



Roof Top Air Conditioner

Ducted System

INSTALLATION AND OPERATING INSTRUCTIONS

RECORD THIS UNIT INFORMATION FOR FUTURE REFERENCE:

Model Number:
Serial Number:
Date Purchased:



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



ROOM AIR
CONDITIONER
3TY1

ASAelectronics®
THE MOBILE ELECTRONICS COMPANY SINCE 1977

888.283.7374
techservice@asaelectronics.com
www.asaelectronics.com

**ADVENT®
24 MONTH LIMITED WARRANTY**

ASA Electronics (ASA) warrants to the original retail purchaser of this Advent product that should this product or any part thereof, under normal use and conditions, be proven defective in material or workmanship within 24 months from the date of original purchase, such defect(s) will be repaired or replaced (at ASA's option) without charge for parts and repair labor.

To obtain repair or replacement within the terms of this warranty, contact ASA at (888) 283-7374. The product is to be delivered with proof of warranty coverage (dated bill of sale), specification of defect(s) with purchaser's name and return address, transportation prepaid to ASA at the address shown provided at the time of return authorization.

This warranty does not extend to the effects of this device on other devices, to costs incurred for removal or reinstallation of the product, or to damage of any product, accessories, or electrical system(s). This warranty does not apply to any product or part thereof which, in the opinion of the company, has been damaged through alteration, improper installation, mishandling, misuse, neglect, or accident.

THE EXTENT OF ASA'S LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT PROVIDED ABOVE, AND, IN NO EVENT, SHALL ASA'S LIABILITY EXCEED THE PURCHASE PRICE PAID BY THE PURCHASER FOR THE PRODUCT.

This warranty is in lieu of all other express warranties or liabilities. ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. ANY ACTION FOR BREACH OF ANY WARRANTY HEREUNDER INCLUDING WARRANTY OF MERCHANTABILITY MUST BE BROUGHT WITHIN A PERIOD OF 30 DAYS FROM THE DATE OF ORIGINAL PURCHASE. IN NO CASE SHALL ASA BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHATSOEVER. No person or representative is authorized to assume for the company any liability other than expressed herein in connection with the sale of this product.

ASA Electronics
(888) 283-7374

IMPORTANT WARRANTY INFORMATION

**DO NOT RETURN DEFECTIVE PRODUCT
TO YOUR PLACE OF PURCHASE**

CONTACT ADVENT® @ 1-888-283-7374

**Please place this Warranty Agreement and a copy of your sales receipt in a safe and secure location,
along with your other valuable documents.**

CONNECTING 115VAC 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.
2. Route the 115 VAC supply wiring previously routed into the frame of the roof opening, through the strain relief of the electrical box and into the high voltage wiring area.

DANGER

TO PREVENT THE POSSIBILITY OF SHOCK INJURY FROM APPLIANCE OPERATION: THE WHITE WIRE MUST BE CONNECTED TO NEUTRAL IN THE SERVICE BOX ENTRANCE AND THE GREEN GROUND WIRE MUST BE CONNECTED TO A GROUNDING SCREW.

ATTACH CEILING GRILL

1. Position the grill next to the interior frame and attach it with the 4 provided screws.
2. Install the filter on the air intake grill section.
3. Snap the intake grill section onto the main grille.

MAINTENANCE

1. AIR FILTER:

Remove the return air filter (after every 30 days of use) located above the removable air intake grill. Wash the filter with soap and warm water, let dry and then reinstall.

Note: Never run the air conditioner without returning air filter in place. This may plug the unit evaporator coil with dirt and may substantially affect the performance of the unit.

2. Air Return Grill:

Clean panel and control panel with a soft cloth dampened with a mild detergent. Never use furniture polish or harsh chemicals.

3. FAN MOTOR:

Factory lubricated and requires no service.

4. 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 control knob to a warmer setting (clockwise).

SERVICE

If the unit does not operate:

1. If RV is connected to a generator, check to be sure generator is running and producing the proper power.
2. If RV is connected to shore power, check to be sure supply breaker is sized properly to run air conditioner load and it is plugged into power supply.
3. Check your fuse or circuit breaker to see if it is off.
4. After the above checks, call your local service center for further help. This unit must be serviced by qualified service personnel only.

INSTALLATION & OPERATING INSTRUCTIONS

These instructions must stay with the unit

Safety Instructions

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

Read and follow all safety information, installation guides, recommended precautions, and safe operating instructions.

GENERAL INFORMATION

A. This air conditioner is designed for:

1. Installation on a recreational vehicle.
2. Mounting on the roof of a recreational vehicle.
3. Roof construction with rafters/joists on 16 inch centers.
4. 2.5" to 5" inch thick roofs.

B. The efficiency of the air conditioner will be affected by the conditions inside and outside of the RV. Reducing the heat gain of the RV will allow the air conditioner to function with greater efficiency. Here are some suggestions to reduce heat gain in your RV.

1. Select a shaded area to park your RV
2. Close windows and utilize the blinds and/or curtains.
3. Keep doors shut.
4. Avoid using appliances that produce heat.

Beginning the cooling process early in the day will greatly improve that air conditioner's ability to maintain the desired temperature.

In high temperature and high humidity environments, the AC should be set in Cool mode with the Fan Speed in the high position. This will allow for optimal cooling efficiency.

C. Condensation

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 operating will minimize condensation.

Model	COOL	Electrical Rating	Compressor rated load (amps)	Compressor locked rotor (amps)	Fan motor rated load (amps)	Fan motor locked rotor (amps)	Air flow (High speed) (cfm)	Refrigerant (R410a) (oz)	Min. wire size	AC circuit protection (User supplied)	Unit dimensions (in)	Weight (lbs)
	BTU/HR											
AC135	13500	115VAC 60HZ 1PH	12.4	61	2.5	5.8	500	17.6	12AWG copper up to 24'	20Amp	35.1x29.9x13.2"	86
AC150	15000		13.5	66	2.5	5.8	500	18.3		20Amp	35.1x29.9x13.2"	90

Notes:

1. Consult the National Electric Code for proper sizing for wire lengths over 24 ft.
2. When sizing the generator, the total power usage of your recreational vehicle must be considered. Keep in mind generators lose power at high altitudes and from lack of maintenance.
3. CIRCUIT PROTECTION: Time Delay Fuse or HACR Circuit Breakers Required.

INSTALLATION INSTRUCTIONS

1. PRECAUTIONS

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

2. CHOOSING A LOCATION FOR THE AIR CONDITIONER

This product is designed for use as a RV roof top air conditioner. The use of this product in other applications will void the manufactures warranty.

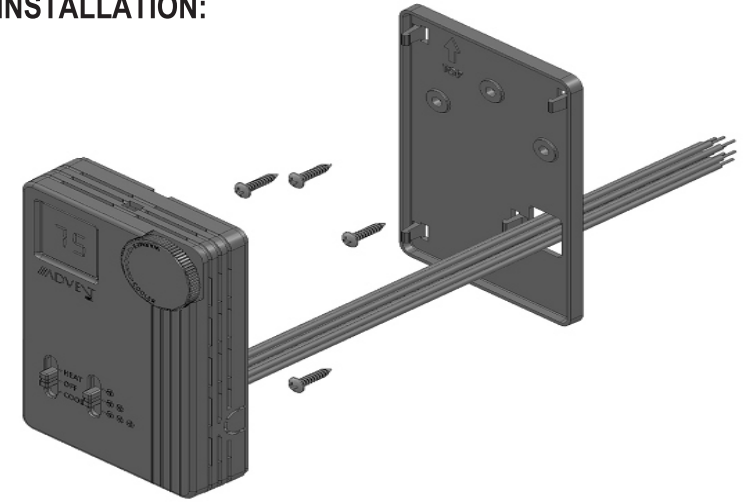
A. NORMAL LOCATIONS:

The air conditioner is designed to fit over an existing roof vent opening. When the vent is removed, it normally creates a 14-1/4" x 14-1/4" ±1/8" opening.

B. OTHER LOCATIONS:

When a roof vent is not available or another location is desired, the following is recommended:

THERMOSTAT INSTALLATION:



ACTH THERMOSTAT WIRING

Function	Thermostat Wire Color	Label Text	Relay Box Wire Color
12VDC input from relay box	Red with White Stripe	"T-Stat Power (12VDC)"	Red with White Stripe
DC Ground from relay box	Green	"T-Stat Trigger"	Green
Output to relay box	Yellow	"Compressor"	Yellow
Output to relay box	White with Orange Stripe	"Heat Trigger"	Orange
Output to relay box	Blue	"Hi Fan"	Blue
Output to relay box	Tan	"Mid Fan"	Tan
Output to relay box	Grey	"Low Fan"	Grey
Input from relay box	Purple	"Freeze Sensor"	Purple

ACTH11 THERMOSTAT WIRING

Function	Thermostat Wire Color	Label Text	Relay Box Wire Color
12VDC input from relay box	Red with White Stripe	"T-Stat Power (12VDC)"	Red with White Stripe
DC Ground from relay box	Green	"T-Stat Trigger"	Green
Output to relay box	Yellow	"Compressor"	Yellow
Output to relay box	Orange with Black Stripe	"Furnace"	Orange with Black Stripe
Output to relay box	Blue	"Hi Fan"	Blue
Output to relay box	Tan	"Mid Fan"	Tan
Output to relay box	Grey	"Low Fan"	Grey
Input from relay box	Purple	"Freeze Sensor"	Purple

IMPORTANT: When connecting the wires:

1. Make any adjustments required to relieve pinched or stressed wiring.
2. Verify that the connectors have snapped together on both sides. Do not use excessive force when joining the connectors.

MAIN CONTROLLER WIRING

Function	Wire Color	Label Text
12VDC output to Thermostat	Red with White Stripe	"T-Stat Power (12VDC)"
Ground output to Thermostat	Green	"T-Stat Trigger"
Input from Thermostat	Yellow	"Compressor"
Input from Thermostat	Orange	"Elec. Heat Strip"
Input from Thermostat	Blue	"Hi Fan"
Input from Thermostat	Tan	"Mid Fan"
Input from Thermostat	Grey	"Low Fan"
Output to Thermostat	PURPLE	Freeze Sensor
Input from Thermostat	Orange with Black Stripe	Furnace Trigger
12VDC input from battery	Red	"Power (12VDC)"
DC ground from battery	Black	"Ground (12VDC)"
12VDC output for furnace relay	Brown with White Stripe	To Furnace (12VDC)

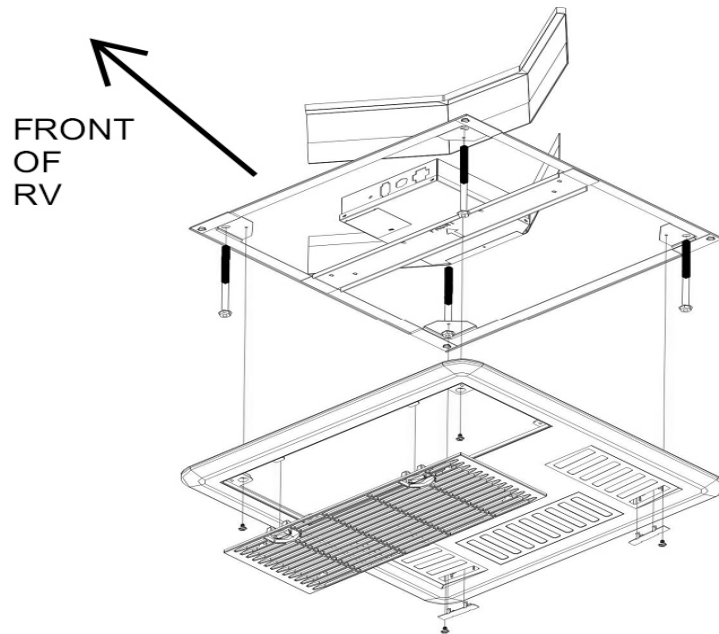


FIG. 6

1. For one unit installation: The air conditioner should be mounted slightly forward of center (front to back) and centered from side to side. See FIG. 1.

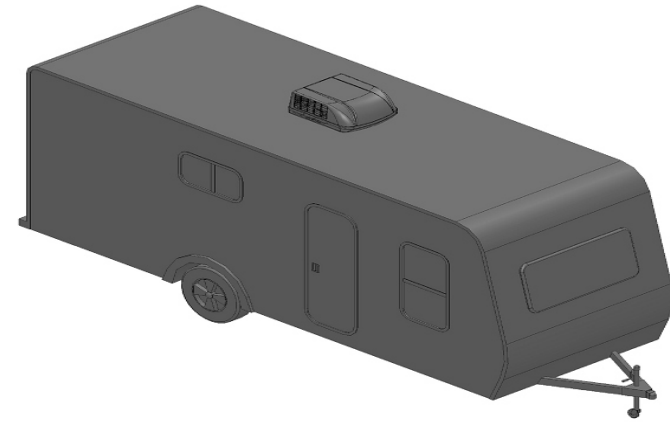


FIGURE 1

2. For two unit installation: Install one air conditioner 1/3 distance and the other air conditioner 2/3's from front of RV and centered from side to side. See FIG. 2.

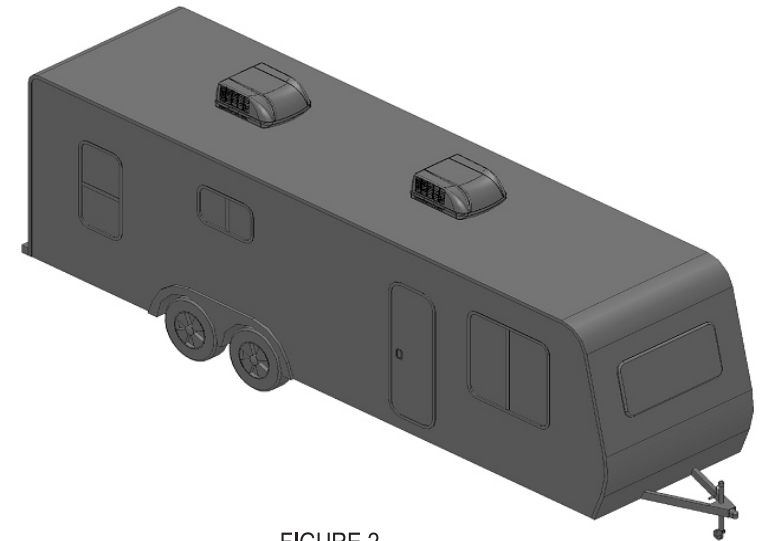


FIGURE 2

It is preferred that this air conditioner be installed in a relatively flat and level roof section measured with the RV parked on a level surface; however, up to 15° slant to either side, or front-to-back is acceptable.

C. POST LOCATION SELECTION:

1. Check for obstructions in the area where air conditioner will be installed. A

minimum clearance of 18" is required for the rear section of the air conditioner to any other roof mounted object.

2. The roof must be capable of supporting 130lbs while the RV is in motion. Normally, a 200 lb. static load design will meet this requirement.

3. ROOF PREPARATION

⚠ WARNING

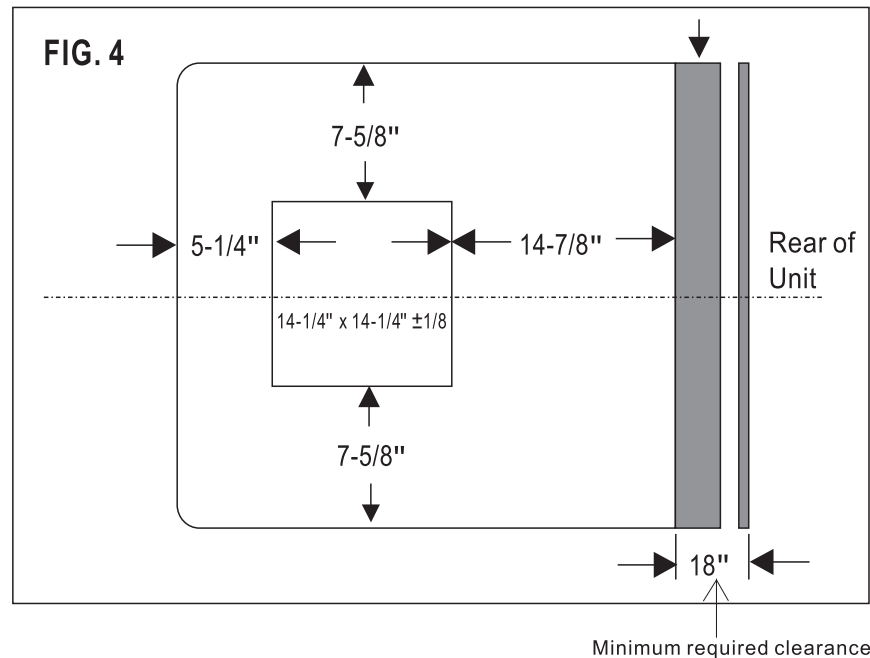
There may be electrical wiring between the roof and the ceiling. Disconnect 120 volt AC power cord and the positive (+) 12 volt DC terminal at the supply battery. Failure to follow this instruction may create a shock hazard causing death or severe personal injury.

A. EXISTING ROOF VENT REMOVAL:

1. Unscrew and remove the roof vent.
2. Remove all caulking compound around opening.
3. Seal all screw holes and seams where the roof gasket will be located. Use a good grade of all weather sealant.

B. NEW OPENING:

1. A 14-1/4" x 14-1/4" ±1/8" opening must be cut through the roof and ceiling of the RV. It is recommended this opening be located between roof framework.
2. Mark a 14-1/4" x 14-1/4" square on the roof and carefully cut the opening.
3. Using the roof opening as a guide, cut the matching hole in the ceiling. See FIG.4.



3. Position the mount frame into the ceiling opening. See Figure 6.
4. Using the four bolts provided, hold up the mount template to the ceiling. The four mounting bolts are to be inserted up through the bottom of the mount template and into the bottom of the roof unit.
5. Route the wires to the air return side (to be connected later).
6. Measure the distance between the ceiling and the upper unit base pan. If the divider is not high enough, please fix the additional divider together by screws. The height can be adjusted by the slotted holes until the divider is touching the base pan.
7. Cut the insulation to fit the divider. Remove paper backing and apply it to the divider.
8. Connect 115VAC and 12VDC wires, Thermistor (Freeze Sensor), and thermostat cable according to the wiring diagram. Install the cover over the electrical box using the small screw provided as shown in Figure 6.
9. Seal all seams between cool airside and return airside with insulation and foil tape.

B. Registers

Cold air registers should have a minimum discharge area of 48 square inches per system, or 24 square inches per duct run.

Warnings about wiring:







1. U.L. approval requires the power supply to be copper conductors with minimum #12 AWG.
2. To prevent voltage drops greater than 10% during starting loads, adhere to the following guideline: **For lengths greater than 50 feet, use #10 AWG.**

TEMPLATE MOUNTING

Frame Mounting

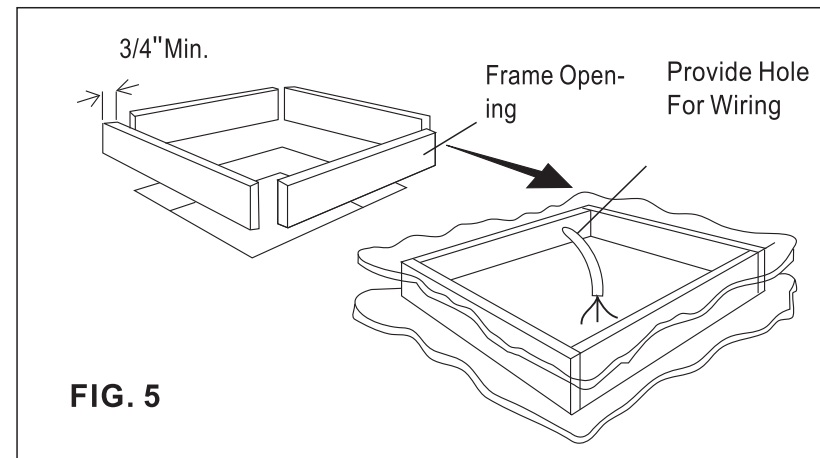
1. Place the roof top unit over the roof opening.
2. Anti-freezing sensor installation

ANTI-FREEZING SENSOR INSTALLATION

	
1. Before template installation, with upper unit placed over opening; the freeze sensor should be installed in evaporator coil.	4. Slowly press fork and sensor into gap created in step 3, until clip locks onto 3 rd coil.
	
2. Remove the sensor from the parts bag.	5. Install the template and electrical box on the ceiling.
	
3. Use a flat screw driver to create 1/4" gap between 2 nd fins (between 2 nd tube and 3 rd tube) to accept the sensor.	6. Connect the sensor.
<p style="text-align: center;">CAUTION:</p> <ol style="list-style-type: none"> 1. Make sure the sensor dip is secured to copper tube. 2. Don't pull the wire to avoid damage to sensor. 	

C. OPENING PREPARATION:

1. If the opening exceeds 14-3/8" x 14-3/8", it will be necessary to install spacers.
2. If the opening is less than 14-1/8" x 14-1/8", it must be enlarged.
3. Route a 12/3 Romex type supply line from the circuit breaker box to the Front of the roof opening.
 - a. The power supply must be on a separate 20 amp Time Delay Fuse or HACR Circuit Breaker.
 - b. Wiring must comply with all National, State and Local wiring codes.
 - c. Make sure at least 15" of wire extend into the roof opening to ensure easy connections.
4. The 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 in the front of the opening for 110v, 12v, and thermostat wires. See FIG. 5.



5. The 14-1/4" x 14-1/4" (±1/8) roof opening is part of the return air duct and must be finished in accordance with NFPA standard 501C, Standard for Recreational Vehicles, Section 2-7.

CAUTION

It is the responsibility of the installer of this air conditioner/heat pump system to ensure structural integrity of the RV roof. Never create a low spot on the roof where water will collect. Water standing around the air conditioner/heat pump may leak into the interior causing damage to the product and RV

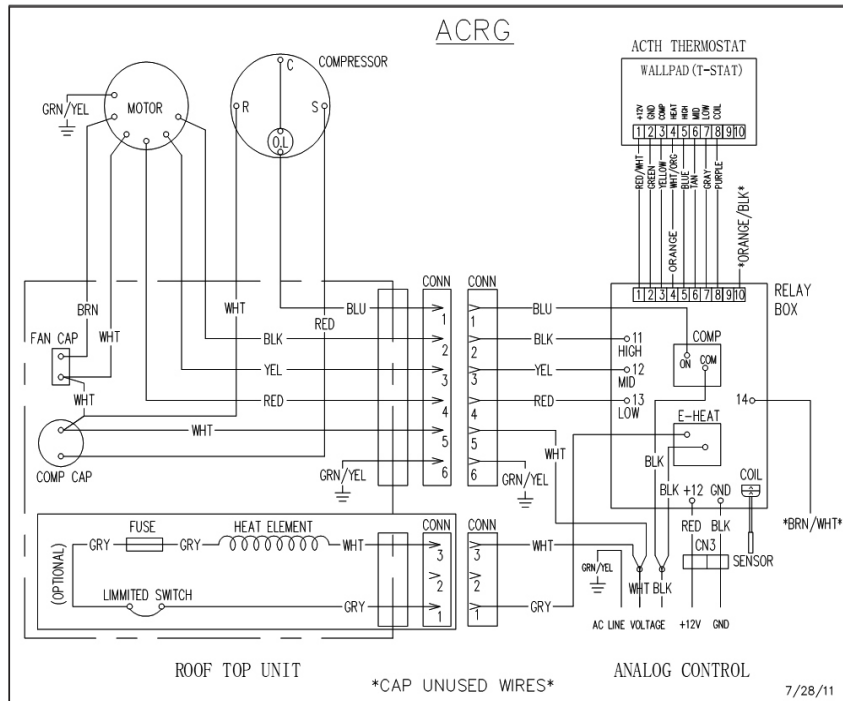
AIR CONDITIONER RETURN GRILL (ACRG) INSTALLATION

The Air Return Grill is designed for application in systems that utilize field fabricated (OEM supplied) air ducting. The ducting must be routed through the ceiling cavity (between the interior ceiling and roof). Ducting specifications are given in the section labeled "Supply Ducting and Registers".

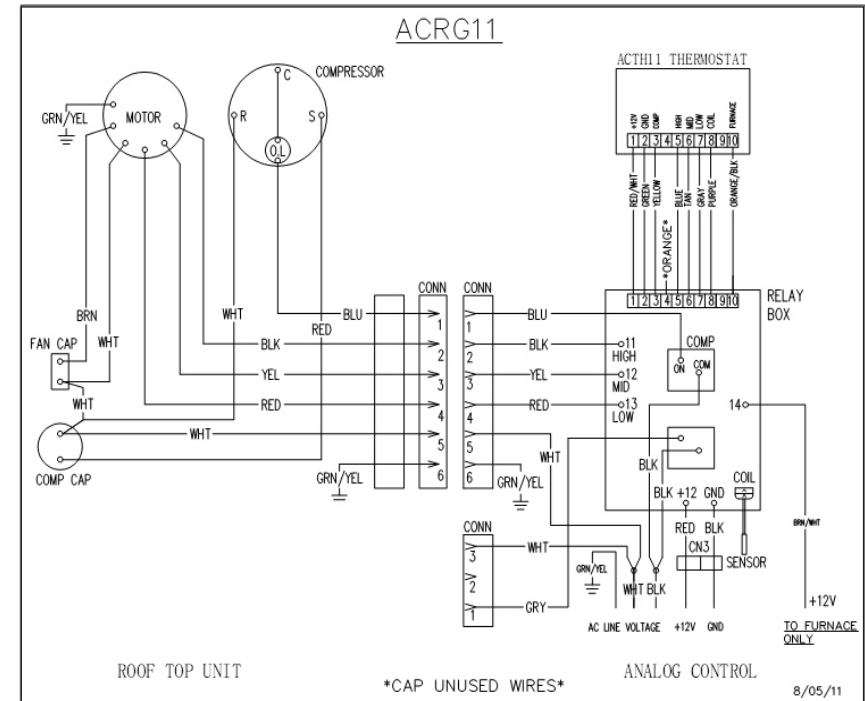
ACRG INSTALLATION REQUIREMENTS (ROOF THICKNESS MUST BE AT LEAST 2.5")

1. The ACRG must be installed under the roof opening. The ACRG bolts to the underside of the roof unit. Compression of the framed ceiling cavity between the roof unit and the ACRG is what holds both components in place.
2. Ceiling cavity depth (the measurement from the ceiling to the roof): 5.5" - Maximum, 2.5" - Minimum
3. The 115 VAC service for the roof unit must be routed into the ACRG (refer to the wiring diagram below). 12VDC should be routed to the analog control box. If a LP furnace is being used, a control wire must be connected from the furnace to the analog control box for proper operation.

WIRING DIAGRAM FOR HEAT STRIP (NO LP FURNACE)



WIRING DIAGRAM LP FURNACE (NO HEAT STRIP)



4. The ACRG has a 6 pin and a 3 pin connector extending from the front of the electrical box. These connectors mate with the roof unit. When making this connection, verify that the plugs are properly aligned and have snapped together securely.
5. Provided with the ACRG, is a divider plate which is used to separate the warm return air from the cold supply air. If the roof thickness is greater than 2.5", you MUST use the additional divider provided.

SUPPLY DUCTING AND REGISTERS

A. Ducting

1. The field fabricated supply ducting must attach to both sides of the ACRG. A minimum of two ducts are required, with one duct attached to each side of the plenum.
2. Each duct must have a minimum height of 1-1/2". Maximum height cannot exceed 4". Total free area inside each duct must be no less than 10 square inches.

NOTE: To decrease restriction and increase airflow, the ducting should make as few bends and turns as possible. When corners or turns are required, we recommend that you add radii to the corners to keep airflow at a maximum. Ten square inches of free area per duct is the minimum requirement. Larger ducting will improve airflow and system performance.

3. All field fabricated cold air supply ducting must be insulated to avoid condensation and prevent cooling loss.