

G Series

ENCASED/UNCASED AIR COILS

Geothermal/Water Source Heat Pumps

- R-410A Refrigerant
- 2-5 Ton

Dimensional Data

Installation Information

Maintenance



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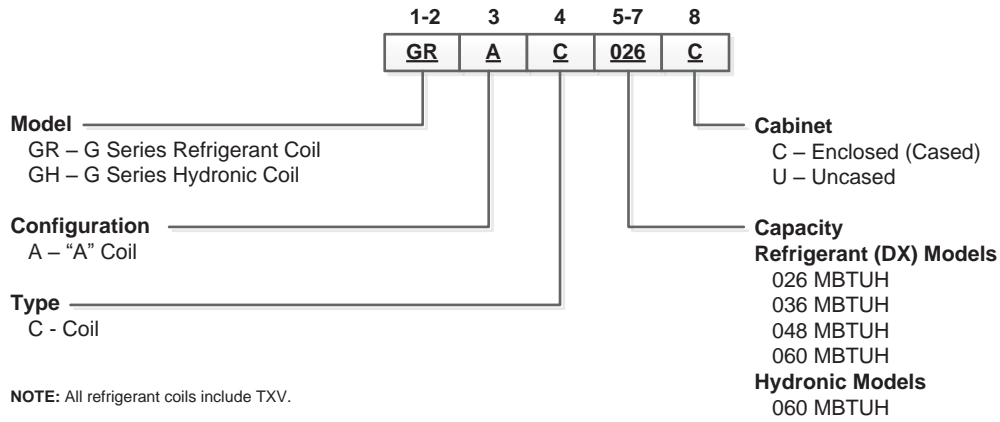
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Model Nomenclature



Rev.: 08 April 2013D

Initial Inspection

When the equipment is received, all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. Examine units for shipping damage, removing the units from packaging if necessary. Units in question should also

be internally inspected. If any damage is noted, the carrier should make the proper notation on the delivery receipt, acknowledging the damage.

Safety Considerations



WARNING: Before performing service or maintenance operations on a system, turn off main power switches to the equipment. If applicable, turn off the accessory heater power switch. Electrical shock could cause personal injury.

Installation and servicing heating and air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair or service heating and air conditioning equipment. Untrained personnel can perform the basic maintenance functions of cleaning coils and cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating and air conditioning equipment, observe precautions in the literature, tags and labels attached to the unit and other safety precautions that apply.

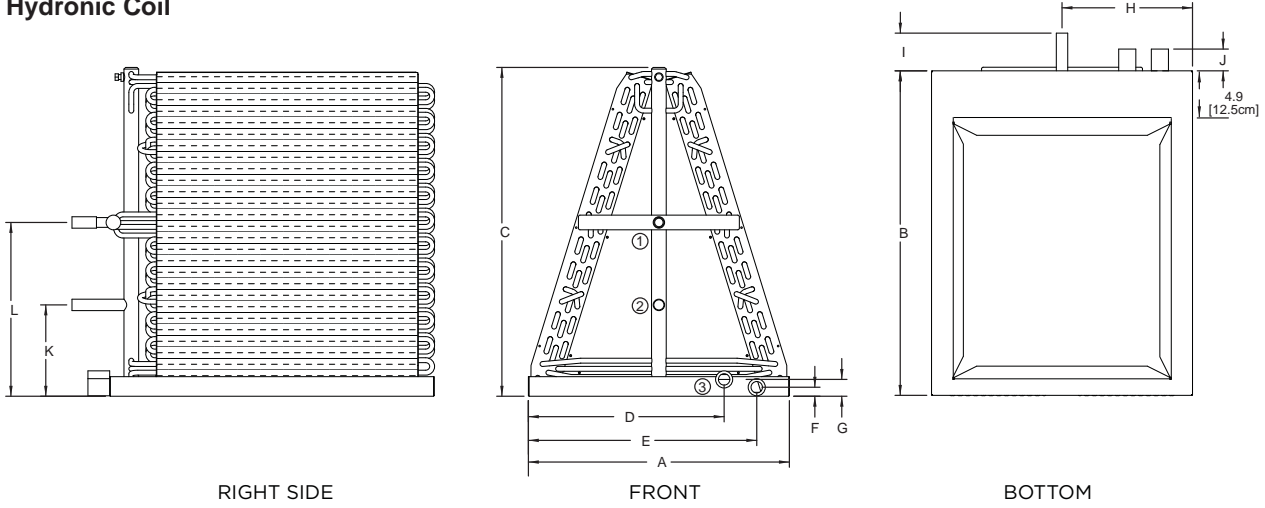
Follow all safety codes. Wear safety glasses and work gloves.

Use a quenching cloth for brazing operations and have a fire extinguisher available.

NOTE: Local codes and regulations take precedent over any recommendations by the manufacturer. In addition to conforming to manufacture's and local municipal building codes, the equipment should be installed in accordance with the National Electric Code and National Fire Protection Agency recommendations.

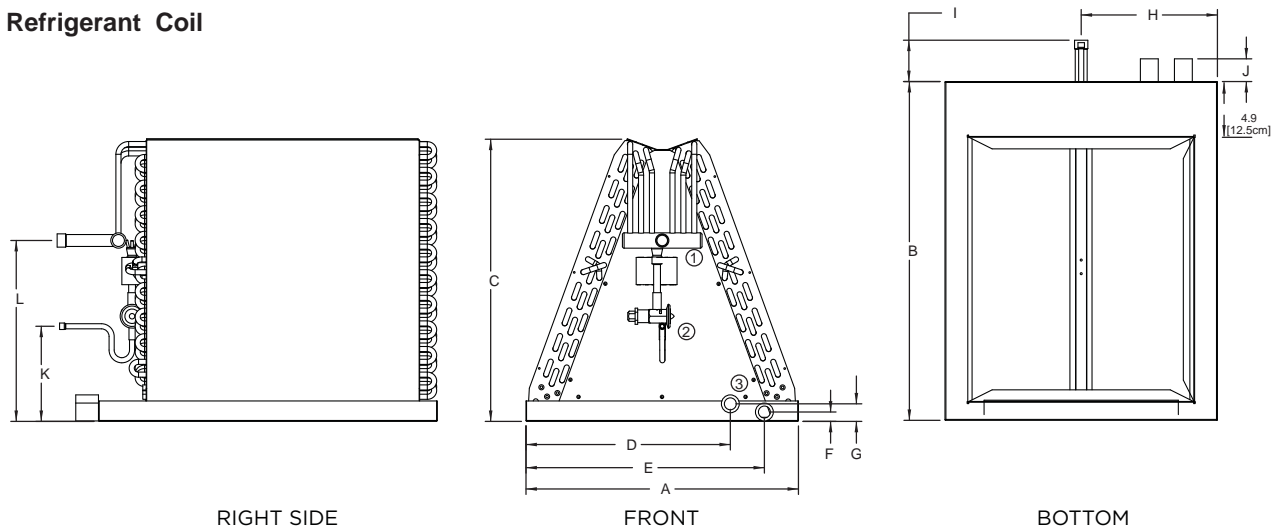
Dimensional Data

Hydronic Coil



Uncased Models		Overall Dimensions			Connections			Condensate Connections					Hydronic Connections			
					1	2	3						I	J	K	L
		A	B	C	Water	Water	Condensate	D	E	F	G	H				
	Width	Depth	Height	Sweat	Sweat	Tube										
060	in.	20.0	24.9	25.2	7/8	7/8	3/4	15.0	17.5	0.7	1.3	10.0	2.9	1.7	7.0	13.3
	cm.	50.8	63.3	63.5	2.2	2.2	1.9	38.1	44.5	1.8	3.3	25.4	7.4	4.3	17.8	33.8

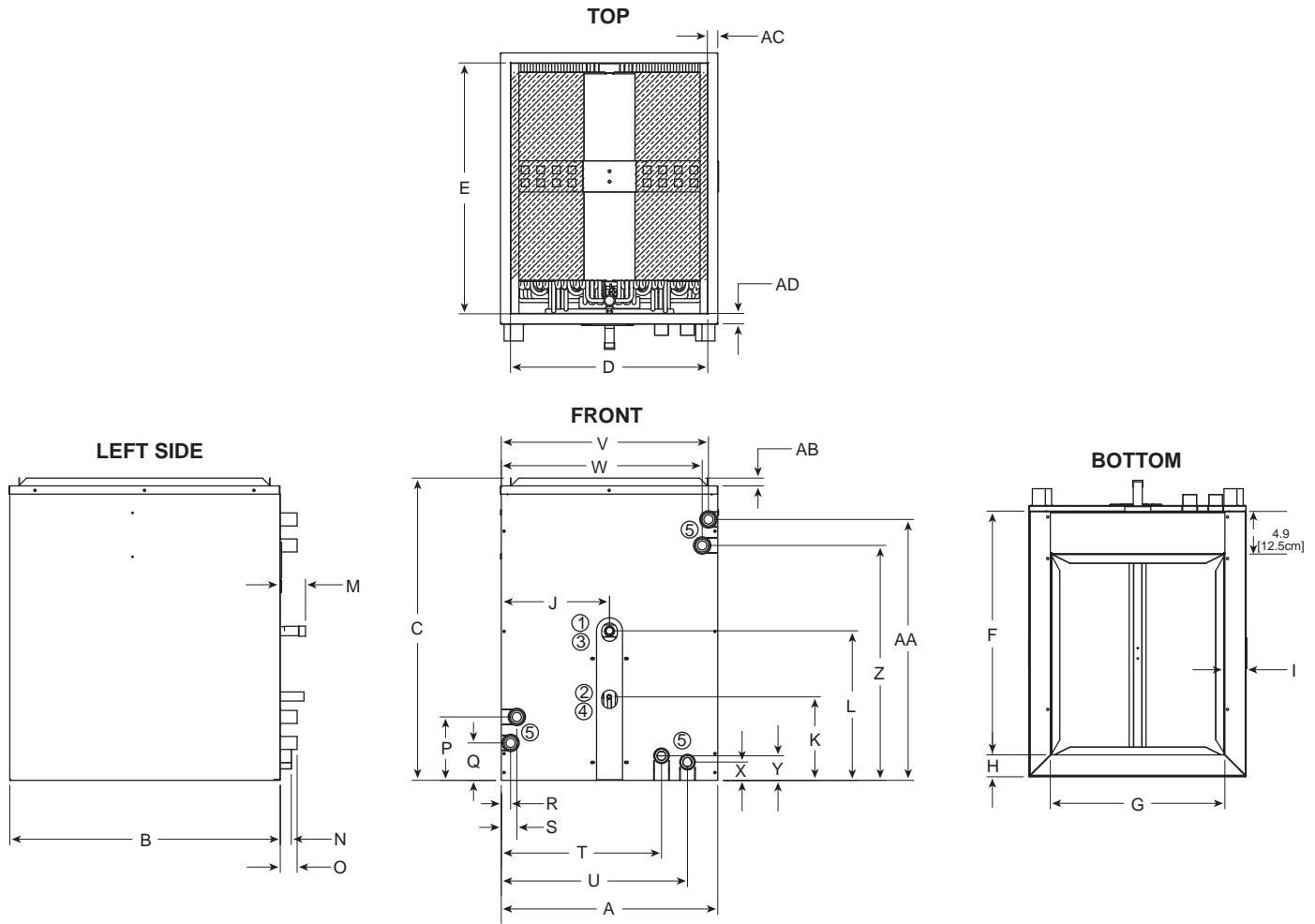
Refrigerant Coil



Uncased Models		Overall Dimensions			Connections			Condensate Connections					Refrigerant Connections			
					1	2	3						I	J	K	L
		A	B	C	Suction	Liquid	Condensate	D	E	F	G	H				
	Width	Depth	Height	Sweat	Sweat	Tube										
DX 026-036	in.	20.0	24.9	20.7	5/8	3/8	3/4	15.0	17.5	0.7	1.3	10.0	3.0	1.7	7.0	13.3
	cm.	50.8	63.3	52.6	1.6	1.0	1.9	38.1	44.5	1.8	3.3	25.4	7.6	4.2	17.8	33.8
DX 048-060	in.	20.0	24.9	20.7	7/8	3/8	3/4	15.0	17.5	0.7	1.3	10.0	3.0	1.7	7.0	13.3
	cm.	50.8	63.3	52.6	2.2	1.0	1.9	38.1	44.5	1.8	3.3	25.4	7.6	4.2	17.8	33.8

NOTE: All refrigerant coils feature factory installed TXV. Water connection dimensions are O.D.

Dimensional Data - DX Cased Coils



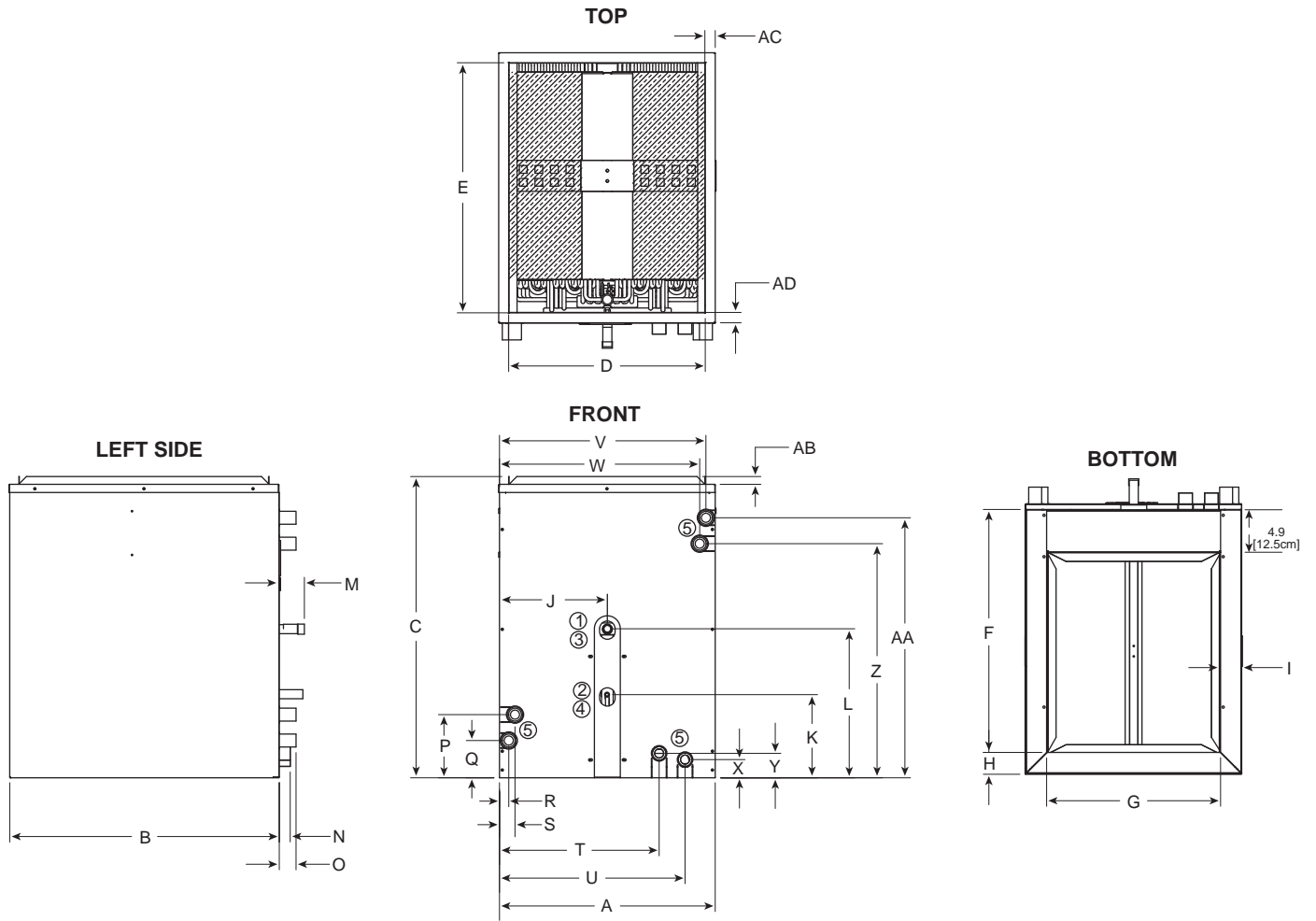
Encased Models	Overall Cabinet			Connections					Supply Connection		Inlet Connection				
	A	B	C	1	2	3	4	5	D	E	F	G	H	I	
	Width	Depth	Height*	Suction	Liquid	Water	Water	Condensate	Supply Width	Supply Depth					
DX 026-036	in.	20.8	26.0	29.1	5/8	3/8	-	-	3/4	19.0	24.1	23.4	16.8	2.1	2.0
	cm.	52.8	66.0	73.9	1.6	1.0	-	-	1.9	48.3	61.2	59.4	42.7	5.3	5.1
DX 048-060	in.	20.8	26.0	29.1	7/8	3/8	-	-	3/4	19.0	24.1	23.4	16.8	2.1	2.0
	cm.	52.8	66.0	73.9	2.2	1.0	-	-	1.9	48.3	61.2	59.4	42.7	5.3	5.1

Encased Models	Refrigerant & Water Connections				Condensate Connections														Miscellaneous			
	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	
DX 026-036	in.	10.4	8.0	14.4	2.4	1.1	1.6	6.1	3.6	0.9	1.5	15.4	17.9	19.9	19.3	1.8	2.4	22.6	25.1	0.8	1.0	1.0
	cm.	26.4	20.3	36.6	6.1	2.8	4.1	15.5	9.1	2.3	3.8	39.1	45.5	50.6	49.1	4.5	6.0	57.4	63.7	1.9	2.5	2.5
DX 048-060	in.	10.4	8.0	14.4	2.4	1.1	1.6	6.1	3.6	0.9	1.5	15.4	17.9	19.9	19.3	1.8	2.4	22.6	25.1	0.8	1.0	1.0
	cm.	26.4	20.3	36.6	6.1	2.8	4.1	15.5	9.1	2.3	3.8	39.1	45.5	50.6	49.1	4.5	6.0	57.4	63.7	1.9	2.5	2.5

NOTE: All refrigerant coils feature factory installed TXV.

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Dimensional Data - Hydronic Cased Coils



Encased Models	Overall Cabinet			Connections					Supply Connection		Inlet Connection				
	A Width	B Depth	C Height*	1 Suction Sweat	2 Liquid Sweat	3 Water Sweat	4 Water Sweat	5 Condensate Tube	D Supply Width	E Supply Depth	F	G	H	I	
Hydronic 060	in.	20.8	26.0	29.1	-	-	7/8	7/8	3/4	19.0	24.1	23.4	16.8	2.1	2.0
	cm.	52.8	66.0	73.9	-	-	2.2	2.2	1.9	48.3	61.2	59.4	42.7	5.3	5.1

Encased Models	Refrigerant & Water Connections				Condensate Connections												Miscellaneous					
	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	
Hydronic 060	in.	10.4	8.0	14.4	2.4	1.1	1.6	6.1	3.6	0.9	1.5	15.4	17.9	19.9	19.3	1.8	2.4	22.6	25.1	0.8	1.0	1.0
	cm.	26.4	20.3	36.6	6.1	2.8	4.1	15.5	9.1	2.3	3.8	39.1	45.5	50.6	49.1	4.5	6.0	57.4	63.7	1.9	2.5	2.5

General Installation Information

The G Series encased and uncased coils are designed for upflow, horizontal, and bottomflow applications. The coils have a dry nitrogen holding charge and are equipped with brazing stub refrigerant connections for easy installation. Both models come equipped with a factory installed TXV.

The installer should read the installation manual supplied with the compressor section for refrigerant line set sizing, connection procedure, and other important information pertaining to the system installation.

The installer should:

1. Make sure that the air delivery of the furnace is adequate enough to handle the recommended CFM and allow for pressure drop across the air coil, filter, and duct work.
2. Where precise forming of refrigerant lines is required, a copper tubing bender is recommended for small diameter tubing. One should avoid sharp bends and contact of the refrigerant lines with metal surfaces.

3. Refrigerant lines should be protected where they pass through the raw edges of holes.
4. Coil suction line must be insulated, as well as the field constructed plenum used to enclose the uncased coil. Encased coils are manufactured with insulated cabinets.
5. Coil must be level for proper condensate drainage.
6. Seal the openings into the cabinet to reduce risk of condensate blow off from the coil.

NOTE: The installation of optional heating and cooling equipment must be properly sized and installed in accordance with the furnace manufacture's specifications and recommendations. In some cases "heating only" furnace air circulators may have to be replaced with multispeed blowers to upgrade the air delivery (CFM) when an add-on coil is installed. Refer to the Encased and Uncased Coil Specification table for recommended CFM across the coil and filters.

Encased and Uncased Coil Specifications

Model	GRAC026	GRAC036	GRAC048	GRAC060	GHAC060
BTUH	26,000	36,000	48,000	60,000	60,000
CFM	925	1,225	1,625	1,760	1,760*

* GHAC060 CFM is dependent on desired capacity (see Hydronic Coil Performance tables in the Air Handler Specification Catalog.)

Coil Installation for Encased Models



WARNING: Electric furnaces may be connected to more than one supply circuit.

The installer should:

1. Disconnect all electrical power to the furnace.
2. For the install of an encased coil, it might be necessary to fabricate a plate to adapt the coil's cabinet to the furnace or air handler air discharge opening.
3. Install the cabinet and level it as needed to allow proper condensate drainage.
4. Seal the enclosure as required minimizing air leakage.
5. Connect the refrigerant lines as outlined in the Refrigerant Lines section.

Coil Installation for Uncased Models



WARNING: Electric furnaces may be connected to more than one supply circuit.

The installer should:

1. Disconnect all electrical power to the furnace.
2. For the install of an uncased coil, it might be necessary to fabricate a plate to adapt the coil's cabinet to the furnace or air handler air discharge opening.
3. Install the coil and level it as needed to allow proper condensate drainage.
4. Make a plenum to enclose the coil or drop the duct directly over the coil.
5. Seal the enclosure as required minimizing air leakage to reduce risk of condensate blow off from the coils.
6. Insulate the entire plenum assembly as needed.
7. Connect the refrigerant lines as outlined in the Refrigerant Lines section.

General Installation Information cont.

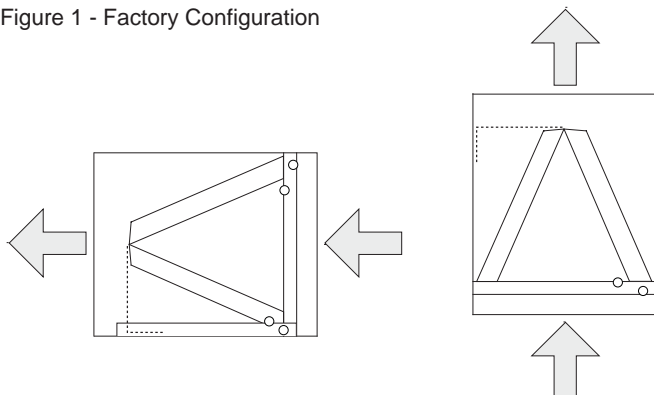
Encased Coil Cabinet Configuration

The G Series encased coil cabinet is factory configured for upflow and horizontal left hand air discharge installation (Figure 1). For bottomflow or horizontal right hand discharge, certain field modifications are required.



WARNING: Do not lift or reposition the 'A' coil by grasping the copper tube header or distributor. This could cause a tubing fracture resulting in a refrigerant leak.

Figure 1 - Factory Configuration

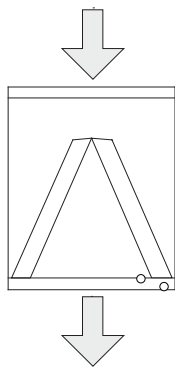


Bottomflow Application

To convert the GRA/GHA encased coil cabinets for bottomflow applications follow the steps shown below:

1. Bottom air discharge units require the supply air opening to be cut at least a 1/2" larger than the unit's air outlet.
2. When installed on combustible flooring, protect the edges of the floor opening with sheet metal over wrap or other non-combustible material.
3. Bottom air discharge units should be sealed well to the floor to prevent air leakage.

Figure 2 - Bottomflow GRA/GHA

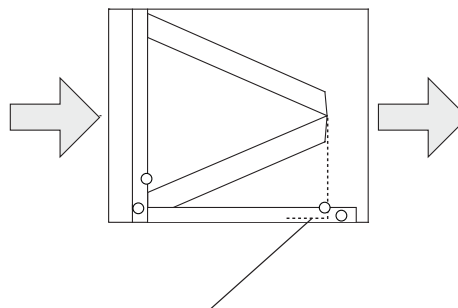


Horizontal Right Air Discharge Application

To convert the GRA/GHA encased coil cabinets for horizontal right air discharge applications follow the steps shown below

1. Remove all access panels. Remove the 'A' coil assembly and the horizontal drain pan.
2. From the vertical upflow position, rotate the top of the cabinet 90° to the right and set in place.
3. Remove the support bracket mounted to the top plate of the 'A' coil. Rotate the 'A' coil support bracket 180° from its original position and re-attach into existing holes in the top plate of the coil. This must be done to prevent the 'A' coil from falling into the drain pan (Figure 3).
4. Move the horizontal drain pan from the left side of the 'A' coil to the right hand side of the 'A' coil. Place the 'A' coil and horizontal drain pan assembly into the cabinet so that the support bracket is resting in the horizontal drain pan as shown in Figure 3.
5. Remove the 2 drain plugs from the upper right of the access panel and install them on the lower left of the access panel. Replace the access panels.
6. If the unit is suspended, the entire length of the cabinet should be supported.

Figure 3 - Horizontal Right Hand Air Discharge



Rotate the coil support bracket to this position



IMPORTANT: When removing the coil, there is possible danger of equipment damage and personal injury. Be careful when removing the coil assembly from the unit.

General Installation Information

Refrigerant Line Connections

Use field supplied tubing of refrigerant grade. Refer to the Refrigerant Line Sizing table to determine the proper line set configuration for the system being installed. Line sets over 60 feet in length are not recommended. If the line set is kinked or deformed and cannot be reformed, the bad section of pipe should be replaced. A restricted line set will affect unit performance. Line sets should be routed as directly as possible, avoiding any unnecessary bends, and turns. As in all R-410a equipment, a reversible liquid line filter drier is required to insure all moisture and non-condensables are removed from the system. This drier should be installed in the common liquid line if not already installed in the compressor section. This drier should be replaced whenever "breaking into" the system for service. ALWAYS evacuate the coil and line set before opening the compressor section unit service valves.

When matched with a G Series split the Refrigerant Line Sizing table below should be followed. If another compressor section is used, follow the manufactures guidelines for installation.

Encased and Uncased Refrigerant Line Sizing

Air Coil	20 Feet		40 Feet		60 Feet	
	Suction	Liquid	Suction	Liquid	Suction	Liquid
GRAC026	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	1/2" OD
GRAC036	5/8" OD	3/8" OD	3/4" OD	3/8" OD	3/4" OD	1/2" OD
GRAC048	3/4" OD	3/8" OD	7/8" OD	3/8" OD	7/8" OD	1/2" OD
GRAC060	7/8" OD	1/2" OD	7/8" OD	1/2" OD	1-1/8" OD	1/2" OD

NOTE: Adding refrigerant charge for R-410a line set should be calculated using 0.50 oz. per ft. for 3/8" and 1.0oz. per ft. for 1/2" tube.

Leak Testing

The refrigeration line set must be pressurized and checked for leaks before purging and charging the system. To pressurize the line set, attach refrigerant gauges to the service ports and add an inert gas (nitrogen or dry carbon dioxide) until pressure reaches 60 to 90 PSIG. Never use oxygen or acetylene to pressure test the system. Use an electronic leak detector or a good quality bubble solution to detect leaks on all connections made in the field. If a leak is found, repair it and repeat the above steps. For safety reasons do not pressurize the system above 150 PSIG. Purge pressure from the line set slowly when the pressure test is complete. The system is now ready for evacuation.

System Evacuation

The line set and air coil must be evacuated to 250 microns with a good quality vacuum pump and use a vacuum gauge to ensure that the air and moisture are removed. With the system shut off from the vacuum pump a sufficient system vacuum is achieved when a 500 micron vacuum can be held for 30 minutes. A fast

The installer should.

1. The encased and uncased coils are pressure tested at the factory; slowly relieve pressure from the coil and remove the pressure taps from the suction and liquid stubs on the coil.
2. Wrap the TXV and nearby tubing with a heat sinking material such as a wet cloth.
3. Connect the refrigerant line set to the coils stubs.
4. Nitrogen should be bled through the system at 2 to 3 psi to prevent oxidation inside the refrigerant tubing.
5. Braze the connections using a low silver phos-copper braze alloy rod.
6. After brazing, allow joints to cool, leak check the connections, evacuate the lines, insulate the suction line and connect TXV as instructed in the TXV Connection section.

rise in atmospheric pressure indicates a leak, while a slower rise to around 1500 microns indicates moisture is still present in the system and further evacuation is required.

TXV Connection

The G Series encased and uncased coils are supplied with an expansion device. Once the line set has been brazed into the coil the txv bulb must be attached to the suction line and insulated with foam tape. The bulb should be placed at the 2 or 10 o'clock position on the suction line. Be careful not to crush the txv bulb by over-tightening the clamp. The TXV supplied has an internal check valve so no external check valve is necessary. The TXV supplied with the coil can be adjusted to achieve desired superheat. After unit start up, check sub-cooling, superheat, and refrigerant charge; TXV may require further adjustment.

TXV's may require adjustments for a specific application.

General Installation Information

The installer should.

1. Remove the seal cap from the bottom of the valve.
2. Turn the adjustment screw counterclockwise to increase superheat and clockwise to decrease superheat. One complete 360° turn changes the superheat approximately 3-4° F. You may need to allow as much as 30 minutes after the adjustment is made for the system to stabilize.
3. Once the proper superheat setting has been achieved replace and tighten the seal cap.

WARNING: There are a total of 8 (360°) turns on the superheat adjustment stem from wide open to fully close. When adjusting the superheat stem counterclockwise (superheat increase) and the stop is reached, any further counterclockwise turning adjustment will damage the valve.

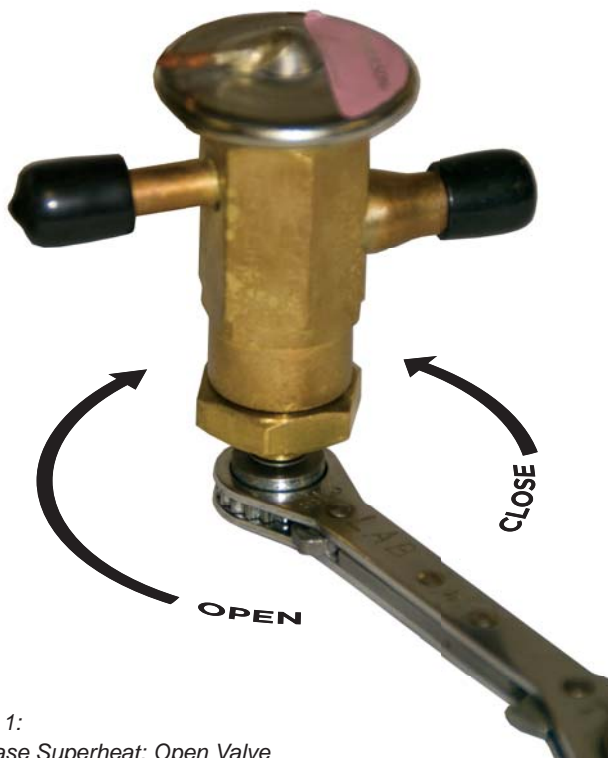
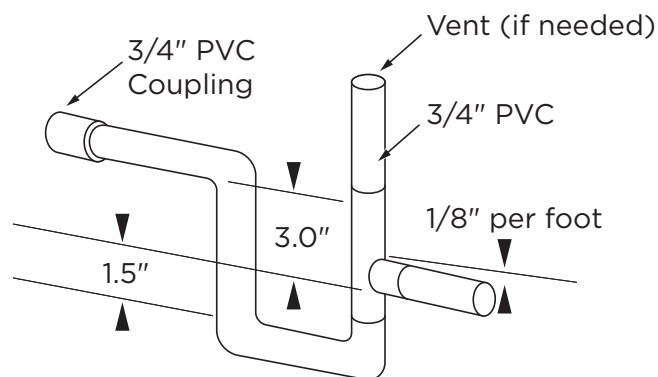


Figure 1:
Decrease Superheat: Open Valve
Increase Superheat: Close Valve

Condensate Drain

To facilitate condensate removal, the air handler should be pitched 1/4" towards the drain in both directions. The drain line contains cold water and should be insulated in unconditioned spaces to avoid drain line condensation from dripping on ceiling, etc. The drain pan has a primary and auxiliary drain connection. The 21S521A03 condensate hose assembly kit is provided to connect the drain pan's primary stainless steel tube to the PVC coupling. The air handler drain connections must be connected to a drain line and pitched away from the unit a minimum of 1/8" per foot to allow the condensate to flow away from the air handler.

A trap must be installed in the drain line below the bottom of the drain pan to ensure free condensate flow (units are not internally trapped). The primary condensate drain must be terminated to an open drain or sump. Do not connect the condensate drain to a closed waste system. An open vertical air vent should be installed to overcome line length, friction and static pressure. It is recommended that the auxiliary drain be connected to a drain line for all units. The auxiliary drain should be run to an area where the homeowner will notice it draining. The drain line should not be smaller than the drain connection at the condensate pan. If the air handler is located in an unconditioned space, water in the trap may freeze. It is recommended that the trap material be of a type that will allow for expansion of water when it freezes. Drain lines must be in conformance with local codes.



Charging the System

Refer to the installation manual supplied with the compressor section unit for amount of refrigerant charge and other important information pertaining to the charging of the system.

Hydronic Models

The water heater and hydronic air handler must be located indoors and not subject to freezing temperatures. The water heater must be installed in accordance to local codes and its own installation instructions. The piping between the water heater and air handler should be kept to a minimum. Piping should be sized to allow for water velocities of 2'-4' per second. At average water velocities, air bubbles should be carried along the piping to an air separator where they can be discharged from the system. Water velocities greater than 4' per second could cause flow noise and should be avoided. If water lines pass through an unconditioned space they should be protected to prevent them from freezing. Valves should be installed to allow system isolation. All closed loop hydronic systems must be equipped with an expansion tank to allow room for the heated liquid to expand. A system is considered closed when a check valve or backflow prevention valve is installed in the cold water pipe upstream of the water heater.

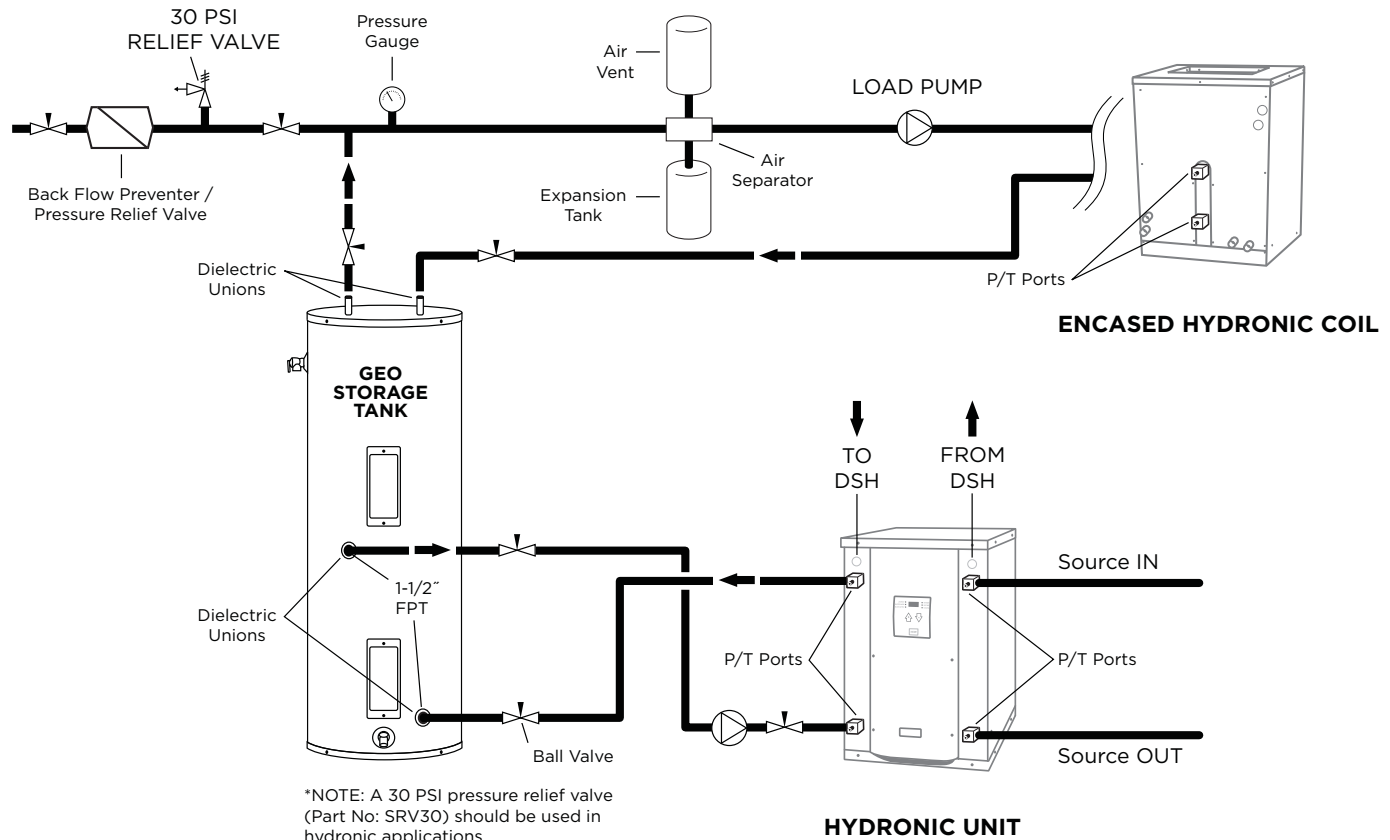
Once piping is complete all air must be purged from the water lines. There is a dole valve at the top of the hydronic coil header that can be opened to purge air from the coil. There is also a plug at the bottom of the hydronic coil header for draining the coil.

Dole valve for air purging



Plug for coil drainage.

Typical Installation. See the Hydronic Application Guide for other applications



Hydronic Models

Water Pressure Drop - Hydronic Coil

Flow gpm	Pressure Drop (PSI)						
	40°F	50°F	60°F	100°F	110°F	120°F	130°F
3.0	0.5	0.5	0.5	0.4	0.4	0.4	0.4
4.5	0.9	0.9	0.9	0.8	0.8	0.8	0.8
6.0	1.4	1.4	1.4	1.2	1.2	1.2	1.2
9.0	2.8	2.6	2.5	2.4	2.4	2.4	2.3
12.0	4.6	4.4	4.2	4.0	4.0	4.0	3.9
15.0	7.0	6.8	6.6	6.0	6.0	5.9	5.8

Coil Capacity vs. Entering Water Temperature

EAT °F	Entering Water Temperature °F					
	100	110	120	130	140	150
65	44%	56%	69%	81%	94%	106%
70	37%	50%	63%	75%	87%	100%

Maintenance

To ensure optimum system performance and to minimize the possibility of equipment failure, the following periodic maintenance should be performed on the coil.

Filter Maintenance

The air filter installed with the system must be cleaned or replaced to obtain maximum performance. They should be inspected monthly under normal operating conditions and be replaced when necessary. Coils should never be operated without a filter. Always replace the filter with the same type as originally furnished with the system.

Condensate Drain

In areas where airborne bacteria produce slime in the drain pan, it may be necessary to treat chemically to minimize the problem. The condensate drain can pick up lint and dirt, especially with dirty filters.

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.

Notes

Revision Guide

Pages:	Description:	Date:	By:
All	Updated Dimensional Data for New Vertical Condensate Drain	09 May 2014	DS
15	Added Revision Guide	09 May 2014	DS
4,5,9	Updated Hydronic Data	26 Aug 2014	MA



Product: **G Series Air Coils**
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