GEOSMART ENERGY

GEOSMART PREMIUM Q

Geothermal Heat Pumps with
Water Heating for Radiant Floor Applications

• 3 - 6 Tons

ARI PERFORMANCE CERTIFIED ANSI/ARI/ASHRAE/ISO Standard 13256-1 60 Hz Water Source HP

ETL LISTED

Premium Q Series: Installation Manual

Table of Contents

GEOSMART PREMIUM Q

Model Nomenclature

1-2	3-5	6	7	8	9	10	11	12	13	14	15	16
QT	038	T	L	1	2	1	C	B	D	S	S	A

Family
QT = Quad Two Stage

Unit Capacity
MBTUH

Discharge Air Configuration
T = Top Discharge

Return Air Configuration
L = Left
R = Right

Voltage
1 = 208-230/60/1 - residential

Hot Water Option
0 = None
2 = Hot Water Generation Without Factory Installed Pump

Vintage
A = Current

Non-Standard Option Details
S=std

Non-Standard Options
S=std

Cabinet Options
D = White Cabinet
L = Blue Cabinet

Sound Kit
B = Blanket

Coax Options
C = Copper
N = Cupronickel

Blower Options
1 = ECM Blower
2= Oversized ECM Blower Option (038 & 049)

The factory installed Hot Water option (desuperheater) does not include a factory mounted circulating pump or temperature control. Kit DPK5 (ordered separately) includes field installed circulator, hot water tank adaptor, temperature limit and installation instructions.

General Installation Information

Safety Considerations

Installation and servicing of 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 basic maintenance functions of cleaning coils and cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in the literature, tags and labels attached to the unit and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available for all brazing operations.

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

Moving and Storage

Move units in the normal "Up" orientation. Vertical units are not to be moved, but may be stored one upon another to a maximum height of two units. 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 the 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.

Unit Location

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, such as a closet, provisions must be made for return air to freely enter the space by means of a louvered door, etc. Care should be taken when units are located in unconditioned spaces to prevent damage from frozen water lines and excessive heat that could damage electrical components.

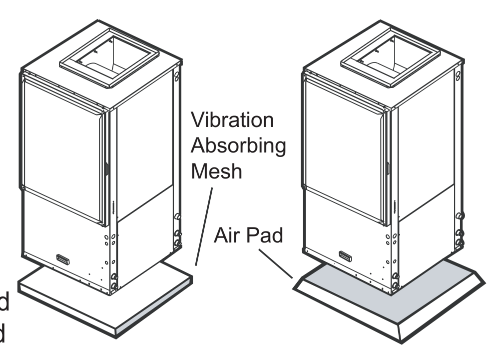
CAUTION: A minimum of 24-inch clearance should be allowed for access to front access panel.

Setting Vertical Units

Prior to setting the unit in place, remove and discard the compressor hold down shipping bolt located at the front of the compressor mounting bracket.

Vertical units are available in left or right hand return configuration. Vertical units should be mounted level on a vibration absorbing pad slightly larger than the base to provide isolation between the unit and the floor. It is not necessary to anchor the unit to the floor (See Figure 1).

Figure 1: Vertical Unit Mounting



Duct System

An air outlet collar is provided on vertical top flow units to facilitate a duct connection, which is shipped inside the unit. A flexible connector is recommended for discharge and return air duct connections on metal duct systems. Uninsulated duct should be insulated with a minimum of 1-inch duct insulation. Application of the unit to uninsulated ductwork in an unconditioned space is not recommended as the unit's performance will be adversely affected.

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

The duct system should be sized to handle the design airflow quietly. To maximize sound attenuation of the unit blower, the supply and return plenums should include internal duct liner of glass fiber or be of ductboard construction for the first few feet. If air noise or excessive airflow is a problem, the blower speed can be changed. See the Blower Performance and Fan Speed.

General Installation Information (cont.)

Water Piping Connections

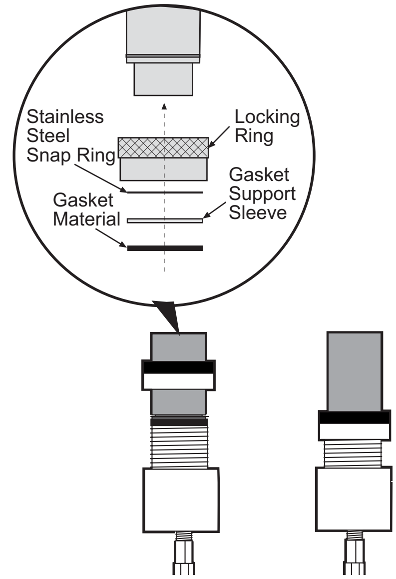
All Premium Q Series source water connections are swivel piping fittings that accept a 1-inch Male Pipe Thread (MPT) (see Figure 2). The swivel pipe connector has a rubber gasket seal similar to a garden hose gasket, which when mated to the flush end of 1-inch threaded pipe provides a leak-free seal without the need for thread sealing tape or compound. Check to ensure that the rubber seal is in the swivel connector prior to attempting any connection. The rubber seals are shipped attached to the water line.

To make the connection to a ground loop system, mate the brass connector (supplied in CK4L and CK4L-GL connector kits) against the rubber gasket in the swivel connector, and thread the female locking ring onto the pipe threads, while maintaining the brass connector in the desired direction (see Figure 2). Tighten the connectors by hand and then gently snug the fitting with pliers to provide a leak proof joint. When connecting to an open loop (ground water) system, thread 1-inch MPT fitting into the swivel connector and tighten in the same manner as noted above. The open and closed loop piping system must include pressure/temperature taps for serviceability.

Never use flexible hoses smaller than 1-inch inside diameter on the unit and limit hose length to 10 feet. per connection. Check carefully for water leaks.

CAUTION: Water piping exposed to outside temperature may be subject to freezing.

Figure 2: Female Locking Ring



Note: Load side fittings are same type as source.

Water Quality

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. The heat exchanger coils in ground water systems may, over a period of time, lose heat exchange capabilities due to a buildup of mineral deposits inside. These can be cleaned, but only by a qualified service mechanic, as special solutions and pumping equipment are required. Desuperheater coils can likewise become

Material		**Copper**	**90/10 Cupro-Nickel**
pH	**Acidity/Alkalinity**	7- 9	5 - 9
Scaling	Calcium and Magnesium Carbonate	(Total Hardness) less than 350 ppm	(Total Hardness) less than 350 ppm
Corrosion	Hydrogen Sulfide	Less than .5 ppm (rotten egg smell appears at 0.5 PPM)	10 - 50 ppm
	Sulfates	Less than 125 ppm	Less than 125 ppm
	Chlorine	Less than .5 ppm	Less than .5 ppm
	Chlorides	Less than 20 ppm	Less than125 ppm
	Carbon Dioxide	Less than 50 ppm	10 - 50 ppm
	Ammonia	Less than 2 ppm	Less than 2 ppm
	Ammonia Chloride	Less than .5 ppm	Less than .5 ppm
	Ammonia Nitrate	Less than .5 ppm	Less than .5 ppm
	Ammonia Hydroxide	Less than .5 ppm	Less than .5 ppm
	Ammonia Sulfate	Less than .5 ppm	Less than .5 ppm
	Total Dissolved Solids (TDS)	Less than 1000 ppm	1000-1500 ppm
Iron Fouling (Biological Growth)	Iron, Fe^{2}+ (Ferrous) Bacterial Iron Potential	None	None
	Iron Oxide	Less than 1 ppm. Above this level deposition will occur.	Less than 1 ppm. Above this level deposition will occur.
Erosion	Suspended Solids	Less than 10 ppm and filtered for max of 600 micron size	Less than 10 ppm and filtered for max of 600 micron size
	Threshold Velocity (Fresh Water)	5-8 ft/sec	8-12 ft/sec

Note: Grains = PPM divided by 17 • mg/l is equivalent to PPM

General Installation Information (cont.)

scaled and possibly plugged. In areas with extremely hard water, the owner should be informed that the heat exchanger may require occasional flushing.

Units with cupronickel heat exchangers are recommended for open loop applications due to the increased resistance to build-up and corrosion, along with reduced wear caused by acid cleaning.

Low Source Temperature Limit (Water Flow)

Set the low source water temperature limit switch SW2 #2 to “Loop” on the printed circuit board for applications using a closed loop antifreeze solution. On applications using an open loop/ground water system, set to “Well” (the factory setting). If using closed loop and no antifreeze solution leave in “Well” position (the factory setting).

Condensate Drain

The internal condensate drain assembly consists of a drain tube, which is attached to the drain pan, a 3/4-inch PVC female adapter, and a flexible connecting hose. The female adapter may exit either the front or the side of the vertical cabinet. The adapter will be glued to the field-installed PVC condensate piping. A condensate hose is inside all cabinets as a trapping loop; therefore, an external trap is not necessary.

Air Coil

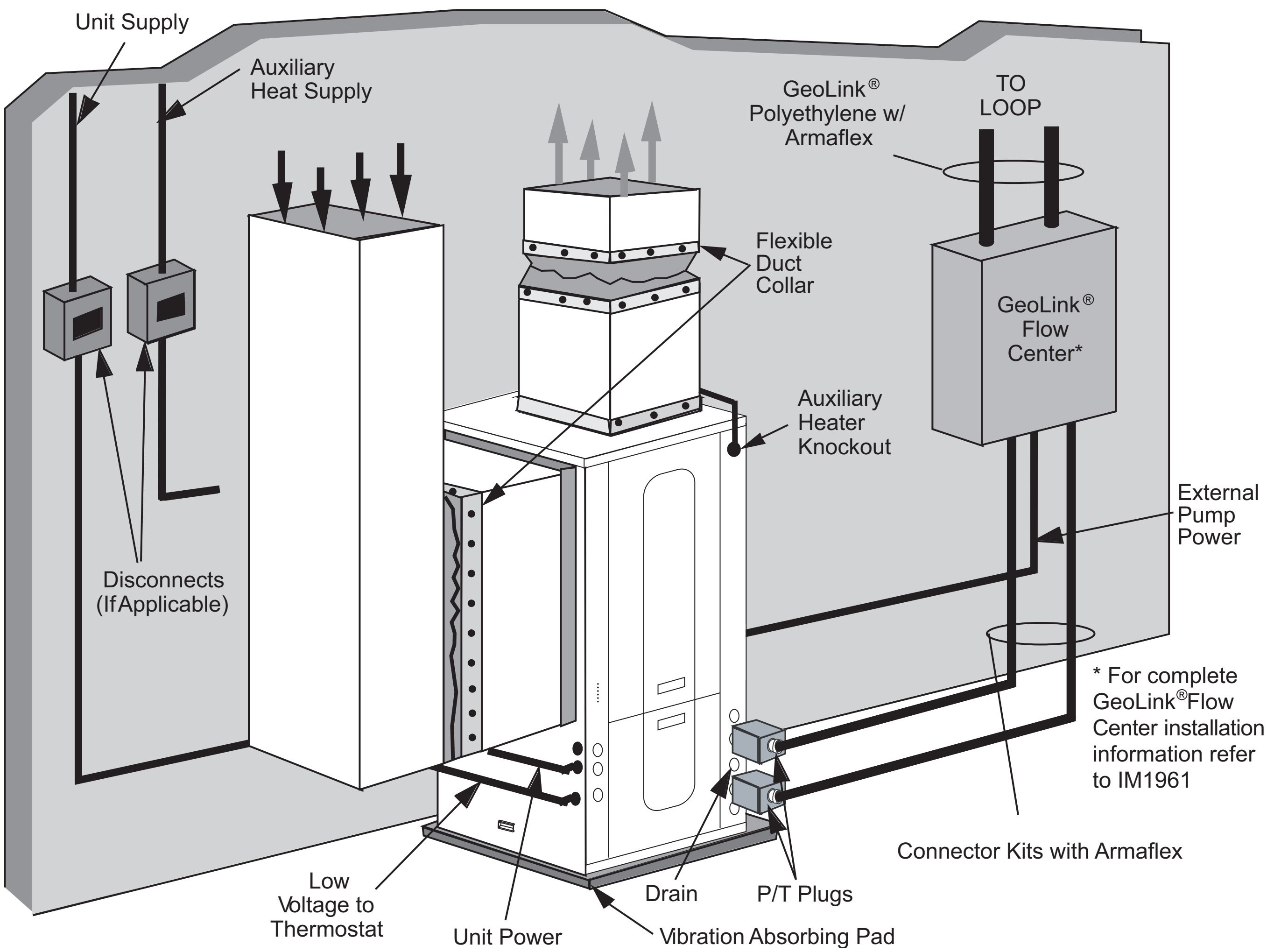
To obtain maximum performance the air coil should be cleaned before start up. A 10% solution of dishwasher detergent and water is recommended for both sides of coil; a thorough water rinse should follow.

Closed Loop Ground Source Systems

Once piping is completed between the unit, flow center and the ground loop (Figure 3), final purging and charging of the loop is needed. A flush cart (at least a 1.5 HP pump) is needed to achieve adequate flow velocity in the loop to purge air and dirt particles from the loop itself. Antifreeze solution is used in most areas to prevent freezing. Flush the system adequately to remove as much air as possible then pressurize the loop to a static pressure of 50-75 psi (winter) or 40-50 psi (summer). This is normally adequate for good system operation. Loop static pressure will fluctuate with the seasons. Pressures will be higher in the winter months than during the cooling season. This fluctuation is normal and should be considered when charging the system initially.

After pressurization, be sure to remove the plug in the end of the loop pump motor(s) (if Grundfos® pumps are used) to allow trapped air to be discharged and to ensure the motor housing has been flooded. Ensure the loop flow center provides adequate flow through the unit by checking pressure drop across the heat exchanger (Refer to Pressure Drop table). Usually 2.5-3 gpm of flow per ton of cooling capacity is recommended in earth loop applications. Refer to Wiring Schematics for loop pump power wiring details.

Figure 3 - Closed Loop: Ground Source Application



Multiple Units on One Flow Center

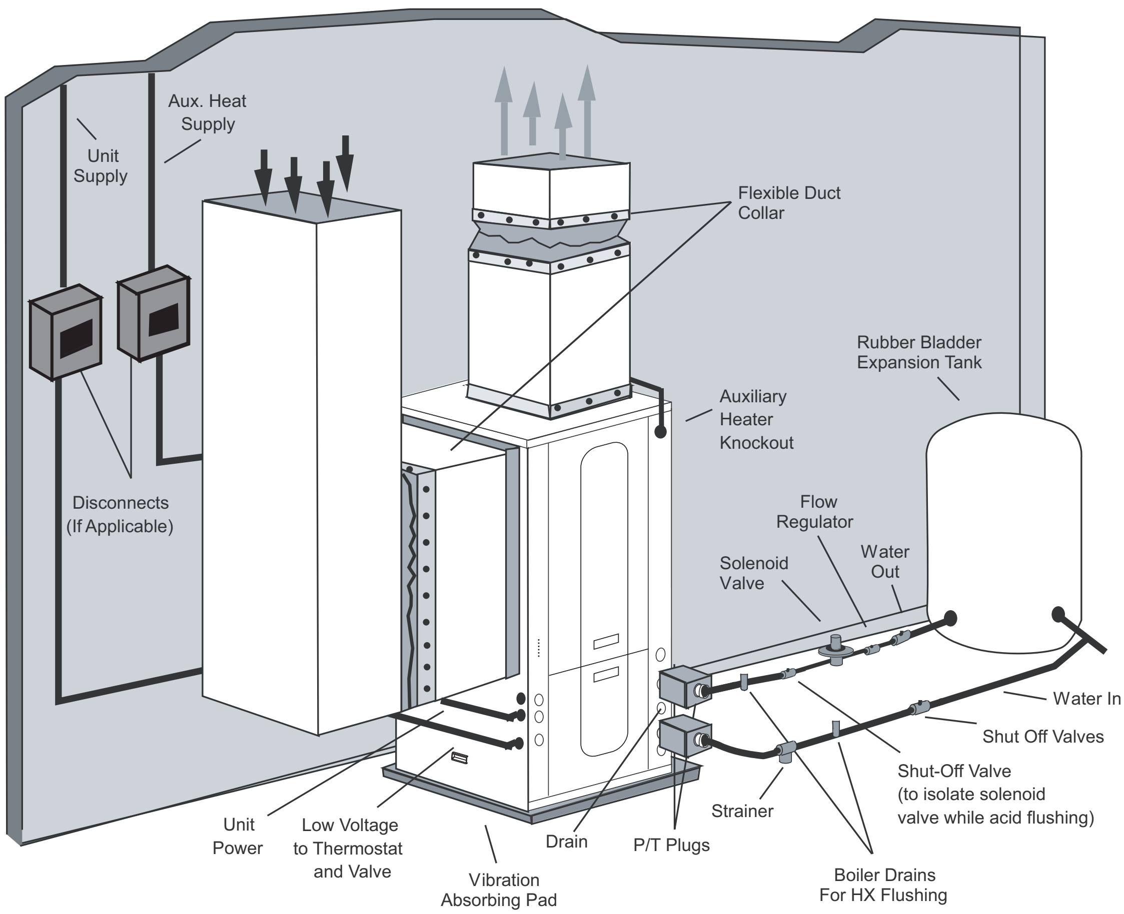
When two Premium Q Series units are connected to one loop pumping system, pump control is automatically achieved by connecting the slave terminals on connector P2 in both units with 2-wire thermostat wire. These terminals are polarity conscious (see Figure 10). The loop pump(s) may be powered from either unit, whichever is more convenient. If either unit calls, the loop pump(s) will automatically start.

Open Loop Ground Water Systems

Typical open loop piping is shown in Figure 5. Always maintain water pressure in the heat exchanger by placing water control valves at the outlet of the unit to prevent mineral precipitation. Use a closed, bladder-type expansion tank to minimize mineral formation due to air exposure. Ensure proper water flow through the unit by checking pressure drop across the heat exchanger and comparing it to the figures in the pressure drop tables. Normally about 2 GPM flow rate per ton of cooling capacity (1.5 GPM per ton minimum at 50° F) is needed in open loop systems.

Discharge water from the unit is not contaminated in any manner and can be disposed of in various ways such as recharge well, storm sewer, drain field, adjacent stream or pond, etc. depending on local building codes. Most local codes forbid the use of sanitary sewer for disposal. Consult your local building and zoning department to ensure compliance in your area.

Figure 5 - Open System: Ground Water Application



Notes: For open loop ground water systems or systems that do not contain and antifreeze solution, set SW2-#2 to the “Well” position.

Figure 6: Open Loop Solenoid Valve Connection Option

Typical slow operating external 24V water solenoid valve (type VM) wiring.

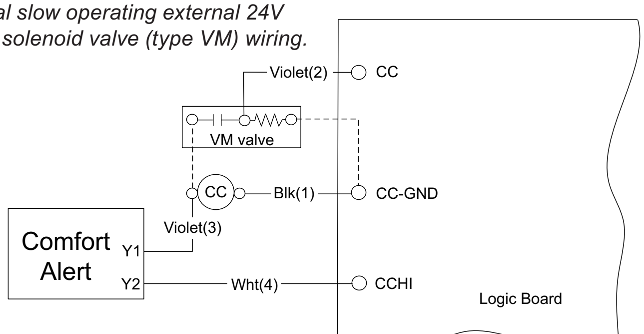
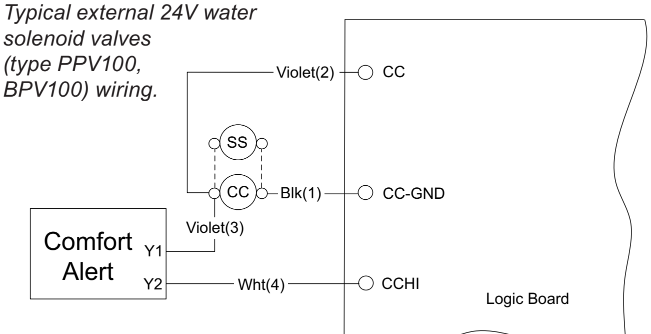


Figure 7: BPV or PPV Valve Wiring

Typical external 24V water solenoid valves (type PPV100, BPV100) wiring.

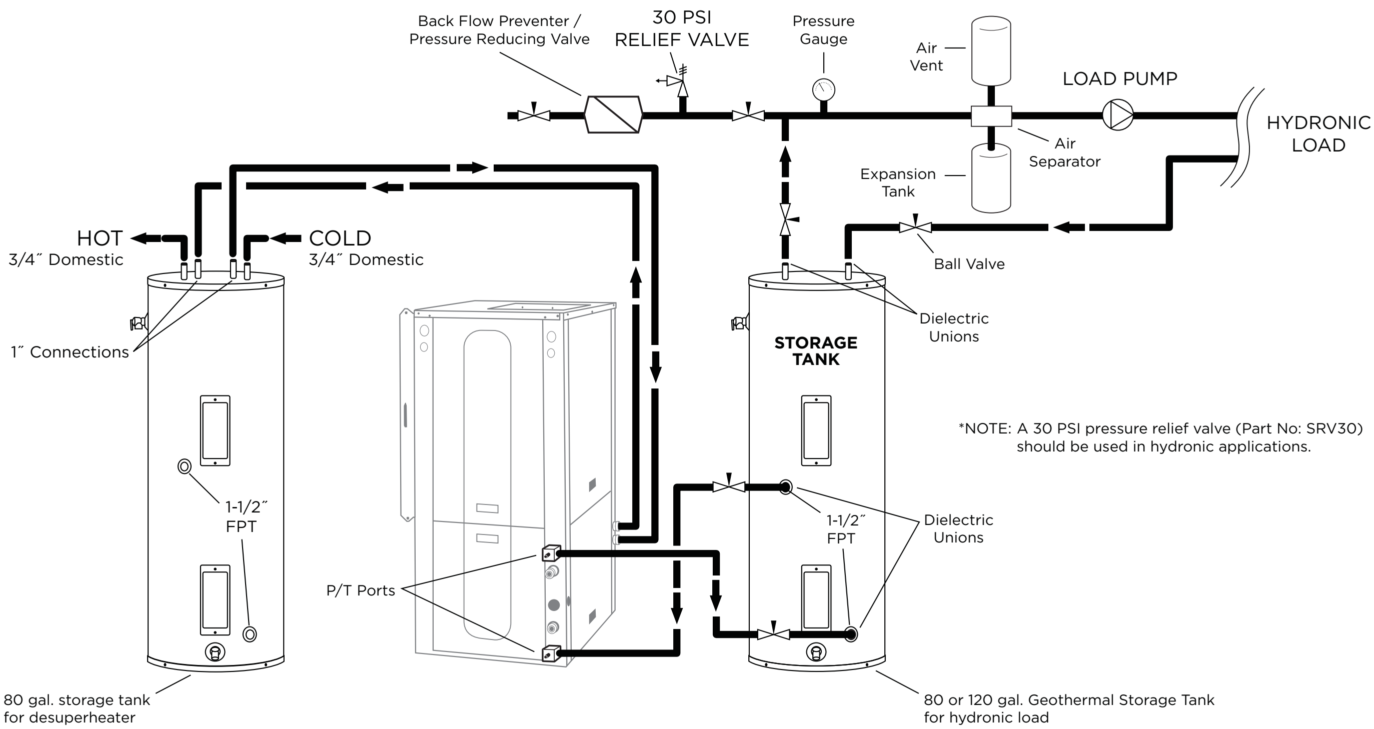


Desuperheater Connections

To maximize the benefits of the desuperheater a minimum 50-gallon water heater is recommended. For higher demand applications, use an 80-gallon water heater as shown below or two 50-gallon water heaters connected in a series. Electric water heaters are recommended. Make sure all local electrical and plumbing codes are met for installing a desuperheater. The Premium Q Series is not supplied with an internal circulator. A DPK5 kit will need to be purchased to connect to the desuperheater. The DPK5 kit is supplied with installation instructions, circulator, tank adaptor and temperature limit switch. Be sure to remove the plug in the end of the desuperheater pump motor (if Grundfos® pumps are used) to allow trapped air to be discharged and to ensure the motor housing has been flooded.

Typical Buffer Tank Installation

Figure 8: Premium Q Series with Hydronic Storage Tank and Domestic Water Storage Tank



Premium Q Series Recommendations

Unit Model	Copper I.D. Pipe Size (in)	Flow Rates (GPM)	Maximum Feet of Pipe One Way	Total Number of Elbows	Recommended Buffer Tank Size
038	1.25	9	30’	10	80 U.S. Gals
049	1.25	12	30’	10	80 U.S. Gals
064	1.25	15	30’	10	120 U.S. Gals
072	1.50	18	30’	10	120 U.S. Gals

Electrical

General

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.

Unit Power Connection

Line Voltage connection is made by connecting the incoming line voltage wires to the "L" side of the contactor as shown in Figure 9. Consult the Unit Electrical Data table below for correct fuse size.

External Loop Pump Power Connection

If the unit is to be used with an external loop pump (FC1 or FC2 flow center), the pump(s) will be connected to the terminals on PB1 in the unit electrical box as shown in Figure 9. The pumps will automatically be cycled as required by the unit or by a secondary signal from another Premium Q Series unit sharing the flow center. (Refer to wiring schematics.)

208 Volt Operation

All 208-230 volt units are factory wired for 230 volt operation. For 208 volt operation, the red and the blue transformer wires must be switched on terminal strip PS1. (Refer to wiring schematics.)

Figure 9: Premium Q Series Line Voltage 208-230/60/1

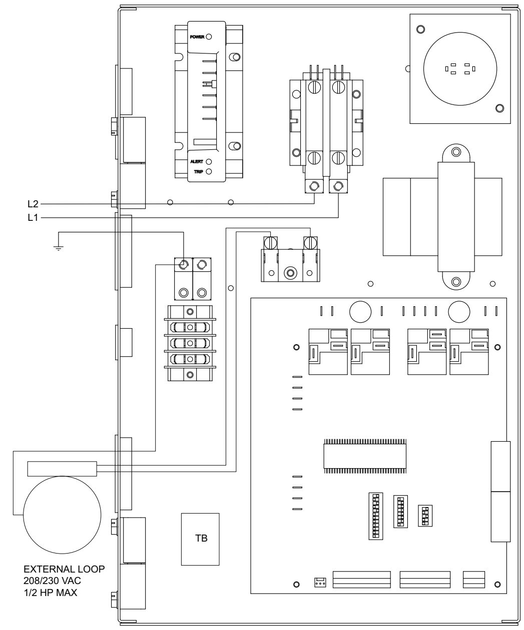
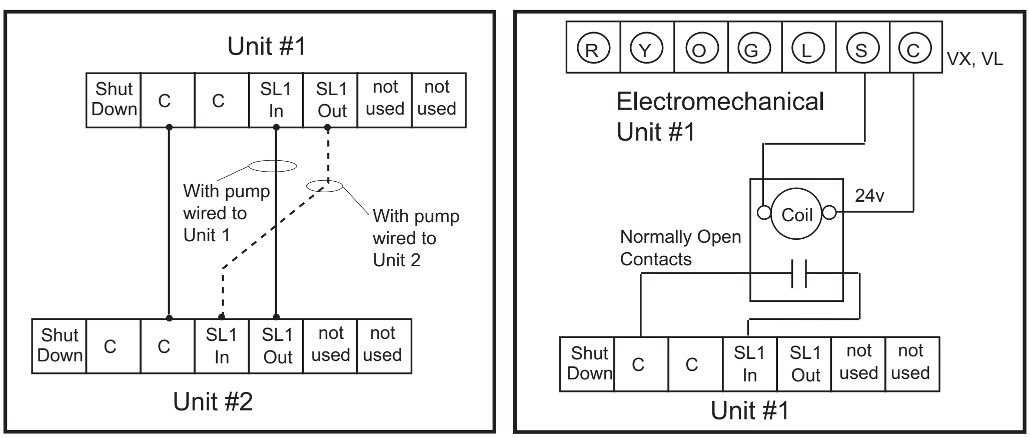


Figure 10: Wiring Multiple Units to One Flow Center



Electrical Data

Model	Rated Voltage	Voltage Min/Max	Compressor			Int Pump FLA	Ext Loop FLA	Fan Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse calc	Max Fuse/ HACR
			MCC	RLA	LRA							
038	208-230/60/1	197/254	26.0	16.6	82.0	1.07	5.4	4.0	27.1	31.2	47.8	45
038*	208-230/60/1	197/254	26.0	16.6	82.0	1.07	5.4	7.0	30.1	34.2	50.8	50
049	208-230/60/1	197/254	33.0	21.1	96.0	1.07	5.4	4.0	31.6	36.8	57.9	50
049*	208-230/60/1	197/254	33.0	21.1	96.0	1.07	5.4	7.0	34.6	39.8	60.9	60
064	208-230/60/1	197/254	40.0	25.6	118.0	1.07	5.4	7.0	39.1	45.5	71.2	70
072	208-230/60/1	197/254	42.5	27.2	150.0	1.07	5.4	7.0	40.7	47.5	74.7	70

6/17/08

* With optional 1 HP ECM2 motor
Rated Voltage of 208-230/60/1.
HACR circuit breaker in USA only.
Local electrical codes overule any wiring recommendations.

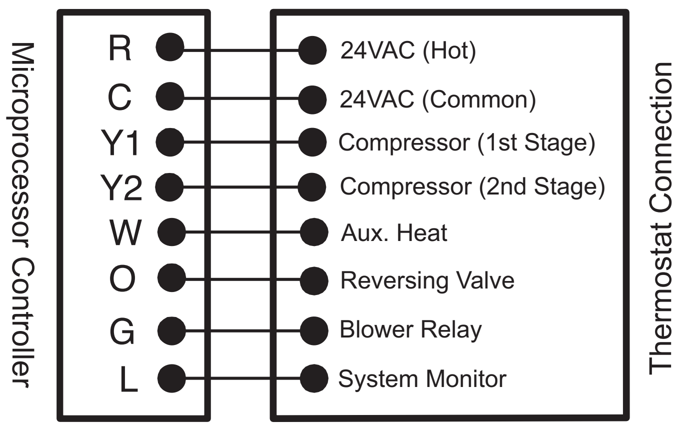
Min/Max Voltage of 197/254.
All fuses Class RK-5.

Thermostat Installation

Installation

Position the thermostat subbase against the wall so that it is level and the thermostat wires protrude through the subbase. Mark the position of the subbase mounting holes and drill holes with a 3/16-inch bit. Install anchors and secure base to the wall. Thermostat wire must be 8 conductor 18 AWG wire. Strip the wires back 1/4-inch (longer strip lengths may cause shorts) and insert the thermostat wires into the Premium Q Series connector as shown in Figure 11. Tighten the screws to ensure good connections. The thermostat has the same type of connectors, requiring the same wiring. See instructions enclosed in the thermostat for detailed installation and operation information.

Figure 11 - Thermostat Wiring



Other Thermostats

The Premium Q Series unit is compatible with virtually any 24VAC thermostat. However, the multi-stage nature of this product requires a 3-stage heating/2-stage cooling type thermostat.

Note: DIP switch SW2-8 is required to be in the “OFF” position for the control to operate with FaultFlash or ComforTalk thermostats. SW2-8 in the “ON” position configures the control to operate with typical thermostats (continuous lockout signal). There must be a wire connecting Y2 on the microprocessor controller to 2nd stage compressor on the thermostat for proper operation.

Physical Data

Model	038	049	064	072
Compressor (1 each)	Copeland Scroll			
Factory Charge R410a, oz [kg]	90 [2.55]	111 [3.14]	128 [3.62]	128 [3.62]
ECM Fan Motor & Blower				
Fan Motor Type/Speeds	ECM Variable Speed			
Fan Motor- hp [W]	1/2 [373]	1/2 [373]	1 [746]	1 [746]
Blower Wheel Size (Dia x W), in. [mm]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]
Coax and Water Piping				
Loop Water Connections Size - Swivel - in [mm]	1” [25.4]	1” [25.4]	1” [25.4]	1” [25.4]
Hydronic Water Connections Size - Swivel - in [mm]	1” [25.4]	1” [25.4]	1” [25.4]	1” [25.4]
HWG Connection Size - Swivel - in [mm]	1” [25.4]	1” [25.4]	1” [25.4]	1” [25.4]
Coax & Piping Water Volume - gal [l]	1.3 [4.9]	1.6 [6.1]	1.6 [6.1]	1.6 [6.1]
Vertical				
Air Coil Dimensions (H x W), in. [mm]	28 x 25 [711 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]	36 x 25 [914 x 635]
Air Coil Total Face Area, ft^2 [m^2]	4.9 [0.451]	5.6 [0.570]	6.3 [0.641]	6.3 [0.641]
Air Coil Tube Size, in [mm]	3/8 [9.5]	3/8 [9.5]	3/8 [9.5]	3/8 [9.5]
Air Coil Number of rows	3	3	4	4
Filter Standard - 1˝ [25mm] Electrostatic	28 x 30 [712 x 762]	32 x 30 [813 x 762]	36 x 30 [914 x 762]	36 x 30 [914 x 762]
Weight - Operating, lb [kg]	425	530	540	540
Weight - Packaged, lb [kg]	445	550	560	560

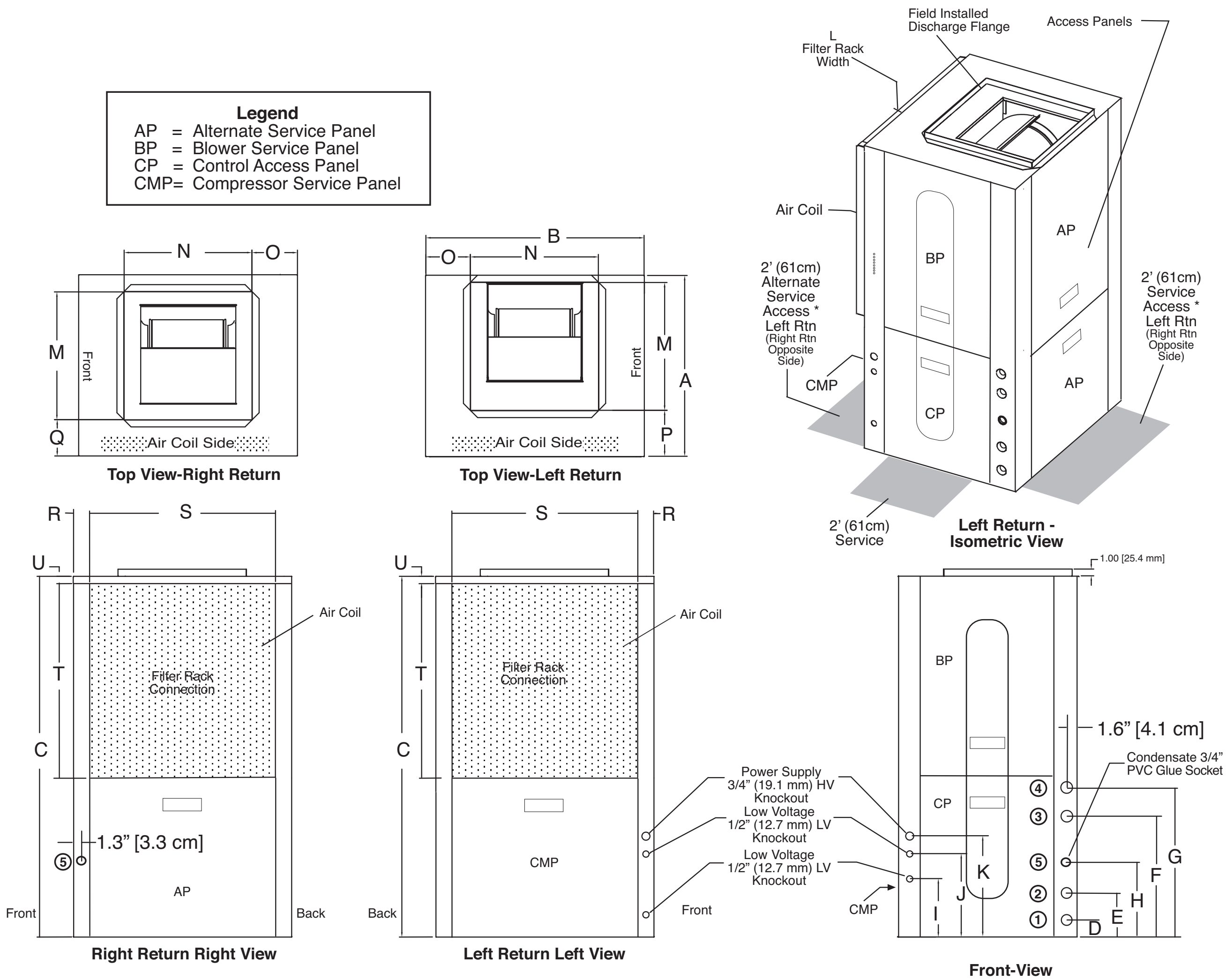
6/2/08

Pressure Drop

Model	GPM	Pressure Drop (psi)				
		30°F	50°F	70°F	90°F	110°F
038 full load	5	1.2	1.2	1.1	1.0	1.0
	7	2.2	2.1	1.9	1.8	1.7
	9	3.4	3.2	3.0	2.8	2.6
	11	4.9	4.6	4.3	4.0	3.7
038 part load	4	0.9	0.8	0.8	0.7	0.7
	6	1.7	1.6	1.5	1.4	1.3
	8	2.8	2.6	2.5	2.3	2.1
	10	4.2	3.9	3.7	3.4	3.2
049 full load	6	1.2	1.2	1.1	1.0	1.0
	9	2.4	2.2	2.1	2.0	1.8
	12	3.9	3.6	3.4	3.2	2.9
	15	5.7	5.3	5.0	4.7	4.3
049 part load	5	1.1	1.1	1.0	0.9	0.9
	8	2.0	1.8	1.7	1.6	1.5
	11	3.4	3.1	2.9	2.8	2.5
	14	5.0	4.7	4.4	4.1	3.8
064 full load	8	2.0	1.8	1.7	1.6	1.5
	12	3.9	3.6	3.4	3.2	2.9
	16	6.5	6.0	5.6	5.2	4.8
	20	9.7	9.1	8.5	8.0	7.4
064 part load	6	1.2	1.2	1.1	1.0	1.0
	10	2.6	2.5	2.3	2.1	2.0
	14	5.0	4.7	4.4	4.1	3.8
	18	8.1	7.6	7.1	6.6	6.1
072 full load	12	3.9	3.6	3.4	3.2	2.9
	15	5.7	5.3	5.0	4.7	4.3
	18	8.1	7.6	7.1	6.6	6.1
	21	10.8	10.1	9.5	8.9	8.2
072 part load	10	2.6	2.5	2.3	2.1	2.0
	13	3.4	3.3	3.0	2.7	2.6
	16	6.5	6.1	5.8	5.4	5.0
	19	8.9	8.4	7.9	7.4	6.9

4/9/08

Dimmensional Data



* Note: Shaded areas are recommended service areas, not required.

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Vertical Models		Overall Cabinet			Water Connections							Electrical Knockouts				Discharge Connection duct flange installed (±0.10 in)					Return Connection using std deluxe filter rack (±0.10 in)			
					1	2	3	4	5			I	J	K										
		A	B	C	D	E	F	G	H	Loop		1/2" cond	1/2" cond	3/4" cond	L	M	N	O	P	Q	R	S	T	U
		Width	Depth	Height*	In	Out	HWG In	HWG Out	Cond-ensate	Water FPT	HWG FPT	Low Voltage	Ext Pump	Power Supply	Filter Rack Width	Supply Width	Supply Depth					Return Depth	Return Height	
022-030	in.	22.3	26.3	48.4	1.9	6.9	13.4	16.4	10.2	1" Swivel	1" Swivel	5.1	10.8	12.8	2.2	14.0	14.0	6.3	7.8	5.9	2.3	22.0	26.0	2.0
	cm.	56.6	66.8	122.9	4.8	17.5	34.0	41.7	25.9			13.0	27.4	32.5	5.6	35.6	35.6	16.0	19.8	15.0	5.8	55.9	66.0	5.1
036-038	in.	25.5	31.2	58.4	3.0	5.3	15.9	18.9	10.6	1" Swivel	1" Swivel	5.6	11.4	13.4	2.2	18.0	18.0	6.6	6.5	3.7	1.6	28.1	34.0	1.7
	cm.	64.8	79.2	148.3	7.6	13.5	40.4	48.0	26.9			14.2	29.0	34.0	5.5	45.7	45.7	16.8	16.5	9.4	4.1	71.4	86.4	4.3
042-049	in.	25.5	31.2	58.4	3.0	5.3	15.9	18.9	10.6	1" Swivel	1" Swivel	5.6	11.4	13.4	2.2	18.0	18.0	6.6	6.5	3.7	1.6	28.1	34.0	1.7
	cm.	64.8	79.2	148.3	7.6	13.5	40.4	48.0	26.9			14.2	29.0	34.0	5.5	45.7	45.7	16.8	16.5	9.4	4.1	71.4	86.4	4.3
060-072	in.	25.5	31.2	58.4	3.0	5.3	15.9	18.9	10.6	1" Swivel	1" Swivel	5.6	11.4	13.4	2.2	18.0	18.0	6.6	6.5	3.7	1.6	28.1	34.0	1.7
	cm.	64.8	79.2	148.3	7.6	13.5	40.4	48.0	26.9			14.2	29.0	34.0	5.5	45.7	45.7	16.8	16.5	9.4	4.1	71.4	86.4	4.3

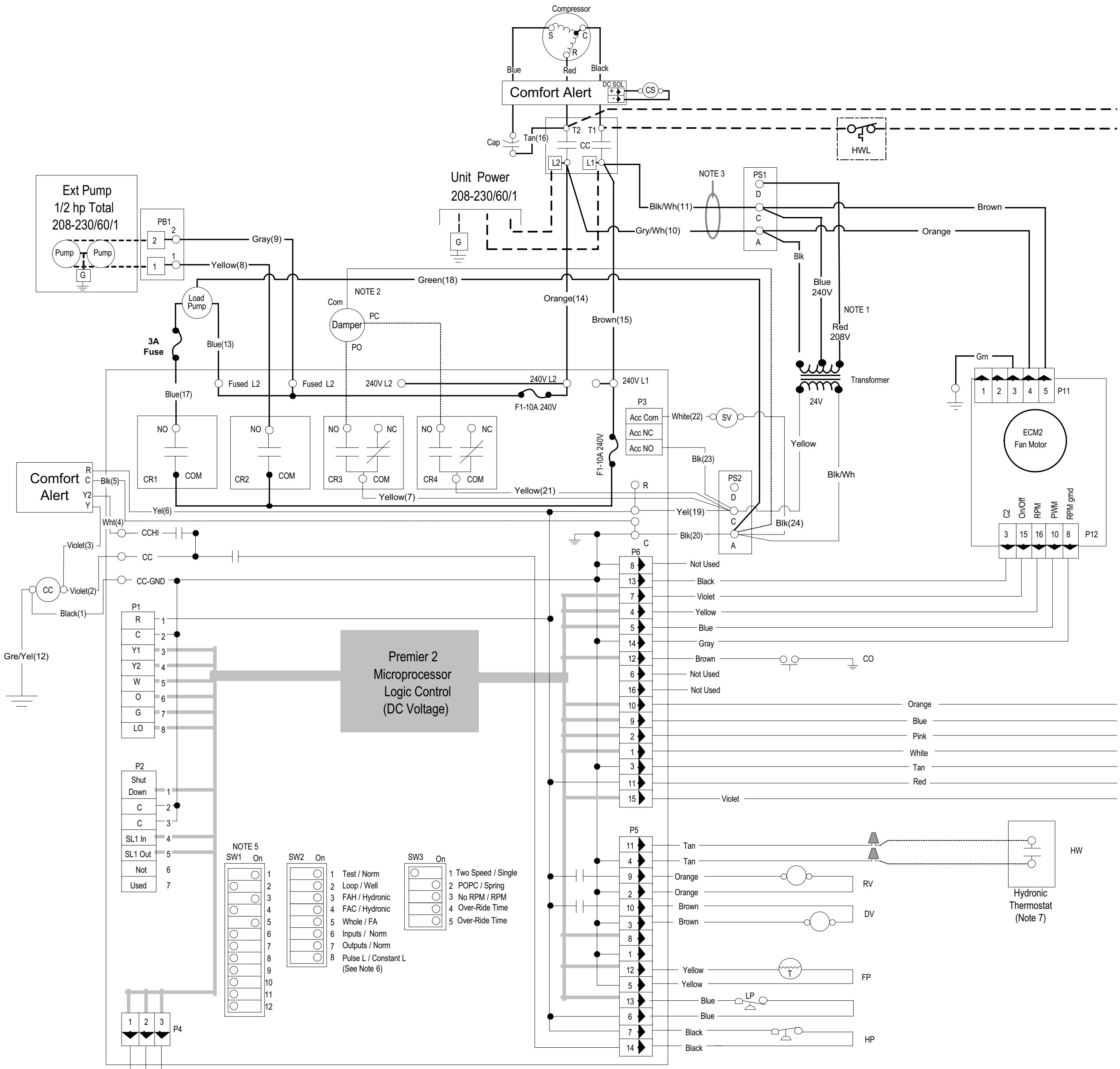
Condensate is 3/4" PVC female glue socket and is switchable from side to front

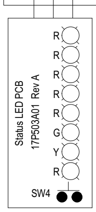
Vertical unit shipped with deluxe 1" (field adjustable to 2") duct collar/filter rack extending from unit 3.25" and is suitable for duct connection.

Discharge flange is field installed and extends 1" (25.4 mm) from cabinet

Rev.: 05/02/07 B

Wiring Schematic

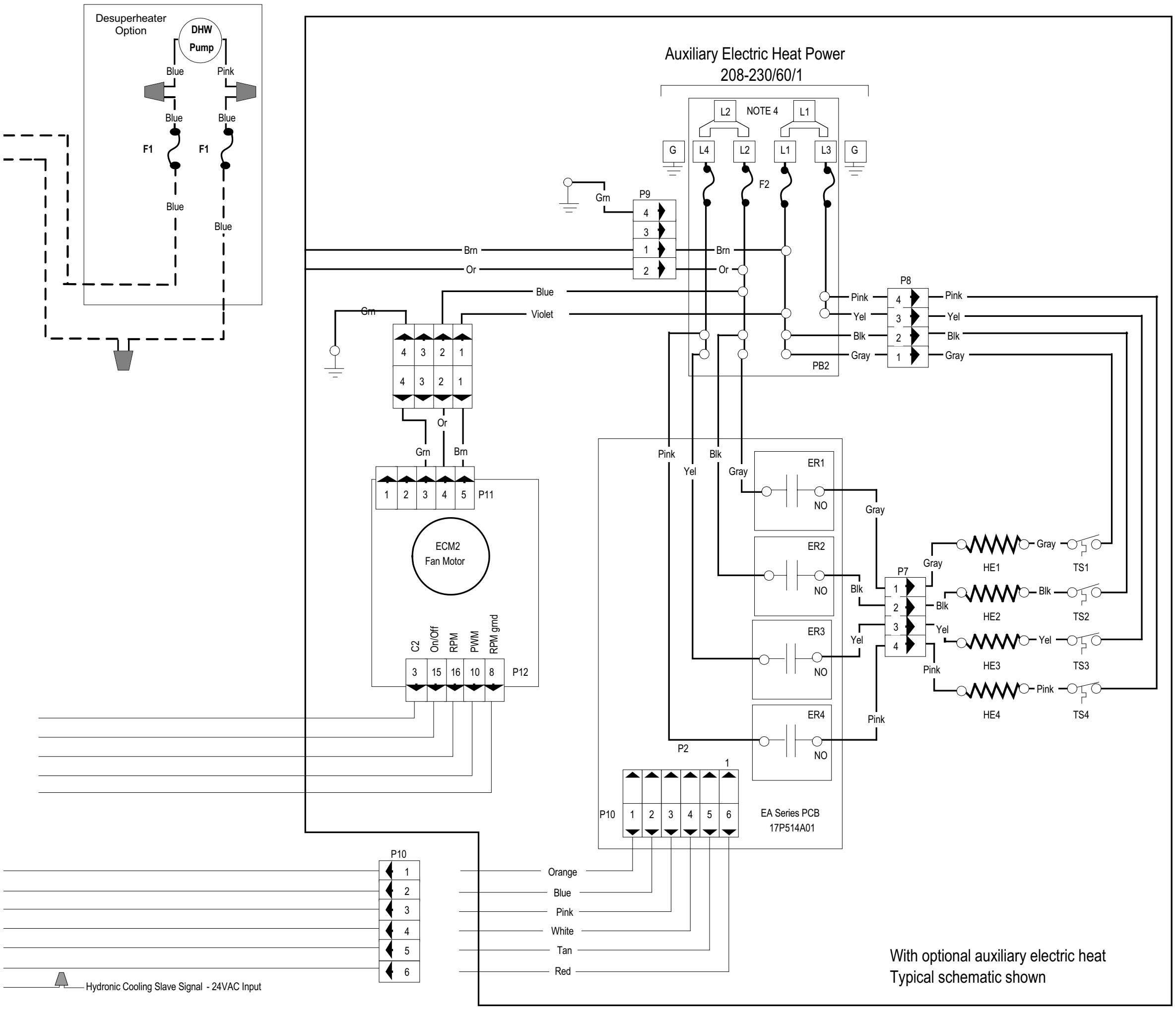




LED	Normal Display Mode	Diagnostic Modes			
		Current Fault Status	Inputs	Outputs	Outputs2
	Field Selection Dips - #1 On, #6 On, #7 On	#1 Off, #6 On, #7 On	#6 Off, #7 On	#6 On, #7 Off	#6 Off, #7 Off
Drain	Drain pan overflow lockout	Drain pan overflow	Y1	Compressor	Blower low
Water Flow	FP thermister (loop<15°F, well<30°F) Lockout	FP thermister (loop<15°F, well<30°F)	Y2	Not used	Blower med
High Press	High pressure lockout	High pressure	O	RV	Blower hi
Low Press	Low pressure lockout	Low pressure	G	FAN	Aux heat #1
Air Flow	ECM2 RPM < 100 rpm lockout	ECM2 RPM < 100 rpm	W	HW pump	Aux heat #2
Status	Microprocessor malfunction	Not used	SL1	Loop pump	Aux heat #3
HW Limit	Not used	Not used	HW	DV	Aux heat #4
HW off	Hot-water disable	HW off	HW off	HW off	HW off

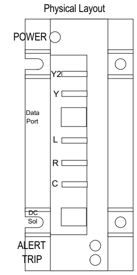
Over-Ride Selection

Over-ride time	SW3-4	SW3-5
5 minutes	On	On
15 minutes	Off	On
30 minutes	On	Off
60 minutes	Off	Off



Operation Logic Data							
Operation Logic Table	Heating				Cooling		Hot Water Mode
	STG1	STG2	STG3	EMERG	STG1	STG2	
Compressor	On	On	On	Off	On	On	Stg 2 On
Reversing Valve	Off	Off	Off	Off	On	On	Off
Loop Pump	On	On	On	Off	On	On	On
Load Pump	Off	Off	Off	Off	Off	Off	On
Aux Heater	Off	Off	Staged	Staged	Off	Off	Off
Acc Relay	On	On	On	Off	On	On	Off
Diverting Valve	Off	Off	Off	Off	Off	Off	On
ECM Speed	On	On	On	Off	On	On	Off
T-Stat Signal	Y1	Y1, Y2	Y1, Y2, W	W	Y1, O	Y1, Y2, O	HW
Damper	Off	Off	Off	On	Off	Off	Off
Auxiliary 1 - Out	On	On	On	Off	On	On	On

Comfort Alert Physical Layout



Legend

- Factory Low voltage wiring
- Factory Line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Optional block
- DC Voltage PCB traces
- Internal junction
- Quick connect terminal
- Wire nut
- L1 Field wire lug
- Ground
- Relay Contacts- N.O., N.C.
- Fuse
- SV 24 vac coil
- T Thermistor
- G Light emitting diode - Green
- Relay coil
- Capacitor w/ bleed resistor
- Switch - Condensate overflow
- Switch - High pressure
- Switch - Low pressure
- Switch -Hot Water On/Off
- P Polarized connector

CS - Compressor Solenoid
CC - Compressor Contactor
CO - Condensate overflow sensor
CR1 - HW pump relay
CR2- Loop pump relay
CR3 - Damper relay
CR4 - Damper relay
DV - Diverting Valve
F1 and F2 - Fuses
FP - Freeze protection sensor
HP - High pressure switch
LP - Low pressure switch
PB1 - Power block
PS1,PS2 Power strips
RV - Reversing Valve coil
SW1 - DIP package 12 position
SW2 - DIP package 8 position
SW3 - DIP package 5 position
SW4 - Hot water enable switch
HWL- Hot Water Temperature Limit

Notes

1 - Switch blue and red wires for 208V operation.
2 - Typical hook-up shown for power open - power closed damper shown.
3 - The blk/wh and gray/wh wires are removed when Aux Heat is installed
4 - Buss lugs L1 and L2 can be removed and dual power wire sets connected directly to box lugs L 1, L2, and L3, L4.
5 - Air Flow Configuration Example: SW1 configured for dip 1 as low, dip 3 as medium, and dip 5 as high speed ECM2 fan.
6 – SW2-8 must be in the OFF position for pulsed "L" lockout signal and in th ON position for constant "L" lockout signal .
7 – A hydronic input will generate a Y2 compressor call so that compressor only operates in high capacity.

Comfort Alert Status		
LED	Flash Code	Description
Green	Solid	Module Has Power
Red	Solid	Y1 Present But Compressor Not Running
Yellow	Code 1	Long Run Time
	Code 2	System Pressure Trip
	Code 3	Short Cycling
	Code 4	Locked Rotor
	Code 5	Open Circuit
	Code 6	Open Start Circuit
	Code 7	Open Run Circuit
	Code 8	Welded Contactor
	Code 9	Low Voltage

7/02/08

Hydronic Section

General guidelines are shown below for component selection and design/installation criteria for the piping system. Local codes supersede any recommendations in this manual.

Shut off/flow regulation valves: Use full port ball valves or gate valves for component isolation. If valves are going to be used frequently, ball valves are recommended. Globe valves are designed for flow regulation. Always install globe valves in the correct direction (fluid should enter through the lower body chamber).

Check valves: Swing check valves must be installed in the horizontal position with the bonnet of the valve upright. Spring check valves can be mounted in any position. A flow check valve is required to prevent thermo-siphoning (or gravity flow) when the circulator pump is off or when there are two circulators on the same system.

Storage (Buffer) tank: A buffer tank is required for all hydronic heating systems using Premium Q Series heat pumps. The tank should be sized to provide 2 gallons of storage capacity for every one thousand btuh's of nominal heat pump capacity.

Pressure relief valve: Most codes require the use of a pressure relief valve if a closed loop heat source can be isolated by valves. Even if local code does not require this device, the manufacturer recommends its installation. If the pressure relief valve in the buffer tank is not already rated at 30 psi (207 kPa) maximum pressure, one must be installed. The pressure relief valve should be tested at start up for operation. This valve can also be used during initial filling of the system to purge air. Note that the waste pipe must be at least the same diameter as the valve outlet (never reduce), and valves may not be added to this pipe. The bottom of the pipe must terminate at least 6" (15 cm) above the floor. If the piping is connected to a drain, there must be an air gap.

Backflow prevention check valves: Most codes require backflow prevention check valves. Note that a single check valve is not equal to a backflow prevention check valve. Even if local code does not require this device, the manufacturer recommends its installation. This is particularly important if the system will use antifreeze.

Pressure reducing valves or feed water valves: This valve lowers the pressure from the make-up water line to the system. Most are adjustable and directional. A "fast fill" valve is required for initial filling of the system. Some have screens, which must be cleaned after the initial filling. If there is a restriction in the screen, the system could go to 0 psi (0 kPa), potentially causing pumps(s) failure. A valve should be installed on each side of the pressure reducing valve for servicing. Both valves should have tags reading "Do not shut this valve under normal operation – service valve only".

Expansion tanks: Expansion tanks are required on hydronic systems to help absorb the pressure swings as the temperature in the system fluctuates.

Elbows/tees: Long radius elbows or two 45° elbows will lower pressure drop. Standard tees have a greater restriction on the "T" portion than tees designed with angled outlet ports.

Antifreeze: Antifreeze is required if any of the piping system is located in areas subject to freezing.

Dielectric unions: Dielectric unions are recommended whenever connecting two dissimilar metals to one and other to prevent electro-galvanic corrosion.

When using the various types of hydronic heat distribution systems, the temperature limits of the geothermal system must be a major consideration. In new construction, the distribution system can easily be designed with the temperature limits in mind. In retrofits, care must be taken to address the operating temperature limits of the existing distribution system. The maximum storage tank temperature for the Premium Q Series is 130°F (54.4°C). Typical in floor radiant systems require much lower temperatures, typically 100°-115°F, which is ideal for the Premium Q Series.

The Premium Q Series uses an external temperature sensor such as the lower thermostat in a water heater storage tank to control the tank temperature. The thermostat should be wired to the Premium Q Series P5 connector wires, P5-11 and P5-4 tan wires. When the tank temperature drops below the thermostat setting the contacts in the thermostat will close and

Hydronic Section (cont.)

initiate a signal to the Premium Q Series to heat water.

A storage tank must be used to store the heated water supplied by the Premium Q Series. It is not recommended to send heated water from the Premium Q Series directly to the hydronic zones since the Premium Q Series also has the ability to condition the space with forced air. There must be adequate storage capacity in the storage tank to accommodate the hydronic load while the Premium Q Series is operating in forced air mode. The hydronic storage tank should be sized to provide 2 gallons of storage capacity for every one thousand btuh's of nominal heat pump capacity.

Adequate rate of flow (GPM) is very important to system performance and long term reliability. Follow the guidelines for recommended flow and pipe sizing in the Premium Q Series Recommendations table.

Be sure to remove the plug in the end of the pump motor (if Grundfos® pumps are used) to allow trapped air to be discharged and to ensure the motor housing has been flooded.

Geothermal storage tank thermostat

Premium Q Series must be wired to the thermostat screw terminals. The yellow thermistor wires will not operate with the Premium Q Series as they are used with the EW series water to water.

Microprocessor Control

Startup

The unit will not operate until all the inputs and safety controls are checked for normal conditions. At first power-up, a four minute delay is employed before the compressor is energized.

Component Sequencing Delays

Components are sequenced and delayed for optimum space conditioning performance.

Short Cycle Protection

The control employs a minimum "off" time of four minutes to provide for short cycle protection of the compressor.

Condensate Overflow Protection

The control board incorporates an impedance sensing liquid sensor at the top of the drain pan. Upon a continuous 30-second sensing of the condensate, compressor operation is suspended (see Fault Retry), and the condensate overflow lockout LED begins flashing.

Shutdown Mode

A 24VAC common signal to the “shutdown” input on the control board puts the unit into shutdown mode. Compressor, hot water pump and fan operation are suspended.

Safety Controls

The control receives separate signals for a high pressure switch for safety, a low pressure switch to prevent loss of charge damage, and a low suction temperature thermistor for low source water temperature limit. Upon a continuous 30-second measurement of the fault (immediate for high pressure), compressor operation is suspended, the appropriate lockout LED begins flashing. (Refer to the "Fault Retry" section below.)

Testing

The control allows service personnel to shorten most timing delays for faster diagnostics (Refer to Dip Switch description.)

Fault Retry

All faults (except for low RPM faults with the ECM2 fan motor) are retried twice before finally locking the unit out. An output signal is made available for a fault LED at the thermostat. The “fault retry” feature is designed to prevent nuisance service calls.

Diagnostics

The control board allows all inputs and outputs to be displayed on the LEDs for fast and simple control board diagnosis. (Refer to Dip Switch description).

Resistance Heat Control (208-230 Units)

The electric heat control module contains the appropriate high-voltage control relays. Control signals energize the relays in the proper sequence, and the LED display board indicates which stages are energized.

Microprocessor Control Operation

Heating Operation

Heat, 1st Stage (Y1)

The fan motor is started on low speed immediately, the loop pump is energized 5 seconds after the “Y1” input is received, and the compressor is energized on low capacity 10 seconds after the “Y1” input. The fan is switched to medium speed 15 seconds after “Y1” input (ECM only).

Heat, 2nd Stage (Y1,Y2) Dual Capacity Units

The second stage compressor will be activated 5 seconds after receiving a “Y2” input as long as the minimum first stage compressor run time of 1 minute has expired. The ECM blower changes from medium to high speed 15 seconds after the “Y2” input.

The Comfort Alert will delay the second stage compressor until 5 seconds after it receives a “Y2” from the board.

Heat, 3rd Stage (Y1,Y2,W) Dual Capacity Units

The 1st stage of resistance heat is energized 10 seconds after “W” input, and with continuous 3rd stage demand, the second stage of resistance heat will engage after 5 minutes.

Emergency Heat (W Only)

Low speed blower and damper output CR3 will be energized immediately after receiving (W only). The first stage auxiliary heater will be energized 10 seconds upon receiving a (W only) and the blower will shift to high speed 15 seconds after receiving a “W” only input. If the “W” input is not removed, the second, third, and fourth auxiliary heat outputs will stage on, one at a time, every two minutes.

Cooling Operation

Cool, 1st Stage (Y1,O)

The blower is started immediately, and the loop pump(s) is energized 5 seconds after the “Y1” input is received. The compressor will be energized (on low capacity for Dual Capacity units) 10 seconds after the “Y1” input. The ECM blower will shift from low to medium speed 15 seconds after the “Y1” input.

Cool, 2nd Stage (Y1, Y2, O) Dual Capacity Units

The second stage compressor will be activated 5 seconds after receiving a “Y2” input as long as the minimum first stage compressor run time of 1 minute has expired. The ECM blower changes to high speed 15 seconds after the “Y2” input. The Comfort Alert will delay the second stage compressor until 5 seconds after it receives a “Y2” from the board.

Hydronic Cooling Slave Signal (24 vac input on P6-pin 15 violet wire)

The Premium Q Series control board must be operating in cooling mode (Y1 and O inputs) or the cooling slave signal is ignored. When “Y1”, and “O” inputs have been received and a cooling slave input from heating/cooling thermostat located in a hydronic heated/force air cooled zone are received the control will activate CR3 relay to open damper(s) which will allow for cooling to occur in zone. When cooling slave input (24VAC) signal is removed the control will turn off the CR3 relay output, if spring damper operation is selected, or active, the CR4 output if POPC damper operation is selected. This will close field installed damper(s) located in ductwork.

NOTE: The control will not operate in forced air cooling and hydronic water heating modes simultaneously.

Hot Water Operation

After a hot water input is received, the diverting valve, loop pump and hot water pump are turned on. Five seconds after hot water input is received the compressor is activated in second stage.

Fan (G Only)

The fan starts on low speed. Regardless of fan input (G) from thermostat, the fan will remain on low speed for 30 seconds at the end of each heating, cooling or emergency heat cycle.

Lockout Conditions

During lockout mode the appropriate unit and thermostat lockout LEDs will illuminate. The compressor, loop pump, load water pump and accessory outputs are de-energized. Unless the lockout is caused by an ECM2 low RPM fault, the fan will continue to run on low speed, and if the thermostat calls for heating 3rd stage, emergency heat operation will occur.

Lockout modes can be reset at the thermostat after a five-second waiting period, which restores normal operation but keeps the unit lockout LED illuminated. Comfort Alert faults can not be reset at the thermostat and will not be displayed on the thermostat. Interruption of power to the unit will reset a lockout without a waiting period and clear all lockout LEDs and Comfort Alert faults.

High Pressure

This lockout mode occurs when the normally closed safety switch is opened momentarily. >600 PSI

Microprocessor Control Operation (cont.)

Low Pressure

This lockout mode occurs when the normally closed switch is opened for 30 continuous seconds. <40 PSI

Low Source Water Temperature Limit (Water Flow)

This lockout mode occurs when the low source water thermistor temperature is at or below the selected point (well 30°F or loop 15°F) for 30 continuous seconds.

Fan RPM (ECM2)

The control board monitors fan RPM to sense if the fan is not operating. This lockout mode occurs if the fan RPM falls below the low RPM limit (100 RPM) for 30 continuous seconds.

ComforTalk and FaultFlash Thermostats

When the heat pump micro processor control is configured for ComforTalk or FaultFlash (SW2-8 'off') thermostats the thermostats will flash or display alert codes when a lockout condition is present. SW2-8 in the 'on' position configures the control to operate with typical thermostats (continuous lockout signal).

Tables 1 and 2 show the codes that will be displayed on the different ComforTalk and FaultFlash thermostats. Comfort Alert faults will not be displayed on the thermostat.

Table 1

FaultFlash Thermostats

TA32W01 and TP32W02 Thermostats	
Thermostat Display Lockout Code	Lockout Description
2 Flashes	High Pressure Fault
3 Flashes	Low Pressure Fault
4 Flashes	Freeze Protection Fault
5 Flashes	Water Flow Fault
6 Flashes	Hot Water Fault
7 Flashes	Condensate Fault
8 Flashes	Voltage our of Range
9 Flashes	RPM Fault

Comfort Alert fault codes can not be displayed on the thermostat module. See the Comfort Alert module to determine the specific flash code for compressor abnormalities.

Table 2

ComforTalk Thermostats

TP32U03, TP32U04 and TP32U05 Thermostats	
Thermostat Display Lockout Code	Lockout Description
"High Pressure" or "E2"	High Pressure Fault
"Low Pressure" or "E3"	Low Pressure Fault
"Water Flow" or "E4"	Freeze Protection Fault
"Freeze Protection" or "E5"	Water Flow Fault
"Hot Water" or "E6"	Hot Water Fault
"Condensate" or "E7"	Condensate Fault
"Voltage Range" or "E8"	Voltage our of Range
"RPM" or "E9"	RPM Fault

These thermostats can be configured to display the lockout condition "text" or error number.
* A slow flash of 1 second on and off means the heat pump microprocessor SW2-1 is configured for "Test Mode".
Comfort Alert fault codes can not be displayed on the thermostat module. See the Comfort Alert module to determine the specific flash code for compressor abnormalities.

Microprocessor Control Operation (cont.)

ComforTalk and FaultFlash Thermostats (cont.)

Green “POWER” LED - module has power
Red “TRIP” LED - Thermostat “Y” demand signal is present, but the compressor is not running.

Comfort Alert Flash Codes		
Yellow “ALERT” LED	**LED Description**	**Cause**
Flash Code 1	Long Run Time	Eighteen consecutive hours of compressor run time
Flash Code 2	System Pressure Trip	Not applicable
Flash Code 3	Short Cycling	Compressor run time of less than 3 minutes on 4 consecutive cycles
Flash Code 4	Locked Rotor	Four consecutive compressor protector trips indicating compressor won’t start
Flash Code 5	Open Circuit	“Y” thermostat demand signal with no compressor current
Flash Code 6	Open Start Circuit	“Y” thermostat demand signal with no current in the start circuit
Flash Code 7	Open Run Circuit	“Y” thermostat demand signal with no current in the run circuit
Flash Code 8	Welded Contactor	Current detected with no “Y” thermostat demand signal present
Flash Code 9	Low Voltage	Less than 17 VAC detected in control circuit

* Flash code number corresponds to a number of LED flashes, followed by a pause and then repeated.
* TRIP and ALERT LEDs flashing at the same time indicates control circuit voltage is too low for operation.
* Reset ALERT flash code by removing 24 VAC power from module.
* Last ALERT flash code is displayed for 1 minute after module is powered on.

Resetting Comfort Alert Codes

Alert codes can be reset manually by cycling power off and on to the Comfort Alert module.
Alert codes will reset automatically if conditions return to normal.

Flash Code Number	LED Description	Automatic Reset of Alert Codes
Flash Code 1	Long Run Time	Thirty “alert free” on and off cycles to reset automatically
Flash Code 2	System Pressure Trip	Not applicable
Flash Code 3	Short Cycling	Four “alert free” on and off cycles to reset automatically
Flash Code 4	Locked Rotor	Four “alert free” on and off cycles to reset automatically
Flash Code 5	Open Circuit	One “alert free” on and off cycles to reset automatically
Flash Code 6	Open Start Circuit	One “alert free” on and off cycles to reset automatically
Flash Code 7	Open Run Circuit	One “alert free” on and off cycles to reset automatically
Flash Code 8	Welded Contactor	One “alert free” on and off cycles to reset automatically
Flash Code 9	Low Voltage	Resets when voltage rises above 19 VAC

* Reset ALERT flash code by removing 24 VAC power from module.

Microprocessor Control Operation (cont.)

Airflow Selection DIP Switches (SW1)

See Fan Speed section.

Field Selection DIP Switches (SW2)

An “8-position” DIP switch package on the Premium Q Series control allows the following field selectable options:

This DIP switch on the control allows field selection of “Normal” or “Test” operational modes. The test mode accelerates most timing functions 16 times to allow faster troubleshooting. Test mode also allows viewing the “current” status of the fault inputs on the LED display.

This DIP switch allows field selection of low source water thermistor fault sensing for well water or antifreeze-protected earth loops.

This DIP switch allows field selection of “Heating Forced Air Priority” or “Hydronic Priority”.

This DIP switch allows field selection of “Cooling” “Forced Air Priority” or “Hydronic Priority”.

This DIP switch allows field selection option for constant fan. When whole house is selected CR3, relay will activate and open dampers. When forced air is selected a damper (s) located in the hydronically heated forced air cooled zone will not be opened.

This DIP switch allows viewing the inputs from the thermostat to the control board such as “Y1”, “Y2”, “O”, “G”, “W”, “HW” “SL1-In” on the LED display.

This DIP switch allows viewing the outputs from the control board such as compressor, diverting valve, reversing valve, blower, hot water pump, and loop pump on the LED display.

Configures the control for a pulsed lockout signal (ComforTalk and FaultFlash thermostats) or continuous lockout signal.

Factory Setup DIP Switches (SW3)

A “5-position” DIP switch package on the Premium Q Series control allows the following factory setup options:

1-Dual Capacity/Single Speed

2-POPC/Spring

This switch allows field selection of “Power Open, Power Closed” dampers or “Power Open, Spring Close” dampers.

3-No RPM / RPM

This DIP switch configures the control to monitor the RPM output of an ECM2 blower motor. When using a PSC blower motor, the control should be configured for no RPM sensing.

4 and 5-Over-ride Time

These switches are used in conjunction to determine the override timings for forced air and hydronic operation. See Override Selection table for timings.

Operating Limits

Operating Limits	Cooling		Heating	
	(°F)	(°C)	(°F)	(°C)
Air Limits				
Min. Ambient Air	45	7.2	45	7.2
Rated Ambient Air	80	26.7	70	21.1
Max. Ambient Air	100	37.8	85	29.4
Min. Entering Air	50	10.0	40	4.4
Rated Entering Air db/wb	80.6/66.2	27/19	68	20.0
Max. Entering Air db/wb	110/83	43/28.3	80	26.7
Water Limits				
Min. Entering Water	30	-1.1	20	-6.7
Normal Entering Water	50-110	10-43.3	30-70	-1.1
Max. Entering Water	120	48.9	90	32.2

Notes:

Minimum/maximum limits are only for start-up conditions, and are meant for bringing the space up to occupancy temperature. Units are not designed to operate at the minimum/maximum conditions on a regular basis. The operating limits are dependant upon three primary factors: 1) water temperature, 2) return air temperature, and 3) ambient temperature. When any of the factors are at the minimum or maximum levels, the other two factors must be at the normal level for proper and reliable unit operation.

Operation Logic

	Heating				Cooling		Hot Water Mode
	STG1	STG2	STG3	EMERG	STG1	STG2	
Compressor	On	On	On	Off	On	On	Stg 2 On
Reversing Valve	Off	Off	Off	Off	On	On	Off
Loop Pump	On	On	On	Off	On	On	On
Load Pump	Off	Off	Off	Off	Off	Off	On
Aux Heater	Off	Off	Staged	Staged	Off	Off	Off
Acc Relay	On	On	On	Off	On	On	Off
Diverting Valve	Off	Off	Off	Off	Off	Off	On
ECM Speed	On	On	On	On	On	On	Off
T-Stat Signal	Y1	Y1, Y2	Y1, Y2, W	W	Y1, O	Y1, Y2, O	HW
Damper	Off	Off	Off	On	Off	Off	Off
Auxiliary 1 - Out	On	On	On	Off	On	On	On

Correction Factor Tables

Part Load Air Flow Corrections

Airflow		Cooling				Heating		
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.778	0.956	0.924	0.943	1.239	0.879
275	69	0.944	0.830	0.962	0.944	0.958	1.161	0.914
300	75	0.957	0.866	0.968	0.958	0.968	1.115	0.937
325	81	0.970	0.900	0.974	0.970	0.977	1.075	0.956
350	88	0.982	0.933	0.981	0.980	0.985	1.042	0.972
375	94	0.991	0.968	0.991	0.991	0.993	1.018	0.988
400	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
425	106	1.007	1.033	1.011	1.008	1.007	0.990	1.010
450	113	1.013	1.065	1.023	1.015	1.012	0.987	1.018
475	119	1.017	1.099	1.037	1.022	1.018	0.984	1.025
500	125	1.020	1.132	1.052	1.027	1.022	0.982	1.031
520	130	1.022	1.159	1.064	1.030	1.025	0.979	1.034

5/30/06

Full Load Air Flow Corrections

Airflow		Cooling				Heating		
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.786	0.910	0.920	0.943	1.150	0.893
275	69	0.944	0.827	0.924	0.940	0.958	1.105	0.922
300	75	0.959	0.860	0.937	0.955	0.968	1.078	0.942
325	81	0.971	0.894	0.950	0.967	0.977	1.053	0.959
350	88	0.982	0.929	0.964	0.978	0.985	1.031	0.973
375	94	0.992	0.965	0.982	0.990	0.993	1.014	0.988
400	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
425	106	1.007	1.034	1.020	1.010	1.007	0.990	1.011
450	113	1.012	1.065	1.042	1.018	1.013	0.983	1.020
475	119	1.017	1.093	1.066	1.026	1.018	0.980	1.028
500	125	1.019	1.117	1.092	1.033	1.023	0.978	1.034
520	130	1.020	1.132	1.113	1.038	1.026	0.975	1.038

5/30/06

Cooling Capacity Corrections (Dual Capacity Full & Part Load)

Entering Air WB ºF	Total Clg Cap	Sensible Cooling Capacity Multipliers - Entering DB ºF										Power Input	Heat of Rejection
		60	65	70	75	**80**	80.6	85	90	95	100		
45	0.719	0.891	1.058	1.128	*	*	*	*	*	*	*	0.898	0.741
50	0.719	0.893	0.980	1.106	*	*	*	*	*	*	*	0.898	0.741
55	0.812	0.629	0.844	1.026	1.172	*	*	*	*	*	*	0.922	0.819
60	0.897			0.820	0.995	1.206	1.238	*	*	*	*	0.955	0.895
65	0.960			0.568	0.810	1.004	1.052	1.227	*	*	*	0.982	0.951
66.2	0.984			0.505	0.743	1.002	1.027	1.151	*	*	*	0.993	0.980
67	**1.000**			0.463	0.699	**1.000**	1.011	1.101	1.310	*	*	**1.000**	**1.000**
70	1.047				0.599	0.865	0.879	1.007	1.225	1.433	*	1.018	1.029
75	1.148					0.567	0.584	0.734	0.956	1.261	1.476	1.056	1.118

Note: * Sensible capacity equals total capacity at conditions shown.

7/20/06

Heating Capacity Corrections (Dual Capacity Full & Part Load)

	Heating Corrections		
Ent Air DB °F	Htg Cap	Power	Heat of Ext
45	1.050	0.749	1.158
50	1.059	0.859	1.130
55	1.043	0.894	1.096
60	1.033	0.947	1.064
65	1.023	0.974	1.030
68	1.009	0.990	1.012
70	**1.000**	**1.000**	**1.000**
75	1.011	1.123	0.970
80	1.000	1.196	0.930

7/20/06

Auxiliary Heat

Auxiliary Heat Electrical Data

Model	Supply	Heater Amps		Min Circuit Amp		Max Fuse (USA)		Max Fuse (CAN)		Max CKT BRK	
	Circuit	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
EAL(H)10	Single	34.7	40	53.3	60	60	60	60	60	60	60
EAL(H)15	Single	52.0	60	75	85	80	90	80	90	70	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	17.3	20	21.7	25	25	25	25	25	20	30
EAL(H)20	Single	69.3	80	96.7	110	100	110	100	110	100	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	34.7	40	43.3	50	45	50	45	50	40	50

All heaters rated single phase 60 cycle and include unit fan load
All fuses type "D" time delay (or HACR circuit breaker in USA)

Auxiliary Heat Ratings

Model	KW		Stages	BTU/HR		Min	Premium Q Series Compatibility			
	208V	230V		208V	230V	CFM	038	049	064	072
EAL(H)10	7.2	9.6	2	24,600	32,700	1100	•	•	•	•
EAL(H)15	10.8	14.4	3	36,900	49,100	1250	•	•	•	•
EAL(H)20	14.4	19.2	4	49,200	65,500	1500			•	•

Notes: High fan tap setting must be above the minimum CFM for the heater selected.

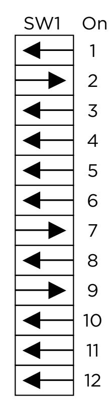
Blower Performance Data

MODEL	MAX	AIR FLOW DIP SWITCH SETTINGS											
	ESP	1	2	3	4	5	6	7	8	9	10	11	12
038	0.50	650	750 L	850	1000	**1100 M**	**1200**	**1300 H**	**1400**	**1500**			
038 w/1hp*	0.75	800 L	1000	**1100 M**	**1300 H**	**1500**	**1600**	1800					
049	0.50	650	800 L	900	1050	1150	**1250**	**1350 M**	**1450**	**1550 H**			
049 w/1hp*	0.75	800 L	900	1000	1200	**1400 M**	**1600 H**	**1700**	**1850**	2000	2200	2300	2400
064	0.75	800	950 L	1100	1300	**1500 M**	**1750**	**1950 H**	**2100**	**2300**			
072	0.75	800	950	1100 L	1300	**1500**	**1750 M**	**1950**	**2100 H**	**2300**			

Factory settings are at recommended L-M-H DIP switch locations
M-H settings MUST be located within boldface CFM range
Lowest and Highest DIP switch settings are assumed to be L and H respectively
CFM is controlled within ±5% up to the maximum ESP
Max ESP includes allowance for wet coil and standard filter
3/18/08

A 12-position DIP switch package on the Premium Q Series control allows the airflow levels to be set for Low, Medium and High speed when using the ECM2 blower motor.

Only three of the DIP switches can be in the “On” position. The first “On” switch (the lowest position number) determines the “Low Speed Fan” setting. The second “On” switch determines the “Medium Speed Fan” setting, and the third “On” switch determines the “High Speed Fan” setting.



The example to the right shows SW1 on the Premium Q Series control board configured for the following 049 airflow settings:
Low Speed Fan: 800 CFM
Medium Speed Fan: 1350 CFM
High Speed Fan: 1550 CFM

Startup

Before powering unit, check the following:

- Fuses, breakers and wire size are correct and match the name plate.
- Low voltage wiring is complete.
- Piping has been completed and the water system is cleaned and flushed.
- Air is purged from the closed loop system.
- Air is purged from buffer tank, hydronic system isolation valves are open, and water control valves or loop pumps are wired.
- Condensate line is open and correctly pitched.
- Black/white and gray/white wires in unit control box have been removed if auxiliary heat has been installed.
- DIP switches are set correctly.
- Blower rotates freely and foam shipping support has been removed.
- Blower speed is correct (DIP switch setting).
- Air filter is clean and in position.
- Service/access panels are in place.
- Return air temperature is between 60-80°F in heating and 70-95°F in cooling.

Air coil is clean.

Hydronic Startup Instructions

1. Initiate a control signal to place the unit in the hydronic heating mode. Heating setpoint must be above the water temperature of the buffer tank and/or load side water loop.
2. Be sure that the water control valve or loop pumps are activated.
3. the compressor and load side circulating pump will energize after a time delay.
4. using a digital thermometer measure the load side water entering the Premium Q Series unit.

Note: *Ensure that the sensing probe is in contact with copper piping and that it is well insulated to prevent measurement errors due to ambient room temperature. Allow 2-3 minutes before measurement for best results.*

5. Using a digital thermometer, measure the load-side water temperature leaving the Premium Q Series unit. Refer to Operating Parameters table and compare measured temperature rise with data.
6. Adjust the heating setpoint below the water temperature of the buffer tank and/or load side water. Verify that the compressor, load side circulating pump and water control valve or loop pumps deactivate.
7. During test, check for excessive vibration, noise or water leaks. Correct or repair as required.
8. Set system to desired normal operating temperature to maintain desired comfort level.
9. Instruct the owner/operator in the proper operation of the hydronic temperature control and system maintenance.

Forced Air Startup Instructions

NOTE: On initial power-up a four-minute time delay will occur.

1. Initiate a control signal to energize the blower motor. Check blower operation.
2. Initiate a control signal to place the unit in the cooling mode. Cooling setpoint must be set below room temperature.
3. First stage cooling will energize after a time delay.
4. Be sure that the compressor and water control valve or loop pumps are activated.
5. Verify that the water flow rate is correct by measuring the pressure drop through the heat exchanger using the P/T plugs and comparing to water *Pressure Drop* table.
6. Check the temperature of both the supply and discharge water. Refer to *Operating Parameters* tables.
7. Check for an air temperature drop of 15° to 25° F across the air coil, depending on the fan speed and entering water temperature. Refer to *Operating Parameters* tables.
8. Adjust the cooling setpoint above the room temperature and verify that the compressor and water valve or loop pumps deactivate.
9. Initiate a control signal to place the unit in the heating mode. Heating setpoint must be set above room temperature.

Startup (cont.)

10. First stage heating will energize after a time delay.
11. Check for an air temperature rise of 20° to 35° F across the air coil, depending on the fan speed and entering water temperature. Refer to *Operating Parameters* tables.
12. If auxiliary electric heaters are installed, adjust the heating setpoint until the electric heat banks are sequenced on. All stages of the auxiliary heater should be sequenced on when the thermostat is in the “Emergency Heat” mode. Check amperage of each element.
13. Adjust the heating setpoint below room temperature and verify that the compressor and water valve or loop pumps deactivate.
14. During all testing, check for excessive vibration, noise or water leaks. Correct or repair as required.
15. Set system to desired normal operating mode and set temperature to maintain desired comfort level.
16. Instruct the owner/operator in the proper operation of the thermostat and system maintenance.

Premium Q Series Startup and Troubleshooting Form

Company Name:______________________________ Company Phone No:______________________________
Technician Name: ______________________________ Date: ______________________________
Synergy3D Model No:______________________________ Serial No:______________________________
Owner's Name: ______________________________ Open or Closed Loop: ______________________________
Installation Address: ______________________________ Installation Date:______________________________

Check One

❑ Start up/Check-out for new installation ❑ Troubleshooting Problem: ______________________________

1. FLOW RATE IN GPM (SOURCE SIDE HEAT EXCHANGER)

Water In Pressure:	a.______	PSI
Water Out Pressure:	b.______	PSI
Pressure Drop = a - b	c.______	PSI
Convert Pressure Drop to Flow Rate (refer to *Pressure Drop* table)	d.______	GPM

2. TEMPERATURE RISE OR DROP ACROSS SOURCE SIDE HEAT EXCHANGER

	COOLING		HEATING	
Water In Temperature:	e.______	°F	e.______	°F
Water Out Temperature:	f. ______	°F	f. ______	°F
Temperature Difference:	g.______	°F	g.______	°F

3. TEMPERATURE RISE OR DROP ACROSS AIR COIL

	COOLING		HEATING	
Supply Air Temperature:	h.______	°F	h.______	°F
Return Air Temperature:	i. ______	°F	i. ______	°F
Temperature Difference:	j. ______	°F	j. ______	°F

4. HEAT OF REJECTION (HR) / HEAT OF EXTRACTION (HE) CALCULATION

HR or HE = Flow Rate x Temperature Difference x Brine Factor*
d. (above) x g. (above) x 485 for Methanol or Environol, 500 for water*
Heat of Extraction (Heating Mode) = __________ btu/hr
Heat of Rejection (Cooling Mode) = __________ btu/hr
Compare results to Capacity Data Tables

Note: Steps 5 through 8 need only be completed if a problem is suspected

5. WATTS

	COOLING		HEATING		HYDRONIC	
Volts:	m.______	VOLTS	m.______	VOLTS	m. ______	VOLTS
Total Amps (Comp. + Fan):	n. ______	AMPS	n. ______	AMPS	n. ______	AMPS
Watts = m. x n. x 0.85	o. ______	WATTS	o. ______	WATTS	o. ______	WATTS

6. CAPACITY

Cooling Capacity = HR. - (o. x 3.413)	p. _____	btu/hr
Heating Capacity= HE. + (o. x 3.413)	p. _____	btu/hr

7. EFFICIENCY

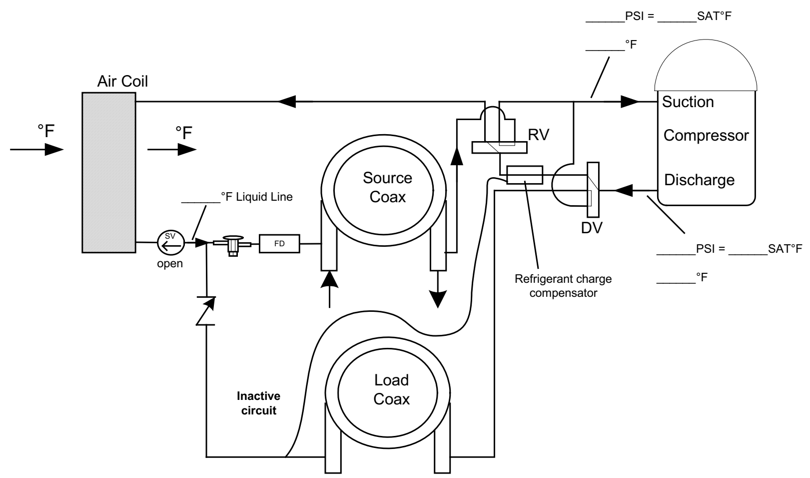
Cooling EER = p. / o.	q. _____	EER
Heating COP = p. / (o. x 3.413)	q. _____	COP

8. SUPERHEAT (S.H.) / SUBCOOLING (S.C.)

	COOLING		HEATING		HYDRONIC	
Suction Pressure:	r. ______	PSI	r. ______	PSI	r. ______	PSI
Suction Saturation Temperature:	s. ______	°F	s. ______	°F	s. ______	°F
Suction Line Temperature:	t. ______	°F	t. ______	°F	t. ______	°F
Superheat = t. - s.	u. ______	°F	u. ______	°F	u. ______	°F
Head Pressure:	v. ______	PSI	v. ______	PSI	v. ______	PSI
High Pressure Saturation Temp.:	w. ______	°F	w. ______	°F	w. ______	°F
Liquid Line Temperature*:	x. ______	°F	x. ______	°F	x. ______	°F
Subcooling = w. - x.	y. ______	°F	y. ______	°F	y. ______	°F

* Note: Liquid line is between the source coax and the expansion valve in the cooling mode; between the air coil and the expansion valve in the heating mode; between hot water (load) coax and txv in hot water mode.

Premium Q Series Heating Cycle Analysis



Unit Amp Draw ____________

Line Voltage _________

Loop:______ Open ______ Closed

Subcooling _______

Superheat _______

Entering Source Water ________°F

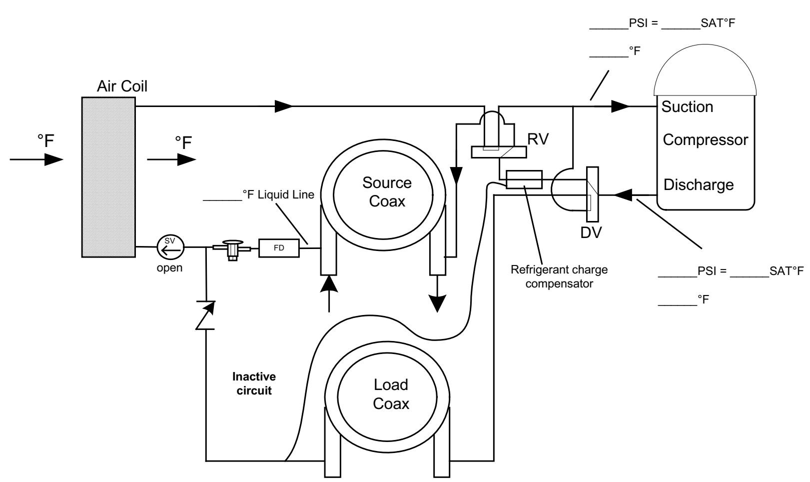
Entering Water Pressure Drop _____ PSI

Leaving Source Water ________°F

Leaving Water Pressure Drop _____ PSI

NOTE: Do not attach refrigerant gauges unless a problem is suspected!

Premium Q Series Cooling Cycle Analysis



Unit Amp Draw ____________

Line Voltage _________

Loop:______ Open ______ Closed

Subcooling _______

Superheat _______

Entering Source Water ________°F

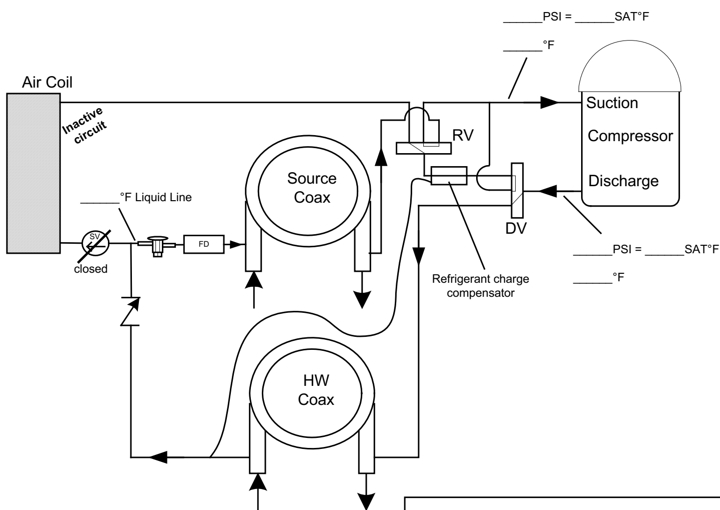
Entering Water Pressure Drop _____ PSI

Leaving Source Water ________°F

Leaving Water Pressure Drop _____ PSI

NOTE: Do not attach refrigerant gauges unless a problem is suspected!

Premium Q Series Hot Water Cycle Analysis



Unit Amp Draw ____________

Line Voltage _________

Loop:______ Open ______ Closed

Subcooling _______

Superheat _______

Entering Source Water ________°F

Entering Water Pressure Drop _____ PSI

Leaving Source Water ________°F

Leaving Water Pressure Drop _____ PSI

Entering Load Water ________°F

Leaving Load Water ________°F

NOTE: Do not attach refrigerant gauges unless a problem is suspected!

Operating Parameters

Premium Q Series 1st Stage Operating Parameters 038-072

		Forced Air Cooling						Forced Air Heating					
EWT °F	Water Flow (GPM/ Ton)	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Water Temp Rise °F	Air Temp Drop °F DB	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Water Temp Rise °F	Air Temp Drop °F DB
20	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25												
	3.0							57-64	272-282	12° - 21°	8° - 16°	3 - 8	16-20
30	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	108-113	141-178	22° - 40°	4° - 18°	8-13	14-22	73-87	244-279	7° -18°	3° - 16°	4 - 9	16-20
	3.0	102-109	154-192	22° - 40°	4° - 18°	8-12	18-25	68-81	282-298	7° - 18°	3° - 16°	3 - 8	18-23
50	1.5	141-156	170-222	9° - 19°	7° - 18°	8-15	18-25	125-136	271-320	10° - 17°	4° - 17°	4 - 10	21-29
	2.25	130-146	188-224	7° - 17°	7° - 18°	7-12	22-26	107-122	288-326	7° - 15°	4° - 17°	4 - 9	20-29
	3.0	121-139	208-239	8° - 18°	7° - 18°	8-13	21-25	98-114	310-338	7° - 18°	4° - 17°	4 - 8	22-30
70	1.5	152-162	232-242	7° - 15°	8° - 18°	7-18	18-23	163-185	301-357	12° - 21°	4° - 17°	6 - 10	22-28
	2.25	139-151	247-281	7° - 14°	8° - 18°	6-14	18-25	147-162	321-368	9° - 13°	4° - 17°	5 - 9	28-36
	3.0	135-144	269-309	7° - 13°	8° - 18°	8-12	20-25	132-156	351-382	8° - 16°	4° - 17°	4 - 8	30-37
90	1.5	155-168	311-335	7° - 18°	9° - 18°	8-19	17-21	195-215	320-392	12° - 24°	2° - 14°	8 - 12	23-32
	2.25	141-155	327-361	6° - 14°	9° - 18°	9-15	18-23	177-202	351-398	9° - 18°	2° - 14°	6-10	32-42
	3.0	132-150	348-387	6° - 15°	9° - 18°	9-13	19-23	158-189	378-418	12° - 24°	2° - 14°	4 - 9	37-42
110	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	145-164	421-453	6° - 12°	9° - 18°	7-12	18-22						
	3.0	133-149	439-481	6° - 12°	10° - 20°	7-11	18-22						
120	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	145-158	481-511	6° - 12°	10° - 20°	8-14	17-21						
	3.0	139-151	491-528	6° - 12°	10° - 20°	5-12	17-21						

*Based on Nominal 400 cfm per ton airflow and 70°F EAT heating and 80/67°F EAT cooling
**Cooling air and water numbers can vary greatly with changes in humidity
*** No Desuperheater

Premium Q Series 2nd Stage Operating Parameters 038-072

		Forced Air Cooling						Forced Air Heating					
EWT °F	Water Flow (GPM/ Ton)	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Water Temp Rise °F	Air Temp Drop °F DB	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Water Temp Rise °F	Air Temp Drop °F DB
20	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25												
	3.0							57-64	272-282	12° - 21°	8° - 16°	3 - 8	16-20
30	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	118-114	144-182	22° - 40°	4° - 18°	8-13	14-22	77-90	249-284	3° -18°	3° - 16°	4 - 9	16-20
	3.0	106-114	154-192	22° - 40°	4° - 18°	8-13	18-25	71-85	288-305	6° - 18°	3° - 16°	3 - 8	18-23
50	1.5	144-159	172-225	9° - 19°	7° - 18°	8-15	18-25	127-139	273-325	10° - 17°	4° - 17°	4 - 9	21-29
	2.25	133-149	191-228	7° - 17°	7° - 18°	7-12	22-26	111-126	292-330	6° - 15°	4° - 17°	4 - 8	20-29
	3.0	125-142	210-242	8° - 18°	7° - 18°	8-13	21-25	102-118	315-343	6° - 18°	4° - 17°	4 - 8	22-30
70	1.5	155-166	234-246	8° - 15°	8° - 18°	7-16	18-23	166-189	305-361	12° - 21°	4° - 17°	6 -10	22-28
	2.25	142-155	253-289	7° - 14°	8° - 18°	6-13	18-25	151-168	326-371	6° - 13°	4° - 17°	5 - 9	28-36
	3.0	138-147	274-319	7° - 13°	8° - 18°	8-14	20-25	138-160	355-386	8° - 16°	4° - 17°	4 - 9	30-37
90	1.5	157-170	313-338	7° - 18°	9° - 18°	8-19	17-21	198-219	322-398	12° - 24°	2° - 14°	8 -12	23-32
	2.25	147-159	331-365	7° - 14°	9° - 18°	6-13	18-23	181-206	355-402	9° - 18°	2° - 14°	6 -10	32-42
	3.0	139-153	351-392	6° - 15°	9° - 18°	9-13	19-23	162-193	382-422	12° - 24°	2° - 14°	4 - 9	37-42
110	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	148-167	425-458	7° - 12°	9° - 18°	5-12	18-22						
	3.0	143-157	444-485	6° - 12°	10° - 20°	7-11	18-22						
120	1.5	Operation Not Recommended						Operation Not Recommended					
	2.25	149-160	487-519	7° - 12°	10° - 20°	8-19	17-21						
	3.0	144-156	496-534	6° - 12°	10° - 20°	5-12	17-21						

*Based on Nominal 400 cfm per ton airflow and 70°F EAT heating and 80/67°F EAT cooling
**Cooling air and water numbers can vary greatly with changes in humidity
*** No Desuperheater

Premium Q Series 038-072

Water Heating												
EWT °F	80°F ELT				100°F ELT				120°F ELT			
	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat °F	Sub-cooling °F
30	69-82	275-311	9° - 17°	10° - 19°	71-84	368-407	8° - 15°	10° - 19°	73-88	462-502	10° - 19°	11° - 19°
50	103-117	288-327	9° - 18°	13° - 20°	106-122	380-419	8° - 16°	13° - 20°	110-124	472-512	7° - 14°	9° - 20°
70	139-153	300-343	11° - 17°	15° - 24°	142-157	394-432	8° - 17°	15° - 24°	148-162	483-523	8° - 15°	7° - 24°

Troubleshooting

Standard Microprocessor Controls

To check the unit control board for proper operation:

1) Disconnect thermostat wires at the control board.
2) Jumper the desired test input (Y1, Y2, W, O or G) to the R terminal to simulate a thermostat signal. To simulate a hot water call, jumper tan wires 11 and 14 on P5 connector.
3) If control functions properly:
    - Check for thermostat and field control wiring (use the diagnostic inputs mode).
4) If control responds improperly:
    - Ensure that component being controlled is functioning (compressor, blower, reversing valve, etc.).
    - Ensure that wiring from control to the component is functioning (refer to the LED Definition table below and use the diagnostic outputs mode).
    - If steps above check properly, replace unit control.

LED Definitions and Diagnostics

Standard Microprocessor

LED	NORMAL DISPLAY MODE		DIAGNOSTIC MODES							
			CURRENT FAULT STATUS		INPUTS		OUTPUTS 1		OUTPUTS 2	
	Field Selection DIPS									
	SW2-	1 On	SW2-	1 Off	SW2-	1 NA	SW2-	1 NA	SW2-	1 NA
	SW2-	6 On	SW2-	6 On	SW2-	6 Off	SW2-	6 On	SW2-	6 Off
	SW2-	7 On	SW2-	7 On	SW2-	7 On	SW2-	7 Off	SW2-	7 Off
Drain	Drain Pan Overflow Lockout		Drain Pan Overflow		Y1		Compressor (On or Low)		Blower Low	
Water Flow	FP Thermistor (Loop <15º F, Well<30ºF) Lockout		FP Thermistor (Loop <15º F, Well<30ºF)		Y2		Compressor (On or High)		Blower Medium	
High Pressure	High Pressure >600 PSI Lockout		High Pressure >600		O		Reversing Valve		Blower High	
Low Pressure/ Compressor	Low Pressure <40 PSI Lockout or Comfort Alert		Low Pressure <40 or Comfort Alert		G		Fan		Aux Heat 1	
Airflow	ECM2 RPM <100 RPM		ECM2 RPM <100 RPM		W		HW Pump		Aux Heat 2	
Status	Microprocessor Malfunction		Not Used		SL1		Loop Pump(s)		Aux Heat 3	
DHW Limit	Not Used		Not Used		HW		DV		Aux Heat 4	
DHW Off	Hot-Water Disable		HW Off		HW Off		HW Off		HW Off	

Refrigerant Systems

To maintain sealed circuit integrity, do not install service gauges unless unit operation appears abnormal. Compare the change in temperature on the air side as well as the water side to the information found in the *Operation Parameters* tables. If the unit's performance is not within the ranges listed, and the airflow and water flow are known to be correct, gauges should then be installed and superheat and subcooling numbers calculated. If superheat and subcooling are outside recommended ranges, an adjustment to the refrigerant charge may be necessary.

Note: Refrigerant tests must be made with desuperheater turned "OFF". Verify that air and water flow rates are at proper levels before servicing the refrigerant circuit.

Preventive Maintenance

Water Coil Maintenance

1. Keep all air out of the water. An open loop system should be checked to ensure that the well head is not allowing air to infiltrate the water line. Lines should always be airtight.
2. Keep the system under pressure at all times. It is recommended in open loop systems that the water control valve be placed in the discharge line to prevent loss of pressure during off cycles. Closed loop systems must have positive static pressure.

Note: On open loop systems, if the installation is in an area with a known high mineral content (125 PPM or greater) in the water, it is best to establish with the owner a periodic maintenance schedule so the coil can be checked regularly. Should periodic coil cleaning be necessary, use standard coil cleaning procedures which are compatible with either the cupronickel or copper water lines. Generally, the more water flowing through the unit the less chance for scaling.

Other Maintenance

Filters

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

Condensate Drain

In areas where airborne bacteria produce a 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. Inspect twice a year to avoid the possibility of overflow.

Blower Motors

ECM blower motors are equipped with sealed ball bearings and require no periodic oiling.

PSC blower motors should only be lubricated if dry operation is suspected.

Desuperheater Coil

See Water Coil Maintenance section above.

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 (with a brush attachment) clean. Care must be taken not to damage the aluminum fins while cleaning.

CAUTION: Fin edges are sharp.

Replacement Procedures

Obtaining Parts

When ordering service or replacement parts, refer to the model number and serial number of the unit as stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and the date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

In-Warranty Material Return

Material may not be returned except by permission of authorized warranty personnel. Contact your local distributor for warranty return authorization and assistance.

GEOSMART GEOTHERMAL Specialist

Product:	**Premium Q Series**
Type:	Geothermal Heat Pumps with Water Heating for Radiant Floor Applications
Size:	3 thru 6 Ton
Document:	Installation Manual - IM1602GS
Release Date:	08/08

GEOSMART ENERGY

290 Pinebush Road, Cambridge, Ontario N1T 1Z6 | o: 1.866.310.6690 | f: 1.866.533.3889

www.geosmartenergy.com

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