Genesis Ultra (GC) Series Submittal Data

Models GCH/V 006 - 060 60Hz - R22

English Language/I-P Units

Rev.: 22 May, 2009B

CLIMATEMASTER®
Geothermal Heat Pump Systems

SUBMITTAL DATA - I-P UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ Btuh

EER: _____

Heating Capacity: _____ Btuh

COP: _____

Ambient Air Temp: _____ °F

Entering Water Temp (Clg): _____ °F

Entering Air Temp (Clg): _____ °F

Entering Water Temp (Htg): _____ °F

Entering Air Temp (Htg): _____ °F

Airflow: _____ CFM

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (lb)

ELECTRICAL DATA

Power Supply: _____ Volts _____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

Genesis Ultra (GC) Series Submittal Data

Models GCH/V 006 - 060 60Hz - R22

English Language/S-I Units

Rev.: 22 May, 2009B

CLIMATEMASTER®
Geothermal Heat Pump Systems

SUBMITTAL DATA - S-I UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ kW

EER: _____

Heating Capacity: _____ kW

COP: _____

Ambient Air Temp: _____ °C

Entering Water Temp (Clg): _____ °C

Entering Air Temp (Clg): _____ °C

Entering Water Temp (Htg): _____ °C

Entering Air Temp (Htg): _____ °C

Airflow: _____ l/s

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (kg)

ELECTRICAL DATA

Power Supply: _____ Volts _____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

Table of Contents

*Document page number is shown next to part number (e.g. LC250 - 3 = page 3). Since not all pages are typically used in the submittals process, the page number in the lower right corner can still be used (page ____of_____).

CLIMATEMASTER
Geothermal Heat Pump Systems

THE GENESIS COMPACT (GC) SERIES

Uniquely designed to be backwards compatible with hundreds of thousands of older water-source heat pumps, the Genesis Compact (GC) Series utilizes innovative ClimateMaster cabinet design solutions to meet ASHRAE 90.1 efficiencies, while maintaining one of the smallest cabinets in the industry. The Vertical GCV041 is designed to be a “drop-in” replacement unit for thousands of existing Condo / Apartment units.

The GC Series is designed specifically for boiler-tower applications where low first cost matters. Refrigerant circuits use trouble-free cap tube metering devices and reliable rotary, reciprocating or scroll compressors to create a full line of products to meet the varying needs of today’s construction projects. Sizes from 1/2 ton (1.76 kW) through 5 tons (17.6 kW) and field convertible discharge options for horizontal units make the GC Series extremely flexible.

The GC Series features long-lasting galvanized steel for all models and polyester powder coat paint for vertical units. ClimateMaster’s exclusive double isolation compressor mounting system and standard cabinet insulation make the GC Series exceptionally quiet.

Some manufacturers’ compact cabinet designs offer limited features. The GC series includes many standard features and a number of options. Factory installed hanger brackets (Horizontal units only), microprocessor controls and torsion flex motor mounting (006-042) are standard features. Options such as e-coated air coils, ClimaDry modulating reheat and DDC controls allow customized design solutions. Optional high static motors help overcome some of the challenges associated with ductwork for retrofit installations.

The GC 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)
- Meets ASHRAE 90.1 efficiencies
- Compact cabinet design: Great for retrofit or tight spaces
- Galvanized steel construction (powder coat paint on vertical units)
- Unique double isolation compressor mounting for quiet operation
- Reliable rotary, reciprocating and scroll compressors
- Trouble-free cap tube refrigerant metering device
- Standard Range (60 to 95°F, [16 to 35°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
- High static blowers available
- Low cost/high value product specifically designed for standard range (boiler/tower) applications
- Wide variety of options including ClimaDry modulating reheat and e-coated air coils
- Seven Safeties Standard

CLIMATEMASTER
Geothermal Heat Pump Systems

Selection Procedure

Reference Calculations

Heating

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

$$LAT = EAT + \frac{HC}{CFM \times 1.08}$$

Cooling

$$LWT = EWT + \frac{HR}{GPM \times 500}$$

$$LAT\ (DB) = EAT\ (DB) - \frac{SC}{CFM \times 1.08}$$

$$LC = TC - SC$$

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

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Selection Procedure

Step 1 Determine the actual heating and cooling loads at the desired dry bulb and wet bulb conditions.

Step 2 Obtain the following design parameters: Entering water temperature, water flow rate in GPM, air flow in CFM, water flow pressure drop and design wet and dry bulb temperatures. Air flow CFM should be between 300 and 450 CFM per ton. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. Go to the appropriate tables and find the proper indicated water flow and water temperature.

Step 3 Select a unit based on total and sensible cooling conditions. Select a unit which is closest to, but no larger than, the actual cooling load.

Step 4 Enter tables at the design water flow and water temperature. Read the total and sensible cooling capacities (Note: interpolation is permissible, extrapolation is not).

Step 5 Read the heating capacity. If it exceeds the design criteria it is acceptable. It is quite normal for Water-Source Heat Pumps to be selected on cooling capacity only since the heating output is usually greater than the cooling capacity.

Step 6 Determine the correction factors associated with the variable factors of dry bulb and wet bulb.

Corrected Total Cooling =
tabulated total cooling x wet bulb correction.
Corrected Sensible Cooling =
tabulated sensible cooling x wet/dry bulb correction.

Step 7 Compare the corrected capacities to the load requirements. Normally if the capacities are within 10% of the loads, the equipment is acceptable. It is better to undersize than oversize, as undersizing improves humidity control, reduces sound levels and extends the life of the equipment.

Step 8 When completed, calculate water temperature rise and assess the selection. If the units selected are not within 10% of the load calculations, then review what effect changing the GPM, water temperature and/or air flow and air temperature would have on the corrected capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure. Remember, when in doubt, undersize slightly for best performance.

Example Equipment Selection For Cooling

Step 1 Load Determination:
Assume we have determined that the appropriate cooling load at the desired dry bulb 80°F and wet bulb 65°F conditions is as follows:

Total Cooling ..... 22,100 BTUH
Sensible Cooling ..... 16,500 BTUH
Entering Air Temp ... 80°F Dry Bulb / 65°F Wet Bulb

Step 2 Design Conditions:
Similarly, we have also obtained the following design parameters:

Entering Water Temp ..... 90°F
Water Flow (Based upon 12°F rise in temp.) 4.5 GPM
Air Flow ..... 700 CFM

Step 3, 4 & 5 HP Selection:
After making our preliminary selection (GCH024B), we enter the tables at design water flow and water temperature and read Total Cooling, Sens. Cooling and Heat of Rej. capacities:

Total Cooling ..... 23,500 BTUH
Sensible Cooling ..... 17,800 BTUH
Heat of Rejection ..... 30,300 BTUH

Step 6 & 7 Entering Air and Airflow Corrections:
Next, we determine our correction factors.

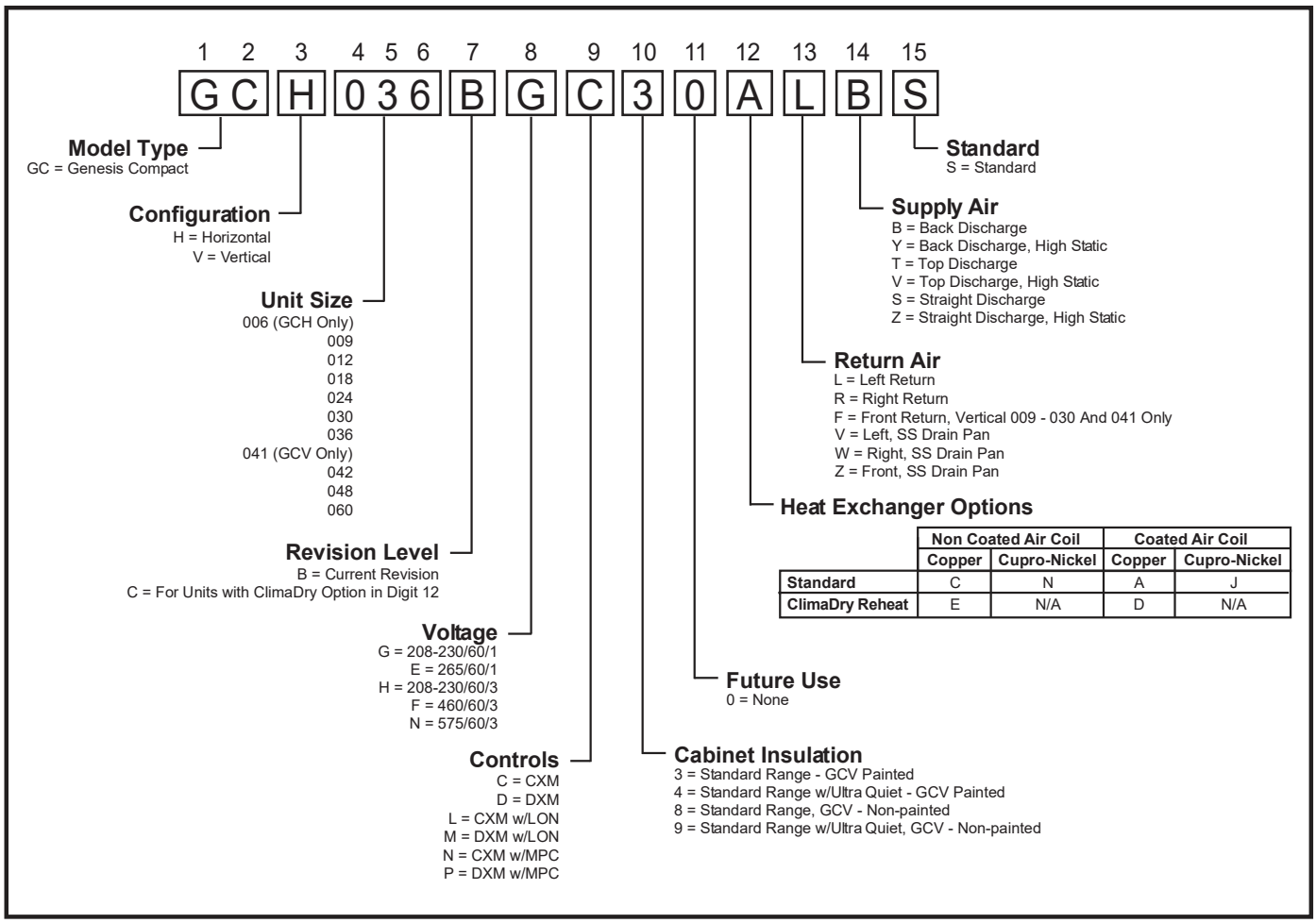
	Table	Ent Air	Air Flow	Corrected
Corrected Total Cooling =	23,500	x 0.964	x 0.987	= 22,359
Corrected Sens Cooling =	17,800	x 1.076	x 0.949	= 18,176
Corrected Heat of Reject =	30,300	x 0.971	x 0.985	= 28,980

Step 8 Water Temperature Rise Calculation & Assessment:

Actual Temperature Rise 12.9°F

When we compare the Corrected Total Cooling and Corrected Sensible Cooling figures with our load requirements stated in Step 1, we discover that our selection is within +/- 10% of our sensible load requirement. Furthermore, we see that our Corrected Total Cooling figure is within 259 Btuh of the actual indicated load.

GC Series Nomenclature



Rev.: 05 Nov, 2008B

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
ASHRAE/ARI/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	
	Capac-ity Btuh	EER Btuh/W	Capac-ity Btuh	COP	Capac-ity Btuh	EER Btuh/W	Capac-ity Btuh	COP	Capac-ity Btuh	EER Btuh/W	Capac-ity Btuh	COP
GCH006	6,400	12.5	8,300	4.2	Please see GR, GS, TT, or TS Series for extended range applications.				Please see GR, GS, TT, or TS Series for extended range applications.			
GCH/V009	8,300	12.7	10,800	4.3								
GCH/V012	11,500	12.7	14,300	4.2								
GCH/V018	18,200	12.3	22,000	4.2								
GCH/V024	23,800	13.0	27,800	4.6								
GCH/V030	28,000	12.2	33,500	4.4								
GCH/V036	35,000	12.0	45,500	4.2								
GCV041	37,700	12.0	47,500	4.2								
GCH/V042	41,000	12.0	52,600	4.2								
GCH/V048	47,100	12.2	58,200	4.4								
GCH/V060	58,000	12.0	76,800	4.2								

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	
	Capac-ity Watts	EER W/W	Capac-ity Watts	COP	Capac-ity Watts	EER W/W	Capac-ity Watts	COP	Capac-ity Watts	EER W/W	Capac-ity Watts	COP
GCH006	1,876	3.7	2,433	4.2	Please see GR, GS, TT, or TS Series for extended range applications.				Please see GR, GS, TT, or TS Series for extended range applications.			
GCH/V009	2,433	3.7	3,165	4.3								
GCH/V012	3,370	3.7	4,191	4.2								
GCH/V018	5,334	3.6	6,448	4.2								
GCH/V024	6,974	3.8	8,148	4.6								
GCH/V030	8,206	3.6	9,818	4.4								
GCH/V036	10,258	3.5	13,335	4.2								
GCV041	11,049	3.5	13,921	4.2								
GCH/V042	12,016	3.5	15,416	4.2								
GCH/V048	13,804	3.6	17,057	4.4								
GCH/V060	16,999	3.5	22,509	4.2								

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GCH006

220 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	0.9	0.7	1.7	7.6	5.1	0.67	0.49	9.3	15.4	7.5	0.58	5.5	101.4	3.75
	1.1	1.2	2.9	7.8	5.1	0.66	0.47	9.4	16.6	7.7	0.59	5.7	102.6	3.83
	1.7	2.0	4.5	8.0	5.2	0.65	0.44	9.5	18.2	8.1	0.60	6.0	104.0	3.92
70	0.9	0.7	1.6	7.1	5.0	0.69	0.54	9.0	13.1	8.3	0.61	6.2	105.0	3.98
	1.1	1.2	2.7	7.4	5.0	0.68	0.52	9.2	14.2	8.6	0.62	6.5	106.1	4.06
	1.7	1.9	4.4	7.6	5.1	0.67	0.49	9.3	15.6	8.9	0.63	6.8	107.5	4.14
80	0.9	0.7	1.6	6.6	4.8	0.73	0.59	8.6	11.3	9.0	0.63	6.9	108.1	4.18
	1.1	1.2	2.7	6.9	4.9	0.71	0.57	8.8	12.1	9.3	0.64	7.1	109.1	4.25
	1.7	1.8	4.3	7.2	5.0	0.69	0.54	9.0	13.3	9.6	0.65	7.4	110.5	4.32
85	0.9	0.7	1.5	6.3	4.7	0.75	0.60	8.3	10.4	9.4	0.64	7.2	109.5	4.27
	1.1	1.1	2.6	6.6	4.8	0.73	0.59	8.6	11.2	9.6	0.65	7.4	110.5	4.33
	1.7	1.8	4.2	6.9	4.9	0.71	0.56	8.8	12.2	10.0	0.66	7.7	112.0	4.40
90	0.9	0.7	1.5	5.9	4.6	0.77	0.62	8.1	9.6	9.7	0.65	7.5	110.8	4.34
	1.1	1.1	2.6	6.3	4.7	0.75	0.61	8.3	10.3	10.0	0.66	7.7	112.0	4.40
	1.7	1.8	4.1	6.6	4.8	0.73	0.59	8.6	11.3	10.3	0.68	8.0	113.5	4.46
95	0.9	0.6	1.5	5.6	4.5	0.80	0.63	7.7	8.9	Operation Not Recommended				
	1.1	1.1	2.6	5.9	4.6	0.78	0.62	8.0	9.5					
	1.7	1.8	4.1	6.3	4.7	0.75	0.60	8.3	10.4					

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

GC Series 60Hz - R22 Submittal Data Eng / I-P

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 009

325 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	1.1	2.4	5.6	9.3	7.0	0.75	0.58	11.3	16.2	9.6	0.70	7.2	97.2	3.98
	1.7	3.1	7.2	9.6	7.1	0.74	0.54	11.5	17.8	10.0	0.72	7.6	98.6	4.09
	2.3	4.0	9.3	9.7	7.2	0.74	0.53	11.5	18.5	10.2	0.73	7.8	99.2	4.14
70	1.1	2.3	5.4	8.9	6.8	0.76	0.63	11.1	14.1	10.5	0.73	8.0	99.9	4.19
	1.7	3.0	6.9	9.2	7.0	0.76	0.59	11.2	15.6	10.9	0.74	8.4	101.1	4.29
	2.3	3.9	9.0	9.4	7.0	0.75	0.57	11.3	16.3	11.1	0.75	8.5	101.6	4.34
80	1.1	2.3	5.2	8.4	6.5	0.78	0.69	10.8	12.2	11.3	0.75	8.7	102.1	4.38
	1.7	2.9	6.7	8.8	6.7	0.77	0.65	11.0	13.6	11.7	0.77	9.1	103.4	4.48
	2.3	3.8	8.8	8.9	6.8	0.76	0.63	11.1	14.2	11.9	0.77	9.3	104.0	4.54
85	1.1	2.2	5.1	8.2	6.4	0.78	0.72	10.6	11.3	11.6	0.76	9.0	103.2	4.47
	1.7	2.9	6.7	8.5	6.6	0.77	0.68	10.8	12.6	12.2	0.78	9.5	104.7	4.58
	2.3	3.7	8.6	8.7	6.7	0.77	0.66	10.9	13.2	12.4	0.79	9.8	105.5	4.63
90	1.1	2.2	5.1	7.9	6.2	0.79	0.75	10.5	10.5	12.1	0.78	9.4	104.4	4.56
	1.7	2.8	6.6	8.3	6.4	0.78	0.71	10.7	11.7	12.7	0.79	10.0	106.1	4.68
	2.3	3.7	8.5	8.4	6.5	0.78	0.69	10.8	12.2	13.0	0.81	10.3	107.1	4.73
95	1.1	2.2	5.0	7.6	6.0	0.79	0.79	10.3	9.7	Operation Not Recommended				
	1.7	2.8	6.5	8.0	6.3	0.79	0.74	10.5	10.8					
	2.3	3.6	8.4	8.1	6.4	0.78	0.72	10.6	11.3					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 012

400 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	1.5	2.3	5.3	12.7	9.0	0.71	0.82	15.5	15.5	13.0	1.00	9.5	100.0	3.79
	2.3	4.5	10.3	13.1	9.2	0.70	0.77	15.7	17.1	13.6	1.02	10.1	101.6	3.90
	3.0	6.4	14.9	13.2	9.2	0.70	0.74	15.8	17.8	13.9	1.03	10.4	102.3	3.95
70	1.5	2.2	5.1	12.1	8.7	0.71	0.90	15.2	13.5	14.4	1.05	10.8	103.2	4.01
	2.3	4.3	9.9	12.6	8.9	0.71	0.84	15.5	14.9	15.0	1.07	11.4	104.8	4.11
	3.0	6.2	14.3	12.8	9.0	0.71	0.82	15.6	15.6	15.3	1.08	11.7	105.5	4.16
80	1.5	2.1	4.9	11.4	8.3	0.73	0.98	14.7	11.6	15.6	1.09	11.9	106.1	4.19
	2.3	4.2	9.7	11.9	8.6	0.72	0.92	15.1	12.9	16.3	1.11	12.5	107.7	4.28
	3.0	6.0	13.9	12.1	8.7	0.71	0.90	15.2	13.5	16.6	1.12	12.7	108.3	4.33
85	1.5	2.1	4.9	11.0	8.1	0.73	1.02	14.4	10.7	16.2	1.11	12.4	107.5	4.27
	2.3	4.1	9.5	11.5	8.3	0.72	0.96	14.8	12.0	16.8	1.13	13.0	108.9	4.36
	3.0	6.0	13.8	11.8	8.5	0.72	0.94	15.0	12.5	17.1	1.14	13.2	109.6	4.40
90	1.5	2.1	4.8	10.5	7.8	0.75	1.07	14.1	9.8	16.7	1.13	12.9	108.7	4.35
	2.3	4.1	9.4	11.1	8.1	0.73	1.01	14.5	11.0	17.3	1.14	13.4	110.1	4.44
	3.0	5.9	13.6	11.4	8.3	0.73	0.98	14.7	11.6	17.6	1.15	13.7	110.8	4.48
95	1.5	2.1	4.8	10.0	7.6	0.76	1.11	13.8	9.0	Operation Not Recommended				
	2.3	4.0	9.3	10.6	7.9	0.74	1.05	14.2	10.1					
	3.0	5.8	13.4	10.9	8.0	0.74	1.03	14.4	10.6					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
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.
See performance correction tables for operating conditions other than those listed above.

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 018

600 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	2.3	2.1	4.8	20.2	14.8	0.73	1.37	24.8	14.7	19.9	1.54	14.6	100.7	3.78
	3.4	3.0	7.0	20.9	15.1	0.72	1.28	25.3	16.4	20.7	1.57	15.4	102.0	3.87
	4.5	4.3	9.8	21.3	15.2	0.71	1.24	25.6	17.2	21.1	1.58	15.7	102.6	3.90
70	2.3	2.0	4.6	19.3	14.4	0.75	1.48	24.4	13.1	21.6	1.60	16.1	103.3	3.95
	3.4	2.9	6.7	20.0	14.7	0.74	1.39	24.7	14.3	22.4	1.63	16.8	104.6	4.03
	4.5	4.1	9.5	20.3	14.9	0.73	1.36	24.9	14.9	22.7	1.64	17.1	105.1	4.06
80	2.3	1.9	4.5	18.3	13.8	0.75	1.58	23.7	11.5	23.1	1.65	17.4	105.6	4.09
	3.4	2.8	6.5	19.1	14.3	0.75	1.50	24.2	12.7	23.8	1.68	18.1	106.8	4.15
	4.5	4.0	9.2	19.4	14.4	0.74	1.47	24.4	13.2	24.1	1.69	18.3	107.2	4.17
85	2.3	1.9	4.4	17.6	13.4	0.76	1.63	23.1	10.8	23.7	1.68	18.0	106.6	4.14
	3.4	2.8	6.4	18.6	14.0	0.75	1.56	23.9	11.9	24.4	1.71	18.6	107.6	4.19
	4.5	3.9	9.1	18.9	14.2	0.75	1.52	24.1	12.4	24.7	1.72	18.8	108.1	4.20
90	2.3	1.9	4.4	16.7	12.9	0.77	1.67	22.4	10.0	24.3	1.70	18.5	107.5	4.18
	3.4	2.7	6.3	17.9	13.6	0.76	1.61	23.4	11.2	24.9	1.73	19.0	108.5	4.22
	4.5	3.9	9.0	18.3	13.8	0.75	1.58	23.7	11.6	25.3	1.74	19.4	109.0	4.25
95	2.3	1.9	4.3	15.7	12.3	0.78	1.72	21.5	9.1	Operation Not Recommended				
	3.4	2.7	6.3	17.1	13.1	0.77	1.65	22.7	10.3					
	4.5	3.8	8.9	17.6	13.4	0.76	1.63	23.2	10.8					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
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.
See performance correction tables for operating conditions other than those listed above.

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 024

800 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	3.0	2.0	4.6	25.5	19.1	0.75	1.71	31.3	14.9	26.3	1.74	20.3	100.4	4.42
	4.5	3.8	8.9	25.8	19.2	0.74	1.62	31.4	15.9	27.4	1.78	21.4	101.8	4.51
	6.0	6.4	14.9	26.0	19.3	0.74	1.58	31.4	16.5	28.0	1.80	21.9	102.4	4.55
70	3.0	1.9	4.4	24.9	18.7	0.75	1.85	31.2	13.5	28.6	1.83	22.4	103.1	4.59
	4.5	3.7	8.5	25.3	19.0	0.75	1.76	31.3	14.4	29.7	1.87	23.3	104.3	4.66
	6.0	6.2	14.3	25.5	19.1	0.75	1.71	31.3	14.9	30.1	1.89	23.7	104.9	4.68
80	3.0	1.9	4.3	23.9	18.0	0.75	1.97	30.6	12.1	30.5	1.90	24.0	105.3	4.70
	4.5	3.6	8.3	24.6	18.5	0.75	1.89	31.0	13.0	31.3	1.94	24.7	106.2	4.73
	6.0	6.0	13.9	24.9	18.7	0.75	1.84	31.2	13.5	31.6	1.95	25.0	106.6	4.74
85	3.0	1.8	4.2	23.2	17.6	0.76	2.03	30.2	11.4	31.2	1.93	24.6	106.1	4.73
	4.5	3.6	8.2	24.1	18.2	0.75	1.95	30.8	12.4	31.9	1.97	25.1	106.9	4.75
	6.0	6.0	13.8	24.5	18.4	0.75	1.91	31.0	12.8	32.1	1.98	25.3	107.2	4.75
90	3.0	1.8	4.2	22.4	17.2	0.77	2.08	29.5	10.8	31.8	1.96	25.1	106.8	4.75
	4.5	3.5	8.1	23.5	17.8	0.76	2.01	30.3	11.7	32.3	1.99	25.5	107.3	4.75
	6.0	5.9	13.6	23.9	18.1	0.75	1.97	30.6	12.1	32.4	2.00	25.6	107.5	4.74
95	3.0	1.8	4.1	21.5	16.6	0.77	2.13	28.7	10.1	Operation Not Recommended				
	4.5	3.5	8.0	22.7	17.3	0.76	2.07	29.8	11.0					
	6.0	5.8	13.4	23.2	17.6	0.76	2.03	30.2	11.5					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 030

1000 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	3.8	1.6	3.6	28.8	21.3	0.74	2.00	35.7	14.4	31.2	2.22	23.6	98.9	4.12
	5.6	2.8	6.5	29.2	21.5	0.74	1.91	35.7	15.3	32.1	2.24	24.5	99.7	4.21
	7.5	4.4	10.1	29.4	21.7	0.74	1.87	35.7	15.7	32.6	2.25	24.9	100.2	4.25
70	3.8	1.5	3.5	28.1	21.0	0.75	2.17	35.5	13.0	33.3	2.26	25.5	100.8	4.31
	5.6	2.7	6.2	28.7	21.2	0.74	2.06	35.7	13.9	34.1	2.28	26.3	101.6	4.38
	7.5	4.2	9.7	28.9	21.3	0.74	2.01	35.7	14.4	34.6	2.29	26.7	102.0	4.42
80	3.8	1.5	3.4	26.9	20.4	0.76	2.34	34.9	11.5	35.0	2.30	27.2	102.4	4.45
	5.6	2.6	6.1	27.7	20.8	0.75	2.23	35.4	12.4	35.8	2.33	27.9	103.2	4.51
	7.5	4.1	9.4	28.1	20.9	0.75	2.18	35.5	12.9	36.2	2.34	28.2	103.5	4.53
85	3.8	1.4	3.3	26.2	20.1	0.77	2.43	34.5	10.8	35.8	2.33	27.9	103.2	4.51
	5.6	2.6	6.0	27.1	20.5	0.76	2.32	35.0	11.7	36.6	2.36	28.5	103.8	4.55
	7.5	4.0	9.3	27.5	20.7	0.75	2.27	35.3	12.1	36.9	2.37	28.8	104.2	4.56
90	3.8	1.4	3.3	25.4	19.7	0.77	2.50	33.9	10.2	36.6	2.36	28.5	103.8	4.55
	5.6	2.6	5.9	26.4	20.1	0.76	2.41	34.6	11.0	37.2	2.38	29.1	104.5	4.58
	7.5	4.0	9.2	26.8	20.4	0.76	2.35	34.9	11.4	37.5	2.40	29.3	104.8	4.59
95	3.8	1.4	3.2	24.5	19.2	0.78	2.57	33.3	9.5	Operation Not Recommended				
	5.6	2.5	5.8	25.6	19.7	0.77	2.49	34.1	10.3					
	7.5	3.9	9.1	26.1	20.0	0.77	2.44	34.4	10.7					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 036

1200 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	4.5	1.8	4.1	38.2	26.8	0.70	2.74	47.6	14.0	39.0	2.94	28.9	100.1	3.88
	6.8	3.2	7.4	39.0	26.9	0.69	2.58	47.8	15.1	41.4	3.03	31.0	101.9	4.00
	9.0	5.1	11.8	39.3	27.1	0.69	2.50	47.8	15.7	42.6	3.07	32.1	102.9	4.06
70	4.5	1.7	3.9	36.6	26.3	0.72	2.95	46.6	12.4	43.9	3.12	33.3	103.9	4.12
	6.8	3.1	7.2	37.8	26.7	0.71	2.80	47.3	13.5	46.2	3.21	35.2	105.6	4.22
	9.0	4.9	11.3	38.3	26.8	0.70	2.72	47.6	14.1	47.2	3.25	36.1	106.4	4.26
80	4.5	1.7	3.8	34.4	25.6	0.74	3.15	45.1	10.9	47.9	3.28	36.7	107.0	4.28
	6.8	3.0	7.0	35.9	26.2	0.73	3.01	46.2	11.9	49.7	3.36	38.2	108.3	4.34
	9.0	4.8	11.0	36.7	26.4	0.72	2.94	46.7	12.5	50.5	3.40	38.9	108.9	4.35
85	4.5	1.6	3.8	33.1	25.0	0.76	3.24	44.1	10.2	49.5	3.35	38.1	108.2	4.33
	6.8	3.0	6.9	34.8	25.8	0.74	3.11	45.4	11.2	50.9	3.42	39.3	109.3	4.36
	9.0	4.7	10.9	35.6	26.0	0.73	3.05	46.0	11.7	51.5	3.45	39.7	109.7	4.37
90	4.5	1.6	3.7	31.6	24.3	0.77	3.34	43.0	9.5	50.8	3.41	39.1	109.2	4.36
	6.8	2.9	6.8	33.5	25.2	0.75	3.21	44.5	10.4	51.8	3.47	39.9	110.0	4.37
	9.0	4.6	10.7	34.4	25.6	0.74	3.15	45.1	10.9	52.1	3.50	40.2	110.2	4.36
95	4.5	1.6	3.7	30.1	23.5	0.78	3.43	41.8	8.8	Operation Not Recommended				
	6.8	2.9	6.7	32.0	24.6	0.77	3.31	43.3	9.7					
	9.0	4.6	10.6	33.0	25.0	0.76	3.25	44.1	10.2					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GCV041

1325 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	5.3	1.0	2.2	40.0	29.0	0.73	2.78	49.4	14.4	43.1	3.21	32.2	100.1	3.93
	7.9	2.2	5.1	40.5	29.0	0.72	2.67	49.6	15.2	44.7	3.28	33.5	101.2	3.99
	10.5	4.0	9.3	40.9	29.0	0.71	2.62	49.8	15.6	45.5	3.32	34.1	101.8	4.02
70	5.3	0.9	2.1	39.1	29.0	0.74	3.00	49.4	13.1	46.6	3.37	35.1	102.6	4.06
	7.9	2.1	5.0	39.7	29.0	0.73	2.86	49.4	13.9	48.1	3.43	36.3	103.6	4.10
	10.5	3.9	8.9	39.9	29.0	0.73	2.79	49.4	14.3	48.8	3.46	36.9	104.1	4.13
80	5.3	0.9	2.1	37.9	28.4	0.75	3.24	49.0	11.7	49.6	3.50	37.6	104.7	4.15
	7.9	2.1	4.8	38.8	28.9	0.75	3.09	49.3	12.5	50.8	3.56	38.7	105.5	4.19
	10.5	3.8	8.7	39.1	29.0	0.74	3.01	49.4	13.0	51.4	3.58	39.2	106.0	4.21
85	5.3	0.9	2.0	37.0	27.8	0.75	3.36	48.5	11.0	50.9	3.56	38.7	105.5	4.19
	7.9	2.1	4.8	38.1	28.5	0.75	3.21	49.1	11.9	52.0	3.61	39.7	106.3	4.22
	10.5	3.7	8.6	38.5	28.8	0.75	3.13	49.2	12.3	52.6	3.64	40.1	106.7	4.23
90	5.3	0.9	2.0	35.9	27.1	0.75	3.48	47.7	10.3	52.0	3.61	39.7	106.3	4.22
	7.9	2.0	4.7	37.3	27.9	0.75	3.33	48.6	11.2	53.0	3.66	40.5	107.1	4.25
	10.5	3.7	8.5	37.8	28.3	0.75	3.26	48.9	11.6	53.5	3.68	40.9	107.4	4.26
95	5.3	0.9	2.0	34.4	26.3	0.76	3.58	46.7	9.6	Operation Not Recommended				
	7.9	2.0	4.6	36.2	27.3	0.75	3.45	47.9	10.5					
	10.5	3.6	8.4	36.9	27.7	0.75	3.38	48.4	10.9					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 042

1350 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	5.3	1.0	2.4	43.2	31.0	0.72	3.03	53.5	14.3	46.8	3.47	34.9	102.1	3.95
	8.0	2.7	6.2	43.8	31.0	0.71	2.89	53.6	15.2	48.9	3.58	36.7	103.5	4.00
	11.0	5.5	12.7	44.2	31.0	0.70	2.84	53.9	15.6	50.0	3.63	37.6	104.3	4.04
70	5.3	1.0	2.3	42.3	30.8	0.73	3.29	53.5	12.8	51.2	3.69	38.7	105.1	4.07
	8.0	2.6	6.0	42.9	30.9	0.72	3.11	53.5	13.8	53.3	3.79	40.4	106.6	4.13
	11.0	5.3	12.2	43.2	31.0	0.72	3.02	53.5	14.3	54.4	3.83	41.3	107.3	4.16
80	5.3	1.0	2.2	40.8	30.2	0.74	3.58	53.0	11.4	55.1	3.87	42.0	107.8	4.18
	8.0	2.5	5.8	41.9	30.7	0.73	3.38	53.4	12.4	57.0	3.95	43.6	109.1	4.24
	11.0	5.2	11.9	42.3	30.8	0.73	3.28	53.5	12.9	58.0	3.98	44.4	109.8	4.26
85	5.3	1.0	2.2	39.6	29.7	0.75	3.72	52.3	10.7	56.9	3.94	43.4	109.0	4.23
	8.0	2.5	5.8	41.1	30.4	0.74	3.53	53.1	11.6	58.6	4.01	45.0	110.2	4.29
	11.0	5.1	11.8	41.6	30.6	0.73	3.43	53.3	12.1	59.5	4.04	45.7	110.8	4.32
90	5.3	0.9	2.2	38.2	29.0	0.76	3.85	51.3	9.9	58.4	4.00	44.8	110.1	4.28
	8.0	2.5	5.7	40.0	29.9	0.75	3.67	52.6	10.9	60.1	4.06	46.2	111.2	4.34
	11.0	5.0	11.6	40.8	30.2	0.74	3.58	53.0	11.4	60.8	4.08	46.9	111.7	4.37
95	5.3	0.9	2.2	36.4	28.0	0.77	3.96	49.9	9.2	Operation Not Recommended				
	8.0	2.4	5.6	38.7	29.2	0.76	3.81	51.7	10.1					
	11.0	5.0	11.5	39.6	29.7	0.75	3.72	52.3	10.6					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
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.
See performance correction tables for operating conditions other than those listed above.

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 048

1600 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	6.0	1.2	2.9	50.2	35.8	0.71	3.67	62.7	13.7	52.1	3.70	39.5	100.1	4.13
	9.0	2.9	6.7	50.9	36.1	0.71	3.48	62.8	14.6	54.6	3.79	41.7	101.6	4.22
	12.0	5.3	12.3	51.2	36.3	0.71	3.39	62.8	15.1	56.0	3.84	42.9	102.4	4.27
70	6.0	1.2	2.8	48.8	35.4	0.73	3.96	62.3	12.3	57.4	3.89	44.1	103.2	4.32
	9.0	2.8	6.5	49.8	35.6	0.72	3.76	62.6	13.3	59.9	3.98	46.3	104.6	4.41
	12.0	5.1	11.8	50.2	35.8	0.71	3.66	62.7	13.7	61.1	4.02	47.4	105.4	4.45
80	6.0	1.2	2.7	46.6	34.8	0.75	4.25	61.1	11.0	62.0	4.05	48.2	105.9	4.48
	9.0	2.7	6.3	48.2	35.3	0.73	4.05	62.0	11.9	64.2	4.13	50.1	107.1	4.56
	12.0	5.0	11.5	48.8	35.4	0.73	3.95	62.3	12.4	65.2	4.16	51.0	107.8	4.60
85	6.0	1.2	2.7	45.2	34.3	0.76	4.38	60.2	10.3	64.0	4.12	49.9	107.0	4.55
	9.0	2.7	6.2	47.1	34.9	0.74	4.20	61.4	11.2	66.0	4.18	51.7	108.2	4.62
	12.0	4.9	11.3	47.9	35.2	0.73	4.10	61.8	11.7	66.9	4.21	52.6	108.7	4.66
90	6.0	1.1	2.6	43.5	33.5	0.77	4.51	58.9	9.7	65.7	4.18	51.5	108.0	4.61
	9.0	2.7	6.1	45.7	34.5	0.75	4.34	60.5	10.5	67.6	4.23	53.1	109.1	4.68
	12.0	4.8	11.2	46.7	34.8	0.75	4.24	61.1	11.0	68.4	4.25	53.9	109.6	4.71
95	6.0	1.1	2.6	41.6	32.6	0.78	4.62	57.4	9.0	Operation Not Recommended				
	9.0	2.6	6.1	44.1	33.8	0.77	4.47	59.3	9.9					
	12.0	4.8	11.0	45.2	34.3	0.76	4.38	60.2	10.3					

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

CLIMATEMASTER
Geothermal Heat Pump Systems

Performance Data
GC H/V 060

2000 CFM Nominal (Rated) Airflow

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		Cooling - EAT 80/67°F						Heating - EAT 70°F				
		PSI	FT	TC	SC	Sens/ Tot Ratio	kW	HR	EER	HC	kW	HE	LAT	COP
60	7.5	4.4	10.1	60.5	43.1	0.71	4.36	75.4	13.9	63.0	5.02	45.9	99.2	3.68
	11.3	7.6	17.5	61.2	43.2	0.71	4.17	75.5	14.7	67.4	5.17	49.8	101.2	3.82
	15.0	11.5	26.7	61.6	43.3	0.70	4.08	75.5	15.1	69.8	5.25	51.9	102.3	3.90
70	7.5	4.2	9.7	59.0	42.9	0.73	4.68	74.9	12.6	72.6	5.34	54.4	103.6	3.98
	11.3	7.3	16.9	60.1	43.1	0.72	4.46	75.3	13.5	77.0	5.49	58.2	105.6	4.11
	15.0	11.1	25.6	60.5	43.2	0.71	4.36	75.4	13.9	79.2	5.56	60.2	106.6	4.17
80	7.5	4.1	9.4	56.8	42.4	0.75	5.04	74.0	11.3	80.6	5.61	61.5	107.3	4.21
	11.3	7.1	16.4	58.3	42.8	0.73	4.80	74.7	12.2	84.4	5.74	64.8	109.1	4.31
	15.0	10.8	25.0	59.0	42.9	0.73	4.68	74.9	12.6	86.2	5.80	66.4	109.9	4.35
85	7.5	4.0	9.3	55.4	42.0	0.76	5.23	73.3	10.6	83.9	5.73	64.4	108.9	4.30
	11.3	7.0	16.2	57.2	42.5	0.74	4.98	74.1	11.5	87.3	5.84	67.4	110.4	4.38
	15.0	10.7	24.6	57.9	42.7	0.74	4.86	74.5	11.9	88.7	5.89	68.7	111.1	4.42
90	7.5	4.0	9.2	53.9	41.4	0.77	5.44	72.4	9.9	86.8	5.82	66.9	110.2	4.37
	11.3	6.9	16.0	55.8	42.1	0.75	5.17	73.5	10.8	89.5	5.91	69.4	111.5	4.44
	15.0	10.5	24.3	56.7	42.4	0.75	5.04	73.9	11.2	90.6	5.95	70.3	112.0	4.46
95	7.5	3.9	9.1	52.1	40.5	0.78	5.66	71.4	9.2	Operation Not Recommended				
	11.3	6.8	15.8	54.3	41.6	0.77	5.38	72.7	10.1					
	15.0	10.4	24.0	55.3	42.0	0.76	5.24	73.2	10.6					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
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.
See performance correction tables for operating conditions other than those listed above.

GC Series 60Hz - R22 Submittal Data Eng / I-P

CLIMATEMASTER
Geothermal Heat Pump Systems

Blower Performance Data
Standard Unit - No Reheat

Airflow in CFM with dry coil and clean air filter.

Model	Fan Speed	Rated Air-flow	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
GCH 006	HI	220	150			310	300	290	280	270	250	230	210	180					
	MED	220	150			260	250	240	230	210	200	190	150						
	LOW	220	150			210	200	190	180	160	150								
GCH/V 009	HI	325	225			410	400	380	360	350	330	320	300	280					
	MED	325	225			390	370	360	340	320	310	290	280	260					
	LOW	325	225			340	330	322	310	300	280	260	250						
GCH/V 012	HI	400	300			470	460	450	440	430	420	400	390	380	320				
	MED	400	300			420	410	400	390	380	370	360	350	340					
	LOW	400	300			360	360	350	340	320	320	310	300						
GCH/V 018	HI	600	450			760	740	720	710	700	680	650	600	550	460				
	MED	600	450	700	690	680	670	660	650	630	620	600	560	520					
	LOW	600	450	620	610	600	590	580	570	560	540	520	490	460					
GCH/V 024	HI	800	600									1000	970	930	870	770	690		
	MED	800	600	1010	1000	990	980	960	940	920	900	880	860	830	770	700	600		
	LOW	800	600	820	810	800	790	780	770	760	750	730	720	700	650	600			
GCH/V 030	HI	1000	750							1160	1130	1100	1070	1030	950	840			
	MED	1000	750	1250	1230	1200	1180	1150	1120	1090	1070	1040	1010	970	890	750			
	LOW	1000	750	1120	1100	1070	1050	1030	1010	980	960	930	900	870	790				
GCH/V 036	HI	1200	900	1520	1500	1480	1460	1430	1400	1370	1350	1320	1270	1210	1110	960			
	MED	1200	900	1210	1200	1140	1140	1130	1130	1120	1110	1100	1070	1040	940				
	LOW	1200	900	1010	1010	1000	1000	990	990	980	980	970	950	930					
GCV 041	HI	1325	950	1380	1370	1350	1330	1300	1260	1220	1170	1120	1080	1040					
	MED	1325	950	1230	1220	1200	1190	1180	1150	1120	1080	1030	990	950					
	LOW	1325	950	1040	1030	1010	1000	990	970	950									
GCH/V 042	HI	1350	1050	1640	1610	1580	1550	1520	1490	1450	1410	1370	1330	1290	1190	1100			
	MED	1350	1050	1490	1470	1440	1420	1390	1370	1340	1310	1270	1230	1190	1120				
	LOW	1350	1050	1140	1140	1130	1130	1120	1110	1100	1080	1060							
GCH/V 048	HI	1600	1200					1980	1950	1910	1860	1800	1740	1680	1490	1280	1280		
	MED	1600	1200	1940	1920	1900	1880	1860	1820	1770	1740	1710	1660	1600	1410				
	LOW	1600	1200	1770	1750	1730	1710	1690	1670	1650	1610	1570	1510	1450	1330				
GCH/V 060	HI	2000	1500	2240	2240	2230	2220	2200	2160	2120	2090	2060	2040	2010	1960	1880	1790	1660	1510
	MED	2000	1500	2050	2050	2040	2020	1990	1970	1940	1920	1890	1860	1830	1780	1710	1620		
	LOW	2000	1500	1850	1850	1840	1830	1810	1800	1780	1760	1730	1700	1670	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.

CLIMATEMASTER
Geothermal Heat Pump Systems

Blower Performance Data - High Static
Standard Unit - No Reheat

Airflow in CFM with dry coil and clean air filter.

Model	Fan Speed	Rated Air-flow	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
GCH/V 018	HS HI	600	450				790	780	770	760	750	730	710	690	650	530			
	HS MED	600	450	750	740	720	710	700	690	670	670	660	650	630	600	490			
	HS LOW	600	450	670	660	640	630	620	610	600	590	580	580	570	530				
GCH/V 024	HS HI	800	600											1030	950	840	700		
	HS MED	800	600									1040	1010	970	890	750	620		
	HS LOW	800	600					1030	1010	980	960	930	900	870	790	710			
GCH/V 030	HS HI	1000	750											1160	1040	920	800	750	
	HS MED	1000	750									1130	1080	1030	930	820	750		
	HS LOW	1000	750	1050	1040	1030	1010	990	980	960	940	910	880	840	750				
GCH/V 036	HS HI	1200	900									1530	1500	1470	1400	1290	1170	960	
	HS MED	1200	900	1360	1350	1340	1330	1320	1310	1300	1280	1260	1250	1230	1150	1070	910		
	HS LOW	1200	900	1030	1020	1010	1010	1000	1000	990	980	960	950	930					
GCH/V 042	HS HI	1350	1050					1550	1540	1520	1500	1470	1460	1450	1380	1240	1080		
	HS MED	1350	1050	1390	1380	1370	1360	1350	1340	1320	1310	1300	1280	1250	1180	1080			
	HS LOW	1350	1050																
GCH/V 048	HS HI	1600	1200									2060	2040	2010	1960	1880	1790	1660	1510
	HS MED	1600	1200	2050	2050	2040	2020	1990	1970	1940	1920	1890	1860	1830	1780	1710	1620	1490	1320
	HS LOW	1600	1200	1850	1850	1840	1830	1810	1800	1780	1760	1730	1700	1670	1600	1510	1380	1220	
GCH/V 060	HS HI	2000	1500	2400	2400	2390	2380	2370	2360	2340	2320	2300	2270	2240	2200	2130	2060	1980	1890
	HS MED	2000	1500	2160	2160	2150	2150	2140	2110	2080	2060	2040	2030	2020	1980	1930	1880	1490	1750
	HS LOW	2000	1500	1930	1930	1920	1920	1910	1900	1890	1890	1880	1870	1850	1830	1800	1750	1700	1620

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.

CLIMATEMASTER
Geothermal Heat Pump Systems

Blower Performance Data
Units With ClimaDry

GCV Unit Blower Performance with ClimaDry Reheat Option

Coil Face Velocity FPM	GCV with Reheat ESP Loss		
	GCV 018, 024, 030 In. of Water	GCV 036, 042 In. of Water	GCV 048, 060 In. of Water
200	0.060	0.049	0.038
250	0.070	0.055	0.040
300	0.090	0.068	0.045
350	0.124	0.091	0.059
400	0.164	0.129	0.094
450	0.252	0.221	0.189
500	0.380	0.350	0.320

For GCV units with Reheat coil applications. calculate coil face velocity of the entering air. From the table above find ESP loss for Reheat application.
This loss includes the wet coil loss.

Example:
Reheat coil loss can be determined from the above table. Coil velocity (FPM) = Airflow (CFM) / Face Area (sq. ft.)

1) GCV036 has a face area of 3.63 sq. ft. (see physical data table).
2) At 1,100 cfm, coil velocity (FPM) = 1,100 / 3.63 = 303 FPM
3) From above table, it will be necessary to subtract 0.068 from the blower performance ESP.
4) On medium speed, the GCV036 (without reheat – see blower table) can deliver 1,100 CFM at 0.40 in. wg.; with the reheat coil, it now delivers 1,063 CFM at 0.40 in. wg (includes adder for wet coil) or 1,100 CFM at 0.33 in. wg.
5) To compensate, high speed fan should be used to overcome pressure drop of reheat coil.

GCV Unit Blower Performance with Wet Coil

Coil Face Velocity FPM	Wet Coil Reduction In. of Water
200	0.030
250	0.055
300	0.080
350	0.100
400	0.120
450	0.140
500	0.160

Example:
Wet coil loss can be determined from the above table. Coil velocity (FPM) = Airflow (CFM) / Face Area (sq. ft.)

1) GCV036 has a face area of 3.63 sq. ft. (see physical data table).
2) At 1,100 cfm, coil velocity (FPM) = 1,100 / 3.63 = 303 FPM
3) From above table, it will be necessary to subtract 0.080 from the blower performance ESP.
4) On medium speed, the GCV036 (without dry coil – see blower table) can deliver 1,100 CFM at 0.40 in. wg.; with a wet coil, it now delivers 1,055 CFM at 0.40 in. wg or 1,100 CFM at 0.32 in. wg.
5) If unit has reheat option, reheat coil pressure drop already includes adjustment for wet coil (Reheat ESP Loss Table).

CLIMATEMASTER
Geothermal Heat Pump Systems

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%	0.970	0.899	0.953	0.967	0.966	1.051	0.939
81%	0.979	0.924	0.966	0.976	0.976	1.037	0.956
88%	0.987	0.949	0.979	0.985	0.985	1.023	0.973
94%	0.994	0.975	0.990	0.993	0.993	1.012	0.987
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.005	1.026	1.008	1.005	1.006	0.991	1.010
113%	1.009	1.051	1.016	1.010	1.011	0.982	1.020
119%	1.011	1.077	1.022	1.013	1.014	0.975	1.027
125%	1.013	1.102	1.027	1.016	1.017	0.968	1.033

Entering Air Correction Table

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
45	1.044	0.803	1.123
50	1.042	0.847	1.107
55	1.037	0.888	1.086
60	1.028	0.927	1.062
65	1.016	0.965	1.033
68	1.007	0.986	1.014
70	1.000	1.000	1.000
75	0.980	1.033	0.963
80	0.957	1.065	0.921

Cooling										
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	0.858	0.812	1.062	1.217	1.229	*	*	*	0.982	0.886
65	0.964	0.622	0.876	1.076	1.098	1.240	*	*	0.996	0.971
66.2	0.986	0.577	0.822	1.032	1.055	1.214	*	*	0.999	0.989
67	1.000	0.547	0.785	1.000	1.024	1.192	1.362	1.508	1.000	1.000
70	1.049		0.630	0.864	0.891	1.086	1.236	1.399	1.004	1.039
75	1.113			0.580	0.609	0.814	1.027	1.218	1.007	1.089

* = 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

GC Series 60Hz - R22 Submittal Data Eng / I-P

CLIMATEMASTER
Geothermal Heat Pump Systems

Physical Data

Model	006	009	012	018	024	030	036	041	042	048	060
Compressor (1 Each)	Rotary			Reciprocating							Scroll
Factory Charge Vertical R22 (oz) [kg]	-	14 [.40]	14 [.40]	25 [.74]	38 [1.08]	37 [1.05]	42 [1.19]	50 [1.42]	51 [1.87]	66 [1.87]	74 [2.10]
Factory Charge Horizontal R22 (oz) [kg]	14 [.40]	14 [.40]	14 [.40]	25 [.74]	38 [1.08]	37 [1.05]	41 [1.16]	-	51 [1.87]	66 [1.87]	74 [2.10]
PSC Fan Motor & Blower (3 Speeds)											
Fan Motor (hp) [W]	1/25 [30]	1/10 [75]	1/10 [75]	1/6 [124]	1/4 [187]	3/4 [560]	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]	8 x 7 [208 x 178]	9 x 7 [229 x 178]	9 x 7 [229 x 178]	9 x 8 [229 x 203]	9 x 8 [229 x 203]	9 x 8 [229 x 203]	10 x 10 [254 x 254]	11 x 10 [279 x 254]
Water Connection Size											
IPT (in)	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Coax Volume											
Volume (US Gallons) [liters]	0.123 [0.47]	0.143 [0.54]	0.167 [0.63]	0.286 [1.08]	0.286 [1.08]	0.323 [1.22]	0.526 [1.99]	0.738 [2.79]	0.890 [3.37]	0.738 [2.79]	0.939 [3.55]
Vertical Upflow											
Air Coil Dimensions (h x w) - (in) [mm]	-	10 x 15 [254 x 381]	10 x 15 [254 x 381]	20 x 17.25 [508 x 438]	20 x 17.25 [508 x 438]	20 x 17.25 [508 x 438]	24 x 21.75 [610 x 552]	20 x 17.25 [508 x 438]	24 x 21.75 [610 x 552]	24 x 28.25 [610 x 718]	24 x 28.25 [610 x 718]
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	-	10 x 18 [254 x 457]	10 x 18 [254 x 457]	20 x 20 [508 x 508]	20 x 20 [508 x 508]	20 x 20 [508 x 508]	24 x 24 [610 x 610]	20 x 20 [508 x 508]	24 x 24 [610 x 610]	1 - 14 x 24, 1 - 18 x 24 [356 x 610], [457 x 610]	1 - 14 x 24, 1 - 18 x 24 [356 x 610], [457 x 610]
Horizontal											
Air Coil Dimensions (h x w) - (in) [mm]	10 x 15 [254 x 381]	10 x 15 [254 x 381]	10 x 15 [254 x 381]	16 x 22 [406 x 559]	16 x 22 [406 x 559]	16 x 22 [406 x 559]	20 x 25 [508 x 635]	-	20 x 25 [508 x 635]	20 x 35 [508 x 889]	20 x 35 [508 x 889]
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	10 x 18 [254 x 457]	10 x 18 [254 x 457]	10 x 18 [254 x 457]	16 x 25 [406 x 635]	16 x 25 [406 x 635]	16 x 25 [406 x 635]	20 x 28 or 2 - 20 x 14 [508 x 711] or [2 - 508 x 356]	-	20 x 28 or 2 - 20 x 14 [508 x 711] or [2 - 508 x 356]	1 - 20 x 24, 1 - 20 x 14 [508 x 610], [508 x 356]	1 - 20 x 24, 1 - 20 x 14 [508 x 610], [508 x 356]
Weight - Operating, (lbs) [kg]	103 [47]	105 [48]	114 [52]	181 [82]	189 [86]	197 [89]	203 [92]	207 [94]	218 [99]	263 [119]	278 [126]
Weight - Packaged, (lbs) [kg]	113 [51]	115 [52]	124 [56]	186 [84]	194 [88]	202 [92]	209 [95]	212 [96]	224 [102]	270 [122]	285 [129]

All units have grommet compressor mountings, and 1/2" [12.2mm] & 3/4" [19.mm] electrical knockouts.

Unit Maximum Water Working Pressure	
Options	**Max Pressure PSIG [kPa]**
Base Unit	450 [3100]
ClimaDry	145 [999]

Use the lowest maximum pressure rating when multiple options are combined.

CLIMATEMASTER
Geothermal Heat Pump Systems

GC - Horizontal Dimensional Data

Horizontal Model		Overall Cabinet		
		A Width	B Length	C Height
006 - 012	in	19.1	34.1	11.0
	cm	48.5	86.6	27.9
018	in	20.1	43.1	17.1
	cm	51.1	109.5	43.4
024 - 030	in	20.1	43.1	17.1
	cm	51.1	109.5	43.4
036 - 042	in	20.1	47.1	21.1
	cm	51.1	119.6	53.6
048	in	24.1	54.1	21.1
	cm	61.2	137.4	53.6
060	in	24.1	54.1	21.1
	cm	61.2	137.4	53.6

Horizontal Model		Water Connections				
		1	2	3	4	
		Loop In D	Loop In E	Loop Out F	Loop Out G	Size IPT
006 - 012	in	9.6	0.8	1.8	0.8	1/2”
	cm	24.4	2.0	4.4	2.0	
018	in	15.3	2.4	1.9	2.1	1/2”
	cm	38.9	6.1	4.9	5.3	
024 - 030	in	15.3	2.4	1.9	2.1	3/4”
	cm	38.9	6.1	4.9	5.3	
036 - 042	in	18.8	2.2	4.7	1.2	3/4”
	cm	47.6	5.5	11.9	3.0	
048	in	19.4	5.9	4.3	2.3	3/4”
	cm	49.2	14.9	11.0	5.8	
060	in	19.4	5.9	4.3	2.3	1”
	cm	49.2	14.9	11.0	5.8	

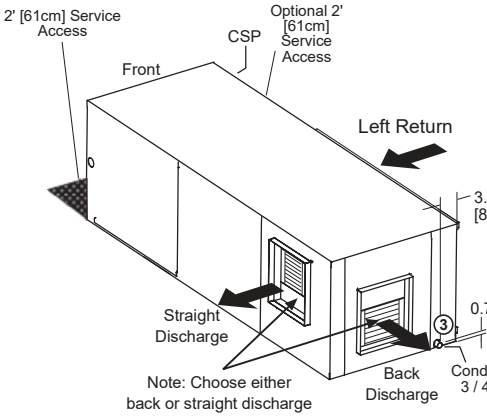
Horizontal Model		Electrical Knockouts		
		H 1/2”	J 1/2”	K 3/4”
		Low Voltage	Low Voltage	Power Supply
006 - 012	in	8.1	5.1	2.1
	cm	20.6	13.0	5.4
018	in	12.1	9.1	6.1
	cm	30.8	23.2	15.6
024 - 030	in	12.1	9.1	6.1
	cm	30.8	23.2	15.6
036 - 042	in	16.1	13.1	10.1
	cm	41.0	33.3	25.7
048	in	16.1	13.1	10.1
	cm	41.0	33.3	25.7
060	in	16.1	13.1	10.1
	cm	41.0	33.3	25.7

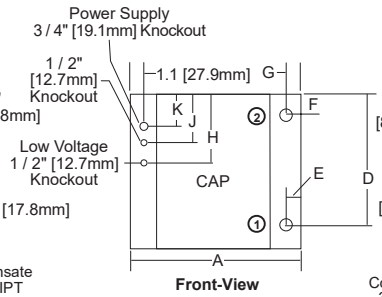
Horizontal Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		L	M Supply Height	N Supply Width	O	P	Q Return Width	R Return Height	S	T
006 - 012	in	0.8	8.9	6.7	5.2	1.3	16.1	9.8	1.1	0.6
	cm	1.9	22.7	17.0	13.3	3.3	41.0	25.0	2.7	1.5
018	in	2.6	13.3	9.9	4.1	1.3	23.0	15.0	1.1	1.0
	cm	6.6	33.8	25.1	10.5	3.3	58.4	38.1	2.8	2.5
024 - 030	in	2.6	13.3	9.9	4.1	1.3	23.0	15.0	1.1	1.0
	cm	6.6	33.8	25.1	10.5	3.3	58.4	38.1	2.8	2.5
036 - 042	in	2.5	16.1	11.0	3.0	2.5	25.9	19.0	1.1	1.0
	cm	6.3	40.9	27.9	7.7	6.4	65.8	48.3	2.8	2.5
048	in	3.7	16.1	13.7	4.1	1.3	35.9	19.0	1.1	1.0
	cm	9.5	41.0	34.8	10.3	3.2	91.2	48.3	2.8	2.5
060	in	1.7	18.1	13.7	4.1	1.3	35.9	19.0	1.1	1.0
	cm	4.4	46.0	34.8	10.3	3.2	91.2	48.3	2.8	2.5

CLIMATEMASTER
Geothermal Heat Pump Systems

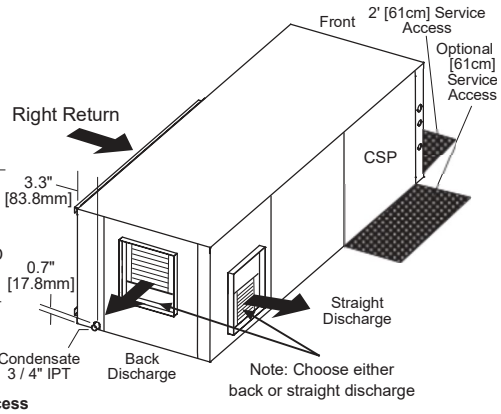
GC - Horizontal
Dimensional Data

LEFT RETURN

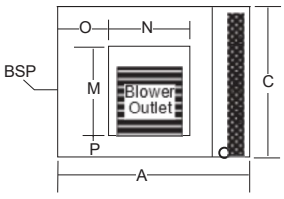




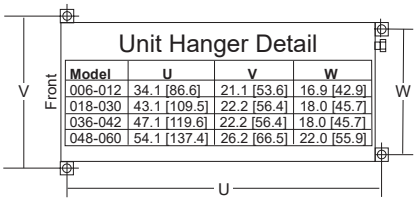
RIGHT RETURN

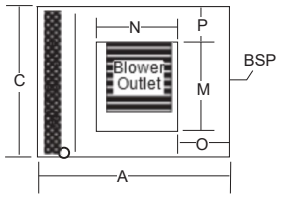


Note: Blower service panel requires 2' service access

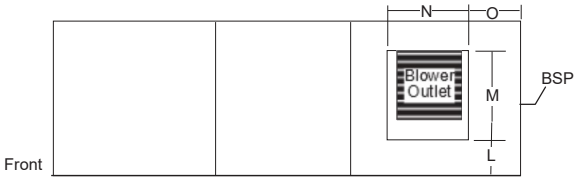


Left Return Back Discharge

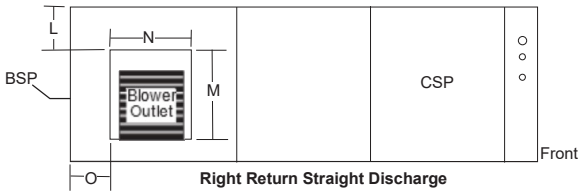




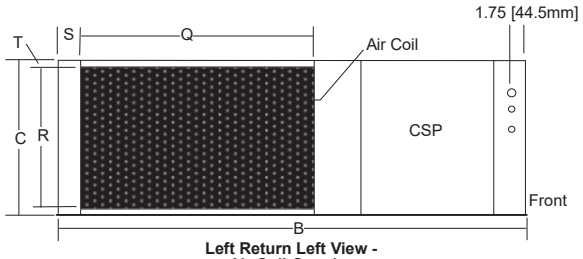
Right Return Back Discharge



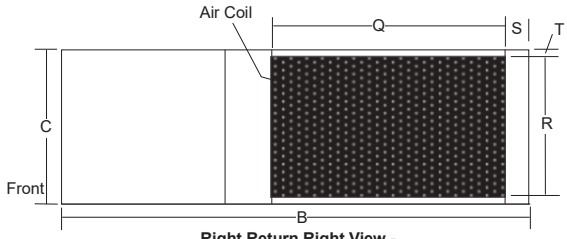
Left Return Straight Discharge



Right Return Straight Discharge



Left Return Left View - Air Coil Opening



Right Return Right View - Air Coil Opening

Notes:
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. 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.
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

CLIMATEMASTER
Geothermal Heat Pump Systems

GC - Vertical Upflow Dimensional Data

Vertical Upflow Model		Overall Cabinet		
		A Width	B Depth	C Height
009 - 012	in	19.1	19.1	22.0
	cm	48.5	48.5	55.9
018	in	21.5	21.5	39.0
	cm	54.6	54.6	99.1
024 - 030	in	21.5	21.5	39.0
	cm	54.6	54.6	99.1
036 - 042	in	21.5	26.0	44.0
	cm	54.6	66.0	111.8
041	in	21.5	21.5	39.0
	cm	54.6	54.6	99.1
048 - 060	in	24.0	32.5	46.0
	cm	61.0	82.6	116.8

Vertical Upflow Model		Water Connections - Standard Units							Water Connections - Units with ClimaDry			
		1		2		3			1		2	
		Loop In D	Loop In E	Loop Out F	Loop Out G	H	I	Size IPT	Loop In D	Loop In E	Loop Out F	Loop Out G
009 - 012	in	1.4	2.8	9.4	2.8	6.1	2.3	1/2"	N/A	N/A	N/A	N/A
	cm	3.6	7.1	24.0	7.1	15.6	5.9					
018	in	1.8	3.8	15.2	3.6	8.1	2.3	1/2"	5.424	2.608	14.875	4.071
	cm	4.5	9.7	38.6	9.1	20.6	5.8		13.78	6.62	37.78	10.34
024 - 030	in	1.8	3.8	15.2	3.6	8.1	2.3	3/4"	5.438	2.609	13.312	3.978
	cm	4.5	9.7	38.6	9.1	20.6	5.8		13.81	6.62	33.81	10.10
036 - 042	in	2.0	3.7	16.2	2.6	10.4	2.3	3/4"	6.344	2.633	14.500	2.759
	cm	5.1	9.4	41.1	6.6	26.4	5.8		16.11	6.69	36.83	7.01
041	in	1.7	3.6	16.4	2.6	8.1	2.3	3/4"	7.187	2.754	14.531	4.383
	cm	4.4	9.1	41.7	6.6	20.6	5.8		18.25	7.00	36.91	11.13
048 - 060	in	1.8	5.9	16.7	2.3	10.1	2.3	1"	7.187	2.754	15.251	3.321
	cm	4.5	14.9	42.4	5.8	25.7	5.8		18.25	7.00	38.74	8.43

Vertical Upflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	Low Voltage	Power Supply
009 - 012	in	2.9	5.9	8.9
	cm	7.3	14.9	22.5
018	in	4.1	7.1	10.1
	cm	10.5	18.1	25.7
024 - 030	in	4.1	7.1	10.1
	cm	10.5	18.1	25.7
036 - 042	in	4.1	7.1	10.1
	cm	10.5	18.1	25.7
041	in	4.1	7.1	10.1
	cm	10.5	18.1	25.7
048 - 060	in	4.1	7.1	10.1
	cm	10.5	18.1	25.7

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. (Except on GCV 009-030 & 041 with front return)
3. Discharge flange is field installed.
4. Condensate is 3/4" IPT.

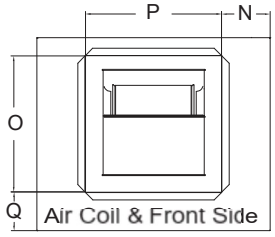
Legend:
CAP = Control Access Panel
BSP = Blower Service Panel
CSP = Compressor Access Panel
ASP = Alternative Service Panel

GC Series 60Hz - R22 Submittal Data Eng / I-P

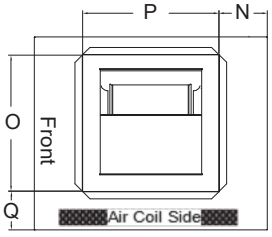
CLIMATEMASTER
Geothermal Heat Pump Systems

GC - Vertical Upflow
Dimensional Data

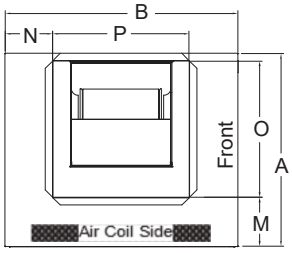
Vertical Upflow Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U
009 - 012	in	8.9	5.1	9.0	9.0	5.5	2.1	16.2	9.9	0.7
	cm	22.7	12.9	22.9	22.9	14.0	5.3	41.1	25.1	1.9
018	in	6.4	3.8	14.0	14.0	5.3	2.3	18.3	20.2	0.7
	cm	16.1	9.5	35.6	35.6	13.6	5.8	46.5	51.3	1.9
024 - 030	in	6.4	3.8	14.0	14.0	5.3	2.3	18.3	20.2	0.7
	cm	16.1	9.5	35.6	35.6	13.6	5.8	46.5	51.3	1.9
036 - 042	in	6.4	3.8	14.0	14.0	5.1	2.3	22.8	24.2	0.7
	cm	16.1	9.5	35.6	35.6	13.1	5.8	57.9	61.4	1.9
041	in	6.4	3.8	14.0	14.0	5.3	2.3	18.3	20.2	0.7
	cm	16.1	9.5	35.6	35.6	13.6	5.8	46.5	51.3	1.9
048 - 060	in	6.9	7.3	16.0	18.0	5.1	2.3	29.3	24.2	0.7
	cm	17.4	18.4	40.6	45.7	13.1	5.8	74.4	61.4	1.9



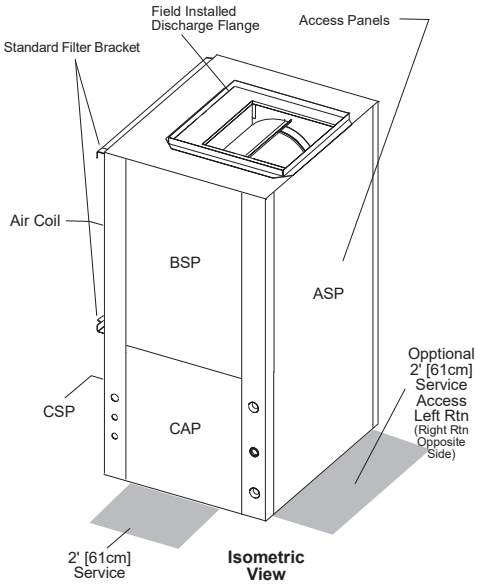
Top View-Front Return



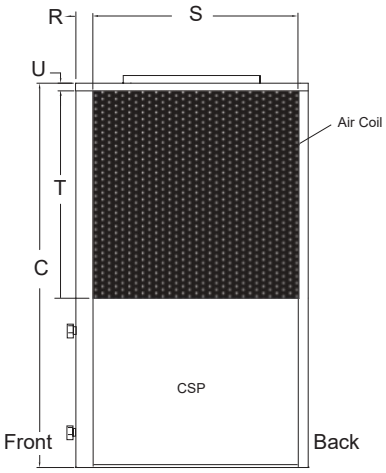
Top View-Right Return



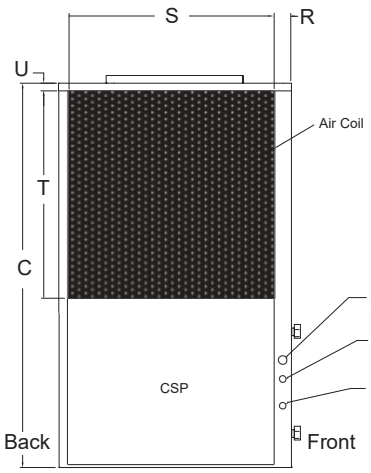
Top View-Left Return



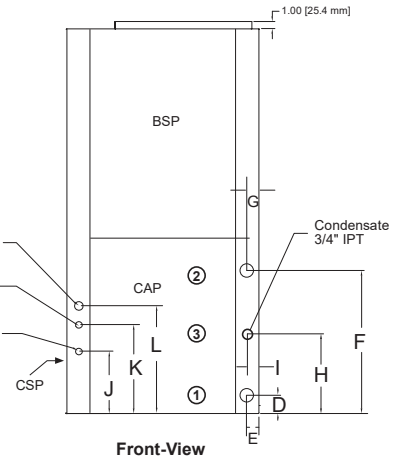
Isometric View



Right Return Right View - Air Coil Opening



Left Return Left View - Air Coil Opening



Front-View

Corner Weights for GCH Series Units

Model		Total	Left-Front*	Right-Front*	Left-Back*	Right-Back*
GCH006	Lbs	103	37	24	23	19
	kg	46.72	16.78	10.89	10.43	8.62
GCH009	Lbs	105	38	24	23	20
	kg	47.63	17.24	10.89	10.43	9.07
GCH012	Lbs	114	42	26	25	21
	kg	51.71	19.05	11.79	11.34	9.53
GCH018	Lbs	181	66	42	40	33
	kg	82.10	29.94	19.05	18.14	14.97
GCH024	Lbs	189	70	43	42	34
	kg	85.73	31.75	19.50	19.05	15.42
GCH030	Lbs	197	74	45	43	35
	kg	89.36	33.57	20.41	19.50	15.88
GCH036	Lbs	203	75	47	44	37
	kg	92.08	34.02	21.32	19.96	16.78
GCH042	Lbs	218	81	50	48	39
	kg	98.88	36.74	22.68	21.77	17.69
GCH048	Lbs	263	98	60	58	47
	kg	119.29	44.45	27.22	26.31	21.32
GCH060	Lbs	303	103	64	61	75
	kg	137.44	46.72	29.03	27.67	34.02

*Front is control box end.

GC Series 60Hz - R22 Submittal Data Eng / I-P

CLIMATEMASTER
Geothermal Heat Pump Systems

Electrical Data
Standard Blower Units

All GC Units								Standard GC Unit			GCV Units with ClimaDry			
Model	Voltage Code	Voltage	Min/ Max Voltage	Compressor			Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/ HACR	Reheat Pump FLA	Total Unit FLA	Min Cir-cuit Amps	Max Fuse/ HACR
				QTY	RLA	LRA								
GCH 006	G	208-230/60/1	197/254	1	2.9	17.7	0.4	3.3	4.0	15	N/A	N/A	N/A	N/A
	E	265/60/1	239/292	1	2.5	15.0	0.4	2.8	3.5	15	N/A	N/A	N/A	N/A
GCH/V 009	G	208-230/60/1	197/254	1	3.9	22.2	0.8	4.7	5.7	15	N/A	N/A	N/A	N/A
	E	265/60/1	239/292	1	3.3	18.8	0.7	4.0	4.8	15	N/A	N/A	N/A	N/A
GCH/V 012	G	208-230/60/1	197/254	1	5.3	27.9	0.8	6.1	7.4	15	N/A	N/A	N/A	N/A
	E	265/60/1	239/292	1	4.2	22.2	0.7	4.9	6.0	15	N/A	N/A	N/A	N/A
GCH/V 018	G	208-230/60/1	197/254	1	8.6	49.0	1.0	9.6	11.8	20	0.80	10.4	12.6	20
	E	265/60/1	239/292	1	8.1	44.0	0.9	8.9	11.0	15	0.70	9.6	11.7	15
GCH/V 024	G	208-230/60/1	197/254	1	9.6	50.0	1.5	11.1	13.5	20	0.80	11.9	14.3	20
	E	265/60/1	239/292	1	9.1	55.0	1.3	10.4	12.7	20	0.70	11.1	13.4	20
	H	208-230/60/3	197/254	1	6.7	51.0	1.5	8.2	9.9	15	0.80	9.0	10.7	15
	F*	460/60/3*	414/506	1	3.5	25.0	0.8	4.3	5.2	15	0.70	5.0	5.9	15
GCH/V 030	G	208-230/60/1	197/254	1	11.2	61.0	3.0	14.2	17.0	25	0.80	15.0	17.8	25
	E	265/60/1	239/292	1	10.0	58.0	2.7	12.7	15.2	25	0.70	13.4	15.9	25
	H	208-230/60/3	197/254	1	6.9	55.0	3.0	9.9	11.6	15	0.80	10.7	124	15
	F*	460/60/3*	414/506	1	3.6	28.0	1.7	5.3	6.2	15	0.70	6.0	6.9	15
GCH/V 036	G	208-230/60/1	197/254	1	15.4	82.0	1.8	17.2	21.1	35	0.80	18.0	21.9	35
	E	265/60/1	239/292	1	14.4	83.0	2.0	16.4	20.0	30	0.70	17.1	20.7	35
	H	208-230/60/3	197/254	1	9.6	70.0	1.8	11.4	13.8	20	0.80	12.2	14.6	20
	F*	460/60/3*	414/506	1	4.9	33.0	1.2	6.1	7.4	15	0.70	6.8	8.1	15
GCV 041	G	208-230/60/1	197/254	1	16.2	96.0	3.0	19.2	23.3	35	N/A	N/A	N/A	N/A
	H	208-230/60/3	197/254	1	10.3	75.0	3.0	13.3	15.9	25	N/A	N/A	N/A	N/A
	F*	460/60/3*	414/506	1	4.3	40.0	1.7	6.0	7.1	15	N/A	N/A	N/A	N/A
	N	575/60/3	518/633	1	3.7	31.0	1.5	5.2	6.0	15	N/A	N/A	N/A	N/A
GCH/V 042	G	208-230/60/1	197/254	1	17.1	105.0	3.0	20.1	24.4	40	0.80	20.9	25.2	40
	H	208-230/60/3	197/254	1	10.7	85.0	3.0	13.7	16.4	25	0.80	14.5	17.2	25
	F*	460/60/3*	414/506	1	5.3	42.0	1.7	7.0	8.3	15	0.70	7.7	9.0	15
	N	575/60/3	518/633	1	4.3	34.0	1.4	5.7	6.8	15	N/A	N/A	N/A	N/A
GCH/V 048	G	208-230/60/1	197/254	1	18.3	102.0	3.4	21.7	26.3	40	1.07	22.8	27.3	45
	H	208-230/60/3	197/254	1	12.6	91.0	3.4	16.0	19.2	30	1.07	17.1	20.2	30
	F*	460/60/3*	414/506	1	5.7	42.0	1.8	7.5	8.9	15	1.00	8.6	10.0	15
	N	575/60/3	518/633	1	4.7	39.0	1.4	6.1	7.2	15	N/A	N/A	N/A	N/A
GCH/V 060	G	208-230/60/1	197/254	1	25.6	170.0	4.9	30.5	36.9	60	1.07	31.0	37.4	60
	H	208-230/60/3	197/254	1	14.7	124.0	4.9	19.6	23.3	35	1.07	20.1	23.7	35
	F*	460/60/3*	414/506	1	7.4	59.6	2.5	9.9	11.8	15	1.00	11.0	12.8	20
	N	575/60/3	518/633	1	5.9	49.4	1.9	7.8	9.3	15	N/A	N/A	N/A	N/A

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

*** NEUTRAL CONNECTION REQUIRED! All F Voltage (460 vac) units with ClimaDry require a four wire power supply with neutral. Reheat pump is rated 265 vac and is wired between one hot leg and neutral.**

CLIMATEMASTER
Geothermal Heat Pump Systems

Electrical Data
High Static Blower Units

All GC Units								Standard GC Unit			GCV Units with ClimaDry			
Model	Voltage Code	Voltage	Min/ Max Voltage	Compressor			Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/ HACR	Reheat Pump FLA	Total Unit FLA	Min Cir-cuit Amps	Max Fuse/ HACR
				QTY	RLA	LRA								
GCH/V 018	G	208-230/60/1	197/254	1	8.6	49.0	1.0	9.6	11.8	20	0.80	10.4	12.6	20
	E	265/60/1	239/292	1	8.1	44.0	0.9	9.0	11.0	15	0.70	9.7	11.7	15
GCH/V 024	G	208-230/60/1	197/254	1	9.6	50.0	3.0	12.6	15.0	20	0.80	13.4	15.8	25
	E	265/60/1	239/292	1	9.1	55.0	2.7	11.8	14.1	20	0.70	12.5	14.8	20
	H	208-230/60/3	197/254	1	6.7	51.0	3.0	9.7	11.4	15	0.80	10.5	12.2	15
	F*	460/60/3*	414/506	1	3.5	25.0	1.7	5.2	6.1	15	0.70	5.9	6.8	15
GCH/V 030	G	208-230/60/1	197/254	1	11.2	61.0	3.0	14.2	17.0	25	0.80	15.0	17.8	25
	E	265/60/1	239/292	1	10.0	58.0	2.7	12.7	15.2	25	0.70	13.4	15.9	25
	H	208-230/60/3	197/254	1	6.9	55.0	3.0	9.9	11.6	15	0.80	10.7	12.4	15
	F*	460/60/3*	414/506	1	3.6	28.0	1.7	5.3	6.2	15	0.70	6.0	6.9	15
GCH/V 036	G	208-230/60/1	197/254	1	15.4	82.0	3.0	18.4	22.3	35	0.80	19.2	23.1	35
	E	265/60/1	239/292	1	14.4	83.0	2.7	17.1	20.7	35	0.70	17.8	21.4	35
	H	208-230/60/3	197/254	1	9.6	70.0	3.0	12.6	15.0	20	0.80	13.4	15.8	20
	F*	460/60/3*	414/506	1	4.9	33.0	1.7	6.6	7.8	15	0.70	7.3	8.5	15
GCH/V 042	G	208-230/60/1	197/254	1	17.1	105.0	3.0	20.1	24.4	40	0.80	20.9	25.2	40
	H	208-230/60/3	197/254	1	10.7	85.0	3.0	13.7	16.4	25	0.80	14.5	17.2	25
	F*	460/60/3*	414/506	1	5.3	42.0	1.7	7.0	8.3	15	0.70	7.7	9.0	15
	N	575/60/3	518/633	1	4.3	34.0	1.4	5.7	6.8	15	N/A	N/A	N/A	N/A
GCH/V 048	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	1.00	9.3	10.7	15
	N	575/60/3	518/633	1	4.7	39.0	1.9	6.6	7.8	15	N/A	N/A	N/A	N/A
GCH/V 060	G	208-230/60/1	197/254	1	25.6	170.0	5.8	31.4	37.8	60	1.07	32.5	38.9	60
	H	208-230/60/3	197/254	1	14.7	124.0	5.8	20.5	24.2	35	1.07	21.6	25.2	35
	F*	460/60/3*	414/506	1	7.4	59.6	2.6	10.0	11.9	15	1.00	11.1	12.9	20
	N	575/60/3	518/633	1	5.9	49.4	2.3	8.2	9.7	15	N/A	N/A	N/A	N/A

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

*** NEUTRAL CONNECTION REQUIRED! All F Voltage (460 vac) units with ClimaDry require a four wire power supply with neutral. Reheat pump is rated 265 vac and is wired between one hot leg and neutral.**

CLIMATEMASTER
Geothermal Heat Pump Systems

GC Series Wiring Diagram Matrix

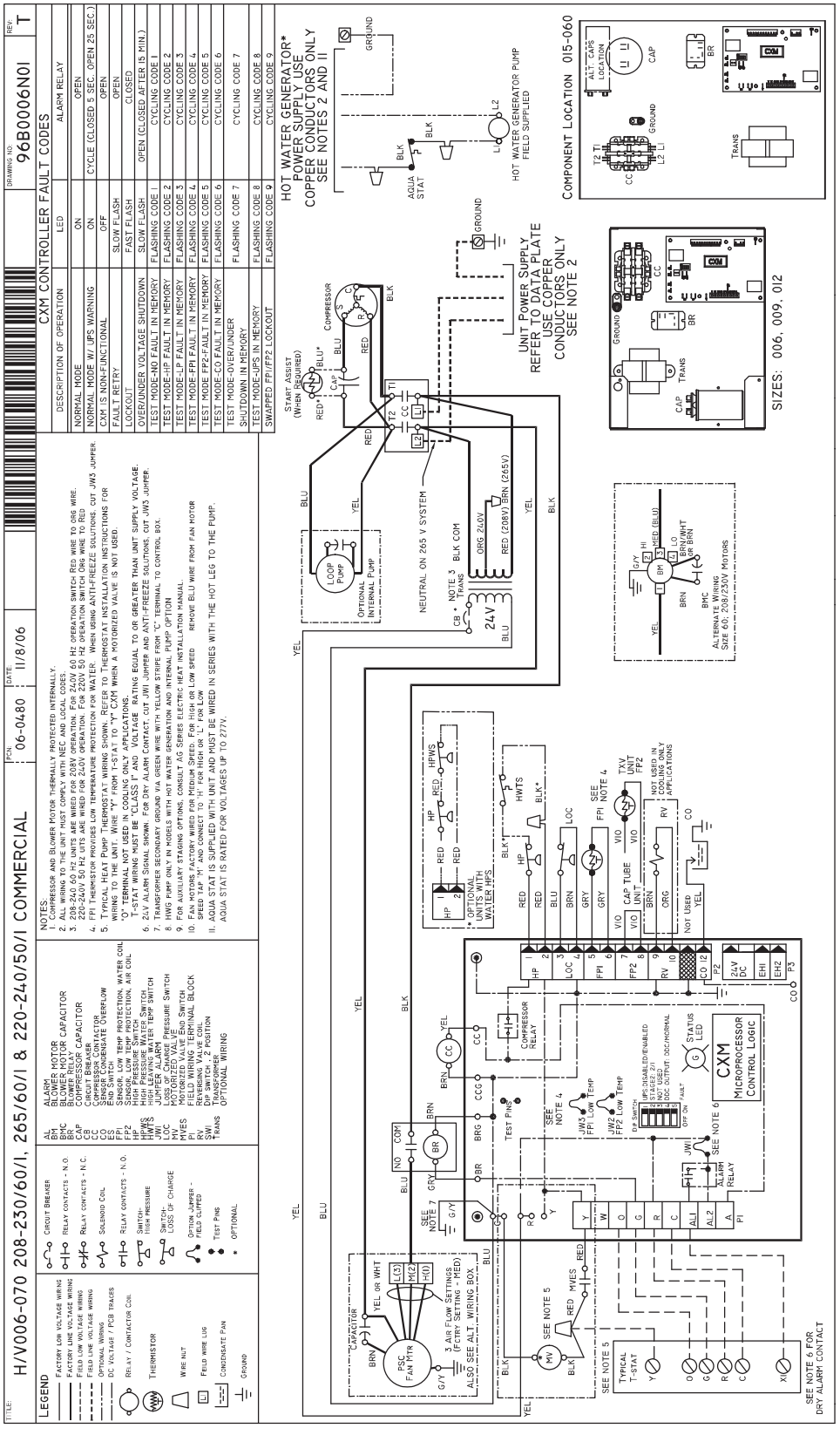
Only CXM and DXM diagrams, with a representative diagram of LON and MPC Options are presented in this submittal. Other diagrams can be located online at climatemaster.com using the part numbers presented below.

Model	Refrigerant	Wiring Diagram Part Number	Electrical	Control	DDC	Agency
GC 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	-
	R22	96B0014N02		DXM with Reheat Option		
GC 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	-
GC 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 climatemaster.com. R407C submittals will only contain CE Mark wiring diagrams

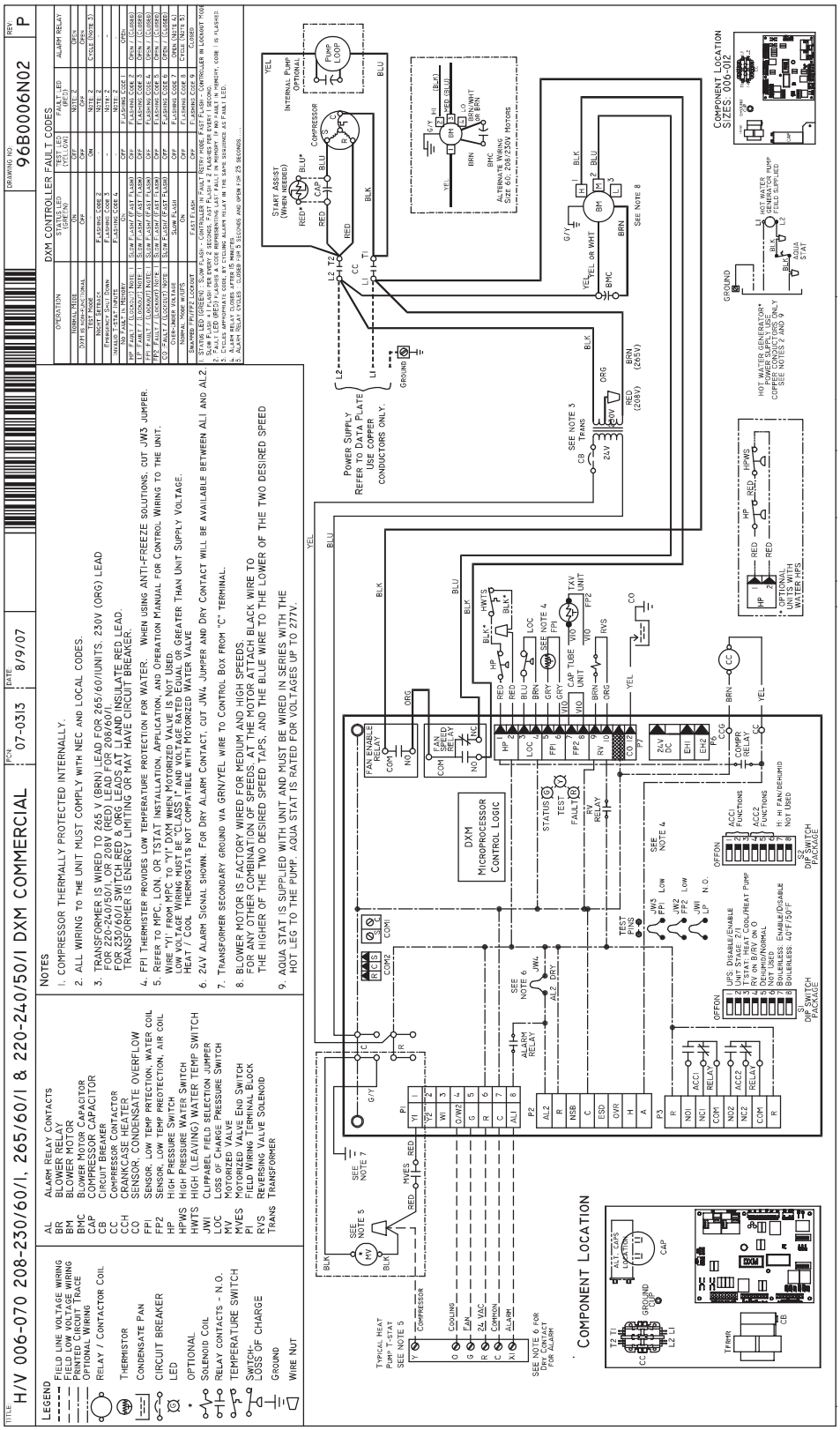
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram Single Phase GC Units With CXM Controller



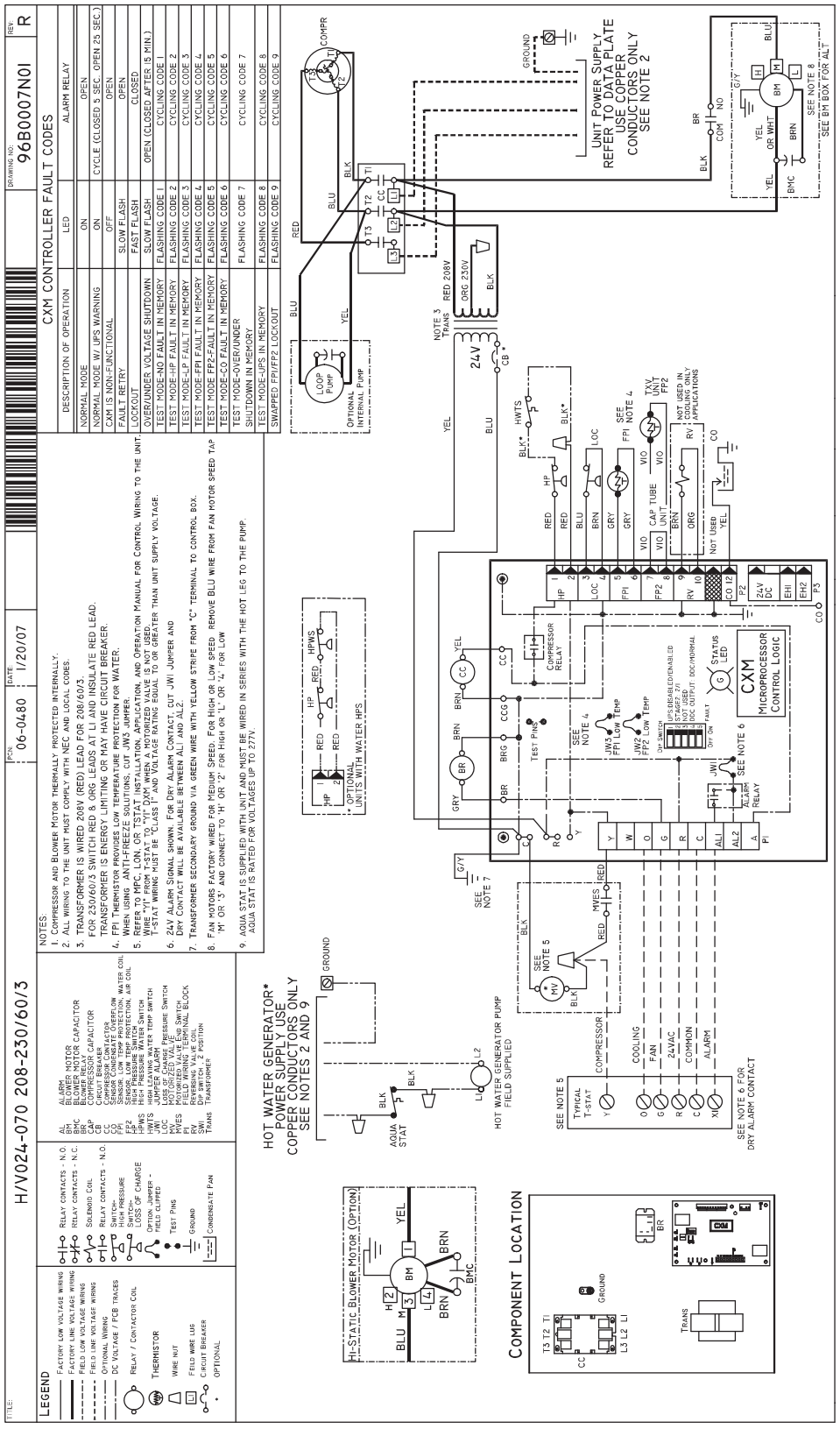
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Single Phase GC Units
With DXM Controller



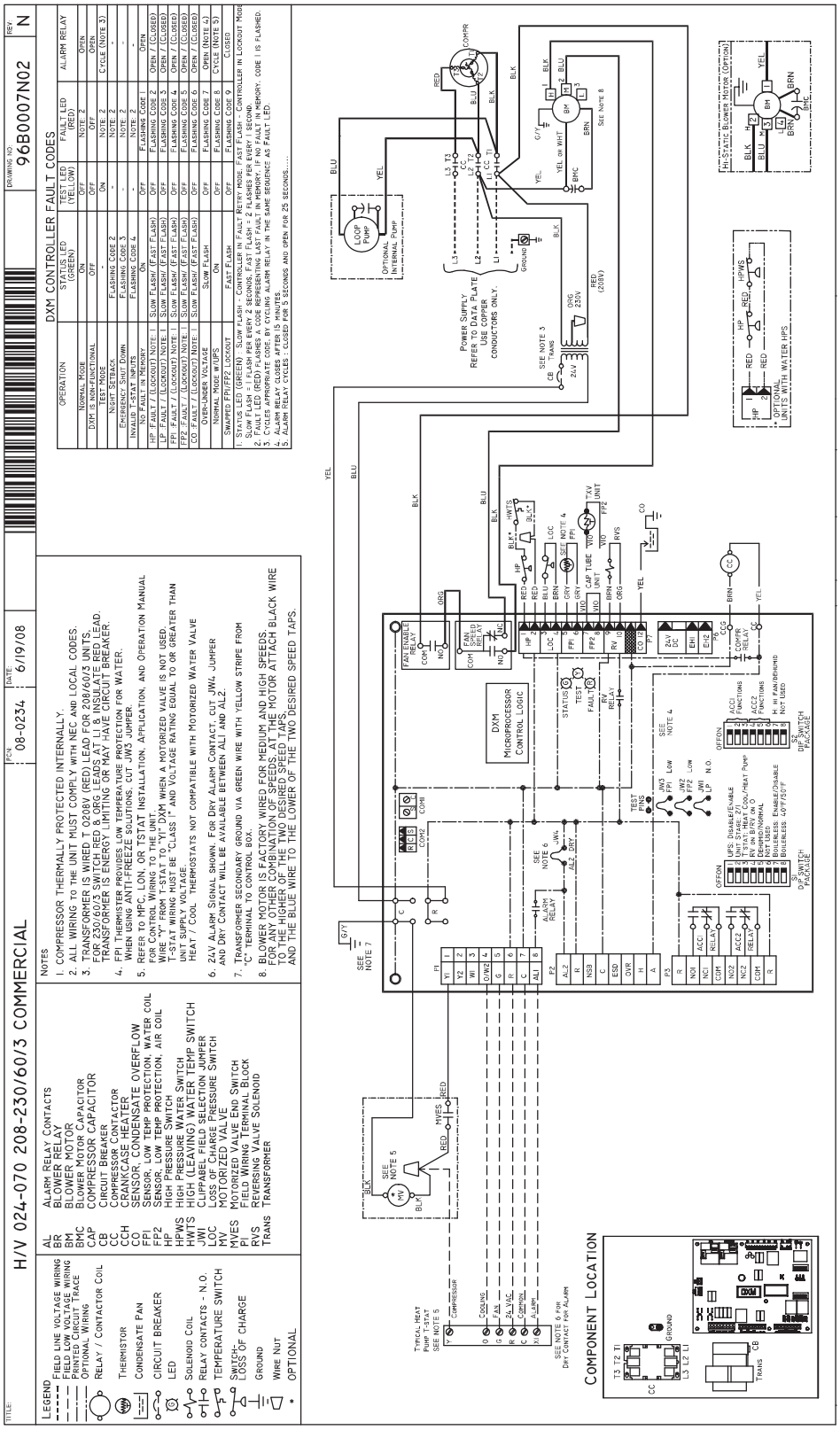
CLIMATEMASTER
Geothermal Heat Pump Systems

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



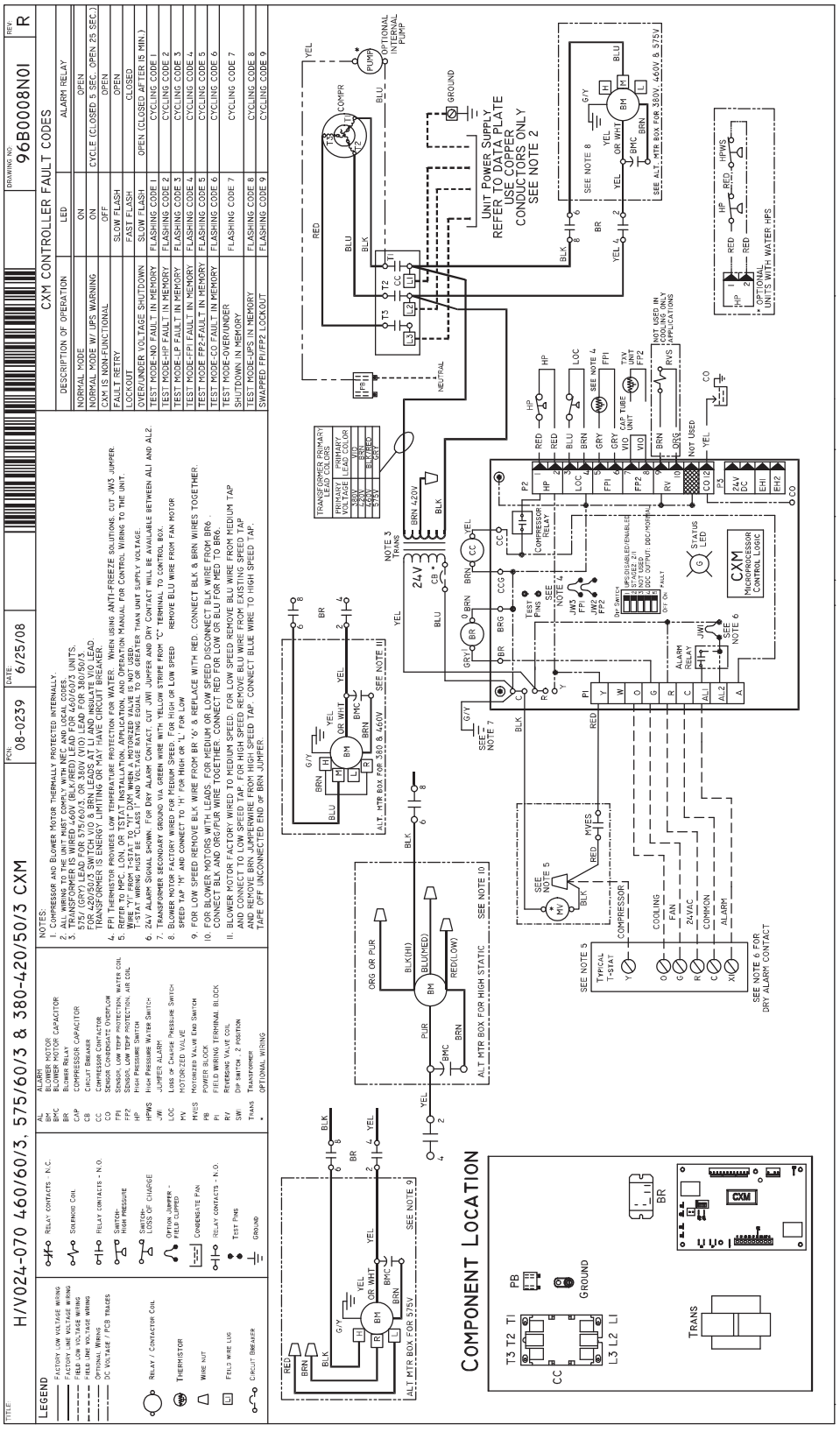
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Three Phase 208/230V GC Units
With DXM Controller



CLIMATEMASTER
Geothermal Heat Pump Systems

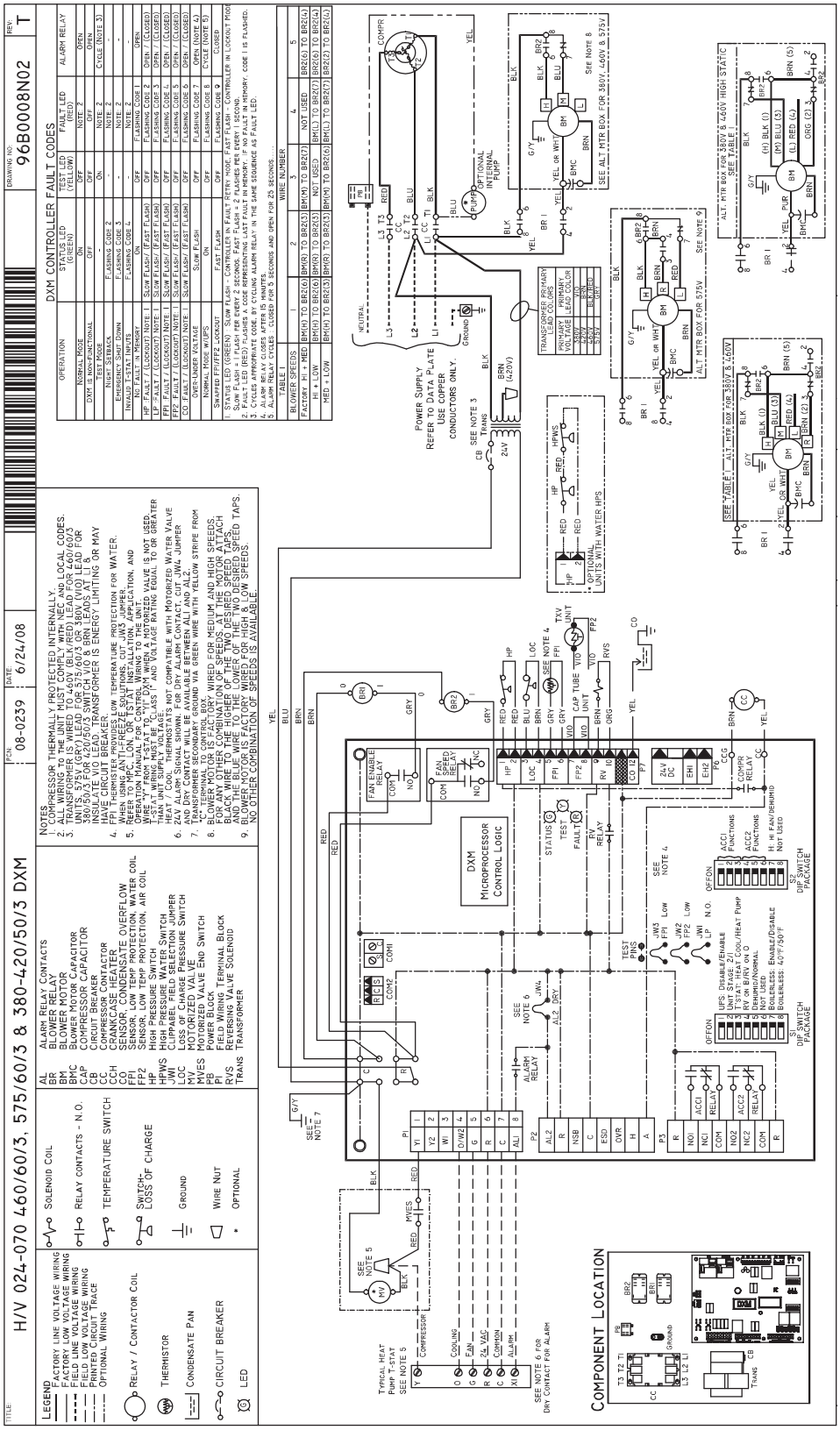
Typical Wiring Diagram
Three Phase 460/575V GC Units
With CXM Controller



ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-405-745-6000 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products. The latest version of this document is available at **climatemaster.com**.

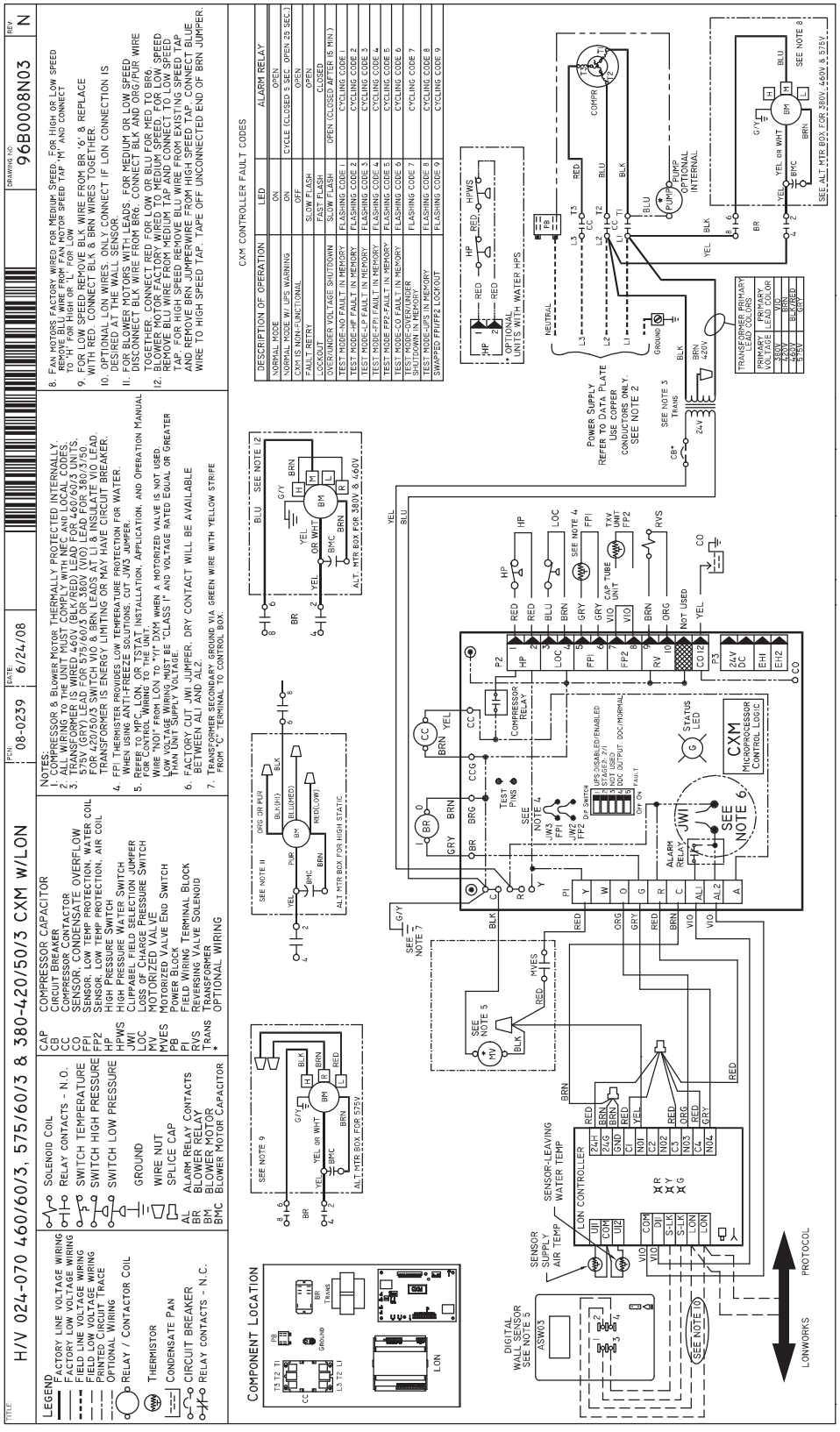
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Three Phase 460/575V GC Units
With DXM Controller



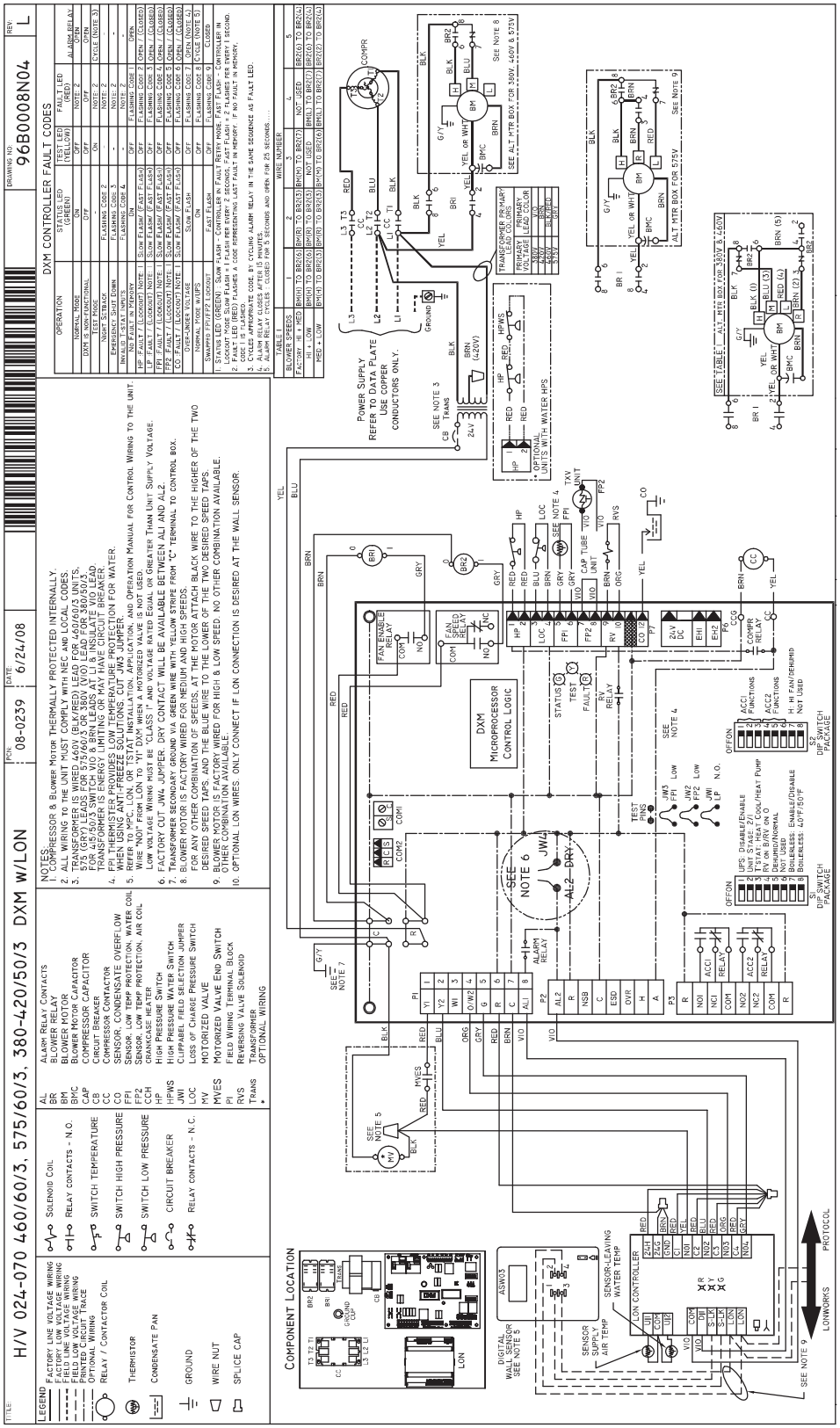
CLIMATEMASTER
Geothermal Heat Pump Systems

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



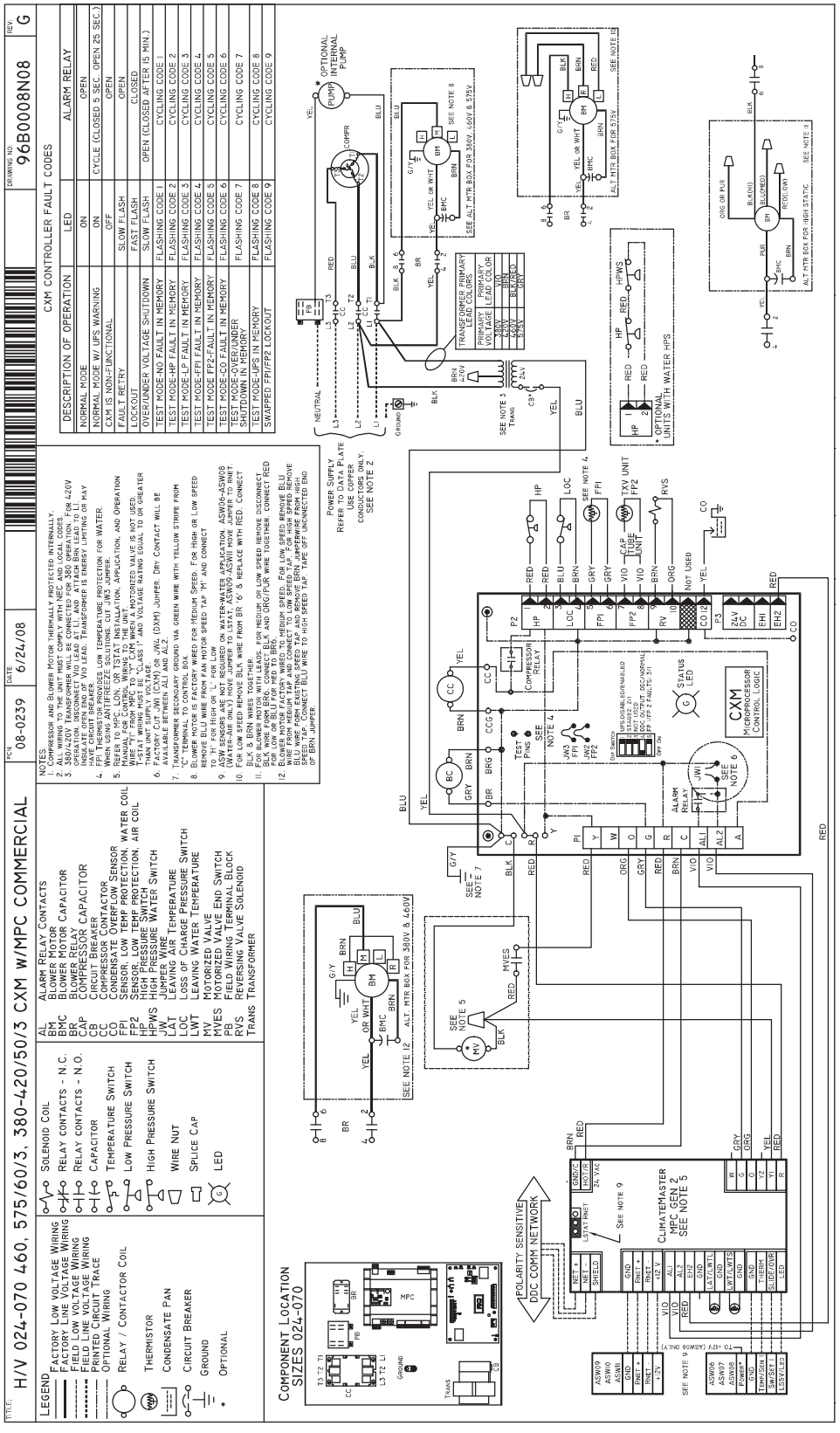
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Three Phase 460/575V GC Units
With DXM & LON Controller



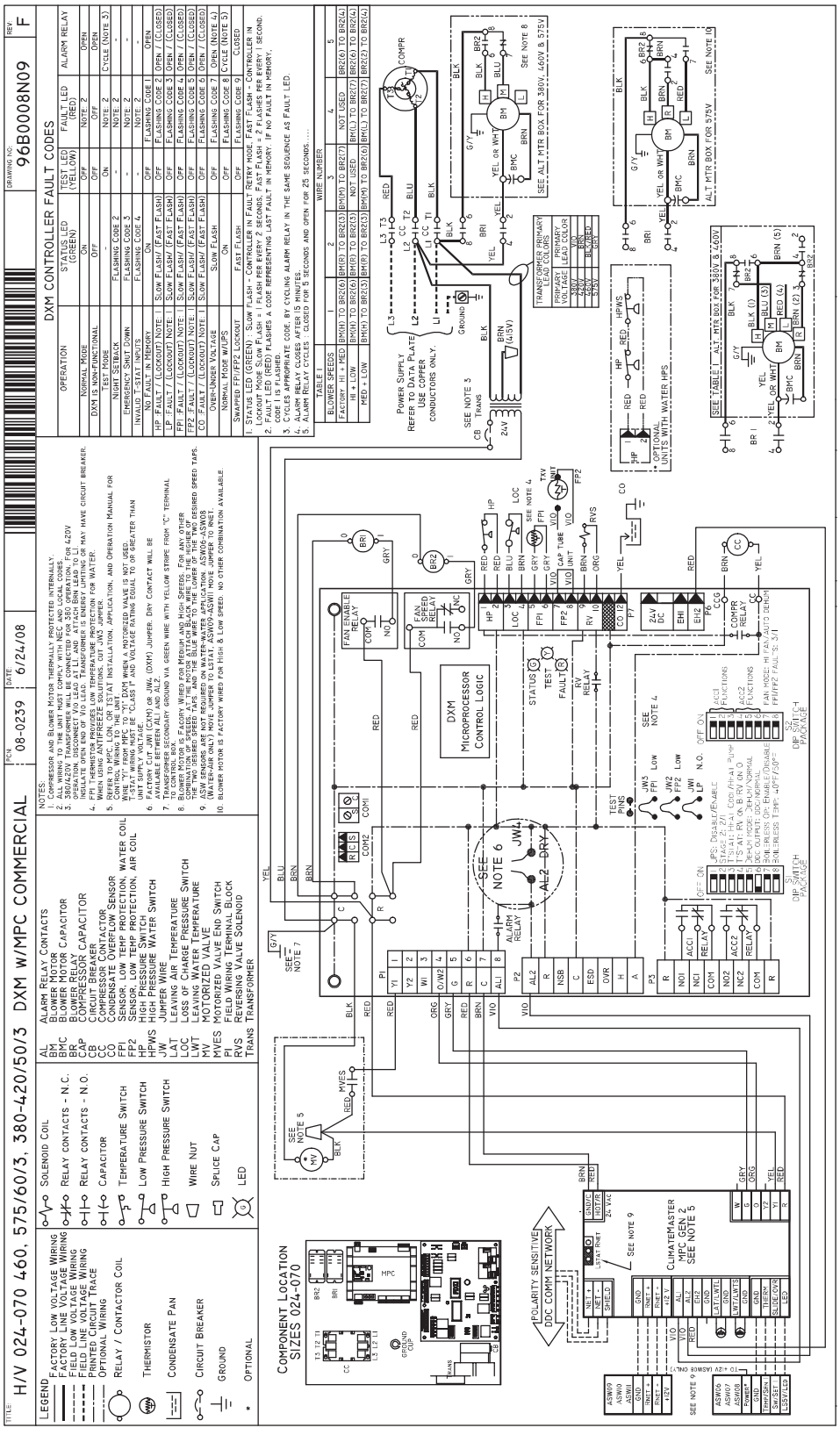
CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Three Phase 460/575V GC Units
With CXM & MPC Controller



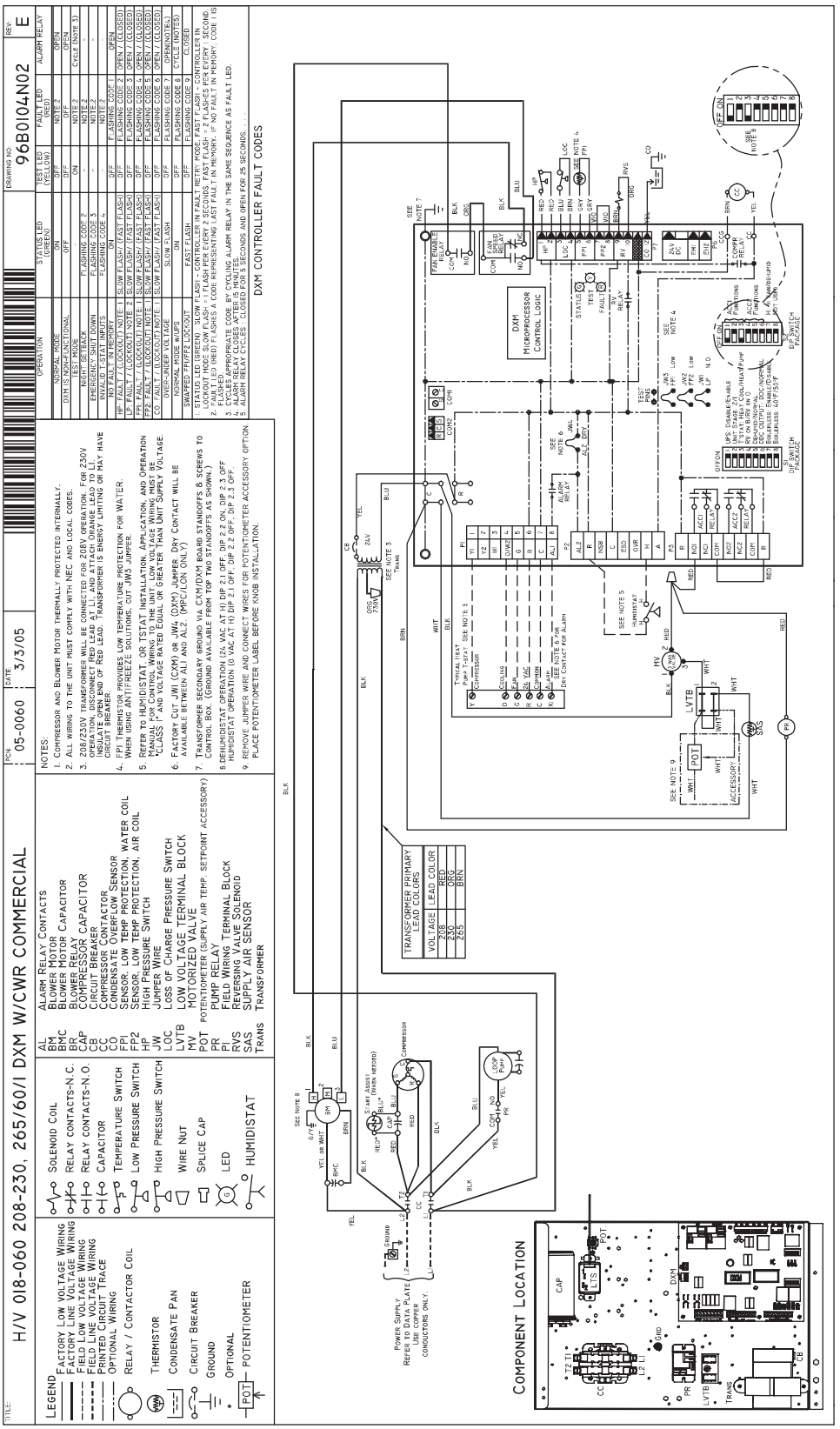
CLIMATEMASTER
Geothermal Heat Pump Systems

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



CLIMATEMASTER
Geothermal Heat Pump Systems

Typical Wiring Diagram
Single Phase GC Units
With DXM Controller & Reheat



ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-405-745-6000 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products. The latest version of this document is available at **climatemaster.com**.

CLIMATEMASTER
Geothermal Heat Pump Systems

Genesis Compact (GC) Series 60Hz
Engineering Specifications Rev.: 10/16/08 Page 1

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 60° to 95°F (15.6° to 35.0°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 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 criteria. *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, Front Return/Top Discharge - (size 009-030&041), 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.*

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. All water connections and electrical knockouts must be in the compressor compartment corner post so as not to interfere with the serviceability of unit. *Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature.* Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

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

Option: Ultra Quiet package shall consist of dual density acoustical, 1/2"(12.7mm) fiberglass insulation; spring isolation under compressor; discharge muffler (except rotary compressors); and sound attenuating material applied to the fan housing.

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).

Option (vertical units only): Unit shall include ClimaDry reheat option. Only modulating reheat that will adjust capacity based upon supply air temperature to provide "neutral" (72ºF, 22.2ºC) constant air temperature will be accepted. "Neutral" supply air temperature shall be provided regardless of entering loop water temperatures (above 55ºF, 12.8ºC) or refrigerant condensing pressures. Control of reheat must be accomplished via a humidistat or dehumidistat contact closure. Refrigerant circuit must be ARI certified. Approved equal manufacturers may provide pre-engineered integrated modulating hot gas reheat within the unit cabinet, or the installing contractor in conjunction with the "approved equal" unit manufacturer can provide for approval (during the submittal phase) an engineered system consisting of: a duct mounted hot water coil, small circulating pump, modulating control valve, and associated piping using the discharge condenser water off of the unit as the heating medium. All design costs and costs of field installed items including additional power wiring to pump, and control wiring to and from pump and control valve to unit shall be borne by mechanical contractor. Refrigerant circuits that are not ARI certified when the reheat option is applied will not be accepted. (See ClimaDry submittal for more details and unit availability.)

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 dry coil and a clean filter in place.

Option: High static motors (except 006-012 and GCV041)

Refrigerant Circuit:
Units shall have a sealed refrigerant circuit including a high efficiency scroll, rotary or reciprocating compressor designed for heat pump operation, a capillary tube assembly 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), and water 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 grommets or 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

CLIMATEMASTER
Geothermal Heat Pump Systems

Genesis Compact (GC) Series 60Hz
Engineering Specifications Rev.: 10/16/08 Page 3

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 capillary tube assembly. Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the unit's reversing valve solenoid defaults to cooling mode, a separate 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 IPT 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).

NOTE: Units not providing the 7 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), water coil low temperature cut-out, and condensate overflow protections will not be accepted.

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 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 have ability tocommunicate with thermostat with fault light 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

CLIMATEMASTER
Geothermal Heat Pump Systems

Genesis Compact (GC) Series 60Hz
Engineering Specifications Rev.: 10/16/08 Page 5

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.
b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve 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 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 ºF or ºC. 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 ºF or ºC. 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 ºF or ºC. 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 ºF or ºC. 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 ºF or ºC. 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 ºF or ºC. 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 ºF or ºC. 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

CLIMATEMASTER
Geothermal Heat Pump Systems

Genesis Compact (GC) Series 60Hz
Engineering Specifications Rev.: 10/16/08 Page 7

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 ºF or ºC. 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).

Notes:

CLIMATEMASTER
Geothermal Heat Pump Systems

Revision History

Date:	Item:	Action:
22 May, 2009	Stand-Alone and All Products Guide Submittals	Consolidated
16 Oct, 2008	Engineering Specifications	Verbiage Updated
24 Sept, 2008	Engineering Specifications	ClimaDry Note Added
26 Aug, 2008	Physical Data Table	Max Working Pressure Table Added
11 Aug, 2008	Engineering Specifications	Verbiage Updated
30 May, 2008	Electrical Data Tables	460 Vac Neutral Note Added
1 May, 2008	Electrical Data Tables	Asterisks added
18 Oct, 2007	Dimensional Data	Updated Vertical Water Connection Data
17 April, 2007	Blower Data	Updated Blower Data
17 April, 2007	Specifications	Updated Specifications for new Safety Agency
17 April, 2007	Table of Contents	Added Table of Contents
19 July, 2006	Dimensional Data	Updated dimensional data to new format
19 July, 2006	Performance Data/Blower Data	Added new rated voltage note
19 July, 2006	Specifications	Updated thermostat offering
19 July, 2006	Wiring Diagrams	Added pressure switch for motorized valve option
19 July, 2006	Electrical Data	Updated RLA and LRA compressor data, added high static blower electrical data
19 July, 2006	Updated Decoder	Corrected Cabinet Insulation options
30 Nov, 2005	Tables	Updated all tables to new format
30 Nov, 2005	Dimensional Data	Added new cabinet drawings, horizontal corner weights, and installation
30 Nov, 2005	Physical Data	Added Coax Volumes
18 Aug, 2005	Specifications	Updated CXM verbiage; Added discharge muffler to UltraQuiet option
18 Aug, 2005	Correction Factors	Changed "Nominal" to "Rated"
18 Aug, 2005	Electrical Data	Changed “*” note to define for units with ClimaDry option only
09 Dec, 2004	Specifications	Added reheat option to specifications
09 Dec, 2004	Wiring Diagrams	Added reheat wiring diagram
09 Dec, 2004	Electrical Data	Added electrical data for reheat option
09 Dec, 2004	Reheat Blower Performance	Added wet coil performance chart
09 Dec, 2004	Reheat Blower Performance	Added reheat coil pressure drop chart
09 Dec, 2004	Model Nomenclature	Updated model nomenclature for reheat option
09 Dec, 2004	Added Change Log	