
Comfort-Aire®

Century®

Submittal Data

HBH/V Compact Series

Table of Contents

HB Compact Packaged Series



	Unit Features	4
	Intelligent Communicating Controls	5
	Constant Volume ECM Control	6
	Selection Procedure	7
	HB-Series Nomenclature	9
	Performance Data – ASHRAE/AHRI/ISO 13256-1	10
	Performance Data – Selection Notes	11
	Performance Data – HB H/V 006	12
	Performance Data – HB H/V 009	13
	Performance Data – HB H/V 012	14
	Performance Data – HB H/V 015	15
	Performance Data – HB H/V 018	16
	Performance Data – HB H/V 024	17
	Performance Data – HB H/V 030	18
	Performance Data – HB H/V 036	19
	Performance Data – HB H/V 041	20
	Performance Data – HB H/V 042	21
	Performance Data – HB H/V 048	22
	Performance Data – HB H/V 060	23
	Performance Correction Tables for Units	24
	Antifreeze Correction Table	25
	Blower Performance Data – HB006	27
	Blower Performance Data – HB009	28
	Blower Performance Data – HB012	29
	Blower Performance Data – HB015	30
	Blower Performance Data – HB018	31
	Blower Performance Data – HB024	32
	Blower Performance Data – HB030	33
	Blower Performance Data – HB036	34
	Blower Performance Data – HB041	35
	Blower Performance Data – HB042	36
	Blower Performance Data – HB048	37
	Blower Performance Data – HB060	38
	Waterside Economizer Data	39
	Airside PD	42

Table of Contents

HB Compact Packaged Series

Waterside Economizer Correction Tables	43
Physical Data	44
HB - Horizontal – Dimensional Data	45
HBH - with Waterside Economizer - Dimensional Data	47
HB - Horizontal Service Access	49
HB - Vertical Upflow – Dimensional Data	50
HBV - with Waterside Economizer - Dimensional Data	52
HB - Vertical Service Access	54
Corner Weights for HBH Series Units	55
Electrical Data – PSC	56
Electrical Data – ECM	57
HB-Series Wiring Diagram Matrix	58
DIP Setting Table	59
Engineering Specifications	60
Performance Sheet	67
Revision History	69



Unit Features

HB COMPACT PACKAGED SERIES

The award winning HB Series raises the bar for water-source heat pump efficiencies, features and application flexibility. Not only does the HB-Series exceed ASHRAE 90.1 efficiencies, but it also uses HFC-410A zero ozone depletion refrigerant, making it an extremely environmentally-friendly option. The HB-Series is eligible for LEED® (Leadership in Energy and Environmental Design) points because of the “green” technology design. With one of the smallest cabinets in the industry, the HB-Series will easily fit into tight spaces. Designed to be backward compatible with thousands of older water-source heat pumps, the HB-Series heat pump is packed full of the innovation you have come to expect from the experts at Comfort Aire/Century.

Available in sizes from 1/2 ton (1.76 kW) through 5 tons (17.6 kW) with multiple cabinet options (vertical upflow and horizontal) the HB-Series offers a wide range of units for most any application.

Comfort Aire/Century’s double isolation compressor mounting system makes the HB-Series one of the quietest units on the market. Compressors are mounted on specially engineered sound-tested EPDM grommets to a heavy gauge mounting plate, which is further isolated from the cabinet base with rubber grommets for maximized vibration/sound attenuation. The easy access control box and large access panels make installing and maintaining the unit easier than other water-source heat pumps currently in production, proving that a small unit can be easy to service.

Options such as tin-plated air coil, DDC controls, and high efficiency pleated MERV rated air filters allow customized design solutions. High static fan motors expand the operating range and help overcome some of the challenges associated with ductwork for retrofit installations. Intelligent Constant Volume ECM’s allow for CFM to be dialed in over a wide range of static pressures. A cupro-nickel water-coil and sound attenuation package are options that make a great unit even better. A factory installed Waterside Economizer (WSE) uses cool loop water for “free” cooling and meets IECC section C403.3.1 which is a requirement in many states.

The HB-Series Water-Source Heat Pumps are designed to meet the challenges of today’s HVAC demands with one of the most innovative products available on the market.

UNIT FEATURES

- Sizes 006 (1/2 ton, 1.76 kW) through 060 (5 tons, 17.6 kW)
- HFC-410A refrigerant
- Exceeds ASHRAE 90.1 efficiencies
- Galvanized steel construction
- Sound absorbing glass fiber insulation
- Unique double isolation compressor mounting via vibration isolating rubber grommets for quiet operation
- Insulated divider and separate compressor/air handler compartments
- Copeland scroll compressors (rotary for size 018 and below)
- TXV metering device
- Microprocessor controls
- Field convertible discharge air arrangement for horizontal units
- PSC three-speed fan motor
- Eight Safeties Standard

AVAILABLE OPTIONS

- Intelligent communicating start-up and commissioning DXM2 controls
- Constant CFM (CV) ECM variable speed communicating blower motors
- High static blower motors
- LonWorks, BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Sound attenuation package
- Waterside Economizer (WSE)
- Stainless steel condensate drain pan
- Electrical service disconnect
- Cupro-nickel water-coil
- Extended range (20 to 120°F, -6.7 to 48.9°C) capable

Intelligent Communicating Controls

An information gateway to monitor, control and diagnose your system

HB-Series intelligent controls offer an information gateway into the system. This allows users to interact with their system in plain English, delivering improved reliability and efficiency by precisely controlling smart variable speed components. This makes the HB-Series easy to install and service.

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

Precise Control – The DXM2 board enables intelligent, 2-way communication between the DXM2 board and smart components like the variable CFM constant volume (CV) ECM fan motor. The DXM2 board uses information received from the smart components and sensors to precisely control unit operation to deliver higher efficiency, reliability and increased comfort.

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

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



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

POSSIBLE FAULT CAUSES	
LOW WATER COIL TEMP	
LOW WATER TEMP - HTG	
LOW WATER FLOW - HTG	
LOW REFRIG CHARGE - HTG	
INCORRECT LT1 SETTING	
BAD LT1 THERMISTOR	
◀ PREVIOUS	

FAULT TEMPERATURE CONDITIONS	
LT1 LOW WATER TEMP	
HEAT 1 11:11 AM 11/14	
LT1 TEMP	28.1
LT2 TEMP	97.3
HOT WATER EWT	121.5
COMP DISCHARGE	157.7
LEAVING AIR	92.7
LEAVING WATER	34.9
ENTERING WATER	42.1
CONTROL VOLTAGE	26.4
◀ PREVIOUS	

Constant Volume ECM Control

The ECM Constant Volume (CV) blower motors (optional) are controlled directly by the DXM2 control board which converts thermostat inputs and CFM settings to signals used by the ECM-CV motor controller.

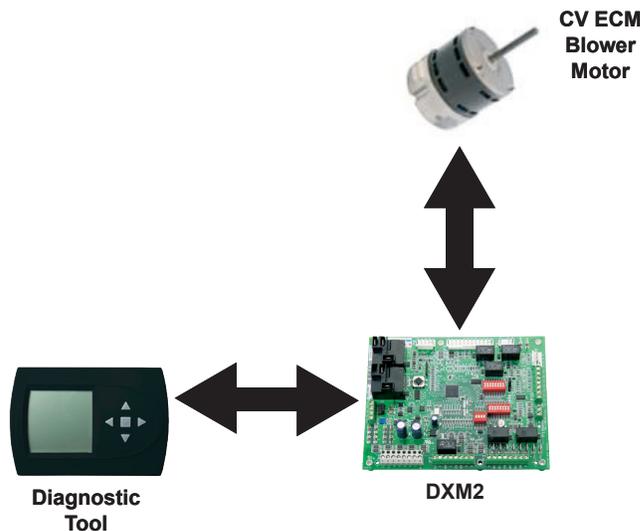
To take full advantage of the ECM-CV motor features a communicating service tool is used. The DXM2 control maintains a selectable operating airflow [CFM] for each heat pump operating mode. For each operating mode there are maximum and minimum airflow limits. See the ECM-CV Blower Performance tables for the maximum, minimum, and default operating airflows. Airflow levels are selected using the configuration menus of a configuration/ diagnostic tool. The configuration menus allow the installer to independently select and adjust the operating airflow for each of the operating modes. Airflow can be selected in 25 CFM increments within the minimum and maximum limits shown in the ECM-CV Blower Performance Table. The blower operating modes include:

- First Stage Cooling (Y1 & O)
- First Stage Heating (Y1)
- Fan (G with no Y1, Y2, or W)

The ECM-CV motor includes “soft start” and “ramp down” features. The soft start feature is a gentle increase of motor rpm at blower start up. This creates a much quieter blower start cycle.

The ramp down feature allows the blower to slowly decrease rpm to a full stop at the end of each blower cycle. This creates a much quieter end to each blower cycle and adds overall unit efficiency. The ramp down feature is eliminated during an ESD (Emergency Shut Down) situation. When the DXM2 ESD input is activated, the blower and all other control outputs are immediately de-activated.

The ramp down feature (also known as the heating or cooling “Off Delay”) is field selectable by the installer. The allowable range is 0 to 255 seconds.



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

Airflow Configuration Screen on Communicating Service Tool.

Selection Procedure

Reference Calculations

Heating	Cooling
$LWT = EWT - \frac{HE}{GPM \times \text{Constant}}$ $LAT = EAT + \frac{HC}{CFM \times 1.08}$	$LWT = EWT + \frac{HR}{GPM \times \text{Constant}} \qquad LC = TC - SC$ $LAT (DB) = EAT (DB) - \frac{SC}{CFM \times 1.08} \qquad S/T = \frac{SC}{TC}$

Constant = 500 for water, 485 for antifreeze.

Legend and Glossary of Abbreviations

<p>BTUH = BTU (British Thermal Unit) per hour MBTUH = 1,000 BTU per hour TC = total cooling capacity, BTUH SC = sensible cooling capacity, BTUH S/T = sensible to total cooling ratio LC = latent cooling capacity, BTUH HC = air heating capacity, BTUH CFM = airflow, cubic feet/minute ESP = external static pressure (inches w.g.) EAT = entering air temperature LAT = leaving air temperature, °F DB = dry bulb temperature (°F) WB = wet bulb temperature (°F) EWT = entering water temperature LWT = leaving water temperature, °F TD or delta T = temperature differential</p>	<p>GPM = water flow in U.S. gallons/minute WPD = waterside pressure drop (psi & ft. of hd.) HE = total heat of extraction, BTUH HR = total heat of rejection, BTUH KW = total power unit input, kilowatts EER = energy efficient ratio = BTUH output/Watt input COP = coefficient of performance = BTUH output/BTUH input MPT = male pipe thread FPT = female pipe thread HWC = hot water generator (desuperheater) capacity, Mbtuh ECM-CV = electronic commutated constant volume fan motor ECM-CT = electronic commutated constant torque fan motor MWV = motorized water valve WSE = waterside economizer VFD = variable frequency drive</p>
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Conversion Table - to convert inch-pound (English) to S-I (Metric)

Air Flow	Water Flow	Est Static Pressure	Water Pressure Drop
Airflow (L/s) = CFM x 0.472	Water Flow (L/s) = gpm x 0.0631	ESP (Pa) = ESP (in of wg) x 249	PD (kPa) = PD (ft of hd) x 2.99

Selection Procedure

- Step 1** Determine the actual heating and cooling loads at the desired dry bulb and wet bulb conditions.
- Step 2** Obtain the following design parameters: Entering water temperature, water flow rate in GPM, air flow in CFM, water flow pressure drop and design wet and dry bulb temperatures. Air flow CFM should be between 300 and 450 CFM per ton. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. Go to the appropriate tables and find the proper indicated water flow and water temperature.
- Step 3** Select a unit based on total and sensible cooling conditions. Select a unit which is closest to, but no larger than, the actual cooling load.
- Step 4** Enter tables at the design water flow and water temperature. Read the total and sensible cooling capacities (**Note: interpolation is permissible, extrapolation is not**).
- Step 5** Read the heating capacity. If it exceeds the design criteria it is acceptable. It is quite normal for Water-Source Heat Pumps to be selected on cooling capacity only since the heating output is usually greater than the cooling capacity.
- Step 6** Determine the correction factors associated with the variable factors of dry bulb, wet bulb and air flow. Corrected Total Cooling = tabulated total cooling x wet bulb correction x air flow correction
Corrected Sensible Cooling = tabulated sensible cooling x dry bulb correction x air flow correction.
- Step 7** Compare the corrected capacities to the load requirements. Normally if the capacities are within 10% of the loads, the equipment is acceptable. It is better to undersize than oversize, as undersizing improves humidity control, reduces sound levels and extends the life of the equipment.
- Step 8** When completed, calculate water temperature rise and assess the selection. If the units selected are not within 10% of the load calculations, then review what effect changing the GPM, water temperature and/or air flow and air temperature would have on the corrected capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure. Remember, when in doubt, undersize slightly for best performance.

Example Equipment Selection For Cooling Step 1 Load Determination:

Assume we have determined that the appropriate cooling load at the desired dry bulb 80°F and wet bulb 65°F conditions is as follows:

Total Cooling.....	23,700 BTUH
Sensible Cooling.....	16,500 BTUH
Entering Air Temp.....	80°F Dry Bulb / 65°F Wet Bulb

Step 2 Design Conditions:

Similarly, we have also obtained the following design parameters:

Entering Water Temp.....	90°F
Water Flow (Based upon 10°F rise in temp.).....	6.0 GPM
Air Flow.....	800 CFM

Steps 3, 4 & 5 HP Selection:

After making our preliminary selection (HB024), we enter the tables at design water flow and water temperature and read Total Cooling, Sens. Cooling and Heat of Rej. capacities:

Total Cooling.....	23,400 BTUH
Sensible Cooling.....	17,500 BTUH
Heat of Rejection.....	30,200 BTUH

Steps 6 & 7 Entering Air and Airflow Corrections:

Next, we determine our correction factors.

	Table	Ent Air	Air Flow	Corrected
Corrected Total Cooling =	23,400	x 0.9681	x 1.0050	= 22,767
Corrected Sens Cooling =	17,500	x 1.1213	x 0.9820	= 19,270
Corrected Heat of Rej. =	30,200	x 0.9747	x 1.0434	= 30,713

Step 8 Water Temperature Rise Calculation and Assessment:

Actual Temperature Rise.....	10.2°F
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When we compare the Corrected Total Cooling and Corrected Sensible Cooling figures with our load requirements stated in Step 1, we discover that our selection is within +/- 10% of our sensible load requirement. Furthermore, we see that our Corrected Total Cooling figure is within 1,000 Btuh the actual indicated load.

HB-Series Nomenclature

Model Type
HB = Heat Controller Compact

Configuration
H = Horizontal
V = Vertical

Unit Size
072
096
120
160 [1]
192
240
300

Revision Level
A = Current Revision

Voltage
3 = 208-230/60/3
4 = 460/60/3
5 = 575/60/3

Controls
C = CXM
D = DXM
N = CXM w/MPC
P = DXM w/MPC

Cabinet Insulation

Heat Exchanger Options

OPTION	COPPER WATER COIL	CUPRO-NICKEL WATER COIL	NON-COATED AIR COIL	COATED COIL	WATER SIDE ECONOMIZER
A	YES	NO	NO	YES	NO
C	YES	NO	YES	NO	
J	NO	YES	NO	YES	
N	NO	YES	YES	NO	
1	YES	NO	NO	YES	LOW AIRSIDE PRESSURE
2	YES	NO	YES	NO	
3	NO	YES	NO	YES	
4	NO	YES	YES	NO	

Return Air Flow Configuration
L = Left Return
R = Right Return
V = Left Return, S.S. Drain Pan
W = Right Return, S.S. Drain Pan } Horizontal Only
B = Back Return
F = Front Return
Y = Back Return, S.S. Drain Pan
Z = Front Return, S.S. Drain Pan } Vertical Only

Supply Air Flow Configuration
S = Straight Supply
B = Back Supply
F = Front Return
T = Top Supply

Blower Drive Package
A = Standard RPM & Standard Motor
B = Low RPM & Standard Motor
C = High RPM & Standard Motor
D = Standard RPM & Large Motor
E = High RPM & Large Motor

OPTION	RANGE	ULTRA QUIET	4" FILTER RALS-FRAMES	2" FILTER RALS-FRAMES	4" FILTER RALS-FRAMES
1	ENLARGED RANGE	NO	YES	NO	NO
		NO	NO	YES	NO
		NO	YES	NO	YES
		YES	NO	NO	YES
3	STANDARD RANGE	NO	YES	NO	NO
		NO	NO	YES	NO
		NO	NO	NO	YES
		YES	YES	NO	NO
4	STANDARD RANGE	NO	NO	YES	NO
		NO	NO	NO	YES
		YES	NO	YES	NO
		YES	NO	NO	YES

[1] Sizes 160-300 are vertical only
[2] When digit 12 is 1, 2, 3, or 4 digit 9 must be D, M, or P.
[3] When digit 12 is 1, 2, 3, or 4 digit 10 must be 1, 2, A, B, C, or D.
[4] Horizontal units not available with 4" filter frames.

Note: Above model nomenclature is a general reference. Not all configurations are available on all models. Consult selection software for detailed information.

Performance Data – ASHRAE/AHRI/ISO 13256-1

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

Model	Fan Motor	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 77°F		Heating 32°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
HB-006	PSC	5,800	13.2	7,500	4.7	7,000	21.1	6,300	4.0	6,200	15.4	4,900	3.1
HB-009	PSC	8,600	13.4	11,600	4.3	10,000	21.1	9,700	3.9	9,100	15.7	7,800	3.4
HB-012	PSC	11,100	12.5	14,700	4.3	13,500	19.2	12,100	3.7	12,000	14.3	10,000	3.2
HB-015	PSC	14,300	14.5	17,100	5.0	16,500	24.0	14,100	4.3	14,800	17.0	11,000	3.5
	ECM	14,300	15.5	17,100	5.3	16,500	25.0	14,100	4.5	14,800	18.0	11,000	3.6
HB-018	PSC	18,700	14.0	21,800	5.0	21,500	22.0	17,800	4.2	19,500	16.1	14,100	3.4
	ECM	18,700	15.0	21,800	5.2	21,500	23.6	17,800	4.5	19,500	17.1	14,100	3.7
HB-024	PSC	23,600	13.0	27,500	4.6	27,000	20.5	23,500	4.1	24,500	15.0	18,600	3.3
	ECM	23,600	13.5	27,500	4.8	27,000	21.5	23,500	4.3	24,500	16.0	18,600	3.5
HB-030	PSC	28,600	13.0	37,000	4.7	32,000	19.6	30,500	4.1	29,500	14.7	24,000	3.4
	ECM	28,600	13.6	37,000	4.9	32,000	21.6	30,500	4.3	29,500	16.0	24,000	3.6
HB-036	PSC	34,500	13.2	45,200	4.4	38,700	20.0	37,000	3.9	35,300	14.5	28,700	3.3
	ECM	34,500	14.0	45,200	4.5	38,700	21.0	37,000	4.0	35,300	15.5	28,700	3.4
HBV-041	PSC	36,500	13.2	45,700	4.3	41,400	19.7	38,000	3.7	38,000	14.8	30,000	3.2
HB-042	PSC	41,000	13.2	52,700	4.3	46,400	19.6	42,400	3.8	42,500	14.5	33,900	3.2
	ECM	41,000	14.9	52,700	4.5	46,400	21.0	42,400	4.0	42,500	16.0	33,900	3.4
HB-048	PSC	48,000	13.3	53,600	4.7	54,200	20.5	45,300	4.1	50,400	14.7	36,500	3.4
	ECM	48,000	14.0	53,600	4.8	54,200	21.0	45,300	4.3	50,400	16.2	36,500	3.6
HB-060	PSC	59,500	13.0	72,000	4.3	66,500	18.7	61,000	3.9	61,500	14.5	49,200	3.3
	ECM	59,500	14.6	72,000	4.4	66,500	20.5	61,000	4.0	61,500	16.5	49,200	3.4

Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature
 Heating capacities based upon 68°F DB, 59°F WB entering air temperature
 All ratings based upon operation at lower voltage of dual voltage rated models

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

Model	Fan Motor	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Full Cooling 25°C		Full Heating 0°C	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP
HB-006	PSC	1.70	3.9	2.20	4.7	2.05	6.2	1.84	4.0	1.82	4.5	1.43	3.1
HB-009	PSC	2.52	3.9	3.40	4.3	2.93	6.2	2.84	3.9	2.66	4.6	2.28	3.4
HB-012	PSC	3.25	3.7	4.30	4.3	3.95	5.6	3.54	3.7	3.51	4.2	2.93	3.2
HB-015	PSC	4.19	4.2	5.01	5.0	4.84	7.0	4.13	4.3	4.34	5.0	3.22	3.5
	ECM	4.19	4.5	5.01	5.3	4.84	7.3	4.13	4.5	4.34	5.3	3.22	3.5
HB-018	PSC	5.48	4.1	6.38	5.0	6.30	6.4	5.21	4.2	5.71	4.7	4.13	3.4
	ECM	5.48	4.4	6.38	5.2	6.30	6.9	5.21	4.5	5.71	5.0	4.13	3.7
HB-024	PSC	6.91	3.8	8.05	4.6	7.91	6.0	6.88	4.1	7.17	4.4	5.45	3.3
	ECM	6.91	4.0	8.05	4.8	7.91	6.3	6.88	4.3	7.17	4.7	5.45	3.5
HB-030	PSC	8.37	3.8	10.83	4.7	9.37	5.7	8.93	4.1	8.64	4.3	7.03	3.4
	ECM	8.37	4.0	10.83	4.9	9.37	6.3	8.93	4.3	8.64	4.7	7.03	3.6
HB-036	PSC	10.11	3.9	13.25	4.4	11.34	5.9	11.05	3.9	10.35	4.2	8.41	3.3
	ECM	10.11	4.1	13.25	4.5	11.34	6.2	11.05	4.0	10.35	4.5	8.41	3.4
HBV-041	PSC	10.69	3.9	13.38	4.3	12.12	5.8	11.13	3.7	11.13	4.3	8.78	3.2
HB-042	PSC	12.02	3.9	15.44	4.3	13.60	5.7	12.43	3.8	12.46	4.2	9.94	3.2
	ECM	12.02	4.4	15.44	4.5	13.60	6.2	12.43	4.0	12.46	4.5	9.94	3.4
HB-048	PSC	14.05	3.9	15.69	4.7	15.87	6.0	13.26	4.1	14.76	4.3	10.69	3.4
	ECM	14.05	4.1	15.69	4.8	15.87	6.1	13.26	4.3	14.76	4.7	10.69	3.6
HB-060	PSC	17.42	3.8	21.08	4.3	19.47	5.5	17.86	3.9	18.01	4.2	14.41	3.3
	ECM	17.42	4.3	21.08	4.4	19.47	6.0	17.86	4.0	18.01	4.8	14.41	3.4

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature
 Heating capacities based upon 20°C DB, 15°C WB entering air temperature
 All ratings based upon operation at lower voltage of dual voltage rated models

Performance Data – Selection Notes

For operation in the shaded area when water is used in lieu of an antifreeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level such that the LWT is maintained above 40°F [4.4°C] when the JW3 jumper is not clipped (see example below). Otherwise, appropriate levels of a proper antifreeze solution should be used in systems with leaving water temperatures of 40°F or below and the JW3 jumper should be clipped. This is due to the potential of the refrigerant temperature being as low as 32°F [0°C] with 40°F [4.4°C] LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

Example:

At 50°F EWT (Entering Water Temperature) and 2.25 gpm/ton, a 3 ton unit has a HE of 27,300 Btuh. To calculate LWT, rearrange the formula for HE as follows:

$HE = TD \times GPM \times 500$, where HE = Heat of Extraction (Btuh); TD = temperature difference (EWT - LWT) and GPM = U.S. Gallons per Minute.

$$TD = HE / (GPM \times 500)$$

$$TD = 27,300 / (6.75 \times 500)$$

$$TD = 8^\circ F$$

$$LWT = EWT - TD$$

$$LWT = 50 - 8 = 42^\circ F$$

In this example, as long as the EWT does not fall below 50°F, the system will operate as designed. For EWTs below 50°F, higher flow rates will be required (open loop systems, for example, require at least 2 gpm/ton when EWT is below 50°F).

Heating - EAT 70°F						
	Airflow CFM	HC	kW	HE	LAT	COP
	860	22.6	2.67	14.1	94	2.49
	1150	23.2	2.39	15.1	89	2.84
23.8	860	25.6	2.80	16.6	98	2.68
23.8	1150	26.2	2.51	17.7	91	3.06
24.7	860	26.8	2.85	17.6	99	2.76
24.7	1150	27.5	2.56	18.8	92	3.15
25.0	860	27.5	2.88	18.2	100	2.80
25.0	1150	28.2	2.59	19.4	93	3.19
21.8	860	30.1	2.98	20.3	102	2.95
21.8	1150	30.8	2.68	21.7	95	3.37
23.3	860	31.6	3.05	21.6	104	3.04
23.3	1150	32.4	2.74	23.1	96	3.47
23.9	860	32.4	3.08	22.3	105	3.09
23.9	1150	33.2	2.77	23.8	97	3.52
19.2	860	34.5	3.16	24.1	107	3.20
19.2	1150	35.4	2.84	25.7	98	3.65
21.0	860	36.3	3.23	25.6	109	3.30
21.0	1150	37.2	2.90	27.3	100	3.76
21.9	860	37.3	3.27	26.4	110	3.35
21.9	1150	38.2	2.93	28.2	101	3.82
16.4	860	38.9	3.32	27.8	112	3.43
16.4	1150	39.8	2.99	29.7	102	3.91
	860	40.9	3.40	29.5	114	3.53
	1150	41.9	3.05	31.5	104	4.02
	860	42.0	3.44	30.4	115	3.58
	1150	43.0	3.09	32.5	105	4.08
		43.1	3.47	31.4	116	3.64
		44.1	3.12	33.5	106	4.14
			3.55	33.2	118	3.70

Performance Data – HB H/V 006

225 CFM Airflow

Performance capacities shown in thousands of Btu/h

EWT °F	WPD			Cooling - EAT 80/67°F					Heating - EAT 70°F				
	FLOW GPM	PSI	FT	TC	SC	PSC			PSC				
						Power kW	HR	EER	HC	Power kW	HE	LAT	COP
20	0.75	Operation Not Recommended							Operation Not Recommended				
	1.13	Operation Not Recommended							Operation Not Recommended				
	1.50	1.9	4.4						4.1	0.43	2.7	84.6	2.8
30	0.75	0.5	1.2	7.7	5.3	0.26	8.6	30.2	4.8	0.44	3.4	87.9	3.2
	1.13	0.8	1.8	7.7	5.4	0.25	8.5	31.4	5.0	0.44	3.5	88.5	3.4
	1.50	1.3	3.0	7.8	5.4	0.24	8.6	33.2	5.1	0.45	3.6	88.8	3.4
40	0.75	0.4	0.9	7.5	5.3	0.30	8.5	25.4	5.8	0.46	4.3	91.8	3.7
	1.13	0.6	1.4	7.6	5.3	0.29	8.6	26.7	6.0	0.46	4.5	92.5	3.9
	1.50	1.0	2.3	7.7	5.3	0.28	8.6	28.0	6.1	0.46	4.6	92.9	3.9
50	0.75	0.3	0.7	7.3	5.1	0.34	8.4	21.8	6.7	0.47	5.2	95.7	4.2
	1.13	0.5	1.2	7.4	5.2	0.33	8.5	22.8	6.9	0.48	5.4	96.5	4.3
	1.50	0.9	2.1	7.4	5.2	0.32	8.5	23.5	7.1	0.48	5.5	97.0	4.4
60	0.75	0.3	0.7	6.9	5.0	0.38	8.2	18.4	7.6	0.49	6.0	99.3	4.6
	1.13	0.5	1.2	7.1	5.0	0.37	8.3	19.5	7.9	0.49	6.3	100.3	4.8
	1.50	0.8	1.8	7.1	5.0	0.36	8.3	20.0	8.0	0.49	6.4	100.7	4.8
70	0.75	0.2	0.5	6.5	4.8	0.43	8.0	15.3	8.5	0.50	6.8	102.7	5.0
	1.13	0.4	0.9	6.7	4.8	0.41	8.1	16.5	8.7	0.50	7.0	103.6	5.2
	1.50	0.7	1.6	6.8	4.9	0.40	8.1	17.2	8.8	0.50	7.1	104.1	5.2
80	0.75	0.2	0.5	6.1	4.6	0.47	7.7	13.1	9.2	0.51	7.5	105.6	5.3
	1.13	0.4	0.9	6.2	4.6	0.45	7.7	13.9	9.4	0.51	7.7	106.5	5.5
	1.50	0.6	1.4	6.3	4.7	0.45	7.8	14.2	9.5	0.52	7.8	106.9	5.4
85	0.75	0.2	0.5	5.8	4.5	0.49	7.5	11.8	9.5	0.5	7.75	106.8	5.4
	1.13	0.4	0.8	6.0	4.5	0.47	7.6	12.7	9.7	0.5	7.95	107.6	5.5
	1.50	0.6	1.4	6.1	4.6	0.47	7.7	12.9	9.8	0.5	8.00	107.9	5.5
90	0.75	0.2	0.5	5.5	4.3	0.52	7.3	10.7	9.7	0.52	8.0	108.0	5.5
	1.13	0.3	0.7	5.7	4.4	0.50	7.4	11.5	9.9	0.53	8.2	108.6	5.5
	1.50	0.6	1.4	5.8	4.4	0.50	7.5	11.7	10.0	0.53	8.2	108.9	5.6
100	0.75	0.2	0.5	5.0	4.1	0.57	6.9	8.8	Operation Not Recommended				
	1.13	0.3	0.7	5.2	4.2	0.56	7.1	9.4					
	1.50	0.5	1.2	5.3	4.2	0.55	7.2	9.7					
110	0.75	0.2	0.5	4.4	3.8	0.63	6.5	7.0	Operation Not Recommended				
	1.13	0.3	0.7	4.6	3.9	0.61	6.7	7.6					
	1.50	0.5	1.2	4.7	3.9	0.61	6.8	7.8					
120	0.75	0.1	0.2	3.8	3.5	0.69	6.1	5.5	Operation Not Recommended				
	1.13	0.3	0.7	4.0	3.6	0.68	6.3	5.9					
	1.50	0.5	1.2	4.1	3.6	0.67	6.4	6.2					

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 009

325 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F					Heating - EAT 70°F				
	FLOW GPM	PSI	FT	TC	SC	PSC			PSC				
						Power kW	HR	EER	HC	Power kW	HE	LAT	COP
20	1.13	Operation Not Recommended							Operation Not Recommended				
	1.69	Operation Not Recommended							Operation Not Recommended				
	2.25	7.8	18.0						6.6	0.71	4.2	86.6	2.7
30	1.13	2.1	4.7	10.9	7.5	0.39	12.3	27.7	7.3	0.74	4.9	88.8	2.9
	1.69	4.3	9.9	10.9	7.4	0.37	12.2	29.9	7.6	0.74	5.1	89.5	3.0
	2.25	7.0	16.2	10.9	7.4	0.35	12.1	31.0	7.7	0.75	5.2	89.9	3.0
40	1.13	1.5	3.6	10.8	7.5	0.45	12.3	24.0	8.4	0.77	5.9	91.8	3.2
	1.69	3.1	7.3	10.9	7.5	0.42	12.3	25.9	8.7	0.77	6.1	92.7	3.3
	2.25	5.2	12.1	10.9	7.5	0.41	12.3	26.9	8.8	0.78	6.3	93.1	3.3
50	1.13	1.5	3.5	10.5	7.3	0.51	12.2	20.6	9.5	0.80	6.9	94.9	3.5
	1.69	3.1	7.1	10.6	7.4	0.48	12.3	22.3	9.8	0.81	7.2	95.9	3.5
	2.25	5.1	11.8	10.7	7.4	0.46	12.3	23.2	10.0	0.81	7.3	96.4	3.6
60	1.13	1.5	3.4	10.0	7.1	0.57	12.0	17.7	10.5	0.83	7.8	98.0	3.7
	1.69	3.0	6.9	10.3	7.2	0.54	12.1	19.2	10.9	0.84	8.2	99.1	3.8
	2.25	5.0	11.4	10.4	7.3	0.52	12.2	20.0	11.1	0.85	8.4	99.7	3.8
70	1.13	1.4	3.3	9.5	6.8	0.63	11.7	15.0	11.6	0.86	8.8	100.9	4.0
	1.69	2.9	6.7	9.8	6.9	0.60	11.9	16.3	12.0	0.88	9.1	102.1	4.0
	2.25	4.8	11.1	9.9	7.0	0.58	11.9	17.0	12.2	0.88	9.3	102.7	4.1
80	1.13	1.4	3.2	8.9	6.4	0.70	11.3	12.7	12.6	0.90	9.6	103.8	4.1
	1.69	2.8	6.5	9.2	6.6	0.67	11.5	13.8	13.0	0.92	10.0	105.0	4.1
	2.25	4.7	10.8	9.4	6.7	0.65	11.6	14.4	13.2	0.93	10.2	105.6	4.2
85	1.13	1.3	3.1	8.6	6.3	0.74	11.1	11.6	13.1	0.9	10.00	105.1	4.2
	1.69	2.8	6.5	8.9	6.4	0.70	11.3	12.6	13.5	0.9	10.35	106.3	4.2
	2.25	4.6	10.6	9.1	6.5	0.69	11.4	13.2	13.7	1.0	10.55	106.9	4.2
90	1.13	1.3	3.1	8.2	6.1	0.77	10.9	10.6	13.5	0.94	10.4	106.4	4.2
	1.69	2.8	6.4	8.6	6.3	0.74	11.1	11.6	13.9	0.97	10.7	107.6	4.2
	2.25	4.6	10.5	8.7	6.3	0.72	11.2	12.1	14.1	0.98	10.9	108.2	4.2
100	1.13	1.3	3.0	7.4	5.8	0.85	10.3	8.8	Operation Not Recommended				
	1.69	2.7	6.2	7.8	5.9	0.82	10.6	9.6					
	2.25	4.5	10.3	8.0	6.0	0.80	10.7	10.0					
110	1.13	1.3	2.9	6.6	5.4	0.93	9.8	7.1	Operation Not Recommended				
	1.69	2.6	6.1	7.0	5.5	0.90	10.0	7.8					
	2.25	4.4	10.1	7.2	5.6	0.88	10.1	8.2					
120	1.13	1.2	2.8	5.7	5.0	1.01	9.1	5.6	Operation Not Recommended				
	1.69	2.6	5.9	6.1	5.1	0.98	9.4	6.2					
	2.25	4.3	10.0	6.3	5.2	0.96	9.5	6.5					

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 012

375 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F					Heating - EAT 70°F					
	FLOW GPM	PSI	FT	TC	SC	PSC			PSC					
						Power kW	HR	EER	HC	Power kW	HE	LAT	COP	
20	1.50	Operation Not Recommended							Operation Not Recommended					
	2.25	Operation Not Recommended							Operation Not Recommended					
	3.00	8.5	19.6	Operation Not Recommended							Operation Not Recommended			
30	1.50	1.9	4.4	14.8	9.3	0.57	16.8	25.8	9.5	0.90	6.40	91.9	3.1	
	2.25	3.6	8.3	14.9	9.3	0.53	16.7	27.9	9.9	0.91	6.80	92.8	3.2	
	3.00	6.7	15.5	14.9	9.3	0.52	16.6	28.8	10.1	0.92	7.00	93.3	3.2	
40	1.50	1.4	3.2	14.5	9.2	0.63	16.7	22.9	10.8	0.93	7.60	95.0	3.4	
	2.25	3.0	6.9	14.8	9.3	0.59	16.8	25.1	11.3	0.94	8.10	96.2	3.5	
	3.00	5.7	13.2	14.8	9.3	0.57	16.8	26.2	11.6	0.95	8.30	96.8	3.6	
50	1.50	1.1	2.5	14.1	8.9	0.70	16.5	20.1	12.2	0.97	8.90	98.2	3.7	
	2.25	2.6	6.0	14.4	9.1	0.65	16.7	22.2	12.8	0.98	9.50	99.6	3.8	
	3.00	5.0	11.6	14.6	9.2	0.63	16.7	23.3	13.1	0.99	9.80	100.4	3.9	
60	1.50	0.9	2.1	13.5	8.6	0.77	16.1	17.4	13.6	1.00	10.2	101.5	4.0	
	2.25	2.3	5.3	13.9	8.8	0.72	16.4	19.3	14.3	1.02	10.8	103.1	4.1	
	3.00	4.5	10.4	14.1	8.9	0.69	16.5	20.4	14.7	1.03	11.2	104.0	4.2	
70	1.50	0.8	1.8	12.7	8.3	0.85	15.6	14.9	15.0	1.04	11.5	104.8	4.2	
	2.25	2.1	4.9	13.1	8.4	0.80	15.8	16.3	15.8	1.06	12.2	106.5	4.4	
	3.00	4.1	9.5	13.3	8.5	0.78	15.9	17.0	16.2	1.07	12.5	107.5	4.4	
80	1.50	0.7	1.6	11.9	7.9	0.94	15.1	12.7	16.4	1.08	12.7	108.0	4.5	
	2.25	1.9	4.4	12.3	8.0	0.88	15.3	13.9	17.2	1.10	13.4	109.8	4.6	
	3.00	3.8	8.8	12.5	8.1	0.86	15.4	14.5	17.6	1.11	13.8	110.7	4.6	
85	1.50	0.6	1.4	11.4	7.7	0.98	14.7	11.7	17.0	1.10	13.3	109.4	4.6	
	2.25	1.8	4.2	11.9	7.9	0.93	15.0	12.8	17.8	1.10	14.0	111.2	4.6	
	3.00	3.7	8.5	12.1	7.9	0.90	15.1	13.4	18.2	1.10	14.3	112.1	4.7	
90	1.50	0.6	1.4	10.9	7.5	1.03	14.4	10.7	17.7	1.12	13.9	110.9	4.6	
	2.25	1.8	4.2	11.4	7.7	0.97	14.7	11.7	18.4	1.15	14.5	112.6	4.7	
	3.00	3.6	8.3	11.6	7.7	0.95	14.8	12.3	18.8	1.16	14.8	113.5	4.7	
100	1.50	0.5	1.2	9.9	7.2	1.12	13.8	8.9	Operation Not Recommended					
	2.25	1.7	3.9	10.5	7.3	1.06	14.1	9.8						
	3.00	3.3	7.6	10.8	7.5	1.04	14.3	10.4						
110	1.50	0.5	1.2	8.9	6.8	1.22	13.1	7.3	Operation Not Recommended					
	2.25	1.6	3.7	9.4	7.0	1.16	13.4	8.1						
	3.00	3.2	7.4	9.8	7.1	1.14	13.7	8.6						
120	1.50	0.4	0.9	7.8	6.4	1.32	12.3	5.9	Operation Not Recommended					
	2.25	1.5	3.5	8.3	6.6	1.27	12.7	6.6						
	3.00	3.0	6.9	8.7	6.7	1.24	12.9	7.0						

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 015

525 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F								
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM					
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP
20	1.88	Operation Not Recommended																			
	2.81	Operation Not Recommended																			
	3.75	4.4	10.2										9.2	0.96	6.1	84.2	2.9	9.2	0.92	6.1	84.2
30	1.88	0.5	1.3	16.7	12.3	0.68	19.0	24.3	0.65	18.9	25.8	10.1	0.98	6.9	85.7	3.1	10.1	0.9	6.9	85.7	3.1
	2.81	1.3	3.1	16.7	12.2	0.61	18.8	27.2	0.58	18.7	29.0	10.6	0.99	7.3	86.6	3.2	10.6	1.0	7.3	86.6	3.2
	3.75	2.3	5.4	16.7	12.0	0.58	18.6	28.6	0.54	18.5	30.6	10.8	0.99	7.5	87.0	3.3	10.8	1.0	7.5	87.0	3.3
40	1.88	0.5	1.2	16.3	12.1	0.77	18.9	21.1	0.73	18.8	22.2	11.5	1.01	8.2	88.3	3.5	11.5	1.0	8.2	88.3	3.5
	2.81	1.3	2.9	16.6	12.3	0.70	19.0	23.9	0.66	18.9	25.3	12.1	1.02	8.8	89.3	3.6	12.1	1.0	8.8	89.3	3.6
	3.75	2.1	4.9	16.7	12.3	0.66	19.0	25.3	0.62	18.8	26.9	12.5	1.03	9.1	89.9	3.7	12.5	1.0	9.1	89.9	3.7
50	1.88	0.5	1.1	15.7	11.8	0.86	18.7	18.2	0.83	18.5	19.0	13.0	1.04	9.6	91.0	3.8	13.0	1.0	9.6	91.0	3.8
	2.81	1.2	2.7	16.2	12.1	0.78	18.9	20.7	0.75	18.8	21.8	13.7	1.05	10.3	92.2	4.0	13.7	1.0	10.3	92.2	4.0
	3.75	2.0	4.6	16.4	12.2	0.74	19.0	22.1	0.71	18.8	23.3	14.1	1.06	10.6	92.9	4.1	14.1	1.0	10.6	92.9	4.1
60	1.88	0.5	1.0	15.0	11.4	0.96	18.3	15.6	0.92	18.1	16.2	14.6	1.07	11.1	93.6	4.1	14.6	1.03	11.1	93.6	4.1
	2.81	1.1	2.5	15.6	11.8	0.88	18.6	17.8	0.84	18.5	18.6	15.4	1.08	11.8	95.1	4.3	15.4	1.04	11.8	95.1	4.3
	3.75	1.9	4.3	15.9	11.9	0.84	18.8	19.0	0.80	18.6	19.9	15.8	1.09	12.2	95.8	4.4	15.8	1.05	12.2	95.8	4.4
70	1.88	0.4	1.0	14.1	10.9	1.07	17.8	13.3	1.03	17.6	13.7	16.1	1.09	12.5	96.3	4.5	16.1	1.06	12.5	96.3	4.5
	2.81	1.0	2.3	14.8	11.3	0.98	18.2	15.1	0.94	18.1	15.8	17.0	1.11	13.3	97.9	4.7	17.0	1.07	13.3	97.9	4.7
	3.75	1.7	4.0	15.2	11.5	0.94	18.4	16.2	0.90	18.3	16.9	17.5	1.12	13.8	98.8	4.8	17.5	1.08	13.8	98.8	4.8
80	1.88	0.4	0.9	13.2	10.5	1.17	17.2	11.2	1.13	17.0	11.6	17.6	1.12	13.9	99.0	4.8	17.6	1.08	13.9	99.0	4.8
	2.81	0.9	2.1	13.9	10.9	1.09	17.7	12.8	1.05	17.5	13.3	18.6	1.13	14.8	100.7	5.0	18.6	1.10	14.8	100.7	5.0
	3.75	1.6	3.7	14.3	11.0	1.04	17.9	13.7	1.00	17.7	14.3	19.1	1.14	15.4	101.6	5.1	19.1	1.10	15.4	101.6	5.1
85	1.88	0.4	0.8	12.7	10.3	1.23	16.9	10.3	1.19	16.7	10.7	18.3	1.13	14.6	100.3	4.9	18.3	1.09	14.6	100.3	4.9
	2.81	0.9	2.0	13.5	10.6	1.14	17.3	11.8	1.10	17.2	12.2	19.3	1.14	15.6	102.0	5.1	19.3	1.11	15.6	102.0	5.1
	3.75	1.5	3.6	13.8	10.8	1.10	17.6	12.6	1.06	17.5	13.1	19.9	1.15	16.1	103.0	5.2	19.9	1.12	16.1	103.0	5.2
90	1.88	0.4	0.8	12.2	10.1	1.28	16.6	9.5	1.24	16.4	9.8	19.1	1.14	15.3	101.6	5.1	19.1	1.10	15.3	101.6	5.1
	2.81	0.9	2.0	13.0	10.4	1.20	17.0	10.8	1.16	16.9	11.2	20.1	1.16	16.3	103.4	5.3	20.1	1.12	16.3	103.4	5.3
	3.75	1.5	3.4	13.4	10.6	1.15	17.3	11.6	1.11	17.2	12.0	20.7	1.16	16.8	104.4	5.4	20.7	1.13	16.8	104.4	5.4
100	1.88	0.3	0.8	11.2	9.7	1.40	16.0	8.0	1.36	15.8	8.2	Operation Not Recommended									
	2.81	0.8	1.9	11.9	9.9	1.31	16.4	9.1	1.27	16.3	9.4	Operation Not Recommended									
	3.75	1.4	3.2	12.3	10.1	1.27	16.6	9.7	1.23	16.5	10.0	Operation Not Recommended									
110	1.88	0.3	0.8	10.2	9.4	1.51	15.4	6.7	1.47	15.2	6.9	Operation Not Recommended									
	2.81	0.8	1.7	10.9	9.6	1.43	15.8	7.6	1.39	15.6	7.8	Operation Not Recommended									
	3.75	1.3	3.0	11.3	9.7	1.39	16.0	8.1	1.35	15.9	8.4	Operation Not Recommended									
120	1.88	0.3	0.7	9.3	9.2	1.63	14.8	5.7	1.59	14.7	5.8	Operation Not Recommended									
	2.81	0.7	1.6	9.9	9.3	1.55	15.2	6.4	1.51	15.1	6.6	Operation Not Recommended									
	3.75	1.2	2.9	10.2	9.4	1.51	15.4	6.8	1.47	15.3	7.0	Operation Not Recommended									

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 024

825 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F											
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM								
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP			
20	3.00	Operation Not Recommended											Operation Not Recommended											
	4.50	8.5	19.6												15.5	1.91	9.5	92.0	2.4	15.9	1.87	9.5	92.0	2.5
	6.00	8.5	19.6												15.9	1.71	10.1	87.0	2.7	15.8	1.67	10.1	87.0	2.8
30	3.00	2.2	5.1	28.9	19.7	1.16	32.8	24.8	1.12	32.7	25.8	17.6	1.74	11.8	89.0	3.0	17.6	1.70	11.8	89.0	3.0			
	4.50	4.0	9.2	29.4	19.8	1.09	33.1	26.9	1.05	33.0	28.0	18.4	1.75	12.5	90.0	3.1	18.3	1.71	12.5	90.0	3.1			
	6.00	7.2	16.6	29.6	19.8	1.06	33.2	28.0	1.02	33.1	29.0	18.8	1.76	12.9	91.0	3.1	18.8	1.72	12.9	90.0	3.2			
40	3.00	1.9	4.4	28.0	19.4	1.28	32.4	21.9	1.24	32.2	22.6	20.4	1.78	14.4	92.0	3.4	20.3	1.74	14.4	92.0	3.4			
	4.50	3.6	8.3	28.7	19.6	1.19	32.7	24.0	1.15	32.6	24.9	21.3	1.79	15.3	93.0	3.5	21.3	1.75	15.3	93.0	3.6			
	6.00	6.4	14.8	28.9	19.7	1.16	32.8	25.1	1.12	32.7	25.8	21.9	1.80	15.7	94.0	3.6	21.7	1.76	15.7	94.0	3.6			
50	3.00	1.7	3.9	27.3	19.1	1.42	32.1	19.3	1.38	32.0	19.8	23.2	1.82	17.0	95.0	3.7	23.1	1.78	17.0	95.0	3.8			
	4.50	3.2	7.4	27.8	19.3	1.32	32.2	21.1	1.28	32.2	21.7	24.3	1.84	18.0	96.0	3.9	24.1	1.80	18.0	96.0	3.9			
	6.00	5.9	13.6	28.1	19.4	1.27	32.4	22.1	1.23	32.3	22.8	24.9	1.85	18.6	97.0	3.9	24.8	1.81	18.6	97.0	4.0			
60	3.00	1.5	3.5	26.3	18.8	1.58	31.7	16.7	1.54	31.6	17.1	25.9	1.87	19.6	98.0	4.1	25.8	1.83	19.6	98.0	4.1			
	4.50	3.0	6.9	26.8	18.9	1.46	31.7	18.3	1.42	31.6	18.9	27.2	1.89	20.7	100.0	4.2	27.0	1.85	20.7	99.0	4.3			
	6.00	5.5	12.7	27.1	19.0	1.41	31.9	19.3	1.37	31.8	19.8	27.9	1.90	21.4	100.0	4.3	27.8	1.86	21.4	100.0	4.4			
70	3.00	1.4	3.2	25.1	18.3	1.77	31.1	14.2	1.73	31.0	14.5	28.6	1.91	22.1	101.0	4.4	28.5	1.87	22.1	101.0	4.5			
	4.50	2.8	6.5	25.6	18.4	1.63	31.2	15.7	1.59	31.0	16.1	29.9	1.94	23.3	103.0	4.5	29.8	1.90	23.3	102.0	4.6			
	6.00	5.2	12.0	26.0	18.6	1.57	31.4	16.6	1.53	31.2	17.0	30.6	1.95	24.0	103.0	4.6	30.5	1.91	24.0	103.0	4.7			
80	3.00	1.3	3.0	23.8	17.8	1.99	30.6	12.0	1.95	30.5	12.2	31.1	1.96	24.4	104.0	4.7	31.0	1.92	24.4	104.0	4.7			
	4.50	2.6	6.0	24.4	17.9	1.84	30.7	13.3	1.80	30.5	13.5	32.5	1.99	25.7	105.0	4.8	32.4	1.95	25.7	105.0	4.9			
	6.00	4.9	11.3	24.8	18.1	1.77	30.8	14.1	1.73	30.7	14.3	33.1	2.00	26.3	106.0	4.9	33.0	1.96	26.3	106.0	4.9			
85	3.00	1.3	3.0	23.1	17.5	2.12	30.4	11.0	2.08	30.2	11.1	32.3	1.98	25.5	105.0	4.8	32.1	1.94	25.5	105.0	4.8			
	4.50	2.6	6.0	23.7	17.6	1.95	30.4	12.2	1.91	30.2	12.4	33.5	2.01	26.7	107.0	4.9	33.4	1.97	26.7	107.0	5.0			
	6.00	4.8	11.1	24.1	17.8	1.88	30.5	12.9	1.84	30.4	13.1	34.2	2.02	27.2	107.0	5.0	34.0	1.98	27.2	108.0	5.0			
90	3.00	1.2	2.8	22.4	17.3	2.25	30.1	10.0	2.21	29.9	10.1	33.4	2.01	26.5	106.0	4.9	33.2	1.97	26.5	107.0	4.9			
	4.50	2.5	5.8	23.1	17.4	2.07	30.1	11.1	2.03	30.0	11.4	34.6	2.03	27.6	108.0	5.0	34.4	1.99	27.6	108.0	5.1			
	6.00	4.7	10.9	23.4	17.5	1.99	30.2	11.8	1.95	30.1	12.0	35.2	2.05	28.2	108.0	5.0	35.1	2.01	28.2	109.0	5.1			
100	3.00	1.2	2.8	21.0	16.8	2.54	29.7	8.3	2.50	29.5	8.4	Operation Not Recommended												
	4.50	2.4	5.5	21.6	16.9	2.34	29.7	9.2	2.30	29.5	9.4													
	6.00	4.5	10.4	22.0	17.0	2.25	29.7	9.8	2.21	29.5	9.9													
110	3.00	1.1	2.5	19.5	16.3	2.88	29.4	6.8	2.84	29.2	6.9	Operation Not Recommended												
	4.50	2.3	5.3	20.1	16.3	2.66	29.2	7.6	2.62	29.0	7.7													
	6.00	4.3	9.9	20.5	16.4	2.55	29.3	8.0	2.51	29.1	8.2													
120	3.00	1.0	2.3	17.8	15.7	3.26	29.0	5.5	3.22	28.8	5.5	Operation Not Recommended												
	4.50	2.2	5.1	18.6	15.8	3.01	28.9	6.2	2.97	28.7	6.3													
	6.00	4.2	9.7	19.1	16.0	2.89	29.0	6.6	2.85	28.8	6.7													

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 030

1,000 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F								
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM					
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP
20	3.75			Operation Not Recommended									Operation Not Recommended								
	5.63	5.0	11.6									20.0	2.31	12.6	95.0	2.5	20.3	2.25	12.6	92.0	2.6
	7.50	5.0	11.6									20.4	2.08	13.4	89.0	2.9	20.3	2.02	13.4	87.0	2.9
30	3.75	1.3	3.0	34.7	22.9	1.44	39.5	24.0	1.38	39.4	25.1	22.1	2.13	14.9	90.0	3.0	22.0	2.07	14.9	89.0	3.1
	5.63	2.3	5.3	34.9	22.8	1.36	39.5	25.7	1.30	39.3	26.8	23.0	2.15	15.7	91.0	3.1	22.8	2.09	15.7	90.0	3.2
	7.50	4.2	9.7	35.0	22.7	1.32	39.4	26.5	1.26	39.3	27.7	23.5	2.16	16.2	92.0	3.2	23.4	2.10	16.2	90.0	3.3
40	3.75	1.0	2.3	34.0	22.8	1.57	39.3	21.6	1.51	39.2	22.5	25.3	2.20	17.8	93.0	3.4	25.1	2.14	17.8	92.0	3.4
	5.63	2.0	4.6	34.5	22.9	1.48	39.5	23.3	1.42	39.4	24.3	26.4	2.23	18.8	94.0	3.5	26.2	2.17	18.8	93.0	3.5
	7.50	3.7	8.5	35.1	23.2	1.44	39.9	24.4	1.38	39.8	25.4	26.9	2.24	19.4	95.0	3.5	26.8	2.18	19.4	94.0	3.6
50	3.75	0.9	2.1	32.9	22.5	1.72	38.8	19.2	1.66	38.6	19.8	28.5	2.26	20.8	96.0	3.7	28.3	2.20	20.8	95.0	3.8
	5.63	1.8	4.2	33.7	22.8	1.61	39.1	20.9	1.55	39.0	21.7	29.8	2.29	22.0	98.0	3.8	29.6	2.23	22.0	96.0	3.9
	7.50	3.4	7.9	34.0	22.9	1.57	39.3	21.7	1.51	39.2	22.5	30.5	2.30	22.7	98.0	3.9	30.3	2.24	22.7	97.0	4.0
60	3.75	0.8	1.8	31.7	21.9	1.89	38.1	16.8	1.83	37.9	17.3	31.8	2.32	23.9	99.0	4.0	31.6	2.26	23.9	98.0	4.1
	5.63	1.7	3.9	32.4	22.2	1.77	38.4	18.3	1.71	38.2	18.9	33.3	2.34	25.3	101.0	4.2	33.1	2.28	25.3	99.0	4.2
	7.50	3.1	7.2	32.7	22.3	1.71	38.5	19.1	1.65	38.3	19.8	34.1	2.36	26.0	102.0	4.2	33.9	2.30	26.0	100.0	4.3
70	3.75	0.7	1.6	30.2	21.2	2.08	37.3	14.5	2.02	37.1	14.9	35.1	2.37	26.9	102.0	4.3	34.8	2.31	26.9	101.0	4.4
	5.63	1.5	3.5	31.2	21.7	1.95	37.8	16.0	1.89	37.7	16.5	36.7	2.40	28.5	104.0	4.5	36.5	2.34	28.5	102.0	4.6
	7.50	2.9	6.7	31.7	21.9	1.89	38.1	16.8	1.83	37.9	17.3	37.6	2.42	29.3	105.0	4.6	37.4	2.36	29.3	103.0	4.6
80	3.75	0.7	1.6	28.8	20.7	2.30	36.7	12.5	2.24	36.4	12.8	38.2	2.43	29.9	105.0	4.6	38.0	2.37	29.9	104.0	4.7
	5.63	1.4	3.2	29.6	21.0	2.16	37.0	13.7	2.10	36.8	14.1	40.0	2.47	31.5	107.0	4.7	39.7	2.41	31.5	105.0	4.8
	7.50	2.7	6.2	30.2	21.2	2.08	37.3	14.5	2.02	37.1	14.9	41.2	2.50	32.6	108.0	4.8	40.9	2.44	32.6	106.0	4.9
85	3.75	0.6	1.4	27.8	20.1	2.43	36.1	11.5	2.37	35.9	11.7	39.8	2.50	31.3	107.0	4.7	39.6	2.44	31.3	105.0	4.8
	5.63	1.4	3.2	28.8	20.6	2.27	36.5	12.7	2.21	36.3	13.0	41.5	2.50	32.9	108.0	4.8	41.2	2.44	32.9	107.0	4.9
	7.50	2.7	6.2	29.3	20.8	2.20	36.8	13.4	2.14	36.6	13.7	42.6	2.50	33.9	109.0	4.9	42.2	2.44	33.9	108.0	5.1
90	3.75	0.6	1.4	26.8	19.6	2.56	35.5	10.5	2.50	35.3	10.7	41.3	2.51	32.7	108.0	4.8	41.1	2.45	32.7	107.0	4.9
	5.63	1.4	3.2	27.9	20.1	2.39	36.1	11.7	2.33	35.9	12.0	43.0	2.56	34.3	110.0	4.9	42.8	2.50	34.3	108.0	5.0
	7.50	2.6	6.0	28.5	20.4	2.31	36.4	12.3	2.25	36.2	12.7	44.0	2.59	35.1	111.0	5.0	43.7	2.53	35.1	109.0	5.1
100	3.75	0.6	1.4	24.9	18.8	2.85	34.7	8.7	2.79	34.4	8.9										
	5.63	1.3	3.0	26.1	19.3	2.67	35.2	9.8	2.61	35.0	10.0										
	7.50	2.5	5.8	26.7	19.6	2.58	35.5	10.3	2.52	35.3	10.6										
110	3.75	0.5	1.2	23.5	18.2	3.19	34.4	7.4	3.13	34.2	7.5										
	5.63	1.2	2.8	24.2	18.4	2.98	34.4	8.1	2.92	34.2	8.3										
	7.50	2.4	5.5	24.8	18.7	2.88	34.6	8.6	2.82	34.4	8.8										
120	3.75	0.5	1.2	21.2	17.2	3.58	33.5	5.9	3.52	33.2	6.0										
	5.63	1.2	2.8	22.3	17.6	3.34	33.8	6.7	3.28	33.5	6.8										
	7.50	2.3	5.3	22.9	17.8	3.23	33.9	7.1	3.17	33.7	7.2										

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 036

1,150 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F									
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM						
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP	
20	4.50			Operation Not Recommended									Operation Not Recommended									
	6.75	6.4	14.8										22.6	2.67	14.1	94.0	2.5	20.0	2.31	12.6	95.0	2.5
	9.00	6.4	14.8										23.2	2.39	15.1	89.0	2.8	20.4	2.08	13.4	89.0	2.9
30	4.50	1.8	4.2	41.5	27.4	1.74	47.4	23.8	1.70	47.3	24.4	26.2	2.51	17.7	91.0	3.1	26.1	2.47	17.7	89.0	3.1	
	6.75	3.1	7.2	41.7	27.5	1.69	47.4	24.7	1.65	47.3	25.2	27.5	2.56	18.8	92.0	3.2	27.4	2.52	18.8	90.0	3.2	
	9.00	5.4	12.5	41.7	27.5	1.67	47.3	25.0	1.63	47.3	25.5	28.2	2.59	19.4	93.0	3.2	28.1	2.55	19.4	90.0	3.2	
40	4.50	1.6	3.7	40.8	27.2	1.87	47.1	21.8	1.83	47.1	22.3	30.8	2.68	21.7	95.0	3.4	30.7	2.64	21.7	92.0	3.4	
	6.75	2.7	6.2	41.4	27.4	1.78	47.4	23.3	1.74	47.3	23.8	32.4	2.74	23.1	96.0	3.5	32.3	2.70	23.1	93.0	3.5	
	9.00	4.8	11.1	41.6	27.4	1.74	47.4	23.9	1.70	47.4	24.4	33.2	2.77	23.8	97.0	3.5	33.1	2.73	23.8	94.0	3.6	
50	4.50	1.4	3.2	39.5	26.7	2.06	46.5	19.2	2.02	46.4	19.5	35.4	2.84	25.7	98.0	3.7	35.3	2.80	25.7	95.0	3.7	
	6.75	2.4	5.5	40.4	27.0	1.92	47.0	21.0	1.88	46.8	21.5	37.2	2.90	27.3	100.0	3.8	37.1	2.86	27.3	96.0	3.8	
	9.00	4.4	10.2	40.8	27.2	1.87	47.2	21.9	1.83	47.1	22.3	38.2	2.93	28.2	101.0	3.8	38.1	2.89	28.2	97.0	3.9	
60	4.50	1.3	3.0	37.6	25.9	2.29	45.4	16.4	2.25	45.3	16.7	39.8	2.99	29.7	102.0	3.9	39.8	2.95	29.7	98.0	3.9	
	6.75	2.3	5.3	39.1	26.5	2.13	46.3	18.4	2.09	46.2	18.7	41.9	3.05	31.5	104.0	4.0	41.8	3.01	31.5	99.0	4.1	
	9.00	4.0	9.2	39.6	26.7	2.05	46.5	19.3	2.01	46.5	19.7	43.0	3.09	32.5	105.0	4.1	42.9	3.05	32.5	100.0	4.1	
70	4.50	1.2	2.8	36.0	25.5	2.56	44.7	14.0	2.52	44.6	14.3	44.1	3.12	33.5	106.0	4.2	44.0	3.08	33.5	101.0	4.2	
	6.75	2.1	4.9	37.3	25.9	2.38	45.4	15.7	2.34	45.3	15.9	46.3	3.19	35.4	107.0	4.3	46.2	3.15	35.4	102.0	4.3	
	9.00	3.8	8.8	37.9	26.1	2.29	45.7	16.6	2.25	45.6	16.8	47.5	3.22	36.5	108.0	4.3	47.4	3.18	36.5	103.0	4.4	
80	4.50	1.1	2.5	33.8	24.7	2.88	43.7	11.8	2.84	43.5	11.9	48.2	3.24	37.1	109.0	4.4	48.0	3.20	37.1	104.0	4.4	
	6.75	2.0	4.6	35.3	25.2	2.67	44.4	13.2	2.63	44.3	13.4	50.4	3.30	39.1	111.0	4.5	50.2	3.26	39.1	105.0	4.5	
	9.00	3.6	8.3	35.9	25.5	2.57	44.7	14.0	2.53	44.5	14.2	51.5	3.34	40.1	111.0	4.5	51.4	3.30	40.1	106.0	4.6	
85	4.50	1.0	2.3	32.8	24.4	3.05	43.3	10.8	3.01	43.1	10.9	50.0	3.29	38.8	110.0	4.5	49.9	3.25	38.8	105.0	4.5	
	6.75	1.9	4.4	34.1	24.8	2.84	43.8	12.1	2.80	43.7	12.2	52.2	3.35	40.7	112.0	4.6	52.0	3.31	40.7	107.0	4.6	
	9.00	3.5	8.1	34.7	25.0	2.73	44.1	12.8	2.69	43.9	12.9	53.2	3.38	41.7	113.0	4.6	53.1	3.34	41.7	108.0	4.7	
90	4.50	1.0	2.3	31.8	24.0	3.23	42.8	9.8	3.19	42.7	10.0	51.9	3.34	40.4	112.0	4.5	51.7	3.30	40.4	107.0	4.6	
	6.75	1.9	4.4	33.0	24.4	3.00	43.3	11.0	2.96	43.1	11.1	54.0	3.40	42.3	113.0	4.7	53.8	3.36	42.3	108.0	4.7	
	9.00	3.4	7.9	33.5	24.5	2.89	43.4	11.6	2.85	43.2	11.7	55.0	3.43	43.2	114.0	4.7	54.8	3.39	43.2	109.0	4.7	
100	4.50	0.9	2.1	29.5	23.1	3.62	41.9	8.2	3.58	41.7	8.2	Operation Not Recommended										
	6.75	1.8	4.2	30.7	23.5	3.37	42.2	9.1	3.33	42.1	9.2											
	9.00	3.3	7.6	31.3	23.7	3.25	42.5	9.6	3.21	42.3	9.7											
110	4.50	0.9	2.1	27.3	22.4	4.04	41.1	6.8	4.00	41.0	6.8	Operation Not Recommended										
	6.75	1.7	3.9	28.4	22.6	3.78	41.3	7.5	3.74	41.2	7.6											
	9.00	3.1	7.2	28.8	22.7	3.65	41.3	7.9	3.61	41.1	8.0											
120	4.50	0.9	2.1	25.1	21.4	4.49	40.4	5.6	4.45	40.3	5.6	Operation Not Recommended										
	6.75	1.6	3.7	26.1	21.8	4.21	40.6	6.2	4.17	40.3	6.3											
	9.00	3.0	6.9	26.5	21.8	4.08	40.5	6.5	4.04	40.3	6.6											

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB V 041

1,125 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F					Heating - EAT 70°F				
	FLOW GPM	PSI	FT	TC	SC	Power kW	HR	EER	HC	Power kW	HE	LAT	COP
20	10.00	8.8	20.3	Operation Not Recommended					27.2	2.85	17.6	92.4	2.8
30	5.00	2.2	5.0	46.8	28.5	1.71	52.6	27.4	29.5	2.90	19.7	94.3	3.0
	7.50	4.6	10.7	47.6	28.6	1.57	52.9	30.4	30.7	2.93	20.7	95.2	3.1
	10.00	7.7	17.9	48.0	28.6	1.50	53.0	32.1	31.3	2.94	21.3	95.7	3.1
40	5.00	1.9	4.3	45.6	28.1	1.89	52.0	24.2	33.2	2.99	23.1	97.4	3.3
	7.50	4.0	9.3	46.1	28.3	1.82	52.3	25.3	34.6	3.02	24.3	98.5	3.4
	10.00	6.9	19.9	46.5	28.4	1.77	52.4	26.2	35.3	3.04	25.0	99.1	3.4
50	5.00	1.6	3.6	44.2	27.6	2.07	51.2	21.3	37.0	3.08	26.5	100.4	3.5
	7.50	3.5	8.0	45.3	28.0	1.93	51.8	23.4	38.5	3.12	27.9	101.7	3.6
	10.00	6.1	14.2	45.8	28.2	1.86	52.1	24.6	39.4	3.14	28.7	102.4	3.7
60	5.00	1.3	3.0	42.6	27.0	2.27	50.3	18.8	40.7	3.17	29.9	103.5	3.8
	7.50	3.0	7.0	43.8	27.4	2.12	51.0	20.6	42.5	3.22	31.5	104.9	3.9
	10.00	5.5	12.8	44.4	27.7	2.05	51.3	21.7	43.4	3.24	32.4	105.7	3.9
70	5.00	1.1	2.6	40.8	26.2	2.49	49.3	16.4	44.4	3.27	33.3	106.6	4.0
	7.50	2.6	6.1	42.1	26.8	2.33	50.0	18.1	46.4	3.32	35.1	108.2	4.1
	10.00	5.1	11.7	42.8	27.0	2.25	50.4	19.0	47.4	3.35	36.0	109.0	4.2
80	5.00	0.9	2.2	38.9	25.4	2.74	48.3	14.2	48.1	3.37	36.7	109.6	4.2
	7.50	2.3	5.4	40.3	26.0	2.56	49.0	15.8	50.3	3.43	38.6	111.4	4.3
	10.00	4.7	11.0	41.0	26.3	2.47	49.4	16.6	51.4	3.46	39.6	112.3	4.4
85	5.00	0.9	2.0	37.9	25.0	2.88	47.8	13.2	50.0	3.40	38.3	111.1	4.3
	7.50	2.2	5.1	39.3	25.6	2.69	48.5	14.7	52.2	3.50	40.3	113.0	4.4
	10.00	4.6	10.7	40.0	25.9	2.60	48.9	15.5	53.4	3.50	41.4	114.0	4.4
90	5.00	0.8	1.9	36.9	24.6	3.03	47.3	12.2	51.8	3.47	40.0	112.7	4.4
	7.50	2.1	4.4	38.3	25.2	2.82	48.0	13.6	54.1	3.54	42.0	114.6	4.5
	10.00	4.6	10.6	39.0	25.5	2.72	48.3	14.3	55.4	3.58	43.2	115.6	4.5
100	5.00	0.7	1.7	32.7	23.0	3.76	45.5	8.7	Operation Not Recommended				
	7.50	2.0	4.5	34.1	23.6	3.49	46.1	9.8					
	10.00	4.5	10.5	34.9	23.8	3.36	46.4	10.4					
110	5.00	0.7	1.5	30.5	22.3	4.22	44.9	7.2					
	7.50	1.9	4.4	31.9	22.8	3.91	45.3	8.2					
	10.00	4.6	10.7	32.7	23.0	3.76	45.5	8.7					
120	5.00	0.7	1.5	28.7	21.7	4.63	44.6	6.2					
	7.50	1.9	4.4	30.2	22.2	4.28	44.9	7.1					
	10.00	4.8	11.2	30.9	22.4	4.12	45.0	7.5					

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 048

1,550 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F																		
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM															
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP										
20	6.00			Operation Not Recommended									Operation Not Recommended																		
	9.00	6.8	15.7																			30.9	3.54	19.6	94.0	2.6	31.4	3.45	19.6	92.0	2.7
	12.00	6.8	15.7																			31.6	3.18	20.9	88.0	2.9	31.5	3.09	20.9	87.0	3.0
30	6.00	1.8	4.2	58.8	39.0	2.34	66.7	25.1	2.25	66.5	26.1	34.7	3.24	23.8	90.0	3.1	34.6	3.15	23.8	89.0	3.2										
	9.00	3.4	7.9	59.8	39.1	2.20	67.2	27.2	2.11	67.0	28.3	35.3	3.26	24.2	90.0	3.2	35.0	3.17	24.2	90.0	3.2										
	12.00	6.2	14.3	60.3	39.1	2.14	67.5	28.2	2.05	67.3	29.4	36.0	3.27	24.9	91.0	3.2	35.8	3.18	24.9	90.0	3.3										
40	6.00	1.6	3.7	57.1	38.5	2.57	65.8	22.2	2.48	65.6	23.0	38.8	3.33	27.5	92.0	3.4	38.6	3.24	27.5	92.0	3.5										
	9.00	3.1	7.2	58.3	38.9	2.40	66.4	24.3	2.31	66.2	25.2	40.5	3.36	29.1	93.0	3.5	40.3	3.27	29.1	93.0	3.6										
	12.00	5.8	13.4	58.9	39.0	2.32	66.8	25.4	2.23	66.5	26.4	41.7	3.37	30.2	94.0	3.6	41.4	3.28	30.2	94.0	3.7										
50	6.00	1.5	3.5	55.1	37.7	2.83	64.7	19.4	2.74	64.5	20.1	44.7	3.42	33.0	96.0	3.8	44.4	3.33	33.0	95.0	3.9										
	9.00	3.0	6.9	56.5	38.3	2.64	65.5	21.4	2.55	65.2	22.1	46.0	3.46	34.3	97.0	3.9	45.8	3.37	34.3	96.0	4.0										
	12.00	5.5	12.7	57.2	38.5	2.55	65.8	22.5	2.46	65.6	23.2	47.1	3.48	35.3	97.0	4.0	46.9	3.39	35.3	97.0	4.0										
60	6.00	1.4	3.2	52.8	36.8	3.15	63.5	16.8	3.06	63.3	17.2	49.3	3.51	37.4	99.0	4.1	49.1	3.42	37.4	98.0	4.2										
	9.00	2.8	6.5	54.5	37.5	2.92	64.4	18.6	2.83	64.2	19.2	51.8	3.56	39.6	100.0	4.3	51.5	3.47	39.6	99.0	4.3										
	12.00	5.3	12.2	55.2	37.8	2.81	64.8	19.6	2.72	64.5	20.3	53.1	3.58	40.9	101.0	4.3	52.8	3.49	40.9	100.0	4.4										
70	6.00	1.3	3.0	50.3	35.7	3.52	62.3	14.3	3.43	62.0	14.6	54.8	3.61	42.4	102.0	4.4	54.4	3.52	42.4	101.0	4.5										
	9.00	2.7	6.2	52.1	36.4	3.25	63.2	16.0	3.16	62.9	16.5	57.5	3.67	45.0	103.0	4.6	57.2	3.58	45.0	102.0	4.7										
	12.00	5.1	11.8	53.0	36.8	3.13	63.6	16.9	3.04	63.4	17.4	59.0	3.70	46.4	104.0	4.7	58.7	3.61	46.4	103.0	4.8										
80	6.00	1.3	3.0	47.6	34.5	3.94	61.0	12.1	3.85	60.8	12.3	60.2	3.72	47.5	105.0	4.7	59.9	3.63	47.5	104.0	4.8										
	9.00	2.6	6.0	49.5	35.3	3.64	61.9	13.6	3.55	61.6	13.9	63.2	3.78	50.2	107.0	4.9	62.8	3.69	50.2	105.0	5.0										
	12.00	4.9	11.3	50.4	35.7	3.50	62.4	14.4	3.41	62.1	14.8	64.8	3.82	51.7	107.0	5.0	64.4	3.73	51.7	106.0	5.1										
85	6.00	1.2	2.8	46.1	33.8	4.19	60.4	11.1	4.10	60.1	11.2	62.8	3.78	49.9	106.0	4.9	62.5	3.69	49.9	105.0	5.0										
	9.00	2.6	6.0	48.1	34.7	3.87	61.3	12.5	3.78	61.0	12.7	65.9	3.84	52.7	108.0	5.0	65.5	3.75	52.7	107.0	5.1										
	12.00	4.9	11.3	49.0	35.1	3.72	61.7	13.2	3.63	61.4	13.5	67.5	3.88	54.1	109.0	5.1	67.0	3.79	54.1	108.0	5.2										
90	6.00	1.2	2.8	44.6	33.2	4.43	59.8	10.1	4.34	59.4	10.3	65.5	3.83	52.3	108.0	5.0	65.1	3.74	52.3	107.0	5.1										
	9.00	2.6	6.0	46.6	34.1	4.10	60.6	11.4	4.01	60.3	11.6	68.6	3.91	55.1	110.0	5.1	68.1	3.82	55.1	108.0	5.2										
	12.00	4.8	11.1	47.6	34.5	3.94	61.1	12.1	3.85	60.8	12.3	70.2	3.95	56.6	111.0	5.2	69.8	3.86	56.6	109.0	5.3										
100	6.00	1.2	2.8	41.4	31.9	4.99	58.5	8.3	4.90	58.1	8.4	Operation Not Recommended																			
	9.00	2.5	5.8	43.5	32.7	4.62	59.3	9.4	4.53	59.0	9.6																				
	12.00	4.7	10.9	44.6	33.2	4.44	59.7	10.0	4.35	59.5	10.2																				
110	6.00	1.1	2.5	38.0	30.4	5.62	57.3	6.8	5.53	56.9	6.9	Operation Not Recommended																			
	9.00	2.4	5.5	40.2	31.4	5.21	58.0	7.7	5.12	57.7	7.8																				
	12.00	4.6	10.6	41.3	31.8	5.01	58.5	8.2	4.92	58.1	8.4																				
120	6.00	1.1	2.5	34.4	28.9	6.34	56.1	5.4	6.25	55.7	5.5	Operation Not Recommended																			
	9.00	2.4	5.5	36.7	29.9	5.88	56.8	6.2	5.79	56.5	6.3																				
	12.00	4.5	10.4	37.8	30.3	5.66	57.2	6.7	5.57	56.8	6.8																				

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Data – HB H/V 060

1,950 CFM Airflow

Performance capacities shown in thousands of Btuh

EWT °F	WPD			Cooling - EAT 80/67°F									Heating - EAT 70°F								
	FLOW GPM	PSI	FT	TC	SC	PSC			ECM			PSC				ECM					
						Power kW	HR	EER	Power kW	HR	EER	HC	Power kW	HE	LAT	COP	HC	Power kW	HE	LAT	COP
20	7.50	Operation Not Recommended																			
	11.25	Operation Not Recommended																			
	15.00	14.0	32.3										42.6	4.48	27.5	90.0	2.8	42.0	4.2	27.5	87.0
30	7.50	3.4	7.9	71.0	47.0	3.12	81.6	22.8	2.9	80.8	24.7	46.6	4.56	31.1	92.0	3.0	45.8	4.3	31.1	89.0	3.1
	11.25	6.8	15.7	71.8	47.0	2.99	82.0	24.0	2.7	81.2	26.2	48.6	4.61	33.0	93.0	3.1	47.9	4.4	33.0	90.0	3.2
	15.00	12.6	29.1	72.1	46.8	2.94	82.1	24.6	2.7	81.3	26.7	49.7	4.64	34.0	94.0	3.1	49.0	4.4	34.0	90.0	3.3
40	7.50	3.1	7.2	69.3	46.5	3.34	80.6	20.8	3.1	79.9	22.4	53.5	4.73	37.5	95.0	3.3	52.8	4.5	37.5	92.0	3.5
	11.25	6.3	14.6	70.6	47.0	3.18	81.3	22.2	2.9	80.6	24.1	56.1	4.80	39.8	97.0	3.4	55.3	4.6	39.8	93.0	3.6
	15.00	11.8	27.3	71.1	47.0	3.10	81.6	22.9	2.9	80.8	24.9	57.5	4.83	41.1	97.0	3.5	56.7	4.6	41.1	94.0	3.6
50	7.50	2.8	6.5	67.3	45.6	3.61	79.6	18.7	3.4	78.8	20.0	60.9	4.92	44.2	99.0	3.6	60.2	4.7	44.2	95.0	3.8
	11.25	5.9	13.6	68.7	46.3	3.41	80.3	20.1	3.2	79.5	21.7	64.1	5.01	47.1	100.0	3.8	63.4	4.8	47.1	96.0	3.9
	15.00	11.1	25.6	69.4	46.6	3.32	80.7	20.9	3.1	79.9	22.6	65.9	5.05	48.7	101.0	3.8	65.1	4.8	48.7	97.0	4.0
60	7.50	2.6	6.0	65.0	44.5	3.93	78.4	16.5	3.7	77.6	17.6	68.5	5.12	51.0	103.0	3.9	67.6	4.9	51.0	98.0	4.1
	11.25	5.6	12.9	66.3	45.1	3.70	78.9	17.9	3.5	78.1	19.2	72.1	5.22	54.4	104.0	4.1	71.4	5.0	54.4	99.0	4.2
	15.00	10.7	24.7	66.8	45.3	3.59	79.0	18.6	3.3	78.2	20.0	74.1	5.28	56.2	105.0	4.1	73.4	5.0	56.2	100.0	4.3
70	7.50	2.4	5.5	62.0	43.0	4.32	76.7	14.3	4.1	75.9	15.2	75.9	5.33	57.8	106.0	4.2	75.2	5.1	57.8	101.0	4.3
	11.25	5.4	12.5	63.6	43.7	4.05	77.4	15.7	3.8	76.6	16.7	79.9	5.44	61.4	108.0	4.3	79.1	5.2	61.4	102.0	4.5
	15.00	10.3	23.8	64.2	43.9	3.92	77.5	16.3	3.7	76.7	17.5	82.0	5.50	63.2	109.0	4.4	81.1	5.3	63.2	103.0	4.5
80	7.50	2.3	5.3	58.8	41.5	4.78	75.1	12.3	4.5	74.3	13.0	83.0	5.52	64.2	109.0	4.4	82.2	5.3	64.2	104.0	4.6
	11.25	5.2	12.0	60.4	42.2	4.47	75.7	13.5	4.2	74.8	14.3	87.0	5.63	67.7	111.0	4.5	86.1	5.4	67.7	105.0	4.7
	15.00	9.9	22.9	61.1	42.4	4.32	75.8	14.1	4.1	75.0	15.0	89.0	5.69	69.5	112.0	4.6	88.1	5.4	69.5	106.0	4.7
85	7.50	2.3	5.3	57.0	40.8	5.04	74.2	11.4	4.8	73.4	11.9	86.2	5.60	67.0	111.0	4.5	85.3	5.4	67.0	105.0	4.7
	11.25	5.1	11.8	58.7	41.4	4.71	74.8	12.5	4.5	73.9	13.1	89.9	5.70	70.4	113.0	4.6	89.0	5.5	70.4	107.0	4.8
	15.00	9.8	22.6	59.5	41.6	4.55	75.0	13.1	4.3	74.2	13.8	91.8	5.80	72.0	114.0	4.7	91.0	5.6	72.0	108.0	4.8
90	7.50	2.2	5.1	55.3	40.1	5.30	73.4	10.4	5.1	72.5	10.9	89.3	5.70	69.9	112.0	4.6	88.5	5.5	69.9	107.0	4.8
	11.25	5.0	11.6	57.1	40.7	4.95	74.0	11.5	4.7	73.2	12.1	92.9	5.80	73.1	114.0	4.7	92.1	5.6	73.1	108.0	4.9
	15.00	9.6	22.2	57.8	40.9	4.78	74.1	12.1	4.5	73.3	12.7	94.5	5.84	74.5	115.0	4.7	93.6	5.6	74.5	109.0	4.9
100	7.50	2.1	4.9	51.7	38.9	5.90	71.9	8.8	5.7	71.0	9.1	Operation Not Recommended									
	11.25	4.9	11.3	53.5	39.3	5.51	72.3	9.7	5.3	71.5	10.2										
	15.00	9.4	21.7	54.2	39.4	5.32	72.4	10.2	5.1	71.5	10.7										
110	7.50	2.0	4.6	48.5	38.2	6.59	71.0	7.4	6.3	70.2	7.6	Operation Not Recommended									
	11.25	4.8	11.1	49.8	38.1	6.15	70.8	8.1	5.9	69.9	8.4										
	15.00	9.2	21.3	50.6	38.2	5.94	71.0	8.5	5.7	70.0	8.9										
120	7.50	2.0	4.6	44.7	37.5	7.36	70.0	6.1	7.1	69.0	6.3	Operation Not Recommended									
	11.25	4.7	10.9	46.0	37.1	6.88	69.6	6.7	6.6	68.6	6.9										
	15.00	9.0	20.8	46.8	37.0	6.64	69.5	7.0	6.4	68.6	7.3										

Interpolation is permissible; extrapolation is not.
 All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
 Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.
 Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
 Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
 Operation below 60°F EWT requires optional insulated water/refrigerant circuit.
 See performance correction tables for operating conditions other than those listed above.
 See Performance Data Selection Notes for operation in the shaded areas.

Performance Correction Tables for Units

Entering Air Correction Table – Cooling

Cooling Corrections												
Ent Air WB F	Total Clg Cap	Sens Clg Cap Multipliers- Entering DB °F									Power	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95		
50	0.78	0.86	0.98	*	*	*	*	*	*	*	1.00	0.82
55	0.83	0.77	0.90	1.06	*	*	*	*	*	*	1.00	0.87
60	0.90		0.75	0.92	1.11	*	*	*	*	*	1.00	0.92
65	0.97			0.68	0.90	1.12	1.15	1.34	*	*	1.00	0.97
66.2	0.99			0.61	0.84	1.07	1.10	1.29	*	*	1.00	0.99
67	1.00			0.55	0.78	1.00	1.03	1.22	1.43	*	1.00	1.00
70	1.05				0.64	0.89	0.91	1.11	1.31	1.49	1.00	1.04
75	1.14					0.61	0.64	0.86	1.07	1.24	1.00	1.11

* Sensible capacity equals total capacity.
 AHR/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6 °F DB/ 66.2 °F WB, and Heating - 68 °F DB/ 59 °F WB entering air temperature.

Entering Air Correction Table – Heating

Heating Corrections			
Ent Air DB °F	Heating Capacity	Heating Power	Heat of Extraction
45	1.05	0.78	1.13
50	1.03	0.82	1.10
55	1.02	0.87	1.06
60	1.01	0.92	1.04
65	1.00	0.97	1.01
68	1.00	1.00	1.00
70	1.00	1.02	0.99
75	0.99	1.08	0.97
80	0.99	1.14	0.94

Airflow Correction Table

Airflow % of Rating	Heating			Cooling				
	Heating Capacity	Heating Power	Heat of Extraction	Total Capacity	Sensible Capacity	Sens/Total Ratio	Power	Heat of Rejection
75	0.98	1.11	0.94	0.96	0.88	0.92	0.96	0.96
81.25	0.98	1.08	0.96	0.97	0.91	0.94	0.97	0.97
87.5	0.99	1.05	0.97	0.98	0.94	0.95	0.98	0.98
93.75	0.99	1.02	0.99	0.99	0.97	0.97	0.99	0.99
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
106.25	1.00	0.98	1.01	1.01	1.04	1.04	1.01	1.01
112.5	1.01	0.97	1.02	1.01	1.10	1.09	1.03	1.01
118.75	1.01	0.96	1.03	1.01	1.18	1.17	1.04	1.02
125	1.02	0.95	1.04	1.01	1.28	1.27	1.05	1.02

Antifreeze Correction Table

EWT	Antifreeze Type	Antifreeze %	Cooling			Heating		WPD
			Total Cap	Sensible Cap	Watts	Total Cap	Watts	
90	Water	0%	1	1	1	1	1	1
	Ethanol	5%	0.998	0.998	1.002	0.996	0.999	1.025
		10%	0.996	0.996	1.003	0.991	0.997	1.048
		15%	0.994	0.994	1.005	0.987	0.996	1.098
		20%	0.991	0.991	1.006	0.982	0.994	1.142
		25%	0.986	0.986	1.009	0.972	0.991	1.207
		30%	0.981	0.981	1.012	0.962	0.988	1.265
		35%	0.977	0.977	1.015	0.953	0.985	1.312
		40%	0.972	0.972	1.018	0.943	0.982	1.37
		45%	0.966	0.966	1.023	0.931	0.978	1.431
	50%	0.959	0.959	1.027	0.918	0.974	1.494	
	Ethylene Glycol	5%	0.998	0.998	1.002	0.996	0.999	1.021
		10%	0.996	0.996	1.003	0.991	0.997	1.04
		15%	0.994	0.994	1.004	0.987	0.996	1.079
		20%	0.991	0.991	1.005	0.982	0.995	1.114
		25%	0.988	0.988	1.008	0.976	0.993	1.146
		30%	0.985	0.985	1.01	0.969	0.99	1.175
		35%	0.982	0.982	1.012	0.963	0.988	1.208
		40%	0.979	0.979	1.014	0.956	0.986	1.243
		45%	0.976	0.976	1.016	0.95	0.984	1.278
	50%	0.972	0.972	1.018	0.943	0.982	1.314	
	Methanol	5%	0.997	0.997	1.002	0.993	0.998	1.039
		10%	0.993	0.993	1.004	0.986	0.996	1.075
		15%	0.99	0.99	1.007	0.979	0.994	1.116
		20%	0.986	0.986	1.009	0.972	0.991	1.154
		25%	0.982	0.982	1.012	0.964	0.989	1.189
		30%	0.978	0.978	1.014	0.955	0.986	1.221
		35%	0.974	0.974	1.017	0.947	0.984	1.267
		40%	0.97	0.97	1.02	0.939	0.981	1.31
		45%	0.966	0.966	1.023	0.93	0.978	1.353
	50%	0.961	0.961	1.026	0.92	0.975	1.398	
	Propylene Glycol	5%	0.995	0.995	1.003	0.99	0.997	1.065
		10%	0.99	0.99	1.006	0.98	0.994	1.119
		15%	0.986	0.986	1.009	0.971	0.991	1.152
		20%	0.981	0.981	1.012	0.962	0.988	1.182
		25%	0.978	0.978	1.014	0.956	0.986	1.227
		30%	0.975	0.975	1.016	0.95	0.984	1.267
		35%	0.972	0.972	1.018	0.944	0.982	1.312
		40%	0.969	0.969	1.02	0.938	0.98	1.356
		45%	0.965	0.965	1.023	0.929	0.977	1.402
	50%	0.96	0.96	1.026	0.919	0.974	1.45	

Table Continued on Next Page

Antifreeze Correction Table

Table Continued from Previous Page

EWT	Antifreeze Type	Antifreeze %	Cooling			Heating		WPD
			Total Cap	Sensible Cap	Watts	Total Cap	Watts	
30	Water	0%	1	1	1	1	1	1
	Ethanol	5%	0.991	0.991	1.006	0.981	0.994	1.14
		10%	0.981	0.981	1.012	0.961	0.988	1.242
		15%	0.973	0.973	1.018	0.944	0.983	1.295
		20%	0.964	0.964	1.024	0.927	0.977	1.343
		25%	0.959	0.959	1.028	0.917	0.974	1.363
		30%	0.954	0.954	1.031	0.907	0.97	1.383
		35%	0.949	0.949	1.035	0.897	0.967	1.468
		40%	0.944	0.944	1.038	0.887	0.964	1.523
		45%	0.94	0.94	1.041	0.88	0.962	1.58
	50%	0.936	0.936	1.043	0.872	0.959	1.639	
	Ethylene Glycol	5%	0.997	0.997	1.002	0.993	0.998	1.04
		10%	0.993	0.993	1.004	0.986	0.996	1.075
		15%	0.99	0.99	1.006	0.98	0.994	1.122
		20%	0.987	0.987	1.008	0.973	0.992	1.163
		25%	0.983	0.983	1.011	0.966	0.99	1.195
		30%	0.979	0.979	1.013	0.958	0.987	1.225
		35%	0.976	0.976	1.016	0.951	0.985	1.279
		40%	0.972	0.972	1.018	0.943	0.982	1.324
		45%	0.969	0.969	1.021	0.937	0.98	1.371
	50%	0.966	0.966	1.023	0.93	0.978	1.419	
	Methanol	5%	0.995	0.995	1.004	0.989	0.997	1.069
		10%	0.989	0.989	1.007	0.978	0.993	1.127
		15%	0.984	0.984	1.011	0.968	0.99	1.164
		20%	0.979	0.979	1.014	0.957	0.986	1.197
		25%	0.975	0.975	1.017	0.949	0.984	1.216
		30%	0.971	0.971	1.019	0.941	0.981	1.235
		35%	0.967	0.967	1.022	0.933	0.979	1.286
		40%	0.963	0.963	1.025	0.924	0.976	1.323
		45%	0.959	0.959	1.028	0.917	0.974	1.36
	50%	0.955	0.955	1.03	0.91	0.971	1.399	
	Propylene Glycol	5%	0.995	0.995	1.004	0.989	0.997	1.071
		10%	0.989	0.989	1.007	0.978	0.993	1.13
		15%	0.985	0.985	1.01	0.968	0.99	1.206
		20%	0.98	0.98	1.013	0.958	0.987	1.27
		25%	0.974	0.974	1.017	0.947	0.983	1.359
		30%	0.968	0.968	1.021	0.935	0.979	1.433
		35%	0.963	0.963	1.025	0.924	0.976	1.522
		40%	0.957	0.957	1.029	0.913	0.972	1.614
		45%	0.949	0.949	1.034	0.898	0.967	1.712
	50%	0.941	0.941	1.039	0.882	0.962	1.816	

Blower Performance Data – HB006

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)										
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
PSC - Low Static	Low	CFM	210	190	160								
	Medium	CFM	260	240	210	190							
	High	CFM	310	290	270	230	180						

Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Blower Performance Data – HB009

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)										
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
PSC - Low Static	Low	CFM	340	322	300	260							
	Medium	CFM	390	360	320	290							260
	High	CFM	410	380	350	320							280

Airflow is controlled within 5% up to the Max ESP shown with wet coil.

Do not select Dehumidification mode if HP CFM is on setting 1.

Black areas denote ESP where operation is not recommended.

PSC: Units factory shipped on medium speed. Other speeds require field selection.

All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.

Only two speed PSC fan (H & M) available on 575V units.

Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.

All data is shown wet coil with clean 1" filter.

All data is ran at 80 °F DB and 67 °F WB.

CFM Tolerance is 7%.

RPM/Watt Tolerance 10%.

Blower Performance Data – HB012

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)										
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
PSC - Low Static	Low	CFM	360	350	320	310							
	Medium	CFM	420	400	380	360	340						
	High	CFM	470	450	430	400	380	320					

Airflow is controlled within 5% up to the Max ESP shown with wet coil.

Do not select Dehumidification mode if HP CFM is on setting 1.

Black areas denote ESP where operation is not recommended.

PSC: Units factory shipped on medium speed. Other speeds require field selection.

All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.

Only two speed PSC fan (H & M) available on 575V units.

Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.

All data is shown wet coil with clean 1" filter.

All data is ran at 80 °F DB and 67 °F WB.

CFM Tolerance is 7%.

RPM/Watt Tolerance 10%.

Blower Performance Data – HB015

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)										
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
PSC - Low Static	Low	CFM	503	490	479	439							
	Medium	CFM	595	575	562	510	451						
	High	CFM				581	510	386					
PSC - High Static	Low	CFM	462	456	443	425	385						
	Medium	CFM	546	539	531	513	481	414					
	High	CFM						547	426				
ECM - Constant Volume	Minimum CFM	RPM		617	741	848	945	1028	1103	1171			
		Power (W)		36	52	68	84	99	114	129			
		CFM		375	375	375	375	375	375	375	375		
	Default CFM	RPM		661	767	859	944	1028	1107	1179	1247		
		Power (W)		55	74	90	108	127	147	166	186		
		CFM		525	525	525	525	525	525	525	525	525	
	Maximum CFM	RPM	586	695	795	882	963	1038	1111	1180	1248	1312	
		Power (W)	54	73	93	112	132	152	173	194	216	238	
		CFM	625	625	625	625	625	625	625	625	625	625	625

See ECM control section for details on setting airflow.
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Blower Performance Data – HB018

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)											
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
PSC - Low Static	Low	RPM	764	799	925	985								
		Power (W)	147	145	135	127								
		CFM	524	509	493	451								
	Medium	RPM	863	908	928	1022								
		Power (W)	170	167	161	143								
		CFM	611	588	564	514								
	High	RPM	972	992	1015	1032							1088	
		Power (W)	195	189	184	177							149	
		CFM	704	668	643	617							504	
PSC - High Static	Low	RPM	583											
		Power (W)	152											
		CFM	461											
	Medium	RPM	621							732	813	892	951	
		Power (W)	183							179	175	166	160	
		CFM	553							543	533	506	468	
	High	RPM	697							766	865	923	979	1027
		Power (W)	227							222	212	206	192	177
		CFM	670							661	645	628	587	534
ECM - Constant Volume	Minimum CFM	RPM					1015	1096	1179	1275	1361			
		Power (W)					93	111	132	157	180			
		CFM					450	450	450	450	450			
	Default CFM	RPM	847	918	971	1095	1208	1297	1360	1418	1467			
		Power (W)	85	101	113	145	178	206	228	248	266			
		CFM	600	600	600	600	600	600	600	600	600			
	Maximum CFM	RPM	1036	1080	1131	1172	1213	1317	1406	1494				
		Power (W)	157	171	186	200	214	251	286	323				
		CFM	750	750	750	750	750	750	750	750				

See ECM control section for details on setting airflow. Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter. All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%. RPM/Watt Tolerance 10%.

Blower Performance Data – HB024

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)											
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
PSC - Low Static	Low	CFM	760	741	722	694	665	618						
	Medium	CFM	941	912	874	836	789	732						665
	High	CFM				950	884	827						732
PSC - High Static	Low	CFM	979		931	884	827	751	675					
	Medium	CFM				988	922	846	713					
	High	CFM				979	903	798	665					
ECM - Constant Volume	Minimum CFM	RPM	706	788	867	941	1013	1080	1143	1203	1259	1311		
		Power (W)	71	89	107	124	141	159	177	195	213	230		
		CFM	600	600	600	600	600	600	600	600	600	600		
	Default CFM	RPM	882	943	1002	1059	1114	1168	1220	1271	1319	1366		
		Power (W)	145	165	185	205	225	245	266	285	306	326		
		CFM	800	800	800	800	800	800	800	800	800	800		
	Maximum CFM	RPM	1077	1122	1162	1200	1233	1263	1288	1310	1329	1343		
		Power (W)	284	300	315	332	351	364	379	396	412	428		
		CFM	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		

See ECM control section for details on setting airflow. Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter. All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%. RPM/Watt Tolerance 10%.

Blower Performance Data – HB030

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)											
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
PSC - Low Static	Low	CFM	1017	979	931	884	827	751						
	Medium	CFM	1140	1093	1036	988	922	846						
	High	CFM			1102	1045	979	903						798
PSC - High Static	Low	CFM	979	941	912	865	798							
	Medium	CFM				1074	979						884	779
	High	CFM					1102						988	874
ECM - Constant Volume	Minimum CFM	RPM	872	928	990	1046	1096	1143	1192	1238	1282	1327		
		Power (W)	71	89	108	127	145	162	181	199	217	235		
		CFM	750	750	750	750	750	750	750	750	750	750		
	Default CFM	RPM	1131	1177	1218	1252	1295	1337	1381	1415				
		Power (W)	251	274	296	315	337	362	387	407				
		CFM	1000	1000	1000	1000	1000	1000	1000	1000				
	Maximum CFM	RPM	1260	1299	1334	1373	1403							
		Power (W)	388	410	431	453	471							
		CFM	1150	1150	1150	1150	1150							

See ECM control section for details on setting airflow. Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter. All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%. RPM/Watt Tolerance 10%.

Blower Performance Data – HB036

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)												
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
PSC - Low Static	Low	CFM	970	960	951	941	902								
	Medium	CFM	1106	1096	1086	1067	1009							912	
	High	CFM	1436	1387	1329	1280	1174							1077	931
PSC - High Static	Low	CFM	980	970	960	931	902								
	Medium	CFM	1300	1280	1261	1222	1193							1116	1038
	High	CFM					1484							1426	1358
ECM - Constant Volume		RPM					682	788	898	976	1043	1107	1170	1230	1297
		Minimum CFM	Power (W)	105	132	164	188	211	233	257	280	307	339		
			CFM	900	900	900	900	900	900	900	900	900	900	900	
		Default CFM	RPM	830	895	961	1054	1145	1209	1267	1321	1371	1419		
			Power (W)	205	232	261	303	349	382	415	446	475	505		
			CFM	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	
		Maximum CFM	RPM	1042	1040	1095	1149	1199	1273	1355	1420	1459	1493		
			Power (W)	406	403	438	474	511	564	629	680	692	691		
			CFM	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	

See ECM control section for details on setting airflow.
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Blower Performance Data – HB041

Rated CFM	Min CFM	Motor Type	Motor Speed Setting	External Static Pressure (in. wg)											
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
1125	845	PSC	Low	CFM	1008	971									
			Medium	CFM	1142	1090	1023								
			High	CFM	1269	1198	1114	1018							

Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 Units factory shipped on medium speed. Other speeds require field selection.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Blower Performance Data – HB042

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PSC - Low Static	Low	CFM	1074	1064								
	Medium	CFM	1368	1321	1273	1207	1131	1064				
	High	CFM	1501	1444	1378	1302	1226	1131				
PSC - High Static	Low	CFM										
	Medium	CFM	1302	1283	1254	1235	1188	1121				
	High	CFM			1473	1444	1397	1378	1311	1178		
ECM - Constant Volume	Minimum CFM	RPM	786	855	920	985	1059	1125	1186	1240	1292	1346
		Power (W)	154	177	200	224	252	280	306	331	355	383
		CFM	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050
	Default CFM	RPM	997	1042	1094	1145	1193	1241	1292	1345	1400	1451
		Power (W)	334	359	390	421	453	484	517	555	595	636
		CFM	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
	Maximum CFM	RPM	1224	1245	1282	1305	1327					
		Power (W)	658	674	703	700	697					
		CFM	1750	1750	1750	1750	1750					

See ECM control section for details on setting airflow.
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Blower Performance Data – HB048

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)												
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
PSC - Low Static	Low	CFM	1644	1606	1568	1492	1378	1264							
	Medium	CFM	1805	1767	1682	1625	1520	1340							
	High	CFM		1881	1815	1710	1596	1416						1216	1216
PSC - High Static	Low	CFM	1748	1720	1691	1644	1587	1520	1435	1311					
	Medium	CFM	1938	1891	1843	1796	1739	1691	1625	1539				1416	1254
	High	CFM				1957	1910	1862	1786	1701				1577	1435
ECM - Constant Volume	Minimum CFM	RPM	703	766	827	886	943	998	1051	1102	1150	1196			
		Power (W)	174	205	237	269	302	336	371	407	444	482			
		CFM	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200		
	Default CFM	RPM	833	884	932	986	1043	1089	1137	1191	1242	1293			
		Power (W)	287	329	369	412	455	495	536	578	620	662			
		CFM	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500		
	Maximum CFM	RPM	993	1038	1082	1129	1178	1220	1264	1311	1357	1402			
		Power (W)	562	616	669	724	781	832	885	940	994	1048			
		CFM	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		

See ECM control section for details on setting airflow.

Airflow is controlled within 5% up to the Max ESP shown with wet coil.

Do not select Dehumidification mode if HP CFM is on setting 1.

Black areas denote ESP where operation is not recommended.

PSC: Units factory shipped on medium speed. Other speeds require field selection.

CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.

All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.

Only two speed PSC fan (H & M) available on 575V units.

Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.

All data is shown wet coil with clean 1" filter.

All data is ran at 80 °F DB and 67 °F WB.

CFM Tolerance is 7%.

RPM/Watt Tolerance 10%.

Blower Performance Data – HB060

Blower Type	Speed Mode	Values	External Static Pressure (in. wg)												
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
PSC - Low Static	Low	CFM	1803	1774	1744	1695	1637	1568							
	Medium	CFM	1999	1950	1901	1852	1793	1744						1676	1588
	High	CFM		1881	1815	1710	1596	1416						1216	1216
PSC - High Static	Low	CFM	1882	1872	1852	1842	1813	1793	1764	1715	1666	1588			
	Medium	CFM	2107	2097	2038	1999	1980	1940	1891	1842	1460	1715			
	High	CFM	2342	2323	2293	2254	2195	2156	2087	2019	1940	1852			
ECM - Constant Volume	Minimum CFM	RPM	705	773	836	894	949	998	1044	1085	1121	1153			
		Power (W)	246	301	354	405	453	500	544	587	627	665			
		CFM	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500		
	Default CFM	RPM	852	899	949	992	1031	1085	1136	1179	1225	1272			
		Power (W)	501	562	629	683	731	804	871	926	986	1047			
		CFM	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950		
	Maximum CFM	RPM	995	1020	1044	1069	1094								
		Power (W)	885	896	901	916	937								
		CFM	2200	2200	2200	2200	2200								

See ECM control section for details on setting airflow.
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.
 Do not select Dehumidification mode if HP CFM is on setting 1.
 Black areas denote ESP where operation is not recommended.
 PSC: Units factory shipped on medium speed. Other speeds require field selection.
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.
 Only two speed PSC fan (H & M) available on 575V units.
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.
 All data is shown wet coil with clean 1" filter.
 All data is ran at 80 °F DB and 67 °F WB.
 CFM Tolerance is 7%.
 RPM/Watt Tolerance 10%.

Waterside Economizer Data

WSE Cooling Performance Data

Model		Water Side			Airside		Capacity	
		FLOW (gpm)	PD (psi)	PD (ft)	CFM	PD (in. wg.)	TC	SC
Vertical	006	1.5	1.9	4.4	225	0.05	6.641	4.922
	009	2.3	3.2	7.3	300	0.07	8.288	6.631
	012	3.0	1.9	4.3	400	0.11	8.485	7.569
	015	3.8	2.6	5.9	500	0.06	15.467	12.181
	018	4.5	3.5	8.2	600	0.09	17.123	14.375
	024	6.0	2.1	4.8	800	0.07	18.828	16.091
	030	7.5	3.0	7.0	1000	0.11	21.711	19.242
	036	9.0	1.6	3.8	1200	0.09	24.105	21.108
	042	10.5	2.3	5.2	1400	0.11	26.739	23.785
	048	12.0	1.8	4.2	1600	0.08	34.790	30.193
060	15.0	2.5	5.8	2000	0.14	39.031	35.758	
Horizontal	006	1.5	1.9	4.4	225	0.05	6.641	4.922
	009	2.3	3.2	7.3	300	0.07	8.288	6.631
	012	3.0	1.9	4.3	400	0.11	8.485	7.569
	015	3.8	2.9	6.6	500	0.05	15.118	11.905
	018	4.5	4.0	9.2	600	0.07	16.740	14.039
	024	6.0	1.2	2.8	800	0.08	19.110	16.294
	030	7.5	1.8	4.1	1000	0.12	22.209	19.672
	036	9.0	1.7	4.0	1200	0.11	25.142	21.717
	042	10.5	2.4	5.6	1400	0.14	27.879	24.488
	048	12.0	2.1	4.9	1600	0.10	37.671	31.675
060	15.0	3.0	6.9	2000	0.15	42.388	37.813	

Entering water 45 °F, Entering air DB 80 °F/WB 67 °F.

Physical Data Unit with WSE Option

HB Series	006	009	012	015	018	024	030	036	042	048	060
Water Connection Size FTP	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	1"	1"
Vertical											
WSE Coil Dimensions (H x W)	10x15	10x15	10x15	20x17.25	20x17.25	20x17.25	20x17.25	24x21.75	24x21.76	24x28.25	24x28.25
WSE Coil Volume (Gal)	0.150	0.150	0.144	0.348	0.348	0.357	0.357	0.746	0.746	1.001	1.001
Weight - Operating (lbs.)	138	140	149	219	224	259	267	289	303	353	368
Weight - Packaged (lbs.)	148	150	159	224	229	264	272	295	310	360	375
Horizontal											
WSE Coil Dimensions (H x W)	10x15	10x15	10x15	16x22	16x22	16x22	16x22	20x25	20x25	20x35	20x35
WSE Coil Volume (Gal)	0.150	0.150	0.139	0.341	0.341	0.382	0.382	0.735	0.735	1.041	1.041
Weight - Operating (lbs.)	145	147	156	220	225	257	265	311	326	372	387
Weight - Packaged (lbs.)	155	157	166	225	230	262	270	317	332	379	394

Waterside Economizer Data

225 CFM Nominal Airflow – HB-006

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	0.8	1.0	2.4	5.051	4.125	58.5
45	1.1	1.4	3.3	5.965	4.627	55.6
45	1.5	1.9	4.4	6.641	4.922	53.9
50	0.8	1.0	2.4	4.297	3.578	61.5
50	1.1	1.4	3.2	4.956	4.064	58.8
50	1.5	1.9	4.3	5.420	4.345	57.2
55	0.8	1.0	2.4	3.640	2.950	64.7
55	1.1	1.4	3.2	4.112	3.418	62.3
55	1.5	1.9	4.3	4.425	3.682	60.9
60	0.8	1.0	2.4	3.045	2.230	68.1
60	1.1	1.4	3.2	3.400	2.676	66.0
60	1.5	1.9	4.3	3.619	2.926	64.8

300 CFM Nominal Airflow – HB-009

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	1.1	1.4	3.3	6.442	5.757	56.5
45	1.7	2.2	5.0	7.518	6.312	53.9
45	2.3	3.2	7.3	8.288	6.631	52.4
50	1.1	1.4	3.2	5.394	5.041	59.6
50	1.7	2.2	5.0	6.140	5.572	57.3
50	2.3	3.1	7.3	6.652	5.878	55.9
55	1.1	1.4	3.2	4.507	4.219	63.0
55	1.7	2.1	4.9	5.016	4.721	60.9
55	2.3	3.1	7.2	5.346	5.002	59.8
60	1.1	1.4	3.2	3.742	3.274	66.7
60	1.7	2.1	4.9	4.103	3.750	64.9
60	2.3	3.1	7.2	4.321	4.011	63.8

400 CFM Nominal Airflow – HB-012

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	1.5	0.7	1.5	6.898	6.590	54.2
45	2.3	1.2	2.8	7.820	7.189	52.0
45	3.0	1.9	4.3	8.485	7.569	50.7
50	1.5	0.6	1.5	5.843	5.771	57.8
50	2.3	1.2	2.7	6.410	6.232	55.7
50	3.0	1.9	4.3	6.784	6.509	54.5
55	1.5	0.6	1.4	4.937	4.927	61.6
55	2.3	1.2	2.7	5.369	5.344	59.8
55	3.0	1.8	4.3	5.611	5.568	58.7
60	1.5	0.6	1.4	3.892	3.874	65.2
60	2.3	1.2	2.7	4.326	4.314	63.8
60	3.0	1.8	4.2	4.558	4.548	63.0

500 CFM Nominal Airflow – HB-015

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	1.9	0.8	1.9	11.606	10.149	57.4
45	2.8	1.7	3.9	13.603	11.282	54.7
45	3.8	2.9	6.6	15.118	11.905	53.1
50	1.9	0.8	2.0	9.883	8.861	60.5
50	2.8	1.7	3.9	11.233	9.896	58.0
50	3.8	2.8	6.5	12.189	10.519	56.5
55	1.9	0.8	2.0	8.377	7.518	63.9
55	2.8	1.7	3.9	9.367	8.419	61.7
55	3.8	2.8	6.5	9.986	8.946	60.3
60	1.9	0.8	2.0	6.822	6.075	67.3
60	2.8	1.7	3.8	7.696	6.883	65.5
60	3.8	2.8	6.4	8.189	7.343	64.4

600 CFM Nominal Airflow – HB-018

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	2.3	1.1	2.7	12.933	12.189	56.5
45	3.4	2.4	5.4	15.110	13.404	54.0
45	4.5	4.0	9.2	16.740	14.039	52.4
50	2.3	1.1	2.7	10.918	10.653	59.7
50	3.4	2.3	5.4	12.351	11.788	57.3
50	4.5	3.9	9.1	13.359	12.462	55.9
55	2.3	1.1	2.6	9.223	9.052	63.2
55	3.4	2.3	5.4	10.225	10.028	61.1
55	4.5	3.9	9.0	10.854	10.597	59.8
60	2.3	1.1	2.6	7.543	7.346	66.7
60	3.4	2.3	5.3	8.400	8.216	65.0
60	4.5	3.8	8.9	8.880	8.705	63.9

800 CFM Nominal Airflow – HB-024

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	3.0	0.4	0.8	13.625	12.035	54.1
45	4.5	0.7	1.6	16.786	14.548	52.5
45	6.0	1.2	2.8	19.110	16.294	51.4
50	3.0	0.4	0.8	11.758	10.732	57.8
50	4.5	0.7	1.6	14.407	12.993	56.4
50	6.0	1.2	2.7	16.265	14.484	55.4
55	3.0	0.4	0.8	10.064	9.250	61.7
55	4.5	0.7	1.6	12.225	11.250	60.4
55	6.0	1.2	2.7	13.632	12.481	59.5
60	3.0	0.4	0.8	8.560	7.569	65.7
60	4.5	0.7	1.6	10.254	9.307	64.6
60	6.0	1.2	2.7	11.223	10.277	63.7

Interpolation is permissible, extrapolation is not. All entering air conditions are 80 °F DB and 67 °F WB. See performance correction tables for operating conditions other than those listed above.

Waterside Economizer Data

1000 CFM Nominal Airflow – HB-030

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	3.8	0.5	1.2	16.369	15.150	53.7
45	5.6	1.1	2.4	19.937	18.055	52.1
45	7.5	1.8	4.1	22.209	19.672	50.9
50	3.8	0.5	1.2	14.115	13.516	57.5
50	5.6	1.1	2.4	17.032	16.062	56.1
50	7.5	1.8	4.1	18.697	17.317	55.0
55	3.8	0.5	1.2	12.056	11.674	61.4
55	5.6	1.1	2.4	14.344	13.853	60.1
55	7.5	1.8	4.1	15.418	14.742	59.1
60	3.8	0.5	1.2	10.208	9.604	65.4
60	5.6	1.0	2.4	11.889	11.414	64.2
60	7.5	1.8	4.1	12.383	11.935	63.3

1200 CFM Nominal Airflow – HB-036

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	4.5	0.3	0.7	18.768	17.626	53.3
45	6.8	0.9	2.1	22.404	20.058	51.6
45	9.0	1.7	4.0	25.142	21.717	50.6
50	4.5	0.3	0.6	16.318	15.344	57.3
50	6.8	0.9	2.0	19.284	17.552	55.7
50	9.0	1.7	4.0	21.383	19.009	54.8
55	4.5	0.3	0.6	13.912	12.951	61.2
55	6.8	0.9	2.1	16.212	14.929	59.8
55	9.0	1.8	4.1	17.675	16.181	58.9
60	4.5	0.4	0.8	11.549	10.445	65.1
60	6.8	1.0	2.3	13.190	12.188	63.9
60	9.0	1.9	4.5	14.020	13.232	63.1

1400 CFM Nominal Airflow – HB-042

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	5.3	0.5	1.1	21.057	20.113	53.0
45	7.9	1.3	3.0	25.064	22.800	51.4
45	10.5	2.4	5.6	27.879	24.488	50.3
50	5.3	0.4	1.0	18.254	17.544	57.0
50	7.9	1.3	2.9	21.453	19.959	55.4
50	10.5	2.4	5.6	23.492	21.398	54.5
55	5.3	0.5	1.1	15.497	14.853	60.9
55	7.9	1.3	3.0	17.895	16.990	59.5
55	10.5	2.5	5.8	19.160	18.176	58.6
60	5.3	0.6	1.3	12.787	12.039	64.9
60	7.9	1.4	3.3	14.389	13.893	63.7
60	10.5	2.7	6.2	14.884	14.823	62.8

1600 CFM Nominal Airflow – HB-048

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	6.0	0.9	2.2	29.364	26.323	54.8
45	9.0	1.5	3.4	34.188	29.606	52.6
45	12.0	2.1	4.9	37.671	31.675	51.3
50	6.0	1.0	2.2	25.063	22.810	58.4
50	9.0	1.5	3.4	28.940	25.807	56.4
50	12.0	2.2	5.0	31.653	27.659	55.3
55	6.0	1.0	2.2	21.061	19.070	62.0
55	9.0	1.5	3.4	24.060	21.779	60.3
55	12.0	2.2	5.0	26.048	23.413	59.3
60	6.0	0.9	2.2	17.384	15.081	65.8
60	9.0	1.5	3.4	19.572	17.506	64.3
60	12.0	2.2	5.0	20.879	18.924	63.5

2000 CFM Nominal Airflow – HB-060

EWT °F	Waterside			Capacity		
	FLOW (gpm)	PD (psi)	PD (ft)	TC	SC	LWT
45	7.5	1.2	2.7	33.525	32.134	53.9
45	11.3	1.9	4.5	38.794	35.768	51.9
45	15.0	3.0	6.9	42.388	37.813	50.7
50	7.5	1.2	2.8	28.521	27.934	57.6
50	11.3	2.0	4.6	32.687	31.220	55.8
50	15.0	3.0	6.9	35.360	32.993	54.7
55	7.5	1.2	2.8	23.862	23.471	61.4
55	11.3	2.0	4.6	26.996	26.408	59.8
55	15.0	3.0	7.0	28.793	27.909	58.8
60	7.5	1.2	2.7	19.574	18.723	65.2
60	11.3	2.0	4.6	21.744	21.316	63.9
60	15.0	3.0	7.0	22.709	22.548	63.0

PD Table for WSE 3 Way Valve

Model	Econ - On	Econ -Off
	CV	
006	5.6	4.9
009	5.6	4.9
012	5.6	4.9
015	11.7	5.8
018	11.7	5.8
024	11.7	5.8
030	11.7	5.8
036	11.7	5.8
042	11.7	5.8
048	18.7	9.3
060	18.7	9.3

Interpolation is permissible, extrapolation is not. All entering air conditions are 80 °F DB and 67 °F WB. See performance correction tables for operating conditions other than those listed above.

Airside PD

Airside PD

		AirSide PD Adder (in. wg) at CFM				
Model	Rated Airflow	150	175	200	225	250
HB*006	225	0.03	0.03	0.04	0.05	0.06
Model	Rated Airflow	225	260	300	340	375
HB*009	300	0.05	0.06	0.07	0.09	0.10
Model	Rated Airflow	300	350	400	450	500
HB*012	400	0.07	0.09	0.11	0.13	0.15
Model	Rated Airflow	375	437.5	500	562.5	625
HB*015	500	0.03	0.04	0.05	0.06	0.07
Model	Rated Airflow	450	525	600	675	750
HB*018	600	0.04	0.06	0.07	0.08	0.10
Model	Rated Airflow	600	700	800	900	1000
HB*024	800	0.05	0.07	0.08	0.10	0.12
Model	Rated Airflow	750	875	1000	1125	1250
HB*030	1000	0.08	0.10	0.12	0.14	0.16
Model	Rated Airflow	900	1050	1200	1350	1500
HB*036	1200	0.07	0.09	0.11	0.13	0.16
Model	Rated Airflow	1050	1225	1400	1575	1750
HB*042	1400	0.09	0.12	0.14	0.17	0.21
Model	Rated Airflow	1200	1400	1600	1800	2000
HB*048	1600	0.06	0.08	0.10	0.12	0.15
Model	Rated Airflow	1500	1750	2000	2250	2500
HB*060	2000	0.09	0.12	0.15	0.17	0.20

Add WSE to your duct static to get total ESP. Check blower performance table to be sure you meet CFM requirement and are within operational range.

Waterside Economizer Correction Tables

Entering Air Correction Table for WSE

Full Load Cooling Corrections 400 CFM per Ton										
Ent Air WB °F	Total Clg Cap	Sens Clg Cap Multipliers - Entering DB °F								
		65	70	75	80	80.6	85	90	95	100
50	0.352	*	*	*	*	*	*	*	*	*
55	0.507	0.615	0.766	*	*	*	*	*	*	*
60	0.693	0.542	0.740	0.912	*	*	*	*	*	*
65	0.906		0.623	0.842	1.035	1.057	*	*	*	*
66.2	0.962		0.582	0.811	1.016	1.039	1.195	*	*	*
67	1.000		0.551	0.788	1.000	1.024	1.187	*	*	*
70	1.148			0.681	0.920	0.947	1.135	1.324	*	*
75	1.420				0.715	0.748	0.976	1.211	1.421	1.421

* Sensible capacity equals total capacity.
 AHRI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6°F DB/ 66.2°F WB, and Heating - 68°F DB/ 59°F WB entering air temperature.

Airflow Correction Table

Airflow	Cooling Corrections	
% Normal Capacity	Sensible Capacity	Sens/ Total Ratio
75	0.834	0.940
81.25	0.878	0.957
87.5	0.921	0.972
93.75	0.962	0.987
100	1.000	1.000
106.25	1.036	1.012
112.5	1.071	1.023
118.75	1.103	1.033
125	1.133	1.042

Physical Data

HB-Series (60 Hz)

HB Series	006	009	012	015	018	024	030	036	041	042	048	060
Compressor (1 Each)	Rotary						Scroll					
Factory Charge HFC-410A (oz)	19	20	23	35	43	40	48	50	70	70	74	82
ECM Fan Motor & Blower												
Blower Wheel Size (Dia x w)	N/A	N/A	N/A	9x7	9x7	9x7	9x7	9x8	N/A	9x8	10x10	12x10
PSC Fan Motor & Blower												
Fan Motor Type/Speeds	PSC/3	PSC/3	PSC-3	PSC/3	PSC/3	PSC/3	PSC/3	PSC/3	PSC/3	PSC/3	PSC/3	PSC/3
Blower Wheel Size (Dia x w)	5x5	5x5	6x5	8x7	8x7	9x7	9x7	9x8	9x8	9x8	10x10	12x10
Water Connection Size												
FPT	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"
Coax Volume (gallons)	0.123	0.143	0.167	0.286	0.450	0.286	0.323	0.323	0.890	0.890	0.738	0.939
Vertical												
Air Coil Dimensions (H x W)	10x15	10x15	10x15	20x17.25	20x17.25	20x17.25	20x17.25	24x21.75	20x17.25	24x21.76	24x28.25	24x28.25
Filter Standard - 1" Throwaway	10x18	10x18	10x18	20x20	20x20	20x20	20x20	24x24	20x20	24x24	1-14x24, 1-18x24	1-14x24, 1-18x24
Weight - Operating (lbs.)	103	105	114	153	158	189	197	203	210	218	263	278
Weight - Packaged (lbs.)	113	115	124	158	163	194	202	209	217	224	270	285
Horizontal												
Air Coil Dimensions (H x W)	10x15	10x15	10x15	16x22	16x22	16x22	16x22	20x25	N/A	20x25	20x35	20x35
Filter Standard - 1" Throwaway	10x18	10x18	10x18	16x25	16x25	18x25	18x25	20x28 or 2-20x14	N/A	20x28 or 2-20x14	1-20x24, 1-20x14	1-20x24, 1-20x14
Weight - Operating (lbs.)	103	105	114	153	158	174	182	203	N/A	218	263	278
Weight - Packaged (lbs.)	113	115	124	158	163	179	187	209	N/A	224	270	285

Notes:
 All units have TXV expansion device, and 1/2" & 3/4" electrical knockouts.
 FPT = Female Pipe Thread
 Condensate Drain Connection is rubber coupling that couples to 3/4" schedule 40/80 PVC.
 575 volt fan motors are two speed.

Unit Maximum Water Working Pressure	Max Pressure PSIG [kPa]
Base Unit	500 [3447]
WSE Option	300 [2068]

HB - Horizontal – Dimensional Data

Horizontal Model		Overall Cabinet		
		A Width	B Length	C Height
006 - 012	in cm	19.1 48.5	34.1 86.6	11.1 28.2
015 - 018	in cm	20.1 51.1	43.1 109.5	17.0 43.2
024 - 030	in cm	20.1 51.1	43.1 109.5	18.3 46.5
036 - 042	in cm	20.1 51.1	47.1 119.6	21.0 53.3
048 - 060	in cm	24.1 61.2	54.1 137.4	21.0 53.3

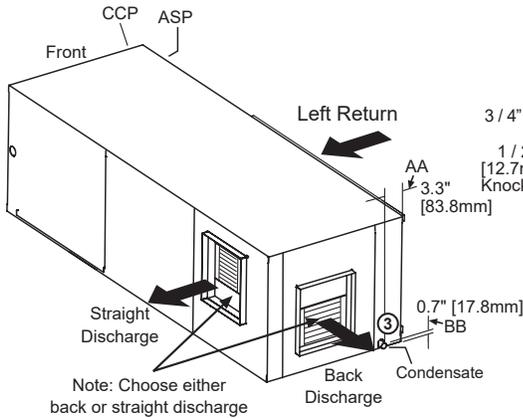
Horizontal Model		Electrical Knockouts	
		J 1/2"	K 3/4"
		Low Voltage	Power Supply
006 - 012	in cm	5.1 13.0	2.1 5.4
015 - 018	in cm	9.9 25.2	6.9 17.5
024 - 030	in cm	11.1 28.2	8.1 20.6
036 - 060	in cm	13.9 35.3	10.9 27.7

Horizontal Model		Water Connections						Loop In/Out FPT
		①		②		③		
		Loop In D	Loop In E	Loop Out F	Loop Out G	AA	BB	
006 - 012	in cm	5.6 14.2	1.1 2.7	1.6 4.1	1.1 2.7	3.3 8.4	0.7 1.8	1/2"
015	in cm	15.1 38.4	1.4 3.4	3.2 8.1	1.4 3.5	3.3 8.4	0.7 1.8	1/2"
018	in cm	15.1 38.4	1.4 3.4	4.1 10.4	1.4 3.5	3.3 8.4	0.7 1.8	1/2"
024	in cm	16.4 41.7	1.4 3.4	4.4 11.3	1.4 3.5	3.3 8.4	0.7 1.8	3/4"
030	in cm	16.4 41.7	1.4 3.4	3.1 7.8	1.4 3.5	3.3 8.4	0.7 1.8	3/4"
036	in cm	19.1 48.5	1.4 3.4	5.3 13.4	1.4 3.5	3.3 8.4	0.7 1.8	3/4"
042	in cm	19.1 48.5	1.4 3.4	4.4 11.3	1.4 3.5	3.3 8.4	0.7 1.8	3/4"
048	in cm	19.1 48.5	1.4 3.4	4.4 11.1	1.4 3.5	3.3 8.4	0.7 1.8	1"
060	in cm	19.1 48.5	1.4 3.4	3.8 9.7	1.4 3.5	3.3 8.4	0.7 1.8	1"

Horizontal Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		L	M Supply Height	N Supply Width	O	P	Q Return Width	R Return Height	S	T
006 - 012	in cm	0.8 1.9	8.9 22.7	6.7 17.0	6.0 15.2	1.3 3.3	16.1 41.0	9.8 25.0	1.1 2.7	0.6 1.5
015 - 018	in cm	2.6 6.6	13.3 33.8	9.9 25.1	4.1 10.5	1.3 3.3	23.0 58.4	15.0 38.1	1.1 2.8	1.0 2.5
024 - 030	in cm	2.6 6.6	13.3 33.8	9.9 25.1	4.1 10.5	1.3 3.3	23.0 58.4	16.3 41.4	1.1 2.8	1.0 2.5
036 - 042	in cm	2.5 6.3	16.1 40.9	11.0 27.9	3.0 7.7	2.5 6.4	25.9 65.8	19.0 48.3	1.1 2.8	1.0 2.5
048	in cm	3.7 9.5	16.1 41.0	13.7 34.8	4.1 10.3	1.3 3.2	35.9 91.2	19.0 48.3	1.1 2.8	1.0 2.5
060	in cm	1.7 4.4	18.1 46.0	13.7 34.8	4.1 10.3	1.3 3.2	35.9 91.2	19.0 48.3	1.1 2.8	1.0 2.5

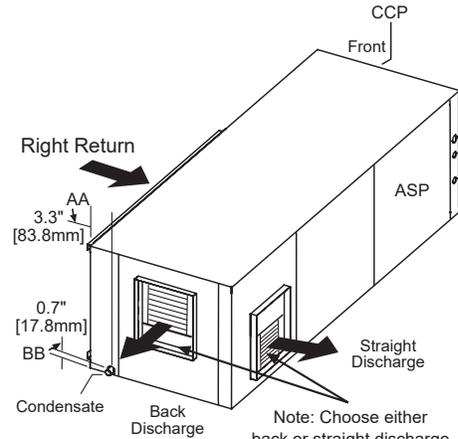
HB - Horizontal – Dimensional Data

LEFT RETURN

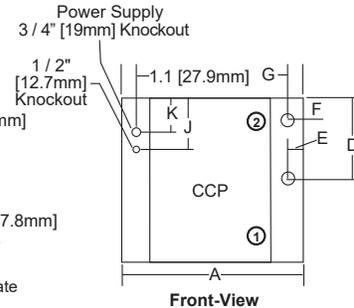


Note: Choose either back or straight discharge

RIGHT RETURN

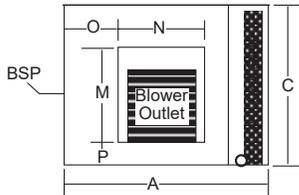


Note: Choose either back or straight discharge



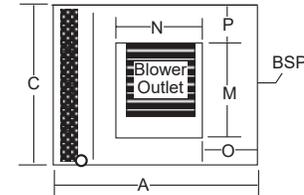
Front-View

Note: Blower service panel requires 2' service access

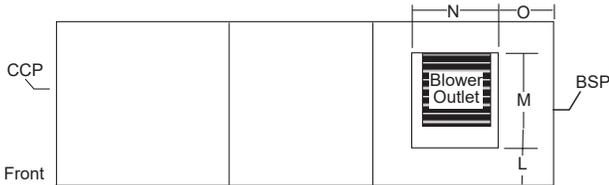


Left Return Back Discharge

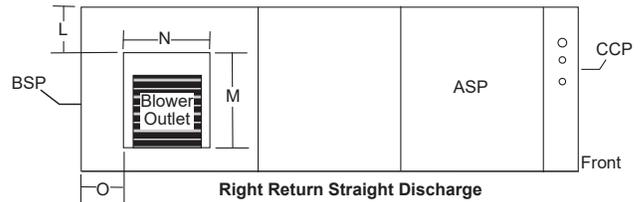
Unit Hanger Detail				
Model	U	V	W	
006-012	34.1 [86.6]	21.1 [53.6]	16.9 [42.9]	
015-030	43.1 [109.5]	22.2 [56.4]	18.0 [45.7]	
036-042	47.1 [119.6]	22.2 [56.4]	18.0 [45.7]	
048-060	54.1 [137.4]	26.2 [66.5]	22.0 [55.9]	



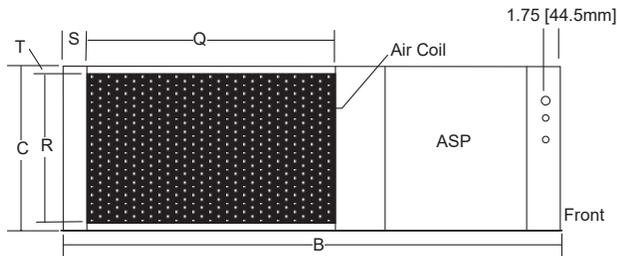
Right Return Back Discharge



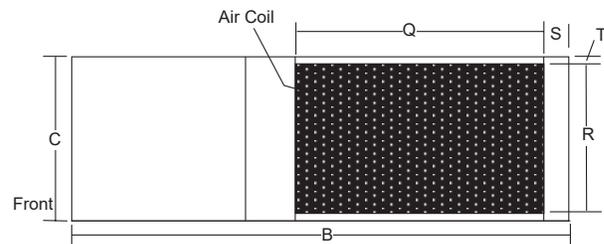
Left Return Straight Discharge



Right Return Straight Discharge



Left Return Left View - Air Coil Opening



Right Return Right View - Air Coil Opening

Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate Drain Connection is rubber coupling that couples to 3/4" schedule 40/80 PVC, S.S. drain pan is 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units

Legend:

CCP = Control/Compressor Access Panel
 BSP = Blower Service Panel
 *ASP = Additional Service Panel (not required)

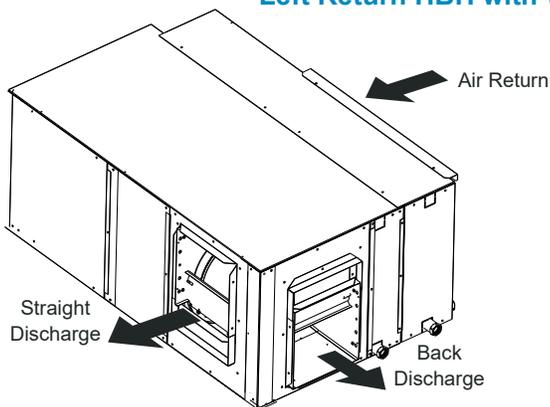
Note:

*ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

HBH with Left Hand Waterside Economizer – Dimensional Data

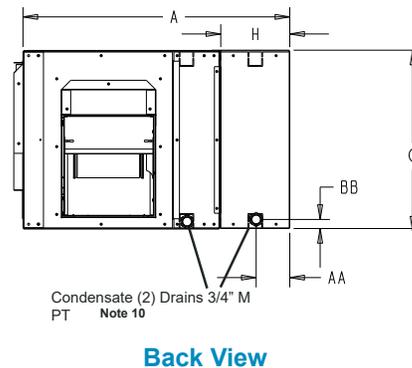
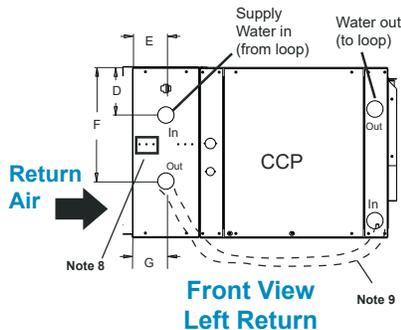
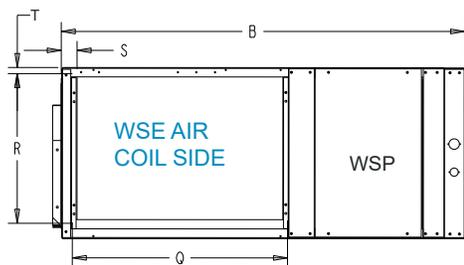
Horizontal Model		Overall Cabinet				WSE	Left WSE Connections						Return Connection Using Return Air Opening			
		A	B	C	H		In		Out		Cond. 3/4" MPT		Water In/Out FPT	Q Return Width	R Return Height	S
		Width	Length	Height	Width	D	E	F	G	AA	BB					
006-012	in	26.1	34.1	11.0	7.1	4.7	3.5	8.0	3.5	3.5	0.8	1/2"	16.1	10.0	1.5	0.3
	cm	66.3	86.6	27.9	18.0	11.9	8.9	20.3	8.9	8.9	2.0		40.9	25.4	3.8	0.8
015-018	in	27.2	43.1	17.0	7.1	5.3	3.5	11.5	3.5	3.5	0.8	1/2"	23.0	16.0	1.5	0.3
	cm	69.1	109.5	43.2	18.0	13.5	8.9	29.2	8.9	8.9	2.0		58.4	40.6	3.8	0.8
024-030	in	27.2	43.1	18.2	7.1	5.1	3.5	21.1	3.5	3.5	0.8	3/4"	22.9	16.0	1.5	0.3
	cm	69.1	109.5	46.2	18.0	13.0	8.9	53.6	8.9	8.9	2.0		58.2	40.6	3.8	0.8
036-042	in	27.2	47.1	21.0	7.1	6.5	3.5	14.0	3.5	3.5	0.8	3/4"	26.0	20.0	1.5	0.3
	cm	69.1	119.6	53.3	18.0	16.5	8.9	35.6	8.9	8.9	2.0		66.0	50.8	3.8	0.8
048-060	in	31.6	54.1	21.0	7.5	5.0	1.3	15.9	1.3	3.5	0.8	3/4"	36.0	20.0	1.5	0.3
	cm	80.3	137.4	53.3	19.1	12.7	3.3	40.4	3.3	8.9	2.0		91.4	50.8	3.8	0.8

Left Return HBH with WSE



Unit Hanger Detail

Model	U	V	W
006-012	34.1 [86.6]	21.1 [53.6]	16.9 [42.9]
015-030	43.1 [109.5]	22.2 [56.4]	18.0 [45.7]
036-042	47.1 [119.6]	22.2 [56.4]	18.0 [45.7]
048-060	54.1 [137.4]	26.2 [66.5]	22.0 [55.9]



Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate drains are 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
7. Filters same size as standard unit
8. Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect moxex.
9. WSE to unit piping to be field fabricated, Run below or in front. Must leave room to remove front access panel (CCP) to service unit.
10. External trap and vent both drains before joining.
11. For Discharge air connection dimensions see page 43.

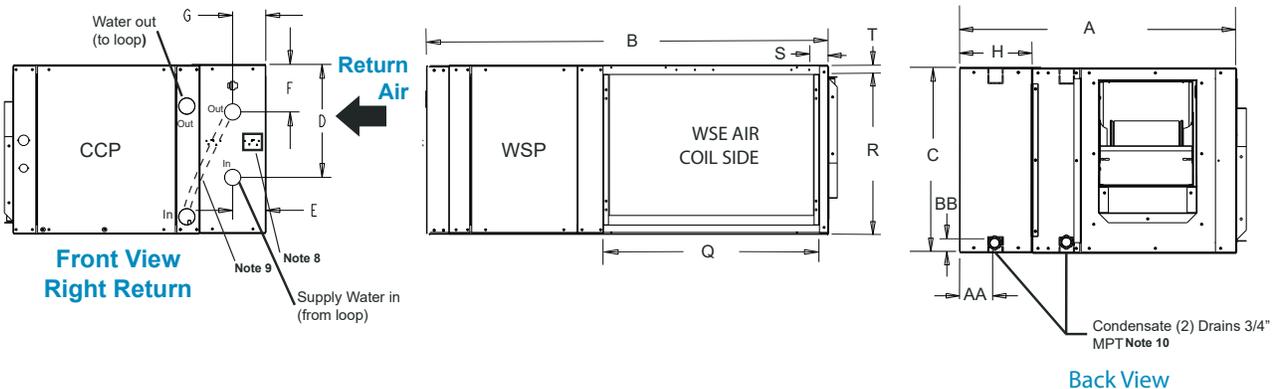
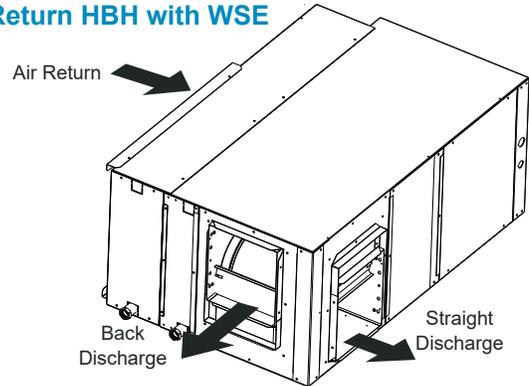
HBH with Right Hand Waterside Economizer – Dimensional Data

Horizontal Model		Overall Cabinet			WSE	Right WSE Connections						Return Connection Using Return Air Opening				
		A Width	B Length	C Height	H Width	In		Out		Cond. 3/4" MPT		Water In/Out FPT	Q Return Width	R Return Height	S	T
						D	E	F	G	AA	BB					
006-012	in	26.1	34.1	11.0	7.1	8.0	3.5	4.7	3.5	3.5	0.8	1/2"	16.1	10.0	1.5	0.3
	cm	66.3	86.6	27.9	18.0	20.3	8.9	11.9	8.9	8.9	2.0		40.9	25.4	3.8	0.8
015-018	in	27.2	43.1	17.0	7.1	11.5	3.5	5.3	3.5	3.5	0.8	1/2"	23.0	16.0	1.5	0.3
	cm	69.1	109.5	43.2	18.0	29.2	8.9	13.5	8.9	8.9	2.0		58.4	40.6	3.8	0.8
024-030	in	27.2	43.1	18.2	7.1	12.1	3.5	5.1	3.5	3.5	0.8	3/4"	22.9	16.0	1.5	0.3
	cm	69.1	109.5	46.2	18.0	30.7	8.9	13.0	8.9	8.9	2.0		58.2	40.6	3.8	0.8
036-042	in	27.2	47.1	21.0	7.1	14.0	3.5	6.5	3.5	3.5	0.8	3/4"	26.0	20.0	1.5	0.3
	cm	69.1	119.6	53.3	18.0	35.6	8.9	16.5	8.9	8.9	2.0		66.0	50.8	3.8	0.8
048-060	in	31.6	54.1	21.0	7.5	15.9	1.3	5.0	1.3	3.5	0.8	3/4"	36.0	20.0	1.5	0.3
	cm	80.3	137.4	53.3	19.1	40.4	3.3	12.7	3.3	8.9	2.0		91.4	50.8	3.8	0.8

Unit Hanger Detail

Model	U	V	W
006-012	34.1 [86.6]	21.1 [53.6]	16.9 [42.9]
015-030	43.1 [109.5]	22.2 [56.4]	18.0 [45.7]
036-042	47.1 [119.6]	22.2 [56.4]	18.0 [45.7]
048-060	54.1 [137.4]	26.2 [66.5]	22.0 [55.9]

Right Return HBH with WSE

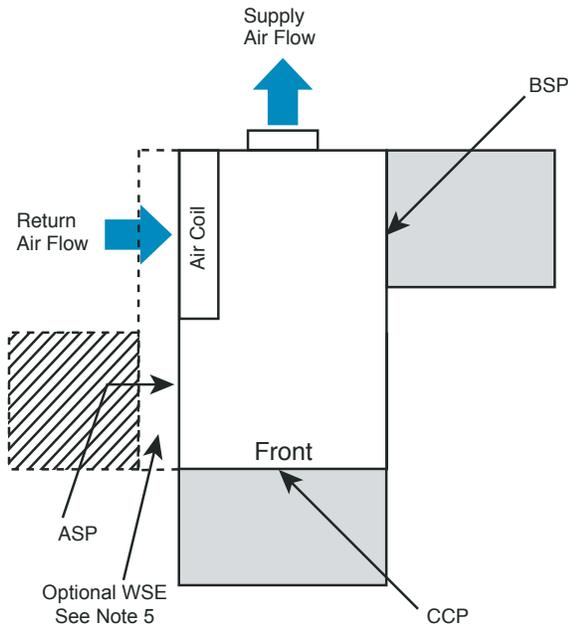


Notes:

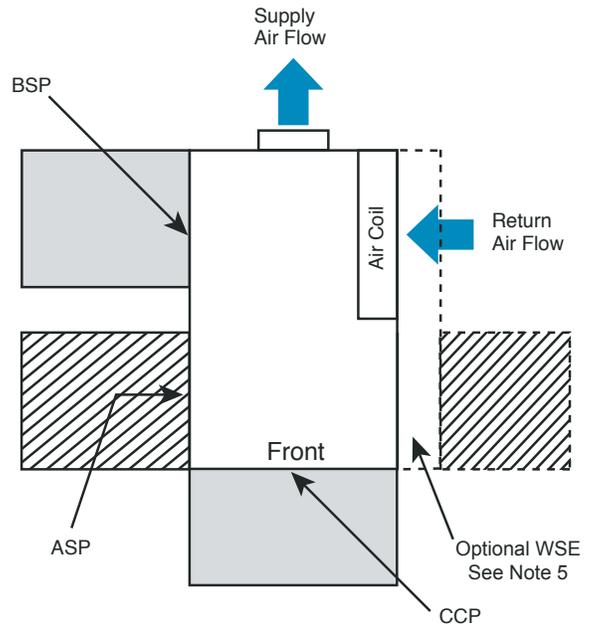
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate drains are 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
7. Filters same size as standard unit
8. Factory supplied controller (aquastat) is shipped inside unit open waterside economizer panel (WSP), remove, slide onto dinrail, and connect molex.
9. WSE to unit piping to be field fabricated. Run below or in front. Must leave room to remove front access panel (CCP) to service unit.
10. External trap and vent both drains before joining.
11. For Discharge air connection dimensions see page 43.

HB - Horizontal Service Access

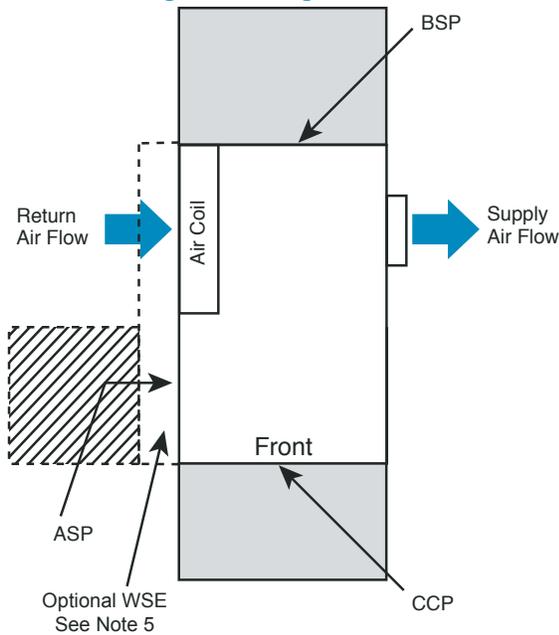
Left Return Back Discharge



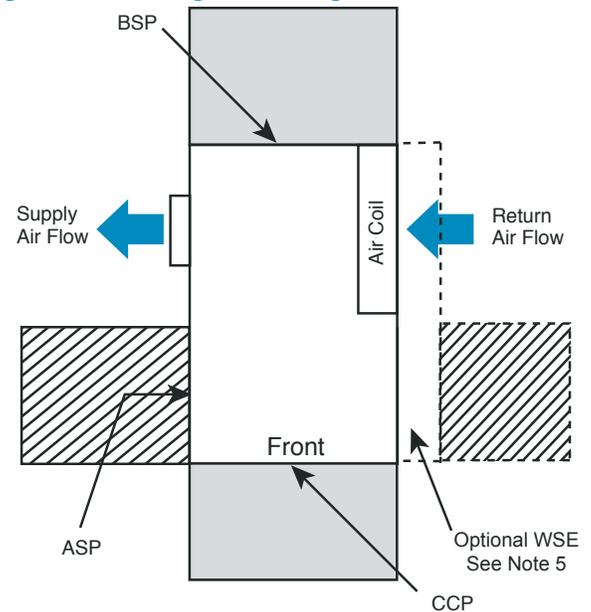
Right Return Back Discharge



Left Return Straight Discharge



Right Return Straight Discharge



 = mandatory 2' service access

 = (optional) additional 2' service access

Notes:

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

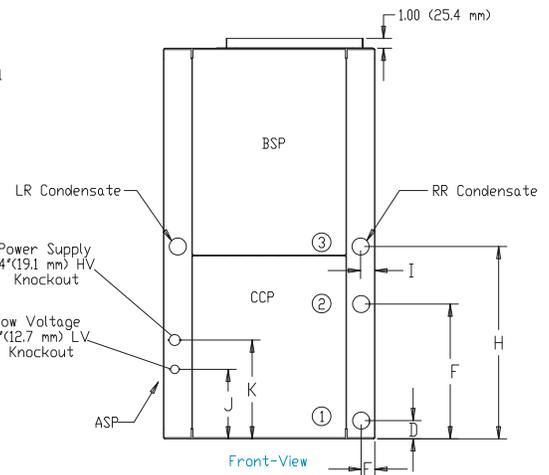
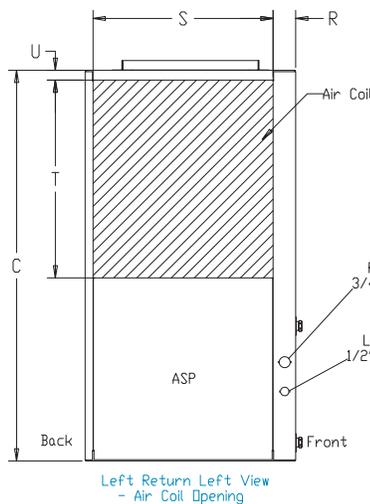
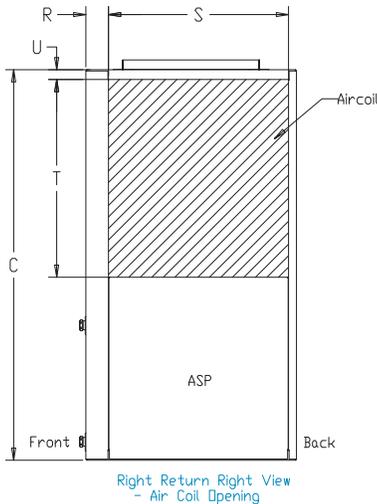
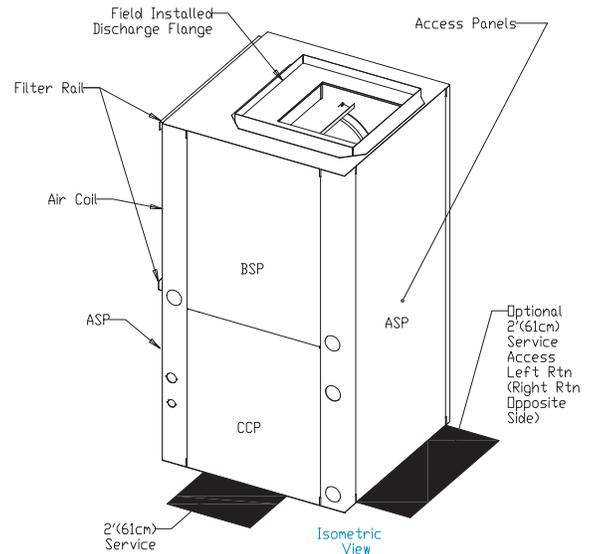
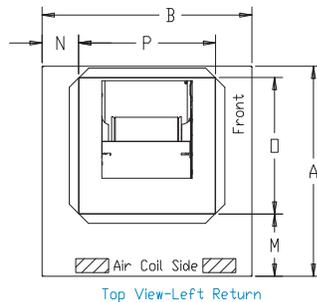
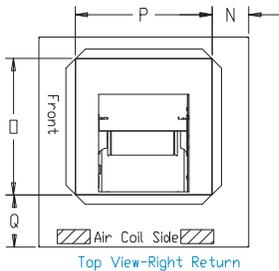
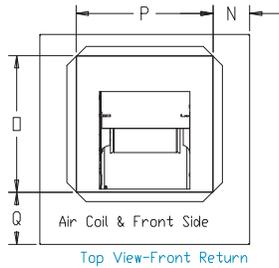
Legend:

- CCP = Control/Compressor Access Panel
- BSP = Blower Service Panel
- ASP = Additional Service Panel (not required)
- WSE = Waterside Economizer

HB - Vertical Upflow – Dimensional Data

Vertical Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U
006 - 012	in	8.9	5.1	9.0	9.0	5.5	2.1	16.2	9.9	0.7
	cm	22.7	12.9	22.9	22.9	14.0	5.3	41.1	25.1	1.9
015 - 018	in	6.4	3.8	14.0	14.0	5.3	2.3	18.3	20.9	0.7
	cm	16.1	9.5	35.6	35.6	13.6	5.8	46.5	53.1	1.9
024 - 030, *041	in	6.4	5.0	14.0	14.0	5.8	2.0	18.5	19.3	0.9
	cm	16.3	12.7	35.6	35.6	14.7	5.1	47.0	49.0	2.3
036 - 042	in	6.4	3.8	14.0	14.0	5.1	2.3	22.8	23.9	0.7
	cm	16.1	9.5	35.6	35.6	13.1	5.8	57.9	60.7	1.9
048 - 060	in	6.9	7.3	16.0	18.0	5.1	2.3	29.3	22.5	0.7
	cm	17.4	18.4	40.6	45.7	13.1	5.8	74.4	57.0	1.9

* Size 041 units have unique M, N, Q dimensions due to the position of the blower assembly.
 Front Return - N = 4.8 in (12.2 cm), Q = 6.4 in (16.3 cm).
 Right Return - N = 3.8 in (9.7 cm), Q = 5.5 in (14.0 cm).
 Left Return - M = 6.4 in (16.3 cm), N = 2.8 in (7.1 cm).

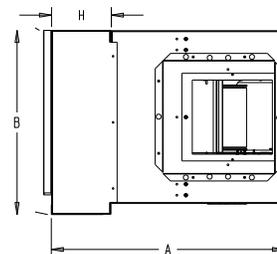
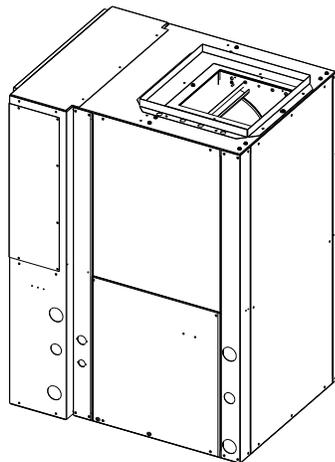


Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory, see the Comfort Aire/Century Accessory Submittal set for further information on this frame.

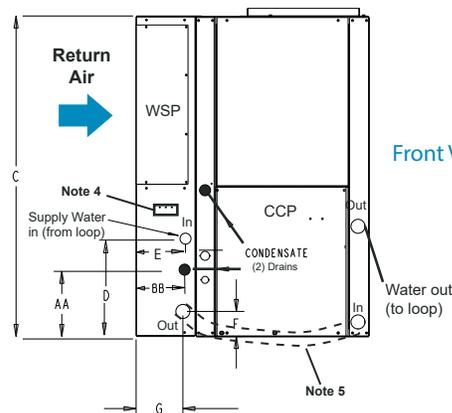
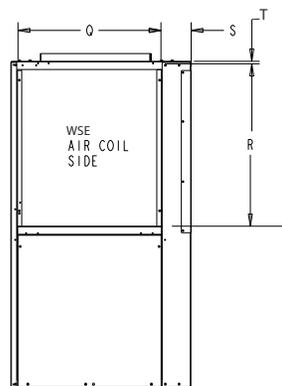
HBV with Left Hand Waterside Economizer – Dimensional Data

Horizontal Model		Overall Cabinet				WSE	WSE Connections						Return Connection Using Return Air Opening			
		A Width	B Length	C Height	H Width	In		Out		AA	BB	Water In/Out FPT	Q Return Width	R Return Height	S	T
						D	E	F	G							
006-012	in	26.1	21.2	22.0	7.1	8.1	5.5	2.1	5.5	5.1	5.5	1/2"	16.1	10.0	4.2	0.4
	cm	66.3	53.8	55.9	18.0	20.6	14.0	5.3	14.0	13.0	14.0		40.9	25.4	10.7	1.0
015-018	in	29.0	24.7	40.0	7.4	11.6	6.0	2.6	6.0	7.1	6.0	1/2"	18.1	20.0	3.8	0.3
	cm	73.7	62.7	101.6	18.8	29.5	15.2	6.6	15.2	18.0	15.2		46.0	50.8	9.7	0.8
024-030	in	29.0	24.7	40.0	7.4	11.6	6.0	2.6	6.0	7.1	6.0	3/4"	18.1	20.0	3.8	0.3
	cm	73.7	62.7	101.6	18.8	29.5	15.2	6.6	15.2	18.0	15.2		46.0	50.8	9.7	0.8
036-042	in	29.0	28.7	45.0	7.4	12.1	6.0	2.6	6.0	7.1	6.0	3/4"	22.7	24.0	4.6	0.1
	cm	73.7	72.9	114.3	18.8	29.5	15.2	6.6	15.2	18.0	15.2		57.7	61.0	11.7	0.3
048-060	in	31.2	37.2	46.0	7.0	12.1	5.8	3.1	5.8	7.1	5.8	3/4"	29.3	24.0	5.0	0.1
	cm	79.2	94.5	116.8	17.8	30.7	14.7	7.9	14.7	18.0	14.7		74.4	61.0	12.7	0.3

Left Return HBV with WSE



Top View



Front View Left Return

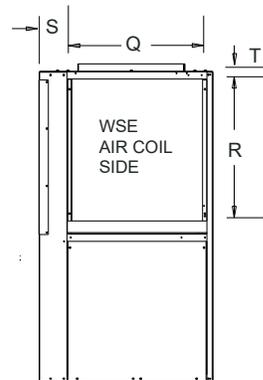
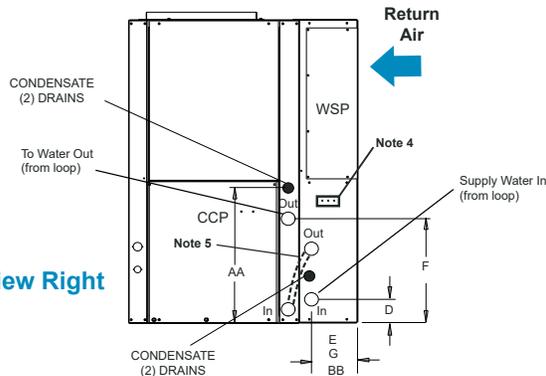
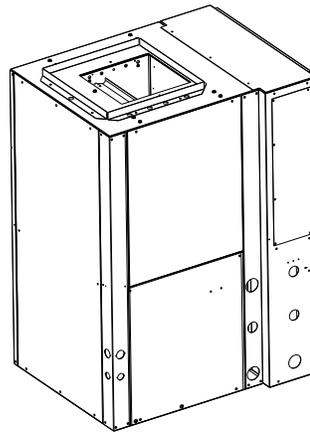
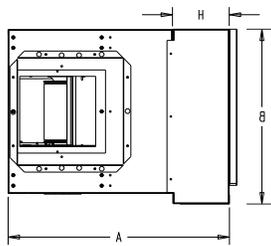
Notes:

- Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory.
- WSE condensate drain is 3/4" FPT, Unit condensate drain is 3/4" MPT. Externally trap and vent both drains before joining.
- Filters same size as standard unit.
- Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect moxex.
- WSE to unit piping to be field fabricated, run below or in front. Must leave room to remove front access panel (CCP) to service unit.
- For Discharge air connection dimensions see page 49.

HBV with Right Hand Waterside Economizer – Dimensional Data

Horizontal Model		Overall Cabinet			WSE	WSE Connections							Return Connection Using Return Air Opening			
		A Width	B Length	C Height	H Width	In		Out		Cond. 3/4" FPT		Water In/Out FPT	Q Return Width	R Return Height	S	T
						D	E	F	G	AA	BB					
006-012	in	26.1	21.2	22.0	7.1	2.1	5.5	8.1	5.5	5.1	5.5	1/2"	16.1	10.0	4.2	0.4
	cm	66.3	53.8	55.9	18.0	5.3	14.0	20.6	14.0	13.0	14.0		40.9	25.4	10.7	1.0
015-018	in	28.9	23.2	38.9	7.4	2.6	6.0	10.8	6.0	7.1	6.0	1/2"	18.1	20.0	3.8	0.3
	cm	73.4	58.9	98.8	18.8	6.6	15.2	27.4	15.2	18.0	15.2		46.0	50.8	9.7	0.8
024-030	in	29.0	24.7	40.0	7.4	2.6	6.0	11.6	6.0	7.1	6.0	3/4"	18.1	20.0	3.8	0.3
	cm	73.7	62.7	101.6	18.8	6.6	15.2	29.5	15.2	18.0	15.2		46.0	50.8	9.7	0.8
036-042	in	29.0	28.7	45.0	7.4	2.6	6.0	12.1	6.0	7.1	6.0	3/4"	22.7	24.0	4.6	0.1
	cm	73.7	72.9	114.3	18.8	6.6	15.2	29.5	15.2	18.0	15.2		57.7	61.0	11.7	0.3
048-060	in	31.2	37.2	46.0	7.0	3.1	5.8	12.1	5.8	7.1	5.8	3/4"	29.3	24.0	5.0	0.1
	cm	79.2	94.5	116.8	17.8	7.9	14.7	30.7	14.7	18.0	14.7		74.4	61.0	12.7	0.3

Right Return HBV with WSE



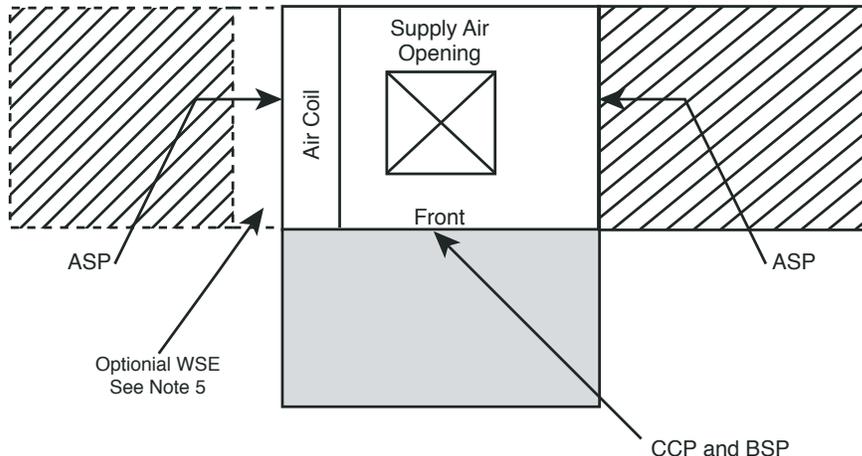
Notes:

- Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory.
- WSE condensate drain is 3/4" FPT, Unit condensate drain is 3/4" MPT. Externally trap and vent both drains before joining.
- Filters same size as standard unit.
- Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect molex.
- WSE to unit piping to be field fabricated below or in front. Must leave room to remove front access panel (CCP) to service unit.
- For Discharge air connection dimensions see page 49.

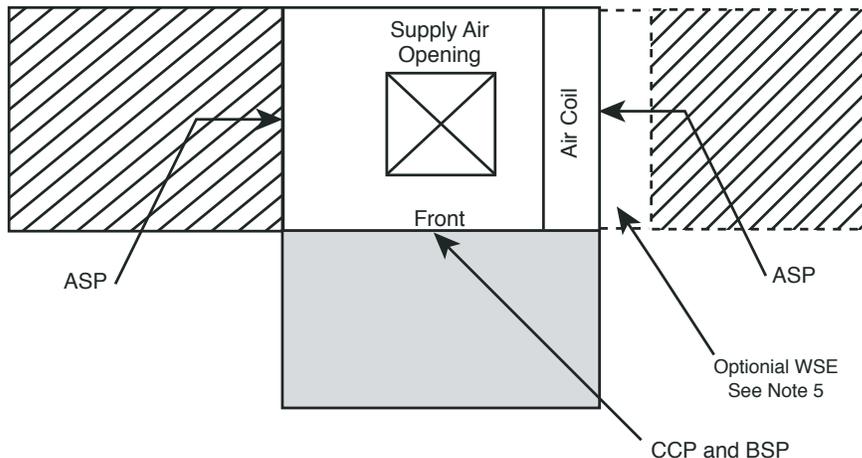
HB - Vertical Service Access

Vertical Units

Left Return



Right Return



Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Front & Side access is preferred for service access. However, units without WSE option may be serviced from the front access panel if side access is not available.
3. ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.
4. Front return units (not shown) require front access for controls/compressor and left side access for blower.
5. Units with WSE Must have access to water valve through side access panel.

- = mandatory 2' service access
- = (optional) additional 2' service access

Legend:

- CCP = Control/Compressor Access Panel
- BSP = Blower Service Panel
- ASP = Additional Service Panel (not required)
- WSE = Waterside Economizer

Corner Weights for HBH Series Units

Model		Total	Left-Front*	Right-Front*	Left-Back*	Right-Back*
HBH006	Lbs	103	37	24	23	19
	kg	46.72	16.78	10.89	10.43	8.62
HBH009	Lbs	105	38	24	23	20
	kg	47.63	17.24	10.89	10.43	9.07
HBH012	Lbs	114	42	26	25	21
	kg	51.71	19.05	11.79	11.34	9.53
HBH015	Lbs	153	53	36	34	30
	kg	69	24	16	15	14
HBH018	Lbs	158	55	37	35	31
	kg	72	25	17	16	14
HBH024	Lbs	174	62	40	39	33
	kg	79	28	18	18	15
HBH030	Lbs	182	67	41	40	34
	kg	83	30	19	18	15
HBH036	Lbs	203	75	47	44	37
	kg	92	34	21	20	17
HBH042	Lbs	218	81	50	48	39
	kg	99	37	23	22	18
HBH048	Lbs.	263	98	60	58	47
	kg	119	44	27	26	21
HBH060	Lbs.	278	94	59	56	69
	kg	126	43	27	25	31

*Front is control box end.

Electrical Data – PSC

Size	VOLTAGE CODE	RATED VOLTAGE	VOLTAGE MIN/MAX	COMPRESSOR			STANDARD PSC				HI STATIC PSC				SCCR kA rms symmetrical	SCCR Volts Maximum	
				QTY	RLA	LRA	FAN MOTOR FLA	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE/HACR	FAN MOTOR FLA	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE/HACR			
6	G	208-230 / 60 / 1	187.2 / 253	1	2.6	17.7	0.3	2.9	3.6	15A						5	600
	E	265 / 60 / 1	238.5 / 291.5	1	2.6	13.5	0.4	3.0	3.6	15A						5	600
9	G	208-230 / 60 / 1	187.2 / 253	1	3.7	22	0.8	4.5	5.5	15A						5	600
	E	265 / 60 / 1	238.5 / 291.5	1	3.4	17.5	0.8	4.2	5.1	15A						5	600
12	G	208-230 / 60 / 1	187.2 / 253	1	5.6	32.5	0.8	6.4	7.8	15A						5	600
	E	265 / 60 / 1	238.5 / 291.5	1	4.2	31.5	0.8	5.0	6.1	15A						5	600
15	G	208-230 / 60 / 1	187.2 / 253	1	5.6	29	0.9	6.5	7.9	15A	0.9	6.5	7.9	15A	5	600	
	E	265 / 60 / 1	238.5 / 291.5	1	5	28	0.7	5.7	7.0	15A	0.7	5.7	7.0	15A	5	600	
18	G	208-230 / 60 / 1	187.2 / 253	1	7.4	33	0.9	8.3	10.2	15A	0.9	8.3	10.2	15A	5	600	
	E	265 / 60 / 1	238.5 / 291.5	1	6	28	0.7	6.7	8.2	15A	0.7	6.7	8.2	15A	5	600	
24	G	208-230 / 60 / 1	187.2 / 253	1	12.8	58.3	1.5	14.3	17.5	30A	2.7	15.5	18.7	30A	5	600	
	E	265 / 60 / 1	238.5 / 291.5	1	9.6	54	1.2	10.8	13.2	20A	2.9	12.5	14.9	20A	5	600	
	F	460 / 60 / 3	414 / 506	1	3.6	28	1.4	5.0	5.9	15A	1.6	5.2	6.1	15A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	7.7	55.4	1.5	9.2	11.1	15A	2.7	10.4	12.3	20A	5	600	
30	G	208-230 / 60 / 1	187.2 / 253	1	14.1	73	2.7	16.8	20.3	30A	2.7	16.8	20.3	30A	5	600	
	E	265 / 60 / 1	238.5 / 291.5	1	11.2	60	2.9	14.1	16.9	25A	2.9	14.1	16.9	25A	5	600	
	F	460 / 60 / 3	414 / 506	1	4.2	28	1.6	5.8	6.9	15A	1.6	5.8	6.9	15A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	8.9	58	2.7	11.6	13.8	20A	2.7	11.6	13.8	20A	5	600	
36	G	208-230 / 60 / 1	187.2 / 253	1	16.7	79	2.7	19.4	23.6	40A	2.7	19.4	23.6	40A	5	600	
	E	265 / 60 / 1	238.5 / 291.5	1	13.5	72	2.0	15.5	18.9	30A	2.9	16.4	19.8	30A	5	600	
	F	460 / 60 / 3	414 / 506	1	5.8	38	1.2	7.0	8.5	15A	1.6	7.4	8.9	15A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	10.4	73	2.7	13.1	15.7	25A	2.7	13.1	15.7	25A	5	600	
42	G	208-230 / 60 / 1	187.2 / 253	1	17.9	112	2.7	20.6	25.1	40A	2.7	20.6	25.1	40A	5	600	
	F	460 / 60 / 3	414 / 506	1	6	44	1.6	7.6	9.1	15A	1.6	7.6	9.1	15A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	13.5	88	2.7	16.2	19.6	30A	2.7	16.2	19.6	30A	5	600	
	N	575 / 60 / 3	517.5 / 632.5	1	4.9	34	1.4	6.3	7.5	15A	1.4	6.3	7.5	15A	5	600	
48	G	208-230 / 60 / 1	187.2 / 253	1	21.8	117	3.3	25.1	30.6	50A	4.8	26.6	32.1	50A	5	600	
	F	460 / 60 / 3	414 / 506	1	6.2	41	1.7	7.9	9.5	15A	2.4	8.6	10.2	15A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	13.7	83.1	3.3	17.0	20.4	30A	4.8	18.5	21.9	35A	5	600	
	N	575 / 60 / 3	517.5 / 632.5	1	4.8	33	1.4	6.2	7.4	15A	1.8	6.6	7.8	15A	5	600	
60	G	208-230 / 60 / 1	187.2 / 253	1	26.3	134	4.8	31.1	37.7	60A	5.7	32.0	38.6	60A	5	600	
	F	460 / 60 / 3	414 / 506	1	7.8	52	2.4	10.2	12.2	15A	2.5	10.3	12.3	20A	5	600	
	H	208-230 / 60 / 3	187.2 / 253	1	15.6	110	4.8	20.4	24.3	40A	5.7	21.3	25.2	40A	5	600	
	N	575 / 60 / 3	517.5 / 632.5	1	5.8	38.9	1.8	7.6	9.1	15A	1.9	7.7	9.2	15A	5	600	

Electrical Data – ECM

Size	VOLTAGE CODE	RATED VOLTAGE	VOLTAGE MIN/MAX	COMPRESSOR			ECM-CV*				SCCR kA rms symmetrical	SCCR Volts Maximum
				QTY	RLA	LRA	FAN MOTOR FLA	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE/HACR		
15	G	208-230 / 60 / 1	187.2 / 253	1	5.6	29	2.6	8.2	9.6	15A	5	600
	E	265 / 60 / 1	238.5 / 291.5	1	5	28	2.4	7.4	8.7	15A	5	600
18	G	208-230 / 60 / 1	187.2 / 253	1	7.4	33	2.6	10.0	11.9	15A	5	600
	E	265 / 60 / 1	238.5 / 291.5	1	6	28	2.4	8.4	9.9	15A	5	600
24	G	208-230 / 60 / 1	187.2 / 253	1	12.8	58.3	3.9	16.7	19.9	30A	5	600
	E	265 / 60 / 1	238.5 / 291.5	1	9.6	54	3.2	12.8	15.2	20A	5	600
	F*	460 / 60 / 3	414 / 506	1	3.6	28	3.2	6.8	7.7	15A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	7.7	55.4	3.9	11.6	13.5	20A	5	600
30	G	208-230 / 60 / 1	187.2 / 253	1	14.1	73	3.9	18.0	21.5	35A	5	600
	E	265 / 60 / 1	238.5 / 291.5	1	11.2	60	3.2	14.4	17.2	25A	5	600
	F*	460 / 60 / 3	414 / 506	1	4.2	28	3.2	7.4	8.5	15A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	8.9	58	3.9	12.8	15.0	20A	5	600
36	G	208-230 / 60 / 1	187.2 / 253	1	16.7	79	6.0	22.7	26.9	40A	5	600
	E	265 / 60 / 1	238.5 / 291.5	1	13.5	72	4.8	18.3	21.7	35A	5	600
	F*	460 / 60 / 3	414 / 506	1	5.8	38	4.8	10.6	12.1	15A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	10.4	73	6.0	16.4	19.0	25A	5	600
42	G	208-230 / 60 / 1	187.2 / 253	1	17.9	112	6.0	23.9	28.4	45A	5	600
	F*	460 / 60 / 3	414 / 506	1	6	44	4.8	10.8	12.3	15A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	13.5	88	6.0	19.5	22.9	35A	5	600
48	G	208-230 / 60 / 1	187.2 / 253	1	21.8	117	7.5	29.3	34.8	50A	5	600
	F*	460 / 60 / 3	414 / 506	1	6.2	41	6.2	12.4	14.0	15A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	13.7	83.1	7.5	21.2	24.6	35A	5	600
60	G	208-230 / 60 / 1	187.2 / 253	1	26.3	134	7.5	33.8	40.4	60A	5	600
	F*	460 / 60 / 3	414 / 506	1	7.8	52	6.0	13.8	15.8	20A	5	600
	H	208-230 / 60 / 3	187.2 / 253	1	15.6	110	7.5	23.1	27.0	40A	5	600

* 460 volt units with ECM-CV Require a Neutral Wire

HB-Series Wiring Diagram Matrix

Unit Controller	Fan Motor	Water Side Economizer	208v/1 - 265v/1		208v/3	460v/3	575v/3	
			006-012	015-060	024-060	024-060	041-060	
CXM	PSC	None	96B0500N11		96B0500N21	96B0500N31		
		WSE	96B0452N15		96B0452N20	96B0452N30		
	CT ECM	None	96B0506N11		96B0506N21	96B0506N31		
		WSE	96B0455N11		96B0455N21	96B0455N31		
DXM2	PSC	None	96B0521N11		96B0521N21	96B0521N31		
		WSE	96B0476N11		96B0476N21	96B0476N31		
	CT ECM	None	96B0527N11		96B0527N21	96B0527N31		
		WSE	96B0478N11		96B0478N21	96B0478N31		
	CV ECM	None	96B0523N01	96B0523N11	96B0523N21	96B0523N31		
		WSE	96B0477N01	96B0477N11	96B0477N21	96B0477N31		
Auxiliary WD for LON			96B0147N17					
Auxiliary WD for MPC			96B0147N14					
Control Box Layouts			96B0500N00					

DIP Setting Table

DIP Setting Table - 99D0061N01

Note: Shade indicates DIP switch locating

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HB-Series 60 Hz Engineering Specifications – Page 1

General:

Furnish and install Comfort Aire/Century Water Source Heat Pumps, as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.

Units shall be supplied completely factory built capable of operating over an entering water temperature range from 20° to 120°F (-6.7° to 48.9°C) as standard. Equivalent units from other manufacturers may be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated and certified in accordance with Air-Conditioning, Heating and Refrigeration Institute/International Standards Organization (AHRI/ISO 13256-1). All equipment must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada, by Intertek Testing Laboratories (ETL). The units shall have AHRI/ISO and ETL-US-C labels.

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

Basic Construction:

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

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

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

Compressor section interior surfaces shall be lined with 1/2 inch (12.7mm) thick, 1-1/2 lb/ft³ (24 kg/m³) acoustic type glass fiber insulation. Air handling section interior surfaces shall be lined with 1/2 in (12.7mm) thick, 1-1/2 lb/ft³ (24 kg/m³) **foil-faced** fiber insulation for ease of cleaning. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream. **Units without foil-faced insulation in the air handling section will not be accepted.**

The heat pumps shall be fabricated from heavy gauge galvanized steel.

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

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

HB-Series 60 Hz Engineering Specifications – Page 2

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

Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper FPT fittings. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Option: 2 inch (50.8 mm) filter frame with removable access door and 2 inch (50.8 mm) Glass Fiber throwaway filters on all units.

Option: Sound attenuation package shall consist of additional sound insulation applied to the base pan, removable panels and blower housing. A discharge muffler is included on sizes 015 through 060.

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

Option: The unit shall be supplied with Waterside Economizer (WSE). The WSE will consist of hydronic coil, 3 way valve, and aquastat. Aquastat will be adjustable type and factory set at 45 °F (72 °C). Units with WSE will require heat pump thermostat with 2 stages of cooling and S.S. drain pan.

Fan and Motor Assembly:

Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing. Units shall have a direct-drive centrifugal fan. The fan motor shall be 3-speed (2-speed for 575 V), permanently lubricated, PSC type, with internal thermal overload protection. Units supplied without permanently lubricated motors must provide external oilers for easy service. The fan motor on small and medium size units (006-042) shall be isolated from the fan housing by a torsionally flexible motor mounting system with rubber type grommets to inhibit vibration induced high noise levels associated with “hard wire belly band” motor mounting. The fan motor on larger units (048 & 060) shall be isolated with flexible rubber type isolation grommets only. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. Airflow/Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. **Ratings based on a dry coil, and/or no air filter shall NOT be acceptable.**

Option: High static motors (Sizes 015-060)

Option: ECM Constant Volume (CV) variable speed ball bearing type motor (Series 015-060). The ECM-CV fan motor shall provide soft starting, maintain constant CFM over its static operating range and provide airflow adjustment in 25 CFM increments via its control board. The fan motor shall be isolated from housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection. A special dehumidification mode shall be provided to allow lower airflows in cooling for better dehumidification. The dehumidification mode may be constant or automatic (humidistat controlled).

HB-Series 60 Hz Engineering Specifications – Page 3

Refrigerant Circuit:

All units shall contain an HFC-410A sealed refrigerant circuit including a high efficiency scroll or rotary compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant to air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant to water heat exchanger, and safety controls including a high pressure switch, low pressure (loss of charge) switch, water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch.

The compressor shall have a dual level vibration isolation system. The compressor will be mounted on specially engineered sound-tested EPDM vibration isolation grommets or springs to a large heavy gauge compressor mounting plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation. Compressor shall have thermal overload protection. Compressor shall be located in an insulated compartment away from air stream to minimize sound transmission.

Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 625 PSIG (4309 kPa) working refrigerant pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 625 PSIG (4309 kPa) working refrigerant pressure and 500 PSIG (3445 kPa) working water pressure. The refrigerant to water heat exchanger shall be “electro-coated” with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 – 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1,000 hours salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs (184 kg-cm) direct (ASTM D2794-93).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced type with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 120 °F (-6.7° to 48.9 °C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling an already cold room.

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

Drain Pan:

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

Option: The unit shall be supplied with stainless steel drain pan with 3/4” MPT plumbing connection. The stainless steel drain pan shall be fully insulated on all sides.

Electrical:

A control box shall be located within the unit compressor compartment and shall contain a 50VA transformer, 24 volt activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. The control box on sizes 015 through 060 shall have a door to protect the internal components. The entire control box shall be capable of rotating out of the unit to allow access to the components behind the control box. Low voltage wires shall enter the box through a hole in the lower

HB-Series 60 Hz Engineering Specifications – Page 4

left side and high voltage wires shall enter the box through a hole in the upper left side. Reversing valve and fan motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volt and provide heating or cooling as required by the remote thermostat/sensor.

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

Solid State Control System (CXM):

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

- a. Anti-short cycle time delay on compressor operation.
- b. Random start on power up mode.
- c. Low voltage protection.
- d. High voltage protection.
- e. Unit shutdown on high or low refrigerant pressures.
- f. Unit shutdown on low water temperature.
- g. Condensate overflow electronic protection.
- h. Option to reset unit disconnect.
- i. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
- j. Ability to defeat time delays for servicing.
- k. Light emitting diode (LED) on circuit board to indicate high pressure, low pressure, low voltage, high voltage, low water/air temperature cut-out, condensate overflow, and control voltage status.
- l. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- m. 24 V output to cycle a motorized water valve or other device with compressor contactor.
- n. Water coil low temperature sensing (selectable for water or anti-freeze).
- o. Air coil low temperature sensing.

NOTE: Units not providing the 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protections will not be accepted.

Option: Enhanced Solid State Control System (DXM2)

Control shall have all of the above mentioned features of the CXM control system along with the following expanded features:

- a. Removable thermostat connector.
- b. Night setback control.
- c. Random start on return from night setback.
- d. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life.).
- e. Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.
- f. Dry contact night setback output for digital night setback thermostats.
- g. Ability to work with heat pump or heat/cool (Y, W) type thermostats.
- h. Ability to work with heat pump thermostats using O or B reversing valve control.
- i. Emergency shutdown contacts.

HB-Series 60 Hz Engineering Specifications – Page 5

- j. Boilerless system heat control at low loop water temperature.
- k. Ability to allow up to 3 units to be controlled by one thermostat.
- l. Relay to operate an external damper.
- m. Ability to automatically change fan speed from multistage thermostat.
- n. Relay to start system pump.
- o. 75 VA control transformer. Control transformer shall have load side short circuit and overload protection via a built in circuit breaker.

Option: Lonworks Interface System

Units shall have all the features listed above (either CXM or DXM) and the control board will be supplied with a LONWORKS interface board, which is LONMark certified. This will permit all units to be daisy chained via a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. Space temperature
- b. Leaving water temperature
- c. Discharge air temperature
- d. Command of space temperature setpoint
- e. Cooling status
- f. Heating status
- g. Low temperature sensor alarm
- h. Low pressure sensor alarm
- i. High pressure switch alarm
- j. Condensate sensor alarm
- k. Hi/low voltage alarm
- l. Fan "ON/AUTO" position of space thermostat as specified above
- m. Unoccupied/occupied command
- n. Cooling command
- o. Heating command
- p. Fan "ON/AUTO" command
- q. Fault reset command
- r. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

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

Option: MPC (Multiple Protocol Control) Interface System

Units shall have all the features listed above (either CXM or DXM) and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Comfort Aire/Century N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. **Protocol selection shall not require any additional programming or special external hardware or software tools.** This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. Space temperature
- b. Leaving water temperature
- c. Discharge air temperature
- d. Command of space temperature setpoint
- e. Cooling status
- f. Heating status

HB-Series 60 Hz Engineering Specifications – Page 6

- g. Low temperature sensor alarm
- h. Low pressure sensor alarm
- i. High pressure switch alarm
- j. Condensate overflow alarm
- k. Hi/low voltage alarm
- l. Fan “ON/AUTO” position of space thermostat as specified above
- m. Unoccupied/occupied command
- n. Cooling command
- o. Heating command
- p. Fan “ON/AUTO” command
- q. Fault reset command
- r. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

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

FIELD INSTALLED OPTIONS

Hose Kits:

All units shall be connected with hoses. The hoses shall be 1.5, 2, 3, or 4 feet long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

- a. Supply and return hoses only.
- b. Supply and return hoses having ball valve with PT port.
- c. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve with PT ports, and ball valve.
- d. Supply hose having “Y” strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator with PT ports, and ball valve.
- e. Supply hose having “Y” strainer with blowdown valve, and ball valve with PT port; return hose having ball valve with PT port.
- f. Supply hose having ball valve with PT port; return hose having motorized water valve and ball valve with PT port.
- g. Supply hose having ball valve with PT port; return hose having motorized water valve, automatic flow regulator valve with PT ports, and ball valve.
- h. Supply hose having “Y” strainer with blowdown valve, and ball valve with PT port; return hose having motorized water valve, automatic flow regulator with PT ports, and ball valve.
- i. Supply hose having “Y” strainer with blowdown valve, and ball valve with PT port; return hose having motorized water valve, and ball valve with PT port.

Thermostats:

The thermostat shall be a Comfort Aire/Century mechanical or electronic type thermostat.

DDC Sensors:

Wall-mounted DDC sensor to monitor room temperature and interfaces with optional interface system described above. Several types as described below:

- a. Sensor only with no display (LON and MPC).
- b. Sensor with override (LON only).
- c. Sensor with setpoint adjustment and override (MPC only).
- d. Sensor with setpoint adjustment and override, LCD display, status/fault indication (LON and MPC).

HB-Series 60 Hz Engineering Specifications – Page 7

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

Performance Sheet

SUBMITTAL DATA - S-I UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ kW

EER: _____

Heating Capacity: _____ kW

COP: _____

Ambient Air Temp: _____ °C

Entering Water Temp (Clg): _____ °C

Entering Air Temp (Clg): _____ °C

Entering Water Temp (Htg): _____ °C

Entering Air Temp (Htg): _____ °C

Airflow: _____ l/s

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (kg)

ELECTRICAL DATA

Power Supply: _____ Volts

_____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

SUBMITTAL DATA - I-P UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ Btuh

EER: _____

Heating Capacity: _____ Btuh

COP: _____

Ambient Air Temp: _____ °F

Entering Water Temp (Clg): _____ °F

Entering Air Temp (Clg): _____ °F

Entering Water Temp (Htg): _____ °F

Entering Air Temp (Htg): _____ °F

Airflow: _____ CFM

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (lb)

ELECTRICAL DATA

Power Supply: _____ Volts

_____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

Notes

Revision History

Date:	Item:	Action:
08/25/21	Engineering Specifications	Added drain pan insulation text
07/08/21	All	Added Polymer Drain Pan
01/22/21	Pg. 5, 66-69	Updated Legend/Glossary of Abbreviations and Electrical Data with SCCR columns
11/18/20	Pg. 8	Updated ASHRAE performance data
11/6/20	Pg. 72-81	Updated Engineering Specs
7/8/20	Pg. 73	Updated Engineering Spec
7/7/20	Pgs 18-19, 57-58, 62-63, 70	Updated Performance Tables for size 018, Added note to WSE Dimensional Data, Updated Wiring Diagram Matrix
5/13/20	ALL	Converted from DXM to DXM2, Updated all data tables
4/17/20	Pgs 36-47	Updated Blower Performance Tables
4/14/20	Pgs 10-32	Updated Performance Tables
3/25/20	Page 4	Added two ECM bullet Points to "Available Options"
	Page 50	New Section Added
	Page 83	Updated Engineering Specs Under "Fan & Motor Assembly" with two ECM Options
3/9/20	Page 8	Updated ASHRAE Tables
2/14/20	Page 65-68	Updated Electrical Data Tables
2/10/20	ALL	Updated fonts
09/19/19	pg 8	Text updates
7/25/19	Page 8	Updated Performance Data Tables
6/11/19	All	Updated with ECM constant torque
11/27/18	Electrical service disconnect	Added
8/1/18	Page 8	Updated size HB006
4/2/18	Unit photos	Changed unit photos from black to steel color
03/8/18	Page 71	Update Text
11/14/17	Page 43	Updated dimensions D, F, O
11/2/17	Page 58	Added WSE DIP setting table

Due to ongoing product improvements, specifications and dimensions are subject to change and correction without notice or incurring obligations. Determining the application and suitability for use of any product is the responsibility of the installer. Additionally, the installer is responsible for verifying dimensional data on the actual product prior to beginning any installation preparations.

Incentive and rebate programs have precise requirements as to product performance and certification. All products meet applicable regulations in effect on date of manufacture; however, certifications are not necessarily granted for the life of a product. Therefore, it is the responsibility of the applicant to determine whether a specific model qualifies for these incentive/rebate programs.



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