range of 2 to 80 PSID. Valves must utilize threaded connections and be easily removable for cleaning and maintenance.

G. (OPTION1) Standard Two-way, two-position (On/Off) control valve (30 psi differential pressure) – A two-way, two-position (On/Off) electric control valve shall be factory mounted and wired into the refrigeration chassis.

(OPTION2) High Pressure Two-way, two-position (On/Off) control valve (60 psi differential pressure) – A two-way, two-position (On/Off) electric control valve shall be factory mounted and wired into the refrigeration chassis.

H. The chassis shall be shipped separately from the WSHP cabinets to prevent exposure to, and fouling from finishing work.

I. Water connections between chassis and the riser shall be accomplished via an Insta-Lock™ quick connect accessory hose kit consisting of synthetic yarn-reinforced EPDM core hose surrounded by a 304 stainless-steel braid. Hose kit shall have brass fittings with stainless-steel locking balls and EPDM seals. Hose ends shall have colored bands to indicate supply or return water as well as colored indicator to verify locking status which connects to Insta-Lock™ fitting on chassis and mating shut-off valve. Threaded connections with or without sealing washers are not permitted. The hose kit shall be rated for maximum working pressure of 750 psi and minimum burst pressure rating of 2250 psi.

2.05 RISERS

A. The unit manufacturer shall furnish Type M (OPTION: Type L) copper supply and return condenser water risers as an integral factory-assembled component of the heat pump. Supply and return risers shall be protected by a galvanized steel pipe chase the length of the cabinet. (OPTION) Provide (3/8) (1/2)-inch thick closed-cell riser insulation the length of the cabinet for ground-source applications.

B. Ball-type isolation valves shall be factory assembled on the risers by the heat pump manufacturer. The chassis shall be connected to the isolation valves through high-pressure stainless steel hoses provided by the unit manufacturer, to isolate compressor noise and vibration from the piping system. Connection of the refrigerant chassis to building water system through the use of unions is unacceptable.

C. The unit manufacturer shall furnish the heat pump cabinet with the supply and return risers connected together (short circuited) between the isolation valves to facilitate flushing by bypassing water directly into the return loop without the water passing thru any device in the unit (i.e. refrigeration chassis, automatic flow control valve).

D. The condensate drain riser shall be Type M copper and insulated the length of the cabinet with 3/8-inch closed-cell insulation.

2.06 DRAIN PAN

A. The drain pan shall collect and drain condensate that may form from any component internal to the heat pump and shall be fabricated of welded and soldered 20 Ga. 304 stainless steel. The copper condensate drain shall be rolled and soldered into the pan.

2.07 FANS

A. The fan shall be slow speed forward curved centrifugal type capable of two fan speeds, and shall be accessible for removal and maintenance through the return air opening.

2.08 MOTORS

A. Fan motors for heat pumps under 2-ton shall be of the permanently lubricated PSC standard or hi-static pressure (OPTION: ECM) type, as required; suitable for the current characteristics shown on the drawings, and shall have built-in thermal overload protection.

B. Fan motors for heat pumps 2-ton and above shall be of the permanently lubricated constant-torque ECM (OPTION: constant-volume ECM) type, suitable for the current characteristics shown on the drawings, and shall have built-in overload protection.

C. Motors shall be plug-in, multi-speed type with 1050-RPM maximum.

D. (OPTION) Provide a two-speed fan switch located behind the acoustic return air panel. The fan switch must be configurable for use with available fan speed motor taps.

2.09 SUPPLY GRILLES

A. (OPTION 1) The supply grilles shall be of the single deflection type fabricated of clear anodized aluminum. All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

(OPTION 2) The supply grilles shall be of the single deflection type fabricated of (factory white painted extruded aluminum) or (custom painted extruded aluminum) (SELECT ONE). All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

(OPTION 3) The supply grilles shall be of the double deflection type fabricated of (clear anodized extruded

aluminum), (factory white painted extruded aluminum) or (custom painted extruded aluminum) (SELECT ONE). All supply openings shall be painted black with a damper assembly and sight baffle provided when one unit is serving two separate rooms.

2.10 RETURN AIR PANEL

A. (OPTION 1) Painted Flush Mounted Acoustical Panel – The return air opening shall be covered with a flush mounted hinged front acoustical panel with return air entering through the bottom, top and both sides. The panel shall be fabricated of etched galvanized steel and painted factory white. The return air panel shall allow for filter removal without the use of tools.

(OPTION 2) Flush Mounted Acoustical Panel – The return air opening shall be covered with a flush mounted hinged front acoustical panel with return air entering through the bottom, top and both sides. The panel shall be fabricated of etched galvanized steel suitable for field painting to match the room décor after attachment to the field installed drywall framing on the front of the unit. The return air panel shall allow for filter removal without the use of tools.

(OPTION 3) Unit Mounted Acoustical Panel - The return air opening shall be covered with a standard solid hinged front acoustical panel with return air entering through the bottom, top and both sides. The front panel shall be fabricated of etched galvanized steel suitable for field painting to match the room decor. The return air panel shall allow for filter maintenance without the use of tools.

(OPTION 4) Standard Return Air Grille – The return air opening shall be covered with an (Standard) Clear anodized aluminum, (Option A) Factory white painted extruded aluminum or (Option B) Custom painted extruded aluminum air grille that is attached directly to the unit with two screws.

(OPTION 5) Removable Core Return Air Grille – The return air opening shall be covered with a (Standard) clear anodized aluminum, (Option A) factory white painted extruded aluminum or (Option B) custom painted extruded aluminum air grille with quick-removal fasteners for easy filter removal without the use of tools.

2.11 FILTERS

B. (STANDARD) Filters shall be 1” thick disposable fiberglass media, MERV 4.

(OPTION 1) Filters shall be 1” thick disposable pleated media, MERV 8.

(OPTION 2) Filters shall be 1” thick disposable pleated media, MERV 13.

(OPTION 3) Filters shall be 1” thick permanent aluminum cleanable media, MERV 4.

2.12 OUTDOOR AIR

A. (OPTION 1) Heat pumps to be furnished with an outdoor air plenum for field installation incorporating an outdoor air opening to provide conditioning of outdoor air and manual (motorized) block-off damper. The OA plenum shall be attached directly to the front of the heat pump unit and surround the return air opening. The outdoor air opening shall be located on the side of the plenum kit for either right or left side connection.

(OPTION 2) Heat pumps to be furnished with a "deep cabinet" configuration incorporating an outdoor air opening to provide conditioning of outdoor air and manual (motorized) block-off damper. Outdoor air opening must be placed before the heat pump air coil to allow conditioning while the heat pump is operating. The outdoor air opening shall be located on either side of the cabinet.

2.13 POWER SUPPLY

A. Single point field power connection is made to unit junction box through either of the 7/8" knockouts located on the side or on the top of the cabinet as shown on the drawings.

(OPTION 1) Each unit shall include a non-fused disconnect switch, factory mounted and wired.

(OPTION 2) Each unit shall include a fused disconnect switch, factory mounted and wired.

2.14 CONTROLS

A. Unit shall include a solid-state control board as part of the unit control system incorporating these features:

a. Random start compressor protection. Anti-short cycle compressor minimum OFF time delay. Safety con trols that protect the compressor from the following conditions:

i. High pressure

ii. Low pressure (Loss of Charge Protection)

iii. Low airflow

iv. Low liquid flow

v. Low entering air temperature

vi. Brown-out power conditions

vii. Condensate Overflow Protection

viii. Low liquid temperature protection with three different settings based on liquid properties.

b. Status LED indicating the device causing a fault condition.

c. Soft lockout feature that provides for an automatic reset prior to the initiation of a hard lockout.

d. Test mode capability with shortened time delays for servicing.

2.15 THERMOSTAT

A. The heat pump manufacturer shall provide a 24-volt manual changeover wall thermostat with a HEAT-OFF-COOL system switch and AUTO-ON fan selector switch.

B. On units up to two tons of cooling, the thermostat shall be unit mounted at a height of 48 inches from the bottom of the cabinet. On units greater than two tons of cooling, the thermostat shall be remote mounted.

C. Others shall install thermostat by plugging into the control wiring with a polarized male-female plug after the walls are finished when unit mounted or attaching to color coded pigtails when remote mounted. High voltage, return air thermostats with remote bulbs subject to damage during routine service will not be accepted.

2.16 SPARE PARTS

A. The installing contractor shall provide to the Owner one spare chassis for each fifty heat pumps of a given size. (Add any additional spare parts requirements here).

PART 3 EXECUTION

3.01 INSTALLATION

A. Furnish as shown on the drawings and as specified herein, vertical stack water source heat pumps with integral risers, and with capacity and electrical characteristics as scheduled. Units shall be Series VI as manufactured by The Whalen Company of Easton, MD.

B. Install in accordance with manufacturer's installation instructions. Install units plumb and level, and maintain manufacturer's recommended clearances for the unit and accessories.

C. Follow manufacturer's recommendations for cleaning and flushing.

The Whalen Company
Limited Express Warranty
Water-to-Air Heat Pump Standard Warranty

The Whalen Company warrants to the purchaser each water-to-air heat pump to be free from original defects in materials and workmanship.

Where inspection by an authorized representative of The Whalen Company confirms such defects to be present, for a period of eighteen months from date of shipment, Whalen will furnish replacement components or materials to the original purchaser without charge.

This Limited Express Warranty is intended to cover original equipment defects only and does not cover or apply to: (1) Air filters, refrigerant, fluids, oil; (2) Equipment relocated after initial installation; (3) Any portion or component of any system that is not supplied by The Whalen Company, regardless of the cause of the failure of such portion or component; (4) Equipment on which the unit identification tags or labels have been removed or modified; (5) Equipment which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, acts of God, alteration or misapplication of the product; (6) Equipment used as temporary heating or cooling while the facility is still under construction is considered misuse and as such, will void all warranty coverage regardless of the cause of failure; (7) Equipment which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Equipment subjected to corrosion or abrasion; (10) Equipment manufactured or supplied by others; (11) Equipment which have been operated in any manner contrary to The Whalen Company printed instructions; or (12) Equipment which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of The Whalen Company products.

The Whalen Company neither assumes nor authorizes any person to assume for it any obligation or warranty other than those stated herein.

This Limited Express Warranty does not cover labor charges associated with making repairs, inspection and diagnosis of malfunctions, all field labor in connection with repair or replacement of parts, all field labor in connection with removal and transportation to and from a repair facility and all field labor in connection with reinstallation after repairs are completed. However, The Whalen Company at its sole discretion may provide a labor allowance in cases of DOA (Dead on Arrival) equipment for replacement or repair of defective components within 30-days of start-up or 90-days from factory shipment, whichever comes first. After this period only the Limited Express Warranty will apply. Labor will be paid per The Whalen Company Warranty Labor Allowance schedule.
Replacement or repair under this warranty will not extend the warranty time periods defined above.
Whalen shall not, in any event, have any liability under this warranty unless and until it has been paid in full for the equipment supplied. The warranty period shall commence on the date of shipment, however, whether or not payment has been made.

This warranty applies only to Whalen heat pump installations in the fifty United States and in Canada. There are no warranties outside those areas.

The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. NO IMPLIED WARRANTY OR MERCHANTABILITY SHALL ACCOMPANY THE SALE OF THIS EQUIPMENT, AND THIS EXPRESS WARRANTY IS INTENDED TO AND DOES REPLACE ANY IMPLIED WARRANTY OF MERCHANTABILITY.

This warranty, its limitations and its exclusions are to be governed by the laws of Maryland. Although some warranties may vary in their effect and coverage from locality to locality, this warranty, its effects, coverage and remedies are only those available in Maryland.

Rev: 12/2020

The Whalen Company
Limited Express Warranty
Water-to-Air Heat Pump Chassis Standard Warranty

The Whalen Company warrants to the purchaser each water-to-air heat pump chassis (or each refrigeration chassis) to be free from original defects in materials and workmanship.

Where inspection by an authorized representative of The Whalen Company confirms such defects to be present, for a period of twelve months from date of shipment, Whalen will furnish replacement components or materials to the original purchaser without charge.

This Limited Express Warranty is intended to cover original equipment defects only and does not cover or apply to: (1) Air filters, refrigerant, fluids, oil; (2) Equipment relocated after initial installation; (3) Any portion or component of any system that is not supplied by The Whalen Company, regardless of the cause of the failure of such portion or component; (4) Equipment on which the unit identification tags or labels have been removed or modified; (5) Equipment which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, acts of God, alteration or misapplication of the product; (6) Equipment used as temporary heating or cooling while the facility is still under construction is considered misuse and as such, will void all warranty coverage regardless of the cause of failure; (7) Equipment which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Equipment subjected to corrosion or abrasion; (10) Equipment manufactured or supplied by others; (11) Equipment which have been operated in any manner contrary to The Whalen Company printed instructions; or (12) Equipment which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of The Whalen Company products.

The Whalen Company neither assumes nor authorizes any person to assume for it any obligation or warranty other than those stated herein.

This Limited Express Warranty does not cover labor charges associated with making repairs, inspection and diagnosis of malfunctions, all field labor in connection with repair or replacement of parts, all field labor in connection with removal and transportation to and from a repair facility and all field labor in connection with reinstallation after repairs are completed. However, The Whalen Company at its sole discretion may provide a labor allowance in cases of DOA (Dead on Arrival) equipment for replacement or repair of defective components within 30-days of start-up or 90-days from factory shipment, whichever comes first. After this period only the Limited Express Warranty will apply. Labor will be paid per The Whalen Company Warranty Labor Allowance schedule. Replacement or repair under this warranty will not extend the warranty time periods defined above. Whalen shall not, in any event, have any liability under this warranty unless and until it has been paid in full for the equipment supplied. The warranty period shall commence on the date of shipment, however, whether or not payment has been made.

This warranty applies only to Whalen heat pump installations in the fifty United States and in Canada. There are no warranties outside those areas.

The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. NO IMPLIED WARRANTY OR MERCHANTABILITY SHALL ACCOMPANY THE SALE OF THIS EQUIPMENT, AND THIS EXPRESS WARRANTY IS INTENDED TO AND DOES REPLACE ANY IMPLIED WARRANTY OF MERCHANTABILITY.

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Rev: 12/2020

The Whalen Company
Limited Express Warranty
Water-to-Air Heat Pump with 5 Year Compressor Warranty

The Whalen Company warrants to the purchaser each water-to-air heat pump to be free from original defects in materials and workmanship.

Where inspection by an authorized representative of The Whalen Company confirms such defects to be present, for a period of eighteen months from date of shipment, Whalen will furnish replacement components or materials to the original purchaser without charge.

In addition, for a period of sixty months from date of shipment, Whalen will furnish a replacement for any compressor found by an authorized representative of The Whalen Company to contain an original defect.

This Limited Express Warranty is intended to cover original equipment defects only and does not cover or apply to: (1) Air filters, refrigerant, fluids, oil; (2) Equipment relocated after initial installation; (3) Any portion or component of any system that is not supplied by The Whalen Company, regardless of the cause of the failure of such portion or component; (4) Equipment on which the unit identification tags or labels have been removed or modified; (5) Equipment which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, acts of God, alteration or misapplication of the product; (6) Equipment used as temporary heating or cooling while the facility is still under construction is considered misuse and as such, will void all warranty coverage regardless of the cause of failure; (7) Equipment which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Equipment subjected to corrosion or abrasion; (10) Equipment manufactured or supplied by others; (11) Equipment which have been operated in any manner contrary to The Whalen Company printed instructions; or (12) Equipment which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of The Whalen Company products.

The Whalen Company neither assumes nor authorizes any person to assume for it any obligation or warranty other than those stated herein.

This Limited Express Warranty does not cover labor charges associated with making repairs, inspection and diagnosis of malfunctions, all field labor in connection with repair or replacement of parts, all field labor in connection with removal and transportation to and from a repair facility and all field labor in connection with reinstallation after repairs are completed. However, The Whalen Company at its sole discretion may provide a labor allowance in cases of DOA (Dead on Arrival) equipment for replacement or repair of defective components within 30-days of start-up or 90-days from factory shipment, whichever comes first. After this period only the Limited Express Warranty will apply. Labor will be paid per The Whalen Company Warranty Labor Allowance schedule.

Replacement or repair under this warranty will not extend the warranty time periods defined above. Whalen shall not, in any event, have any liability under this warranty unless and until it has been paid in full for the equipment supplied. The warranty period shall commence on the date of shipment, however, whether or not payment has been made.

This warranty applies only to Whalen heat pump installations in the fifty United States and in Canada. There are no warranties outside those areas.

The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. NO IMPLIED WARRANTY OR MERCHANTABILITY SHALL ACCOMPANY THE SALE OF THIS EQUIPMENT, AND THIS EXPRESS WARRANTY IS INTENDED TO AND DOES REPLACE ANY IMPLIED WARRANTY OF MERCHANTABILITY.

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Rev: 12/2020

The Whalen Company Limited Express Warranty
Water-to-Air Heat Pump with 5 Year Refrigeration Circuit Warranty

The Whalen Company warrants to the purchaser each water-to-air heat pump to be free from original defects in materials and workmanship.

Where inspection by an authorized representative of The Whalen Company confirms such defects to be present, for a period of eighteen months from date of shipment, Whalen will furnish replacement components or materials to the original purchaser without charge.

In addition, for a period of sixty months from the date of shipment, Whalen will repair or replace refrigeration circuit components found by an authorized representative of The Whalen Company to contain an original defect. Refrigeration circuit components are defined to include the compressor, reversing valve, water coil, air coil, expansion device and interconnecting tubing only.

This Limited Express Warranty is intended to cover original equipment defects only and does not cover or apply to: (1) Air filters, refrigerant, fluids, oil; (2) Equipment relocated after initial installation; (3) Any portion or component of any system that is not supplied by The Whalen Company, regardless of the cause of the failure of such portion or component; (4) Equipment on which the unit identification tags or labels have been removed or modified; (5) Equipment which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, acts of God, alteration or misapplication of the product; (6) Equipment used as temporary heating or cooling while the facility is still under construction is considered misuse and as such, will void all warranty coverage regardless of the cause of failure; (7) Equipment which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Equipment subjected to corrosion or abrasion; (10) Equipment manufactured or supplied by others; (11) Equipment which have been operated in any manner contrary to The Whalen Company printed instructions; or (12) Equipment which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of The Whalen Company products

The Whalen Company neither assumes nor authorizes any person to assume for it any obligation or warranty other than those stated herein.

This Limited Express Warranty does not cover labor charges associated with making repairs, inspection and diagnosis of malfunctions, all field labor in connection with repair or replacement of parts, all field labor in connection with removal and transportation to and from a repair facility and all field labor in connection with reinstallation after repairs are completed. However, The Whalen Company at its sole discretion may provide a labor allowance in cases of DOA (Dead on Arrival) equipment for replacement or repair of defective components within 30-days of start-up or 90-days from factory shipment, whichever comes first. After this period only the Limited Express Warranty will apply. Labor will be paid per The Whalen Company Warranty Labor Allowance schedule

Replacement or repair under this warranty will not extend the warranty time periods defined above. Whalen shall not, in any event, have any liability under this warranty unless and until it has been paid in full for the equipment supplied. The warranty period shall commence on the date of shipment, however, whether or not payment has been made.

This warranty applies only to Whalen heat pump installations in the fifty United States and in Canada. There are no warranties outside those areas.

The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

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Rev: 12/2020

Date	Description
02/09/2021	Updated Warranty Certificates
09/24/2020	Updated Mechanical Specifications and Thermostats
08/12/2020	Added Wiring Diagrams
04/2019	New Release of document

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