



# **INSTALLATION INSTRUCTIONS**

**FOR**

**6532 SERIES**

**PACKAGE HEAT PUMP**

**RV Products  
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## 1. WARNINGS

### 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 by some states 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

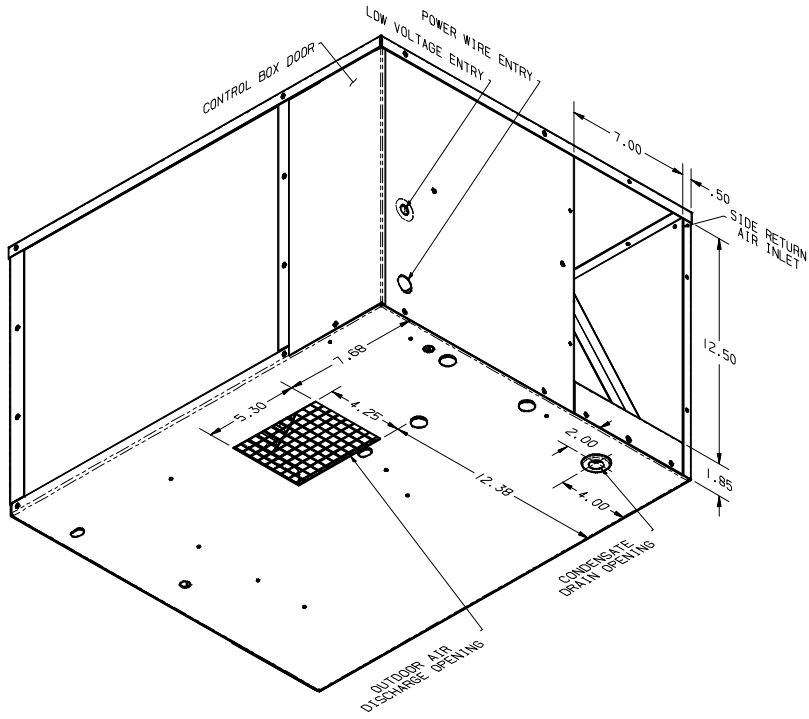
**Improper installation may damage equipment, can create a hazard and will void the warranty.**

**The use of components not tested in combination 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.**

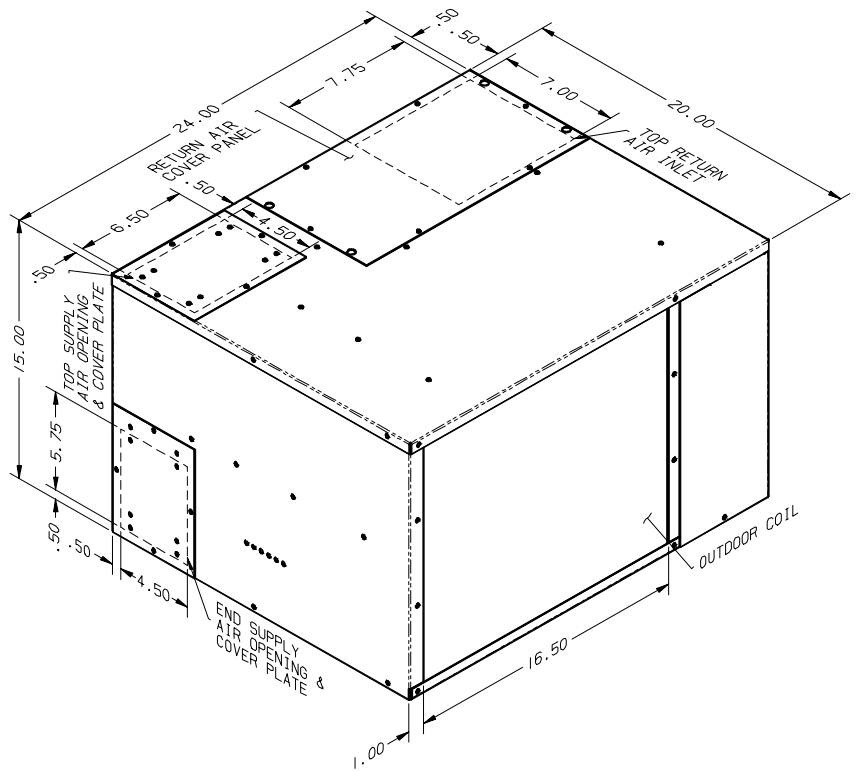
## 2. COMPONENT MATCH-UP

- |    |   |    |  |
|----|---|----|--|
| 1. | 6532 Series Package Heat Pump.  | 3. | If installing multiple zoned units, use 8330-3351 Zone Thermostat, 6535A5081 Zone Control Box with 6535-3091 (7 ft.) or 6535-3071 (75 ft.) Unit Cable Assembly and 6535-3121 (50 ft.) Thermostat Cable Assembly. |
| 2. | Use 8530-3451 12 VDC Wall Mounted Thermostat for single unit control. |    |  |

### 3. DEPICTION FIGURES



**FIGURE 1**



**FIGURE 2**

## 4. GENERAL INFORMATION

The 6532 series package heat pumps are intended only for installation by RV manufacturers. The units are for “off the roof” installations and will usually be installed under the floor of the vehicle. It is understood that the vehicle manufacturer has provided an installation area which allows for floor cutouts and unit mounting without cutting vital frame members or electrical wiring and that structural members in the installation area will not create restrictions by passing through airways required by the heat pump.

Conditioned air is delivered from the unit to the interior of the vehicle through ducting that is supplied and installed by the vehicle manufacturer. The system return air duct, return air filter and filter retainer are also supplied by the vehicle manufacturer.

The heat pump is powered by a 115 volt, 15 AMP electrical service.

The heat pump is controlled by a 12 VDC electronic wall mounted thermostat. The vehicle manufacturer must provide the power source for the thermostat.

## 5. UNIT INSTALLATION

### CONDENSING AIR FLOW

The heat pump draws in outside air for what is referred to as the outdoor coil. The air that is drawn across the outdoor coil is the outdoor air flow.

The installer is responsible for the proper ducting and routing of the outdoor air flow.

The outdoor air flow is drawn in through the side of the air conditioner (across the outdoor coil), and discharged out through the bottom of the appliance (through the discharge opening). Figures 1 and 2 show the location of both the outdoor coil and discharge air opening.

The unit must be installed so that the side that houses both the outdoor coil and the electrical box, faces towards the outer skin of the vehicle. The unit is installed this way so that:

- 1) the outdoor air flow will be drawn in from the outdoors through the side of the vehicle; and
- 2) the heat pump can be serviced electrically.

To provide adequate air flow, the installer must adhere to the following guidelines:

- 1) Install the heat pump so that the outdoor coil faces the outer skin of the vehicle; and
- 2) The outdoor air path to the coil should be as direct and non-restrictive as possible. RV Products recommends placing the exterior condenser air flow grille into the side of the vehicle, directly in front of the outdoor coil. The installer must provide the exterior air opening and/or grille.

- 3) Any decorative grille or louver used as an opening should have 230 square inches of free area minimum.

- 4) Do not block or restrict the discharge air opening (located in the bottom of the air conditioner) with any flooring or bracing.

- 5) The air being used by the outdoor coil cannot be drawn from the underside of the vehicle. Seal or baffle the sides and bottom edge of the heat pump to prevent the recirculation of air from underneath the vehicle. Recirculation of air across the outdoor coil will decrease both system performance and equipment life.

- 6) Do not install any other heat generating appliance in the same cavity as the heat pump. Additional heat in this cavity will decrease system performance in the cooling mode. Overall package dimensions are shown in Figure 1. RV Products requires that a minimum of 4 additional inches be allowed at the wiring box end of the unit to allow for the installation of both the low and high voltage wiring.

- 7) Insure that neither the vehicle engine exhaust, on-board generator engine exhaust or water heater vent exhaust are pulled into the outdoor coil air flow. These hot gases will both: (a) increase system temperature reducing performance and equipment life; and (b) the collection of these gases chemical by-products will begin the chemical degradation of the surfaces they collect on.

In order to improve installation time and reduce down time when servicing, RV Products recommends using drawer slides for mounting the heat pump.

This unit must be supported from below by angle iron, channels or RV frame members. These supports must be located under the air conditioner and must not obstruct the condenser air discharge or condensate drain.

When suspending the unit from flooring or frame members, a minimum of four threaded rods are required. Minimum rod diameter is 5/16". The support rods and hardware must be plated or equivalently protected against corrosion. All threaded fasteners should be provided with lock washers, "locktite", "double-nutted", or equivalently protected from vibration loosening after installation.

Condensation may at times splash out of the drain pan and drain from the unit corners. Therefore, do not mount the air conditioner above areas which might be damaged by exposure to moisture. A condensate drain tube is supplied with the unit (shipped in the electrical box) that allows the condensed water to drain from the indoor coil yet prevent outside air or fumes from entering the unit. This assembly must be installed in the condensate drain opening by inserting the barbed end of the tube into the rubber grommet in the unit drain pan. The barbed fitting may be sprayed with furniture polish to ease installation.

Upon completion of the installation, verify a minimum clearance of 14" from the bottom of the heat pump to ground level.

## 6. DUCT MOUNTING AND CONFIGURATION

This unit as shipped is configured with the return air inlet on the control box end of the cabinet. Unit may be converted to top return air inlet by removing the panel covering the top return air inlet and re-installing it over the side return air inlet.

This unit has the option of either top or side conditioned air discharge. Determine which configuration is desired and remove that supply air cover and foam block. **ONLY ONE SUPPLY AIR COVER MAY BE REMOVED.**

Under no circumstances will either of the openings or associated ducting be allowed to have a misaligned or smaller inner perimeter than either heat pump opening.

To provide both vibration dampening for the unit and air tight seals for both supply and return air openings, RV Products recommends the use of foam gaskets.

Gaskets do not come with the unit, they must be provided by the installer. This allows the installer the option of either providing their own gaskets or not using gaskets and attach ducting directly to the heat pump.

Attaching ducting directly to the heat pump is not recommended unless the installer can provide a means for access and quick disconnect. Generally an installation of this type will require vehicle disassembly before some types of unit repair can be completed.

### **DANGER - SHOCK HAZARD**

**Do not drill or cut any openings into this heat pump. Use only the pilot holes already provided. Drilling new openings and inserting screws may damage either the refrigeration circuit or electrical wiring causing possible equipment damage, personal injury or death.**

### **IMPORTANT**

**Regardless of installation configuration, insure that both duct connections are air tight. Loose or leaking connections can reduce system performance and allow gases, odors and dirt to be drawn in from outside the vehicle.**

## 7. DUCT AND REGISTER SPECIFICATIONS

### **GENERAL INFORMATION**

All supply air ducts, registers, return air ducts, return air filters and filter retainers must be supplied by the installer or vehicle manufacturer.

Any ducting (supply or return) exposed to a heat source or outdoor environment must be sealed and insulated to prevent heat gain and decreased system performance.

When ducting is attached directly to the heat pump cabinet, the installer must utilize the screw openings already provided. RV Products strongly recommends that all air distribution systems be tested by the vehicle manufacturer in a floor mock-up prior to installation in the vehicle. In doing so, the vehicle manufacturer can insure that air volume, distribution and noise levels are optimized.

## GUIDELINES FOR SUPPLY AIR DUCTING

Minimum free area inside the supply duct is 28 square inches. Ducting with more free area than 28 square inches will improve system performance and vehicle cool down time.

To decrease restriction and increase air flow, the ducting should make as few bends and turns as possible. When corners or turns are required, it is recommended that these turns be radiused and as gradual as possible.

The supply duct, unless made of an insulating material, must be insulated to prevent condensation from collecting on its exterior. Moisture condensation within the ceiling or wall cavity can damage insulation, stain vehicle interiors or create odors. 1/8", 3 pound density fiberglass or closed cell foam insulation has proven effective for this purpose.

Any ducting exposed to heat sources must be further insulated to prevent significant performance degradation due to heat gain. An example of an area capable of creating significant heat gain is the roof area which can sometimes experience temperatures of 160 degrees or more when exposed to direct sunlight. For ducting in or near the ceiling, it is impossible to provide "too much" thermal insulation.

## GUIDELINES FOR SUPPLY REGISTERS

Total free area provided by the supply air registers must equal a minimum of 36 square inches.

Free area is the size of the opening(s) that remain in a grille or louvered panel after restrictions (the louvers) are subtracted. Most metal and plastic grilles average 30% to 60% open. That is the actual "free area" for the grille will be 30% to 60% of the total opening area.

## GUIDELINES FOR RETURN AIR DUCTING AND FILTERS

All return air must be filtered. A 1-inch thick disposable fiberglass filter is recommended. A washable filter is acceptable if supported by a mesh or grille to prevent collapse.

Should the return air filter and filter retainer be located in the floor, a traffic duty grille will be required. The return air filter should be located in an area where:

- 1) drapes or bed sheets cannot block the opening;
- 2) the consumer can gain easy access for servicing.

This system is designed to operate without return air ducting. However, the fabrication and use of return air ducting is permissible.

When a return air duct is utilized, it is recommended that:

- 1) the length of the duct be kept to an absolute minimum;
- 2) the inner perimeter of the duct be kept as large as possible.

Return air ducting will contribute to the overall pressure and air flow loss of the system. Should the addition of return air ducting reduce air flow below acceptable levels, then either:

- 1) the supply air duct inner perimeter will need to be enlarged;
- 2) the supply air registers will need to be added;
- 3) the return air duct inner perimeter will need to be enlarged;
- 4) the return air duct will need to be shortened;
- 5) all of the above.

## **8. 115 VAC ELECTRICAL WIRING**

### **1. WARNING - SHOCK HAZARD**

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

**To prevent electrical shock due to mis-wiring, adhere to the following procedure:**

- A) Connect the circuits black (115V to GND) power lead to the "BLACK" high voltage lug on the p.c. board.**

- B) **Connect the circuits white (-0-V to GND) power lead to the “WHITE” high voltage lug on the p.c. board.**
- C) **Connect the circuits green or bare copper ground wire to the “GND” lug on the p.c. board.**

2. High Voltage Wiring Specifications

RV Products requires the power supply to be copper conductors only with minimum #12 AWG.

- 3. For circuit protection, adhere to the following guidelines:

Time Delay Fuse - Maximum 15 AMP

Circuit Breakers –  
 (H.A.C.R. Type) - Maximum 15 AMP  
 (C.S.A.) - Maximum 15 AMP

4. High Voltage Routing Specifications

When routing the high voltage supply wiring, the following guidelines must be followed:

- A) Route all wiring per applicable local and national electrical codes.
- B) High voltage wiring must be routed through a separate opening in the outer cabinet of the wiring box. This opening is referred to as the “power wire entry”. See Figure 2. RV Products provides this opening. The opening is 7/8" diameter.
- C) Circuit wiring must be secured at the “power wire entry” by a U.L. listed “Rain Tight” or equivalent electrical conduit fitting. The fitting must be supplied by the installer or vehicle manufacturer.

**DANGER**

**WHEN USING NON-METALLIC SHEATH SUPPLY CABLES (ROMEX, ETC.), STRIP SHEATH BACK TO EXPOSE 4-6 INCHES OF THE SUPPLY LEADS. STRIP THE INDIVIDUAL WIRE LEAD ENDS FOR WIRE CONNECTION (ABOUT 3/4" BARE WIRE). INSERT THE SUPPLY WIRES INTO THE ELECTRICAL CONNECTOR CLAMP. SHEATH MUST PROTRUDE**

**PAST CLAMP BUSHING INSIDE THE BOX. MAKE SURE SHEATH CABLE IS CENTERED IN CLAMP BEFORE TIGHTENING IT. DO NOT OVERTIGHTEN!! THIS COULD RESULT IN PINCHING THROUGH THE PLASTIC WIRE INSULATION AND CAUSE SHORTING OF “HOT” WIRES TO GROUND (SHOCK HAZARD). THE CLAMP IS INTENDED FOR STRAIN RELIEF OF THE WIRES, SLIGHT PRESSURE IS USUALLY SUFFICIENT TO ACCOMPLISH THIS.**

**IF OTHER THAN NON-METALLIC CABLES ARE USED FOR SUPPLY CONDUCTORS, APPROPRIATE STRAIN RELIEF CONNECTORS OR CLAMPS SHOULD BE USED.**

**IN NO CASE SHOULD CLAMPING OR PINCHING ACTION BE APPLIED TO THE INDIVIDUAL SUPPLY LEADS (NEUTRAL AND “HOT” WIRES).**

- D) The installer must form a drip loop in the high voltage wiring routed between the “Rain Tight” electrical fitting and the high voltage terminal board wiring lugs. Do not allow excess wiring to contact electrical terminals, sharp screw ends or edging that can cut or damage the wiring insulation.
- E) After connecting the ground wire to the grounding lug, verify that the ground wire (which in some instances will be bare copper) cannot come into contact with any high voltage terminal.

## 9. THERMOSTAT AND 12 VDC WIRING

The 6532 series heat pump is designed to be operated from an RV Products electronic wall mounted thermostat. See component match-up section for thermostat part numbers and descriptions. The thermostat is designed to operate from a 12 VDC power source. The installer must provide the power source used to operate the thermostat and its control circuits. This power source must provide one amp of continuous current at 12 VDC.

Maximum thermostat output for any load including the furnace control must not exceed one amp. A fast-acting two amp fuse is located on the base of the thermostat. The fuse is designed to open if the thermostat is mis-wired or shorted. Before replacing fuse, the cause of the failure must be located and corrected.

### THERMOSTAT CONTROL OPTIONS

In each case, see the installation guide included with the thermostat for further instructions and recommendations.

- 1) Multiple units operated by one multi-zone control thermostat:

In this system the heat pump, thermostat and control box are interconnected with pre-made cable assemblies that plug together. The 12 VDC supply wires connect to a terminal block inside the zone control box. 12 VDC power is then distributed to the thermostat and heat pump through these cables.

The unit cable assembly connects between the zone control box and the low voltage plug located in wirebox of the heat pump. The unit cable assembly includes a rain-tight fitting for assembly to the "low voltage entry" hole (See Figure 2). The "knock-out" around the low voltage entry hole will need to be removed to facilitate this fitting.

Mate the plugs on the heat pump and the unit control cable, pushing them together until they "snap" lock in place. Push excess low voltage wiring back into the low voltage junction box of the heat pump and re-install the unit control box door.

- 2) Single unit installation operated by single wall thermostat:

This configuration requires the installer to cut the connection plug from the unit low voltage control wires and wire nut the thermostat cable with these wires. Cut the wires as close to the plug as possible. Some of these wires have in-line diodes that must remain on the wire. The installer must provide an 18 gauge, 5 conductor sheathed cable to connect the thermostat to the unit. Also required is a rain-tight bushing where the thermostat wiring passes through the 1/2" diameter "low voltage entry" hole (See Figure 2).

WIRE COLOR	FUNCTION
RED	+12 VDC Supply
BLUE	-12 VDC Supply
WHITE	Furnace Control
WHITE/BLACK	Unit Heat Signal
YELLOW	Unit Compressor Signal
GREEN	Unit High Fan Signal
GRAY	Unit Low Fan Signal

The 12 VDC supply wiring is connected at the thermostat along with the control signal wire to the furnace. Use U.L. listed wire nuts and electrical tape to make the wire connections in a workmanlike manner. See chart for wire identification on both the unit low voltage and the thermostat. Push excess low voltage wiring back into the low voltage junction box of the heat pump and re-install the unit control box door.

Routing of the thermostat wiring must comply with all local and national electrical codes. Collect any excess thermostat wiring in the heat pump mounting compartment. Be sure to secure the excess wiring within the compartment. Coiling the excess harness into 3" diameter circles or larger is acceptable.

### THERMOSTAT MOUNTING

Follow the instructions packed with the thermostat to select a location for thermostat mounting. Pay particular attention to choose a location which is not totally isolated from air currents and is not subject to direct discharge from an air register.

## 10. CHECKOUT

1. Before engaging power to any system, insure the following:
  - A) All tools have been removed from the equipment.
  - B) All wiring is attached, routed and properly secured.
  - C) All panels (both mechanical and electrical) are in place.
  - D) The thermostat system switch is placed into the "OFF" position and fan switch is placed in the "Auto" position.
  - E) All co-workers have been warned that the equipment is being energized.
2. System wiring may be checked by referring to the wiring diagram located on the back of the wiring box door.
3. Before beginning the checkout procedure, thoroughly read the instructions in either the thermostat installation instructions or in the owners manual provided with this product.

Keep in mind that the wall thermostat provides a 3 minute delay between off and on cycles.
4. After complying with steps 1 through 3, engage power to all systems and begin checkout procedure.
5. Test each thermostat function, such as fan modes, heat modes and cool modes to insure proper operation.