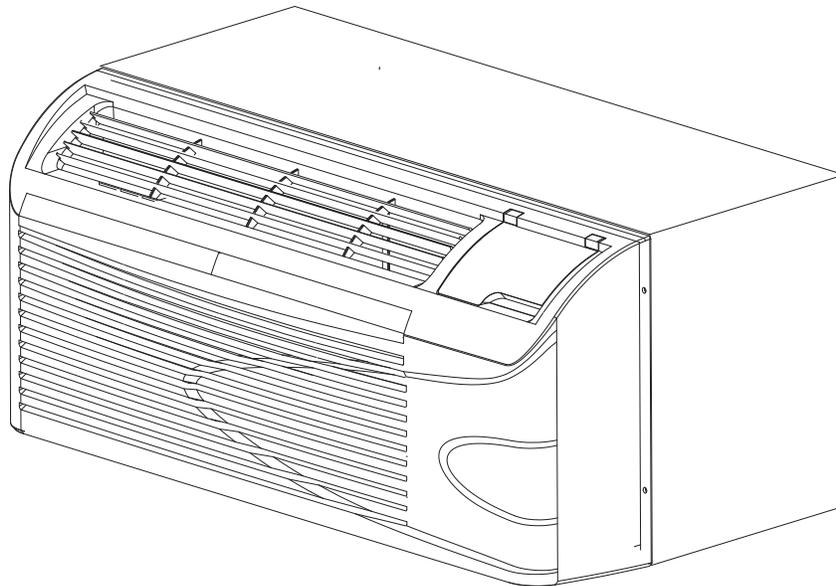


# Service Technician Guide



A07228

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## SAFETY CONSIDERATIONS

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 **may** 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.

### WARNING

PERSONAL INJURY AND/OR PROPERTY DAMAGE HAZARD

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

For your safety, the information in this manual must be followed to minimize the risk of fire or explosion, electric shock, or to prevent property damage, personal injury, or loss of life.

- This unit must be properly installed in accordance with the Installation Instructions before it is used.
- Immediately repair or replace all electric service cords that have become frayed or otherwise damaged.
- Unplug or disconnect the unit at the fuse box or circuit breaker before making any repairs.

**NOTE:** We strongly recommend that any servicing be performed by a qualified individual.

## GENERAL

The focus of this manual is to provide basic information on service procedures, safety, troubleshooting, cleaning, and component replacement for service technicians.

It is intended for use only by HVAC service technicians who have successfully completed instruction and received Type I Certification from the U.S. Environmental Protection Agency. The instructions in this manual are general in nature and are not to be substituted for installation and service instructions shipped with the unit. No attempt to install, operate, adjust, repair, or dismantle any equipment should be made until the manufacturer's instructions are read and thoroughly understood by the service technician. Even equipment that seems familiar may have specific model differences from year to year. Always review manufacturer's instructions.

Gree GA series packaged terminal air conditioner (PTAC) and heat pump units are self-contained for installation through the wall for individual room heating and cooling. The PTAC polymer and metal sleeves are permanently fastened to the wall; the unit chassis slides out of the sleeve to allow the service technician easy access. Many accessories are offered to complement the unit's performance and comfort control.

Before beginning any service procedure, it is important to check the unit model number. See Figure 1 and 2. Units that seem similar may have subtle differences that could affect service procedures. The following units are covered in this manual:

**GAE — 60 Hz cooling with electric heat units**

**GAA — 60 Hz heat pump with electric heat units**

Knowing which model is being serviced will help determine if the unit is performing at optimum levels. The model number is located on the data information plate behind the front panel of the unit. See Figure 1. The data information plate also lists voltage ranges and other important electrical information about the unit.

<p><b>GREE</b> GREE ELECTRIC APPLIANCES INC. OF ZHUHAI MODEL: PTAC-GAA12AB-P SERIAL: 3504Z88741 63229919466</p>	DESIGN PRESSURE LOWSIDE 300 P.S.I. HISIDE 500 P.S.I.	COOLING	ELECTRIC HEATING	HEATING	<p>Also Verified In Accordance With Energy Standards DOE Test Procedure 10 CFR, Part 430, App. F, Issued 01/01 and CAN/CSA-C368.1-M90</p>	
	RATED VOLTS 265	1 PHASE 60Hz	BTU/HR 12000	BTU/HR 17060/10236/6824		BTU/HR 10700
	EER 10.7 COP 3.1 R410A 35.98 OZ.		AMPS 4.8	AMPS 21.5/13.2/8.9		AMPS 4.5
	MFG. DATE		WATTS 1120	WATTS 5000/3000/2000		WATTS 1010
Warning: Use on Single Outlet Circuit Only					<p>VERIFIÉ PACKAGED TERMINAL AIR CONDITIONER</p>	
					<p>LISTED 3JNY</p>	

Fig. 1 – Sample Data Information Plate

A07229

# PRODUCT CATALOG NUMBER-NOMENCLATURE

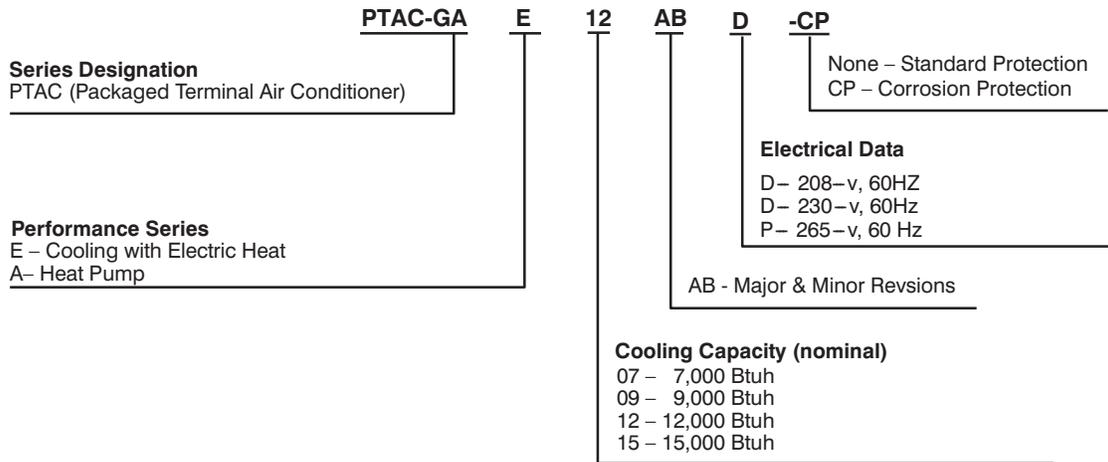
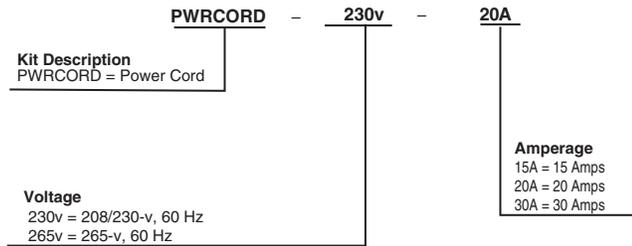


Fig. 2 – Catalog Number Nomenclature

A08385

## ACCESSORY POWER CORD (REQUIRED) CATALOG NUMBER



A07636



\*Power Cord for 208/230v\*



\*Power Cord for 265v

A07637

## UNIT DIS-ASSEMBLY

This section includes common procedures for dis-assembly and re-assembly of unit.

**IMPORTANT:** Follow manufacturer’s instructions when disassembling and reassembling a unit for cleaning, maintenance, or part replacement. When disassembling wiring, it is strongly recommended that numbered stickers be attached to identify leads and terminals to aid in the re-assembly process. Always review safety procedures prior to the start of a job.

### ⚠ WARNING

#### ELECTRICAL SHOCK HAZARD

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

Prior to servicing electrical equipment, disconnect all power to avoid electric shock.

Tag all disconnects.

Never alter cord or plug and **DO NOT** use extension cords.

## TOOLS NEEDED

The following field-supplied items are recommended for general dis-assembly of the unit:

- Phillips-head screw driver
- 10 mm open wrench
- Safety glasses

### A. Remove Front Panel

1. Grasp the front panel firmly at the center of the top and bottom of the panel.
2. Remove the front panel by pulling it out at the bottom to release it, then lift up to clear the rail along the unit top. See Fig. 3.

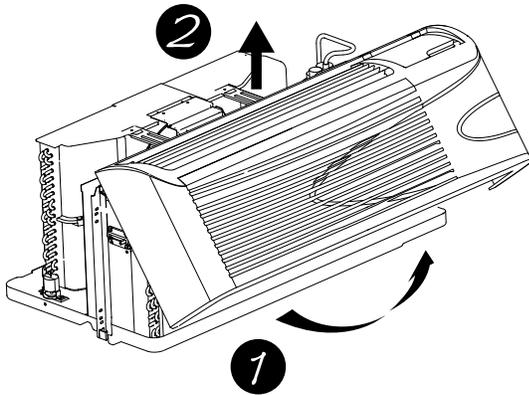


Fig. 3 – Removal of Front Panel

A07064

### B. Disconnect Power for Cord-Connected Unit



## WARNING

#### ELECTRICAL SHOCK HAZARD

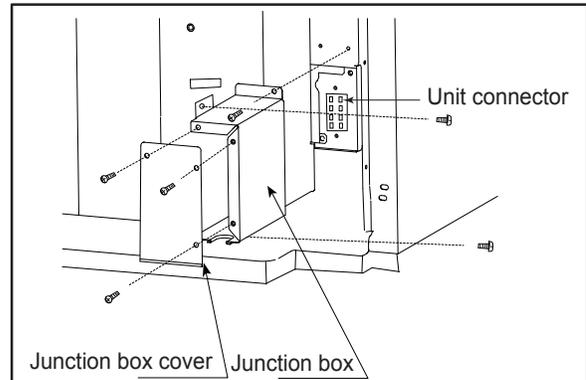
Failure to follow this warning could result in personal injury or death.

Disconnect all power to unit to avoid possible electrical shock during service or installation.

1. Use power button on keypad or wall thermostat to turn unit OFF.
2. Open the disconnect switch at main power supply. Use proper lockout and tag procedures.
3. Unplug the unit service cord.

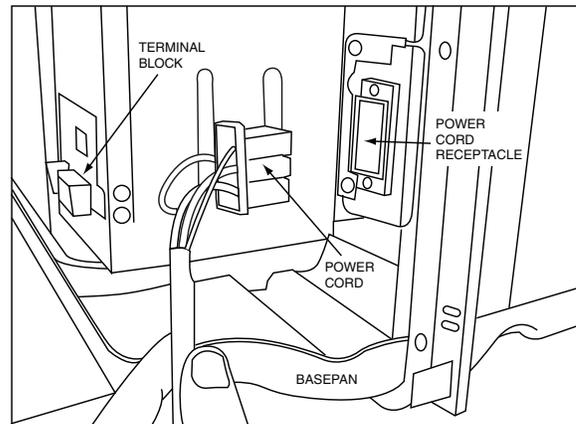
### DISCONNECT POWER FOR PERMANENTLY CONNECTED (HARDWIRED) UNITS

1. Use power button on keypad or wall thermostat to turn unit OFF.
2. Open the disconnect switch at main power supply.
3. Remove junction box cover by removing three screws from front. Remove junction box by taking out top, rear and side screws. See Fig. 4
4. Pull out the plug assembly and disconnect. See Fig. 5.



A07058

Fig. 4 – Removal of Junction Box Cover



A07059

Fig. 5 – Plug Assembly on Hardwire Units

### C. Remove Unit From The Wall Sleeve

1. Remove the four mounting screws that secure the PTAC unit to the wall sleeve (2 screws per side). See Fig. 6 and Fig. 7.
2. Grasp sides of unit and slide it from the sleeve.



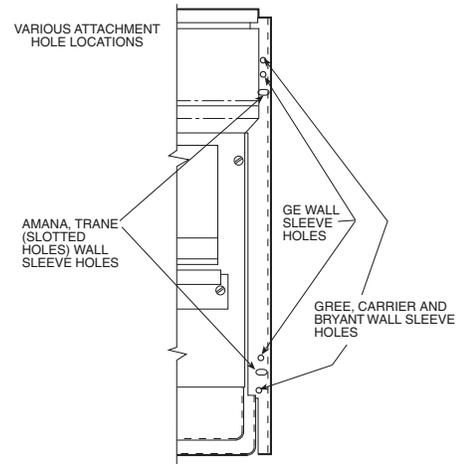
## WARNING

### PERSONAL INJURY HAZARD

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

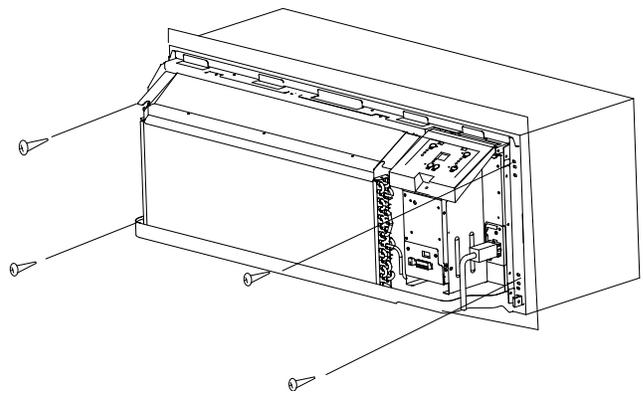
Chassis weighs up to 150 pounds (68.0 kg). Seek help when lifting unit.

Lift unit by holding unit basepan. The basepan may contain water. Tilt the unit back slightly when removing it from the sleeve to drain some of the water into the sleeve.



A08516

Fig. 6 – PTAC Unit to Wall Sleeve Mounting Screws



A07057

Fig. 7 – Location of Wall Sleeve Screws

# ACCESSING COMPONENTS

## ACCESSING INDOOR-AIR COMPONENTS

### Remove the Gussets

1. Remove the 2 screws on each side that secure the gussets to the partition.
2. Remove the 2 screws that secure the gussets to the outdoor fan shroud. See Fig. 8.
3. Lift gussets from the unit.

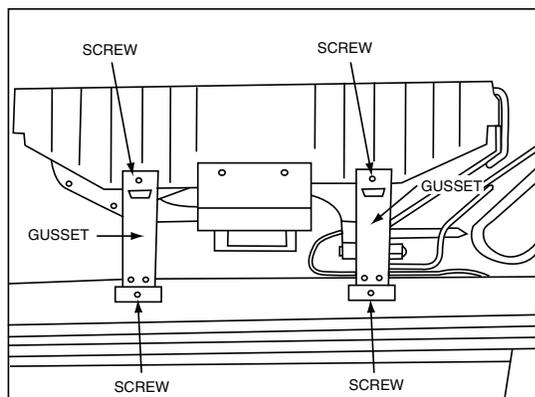


Fig. 8 – Location of Gusset Screws

A08521

### Remove the Top Plate

1. Locate 7 screws that secure top plate to partition and remove. See Fig. 9.
2. Once all 7 screws have been removed, lift the top plate up and away from the unit. See Fig. 10.

### Removal of Discharge Screen

1. Once the top plate has been removed, locate and remove 3 screws that secure discharge screen to fan assembly. See Fig. 9.
2. After the screws have been removed, the discharge screen can be lifted from the unit.

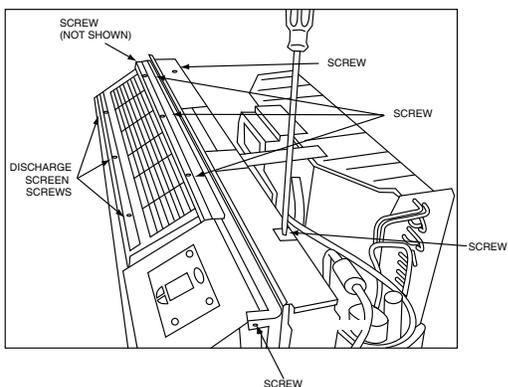


Fig. 9 – Removal of Screws from Top Plate

A08522

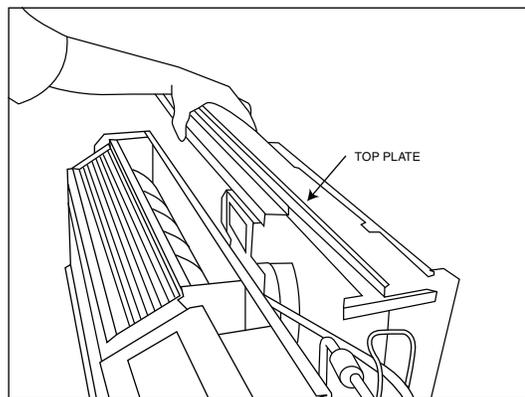


Fig. 10 – Removing Top Plate from Unit

A08523

### Removal of Controls Keypad

The controls keypad must be removed to gain access to 2 screws that secure the electrical box to the partition.

1. Locate and remove the screw that attaches controls keypad to electrical box and remove. See Fig. 11.
2. Push keypad toward partition to release from plastic tabs underneath, then lift up to remove keypad.

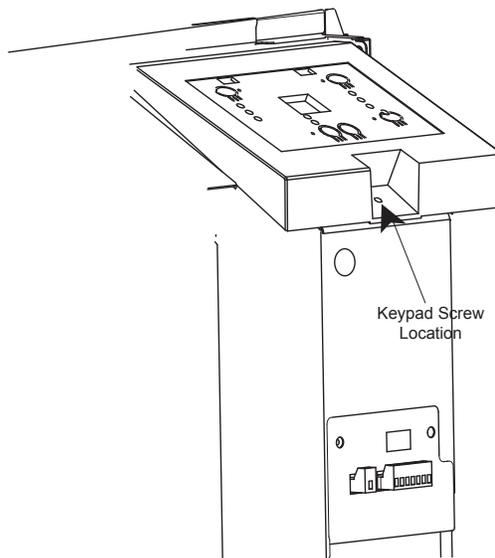
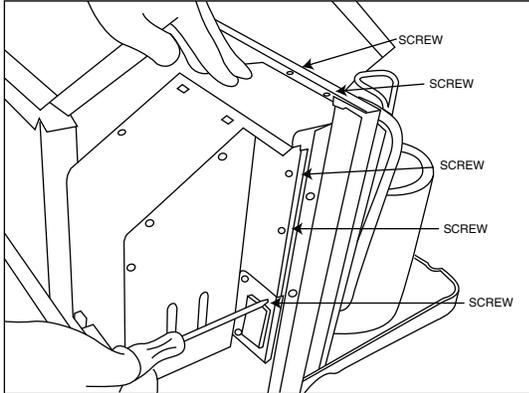


Fig. 11 – Keypad Screw Location

A08549

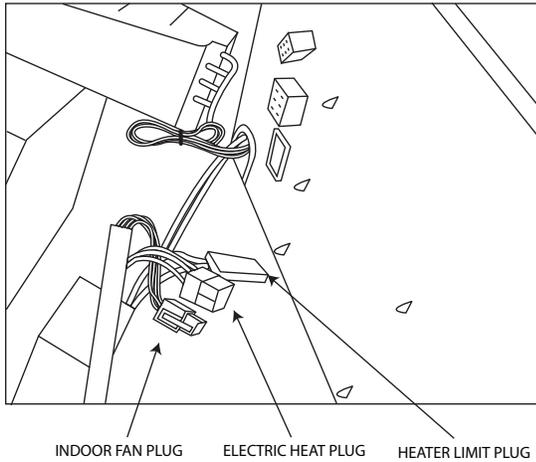
## Remove Electrical Box

1. Locate and remove the 5 screws that fix the electrical box to the rest of the unit. See Fig. 12.
2. At this point, the heater limits (black), electric heat (large white), and indoor fan motor (small white) plugs need to be disconnected. See Fig. 13.
3. To remove the electrical box, firmly grasp and lift box up and away from the 2 tabs located behind the box.



A08524

**Fig. 12 – Remove 5 Screws from Electrical Box**



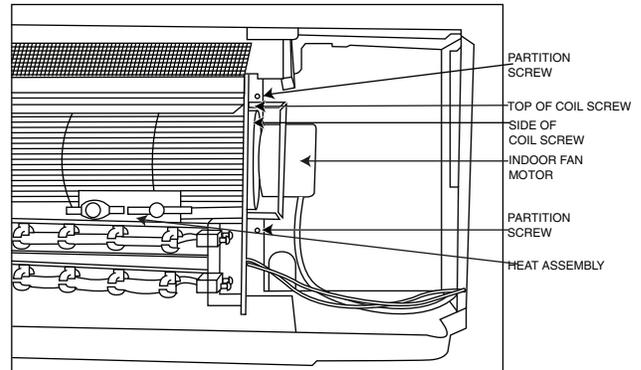
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**Fig. 13 – Heater Limits, Electric Heat, and Indoor Fan Motor Plugs**

## Removing Indoor Fan/ Electric Heat Assembly

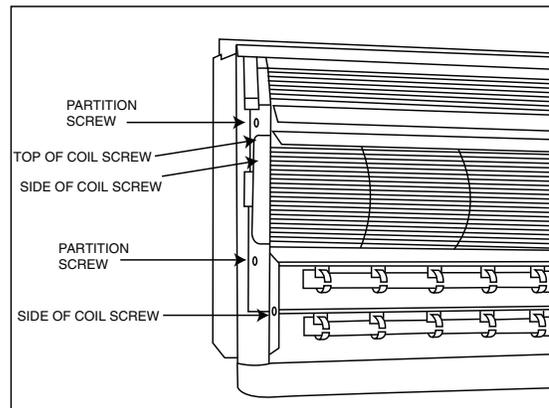
Once the top plate and electrical box have been removed, the indoor fan/ electric heat assembly is accessible.

1. Locate and remove the screws that secure the assembly to the partition. There are 2 screws located on the fan motor side and 2 screws located on the opposite side. See Fig. 14 and Fig. 15.
2. There are a total of 5 screws that secure the indoor fan/electric heat assembly to the indoor coil that must be removed. 2 screws (one on each side) are located at the top of the coil. The remaining screws are found along the sides of the coil. 1 screw will be on the fan motor side, and the other 2 at the opposite end. See Fig. 14 and Fig. 15.
3. Once all screws have been removed, separate the assembly from the partition to release it. See Fig. 16.
4. The assembly can then be lifted up and away from the unit for removal.



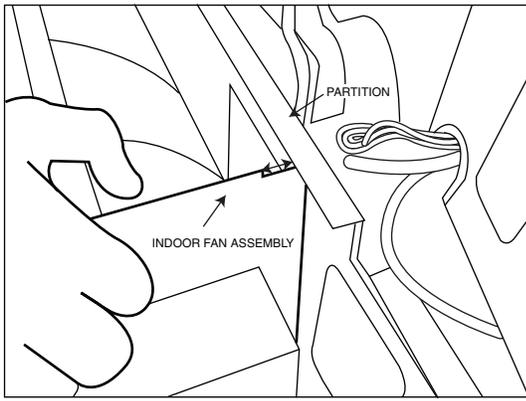
A08526

**Fig. 14 – Location of Fan Assy. Screws on Fan Motor Side**



A08527

**Fig. 15 – Location of Fan Assembly Screws on Opposite Side**

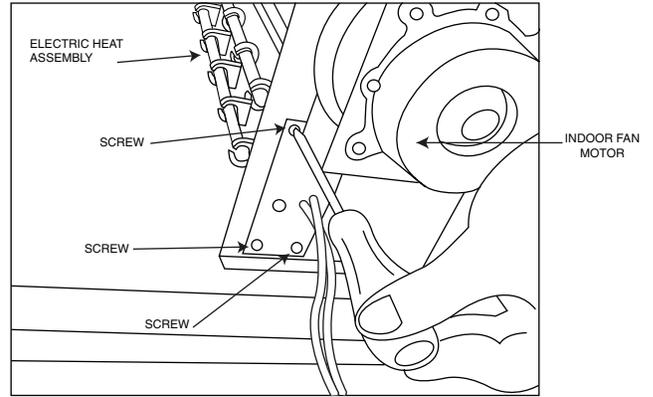


**Fig. 16 – Separate Indoor Fan Assembly from Partition**

A08528

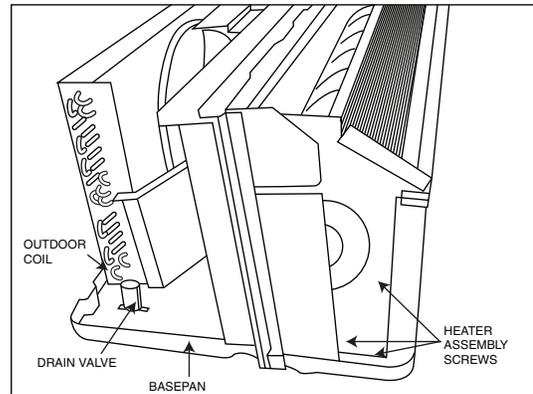
**Accessing Electric Heat Assembly**

1. Once the indoor fan assembly has been removed, the electric heat assembly is accessible.
2. To detach heat assembly from indoor fan assembly, locate and remove 3 screws on each end of heat assembly. See Fig. 17 and Fig. 18.



**Fig. 17 – Location of Heater Assembly Screws (Fan Motor Side)**

A08529



**Fig. 18 – Location of Heater Assembly Screws (Opposite Side)**

A08545

## ACCESSING CONTROL COMPONENTS

### Removal of Controls Keypad

The controls keypad must be removed to access unit-mounted interface and display board. The controls keypad should also be removed if additional room is required to access components in the control box.

1. Locate and remove the screw that attaches the controls keypad to the electrical box. (See Fig. 19.)
2. Push keypad toward partition to release from plastic tabs underneath, then lift up to remove keypad.

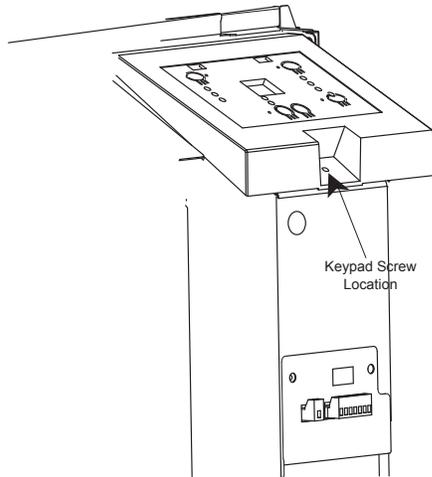


Fig. 19 – Keypad Screw Location

### Accessing Control Box Wiring, Capacitors or to Check Voltages

To remove the side cover for access to control box:

1. Remove nine (9) screws as shown in Fig. 20 from side cover. Fig. 21 shows the side cover removed.

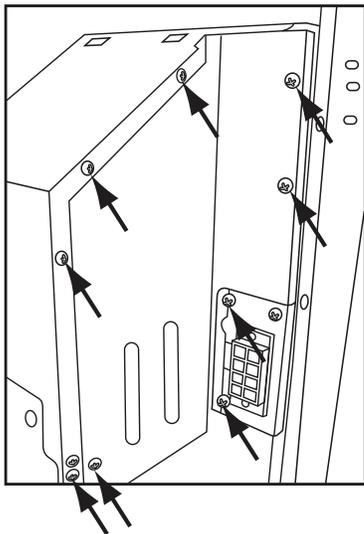


Fig. 20 – Screw Location

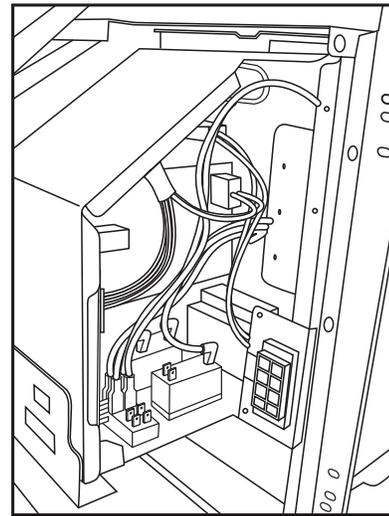


Fig. 21 – Side Cover Removed

The control components will be accessible when the panel has been removed. The control component layout is shown in Fig. 22.

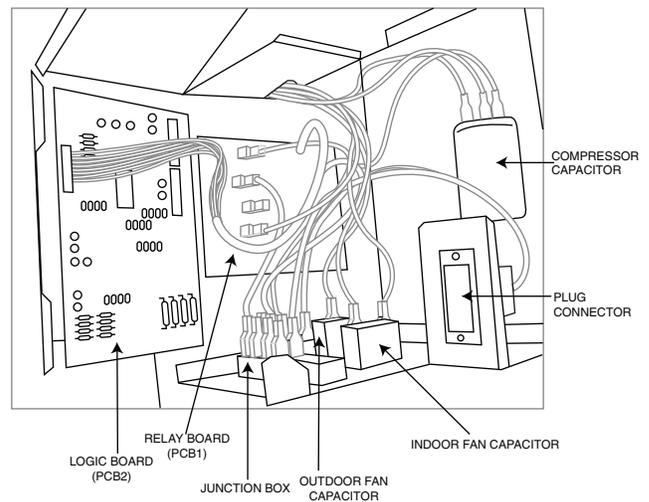


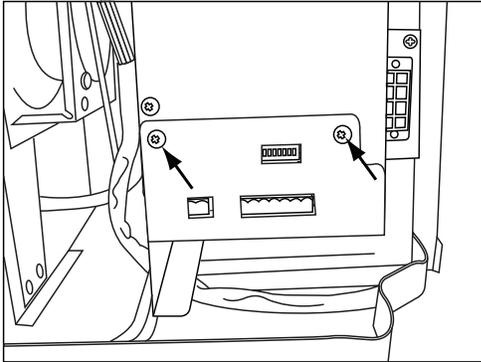
Fig. 22 – Location of Components Inside Control Box

## Access or Remove Control Boards

Remove the control box side-access cover as shown in previous section.

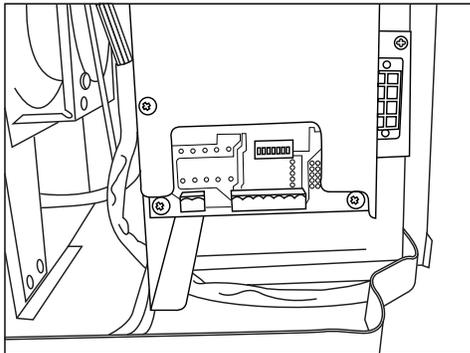
To remove the front control box cover:

1. Remove the two (2) screws that hold the bottom cover in place as shown in Fig. 23.
2. Remove cover. See Fig. 24.
3. Remove the five (5) remaining screws from the front cover as shown in Fig. 25.
4. Remove two (2) additional screws that hold the control board to the control box as shown in Fig. 26.



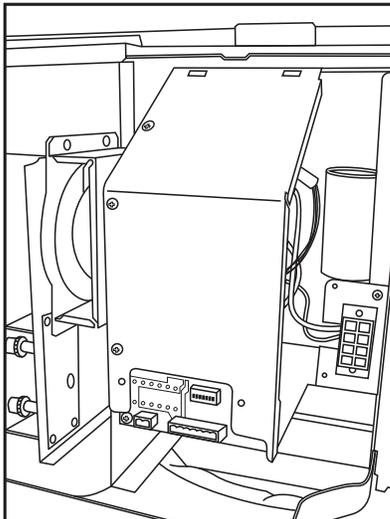
**Fig. 23 – Location of Control Box Cover Screws**

A09313



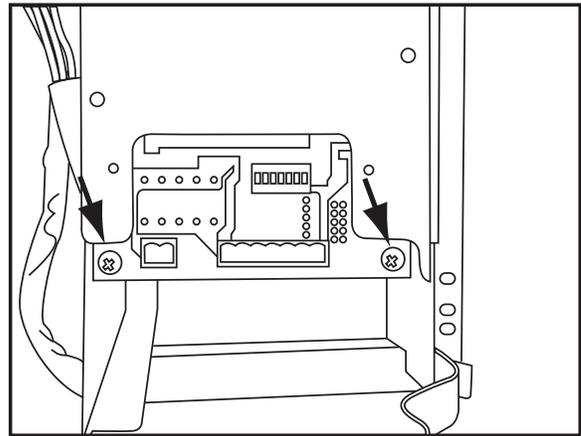
**Fig. 24 – Control Box Cover Removed**

A09314



**Fig. 25 – Screw Location in Front Cover**

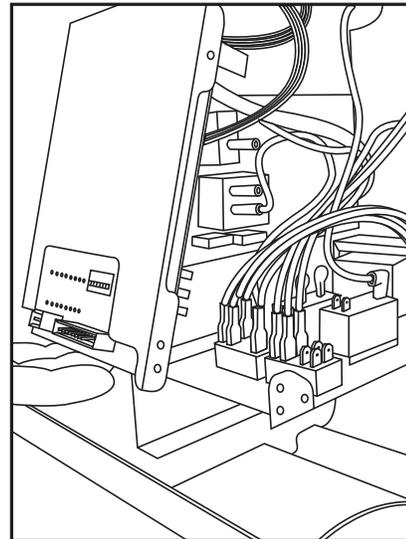
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**Fig. 26 – Location of Screws Holding Control Board to Control Box**

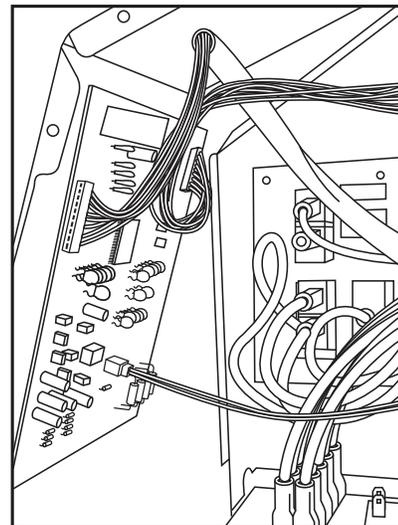
A09316

5. Gently pull the front cover of control box away from the bottom. See Fig. 27 and Fig. 28.



**Fig. 27 – Pull Control Box Away From Bottom**

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**Fig. 28 – Control Box Pulled Away From Bottom**

A09318

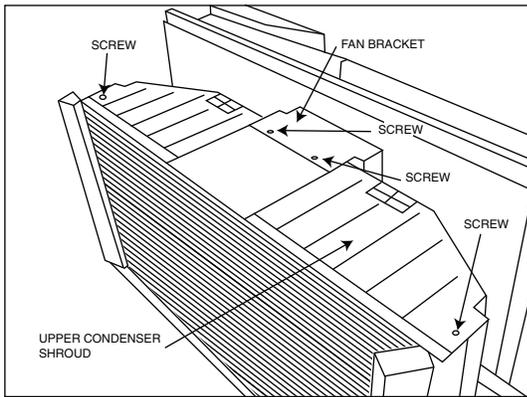
## ACCESSING OUTDOOR-AIR COMPONENTS

### Remove Gussets

Refer to *Remove Gussets* section in *Accessing Indoor-Air Section Components* (page 6).

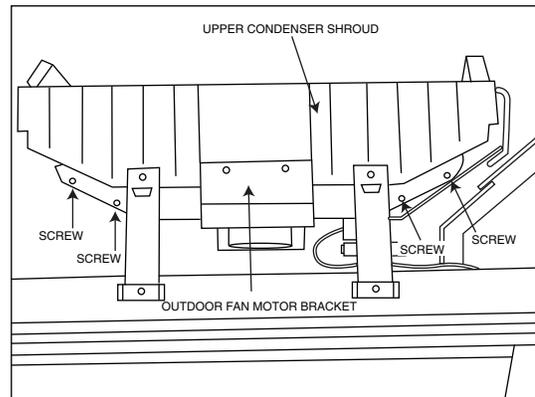
### Remove Upper Condenser Shroud

1. Locate and remove 2 screws that join condenser shroud to outdoor coil. Also remove 2 screws that attach condenser shroud to fan bracket. See Fig. 29.
2. Locate and remove the 4 connecting screws (2 on each side) located on the rear of the shroud. See Fig. 30
3. Once the 4 connecting screws have been removed, push the shroud away from the fan motor. See Fig. 31.
4. With upper shroud separated from the fan motor bracket, grasp the shroud and remove it from the unit. See Fig. 32.



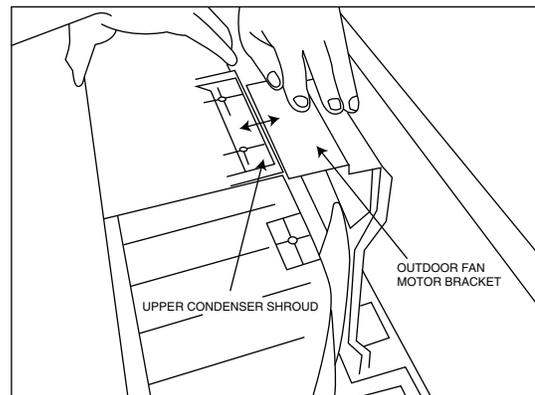
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**Fig. 29 – Location of Attachment Screws on Top of Condenser Shroud**



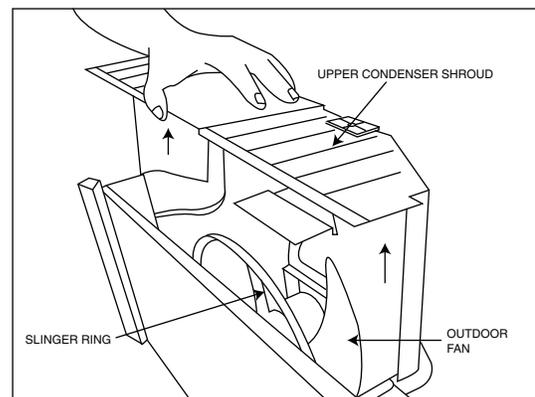
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**Fig. 30 – Location of Screws Connecting Shroud**



A08533

**Fig. 31 – Push Condenser Shroud from Fan Motor Bracket**



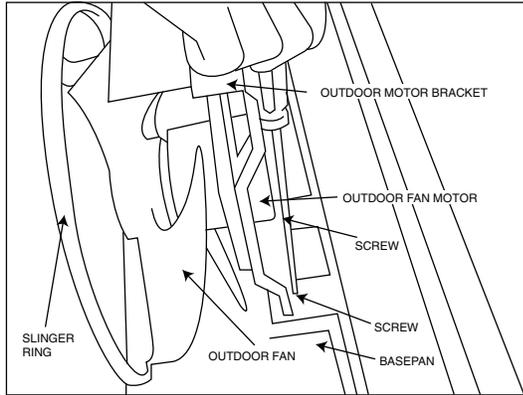
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**Fig. 32 – Removal of Upper Condenser Shroud**

## **Remove the Outdoor Fan Assembly**

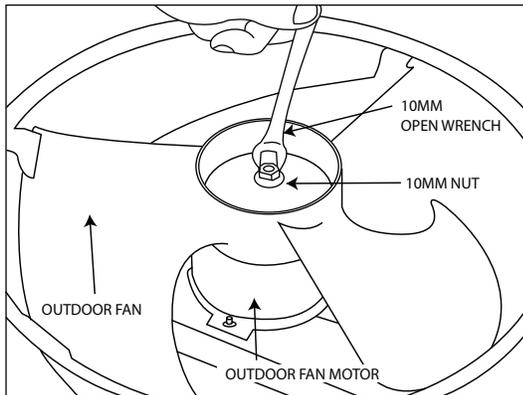
With the upper condenser shroud removed, the outdoor fan assembly can be removed.

1. Locate and remove 2 screws that attach fan motor bracket to base of unit. See Fig. 33.
2. Lift outdoor fan assembly out of unit.
3. To remove fan from assembly, use 10 mm open wrench to loosen nut on motor shaft. See Fig. 34
  - a. Pull outdoor fan off fan motor shaft.



A08535

**Fig. 33 – Location of Fan Motor Bracket Screws**



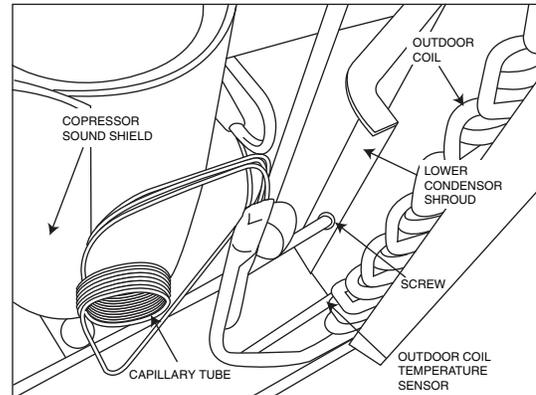
A08536

**Fig. 34 – Remove 10 mm Nut on Fan Motor Shaft**

## **Removal of Lower Condenser Shroud**

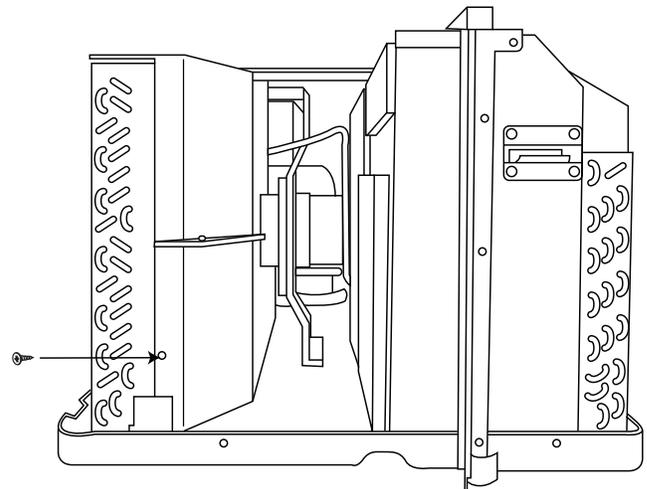
For cleaning purposes, the lower condenser shroud may need to be removed from the unit to provide access to the outdoor coil.

1. Verify the upper condenser shroud and outdoor fan assembly have been removed. If necessary, refer to previous sections.
2. Locate and remove 2 screws (1 on each side) that fasten lower condenser shroud to outdoor coil. See Fig. 35 and Fig. 36.
3. The lower condenser shroud can now be separated from the coil and taken out of the unit.



A08537

**Fig. 35 – Location of Shroud to Coil Screw (Compressor Side)**



A08550

**Fig. 36 – Location of Shroud to Coil Screw (Vent Door Side)**

# COMPONENT OPERATION

## COMPRESSOR

A cutaway view of the rotary compressor with key components labeled is shown in Fig. 37. The motor stator is rigidly attached to the compressor shell. The rotor is pressed onto the eccentric shaft, which is supported by 2 bearings. Both the discharge valve and discharge muffler are attached to the motor bearing. The pump bearing provides a thrust surface

for the shaft and the rolling piston. Compressed gas is separated from the suction gas by the vane. Discharge gas pressure and the vane spring keep the vane in contact with the rolling piston.

**NOTE:** The compressor sound shield is secured by Velcro and should be removed before servicing the compressor.

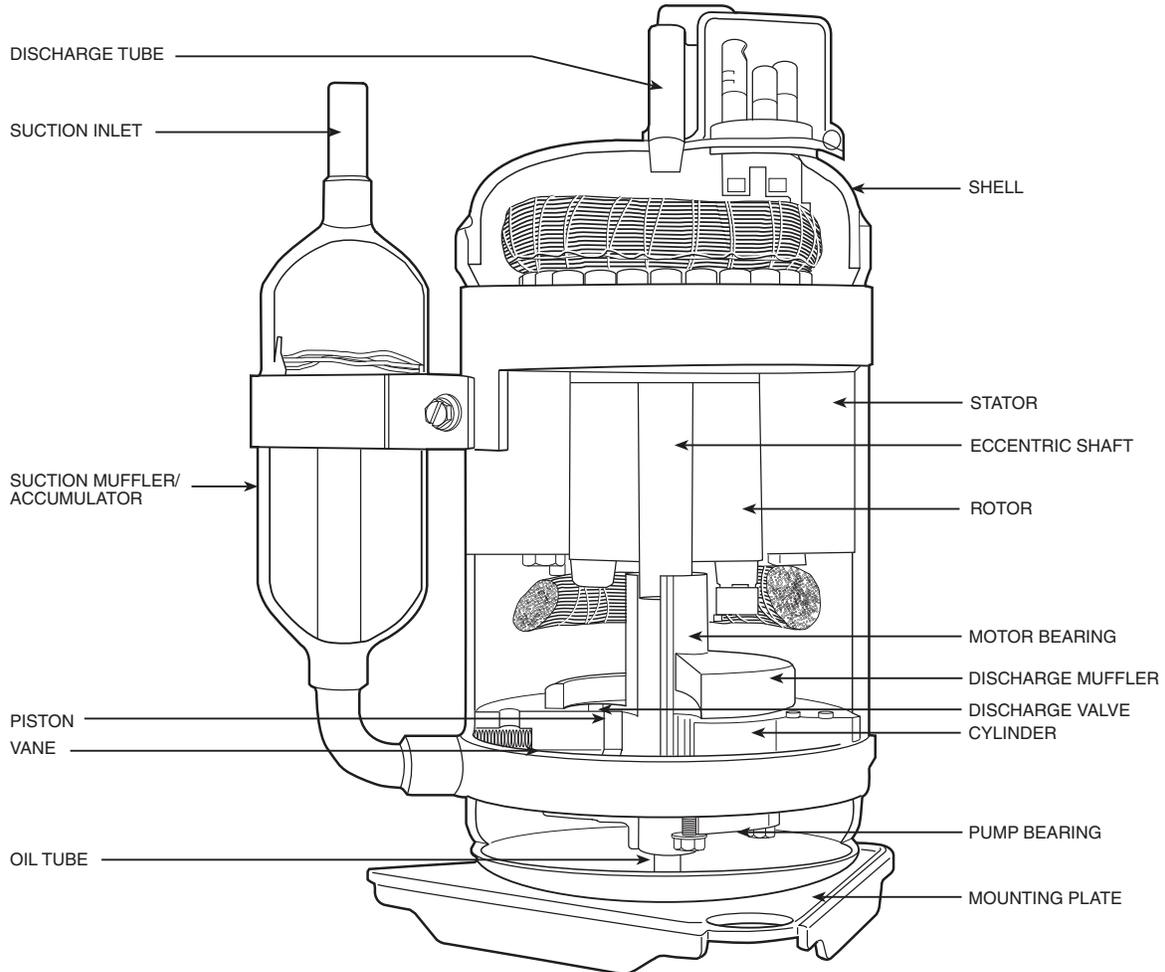


Fig. 37 – Rotary Compressor Components

A08557

The rotary compression process (see Fig. 38), starts at top dead center as shown in (1). Suction gas flows through the suction inlet and into the cylinder area. As the shaft rotates through 90 degrees, the rolling piston moves to position A as shown in (2). The suction volume is now the area defined by point A and the tip of the vane. Gas in the remaining volume has been compressed above suction pressure. After another 90 degrees of shaft rotation, the rolling piston has moved to position B as shown in (3). Both the compressed gas and suction gas volumes are now equal. Another 90 degrees of shaft rotation is shown in (4). Compressed gas has reached a pressure sufficient to open the discharge valve, and flows from the cylinder into the compressor shell. After another 90 degrees of shaft rotation, the entire process begins again. Continuous suction and discharge allows for a smooth compression process.

The rolling piston is not in actual contact with the cylinder wall, vane, or bearing faces. Hydrodynamic sealing prevents leakage from the compressed gas volume to the suction volume via these paths. Precise control of machining tolerances, surfaces, finishes, and assembly clearances is critical to achieve high efficiency performance. In addition, the line contact

between the vane tip and the rolling piston requires careful selection and control of materials to provide wear resistance and reliable long-term operation.

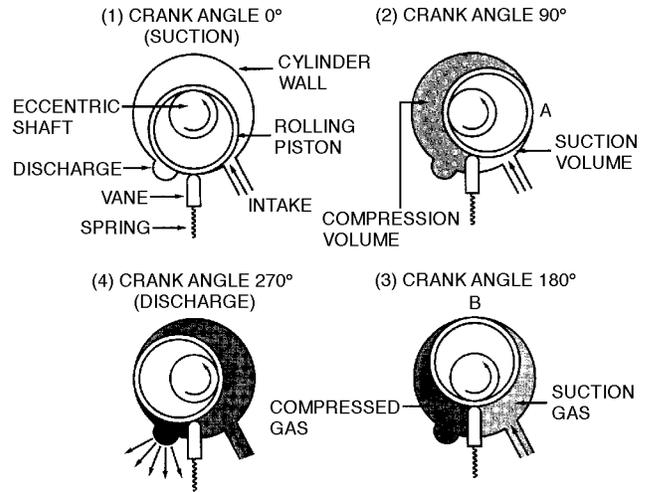


Fig. 38 – Rotary Compressor Compression Process

## COMPRESSOR TROUBLESHOOTING

Refer to the Compressor Troubleshooting Table below for a basic compressor troubleshooting guide.

### COMPRESSOR TROUBLESHOOTING GUIDE

POSSIBLE CAUSE	SYMPTOM				
	Compressor Starts and Runs But Cycles On the Overload	Compressor Starts After Cycling the Overload Several Times	Compressor Will Not Start. It Hums and Cycles On the Overload	Compressor Will Not Start and Makes No Noise	Compressor Cycles Off (Not On Overload)
CHECK UNIT STATUS INDICATOR FOR A DIAGNOSTIC CODE (See <i>Control Diagnostics</i> section of this manual)				X	X
UNIT MAY BE IN A RANDOM 3-MINUTE TIMEGUARD				X	X
COILS/FILTERS DIRTY OR PLUGGED	X				
AIR OR NON-CONDENSABLE GASES IN SYSTEM	X	X			
SYSTEM REFRIGERANT OVERCHARGED	X				X
DISCHARGE LINE RESTRICTED	X	X			
CAPILLARY TUBE OR STRAINER RESTRICTED OR PLUGGED	X	X			X
FAN BLADE OR MOTOR DEFECTIVE	X				X
FAN BLADE OR BLOWER WHEEL STUCK	X				X
SYSTEM REFRIGERANT UNDERCHARGED	X				X
EVAPORATOR AIRFLOW RECIRCULATION					X
UNIT OVERSIZED FOR APPLICATION					X
COMPRESSOR REQUIRES START ASSIST		X	X		
NO POWER TO UNIT				X	
LOW VOLTAGE TO UNIT	X	X	X		X
OVERLOAD PROTECTOR OPEN				X	
OVERLOAD PROTECTOR INCORRECT OR DEFECTIVE	X		X	X	
CAPACITOR INCORRECT OR DEFECTIVE	X	X	X		X
THERMOSTAT IS SET TOO HIGH OR LOW				X	
WIRING IS INCORRECT OR DEFECTIVE	X		X	X	X
SYSTEM PRESSURES NOT EQUALIZED		X	X		X
COMPRESSOR MOTOR OR MECHANISM DEFECTIVE	X	X	X	X	X
COMPRESSOR GROUNDED			X		

**Note:** In order to aid in compressor operation troubleshooting, disable control delays and timers for one cycle by depressing the temp up and temp down . . . . keys at the same time (hold for 3 seconds). The delays and timers will be enabled after the cycle has completed or if power is cycled.

## BASIC HERMETIC COMPRESSOR ELECTRICAL MEASUREMENTS

There are 2 basic electrical tests for hermetic compressors that will determine the electrical state of the motor. The first test requires checking the electrical resistance of each of the electrical motor windings. The second test requires checking the electrical resistance of each of the electrical motor windings to ground. These tests may be accomplished by performing the following steps:

### 1. DISCONNECT ALL POWER TO THE UNIT.

## ⚠ WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.  
Disconnect all power to unit to avoid possible electrical shock during service or installation.

2. Remove the unit chassis from the sleeve as detailed in the *Unit Dis-assembly* section.
3. Open the control box as detailed in the *Accessing Components* section then locate, label, and remove the three (3) compressor wires from the following locations: the RUN wire (blue) from the capacitor, the START wire (yellow) from the capacitor. The third wire, COMMON wire (red), will be connected to the terminal block.

## ⚠ DANGER

### PERSONAL INJURY OR DEATH HAZARD

Failure to follow this warning could result in personal injury or death.  
For compressors that are known to be damaged:  
Remove refrigerant prior to disconnecting compressor wires. Damaged hermetic compressor terminals may become loose and eject from the compressor. Wear safety glasses and keep your face away from the area above the terminals when removing compressor wires.

4. Perform a shorted/open windings test to measure the resistance between the windings of the compressor motor. Use a volt-ohmmeter set to the lowest ohm reading level then read and record the resistance between the RUN and START, START and COMMON, and RUN and COMMON wires. See Fig. 39. The typical resistance readings will be about 4, 3, and 1 ohms respectively. The smaller values should add to equal the larger value. If this is not true then the compressor is likely shorted winding to winding.

**NOTE:** The rotary compressor has the compressor overload located under the terminal cover. If the overload is open it can show ohm readings that are infinite. The unit should be off for at least an hour to give this overload time to reset if it is open.

5. Next, perform a grounded windings test to test the resistance individually of each wire to the shell of the compressor. The paint on the compressor can prevent good contact between the probe and the metal. The paint should be removed from a small section of the shell of the compressor to ensure good contact by the meter probe. The volt-ohmmeter should be set to at least the 100X ohm level. The measured resistance between each wire and ground should be infinite or O.L. on the readout. If there is measurable resistance one of the windings is likely shorted to ground. See Fig. 40.
6. A compressor that has a winding to winding short or a winding to compressor shell short is electrically failed and needs to be replaced. See the *Compressor Replacement* section for details.

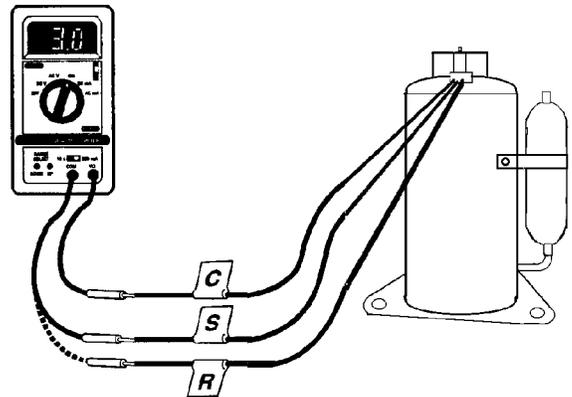


Fig. 39 – Shorted/Open Windings Test

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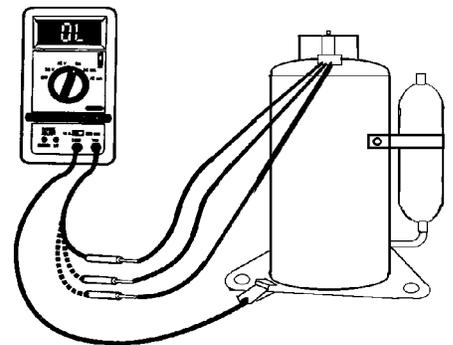


Fig. 40 – Grounded Windings Test

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## COMPRESSOR REPLACEMENT

Before working on the compressor, read the instructions thoroughly and gather the necessary tools for the job. Review all safety information on unit and in literature. Always turn off all power to unit to avoid the possibility of electrical shock.

### **WARNING**

#### **ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.  
Disconnect all power to unit to avoid possible electrical shock during service or installation.

### **Consider the following safety issues before beginning:**

- New and unfamiliar tasks should be performed under the supervision of an experienced service technician.
- Personal protective equipment, such as work gloves and safety glasses, should be worn.
- The floor around the work area should be clean and free of debris.
- Make sure tools are the correct tools for the job and that they are working properly and in good condition.
- Never replace a blown fuse without correcting the cause of the original failure. If thermally operated circuit breakers or overloads are tripping, make sure the trip is not due to excessively high temperatures or loose connections.
- When brazing suction and discharge lines, cool the lines with a damp, clean cloth to prevent injury.
- Oil may be present in the compressor accumulator and interconnecting tubing. Use caution when removing tubing.

### **DANGER**

#### **PERSONAL INJURY OR DEATH HAZARD**

Failure to follow this warning could result in personal injury or death.  
For compressors that are known to be damaged:  
Remove refrigerant prior to disconnecting compressor wires. Damaged hermetic compressor terminals may become loose and eject from the compressor. Wear safety glasses and keep your face away from the area above the terminals when removing compressor wires.

### **Tools Needed**

The following list includes the recommended tools and devices for removing and replacing the compressor.

1/2-in. and 3/8-in. Tube Benders
1/2-in. Nut Driver
5/16-in. Nut Driver
Flat Head Screwdriver
Piercing Valve
Top Tech Access Valve (Part No. TT-AVX2 )
Pinch Off Tool
Top Tech Filter Drier -All Units (Part No. T-LLDBF083S)
Refrigerant Acidic Test Kit
Refrigerant Reclaim System
Charging Cylinder or an Electronic Scale
R410A Refrigerant
Tubing Cutter
Torch
Nitrogen Cylinder with Regulator
Strainers
Capillary Tubes

### **Removing the Compressor**

Follow the steps below to remove the compressor:

1. **Disconnect all power to unit.**
2. Remove unit from wall sleeve as detailed in the *Unit Dis-assembly* section. The unit weighs up to 150 pounds (68 kg). Seek assistance or use a lifting device when removing unit from wall sleeve.
3. **If the unit is a heat pump:** Disconnect the wire plug on the reversing valve solenoid and carefully remove the outdoor coil temperature sensor. See Fig. 41.
4. Attach the piercing valve to the suction side process tube below the crimps. Use a refrigerant acidic tester to verify acidity of the system. After verifying the system acidity, remove the refrigerant using a certified refrigerant recovery system.

### **CAUTION**

#### **ENVIRONMENTAL HAZARD**

Failure to follow this caution may result in environmental pollution.  
Remove and recycle all components (i.e. oil, refrigerant, etc.) before unit final disposal.

5. When all the refrigerant has been recovered, remove the terminal cover from the compressor with a nut driver. Disconnect the 3 wires from the compressor and label the location of each. Once the wires are labeled, replace the terminal cover to protect the compressor terminals.
6. Remove the air system components by following the procedure detailed in the *Accessing Unit Components* section.

7. Remove the piercing valve and cut the crimped portion of both process tubes off with a small tubing cutter. Braze an access valve on each process tube. Using a torch, disconnect the suction and discharge tubes from the compressor connections.
8. Remove the compressor mounting bolts, and remove the compressor.


CAUTION

**PERSONAL INJURY HAZARD**

Failure to follow this caution may result in personal injury.  
The compressor may still be hot from brazing process.

**IMPORTANT:** Any time the compressor is replaced, the strainer and capillary tubes must be removed and replaced also.

9. **For all units:** Remove and replace the strainer and capillary tubes from the system. See Fig. 41 for strainer and capillary tube location.
10. **For Heat/Cool Units:** Use an in-line filter drier (Part No. T-LLDBF083S). The filter drier can be installed in any location in suction line. See Fig. 42 for general installation location.

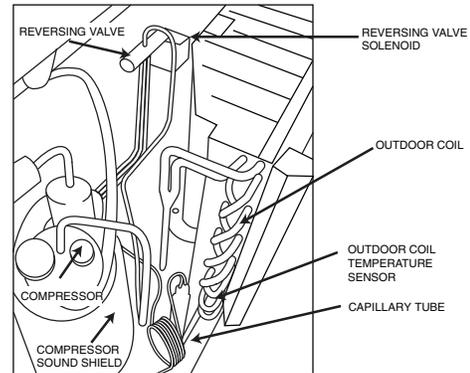
**For Heat Pump Units:** Use an in-line filter drier (Part No. T-LLDBF083S) and **install between the reversing valve and the compressor accumulator.** There are several suction tube configurations and the in-line filter drier will be field piped and brazed into the suction tube for your unit.

11. Remove the grommets from the existing compressor and install them onto the new compressor.
12. Install the new compressor and the new capillary assembly.

**IMPORTANT:** Any time the compressor is replaced, the strainer and capillary tubes must also be removed and replaced. An in-line filter drier must also be added. See Fig. 42 for location.

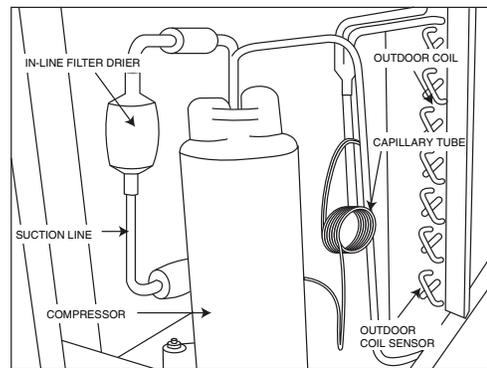
13. Leak check the unit with 150 psi (10.55 kg/cm<sup>2</sup>) of nitrogen pressure.
14. The refrigeration system should be evacuated from the high side to the low side to a minimum of 200 microns of mercury. This evacuation removes residual moisture from the system prior to charging.
15. Recharge unit to the nameplate refrigerant charge using a charging cylinder or scale.

16. Pinch off each access valve on the process tubes in 2 places using a pinch off tool. Release any refrigerant pressure trapped in the access valve by depressing the valve core, then confirm that no R410A is leaking past the pinch off tool location. Cut the access valve stem of the process tube above the top crimp and braze the top of each process tube to ensure the system is sealed (leave the pinch off tool in place until after the brazing process is complete).
17. Reassemble the unit.
18. Re-install compressor sound shield.
19. Connect the compressor wires and energize the unit to verify operation.



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**Fig. 41 – Reversing Valve Solenoid and Outdoor Temperature Sensor**



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**Fig. 42 – In-line Filter Drier general Installation Location**

### Refrigerant Charging

Every mechanical refrigeration system that is opened for servicing must be accurately charged before it is returned to service. Run the compressor **ONLY** after charging the system with refrigerant.

**IMPORTANT: The compressor should never be operated without refrigerant!**

It is important to remember that recovered and/or recycled refrigerant may only be recharged into the system from which it was initially recovered, or another one owned by the same customer. Charge level is important. Charge units only as recommended by manufacturer.

## HEATERS

The heater in Gree GA series PTACs is located directly behind the evaporator coil. The heater assembly includes the universal heater (which can be configured for 2.0kW, 3.0kW or 5.0kW), a primary limit switch, and a secondary limit switch. See Fig. 43. The primary and secondary limit switches are safety switches that regulate heater operation. The primary limit switch disables current to the heater when the temperature exceeds the setting on the switch.

For example, a 3.0 kW heater may have a primary limit switch setting of 140° F (60° C). If the temperature at the switch exceeds 140° F (60° C), the primary limit switch will electrically open and shut off power to the heater. Once the temperature drops below 110° F (43° C), the primary limit switch will automatically reset.

The secondary limit switch works in the same manner as the primary limit switch, except it is a one time switch and has a slightly higher temperature setting of 178° F (81° C). Once this switch is thermally opened, it must be replaced. Together, the primary and secondary switches help maintain safe temperature limits for unit operation.

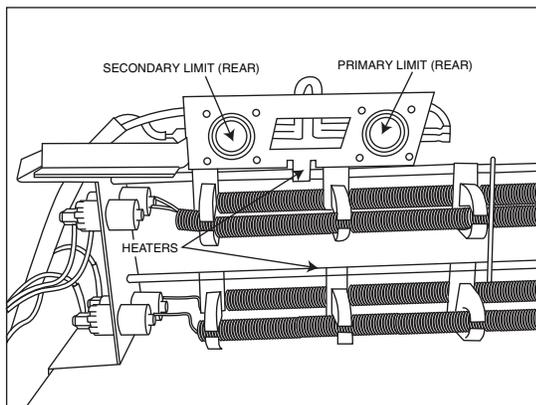


Fig. 43 – Limit Switch Location

## COMMON CAUSES OF HEATER FAILURE

Heater failure may result from broken heater coils, primary limit switch failure, or an open secondary limit switch. These conditions are generally caused by low or no airflow or failed electronic board.

## HEATER REMOVAL

Before working on the heater, read the instructions thoroughly and gather the necessary tools for the job. Review all safety information on the unit and in the product literature.

### **WARNING**

#### **ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.  
Disconnect all power to unit to avoid possible electrical shock during service or installation.

The manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

#### **Consider the following safety issues:**

- **Disconnect All Power to unit** prior to performing any service or maintenance.
- New and unfamiliar tasks should be performed under the supervision of an experienced service technician.
- Personal protective equipment, such as safety glasses and work gloves, should be worn.
- The floor around the work area should be clean and free of debris.
- Make sure tools are the correct tools for the job, and that they are working properly and in good condition.

#### **Tools Needed**

The following list includes the recommended tools and devices for removing and replacing the compressor.

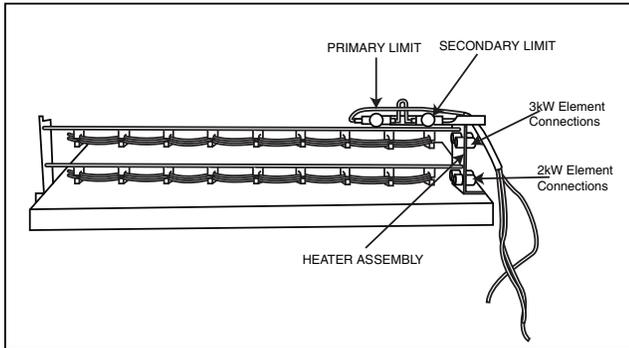
Phillips Head Screw Driver
Volt-ohmmeter

Perform the following steps to remove the Heater Assembly.

1. **DISCONNECT ALL POWER TO UNIT.**
2. Remove heater by following instructions in *Accessing Unit Components* section.

**After the heater is removed, examine the heater as follows to determine if it is operational:**

Perform a visual inspection. The heater coil should be free of breaks. If there are any breaks in the coil, replacement of the heater assembly is necessary.



**Fig. 44 – Heater Coil (Removed)**

Coil resistance must also be checked to verify the heater is operating correctly. The resistance of the heater coils must meet approximate levels for the heater to perform at its optimum efficiency. See *Acceptable Heater Resistance Values* table for approximate resistance for heaters at 75° F (24° C). Before checking the heater coil resistance, **be sure all power to unit is off.**

To check resistance, set the volt-ohmmeter selector switch to the proper ohm range setting. Connect the volt-ohmmeter leads to the metal studs on each side of the heater coil at the element connections that hold the incoming wires in place. Incorrect readings can be obtained if the heater connecting plug is not removed from connector located on the control box (see figure 14). If the resistive reading is infinite or zero, the heater is failed and replacement is necessary.

**NOTE:** If the application is using a 30 amp power cord / 5 kW heater, the 2kW and 3kW heaters are operated in parallel. The resistance values for the individual 2kW and 3kW elements should be measured and compared to the values provided in the table

**ACCEPTABLE HEATER RESISTANCE VALUES**

HEATER SIZE	WATTS	VOLTS	ACCEPTABLE RESISTANCE (Ohms)
2.0 kW	2000	230	25.2–27.8
3.0 kW	3000	230	16.8–18.6
2.0 kW	2000	265	33.4–37.0
3.0 kW	3000	265	22.3–24.6

**FAN MOTORS**

The Gree GA series PTAC has an indoor and an outdoor fan, each with their own motor. The indoor fan motor can operate at 3 speeds: High, Medium, and Low. Each motor has it’s own capacitor located inside the control box. the indoor fan capacitor is gray in color and the outdoor fan capacitor is black.

**FAN MOTOR TROUBLESHOOTING**

Refer to the Fan Motor Troubleshooting table for a basic troubleshooting chart.

**Tools Needed**

The following list includes the recommended tools and devices for working on the fan motor.

Gloves
Safety Glasses
Small Adjustable Wrench
Phillips Head Screwdriver
Volt-ohmmeter

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

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

Before cleaning, servicing, performing maintenance, or removing the chassis from the wall sleeve, disconnect all power to the unit.

Only trained and qualified service personnel should perform installation and service procedures on these units. Untrained personnel may perform basic maintenance tasks such as cleaning and replacing filters. Refer to *Accessing Unit Components* section of this manual for proper procedures to disconnect power to units.

**BASIC FAN MOTOR ELECTRICAL TESTS**

There are two basic electrical tests for fan motors that will determine the electrical state of the motor. The first test requires checking the electrical resistance between the motor windings. The second test requires checking the electrical resistance between the motor windings and ground. These tests may be accomplished by performing the following steps:

**Outdoor Fan Motor**

1. **DISCONNECT ALL POWER TO UNIT.**
2. Open the control box as detailed in the *UNIT DIS-ASSEMBLY* section.
3. Label and disconnect the fan motor wires from the circuit board and outdoor fan capacitor. See Fig. 48.

**NOTE:** The outdoor fan motor has 2 wires that run to the outdoor fan capacitor and 2 wires that run to the circuit board.

4. Measure and record the resistance between the black wire and each of the other wires. Make sure the motor is cool before attempting to measure resistance. The internal thermostat of the motor may be electrically open and will not close until the motor cools. See typical motor winding resistance measurements in *Outdoor Fan Motor Information* table on the following page. The resistance values in the table are

approximate. Values that are within 10% of those listed are acceptable. If the motor in your model is not listed, find a motor of similar horsepower and voltage on the chart and compare it to the resistance measurements of your motor.

5. Measure the resistance of each of the motor wires to the motor casing. The resistance should be infinite. Make sure the motor is cool before attempting to measure resistance. The internal thermostat of the motor may be electrically open and will not close until the motor cools. A motor that has measurable resistance to ground is shorted to ground and must be replaced.

### **Indoor Fan Motor**

1. **DISCONNECT ALL POWER TO UNIT.**
2. Open the control box as detailed in the *UNIT DIS-ASSEMBLY* section.
3. Unplug indoor fan harness from side of control box. See Fig. 13.

**NOTE:** The indoor fan motor has 3 wires that run to the indoor fan capacitor and 3 wires that run to the circuit board.

4. Measure and record the resistance between the black wire and each of the other wires. Make sure the motor is cool before attempting to measure resistance. The internal thermostat of the motor may be electrically open and will not close until the motor cools. See typical motor winding resistance measurements in the following *Indoor Fan Motor Information* table. The resistance values in the table are approximate. Values that are within 10% of those listed are acceptable. If the motor in your model is not listed, find a motor of similar horsepower and voltage on the chart and compare it to the resistance measurements of your motor.

5. Measure the resistance of each of the motor wires to the motor casing. The resistance should be infinite. Make sure the motor is cool before attempting to measure resistance. The internal thermostat of the motor may be electrically open and will not close until the motor cools. A motor that has measurable resistance to ground is shorted to ground and must be replaced.

**NOTE:** When troubleshooting fan motors, test capacitors first (covered on following pages). If capacitors are not faulty, fan motors may need to be replaced.

**FAN MOTOR TROUBLESHOOTING CHART**

POSSIBLE CAUSE	SYMPTOM					
	Motor Hums But Does Not Start	Makes No Noise and Does Not Start	Starts But Stops After Short Time	Starts But Runs Slow	Runs On One Speed, Not On Others	
DEFECTIVE BEARING	X		X	X		
CAPACITOR DEFECTIVE	X		X			
CONTROL BOARD DEFECTIVE		X			X	
LOW LINE VOLTAGE	X		X	X		
SHORTED MOTOR WINDING	X				X	
NO POWER TO UNIT		X				
INTERNAL THERMOSTAT OPEN		X	X		X	
MISWIRED	X					
FAN STUCK	X					
BROKEN MOTOR WIRE	X		X		X	
MOTOR WINDING GROUNDED	X		X			
OPEN MOTOR WINDING	X		X		X	

**INDOOR FAN MOTOR INFORMATION**

GAE/GAA series (BTUH)	7000	9000	9000	12000 / 15000	15000	12000 / 15000
Voltage Rating	208/230	265	208/230	208/230	208/230	208/230
Description	GAE / GAA Series	GAE / GAA Series	GAE / GAA Series	15000 GAE, 12000 GAE/GAA Series	GAA Series	GAE / GAA Series
<b>Indoor Fan Motor Information:</b>						
Gree's Motor Part Number	1501180202	1501180204	1501180201	1501180203	1501180203	1501180205
Motor Manufacturer	Zhongshan Nan-feng Electrical Machinery Co.,Ltd.	Zhongshan Broad-Ocean Motor Co.,Ltd.				
Motor Manufacturer's Part Number	FN18F	FN18P	FN21P	FN23F	FN23F	FN23P
Motor Voltage	208/230	265	208/230	208/230	208/230	265
Motor Horsepower (Watts)	0.024 (17.9)	0.024 (17.9)	0.029 (21.6)	0.031 (23.1)	0.031 (23.1)	0.031 (23.1)
Motor Full Load Amps	0.1	0.2	0.2	0.2	0.2	0.2
Motor Speeds	3	3	3	3	3	3
Resistance (Ohms) Black to Brown	517.4±8% (at 68° F/20° C)	502.2±8% (at 68° F/20° C)	391.7±8% (at 68° F/20° C)	247±8% (at 68° F/20° C)	247±8% (at 68° F/20° C)	421.7±8% (at 68° F/20° C)
Resistance (Ohms) Black to Red	328.0±8% (at 68° F/20° C)	202.5±8% (at 68° F/20° C)	222.3±8% (at 68° F/20° C)	303±8% (at 68° F/20° C)	303±8% (at 68° F/20° C)	192.2±8% (at 68° F/20° C)
Resistance (Ohms) Black to Yellow	33.2±8% (at 68° F/20° C)	26.8±8% (at 68° F/20° C)	22.4±8% (at 68° F/20° C)	50.8±8% (at 68° F/20° C)	50.8±8% (at 68° F/20° C)	110.2±8% (at 68° F/20° C)
Resistance (Ohms) Black to Blue	67.0±8% (at 68° F/20° C)	48.4±8% (at 68° F/20° C)	42.2±8% (at 68° F/20° C)	80.4±8% (at 68° F/20° C)	80.4±8% (at 68° F/20° C)	159.8±8% (at 68° F/20° C)
<b>Outdoor Fan Motor Information:</b>						
Gree's Motor Part Number	150110343	150110345	150110343	15011047	15011048	150110342
Motor Manufacturer	Zhongshan Nan-feng Electrical Machinery Co.,Ltd.	Zhongshan Broad-Ocean Motor Co.,Ltd.	Zhongshan Nan-feng Electrical Machinery Co.,Ltd.	Zhongshan Nan-feng Electrical Machinery Co.,Ltd.	Zhongshan Nan-feng Electrical Machinery Co.,Ltd.	Zhongshan Broad-Ocean Motor Co.,Ltd.
Motor Manufacturer's Part Number	FW40G	FW40P	FW40G	FW65G	FW65G	FW45P
Motor Voltage	208/230	265	208/230	208/230	208/230	265
Motor Horsepower (Watts)	0.054 (40.3)	0.054 (40.3)	0.054 (40.3)	0.088 (65.6)	0.088 (65.6)	0.06 (44.7)
Motor Full Load Amps	0.4	0.3	0.4	0.6	0.6	0.35
Motor Speeds	1	1	1	1	1	1
Resistance (Ohms) Black to Brown	147±8% (at 68° F/20° C)	287.4±8% (at 68° F/20° C)	147±8% (at 68° F/20° C)	96±8% (at 68° F/20° C)	97.8±8% (at 68° F/20° C)	214.3±8% (at 68° F/20° C)
Resistance (Ohms) Black to Red	98±8% (at 68° F/20° C)	203.2±8% (at 68° F/20° C)	98±8% (at 68° F/20° C)	107±8% (at 68° F/20° C)	110.4±8% (at 68° F/20° C)	138.1±8% (at 68° F/20° C)

## CAPACITORS

For capacitor locations and identification refer to Fig. 48.

 <b>WARNING</b>
<b>ELECTRICAL SHOCK HAZARD</b>
Failure to follow this warning could result in personal injury. Capacitors are capable of holding charge similar to a battery and may cause an electrical shock.

### Capacitors

The Gree GA series model uses 3 capacitors. the compressor capacitor (designated on wiring diagram as C1), the indoor fan capacitor, and outdoor fan capacitor (both of which are designated as C2 on wiring diagram). See Fig. 60.

**NOTE:** Wiring diagram shows both indoor and outdoor fan capacitors are designated as C2. to ensure correct capacitor is tested, verify that outdoor fan capacitor is wired to M2 (outdoor fan motor ) and indoor fan capacitor is wired to M3 (indoor fan motor).

Run-circuits on single-phase compressor motors use capacitors which dramatically affect the motor operation. *Run capacitors are connected to the motor circuit at all times.*

To evaluate the capacitor, perform a visual check first. A shorted capacitor may give a visual indication of its failure. For example, the pop-out hole at the top of a start capacitor may bulge or blow out. A run capacitor may bulge or leak. In these instances, the capacitor must be replaced with one recommended by the manufacturer. If there are no visual signs of capacitor failure, testing of the capacitor resistance may be done with a volt-ohmmeter as follows:

1. **Turn off unit power** as described in *UNIT DIS-ASSEMBLY* section but do not unplug the service cord; it will supply ground connection for the unit chassis. **Check to ensure power is off and LOCKED OUT.**
2. Connect one lead of a 20,000 ohm, 2-watt resistor to the center group of terminals on the dual capacitor. Attach the other lead from the resistor to an unpainted metal section of the unit chassis. This allows that section of the dual capacitor to discharge. Repeat this process between the other group of terminals.
3. Locate and disconnect the wires from the start and/or run capacitor to isolate them from the remainder of the circuit. Refer to the unit wiring diagram (Fig. 60) if you need assistance locating wires.
4. Perform capacitor test. Set up the volt-ohmmeter to measure resistance by connecting terminals C to HERM on the meter.
5. The reading on the meter should first indicate zero, or a low resistance, then slowly rise toward infinity or some high value or measurable resistance. This indicates the capacitor is most likely good. If the reading goes to zero or a low resistance and stays there, the capacitor is likely shorted and needs replacement. If the reading immediately indicates infinity, the capacitor is likely open and must be replaced.
6. Replace the capacitor if failed and rewire according to the wiring schematic. See Fig. 60.

## CONDENSATE DRAIN VALVE

The condensate drain valve is a temperature-activated valve that begins to open when outdoor temperature drops below 59° F (15° C). The valve function allows water to build up in the basepan at higher ambient temperatures (>59° F / >15° C) and drains at lower temperatures to prevent water from freezing in the basepan. At higher ambient conditions, above 59° F (15° C), the collected water is distributed on the outdoor coil by the slinger ring and evaporated into the air passing through the heating coil. The basic location and installation of the condensate drain valve is shown in Fig. 45.

The condensate drain valve may be faulty or the outlet may be plugged if the basepan is full of water

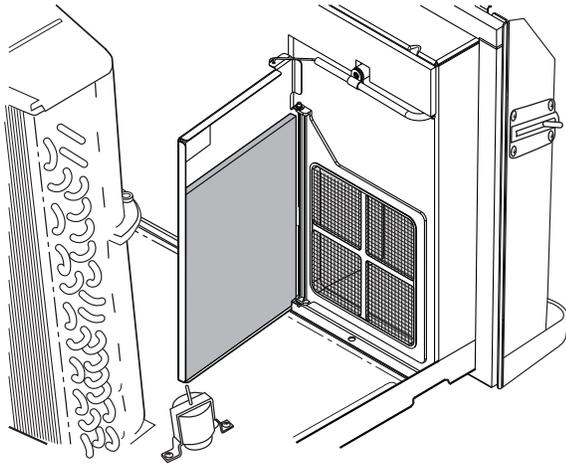


Fig. 45 – Condensate Drain Valve

A07550

at ambient temperatures below 45° F (7.2° C) (drain valve should be open), or if the outdoor fan has become frozen. If this is the case, the condensate drain valve should be inspected to determine if it may need to be replaced or if any obstructions must be removed from the drain pan opening. The condensate drain valve may also fail in the open position. If the water continuously drains from the basepan at ambient temperatures greater than 59° F (15° C), the drain valve should be inspected to determine if it may need to be replaced.

**NOTE:** If outdoor fan has become frozen due to buildup, slinger ring may have been damaged and in need of replacement. See Fig. 46.

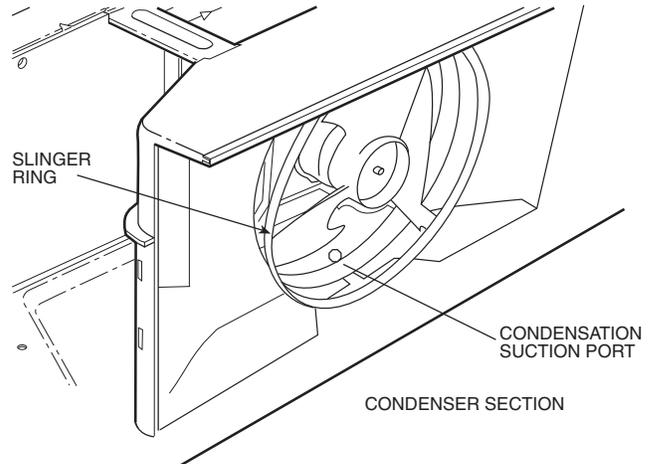


Fig. 46 – Slinger Ring

A07678

## INDOOR COIL SENSOR

The indoor coil temperature sensor is located on the return bend end of the indoor coil (closest to the control box) and is labeled “TUBE” on the schematic diagram. The sensor is mounted in a well brazed to the coil to provide better sensor response (see figure 48 for approximate location). The indoor coil temperature sensor prevents the indoor coil temperature from exceeding operating limits. The sensor wiring connects the sensor bulb to the control board in the control box. Resistance testing the indoor coil sensor will verify operation is within range. The resistance in Ohms should be taken at the board connection end of the sensor lead wires. The resistance of the indoor coil temperature sensor varies with temperature. The approximate correlation temperatures are listed in Appendix A. If the sensor resistance reading is open or shorted, the sensor has failed.

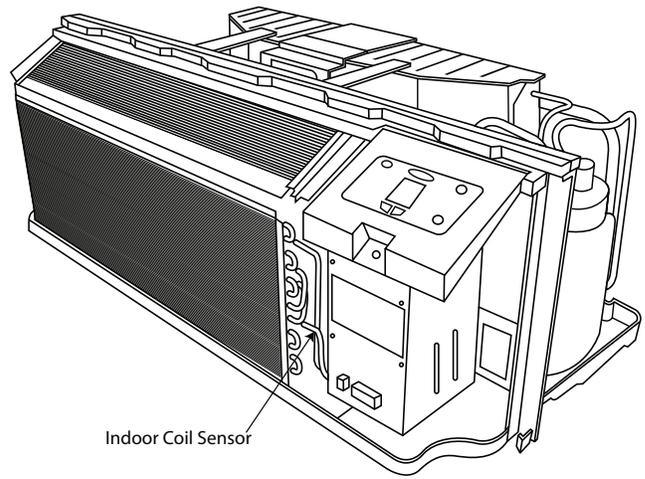


Fig. 47 – Location of Indoor Coil Sensor

A08590

## OUTDOOR COIL SENSOR

The outdoor coil temperature sensor is located on the return bend end of the outdoor coil (closest to the compressor) and is labeled “OUTTUBE” on the schematic diagram. The sensor is mounted in a well brazed to the coil to provide better sensor response (see figure 49 for approximate location). The outdoor coil temperature sensor prevents the outdoor coil temperature from exceeding operating limits and acts as the board sensor input for defrost function on heat pump units. The sensor wiring connects the sensor bulb to the control board in the control box. Resistance testing the outdoor coil sensor will verify operation is within range. The resistance in Ohms should be taken at the board connection end of the sensor lead wires. The resistance of the outdoor coil temperature sensor varies with temperature. The approximate correlation temperatures are listed in Appendix A. If the sensor resistance reading is open or shorted, the sensor has failed.

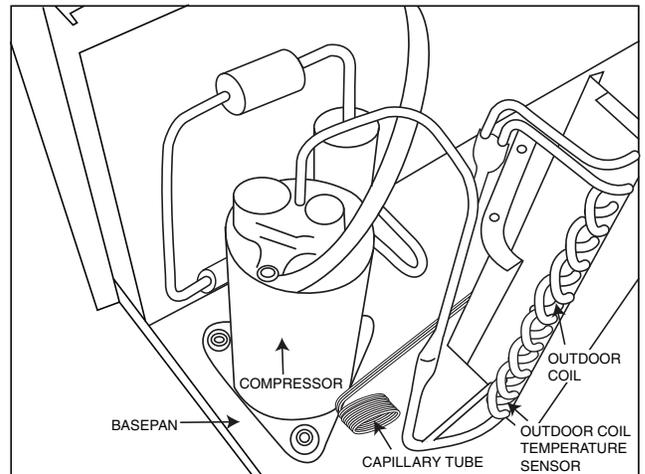


Fig. 48 – Location of Outdoor Coil Sensor

A08544

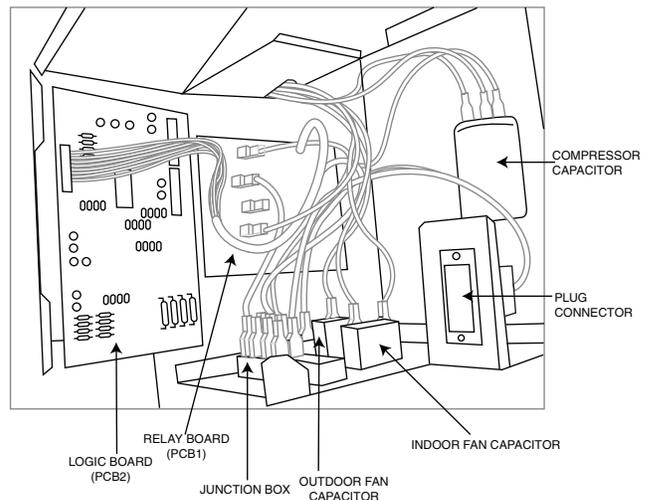


Fig. 49 – Location of Components Inside Control Box

A09324

## ROOM TEMPERATURE SENSOR

The room temperature sensor is located in the middle of the indoor coil and reads the temperature on the inside of the room. The room temperature sensor has wiring that runs to the circuit board on the inside of the control box.

The approximate correlation temperatures are listed in Appendix A. If the sensor resistance reading is open or shorted, the sensor has failed.

## OPERATING CONTROL FUNCTIONS / PROTECTIONS

### Keypad Controls

The keypad for the GREE GA series models is located on the top right of the front of the unit and serves as an interface for common user controls. See Fig. 50.

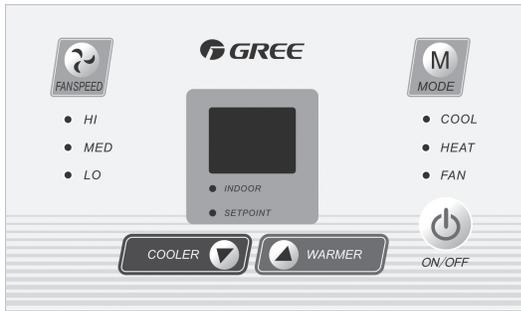


Fig. 50 – Keypad Controls

### Keypad Button Functions

There are 5 buttons on the keypad: ON/OFF, UP, DOWN, MODE, and FAN SPEED. There is a 3 second delay between mode changes but the display will change immediately. This will prevent going in and out of modes while scrolling through keypad.

#### While in OFF Mode:

Only ON/OFF, UP, DOWN, and MODE buttons are enabled. If UP or DOWN buttons are pressed, a 7 segment display will show indoor air temperature for 15 seconds. If ON/OFF or MODE buttons are pressed, the unit will be started in last used mode setting.

#### While in ON Mode:

All buttons are enabled. The button functions are defined below.

Button	Function
ON/OFF	Turns unit ON or OFF when pressed
MODE	Switches run mode between COOL, HEAT, and FAN ONLY
FAN SPEED	Specifies HIGH, MED, or LOW fan speed when pressed
UP	Increases the temperature set point value
DOWN	Decreases the temperature set point value

### Keypad selected functions

#### FAN ONLY Mode

FAN ONLY and MEDIUM fan speed is the default mode when unit is first powered ON.

While in FAN ONLY mode:

- The FAN ONLY mode LED indicator is ON as well as the requested fan speed LED indicator.
- The indoor fan will run at the requested fan speed (High, Medium, or Low).
- The compressor and electric heat are disabled.
- The UP and DOWN buttons on the keypad will be disabled.
- The air temperature of the room is displayed (display range is between 32° F~ 122° F, 0° C ~ 50° C).
- The indoor LED indicator will be on, showing the room temperature.
- Fan speed will remain constant during changes to other modes of operation.

#### OFF Mode:

While unit is in OFF mode:

- The 7 segment display will be blank.
- The Power LED indicator will be red to show the unit is still plugged in. All other indicator LEDs will be off.
- All outputs will be disabled but Freeze Guard protection feature will still be available (see *Freeze Guard* section).

#### COOL Mode:

While unit is in COOL Mode:

- Reversing valve is de-energized
- COOL Mode LED indicator is ON
- Setpoint LED indicator is ON and 7 segment display shows temperature setpoint value (unless configured to show room temp.)
- Setpoint remains constant with mode changes.
- Fan speed remains constant with mode changes.

#### Regular Cooling Operation:

1. If indoor air temperature + temperature cool bias is greater than or equal to temperature setpoint + 2° F (1° C):
  - Cooling is requested
  - Outdoor fan starts to run
  - Indoor fan motor runs at fan speed requested
  - 10 seconds later, the compressor is allowed to start up
  - Fan motors will energize immediately

**NOTE:** Compressor may not start because of internal protections or timers (see *Diagnostic* section).

2. When indoor air temperature + cool bias is less than or equal to temperature setpoint - 2° F (1° C):
  - Cooling is satisfied
  - Compressor and outdoor fan stop running
  - Indoor fan motor runs at the requested fan speed

**NOTE:** If fan cycle for cooling mode has been selected through dip switches, the indoor fan will operate for 60 seconds after the compressor has de-energized. CYCLE Mode will not override any protections which requires the indoor fan to be ON.

### **COOLING Mode protections**

#### **Outdoor Coil High Temperature Protection**

**Safety Start Condition:** If outdoor coil temperature rises above 149° F (65° C) continuous for 1 minute, the outdoor coil high temperature protection is activated and compressor will turn off.

**Safety Stop Condition:** If the outdoor coil high temperature protection is active and outdoor coil temperature falls below 131° F (55° C) continuously for 2 minutes, the outdoor coil high temperature protection de-activates and compressor will be allowed to restart.

#### **Indoor Coil Anti-Freeze Protection**

**Safety Start Condition:** If indoor coil temperature falls below 28° F (-2° C) continuously for 1 minute, the indoor coil anti-freeze protection is activated. The compressor and outdoor fan will turn off.

**Safety Stop Condition:** if the indoor coil anti-freeze protection is active and indoor coil temperature rises above 40° F (5° C) continuously for 2 minutes, the indoor coil anti-freeze protection de-activates. The compressor and outdoor fan will be allowed to restart.

#### **Temperature Setpoint Limit**

This feature is a configurable option that applies to both heating and cooling modes. It allows the owner to configure what the minimum and maximum setpoint values will be, regardless of what the user selects on the display.

The following ranges can be selected through use of dipswitches. Refer to *Dip Switch* section.

Range 1: 61~ 86° F (16~ 30° C)+

Range 2: 63~ 80° F (18~ 28° C)

Range 3: 65~ 78° F (19~ 26° C)

Range 4: 68~ 75° F (20~ 24° C)

**NOTE:** The unit setpoint display will show the full range of 61~ 86° F (16~ 30° C) no matter which limit

range is selected. The software will control to the actual setpoint limit selected.

### **Heat Mode**

While the unit is in HEAT mode:

- The reversing valve stays energized as long as heat pump heating is being used.
- HEAT mode LED indicator is ON, requested fan speed LED indicator is ON, and the 7 segment display will show setpoint temperature (unless configured to show room temperature).
- Setpoint and fan speed remain constant with mode changes.

### **Regular Heating Operation:**

#### **Heat Pump Models**

**NOTE:** The compressor and electric heaters are not allowed to run at the same time. The regular operation conditions are defined below.

1. If indoor temperature - temperature heat bias falls between 5° F (3° C) less than the setpoint temperature, and 2° F (1° C) less than the setpoint temperature, the following occurs:
  - Heating is requested
  - Reversing valve becomes energized
  - Outdoor fan starts to run
  - Indoor fan starts to run at requested fan speed
  - 10 seconds later, compressor is allowed to restart
2. If indoor temperature - temperature heat bias falls to less than setpoint temperature -5° F (-3° C), the electric heater will be used to produce heat quickly (compressor will turn off if it was on), the indoor fan will run at requested speed. Once step 2 is initiated, the unit will continue to heat with electric heat until the demand is satisfied.
3. If heat pump is needed while the compressor is disabled by protection, the electric heater will replace the compressor after a 15 second delay.
4. If indoor temperature - temperature heat bias is greater than setpoint temperature +2° F (+1° C):
  - Heating satisfied (heating demand is off)
  - Compressor or electric heater stops
  - If configured for fan cycle (through dip switch setting), the indoor fan will continue to run at the requested speed for 60 seconds to blow the remaining heat from the unit. Fan will then turn off.
  - If configured for continuous mode, the indoor fan will run at the user selected speed.

## Heat/Cool Models

Heat/Cool models use electric heat only for heating. Normal operating conditions are defined below:

1. If indoor temperature - temperature heat bias is less than or equal to the setpoint temperature -2° F (1° C), the electric heater starts up and the indoor fan will run at requested speed.
2. If indoor temperature - temperature heat bias is greater than setpoint temperature +2° F (1° C):
  - Heating is satisfied (heating demand is off)
  - Electric heater stops
  - If configured for fan cycle (through dip switch setting), the indoor fan will continue to run at the requested speed for 60 seconds to blow the remaining heat from the unit. Fan will then turn off.
  - If configured for continuous mode, the indoor fan will run at the user selected speed.

## Heating mode protections

### **Indoor Coil High Temperature Protection (Heat Pump Models Only)**

**Safety Start Condition:** If indoor coil temperature rises above 136° F (58° C) continuously for 1 minute, the indoor coil high temperature protection activates. The compressor and outdoor fan will be turned off.

**Safety Stop Condition:** If the outdoor coil high temperature protection is active and outdoor coil temperature falls below 126° F (52° C) continuously for 2 minutes, the indoor coil high temperature protection de-activates. The compressor and outdoor fan will be allowed to restart (all other safeties and protections will still be enforced).

### Sound Protection

When turning the unit off or changing the operation mode, the reversing valve will de-energize 2 minutes after the compressor has stopped.

### Defrost (Heat Pump Models Only)

**Safety Start Condition:** If the outdoor coil temperature falls below 28° F (-2° C) continuously for 1 minute and the accumulated compressor run time is above the minimum run time, DEFROST activates. The compressor and outdoor fan will stop and the electric heater will replace the compressor until DEFROST de-activates.

**Safety Stop Condition:** If DEFROST is active and the outdoor coil temperature rises above 40° F (5° C) continuously for 10 minutes, DEFROST de-activates and the compressor and outdoor fan will be allowed to restart at the next heating cycle.

## MISCELLANEOUS PROTECTIONS

### Freeze Guard Protection

Freeze Guard Protection is only active in OFF, FAN ONLY, and COOL modes

**Safety Start Condition:** If Freeze Guard Protection is enabled (dip switch) and the indoor air temperature is below 40° F (5° C), Freeze Guard activates. The electric heater and indoor fan will turn ON and the 7 segment display will show “FP”.

NOTE: Freeze Guard Protection mode cannot be stopped using the keypad or wall thermostat.

**Safety Stop Condition:** When the indoor air temperature rises to 50° F (10° C), Freeze Guard de-activates.

### Temperature Sensor Open/Short Failure

If any temperature sensor has an open or short failure, a warning signal will be sent to the main STATUS LED indicator and the 7 segment display will show the failure code. When this happens in COOLING or FAN ONLY modes, only the indoor fan is allowed to run. For HEAT mode, all outputs will be disabled.

### Minimum Compressor ON Time

Any time the compressor relay turns ON, there must be a 3 minute minimum run-time regardless of the actual room temperature. This function prevents short-cycling of the compressor. This protection can be over-ridden by: other protections, turning the unit off, a mode change, or adjusting the setpoint.

### Minimum Compressor OFF Time

Any time the compressor switches OFF, or power is reset, the compressor will stay off for a random time period of 2 minutes, 45 seconds to 3 minutes, 15 seconds. This allows pressures to equalize.

### Timer Speed-Up

For easier field service, push UP and DOWN buttons at the same time and hold for 3 seconds. This will speed up the internal timers for one compressor ON cycle.

### Other Safety Protections

Whenever the compressor or electric heater runs, the indoor fan is always ON. If a wall thermostat is being used and there is a request for the compressor or electric heater, but no fan, the indoor fan will run at MED speed by default.

The compressor and electric heater will never be allowed to run at the same time.

# CONFIGURATION

## Dipswitches

Auxiliary dip switch controls can easily be found behind front panel.

To access, remove front panel. See Fig. 3.

7 Dip switches are accessible without opening the control box.

**IMPORTANT: Unit must be powered down to change their status. See Fig. 51 and Fig. 52.**

Factory settings for dip switches will be in the **DOWN** position. See *Dip Switch Functions* Table for the function of each dip switch position.

**NOTE:** The Unit Type Selector dip switch is NOT accessible without first opening the electrical box. the Unit Type Selector switch defines the unit type where ON is for heat pump, and OFF is for heat/cool. Effective changing of Unit Type Selector status requires the unit to be turned off.

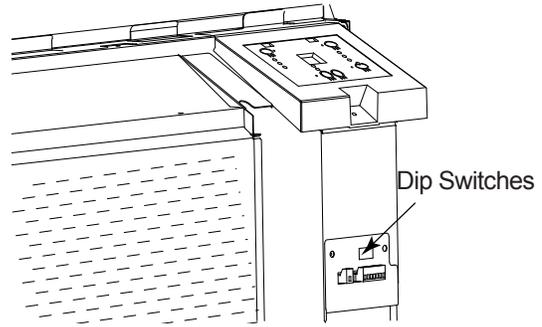


Fig. 51 – Dipswitch Location on Unit

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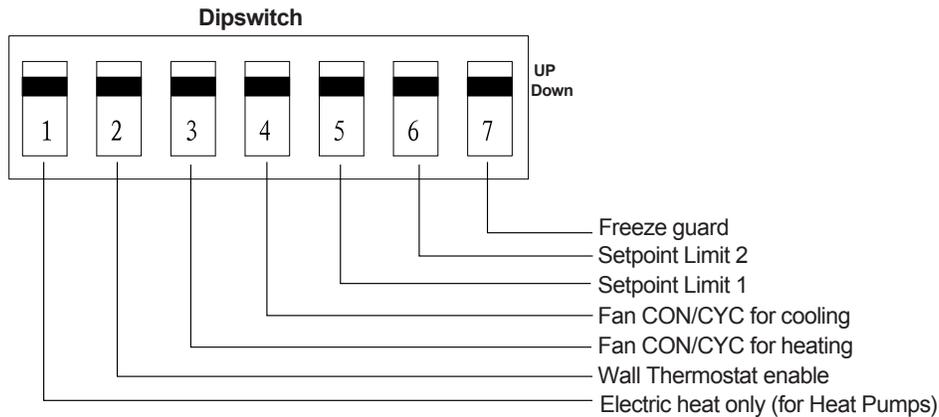


Fig. 52 – Dip Switches

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### DIP SWITCH FUNCTIONS

No,	UP		DOWN		REMARKS	DEFAULT
1	Electric Heat Only		Heat Pump		For Heat Pump unit only.	DOWN
2	Wall Thermostat Enable		Control Panel Enable			DOWN
3	Fan Continuous Run for Heating		Fan Cycle for Heat			DOWN
4	Fan Cycle for Cool		Fan Continuous Run for Cooling			DOWN
5*6	UP*UP 68–75 °F 20–24 °C	UP*DOWN 63–80 °F 18–28 °C	DOWN*UP 65–78 °F 19–26 °C	DOWN*DOWN 61–86 °F 16–30 °C (full range)	Two configurations (5*6) combine to select set point range. The display always shows the full range.	DOWN*DOWN 61–86 °F 16–30 °C
7	Freeze Guard Disable		Freeze Guard Enable			DOWN

## **Keypad Configuration**

Allows further configuration of system.

**NOTE:** Changes do not take affect until power is cycled on the unit.

### **To enter Keypad configuration**

Cycle power to unit. Press and hold the Fan Speed Button and the setpoint DOWN button for 5 continuous seconds, within 30 seconds of the unit being powered up. If the unit has had power for more than 30 continuous seconds, keypad configuration cannot be entered. When keypad configuration mode is first entered, it will default to Fahrenheit/ Celsius Display Mode.

### **To scroll through the Keypad Configuration Options**

Press and release the Fan Speed button. The stored value will be displayed.

### **To modify configuration settings**

Press and release the Setpoint Up or Setpoint Down buttons.

### **To exit Keypad Configuration**

Keypad Configuration will end on its own 30 seconds after the last button press or when the MODE button on the Keypad is pressed.

### **Fahrenheit/ Celsius Display Switch:**

Change between degrees Fahrenheit and Celsius on the display. An “F” indicates Fahrenheit display and ‘C’ indicates Celsius. Default is degrees “F”.

### **Indoor Air Temperature Sensor Biasing for Cooling mode:**

Sometimes known as an anticipator, the air temperature sensor bias is used to adjust the room air temperature reading when in cooling mode. (Not normally required.) Default biasing value is zero.

**NOTE:** The range for biasing change is  $-6^{\circ}\text{F}$  to  $+6^{\circ}\text{F}$  ( $-3^{\circ}\text{C}$  to  $+3^{\circ}\text{C}$ )

### **Indoor Air Temperature Sensor Biasing for Heating mode:**

Sometimes known as an anticipator, the air temperature sensor bias is used to adjust the room air temperature reading when in heating mode. (Not normally required.) Default biasing value is zero.

**NOTE:** The range for biasing change is  $-6^{\circ}\text{F}$  to  $+6^{\circ}\text{F}$  ( $-3^{\circ}\text{C}$  to  $+3^{\circ}\text{C}$ )

### **Indoor Temperature Display:**

Change between showing setpoint only on the display during heating and cooling modes “SP” or displaying room temperature during heating and cooling modes “AA”. “SP” mode is the default mode.

- If “SP” is selected, only the setpoint will be displayed during heating and cooling modes, regardless of what the real temperature is in the room.
- If “AA” mode is selected, the room temperature will be displayed during heating, cooling and fan only modes.
  - If the mode button has been changed to either heating or cooling modes, setpoint will be displayed for 10 seconds. After the 10 seconds, the room temperature will again be displayed.
  - If the on/off button is depressed (when the unit is off) and the last mode was either cooling or heating mode, the setpoint will be displayed for 10 seconds before displaying room temperature.
  - During heating and cooling modes, if either the up or down setpoint button is depressed, the display will show the setpoint for 10 seconds after the last up or down button press. Then the room temperature will be displayed again.

## WALL THERMOSTAT INTERFACE

### Wall Thermostat Terminal

**NOTE:** If configured for a wall thermostat, the digital display and buttons on the control pad become disabled.

**IMPORTANT: Only trained, qualified personnel should access electrical panel on unit and install electrical accessories. Please contact your local electrical contractor, dealer, or distributor for assistance.**

**! WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.  
Disconnect all power to unit to avoid possible electrical shock during service or installation.

### Wall thermostat terminal connections

The wall thermostat terminal block is located behind the front panel and is easily accessible.

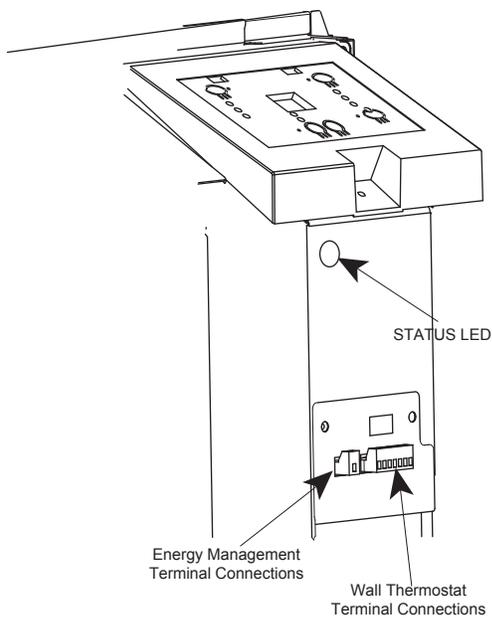


Fig. 53 – Terminal Connector and Status LED Location

A07088

**! CAUTION**

**UNIT DAMAGE HAZARD**

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

Improper wiring may damage unit electronics. Common busing is not permitted. Damage or erratic operation may result.

### Thermostat Wire Routing

Thermostat wire is field supplied. Recommended wire gauge is 18 to 20 gauge solid thermostat wire.

**NOTE:** It is recommended that extra wires are run to unit in case any are damaged during installation.

Thermostat wire should always be routed around or under, **NEVER** through, the wall sleeve. The wire should then be routed behind the front panel to the easily accessible terminal connector. See Fig 45.

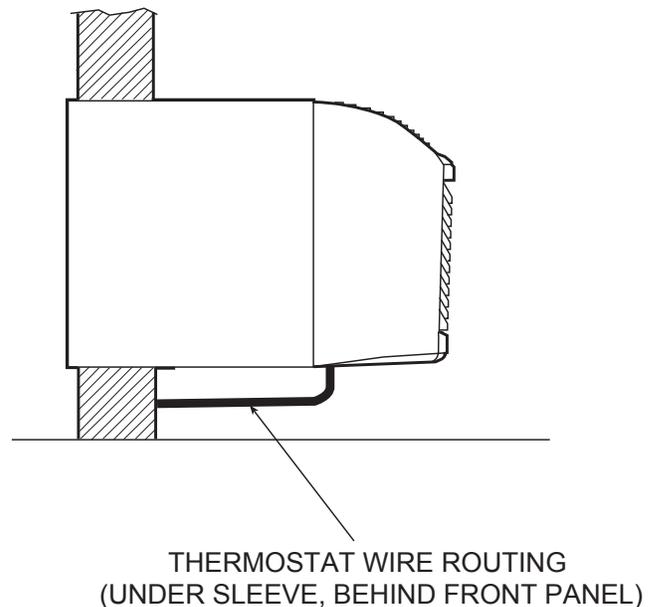


Fig. 54 – Proper Wire Routing Beneath Unit

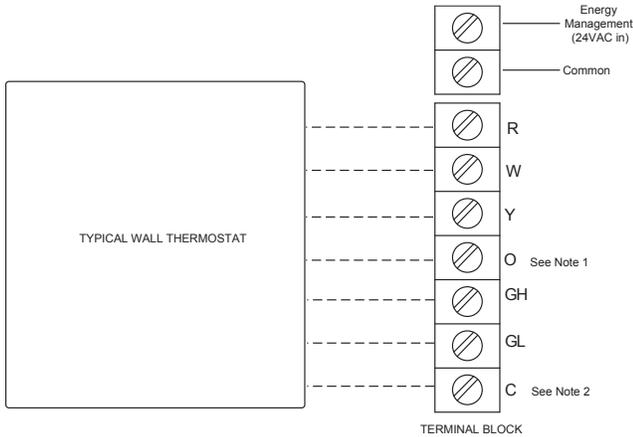
A07074

## Wiring Thermostat To Unit

Wire wall thermostat input as defined in Fig. 55.

**NOTE:** Terminal connector can be removed and replaced to simplify the wiring (see Fig. 56).

**NOTE:** For heat pump models, anytime there is a second-stage call for heating from the wall thermostat, the unit will automatically switch over to electric heating.



### NOTES:

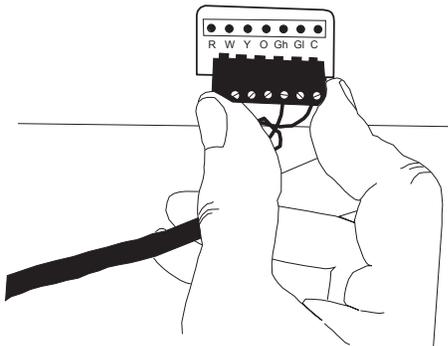
1. Use terminal "O" for heat pump connection only.
2. Terminal "C" (common) is typically only required for digital thermostats.

A07076

TERMINAL	DESIGNATION
R	24 VAC
W	Electric Heat
Y	Compressor
O	Reversing Valve
GH	High Fan
GL	Low Fan
C	Common

**NOTE:** Any illegal input combinations will be captured as thermostat wiring failures and will light the STATUS LED indicator on main board (see *Intelligent Self-Checking Control* section)

Fig. 55 – Wiring Connections



A07073

Fig. 56 – Terminal Connector Removal and Replacement

## Install Thermostat Wiring

1. Check to be sure power to unit is disconnected.
2. Pull terminal connector to remove
3. Connect wires from the thermostat to terminals on unit terminal connector.
4. Reinstall terminal connector.
5. Ensure that unit is configured for wall thermostat enable.
6. Replace control panel label with wall thermostat label (included with Owner's Manual). See Fig. 57.
7. Restore power to unit.
8. Typical wiring schematic for multiple units connected to single wall thermostat is shown in Fig. 58.

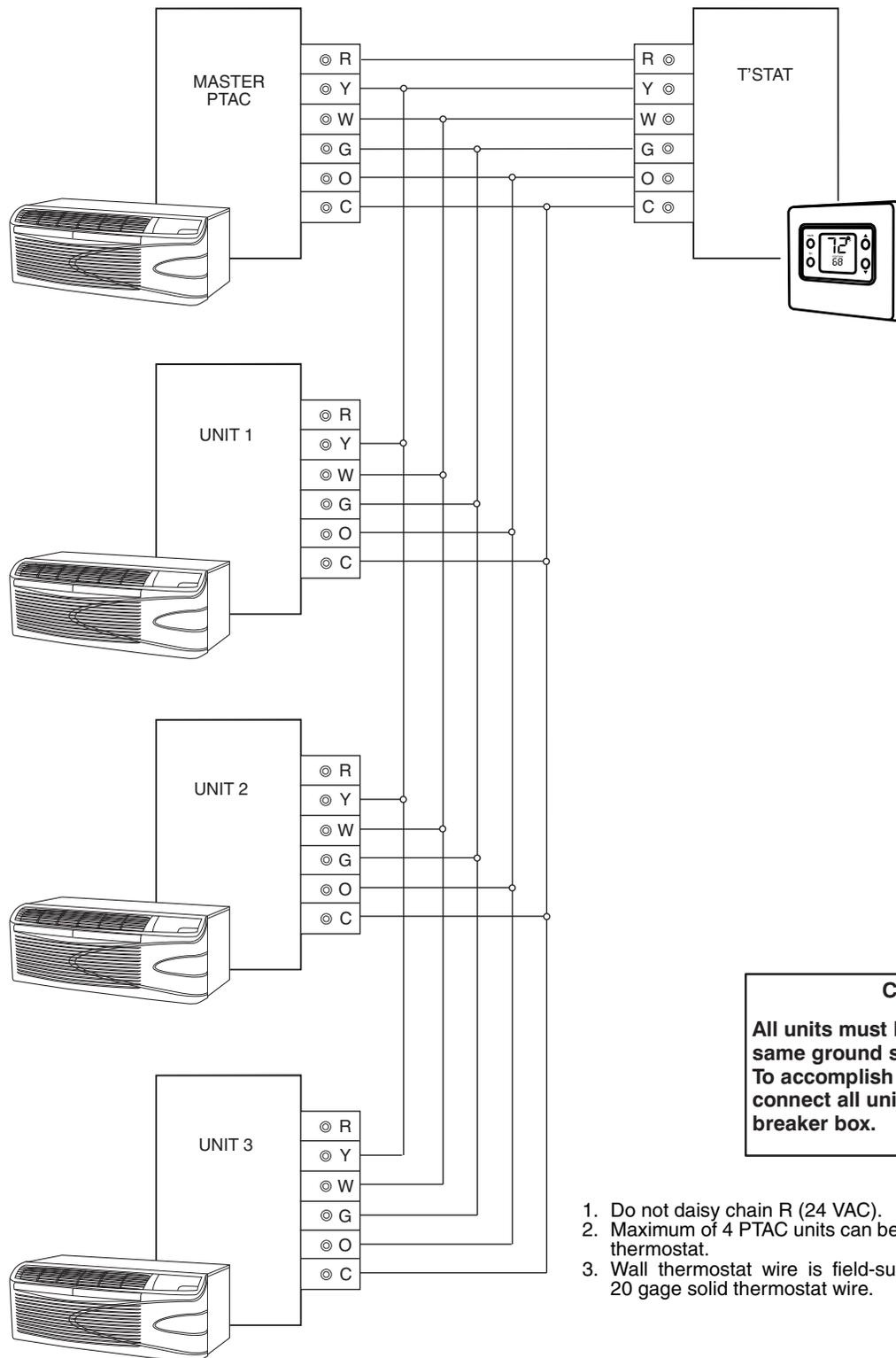


A07315

Fig. 57 – Wall Thermostat Control Panel Label

**NOTE:** For thermostats that have only one fan speed output (on or auto), the fan speed is determined by how the terminal connector is wired. If Low fan is desired, wire the G output from the thermostat to GL on the unit's terminal block. If Hi fan is desired, wire the G output from the thermostat to GH on the unit's terminal block.

**NOTE:** After proper installation, if your thermostat is not working properly, refer to the *Trouble Shooting* section.



**CAUTION**

**All units must be connected to the same ground source. To accomplish this, be sure to connect all units back to the same breaker box.**

1. Do not daisy chain R (24 VAC).
2. Maximum of 4 PTAC units can be connected to one single wall thermostat.
3. Wall thermostat wire is field-supplied and should be 18 to 20 gage solid thermostat wire.

**Fig. 58 – Typical Wiring Schematic for Multiple PTAC Units Connected to a Single Wall Thermostat**

A07391

## ENERGY MANAGEMENT INPUT (FRONT DESK CONTROL)

The controller can handle a switch signal from remote energy management input, called EM signal or front desk control. Input must be 24VAC. If system receives a 24VAC signal, it will turn unit off;

otherwise, the unit runs in normal control. This function will be disabled under Freeze Guard protection. For energy management wiring schematic, see Fig. 59.

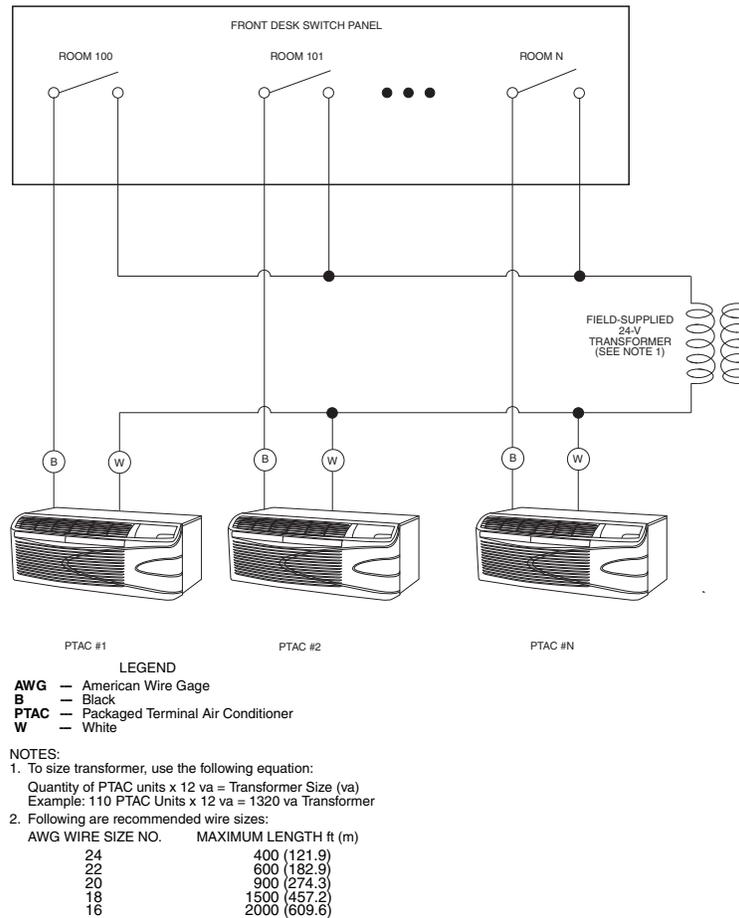


Fig. 59 – Energy Management Wiring Schematic

A07390

## CONTROL DIAGNOSTICS

### Intelligent Self-Checking Control

Your Gree PTAC has a computer board that continuously checks key components of the unit to ensure they are operating properly. Under normal operation, unit status indicator (STATUS, on main PCB), light is steadily ON. If there is a major problem, the unit will shut down and display a

diagnostic failure code on the unit's display. If it is only a minor failure and unit is correcting the fault by itself, the diagnostic code will be flashed on the status LED that can easily be seen when the front panel is removed (see Fig. 53). Failure STATUS codes are defined in the table below.

### STATUS LED INDICATOR DEFINITIONS

1	Indoor air temp sensor open/short	7–segment display 'F1', with STATUS light flash 1 time, off 2 seconds
2	Indoor coil sensor open/short	7–segment display 'F2', with STATUS light flash 2 time, off 2 seconds
3	Outdoor coil sensor open/short	7–segment display 'F4', with STATUS light flash 4 time, off 2 seconds
4	Freeze Guard protection	7–segment display 'FP'
5	Thermostat wiring error	STATUS light flash 9 times and off 3 sec, repeat
6	Indoor coil high temp protection	STATUS light flash 8 times and off 3 sec, repeat
7	Defrost (heat pump type)	STATUS light flash 7 times and off 3 sec, repeat
8	Outdoor coil high temp protection	STATUS light flash 6 times and off 3 sec, repeat
9	Indoor coil freeze protection	STATUS light flash 5 times and off 3 sec, repeat

**NOTE:** When status light is flashing, it will be ON for 0.5 seconds and OFF for another 0.5 seconds.

LEGEND	
AP1	Main Circuit Board
AP2	Relay Circuit Board
AP3	Display Circuit Board
C1	Compressor Capacitor
C2	Fan Motor Capacitor
L1, L2	Electric Heater Relay
L3	Compressor Relay
M1	Compressor Motor
M2	Outdoor Fan Motor
M3	Indoor Fan Motor
OUTTUBE	Outdoor Coil Sensor
ROOM	Room Air Temp. Sensor
SAT	Compressor Overload
TC	Transformer
TRIN-24V	Transformer 24 Volt Connector
TUBE	Indoor Coil Sensor
X1	Main Power Connector
X2	Heater Connector
X3	Heater Limit Connector
X4	Indoor Fan Motor Connector
X5,X6	Transformer Connector
X7,X8	Board Jumper Connector
XT1	Terminal Block (White)
XT2	Terminal Block (Black)
YV	Reversing Valve (Heat Pump Units)

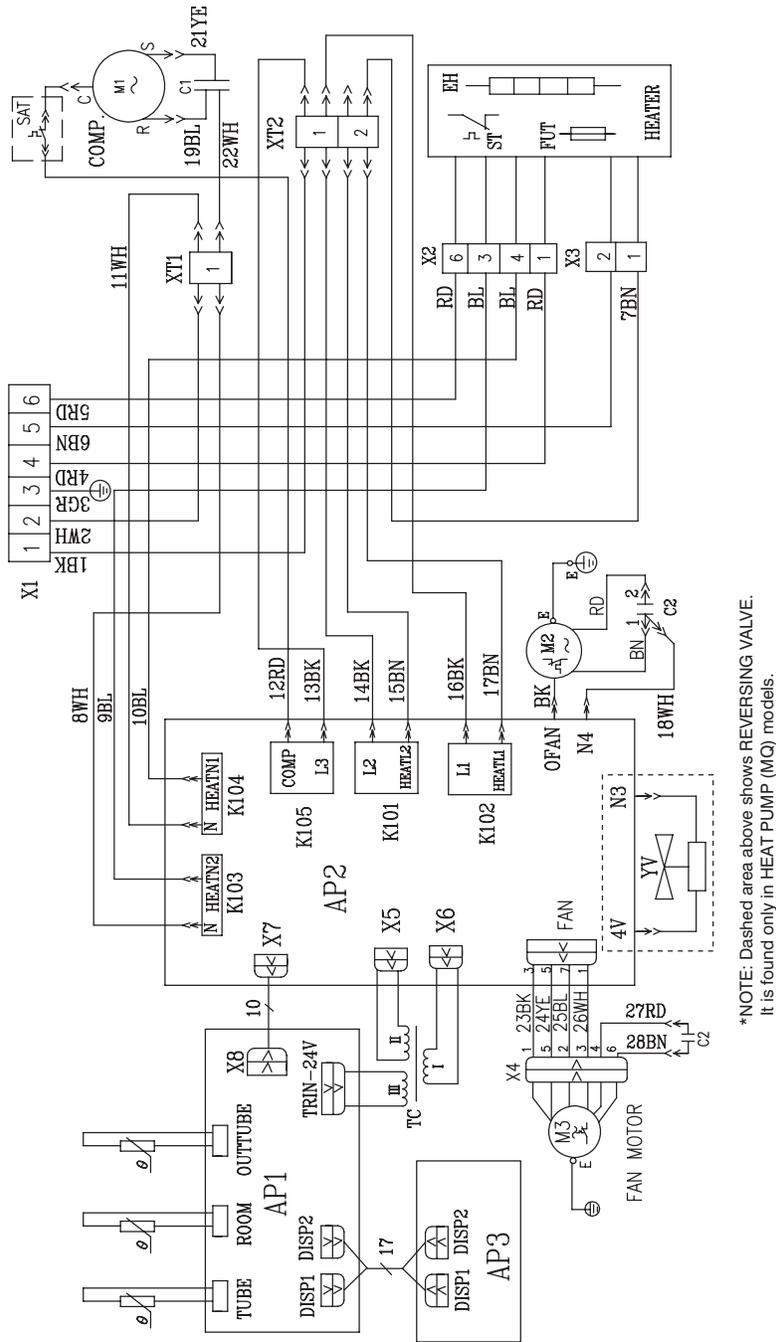


Fig. 60 – Typical Wiring Schematic for Standard Units

# TROUBLESHOOTING

POSSIBLE CAUSES	SOLUTIONS
<p><b>UNIT DOES NOT START</b></p> <ul style="list-style-type: none"> <li>Unit may have become unplugged</li> <li>Fuse may have blown</li> <li>Circuit breaker may have been tripped</li> <li>Unit may be off or in wall thermostat mode. Check section on dipswitch settings to verify dipswitches are set properly.</li> <li>Unit may be in a protection or diagnostic failure mode. See section on Intelligent Self-checking Control.</li> </ul>	<ul style="list-style-type: none"> <li>Check that plug is plugged securely in wall receptacle. <b>Note</b> :Plug has a test/reset button on it. Make sure that the plug has not tripped.</li> <li>Replace the fuse. See Note 1.</li> <li>Reset circuit breaker. See Note 1.</li> <li>Turn unit on (bottom right button on keypad). <b>Note</b>: If the unit turns on, the LED will be green. If the unit is off, the LED will be red. If there is no LED on, there is a problem with power or damage to the control.</li> </ul>
<p><b>UNIT NOT COOLING/HEATING ROOM</b></p> <ul style="list-style-type: none"> <li>Unit air discharge section is blocked</li> <li>Temperature setting is not high or low enough <b>Note</b>: Setpoint limits may not allow the unit to heat or cool the room to the temperature desired. Check section on dipswitch settings.</li> <li>Unit air filters are dirty.</li> <li>Room is excessively hot or cold when unit is started.</li> <li>Vent door left open</li> <li>Unit may be in a protection or diagnostic failure mode. Check section on Intelligent Self-checking Control.</li> <li>Compressor is in time delay. There is a protective time delay (approx. 3 minutes) on starting the compressor after a power outage (or restarting after it has been turned off), to prevent tripping of the compressor overload.</li> </ul>	<ul style="list-style-type: none"> <li>Make sure that curtains, blinds or furniture are not restricting or blocking unit airflow.</li> <li>Reset to a lower or higher temperature setting.</li> <li>Remove and clean filters.</li> <li>Allow sufficient amount of time for unit to heat or cool the room. Start heating or cooling early before outdoor temperature, cooking heat or gatherings of people make room uncomfortable.</li> <li>Close vent door.</li> <li>Check dipswitch settings for desired comfort.</li> </ul> <p>Wait approximately 3 minutes for compressor to start</p>
<p><b>DISPLAY HAS STRANGE NUMBERS/CHARACTERS ON IT</b></p>	<ul style="list-style-type: none"> <li>The unit may be in a diagnostic condition. Check Intelligent Self-checking Control section to determine if unit has had a failure.</li> <li>The unit may be set for °C (instead of °F), see the keypad configuration section</li> </ul>
<p><b>UNIT MAKING NOISES</b></p>	<ul style="list-style-type: none"> <li>Clicking, gurgling and whooshing noises are normal during operation of unit.</li> </ul>
<p><b>WATER DRIPPING OUTSIDE</b></p>	<ul style="list-style-type: none"> <li>If a drain kit has not been installed, condensation runoff during very hot and humid weather is normal. See Note 2. If a drain kit has been installed and is connected to a drain system, check gaskets and fittings around drain for leaks and plugs.</li> </ul>
<p><b>WATER DRIPPING INSIDE</b></p> <ul style="list-style-type: none"> <li>Wall sleeve is not installed level</li> </ul>	<ul style="list-style-type: none"> <li>Wall sleeve must be installed level for proper drainage of condensation. Check that installation is level and make any necessary adjustments.</li> </ul>
<p><b>ICE OR FROST FORMS ON INDOOR COIL</b></p> <ul style="list-style-type: none"> <li>Low outdoor temperature</li> <li>Dirty filters</li> </ul>	<ul style="list-style-type: none"> <li>When outdoor temperature is approximately 55°F (12.8°C) or below, frost may form on the indoor coil when unit is in Cooling mode. Switch unit to FAN operation until ice or frost melts.</li> <li>Remove and clean filters.</li> </ul>
<p><b>COMPRESSOR PROTECTION</b></p> <ul style="list-style-type: none"> <li>Power may have cycled, so compressor is in a restart protection.</li> </ul>	<ul style="list-style-type: none"> <li><b>Random Compressor restart</b> – Whenever the unit is plugged in, or power has been restarted, a random compressor restart will occur. After a power outage, the compressor will restart after approximately 3 minutes.</li> <li><b>Compressor Protection</b> – To prevent short cycling of the compressor, there is a random start-up delay of 3 minutes and a minimum compressor run time of 3 minutes.</li> </ul>

**NOTES:**

- If circuit breaker is tripped or fuse is blown more than once, contact a qualified electrician.
- If unit is installed where condensation drainage could drip in an undesirable location, an accessory drain kit should be installed and connected to drain system.

# CARE AND CLEANING

## GENERAL CLEANING

Maintaining proper performance of Gree GA series PTAC requires conscientious cleaning and care of components. See Figure 52. Specific components require periodic cleaning and/or replacement, including the following:

### COMPONENT CLEANING SCHEDULE

Indoor Air Filter	Monthly
Vent Air Filter	Monthly
Indoor Coil	Seasonally
Indoor Fan	Seasonally
Outdoor Coil	Seasonally

## CLEANING AND SAFETY

Before starting to clean a unit, read the instructions thoroughly and gather the necessary tools for the job. Review all safety information on unit and in literature.

### Consider the following safety issues before beginning:

- New and unfamiliar tasks should be performed under the supervision of an experienced service technician.
- Personal protective equipment, such as safety glasses and work gloves, should be used.
- The floor around the work area should be clean and free of debris.
- The unit weighs up to 150 pounds (68 kg). Use a lifting device or ask for assistance if the unit must be moved.
- Make sure tools are the correct tools for the job, and that they are working properly and in good condition.

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

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

Before cleaning, servicing, performing maintenance, or removing the chassis from the wall sleeve, disconnect all power to the unit.

Only trained and qualified service personnel should perform installation and service procedures on these units. Untrained personnel may perform basic maintenance tasks such as cleaning and replacing filters. Refer to Accessing Unit Components section of this manual for proper procedures to disconnect power to units.

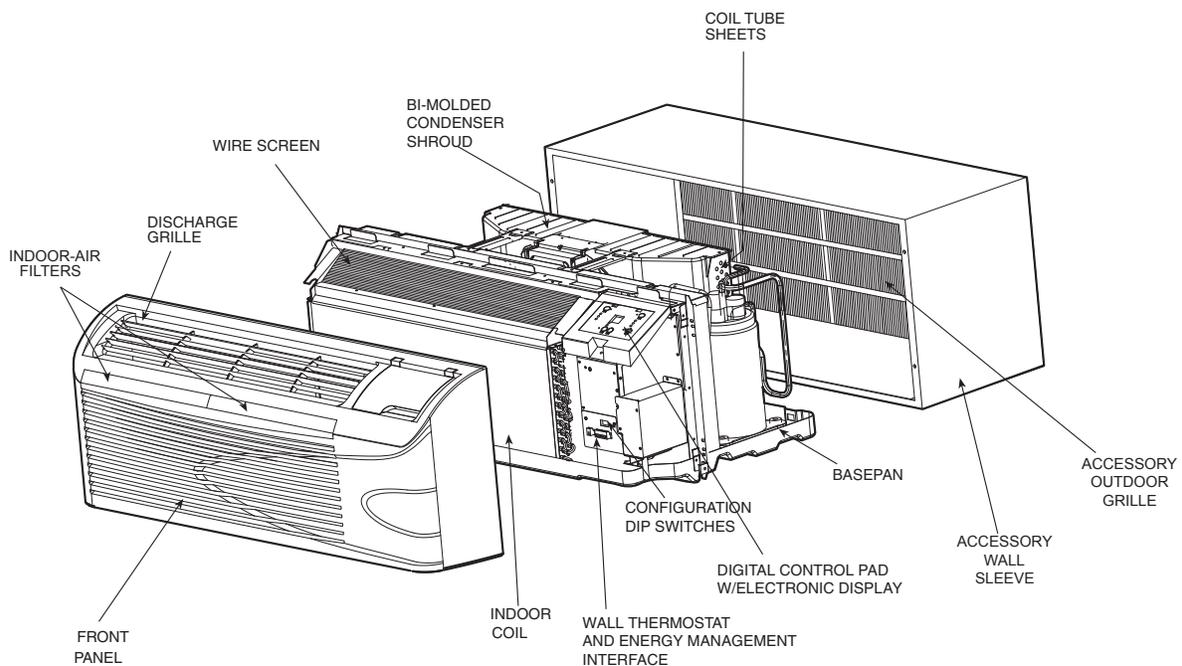


Fig. 61 – Typical GA series PTAC System

## CARE AND CLEANING (CONTINUED)

### FRONT PANEL AND CASE

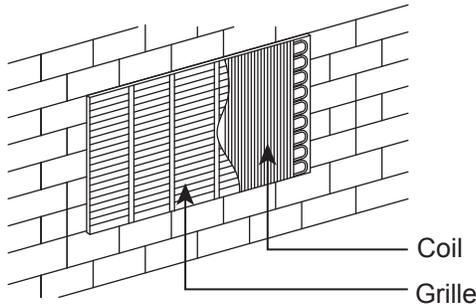
Turn unit off and disconnect power supply.

To clean, use water and a mild detergent. **DO NOT** use bleach or abrasives. Some commercial cleaners may damage the plastic parts.

### OUTDOOR COIL

Coil on outdoor side of unit should be checked regularly. Unit will need to be removed to inspect dirt build-up that will occur on the inside of the coil. If clogged with dirt or soot, coil should be professionally cleaned.

**NOTE:** Never use a high-pressure spray on coil.



Clean inside and outside of outdoor coil regularly

Fig. 62 – Outdoor Coil

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### AIR FILTERS

**IMPORTANT: TURN UNIT OFF BEFORE CLEANING**



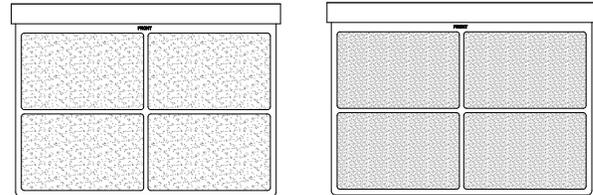
## CAUTION

#### UNIT DAMAGE HAZARD

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

**Do not** operate unit without filters in place. If a filter becomes torn or damaged, it should be replaced immediately.

Operating without filters in place or with damaged filters will allow dirt and dust to reach indoor coil and reduce cooling, heating, airflow and efficiency of unit. Airflow restriction may cause damage to unit.



Dirty filter -  
Needs cleaning

Clogged filter -  
Greatly reduces cooling,  
heating and airflow.

A07078

Fig. 63 – Identifying Clogged Filter

The most important thing you can do to maintain unit efficiency is to clean the filters at least every 30 days (or sooner depending on application). Clogged filters reduce cooling, heating and airflow.

#### Keeping filters clean will:

- Decrease cost of operation.
- Save energy.
- Prevent clogged indoor coil.
- Reduce risk of premature component failure.

#### To Clean Air Filters:

- Vacuum off heavy soil.
- Run water through filters.
- Dry thoroughly before replacing.



## CAUTION

#### UNIT DAMAGE HAZARD

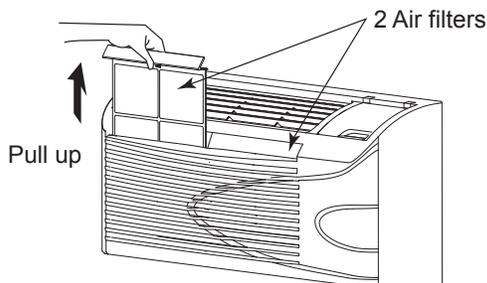
Failure to follow this caution may result in equipment damage or improper operation.

Airflow restriction may cause damage to the unit.

### BASE PAN

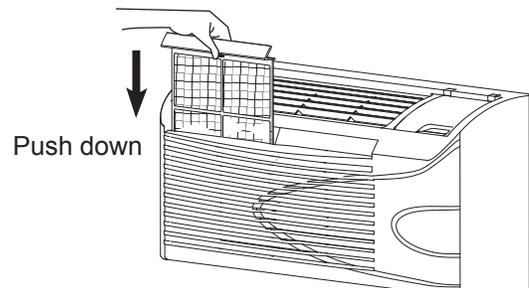
In some installations, dirt or other debris may be blown into unit from outside and settle in base pan (bottom of unit).

In some areas of the United States, a “jell-like” substance may be seen in the base pan. Check base pan periodically and clean, if necessary.



Removing Air Filter

A07079



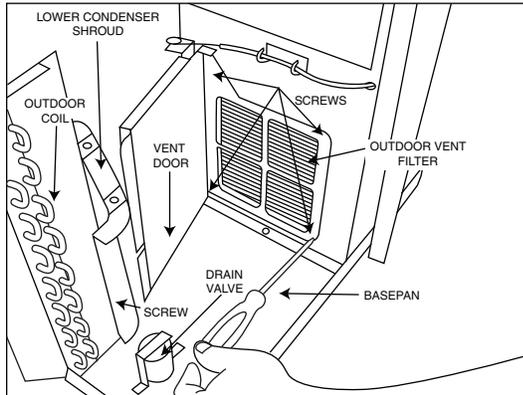
Replacing Air Filter

A07080

Fig. 64 – Removing and Replacing Air Filter

## **Cleaning Outdoor Vent Filter**

1. Open the vent door and remove 4 screws that secure the outdoor filter to the partition. See Fig. 65.
2. Remove the outdoor vent filter for cleaning.



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**Fig. 65 – Removal of Outdoor Vent Filter Screws**

# APPENDIX A

R-T CONVERSION TABLE			
R25 :20.0kΩ (Tolerance 1%)			
t[F]	Rmin.[kΩ]	Rnom.[kΩ]	Rmax.[kΩ]
32.0	64.46	65.89	67.34
33.0	62.68	64.03	65.40
34.0	60.95	62.23	63.53
35.0	59.27	60.48	61.71
36.0	57.65	58.80	59.96
37.0	56.07	57.16	58.26
38.0	54.54	55.58	56.62
39.0	53.06	54.04	55.03
40.0	51.63	52.55	53.49
41.0	50.23	51.11	52.00
42.0	48.88	49.72	50.56
43.0	47.57	48.36	49.16
44.0	46.30	47.05	47.81
45.0	45.07	45.78	46.50
46.0	43.87	44.55	45.23
47.0	42.71	43.35	44.00
48.0	41.58	42.19	42.81
49.0	40.48	41.07	41.65
50.0	39.42	39.98	40.53
51.0	38.39	38.92	39.45
52.0	37.39	37.89	38.39
53.0	36.42	36.89	37.37
54.0	35.47	35.93	36.39
55.0	34.56	34.99	35.43
56.0	33.66	34.08	34.50
57.0	32.80	33.20	33.59
58.0	31.96	32.34	32.72
59.0	31.14	31.51	31.87
60.0	30.35	30.70	31.05
61.0	29.58	29.91	30.25
62.0	28.83	29.15	29.47
63.0	28.10	28.41	28.72
64.0	27.40	27.69	27.99
65.0	36.71	26.99	27.28
66.0	36.04	26.31	26.59
67.0	25.39	25.66	25.92
68.0	24.76	25.01	25.27
69.0	24.15	24.39	24.64
70.0	23.55	23.79	24.03
71.0	22.97	23.20	22.43
72.0	22.40	22.63	22.85
73.0	21.85	22.07	22.29
74.0	21.32	21.53	21.74
75.0	20.80	21.01	21.21
76.0	20.30	20.50	20.70
77.0	19.80	20.00	20.19
78.0	19.33	19.52	19.71
79.0	18.86	19.05	19.23
80.0	18.41	18.59	18.77
81.0	17.97	18.15	18.32
82.0	17.54	17.71	17.89
83.0	17.12	17.29	17.46
84.0	16.71	16.88	17.05
85.0	16.32	16.48	16.65
86.0	15.93	16.10	16.26
87.0	15.56	15.72	15.88
88.0	15.19	15.35	15.51
89.0	14.84	14.99	15.15
90.0	14.49	14.65	14.80
91.0	14.15	14.31	14.46
92.0	13.82	13.98	14.13
93.0	13.50	13.66	13.81
94.0	13.19	13.34	13.49
95.0	12.89	13.04	13.19
96.0	12.59	12.74	12.89

## APPENDIX A (CONT.)

<b>R-T CONVERSION TABLE (cont.)</b>			
<b>R25 :20.0kΩ (Tolerance 1%)</b>			
<b>t[F]</b>	<b>Rmin.[kΩ]</b>	<b>Rnom.[kΩ]</b>	<b>Rmax.[kΩ]</b>
97.0	12.30	12.45	12.60
98.0	12.02	12.17	12.32
99.0	11.75	11.90	12.04
100.0	11.48	11.63	11.77
101.0	11.22	11.37	11.51
102.0	10.97	11.11	11.26
103.0	10.72	10.87	11.01
104.0	10.48	10.62	10.77
105.0	10.25	10.39	10.53
106.0	10.02	10.16	10.30
107.0	9.791	9.937	10.08
108.0	9.573	9.719	9.866
109.0	9.361	9.506	9.653
110.0	9.154	9.299	9.446
111.0	8.952	9.097	9.243
112.0	8.755	8.900	9.046
113.0	8.563	8.708	8.854
114.0	8.376	8.520	8.667
115.0	8.193	8.338	8.484
116.0	8.015	8.159	8.305
117.0	7.841	7.985	8.131
118.0	7.671	7.815	7.961
119.0	7.506	7.650	7.796
120.0	7.344	7.488	7.634
121.0	7.186	7.330	7.476
122.0	7.033	7.176	7.322



