

Legacy Console Water Source Heat Pumps 3/4 to 1½ Ton

Unit Sizes 009-019

R-410A Models – For Replacement of McQuay Console Models:

WAA, WAF, WAG, WAH, WAS, WAX, WCB, WCQ, WDA, WDB, WDC, WDD, WDE, WDF, WDG, WDH, WDJ, WDL, WDN, WDS, WDU, WDX, WDY, Wdz, WFQ, WLA, WLB, WLC, WLL, WLZ, WMA, WMB, WMC, WMD, WME, WMF, WMG, WMH, WMJ, WMK, WML, WMM, WMN, WMO, WMP, WMQ, WMR, WMS, WMT, WMU, WMV, WMW, WMX, WMY, WMZ, WSQ, WST, WXA, WXB, WXC, WXD, WXE, WXF, WXG, WXJ, WXK, WXQ, WXS, WXU, WZA, WZC, WZD, WZE, WZF, WZG, WZH, WZK, WZL, WZM, WZP, WZQ, WZS, WZZ



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Note: Text displayed in ***Bold-Italic*** designate standard offering.

Category	Code Item	Code Option	Code Designation & Description (<i>Bold-Italic = Standard</i>)
Product Category	01	1	W = Water Source Heat Pump
Product Identifier	02	2-4	WXH = Slope Top Wall Mtd/High Sill/DDC Less Board/Chassis Only WXL = Flat Top Wall Mtd/High Sill/DDC Less Board/Chassis Only WXM = Flat Top Wall Mtd/Low Sill/DDC Less Board/Chassis Only WXN = Flat Top Wall Mtd/High Sill/DDC Less Board WXP = Flat Top Wall Mtd/Low Sill/DDC Less Board WXR = Slope Top Wall Mtd/High Sill/DDC Less Board WXT = Slope Top Wall Mtd/Low Sill/DDC Less Board/Chassis Only WXV = Slope Top Wall Mtd/Low Sill/DDC Less Board WZB = Flat Top Wall Mtd/Low Sill/Mark IV WZJ = Flat Top Wall Mtd/High Sill/Mark IV WZN = Slope Top Wall Mtd/Low Sill/Mark IV WZU = Slope Top Wall Mtd/High Sill/Mark IV/Chassis Only WZV = Slope Top Wall Mtd/Low Sill/Mark IV/Chassis Only WZW = Flat Top Wall Mtd/High Sill/Mark IV/Chassis Only WZX = Flat Top Wall Mtd/Low Sill/Mark IV/Chassis Only WZY = Slope Top Wall Mtd/High Sill/Mark IV
Design Series (Vintage)	03	5	2 = Design Series 2 3 = Design Series 3
Nominal Capacity	04	6-8	009 = <i>9,000 Btuh Nominal Cooling</i> 012 = 12,000 Btuh Nominal Cooling 015 = 15,000 Btuh Nominal Cooling 019 = 19,000 Btuh Nominal Cooling
Voltage	05	9	A = 115-60-1 (Sizes 009 and 012 only) <i>E = 208-230/60/1</i> J = 265/277-60-1 (Sizes 009 and 015 Only)
Coil Options	06	10	G = Cupro-Nickel Coax Coil, Geothermal <i>S = Copper-Steel Coax Coil</i> T = Cupro-Nickel Coax Coil W = Copper-Steel Coax, Geothermal
Heating Options (Not available in 115/60/1 voltage)	07	11-12	00 = <i>None</i> 20 = 1.0 kW Electric Heat Nominal 30 = 2.0 kW Electric Heat Nominal <i>Note:</i> See Table 5 on page 11 for allowable maximum kW based on voltage selection
Hand Orientation	08	13	U = Right <i>V = Left</i>
Controls	09	14-15	11 = Unit-Mounted ACO 12 = <i>Unit-Mounted MCO</i> 13 = 24V Wall T-Stat Setup 25 = Unit-Mounted ACO with Low Limit, NSB and Override 00 = None (DDC Less Control)*
<i>*Note: Code 00 designed for use with field-installed Alerton control board</i>			
Discharge	10	16-17	<i>AA = Top</i>
Return Air	11	18-19	13 = Front (Low sill only) 14 = <i>Bottom (High sill only)</i>
Power Connection	12	20	A = <i>Std. Electrical Junction Box</i> C = Cord (Chassis Only) P = Power Cord w/Fused Disconnect (Available with cabinet and chassis combination)
Color	13	21	B = Putty Beige (Flat-top only) C = Cupola White (Slope-top and Flat-top) G = Soft Gray (Flat-top only) <i>I = Antique Ivory (Standard color for slope-top, option for flat-top)</i> Z = None

Product Identifiers

Previous Model	Replacement Model	Cabinet		Subbase Height		Controls		Chassis Only ²
		Slope Top	Flat Top	High Sill	Low Sill	Mark IV	¹ DDC Less Board	
WAH, WDD, WDN	WXH	•		•			•	•
WDC, WDX, WXG	WXL		•	•			•	•
–	WXM		•		•		•	•
WAF, WAX, WDF, WDG, WDL, WDU, WDX, WXC, WXF, WXJ, WXQ, WZK, WZK	WXN		•	•			•	
WAA, WDA, WXE	WXP		•		•		•	
WAG, WAS, WDH, WDS, WDY, WZC, WZD, WZG, WZH, WST, WDS	WXR	•		•			•	
WDE	WXT	•			•		•	•
WDB, WDJ, WXA, WXB, WZL	WXV	•			•		•	
WCB, WLB, WMB, WMJ, WMW, WXD, WXU	WZB		•		•	•		
WFQ, WLL, WME, WMF, WMX, WXS, WZF, WZP	WZJ		•	•		•		
WLC, WMA, WMP, WSQ, WZA	WZN	•			•	•		
WVG, WMN, WZQ	WZU	•		•		•		•
WCQ, WMH, WMM, WXK, WZZ	WZV	•			•	•		•
WMC, WMK, WMT, WMU, WZM	WZW		•	•		•		•
WMD, WML, WMQ, WMV, WZE	WZX		•		•	•		•
WLA, WLZ, WMO, WMR, WMS, WMY, WMZ, WZS	WZY	•		•		•		

¹ Field-supplied control board

² Subbase not included

Introduction

More than 30 years ago, McQuay designed the first complete line of water source heat pumps for high efficiency, individually-zoned comfort control in offices, schools, assisted living facilities, manufacturing facilities and other commercial buildings. Our reputation for outstanding reliability and quiet operation has been reinforced in thousands of successful installations.

The Legacy console is available in sizes 3/4 ton (2215 watts) through 1½ tons (4455 watts) with numerous cabinet, water piping and control choices. The legacy series is capable of water loop (boiler-tower) applications. This model incorporates a non-ozone depleting R-410A refrigerant, which along with high Energy Efficiency Ratios (EER's) – helps preserve our environment and precious energy resources.

Legacy Console Feature Overview:

Unit Features:

- 4 unit sizes
- Standard or Geothermal range
- Rotary compressor
- Flat or Slope top cabinet
- Modern grille and cabinet shape
- Antique Ivory/Oxford Brown finish
- Slide-out chassis design
- Compact dimension – only 10¾" (273 mm) deep
- Continuous or cycle fan operation
- Optional electric heat with boilerless system control
- Optional plug-in cord and receptacles (field installed)

Control Features (Not all options available simultaneously)

- Unit mounted thermostat
- Built-in night setback, load shed and shutdown
- Built-in 2-hour override push-button
- Random start and compressor anti-short cycle protection
- Condensate overflow protection
- Remote reset of automatic lockouts
- Fault retry to minimize nuisance trips
- Pump restart relay signal
- Unit mounted tenant setpoint adjustment
- Unit mounted override pushbutton
- Night setback, cycle fan and pump restart operation
- Wall-mounted thermostat capable

A Case Study

Read [the Case Study](#) how Auburn, NY, preserves city hall and improves employee comfort.



Unit Configurations

Console water source heat pumps are available in four cooling capacity sizes, 3/4 ton through 1-1/2 tons, 2215 to 4455 watts (2987 to 5774 watts in reverse cycle heating). Each is available in four different configurations. Flat top units meet the traditional requirements for a rugged unit. Slope top units offer a modern look. The high silhouette unit is 25" (635mm) high and the low silhouette unit is only 22-1/2" (572mm) high. The overall unit dimensions are very compact; unit sizes 009 and 012 are 46" (1168mm) long and sizes 015 and 019 are 54" (1372mm) long. All units are a constant 10-3/4" (273mm) deep for minimum floor space and a consistent "look" for all unit sizes.

All units incorporate a slide-out chassis concept which is preferred by many owners, developers and contractors. The back part of the cabinet (backwrap) is attached to the subbase and secures to the back wall or floor. The front cabinet simply lifts off, exposing the chassis for field hook-up of water and electrical connections. The chassis easily slides off the subbase for service or changeout.

Table 1: Cabinet & subbase dimensions

Unit Size	A - Cabinet		B - Subbase	
	in.	mm	in.	mm
009 – 012	46	1168	45	1143
015 – 019	54	1372	53	1346

Figure 1: High sill cabinets

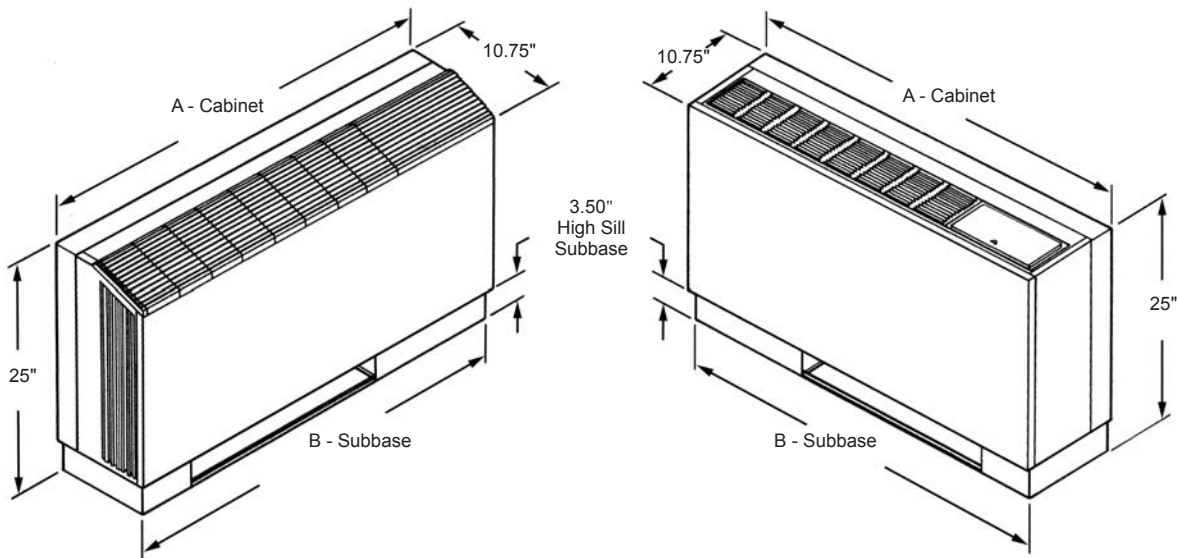
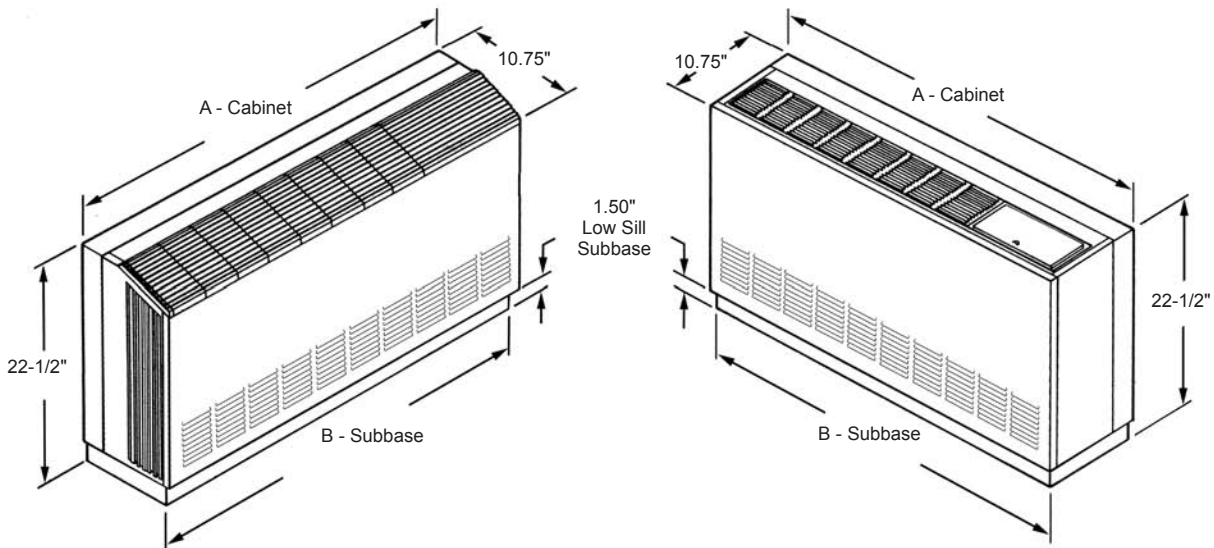


Figure 2: Low sill cabinets



Cabinet

All cabinets are painted with a baked enamel finish for a great match to any room. The discharge grilles and subbase are Oxford Brown on flat top units.

Figure 3: Slope top console unit



The shallow 22° slope top cabinet is constructed of 18-gauge steel. The side pieces are constructed of ABS polycarbonate with accent lines to match the grille. The grille and door are also of ABS polycarbonate with unique detail. The “raised” grille extends to the front and sides for a smooth look as well as providing a curtain stop in back. Again, the accent lines on the sides follow the grille and control door lines. The discharge grilles direct the air in an 11° angle from the vertical and can be reversed for a 33° discharge angle. The control door has a finger slot and simply lifts up for access to the controls. Overall, the slope top unit allows minimal airflow interference from curtains and objects resting on the cabinet while at the same time providing a rugged, aesthetically pleasing look.

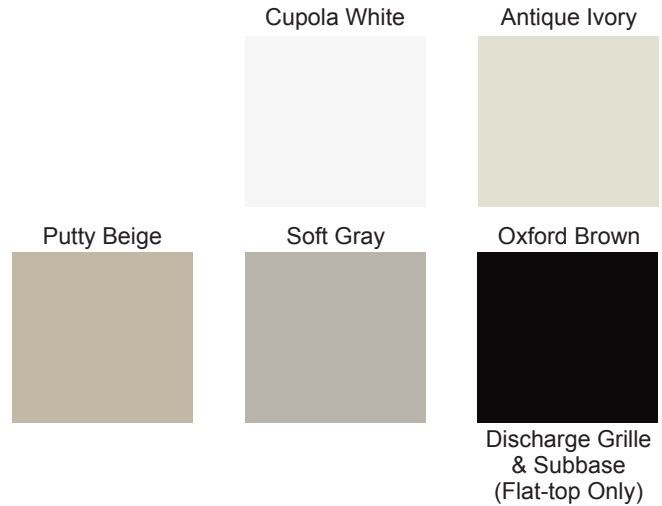
The flat top cabinet is constructed of 18-gauge steel with a one piece steel grille that meets basic needs with its rugged construction and its 11° discharge angle.

Figure 4: Flat top console unit



Available Cabinet Colors

Note: See “Model Nomenclature” on page 4 for color options.



Chassis

The slide-out chassis houses the fan section, refrigerant circuit and controls. The air enters through the bottom of the chassis through the subbase.

The refrigeration system includes a rotary compressor, reversing valve, coaxial heat exchanger, thermal expansion valve, air coil, high and low side access valves, and safety controls. Access to the compressor is through a panel. The compressor is isolated from the unit with external vibration mounts and the compartment is totally insulated. Electrical controls include a unit-mounted return air thermostat and mode control rotary switch. Safety controls include low temperature (freezestat) and refrigerant high pressure switches. The control box top is removable for access to all of the controls.

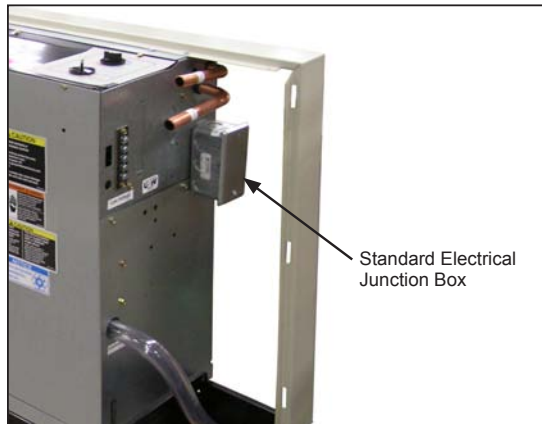
The fan section includes single or multiple split fan housings for motor/wheel removal, two-speed PSC motor for selectable airflow and/or noise level. Access to the fan section is made through a large insulated panel. The motor is isolated from the chassis with rubber end ring grommets.

Supply and return water piping connections are 5/8" O.D. sweat terminations facing the front of the unit, allowing easy access for making pipe connections. Unique left- and right-hand piping (includes condensate and electrical) locations are available.

The 3/4" (19mm) I.D. flexible clear vinyl condensate draitube is internally trapped and extends 14" (356mm) into the piping compartment for easy connection. Piping (electrical and condensate also) can enter through the back wall within the backwrap or through the floor within the subbase. The compact size of the chassis allows for a large piping compartment between the chassis and the cabinet.

The standard unit uses a Mark IV controller which has a printed circuit board for clean wiring and a low voltage control circuit with a 50 VA transformer. See “Typical Wiring Diagrams” on page 41 through page 43 for more detailed wiring information. The electrical connection for main power is made to the standard chassis-mounted 2" x 4" (51mm x 102mm) junction box.

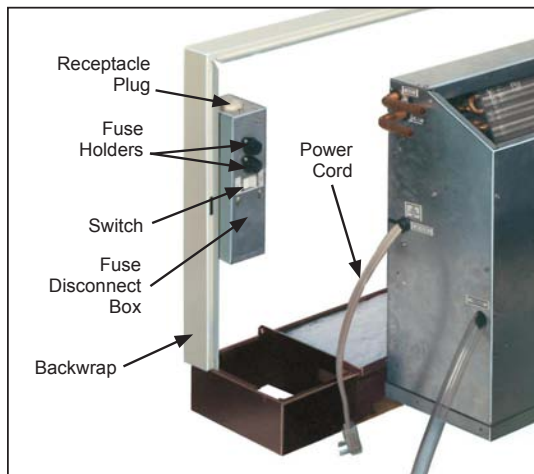
Figure 5: Standard electrical junction box



Power Cord With Fuse Disconnect (Factory-Installed)

Cord connected equipment comes with a fuse disconnect box and appropriate voltage receptacle. A disconnect switch and fuses can also be provided. As an option, the box comes factory mounted on the backwrap and is ready to be field wired to the incoming power. The box is mounted on the same side as the piping.

Figure 6: Power cord with fuse disconnect



Electric Heat With Boilerless System Control

Eliminates the need for a boiler in the heat pump water loop. An electric heater is added to the discharge side of the fan housing(s). If the entering water temperature falls to 58°F (15°C) the thermostat locks out compressor operation. On a call for heat, the electric heater is energized. When the entering water temperature rises,

the unit will resume compressor operation on a call for heat. An emergency heat switch allows electric heating if the compressor should ever fail. Each unit has various heater sizes to select from. Not available on 115 volt units.

Mark IV Unit-Mounted Manual Changeover (MCO) Control - Rotary Switch

The Mark IV Unit-Mounted Manual Changeover controller provides an easy-to-read and operate rotary “warmer-cooler” thermostat adjustment knob, with a rotary switch to select the “high” or “low” temperature setting in heating or cooling, “high” or “low” fan operation, or “OFF”.



Mark IV Unit-Mounted Automatic Changeover (ACO) Control – Start-Stop Switch & High/Low Fan Tap-Touch Operation

The Mark IV Unit-Mounted Automatic Changeover Control option includes a thermostat adjustment knob for “warmer-cooler” and membrane system/fan switches for simple tap-touch operation. Also available is a Unit-Mounted Automatic Changeover Control with Low Limit, Night Setback, and Override.



DDC Less Board

The DDC-Less Board (LB) option is intended for use with a field supplied and installed Alerton BACtalk or MicroTech 2000 control board. The IDEC connectors are loose in the control box and include terminations to connect directly to the Alerton or MicroTech 2000 control board.

Note: DDC-LB is not intended to be used as “DDC Ready”.

Performance Data

Table 2: Performance data

Model	Water Loop			
	Cooling		Heating	
	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
009	8600	11.5	11300	4.2
012	10300	11.5	13800	4.2
015	13400	11.7	18100	4.2
019	16800	12.0	22500	4.2

Notes: Rated in accordance with ISO Standard 13256-1

EER = Energy Efficiency Ratio **COP** = Coefficient of Performance

Water Loop: 1. Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) EAT and 86°F (30°C) EWT.
 2. Heating capacity is based on 68°F db, 59.0°F wb (20/15°C) EAT and 68°F (20°C) EWT.

Physical Data

Table 3: Physical data

Unit Size		009	012	015	019
Fan Wheel - D x W (in.)		5-3/4 x 9.15	5-3/4 x 9.15	6 x 7.8	6 x 7.8
Fan Motor (hp)		1/24	1/15	1/8	1/8
Coil Face Area (ft.2)		1.4	1.4	1.9	1.9
Coil Rows		3	3	3	3
Refrigerant Charge (oz.)		21.5	21.5	33.0	33.5
Filter Size (in.)		9-3/4 x 23-3/4	9-3/4 x 23-3/4	9-3/4 x 31-3/4	9-3/4 x 31-3/4
Water Connections, Tube (in.)		5/8 O.D.	5/8 O.D.	5/8 O.D.	5/8 O.D.
Condensate Connection, I.D. (In.)*		3/4	3/4	3/4	3/4
Weight, Operating (lbs.)	Cabinet & Chassis	164	166	185	193
	Chassis Only	125	127	129	131
Weight, Shipping (lbs.)	Cabinet & Chassis	184	186	215	223
	Chassis Only	145	146	153	156

* Condensate hose is 14" long.

Electrical Data

Table 4: Unit electrical data

Unit Size	Power			Compressor		Motor FLA	Total Unit FLA	Min. Volts	Min. Circuit Ampacity	Max. Fuse Size
	Volt	Hz	Phase	RLA	LRA					
009	115	60	1	8.0	50	0.63	8.63	104	10.6	15
	208/230	60	1	3.7	22	0.40	4.10	197	5.0	15
	265	60	1	3.5	22	0.35	3.85	240	4.7	15
012	115	60	1	9.5	50	1.60	11.10	104	13.5	20
	208/230	60	1	4.7	25	0.60	5.30	197	6.5	15
015	208/230	60	1	5.6	29	0.82	6.42	197	7.8	15
	265	60	1	5.0	28	0.55	5.55	240	6.8	15
019	208/230	60	1	7.4	33	0.82	8.22	197	10.1	15

Table 5: Units with boilerless system electric heat

Unit Size	Power Volt/Hz/Phase	Electric Heater			Compressor		Motor FLA	Total Unit FLA	Min. Volts	Min. Circuit Ampacity	Max. Fuse Size
		kW		Amps	RLA	LRA					
		Nominal	Actual								
009	208/60/1	1.0	0.62	3.0	3.7	22	0.40	4.10	197	5.0	15
	230/60/1		0.75	3.3	3.7	22	0.40	4.10	197	5.0	15
	265/60/1		1.00	3.8	3.5	22	0.35	3.85	240	5.2	15
	208/60/1	2.0	1.23	5.9	3.7	22.0	0.40	4.10	197	5.0	15
	230/60/1		1.5	6.5	3.7	22.0	0.40	4.10	197	5.0	15
	265/60/1		2.0	7.5	3.5	22.0	0.35	3.85	240	5.2	15
012	208/60/1	1.0	0.62	3.0	4.7	25	0.60	5.30	197	6.5	15
	230/60/1		0.75	3.3	4.7	25	0.60	5.30	197	6.5	15
	208/60/1	2.0	1.23	5.9	4.7	25.0	0.60	5.30	197	6.5	15
	230/60/1		1.5	6.5	4.7	25.0	0.60	5.30	197	6.5	15
015	208/60/1	2.0	1.23	5.9	5.6	29	0.82	6.42	197	8.4	15
	230/60/1		1.50	6.5	5.6	29	0.82	6.42	197	9.9	15
	265/60/1		2.00	7.5	5.0	28	0.55	5.55	240	10.1	15
019	208/60/1	2.0	1.23	5.9	7.4	33	0.82	8.22	197	10.1	15
	230/60/1		1.50	6.5	7.4	33	0.82	8.22	197	10.1	15

Operating Limits

Table 6: Air limits in °F (°C)

Air Limits	Cooling	Heating
Minimum Ambient Air ¹	40°F (4°C)	40°F (4°C)
Rated Ambient	80°F (27°C)	70°F (21°C)
Maximum Ambient Air ²	100°F (38°C)	85°F (29°C)
Minimum Entering Air ¹	50°F (10°C)	40°F (4°C)
Rated Entering Air	80/67°F (27°/19°C)	70°F (21°C)
Maximum Entering Air ²	100/83°F (38/28°C)	80°F (27°C)

Table 7: Fluid limits

Fluid Limits	Cooling	Heating
Minimum Entering	30°F (-1°C)	20°F (-6°C)
Normal Entering	77°F (25°C)	40°F (4°C)
Maximum Entering	110°F (43°C)	90°F (32°C)
Minimum GPM/Ton	1.5	
Nominal GPM/Ton	3.0	
Maximum GPM/Ton	4.0	

- Notes:**
- Maximum and minimum values may not be combined. If one value is at maximum or minimum, the other two conditions may not exceed the normal condition for standard units. Extended range units may combine any two maximum conditions, but not more than two, with all other conditions being normal conditions.
 - This is not a normal or continuous operating condition. It is assumed that such a start-up is for the purpose of bringing the building space up to occupancy temperature.

Water Pressure Drop

Table 8: Water pressure drop

Unit Size	GPM	Ft-H ₂ O	PSI
009	1.1	1.8	0.8
	2.3	6.1	2.6
	3.0	10.2	4.4
012	1.5	2.9	1.3
	3.0	10.2	4.4
	4.0	17.1	7.4
015	1.9	2.1	0.9
	3.8	7.1	3.1
	5.0	11.8	5.1
019	2.4	3.1	1.4
	4.8	10.7	4.7
	6.3	17.9	7.7

Features of the Mark IV Unit Controller

The Mark IV/AC control system is a microprocessor-based control board conveniently located in the unit control box for accessibility. Mark IV/AC controllers include a 14-pin low voltage terminal strip for a hardwired interface for all the necessary field connections interfacing to external equipment (See Table 9). LED's are located in front for quick inspection (See Table 10).

Table 9: 14-Position terminal strip

Pin	Designation	Description
1	C	Transformer ground (0vac)
2	R	Transformer supply (24vac)
3	V	- DC power connection
4	P	Pump request output
5	A	Alarm fault output
6	U	Unoccupied input
7	L	Load shed input
8	E	Remote shutdown input
9	F	+DC power connection
10	Y1	Occupied cooling mode input
11	W1	Occupied heating mode input
12	G	Fan only input
13	W2	Unoccupied heating mode input
14	O	Tenant override input

Table 10: Mark IV/AC LED & fault outputs

Indication	LED			Fault Output
	Yellow	Green	Red	
Normal Mode	Off	On	Off	Off
Pressure Fault	Off	On	Flash	On
Low Temperature Fault*	Flash	Off	Off	On
Condensate Overflow**	On	Dim	Off	On
Brownout	Off	Flash	Off	On
Load Shed	Off	Off	On	Off
Unoccupied Mode	On	On	Off	Off
Unit Shutdown	Off	Flash	Off	On

* Only in the heating mode

** Only in the cooling mode

The board can be wired for 24-volt AC output to the wall thermostat by using terminals R & C. If a DC voltage output to the thermostat is required, use terminals F & V. This allows you to choose the control output voltage to accommodate controls by others or accessories. See [OM 120-X](#) (Mark IV/AC Controller for Water Source Heat Pump Units) for details.



Mark IV/AC Operating Features




The Mark IV/AC control system has the following operating features (board is wired for continuous fan - see wiring diagram for cycle fan conversion):

- **Start-up** – The unit will not operate until all the inputs and safety controls are checked for normal conditions.
- **Cooling Mode** – On a call for cooling, the compressor and fan will start 0 to 32 seconds later. When the load is satisfied, the compressor and fan shut off immediately.
- **Heating Mode** – On a call for heating, the reversing valve is energized after 60 seconds and the compressor and fan start immediately. When the load is satisfied, the compressor and fan shut off immediately. The reversing valve is deenergized 60 seconds later to eliminate “swish” noise and to allow the compressor to always start up at equalized pressure.
- **Short Cycle Protection & Random Start** – Each time the compressor stops, a new random compressor start-delay time between 180 and 212 seconds is generated. This prevents compressor short cycling and prevents units from starting simultaneously after coming back from an unoccupied cycle.
- **Unoccupied Mode** – A simple “grounded” signal, no power source required, puts the unit into the unoccupied mode for night setback operation. The fan shuts off and the unit controls to the setpoint from the setback bulb of the thermostat. The day heating thermostat control and cooling is locked out. A unique LED status is generated to indicate the unoccupied mode. On a call for heating, the fan and the compressor start after 60 seconds.
- **Override Mode** – A switch on the deluxe automatic changeover thermostat can be activated during the unoccupied mode to put the unit back into the occupied mode for two hours for after-hours heating or cooling.
- **Pump Restart** – A signal from the Mark IV/AC board to our Loop Water Control Panel will restart the water circulating loop pump when the compressor is energized. The signal can be “daisy chained” between 200 units.
- **Load Shed** – A simple grounded signal puts the unit into the load-shed mode. The compressor shuts off and the fan starts on a call for heating and cooling. A unique LED status is generated to indicate the load-shed mode.
- **Brownout Protection** – The Mark IV/AC board measures the input voltage and will suspend compressor and fan operation should the voltage fall below 80% of the normal line voltage. A unique LED status is generated to indicate the brownout protection.

- **Unit Shutdown** – A simple grounded signal puts the unit into the shutdown mode. Compressor and fan operations are suspended. A unique LED status is generated to indicate the unit shutdown.
 - **Condensate Overflow Protection** – The Mark IV/AC board incorporates a liquid sensor at the top of the drain pan. Upon sensing water flow, cooling operation is suspended. A unique LED status is generated to indicate condensate overflow protection.
 - **Remote Reset of Automatic Lockouts** – The Remote Reset feature provides the means to remotely reset automatic lockouts generated by high-pressure and/or low-temperature (in heating) faults. When the Mark IV board is in automatic lockout due to one of these faults, and the cause of the fault condition has been alleviated, energizing the “O” terminal for 10 seconds or more will force the Mark IV board to clear the lockout. A unit power cycle can also be used to clear an automatic lockout if the conditions causing the fault have been alleviated.
 - **Fault Retry To Minimize Nuisance Trips** – The Fault Retry feature helps to minimize nuisance trips of automatic lockouts caused by high-pressure and/or low-temperature (in heating) faults. This feature clears faults the first two times they occur within a 24-hour period and triggers an automatic lockout on the 3rd fault. The retry count is reset to zero every 24 hours.
- Note:** Most unit fault conditions are the result of operating the equipment outside the unit specifications.
- **Safety Control** – The Mark IV/AC board receives separate input signals from the refrigerant high pressure switch and the low suction temperature (freezestat) switch. If a high pressure situation occurs while in the heating mode, compressor operation is suspended. In a low temperature situation, the unit goes into a defrost cycle where the unit is put into cooling operation for 60 seconds until the coaxial heat exchanger is free of ice. If a low temperature situation occurs while in the cooling mode, the low temperature switch will cycle unit OFF and ON, as the fault is related to air flow. Each switch generates its own unique LED status to indicate safety control.

Thermostats and Sensor

Table 11: Accessory thermostats & sensor

		Thermostats		Optional Remote Sensor for Thermostat Applications
		Non-Programmable	Programmable	
Thermostats & Remote Sensor used with Legacy Console Units		 (See page 32 for details) Part No. 668375401	 (See page 32 for details) Part No. 668375301	 Used with Thermostats 668375401 & 668375301 Part No. 667720401
		Feature		
Display	Room Temperature & Setpoint	●	●	
Changeover	Manual	●		
	Automatic	●	●	
Stages	Heating	2	2	
	Cooling	2	2	
Operating Modes	System	Cool-Off-Heat-Auto	Cool-Off-Heat-Auto	
	Fan	On-Auto	On-Auto	
Annunciation	Status LED 5VDC	●	●	
Reset	Alarm	Cycle Mode to “OFF” or push ▲▼ for 10 seconds	Cycle Mode to “OFF” or push ▲▼ for 10 seconds	
	Setback Override	Push ▲▼ for 3 seconds	Push ▲▼ for 3 seconds	
Optional Remote Sensor	Indoor Room Temperature	●	●	
Application				
Electric Heat	Boilerless	●	●	●

Water Source Heat Pump Systems

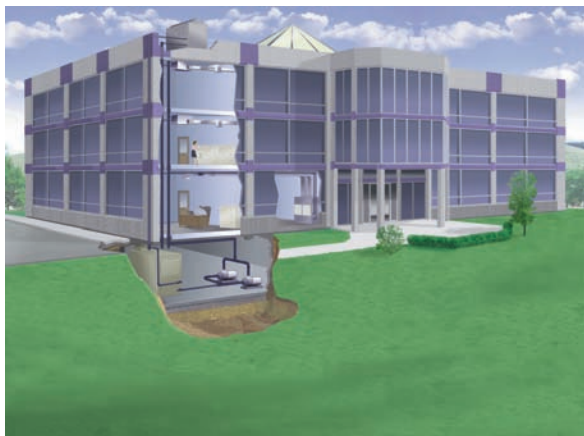
Water source heat pump systems are one of the most efficient, environmentally friendly systems available for heating and cooling buildings. High-efficiency, self contained units (sizes 7,000 btuh to 420,000 btuh) can be placed in virtually any location within a building. Each unit responds only to the heating or cooling load of the individual zone it serves. This permits an excellent comfort level for occupants, better control of energy use for building owners and lower seasonal operating costs. The Air-Conditioning Refrigeration Institute (ARI) and the International Standards Organization (ISO) publish standards so that water source heat pumps are rated for specific applications. The ARI/ISO loop options shown in this catalog are typical water source heat pump loop choices available in today's market. These systems offer benefits ranging from low cost installation to the highest energy efficiency available in the market today.

Boiler / Tower Applications: ISO Standard 13256-1

A "Boiler/Tower" application uses a simple two-pipe water circulating system that adds heat, removes heat or transfers rejected heat to other units throughout the building. The water temperature for heating is generally maintained between 65°F – 70°F and is usually provided by a natural gas or electric boiler located in a mechanical room. The condensing water temperature, during cooling months, is maintained between 85°F and 95°F and requires the use of a cooling tower to dissipate waste heat. Cooling towers can be located on the roof, or inside or adjacent to the building. This application can be the lowest cost of the loop options available.

Note: ASHRAE 90.1 standards require that circulating pumps over 10 HP will require use of "variable frequency drive" equipment and pipe insulation to be used whenever water temperatures are below 60 degrees and above 105 degrees. See ASHRAE 90.1 Standards for details.

Figure 7: Boiler/Tower application

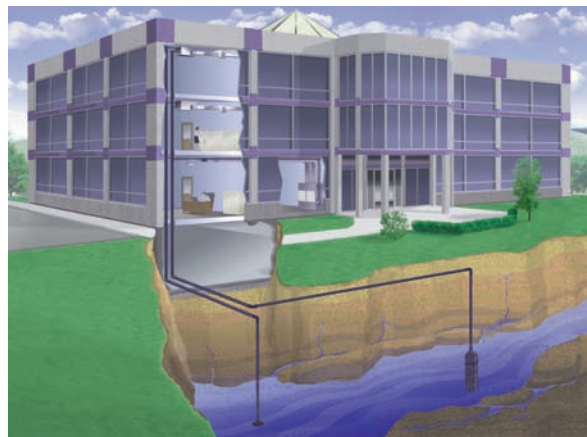


Open Loop Well Water

Applications: ISO Standard 13256-1

"Open Loop" well water systems use ground water to remove or add heat to the interior water loop. The key benefit of an open loop system is the constant water temperature, usually 50°F to 60°F, which provides efficient operation at a low first cost. Most commercial designers incorporate a heat exchanger to isolate the building loop from the well water. Using heat exchangers can reduce maintenance issues while still allowing the transfer of heat from unit to unit as with the "Boiler/Tower System". A successful design provides an ample amount of groundwater (approximately 2 GPM per ton) and adequate provisions for discharging water back to the aquifer or surface. Open Loop applications are commonly used in coastal areas where soil characteristics allow reinjection wells to return the water back to the aquifer. Note that some states have requirements on the depths of return water reinjection wells, and such wells must be approved by the United States Environmental Protection Agency. Also, bad water quality can increase problems with heat exchanger scaling. Suspended solids can erode the heat exchanger. Strainers can be used to contain suspended solids.

Figure 8: Open loop well application



Closed Loop Geothermal

Applications: ISO Standard 13256-1

“Vertical Closed Loop” applications are installed by drilling vertical bore holes into the earth and inserting a plastic polyethylene supply/return pipe into the holes. The vertical wells are connected in parallel reverse return fashion to allow the water from the building to circulate evenly throughout the borefield. The circulating fluid dissipates heat to the ground in a similar manner as a “tower” and adds heat back to the loop like a boiler. If properly designed, the loop field can maintain the loop temperatures necessary to condition the building without the use of a boiler or a tower. Loop temperatures usually range from 37°F to 95°F in Northern climates.

Southern applications can see temperatures ranging from 40°F to 100°F. The number of bore holes and their depth should be determined by using commercial software that is specifically designed for vertical geothermal applications. Typical bore depths of a vertical loop range from 150 to 400 feet and generally require about 250 feet of surface area per ton of cooling.

Figure 9: Vertical loop application



A closed loop “Horizontal” geothermal application is similar to a vertical loop application with the exception that the loops are installed in trenches approximately 5 feet below the ground surface. The piping may be installed using a “four-pipe” or “six-pipe” design and could require 1,500 to 2,000 square feet of surface area per ton of cooling. Loop temperatures for a commercial application can range from 35°F to 95°F in Northern climates. Southern climates can see temperatures ranging from 40°F to 100°F. Horizontal loops are generally not applied in urban areas because land use and costs can be prohibitive. New advances in installation procedures have improved the assembly time of horizontal loops while keeping the first cost lower than a vertical loop.

Figure 10: Horizontal loop application



A “Surface Water” or “Lake” closed loop system is a geothermal loop that is directly installed in a lake or body of water that is near the building. In many cases, the body of water is constructed on the building site to meet drainage or aesthetic requirements. Surface loops use bundled polyethylene coils that are connected in the same manner as a vertical or horizontal loop using a parallel reverse return design. The size and the depth of the lake is critical. Commercial design services should be used to certify that a given body of water is sufficient to withstand the building loads. Loop temperatures usually range from 35°F to 90°F and prove to be the best cooling performer and lowest cost loop option of the three geothermal loops. Some applications may not be good candidates due to public access or debris problems from flooding.

Figure 11: Surface water loop application



Unit Size 009 (310 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power In-put (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
20	1.5	1.5	3.4	65/55	Tinted Area = Operation Not Recommended EWT = Entering Water Temperature GPM = Gallons Per Minute WPD = Water Pressure Drop Ft of W.C. = Foot of Water Column EAT = Entering Air Temperature Btuh/hr = British thermal units per hour kW = Kilowatts EER = Energy Efficiency Ratio THR = Total Heat of Rejection THA = Total Heat of Absorption LAT = Leaving Air Temperature COP = Coefficient of Performance					6000	0.629	3900	84	2.79
		1.5	3.4	70/59						5800	0.651	3600	87	2.61
		1.5	3.4	75/63						5600	0.678	3300	92	2.42
		1.5	3.4	80/67						5400	0.705	3000	96	2.24
		1.5	3.4	85/71										
	2.3	3.1	7.0	65/55						6200	0.634	4000	84	2.86
		3.1	7.0	70/59						6000	0.656	3800	88	2.68
		3.1	7.0	75/63						5800	0.683	3500	92	2.49
		3.1	7.0	80/67						5600	0.711	3200	97	2.31
		3.1	7.0	85/71										
	3.0	5.1	11.7	65/55						6400	0.640	4200	85	2.93
		5.1	11.7	70/59						6300	0.662	4000	89	2.79
		5.1	11.7	75/63						6100	0.689	3700	93	2.59
		5.1	11.7	80/67						5900	0.716	3500	98	2.41
		5.1	11.7	85/71										
30	1.5	1.4	3.3	65/55	6900	0.657	4700	86	3.07					
		1.4	3.3	70/59	10300	7300	0.428	11800	24.1	6700	0.679	4400	90	2.89
		1.4	3.3	75/63	11200	7500	0.423	12600	26.4	6500	0.706	4100	94	2.69
		1.4	3.3	80/67	12000	7800	0.419	13400	28.6	6300	0.734	3800	99	2.51
		1.4	3.3	85/71	12800	8000	0.415	14200	30.9					
	2.3	3.0	6.8	65/55	9600	7300	0.409	11000	23.5	7100	0.663	4800	87	3.14
		3.0	6.8	70/59	10400	7300	0.405	11800	25.7	7000	0.685	4700	91	2.99
		3.0	6.8	75/63	11300	7500	0.400	12700	28.2	6800	0.712	4400	95	2.80
		3.0	6.8	80/67	12100	7800	0.396	13500	30.5	6600	0.739	4100	100	2.61
		3.0	6.8	85/71	12900	8000	0.392	14200	32.9					
	3.0	5.0	11.4	65/55	9700	7300	0.386	11000	25.1	7400	0.668	5100	88	3.24
		5.0	11.4	70/59	10500	7300	0.382	11800	27.5	7200	0.690	4800	91	3.06
		5.0	11.4	75/63	11400	7600	0.377	12700	30.2	7000	0.717	4600	96	2.86
		5.0	11.4	80/67	12200	7800	0.373	13500	32.7	6800	0.744	4300	100	2.67
		5.0	11.4	85/71	13000	8000	0.369	14300	35.3					
40	1.5	1.4	3.2	65/55	8900	7100	0.481	10500	18.5	7900	0.687	5600	89	3.37
		1.4	3.2	70/59	9700	7100	0.476	11300	20.4	7800	0.708	5400	93	3.22
		1.4	3.2	75/63	10600	7300	0.472	12200	22.5	7600	0.736	5100	98	3.03
		1.4	3.2	80/67	11400	7600	0.468	13000	24.4	7400	0.763	4800	102	2.84
		1.4	3.2	85/71	12200	7800	0.463	13800	26.3					
	2.3	2.9	6.6	65/55	9000	7100	0.458	10600	19.7	8200	0.692	5800	90	3.47
		2.9	6.6	70/59	9800	7100	0.453	11300	21.6	8000	0.714	5600	94	3.28
		2.9	6.6	75/63	10700	7300	0.449	12200	23.8	7800	0.741	5300	98	3.08
		2.9	6.6	80/67	11500	7600	0.445	13000	25.9	7600	0.768	5000	103	2.90
		2.9	6.6	85/71	12300	7800	0.440	13800	27.9					
	3.0	4.8	11.0	65/55	9100	7100	0.435	10600	20.9	8400	0.697	6000	91	3.53
		4.8	11.0	70/59	10000	7100	0.430	11500	23.2	8300	0.719	5800	95	3.38
		4.8	11.0	75/63	10800	7300	0.426	12300	25.3	8100	0.746	5600	99	3.18
		4.8	11.0	80/67	11600	7600	0.422	13000	27.5	7900	0.774	5300	103	2.99
		4.8	11.0	85/71	12400	7800	0.417	13800	29.7					
50	1.5	1.4	3.1	65/55	8300	6900	0.536	10100	15.5	9100	0.716	6700	93	3.72
		1.4	3.1	70/59	9200	6800	0.531	11000	17.3	8900	0.737	6400	96	3.53
		1.4	3.1	75/63	10000	7100	0.527	11800	19.0	8700	0.765	6100	101	3.33
		1.4	3.1	80/67	10800	7300	0.523	12600	20.7	8500	0.792	5800	105	3.14
		1.4	3.1	85/71	11600	7500	0.518	13400	22.4					
	2.3	2.8	6.4	65/55	8400	6900	0.513	10200	16.4	9300	0.721	6800	94	3.78
		2.8	6.4	70/59	9300	6900	0.508	11000	18.3	9100	0.743	6600	97	3.59
		2.8	6.4	75/63	10100	7100	0.504	11800	20.0	9000	0.770	6400	102	3.42
		2.8	6.4	80/67	10900	7300	0.500	12600	21.8	8800	0.797	6100	106	3.23
		2.8	6.4	85/71	11700	7600	0.495	13400	23.6					
	3.0	4.7	10.8	65/55	8500	6900	0.490	10200	17.4	9600	0.726	7100	95	3.87
		4.7	10.8	70/59	9400	6900	0.485	11100	19.4	9400	0.748	6800	98	3.68
		4.7	10.8	75/63	10200	7100	0.481	11800	21.2	9200	0.775	6600	102	3.47
		4.7	10.8	80/67	11000	7300	0.477	12600	23.1	9000	0.803	6300	107	3.28
		4.7	10.8	85/71	11900	7600	0.472	13500	25.2					
60	1.5	1.3	3.0	65/55	7700	6600	0.596	9700	12.9	10200	0.743	7700	96	4.02
		1.3	3.0	70/59	8600	6600	0.592	10600	14.5	10100	0.765	7500	100	3.86
		1.3	3.0	75/63	9400	6800	0.587	11400	16.0	9900	0.792	7200	104	3.66
		1.3	3.0	80/67	10200	7000	0.583	12200	17.5	9700	0.820	6900	109	3.47
		1.3	3.0	85/71	11000	7300	0.579	13000	19.0					
	2.3	2.7	6.3	65/55	7800	6600	0.573	9800	13.6	10500	0.749	7900	97	4.11
		2.7	6.3	70/59	8700	6600	0.569	10600	15.3	10300	0.771	7700	101	3.91
		2.7	6.3	75/63	9500	6800	0.564	11400	16.8	10100	0.798	7400	105	3.71
		2.7	6.3	80/67	10300	7100	0.560	12200	18.4	9900	0.825	7100	109	3.51
		2.7	6.3	85/71	11100	7300	0.556	13000	20.0					
	3.0	4.6	10.5	65/55	8000	6600	0.550	9900	14.5	10700	0.754	8100	98	4.15
		4.6	10.5	70/59	8800	6600	0.546	10700	16.1	10500	0.776	7800	101	3.96
		4.6	10.5	75/63	9600	6800	0.541	11400	17.7	10300	0.803	7600	106	3.75
		4.6	10.5	80/67	10400	7100	0.537	12200	19.4	10100	0.830	7300	110	3.56
		4.6	10.5	85/71	11300	7300	0.533	13100	21.2					

Unit Size 009 (310 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	1.5	1.3	3.0	65/55	7100	6300	0.661	9400	10.7	11300	0.769	8700	100	4.30
		1.3	3.0	70/59	8000	6300	0.657	10200	12.2	11200	0.791	8500	103	4.15
		1.3	3.0	75/63	8800	6500	0.652	11000	13.5	11000	0.818	8200	108	3.94
		1.3	3.0	80/67	9600	6700	0.648	11800	14.8	10800	0.845	7900	112	3.74
		1.3	3.0	85/71	10400	7000	0.644	12600	16.2					
	2.3	2.7	6.1	65/55	7200	6300	0.638	9400	11.3	11600	0.775	9000	100	4.39
		2.7	6.1	70/59	8100	6300	0.634	10300	12.8	11400	0.796	8700	104	4.19
		2.7	6.1	75/63	8900	6500	0.629	11000	14.1	11200	0.824	8400	108	3.98
		2.7	6.1	80/67	9700	6800	0.625	11800	15.5	11000	0.851	8100	113	3.79
		2.7	6.1	85/71	10500	7000	0.621	12600	16.9					
	3.0	4.5	10.3	65/55	7400	6300	0.615	9500	12.0	11800	0.780	9100	101	4.43
		4.5	10.3	70/59	8200	6300	0.611	10300	13.4	11700	0.802	9000	105	4.27
		4.5	10.3	75/63	9000	6500	0.606	11100	14.8	11500	0.829	8700	109	4.06
		4.5	10.3	80/67	9800	6800	0.602	11900	16.3	11300	0.856	8400	114	3.86
		4.5	10.3	85/71	10700	7000	0.598	12700	17.9					
80	1.5	1.3	2.9	65/55	6500	6000	0.731	9000	8.9	12400	0.792	9700	103	4.59
		1.3	2.9	70/59	7400	6000	0.726	9900	10.2	12200	0.813	9400	106	4.39
		1.3	2.9	75/63	8200	6200	0.722	10700	11.4	12000	0.841	9100	111	4.18
		1.3	2.9	80/67	9000	6400	0.718	11500	12.5	11800	0.868	8800	115	3.98
		1.3	2.9	85/71	9800	6700	0.713	12200	13.7					
	2.3	2.6	6.0	65/55	6600	6000	0.708	9000	9.3	12600	0.797	9900	103	4.63
		2.6	6.0	70/59	7500	6000	0.703	9900	10.7	12400	0.819	9600	107	4.43
		2.6	6.0	75/63	8300	6200	0.699	10700	11.9	12200	0.846	9300	111	4.22
		2.6	6.0	80/67	9100	6400	0.695	11500	13.1	12000	0.873	9000	116	4.02
		2.6	6.0	85/71	9900	6700	0.690	12300	14.3					
	3.0	4.4	10.1	65/55	6700	6000	0.685	9000	9.8	12800	0.802	10100	104	4.67
		4.4	10.1	70/59	7600	6000	0.680	9900	11.2	12700	0.824	9900	108	4.51
		4.4	10.1	75/63	8400	6200	0.676	10700	12.4	12500	0.851	9600	112	4.30
		4.4	10.1	80/67	9200	6500	0.672	11500	13.7	12300	0.879	9300	117	4.10
		4.4	10.1	85/71	10100	6700	0.667	12400	15.1					
90	1.5	1.2	2.9	65/55	5900	5700	0.804	8600	7.3	13300	0.810	10500	106	4.81
		1.2	2.9	70/59	6700	5600	0.799	9400	8.4	13100	0.832	10300	109	4.61
		1.2	2.9	75/63	7600	5900	0.795	10300	9.6	12900	0.859	10000	113	4.40
		1.2	2.9	80/67	8400	6100	0.791	11100	10.6	12700	0.886	9700	118	4.20
		1.2	2.9	85/71	9200	6300	0.786	11900	11.7					
	2.3	2.6	5.9	65/55	6000	5700	0.781	8700	7.7	13500	0.815	10700	106	4.85
		2.6	5.9	70/59	6800	5700	0.776	9500	8.8	13300	0.837	10400	110	4.65
		2.6	5.9	75/63	7700	5900	0.772	10300	10.0	13100	0.864	10100	114	4.44
		2.6	5.9	80/67	8500	6100	0.768	11100	11.1	12900	0.892	9900	118	4.24
		2.6	5.9	85/71	9300	6400	0.763	11900	12.2					
	3.0	4.3	9.9	65/55	6100	5700	0.758	8700	8.1	13800	0.821	11000	107	4.92
		4.3	9.9	70/59	7000	5700	0.753	9600	9.3	13600	0.843	10700	110	4.73
		4.3	9.9	75/63	7800	5900	0.749	10400	10.4	13400	0.870	10400	115	4.51
		4.3	9.9	80/67	8600	6100	0.745	11100	11.6	13200	0.897	10100	119	4.31
		4.3	9.9	85/71	9400	6400	0.740	11900	12.7					
100	1.5	1.2	2.8	65/55	5300	5300	0.879	8300	6.0	<p>Tint = Operation Not Recommended</p> <p>Notes:</p> <ol style="list-style-type: none"> Operation below 40°F EWT is based upon a 15% methanol antifreeze solution. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated. See performance correction tables for operating conditions other than those listed. Interpolation is permissible; extrapolation is not. For performance data outside the EAT listed, refer to the Daikin SelectTools selection program Table does not reflect fan or pump power corrections for AHRI/ISO conditions. Data is base on unit at full load operation. 				
		1.2	2.8	70/59	6100	5300	0.875	9100	7.0					
		1.2	2.8	75/63	6900	5500	0.871	9900	7.9					
		1.2	2.8	80/67	7800	5800	0.866	10800	9.0					
		1.2	2.8	85/71	8600	6000	0.862	11500	10.0					
	2.3	2.6	5.8	65/55	5400	5300	0.856	8300	6.3					
		2.6	5.8	70/59	6200	5300	0.852	9100	7.3					
		2.6	5.8	75/63	7100	5500	0.848	10000	8.4					
		2.6	5.8	80/67	7900	5800	0.843	10800	9.4					
		2.6	5.8	85/71	8700	6000	0.839	11600	10.4					
	3.0	4.3	9.8	65/55	5500	5300	0.833	8300	6.6					
		4.3	9.8	70/59	6300	5300	0.829	9100	7.6					
		4.3	9.8	75/63	7200	5600	0.825	10000	8.7					
		4.3	9.8	80/67	8000	5800	0.820	10800	9.8					
		4.3	9.8	85/71	8800	6000	0.816	11600	10.8					
110	1.5	1.2	2.8	65/55	4700	4700	0.958	8000	4.9					
		1.2	2.8	70/59	5500	4900	0.953	8800	5.8					
		1.2	2.8	75/63	6300	5200	0.949	9500	6.6					
		1.2	2.8	80/67	7100	5400	0.945	10300	7.5					
		1.2	2.8	85/71	8000	5600	0.940	11200	8.5					
	2.3	2.5	5.8	65/55	4800	4800	0.935	8000	5.1					
		2.5	5.8	70/59	5600	5000	0.930	8800	6.0					
		2.5	5.8	75/63	6400	5200	0.926	9600	6.9					
		2.5	5.8	80/67	7200	5400	0.922	10300	7.8					
		2.5	5.8	85/71	8100	5700	0.917	11200	8.8					
	3.0	4.2	9.7	65/55	4900	4900	0.912	8000	5.4					
		4.2	9.7	70/59	5700	5000	0.907	8800	6.3					
		4.2	9.7	75/63	6500	5200	0.903	9600	7.2					
		4.2	9.7	80/67	7400	5400	0.899	10500	8.2					
		4.2	9.7	85/71	8200	5700	0.894	11300	9.2					

Unit Size 012 (320 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating					
		PSI	Ft of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power In-put (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP	
20	2.0	2.5	5.7	65/55	Tinted Area = Operation Not Recommended EWT = Entering Water Temperature GPM = Gallons Per Minute WPD = Water Pressure Drop Ft of W.C. = Foot of Water Column EAT = Entering Air Temperature Btuh/hr = British thermal units per hour kW = Kilowatts EER = Energy Efficiency Ratio THR = Total Heat of Rejection THA = Total Heat of Absorption LAT = Leaving Air Temperature COP = Coefficient of Performance					7300	0.768	4700	87	2.78	
		2.5	5.7	70/59						7200	0.795	4500	91	2.65	
		2.5	5.7	75/63						6900	0.828	4100	95	2.44	
		2.5	5.7	80/67						6700	0.861	3800	99	2.28	
		2.5	5.7	85/71											
	3.0	5.1	11.7	65/55						7800	0.777	5100	88	2.94	
		5.1	11.7	70/59						7600	0.804	4900	92	2.77	
		5.1	11.7	75/63						7300	0.837	4400	96	2.55	
		5.1	11.7	80/67						7100	0.870	4100	100	2.39	
		5.1	11.7	85/71											
	4.0	8.6	19.7	65/55						8200	0.786	5500	90	3.05	
		8.6	19.7	70/59						8000	0.813	5200	93	2.88	
		8.6	19.7	75/63						7700	0.846	4800	97	2.67	
		8.6	19.7	80/67						7500	0.879	4500	102	2.50	
		8.6	19.7	85/71											
	30	2.0	2.4	5.5						65/55	8500	0.803	5800	90	3.10
			2.4	5.5						70/59	12400	0.830	5500	94	2.93
			2.4	5.5						75/63	13400	0.863	5200	98	2.75
			2.4	5.5						80/67	14300	0.896	4700	102	2.55
			2.4	5.5						85/71	15300	0.929	4200	106	2.35
		3.0	5.0	11.4						65/55	8900	0.812	6100	92	3.21
			5.0	11.4						70/59	12500	0.838	5800	95	3.04
			5.0	11.4						75/63	13500	0.872	5500	99	2.86
			5.0	11.4						80/67	14500	0.905	5100	104	2.65
5.0			11.4	85/71	15500	0.938	4700	108	2.45						
4.0		8.4	19.1	65/55	9300	0.821	6500	93	3.32						
		8.4	19.1	70/59	12700	0.847	6200	96	3.15						
		8.4	19.1	75/63	13700	0.880	5900	101	2.96						
		8.4	19.1	80/67	14700	0.914	5500	105	2.76						
		8.4	19.1	85/71	15700	0.947	5100	109	2.56						
40	2.0	2.3	5.3	65/55	9800	0.839	6900	94	3.42						
		2.3	5.3	70/59	11700	0.865	6600	98	3.25						
		2.3	5.3	75/63	12700	0.898	6200	102	3.03						
		2.3	5.3	80/67	13600	0.932	5900	106	2.86						
		2.3	5.3	85/71	14600	0.965	5500	110	2.68						
	3.0	4.8	11.0	65/55	10200	0.848	7300	95	3.52						
		4.8	11.0	70/59	11800	0.874	7000	99	3.35						
		4.8	11.0	75/63	12800	0.907	6600	103	3.13						
		4.8	11.0	80/67	13800	0.940	6300	107	2.96						
		4.8	11.0	85/71	14800	0.973	5900	111	2.78						
	4.0	8.1	18.5	65/55	10600	0.856	7700	97	3.62						
		8.1	18.5	70/59	12000	0.883	7400	100	3.45						
		8.1	18.5	75/63	13000	0.916	7000	104	3.23						
		8.1	18.5	80/67	14000	0.949	6700	108	3.05						
		8.1	18.5	85/71	15000	0.982	6300	112	2.87						
50	2.0	2.3	5.2	65/55	11200	0.874	8200	98	3.75						
		2.3	5.2	70/59	11000	0.901	7900	102	3.58						
		2.3	5.2	75/63	12000	0.934	7500	106	3.36						
		2.3	5.2	80/67	12900	0.967	7200	110	3.18						
		2.3	5.2	85/71	13900	1.000	6800	114	2.99						
	3.0	4.7	10.8	65/55	11600	0.883	8600	99	3.85						
		4.7	10.8	70/59	11400	0.909	8300	103	3.67						
		4.7	10.8	75/63	11100	0.943	7900	107	3.45						
		4.7	10.8	80/67	10900	0.976	7600	111	3.27						
		4.7	10.8	85/71	11900	1.009	7200	115	3.08						
	4.0	7.9	18.0	65/55	12000	0.892	9000	101	3.94						
		7.9	18.0	70/59	11800	0.918	8700	104	3.76						
		7.9	18.0	75/63	11500	0.951	8300	108	3.54						
		7.9	18.0	80/67	11300	0.985	7900	113	3.36						
		7.9	18.0	85/71	12300	1.018	7500	117	3.17						
60	2.0	2.2	5.1	65/55	12600	0.908	9500	102	4.06						
		2.2	5.1	70/59	10300	0.935	9200	106	3.89						
		2.2	5.1	75/63	11200	0.968	8800	110	3.66						
		2.2	5.1	80/67	12200	1.001	8500	114	3.48						
		2.2	5.1	85/71	13200	1.034	8100	118	3.29						
	3.0	4.6	10.5	65/55	13000	0.917	9900	103	4.15						
		4.6	10.5	70/59	12800	0.943	9600	107	3.97						
		4.6	10.5	75/63	11400	0.977	9200	111	3.75						
		4.6	10.5	80/67	12400	1.010	8900	115	3.57						
		4.6	10.5	85/71	13400	1.043	8500	119	3.38						
	4.0	7.7	17.6	65/55	13400	0.926	10200	105	4.24						
		7.7	17.6	70/59	10600	0.952	9900	108	4.06						
		7.7	17.6	75/63	11600	0.985	9500	112	3.83						
		7.7	17.6	80/67	12600	1.018	9200	117	3.65						
		7.7	17.6	85/71	13600	1.051	8800	121	3.46						

Unit Size 012 (310 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	2.0	2.2	5.0	65/55	8600	7500	0.782	11300	11.0	13900	0.939	10700	106	4.33
		2.2	5.0	70/59	9500	7500	0.776	12200	12.2	13700	0.966	10400	109	4.15
		2.2	5.0	75/63	10500	7800	0.771	13100	13.6	13500	0.999	10100	114	3.96
		2.2	5.0	80/67	11500	8100	0.766	14100	15.0	13300	1.032	9800	118	3.77
	3.0	4.5	10.3	65/55	8700	7500	0.745	11200	11.7	14300	0.948	11100	107	4.42
		4.5	10.3	70/59	9700	7500	0.740	12200	13.1	14100	0.975	10800	111	4.24
		4.5	10.3	75/63	10700	7800	0.735	13200	14.6	13900	1.008	10500	115	4.04
		4.5	10.3	80/67	11700	8100	0.730	14200	16.0	13700	1.041	10100	119	3.85
		4.5	10.3	85/71	12700	8400	0.724	15200	17.5					
		4.0	7.5	17.2	65/55	8900	7600	0.709	11300	12.6	14700	0.957	11400	108
	7.5		17.2	70/59	9900	7500	0.703	12300	14.1	14500	0.983	11100	112	4.32
	7.5		17.2	75/63	10900	7800	0.698	13300	15.6	14300	1.017	10800	116	4.12
7.5	17.2		80/67	11900	8100	0.693	14300	17.2	14100	1.050	10500	121	3.93	
80	2.0	2.1	4.9	65/55	7800	7200	0.864	10800	9.0	15200	0.967	11900	110	4.60
		2.1	4.9	70/59	8800	7100	0.859	11700	10.2	15000	0.993	11600	113	4.42
		2.1	4.9	75/63	9800	7400	0.854	12700	11.5	14800	1.026	11300	118	4.22
		2.1	4.9	80/67	10800	7700	0.849	13700	12.7	14500	1.060	10900	122	4.01
	3.0	4.4	10.1	65/55	8000	7200	0.828	10800	9.7	15600	0.976	12300	111	4.68
		4.4	10.1	70/59	9000	7200	0.823	11800	10.9	15400	1.002	12000	114	4.50
		4.4	10.1	75/63	10000	7400	0.817	12800	12.2	15200	1.035	11700	119	4.30
		4.4	10.1	80/67	11000	7700	0.812	13800	13.5	14900	1.068	11300	123	4.08
		4.4	10.1	85/71	12000	8000	0.807	14800	14.9					
		4.0	7.4	16.9	65/55	8200	7200	0.791	10900	10.4	16000	0.984	12600	112
	7.4		16.9	70/59	9200	7200	0.786	11900	11.7	15800	1.011	12300	115	4.58
	7.4		16.9	75/63	10200	7500	0.781	12900	13.1	15600	1.044	12000	120	4.38
7.4	16.9		80/67	11100	7700	0.776	13700	14.3	15300	1.077	11600	124	4.16	
90	2.0	2.1	4.8	65/55	7100	6800	0.951	10300	7.5	16300	0.989	12900	113	4.82
		2.1	4.8	70/59	8100	6700	0.946	11300	8.6	16100	1.016	12600	116	4.64
		2.1	4.8	75/63	9100	7000	0.941	12300	9.7	15900	1.049	12300	121	4.44
		2.1	4.8	80/67	10100	7300	0.936	13300	10.8	15600	1.082	11900	125	4.22
	3.0	4.3	9.9	65/55	7300	6800	0.915	10400	8.0	16700	0.998	13300	114	4.90
		4.3	9.9	70/59	8300	6800	0.910	11400	9.1	16500	1.025	13000	117	4.72
		4.3	9.9	75/63	9200	7000	0.904	12300	10.2	16300	1.058	12700	122	4.51
		4.3	9.9	80/67	10200	7300	0.899	13300	11.3	16000	1.091	12300	126	4.29
		4.3	9.9	85/71	11200	7600	0.894	14300	12.5					
		4.0	7.3	16.6	65/55	7400	6800	0.878	10400	8.4	17100	1.007	13700	115
	7.3		16.6	70/59	8400	6800	0.873	11400	9.6	16900	1.033	13400	119	4.79
	7.3		16.6	75/63	9400	7100	0.868	12400	10.8	16700	1.066	13100	123	4.59
7.3	16.6		80/67	10400	7300	0.863	13300	12.1	16400	1.100	12600	127	4.37	
100	2.0	2.1	4.7	65/55	6300	6300	1.042	9900	6.0	Tint = Operation Not Recommended Notes: 1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution. 2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated. 3. See performance correction tables for operating conditions other than those listed. 4. Interpolation is permissible; extrapolation is not. 5. For performance data outside the EAT listed, refer to the Daikin SelectTools selection program 6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions. 7. Data is base on unit at full load operation.				
		2.1	4.7	70/59	7300	6300	1.036	10800	7.0					
		2.1	4.7	75/63	8300	6600	1.031	11800	8.0					
		2.1	4.7	80/67	9300	6900	1.026	12800	9.1					
	3.0	4.3	9.8	65/55	6500	6400	1.005	9900	6.5					
		4.3	9.8	70/59	7500	6400	1.000	10900	7.5					
		4.3	9.8	75/63	8500	6600	0.995	11900	8.5					
		4.3	9.8	80/67	9500	6900	0.990	12900	9.6					
		4.3	9.8	85/71	10500	7200	0.984	13900	10.7					
		4.0	7.2	16.4	65/55	6700	6400	0.968	10000					
	7.2		16.4	70/59	7700	6400	0.963	11000	8.0					
	7.2		16.4	75/63	8700	6700	0.958	12000	9.1					
7.2	16.4		80/67	9700	6900	0.953	13000	10.2						
110	2.0	2.0	4.7	65/55	5600	5600	1.135	9500	4.9					
		2.0	4.7	70/59	6600	5900	1.129	10500	5.8					
		2.0	4.7	75/63	7600	6200	1.124	11400	6.8					
		2.0	4.7	80/67	8600	6500	1.119	12400	7.7					
	3.0	4.2	9.7	65/55	5800	5800	1.098	9500	5.3					
		4.2	9.7	70/59	6800	5900	1.093	10500	6.2					
		4.2	9.7	75/63	7700	6200	1.088	11400	7.1					
		4.2	9.7	80/67	8700	6500	1.083	12400	8.0					
		4.2	9.7	85/71	9700	6800	1.077	13400	9.0					
		4.0	7.1	16.2	65/55	5900	5900	1.061	9500	5.6				
	7.1		16.2	70/59	6900	6000	1.056	10500	6.5					
	7.1		16.2	75/63	7900	6200	1.051	11500	7.5					
7.1	16.2		80/67	8900	6500	1.046	12500	8.5						
7.1	16.2	85/71	9900	6800	1.041	13500	9.5							

Unit Size 015 (420 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	2.5	1.5	3.5	65/55	11300	8500	0.969	14600	11.7	18300	1.207	14200	106	4.44
		1.5	3.5	70/59	12300	8600	0.965	15600	12.7	18000	1.243	13800	109	4.24
		1.5	3.5	75/63	13400	9100	0.962	16700	13.9	17700	1.287	13300	114	4.03
		1.5	3.5	80/67	14400	9500	0.959	17700	15.0	17400	1.332	12900	118	3.83
	3.8	1.5	3.5	85/71	15500	10000	0.956	18800	16.2					
		3.1	7.1	65/55	11400	8500	0.940	14600	12.1	18500	1.216	14300	107	4.46
		3.1	7.1	70/59	12400	8600	0.937	15600	13.2	18300	1.251	14000	110	4.28
		3.1	7.1	75/63	13500	9100	0.934	16700	14.5	18000	1.296	13600	114	4.07
		3.1	7.1	80/67	14600	9500	0.931	17800	15.7	17700	1.340	13100	119	3.87
	5.0	3.1	7.1	85/71	15600	10000	0.928	18800	16.8					
		5.2	11.8	65/55	11500	8500	0.912	14600	12.6	18800	1.224	14600	107	4.50
		5.2	11.8	70/59	12600	8600	0.908	15700	13.9	18600	1.260	14300	111	4.32
5.2		11.8	75/63	13600	9100	0.905	16700	15.0	18200	1.304	13700	115	4.09	
80	2.5	5.2	11.8	80/67	14700	9500	0.902	17800	16.3	17900	1.349	13300	119	3.89
		5.2	11.8	85/71	15800	10000	0.899	18900	17.6					
		1.5	3.4	65/55	10700	8300	1.074	14400	10.0	19800	1.261	15500	109	4.60
		1.5	3.4	70/59	11700	8400	1.071	15400	10.9	19600	1.296	15200	113	4.43
	3.8	1.5	3.4	75/63	12800	8900	1.068	16400	12.0	19200	1.341	14600	117	4.19
		1.5	3.4	80/67	13800	9300	1.065	17400	13.0	18900	1.385	14200	121	4.00
		1.5	3.4	85/71	14900	9800	1.062	18500	14.0					
		3.1	7.0	65/55	10800	8300	1.045	14400	10.3	20100	1.269	15800	110	4.64
		3.1	7.0	70/59	11800	8400	1.042	15400	11.3	19800	1.305	15300	113	4.44
	5.0	3.1	7.0	75/63	12900	8900	1.039	16400	12.4	19500	1.349	14900	118	4.23
		3.1	7.0	80/67	14000	9300	1.036	17500	13.5	19200	1.394	14400	122	4.03
		3.1	7.0	85/71	15000	9800	1.033	18500	14.5					
5.1		11.6	65/55	10900	8300	1.017	14400	10.7	20300	1.278	15900	111	4.65	
5.1		11.6	70/59	12000	8400	1.014	15500	11.8	20100	1.313	15600	114	4.48	
90	2.5	5.1	11.6	75/63	13000	8900	1.011	16500	12.9	19800	1.358	15200	118	4.27
		5.1	11.6	80/67	14100	9300	1.008	17500	14.0	19400	1.402	14600	123	4.05
		5.1	11.6	85/71	15100	9800	1.005	18500	15.0					
		1.5	3.3	65/55	9900	8000	1.186	13900	8.3	21200	1.311	16700	112	4.73
	3.8	1.5	3.3	70/59	11000	8100	1.182	15000	9.3	21000	1.347	16400	116	4.57
		1.5	3.3	75/63	12000	8600	1.179	16000	10.2	20600	1.391	15800	120	4.34
		1.5	3.3	80/67	13100	9100	1.176	17100	11.1	20300	1.436	15400	125	4.14
		1.5	3.3	85/71	14200	9500	1.174	18200	12.1					
		3.0	6.9	65/55	10100	8000	1.157	14100	8.7	21500	1.320	17000	113	4.77
	5.0	3.0	6.9	70/59	11100	8100	1.154	15000	9.6	21200	1.355	16600	116	4.58
		3.0	6.9	75/63	12200	8600	1.151	16100	10.6	20900	1.400	16100	121	4.37
		3.0	6.9	80/67	13200	9100	1.148	17100	11.5	20600	1.444	15700	125	4.18
3.0		6.9	85/71	14300	9500	1.145	18200	12.5						
5.0		11.4	65/55	10200	8000	1.129	14100	9.0	21700	1.328	17200	114	4.78	
100	2.5	5.0	11.4	70/59	11200	8100	1.125	15000	10.0	21500	1.364	16800	117	4.62
		5.0	11.4	75/63	12300	8600	1.122	16100	11.0	21200	1.408	16400	121	4.41
		5.0	11.4	80/67	13400	9000	1.119	17200	12.0	20800	1.453	15800	126	4.19
		5.0	11.4	85/71	14400	9500	1.116	18200	12.9					
	3.8	1.4	3.3	65/55	9000	7700	1.303	13500	6.9					
		1.4	3.3	70/59	10100	7800	1.300	14500	7.8					
		1.4	3.3	75/63	11200	8200	1.297	15600	8.6					
		1.4	3.3	80/67	12200	8700	1.294	16600	9.4					
		1.4	3.3	85/71	13300	9100	1.291	17700	10.3					
	5.0	3.0	6.8	65/55	9200	7700	1.275	13600	7.2					
		3.0	6.8	70/59	10200	7800	1.272	14500	8.0					
		3.0	6.8	75/63	11300	8200	1.269	15600	8.9					
3.0		6.8	80/67	12300	8700	1.266	16600	9.7						
3.0		6.8	85/71	13400	9100	1.263	17700	10.6						
110	2.5	4.9	11.3	65/55	9300	7700	1.246	13600	7.5					
		4.9	11.3	70/59	10300	7800	1.243	14500	8.3					
		4.9	11.3	75/63	11400	8200	1.240	15600	9.2					
		4.9	11.3	80/67	12500	8700	1.237	16700	10.1					
	3.8	4.9	11.3	85/71	13500	9100	1.234	17700	10.9					
		2.9	6.7	65/55	8100	7200	1.398	12900	5.8					
		2.9	6.7	70/59	9100	7300	1.394	13900	6.5					
		2.9	6.7	75/63	10200	7700	1.391	15000	7.3					
		2.9	6.7	80/67	11200	8200	1.388	15900	8.1					
	5.0	2.9	6.7	85/71	12300	8600	1.385	17000	8.9					
		4.9	11.1	65/55	8200	7200	1.369	12900	6.0					
		4.9	11.1	70/59	9200	7300	1.366	13900	6.7					
4.9		11.1	75/63	10300	7700	1.363	15000	7.6						
4.9		11.1	80/67	11400	8200	1.360	16000	8.4						
		4.9	11.1	85/71	12400	8600	1.357	17000	9.1					

Tint = Operation Not Recommended
Notes:

1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
3. See performance correction tables for operating conditions other than those listed.
4. Interpolation is permissible; extrapolation is not.
5. For performance data outside the EAT listed, refer to the Daikin SelectTools selection program
6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
7. Data is base on unit at full load operation.

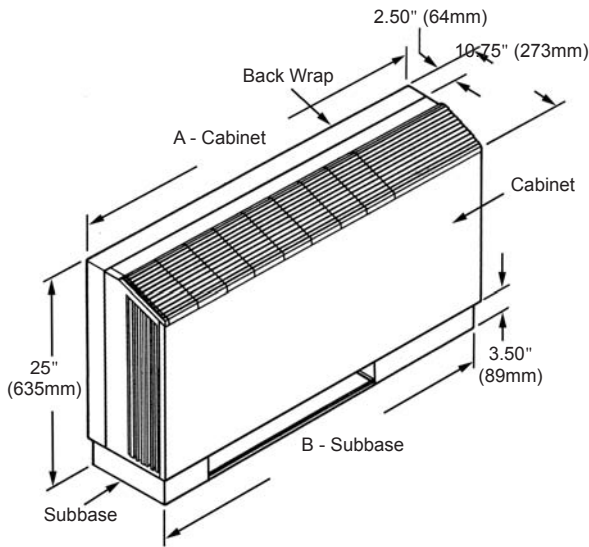
Unit Size 019 (480 SCFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	2.5	1.5	3.5	65/55	14100	10800	1.206	18200	11.7	22600	1.516	17400	109	4.37
		1.5	3.5	70/59	15400	11000	1.202	19500	12.8	22300	1.561	17000	113	4.18
		1.5	3.5	75/63	16800	11500	1.198	20900	14.0	21900	1.617	16400	117	3.97
		1.5	3.5	80/67	18100	12100	1.195	22200	15.2	21500	1.673	15800	121	3.76
	3.8	1.5	3.5	85/71	19400	12700	1.191	23500	16.3					
		3.1	7.1	65/55	14300	10800	1.171	18300	12.2	22900	1.526	17700	110	4.39
		3.1	7.1	70/59	15600	10900	1.167	19600	13.4	22600	1.571	17200	113	4.21
		3.1	7.1	75/63	16900	11500	1.163	20900	14.5	22200	1.628	16600	118	3.99
		3.1	7.1	80/67	18300	12100	1.160	22300	15.8	21800	1.684	16000	122	3.79
		3.1	7.1	85/71	19600	12700	1.156	23500	17.0					
	5.0	5.2	11.8	65/55	14500	10800	1.136	18400	12.8	23300	1.537	18100	111	4.44
		5.2	11.8	70/59	15800	10900	1.132	19700	14.0	23000	1.582	17600	114	4.26
5.2		11.8	75/63	17100	11500	1.128	21000	15.2	22600	1.638	17000	118	4.04	
5.2		11.8	80/67	18400	12100	1.125	22200	16.4	22200	1.695	16400	123	3.84	
5.2	11.8	85/71	19800	12700	1.121	23600	17.7							
80	2.5	1.5	3.4	65/55	13400	10500	1.335	18000	10.0	24500	1.583	19100	113	4.53
		1.5	3.4	70/59	14700	10700	1.331	19200	11.0	24200	1.628	18600	116	4.35
		1.5	3.4	75/63	16000	11300	1.327	20500	12.1	23800	1.685	18000	121	4.14
		1.5	3.4	80/67	17300	11800	1.324	21800	13.1	23400	1.741	17500	125	3.94
	3.8	1.5	3.4	85/71	18700	12400	1.320	23200	14.2					
		3.1	7.0	65/55	13500	10500	1.300	17900	10.4	24800	1.594	19400	114	4.56
		3.1	7.0	70/59	14800	10700	1.296	19200	11.4	24500	1.639	18900	117	4.38
		3.1	7.0	75/63	16200	11300	1.292	20600	12.5	24100	1.695	18300	121	4.16
		3.1	7.0	80/67	17500	11800	1.289	21900	13.6	23700	1.752	17700	125	3.96
		3.1	7.0	85/71	18800	12400	1.285	23200	14.6					
	5.0	5.1	11.6	65/55	13700	10500	1.265	18000	10.8	25200	1.605	19700	114	4.60
		5.1	11.6	70/59	15000	10700	1.261	19300	11.9	24800	1.650	19200	118	4.40
5.1		11.6	75/63	16300	11200	1.257	20600	13.0	24400	1.706	18600	122	4.19	
5.1		11.6	80/67	17700	11800	1.254	22000	14.1	24100	1.762	18100	126	4.00	
5.1	11.6	85/71	19000	12400	1.250	23300	15.2							
90	2.5	1.5	3.3	65/55	12500	10200	1.472	17500	8.5	26300	1.647	20700	116	4.67
		1.5	3.3	70/59	13800	10300	1.468	18800	9.4	25900	1.693	20100	120	4.48
		1.5	3.3	75/63	15100	10900	1.465	20100	10.3	25500	1.749	19500	124	4.27
		1.5	3.3	80/67	16400	11500	1.461	21400	11.2	25200	1.805	19000	128	4.09
	3.8	1.5	3.3	85/71	17800	12100	1.457	22800	12.2					
		3.0	6.9	65/55	12600	10200	1.437	17500	8.8	26600	1.658	20900	117	4.70
		3.0	6.9	70/59	13900	10300	1.433	18800	9.7	26300	1.703	20500	120	4.52
		3.0	6.9	75/63	15300	10900	1.430	20200	10.7	25900	1.760	19900	125	4.31
		3.0	6.9	80/67	16600	11500	1.426	21500	11.6	25500	1.816	19300	129	4.11
		3.0	6.9	85/71	17900	12100	1.422	22800	12.6					
	5.0	5.0	11.4	65/55	12800	10200	1.402	17600	9.1	26900	1.669	21200	118	4.72
		5.0	11.4	70/59	14100	10300	1.398	18900	10.1	26600	1.714	20700	121	4.54
5.0		11.4	75/63	15400	10900	1.395	20200	11.0	26200	1.770	20200	125	4.33	
5.0		11.4	80/67	16800	11500	1.391	21600	12.1	25800	1.827	19600	129	4.14	
5.0	11.4	85/71	18100	12000	1.387	22800	13.0							
100	2.5	1.4	3.3	65/55	11300	9800	1.616	16800	7.0	Tint = Operation Not Recommended Notes: 1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution. 2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated. 3. See performance correction tables for operating conditions other than those listed. 4. Interpolation is permissible; extrapolation is not. 5. For performance data outside the EAT listed, refer to the Daikin SelectTools selection program 6. Table does not reflect fan or pump power corrections for AHR/ISO conditions. 7. Data is base on unit at full load operation.				
		1.4	3.3	70/59	12700	9900	1.613	18200	7.9					
		1.4	3.3	75/63	14000	10500	1.609	19500	8.7					
		1.4	3.3	80/67	15300	11000	1.605	20800	9.5					
	3.8	1.4	3.3	85/71	16700	11600	1.602	22200	10.4					
		3.0	6.8	65/55	11500	9700	1.581	16900	7.3					
		3.0	6.8	70/59	12800	9900	1.578	18200	8.1					
		3.0	6.8	75/63	14200	10500	1.574	19600	9.0					
		3.0	6.8	80/67	15500	11000	1.570	20900	9.9					
		3.0	6.8	85/71	16800	11600	1.567	22200	10.7					
	5.0	4.9	11.3	65/55	11700	9700	1.547	17000	7.6					
		4.9	11.3	70/59	13000	9900	1.543	18300	8.4					
4.9		11.3	75/63	14300	10500	1.539	19600	9.3						
4.9		11.3	80/67	15600	11000	1.535	20800	10.2						
4.9	11.3	85/71	17000	11600	1.532	22200	11.1							
110	2.5	1.4	3.3	65/55	10000	9100	1.767	16000	5.7					
		1.4	3.3	70/59	11300	9300	1.763	17300	6.4					
		1.4	3.3	75/63	12600	9800	1.760	18600	7.2					
		1.4	3.3	80/67	14000	10400	1.756	20000	8.0					
	3.8	1.4	3.3	85/71	15300	11000	1.752	21300	8.7					
		2.9	6.7	65/55	10100	9100	1.732	16000	5.8					
		2.9	6.7	70/59	11400	9300	1.728	17300	6.6					
		2.9	6.7	75/63	12800	9800	1.725	18700	7.4					
		2.9	6.7	80/67	14100	10400	1.721	20000	8.2					
		2.9	6.7	85/71	15400	11000	1.717	21300	9.0					
	5.0	4.9	11.1	65/55	10300	9100	1.697	16100	6.1					
		4.9	11.1	70/59	11600	9300	1.693	17400	6.9					
4.9		11.1	75/63	12900	9800	1.690	18700	7.6						
4.9		11.1	80/67	14300	10400	1.686	20100	8.5						
4.9	11.1	85/71	15600	11000	1.682	21300	9.3							

Cabinet & Subbase

High Sill Units – Sizes 009–019

Figure 12: High sill slope top unit



Low Sill Units – Sizes 009–019

Figure 14: Low sill slope top unit

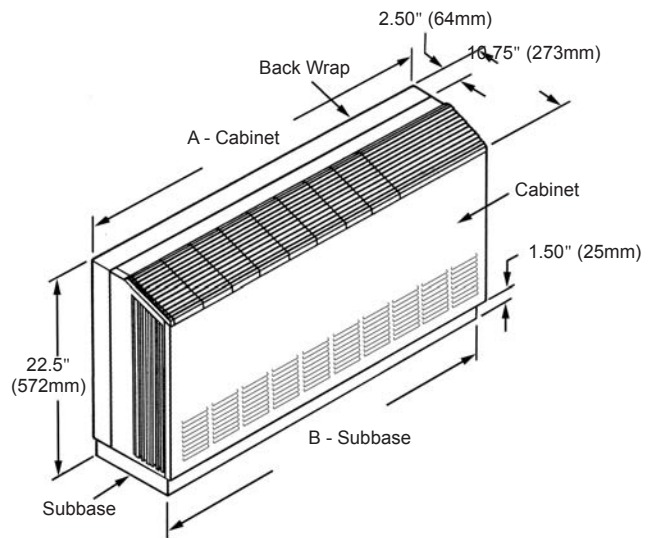


Figure 13: High sill flat top unit

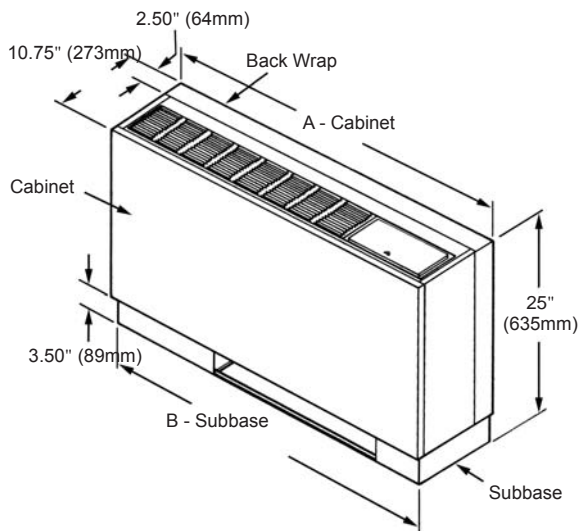


Figure 15: Low sill flat top unit

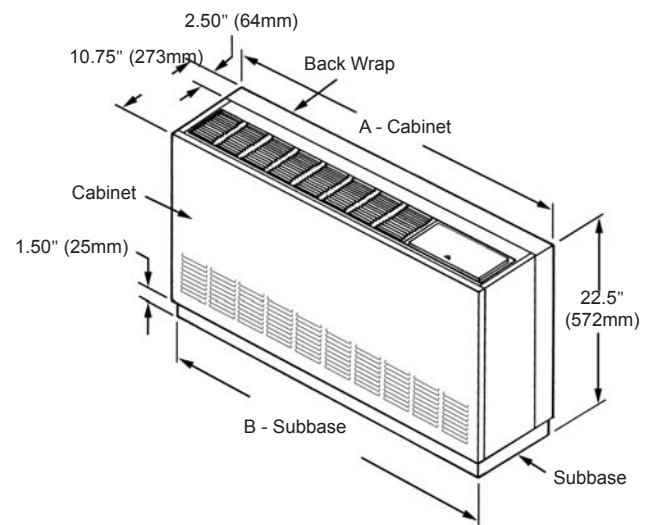
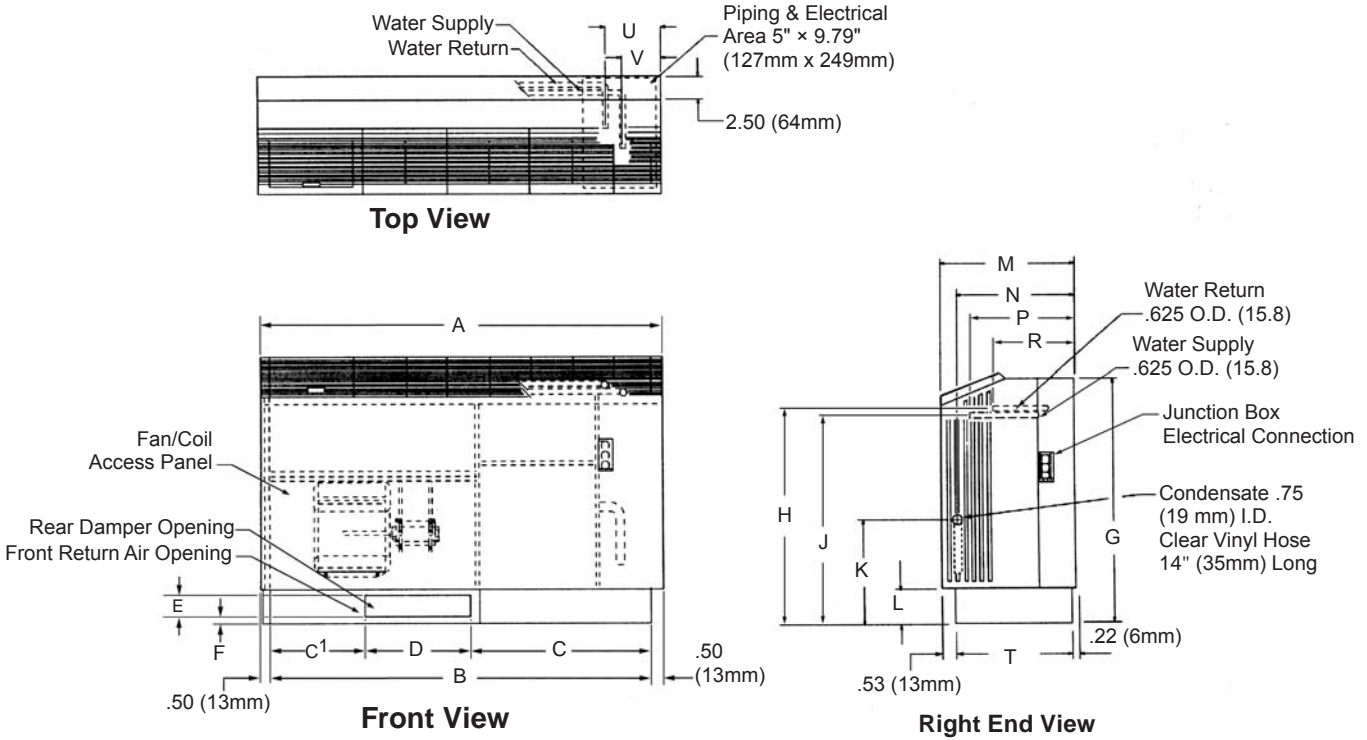


Table 12: Cabinet & subbase dimensions

Unit Size	A - Cabinet		B - Subbase	
	in.	mm	in.	mm
009 – 012	46	1168	45	1143
015 – 019	54	1372	53	1346

Slope Top, High Sill – Right-Hand Piping



Slope Top, High Sill – Left-Hand Piping

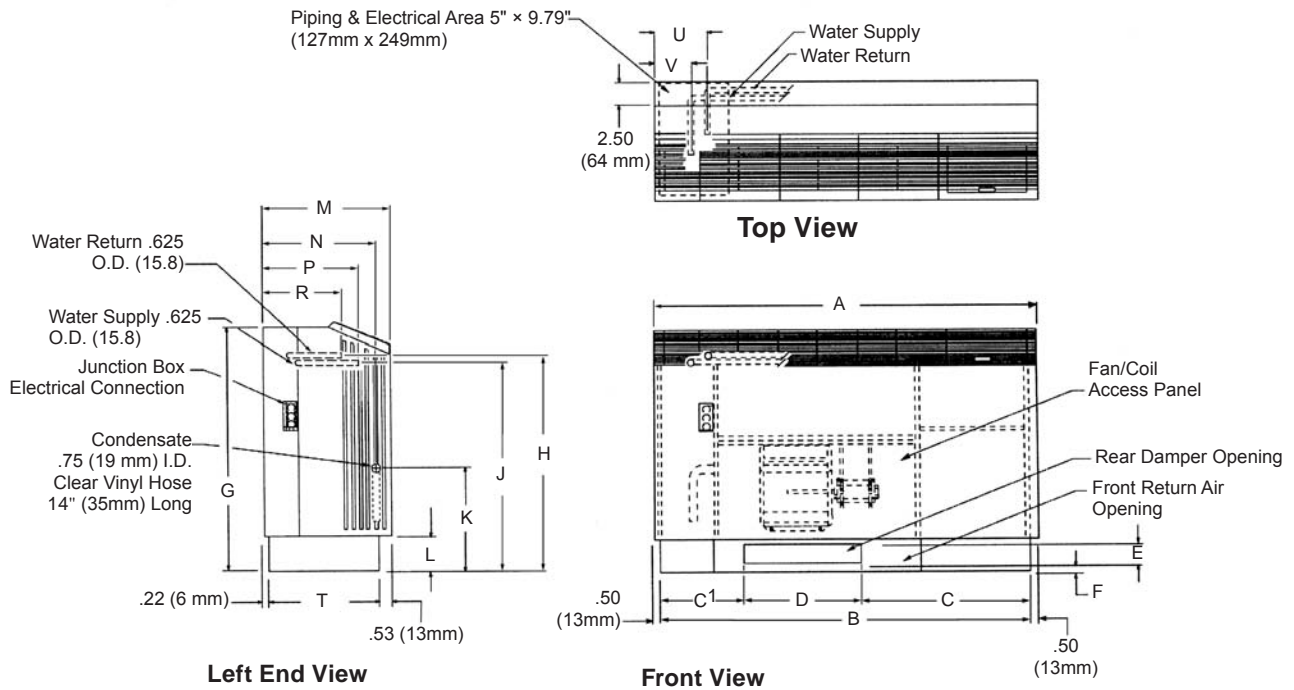
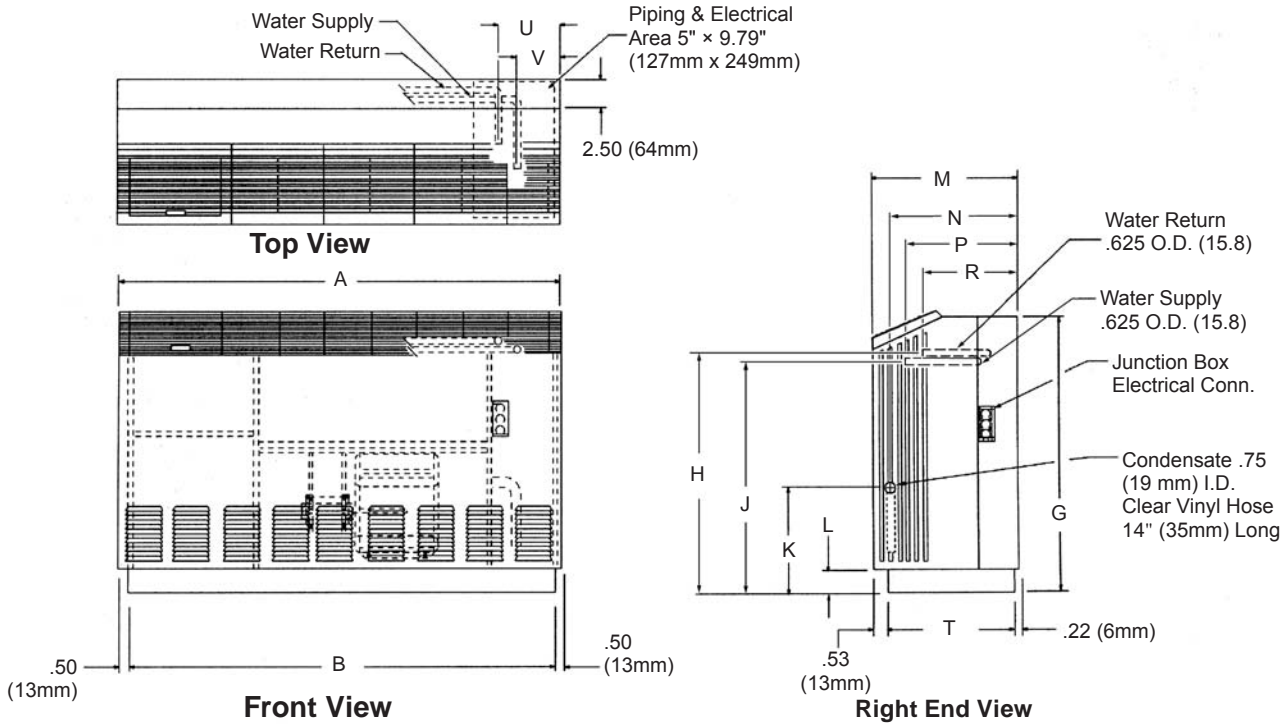


Table 13: Dimensions

Unit Size	A	B	C	C1	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	
009-012	in.	46.00	45.00	21.09	11.38	12.53	2.25	0.52	25.00	23.30	22.45	10.85	3.50	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1168	1143	536	289	318	57	13	635	592	570	276	89	273	232	188	140	254	124	102
015-019	in.	54.00	53.00	22.25	11.38	12.53	2.25	0.52	25.00	23.30	22.45	10.85	3.50	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1372	1346	565	289	318	57	13	635	592	570	276	89	273	232	188	140	254	124	102

Slope Top, Low Sill – Right-Hand Piping



Slope Top, Low Sill – Left-Hand Piping

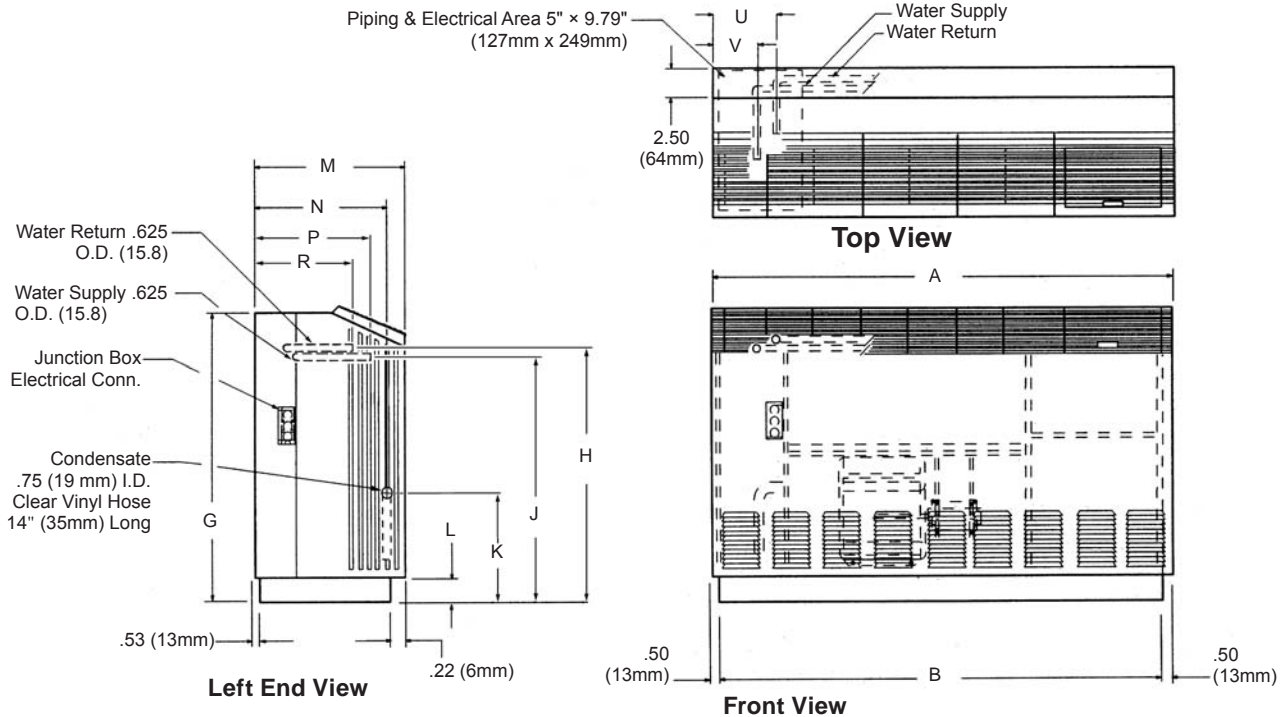
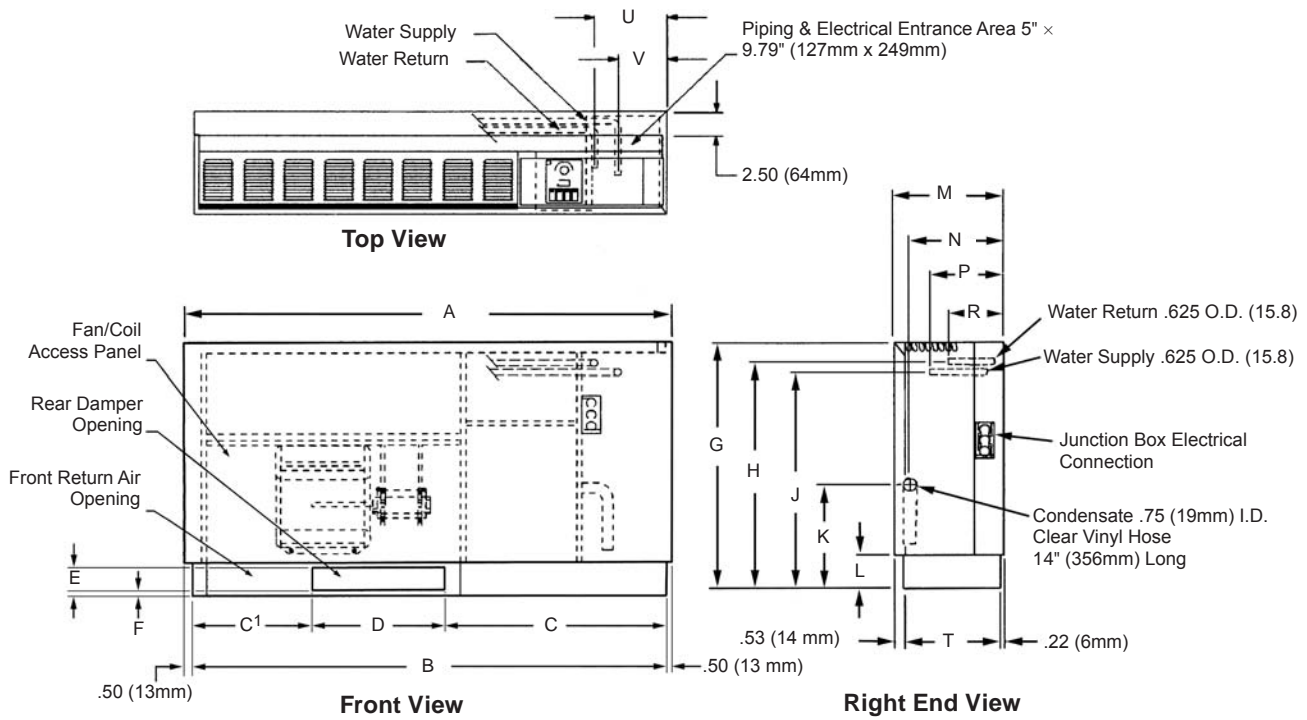


Table 14: Dimensions

Unit Size		A	B	G	H	J	K	L	M	N	P	R	T	U	V
009-012	in.	46.00	45.00	22.50	20.08	19.95	8.35	1.00	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1168	1143	572	510	507	212	25	273	232	188	140	254	124	102
015-019	in.	54.00	53.00	22.50	20.08	19.95	8.35	1.00	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1372	1346	572	510	507	212	25	273	232	188	140	254	124	102

Flat Top, High Sill – Right-Hand Piping



Flat Top, High Sill – Left-Hand Piping

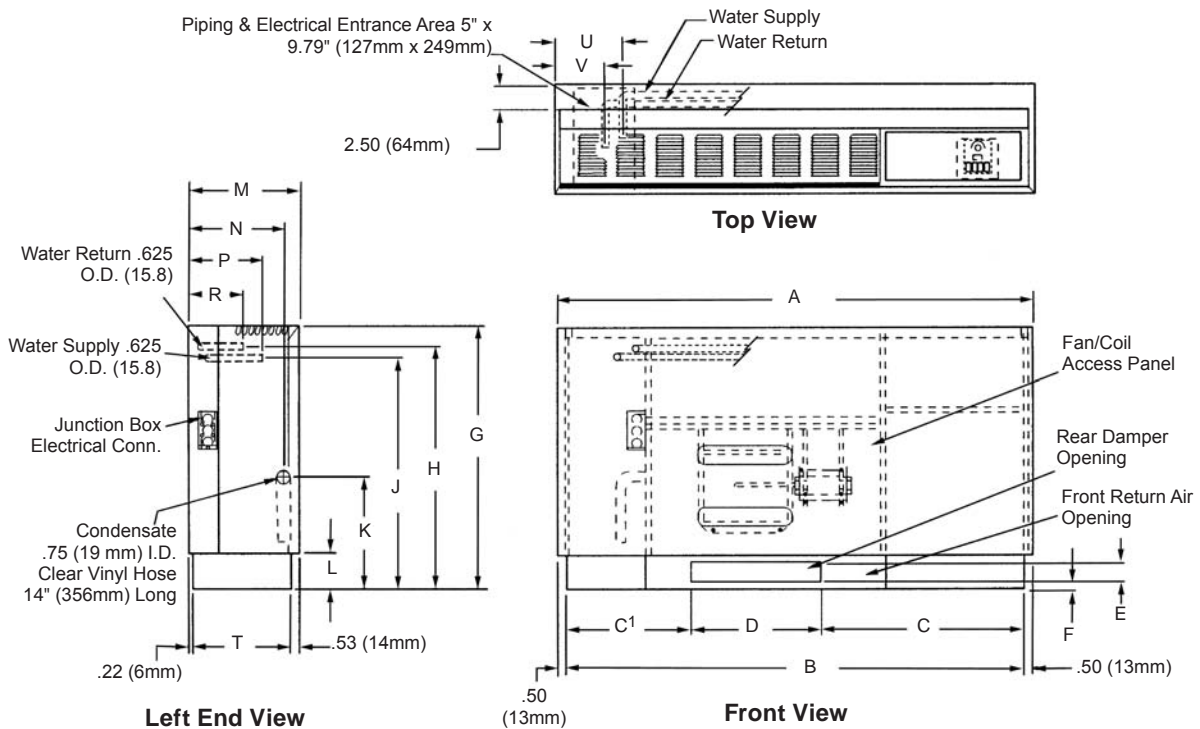
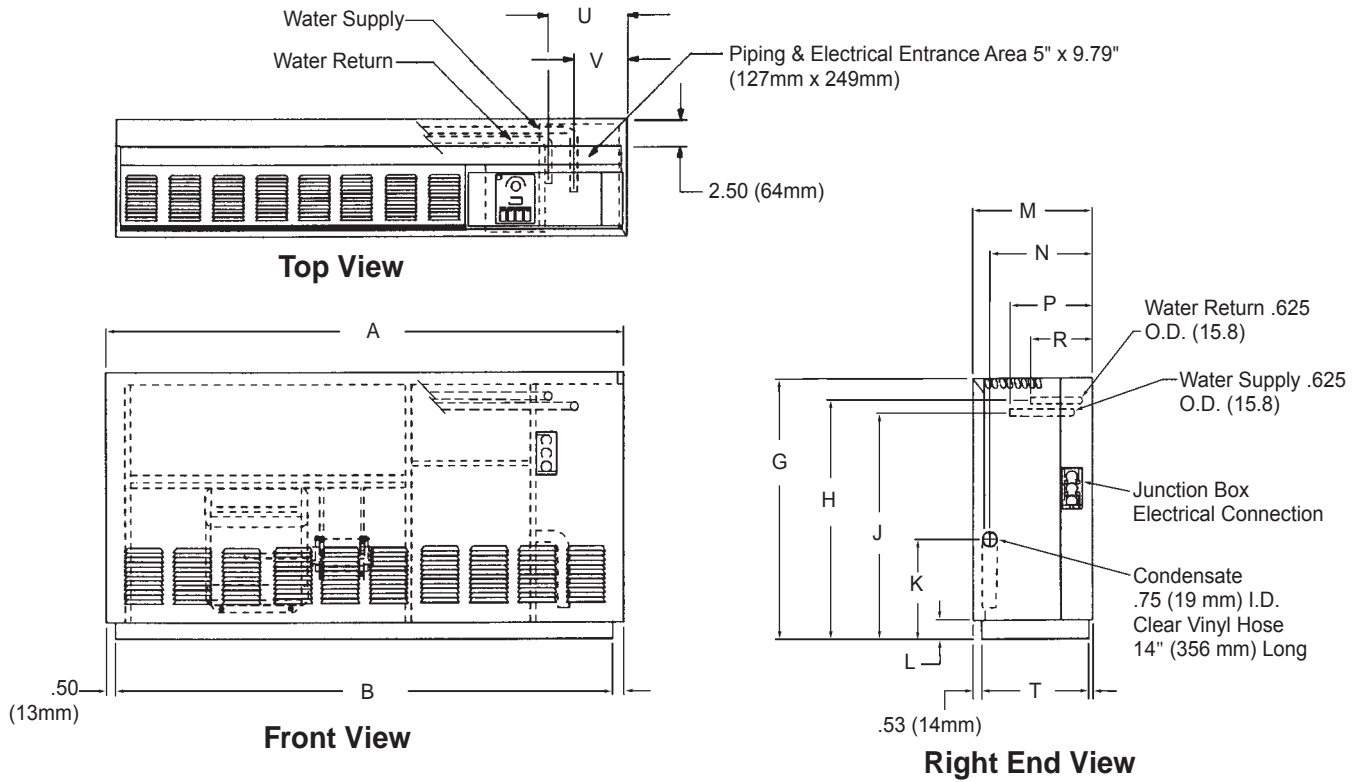


Table 15: Dimensions

Unit Size	A	B	C	C1	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	
009-012	in.	46.00	45.00	21.09	11.38	12.53	2.25	0.52	25.00	23.30	22.45	10.85	3.50	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1168	1143	536	289	318	57	13	635	592	570	276	89	273	232	188	140	254	124	102
015-019	in.	54.00	53.00	22.25	11.38	12.53	2.25	0.52	25.00	23.30	22.45	10.85	3.50	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1372	1346	565	289	318	57	13	635	592	570	276	89	273	232	188	140	254	124	102

Flat Top, Low Sill – Right-Hand Piping



Flat Top, Low Sill – Left-Hand Piping

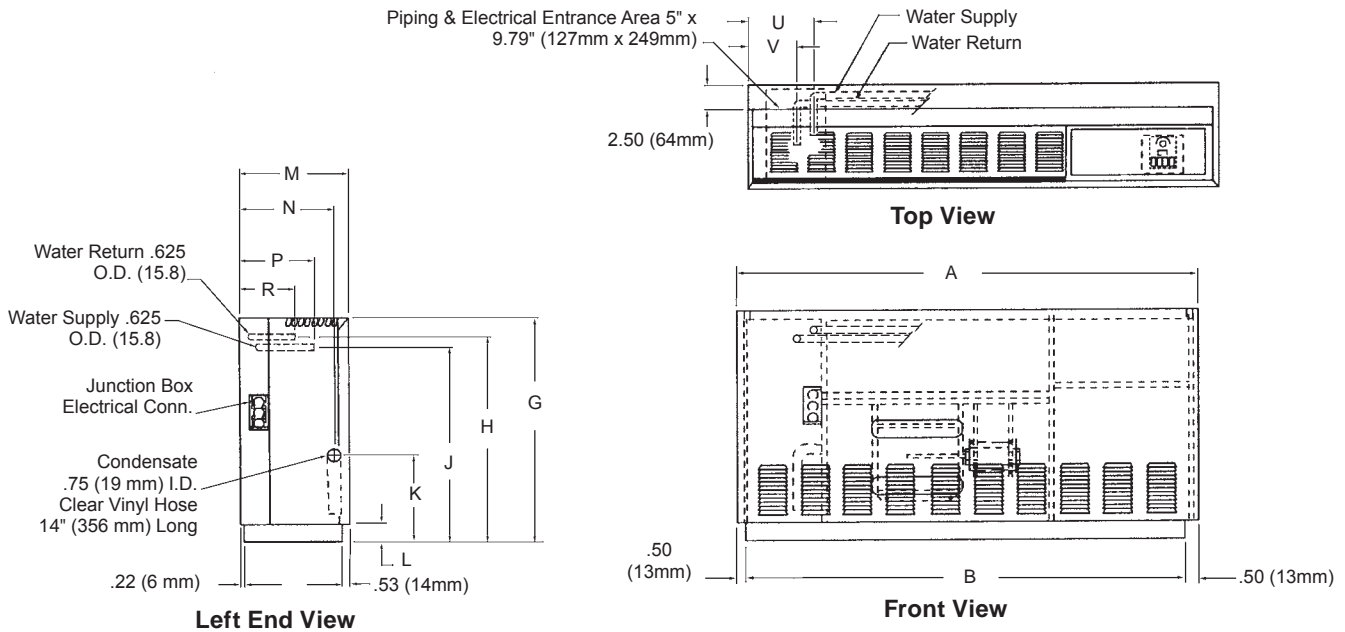
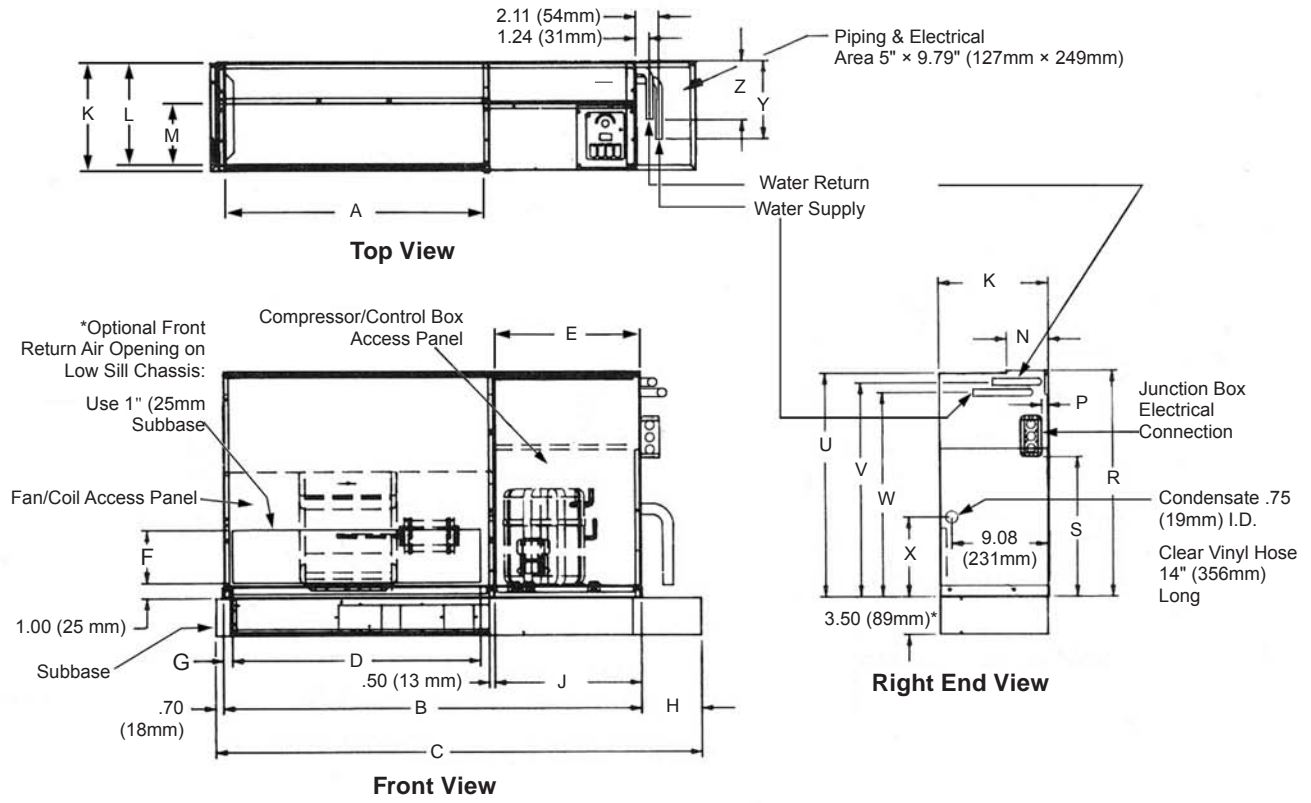


Table 16: Dimensions

Unit Size	A	B	G	H	J	K	L	M	N	P	R	T	U	V	
009-012	in.	46.00	45.00	22.50	20.08	19.95	8.35	1.00	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1168	1143	572	510	507	212	25	273	232	188	140	254	124	102
015-019	in.	54.00	53.00	22.50	20.08	19.95	8.35	1.00	10.75	9.15	7.42	5.53	10.00	4.87	4.00
	mm	1372	1346	572	510	507	212	25	273	232	188	140	254	124	102

Chassis Only with Subbase - Right-Hand Piping

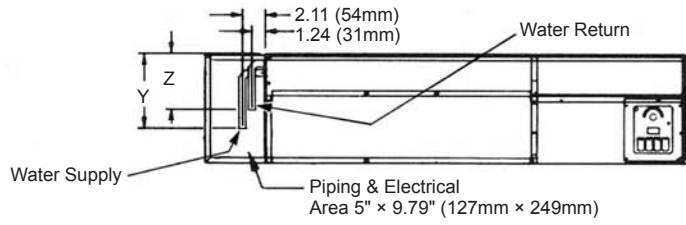


* High Sill - Bottom Return Air uses 3.50" Subbase
 Low Sill - (Optional) Front Return Air use 1.00" Subbase

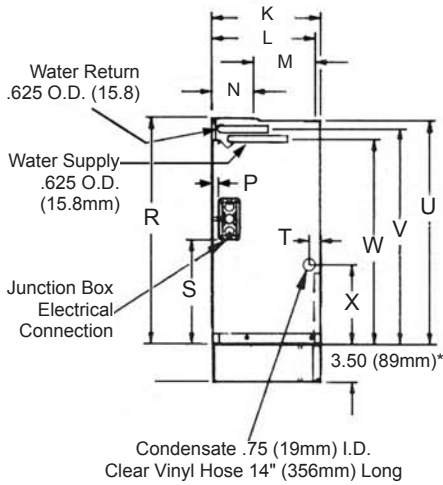
Table 17: Right-hand piping, chasis only with subbase, dimensions in inches (mm)

Unit Size	A	B	C	D	E	F	G	H	J	K	L	M	N
009-012	24.09	38.71	45.00	24.00	14.08	7.00	0.60	5.59	13.60	10.14	9.64	5.76	3.88
	(612)	(983)	(1143)	(610)	(358)	(178)	(15)	(142)	(345)	(258)	(245)	(146)	(99)
015-019	32.09	46.71	53.00	32.00	14.08	7.00	0.60	5.59	13.60	10.14	9.64	5.76	3.88
	(815)	(1186)	(1346)	(813)	(358)	(178)	(15)	(142)	(345)	(258)	(245)	(146)	(99)
	P	R	S	T	U	V	W	X	Y	Z			
009-012	0.62	20.85	9.65	1.06	20.62	19.50	18.50	7.35	7.28	5.40			
	(16)	(530)	(245)	(27)	(524)	(495)	(472)	(187)	(185)	(137)			
015-019	0.62	20.85	9.65	1.06	20.62	19.50	18.50	7.35	7.28	5.40			
	(16)	(530)	(245)	(27)	(524)	(495)	(472)	(187)	(185)	(139)			

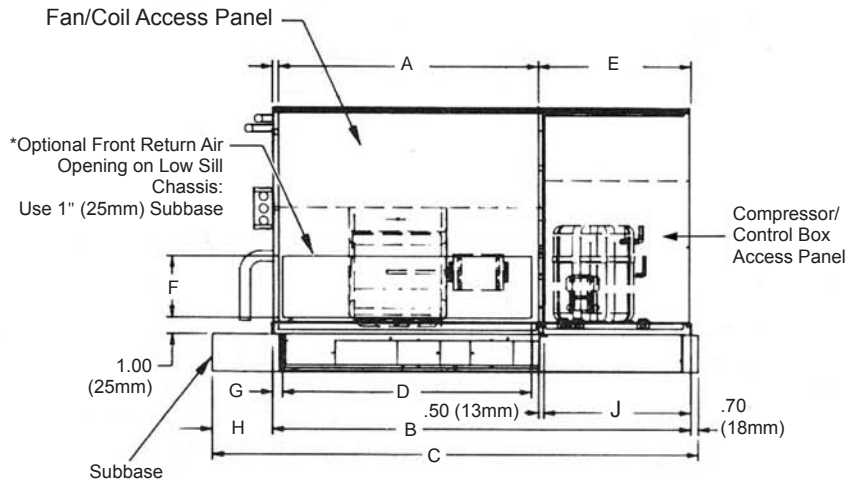
Chassis Only with Subbase - Left-Hand Piping



Top View



Left End View



Front View

* High Sill - Bottom Return Air uses 3.50" Subbase
 Low Sill - (Optional) Front Return Air use 1.00" Subbase

Table 18: Left-hand piping, chassis only with subbase, dimensions in inches (mm)

Unit Size	A	B	C	D	E	F	G	H	J	K	L	M	N
009-012	24.09	38.71	45.00	24.00	14.08	7.00	0.60	5.59	13.60	10.14	9.64	5.76	3.88
	(612)	(983)	(1143)	(610)	(358)	(178)	(15)	(142)	(345)	(258)	(245)	(146)	(99)
015-019	32.09	46.71	53.00	32.00	14.08	7.00	0.60	5.59	13.60	10.14	9.64	5.76	3.88
	(815)	(1186)	(1346)	(813)	(358)	(178)	(15)	(142)	(345)	(258)	(245)	(146)	(99)
	P	R	S	T	U	V	W	X	Y	Z			
009-012	0.62	20.85	9.65	1.06	20.62	19.50	18.50	7.35	7.28	5.40			
	(16)	(530)	(245)	(27)	(524)	(495)	(472)	(187)	(185)	(137)			
015-019	0.62	20.85	9.65	1.06	20.62	19.50	18.50	7.35	7.28	5.40			
	(16)	(530)	(245)	(27)	(524)	(495)	(472)	(187)	(185)	(139)			

Programmable Electronic Thermostat Two-Stage Heat/Two-Stage Cool, 7-Day Programmable (1-Pk, White with Wall Plate)



Features

- Hardwired
- Programmable and configurable
- Simpleset™ feature enables easy copying of one day's programming for the entire week
- Title 24 compliant/No batteries required
- Relay Outputs (minimum voltage drop in thermostat)
- Clear, backlit display makes it easy to see time, temperature, and setpoint — even in the dark
- Ideally suited for: Light commercial/residential (new construction/replacement)
- Lockout feature prevents unwanted tampering
- Optional remote temperature sensor available

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC/VDC)
- 1 amp maximum per terminal
- 4 amp maximum total load
- Easy access terminal block

Temperature Control Ranges:

- 45°F to 90°F (7°C to 32°C), Accuracy: ± 1°F (± 0.5°C)

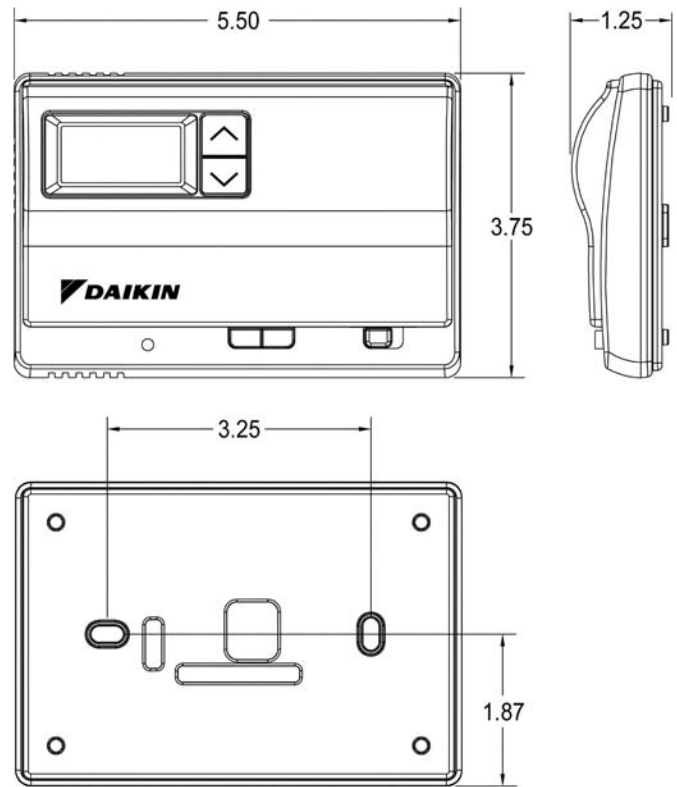
System Configurations:

- Two-stage heat/Two-stage cool

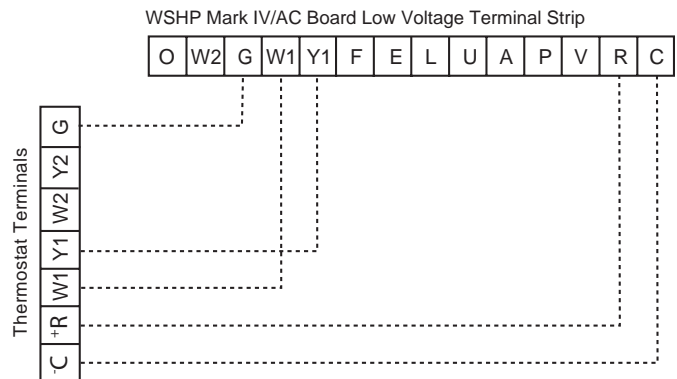
Terminations:

- R, C, W1, Y1, W2, Y2, G, S1, S2

Dimensions



Wiring



Non-Programmable, Auto or Manual Changeover Two Stage Heat/Two Stage Cool, Night Setback Override

(1-Pk, White with Wall Plate)



Features

- Hardwired
- Two-stage heat / two-stage cool systems
- Backlit display
- Field temperature calibration
- Status indicator light
- Relay outputs (minimum voltage drop in thermostat)
- Night set-back override (used when unit is wired through a time clock on the U-terminal)
- Optional remote temperature sensor available

Specifications

Electrical Rating:

- 24 VAC (18 to 30 VAC/VDC)
- 1 amp maximum per terminal
- 4 amp maximum total load
- Easy access terminal block

Temperature Control Ranges:

- 45°F to 90°F (7°C to 32°C), Accuracy: ± 1°F (± 0.5°C)

System Configurations:

- Two-stage heat / two-stage cool

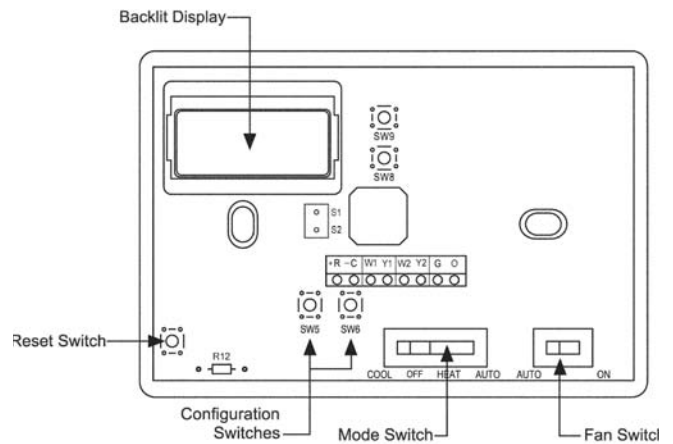
Timing:

- Backlight Operation: 13 seconds after mode change or button press

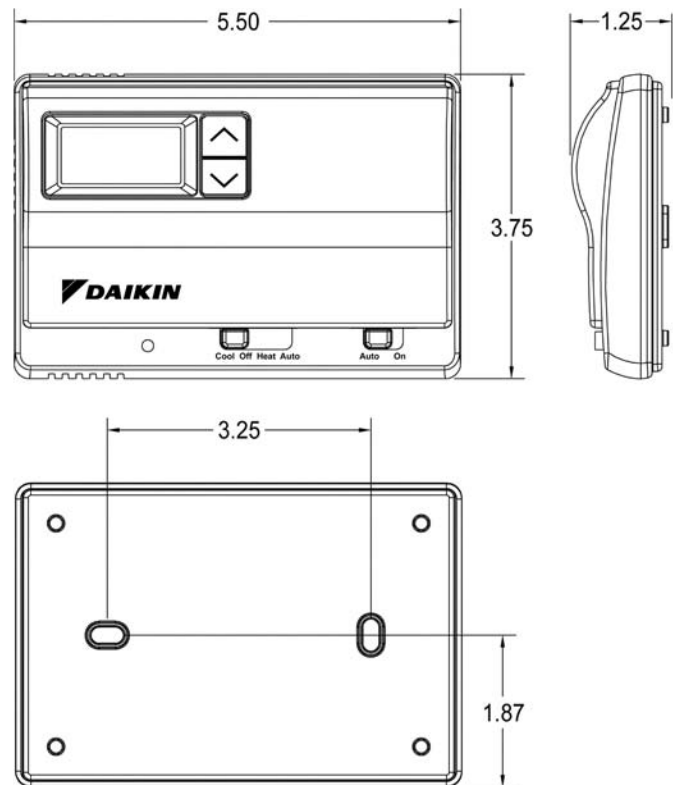
Terminations:

- +R, -C, W1, Y1, W2, Y2, G, O, S1, S2

Parts Diagram



Dimensions



Wiring

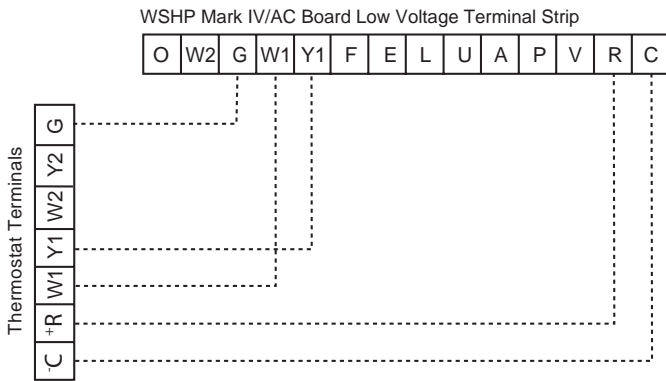
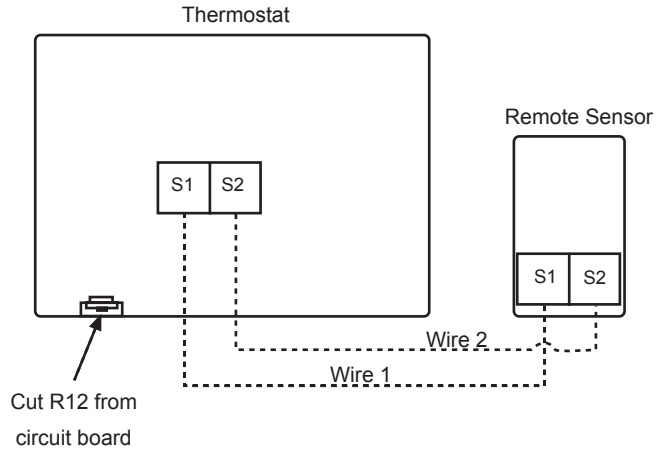


Figure 16: Remote sensor wiring



Optional Remote Sensor

(Used with Thermostats 668375301 & 668375401)



The fast, easy solution for temperature sensing problems.

- For tamper prone areas
- Poor airflow areas
- Troubled applications
- Foam gasket prevents drafts through wall opening
- Mounts to standard 2" x 4" outlet box
- 2-3/4"W x 4-1/2"H

Supply and Return Water Hoses

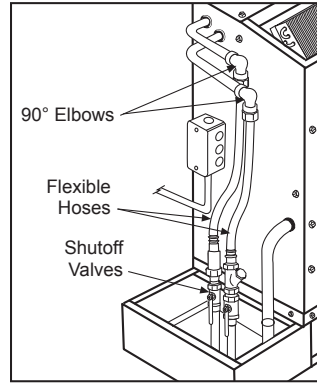
Available as fire rated construction in lengths of 9", 12", 18", or 24" Fire rated hoses have a synthetic polymer core with an outer rated covering of stainless steel. Fittings are steel. Assembly is "fire rated" and tested according to UL 94 with a VO rating and ASTM 84. Each hose has MPT connections. Fire rated hoses have a swivel connection at one end. Hoses are available in 1/2" (13 mm) diameter.



Table 19: Console WSHP units – fire rated (2-Pack) supply and return hose kits (See Figure 18)

MPT Size x Nominal Length "A"	Maximum Recommended Working Pressure	Minimum Burst Pressure @ 70°-90°	Minimum Bend Radius
1/2" MPT x 9"	400 psig (2758 kPa)	1200 psig (8274 kPa)	2-1/2" (64mm)
1/2" MPT x 12"			
1/2" MPT x 18"			
1/2" MPT x 24"			

Note: Hoses are available in multiple lengths to accommodate various piping locations and optional components.



Note: Valves, hoses and 90 degree elbows are factory available accessories, to be field-mounted by others.

Pipe Elbows

90 degree, 1/2" SWT x 1/2" FPT Cast Bronze elbow fittings can be ordered to make sweat connections to the unit supply and return pipe stubs to accept the threaded connection of flexible hoses.

Figure 17: 90 Degree pipe elbow (See Table 20 for letter dimensions)

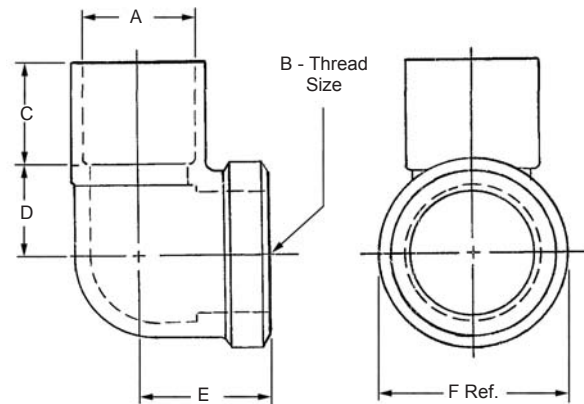
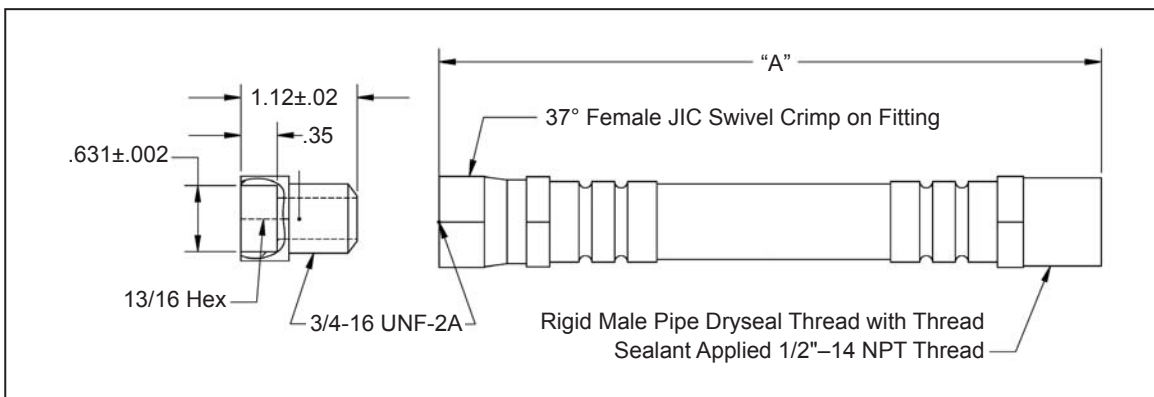


Table 20: 90 Degree pipe elbow dimensions for Figure 17

A - Nominal Size	A	B	C	D	E	F
1/2" x 1/2"	.627"/.631"	1/2" FPT	.50	.43	.81	1.08

Figure 18: Supply and return hose detail



Combination Balancing and Shutoff Valves

Constructed of brass and rated at 400 psig (2758 kPa) maximum working pressure. Valves have a built-in adjustable memory stop to eliminate rebalancing. Valves have FPT connections on both ends for connection to the water hose and to the field piping.



- A motorized valve relay and control valve assembly includes a relay, valve and wire harness. The valve opens when the compressor is turned on and closes when the compressor is off. The valve is rated for 300 psig (2068 kPa).
- A multiple unit control panel allows a single wall-mounted thermostat to control up to three units in a common space.
- An auxiliary relay controls optional devices when the fan is operating. The relay has SPDT contacts.

Table 21: Flow coefficients & maximum close-off pressure differential

Valve Size	Connection Type	2-way Cv (kv)	PSI Close-off ΔP (kPa)
1/2"	NPT	3.5 (3.0)	30 (207)

2-Way Motorized Valve

Used for variable pumping applications, the valve is wired in the compressor circuit and piped in the return water line from the unit.



Chassis Only (Field-Installed) Duct Collar Kit – Right-Hand Piping (Shown with subbase)

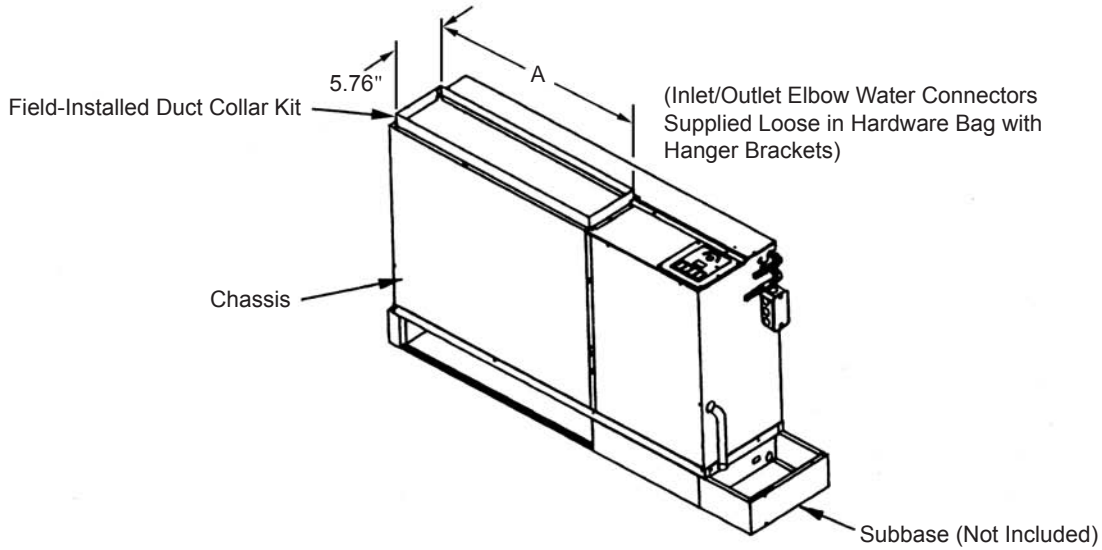
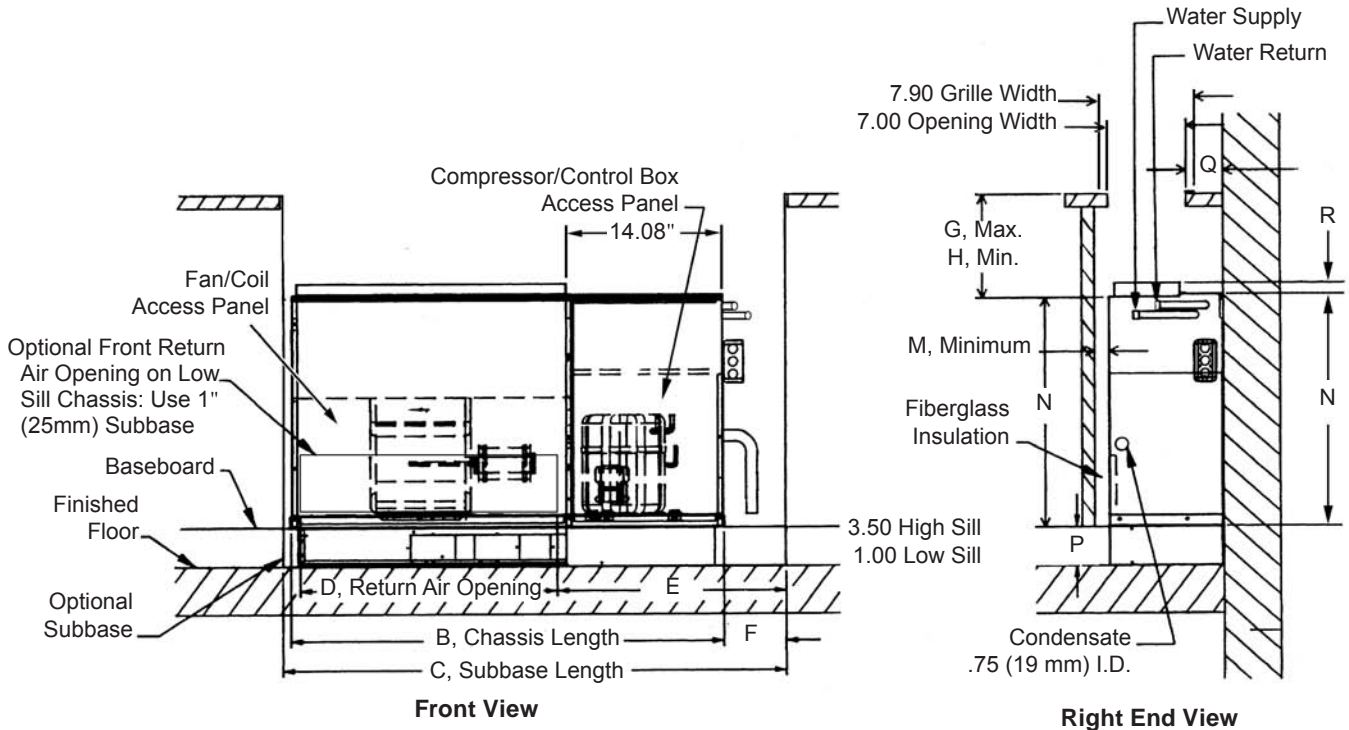


Table 22: Right-hand piping chassis only (with subbase) dimensions, in inches (mm)

Unit Size	A	B	C	D	E	F	G	H	M	N	P	Q	R
009-012	24.09	38.71	45.00	24.00	6.35	5.59	7.62	4.62	0.5	20.85	3.50	3.88	1
	(612)	(983)	(1143)	(610)	(161)	(142)	(194)	(117)	(13)	(530)	(89)	(99)	(25)
015-019	32.09	46.71	53.00	32.00	6.35	5.59	7.62	4.62	0.5	20.85	3.5	3.88	1
	(815)	(1186)	(1346)	(813)	(161)	(142)	(194)	(117)	(13)	(530)	(89)	(99)	(25)

Chassis Only (Field-Installed) Duct Collar Kit – Left-Hand Piping (Shown with subbase)

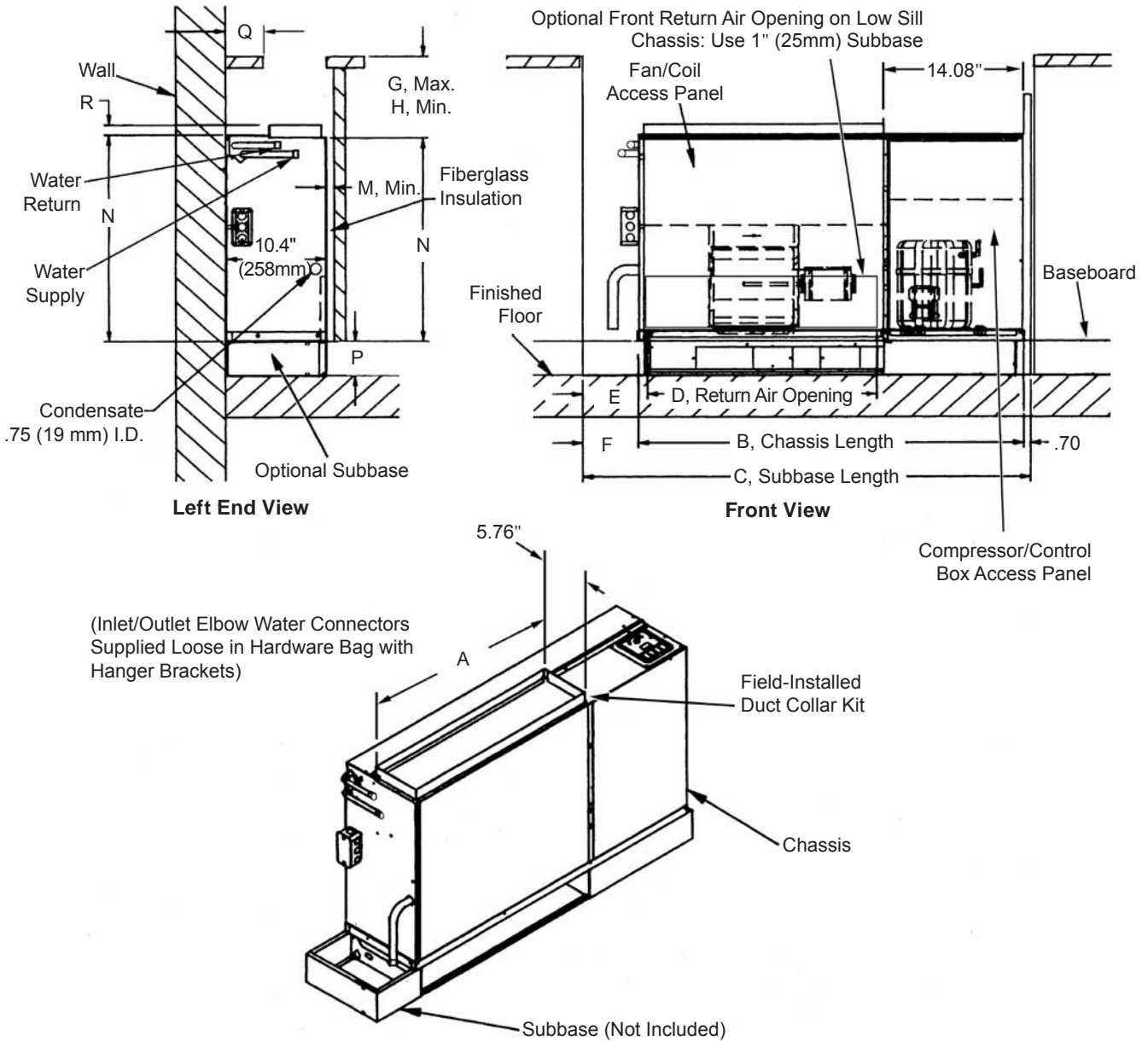


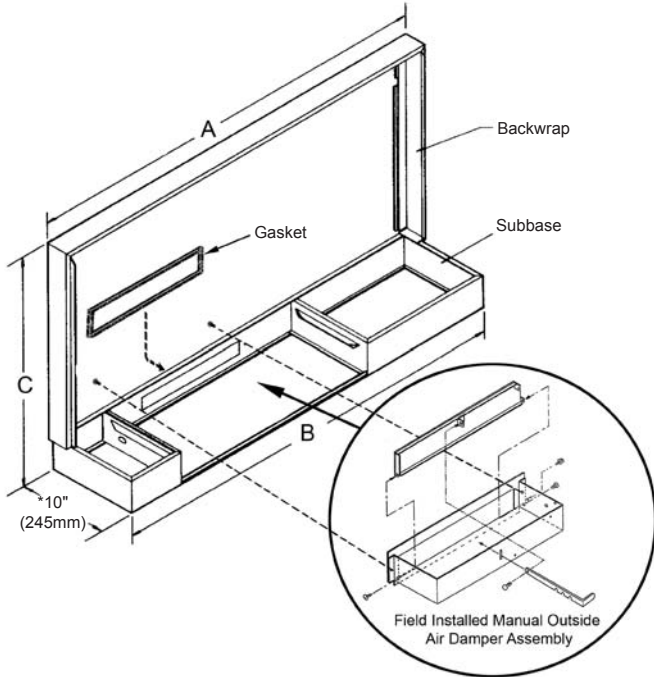
Table 23: Left-hand piping chassis only (with subbase) dimensions, in inches (mm)

Unit Size	A	B	C	D	E	F	G	H	M	N	P	Q	R
009-012	24.09	38.71	45	24.00	6.35	5.59	7.62	4.62	0.5	20.85	3.5	3.88	1
	(612)	(983)	(1143)	(610)	(161)	(142)	(194)	(117)	(13)	(530)	(89)	(99)	(25)
015-019	32.09	46.71	53	32.00	6.35	5.59	7.62	4.62	0.5	20.85	3.5	3.88	1
	(815)	(1186)	(1346)	(813)	(161)	(142)	(194)	(117)	(13)	(530)	(89)	(99)	(25)

Cabinet Backwrap & Subbase, and Field-Installed Outside Air Damper (Accessory)

Manual Outside Air Damper

Figure 19: Rear inlet - typical manual damper installation



Motorized Outside Air Damper

Figure 20: Rear inlet - typical motorized damper installation

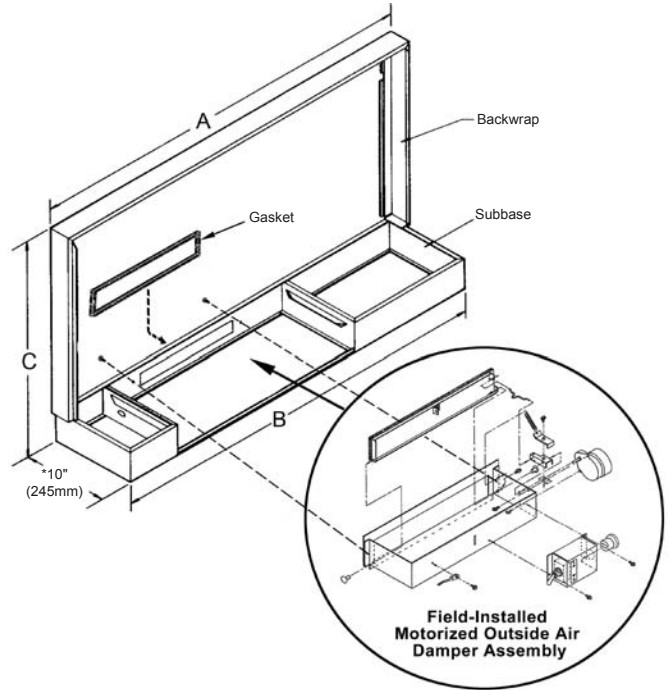


Table 24: Dimensions, in inches (mm)

Unit Type	Unit Size	A	B	C
Standard Height	009-012	46 (1168)	45 (1143)	25 (635)
	015-019	54 (1372)	53 (1346)	25 (635)

Notes: *Total unit is 10-3/4" deep. The cabinet extends beyond the subbase 1/4" in the back and 1/2" in the front. See "Manual or Motorized Outside Air Damper Location Details & Dimensions" on page 39 & "Motorized Outside Air Damper Wiring" on page 40 for details.

Manual or Motorized Outside Air Damper Location Details & Dimensions

Caution:

1. To prevent infiltration of ambient conditions, it is the responsibility of the contractor to assure that factory installed gasketing matches up with the wall opening, or that additional material is used to assure a positive seal.
2. **Cold Weather Operation:** Console water source heat pumps may experience erratic operation during cold ambient conditions with the outside air damper in the open position. See "Operating Limits" on page 11, for guidelines.
3. **Note:** Illustrations not to scale.

Figure 21: Left-hand & right-hand views

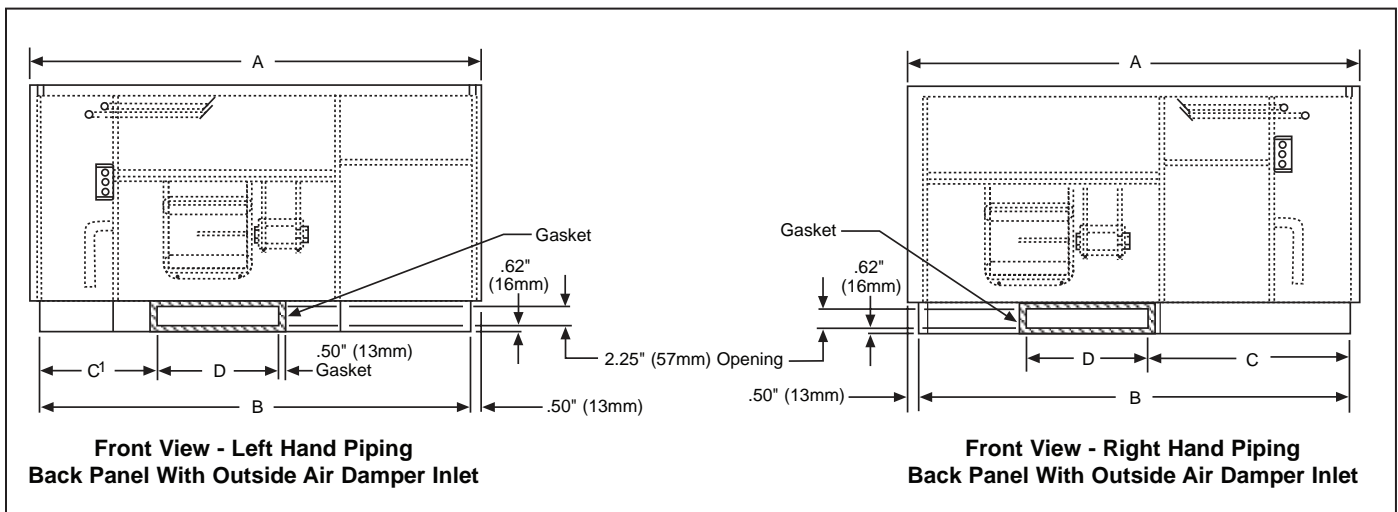


Table 25: Outside air damper & unit dimension details

Unit Size	A	B	C	C1	D	E
009 - 012	46 (1168)	45 (1143)	21.09 (536)	11.38 (289)	12.53 (318)	2.25 (57)
015 - 019	54 (1372)	53 (1346)	22.25 (565)	22.25 (565)	12.53 (318)	2.25 (57)

Motorized Outside Air Damper Wiring

Figure 22: Right-hand unit installation detail

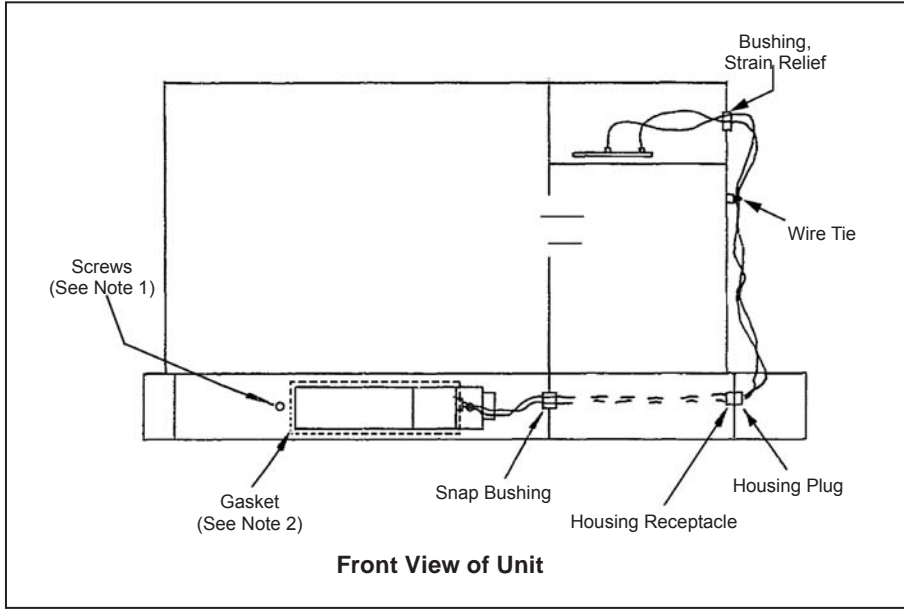
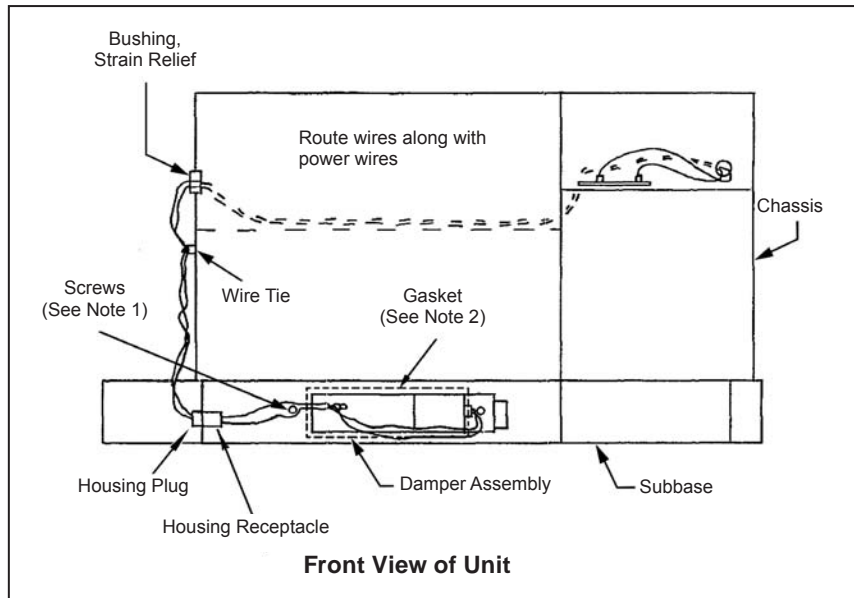


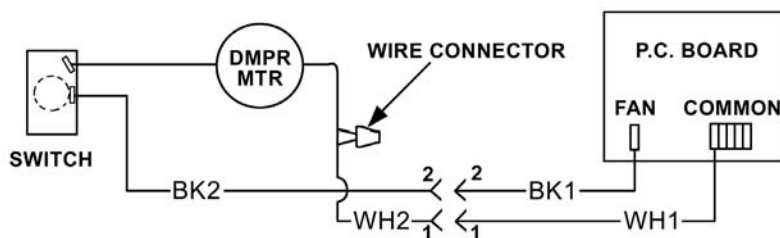
Figure 23: Left-hand unit installation detail



Notes: 1. Remove appropriate knock-outs and install damper using two (2) #8-18 screws provided.

2. Install gasket material as shown to prevent infiltration of ambient conditions. It is the responsibility of the installing contractor to assure that field-installed gasketing matches up with the wall opening or that additional material is used to assure a positive seal.

Figure 24: Mark IV motorized damper typical wiring diagram



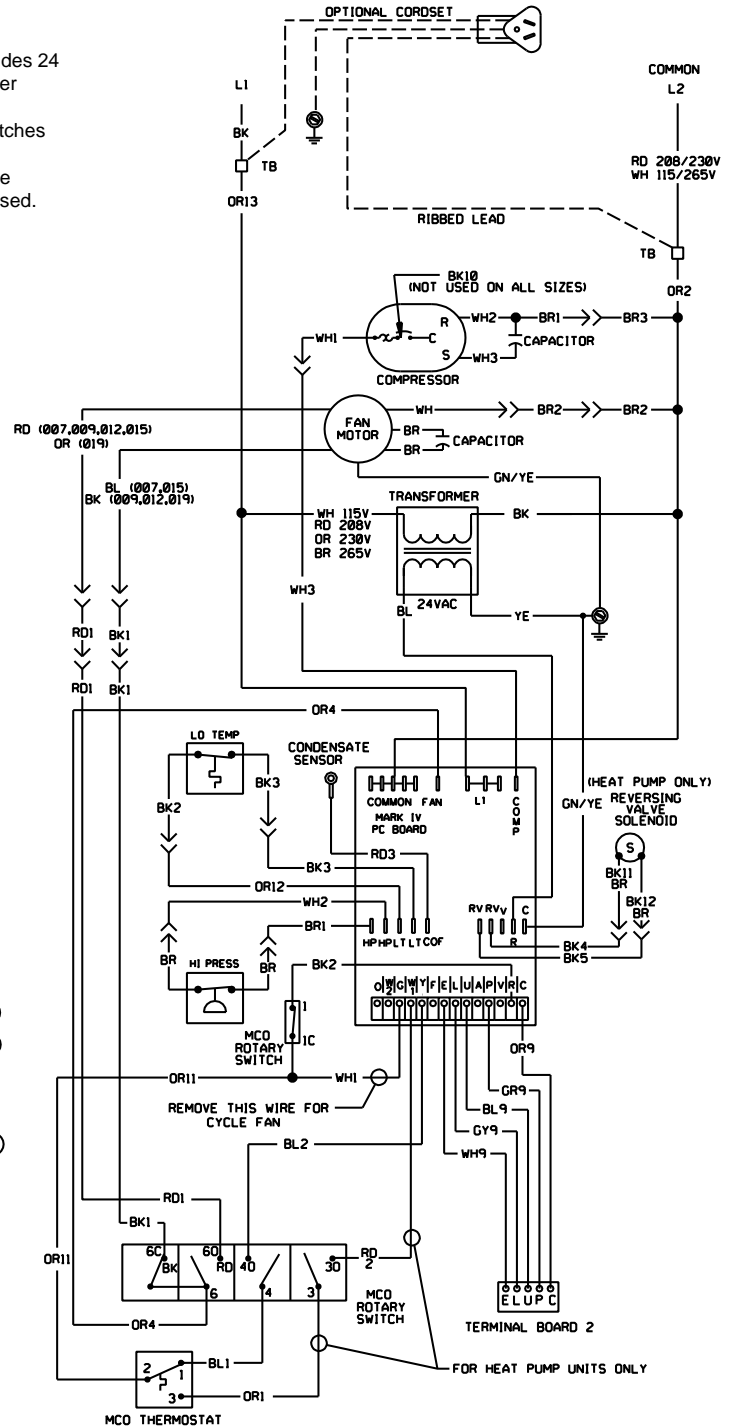
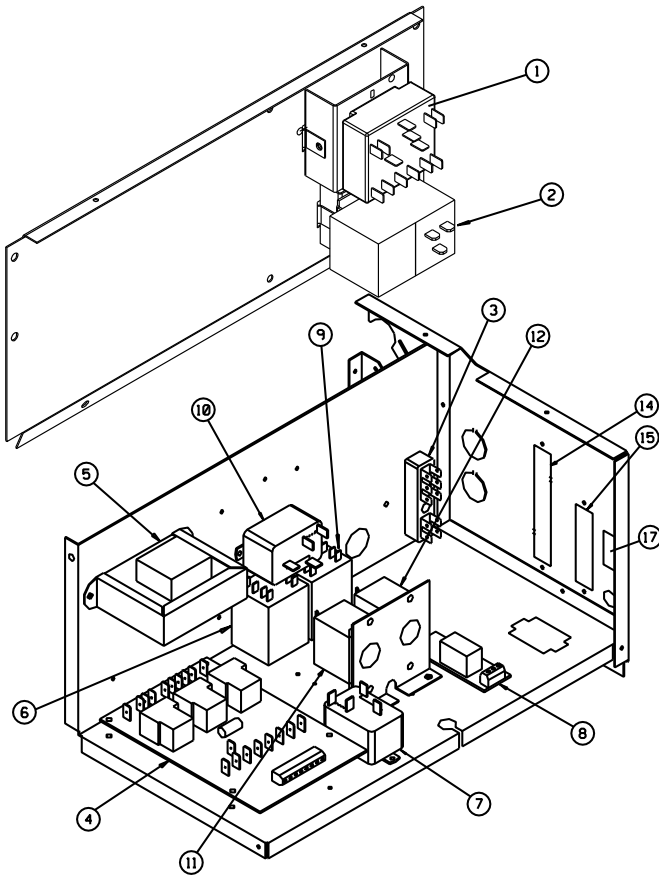
Console WSHP Size 009–019, All Voltages, 60Hz / Single Phase, Mark IV Board with Manual Changeover (MCO)

- >> - Plug Connection
- TB - Terminal Block
- ACO - Automatic Changeover
- MCO - Manual Changeover
- BR - Boilerless Relay
- HR - Heater Relay

- Notes:**
1. Terminal block on PC board provides 24 VAC at terminals C and R. All other terminals are 24 VDC output.
 2. All temperature and pressure switches are normally closed.
 3. Component layout is typical, some components shown may not be used.

Component Layout

1. Rotary Switch
2. Thermostat
3. Terminal Block
4. PC Board
5. Transformer
6. Boilerless Relay
7. Shutdown Relay
8. Auxiliary Relay
9. Heater Relay
10. Water Reg Valve Relay
11. Low Limit Thermostat
12. Night Setback Thermostat
14. Terminal Board 1
15. Terminal Board 2
17. Standby Electric Heat Switch



Console WSHP Size 009–019, All Voltages, 60Hz / Single Phase, Mark IV Board with Auto Changeover (ACO)

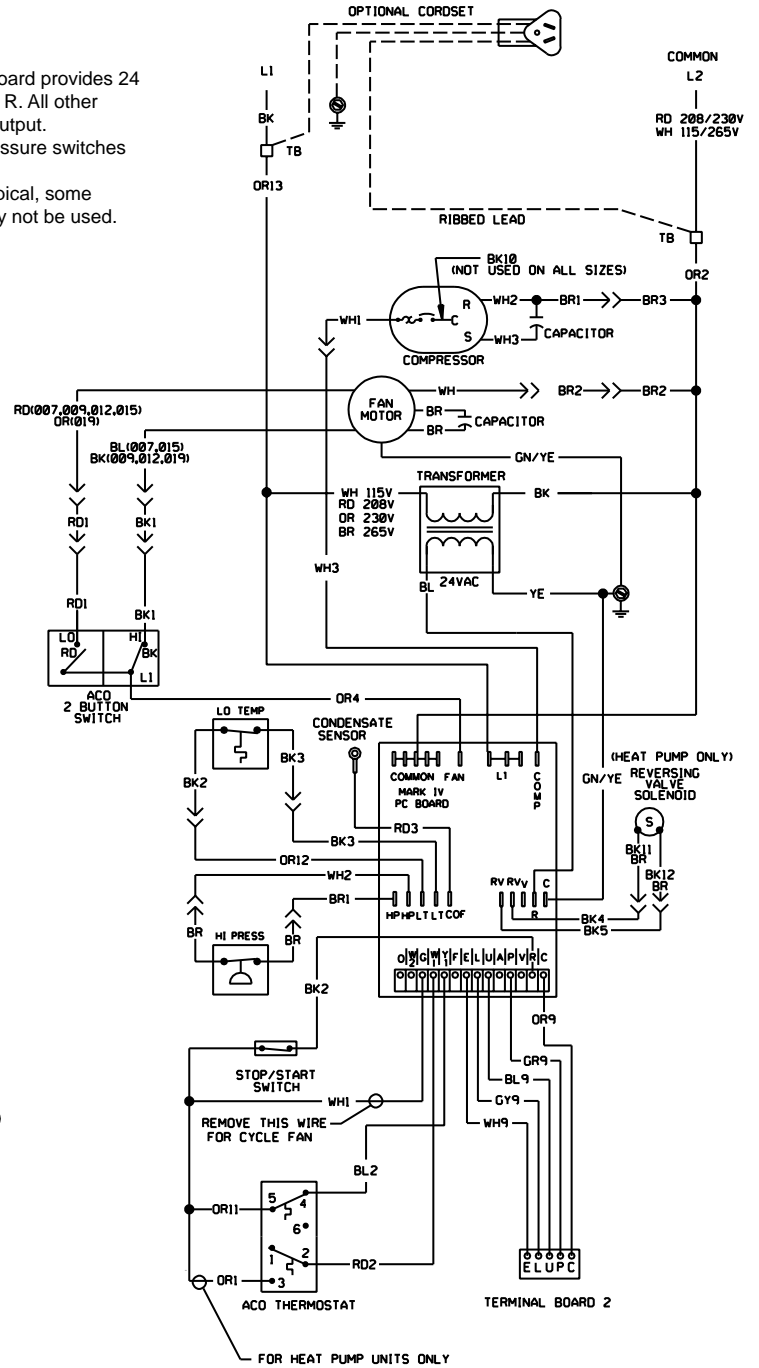
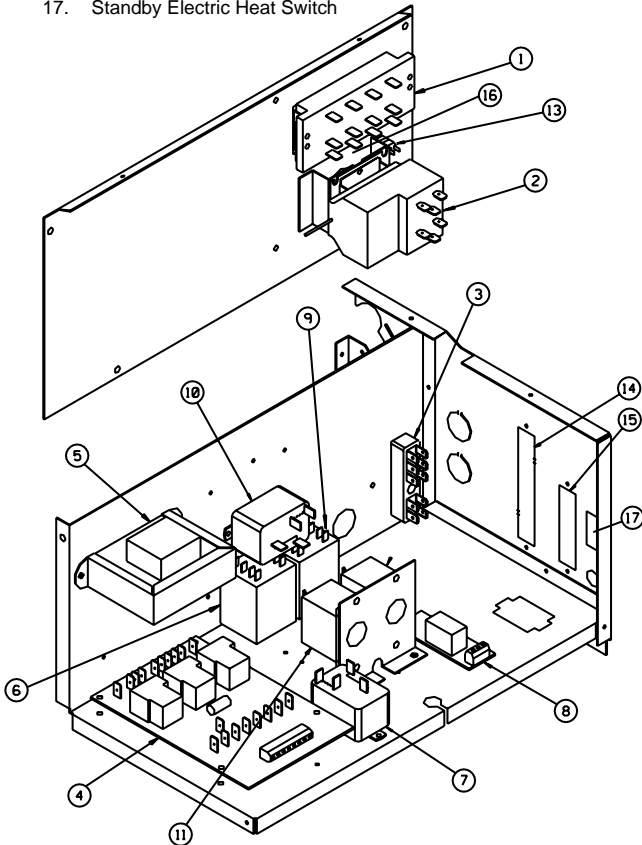
- >> - Plug Connection
- TB - Terminal Block
- ACO - Automatic Changeover
- MCO - Manual Changeover
- BR - Boilerless Relay
- HR - Heater Relay

Component Layout

1. Tap-Touch Switch
2. Thermostat
3. Terminal Block
4. PC Board
5. Transformer
6. Boilerless Relay
7. Shutdown Relay
8. Auxiliary Relay
9. Heater Relay
10. Water Reg Valve Relay
11. Low Limit Thermostat
12. Night Setback Thermostat
13. Override Switch
14. Terminal Board 1
15. Terminal Board 2
16. Stop/Start Switch
17. Standby Electric Heat Switch

Notes:

1. Terminal block on PC board provides 24 VAC at terminals C and R. All other terminals are 24 VDC output.
2. All temperature and pressure switches are normally closed.
3. Component layout is typical, some components shown may not be used.

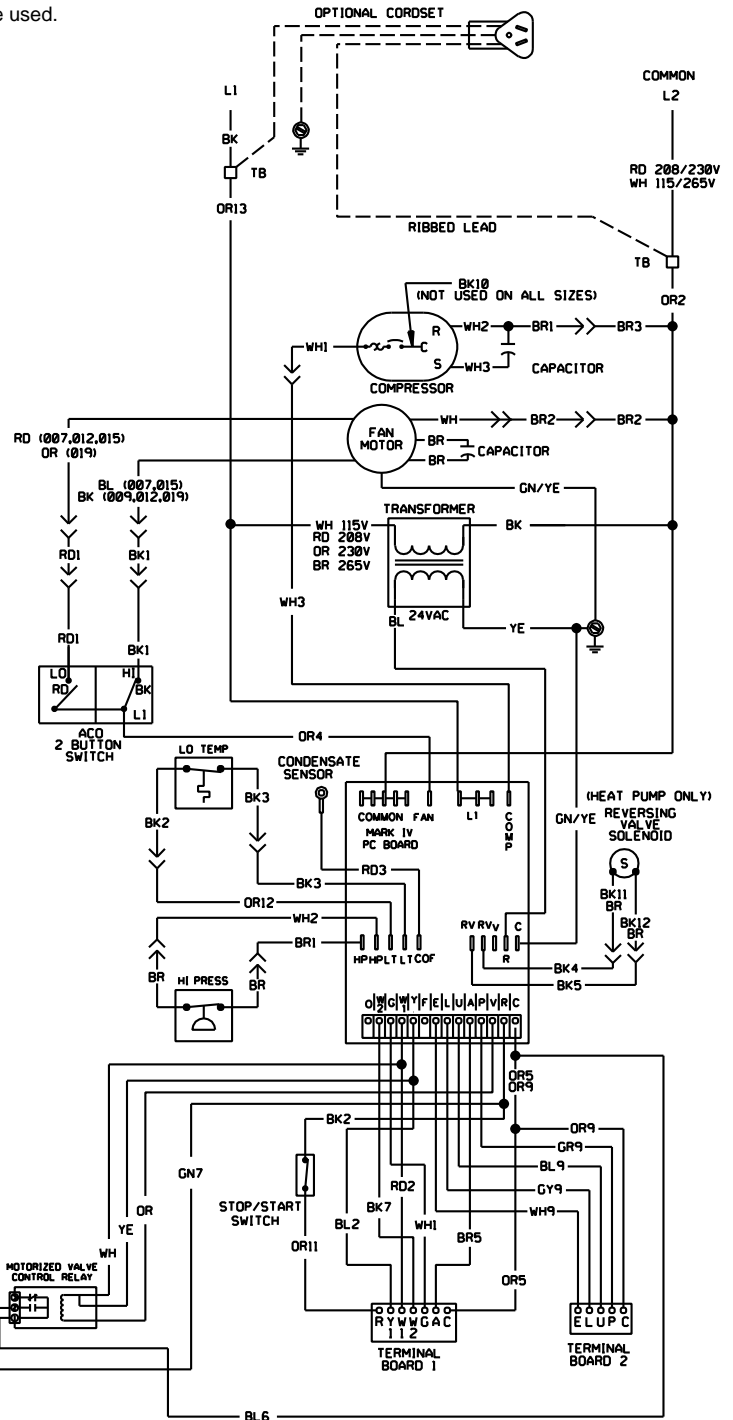
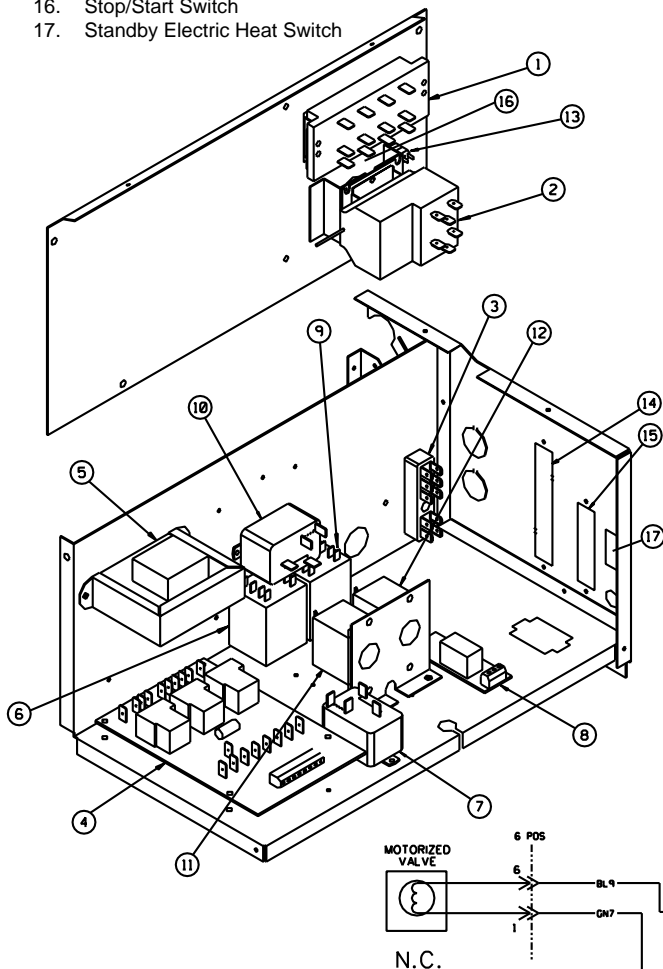


Console WSHP Size 009–019, All Voltages, 60Hz / Single Phase, Mark IV Board with Auto Changeover (ACO) Remote Thermostat

- >> - Plug Connection
- TB - Terminal Block
- ACO - Automatic Changeover
- MCO - Manual Changeover
- BR - Boilerless Relay
- HR - Heater Relay

- Notes:**
1. Terminal block on PC board provides 24 VAC at terminals C and R. All other terminals are 24 VDC output.
 2. All temperature and pressure switches are normally closed.
 3. Component layout is typical, some components shown may not be used.

- Component Layout**
1. Tap-Touch Switch
 2. Thermostat
 3. Terminal Block
 4. PC Board
 5. Transformer
 6. Boilerless Relay
 7. Shutdown Relay
 8. Auxiliary Relay
 9. Heater Relay
 10. Water Reg Valve Relay
 11. Low Limit Thermostat
 12. Night Setback Thermostat
 13. Override Switch
 14. Terminal Board 1
 15. Terminal Board 2
 16. Stop/Start Switch
 17. Standby Electric Heat Switch



Console WSHP Size 009–019, All Voltages, 60Hz / Single Phase, Mark IV Board with Manual Changeover (MCO) Boilerless Constant Fan

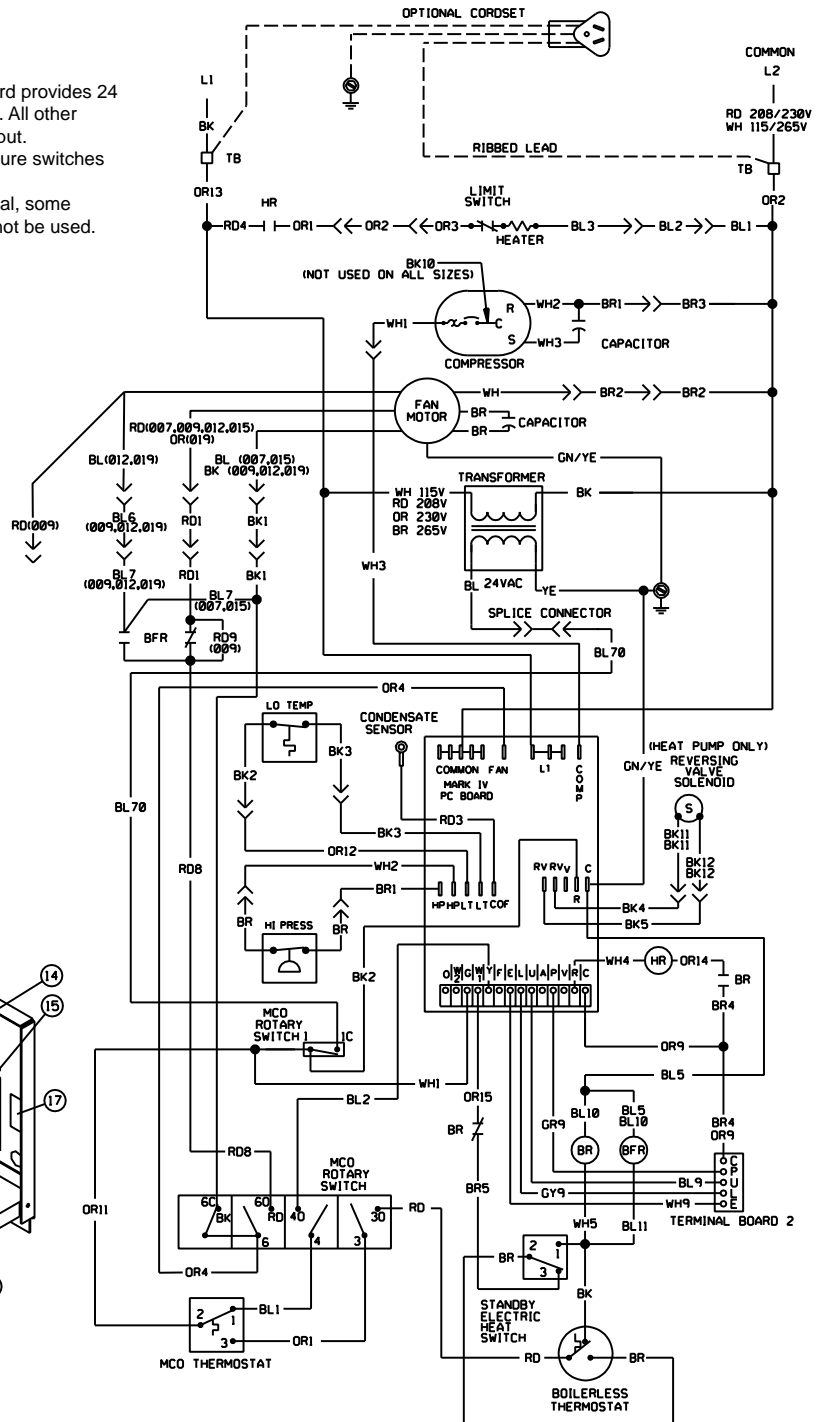
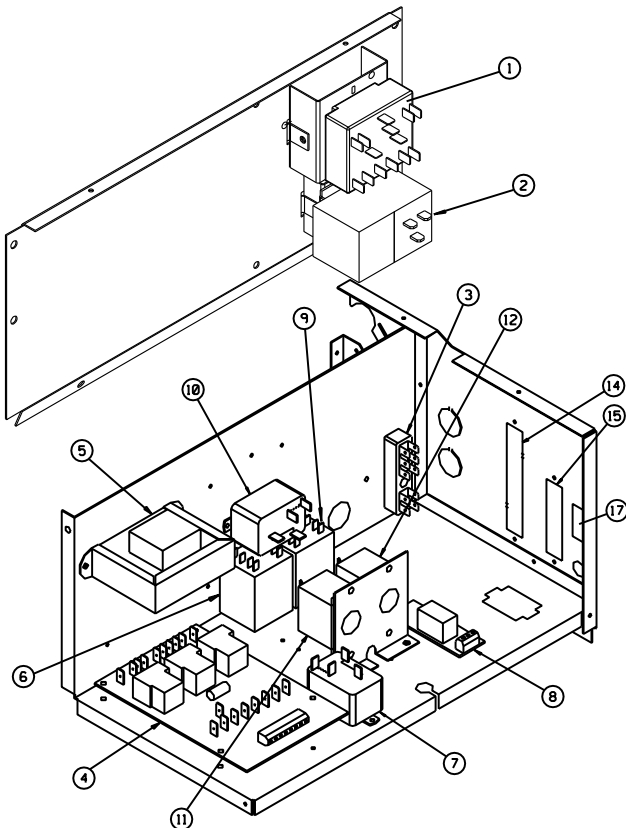
- >> - Plug Connection
- TB - Terminal Block
- ACO - Automatic Changeover
- MCO - Manual Changeover
- BR - Boilerless Relay
- HR - Heater Relay

Component Layout

1. Rotary Switch
2. Thermostat
3. Terminal Block
4. PC Board
5. Transformer
6. Boilerless Relay
7. Shutdown Relay
8. Auxiliary Relay
9. Heater Relay
10. Water Reg Valve Relay
11. Low Limit Thermostat
12. Night Setback Thermostat
14. Terminal Board 1
15. Terminal Board 2
17. Standby Electric Heat Switch

Notes:

1. Terminal block on PC board provides 24 VAC at terminals C and R. All other terminals are 24 VDC output.
2. All temperature and pressure switches are normally closed.
3. Component layout is typical, some components shown may not be used.



Console WSHP Size 009–019, All Voltages, 60Hz / Single Phase, Mark IV Board with Auto Changeover (ACO) Boilerless with Remote Thermostat

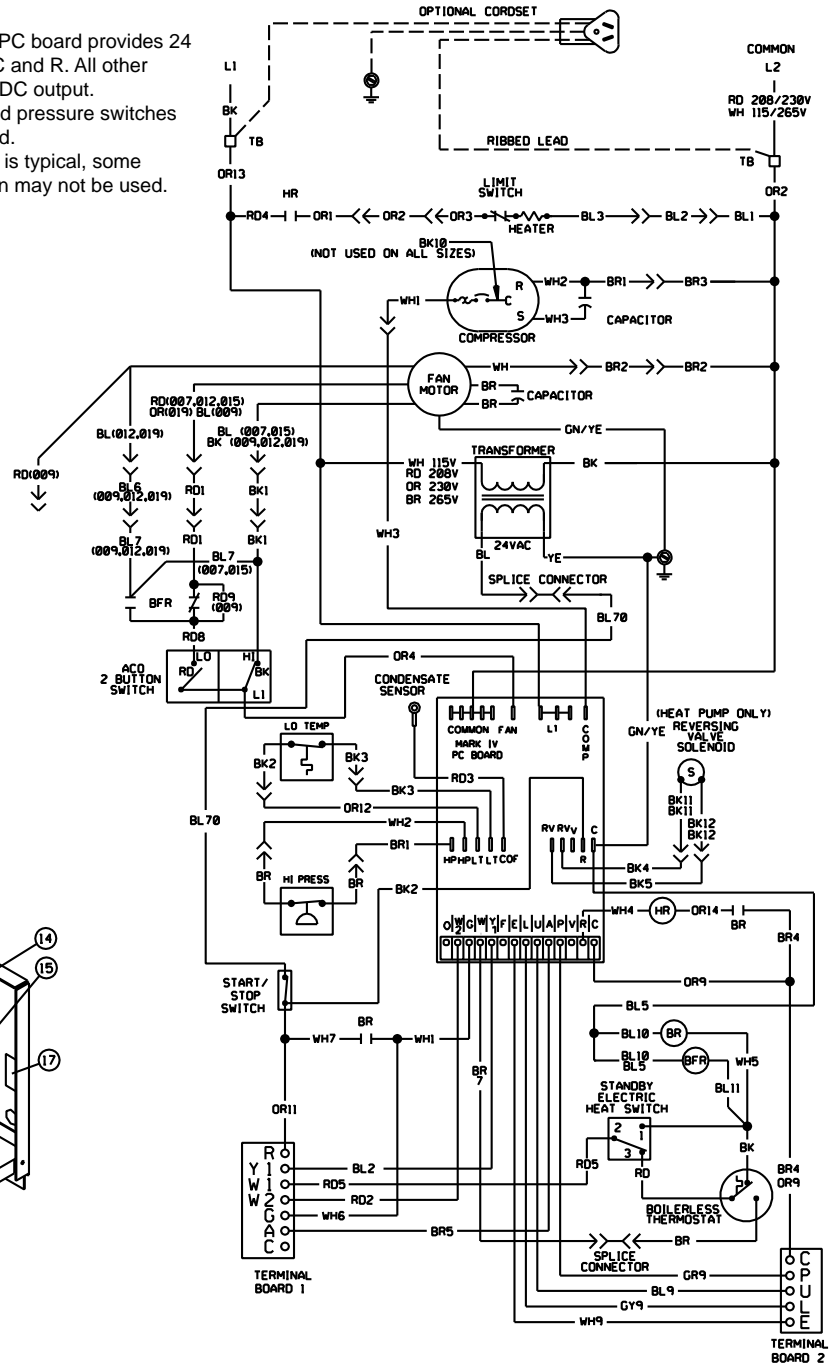
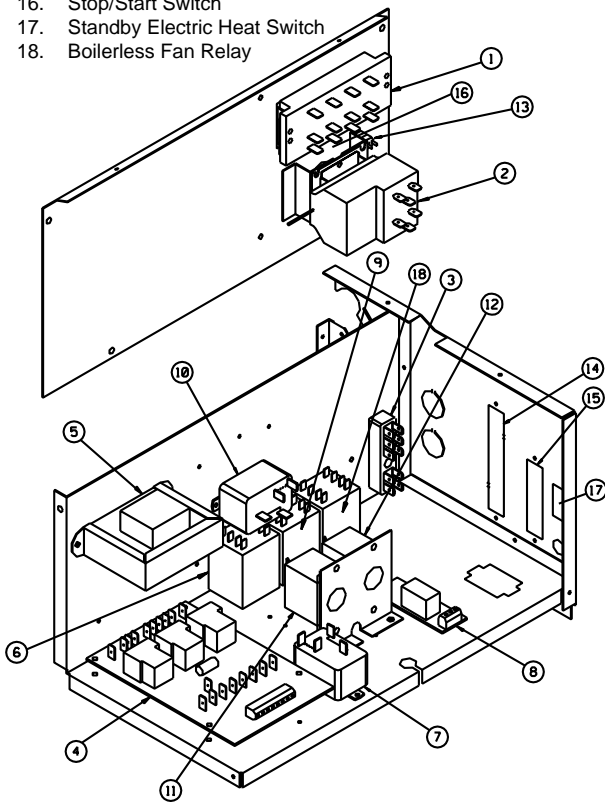
- >> - Plug Connection
- TB - Terminal Block
- ACO - Automatic Changeover
- MCO - Manual Changeover
- BR - Boilerless Relay
- HR - Heater Relay

Notes:

1. Terminal block on PC board provides 24 VAC at terminals C and R. All other terminals are 24 VDC output.
2. All temperature and pressure switches are normally closed.
3. Component layout is typical, some components shown may not be used.

Component Layout

1. Tap-Touch Switch
2. Thermostat
3. Terminal Block
4. PC Board
5. Transformer
6. Boilerless Relay
7. Shutdown Relay
8. Auxiliary Relay
9. Heater Relay
10. Water Reg Valve Relay
11. Low Limit Thermostat
12. Night Setback Thermostat
13. Override Switch
14. Terminal Board 1
15. Terminal Board 2
16. Stop/Start Switch
17. Standby Electric Heat Switch
18. Boilerless Fan Relay



General — Contractor shall furnish and install Water Source Heat Pump units as indicated on plans. Each unit shall be AHRI rated and CETL listed. Each unit shall be fully run tested at the factory. Each unit shall ship in its own corrugated box. The unit shall consist of a subbase/backwrap for floor mounting and attachment to the back wall or floor, a cabinet front capable of attachment to the backwrap and a slide-out chassis for mounting on the subbase. The chassis shall include the refrigeration system, fan assembly and all controls. The unit shall be capable of being shipped as a (choose one):

- complete unit including subbase, backwrap, cabinet front and chassis.
- chassis only for spare unit or future installation.

Cabinet and Chassis — The cabinet shall be fabricated from 18-gauge steel and include multiple holes/slots for attachment to the wall or floor. The backwrap and cabinet front shall be finished in *Antique Ivory baked enamel. The subbase shall be finished in Oxford Brown baked enamel.

*Available unit color options.

- Cupola White Soft Gray
- Antique Ivory Putty Beige
- Oxford Brown (Discharge Grille & Subbase, Flat-top Only)

The cabinet shall be insulated. The chassis shall house the refrigeration system, fan assembly and all controls. Panels shall provide access to the fan compartment and the compressor/control box compartment. The filter shall be a 1/2" (25mm) throwaway type with front removal from the subbase.

The chassis shall be fully insulated and incorporate a steel drain pan with a coating of anti-corrosion thermoplastic and a bottom connection.

The cabinet shall be 10-3/4" (273mm) maximum depth and shall (choose one):

- have a 22° slope top angle and an opening in the subbase for return air with a maximum height of 25" (635mm).
- have a flat top and an opening in the subbase for return air with a maximum height of 25" (635mm).

Slope top unit shall:

- incorporate a raised discharge grill and control box cover with flush mounting to the front and sides of the cabinet. The discharge grille shall direct the air at an 11° angle from the vertical and be field reversible for a 33° discharge angle. The grille shall be Antique Ivory and be constructed of fire retardant ABS polycarbonate. The sides of the cabinet front shall be

Antique Ivory and be constructed of polycarbonate with accent lines the entire height to match the pattern of the discharge grilles and control door.

The flat top unit shall (choose one).

- incorporate a one-piece stamped steel grille. The grille shall be painted Oxford Brown.
- incorporate no cabinet and a duct collar on the chassis for installation into a field supplied custom cabinet enclosure.

Refrigerant Circuit — Each unit shall have a sealed refrigerant circuit including a R-410A refrigerant compressor, thermal expansion valve, finned tube heat exchanger, reversing valve, water-to-refrigerant coaxial heat exchanger, high and low side access valves, and safety controls.

Compressor shall be rotary type with external vibration mounts and thermal overload protection. The finned tube coil shall be constructed of aluminum fins bonded to copper tubes. The coaxial heat exchanger shall be constructed of a copper inner tube and a steel outer tube and be U.L. listed. The heat exchanger shall be rated for 400 psig (2759 kPa) on the water side and 600 psig (4137 kPa) on the refrigerant side.

Safety controls shall include a low suction temperature (freezestat) switch and a high refrigerant pressure switch to lock out compressor operation. Unit shall be capable of being reset only by interrupting the power supply to the unit. Manual reset of the safety switch at the unit shall not be allowed. Unit shall be capable of starting at entering air of 40°F (5°C) and entering water at 70°F (21°C) with both air and water flow rates at the ARI rating conditions.

Electrical — A control box with removable top cover shall be located on the right side of the chassis and shall contain controls for compressor, reversing valve and fan motor operation and a 50 VA transformer. The chassis shall have a 2" x 4" (51mm x mm) junction box mounted on the side to facilitate main power wiring and be capable of being located on the left or right side of the chassis. Unit shall be nameplated to accept time delay fuses or HACR circuit breaker for branch overcurrent protection of the power source.

Fan and Motor Assembly — Unit shall have direct-drive centrifugal fan wheel(s). The fan housing shall be of clam shell design for splitting for removal of the fan motor/wheel assembly. The motor shall be thermally protected, two-speed, PSC type and be isolated from the chassis. The motor shall have a plug connection to the compressor compartment to facilitate removal.

Piping — The supply and return lines shall be 5/8" OD copper tubing and terminate away from the side of the chassis. The internally trapped condensate shall be a 3/4" (19mm) I.D. clear flexible vinyl tube protruding 14"

(356mm) out of the chassis for connection at the floor or at the back wall. The supply, return and condensate tubing shall be capable of terminating at the left or right side of the chassis.

Thermostat — The thermostat shall be (choose one):

- DDC (less board)
- unit mounted with a remote bulb located in the return air stream. The thermostat shall have an exposed rotary knob under the control door with a “warmer-cooler” identification scale.
- remote mounted low voltage wall thermostat for field installation.

Mark IV Control System — Unit shall have a microprocessor based control system and provide random start, compressor short cycle protection, grounded signal input (one each) for activation of unoccupied, load shed or emergency shutdown modes, LED status, optimal two-hour override of the unoccupied mode, brownout protection, condensate overflow protection, defrost cycle and pump restart relay output.

The control system type shall have a (choose one):

- unit-mounted automatic changeover thermostat with continuous fan operation, stop-start switch and high fan-low fan tap switches.
- unit-mounted automatic changeover thermostat with cycle fan operation, stop-start switch and high fan-low fan tap-touch switches.
- unit-mounted manual changeover thermostat with continuous fan operation, rotary switch.
- unit-mounted manual changeover thermostat with cycle fan operation, rotary switch.
- unit-mounted automatic changeover thermostat and night setback operation with (continuous cycle) occupied fan operation, 58°F (15°C) unit-mounted night heating thermostat, cycle fan in unoccupied mode, stop-start switch and high fan-low fan tap switches.
- unit-mounted automatic changeover thermostat, night setback and override operation with (continuous cycle) occupied fan operation, 58°F (15°C) unit-mounted night heating thermostat, unit-mounted two-hour override button, cycle fan in unoccupied mode, stop-start switch and high fan-low fan tap switches.

- unit-mounted manual changeover thermostat and low limit operation with (continuous cycle) fan operation, 58°F (15°C) unit-mounted heating thermostat, rotary thermostat knob.
- remote wall thermostat including unit-mounted stop-start switch and high fan-low fan tap switches.

Optional Boilerless System Electric Heat — Unit shall have a factory mounted electric heater and control system. A unit-mounted entering water temperature thermostat shall lock out compressor heating operation at 55°F ±4°F (12.8°C ± -15.5°C). On a call for heating, the electric heater shall be activated. When the entering water temperature rises, the unit shall resume normal compressor heating operation. An emergency heat switch shall provide heating only from the electric heater in the event of a compressor failure.

Optional Outside Air Damper Kit — The damper is located in the back of the subbase for outside air intake and shall be operated manually from the subbase.

Optional Plug Cord Kit — The chassis shall incorporate a plug cord for connection to a unit-mounted receptacle/fused disconnect switch box on the backwrap of the cabinet. The plug cord shall electrically mate to the receptacle.

Optional Receptacle/Fused Disconnect Kit — The permanent portion of the cabinet shall have a receptacle and fused disconnect switch to facilitate main power electrical connection permitting chassis removal without disconnecting main power wiring.

Optional Motorized Valve Kit — The return water line shall have a unit-mounted valve. The valve shall operate in conjunction with the compressor; valve opens when compressor is on. The valve shall have a maximum rating of 150 psig (1035 kPa).

Field Installed Accessories

Flexible Hoses — As ordered each unit can be supplied with two stainless steel fire-rated hoses for connection to unit and field piping. Hose assembly shall be rated at 500 psig (3494 kPa).

Ball Valves — As ordered each unit can be supplied with two combination balancing and shutoff valves with adjustable memory stop.

Pipe Elbows — As ordered each unit can be supplied with two 90 degree, 1/2" SWT × 3/4" FPT or 1/2" SWT × 1/2" FPT Cast Bronze elbow fittings.



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