



GENESIS STANDARD (GR) SERIES



SIZE 006 - 060 (1.76kW - 17.6kW)
HORIZONTAL & VERTICAL
R22 - 60Hz STANDARD & EXTENDED RANGE



GENESIS STANDARD (GR) SERIES



R22 - 90Hz STANDARD AND EXTENDED RANGE
HORIZONTAL & VERTICAL
SIZE 008 - 080 (1.76kW - 17.6kW)

THE GENESIS STANDARD (GR) SERIES

The GR series offers high efficiency, quiet operation with advanced features and application flexibility at competitive prices. GR series exceeds ASHRAE 90.1 efficiencies, yet maintains small cabinet dimensions.

Available in sizes 1/2 ton (1.76 kW) through 5 tons (17.6 kW) with multiple vertical and horizontal cabinet options the GR series offers a wide range of units for most any installation. The GR has an extended range refrigerant circuit, capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Standard features are many. Microprocessor controls, galvanized steel cabinet, polyester powder coat paint (vertical units) and TXV refrigerant metering device are just some of the features of the flexible GR series.

ClimateMaster's exclusive double isolation compressor mounting system makes the GR series the quietest unit on the market. Compressors are mounted on vibration isolation springs to a heavy gauge mounting plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration/sound attenuation. Options such as e-coated air coil, DDC controls, internal pump and factory-installed water solenoid valves allow customized design solutions.

The GR Series water-source heat pumps are designed to meet the challenges of today's HVAC demands with a low cost/high value solution.

UNIT FEATURES

- Sizes 006 (1/2 ton, 1.76 kW) through 060 (5 tons, 17.6 kW)
- Rotary, reciprocating and scroll compressors
- Exceeds ASHRAE 90.1 efficiencies
- Galvanized steel construction with polyester powder coat paint (vertical units)
- Unique double isolation compressor mounting with vibration isolation springs for quiet operation
- Insulated divider and separate compressor/air handler compartments
- TXV metering device
- Extended range (20 to 120°F, -6.7 to 48.9°C) operation
- Microprocessor controls standard (optional DXM and/or DDC controls)
- LonWorks, BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Field convertible discharge air arrangement for horizontal units
- Factory-mounted hanger brackets for horizontal units
- Internally trapped condensate drain line (vertical units only)
- Flush securely-mounted corner post water connections (no backup wrench required)
- Unit Performance Sentinel performance monitoring system
- Eight Safeties Standard
- Wide variety of options including e-coated air coils and internal pumps

Selection Procedure**Reference Calculations**

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

$LC = TC - SC$

$S/T = \frac{SC}{TC}$

Legend and Glossary of Abbreviations

BTUH = BTU(British Thermal Unit) per hour
 CFM = airflow, cubic feet/minute
 COP = coefficient of performance = BTUH output/BTUH input
 DB = dry bulb temperature (°F)
 EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
 EER = energy efficiency ratio = BTUH output/Watt input
 EPT = external pipe thread
 ESP = external static pressure (inches w.g.)
 EWT = entering water temperature
 GPM = water flow in U.S. gallons/minute
 HE = total heat of extraction, BTUH
 HC = air heating capacity, BTUH
 HR = total heat of rejection, BTUH

HWC = hot water generator (desuperheater) capacity, Mbtuh
 IPT = internal pipe thread
 KW = total power unit input, kilowatts
 LAT = leaving air temperature, °F
 LC = latent cooling capacity, BTUH
 LWT = leaving water temperature, °F
 MBTUH = 1000 BTU per hour
 S/T = sensible to total cooling ratio
 SC = sensible cooling capacity, BTUH
 TC = total cooling capacity, BTUH
 WB = wet bulb temperature (°F)
 WPD = waterside pressure drop (psi & ft. of hd.)

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 (page 14).
- 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	21,100 BTUH
Sensible Cooling	15,900 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 12°F rise in temp.)	4.5 GPM
Air Flow	700 CFM

Step 3, 4 & 5 HP Selection:

After making our preliminary selection (GRH024), we enter the tables at design water flow and water temperature and read Total Cooling, Sens. Cooling and Heat of Rej. capacities:

Total Cooling	21,900 BTUH
Sensible Cooling	16,700 BTUH
Heat of Rejection	29,000 BTUH

Step 6 & 7 Entering Air and Airflow Corrections:

Next, we determine our correction factors.

Table	Ent Air	Air Flow	Corrected
Corrected Total Cooling =	21,900	x 0.971	x 0.985 = 20,946
Corrected Sens Cooling =	16,700	x 1.070	x 0.938 = 16,761
Corrected Heat of Reject =	29,000	x 0.969	x 0.983 = 27,623

Step 8 Water Temperature Rise Calculation & Assessment:

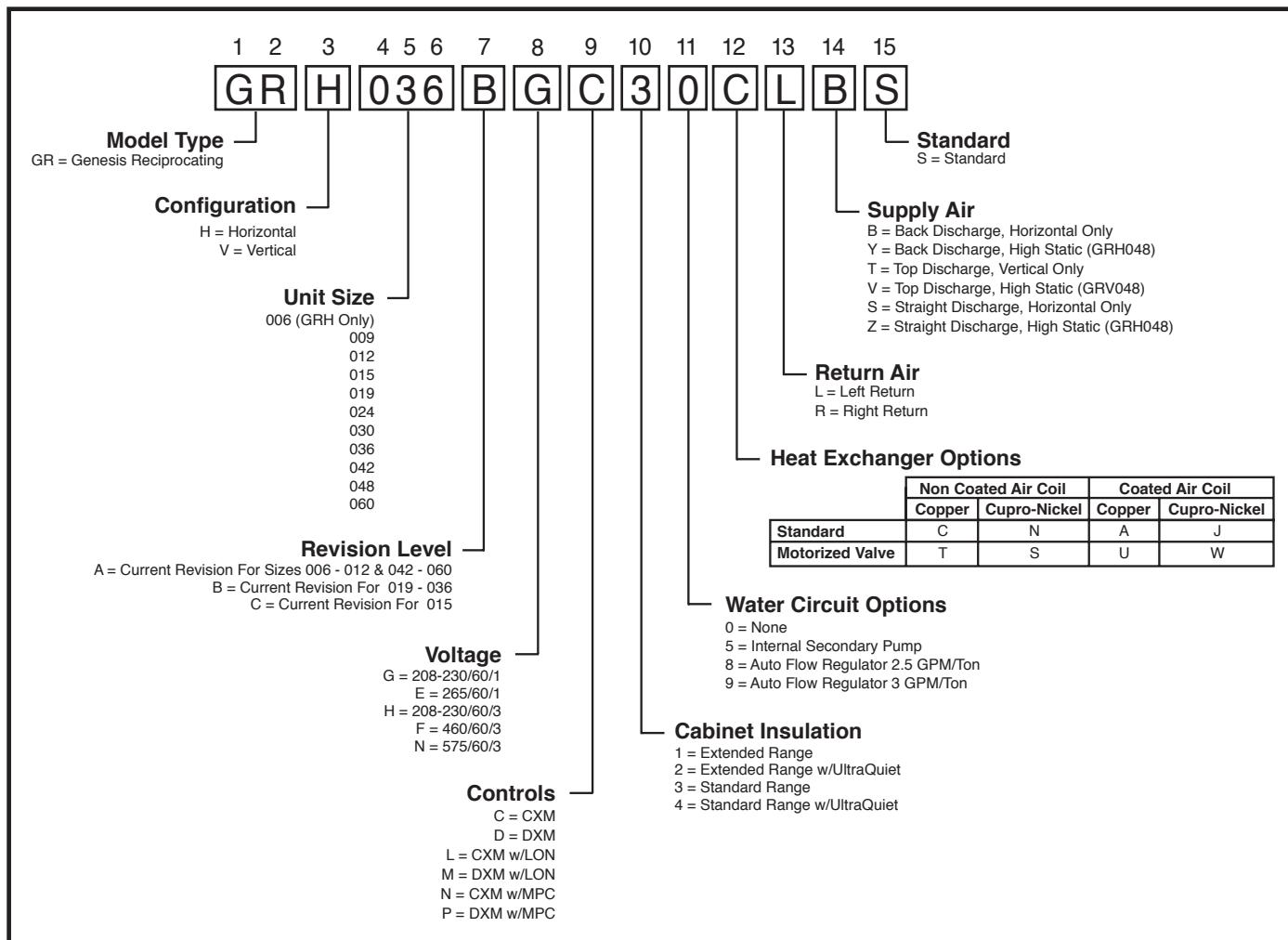
Actual Temperature Rise	12.3°F
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When we compare the Corrected Total Cooling and Corrected Sensible Cooling figures with our load requirements stated in Step 1, we discover that our selection is within +/- 10% of our sensible load requirement. Furthermore, we see that our Corrected Total Cooling figure is slightly undersized as recommended, when compared to the actual load.

Genesis Standard (GR) Series

Rev.: 05/23/07D

GR Series Nomenclature



Rev.: 09/13/06D

Performance Data
ARI/ASHRAE/ISO 13256-1

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

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 77°F		Heating 32°F	
	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
GRH/V006	5,400	12.8	7,400	4.2	5,900	17.6	5,500	3.8	5,600	14.3	4,400	3.4
GRH/V009	8,100	12.8	10,300	4.3	8,800	17.6	7,700	3.8	8,300	14.2	6,200	3.4
GRH/V012	11,800	12.7	14,600	4.2	12,500	17.6	11,000	3.6	12,100	14.2	8,700	3.4
GRH/V015	14,100	13.3	16,800	4.6	15,200	17.6	13,500	4.1	14,500	14.8	10,700	3.5
GRH/V019	18,900	12.5	22,500	4.2	20,100	17.6	16,700	3.6	19,100	13.4	11,800	3.2
GRH/V024	23,000	12.3	27,600	4.2	26,100	18.2	21,300	3.7	23,000	13.3	16,700	3.3
GRH/V030	28,500	13.2	33,300	4.4	31,100	18.3	27,000	3.9	28,700	14.4	20,100	3.4
GRH/V036	34,000	13.0	41,700	4.2	37,500	18.2	33,400	3.9	35,200	14.7	25,500	3.4
GRH/V042	40,000	13.0	46,700	4.3	46,500	18.6	38,300	3.9	42,000	15.0	29,400	3.4
GRH/V048	47,000	12.8	58,000	4.2	54,000	18.1	46,000	3.8	48,500	14.3	35,300	3.3
GRH/V060	59,000	12.8	68,000	4.2	64,500	16.8	56,000	3.8	60,600	14.1	44,000	3.2

Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature

Heating capacities based upon 68°F DB, 59°F WB entering air temperature

All air flow is rated on high speed

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

ASHRAE/ARI/ISO 13256-1. Metric (SI) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Cooling 25°C		Heating 0°C	
	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP
GRH/V006	1,583	3.8	2,169	4.2	1,729	5.2	1,612	3.8	1,641	4.2	1,290	3.4
GRH/V009	2,374	3.8	3,019	4.3	2,579	5.2	2,257	3.8	2,433	4.2	1,817	3.4
GRH/V012	3,458	3.7	4,279	4.2	3,664	5.2	3,224	3.6	3,546	4.2	2,550	3.4
GRH/V015	4,131	3.9	4,982	4.6	4,454	5.2	3,956	4.1	4,249	4.3	3,135	3.5
GRH/V019	5,539	3.7	6,594	4.2	5,891	5.2	4,894	3.6	5,598	3.9	3,458	3.2
GRH/V024	6,741	3.6	8,089	4.2	7,649	5.3	6,243	3.7	6,741	3.9	4,894	3.3
GRH/V030	8,353	3.9	9,760	4.4	9,115	5.4	7,913	3.9	8,411	4.2	5,891	3.4
GRH/V036	9,965	3.8	12,222	4.2	10,991	5.3	9,789	3.9	10,317	4.3	7,474	3.4
GRH/V042	11,720	3.8	13,687	4.3	13,628	5.4	11,225	3.9	12,309	4.4	8,617	3.4
GRH/V048	13,775	3.8	16,999	4.2	15,826	5.3	13,482	3.8	14,215	4.2	10,346	3.3
GRH/V060	17,292	3.8	19,930	4.2	18,904	4.9	16,413	3.8	17,761	4.1	12,896	3.2

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature

Heating capacities based upon 20°C DB, 15°C WB entering air temperature

All air flow is rated on high speed

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 42°F [5.6°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:

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

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

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

$$TD = 10^{\circ}\text{F}$$

$$LWT = EWT - TD$$

$$LWT = 50 - 10 = 40^{\circ}\text{F}$$

In this example, a higher flow rate will be required for EWTs at or below 50°F without antifreeze. At 2 gpm/ton, the calculation above results in a TD of 7.5. $LWT = 50 - 7.5 = 42.5^{\circ}\text{F}$, which is above 42°F EWT, and is acceptable for this application.

Heating - EAT 70°F					
EER	HC	kW	HE	LAT	COP
8.0	4.8	0.47	3.2	92.4	2.98
8.2	5.1	0.52	3.3	93.5	2.89
8.3	5.2	0.50	3.5	94.3	3.05
8.5	5.4	0.49	3.7	95.0	3.22
8.7	5.6	0.53	3.8	96.0	3.09
8.8	5.8	0.52	4.0	96.8	3.27
8.9	6.0	0.51	4.2	97.6	3.45
9.0	6.2	0.55	4.3	98.5	3.28
9.1	6.3	0.54	4.5	99.4	3.47
9.2	6.5	0.52	4.8	100.3	3.66
9.3	6.7	0.57	4.8	101.0	3.40
9.4	5.0				

Performance Data GRH006

200 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GRH006 (Cv = 3.5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
		20	1.5	1.6	3.6	Operation Not Recommended					4.8	0.47	3.2	92.4	2.98		
GPM	WPD Adder	30	0.8	0.6	1.3	7.4	4.8	0.65	0.23	8.2	32.1	5.1	0.52	3.3	93.5	2.89	
	PSI		1.1	1.0	2.3	7.6	4.9	0.65	0.22	8.3	34.2	5.2	0.50	3.5	94.3	3.05	
	FT		1.5	1.5	3.5	7.8	5.0	0.64	0.21	8.5	36.6	5.4	0.49	3.7	95.0	3.22	
0.8	0.65	1.49	40	0.8	0.6	1.3	7.1	4.7	0.65	0.29	8.1	24.2	5.6	0.53	3.8	96.0	3.09
1.1	1.11	2.57		1.1	1.0	2.2	7.3	4.8	0.65	0.28	8.3	25.9	5.8	0.52	4.0	96.8	3.27
1.5	1.76	4.06		1.5	1.5	3.4	7.5	4.8	0.65	0.27	8.4	27.7	6.0	0.51	4.2	97.6	3.45
		50	0.8	0.5	1.3	6.9	4.5	0.66	0.36	8.1	19.2	6.2	0.55	4.3	98.5	3.28	
			1.1	0.9	2.1	7.0	4.6	0.66	0.34	8.2	20.5	6.3	0.54	4.5	99.4	3.47	
			1.5	1.4	3.3	7.2	4.7	0.65	0.33	8.3	21.9	6.5	0.52	4.8	100.3	3.66	
		60	0.8	0.5	1.2	6.6	4.4	0.66	0.42	8.0	15.7	6.7	0.57	4.8	101.0	3.46	
			1.1	0.9	2.1	6.8	4.5	0.66	0.40	8.1	16.7	6.9	0.55	5.0	101.9	3.66	
			1.5	1.4	3.2	6.9	4.5	0.66	0.39	8.2	17.9	7.1	0.54	5.3	102.9	3.86	
		70	0.8	0.5	1.2	6.3	4.2	0.67	0.48	8.0	13.1	7.2	0.58	5.2	103.4	3.63	
			1.1	0.9	2.0	6.5	4.3	0.66	0.46	8.1	14.0	7.5	0.57	5.5	104.5	3.83	
			1.5	1.3	3.1	6.6	4.4	0.66	0.44	8.2	14.9	7.7	0.56	5.8	105.6	4.05	
		80	0.8	0.5	1.1	6.1	4.1	0.67	0.55	7.9	11.1	7.8	0.60	5.7	105.9	3.79	
			1.1	0.8	1.9	6.2	4.2	0.67	0.53	8.0	11.8	8.0	0.59	6.0	107.1	4.00	
			1.5	1.3	3.0	6.4	4.2	0.67	0.50	8.1	12.6	8.2	0.57	6.3	108.2	4.23	
		90	0.8	0.5	1.1	5.8	3.9	0.68	0.61	7.9	9.5	8.3	0.62	6.2	108.4	3.94	
			1.1	0.8	1.9	5.9	4.0	0.68	0.59	7.9	10.1	8.6	0.60	6.5	109.6	4.16	
			1.5	1.3	2.9	6.1	4.1	0.67	0.56	8.0	10.8	8.8	0.59	6.8	110.8	4.40	
		100	0.8	0.5	1.1	5.5	3.8	0.69	0.67	7.8	8.2	Operation Not Recommended					
			1.1	0.8	1.8	5.7	3.9	0.68	0.65	7.9	8.7						
			1.5	1.2	2.8	5.8	3.9	0.68	0.62	7.9	9.3						
		110	0.8	0.4	1.0	5.3	3.6	0.69	0.74	7.8	7.1						
			1.1	0.7	1.7	5.4	3.7	0.69	0.71	7.8	7.6						
			1.5	1.2	2.7	5.5	3.8	0.69	0.68	7.8	8.1						

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.

ARI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68.6°F DB in heating.

Table does not reflect fan or pump power corrections for ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data

GR H/V 009

300 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btu/h

*WPD Adder for Motorized Valve, GR H/V 009 (Cv = 3.5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
20	2.2	3.6	8.3	Operation Not Recommended					5.5	0.63	3.4	87.0	2.57				
GPM	1.1	1.2	2.8	10.6	7.0	0.65	0.40	12.0	26.7	5.9	0.62	3.8	88.2	2.77			
	1.7	2.4	5.6	10.9	7.1	0.65	0.38	12.2	28.5	6.2	0.64	4.0	89.2	2.84			
	2.2	3.5	8.0	11.1	7.2	0.65	0.36	12.4	30.5	6.5	0.66	4.3	90.1	2.91			
1.1	1.33	3.08		1.1	1.2	2.7	10.1	6.8	0.67	0.47	11.7	21.7	6.8	0.65	4.6	91.0	3.06
1.7	2.75	6.36		1.7	2.4	5.5	10.3	6.9	0.67	0.45	11.8	23.1	7.2	0.67	4.9	92.1	3.14
2.2	3.98	9.19		2.2	3.4	7.8	10.6	7.0	0.66	0.43	12.0	24.7	7.5	0.69	5.2	93.2	3.22
40	1.1	1.1	2.6	9.5	6.5	0.69	0.53	11.3	17.9	7.7	0.68	5.4	93.8	3.33			
	1.7	2.3	5.3	9.7	6.7	0.68	0.51	11.5	19.1	8.1	0.70	5.7	95.1	3.42			
	2.2	3.3	7.6	10.0	6.8	0.68	0.49	11.6	20.4	8.5	0.71	6.1	96.3	3.50			
50	1.1	1.1	2.5	9.0	6.3	0.71	0.60	11.0	14.9	8.6	0.71	6.2	96.6	3.58			
	1.7	2.2	5.1	9.2	6.5	0.70	0.58	11.1	15.9	9.1	0.72	6.6	98.0	3.67			
	2.2	3.2	7.3	9.4	6.6	0.70	0.55	11.3	17.0	9.5	0.74	7.0	99.4	3.76			
60	1.1	1.1	2.4	8.4	6.1	0.73	0.67	10.7	12.6	9.5	0.73	7.0	99.4	3.81			
	1.7	2.2	5.0	8.6	6.2	0.72	0.64	10.8	13.4	10.0	0.75	7.5	100.9	3.91			
	2.2	3.1	7.1	8.8	6.4	0.72	0.61	10.9	14.4	10.5	0.77	7.9	102.5	4.00			
70	1.1	1.0	2.4	7.9	5.9	0.75	0.74	10.4	10.7	10.4	0.76	7.8	102.2	4.03			
	1.7	2.1	4.8	8.0	6.0	0.75	0.71	10.5	11.4	11.0	0.78	8.3	103.9	4.13			
	2.2	3.0	6.8	8.2	6.1	0.75	0.68	10.5	12.2	11.5	0.80	8.8	105.6	4.23			
80	1.1	1.0	2.3	7.3	5.7	0.78	0.80	10.1	9.1	11.3	0.79	8.7	105.0	4.23			
	1.7	2.0	4.6	7.5	5.8	0.78	0.77	10.1	9.7	11.9	0.81	9.2	106.8	4.34			
	2.2	2.9	6.6	7.7	5.9	0.77	0.74	10.2	10.4	12.5	0.83	9.7	108.7	4.44			
90	1.1	0.9	2.2	6.8	5.5	0.81	0.87	9.7	7.8	Operation Not Recommended							
	1.7	1.9	4.5	6.9	5.6	0.81	0.84	9.8	8.3								
	2.2	2.8	6.4	7.1	5.7	0.81	0.80	9.8	8.8								
100	1.1	0.9	2.1	6.2	5.3	0.85	0.94	9.4	6.6								
	1.7	1.9	4.3	6.4	5.4	0.85	0.90	9.4	7.1								
	2.2	2.6	6.1	6.5	5.5	0.85	0.86	9.4	7.5								
110	1.1	0.9	2.1	6.4	5.3	0.85	0.94	9.4	6.6	Operation Not Recommended							
	1.7	1.9	4.3	6.4	5.4	0.85	0.90	9.4	7.1								
	2.2	2.6	6.1	6.5	5.5	0.85	0.86	9.4	7.5								

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data GR H/V 012

375 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 012 (Cv = 3.5, MOPD = 25 psi)	EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F					
			PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
	20	3.0	7.1	16.5	Operation Not Recommended					7.6	0.84	4.7	87.5	2.62	
GPM	30	1.5	2.5	5.7	14.3	10.1	0.71	0.57	16.2	25.2	8.2	0.85	5.3	89.1	2.85
		2.3	4.9	11.2	14.6	10.3	0.70	0.54	16.5	26.9	8.7	0.87	5.7	90.1	2.92
		3.0	6.9	16.0	15.0	10.5	0.70	0.52	16.8	28.7	9.1	0.89	6.1	91.1	2.99
1.5	2.74	6.33													
2.3	5.43	12.54													
3.0	7.87	18.18													
40	40	1.5	2.4	5.6	13.8	9.8	0.71	0.65	16.0	21.2	9.6	0.89	6.6	92.3	3.17
		2.3	4.7	10.9	14.1	10.0	0.71	0.63	16.3	22.6	10.1	0.92	7.0	93.5	3.25
		3.0	6.7	15.5	14.4	10.2	0.71	0.60	16.5	24.1	10.6	0.94	7.4	94.6	3.32
50	50	1.5	2.3	5.4	13.3	9.6	0.72	0.74	15.8	18.0	11.0	0.94	7.8	95.6	3.45
		2.3	4.6	10.5	13.6	9.8	0.72	0.71	16.0	19.3	11.6	0.96	8.3	96.9	3.54
		3.0	6.5	15.0	13.9	10.0	0.72	0.68	16.2	20.6	12.2	0.99	8.8	98.2	3.62
60	60	1.5	2.3	5.2	12.8	9.3	0.73	0.82	15.6	15.6	12.4	0.98	9.1	98.8	3.71
		2.3	4.4	10.2	13.1	9.5	0.73	0.79	15.8	16.6	13.1	1.01	9.7	100.3	3.81
		3.0	6.3	14.6	13.4	9.7	0.72	0.75	15.9	17.8	13.7	1.03	10.2	101.8	3.90
70	70	1.5	2.2	5.0	12.3	9.1	0.74	0.90	15.3	13.6	13.8	1.03	10.3	102.0	3.95
		2.3	4.3	9.9	12.5	9.2	0.74	0.87	15.5	14.5	14.6	1.05	11.0	103.7	4.05
		3.0	6.1	14.1	12.8	9.4	0.73	0.83	15.7	15.5	15.3	1.08	11.6	105.4	4.14
80	80	1.5	2.1	4.9	11.7	8.8	0.75	0.99	15.1	11.9	15.2	1.07	11.6	105.3	4.16
		2.3	4.1	9.5	12.0	9.0	0.75	0.95	15.3	12.7	16.0	1.10	12.3	107.1	4.27
		3.0	5.9	13.6	12.3	9.2	0.74	0.91	15.4	13.6	16.8	1.13	13.0	109.0	4.37
90	90	1.5	2.0	4.7	11.2	8.6	0.76	1.07	14.9	10.5	16.6	1.12	12.8	108.5	4.36
		2.3	4.0	9.2	11.5	8.7	0.76	1.03	15.0	11.2	17.5	1.15	13.6	110.5	4.47
		3.0	5.7	13.1	11.8	8.9	0.76	0.98	15.1	12.0	18.4	1.18	14.4	112.5	4.58
100	100	1.5	2.0	4.5	10.7	8.3	0.77	1.16	14.7	9.3	Operation Not Recommended				
		2.3	3.8	8.9	11.0	8.5	0.77	1.11	14.8	9.9	Operation Not Recommended				
		3.0	5.5	12.6	11.2	8.6	0.77	1.06	14.9	10.6	Operation Not Recommended				
110	110	1.5	1.9	4.4	10.2	8.1	0.79	1.24	14.4	8.2	Operation Not Recommended				
		2.3	3.7	8.5	10.5	8.2	0.79	1.19	14.5	8.8	Operation Not Recommended				
		3.0	5.3	12.2	10.7	8.4	0.78	1.14	14.6	9.4	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.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data

GR H/V 015

500 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 015 (Cv = 3.5, MOPD = 25 psi)		EWT °F	GPM	WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
20	3.5	2.7	6.3	Operation Not Recommended					9.3	0.84	6.4	87.2	3.24				
GPM	WPD Adder		1.8	0.8	1.9	16.1	11.8	0.74	0.57	18.0	28.5	10.0	0.86	7.1	88.5	3.42	
	PSI	FT	2.6	1.7	3.9	16.3	11.9	0.73	0.52	18.1	31.4	10.3	0.87	7.4	89.1	3.49	
			3.5	2.6	6.1	16.4	11.9	0.73	0.49	18.1	33.6	10.5	0.87	7.5	89.5	3.54	
1.8	1.12	2.60	40	1.8	0.8	1.9	15.8	11.7	0.74	0.64	18.0	24.8	11.3	0.88	8.3	90.9	3.74
2.6	2.28	5.28		2.6	1.6	3.8	16.0	11.8	0.74	0.59	18.0	27.0	11.7	0.89	8.6	91.6	3.84
3.5	3.71	8.58		3.5	2.6	5.9	16.1	11.8	0.74	0.57	18.0	28.4	11.9	0.90	8.9	92.1	3.91
50	1.8	0.8	1.8	1.8	0.8	1.8	15.5	11.5	0.74	0.71	17.9	21.8	12.7	0.91	9.6	93.5	4.09
	2.6	1.6	3.7	2.6	1.6	3.7	15.7	11.6	0.74	0.66	18.0	23.6	13.2	0.91	10.1	94.4	4.22
	3.5	2.5	5.7	3.5	2.5	5.7	15.8	11.7	0.74	0.57	17.8	27.9	13.5	0.92	10.4	95.0	4.30
60	1.8	0.8	1.8	1.8	0.8	1.8	15.0	11.2	0.74	0.79	17.7	18.9	14.1	0.93	11.0	96.2	4.46
	2.6	1.5	3.5	2.6	1.5	3.5	15.3	11.3	0.74	0.74	17.8	20.6	14.7	0.94	11.5	97.2	4.60
	3.5	2.4	5.5	3.5	2.4	5.5	15.4	11.4	0.74	0.71	17.9	21.7	15.1	0.94	11.9	97.9	4.69
70	1.8	0.7	1.7	1.8	0.7	1.7	14.4	10.8	0.75	0.89	17.4	16.2	15.6	0.95	12.4	98.9	4.82
	2.6	1.5	3.4	2.6	1.5	3.4	14.8	11.0	0.75	0.83	17.6	17.8	16.2	0.96	13.0	100.0	4.97
	3.5	2.3	5.4	3.5	2.3	5.4	15.0	11.1	0.74	0.80	17.7	18.8	16.6	0.96	13.3	100.8	5.06
80	1.8	0.7	1.6	1.8	0.7	1.6	13.7	10.5	0.77	1.02	17.1	13.4	17.0	0.97	13.7	101.5	5.15
	2.6	1.4	3.3	2.6	1.4	3.3	14.1	10.7	0.76	0.94	17.3	15.0	17.6	0.97	14.3	102.7	5.30
	3.5	2.2	5.2	3.5	2.2	5.2	14.4	10.8	0.75	0.90	17.4	16.0	18.0	0.98	14.7	103.4	5.39
90	1.8	0.7	1.6	1.8	0.7	1.6	12.7	10.1	0.79	1.17	16.7	10.9	18.3	0.98	14.9	103.8	5.45
	2.6	1.4	3.2	2.6	1.4	3.2	13.3	10.3	0.77	1.08	17.0	12.3	18.9	0.99	15.5	105.0	5.58
	3.5	2.2	5.0	3.5	2.2	5.0	13.6	10.4	0.77	1.03	17.1	13.2	19.2	1.00	15.8	105.6	5.65
100	1.8	0.7	1.5	1.8	0.7	1.5	11.7	9.6	0.83	1.37	16.3	8.5	Operation Not Recommended				
	2.6	1.3	3.1	2.6	1.3	3.1	12.3	9.9	0.80	1.25	16.6	9.8					
	3.5	2.1	4.8	3.5	2.1	4.8	12.6	10.0	0.79	1.19	16.7	10.6					
110	1.8	0.6	1.5	1.8	0.6	1.5	10.3	9.1	0.87	1.61	15.9	6.4					
	2.6	1.3	3.0	2.6	1.3	3.0	11.1	9.4	0.85	1.47	16.1	7.5					
	3.5	2.0	4.6	3.5	2.0	4.6	11.5	9.6	0.83	1.40	16.3	8.2					

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

**Performance Data
GR H/V 019**

600 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 019 (Cv = 3.5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
		20	4.5	5.6	12.9	Operation Not Recommended					11.7	1.14	7.9	88.1	3.02		
GPM	WPD Adder	30	2.3	1.7	3.9	24.3	15.7	0.64	1.01	27.7	24.0	13.1	1.18	9.1	90.3	3.25	
	PSI		3.4	3.3	7.7	25.1	15.9	0.63	0.98	28.5	25.7	13.8	1.22	9.6	91.3	3.32	
	FT		4.5	5.4	12.5	26.0	16.2	0.62	0.94	29.2	27.6	14.5	1.25	10.2	92.3	3.38	
2.3	2.16	5.00	40	2.3	1.6	3.8	24.1	15.4	0.64	1.14	27.9	21.2	15.6	1.29	11.2	94.1	3.54
3.4	4.37	10.09		3.4	3.2	7.4	24.9	15.6	0.63	1.10	28.6	22.7	16.4	1.33	11.8	95.3	3.61
4.5	7.23	16.70		4.5	5.3	12.1	25.8	15.9	0.62	1.05	29.4	24.4	17.2	1.37	12.5	96.5	3.68
		50	2.3	1.6	3.7	23.3	15.0	0.65	1.26	27.5	18.5	18.1	1.40	13.3	97.9	3.78	
			3.4	3.1	7.2	24.1	15.3	0.63	1.21	28.2	19.8	19.0	1.44	14.1	99.3	3.86	
			4.5	5.1	11.8	24.9	15.5	0.62	1.17	28.9	21.3	19.9	1.48	14.8	100.7	3.93	
		60	2.3	1.5	3.5	22.0	14.6	0.66	1.38	26.7	15.9	20.5	1.51	15.4	101.7	3.99	
			3.4	3.0	7.0	22.8	14.8	0.65	1.33	27.3	17.1	21.6	1.55	16.3	103.3	4.07	
			4.5	4.9	11.4	23.6	15.1	0.64	1.28	28.0	18.4	22.6	1.60	17.2	104.9	4.15	
		70	2.3	1.5	3.4	20.5	14.1	0.69	1.50	25.7	13.7	23.0	1.61	17.5	105.5	4.17	
			3.4	2.9	6.8	21.3	14.4	0.68	1.45	26.2	14.7	24.2	1.66	18.5	107.3	4.26	
			4.5	4.8	11.0	22.0	14.6	0.66	1.40	26.8	15.8	25.3	1.71	19.5	109.1	4.34	
		80	2.3	1.4	3.3	19.0	13.6	0.72	1.63	24.5	11.7	25.5	1.72	19.6	109.3	4.33	
			3.4	2.8	6.5	19.6	13.8	0.70	1.57	25.0	12.5	26.8	1.77	20.7	111.3	4.42	
			4.5	4.6	10.6	20.3	14.1	0.69	1.51	25.5	13.5	28.1	1.83	21.8	113.3	4.50	
		90	2.3	1.4	3.2	17.5	13.0	0.74	1.75	23.4	10.0	27.9	1.83	21.7	113.1	4.47	
			3.4	2.7	6.3	18.1	13.2	0.73	1.69	23.9	10.7	29.4	1.88	22.9	115.3	4.56	
			4.5	4.4	10.3	18.7	13.4	0.72	1.62	24.3	11.5	30.8	1.94	24.2	117.5	4.65	
		100	2.3	1.3	3.1	16.2	12.4	0.76	1.87	22.6	8.7	Operation Not Recommended					
			3.4	2.6	6.1	16.8	12.6	0.75	1.80	23.0	9.3						
			4.5	4.3	9.9	17.4	12.8	0.74	1.74	23.3	10.0						
		110	2.3	1.3	3.0	15.4	11.7	0.76	1.99	22.2	7.7						
			3.4	2.5	5.8	15.9	11.8	0.74	1.92	22.5	8.3						
			4.5	4.1	9.5	16.5	12.0	0.73	1.85	22.8	8.9						

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.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data

GR H/V 024

800 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btu/h

*WPD Adder for Motorized Valve, GR H/V 024 (Cv = 3.5, MOPD = 25 psi)	EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F					
			PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
	20	6.0	9.2	21.3	Operation Not Recommended					13.4	1.34	8.9	85.5	2.94	
GPM	30	3.0	2.7	6.2	29.8	19.3	0.65	1.12	33.6	26.5	13.6	1.37	8.9	85.7	2.91
		4.5	5.4	12.5	30.2	19.4	0.64	1.08	33.9	28.1	14.0	1.39	9.2	86.2	2.94
		6.0	8.9	20.6	30.7	19.6	0.64	1.03	34.2	29.9	14.4	1.42	9.5	86.7	2.97
3.0	40	3.0	2.6	6.0	28.3	19.5	0.69	1.34	32.9	21.1	16.2	1.50	11.1	88.7	3.16
		4.5	5.3	12.1	28.8	19.6	0.68	1.28	33.2	22.4	16.7	1.53	11.5	89.3	3.19
		6.0	8.7	20.0	29.2	19.8	0.68	1.23	33.4	23.8	17.2	1.56	11.8	89.9	3.22
4.5	50	3.0	2.5	5.8	27.0	18.9	0.70	1.49	32.1	18.2	19.7	1.66	14.1	92.8	3.47
		4.5	5.1	11.8	27.5	19.0	0.69	1.42	32.3	19.3	20.3	1.70	14.5	93.5	3.51
		6.0	8.4	19.4	27.9	19.2	0.69	1.36	32.5	20.5	20.9	1.73	15.0	94.2	3.55
6.0	60	3.0	2.4	5.6	25.7	18.0	0.70	1.62	31.3	15.9	23.4	1.83	17.2	97.1	3.76
		4.5	4.9	11.4	26.1	18.2	0.69	1.55	31.4	16.9	24.1	1.86	17.8	97.9	3.80
		6.0	8.1	18.8	26.5	18.3	0.69	1.48	31.6	17.9	24.9	1.90	18.4	98.8	3.84
7.0	70	3.0	2.4	5.4	24.4	17.3	0.71	1.77	30.4	13.8	26.5	1.96	19.8	100.7	3.96
		4.5	4.8	11.0	24.8	17.4	0.70	1.69	30.5	14.6	27.3	2.00	20.5	101.6	4.01
		6.0	7.9	18.2	25.1	17.5	0.70	1.62	30.7	15.5	28.1	2.03	21.2	102.6	4.05
8.0	80	3.0	2.3	5.2	23.0	16.8	0.73	1.95	29.6	11.8	28.2	2.04	21.3	102.7	4.05
		4.5	4.6	10.6	23.3	16.9	0.73	1.87	29.7	12.5	29.1	2.08	22.0	103.6	4.10
		6.0	7.6	17.5	23.7	17.1	0.72	1.78	29.8	13.3	29.9	2.12	22.7	104.6	4.14
9.0	90	3.0	2.2	5.1	21.6	16.6	0.77	2.15	28.9	10.1	27.7	2.03	20.8	102.1	4.00
		4.5	4.4	10.3	21.9	16.7	0.76	2.06	29.0	10.7	28.6	2.07	21.5	103.1	4.04
		6.0	7.3	16.9	22.3	16.8	0.76	1.97	29.0	11.3	29.4	2.11	22.2	104.0	4.08
10.0	100	3.0	2.1	4.9	20.4	16.4	0.80	2.33	28.4	8.7	Operation Not Recommended				
		4.5	4.3	9.9	20.7	16.5	0.80	2.24	28.3	9.3					
		6.0	7.1	16.3	21.0	16.6	0.79	2.14	28.3	9.8					
11.0	110	3.0	2.0	4.7	19.6	15.7	0.80	2.45	27.9	8.0	Operation Not Recommended				
		4.5	4.1	9.5	19.9	15.9	0.80	2.35	27.9	8.5					
		6.0	6.8	15.7	20.2	16.0	0.79	2.24	27.8	9.0					

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

**Performance Data
GR H/V 030**

1000 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 030 (Cv = 5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
		20	7.5	4.5	10.3	Operation Not Recommended					17.2	1.69	11.5	86.0	2.98		
GPM	WPD Adder	30	3.8	1.3	3.0	39.6	28.7	0.72	1.46	44.6	27.1	18.9	1.77	12.8	87.5	3.13	
	PSI		5.5	2.5	5.8	40.9	29.2	0.71	1.41	45.7	29.0	19.5	1.80	13.4	88.1	3.18	
	FT		7.5	4.3	10.0	42.2	29.8	0.71	1.36	46.9	31.1	20.2	1.83	14.0	88.7	3.24	
3.8	0.58	1.33	40	3.8	1.3	2.9	34.6	25.5	0.74	1.59	40.1	21.8	21.9	1.90	15.5	90.3	3.38
5.5	1.21	2.80		5.5	2.4	5.6	35.8	26.0	0.73	1.53	41.0	23.4	22.7	1.93	16.1	91.0	3.44
7.5	2.25	5.20		7.5	4.2	9.7	37.0	26.5	0.72	1.48	42.0	25.0	23.5	1.96	16.8	91.8	3.50
		50	3.8	1.2	2.8	31.5	23.6	0.75	1.75	37.4	18.0	25.2	2.03	18.3	93.4	3.64	
			5.5	2.4	5.4	32.5	24.1	0.74	1.68	38.3	19.3	26.1	2.07	19.1	94.2	3.70	
			7.5	4.1	9.4	33.6	24.5	0.73	1.62	39.1	20.7	27.0	2.10	19.8	95.0	3.77	
		60	3.8	1.2	2.7	29.6	22.5	0.76	1.92	36.1	15.4	28.6	2.16	21.2	96.4	3.88	
			5.5	2.3	5.3	30.5	23.0	0.75	1.86	36.9	16.4	29.6	2.20	22.1	97.4	3.95	
			7.5	3.9	9.1	31.5	23.4	0.74	1.79	37.6	17.6	30.6	2.23	23.0	98.3	4.01	
		70	3.8	1.1	2.7	28.4	22.0	0.77	2.11	35.6	13.4	31.9	2.28	24.1	99.5	4.10	
			5.5	2.2	5.1	29.4	22.4	0.76	2.04	36.3	14.4	33.0	2.32	25.1	100.5	4.17	
			7.5	3.8	8.8	30.3	22.9	0.75	1.97	37.0	15.4	34.1	2.36	26.1	101.6	4.24	
		80	3.8	1.1	2.6	27.6	21.7	0.78	2.31	35.5	12.0	35.0	2.39	26.9	102.4	4.30	
			5.5	2.1	4.9	28.5	22.1	0.77	2.23	36.1	12.8	36.2	2.43	27.9	103.5	4.37	
			7.5	3.7	8.5	29.5	22.5	0.76	2.15	36.8	13.7	37.5	2.47	29.0	104.7	4.45	
		90	3.8	1.1	2.5	26.6	21.2	0.80	2.50	35.1	10.6	37.9	2.48	29.4	105.0	4.47	
			5.5	2.1	4.7	27.5	21.6	0.79	2.41	35.7	11.4	39.2	2.52	30.6	106.3	4.55	
			7.5	3.6	8.2	28.4	22.0	0.78	2.32	36.3	12.2	40.5	2.56	31.8	107.5	4.63	
		100	3.8	1.0	2.4	24.8	20.4	0.82	2.69	34.0	9.2	Operation Not Recommended					
			5.5	2.0	4.6	25.7	20.8	0.81	2.60	34.5	9.9						
			7.5	3.4	7.9	26.5	21.2	0.80	2.50	35.0	10.6						
		110	3.8	1.0	2.3	21.9	18.9	0.87	2.88	31.7	7.6						
			5.5	1.9	4.4	22.6	19.3	0.85	2.77	32.1	8.1						
			7.5	3.3	7.6	23.3	19.7	0.84	2.67	32.4	8.7						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Genesis Standard (GR) Series

Rev.: 05/23/07D

Performance Data

GR H/V 036

1200 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btu/h

*WPD Adder for Motorized Valve, GR H/V 036 (Cv = 5, MOPD = 25 psi)	EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
			PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
	20	9.0	3.9	8.9	Operation Not Recommended					20.2	2.09	13.1	85.6	2.84		
GPM	WPD Adder	4.5	0.9	2.1	41.1	28.2	0.69	1.94	47.7	21.2	22.9	2.20	15.4	87.7	3.05	
		6.8	2.1	4.9	41.8	28.4	0.68	1.89	48.3	22.2	23.6	2.24	16.0	88.2	3.09	
		9.0	3.7	8.6	42.6	28.6	0.67	1.83	48.8	23.3	24.3	2.28	16.5	88.8	3.12	
4.5 0.81 1.87			6.8 1.85 4.27			9.0 3.24 7.48										
	40	4.5	0.9	2.1	39.2	28.5	0.73	2.05	46.2	19.1	27.0	2.39	18.9	90.9	3.32	
		6.8	2.1	4.8	39.9	28.7	0.72	1.99	46.6	20.0	27.9	2.44	19.6	91.5	3.36	
		9.0	3.6	8.4	40.5	28.9	0.71	1.93	47.1	21.0	28.7	2.48	20.3	92.2	3.39	
	50	4.5	0.9	2.0	38.0	28.1	0.74	2.23	45.6	17.1	31.4	2.58	22.5	94.2	3.56	
		6.8	2.0	4.6	38.7	28.3	0.73	2.16	46.1	17.9	32.4	2.64	23.4	95.0	3.60	
		9.0	3.5	8.1	39.4	28.5	0.72	2.10	46.5	18.7	33.3	2.69	24.2	95.7	3.64	
	60	4.5	0.8	1.9	37.0	27.3	0.74	2.43	45.3	15.2	35.7	2.78	26.3	97.6	3.76	
		6.8	1.9	4.5	37.7	27.5	0.73	2.36	45.7	16.0	36.9	2.84	27.2	98.4	3.81	
		9.0	3.4	7.9	38.3	27.7	0.72	2.29	46.1	16.8	38.0	2.89	28.1	99.3	3.85	
	70	4.5	0.8	1.9	35.8	26.4	0.74	2.62	44.7	13.7	40.1	2.98	29.9	100.9	3.94	
		6.8	1.9	4.3	36.4	26.6	0.73	2.54	45.1	14.3	41.4	3.04	31.0	101.9	3.99	
		9.0	3.3	7.6	37.0	26.8	0.72	2.46	45.4	15.0	42.6	3.10	32.1	102.9	4.03	
	80	4.5	0.8	1.8	34.1	25.5	0.75	2.78	43.6	12.2	44.4	3.17	33.5	104.2	4.10	
		6.8	1.8	4.2	34.7	25.7	0.74	2.70	43.9	12.8	45.8	3.23	34.7	105.3	4.15	
		9.0	3.2	7.3	35.3	25.9	0.73	2.62	44.2	13.5	47.2	3.30	35.9	106.4	4.19	
	90	4.5	0.8	1.7	32.0	24.7	0.77	2.96	42.1	10.8	48.6	3.36	37.1	107.5	4.24	
		6.8	1.7	4.0	32.6	24.9	0.76	2.87	42.4	11.4	50.1	3.43	38.4	108.7	4.28	
		9.0	3.1	7.1	33.1	25.1	0.76	2.78	42.6	11.9	51.6	3.49	39.7	109.8	4.33	
	100	4.5	0.7	1.7	29.9	23.9	0.80	3.17	40.7	9.4	Operation Not Recommended					
		6.8	1.7	3.9	30.4	24.1	0.79	3.08	41.0	9.9						
		9.0	3.0	6.8	31.0	24.3	0.78	2.99	41.2	10.4						
	110	4.5	0.7	1.6	28.3	23.1	0.82	3.51	40.3	8.1						
		6.8	1.6	3.7	28.8	23.3	0.81	3.40	40.5	8.5						
		9.0	2.8	6.6	29.3	23.4	0.80	3.30	40.6	8.9						

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.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

**Performance Data
GR H/V 042**

1400 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 042 (Cv = 5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
		20	10.5	5.3	12.2	Operation Not Recommended					24.4	2.37	16.3	86.1	3.02		
GPM	WPD Adder	30	5.3	1.3	3.0	47.6	33.2	0.70	2.10	54.8	22.7	28.5	2.54	19.8	88.8	3.29	
	PSI		7.9	2.9	6.6	48.1	33.4	0.69	2.03	55.0	23.7	29.2	2.57	20.5	89.3	3.33	
	FT		10.5	5.1	11.8	48.6	33.6	0.69	1.97	55.3	24.7	30.0	2.61	21.1	89.8	3.37	
5.3	1.12	2.60	40	5.3	1.2	2.9	48.0	33.6	0.70	2.35	56.0	20.4	33.5	2.75	24.1	92.1	3.56
7.9	2.50	5.77		7.9	2.8	6.4	48.5	33.8	0.70	2.27	56.2	21.3	34.4	2.79	24.8	92.7	3.61
10.5	4.41	10.19		10.5	5.0	11.4	49.0	34.1	0.70	2.20	56.5	22.2	35.3	2.83	25.6	93.3	3.65
		50	5.3	1.2	2.8	47.3	33.4	0.71	2.56	56.0	18.5	38.1	2.95	28.1	95.2	3.79	
GPM	WPD Adder		7.9	2.7	6.2	47.8	33.7	0.70	2.48	56.3	19.3	39.1	2.99	28.9	95.9	3.84	
	PSI		10.5	4.8	11.1	48.3	33.9	0.70	2.40	56.5	20.1	40.2	3.03	29.8	96.6	3.88	
	FT		5.3	1.2	2.7	45.8	32.7	0.72	2.77	55.2	16.5	42.4	3.12	31.8	98.1	3.98	
5.3	1.12	2.60	60	7.9	2.6	6.0	46.2	33.0	0.71	2.69	55.4	17.2	43.6	3.16	32.8	98.8	4.03
7.9	2.50	5.77		10.5	4.6	10.7	46.7	33.2	0.71	2.60	55.6	18.0	44.7	3.21	33.8	99.6	4.08
10.5	4.41	10.19		5.3	1.1	2.6	43.6	31.7	0.73	3.00	53.8	14.5	46.4	3.27	35.2	100.7	4.15
		70	7.9	2.5	5.8	44.0	31.9	0.72	2.91	54.0	15.1	47.6	3.32	36.3	101.5	4.21	
GPM	WPD Adder		10.5	4.5	10.4	44.5	32.1	0.72	2.82	54.1	15.8	48.9	3.36	37.4	102.3	4.26	
	PSI		5.3	1.1	2.5	41.0	30.4	0.74	3.26	52.1	12.6	50.0	3.40	38.4	103.1	4.30	
	FT		7.9	2.4	5.6	41.4	30.6	0.74	3.16	52.2	13.1	51.4	3.45	39.6	104.0	4.36	
5.3	1.12	2.60	80	10.5	4.3	10.0	41.8	30.8	0.74	3.06	52.2	13.7	52.7	3.50	40.8	104.9	4.41
7.9	2.50	5.77		5.3	1.1	2.4	38.2	29.0	0.76	3.52	50.2	10.8	53.3	3.52	41.3	105.3	4.44
10.5	4.41	10.19		7.9	2.4	5.4	38.5	29.2	0.76	3.42	50.2	11.3	54.8	3.57	42.6	106.2	4.50
		90	10.5	4.2	9.7	38.9	29.4	0.75	3.31	50.2	11.8	56.2	3.61	43.9	107.2	4.56	
GPM	WPD Adder		5.3	1.0	2.3	35.4	27.7	0.78	3.78	48.2	9.4	Operation Not Recommended					
	PSI		7.9	2.3	5.3	35.7	27.9	0.78	3.66	48.2	9.8						
	FT		10.5	4.0	9.3	36.1	28.1	0.78	3.55	48.2	10.2						
5.3	1.12	2.60	100	5.3	1.0	2.3	32.8	26.8	0.82	3.98	46.4	8.3					
7.9	2.50	5.77		7.9	2.2	5.1	33.2	27.0	0.81	3.86	46.3	8.6					
10.5	4.41	10.19		10.5	3.9	9.0	33.5	27.2	0.81	3.73	46.2	9.0					

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data

GR H/V 048

1600 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 048 (Cv = 5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F					
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
20	12.0	7.6	17.6	Operation Not Recommended					29.6	2.96	19.5	87.1	2.93			
GPM	6.0	2.5	5.8	51.6	35.5	0.69	2.49	60.1	20.7	33.5	3.01	23.2	89.4	3.26		
	9.0	4.7	10.9	52.5	35.0	0.67	2.42	60.8	21.7	34.4	3.07	23.9	89.9	3.28		
	12.0	7.4	17.1	53.4	34.6	0.65	2.35	61.4	22.8	35.2	3.14	24.5	90.4	3.29		
6.0	1.44	3.33														
9.0	3.24	7.48														
12.0	5.76	13.31														
40	6.0	2.4	5.6	55.4	38.6	0.70	2.76	64.8	20.1	38.7	3.23	27.7	92.4	3.51		
	9.0	4.6	10.6	56.3	38.1	0.68	2.68	65.5	21.0	39.7	3.30	28.5	93.0	3.53		
	12.0	7.2	16.6	57.3	37.6	0.66	2.60	66.1	22.1	40.7	3.37	29.2	93.6	3.54		
50	6.0	2.3	5.4	55.0	39.3	0.71	3.01	65.2	18.2	44.4	3.48	32.6	95.7	3.74		
	9.0	4.4	10.2	55.9	38.8	0.69	2.92	65.9	19.1	45.6	3.56	33.5	96.4	3.76		
	12.0	7.0	16.1	56.8	38.2	0.67	2.83	66.5	20.1	46.8	3.63	34.4	97.1	3.77		
60	6.0	2.3	5.2	52.6	38.5	0.73	3.27	63.8	16.1	50.9	3.75	38.1	99.4	3.97		
	9.0	4.3	9.9	53.5	38.0	0.71	3.17	64.3	16.9	52.2	3.83	39.1	100.2	3.99		
	12.0	6.7	15.6	54.4	37.5	0.69	3.08	64.9	17.7	53.6	3.91	40.2	101.0	4.01		
70	6.0	2.2	5.1	49.8	37.2	0.75	3.53	61.9	14.1	57.6	4.03	43.9	103.4	4.19		
	9.0	4.1	9.6	50.7	36.7	0.72	3.43	62.4	14.8	59.2	4.12	45.1	104.2	4.21		
	12.0	6.5	15.1	51.5	36.2	0.70	3.32	62.9	15.5	60.7	4.20	46.3	105.1	4.23		
80	6.0	2.1	4.9	47.4	35.8	0.76	3.81	60.4	12.4	63.8	4.31	49.1	106.9	4.34		
	9.0	4.0	9.3	48.2	35.3	0.73	3.70	60.8	13.0	65.5	4.41	50.5	107.9	4.36		
	12.0	6.3	14.6	49.0	34.8	0.71	3.59	61.3	13.7	67.2	4.50	51.8	108.9	4.38		
90	6.0	2.0	4.7	45.5	34.5	0.76	4.10	59.4	11.1	68.0	4.60	52.3	109.4	4.33		
	9.0	3.9	8.9	46.2	34.0	0.74	3.98	59.8	11.6	69.8	4.70	53.8	110.4	4.35		
	12.0	6.1	14.0	47.0	33.5	0.71	3.86	60.2	12.2	71.6	4.80	55.2	111.4	4.37		
100	6.0	2.0	4.5	43.3	33.1	0.76	4.39	58.3	9.9	Operation Not Recommended						
	9.0	3.7	8.6	44.1	32.6	0.74	4.26	58.6	10.3							
	12.0	5.9	13.5	44.8	32.2	0.72	4.13	58.9	10.8							
110	6.0	1.9	4.4	39.6	31.3	0.79	4.68	55.6	8.5							
	9.0	3.6	8.3	40.3	30.9	0.77	4.54	55.8	8.9							
	12.0	5.6	13.0	41.0	30.4	0.74	4.40	56.0	9.3							

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data
GR H/V 060

2000 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

*WPD Adder for Motorized Valve, GR H/V 060 (Cv = 5, MOPD = 25 psi)		EWT °F	GPM	*WPD		Cooling - EAT 80/67°F					Heating - EAT 70°F						
				PSI	FT	TC	SC	Sens/Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP	
		20	15.0	10.8	25.0	Operation Not Recommended					38.5	3.91	25.1	87.8	2.88		
GPM	WPD Adder	30	7.5	3.5	8.2	54.2	37.6	0.69	3.29	65.4	16.5	43.1	3.97	29.6	90.0	3.18	
	PSI		11.3	6.7	15.6	54.3	37.7	0.69	3.18	65.2	17.1	43.8	4.01	30.1	90.3	3.20	
	FT		15.0	10.5	24.3	54.5	37.8	0.69	3.08	65.0	17.7	44.5	4.04	30.7	90.6	3.22	
7.5	2.25	5.20	40	7.5	3.4	7.9	62.6	44.3	0.71	3.64	75.0	17.2	49.3	4.12	35.2	92.8	3.51
11.3	5.11	11.80		11.3	6.5	15.1	62.7	44.5	0.71	3.52	74.7	17.8	50.1	4.15	35.9	93.2	3.53
15.0	9.00	20.79		15.0	10.2	23.6	62.9	44.6	0.71	3.40	74.5	18.5	50.8	4.19	36.5	93.5	3.55
		50	7.5	3.3	7.7	65.3	47.0	0.72	3.93	78.7	16.6	55.8	4.28	41.2	95.8	3.82	
			11.3	6.3	14.6	65.5	47.2	0.72	3.80	78.4	17.2	56.7	4.32	41.9	96.2	3.84	
			15.0	9.9	22.9	65.6	47.3	0.72	3.68	78.2	17.8	57.6	4.36	42.7	96.7	3.87	
		60	7.5	3.2	7.4	64.8	47.3	0.73	4.21	79.2	15.4	62.4	4.46	47.2	98.9	4.10	
			11.3	6.1	14.2	65.0	47.5	0.73	4.07	78.9	16.0	63.4	4.50	48.1	99.4	4.13	
			15.0	9.6	22.1	65.2	47.6	0.73	3.94	78.6	16.6	64.4	4.54	48.9	99.8	4.16	
		70	7.5	3.1	7.2	63.0	46.5	0.74	4.50	78.3	14.0	68.6	4.63	52.8	101.7	4.34	
			11.3	5.9	13.7	63.1	46.7	0.74	4.36	78.0	14.5	69.6	4.67	53.7	102.2	4.37	
			15.0	9.3	21.4	63.3	46.8	0.74	4.21	77.6	15.0	70.7	4.72	54.6	102.7	4.39	
		80	7.5	3.0	6.9	60.7	45.4	0.75	4.83	77.2	12.6	73.3	4.77	57.1	104.0	4.51	
			11.3	5.7	13.2	60.9	45.5	0.75	4.67	76.8	13.0	74.5	4.81	58.1	104.5	4.54	
			15.0	8.9	20.7	61.0	45.6	0.75	4.52	76.5	13.5	75.7	4.85	59.1	105.0	4.57	
		90	7.5	2.9	6.7	58.6	44.3	0.76	5.22	76.4	11.2	75.6	4.82	59.1	105.0	4.59	
			11.3	5.5	12.8	58.7	44.4	0.76	5.05	76.0	11.6	76.8	4.87	60.2	105.6	4.62	
			15.0	8.6	19.9	58.9	44.5	0.76	4.88	75.5	12.1	78.0	4.91	61.2	106.1	4.65	
		100	7.5	2.8	6.5	56.3	43.1	0.77	5.67	75.6	9.9	Operation Not Recommended					
			11.3	5.3	12.3	56.4	43.3	0.77	5.49	75.2	10.3						
			15.0	8.3	19.2	56.6	43.4	0.77	5.30	74.7	10.7						
		110	7.5	2.7	6.2	52.9	41.4	0.78	6.21	74.1	8.5						
			11.3	5.1	11.8	53.0	41.5	0.78	6.00	73.5	8.8						
			15.0	8.0	18.5	53.2	41.7	0.78	5.80	73.0	9.2						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.

ARI/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 ARI/ISO conditions.

All performance is based upon the lower voltage of dual voltage rated units.

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

Operation below 40°F EWT is based upon a 15% antifreeze solution.

Operation below 60°F EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

See Performance Data Selection Notes for operation in the shaded areas.

Performance Data Correction Tables

Air Flow Correction Table

Airflow	Cooling				Heating			
	% of Rated	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
75%	0.962	0.873	0.962	0.961	0.957	1.061	0.922	
81%	0.974	0.906	0.971	0.972	0.968	1.040	0.946	
88%	0.985	0.938	0.980	0.983	0.979	1.020	0.970	
94%	0.993	0.969	0.990	0.992	0.989	1.010	0.985	
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
106%	1.007	1.034	1.010	1.008	1.011	0.997	1.015	
113%	1.014	1.068	1.019	1.016	1.021	0.994	1.030	

Entering Air Correction Table

Heating				Cooling										
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction	Entering Air WB°F	Total Capacity	Sensible Cooling Capacity Multiplier - Entering DB °F						Power	Heat of Rejection	
						70	75	80	80.6	85	90	95		
60	1.065	0.937	1.112	60	0.848	0.882	1.044	1.169	1.203	*	*	*	0.994	0.869
65	1.024	0.971	1.044	65	0.971	0.633	0.861	1.070	1.083	1.272	*	*	0.996	0.969
68	1.005	0.990	1.011	66.2	0.996	0.574	0.817	1.030	1.065	1.228	*	*	0.998	0.990
70	1.000	1.000	1.000	67	1.000	0.534	0.788	1.000	1.017	1.198	1.314	1.360	1.000	1.000
75	0.985	1.026	0.970	70	1.030		0.678	0.863	0.900	1.082	1.210	1.300	1.003	1.019
80	0.972	1.052	0.944	75	1.065			0.548	0.653	0.880	1.036	1.201	1.008	1.047

* = Sensible capacity equals total capacity

ARI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6°F DB/66.2°F WB, 1 and Heating - 68°F DB/59°F WB entering air temperature

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	

Genesis Standard (GR) Series

Rev.: 05/23/07D

Blower Performance Data

Model	Fan Speed	Rated Airflow	Min CFM	Airflow (cfm) at External Static Pressure (in. wg)															
				0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	0.70	0.80	0.90	1.00
GRH 006	HI	200	150	300	290	280	270	260	250	240	225	210	185	160					
	MED	200	150	240	230	220	210	200	190	180	160								
	LOW	200	150	220	210	200	195	190	175	160									
GRH/V 009	HI	300	225	450	440	430	415	400	385	370	345	320	310	300	230				
	MED	300	225	410	400	390	375	360	350	340	325	310	290	270					
	LOW	300	225	370	360	350	335	320	315	310	295	280	260	240					
GRH/V 012	HI	375	300	470	460	450	440	430	415	400	390	380	365	350	330				
	MED	375	300	410	395	380	370	360	355	350	340	330	320	310					
	LOW	375	300	340	330	320	315	310	305	300									
GRH/V 015	HI	500	375	750	730	710	695	680	655	630	600	570	535	500	400				
	MED	500	375	660	640	620	605	590	570	550	525	500	470	440					
	LOW	500	375	580	565	550	535	520	500	480	455	430	400						
GRH/V 019	HI	600	450	850	820	790	765	740	705	670	635	600	560	520	450				
	MED	600	450	700	680	660	640	620	590	560	530	500	470						
	LOW	600	450	600	580	560	535	510	485	460									
GRH/V 024	HI	800	600						860	825	790	755	720	680	640				
	MED	800	600	850	825	800	770	740	715	690	655	620							
	LOW	800	600	700	680	660	645	630	610										
GRH/V 030	HI	1000	750	1330	1295	1260	1225	1190	1145	1100	1050	1000	960	920	830				
	MED	1000	750	1210	1185	1160	1130	1100	1050	1000	965	930	880	830					
	LOW	1000	750	1050	1030	1010	980	950	920	890	850	810	770						
GRH/V 036	HI	1200	900								1325	1280	1240	1200	1090	940			
	MED	1200	900			1340	1310	1280	1250	1220	1185	1150	1100	1050	920				
	LOW	1200	900	1100	1080	1060	1035	1010	980	950	920								
GRH/V 042	HI	1400	1050	1790	1760	1730	1695	1660	1625	1590	1550	1510	1475	1440	1370	1270	1120		
	MED	1400	1050	1500	1485	1470	1445	1420	1400	1380	1350	1320	1295	1270	1180	1070			
	LOW	1400	1050	1110	1100	1090	1075	1060	1050										
GRH/V 048	HI	1600	1200					1840	1795	1750	1725	1700	1650	1600	1540	1480	1380	1300	
	MED	1600	1200	1830	1785	1740	1700	1660	1615	1570	1535	1500	1450	1400	1320	1210			
	LOW	1600	1200	1700	1670	1640	1600	1560	1525	1490	1460	1430	1385	1340	1250				
GRH/V 048	HS HI	1600	1200								1800	1750	1690	1580	1440	1270			
	HS MED	1600	1200							1870	1820	1740	1650	1640	1620	1530	1320	1220	
	HS LOW	1600	1200					1840	1810	1770	1710	1650	1620	1580	1460	1340			
GRH/V 060	HI	2000	1500	2230	2215	2200	2160	2120	2090	2060	2035	2010	1985	1960	1880	1790	1660		
	MED	2000	1500	2040	2015	1990	1965	1940	1915	1890	1860	1830	1805	1780	1710	1620			
	LOW	2000	1500	1840	1825	1810	1795	1780	1755	1730	1700	1670	1635	1600	1510				

Black areas denote ESP where operation is not recommended

Units factory shipped on medium speed, other speeds require field selection

All airflow is rated at lowest Voltage if unit is dual Voltage rated, e.g. 208V for 208-230V units

All units ARI/ISO/ASHRAE 13256-1 rated on high fan speed

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

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

Physical Data

Model	006	009	012	015	019	024	030	036	042	048	060	
Compressor (1 Each)	Rotary				Reciprocating							
Factory Charge R22 (oz) [kg]	12 [.34]	15 [.43]	15 [.43]	30 [.85]	30 [.85]	30 [.85]	41 [1.16]	44 [1.25]	46 [1.30]	54 [1.53]	80 [2.26]	
PSC Fan Motor & Blower (3 Speeds)												
Fan Motor (hp) [W]	1/25 [30]	1/10 [75]	1/10 [75]	1/6 [124]	1/5 [150]	1/3 [250]	1/2 [373]	3/4 [560]	3/4 [560]	3/4 [560]	1 [746]	
Blower Wheel Size (dia x w) - (in) [mm]	5 x 5 [127 x 127]	5 x 5 [127 x 127]	6 x 5 [152 x 127]	9 x 7 [229 x 178]	10 x 10 [254 x 254]	10 x 10 [254 x 254]	10 x 10 [254 x 254]	11 x 10 [279 x 254]				
Water Connection Size												
IPT (in)	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1	1	
Coax Volume												
Volume (US Gallons) [liters]	0.123 [0.47]	0.143 [0.54]	0.167 [0.63]	0.286 [1.08]	.45 [1.70]	.45 [1.70]	0.56 [2.12]	0.76 [2.88]	0.76 [2.88]	0.92 [3.48]	0.92 [3.48]	
Vertical Upflow												
Air Coil Dimensions (h x w) - (in) [mm]	10 x 16 [254 x 406]	10 x 16 [254 x 406]	10 x 16 [254 x 406]	16 x 16 [406 x 406]	16 x 16 [406 x 406]	16 x 16 [406 x 406]	20 x 20 [508 x 508]	20 x 20 [508 x 508]	28 x 20 [711 x 508]	28 x 20 [711 x 508]	28 x 25 [711 x 635]	
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	10 x 20 [254 x 508]	10 x 20 [254 x 508]	10 x 20 [254 x 508]	16 x 20 [406 x 508]	16 x 20 [406 x 508]	16 x 20 [406 x 508]	20 x 24 [508 x 610]	20 x 24 [508 x 610]	28 x 24 [711 x 610]	28 x 24 [711 x 610]	28 x 30 [711 x 762]	
Horizontal												
Air Coil Dimensions (h x w) - (in) [mm]	10 x 16 [254 x 406]	10 x 16 [254 x 406]	10 x 16 [254 x 406]	16 x 16 [406 x 406]	16 x 16 [406 x 406]	16 x 16 [406 x 406]	18 x 22 [457 x 559]	18 x 22 [457 x 559]	18 x 31 [457 x 787]	18 x 31 [457 x 787]	20 x 35 [508 x 889]	
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	10 x 20 [254 x 508]	10 x 20 [254 x 508]	10 x 20 [254 x 508]	16 x 20 [406 x 508]	16 x 20 [406 x 508]	16 x 20 [406 x 508]	18 x 24 [457 x 610]	18 x 24 [457 x 610]	(2) 18 x 18 [457 x 457]	(2) 18 x 18 [457 x 457]	1 - 12 x 20, 1 - 25 x 20 [305 x 508], [635 x 508]	
Weight - Operating, (lbs) [kg]	110 [50]	112 [51]	121 [55]	147 [67]	169 [77]	193 [88]	219 [100]	229 [104]	257 [117]	267 [121]	323 [147]	
Weight - Packaged, (lbs) [kg]	120 [55]	122 [56]	131 [60]	157 [72]	179 [82]	203 [93]	231 [105]	241 [110]	269 [124]	279 [127]	338 [254]	

All units have spring compressor mountings, and 1/2" [12.2mm] & 3/4" [19.0mm] electrical knockouts.

Genesis Standard (GR) Series

Rev.: 05/23/07D

GR - Horizontal

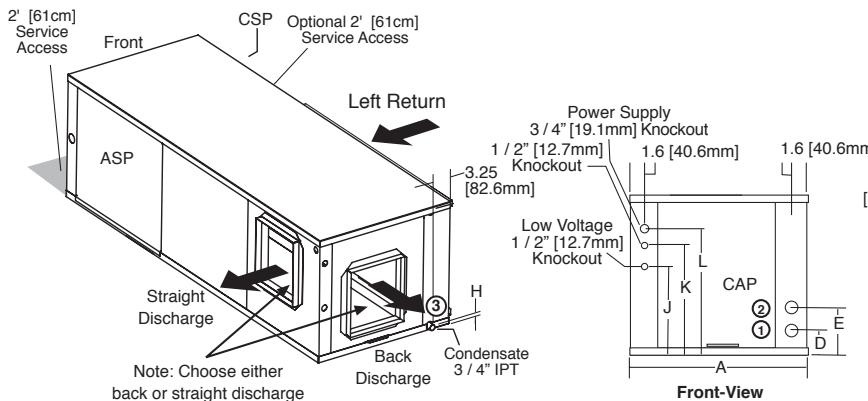
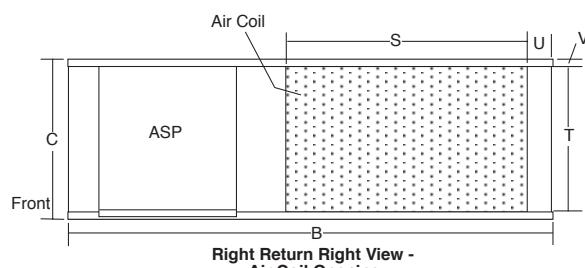
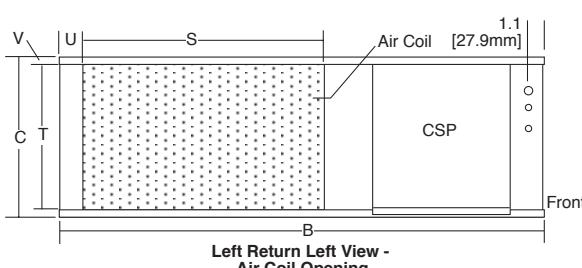
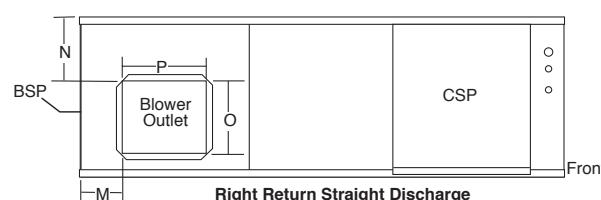
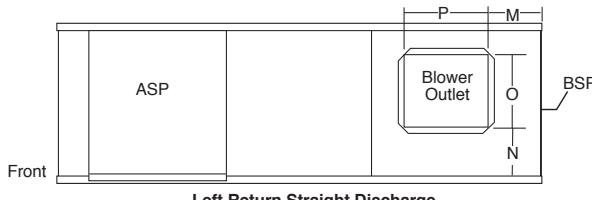
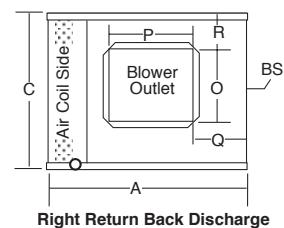
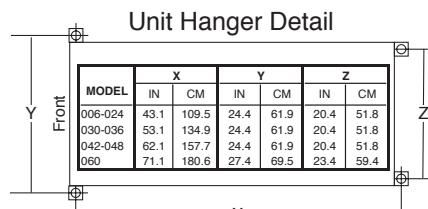
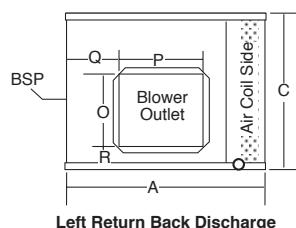
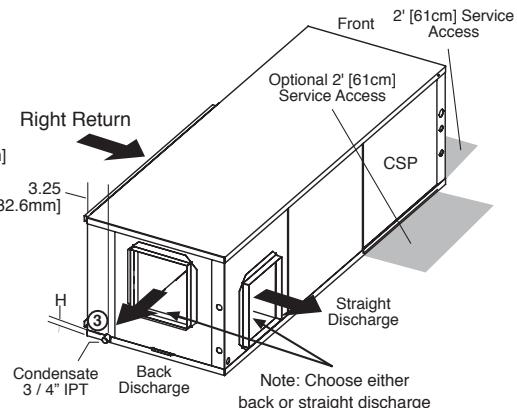
Dimensional Data

Horizontal Model		Overall Cabinet		
		A Width	B Length	C Height
009 - 012	in cm	22.4 56.8	43.1 109.5	11.3 28.7
015 - 024	in cm	22.4 56.8	43.1 109.5	17.3 43.9
030	in cm	22.4 56.8	53.2 135.1	19.3 49.0
036	in cm	22.4 56.8	53.2 135.1	19.3 49.0
042 - 048	in cm	22.4 56.8	62.2 158.0	19.3 49.0
060	in cm	25.4 64.5	71.2 180.8	21.3 54.1

Horizontal Model		Water Connections			
		1	2	3	
		Loop In D	Loop Out E	H	Size IPT
009 - 012	in cm	2.4 6.1	5.4 13.7	0.6 1.5	1/2"
015 - 024	in cm	2.4 6.1	4.9 12.4	0.6 1.5	3/4"
030	in cm	2.4 6.1	5.4 13.7	0.6 1.5	3/4"
036	in cm	2.4 6.1	5.4 13.7	0.6 1.5	3/4"
042 - 048	in cm	2.4 6.1	5.4 13.7	0.6 1.5	1"
060	in cm	2.4 6.1	5.4 13.7	0.6 1.5	1"

Horizontal Model		Electrical Knockouts			
		J 1/2"	K 1/2"	L 3/4"	
		Low Voltage	External Pump	Power Supply	
009 - 012	in cm	3.5 8.9	5.5 14.0	8.2 20.8	
015 - 024	in cm	3.5 8.9	7.5 19.1	10.2 25.9	
030	in cm	5.7 14.5	9.7 24.6	12.2 31.0	
036	in cm	5.7 14.5	9.7 24.6	12.2 31.0	
042 - 048	in cm	5.7 14.5	9.7 24.6	12.2 31.0	
060	in cm	8.1 20.6	11.7 29.7	14.2 36.1	

Horizontal Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening				
		M	N	O Supply Height	P Supply Width	Q	R	S Return Width	T Return Height	U	V
009 - 012	in cm	5.8 14.7	4.0 10.2	5.8 14.7	8.0 20.3	5.8 14.7	1.5 3.8	17.1 43.4	9.3 23.6	2.2 5.6	1.0 2.5
015 - 024	in cm	5.0 12.7	5.6 14.2	10.4 26.4	9.3 23.6	5.0 12.7	1.5 3.8	17.1 43.4	15.3 38.9	2.2 5.6	1.0 2.5
030	in cm	5.0 12.7	6.8 17.3	10.4 26.4	9.3 23.6	5.0 12.7	2.1 5.3	23.1 58.7	17.3 43.9	2.2 5.6	1.0 2.5
036	in cm	2.9 7.4	3.8 9.7	13.5 34.3	13.1 33.3	2.9 7.4	1.9 4.8	23.1 58.7	17.3 43.9	2.5 5.6	1.0 2.5
042 - 048	in cm	2.9 7.4	3.8 9.7	13.5 34.3	13.1 33.3	2.9 7.4	1.9 4.8	32.1 81.5	17.3 43.9	2.2 5.6	1.0 2.5
060	in cm	5.8 14.7	5.0 12.7	13.6 34.5	13.3 33.8	4.2 14.7	2.9 7.4	36.1 91.7	19.3 49.0	2.2 5.6	1.0 2.5

GR - Horizontal
Dimensional Data**LEFT RETURN****RIGHT RETURN**

Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Horizontal units shipped with filter bracket only. This bracket should be removed for return duct connection.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate is 3/4" IPT copper.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.

Legend:

CAP = Control Access Panel
BSP = Blower Service Panel
CSP = Compressor Access Panel
ASP = Alternative Service Panel

Genesis Standard (GR) Series

Rev.: 05/23/07D

GR - Vertical Upflow

Dimensional Data

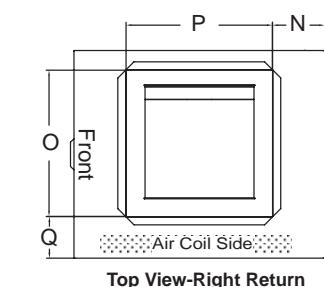
Vertical Upflow Model		Overall Cabinet		
		A Width	B Depth	C Height
009 - 012	in cm	22.4 56.8	21.6 54.9	22.6 54.7
015 - 024	in cm	22.4 56.8	21.6 54.9	34.6 87.9
030	in cm	22.4 56.8	25.6 65.1	40.6 103.1
036	in cm	22.4 56.8	25.6 65.1	40.6 103.1
042 - 048	in cm	22.4 56.8	25.6 65.1	48.6 123.4
060	in cm	25.4 64.5	30.6 77.8	50.6 128.5

Vertical Upflow Model		Water Connections			
		1	2	3	
Loop In D	Loop Out E	H	Size IPT		
009 - 012	in cm	2.6 6.6	5.4 13.7	7.8 19.8	1/2"
015 - 024	in cm	2.4 6.1	4.8 12.2	8.5 21.6	3/4"
030	in cm	2.4 6.1	5.4 13.7	9.7 24.6	3/4"
036	in cm	2.4 6.1	5.4 13.7	9.7 24.6	3/4"
042 - 048	in cm	2.4 6.1	5.4 13.7	9.7 24.6	1"
060	in cm	2.4 6.1	5.4 13.7	10.7 27.2	1"

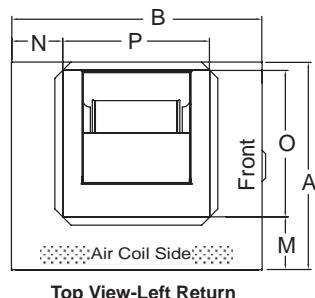
Vertical Upflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
Low Voltage	External Pump	Power Supply		
009 - 012	in cm	3.5 8.9	5.5 14.0	8.2 20.8
015 - 024	in cm	3.5 8.9	7.5 19.1	10.2 25.9
030	in cm	5.7 14.5	9.7 24.6	12.2 31.0
036	in cm	5.7 14.5	9.7 24.6	12.2 31.0
042 - 048	in cm	5.7 14.5	9.7 24.6	12.2 31.0
060	in cm	8.1 20.6	11.7 29.7	14.2 36.1

Vertical Upflow Model		Discharge Connection					Return Connection			
		Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Using Return Air Opening			
M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U		
009 - 012	in cm	10.6 26.9	6.8 17.3	5.8 14.7	8.0 20.3	6.0 15.2	2.2 5.6	17.1 43.4	9.3 23.6	1.0 2.5
015 - 024	in cm	7.2 18.3	3.8 9.7	14.0 35.6	14.0 35.6	4.3 10.9	2.2 5.6	17.1 43.4	15.3 38.9	1.0 2.5
030	in cm	7.2 18.3	5.8 14.7	14.0 35.6	14.0 35.6	4.3 10.9	2.5 5.6	21.1 53.6	19.2 48.8	1.0 2.5
036	in cm	7.2 18.3	5.8 14.7	14.0 35.6	14.0 35.6	4.3 10.9	2.2 5.6	21.1 53.6	19.2 48.8	1.0 2.5
042 - 048	in cm	7.2 18.3	5.8 14.7	14.0 35.6	14.0 35.6	4.3 10.9	2.2 5.6	21.1 53.6	27.2 69.1	1.0 2.5
060	in cm	6.2 15.7	6.3 16.0	18.0 45.7	18.0 45.7	5.1 13.1	2.2 5.6	26.1 66.3	27.2 69.1	1.0 2.5

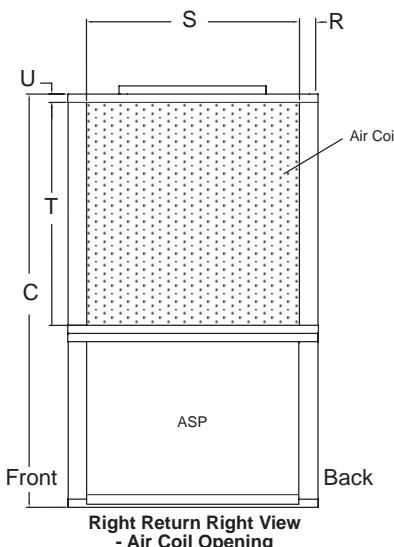
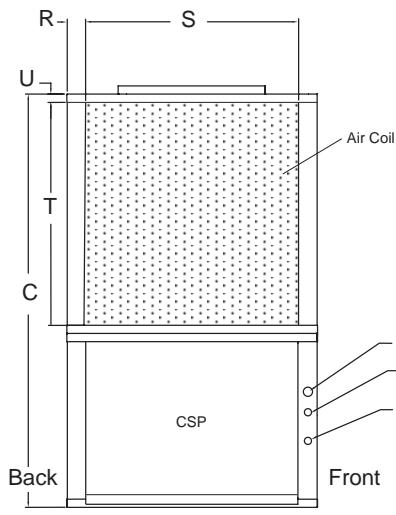
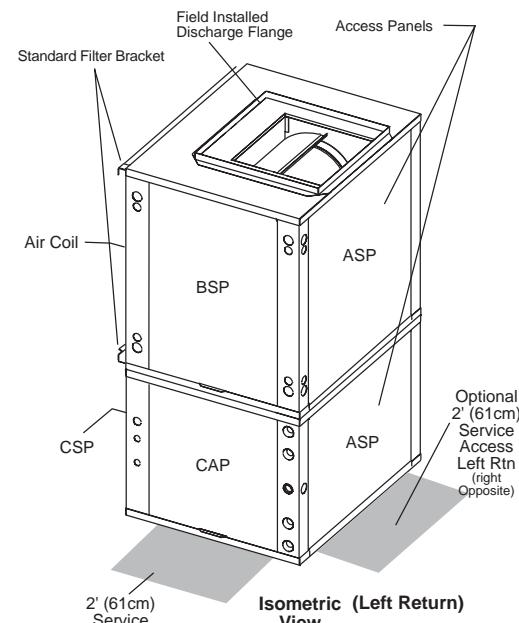
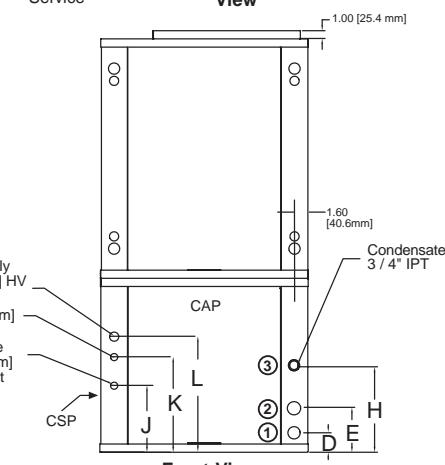
GR - Vertical Upflow Dimensional Data



Top View-Right Return



Top View-Left Return

Right Return Right View
- Air Coil OpeningLeft Return Left View
- Air Coil OpeningIsometric (Left Return)
View

Front-View

Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
3. Discharge flange is field installed.
4. Condensate is 3/4" IPT PVC and is switchable from front to side.

Legend:

- CAP = Control Access Panel
 BSP = Blower Service Panel
 CSP = Compressor Access Panel
 ASP = Alternative Service Panel

Corner Weights for GRH Series Units

Model		Total	Left-Front*	Right-Front*	Left-Back*	Right-Back*
GRH006	Lbs	110	30	24.5	30	25.5
	kg	49.90	13.61	11.11	13.61	11.57
GRH009	Lbs	112	30.5	25	30.5	26
	kg	50.80	13.83	11.34	13.83	11.79
GRH012	Lbs	121	33	27	33	28
	kg	54.88	14.97	12.25	14.97	12.70
GRH015	Lbs	147	40	33	40	34
	kg	66.68	18.14	14.97	18.14	15.42
GRH019	Lbs	169	46	38	46	39
	kg	76.66	20.87	17.24	20.87	17.69
GRH024	Lbs	193	52.5	43	52.5	45
	kg	87.54	23.81	19.50	23.81	20.41
GRH030	Lbs	219	60	49	60	50
	kg	99.34	27.22	22.23	27.22	22.68
GRH036	Lbs	229	62.5	51	62.5	53
	kg	103.87	28.35	23.13	28.35	24.04
GRH042	Lbs	257	70	57.5	70	59.5
	kg	116.57	31.75	26.08	31.75	26.99
GRH048	Lbs	267	72.5	60	72.5	62
	kg	121.11	32.89	27.22	32.89	28.12
GRH060	Lbs	323	88	72	88	75
	kg	146.51	39.92	32.66	39.92	34.02

*Front is control box end.

Electrical Data

All GR Units							Standard GR Units			GR Units with Secondary Pump				
Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/HACR	Pump FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/HACR
				QTY	RLA	LRA								
GRH/V 006	G	208-230/60/1	197/254	1	2.9	17.7	0.40	3.3	4.0	15	0.43	3.7	4.5	15
	E	265/60/1	239/292	1	2.5	15.0	0.40	2.9	3.5	15	N/A	N/A	N/A	N/A
GRH/V 009	G	208-230/60/1	197/254	1	3.9	22.2	0.80	4.7	5.7	15	0.43	5.1	6.1	15
	E	265/60/1	239/292	1	3.3	18.8	0.70	4.0	4.8	15	N/A	N/A	N/A	N/A
GRH/V 012	G	208-230/60/1	197/254	1	5.3	27.9	0.80	6.1	7.4	15	0.8	6.9	8.2	15
	E	265/60/1	239/292	1	4.2	22.2	0.70	4.9	6.0	15	0.7	5.6	6.7	15
GRH/V 015	G	208-230/60/1	197/254	1	5.9	29.0	1.00	6.9	8.4	15	0.43	7.3	8.8	15
	E	265/60/1	239/292	1	5.4	27.0	0.90	6.3	7.6	15	N/A	N/A	N/A	N/A
GRH/V 019	G	208-230/60/1	197/254	1	8.6	49.0	1.10	9.7	11.9	20	0.8	10.5	12.7	20
	E	265/60/1	239/292	1	8.1	44.0	0.90	9.0	11.0	15	0.7	9.7	11.7	15
GRH/V 024	G	208-230/60/1	197/254	1	9.6	50.0	1.30	10.9	13.3	20	0.8	11.7	14.1	20
	E	265/60/1	239/292	1	8.8	55.0	1.60	10.4	12.6	20	0.7	11.1	13.3	20
	H	208-230/60/3	197/254	1	6.7	51.0	1.30	8.0	9.7	15	0.8	8.8	10.5	15
	F	460/60/3	414/506	1	3.5	25.0	0.90	4.4	5.3	15	0.7	5.1	6.0	15
GRH/V 030	G	208-230/60/1	197/254	1	11.2	61.0	1.90	13.1	15.9	25	0.8	13.9	16.7	25
	E	265/60/1	239/292	1	9.8	58.0	1.70	11.5	14.0	20	0.7	12.2	14.7	20
	H	208-230/60/3	197/254	1	6.9	55.0	1.90	8.8	10.5	15	0.8	9.6	11.3	15
	F	460/60/3	414/506	1	3.6	28.0	1.00	4.6	5.5	15	0.7	5.3	6.2	15
GRH/V 036	G	208-230/60/1	197/254	1	14.4	82.0	3.00	17.4	21.0	35	0.8	18.2	21.8	35
	E	265/60/1	239/292	1	12.2	64.0	2.70	14.9	18.0	30	0.7	15.6	18.7	30
	H	208-230/60/3	197/254	1	9.4	65.5	3.00	12.4	14.8	20	0.8	13.2	15.6	20
	F	460/60/3	414/506	1	4.4	33.0	1.70	6.1	7.2	15	0.7	6.8	7.9	15
GRH/V 042	G	208-230/60/1	197/254	1	16.2	96.0	3.00	19.2	23.3	35	0.8	20.0	24.1	40
	H	208-230/60/3	197/254	1	10.3	75.0	3.00	13.3	15.9	25	0.8	14.1	16.7	25
	F	460/60/3	414/506	1	4.3	40.0	1.70	6.0	7.1	15	0.7	6.7	7.8	15
	N	575/60/3	518/633	1	3.7	31.0	1.50	5.2	6.0	15	N/A	N/A	N/A	N/A
GRH/V 048	G	208-230/60/1	197/254	1	18.3	102.0	3.40	21.7	26.3	40	1.07	22.8	27.3	45
	H	208-230/60/3	197/254	1	12.6	91.0	3.40	16.0	19.2	30	1.07	17.1	20.2	30
	F	460/60/3	414/506	1	5.7	42.0	1.80	7.5	8.9	15	1.07	8.6	10.0	15
	N	575/60/3	518/633	1	4.7	39.0	1.40	6.1	7.3	15	N/A	N/A	N/A	N/A
GRH/V 048 High Static	G	208-230/60/1	197/254	1	18.3	102.0	4.9	23.2	27.8	45	1.07	24.3	28.8	45
	H	208-230/60/3	197/254	1	12.6	91.0	4.9	17.5	20.7	30	1.07	18.6	21.7	30
	F	460/60/3	414/506	1	5.7	42.0	2.5	8.2	9.6	15	1.07	9.3	10.7	15
	N	575/60/3	518/633	1	4.7	39.0	1.9	6.6	7.6	15	N/A	N/A	N/A	N/A
GRH/V 060	G	208-230/60/1	197/254	1	25.6	170.0	4.90	30.5	36.9	60	1.07	31.6	38.0	60
	H	208-230/60/3	197/254	1	14.7	124.0	4.90	19.6	23.3	35	1.07	20.7	24.3	35
	F	460/60/3	414/506	1	7.4	59.6	2.50	9.9	11.8	15	1.07	11.0	12.8	20
	N	575/60/3	518/633	1	5.9	49.4	1.90	7.8	9.3	15	N/A	N/A	N/A	N/A

HACR circuit breaker in USA only
All fuses Class RK-5

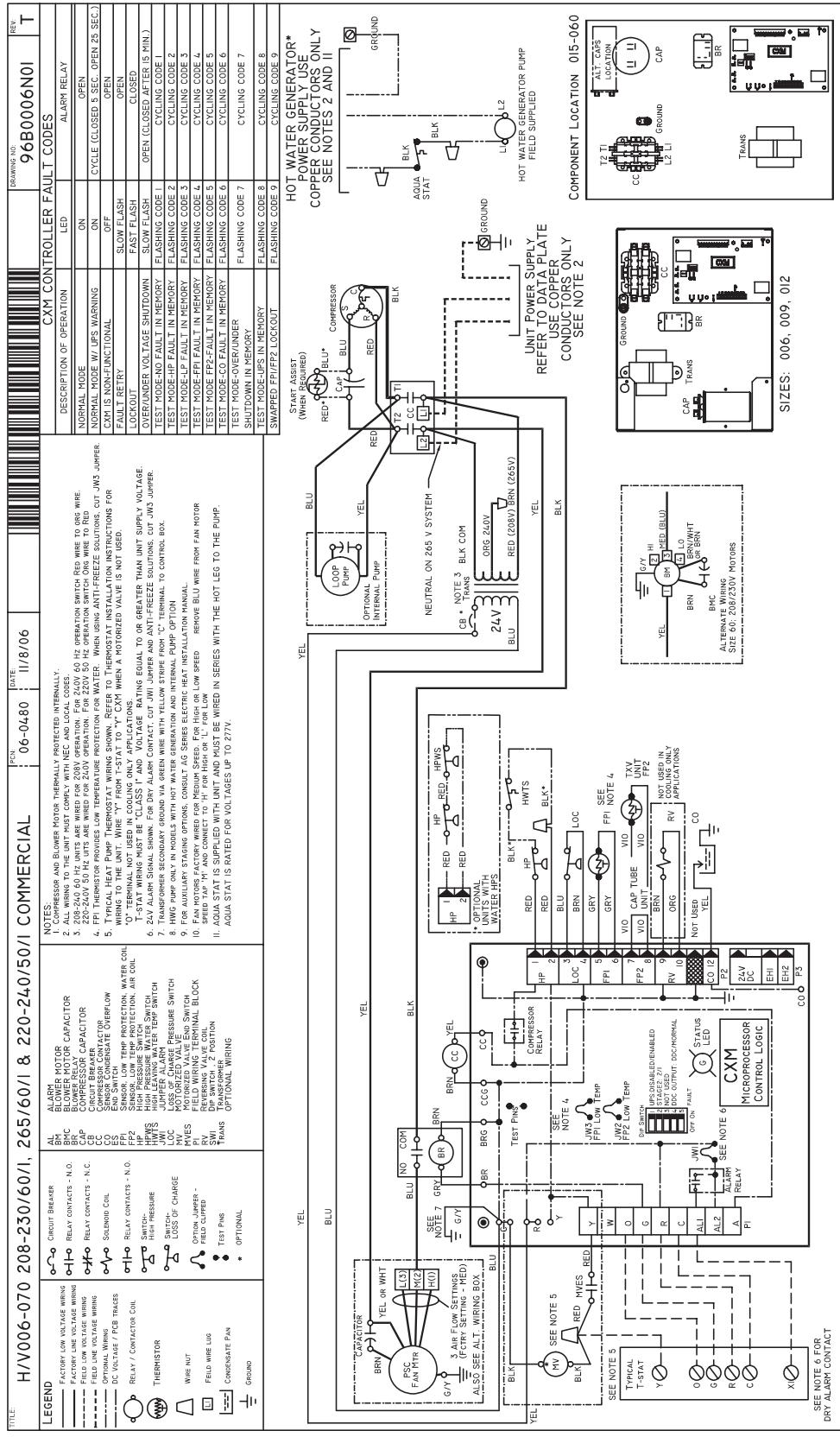
GR Series Wiring Diagram Matrix

Only CXM and DXM diagrams, with a representative diagram of LON and MPC Options are presented in this submittal.
 Other diagrams can be located online at www.climatemaster.com using the part numbers presented below.

Model	Refrigerant	Wiring Diagram Part Number	Electrical	Control	DDC	Agency
GR Series Single Phase	R22	96B0006N01	208-230/60/1, 265/60/1, 220-240/50/1	CXM	-	-
	R22 & R407C	96B0006N06			-	CE
	R22	96B0006N03			LON	-
	R22	96B0006N09			MPC	-
	R22 & R407C	96B0006N11			MPC	CE
	R22	96B0006N02		DXM	-	-
	R22 & R407C	96B0006N05			-	CE
	R22	96B0006N04			LON	-
	R22	96B0006N10			MPC	-
GR Series Three Phase (230 Style)	R22	96B0007N01	208-230/60/3, 220-240/50/3	CXM	-	-
	R22	96B0007N03			LON	-
	R22	96B0007N06			MPC	-
	R22	96B0007N02		DXM	-	-
	R22	96B0007N04			LON	-
	R22	96B0007N07			MPC	-
GR Series Three Phase (460 Style)	R22	96B0008N01	460/60/3, 575/60/3, 380-420/50/3	CXM	-	-
	R22 & R407C	96B0008N06			-	CE
	R22	96B0008N03			LON	-
	R22	96B0008N08			MPC	-
	R22	96B0008N02		DXM	-	-
	R22 & R407C	96B0008N05			-	CE
	R22	96B0008N04			LON	-
	R22	96B0008N09			MPC	-

All wiring diagrams available at www.climatemaster.com. R407C submittals will only contain CE Mark wiring diagrams

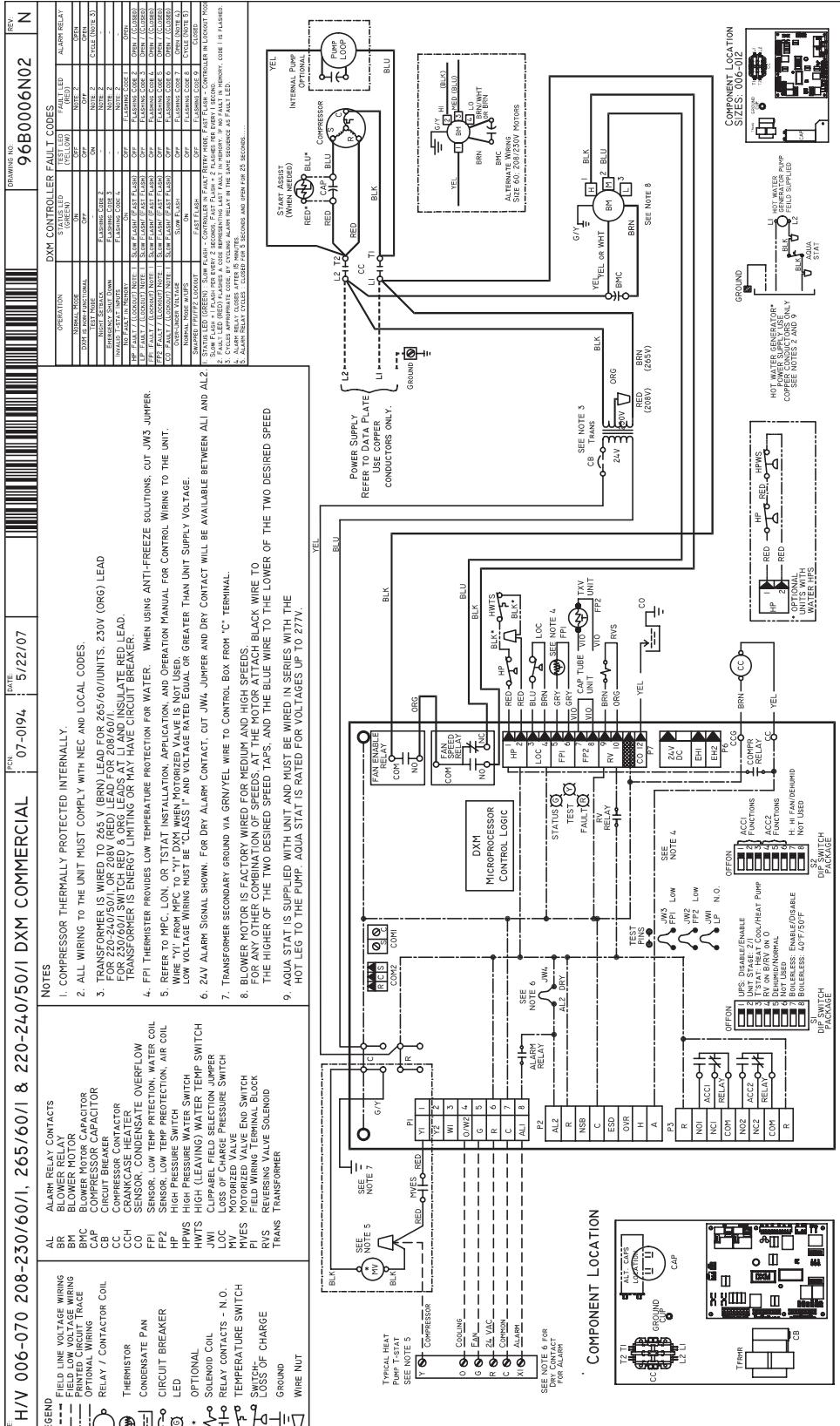
Typical Wiring Diagram Single Phase GR Units With CXM Controller



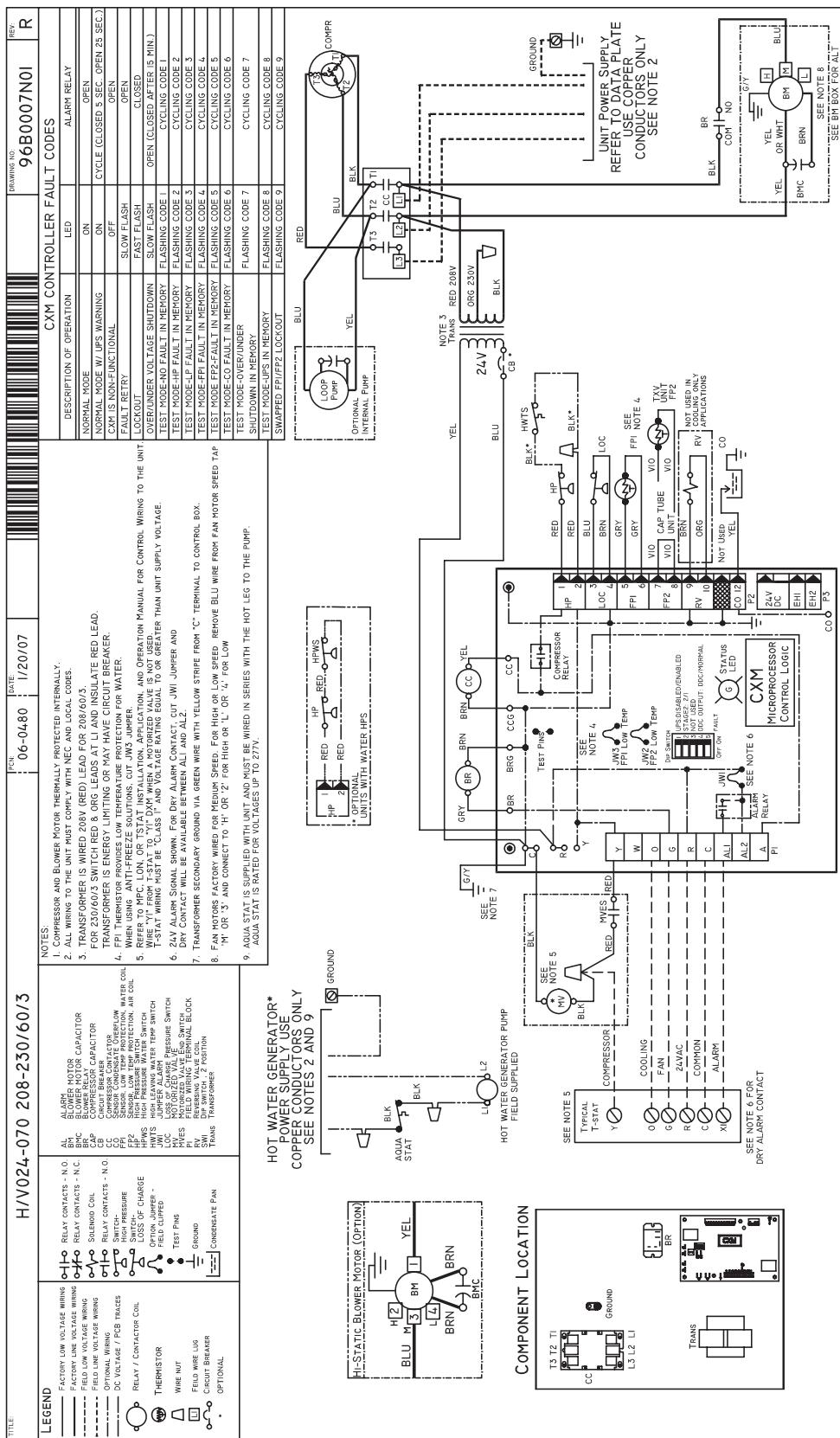
CLIMATEMASTER WATER-SOURCE HEAT PUMPS

Genesis Standard (GR) Series
Rev.: 05/23/07D

Typical Wiring Diagram Single Phase GR Units With DXM Controller

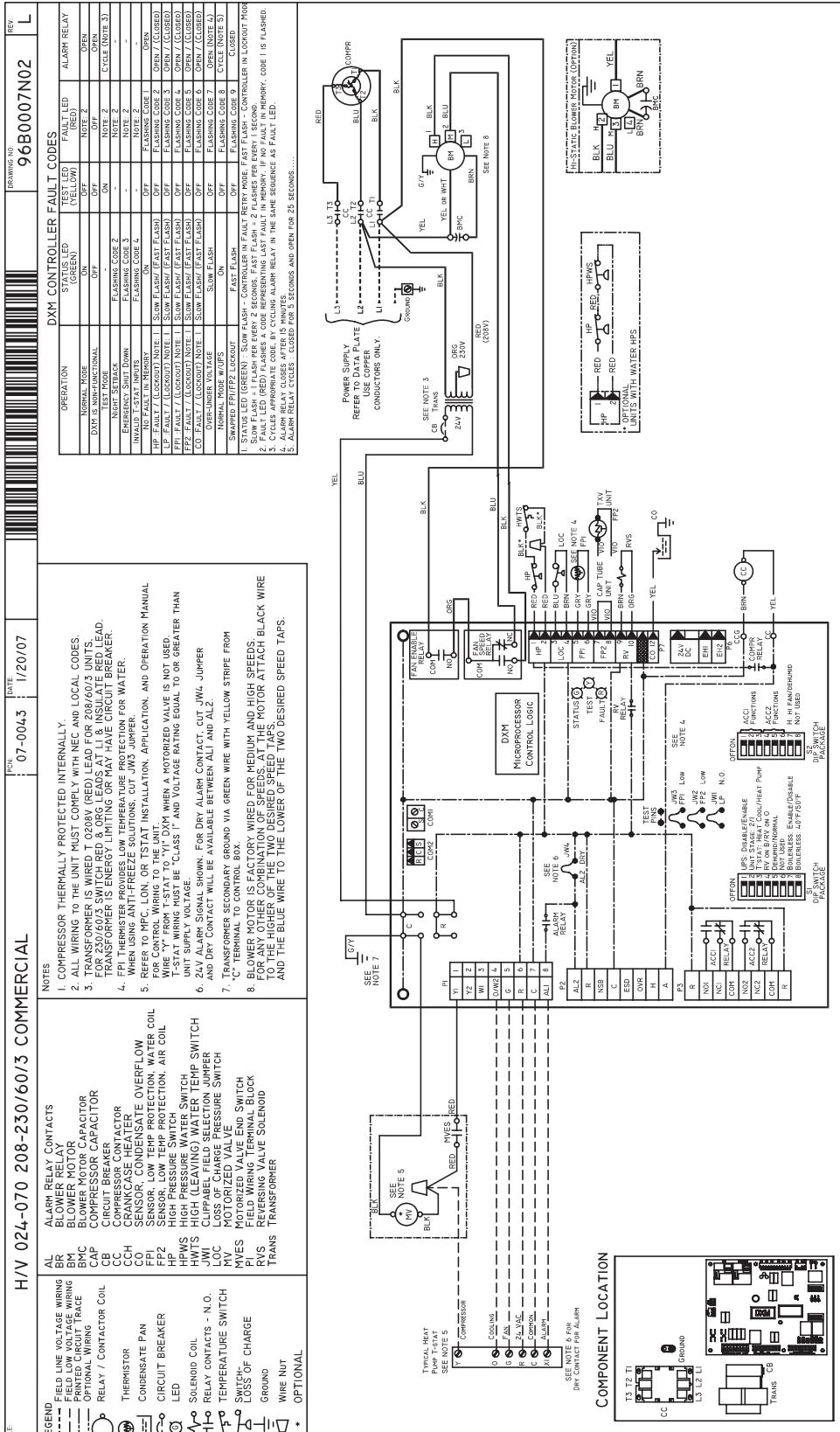


Typical Wiring Diagram Three Phase 208/230V GR Units With CXM Controller

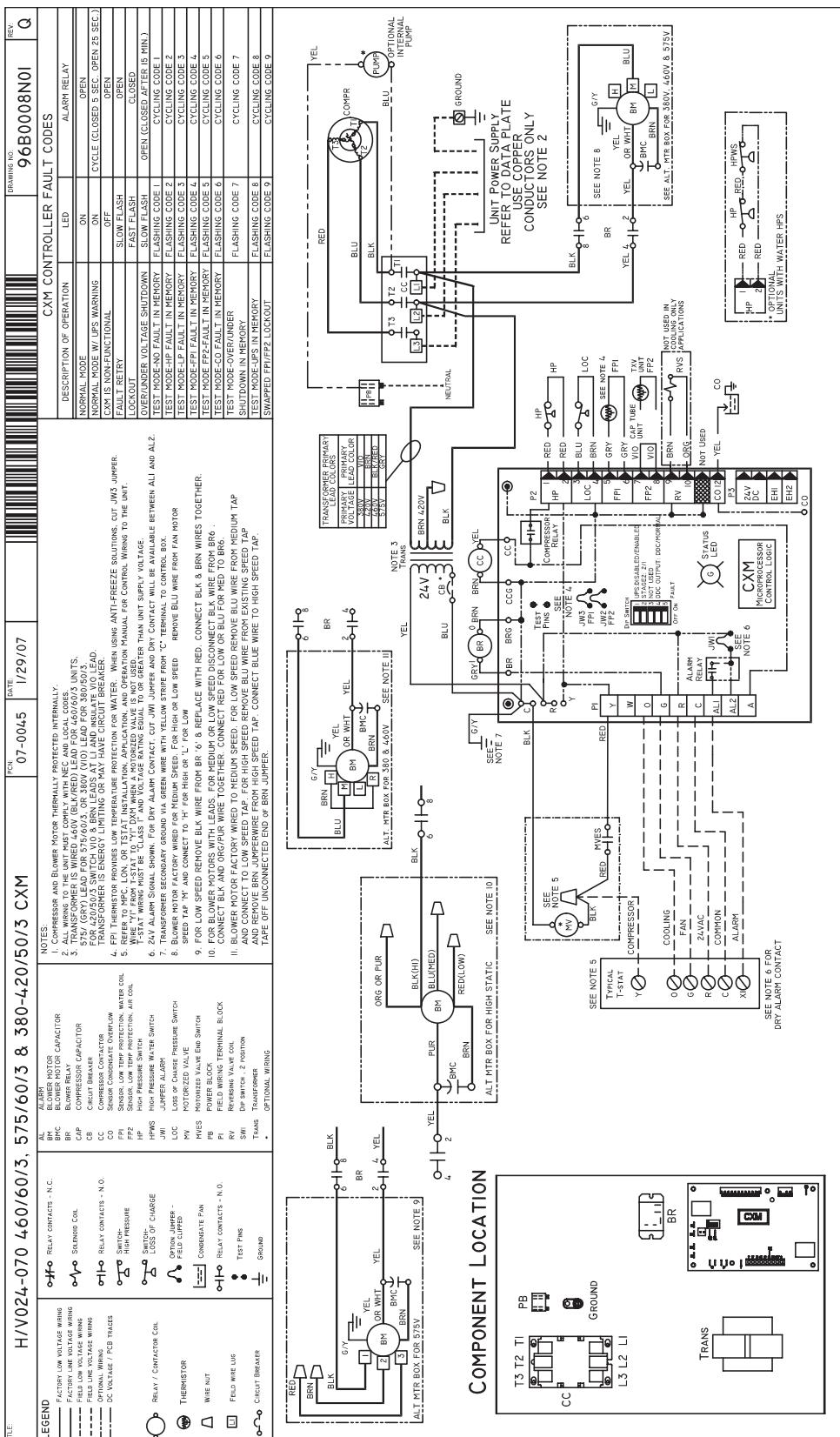


Typical Wiring Diagram

Three Phase 208/230V GR Units With DXM Controller

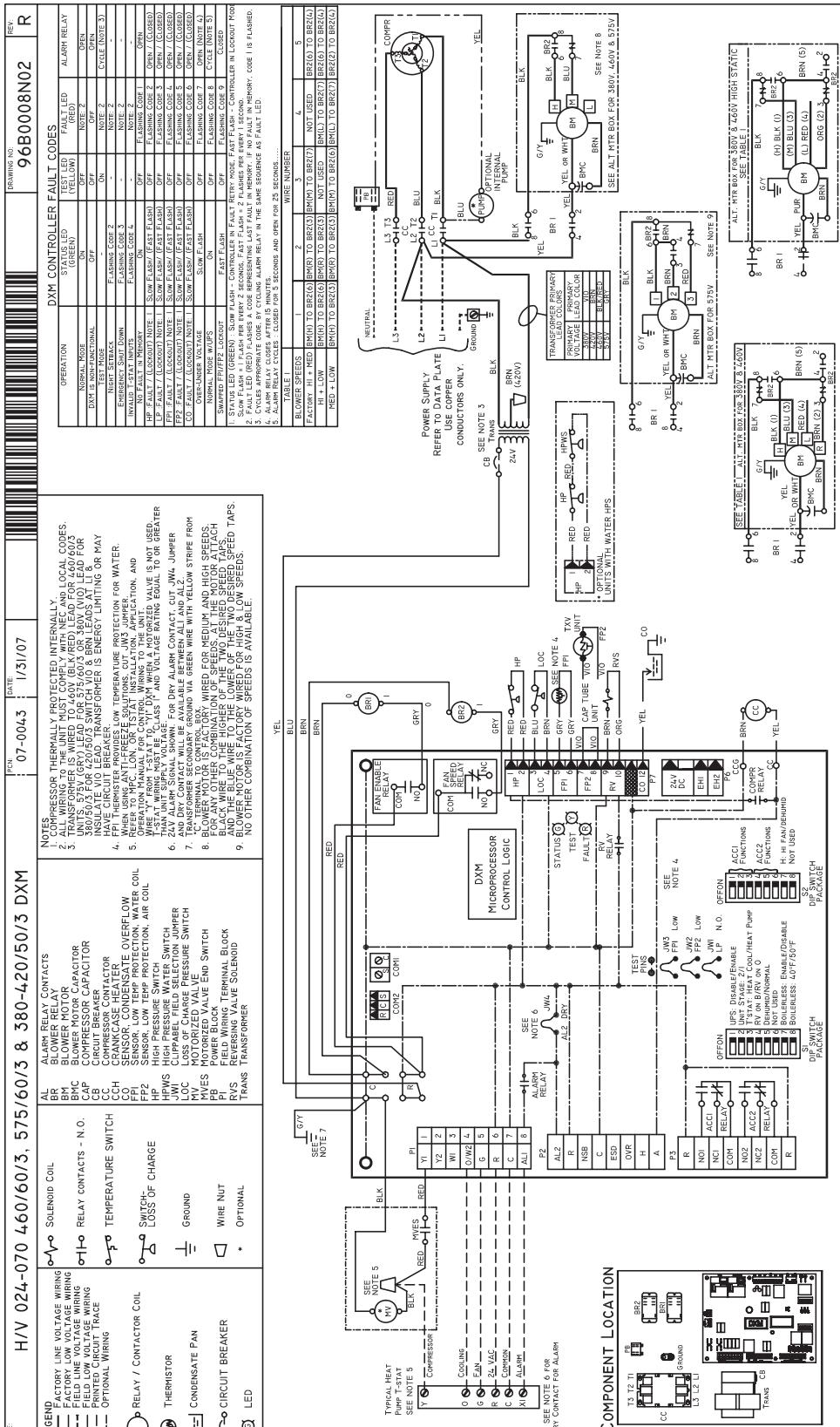


Typical Wiring Diagram Three Phase 460/575V GR Units With CXM Controller

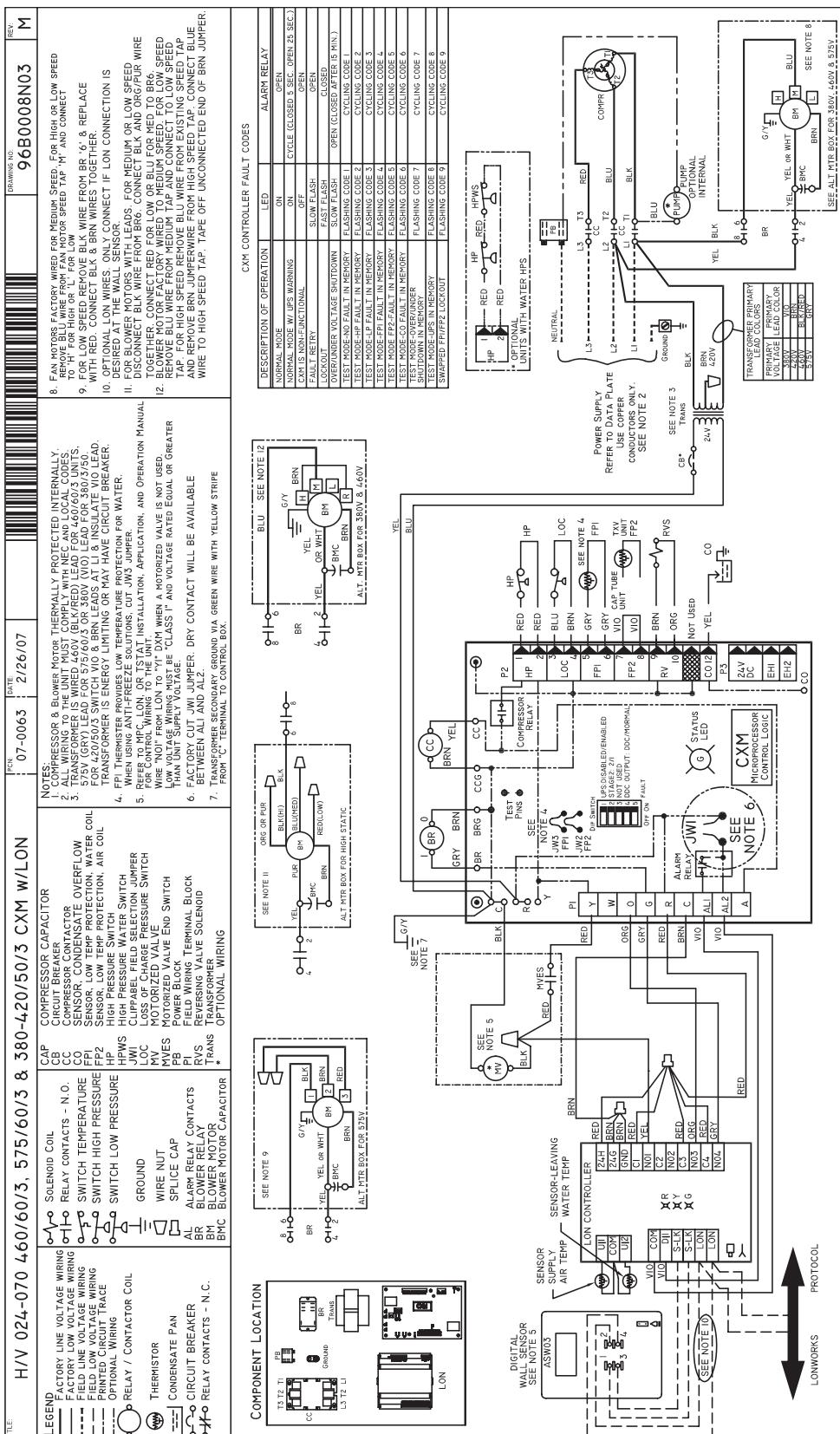


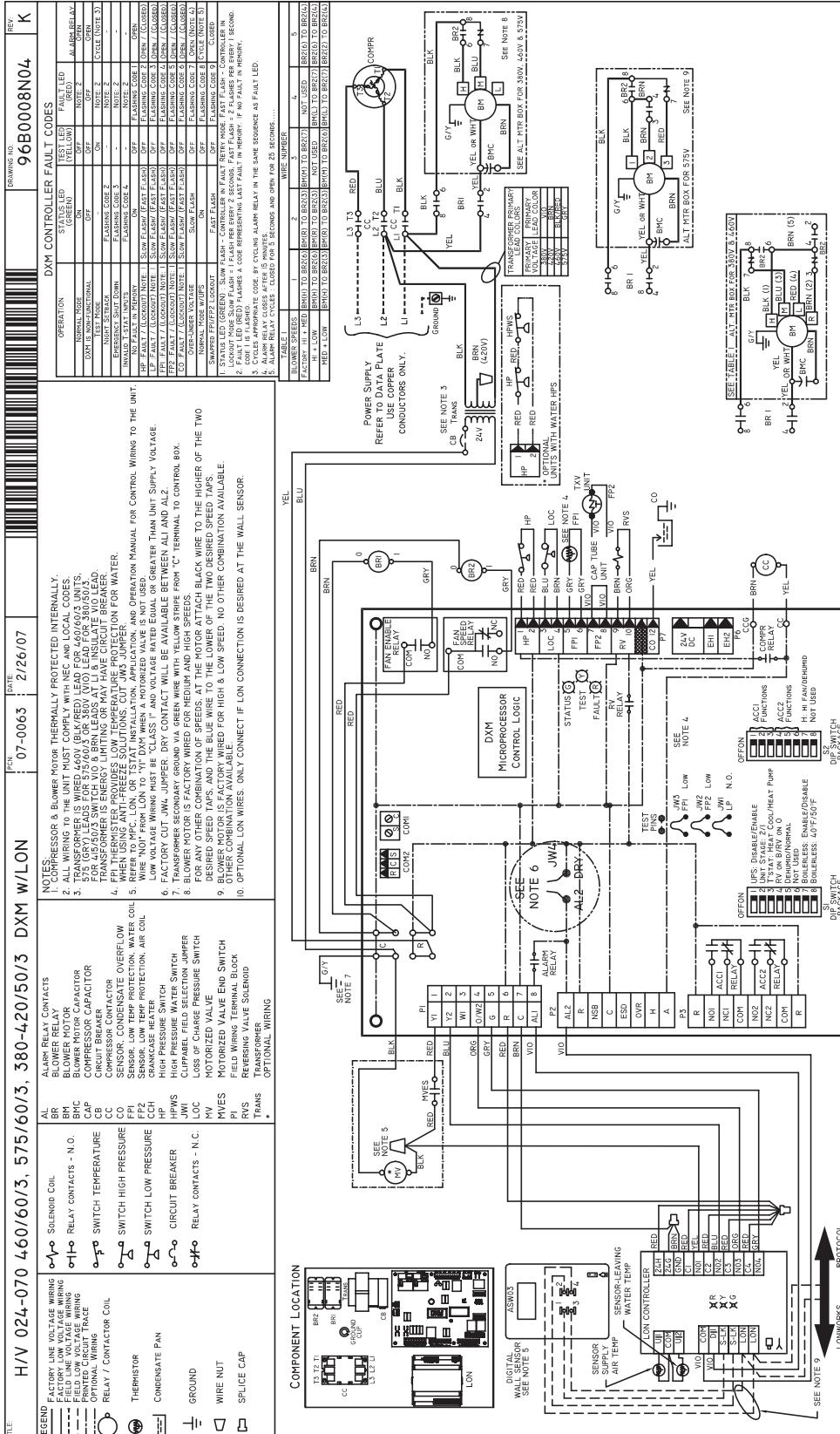
Typical Wiring Diagram

Three Phase 460/575V GR Units With DXM Controller



Typical Wiring Diagram Three Phase 460/575V GR Units With CXM & LON Controller

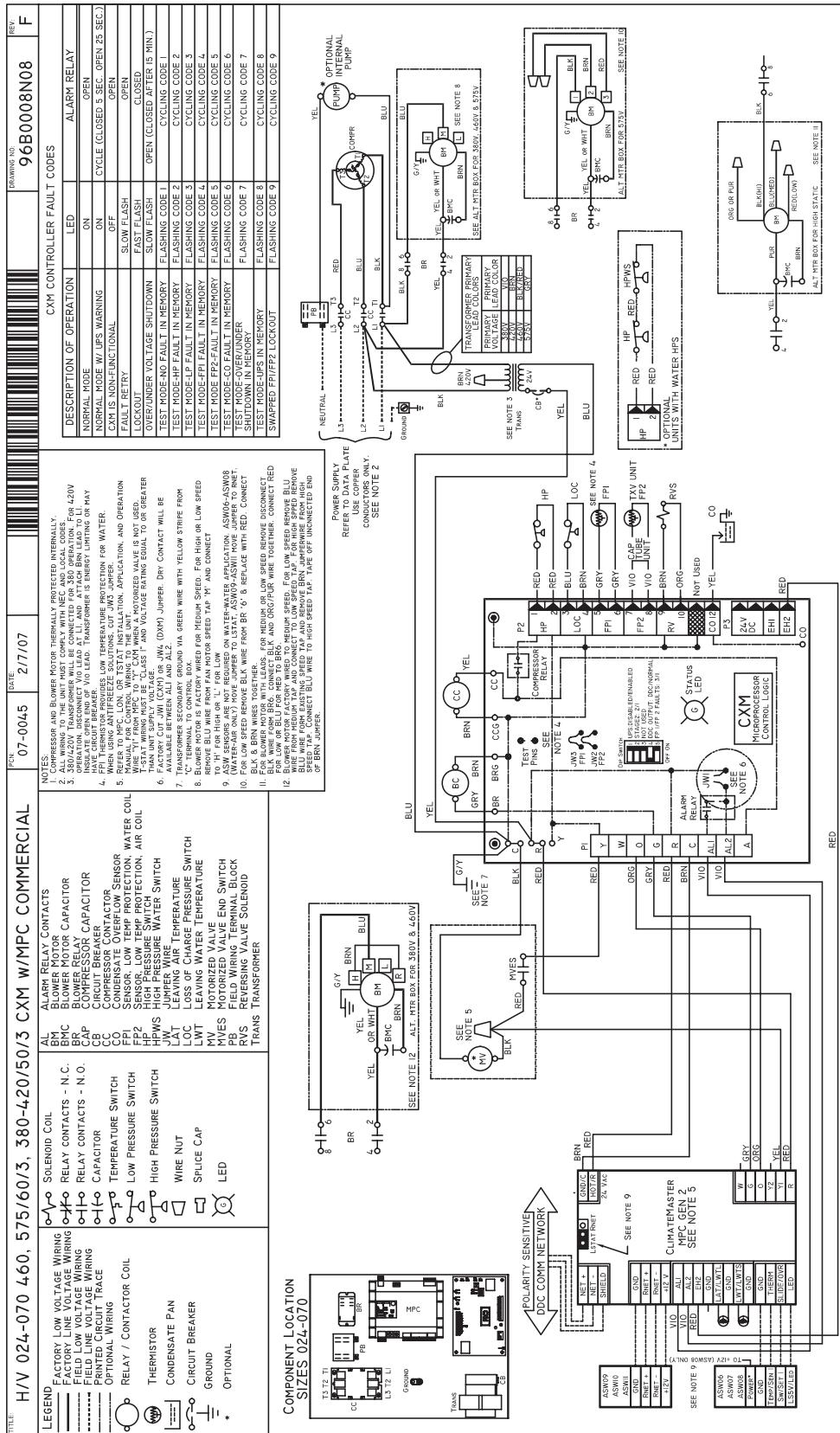


Genesis Standard (GR) Series
Rev.: 05/23/07DTypical Wiring Diagram
Three Phase 460/575V GR Units
With DXM & LON Controller

Typical Wiring Diagram

Three Phase 460/575V GR Units

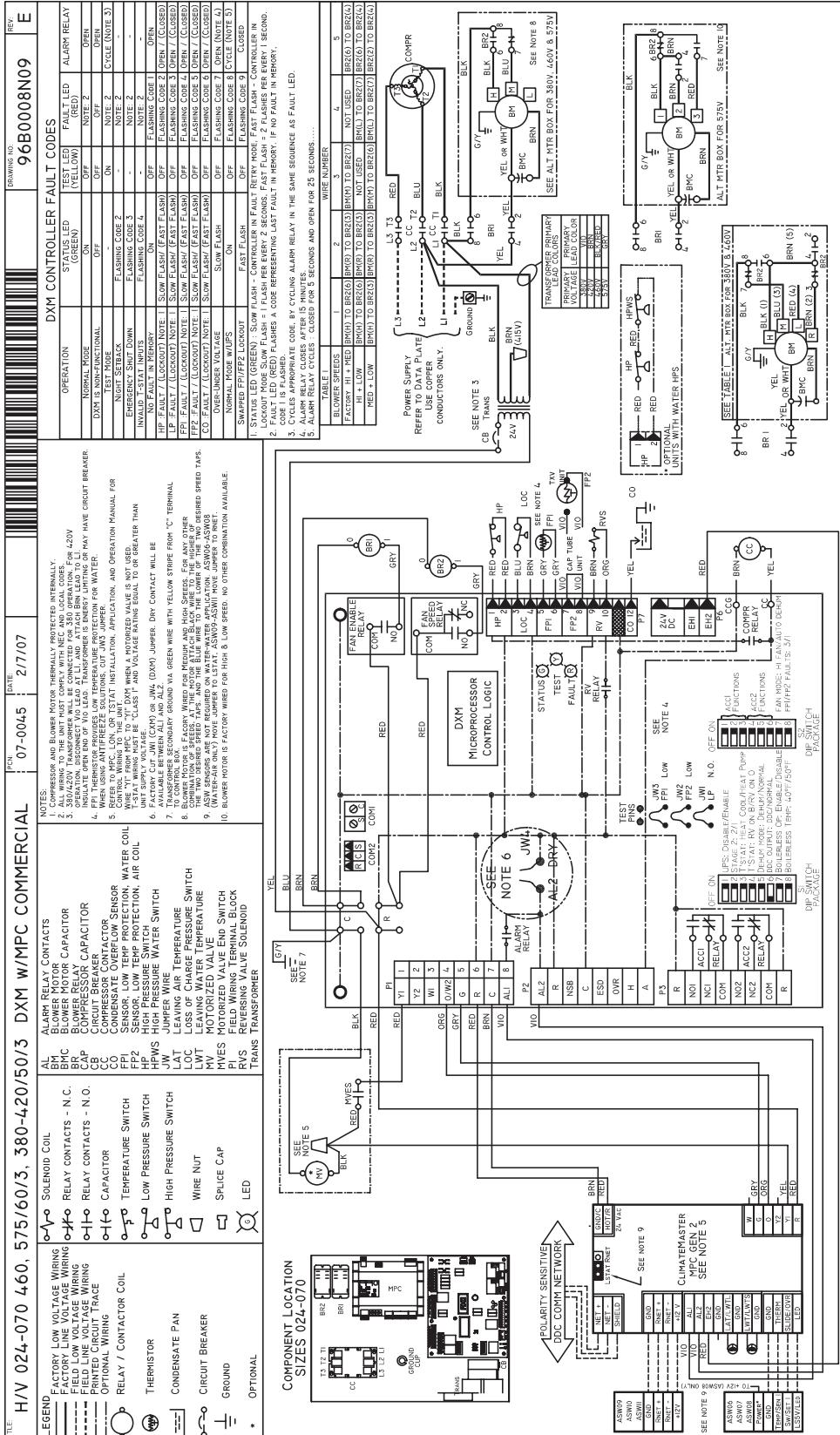
With CXM & MPC Controller



CLIMATEMASTER WATER-SOURCE HEAT PUMPS

Genesis Standard (GR) Series
Rev.: 05/23/07D

Typical Wiring Diagram Three Phase 460/575V GR Units With DXM & MPC Controller



Genesis Standard (GR) Series 60Hz Engineering Specifications Rev.: 04/02/07

General:

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

Horizontal / Vertical Water Source Heat Pumps:

Units shall be supplied completely factory built for an entering water temperature range from 20° to 110°F (-6.7° to 43.3°C) as standard. Equivalent units from other manufacturers can be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated and certified in accordance with American Refrigeration Institute / International Standards Organization (ARI / ISO) and Environmental Testing Laboratories for United States and Canada (ETL-US-C). The units shall have ARI / ISO and ETL-US-C labels. All units shall be fully quality tested by factory run testing under normal operating conditions and water flow rates as described herein. Quality control system shall automatically perform via computer: triple leak check, pressure tests, evacuate and accurately charge system, perform detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail data base. Detailed report card will ship with each unit displaying all test performance data. Note: If unit fails on any cross check, system shall not be allowed unit to ship. Serial numbers will be recorded by factory and furnished to contractor on report card for ease of unit warranty status. **Units tested without water flow are not acceptable.**

Basic Construction:

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

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

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

The heat pumps shall be fabricated from heavy gauge galvanized steel. All interior surfaces shall be lined with 1/2 inch (12.7mm) thick, dual density, 1-3/4 lb/ft³ (28 kg/m³) acoustic type glass fiber insulation. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream.

Vertical heat pumps shall be fabricated from heavy gauge galvanized steel with powder coat paint finish. The color will be Polar Ice. Both sides of the steel shall be painted for added protection.

Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. **Unit insulation must meet these stringent requirements or unit(s) will not be accepted.**

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

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

Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper IPT fittings, and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench. **Water connections that protrude through the cabinet or require the use of a backup wrench shall not be allowed.** All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. **Contractor shall be responsible for**

Genesis Standard (GR) Series

Rev.: 05/23/07D

any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Option: Contractor shall install 2-inch (50.8mm) filter brackets and 2 inch(50.8mm) glass fiber throwaway filters on all units.

Option: UltraQuiet package shall consist of a discharge muffler (except rotary compressors) and high technology sound attenuating material that is strategically applied to the compressor and air handling compartment casings and fan scroll in addition to the standard ClimaQuiet system design, to further dampen and attenuate sound transmissions.

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

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

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

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

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

Option: The refrigerant to air heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 – 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1000 hours salt spray protection per ASTM B117-97 on all galvanized end plates and copper tubing, and a minimum of 2000 hours of salt spray on all aluminum fins. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs (184 kg-cm) direct (ASTM D2794-93).

Fan and Motor Assembly:

Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing. Units shall have a direct-drive centrifugal fan. The fan motor shall be 3-speed (2-speed for 575V), permanently lubricated, PSC type, with internal thermal overload protection. Units supplied without permanently lubricated motors must provide external oilers for easy service. The fan motor on small and medium size units (006-042) shall be isolated from the fan housing by a torsionally flexible motor mounting system with rubber type grommets to inhibit vibration induced high noise levels associated with "hard wire belly band" motor mounting. The fan motor on larger units (048 & 060) shall be isolated with flexible rubber type isolation grommets only. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. Airflow / Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. **Ratings based on a dry coil and / or no filter, or on an ESP less than 0.25 in w.g. (6.35 mm w.g.) shall NOT be acceptable.**

Option: High static motor (models GRH048 or GRV048).

Refrigerant Circuit:

Units shall have a sealed refrigerant circuit including a high efficiency scroll, rotary or reciprocating compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant to air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant to water heat exchanger, and safety controls including a high pressure switch, low pressure switch (loss of charge), water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch. **Units that cannot be reset at the thermostat shall not be acceptable.**

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

Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 450 PSIG (3101 kPa) refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 450 PSIG (3101 kPa) working refrigerant pressure and

450 PSIG (3101 kPa) working water pressure. The refrigerant to water heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 – 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1000 hours salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs (184 kg-cm) direct (ASTM D2794-93).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 110°F (-6.7° to 43.3°C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling an already cold room.

Drain Pan:

The drain pan shall be constructed of galvanized steel and have a powder coat paint application to further inhibit corrosion. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. If plastic type material is used, it must be HDPE (High Density Polyethylene) to avoid thermal cycling shock stress failure over the lifetime of the unit. Stainless Steel materials are also acceptable. Drain pan shall be fully insulated. Drain outlet shall be located at pan as to allow complete and unobstructed drainage of condensate. Drain outlet for horizontal units shall be connected from pan directly to IPT fitting.

No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted. The unit as standard will be supplied with solid-state electronic condensate overflow protection. **Mechanical float switches will NOT be accepted.**

Vertical units shall be furnished with a PVC slip condensate drain connection and an internal factory installed condensate trap. **If units without an internal trap are used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for his sub-contractor to install these provisions.**

Electrical:

A control box shall be located within the unit compressor compartment and shall contain a 50VA transformer, 24 volt activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve and fan motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volt and provide heating or cooling as required by the remote thermostat / sensor.

Solid State Control System (CXM):

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

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

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

Genesis Standard (GR) Series

Rev.: 05/23/07D

Option: Enhanced solid state control system (DXM)

This control system features two stage control of cooling and two stage control of heating modes for exacting temperature and dehumidification purposes.

This control system coupled with a multi-stage thermostat will better dehumidify room air by automatically running the heat pump's fan at lower speed on the first stage of cooling thereby implementing low sensible heat ratio cooling. On the need for higher cooling performance the system will activate the second stage of cooling and automatically switch the fan to the higher fan speed setting. This system may be further enhanced with a humidistat. **Units not having automatic low sensible heat ratio cooling will not be accepted;** as an alternate a hot gas reheat coil may be provided with control system for automatic activation.

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

- a. Removable thermostat connector.
- b. Night setback control.
- c. Random start on return from night setback.
- d. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life.).
- e. Override temperature control with 2-hour (adjustable) timer for room occupant to override setback temperature at the thermostat.
- f. Dry contact night setback output for digital night setback thermostats.
- g. Ability to work with heat pump or heat/cool (Y, W) type thermostats.
- h. Ability to work with heat pump thermostats using O or B reversing valve control.
- i. Emergency shutdown contacts.
- j. Boilerless system heat control at low loop water temperature.
- k. Ability to allow up to 3 units to be controlled by one thermostat.
- l. Relay to operate an external damper.
- m. Ability to automatically change fan speed from multistage thermostat.
- n. Relay to start system pump.
- o. 75 VA control transformer. Control transformer shall have load side short circuit and overload protection via a built in circuit breaker.

Remote Service Sentinel (CXM/DXM):

Solid state control system shall communicate with thermostat to display (at the thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown. The Remote Service Sentinel allows building maintenance personnel or service personnel to diagnose unit from the wall thermostat. The control board shall provide a signal to the thermostat fault light, indicating a lockout. Upon cycling the G (fan) input 3 times within a 60 second time period, the fault light shall display the specific code as indicated by a sequence of flashes. A detailed flashing code shall be provided at the thermostat LED to display unit status and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, condensate overflow fault, etc. **Units that do not provide this remote service sentinel shall not be acceptable.**

Option: Lonworks interface system

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

- a. Space temperature
- b. Leaving water temperature
- c. Discharge air temperature
- d. Command of space temperature setpoint
- e. Cooling status
- f. Heating status
- g. Low temperature sensor alarm
- h. Low pressure sensor alarm
- i. High pressure switch alarm
- j. Condensate sensor alarm
- k. Hi/low voltage alarm
- l. Fan "ON/AUTO" position of space thermostat as specified above
- m. Unoccupied / occupied command
- n. Cooling command
- o. Heating command

- p. Fan "ON / AUTO" command
- q. Fault reset command
- r. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

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

Option: MPC (Multiple Protocol Control) interface system

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

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

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

Warranty:

Climate Master shall warranty equipment for a period of 12 months from start up or 18 months from shipping (which ever occurs first).

Option: Extended 4-year compressor warranty covers compressor for a total of 5 years.

Option: Extended 4-year refrigeration circuit warranty covers coils, reversing valve, expansion valve and compressor for a total of 5 years.

Option: Extended 4-year control board warranty covers the CXM/DXM control board for a total of 5 years.

FIELD INSTALLED OPTIONS

Hose Kits:

All units 120000 BTUH (35 kW) and below shall be connected with hoses. The hoses shall be 2 feet (61cm) long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

Valves:

The following valves are available and will be shipped loose:

- a. Ball valve; bronze material, standard port full flow design, IPT connections.
- b. Ball valve with memory stop and PT Port; standard port full flow design, IPT connections.
- c. "Y" strainer with cap; bronze material, IPT connections.
- d. "Y" strainer with blowdown valve; bronze material, IPT connections.
- e. Motorized water valve; slow acting, 24v, IPT connections.

Hose Kit Assemblies:

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

- a. Supply and return hoses having ball valve with PT port.

Genesis Standard (GR) Series

Rev.: 05/23/07D

- b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve (Measureflo) with PT ports, and ball valve.
- c. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator (Measureflo) with PT ports, and ball valve.

Thermostats:

The thermostat shall be a ClimateMaster mechanical or electronic type thermostat as selected below with the described features:

- a. Single Stage Standard Manual Changeover (ATM11C01)
Thermostat shall be a single-stage, vertical mount, manual changeover with HEAT-OFF-COOL system switch and fan ON-AUTO switch. Thermostat shall have a mechanical temperature indicator and set point indication. Thermostat shall only require 4 wires for connection. Mercury bulb thermostats are not acceptable.
- b. Single Stage Digital Manual Changeover with Two-Speed Fan Control (ATM11C03) – DXM and PSC Fan required
Thermostat shall be a single-stage, digital, manual changeover with HEAT-OFF-COOL system switch, fan ON-AUTO switch, and fan LO-HI switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall come standard with remote temperature sensor, but may be operated with internal sensor if desired via installation of a jumper.
- c. Single Stage Digital Auto or Manual Changeover (ATA11U01)
Thermostat shall be a single-stage, digital, auto or manual changeover with HEAT-OFF-COOL-AUTO system switch and fan ON-AUTO switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall provide temperature display offset for custom applications.
- d. Single Stage Digital Automatic Changeover with Two-Speed Fan Control (ATA11C04) – DXM and PSC Fan required
Thermostat shall be a single-stage, digital, auto or manual changeover with HEAT-OFF-COOL-AUTO system switch, fan ON-AUTO switch, and fan LO-HI switch. Thermostat shall have an LCD display with temperature and set-point(s) in °F or °C. The Thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall come standard with remote temperature sensor, but may be operated with internal sensor if desired via installation of a jumper.
- e. Multistage Digital Automatic Changeover (ATA22U01)
Thermostat shall be multi-stage (2H/2C), manual or automatic changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. A fault LED shall be provided to indicate specific fault condition(s). Thermostat shall provide temperature display offset for custom applications. Thermostat shall allow unit to provide better dehumidification with optional DXM controller by automatically using lower fan speed on stage 1 cooling (higher latent cooling) as main cooling mode, and automatically shifting to high speed fan on stage 2 cooling.
- f. Single Stage Manual Changeover Programmable 5/2 Day (ATP11N01)
Thermostat shall be 5 day/2 day programmable (with up to 4 set points per day), single stage (1H/1C), manual changeover with HEAT-OFF-COOL system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. Thermostat shall provide convenient override feature to temporarily change set point.
- g. Multistage Automatic or Manual Changeover Programmable 5/2 Day (ATP21U01)
Thermostat shall be 5 day/2 day programmable (with up to 4 set points per day), multi-stage (2H/1C), automatic or manual changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of set-point(s) without batteries. Thermostat shall provide convenient override feature to temporarily change set point.
- h. Multistage Automatic or Manual Changeover Programmable 7 Day (ATP32U01)
Thermostat shall be 7 day programmable (with up to 4 set points per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Thermostat shall have a blue backlit dot matrix LCD display with temperature, set-points, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided (when used with ClimateMaster CXM or DXM controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of set-points without batteries. Thermostat shall provide heating set-point range limit, cooling set-point range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

- i. Multistage Automatic or Manual Changeover Programmable 7 Day with Humidity Control (ATP32U02)
Thermostat shall be 7 day programmable (with up to 4 set points per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO system settings and fan ON-AUTO settings. Separate dehumidification and humidification set points shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier. Installer configuration mode shall allow thermostat dehumidification mode to operate with ClimaDry reheat or with ECM fan dehumidification mode via settings changes. Thermostat shall have a blue backlit dot matrix LCD display with temperature, relative humidity, set-points, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided (when used with ClimateMaster CXM or DXM controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of set-points without batteries. Thermostat shall provide heating set-point range limit, cooling set-point range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

DDC Sensors:

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

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

Section Change Log

Date:	Item:	Action:
01/01/07	Dimensional Data	Updated Dimensional Data
01/01/07	Specifications	Updated thermostat offering
01/01/07	Wiring Diagram	Added pressure switch for motorized water valve option
01/01/07	Electrical Data	Added secondary loop pump, 048 high static data, and fixed several model compressor RLA and LRA data
01/01/07	Performance Data	Added low temperature selection notes
01/01/07	Motorized Valves	Added Cv, MOPD, and WPD data
01/01/06	First Published	

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Rev.: 05/23/07D

Notes:

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Rev.: 05/23/07D