The Whalen Company

PRODUCT DESIGN GUIDE

Closetline® WZ Series Packaged Heat Pump

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whalencompany.com

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WZ
024-060

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THE WHALEN CLOSETLINE WZ TWO-STAGE SERIES

The Whalen Closetline WZ Two-Stage Series showcases superb efficiency ratings, quiet operation, and application flexibility that is synonymous with the Whalen heat-pump family. The Closetline WZ surpasses ASHRAE 90.1 efficiency standards and utilizes R-454B low Global Warming Potential (GWP) refrigerant, setting a high standard for eco-friendly performance. The WZ qualifies for LEED® (Leadership in Energy and Environmental Design) points due to its innovative and environmentally-conscious design.

Available in sizes 2 tons (7.0 kW) through 5 tons (17.6 kW) with multiple cabinet options (vertical upflow and horizontal) the Closetline WZ offers a wide range of units for most any installation. The Closetline WZ has an extended-range refrigerant circuit, capable of ground-loop (geothermal) applications as well as water-loop (boiler-tower) applications. Some of the features of the innovative Closetline WZ series include: ultra-efficient two-stage unloading-scroll compressor, EC variable blower motor, microprocessor controls, galvanized-steel cabinet, non-corrosive polymer drain pan, and acoustic-type fiber insulation.

Recent EPA mandates require an industry transition to low-GWP refrigerants, such as R-454B which is a gas that is classified as having low-toxicity, low-flammability rating. Due to these characteristics, R-454B systems charged with over 62 ounces of refrigerant must contain an integrated Refrigerant Detection System (RDS). In the unlikely event of a system-refrigerant leak, the RDS shuts down compressor operation and runs the unit blower motor to disperse any concentration of leaked refrigerant in compliance with UL 60335-2-40 safety standards. For Closetline WZ products, only the 5 ton size (060) is required to have the RDS and the feature is optional on all other sizes.

Whalen's double isolation compressor mounting system makes the Closetline WZ one of the quietest units on the market. Compressors are mounted on specially engineered sound tested EPDM grommets to a heavy gauge mounting plate, which is then isolated from the cabinet base with EPDM grommets to minimize vibration transmission and maximize sound attenuation. Multiple removable access panels and an easily-accessible control box make installation and maintenance user friendly. Options such as coated air coil, DDC controls, internal variable-speed pump, modulating-water valve, and high-efficiency MERV-rated air filters allow for customizable-design solutions.

Intelligent communicating controls provide technicians an interface into the operation of the system in real time without the need for hard tooling. On-board advanced controls communicate the key operating system temperatures allowing technicians to startup, commission, and service equipment via a handheld service tool. Communicating controls also enable the functionality to make system adjustments and capture operating conditions at time of fault. The data is presented in a user-friendly format, enhancing the overall usability of the experience.

Variable water flow technology represents a major advancement in water-flow system-management efficiency. Variable water flow not only builds major water circulation components into the unit for a clean installation, it also intelligently varies water flow to minimize pump-energy consumption and improve system reliability.

The heart of variable water flow is either a variable-speed pump or modulating water valve intelligently controlled with DXM2.5 unit controls. Water flow is automatically varied based on changes in unit-capacity level (stage) and source water temperature to maintain optimum-system performance. Variable water flow allows the use of direct-return piping, while eliminating external two-way valves and automatic-flow regulators - making variable water flow systems inherently self-balancing.

Variable water flow systems provide reduced water-pumping power compared to traditional fixed-speed pumping systems. They also protect the unit against extreme operating conditions, thus extending the life of the compressor and air coil. Since variable water flow is built inside the unit, it also saves on installation time and makes for a very clean and compact installation. The Closetline WZ Series water-source heat pumps are designed to meet the challenges of today's HVAC demands with one of the most innovative products available on the market.

Features, Options, and Accessories

FEATURES

- Sizes 024 (2 ton, 7 kW) through 060 (5 tons, 17.6 kW)
- Exceeds ASHRAE 90.1 efficiency standards
- Environmentally-friendly R-454B low-GWP refrigerant
- Refrigerant Detection System (RDS) (mandatory on size 060, optional feature for sizes 024-048)
- Intelligent variable speed Constant Volume (CV) EC blower motors for precise airflow control and soft-start feature
- Part-load operation significantly lowers annual operating costs
- Galvanized-steel cabinet construction
- Sound-absorbing glass-fiber insulation
- Unique double-isolation compressor mounting with vibration isolation for quieter operation
- Insulated divider and separate compressor/air-handler compartments
- TXV metering device
- Field-convertible supply-air arrangement (horizontal configurations only)
- Unit Performance Sentinel performance-monitoring system
- Eight standard safety features
- Non-corrosive polymer drain pan
- Communicating Controls Powered by Deluxe Solid State Control:
  - Connect directly to the system with a handheld service tool
  - Provides real-time unit operating conditions
  - Reduces startup, commissioning, and service time by providing key system temperatures electronically
  - Captures operating conditions in the event of a safety shutdown
- Anti-short cycle and over/under-voltage protection
- Easy-access control box
- High-pressure, loss-of-charge, and condensate-overflow protection
- LED fault and status indication at controller
- Flush-mounted water fittings (no backup wrench required)

OPTIONS

- BACnet, Modbus, and Johnson Controls N2 compatibility options for Building Management Systems (BMS)
- Corrosion-resistant cupro-nickel water-heat exchanger
- Sound-attenuation package
- Tin-plated air coils for added protection from formicary corrosion
- Domestic Hot Water Generator (HWG)
- Variable water flow unit-integrated variable-speed water pump
- Unit-integrated modulating water valve for maximum water-flow control (replaces traditional motorized water valve and autoflow regulator)
- Easy-to-clean rust-prohibitive stainless-steel drain pans
- Integrated power disconnect
- Extended-range insulation for geothermal applications
- Return-air filter frames

ACCESSORIES

- Wide variety of thermostat options to meet your application needs
- Braided-hose kits in various lengths with optional water valve, PT plugs, blowdown valve, flow regulator, and strainer
- 1-inch Merv 8 filter
- 2-inch Merv 8 or 13 filters
- Aesthetically-pleasing wall sensors for connection to BMS (MPC) controls
- Auxiliary electric-duct heaters

AN INFORMATION GATEWAY TO MONITOR, CONTROL, AND DIAGNOSE YOUR SYSTEM

Whalen's communicating water-source heat pump offers an information gateway into the system. This allows users to interact with their system in clear language, delivering improved reliability and efficiency by monitoring and controlling the system. This makes Whalen water-source heat pumps easy to install and service.

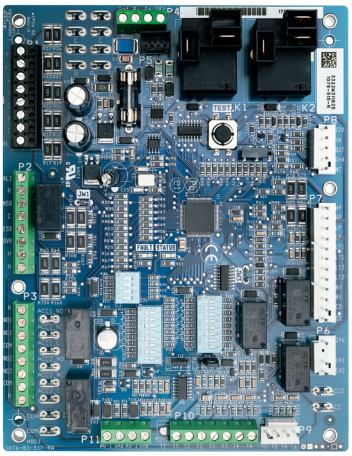
Monitor/Configure – Installers can configure from the configuration/diagnostic tool, unit family, size, accessory configuration, and demand reduction (optional, to limit unit operation during peak times). Users can look up the current system status: temperature sensor readings and operational status of the blower.

Precise Control – Deluxe Solid State Control Exclusive - Intelligent, two-way communication between the Deluxe Solid State Control board and smart components like the variable CFM CV EC blower motor. The Deluxe Solid State Control board uses information received from the smart components and sensors to precisely control unit operation to deliver higher efficiency, reliability and increased comfort.

Diagnostics – While in Service mode, technicians can access fault description, possible causes and most importantly, the conditions (temp, flow, i/o conditions, configuration) at the time of the fault. Manual Operation mode allows technicians to manually command operation for any of the thermostat outputs, blower speed, to help troubleshoot specific components.

With communicating controls, technicians have a gateway to system information never before available to Whalen water-source heat pump products.

Deluxe Solid State Control



AIRFLOW SELECTION	CFM
HEAT STAGE 1	600
HEAT STAGE 2	750
AUXILIARY HEAT	850
EMERGENCY HEAT	850
COOL STAGE 1	525
COOL STAGE 2	700
COOL DEHUMID 1	425
COOL DEHUMID 2	550
CONTINUOUS FAN	350
HEAT OFF DELAY	60
COOL OFF DELAY	30

◀ PREVIOUS NEXT ▶

POSSIBLE FAULT CAUSES
LOW WATER COIL TEMP

LOW WATER TEMP - HTG

LOW WATER FLOW - HTG

LOW REFRIG CHARGE - HTG

INCORRECT LT1 SETTING

BAD LT1 THERMISTOR

◀ PREVIOUS

FAULT TEMPERATURE CONDITIONS
LT1 LOW WATER TEMP
HEAT 1 11:11 AM 11/14

LT1 TEMP	28.1
LT2 TEMP	97.3
HOT WATER EWT	121.5
COMP DISCHARGE	157.7
LEAVING AIR	92.7
LEAVING WATER	34.9
ENTERING WATER	42.1
CONTROL VOLTAGE	26.4

◀ PREVIOUS

INTERNAL VARIABLE WATER FLOW

Industry-first, built-in variable water flow replaces a traditionally inefficient, external component of the system (water circulation) with an ultra-high-efficient, variable speed, internal water-flow system. This saves 70-80% on water circulation compared to traditional single-speed pump systems. Multi-unit installations are also much simpler with variable water flow systems, as the units automatically adjust water flow across the system.

Intelligent controls facilitate intelligent communication between the thermostat, DXM2.5 control, sensors, and internal water pump/valve to make true variable water flow a reality.

VARIABLE WATER FLOW IS AVAILABLE IN FOUR VARIATIONS:

1. Low System-Pressure Drop Modulating Valve – High CV motorized valve for central pumping. (Standard Unit).
2. High System-Pressure Drop Modulating Valve – Motorized valve for higher pressure water system such as water well pumps (optional).
3. Standard-Head Variable Pump – multi unit/ central pumping (optional).
4. High-Head Variable Pump – multi/individual unit pumping (optional).

VARIABLE WATER FLOW DELIVERS THREE MAIN BENEFITS:

1. Easier and quicker unit installation as the flow control is built in to the unit.
2. Superior reliability by varying the water flow to deliver more stable operation.
3. Increased cost savings by varying the flow (and pump watt consumption) to match the unit's mode of operation.

INTERNAL COMPONENTS

Whalen WZ products can be installed more easily and compactly than their predecessors because variable water flow components are internal to the unit. They also save installing contractors labor and time by eliminating the need for an external-flow regulator or a bulky, external-pumping module.

VARIABLE FLOW

Variable water-flow technology enables variable water flow through the unit, with the Deluxe Solid State Control control adjusting the pump speed to maintain an installer-set loop delta T. By controlling the water flow, the system is able to operate at its optimal capacity and efficiency. Variable water flow provides a lower flow rate for part load where units typically operate 80% of the time and a higher, more normal flow rate for full-load operation.

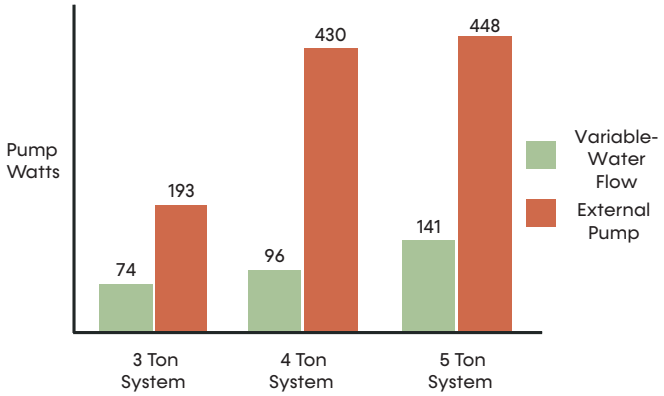
Variable-speed pump or motorized-modulating valve delivers variable water flow, controlled by Deluxe Solid State Control control, based on loop water ΔT.

ENERGY SAVINGS WITH WATER-CIRCULATION CONTROL

Units with variable water flow deliver greater operating cost savings by varying the water flow to match the unit's operation (ex: lower water flow when unit is in part-load operation). Lowering the flow results in lower energy consumption by the water pump (=greater cost savings) in variable water flow units (whether internal or external pump).

In applications using internal variable-speed (EC) pumps, the EC pump uses fewer watts than a fixed-speed (PSC) pump, even at full load. The EC pump excels in energy savings in part load, saving 70-80% watts compared to fixed-speed pumps (see chart). The EC pump can operate with independent-flow rates for both heating and cooling operations allowing for more energy savings.

In loop applications, when the motorized modulating valve slows down the water flow during part-load operation, the external pump consumes fewer watts, saving more energy.



Position	Option	Option Code	Decription
1	Brand	W	W - Whalen Closetline Series
2	Product Family	Z	Z - Two-Stage Mid-Size Cabinet
3	Configuration	H	H - Horizontal unit configuration
		V	V - Vertical unit configuration
4	System Type	G	G - Heat Pump (Heating default)
5-7	Unit Capacity	024	024 - 2.00 ton R-454B WZ Packaged Heat Pump
		030	030 - 2.50 ton R-454B WZ Packaged Heat Pump
		036	036 - 3.00 ton R-454B WZ Packaged Heat Pump
		042	042 - 3.50 ton R-454B WZ Packaged Heat Pump
		048	048 - 4.00 ton R-454B WZ Packaged Heat Pump
		060	060 - 5.00 ton R-454B WZ Packaged Heat Pump
8	Revision	A	A - 1st Generation
9	Voltage	B	B - Unit Voltage: 208/230-60-1
		J	J - Unit Voltage: 208/230-60-3
		M	M - Unit Voltage: 460-60-3
10	Refrigerant Detection	X	X - No Refrigerant Detection Sensor Installed
		A	A - Refrigerant Detection Sensor
11	Control Type	C	C - Deluxe Solid State Control for Thermostat Input
		D	D - Deluxe Solid State Control with IO Zone 560 DDC Control
12	Power Termination	X	X - Single Point Power: No disconnect
		A	A - Single Point Power: Non-Fused unit disconnect
13	Drain pan	A	A - Standard Stainless Steel P-trap Drain Pan
		C	C - Anti-corrosion Polymer Drain Pan
14	Insulation	A	A - Fiberglass
15	Application	1	1 - WSHP Application
		2	2 - Extended Range / Geothermal Application
16	Sound Attenuation	X	X - Standard Quiet Construction
		C	C - Enhanced Quiet Construction
17	Filter Mount	A	A - Filter Rail - 1 Inch - Free Return
		B	B - Full Frame - 1 Inch - Ducted
		C	C - Filter Rail - 2 Inch - Free Return
		D	D - Full Frame - 2 Inch - Ducted
18	Filtration	X	X - Field installed / field furnished
		A	A - 1" MERV 4 Throwaway

Position	Option	Option Code	Decription
19	Refrigerant Circuit	S	S - Standard Coax
		C	C - Cupro-Nickel Coax
20	Control valves	X	X - No control valve installed
		T	T - Modulating Control Valve
21	Flow Control	X	X - No flow control device installed
		D	D - Secondary Circulating Pump
		E	E - Internal Pump - Standard Head (Variable Flow)
		F	F - Internal Pump - Standard Head (Variable w/o Check Valve)
		G	G - Internal Pump - High Head (Variable Flow)
		H	H - Internal Pump - High Head (Variable w/o Check Valve)
		J	J - Modulating Valve
22	Strainers	X	X - No Strainer or Pressure Ports Installed
23	Coil Protection	C	C - Copper tube / Aluminum fin
		T	T - Tin Dipped Hairpins
24	Air Flow	T	T - Top Supply / Left Return
		K	K - Top Supply / Right Return
		B	B - Back Supply / Left Return
		P	P - Back Supply / Right Return
		L	L - Straight Supply / Left Return
		R	R - Straight Supply / Right Return
25	Fan	V	V - ECM - Constant Air Volume Motor
26	HWG	X	X - None - No Hot Water Generator
		A	A - Hot Water Generator (Coil Only)
27	Future	X	X - Future Option 1
28-30	Future	XXX	XXX - Future Option 2

ASHRAE/AHRI/ISO 13256-1 English (I-P) Units Part Load

Model	Motor Type	WSHP (Part Load)											
		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 68°F		Heating 41°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
WZ024	EC	17,500	17.0	19,900	5.7	20,000	29.7	16,600	4.8	19,300	25.3	14,600	4.2
WZ030	EC	21,200	15.2	24,400	5.1	24,700	26.4	20,800	4.4	23,400	22.0	18,700	4.0
WZ036	EC	26,100	16.1	31,600	5.3	29,900	26.0	25,700	4.4	28,500	22.6	22,600	4.1
WZ042	EC	32,500	17.0	36,000	5.1	36,000	28.5	29,800	4.5	35,000	23.5	26,400	4.0
WZ048	EC	34,000	16.5	39,000	5.5	38,500	28.5	31,800	4.5	37,000	24.0	28,000	4.0
WZ060	EC	42,000	17.5	47,300	5.5	47,000	29.0	38,500	4.7	45,500	24.9	34,000	4.2

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature.
- Heating capacities based upon 68°F DB, 59°F WB entering air temperature.
- Ground Loop Heat Pump ratings based on 15% antifreeze solution.

ASHRAE/AHRI/ISO 13256-1 English (I-P) Units Full Load

Model	Motor Type	WSHP (Full Load)											
		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Full Cooling 77°F		Full Heating 32°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
WZ024	EC	24,000	15.1	28,400	5.3	27,000	24.1	23,500	4.7	25,000	18.0	18,400	3.9
WZ030	EC	28,700	14.0	33,200	4.6	32,900	21.7	28,700	4.1	30,200	16.3	23,200	3.6
WZ036	EC	35,000	14.0	44,200	4.6	39,300	20.2	36,300	4.2	36,400	16.4	28,600	3.6
WZ042	EC	43,000	15.5	49,500	4.7	47,500	22.8	41,000	4.2	44,500	17.3	32,500	3.5
WZ048	EC	47,500	15.5	55,000	4.8	52,000	22.9	45,000	4.3	49,000	17.7	36,000	3.7
WZ060	EC	59,000	15.5	67,200	5.0	65,000	22.8	55,700	4.4	61,500	17.8	44,600	3.7

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature.
- Heating capacities based upon 68°F DB, 59°F WB entering air temperature.
- Ground Loop Heat Pump ratings based on 15% antifreeze solution.

ASHRAE/AHRI/ISO 13256-1 Metric (S-I) Units Part Load

Model	Motor Type	WSHP (Part Load)											
		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Cooling 25°F		Heating 0°F	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP
WZ024	EC	5	5.0	6	5.7	6	8.7	5	4.8	6	7.4	4	4.2
WZ030	EC	6	4.5	7	5.1	7	7.7	6	4.4	7	6.5	5	4.0
WZ036	EC	8	4.7	9	5.3	9	7.6	8	4.4	8	6.6	7	4.1
WZ042	EC	10	5.0	11	5.1	11	8.4	9	4.5	10	6.9	8	4.0
WZ048	EC	10	4.8	11	5.5	11	8.4	9	4.5	11	7.0	8	4.0
WZ060	EC	12	5.1	14	5.5	14	8.5	11	4.7	13	7.3	10	4.2

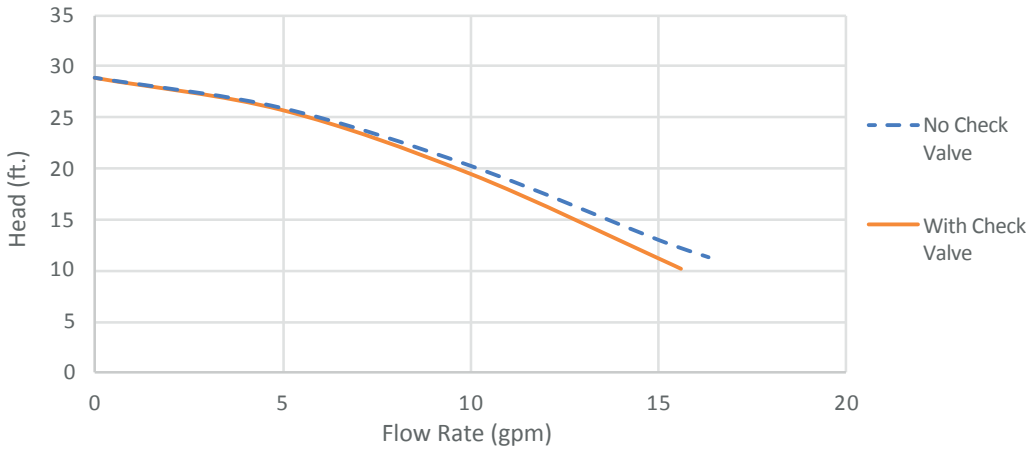
Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 20°C DB, 15°C WB entering air temperature.
- Heating capacities based upon 20°C DB, 15°C WB entering air temperature.
- Ground Loop Heat Pump ratings based on 15% antifreeze solution.

ASHRAE/AHRI/ISO 13256-1 Metric (S-I) Units Full Load

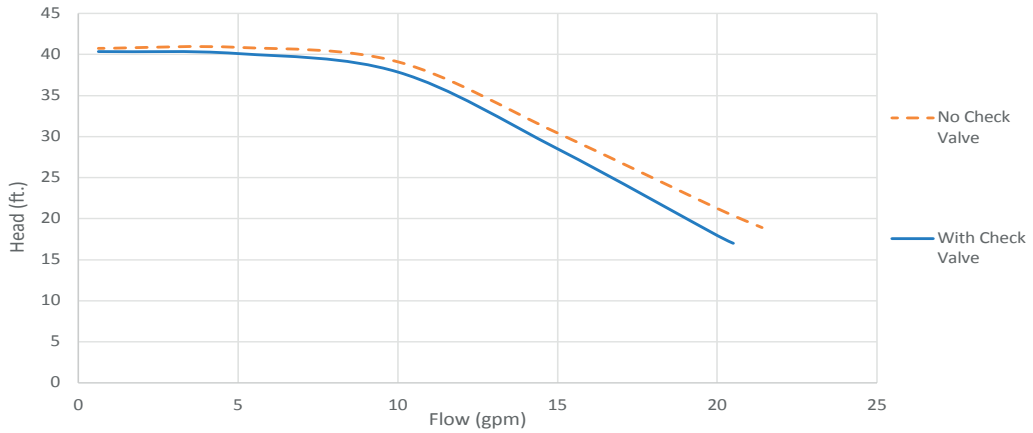
Model	Motor Type	WSHP (Full Load)											
		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 30°C		Heating 30°C		Cooling 15°C		Heating 10°C		Full Cooling 25°F		Full Heating 0°F	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity Btuh	COP	Capacity kW	EER W/W	Capacity kW	COP
WZ024	EC	7	4.4	8	5.3	8	7.1	7	4.7	7	5.3	5	3.9
WZ030	EC	8	4.1	10	4.6	10	6.4	8	4.1	9	4.8	7	3.6
WZ036	EC	10	4.1	13	4.6	12	5.9	11	4.2	11	4.8	8	3.6
WZ042	EC	13	4.5	15	4.7	14	6.7	12	4.2	13	5.1	10	3.5
WZ048	EC	14	4.5	16	4.8	15	6.7	13	4.3	14	5.2	11	3.7
WZ060	EC	17	4.5	20	5.0	19	6.7	16	4.4	18	5.2	13	3.7

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 27°C DB, 19°C WB entering air temperature.
- Heating capacities based upon 20°C DB, 15°C WB entering air temperature.
- Ground Loop Heat Pump ratings based on 15% antifreeze solution.

Standard Head Variable Pump Performance



High Head Variable Pump Performance



WZ Series

Model	024	030	036	042	048	060
Compressor (1 Each)	Scroll					
Number of refrigerant circuits	1	1	1	1	1	1
Factory Charge R-454B (oz)	40	36	46	56	56	69
Refrigerant Leak Detection System	O	O	O	O	O	R
Number of Sensors	2	2	2	2	2	2
Water Connection Size						
FPT - All Other (inch)	3/4"	3/4"	3/4"	3/4"	1"	1"
System Water Volume (gal)*	0.323	0.323	0.738	0.89	0.89	0.939
Vertical						
Filter Standard - 1" Throwaway (inch)	20x20	20x20	24x24	24x24	28x28	28x28
Weight - Operating (lbs.)	189	197	203	218	315	330
Weight - Packaged (lbs.)	194	202	209	224	322	337
Horizontal						
Filter Standard - 1" Throwaway	18x24	18x24	2-14x20	2-14x20	1-20x24 1-14x20	1-20x24 1-14x20
Weight - Operating (lbs.)	174	182	203	218	263	278
Weight - Packaged (lbs.)	179	187	209	224	270	285
Hot Water Generator - Vertical						
Swivel - Residential Class	1"	1"	1"	1"	1"	1"
FPT - All Other	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Weight - Operating (lbs.)	231	239	260	275	330	345
Weight - Packaged (lbs.)	236	244	266	281	337	352
Hot Water Generator - Horizontal						
Swivel - Residential Class	1"	1"	1"	1"	1"	1"
FPT - All Other	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Weight - Operating (lbs.)	223	223	248	259	314	329
Weight - Packaged (lbs.)	228	228	254	265	321	336

Notes:
All dimensions displayed above are in inches unless otherwise marked.
The standard Condensate Drain Connection is rubber coupling that couples to ¾-inch schedule 40/80 PVC.
The optional Stainless Steel Condensate Drain Connection is ¾-inch FPT.
*Volume without water options
FPT = Female Pipe Thread.
O = Optional, R = Required

Unit Maximum Water Working Pressure

Options	Max Pressure PSIG [kPa]
Base Unit	300 [2,068]
Internal Secondary Pump (ISP)	145 [999]
Internal Motorized Water Valve (MWV)	300 [2,068]
Internal Auto Flow Valve	300 [2,068]

Cabinet Dimensions (inch)

Model	Cabinet Config	Depth/ Length	Width	Height
		A	B	C
WZ024-030	H	48.4	22.5	18.3
	V	22.5	22.5	40.0
WZ036-042	H	53.3	22.5	21.0
	V	26.0	22.5	45.0
WZ048-060	H	68.0	25.5	21.0
	V	29.3	25.5	50.5

Electrical Knockouts (inch)

Model	Cabinet Config	H	Low Voltage	High Voltage	G
			J KO 1/2"	K KO 3/4"	
WZ024-030	H	4.1	7.1	14.8	1.3
	V	4.1	6.7	14.8	1.3
WZ036-042	H	4.1	7.1	15.8	1.3
	V	4.1	7.1	15.8	1.3
WZ048-060	H	4.1	7.1	16.7	1.3
	V	4.1	7.1	16.7	1.3

Water Connections (inch)

Model	Cabinet Config	Water Connections									Condensate Drain Pan		
		Water In		Water Out		Water In/Out	HWG In		HWG Out		AA	BB	Condensate Drain Pan Fitting
		D	E	F	E		DD	EE	FF	EE			
WZ024-30	H	3.7	2.0	9.8	2.0	3/4"	13.1	1.6	15.8	1.6	3.4	0.8	*3/4" MPT
	V	3.7	2.0	9.8	2.0	3/4"	13.1	1.6	15.8	1.6	1.4	19.7	*3/4" MPT
WZ036-042	H	3.7	2.0	11.1	2.0	3/4"	14.8	1.6	17.6	1.6	3.4	0.8	*3/4" MPT
	V	3.7	2.0	11.1	2.0	3/4"	14.8	1.6	17.6	1.6	1.4	20.7	*3/4" MPT
WZ048-060	H	3.7	2.0	11.1	2.0	1"	15.8	1.6	18.5	1.6	3.4	0.8	*3/4" MPT
	V	3.7	2.0	11.1	2.0	1"	15.8	1.6	18.5	1.6	1.4	22.2	*3/4" MPT

* See PDF drawings for reference

Discharge and Return Connections (inch)

Model	Cabinet Config	Discharge Connection Duct Flange Installed				Return Connection Using Return Air Opening			
		Supply Height	Supply Width	O	P	Return Width	Return Height	S	T
		M	N			Q	R		
WZ024-030	H	13.1	9.6	3.9	1.2	22.9	16.3	1.2	1.0
	V	14.0	14.0	7.5	4.2	18.4	18.2	1.7	1.0
WZ036-042	H	16.0	11.0	2.9	2.5	26.1	19.0	1.2	1.0
	V	14.0	14.0	7.5	6.0	22.9	22.2	0.8	1.0
WZ048-060	H	15.9	13.5	4.1	1.2	36.1	19.0	1.2	1.0
	V	18.0	16.0	8.5	5.7	26.2	26.2	0.8	1.0

Hanger Dimensions (inch)

Model	Cabinet Config	Unit Hanger Detail		
		U	V	W
WZ024-030	H	48.1	24.6	20.3
WZ036-042	H	53.1	24.6	20.3
WZ048-060	H	67.8	27.6	23.3

Cabinet Dimensions (cm)

Model	Cabinet Config	Depth/ Length	Width	Height
		A	B	C
WZ024-030	H	123.0	57.0	46.4
	V	57.0	57.1	101.6
WZ036-042	H	135.4	57.0	53.3
	V	66.2	57.1	114.3
WZ048-060	H	172.8	64.7	53.3
	V	74.4	64.7	128.3

Electrical Knockouts (cm)

Model	Cabinet Config	H	Low Voltage	High Voltage	G
			J KO 1/2"	K KO 3/4"	
WZ024-030	H	10.5	18.1	37.5	3.2
	V	10.5	17.0	37.5	3.2
WZ036-042	H	10.5	18.1	40.1	3.2
	V	10.5	18.1	40.1	3.2
WZ048-060	H	10.5	18.1	42.4	3.2
	V	10.5	18.1	42.4	3.2

Water Connections (cm)

Model	Cabinet Config	Water Connections									Condensate Drain Pan		
		Water In		Water Out		Water In/Out	HWG In		HWG Out		AA	BB	Condensate Drain Pan Fitting
		D	E	F	E		DD	EE	FF	EE			
WZ024-030	H	9.5	5.1	24.8	5.1	3/4"	33.3	4.0	40.2	4.0	8.6	2.1	*3/4" MPT
	V	9.5	5.1	24.8	5.1	3/4"	33.3	4.0	40.2	4.0	3.7	50.1	*3/4" MPT
WZ036-042	H	9.5	5.1	28.1	5.1	3/4"	37.7	4.0	44.7	4.0	8.6	2.1	*3/4" MPT
	V	9.5	5.1	28.1	5.1	3/4"	37.7	4.0	44.7	4.0	3.7	52.5	*3/4" MPT
WZ048-060	H	9.5	5.1	28.1	5.1	1"	40.0	4.0	47.0	4.0	8.6	2.1	*3/4" MPT
	V	9.5	5.1	28.1	5.1	1"	40.0	4.0	47.0	4.0	3.7	56.4	*3/4" MPT

Discharge and Return Connections (cm)

Model	Cabinet Config	Discharge Connection Duct Flange Installed				Return Connection Using Return Air Opening			
		Supply Height	Supply Width	O	P	Return Width	Return Height	S	T
		M	N			Q	R		
WZ024-030	H	33.3	24.5	10.0	3.0	58.3	41.3	3.1	2.5
	V	35.6	35.5	19.0	10.7	46.7	46.3	4.4	2.5
WZ036-042	H	40.6	27.9	7.4	6.4	66.2	48.3	3.0	2.5
	V	35.6	35.5	19.0	15.3	58.2	56.5	2.1	2.5
WZ048-060	H	40.4	34.4	10.3	3.0	91.6	48.3	3.0	2.5
	V	45.7	40.6	21.5	14.4	66.5	66.7	2.1	2.5

Hanger Dimensions (cm)

Model	Cabinet Config	Unit Hanger Detail		
		U	V	W
WZ024-030	H	122.3	62.4	51.5
WZ036-042	H	134.7	62.4	51.6
WZ048-060	H	172.2	70.0	59.2

Electric Heater Knockouts (inch)

Model	Cabinet Config	X	Y
WZ024	H	1.5	5.1
	V	1.7	2.7
WZ030	H	1.5	5.1
	V	1.7	2.7
WZ036	H	1.1	6.3
	V	1.7	2.7
WZ042	H	1.1	6.3
	V	1.7	2.7
WZ048	H	1.5	6.3
	V	2.3	3.3
WZ060	H	1.5	6.3
	V	2.3	3.3

Electric Heater Knockouts (cm)

Model	Cabinet Config	X	Y
WZ024	H	3.8	13.0
	V	4.2	6.8
WZ030	H	3.8	13.0
	V	4.2	6.8
WZ036	H	2.9	15.9
	V	4.2	6.8
WZ042	H	2.9	15.9
	V	4.2	6.8
WZ048	H	3.8	15.9
	V	5.8	8.4
WZ060	H	3.8	15.9
	V	5.8	8.4

Corner Weights (lb)

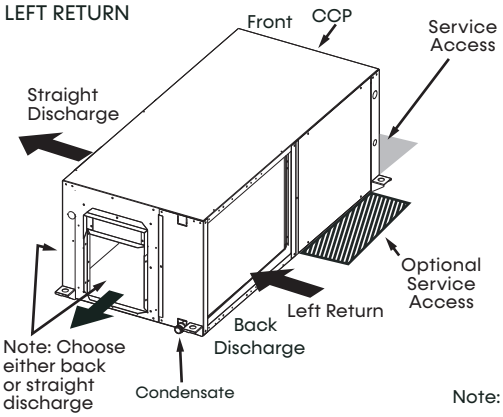
Model	Left - Front	Right - Front	Left - Back	Right - Back
WZ024	68.0	56.0	42.0	42.0
WZ030	68.0	56.0	42.0	42.0
WZ036	76.0	63.0	47.0	47.0
WZ042	80.0	66.0	49.0	49.0
WZ048	98.0	81.0	60.0	60.0
WZ060	103.0	85.0	63.0	63.0

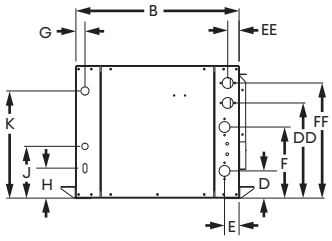
Corner Weights (kg)

Model	Left - Front	Right - Front	Left - Back	Right - Back
WZ024	30.8	25.4	19.1	19.1
WZ030	30.8	25.4	19.1	19.1
WZ036	34.5	28.6	21.3	21.3
WZ042	36.3	29.9	22.2	22.2
WZ048	44.5	36.7	27.2	27.2
WZ060	46.7	38.6	28.6	28.6

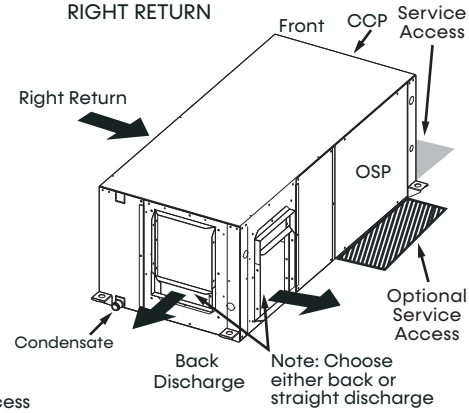
Horizontal Dimensional Data

LEFT RETURN

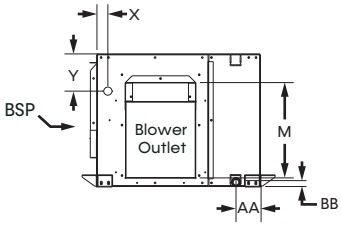




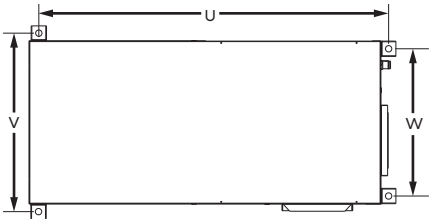
RIGHT RETURN

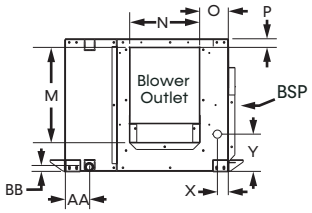


Note: Blower service panel requires 2-foot service access

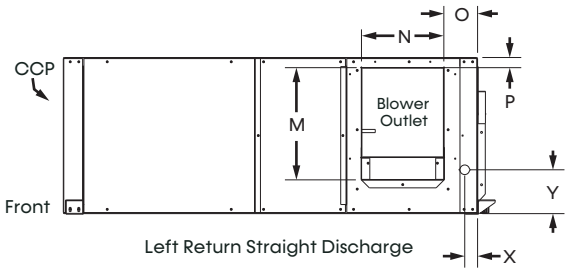


Left Return Back Discharge

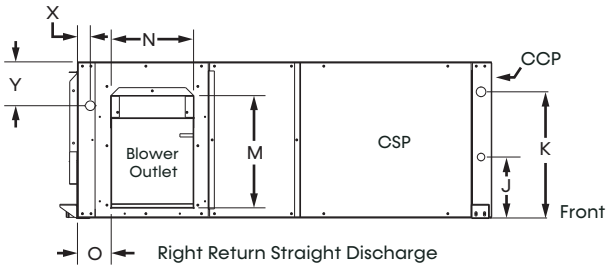




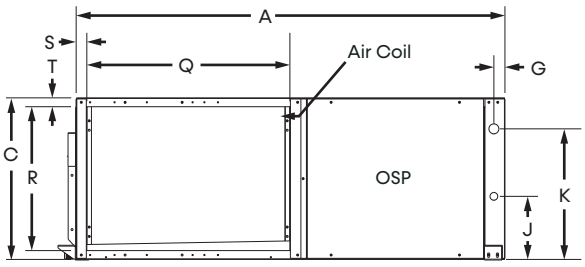
Right Return Back Discharge



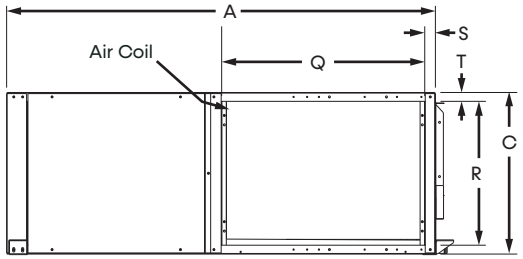
Left Return Straight Discharge



Right Return Straight Discharge



Left Return Left View
Air Coil Opening



Right Return Right View
Air Coil Opening

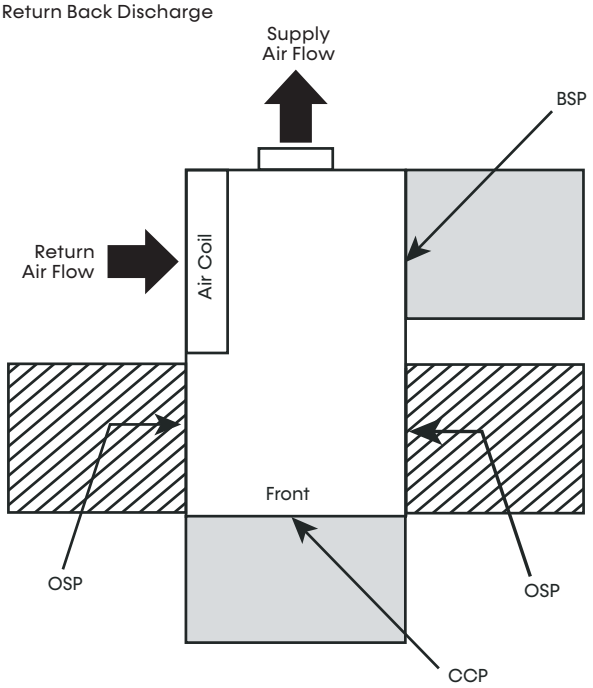
Notes:
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units come standard with air filter rails. For duct connections, order optional filter frames. See product options decoder for details. You can convert filter rails in the field with an accessory air filter frame kit. Please see the accessory submittal for details.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate is a rubber coupling that couples to ¾-inch schedule 40/80 PVC.
5. Blower service panel requires 2-foot service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
7. Water connections for optional hot water generator are ½-inch FPT.
8. OSP are removable panels that provide additional access to the units interior. Clear access to OSP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

Legend:
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

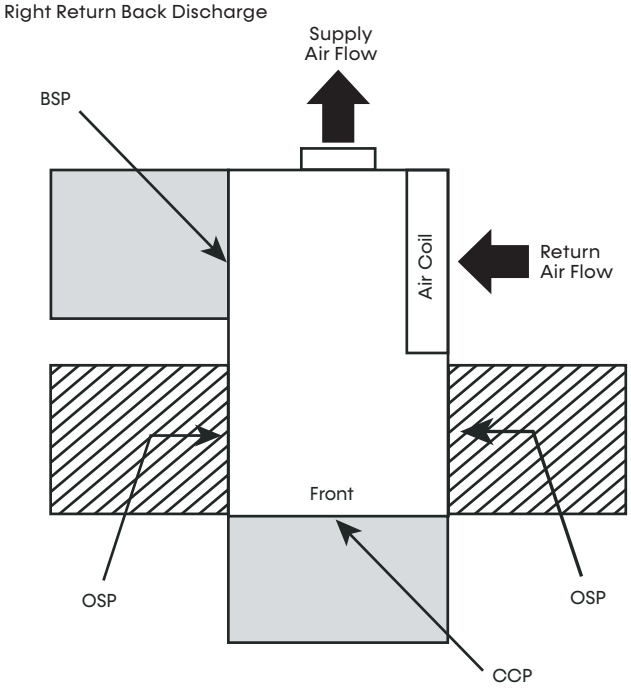
Horizontal Service Access

Models:
WZ
024-060

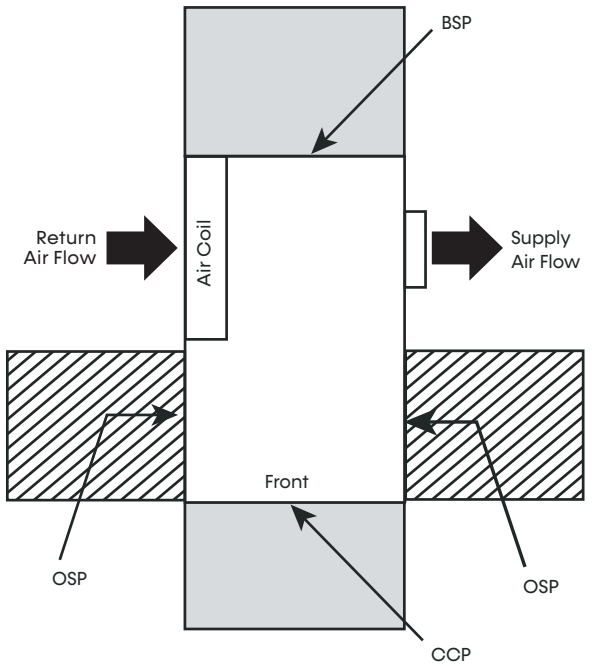
Left Return Back Discharge



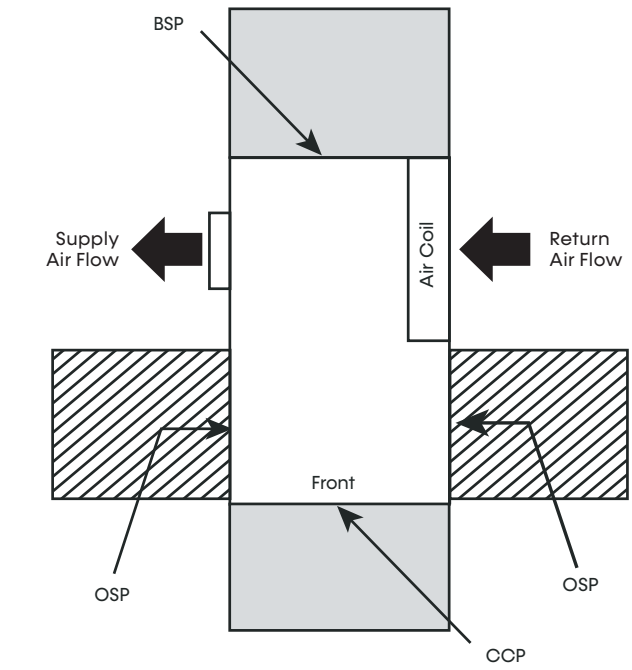
Right Return Back Discharge



Left Return Straight Discharge



Right Return Straight Discharge



Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. CCP and BSP requires 2-feet of service access.
3. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
4. OSP are removable panels that provide additional access to the units interior. Clear access to OSP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

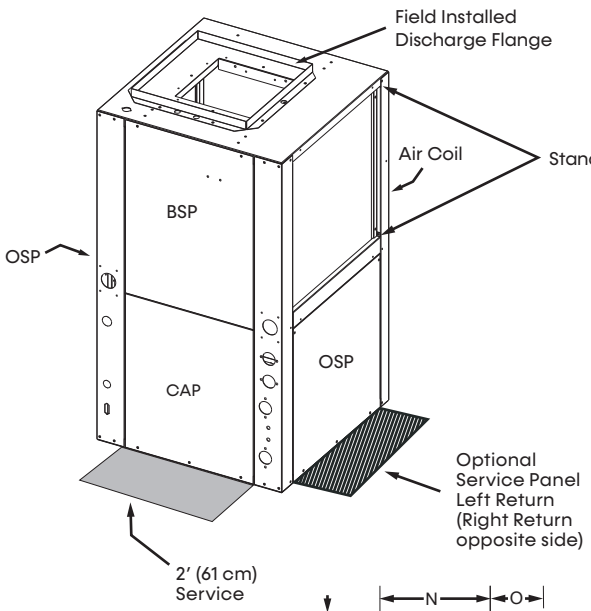
= Mandatory Service Access 2-foot (61 cm)

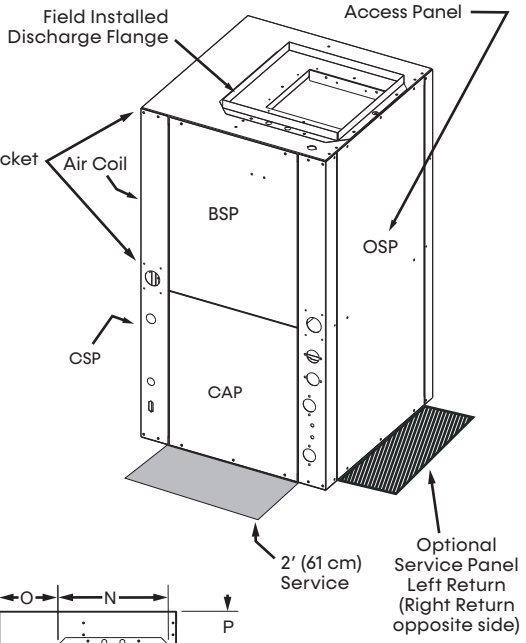
= Optional Service Access 2-foot (61 cm)

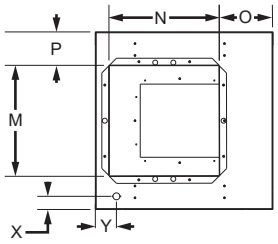
Legend:
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

Vertical Upflow Dimensional Data

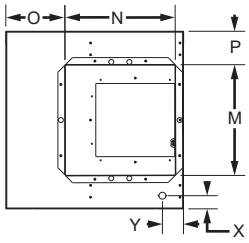
Models:
WZ
024-060



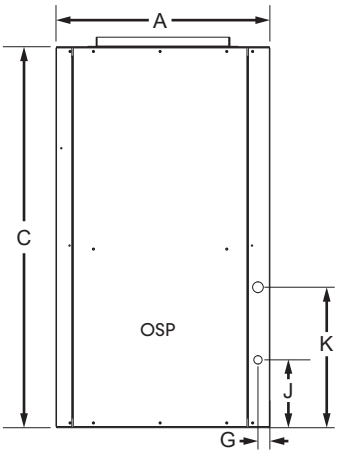




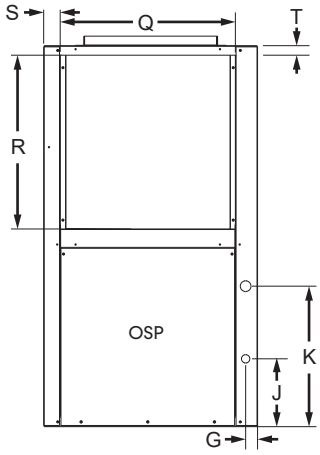
Top View - Right Return



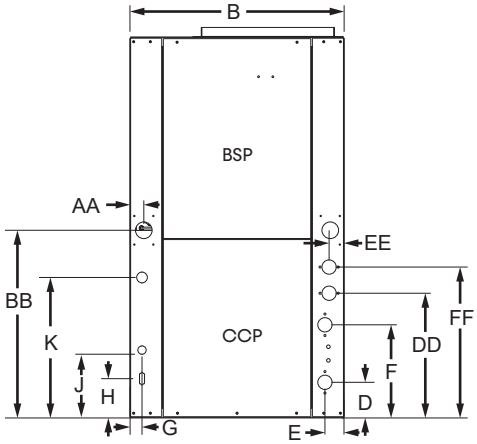
Top View - Left Return



Right Return Right View
Air Coil Opening



Left Return Left View
Air Coil Opening

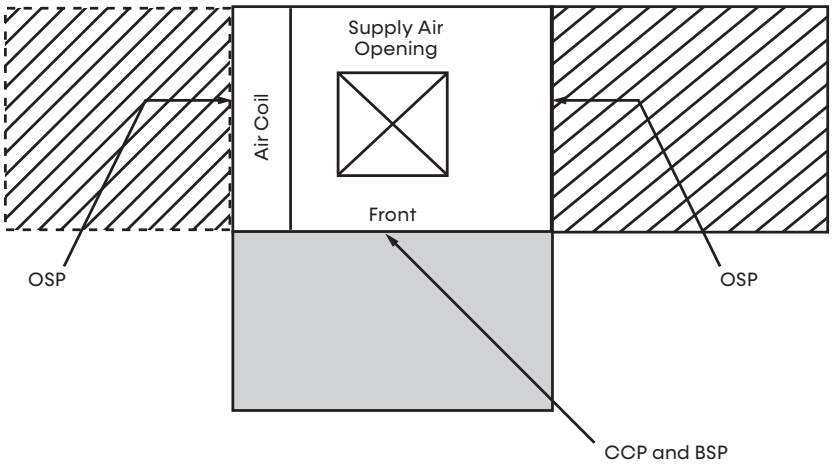


Notes:

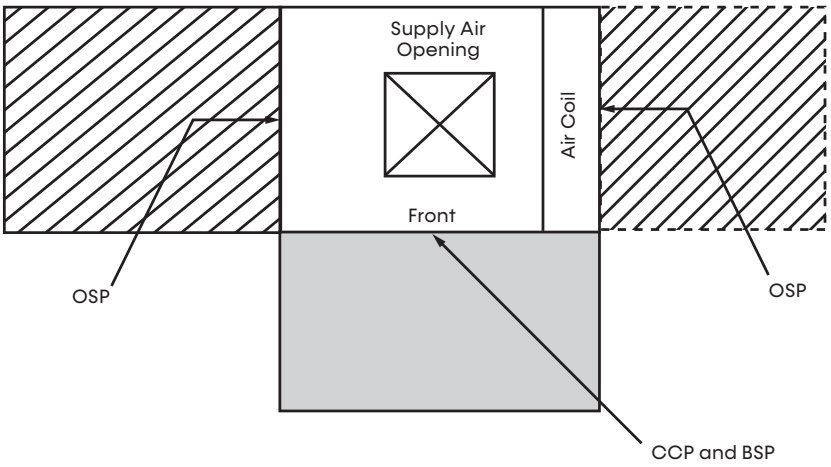
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Front and Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
3. Discharge flange is field installed.
4. Condensate is rubber coupling that couples to 3/4-inch schedule 40/80 PVC.
5. Water connections for optional hot water generator are 1/2-inch FPT.
6. Units come standard with air filter rails. For duct connections, optional filter frames should be ordered. See product options decoder for details. Filter rails can be converted in the field with an accessory air filter frame kit. Please see the accessory submittal for details.

Legend:
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

Left Return



Right Return



Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Front and side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
3. OSP are removable panels that provide additional access to the units interior. Clear access to OSP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.
4. Top supply air is shown, the same clearances apply to bottom supply air units.

= Mandatory Service Access 2-foot (61 cm)

= Optional Service Access 2-foot (61 cm)

Legend:
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

MINIMUM INSTALLATION AREA

Minimum area where a blower-equipped unit must be installed, and mechanical/natural ventilation is not required

Model	Charge (oz)	Configuration	Minimum Installation Area ft² (m²) [A_{min}]			
			Floor	Window	Wall	Ceiling
WZ060	69	Vertical	237 (22.0)	132 (12.2)	76 (7.0)	63 (5.9)
		Horizontal	237 (22.0)	141 (13.1)	79 (7.3)	65 (3.0)

A_{min} = Minimum area where unit is installed where unit has incorporated airflow

h_{inst} (floor) = 0.0 ft (0.0 m)

h_{inst} (window) = 3.3 ft (1.0 m)

h_{inst} (wall) = 5.9 ft (1.8 m)

h_{inst} (ceiling) = 7.2 ft (2.2 m)

Minimum area and CFM requirements for the conditioned space

Model	Charge (oz)	Minimum CFM [Q_{min}]	
		TA_{min} (ft²)	Q_{min} (ft³/min)
WZ060	69	3.54	117

TA_{min} = Minimum conditioned area for venting leaked refrigerant

Q_{min} = Minimum ventilation flow rate for conditioned space if space is less than TA_{min}

Minimum area of opening for natural ventilation

Model	Charge (oz)	Anv_{min} in² (m²)
WZ060	69	111.57 (0.07)

Anv_{min} = Minimum natural ventilation area opening

When the openings for connected rooms or natural ventilation are required, the following conditions shall be applied:

- The area of any openings above 11.8 inches (300 mm) from the floor shall not be considered in determining compliance with Anv_{min}.
- At least 50% of the required opening area Anv_{min} shall be below 7.8 inches (200 mm) from the floor.
- The bottom of the lowest openings shall not be higher than the point of release when the unit is installed and not more than 3.9 inches (100 mm) from the floor.
- Openings are permanent openings which cannot be closed.
- For openings extending to the floor, the height shall not be less than 0.78 inch (20 mm) above the surface of the floor covering.
- A second higher opening shall be provided. The total size of the second opening shall not be less than 50% of minimum opening area for Anv_{min} and shall be at least 3.3 ft (1.5 m) above the floor.

GENERAL

Furnish and install the Closetline WZ water-source heat pumps, as indicated on the plans. Equipment shall be completely assembled, piped, and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.

Units shall be supplied completely factory built capable of operating over an entering water temperature range from 20° to 120° F (-6.7° to 48.9° C) as standard. Equivalent units from other manufacturers may be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated and certified in accordance with Air-Conditioning, Heating and Refrigeration Institute/International Standards Organization (AHRI/ISO 13256-1). All equipment must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL 60335-2-40 4th Edition, UL 60335-1 6th Edition for the United States and Can/CSA C22.2 No. 60335-2-40:22, CAN/CSA C22.2 No 60335-1:16 for Canada, by Intertek Testing Laboratories (ETL). The units shall have AHRI/ISO and ETL-US-C labels.

All units shall pass a factory acceptance test. The quality control system shall automatically perform the factory acceptance test via computer. A detailed report card from the factory acceptance test shall ship with each unit. **Note: If unit fails the factory acceptance test it shall not be allowed to ship. Unit serial number will be recorded by factory acceptance test and furnished on report card for ease of unit warranty status.**

BASIC CONSTRUCTION

Horizontal units shall have one of the following air flow arrangements: Left Inlet/Straight (Right) Discharge; Right Inlet/Straight (Left) Discharge; Left Inlet/Back Discharge; or Right Inlet/Back Discharge as shown on the plans. Units must have the ability to be field convertible from straight to back or back to straight discharge with no additional parts or unit structure modification. Horizontal units will have factory installed hanger brackets with EPDM isolation grommets packaged separately.

Vertical units shall have one of the following air flow arrangements: Left Return/Top Discharge, Right Return/Top Discharge, as shown on the plans.

If units with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades. All units (horizontal and vertical) must have multiple access panels for serviceability of compressor compartment. **Units having only one access panel to compressor/heat exchangers/ expansion device/refrigerant piping shall not be acceptable.**

Compressor section interior surfaces shall be lined with ½-inch (12.7 mm) thick, 1-½ lb/ft³ (24 kg/m³) acoustic type glass fiber insulation. Air handling section interior surfaces shall be lined with ½-inch (12.7 mm) thick, 1-½ lb/ft³ (24 kg/m³) **foil-faced**, glass-fiber for ease of cleaning. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream. **Units without foil-faced insulation in the air handling section will not be accepted.**

The heat pump cabinets shall be fabricated from heavy gauge galvanized steel.

Standard insulation must meet NFPA Fire Hazard Classification requirements 25/50 per ASTM E84, UL 723, CAN/ULC S102-M88 and NFPA 90A requirements; air erosion and mold growth limits of UL-181; stringent fungal resistance test per ASTM-C1071 and ASTM G21; and shall meet zero level bacteria growth per ASTM G22. **Unit insulation must meet these stringent requirements or unit(s) will not be accepted.**

All horizontal units to have factory installed 1-inch (25.4 mm) discharge air duct collars, 1-inch (25.4 mm) filter rails with 1-inch (25.4 mm) filters factory installed, and factory installed unit-mounting brackets. Vertical units to have field installed discharge air duct collar, shipped loose and 1-inch (25.4 mm) filter rails with 1-inch (25.4 mm) filters factory installed. **If units with these factory-installed provisions are not used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for his sub-contractor to install these provisions.**

All units must have an insulated panel separating the fan compartment from the compressor compartment. **Units with the compressor in the air stream are not acceptable.** Units shall have a factory installed 1-inch (25.4 mm) wide filter bracket for filter removal from either side. Units shall have a 1-inch (25.4 mm) thick throwaway type glass fiber filter. The contractor shall purchase one spare set of filters and replace factory shipped filters on completion of startup. Filters shall be standard sizes. If units utilize non-standard filter sizes then the contractor shall provide 12 spare filters for each unit.

Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper FPT fittings, and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench. **Water connections that protrude through the cabinet or require the use of a backup wrench shall not be allowed.** All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Option: **The unit will be supplied with optional field or factory installed 2-inch air filter rails (typically used for free return installation) or 1-inch or 2-inch air filter frames with filter access door and return air duct flanges (typically used for ducted return installation). A corresponding 1-inch or 2-inch throwaway type glass fiber filter will ship with the factory installed filter rail or frame.**

Option: **The contractor shall install 1-inch or 2-inch MERV-rated pleated media disposable air filters on all units.**

Option: **Sound Attenuation package shall consist of high technology sound attenuating material that is strategically applied to the compressor and air handling compartment casings and fan scroll in addition to the standard ClimaQuiet system design, to further dampen and attenuate sound transmissions.**

Option: **The unit will be supplied with internally factory mounted modulating water valve with delta T control. The factory built-in valve shall modulate water flow through unit based on a field adjustable water temperature difference between the entering and leaving water.**
For two-stage units, the modulating valve will automatically reduce the water flow through the unit during part load operation to maintain the configured temperature difference. The valve shall automatically adjust for operating mode, stage of capacity, source water temperature and variations in external head pressure. The valve will also act as a shut-off valve to prevent water flow through the unit when the unit is not activated and will have a minimum position capability. Externally mounted modulating water valves will not be accepted.

Option: **The unit will be supplied with internally factory mounted variable speed water circulating pump with internal check valve. The variable speed pump shall modulate water flow through the unit based on a field adjustable temperature difference between the entering and leaving water. For two-stage units, the modulating valve will automatically reduce the water flow through the unit during part load operation to maintain the configured temperature difference. The variable speed pump shall automatically adjust for operating mode, stage of capacity, source water temperature, and variations in external head pressure. Externally mounted circulating pumps will not be accepted.**

Option: The unit will be supplied with internally mounted secondary pump for primary/ secondary applications, including one-pipe systems. Externally mounted secondary pump will not be accepted.

Option: The unit shall be supplied with extended range insulation option, which adds closed cell insulation to internal water lines, and provides insulation on suction side refrigeration tubing including refrigerant-to-water heat exchanger.

BLOWER AND MOTOR ASSEMBLY

Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing. Units shall have a direct-drive centrifugal fan. The fan motor shall be an EC variable speed ball bearing type motor. The EC blower motor shall provide soft starting, maintain constant CFM over its static operating range and provide airflow adjustment in 25 CFM increments via its control board. The fan motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection. A special dehumidification mode shall be provided to allow lower airflows in cooling for better dehumidification. The dehumidification mode may be constant or automatic (humidistat controlled). Airflow/Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. **Ratings based on a dry coil, and/or no air filter, shall NOT be acceptable.**

REFRIGERANT CIRCUIT

All units shall contain an R-454B sealed refrigerant circuit including a high efficiency two-stage scroll compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant-to-air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant-to-water heat exchanger, and safety controls including a high pressure switch, low pressure switch (loss of charge), water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch. **Units that cannot be reset at the thermostat shall not be acceptable.**

Hermetic compressors shall be internally sprung. The compressor shall have a dual level vibration isolation system. The compressor will be mounted on specially engineered sound-tested EPDM vibration isolation grommets to a large heavy gauge compressor mounting plate, which is then isolated from the cabinet base with EPDM grommets for maximized vibration attenuation. All units shall include a discharge muffler to further enhance sound attenuation. Compressor shall have thermal overload protection. Compressor shall be located in an insulated compartment away from air stream to minimize sound transmission.

Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 625 PSIG (4,309 kPa) refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 625 PSIG (4,309 kPa) working refrigerant pressure and 300 PSIG (2,068 kPa) working water pressure. The refrigerant-to-water heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 – 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1,000 hours salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs (184 kg-cm) direct (ASTM D2794-93).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 120° F (-6.7° to 48.9° C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to

heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling an already cold room.

Units charged with 62 ounces or greater of R-454B shall be supplied with a Refrigerant Detection System (RDS) with sensors to be strategically placed within the cabinet. In the event of a refrigerant leak, the RDS disables compressor operation and the unit blower runs to disperse any concentration of leaked refrigerant in compliance with UL 60335-2-40 safety standards for flammable refrigerants. **Units charged with 62 ounces or greater of R-454B that do not have an RDS shall not be acceptable.**

Option: The unit will be supplied with a cupro-nickel coaxial water to refrigerant heat exchanger.

Option: The unit shall be supplied with a hot water generator (desuperheater).

Option: The refrigerant-to-air heat exchanger shall be tin-plated.

Option: The Refrigerant Detection System (RDS) package shall consist of the RDS module and sensors to be strategically placed within the cabinet. In the event of a refrigerant leak, the RDS disables compressor operation and the unit blower runs to disperse any concentration of leaked refrigerant in compliance with UL 60335-2-40 safety standards for flammable refrigerants (Optional for sizes 024-048).

DRAIN PAN

The drain pan shall be constructed of a polymer material that inhibits corrosion. Drain outlet shall be connected from pan using provided polymer coupling and clamps that meet UL 2043 as required for discrete products by the IMC and UMC when located in a plenum. If galvanized steel drain pan is used, it shall be fully insulated on all sides and must meet the stringent 1,000 hour salt spray test per ASTM B117. Drain outlet shall be located at pan as to allow unobstructed drainage of condensate. Drain outlet shall be connected from pan directly to a rubber coupling. **No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted.** The unit as standard will be supplied with solid-state electronic condensate overflow protection. **Mechanical float switches will NOT be accepted.**

Option: The unit shall be supplied with stainless steel drain pan with ¾-inch MPT plumbing connection. The stainless steel drain pan shall be fully insulated on all sides.

ELECTRICAL

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24V activated, two or three-pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve and blower motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24V and provide heating or cooling as required by the remote thermostat/sensor.

Option: Disconnect Switch, Non-Fused, classified as motor disconnect.

DELUXE SOLID STATE CONTROL

This control system is a communicating controller with the following features.

a. Anti-short cycle time delay on compressor operation.
b. Random start on power up mode.
c. Low voltage protection.
d. High voltage protection.
e. Unit shutdown on high- or low-refrigerant pressures.
f. Unit shutdown on low water temperature.
g. Condensate overflow electronic protection.
h. Option to reset unit at thermostat or disconnect.
i. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs three times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
j. Ability to defeat time delays for servicing.

k. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.

l. 24V output to cycle a motorized water valve or other device with compressor contactor.

m. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.

n. Water coil low temperature sensing (selectable for water or anti-freeze).

o. Air coil low temperature sensing.

p. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life).

q. Emergency shutdown contacts.

r. Entering and leaving water temperature sensing.

s. Leaving air temperature sensing.

t. Compressor discharge temperature sensing.

u. Removable thermostat connector.

v. Night setback control.

w. Random start on return from night setback.

x. Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.

y. Dry contact night setback output for digital night setback thermostats.

z. Ability to work with heat pump or heat/cool (Y, W) type thermostats.

aa. Ability to work with heat pump thermostats using O or B reversing valve control.

ab. Boilerless system heat control at low loop water temperature.

ac. Ability to allow up to three units to be controlled by one thermostat.

ad. Relay to operate an external damper.

ae. Relay to start system pump.

af. 75VA control transformer. Control transformer shall have load side short circuit and overload protection via a built-in circuit breaker.

NOTE: Units not providing the eight safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protection for both drain pans will not be accepted.

When Deluxe Solid State Control is connected to a handheld service tool, the installer/service technician can; check and set CFM and check DIP switch S1, S2, and S3 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults.

REMOTE SERVICE SENTINEL (SOLID-STATE CONTROL)

Solid state control system shall communicate with thermostat to display (at the thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown. The Remote Service Sentinel allows building maintenance personnel or service personnel to diagnose unit from the wall thermostat. The control board shall provide a signal to the thermostat fault light, indicating a lockout. Upon cycling the G (fan) input 3 times within a 60 second time period, the fault light shall display the specific code as indicated by a sequence of flashes. A detailed flashing code shall be provided at the thermostat LED to display unit status and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, condensate overflow fault, etc. Units that do not provide this remote service sentinel shall not be acceptable.

Option: DDC Control Interface System

Units shall have all the features listed above and the control board will be supplied with a DDC Control 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. The following points must be available at a central or remote computer location:

a. space temperature
b. leaving-water temperature
c. discharge-air temperature
d. command of space temperature setpoint
e. cooling status
f. heating status
g. low-temperature sensor alarm
h. low-pressure sensor alarm
i. high-pressure switch alarm
j. condensate-overflow alarm
k. high-/low-voltage alarm
l. fan "ON/AUTO" position of space thermostat as specified above
m. unoccupied/occupied command
n. cooling command
o. heating command
p. fan "ON/AUTO" command
q. fault reset command
r. itemized fault code revealing reason for specific shutdown fault (any one of seven)

WARRANTY

The heat pump manufacturer shall warranty equipment for a period of 12 months from startup 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.

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.

FIELD-INSTALLED OPTIONS

Hose Kits

All units shall be connected with hoses. The hoses shall be 2-feet (61-cm) long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

Valves

The following valves are available and will be shipped loose:

a. Ball valve; bronze material, standard port full flow design, FPT connections.

b. Ball valve with memory stop and PT port.

c. "Y" strainer with blowdown valve; bronze material, FPT connections.

d. Motorized water valve; slow acting, 24V, FPT connections.

Hose Kit Assemblies

The following assemblies ship with the valves already assembled to the hose described:

a. Supply and return hoses having ball valve with PT port.

b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve with PT ports, and ball valve.

c. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator with PT ports, and ball valve.

d. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having ball valve with PT port.

THERMOSTATS

The thermostat shall be a Whalen mechanical or electronic type thermostat.

DDC SENSORS

Whalen's wall mounted DDC sensor to monitor room temperature and interfaces with optional interface system described above. Several types as described below:

a. Sensor only with no display (MPC).

b. Sensor with setpoint adjustment and override (MPC only).

c. Sensor with setpoint adjustment and override, LCD display, status/fault indication (MPC).

NOTICE! This product specification document is furnished as a means to copy and paste Whalen product information into project specification. It is not intended to be a complete list of product requirements. This document is an excerpt from the product submittal and must not be used without consulting the complete product submittal. For complete product installation and application requirements, please consult the complete product submittal. Whalen is not responsible for misuse of this document or a failure to adequately review specific requirements in the product design guide.

The Whalen Company

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

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

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

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

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

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

Replacement or repair under this warranty will not extend the warranty time periods defined above.

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

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

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

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

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

Rev: 12/2020

Revision History

Date	Section	Description
09/30/24	Minimum Installation Area	Updated Minimum Installation Area data
	Engineering Specifications	Updated Unit Maximum Water Working Pressure
08/22/24	All	Created

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