



PRODUCT DESIGN GUIDE

Whispertherm® Vertical Stack



July 2024

whalencompany.com

Table of Contents

Cabinet Nomenclature	1
Chassis Nomenclature	5
Whispertherm® Performance Ratings	8
Features & Benefits	9
Whispertherm® Thermostats	12
Unit Protection & LED Fault Status	13
Multi-protocol DDC Controller	14
Physical Data Table	15
Unit Voltage / Operating Limits	16
Whispertherm® Performance Data	17
Airflow - EC CT Performance Table	19
Performance Data Correction Factors	20
Whispertherm® Standard Riser & TRU Details	25
Whispertherm® Extended Riser & TRU Details	26
Whispertherm® Split Riser & TRU Details	27
Whispertherm® TRU Connection Locations	28
Whispertherm® Cabinet Drawings	30
Whispertherm® Cabinet Drawings	31
Mechanical Specifications	42
Whispertherm® Warranty Statements	51
Whispertherm® Design Guide Revision Table	55



Category	Position	Option Digit and Description
Product Family	1	V - Vertical Stack Water Source Heat Pump
Product Type	2	P - Whisper Series 1-Stage D - Whisper Series 2-Stage H - Whisperpack Hydronic Heating Unit S - Whisper Series Single Riser System T - Whispertherm Integrated Thermal Recovery Unit (Enthalpy Core) N - Whispertherm Integrated Thermal Recovery Unit (Sensible Core) I - Internal Whalen Drain - Replacement Only
System Configuration	3	A - Heat Pump (Reverse Cycle) C - Air Conditioning and Hydronic Heat D - Cooling Only E - Heating Only H - Heat Pump and Electric Heat (Supplemental heat) J - Heat Pump or Electric Heat (Boilerless heat)
Unit Capacity	4-6	020 - Size 200 - 0.50-ton Vertical Stack Water Source Heat Pump 030 - Size 300 - 0.75-ton Vertical Stack Water Source Heat Pump 040 - Size 400 - 1.00-ton Vertical Stack Water Source Heat Pump 050 - Size 500 - 1.25-ton Vertical Stack Water Source Heat Pump 060 - Size 600 - 1.5-ton Vertical Stack Water Source Heat Pump 080 - Size 800 - 2.0-ton Standard Vertical Stack Water Source Heat Pump 081 - Size 801 - 2.0-ton Enhanced Vertical Stack Water Source Heat Pump 100 - Size 1000 - 2.5-ton Vertical Stack Water Source Heat Pump 120 - Size 1200 - 3.0-ton Vertical Stack Water Source Heat Pump
Revision (Major)	7	5 - 5th Generation
Unit Voltage	8	B - Unit Voltage: 208/230-60-1 D - Unit Voltage: 265-60-1 F - Dual Point Power: 208/230-60-1 H - Dual Point Power: 265-60-1
Fan	9	T - ECM - Constant Torque Motor L - ECM - Constant Torque Motor (Low Static) V - ECM - Constant Air Volume Motor

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Cabinet Nomenclature

Category	Position	Option Digit and Description
Revision (Minor)	10	A - Minor Revision A
Sound Attenuation	11	A - Standard Quiet Construction B - Whalen Drain with silver rails C - Whalen Drain with Standard Construction and Vibration Isolator Pad D - Standard Quiet Construction with Silver Rail Isolation E - Standard Quiet Construction with Silver Rail Isolation & Vibration Isolation Pad F - Standard Quiet Construction with Vibration Isolation Pad
Cabinet Type / Height	12	B - 84 inch tall - Galvanized L - 93 inch tall - Galvanized G - 84 inch tall - Paint Grip M - 93 inch tall - Paint Grip S - 84 inch tall with Factory Mounted Cabinet Stand N - 93 inch tall with Factory Mounted Cabinet Stand 5 - 84 inch tall - Paint Grip with Factory Mounted Cabinet Stand Z - Special customer defined cabinet height - (Special Engineering Request is required)
Electric Heat	13	1 - 35 CFM (constant) / 150 CFM (intermittent) TRU Ventilation Rate 2 - 50 CFM (constant) / 150 CFM (intermittent) TRU Ventilation Rate 3 - 70 CFM (constant) / 150 CFM (intermittent) TRU Ventilation Rate 4 - 90 CFM (constant) / 150 CFM (intermittent) TRU Ventilation Rate 5 - 25 CFM (constant) / 100 CFM (intermittent) TRU Ventilation Rate 6 - 35 CFM (constant) / 100 CFM (intermittent) TRU Ventilation Rate 7 - 50 CFM (constant) / 100 CFM (intermittent) TRU Ventilation Rate 8 - 70 CFM (constant) / 100 CFM (intermittent) TRU Ventilation Rate
Electric Heat Voltage	14	X - No electric heat installed A - Electric Heat / TRU Voltage: 115-60-1 2 - Electric Heat / TRU Voltage: 208-60-1 B - Electric Heat Voltage: 230-60-1 D - Electric Heat Voltage: 265-60-1 3 - Dual Point Power: 208-60-1 F - Dual Point Power: 230-60-1 H - Dual Point Power: 265-60-1
Fan Control Wiring	15	A - Fan wiring - Single speed B - Fan wiring - Single speed with 2-speed fan switch D - Fan wiring - Single speed with Ultra-low airflow

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Category	Position	Option Digit and Description
		E - Fan wiring - Single speed with Ultra-low airflow and 2-speed fan switch F - Fan wiring - Two speed G - Fan wiring - Two speed with Ultra-low airflow K - DDC Wall Sensor Z - Special fan control wiring scheme - (Special Engineering Request is required)
Supply Air Discharge	16	1 - 1 Supply Air Outlet Opening (Does not include SA grille) 2 - 2 Supply Air Outlet Openings (Does not include SA grilles) 3 - 3 Supply Air Outlet Openings (Does not include SA grilles) P - Knockout - all sides (Does not include SA grilles) Z - Special Supply Air Discharge Configuration - (Special Engineering Request is required)
Cabinet Protection	17	X - No SA / RA covers installed (Does not include RA grille) A - Return Air Opening Cover (Does not include RA grille) B - Supply Air Opening Cover (Does not include RA grille) C - Supply & Return Air Opening Cover (Does not include RA grille) D - All Openings Shrink Wrapped (Does not include RA grille)
Power Termination	18	X - Side Entry - No unit disconnect A - Side Entry - With Unfused unit disconnect B - Side Entry - With Unit circuit breaker (Fused disconnect) P - Side Entry - Dual Point Power: Without unit disconnect C - Side Entry - Dual Point Power: Unfused unit disconnect on both circuit D - Side Entry - Dual Point Power: Unit circuit breaker on both circuits E - Side Entry - Dual Point Power: Unfused unit disconnect on unit & circuit breaker on E-heat F - Side Entry - Dual Point Power: Unit circuit breaker on unit & unfused disconnect on E-heat N - Top Entry - Single Point Power: Without unit disconnect G - Top Entry - Single Point Power: Unfused unit disconnect H - Top Entry - Single Point Power: Unit circuit breaker (Fused disconnect to protect unit only) Q - Top Entry - Dual Point Power: Without unit disconnect J - Top Entry - Dual Point Power: Unfused unit disconnect on both circuit K - Top Entry - Dual Point Power: Unit circuit breaker on both circuits L - Top Entry - Dual Point Power: Unfused unit disconnect on unit & circuit breaker on E-heat M - Top Entry - Dual Point Power: Unit circuit breaker on unit & unfused disconnect on E-heat R - Top Entry in Conduit - Single Point Power: without unit disconnect S - Top Entry in Conduit - Single Point Power: Unfused unit disconnect

Cabinet Nomenclature

Category	Position	Option Digit and Description
Thermostat Extension	19	B - T-stat Extension w/plug for offset mounting - 5 ft C - T-stat Extension w/plug for offset mounting - 10 ft D - T-stat Extension w/plug for offset mounting - 20 ft E - T-stat Extension w/plug for offset mounting - 30 ft F - T-stat Extension w/plug for offset mounting - 40 ft G - T-stat Extension w/plug for offset mounting - 50 ft P - Panel Mount Thermostat / Wall Sensor A - Factory Wired Remote Thermostat – Front 7 - Factory Wired Remote Thermostat - Right Side 8 - Factory Wired Remote Thermostat - Left Side 2 - Factory Wired Remote Thermostat (Secondary Unit) - Front 3 - Factory Wired Remote Thermostat (Secondary Unit) - Right Side 4 - Factory Wired Remote Thermostat (Secondary Unit) - Left Side
Control Type	20	A - Solid State Control
Water Temperature Sensors	21	A - 32°F Freeze Protection with 36°F Low Liquid Temp setting E - 32°F Freeze Protection with 125°F High Liquid Temp setting G - 20°F Freeze Protection with 20°F Low Liquid Temp setting N - 10°F Freeze Protection with 10°F Low Liquid Temp setting P - 10°F Freeze Protection with 0°F Low Liquid Temp setting
DDC Control	22	X - No DDC control package installed A - Whalen DDC Control (IO Zone 560) with current switch B - Whalen DDC Control (IO Zone 560) no current switch E - IO Zone 560 DDC Control with Fan & Compressor status current switch F - IO Zone 560 DDC Control with Discharge Air Temperature G - IO Zone 560 DDC Control with Fault Alarm H - IO Zone 560 DDC Control with Fan & Compressor status current switch with Discharge Air Temperature J - IO Zone 560 DDC Control with Fan & Compressor status current switch with Fault Alarm K - IO Zone 560 DDC Control with Fan & Compressor status current switch, Discharge Air Temperature, and Fault Alarm L - IO Zone 560 DDC Control with Discharge Air Temperature & Fault Alarm Z - Special DDC Control - (Special Engineering Request is required)
Drain Pan Option	23	A - Standard Stainless Steel P-trap Drain Pan B - Standard Stainless Steel P-trap Drain Pan with Condensate Pump E - Standard Stainless Steel Whalen Style Insulated Drain Pan with Condensate Pump G - Standard Stainless Steel Whalen Style Insulated Drain Pan

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Category	Position	Option Digit and Description
Insulation Option	24	A - 1/2" thick fiberglass insulation B - 1/2" thick Foil Face fiberglass insulation - Entire Unit C - 1/2" thick Closed Cell insulation - Entire Unit D - 1" thick fiberglass insulation in top of unit - 1/2" thick fiberglass in bottom of unit
Outdoor Air	25	X - No outside air opening installed A - 4" Internal Duct - top connection B - 4" Internal Duct - top connection with constant airflow regulator J - 2x8 Opening - Right side of cabinet with Manual outdoor air damper K - 2x8 Opening - Right side of cabinet with Motorized outdoor air damper U - 2x8 Opening - Left side of cabinet with Manual outdoor air damper V - 2x8 Opening - Left side of cabinet with Motorized outdoor air damper 1 - Whispertherm Top Connections Z - Special Outdoor Air Configuration - (Special Engineering Request is required)
Filtration	26	X - Field installed / field furnished 1" thick air filters A - 1" MERV 4 Fiberglass Throwaway B - 1" MERV 8 Pleated C - 1" MERV 11 Pleated D - 1" MERV 13 Pleated E - 2" MERV 4 Throwaway F - 2" MERV 8 Pleated G - 2" MERV 11 Pleated H - 2" MERV 13 Pleated J - 1" Permanent Aluminum, MERV 4
Riser Style	27	A - Factory Supplied / Unit mounted risers with riser cover (Risers configured separate) B - Factory Supplied / Unit mounted risers without riser cover (Risers configured separate) C - Factory Supplied / Unit mounted primary riser with riser cover (Risers configured separate) D - Factory Supplied / Unit mounted primary riser without riser cover (Risers configured separate) E - Factory Supplied / Unit mounted secondary riser with condensate riser (Risers configured separate) F - Factory Supplied / Shipped Separate - Chassis Shipped in Cabinet (Risers configured separate) M - Factory Supplied / Shipped Separate (Risers configured separate) Q - Factory Supplied / Shipped Separate - Knockouts - all sides (Risers configured separate) R - Field Supplied Risers - Chassis Shipped in Cabinet S - Field Supplied Risers - Knockouts all sides T - Field Supplied Risers - Knockouts all sides - Chassis Shipped in Cabinet X - Field Supplied Risers / None / Secondary unit with no risers or condensate Z - Special Riser Configuration - (Special Engineering Request is required)

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Chassis Nomenclature

Category	Position	Option Digit and Description
Riser Spacing	28	A - Standard Spacing B - Standard spacing with Bulls-Eye Stand-off C - Standard spacing with 4" x 4" (W x H) Rear Riser Opening D - Standard spacing with 7" x 4" (W x H) Side Riser Opening F - Extended Spacing G - Extended spacing with Bulls-Eye Stand-off H - Extended spacing with 4" x 4" (W x H) Rear Riser Opening J - Extended spacing with 8" x 4" (W x H) Side Riser Opening L - Split Spacing M - Split spacing with Bulls-Eye Stand-off N - Split spacing with 4" x 4" (W x H) Riser Opening S - Bulls-Eye Stand-off for Cast-in Firestop Device - Up to 2" Max Riser T - Bulls-Eye Stand-off for Cast-in Firestop Device - 3" Max Riser U - Bulls-Eye Stand-off for Cast-in Firestop Device - 4" Max Riser Z - Special Riser Spacing / Configuration - (Special Engineering Request is required)
Riser Location	29	1 - Factory Supplied - Unit mounted risers 2 - Factory Supplied - Shipped Separate X - None / Field Supplied Risers Z - Special Riser Location - (Special Engineering Request is required)
Special Configuration	30	X - Future Option Z - Future Option - (Special Engineering Request is required)

Category	Position	Option Digit and Description
Brand	1	W - Whalen
Product Family	2-3	VI - R-454B - Whisperline Refrigeration Chassis w/ Whalen drain VP - R-454B - Whisperline Refrigeration Chassis - 1-stage VD - R-454B - Whisperline Refrigeration Chassis - 2-stage
System Configuration	4	A - Heat Pump (Cooling default) B - Cooling Only C - Air Conditioning or Hydronic Heat E - Heating Only G - Heat Pump (heating default) J - Heat Pump or Electric Heat (Boilerless)
Unit Capacity	5-7	020 - 0.50-ton R-454B Refrigeration Chassis 030 - 0.75-ton R-454B Refrigeration Chassis 040 - 1.00-ton R-454B Refrigeration Chassis 050 - 1.25-ton R-454B Refrigeration Chassis 060 - 1.5-ton R-454B Refrigeration Chassis 080 - 2.0-ton Standard R-454B Refrigeration Chassis 081 - 2.0-ton Enhanced R-454B Refrigeration Chassis 100 - 2.5-ton R-454B Refrigeration Chassis 120 - 3.0-ton R-454B Refrigeration Chassis
Revision (Major)	8	5 - 5th Generation
Unit Voltage	9	B - Unit Voltage: 208/230-60-1 D - Unit Voltage: 265-60-1
Compressor	10	C - Copeland L - LG T - Tecumseh
Distributor Option	11	G - Geothermal (TXV) Y - Standard (TXV)
Revision (Minor)	12	A - Minor Revision A
Control Voltage	13	L - Normally Closed - 24 VAC 1 - Normally Open - 24 VAC

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Category	Position	Option Digit and Description
Control Type	14	A - Solid State Control
Sound Attenuation	15	X - Standard A - Anti-vibe Compressor Enclosure
Coil Casing	16	A - Standard (Galvanized) Chassis & Galvanized Coil Casing with Copper tube / Aluminum fin C - Standard (Galvanized) Chassis & Galvanized Coil Casing with Epoxy Coating (E-Coating) F - Standard (Galvanized) Chassis & Stainless Steel Coil Casing with Copper tube / Aluminum fin H - Standard (Galvanized) Chassis & Stainless Steel Coil Casing with Epoxy Coating (E-Coating)
Hot Water Coil	17	X - No hot water coil installed B - 2-row Hot Water Coil C - 3-row Hot Water Coil
Control Valve	18	X - None A - 2-way valve, on/off, 30 psi diff B - 2-way valve, on/off, 60 psi diff C - 2-way valve, on/off, 125 psi diff H - Pressure Independent Control Valve J - 3-way valve, on/off, 30 psi diff (Whisperpack Only) K - 3-way valve, on/off, 60 psi diff (Whisperpack Only) 2 - Two 2-way valve, on/off, 30 psi diff (Qty 2 valves for use with Whisperpack) 3 - Two 2-way valve, on/off, 60 psi diff (Qty 2 valves for use with Whisperpack) 4 - Two 2-way valve, on/off, 125 psi diff (Qty 2 valves for use with Whisperpack)
Flow Control	19	X - No control valve installed C - Automatic Flow Valve - Griswold K with PT Ports D - Automatic Flow Valve - Hays E - Automatic Flow Valve - Hays with PT Ports H - Manual Flow Control Valve L - Internal Circulating Pump - Taco (208 or 265V) M - Internal Circulating Pump - Grundfos (208V only) Q - Pressure Independent Control Valve R - Internal Circulating Pump - Modulating S - Internal By-pass Circuit Z - Customer specified flow control device - (Special Engineering Request is required)

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com



Category	Position	Option Digit and Description
Water Flow	20-23	XXXX - Manual valve or no flow control device installed
		0100 - 1.0 GPM
		0113 - 1.13 GPM
		0120 - 1.20 GPM
		0125 - 1.25 GPM
		0150 - 1.5 GPM
		0163 - 1.63 GPM
		0175 - 1.75 GPM
		0200 - 2.0 GPM
		0225 - 2.25 GPM
		0230 - 2.30 GPM
		0250 - 2.5 GPM
		0300 - 3.0 GPM
		0325 - 3.25 GPM
		0330 - 3.30 GPM
		0350 - 3.5 GPM
		0400 - 4.0 GPM
		0450 - 4.5 GPM
		0500 - 5.0 GPM
		0550 - 5.5 GPM
		0600 - 6.0 GPM
		0650 - 6.5 GPM
		0660 - 6.6 GPM
0700 - 7.0 GPM		
0740 - 7.4 GPM		
0750 - 7.5 GPM		
0800 - 8.0 GPM		
0900 - 9.0 GPM		
1000 - 10.0 GPM		
		ZZZZ - Customer specified GPM - (Special Engineering Request is required)
Strainer	24	X - No strainer installed
		2 - Y-strainer
		3 - Y-strainer with blowdown
Water Connections	25	A - GHT (Male) - (Hose Kit Not Included)
		C - NPSH (Straight) - (Hose Kit Not Included)
		J - Insta-Lock Connector - (Hose Kit Not Included)

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Category	Position	Option Digit and Description
Water-side Access Ports	26	X - None
		A - Pressure / Temperature Port (Supply)
		B - Pressure / Temperature Port (Return)
		C - Pressure / Temperature Port (Supply & Return)
		D - Pressure / Temperature Port (Supply) and Manual Air Vent
		E - Pressure / Temperature Port (Return) and Manual Air Vent
		F - Pressure / Temperature Port (Supply & Return) and Manual Air Vent
		G - Pressure / Temperature Port (Supply) with Manual Air Vent & Drain Petcock
Coax Type	27	A - Standard
		B - Cupro-Nickel Coax
		C - Insulated Coax
		D - Insulated Cupro-Nickel Coax
Chassis Plug	28	Q - 15 pin
Air / Fluid Sensor	29	D - Differential Pressure Switch
		X - None
Coil Height	30	D - 18" tall
		E - 20" tall
		G - 24" tall
		J - 28" tall
		N - 36" tall

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Table 1A: Whisperline® Chassis AHRI Performance Ratings – ASHRAE / ANSI / AHRI / ISO Standard 13256-1

Model	CFM	GPM	Water Loop Heat Pump				Ground Loop Heat Pump			
			Cooling 86°F		Heating 68°F		Cooling 77°F		Heating 32°F	
			Capacity Btuh	EER Btuh / W	Capacity Btuh	COP	Capacity Btuh	EER Btuh / W	Capacity Btuh	COP
V(T,N)-A-0204*G	280	1.5	6,500	15.0	8,000	5.5	6,600	14.2	4,600	3.2
V(T,N)-A-0304*G	340	2.5	9,300	15.0	12,500	5.7	9,650	15.4	6,850	3.3
V(T,N)-A-0404*G	420	3.3	12,800	15.6	15,000	5.5	12,700	16.0	9,400	3.3
V(T,N)-A-0504*G	540	3.9	15,000	16.1	18,200	5.5	15,500	17.0	10,800	3.2
V(T,N)-A-0604*G	655	4.5	18,200	15.2	21,600	5.1	19,000	16.2	13,000	3.3
V(T,N)-A-0804*D	830	6.0	23,000	13.1	30,000	5.0	25,000	14.5	19,000	3.2
V(T,N)-A-0814*D	830	6.0	23,200	16.0	28,200	5.6	24,000	17.1	17,000	3.8
V(T,N)-A-1004*D	970	7.5	30,000	17.0	34,800	5.5	31,000	18.2	20,800	3.8
V(T,N)-A-1204*D	1170	9.0	37,000	15.9	41,200	5.5	38,200	16.9	24,800	3.7

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

Table 1B: Whispertherm® Thermal Recovery Unit Efficiency Performance (Enthalpy Core)

Winter			Summer	
Outdoor 32°F DB, 29°F WB			Outdoor 95°F DB, 78°F WB	
Indoor 70°F DB, 58°F WB			Indoor 75°F DB, 63°F WB	
CFM	Apparent Sensible Effectiveness	Total Recovery Efficiency	Apparent Sensible Effectiveness	Total Recovery Efficiency
50	85%	67%	68%	49%

Typical Ventilation System Running Load

Constant Ventilation Speed	Intermittent Timed High Speed (1)
52 WATTS	98 WATTS

(1) The unit is designed for constant 24/7 ventilation with a timed high-speed washroom exhaust.

The thermal recovery performance shown above applies to the Whalen Whispertherm® product with an integrated TRU.

Features & Benefits of the Thermal Recovery Unit

Integrated Thermal Recovery Unit The Whispertherm® includes an integrated thermal recovery unit (TRU) having easy access. The TRU is self-contained and includes all items needed for a fully-functioning engineered unit. The unit includes controls to ensure dedicated constant ventilation and high-speed exhaust.



FreshPath™ Technology Industry exclusive system ensures fresh air is pre-treated, filtered (TRU prefilter and then the main unit filter) and conditioned before entering the occupied space.

May Assist in Additional LEED® Points The Whispertherm® unit may allow for additional points based on ventilation and IAQ.

Improves Indoor Air Quality (IAQ) Providing the living space with dedicated tempered ventilation air enhance

Features & Benefits of Whispertherm®

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.

Constant Torque EC Motor Standard on all units. Provides 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.

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 horizontally and adjust easily for directing the unit discharge air.

ing personal comfort. The unique unit design allows the Supply Air from the TRU to pass through the main unit filter prior to passing through the unit coil(s).

Multiple Ventilation Rate Settings Factory preset ventilation CFM settings based on the living space size.

“Polar Shield” & Defrost Cycle Included sensors protect freezing air from reaching the unit and/or the space. The outdoor air duct is closed-off and the TRU supply fan is de-energized. The TRU exhaust fan continues to operate, exhausting the warm recovery air from the washroom, until permitted operating conditions are reached.

MERV-6 filters Standard filters are MERV-6 rated.

Occupant (Washroom) Timers The timer allows for activation of timed high speed exhaust, eliminating excess humidity build up and/or odors from the recovery space. The timer is a momentary switch and is adjustable from 5-60 minutes.

Flush Mounted Panel Constructed of heavy gauge steel, lined with insulation to help attenuate sound from the compressor and fan assembly. Magnetic clips ensure the panel doors stay closed during operation. Panel has 2 doors to access the chassis and to access the TRU. Panel is painted appliance white and contains a supply air grille for front supply units.

Telescoping SA Extension Front supply units come with a sheet metal telescoping supply sleeve standard in the cabinet. A canvas connector can be used for top and side supply ducts. 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 (circuit breaker for secondary overcurrent protection). 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 50 foot ending with 6-P-in Molex quick connector. The extension can exit cabinet on the side opposite of the riser location.

Condensate pump The optional 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 cooling operation. The condensate is pumped to the top of the Whispertherm® cabinet where it must be connected to a building drain.

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

2-Way Valve Optional 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 optional automatic flow control device may be selected for 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 An optional 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 and 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 The Adjustable Memory Stop option 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 optional accessible port where water pressure and temperature can be measured. Accepts standard 1/8" gauge adapter.

Strainer The optional Y-type strainer body is constructed of brass with a 20 gauge 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 Multiple hose connection types are available.

Insta-lock™ Connection - Braided Hoses Brass body with stainless locking balls and EPDM seals. 304 stainless steel (ASTM A580-18) outer braid. Full flow technology to minimize pressure drop.

GHT Connection - Flexible 302/304 stainless steel hose with EPTF inner tube and FGH connections. Meets UL-94 VO fire rating.

NPSH Connection - 304 Stainless Steel hose with Kevlar® reinforced EPDM core built to ASTM E 84-00 / NFPA 255 standard. EPDM gasket with female NPSH swivel on both ends to provide a reliable seal.

O.A. Internal Duct Three 5" diameter connections are required for TRU.

Filter Units come standard with a one-inch MERV 4 fiberglass throwaway filter. High efficiency MERV 4, MERV 8, MERV 11, and MERV 13 pleated filters as well as a

Whispertherm® Thermostats

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 option further attenuates the sound level of our standard unit by adding a set of rubber in shear isolators under the compressor chassis rails to enhance the dual-level vibration isolation.

Table 2: Whispertherm® Thermostats for Standalone Operation

Feature		SCI SC2010L	SCI SC4011	SCI SC5011
Mounting Style	Electrical Box			
	Drywall	•	•	•
Display	Backlit LCD	•	•	•
	Temperature & Setpoint	•	•	•
	Operating Mode	•	•	•
	Fan Status	•	•	•
	Remote Setback	•	•	•
Operation	Non-programmable	•	•	
	Programmable			7 day
	Sensing	Local or Remote	Local or Remote	Local or Remote
	Setpoint Range	45°F to 90°F	45°F to 90°F	45°F to 90°F
	Changeover	Manual	Automatic	Manual or Automatic
Operating Modes	System Settings	Heat - Cool - Auto - Off	Heat - Cool - Auto - Off	Heat - Cool - Auto - Off
	Fan Settings	On - Auto	On - Auto	On - Auto
	Fan Speeds	1	1	1
Stages	Heating	1	1	1
	Cooling	1	1	1
Voltage	Operating Voltage	20 - 30 VAC	20 - 30 VAC	20 - 30 VAC

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

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, the control board will initiate a hard lockout and the alarm contact will energize.

Condensate Overflow Sensor

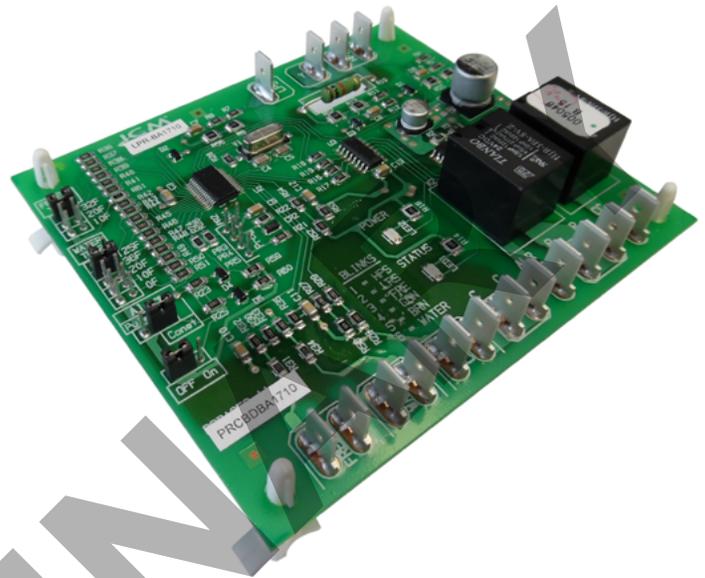
The control is designed to sense when condensate water levels in the drain pan become excessively high. When high condensate water levels are detected, the controller will go into condensate overflow warning mode. If the condensate overflow sensor detects liquid twice within 1 hour, the control board 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, and damage the compressor. 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. The threshold temperature is field selectable for 0°, 10°, 20°, or 36°F. If the sensor drops below the set temperature, the control board will initiate a hard lock-



out 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 caused by temporary conditions that might inhibit the unit from performing normal functions. When a 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 \pm 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 Cyclopol 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).

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Table 3: Physical Data Table

Component	Models								
	V(T,N)-A-0204	V(T,N)-A-0304	V(T,N)-A-0404	V(T,N)-A-0504	V(T,N)-A-0604	V(T,N)-A-0804	V(T,N)-A-0814	V(T,N)-A-1004	V(T,N)-A-1204
Nominal Tonnage	0.5	0.75	1.0	1.25	1.5	2.0	2.0	2.5	3.0
COOLING PERFORMANCE									
Capacity (MBTUH), ECM fan	6.5	9.3	12.8	15.0	18.2	23.0	23.2	30.0	37.0
EER (Btuh/W), ECM fan	15.0	15.0	15.6	16.1	15.2	13.1	16.0	17.0	15.9
Entering Water Temp (°F)	86	86	86	86	86	86	86	86	86
Water Flow (GPM)	1.5	2.5	3.3	3.9	4.5	6.0	6.0	7.5	9.0
Rated CFM	280	340	420	540	655	830	830	970	1170
Refrigerant type	R-454B	R-454B	R-454B						
Refrigerant charge (oz)	TBD	TBD	TBD						
HEATING PERFORMANCE									
Capacity (MBTUH), ECM fan	8.0	12.5	15.0	18.2	21.6	30.0	28.2	34.8	41.2
COP, ECM fan	5.5	5.7	5.5	5.5	5.1	5.0	5.6	5.5	5.5
Entering Water Temp (°F)	68	68	68	68	68	68	68	68	68
Water Flow (GPM)	1.5	2.5	3.3	3.9	4.5	6.0	6.0	7.5	9.0
DIMENSIONS (inches)									
Width (in.)	21	21	21	21	21	21	21	21	21
Depth (in.)	28	28	28	28	28	28	29	29	29
Height (in.)	84	84	84	84	84	84	93	93	93
OPERATING WEIGHT (lbs.)									
Chassis	79	81	83	122	123	132	180	165	175
Cabinet	260	260	260	260	260	260	290	290	290
SHIPPING WEIGHT (lbs.)									
Chassis	85	87	89	128	129	138	186	171	181
Cabinet	272	272	272	272	272	272	302	302	302
COMPRESSORS									
Type (208-230/60/1)	Rotary	Rotary	Rotary	Rotary	Rotary	Rotary	Scroll	Scroll	Scroll
Type (265/60/1)	Rotary	Rotary	Rotary	Rotary	Rotary	Scroll	Scroll	Scroll	Scroll
Quantity	1	1	1	1	1	1	1	1	1
EVAPORATOR COIL DATA									
Rows	3	3	3	3	3	3	3	3	3
Refrigerant control	TXV	TXV	TXV						
SUPPLY FAN DATA									
Quantity	1	1	1	1	1	1	1	1	1
Fan Size (D x W)	7.62 x 5	7.62 x 5	8 x 5	8.5 x 7	8.5 x 7	9 x 8	9.5 x 9.5	9.87 x 10.5	10.7 x 10.5
Fan type	Centrifugal	Centrifugal	Centrifugal						
Maximum E.S.P.									
ECM Motor - Constant Torque	0.35	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
CONSTANT TORQUE ECM HP									
Voltage - 208-230/60/1	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2
Voltage - 265/60/1	1/4	1/4	1/4	1/4	1/4	1/2	1/2	1/2	1/2
ACOUSTICAL RETURN AIR PANEL									
Chassis Accessible Flush Mounted	27 x 81	27 x 90	27 x 90	27 x 90					
SUPPLY GRILLE									
1 Grille (W x H)	10 x 8	14 x 8	14 x 10	16 x 12	16 x 12	16 x 16	16 x 16	NA	NA
2 Grille (W x H)	10 x 4	14 x 6	14 x 6	16 x 6	16 x 6	16 x 8	16 x 8 & 8 x 18	16 x 14 & 10 x 18	16 x 16 & 10 x 20
2 Grille Cornerstone (W x H)	4 x 10	6 x 14	6 x 14	8 x 16	8 x 16	8 x 16	8 x 18	10 x 18	10 x 20
3 Grille (W x H)	10 x 4	14 x 6	14 x 6	16 x 6	16 x 6	16 x 8	16 x 8 & 8 x 18	16 x 14 & 10 x 18	16 x 16 & 10 x 20
Top Duct (W x H)	12 x 10	12 x 10	12 x 12	14 x 14	14 x 14	14 x 16	14 x 16	14 x 16	14 x 16
FILTERS									
Size	13 x 24 x 1	13 x 24 x 1	13 x 24 x 1	15 x 28 x 1	15 x 28 x 1	15 x 28 x 1	17 x 40 x 1	17 x 40 x 1	17 x 40 x 1
Quantity	1	1	1	1	1	1	1	1	1

The Whalen Company works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

Unit Voltage / Operating Limits

Table 4: VT / VR Unit Voltage Limitations

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

Table 5: Whisperline® Chassis Continuous Operating Limits

Continuous 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: Whisperline® Chassis Start-up Operating Limits, High Fan Speed Recommended

Start-up 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 fluid at 20°F (-7°C), with nominal air flow and fluid 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

fluid at 30°F (-1°C), with nominal air flow and fluid 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.

For each of the five nominal fan sizes, the outdoor air CFM at the Tempered Outdoor conditions is mixed with the indoor supply air to the cooling / heating air coil.

25 CFM Nominal

Cooling					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
95	79	75	63	77.4	67.5
95	79	78	65	80.0	68.9
95	79	80	67	81.8	70.3

35 CFM Nominal

Cooling					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
95	79	75	63	78.0	67.9
95	79	78	65	80.6	69.3
95	79	80	67	82.3	70.6

50 CFM Nominal

Cooling					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
95	79	75	63	78.6	68.4
95	79	78	65	81.1	69.7
95	79	80	67	82.7	71.0

70 CFM Nominal

Cooling					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
95	79	75	63	79.6	69.5
95	79	78	65	81.9	70.7
95	79	80	67	83.5	71.8

90 CFM Nominal

Cooling					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
95	79	75	63	80.4	70.1
95	79	78	65	82.6	71.1
95	79	80	67	84.1	72.2

Heating					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
32	29.0	71.6	57	66.8	51.9
-13	-14.0	71.6	57	61.4	49.0
-31	-31.5	71.6	57	59.3	47.9

Heating					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
32	29.0	71.6	57	65.7	51.2
-13	-14.0	71.6	57	58.9	47.6
-31	-31.5	71.6	57	56.2	46.2

Heating					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
32	29.0	71.6	57	64.5	50.4
-13	-14.0	71.6	57	56.4	46.0
-31	-31.5	71.6	57	53.1	44.3

Heating					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
32	29.0	71.6	57	62.5	48.7
-13	-14.0	71.6	57	52.1	42.9
-31	-31.5	71.6	57	48.0	40.7

Heating					
Outdoor °F		Indoor °F		Tempered Outdoor °F	
Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
32	29.0	71.6	57	60.9	47.7
-13	-14.0	71.6	57	48.8	40.8
-31	-31.5	71.6	57	43.9	38.0

Airflow - EC CT Performance Table
Table 7: VT / VR Blower EC Constant Torque Performance Table³

Unit	Rated CFM	Min. CFM	Fan Option		CFM at External Static Pressure (in wg.)										
			Option	Speed	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
0204-xG (0.5)	280	170	EC Constant Torque	HI	354	346	330	308	278	240	196				
				MED HI ₁	320	303	280	251	217	176					
				MED	307	290	267	238	204						
				MED LO ₂	272	247	217	181							
				LOW	219	193									
0304-xG (0.75)	345	220	EC Constant Torque	HI	443	411	378	346	315	283	252	221			
				MED HI ₁	408	375	343	311	280	250	221				
				MED	378	352	323	291	257	220					
				MED LO ₂	337	302	263	220							
				LOW	278	248									
0404-xG (1.0)	420	280	EC Constant Torque	HI	521	493	466	439	413	386	360	334	309	283	
				MED HI ₁	498	470	443	416	389	363	337				
				MED	445	411	378	345	312	280					
				MED LO ₂	400	366	328	286							
				LOW	364	319	281								
0504-xG (1.25)	540	380	EC Constant Torque	HI	594	579	563	546	528	509	489	468	446	423	400
				MED HI ₁	557	541	523	504	484	462	438	413	387		
				MED	521	504	486	464	440	414	385				
				MED LO ₂	478	457	435	410	383						
				LOW	440	410	383								
0604-xG (1.5)	655	420	EC Constant Torque	HI	723	711	698	684	670	655	639	622	604	585	566
				MED HI ₁	677	665	652	639	624	609	593	576	558	540	520
				MED	588	572	555	535	513	489	463	434			
				MED LO ₂	509	492	473	453	431						
				LOW	464	447	428								
0804-xD (2.0)	830	580	EC Constant Torque	HI	966	949	931	914	897	880	863	847	830	814	798
				MED HI ₁	902	886	870	853	837	821	804	788	771	755	738
				MED	848	829	810	792	773	755	737	720	702		
				MED LO ₂	752	731	710	690	671	652					
				LOW	645	625	605	585							
0814-xD (2.0)	830	580	EC Constant Torque	HI	911	897	883	869	856	842	829	815	801	788	775
				MED HI ₁	860	845	831	817	803	788	774	760	746	731	717
				MED	798	780	763	746	730	714	698	684	669	655	642
				MED LO ₂	757	738	719	701	685	669	654	639	626	613	602
				LOW	683	662	642	622	602	582					
1004-xD (2.5)	970	650	EC Constant Torque	HI	1237	1223	1208	1193	1177	1161	1144	1127	1109	1091	1073
				MED HI ₁	1081	1062	1044	1025	1006	986	967	947	927	907	886
				MED	988	969	949	929	909	888	866	844	822	799	776
				MED LO ₂	937	917	896	874	852	829	806	782	757	731	705
				LOW	840	818	794	769	743	715	687	657			
1204-xD (3.0)	1170	750	EC Constant Torque	HI	1368	1353	1338	1322	1307	1291	1274	1258	1241	1224	1207
				MED HI ₁	1273	1256	1240	1223	1206	1188	1170	1152	1133	1114	1095
				MED	1163	1145	1128	1109	1091	1072	1052	1033	1012	992	970
				MED LO ₂	1083	1063	1043	1023	1002	981	960	938	916	894	872
				LOW	913	889	864	840	815	791	766				

¹ - Indicates single / high speed factory default setting

² - Indicates dual / low speed factory default setting

³ - CFM data is wet-coil and does NOT account for the air flow resistance of the selected air filter, supply grille, or the flush mount panel. See Table 17

Table 17: Additional Static Resistance (Inches of Water Column)

Size (Tons)	Model	Fan Speed	Flush Mount Panel	Supply Grille	Filter ¹				
					MERV 4 (Fiberglass)	MERV 4 (Poly)	MERV 8	MERV 11	MERV 13
0204 (0.5)	VT VN	High	0.01	0.05	0.02	0.03	0.08	0.09	0.08
		Low	0.01	0.03	0.01	0.02	0.05	0.06	0.05
0304 (0.75)		High	0.02	0.05	0.02	0.03	0.09	0.10	0.10
		Low	0.01	0.03	0.01	0.01	0.04	0.05	0.04
0404 (1.0)		High	0.03	0.04	0.03	0.05	0.12	0.13	0.13
		Low	0.02	0.02	0.02	0.03	0.07	0.08	0.07
0504 (1.25)		High	0.02	0.03	0.03	0.04	0.10	0.12	0.11
		Low	0.01	0.02	0.02	0.03	0.08	0.09	0.09
0604 (1.5)		High	0.03	0.05	0.04	0.06	0.14	0.15	0.16
		Low	0.01	0.02	0.02	0.03	0.09	0.10	0.10
0804 (2.0)		High	0.05	0.05	0.07	0.10	0.22	0.22	0.26
		Low	0.03	0.03	0.05	0.07	0.17	0.17	0.19
0814 (2.0)		High	0.02	0.03	0.02	0.03	0.09	0.10	0.09
		Low	0.01	0.02	0.02	0.02	0.07	0.08	0.07
1004 (2.5)		High	0.03	0.03	0.03	0.05	0.11	0.12	0.13
		Low	0.02	0.02	0.02	0.03	0.09	0.10	0.09
1204 (3.0)		High	0.04	0.03	0.05	0.07	0.16	0.16	0.18
		Low	0.03	0.02	0.03	0.05	0.12	0.13	0.13

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

GENERAL

Equipment is a Vertical Stack Water Source Heat Pump, factory assembled, piped, internally wired, fully charged with R-454B refrigerant.

ETL Listed under Underwriters Laboratories Standard for Safety UL1995 for heat pumps. Products are certified in accordance ANSI/AHRI/ASHRAE/ISO13256-1 Certification Program.

Products shall be delivered to site, stored and protected 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.

Units shall be protected 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 and will void unit warranty.

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.

PRODUCTS

Vertical Stack Heat Pump capable of operation at water source or ground source temperatures with integral risers, air discharge openings, hose kits, and all accessories. Standard units shall operate in an entering fluid temperature range of 60°F to 95°F (15.6°C to 35°C). Ground source units shall operate in an extended entering fluid temperature range of 20°F to 120°F (-6.7°C to 48.9°C).

Capacities shall be certified under AHRI ISO Standard 13256-1.

CABINET

CABINET CONSTRUCTION

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.

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 NFPA 90A and NFPA 90B.

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

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

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.

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

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

(OPTION): Unit shall be supplied with perforated supply air opening knockouts. Knockouts shall be factory sealed and left in place during shipping and staging at the job site.

(OPTION): Unit shall be supplied with foil faced 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 NFPA 90A and NFPA 90B.

(OPTION): Unit shall be supplied with Elastomeric Closed Cell Foam Insulation in lieu of standard. Insulation shall conform to UL 181 for erosion and NFPA 90A for fire, smoke and melting, and comply with a 25/50 Flame Spread and Smoke Developed Index per ASTM E-84 or UL 723.

(OPTION): Unit shall be supplied with 1-inch thick 1-1/2-pound density thermal and acoustical fiberglass insulated discharge plenum.

(OPTION): Unit shall be supplied with a factory installed vibration isolation pad shall be installed on the bottom of the unit.

DRAIN PAN

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. A drain hose is factory clamped onto the drain connection for field connection.

FAN ASSEMBLY

The fan shall be slow speed, double width, double inlet (DWDI) forward curved, centrifugal type wheel capable of multiple fan speeds, and shall be accessible for removal and maintenance through the return air opening.

The fan motor shall be multi-speed, permanently lubricated, PSC type with thermal overload protection. The fan motor shall be isolated from the fan housing by a motor mounting system with rubber type grommets to inhibit vibration induced noise.

MOTORS

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

Mechanical Specifications

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

(OPTION): Constant Volume (CV) Electronically Commutated (EC) variable speed ball bearing type motor. The CV EC fan motor shall provide soft starting, maintain constant CFM over its static operating range. The fan motor shall be isolated from housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection.

(OPTION): Constant Torque (CT) Electronically Commutated (EC) variable speed ball bearing type motor. The CT EC fan motor shall provide soft starting and provide multiple fan speeds. The fan motor shall be isolated from housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection.

(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.

FILTERS

Unit return air filters shall be 1" thick disposable fiberglass media with a MERV 4 rating.

(OPTION): Unit return air filters shall be 2" thick disposable fiberglass media with a MERV 4 rating.

(OPTION): Filters shall be 1-inch or 2-inch thick disposable pleated media with a MERV 8 rating.

(OPTION): Filters shall be 1-inch or 2-inch thick disposable pleated media, MERV 13 rating.

(OPTION): Filters shall be 1-inch or 2-inch thick permanent aluminum cleanable media, MERV 4 rating.

OUTDOOR AIR

(OPTION): A 4" round internal duct is factory installed to provide a top connection for outside air supplied to the return side of the air coil to condition the outdoor air prior to entering the occupied space. The outdoor air internal duct is insulated within the cabinet.

(OPTION): 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): 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.

POWER SUPPLY

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

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

CONTROLS

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

1. Random start compressor protection.
2. Anti-short cycle compressor minimum OFF time delay.
3. Safety controls that protect the compressor from the following conditions:
 - a. High pressure
 - b. Low pressure (Loss of Charge Protection)
 - c. Low airflow
 - d. Low liquid flow
 - e. Low entering air temperature
 - f. Brown-out power conditions
 - g. Condensate Overflow Protection
 - h. Low liquid temperature protection with three different settings based on liquid properties.
4. Status LED indicating the device causing a fault condition.
5. Soft lockout feature that provides for an automatic reset prior to the initiation of a hard lockout.
6. Test mode capability with shortened time delays for servicing.

(OPTION): Factory Mounted DDC Board shall have all the features listed above and the control board will be supplied with a multi-protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. Product will ship from the factory ready to run. DDC integration is finalized by control contractor.

(OPTION): Factory provided communicating room/zone sensor with no display, set point adjust or override.

(OPTION): Factory provided communicating room/zone sensor with no display. Set point adjustment and override made via slide on sensor.

(OPTION): Factory provided communicating room/zone sensor with programmable LCD display, set point adjustment and override.

(OPTION): Factory provided communicating room/zone sensor with programmable LCD display, set point adjustment and override and fan speed control.

REFRIGERATION CHASSIS

Cabinets shall be supplied with a thermal recovery unit that is easily accessible and removable for servicing. Duct connections for the thermal recovery unit shall be standard 5-inch diameter.

The thermal recovery unit shall be fabricated from heavy-gauge galvanized steel. A ½ inch drain hose emptying into the cabinet drain pan shall be provided. A positive closing damper shall be included on the exhaust air discharge duct connection. Electrical connection for the module shall be made by a male plug into a female receptacle supplied in the cabinet.

Air filters shall be supplied for the fresh air and exhaust air flows. Filters shall be easily serviced or replaced through the front of the unit. Filters shall be washable.

The thermal recovery unit shall house fresh air and exhaust air blowers. Blowers shall be statically and dynamically balanced, direct drive, single phase with integral thermal overload protection. The blower wheel shall be the forward-curved SWSI centrifugal type.

The fresh air and exhaust air blower speed shall be set at the factory.

The thermal recovery core shall be protected by a defrost sensor that terminates operation of the fresh air blower.

(OPTION): An optional timed washroom exhaust control with reset to be provided with decorative momentary switch to activate the exhaust fan for a maximum of 20 minutes.

(OPTION): Factory set dedicated constant ventilation rate selection 1) 25 CFM 2) 35 CFM 3) 50 CFM 4) 70 CFM 5) 90 CFM.

(OPTION): Factory set nominal intermittent exhaust rate high speed selection 1) 100 CFM 2) 150 CFM when used in conjunction with optional timed momentary switch.

REFRIGERATION CHASSIS

CHASSIS CONSTRUCTION

The refrigeration chassis consisting of the compressor, low global warming potential (GWP) refrigerant, 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. The reversing valve shall be 4-way electric type, pilot operated for quiet reversal.

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.

The air-to-refrigerant 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.

The water-to-refrigerant 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.

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

(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.

(OPTION): 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.

(OPTION): 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.

(OPTION): The refrigerant to water heat exchanger shall be constructed with a Cupro-Nickel inner water tube for enhanced corrosion protection.

(OPTION): The chassis shall be shipped installed in the WSHP cabinets with a factory installed return air cover to protect the air-to-refrigerant coil from damaged.

CONDENSER WATER RISERS

RISER CONSTRUCTION

The unit manufacturer shall furnish Type L or Type M 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.

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.

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).

Mechanical Specifications

The condensate drain riser shall be Type M copper and insulated the length of the cabinet with 3/8-inch closed-cell insulation. The riser insulation shall be an elastomer with a UL 94-5V rating.

(OPTION): Provide 3/8-inch thick or 1/2-inch thick closed-cell riser insulation the length of the cabinet or length of the riser for extended range applications. The optional riser piping insulation shall be an elastomer with a UL 94-5V rating.

(OPTION): Swages / Transition Up / Transition Down from one diameter to another are performed as part of the manufacturing process as specified by the engineer in the field.

(OPTION): Risers boxed and shipped separate so complete riser stack can be installed, pressure tested, and filled prior to cabinet installation.

(OPTION): Unit shall be supplied with perforated riser opening knockouts. Knockouts shall be factory sealed and left in place during shipping and staging at the job site.

FACTORY ACCESSORIES

SUPPLY/RETURN HOSE KIT

Two fire-rated flexible hoses with ASTM ratings of Flame Spread 25, Fuel Contribution 25 and Smoke Density 50 for connection to unit and field piping. Hose shall be covered with stainless steel braiding to prevent damage.

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

(OPTION): GHT Connection - Flexible 304 stainless steel hose with EPTF Kevlar reinforced inner tube and brass female garden hose thread fitting connections. Hose shall have a 400-psi working pressure and tagged with tracking and test data. Hoses must meet UL-94 VO fire rating.

(OPTION): NPSH Connection - 304 Stainless Steel hose with Kevlar® reinforced EPDM core built to ASTM E 84-00 / NFPA 255 standard. EPDM gasket with female NPSH swivel on both ends to provide a reliable seal. Hoses must meet UL-94 VO fire rating.

SUPPLY GRILLES

(OPTION): The supply grilles shall be of the single deflection type fabricated of factory white painted extruded aluminum or 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): The supply grilles shall be of the double deflection type fabricated of factory white painted extruded aluminum or 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): Units with multiple supply air openings shall ship with opposed blade dampers to facilitate air balance between each outlet.

RETURN PANELS

(OPTION): Painted or “Paint-ready” 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 or ready for field painting. The return air panel shall stud mounted and allow for removal of the refrigeration chassis without removing the acoustic panel. Filter must be accessible and removable without the use of tools.

(OPTION): 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.

THERMOSTAT

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.

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 pigtailed when remote mounted. High voltage, return air thermostats with remote bulbs subject to damage during routine service will not be accepted.

(OPTION): The heat pump manufacturer shall provide a thermostat extension whip with thermostat plug out of the top of the unit for remote mounting the thermostat.

WARRANTY

The heat pump manufacturer shall warranty equipment for a period of 12 months from start-up or 18 months from shipment (whichever occurs first).

(OPTION): The heat pump manufacturer shall provide an extended compressor warranty covering the compressor only (no labor) for a total period of 2-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended parts warranty covering the solid-state control circuit board, air coil, coaxial coil, ERV module (if equipped), reversing valve, expansion valve, and compressor (no labor) for a total period of 2-years from the date of shipment.

Mechanical Specifications

(OPTION): The heat pump manufacturer shall provide an extended refrigeration circuit warranty covering coils, reversing valve, expansion valve and compressor (no labor) for a total period of 2-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended solid-state control warranty covering the solid-state control circuit board (no labor) for a total period of 2-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended compressor warranty covering the compressor only (no labor) for a total period of 5-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended parts warranty covering the solid-state control circuit board, air coil, coaxial coil, ERV module (if equipped), reversing valve, expansion valve, and compressor (no labor) for a total period of 5-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended refrigeration circuit warranty covering coils, reversing valve, expansion valve and compressor (no labor) for a total period of 5-years from the date of shipment.

(OPTION): The heat pump manufacturer shall provide an extended solid-state control warranty covering the solid-state control circuit board (no labor) for a total period of 5-years from the date of shipment.

SPARE PARTS

The installing contractor shall provide to the Owner one spare chassis for each fifty heat pumps of a given size.

FACTORY ACCESSORIES

INSTALLATION

Furnish as shown on the Whalen factory drawings and as specified herein, vertical stack water source heat pumps with integral risers, and with capacity and electrical characteristics as listed in the manufacturer's submittal documents. Units shall be Whisper Series as manufactured by The Whalen Company of Easton, MD.

Install in accordance with manufacturer's installation instructions and maintain manufacturer's recommended clearances for the unit and accessories. Follow manufacturer's recommendations for cleaning and flushing.



The Whalen Company
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 works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com



**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.

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 works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com



The Whalen Company
Whalen 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.

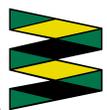
The Whalen Company has no liability for incidental or consequential damages arising out of the ownership, use, or operation of Whalen heat pumps.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. NO IMPLIED WARRANTY OF 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 works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact The Whalen Company's Customer Service Department at 1-410-822-9200 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely The Whalen Company's opinion or commendation of its products. The latest version of this document is available at whalencompany.com

**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.

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

Whispertherm® Design Guide Revision Table

Date	Description
07/2024	New Release of document

PRELIMINARY



8900 Glebe Park Drive
Easton, MD 21601
Tel, 410.822.9200 • 410.822.8926
whalencompany.com



Whispertherm® is a trademark of The Whalen Company. © Whalen Company. All rights reserved.

