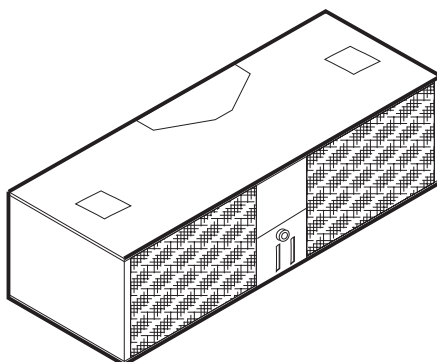


Duo-THERM®
by Dometic

**RECORD THIS INFORMATION FOR FUTURE REFERENCE
BEFORE INSTALLING THE UNIT:**

Model Number _____
Serial Number _____
Date Purchased _____
Place of Purchase _____

SELF-CONTAINED AIR CONDITIONER/ HEAT PUMP FOR RECREATIONAL VEHICLES



**ROTARY COMPRESSOR
SYSTEM MODEL 39424.602
39224.602**

USA
SERVICE OFFICE
The Dometic Corp.
509 So. Poplar St.
LaGrange, IN 46761
219-463-4858

CANADA
Dometic Dist.
866 Langs Dr.
Cambridge, Ontario
CANADA N3H 2N7
519-653-4390

**For Service Center
Assistance Call:**
800-544-4881

**THIS UNIT IS DESIGNED FOR OEM INSTALLATION
ALL INITIAL INSTALLATIONS MUST BE APPROVED BY THE SALES DEPT.**

⚠ WARNING

This Manual should be read and understood before installation, adjustment, service or maintenance is performed. This unit must be installed and serviced by a qualified serviceman. Modification of this appliance can be extremely hazardous and could result in personal injury or property damage.

⚠ AVERTISSEMENT

Lire et comprendre ce manuel avant de procéder à l'installation, à des réglages, de l'entretien ou des réparations. L'installation et l'entretien de cet appareil doivent être effectués par un réparateur qualifié. Toute modification de cet appareil peut être extrêmement dangereuse et entraîner des blessures ou dommages matériels.

INSTALLATION & OPERATING INSTRUCTIONS

**SYSTEM
MODEL
39424.602
39224.602**



**UNDERWRITERS
LABORATORIES**
LISTED INC. ®



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1. SPECIFICATIONS, GENERAL INFORMATION & LOCATION

System Model		39424 and 39224	
Nominal BTU Capacity		27,000	
Volts/Phase/Hertz (each circuit)		115 AC / 1 / 60	
Run Amps Comp/Motor		[Circuit 1 = 8.7/4.1]	[Circuit 2 = 8.7 /4.1]
LRA Compressor		[Circuit 1 = 54]	[Circuit 2 = 54]
Normal Min.	1 Unit	5.0 KW	
Generator Size **			
Wire Size		Up to 24 ft. - Use No. 12 AWG Copper Conductors	
Circuit Protection Each Circuit		15 Amp Time Delay Fuse or 15 Amp HACR Circuit Breaker	
Control Voltage		12V DC	
Refrigerant		R-22	
System Refrigerant Charge		22.5 oz. (each Circuit)	
Size (In Inches)	Width 44	Height 16.25	Depth 21
Installed Weight		185 Pounds	

** The Manufacturer gives only general guidelines for generator requirements. These generator requirements come from experiences consumers have with our equipment in field applications. When sizing the generator, the total electrical power must be taken into consideration. Keep in mind that generators lose power because of altitude increases above sea level, high outdoor temperatures and lack of maintenance.

GENERAL INFORMATION

THE 39424 AIR CONDITIONING HEAT PUMP:

Was designed to operate in a **MILD GEOGRAPHICAL AREA** for heating where the heat loss is minimum. The 39424 will operate down to an outside ambient temperature of 24 degrees. At 24 degrees, the outdoor ambient sensor will turn off the heat pump circuit and start up the coach's main furnace. As long as the temperature remains below 24 degrees, the main furnace will heat your home. As the outside temperature increases to 34 degrees, the ambient sensor switches back to the heat pump circuit.

The advantages of the 39424 heat pump central air conditioner are:

1. It's user friendly – only one unit for both heating and cooling;
2. The heat pump uses the campsite electrical hookup and saves on trips to refill the LP tanks;
3. An LP furnace is not needed, depending upon coach size, when used in mild climates where the outdoor temperature range is 40 degrees or higher.

NOTE: Geographical location usage should be determined before omitting a central furnace.

4. The unit is not exposed to the elements.

THE 39224 CENTRAL AIR CONDITIONING UNIT:

Was designed for installation in a basement storage compartment of the RV. The advantages of the 39224 central air conditioning unit are the unit is not exposed to the elements, easier to service, and eliminates the need for two roof mounted air conditioning units.

The 39224 is designed to be used exclusively with external ductwork for the cold air discharge. There are not provisions for an electric heater to be installed as part of the unit. The heating of the RV will be supplied by the central furnace, if installed.

Since it is necessary to install all or part of the ductwork in the ceiling and sidewall or floor, it is the responsibility of the RV manufacturer to assure that structural integrity is maintained throughout the coach. The RV manufacturer should review each RV floor plan to determine proper duct design and register location.

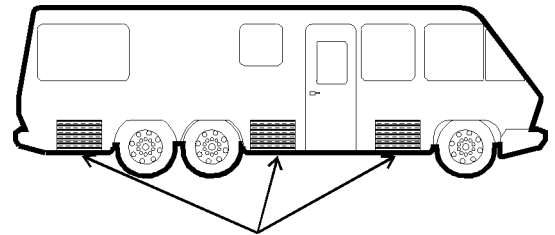
The Dometic Product Engineering and Applications Departments are available for recommendations and suggestions.

LOCATION

This system is intended for installation in a recreational vehicle where the interior is essentially one undivided space. (See FIG. 1)

A **Condenser Section** MUST be installed with DIRECT access to the out-of-doors.

FIG. 1



POSSIBLE LOCATIONS

NOTE: THE FINS OF THE CONDENSER COIL SHOULD FACE THE EXTERIOR OF THE VEHICLE.

2. CONDENSER SECTION

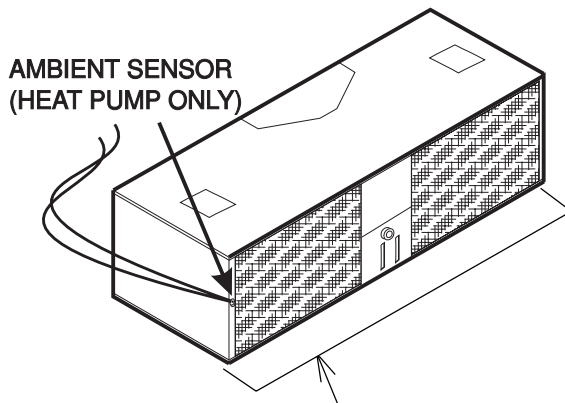
A. SUPPLY AIR

The inlet of the condenser coil should be positioned so that it draws air from outside the vehicle. **SPECIAL CARE MUST BE TAKEN TO PREVENT THE DISCHARGE AIR FROM RECIRCULATING TO THE INLET OF THE CONDENSER COIL.** Shields should be added to ensure fresh air supply. (See FIG. 2A).

CAUTION

DO NOT INSTALL THE CONDENSER WHERE THE FAN WILL DRAW AIR FROM THE EXHAUST OF THE VEHICLE, A MOTOR GENERATOR SET, TRANSMISSION, ROAD HEAT OR ANY OTHER HEAT PRODUCING SOURCE.

FIG. 2A



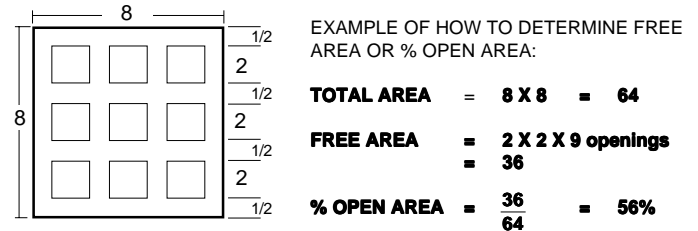
FIELD INSTALLED SHIELD THAT WILL PREVENT RECIRCULATION OF CONDENSER AIR.

The condenser section is a "draw-through" type. When the face of the coil is positioned behind a louvered or other type of restrictive opening, the **FREE AREA** of the opening must be **at least 460 square inches**.

B. FREE AREA — is the opening that remains in a grill or louvered panel after the restrictions are taken away. For example, an opening of 10 x 20 inches has 200 square inches. When this opening is covered with a grill that is 56 percent open, the **FREE AREA** is (200 x .56), 112 square inches.

Expanded and perforated metal grills in general vary from 30 percent to 60 percent open. Be certain that **460 square inches** of **FREE AREA** is available to the face of the condenser.

FIG. 2B



NOTE: Service access must always be supplied either as clearance or as a defined access panel.

3. MOUNTING

The Dual Heat Pump Air Conditioning unit design is for installation below the floor in an unfinished storage compartment. This unit should be mounted in an angle-iron frame, designed and built for the Dual Compressor Unit. Optional mounting, with frame rails attached within the unfinished compartment. The unit should be mounted with a slight tilt toward the condensing section. This will allow condensation to drain easily from the unit. If frame rails are used, be careful not to restrict the condenser air discharge opening.

Vibration pads are factory installed to the unit base at the corners and the center balance point.

4. LOW TEMPERATURE OPERATIONS

The Dual compressor heat pump has an **OUTSIDE AMBIENT SENSOR**. The ambient sensor will allow the heat pump to operate down to an outside temperature of 24 degrees Fahrenheit. At 24 degrees, the sensor will turn "OFF" the heat pump and make a circuit to the gas furnace.

The gas furnace will provide heat to the coach as long as the outside temperature remains below 24 degrees. When the outside temperature rises above 34 degrees, the ambient sensor will switch back to the heat pump mode.

CLEARANCES

The air conditioning unit clearances depend on:

1. Inlet air access used;
2. Discharge air duct arrangement;
3. Return air duct;
4. Storage compartment location and design.

A one (1) inch clearance is required on three (3) sides of the air conditioner if the top return is used. When using the side access for return, please allow a minimum of eight (8) inches for the return air duct. Access to the electrical connections must be provided when making the installation.

5. EVAPORATION SECTION

A. INLET AIR

The evaporation section must have free access to room air. A minimum of 128 square inches of FREE AREA opening is required. Where the return air must be provided through louvers or mesh screen, the FREE AREA percentage of the material used shall be taken into consideration when making this determination. An example of how to determine FREE AREA is included under "2. CONDENSER SECTION".

B. GRILLS (See Fig. 3)

NOTE: The return air grill must have the same square surface as the return air duct.

- 1) For each air conditioning system, there must be a return grill to bring cabin air back into the unit. There must also be at least four discharge grills per unit.

- 2) Return grills must be mounted in front of the evaporator. If this is not possible, make sure there is nothing blocking the air flow from the grill to the evaporator.

- 3) The unit must have a return filter between the grill and the unit. This filter must be accessible for periodic cleaning.

C. OUTLET AIR (See Fig. 3)

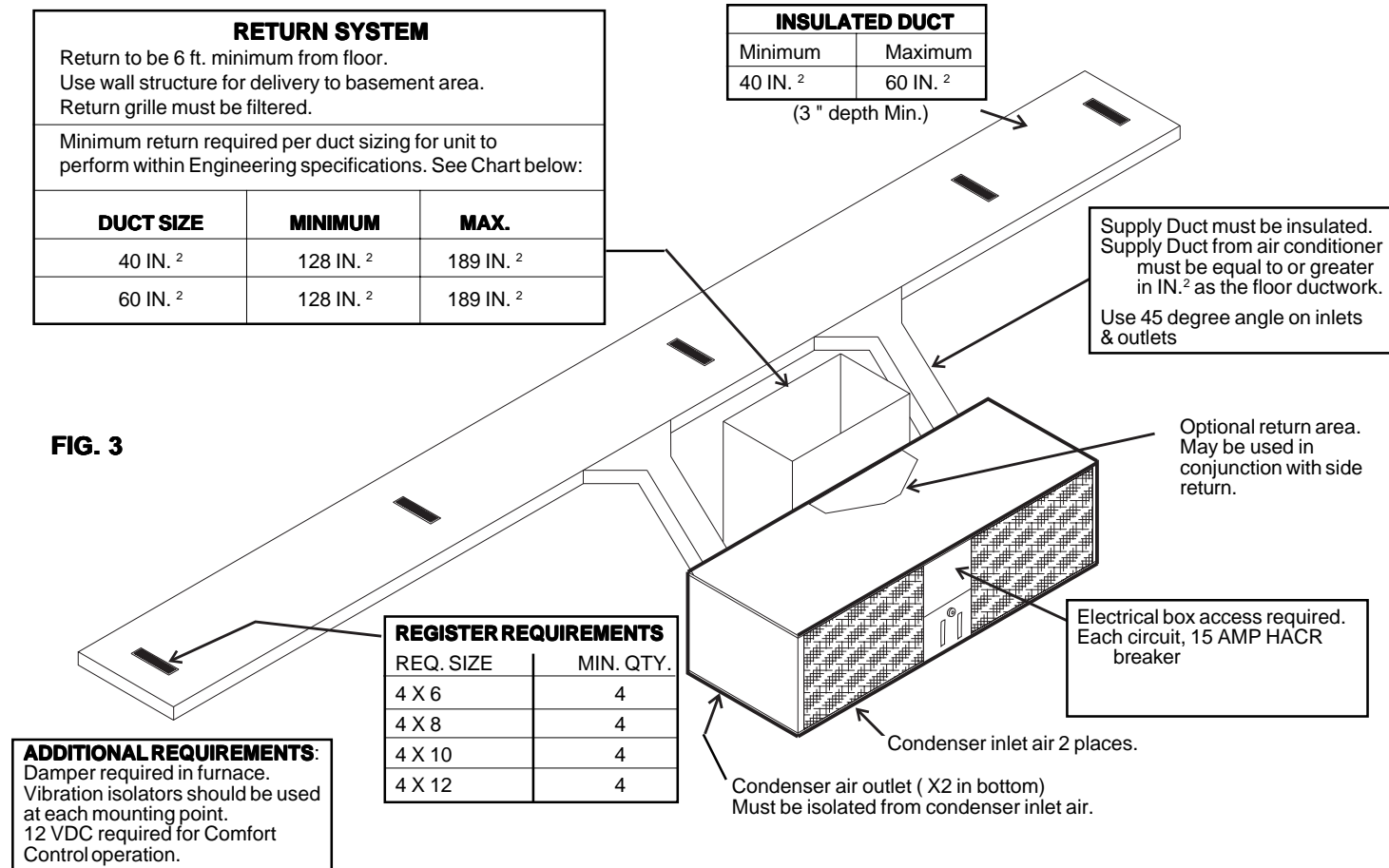
The air diffusion system, supplied by the installer, must be sized to maintain a static pressure at the blower outlet between .4 and 1.2 inches water column.

All air handling ducts must be properly insulated to prevent condensation forming on their surface during operation. A vapor barrier must also be supplied on the outer surface of the insulation to prevent moisture from traveling through the insulation and condensing on the cold ductwork.

D. CONDENSATE DRAIN

A .50 dia. hole for condensate drainage is located between the condenser coils. A 1/4" NPT fitting with tubing may be added to direct condensation.

NOTE: Drain fitting and tubing must be used if installed in a finished compartment.



6. ELECTRICAL WIRING

See FIG. 6.

NOTE: All wiring must comply with the National Electrical Code or CSA Standard C22.1, Canadian Electric Code, Part 1; and all local codes.

A. GENERAL

1. All wiring must be at least 12 AWG.
2. Two independent 15 amp circuits must be supplied to the air conditioner.
3. Two conductors plus a ground must be provided for each circuit protected by a 15 amp slow-blow fuse or a 15 amp HACR type circuit breaker.

B. UNIT LINE VOLTAGE (See Fig. 6)

1. The 39424 Electrical Control Box, and Comfort control Center was shipped in a separate package.
2. Locate the unit electrical box. Remove the cover from the electrical box.
 - A. Using the four (4) mounting screws supplied, mount the electrical box high on a wall within the air conditioner storage compartment.
 - B. Each electrical circuit terminal block is marked.

CIR. 1	L1	N	GR
CIR. 2	L1	N	GR
 - C. Route two independent 15 amp supply circuits to the air conditioner electrical box. Each supply should be marked Cir #1 and Cir #2.
 - D. Circuit #1 should be wired directly from the coach's main breaker panel.
 - E. Circuit #2 should be wired through the on-board generator.

NOTE: A standard 30 amp hookup will not power both Circuit 1 and Circuit 2 and the coach's other major appliances.
3. Route field supply Cir. #1 to terminal block Cir. #1. Attach black "**Hot**" to "**L1**" terminal. Attach White to "**N**" terminal and attach the ground wire to the "**GR**" terminal. Route field supply Cir. #2 to terminal block Cir. #2. Attach Black "**Hot**" to "**L1**" terminal. Attach White to "**N**" terminal and attach the ground wire to the "**GR**" terminal.
5. Route the nonmetallic liquid-tight tubing with the two 9-pin connectors and ground wire to the air conditioning unit.
6. Remove the field connect junction box cover. Remove lower vent panel. Place pin connectors Cir. #1 and Cir. #2 and ground wire through bushing in vent panel. Move bushing down tubing about four (4) inches. Install bushing with tubing in vent panel. Place the tubing into slot at bottom of the junction box with about 3/4 inches extending into junction box. Install vent panel using screws removed.
7. Locate ground wire and locate ground screw in junction box. Attach ground wire to junction box using ground screw.
8. Locate pin connector for Cir. #2. Insert connector into receptacle marked Cir. #2. Push the connector into seat. Pull lightly on connector assuring it is attached.
9. Repeat Step 8 using Cir. #1 connector.

! WARNING

FAILURE TO CORRECTLY WIRE THE UNIT WILL CAUSE PRODUCT DAMAGE AND MAY CAUSE PERSONAL INJURY.

7. DOMETIC COMFORT CONTROL CENTER™ & CABLE INSTALLATION

A. LOCATION

- 1) If the system is to be used **WITHOUT** a **Remote Temperature Sensor**, the proper location of the **Comfort Control Center™** is very important to ensure that it will provide a comfortable RV temperature. Observe the following rules when selecting a location:
 - a) Locate the **Comfort Control Center™** 54" above the floor.
 - b) Install the **Comfort Control Center™** on a partition, not on an outside wall.
 - c) **NEVER** expose it to direct heat from lamps, sun or other heat producing items.
 - d) Avoid locations close to doors that lead outside, windows or adjoining outside walls.
 - e) Avoid locations close to supply registers and the air from them.
- 2) If the system is to be used **WITH** a **Remote Temperature Sensor** in **ALL** zones, the comfort control Center may be mounted anywhere that is convenient in the coach. Try to avoid hard to reach and hard to see areas.
- 3) A 3/8" diameter hole will be needed to route the cable through the wall.

B. CONTROL CABLE INSTALLATION

A 4-conductor telephone cable must be routed from the electronic control box to the **Comfort Control Center™**.

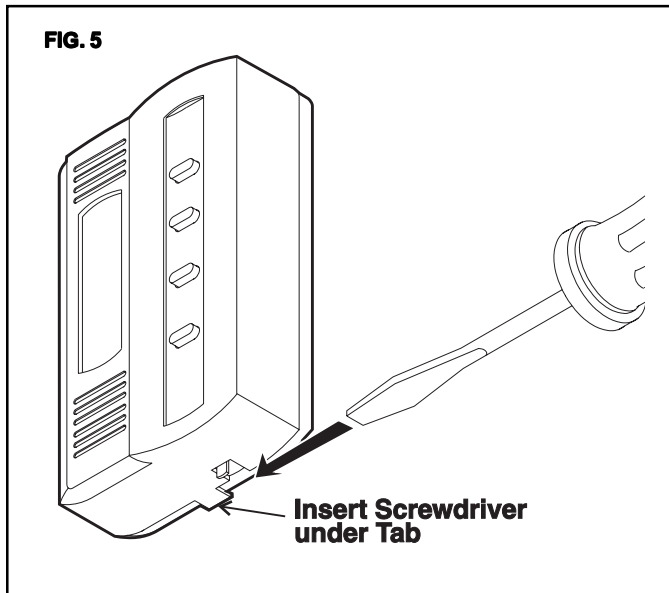
- 1) Choose the shortest, most direct route to the **Comfort Control Center™** location selected. Leave 6" of cable extending through the wall.
- 2) The cable that should be used is a flat, 4-conductor telephone cable.
- 3) The cable must be terminated with a telephone RJ-11 connector. Refer to the crimp tool manufacturer for crimping instructions. Ensure that the cable is installed into the connector correctly before crimping. (See FIG. 4).

FIG. 4



C. COMFORT CONTROL CENTER™ INSTALLATION

- 1) Carefully remove the base plate from the **Comfort Control Center™**. This may be accomplished by inserting a small screwdriver under the tab on the bottom edge of the front cover and gently prying. (See FIG. 5).



- 2) Insert the telephone cable through the hole in the base plate and mount the plate to the wall with the two screws provided. Check the alignment to ensure level installation.
- 3) Install the control cable RJ-11 connector into the back of the **Comfort Control Center™** and gently press onto the base plate.
- 4) If a Remote Temperature Sensor is to be used, the connector end must be routed to the electronic relay board.
- 5) If a furnace is to be controlled by the system, the two furnace thermostat leads must be routed to the electrical control box of the air conditioner that will control it. Make sure at least 15" of the furnace thermostat wires extend into the electrical control box.
- 6) If an Energy Management System – EMS (load shed) is to be used with the control, two wires must be routed to the electrical control box. The signal required for this function is a normally open relay contact. When the EMS calls for the compressor to shut off, the relay contacts should close. Make sure that at least 15" of the EMS wires extend into the electrical box.
- 7) In the event that other A/C's are to be installed (additional zones), an additional 4-conductor telephone cable must be routed to the **other A/C's**. Make sure that at least 15" of the wire extends into each of the electrical control boxes.

8. SYSTEM WIRING INSTRUCTIONS

A. CONNECTION OF LOW VOLTAGE WIRES

- 1) Route Remote Temperature Sensor cable, if applicable, and attach it to the matched color on the main board.
- 2) Connect the previously run 12V DC to the red and black wires from the connector on the main board. This needs to be done at only one board. Connect +12V DC to the red wire; -12V DC to the black wire.
- 3) Connect previously run furnace thermostat wires (if applicable) to the blue wires extending from the main board. The polarity of these connections does not matter.
- 4) Connect the previously run Energy Management System wires (if applicable) to the yellow wires extending from the main board. The polarity of these wires does not matter.
- 5) Terminate the 4-conductor telephone cables. The cable(s) must be terminated with a telephone RJ-11 connector. Refer to the crimp tool manufacturer for crimping instructions. Ensure that the cable is installed into the connector correctly before crimping.
- 6) Plug the telephone cable(s) into one of the telephone jack(s) protruding through the electrical box. (It does not matter which one.)

9. SYSTEM CHECKOUT & CONFIGURATION

Now that the system is installed, it is necessary to check all operations and then configure the electronics.

Refer to the Operating Manual for a description of the air conditioner operation.

SYSTEM CHECKOUT: Verify that all features of the installed system work. Check fan speeds, cooling mode, furnace (if connected) and heat pump. If the features do not work, check all wiring and confirm that the correct options have been selected on the Electronic Control Box.

SYSTEM CONFIGURATION: If all features are functioning, perform the following configuration procedure: Simultaneously depress UP and DOWN pushbuttons on the Comfort Control Center for at least one second. This completes the system configuration.

FOR COMPLETE COMFORT CONTROL CENTER OPERATING INSTRUCTIONS, REFER TO FORM NO. 3106705.XXX.

10. ADDITIONAL FEATURE

A circuit for the furnace blower motor has been added to enhance both the cooling and heating operation.

NOTE: This circuit will not work with all furnaces. Before using this circuit, check with the furnace manufacturer for proper wire connection to the furnace. Other components may or may not be required. Read and follow the instructions provided with the furnace.

INSTRUCTIONS FOR FURNACE CONNECTIONS:



THE FOLLOWING FURNACE CONNECTION INSTRUCTIONS ONLY PERTAIN TO ONE SPECIFIC FURNACE MANUFACTURER, AND MAY NOT APPLY TO YOUR INSTALLATION.

1. Run a 12 volt DC positive lead to one of the black wires in the unit electrical box marked "for furnace blower motor use only", and secure with an approved connector.
2. Run a second lead from the furnace blower motor or terminal board to the remaining black lead in the unit electrical box. Secure with an approved connector.

11. MAINTENANCE

- A. AIR FILTER:** Your air conditioner will operate more efficiently with a clean filter. Replace the filter with a new one every three months.
- B.** To maintain efficient operation, the exposed **CONDENSER COIL** should be cleaned as often as necessary to keep it free of dirt and debris. Be careful not to damage the coil fins when cleaning.

12. SERVICING

If service work is needed, contact your dealer or the nearest authorized service center. When requesting service, always give complete model and serial numbers. These numbers are located on the left side of the condenser bulkhead.

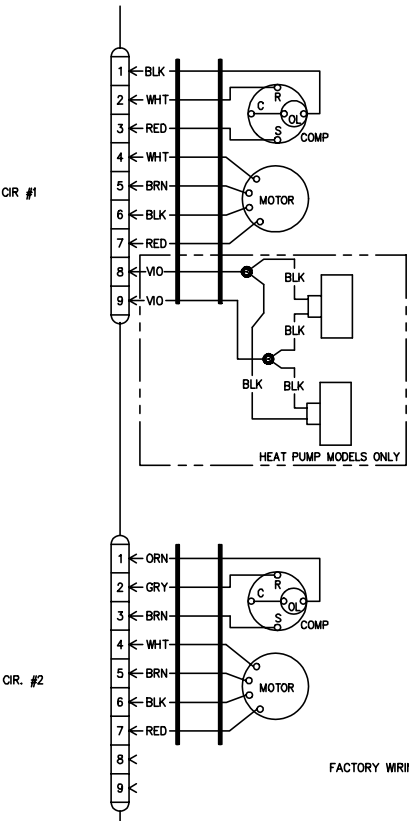
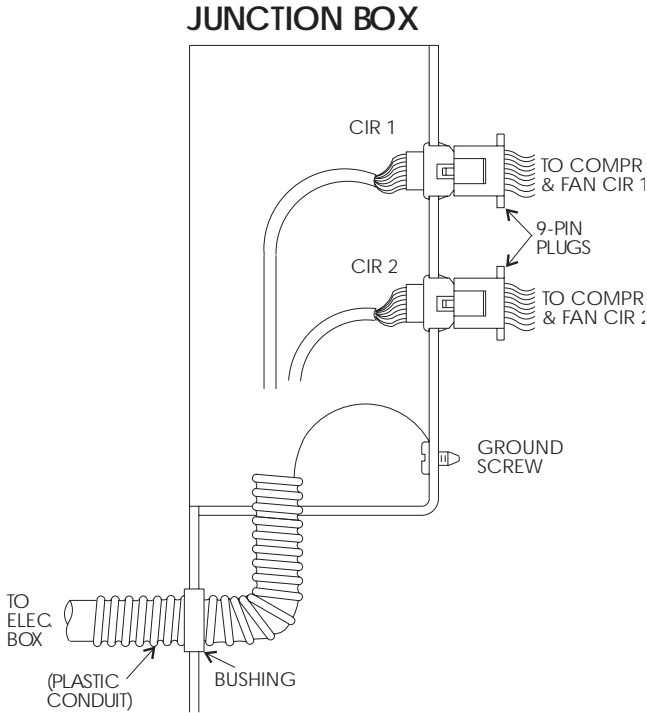
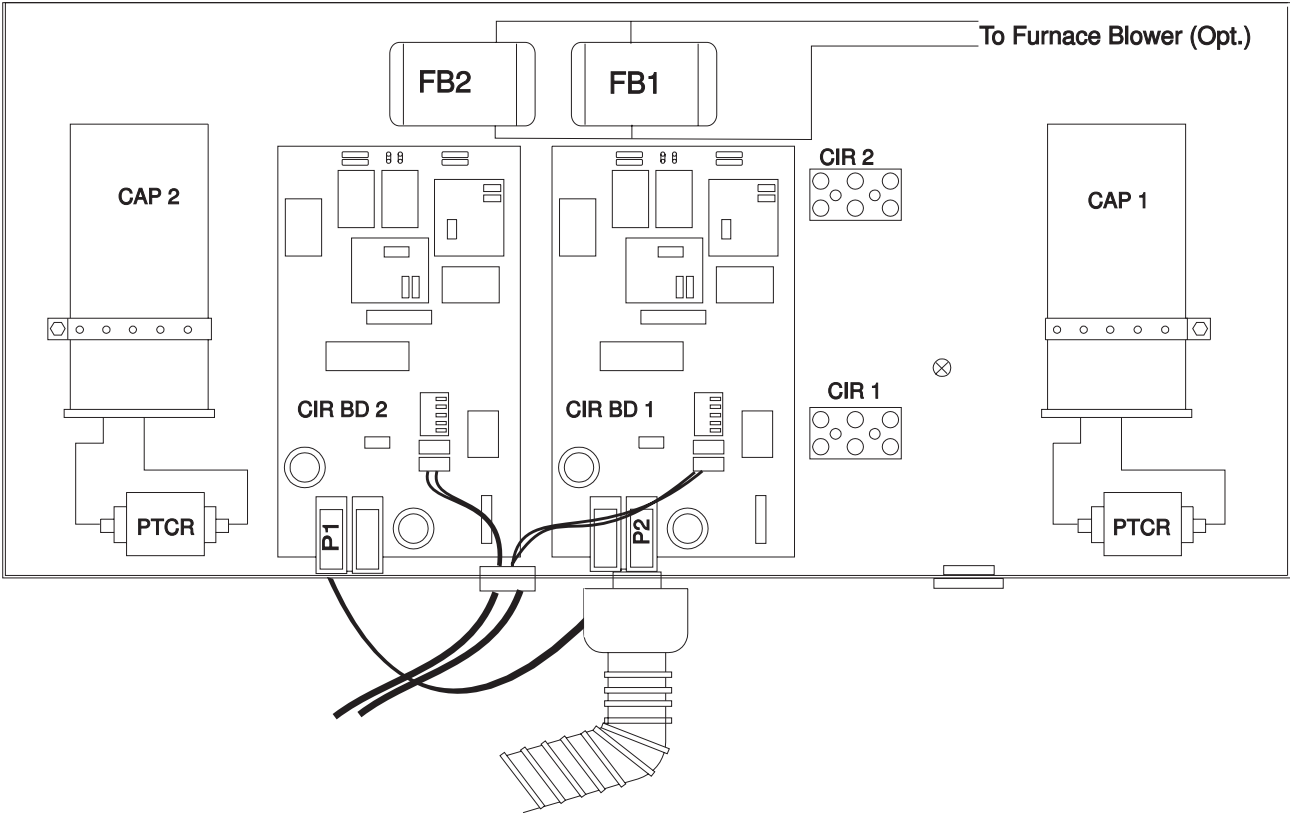
BEFORE YOU CONTACT A SERVICEMAN:

There are several built-in features that may automatically shut off the unit under abnormal conditions. If your unit should shut off, here are some things you should check before you contact a service center:

- A. Wait 15 to 30 minutes to see if unit will resume operation.
- B. Check thermostat to see if it is properly set.
- C. Check fuses on electrical supply in the vehicle.
- D. Check the filter (indoor section) to see if it is clean.
- E. Check the condenser coil to be sure it is clean.

(Continued on next page . . .)

FIG. 6



WIRING DIAGRAM

