Genesis Large (GL) Series

Commercial Horizontal & Vertical Packaged Heat Pumps 50Hz - R407C

Installation, Operation & Maintenance Instructions

97B0025N01

Revision: August 13, 2010

CLIMATEMASTER®
Water-Source Heat Pump Systems

Table of Contents

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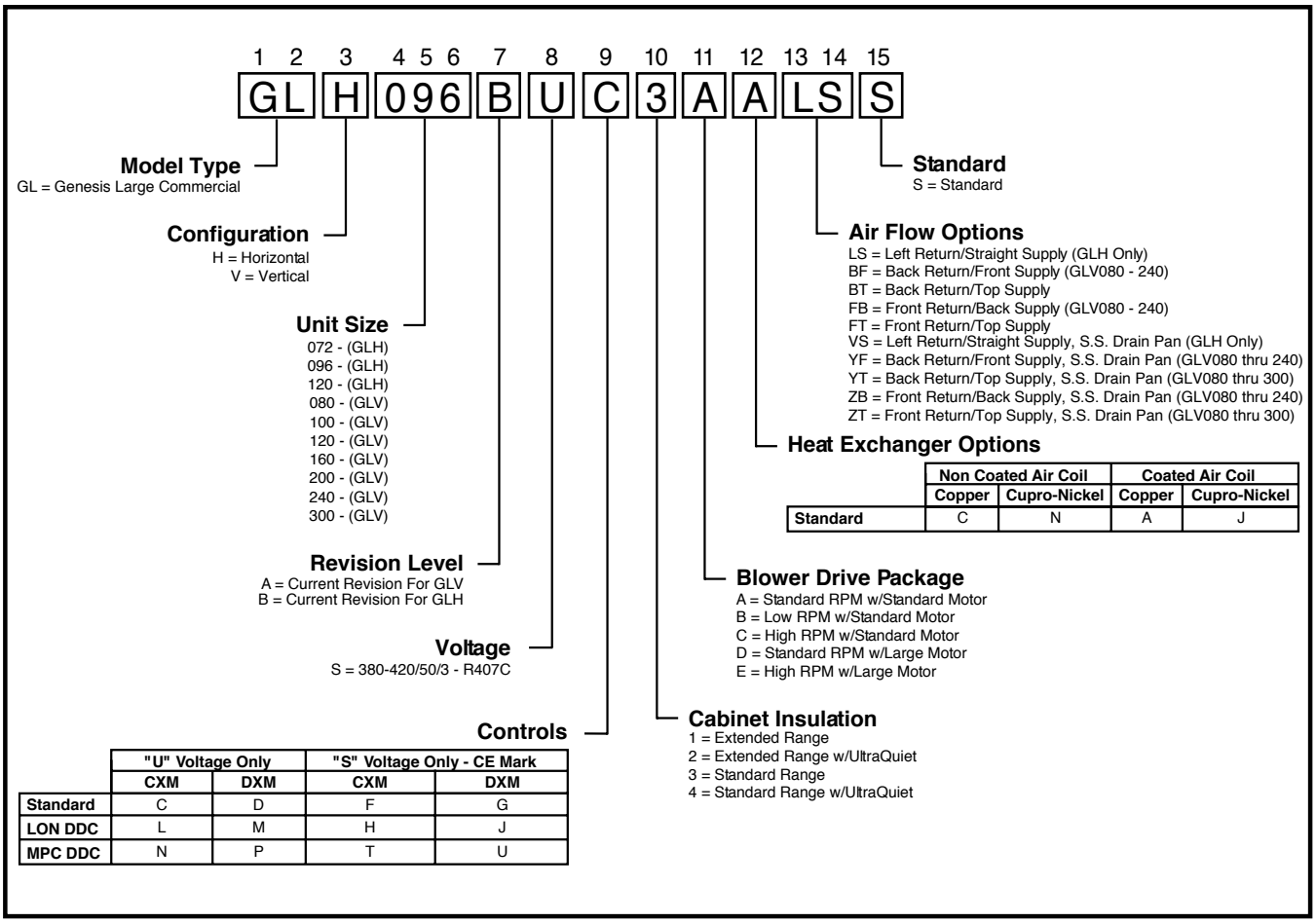
Model Nomenclature



	Non Coated Air Coil		Coated Air Coil	
	Copper	Cupro-Nickel	Copper	Cupro-Nickel
Standard	C	N	A	J

	"U" Voltage Only		"S" Voltage Only - CE Mark	
	CXM	DXM	CXM	DXM
Standard	C	D	F	G
LON DDC	L	M	H	J
MPC DDC	N	P	T	U

Rev.: 11/10/08B

Genesis Large (GL) Series
Rev.: 08/13/10

General Information

Inspection
Upon receipt of the equipment, carefully check the shipment against the bill of lading. Make sure all units have been received. Inspect the carton or crating of each unit, and inspect each unit for damage. Assure the carrier makes proper notation of any shortages or damage on all copies of the freight bill and completes a common carrier inspection report. Concealed damage not discovered during unloading must be reported to the carrier within 15 days of receipt of shipment. If not filed within 15 days, the freight company can deny the claim without recourse. Note: It is the responsibility of the purchaser to file all necessary claims with the carrier. Notify the ClimateMaster Traffic Department of all damage within fifteen (15) days of shipment.

Storage
Equipment should be stored in its shipping carton in a clean, dry area. Store units in an upright position at all times. Stack units a maximum of 3 units high.

Unit Protection
Cover units on the job site with either shipping cartons, vinyl film, or an equivalent protective covering. Cap the open ends of pipes stored on the job site. In areas where painting, plastering, and/or spraying has not been completed, all due precautions must be taken to avoid physical damage to the units and contamination by foreign material. Physical damage and contamination may prevent proper start-up and may result in costly equipment clean-up.

Examine all pipes, fittings, and valves before installing any of the system components. Remove any dirt or trash found in or on these components.

⚠ WARNING! ⚠

DO NOT store or install horizontal units in corrosive environments or in locations subject to temperature or humidity extremes (e.g., attics, garages, rooftops, etc.) Corrosive conditions and high temperature or humidity can significantly reduce performance, reliability, and service life. Always move units in an upright position. Tilting units on their sides may cause equipment damage.

⚠ WARNING! ⚠

The installation of water source heat pumps and all associated components, parts, and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations

⚠ WARNING! ⚠

To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. The mechanical components and filters used in these units will quickly become clogged with construction dirt and debris which may cause system damage.

To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state, and federal proficiency requirements.

All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants.

If a compressor is removed from this unit, system refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, the refrigerant lines of the compressor must be sealed after it is removed.

Pre-Installation
Installation, Operation, and Maintenance instructions are provided with each unit. GL Series horizontal equipment is designed for installation above false ceiling or in a ceiling plenum. The installation site chosen should include adequate service clearance around the unit. Before unit start-up, read all manuals and become familiar with the unit and its operation. Thoroughly check the system before operation.

Prepare units for installation as follows:

1. Compare the electrical data on the unit nameplate with ordering and shipping information to verify that the correct unit has been shipped.
2. Keep the cabinet covered with the shipping carton until installation is complete and all plastering, painting, etc. is finished.
3. Verify refrigerant tubing is free of kinks or dents and that it does not touch other unit components.
4. Inspect all electrical connections. Connections must be clean and tight at the terminals.
5. Remove any blower support cardboard from mouth of blower.
6. Loosen compressor bolts on units equipped with compressor spring vibration isolation until the compressor rides freely on the springs. Remove shipping restraints.
7. Locate and verify any hanger, or other accessory kit located in the compressor section and or the blower section.

GLH Physical Data

GLH Physical Data

Model	072	096	120
Refrigerant Circuit			
Compressor (2 each)	Recip	Scroll	Scroll
Factory Charge R-407C kg per Circuit	1.59	1.417	2.268
Fan Motor			
Standard kW	1.1	1.5	1.5
Large kW	1.5	2.2	2.2
Blower			
Wheel Size -Dia x W cm	30.5 x 27.9	25.4 x 25.4	27.9 x 25.4
Water Connection Size			
IPT - (in)	1-1/4"	1-1/4"	1-1/4"
Condensate Connection Size			
IPT - (in)	3/4"	3/4"	3/4"
Horizontal Units			
Air Coil Dimensions - H X W mm	2 - 50.8 x 61	2 - 50.8 x 76.2	2 - 50.8 x 76.2
Filter Standard - 25.4mm Throwaway cm	50.8 x 66.0	40.6 x 50.8	40.6 x 50.8
Weight - Operating kg	245	263	299
Weight - Packaged kg	254	272	308

Notes:

All units have grommet compressor mountings, TXV expansion devices, 12.7mm & 35.0mm - 44.5mm knockouts.
FPT - Female Pipe Thread - (U.S.)

GLV Physical Data

Model	080	100	120	160	200	240	300
Compressor	Scroll			Scroll			
Number of Circuits (Compressors)	1			2			
Factory Charge R407C - kg per circuit	3.12	3.41	3.74	3.12	3.41	3.74	5.46
Blower Motor							
Blower Motor Quantity	1	1	1	1	2	2	2
Standard motor kW	1.12	1.12	1.49	2.24	1.12	1.49	2.24
Large Motor kW	1.49	1.49	2.24	NA	1.49	2.24	NA
Blower							
No. of Blowers	1			2			
Blower Wheel Size D x W cm	30.5 x 22.9	38.1 x 38.1		30.5 x 22.9	38.1 x 38.1		
Water Connection Size							
FPT (in)	1-1/2"						
Condensate Connection Size							
FPT (in)	1"						
Vertical Units							
Air Coil Dimensions - H x W mm	91.4 x 91.4			2 - 91.4 x 91.4			2 - 95.3 x 91.4
Filter Standard - 25.4mm Throwaway cm	2 63.5 X 63.5			4 63.5 X 63.5			
Weight - Operating kg	272	311	333	508	574	612	664
Weight - Packaged kg	277	315	338	519	578	624	669

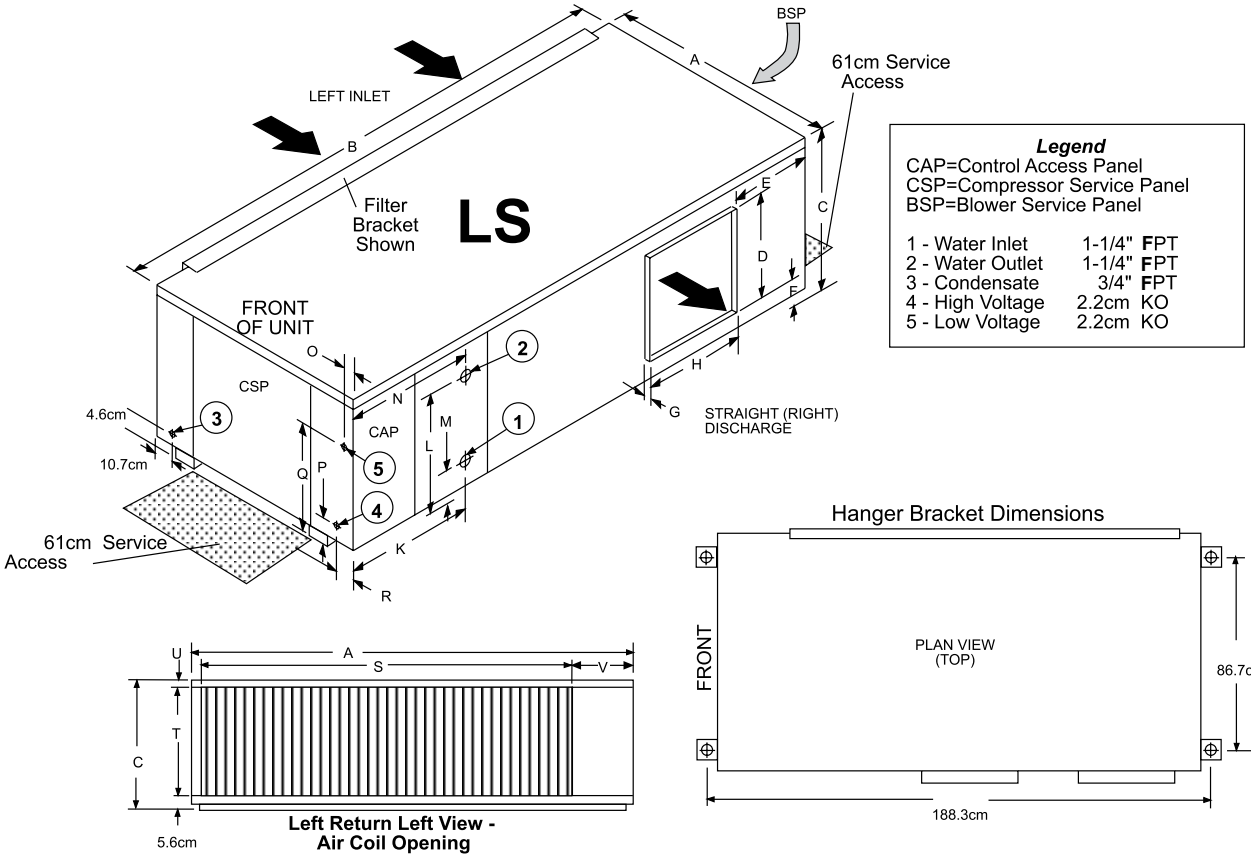
All units have grommets for compressor mounting, TXV expansion devices, 12.7mm & 35.0 - 44.5mm knockouts.
FPT - Female Pipe Thread (U.S.)

Genesis Large (GL) Series
Rev.: 08/13/10

Dimensional Data

GLH072 Dimensions

LEFT RETURN STRAIGHT DISCHARGE



NOTE:
All Dimensions in cm
Flanged filter bracket shipped with unit. Leave one end of duct collar open for filter removal.
All side panels are removable.
Available in left return, straight discharge only.

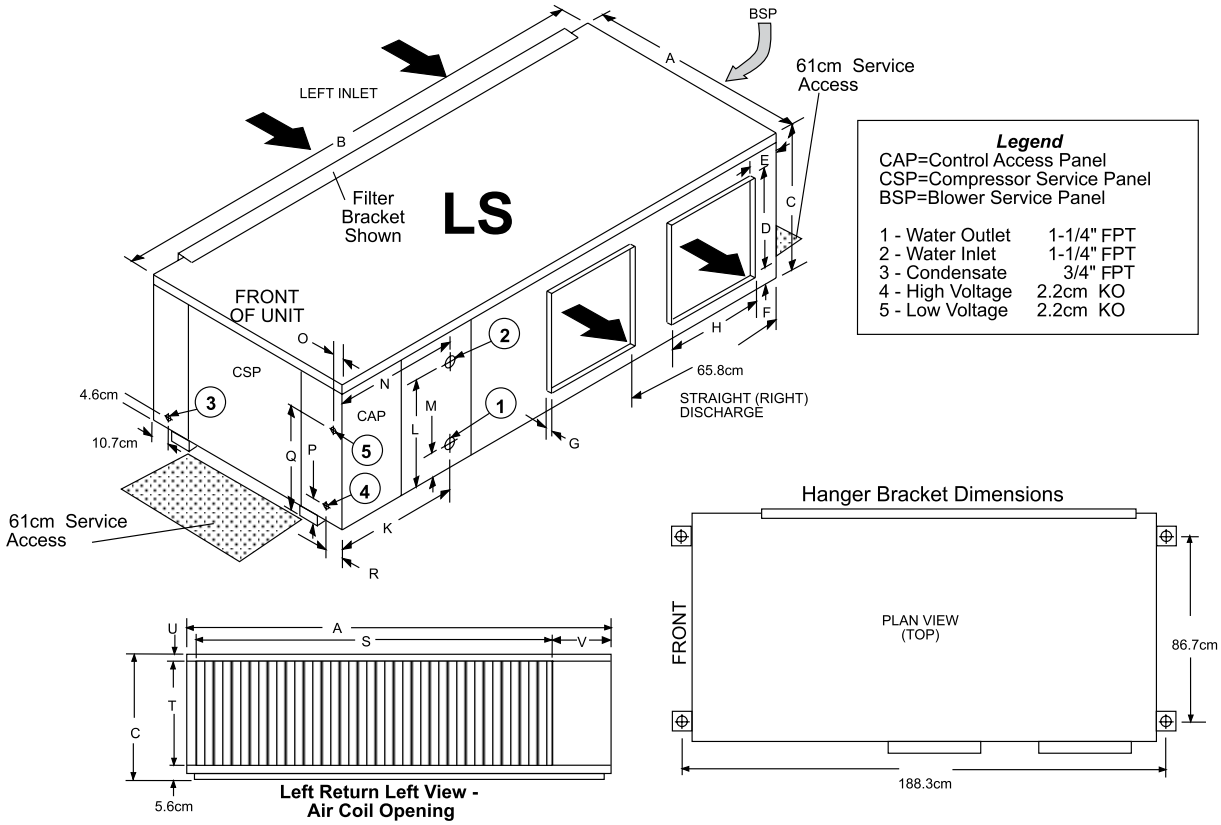
Horizontal Model		Overall Cabinet			Discharge Connections duct flange (± 2.5mm)					Water Connections				Electrical Knockouts				Return Air Connections using return air opening			
		A Width	B Depth	C Height	D Supply Height	E	F	G	H Supply Depth	K	L	M	N	O	P	Q	R	S Return Depth	T Return Height	U	V
072	cm.	92.2	183.6	54.9	40.6	36.8	10.2	2.5	40.6	53.3	45.2	10.0	57.2	5.1	14.2	46.5	5.1	129.5	46.7	2.5	49.8

Condensate is 3/4" FPT copper.
Horizontal unit shipped with filter bracket only. This bracket should be removed for return duct connection.

Dimensional Data

GLH096-120 Dimensions

LEFT RETURN STRAIGHT DISCHARGE



NOTE:
All Dimensions in cm
Flanged filter bracket shipped with unit. Leave one end of duct collar open for filter removal.
All side panels are removable.
Available in left return, straight discharge only.

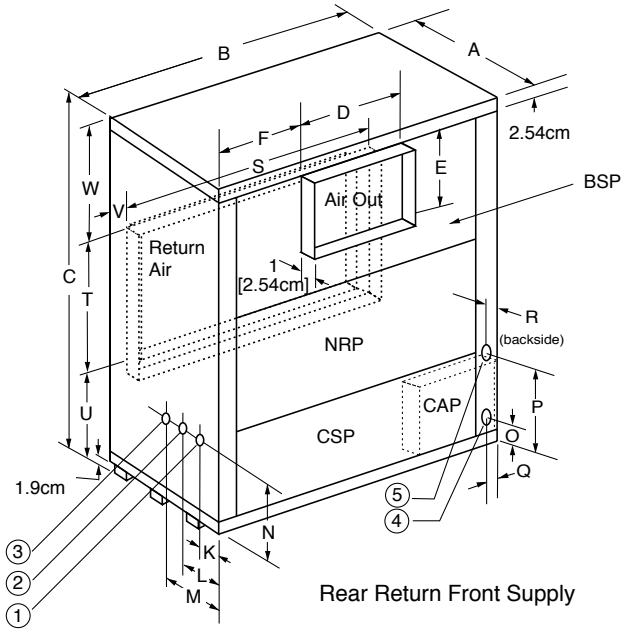
Horizontal Model		Overall Cabinet			Discharge Connections duct flange (± 2.5mm)					Water Connections				Electrical Knockouts				Return Air Connections using return air opening			
		A Width	B Depth	C Height	D Supply Height	E	F	G	H Supply Depth	K	L	M	N	O	P	Q	R	S Return Depth	T Return Height	U	V
096	cm.	92.2	183.6	54.9	33.3	7.4	9.7	2.5	38.4	52.6	47.3	9.7	56.9	5.1	14.2	46.5	5.1	160.5	46.7	2.5	19.1
120	cm.	92.2	183.6	54.9	33.3	7.4	11.9	2.5	38.4	48.3	48.8	9.7	56.9	5.1	14.2	46.5	5.1	160.5	46.7	2.5	19.1

Condensate is 3/4"**F**PT copper.
Horizontal unit shipped with filter bracket only. This bracket should be removed for return duct connection.

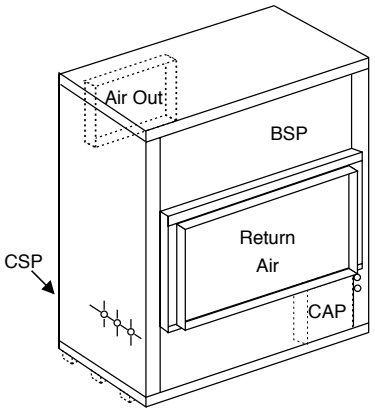
Genesis Large (GL) Series
Rev.: 08/13/10

Dimensional Data

GLV080-120 Dimensions



Rear Return Front Supply

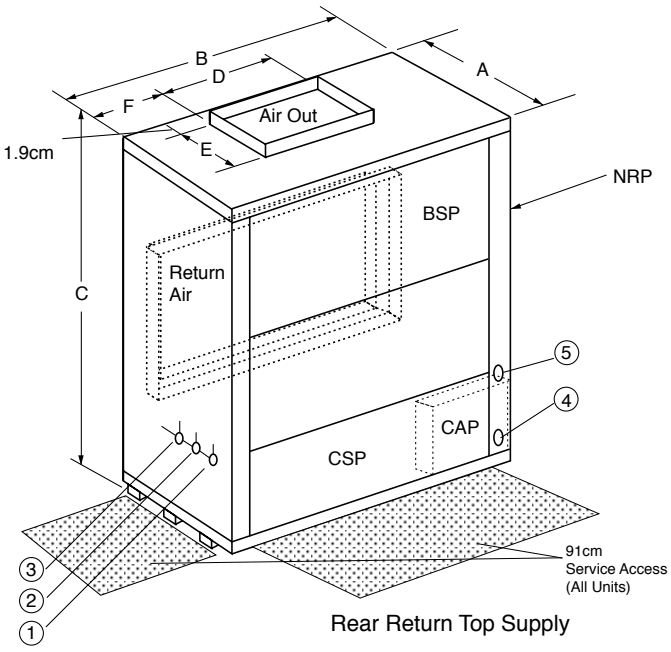


Front Return Rear Blow

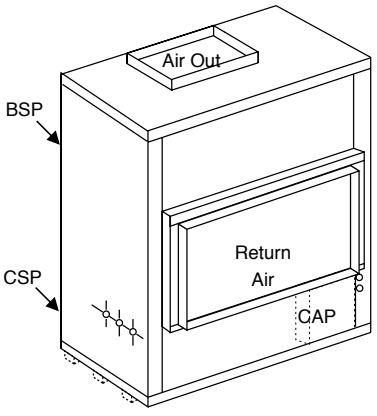
Legend

① Water Inlet	1-1/2" FPT
② Water Outlet	1-1/2" FPT
③ Condensate Drain	1 FPT
④ High Voltage Access	3.49 or 4.45cm K.O.
⑤ Low Voltage Access	12.7cm K.O.

NRP - Non-Removable Panel
CAP - Control Access Panel
BSP - Blower Service Panel
CSP - Compressor Service Panel
NRP Non-Removable Panel



Rear Return Top Supply



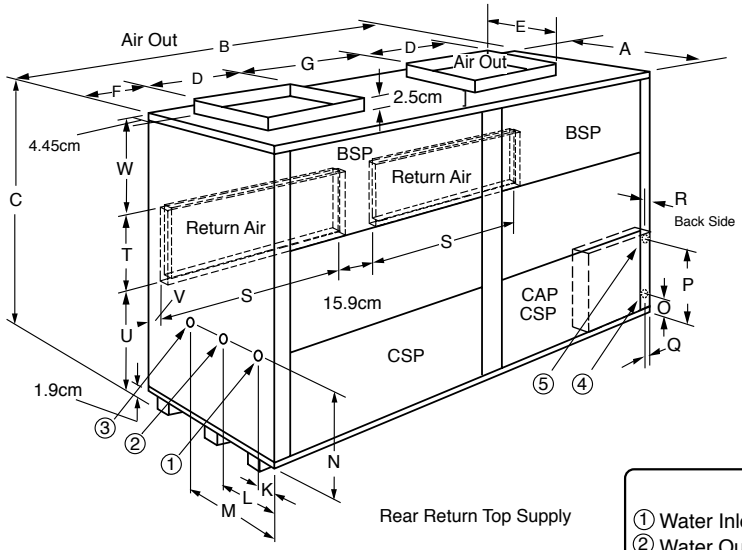
Front Return Top Blow

NOTES:

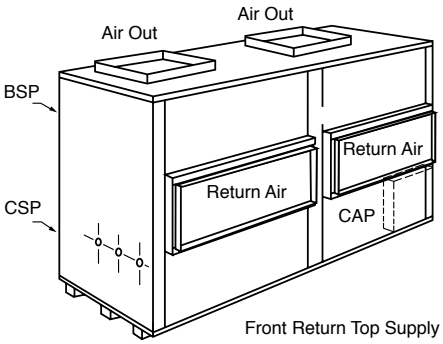
Model		Overall Cabinet			Discharge Connections duct flange (± 2.5mm)			Water Connections				Electrical Knockouts				Return Air Connections using duct flange				
		A	B	C	D	E	F	K	L	M	N	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	Supply Width	Supply Depth		1-Water Inlet	2-Water Outlet	3-Cond-ensate						Return Depth	Return Height			
080	cm.	73.7	104.1	181.6	37.3	40.1	28.4	10.2	18.7	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4
100-120	cm.	73.7	104.1	181.6	47.6	40.9	14.7	10.2	18.7	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4

Dimensional Data

GLV160-240 Dimensions

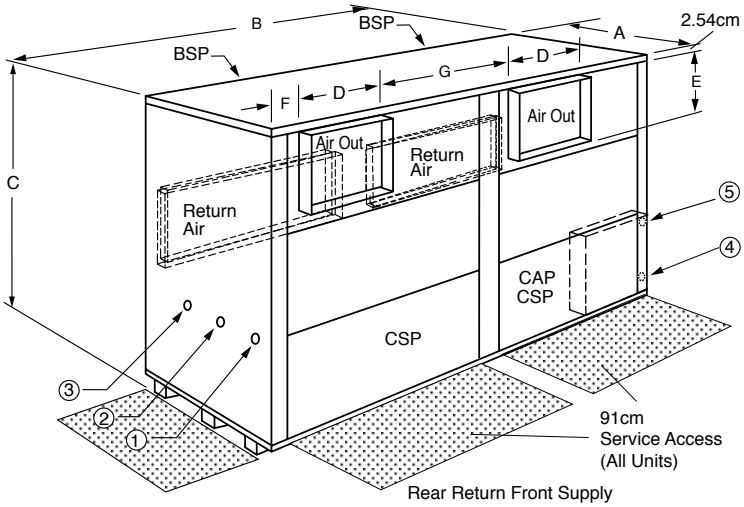


Rear Return Top Supply

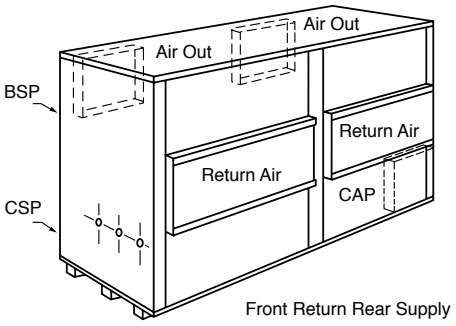


Front Return Top Supply

Legend	
① Water Inlet	1-1/2" FPT
② Water Outlet	1-1/2" FPT
③ Condensate Drain	1" FPT
④ High Voltage Access	3.49 or 4.45cm K.O.
⑤ Low Voltage Access	12.7mm K.O.
NRP - Non-Removable Panel	
CAP - Control Access Panel	
BSP - Blower Service Panel	
CSP - Compressor Service Panel	
NRP Non-Removable Panel	



Rear Return Front Supply



Front Return Rear Supply

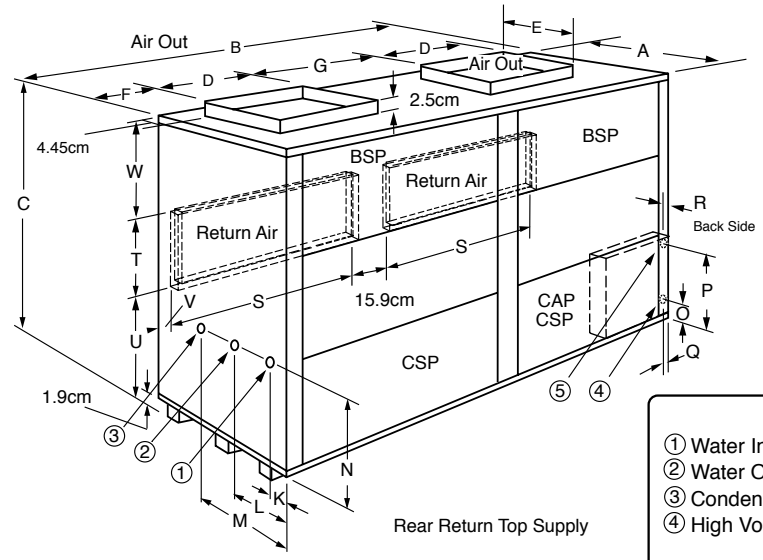
NOTES:
-All Dimensions in cm
-Units require 91cm clearance for water connections, CAP, CSP and BSP Service access.
-All side panels are removable Except those identified by NRP(Non-Removable Panel)
-Overall cabinet height dimension does not include duct flange when in the top discharge configuration
-Overall cabinet width dimension does not include duct flange when in the front or back discharge configuration

Model		Overall Cabinet			Discharge Connections (duct flange (± 2.5mm))				Water Connections				Electrical Knockouts				Return Air Connections (using duct flange)				
		A	B	C	D	E	F	G	K	L	M	N	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	Supply Width	Supply Depth			1-Water Inlet	2-Water Outlet	3-Cond-ensate						Return Depth	Return Height			
160	cm.	73.7	208.3	181.6	37.3	40.1	49.3	35.1	10.2	18.8	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4
200-240	cm.	73.7	208.3	181.6	47.6	40.9	14.6	56.6	10.2	18.8	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4

Genesis Large (GL) Series
Rev.: 08/13/10

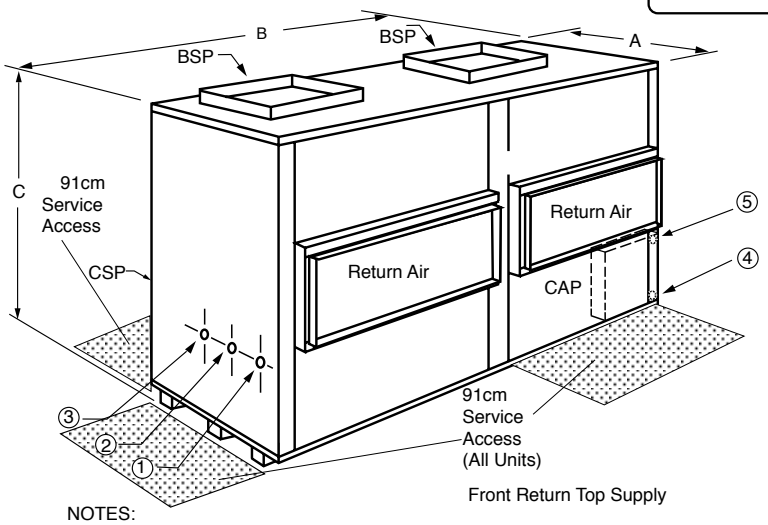
Dimensional Data

GLV300 Dimensions



Rear Return Top Supply

Legend	
① Water Inlet	1-1/2" FPT
② Water Outlet	1-1/2" FPT
③ Condensate Drain	1" FPT
④ High Voltage Access	3.49 or 4.45cm K.O.
⑤ Low Voltage Access	12.7mm K.O.
NRP - Non-Removable Panel	
CAP - Control Access Panel	
BSP - Blower Service Panel	
CSP - Compressor Service Panel	
NRP - Non-Removable Panel	



Front Return Top Supply

NOTES:
-All Dimensions in cm
-Units require 91cm clearance for water connections, CAP, CSP and BSP Service access.
-All side panels are removable Except those identified by NRP(Non-Removable Panel)
-Overall cabinet height dimension does not include duct flange when in the top discharge configuration
-Overall cabinet width dimension does not include duct flange when in the front or back discharge configuration

Model		Overall Cabinet			Discharge Connections (duct flange (± 2.5mm))				Water Connections				Electrical Knockouts				Return Air Connections (using duct flange)				
		A	B	C	D	E	F	G	K	L	M	N	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	Supply Width	Supply Depth			1-Water Inlet	2-Water Outlet	3-Cond-ensate						Return Depth	Return Height			
160	cm.	73.7	208.3	181.6	37.3	40.1	49.3	35.1	10.2	18.8	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4
200-240	cm.	73.7	208.3	181.6	47.6	40.9	14.6	56.6	10.2	18.8	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	64.5	7.9	57.4

Installation

GL Horizontal Unit Location

These units are not designed for outdoor installation. Locate the unit in an INDOOR area that allows enough space for service personnel to perform typical maintenance or repairs without removing from the ceiling. Horizontal units are typically installed above a false ceiling or in a ceiling plenum. Refer to Figure 3 for an illustration of a typical installation.

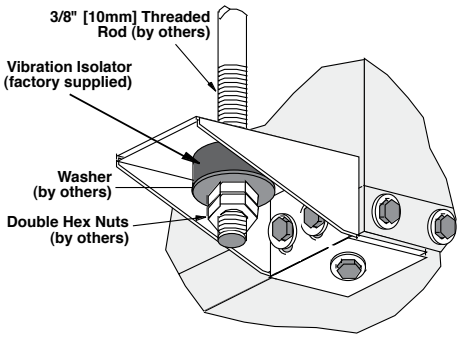
Conform to the following guidelines when selecting unit location:

1. Provide a hinged access door in concealed-spline or plaster ceilings. Provide removable ceiling tiles in t-bar or lay-in ceilings. Refer to physical dimensions page or submittal drawing for horizontal unit dimensions. Size the access opening to accommodate the service technician during the removal or replacement of the compressor and the removal or installation of the unit itself.
2. Provide access to hangar brackets, water valves and fittings. Provide screwdriver clearance to access panels, discharge collars and all electrical connections.
3. **DO NOT obstruct the space beneath the unit with piping, electrical cables and other items that prohibit future removal of components or the unit itself.**
4. Use a manual portable jack/lift to lift and support the weight of the unit during installation and servicing.

The installation of water source heat pump units and all associated components, parts and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the Installing Contractor to determine and comply with ALL applicable codes and regulations.

Locate the unit in an indoor area that allows easy removal of the filter and access panels, and has enough space for service personnel to perform maintenance or repair. Provide sufficient room to make water, electrical, and duct connection(s). If the unit is located in a confined space provisions must be made for return air to freely enter the space by means of a louvered door, etc. Any access panel screws that would be difficult to remove after the unit is installed should be removed prior to setting the unit. These units are not approved for outdoor installation and, therefore, must be installed inside the structure being conditioned. Do not locate in areas where ambient conditions are not maintained within4.4-37.8°C and up to 75% relative humidity.

Figure 1. Hanger Bracket



Mounting Horizontal Units

Figure 3 shows a typical commercial horizontal unit installation.

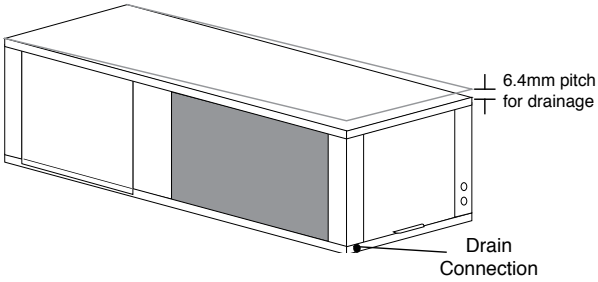
Horizontal heat pumps are typically suspended above a ceiling or within a soffit using field supplied, threaded rods sized to support the weight of the unit.

A mounting kit including four (4) mounting brackets and four (4) vibration isolators is bagged within the unit. Refer to Figure 1 to complete mounting bracket installation. Attach brackets and isolators to the bottom corners of the unit. Use four (4) field supplied threaded rods to suspend the unit. Hang the unit clear of the floor slab above and support the unit by the mounting bracket assemblies only. DO NOT attach the unit flush with the floor slab above.

Duct System Installation

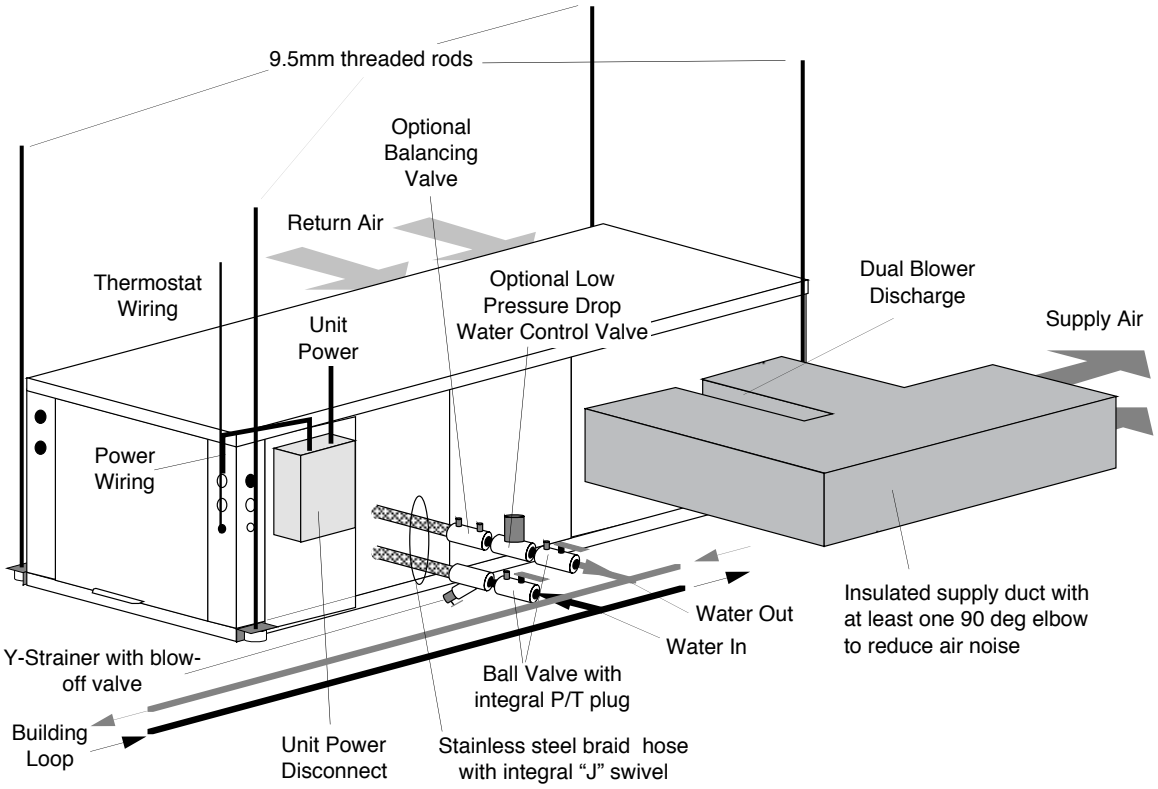
The duct system should be sized to handle the design airflow quietly. Refer to Figure 3a for duct system details.

Figure 2. Horizontal Unit Pitch



Installation

Figure 3a. Typical Horizontal Unit Installation



Sound Attenuation for Horizontal Units

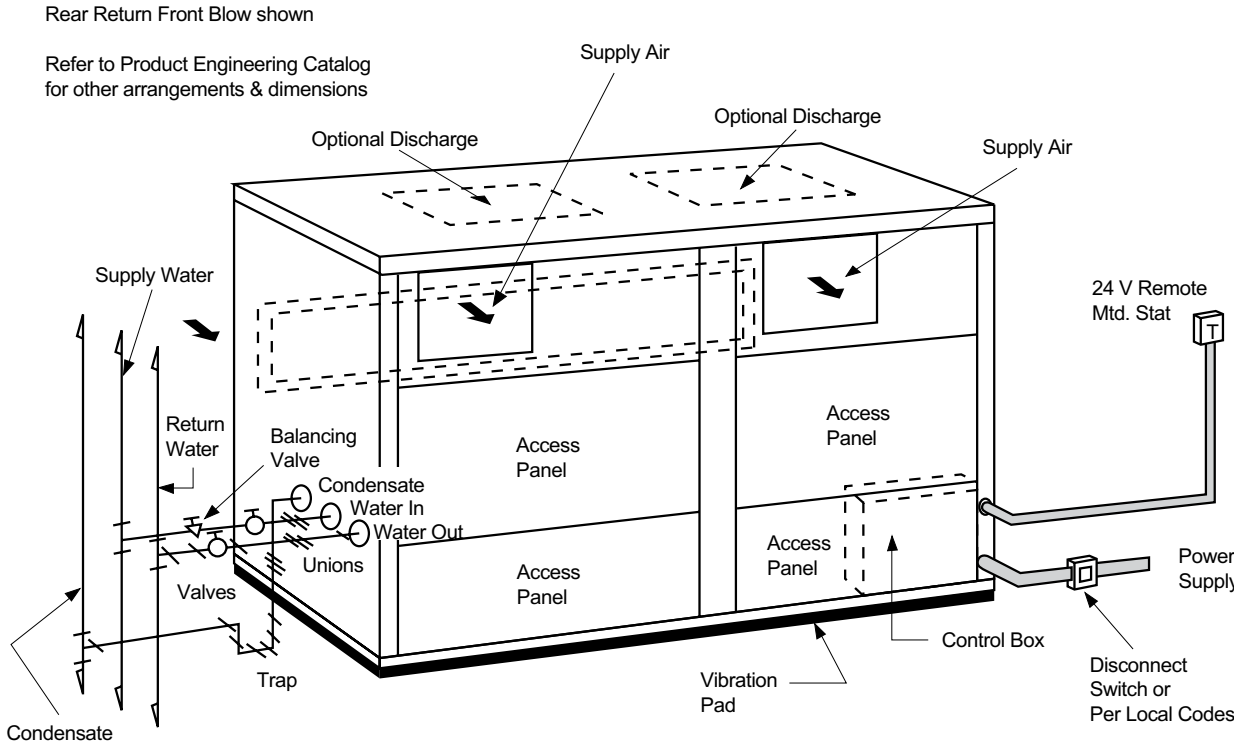
Sound minimization is achieved by correct placement of the unit. Place the units so that principal sound emission is ducted outside the occupied, sound sensitive space. Note: If a fire wall is penetrated, a fire damper may be required by local codes.

Vertical Location and Access

GLV units are typically installed in a floor level closet or in a small mechanical room. Refer to Figure 3b for an illustration of a typical installation. Install units with adequate clearance to allow maintenance and servicing. Conform to the following guidelines when selecting unit location:

1. Provide adequate clearance for filter replacement and drain pan cleaning. DO NOT block filter access with piping, conduit or other materials. Refer to submittal drawing for Vertical Unit Dimensions.
2. Provide access for fan and fan motor maintenance and for servicing of the compressor and coils without removal of the unit.
3. Provide an unobstructed path to the unit within the closet or mechanical room to enable removal of the unit if necessary.
4. Provide access to water valves and fittings, and screwdriver access to the unit side panels, discharge collar and all electrical connections

Figure 3b. Typical Vertical Installation.



Duct System Installation

A flexible connector is recommended for both discharge and return air duct connections on metal duct systems to eliminate the transfer of vibration to the duct system. To maximize sound attenuation of the unit blower, the supply and return plenums should include internal duct liner of glass fiber or be of ductboard construction for the first few feet. Application of the unit to uninsulated ductwork in an unconditioned space is not recommended as the unit's performance will be adversely affected.

At least one 90° elbow should be included in the supply duct to reduce air noise. If air noise or excessive air flow is a problem, the blower speed can be changed. See the Blower Performance and Fan Speed sections for further instruction.

If the unit is connected to existing ductwork, a previous check should have been made to assure the ducts have the capacity to handle the air required for the unit. If ducting is too small, as in the replacement of heating only systems, larger ductwork should be installed. All existing ductwork should be checked for leaks and repaired as necessary.

Air Coil

To obtain maximum performance, the air coil should be cleaned before start-up. A 10% solution of dishwasher detergent and water is recommended for both sides of coil. A thorough water rinse should follow.

Installation

Piping Installation

Installation of Supply and Return Piping

Follow these piping guidelines.

1. Install a drain valve at the base of each supply and return riser to facilitate system flushing.
2. Install shut-off / balancing valves and unions at each unit to permit unit removal for servicing.
3. Place strainers at the inlet of each system circulating pump.
4. Select the proper hose length to allow slack between connection points. Hoses may vary in length by +2% to -4% under pressure.
5. Refer to Table 1. Do not exceed the minimum bend radius for the hose selected. Exceeding the minimum bend radius may cause the hose to collapse which reduces water flow rate. Install an angle adapter to avoid sharp bends in the hose when the radius falls below the required minimum.

⚠ CAUTION! ⚠

Piping must comply with all applicable codes.

Table 1. Metal Hose Minimum Bend Radii

Hose Diameter	Minimum Bend Radii
12.7mm	6.4cm
19.1mm	10.2cm
25.4mm	14.0cm
31.8mm	17.1cm

Insulation is not required on loop water piping except where the piping runs through unheated areas or outside the building or when the loop water temperature is below the minimum expected dew point of the pipe ambient. Insulation is required if loop water temperature drops below the dew point.

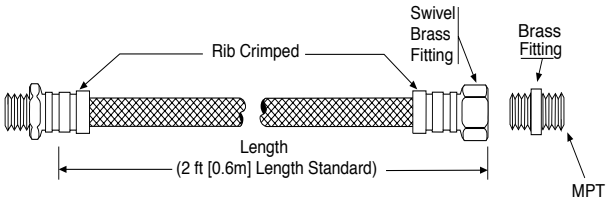
Pipe joint compound is not necessary when Teflon threaded tape is pre-applied to hose assemblies or when flared-end connections are used. If pipe joint compound is preferred, use compound only in small amounts on the male pipe threads of the fitting adapters. Prevent sealant from reaching the flared surfaces of the joint. Note: When anti-freeze is used in the loop, assure that it is compatible with Teflon tape or pipe joint compound employed.

Maximum allowable torque for brass fittings is 30 foot-pounds. If a torque wrench is not available, tighten finger-tight plus one quarter turn. Tighten steel fittings as necessary.

⚠ WARNING! ⚠

Do not bend or kink supply lines or hoses.

Figure 4. Supply/Return Hose Kit



Optional pressure-rated hose assemblies designed specifically for use with ClimateMaster units are available. Similar hoses can be obtained from alternate suppliers. Supply and return hoses are fitted with swivel-joint fittings at one end to prevent kinking during installation.

Refer to Figure 4 for an illustration of a Supply/Return Hose Kit. Male adapters secure hose assemblies to the unit and risers. Install hose assemblies properly and check them regularly to avoid system failure and reduced service life.

⚠ CAUTION! ⚠

CAUTION! Many units are installed with a factory or field supplied manual or electric shut-off valve. DAMAGE WILL OCCUR if shut-off valve is closed during unit operation. A high pressure switch must be installed on the heat pump side of any field provided shut-off valves and connected to the heat pump controls in series with the built-in refrigerant circuit high pressure switch to disable compressor operation if water pressure exceeds pressure switch setting. The field installed high pressure switch shall have a cut-out pressure of 2068 kPa and a cut-in pressure of 1724 kPa. This pressure switch can be ordered from ClimateMaster with a 1/4" internal flare connection as part number 39B0005N02.

Piping Installation

⚠ CAUTION! ⚠

Corrosive system water requires corrosion resistant fittings and hoses and possibly water treatment.

Condensate Piping

Units are typically installed directly above each other on successive floors with condensate drains located near the units.

Pitch the unit toward the drain as shown in Figure 5 to improve the condensate drainage. On small units (less than 8.8kW) ensure that unit pitch does not cause condensate leaks inside the cabinet.

Install condensate trap at each unit with the top of the trap positioned below the unit condensate drain connection.

Figure 5 illustrates a typical trap and vent used with GL series equipment. Design the depth of the trap (water-seal) based upon the amount of ESP capability of the blower (where 51mm of ESP capability requires 2 inches 51mm of trap depth). As a rule 38mm trap depth is a minimum trap depth.

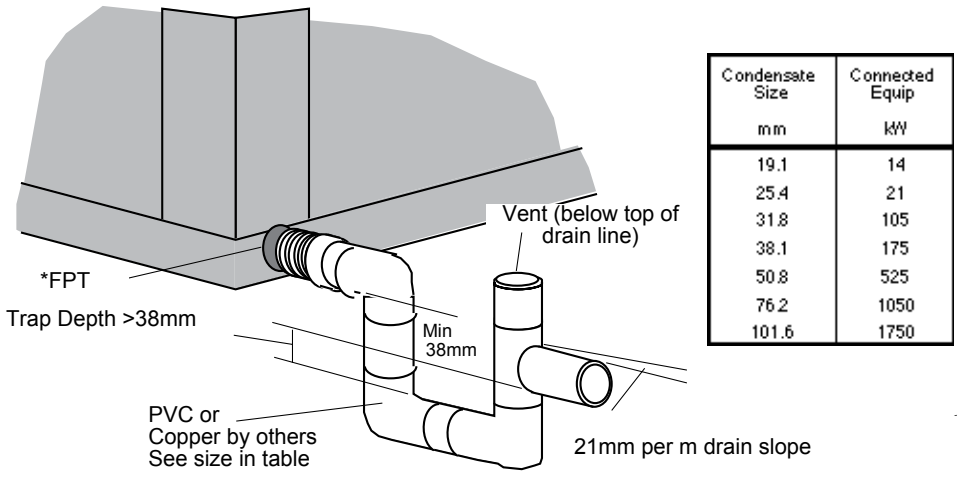
⚠ WARNING! ⚠

Ensure condensate line is pitched toward drain 21mm per m of run.

Each unit must be installed with its own individual trap and connection to the condensate line (main) or riser. Provide a means to flush or blow out the condensate line. DO NOT install units with a common trap and or vent.

Always vent the condensate line when dirt or air can collect in the line or a long horizontal drain line is required. Also vent when large units are working against higher external static pressure than other units connected to the same condensate main since this may cause poor drainage for all units on the line. WHEN A VENT IS INSTALLED IN THE DRAIN LINE, IT MUST BE LOCATED AFTER THE TRAP IN THE DIRECTION OF THE CONDENSATE FLOW.

Figure 5. Condensate Connection



Condensate Size mm	Connected Equip kW
19.1	14
25.4	21
31.8	105
38.1	175
50.8	525
76.2	1050
101.6	1750

Commercial Water Loop Applications

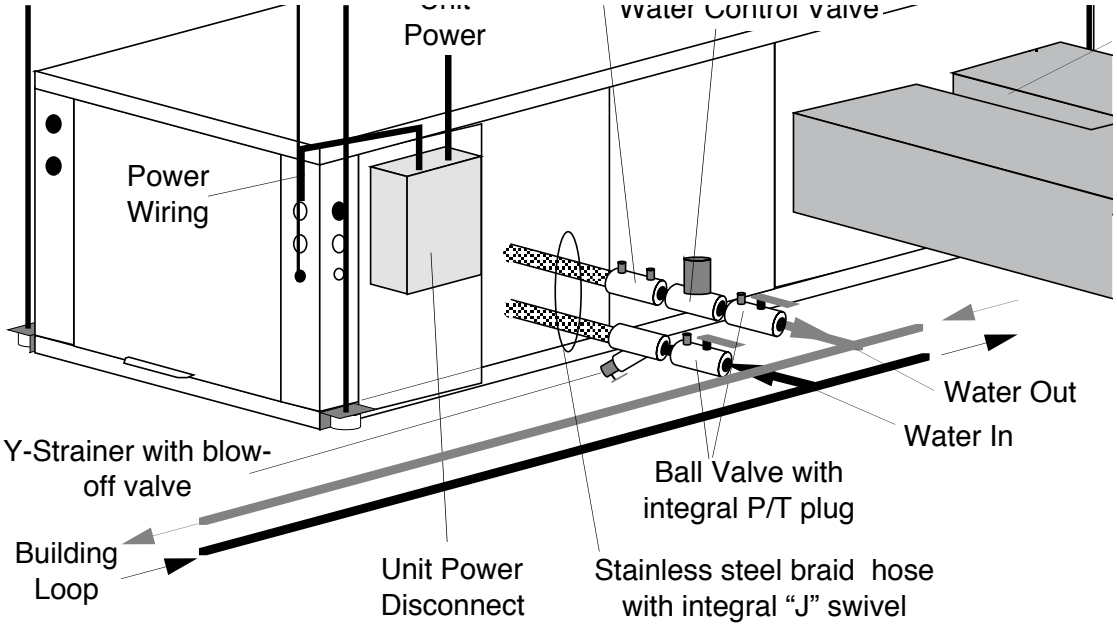
Commercial systems typically include a number of units plumbed to a common piping system. Any unit plumbing maintenance work can introduce air into the piping system, therefore air elimination equipment is a major portion of the mechanical room plumbing. In piping systems expected to utilize water temperatures below 10°C, 25mm closed cell insulation is required on all piping surfaces to eliminate condensation. Metal to plastic threaded joints should never be employed due to their tendency to leak over time. All non-distributor class units include a low temperature-soldered bracket-supported FPT water connection. Teflon tape thread sealant is recommended to minimize internal fouling of the heat exchanger. Do not overtighten connections and route piping so as not to interfere with service or maintenance access. Hose kits are available from ClimateMaster in different configurations as shown in Figure 8 for connection between the GL Series and the piping system. The hose kits include shut off valves, P/T plugs for performance measurement, high pressure stainless steel braid hose, "Y" type strainer with blowdown valve, and "J" type swivel connection. Balancing valves to facilitate the balancing of the system, and an external low pressure drop solenoid valve for use in variable speed pumping systems, may also be included in the hose kit. The piping system should be flushed to remove dirt, piping chips, and other foreign material prior to operation. See page 19 for Piping System Cleaning and Flushing Procedures. The flow rate is usually set between 0.0403 - 0.0537 per kW of cooling capacity. ClimateMaster recommends 0.0448 per kW for most applications of water loop heat pumps. To insure proper maintenance and servicing, P/T ports are imperative for temperature and flow verification, as well as performance checks.

Cooling Tower/Boiler Systems typically utilize a common loop maintained 15.6-32.2°C. The use of a closed circuit evaporative cooling tower with a secondary heat exchanger between the tower and the water loop is recommended. If an open type cooling tower is used continuously, chemical treatment and filtering will be necessary.

Low Water Temperature Cutout Setting

CXM or DXM Control:
When an antifreeze is selected, the FP1 jumper (JW2) should be clipped to select the low temperature (Antifreeze -10.6°C) setpoint to avoid nuisance faults. See Low Water Temperature Cutout Selection. NOTE THAT THE EXTENDED RANGE OPTION SHOULD BE SELECTED WHEN LOOP CONDITIONS ARE EXPECTED TO DROP BELOW 15.6°C.

Figure 6. Typical Water Loop Application



Electrical Data

Electrical - Line Voltage

⚠ WARNING! ⚠

To avoid possible injury or death due to electrical shock, open the power supply disconnect switch and secure it in an open position during installation.

⚠ CAUTION! ⚠

Use only copper conductors for field installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

All field installed wiring, including electrical ground, must comply with the National Electrical Code as well as all applicable local codes.

Refer to the unit wiring diagrams for fuse sizes and a schematic of the field connections which must be made by the installing (or electrical) contractor.

Consult the unit wiring diagram located on the inside of the compressor access panel to ensure proper electrical hookup.

All final electrical connections must be made with a length of flexible conduit to minimize vibration and sound transmission to the building.

R407c

Model	Volt Code	Rated Voltage	Voltage Min/Max	Blower Motor Option	Compressor			Fan Motor			Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
					Qty	RLA	LRA	Qty	HP	FLA			
072	S	380-420/50/3	342-462	Standard	2	4.7	32	1	1.5	2.4	11.8	13.0	15
				Large	2	4.7	32	1	2.0	3.3	12.7	13.9	15
096	S	380-420/50/3	342-462	Standard	2	7.2	48	1	2.0	3.3	17.7	19.5	25
				Large	2	7.2	48	1	3.0	4.9	19.3	21.1	25
120	S	380-420/50/3	342-462	Standard	2	8.2	61.8	1	2.0	3.3	19.7	21.8	25
				Large	2	8.2	61.8	1	3.0	4.9	21.3	23.4	25

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

Rev.: 07/01/03 B

Table 2b. GLV Electrical Data

R407c

Model	Refrigerant	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°		Heating 0°C	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP
GLH072	R-407C	16.50	4.0	18.78	4.6	19.00	5.8	15.26	4.2	17.40	4.5	11.75	4.2
GLH096	R-407C	23.61	4.1	26.97	4.5	25.68	5.6	22.42	4.0	24.29	4.5	17.74	4.0
GLH120	R-407C	29.24	3.7	34.58	4.5	31.52	5.2	27.95	3.9	29.99	4.2	21.99	3.9
GLV080	R-407C	16.62	4.0	21.95	4.9	17.86	5.3	17.59	4.3	17.11	4.5	13.90	4.3
GLV100	R-407C	23.14	3.8	27.85	4.6	25.51	5.1	22.84	4.0	24.03	4.3	18.26	4.0
GLV120	R-407C	25.18	3.5	31.58	4.2	26.21	4.4	25.70	3.8	25.49	3.8	20.87	3.8
GLV160	R-407C	33.23	4.0	43.91	4.9	35.71	5.3	35.19	4.3	34.22	4.5	27.79	4.3
GLV200	R-407C	46.28	3.8	55.71	4.6	51.02	5.1	45.68	4.0	48.07	4.3	36.52	4.0
GLV240	R-407C	50.37	3.5	63.16	4.2	52.43	4.4	51.39	3.8	50.98	3.8	41.73	3.8
GLV300	R-407C	62.87	3.4	78.31	3.9	65.79	4.3	64.76	3.4	64.27	3.7	51.07	3.4

Power Wiring

⚠ WARNING! ⚠

Disconnect electrical power source to prevent injury or death from electrical shock.

General Line Voltage Wiring

Be sure the available power is the same voltage and phase as that shown on the unit serial plate. Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

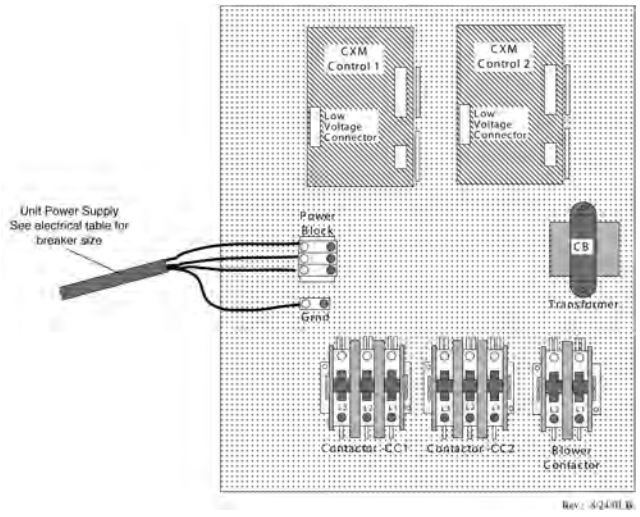
GL Power Connection

Line voltage connection is made by connecting the incoming line voltage wires to the power block as shown in Figure 7. Consult Table 2 for correct fuse size.

220 Volt Operation

All 220-240 Volt units are factory wired for 220 Volt. The transformers may be switched to 240V operation as illustrated on the wiring diagram. By switching the Red (240V) and the Orange (220V) at the contactor terminal L2.

Figure 7. Typical GL Series Line Voltage Field Wiring.



⚠ CAUTION! ⚠

Use only copper conductors for field installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

Airflow and External Static Pressure Selection Adjustment

The GL Series is available with standard, low, and high static options. These options will substitute a different blower drive sheave for each static range. In addition certain static ranges (bold print in Tables 3a and b) may require the optional large fan motor. Please specify static range and motor horsepower when ordering. See model nomenclature.

Sheave Adjustment

The GL Series is supplied with variable sheave drive on the fan motor to adjust for differing airflows at various ESP conditions. Select an airflow requirement on the left side of Table 3a and b, then move horizontally to right under the required ESP. Note the sheave turns open, rpm and horsepower [kW] for that condition. Fully closed the sheave will produce the highest static capability (higher rpm). To adjust sheave position: loosen belt tension and remove belt, loosen set screw on variable sheave (on fan motor) and open sheave to desired position. Retighten set screw and replace belt and set belt tension as below.

Belt Tensioning

An overly loose belt will, upon motor start, produce a slippage 'squeel' and cause premature belt failure and or intermittent airflow. An overly tight belt can cause premature motor or blower bearing failure.

Belt Tensioning Procedure

1) Remove belt from motor sheave

2) Lift motor assembly

3) Loosen the 7.9mm hex nuts on the grommet motor adjustment bolts (2 per bolt). To increase the belt tension loosen the top hex nut. To decrease the belt tension loosen the bottom hex nut.

4) Turn the bolts by hand to the desired position then tighten the 7.9mm hex nuts (2 per bolt).

5) Lower the motor assembly

6) Install the belt

7) The belt should be tensioned using one of the following tension measurement methods:

-Tighten until belt deflects approximately 12.7mm with very firm finger pressure.

-Grasp belt midway between two pulleys and twist for a 90° rotation. Less than 90° is overtightened and more than 90° is too loose.

-Use tensioning gauge method such as the Browning Belt Tensioner to set proper belt tension of 70-80 lbs.

Electrical - Blower Performance

Notes:

-Motor position should not need adjustment.

-The belt can also be accomplished by turning the 5/16" [7.9mm] hex nuts to the desired position.

-Motor sheave position is at mid position of each sheave. Thus the motor sheave is typically 2.5 turns open on a 5 turn sheave.

Table 2b. GLH Blower Sheave and Belt Information.

Model	072	096	120
Fan Motor			
Standard kW	1.1	1.5	1.5
Large kW	NA	NA	NA
Standard Sheave cm	2.22	2.22	2.22
Low Static Sheave cm	2.22	2.22	2.22
High Static Sheave cm	2.22	2.22	2.22
Blower			
Wheel Size -Dia x W cm	30.5 x 27.9	25.4 x 25.4	27.9 x 25.4
Standard Sheave cm	AK71 X 1.9	AK61 X 2.5	AK66 X 2.5
Low Static Sheave cm	AK71 X 1.9	AK74 X 2.5	AK79 X 2.5
High Static Sheave cm	AK56 X 1.9	AK51 X 2.5	AK56 X 2.5
Belts			
Standard Belt	AX43	A43	A45
Low Static Belt	AX42	A44	A45
High Static Belt	A40	A40	A41

Table 2c. GLV Blower Sheave and Belt Information.

Model	080	100	120	160	200	240	300
Fan Motor							
Quantity	1	1	1	1	2	2	2
Standard kW	1.1	1.1	1.5	2.2	1.1	1.5	2.2
Large kW	NA	NA	NA	NA	NA	NA	NA
Standard Sheave cm	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22
Low Static Sheave cm	1VP34 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VP34 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VP34 x 2.22
High Static Sheave cm	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22	1VL44 x 2.22
Blower							
Quantity	1	1	1	2	2	2	2
Wheel Size -Dia x W cm	30.5 x 22.9	38.1 x 38.1	38.1 x 38.1	30.5 x 22.9	38.1 x 38.1	38.1 x 38.1	38.1 x 38.1
Standard Sheave cm	AK71 X 1.9	AK74 X 2.5	AK74 X 2.5	AK71 X 1.9	AK74 X 2.5	AK74 X 2.5	AK84 X 2.5
Low Static Sheave cm	AK74 X 1.9	AK94 X 2.5	AK94 X 2.5	AK74 X 1.9	AK94 X 2.5	AK94 X 2.5	NA
High Static Sheave cm	AK59 X 1.9	AK66 X 2.5	AK66 X 2.5	AK59 X 1.9	AK66 X 2.5	AK66 X 2.5	AK84 X 2.5
Belts							
Standard Belt	AX31	AX35	AX35	AX31	AX35	AX35	AX35
Low Static Belt	AX31	AX35	AX35	AX31	AX35	AX35	AX35
High Static Belt	AX31	AX35	AX35	AX31	AX35	AX35	AX35

Genesis Large (GL) Series
Rev.: 08/13/10

Electrical - Blower Performance

Table 3a. GL Series Dry Coil to Wet Coil Conversion Table

Air Coil Face Velocity (m per sec)	Required BkW Multiplier	Required RPM Multiplier
1.28	1.00	1.00
1.54	1.02	1.06
1.79	1.05	1.12
2.05	1.08	1.18
2.31	1.11	1.26
2.56	1.14	1.34

Notes:
-Sheave Turns and RPM relationship is unchanged
Use original table to find correct turns based upon new rpm

Table 3b. GLH 072 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
743	BkW					0.19	0.23	0.26	0.30	0.33	0.37	0.40	0.44	0.48	0.52	0.56	
	RPM					603	654	705	752	798	841	884	925	965	1005	1041	
	TURNS					1.0	3.0	2.2	1.5	0.7	3.0	2.6	1.9	1.5	0.7	0.4	
826	BkW				0.22	0.25	0.28	0.31	0.34	0.38	0.42	0.46	0.50	0.54	0.59	0.63	
	RPM				578	630	679	726	770	814	856	897	936	975	1012	1048	
	TURNS				1.5	0.5	3.5	2.5	1.5	0.5	4.0	3.0	2.5	1.5	1.0	0.0	
909	BkW		0.21	0.24	0.27	0.31	0.34	0.37	0.40	0.45	0.48	0.53	0.57	0.61	0.66	0.71	
	RPM		512	563	614	661	708	751	795	835	875	914	952	989	1025	1060	
	TURNS		3.0	2.0	0.5	4.0	3.0	2.0	1.0	0.0	3.5	2.5	2.0	1.5	0.5	0.0	
991	BkW	0.25	0.28	0.31	0.34	0.37	0.40	0.44	0.48	0.52	0.56	0.60	0.65	0.70	0.75		
	RPM	515	560	606	652	698	740	782	822	861	900	936	972	1008	1042		
	TURNS	3.0	2.0	1.0	4.0	3.0	2.0	1.0	0.0	3.5	3.0	2.5	1.5	1.0	0.5		
1074	BkW	0.30	0.34	0.37	0.41	0.45	0.48	0.52	0.56	0.60	0.66	0.70	0.75	0.80	0.84		
	RPM	571	612	653	694	735	776	816	853	891	927	962	997	1030	1063		
	TURNS	1.5	0.5	4.0	3.0	2.5	1.5	0.5	4.0	3.0	2.5	2.0	1.0	0.5	0.0		
1156	BkW	0.40	0.43	0.47	0.51	0.54	0.58	0.63	0.66	0.71	0.75	0.81	0.86	0.91			
	RPM	619	659	698	738	777	816	852	889	924	958	992	1025	1057			
	TURNS	0.5	4.0	3.0	2.0	1.5	0.5	4.0	3.0	2.5	2.0	1.5	0.5	0.0			
1239	BkW	0.50	0.54	0.57	0.61	0.66	0.69	0.74	0.78	0.84	0.89	0.93	0.98				
	RPM	675	710	747	785	822	857	893	927	960	994	1025	1057				
	TURNS	3.5	3.0	2.0	1.0	0.0	4.0	3.0	2.5	2.0	1.0	0.5	0.0				

B A C

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (991 l/s @ 112 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (991 l/s @ 125 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Electrical - Blower Performance

Table 3c. GLH 096 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
1074	BkW		0.40	0.45	0.49	0.54	0.58	0.62	0.66	0.71	0.75	0.80	0.84	0.89	0.94	0.98	1.03
	RPM		897	950	1003	1052	1100	1145	1190	1233	1274	1314	1353	1391	1427	1463	1498
	TURNS		3.5	2.0	1.0	4.5	3.5	2.5	1.5	0.5	0.0	3.5	3.0	2.0	1.5	1.0	0.5
1156	BkW	0.45	0.50	0.54	0.59	0.63	0.68	0.72	0.77	0.82	0.87	0.92	0.96	1.01	1.06	1.11	1.16
	RPM	901	953	1005	1053	1101	1145	1190	1232	1273	1314	1352	1391	1427	1463	1498	1532
	TURNS	3.5	2.0	1.0	4.5	3.5	2.5	1.5	0.5	0.0	3.5	3.0	2.0	1.5	1.0	0.5	0.0
1239	BkW	0.54	0.60	0.64	0.69	0.74	0.79	0.84	0.89	0.94	0.99	1.04	1.09	1.14	1.19	1.25	
	RPM	957	1007	1055	1102	1146	1190	1232	1273	1313	1352	1390	1426	1462	1498	1531	
	TURNS	2.0	0.5	4.5	3.5	2.5	1.5	0.5	0.0	3.5	3.0	2.5	1.5	1.0	0.5	0.0	
1322	BkW	0.65	0.70	0.75	0.81	0.86	0.91	0.96	1.01	1.07	1.13	1.18	1.23	1.29	1.34		
	RPM	1012	1058	1104	1148	1191	1232	1273	1313	1351	1389	1426	1461	1497	1531		
	TURNS	0.5	4.0	3.5	2.5	1.5	0.5	0.0	3.5	3.0	2.5	1.5	1.0	0.5	0.0		
1404	BkW	0.77	0.82	0.87	0.93	0.98	1.04	1.10	1.16	1.21	1.27	1.32	1.38	1.44			
	RPM	1063	1107	1150	1193	1233	1274	1313	1351	1389	1425	1461	1496	1530			
	TURNS	4.0	3.0	2.5	1.5	0.5	0.0	3.5	3.0	2.5	1.5	1.0	0.5	0.0			
1487	BkW	0.90	0.95	1.01	1.07	1.12	1.18	1.24	1.30	1.36	1.42	1.48	1.54				
	RPM	1112	1154	1196	1236	1275	1314	1351	1389	1425	1460	1495	1529				
	TURNS	3.0	2.5	1.5	0.5	4.0	3.5	3.0	2.5	1.5	1.0	0.5	0.0				
1569	BkW	1.03	1.09	1.15	1.21	1.27	1.34	1.40	1.45	1.51	1.58	1.65					
	RPM	1159	1200	1239	1278	1316	1353	1390	1425	1460	1495	1529					
	TURNS	2.0	1.5	4.5	4.0	3.5	3.0	2.5	1.5	1.0	0.5	0.0					

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (1322 l/s @ 150 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (1322 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Table 3d. GLH 120 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
1404	BkW		0.62	0.65	0.69	0.72	0.75	0.78	0.81	0.84	0.87	0.90	0.93	0.96	0.99	1.02	1.05
	RPM		963	995	1026	1055	1085	1114	1141	1169	1196	1222	1248	1273	1299	1323	1347
	TURNS		4.5	4.0	3.0	2.5	1.5	0.7	0.4	0.0	2.6	2.2	1.9	1.5	1.1	0.7	0.4
1487	BkW	0.68	0.72	0.75	0.78	0.82	0.85	0.88	0.92	0.95	0.98	1.01	1.04	1.08	1.11	1.14	1.17
	RPM	965	998	1027	1057	1087	1115	1142	1170	1197	1223	1248	1273	1299	1322	1346	1370
	TURNS	4.5	3.5	3.0	2.5	2.0	1.0	0.5	0.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0
1569	BkW	0.78	0.81	0.85	0.89	0.92	0.95	0.99	1.03	1.07	1.10	1.13	1.16	1.20	1.23	1.27	
	RPM	1001	1030	1060	1089	1117	1144	1171	1199	1224	1249	1274	1299	1323	1347	1370	
	TURNS	3.5	3.0	2.5	1.5	1.0	0.5	0.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0	
1652	BkW	0.88	0.92	0.95	0.99	1.04	1.07	1.11	1.15	1.19	1.22	1.26	1.29	1.33	1.37		
	RPM	1034	1063	1092	1120	1147	1174	1201	1226	1251	1276	1301	1325	1348	1371		
	TURNS	3.0	2.5	1.5	1.0	0.5	0.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0		
1735	BkW	0.99	1.03	1.07	1.12	1.16	1.19	1.24	1.28	1.31	1.35	1.40	1.43	1.47			
	RPM	1067	1096	1124	1150	1177	1204	1229	1254	1279	1303	1327	1350	1373			
	TURNS	2.0	1.5	1.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0			
1817	BkW	1.11	1.16	1.20	1.25	1.28	1.33	1.37	1.41	1.45	1.50	1.54	1.57				
	RPM	1101	1128	1155	1182	1208	1233	1257	1282	1307	1330	1353	1376				
	TURNS	1.5	5.0	4.5	3.5	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0				
1900	BkW	1.24	1.28	1.34	1.38	1.42	1.47	1.51	1.56	1.60	1.64	1.69					
	RPM	1133	1160	1187	1212	1237	1262	1287	1310	1334	1357	1380					
	TURNS	4.5	4.0	3.5	3.0	2.5	2.5	2.0	1.5	1.0	0.5	0.0					

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (1652 l/s @ 125 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3.5 turns open (1652 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Genesis Large (GL) Series
Rev.: 08/13/10

Electrical - Blower Performance

Table 3e. GLV 080 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
826	BkW	0.19	0.22	0.25	0.28	0.31	0.33	0.36	0.39	0.42	0.45	0.48	0.51				
	RPM	561	607	650	694	735	776	816	854	892	929	964	1000				
	TURNS	1.5	0.0	4.5	3.0	2.5	1.5	0.5	3.0	2.0	1.5	1.0	0.0				
909	BkW	0.25	0.28	0.31	0.33	0.36	0.39	0.42	0.45	0.48	0.51	0.54	0.57				
	RPM	593	635	675	715	754	793	830	867	903	938	972	1006				
	TURNS	0.5	4.5	3.5	2.5	2.0	1.0	0.0	2.5	2.0	1.5	0.5	0.0				
991	BkW	0.31	0.34	0.36	0.39	0.43	0.46	0.48	0.51	0.55	0.58	0.62	0.65				
	RPM	623	663	702	738	775	811	846	881	915	949	982	1014				
	TURNS	0.0	4.0	3.0	2.0	1.5	0.5	3.0	2.5	2.0	1.0	0.5	0.0				
1074	BkW	0.37	0.40	0.43	0.46	0.49	0.53	0.56	0.60	0.63	0.66	0.70					
	RPM	656	693	728	763	797	831	864	897	929	961	993					
	TURNS	4.0	3.5	2.5	1.5	1.0	0.0	3.0	2.0	1.5	1.0	0.0					
1156	BkW	0.44	0.48	0.51	0.54	0.57	0.61	0.64	0.68	0.72	0.75	0.79					
	RPM	688	722	755	788	820	852	884	915	945	976	1006					
	TURNS	3.5	2.5	2.0	1.0	0.0	3.0	2.5	2.0	1.0	0.5	0.0					
1239	BkW	0.52	0.56	0.60	0.63	0.66	0.70	0.74	0.78	0.81	0.86						
	RPM	720	751	783	814	844	875	905	934	963	992						
	TURNS	2.5	2.0	1.0	0.5	3.0	2.5	2.0	1.5	1.0	0.5						
1322	BkW	0.62	0.66	0.69	0.72	0.76	0.81	0.84	0.89	0.93	0.96						
	RPM	751	781	811	840	869	898	926	954	982	1010						
	TURNS	2.0	1.0	0.5	0.0	2.5	2.0	1.5	1.0	0.5	0.0						

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (1074 l/s @ 125 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (1074 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Table 3f. GLV 100 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
1115	BkW			0.26	0.30	0.34	0.39	0.43	0.48	0.53	0.58	0.63	0.69	0.74	0.79		
	RPM			502	542	583	621	658	694	728	760	793	823	853	883		
	TURNS			4.0	2.5	1.5	4.5	3.5	2.5	1.5	1.0	0.0	1.5	1.0	0.5		
1198	BkW			0.30	0.34	0.38	0.43	0.48	0.53	0.58	0.63	0.69	0.74	0.80	0.85		
	RPM			515	554	594	630	666	701	734	766	798	828	857	886		
	TURNS			3.5	2.0	1.0	4.0	3.0	2.5	1.5	0.5	0.0	1.5	1.0	0.0		
1281	BkW		0.30	0.34	0.37	0.43	0.48	0.52	0.57	0.63	0.69	0.74	0.80	0.86	0.92		
	RPM		488	528	567	605	640	675	708	740	772	803	832	861	890		
	TURNS		4.5	3.0	2.0	4.5	4.0	3.0	2.0	1.5	0.5	0.0	1.5	0.5	0.0		
1363	BkW		0.34	0.37	0.43	0.47	0.52	0.57	0.63	0.69	0.74	0.80	0.86	0.92	0.98		
	RPM		504	542	580	616	650	684	716	747	778	809	837	866	894		
	TURNS		4.0	2.5	1.5	4.5	3.5	3.0	2.0	1.0	0.5	2.0	1.5	0.5	0.0		
1446	BkW	0.34	0.38	0.43	0.47	0.52	0.57	0.63	0.68	0.74	0.80	0.86	0.93	0.98	1.04		
	RPM	480	519	556	593	627	660	694	725	755	785	815	843	871	899		
	TURNS	4.5	3.5	2.0	1.0	4.0	3.5	2.5	2.0	1.0	0.5	2.0	1.0	0.5	0.0		
1528	BkW	0.39	0.43	0.48	0.52	0.57	0.63	0.69	0.74	0.80	0.87	0.93	0.99	1.05	1.11		
	RPM	497	534	571	606	639	671	704	733	763	793	821	848	876	903		
	TURNS	4.0	3.0	1.5	4.5	4.0	3.0	2.5	1.5	1.0	0.0	1.5	1.0	0.5	0.0		
1611	BkW	0.45	0.48	0.53	0.58	0.63	0.69	0.75	0.81	0.87	0.93	0.99	1.06	1.12			
	RPM	514	549	585	619	651	683	713	743	772	801	828	855	882			
	TURNS	3.5	2.5	1.0	4.5	3.5	3.0	2.0	1.5	0.5	0.0	1.5	1.0	0.5			
1694	BkW	0.50	0.54	0.60	0.65	0.70	0.75	0.81	0.87	0.94	1.00	1.06	1.13	1.19			
	RPM	530	565	600	632	663	695	724	752	781	809	835	862	888			
	TURNS	3.0	2.0	0.5	4.0	3.5	2.5	2.0	1.0	0.5	2.0	1.5	0.5	0.0			

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (1445 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2.0 turns open (1446 l/s @ 112 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Electrical - Blower Performance

Table 3g. GLV 120 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
1156	BkW			0.27	0.31	0.35	0.40	0.45	0.50	0.54	0.60	0.65	0.70	0.75	0.81		
	RPM			502	542	583	620	657	693	726	759	791	822	851	880		
	TURNS			4.0	2.5	1.5	4.5	3.5	2.5	1.5	1.0	0.0	1.5	1.0	0.5		
1239	BkW		0.27	0.31	0.35	0.40	0.44	0.49	0.54	0.60	0.65	0.70	0.76	0.81	0.87		
	RPM		473	516	555	594	630	665	700	733	765	797	826	855	884		
	TURNS		4.5	3.5	2.0	1.0	4.0	3.0	2.5	1.5	1.0	0.0	1.5	1.0	0.0		
1322	BkW		0.31	0.35	0.39	0.44	0.48	0.54	0.59	0.65	0.70	0.76	0.82	0.87	0.93		
	RPM		490	530	568	606	640	674	708	740	771	802	831	860	888		
	TURNS		4.0	3.0	1.5	4.5	4.0	3.0	2.0	1.5	0.5	0.0	1.5	1.0	0.0		
1404	BkW		0.35	0.39	0.44	0.48	0.54	0.59	0.64	0.70	0.76	0.82	0.88	0.94	1.00		
	RPM		507	544	581	617	651	684	716	747	778	808	836	865	893		
	TURNS		3.5	2.5	1.5	4.5	3.5	3.0	2.0	1.0	0.5	2.0	1.5	0.5	0.0		
1487	BkW	0.36	0.40	0.44	0.49	0.54	0.59	0.64	0.70	0.76	0.82	0.88	0.95	1.01	1.07		
	RPM	483	522	559	595	629	662	695	725	755	785	814	842	870	898		
	TURNS	4.5	3.0	2.0	1.0	4.0	3.5	2.5	2.0	1.0	0.5	2.0	1.0	0.5	0.0		
1569	BkW	0.41	0.46	0.50	0.54	0.60	0.65	0.70	0.76	0.82	0.89	0.95	1.01	1.07	1.14		
	RPM	501	537	574	609	641	673	705	735	764	794	821	849	876	903		
	TURNS	4.0	2.5	1.5	4.5	4.0	3.0	2.0	1.5	1.0	0.0	1.5	1.0	0.5	0.0		
1652	BkW	0.46	0.51	0.55	0.60	0.66	0.71	0.77	0.83	0.90	0.95	1.01	1.08	1.15			
	RPM	518	553	589	622	653	685	715	744	773	802	829	856	882			
	TURNS	3.5	2.0	1.0	4.5	3.5	2.5	2.0	1.5	0.5	0.0	1.5	1.0	0.5			
1735	BkW	0.52	0.57	0.62	0.67	0.72	0.78	0.84	0.90	0.96	1.03	1.09	1.16	1.22			
	RPM	534	569	604	635	666	698	726	755	783	810	837	863	889			
	TURNS	3.0	1.5	5.0	4.0	3.0	2.5	1.5	1.0	0.5	2.0	1.5	0.5	0.0			
1817	BkW	0.59	0.64	0.69	0.74	0.80	0.86	0.92	0.98	1.04	1.10	1.16	1.24	1.31			
	RPM	551	586	618	649	679	709	737	765	793	819	845	871	897			
	TURNS	2.5	1.0	4.5	3.5	3.0	2.0	1.5	1.0	0.0	1.5	1.0	0.5	0.0			
1900	BkW	0.66	0.71	0.76	0.82	0.88	0.94	1.00	1.06	1.11	1.19	1.25	1.32	1.40			
	RPM	569	602	632	663	693	721	749	776	803	829	854	880	905			
	TURNS	1.5	0.5	4.0	3.5	2.5	2.0	1.0	0.5	2.0	1.5	1.0	0.5	0.0			

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (1652 l/s @ 55 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (1652 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.

Table 3h. GLV 160 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
1652	BkW	0.40	0.45	0.50	0.55	0.60	0.66	0.72	0.77	0.83	0.90	0.95	1.01				
	RPM	561	607	650	694	735	776	816	854	892	929	964	1000				
	TURNS	1.5	0.0	4.5	3.0	2.5	1.5	0.5	3.0	2.0	1.5	1.0	0.0				
1817	BkW	0.50	0.55	0.60	0.66	0.72	0.77	0.84	0.90	0.96	1.02	1.08	1.15				
	RPM	593	635	675	715	754	793	830	867	903	938	972	1006				
	TURNS	0.5	4.5	3.5	2.5	2.0	1.0	0.0	2.5	2.0	1.5	0.5	0.0				
1982	BkW	0.61	0.66	0.72	0.78	0.84	0.91	0.97	1.04	1.10	1.16	1.24	1.31				
	RPM	625	663	702	738	775	811	846	881	915	949	982	1014				
	TURNS	0.0	4.0	3.0	2.0	1.5	0.5	3.0	2.5	2.0	1.0	0.5	0.0				
2148	BkW	0.74	0.80	0.86	0.93	0.99	1.05	1.12	1.19	1.26	1.33	1.40					
	RPM	656	693	728	763	797	831	864	897	929	961	993					
	TURNS	4.0	3.5	2.5	1.5	1.0	0.0	3.0	2.0	1.5	1.0	0.0					
2313	BkW	0.89	0.95	1.01	1.08	1.15	1.22	1.29	1.36	1.43	1.51	1.58					
	RPM	688	722	755	788	820	852	884	915	945	976	1006					
	TURNS	3.5	2.5	2.0	1.0	0.0	3.0	2.5	2.0	1.0	0.5	0.0					
2478	BkW	1.05	1.12	1.19	1.26	1.33	1.40	1.48	1.55	1.63	1.71						
	RPM	720	751	783	814	844	875	905	934	963	992						
	TURNS	2.5	2.0	1.0	0.5	3.0	2.5	2.0	1.5	1.0	0.5						
2643	BkW	1.23	1.31	1.38	1.45	1.53	1.61	1.69	1.77	1.85	1.93						
	RPM	751	781	811	840	869	898	926	954	982	1010						
	TURNS	2.0	1.0	0.5	0.0	2.5	2.0	1.5	1.0	0.5	0.0						

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (2148 l/s @ 38 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (2148 l/s @ 75 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Genesis Large (GL) Series
Rev.: 08/13/10

Electrical - Blower Performance

Table 3i. GLV 200 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
2230	BkW			0.26	0.30	0.34	0.39	0.43	0.48	0.53	0.58	0.63	0.68	0.73	0.78		
	RPM			502	542	583	621	658	694	728	761	794	824	853	883		
	TURNS			4.0	2.5	1.5	4.5	3.5	2.5	1.5	1.0	0.0	1.5	1.0	0.5		
2395	BkW			0.30	0.34	0.38	0.43	0.48	0.52	0.57	0.63	0.69	0.74	0.79	0.85		
	RPM			515	554	594	630	666	702	734	766	799	828	857	887		
	TURNS			3.5	2.0	1.0	4.0	3.0	2.5	1.5	0.5	0.0	1.5	1.0	0.0		
2561	BkW		0.30	0.34	0.37	0.43	0.47	0.52	0.57	0.63	0.68	0.74	0.80	0.85	0.91		
	RPM		488	528	567	605	640	675	709	740	772	804	832	861	890		
	TURNS		4.5	3.0	2.0	4.5	4.0	3.0	2.0	1.5	0.5	0.0	1.5	0.5	0.0		
2726	BkW		0.34	0.37	0.42	0.47	0.52	0.57	0.63	0.68	0.74	0.80	0.86	0.92	0.98		
	RPM		504	542	580	616	650	684	716	747	779	809	837	866	894		
	TURNS		4.0	2.5	1.5	4.5	3.5	3.0	2.0	1.0	0.5	2.0	1.5	0.5	0.0		
2891	BkW	0.34	0.37	0.43	0.47	0.51	0.57	0.63	0.68	0.74	0.80	0.86	0.92	0.98	1.04		
	RPM	479	519	556	593	627	660	694	725	755	785	815	843	871	899		
	TURNS	4.5	3.5	2.0	1.0	4.0	3.5	2.5	2.0	1.0	2.5	2.0	1.0	0.5	0.0		
3056	BkW	0.38	0.43	0.48	0.52	0.57	0.63	0.68	0.74	0.80	0.86	0.93	0.98	1.04	1.11		
	RPM	497	534	570	606	639	671	704	733	763	793	821	849	876	903		
	TURNS	4.0	3.0	1.5	4.5	4.0	3.0	2.5	1.5	3.0	2.5	1.5	1.0	0.5	0.0		
3221	BkW	0.44	0.48	0.53	0.57	0.63	0.69	0.74	0.80	0.87	0.93	0.99	1.05	1.12			
	RPM	513	549	585	619	651	683	713	743	772	801	828	855	882			
	TURNS	3.5	2.5	1.0	4.5	3.5	3.0	2.0	3.5	2.5	2.0	1.5	1.0	0.5			
3387	BkW	0.50	0.54	0.59	0.64	0.69	0.75	0.81	0.87	0.93	1.00	1.06	1.12	1.19			
	RPM	529	565	600	632	663	694	724	752	781	809	835	862	888			
	TURNS	3.0	2.0	0.5	4.0	3.5	4.5	4.0	3.0	2.5	2.0	1.5	0.5	0.0			

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (2891 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2.0 turns open (2891 l/s @ 112 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.

Table 3j. GLV 240 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
2313	BkW			0.27	0.31	0.35	0.40	0.45	0.50	0.54	0.60	0.65	0.70	0.75	0.81		
	RPM			502	542	583	620	657	693	726	759	791	822	851	880		
	TURNS			4.0	2.5	1.5	4.5	3.5	2.5	1.5	1.0	0.0	1.5	1.0	0.5		
2478	BkW			0.31	0.35	0.40	0.44	0.49	0.54	0.60	0.65	0.70	0.76	0.81	0.87		
	RPM			516	555	594	630	665	700	733	765	797	826	855	884		
	TURNS			3.5	2.0	1.0	4.0	3.0	2.5	1.5	1.0	0.0	1.5	1.0	0.0		
2643	BkW		0.31	0.35	0.39	0.44	0.48	0.54	0.59	0.65	0.70	0.76	0.82	0.87	0.93		
	RPM		490	530	568	606	640	674	708	740	771	802	831	860	888		
	TURNS		4.0	3.0	1.5	4.5	4.0	3.0	2.0	1.5	0.5	0.0	1.5	1.0	0.0		
2808	BkW		0.35	0.39	0.44	0.48	0.54	0.59	0.64	0.70	0.76	0.82	0.88	0.94	1.00		
	RPM		507	544	581	617	651	684	716	747	778	808	836	865	893		
	TURNS		3.5	2.5	1.5	4.5	3.5	3.0	2.0	1.0	0.5	2.0	1.5	0.5	0.0		
2974	BkW	0.36	0.40	0.44	0.49	0.54	0.59	0.64	0.70	0.76	0.82	0.88	0.95	1.01	1.07		
	RPM	483	522	559	595	629	662	695	725	755	785	814	842	870	898		
	TURNS	4.5	3.0	2.0	1.0	4.0	3.5	2.5	2.0	1.0	0.5	2.0	1.0	0.5	0.0		
3139	BkW	0.41	0.46	0.50	0.54	0.60	0.65	0.70	0.76	0.82	0.89	0.95	1.01	1.07	1.14		
	RPM	501	537	574	609	641	673	705	735	764	794	821	849	876	903		
	TURNS	4.0	2.5	1.5	4.5	4.0	3.0	2.0	1.5	1.0	0.0	1.5	1.0	0.5	0.0		
3304	BkW	0.46	0.51	0.55	0.60	0.66	0.71	0.77	0.83	0.90	0.95	1.01	1.08	1.15			
	RPM	518	553	589	622	653	685	715	744	773	802	829	856	882			
	TURNS	3.5	2.0	1.0	4.5	3.5	2.5	2.0	1.5	0.5	0.0	1.5	1.0	0.5			
3469	BkW	0.52	0.57	0.62	0.67	0.72	0.78	0.84	0.90	0.96	1.03	1.09	1.16	1.22			
	RPM	534	569	604	635	666	698	726	755	783	810	837	863	889			
	TURNS	3.0	1.5	5.0	4.0	3.0	2.5	1.5	1.0	0.5	2.0	1.5	0.5	0.0			
3634	BkW	0.59	0.64	0.69	0.74	0.80	0.86	0.92	0.98	1.04	1.10	1.16	1.24	1.31			
	RPM	551	586	618	649	679	709	737	765	793	819	845	871	897			
	TURNS	2.5	1.0	4.5	3.5	3.0	2.0	1.5	1.0	0.0	1.5	1.0	0.5	0.0			
3800	BkW	0.66	0.71	0.76	0.82	0.88	0.94	1.00	1.06	1.11	1.19	1.25	1.32	1.40			
	RPM	569	602	632	663	693	721	749	776	803	829	854	880	905			
	TURNS	1.5	0.5	4.0	3.5	2.5	2.0	1.0	0.5	0.0	1.5	1.0	0.5	0.0			

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (3304 l/s @ 55 pascals ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 1.5 turns open (3304 l/s @ 100 pascals ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Performance data does not include drive losses and is based on sea level conditions.
Do not operate in gray region.
All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.
For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).
Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

Electrical - Blower Performance

Table 3k. GLV 300 Blower Performance

Airflow in l/s with dry coil and clean air filter.

Airflow (l/s)		External Static Pressure (pascals)															
		0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
3056	BkW	0.47	0.51	0.56	0.61	0.67	0.72	0.78	0.85	0.91	0.97	1.04	1.10				
	RPM	563	600	629	665	698	728	757	787	816	843	871	898				
	TURNS	2.0	0.5	0.0	4.0	3.0	2.0	1.5	0.5	2.5	2.0	1.0	0.5				
3221	BkW	0.53	0.58	0.63	0.69	0.75	0.81	0.87	0.93	0.99	1.06	1.12	1.19				
	RPM	587	621	653	685	715	744	774	803	830	857	884	910				
	TURNS	1.0	0.0	4.5	3.5	2.5	1.5	1.0	0.0	2.5	1.5	1.0	0.0				
3387	BkW	0.60	0.66	0.71	0.77	0.83	0.90	0.95	1.01	1.08	1.14	1.22					
	RPM	610	642	673	704	733	762	790	818	844	871	897					
	TURNS	0.5	4.5	3.5	3.0	2.0	1.0	0.5	2.5	2.0	1.0	0.5					
3552	BkW	0.69	0.74	0.80	0.86	0.93	0.98	1.04	1.10	1.17	1.25	1.31					
	RPM	629	664	695	723	751	779	807	833	859	885	911					
	TURNS	0.0	4.0	3.0	2.5	1.5	0.5	0.0	2.0	1.5	0.5	0.0					
3717	BkW	0.78	0.84	0.90	0.95	1.01	1.07	1.14	1.21	1.28	1.35						
	RPM	655	686	715	742	770	798	824	849	875	900						
	TURNS	4.0	3.5	2.5	2.0	1.0	0.0	2.5	1.5	1.0	0.5						
3882	BkW	0.88	0.94	0.99	1.05	1.11	1.18	1.25	1.32	1.39	1.45						
	RPM	678	707	735	762	789	815	840	866	891	915						
	TURNS	3.5	3.0	2.0	1.0	0.5	2.5	2.0	1.5	0.5	0.0						
4047	BkW	0.98	1.04	1.10	1.16	1.22	1.29	1.36	1.42	1.50							
	RPM	701	728	755	782	808	833	858	882	907							
	TURNS	3.0	2.0	1.5	0.5	0.0	2.0	1.5	1.0	0.0							
4213	BkW	1.08	1.14	1.21	1.28	1.34	1.41	1.48	1.55								
	RPM	722	749	775	802	826	851	875	900								
	TURNS	2.5	1.5	1.0	0.0	2.5	1.5	1.0	0.5								
4378	BkW	1.20	1.27	1.33	1.40	1.46	1.53	1.61	1.69								
	RPM	744	770	796	821	845	869	893	916								
	TURNS	1.5	1.0	0.0	2.5	2.0	1.0	0.5	0.0								

B

A

C

Bold Face Requires Large Motor. Consult physical data for sizes. Rev.: 05/08/03 B

A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; E=High Static/Large Mtr

Units factory shipped with standard static sheave and drive at 2.5 turns open (3717 l/s @ 32 pascals ESP Wet Coil). Other speeds require field selection.

ISO/ARI rating point with standard static sheave and drive at 1.0 turns open (3717 l/s @ 75 pascals ESP Wet Coil). Other speeds require field selection.

For applications requiring higher static pressures, contact your local representative.

Performance data does not include drive losses and is based on sea level conditions.

Do not operate in gray region.

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

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [l/s] /(Face Area [sq m] * 1000)).

Then for velocities of 1.0 m/s reduce the static capability by 7.5 pascals, 1.5 m/s by 19.9 pascals, 2.0 m/s by 29.9 pascals and 2.5 m/s by 39.8 pascals.

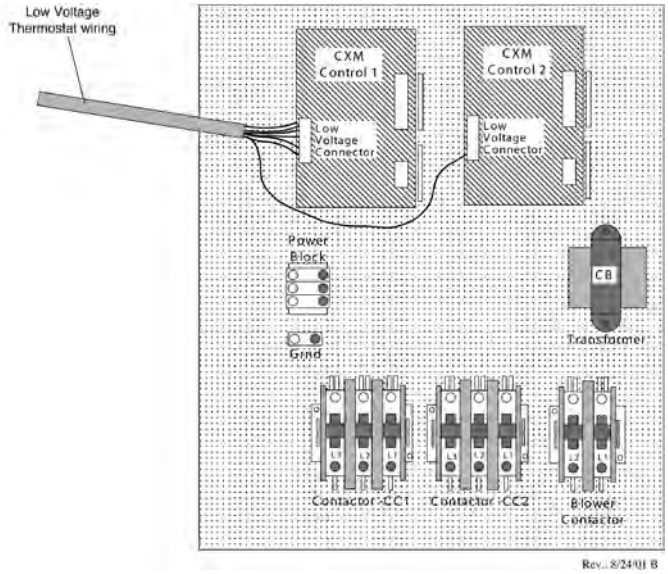
Genesis Large (GL) Series
Rev.: 08/13/10

Electrical - Low Voltage

Thermostat Connections

The thermostat should be wired directly to the CXM/DXM board as shown in Figure 11. Consult the Thermostat section for specific wiring.

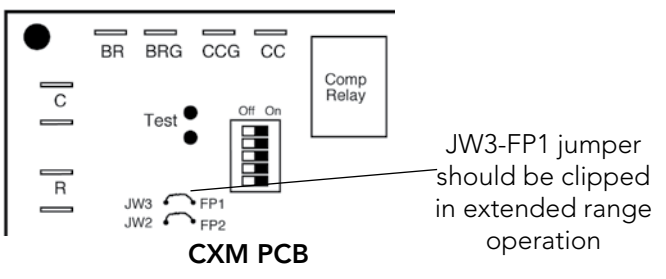
Figure 8. Low Voltage Field Wiring (CXM shown-NOTE:For DXM, Y2 wiring at DXM1)



Low Water Temperature Cutout - FP1

The CXM/DXM control allows the field selection of source fluid low temperature cutout points. The factory setting of FP1 is set for water (-1.1°C). In cold temperature applications jumper JW3 (FP1- antifreeze -12.2°C) should be clipped as shown in Figure 12 to change the setting to -12.2°C, a more suitable temperature when using antifreezes. It should be noted that the extended range option should be specified to operate the GL Series at entering water temperatures below 15.6°C.

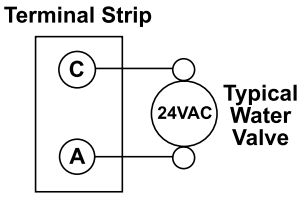
Figure 9. Changing FP1-Low Water Temperature Cutout Setpoint



Accessory Connections

A terminal paralleling the compressor contactor coil has been provided on the CXM/DXM control of the GL line. "A" has been provided to control accessory devices, such as water valves, electronic air cleaners, humidifiers, etc. Note: This terminal should be used only with 24 Volt signals and not line voltage signals. This signal operates with the compressor contactor. See Figure 13 or the wiring schematic for details.

Figure 10. Accessory Wiring



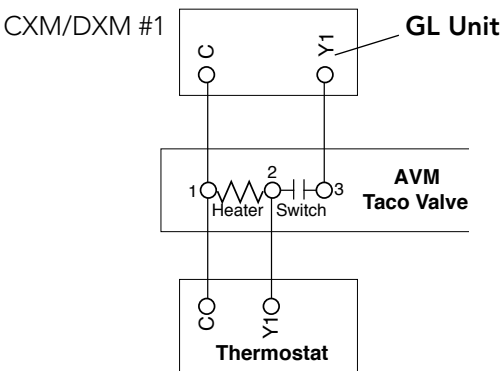
Water Solenoid Valves

When using external solenoid valves on ground water installations. Figure 14 illustrates a typical slow closing water control valve wiring which will limit wasted water during a lockout condition. A slow closing valve may be required to prevent water hammer. When using an AVM -Taco Slow Closing valves on GL Series equipment Figure 14 wiring should be utilized. The valve takes approximately 60 seconds to open (very little water will flow before 45 seconds) and it activates the compressor only after the valve is completely opened (by closing its end switch). Only relay or triac based electronic thermostats should be used with the AVM valve. When wired as shown, the valve will operate properly with the following notations:

1-The valve will remain open during a unit lockout.

2-The valve will draw approximately 25-35 VA through the "Y" signal of the thermostat. **Note: This can overheat the anticipators of electromechanical thermostats.** Therefore only relay or triac based thermostats should be used.

Figure 11. Well Water AVM Valve Wiring



Typical Thermostat Selection and Wiring

Practically any multi-stage thermostat will work with the GL Series. Figure 12 show s typical thermostat wiring.

Figure 12a. Typical Manual Changeover 2 heat/ 2 cool thermostat wiring with GL unit & CXM

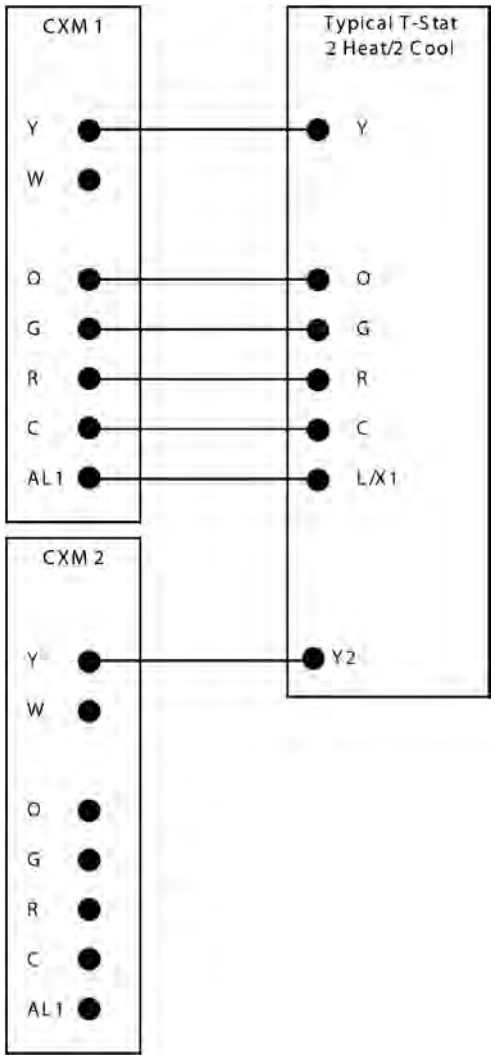
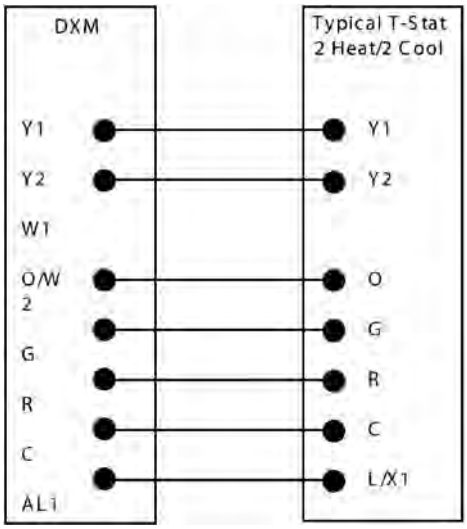


Figure 12b. Typical Manual Changeover 2 heat/ 2 cool thermostat wiring with GL unit & DXM



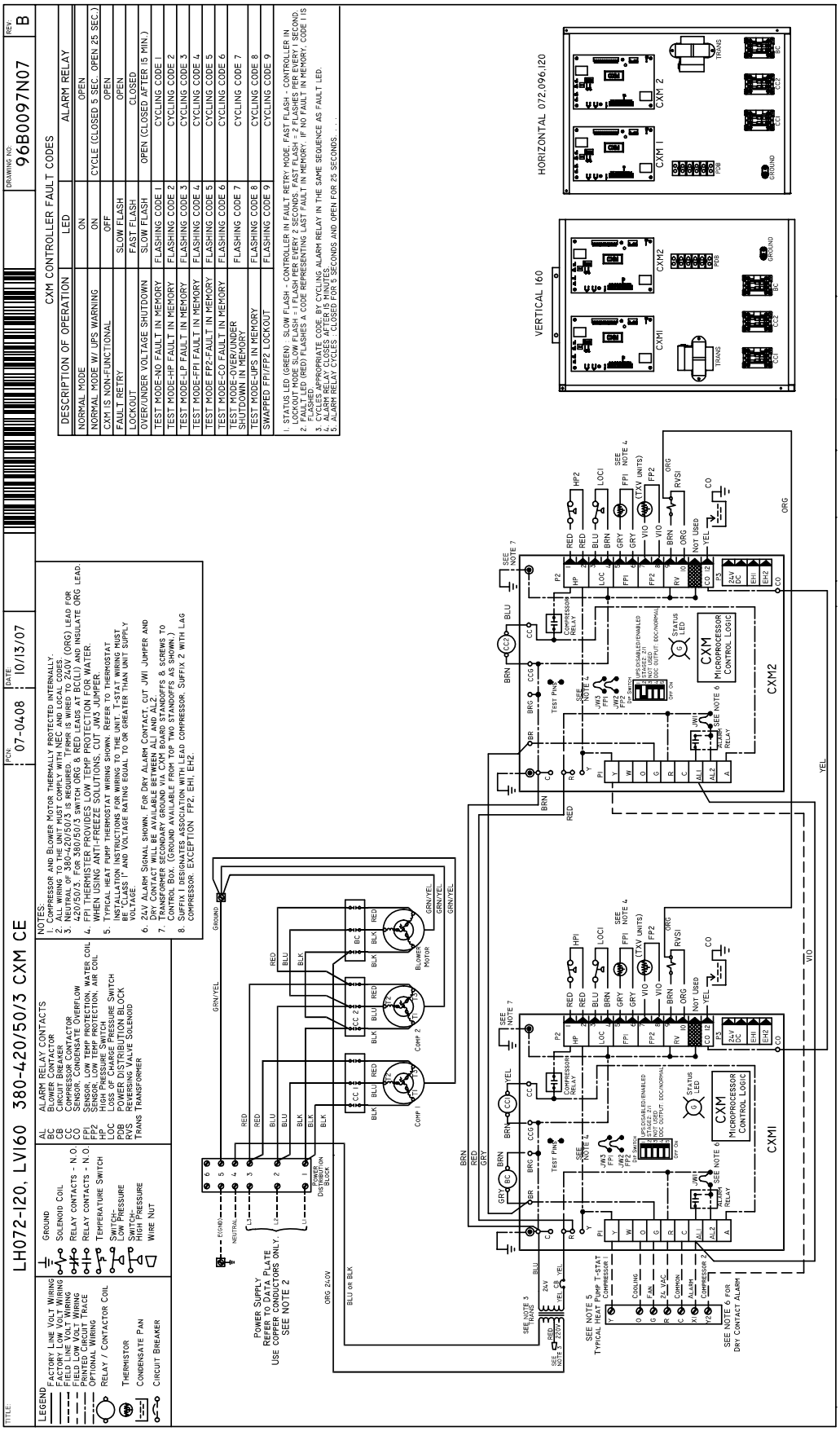
Note: See CXM/DXM AOM (part #97B0003N08) included separately with this heat pump or

Lon Controller AOM (97B0013N01) and MPC AOM (97B0031N01) included with any unit utilizing the Lon or MPC Controller Option.

Genesis Large (GL) Series
Rev.: 08/13/10

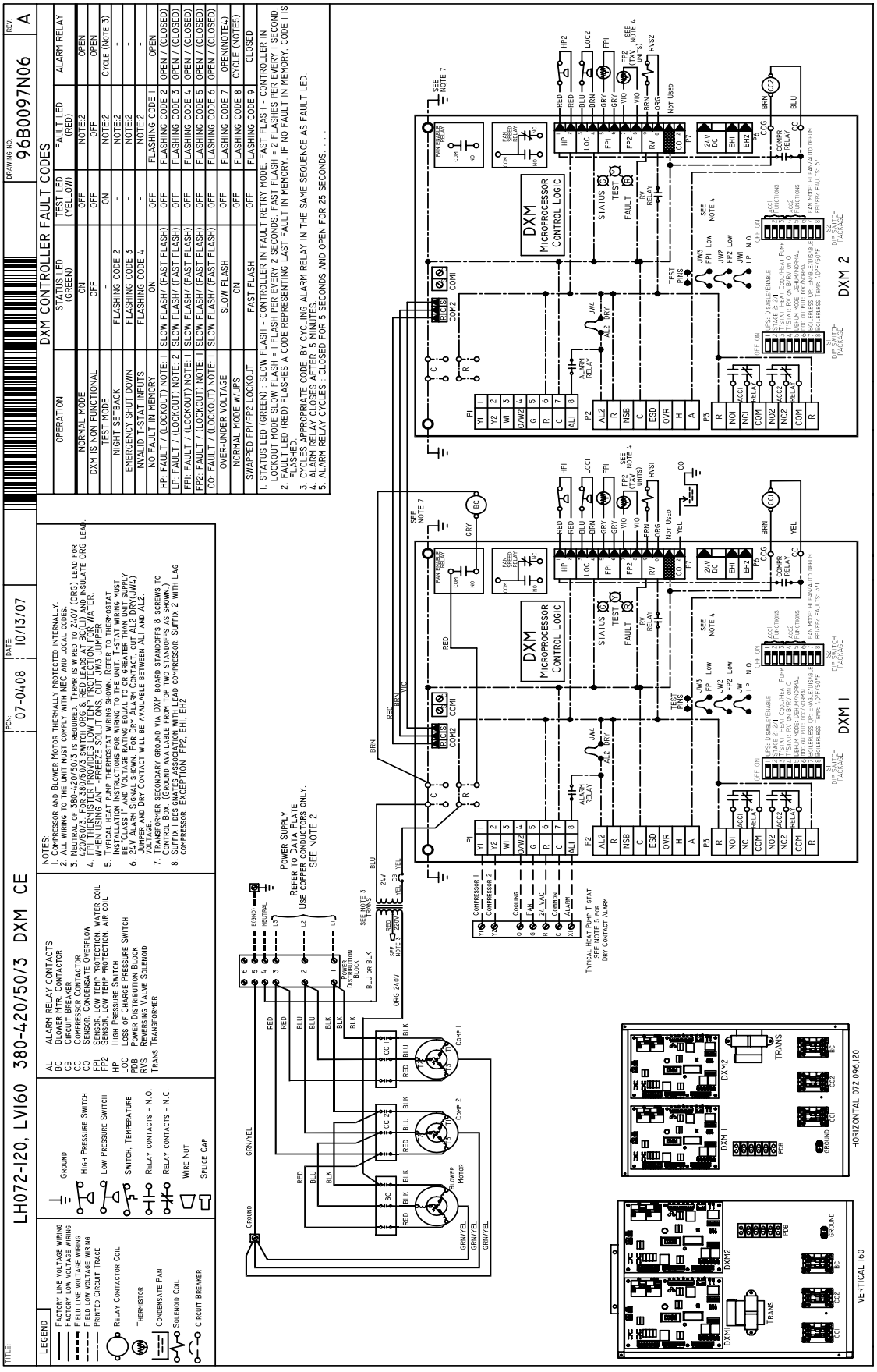
Wiring Diagrams

GLH072-120, GLV160 Three Phase with CXM Schematic



Wiring Diagrams

GLH072-120, GLV160 Three Phase with DXM Schematic



Unit Starting and Operating Conditions

Operating Limits

Environment – This unit is designed for indoor installation only.

Power Supply – A voltage variation of +/– 10% of nameplate utilization voltage is acceptable.

Starting Conditions

GL Units – Units start and operate in an ambient of 7.2°C with entering air at 10°C, entering water at -1°C and both air and water at the stated flow rates of 0.0537 l/s per kW for initial winter start-up.

Notes:

1. These are not normal or continuous operating conditions. It is assumed that winter start-up is to bring the building space up to occupancy temperatures.
2. Voltage utilization range complies with ARI Standard 110.

Determination of operating limits is dependent primarily upon three factors: 1) return air temperature. 2) water temperature and 3) ambient temperature. When any one of these factors is at minimum or maximum levels, the other two factors should be at normal levels to ensure proper unit operation.

Extreme variations in temperature and humidity and corrosive water or air will adversely affect unit performance, reliability, and service life.

Table 4. Operating Limits

Air Limits	Cooling	Heating
Min Ambient Air	7.2°C	7.2°C
Rated Ambient Air	27°C	20°C
Max. Ambient Air	37.8°C	29.4°C
Min. Ent. Air	10°C	4.4°C
Normal Entering Air db/wb	24/17 - 27/19°C	20°C
Max Entering Air db/wb	43.3/28.3°C	27°C
Water Limits		
Min. Entering Water	*-1°C	7°C (*-5°C)
Normal Entering Water	4.1-32.2°C	4.1-32.2°C
Max. Entering Water	43.3°C	32.2°C

Note: * with antifreeze, optional extended range insulation and low temperature cutout jumper clipped for antifreeze.

Piping System Cleaning and Flushing

Cleaning and flushing of the WLHP piping system is the single most important step to ensure proper start-up and continued efficient operation of the system.

Follow the instructions below to properly clean and flush the system:

1. Verify electrical power to the unit is disconnected.
2. Install the system with the supply hose connected directly to the return riser valve. Use a single length of flexible hose.
3. Open all air vents. Fill the system with the water. DO NOT allow system to overflow. Bleed all air from the system. Pressurize and check the system for leaks and repair appropriately.
4. Verify all strainers are in place. Start the pumps, and systematically check each vent to ensure all air is bled from the system.
5. Verify make-up water is available. Adjust make-up water appropriately to replace the air which was bled from the system. Check and adjust the water/air level in the expansion tank.
6. Set the boiler to raise the loop temperature to approximately 29.4°C. Open the a drain at the lowest point in the system. Adjust the make-up water replacement rate to equal the rate of bleed.
7. Refill the system and add trisodium phosphate in a proportion of approximately one pound per 1 gm to 1.3 liter of water (or other equivalent approved cleaning agent). Reset the boiler to raise the loop temperature to about 38°C. Circulate the solution for a minimum of 8 to 24 hours. At the end of this period, shut off the circulating pump and drain the solution. Repeat system cleaning if desired.
8. When the cleaning process is complete, remove the short-circuited hoses. Reconnect the hoses to the proper supply, and return the connections to each of the units. Refill the system and bleed off all air.
9. Test the system pH with litmus paper. The system water should be slightly alkaline (pH 7.5-8.5). Add chemicals, as appropriate, to maintain acidity levels.
10. When the system is successfully cleaned, flushed, refilled and bled, check the main system panels, safety cutouts and alarms. Set the controls to properly maintain loop temperatures.

⚠ CAUTION! ⚠

To avoid possible damage to a plastic (PVC) piping system, do not allow temperatures to exceed 43°C.

⚠ CAUTION! ⚠

DO NOT use 'stop leak' or any similar chemical agent in this system. Addition of these chemicals to the loop water will foul the system and inhibit unit operation.

Unit and System Checkout

BEFORE POWERING SYSTEM, please check the following:

UNIT CHECKOUT

- ❑ Balancing/Shutoff Valves: Ensure all isolation valves are open, water control valves wired and open or coax may freeze and burst.

⚠ WARNING! ⚠

Verify ALL water controls are open and allow water flow prior to engaging the compressor. Freezing of the coax or water lines can permanently damage the heat pump.

- ❑ Line Voltage and Wiring: Ensure Voltage is within an acceptable range for the unit and wiring and fuses/breakers are properly sized. Low voltage wiring is complete.
- ❑ Unit Control Transformer: Ensure transformer has properly selected control voltage tap. 220-240V units are factory wired for 220V operation unless specified otherwise.
- ❑ Entering Water and Air: Ensure entering water and air temperatures are within operating limits of Table 4.
- ❑ Low Water Temperature Cutout: Verify low water temperature cut-out on CXM/DXM is properly set.
- ❑ Unit Fan: Manually rotate fans to assure free rotation and ensure blower wheel is secured to motor shaft. Be sure to remove any shipping supports if needed. DO NOT oil motors upon start-up. Fan motors are pre-oiled at factory. Verify unit fan speed selected is correct.
- ❑ Condensate Line: Condensate line is open and properly pitched toward drain.
- ❑ Water Flow Balancing: Verify inlet and outlet water temperatures are recorded for each heat pump upon startup. This check can eliminate nuisance trip outs and high velocity water flows that can erode heat exchangers.
- ❑ Unit Air Coil & Filters: Ensure filter is clean and accessible. Clean or 'season' air coil of all manufacturing oils if needed.
- ❑ Unit Controls: Verify CXM or DXM field selection options are proper and complete.

SYSTEM CHECKOUT

- ❑ System Water Temperature: Check water temperature for proper range and also verify heating and cooling setpoints for proper operation.
- ❑ System pH: System water pH is 7.5 - 8.5. Proper pH promotes longevity of hoses and fittings.
- ❑ System Flushing: Verify all hoses are connected end to end when flushing to ensure debris bypasses unit heat exchanger and water valves etc. Water used in the system must be potable quality initially and clean of dirt, piping slag, and strong chemical cleaning agents. Verify all air is purged from the system. Air in the system can cause poor operation or system corrosion.
- ❑ Cooling Tower/Boiler: Check equipment for proper setpoints and operation.
- ❑ Standby Pumps: Verify the standby pump is properly installed and in operating condition.
- ❑ System Controls: Verify system controls function and operate in the proper sequence.
- ❑ Low Water Temperature Cutout: Verify low water temperature cut-out controls are provided for the outdoor portion of the loop or operating problems will occur.
- ❑ System Control Center: Verify control center and alarm panel for proper setpoints and operation.
- ❑ Miscellaneous: Note any questionable aspects of the installation.

⚠ WARNING! ⚠

To avoid equipment damage, DO NOT leave system filled in a building without heat during the winter unless antifreeze is added to system water. Condenser coils never fully drain by themselves and will freeze unless winterized with antifreeze.

Unit Start Up Procedure

⚠ WARNING! ⚠

When the disconnect switch is closed, high voltage is present in some areas of the electrical panel. Exercise caution when working with energized equipment.

1. Turn thermostat fan position to "ON". Blower should start.
2. Balance air flow at registers.
3. Adjust all valves to their full open position. Turn on the line power to all heat pump units.

⚠ WARNING! ⚠

Verify ALL water controls are open and allow water flow prior to engaging the compressor. Freezing of the coax or water lines can permanently damage the heat pump.

4. Operate unit in cooling cycle. Room temperature should be approximately 7.2-37.8°C DB. For Start-up check, loop water temperature entering the heat pumps should be between 7.2°C and 43.3°C.
5. Two factors determine the operating limits of a ClimateMaster GL System– (a) return air temperature, and (b) water temperature. When any one of these factors is at a minimum or maximum level, the other factor must be at normal levels to ensure proper unit operation.

   a. Adjust the unit thermostat to the warmest position.Slowly reduce thermostat setting until the compressor activates.

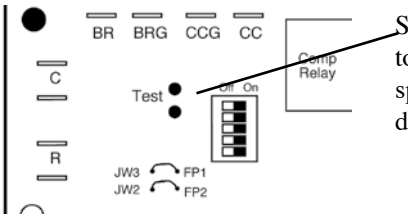
   b. Check for cool air delivery at the unit grille within a few minutes after the unit has begun to operate.

Note: Units have a five minute time delay in the control circuit that can be eliminated on the CXM PCB as shown below in Figure 16. See controls description for detailed features of the control.

c. Verify that the compressor is on and that the water flow rate is correct by measuring pressure drop through the heat exchanger using the Pete's plugs and comparing to Table 5.

d. Check the elevation and cleanliness of the condensate lines. Dripping may be a sign of a blocked line. Check that the condensate trap includes a water seal.

Figure 13. Test Mode Pins



Short test pins together to enter Test Mode and speed-up timing and delays for 20 minutes.

e. Refer to Table 6. Check the temperature of both supply and discharge water. If temperature is within range, proceed with test. If temperature is outside operating range, check cooling refrigerant pressures in Table 7. Verify correct water flow by comparing unit pressure drop across the heat exchanger versus the data in Table 6. Heat of rejection can be calculated and compared to specification catalog.

f. Check air temperature drop across the coil when compressor is operating. Air temperature should drop between 8°C and 14°C.

g. Turn thermostat to "OFF" position. A hissing noise indicates proper functioning of the reversing valve.

6. Operate the heat pump in the heating cycle immediately after checking cooling cycle operation. Allow five (5) minutes between tests for pressure to equalize or cycle the reversing valve to equalize.

   a. Turn thermostat to lowest setting and set thermostat switch to "HEAT" position.

   b. Slowly turn thermostat to a higher temperature until the compressor activates.

   c. Check for warm air delivery at the unit grille within a few minutes after the unit has begun to operate.

   d. Check the temperature of both supply and discharge water. Refer to Table 6. If temperature is within range, proceed with test. If temperature is outside operating range, check heating refrigerant pressures in Table 7.

   e. Check air temperature rise across the coil when compressor is operating. Air temperature should rise between 11°C and 16.7 °C. Heat of extraction can be calculated and compared to specification catalog.

   f. Check for vibration, noise, and water leaks.

7. If unit fails to operate, perform troubleshooting analysis (CXM/DXM AOM). If the check described fails to reveal the problem and the unit still does not operate, contact a trained service technician to ensure proper diagnosis and repair of the equipment.
8. When testing is complete, set system to maintain desired comfort level.
9. BE CERTAIN TO FILL OUT AND FORWARD ALL WARRANTY REGISTRATION PAPERS TO CLIMATEMASTER.

Note: If performance during any mode appears abnormal, refer to the troubleshooting section of CXM/DXM AOM. To obtain maximum performance the air coil should be cleaned before start-up. A 10% solution of dishwasher detergent and water is recommended.

Unit Start Up Procedure

Table 5. Coax Water Pressure Drop

Model	Flow	Pressure Drop (kPa)			
	l/s	-1°C	10°C	21°C	32°C
GLH072	0.568	11.7	9.0	8.3	7.6
	0.883	21.4	17.3	15.9	14.5
	1.136	37.3	29.0	26.2	24.9
	1.514	79.2	63.5	56.8	54.5
GLH096	0.757	40.8	39.4	38.7	37.3
	1.136	54.6	53.2	51.8	49.7
	1.514	73.2	71.1	69.1	67.0
	2.019	99.1	95.6	92.8	90.0
GLH120	0.947	35.2	33.8	33.2	31.8
	1.451	58.7	56.6	54.6	53.2
	1.893	97.4	93.9	91.2	88.4
	2.524	155.2	149.7	145.3	140.9

Model	Flow	Pressure Drop (kPa)			
	l/s	-1°C	10°C	21°C	32°C
GLY080	0.568	47.0	33.8	31.8	31.1
	0.883	60.8	47.7	44.9	43.5
	1.136	78.7	62.2	59.4	56.6
	1.514	109.8	93.4	90.1	84.6
GLY100	0.757	47.0	40.8	38.0	36.6
	1.136	64.2	55.3	51.8	49.7
	1.514	88.4	75.3	69.8	67.7
	2.019	134.6	113.3	104.8	101.9
GLY120	0.947	60.8	47.0	44.2	42.1
	1.451	88.4	71.1	67.0	64.2
	1.893	122.9	97.4	91.9	87.7
	2.524	196.6	160.0	151.1	144.7
GLY160	1.136	51.8	37.3	35.2	33.8
	1.704	66.3	51.8	49.7	47.7
	2.335	86.3	68.4	64.9	62.9
	3.029	116.2	98.3	94.0	91.3
GLY200	1.514	51.1	44.2	41.4	40.1
	2.272	71.1	60.8	56.6	54.6
	3.029	96.7	82.2	76.7	73.9
	4.038	148.5	124.6	115.7	111.3
GLY240	1.893	67.0	51.1	48.3	46.3
	2.903	97.4	78.0	73.2	70.5
	3.786	134.7	107.1	100.8	96.0
	5.048	214.7	177.2	166.1	158.0
GLY300	2.398	59.4	47.7	44.9	42.8
	3.534	87.0	67.7	64.2	61.5
	4.733	120.9	94.6	89.1	85.6
	6.310	197.6	151.2	142.7	137.8

Table 6. Water Temperature Change Through Heat Exchanger

Water Flow, gpm (l/m)	Rise, Cooling °C	Drop, Heating °C
For Closed Loop: Ground Source or Closed Loop Systems at 3.9 l/m per kw	5 - 6.7	2.2 - 4.4
For Open Loop: Ground Water Systems at 2.0 l/m per kw	11.1 - 14.4	5.6 - 9.4

CXM/DXM Safety Control Reset

Lockout - In Lockout mode, the Status LED will begin fast flashing. The compressor relay is turned off immediately. Lockout mode can be soft reset via the thermostat "Y" input or can be hard reset via the disconnect. The last fault causing the lockout will be stored in memory and can be viewed by going into test mode.

Fault Retry - In Fault Retry mode, the Status LED begins slow flashing to signal that the control is trying to recover from a fault input. The CXM control will stage off the outputs and then "try again" to satisfy the thermostat "Y" input call. Once the thermostat input calls are satisfied, the control will continue on as if no fault occurred. If 3 consecutive faults occur without satisfying the thermostat "Y" input call, then the control will go to Lockout mode. The last fault causing the lockout will be stored in memory and can be viewed by going into test mode.

Consult the CXM/DXM AOM for complete descriptions.

Table 7. Typical Unit Operating Pressures and Temperatures

		Cooling**						Heating					
Entering Water Temp °C	Water Flow l/s per kW	Suction Pressure kPa	Discharge Pressure kPa	Super-heat °C	Sub-cooling °C	Water Temp Rise	Air Temp* Drop°C DB	Suction Pressure kPa	Discharge Pressure kPa	Super-heat °C	Sub-cooling °C	Water Temp Drop°C DB	Air Temp* Rise
-1	0.027	225-254	269-314	14-22	7-11	12-13	12-14	102-117	499-556	7-9	1-2	4-5	8-11
	0.041	222-251	239-284	14-22	6-10	7-9	12-14	111-129	514-571	7-9	1-2	3-4	9-12
	0.054	219-248	209-254	14-22	6-9	3-6	12-14	120-138	529-586	7-9	1-2	2-3	9-12
10	0.027	225-254	374-463	7-11	6-10	11-13	11-14	150-179	538-628	6-9	1-3	6-7	13-16
	0.041	222-251	359-425	7-11	5-9	7-8	11-14	158-185	553-643	6-9	1-3	4-5	13-17
	0.054	219-248	344-413	7-11	4-8	4-7	11-14	164-194	568-658	6-9	1-3	3-4	14-17
21	0.027	225-254	535-592	5-9	4-8	11-12	11-13	212-245	613-688	8-11	1-3	8-9	16-19
	0.041	222-251	502-556	5-9	4-7	7-9	11-13	218-254	628-712	8-11	1-3	5-6	17-21
	0.054	219-248	472-523	5-9	4-7	4-7	11-13	227-263	643-724	8-11	1-3	3-4	17-21
32	0.027	225-254	685-750	5-9	4-8	10-12	9-13	254-284	658-777	10-16	1-3	8-9	18-22
	0.041	222-251	652-721	5-9	4-7	6-8	9-13	269-299	673-792	10-16	1-3	6-7	18-23
	0.054	219-248	622-688	5-9	4-7	3-6	9-13	284-314	688-807	10-16	1-3	4-5	19-23
43	0.027	231-260	837-957	4-8	6-14	9-11	8-11						
	0.041	228-257	807-927	4-8	6-13	5-7	8-11						
	0.054	225-254	777-897	4-8	6-12	3-6	8-11						

*Based on Nominal 54 l/s per kW airflow and 21°F EAT htg and 26.7/19.4°C EAT cooling
**Cooling air and water numbers can vary greatly with changes in humidity
Subcooling is based upon the head pressure at compressor service port

Preventive Maintenance

Water Coil Maintenance
(Direct Ground Water Applications Only)

If the installation is performed in an area with a known high mineral content (125 P.P.M. or greater) in the water, it is best to establish with the owner a periodic maintenance schedule so the coil can be checked regularly. Consult the well water applications section of this manual for a more detailed water coil material selection. Should periodic coil cleaning be necessary, use standard coil cleaning procedures which are compatible with either the heat exchanger material or copper water lines. Generally, the more water flowing through the unit the less chance for scaling therefore 0.0269 l/s per kW is recommended as a minimum flow.

Water Coil Maintenance

(All Other Water Loop Applications)

Generally water coil maintenance is not needed however, if the installation is located in a system with a known high dirt or debris content, it is best to establish with the owner a periodic maintenance schedule so the coil can be checked regularly. These dirty installations are a result of the deterioration of iron or galvanized piping or components in the system or open cooling towers requiring heavy chemical treatment and mineral buildup through water use. Should periodic coil cleaning be necessary, use standard coil cleaning procedures which are compatible with both the heat exchanger material and copper water lines. Generally, the more water flowing through the unit, the less chance for scaling, however flow rates over 0.0537 l/s per kW can produce water (or debris) velocities that can erode the heat exchanger wall and ultimately produce leaks.

Filters

Filters must be clean to obtain maximum performance. They should be inspected every month under normal operating conditions and be replaced when necessary. Units should never be operated without a filter.

Washable high efficiency electrostatic filters, when dirty, can exhibit a very high pressure drop for the fan motor and reduce air flow resulting in poor performance. It is especially important to provide consistent washing of these filters (in opposite direction of the normal air flow) once per month using a high pressure wash similar to that found at self-serve car washes.

Condensate Drain

In areas where airborne bacteria produce a slime in the drain pan, it may be necessary to treat chemically with an algaecide every three months or so to minimize the problem. The condensate pan may also need to be cleaned periodically to assure indoor air quality. The condensate drain can pick up lint and dirt, especially with dirty filters. Inspect the drain twice a year to avoid the possibility of overflow.

Compressor

Conduct annual amperage checks to ensure amp draw is no more than 10% greater than that indicated by serial plate data.

Fan Motors

All units have lubricated fan motors. Annual inspection should be performed for proper tension and excessive wear of drive belts..

Air Coil

The air coil must be cleaned to obtain maximum performance. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Care must be taken not to damage the aluminum fins while cleaning. CAUTION: Fin edges are sharp.

Cabinet

Do not allow water to stay in contact with the cabinet for long periods of time to prevent corrosion of the cabinet sheet metal. Generally vertical cabinets are set up from the floor a few inches for prevention. The cabinet can be cleaned using a mild detergent.

Refrigerant System

To maintain sealed circuit integrity, do not install service gauges unless unit operation appears abnormal. Reference the operating chart for pressure and temperatures. Verify that air and water flow rates are at proper levels before servicing the refrigerant circuit.

Notes:

Genesis Large (GL) Series
Rev.: 08/13/10

Revision History

Date:	Item:	Action:
08/13/10	Entire Document	Remove All I-P Units
12/23/08	Condensate Drain Figures	Updated
06/30/08	Shut-Off Valve Note	Added
07/02/03	First Published	

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