



## INSTALLATION INSTRUCTIONS

FOR  
*Coleman®-Mach®*

230/240 VAC, 1ø, 50Hz

47000 SERIES

**RV ROOF TOP AIR CONDITIONER/HEAT PUMP**



Service Contact:  
Coast to Coast RV Services Pty Ltd.  
PO BOX 415  
REGENTS PARK DC NSW 2143 Australia  
Tel: +61-2-9645 7600  
[technical@coastrv.com.au](mailto:technical@coastrv.com.au)

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These instructions are a general guide for installing the 47000 Series, 230/240 VAC 50Hz Coleman-Mach roof top heat pumps.

## IMPORTANT NOTICE

These instructions are for the use of qualified individuals specially trained and experienced in installation of this type equipment and related system components.

Installation and service personnel are required to be licensed. **PERSONS NOT QUALIFIED SHALL NOT INSTALL NOR SERVICE THIS EQUIPMENT.**

## NOTE

The words “Shall” or “Must” indicate a requirement which is essential to satisfactory and safe product performance.

The words “Should” or “May” indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

## WARNING – SHOCK HAZARD

**To prevent the possibility of severe personal injury or equipment damage due to electrical shock, always be sure the electrical power source to the appliance is disconnected.**

**CAREFULLY FOLLOW ALL INSTRUCTIONS AND WARNINGS IN THIS BOOKLET TO AVOID DAMAGE TO THE EQUIPMENT, PERSONAL INJURY OR FIRE.**

## WARNING

**Improper installation may damage equipment, can create a hazard and will void the warranty.**

**The use of components not tested in accordance with these units will void the warranty, may make the equipment in violation of state codes, may create a hazard and may ruin the equipment.**

## SAFETY WARNING

**This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure they can use the appliance safely.**

## 1. GENERAL INFORMATION

OEM – Please make sure the Customer Envelope Package accompanies the heat pump.

INSTALLER AND/OR DEALER – Please make sure the Customer Envelope Package is presented to the product consumer.

INQUIRIES ABOUT THE A/C UNIT – Inquiries to your Airxcel, Inc. representative or to Airxcel, Inc. pertaining to product installation should contain both the model and serial numbers of the roof top unit. These roof top heat pumps have

model and serial number identification in two locations : (1) The rating plate sticker can be seen by removing the upper unit outer plastic shroud, (2) model/serial number sticker (silver color) is located on the return air section of the basepan of the roof top unit.

Additionally, if the heat pump is installed, the Manufacturer and Model Number may be viewed from the rear at the center of the basepan under the plastic shroud.

## II. HEAT PUMP SIZING

The ability of a heat pump in the cooling mode to cool a vehicle or maintain a consumer desired temperature is dependent on the heat gain of the vehicle. The physical size, the window area, the quality and amount of insulation, the exposure to sunlight, the number of people using the vehicle and the outside temperature, may increase the heat gain such that the capacity of the air conditioner is exceeded.

As a general rule, air supplied (discharge air) in the cooling mode will be 15 to 20 degrees F. (8 to 12 degrees C) cooler than the air entering (return air) the ceiling assembly bottom air grilles.

For example, if the air entering the heat pump is 80 degrees F. (27 degrees C) (return air), the supply air (discharge air) into the vehicle will be 60 to 65 degrees F. (15 to 19 degrees C).

As long as this temperature difference (15 to 20 degrees F, 8 to 12 degrees C) is being maintained, the unit is operating properly.

Again, give careful consideration to the vehicle heat gain variables. During extreme outdoor temperatures, the heat gain of the vehicle may be reduced by:

- Parking the vehicle in a shaded area
- Keeping windows and doors closed
- Avoiding the use of heat producing appliances
- Using window shades (blinds and/or curtains)

For a more permanent solution to high heat gain situations, additional vehicle insulation, window awnings and/or window glass tinting should be considered.

## III. SELECTING AN INSTALLATION LOCATION

Your Coleman-Mach heat pump has been designed for use primarily in recreational vehicles.

Is the roof of the vehicle capable of supporting both the roof top unit and ceiling assembly without additional support structures? Inspect the interior ceiling mounting area to avoid interference with existing structural members such as: bunks, curtains, tracks or room dividers. The depth of the ceiling assembly shroud is 51mm. Be sure to check clearance to doors which must be swung open (refrigerator – closets - cabinets).

Most of the time, roof mount heat pumps are installed at existing roof vent locations. If there is no roof vent (existing mounting hole), the following placement locations are recommended.

Motorhomes – a single unit or the forward of two units should be mounted within 2.7m of the driver compartment.

Travel Trailers or Mini-Homes – a location should be selected that is near the door slightly forward of the vehicle center length.

Vans – location should be in the center of the roof (side to side – front to back).

Truck with Camper – location should be between 1.2 and 1.5m from the rear of the camper to achieve maximum cooling effect.

## IV. INSTALLING THE ROOF TOP UNIT

### **DANGER SHOCK HAZARD**

**DISCONNECT ALL POWER TO THE VEHICLE BEFORE PERFORMING ANY CUTTING TO THE VEHICLE. CONTACT WITH HIGH VOLTAGE CAN RESULT IN EQUIPMENT DAMAGE, PERSONAL INJURY OR DEATH.**

### **IMPORTANT**

**TO PREVENT DAMAGE TO THE WIRING AND BATTERY, DISCONNECT THE BATTERY CABLE FROM THE POSITIVE BATTERY TERMINAL BEFORE PERFORMING ANY CUTTING TO THE VEHICLE.**

Once the location for your heat pump has been determined (See Section III), a reinforced and framed roof hole opening must be provided (may use existing vent hole). Before cutting into the vehicle roof, verify that the cutting action will clear all structural members and crossbeams. Additionally, the location of any inner roof plumbing and electrical supplies must be considered.

A. If a roof vent is already present in the desired mounting location for the heat pump, the following steps must be taken.

1. Remove all screws which secure the roof vent to the vehicle. Remove the vent and any additional trim materials. Carefully remove all caulking from around the roof opening to obtain clean exterior roof surface.

2. It may be necessary to seal some of the old roof vent mounting screw holes which may fall outside of the heat pump basepan gasket.
3. Examine the roof opening. If the opening is smaller than 356mm x 356mm, the opening must be enlarged.

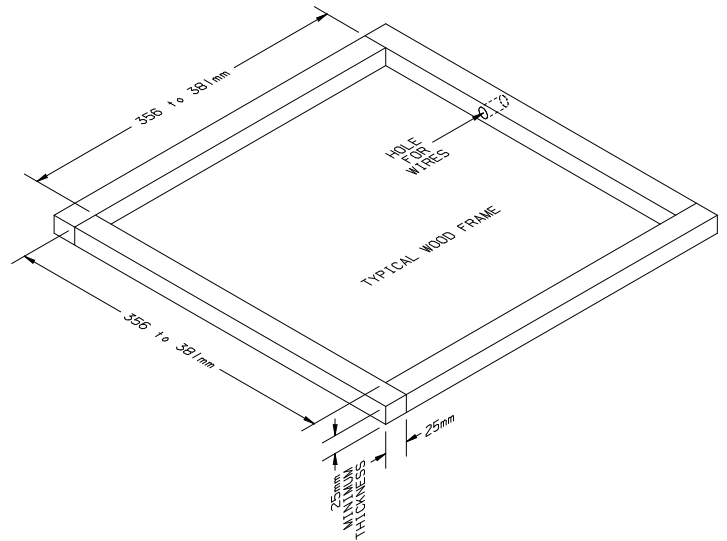
B. If a roof vent opening is not used, a new opening (See Figure 1) will have to be cut into the vehicle roof. A matching opening will also have to be cut into the interior vehicle ceiling. If the ceiling opening is carpeted, snagging could occur. After the opening in the roof and interior ceiling are the correct size, a framed support structure must be provided between the exterior roof top and interior ceiling. The reinforced framed structure must provide the following guidelines:

1. Capable of supporting both the weight of the roof top heat pump and the interior ceiling assembly.
2. Capable of holding or supporting the roof outer surface and interior ceiling apart, so that when the roof top heat pump and ceiling assembly are bolted together, no collapsing occurs.

Airxcel, Inc. recommends that the spacing from the vehicle roof top to the interior ceiling top be no less than 25mm. A typical support frame is shown in Figure 1.

The frame must provide an opening through the frame to allow passage for the power supply wiring. Route the supply wiring through the frame at the same time the support frame is being installed.

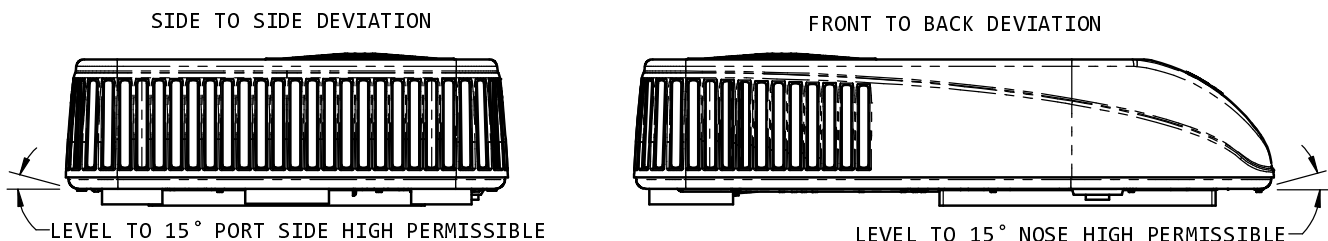
- C. The heat pump must be mounted as near level front to rear and side to side as possible when the vehicle is parked level. Figure 2 shows the maximum allowable degree deviations.



**FIGURE 1**

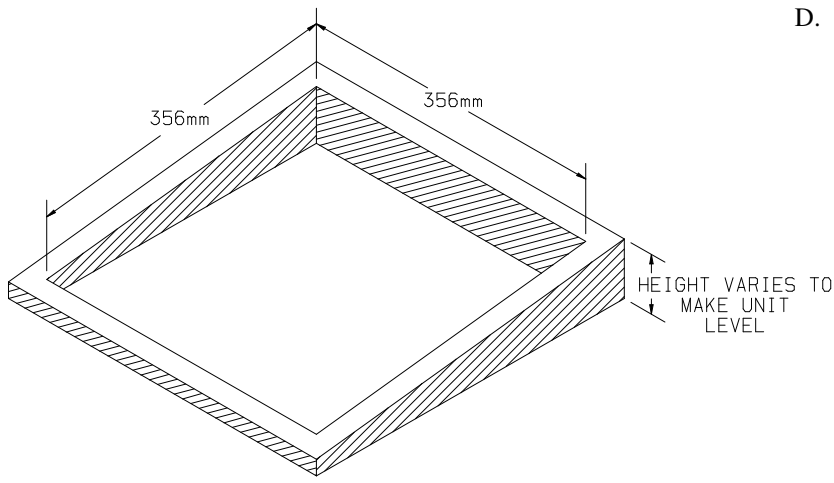
**IMPORTANT** – Allow 600mm of supply wiring through the support frame (working length).

After the support frame is installed, seal **all gaps** between the frame and both the roof exterior and the supply wiring.



**FIGURE 2**

If the roof of the vehicle is sloped such that the heat pump cannot be mounted within the maximum allowable degree deviations, an exterior leveling shim will need to be added to make the unit level. A typical front to back leveling shim is shown in Figure 3.



**FIGURE 3**

## **V. SECURING THE HEAT PUMP TO THE ROOF**

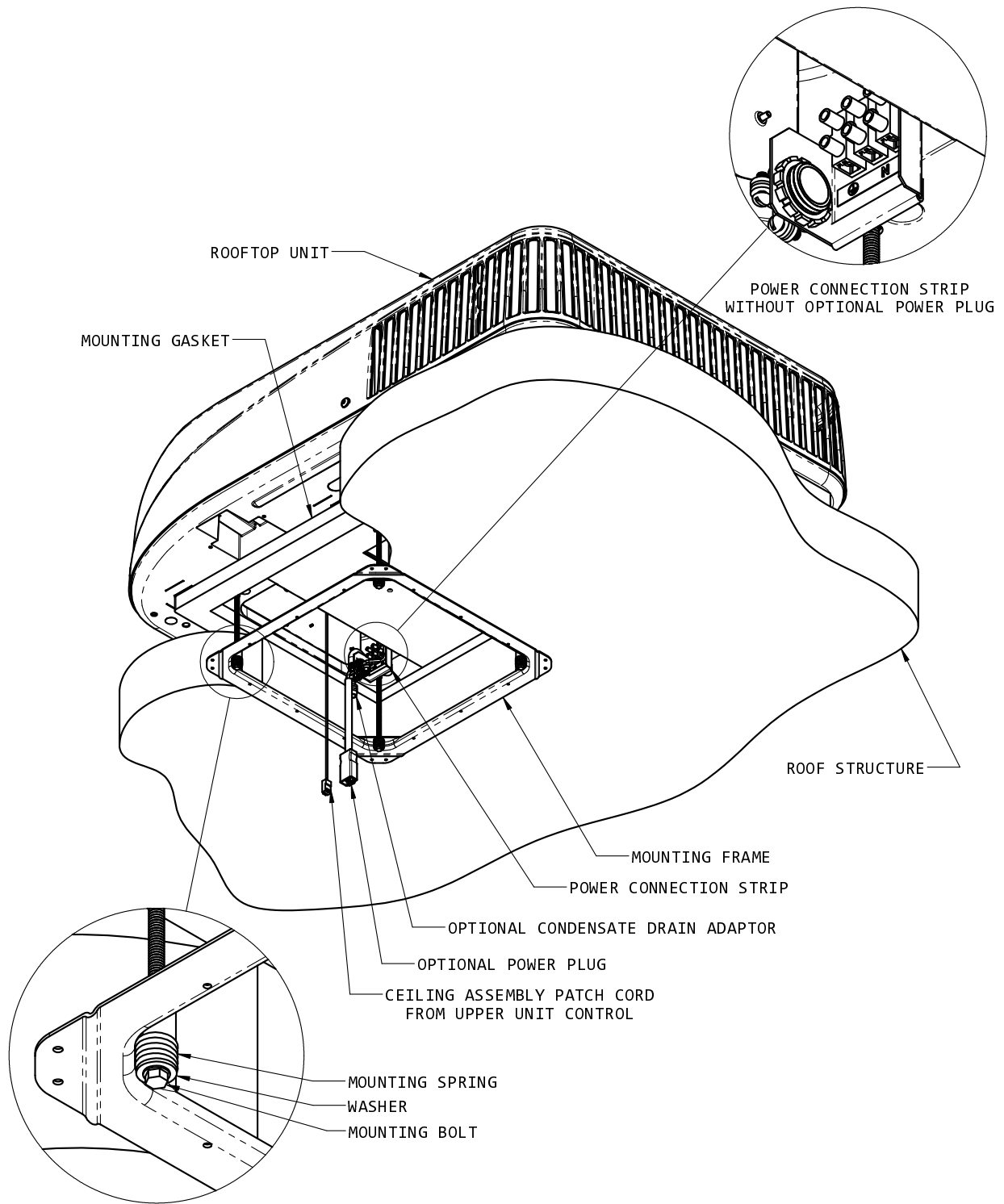
See Figure 4

A mounting frame is supplied with the ceiling assembly. Follow the steps below to secure the heat pump to the roof.

- A. Locate the heat pump mount gasket over the 356mm to 381mm square opening in the roof.
- B. Install the ceiling assembly mount frame using the four bolts, washers and springs found with the ceiling assembly.

Once the heat pump has been leveled, some additional shimming may be required above the interior ceiling assembly. The heat pump and the interior ceiling assembly must have a squared installation relationship before they are secured together.

- D. After the mounting hole is properly prepared, remove the carton and shipping pads from around the heat pump. **Carefully** lift the unit to the top of the vehicle. Do not use the outer plastic shroud for lifting. Place the heat pump over the prepared mounting hole. The pointed end (nose) of the shroud must face towards the front of the vehicle. Pull down all loose electrical connectors from the heat pump through the mounting opening and let hang.
- C. Proper tension has been achieved for each bolt when the spring coils have just come together (See Figure 4). The upper unit has now been properly installed with optimum gasket compression.
- D. If the heat pump is equipped with an optional evaporator condensate pump, a 13 mm I.D. hose must be provided that runs from the 356 mm square opening, through the vehicle ceiling and down the side wall to allow water to drain under the vehicle. The hose must not be allowed to kink shut while making a bend. Connect the top end of the drain hose to the barbed fitting shown in Figure 4.



**FIGURE 4**

## VI. ELECTRICAL WIRING

### ROUTING 230/240 VAC WIRING

See Figure 4

Following high voltage wiring specifications and all local and national electrical codes, route the 230/240 VAC supply wiring from its power source through the strain relief and connect to the power strip. Tighten screws to 8 Kg-centimeters torque. Some OEM units are equipped with a pre-wired power umbilical with plug which will snap-lock into the OEM supplied mating part.

#### High Voltage Wiring Specifications

Refer to most recent Australian/NZ Standard for Wiring Rules

**INSTALLER MUST PROVIDE A TWO POLE DISCONNECT FOR ACTIVE AND NEUTRAL.**

**MAXIMUM OVERCURRENT PROTECTIVE DEVICE FOR THESE UNITS: 15 AMPS**

#### DANGER – SHOCK HAZARD

**MAKE SURE THAT ALL POWER SUPPLY TO THE UNIT IS DISCONNECTED BEFORE PERFORMING ANY WORK ON THE UNIT TO AVOID THE POSSIBILITY OF SHOCK INJURY OR DAMAGE TO THE EQUIPMENT.**

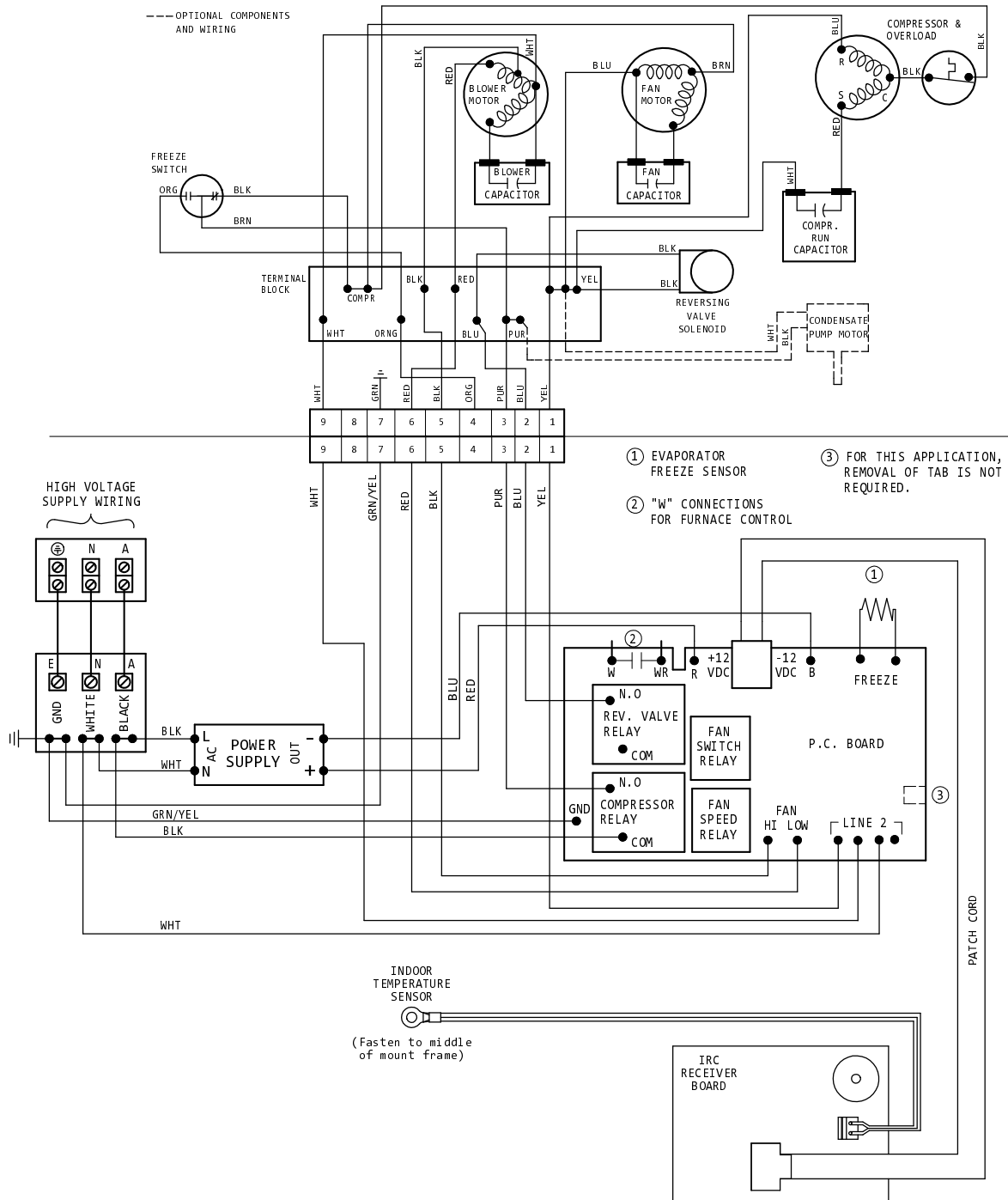
#### DANGER

**WITH NON-METALLIC SHEATH CABLES (ROMEX, ETC.), STRIP SHEATH BACK TO EXPOSE 100-150mm OF SUPPLY LEADS. STRIP INDIVIDUAL WIRE LEAD ENDS FOR WIRE CONNECTION (ABOUT 19mm BARE WIRE). INSERT SUPPLY WIRES INTO THE ELECTRICAL CONNECTOR CLAMP. SHEATH MUST PROTRUDE PAST THE CLAMP BUSHING INSIDE THE BOX. MAKE SURE CABLE IS CENTERED IN CLAMP BEFORE TIGHTENING. DO NOT OVERTIGHTEN!!**

**THIS COULD RESULT IN PINCHING THROUGH THE PLASTIC WIRE INSULATION AND CAUSE SHORTING OR “HOT” WIRES TO GROUND (SHOCK HAZARD). THE CLAMP IS INTENDED FOR STRAIN RELIEF OF THE WIRES. SLIGHT PRESSURE IS USUALLY SUFFICIENT TO ACCOMPLISH THIS.**

# VII.

## SYSTEM WIRING DIAGRAM



## VIII. INSTALLING THE 9430-451 CEILING ASSEMBLY

Refer to Figures 5 and 6

### NOTE

The following step by step instructions must be performed in sequence to insure a quick and easy installation.

- A. Remove the grilles and filters from the ceiling assembly shroud.
- B. Locate the cloth duct assembly and attach to the upper unit basepan with three of the provided short screws.
- C. Raise the ceiling assembly chute to align with the cloth duct assembly. Attach the chute to the steel mount frame with 4 short screws provided. Unfurl the cloth duct to drop through the ceiling assembly opening.
- D. Gently peel off the release liner from the VHB (Very High Bond) double sided tape. Press the cloth duct uniformly around the perimeter of the opening to adhere the cloth duct to the plastic chute. Carefully trim the excess cloth duct (a razor knife is very effective for this).
- E. Plug in the room temperature sensor to the receptacle on the ceiling assembly shroud. Raise the shroud up near the mount frame and push the temperature sensor up through the center opening of the air chute and allow the sensor to hang over the side of the chute. Plug in the patch cord from the upper unit to the receptacle on the ceiling shroud as shown in the magnified section of Figure 6.
- F. Align the shroud with the air chute insuring that no wires are trapped between plastic parts. Attach the shroud to the steel frame with 4 short screws provided.
- G. Attach the room temperature sensor to a middle hole of the steel mount frame with a short screw provided.
- H. Replace the filters and retaining grilles. Using the long screws provided, mount the hand held remote control holster to an interior wall at a height of 24 cm. in a location to prevent outlet air from playing onto the remote control and within "line of sight" to the ceiling assembly sensor. Avoid locations near heat producing appliances or direct exposure to sunlight. This is particularly important if using the "follow me" mode of the system in which the temperature sensing will be by the hand held remote instead of the sensor mounted in the ceiling assembly return airstream.
- I. Install the batteries into the hand held unit.
- J. Restore power to the system.

**This concludes the installation of the system. The owner's manual contains the operating and maintenance instructions.**

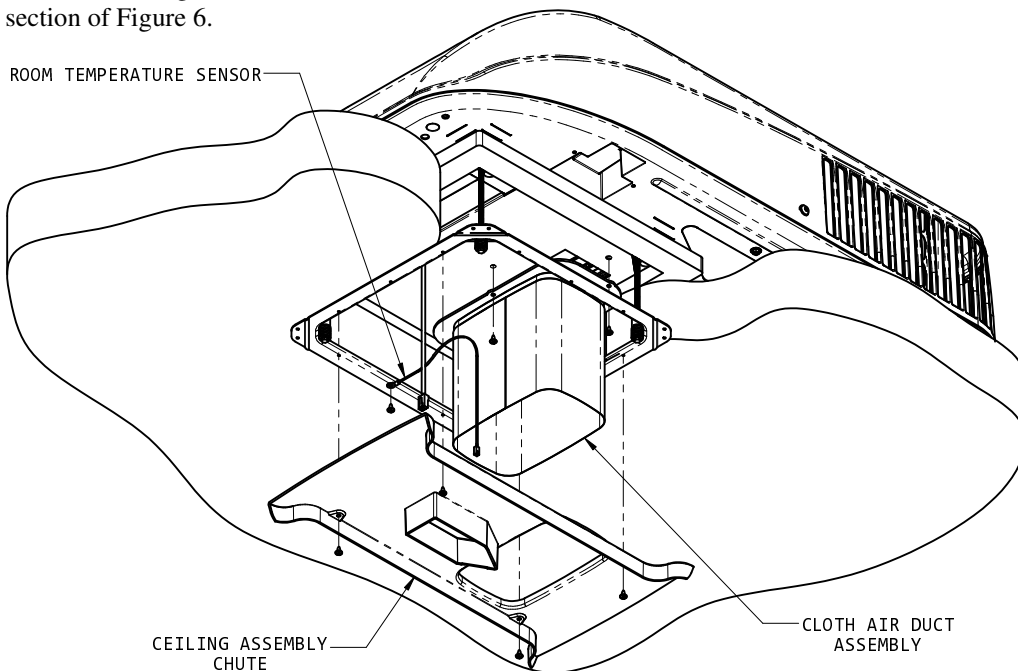
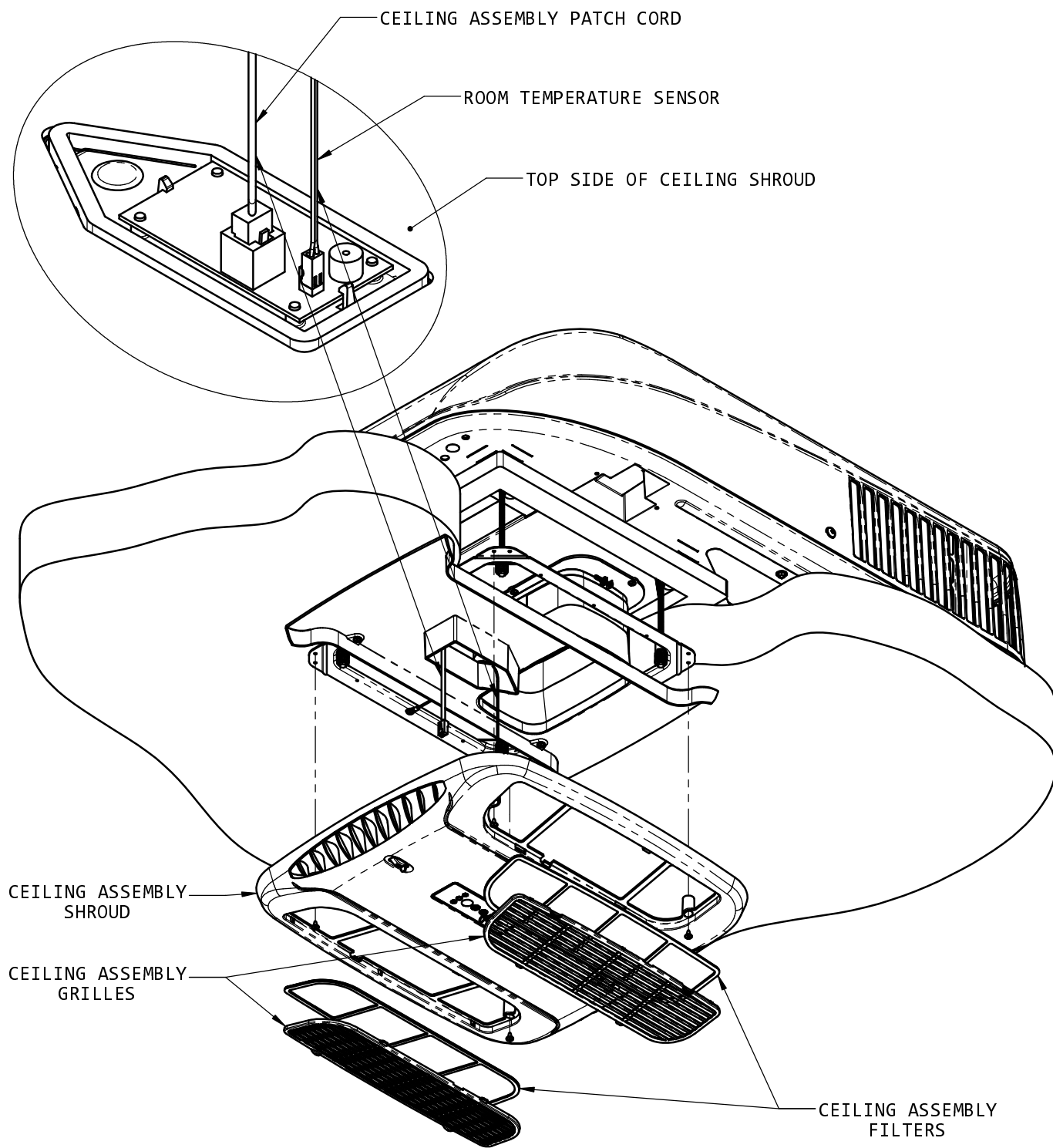


FIGURE 5



**FIGURE 6**



Airxcel, Inc.  
RV Products Division  
P.O. Box 4020  
Wichita, KS 67204