



PRODUCT DESIGN GUIDE

Closetline® WR Series Packaged Heat Pump



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THE WHALEN CLOSETLINE WR SERIES

The Whalen Closetline WR Series raises the bar for water-source heat pump features and application flexibility. Not only does the Closetline WR exceed ASHRAE 90.1 efficiency standards, but it also uses R-454B low Global Warming Potential (GWP) refrigerant, making it an environmentally-friendly space conditioning product solution. The Closetline WR is eligible for LEED® (Leadership in Energy and Environmental Design) points due to its innovative and environmentally-conscious design. The Closetline WR stands out as having the most comprehensive set of options contained in a compact footprint making it the value leader in water source heat pump products.

Available in sizes from ½ ton (1.8 kW) through 5 tons (17.6 kW) with multiple cabinet options (vertical upflow and horizontal), the Closetline WR offers flexibility for most any installation. The Closetline WR has an extended-range refrigerant circuit, capable of geothermal ground loop applications (with optional extended-range insulation) as well as boiler-tower water loop applications. Standard features include: scroll compressor, microprocessor controls, galvanized steel cabinet, polymer drain pan, and sound-absorbing air handler insulation are just some of the features of the Closetline WR.

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 WR 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 WR 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 further isolated from the cabinet base with EPDM grommets for maximized vibration and sound attenuation. The easy access control box and large access panels make installing and maintaining the unit easier than other water-source heat pumps on the market.

Options such as the tin-plated air coil, DDC controls, hybrid hydronic heating, and high-efficiency MERV rated air filters allow for customized design solutions. Cupro-nickel water-coils and Whalen's industry leading Sound Attenuation package are options that make a great unit even better.

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. Communication can also be established at the unit 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.

The Whalen Closetline WR 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

Models:
WR
006-060

FEATURES

- Sizes 006 (½ ton, 1.8 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 006-048)
- Coaxial heat exchanger
- Galvanized-steel cabinet construction
- Sound-absorbing glass-fiber insulation
- Unique double-isolation compressor mounting for quiet operation
- Insulated divider and separate compressor/air-handler compartments
- TXV metering device
- Microprocessor controls with on-board fuse and emergency shutdown
- Field-convertible discharge-air arrangement (horizontal configurations only)
- PSC three-speed fan motor (two-speed for 575V)
- Unit Performance Sentinel performance-monitoring system
- Eight standard safety features
- Non-corrosive polymer drain pan
- External Connecting Port on front-left corner post facilitates service tool connectivity, thereby reducing startup, commissioning, and service time
- Communicating Controls Powered by 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

OPTIONS

- High efficiency EC blower motors:
 - Intelligent Constant Volume (CV) EC motors for ultimate airflow control
 - Entry-level Constant Torque (CT) EC motors provide efficiency at a value
- Communicating Controls Powered by Deluxe Solid State Control:
 - Includes all of the Solid State Control control features
 - Dial in desired airflows for CV EC blower motors
 - Controls operation of domestic Hot Water Generator (HWG)
- BACnet, Modbus, and Johnson Controls N2 compatibility options for Building Management Systems (BMS)
- Corrosion-resistant cupro-nickel water-heat exchanger
- UltraQuiet sound-attenuation package
- Tin-plated air coils for added protection from formicary corrosion
- Domestic Hot Water Generator (HWG)
- Internally-mounted water pump for single-pipe systems
- Autoflow regulators that limit water flow, preventing system overpumping
- Motorized water valves prevent water flow when not in operation, increasing system-pumping efficiency
- Easy-to-clean rust-prohibitive stainless-steel drain pans
- Integrated power disconnect
- Extended-range insulation for geothermal applications

Whalen 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 Whalen's Customer Service Department at 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 Whalen's opinion or commendation of its products. The latest version of this document is available at whalencompany.com. Engineered and assembled in the USA. © Whalen, Inc. All Rights Reserved 2024

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
- Externally-mounted manual and motorized water valves
- 1-inch Merv 8 filter
- 2-inch Merv 8 or 13 filters
- Aesthetically-pleasing wall sensors for connection to BMS (DDC Control) controls

Intelligent Communicating Controls

Models:
WR
006-060

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.

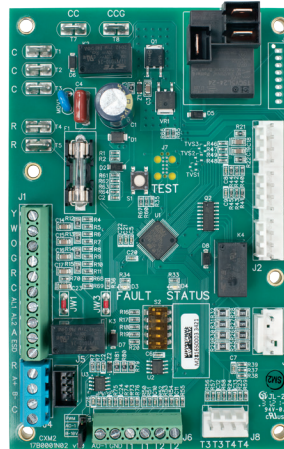
Monitor/Configure – Installers can configure from the configuration/diagnostic tool, unit family, size, accessory configuration, and demand reduction (optional, to limit unit operation during peak times). Users can look up the current system status: temperature sensor readings and operational status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

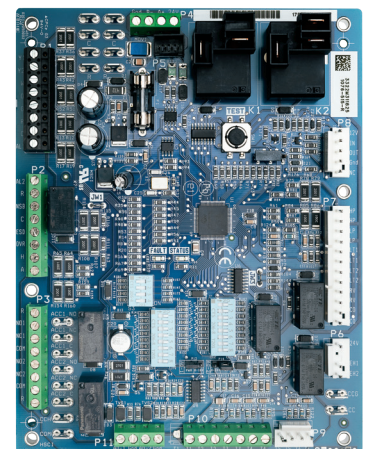
Diagnostics – While in Service mode, technicians can access fault description, possible causes and most importantly, the conditions (temp, flow, i/o conditions, configuration) at the time of the fault. Manual Operation mode allows technicians to manually command operation for any of the thermostat outputs,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

Solid State Control



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	

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Model Nomenclature

Models:
WR
006-060

Position	Option	Option Code	Description
1	Brand	W	W - Whalen Closetline Series
2	Product Family	R	R - Single-Stage Mid-Size Cabinet
3	Configuration	H	H - Horizontal unit configuration
		V	V - Vertical unit configuration
4	System Type	G	G - Heat Pump
		C	C - Air Conditioning and Hydronic Heat
5-7	Unit Capacity	M	M - Heat Pump with Waterside Economizer
		006	006 - 0.50 ton R-454B WR Packaged Heat Pump
		009	009 - 0.75 ton R-454B WR Packaged Heat Pump
		012	012 - 1.00 ton R-454B WR Packaged Heat Pump
		015	015 - 1.25 ton R-454B WR Packaged Heat Pump
		018	018 - 1.50 ton R-454B WR Packaged Heat Pump
		024	024 - 2.00 ton R-454B WR Packaged Heat Pump
		030	030 - 2.50 ton R-454B WR Packaged Heat Pump
		036	036 - 3.00 ton R-454B WR Packaged Heat Pump
		042	042 - 3.50 ton R-454B WR Packaged Heat Pump
		048	048 - 4.00 ton R-454B WR Packaged Heat Pump
		060	060 - 5.00 ton R-454B WR Packaged Heat Pump
8	Revision	A	A - 1st Generation
9	Voltage	A	A - Unit Voltage: 115-60-1
		B	B - Unit Voltage: 208/230-60-1
		D	D - Unit Voltage: 265-60-1
		J	J - Unit Voltage: 208/230-60-3
		M	M - Unit Voltage: 460-60-3
		Q	Q - Unit Voltage: 575-60-3
10	Refrigerant Detection	X	X - No Refrigerant Detection Sensor Installed
		A	A - Refrigerant Detection Sensor
11	Control Type	A	A - Solid State Control for Thermostat Input
		B	B - Solid State Control with IO Zone 560 DDC Control
		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

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Model Nomenclature

Models:
WR
006-060

Position	Option	Option Code	Description
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
19	Refrigerant Circuit	S	S - Standard Coax
		C	C - Cupro-Nickel Coax
20	Control valves	X	X - No control valve installed
		A	A - 2-way valve, on/off, 30 psi differential
		B	B - 2-way valve, on/off, 60 psi differential
		C	C - 2-way valve, on/off, 125 psi differential
		D	D - 3-way valve, on/off, 30 psi differential
21	Flow Control	X	X - No flow control device installed
		A	A - Automatic Flow Valve - 2.5 GPM / Ton
		B	B - Automatic Flow Valve - 3.0 GPM / Ton
		C	C - Manual Flow Control Valve
		D	D - Secondary Circulating Pump
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	S	S - PSC - Standard Motor
		T	T - ECM - Constant Torque Motor
		V	V - ECM - Constant Air Volume Motor - DELUXE CONTROL REQUIRED
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

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Performance Data: ASHRAE/AHRI/ISO 13256-1

Models:
WR
006-060

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

Model	Motor Type	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
WR006	PSC	5,900	13.4	8,400	4.8	7,200	22.8	6,600	3.9	6,300	15.5	4,900	3.1
	EC	6,100	15.0	8,300	5.1	7,300	26.6	6,500	4.0	6,400	17.7	4,800	3.3
WR009	PSC	8,500	13.8	11,700	4.4	10,000	22.0	9,500	3.9	8,900	15.7	7,200	3.3
	EC	8,600	14.3	11,600	4.5	10,000	23.4	9,500	4.0	9,000	16.7	7,200	3.3
WR012	PSC	10,500	12.7	14,400	4.5	12,800	19.0	11,700	3.9	11,400	14.1	9,300	3.2
	EC	10,700	13.4	14,400	4.6	13,000	21.0	11,700	4.0	11,500	14.9	9,300	3.3
WR015	PSC	14,500	15.2	16,000	4.8	16,700	23.5	13,800	4.3	15,000	16.5	11,000	3.5
	EC	14,700	16.4	15,900	4.9	16,900	26.2	13,800	4.5	15,200	17.3	10,700	3.6
WR018	PSC	17,900	14.3	21,500	4.9	20,700	23.0	17,900	4.2	19,000	16.1	14,000	3.4
	EC	18,000	15.0	21,500	5.1	20,900	25.0	17,700	4.4	19,400	17.3	13,800	3.6
WR024	PSC	24,700	14.7	28,800	5.0	27,500	23.3	24,200	4.4	25,600	17.3	19,000	3.6
	EC	24,900	15.4	28,500	5.1	27,800	24.0	24,000	4.5	25,800	18.0	19,000	3.7
WR030	PSC	28,800	13.7	35,400	4.6	32,400	21.0	29,200	4.1	30,100	16.0	23,300	3.5
	EC	29,200	14.5	35,000	4.8	32,800	23.5	28,800	4.3	30,500	17.3	23,000	3.6
WR036	PSC	34,800	14.6	43,900	4.6	38,800	23.3	36,200	4.0	36,100	16.7	28,500	3.4
	EC	35,200	15.3	43,500	4.8	39,200	25.2	35,800	4.2	36,400	17.4	27,900	3.6
WR042	PSC	41,100	14.0	49,500	4.6	45,200	21.0	40,900	4.0	42,700	16.0	32,700	3.4
	EC	41,800	15.2	48,500	4.9	46,000	22.9	39,900	4.3	43,400	17.4	31,700	3.5
WR048	PSC	48,000	14.3	57,900	4.7	53,000	21.5	48,000	4.1	50,400	16.5	38,000	3.5
	EC	48,900	15.2	57,500	4.8	53,500	22.8	47,700	4.2	50,800	17.6	38,100	3.5
WR060	PSC	59,400	13.2	70,000	4.4	65,800	18.2	59,200	3.9	61,300	15.0	45,400	3.3
	EC	60,200	14.7	68,000	4.7	67,000	21.5	57,100	4.2	62,200	17.4	44,300	3.5

- 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.

Performance Data: ASHRAE/AHRI/ISO 13256-1

Models:
WR
006-060

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

Model	Motor Type	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Full Cooling 25°C		Full Heating 0°C	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP
WR006	PSC	2	3.9	2	4.8	2	6.7	2	3.9	2	4.5	1	3.1
	EC	2	4.4	2	5.1	2	7.8	2	4.0	2	5.2	1	3.3
WR009	PSC	2	4.0	3	4.4	3	6.5	3	3.9	3	4.6	2	3.3
	EC	3	4.2	3	4.5	3	6.9	3	4.0	3	4.9	2	3.3
WR012	PSC	3	3.7	4.2	4.5	3.8	5.6	3	3.9	3	4.1	3	3.2
	EC	3	3.9	4.2	4.6	3.8	6.2	3	4.0	3	4.4	3	3.3
WR015	PSC	4	4.5	4.7	4.8	4.9	6.9	4	4.3	4	4.8	3	3.5
	EC	4	4.8	4.7	4.9	5.0	7.7	4	4.5	4	5.1	3	3.6
WR018	PSC	5	4.2	6.3	4.9	6.1	6.7	5	4.2	6	4.7	4	3.4
	EC	5	4.4	6.3	5.1	6.1	7.3	5	4.4	6	5.1	4	3.6
WR024	PSC	7.2	4.3	8.4	5.0	8.1	6.8	7.1	4.4	7.5	5.1	5.6	3.6
	EC	7.3	4.5	8.4	5.1	8.1	7.0	7.0	4.5	7.6	5.3	5.6	3.7
WR030	PSC	8.4	4.0	10.4	4.6	9.5	6.2	8.6	4.1	8.8	4.7	6.8	3.5
	EC	8.6	4.3	10.3	4.8	9.6	6.9	8.4	4.3	8.9	5.1	6.7	3.6
WR036	PSC	10.2	4.3	12.9	4.6	11.4	6.8	10.6	4.0	10.6	4.9	8.4	3.4
	EC	10.3	4.5	12.7	4.8	11.5	7.4	10.5	4.2	10.7	5.1	8.2	3.6
WR042	PSC	12.0	4.1	14.5	4.6	13.2	6.2	12.0	4.0	12.5	4.7	9.6	3.4
	EC	12.3	4.5	14.2	4.9	13.5	6.7	11.7	4.3	12.7	5.1	9.3	3.5
WR048	PSC	14.1	4.2	17.0	4.7	15.5	6.3	14.1	4.1	14.8	4.8	11.1	3.5
	EC	14.3	4.5	16.9	4.8	15.7	6.7	14.0	4.2	14.9	5.2	11.2	3.5
WR060	PSC	17.4	3.9	20.5	4.4	19.3	5.3	17.3	3.9	18.0	4.4	13.3	3.3
	EC	17.6	4.3	19.9	4.7	19.6	6.3	16.7	4.2	18.2	5.1	13.0	3.5

- 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.

CV EC MOTOR ADVANTAGE

A major benefit of the CV EC motor over other blower motor types is its ability to adjust airflow directly at the unit with a communicating diagnostic service tool. Airflow levels can be adjusted in increments of 25 CFM from the unit's minimum and maximum CFM range (see the CV EC motor configuration table for details).

Table 1: CV EC Blower Motor Limits

Size	Max ESP (in. wg)	Fan Motor (hp)	Airflow Range	Cooling Mode	Heating Mode	Dehumid Mode	Fan Only
6	0.9	1/8	Minimum	150	150	150	150
	1.0		Default	275	275	150	275
	1.0		Maximum	275	275	225	275
9	0.9	1/8	Minimum	225	225	225	225
	0.9		Default	345	345	225	345
	0.9		Maximum	375	375	325	375
12	0.8	1/4	Minimum	300	300	300	300
	0.8		Default	400	400	300	400
	0.9		Maximum	415	415	380	415
15	0.8	1/3	Minimum	375	375	375	375
	1.0		Default	525	525	375	525
	1.0		Maximum	625	625	600	625
18	0.8	1/3	Minimum	450	450	450	450
	0.9		Default	630	630	450	630
	0.9		Maximum	750	750	600	750
24	0.75	1/2	Minimum	600	600	600	300
			Default	750	750	650	350
			Maximum	850	850	800	850
30	0.5	1/2	Minimum	750	750	750	375
			Default	925	925	800	425
			Maximum	1,050	1,050	1,000	1,050
36	0.6	3/4	Minimum	900	900	900	450
			Default	1,125	1,125	975	525
			Maximum	1,275	1,275	1,200	1,275
42	0.6	3/4	Minimum	1,050	1,050	1,050	525
			Default	1,300	1,300	1,125	600
			Maximum	1,475	1,475	1,400	1,475
48	0.6	3/4	Minimum	1,200	1,200	1,200	600
			Default	1,500	1,500	1,300	700
			Maximum	1,700	1,700	1,600	1,700
60	0.75	1	Minimum	1,500	1,500	1,500	750
			Default	1,875	1,875	1,625	875
			Maximum	2,125	2,125	2,000	2,125

- Airflow is controlled within $\pm 5\%$ up to Max ESP shown with wet coil and standard 1-inch fiberglass air filter.
- Performance shown is with wet coil and factory air filters.

Blower Performance

WR*006

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)												
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
WR006	275	150	PSC	Low	Power (W)	72	69	65	61	57	Operation Not Recommended							
					CFM	238	218	196	170	142								
				Medium	Power (W)	81	77	73	68	63	58							
					CFM	261	242	220	193	163	129							
				High	Power (W)	103	98	93	88	82	75	68						
					CFM	326	306	282	253	219	181	139						
	275	150	CT EC	1	Power (W)	22	24	25	28	30								
					CFM	225	207	187	169	150								
				2	Power (W)				34	37	39	42	44	48	51			
					CFM				233	217	201	185	173	164	150			
				3	Power (W)					43	45	48	51	54	58	61		
					CFM					241	227	212	200	188	179	168		
				4	Power (W)	Operation Not Recommended					55	58	61	65	67			
					CFM						240	227	216	205	193			
				275	150	CV EC	Minimum CFM	Power (W)	16	21	27	40	36	41	46	52	59	
								CFM	150	150	150	150	150	150	150	150	150	
							Default CFM	Power (W)	29	35	41	47	53	60	67	76	81	77
								CFM	225	225	225	225	225	225	225	225	225	255
	Maximum CFM	Power (W)	35				41	47	53	60	67	76	84	88	78			
		CFM	250				250	250	250	250	250	250	250	250	250			

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- Blower performance is based on operating conditions of 80°F DB and 67°F WB.
- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*009

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)																													
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0																				
WR009	345	225	PSC	Low	Power (W)	Operation Not Recommended																													
					CFM											340	322	300	260																
				Medium	Power (W)											Operation Not Recommended																			
					CFM																					390	360	320	290	260					
				High	Power (W)																					Operation Not Recommended									
					CFM																														
	345	225	CT EC	1	Power (W)	40	42	44	47	49																									
					CFM	294	278	259	245	230																									
				2	Power (W)	67	70	73	74	79	82	85	88	90	85																				
					CFM	370	357	343	326	318	302	291	278	265	235																				
				3	Power (W)				86	88	91	95	98	101	96	90																			
					CFM							370	358	346	334	322	307	280	247																
				4	Power (W)	Operation Not Recommended						120	113	107	102																				
					CFM							Operation Not Recommended						340	309	276	234														
	345	225	CV EC	Minimum CFM	Power (W)	25	32	39	45	53	60							66	78	83															
					CFM	225	225	225	225	225	225	225	225	225																					
				Default CFM	Power (W)	49	58	67	77	88	100	105	95	88																					
					CFM	325	325	325	325	325	325	325	325	325																					
				Maximum CFM	Power (W)	126	134	131	125	119	118	105	98	90																					
					CFM	375	375	375	375	375	375	375	375	375																					

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*012

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)													
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0				
WR012	400	300	PSC	Low	Power (W)	Operation Not Recommended													
					CFM											360	350	320	310
				Medium	Power (W)														
					CFM	420	400	380	360	340									
				High	Power (W)														
					CFM											470	450	430	400
	400	300	CT EC	1	Power (W)											64	66	69	71
					CFM	358	345	332	319	305	291	275	261	247	218				
				2	Power (W)	86	88	91	94	97	100	103	104	97	91				
					CFM	400	388	377	365	354	342	328	309	269	237				
				3	Power (W)	116	119	122	124	126	126	121	114	99	91				
					CFM	449	437	427	414	401	385	359	327	274	238				
				4	Power (W)	131	133	135	137	135	130	123	110	99	92				
					CFM	467	456	444	433	414	390	361	318	273	239				
	400	300	CV EC	Minimum CFM	Power (W)	55	64	73	81	90	99	107	106						
					CFM	300	300	300	300	300	300	300	300			300			
				Default CFM	Power (W)	105	115	125	135	132	127	123	118						
					CFM	380	380	380	380	380	380	380	380	380					
				Maximum CFM	Power (W)	147	149	146	143	139	134	130	126	120					
					CFM	415	415	415	415	415	415	415	415	415			415		

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*015

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)											
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
WR015	525	375	PSC	Low	Power (W)	161	158	146	138	Operation Not Recommended							
					CFM	503	490	479	439								
				Medium	Power (W)	184	181	174	153							143	
					CFM	595	575	562	510							451	
				High	Power (W)				174							159	141
					CFM				581							510	386
	525	375	CTEC	1	Power (W)	67	55	62	68	75	82						
					CFM	648	588	542	493	441	378						
				2	Power (W)	67	74	81	87	95	102	108					
					CFM	648	608	557	514	460	402	354					
				3	Power (W)	79	86	94	101	107	117	124	130				
					CFM	695	659	611	570	526	475	422	377				
				4	Power (W)	92	98	107	114	121	129	138	145	151			
					CFM	737	705	661	622	582	534	482	438	396			
				5	Power (W)	106	110	117	126	133	141	151	159	165	172		
					CFM	745	745	708	662	626	585	535	488	444	402		
	525	375	CV EC	Minimum CFM	Power (W)		36	52	68	84	99	114	129				
					CFM		375	375	375	375	375	375	375				
				Default CFM	Power (W)		55	74	90	108	127	147	166	186			
					CFM		525	525	525	525	525	525	525	525			
				Maximum CFM	Power (W)	54	73	93	112	132	152	173	194	216	238		
					CFM	625	625	625	625	625	625	625	625	625	625		

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- Cells in grey - option not available

Blower Performance

WR*018

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)																	
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0								
WR018	630	450	PSC	Low	Power (W)	147	145	135	127	Operation Not Recommended													
					CFM	524	509	493	451														
				Medium	Power (W)	170	167	161	143														
					CFM	611	588	564	514														
				High	Power (W)	195	189	184	177	149													
					CFM	704	668	643	617	504													
	630	450	CTEC	1	Power (W)	73	78	85	90														
					CFM	600	558	518	491														
				2	Power (W)	92	99	107	109	116	123	131											
					CFM	676	641	599	570	536	498	452											
				3	Power (W)	112	118	126	135	140	147	155	163	170									
					CFM	741	713	677	640	619	586	554	512	471									
				4	Power (W)	138	144	152	161	170	174	181	190	199	207								
					CFM	802	780	751	714	680	662	633	603	567	529								
				5	Power (W)	170	175	182	190	201	210	214	222	231	240								
					CFM	854	848	820	791	754	724	711	683	655	625								
	630	450	CV EC	Minimum CFM	Power (W)	Operation Not Recommended			93	111	132	157	180										
					CFM				450	450	450	450	450										
				Default CFM	Power (W)	85	101	113	145	178	206	228	248	266									
					CFM	600	600	600	600	600	600	600	600	600									
				Maximum CFM	Power (W)	157	171	186	200	214	251	286	323										
					CFM	750	750	750	750	750	750	750	750										

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- Cells in grey - option not available

Blower Performance

WR*024

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)														
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0					
WR024	800	600	PSC	Low	Power (W)	224	215	204	191	176	Operation Not Recommended									
					CFM	777	768	737	684	608										
				Medium	Power (W)	257	246	233	219	204						187				
					CFM	888	868	830	774	701						610				
				High	Power (W)	294	281	268	253	237						219				
					CFM	997	964	916	854	777						686				
	800	600	CT EC	1	Power (W)	116	122	128	135											
					CFM	755	728	695	653											
				2	Power (W)	146	152	159	166	174	185	193								
					CFM	836	810	782	750	708	657	616								
				3	Power (W)	181	187	194	201	209	218	230	239	246	252					
					CFM	910	887	861	834	804	762	714	674	642	619					
				4	Power (W)	232	240	247	254	262	270	278	291	303	312					
					CFM	996	975	952	929	904	876	845	798	755	725					
				5	Power (W)	Operation Not Recommended				323	331	340	348	361	374					
					CFM					999	975	951	923	884	840					
	800	600	CV EC	Minimum CFM	Power (W)	71	89	107	124	141	159	177	195	213	230					
					CFM	600	600	600	600	600	600	600	600	600	600					
				Default CFM	Power (W)	145	165	185	205	225	245	266	285	306	326					
					CFM	800	800	800	800	800	800	800	800	800	800					
				Maximum CFM	Power (W)	284	300	315	332	351	364	379	396	412	428					
					CFM	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000					

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*030

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)												
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
WR030	1,000	750	PSC	Low	Power (W)	305	290	274	256	236	Operation Not Recommended							
					CFM	916	911	883	833	761								
				Medium	Power (W)	338	323	306	288	268						246		
					CFM	1,021	1,014	983	929	850						747		
				High	Power (W)	384	372	357	340	322						301		
					CFM	1,084	1,076	1,044	988	906						800		
	1,000	750	CT EC	1	Power (W)	158	165	176	184	192								
					CFM	904	873	832	796	763								
				2	Power (W)	211	219	227	240	250	258	267	276	285				
					CFM	1,020	992	965	927	894	864	835	805	771				
				3	Power (W)	280	289	298	306	321	330	342	351	361		368		
					CFM	1,139	1,113	1,089	1,064	1,027	999	966	937	910		879		
				4	Power (W)	336	346	355	364	374	389	399	413	423		430		
					CFM	1,216	1,193	1,168	1,146	1,123	1,086	1,062	1,028	1,002		975		
				5	Power (W)				452	462	471	490	499	508		478		
					CFM				1,250	1,229	1,208	1,173	1,151	1,112		1,036		
				1,000	750	CV EC	Minimum CFM	Power (W)	71	89	108	127	145	162	181	199	217	235
								CFM	750	750	750	750	750	750	750	750	750	750
	Default CFM	Power (W)	251				274	296	315	337	362	387	407					
		CFM	1,000				1,000	1,000	1,000	1,000	1,000	1,000	1,000					
	Maximum CFM	Power (W)	388				410	431	453	471	Operation Not Recommended							
		CFM	1,150				1,150	1,150	1,150	1,150								

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*036

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)									
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
WR036	1,150	900	PSC	Low	Power (W)	Operation Not Recommended									
					CFM										
				Medium	Power (W)	Operation Not Recommended									
					CFM										
				High	Power (W)	Operation Not Recommended									
					CFM										
	1,150	900	CTEC	1	Power (W)	166	175	184	Operation Not Recommended						
					CFM	974	941	904							
				2	Power (W)	241	251	261	272	282	292	299	307	Operation Not Recommended	
					CFM	1,132	1,103	1,074	1,041	1,005	973	944	916		
				3	Power (W)	294	304	316	326	337	349	359	367	375	385
					CFM	1,271	1,242	1,214	1,185	1,153	1,118	1,083	1,056	1,029	999
				4	Power (W)	376	387	399	409	421	433	446	457	468	478
					CFM	1,403	1,377	1,351	1,324	1,295	1,268	1,233	1,201	1,169	1,143
				5	Power (W)	Operation Not Recommended		499	510	523	524	521	519	516	514
					CFM			1,485	1,460	1,434	1,396	1,347	1,295	1,240	1,194
	1,150	900	CV EC	Minimum CFM	Power (W)	105	132	164	188	211	233	257	280	307	339
					CFM	900	900	900	900	900	900	900	900	900	900
				Default CFM	Power (W)	205	232	261	303	349	382	415	446	475	505
					CFM	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
				Maximum CFM	Power (W)	406	403	438	474	511	564	629	680	692	691
					CFM	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*042

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)											
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
WR042	1,350	1,050	PSC	Low	Power (W)	388	Operation Not Recommended										
					CFM	918											
				Medium	Power (W)	517	509	496	477	452	422	Operation Not Recommended					
					CFM	1,201	1,223	1,218	1,185	1,125	1,038						
				High	Power (W)	665	654	636	611	580	542	498	Operation Not Recommended				
					CFM	1,584	1,592	1,571	1,518	1,436	1,323	1,180					
	1,350	1,050	CT EC	1	Power (W)	238	248	259	272	Operation Not Recommended							
					CFM	1,186	1,152	1,113	1,056								
				2	Power (W)	331	369	352	365	381	396	411	423	437	446		
					CFM	1,345	1,317	1,283	1,251	1,215	1,181	1,150	1,124	1,094	1,050		
				3	Power (W)	448	461	474	486	501	518	534	551	568	581		
					CFM	1,507	1,482	1,455	1,427	1,396	1,365	1,331	1,296	1,276	1,246		
				4	Power (W)	582	595	609	622	635	651	669	688	706	681		
					CFM	1,641	1,623	1,601	1,577	1,548	1,519	1,488	1,455	1,423	1,355		
				5	Power (W)	Operation Not Recommended			756	775	776	774	772	768	765	679	
					CFM				Operation Not Recommended			1,743	1,717	1,688	1,645	1,596	1,541
	1,350	1,050	CV EC	Minimum CFM	Power (W)	154	177	200				224	252	280	306	331	355
					CFM	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050		
				Default CFM	Power (W)	334	359	390	421	453	484	517	555	595	636		
					CFM	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400		
				Maximum CFM	Power (W)	658	674	703	700	697	Operation Not Recommended						
					CFM	1,750	1,750	1,750	1,750	1,750							

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*048

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)												
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
WR048	1,550	1,200	PSC	Low	Power (W)	608	585	559	531	499								
					CFM	1,512	1,487	1,440	1,371	1,280								
				Medium	Power (W)	680	652	622	588	552	513							
					CFM	1,670	1,639	1,584	1,507	1,406	1,281							
				High	Power (W)	780	746	709	669	625	579	529						
					CFM	1,885	1,841	1,772	1,678	1,560	1,416	1,248						
	1,550	1,200	CT EC	1	Power (W)	286	303	320	336	351	Operation Not Recommended							
					CFM	1,482	1,411	1,342	1,276	1,211								
				2	Power (W)	360	379	397	415	433	450	467						
					CFM	1,604	1,553	1,500	1,444	1,385	1,323	1,258						
				3	Power (W)	457	472	488	505	525	546	569						
					CFM	1,753	1,707	1,659	1,607	1,553	1,495	1,435						
				4	Power (W)	626	642	658	673	687	701							
					CFM	1,984	1,937	1,890	1,843	1,795	1,747							
				5	Power (W)				805	829								
					CFM				1,980	1,938								
				1,550	1,200	CV EC	Minimum CFM	Power (W)	240	132	163	293	342	309	280	395	401	453
								CFM	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
							Default CFM	Power (W)	445	251	294	500	570	498	438	617	602	672
								CFM	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550	1,550
	Maximum CFM	Power (W)	723				418	474	780	873	761	644	912	853	939			
		CFM	1,900				1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900	1,900			

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- CFM Tolerance is ±7%
- Cells in grey - option not available

Blower Performance

WR*060

Models:
WR
006-060

Model	Rated CFM	Min CFM	Motor Type	Speed Tap		External Static Pressure (in. wg)											
						0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
WR060	2,000	1,500	PSC	Low	Power (W)	779	766	750	731	710	686	659					
					CFM	1,771	1,756	1,732	1,700	1,658	1,608	1,549					
				Medium	Power (W)	877	856	833	806	777	744	708	669				
					CFM	1,979	1,968	1,940	1,894	1,831	1,751	1,653	1,539				
				High	Power (W)	996	969	938	904	867	826	783	736	687			
					CFM	2,208	2,178	2,132	2,069	1,990	1,893	1,780	1,649	1,502			
	2,000	1,500	CT EC	1	Power (W)	342	354	366	380	Operation Not Recommended							
					CFM	1,685	1,640	1,593	1,545								
				2	Power (W)	460	476	489	501	518	533	548	561	577			
					CFM	1,879	1,833	1,795	1,754	1,705	1,657	1,608	1,563	1,514			
				3	Power (W)	648	666	678	694	708	724	740	757	773			
					CFM	2,113	2,069	2,039	1,998	1,963	1,925	1,885	1,840	1,795			
				4	Power (W)	771	785	803	817	832	848	864	883	900			
					CFM	2,235	2,198	2,163	2,130	2,094	2,061	2,019	1,977	1,939			
				5	Power (W)	866	881	899	916	934	951	970	977	973	969		
					CFM	2,322	2,290	2,253	2,219	2,188	2,152	2,120	2,083	2,013	1,940		
	2,000	1,500	CV EC	Minimum CFM	Power (W)	246	301	354	405	453	500	544	587	627	665		
					CFM	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500		
				Default CFM	Power (W)	503	564	631	686	734	808	875	929	990	1,051		
					CFM	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000		
				Maximum CFM	Power (W)	885	896	901	916	937	Operation Not Recommended						
					CFM	2,200	2,200	2,200	2,200	2,200							

- Blower performance data is based on the lowest nameplate voltage setting.
- Blower performance is based on a wet coil with clean 1-inch filter.
- Blower performance is based on operating conditions of 80°F DB and 67°F WB.
- CFM Tolerance is ±7%
- Cells in grey - option not available

Physical Data

Models:
WR
006-060

Whalen (WR) Series

Unit Size	006	009	012	015	018	024	030	036	042	048	060
Number of refrigerant circuits	1	1	1	1	1	1	1	1	1	1	1
Factory Charge R-454B - (oz.)	17	18	21	29	37	40	39	46	56	56	69
Refrigerant Leak Detection System	O	O	O	O	O	O	O	O	O	O	R
Number of Sensors	2	2	2	2	2	2	2	2	2	2	2
Water Connection Size											
Source FPT	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	1"	1"
System Water Volume (gallons)	0.143	0.143	0.167	0.286	0.45	0.323	0.323	0.738	0.89	0.89	0.939
Vertical											
Filter Standard - 1" Throwaway	10X18	10X18	10X18	20X20	20X20	20x20	20x20	24x24	24x24	28x28	28x28
Weight - Operating (lbs.)	110	112	121	163	168	216	224	245	260	315	330
Weight - Packaged (lbs.)	115	117	126	168	173	221	229	251	266	322	337
Horizontal											
Filter Standard - 1" Throwaway	10X18	10X18	10X18	16X25	16X25	18x24	18x24	2-14x20	2-14x20	1-20x24 1-14x20	1-20x24 1-14x20
Weight - Operating (lbs.)	110	112	121	163	168	208	208	233	244	299	314
Weight - Packaged (lbs.)	115	117	126	168	173	213	213	239	250	306	321
Vertical - Hot Water Generator											
FPT - All Other				1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Weight - Operating (lbs.)				178	183	231	239	260	275	330	345
Weight - Packaged (lbs.)				183	188	236	244	266	281	337	352
Horizontal - Hot Water Generator											
FPT - All Other				1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Weight - Operating (lbs.)				178	183	223	223	248	259	314	329
Weight - Packaged (lbs.)				183	188	228	228	254	265	321	336

Notes:

All dimensions displayed above are in inches unless otherwise marked.

All units have TXV and 1/2-inch and 3/4-inch electrical knockouts.

The standard Condensate Drain Connection is a rubber coupling that couples to 3/4-inch schedule 40/80 PVC.

The optional Stainless Steel Condensate Drain Connection is 3/4-inch FPT.

575V fan motors are two speed.

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]

Use the lowest maximum pressure rating when multiple options are combined.

Dimensional Data

Models:
WR
006-060

Cabinet Dimensions (inches)

Model	Cabinet Config	Depth	Width	Height
		A	B	C
WR006-012	H	40.3	22.5	11.1
	V	21.3	22.5	22.0
WR015-018	H	48.4	22.5	17.0
	V	22.5	22.5	40.0
WR024-030	H	48.4	22.5	18.3
	V	22.5	22.5	40.0
WR036-042	H	53.3	22.5	21.0
	V	26.0	22.5	45.0
WR048-060	H	68.0	25.5	21.0
	V	29.3	25.5	50.5

Electrical Knockouts (inches)

Model	Cabinet Config	H	Low Voltage	High Voltage	G
			J KO 1/2"	K KO 3/4"	
WR006-012	H	3.6	5.9	8.9	1.1
	V	3.6	5.9	8.1	1.1
WR015-018	H	4.1	7.1	14.8	1.3
	V	4.1	7.1	14.8	1.3
WR024-030	H	4.1	7.1	14.8	1.3
	V	4.1	6.7	14.8	1.3
WR036-042	H	4.1	7.1	15.8	1.3
	V	4.1	7.1	15.8	1.3
WR048-060	H	4.1	7.1	16.7	1.3
	V	4.1	7.1	16.7	1.3

Water Connections (inches)

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			
WR006-012	H	3.7	1.5	8.6	1.5	1/2"	-	-	-	-	3.3	0.6	*3/4" MPT
	V	3.7	1.5	8.6	1.5	1/2"	-	-	-	-	1.5	11.7	*3/4" MPT
WR015-018	H	3.7	2.0	9.8	2.0	1/2"	12.6	1.6	14.9	1.6	3.3	0.9	*3/4" MPT
	V	3.7	2.0	9.8	2.0	1/2"	12.6	1.6	14.9	1.6	1.5	19.7	*3/4" MPT
WR024-030	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
WR036-042	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
WR048-060	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 (inches)

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						
WR006-012	H	8.9	6.6	7.4	1.3	16.1	9.0	1.2	1.0
	V	9.0	9.0	6.2	8.2	16.1	9.0	2.1	1.0
WR015-018	H	13.1	9.6	3.9	1.2	23.0	15.0	1.1	1.0
	V	14.0	14.0	4.2	7.5	18.5	18.2	1.7	1.0
WR024-030	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
WR036-042	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
WR048-060	H	18.0	13.3	4.2	1.1	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 (inches)

Model	Cabinet Config	Unit Hanger Detail		
		U	V	W
WR006-012	H	40.3	24.6	20.3
WR015-018	H	48.1	24.6	20.3
WR024-030	H	48.1	24.6	20.3
WR036-042	H	53.1	24.6	20.3
WR048-060	H	67.8	27.6	23.4

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Dimensional Data

Models:
WR
006-060

Cabinet Dimensions (cm)

Model	Cabinet Config	Depth	Width	Height
		A	B	C
WR006-012	H	102.4	57.2	27.9
	V	54.1	57.2	55.9
WR015-018	H	122.9	57.2	43.2
	V	57.2	57.2	101.6
WR024-030	H	123.0	57.0	46.4
	V	57.0	57.1	101.6
WR036-042	H	135.4	57.0	53.3
	V	66.2	57.1	114.3
WR048-060	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"	
WR006-012	H	9.1	15.0	22.6	2.8
	V	9.1	15.0	20.6	2.8
WR015-018	H	10.4	18.0	37.6	3.3
	V	10.4	18.0	37.6	3.3
WR024-030	H	10.5	18.1	37.5	3.2
	V	10.5	17.0	37.5	3.2
WR036-042	H	10.5	18.1	40.1	3.2
	V	10.5	18.1	40.1	3.2
WR048-060	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			
WR006-012	H	9.4	3.8	21.8	3.8	1/2"	-	-	-	-	8.4	1.5	*3/4" MPT
	V	9.4	3.8	21.8	3.8	1/2"	-	-	-	-	3.8	29.7	*3/4" MPT
WR015-018	H	9.4	5.1	24.9	5.1	1/2"	32.0	4.1	37.8	4.1	8.4	2.3	*3/4" MPT
	V	9.4	5.1	24.9	5.1	3/4"	32.0	4.1	37.8	4.1	3.8	50.0	*3/4" MPT
WR024-30	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
WR036-042	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	1"	37.7	4.0	44.7	4.0	3.7	52.5	*3/4" MPT
WR048-060	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	0.0	40.0	4.0	47.0	4.0	3.7	56.4	*3/4" MPT

* See PDF drawings for reference

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		
WR006-012	H	22.6	16.8	18.8	3.3	40.9	22.9	3.0	2.5
	V	22.9	22.9	15.7	20.8	40.9	22.9	5.3	2.5
WR015-018	H	33.3	24.4	9.9	3.0	58.4	38.1	2.8	2.5
	V	35.6	35.6	10.7	19.1	47.0	46.2	4.3	2.5
WR024-030	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
WR036-042	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
WR048-060	H	45.8	33.9	10.6	2.9	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
WR006-012	H	102.4	62.5	51.6
WR015-018	H	122.9	61.0	54.4
WR024-030	H	122.3	62.4	51.5
WR036-042	H	134.7	62.4	51.6
WR048-060	H	172.2	70.0	59.3

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Corner Weights (lb)

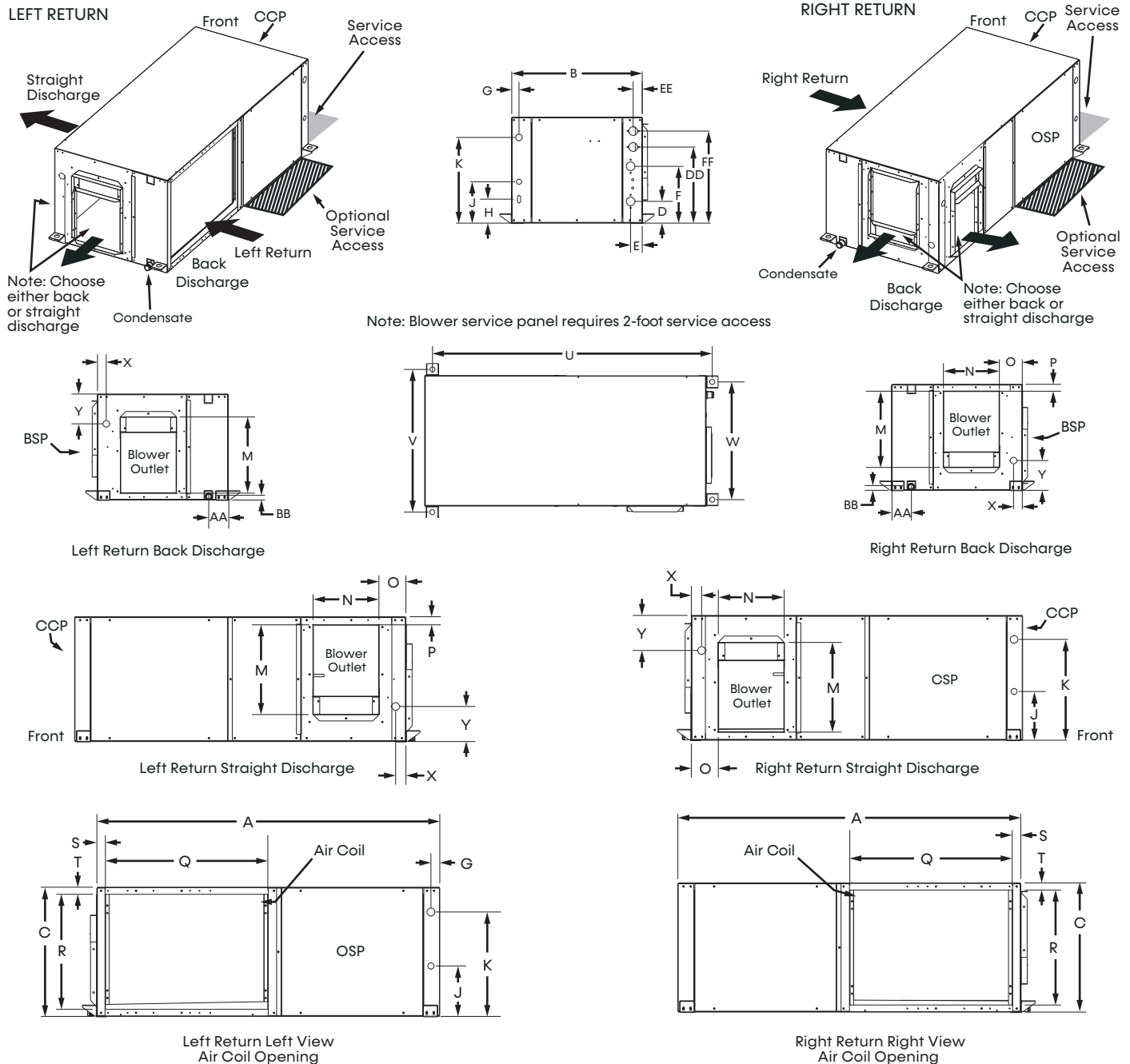
Model	Left - Front	Right - Front	Left - Back	Right/Back
WR006	40.0	20.0	25.0	25.0
WR009	41.0	21.0	25.0	25.0
WR012	45.0	22.0	27.0	27.0
WR015	54.0	44.0	33.0	33.0
WR018	55.0	45.0	34.0	34.0
WR024	61.0	50.0	37.0	37.0
WR030	63.0	52.0	38.0	38.0
WR036	70.0	58.0	43.0	43.0
WR042	75.0	62.0	46.0	46.0
WR048	93.0	76.0	57.0	57.0
WR060	98.0	80.0	60.0	60.0

Corner Weights (kg)

Model	Left - Front	Right - Front	Left - Back	Right/Back
WR006	18.1	9.1	11.3	11.3
WR009	18.6	9.5	11.3	11.3
WR012	20.4	10.0	12.2	12.2
WR015	24.5	20.0	15.0	15.0
WR018	24.9	20.4	15.4	15.4
WR024	27.7	22.7	16.8	16.8
WR030	28.6	23.6	17.2	17.2
WR036	31.8	26.3	19.5	19.5
WR042	34.0	28.1	20.9	20.9
WR048	42.2	34.5	25.9	25.9
WR060	44.5	36.3	27.2	27.2

Horizontal Dimensional Data

Models:
WR
006-060



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 3/4-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 1/2-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:

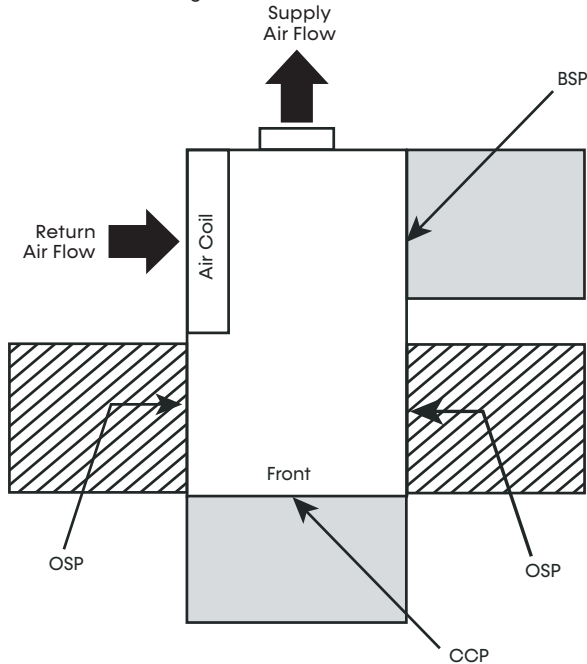
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

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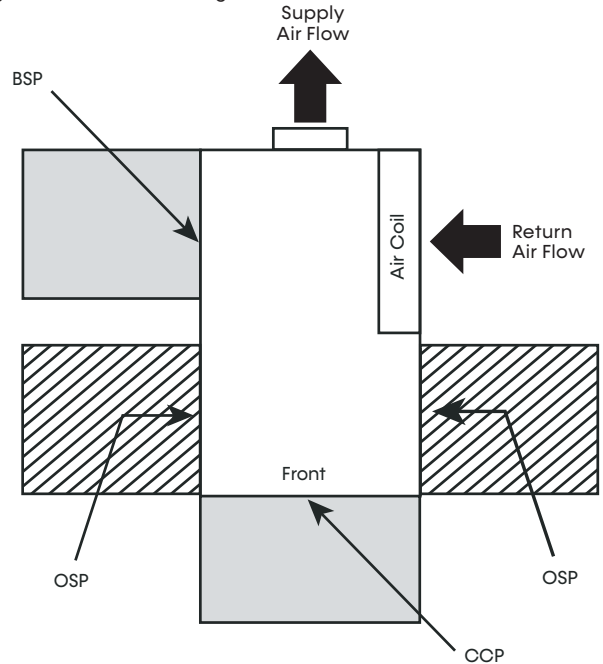
Horizontal Service Access

Models:
WR
006-060

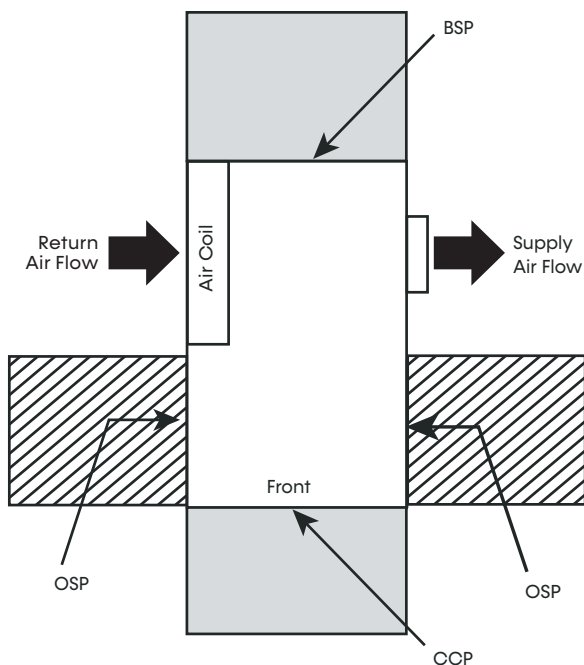
Left Return Back Discharge



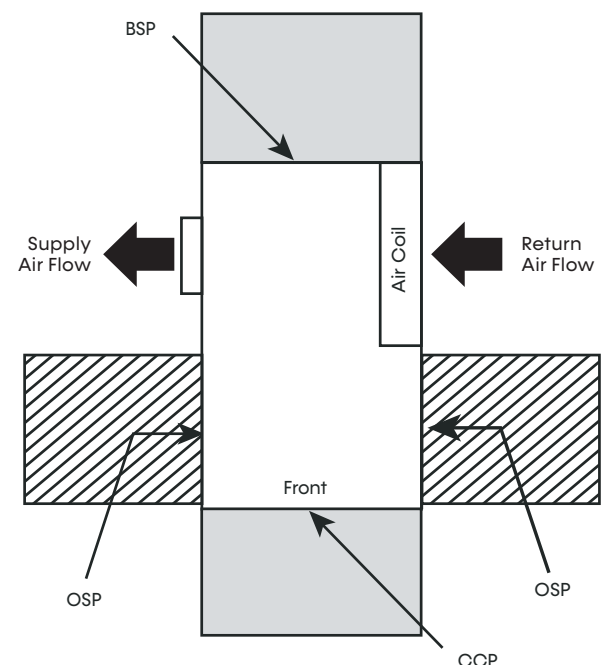
Right Return Back Discharge



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)

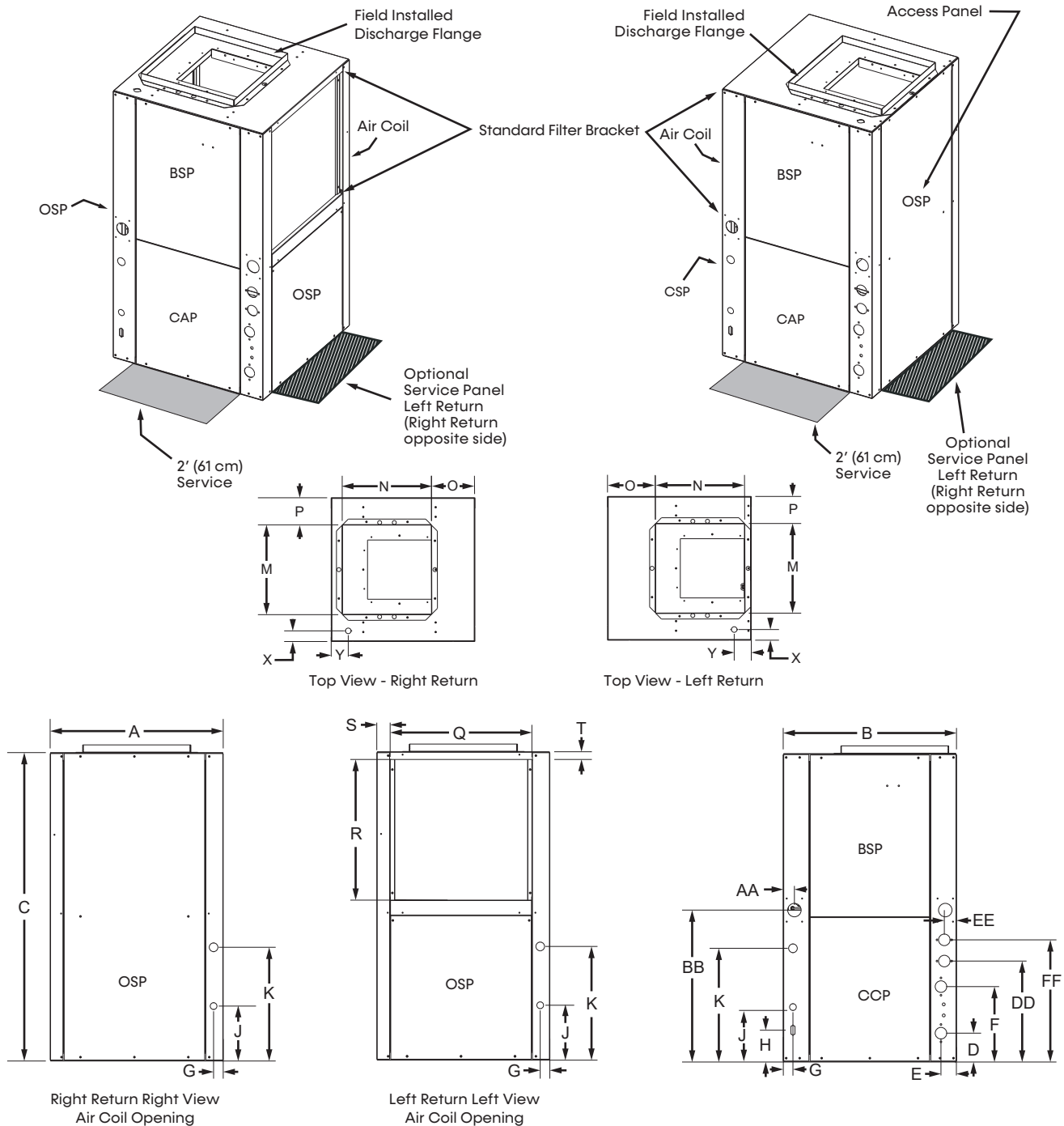
Legend:

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

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Vertical Upflow Dimensional Data

Models:
WR
006-060



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:

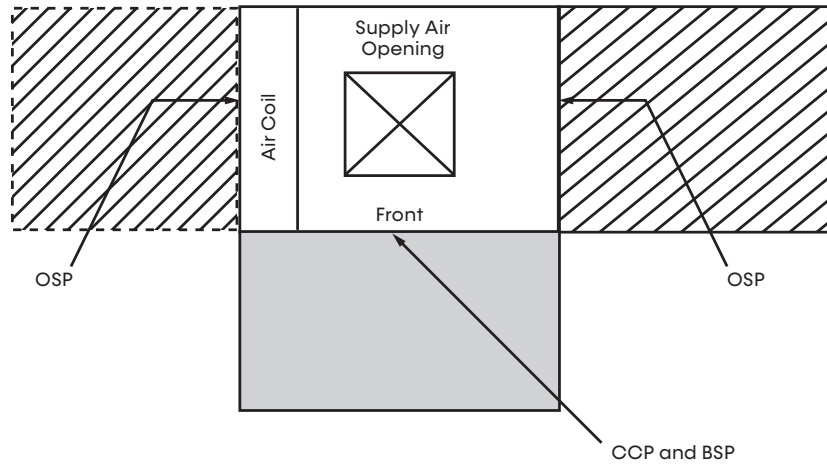
CCP = Control/Compressor Access
BSP = Blower Service Panel
OSP = Optional Service Panel (not required)

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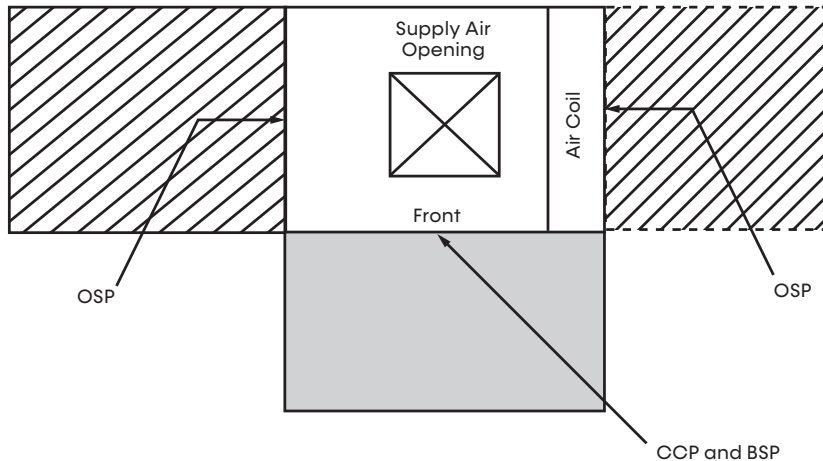
Vertical Service Access

Models:
WR
006-060

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

Models:
WR
006-060

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 ft ² (m ²) [A _{min}]			
			Floor	Window	Wall	Ceiling
WR060	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} (ft ²)	Q _{min} (ft ³ /min)
WR060	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} in ² (m ²)
WR060	69	111.57 (0.07)

Anv _{min}	=	Minimum natural ventilation area opening
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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.

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GENERAL

Furnish and install Closetline WR 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 43.3°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 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 shall 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 rubber 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 a minimum of three access panels for serviceability of compressor compartment. **Units having only one or two access panels 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 insulation 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 pumps 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 their 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 factory installed 1-inch (25.4 mm) wide filter rails 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. 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 filter will ship with the factory installed filter rails or frame.

Option: UltraQuiet package shall consist of additional sound insulation applied to the base pan, removable panels and blower housing.

Option: The unit shall be supplied with extended range insulation option, which adds closed cell foam 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 three-speed (two-speed for 575V), permanently lubricated, PSC type, with internal thermal overload protection. Units supplied without permanently lubricated motors must provide external oilers for easy service. The fan motor on small and medium size units (006-042) shall be isolated from the fan housing by a torsionally flexible motor mounting system with rubber type grommets to inhibit vibration induced high noise levels associated with "hard wire belly band" motor mounting. The fan motor on larger units (048 and 060) shall be isolated with flexible rubber type isolation grommets only. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. 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.

Option: Constant Torque (CT) EC motors (sizes 006 to 060): The CT EC fan motor maximizes efficiency over its static operating range and provides airflow adjustment with 4 or 5 speed taps. The fan motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection.

Option: Constant Volume (CV) EC motors (sizes 006 to 060): EC variable speed ball bearing type motor. The EC fan motor shall provide a soft low noise fan start by ramping fan up to full selected speed over a 30 second period, and slowly ramp down fan at the end of each blower cycle, maintain constant CFM, maximize fan system efficiency over its static operating range, and provide airflow adjustment in 25 CFM increments. 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). Constant CFM EC motors without controlled ramp up and ramp down features, with constant CFM speed taps, or with no microprocessor controller are not acceptable.

REFRIGERANT CIRCUIT

All units shall contain an R-454B sealed refrigerant circuit including a high efficiency scroll or rotary 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 (loss of charge) switch, 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 or springs to a heavy gauge compressor mounting plate, which is then isolated from the cabinet base with EPDM grommets for maximized vibration 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 1000 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).

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 internally factory mounted two-way water valve for variable speed pumping requirements. A factory-mounted or field-installed high pressure switch shall be installed in the water piping to disable compressor operation in the event water pressures build due to water freezing in the piping system.

Option: The unit will be supplied with internally factory mounted automatic water flow regulators.

Option: The unit will be supplied with internally mounted secondary pump for primary/secondary applications, including one-pipe systems.

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

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 006-048).

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

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

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced type 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.

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 50VA transformer, 24V activated, two or three-pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. The control box on sizes 006 through 060 shall have a door to protect the internal components. The entire control box shall be capable of rotating out of the unit to allow access to the components behind the control box. Low voltage wires shall enter the box through a hole in the lower left side and high voltage wires shall enter the box through a hole in the upper left side. 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 or sensor.

SOLID STATE CONTROL

Units shall have a solid state control system. Units utilizing electro-mechanical control shall not be acceptable. The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall interface with a heat pump type thermostat. The control system shall have 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 3 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.

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 protections will not be accepted.

When Solid State Control is connected to a handheld service tool, the installer/service technician can; check DIP switch S2 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.

Option: Deluxe Solid State Control

This control system is a communicating controller.

Control shall have the above-mentioned features of the Solid State Control control system along with the following expanded features:

- a. Removable thermostat connector.
- b. Night setback control.
- c. Random start on return from night setback.
- d. Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.
- e. Dry contact night setback output for digital night setback thermostats.
- f. Ability to work with heat pump or heat/cool (Y, W) type thermostats.
- g. Ability to work with heat pump thermostats using O or B reversing valve control.
- h. Boilerless system heat control at low loop water temperature.
- i. Ability to allow up to three units to be controlled by one thermostat.
- j. Relay to operate an external damper.
- k. Relay to start system pump.
- l. 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; 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 a service tool to display (on the service tool) 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 the unit from the service tool. The control board shall provide a signal to the service tool, indicating a lockout. A detailed message shall be provided at the service tool 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 (either Solid State Control or Deluxe Solid State Control) 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).

This option also provides the upgraded 75VA control transformer with load side short circuit and overload protection via a built in circuit breaker.

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.

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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 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:

- Ball valve; bronze material, standard port full flow design, FPT connections.
- Ball valve with memory stop and PT port.
- "Y" strainer with blowdown valve; bronze material, FPT connections.
- Motorized water valve; slow acting, 24V, FPT connections.

Hose Kit Assemblies

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

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

- Sensor only with no display (MPC).
- Sensor with setpoint adjustment and override (MPC only).
- 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 The Whalen Company 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 catalog and must not be used without consulting the complete product catalog. For complete product installation and application requirements, please consult the complete product catalog. The Whalen Company is not responsible for misuse of this document or a failure to adequately review specific requirements in the product design guide.

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

Models:
WR
006-060

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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