

Duo-THERM[®]

by Dometic

**RECORD THIS UNIT INFORMATION FOR FUTURE
REFERENCE:**

Model Number _____
Serial Number _____
Date Purchased _____

600 SERIES PENGUIN

Roof Top Air Conditioner

USED WITH

Part No. 3105460

Air Distribution Box Kit

With Remote Bi-Metal Thermostat

USA
SERVICE OFFICE
The Dometic Corp.
509 So. Poplar St.
LaGrange, IN 46761

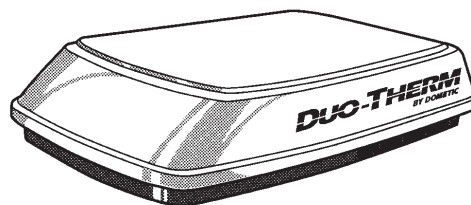
CANADA
Dometic Dist.
866 Lings Dr.
Cambridge, Ontario
CANADA N3H 2N7



**UNDERWRITERS
LABORATORIES**
LISTED INC. [®]
637G



CERTIFIED
LR 23565



WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

AVERTISSEMENT

Une mauvaise installation, de mauvais réglages, modifications ou opérations d'entretien peuvent endommager les biens ou même blesser. Se reporter à la notice. Pour obtenir de l'aide ou des renseignements complémentaires, consulter un installateur qualifié ou une agence de service après-vente.

INSTALLATION & OPERATING INSTRUCTIONS

MODELS

600312.321

600312.421

600315.321

600315.421

1. SPECIFICATIONS

MODEL NUMBER	600312.421	600312.321	600315.321	600315.421
Nominal Capacity (BTU/HR)	11,000	11,000	13,500	13,500
Electrical Rating	115 VAC, 60 Hz., 1 PH.			
Compressor Rated Load Amps	10.7	9.5	12.4	11.5
Fan Motor Rated Load Amps	3.1	3.1	3.1	3.1
Compressor Locked Rotor Amps	50.0	53.0	60.0	50.0
Fan Motor Locked Rotor Amps	8.8	8.8	8.8	8.8
Heater Amps/Watts @ 120V AC	12.7 / 1530			
Refrigerant (R22) oz.	16.0	16.5	15.5	17.0
Minimum Wire Size * (AC)	12 AWG Copper up to 24 ft.			
Circuit Protection	20 Amp Time Delay Fuse or 20 HACR Circuit Breaker			
Installed Weight (Pounds)	101	95	96	102
Minimum Generator	1 UNIT	2.5 KW	2.5 KW	3.5 KW
Size **	2 UNITS	4.0 KW	4.0 KW	5.0 KW

* For lengths over 24 ft., consult the National Electrical Code.

** The Dometic Corp. gives **general** guidelines for generator requirements. These guidelines come from experiences people have had in actual applications. When sizing the generator, the **total** power usage of your recreational vehicle must be considered. Also keep in mind generators lose power at high altitudes and from lack of maintenance.

2. PRECAUTIONS

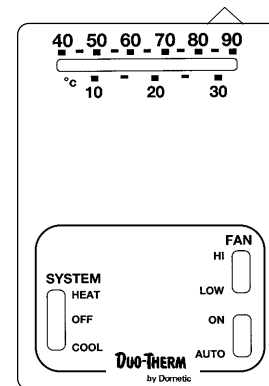
WARNING

IMPROPER INSTALLATION MAY DAMAGE EQUIPMENT, COULD ENDANGER LIFE, CAUSE SERIOUS INJURY AND/OR PROPERTY DAMAGE.

- Read installation and operating instructions carefully before attempting to start your air conditioner.
- The Dometic Corporation will not be liable for any damages or injury incurred due to failure in following these instructions.
- Installation **must** comply with the National Electrical Code and any State or Local Codes or regulations.
- DO NOT** add any devices or accessories to this air conditioner except those specifically authorized by Dometic.
- This equipment must be serviced by qualified personnel and some states require these people to be licensed.

- Select **Auto/On Switch** operation as follows:
(Lower right switch at bottom of thermostat)
 - Auto Position:** Air conditioner fan runs whenever cooling is required and stops whenever cooling is not required.
 - On Position:** Air conditioner fan runs continuously to circulate air in RV.
- Set the **Heat/Off/Cool Switch** to cool position (located at lower left side of thermostat).

The air conditioner compressor will now come on when cooling is required and cycle off when the temperature level selected is reached.



3. OPERATING INSTRUCTIONS

A. COOLING OPERATION

- Place the **Temperature Set Lever** to desired temperature level (located at top of thermostat).
- Select fan speed that best satisfies your needs: (Upper right switch at bottom of thermostat).
 - High Speed:** Selected when maximum cooling and dehumidification are required.
 - Low Speed:** Selected when RV reaches desired comfort level and needs to be maintained. Normally this speed is used for night-time operation.

CAUTION

Wait at least two (2) minutes before restarting the air conditioner after shutting off with either the Heat/Off/Cooling Switch or the Temperature Set Lever. This allows the refrigerant pressure in the air conditioner to equalize and will allow the compressor to restart easily. Failure to follow this instruction may cause circuit breaker or fuse to open.

B. HEATING OPERATION

(If Furnace is connected to Thermostat)

1. Set the **Temperature Set Lever** to desired temperature level (locate at top of thermostat).
2. Set the **Heat/Off/Cool** switch to heat position (located at lower left side of thermostat).

The furnace will now come on when heat is required and cycle off when temperature level selected is reached.

C. SPECIAL FEATURE:

When thermostat:

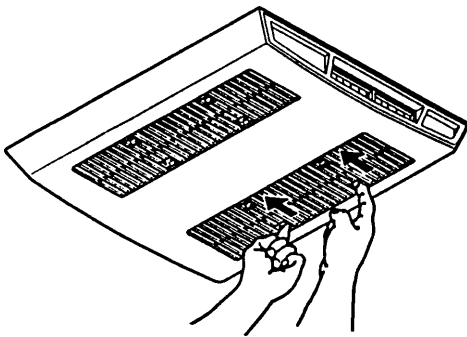
1. **Heat/Off/Cool Switch:** is in the OFF or HEAT position and
2. **Auto/On Switch:** is in the ON position,

. . . the air conditioner fan will run continuously at the selected fan speed to circulate the air inside the RV.

4. MAINTENANCE

A. AIR FILTERS:

Periodically remove the filter/grille assemblies located in the air box and clean. Remove the assemblies by placing fingers on the long portion of latches and with an over-and-downward pressure, unlatch the catches. After assemblies are removed, wash the filter/grille assemblies with soap and warm water. Let assemblies dry and then reinstall.



NOTE: Never run the air conditioner without return air filters in place. This may plug the unit evaporator coil with dirt and may substantially affect the performance of the unit.

B. AIR BOX HOUSING:

Clean air box housing and control panel with a soft cloth dampened with a mild detergent. Never use furniture polish or abrasive cleaning materials.

C. FAN MOTOR:

Factory lubricated and requires no service under normal use.

D. FROST FORMATION ON COOLING COIL:

Under certain conditions, frost may form on the evaporator coil. If this should occur, inspect the filter and clean if dirty. Make sure air louvers are not obstructed. Air conditioners have a greater tendency to frost when the outside temperature is relatively low.

This may be prevented by adjusting the thermostat to a warmer setting. Should frosting continue, operate on LOW or HIGH FAN setting until the cooling coil is free of frost.

5. GENERAL INFORMATION

The ability of the air conditioner to maintain the desired inside temperature depends on the heat gain of the RV. Some preventative measures taken by the occupants of the RV can reduce the heat gain and improve the performance of the air conditioner. During extremely high outdoor temperatures, the heat gain of the vehicle may be reduced by:

- a. Parking the RV in a shaded area
- b. Using window shades (blinds and/or curtains)
- c. Keeping windows and doors shut or minimizing usage
- d. Avoiding the use of heat producing appliances

Starting the air conditioner early in the morning and giving it a "head start" on the expected high outdoor ambient will greatly improve its ability to maintain the desired indoor temperature.

NOTE

The manufacturer of this air conditioner will not be responsible for damage caused by condensed moisture on ceilings or other surfaces. Air contains moisture and this moisture tends to condense on cold surfaces. When air enters the RV, condensed moisture may appear on the ceiling, windows, metal parts, etc. The air conditioner removes this moisture from the air during normal operation. Keeping doors and windows closed when this air conditioner is in operation will minimize condensed moisture on cold surfaces.

6. SERVICE - Unit Does Not Operate

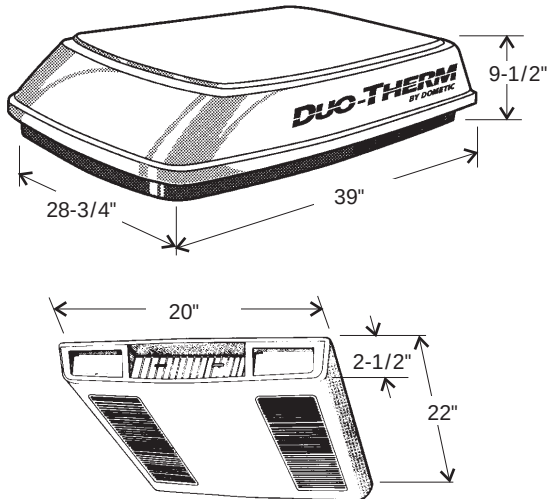
If your unit fails to operate or operated improperly, check the following before calling your service center.

- A. If RV connected to motor generator, check to be sure motor generator is running and producing power.
- B. If RV connected to power supply by a land line, check to be sure line is sized properly to run air conditioner load and it is plugged into power supply.
- C. Check your fuse or circuit breaker to see if it is open.
- D. After the above checks, call your local service center for further help. This unit must serviced by qualified service personnel only.

When calling for service, always give the following:

- 1) **Air conditioner Model Number and Serial Number found on rating plate located on base pan of air conditioner bottom. Remove return air grille to observe this rating plate.**
- 2) **Air distribution Box Kit Part and Serial Number found on rating plate located on ceiling template. Observe this rating plate through the air discharge louver of ADB.**

7. INSTALLATION INSTRUCTIONS



A. PRECAUTIONS

! WARNING

IMPROPER INSTALLATION MAY DAMAGE EQUIPMENT, COULD ENDANGER LIFE, CAUSE SERIOUS INJURY AND/OR PROPERTY DAMAGE.

1. Read installation and operating instructions carefully before starting your air conditioner installation.
2. The Dometic Corporation will not be liable for any damages or injury incurred due to failure in following these instructions.
3. Installation must comply with the National Electrical Code and any State or Local codes or regulations.
4. **DO NOT** add any devices or accessories to this air conditioner except those specifically authorized by The Dometic Corporation.
5. This equipment must be serviced by qualified personnel and some states require these people to be licensed.

B. CHOOSING PROPER LOCATION FOR THE AIR CONDITIONER

This air conditioner is specifically designed for installation on the roof of a recreational vehicle (RV).

1. Normal Location

The air conditioner is designed to fit over an existing roof vent opening. When the vent is removed, it normally creates a 14" X 14" opening.

2. Other Locations

When no roof vent is available or another location is desired, the following is recommended:

For one unit installation: The air conditioner should

be mounted slightly forward of center (front to back) and centered from side to side.

For two unit installations: Install one Air Conditioner 1/3 and one Air Conditioner 2/3's from front of RV and centered from side to side.

It is preferred that the air conditioner be installed in a relatively **flat and level** roof section measured with the RV parked on a level surface; however, up to an 8° slant to **either** side, or front to back, is acceptable.

3. After location has been selected:

- a. Check for obstructions in the area where air conditioner will be installed.
- b. The roof must be designed to support 130 lbs. when the RV is in motion. Normally a 220 lb. static load design will meet this requirement.
- c. Check **inside** the RV for air box obstructions (i.e. door openings, room dividers, curtains, ceiling fixtures, etc.)

AIR BOX PERIMETER

C. ROOF PREPARATION

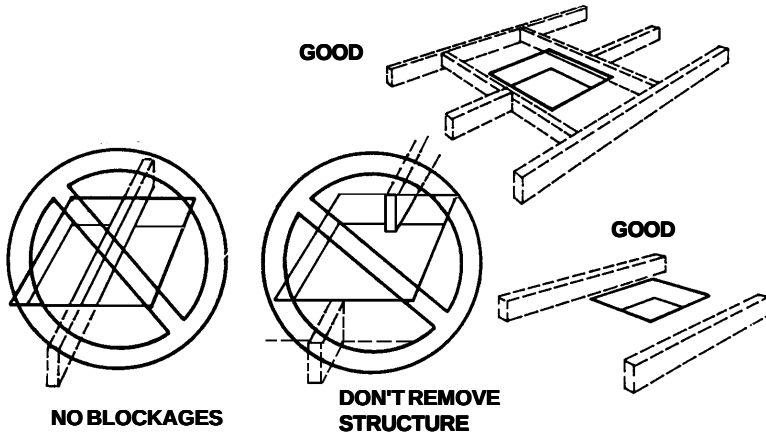
1. ROOF VENT REMOVAL

- a. Unscrew and remove the roof vent.
- b. Remove all caulking compound around opening.
- c. Seal all screw holes and seams where the roof gasket will be located. Use a good grade of all weather sealer.

2. NEW OPENING

(Installation Other Than Vent Opening)

- a. A 14" X 14" opening must be cut through the roof and ceiling of the RV. It is recommended this opening be located between roof reinforcing members.



! WARNING

Disconnect all power supplies and the positive (+) terminal from the supply battery. Failure to follow this instruction may create a shock hazard.

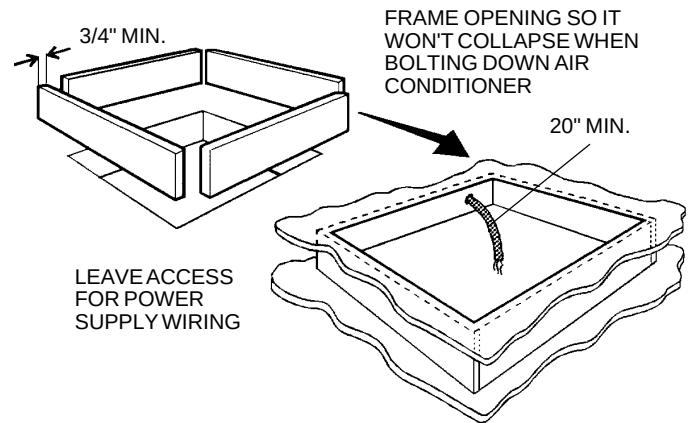
- b. Mark a 14" X 14" square on the roof and carefully cut the opening.
- c. Using the roof opening as a guide, cut the matching hole in the ceiling.

! CAUTION

There may be electrical wiring between the roof and ceiling.

3. OPENING PREPARATION

- a. If the opening exceeds 14-1/2" X 14-1/2", it will be necessary to install spacers.
- b. If the opening is less than 14" X 14", it must be enlarged.
- c. Route a copper 12 AWG with ground supply line from the fuse box or circuit breaker to the roof opening.
 1. The power supply must be on a separate 20 amp Time Delay Fuse or HACR Circuit Breaker.
 2. Wiring must comply with all National, State and Local wiring codes.
 3. Make sure at least 20" of wire extend into the roof opening. This ensures easy air conditioner attachment.
 4. If vent fan was removed, the existing wire may be used provided it is of proper size and correctly fused.
- d. The roof opening must be framed to provide adequate support and prevent air from being drawn from the roof cavity. Lumber 3/4" thick or more and long enough to bridge the opening must be used. Remember to provide an entrance hole for the power supply wire.



NOTE: NEVER create a LOW SPOT on the roof where water will collect. Water standing around the air conditioner may leak into the RV interior.

- e. The 14" X 14" roof opening is part of the return air and must be finished in accordance with NFPA Standard 501 C, Standard for recreational vehicles, Section 2-7.
- f. Use a steel sleeve and a grommet (or equivalent methods) to protect the wire where it passes through the return air duct.

D. THERMOSTAT LOCATION

The proper location of the thermostat is very important to ensure that it will provide a comfortable RV temperature. Observe the following general rules when selecting a location.

1. Locate the thermostat 54" above the floor.
2. Install thermostat on a partition, not on an outside wall.
3. NEVER expose it to direct heat from lamps, sun or other heat producing items.
4. Avoid locations close to doors that lead outside, windows or adjoining outside walls.
5. Avoid locations close to supply registers and the air from them.
6. Never locate thermostat in a room that is warmer or cooler than the rest of the coach - such as the kitchen.
7. The major living area is normally a good location.

E. CABLE INSTALLATION (OEM)

1. A four-conductor cable, 18 to 22 AWG is to be used for low voltage connections.
2. Choose the shortest, direct route from the 14" opening to the thermostat location selected.
3. Consider where screws, nails or staples might contact the cable.
4. Leave approximately 3" of cable extending through the wall for connection to the thermostat.
5. Leave approximately 10" of cable extending into the 14" opening for connection at unit.
6. If system is to control a gas furnace: Route 18 gauge thermostat wire from furnace to wall thermostat location at this time.

F. CABLE INSTALLATION (AFTERMARKET)

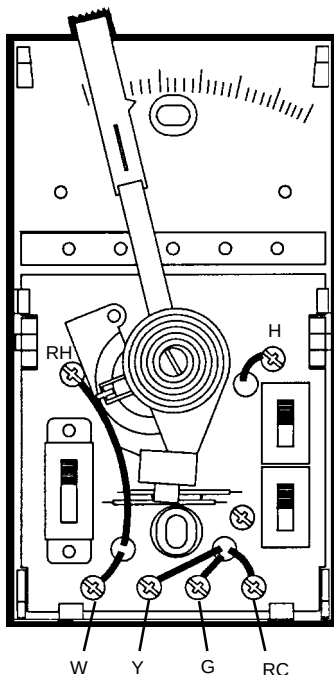
The same steps must be taken as for OEM installation but routing through the ceiling and walls may not be practical. There are metal or plastic raceways available at most electrical distributors. This will allow routing along the interior surface of your ceiling and wall to the thermostat.

G. THERMOSTAT INSTALLATION

The provided thermostat is a "heat/cool thermostat". These instructions cover only the cooling connections required. If connection of furnace is required, follow the instructions provided with the furnace. Normally the furnace will connect to the "RH" and "W" terminals on the thermostat.

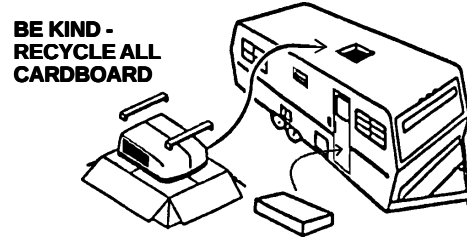
1. Remove the cover of the provided thermostat.
2. Connect the **"RED"** wire from the air conditioner to the **"RC"** terminal on the thermostat.
3. Connect the **"YELLOW"** wire from the air conditioner to the **"Y"** terminal on the thermostat.
4. Connect the **"BLUE"** wire from the air conditioner to the **"H"** terminal on the thermostat.
5. Connect the **"ORANGE"** wire from the air conditioner to the **"G"** terminal on the thermostat.
6. Push the thermostat wires into hole in wall and fill excess hole with insulation.
7. Mount thermostat base to the wall with screws provided.
8. Check all thermostat wires on base to insure they are completely clear of the bi-metal coil of the thermostat. Adjust if necessary.
9. Replace thermostat cover.

THERMOSTAT BASE



H. PLACING THE AIR CONDITIONER ON THE ROOF

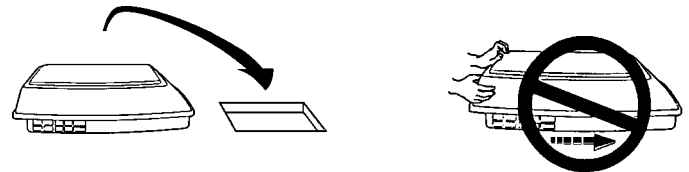
1. Remove the air conditioner from the carton and discard carton.
2. Place air conditioner on the roof.



! CAUTION

Use care in lifting. This unit weighs approximately one hundred (100) pounds.

3. Lift and place the unit over the prepared opening using the gasket as a guide. The **blunt end** goes toward the **rear** of the RV.
4. Place the 3105460 Air Box Kit inside the RV. This box contains mounting hardware for the air conditioner and will be used inside the RV.



! CAUTION

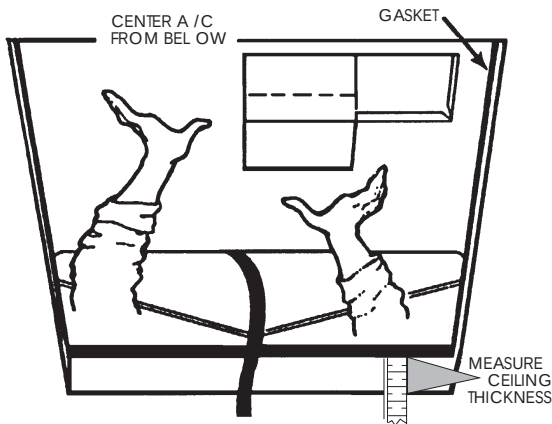
DO NOT slide the unit. This may damage the neoprene gasket attached to the bottom and create a leaky installation.

This completes the outside work. Minor adjustments can be done from the inside if required.

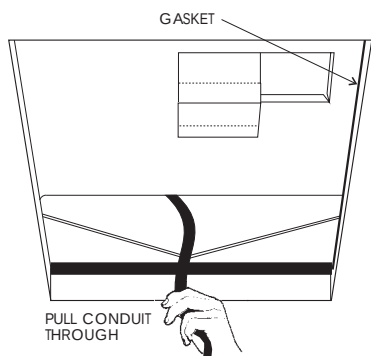
I. DISCHARGE DUCT AND CEILING TEMPLATE INSTALLATION

1. Remove the air box and mounting hardware from their carton. The upper duct is shipped inside the lower duct which is part of the ceiling template.

2. Remove the upper duct from the ceiling template and locate it over the blower discharge. **NOTE:** The edge without the flange installs toward the **rear** of the RV.
3. Use two of the sharp pointed sheet metal screws to hold the duct to the base pan. The holes are prepunched in the pan for ease of location.

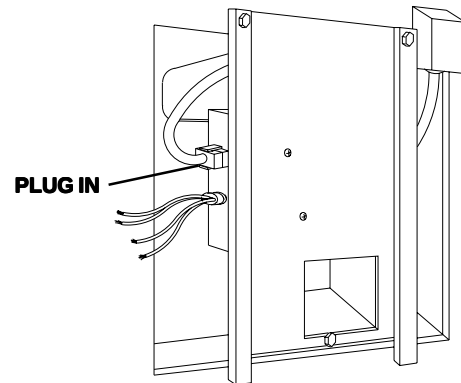


4. Check gasket alignment over roof opening and adjust if necessary. Unit may be moved from below by lifting and sliding.

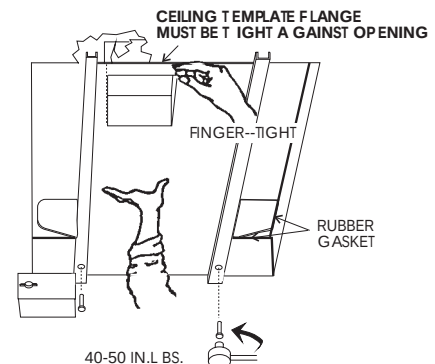


5. Reach up into the return air opening and pull the conduit power cable down for later connection.

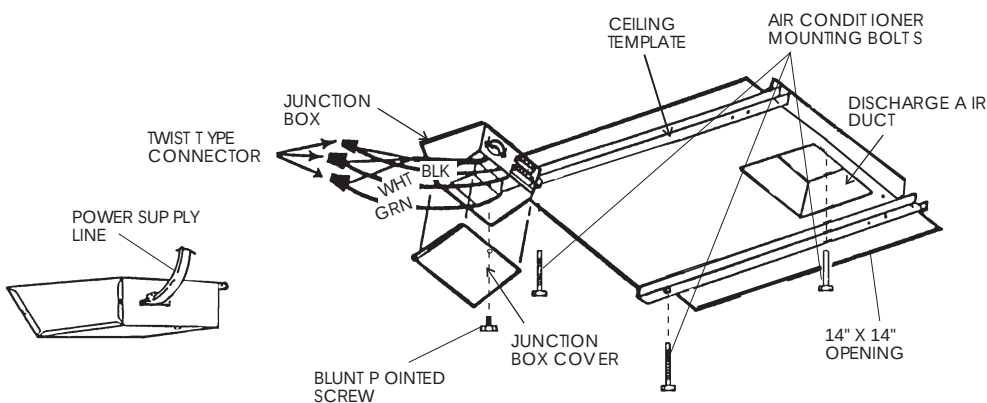
6. Measure the ceiling thickness:
 - a. If the distance is 2" to 3" remove the perforated tabs from the bottom duct only.
 - b. If the distance is 3" to 4-1/4" install the ducts as received.
 - c. If the distance is 4-1/4" to 6" (maximum thickness), optional duct and bolt kits are available:
 Duct (Part No. 318556)
 Bolts (Part No. 318557)
7. Plug the electrical conduit from the upper unit into the mating connector in relay module located on top of the ceiling template.



8. Take the ceiling template and slide the lower duct over the upper duct.



9. Hold the ceiling template with one hand and with the other install the three 1/4" mounting bolts through the template and into the base pan.

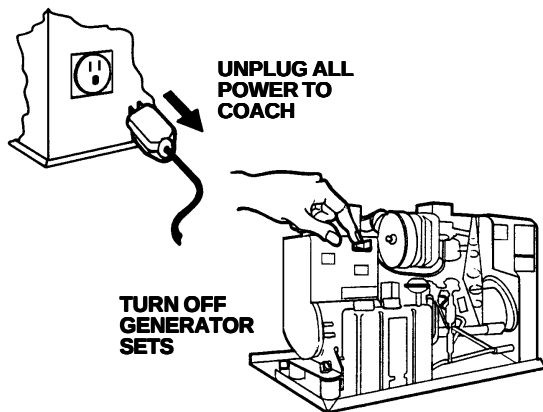


- a. Finger-tighten the (3) bolts and check alignment. There should be an equal opening on each side and the rear flange must be tight against the roof opening.
- b. EVENLY tighten the bolts to a torque of 40 to 50 inch pounds. This will compress the roof gasket to approximately 1/2".

! CAUTION

If bolts are left loose there may not be an adequate roof seal. If bolts are over-tightened damage may occur to the air conditioner base or ceiling template.

J. CONNECTION OF POWER SUPPLY



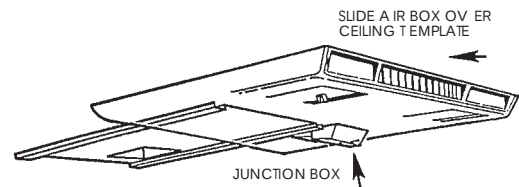
! WARNING

Disconnect ALL power before wire leads are connected.

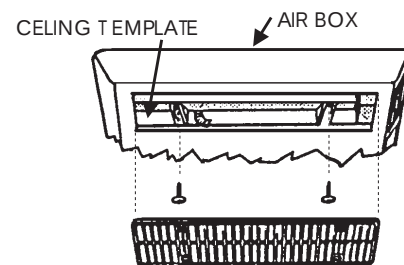
1. Route supply line into junction box on ceiling template.
2. Connect white to white; black to black; and green to green or bare copper wire using appropriate sized twist connectors.
3. Tape the connectors to the wire with electrician's tape.
4. Push the wires into the box and tighten the strain relief.
5. Install the cover (part of the mounting hardware) with the one blunt point screw provided.
6. CONNECTION OF THERMOSTAT CABLE:
 - a. Connect "**RED**" wire from the unit to wire coming from "**RC**" terminal on thermostat.
 - b. Connect "**YELLOW**" wire from unit to wire coming from "**Y**" terminal on thermostat.
 - c. Connect "**BLUE**" wire from unit to wire coming from "**H**" terminal on thermostat.
 - d. Connect "**ORANGE**" wire from unit to wire coming from "**G**" terminal on thermostat.
 - e. Use wire nuts to assure good connections.

K. AIR BOX INSTALLATION

1. Remove the two filter-grilles from the air box.
2. Slide the air box over the ceiling template.

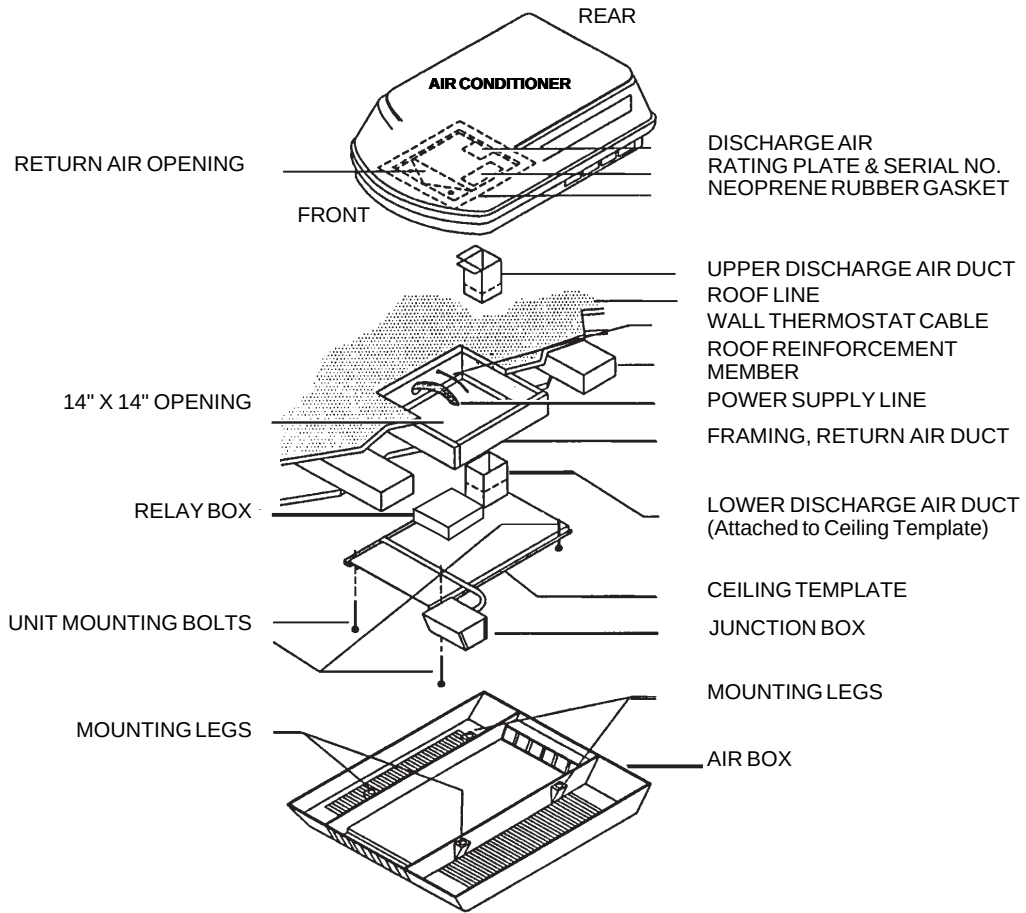


3. Install the four (4) sharp pointed screws through the air box legs and into the prepunched holes in ceiling template. NOTE: There are four optional mounting holes on the outer edge of the return air opening for which **no** screws are provided. These are only required where an uneven ceiling does not allow proper fitting of the air box.



4. Install the filter-grilles by pushing them into place. Turn on power to the air conditioner for operational check.

ROOF MOUNT ASSEMBLY



WIRING DIAGRAM

