CLIMATEMASTER®
Geothermal Heating & Cooling Systems

Genesis Large (GL) Series
Commercial Horizontal &
Vertical Packaged
Heat Pump

Revision: 13 April, 2009B

GENESIS LARGE (GL) SERIES

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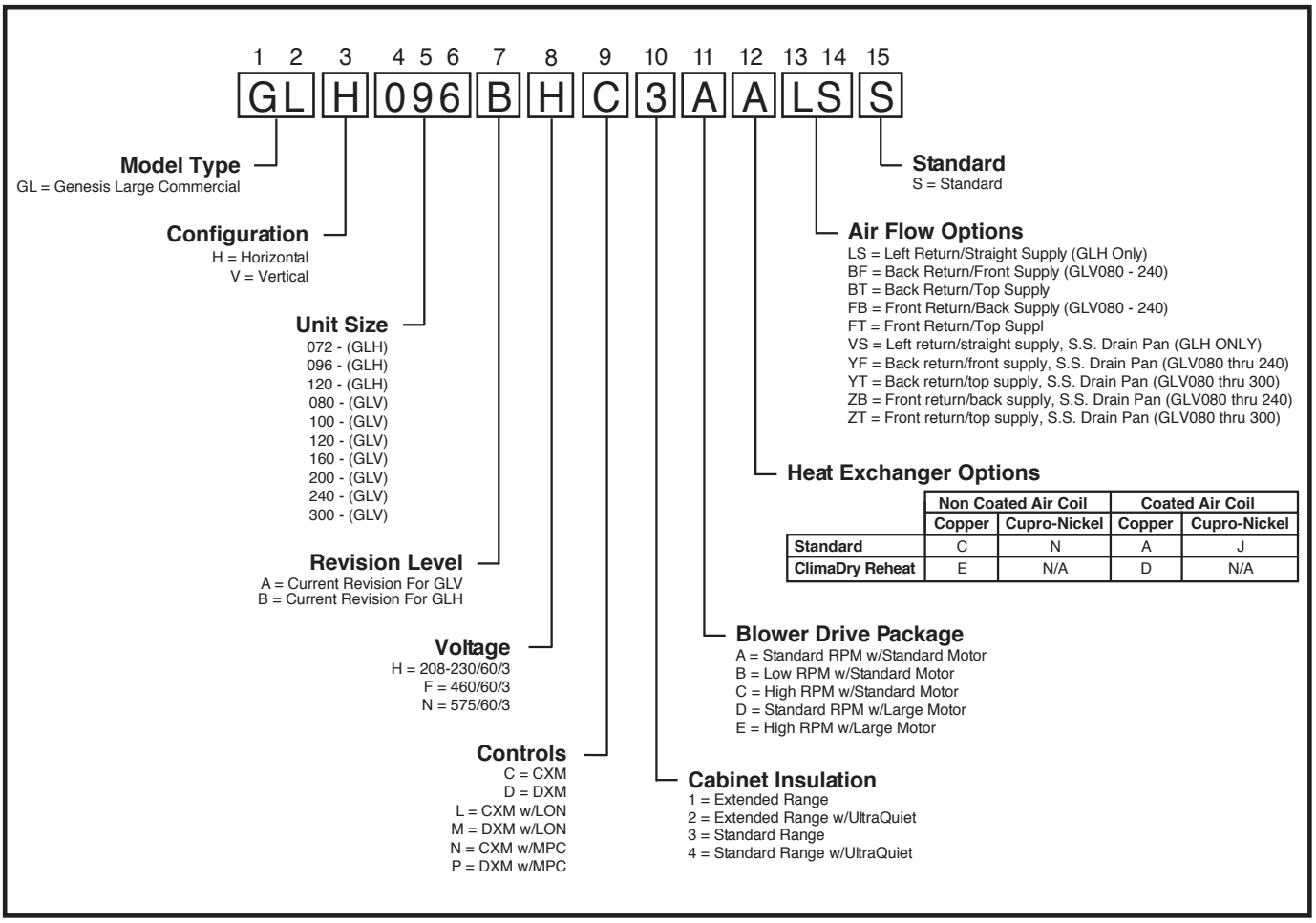
HORIZONTAL & VERTICAL
INSTALLATION, OPERATION & MAINTENANCE

Model Nomenclature



	Non Coated Air Coil		Coated Air Coil	
	Copper	Cupro-Nickel	Copper	Cupro-Nickel
Standard	C	N	A	J
ClimaDry Reheat	E	N/A	D	N/A

Rev.: 5 Nov, 2008B

Genesis Large (GL) Series
Rev.: 13 April, 2009B

GLH Physical Data

Model	072	096	120
Refrigerant Circuit			
Compressor (2 each)	Recip	Scroll	Scroll
Factory Charge oz [kg] per Circuit	56 [1.59]	50 [1.417]	80 [2.268]
Fan Motor			
Standard (hp) [kW]	1.5 [1.1]	2 [1.5]	2 [1.5]
Large (hp) [kW]	2 [1.5]	3 [2.2]	3 [2.2]
Blower			
Wheel Size -Dia x W (in) [cm]	12 x 11 [30.5 x 27.9]	2 - 10 x 10 [25.4 x 25.4]	2 - 11 x 10 [27.9 x 25.4]
Water Connection Size			
FPT - (in)	1-1/4" [3.175]	1-1/4" [3.175]	1-1/4" [3.175]
Condensate Connection Size			
FPT - (in)	3/4" [1.909]	3/4" [1.909]	3/4" [1.909]
Horizontal Units			
Air Coil Dimensions - H x W (in) [cm]	2 - 20 x 24 [50.8 x 61]	2 - 20 x 30 [50.8 x 76.2]	2 - 20 x 30 [50.8 x 76.2]
Air Coil Total Face Area (ft2) [m2]	6.66 [0.6188]	8.33 [0.7739]	8.33 [0.7739]
Air Coil Tube Size (in.) [cm]	3/8 [0.953]	3/8 [0.953]	3/8 [0.953]
Air Coil Fin Spacing (fpi) [fins per cm]	14 [5.5]	14 [5.5]	12 [4.7]
Air Coil Number of Rows	3	3	4
Filter Standard - 1" (25.4mm) Throwaway (in) [cm]	2-20x18 & 1-20x20 [2-50.8x45.7& 1-50.8x50.8]	2-20x25 & 1-20x18 [2-50.8x63.5 & 1-50.8x45.7]	2-20x25 & 1-20x18 [2-50.8x63.5 & 1-50.8x45.7]
Weight - Operating (lbs.) [kg]	540 [245]	580 [263]	660 [299]
Weight - Packaged (lbs.) [kg]	560 [254]	600 [272]	680 [308]

Notes:
All units have grommet & spring compressor mountings,and ½" & 1⅜" electrical knockouts.
Check serial plate for refrigerant type (R22 or R407c).

Rev.: 12/16/08B

GLV Physical Data

Model	080	100	120	160	200	240	300
Compressor	Scroll			Scroll			
Number of Circuits (Compressors)	1			2			
Factory Charge R22 - (oz) [kg] per circuit	110 [3.12]	120 [3.41]	128 [3.64]	110 [3.12]	120 [3.41]	128 [3.64]	192 [5.46]
Blower Motor							
Blower Motor Quantity	1	1	1	1	2	2	2
Standard motor (hp) [kW]	1.5 [1.12]	1.5 [1.12]	2 [1.49]	3 [2.24]	1.5 [1.12]	2 [1.49]	3 [2.24]
Large Motor (hp) [kW]	2 [1.49]	2 [1.49]	3 [2.24]	NA	2 [1.49]	3 [2.24]	NA
Blower							
No. of Blowers	1			2			
Blower Wheel Size D x W (in) [cm]	12 x 9 [30.5 x 22.9]	15 x 15 [38.1 x 38.1]		12 x 9 [30.5 x 22.9]	15 x 15 [38.1 x 38.1]		
Water Connection Size							
FPT (in) [mm]	1-1/2" [38.1]						
Condensate Connection Size							
FPT (in) [mm]	1" [25.4]						
Air Coil Data							
Air Coil Dimensions H x W (in) [cm]	36 x 36 [91.4 x 91.4]			(2) 36 x 36 [91.4 x 91.4]			(2) 37.5 x 36 [95.3 x 91.4]
Air Coil Total Face Area (ft2) [m2]	9 [0.836]			18 [1.672]			18.75 [1.742]
Air Coil Tube Size (in) [cm]	3/8 [0.953]			3/8 [0.953]			1/2 [1.271]
Air Coil Fin Spacing (fpi) [fins per cm]	14 [5.5]			14 [5.5]			15 [5.9]
Air Coil Number of rows	2	3		2	3		4
Miscellaneous Data							
Filter Standard - 1" [25.4mm] Throwaway (qty) (in) [cm]	(2) (25 X 25) [635 X 635]			(4) (25 X 25) [635 X 635]			
Weight - Operating (lbs) [kg]	600 [272]	685 [311]	735 [333]	1120 [508]	1265 [574]	1350 [612]	1465 [664]
Weight - Packaged (lbs) [kg]	610 [277]	695 [315]	745 [338]	1145 [519]	1275 [578]	1375 [624]	1475 [669]

Rev.: 12/16/08B

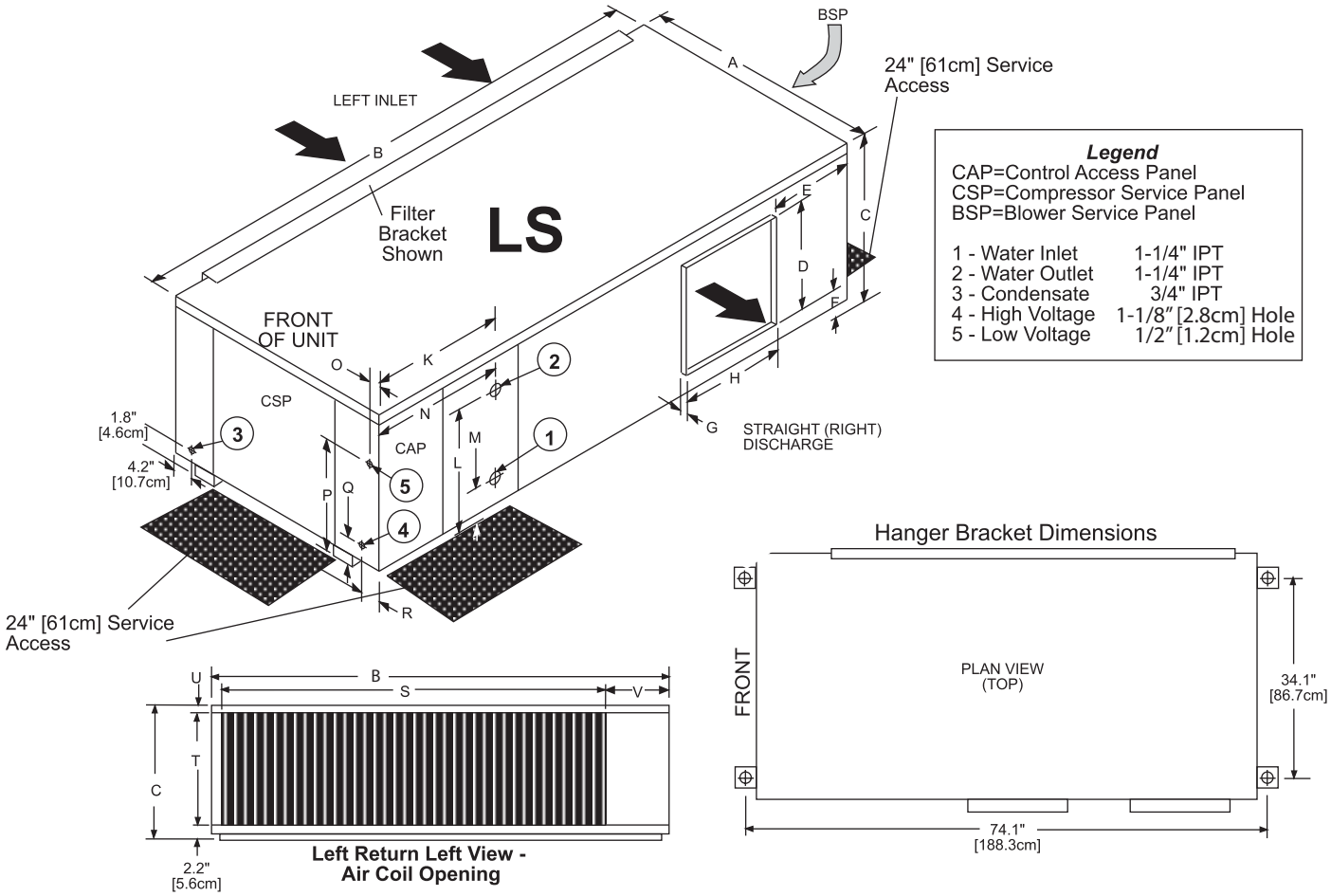
All units have grommets for compressor mounting, TXV expansion devices, 1/2" [12.7mm] & 1-3/8"-1-3/4" [35.0-44.5mm] knockouts.

Unit Maximum Water Pressure	
Options	PSIg[kpa]
Base Unit	450 [3,100]
ClimaDry	145 [999]

Use lowest maximum pressure rating when multiple options are combined.

GLH072 Dimensional Data

LEFT RETURN STRAIGHT DISCHARGE



NOTE:
All Dimensions in inches [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.

Rev.: 07/28/08B

Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)					Water Connections				Electrical Knockouts / Holes				Return Air Connections Using Return Air Opening			
		A	B	C	D	E	F	G	H	K	L	M	N	O	P	Q	R	S	T	U	V
		Width	Depth	Height	Supply Height				Supply Depth									Return Depth	Return Height		
072	in.	36.3	72.3	21.6	16.0	14.5	3.5	1.0	16.0	21.0	17.8	3.9	22.5	.53	13.5	5.0	2.0	51.0	18.4	1.0	19.6
	cm.	92.2	183.6	54.9	40.6	36.8	8.9	2.5	40.6	53.3	45.2	10.0	57.2	1.3	34.3	12.7	5.1	129.5	46.7	2.5	49.8

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

Genesis Large (GL) Series
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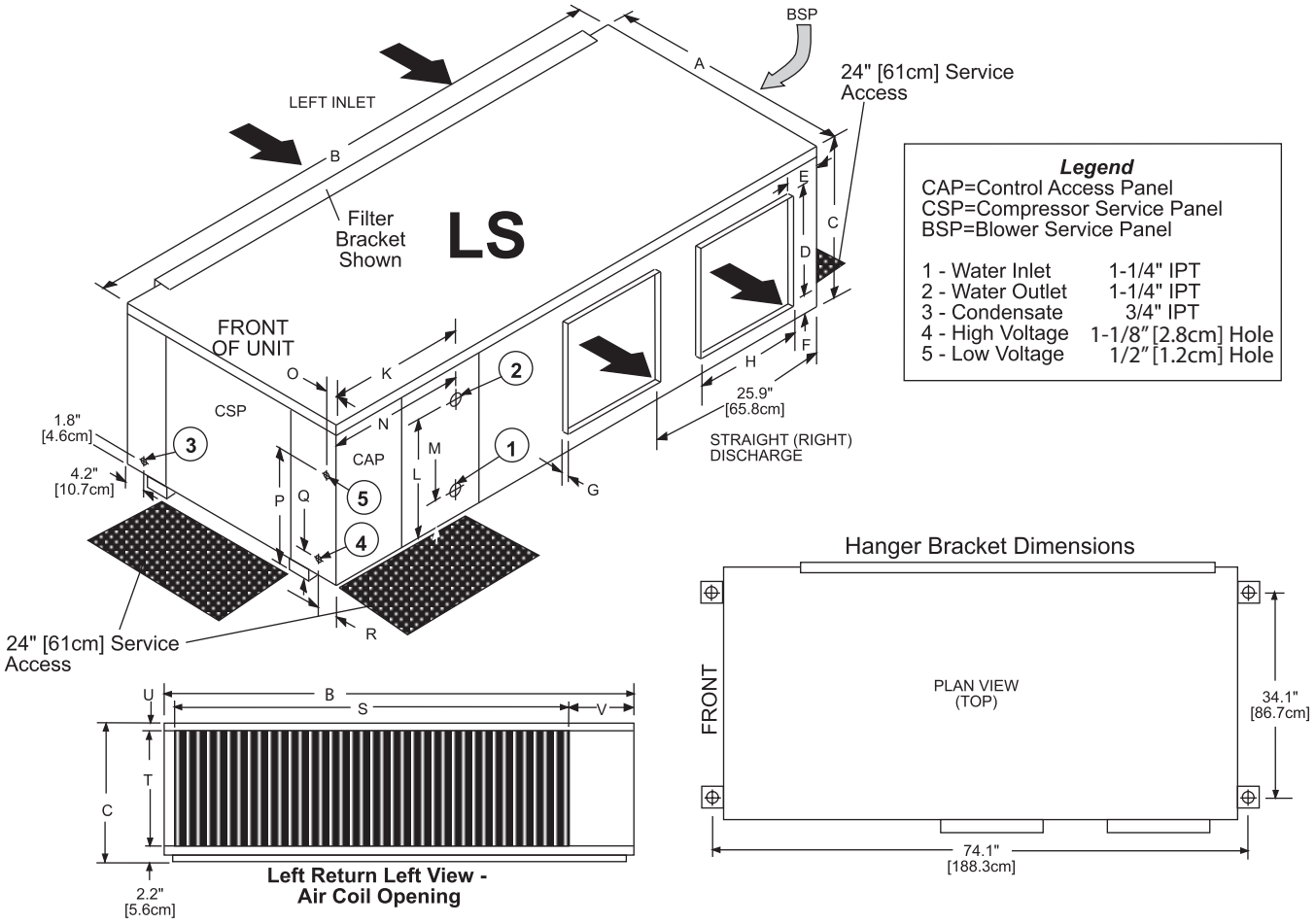
GLH096-120 Dimensional Data

LEFT RETURN STRAIGHT DISCHARGE



NOTE:
All Dimensions in inches [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.

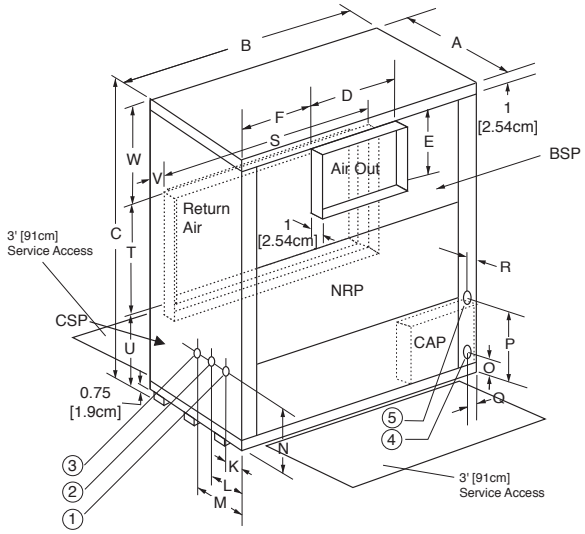
Rev.: 08/22/08B

Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)					Water Connections				Electrical Knockouts / Holes				Return Air Connections Using Return Air Opening			
		A	B	C	D	E	F	G	H	K	L	M	N	O	P	Q	R	S	T	U	V
		Width	Depth	Height	Supply Height				Supply Depth									Return Depth	Return Height		
096	in.	36.3	72.3	21.6	15.1	2.9	3.4	1.0	15.1	20.7	18.6	3.3	22.4	.53	13.5	5.0	2.0	63.2	18.4	1.0	7.5
	cm.	92.2	183.6	54.9	8.9	7.4	8.6	2.5	38.4	52.6	47.3	8.4	56.9	1.3	43.3	12.7	5.1	160.5	46.7	2.5	19.1
120	in.	36.3	72.3	21.6	13.1	2.9	4.7	1.0	15.1	19.0	19.2	3.8	22.4	2.0	5.6	18.3	2.0	63.2	18.4	1.0	7.5
	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

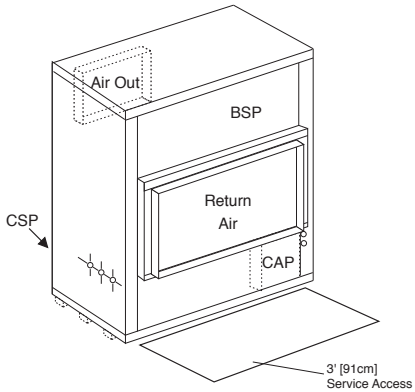
Condensate is 3/4" IPT copper
Horizontal unit shipped with filter bracket only. This bracket should be removed for return duct connection

GLV080-120 Dimensional Data

Back Return Front Supply (BF)



Front Return Back Supply (FB)



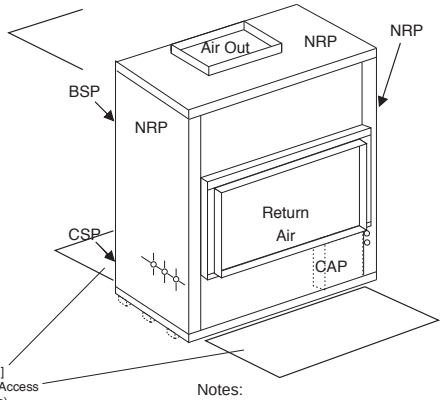
Service Access
RF/ = Rear/Blwr
FT/Controls
RT/ = FT/Blw & Cont
FR = FT/Blw & Cont
FT = FT/Cont
RR/Blw

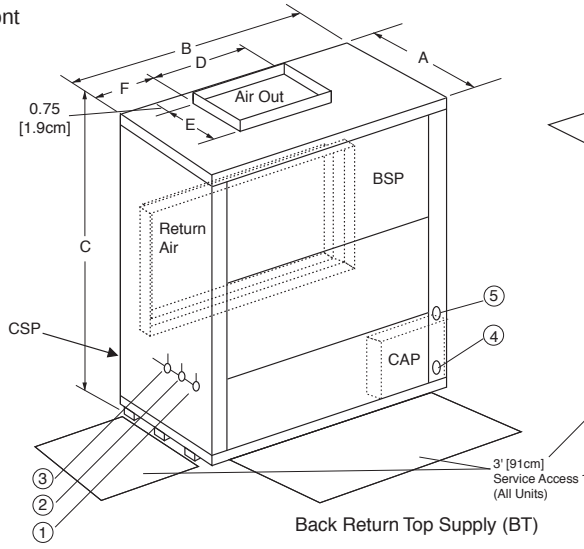
Legend

① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access	1-3/8" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7cm] Hole

CAP - Control Access Panel
BSP - Blower Service Panel

Front Return Top Supply (FT)





Back Return Top Supply (BT)

Notes:
1. Service access provided on front and rear only. No service access from unit ends provided.
2. While clear access to all removable panels is not required, it may be. Access to some panels will always be required. Installer should take care to comply with all building codes and insure adequate clearance for future field service.

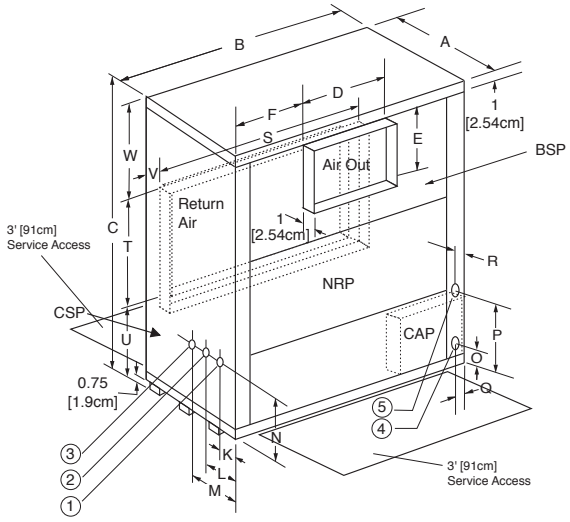
Rev.: 07/30/08B

NOTES:
-All Dimensions in inches [cm]
-Units require 3' [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 dimensions does not include duct flange when in the front or back discharge configuration
-Overall cabinet width dimensions does not include filter rack. 1" filter rack standard. 2" filter rack optional

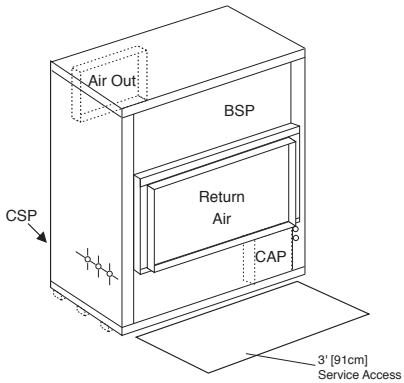
Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)			Water Connections				Electrical Knockouts / Holes				Return Air Connections Using Return Air Opening				
		A Width	B Depth	C Height	D Supply Width	E Supply Depth	F	K 1 Water Inlet	L 2 Water Outlet	M 3 Con-densate	N	O	P	Q	R	S Return Depth	T Return Height	U	V	W
080	in.	29.0	41.0	71.5	14.7	15.8	11.2	4.0	7.4	14.5	20.5	2.1	20.6	1.0	3.1	34.8	23.4	25.4	3.1	22.6
	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	in.	29.0	41.0	71.5	18.8	16.1	5.8	4.0	7.4	14.5	20.5	2.1	20.6	1.0	3.1	34.8	23.4	25.4	3.1	22.6
	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	65.4	7.9	57.4

GLV080-120 Dimensional Data with ClimaDry Reheat

Back Return Front Supply (BF)



Front Return Back Supply (FB)

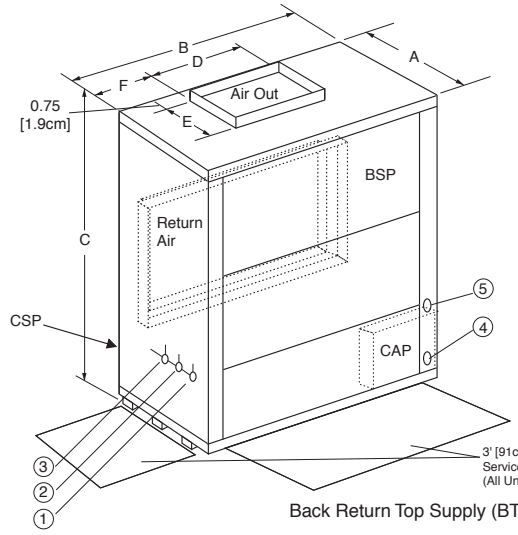


Notes:
1. SERVICE ACCESS
   Provided on unit Front and Back sides only. No service access from unit side panels.
2. While clear access to all removable panels is not required, it may be. Access to some panels will always be required. Installer should take care to comply with all building codes and insure adequate clearance for future field service.

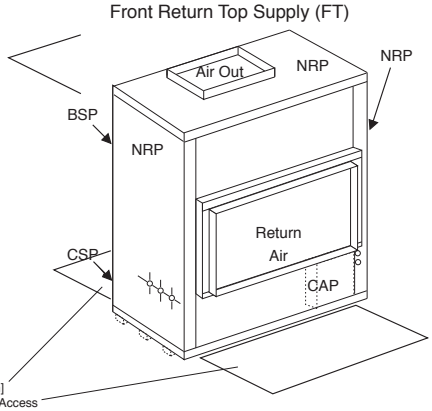
Legend

① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access	1-3/8" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7cm] Hole

CAP - Control Access Panel
BSP - Blower Service Panel



Front Return Top Supply (FT)



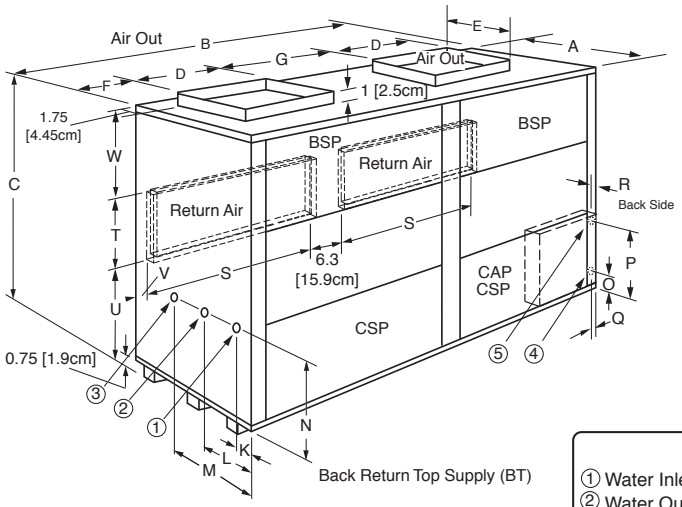
Back Return Top Supply (BT)

NOTES:
-All Dimensions in inches [cm]
-Units require 3' [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 dimensions does not include duct flange when in the front or back discharge configuration
-Overall cabinet width dimensions does not include filter rack. 1" filter rack standard. 2" filter rack optional

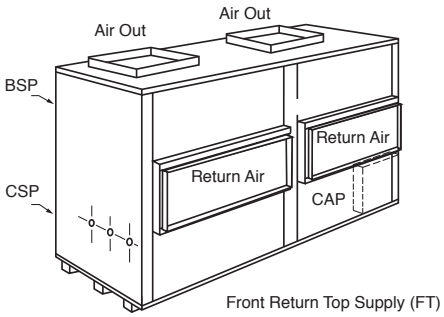
Rev.: 07/30/08B

Reheat Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)			Water Connections					Electrical Knockouts / Holes				Return Air Connections Using Return Air Opening				
		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 Condensate							Return Depth	Return Height			
										Back Return	Front Return										
080	in.	34.0	41.0	71.0	14.5	15.8	11.2	3.0	7.5	26.5	7.4	17.8	5.8	8.5	1.0	3.1	36.2	38.2	24.9	2.4	8.6
	cm.	86.4	104.1	180.3	36.7	40.1	28.4	7.6	19.0	67.3	18.8	45.2	14.7	21.6	2.5	7.9	91.9	97.0	63.2	6.1	21.8
100-120	in.	34.0	41.0	71.0	14.5	16.2	5.8	3.0	7.5	26.5	7.4	17.8	5.8	8.5	1.0	3.1	36.2	38.2	24.9	2.4	8.6
	cm.	86.4	104.1	180.3	36.7	41.1	14.7	7.6	19.0	67.3	18.8	45.2	14.7		2.5	7.9	91.9	97.0	63.2	6.1	21.8

GLV160-240 Dimensional Data



Back Return Top Supply (BT)



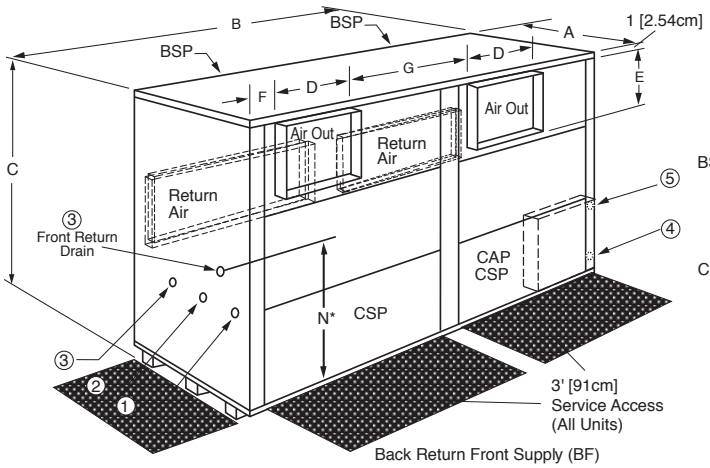
Front Return Top Supply (FT)

Legend

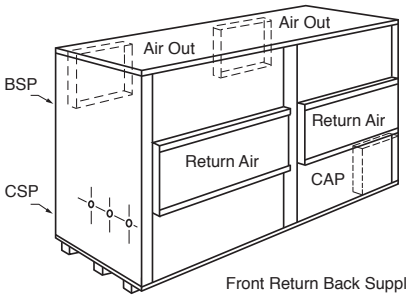
① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access (4 Places)	1-1/4" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7mm] Hole

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

Notes:
1. Service access provided on front and rear only. No service access from unit ends provided.
2. While clear access to all removable panels is not required, it may be. Access to some panels will always be required. Installer should take care to comply with all building codes and insure adequate clearance for future field service.



Back Return Front Supply (BF)



Front Return Back Supply (FB)

NOTES:
-All Dimensions in inches [cm]
-Units require 3' [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

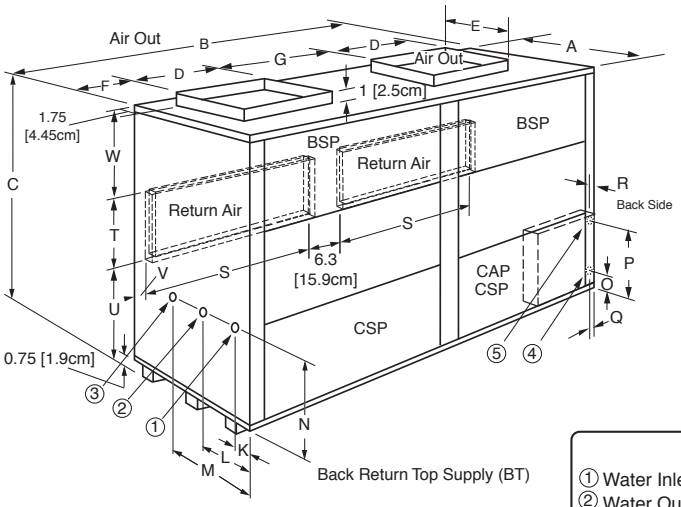
Rev.: 08/22/08B

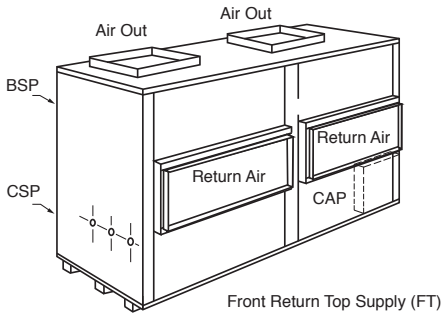
Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)				Water Connections				Electrical Knockouts / Holes				Return Air Connections Using Duct Flange				
		A	B	C	D	E	F	G	K	L	M	N	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	Supply Width	Supply Depth			1 Water Inlet	2 Water Outlet	3 Condensate						Return Depth	Return Height			
160	in.	29.0	82.0	71.5	14.7	15.8	19.4	13.8	4.0	7.4	14.5	20.5	2.1	20.6	1.0	3.1	34.8	23.4	25.4	3.1	22.6
	cm.	73.7	208.3	181.6	37.3	40.1	49.3	35.1	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
200-240	in.	29.0	82.0	71.5*	18.8	16.1	5.8	22.3	4.0	7.4	14.5	20.5**	2.1**	20.6*	1.0	3.1	34.8	23.4	25.4	3.1	22.6
	cm.	73.7	208.3	181.6	47.6	40.9	14.7	56.6	10.2	18.7	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	65.4	7.9	57.4

* = Includes Base Pan Rails, ** = Does not include Base Pan Rails

Genesis Large (GL) Series
Rev.: 13 April, 2009B

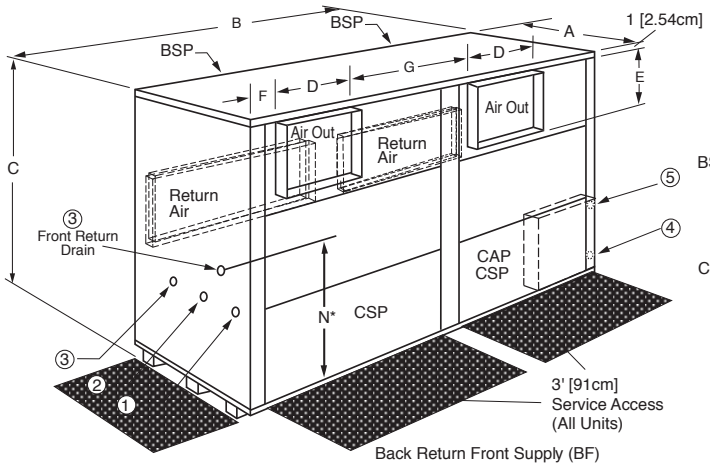
GLV160-240 Dimensional Data with ClimaDry Reheat

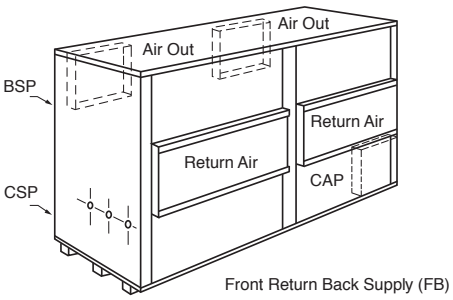




Legend	
① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access (4 Places)	1-1/4" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7mm] Hole
NRP - Non-Removable Panel	
CAP - Control Access Panel	
BSP - Blower Service Panel	
CSP - Compressor Service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

Notes:
1. Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
2. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.



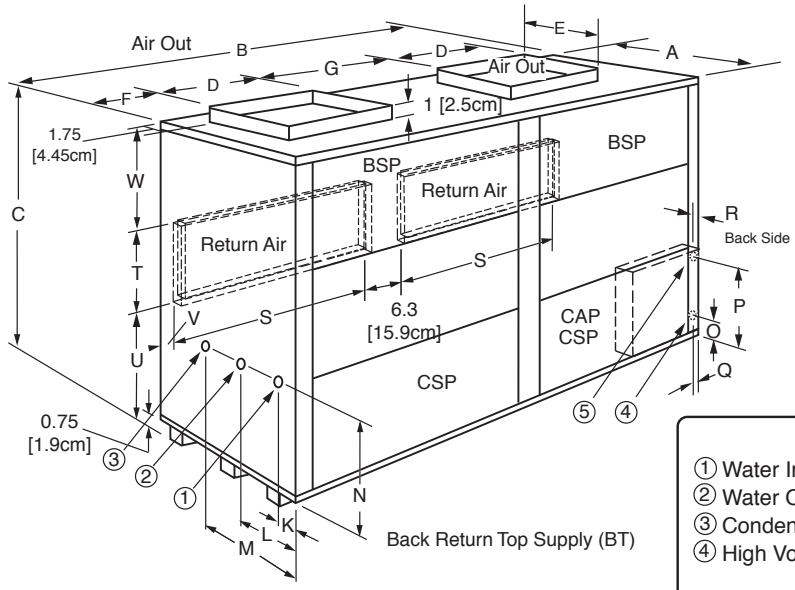


NOTES:
-All Dimensions in inches [cm]
-Units require 3' [91cm] clearance for water connections, CAP, CSP and BSP Service access.
-All side panels are removable Except those identified by NRP(Non-Removable Panel)
-Overall cabinet height dimension does not include duct flange when in the top discharge configuration
-Overall cabinet width dimension does not include duct flange when in the front or back discharge configuration

Rev.: 08/22/08B

Reheat Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±2.5mm)				Water Connections						Electrical Knockouts / Holes				Return Air Connections Using Duct Flange				
		A	B	C	D	E	F	G	K	L	M		N	N*	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	Supply Width	Supply Depth			1 Water Inlet	2 Water Outlet	3 Condensate								Return Depth	Return Height			
											Back Return	Front Return	Back Return	Front Return									
160	in.	34.0	82.0	71.0	14.5	15.8	19.5	13.8	3.0	7.5	26.5	7.4	17.8	22.6	5.8	20.5	1.0	3.1	36.2	38.2	24.9	2.4	8.6
	cm.	86.4	208.3	180.3	36.7	40.1	49.5	35.0	7.6	19.0	67.3	18.8	45.2	57.4	14.7	52.0	2.5	7.9	91.9	97.0	63.2	6.1	21.8
200-240	in.	34.0	82.0	71.0	19.0	16.2	5.8	22.0	3.0	7.5	26.5	7.4	17.8	22.6	5.8	20.5	1.0	3.1	36.2	38.2	24.9	2.4	8.6
	cm.	86.4	208.3	180.3	48.3	41.1	14.7	55.9	7.6	19.0	67.3	18.8	45.2	57.4	14.7	52.0	2.5	7.9	91.9	97.0	63.2	6.1	21.8

GLV300 Dimensional Data

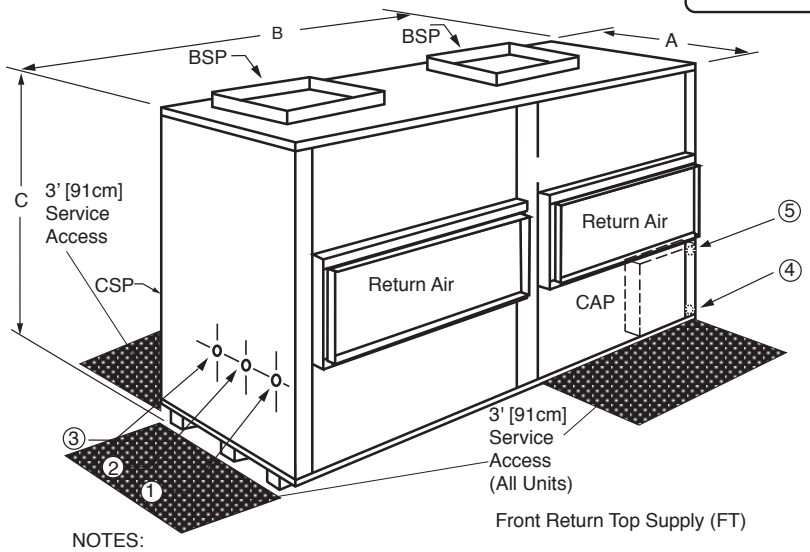


Notes:
1. Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
2. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.

Legend

① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access	1-3/8" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7mm] Hole

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



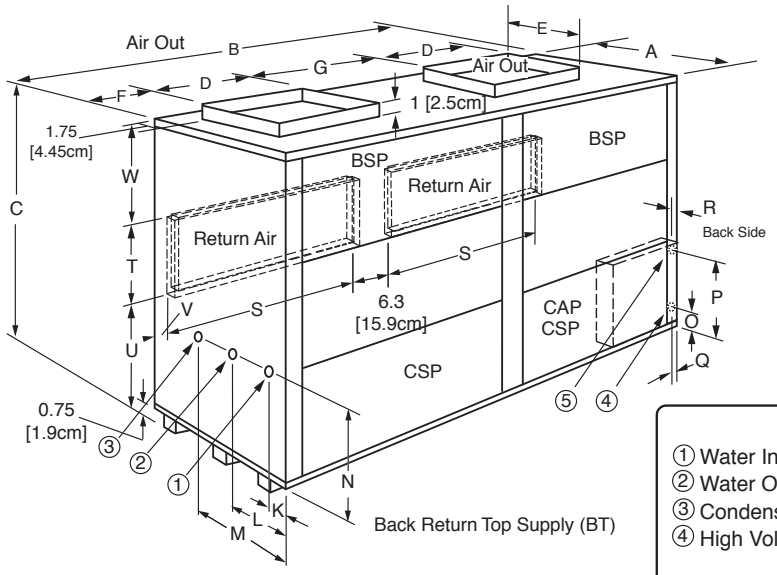
NOTES:
-All Dimensions in inches [cm]
-Units require 3' [91cm] clearance for water connections, CAP, CSP and BSP Service access.
-All side panels are removable Except those identified by NRP(Non-Removable Panel)
-Overall cabinet height dimension does not include duct flange when in the top discharge configuration
-Overall cabinet width dimension does not include duct flange when in the front or back discharge configuration

Rev.: 10/07/08B

Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±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 Con-densate						Return Depth	Return Height			
300	in.	29.0	82.0	71.5	18.8	16.1	5.8	22.1	4.0	7.4	14.5	20.5	2.1	20.6	1.0	3.1	34.8	23.4	25.4	3.1	22.6
	cm.	73.7	208.3	181.6	47.6	40.9	14.7	56.1	10.2	18.7	36.8	52.1	5.3	52.3	2.5	7.9	88.4	59.4	65.4	7.9	57.4

Genesis Large (GL) Series
Rev.: 13 April, 2009B

GLV300 Dimensional Data with ClimaDry Reheat



Notes:
1. Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
2. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.

Legend

① Water Inlet	1-1/2" IPT
② Water Outlet	1-1/2" IPT
③ Condensate Drain	1" IPT
④ High Voltage Access	1-3/8" or 1-3/4" K.O. [3.49 or 4.45cm]
⑤ Low Voltage Access	1/2" [12.7mm] Hole

NRP - Non-Removable Panel
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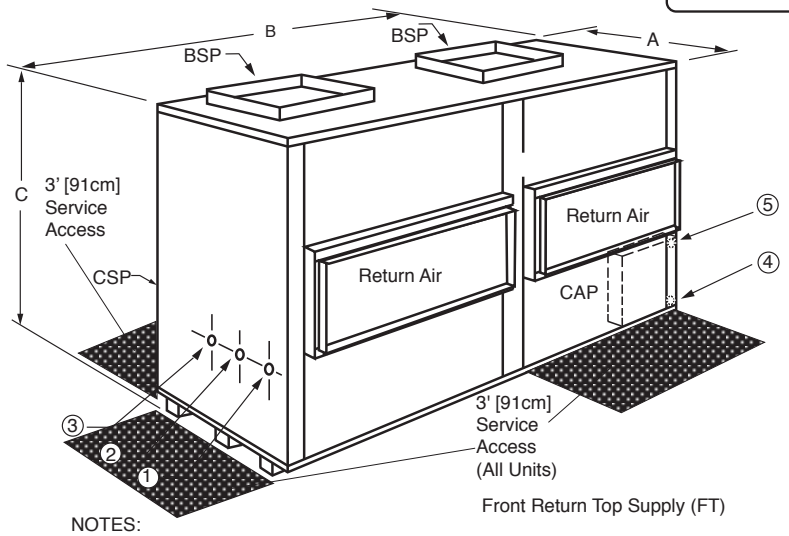


NOTES:
-All Dimensions in inches [cm]
-Units require 3' [91cm] clearance for water connections, CAP, CSP and BSP Service access.
-All side panels are removable Except those identified by NRP(Non-Removable Panel)
-Overall cabinet height dimension does not include duct flange when in the top discharge configuration
-Overall cabinet width dimension does not include duct flange when in the front or back discharge configuration

Rev.: 10/07/08B

Reheat Model		Overall Cabinet			Discharge Connections Duct Flange (± 0.10in, ±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 Condensate							Return Depth	Return Height			
											Back Return	Front Return										
300	in.	34.0	82.0	71.0	19.0	16.2	5.8	22.0	3.0	7.5	26.5	7.4	17.8	5.8	8.5	1.0	3.1	36.2	38.2	24.9	2.4	8.6
	cm.	86.4	208.3	180.3	48.3	41.1	14.7	55.9	7.6	19.0	67.3	18.8	45.2	14.7	21.6	2.5	7.9	91.9	97.0	63.2	6.1	21.8

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.

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 packaging 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.

⚠ WARNING! ⚠

DO NOT store or install 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.

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.

Installation

GL Horizontal Unit Location

GL units are NOT designed for outdoor installation. Locate the unit in an INDOOR area that allows enough space for installation and 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 3a for an illustration of a typical installation.

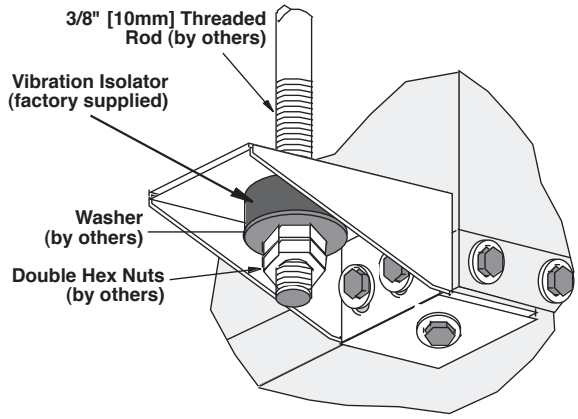
Conform to the following guidelines when selecting unit location:

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 within 40-100°F [4-38°C] and up to 75% relative humidity.

Figure 1: Hanger Bracket



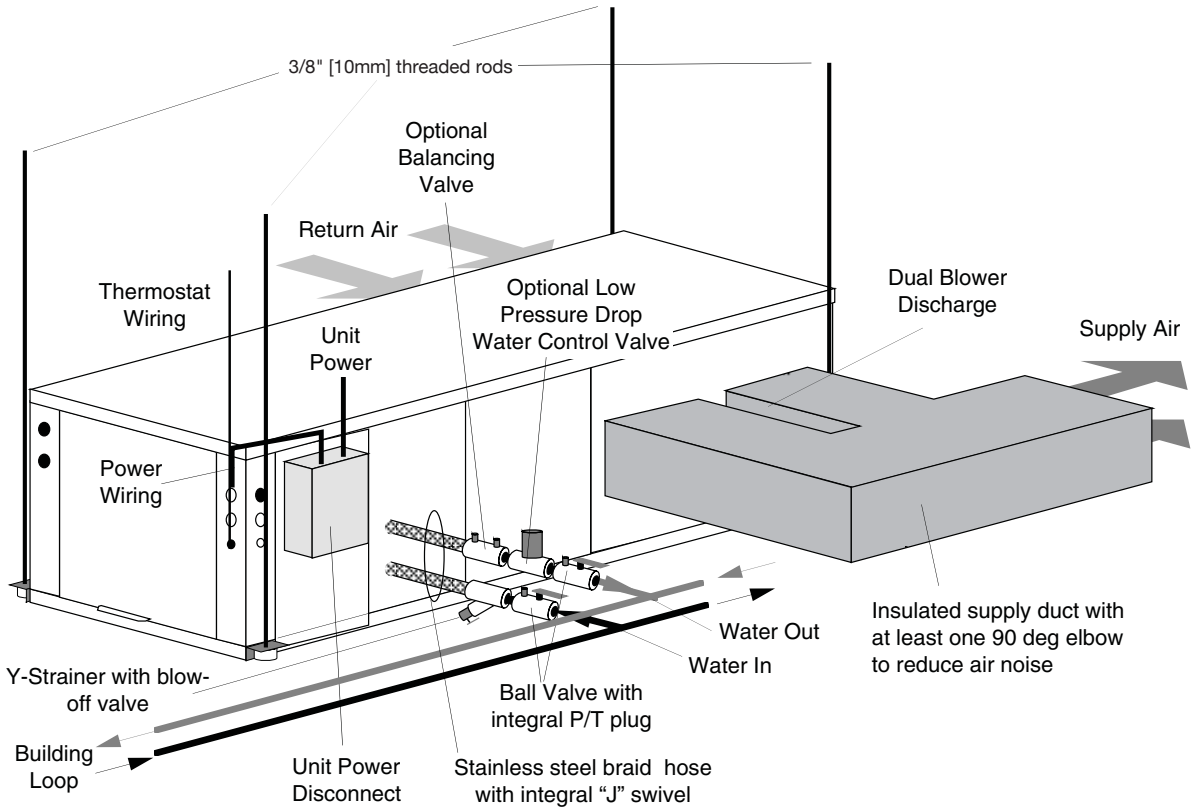
Mounting Horizontal Units

Figure 2a 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.

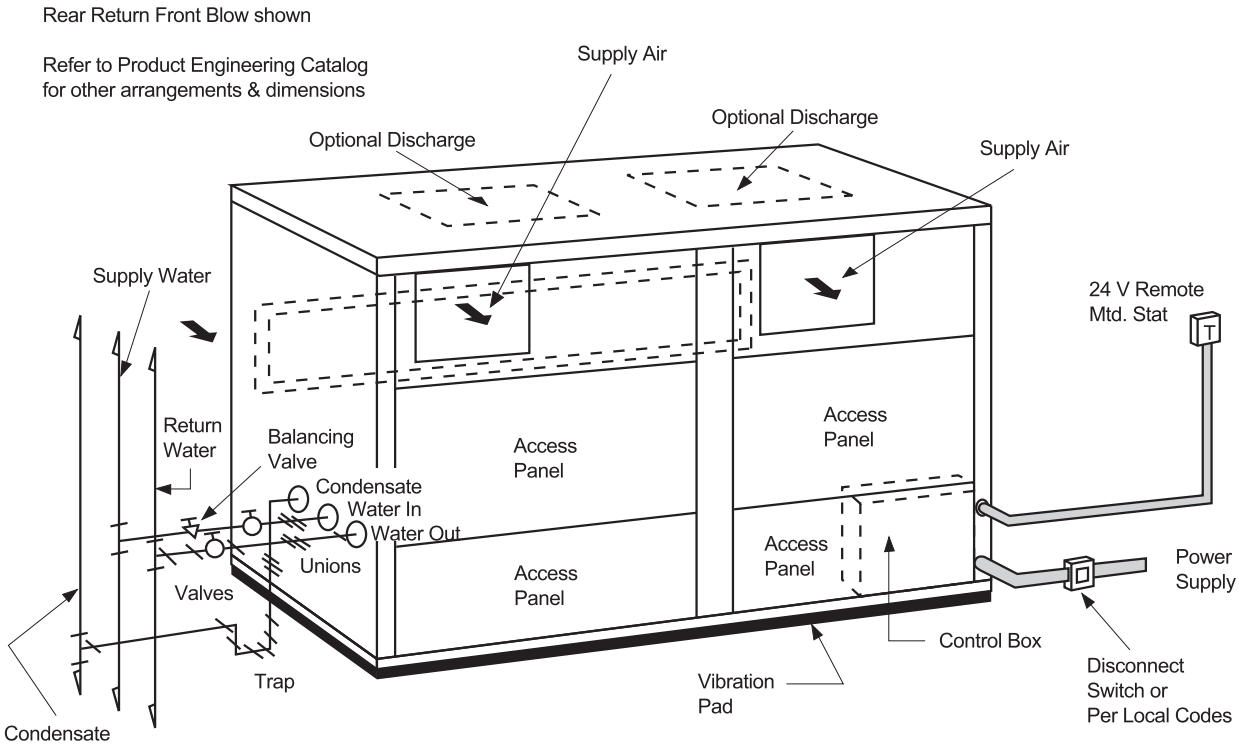
Figure 2a: Typical Horizontal Unit Installation



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.

Installation

Figure 2b: Typical Vertical Installation



Vertical Location and Access

GL units are NOT designed for outdoor installation. Locate the unit in an indoor area that allows enough space for installation and for service personnel to perform typical maintenance or repairs. GLV units are typically installed in a floor level closet or in a small mechanical room. Refer to Figure 2b for an illustration of a typical installation. 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

Duct System Design & Installation Guidelines

The following application guidelines must be used when installing GLH and GLV units. Failure to follow these guidelines could result in unsatisfactory unit performance and/or premature failure of some unit components. ClimateMaster will not warrant, or accept responsibility for products which fail, have defects, damage or insufficient performance as a result of improper application.

- The duct system must be sized to handle the airflow quietly and must not exceed the maximum allowable External Static Pressure. To maximize sound attenuation metal supply and return ducts should include internal insulation or be of duct board construction for the first few feet.
- Install a flexible connector in all supply and return air ducts close to the unit to inhibit sound transfer to the ducts.
- Do not install uninsulated duct in an unconditioned space. The unit performance will be adversely affected and damage from condensate can occur.
- On units with multiple fan outlets a “pair of pants” duct connection must be used for proper air balance and distribution and to prevent fan oscillation.

Installation

- Include at least one 90-degree turn in supply air ducts to reduce noise transmission.
- Existing ducts must be checked to insure proper size and configuration prior to installation of any replacement unit. Also inspect for and repair all air leaks in existing ducts.
- Units may only be connected to a dedicated duct system. Consult the factory BEFORE connecting multiple units to a common duct system.
- Never connect a unit to a duct system with automatic or modulating dampers, VAV boxes, etc. in the supply air system. Never allow a situation where the total unit CFM can drop below the minimum required for proper unit operation.
- Never connect a bypass damper from the supply air duct to the return air duct. Never allow the return air temperature to drop below the minimum allowable normal temperature for proper unit operation.
- Do not use GLH or GLV units for 100% outdoor air treatment. Do not add hot-gas-bypass to “convert” a unit for outdoor air treatment. Always use a dedicated outdoor air unit for outdoor air treatment.
- Do not exceed 10% of the total unit CFM with untreated outdoor air.

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! ⚠

CAUTION! Piping must comply with all applicable codes.

Table 1: Metal Hose Minimum Bend Radii

Hoses in Inches	Minimum Bend Radius
1" [25.4mm]	5.5" [140mm]
1.25" [31.8mm]	7.0" [178mm]
1.5" [38.1mm]	8.5" [216mm]

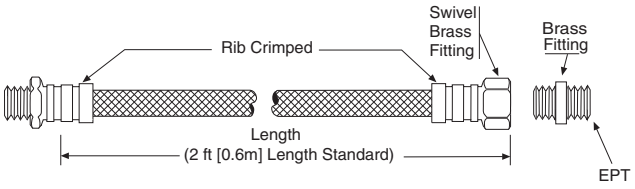
Insulation is not required on loop water piping except where the piping runs through unheated areas or outside the building or when the loop water temperature is below the minimum expected dew point of the pipe ambient. **Insulation is required if loop water temperature drops below the dew point.**

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.

⚠ WARNING! ⚠

WARNING! Do not bend or kink supply lines or hoses.

Figure 3: Supply/Return Hose Kit



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 [41 N-m]. If a torque wrench is not available, tighten finger-tight plus one quarter turn. Tighten steel fittings as necessary.

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 3 for an illustration of a Supply/Return Hose Kit. External Pipe Thread (EPT) 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! ⚠

INSTALLER CAUTION! After making water connections on units equipped with ClimaDry, ensure the three union nuts on the internal three-way water valve are tight.

⚠ CAUTION! ⚠

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

Condensate Installation

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 4a to improve the condensate drainage. 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 4b 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 2 inch [51mm] of ESP capability requires 2 inches [51mm] of trap depth). As a general rule 1.5 inch [38mm] trap depth is a minimum trap depth.

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 4a: Horizontal Unit Pitch

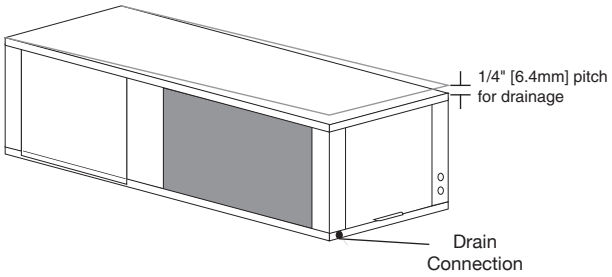
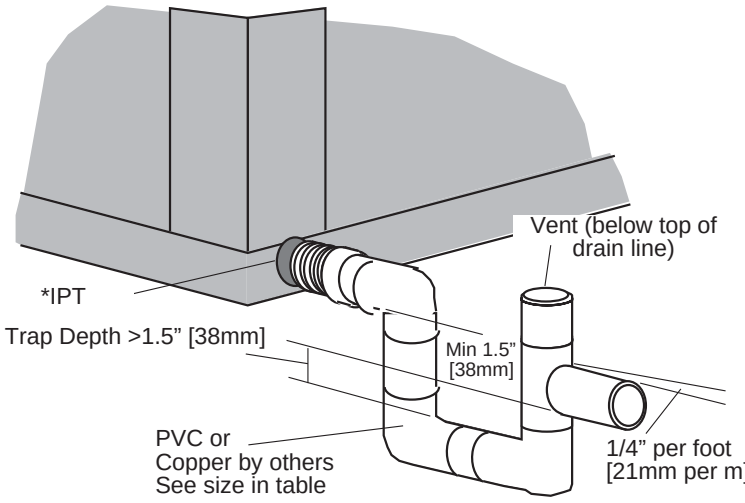


Figure 4b: Condensate Connection



Rev.: 10/11/04D

⚠ WARNING! ⚠

WARNING! Ensure condensate line is pitched toward drain 1/4" per foot [21mm per m] of run.

Pipe Size	Connected Tons	Connected kW
3/4" [19mm]	<4	<14
1" [25mm]	<6	<21
1-1/4" [32mm]	<30	<105
1-1/2" [38mm]	<50	<175
2" [51mm]	<150	<527
3" [76mm]	<300	<1055
4" [102mm]	<500	<1758

*** Some units include a painted drain connection. Using a threaded pipe or similar device to clear any excess paint accumulated inside this fitting may ease final drain line installation.**

Water-Loop Heat Pump Applications

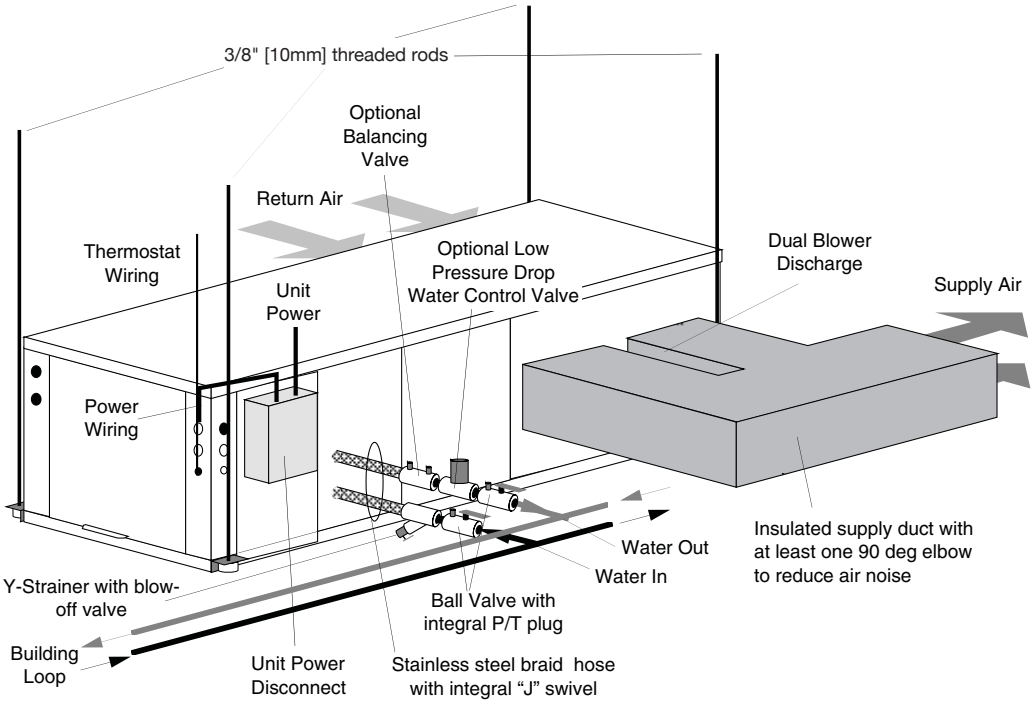
Commercial systems typically include a number of units plumbed to a common piping system. Any unit plumbing maintenance work can introduce air into the piping system, therefore air elimination equipment is a major portion of the mechanical room plumbing. In piping systems expected to utilize water temperatures below 50°F [10°C], 1/2" [13mm] 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 5 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 Piping System Cleaning and Flushing Procedures. The flow rate is usually set between 2.25 and 3.5 gpm per ton [2.9 l/m and 4.5 l/m per kW] of cooling capacity. ClimateMaster recommends 2.5 gpm per ton [3.2 l/m 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 60-90°F [16-32°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 (JW3) should be clipped to select the low temperature (Antifreeze 13°F [-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 60°F [16°C].

Figure 5: Typical Water Loop Application



Ground-Loop Heat Pump Applications

⚠ CAUTION! ⚠

CAUTION! The following instructions represent industry accepted installation practices for Closed Loop Earth Coupled Heat Pump Systems. They are provided to assist the contractor in installing trouble free ground loops. These instructions are recommended only. State and Local Codes MUST be followed and installation MUST conform to ALL applicable Codes. It is the responsibility of the Installing contractor to determine and comply with ALL applicable Codes and Regulations.

Pre-Installation

Prior to installation, locate and mark all existing underground utilities, piping, etc. Install loops for new construction before sidewalks, patios, driveways, and other construction has begun. During construction, accurately mark all ground loop piping on the plot plan as an aid in avoiding potential future damage to the installation.

Piping Installation

The typical closed loop ground source system is shown in Figure 6. All earth loop piping materials should be limited to only polyethylene fusion for inground sections of the loop. Galvanized or steel fitting should not be used at any time due to their tendency to corrode. All plastic to metal threaded fittings should be avoided due to their potential to leak in earth coupled applications and a flanged fitting substituted. P/T plugs should be used so that flow can be measured using the pressure drop of the unit heat exchanger in lieu of other flow measurement means. Earth loop temperatures can range between 25 to 110°F (-4 to 43°C), and 2.25 to 3 gpm of flow per ton (2.41 l/m to 3.23 l/m per kW) of cooling capacity is recommended in these applications. Upon completion of the ground loop piping, pressure test the loop to assure a leak free system. Horizontal Systems: Test individual loops as installed. Test entire system when all loops are assembled. Vertical U-Bends and Pond Loop Systems: Test Vertical U-bends and pond loop assemblies prior to installation with a test pressure of at least 100 psi (689 kpa).

Flushing the Earth Loop

Upon completion of system installation and testing, flush the system to remove all foreign objects and purge to remove all air.

Figure 6: Typical Earth Loop Application

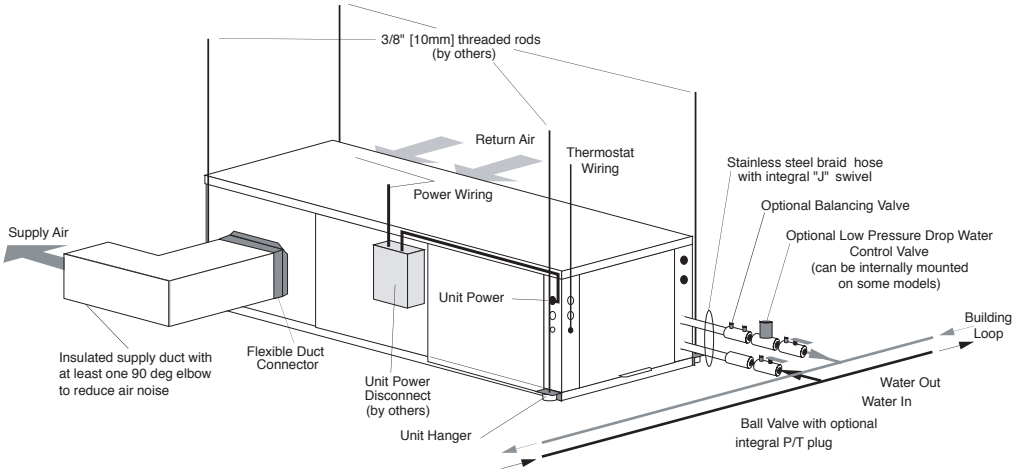


Table 2: Antifreeze Percentages by Volume

Type	Minimum Temperature for Low Temperature Protection			
	10°F [-12.2°C]	15°F [-9.4°C]	20°F [-6.7°C]	25°F [-3.9°C]
Methanol	25%	21%	16%	10%
100% USP food grade Propylene Glycol	38%	25%	22%	15%
Ethanol*	29%	25%	20%	14%

* Must not be denatured with any petroleum based product

Ground-Loop Heat Pump Applications

Antifreeze
In areas where minimum entering loop temperatures drop below 40°F (5°C) or where piping will be routed through areas subject to freezing, anti-freeze is needed. Alcohols and glycols are commonly used as antifreezes, however your local sales manager should be consulted for the antifreeze best suited to your area. Freeze protection should be maintained to 15°F (9°C) below the lowest expected entering loop temperature. For example, if 30°F (-1°C) is the minimum expected entering loop temperature, the leaving loop temperature would be 25 to 22°F (-4 to -6°C) and freeze protection should be at 15°F (-10°C) e.g. 30°F - 15°F = 15°F (-1°C - 9°C = -10°C). All alcohols should be premixed and pumped from a reservoir outside of the building when possible or introduced under water level to prevent fuming. Initially calculate the total volume of fluid in the piping system. Then use the percentage by volume shown in Table 2 for the amount of antifreeze. Antifreeze concentration should be checked from a well mixed sample using a hydrometer to measure specific gravity.

Low Water Temperature Cut-Out Setting
CXM or DXM Control:
When an antifreeze is selected, the FP1 jumper (JW3) should be clipped to select the low temperature (Antifreeze 10°F [-12.2°C]) setpoint to avoid nuisance faults.

Ground-Water Heat Pump Applications

Shut off valves should be included in case of servicing. Boiler drains or other valves should be 'tee'd' into the line to allow acid flushing of just the heat exchanger. Pressure temperature plugs should be used so that flow and temperature can be measured. Piping materials should be limited to PVC SCH80 or copper. **Note: Due to the pressure and temperature extremes, PVC SCH40 is not recommended.**

Water quantity should be plentiful and of good quality. Consult Table 3 for water quality guidelines. The unit can be ordered with either a copper or cupro-nickel water heat exchanger. Consult Table 3 for recommendations. Copper is recommended for closed loop systems and open loop ground water systems that are not high in mineral content or corrosiveness. In conditions anticipating heavy scale formation or in brackish water, a cupro-nickel heat exchanger is recommended. In ground water situations where scaling could be heavy or where biological growth such as iron bacteria will be present, a closed loop system is recommended. Heat exchanger coils may over time lose heat exchange capabilities due to a build up of mineral deposits inside. These can be cleaned only by a qualified service mechanic as acid and special pumping equipment are required. Desuperheater coils can likewise become scaled and possibly plugged. In areas with extremely hard water, the owner should be informed that the heat exchanger may require occasional acid flushing.

Expansion Tank and Pump
Use a closed, bladder-type expansion tank to minimize mineral formation due to air exposure. The expansion tank should be sized to handle at least one minute run time of the pump to prevent premature pump failure using its drawdown capacity rating. Discharge water from the unit is not contaminated in any manner and can be disposed of in various ways, depending on local building codes, i.e. recharge well, storm sewer, drain field, adjacent stream or pond, etc. Most local codes forbid the use of sanitary sewer for disposal. Consult your local building and zoning department to assure compliance in your area.

Water Control Valve
Note the placement of the water control valve. Always maintain water pressure in the heat exchanger by placing water control valves at the outlet of the unit to prevent mineral precipitation during the off-cycle. Pilot operated slow closing valves are recommended to reduce water hammer. If water hammer persists, a mini-expansion tank can be mounted on the piping to help absorb the excess hammer shock. Insure that the total 'VA' draw of the valve can be supplied by the unit transformer. For instance, the slow closing valve can draw up to 35VA. This can overload smaller 40 or 50 VA transformers depending on the other controls employed. A typical pilot operated solenoid valve draws approximately 15VA.

Flow Regulation
Flow regulation can be accomplished by two methods. Most water control valves have a built in flow adjustment. By measuring the pressure drop through the unit heat exchanger, flow rate can be determined and compared to Table 7. Since the pressure is constantly varying, two pressure gauges might be needed. Simply adjust the water control valve until the desired flow of 1.5 to 2 gpm per ton (2.0 to 2.6 l/m per kW) is achieved. Secondly, a flow control device may be installed. The

devices are typically an orifice of plastic material that are designed to allow a specified flow rate. These are mounted on the outlet of the water control valve. On occasion, these valves can produce a velocity noise that can be reduced by applying some back pressure. This is accomplished by slightly closing the leaving isolation valve of the well water setup.

⚠ CAUTION! ⚠

Low Water Temperature Cut-Out Setting
For all open loop systems the 30°F (-1.1°C) FP1 setting (factory setting-water) should be used to avoid freeze damage to the unit. See Freeze Protection Selection for closed loop systems with anitfreeze.

Table 3: Water Quality Standards

Water Quality Parameter	HX Material	Closed Recirculating	Open Loop and Recirculating Well		
Scaling Potential - Primary Measurement					
Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below					
pH/Calcium Hardness Method	All	-	**pH < 7.5 and Ca Hardness <100ppm**		
Index Limits for Probable Scaling Situations - (Operation outside these limits is not recommended)					
Scaling indexes should be calculated at 150°F [66°C] for direct use and HWG applications, and at 90°F [32°C] for indirect HX use. A monitoring plan should be implemented.					
Ryznar Stability Index	All	-	**6.0 - 7.5** If >7.5 minimize steel pipe use.		
Langelier Saturation Index	All	-	**-0.5 to +0.5** If <-0.5 minimize steel pipe use. Based upon 150°F [66°C] HWG and Direct well, 85°F [29°C] Indirect Well HX		
Iron Fouling					
Iron Fe $^{2+}$ (Ferrous) (Bacterial Iron potential)	All	-	**<0.2 ppm (Ferrous)** If Fe^{2+} (ferrous)>0.2 ppm with pH 6 - 8, O2<5 ppm check for iron bacteria		
Iron Fouling	All	-	**<0.5 ppm of Oxygen** Above this level deposition will occur.		
Corrosion Prevention					
pH	All	**6 - 8.5** Monitor/treat as needed	**6 - 8.5** Minimize steel pipe below 7 and no open tanks with pH <8		
Hydrogen Sulfide (H_2S)	All	-	**<0.5 ppm** At H_2S>0.2 ppm, avoid use of copper and copper nickel piping or HX's. Rotten egg smell appears at 0.5 ppm level. Copper alloy (bronze or brass) cast components are OK to <0.5 ppm.		
Ammonia ion as hydroxide, chloride, nitrate and sulfate compounds	All	-	**<0.5 ppm**		
Maximum Chloride Levels			Maximum Allowable at maximum water temperature.		
			50°F (10°C)	75°F (24°C)	100ºF (38ºC)
	Copper	-	<20ppm	NR	NR
	CuproNickel	-	<150 ppm	NR	NR
	304 SS	-	<400 ppm	<250 ppm	<150 ppm
	316 SS	-	<1000 ppm	<550 ppm	< 375 ppm
	Titanium	-	>1000 ppm	>550 ppm	>375 ppm
Erosion and Clogging					
Particulate Size and Erosion	All	<10 ppm of particles and a maximum velocity of 6 fps [1.8 m/s] Filtered for maximum 800 micron [800mm, 20 mesh] size.	<10 ppm (<1 ppm "sandfree" for reinjection) of particlesand a maximum velocity of 6 fps [1.8 m/s]. Filtered for maximum 800 micron [800mm, 20 mesh] size.Any particulate that is not removed can potentially clog components.		

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Notes:
- Closed Recirculating system is identified by a closed pressurized piping system.
- Recirculating open wells should observe the open recirculating design considerations.
- NR - Application not recommended.
- "-" No design Maximum.

Electrical Data

⚠ 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.

Table 4A: GLH Electrical Data

Model	Voltage Code	Voltage	Min/Max Voltage	Blower Option	Compressor			Fan Motor FLA	Total Unit FLA	Min Circuit Amps	Max Fuse/ HACR
					QTY	RLA	LRA				
GLH072	H	208-230/60/3	187/253	A, B, C	2	10.4	65.5	5	25.8	28.4	35
GLH072	H	208-230/60/3	187/253	E	2	10.4	65.5	6.2	27	29.6	40
GLH072	F	460/60/3	414/506	A, B, C	2	4.9	33.0	2.4	12.2	13.4	15
GLH072	F	460/60/3	414/506	E	2	4.9	33.0	3.1	12.9	14.1	15
GLH096	H	208-230/60/3	187/253	A, B, C	2	14.3	91.0	6.5	35.1	38.7	50
GLH096	H	208-230/60/3	187/253	D, E	2	14.3	91.0	8.8	37.4	41.0	50
GLH096	F	460/60/3	414/506	A, B, C	2	7.2	46.0	3.1	17.5	19.3	25
GLH096	F	460/60/3	414/506	D, E	2	7.2	46.0	4.2	18.6	20.4	25
GLH096	N	575/60/3	518/633	A, B, C	2	5.7	37.0	2.8	14.2	15.6	20
GLH096	N	575/60/3	518/633	D, E	2	5.7	37.0	3.4	14.8	16.2	20
GLH120	H	208-230/60/3	187/253	A, B, C	2	19.3	123.0	6.5	45.1	49.9	60
GLH120	H	208-230/60/3	187/253	D, E	2	19.3	123.0	8.8	47.4	52.2	70
GLH120	F	460/60/3	414/506	A, B, C	2	7.5	49.5	3.1	18.1	20.0	25
GLH120	F	460/60/3	414/506	D, E	2	7.5	49.5	4.2	19.2	21.1	25
GLH120	N	575/60/3	518/633	A, B, C	2	6.4	40.0	2.8	15.6	17.2	20
GLH120	N	575/60/3	518/633	D, E	2	6.4	40.0	3.4	16.2	17.8	20

Compressor RLA & LRA values are per compressor.

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

Table 4B: GLV Electrical Data

All GLV Units									Standard GLV Unit			GLV unit with ClimaDry Reheat			
Model	Voltage Code	Voltage	Min/ Max Voltage	Blower Option	Compressor			Fan Motor FLA	Total Unit FLA	Min Circuit Amp	Max Fuse/ HACR	Reheat Pump FLA	Total Unit FLA	Min Circuit Amp	Max Fuse/ HACR
					QTY	RLA	LRA								
GLV080	H	208-230/60/3	197/253	A, B, C	1	20.7	156	5.0	25.7	30.9	50	1.1	26.8	32.0	50
GLV080	H	208-230/60/3	197/253	E	1	20.7	156	6.2	26.9	32.1	50	1.1	28.0	33.2	50
GLV080	F	460/60/3	414/506	A, B, C	1	10.0	75	2.4	12.4	14.9	20	0.6	12.9	15.4	25
GLV080	F	460/60/3	414/506	E	1	10.0	75	3.1	13.1	15.6	25	0.6	13.7	16.2	25
GLV080	N	575/60/3	518/633	A, B, C	1	8.2	54	1.9	10.1	12.1	20	0.4	10.5	12.6	20
GLV080	N	575/60/3	518/633	E	1	8.2	54	2.3	10.5	12.5	20	0.4	10.9	13.0	20
GLV100	H	208-230/60/3	197/253	A, B	1	32.1	195	5.8	37.9	45.9	70	2.0	39.1	47.1	70
GLV100	H	208-230/60/3	197/253	E	1	32.1	195	6.2	38.3	46.3	70	2.0	40.3	48.3	80
GLV100	F	460/60/3	414/506	A, B	1	16.4	95	2.4	18.8	22.9	35	1.0	19.8	23.9	40
GLV100	F	460/60/3	414/506	E	1	16.4	95	3.1	19.5	23.6	40	1.0	20.5	24.6	40
GLV100	N	575/60/3	518/633	A, B	1	12.0	80	1.9	13.9	16.9	25	0.8	14.7	17.7	25
GLV100	N	575/60/3	518/633	E	1	12.0	80	2.3	14.3	17.3	25	0.8	15.1	18.1	30
GLV120	H	208-230/60/3	197/253	A, B, C	1	33.6	225	6.2	39.8	48.2	80	2.0	41.8	50.2	80
GLV120	H	208-230/60/3	197/253	E	1	33.6	225	8.4	42.0	50.4	80	2.0	44.4	52.8	80
GLV120	F	460/60/3	414/506	A, B, C	1	17.3	114	3.1	20.4	24.5	40	1.0	21.4	25.7	40
GLV120	F	460/60/3	414/506	E	1	17.3	114	4.2	21.5	25.8	40	1.0	22.5	26.8	40
GLV120	N	575/60/3	518/633	A, B, C	1	13.5	80	2.3	15.8	19.2	30	0.8	16.6	20.0	30
GLV120	N	575/60/3	518/633	E	1	13.5	80	3.4	16.9	20.3	30	0.8	17.7	21.1	30
GLV160	H	208-230/60/3	197/253	A, B, C	2	20.7	156	8.4	49.8	55.0	70	2.0	52.2	57.3	70
GLV160	F	460/60/3	414/506	A, B, C	2	10.0	74	4.2	24.2	26.7	35	1.0	25.2	27.7	35
GLV160	N	575/60/3	518/633	A, B, C	2	8.2	54	3.4	19.8	21.9	30	0.8	20.6	22.6	30
GLV200	H	208-230/60/3	197/253	A, B	2	32.1	195	5.0	74.2	75.8	110	2.0	76.2	84.2	110
GLV200	H	208-230/60/3	197/253	E	2	32.1	195	6.2	76.6	84.6	110	2.0	78.6	86.6	110
GLV200	F	460/60/3	414/506	A, B	2	16.4	95	2.4	37.6	41.7	50	1.0	38.6	42.7	50
GLV200	F	460/60/3	414/506	E	2	16.4	95	3.1	39.0	43.1	50	1.0	40.0	44.1	60
GLV200	N	575/60/3	518/633	A, B	2	12.0	80	1.9	27.8	30.8	40	0.8	28.6	31.6	40
GLV200	N	575/60/3	518/633	E	2	12.0	80	2.3	28.6	31.6	40	0.8	29.4	32.4	40
GLV240	H	208-230/60/3	197/253	A, B, C	2	33.6	225	6.2	79.6	88.0	110	4.5	84.1	92.5	125
GLV240	H	208-230/60/3	197/253	E	2	33.6	225	8.4	84.0	92.4	125	4.5	89.3	97.7	125
GLV240	F	460/60/3	414/506	A, B, C	2	17.3	114	3.1	40.8	45.1	60	2.3	43.0	47.4	60
GLV240	F	460/60/3	414/506	E	2	17.3	114	4.2	43.0	47.3	60	2.3	45.3	49.6	60
GLV240	N	575/60/3	518/633	A, B, C	2	13.5	80	2.3	31.6	35.0	45	1.8	33.4	36.8	50
GLV240	N	575/60/3	518/633	E	2	13.5	80	3.4	33.8	37.2	50	1..8	35.6	39.0	50
GLV300	H	208-230/60/3	197/253	A, C	2	47.1	245	8.4	111.0	122.8	150	4.5	116.3	128.1	175
GLV300	F	460/60/3	414/506	A, C	2	19.6	125	4.2	47.6	52.5	70	2.3	49.8	54.8	70
GLV300	N	575/60/3	518/633	A, C	2	15.8	100	3.4	38.4	42.4	50	1.8	40.2	44.2	50

HACR circuit breaker in USA only
All fuses Class RK-5
Note: Compressor RLA & LRA values are per compressor
Compressor RLA & LRA values are per compressor.

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

Electrical - Power Wiring

⚠ WARNING! ⚠

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! ⚠

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

⚠ WARNING! ⚠

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 8. Consult Table 4a and 4b for correct fuse size.

208 Volt Operation

All 208-230 Volt units are factory wired for 208 Volt. The transformers may be switched to 230V operation as illustrated on the wiring diagram by switching the Red (208V) and the Orange (230V) at the contactor terminal L2.

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.

Thermostat Installation

The thermostat should be located on an interior wall in a larger room away from supply duct drafts. Do NOT locate the thermostat in areas subject to sunlight, drafts or on external walls. The wire access hole behind the thermostat may in certain cases need to be sealed to prevent erroneous temperature measurement. Position the thermostat backplate against the wall so that it appears level and so the thermostat wires protrude through the middle of the backplate. Mark the position of the backplate mounting holes and drill holes with a 3/16" bit. Install supplied anchors and secure plate to the wall. Thermostat wire must be 18 AWG wire. Wire the appropriate thermostat as shown in Figure 13 to the low voltage terminal strip in the CXM/DXM Control as shown in Figure 9 using 18 AWG thermostat wire of minimum length.

Figure 8: Typical GL Series Line Voltage Field Wiring

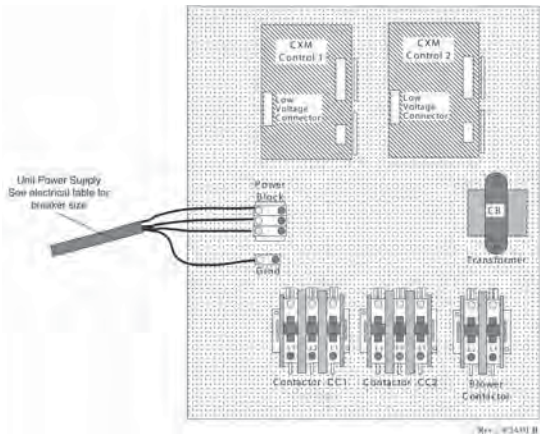
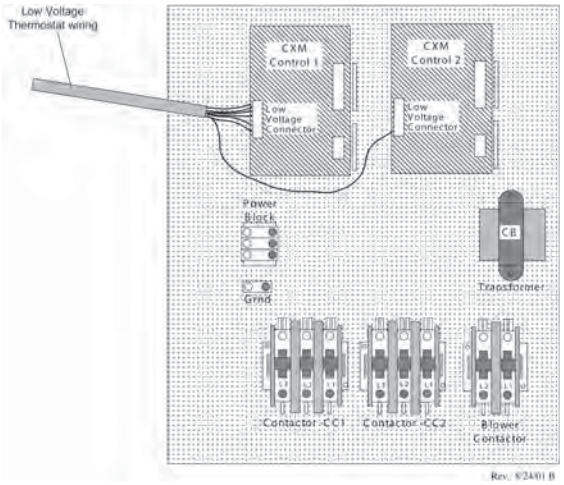


Figure 9: Low Voltage Field Wiring (CXM show)
NOTE: For DXM, Y2 wiring at DXM1

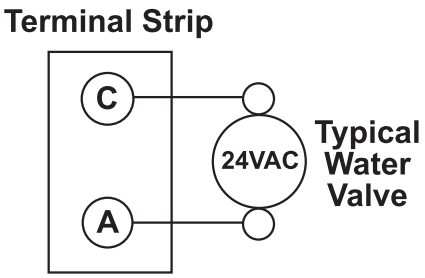


Electrical - Low Voltage

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 (30°F [-1.1°C]). In cold temperature applications jumper JW3 (FP1- antifreeze 10°F [-12.2°C]) should be clipped as shown in Figure 10 to change the setting to 10°F [-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 60°F [15°C].

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 11 or the wiring schematic for details.

Figure 11: Accessory Wiring

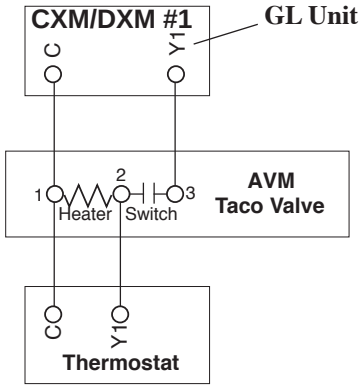


Water Solenoid Valves
When using external solenoid valves on ground water installations, a slow closing valve may be desired. Figure 11 illustrates a typical slow closing water control valve wiring which will limit wasted water during a lockout condition. A slow closing valve may be required to prevent water hammer. When using an AVM -Taco Slow Closing valve on GL Series equipment Figure 12 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 12: Well Water AVM Valve Wiring



⚠ 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 300 psig and a cut-in pressure of 250 psig. This pressure switch can be ordered from ClimateMaster with a 1/4" internal flare connection as part number 39B0005N02.

CXM/DXM, LonWorks or MPC Control Operation

Note: See CXM AOM (part # 97B0003N12) or DXM AOM (97B0003N13) or Lon Controller AOM (97B0013N01) and MPC AOM (97B0031N01) included with any unit utilizing the Lon or MPC Controller Option.

Electrical - Thermostat

Typical Thermostat Selection and Wiring
Practically any multi-stage contact type thermostat will work with the GL Series. Figure 13a and 13b show typical thermostat wiring. **Thermostats with Triac outputs are not compatible with CXM boards.**

Figure 13a: Typical Manual Changeover 2 heat/ 2 cool thermostat wiring with GL unit & CXM

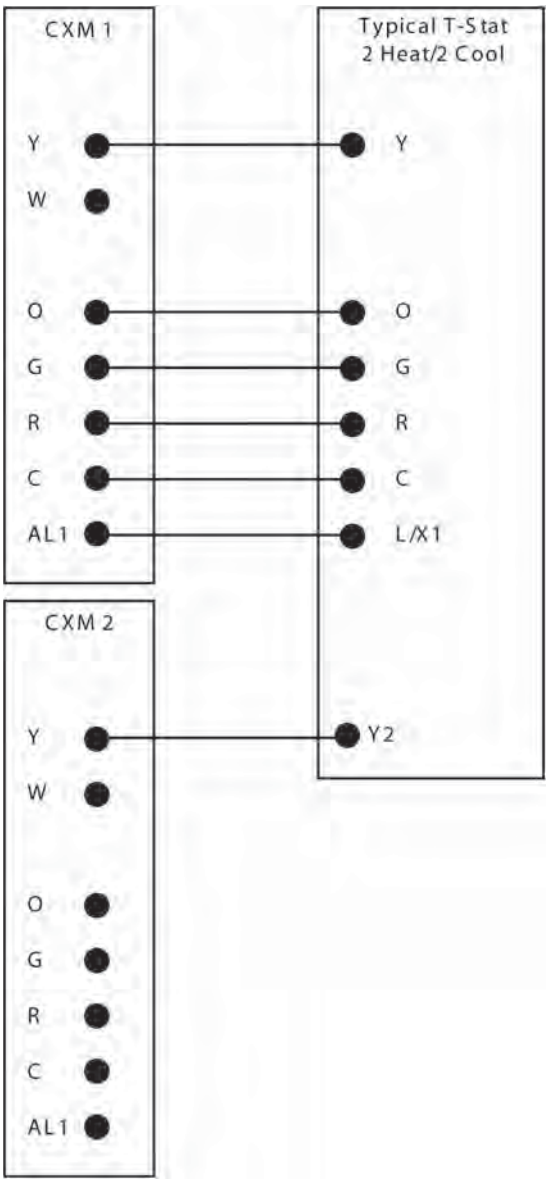
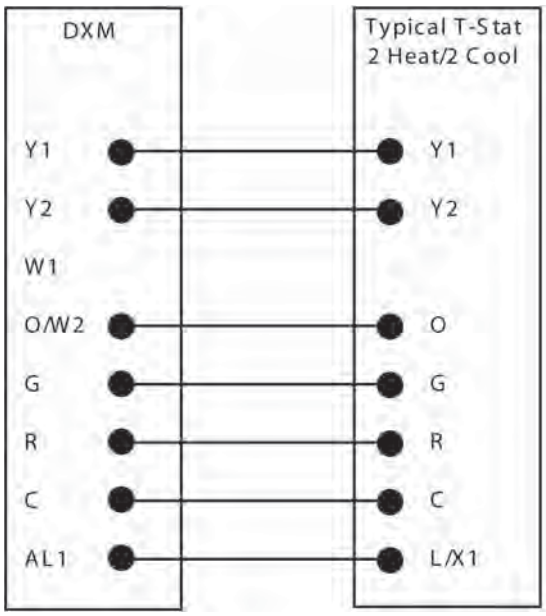
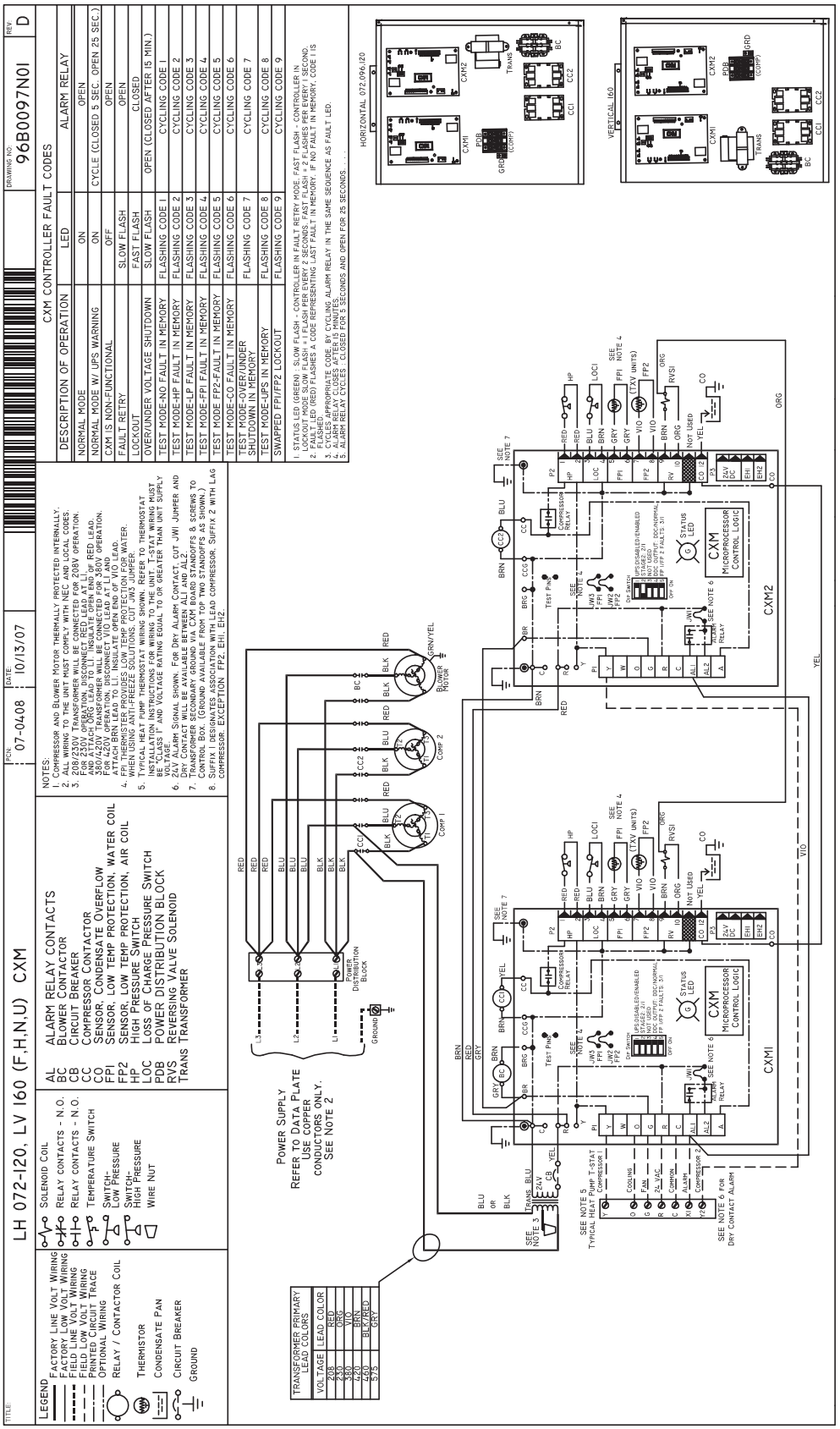


Figure 13b: Typical Manual Changeover 2 heat/ 2 cool thermostat wiring with GL unit & DXM



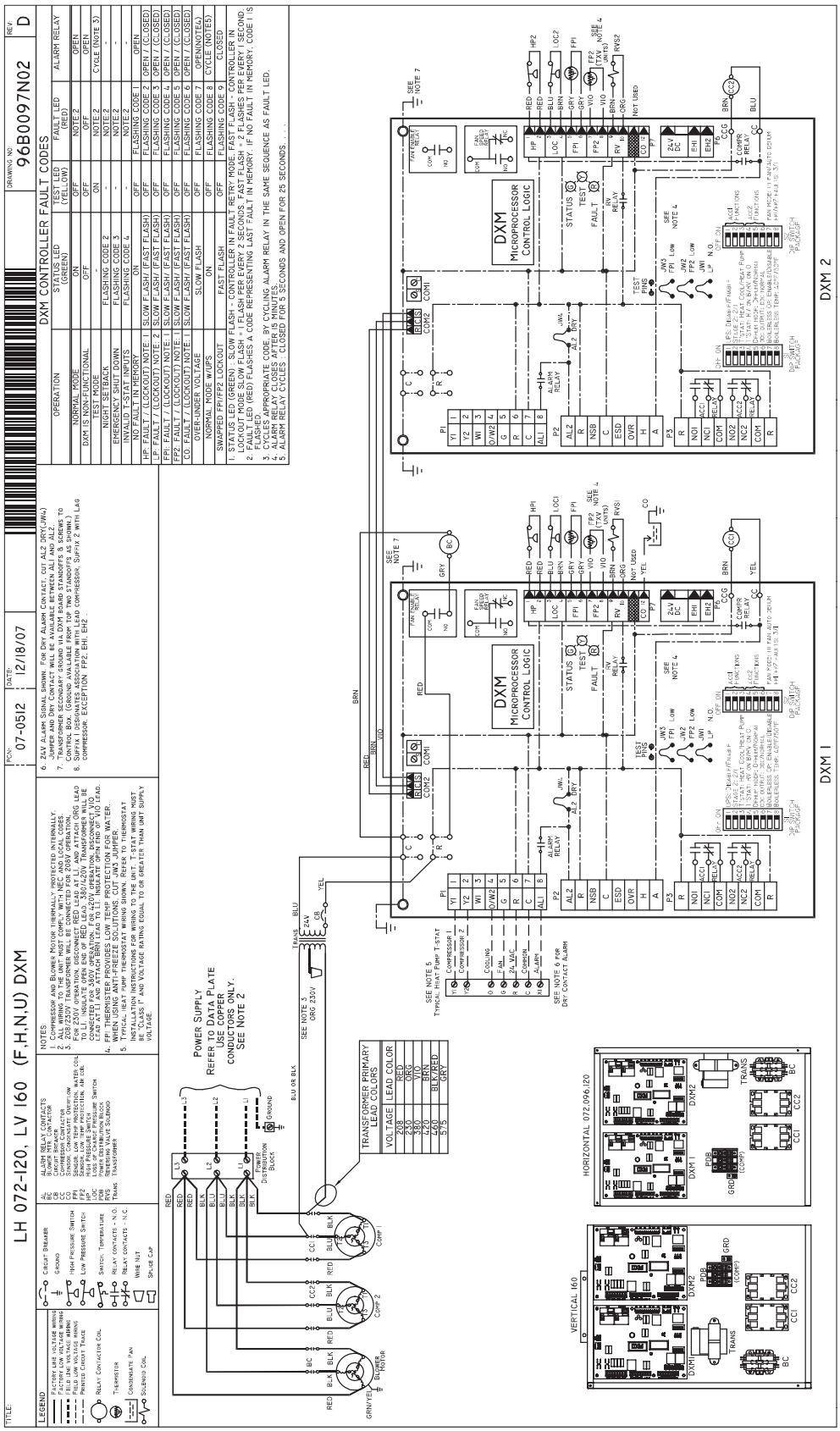
*** NOTE: For units with two (2) DXM boards all thermostat connections will be made to the "Master" DXM board. DO NOT connect thermostat wiring to the "Slave" DXM board.**

GLH072-120, GLV160 Three Phase with CXM Schematic

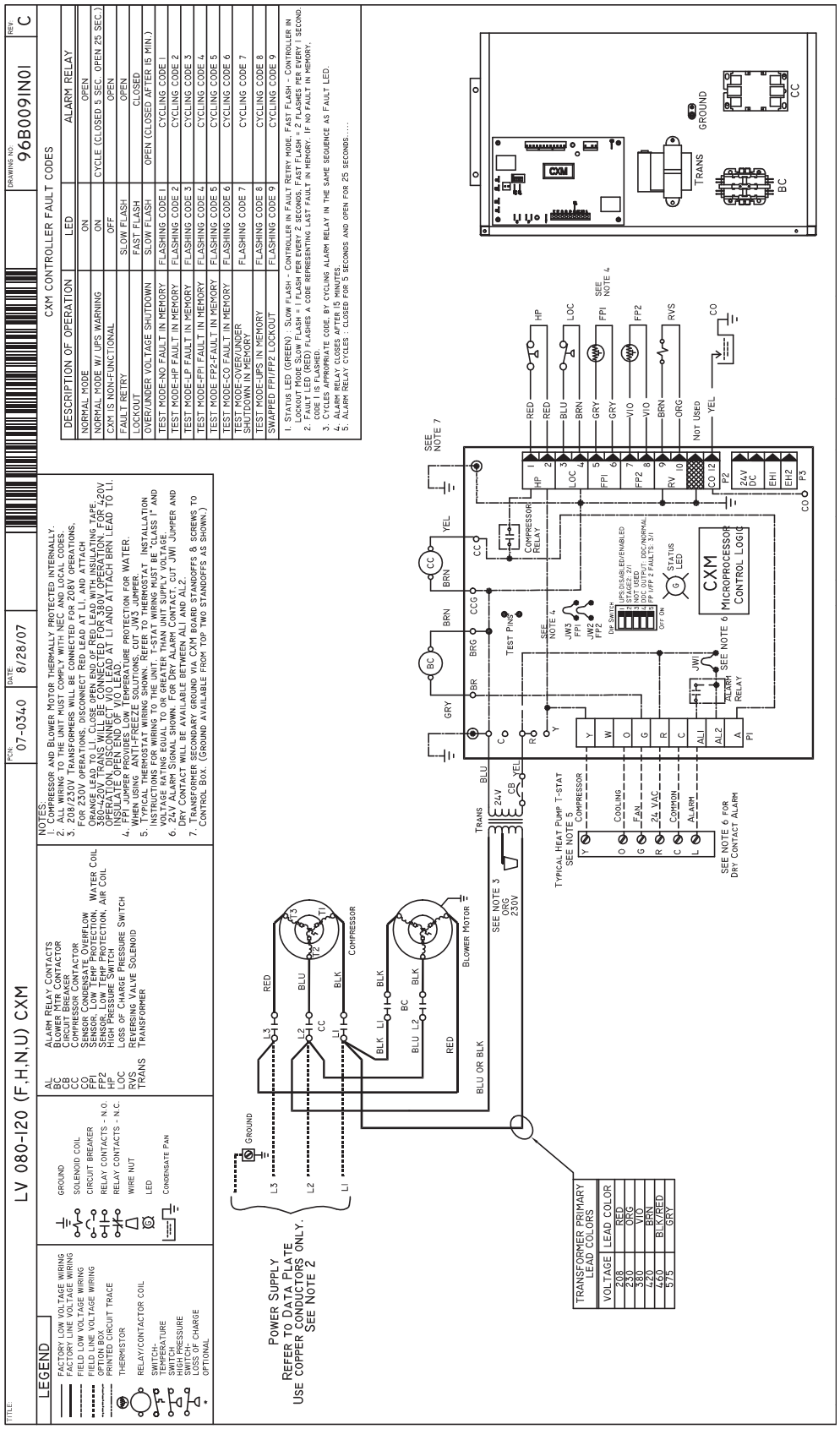


Genesis Large (GL) Series
Rev.: 13 April, 2009B

GLH072-120, GLV160 Three Phase with DXM Schematic

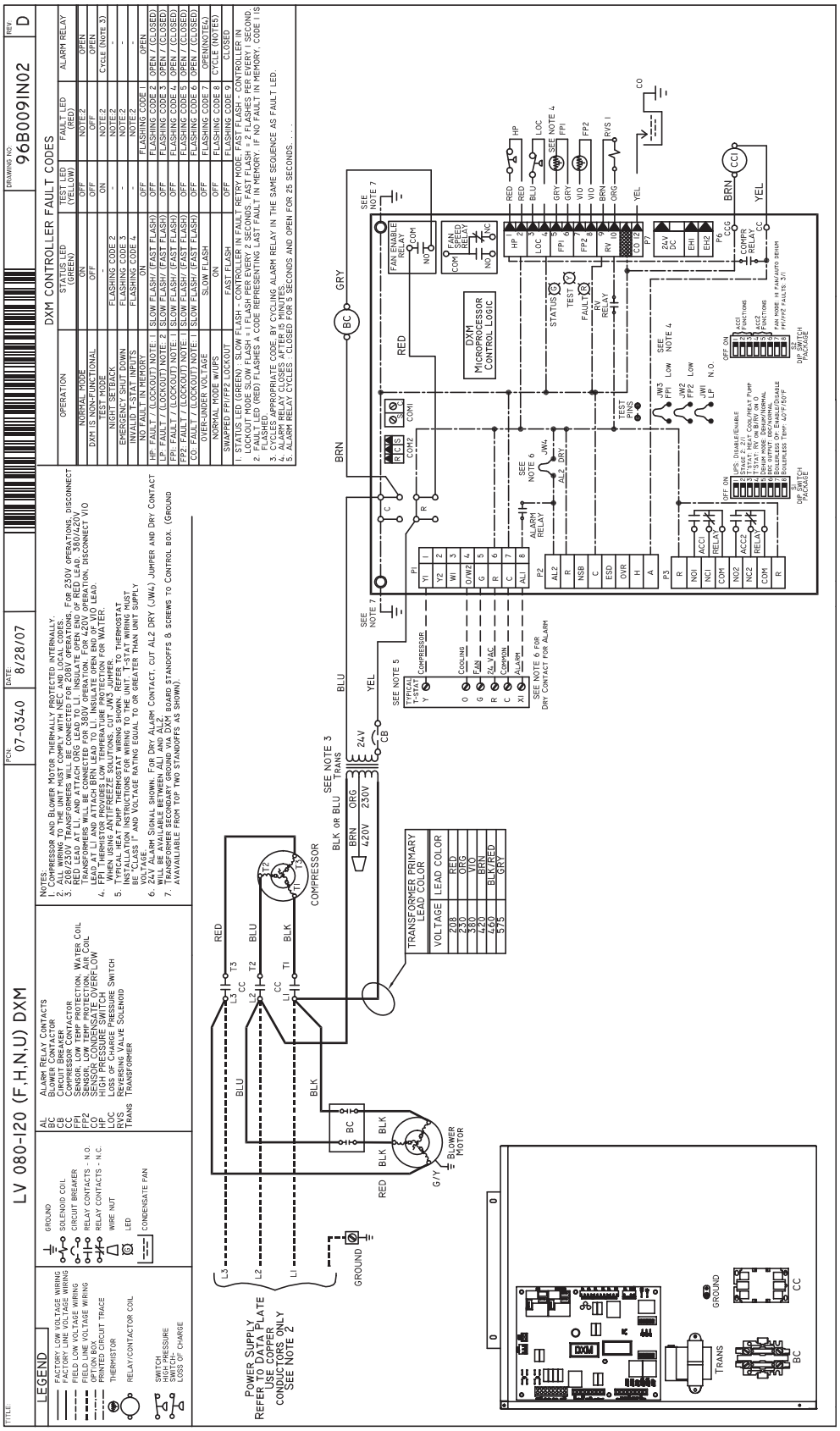


GLV080-120 Three Phase with CXM Schematic

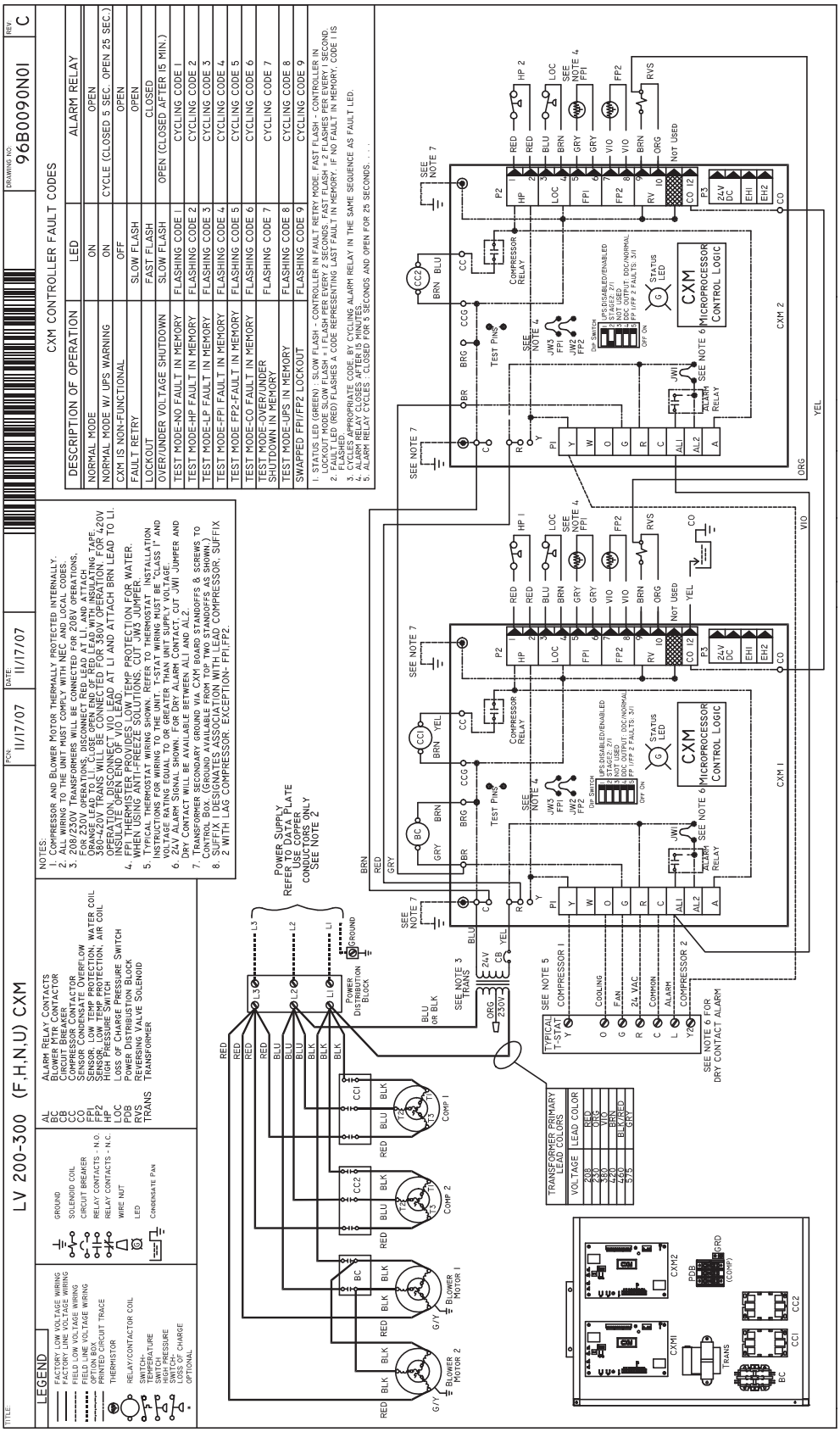


Genesis Large (GL) Series
Rev.: 13 April, 2009B

GLV080-120 Three Phase with DXM Schematic

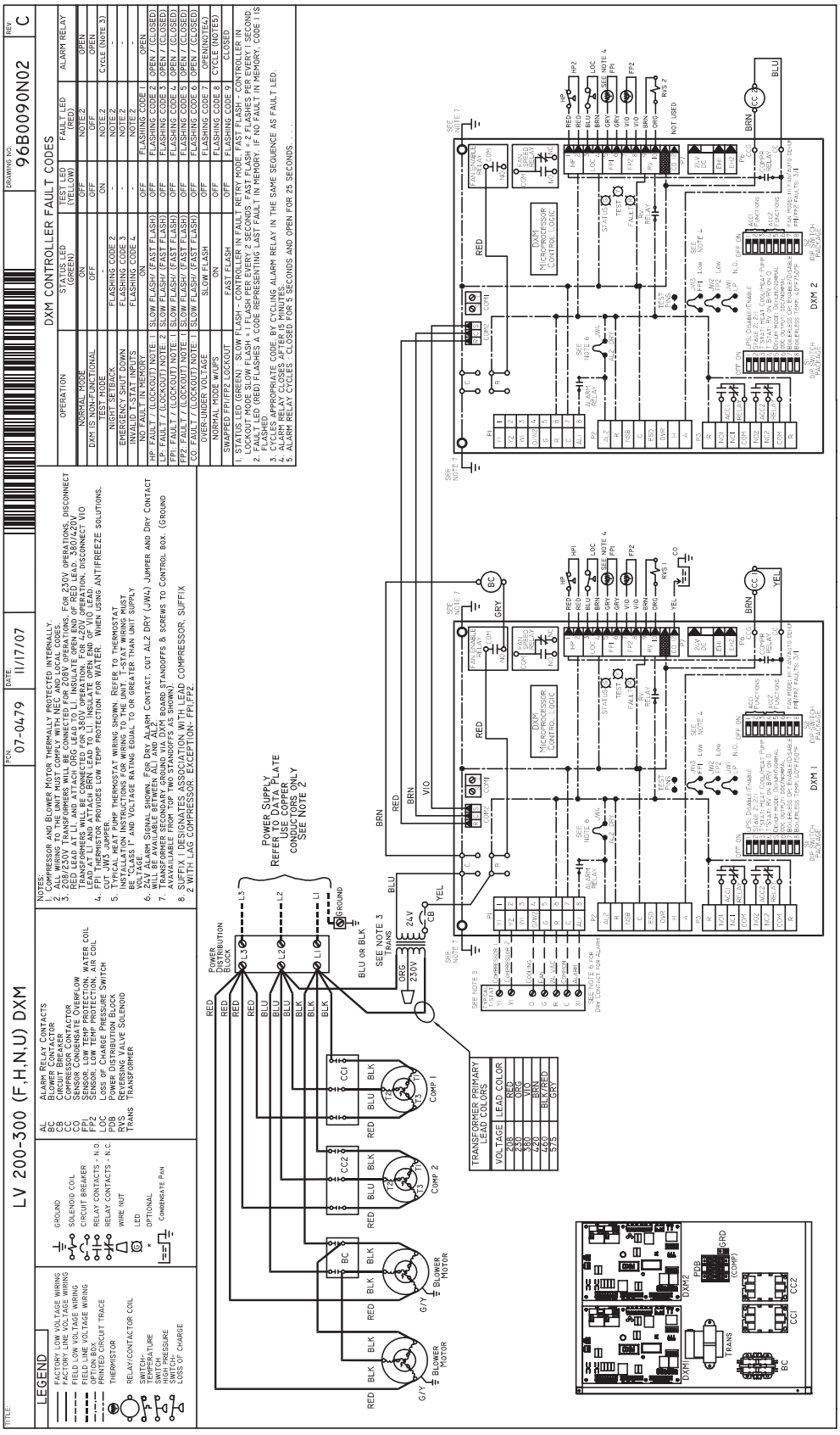


GLV200-300 Three Phase with CXM Schematic

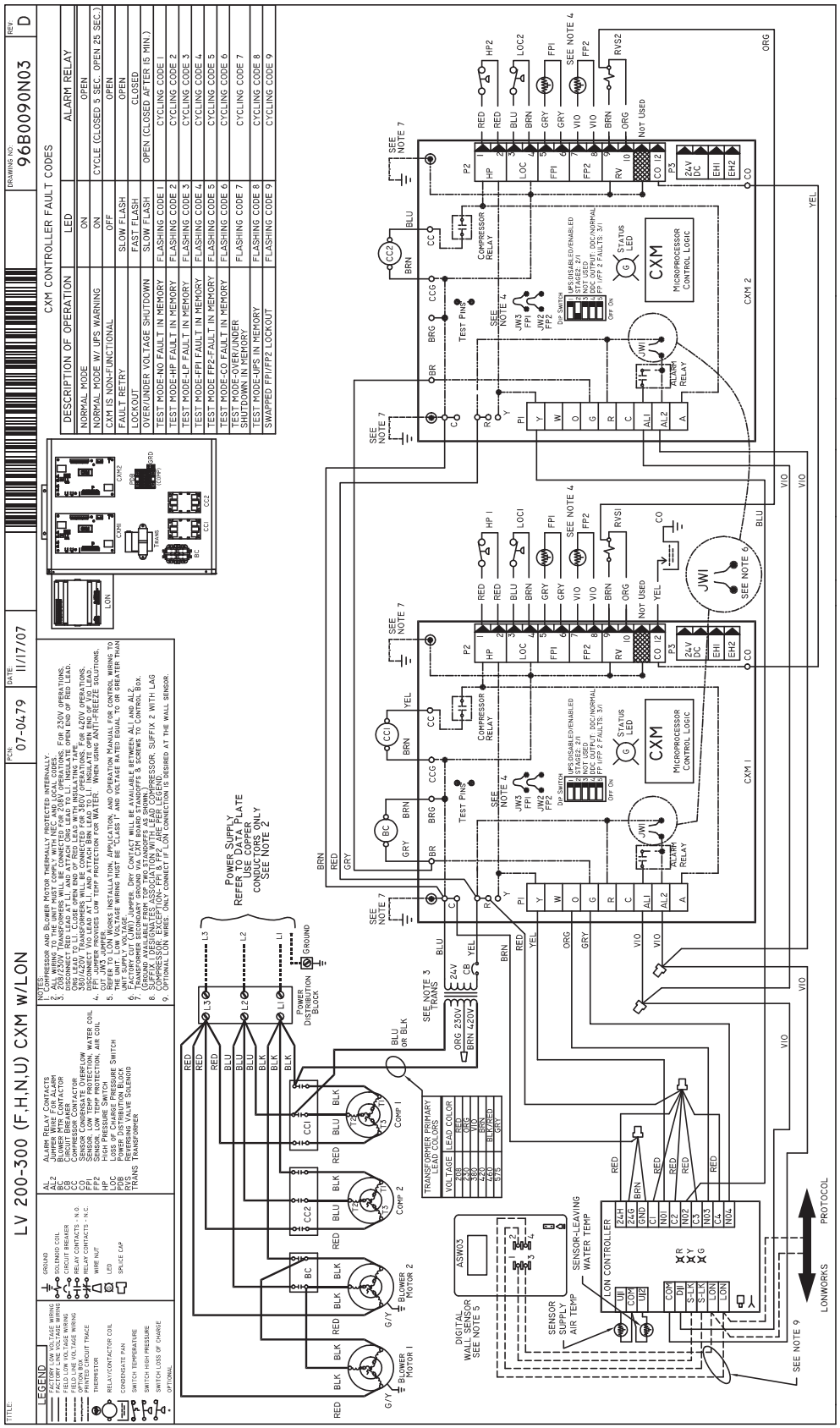


Genesis Large (GL) Series
Rev.: 13 April, 2009B

GLV200-300 Three Phase with DXM Schematic

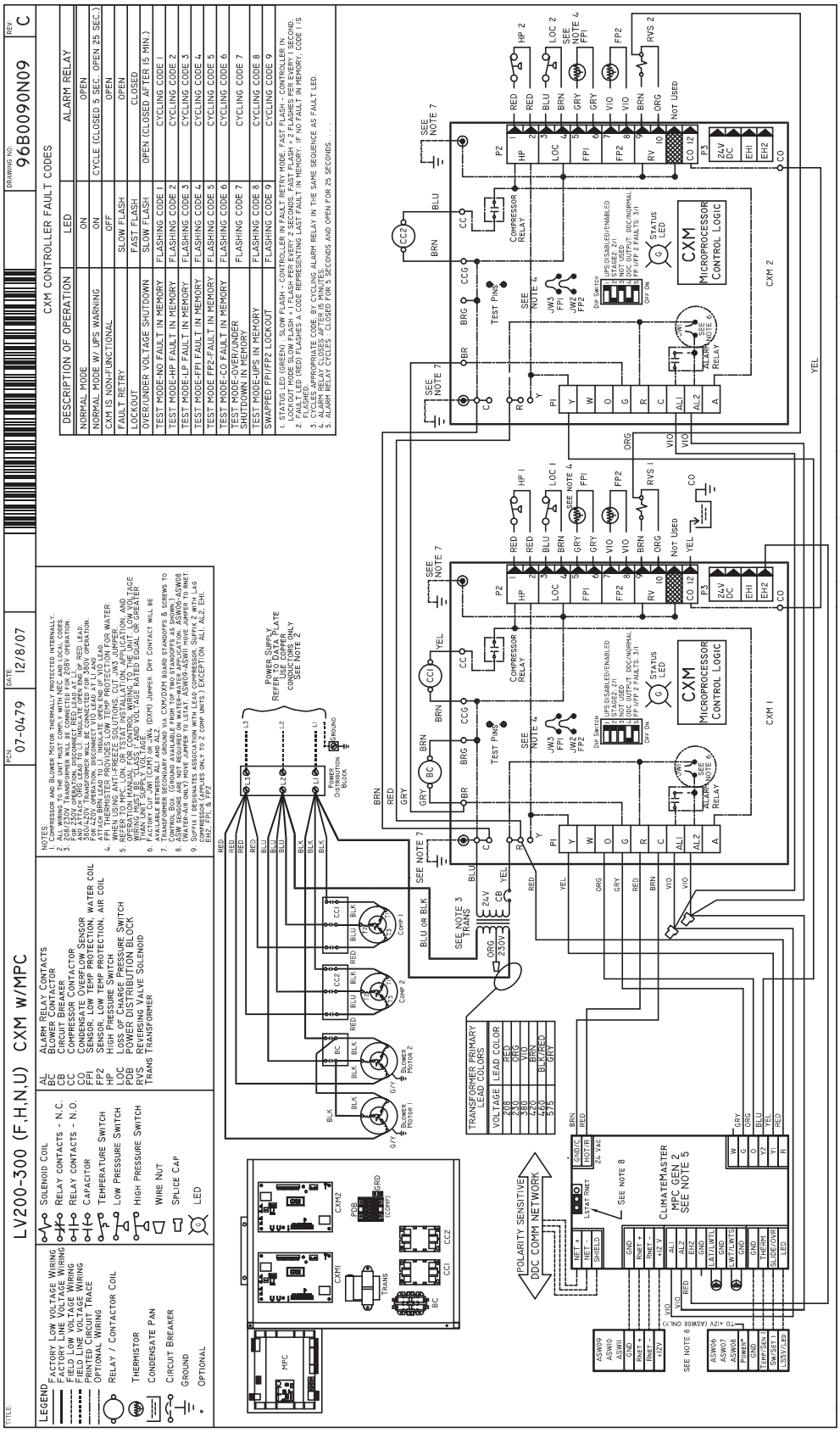


Typical CXM w/ LON Schematic (GLV200-300 Shown)

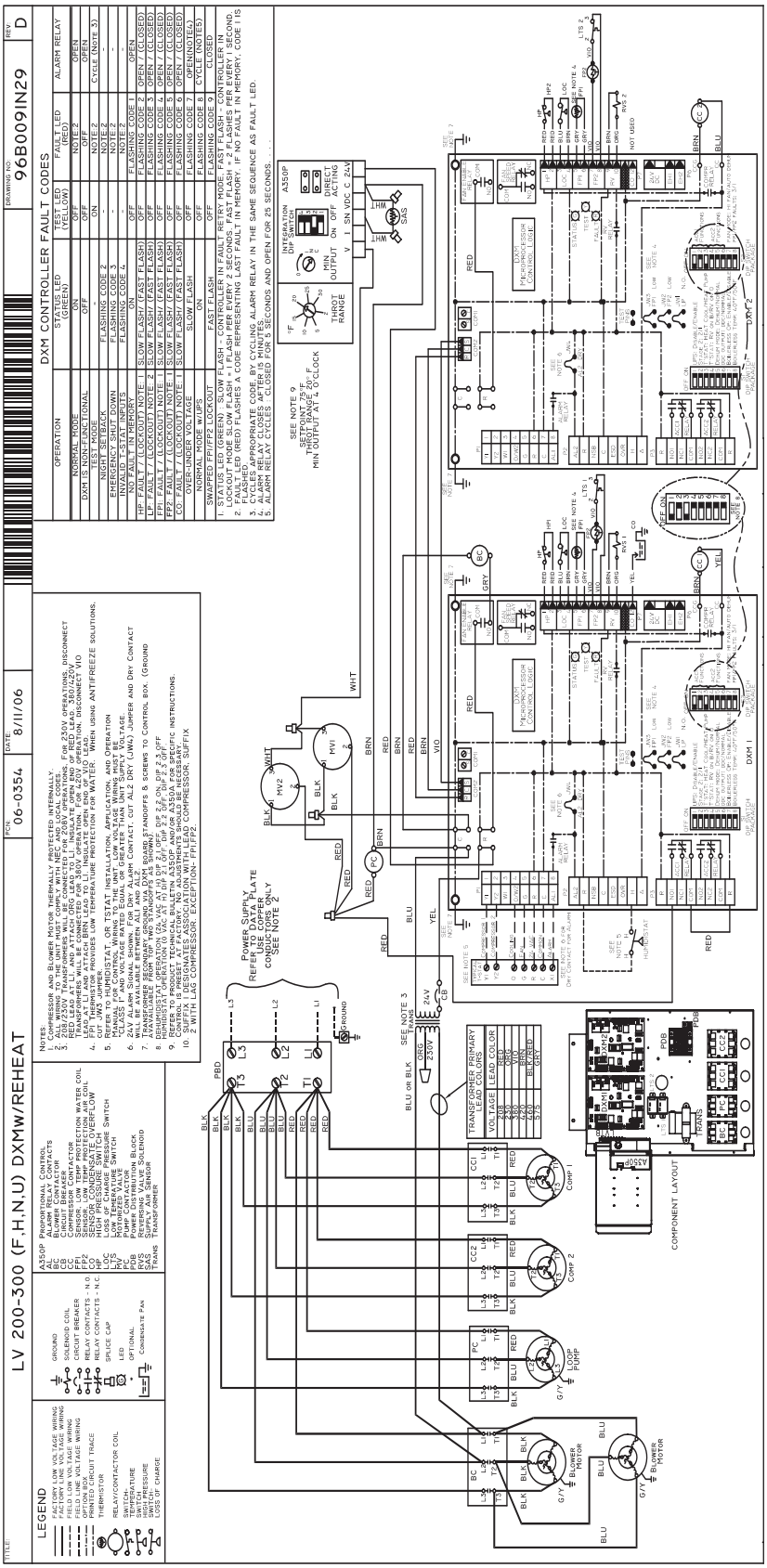


Genesis Large (GL) Series
Rev.: 13 April, 2009B

Typical CXM w/ MPC Schematic (GLV200-300 Shown)



GLV200-300 DXM w/Reheat



ClimaDry Modulating Reheat Option - GLV Unit Only

ClimaDry Sequence Of Operation
A heat pump equipped with ClimaDry can operate in three modes, cooling, cooling with reheat, and heating. The cooling/heating modes are like any other ClimateMaster WSHP. The reversing valve ("O" signal) is energized in cooling, along with the compressor contactor(s) and blower relay. In the heating mode the reversing valve is de-energized. Almost any thermostat will activate the heat pump in heating or cooling modes. The DXM microprocessor board, which is standard with the ClimaDry option, will accept either heat pump (Y,O) thermostats or non-heat pump (Y,W) thermostats.

The reheat mode requires a either a separate humidistat/ dehumidistat or a thermostat that has an integrated dehumidification function for activation. The DXM board is configured to work with either a humidistat or dehumidistat input to terminal "H" (DIP switch settings for the DXM board are shown below in table 4). Upon receiving an "H" input, the DXM board will activate the cooling mode and engage reheat. Table 5 shows the relationship between thermostat input signals and unit operation.

There are four operational inputs for single stage units and six operational inputs for dual stage units:

- Fan Only
- 1st Stage Cooling
- 2nd Stage Cooling
- 1st Stage Heating
- 2nd Stage Heating
- Reheat Mode

- Fan Only: A (G) call from the thermostat to the (G) terminal of the DXM control board will bring the unit on in fan only mode.
- 1st Stage Cooling: A simultaneous call from (G), (Y1), and (O) to the (G), (Y1), (O/W2) terminals of the DXM control board will bring the unit on in 1st Stage Cooling.
- 2nd Stage Cooling: A simultaneous call from (G), (Y1), (Y2), and (O) to the (G), (Y1), (Y2), and (O/W2) terminals of the DXM control board will bring the unit on in 2nd Stage Cooling. When the call is satisfied at the thermostat the unit will continue to run in 1st Stage Cooling until the 1st Stage Cooling call is removed or satisfied, shutting down the unit. NOTE: Not all units have two-stage cooling functionality (e.g. single compressor series units).
- 1st Stage Heating: A simultaneous call from (G) and (Y1) to the (G) and (Y1) terminals of the DXM control board will bring the unit on in 1st Stage Heating.

Table 4: Humidistat/Dehumidistat Logic & DXM (2.1, 2.2., 2.3) DIP Settings

Sensor	2.1	2.2	2.3	Logic	Reheat (ON) - H	Reheat (OFF) - H
Humidistat	OFF	OFF	OFF	Reverse	0 VAC	24 VAC
Dehumidistat	OFF	ON	OFF	Standard	24 VAC	0 VAC

Table 5: ClimaDry Operating Modes

Mode	Input					Output				
	O	G	Y1	Y2[3]	H	O	G	Y1	Y2[3]	Reheat
No Demand	ON/OFF	OFF	OFF	OFF	OFF	ON/OFF	OFF	OFF	OFF	OFF
Fan Only	ON/OFF	ON	OFF	OFF	OFF	ON/OFF	ON	OFF	OFF	OFF
Cooling 1st Stage	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
Cooling 2nd Stage	ON	ON	ON	ON	OFF	ON	ON	ON	ON	OFF
Cooling & Dehumidistat[1]	ON	ON	ON	ON/OFF	ON	ON	ON	ON	ON/OFF	OFF
Dehumidistat Only	ON/OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
Heating 1st Stage	OFF	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
Heating 2nd Stage	OFF	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF
Heating & Dehumidistat[2]	OFF	ON	ON	ON/OFF	ON	OFF	ON	ON	ON/OFF	OFF

[1]Cooling input takes priority over dehumidify input.
[2]DXM is programmed to ignore the H demand when the unit is in heating mode.
[3]N/A for single stage units; Full load operation for dual capacity units.
[4]ON/OFF = Either ON or OFF.

ClimaDry Modulating Reheat Option - GLV Unit Only

- 2nd Stage Heating: A simultaneous call from (G), (Y1), and (Y2) to the (G), (Y1), and (Y2) terminals of the DXM control board will bring the unit on in 2nd Stage Heating. When the call is satisfied at the thermostat the unit will continue to run in 1st Stage Heating until the call is removed or satisfied, shutting down the unit. NOTE: Not all units have two-stage heating functionality (e.g. single compressor series units).
- Reheat Mode: A call from the Humidistat/Dehumidistat to the (H) terminal of the DXM control board will bring the unit on in Reheat Mode if there is no call for cooling at the thermostat. When the Humidistat/ Dehumidification call is removed or satisfied the unit will shut down. NOTE: Cooling always overrides Reheat Mode. In the Cooling mode, the unit cools and dehumidifies. If the cooling thermostat is satisfied but there is still a call for dehumidification, the unit will continue to operate in Reheat Mode.

ClimaDry Component Functions

The ClimaDry option consists of the following components:

- Proportional Controller
- Supply Air Sensor
- Motorized Valve
- Loop Pump
- Hydronic Coil

NOTE: Figure 14 illustrates refrigerant circuit for single stage units; for dual stage units both refrigerant circuits are energized during reheat mode.

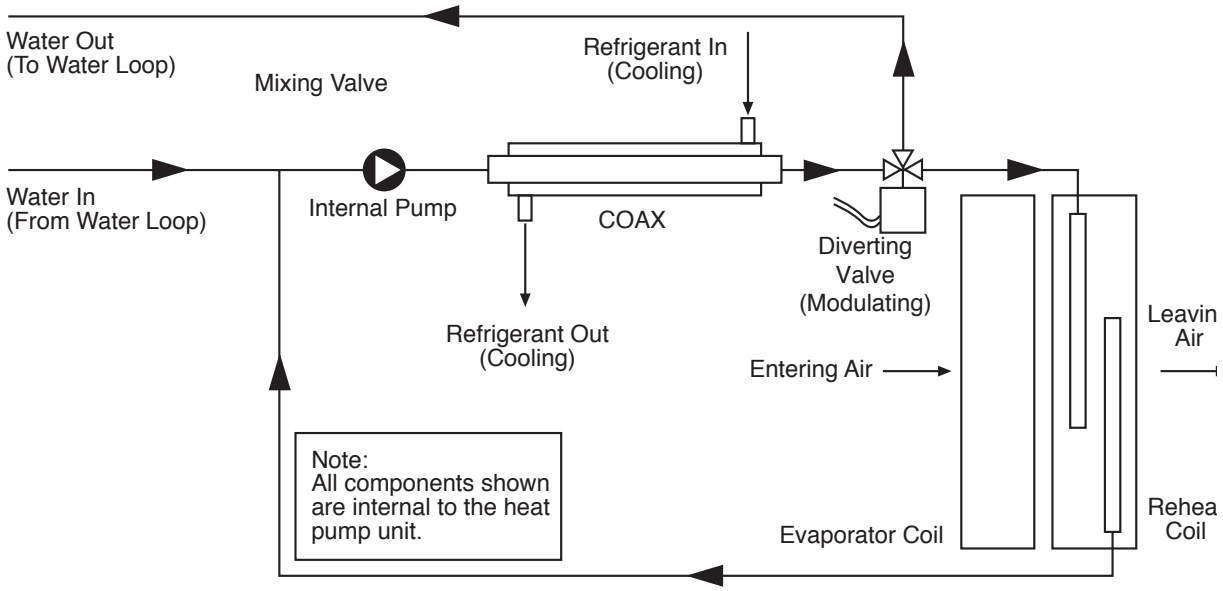
The Proportional Controller operates on 24 VAC power supply and automatically adjusts the water valve based upon the Supply Air Sensor. The Supply Air Sensor senses supply air temperature at the blower inlet providing the input signal necessary for the proportional control to drive the motorized valve during the reheat mode of operation. The Motorized Valve is a proportional actuator/ three-way valve combination used to divert the condenser water from the coax to the hydronic reheat coil during the reheat mode of operation. The proportional controller sends a signal to the motorized valve based on the supply air temperature of the supply air sensor.

The Loop Pump circulates condenser water through the hydronic reheat coil during the reheat mode of operation. In this application, the loop pump is only energized during the reheat mode of operation. The Hydronic Coil is utilized during the reheat mode of operation to reheat the air to the setpoint of the proportional controller. Condenser water is diverted by the motorized valve and pumped through the hydronic coil by the loop pump in proportion to the control setpoint. The amount of reheating is dependent on the setpoint and how far from setpoint the supply air temperature is. The factory setpoint is 70–75°F [21-24°C], generally considered “neutral” air.

⚠ CAUTION! ⚠

Installer Caution: After making water connections on units equipped with ClimaDry, ensure the three union nuts on the internal three-way water valve are tight.

Figure 14: ClimaDry Schematic



ClimaDry Modulating Reheat Option - GLV Unit Only

ClimaDry Application Considerations
Unlike most hot gas reheat options, the ClimaDry option will operate over a wide range of EWTs. Special flow regulation (water regulating valve) is not required for low EWT conditions. However, below 55°F [13°C], supply air temperatures cannot be maintained at 72°F [22°C] because the cooling capacity exceeds the reheat coil capacity at low water temperatures. Below 55°F [13°C], essentially all water is diverted to the reheat coil (no heat of rejection to the building loop). Although the ClimaDry option will work fine with low EWTs, overcooling of the space may result on rare occasions with ground loop (geothermal) systems (Note: Extended range units are required for ground loop systems). Since dehumidification is generally only required in cooling, most ground loop systems will not experience overcooling of the supply air temperature. If overcooling of the space is a concern (e.g. computer room well water application), auxiliary heating may be required to maintain space temperature when the unit is operating in the dehumidification mode.

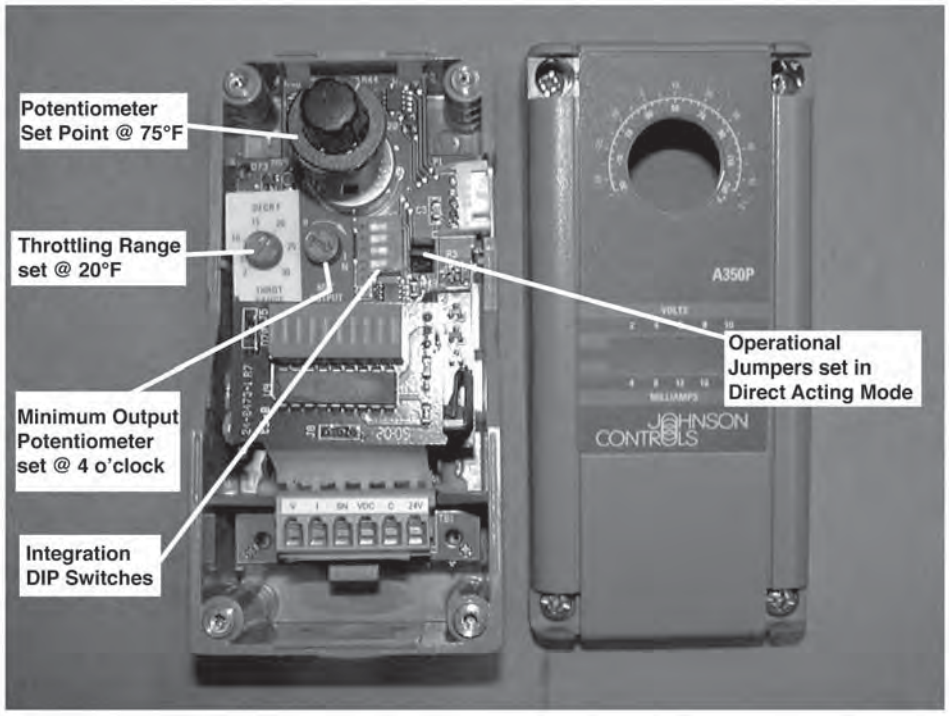
Water-Source Heat Pumps with ClimaDry should not be used as make-up air units. These applications should use equipment specifically designed for makeup air.

Proportional Controller Settings For GLV Units
The A350P proportional controller is factory set as follows:
- Jumpers set for Direct Acting operation. See figure 15.
- Integration DIP Switches: 1 = OFF, 2 = ON, 3 = OFF, and 4 = OFF.
- Throttling Range set at 20°F.
- Minimum Output set at approximately the 4 O'clock position.

⚠ CAUTION! ⚠

Water Source Heat Pump systems (including Water Loop Heat Pump systems) must have antifreeze protection to 20°F [-6.7°C] for ClimaDry applications. The ClimaDry option MUST NOT be used on open water loop systems, or any system without antifreeze protection.

Figure 15: Proportional Controller Settings



Blower Adjustment

⚠ CAUTION! ⚠

Always disconnect all power supply(s) to unit prior to making belt or sheave adjustments. Inadvertently starting of the motor can cause damage to the equipment and personal injury.

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 5a through 5k) 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 the table, then move horizontally to right under the required ESP. Note the sheave turns open, rpm and horsepower 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 - GLH

1. Remove belt from motor sheave
2. Lift motor assembly
3. Loosen the 5/16" 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 5/16" hex nuts (2 per bolt).
5. Lower the motor assembly
6. Install the belt
7. The belt should be tensioned tensioning gauge method such as the Browning Belt Tensioner to set proper belt tension (See next page).

Belt Tensioning Procedure - GLV

Blower motors for GLV models are slide base mounted.
To adjust the belt tension:

1. Loosen the two (2) bolts that lock the base to the slide rails.
2. Insert a socket into the opening at the front of the base assembly.
3. Turn counter clock wise to tighten or clock wise to loosen the belt.
4. The belt should be tensioned tensioning gauge method such as the Browning Belt Tensioner to set proper belt tension (See next page).
5. After belt tension is set secure the (2) locking bolts.

Notes:

- Motor position should not need adjustment.
- 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.

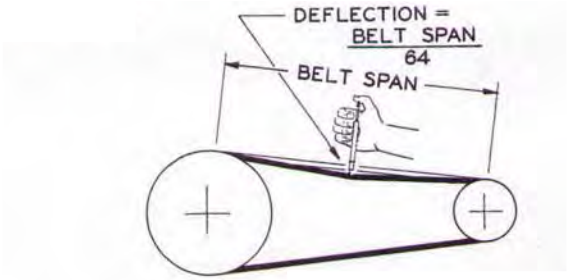
Special Note for AHRI Testing

The Units should be adjusted as follows for rated airflow:
GLH072 - 2400cfm/3.5 turns and 0.57 in wg ESP
GLH096 - 3200cfm/3.5 turns and 0.40 in wg ESP
GLH120 - 4000cfm/2.5 turns and 0.50 in wg ESP
GLV080 - 2600cfm/3.5 turns and 0.48 in wg ESP
GLV100 - 3500cfm/3.5 turns and 0.45 in wg ESP
GLV120 - 4000cfm/2.5 turns and 0.60 in wg ESP

Tensioning V-Belt Drives

General rules of tensioning

1. Ideal tension is the lowest tension at which the belt will not slip under peak load conditions.
2. Check tension frequently during the first 24-48 hours of operation.
3. Over tensioning shortens belt and bearing life.
4. Keep belts free from foreign material which may cause slip.
5. Make V-drive inspection on periodic basis. Tension when slipping. Never apply belt dressing as this willl damage the belt and cause early failure.



Tension Measurement Procedure

1. Measure the belt span (see sketch).
2. Position bottom of the large “O” ring on the span scale at the measured belt span.
3. Set the small “O” ring on the deflection force scale to zero.
4. Place the tension checker squarely on one belt at the center of the belt span. Apply a force on the plunger and perpendicular to the belt span until the bottom of the large “O” ring is even with the top of the next belt or with the bottom of a straight edge laid across the sheaves.
5. Remove the tension checker and read the forct applied from the bottom of the small “O” ring on the deflection force scale.
6. Compare the force you have applied with the values given in the table below. The force should be between the minimum and maximum shown. The maximum value is shown for “New Belt” and new belts should be tensioned at this value to allow for expected tension loss. Used belts should be maintained at the minimum value as indicated in the table below.

NOTE: The ratio of deflection to belt span is 1:64.

	Sheave Diameter - Inches		Deflection Force - LBS			
			Belt Deflection Force			
			Super Gripbelts and Unnotched Gripbands		Gripnotch Belts and Notched Gripbands	
Cross Section	Smallest Sheave Diameter Range	RPM Range	Used Belt	New Belt	Used Belt	New Belt
A, AX	3.0 - 3.6	1000-2500 2501-4000	3.7 2.8	5.5 4.2	4.1 3.4	6.1 5.0
	3.8 - 4.8	1000-2500 2501-4000	4.5 3.8	6.8 5.7	5.0 4.3	7.4 6.4
	5.0 - 7.0	1000-2500 2501-4000	5.4 4.7	8.0 7.0	5.7 5.1	9.4 7.6
B, BX	3.4 - 4.2	860-2500 2501-4000			4.9 4.2	7.2 6.2
	4.4 - 5.6	860-2500 2501-4000	5.3 4.5	7.9 6.7	7.1 7.1	10.5 9.1
	5.8 - 8.6	860-2500 2501-4000	6.3 6.0	9.4 8.9	8.5 7.3	12.6 10.9

Blower Sheave Information

Table 4a: GLH Blower Sheave and Belt Information

Model	072	096	120
Fan Motor			
Standard (hp) [kW]	1.5 [1.5]	2 [1.5]	2 [1.5]
Large (hp) [kW]	2 [1.5]	3 [2.2]	3 [2.2]
Standard Sheave (in) [cm]	1VP34 x 7/8 [2.22]	1VP56 x 7/8 [2.22]	1VP56 x 7/8 [2.22]
Low Static Sheave (in) [cm]	1VP44 x 7/8 [2.22]	1VP56 x 7/8 [2.22]	1VP56 x 7/8 [2.22]
High Static Sheave (in) [cm]	1VP34 x 7/8 [2.22]	1VP56 x 7/8 [2.22]	1VP56 x 7/8 [2.22]
Blower			
Wheel Size - Dia x W (in) [cm]	1 - 12 x 11 [30.5 x 27.9]	2 - 10 x 10 [25.4 x 25.4]	2 - 11 x 10 [27.9 x 25.4]
Standard Sheave (in) [cm]	AK71 x 3/4 [1.9]	AK61 x 1 [2.5]	AK66 x 1 [2.5]
Low Static Sheave (in) [cm]	AK71 x 3/4 [1.9]	AK74 x 1 [2.5]	AK79 x 1 [2.5]
High Static Sheave (in) [cm]	AK56 x 3/4 [1.9]	AK51 x 1 [2.5]	AK56 x 1 [2.5]
Belts			
Standard Belt	AX42	A41	A43
Low Static Belt	AX43	A44	A45
High Static Belt	A40	A40	A41

Table 4b: GLV Blower Sheave and Belt Information

Model	Configuration Return/Supply	Component	Drive Package				
			A	B	C	D	E
080/160	Back or Front/Top Back/Front Front/Back	Blower Sheave Motor Sheave Belt Belt Belt	AK71 x 3/4” 1VL44 x 7/8” AX31 AX42 AX42	AK74 x 3/4” 1VP34 x 7/8” AX31 AX42 AX42	AK59 x 3/4” 1VL44 x 7/8” AX31 AX42 AX42	- - - - -	AK59 x 3/4” 1VL44 x 7/8” AX31 AX42 AX42
100/200	Back or Front/Top Back/Front Front/Back	Blower Sheave Motor Sheave Belt Belt Belt	AK74 x 1” 1VL44 x 7/8” AX35 AX45 AX45	AK94 x 1” 1VL44 x 7/8” AX35 AX45 AX45	_ _ _ _ _	- - - - -	AK66 x 1” 1VL44 x 7/8” AX35 AX45 AX45
120/240	Back or Front/Top Back/Front Front/Back	Blower Sheave Motor Sheave Belt Belt Belt	AK74 x 1” 1VL44 x 7/8” AX35 AX45 AX45	AK94 x 1” 1VL44 x 7/8” AX35 AX45 AX45	AK66 x 1” 1VL44 x 7/8” AX35 AX45 AX45	- - - - -	AK66 x 1” 1VL44 x 7/8” AX35 AX45 AX45
300	Back/Front Front/Back	Blower Sheave Motor Sheave Belt Belt	AK84 x 1” 1VP50 x 7/8” AX35 AX35	_ _ _ _	AK84 x 1” 1VP56 x 7/8” AX35 AX35	- - - -	- - - -

Blower Performance

GL Series Dry Coil to Wet Coil Conversion Table

Air Coil Face Velocity (fpm)	Required BHP Multiplier	Required RPM Multiplier
250	1.00	1.00
300	1.02	1.06
350	1.05	1.12
400	1.08	1.18
450	1.11	1.26
500	1.14	1.34

Example:
GLV080 Dry coil performance is 0.92 BHP, 867 rpm
@ 2600 cfm (or 2600 cfm / 9 ft2 coil = 290 fpm);
Wet Coil performance would be 0.92 x 1.02 = 0.94 BHP Required
and 867 rpm x 1.06 = 919 rpm required

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

GLH 072 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. w.g.)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
1800	BHP		0.23	0.26	0.31	0.35	0.39	0.44	0.48	0.53	0.58	0.63	0.68	0.73	0.79	0.84	0.90
	RPM		482	536	587	636	683	729	773	816	858	899	938	977	1015	1052	1088
	TURNS OPEN		5.0	4.0	3.0	2.0	1.0	5.0	4.0	3.0	2.5	1.5	1.0	0.0	3.5	3.0	2.5
2000	BHP	0.27	0.31	0.35	0.40	0.44	0.49	0.54	0.59	0.64	0.69	0.75	0.80	0.86	0.91	0.97	1.03
	RPM	484	534	582	629	674	717	760	801	841	881	919	956	993	1029	1064	1098
	TURNS OPEN	5.0	4.0	3.0	2.0	1.5	5.0	4.0	3.5	2.5	2.0	1.0	0.5	4.0	3.5	3.0	2.5
2200	BHP	0.36	0.41	0.46	0.51	0.56	0.61	0.66	0.72	0.77	0.83	0.88	0.94	1.00	1.06	1.12	1.18
	RPM	544	589	633	676	717	758	797	836	873	910	946	982	1016	1050	1084	1116
	TURNS OPEN	4.0	3.0	2.0	1.5	5.0	4.0	3.5	3.0	2.0	1.5	0.5	0.0	3.5	3.0	2.5	2.0
2400	BHP	0.49	0.54	0.59	0.64	0.70	0.75	0.81	0.87	0.93	0.99	1.05	1.11	1.17	1.24	1.30	1.37
	RPM	605	647	687	726	765	802	839	875	910	945	979	1012	1045	1077	1109	1140
	TURNS OPEN	2.5	2.0	1.0	5.0	4.0	3.5	2.5	2.0	1.5	0.5	0.0	3.5	3.0	3.0	2.5	2.0
2600	BHP	0.64	0.69	0.75	0.81	0.86	0.92	0.99	1.05	1.11	1.17	1.24	1.30	**1.37**	**1.44**	**1.51**	**1.57**
	RPM	667	705	742	779	814	849	884	917	950	983	1015	1046	**1078**	**1108**	**1138**	**1168**
	TURNS OPEN	1.5	1.0	4.5	4.0	3.0	2.5	2.0	1.0	0.5	0.0	3.5	3.0	**2.5**	**2.5**	**2.0**	**1.5**
2800	BHP	0.81	0.87	0.93	1.00	1.06	1.12	1.19	**1.25**	**1.32**	**1.39**	**1.46**	**1.52**	**1.60**	**1.67**	**1.74**	**1.81**
	RPM	729	764	799	833	866	899	931	**962**	**993**	**1024**	**1054**	**1084**	**1114**	**1143**	**1171**	**1199**
	TURNS OPEN	5.0	4.0	3.5	3.0	2.0	1.5	1.0	**0.5**	**0.0**	**3.5**	**3.0**	**2.5**	**2.0**	**2.0**	**1.5**	**1.0**
3000	BHP	1.02	1.09	1.15	1.22	1.29	**1.35**	**1.42**	**1.49**	**1.56**	**1.64**	**1.71**	**1.78**	**1.85**	**1.93**		
	RPM	793	825	858	889	920	**951**	**981**	**1011**	**1040**	**1069**	**1098**	**1126**	**1154**	**1182**		
	TURNS OPEN	3.5	3.0	2.5	1.5	1.0	**0.5**	**0.0**	**3.5**	**3.5**	**3.0**	**2.5**	**2.0**	**1.5**	**1.0**		

Bold Face Requires 2 HP Motor. Rev.: 12/30/02 B
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (2400 cfm @ 0.5 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2.5 turns open (2400 cfm @ 0.5 in. ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Based on 12x11 blower.
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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Blower Performance

GLH 096 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. w.g.)																
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
2600	BHP			0.84	0.91	0.97	1.04	1.10	1.17	1.24	1.31	1.37	1.44	1.51	1.58	1.65	1.72
	RPM			1048	1095	1140	1184	1226	1267	1308	1346	1384	1421	1457	1493	1527	1560
	TURNS OPEN			4.0	3.0	2.0	1.0	0.0	4.0	3.5	2.5	2.0	1.5	1.0	4.5	4.0	3.5
2800	BHP	0.87	0.94	1.01	1.08	1.15	1.22	1.29	1.36	1.43	1.51	1.58	1.65	1.73	1.80	1.87	1.95
	RPM	1012	1058	1104	1148	1191	1232	1273	1313	1351	1389	1426	1461	1497	1531	1564	1597
	TURNS OPEN	4.5	3.5	2.5	2.0	1.0	4.5	4.0	3.5	2.5	2.0	1.5	1.0	4.5	4.0	3.5	3.0
3000	BHP	1.05	1.12	1.20	1.27	1.35	1.42	1.50	1.57	1.65	1.73	1.80	1.88	1.96	**2.04**	**2.12**	**2.20**
	RPM	1070	1114	1157	1199	1239	1280	1319	1356	1394	1430	1465	1501	1534	**1568**	**1601**	**1632**
	TURNS OPEN	3.5	2.5	1.5	0.5	4.5	4.0	3.0	2.5	2.0	1.5	0.5	0.0	4.0	**3.5**	**3.0**	**2.5**
3200	BHP	1.25	1.32	1.40	1.48	1.56	1.64	1.72	1.80	1.88	**2.00**	**2.04**	**2.13**	**2.21**	**2.29**	**2.38**	**2.46**
	RPM	1126	1167	1208	1248	1287	1325	1362	1400	1435	**1470**	**1505**	**1538**	**1571**	**1604**	**1636**	**1667**
	TURNS OPEN	2.5	1.5	0.5	4.5	3.5	3.0	2.5	2.0	1.0	**0.5**	**0.0**	**4.0**	**3.5**	**3.0**	**2.5**	**2.0**
3400	BHP	1.46	1.54	1.62	1.71	1.79	1.88	1.96	**2.05**	**2.13**	**2.22**	**2.31**	**2.39**	**2.48**	**2.57**	**2.65**	**2.74**
	RPM	1179	1219	1257	1296	1333	1369	1406	**1441**	**1475**	**1510**	**1543**	**1576**	**1608**	**1639**	**1671**	**1702**
	TURNS OPEN	1.0	0.5	4.5	3.5	3.0	2.5	1.5	**1.0**	**0.5**	**0.0**	**4.0**	**3.5**	**3.0**	**2.5**	**2.0**	**1.5**
3600	BHP	1.69	1.78	1.87	1.95	**2.04**	**2.13**	**2.22**	**2.31**	**2.40**	**2.49**	**2.58**	**2.67**	**2.76**	**2.85**	**2.94**	
	RPM	1230	1268	1305	1341	**1377**	**1413**	**1447**	**1481**	**1515**	**1548**	**1580**	**1612**	**1643**	**1674**	**1705**	
	TURNS OPEN	4.5	4.0	3.5	3.0	**2.0**	**1.5**	**1.0**	**0.5**	**0.0**	**4.0**	**3.5**	**3.0**	**2.5**	**2.0**	**1.5**	
3800	BHP	1.94	**2.03**	**2.13**	**2.22**	**2.31**	**2.41**	**2.50**	**2.59**	**2.69**	**2.78**	**2.88**	**2.97**				
	RPM	1280	**1316**	**1351**	**1387**	**1421**	**1455**	**1488**	**1521**	**1553**	**1586**	**1617**	**1648**				
	TURNS OPEN	4.0	**3.0**	**2.5**	**2.0**	**1.5**	**1.0**	**0.5**	**4.0**	**3.5**	**3.0**	**3.0**	**2.5**				

Rev.: 4/7/08S

Bold Face Requires 3 HP Motor
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Units factory shipped with standard static sheave and drive at 2.5 turns open (3200 cfm @ 0.6 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3.5 turns open (3200 cfm @ 0.4 in. ESP Wet Coil). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Based on 2-10x10(R) blowers.
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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

GLH 120 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. w.g.)																
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
3400	BHP	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.54	1.59	1.63	1.68	1.73	1.77	1.82
	RPM	1014	1043	1072	1102	1129	1156	1183	1209	1234	1260	1285	1309	1333	1356	1380	1403
	TURNS OPEN	3.0	2.5	2.0	1.0	0.5	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0	4.5	4.0	4.0
3600	BHP	1.26	1.31	1.37	1.42	1.48	1.53	1.58	1.63	1.68	1.74	1.79	1.84	1.89	1.94	1.99	**2.04**
	RPM	1052	1081	1109	1136	1163	1190	1216	1241	1266	1291	1315	1338	1362	1385	1408	**1430**
	TURNS OPEN	2.5	1.5	1.0	0.5	4.0	3.5	3.0	2.5	2.5	2.0	1.5	1.0	4.5	4.0	3.5	**3.5**
3800	BHP	1.44	1.50	1.56	1.61	1.67	1.73	1.78	1.84	1.89	1.95	2.00	**2.06**	**2.11**	**2.16**	**2.21**	**2.26**
	RPM	1090	1118	1145	1172	1199	1223	1248	1273	1298	1321	1345	**1368**	**1391**	**1413**	**1435**	**1457**
	TURNS OPEN	1.5	1.0	0.0	4.0	3.5	3.0	2.5	2.0	1.5	1.0	1.0	**0.5**	**0.0**	**3.5**	**3.5**	**3.0**
4000	BHP	1.63	1.70	1.76	1.82	1.88	1.94	2.00	**2.06**	**2.11**	**2.17**	**2.22**	**2.28**	**2.34**	**2.39**	**2.45**	**2.50**
	RPM	1127	1154	1181	1207	1232	1257	1281	**1306**	**1329**	**1352**	**1375**	**1398**	**1420**	**1441**	**1463**	**1485**
	TURNS OPEN	0.5	4.5	4.0	3.5	3.0	2.5	2.0	**1.5**	**1.0**	**0.5**	**0.0**	**0.0**	**3.5**	**3.0**	**3.0**	**2.5**
4200	BHP	1.84	1.91	1.98	**2.04**	**2.10**	**2.16**	**2.22**	**2.28**	**2.34**	**2.40**	**2.47**	**2.53**	**2.59**	**2.65**	**2.71**	**2.77**
	RPM	1164	1191	1217	**1241**	**1266**	**1291**	**1314**	**1337**	**1360**	**1383**	**1406**	**1427**	**1449**	**1470**	**1492**	**1513**
	TURNS OPEN	4.0	3.5	3.0	**2.5**	**2.5**	**2.0**	**1.5**	**1.0**	**0.5**	**0.0**	**3.5**	**3.5**	**3.0**	**2.5**	**2.5**	**2.0**
4400	BHP	**2.07**	**2.13**	**2.20**	**2.27**	**2.33**	**2.40**	**2.46**	**2.53**	**2.60**	**2.66**	**2.73**	**2.79**	**2.86**	**2.93**	**2.99**	
	RPM	**1202**	**1227**	**1251**	**1276**	**1300**	**1323**	**1346**	**1369**	**1392**	**1414**	**1435**	**1457**	**1478**	**1500**	**1520**	
	TURNS OPEN	**3.5**	**3.0**	**2.5**	**2.0**	**1.5**	**1.0**	**1.0**	**0.5**	**0.0**	**3.5**	**3.5**	**3.0**	**2.5**	**2.5**	**2.0**	
4600	BHP	**2.30**	**2.37**	**2.44**	**2.51**	**2.59**	**2.66**	**2.73**	**2.80**	**2.87**	**2.95**						
	RPM	**1237**	**1262**	**1287**	**1310**	**1333**	**1356**	**1379**	**1402**	**1423**	**1444**						
	TURNS OPEN	**3.0**	**2.5**	**2.0**	**1.5**	**1.0**	**0.5**	**0.0**	**4.0**	**3.5**	**3.0**						

Rev.: 4/7/08S

Bold Face Requires 3 HP Motor
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Units factory shipped at ISO/ARI setting with standard static sheave and drive at 2.5 turns open (4000 cfm @ 0.5 in. ESP). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3.5 turns open (3200 cfm @ 0.4 in. ESP). Other speeds require field selection.
For applications requiring higher static pressures, contact your local representative.
Based on 2-11x10(R) blowers.
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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Blower Performance

GLV 080 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
2000	BHP	0.36	0.39	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.76	0.80	0.84	0.89	0.93	0.98
	RPM	600	641	681	720	757	794	829	864	898	931	964	996	1027	1058	1088	1117
	Turns Open	3	2	1	0.5	4.5	3.5	3	2	1.5	1	0.5	3	2.5	2	1.5	1
2200	BHP	0.45	0.49	0.53	0.57	0.61	0.65	0.70	0.74	0.79	0.83	0.88	0.92	0.97	1.02	1.06	1.11
	RPM	633	671	708	745	780	814	848	881	913	945	976	1006	1036	1066	1095	1123
	Turns Open	2	1.5	0.5	4.5	4	3	2.5	2	1.5	0.5	0	3	2.5	2	1.5	1
2400	BHP	0.55	0.60	0.64	0.69	0.73	0.78	0.82	0.87	0.92	0.97	1.02	1.07	1.11	1.16	1.22	1.27
	RPM	670	705	740	774	807	840	872	903	934	964	993	1022	1051	1079	1107	1134
	Turns Open	1.5	1	4.5	4	3.5	2.5	2	1.5	1	0.5	3	2.5	2	2	1.5	1
2600	BHP	0.68	0.73	0.77	0.82	0.87	0.92	0.97	1.02	1.07	1.12	1.17	1.22	1.28	1.33	1.38	1.44
	RPM	708	741	773	805	837	867	898	927	957	985	1013	1041	1069	1096	1122	1149
	Turns Open	0.5	4.5	4	3.5	2.5	2	1.5	1	0.5	0	3	2.5	2	1.5	1	0.5
2800	BHP	0.82	0.87	0.92	0.97	1.02	1.08	1.13	1.18	1.24	1.29	1.34	1.40	**1.45**	**1.51**	**1.57**	**1.62**
	RPM	744	775	806	836	866	895	924	952	980	1007	1034	1061	**1087**	**1113**	**1138**	**1164**
	Turns Open	4.5	4	3.5	3	2	1.5	1	0.5	0	3	2.5	2	**1.5**	**1.5**	**1**	**0.5**
3000	BHP	0.97	1.03	1.08	1.14	1.19	1.25	1.30	1.36	**1.41**	**1.47**	**1.53**	**1.59**	**1.65**	**1.70**	**1.76**	**1.82**
	RPM	777	807	836	865	893	921	948	975	**1002**	**1028**	**1054**	**1079**	**1104**	**1129**	**1154**	**1178**
	Turns Open	4	3.5	3	2	1.5	1	0.5	0	**3**	**2.5**	**2**	**2**	**1.5**	**1**	**0.5**	**0**
3200	BHP	1.14	1.19	1.25	1.31	1.36	1.42	**1.48**	**1.54**	**1.60**	**1.66**	**1.72**	**1.78**				
	RPM	807	835	862	890	917	943	**969**	**995**	**1021**	**1046**	**1071**	**1095**				
	Turns Open	3.5	3	2.5	1.5	1	0.5	**3**	**3**	**2.5**	**2**	**2**	**1.5**				

Rev.: 4/7/08S

Bold Face Requires 2 HP Motor.
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (2400 cfm @ 0.6 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3 turns open (2400 cfm @ 0.48 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

GLV 100 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
2700	BHP				0.50	0.56	0.63	0.70	0.77	0.84	0.90	0.97	1.03	1.10	1.17	1.23	1.30
	RPM				561	599	635	670	704	736	767	797	826	854	881	907	933
	Turns Open				4.5	3.5	2.5	1.5	4.5	4	3.5	3	2	1.5	1	0.5	0
2900	BHP				0.57	0.63	0.70	0.78	0.86	0.92	0.99	1.06	1.13	1.20	1.26	1.33	1.40
	RPM				576	613	648	682	714	746	776	805	833	861	887	913	938
	Turns Open				4	3	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0
3100	BHP			0.58	0.64	0.71	0.78	0.86	0.94	1.02	1.10	1.19	1.27	1.35	1.43	**1.52**	**1.60**
	RPM			553	590	626	660	693	724	755	784	813	841	868	894	**919**	**944**
	Turns Open			4.5	3.5	2.5	2	1	4.5	3.5	3	2.5	2	1.5	1	**2.5**	**2**
3300	BHP			0.66	0.73	0.80	0.87	0.94	1.02	1.11	1.19	1.28	1.36	**1.45**	**1.53**	**1.62**	**1.70**
	RPM			569	604	638	671	703	734	764	793	821	848	**874**	**900**	**925**	**950**
	Turns Open			4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	**3.5**	**3**	**2.5**	**2**
3500	BHP		0.68	0.75	0.82	0.89	0.96	1.04	1.12	1.21	1.28	1.36	1.44	**1.52**	**1.59**	**1.67**	**1.75**
	RPM		549	584	618	651	683	714	744	773	802	829	856	**882**	**907**	**932**	**956**
	Turns Open		4.5	3.5	3	2	1	4.5	4	3.5	2.5	2	1.5	**3**	**2.5**	**2**	**2**
3700	BHP		0.78	0.85	0.92	0.99	1.07	1.15	1.23	1.31	1.40	**1.48**	**1.55**	**1.63**	**1.70**	**1.78**	
	RPM		566	600	633	665	696	726	755	783	811	**838**	**864**	**889**	**914**	**939**	
	Turns Open		4	3.5	2.5	1.5	1	4	3.5	3	2.5	**4**	**3.5**	**3**	**2.5**	**2**	
3900	BHP	0.82	0.89	0.96	1.03	1.10	1.18	1.26	1.35	1.43	**1.52**	**1.62**	**1.71**	**1.81**			
	RPM	550	584	616	648	679	709	738	766	794	**821**	**847**	**873**	**898**			
	Turns Open	4.5	3.5	3	2	1.5	4.5	4	3.5	3	**4**	**4**	**3.5**	**3**			
4100	BHP	0.93	1.00	1.08	1.15	1.23	1.31	1.39	**1.48**	**1.56**	**1.66**	**1.75**	**1.85**				
	RPM	570	602	633	664	693	722	751	**778**	**805**	**832**	**857**	**883**				
	Turns Open	4	3.5	2.5	1.5	1	4.5	3.5	**5**	**4.5**	**4**	**3.5**	**3**				

Rev.: 4/7/08S

Bold Face Requires 2 HP Motor.
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (3500 cfm @ 0.7 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3.5 turns open (3500 cfm @ 0.45 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Blower Performance

GLV 120 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
2800	BHP				0.53	0.60	0.67	0.74	0.81	0.87	0.94	1.01	1.08	1.15	1.21	1.28	1.35
	RPM				569	606	642	676	709	741	771	801	830	857	884	910	936
	Turns Open				4	3	2.5	1.5	4.5	4	3.5	2.5	2	1.5	1	0.5	0
3000	BHP			0.54	0.60	0.67	0.74	0.82	0.89	0.98	1.06	1.16	1.22	1.29	1.36	1.43	1.50
	RPM			546	583	619	654	687	719	750	780	809	837	864	891	916	941
	Turns Open			4.5	4	3	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0
3200	BHP			0.62	0.68	0.75	0.82	0.90	0.98	1.06	1.15	1.24	1.34	1.43	1.51	1.58	1.65
	RPM			561	597	632	666	698	729	759	789	817	844	871	897	922	947
	Turns Open			4.5	3.5	2.5	1.5	1	4	3.5	3	2.5	2	1.5	1	0.5	0
3400	BHP			0.70	0.77	0.84	0.91	0.99	1.07	1.16	1.24	1.33	1.42	1.50	1.58	1.67	1.75
	RPM			576	611	645	677	709	739	769	797	825	852	878	904	929	953
	Turns Open			4	3	2	1.5	4.5	4	3.5	3	2.5	1.5	1	0.5	0	2
3600	BHP		0.73	0.80	0.87	0.94	1.01	1.09	1.17	1.26	1.35	1.44	1.53	1.63	1.69	1.74	1.80
	RPM		557	592	625	658	689	720	750	778	806	833	860	886	911	935	959
	Turns Open		4.5	3.5	2.5	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0	2
3800	BHP		0.83	0.90	0.97	1.05	1.12	1.20	1.29	1.37	1.46	1.55	1.65	1.75	**1.85**	**1.95**	**2.06**
	RPM		575	608	640	672	702	732	760	788	816	842	868	894	**918**	**943**	**966**
	Turns Open		4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	1.5	1	**0.5**	**2**	**1.5**
4000	BHP	0.87	0.94	1.01	1.09	1.16	1.24	1.33	1.41	1.50	1.59	1.68	1.78	**1.88**	**1.98**	**2.08**	**2.19**
	RPM	560	593	624	656	686	715	744	772	799	826	852	878	**902**	**927**	**951**	**974**
	Turns Open	4.5	3.5	2.5	2	1	4.5	4	3.5	3	2	1.5	1	**0.5**	**2.5**	**2**	**1.5**
4200	BHP	0.99	1.07	1.14	1.22	1.29	1.38	1.46	1.55	1.63	1.73	1.82	**1.92**	**2.02**	**2.12**	**2.23**	**2.34**
	RPM	580	611	642	672	701	729	757	785	811	837	863	**888**	**912**	**936**	**960**	**983**
	Turns Open	4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	1.5	**1**	**2.5**	**2**	**2**	**1.5**
4400	BHP	1.13	1.20	1.28	1.36	1.44	1.52	1.61	1.69	1.79	**1.88**	**1.98**	**2.07**	**2.17**	**2.28**	**2.39**	**2.49**
	RPM	601	631	660	689	717	745	772	798	824	**850**	**875**	**899**	**923**	**947**	**970**	**993**
	Turns Open	3.5	2.5	2	1	4.5	4	3.5	3	2.5	**2**	**3.5**	**3**	**2.5**	**2**	**1.5**	**1**
4600	BHP	1.27	1.35	1.43	1.51	1.59	1.68	1.77	**1.86**	**1.95**	**2.05**	**2.14**	**2.25**	**2.35**	**2.45**	**2.56**	**2.67**
	RPM	623	652	680	707	734	761	787	**813**	**839**	**864**	**888**	**912**	**936**	**959**	**981**	**1003**
	Turns Open	2.5	2	1.5	4.5	4	3.5	3	**2.5**	**4**	**3.5**	**3**	**2.5**	**2**	**2**	**1.5**	**1**

Rev.: 4/7/08S

Bold Face Requires 3 HP Motor.
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (4000 cfm @ 0.6 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2.5 turns open (4000 cfm @ 0.6 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

GLV 160 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
4000	BHP	0.36	0.39	0.43	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.76	0.80	0.84	0.89	0.93	0.98
	RPM	600	641	681	720	757	794	829	864	898	931	964	996	1027	1058	1088	1117
	Turns Open	3	2	1	0.5	4.5	3.5	3	2	1.5	1	0.5	3	2.5	2	1.5	1
4400	BHP	0.45	0.49	0.53	0.57	0.61	0.65	0.70	0.74	0.79	0.83	0.88	0.92	0.97	1.02	1.06	1.11
	RPM	633	671	708	745	780	814	848	881	913	945	976	1006	1036	1066	1095	1123
	Turns Open	2	1.5	0.5	4.5	4	3	2.5	2	1.5	0.5	0	3	2.5	2	1.5	1
4800	BHP	0.55	0.60	0.64	0.69	0.73	0.78	0.82	0.87	0.92	0.97	1.02	1.07	1.11	1.16	1.22	1.27
	RPM	670	705	740	774	807	840	872	903	934	964	993	1022	1051	1079	1107	1134
	Turns Open	1.5	1	4.5	4	3.5	2.5	2	1.5	1	0.5	3	2.5	2	2	1.5	1
5200	BHP	0.68	0.73	0.77	0.82	0.87	0.92	0.97	1.02	1.07	1.12	1.17	1.22	1.28	1.33	1.38	1.44
	RPM	708	741	773	805	837	867	898	927	957	985	1013	1041	1069	1096	1122	1149
	Turns Open	0.5	4.5	4	3.5	2.5	2	1.5	1	0.5	0	3	2.5	2	1.5	1	0.5
5600	BHP	0.82	0.87	0.92	0.97	1.02	1.08	1.13	1.18	1.24	1.29	1.34	1.40				
	RPM	744	775	806	836	866	895	924	952	980	1007	1034	1061				
	Turns Open	4.5	4	3.5	3	2	1.5	1	0.5	0	3	2.5	2				
6000	BHP	0.97	1.03	1.08	1.14	1.19	1.25	1.30	1.36								
	RPM	777	807	836	865	893	921	948	975								
	Turns Open	4	3.5	3	2	1.5	1	0.5	0								
6400	BHP	1.14	1.19	1.25	1.31	1.36	1.42										
	RPM	807	835	862	890	917	943										
	Turns Open	3.5	3	2.5	1.5	1	0.5										

Rev.: 4/7/08S

A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (5200 cfm @ 0.4 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2 turns open (5200 cfm @ 0.48 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Blower Performance

GLV 200 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)																
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
5400	BHP				0.50	0.56	0.63	0.70	0.77	0.84	0.90	0.97	1.03	1.10	1.17	1.23	1.30
	RPM				561	599	635	670	704	736	767	797	826	854	881	907	933
	Turns Open				4.5	3.5	2.5	1.5	4.5	4	3.5	3	2	1.5	1	0.5	0
5800	BHP				0.57	0.63	0.70	0.78	0.86	0.92	0.99	1.06	1.13	1.20	1.26	1.33	1.40
	RPM				576	613	648	682	714	746	776	805	833	861	887	913	938
	Turns Open				4	3	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0
6200	BHP			0.58	0.64	0.71	0.78	0.86	0.94	1.02	1.10	1.19	1.27	1.35	1.43	**1.52**	**1.60**
	RPM			553	590	626	660	693	724	755	784	813	841	868	894	**919**	**944**
	Turns Open			4.5	3.5	2.5	2	1	4.5	3.5	3	2.5	2	1.5	1	**2.5**	**2**
6600	BHP			0.66	0.73	0.80	0.87	0.94	1.02	1.11	1.19	1.28	1.36	**1.45**	**1.53**	**1.62**	**1.70**
	RPM			569	604	638	671	703	734	764	793	821	848	**874**	**900**	**925**	**950**
	Turns Open			4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	**3.5**	**3**	**2.5**	**2**
7000	BHP		0.68	0.75	0.82	0.89	0.96	1.04	1.12	1.21	1.28	1.36	1.44	**1.52**	**1.59**	**1.67**	**1.75**
	RPM		549	584	618	651	683	714	744	773	802	829	856	**882**	**907**	**932**	**956**
	Turns Open		4.5	3.5	3	2	1	4.5	4	3.5	2.5	2	1.5	**3**	**2.5**	**2**	**2**
7400	BHP		0.78	0.85	0.92	0.99	1.07	1.15	1.23	1.31	1.40	**1.48**	**1.55**	**1.63**	**1.70**	**1.78**	
	RPM		566	600	633	665	696	726	755	783	811	**838**	**864**	**889**	**914**	**939**	
	Turns Open		4	3.5	2.5	1.5	1	4	3.5	3	2.5	**4**	**3.5**	**3**	**2.5**	**2**	
7800	BHP	0.82	0.89	0.96	1.03	1.10	1.18	1.26	1.35	1.43	**1.52**	**1.62**	**1.71**	**1.81**			
	RPM	550	584	616	648	679	709	738	766	794	**821**	**847**	**873**	**898**			
	Turns Open	4.5	3.5	3	2	1.5	4.5	4	3.5	3	**4**	**4**	**3.5**	**3**			
8200	BHP	0.93	1.00	1.08	1.15	1.23	1.31	**1.39**	**1.48**	**1.56**	**1.66**	**1.75**	**1.85**				
	RPM	570	602	633	664	693	722	**751**	**778**	**805**	**832**	**857**	**883**				
	Turns Open	4	3.5	2.5	1.5	1	4.5	**3.5**	**5**	**4.5**	**4**	**3.5**	**3**				

Rev.: 4/7/08S

Bold Face Requires 2 HP Motors.
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (7000 cfm @ 0.7 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 3.5 turns open (7000 cfm @ 0.45 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

GLV 240 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)																
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
5600	BHP				0.53	0.60	0.67	0.74	0.81	0.87	0.94	1.01	1.08	1.15	1.21	1.28	1.35
	RPM				569	606	642	676	709	741	771	801	830	857	884	910	936
	Turns Open				4	3	2.5	1.5	4.5	4	3.5	2.5	2	1.5	1	0.5	0
6000	BHP			0.54	0.60	0.67	0.74	0.82	0.89	0.98	1.06	1.16	1.22	1.29	1.36	1.43	1.50
	RPM			546	583	619	654	687	719	750	780	809	837	864	891	916	941
	Turns Open			4.5	4	3	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0
6400	BHP			0.62	0.68	0.75	0.82	0.90	0.98	1.06	1.15	1.24	1.34	1.43	1.51	1.58	1.65
	RPM			561	597	632	666	698	729	759	789	817	844	871	897	922	947
	Turns Open			4.5	3.5	2.5	1.5	1	4	3.5	3	2.5	2	1.5	1	0.5	0
6800	BHP			0.70	0.77	0.84	0.91	0.99	1.07	1.16	1.24	1.33	1.42	1.50	1.58	1.67	1.75
	RPM			576	611	645	677	709	739	769	797	825	852	878	904	929	953
	Turns Open			4	3	2	1.5	4.5	4	3.5	3	2.5	1.5	1	0.5	0	2
7200	BHP		0.73	0.80	0.87	0.94	1.01	1.09	1.17	1.26	1.35	1.44	1.53	1.63	1.69	1.74	1.80
	RPM		557	592	625	658	689	720	750	778	806	833	860	886	911	935	959
	Turns Open		4.5	3.5	2.5	2	1	4.5	4	3	2.5	2	1.5	1	0.5	0	2
7600	BHP		0.83	0.90	0.97	1.05	1.12	1.20	1.29	1.37	1.46	1.55	1.65	1.75	**1.85**	**1.95**	**2.06**
	RPM		575	608	640	672	702	732	760	788	816	842	868	894	**918**	**943**	**966**
	Turns Open		4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	1.5	1	**0.5**	**2**	**1.5**
8000	BHP	0.87	0.94	1.01	1.09	1.16	1.24	1.33	1.41	1.50	1.59	1.68	1.78	**1.88**	**1.98**	**2.08**	**2.19**
	RPM	560	593	624	656	686	715	744	772	799	826	852	878	**902**	**927**	**951**	**974**
	Turns Open	4.5	3.5	2.5	2	1	4.5	4	3.5	3	2	1.5	1	**0.5**	**2.5**	**2**	**1.5**
8400	BHP	0.99	1.07	1.14	1.22	1.29	1.38	1.46	1.55	1.63	1.73	1.82	**1.92**	**2.02**	**2.12**	**2.23**	**2.34**
	RPM	580	611	642	672	701	729	757	785	811	837	863	**888**	**912**	**936**	**960**	**983**
	Turns Open	4	3	2.5	1.5	4.5	4	3.5	3	2.5	2	1.5	**1**	**2.5**	**2**	**2**	**1.5**
8800	BHP	1.13	1.20	1.28	1.36	1.44	1.52	1.61	1.69	1.79	**1.88**	**1.98**	**2.07**	**2.17**	**2.28**	**2.39**	**2.49**
	RPM	601	631	660	689	717	745	772	798	824	**850**	**875**	**899**	**923**	**947**	**970**	**993**
	Turns Open	3.5	2.5	2	1	4.5	4	3.5	3	2.5	**2**	**3.5**	**3**	**2.5**	**2**	**1.5**	**1**
9200	BHP	1.27	1.35	1.43	1.51	1.59	1.68	1.77	**1.86**	**1.95**	**2.05**	**2.14**	**2.25**	**2.35**	**2.45**	**2.56**	**2.67**
	RPM	623	652	680	707	734	761	787	**813**	**839**	**864**	**888**	**912**	**936**	**959**	**981**	**1003**
	Turns Open	2.5	2	1.5	4.5	4	3.5	3	**2.5**	**4**	**3.5**	**3**	**2.5**	**2**	**2**	**1.5**	**1**

Rev.: 4/7/08S

Bold Face Requires 3 HP Motors.
A=Std Static/Std Mtr; B=Low Static/Std Mtr; C=High Static/Std Mtr; D=Std Static/Large Mtr; E=High Static/Large Mtr
Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.
Units factory shipped with standard static sheave and drive at 2.5 turns open (8000 cfm @ 0.6 in. ESP Wet Coil). Other speeds require field selection.
ISO/ARI rating point with standard static sheave and drive at 2.5 turns open (8000 cfm @ 0.6 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Blower Performance

GLV 300 Blower Performance

Airflow in CFM with dry coil and clean air filter.

Airflow (SCFM)		External Static Pressure (in. wg)															
		0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
7400	BHP						1.25	1.33	1.42	1.52	1.61	1.71	1.81	1.92	2.03	2.14	2.25
	RPM						761	789	817	843	869	895	920	944	968	991	1014
	Turns Open						4.5	3.5	3	2.5	2	1.5	0.5	0	2.5	2	1.5
7800	BHP					1.31	1.40	1.49	1.58	1.67	1.77	1.87	1.97	2.08	2.19	2.30	2.42
	RPM					755	783	810	837	862	888	913	937	961	984	1007	1029
	Turns Open					4.5	4	3	2.5	2	1.5	1	0.5	0	2.5	1.5	1
8200	BHP				1.39	1.47	1.56	1.65	1.74	1.84	1.94	2.04	2.15	2.25	2.37	2.48	2.60
	RPM				749	777	804	830	856	881	906	930	954	977	1000	1022	1044
	Turns Open				4.5	4	3.5	3	2	1.5	1	0.5	0	2.5	2	1.5	1
8600	BHP				1.55	1.64	1.73	1.82	1.92	2.02	2.12	2.22	2.33	2.44	2.55	2.67	2.78
	RPM				771	798	824	849	875	899	923	947	970	993	1015	1037	1058
	Turns Open				4	3.5	3	2.5	2	1	0.5	0	2.5	2	1.5	1	0.5
9000	BHP			1.64	1.73	1.82	1.91	2.01	2.11	2.21	2.31	2.41	2.52	2.63	2.75		
	RPM			766	792	818	843	868	893	917	941	964	986	1008	1030		
	Turns Open			4.5	3.5	3	2.5	2	1.5	1	0.5	2.5	2	1.5	1		
9400	BHP		1.74	1.83	1.92	2.01	2.10	2.20	2.30	2.41	2.51	2.62	2.73	2.84			
	RPM		761	787	813	838	863	887	911	935	958	980	1002	1024			
	Turns Open		4.5	4	3	2.5	2	1.5	1	0.5	0	2.5	2	1.5			
9800	BHP	1.84	1.93	2.02	2.12	2.21	2.31	2.41	2.51	2.62	2.72	2.83					
	RPM	757	783	808	833	858	882	906	929	952	974	996					
	Turns Open	4.5	4	3.5	2.5	2	1.5	1	0.5	0	2.5	2					
10200	BHP	2.04	2.14	2.23	2.33	2.43	2.53	2.63	2.73								
	RPM	779	804	829	853	877	901	924	947								
	Turns Open	4	3.5	3	2.5	1.5	1	0.5	0								
10600	BHP	2.26	2.36	2.45	2.55	2.65	2.76	2.86									
	RPM	801	825	849	873	896	919	942									
	Turns Open	3.5	3	2.5	2	1.5	1	0									

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

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Due to alternate sheaves, 'Turns Open' may vary within +/- 0.5 turn from the position shown above.

Units factory shipped with standard static sheave and drive at 2.5 turns open (9000 cfm @ 0.5 in. ESP Wet Coil). Other speeds require field selection.

ISO/ARI rating point with standard static sheave and drive at 3 turns open (9000 cfm @ 0.42 in. 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 [fpm] = Airflow [cfm] / Face Area [sq ft]).
Then use preceding Dry Coil to Wet Coil Conversion Table.

Unit Starting & 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 45°F [7°C] with entering air at 50°F [10°C], entering water at 30°F [-1°C] and both air and water at the stated flow rates of 3 gpm per ton [3.9 l/m 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 6: Operating Limits

Air Limits	Cooling	Heating
Minimum Ambient Air	45°F [7°C]	45°F [7°C]
Rated Ambient Air	80°F [27°C]	70°F [21°C]
Maximum Ambient Air	100°F [38°C]	85°F [29°C]
Minimum Entering Air	50°F [10°C]	40°F [4°C]
Normal Entering Air db/wb	75/63 - 80/67°F [24/17 - 27/19°C]	70°F [21°C]
Maximum Entering Air db/wb	110/83°F [43/28°C]	80°F [27°C]
Water Limits		
Minimum Entering Water	*30°F [-1°C]	45°F (*20°F) [7°C (*-7°C)]
Normal Entering Water	40-90°F [4-32°C]	40-90°F [4-32°C]
Maximum Entering Water	110°F [43°C]	90°F [32°C]

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

Piping System Cleaning & Flushing

⚠ CAUTION! ⚠

CAUTION! To avoid possible damage to a plastic (PVC) piping system, do not allow temperatures to exceed 110°F [43°C].

⚠ CAUTION! ⚠

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.

Note:
ClimateMaster strongly recommends all piping connections, both internal and external to the unit, be pressure tested for leakage by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. ClimateMaster will not be responsible or liable for damages from water leaks due to inadequate or a lack of pressurized leak testing during installation.

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 85°F [29°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 150 gal-

Unit & System Checkout

lons [1/2 kg per 750 L] of water (or other equivalent approved cleaning agent). Reset the boiler to raise the loop temperature to about 100°F [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.

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.
- ❑ **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. 208-230V units are factory wired for 208V operation unless specified otherwise.
- ❑ **Entering Water and Air:** Ensure entering water and air temperatures are within operating limits of Table 6.
- ❑ **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. To obtain maximum performance and avoid possible condensate blow-off the coil should be cleaned using a 10% solution of dish washing detergent.
- ❑ **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 (if used).
- ❑ **Miscellaneous:** Note any questionable aspects of the installation.

⚠ WARNING! ⚠

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.

⚠ WARNING! ⚠

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! ⚠

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.

⚠ WARNING! ⚠

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.

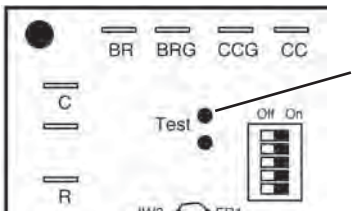
1. Turn thermostat fan position to “ON”. Blower should start.
2. Balance air flow at registers.
3. Adjust all valves to their full open position. Turn on the line power to all heat pump units.
4. Operate unit in cooling cycle. Room temperature should be approximately 45-100°F [7-38°C] DB. For Start-up check, loop water temperature entering the heat pumps should be between 45°F [7°C] and 110°F [43°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 14. 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 7.
   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.
   e. Refer to Table 9. 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 8. Verify correct water flow by comparing unit pressure drop across the heat exchanger versus the data in Table 9. 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 15°F [8°C] and 25°F [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 8. If temperature is within range, proceed with test. If temperature is outside operating range, check heating refrigerant pressures in Table 8.
   e. Check air temperature rise across the coil when compressor is operating. Air temperature should rise between 20°F [11°C] and 30°F [17°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 or DXM AOMs). 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 or DXM AOMs. To obtain maximum performance the air coil should be cleaned before start-up. A 10% solution of dishwasher detergent and water is recommended.

Figure 14: Test Mode Pins



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

CXM Board

Unit Start Up Procedure

Table 7. Coax Water Pressure Drop

Model	GPM	Pressure Drop			
		30°F	50°F	70°F	90°F
GLH096	12	5.9	5.7	5.6	5.4
	18	7.9	7.7	7.5	7.2
	24	10.6	10.3	10.0	9.7
	32	14.3	13.8	13.4	13.0
GLH120	15	5.1	4.9	4.8	4.6
	23	8.5	8.2	7.9	7.7
	30	14.1	13.6	13.2	12.8
	40	22.5	21.7	21.0	20.4
GLV080	9	6.8	4.9	4.6	4.5
	14	8.8	6.9	6.5	6.3
	18	11.4	9.0	8.6	8.2
	24	15.9	13.5	13.0	12.2
GLV100	12	6.8	5.9	5.5	5.3
	18	9.3	8.0	7.5	7.2
	24	12.8	10.9	10.1	9.8
	32	19.5	16.4	15.2	14.8
GLV120	15	8.8	6.8	6.4	6.1
	23	12.8	10.3	9.7	9.3
	30	17.8	14.1	13.3	12.7
	40	28.5	23.2	21.9	21.0
GLV160	18	7.5	5.4	5.1	4.9
	27	9.6	7.5	7.2	6.9
	37	12.5	9.9	9.4	9.1
	48	16.8	14.2	13.6	13.2
GLV200	24	7.4	6.4	6.0	5.8
	36	10.3	8.8	8.2	7.9
	48	14.0	11.9	11.1	10.7
	64	21.5	18.0	16.8	16.1
GLV240	30	9.7	7.4	7.0	6.7
	46	14.1	11.3	10.6	10.2
	60	19.5	15.5	14.6	13.9
	80	31.1	25.7	24.0	22.9
GLV300	38	8.6	6.9	6.5	6.2
	56	12.6	9.8	9.3	8.9
	75	17.5	13.7	12.9	12.4
	100	28.6	21.9	20.7	20.0

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 or DXM AOMs for complete descriptions.

⚠ CAUTION! ⚠

CAUTION! Do not restart units without inspection and remedy of faulting condition. Equipment damage may occur.

Unit Operating Conditions

Table 8: Typical Unit Operating Pressures and Temperatures

Entering Water Temp °F	Water Flow GPM/ton	Cooling** Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Rise °F	Air Temp* Drop °F DB	Heating Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Drop °F DB	Air Temp* Rise °F
	1.5	75-85	90-105	25-40	12-20	21-24	21-26	34-39	167-186	12-16	1-4	7.6-8.4	14-20
30	2.3	74-84	80-95	25-40	11-18	13-16	21-26	37-43	172-191	12-16	1-4	4.8-5.6	16-22
	3.0	73-83	70-85	25-40	10-16	6-11	21-26	40-46	177-196	12-16	1-4	3.4-4.2	16-22
	1.5	75-85	125-155	12-20	10-18	20-23	20-25	50-60	180-210	10-17	1-5	10.8-11.9	23-29
50	2.3	74-84	120-142	12-20	9-16	12-15	20-25	53-62	185-215	10-17	1-5	6.7-8.1	24-30
	3.0	73-83	115-138	12-20	8-14	8-12	20-25	55-65	190-220	10-17	1-5	5.1-5.9	25-31
	1.5	75-85	179-198	9-16	8-15	19-22	19-24	71-82	205-230	14-19	1-5	14.0-15.2	28-34
70	2.3	74-84	168-186	9-16	8-14	12-17	19-24	73-85	210-238	14-19	1-5	9.0-10.2	30-37
	3.0	73-83	158-175	9-16	8-12	7-12	19-24	76-88	215-242	14-19	1-5	6.7-7.9	31-38
	1.5	75-85	229-251	9-17	8-15	18-21	17-23	85-95	220-260	18-28	2-5	14.4-16.6	32-39
90	2.3	74-84	218-241	9-17	8-14	10-14	17-23	90-100	225-265	18-28	2-5	10.8-12.4	33-41
	3.0	73-83	208-230	9-17	8-12	6-11	17-23	95-105	230-270	18-28	2-5	7.2-8.3	35-42
	1.5	77-87	280-320	8-15	10-25	17-20	15-20						
110	2.3	76-86	270-310	8-15	10-24	9-13	15-20						
	3.0	75-85	260-300	8-15	10-22	5-10	15-20						

*Based on Nominal 400 cfm per ton airflow and 70°F EAT htg and 80/67°F 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

Table 9: Water Temperature Change Through Heat Exchanger

Water Flow, gpm [l/m]	Rise, Cooling °F, [°C]	Drop, Heating °F, [°C]
For Closed Loop: Ground Source or Closed Loop Systems at 3 gpm per ton [3.9 l/m per kW]	9 - 12 [5 - 6.7]	4 - 8 [2.2 - 4.4]
For Open Loop: Ground Water Systems at 1.5 gpm per ton [2.0 l/m per kW]	20 - 26 [11.1 - 14.4]	10 - 17 [5.6 - 9.4]

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 1.5 gpm per ton [2.0 l/m 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 3 gpm per ton 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. Inspection should be performed for proper tension and excessive wear of drive belts every three months.

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 and temperatures are at proper levels before servicing the refrigerant circuit.

⚠ WARNING! ⚠

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.

Revision History

Date:	Item:	Action:
12/16/08	Electrical Data	Tables Updated
12/16/08	Dimensional Data	Updated
12/16/08	Physical Data Tables	Notes Edited and Max Water Pressure Box Added
06/30/08	Low Voltage	Shut-Off Valve Note Added
4/15/08	Operating Conditions	Note box added
04/07/08	Blower Performance	Blower Performance Tables Added
04/07/08	Wire Diagrams	Wiring Diagrams Added
01/01/07	Warnings and Cautions	Reformatted and Added New Cautions Throughout
01/01/07	Duct System Installation	Revised Section
01/01/07	ClimaDry	Fixed Potentiometer Notes
01/01/06	First Published	

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