



Geothermal Heat Pump Systems



Models
HEV/H
024 - 060
60 Hz R-410A

Due to ongoing product improvements, design, specifications, performance data and material subject to change without notice.

SUBMITTAL DATA

Unit Designation _____
Job Name _____
Architect _____
Engineer _____
Contractor _____

PERFORMANCE DATA

Cooling Capacity _____ BTUH
EER _____
Heating Capacity _____ BTUH
COP _____
Ambient Air _____ °F
Entering Water Temp (Cooling) _____ °F
Entering Air Temp (Cooling) _____ °F
Entering Water Temp (Heating) _____ °F
Entering Air Temp (Heating) _____ °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 _____

HEAT CONTROLLER, INC.

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THE QUALITY LEADER IN CONDITIONING AIR

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Unit Features

The HEV/H Series

The HEV/H series raises the bar for Water-Source Heat Pump efficiencies, features and application flexibility. Not only does the HEV/H Series exceed ASHRAE 90.1 efficiencies, but it also uses R-410A, a zero ozone depletion refrigerant, making it an extremely environmentally-friendly option. The HEV/H Series is eligible for additional LEED® (Leadership in Energy and Environmental Design) points because of the “green” technology design.

Available in sizes from 2 ton through 5 tons the HEV/H Series offers a wide range of units for most any installation. The HEV/H Series has an extended range refrigerant circuit, capable of geothermal ground loop applications as well as boiler-tower water loop applications. Standard features include: Copeland scroll compressors, microprocessor controls, galvanized steel cabinet with powder coat paint, stainless steel drain pan and sound absorbing air handler insulation are just some of the features of the HEV/H Series series.

Heat Controller’s exclusive double isolation compressor mounting system makes the HEV/H Series the quietest unit on the market. Compressors are mounted via vibration isolators 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.

The HEV/H 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 024 (2 ton) through 060 (5 tons)
- R-410A refrigerant
- Exceeds ASHRAE 90.1 efficiencies
- Galvanized steel construction with powder coat paint
- Stainless steel drain pan
- Sound absorbing glass fiber insulation
- Unique double isolation compressor mounting for quiet operation
- Insulated divider and separate compressor/air handler compartments
- Copeland scroll compressors
- TXV metering device
- Microprocessor controls standard
- ECM fan motor
- Unit Performance Sentinel performance monitoring system
- Eight Safeties Standard
- Extended range (20 to 120°F, -6.7 to 48.9°C) capable
- Tin coated air coil

Available options

- Cupro-Nickel water-coil
- Hot water generator
- Field installed electric heater

Selection Procedure

Reference Calculations

Heating	Cooling	
$LWT = EWT - \frac{HE}{GPM \times 500}$	$LWT = EWT + \frac{HR}{GPM \times 500}$	$LC = TC - SC$
$LAT = EAT + \frac{HC}{CFM \times 1.08}$	$LAT (DB) = EAT (DB) - \frac{SC}{CFM \times 1.08}$	$S/T = \frac{SC}{TC}$

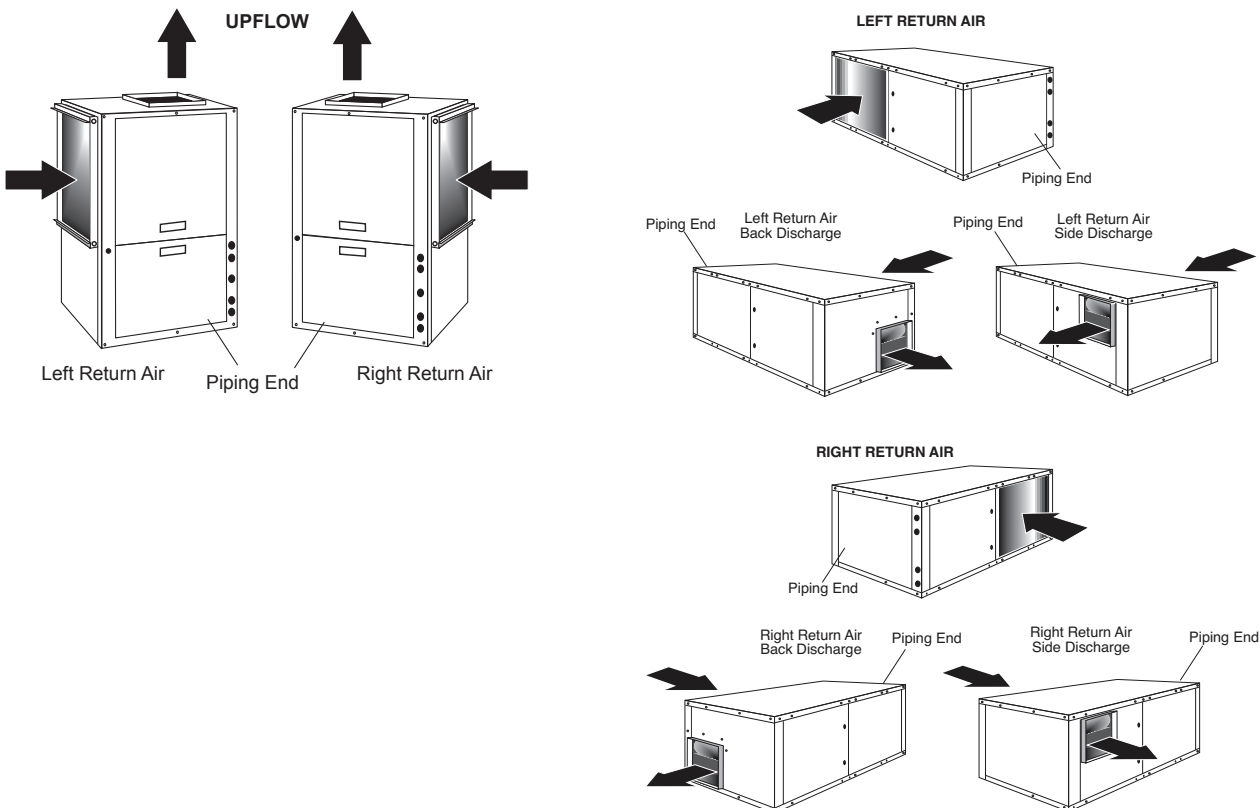
Hot Water Generator capacities (HWC) are based on potable water flow rate of 0.4 gpm per nominal equipment ton and 90°F entering potable water temperature.

Legend and Glossary of Abbreviations

BTUH= BTU(British Thermal Unit) per hour	HWC= hot water generator (desuperheater) capacity, Mbtuh
CFM= airflow, cubic feet/minute	IPT= internal pipe thread
COP= coefficient of performance = BTUH output/BTUH input	KW= total power unit input, kilowatts
DB= dry bulb temperature (°F)	LAT= leaving air temperature, °F
EAT= entering air temperature, Fahrenheit (dry bulb/wet bulb)	LC= latent cooling capacity, BTUH
EER= energy efficiency ratio = BTUH output/Watt input	LWT= leaving water temperature, °F
EPT= external pipe thread	MBTUH= 1000 BTU per hour
ESP= external static pressure (inches w.g.)	S/T= sensible to total cooling ratio
EWT= entering water temperature	SC= sensible cooling capacity, BTUH
GPM= water flow in U.S. gallons/minute	TC= total cooling capacity, BTUH
HE= total heat of extraction, BTUH	WB= wet bulb temperature (°F)
HC= air heating capacity, BTUH	WPD= waterside pressure drop (psi & ft. of hd.)
HR= total heat of rejection, BTUH	

Conversion Table - to convert inch-pound (English) to SI (Metric)

Air Flow	Water Flow	Ext 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 and wet bulb.
- Corrected Total Cooling =
tabulated total cooling x wet bulb correction.
Corrected Sensible Cooling =
tabulated sensible cooling x wet/dry bulb 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	22,100 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	730 CFM

Step 3, 4 & 5 HEV/H Selection:

After making our preliminary selection (HEH026 - Full Load), we enter the tables at design water flow and water temperature and read Total Cooling, Sens. Cooling and Heat of Rej. capacities:

Total Cooling.....	24,200 BTUH
Sensible Cooling.....	16,300 BTUH
Heat of Rejection.....	29,900 BTUH

Step 6 & 7 Entering Air and Airflow Corrections:

Next, we determine our correction factors.

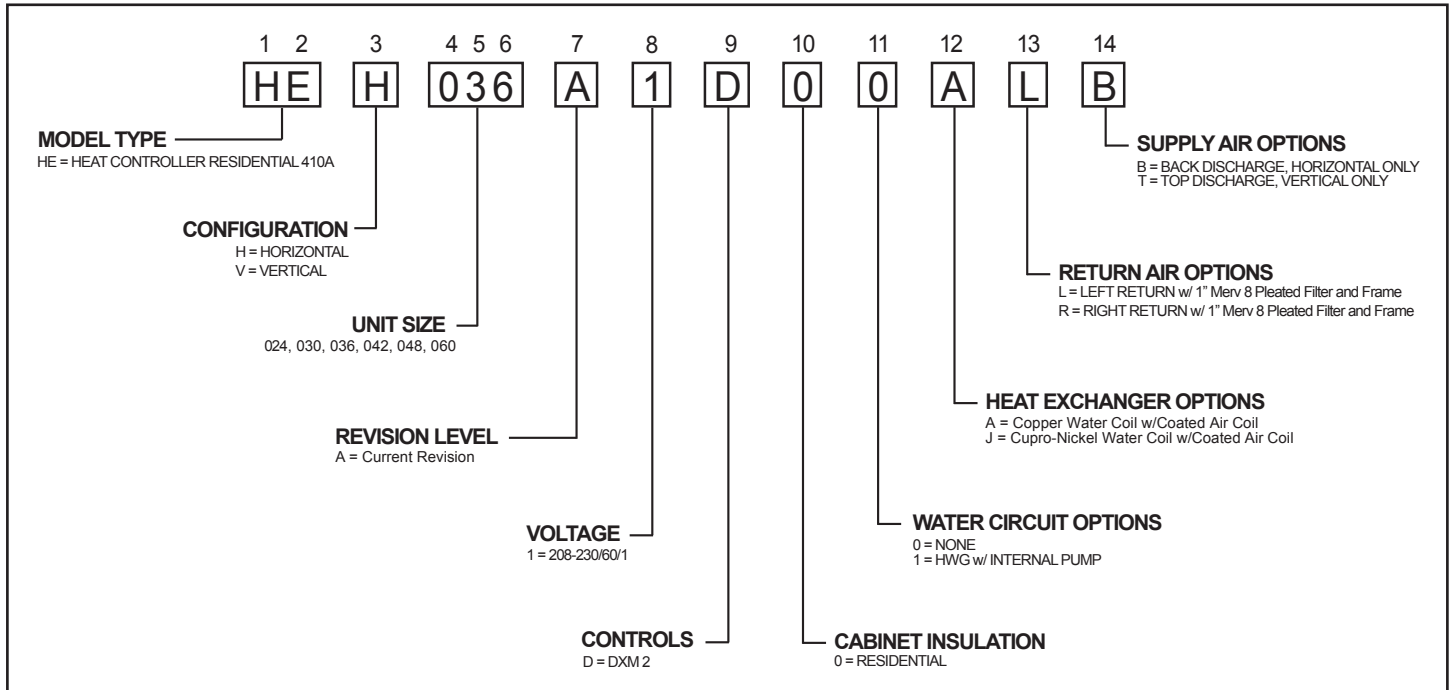
	Table	Ent Air	Air Flow	Corrected
Corrected Total Cooling =	24,200	x 0.975	x 0.978	= 23,076
Corrected Sens Cooling =	16,300	x 1.096	x 0.926	= 16,543
Corrected Heat of Reject =	29,900	x 0.979	x 0.978	= 28,628

Step 8 Water Temperature Rise Calculation & Assessment:

Actual Temperature Rise	9.5°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.

Unit Nomenclature



Performance Data

AHRI/ASHRAE/ISO 13256-1

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

Model	Capacity Modulation	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 Full Load 77°F Part Load 68°F		Heating Full Load 32°F Part Load 41°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
024	Part	16,300	14.3	19,400	5.0	18,600	24.0	16,200	4.3	17,800	20.0	14,100	3.7
	Full	22,000	13.2	27,700	4.7	24,900	20.2	22,900	4.2	22,700	15.0	18,200	3.5
030	Part	21,700	15.0	26,100	4.9	24,700	24.6	21,800	4.2	24,000	20.7	19,200	3.8
	Full	28,300	13.6	35,600	4.5	32,100	20.5	29,800	4.1	29,700	15.5	23,600	3.5
036	Part	24,800	15.0	29,800	5.2	27,700	25.0	24,500	4.4	26,900	20.4	22,100	3.9
	Full	33,300	13.2	41,700	4.5	37,200	19.6	34,700	4.1	34,500	14.6	27,700	3.5
042	Part	30,800	15.6	36,600	5.0	35,000	26.2	30,300	4.2	33,800	21.8	26,700	3.8
	Full	40,900	14.1	50,000	4.5	46,100	21.1	42,100	4.0	42,900	15.9	33,100	3.4
048	Part	33,900	15.0	39,300	5.4	39,000	26.6	32,400	4.5	37,400	21.0	29,000	4.0
	Full	45,700	13.5	53,600	4.8	51,600	20.7	44,800	4.3	47,950	15.3	35,400	3.6
060	Part	42,800	15.6	50,500	5.0	48,900	25.9	42,100	4.2	47,000	21.8	37,000	3.8
	Full	57,000	13.8	69,300	4.4	63,800	20.4	58,000	3.9	59,600	15.9	45,700	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

Ground Loop Heat Pump ratings based on 15% methanol antifreeze solution

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 anti-freeze 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). 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 1.5 gpm/ton, a 3 ton unit has a HE of 22,500 Btuh. To calculate LWT, rearrange the formula for HE as follows:

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

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

$$TD = 22,500 / (4.5 \times 500)$$

$$TD = 10^\circ F$$

$$LWT = EWT - TD$$

$$LWT = 50 - 10 = 40^\circ F$$

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						
	HC	KW	HE	LAT	COP	HWG
	Operation Not Recommended					
	11.2	1.2	7.3	85.3	2.8	1.6
0.7	12.5	1.2	8.5	87.3	3.1	1.7
0.7	13.0	1.2	9.0	88.1	3.2	1.7
0.7	13.3	1.2	9.3	88.5	3.3	1.7
0.8	14.5	1.2	10.4	90.3	3.6	1.8
0.7	15.2	1.2	11.1	91.3	3.7	1.8
0.7	15.5	1.2	11.4	91.9	3.8	1.8
1.1	16.5	1.2	12.4	93.4	4.0	1.9
0.9	17.3	1.2	13.2	94.6	4.2	2.0
0.8	17.7	1.2	13.6	95.3	4.3	2.0
	18.5	1.2	14.4	96.5	4.5	2.0
	19.4	1.2	15.2	97.9	4.7	2.1
		1.2	15.7	98.6	4.8	
		1.2	16.3	99.5	4.9	

Performance Data HEV/H 024 - Part Load

600 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	2.2	3.1	7.1	Operation Not Recommended						Operation Not Recommended					
	3.4	5.1	11.7												
	4.5	7.4	17.0												
30	2.2	2.9	6.7	20.2	14.5	0.6	22.4	31.7	0.7	12.5	1.2	8.5	87.3	3.1	1.7
	3.4	4.7	10.8	20.0	14.7	0.6	22.1	33.8	0.7	13.0	1.2	9.0	88.1	3.2	1.7
	4.5	6.7	15.5	19.9	14.8	0.6	21.9	34.6	0.7	13.3	1.2	9.3	88.5	3.3	1.7
40	2.2	2.2	5.2	20.1	14.2	0.7	22.5	27.8	0.8	14.5	1.2	10.4	90.3	3.6	1.8
	3.4	3.8	8.7	20.2	14.4	0.7	22.4	30.5	0.7	15.2	1.2	11.1	91.3	3.7	1.8
	4.5	5.6	12.9	20.2	14.5	0.6	22.4	31.7	0.7	15.5	1.2	11.4	91.9	3.8	1.8
50	2.2	1.6	3.7	19.6	13.9	0.8	22.4	23.8	1.1	16.5	1.2	12.4	93.4	4.0	1.9
	3.4	2.9	6.7	19.9	14.1	0.8	22.5	26.5	0.9	17.3	1.2	13.2	94.6	4.2	2.0
	4.5	4.4	10.2	20.1	14.2	0.7	22.5	27.8	0.8	17.7	1.2	13.6	95.3	4.3	2.0
60	2.2	1.5	3.5	18.9	13.5	0.9	22.1	20.0	1.5	18.5	1.2	14.4	96.5	4.5	2.0
	3.4	2.7	6.3	19.4	13.7	0.9	22.3	22.5	1.2	19.4	1.2	15.2	97.9	4.7	2.1
	4.5	4.2	9.7	19.6	13.9	0.8	22.4	23.8	1.1	19.9	1.2	15.7	98.6	4.8	2.2
70	2.2	1.5	3.4	18.0	13.1	1.1	21.7	16.6	2.1	20.5	1.2	16.3	99.5	4.9	2.2
	3.4	2.6	6.0	18.6	13.4	1.0	22.0	18.8	1.7	21.4	1.2	17.2	101.0	5.1	2.3
	4.5	4.0	9.3	18.9	13.5	0.9	22.1	19.9	1.5	21.9	1.2	17.7	101.8	5.2	2.4
80	2.2	1.4	3.3	17.0	12.7	1.2	21.3	13.7	2.8	22.3	1.2	18.1	102.4	5.3	2.4
	3.4	2.5	5.8	17.7	13.0	1.1	21.6	15.6	2.3	23.3	1.2	19.0	103.9	5.5	2.5
	4.5	3.8	8.9	18.0	13.1	1.1	21.7	16.5	2.1	23.8	1.2	19.5	104.6	5.6	2.6
90	2.2	1.4	3.1	16.0	12.3	1.4	20.8	11.3	3.6	24.0	1.3	19.7	104.9	5.6	2.6
	3.4	2.4	5.5	16.6	12.6	1.3	21.1	12.8	3.1	24.9	1.3	20.6	106.4	5.8	2.7
	4.5	3.7	8.5	17.0	12.7	1.3	21.2	13.6	2.8	25.4	1.3	21.1	107.0	5.9	2.8
100	2.2	1.3	3.0	14.9	11.9	1.6	20.4	9.3	4.6	Operation Not Recommended					
	3.4	2.3	5.3	15.5	12.2	1.5	20.6	10.5	4.0						
	4.5	3.5	8.1	15.9	12.3	1.4	20.8	11.1	3.7						
110	2.2	1.2	2.8	13.8	11.5	1.8	20.0	7.6	5.8	Operation Not Recommended					
	3.4	2.2	5.0	14.4	11.8	1.7	20.2	8.6	5.0						
	4.5	3.4	7.8	14.8	11.9	1.6	20.3	9.1	4.7						
120	2.2	1.1	2.6	12.8	11.2	2.0	19.8	6.3	7.1	Operation Not Recommended					
	3.4	2.1	4.8	13.4	11.4	1.9	19.9	7.0	6.3						
	4.5	3.3	7.5	13.7	11.5	1.8	20.0	7.4	5.9						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating. 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. All performance data is based upon the lower voltage of dual voltage rated units. See performance correction tables for operating conditions other than those listed above. Operation below 60°F EWT requires optional insulated water circuit. Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 024 - Full Load

750 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	3.0	4.3	9.9	Operation Not Recommended						Operation Not Recommended					
	4.5	7.4	17.0												
	6.0	11.1	25.6												
30	3.0	4.0	9.2	27.6	18.4	1.1	31.4	24.8	0.9	17.4	1.5	12.2	89.5	3.3	2.1
	4.5	6.7	15.5	28.0	18.4	1.1	31.7	26.1	0.8	18.2	1.6	12.9	90.4	3.4	2.2
	6.0	10.0	23.1	28.2	18.4	1.1	31.8	26.6	0.7	18.6	1.6	13.3	91.0	3.5	2.2
40	3.0	3.2	7.4	27.0	18.3	1.2	31.0	22.6	1.3	20.1	1.6	14.7	92.8	3.7	2.3
	4.5	5.6	12.9	27.4	18.4	1.1	31.3	24.2	1.0	21.1	1.6	15.5	94.0	3.8	2.3
	6.0	8.4	19.4	27.7	18.4	1.1	31.5	24.9	0.9	21.6	1.6	16.0	94.6	3.9	2.4
50	3.0	2.4	5.5	26.1	18.0	1.3	30.6	20.1	1.6	22.8	1.7	17.2	96.1	4.0	2.5
	4.5	4.4	10.2	26.7	18.2	1.2	30.9	21.8	1.4	23.9	1.7	18.2	97.4	4.2	2.6
	6.0	6.9	15.8	27.0	18.3	1.2	31.0	22.7	1.2	24.5	1.7	18.7	98.2	4.2	2.7
60	3.0	2.3	5.2	25.2	17.6	1.4	30.1	17.5	2.1	25.5	1.7	19.6	99.4	4.3	2.8
	4.5	4.2	9.8	25.8	17.9	1.3	30.4	19.2	1.8	26.7	1.7	20.7	100.9	4.5	2.9
	6.0	6.6	15.2	26.1	18.0	1.3	30.6	20.1	1.6	27.3	1.8	21.3	101.7	4.5	3.0
70	3.0	2.2	5.0	24.1	17.2	1.6	29.6	15.0	2.7	28.1	1.8	22.0	102.6	4.6	3.1
	4.5	4.0	9.3	24.8	17.5	1.5	29.9	16.6	2.3	29.4	1.8	23.2	104.2	4.8	3.3
	6.0	6.3	14.5	25.2	17.6	1.4	30.1	17.5	2.1	30.0	1.8	23.8	105.0	4.8	3.4
80	3.0	2.1	4.8	22.9	16.7	1.8	29.0	12.8	3.4	30.5	1.8	24.3	105.6	4.9	3.4
	4.5	3.8	8.9	23.7	17.0	1.7	29.4	14.2	2.9	31.9	1.9	25.5	107.3	5.0	3.7
	6.0	6.0	14.0	24.1	17.2	1.6	29.6	15.0	2.7	32.6	1.9	26.1	108.1	5.0	3.8
90	3.0	2.0	4.6	21.6	16.1	2.0	28.5	10.8	4.2	32.9	1.9	26.4	108.5	5.1	3.9
	4.5	3.7	8.5	22.5	16.5	1.9	28.8	12.0	3.7	34.3	1.9	27.6	110.2	5.2	4.2
	6.0	5.8	13.4	22.9	16.6	1.8	29.0	12.7	3.4	34.9	2.0	28.2	111.0	5.2	4.3
100	3.0	1.9	4.4	20.3	15.5	2.2	27.9	9.0	5.0	Operation Not Recommended					
	4.5	3.5	8.1	21.1	15.9	2.1	28.3	10.1	4.5						
	6.0	5.7	13.1	21.6	16.1	2.0	28.5	10.7	4.2						
110	3.0	1.8	4.1	18.8	14.9	2.5	27.4	7.5	6.0						
	4.5	3.4	7.8	19.7	15.3	2.3	27.7	8.4	5.4						
	6.0	5.5	12.7	20.2	15.5	2.3	27.9	8.9	5.1						
120	3.0	1.7	3.9	17.3	14.2	2.8	26.8	6.2	7.0						
	4.5	3.3	7.5	18.2	14.6	2.6	27.2	7.0	6.4						
	6.0	5.4	12.4	18.7	14.8	2.5	27.3	7.4	6.0						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB
 EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 030 - Part Load

750 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F											
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG						
20	3.0	1.9	4.4	Operation Not Recommended						Operation Not Recommended											
	4.5	3.0	6.9																		
	6.0	4.3	9.9													15.7	1.5	10.6	87.3	3.1	2.1
30	3.0	1.7	4.0	27.1	17.7	0.9	30.0	31.9	0.8	17.2	1.5	12.0	89.1	3.3	2.1						
	4.5	2.7	6.3	27.3	17.7	0.8	30.0	34.5	0.8	17.8	1.5	12.6	89.9	3.4	2.2						
	6.0	3.8	8.9	27.3	17.8	0.8	29.9	35.7	0.9	18.2	1.5	13.0	90.4	3.5	2.2						
40	3.0	1.3	3.0	26.5	17.4	1.0	29.8	27.7	1.0	19.5	1.5	14.2	92.0	3.7	2.3						
	4.5	2.2	5.0	26.9	17.6	0.9	30.0	30.5	0.9	20.3	1.6	14.9	92.9	3.8	2.3						
	6.0	3.1	7.3	27.1	17.7	0.9	30.0	31.9	0.8	20.7	1.6	15.3	93.5	3.9	2.4						
50	3.0	0.9	2.0	25.7	17.1	1.1	29.4	23.6	1.3	21.8	1.6	16.4	94.9	4.0	2.4						
	4.5	1.6	3.6	26.3	17.3	1.0	29.7	26.3	1.1	22.7	1.6	17.3	96.0	4.2	2.5						
	6.0	2.4	5.6	26.5	17.4	1.0	29.8	27.7	1.0	23.2	1.6	17.7	96.6	4.2	2.6						
60	3.0	0.8	1.9	24.6	16.6	1.2	28.8	19.9	1.8	24.2	1.6	18.6	97.8	4.4	2.6						
	4.5	1.5	3.4	25.3	16.9	1.1	29.2	22.3	1.5	25.2	1.6	19.6	99.1	4.5	2.7						
	6.0	2.3	5.3	25.6	17.1	1.1	29.4	23.6	1.3	25.8	1.7	20.2	99.8	4.6	2.8						
70	3.0	0.8	1.8	23.4	16.1	1.4	28.2	16.7	2.5	26.6	1.7	20.9	100.7	4.7	2.9						
	4.5	1.4	3.2	24.2	16.4	1.3	28.6	18.7	2.0	27.7	1.7	22.0	102.2	4.8	3.0						
	6.0	2.2	5.0	24.5	16.6	1.2	28.8	19.8	1.8	28.4	1.7	22.6	102.9	4.9	3.0						
80	3.0	0.8	1.8	22.1	15.5	1.6	27.5	13.9	3.3	29.0	1.7	23.2	103.7	5.0	3.1						
	4.5	1.4	3.2	22.9	15.9	1.5	27.9	15.5	2.8	30.2	1.7	24.4	105.3	5.2	3.2						
	6.0	2.1	4.9	23.3	16.1	1.4	28.1	16.5	2.5	30.9	1.7	25.1	106.1	5.3	3.3						
90	3.0	0.8	1.8	20.7	14.9	1.8	26.8	11.5	4.3	31.3	1.7	25.4	106.6	5.3	3.4						
	4.5	1.4	3.2	21.5	15.3	1.7	27.2	12.9	3.7	32.8	1.7	26.8	108.3	5.5	3.5						
	6.0	2.1	4.8	21.9	15.5	1.6	27.4	13.6	3.4	33.5	1.8	27.5	109.3	5.6	3.6						
100	3.0	0.7	1.7	19.3	14.3	2.0	26.3	9.5	5.5	Operation Not Recommended											
	4.5	1.3	3.0	20.1	14.7	1.9	26.6	10.6	4.8												
	6.0	2.0	4.6	20.5	14.8	1.8	26.8	11.3	4.4												
110	3.0	0.7	1.5	18.0	13.7	2.3	25.8	7.9	6.8												
	4.5	1.2	2.8	18.8	14.0	2.1	26.1	8.8	6.0												
	6.0	1.9	4.4	19.2	14.2	2.1	26.2	9.3	5.6												
120	3.0	0.6	1.4	Operation Not Recommended																	
	4.5	1.1	2.6													17.5	13.5	2.4	25.7	7.3	7.5
	6.0	1.8	4.1													17.9	13.6	2.3	25.8	7.7	7.0

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB
 EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 030 - Full Load

900 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F											
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG						
20	3.8	2.5	5.7	Operation Not Recommended						Operation Not Recommended											
	5.6	3.9	9.0																		
	7.5	5.7	13.3													21.8	1.9	15.2	89.2	3.3	2.7
30	3.8	2.3	5.2	35.3	21.8	1.4	40.1	25.3	1.3	23.5	2.0	16.7	90.9	3.5	2.8						
	5.6	3.5	8.1	35.7	22.0	1.3	40.2	27.3	1.1	24.5	2.0	17.6	91.8	3.6	2.9						
	7.5	5.1	11.8	35.8	22.0	1.3	40.1	28.3	1.0	25.0	2.0	18.0	92.3	3.6	2.9						
40	3.8	1.7	4.0	34.5	21.5	1.5	39.7	22.6	1.7	26.6	2.1	19.5	93.8	3.7	3.0						
	5.6	2.9	6.6	35.1	21.7	1.4	40.0	24.5	1.4	27.7	2.1	20.5	94.9	3.8	3.1						
	7.5	4.3	10.0	35.4	21.8	1.4	40.1	25.5	1.3	28.3	2.1	21.0	95.5	3.9	3.2						
50	3.8	1.2	2.8	33.5	21.0	1.7	39.2	20.0	2.2	29.7	2.2	22.3	96.9	4.0	3.3						
	5.6	2.2	5.1	34.2	21.4	1.6	39.6	21.8	1.8	31.0	2.2	23.5	98.2	4.1	3.5						
	7.5	3.5	8.1	34.6	21.5	1.5	39.8	22.8	1.7	31.7	2.2	24.1	98.9	4.2	3.5						
60	3.8	1.2	2.7	32.1	20.5	1.8	38.4	17.5	2.9	32.9	2.3	25.1	100.0	4.2	3.7						
	5.6	2.0	4.6	33.1	20.9	1.7	38.9	19.2	2.4	34.4	2.3	26.5	101.4	4.4	3.9						
	7.5	3.3	7.6	33.5	21.1	1.7	39.2	20.1	2.2	35.2	2.3	27.2	102.2	4.4	4.0						
70	3.8	1.1	2.5	30.7	19.9	2.0	37.6	15.1	3.7	36.0	2.4	28.0	103.0	4.5	4.1						
	5.6	1.9	4.5	31.7	20.3	1.9	38.1	16.7	3.1	37.7	2.4	29.4	104.6	4.6	4.4						
	7.5	3.1	7.2	32.2	20.5	1.8	38.4	17.6	2.9	38.6	2.4	30.2	105.5	4.6	4.5						
80	3.8	1.1	2.5	29.0	19.2	2.2	36.7	13.0	4.6	39.2	2.5	30.8	106.1	4.7	4.6						
	5.6	1.9	4.4	30.1	19.7	2.1	37.3	14.4	3.9	40.9	2.5	32.4	107.8	4.8	4.9						
	7.5	3.0	7.0	30.7	19.9	2.0	37.6	15.1	3.7	41.9	2.5	33.2	108.7	4.8	5.1						
90	3.8	1.1	2.5	27.3	18.5	2.5	35.8	11.0	5.6	42.2	2.6	33.5	109.1	4.8	5.2						
	5.6	1.9	4.3	28.4	19.0	2.3	36.4	12.2	4.9	44.1	2.6	35.2	110.9	4.9	5.6						
	7.5	2.9	6.8	29.0	19.2	2.2	36.7	12.9	4.6	45.1	2.7	36.0	111.8	5.0	5.8						
100	3.8	1.0	2.3	25.6	17.7	2.8	35.0	9.2	6.7	Operation Not Recommended											
	5.6	1.8	4.1	26.7	18.2	2.6	35.5	10.3	6.0												
	7.5	2.8	6.5	27.2	18.4	2.5	35.8	10.9	5.6												
110	3.8	0.9	2.2	23.8	16.9	3.1	34.4	7.7	8.0												
	5.6	1.7	3.9	24.9	17.4	2.9	34.8	8.6	7.2												
	7.5	2.7	6.2	25.5	17.6	2.8	35.0	9.1	6.8												
120	3.8	0.9	2.0	Operation Not Recommended																	
	5.6	1.6	3.7													23.1	16.5	3.2	34.2	7.1	8.5
	7.5	2.6	6.0													23.7	16.8	3.1	34.4	7.6	8.1

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWG = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data HEV/H 036 - Part Load

950 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	3.0	1.9	4.4	Operation Not Recommended						Operation Not Recommended					
	4.5	3.0	6.9												
	6.0	4.3	9.9												
30	3.0	1.7	4.0	30.2	22.2	1.0	33.7	29.4	1.0	18.6	1.7	12.8	86.1	3.2	2.6
	4.5	2.7	6.3	30.2	23.5	1.0	33.6	30.2	1.0	19.5	1.7	13.6	86.9	3.3	2.6
	6.0	3.8	8.9	30.1	24.2	1.0	33.5	30.1	1.0	19.9	1.7	14.1	87.4	3.4	2.7
40	3.0	1.3	3.0	29.8	21.0	1.1	33.6	26.7	1.2	21.4	1.7	15.5	88.8	3.6	2.8
	4.5	2.2	5.0	30.2	21.9	1.0	33.7	28.8	1.0	22.5	1.7	16.5	89.8	3.8	2.8
	6.0	3.1	7.2	30.2	22.4	1.0	33.7	29.6	1.0	23.0	1.7	17.1	90.4	3.9	2.9
50	3.0	0.9	2.0	29.0	20.1	1.3	33.3	23.1	1.7	24.3	1.8	18.3	91.6	4.1	3.0
	4.5	1.6	3.6	29.6	20.7	1.1	33.6	25.8	1.3	25.5	1.8	19.5	92.8	4.2	3.0
	6.0	2.4	5.6	29.9	21.1	1.1	33.7	27.1	1.2	26.2	1.8	20.1	93.4	4.4	3.1
60	3.0	0.8	1.9	27.9	19.6	1.4	32.7	19.4	2.3	27.1	1.8	21.1	94.3	4.5	3.2
	4.5	1.5	3.4	28.7	20.0	1.3	33.1	22.1	1.8	28.5	1.8	22.4	95.7	4.7	3.3
	6.0	2.3	5.3	29.1	20.2	1.2	33.3	23.5	1.6	29.3	1.8	23.2	96.4	4.8	3.4
70	3.0	0.8	1.8	26.5	19.1	1.6	32.1	16.1	3.1	29.9	1.8	23.8	97.1	4.9	3.4
	4.5	1.4	3.2	27.5	19.4	1.5	32.6	18.5	2.5	31.5	1.8	25.4	98.6	5.1	3.6
	6.0	2.2	5.0	28.0	19.6	1.4	32.8	19.8	2.2	32.3	1.8	26.2	99.4	5.3	3.7
80	3.0	0.8	1.8	24.9	18.7	1.9	31.4	13.3	4.2	32.7	1.8	26.5	99.8	5.3	3.7
	4.5	1.4	3.2	26.1	19.0	1.7	31.9	15.2	3.4	34.4	1.8	28.2	101.5	5.6	3.9
	6.0	2.1	4.9	26.6	19.1	1.6	32.1	16.3	3.1	35.4	1.8	29.1	102.4	5.7	4.0
90	3.0	0.8	1.8	23.3	18.2	2.1	30.6	10.9	5.4	35.4	1.8	29.2	102.5	5.7	4.0
	4.5	1.4	3.2	24.5	18.5	2.0	31.1	12.5	4.5	37.3	1.8	31.0	104.3	5.9	4.3
	6.0	2.1	4.8	25.0	18.7	1.9	31.4	13.4	4.1	38.3	1.9	32.0	105.3	6.0	4.4
100	3.0	0.4	0.9	21.6	17.5	2.4	29.9	8.9	6.8	Operation Not Recommended					
	4.5	1.3	3.0	22.8	18.0	2.2	30.4	10.2	5.8						
	6.0	2.0	4.6	23.3	18.2	2.1	30.6	10.9	5.3						
110	3.0	0.7	1.5	20.0	16.7	2.7	29.3	7.4	8.4						
	4.5	1.2	2.8	21.1	17.3	2.5	29.7	8.4	7.3						
	6.0	1.9	4.4	21.6	17.5	2.4	29.9	8.9	6.8						
120	3.0	0.6	1.4	18.5	15.7	3.0	28.7	6.1	10.2						
	4.5	1.1	2.6	19.5	16.4	2.8	29.1	6.9	9.0						
	6.0	1.8	4.1	20.0	16.7	2.7	29.2	7.3	8.4						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 036 - Full Load

1150 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F																	
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG												
20	4.5	3.0	6.9	Operation Not Recommended						Operation Not Recommended																	
	6.8	5.0	11.6																								
	9.0	7.4	17.2													25.3	2.3	17.3	88.3	3.2	3.4						
30	4.5	2.7	6.3	40.6	27.3	1.7	46.4	24.0	1.6	27.5	2.4	19.3	90.1	3.4	3.5												
	6.8	4.5	10.4	40.5	27.8	1.6	46.0	25.4	1.3	28.6	2.4	20.3	91.0	3.5	3.6												
	9.0	6.6	15.3	40.4	28.1	1.5	45.6	26.1	1.2	29.2	2.4	20.9	91.4	3.5	3.7												
40	4.5	2.2	5.0	40.3	26.5	1.8	46.6	21.8	2.1	31.2	2.5	22.7	93.1	3.7	3.8												
	6.8	3.7	8.6	40.6	27.1	1.7	46.5	23.3	1.7	32.5	2.5	23.9	94.1	3.8	3.9												
	9.0	5.6	13.0	40.6	27.4	1.7	46.4	24.0	1.6	33.3	2.5	24.6	94.7	3.8	4.0												
50	4.5	1.6	3.6	39.3	25.7	2.0	46.2	19.6	2.8	35.0	2.6	26.2	96.1	4.0	4.2												
	6.8	3.0	6.9	40.0	26.3	1.9	46.5	21.1	2.3	36.6	2.6	27.6	97.4	4.1	4.3												
	9.0	4.6	10.7	40.3	26.6	1.8	46.6	21.9	2.1	37.4	2.7	28.4	98.1	4.1	4.4												
60	4.5	1.5	3.4	38.0	24.9	2.2	45.5	17.3	3.6	38.9	2.7	29.7	99.2	4.2	4.6												
	6.8	2.8	6.5	39.0	25.5	2.1	46.0	18.9	3.0	40.7	2.7	31.3	100.7	4.3	4.9												
	9.0	4.4	10.2	39.4	25.8	2.0	46.2	19.6	2.8	41.6	2.8	32.2	101.4	4.4	5.0												
70	4.5	1.4	3.2	36.4	24.2	2.4	44.6	15.1	4.6	42.7	2.8	33.2	102.3	4.5	5.1												
	6.8	2.6	6.1	37.5	24.7	2.3	45.3	16.6	3.9	44.7	2.9	34.9	103.9	4.6	5.5												
	9.0	4.2	9.7	38.1	25.0	2.2	45.5	17.4	3.6	45.8	2.9	35.9	104.8	4.6	5.6												
80	4.5	1.4	3.2	34.6	23.4	2.7	43.7	13.0	5.7	46.5	2.9	36.6	105.4	4.7	5.8												
	6.8	2.6	6.0	35.8	23.9	2.5	44.3	14.4	4.9	48.6	3.0	38.5	107.1	4.8	6.2												
	9.0	4.1	9.4	36.4	24.2	2.4	44.6	15.1	4.6	49.8	3.0	39.5	108.0	4.8	6.4												
90	4.5	1.4	3.2	32.5	22.6	3.0	42.7	11.0	7.0	50.2	3.0	39.9	108.3	4.9	6.5												
	6.8	2.5	5.8	33.9	23.1	2.8	43.3	12.2	6.1	52.4	3.1	41.8	110.1	4.9	7.0												
	9.0	3.9	9.1	34.5	23.4	2.7	43.6	12.9	5.7	53.5	3.1	42.8	111.0	5.0	7.3												
100	4.5	1.3	3.0	30.4	21.9	3.3	41.8	9.2	8.4	Operation Not Recommended																	
	6.8	2.4	5.6	31.8	22.3	3.1	42.3	10.3	7.5																		
	9.0	3.8	8.8	32.4	22.6	3.0	42.6	10.9	7.0																		
110	4.5	1.2	2.8	28.3	21.1	3.7	41.1	7.6	10.0																		
	6.8	2.3	5.3	29.6	21.6	3.5	41.5	8.5	9.0																		
	9.0	3.7	8.5	30.3	21.8	3.3	41.7	9.0	8.5																		
120	4.5	1.1	2.6	Operation Not Recommended												Operation Not Recommended											
	6.8	2.2	5.1																			27.5	20.8	3.9	40.9	7.0	10.7
	9.0	3.5	8.1																			28.2	21.0	3.8	41.1	7.4	10.1

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 042 - Part Load

1100 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F											
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG						
20	3.8	1.9	4.4	Operation Not Recommended						Operation Not Recommended											
	5.6	3.3	7.6																		
	7.5	5.0	11.7													19.8	2.1	12.7	84.6	2.8	2.5
30	3.8	1.7	3.9	38.1	28.9	1.1	42.0	33.1	1.0	22.1	2.1	14.9	86.6	3.1	2.6						
	5.6	2.9	6.7	38.3	28.9	1.1	41.9	36.3	1.0	23.1	2.1	15.8	87.4	3.2	2.7						
	7.5	4.5	10.3	38.3	28.8	1.0	41.8	37.6	1.0	23.7	2.1	16.4	87.9	3.2	2.7						
40	3.8	1.4	3.2	37.4	28.5	1.3	41.8	28.6	1.2	25.6	2.2	18.3	89.5	3.5	2.8						
	5.6	2.4	5.6	38.0	28.8	1.2	42.0	32.0	1.0	26.8	2.2	19.4	90.5	3.6	2.9						
	7.5	3.8	8.8	38.1	28.9	1.1	42.0	33.7	1.0	27.5	2.2	20.1	91.1	3.7	2.9						
50	3.8	1.0	2.4	36.3	27.9	1.5	41.4	24.3	1.6	29.1	2.2	21.6	92.5	3.9	3.0						
	5.6	2.0	4.5	37.1	28.4	1.4	41.7	27.5	1.3	30.5	2.2	23.0	93.6	4.1	3.1						
	7.5	3.1	7.2	37.5	28.6	1.3	41.9	29.2	1.2	31.3	2.2	23.8	94.3	4.2	3.1						
60	3.8	1.0	2.3	34.8	27.1	1.7	40.7	20.4	2.2	32.5	2.2	25.0	95.3	4.3	3.2						
	5.6	1.8	4.2	35.9	27.7	1.5	41.2	23.2	1.8	34.1	2.2	26.5	96.7	4.5	3.4						
	7.5	3.0	6.9	36.4	28.0	1.5	41.4	24.7	1.6	35.0	2.2	27.3	97.4	4.6	3.4						
70	3.8	0.9	2.1	33.1	26.2	2.0	39.8	16.9	3.0	35.9	2.2	28.2	98.1	4.7	3.5						
	5.6	1.7	4.0	34.4	26.8	1.8	40.4	19.3	2.4	37.6	2.3	29.9	99.6	4.9	3.6						
	7.5	2.8	6.5	35.0	27.2	1.7	40.7	20.7	2.2	38.6	2.3	30.8	100.4	5.0	3.7						
80	3.8	0.9	2.1	31.1	25.3	2.2	38.7	14.0	4.0	39.1	2.3	31.4	100.9	5.1	3.8						
	5.6	1.7	3.9	32.5	25.9	2.0	39.5	16.0	3.3	41.0	2.3	33.2	102.4	5.3	4.0						
	7.5	2.7	6.3	33.2	26.2	1.9	39.8	17.1	3.0	41.9	2.3	34.1	103.2	5.4	4.1						
90	3.8	0.9	2.0	29.0	24.4	2.5	37.6	11.5	5.2	42.2	2.3	34.4	103.4	5.4	4.1						
	5.6	1.6	3.8	30.5	25.0	2.3	38.4	13.2	4.4	44.1	2.3	36.2	105.0	5.6	4.3						
	7.5	2.6	6.1	31.2	25.3	2.2	38.8	14.1	4.0	45.1	2.3	37.2	105.9	5.7	4.5						
100	3.8	0.9	2.0	26.8	23.5	2.8	36.4	9.5	6.5	Operation Not Recommended											
	5.6	1.6	3.6	28.3	24.1	2.6	37.2	10.8	5.6												
	7.5	2.6	5.9	29.0	24.4	2.5	37.6	11.5	5.2												
110	3.8	0.8	1.9	24.5	22.7	3.2	35.3	7.7	8.1												
	5.6	1.5	3.5	26.0	23.2	2.9	36.0	8.8	7.1												
	7.5	2.5	5.7	26.7	23.5	2.8	36.4	9.4	6.6												
120	3.8	0.8	1.8	Operation Not Recommended																	
	5.6	1.5	3.4													23.6	22.4	3.3	34.8	7.2	8.7
	7.5	2.4	5.5													24.3	22.7	3.2	35.2	7.6	8.2

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB
 EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 042 - Full Load

1300 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F											
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG						
20	5.3	3.0	7.0	Operation Not Recommended						Operation Not Recommended											
	7.9	5.5	12.6																		
	10.5	8.4	19.4													29.6	2.8	19.9	89.0	3.1	3.3
30	5.3	2.7	6.2	50.4	36.7	1.9	57.0	25.9	1.3	32.4	2.9	22.5	91.0	3.3	3.4						
	7.9	4.8	11.1	51.1	37.2	1.8	57.3	28.0	1.1	33.7	2.9	23.7	92.0	3.4	3.5						
	10.5	7.4	17.0	51.3	37.3	1.8	57.4	29.0	1.0	34.4	2.9	24.4	92.5	3.4	3.6						
40	5.3	1.8	4.1	49.2	35.9	2.1	56.4	23.2	1.8	36.9	3.0	26.6	94.2	3.6	3.7						
	7.9	4.1	9.5	50.1	36.5	2.0	56.9	25.2	1.4	38.5	3.0	28.1	95.3	3.7	3.8						
	10.5	6.4	14.7	50.5	36.8	1.9	57.1	26.2	1.3	39.3	3.1	28.9	95.9	3.8	3.9						
50	5.3	1.8	4.1	47.8	35.0	2.3	55.7	20.6	2.3	41.3	3.1	30.7	97.4	3.9	4.1						
	7.9	3.4	7.9	48.8	35.7	2.2	56.2	22.5	1.9	43.2	3.2	32.4	98.7	4.0	4.2						
	10.5	5.4	12.5	49.3	36.0	2.1	56.5	23.4	1.7	44.1	3.2	33.3	99.4	4.1	4.3						
60	5.3	1.7	3.9	46.1	34.1	2.5	54.7	18.1	3.0	45.8	3.2	34.8	100.5	4.2	4.5						
	7.9	3.2	7.5	47.3	34.8	2.4	55.4	19.8	2.5	47.8	3.3	36.6	102.0	4.3	4.7						
	10.5	5.2	11.9	47.9	35.1	2.3	55.7	20.7	2.3	48.9	3.3	37.6	102.8	4.3	4.9						
70	5.3	1.6	3.6	44.1	33.1	2.8	53.7	15.7	3.8	50.1	3.3	38.8	103.6	4.4	5.0						
	7.9	3.1	7.1	45.5	33.8	2.6	54.4	17.3	3.2	52.4	3.4	40.8	105.2	4.5	5.3						
	10.5	4.9	11.3	46.1	34.1	2.5	54.8	18.2	3.0	53.5	3.4	41.9	106.0	4.6	5.5						
80	5.3	1.5	3.5	42.0	32.2	3.1	52.6	13.5	4.7	54.4	3.4	42.6	106.7	4.6	5.6						
	7.9	3.0	6.9	43.5	32.8	2.9	53.3	15.0	4.1	56.8	3.5	44.8	108.3	4.7	6.0						
	10.5	4.8	11.0	44.2	33.1	2.8	53.7	15.8	3.8	58.0	3.6	45.9	109.2	4.8	6.2						
90	5.3	1.5	3.4	39.6	31.3	3.4	51.4	11.5	5.8	58.5	3.6	46.4	109.6	4.8	6.3						
	7.9	2.9	6.6	41.2	31.8	3.2	52.2	12.8	5.1	61.0	3.6	48.6	111.4	4.9	6.8						
	10.5	4.7	10.7	42.0	32.2	3.1	52.6	13.5	4.7	62.3	3.7	49.7	112.3	5.0	7.1						
100	5.3	1.4	3.3	37.1	30.4	3.8	50.2	9.7	6.9	Operation Not Recommended											
	7.9	2.8	6.4	38.8	31.0	3.6	51.0	10.9	6.2												
	10.5	4.5	10.4	39.6	31.2	3.4	51.4	11.5	5.8												
110	5.3	1.4	3.2	34.5	29.6	4.3	49.0	8.1	8.2												
	7.9	2.7	6.2	36.2	30.1	4.0	49.7	9.1	7.4												
	10.5	4.4	10.1	37.0	30.4	3.8	50.1	9.6	7.0												
120	5.3	1.3	3.1	Operation Not Recommended																	
	7.9	2.6	6.0													33.4	29.3	4.4	48.5	7.5	8.8
	10.5	4.2	9.8													34.3	29.6	4.3	48.9	8.0	8.3

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating. 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. All performance data is based upon the lower voltage of dual voltage rated units. See performance correction tables for operating conditions other than those listed above. Operation below 60°F EWT requires optional insulated water circuit. Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data HEV/H 048 - Part Load

1250 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	4.5	1.8	4.0	Operation Not Recommended						Operation Not Recommended					
	6.8	3.4	7.9												
	9.0	5.2	12.1												
30	4.5	1.4	3.2	41.9	28.4	1.4	46.6	30.8	1.2	25.3	2.2	17.8	86.7	3.4	3.0
	6.8	2.5	5.7	42.2	28.2	1.3	46.7	32.5	1.0	26.3	2.2	18.8	87.4	3.5	3.1
	9.0	4.0	9.2	42.3	28.0	1.3	46.7	33.0	1.0	26.8	2.2	19.3	87.8	3.6	3.1
40	4.5	1.2	2.8	41.1	28.3	1.5	46.3	27.3	1.5	28.8	2.2	21.3	89.3	3.8	3.1
	6.8	2.4	5.5	41.7	28.4	1.4	46.5	29.8	1.3	30.0	2.2	22.4	90.2	4.0	3.2
	9.0	3.8	8.7	42.0	28.4	1.4	46.6	30.9	1.2	30.7	2.2	23.1	90.7	4.0	3.2
50	4.5	1.1	2.5	39.9	27.8	1.7	45.7	23.3	2.1	32.4	2.2	24.8	92.0	4.3	3.3
	6.8	2.1	4.9	40.8	28.2	1.6	46.1	26.0	1.7	33.8	2.2	26.2	93.0	4.4	3.4
	9.0	3.4	7.9	41.2	28.3	1.5	46.3	27.4	1.5	34.6	2.2	26.9	93.6	4.5	3.4
60	4.5	1.0	2.3	38.3	27.2	2.0	45.1	19.4	2.9	36.1	2.3	28.4	94.6	4.7	3.5
	6.8	2.0	4.6	39.4	27.6	1.8	45.5	22.0	2.4	37.7	2.3	29.9	95.8	4.9	3.6
	9.0	3.2	7.5	39.9	27.9	1.7	45.8	23.3	2.1	38.5	2.3	30.8	96.5	5.0	3.7
70	4.5	0.9	2.0	36.5	26.3	2.3	44.2	16.0	3.9	39.7	2.3	31.9	97.3	5.1	3.7
	6.8	1.8	4.2	37.7	26.9	2.1	44.8	18.2	3.2	41.4	2.3	33.7	98.6	5.3	3.9
	9.0	3.0	6.9	38.3	27.2	2.0	45.1	19.4	2.9	42.4	2.3	34.6	99.3	5.4	4.0
80	4.5	0.9	2.0	34.4	25.4	2.6	43.3	13.1	5.1	43.2	2.3	35.4	99.9	5.5	4.0
	6.8	1.8	4.0	35.8	26.0	2.4	43.9	14.9	4.3	45.1	2.3	37.3	101.3	5.8	4.2
	9.0	2.9	6.7	36.4	26.3	2.3	44.2	15.9	3.9	46.1	2.3	38.3	102.1	5.9	4.3
90	4.5	0.8	1.8	32.1	24.5	3.0	42.4	10.7	6.4	46.6	2.3	38.8	102.5	6.0	4.4
	6.8	1.7	3.9	33.6	25.1	2.8	43.0	12.2	5.5	48.6	2.3	40.8	103.9	6.2	4.6
	9.0	2.8	6.5	34.3	25.4	2.6	43.3	13.0	5.1	49.6	2.3	41.8	104.7	6.3	4.7
100	4.5	0.8	1.8	29.7	23.5	3.4	41.4	8.7	8.0	Operation Not Recommended					
	6.8	1.6	3.7	31.2	24.1	3.2	42.0	9.9	7.0						
	9.0	2.7	6.1	32.0	24.4	3.0	42.3	10.5	6.5						
110	4.5	0.7	1.7	27.3	22.6	3.9	40.4	7.1	9.8						
	6.8	1.5	3.5	28.8	23.2	3.6	41.0	8.0	8.7						
	9.0	2.6	5.9	29.5	23.4	3.5	41.3	8.5	8.2						
120	4.5	0.7	1.7	24.8	21.8	4.3	39.5	5.8	11.8						
	6.8	1.5	3.5	26.3	22.3	4.0	40.1	6.5	10.6						
	9.0	2.5	5.9	27.0	22.5	3.9	40.4	6.9	10.0						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 048 - Full Load

1500 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	6.0	2.8	6.5	Operation Not Recommended						Operation Not Recommended					
	9.0	5.2	12.1												
	12.0	7.7	17.8												
30	6.0	2.0	4.6	54.4	36.2	2.2	62.0	24.3	2.1	35.2	2.9	25.1	89.6	3.5	3.6
	9.0	4.0	9.2	54.0	36.1	2.2	61.5	24.7	1.9	36.5	3.0	26.4	90.5	3.6	3.7
	12.0	6.5	15.1	53.6	35.9	2.2	61.0	24.7	1.9	37.2	3.0	27.0	90.9	3.7	3.8
40	6.0	1.9	4.4	54.1	36.1	2.4	62.2	22.8	2.5	39.7	3.0	29.4	92.5	3.9	3.9
	9.0	3.8	8.7	54.4	36.2	2.3	62.1	24.0	2.2	41.4	3.1	30.9	93.5	4.0	4.0
	12.0	6.0	13.9	54.4	36.2	2.2	62.0	24.4	2.1	42.3	3.1	31.8	94.0	4.0	4.1
50	6.0	1.7	4.0	53.0	35.6	2.6	61.8	20.5	3.2	44.6	3.1	33.9	95.4	4.2	4.2
	9.0	3.4	7.9	53.8	36.0	2.4	62.1	22.2	2.7	46.5	3.2	35.7	96.6	4.3	4.4
	12.0	5.5	12.7	54.1	36.1	2.4	62.2	22.9	2.5	47.6	3.2	36.7	97.3	4.4	4.5
60	6.0	1.6	3.7	51.3	34.9	2.9	61.0	17.9	4.0	49.5	3.2	38.5	98.5	4.5	4.6
	9.0	3.2	7.5	52.5	35.4	2.7	61.6	19.7	3.4	51.8	3.3	40.7	99.9	4.7	4.8
	12.0	5.3	12.2	53.0	35.6	2.6	61.8	20.6	3.1	53.0	3.3	41.8	100.7	4.7	4.9
70	6.0	1.4	3.3	49.1	34.0	3.2	60.0	15.3	5.0	54.6	3.3	43.2	101.6	4.8	5.0
	9.0	3.0	6.9	50.6	34.7	3.0	60.7	17.1	4.3	57.2	3.4	45.6	103.2	5.0	5.3
	12.0	4.9	11.3	51.3	34.9	2.9	61.0	18.0	4.0	58.6	3.4	46.9	104.1	5.0	5.4
80	6.0	1.4	3.3	46.5	33.0	3.6	58.9	12.8	6.2	59.7	3.4	47.9	104.7	5.1	5.5
	9.0	2.9	6.7	48.2	33.7	3.3	59.6	14.4	5.4	62.5	3.5	50.5	106.5	5.2	5.8
	12.0	4.8	11.1	49.1	34.0	3.2	60.0	15.3	5.0	64.0	3.5	51.9	107.4	5.3	6.0
90	6.0	1.3	3.1	43.8	31.9	4.1	57.8	10.7	7.6	64.7	3.6	52.5	107.8	5.3	6.0
	9.0	2.8	6.5	45.6	32.6	3.8	58.5	12.0	6.6	67.7	3.6	55.3	109.7	5.5	6.4
	12.0	4.7	10.9	46.5	33.0	3.6	58.9	12.8	6.2	69.3	3.7	56.8	110.7	5.5	6.6
100	6.0	1.3	3.0	41.0	30.7	4.7	57.0	8.8	9.2	Operation Not Recommended					
	9.0	2.7	6.1	42.8	31.5	4.3	57.5	9.9	8.1						
	12.0	4.5	10.4	43.7	31.8	4.1	57.8	10.6	7.6						
110	6.0	1.2	2.8	38.3	29.5	5.3	56.5	7.2	11.0						
	9.0	2.6	5.9	40.0	30.3	4.9	56.7	8.2	9.8						
	12.0	4.4	10.1	40.9	30.6	4.7	56.9	8.7	9.2						
120	6.0	1.2	2.8	Operation Not Recommended											
	9.0	2.6	5.9												
	12.0	4.3	10.0												

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB
 EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data HEV/H 060 - Part Load

1600 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	6.0	4.5	10.4	Operation Not Recommended						Operation Not Recommended					
	9.0	7.6	17.6												
	12.0	11.5	26.5												
30	6.0	4.1	9.6	52.3	38.4	1.5	57.6	34.1	1.1	32.0	2.9	22.1	86.5	3.2	3.8
	9.0	6.9	15.9	52.0	38.2	1.5	57.0	35.7	1.0	33.2	2.9	23.3	87.2	3.3	3.8
	12.0	10.4	23.9	51.7	38.0	1.4	56.6	36.1	1.0	33.9	2.9	23.9	87.6	3.4	3.8
40	6.0	3.3	7.6	51.9	38.4	1.7	57.8	30.4	1.4	36.6	2.9	26.6	89.1	3.6	3.9
	9.0	5.7	13.2	52.3	38.4	1.6	57.7	32.9	1.2	38.0	3.0	27.9	90.0	3.8	4.0
	12.0	8.7	20.2	52.3	38.4	1.5	57.6	34.0	1.1	38.8	3.0	28.7	90.4	3.8	4.0
50	6.0	2.5	5.7	50.7	38.1	1.9	57.3	26.2	2.0	41.1	3.0	30.9	91.7	4.0	4.1
	9.0	4.5	10.5	51.6	38.3	1.8	57.7	28.9	1.6	42.7	3.0	32.5	92.7	4.2	4.2
	12.0	7.1	16.4	51.9	38.4	1.7	57.8	30.3	1.5	43.6	3.0	33.3	93.2	4.2	4.2
60	6.0	2.3	5.4	48.8	37.5	2.2	56.3	22.1	2.7	45.6	3.0	35.2	94.3	4.4	4.4
	9.0	4.3	10.0	50.1	37.9	2.0	57.0	24.7	2.2	47.4	3.1	36.9	95.3	4.5	4.5
	12.0	6.8	15.7	50.6	38.1	1.9	57.2	26.0	2.0	48.3	3.1	37.9	95.9	4.6	4.5
70	6.0	2.2	5.1	46.5	36.7	2.5	55.1	18.3	3.6	49.9	3.1	39.4	96.8	4.8	4.7
	9.0	4.1	9.5	48.0	37.2	2.3	55.9	20.6	3.0	51.9	3.1	41.3	98.0	4.9	4.8
	12.0	6.5	15.0	48.7	37.5	2.2	56.3	21.8	2.8	53.0	3.1	42.4	98.6	5.0	4.9
80	6.0	2.1	4.9	43.9	35.6	2.9	53.7	15.2	4.8	54.2	3.1	43.6	99.3	5.1	5.0
	9.0	3.9	9.1	45.5	36.3	2.7	54.6	17.0	4.1	56.4	3.1	45.7	100.5	5.3	5.3
	12.0	6.3	14.4	46.3	36.6	2.6	55.0	18.1	3.7	57.5	3.1	46.8	101.2	5.4	5.4
90	6.0	2.0	4.7	41.2	34.3	3.3	52.4	12.5	6.1	58.4	3.1	47.7	101.7	5.4	5.5
	9.0	3.8	8.7	42.8	35.1	3.1	53.2	14.0	5.3	60.7	3.2	50.0	103.1	5.6	5.8
	12.0	6.0	13.9	43.6	35.4	2.9	53.6	14.8	4.9	62.0	3.2	51.2	103.8	5.7	5.9
100	6.0	2.0	4.6	38.5	32.8	3.7	51.3	10.3	7.6	Operation Not Recommended					
	9.0	3.7	8.5	40.0	33.7	3.5	51.9	11.5	6.7						
	12.0	5.9	13.5	40.8	34.1	3.3	52.3	12.2	6.3						
110	6.0	1.9	4.4	36.1	31.4	4.2	50.5	8.6	9.3						
	9.0	3.6	8.2	37.5	32.2	3.9	50.9	9.5	8.3						
	12.0	5.7	13.2	38.2	32.6	3.8	51.1	10.1	7.8						
120	6.0	1.9	4.3	34.2	30.0	4.7	50.2	7.3	11.3						
	9.0	3.5	8.0	35.2	30.7	4.4	50.3	8.0	10.2						
	12.0	5.5	12.8	35.8	31.1	4.3	50.4	8.4	9.6						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB
 EAT in cooling and 68°F DB / 59°F WB EAT in heating.
 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
 All performance data is based upon the lower voltage of dual voltage rated units
 See performance correction tables for operating conditions other than those listed above.
 Operation below 60°F EWT requires optional insulated water circuit.
 Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
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- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Performance Data

HEV/H 060 - Full Load

1900 CFM Rated Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F					
		PSI	FT	TC	SC	KW	HR	EER	HWG	HC	KW	HE	LAT	COP	HWG
20	7.0	5.5	12.6	Operation Not Recommended						Operation Not Recommended					
	10.5	9.4	21.8												
	14.0	14.5	33.5												
30	7.0	5.0	11.5	70.6	49.8	2.9	80.5	24.3	2.2	45.0	4.0	31.4	89.9	3.3	4.7
	10.5	8.5	19.7	71.3	51.1	2.9	81.2	24.8	1.9	46.9	4.0	33.1	90.8	3.4	4.8
	14.0	13.2	30.4	71.5	51.8	2.9	81.4	24.7	1.9	48.0	4.1	34.1	91.3	3.5	4.8
40	7.0	4.0	9.3	68.9	48.5	3.0	79.2	22.8	2.6	51.1	4.1	37.0	92.8	3.6	5.0
	10.5	7.1	16.5	70.2	49.5	2.9	80.2	24.0	2.3	53.4	4.2	39.0	93.9	3.7	5.2
	14.0	11.1	25.6	70.8	50.1	2.9	80.6	24.4	2.1	54.6	4.2	40.2	94.5	3.8	5.2
50	7.0	3.1	7.2	66.7	47.3	3.2	77.7	20.6	3.3	57.2	4.3	42.5	95.8	3.9	5.4
	10.5	5.8	13.3	68.4	48.2	3.1	78.9	22.3	2.8	59.7	4.4	44.9	97.0	4.0	5.6
	14.0	9.0	20.9	69.2	48.6	3.0	79.4	23.0	2.6	61.1	4.4	46.1	97.7	4.1	5.7
60	7.0	2.9	6.8	64.0	46.1	3.5	76.0	18.2	4.1	63.1	4.4	48.0	98.7	4.2	5.9
	10.5	5.5	12.7	66.0	47.0	3.3	77.3	20.0	3.5	66.0	4.5	50.6	100.1	4.3	6.1
	14.0	8.7	20.1	67.0	47.4	3.2	77.9	20.9	3.2	67.5	4.6	52.0	100.8	4.3	6.3
70	7.0	2.8	6.5	61.1	45.0	3.9	74.3	15.8	5.2	69.0	4.6	53.3	101.6	4.4	6.4
	10.5	5.2	12.1	63.2	45.8	3.6	75.6	17.5	4.4	72.1	4.7	56.2	103.1	4.5	6.7
	14.0	8.3	19.3	64.3	46.2	3.5	76.2	18.4	4.1	73.8	4.7	57.7	103.9	4.6	6.9
80	7.0	2.7	6.2	58.0	43.7	4.3	72.7	13.5	6.4	74.8	4.8	58.6	104.4	4.6	7.0
	10.5	5.0	11.6	60.2	44.6	4.0	73.8	15.0	5.5	78.2	4.8	61.6	106.0	4.7	7.4
	14.0	8.1	18.6	61.3	45.1	3.9	74.4	15.9	5.1	80.0	4.9	63.2	106.9	4.8	7.7
90	7.0	2.6	5.9	54.8	42.3	4.8	71.2	11.4	7.8	80.5	4.9	63.7	107.1	4.8	7.7
	10.5	4.8	11.2	57.0	43.3	4.5	72.2	12.8	6.8	84.1	5.0	66.9	108.9	4.9	8.2
	14.0	7.8	18.0	58.1	43.8	4.3	72.7	13.5	6.3	86.0	5.1	68.6	109.8	5.0	8.5
100	7.0	2.5	5.7	51.8	40.8	5.3	70.0	9.7	9.4	Operation Not Recommended					
	10.5	4.7	10.9	53.8	41.9	5.0	70.8	10.8	8.3						
	14.0	7.6	17.5	54.9	42.4	4.8	71.2	11.5	7.7						
110	7.0	2.4	5.6	49.0	39.1	5.9	69.3	8.2	11.2						
	10.5	4.6	10.6	50.8	40.2	5.5	69.7	9.2	10.0						
	14.0	7.4	17.1	51.8	40.8	5.3	70.0	9.7	9.4						
120	7.0	2.3	5.4	46.6	37.4	6.6	69.1	7.1	13.2						
	10.5	4.4	10.2	48.1	38.5	6.2	69.1	7.8	11.9						
	14.0	7.2	16.7	49.0	39.1	6.0	69.3	8.2	11.2						

†ARI/ASHRAE/ISO 13256-1 (WLHP applications) certified conditions are 86°F EWT, 80.6°F DB / 66.2°F WB EAT in cooling and 68°F DB / 59°F WB EAT in heating. 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. All performance data is based upon the lower voltage of dual voltage rated units. See performance correction tables for operating conditions other than those listed above. Operation below 60°F EWT requires optional insulated water circuit. Operation below 40°F EWT is based upon 15% antifreeze solution.

Legend

- CFM = airflow, cubic feet/minute
- EWT = entering water temperature, °F
- GPM = water flow in US gallons/minute
- EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
- HC = air heating capacity, Mbtuh
- TC = total cooling capacity, Mbtuh
- SC = sensible cooling capacity, Mbtuh
- KW = total power unit input, KiloWatts
- HR = total heat of rejection, Mbtuh
- HE = total heat of extraction, Mbtuh
- HWC = Hot Water Generator (desuperheater) capacity, Mbtuh
- WPD = Water coil pressure drop (psi & ft hd)
- EER = Energy Efficiency Ratio = BTU output/Watt input
- COP = Coefficient of Performance = BTU output/BTU input
- LWT = leaving water temperature, °F
- LAT = leaving air temperature, °F
- LC = latent cooling capacity, Mbtuh
- S/T = sensible to total cooling ratio

Note:

For operation in the shaded area when water is used in lieu of an anti-freeze 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 when the JW3 jumper is not clipped. This is due to the potential of the refrigerant temperature being as low as 32°F with 40°F LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for systems without antifreeze.

Calculate LWT as follows:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Full Load Correction Factors

Air Flow Correction Table

Airflow	Cooling					Heating		
	Total Capacity	Sensible Capacity	S/T	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
80%	0.976	0.919	0.941	0.939	0.969	0.983	1.040	0.967
85%	0.984	0.941	0.957	0.953	0.977	0.987	1.018	0.978
90%	0.990	0.962	0.972	0.968	0.986	0.991	1.004	0.988
95%	0.996	0.982	0.986	0.983	0.993	0.996	0.998	0.995
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
105%	1.003	1.017	1.014	1.018	1.006	1.005	1.010	1.003
110%	1.005	1.032	1.027	1.036	1.012	1.009	1.028	1.004

Entering Air Correction Table

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
50	1.030	0.808	1.092
55	1.026	0.858	1.073
60	1.020	0.905	1.052
65	1.011	0.951	1.027
70	1.000	1.000	1.000
75	0.989	1.054	0.971
80	0.978	1.114	0.940

* = 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

Cooling											
Entering Air WB°F	Total Capacity	Sensible Cooling Capacity Multiplier - Entering DB °F								Power	Heat of Rejection
		65	70	75	80	85	90	95	100		
45	0.638	*	*	*	*	*	*	*	*	0.914	0.694
50	0.720	*	*	*	*	*	*	*	*	0.934	0.763
55	0.803	1.044	*	*	*	*	*	*	*	0.953	0.833
60	0.885	0.751	0.927	1.114	*	*	*	*	*	0.973	0.903
65	0.967		0.693	0.886	1.089	1.300	*	*	*	0.992	0.972
67	1.000		0.607	0.798	1.000	1.211	1.432	*	*	1.000	1.000
70	1.049			0.669	0.866	1.076	1.299	*	*	1.012	1.042
75	1.132				0.644	0.848	1.077	1.329	1.605	1.031	1.111

Part Load Correction Factors

Air Flow Correction Table

Airflow	Cooling					Heating		
	Total Capacity	Sensible Capacity	S/T	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
80%	0.980	0.917	0.936	0.955	0.975	0.979	1.035	0.965
85%	0.986	0.939	0.953	0.964	0.982	0.984	1.021	0.975
90%	0.992	0.961	0.969	0.975	0.988	0.990	1.011	0.984
95%	0.996	0.981	0.985	0.986	0.994	0.995	1.004	0.993
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
105%	1.003	1.017	1.014	1.016	1.005	1.006	1.002	1.007
110%	1.004	1.031	1.027	1.033	1.010	1.011	1.006	1.012

Entering Air Correction Table

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
50	1.023	0.773	1.084
55	1.021	0.827	1.068
60	1.016	0.882	1.049
65	1.009	0.940	1.026
70	1.000	1.000	1.000
75	0.989	1.063	0.971
80	0.978	1.128	0.941

* = 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

Cooling											
Entering Air WB°F	Total Capacity	Sensible Cooling Capacity Multiplier - Entering DB °F								Power	Heat of Rejection
		65	70	75	80	85	90	95	100		
45	0.628	*	*	*	*	*	*	*	*	1.010	0.698
50	0.712	*	*	*	*	*	*	*	*	1.008	0.767
55	0.797	1.026	*		*	*	*	*	*	1.006	0.835
60	0.882	0.669	0.894	1.111	*	*	*	*	*	1.003	0.904
65	0.966		0.693	0.890	1.092	1.298	*	*	*	1.001	0.973
67	1.000		0.640	0.810	1.000	1.202	*	*	*	1.000	1.000
70	1.051			0.706	0.862	1.060	1.298	*	*	0.999	1.041
75	1.135				0.633	0.860	1.087	1.314	1.541	0.996	1.110

Antifreeze Correction Table

Antifreeze Type	Antifreeze %	Cooling			Heating		WPD Corr. Fct. EWT 30°F
		EWT 90°F			EWT 30°F		
		Total Cap	Sens Cap	Power	Htg Cap	Power	
Water	0	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.995	0.995	1.003	0.989	0.997	1.070
	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
Methanol	5	0.997	0.997	1.002	0.989	0.997	1.070
	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.140
	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
Ethylene Glycol	5	0.998	0.998	1.002	0.993	0.998	1.040
	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

Blower Performance Data

Airflow in CFM with wet coil and clean air filter

Model	Max ESP (in. wg)	Fan Motor (hp)	Range	Cooling Mode		Dehumid Mode		Heating Mode		Fan Only Mode	Aux/ Emerg Mode
				Stg 2	Stg 1	Stg 2	Stg 1	Stg 2	Stg 1		
024	0.75	1/2	Default	750	575	650	500	750	575	350	750
			Maximum	850	650	800	600	850	850	850	850
			Minimum	600	450	600	450	600	450	300	650
030	0.5	1/2	Default	950	650	800	575	950	650	450	950
			Maximum	1100	750	1000	700	1100	1100	1100	1100
			Minimum	750	525	750	525	750	525	375	750
036	0.6	1/2	Default	1125	750	975	650	1125	750	525	1125
			Maximum	1250	950	1200	800	1250	1250	1250	1250
			Minimum	900	600	900	600	900	600	450	900
042	0.6	3/4	Default	1300	925	1125	825	1300	925	600	1300
			Maximum	1475	1100	1400	1000	1475	1475	1475	1475
			Minimum	1050	750	1050	750	1050	750	525	1050
048	0.75	3/4	Default	1500	1125	1300	975	1500	1125	700	1500
			Maximum	1700	1300	1600	1200	1700	1700	1700	1700
			Minimum	1200	900	1200	900	1200	900	600	1350
060	0.75	1	Default	1875	1500	1625	1300	1875	1500	875	1875
			Maximum	2100	1700	2000	1600	2100	2100	2100	2100
			Minimum	1500	1200	1500	1200	1500	1200	750	1500

Airflow is controlled within 5% up to the Max ESP shown with wet coil
 Factory shipped on default CFM

Physical Data

Model	024	030	036	042	048	060
Compressor (1 Each)	Copeland UltraTech Two-Stage Scroll					
Factory Charge HFC-410a, oz	49	48	48	70	80	84
ECM Fan Motor & Blower						
Fan Motor, hp [W]	1/2 [373]	1/2 [373]	1/2 [373]	3/4 [559]	3/4 [559]	1 [746]
Blower Wheel Size (Dia x W), in [mm]	9 x 7 [229 x 178]	9 x 7 [229 x 178]	9 x 8 [229 x 203]	9 x 8 [229 x 203]	10 x 10 [254 x 254]	11 x 10 [279 x 254]
Water Connection Size						
Swivel - Residential Class	1"	1"	1"	1"	1"	1"
HWG Water Connection Size						
Swivel - Residential Class	1"	1"	1"	1"	1"	1"
Vertical Upflow						
Air Coil Dimensions (H x W), in [mm]	20 x 17.25 [508 x 438]	20 x 17.25 [508 x 438]	24 x 21.75 [610 x 552]	24 x 21.75 [610 x 552]	28.75 x 24 [730 x 610]	28.75 x 24 [730 x 610]
Standard Filter - 1" [25.4mm] Throw-away, qty (in) [mm]	20 x 20 [508 x 508]	20 x 20 [508 x 508]	24 x 24 [610 x 610]	24 x 24 [610 x 610]	28 x 28 [711 x 711]	28 x 28 [711 x 711]
Weight - Operating, lbs [kg]	216 [98.0]	224 [101.6]	245 [111.1]	260 [117.9]	315 [142.9]	330 [149.7]
Weight - Packaged, lbs [kg]	221 [100.2]	229 [103.9]	251 [113.8]	266 [120.6]	322 [146.0]	337 [152.9]
Horizontal						
Air Coil Dimensions (H x W), in [mm]	16 x 22 [406 x 559]	16 x 22 [406 x 559]	20 x 25 [508 x 635]	20 x 25 [508 x 635]	20 x 35 [508 x 889]	20 x 35 [508 x 889]
Standard Filter - 1" [25.4 mm] Pleated MERV 8 Throwaway, in [mm]	18 x 24 [457 x 610]	18 x 24 [457 x 610]	2 - 14 x 20 [356 x 508]	2 - 14 x 20 [356 x 508]	1 - 20 x 24 [508 x 610] 1 - 14 x 20 [356 x 508]	1 - 20 x 24 [508 x 610] 1 - 14 x 20 [356 x 508]
Weight - Operating, lbs [kg]	200 [90.7]	208 [94.3]	229 [103.9]	244 [110.7]	299 [135.6]	314 [142.4]
Weight - Packaged, lbs [kg]	205 [93.0]	213 [96.6]	235 [106.6]	250 [113.4]	306 [138.8]	321 [145.6]

All units have grommet compressor mountings, TXV expansion devices, and 1/2" [12.7mm] & 3/4" [19.1mm] electrical knockouts.

Electrical Data

Model	Compressor			HWG Pump FLA	Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/HACR
	RLA	LRA	Qty					
024	11.7	58.3	1	0.5	3.9	16.1	19.0	30
030	14.7	73.0	1	0.5	3.9	17.5	20.7	30
036	18.0	83.0	1	0.5	3.9	19.7	23.5	35
042	21.8	96.0	1	0.5	5.2	23.6	28.0	45
048	25.0	104.0	1	0.5	5.2	26.9	32.2	50
060	28.9	152.9	1	0.5	6.9	34.5	41.2	60

Rated Voltage of 208-230/60/1
HACR circuit breaker in USA only

Min/Max Voltage of 197/254
All fuses Class RK-5

HEV - Vertical Upflow Dimensional Data

Vertical Upflow Model		Overall Cabinet		
		A Width	B Depth	C Height
024-030	in	22.4	22.4	40.5
	cm	56.9	56.9	102.9
036-042	in	22.4	26.0	46.5
	cm	56.9	66.0	118.1
048-060	in	25.4	29.3	50.5
	cm	64.5	74.4	128.3

Vertical Upflow Model		Water Connections - Standard Units						
		1	2	3	4	5	Loop Water FPT	HWG FPT
		D Loop In	E Loop Out	Cond.	HWG In	HWG Out		
				F	G	H		
024 - 030	in	3.8	8.8	19.5	13.4	15.7	1	1
	cm	9.6	22.3	49.5	34.0	39.9	2.5	2.5
036 - 042	in	3.8	8.8	22.1	15.2	18.5	1	1
	cm	9.6	22.3	56.1	38.6	47.0	2.5	2.5
048 - 060	in	4.0	9.5	22.1	15.2	18.5	1	1
	cm	10.2	24.1	56.1	38.6	47.0	2.5	2.5

Vertical Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	Ext Pump	Power Supply
024 - 060	in	4.6	6.1	7.6
	cm	11.7	15.5	19.3

Condensate is 3/4" (1.9 cm) FPT.

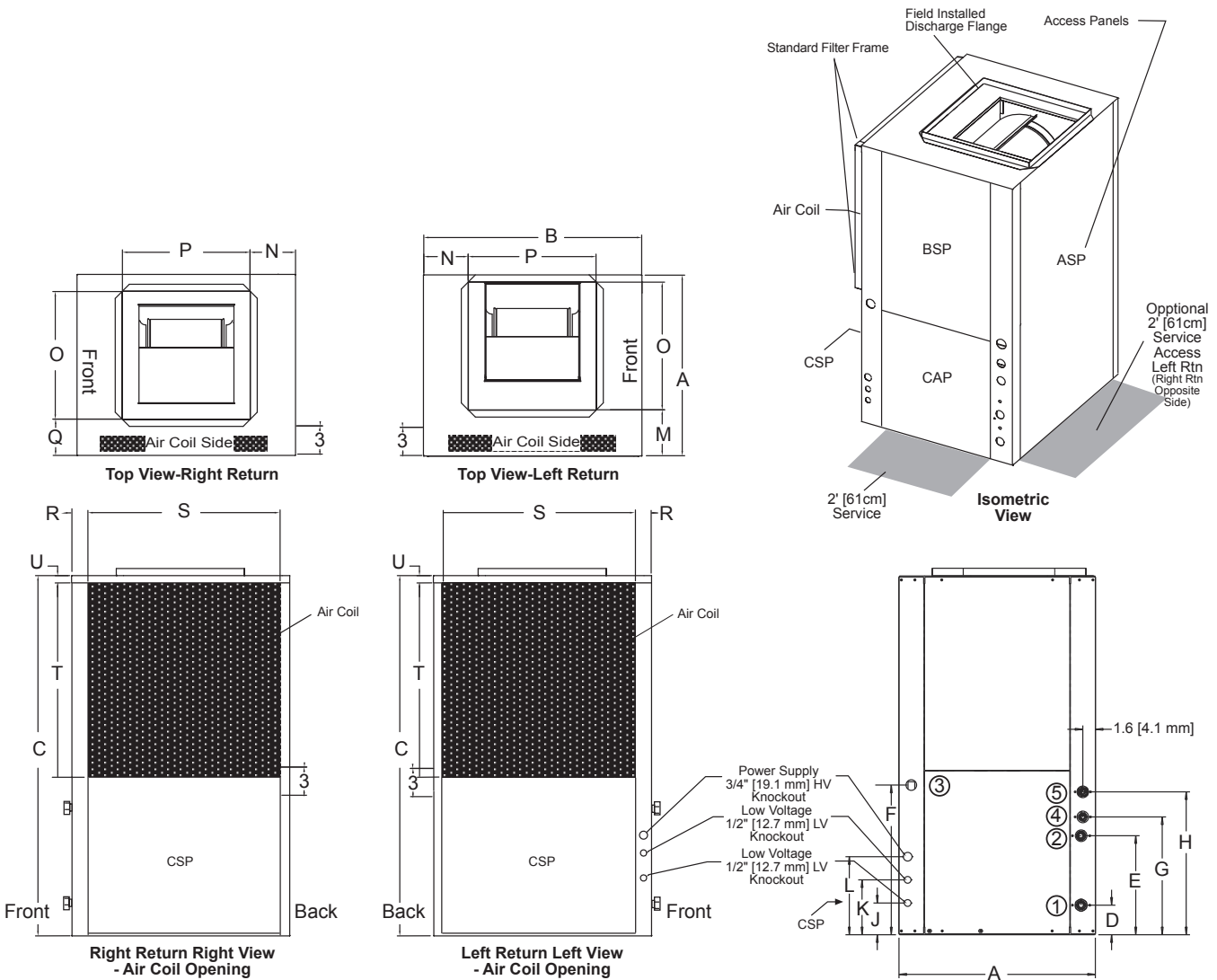
Unit shipped with deluxe duct collar/filter frame extending from unit 2" [7.6cm] and is suitable for duct connection.

Discharge flange is field installed.

HEV - Vertical Upflow Dimensional Data

Vertical Upflow Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Standard Deluxe Filter Frame (+/- 0.10 in, +/- 2.5mm)			
		M Left Return	N	O Supply Width	P Supply Depth	Q Right Return	R	S Return Depth	T Return Height	U
024 - 030	in	7.4	4.2	13.9	14.0	6.7	2.2	18.0	18.0	1.0
	cm	18.8	10.7	35.3	35.6	17.0	5.6	45.7	45.7	2.5
036 - 042	in	7.4	6.0	13.9	14.0	7.4	1.4	22.5	22.0	1.0
	cm	18.8	15.2	35.3	35.6	18.8	3.5	57.1	55.9	2.5
048 - 060	in	7.4	6.0	13.9	14.0	8.4	2.8	22.5	22.0	1.0
	cm	18.8	15.2	35.3	35.6	21.3	7.1	57.1	55.9	2.5

Auxiliary Electric Heaters mounted externally.



HEH - Horizontal Dimensional Data

Horizontal Model		Overall Cabinet		
		A Width	B Depth	C Height
024-030	in	22.5	48.3	18.2
	cm	57.1	122.9	46.2
036-042	in	22.5	53.3	21.2
	cm	57.1	135.4	53.8
048-060	in	25.4	68.0	21.2
	cm	64.5	172.7	53.8

Horizontal Model		Water Connections						
		1	2	3	4	5		
		D In	E Out	F HWG IN	G HWG Out	H Condensate	Loop Water FPT	HWG FPT
024 - 030	in	3.8	8.8	13.4	15.7	0.7	1"	1"
	cm	9.6	22.3	34.0	39.9	1.8		
036 - 042	in	3.8	8.8	15.2	18.5	0.7	1"	1"
	cm	9.6	22.3	38.6	47.0	1.8		
048 - 060	in	4.0	9.5	15.2	18.5	0.7	1"	1"
	cm	10.2	24.1	38.6	47.0	1.8		

Horizontal Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	Low Voltage	Power Supply
024 - 060	in	4.6	6.1	7.6
	cm	11.7	15.5	19.3

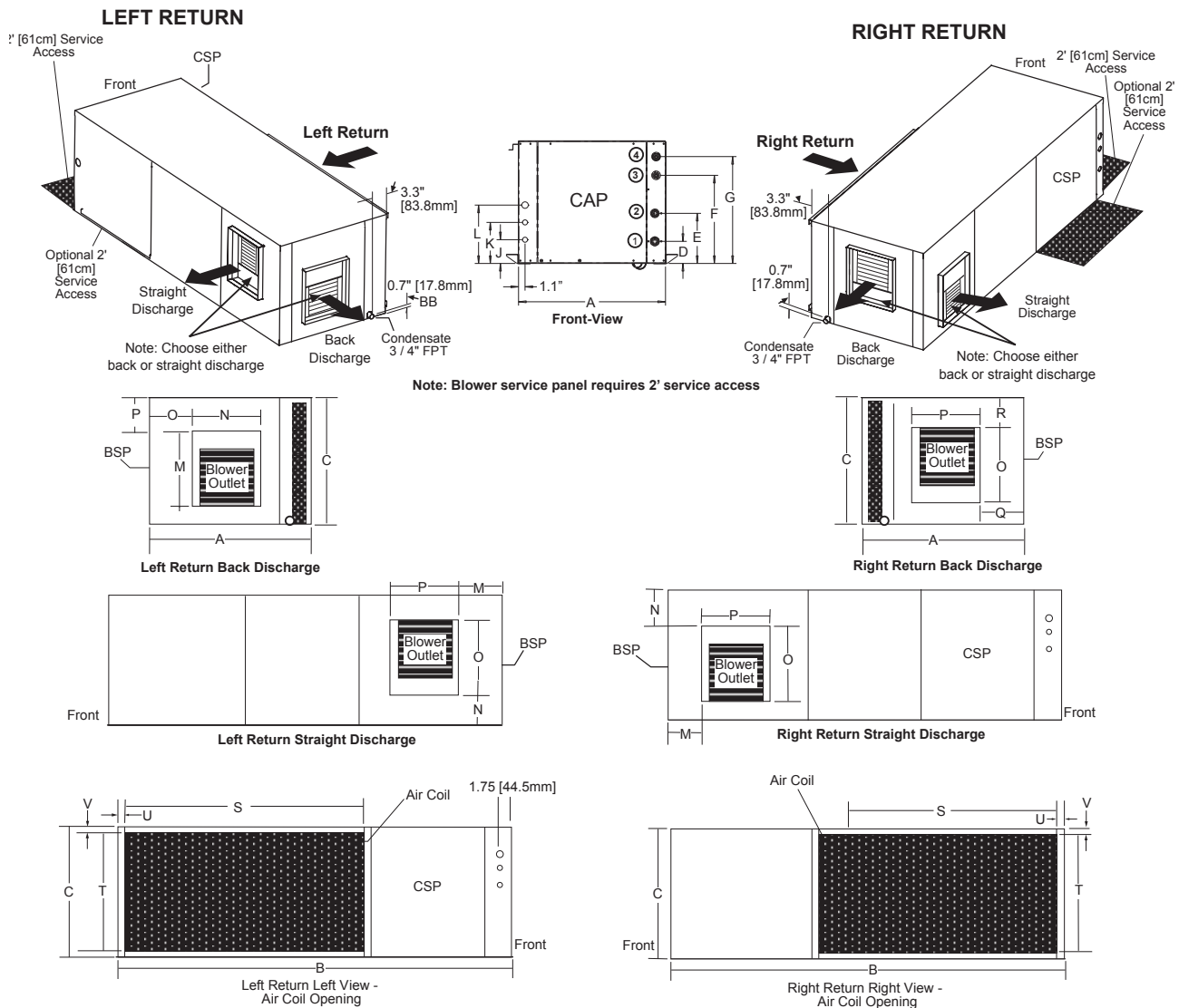
Condensate is 3/4" (1.9 cm) FPT.

Unit shipped with deluxe duct collar/filter frame extending from unit 2" [7.6cm] and is suitable for duct connection. Discharge flange and hanger brackets are factory installed.

HEH - Horizontal Dimensional Data

Horizontal Model		1Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)						Return Connection Standard Deluxe Filter Frame (+/- 0.10 in, +/- 2.5mm)			
		M	N	O Supply Height	P Supply Width	Q	R	S Return Width	T Return Height	U	V
024 - 030	in	2.6	4.8	11.9	11.9	2.6	4.8	22.6	15.8	0.8	1.0
	cm	6.6	12.2	30.2	30.2	6.6	12.2	57.4	40.1	2.0	2.5
036 - 042	in	2.1	3.4	15.4	12.4	2.1	3.4	25.7	18	0.8	1.0
	cm	5.3	8.6	39.1	31.5	5.3	8.6	65.3	45.7	2.0	2.5
048 - 060	in	2.5	1.5	18.2	15.9	2.5	1.5	36	18	0.8	1.0
	cm	6.3	3.8	46.2	40.4	6.3	3.8	91.4	45.7	2.0	2.5

1Discharge connection will change when using the accessory auxiliary electric heat package. Refer to the heater IOM for details.



Auxiliary Heat Ratings

Auxiliary Electric Heat Model	HEV/H Models			kW Rating		Btuh Rating		Minimum CFM Required
	024	030-042	048-060	240V	208V	240V	208V	
HGM5A				4.8	3.6	16300	12300	500
HGM8A				7.6	5.7	25900	19400	650
HGM10A				9.6	7.2	32700	24600	650
HGM12A				11.4	8.6	38900	29200	750
HGL10A				9.6	7.2	32700	24600	1300
HGL15A				14.4	10.8	49100	36900	1350
HGL20A				19.2	14.4	65500	49200	1350

Black area denotes compatibility

Note: Horizontal units rated for zero clearance unit and 1" clearance for the first three feet of duct,

Vertical units rated for zero clearance for both unit and duct.

Auxiliary Electric heaters are mounted externally

Auxiliary Heat Electrical Data

Auxiliary Electric Heat Model	Supply Circuit	Heater Amps		Minimum Circuit Amps		Maximum Fuse	
		240V	208V	240V	208V	240V	208V
HGM5A	Single	20.0	17.3	25.0	21.6	25	25
HGM8A	Single	31.7	27.5	39.6	34.4	40	35
HGM10A	Single	40.0	34.7	50.0	43.4	50	45
HGL10A	Single	40.0	34.7	50.0	43.4	50	45
HGM12A	Single	47.5	41.2	59.4	51.5	60	60
	Dual - L1/L2	31.7	27.5	39.6	34.4	40	35
	Dual - L3/L4	15.8	13.7	19.8	17.1	20	20
HGL15A	Single	60.0	52.0	75.0	65.0	80	70
	Dual - L1/L3	40.0	34.7	50.0	43.4	50	45
	Dual - L2/L4	20.0	17.3	25.0	21.6	25	25
HGL20A	Single	80.0	69.3	100.0	86.6	100	90
	Dual - L1/L3	40.0	34.7	50.0	43.4	50	45
	Dual - L2/L4	40.0	34.7	50.0	43.4	50	45

All heaters rated single phase 208-240V 60Hz

All models 12kW or larger feature internal circuit breakers

All Fuses UL Class K general purpose

Engineering Guide Specifications

General

The water source heating/cooling units shall be vertical upflow air discharge. Units shall be AHRI/ISO/ASHRAE 13256-1 (ground-source closed-loop) performance certified and listed by a nationally recognized safety-testing laboratory or agency. Each unit shall be water run-tested at the factory. Each unit shall be pallet mounted and shipped with appropriate protective packaging to help avoid damage in transportation.

Units shall carry a limited express warranty. Refer to the warranty card shipped with the unit for exact details and instructions on how to register the product.

The water source units shall be designed to operate with entering fluid temperature between 20°F and 120°F.

Control

The unit shall have communicating controls, allowing (1) configuration and diagnostics on the thermostat (2) monitoring key performance metrics on the thermostat and (3) a 4-wire connection between the unit and the thermostat.

Casing & Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and painted with an epoxy powder coating. The interior shall be insulated with 1/2" thick, multi-density, coated glass fiber. Insulation in the air handler section shall be foil backed for ease of cleaning. Two (vertical), one (horizontal) blower compartment and three compressor compartment access panels shall be provided and shall be removable with supply and return ductwork in place. The internal component layout shall provide for major service with the unit in-place for restricted access installations.

A duct collar (Field installed) shall be provided on the supply air opening. 1" high efficiency MERV 8 pleated filters shall be provided with each unit. Units shall have filter frames. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise, and to permit operational service testing without air bypass. Units shall be supplied with left or right air inlet.

Refrigerant Circuit

All units shall contain EarthPure® (HFC-410A) sealed refrigerant circuit employing a hermetic motor-compressor, bidirectional thermal expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger and service ports. An optional Hot Water Generator (desuperheater) coil shall be provided.

Compressors shall be Next Generation Copeland UltraTech™ Two-Stage scroll type designed for heat pump duty and mounted on vibration isolators. Compressor motors shall be single phase PSC with internal overload protection. A factory installed bidirectional filter drier shall be provided on all models. The finned tube coil shall be sized for low-face velocity and constructed of lanced aluminum fins bonded to rifled copper tubes in a staggered pattern not less than three rows deep. Entire air coil surface shall be tin plated for corrosion protection.

The coaxial water-to-refrigerant heat exchangers shall be designed for close approach temperatures and be constructed of a convoluted copper (optional cupro-nickel) inner tube and a steel outer tube. The thermal expansion valves shall provide proper superheat over the entire fluid temperature range with minimal "hunting". The valve shall operate bi-directionally without the use of check valves.

The water-to-refrigerant heat exchanger and refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures.

Fan Motor and Blower

The fan shall be a direct drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low outlet velocity operation and of galvanized steel construction. Tight fan housing geometry shall not be permitted. The fan housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the fan motor. The fan motor shall be an ECM variable speed type. The ECM fan motor shall provide soft starting, maintain constant CFM over its static operating range and provide airflow adjustment on its control board. The fan motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection.

Electrical

The control shall employ quick attach harness assemblies for low voltage connections to the control board to aid in troubleshooting or replacement. An integral terminal block with screw terminals shall be provided on the control for all field low voltage connections. A circuit breaker protected 75VA transformer shall be employed. Line voltage box lugs shall be provided for unit wiring. Units shall have knockouts for entrance of low and line voltage wiring. The fan motor and control box shall be harness plug-connected for easy removal.

Piping

Supply and return water connections, as well as Hot Water Generator (desuperheater) connections shall be 1" [2.5 cm] FPT (Female Pipe Thread) brass swivel fittings which provide a union and eliminate the need for pipe wrenches and sealants when making field connections. A thread by sweat fitting shall be provided for connection to the water heater. All water piping shall be insulated to prevent condensation at low liquid temperatures.

The condensate connection shall be a 3/4" [1.9 cm] FPT with external trap field provided.

Accessories & Options

Hot Water Generator

An optional insulated heat reclaiming desuperheater coil of vented double-wall copper construction suitable for potable water shall be provided. The coil and hot water circulating pump shall be factory mounted inside the unit. A high limit and low compressor discharge line temperature switch shall be provided to disable the pump when these conditions occur.

Cupro-Nickel Heat Exchanger

An optional corrosion resistant CuNi coaxial heat exchanger shall be factory installed in lieu of standard copper construction.

Thermostat (field installed)

A multistage auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer 3 heating and 2 cooling stages with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO fan switch, and indicating LED's shall be provided. The thermostat shall read out in °F or °C. An optional remote indoor sensor and outdoor sensor use shall be available on some models.

Auxiliary Heater (field installed)

An external, field-installed electric heater shall provide supplemental and/or emergency heating capability when used with the three stage heating thermostat. (Heater is externally mounted on horizontal and vertical units).

Design, specifications, performance data and materials subject to change without notice.

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