GT Series
Geothermal Heat Pump
Sizes 024, 036, 048, 060, 072

Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.

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Information in these installation instructions pertains only to GT series units.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

Recognize safety information. This is the safety-alert symbol ⚠ When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could result in personal injury or equipment damage.

Puron® refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron® refrigerant equipment.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

⚠ WARNING

EXPLOSION HAZARD

Failure to follow this warning could result in death, serious personal injury, and/or property damage.

Never use air or gases containing oxygen for leak testing or operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.

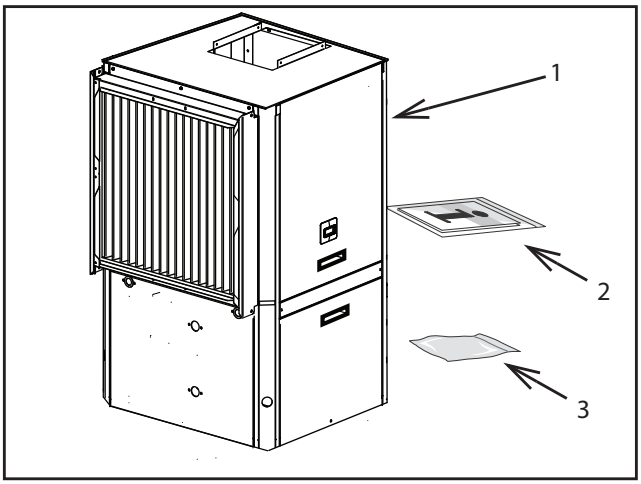

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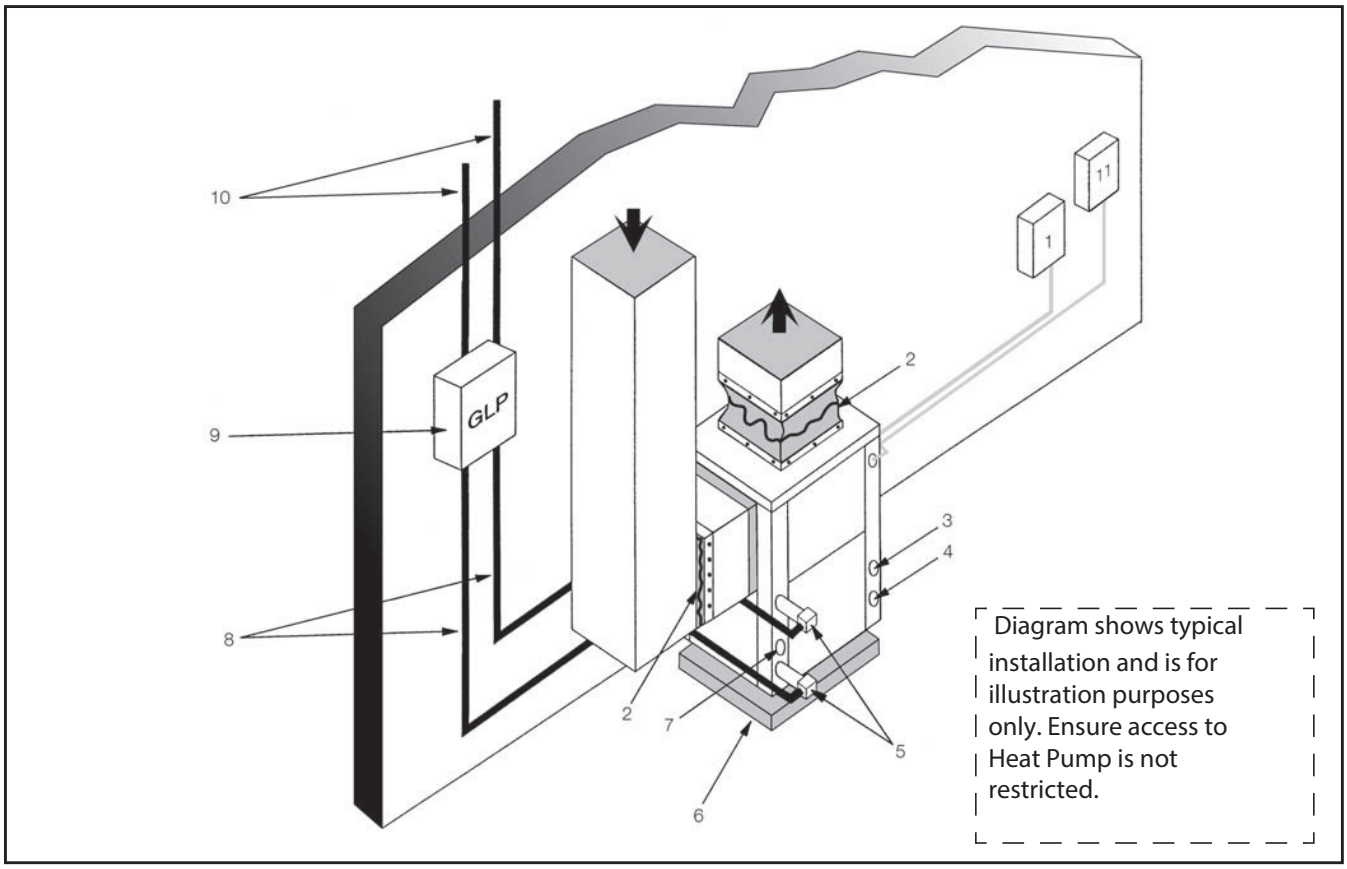
Fig. 1 - Standard Package

1. GT Series Water-To Air Heat Pump
2. Installation and Owner's Manual
3. Hanging Bracket Kit (HZ unit only)

APPLICATION CONSIDERATIONS

Geothermal Systems

Closed loop and pond applications require specialized design knowledge. No attempt at these installations should be made unless the dealer has received specialized training. Anti-freeze solutions are utilized when low evaporating conditions are expected to occur. Refer to the Flow Center installation manuals for more specific instructions. (See Fig. 2)



(1) Line Voltage Disconnect (unit)
(2) Flex Duct Connection
(3) Low Voltage Control Connection
(4) Line Voltage Connection
(5) P/T Ports
(6) Vibration Pad
(7) Condensate Drain Connection
(8) Ground Loop Connection Kit
(9) Ground Loop Pumping Package
(10) Polyethylene with Insulation
(11) Line Voltage Disconnect (electric heater)

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Fig. 2 - Example Geothermal System Setup

Well Water Systems

IMPORTANT: Table 1 must be consulted for water quality requirements when using open loop systems. A water sample must be obtained and tested, with the results compared to the table. Scaling potential should be assessed using the pH/Calcium hardness method. If the pH is <7.5 and the calcium hardness is l<100 ppm, the potential for scaling is low. For numbers out of the range listed, a monitoring plan must be implemented due to probable scaling.

Other potential issues such as iron fouling, corrosion, erosion and clogging must be considered. Careful attention to water conditions must be exercised when considering a well water application.

Failure to perform water testing and/or applying a geothermal heat pump to a water supply that does not fall within the accepted quality parameters will be considered a mis-application of the unit and resulting heat exchanger failures will not be covered under warranty. Where a geothermal system will be used with adverse water conditions, a suitable plate-frame heat exchanger MUST be used to isolate the well water from the geothermal unit.

Proper testing is required to assure the well water quality is suitable for use with water source equipment.

In conditions anticipating moderate scale formation or in brackish water, a cupronickel heat exchanger is recommended. Copper is adequate for ground water that is not high in mineral content.

In well water applications, water pressure must always be maintained in the heat exchanger. This can be accomplished with either a control valve or a bladder type expansion tank.

When using a single water well to supply both domestic water and the heat pump, care must be taken to insure that the well can provide sufficient flow for both.

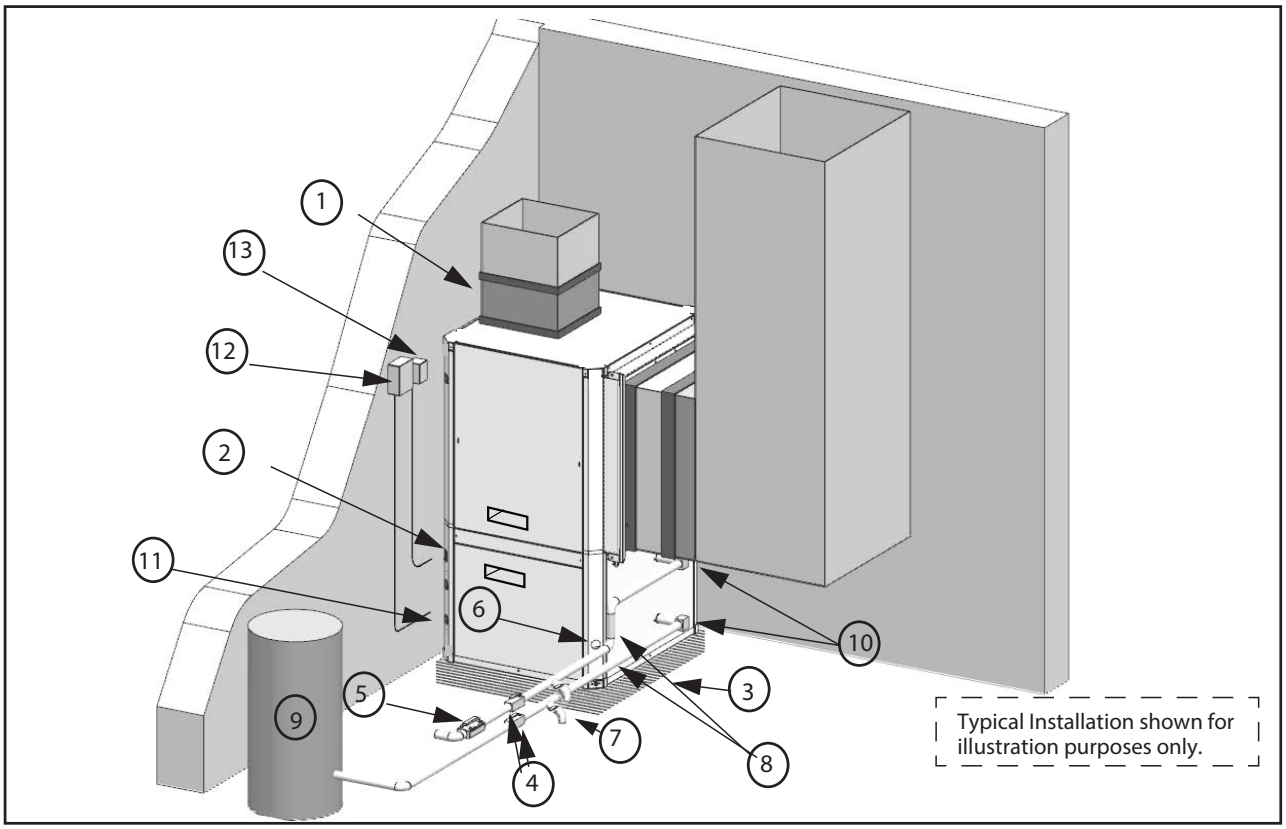
In well water applications, a slow closing solenoid valve must be used to prevent water hammer (hammering or stuttering sound in the pipeline). Solenoid valves should be connected across Y1 and C1 on the thermostat interface board for all. Make sure that the VA draw of the valve does not exceed the contact rating of the thermostat. (See Fig. 3)

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Discharge air configuration change is not possible on Heat Pumps equipped with Electric Heat Option.



(1) Flex Duct Connection
(2) Low Voltage Control Connection
(3) Vibration Pad
(4) Ball Valves
(5) Solenoid Valve Slow Closing
(6) Condensate Drain Connection
(7) Drain Valves
(8) Hose Kits (optional)
(9) Pressure Tank (optional)
(10) P/T Ports (optional)
(11) Line Voltage Connection
(12) Electric Heater Line Voltage Disconnect
(13) Unit Line Voltage Disconnect

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Fig. 3 - Example Well Water System Setup

Table 1 – Water Quality Requirements for Open-Loop Geothermal Heat Pump System

Water Quality Parameter	HX Material	Closed Recirculating	Open Loop and Recirculating Well		
Scaling Potential - Primary Measurement Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below:					
pH/Calcium Hardness Method	All	--	pH <7.5 and Ca Hardness <100ppm		
Index Limits for Probable Scaling Situations - (Operation outside these limits is not recommended) Scaling indexes should be calculated at 150°F for direct use and HWG applications, and at 90°F for indirect HX use. A monitoring plan should be implemented.					
Ryznar Stability Index	All	--	6.0 - 7.5 If > 7.5 minimize steel pipe use		
Langelier Saturation Index	All	--	-0.5 to +0.5 If <-0.5 minimize steel pipe use. Based upon 150°F HWG and Direct well, 84°F Indirect Well HX		
Iron Fouling					
Iron Fe^{2} (Ferrous) (Bacterial Iron Potential)	All	--	<0.2 ppm (Ferrous) If Fe^{2*} (ferrous) >0.2 ppm with pH 6-8, O2<5 ppm check for iron bacteria		
Iron Fouling	All	--	<0.5 ppm of Oxygen Above this level deposition will occur		
Corrosion Prevention					
pH	All	6 - 8.5 Monitor/treat as needed	6 - 8.5 Minimize steel pipe below 7 and no open tanks with pH <8		
Hydrogen Sulfide (H_2S)	All	--	At H S>0.2 ppm, avoid use of copper and copper nickel piping or HXs. Rotten egg smell appears at 0.5 ppm level. Copper alloy (bronze or brass) cast components are OK to <0.5 ppm		
Ammonia ion as hydroxide, chloride, nitrate and sulfate compounds	All	--	<0.5 ppm		
Maximum Chloride Levels			**Maximum Allowable at Maximum Water Temperature**		
			50°F	**75°F**	**100°F**
	Copper	--	<20 ppm	NR	NR
	cupronickel	--	<150 ppm	NR	NR
	304 SS	--	<400 ppm	<250 ppm	<150 ppm
	316 SS	--	<1000 ppm	<550 ppm	<375 ppm
	Titanium	--	>1000 ppm	>550 ppm	>375 ppm
Erosion and Clogging					
Particulate Size and Erosion	All	<10 ppm of particles and a maximum velocity of 1.8 m/s. Filtered for maximum 841 micron [0.84 mm 20 mesh] size	<10 ppm (<1 ppm "sandfree" for reinjection) of particles and a maximum velocity of 1.8 m/s. Filtered for maximum 841 micron [0.84 mm. 20 mesh] size. Any particulate that is not removed can potentially clog components		

NOTES:

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

INSTALLATION RECOMMENDATIONS

The Water-to-Air Heat Pumps are designed to operate with entering fluid temperature between 20°F to 90°F in the heating mode and between 30°F to 120°F in the cooling mode.

NOTE: 50° minimum Entering Water Temperature (EWT) is recommended for well water applications with sufficient water flow to prevent freezing. Antifreeze solution is required for all closed loop applications or EWT less than 45°. Cooling Tower/Boiler and Geothermal applications should have sufficient antifreeze solution to protect against extreme conditions and equipment failure. Frozen water coils are not covered under warranty. Other equivalent methods of temperature control are acceptable.

Check Equipment and Job Site

Moving and Storage

If the equipment is not needed for immediate installation upon its arrival at the job site, it should be left in its shipping carton and stored in a clean, dry area. Units must only be stored or moved in the normal upright position as indicated by the "UP" arrows on each carton at all times.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

If unit stacking is required for storage, stack units as follows:
Do not stack units larger than 6 tons!
Vertical units: less than 6 tons, no more than two high.
Horizontals units: less than 6 tons, no more than three high.

Inspect Equipment

Be certain to inspect all cartons or crates on each unit as received at the job site before signing the freight bill. Verify that all items have been received and that there are no visible damages; note any shortages or damages on all copies of the freight bill. In the event of damage or shortage, remember that the purchaser is responsible for filing the necessary claims with the carrier. Concealed damages not discovered until after removing the units from the packaging must be reported to the carrier within 24 hours of receipt.

Location / Clearance

Locate the unit in an indoor area that allows easy removal of the filter and access panels, and has enough room for service personnel to perform maintenance or repair. Provide sufficient room to make fluid, 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 face of unit's air coil. On horizontal units, allow adequate room below the unit for a condensate drain trap and do not locate the unit above supply piping.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

These units are not approved for outdoor installation; therefore, they must be installed inside the structure being conditioned. Do not locate in areas that are subject to freezing.

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in equipment damage and/or improper equipment operation.

It is extremely important to take the proper precautions to insure that the heat pump unit is installed in the proper location and that measures have been taken to prevent rupturing the water coil due to freezing conditions.

Frozen water coils are not covered under the limited product warranty.

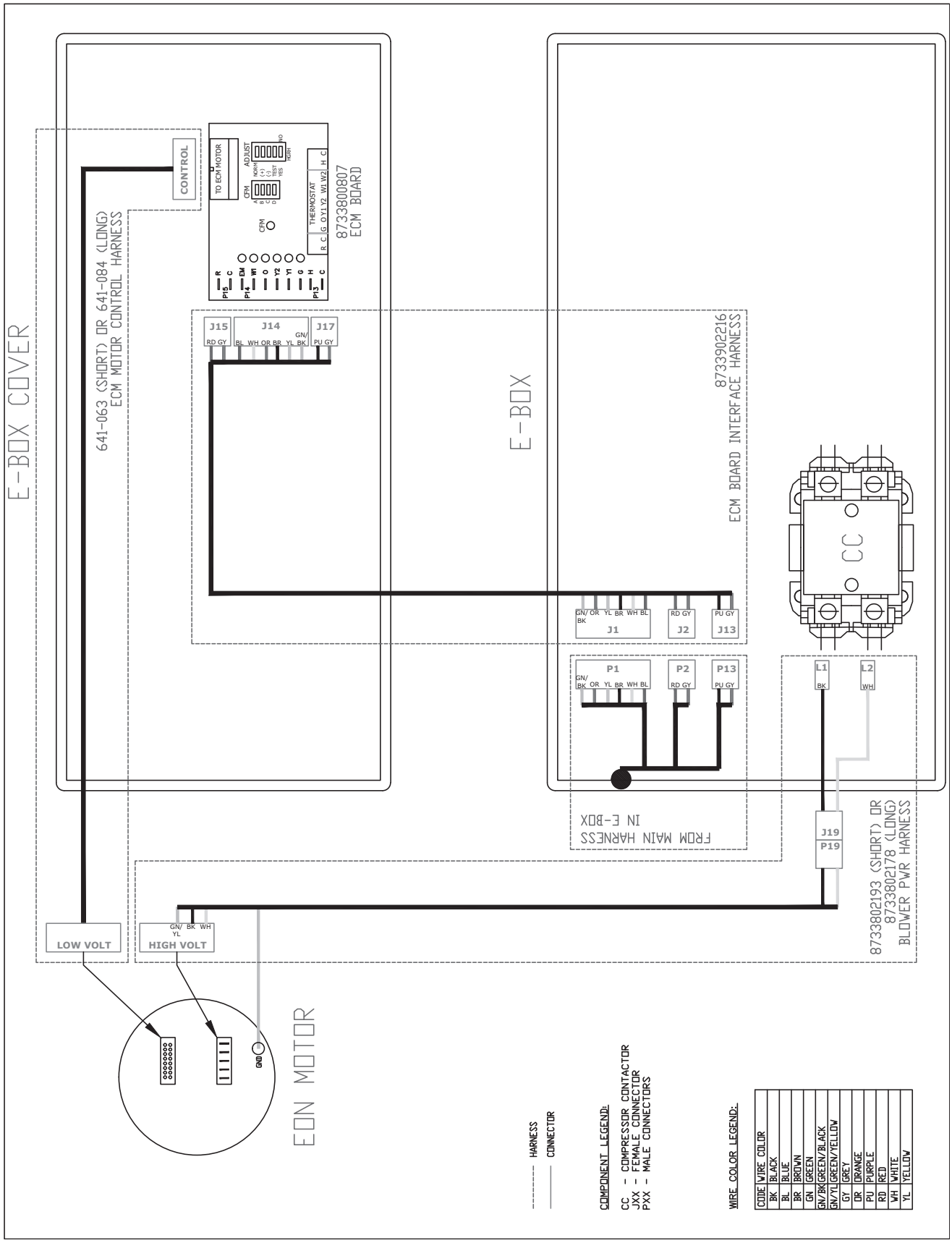

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Fig. 4 - Constant Airflow Motor

MOUNTING VERTICAL UNITS

Vertical units should be mounted level on a vibration absorbing pad slightly larger than the base to minimize vibration transmission to the building structure. It is not necessary to anchor the unit to the floor. See Fig. 5.

NOTE: On VT and CF units, the condensate drain pan is internally sloped. There is no internal P-Trap.

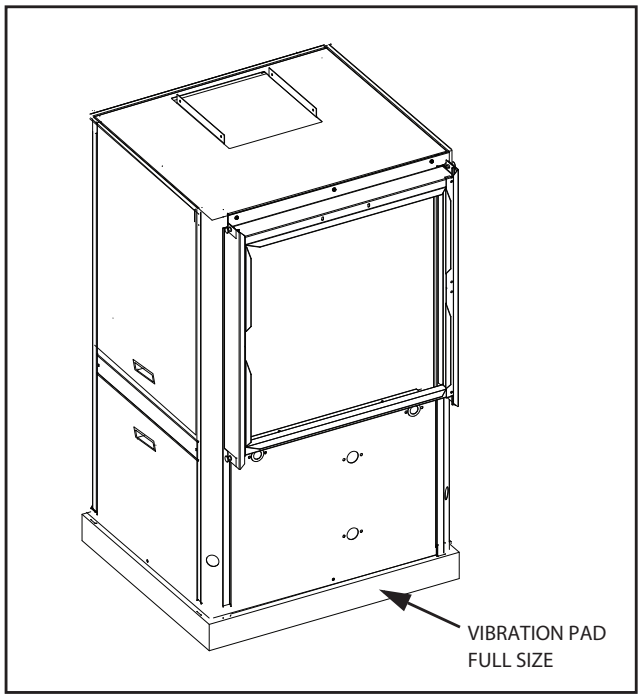

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Fig. 5 - Vibration Absorbing Pad

MOUNTING HORIZONTAL UNITS

While horizontal units may be installed on any level surface strong enough to hold their weight, they are typically suspended above a ceiling by threaded rods. The manufacturer recommends these be attached to the unit corners by hanger bracket kits. The rods must be securely anchored to the ceiling. Refer to the hanging bracket assembly and installation instructions for details.

IMPORTANT: Horizontal units installed above the ceiling must conform to all local codes. An auxiliary drain pan, if required by code, should be at least four inches larger than the bottom of the heat pump.

Plumbing connected to the heat pump must not come in direct contact with joists, trusses, walls, etc. Some applications require an attic floor installation of the horizontal unit. In this case, the unit should be set in a full size secondary drain pan on top of a vibration absorbing mesh.

The Secondary drain pan prevents possible condensate overflow or water leakage damage to the ceiling.

The secondary drain pan is usually placed on a plywood base isolated from the ceiling joists by additional layers of vibration absorbing mesh.

In both cases, a 3/4"drain connected to this secondary pan should be run to an eave at a location that will be noticeable. If the unit is located in a crawl space, the bottom of the unit must be at least 4" above grade to prevent flooding of the electrical parts due to heavy rains.

NOTE: HZ unit condensate drain pan is **NOT** internally sloped.

IMPORTANT: Horizontal (HZ) units must be installed pitched toward the Condensate Drain Connection 1/8" per foot.

CONDENSATE DRAIN

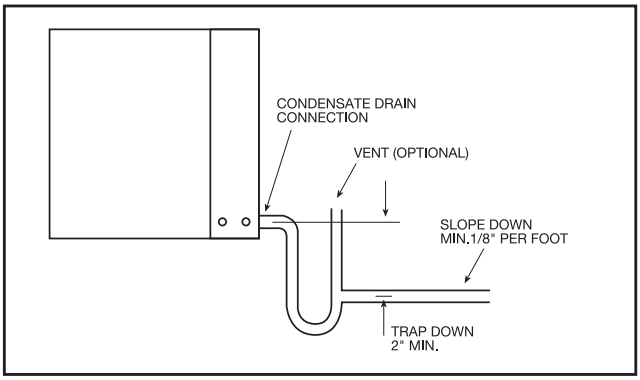

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Fig. 6 - Condensate Drain

A drain line must be connected to the heat pump and pitched away from the unit a minimum of 1/8" per foot to allow the condensate to flow away from the unit.

IMPORTANT: This connection must be in conformance with local plumbing codes. A trap must be installed in the condensate line to insure free condensate flow.

NOTE: HZ heat pump drain pan is not internally sloped.

A vertical air vent is sometimes required to avoid air pockets. The length of the trap depends on the amount of positive or negative pressure on the drain pan. A second trap must not be included.

DUCT SYSTEM

A supply air outlet collar and return air duct flange are provided on all units to facilitate duct connections.

NOTE: Supply air duct and return air duct flanges are shipped unfolded with unit.

Fold the duct flange outwards along the perforated line. Refer to unit Dimensional Drawings for physical dimensions of the collar and flange.

A flexible connector is recommended for supply and return air duct connections on metal duct systems. All metal ducting should be insulated with a minimum of one inch duct insulation to avoid heat loss or gain and prevent condensate from forming during the cooling operation.

Application of the unit to uninsulated duct work is not recommended as the unit's performance will be adversely affected.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in improper equipment operation.

Do not connect discharge ducts directly to the blower outlet.

The factory provided air filter must be removed when using a filter back return air grill. The factory filter should be left in place on a free return system.

If the unit will be installed in a new installation which includes new duct work, the installation should be designed using current ASHRAE procedures for duct sizing.

If the unit is to be connected to existing duct work, a check should be made to assure that the duct system has the capacity to handle the air required for the unit application.

If the duct system is too small, larger duct work should be installed. Check for existing leaks and repair.

The duct system and all diffusers should be sized to handle the designed air flow quietly. To maximize sound attenuation of the unit blower, the supply and return air plenums should be insulated.

There should be no direct straight air path through the return air grille into the heat pump. The return air inlet to the heat pump must have at least one 90 degree turn away from the space return air grille. If air noise or excessive air flow are a problem, the blower speed can be changed to a lower speed to reduce air flow.

PIPING

Supply and return piping must be as large as the unit connections on the heat pump (larger on long runs).

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in improper equipment operation.

Never use flexible hoses of a smaller inside diameter than that of the fluid connections on the unit.

GT units are supplied with either a copper or optional cupronickel condenser. Copper is adequate for ground water that is not high in mineral content.

NOTE: Proper testing is recommended to assure the well water quality is suitable for use with water source equipment. When in doubt, use cupronickel. See Application Considerations notes on page 4.

In conditions anticipating moderate scale formation or in brackish water, a cupronickel heat exchanger is recommended.

Both the supply and discharge water lines will sweat if subjected to low water temperature. These lines should be insulated to prevent damage from condensation. All manual flow valves used in the system must be ball valves. Globe and gate valves must not be used due to high pressure drop and poor throttling characteristics.

⚠ CAUTION

EQUIPMENT DAMAGE AND/OR UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage and/or improper operation.

Never exceed the recommended water flow rates as serious damage or erosion of the water-to-refrigerant heat exchanger could occur.

Always check carefully for water leaks and repair appropriately. Units are equipped with female pipe thread fittings. Consult Unit Dimensional Drawings.

NOTE: Teflon tape sealer should be used when connecting water piping connections to the units to insure against leaks and possible heat exchanger fouling.

NOTE: The unit is shipped with water connection O-rings. A 10 pack of O-rings (part #4026) can be ordered through Replacement Components Division (RCD).

IMPORTANT: Do not over-tighten connections.

Flexible hoses should be used between the unit and the rigid system to avoid possible vibration. Ball valves should be installed in the supply and return lines for unit isolation and unit water flow balancing (on open-loop systems).

ELECTRICAL

Refer to electrical component box layout. See Fig. 7.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage and/or improper operation.

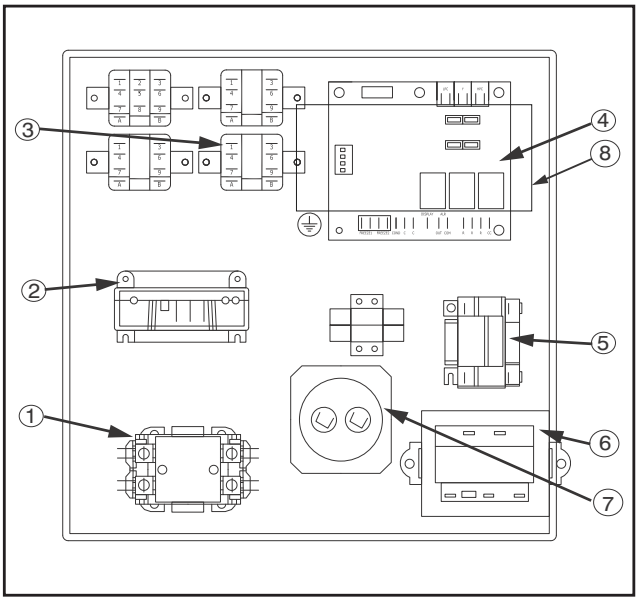
- Field wiring must comply with local and national electrical codes.
- Power to the unit must be within the operating voltage range indicated on the unit nameplate or on the performance data sheet.
- Operation of unit on improper line voltage or with excessive phase imbalance will be hazardous to the unit, constitutes abuse, and may void the warranty.

Properly sized fuses or HACR circuit breakers must be installed for branch circuit protection. See unit nameplate for maximum fuse or breaker size.

The unit is provided with a concentric knock-out for attaching common trade sizes of conduit, route power supply wiring through this opening.

Always connect the ground lead to the grounding lug provided in the control box and power leads to the line side of compressor contactor as indicated on the wiring diagrams.

IMPORTANT: Units supplied with internal electric heat require two (2) separate power supplies:
1) Unit compressor
2) Electric Heat, blower motor and control circuit.
Refer to the *ELECTRIC HEATER PACKAGE OPTION* section. See data plate for minimum circuit ampacities and maximum fuse/breaker sizing.



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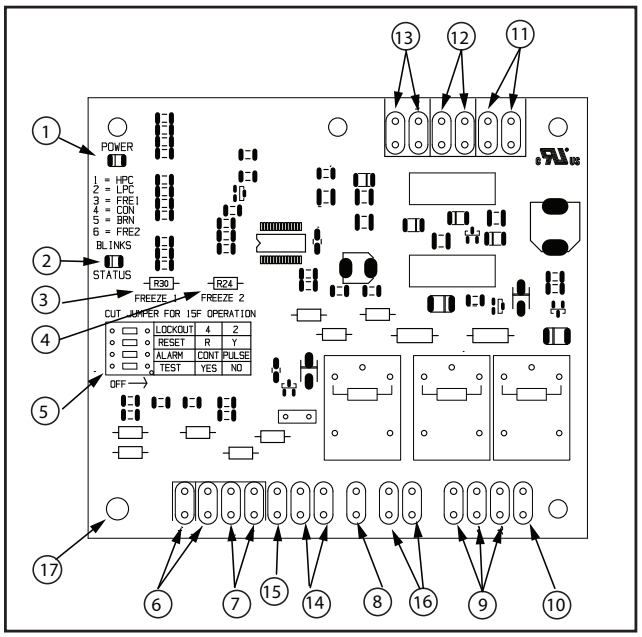
(1) Compressor Contactor
(2) Comfort Alert Module
(3) Second Stage Relay
(4) Unit Protection Module (UPM)
(5) Auxiliary Pump Relay (Option)
(6) Transformer
(7) Capacitor
(8) ECM Module - mounts on E-box cover

Fig. 7 - Electrical Component Box Layout

Safety Devices and UPM Controller



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(1) Board Power Indicator
(2) UPM Status LED Indicator
(3) Water Coil Freeze Protection Temperature Selection [R30]
(4) Air Coil Freeze Protection Temperature Selection
(5) UPM Board Settings
(6) Water Coil Freeze Connection
(7) Air Coil Freeze Connection
(8) LCD Unit Display Connection
(9) 24VAC Power Input
(10) Compressor Contact Output
(11) High Pressure Switch Connection
(12) Call for Compressor Y1
(13) Low Pressure Switch Connection
(14) 24VAC Power Common
(15) Condensate Overflow Sensor
(16) Dry Contact
(17) UPM Ground Standoff

Fig. 8 - Safety Device and UPM Controller

NOTES:

1. If the unit is being connected to a thermostat with a malfunction light, this connection is made at the unit malfunction output or relay. Refer to Fig. 8.
2. If the thermostat is provided with a malfunction light powered off of the common (C) side of the transformer, a jumper between “R” and “COM” terminal of “ALR” contacts must be made.
3. If the thermostat is provided with a malfunction light powered off of the hot (R) side of the transformer, then the thermostat malfunction light connection should be connected directly to the (ALR) contact on the unit’s UPM board.

Each unit is factory provided with a Unit Protection Module (UPM) that controls the compressor operation and monitors the safety controls that protect the unit.

Safety controls include the following:

- High pressure switch located in the refrigerant discharge line and wired across the HPC terminals on the UPM.
- Low pressure switch located in the unit refrigerant suction line and wired across terminals LPC1 and LPC2 on the UPM.

NOTE: UPM Board Dry Contacts are normally open (NO)

- Water side freeze protection sensor, mounted close to condensing water coil, monitors refrigerant temperature between condensing water coil and thermal expansion valve. If temperature drops below or remains at freeze limit trip for 30 seconds, the controller will shut down the compressor and enter into a soft lockout condition.

  The default freeze limit trip is 26°F, however this can be changed to 15°F by cutting the R30 or Freeze1 resistor located on top of DIP switch SW1 (Refer to Fig. 8, item (3) for resistor location), Refer to Fig. 9 for sensor location.

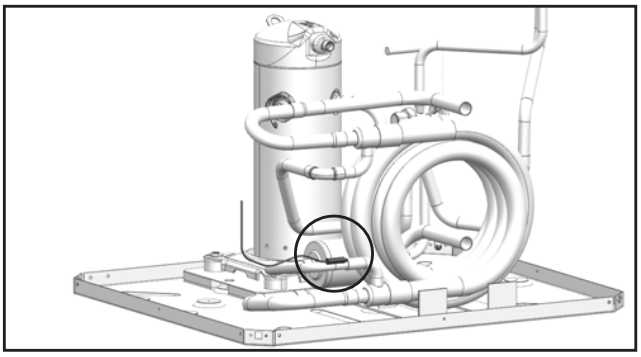

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Fig. 9 - Freeze Protection Sensor Location

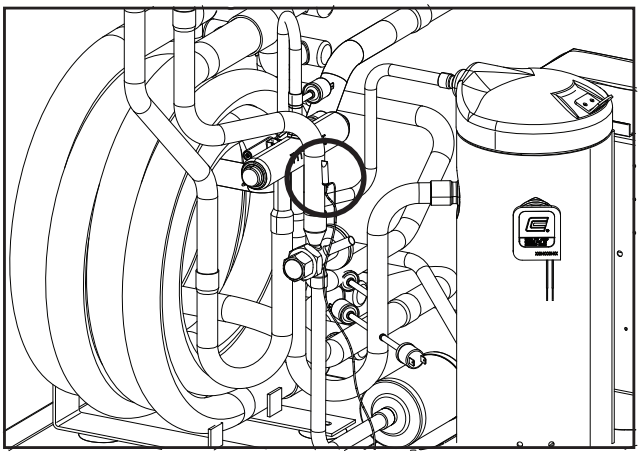
⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

If unit is employing a fresh water system (no anti-freeze protection), it is extremely important to have the Freeze1 R30 resistor set to 26°F in order to shut down the unit at the appropriate leaving water temperature and protect your heat pump from freezing if a freeze sensor is included.

- Evaporator freeze protection sensor, mounted after the thermal expansion device and the evaporator, monitors refrigerant temperature between the evaporator coil and thermal expansion valve. If temperature drops below or remains at freeze limit trip for 30 seconds, the controller will shut down the compressor and enter into a soft lockout condition. The default freeze limit trip is 26°F. See Fig. 10.



A14122

Fig. 10 - Evaporator Freeze Protection Sensor Location

- The condensate overflow protection sensor is located in the drain pan of the unit and connected to the ”COND” terminal on the UPM board. See Fig. 11.

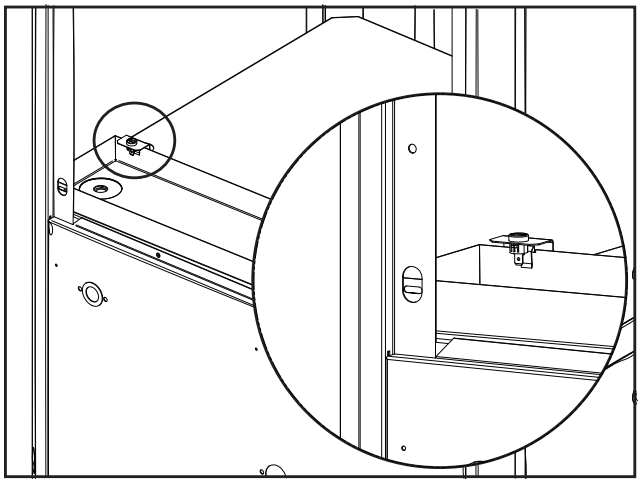


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Fig. 11 - Condensate Overflow Protection Sensor Location

UPM Board Factory Default Settings	
TEMP	30°F
LOCKOUT	2
RESET	Y
ALARM	PULSE
TEST	NO

UPM DIP SWITCH DEFAULT POSITION			
	lockout	4	2
	reset	R	Y
	alarm	Cont	pulse
	test	yes	no

The UPM Board includes the following features:

- **ANTI-SHORT CYCLE TIMER**: 5 minute delay on break timer to prevent compressor short cycling.
- **RANDOM START**: Each controller has an unique random start delay ranging from 270 to 300 seconds on initial power up to reduce the chance of multiple unit simultaneously starting at the same time after power up or after a power interruption, thus avoiding creating large electrical spike.
- **LOW PRESSURE BYPASS TIMER**: If the compressor is running and the low pressure switch opens, the controller will keep the compressor ON for 120 seconds. After 2 minutes if the low pressure switch remains open, the controllers will shut down the compressor and enter a soft lockout. The compressor will not be energized until the low pressure switch closes and the anti-short cycle time delay expires. If the low pressure switch opens 2-4 times in 1 hour, the unit will enter a hard lockout. In order to exit hard lockout power to the unit would need to be reset.
- **BROWNOUT / SURGE / POWER INTERRUPTION PROTECTION**: The brownout protection in the UPM board will shut does the compressor if the incoming power falls below 18 VAC. The compressor will remain OFF until the voltage is above 18 VAC and ANTI-SHORT CYCLE TIMER (300 seconds) times out. The unit will not go into a hard lockout.
- **MALFUNCTION OUTPUT**: Alarm output is Normally Open (NO) dry contact. If pulse is selected the alarm output will be pulsed. The fault output will depend on the dip switch setting for ”ALARM”. If it is set to ”CONT”, a continuous signal will be produced to indicate a fault has occurred and the unit requires inspection to determine the type of fault. If it is set to ”PULSE”, a pulse signal is produced and a fault code is detected by a remote device indicating the fault. See L.E.D Fault Indication below for blink code explanation. The remote device must have a malfunction detection capability when the UPM board is set to ”PULSE”.

NOTE: If 24 VAC output is needed, R must be wired to ALR-COM terminal; 24 VAC will be available on the ALR-OUT terminal when the unit is in the alarm condition.

- **DISPLAY OUTPUT**: The Display output is a pulse output connected to the Unit Diagnostic Display (UDD) and it pulses 24VAC when the unit is in an lockout alarm condition.
- **UPM TEST MODE**: UPM test mode will allow all time-delay settings to be reduced to 10 seconds for troubleshooting and verification of unit operation. Reset unit to TEST mode: NO when test is completed. During UPM test mode, the UPM LED will flash a FREEZE SENSOR 6 flash code. Test mode will automatically defeat after approximately 5 minutes with no LED flash and normal delays.

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Operation of unit in test mode can lead to accelerated wear and premature failure of components. The ”TEST” switch must be set back to ”NO” after troubleshooting/ servicing.

- **FREEZE SENSOR**: The default setting for the freeze limit trip is 26°F (sensor number 1); however this can be changed to 15°F by cutting the R30 resistor located on top of the DIP switch SW1.
  Since freeze sensor 2 is dedicated to monitor the evaporator coil, it is recommended to leave the factory default setting on the board.
  The UPM controller will constantly monitor the refrigerant temperature with the sensor mounted close to the condensing water coil between the thermal expansion valve and water coil. If temperature drops below or remains at the freeze limit trip for 30 seconds, the controller will shut the compressor down and enter into a soft lockout condition. Both the status LED and the Alarm contact will be active.
  The LED will flash the code associated with this alarm condition three (3) times. If this alarm occurs 2 times (or 4 if Dip switch is set to 4) within an hour, the UPM controller will enter into a hard lockout condition. It will constantly monitor the refrigerant temperature with the sensor mounted close to the evaporator between the thermal expansion valve and evaporator coil as shown in Fig. 10.
  If temperature drops below or remains at the freeze limit trip for 30 seconds, the controller will shut the compressor down and enter into a soft lockout condition. Both the status LED and the alarm contact will be active. The LED will flash the code associated with this alarm condition six (6) times. If this alarm occurs 2 times (or 4 if Dip switch is set to 4) within an hour, the controller will enter into a hard lockout condition.

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Freeze sensor will not guard against the loss of water. A flow switch is recommended to prevent the unit from running if water flow is lost or reduced.

Table 2 – 10K Temperature Sensor Resistance Table

°C	°F	OHM	°C	°F	OHM	°C	°F	OHM	°C	°F	OHM
−55	−67	963,800	−9	16	52,410	37	99	6,015	83	181	1,141
−54	−65	895,300	−8	18	49,660	38	100	5,774	84	183	1,105
−53	−63	832,100	−7	19	47,070	39	102	5,545	85	185	1,071
−52	−62	776,800	−6	21	44,630	40	104	5,326	86	187	1,038
−51	−60	719,900	−5	23	42,330	41	106	5,116	87	189	1,006
−50	−58	670,200	−4	25	40,160	42	108	4,916	88	190	975
−49	−56	624,200	−3	27	38,120	43	109	4,725	89	192	945
−48	−54	581,600	−2	28	36,190	44	111	4,542	90	194	916
−47	−53	542,200	−1	30	34,370	45	113	4,368	91	196	889
−46	−51	505,800	0	32	32,650	46	115	4,201	92	198	862
−45	−49	472,000	1	34	31,030	47	117	4,041	93	199	836
−44	−47	440,700	2	36	29,500	48	118	3,888	94	201	811
−43	−45	411,600	3	37	28,050	49	120	3,742	95	203	787
−42	−44	384,700	4	39	26,690	50	122	3,602	96	205	764
−41	−42	359,700	5	41	24,400	51	124	3,468	97	207	741
−40	−40	336,500	6	43	24,170	52	126	3,339	98	208	720
−39	−38	314,900	7	45	23,020	53	127	3,216	99	210	699
−38	−36	294,900	8	46	21,920	54	129	3,099	100	212	679
−37	−35	276,200	9	48	20,890	55	131	2,986	101	214	659
−36	−33	258,800	10	50	19,900	56	133	2,878	102	216	640
−35	−31	242,700	11	52	18,970	57	135	2,774	103	217	622
−34	−29	227,600	12	54	18,090	58	136	2,674	104	219	604
−33	−27	213,600	13	55	17,260	59	138	2,579	105	221	587
−32	−26	200,500	14	57	16,470	60	140	2,488	106	223	571
−31	−24	188,300	15	59	15,710	61	142	2,400	107	225	555
−30	−22	177,000	16	61	15,000	62	144	2,316	108	226	539
−29	−20	166,400	17	63	14,330	63	145	2,235	109	228	525
−28	−18	156,400	18	64	13,380	64	147	2,157	110	230	510
−27	−17	147,200	19	66	13,070	65	149	2,083	111	232	496
−26	−15	138,500	20	68	12,490	66	151	2,011	112	234	483
−25	−13	130,400	21	70	11,940	67	153	1,942	113	235	470
−24	−11	122,800	22	72	11,420	68	154	1,876	114	237	457
−23	−9	115,800	23	73	10,920	69	156	1,813	115	239	445
−22	−8	109,100	24	75	10,450	70	158	1,752	116	241	433
−21	−6	102,900	25	77	10,000	71	160	1,693	117	243	422
−20	−4	97,080	26	79	9,573	72	162	1,637	118	244	411
−19	−2	91,620	27	81	9,166	73	163	1,583	119	246	400
−18	0	86,500	28	82	8,778	74	165	1,531	120	248	389
−17	1	81,700	29	84	8,409	75	167	1,480	121	250	379
−16	3	77,190	30	86	8,057	76	169	1,432	122	252	370
−15	5	72,960	31	88	7,722	77	171	1,386	123	253	360
−14	7	68,980	32	90	7,402	78	172	1,341	124	255	351
−13	9	65,250	33	91	7,098	79	174	1,298	125	257	342
−12	10	61,740	34	93	6,808	80	176	1,256	126	259	333
−11	12	58,440	35	95	6,531	81	178	1,216	127	261	325
−10	14	55,330	36	97	6,267	82	180	1,178	128	262	317

- **HIGH PRESSURE SWITCH**: The high pressure switch safety is designed to shut down the compressor if it exceeds limits. Cut in 420 +/- 15 psig and cut out 600 +/- psig.
- **LOW PRESSURE SWITCH**: The low pressure switch safety is designed to shut down the compressor of loss of charge. Cut in 60 +/- 15 psig and cut out 40 +/- psig.
- **INTELLIGENT RESET**: If a fault condition is initiated, the 5 minute delay on break time period is initiated and the unit will restart after these delays expire. During this period the fault LED will indicate the cause of the fault. If the fault condition still exists or occurs 2 or 4 times (depending on 2 or 4 setting for Lockout dip switch) before 60 minutes, the unit will go into a hard lockout and requires a manual lockout reset.
  A single condensate overflow fault will cause the unit to go into a hard lockout immediately, and will require a manual lockout reset.
- **LOCKOUT RESET**: A hard lockout can be reset by turning the unit thermostat off and then back on when the "RESET" dip switch is set to "Y" or by shutting off unit power at the circuit breaker when the "RESET" dip switch is set to "R".

NOTES: The blower motor will remain active during a lockout condition.

- **ECM TEST MODE**: ECM test mode is to override the motor to constant torque mode for motor troubleshooting. If the motor runs in ECM test mode, the module and motor are good. To engage in ECM test mode, only one switch can be selected. Select TEST ON and all others OFF. Reset the board to NORM ON and TEST OFF when test is complete.
  If the unit remains in test mode for normal operation, the system will not run different CFMs based on thermostat call such as Y1, Y2 or dehumidify. It may also experience problems with nuisance strip during electric heat operation.
  There is no way to check CFM based on number of blinks if the board is set to test mode.

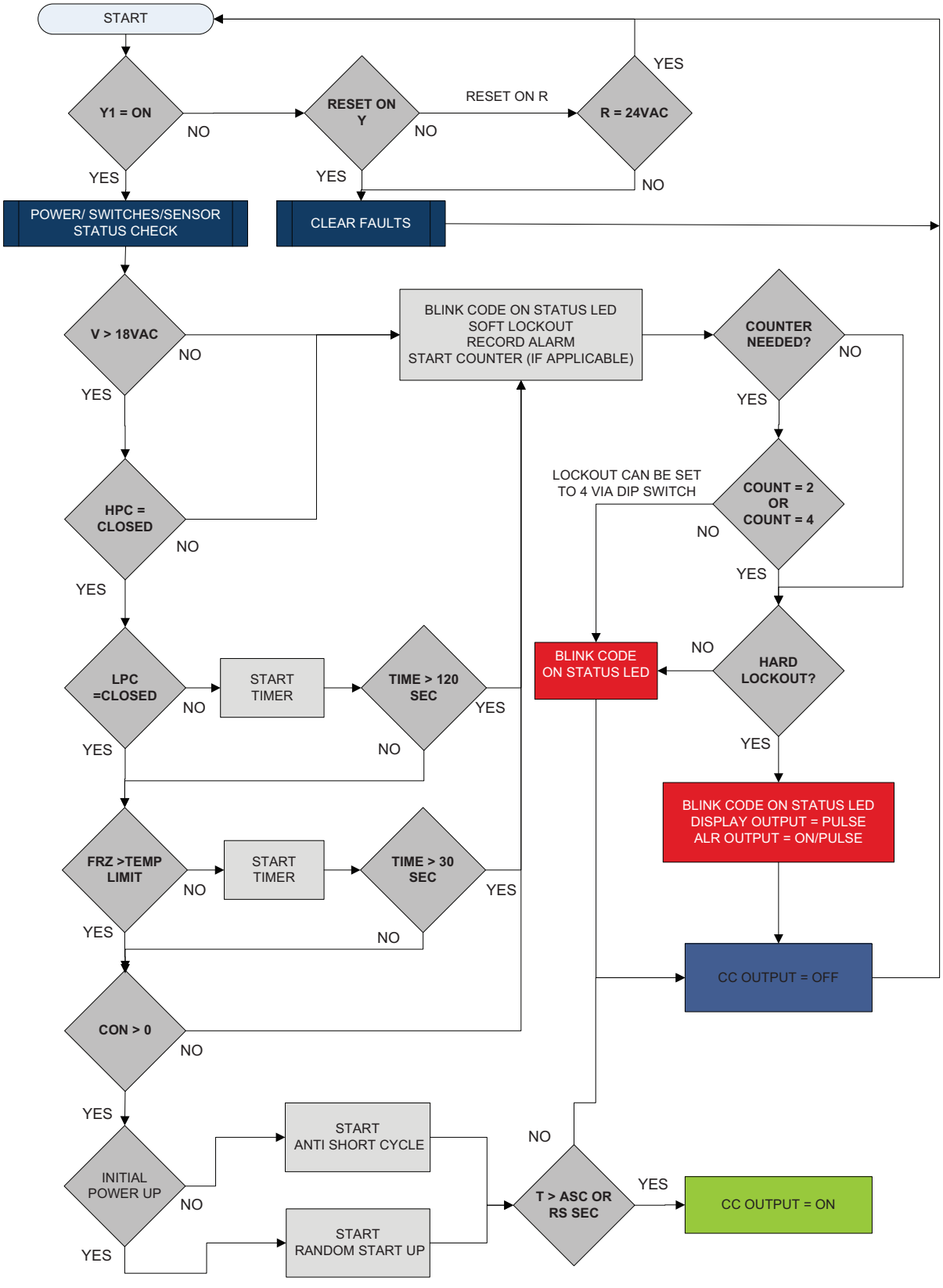
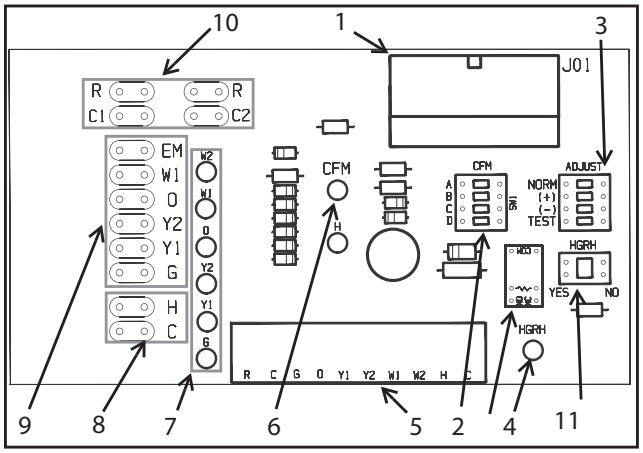


Fig. 12 - UPM Sequence of Operation (SOO) Flow Chart

ECM INTERFACE BOARD

Refer to Fig. 7, item (12) for ECM interface board location. In addition to providing a connecting point for thermostat wiring, the interface board also translates thermostat inputs into control commands for the Electronic Commutated Motor (ECM) DC fan motor and provides thermostat signals to unit's UPM board. The thermostat connections and their functions are as follows:



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(1) Motor Harness Plug
(2) Blower CFM Adjustment
(3) Motor Settings
(4) Dehumidification Indication
(5) Thermostat Contact Inputs
(6) CFM Count Indicator
(7) Thermostat Input Status Indication
(8) Reheat Digital Outputs
(9) Thermostat Outputs
(10) 24 VAC
(11) Dehumidification Method Selector

Fig. 13 - ECM Interface Board

NOTE: CFM LED indication is an approximation. Utilize conventional Test and Balance equipment for accurate airflow measurement.

- CFM count indicator (see Fig. 13, item 6) blinks to indicate approximate airflow in CFM and may flicker when the unit is off.
- Each blink of the LED represent approximately 100 CFM of air delivery so if the LED blinks 12 times, pauses, blinks 12 times, etc. the blower is delivering approximately 1200 CFM.

Dehumidification Mode

Position the HGRH DIP switch in the "NO" (OFF) position. When the switch is in this position, upon a dehumidification call, the unit will operate at a lower speed to increase dehumidification while cooling. See Fig. 14.

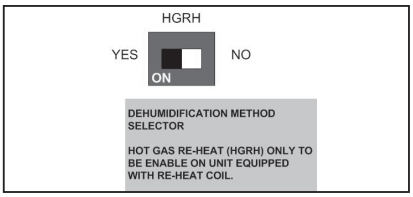

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Fig. 14 - Dehumidification Method Selector

Thermostat Outputs

Dry Contact	Left side terminal strip in the stat, D1, D2
YI	First Stage Compressor Cool
Y/Y2	Second Stage Compressor Cool
W1	Auxiliary Electric Heat (runs in conjunction with compressor)
W2/E	Emergency Heat (electric heat only)
O	Reversing Valve (energized in cooling)
G	Fan
R	Transformer 24 VAC Hot
C	Transformer 24 VAC Common

NOTE: When unit is used with Carrier and Bryant thermostats with Relative Humidity Control (Carrier Edge TP-PRH or TP-NRH / Bryant Preferred T6-PRH or T6-NRH), the unit's dehumidification mode is in reverse logic and will not activate dehum unless a relay, as shown in Fig. 15, is used. A simplified explanation of the reverse logic follows.

	RH Stat Logic:	ECM Board Logic:
No Dehum Demand:	Dh - energized	Dh-not energized
Dehum Demand:	Dh - de-energized	Dh - energized

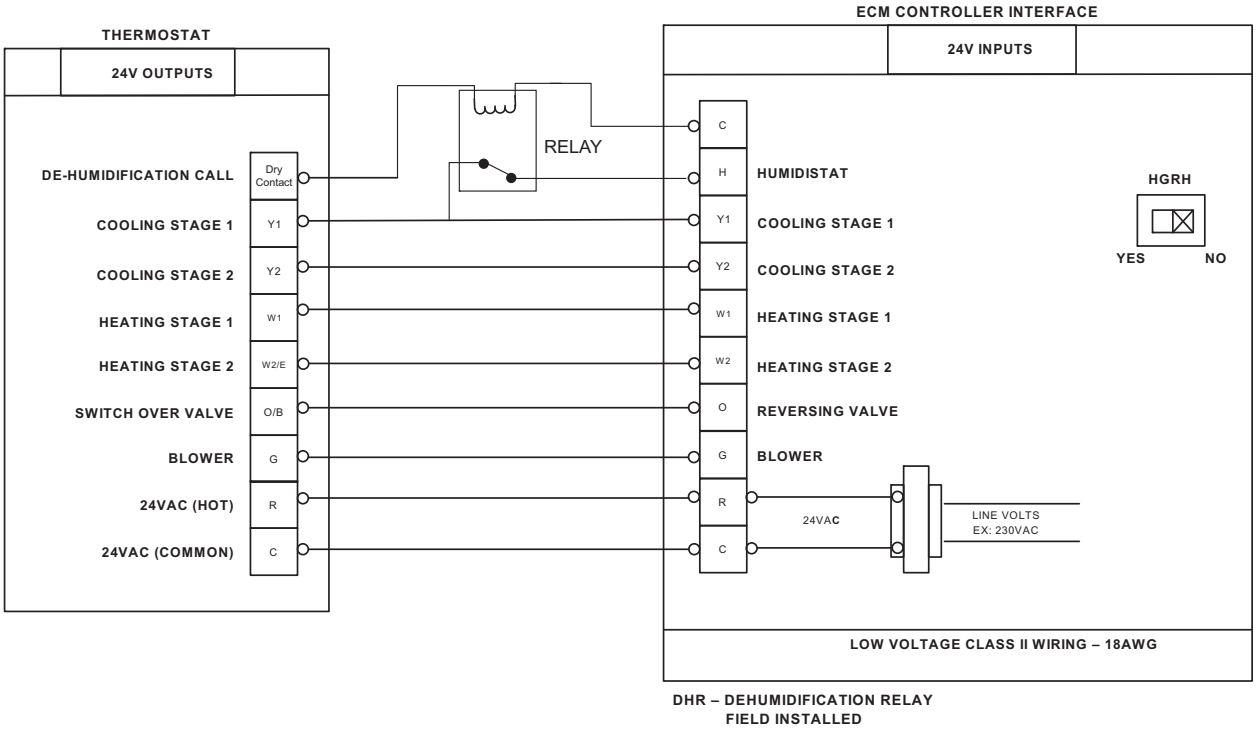

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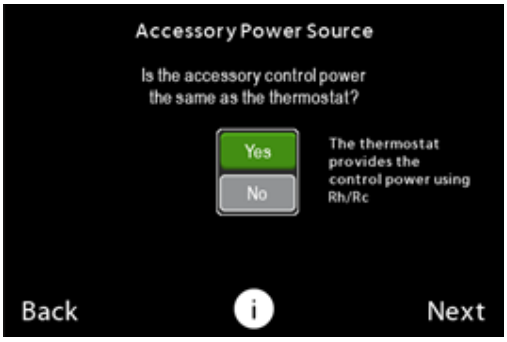
Fig. 15 - Cool to Dehumidify Application for Thermostats with Dehumidification (Not required for Cor / Housewise thermostats)

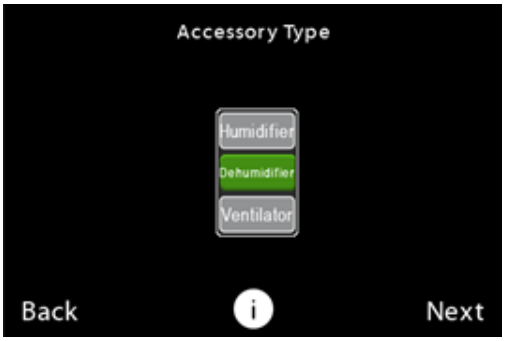
Dehumidification Configuration For Cor/Housewise Thermostats (Carrier: TP-WEM01 / Bryant: T6-WEM01)

These thermostats allow dehum operation without need for a relay if the dehum active status is selected to "Closed"

NOTE: Super-dehum mode is not available in screen options when DEHUM ACTIVE status is selected and is not recommended if using DEHUM ACTIVE status of "Open" and a relay. Airflows programmed in the control boards will not provide super dehum operation.

During the guided setup process, configure the thermostat with a dehumidifier on the output that is powered by the thermostat. Following is an example of the thermostat display screen during guided equipment setup process.

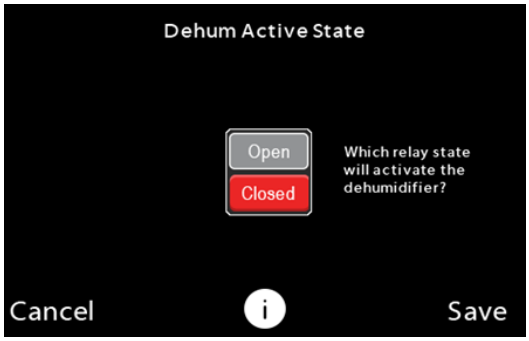




By default, the thermostat will configure the dehumidifier output (ACC+) as ACTIVE OPEN. For geothermal heat pumps, this configuration setting will need to be changed to ACTIVE CLOSED.

The setting can be changed on the thermostat by going to:

Menu > Service (hold for 10 sec) > Installation Settings > Equipment Setup > Accessory > Dehum Active



Super Dehumidification

Super Dehumidification should NOT be used with geothermal heat pumps.

Cor/Housewise with Field Installed Relay

If motor intermittently runs with no call, refer to Fig 16.

NOTE: In thermostats with triacs, such as the Core or Housewise, there is potential for the triac to bleed slight voltage to the blower circuit. In some cases it is low enough to be unnoticeable but in rare occasions the voltage trickle could be enough (typically >8.5 volts) to bump over the blower intermittently with no G call. If this occurs, it is recommended to add a normally open relay in the blower circuit. Refer to Fig 16.

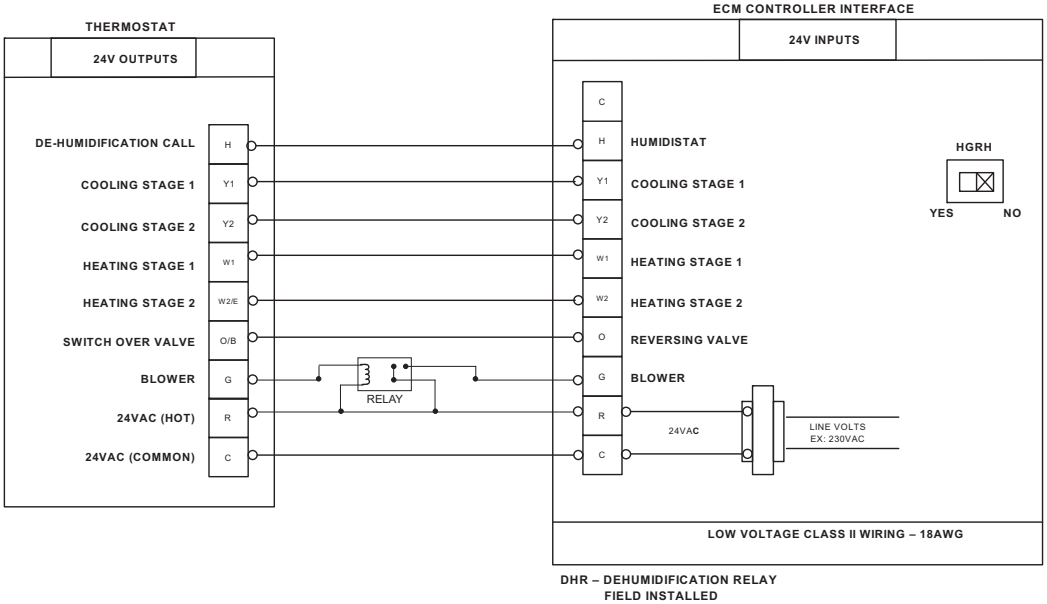


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Fig. 16 - Wiring for Cor / Housewise Adjusted for Geothermal Application

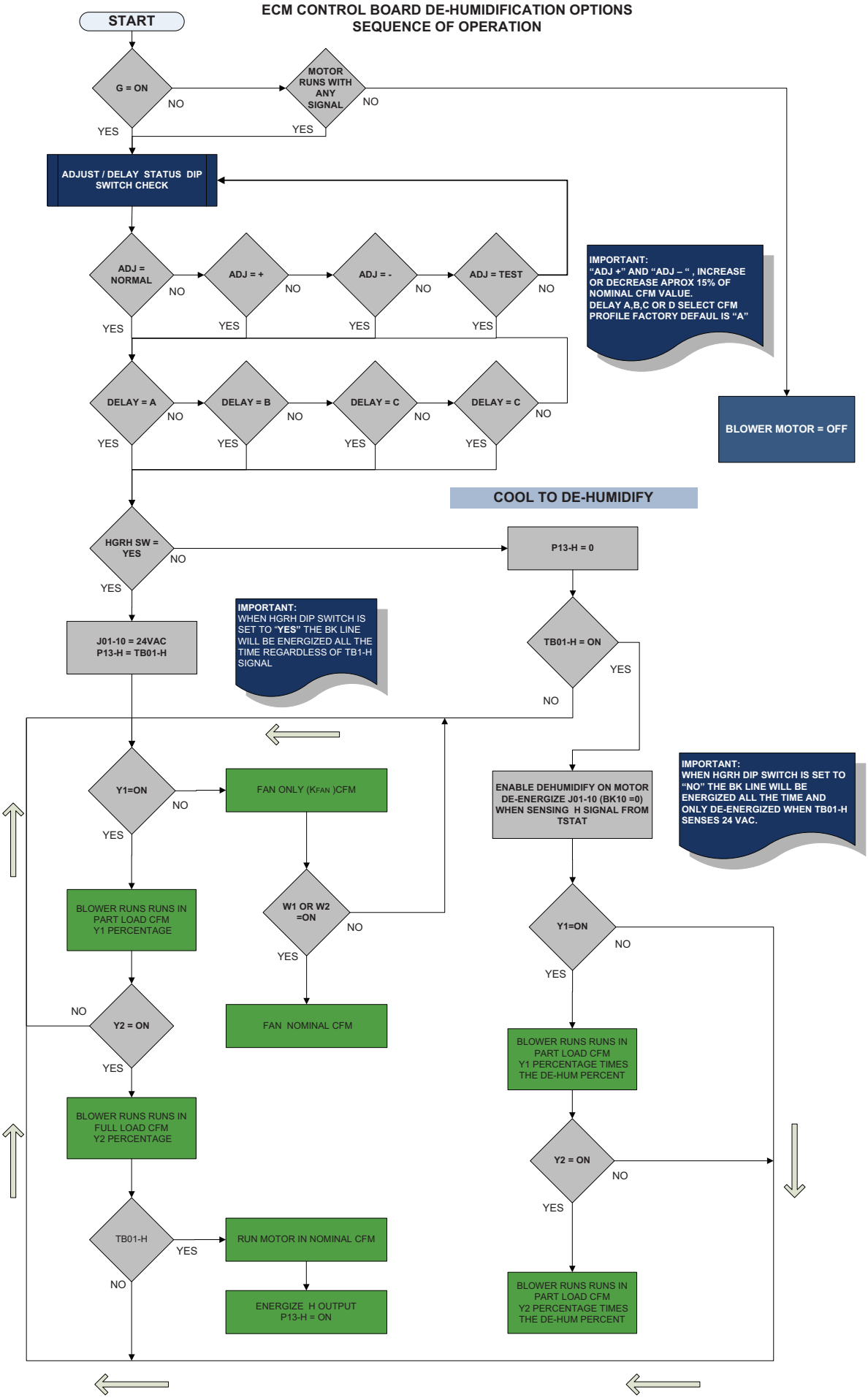

Fig. 17 - ECM Sequence of Operation

Airflow Selector

The airflow selector (see Fig. 13, items 2 and 3 and Fig. 18) allows airflow adjustment to meet application requirements and to ease troubleshooting.

NOTE: Only one switch can be enabled at a time. Refer to Fig. 18 for each airflow setting.

- CFM Selector must remain with only "A" being enabled.
- ADJUST Selector can be adjusted to NOM, (+), (-), or TEST. NOM, (+) and (-) can be adjusted as needed by application. TEST is used for troubleshooting to override unit airflow to 100%.

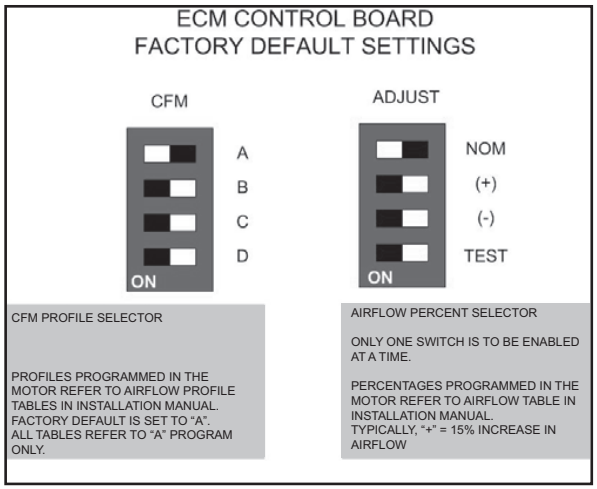

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Fig. 18 - Airflow Selector

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Do not set the ADJUST DIP switch to the (-) setting when electric heaters are installed. Doing so may cause the heaters to cycle on their thermal overload switches, potentially shortening the life of the switches.

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Always disconnect power before changing DIP switch positions on the interface board and reset the unit afterward.

Constant Airflow Motor

The Constant Airflow Motor is an Electronic Commutated Motor (ECM) that provides a constant air flow over a wide range of external static pressures while optimizing the power consumption of the motor. This option allows the unit to have different air flow settings depending on the mode that the unit is operating; i.e heating, cooling, fan only, hot gas reheat, etc. Refer to the ECM Interface Board section in this document for more information.

Pump Relay

The factory installed pump relay can be used to energize a supply pump or solenoid valve when there is a call for compressor operation. This relay can be used to switch either high or low voltage power.

Comfort Alert Diagnostics Module (CADM)

The Comfort Alert Diagnostics Module (CADM) is a breakthrough innovation for troubleshooting heat pump system failures (see Fig. 19).

A14127

Fig. 19 - Comfort Alert Diagnostics Module (CADM)

By monitoring and analyzing data from the compressor and the thermostat demand, the module can accurately detect the cause of electrical and system related failures without any sensors. A flashing LED indicator communicates the ALERT code and guides the service technician more quickly and accurately to the root cause of a problem.

IMPORTANT: This module does not provide safety protection! The Comfort Alert Diagnostics Module is a monitoring device only and cannot shut down the compressor directly.

When an abnormal system condition occurs, the CADM displays the appropriate ALERT and/or TRIP LED. The yellow ALERT LED will flash a number of times consecutively, pause and then repeat the process. To identify a Flash Code number, count the number of consecutive flashes. Every time the module powers up, the last ALERT Flash Code that occurred prior to shut down is displayed for one minute.

Comfort Alert Codes

The comfort alert codes are marked on the back of the device for field service.

GREEN LED - 24VAC Power

YELLOW LED - Flash Code

1. Long run time
2. System pressure trip
3. Short cycling
4. Locked rotor
5. Open circuit
6. Open start circuit
7. Open run circuit
8. Welded contactor
9. Low voltage

RED LED (solid) - Protector open or no compressor power

Reset the codes y breaking 24VAC to the module.

FACTORY INSTALLED FEATURES

A number of factory installed options are available on the GT Series of Heat Pumps. The following details the purpose, function and components of each option.

Smart Start Assist

The Smart Start Assist (SSA) is designed to reduce the in-rush draw during single-phase scroll start-up. The kit contains two main parts (shown in Fig. 20), the mounting plate and the SSA component. The kit is installed on top of the unit's electrical box.

The SSA reduces compressor starting currents, limiting the peak energy demand. SSA has a dedicated algorithm and built-in current limit settings specifically for scroll compressor starting. The designed soft start algorithm slowly ramps the in-rush current which results in the elimination of light flickering, reduction in voltage disturbances and increased compressor lifetime. The SSA can lock out the unit and incorporates its own 5 min. time delay, Refer to Fig. 21, Mode of Operation. This 5 minute anti-cycle delay that could possibly hold unit off even if the UPM test switch is activated in attempt to override the UPM 5 min delay. De-energizing the SSA is the only way to override its built in time delay (refer to unit wiring diagram).

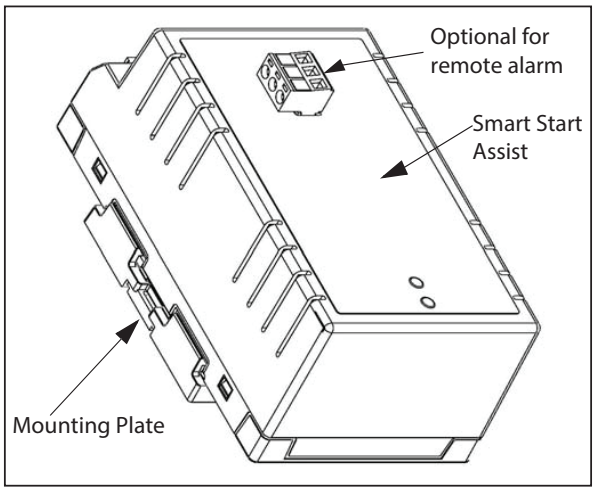

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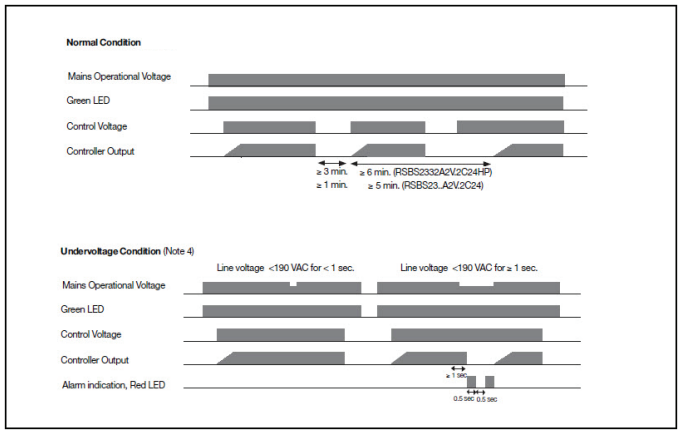
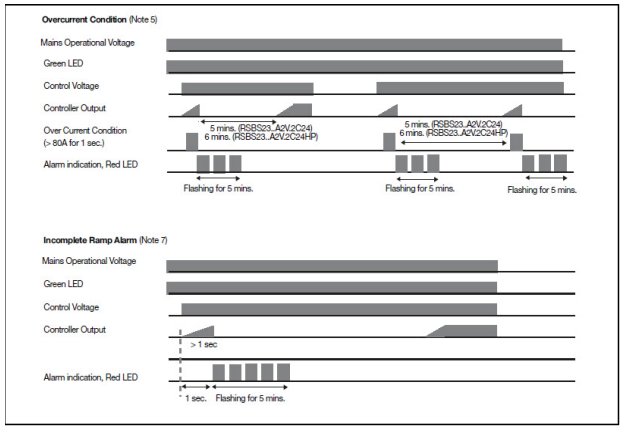
Fig. 20 - Smart Start Assist





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1. The Smart Start Assist has 2 indication LEDs on board. The green LED indicates the status fo the on-board power supply while the red LED indicates an alarm condition or the recovery time between starts[1]
2. Once the mains voltage is present, the green LED will be fully ON. In case the mains voltage is less than the stated pickup voltage alarm value, the green LED will be flashing. In case the mains voltage is higher than the stated pickup voltage and the green LED is flashing, this may indicate that the on-board power supply is faulty. (Power Supply Alarm)
3. Upon closing K1, the Smart Start Assist will start ramping for duration of <1 second provided that the minimum time from stop to start is respected. When opening the K1, the Smart Start Assist will stop without any ramp down.
4. In case of an under-voltage, the Smart Start Assist will shut down and the red LED will flash 2 times as long as the under-voltage is present. Once the mains voltage is restored, the red LED will continue flashing for 5 minutes (6 minutes for HP versions). Following these 5 minutes, the Smart Start Assist will start ramping function in the case k1 is closed. The device can be reset at any time by removing power on L1-N connection. When the power is reapplied, the soft starter will start ramping up as soon as K1 is closed provided that the minimum time between starts and the minimum time from stop to start are respected.
5. If an over-current (>80A for 1 second) is sensed, the Smart Start Assist will shut down and the red LED will flash 3 times indicating an over-current situation. This continues for 5 minutes. In the case that the over-current is still present at the second attempt, user intervention is required to meet the controller by cycling power for the device to operate again as this implies that there are problems in the system.
6. A detection circuitry provides protection in case of a faulty starting capacitor EMR. In such a situation, the red LED will flash 4 times for 5 minutes. Smart Start Assist will check the status of the starting capacitor EMR before attempting a ramping function (in the case K1 is closed). If, at the second attempt, the starting capacitor EMR is found to be faulty, user intervention is required to reset the controller by cycle power for the device.
7. In the case of incomplete ramping of the soft starter, the red LED will flash 5 times. The flashing will be indicated by the red LED for 5 minutes. If, after the second attempt, there is another incomplete ramp alarm, user intervention is required to reset the controller.
8. During recovery from under-voltage, over-current and incomplete ramp alarms, the red LED will flash twice the normal flashing frequency using the same number of flashes. The figure shows the flashing in case of a recovery from an under-voltage alarm.
9. During the recovery time between starts, the Smart Start Assist will be continuously ON until the necessary recovery time elapses[1]
10. If supply on Smart Start Assist is removed before the recovery period has elapsed, when supply is restored, the delay will continue until the remaining recovery time from the last start/stop (before supply removal) is over. Following this, another start may be attempted. If supply is removed during alarm recovery (red LED flashing), when supply is restored, the alarm will be rest and the Smart Start Assist will only wait for the respective delays between starts and/or stop to start to elapse before attempting another start (assuming K1 is closed).

[1] - Applicable to HP versions only

Manual resets may be necessary if consecutive flash codes:
- 2 - Over current
- 4 - Relay Protection
- 5 - Incomplete Ramp

Fig. 21 - Mode of Operation

Heat Recovery Package (HRP) (optional)

The heat recovery package is a factory installed option on GT series heat pumps. The HRP can be used to heat potable water during unit operation using waste heat from the compressor discharge gas. In some cases the HRP can provide most or all of the hot water requirements for a typical home.

The HRP consists of three major components:

1. Double wall, vented refrigerant to water heat exchanger
2. Circulating pump
3. Control circuit

The heat exchanger is rated for use with potable water and is acceptable for use as a domestic water heating device in most building codes.

The pump circulates water between the domestic hot water tank and HRP heat exchanger in the Heat Pump. The control circuit ensures that the HRP only operates when there is available heat from the compressor and when the water is within a safe temperature range of below 140°F. When the heat pump compressor operates, the HRP will monitor the temperature of the discharge gas from the compressor. Once discharge gas is hot enough to provide useful heat to the domestic water tank, the circulating pump will be enabled, drawing water from the tank, through the HRP heat exchanger and then depositing the heated water back into the tank.

If the water temperature reaches 140°F, the circulating pump is disabled to prevent over heating of the domestic water. The HRP is provided with an on/off switch in case the end user desires that the HRP be inactivated (typically during the winter months when space heating is most important).

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

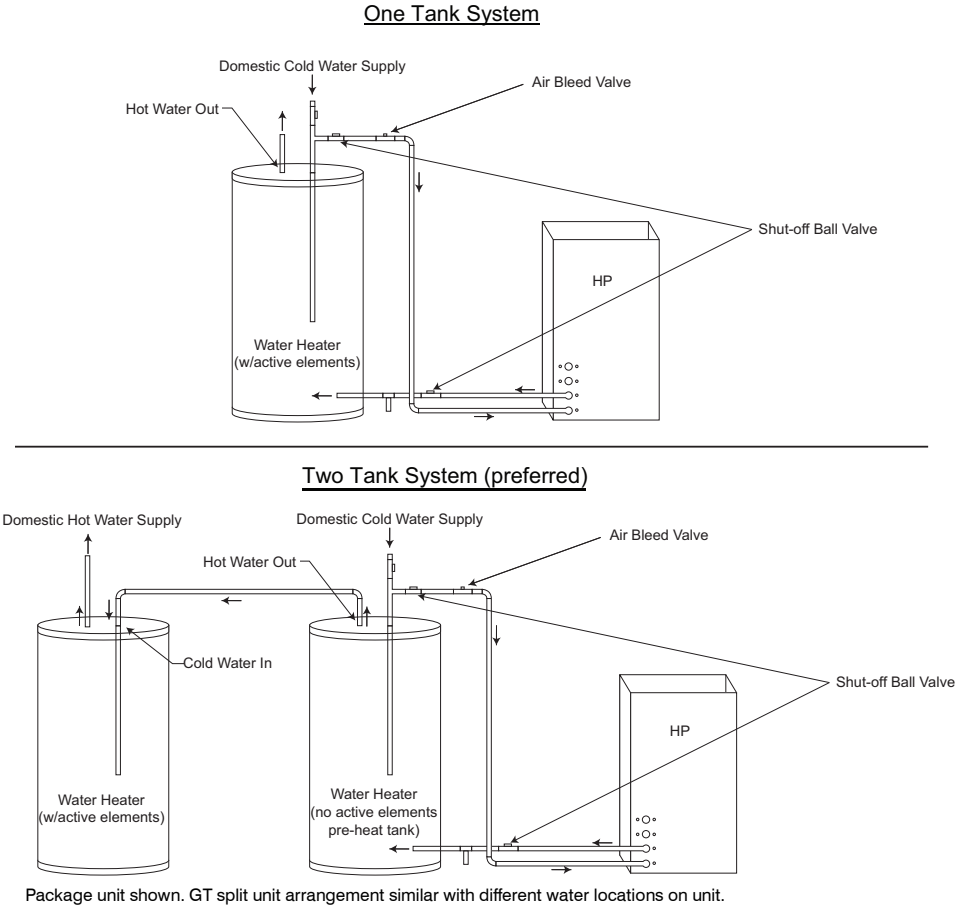
If heat recovery unit is installed in an area where freezing may occur, the unit must be drained during winter months to prevent heat exchanger damage. Heat exchanger ruptures that occur due to freezing will void the heat recovery package warranty along with the heat pump warranty.

Water Tank Preparation

1. Turn off electrical or fuel supply to the water heater.
2. Attach garden hose to water tank drain connection and run other end of hose out doors or to an open drain.
3. Close cold water inlet valve to water heater tank.
4. Drain tank by opening drain valve on the bottom of the tank, then open pressure relief valve or hot water faucet.
5. Once drained the tank should be flushed with cold water until the water leaving the drain hose is clear and free of sediment.
6. Close all valves and remove the drain hose.
7. Install HRP water piping.

HRP Water Piping

All hot water piping MUST be a minimum of 3/8” O.D. copper tube to a maximum distance of 15 feet. For distances beyond 15 feet, but not exceeding 60 feet, use 1/2” copper tube. Separately insulate all exposed surface of both connecting water lines with 3/8” wall closed cell insulation. Install isolation valves on supply and return to the heat recovery. (See Fig. 22)



Package unit shown. GT split unit arrangement similar with different water locations on unit.

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Fig. 22 - HRP Water Piping

Water Tank Refill

1. Open the cold water supply to the tank.
2. Open a hot water faucet to vent air from the system until water flows from the faucet, then close.
3. Depress the hot water tank pressure relief valve handle to ensure there is no air remaining in the tank.
4. Carefully inspect all plumbing for water leaks. Correct as required.
5. Purge all air from HRP by depressing the Schrader valve on the HR unit. Allow all air to bleed out until water appears at the valve.
6. Before restoring the power or fuel supply to the water heater, adjust the temperature setting on the tank thermostat(s) to ensure maximum utilization of heat available from the refrigeration system and to conserve the most energy.
   On tanks with thermostats and both upper and lower elements, the lower element should be turned down to 100°F, while the upper element should be adjusted to 120°F. Depending upon the specific needs of the customer, you may need to adjust the upper element differently.
   On tanks with a single thermostat, lower the thermostat setting to 120°F or the "LOW" position. After thermostat adjustments are completed, replace access cover and restore electrical or fuel supply to water heater.

IMPORTANT: Copper should be used for piping from HRP to domestic water tank(s). Use 5/8" (16mm) O.D. copper or larger. Refer to local codes for hot water piping. Insulate the water lines between the GHP and the water heater with a minimum of 3/8" (10mm) closed cell insulation.

Initial Start-Up

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Make sure all valves in heat recovery water piping system are open. NEVER OPERATE HR PUMP DRY.

1. Turn on the heat pump. The HR pump should not run if the compressor is not running.
2. Turn HR switch to the "ON" position. The pump will operate if entering water temperature to HR is below 120°F.
3. The temperature difference between the water entering and leaving the heat recovery should be 5°F to 15°F.
4. Allow the unit to operate for 20 to 30 minutes to ensure it is functioning properly. The pump should shut off when the water temperature entering the heat recovery reaches 120°F.

FIELD INSTALLED ACCESSORIES

Auxiliary Heaters

Internally mounted auxiliary heaters are available in 10 Kw, 15 Kw and 10 Kw sizes. For installation procedures, refer to the instructions shipped with the heaters. Table 3 lists compatible heaters with GT units.

Flow Centers and Associated Loop Accessories

A wide variety of flow centers are available for both closed and open loop installations, along with hose kits, fittings, solenoid valves, etc. Refer to the instructions shipped with these components for further details.

Table 3 – Electric Heater Compatibility

Heater Model	kW		Stages	Btu/h		Product Series Compatibility				
	208V	230V		208V	230V	GT024	GT036	GTT048	GT060	GT072
KWAEH0101N10	7.2	9.6	2	24600	32700	X	X	X	X	X
KWAEH0101F15	10.8	14.4	2	36900	49100		X	X	X	X
KWAEH0101F20	14.4	19.2	2	49200	63400			X	X	X
X = Compatible										

SEQUENCE OF OPERATION

Cooling Mode

Energizing the “O” terminal energizes the unit reversing valve thus placing the unit into cooling mode. The fan motor starts when the “G” terminal is energized.

NOTE: The fan motor will take 30 seconds to ramp up to operating speed and will run at fan only rated air flow as long as there is no call for compressor or heater operation.

When the thermostat calls for first stage cooling (Y1) the loop pump or solenoid valve, if present, is energized and the first stage of compressor capacity starts. The fan ramps up to first stage cooling air flow in 30 seconds.

NOTE: Some options will have a built in delay therefore, compressor operation is not immediate. See *Factory Installed Options* section for more detail.

When the thermostat calls for second stage cooling (Y2), the second stage (or full compressor capacity) is initiated. The fan ramps up to full cooling air flow.
Once the thermostat is satisfied, the compressor shuts down and the fan ramps down to either FAN ONLY mode or OFF over a span of 30 seconds.

NOTE: A fault condition initiating a lockout will de-energize the compressor irrespective of which stage is engaged.

Heating Mode

The first two stages of heating (Y1 & Y2) operate in the same manner as cooling, but with the reversing valve de-energized. On a call for auxiliary heat (W1), the fan ramps up to auxiliary heat air flow immediately and the electric heater package is energized along with the compressor.

As the thermostat is satisfied, the heaters will shut off as soon as W1 is de-energized, and the compressors will remain on until the thermostat stages are satisfied.

NOTE: If the unit compressor locks out for any reason at this time, the electric heaters will continue to function normally.

Once the thermostat is satisfied, the compressor shuts down and the fan ramps down to either FAN ONLY mode or OFF over a span of 30 seconds.

If thermostat has two different output points one for Auxiliary heat and a different one for Emergency heat the two outputs must be terminated on W1 units equipped with one stage of Electric heat. (See Fig. 23)

NOTE: When using a 2-cool, 3-heat thermostat, both the W1 & W2 on the Heat Pump and W2 & EM on the thermostat must be connected together via a jumper. (See Fig. 23)

ELECTRONIC THERMOSTAT INSTALLATION

Position the thermostat sub-base against the wall so that it is level and the thermostat wires protrude through the middle of the sub-base. Mark the position of the sub-base mounting holes and drill holes with a 3/16-inch bit. Install supplied 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 connector as shown in Fig. 23. Tighten the screws to ensure secure connections. The thermostat has the same type connectors, requiring the same wiring.

Refer to the thermostat Installation Instructions for detailed installation and operation information.

NOTE: When using a 2-cool, 3-heat thermostat, both the W1 & W2 on the Heat Pump and W2 & EM on the thermostat must be connected together via a jumper. (See Fig. 23)

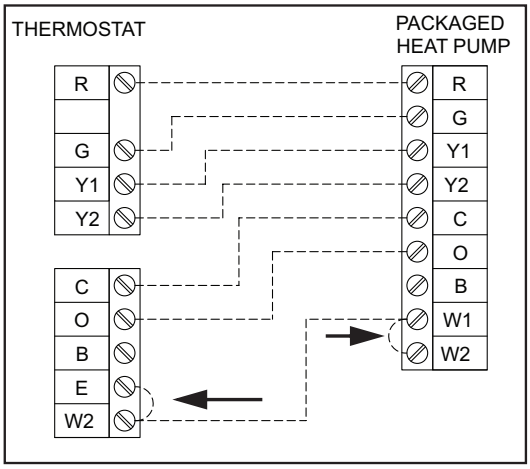

Fig. 23 - Thermostat Wiring

NOTE: Packaged heat pumps are equipped with detachable thermostat connectors. These connectors are located in different locations based on the blower motor that is installed in the unit.

- For the EON motor, the three detachable thermostat connectors are located on the ECM Interface Board. See Wiring Harness Drawing on page 7, Fig. 4.

NOTE: Harness wiring can be loose, based on the options installed for the unit. See the Wiring Harness drawing notes for further details.

SYSTEM CHECKOUT

After completing the installation, and before energizing the unit, the following system checks should be made:

1. Verify that the supply voltage to the heat pump is in accordance with the nameplate ratings.
2. Make sure that all electrical connections are tight and secure.
3. Check the electrical fusing and wiring for the correct size.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Ensure cabinet and electrical box are properly grounded

4. Verify that the low voltage wiring between the thermostat and the unit is correct.
5. Verify that the water piping is complete and correct.
6. Check that the water flow is correct, and adjust if necessary.
7. Check the blower for free rotation, and that it is secured to the shaft.
8. Verify that vibration isolation has been provided.
9. Unit is serviceable. Be certain that all access panels are secured in place.

Considerations:

- Always check incoming line voltage power supply and secondary control voltage for adequacy. Transformer primaries are dual tapped for 208 and 230 volts. Connect the appropriate tap to ensure a minimum of 18 volts secondary control voltage. 24 volts is ideal for best operation.
- Long length thermostat and control wiring leads may create voltage drop. Increase wire gauge or up-sized transformers may be required to insure minimum secondary voltage supply.
- The following guidelines are recommended for wiring between a thermostat and the unit: 18 GA up to 60 foot, 16 GA up to 100 ft and 14 GA up to 140 ft.
- Do not apply additional controlled devices to the control circuit power supply without consulting the factory. Doing so may void equipment warranties.
- Check with all code authorities on requirements involving condensate disposal/overflow protection criteria.

UNIT START-UP

NOTE: A unit Start-Up checklist is included in the unit packet. Complete the Checklist and place it in the customer file at your dealership.

1. Set the thermostat to the highest setting.
2. Set the thermostat system switch to "COOL", and the fan switch to the "AUTO" position. The reversing valve solenoid should energize. The compressor and fan should not run.
3. Reduce the thermostat setting approximately 5 degrees below room temperature.
4. Verify the heat pump is operating in the cooling mode.
5. Turn the thermostat system switch to the "OFF" position. The unit should stop running and the reversing valve should de-energize.
6. Leave the unit off for approximately five (5) minutes to allow for system equalization.
7. Turn the thermostat to the lowest setting.
8. Set the thermostat switch to "HEAT".
9. Increase the thermostat setting approximately five (5) degrees above room temperature.
10. Verify the heat pump is operating in the heating mode.
11. Set the thermostat to maintain desired space temperature.
12. Check for vibrations, leaks, etc.

MAINTENANCE

1. Filter changes or cleanings are required at regular intervals. The time period between filter changes will depend upon type of environment the equipment is used in.
   In a single family home, that is not under construction, changing or cleaning the filter every 60 days is sufficient. In other applications such as motels, where daily vacuuming produces a large amount of lint, filter changes may need to be as frequent as biweekly.

⚠ CAUTION

UNIT DAMAGE AND/OR OPERATION HAZARD

Failure to follow this caution may result in unit damage and/or improper equipment operation.

Equipment should never be used during construction due to likelihood of wall board dust accumulation in the air coil of the equipment which permanently affects the performance and may shorten the life of the equipment.

2. An annual "checkup" is recommended by a licensed refrigeration mechanic. Recording the performance measurements of volts, amps, and water temperature differences (both heating and cooling) is recommended. This data should be compared to the information on the unit's data plate and the data taken at the original start-up of the equipment.
3. Lubrication of the blower motor is not required, however may be performed on some motors to extend motor life. Use SAE-20 non-detergent electric motor oil.
4. The condensate drain should be checked annually by cleaning and flushing to insure proper drainage.
5. Periodic lockouts are commonly caused by air or water flow problems. The lockout (shutdown) of the unit is a normal protective measure in the design of the equipment. If continual lockouts occur, call a mechanic immediately and have them check for the following:
   - Water flow problems
   - Water temperature problems
   - Air flow problems
   - Air temperature problems.

   Use of the pressure and temperature charts for the unit may be required to properly determine the cause.

TROUBLESHOOTING

GT Series Water Source Heat Pump is equipped with an externally mounted LCD screen that displays unit errors. (See Fig. 24)

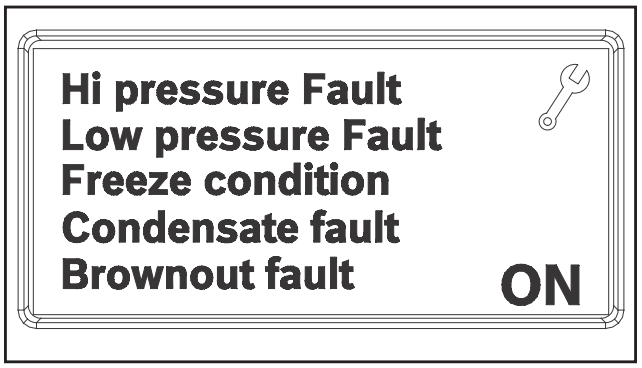

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Fig. 24 - GT Unit Error LCD Screen

IMPORTANT: The following Troubleshooting tables are designed to help identify possible causes and solutions for problems. There could be more than one cause/solution to a problem that can be applied. Check each cause and adopt "process of elimination" and/or verification of each before making a conclusion.

UPM Board LED Indications		
Indication Color	**Blinks**	**Description**
GREEN	Solid	18-30 VAC Power is present
RED	1	High pressure lockout
RED	2	Low pressure lockout
RED	3	Freeze sensor lockout
RED	4	Condensate overflow
RED	5	Brownout
RED	6	Evaporator Freeze condition

Compressor Ohms		
Model	Start Winding	Run Winding
GT024	1.64	1.3
GT036	1.52	0.88
GT048	1.86	0.52
GT060	1.63	0.39
GT072	1.85	0.34
Tolerance +/- 7%. All resistance values must be measured with compressor at room temperature.		

HRP Troubleshooting		
Problem	Possible Cause	Checks and Corrections
NO FLOW LOW FLOW	No Power	Check power supply
	On/Off Switch Position	Set switch to "ON" position
	Compressor Contactor	Engage heat pump contactor
	Broken or loose wires	Repair or tighten wires
	Air Lock	Purge air from piping system
	Stuck pump shaft/impeller	Remove pump cartridge and clean
	Defective pump	Replace pump
	Kinked or under sized water piping	Repair kink and check for proper line size
HIGH WATER TEMPERATURE	Water temp limit closed	Stuck limit switch Sensor not attached securely to line
LOW HEAT OUTPUT	Scaled or fouled heat exchanger	Clean heat exchanger

Unit Troubleshooting		
Problem	Possible Cause	Checks and Correction
ENTIRE UNIT DOES NOT RUN	Power Supply Off	Apply power, close disconnect
	Blown Fuse	Replace fuse or reset circuit breaker. Check for correct fuses
	Voltage Supply Low	If voltage is below minimum voltage specified on unit data plate, contact local power company.
	Thermostat	Set the fan to "ON", the fan should run. Set thermostat to "COOL" and lowest temperature setting, the unit should run in the cooling mode (reversing valve energized). Set unit to "HEAT" and the highest temperature setting, the unit should run in the heating mode. If neither the blower or compressor run in all three cases, the thermostat could be miswired or faulty. To ensure miswired or faulty thermostat verify 24 volts is available on the condensing section low voltage terminal strip between "R" and "C", "Y" and "C", and "O" and "C". If the blower does not operate, verify 24 volts between terminals "G" and "C" in the air handler. Replace the thermostat if defective.
BLOWER OPERATES BUT COMPRESSOR DOES NOT	Thermostat	Check setting, calibration, and wiring
	Wiring	Check for loose or broken wires at compressor, capacitor, or contactor.
	Safety Controls	Check UPM board red default L.E.D. for Blink Code
	Compressor overload open	If the compressor is cool and the overload will not reset, replace compressor.
	Compressor motor grounded	Internal winding grounded to the compressor shell. Replace compressor. If compressor burnout, install suction filter dryer.
	Compressor windings Open	After compressor has cooled, check continuity of the compressor windings. If the windings are open, replace the compressor
UNIT OFF ON HIGH PRESSURE CONTROL	Discharge pressure too high	In "COOLING" mode: Lack of or inadequate water flow. Entering water temperature is too warm. Scaled or plugged condenser. In "HEATING" mode: Lack of or inadequate air flow. Blower inoperative, clogged filter or restrictions in duct work
	Refrigerant charge	The unit is overcharged with refrigerant. Reclaim refrigerant, evacuate and recharge with factor recommended charge.
	High pressure	Check for defective or improperly calibrated high pressure switch.
UNIT OFF ON LOW PRESSURE CONTROL	Suction pressure too low	In "COOLING" mode: Lack of or inadequate air flow. Entering air temperature is too cold. Blower inoperative, clogged filter or restrictions in duct work. In "HEATING" mode: Lack of or inadequate water flow. Entering water temperature is too cold. Scaled or plugged condenser.
	Refrigerant charge	The unit is low on refrigerant. Check for refrigerant leak, repair, evacuate and recharge with factory recommended charge.
	Low pressure switch	Check for defective or improperly calibrated low pressure switch.

Unit Troubleshooting (continued)		
Problem	Possible Cause	Checks and Correction
UNIT SHORT CYCLES	Unit oversized	Recalculate heating and or cooling loads.
	Thermostat	Thermostat installed near a supply air grill; relocate thermostat. Readjust heat anticipator.
	Wiring and controls	Check for defective or improperly calibrated low pressure switch.
INSUFFICIENT COOLING OR HEATING	Unit undersized	Recalculate heating and or cooling loads. If excessive, possibly adding insulation and shading will rectify the problem
	Loss of conditioned air by leakage	Check for leaks in duct work or introduction of ambient air through doors or windows
	Airflow	Lack of adequate air flow or improper distribution of air. Replace dirty
	Refrigerant charge	Low on refrigerant charge causing inefficient operation
	Compressor	Check for defective compressor. If discharge is too low and suction pressure is too high, compressor is not pumping properly. Replace compressor.
	Reversing Valve	Defective reversing valve creating bypass of refrigerant from discharge of suction side of compressor. Replace reversing valve
	Operating pressures	Compare unit operation pressures to the pressure/temperature chart for the unit.
	TXV	Check TXV for possible restriction or defect. Replace if necessary.
	Moisture, noncondensables	The refrigerant system may be contaminated with moisture or noncondensables. Reclaim refrigerant, replace filter dryer, evacuate the refrigerant system, and recharge with factory recommended charge.

Comfort Alert Module -Flash Codes		
Status LED	Status LED Description	Status LED Troubleshooting Information Solution
YELLOW "ALERT" FLASH CODE 3	Short Cycling Compressor is running only briefly	1. Thermostat demand signal is intermittent 2. Time delay relay or control board defective 3. If high pressure switch present go to Flash Code 2 information 4. If low pressure switch present go to Flash Code 1 information
YELLOW "ALERT" FLASH CODE 4	Locked Rotor	1. Run capacitor has failed (may not be bad, verify) 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections 3. Excessive liquid refrigerant in compressor 4. Compressor bearings are seized • Measure compressor oil level
YELLOW "ALERT" FLASH CODE 5	Open Circuit	1. Outdoor unit power disconnect is open 2. Compressor circuit breaker or fuse(s) is open 3. Compressor contactor has failed open • Check compressor contactor wiring and connectors • Check for compressor contactor failure (burned, pitted or open) • Check wiring and connectors between supply and compressor • Check for low pilot voltage at compressor contactor coil 4. High pressure switch is open and requires manual reset 5. Open circuit in compressor supply wiring or connections 6. Unusually long compressor protector reset time due to extreme ambient temperature 7. Compressor windings are damaged • Check compressor motor winding resistance
YELLOW "ALERT" FLASH CODE 6	Open Start Circuit Current only in run circuit	1. Run capacitor has failed (may not be bad, verify) 2. Open circuit in compressor start wiring or connections • Check wiring and connectors between supply and the compressor "S" terminal 3. Compressor start winding is damaged • Check compressor motor winding resistance
YELLOW "ALERT" FLASH CODE 7	Open Run Circuit Current only in start circuit	1. Open circuit in compressor run wiring or connections • Check wiring and connectors between supply and the compressor "R" terminal 2. Compressor run winding is damaged • Check compressor motor winding resistance
YELLOW "ALERT" FLASH CODE 8	Welded Contactor Compressor always runs	1. Compressor contactor has failed closed 2. Thermostat demand signal not connected to module
YELLOW "ALERT" FLASH CODE 9	Low Voltage Control circuit < 17VAC	1. Control circuit transformer is overloaded 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections Flash Code number corresponds to a number of LED flashes, followed by a pause and then repeated. TRIP and ALERT LEDs flashing at same time means control circuit voltage is too low for operation

Operating Temperatures and Pressures										
			COOLING				HEATING			
Model	Entering Water Temp. F	Wat er Flow	Suction Pressure PSIG	Discharge Pressure PSIG	Water Temp Rise °F	Air Temp Drop °F	Suction Pressure PSIG	Discharge Pressure PSIG	Water Temp Drop	Air Temp Rise °F
GT024 Part Load	30°	4					75-91	264-322	5-6	15-17
		8					79-96	270-331	3-4	16-18
	40°	4					88-107	277-339	6-7	17-20
		8	115-140	175-214	8-9	19-23	92-112	284-348	4-5	18-21
	50°	4	129-157	218-267	14-17	18-20	98-122	291-356	7-8	20-23
		8	124-151	204-250	8-9	19-22	110-130	298-364	5-6	21-24
	60°	4	134-163	249-305	13-16	17-20	112-136	304-372	8-10	22-26
		8	128-156	233-287	8-9	18-21	117-143	312-381	6-7	23-28
	70°	4	138-168	281-341	13-16	17-19	124-152	318-389	9-11	24-29
		8	133-161	263-323	7-9	18-21	131-159	325-398	6-8	26-31
	80°	4	143-174	317-388	13-16	16-19	136-166	331-405	11-13	27-32
		8	137-167	297-366	7-9	17-20	143-174	339-415	7-9	28-33
	90°	4	147-179	357-437	13-16	16-18	149-181	345-422	12-14	29-35
		8	141-172	335-411	7-9	17-20	156-190	352-432	8-10	31-37
	100°	4	151-185	402-492	13-15	15-18				
		8	146-177	378-459	7-9	16-19				
GT024 Full Load	30°	4					76-92	242-297	3-4	13-14
		8					80-97	249-304	2-3	13-15
	40°	4	125-151	180-221	14-18	19-22	89-108	255-312	4-5	15-17
		8	120-146	169-207	8-10	20-23	93-113	261-320	3-3	16-18
	50°	4	134-163	211-258	14-18	18-21	106-118	267-327	5-6	17-19
		8	129-157	198-242	8-10	19-23	110-126	274-335	3-4	18-21
	60°	4	139-169	241-295	14-17	18-21	113-138	280-342	6-7	19-22
		8	134-163	227-278	8-10	19-22	119-145	287-351	4-5	20-23
	70°	4	144-175	272-333	14-17	17-20	126-155	292-358	7-8	21-24
		8	138-168	255-313	8-10	18-21	133-162	300-367	5-6	22-26
	80°	4	148-181	307-375	14-17	17-19	138-168	305-373	8-9	23-27
		8	143-174	288-353	8-10	18-21	145-177	312-382	5-6	24-29
	90°	4	153-186	346-423	14-17	16-19	151-184	317-388	8-10	25-29
		8	147-179	325-398	8-9	17-20	158-193	325-398	6-7	26-31
	100°	4	158-191	389-477	13-16	16-18				
		8	152-185	366-448	8-9	17-20				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80º d.b./67º w.b. entering air temperature in cooling, 70º d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50º assumes the use of antifreeze. As a result of continuing research and development, specifications are subject to change without notice.

Operating Temperatures and Pressures										
			COOLING				HEATING			
GT036 Part Load	30°	4.5					73-89	266-325	5-6	15-18
		9.0					77-94	272-333	3-4	16-19
	40°	4.5	117-143	189-231	14-17	18-22	86-105	279-341	6-7	17-21
		9.0	112-137	178-217	8-9	19-24	90-110	286-350	4-5	18-22
	50°	4.5	126-154	221-270	14-17	18-21	105-125	293-358	7-8	20-24
		9.0	121-148	207-253	8-9	19-23	109-130	300-366	5-6	21-25
	60°	4.5	131-160	252-308	13-16	17-21	110-134	306-374	8-10	22-27
		9.0	125-153	237-290	8-9	18-22	115-141	314-383	6-7	23-29
	70°	4.5	135-165	284-347	13-16	17-20	122-150	320-391	9-11	24-30
		9.0	130-158	266-326	7-9	18-22	129-157	327-400	6-8	26-32
	80°	4.5	140-171	320-391	13-16	16-20	134-164	333-407	11-13	27-33
		9.0	134-164	300-367	7-9	17-21	141-172	341-417	7-9	28-35
	90°	4.5	144-176	360-440	13-16	16-19	147-179	347-424	12-14	29-36
		9.0	138-169	338-414	7-9	17-21	154-188	355-434	8-10	31-38
	100°	4.5	149-182	405-495	13-15	15-19				
		9.0	143-174	381-465	7-9	16-20				
GT036 Full Load	30°	4.5					74-90	244-299	3-4	13-15
		9.0					78-95	251-306	2-3	13-16
	40°	4.5	122-149	183-224	14-18	19-23	87-106	257-314	4-5	15-18
		9.0	117-143	172-210	8-10	20-24	91-111	263-322	3-3	16-19
	50°	4.5	131-160	214-261	14-18	18-22	95-105	269-329	5-6	17-20
		9.0	126-154	201-245	8-10	19-24	100-125	276-337	3-4	18-22
	60°	4.5	136-166	244-298	14-17	18-22	111-136	282-344	6-7	19-23
		9.0	131-160	230-281	8-10	19-23	117-143	289-353	4-5	20-24
	70°	4.5	141-172	275-336	14-17	17-21	124-152	294-360	7-8	21-25
		9.0	135-165	258-316	8-10	18-22	131-160	302-369	5-6	22-27
	80°	4.5	145-178	310-378	14-17	17-20	136-166	307-375	8-9	23-28
		9.0	140-171	291-356	8-10	18-22	143-175	314-384	5-6	24-30
	90°	4.5	150-183	349-426	14-17	16-20	149-182	319-390	8-10	25-30
		9.0	144-176	328-401	8-9	17-21	156-191	327-400	6-7	26-32
	100°	4.5	155-189	392-480	13-16	16-19				
		9.0	149-182	369-451	8-9	17-21				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80º d.b./67º w.b. entering air temperature in cooling, 70º d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50º assumes the use of antifreeze. As a result of continuing research and development, specifications are subject to change without notice.

Operating Temperatures and Pressures										
			COOLING				HEATING			
GT048 Part Load	30°	6.0					64-78	248-303	5-6	15-18
		12.0					67-82	254-311	3-4	16-19
	40°	6.0	109-134	183-224	18-22	19-23	75-91	261-319	6-8	17-21
		12.0	105-128	172-210	10-12	20-25	79-96	267-327	4-5	18-23
	50°	6.0	118-144	214-261	18-22	19-23	78-90	273-334	8-10	20-24
		12.0	113-138	201-245	10-12	20-24	82-95	280-342	5-7	21-26
	60°	6.0	122-149	244-298	17-21	18-22	96-117	286-349	9-11	22-27
		12.0	117-143	230-281	10-12	19-24	101-123	293-358	6-8	24-29
	70°	6.0	126-154	275-336	17-21	18-22	107-131	299-365	11-13	25-30
		12.0	121-148	258-316	10-12	19-23	113-138	306-374	7-9	26-32
	80°	6.0	130-159	310-378	17-21	17-21	117-143	311-380	12-15	27-33
		12.0	132-153	291-356	10-12	18-22	123-151	319-390	8-10	29-35
	90°	6.0	134-164	349-426	17-20	17-20	128-157	324-396	13-16	29-36
		12.0	129-158	328-401	9-12	18-22	135-165	332-406	9-11	31-38
	100°	6.0	139-170	392-480	16-20	16-20				
		12.0	133-163	369-451	9-11	17-21				
GT048 Full Load	30°	6.0					71-87	277-339	6-7	15-19
		12.0					75-92	284-347	4-5	16-20
	40°	6.0	118-144	194-237	21-25	19-23	84-102	291-356	7-9	18-22
		12.0	113-138	182-223	12-14	20-24	88-108	299-365	5-6	19-23
	50°	6.0	127-155	226-276	21-25	18-22	92-110	305-373	9-11	20-25
		12.0	122-149	213-260	12-14	19-24	98-120	313-383	6-7	21-26
	60°	6.0	131-160	259-316	21-25	18-22	108-132	320-391	10-13	23-28
		12.0	126-154	243-297	12-14	19-23	113-138	328-400	7-9	24-29
	70°	6.0	136-166	291-355	20-25	17-21	120-147	334-408	12-15	25-31
		12.0	130-159	273-334	12-14	18-22	126-154	342-418	8-10	27-32
	80°	6.0	140-171	328-401	20-24	17-20	131-161	348-425	14-17	27-34
		12.0	135-165	308-377	11-14	18-22	138-169	356-436	9-11	29-36
	90°	6.0	145-177	369-451	20-24	16-20	144-176	362-442	15-18	30-37
		12.0	139-170	347-424	11-14	17-21	151-185	371-453	10-12	32-39
	100°	6.0	149-183	415-508	19-24	16-19				
		12.0	143-175	391-477	11-14	17-21				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80° d.b./67° w.b. entering air temperature in cooling, 70° d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50° assumes the use of antifreeze. As a result of continuing research and development, specifications are subject to change without notice.

Operating Temperatures and Pressures										
			COOLING				HEATING			
GT060 Part Load	30°	7.0					68-84	256-313	5-7	19-23
		14.0					73-89	261-319	4-5	20-25
	40°	7.0	113-138	172-210	18-22	19-23	81-99	277-339	7-8	22-26
		14.0	110-134	161-196	12-14	20-24	86-105	283-346	5-6	23-28
	50°	7.0	116-142	206-252	17-21	19-23	93-114	299-365	8-9	24-29
		14.0	112-137	193-236	12-14	19-24	99-121	305-373	6-7	25-31
	60°	7.0	118-145	241-294	17-21	18-23	106-129	321-392	9-11	26-32
		14.0	115-140	225-275	11-14	19-23	113-138	327-400	7-8	28-34
	70°	7.0	121-148	275-336	17-21	18-22	118-145	342-418	10-12	29-35
		14.0	117-143	257-314	11-14	19-23	126-154	349-427	8-9	30-37
	80°	7.0	123-151	309-378	16-20	18-22	131-160	364-444	11-14	31-38
		14.0	120-146	289-353	11-13	19-23	139-170	371-454	8-10	33-40
	90°	7.0	126-154	344-420	16-20	18-22	143-175	385-471	12-15	33-41
		14.0	122-149	321-392	11-13	18-22	152-186	393-480	9-11	35-43
	100°	7.0	128-157	378-462	16-19	17-21				
		14.0	125-152	353-432	11-13	18-22				
GT060 Full Load	30°	7.0					68-84	256-313	5-7	19-23
		14.0					73-89	261-319	4-5	20-25
	40°	7.0	117-143	182-222	15-19	21-26	81-99	277-339	7-8	22-26
		14.0	114-139	170-208	11-14	22-27	86-105	283-346	5-6	23-28
	50°	7.0	120-147	215-263	15-18	20-25	93-114	299-365	8-9	24-29
		14.0	117-143	201-246	11-14	21-26	99-121	305-373	6-7	25-31
	60°	7.0	123-150	248-304	14-17	20-24	106-129	321-392	9-11	26-32
		14.0	119-146	232-284	11-13	21-25	113-138	327-400	7-8	28-34
	70°	7.0	126-154	282-344	14-17	19-24	118-145	342-418	10-12	29-35
		14.0	122-149	263-322	10-13	20-25	126-154	349-427	8-9	30-37
	80°	7.0	129-157	315-385	13-16	19-23	131-160	364-444	11-14	31-38
		14.0	125-153	294-360	10-12	19-24	139-170	371-454	8-10	33-40
	90°	7.0	132-161	348-426	13-16	18-22	143-175	385-471	12-15	33-41
		14.0	128-156	326-398	10-12	19-23	152-186	393-480	9-11	35-43
	100°	7.0	134-164	382-466	12-15	17-21				
		14.0	131-160	357-436	9-11	18-22				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80° d.b./67° w.b. entering air temperature in cooling, 70° d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50° assumes the use of antifreeze. As a result of continuing research and development, specifications are subject to change without notice.

Operating Temperatures and Pressures										
			COOLING				HEATING			
GT072 Part Load	30°	9.0					71-87	259-316	5-7	19-23
		18.0					76-92	264-322	4-5	20-25
	40°	9.0	116-141	175-213	18-22	19-23	84-102	280-342	7-8	22-26
		18.0	113-137	164-199	12-14	20-24	89-108	286-349	5-6	23-28
	50°	9.0	119-145	209-255	17-21	19-23	96-117	302-368	8-9	24-29
		18.0	115-140	196-239	12-14	19-24	102-124	308-376	6-7	25-31
	60°	9.0	121-148	244-297	17-21	18-23	109-132	324-395	9-11	26-32
		18.0	118-143	228-278	11-14	19-23	116-141	330-403	7-8	28-34
	70°	9.0	124-151	278-339	17-21	18-22	121-148	345-421	10-12	29-35
		18.0	120-146	260-317	11-14	19-23	129-157	352-430	8-9	30-37
	80°	9.0	126-154	312-381	16-20	18-22	134-163	367-447	11-14	31-38
		18.0	123-149	292-356	11-13	19-23	142-173	374-457	8-10	33-40
	90°	9.0	129-157	347-423	16-20	18-22	146-178	388-474	12-15	33-41
		18.0	125-152	324-395	11-13	18-22	155-189	396-483	9-11	35-43
	100°	9.0	131-160	381-465	16-19	17-21				
		18.0	128-155	356-435	11-13	18-22				
GT072 Full Load	30°	9.0					71-87	259-316	5-7	19-23
		18.0					76-92	264-322	4-5	20-25
	40°	9.0	120-146	185-225	15-19	21-26	84-102	280-342	7-8	22-26
		18.0	117-142	173-211	11-14	22-27	89-108	286-349	5-6	23-28
	50°	9.0	123-150	218-266	15-18	20-25	96-117	302-368	8-9	24-29
		18.0	120-146	204-249	11-14	21-26	102-124	308-376	6-7	25-31
	60°	9.0	126-153	251-307	14-17	20-24	109-132	324-395	9-11	26-32
		18.0	122-149	235-287	11-13	21-25	116-141	330-403	7-8	28-34
	70°	9.0	129-157	285-347	14-17	19-24	121-148	345-421	10-12	29-35
		18.0	125-152	266-325	10-13	20-25	129-157	352-430	8-9	30-37
	80°	9.0	132-160	318-388	13-16	19-23	134-163	367-447	11-14	31-38
		18.0	128-156	297-363	10-12	19-24	142-173	374-457	8-10	33-40
	90°	9.0	135-164	351-429	13-16	18-22	146-178	388-474	12-15	33-41
		18.0	131-159	329-401	10-12	19-23	155-189	396-483	9-11	35-43
	100°	9.0	137-167	385-469	12-15	17-21				
		18.0	134-163	360-439	9-11	18-22				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80º d.b./67º w.b. entering air temperature in cooling, 70º d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50º assumes the use of antifreeze. As a result of continuing research and development, specifications are subject to change without notice.

ECM Const CFM Motor														
Models	Fan Speed	Rated Airflow	Adjust	Tap	External Static Pressure (in of Water)									
					0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
GT024 Part Load	Hi	725	+	A	725	725	725	725	725	725	725	725	-	-
	Med	650	Normal	A	650	650	650	650	650	650	650	650	-	-
	Low	500	-	A	500	500	500	500	500	500	500	500	-	-
GT024 Full Load	Hi	950	+	A	950	950	950	950	950	950	950	950	-	-
	Med	825	Normal	A	825	825	825	825	825	825	825	825	-	-
	Low	725	-	A	725	725	725	725	725	725	725	725	-	-
GT036 Part Load	Hi	950	+	A	950	950	950	950	950	950	950	950	950	950
	Med	800	Normal	A	800	800	800	800	800	800	800	800	800	800
	Low	750	-	A	750	750	750	750	750	750	750	750	750	750
GT036 Full Load	Hi	1300	+	A	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
	Med	1100	Normal	A	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
	Low	950	-	A	950	950	950	950	950	950	950	950	950	950
GT048 Part Load	Hi	1400	+	A	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
	Med	1300	Normal	A	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
	Low	1100	-	A	1100	1100	1100	1100	1100	1100	1100	1100	1100	1100
GT048 Full Load	Hi	1800	+	A	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
	Med	1600	Normal	A	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
	Low	1400	-	A	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
GT060 Part Load	Hi	1800	+	A	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
	Med	1600	Normal	A	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
	Low	1400	-	A	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
GT060 Full Load	Hi	2200	+	A	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	Med	2000	Normal	A	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
	Low	1800	-	A	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
GT072 Part Load	Hi	2100	+	A	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
	Med	1850	Normal	A	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
	Low	1600	-	A	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
GT072 Full Load	Hi	2500	+	A	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	Med	2350	Normal	A	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
	Low	2100	-	A	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100

Water Side Pressure Drop Table			
Model	GPM	Heat Pump water pressure drop	Additional pressure drop in hose kit*
		Water PD @ 77°EWT with Water in Psi	Water PD in Psi
GT024	3	0.7	0.04
	4	1.2	0.04
	5	1.7	0.09
	6	2.4	0.09
	7	3.2	0.13
	8	4.0	0.17
GT036	4.5	1.3	0.09
	6	2.2	0.09
	7.5	3.2	0.17
	9	4.5	0.22
	10.5	5.9	0.30
	12	7.5	0.35
GT048	6	1.1	0.09
	8	1.8	0.17
	10	2.7	0.26
	12	3.7	0.35
	14	4.9	0.48
	16	6.2	0.61
GT060	7.5	1.1	0.17
	10	1.9	0.26
	12.5	2.8	0.39
	15	3.9	0.52
	17.5	5.2	0.69
	20	6.6	0.91
GT072	9	0.9	0.22
	12	1.4	0.35
	15	2.1	0.52
	18	3.0	0.74
	21	3.9	0.95
	24	5.0	1.21

* Hose kit pressure drop based on straight hose. Pressure drop may vary depending on installation of hose kits.

Table 4 – Smart start assist Led indicators

Red LED	Relay Contact*	Condition	Action
Fully ON[1]	11/12	Min. recovery time between starts and/or recovery time between stop to start	Auto reset when minimum recovery tie elapses.
2 flashes	11/14	Under–voltage (Ue < 190VAC)****	Auto reset with 5 min. recovery**
3 flashes	11/14	Over current (>80A for ≥1 sec.)	Auto reset with 5 min. recovery
4 flashes	11/14	Relay protection	Auto reset with 5 min. recovery***
5 flashes	11/14	Incomplete ramp	Auto reset with 5 min. recovery
N/A	11/12	Supply phase loss	Physical check
N/A	11/12	Idle state	
N/A	11/12	Ramping state	
N/A	11/12	Bypass mode	
Green LED	**Relay Contact***	**Condition**	**Action**
Flashing	11/12	Power supply alarm	Replace Smart Start device
Fully ON	11/12	Idle state	RSBS waiting for control signal to start

Notes:

1 Applicable to RSBS2332A2V.2C24HP For other models, no indication on the Red LED is provided

* Applies only to RSBS23XXA2V22C24 models

** Monitored during idle and bypass

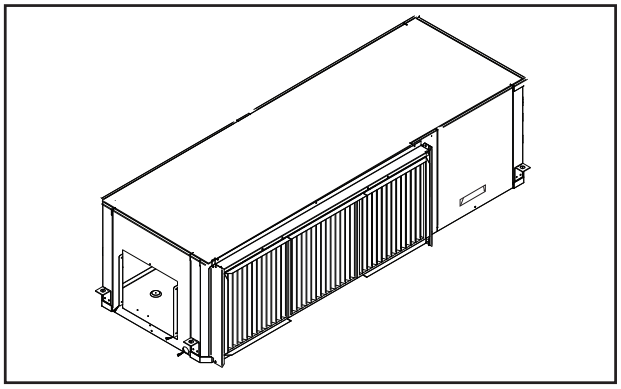
*** Refer to note 6 in Mode of Operation section in Smart Assist Installation Instruction.

**** Refer to voltage dips and interruptions section in Smart Assist Installation Instruction for mode of operation.

CONFIGURATIONS

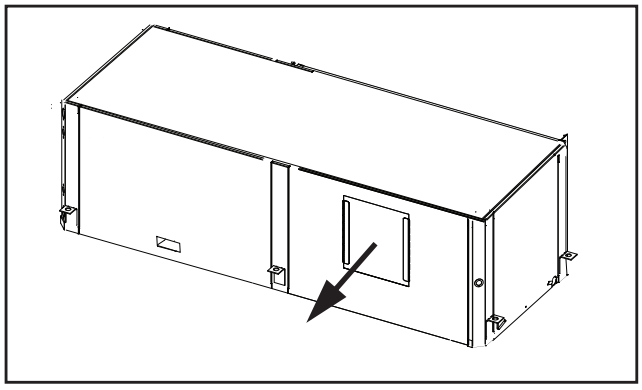
Horizontal Configuration

The Horizontal Configuration water source heat pump is designed to have a field configurable blower orientation: end blow (default) and straight through. (See Fig. 25 and Fig. 26)



A14034

Fig. 25 - End Blow Configuration (default)



A14035

Fig. 26 - Straight Through Configuration

NOTE: Left-hand and Right-hand horizontal (HZ) units have different Blower Configuration instructions. Be sure ro refer to the correct instructions in this document for the proper installation for each configuration.

NOTE: Internally mounted electric heat is available in end blow configurations only.

NOTE: Blower configuration changes should be done prior to unit being installed in the final location.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

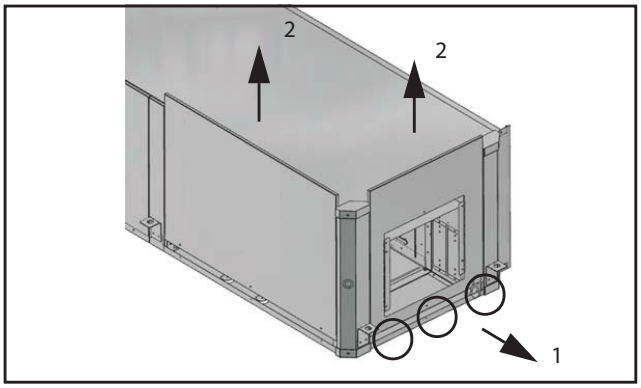
Discharge air configuration change is not possible on Heat Pumps equipped with Electric Heat Option.

REQUIRED TOOLS:

- 5/16” hex head screwdriver
- 3/8” hex head screwdriver
- 7/16” hex head screwdriver
- Flat screwdriver
- Phillips head screwdriver
- 1/4” hex head screwdriver
- Needle nose pliers
- 5/16” - 1/4” ratchet wrench

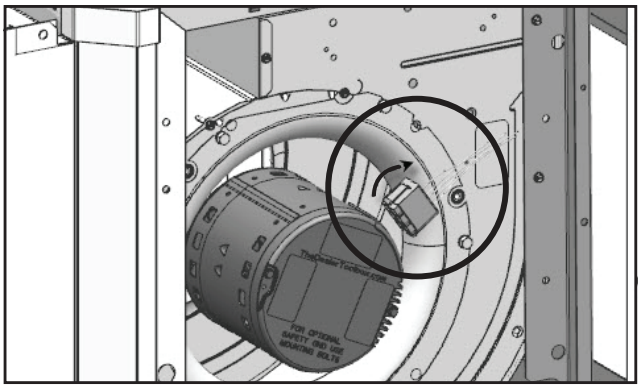
Left-Hand Unit (GT024-72H*L) Instructions:

1. Remove and retain end and side panels. See Fig. 27.
2. Disconnect blower motor wiring and ground wire fastened to blower housing. See Fig. 28.
3. Remove and retain bracket by removing (3) screws. See Fig. 29.
4. Loosen blower assembly by removing (4) screws. See Fig. 30.
5. Remove and retain bracket by removing (2) screws. See Fig. 31.
6. Rotate the blower into its new position. See Fig. 32.



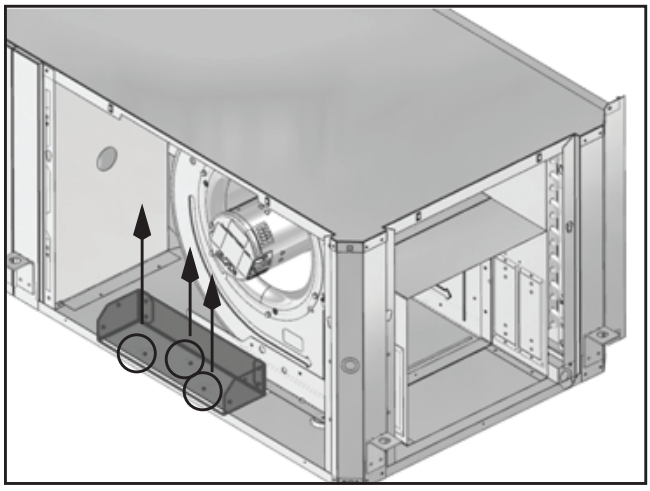
A14036

Fig. 27 - Side Panel Removal



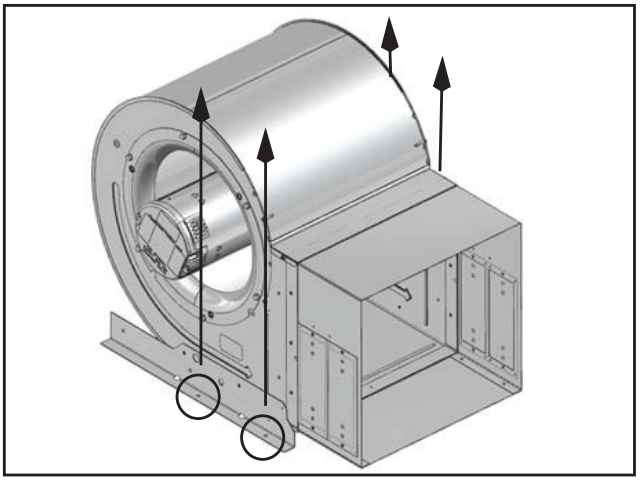
A14037

Fig. 28 - Blower Motor Wring & Ground Wire Location



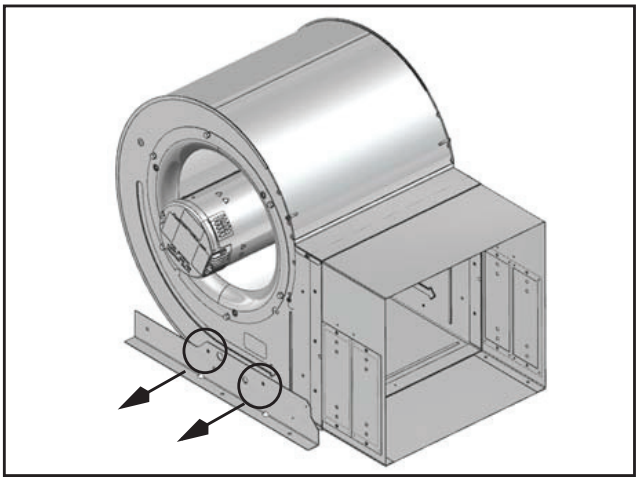
A14038

Fig. 29 - Screws Holding Bracket



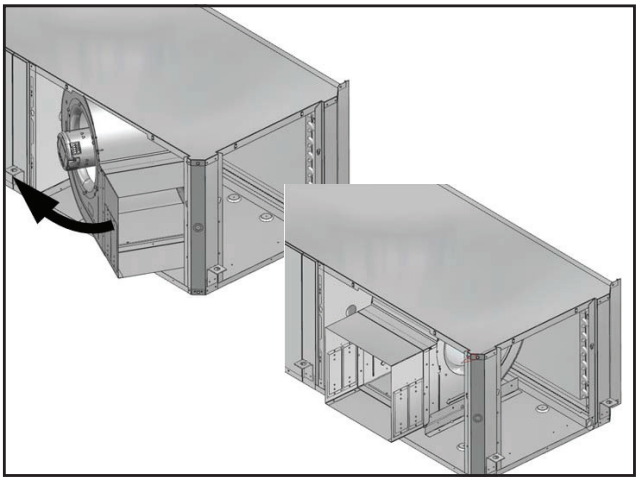
A14039

Fig. 30 - Screws Holding Blower Assembly



A14040

Fig. 31 - Screws Holding Blower Bracket



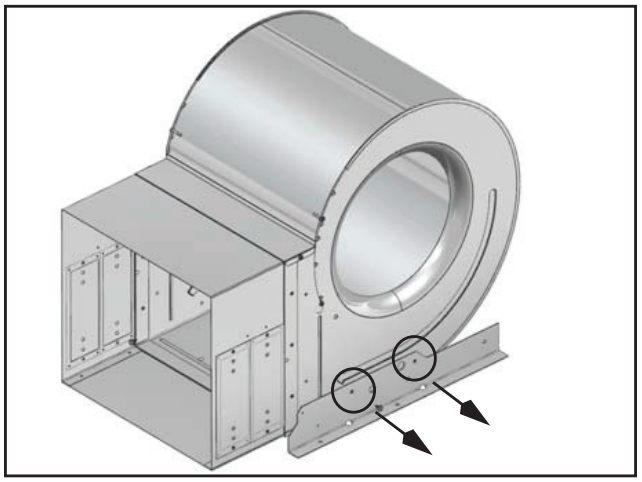
A14041

Fig. 32 - Rotate Blower Into New Position

7. Remove and retain remaining bracket by removing (2) screws. See Fig. 33.
8. Remove the blower assembly by sliding it forward. See Fig. 34.

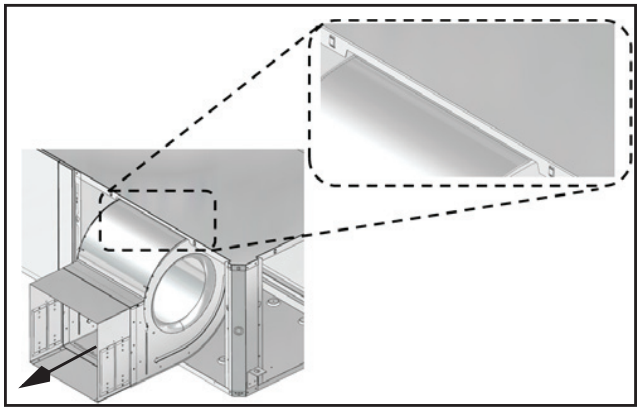
NOTE: Unit top is notched to allow blower to slide through.

9. Remove and discard blower collar by removing (8) screws. See Fig. 35.
10. Reorient the blower assembly 180 degrees with blower "belly" down and slide back into the cabinet. See Fig. 36.
11. Reinstall bracket in the new vertical position using (2) screws. See Fig. 37.
12. Reinstall bracket removed in step 3 using (3) screws in the same location. See Fig. 38.



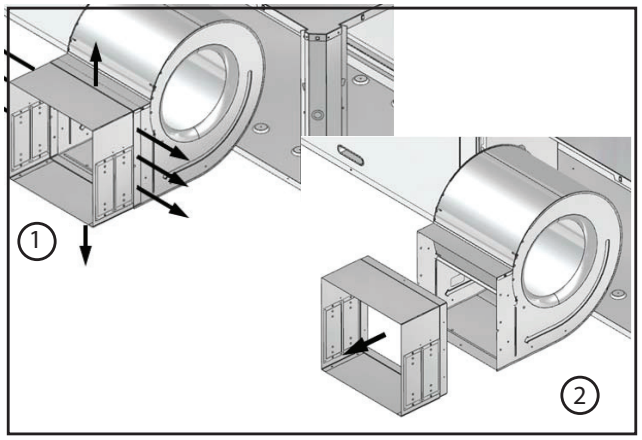
A14042

Fig. 33 - Retaining Bracket Removal



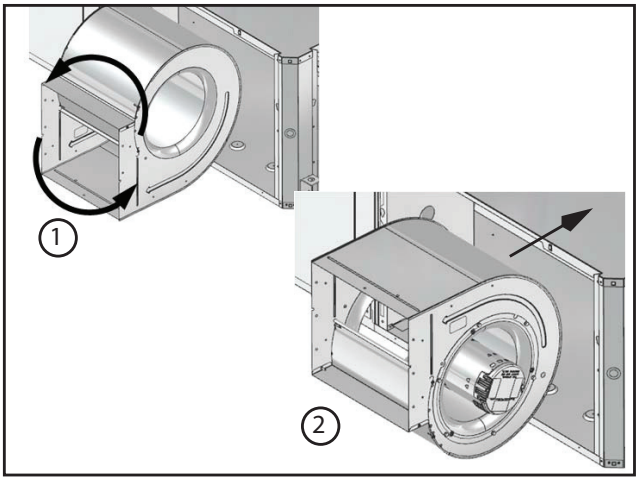
A14043

Fig. 34 - Blower Assembly Removal



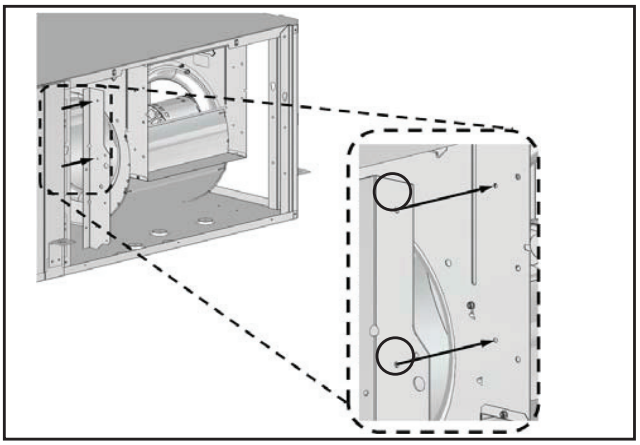
A14044

Fig. 35 - Blower Collar Removal



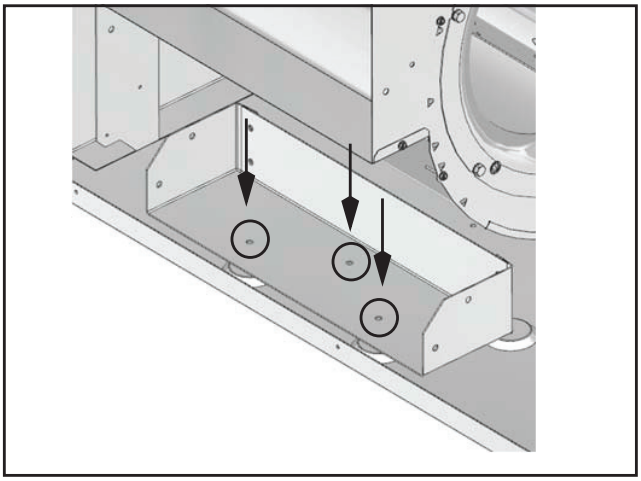
A14045

Fig. 36 - Reinsert Blower Assembly



A14046

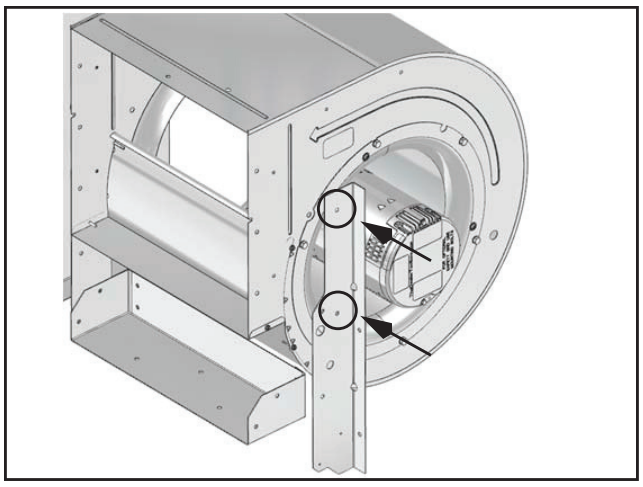
Fig. 37 - Reinstall Bracket



A14047

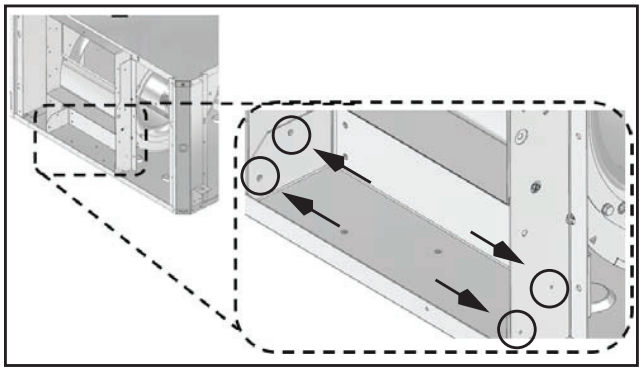
Fig. 38 - Reinstall Bracket Removed in Step 3

13. Reinstall remaining bracket using (2) screws. See Fig. 39.
14. Connect vertical and horizontal brackets by installing (4) screws. See Fig. 40.



A14048

Fig. 39 - Reinstalling Bracket



A14049

Fig. 40 - Connect Vertical and Horizontal Brackets

Right-Hand Unit (GT024-72H*R) Instructions:

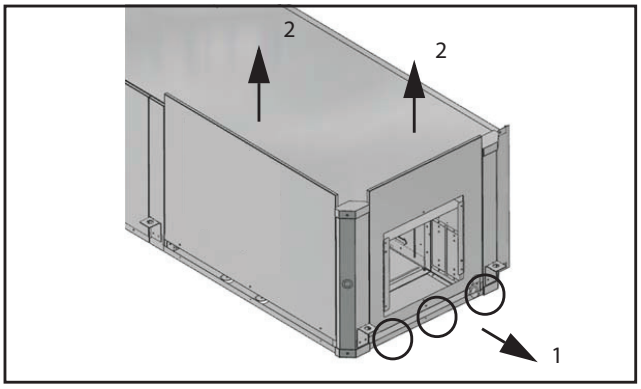
1. Remove and retain end and side panels. See Fig. 41.
2. Disconnect blower motor wiring and ground wire fastened to blower housing. See Fig. 42.
3. Remove and retain (4) screws under the blower collar. See Fig. 43.

⚠ CAUTION

UNIT DAMAGE HAZARD

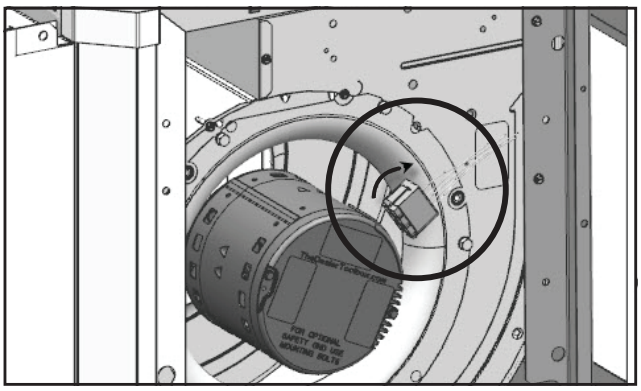
Failure to follow this caution may result in equipment damage or improper operation.

Air coil is in close proximity to the blower. Air coil fins are easily damaged. Great care must be taken during this step to avoid coil damage. Shipping cardboard can be used as protection during blower removal and installation.



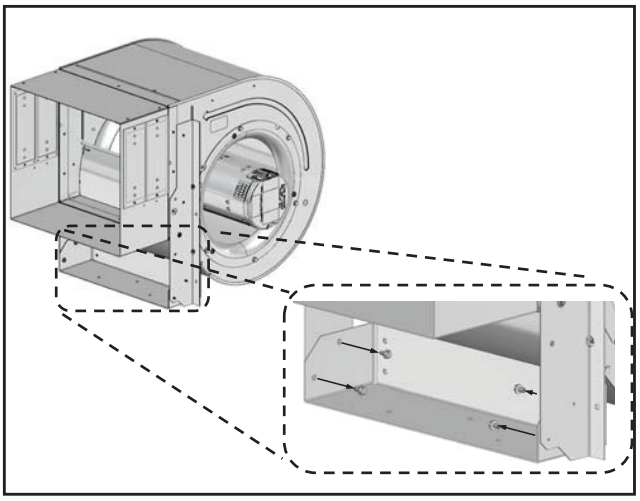
A14036

Fig. 41 - Side and End Panel Removal



A14037

Fig. 42 - Blower Motor Wring & Ground Wire Location

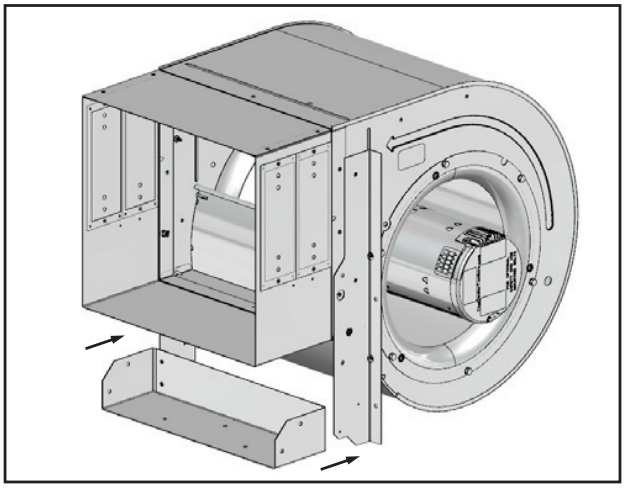


A14054

Fig. 43 - Location of Screws Under the Blower Collar

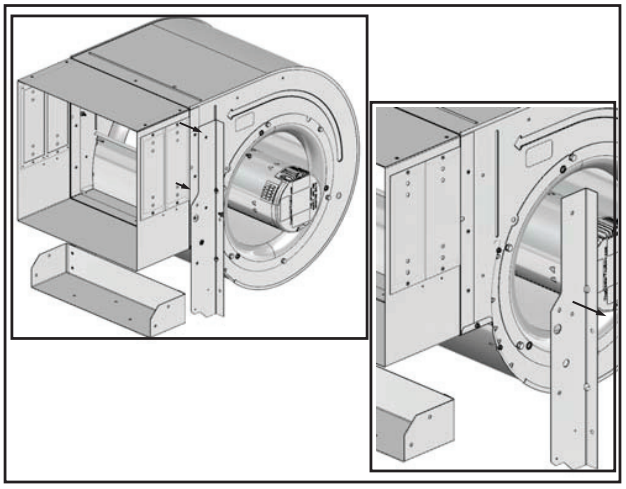
4. Slide blower assembly away from mounting bracket. See Fig. 44.
5. Remove and retain (1) vertical bracket by removing (2) screws . See Fig. 45.
6. Remove and discard horizontal blower bracket by removing (3) screws. See Fig. 46.
7. Rotate blower into its new position. See Fig. 47.
8. Remove and retain remaining vertical blower bracket by removing (2) screws. See Fig. 48.
9. Remove the blower assembly by sliding it forward. See Fig. 49.

NOTE: Unit top is notched to allow blower to slide through.



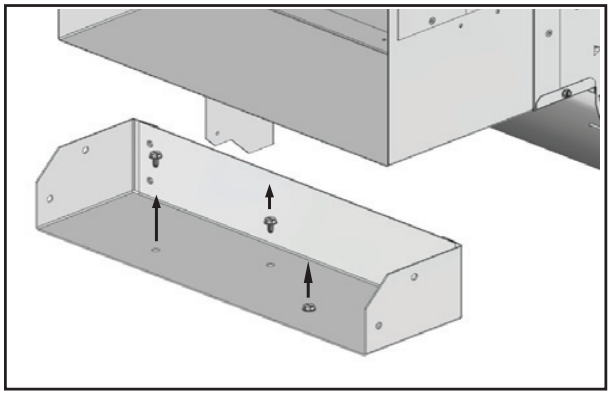
A14055

Fig. 44 - Slide Blower Assembly Away from Mounting Bracket



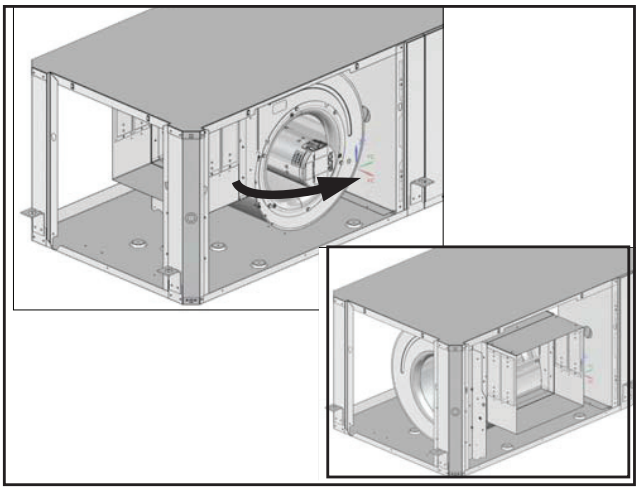
A14056

Fig. 45 - Remove Vertical Bracket



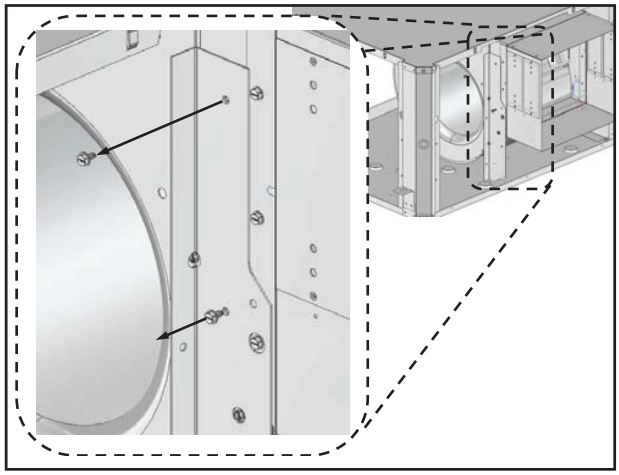
A14057

Fig. 46 - Remove Horizontal Blower Bracket



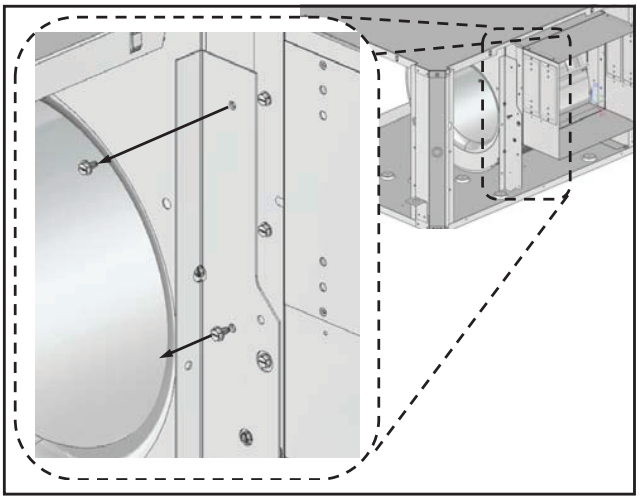
A14058

Fig. 47 - Rotate Blower into New Position



A14059

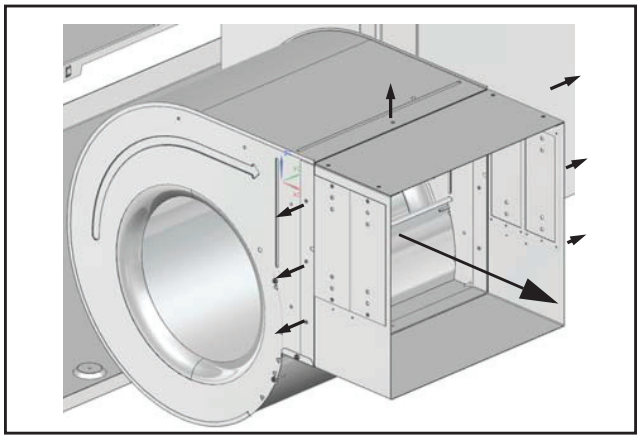
Fig. 48 - Remove Vertical Blower Bracket



A14060

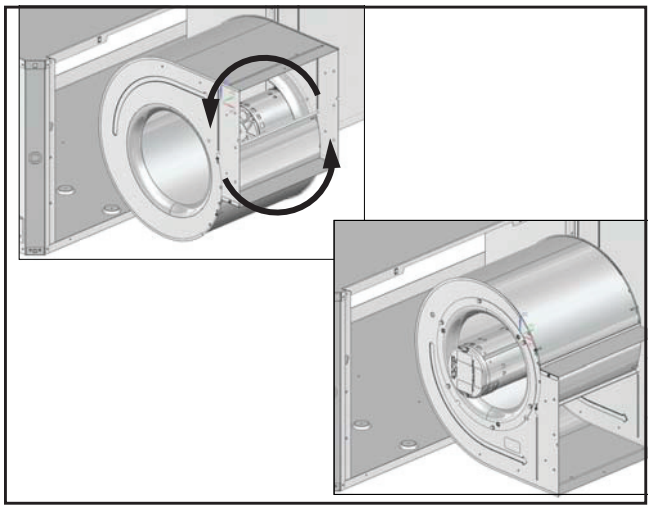
Fig. 49 - Remove Blower Assembly

10. Remove and discard blower collar by removing (8) screws. See Fig. 50.
11. Reorient the blower assembly 180 degrees with blower "belly" up. See Fig. 51.
12. Move the blower back into the cabinet. See Fig. 52.
13. Reinstall (2) vertical blower brackets in the new horizontal position using (4) screws. See Fig. 53.
14. Secure the horizontal blower brackets to the unit base using (4) screws. See Fig. 54.
15. Reconnect blower motor wiring and ground wire.



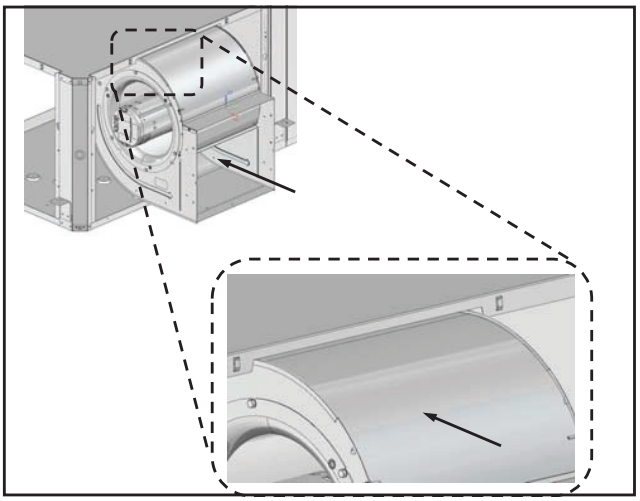
A14061

Fig. 50 – Remove Blower Collar



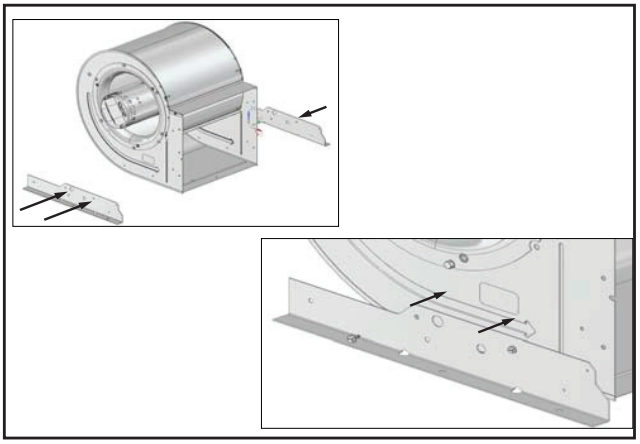
A14062

Fig. 51 – Reorient Blower Assembly



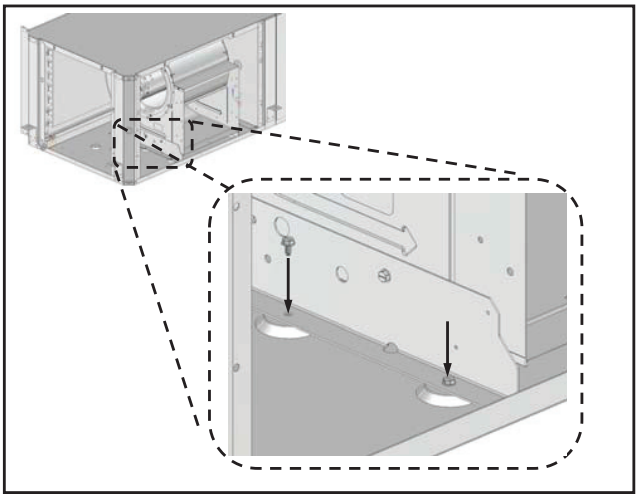
A14063

Fig. 52 – Move Blower Back Into Cabinet



A14064

Fig. 53 – Reinstall Vertical Blower Brackets



A14065

Fig. 54 – Secure Horizontal Brackets to Unit Base

Counter-Flow Configuration

The Counter-Flow Configuration water source heat pump is a dedicated down flow configuration. Available from the factory in Left-hand and right-hand return air configurations.

Vertical Configuration

The Vertical (VT) Configuration water source heat pump is designed to be field configured for various configurations. This is achieved by relocating Electrical box (E-box), unit panels and reorienting blower to discharge UP, BACK, OR SIDE. See Fig. 55 Through Fig. 58 for more detail.

NOTE: The unit, as shipped from the factory, is configured in left-handed return configuration.

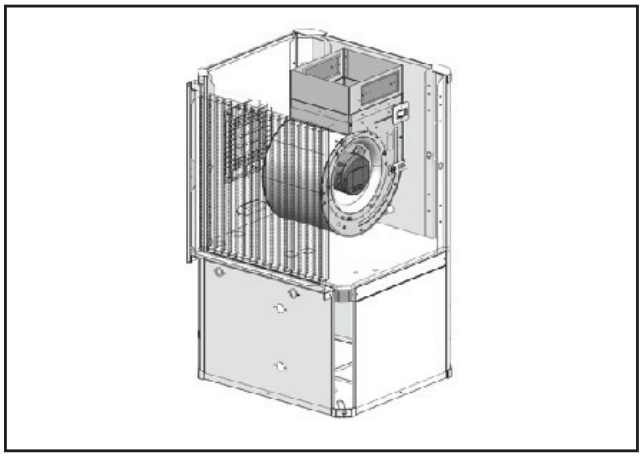
⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

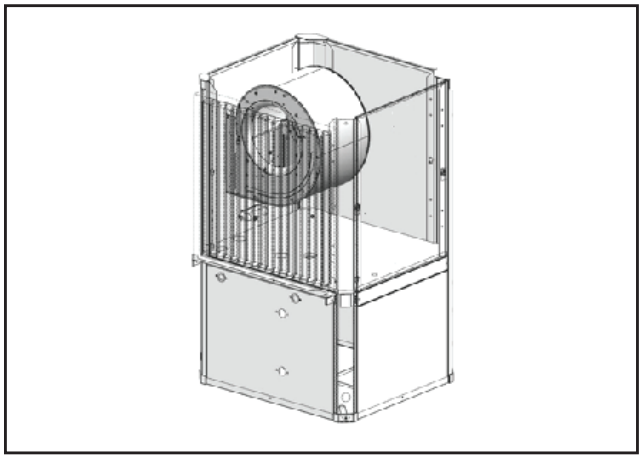
Discharge air configuration change is not possible on Heat Pumps equipped with Electric Heat Option.

NOTE: Blower E-box and panel configuration changes should be done prior to unit being installed in the final location.



A14066

Fig. 55 - Top Discharge (Default)

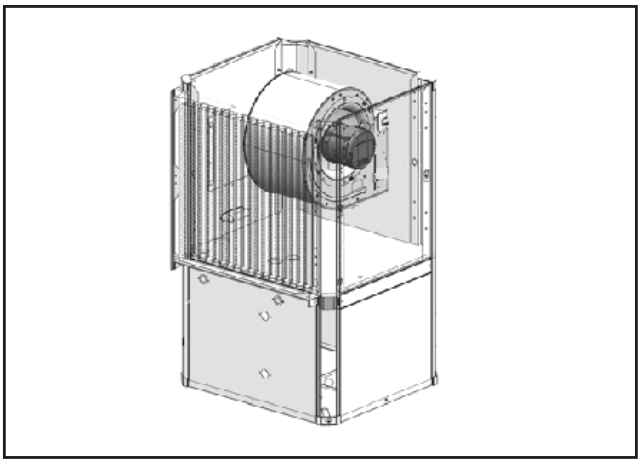


A14067

Fig. 56 - Back Discharge

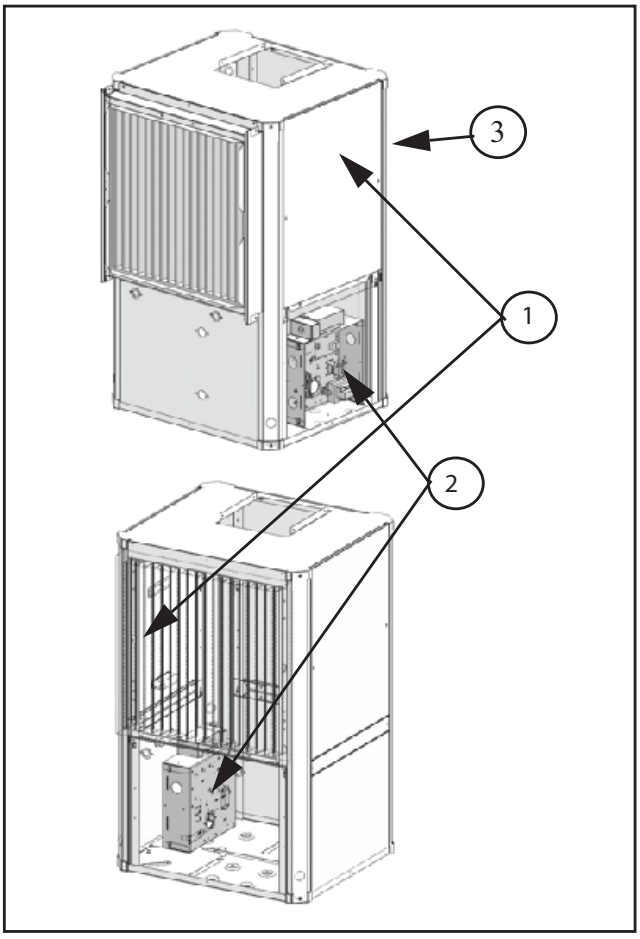
NOTE: Internally mounted electric heat is only available in Top Discharge configuration. See table below for details.

Blower Orientation and Electric Heat Compatibility		
Blower	Top	Yes, internally or duct−mounted
	Back	Duct−mounted
	Side	Duct−mounted



A14068

Fig. 57 - Side Discharge

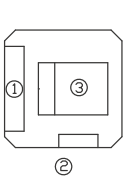
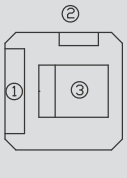
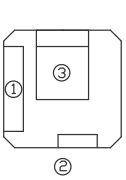
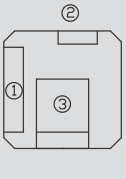
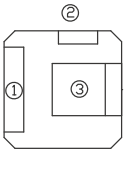
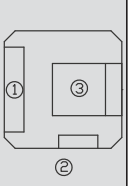


A14069

Fig. 58 - Unit Identifiers

1. Logo/Front Panel
2. Electrical Box
3. Default Configuration (can be ordered as either right- or left-handed return).

Table 5 – Possible Unit Configurations

Required steps	Possible unit configurations					
How to use this table: • Select desired configuration from “possible unit configurations”. • Instructions with “X” have to be performed to reconfigure the unit.						
	Left return, top discharge	Right return, top discharge	Left return, rear discharge	Right return, rear discharge	Right return, left discharge	Left return, right discharge
ACCESS TO INTERNAL COMPONENTS		X	X	X	X	X
BLOWER RE-CONFIGURATION			X	X	X	X
E-BOX CONFIGURATION		X		X	X	
ELECTRIC HEAT RELOCATION*		X*				
CONDENSATE DRAIN RELOCATION		X		X	X	
HRP SWITCH*	X*	X*		X*	X*	
REINSTALL PANELS		X	X	X	X	X
FIELD INSTALLED PANEL KIT						
*APPLIES IF OPTION IS INSTALLED (1) AIR COIL (2) E-BOX (UNIT FRONT) (3) BLOWER X = REQUIRED STEP						

A150265

NOTE: All heat pumps are supplied with panel belt which needs to be removed to access screws for panel removal. The panels have additional internal fasteners to prevent any air leakage.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to follow this caution may result in personal injury.

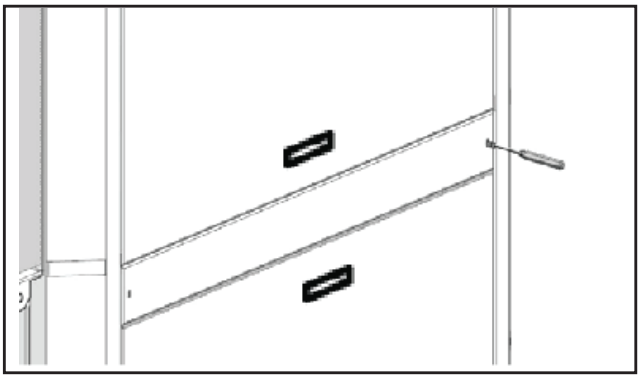
At least two people are required to perform this operation.

REQUIRED TOOLS:

- 5/16” hex head screwdriver
- 3/8” hex head screwdriver
- 7/16” hex head screwdriver
- Flat screwdriver
- Phillips head screwdriver
- 1/4” hex head screwdriver
- Needle nose pliers

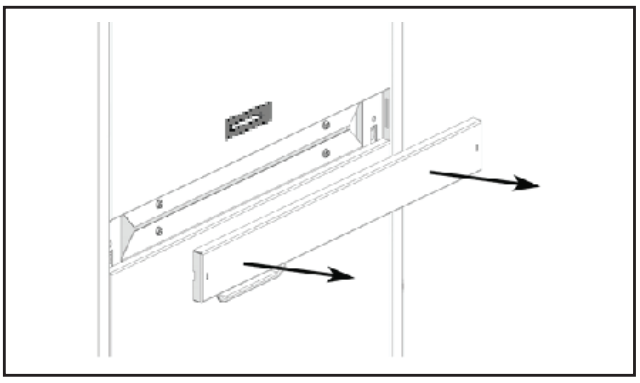
Access to Internal Components

1. Using a Phillips-head screw driver, remove the two (2) screws.



A14070

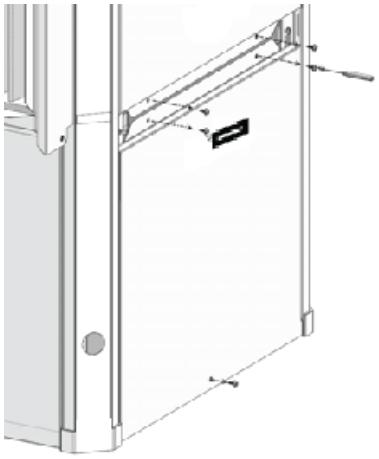
Fig. 59 - Remove Panel Belt



A14071

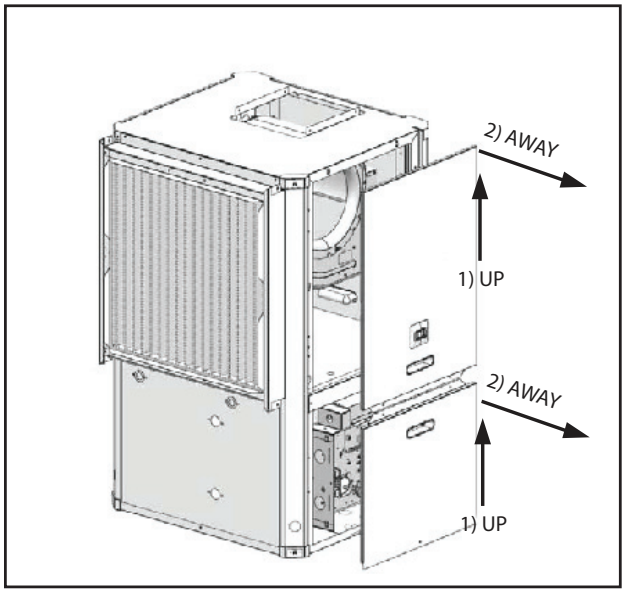
Fig. 60 - Remove Panel Belt

2. Remove and retain Condensing Section access panels (bottom panel) by removing (3) screws. See Fig. 61.
3. Remove and retain Air Handler Panel by lifting up and out as shown in Fig. 62. Remove panel about 12" away from the cabinet and unplug LCD screen wiring. See Fig. 63.



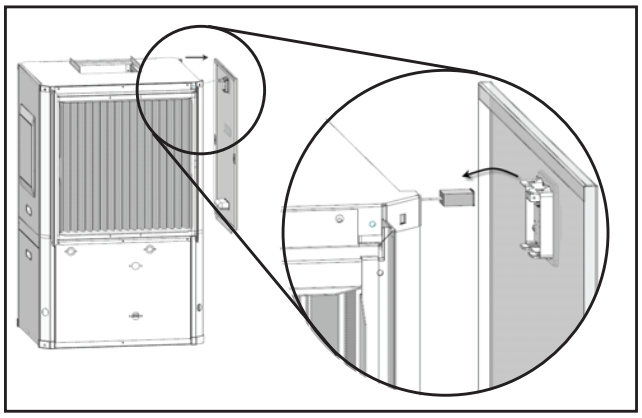
A14072

Fig. 61 - Remove Condensing Section Access Panels



A14074

Fig. 62 - Remove Air Handler Panel



A14073

Fig. 63 - Unplug LCD Screen Wiring

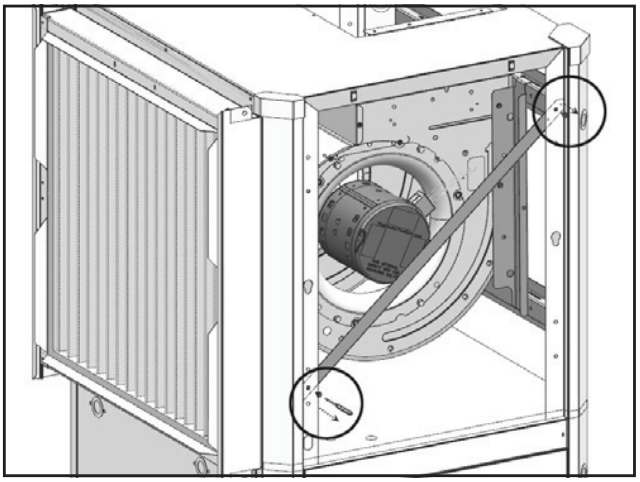
4. Repeat steps 1 - 3 for all three sides.

Blower Re-Configuration

NOTE: This instruction details re-configuration of blower from UP to SIDE discharge. Reconfiguration to other side uses similar steps.

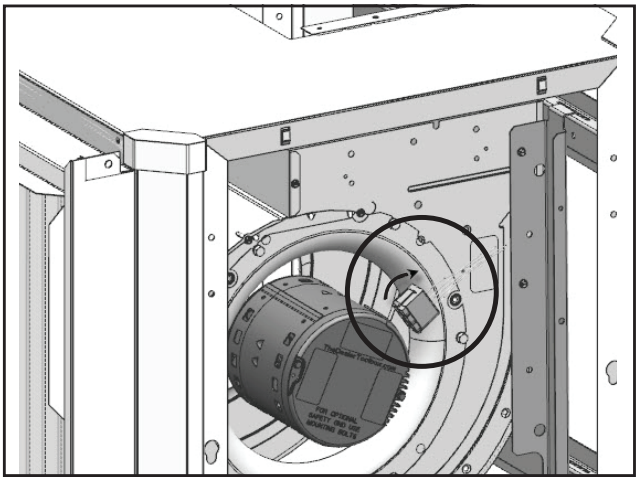
1. Remove and retain diagonal support brackets on front and back sides of the unit. See Fig. 64.
2. Unplug electrical connections of Blower motor and ground wire connected to blower housing. See Fig. 65.
3. Remove and retain blower motor and inlet ring assembly by removing (3) bolts securing blower motor bracket and screws securing the blower inlet ring. See Fig. 66.

NOTE: Removing the blower motor and blower wheel greatly simplifies handling of the blower assembly and reduces the chance of damaging heat pump components.



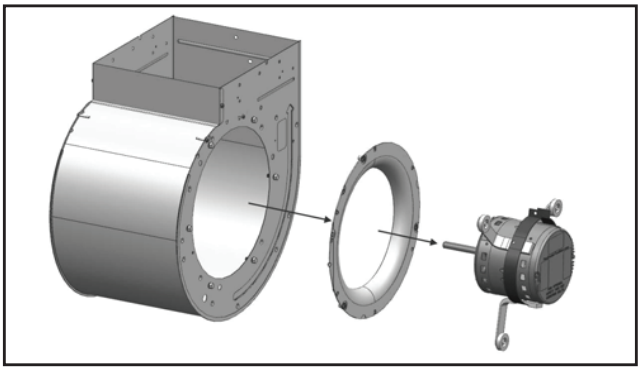
A14075

Fig. 64 - Remove Diagonal Support Brackets



A14076

Fig. 65 - Unplug Electrical Connections and Ground Wire



A14077

Fig. 66 - Remove Blower Motor and Inlet Ring Assembly

4. Remove screws on both sides of the blower securing vertical blower bracket to horizontal support. See Fig. 67.
5. Remove and retain blower assembly by lifting up. See Fig. 68.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

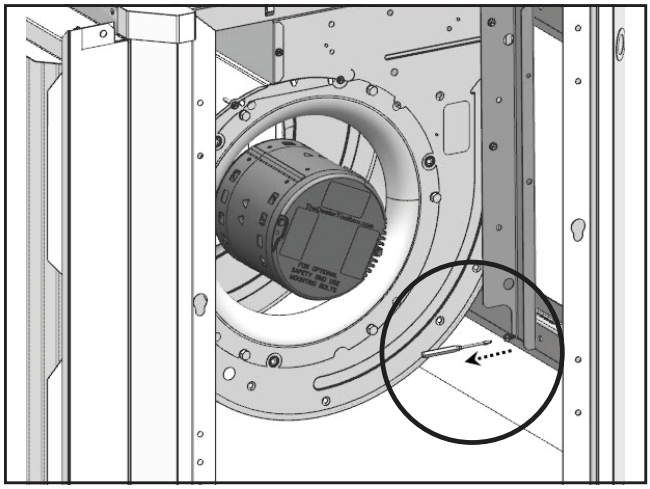
Air coil is in close proximity to the blower. Air coil fins are easily damaged. Great care must be taken during this step to avoid coil damage. Shipping cardboard can be used as protection during blower removal and installation.

6. Remove and discard blower collar. See Fig. 69.

NOTE: Discharge air configuration change is not possible on Heat Pumps equipped with Electric Heat Option.

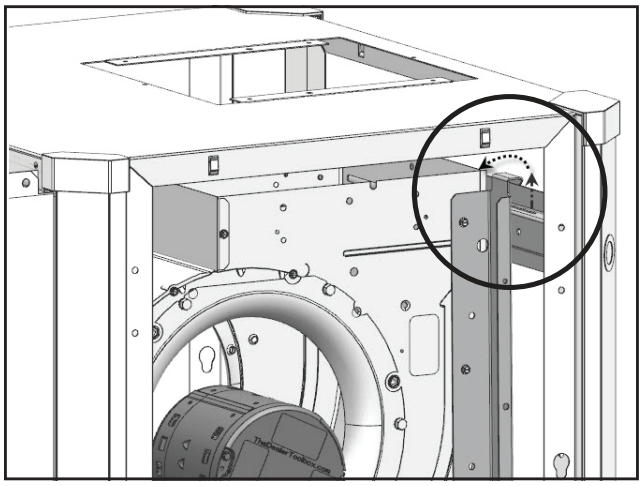
7. Remove and retain (2) horizontal blower support brackets by removing (4) screws in each. See Fig. 70.

NOTE: Upper bracket contains two push-in rubber bump stops.



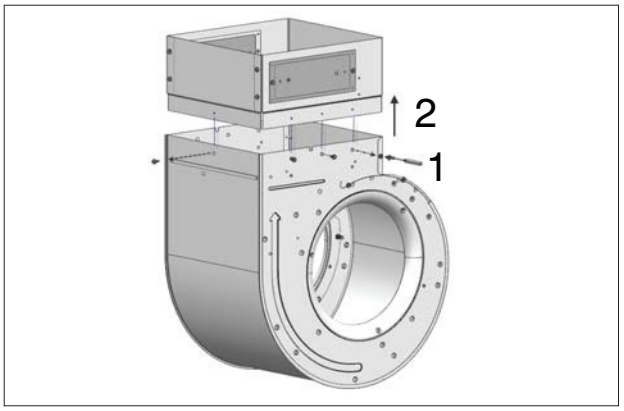
A14078

Fig. 67 - Remove Screws Securing Vertical Blower Bracket



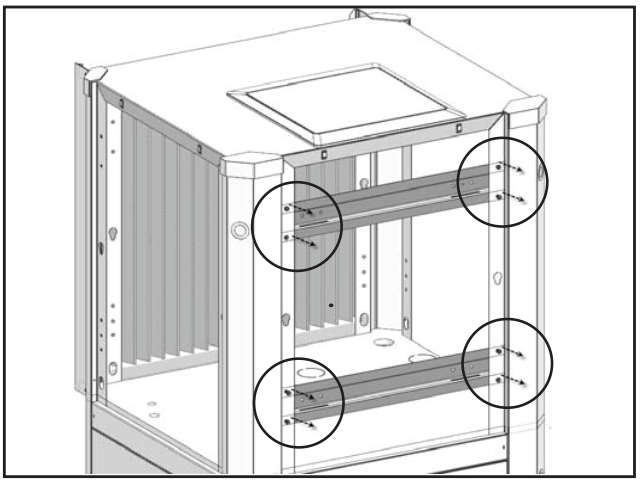
A14079

Fig. 68 - Remove Blower Assembly



A14080

Fig. 69 - Remove Blower Collar



A14083

Fig. 70 - Remove Horizontal Blower Support Brackets

8. Reinstall brackets removed in Step (9) on the same side of the unit as the blower outlet. See Fig. 71.

NOTE: Ensure bracket with push-in rubber bump stops is installed in the top position.

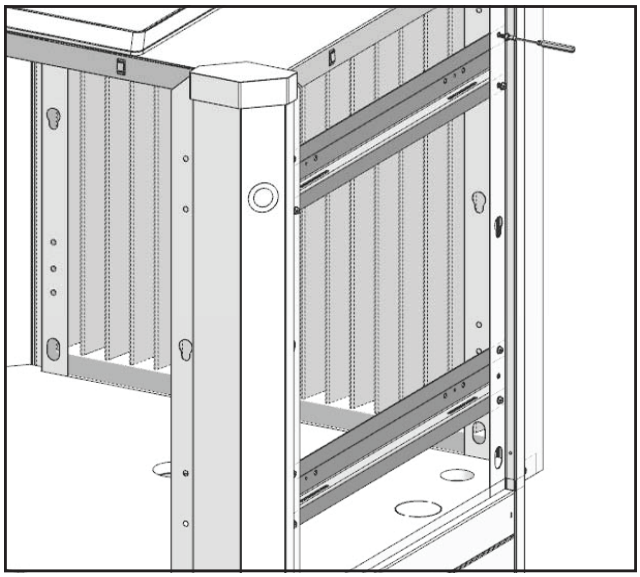
9. Remove and retain vertical brackets from blower by removing (4) screws, (2) on each side of the blower. See Fig. 72.
10. Reinstall vertical brackets in new orientation. See Fig. 73.
11. Reinstall the blower assembly in the new desired location, using the existing holes. See Fig. 74.

⚠ CAUTION

UNIT DAMAGE HAZARD

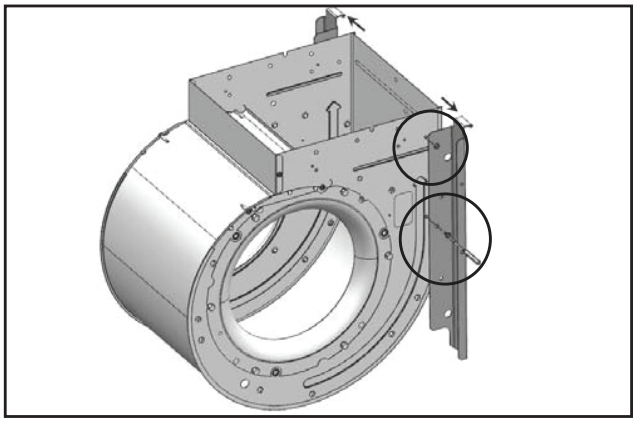
Failure to follow this caution may result in equipment damage or improper operation.

Be aware of blower housing proximity to air side coil and potential for coil damage.



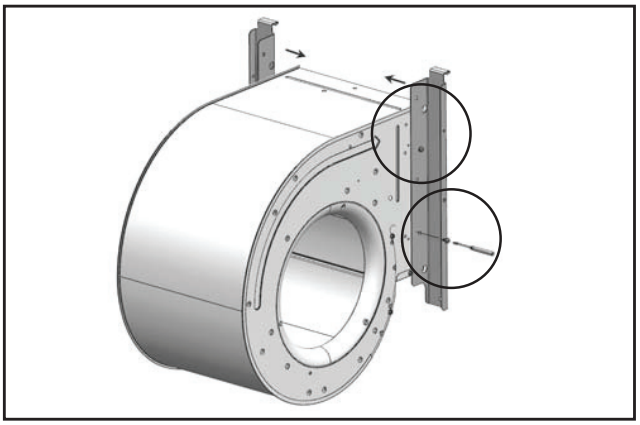
A14084

Fig. 71 - Reinstall Brackets



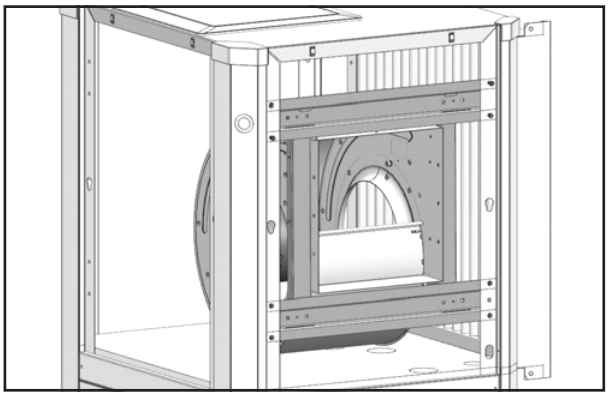
A14085

Fig. 72 - Remove Vertical Brackets from Blower



A14086

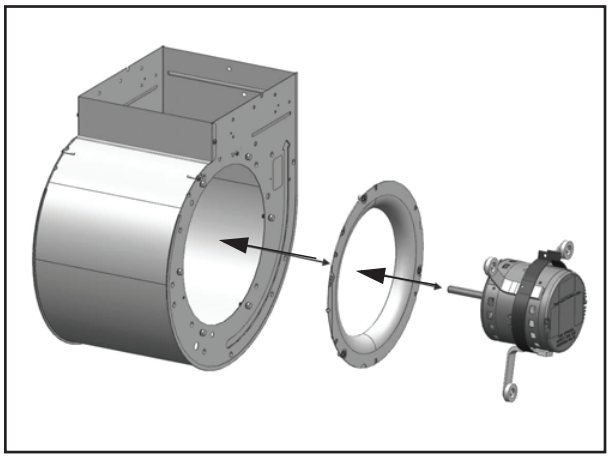
Fig. 73 - Reinstall Vertical Brackets in New Orientation



A14087

Fig. 74 - Reinstall Blower Assembly in New Location

12. Reinstall blower motor and inlet ring assembly by reversing Step 6. See Fig. 75.
13. Reconnect blower motor electrical plug and ground wire.
14. Reinstall diagonal bracket(s). See Fig. 76.



A14088

Fig. 75 - Reinstall Blower and Inlet Ring Assembly

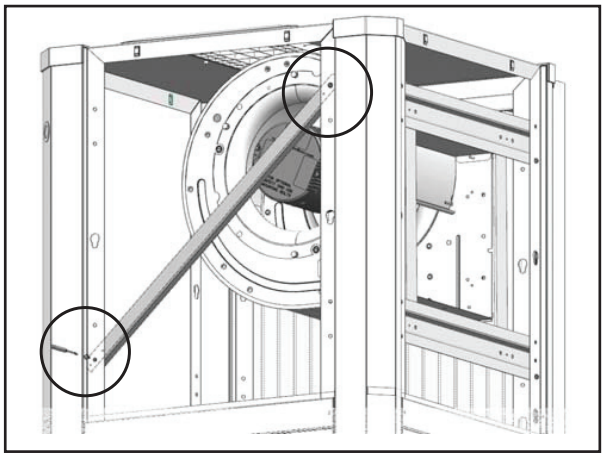


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Fig. 76 - Reinstall Diagonal Bracket(s)

Condensate Drain Connection Re-Configuration

When re-configuring the unit from Left-Hand Return to Right-Hand Return, it is necessary to relocate condensate drain connection from FRONT left corner post to BACK left corner post. See Fig. 77.

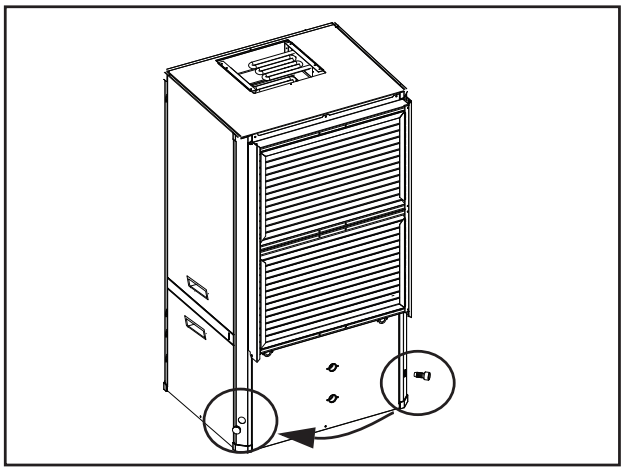

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Fig. 77 - Relocate Condensate Drain Connection (front left corner to back left corner)

1. Cut the condensate drain hose on the inside of the cabinet.

NOTE: Be sure to retain the spring.

2. Remove and retain condensate drain plastic fitting and grommet from the hose by pulling it away from the hose (barb style connection). See Fig. 78.
3. Locate the BACK left condensate drain and remove and retain plastic plug covering the cutout. See Fig. 79.

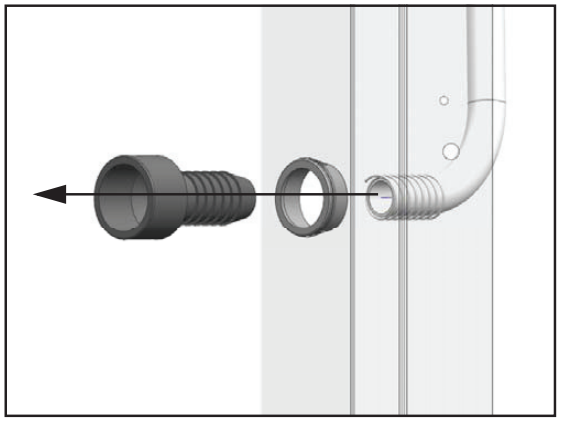

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Fig. 78 - Relocate Condensate Drain Connection

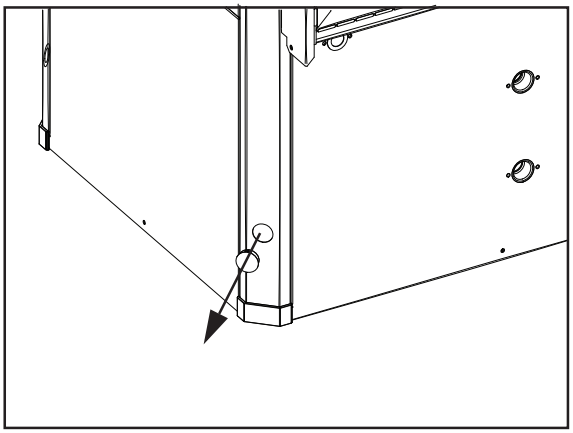

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Fig. 79 - Relocate Condensate Drain Connection

4. Reinstall the removed plastic plugs in the original Condensate Drain Location.
5. Route the flexible plastic tube from FRONT left corner post to BACK left. See Fig. 80.

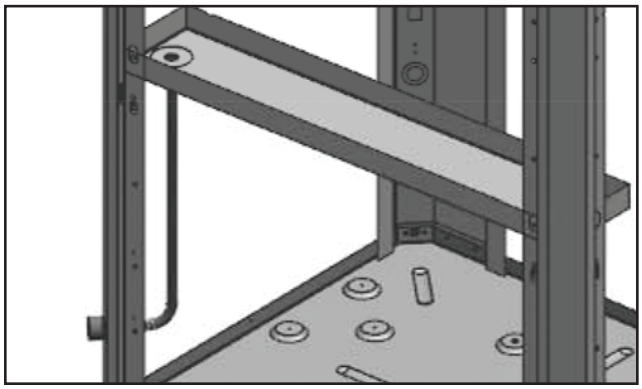
⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Avoid kinking the hose and/or creating a dip which could act as a second internal p-trap. Double trapped drain lines will not drain properly.

6. Measure and cut the condensate drain hose to the appropriate length.
7. Insert spring onto condensate drain hose.
8. Reinstall condensate drain plastic fitting and bushing in its new location. See Fig. 81.



A14093

Fig. 80 - Route Plastic Tube from Front Left to Back Left

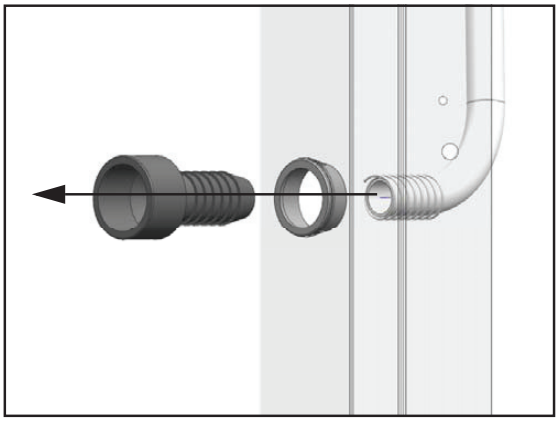


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Fig. 81 - Relocate Condensate Drain Connection

HRP Switch Relocation

The HRP Pump Disconnect Switch is mounted on front right corner post. See Fig. 82.

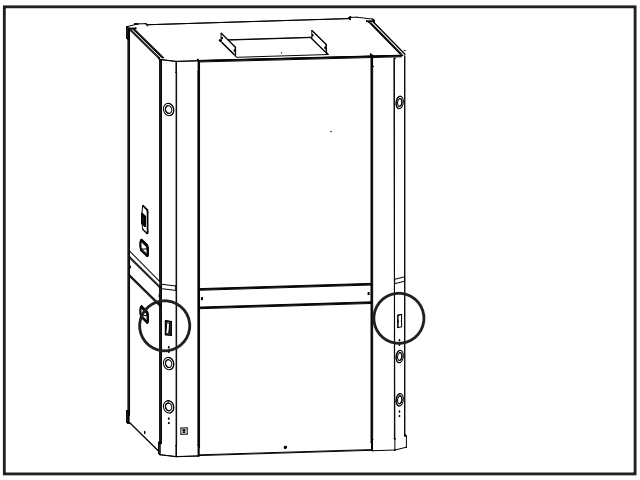

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Fig. 82 - HRP Pump Disconnect Switch Location

⚠ WARNING

PERSONAL INJURY AND/OR UNIT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and/or wire damage.

Do not route wiring over potentially hot surfaces or exposed sharp edges.

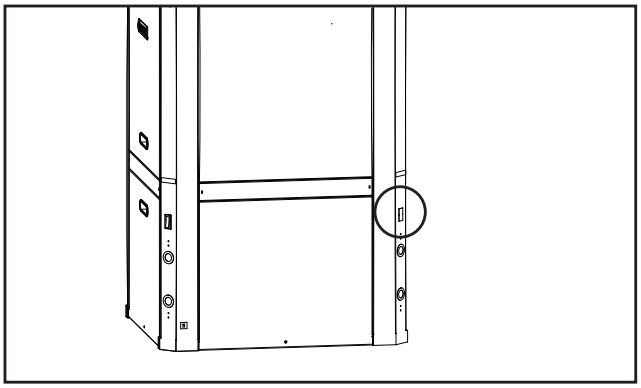

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Fig. 83 - Rectangular Knockout Location

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