

HEAT CONTROLLER LLC

**ENGINEERING
DESIGN GUIDE**

**HTV/HTD/HTH Series
Two-Stage
Geothermal Heat Pumps
2 to 6 Tons**

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What's New with the HT?

High Efficiency

HT units gain an efficiency increase to approach 30 EER part load cooling and 4.8 COP part load heating for ground loop applications. Leveraging the next generation Copeland scroll compressor, variable speed ECM motor and low pressure-drop water-to-refrigerant heat exchanger, the HT has been optimized for maximum operating efficiency and lowest operating cost. The Hot-Water Generator further increases operating cost savings by pre-heating hot water for domestic use. Bottom-line, the HT is one of the highest efficiency heating and cooling systems you can buy, period.

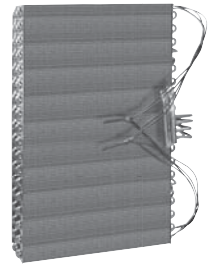
Microchannel Air Heat Exchanger – The Next Generation in Air Coils

The manufacturer is also introducing Microchannel air heat exchanger on the 036 size in the HT. Microchannel aluminum heat exchangers offer higher heating efficiency, higher reliability and have been used for years in automotive applications.



Tin Plated Air Coil

All HT models (except 036) will continue with the rugged tin plated air coils. This plating process will provide years of protection against corrosion from airborne chemicals. Studies have also shown that the air coil plating improves moisture shedding and therefore improve the unit's moisture removal capability resulting in a more comfortable home.



NEW Copeland Scroll Compressor

Utilizing the latest Copeland Scroll UltraTech™ technology, HT delivers superior comfort and efficiency by incorporating a revolutionary two-step compressor design. With a unique 67% part-load capacity step, systems with UltraTech™ maintain precise temperature levels (eliminates peaks and valleys) and lower relative humidity delivering steady comfort. It also delivers greater efficiency by running at part load most of the year saving homeowners significant operating costs. Copeland Scroll UltraTech™ is remarkably quiet at both full- and part-load capacity. While Copeland Scroll UltraTech™ builds on established scroll technology, operating with fewer moving parts, no volumetric efficiency drop-off or compression leakage. The result is unsurpassed reliability and virtually silent operation.



HT Design Features

The HT Series has abundant features and ultra high efficiency.

Application Flexibility

- Five Capacities 024, 036, 048, 060, and 070.
- Extended range operation (20-120°F EWT) and flow rates as low as 1.5 gpm per ton.
- Two-Stage upflow, downflow, and horizontal right or left return.
- Internally trapped condensate drain.
- Variable speed ECM fan motor adapts to various duct systems.
- Internal electric heat unit (optional) designed for easy field installation.
- Circuit breaker protected loop and hot water generator pumps.
- Field selectable low-temperature protection setting for GWHP or GLHP.
- Standard pre-installed 2" filter frame with 2" high performance MERV 11 pleated air filter.*

Operating Efficiencies

- Highest efficiencies in AHRI/ISO/ASHRAE/ANSI 13256-1 ratings for heating COP's, cooling EER's with low water flow rates.
- 30 EER/4.8 COP.
- Two-Stage operation for ultra high efficiencies and unsurpassed comfort.
- Optional hot water generator with internal pump generates hot water at considerable savings.
- Rugged and highly efficient next generation Copeland UltraT-ech™ II scroll compressors provide ultra high efficiencies and full capacity with reduced cycling losses.
- Oversized coaxial tube water-to-refrigerant heat exchangers operate at low liquid pressure drop. Convoluted copper (and optional cupro-nickel) water tube functions efficiently at low-flow rates and provides low-temperature-damage resistance.
- Oversized tin plated, rifled tube/lanced aluminum fin, air to refrigerant heat exchangers provide high efficiency at low face velocity.
- Large low RPM blowers with variable speed fan motors provide quiet, efficient air movement with high static capability.
- Exceeds federal requirements for 30% tax credit on installation costs.
- Exceeds ASHRAE 90.1 and Energy Star 3.0 efficiencies.

Service & Installation Advantages

- Removable panels - 3 for compressor 2 for air handling compartment.
- Low profile control box grants easy access to all internal components.
- Factory installed liquid line filter/drier.
- Brass swivel-type water connections for quick connection and elimination of wrenches or sealants during installation.
- Bi-directional thermal expansion valve.
- CXM control features status lights with memory for easy diagnostics.
- Circuit breaker protected 75VA control transformer.
- ECM control board features thermostat signal diagnostic LEDs, airflow display LED (100 CFM per flash), and simplified CFM selection.
- Insulated divider and separate air handling/compressor

compartments permit service testing without air bypass.

- Fan motors have quick attach wiring harness for fast removal.
- Internal dropout blower for easy servicing.
- High and low pressure service ports on refrigerant circuit.
- Accurate refrigerant sensing low-temperature protection.
- Solid state CXM digital compressor control features: Anti-short cycle, high & low pressure, loss of charge protection, LED fault, and status indication with memory for easy diagnostics.
- Intelligent fault retry -Condensate overflow protection.
- Air coil low temperature cut-out using high accuracy thermistor.
- 24vac accessory relays.
- Exclusive UPS (Unit Performance Sentinel) feature provides early warning of inefficient operating conditions before unit shutdown actually occurs reducing the need for emergency service work, thus letting you fix problems in the early stages. Fault types are not only indicated at the control, but are stored in memory after a user reset for future service use. Fault types can be displayed at the thermostat if equipped with fault LED or display.
- Electronic fan control module (units with ECM fan motor): Independent Heating and Cooling CFM selection, CFM display LED, Input status LEDs, and Dehumidification mode.

Factory Quality & Industry Certifications

- All units are built on our Integrated Process Control Assembly System (IPCS). The IPCS is a unique state-of-the-art manufacturing system that is designed to assure quality of the highest standards of any manufacturer in the water-source industry. Our IPCS system:
 - Verifies that the correct components are being assembled.
 - Automatically performs special leak tests on all joints.
 - Conducts pressure tests.
 - Performs highly detailed run test unparalleled in the HVAC industry.
 - Automatically disables packaging for a "failed" unit.
- All units are water run-tested in all modes to insure efficiency and reliability.
- Heavy gauge galvanized steel cabinets are epoxy powder coated for durable and long-lasting finish.
- All refrigerant brazing is done in a nitrogen atmosphere.
- All units are deep evacuated to less than 100 microns prior to refrigerant charging.
- All joints are both helium and halogen leak tested to insure annual leak rate of less than 1/4 ounce.
- Coaxial heat exchanger, refrigerant suction lines and all water lines are fully insulated to eliminate condensation problems in low temperature applications.
- Noise reduction features include: dual level compressor isolation; insulated compressor compartment; interior cabinet insulation using 1/2" coated glass fiber and variable speed fan.
- Safety features include: high pressure and loss of charge to protect the compressor, condensate overflow protection, low-temperature protection sensors to safeguard the coaxial heat exchanger and air coil, hot water high-limit, and low compressor discharge temperature switch provided to shut down the hot water generator when conditions dictate. Fault lockout enables emergency heat and prevents compressor operation until thermostat or circuit breaker has been reset.

HT Design Features

- Standard 10-year limited warranty on all parts with 5-year labor allowance; Optional additional extended 5-year limited labor allowance available.
- AHRI/ASHRAE/ANSI/ISO 13256-1 certified.
- ETL listed.
- US EPA “Energy Star” compliant.
- ISO 9001:2008 Certified.

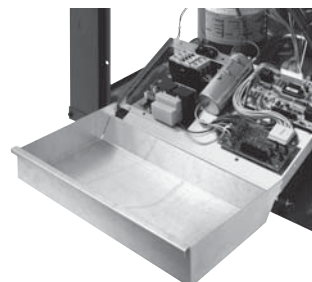
Simplified Controls

- CXM solid state control module.
- ‘CFM’ LED displays airflow.
- Dehumidification mode for higher latent cooling.

Options & Accessories

- Hot water generator with internally mounted pump.
- Cupro-nickel coaxial heat exchanger.
- Electronic thermostat.
- Closed loop flow controller.
- Electronic auto-changeover thermostat with 3-stage heat, 2-stage cool and indicator LEDs.
- Hose kits.
- Additional extended 5-year limited labor allowance.
- Internal electric heat for easy field installation.

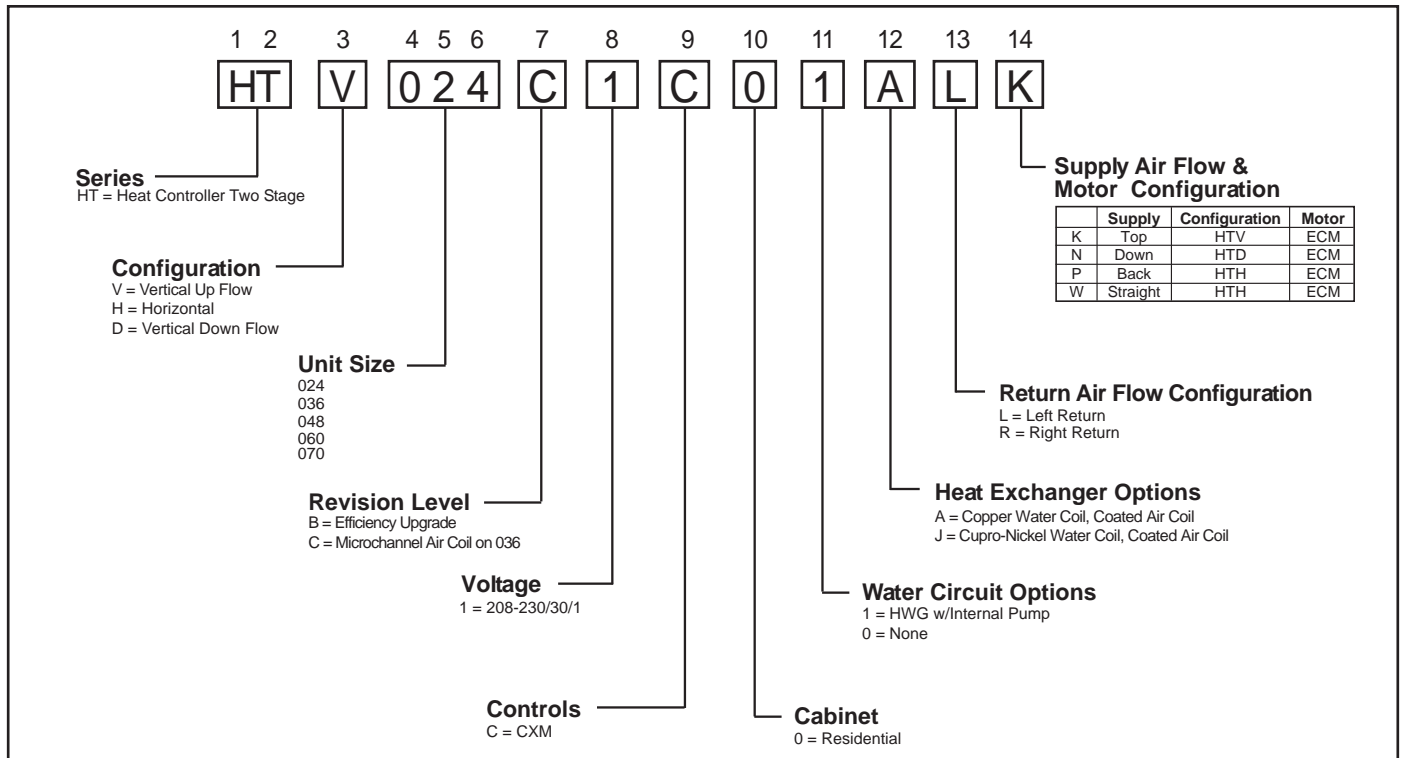
- 1 Copeland™ Ultra-Tech™ II Two-Stage Unloading Scroll Compressor
- 2 Variable speed ECM fan motor adapts to various duct systems
- 3 Tin Plated Air Coil- Long Life, Easy Cleaning and Better Condensate Runoff (Microchannel Air Coil on Size 36)
- 4 Foil Faced Insulation in the Blower Section, Fully Insulated Compressor Section
- 5 Two Inch Filter Frame With High Performance MERV 11 Pleated Air Filter*
- 6 Stainless Steel Drain Pan for Long Life
- 7 Unit Performance Sentinel: Automatic Alert System Lets You Know If The System Is Not Running At Peak Performance**
- 8 Dual Level Compressor Isolation for Ultra Quiet Operation
- 9 Five Easy, Lift-out Service Access Panels With Stainless Steel Front Panels
- 10 Internally Trapped Condensate Piping



* MERV= Minimum Efficiency Reporting Value as specified by ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) standard 52.2.

** When installed with a Manufacturer Residential Thermostat.

Unit Model Key



About AHRI/ISO/ASHRAE 13256-1

About AHRI/ISO/ASHRAE 13256-1

AHRI/ASHRAE/ISO 13256-1 (Air-Conditioning and Refrigeration Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers/ International Standards Organization) is a certification standard for water-source heat pumps used in the following applications:

- WLHP (Water Loop Heat Pump – Boiler/Tower)
- GWHP (Ground Water Heat Pump – Open Loop)
- GLHP (Ground Loop Heat Pump – Geothermal)

The directory at <http://www.ahrinet.org/> is constantly being updated and immediately available on the Internet. All ratings are submitted by the manufacturer for certification, and must be approved by AHRI. Therefore, there is a significant difference between AHRI "certified" and AHRI "rated." Thirty percent of a manufacturer's basic models must be tested each year. AHRI selects models at random from stock for testing on the basis of its evaluation of a participant's certification data.

Units that fail one or more certified test (90% of declared performance or lower) may be declared defective. If the initial failure is a performance test, the manufacturer must obsolete all units within the same basic model group or elect to have a second sample tested. If the second unit fails a performance test, it must be obsoleted, together with all units within the same basic model group. The manufacturer takes certification seriously. We were recently awarded a certificate for consecutive years of no AHRI failures.

Temperatures used in AHRI certification standards are S.I. (Système International – metric) based. For example, typical catalog data for cooling is shown at 80°F DB/67°F WB [26.7°C DB/19.4°C] entering air temperature, but the AHRI standard for cooling is 80.6°F DB/66.2°F WB [27°C DB/19°C], since it is based upon whole numbers in degrees Celsius. Water and air temperatures for the standard are shown below.

Test Condition Comparison Table

	WLHP	GWHP	GLHP
Cooling			
Entering Air Temperature - DB/WB °F [°C]	80.6/66.2 [27/19]	80.6/66.2 [27/19]	80.6/66.2 [27/19]
Entering Water Temperature - °F [°C]	86 [30]	59 [15]	77 [25]
Fluid Flow Rate	*	*	*
Heating			
Entering Air Temperature - DB/WB °F [°C]	68 [20]	68 [20]	68 [20]
Entering Water Temperature - °F [°C]	68 [20]	50 [10]	32 [0]
Fluid Flow Rate	*	*	*

*Flow rate is specified by the manufacturer

Data certified by AHRI include heating/cooling capacities, EER (Energy Efficiency Ratio – Btuh per Watt) and COP (Btuh per Btuh) at the various conditions shown above. Pump power correction is calculated to adjust efficiencies for pumping Watts. Within each model, only one water flow rate is specified for all three groups, and pumping Watts are calculated using the formula below. This additional power is added onto the existing power consumption.

• Pump power correction = $(\text{gpm} \times 0.0631) \times (\text{Press Drop} \times 2990)/300$

Fan power is corrected to zero external static pressure using the equation below. The nominal airflow is rated at a specific external static pressure. This effectively reduces the power consumption of the unit and increases cooling capacity but decreases heating capacity.

• Fan Power Correction = $(\text{cfm} \times 0.472) \times (\text{esp} \times 249)/300$

Capacities and efficiencies are calculated using the following equations:

- ISO Cooling Capacity = Cooling Capacity (Btuh) + [Fan Power Correction (Watts) × 3.412]
- ISO EER Efficiency (Btuh/W) = $\text{ISO Cooling Capacity (Btuh)} / [\text{Power Input (Watts)} - \text{Fan Power Correction (Watts)} + \text{Pump Power Correction (Watts)}]$
- ISO Heating Capacity = Heating Capacity (Btuh) – [Fan Power Correction (Watts) × 3.412]
- ISO COP Efficiency (Btuh/Btuh) = $\text{ISO Heating Capacity (Btuh)} \times 3.412 / [\text{Power Input (Watts)} - \text{Fan Power Correction (Watts)} + \text{Pump Power Correction (Watts)}]$

AHRI/ISO/ASHRAE/ANSI 13256-1 Performance

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
HT026	Part	19,100	19.6	22,100	6.5	22,000	35.3	17,700	5.3	20,900	28.0	15,300	4.6
	Full	25,300	17.7	30,400	5.7	28,700	27.3	24,800	5.0	26,300	19.9	18,900	4.0
HT036	Part	27,000	19.5	31,800	6.4	31,300	34.4	26,100	5.4	30,400	29.6	23,200	4.8
	Full	38,000	17.8	45,100	5.8	43,300	27.1	37,200	5.2	39,900	20.3	29,200	4.4
HT048	Part	36,500	19.4	43,600	6.3	42,000	34.3	35,000	5.1	40,300	27.9	30,100	4.4
	Full	48,700	17.3	59,700	5.5	55,800	26.1	48,400	4.8	50,800	19.3	37,200	4.0
HT060	Part	46,300	18.7	54,700	6.0	53,100	32.4	44,000	5.0	51,200	26.7	38,100	4.4
	Full	61,500	16.2	77,400	5.4	71,500	24.4	63,200	4.8	66,200	18.8	48,700	3.9
HT070	Part	53,000	16.8	64,600	5.2	60,800	28.6	53,200	4.5	58,100	23.2	46,000	3.9
	Full	68,300	15.1	85,300	4.8	77,700	22.5	71,400	4.4	71,700	16.9	55,800	3.7

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

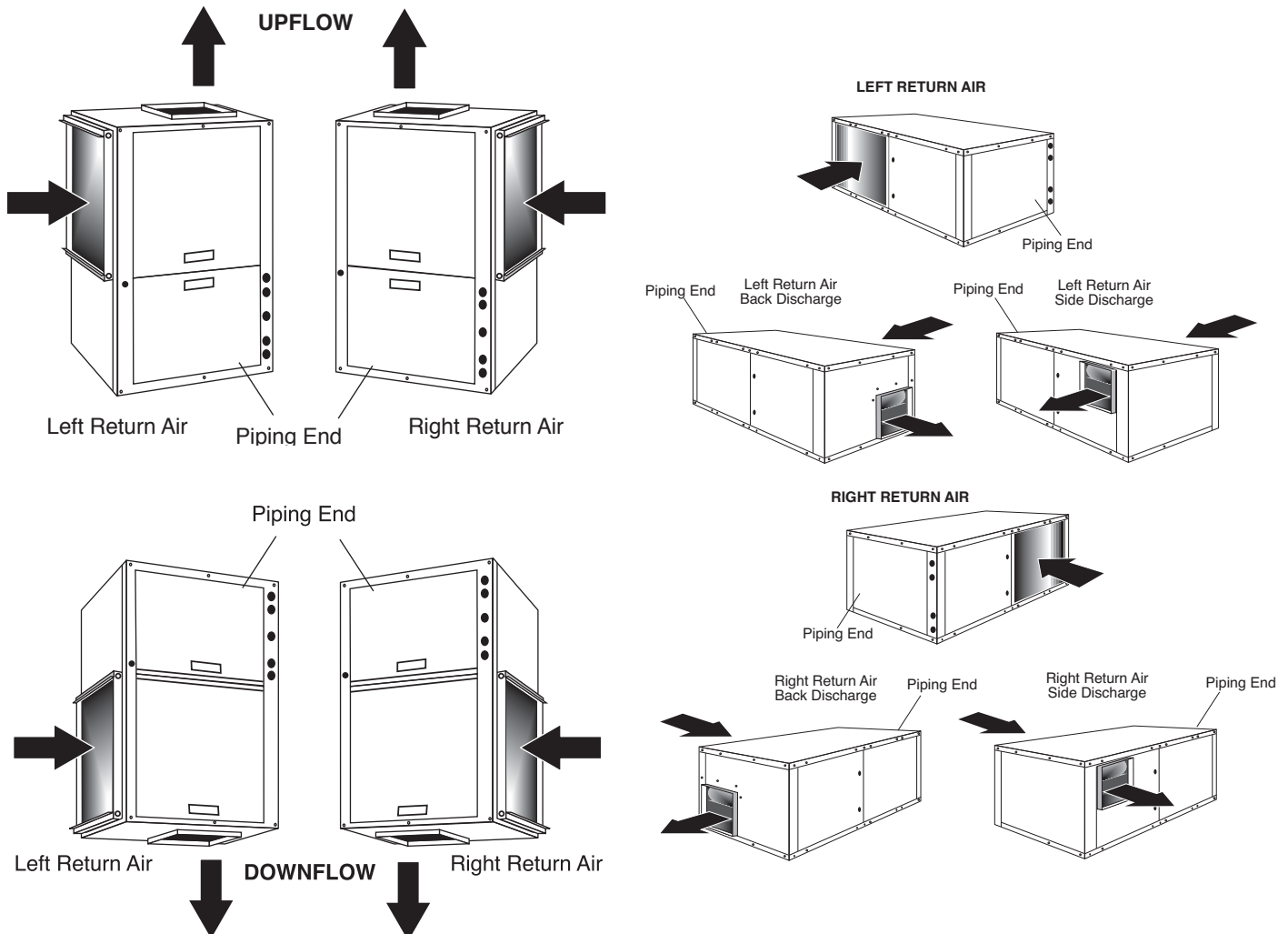
All ratings based upon operation at lower voltage of dual voltage rated models

Reference Calculations & Legend

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.

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



Full Load Correction Factors

Air Flow Correction Table

Airflow	Cooling				Heating		
	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
60%	0.925	0.788	0.913	0.922	0.946	1.153	0.896
69%	0.946	0.829	0.926	0.942	0.959	1.107	0.924
75%	0.960	0.861	0.937	0.955	0.969	1.078	0.942
81%	0.972	0.895	0.950	0.968	0.977	1.053	0.959
88%	0.983	0.930	0.965	0.979	0.985	1.032	0.974
94%	0.992	0.965	0.982	0.990	0.993	1.014	0.988
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.007	1.033	1.020	1.009	1.006	0.989	1.011
113%	1.012	1.064	1.042	1.018	1.012	0.982	1.019
119%	1.016	1.092	1.066	1.025	1.018	0.979	1.027
125%	1.018	1.116	1.091	1.032	1.022	0.977	1.033
130%	1.019	1.132	1.112	1.037	1.026	0.975	1.038

Entering Air Correction Table

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
40	1.052	0.779	1.120
45	1.043	0.808	1.102
50	1.035	0.841	1.084
55	1.027	0.877	1.065
60	1.019	0.915	1.045
65	1.010	0.957	1.023
68	1.004	0.982	1.010
70	1.000	1.000	1.000
75	0.989	1.045	0.974
80	0.976	1.093	0.946

* = 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
		60	65	70	75	80	80.6	85	90	95	100		
45	0.832	*	*	*	*	*	*	*	*	*	*	0.946	0.853
50	0.850	1.004	1.174	*	*	*	*	*	*	*	*	0.953	0.870
55	0.880	0.694	0.902	1.115	*	*	*	*	*	*	*	0.964	0.896
60	0.922		0.646	0.875	1.103	1.329	*	*	*	*	*	0.977	0.932
65	0.975			0.639	0.869	1.096	1.123	1.320	*	*	*	0.993	0.979
66.2	0.990			0.582	0.812	1.039	1.066	1.262	*	*	*	0.997	0.991
67	1.000			0.545	0.774	1.000	1.027	1.223	1.444	*	*	1.000	1.000
70	1.040				0.630	0.853	0.880	1.075	1.297	*	*	1.011	1.035
75	1.117					0.601	0.627	0.821	1.046	1.275	1.510	1.033	1.101

Part Load Correction Factors

Air Flow Correction Table

Airflow	Cooling				Heating		
	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
60%	0.920	0.781	0.959	0.927	0.946	1.241	0.881
69%	0.942	0.832	0.964	0.946	0.960	1.163	0.915
75%	0.956	0.867	0.696	0.959	0.969	1.115	0.937
81%	0.969	0.901	0.975	0.970	0.978	1.076	0.956
88%	0.981	0.934	0.982	0.981	0.986	1.043	0.973
94%	0.991	0.967	0.990	0.991	0.993	1.018	0.988
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.007	1.033	1.011	1.008	1.006	0.990	1.010
113%	1.013	1.065	1.023	1.015	1.012	0.986	1.017
119%	1.018	1.098	1.036	1.021	1.017	0.983	1.024
125%	1.021	1.131	1.051	1.026	1.021	0.981	1.030
130%	1.023	1.159	1.063	1.030	1.024	0.979	1.034

Entering Air Correction Table

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
40	1.084	0.732	1.161
45	1.073	0.764	1.140
50	1.060	0.802	1.117
55	1.046	0.846	1.090
60	1.031	0.893	1.061
65	1.016	0.945	1.031
68	1.006	0.978	1.013
70	1.000	1.000	1.000
75	0.984	1.058	0.968
80	0.968	1.117	0.936

* = 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
		60	65	70	75	80	80.6	85	90	95	100		
45	0.876	*	*	*	*	*	*	*	*	*	*	0.981	0.895
50	0.883	1.002	1.099	*	*	*	*	*	*	*	*	0.985	0.901
55	0.903	0.706	0.871	1.060	*	*	*	*	*	*	*	0.989	0.918
60	0.935		0.617	0.844	1.079	*	*	*	*	*	*	0.993	0.945
65	0.979			0.595	0.849	1.098	1.128	*	*	*	*	0.998	0.982
66.2	0.991			0.531	0.789	1.040	1.070	1.284	*	*	*	0.999	0.993
67	1.000			0.486	0.747	1.000	1.030	1.245	*	*	*	1.000	1.000
70	1.035				0.583	0.842	0.873	1.090	1.327	*	*	1.003	1.030
75	1.105					0.552	0.584	0.811	1.057	1.290	*	1.008	1.088

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). Otherwise, appropriate levels of a proper anti-freeze 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 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.

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

$$TD = 22,500 / (1.5 \times 500)$$

$$TD = 10^\circ F$$

$$LWT = EWT - TD$$

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

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).

Performance capacities shown in thousands of Btuh

Heating - EAT 70°F							
HWC	Airflow CFM	HC	kW	HE	LAT	COP	HWC
2	1850	44.6	4.82	28.8	92.3	2.7	4.9
	2100	45.3	4.67	29.6	90.0	2.8	5.0
.0	1850	49.0	4.89	32.8	94.5	2.9	5.8
	2100	49.7	4.74	33.7	91.9	3.1	5.9
.3	1850	51.1	4.94	34.8	95.6	3.0	5.8
	2100	51.9	4.78	35.7	92.9	3.2	5.9
.5	1850	52.3	4.96	35.8	96.2	3.1	5.8
	2100	53.1	4.81	36.8	93.4	3.2	5.9
.1	1850	56.8	5.06	40.0	98.4	3.3	6.6
	2100	57.7	4.90	41.1	95.4	3.4	6.7
.9	1850	59.7	5.13	42.7	99.9	3.4	6.6
	2100	60.6	4.97	43.8	96.7	3.6	6.7
.0	1850	61.4	5.17	44.2	100.7	3.5	6.6
	2100	62.3	5.01	45.3	97.5	3.6	6.7
3.6	1850	65.5	5.27	47.9	102.8	3.6	7.4
	2100	66.5	5.11	49.1	99.3	3.8	7.6
3.7	1850	69.3	5.37	51.3	104.7	3.8	7.7
	2100	70.3	5.21	52.7	101.0	4.0	7.8
3.9	1850	71.4	5.43	53.2	105.7	3.9	7.9
	2100	72.5	5.26	54.6	102.0	4.1	8.0
4.0	1850	74.7	5.52	56.1	107.4	3.9	8.0
	2100	75.8	5.35	57.6	103.7	4.1	8.1

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

Performance Data — HT 024 - Part Load

725 CFM Nominal (ISO Rated) Airflow Cooling, 825 CFM Nominal (ISO Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

Table with columns for EWT °F, GPM, WPD (PSI, FT), CFM, TC, SC, kW, EER, HR, LWT, HWC for Cooling - EAT 80/67°F and Heating - EAT 70°F. Includes rows for EWT values from 20 to 120.

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. AHR/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating. Table does not reflect fan or pump power corrections for AHR/ISO conditions. All performance is based upon the lower voltage of dual voltage rated units.

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. For operation in the shaded areas, please see the Performance Data Selection Notes.

Performance Data — HT 024 - Full Load

850 CFM Nominal (ISO Rated) Airflow Cooling, 950 CFM Nominal (ISO Rated) Airflow Heating

Performance capacities shown in thousands of Btu/h

EWT °F	Cooling - EAT 80/67°F										Heating - EAT 70°F																																																											
	GPM	WPD		CFM	TC	SC	KW	EER	HR	LWT	HWC	GPM	WPD		CFM	HC	KW	COP	HE	LAT	LWT	HWC																																																
		PSI	FT										PSI	FT																																																								
20	Operation not recommended										6.0	3.7	8.6	820	16.4	1.49	3.2	11.3	88.5	16.2	1.6	6.0	3.7	8.6	950	16.6	1.44	3.4	11.7	86.2	3.9	1.5																																						
	30	3.0	1.1	2.5	850	30.7	21.8	0.98	31.3	34.0	22.7	0.8	3.0	1.1	2.5	950	18.1	1.47	3.6	13.1	87.6	8.7	1.8	4.5	2.0	4.6	820	18.6	1.53	3.6	13.4	91.0	24.1	1.9	4.5	2.0	4.6	850	30.7	21.7	0.92	33.6	33.9	15.1	0.7	6.0	3.1	7.1	730	30.1	20.1	0.86	35.2	33.0	11.2	0.6	6.0	3.1	7.1	950	19.3	1.49	3.8	14.2	88.8	4.7	1.9			
40		3.0	0.9	2.0	850	30.1	21.6	1.08	27.9	33.8	22.5	1.1	3.0	0.9	2.0	950	20.7	1.51	4.0	15.5	90.1	10.3	2.1	4.5	1.6	3.8	820	21.3	1.57	4.0	16.0	94.1	32.9	2.3	4.5	1.6	3.8	850	30.6	21.8	1.00	30.5	34.0	15.1	0.9	6.0	2.6	6.0	730	30.2	20.2	0.93	32.3	33.4	11.3	0.8	6.0	2.6	6.0	950	22.2	1.53	4.2	17.0	91.6	5.7	2.3			
		50	3.0	0.7	1.6	850	29.2	21.2	1.20	24.4	33.3	22.2	1.5	3.0	0.7	1.6	950	23.4	1.55	4.4	18.1	92.8	12.1	2.5	4.5	1.4	3.2	820	24.3	1.62	4.4	18.7	97.4	41.7	2.7	4.5	1.4	3.2	850	29.9	21.5	1.11	27.0	33.7	15.0	1.2	6.0	2.3	5.2	730	29.7	20.1	1.03	28.9	33.2	11.3	1.0	6.0	2.3	5.2	950	25.3	1.59	4.7	19.9	94.7	6.6	2.7		
			60	3.0	0.7	1.5	850	28.0	20.7	1.33	21.1	32.5	21.7	1.9	3.0	0.7	1.5	950	26.3	1.60	4.8	20.8	95.6	13.9	2.8	4.5	1.3	2.9	820	27.3	1.68	4.8	21.6	100.8	50.4	3.1	4.5	1.3	2.9	850	28.9	21.1	1.23	23.5	33.1	14.7	1.6	6.0	2.0	4.7	730	28.8	19.8	1.14	25.3	32.7	11.1	1.4	6.0	2.0	4.7	950	28.5	1.64	5.1	22.9	97.8	7.6	3.1	
				70	3.0	0.6	1.5	850	26.6	20.1	1.47	18.0	31.6	21.1	2.4	3.0	0.6	1.5	950	29.2	1.65	5.2	23.6	98.5	15.7	3.2	4.5	1.2	2.7	820	30.4	1.73	5.1	24.4	104.3	59.1	3.5	4.5	1.2	2.7	850	27.6	20.5	1.37	20.2	32.3	14.3	2.0	6.0	1.9	4.4	730	27.6	19.3	1.27	21.8	32.0	10.9	1.8	6.0	1.9	4.4	950	31.2	1.75	5.2	25.3	105.3	61.6	3.6
					80	3.0	0.7	1.5	850	25.0	19.4	1.64	15.3	30.6	20.4	3.0	3.0	0.7	1.5	950	32.1	1.70	5.5	26.3	101.3	17.5	3.5	4.5	1.2	2.7	820	33.4	1.79	5.5	27.3	107.7	67.9	3.8	4.5	1.2	2.7	850	26.1	19.9	1.52	17.2	31.3	13.9	2.6	6.0	1.8	4.2	730	26.2	18.7	1.41	18.5	31.0	10.6	2.3	6.0	1.8	4.2	950	34.9	1.76	5.8	28.9	104.0	9.6
	90					3.0	0.7	1.6	850	23.0	17.4	1.76	13.1	29.0	19.8	3.6	3.0	0.7	1.6	950	34.4	1.81	5.6	28.2	108.9	71.2	3.9	4.5	1.2	2.7	820	36.3	1.86	5.7	30.0	111.0	76.7	4.2	4.5	1.2	2.7	850	24.5	19.2	1.70	14.5	30.3	13.5	3.3	6.0	1.8	4.1	730	24.6	18.0	1.58	15.6	30.0	10.2	3.0	6.0	1.8	4.1	950	37.3	1.88	5.8	30.9	112.1	79.7
100						3.0	0.7	1.6	850	21.5	16.9	1.95	11.0	28.1	19.2	4.4	3.0	0.7	1.6	950	35.0	1.76	5.8	29.0	104.1	19.3	3.8	4.5	1.2	2.7	820	37.9	1.82	6.1	31.6	106.9	10.5	4.2	4.5	1.2	2.7	850	22.5	17.2	1.82	12.3	28.7	13.0	3.9	6.0	1.8	4.1	730	23.0	17.4	1.76	13.1	29.0	9.9	3.7	6.0	1.8	4.1	950	37.9	1.82	6.1	31.6	106.9	10.5
		110				3.0	0.7	1.5	850	20.0	16.4	2.17	9.2	27.4	18.7	5.3	Operation not recommended																																																					
			120			3.0	0.7	1.5	850	20.3	17.7	2.25	9.0	28.0	18.7	5.4																																																						
				120		4.5	1.1	2.6	850	21.3	17.9	2.10	10.1	28.5	12.6	4.8																																																						
					120	4.5	1.0	2.4	850	19.8	17.5	2.34	8.5	27.8	12.3	5.8																																																						
	120					6.0	1.7	3.9	850	20.2	17.6	2.26	8.9	28.0	9.3	5.5																																																						
120						6.0	1.7	3.9	850	20.2	17.6	2.26	8.9	28.0	9.3	5.5																																																						

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.
 AHR/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
 Table does not reflect fan or pump power corrections for AHR/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.

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.
 For operation in the shaded areas, please see the Performance Data Selection Notes.

Performance Data — HT 060 - Full Load

1825 CFM Nominal (ISO Rated) Airflow Cooling, 2050 CFM Nominal (ISO Rated) Airflow Heating Performance capacities shown in thousands of Btuh

EWT °F	Cooling - EAT 80/67°F										Heating - EAT 70°F																						
	GPM	WPD		CFM	TC	SC	KW	EER	HR	LWT	HWC	GPM	WPD		CFM	HC	KW	COP	HE	LAT	LWT	HWC											
		PSI	FT										PSI	FT																			
20	Operation not recommended										15.0	7.3	16.8	1750	42.8	3.89	3.2	29.5	92.6	16.1	4.0	15.0	7.3	16.8	2050	43.4	3.77	3.4	30.6	89.6	4.1	3.8	
	30	7.5	1.7	3.9	1590	75.3	49.7	2.68	28.1	84.4	22.9	1.9	7.5	1.7	3.9	1750	46.9	3.95	3.5	33.4	94.8	21.1	4.1	7.5	1.7	3.9	2050	47.6	3.82	3.6	34.5	91.5	9.2
11.3		3.7	8.6	1590	74.9	50.3	2.57	29.1	83.6	15.2	1.8	11.3	3.7	8.6	1750	49.1	3.98	3.6	35.6	96.0	23.7	4.2	11.3	3.7	8.6	2050	49.9	3.86	3.8	36.7	92.5	6.5	4.1
15.0		6.1	14.1	1590	74.2	50.5	2.53	29.3	82.9	11.3	1.8	15.0	6.1	14.1	1750	50.4	4.00	3.7	36.7	96.7	25.1	4.2	15.0	6.1	14.1	2050	51.2	3.88	3.9	37.9	93.1	5.1	4.1
15.0		6.1	14.1	1850	75.5	54.3	2.62	28.8	84.5	11.3	1.8	15.0	6.1	14.1	1850	75.5	54.3	2.62	28.8	84.5	11.3	1.8	15.0	6.1	14.1	1850	75.5	54.3	2.62	28.8	84.5	11.3	1.8
40		7.5	1.2	2.7	1590	74.4	48.8	2.86	26.0	84.2	22.9	2.3	7.5	1.2	2.7	1750	53.9	4.06	3.9	40.0	98.5	29.3	4.4	7.5	1.2	2.7	2050	54.7	3.94	4.1	41.3	94.7	11.0
	11.3	3.0	7.0	1590	75.2	49.5	2.72	27.6	84.5	15.3	2.0	11.3	3.0	7.0	1750	56.7	4.12	4.0	42.7	100.0	32.4	4.5	11.3	3.0	7.0	2050	57.6	3.99	4.2	44.0	96.0	7.8	4.4
	15.0	5.3	12.2	1590	75.3	49.8	2.66	28.3	84.3	11.5	1.9	15.0	5.3	12.2	1750	58.3	4.15	4.1	44.1	100.8	34.1	4.6	15.0	5.3	12.2	2050	59.2	4.02	4.3	45.5	96.7	6.1	4.4
	15.0	5.3	12.2	1850	76.6	53.6	2.76	27.8	86.0	11.5	1.9	15.0	5.3	12.2	1850	76.6	53.6	2.76	27.8	86.0	11.5	1.9	15.0	5.3	12.2	1850	76.6	53.6	2.76	27.8	86.0	11.5	1.9
	50	7.5	0.9	2.0	1590	72.4	47.8	3.08	23.5	82.9	22.5	2.8	7.5	0.9	2.0	1750	61.1	4.21	4.3	46.8	102.4	37.5	4.7	7.5	0.9	2.0	2050	62.1	4.08	4.5	48.2	98.0	12.8
11.3		2.6	6.0	1590	74.0	48.6	2.91	25.4	84.0	15.2	2.4	11.3	2.6	6.0	1750	64.5	4.28	4.4	49.9	104.1	41.1	4.9	11.3	2.6	6.0	2050	65.5	4.15	4.6	51.3	99.6	9.1	4.7
15.0		4.7	10.8	1590	74.6	48.9	2.83	26.3	84.3	11.5	2.2	15.0	4.7	10.8	1750	66.3	4.32	4.5	51.6	105.1	43.1	5.0	15.0	4.7	10.8	2050	67.3	4.19	4.7	53.0	100.4	7.1	4.8
15.0		4.7	10.8	1850	75.9	52.6	2.94	25.9	85.9	11.5	2.3	15.0	4.7	10.8	1850	75.9	52.6	2.94	25.9	85.9	11.5	2.3	15.0	4.7	10.8	1850	75.9	52.6	2.94	25.9	85.9	11.5	2.3
60		7.5	0.7	1.7	1590	69.5	46.7	3.35	20.7	81.0	22.0	3.5	7.5	0.7	1.7	1750	68.5	4.37	4.6	53.6	106.2	45.7	5.1	7.5	0.7	1.7	2050	69.5	4.24	4.8	55.1	101.4	14.7
	11.3	2.4	5.4	1590	71.7	47.6	3.15	22.8	82.5	15.0	3.0	11.3	2.4	5.4	1750	72.3	4.46	4.7	57.1	108.3	49.9	5.3	11.3	2.4	5.4	2050	73.4	4.33	5.0	58.6	103.2	10.4	5.2
	15.0	4.3	10.0	1590	72.7	48.0	3.05	23.8	83.1	11.3	2.8	15.0	4.3	10.0	1750	74.4	4.52	4.8	59.0	109.4	52.1	5.5	15.0	4.3	10.0	2050	75.5	4.38	5.1	60.6	104.1	8.1	5.3
	15.0	4.3	10.0	1850	74.0	51.6	3.16	23.4	84.8	11.3	2.8	15.0	4.3	10.0	1850	74.0	51.6	3.16	23.4	84.8	11.3	2.8	15.0	4.3	10.0	1850	74.0	51.6	3.16	23.4	84.8	11.3	2.8
	70	7.5	0.7	1.7	1590	66.1	45.5	3.67	18.0	78.7	21.4	4.4	7.5	0.7	1.7	1750	75.8	4.55	4.9	60.3	110.1	53.9	5.6	7.5	0.7	1.7	2050	77.0	4.41	5.1	61.9	104.8	16.5
11.3		2.3	5.2	1590	68.6	46.4	3.43	20.0	80.4	14.6	3.8	11.3	2.3	5.2	1750	80.1	4.67	5.0	64.2	112.4	58.6	5.8	11.3	2.3	5.2	2050	81.3	4.52	5.3	65.9	106.7	11.7	5.7
15.0		4.1	9.5	1590	69.9	46.9	3.32	21.0	81.2	11.0	3.5	15.0	4.1	9.5	1750	82.4	4.73	5.1	66.3	113.6	61.2	6.0	15.0	4.1	9.5	2050	83.7	4.59	5.3	68.0	107.8	9.1	5.8
15.0		4.1	9.5	1850	71.1	50.4	3.44	20.6	82.8	11.0	3.5	15.0	4.1	9.5	1850	71.1	50.4	3.44	20.6	82.8	11.0	3.5	15.0	4.1	9.5	1850	71.1	50.4	3.44	20.6	82.8	11.0	3.5
80		7.5	0.8	1.8	1590	62.5	44.1	4.05	15.4	76.3	20.8	5.5	7.5	0.8	1.8	1750	83.1	4.75	5.1	66.9	114.0	62.2	6.1	7.5	0.8	1.8	2050	84.4	4.61	5.4	68.7	108.1	18.3
	11.3	2.2	5.2	1590	65.1	45.1	3.78	17.2	78.0	14.1	4.7	11.3	2.2	5.2	1750	87.8	4.89	5.3	71.1	116.4	67.4	6.4	11.3	2.2	5.2	2050	89.1	4.74	5.5	73.0	110.3	13.0	6.2
	15.0	4.1	9.4	1590	66.4	45.6	3.65	18.2	78.8	10.7	4.3	15.0	4.1	9.4	1750	90.3	4.97	5.3	73.4	117.8	70.2	6.6	15.0	4.1	9.4	2050	91.7	4.81	5.6	75.3	111.4	10.0	6.4
	15.0	4.1	9.4	1850	67.5	49.0	3.78	17.9	80.4	10.7	4.4	15.0	4.1	9.4	1850	67.5	49.0	3.78	17.9	80.4	10.7	4.4	15.0	4.1	9.4	1850	67.5	49.0	3.78	17.9	80.4	10.7	4.4
	90	7.5	0.8	2.0	1590	58.7	42.6	4.49	13.1	74.0	20.2	6.7	7.5	0.8	2.0	1750	90.3	4.97	5.3	73.3	117.8	70.4	6.6	7.5	0.8	2.0	2050	91.7	4.81	5.6	75.2	111.4	20.1
11.3		2.3	5.2	1590	61.3	43.7	4.18	14.7	75.5	13.7	5.8	11.3	2.3	5.2	1750	95.2	5.12	5.4	77.8	120.4	76.2	7.1	11.3	2.3	5.2	2050	96.7	4.96	5.7	79.7	113.7	14.2	6.9
15.0		4.0	9.3	1590	62.6	44.2	4.03	15.5	76.4	10.4	5.4	15.0	4.0	9.3	1750	97.9	5.21	5.5	80.1	121.8	79.3	7.3	15.0	4.0	9.3	2050	99.4	5.05	5.8	82.1	114.9	11.0	7.1
15.0		4.0	9.3	1850	63.7	47.5	4.18	15.2	77.9	10.4	5.5	15.0	4.0	9.3	1850	63.7	47.5	4.18	15.2	77.9	10.4	5.5	15.0	4.0	9.3	1850	63.7	47.5	4.18	15.2	77.9	10.4	5.5
100		7.5	0.9	2.0	1590	55.2	41.1	5.00	11.0	72.3	19.7	8.1	Operation not recommended																				
	11.3	2.3	5.2	1590	57.5	42.1	4.65	12.4	73.4	13.3	7.1	Operation not recommended																					
	15.0	4.0	9.3	1590	58.8	42.6	4.48	13.1	74.1	10.1	6.7	Operation not recommended																					
	15.0	4.0	9.3	1850	59.8	45.9	4.65	12.9	75.6	10.1	6.8	Operation not recommended																					
	110	7.5	0.8	1.8	1590	52.2	39.6	5.60	9.3	71.3	19.4	9.8	Operation not recommended																				
11.3		2.2	5.1	1590	54.1	40.6	5.20	10.4	71.8	13.1	8.7	Operation not recommended																					
15.0		4.0	9.2	1590	55.2	41.1	5.01	11.0	72.3	9.8	8.2	Operation not recommended																					
15.0		4.0	9.2	1850	56.1	44.2	5.19	10.8	73.8	9.8	8.3	Operation not recommended																					
120		7.5	0.6	1.3	1590	50.0	38.5	6.30	7.9	71.5	19.5	11.7	Operation not recommended																				
	11.3	2.0	4.7	1590	51.3	39.2	5.83	8.8	71.2	12.9	10.4	Operation not recommended																					
	15.0	3.8	8.8	1590	52.1	39.6	5.62	9.3	71.3	9.7	9.8	Operation not recommended																					
	15.0	3.8	8.8	1850	53.0	42.6	5.82	9.1	72.9	9.7	10.0	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.
 AHR/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F DB in heating.
 Table does not reflect fan or pump power corrections for AHR/ISO conditions.
 All performance is based upon the lower voltage of dual voltage rated units.

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.
 For operation in the shaded areas, please see the Performance Data Selection Notes.

Physical Data

Model	024	036	048	060	070
Compressor (1 Each)	Copeland UltraTech II Two-Stage Scroll				
Factory Charge HFC-410a, oz [kg]	60 [1.70]	64 [1.81]	81 [2.30]	142 [4.02]	140 [4.00]
ECM Fan Motor & Blower Wheel					
Fan Motor Type & Speeds	ECM Variable Speed				
Fan Motor, hp [W]	1/2 [373]	1/2 [373]	1 [746]	1 [746]	1 [746]
Blower Wheel Size (Dia x W), in [mm]	9 x 7 [229 x 178]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]
Water Connection Size					
Swivel - Residential Class	1"	1"	1"	1"	1"
HWG Water Connection Size					
Swivel - Residential Class	1"	1"	1"	1"	1"
Vertical Upflow/Downflow					
Air Coil Dimensions (H x W), in [mm]	28 x 20 [711 x 542]	28 x 25 [711 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]	36 x 25 [914 x 635]
Standard Filter - 2" [51mm] Pleated MERV11 Throwaway, in [mm]	28 x 24 [712 x 610]	28 x 29.5 [712 x 749]	32 x 29.5 [813 x 749]	36 x 29.5 [914 x 749]	36 x 29.5 [914 x 749]
Weight - Operating, lbs [kg]	298 [135.2]	359 [162.8]	448 [203.2]	475 [215.5]	475 [215.5]
Weight - Packaged, lbs [kg]	308 [140]	369 [167]	458 [208]	485 [220]	485 [220]
Horizontal					
Air Coil Dimensions (H x W), in [mm]	18 x 31 [457 x 787]	20 x 35 [508 x 889]	20 x 40 [508 x 1018]	20 x 45 [508 x 1143]	20 x 45 [508 x 1143]
Standard Filter - 2" [51mm] Pleated MERV11 Throwaway, in [mm]	2 - 18 x 18 [457 x 457]	1 - 12 x 20 [305 x 508] 1 - 20 x 25 [508 x 635]	1 - 18 x 20 [457 x 508] 1 - 20 x 24 [508 x 610]	2 - 20 x 24 [508 x 610]	2 - 20 x 24 [508 x 610]
Weight - Operating, lbs [kg]	298 [135.2]	335 [152.0]	448 [203.2]	475 [215.5]	475 [215.5]
Weight - Packaged, lbs [kg]	308 [140]	345 [156.5]	458 [208]	485 [220]	485 [220]

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

Dimensions — Vertical Upflow HT

Vertical Upflow Model		Overall Cabinet		
		A Width	B Depth	C Height
024	in	22.4	25.6	48.5
	cm	56.8	65.1	123.2
036	in	25.4	30.6	50.5
	cm	64.5	77.8	128.3
048	in	25.4	30.6	54.5
	cm	64.5	77.8	138.4
060	in	25.4	30.6	58.5
	cm	64.5	77.8	148.6
070	in	25.4	30.6	58.5
	cm	64.5	77.8	148.6

Vertical Upflow 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	in	2.1	10.0	13.9	16.9	7.8	1"	1"
	cm	5.2	25.4	35.2	42.9	19.8	Swivel	Swivel
036	in	3.4	10.8	15.6	18.9	7.8	1"	1"
	cm	8.6	27.5	39.7	47.9	19.8	Swivel	Swivel
048	in	3.4	10.8	15.6	18.9	7.8	1"	1"
	cm	8.6	27.5	39.7	47.9	19.8	Swivel	Swivel
060	in	3.4	10.8	15.6	18.9	7.8	1"	1"
	cm	8.6	27.5	39.7	47.9	19.8	Swivel	Swivel
070	in	3.4	10.8	15.6	18.9	7.8	1"	1"
	cm	8.6	27.5	39.7	47.9	19.7	Swivel	Swivel

Vertical Upflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
024	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
036	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
048	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
060	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
070	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9

Condensate is 3/4" PVC female glue socket and is switchable from front to side.

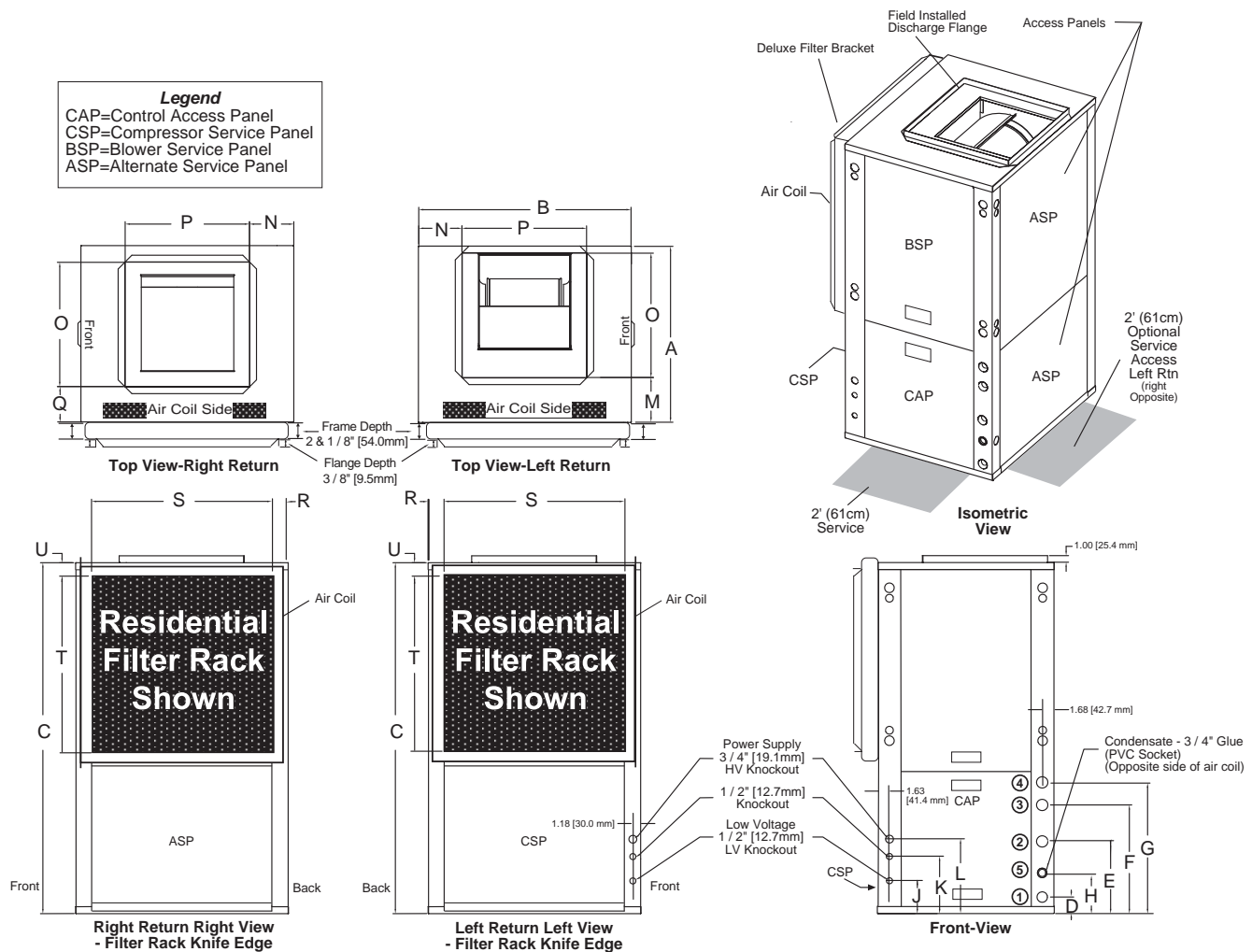
Unit shipped with deluxe duct collar/filter rack extending from unit 3" [7.6cm] and is suitable for duct connection.

Discharge flange is field installed.

Dimensions — Vertical Upflow HT

Vertical Upflow Model		Discharge Connection Duct Flange Installed (+/- 0.20 in, +/- 5.1mm)					Return Connection Standard Deluxe Filter Rack (+/- 0.20 in, +/- 5.1mm)			
		M Left Return	N	O Supply Width	P Supply Depth	Q Right Return	R	S Return Depth	T Return Height	U
024	in cm	7.8 18.3	5.8 14.8	14.0 35.6	14.0 35.6	4.9 12.4	1.7 4.3	22.2 56.4	26.2 66.5	1.7 4.3
036	in cm	6.4 16.1	6.3 16.0	18.0 45.7	18.0 45.7	5.3 13.5	1.7 4.3	27.2 69.1	26.2 66.5	1.7 4.3
048	in cm	6.4 16.1	6.3 16.0	18.0 45.7	18.0 45.7	5.3 13.5	1.7 4.3	27.2 69.1	30.2 76.7	1.7 4.3
060	in cm	6.4 16.1	6.3 16.0	18.0 45.7	18.0 45.7	5.3 13.5	1.7 4.3	27.2 69.1	34.2 86.9	1.7 4.3
070	in cm	6.4 16.1	6.3 16.0	18.0 45.7	18.0 45.7	5.3 13.5	1.7 4.3	27.2 69.1	34.2 86.9	1.7 4.3

Legend
 CAP=Control Access Panel
 CSP=Compressor Service Panel
 BSP=Blower Service Panel
 ASP=Alternate Service Panel



Rev.: 08/9/12B

Dimensions — Vertical Downflow HT

Vertical Downflow Model		Overall Cabinet		
		A Width	B Depth	C Height
024	in	22.4	25.6	52.5
	cm	56.8	65.1	133.4
036	in	25.4	30.6	54.5
	cm	64.5	77.8	138.4
048	in	25.4	30.6	58.5
	cm	64.5	77.8	148.6
060	in	25.4	30.6	62.5
	cm	64.5	77.8	158.8
070	in	25.4	30.6	62.5
	cm	64.5	77.8	158.8

Vertical Downflow 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	in	17.2	9.3	5.4	2.4	3.6	1"	1"
	cm	43.7	23.6	13.7	6.1	9.2	Swivel	Swivel
036	in	17.9	10.5	5.7	2.4	3.6	1"	1"
	cm	45.5	26.7	14.5	6.1	9.2	Swivel	Swivel
048	in	17.9	10.5	5.7	2.4	3.6	1"	1"
	cm	45.5	26.7	14.5	6.1	9.2	Swivel	Swivel
060	in	17.9	10.5	5.7	2.4	3.6	1"	1"
	cm	45.5	26.7	14.5	6.1	9.2	Swivel	Swivel
070	in	17.9	10.5	5.7	2.4	3.6	1"	1"
	cm	45.5	26.7	14.5	6.1	9.2	Swivel	Swivel

Vertical Downflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
024	in	15.7	13.2	10.7
	cm	39.9	33.5	27.2
036	in	17.7	15.2	12.7
	cm	45.0	38.6	32.3
048	in	17.7	15.2	12.7
	cm	45.0	38.6	32.3
060	in	17.7	15.2	12.7
	cm	45.0	38.6	32.3
070	in	17.7	15.2	12.7
	cm	45.0	38.6	32.3

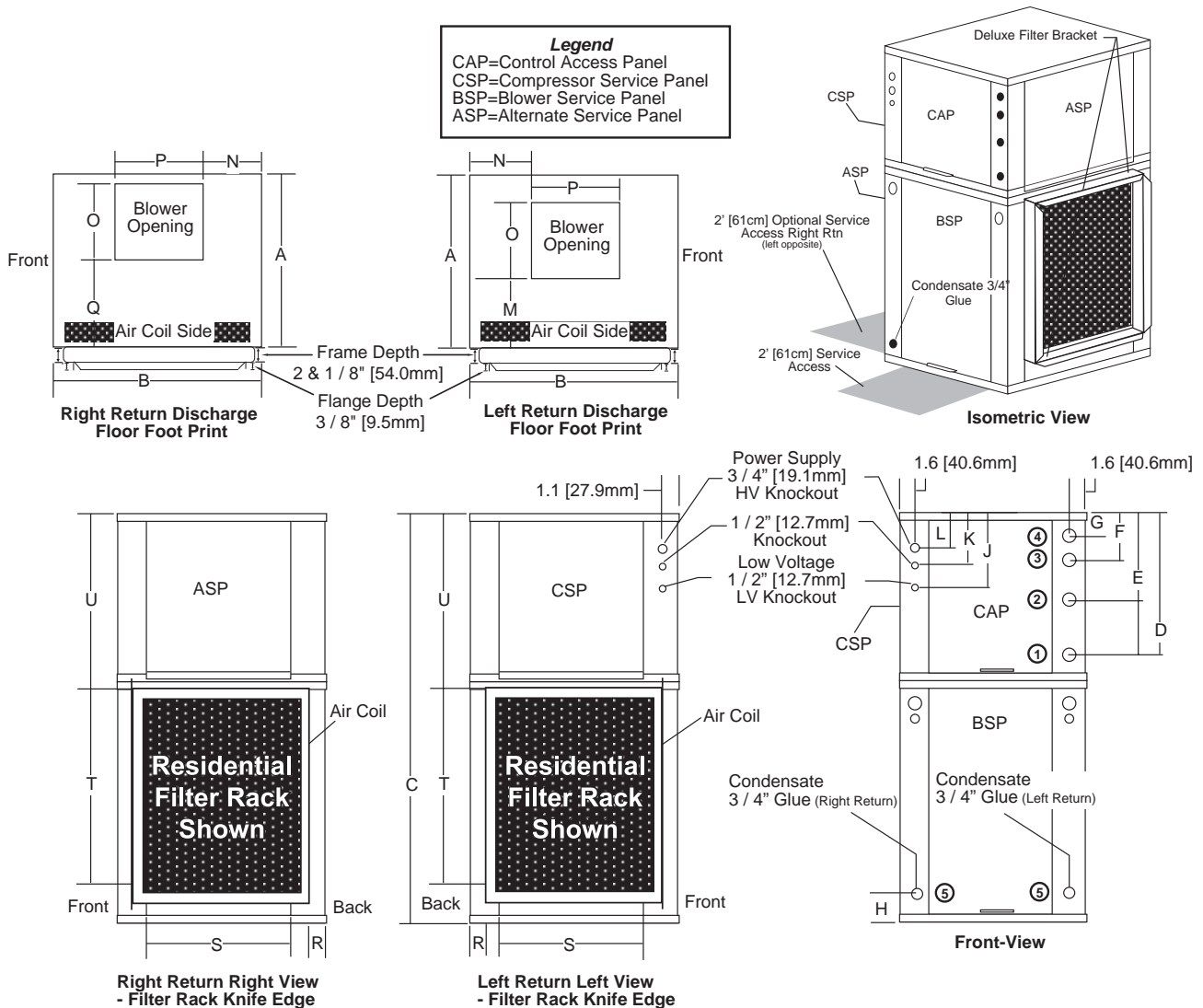
Condensate is 3/4" PVC female glue socket and is switchable from front to side.

Unit shipped with deluxe duct collar/filter rack extending from unit 3" [7.6cm] and is suitable for duct connection.

Downflow unit does not have discharge flange, and is rated for zero clearance installation.

Dimensions — Vertical Downflow HT

Vertical Downflow Model		Discharge Connection Duct Flange Installed (+/- 0.20 in, +/- 5.1mm)					Return Connection Standard Deluxe Filter Rack (+/- 0.20 in, +/- 5.1mm)			
		M Left Return	N	O Supply Width	P Supply Depth	Q Right Return	R	S Return Depth	T Return Height	U
024	in cm	6.7 17.1	8.4 21.4	9.9 25.3	9.1 23.0	10.8 27.4	1.7 4.3	22.2 56.4	26.2 66.5	21.9 55.6
036	in cm	7.4 18.7	9.0 22.9	13.1 33.3	12.9 32.7	10.4 26.5	1.7 4.3	27.2 69.1	26.2 66.5	23.9 60.7
048	in cm	7.4 18.7	9.0 22.9	13.1 33.3	12.9 32.7	10.4 26.5	1.7 4.3	27.2 69.1	30.2 76.7	23.9 60.7
060	in cm	7.4 18.7	9.0 22.9	13.1 33.3	12.9 32.7	10.4 26.5	1.7 4.3	27.2 69.1	34.2 86.9	23.9 60.7
070	in cm	7.4 18.7	9.0 22.9	13.1 33.3	12.9 32.7	10.4 26.5	1.7 4.3	27.2 69.1	34.2 86.9	23.9 60.7



Dimensions — Horizontal HT

Horizontal Model		Overall Cabinet		
		A Width	B Depth	C Height
024	in	22.4	62.2	19.3
	cm	56.8	158.0	48.9
036	in	25.4	71.2	21.3
	cm	64.5	180.8	54.0
048	in	25.4	76.2	21.3
	cm	64.5	193.5	54.0
060	in	25.4	81.2	21.3
	cm	64.5	206.2	54.0
070	in	25.4	81.2	21.3
	cm	64.5	206.2	54.0

Horizontal Model		Water Connections						
		1	2	3	4	5	Loop Water FPT	HWG FPT
		D In	E Out	F HWG IN	G HWG Out	H Condensate		
024	in	2.1	10.0	13.9	16.9	0.6	1"	1"
	cm	5.2	25.4	35.2	42.9	1.5	Swivel	Swivel
036	in	3.4	10.8	15.6	18.9	0.6	1"	1"
	cm	8.6	27.5	39.7	47.9	1.5	Swivel	Swivel
048	in	3.4	10.8	15.6	18.9	0.6	1"	1"
	cm	8.6	27.5	39.7	47.9	1.5	Swivel	Swivel
060	in	3.4	10.8	15.6	18.9	0.6	1"	1"
	cm	8.6	27.5	39.7	47.9	1.5	Swivel	Swivel
070	in	3.4	10.8	15.6	18.9	0.6	1"	1"
	cm	8.6	27.5	39.7	47.9	1.5	Swivel	Swivel

Horizontal Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
024	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
036	in	3.4	6.1	8.6
	cm	9.2	15.6	21.9
048	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
060	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
070	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9

Condensate is 3/4" FPT.

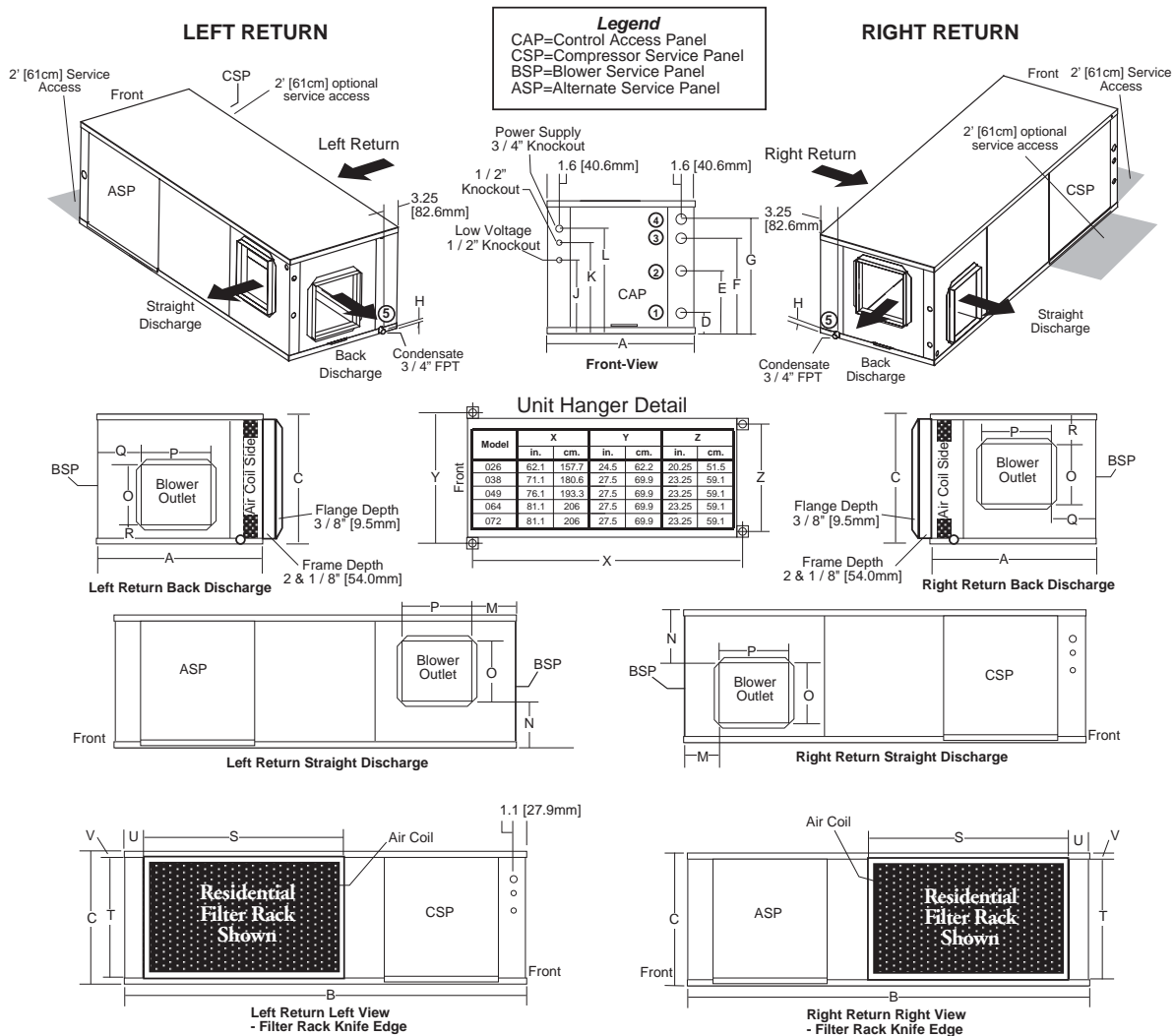
Unit shipped with deluxe duct collar/filter rack extending from unit 3" [7.6cm] and is suitable for duct connection. Discharge flange and hanger brackets are factory installed.

Dimensions — Horizontal HT

Horizontal Model		1Discharge Connection Duct Flange Installed (+/- 0.20 in, +/- 5.1mm)						Return Connection Standard Deluxe Filter Rack (+/- 0.20 in, +/- 5.1mm)			
		M	N	O Supply Height	P Supply Width	Q	R	S Return Width	T Return Height	U	V
024	in cm	3.6 9.3	2.0 5.1	12.5 31.8	15.5 39.4	3.6 9.2	2.0 5.2	33.8 85.8	16.2 41.0	2.3 5.8	1.7 4.3
036	in cm	*3.1 7.9	1.2 3.1	19.0 48.3	17.5 44.5	*3.1 7.9	1.0 2.6	34.8 88.3	18.2 46.1	3.1 7.8	1.7 4.3
048	in cm	3.1 7.9	1.2 3.1	19.0 48.3	17.5 44.5	3.1 7.9	1.0 2.6	39.8 101.0	18.2 46.1	3.1 7.8	1.7 4.3
060	in cm	3.1 7.9	1.2 3.1	19.0 48.3	17.5 44.5	3.1 7.9	1.0 2.6	44.8 113.7	18.2 46.1	3.1 7.8	1.7 4.3
070	in cm	3.1 7.9	1.2 3.1	19.0 48.3	17.5 44.5	3.1 7.9	1.0 2.6	44.8 113.7	18.2 46.1	3.1 7.8	1.7 4.3

*For units with modulating reheat option this dimension is 2.9" (7.4 cm).

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

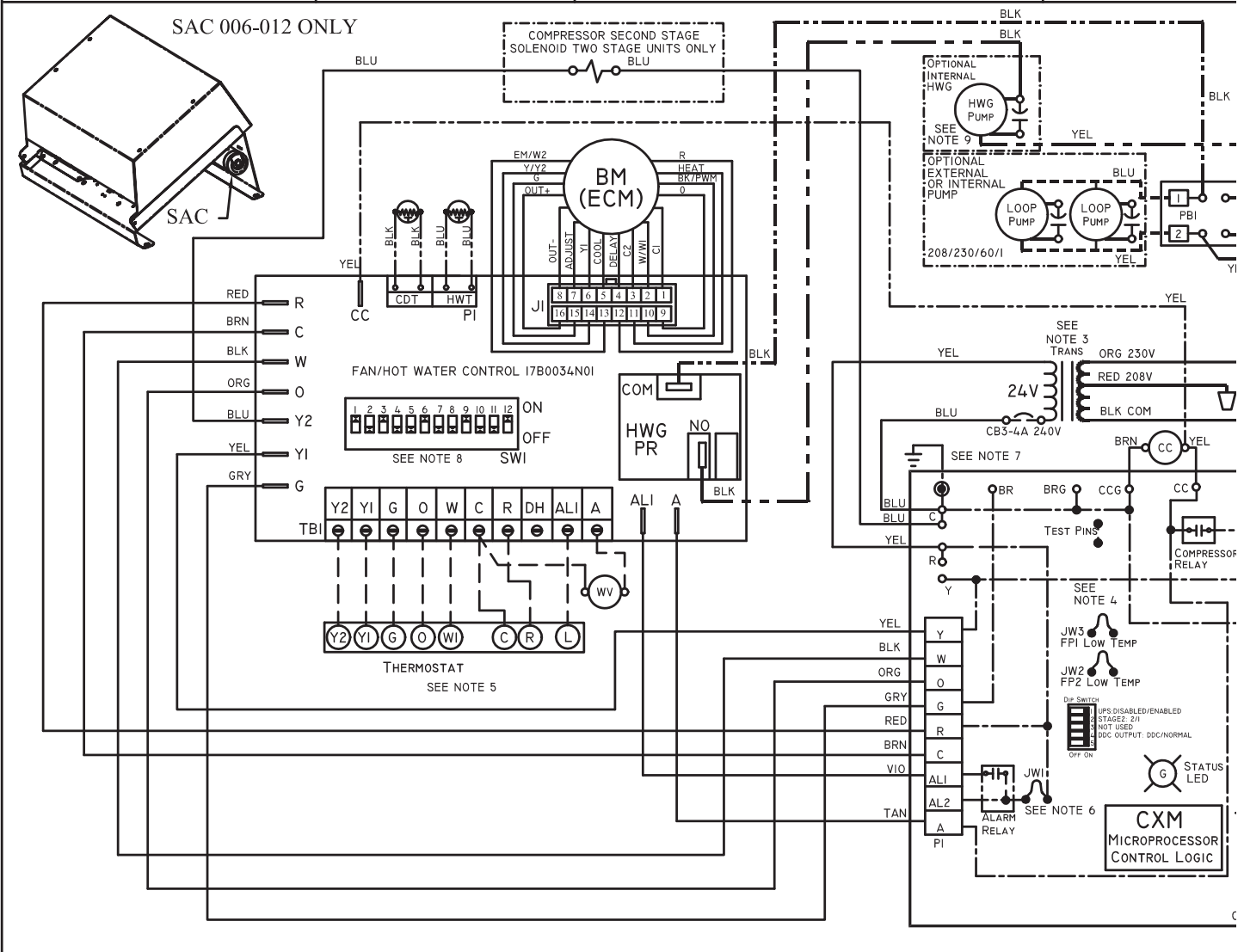


Rev.: 06/18/10B

HT Electrical Wiring Diagram - 96B0005N37

TITLE: **H/V 018-070 208-230/60/1 CXM w/ECM RESIDENTIAL** PCN: 13-01

LEGEND		NOTES:	
	FACTORY LOW VOLTAGE WIRING		SOLENOID COIL
	FACTORY LINE VOLTAGE WIRING		RELAY CONTACTS - N.C.
	FIELD LOW VOLTAGE WIRING		RELAY CONTACTS - N.O.
	FIELD LINE VOLTAGE WIRING		CAPACITOR
	PRINTED CIRCUIT TRACE		TEMPERATURE SWITCH
	OPTIONAL WIRING		LOW PRESSURE SWITCH
	OPTIONAL		HIGH PRESSURE SWITCH
	RELAY / CONTACTOR COIL		WIRE NUT
	THERMISTOR		SPLICE CAP
	CONDENSATE PAN		LED
	CIRCUIT BREAKER		
	GROUND		
	* OPTIONAL		



HT Electrical Wiring Diagram - 96B0005N37

68	DATE: 4/4/13		DRAWING NO: 96B0005N37	REV: E
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WATER MOTOR THERMALLY PROTECTED INTERNALLY.
 UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
 WIRING WILL BE CONNECTED FOR 230V OPERATION.
 TO OPERATE, DISCONNECT ORG LEAD AT LI, AND ATTACH RED LEAD TO LI.
 REMOVE ORG LEAD.

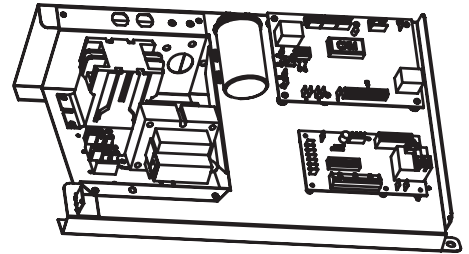
UNIT PROVIDES FREEZE PROTECTION FOR WATER.
 FOR FREEZE SOLUTIONS, CUT JW3 JUMPER.
 FOR TSTAT INSTALLATION, APPLICATION, AND OPERATION MANUAL
 REFER TO THE UNIT. LOW VOLTAGE WIRING MUST BE "CLASS I" AND VOLTAGE
 LOWER THAN UNIT SUPPLY VOLTAGE.
 REMOVE TSTAT ALI (UNCUT), MPC & LON ONLY:
 REMOVE DXM OR JW4 (DXM) JUMPER.
 WIRING IS AVAILABLE BETWEEN AL1 AND AL2.
 PRIMARY GROUND VIA CXM/DXM BOARD STANDOFFS & SCREWS TO CONTROL BOX.
 (FROM TOP TWO STANDOFFS AS SHOWN.)
 SET TO THE DISABLED POSITION.
 (DIP SWITCH I2 = OFF) UNTIL HWG IS CONNECTED TO TANK AND
 SEE IOM FOR INSTRUCTIONS.
 MODELS WITH HOT WATER GENERATION AND INTERNAL PUMP OPTION.
 TEMPERATURE SETTING IS 125F, FOR 150F SETTING ANTI-SCALD VALVE
 REFER TO IOM FOR INSTRUCTIONS.
 FOR WIRING OPTIONS, CONSULT AG SERIES ELECTRIC HEAT INSTALLATION MANUAL.
 CAPACITOR ONLY ON UNIT SIZE 006-012

ECM/HWG BOARD DIP SWITCH SETTINGS

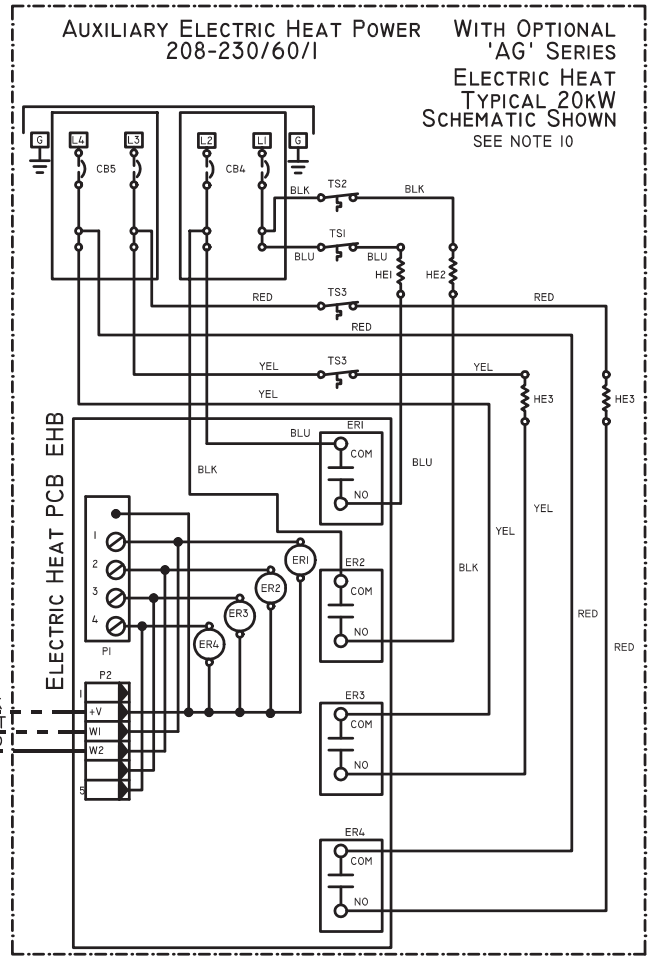
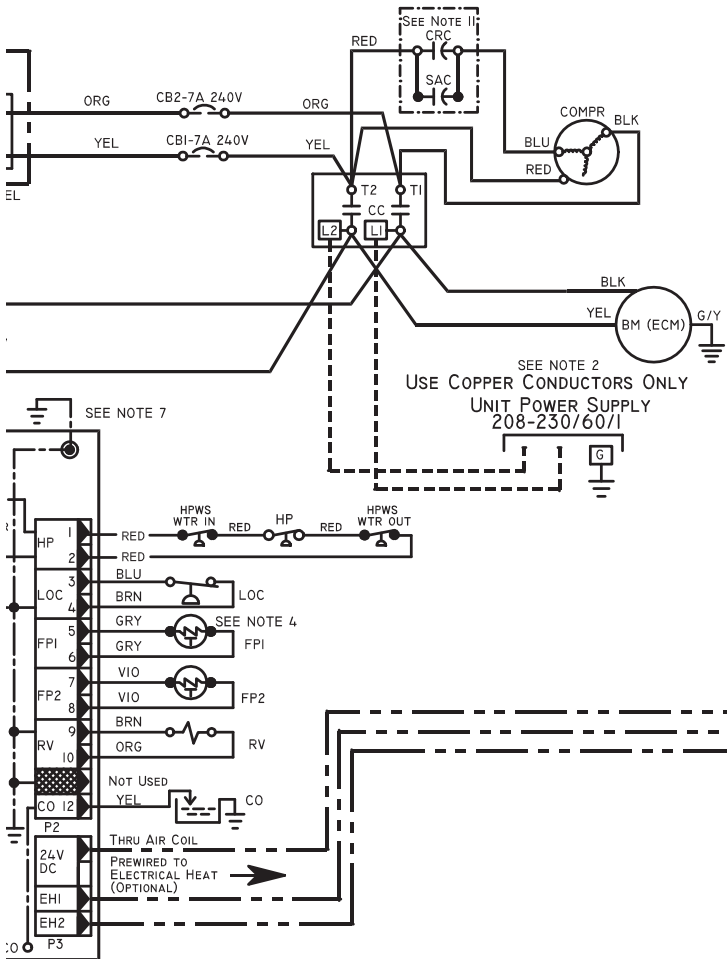
COOL CFM			CFM HEAT			EH CFM			ADJ CFM		
SPD	SW1	SW2	SPD	SW3	SW4	SPD	SW5	SW6	SPD	SW7	SW8
1	ON	ON	1	ON	ON	1	ON	ON	TEST	ON	ON
2	ON	OFF	2	ON	OFF	2	ON	OFF	-	ON	OFF
3	OFF	ON	3	OFF	ON	3	OFF	ON	+	OFF	ON
4	OFF	OFF	4	OFF	OFF	4	OFF	OFF	NORM	OFF	OFF

DEHUM		HWG PUMP TEST		HWG TEMP		HWG STATUS	
SW9	SW10	SW11	SW12	SW11	SW12	SW11	SW12
ON	NORM	ON	PUMP TEST	ON	150F	ON	DISABLED
OFF	DH	OFF	NORM	OFF	125F	OFF	ENABLED

SEE NOTE 9
 FOR HWG DIP SWITCH SETTINGS SEE IOM



CONTROL BOX LAYOUT



Electrical Data

All HT Units with Emerson ECM Fan Motor						HT Units (ECM) Standard			
Model	Compressor			HWG Pump FLA	Ext Loop Pump FLA	Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/HACR (2)
	RLA	LRA	Qty						
024	11.7	58.3	1	0.5	4.0	3.9	20.1	23.0	30
036	15.3	83.0	1	0.5	4.0	3.9	23.7	27.5	40
048	21.2	104.0	1	0.5	4.0	6.9	32.6	37.9	50
060	27.1	152.9	1	0.5	4.0	6.9	38.5	45.2	70
070	29.7	179.2	1	0.5	4.0	6.9	41.1	48.5	70

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

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

HT ECM Control Features

The ECM fan is controlled by an interface board that converts thermostat inputs and field selectable CFM settings to signals used by the ECM motor controller. Units manufactured before July 2005 have version I (P/N 69243707). Units manufactured between July 2005 and May 11, 2009 have version II (P/N 17B0019N01). Fan speeds are selected with jumpers for version I or via a nine position DIP switch for version II and III. To take full advantage of the ECM motor features, a multi-stage thermostat should be used (2-stage heat/2-stage cool or 3-stage heat/2-stage cool).

HFC-410A packaged units built after May 11, 2009 have ECM controller version III (P/N 17B0034N01). This controller includes logic and a relay to control the HWG functions.

Note: Power must be off to the unit for at least three seconds before the ECM motor will recognize a speed change. The motor will recognize a change in the CFM Adjust or dehumidification mode settings while the unit is powered.

There are four different airflow settings from lowest airflow rate (speed tap 1) to the highest airflow rate (speed tap 4). The charts below indicate settings for both versions of the ECM interface board, followed by detailed information for each setting.

Cooling Settings: The cooling setting determines the cooling (normal) CFM for all units with ECM motor. Cooling (normal) setting is used when the unit is not in dehumidification mode. This setting also determines the heating CFM for Genesis (GS) units. Tap 1 is the lowest CFM setting, while tap 4 is the highest CFM setting. To avoid air coil freeze-up, tap 1 may not be used if the dehumidification mode is selected. Consult submittal data or specifications catalog for the specific unit series and model to correlate speed tap setting to airflow in CFM.

Heating Settings: The heating setting determines the heating CFM for HT. This setting is not used for Genesis (GS) units. Tap 1 is the lowest CFM setting, while tap 4 is the highest CFM setting. Consult submittal data or specifications catalog for the specific unit series and model to correlate speed tap setting to airflow in CFM.

Auxiliary/Emergency Heat Settings: The auxiliary/emergency heat setting determines the CFM when the unit is in auxiliary heat or emergency heat mode. This setting is used for residential units with internal electric heat. When auxiliary electric heat is energized (i.e. compressor and electric heat), the greater of the auxiliary/emergency or heating setting will be used. A "G" (fan) signal must be present from the thermostat for electric heat to operate. Consult the submittal data or specifications catalog for the specific unit series and model to correlate speed tap setting to airflow in CFM.

CFM Adjust Settings: The CFM adjust setting allows four selections. The NORM setting is the factory default position. The + or - settings adjust the airflow by +/- 15%. The +/- settings are used to "fine tune" airflow adjustments. The TEST setting runs the ECM motor at 70% torque, which causes the motor to operate like a standard PSC motor, and disables the CFM counter.

Dehumidification Mode Settings: The dehumidification mode setting provides field selection of humidity control. When operating in the normal mode, the cooling airflow settings are determined by the cooling tap setting above. When dehumidification is enabled there is a reduction in airflow in cooling to increase the moisture removal of the heat pump. Consult submittal data or specifications catalog for the specific unit series and model to correlate speed tap to airflow in CFM. The dehumidification mode can be enabled in two ways.

1. **Constant Dehumidification Mode:** When the dehumidification mode is selected (via DIP switch or jumper setting), the ECM motor will operate with a multiplier applied to the cooling CFM settings (approx. 20-25% lower airflow). Any time the unit is running in the cooling mode, it will operate at the lower airflow to improve latent capacity. The "DEHUM" LED will be illuminated at all times. Heating airflow is not affected. NOTE: Do not select dehumidification mode if cooling setting is tap 1.
2. **Automatic (Humidistat-controlled) Dehumidification Mode:** When the dehumidification mode is selected (via DIP switch or jumper setting) AND a humidistat is connected to terminal DH (version II) or HUM (version I), the cooling airflow will only be reduced when the humidistat senses that additional dehumidification is required. The DH (or HUM) terminal is reverse logic. Therefore, a humidistat (not dehumidistat) is required. The "DEHUM" LED will be illuminated only when the humidistat is calling for dehumidification mode. Heating airflow is not affected. NOTE: Do not select dehumidification mode if cooling setting is tap 1.

HT ECM Control Features

ECM Board Tap Settings

Cooling settings: HT Units

Tap Setting	Version I 69243707	Version II and III (17B0019N01 & 17B0034N01)	
	HP CFM Jumper	DIP Switch	
		SW1	SW2
1	1	ON	ON
2	2	ON	OFF
3	3	OFF	ON
4	4	OFF	OFF

Heating settings: HT Units

Tap Setting	Version I 69243707	Version II and III (17B0019N01 & 17B0034N01)	
	DELAY Jumper	DIP Switch	
		SW3	SW4
1	1	ON	ON
2	2	ON	OFF
3	3	OFF	ON
4	4	OFF	OFF

Aux/Emerg Heat settings: HT Units

Tap Setting	Version I 69243707	Version II and III (17B0019N01 & 17B0034N01)	
	AUX CFM Jumper	DIP Switch	
		SW5	SW6
1	1	ON	ON
2	2	ON	OFF
3	3	OFF	ON
4	4	OFF	OFF

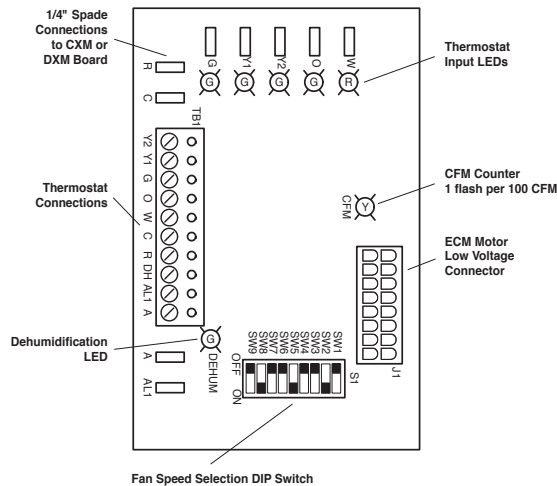
CFM Adjust settings: HT Units

Tap Setting	Version I 69243707	Version II and III (17B0019N01 & 17B0034N01)	
	CFM Adj Jumper	DIP Switch	
		SW7	SW8
TEST	1	ON	ON
-	2	ON	OFF
+	3	OFF	ON
NORM	4	OFF	OFF

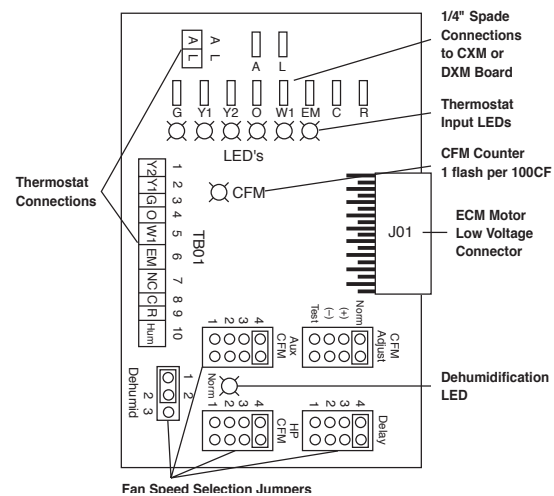
Dehum Mode settings: HT Units

Tap Setting	Version I 69243707	Version II and III (17B0019N01 & 17B0034N01)
	Dehumid Jumper	DIP Switch SW9
NORM	pins 1,2	ON
Dehumid	pins 2,3	OFF

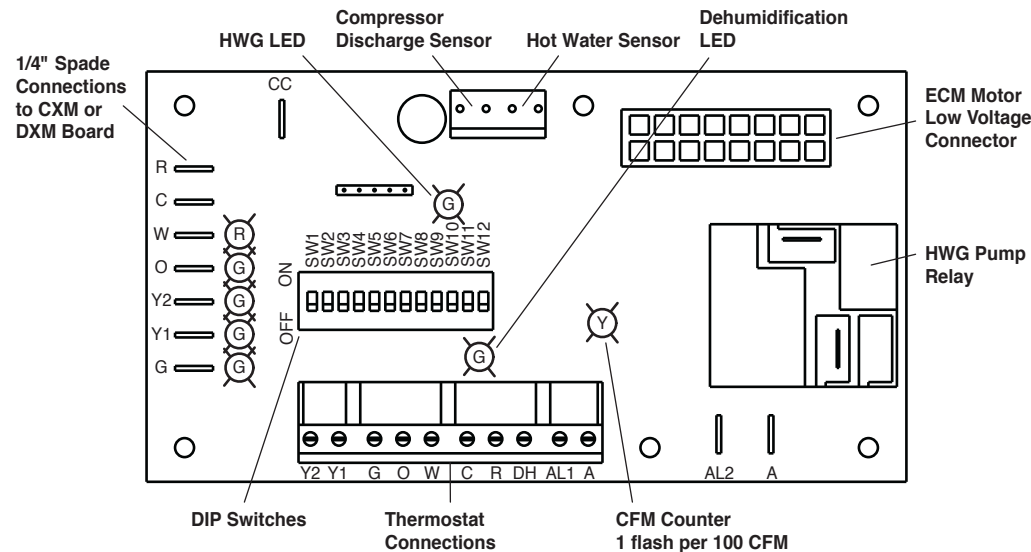
ECM Version II Interface Layout



ECM Version I Interface Layout



ECM Version III Interface Layout



Blower Performance Data

Airflow in CFM with wet coil and clean air filter

Model	Max ESP (in. wg)	Fan Motor (hp)	Tap Setting	Residential Units Only										
				Cooling Mode			Dehumid Mode			Heating Mode			AUX CFM	Aux/ Emerg Mode
				Stg 1	Stg 2	Fan	Stg 1	Stg 2	Fan	Stg 1	Stg 2	Fan		
024	0.50	1/2	4	810	950	475	630	740	475	920	1060	475	4	1060
	0.50	1/2	3	725	850	425	560	660	425	825	950	425	3	950
	0.50	1/2	2	620	730	370	490	570	370	710	820	370	2	820
	0.50	1/2	1	520	610	300				600	690	300	1	690
036	0.50	1/2	4	1120	1400	700	870	1090	700	1120	1400	700	4	1400
	0.50	1/2	3	1000	1250	630	780	980	630	1000	1250	630	3	1350
	0.50	1/2	2	860	1080	540	670	840	540	860	1080	540	2	1350
	0.50	1/2	1	730	900	450				730	900	450	1	1350
048	0.75	1	4	1460	1730	870	1140	1350	870	1560	1850	870	4	1850
	0.75	1	3	1300	1550	780	1020	1210	780	1400	1650	780	3	1660
	0.75	1	2	1120	1330	670	870	1040	670	1200	1430	670	2	1430
	0.75	1	1	940	1120	560				1010	1200	560	1	1350
060	0.75	1	4	1670	2050	1020	1300	1600	1020	1860	2280	1020	4	2280
	0.75	1	3	1500	1825	920	1160	1430	920	1650	2050	920	3	2040
	0.75	1	2	1280	1580	790	1000	1230	790	1430	1750	790	2	1750
	0.75	1	1	1080	1320	660				1200	1470	660	1	1470
070	0.75	1	4	1620	2190	1050	1270	1650	1050	1690	2230	1050	4	2230
	0.75	1	3	1500	1950	980	1170	1520	980	1600	2100	980	3	2100
	0.75	1	2	1400	1830	910	1100	1420	910	1400	1850	910	2	1870
	0.75	1	1	1320	1700	850				1240	1620	850	1	1670

Factory shipped on Tap Setting 2

During Auxiliary operation (residential units only) the CFM will run at the higher if the heating (delay jumper) or AUX settings

Airflow is controlled within +/- 5% up to Max ESP shown with wet coil and standard 1" fiberglass filter

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

All units AHRI/ISO/ASHRAE 13256-1 rated HP (Cooling) Delay (Heating) CFM Setting 3

Auxiliary Electric Heat

Auxiliary Heat Ratings

Auxiliary Electric Heat Model	HT Models			HE Models			WDG Models			kW Rating		Btuh Rating		Minimum CFM Required	
	024	036	048-070	024	030-042	048-060	Auxiliary Electric Heat Model*	024	036	048-060	240V	208V	240V		208V
HGM4A							AGM4C				3.8	2.9	13000	9900	500
HGM5A							AGM5C				4.8	3.6	16300	12300	500
HGM8A							AGM8C				7.6	5.7	25900	19400	650
HGM10A							AGM10C				9.6	7.2	32700	24600	650
HGM12A											11.4	8.6	38900	29200	750
HGL10A							AGL10C				9.6	7.2	32700	24600	1300
HGL15A							AGL15C				14.4	10.8	49100	36900	1350
HGL20A							AGL20C				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.

* Can be used on corresponding HT and HE models

Auxiliary Heat Electrical Data

Auxiliary Electric Heat Model	Supply Circuit	Heater Amps		Minimum Circuit Amps		Maximum Fuse	
		240V	208V	240V	208V	240V	208V
HGM4A	Single	15.8	14.0	19.8	17.1	20	20
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
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
HGL10A	Single	40.0	34.7	50.0	43.4	50	45
HGL15A	Single	60.0	52.0	75.0	65.0	80	70
	Dual - L1/L2	40.0	34.7	50.0	43.4	50	45
	Dual - L3/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/L2	40.0	34.7	50.0	43.4	50	45
	Dual - L3/L4	40.0	34.7	50.0	43.4	50	45

All heaters rated single phase 208-240V 60Hz

All models 15kW or larger feature internal circuit breakers

All Fuses UL Class K general purpose

Revision History

Date	Page #	Description
5 Nov., 13	36	Auxiliary Heat Data Updated

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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