

RECORD THIS INFORMATION FOR FUTURE REFERENCE:

Model Number	
Serial Number	
ADB Model Number	
ADB Serial Number	
Date Purchased	



Roof Top Unit Used With 3105007.XXX or 3105935.XXX Air Distribution Box						
Description	Model	Electronic Control Kit	Thermostat	Optional Indoor Temperature Sensor		
Air Conditioner						
LCD SZ Controls	57908 59712 57915 59516 59530 520300 520310 520315 520316 600312 600315	3316155.000	Thermostat Included With Electronic Control Kit	N/A		

This Unit is designed for OEM installation.



Read these instructions carefully. These instructions MUST stay with this product.

#### **REVISION C**

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#### USA

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### INTRODUCTION

This air conditioner/heat pump (hereinafter referred to as "unit" or "product") is designed and intended for installation on the roof of a Recreational Vehicle (hereinafter referred to as RV) during the time it is manufactured.

Read these instructions and highlight the appropriate steps for your particular procedure before starting the installation.

This unit can be installed by one person with brief help from additional personnel. Use these instructions to ensure a properly installed, and properly functioning product.

Dometic Corporation reserves the right to modify appearances and specifications without notice.

### **TABLE OF CONTENTS**

INTRODUCTION	2
DOCUMENT SYMBOLS	2
IMPORTANT SAFETY INSTRUCTIONS A. Recognize Safety Information B. Understand Signal Words C. Supplemental Directives D. General Safety Messages	3 3 3
SPECIFICATIONS A. Table - Unit Data B. Roof Requirements. C. Table - Air Distribution Duct Sizing & Design	4 4
INSTALLATION INSTRUCTIONS A. Choosing Proper Location For Unit B. Roof Preparation C. Air Distribution Duct Sizing & Design D. Wiring Requirements E. Choosing Thermostat Location F. Thermostat Installation G. Placing Unit On Roof H. Installation Preparation I. LCD SZ System Low Voltage Wire Connections J. Upgrading from Bi-Metal Thermostat to SZ LCD Thermostat K. Installing Return Air Cover	5 6 7 8 9 9 10 12 12
GENERAL INFORMATION A. Frost Formation On Cooling Coil B. Heat Gain C. Condensation D. Air Distribution	14 14 14 14
WIRING DIAGRAMS A. Simple RV Wiring Diagram B. Unit Wiring Diagrams	15

### **DOCUMENT SYMBOLS**



Indicates additional information that is **NOT** related to physical injury.

R

Indicates step-by-step instructions.

# **IMPORTANT SAFETY INSTRUCTIONS**

This manual has safety information and instructions to help users eliminate or reduce the risk of accidents and injuries.

### A. Recognize Safety Information



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### B. Understand Signal Words

A signal word will identify safety messages and property damage messages, and will indicate the degree or level of hazard seriousness.

**AWARNING** indicates a hazardous situation that, if **NOT** avoided, could result in death or serious injury.

**ACAUTION** indicates a hazardous situation that, if **NOT** avoided, could result in minor or moderate injury.

**NOTICE** is used to address practices **NOT** related to physical injury.

### C. Supplemental Directives



Read and follow all safety information and instructions to avoid possible injury or death.

Read and understand these instructions before [installing / using / servicing / performing maintenance on] this product.

Incorrect [installation / operation / servicing / maintaining] of this product can lead to serious injury. Follow all instructions.

The installation **MUST** comply with all applicable local or national codes, including the latest edition of the following standards:

#### U.S.A.

- ANSI/NFPA70, National Electrical Code (NEC)
- ANSI/NFPA 1192, Recreational Vehicles Code

#### CANADA

- CSA C22.1, Parts I & II, Canadian Electrical Code
- CSA Z240 RV Series, Recreational Vehicles

### D. General Safety Messages

**AWARNING** Failure to obey the following warnings could result in death or serious injury:

- This product **MUST** be [installed / serviced] by a qualified service technician.
- Do **NOT** modify this product in any way. Modification can be extremely hazardous.
- Do **NOT** add any devices or accessories to this product except those specifically authorized in writing by Dometic Corporation.

# SPECIFICATIONS

#### A. Table - Unit Data

Model No.	Nominal Capacity (BTU HR) Cooling	Electrical Rating	Compressor Rated Load Amps	Compressor Locked Rotor Amps	Fan Motor Rated Load Amps	Fan Motor Locked Rotor Amps	Refrigerant R-410A (Oz.)	Minimum Wire Size*	AC Circuit Protection ***Installer Supplied	Minimum Generator Size** 1 Unit / 2 Units
57908.321	7,180	120 VAC	6.9	36.0	2.5	5.8	16.0		20 Amp	2.5 kW / 4.0 kW
57908.521	7,100	60Hz. 1PH	6.6	34.0	2.5	5.8	17.0		20 Amp	2.5 kW / 4.0 kW
57912.531	11,000	]	8.0	53.0	2.5	5.8	18.5		20 Amp	2.5 kW / 4.0 kW
57912.532	11,000	]	12.1	59.0	2.5	5.8	16.5	ĺ	20 Amp	3.5 kW / 5.0 kW
57915.331	13,500	1	11.4	58.0	2.5	5.8	15.5		20 Amp	3.5 kW / 5.0 kW
57915.336	13,500	1	12.1	59.0	2.5	5.8	16.5		20 Amp	3.5 kW / 5.0 kW
57915.531	13,500	1	12.1	59.0	2.5	5.8	16.5		20 Amp	3.5 kW / 5.0 kW
57915.536	13,500	1	12.1	59.0	2.5	5.8	16.5		20 Amp	3.5 kW / 5.0 kW
57915.541	13,500	1	11.3	62.0	2.5	5.8	16.0		20 Amp	3.5 kW / 5.0 kW
57915.546	13,500	1	11.3	62.0	2.5	5.8	16.0		20 Amp	3.5 kW / 5.0 kW
57915.741	13,500	1	12.0	58.0	2.5	5.8	15.5		20 Amp	3.5 kW / 5.0 kW
57915.746	13,500	1	12.0	58.0	2.5	5.8	15.5		20 Amp	3.5 kW / 5.0 kW
59516.331	15,000	1	11.5	50.0	2.5	5.8	29.0		20 Amp	3.5 kW / 5.0 kW
59516.336	15,000	1	12.7	60.0	2.0	5.6	29.0		20 Amp	3.5 kW / 5.0 kW
59516.531	15,000	1	11.5	50.0	2.5	5.8	26.5		20 Amp	3.5 kW / 5.0 kW
59516.536	15,000	1	11.5	50.0	2.5	5.8	29.0		20 Amp	3.5 kW / 5.0 kW
59516.731	15,000	1	13.3	62.0	2.0	5.6	29.0		20 Amp	3.5 kW / 5.0 kW
59530.532	N/A	1	8.0	53.0	2.5	5.8	18.5		15 Amp	3.5 kW / 5.0 kW
59530.536	N/A	1	7.8	53.0	2.0	5.6	19.0		15 Amp	3.5 kW / 5.0 kW
520310.501	9,000	1	7.8	49.0	3.0	8.5	20.0		20 Amp	2.5 kW / 4.0 kW
520315.501	13,500	1	10.3	62.0	3.0	8.5	16.5		20 Amp	3.5 kW / 5.0 kW
520315.506	13,500		10.3	62.0	3.0	8.5	16.5		20 Amp	3.5 kW / 5.0 kW
520316.501	15,000		13.2	79.0	2.8	7.6	30.0		20 Amp	3.5 kW / 5.0 kW
520316.506	15,000		13.2	79.0	2.8	7.6	30.0		20 Amp	3.5 kW / 5.0 kW
520300.501	N/A	]	7.8	49.0	3.0	8.5	20.0		15 Amp	2.5 kW / 4.0 kW
600312.331	11,000	1	9.5	53.0	3.5	10.0	17.0		20 Amp	2.5 kW / 4.0 kW
600315.331	13,500	1	12.4	60.0	3.5	10.0	15.2		20 Amp	3.5 kW / 5.0 kW
600315.336	13,500	1	12.4	60.0	3.5	10.0	15.2		20 Amp	3.5 kW / 5.0 kW

\* For wire length over 24 ft., consult the National Electrical Code for proper sizing.

\*\* Dometic Corporation 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 RV must be considered. Keep in mind generators lose power at high altitudes and from lack of maintenance.

\*\*\* CIRCUIT PROTECTION: Time Delay Fuse or Circuit Breaker Required.

#### B. Roof Requirements

- A 14-1/4" x 14-1/4" (±1/8") square opening (hereinafter referred to as "roof opening") is required for installing this unit. This opening is part of the return air system of the unit and **MUST** be finished in accordance with NFPA 1192.
- Roof construction with rafters/joists support frames on a minimum of 16 inch centers.
- Minimum of 2 inches and maximum of 5-1/2 inches distance between roof to ceiling of RV.

### SPECIFICATIONS

#### C. Table - Air Distribution Duct Sizing & Design

Air Distribution Duct Sizing & Design Chart For Ducted Applications					
Return Air Cover Model	3105007.XXX 3105935.XXX				
Roof Cavity Depth	2 in - 2 1/2 in Max.				
Duct Cross Section Area (inside)	21 in <sup>2</sup> Min.				
Duct Size Depth Width Total Duct Length Duct Length (short run)	1 1/2 in Min 2 1/2 in Max. 7 in Min 10 in Max. 15 ft Min 40 ft Max. 1/3 Min. Of Total Duct Length				
Register Requirements per A/C Unit Number Required Free Air Area Per Register Distance From Duct End Distance From Elbow	4 Min 8 Max. 14 in² Min. 5 in Min 8 in Max. 15 in				
Total System Static Air Pressure Blower At High Speed, Filter & Grill In Place	0.12 - 0.65 in W.C.				
Note: Duct sizes listed are inside dimensions					

### **INSTALLATION INSTRUCTIONS**

#### A. Choosing Proper Location For Unit

This unit is specifically designed for installation on the roof of an RV. When determining your cooling requirements, the following should be considered:

- Size of RV;
- Window area (increases heat gain);
- Amount of insulation in walls and roof;
- Geographical location where the RV will be used;
- Personal comfort level required.
- For one unit installation: The unit should be mounted slightly forward of center (front to back) and centered from side to side.
- 2. For two unit installations: Install one unit 1/3 and one unit 2/3's from front of RV and centered from side to side.

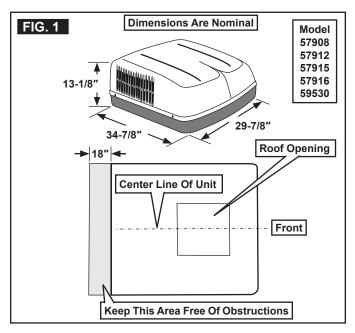
It is preferred that the unit be installed on a relatively flat and level roof section measured with the RV parked on a level surface. See table below for maximum acceptable tilt.

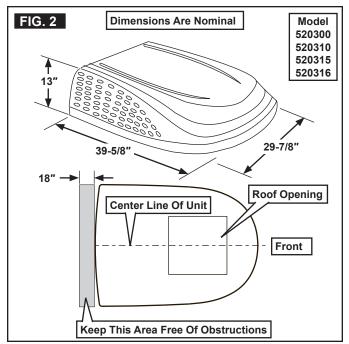
Model Number	Max Tilt	Model Number	Max Tilt
57908 57912 57915	15°	520310 520315 520316	15°
59516 59530 520300		600312 600316	8°

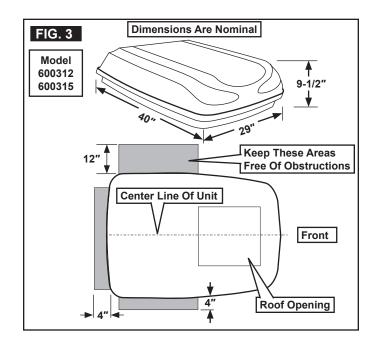
3. After Location Has Been Selected:

- a. Check for obstructions in the area where unit will be installed. See (FIG. 1), (FIG. 2) & (FIG. 3).
- b. **NOTICE** Maintain structural integrity. Otherwise damage to product and/or RV could occur.

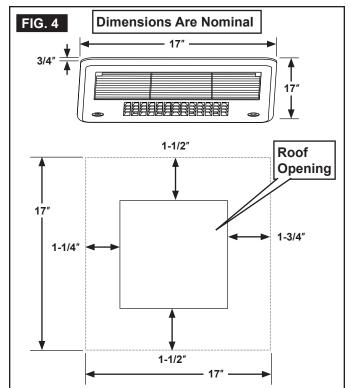
The roof must be designed to support 130 pounds when RV is in motion. Normally a 200 lb. static load design will meet this requirement.







c. Check inside the RV for return air grille (hereinafter referred to as "RAG") obstructions (i.e. door openings, room dividers, curtains, ceiling fixtures, etc). See (FIG. 4).

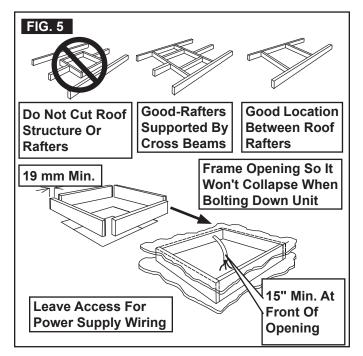


#### B. Roof Preparation

- 1. A WARNING FIRE OR ELECTRICAL SHOCK HAZARD. Make sure there are no obstacles (wires, pipes, etc.) inside RV's [roof / floor / walls]. Shut OFF gas supply, disconnect 120 Vac power from RV, and disconnect positive (+) 12 Vdc terminal from supply battery **BEFORE** drilling or cutting into RV. Failure to obey these warnings could result in death or serious injury.
  - Opening Requirements Before preparing the ceiling opening, the type of system options **MUST** be decided upon. Read all of the following instructions before beginning the installation.
  - 2. Carefully mark and cut the required roof opening. See "B. Roof Requirements" on page (4).
  - 3. Using the roof opening as a guide, cut the matching hole in the ceiling.
  - 4. **NOTICE** Maintain structural integrity. Otherwise damage to product and/or RV could occur.

**NOTICE NEVER** create a low spot on RV roof. Otherwise, water will pool and could cause a leak.

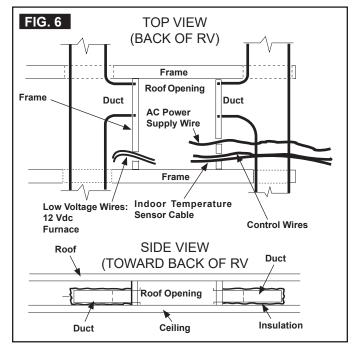
The opening created must be framed to provide adequate support and prevent air from being drawn from the roof cavity. Framing stock 407 mm or more in thickness must be used. Remember to provide an entrance hole for power supplies, indoor temperature sensor (if applicable), thermostat communication cable, and furnace wires (if applicable) at the front of the opening. See (FIG. 5).



### C. Air Distribution Duct Sizing & Design

The installer of this system must design the air distribution system for their particular application. Several requirements must be met for the unit to operate properly. These requirements are as follows:

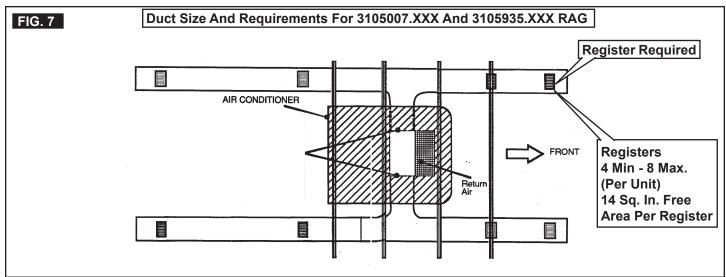
- 1. **NOTICE** Make sure ductwork will **NOT** bend or collapse during and after installation, and that it is correctly insulated and sealed. Otherwise, damage to roof structure and ceiling could occur.
- 2. All discharge air ducts must be properly insulated to prevent condensation from forming on their surfaces or adjacent surfaces during operation of unit. This insulation must be R-7 minimum. See (FIG. 6).



- 3. Ducts and their joints must be sealed to prevent condensation from forming on adjacent surfaces during operation of the unit.
- 4. Return air openings must have 40 square inches minimum free area including the filter.
- 5. Return air to the unit must be filtered to prevent dirt accumulation on unit cooling surface.
- 6. Air Distribution System Installation
  - a. Dometic Corporation recommends the basic configuration shown in (FIG. 7), for installing this system. We have found by testing, that this configuration works best in most applications. It is the responsibility of the installer to review each RV floor plan to determine the following:
    - Duct size
    - Duct layout
    - Register size
    - Register location
    - Thermostat location

• Indoor Temperature Sensor Location These items must be determined in conjunction with the Air Distribution Duct System Sizing & Design requirements. See "C. Table - Air Distribution Duct Sizing & Design" on page (5).

Alternate configurations and methods may be used which will allow the unit to operate properly; however, these alternate configurations and methods **MUST** be approved by Dometic Corporation in writing. The following instructions are based upon the use of RAG Kits 3105007.XXX & 3105935. XXX.



#### D. Wiring Requirements

- Route a copper, with ground, 120 Vac supply wire from the time delay fuse or circuit breaker box to the roof opening. Use a listed/certified non metallic - sheathed single strand cable. See "A. Table - Unit Data" on page (4).
  - a. This supply wire must be located in the front portion of the roof opening.
  - b. The power **MUST** be on an appropriately sized separate time delay fuse or circuit breaker. See "A. Table Unit Data" on page (4).
  - c. Make sure that at least 15" of supply wire extends into the roof opening. This ensures an easy connection at the junction box.
  - d. Protect the wire where it passes into the opening with approved method.
  - 2. 12 volt DC supply comes from control box.
  - 3. Thermostat Communication Cable
    - a. LCD SZ Thermostat
      - Route a 3 conductor communication cable, 18-22 AWG, from the roof opening to the Liquid Crystal Display Single Zone (hereinafter referred to a LCD SZ) thermostat mounting location. Make sure that at least 15" of the wire extends into the roof opening and 15" extends from the wall at the thermostat mounting location. See "E. Choosing Thermostat Location" on page (8).

4. If system includes a gas furnace, route two 18-22 AWG thermostat wires from the furnace to the roof opening of the unit that will control it. If more than one furnace is to be used, route the second set of thermostat wires to the second unit. Make sure that at least 15" of wire extends into the opening.



If converting from Bi-Metal Thermostat to Single Zone Thermostat, see "I. LCD SZ System Low Voltage Wire Connections" on page (12) for wiring details.

### E. Choosing Thermostat Location

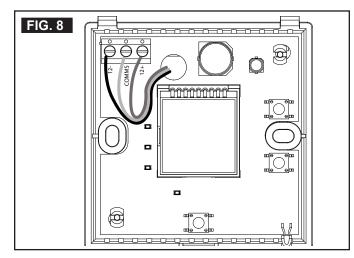
- 1. LCD SZ system
  - a. The proper location of the thermostat is very important to ensure that it will provide a comfortable RV temperature. Observe the following rules when selecting a location.
    - Locate the thermostat 54" above the floor.
    - Install the thermostat on a partition, not on an outside wall.
    - NEVER expose the thermostat to direct heat from lamps, sun, or other heat producing items.
    - Avoid locations close to doors that lead outside, windows, or adjoining outside walls.
    - Avoid locations close to supply registers and the air from them.

#### F. Thermostat Installation

- 1. LCD SZ System
  - i

Wire colors listed for the communication cable (3 conductor cable) match the wire colors in the unit wire harness and the wire harness at the LCD SZ electronic control box. Available wire colors may vary.

- a. Remove the cover from the LCD SZ thermostat. Depress tab on bottom of thermostat and separate it from the base.
- b. Insert the previously run communication cable (3 conductor cable) through the hole in the base assembly.
- c. Cut back the outer cable shield approximately 3 inches and strip 1/4" insulation from each wire.
- d. Mount the thermostat level on the wall using the screws provided.
- e. Make the following connections to the thermostat. See (FIG. 20).



- Red/white wire to the 12V+ terminal
- Black wire to the 12V- terminal
- Orange wire to the "COMMS" terminal
- f. Inspect all connections to make sure they are tight and not touching any other terminals or wires.
- g. Push the wires back through the base into the wall. Place cover on the thermostat and push until an audible click is heard.

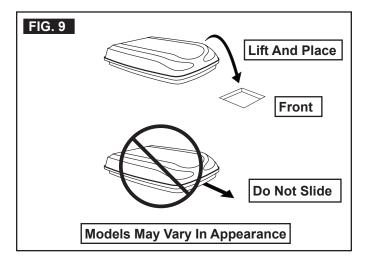
### G. Placing Unit On Roof

- 1. Remove the unit from the carton and discard carton.
  - 2. **ACAUTION** LIFTING HAZARD. Use proper lifting technique and control when lifting product. Failure to obey this caution could result in injury.

Place unit on the roof.

3. **NOTICE** Do **NOT** slide unit. Otherwise, damage to gasket (on bottom of unit) may occur, and could cause a leak.

Lift and place the unit over the prepared opening using the gasket on the unit as a guide. See (FIG. 9).



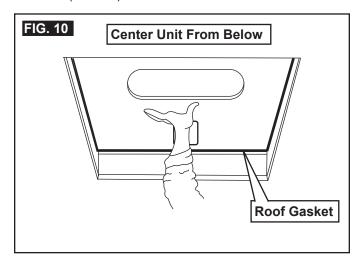
4. Place the electronic control box kit (if applicable) and the ADB kit inside the RV. These boxes contain mounting hardware for the unit and will be used inside the RV.



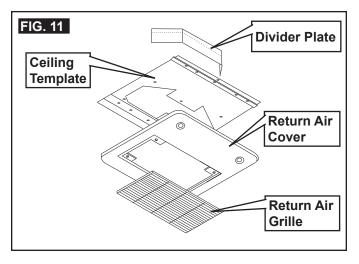
This completes the outside work. Minor adjustments can be done from inside the RV if required.

#### Installation Preparation Н.

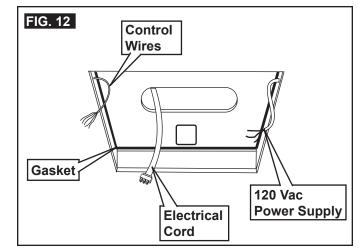
1. Check gasket alignment of the unit over the roof opening and adjust if necessary. Unit may be moved from below by slightly lifting. See (FIG. 10).



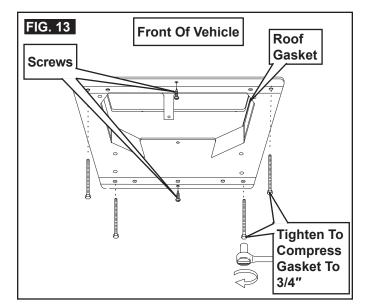
2. Remove return air cover and ceiling template from carton. See (FIG. 11).



- 3. All models listed in this manual will use a four (4) bolt pattern for installing the RAG kit.
- 4. Reach up into the return air opening and pull the unit electric cord down for later connection. See (FIG. 12).



- 5. Hold the ceiling template up to the roof opening. Make sure the large plate faces the rear of the RV. See (FIG. 13).
  - a. Start each mounting bolt through the ceiling template and up into the unit base pan by hand. Install wood screw in each end of the ceiling template. This ensures a tight fit of the return air cover to ceiling. See (FIG. 13).

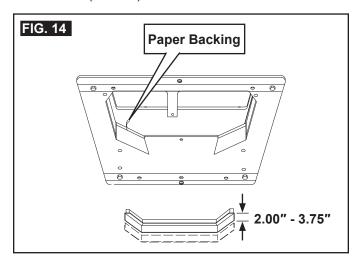


NOTICE Tighten mounting bolts to b. correct torque specifications. Overtightening could damage unit's base pan or ceiling template. Not enough torque will allow an inadequate roof seal, and could cause a leak.

Tighten all four (4) mounting bolts EVENLY with in 40 to 50 inch pounds. (FIG. 13)

This will compress the roof gasket to approximately 3/4".

- 6. Installation Of Divider Plate
  - a. Measure the ceiling to roof thickness:
    - If distance is 2.0" 3-3/4", remove perforated tab from divider plate. See (FIG. 14).
    - If distance is 3-3/4" 5-1/2, remove no tabs.
  - b. Remove the backing paper from doublesided tape located on ceiling template. See (FIG. 14).

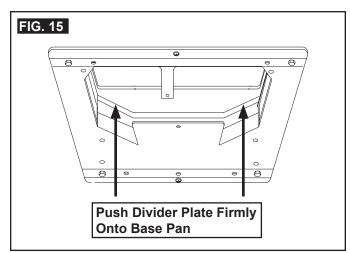


c. **NOTICE** Divider plate **MUST** be installed correctly. Incorrect installation could cause compressor to quick-cycle, and could result in supply circuit overload and reduced product performance.

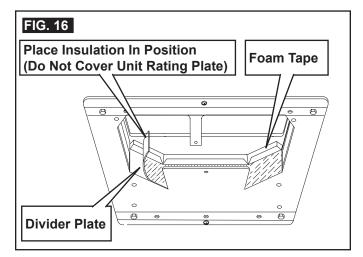


The adhesive on the double-sided tape is extremely sticky. Make sure the divider plate is properly positioned before pressing into place.

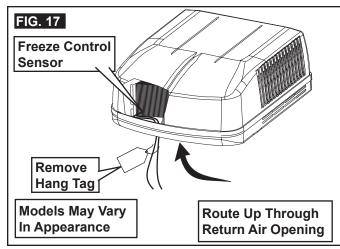
Place the divider plate up to bottom of the unit base pan firmly. The foam tape on the divider plate must seal to bottom of base pan. See (FIG. 15).



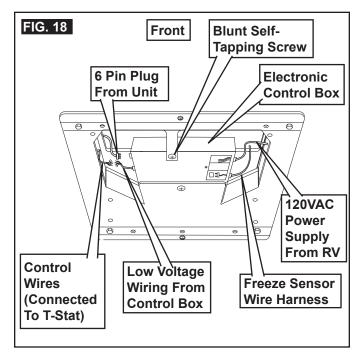
- d. With slight pressure push the divider plate against the double-sided tape on the ceiling template.
- e. Locate the 1/8" x 7" x 18" self-adhesive insulation supplied with the RAG kit. Remove the backing paper from the insulation and carefully stick onto the ceiling template divider plate. See (FIG. 16).



- Excess width is intended to seal the divider plate to the sides of the roof opening. This is to help prevent cold air discharge from circulating into the unit return air opening.
- If the insulation is too high, stick excess height of the insulation to the unit base pan. Do not cover up unit rating plate.
- f. Place the electronic control box on the ceiling template with the white 6 pin plug on the curb side of the RV. Do **NOT** attach at this time.
- g. Plug the 6 pin connector into matching 6 pin connector in the electronic control box. The plug is polarized and will only fit in one direction. See (FIG. 18).
- h. Plug the supplied freeze control sensor and the 4 wire harness into their matching connectors in the electronic control box.
- Insert the freeze control sensor into the evaporator coil fins approximately 1" above the bottom of the coil fins and on the left side. See (FIG. 17). Bend fins over sensor to secure in place.



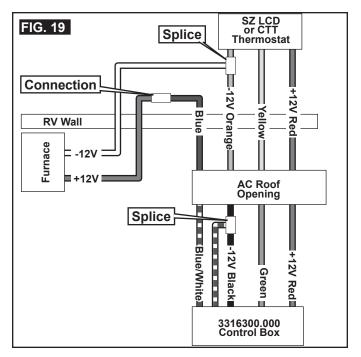
j. Attach electronic control box to the ceiling template using the two (2) blunt self-tapping screws provided in the electronic control box kit. See (FIG. 18).



### I. LCD SZ System Low Voltage Wire Connections

1. All Heat Pump Electronic Control Kit Systems

- a. Plug the outdoor temperature sensor from the unit into the white 2 pin matching connector in the electronic control box.
- 2. All LCD SZ Systems
  - a. Connect the previously run furnace thermostat wires (if applicable) to the blue wires protruding from the roof opening or to the 1/4" connectors at the electronic control box using the supplied 1/4" insulated connectors. The polarity of this connection does not mater.



J. Upgrading from Bi-Metal Thermostat to SZ LCD Thermostat

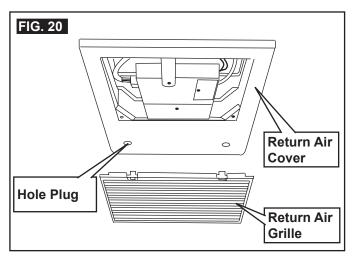
- 1. Remove the existing thermostat from the wall.
- 2. Disconnect the four (4) wires coming from the air conditioner (red, yellow, orange, blue).
- Disconnect the two (2) wires coming from the furnace (+12V, -12V).

**NOTICE** Keep the red wires from the air conditioner and furnace separate, to avoid confusion when connecting the thermostat. Connecting the wires incorrectly could result in property damage.

4. Refer to the wiring diagram (FIG. 19) and make the connections as shown.

#### K. Installing Return Air Cover

- 1. Remove the return air grille from the return air cover.
  - 2. Place the return air cover up to the ceiling template.
  - Install cover to template using six (6) supplied #8 x 10 mm blunt point Phillips head screws.
  - 4. Re-install filter return air grille into return air cover. Align tabs with mating notches and snap into place.
  - 5. Install two (2) hole plugs into screw holes in back of return air cover. See (FIG. 20).



# **GENERAL INFORMATION**

### A. Frost Formation On Cooling Coil

Frost on a small portion of the coil is not unusual. Under certain conditions, ice may form on the evaporator coil. This is indicated by very cold output at very low air speed and the icing can be seen through the air inlet hole with the filter removed. If this should occur, inspect the filter and clean if dirty. Make sure air vents are open and not obstructed. Units have a greater tendency to frost when the outside temperature is relatively low. This may be prevented by adjusting the thermostat control knob to a warmer setting (counter clockwise). Should frosting continue, operate on any FAN ONLY setting until the cooling coil is free of frost; then resume normal operation. If frost condition persist, contact your local service center for assistance.

#### B. Heat Gain

The ability of this 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 RV can may be reduced by:

- 1. Parking the RV in a shaded area
- 2. Using window shades (blinds and/or curtains)
- 3. Keeping windows and doors shut or minimizing usage
- 4. Avoid the use of heat producing appliances

Operation on High Fan/Cooling mode will give optimum or maximum efficiency in high humidity or high outside temperatures.

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.

For a more permanent solution to high heat gain, accessories like Dometic outdoor patio and window awnings will reduce heat gain by removing the direct sun. They also add a nice area to enjoy company during the cool of the evening.

#### C. Condensation

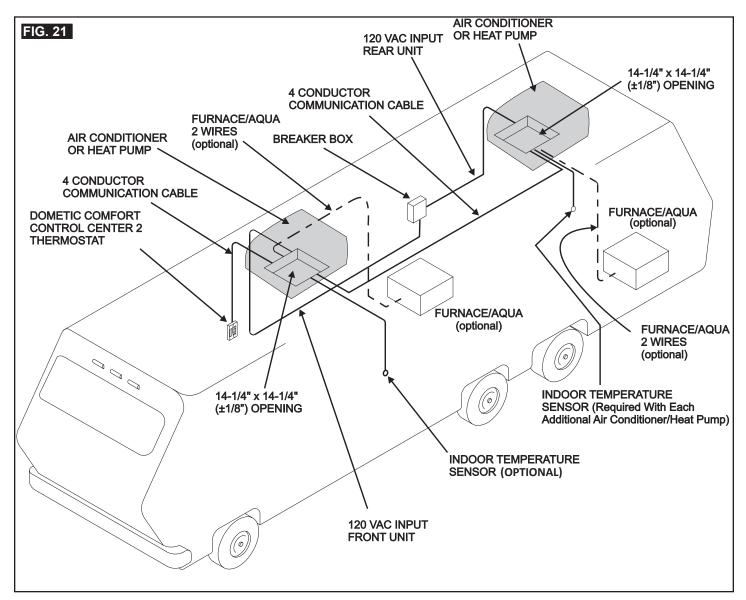
The manufacturer of this unit will not be responsible for damage caused by condensation forming on ceilings, windows, or other surfaces. Air contains water vapor which condenses when temperature of a surface is below Dew point. During normal operation this unit is designed to remove a certain amount of moisture from the air, depending on the size of the space being conditioned. Keeping doors and windows closed when this air conditioner is in operation will greatly reduce the chance of condensation forming on interior surfaces.

#### D. Air Distribution

Each A/C unit operating in cool mode, must have a minimum of 2 distribution vents, or the quick cool vent and one vent open, to avoid the risk of freezing coils and improper function.

# WIRING DIAGRAMS

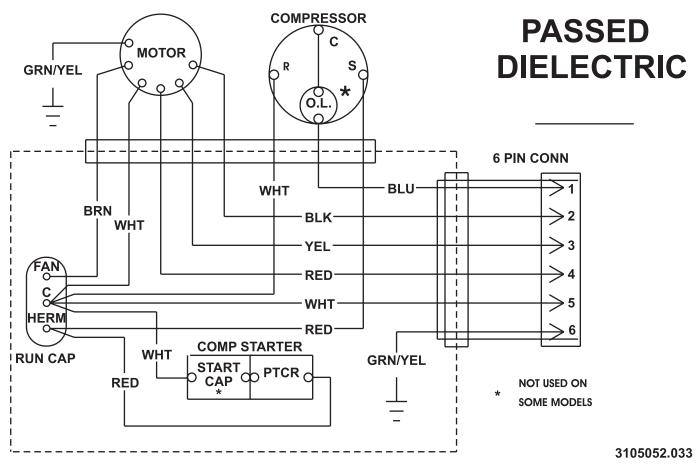
A. Simple RV Wiring Diagram



### WIRING DIAGRAMS

#### B. Unit Wiring Diagrams

1. 57908, 57912, 57915, 59516, 59530, 520300, 520310, 520315, 520316, 600312 & 600315



#### 2. LCD SZ Controls

