

**CRTWOPOS010A00
CRTWOPOS011A00**

**SMALL ROOFTOP UNITS
TWO POSITION OUTDOOR AIR DAMPER
GAS/ELECTRIC HEAT AND HEAT PUMP UNITS
2 to 12-1/2 TONS
(50/60 Hz)**

Installation Instructions

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IMPORTANT: Read these instructions completely before attempting to install the accessory outdoor air damper.

PACKAGE CONTENTS

QTY	CONTENTS
2	Hood side
1	Hood top
1	Hood divider
1	Aluminum filter
1	Bottom panel
1	Damper assembly
1	Hardware bag

PACKAGE USAGE


UNIT SIZE	PART NUMBER
2 to 6 Tons	CRTWOPOS010A00
7-1/2 to 12-1/2 Tons	CRTWOPOS011A00

SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

GENERAL

These 2 position outdoor air packages can be used in either a vertical or horizontal airflow configuration. The damper assembly travel can be adjusted to allow from 25% to 100% outdoor air for the applicable rooftop unit.

INSTALLATION

To install the outdoor damper, perform the following:

IMPORTANT: Follow all applicable local and national electrical codes when installing this accessory.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing accessory, disconnect power supply and install lockout tag.

1. Turn off unit power supply and install lockout tag. For gas units, turn off the gas supply.
2. Determine quantity of ventilation air required for building. Record amount of air for use in Step 10.
3. Remove filter access panel by raising panel and swinging panel outward. Panel is now disengaged from track and can be removed. No tools are required to remove filter access panel. Remove the outdoor-air opening/indoor coil access panel. (See Fig. 1.)

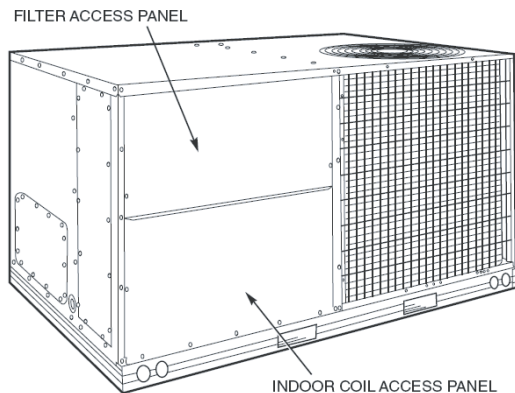


Fig. 1 - Rooftop Unit Panels
(2-6 ton unit shown)

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4. Assemble outside-air hood top, sides and divider as shown in Fig. 2. Do not install hood at this time.
5. Install galvanized, insulated bottom panel per Fig. 3, with the slot at the top of the panel. The lip of the slot should fit behind the corner post as shown. Screw in place.

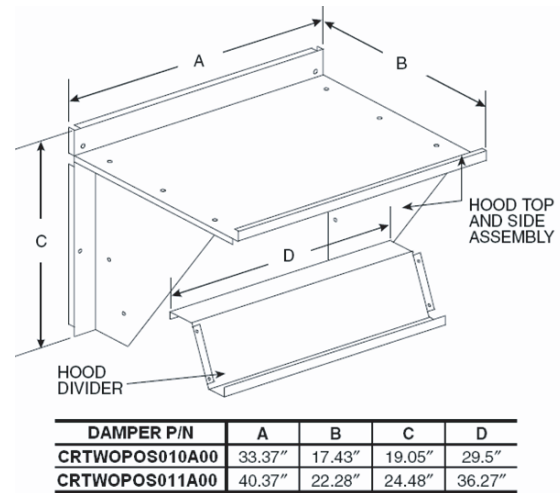


Fig. 2 - Damper Hood Panels

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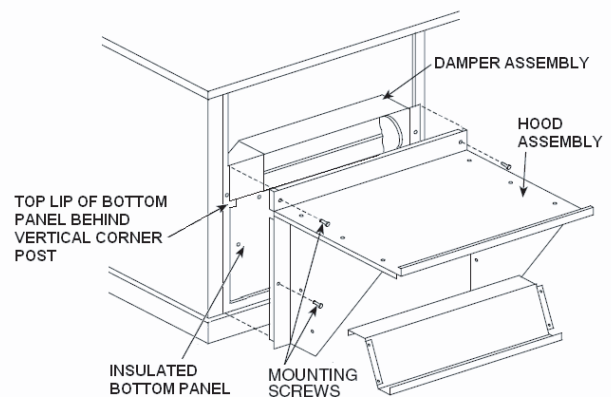


Fig. 3 - Damper and Hood Panel Installation

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6. Adjust the actuator limiter to limit the maximum open position of the damper to the amount of desired ventilation air from Step 2 using method 1 or method 2 below. The adjustment is made by setting the set screw on the end of the actuator to the desired position. Tighten screw firmly to hold in place. (See Fig. 5.)
For vertical return applications, adjustments can be made after the assembly is installed, by removing rooftop unit's horizontal return panel and accessing the actuator.
7. Lift damper assembly and set in place over the top of the bottom panel, per Fig. 3. Secure the damper assembly in place with provided screws.

8. Remove the jumper plug shipped attached to the economizer harness in the HVAC unit. DO NOT DISCARD. Connect the plug from the damper actuator assembly to the economizer plug in the HVAC unit. Set the jumper plug aside in case it is determined at a later date that the two position damper is no longer required, at which time the jumper plug can be reinstalled.

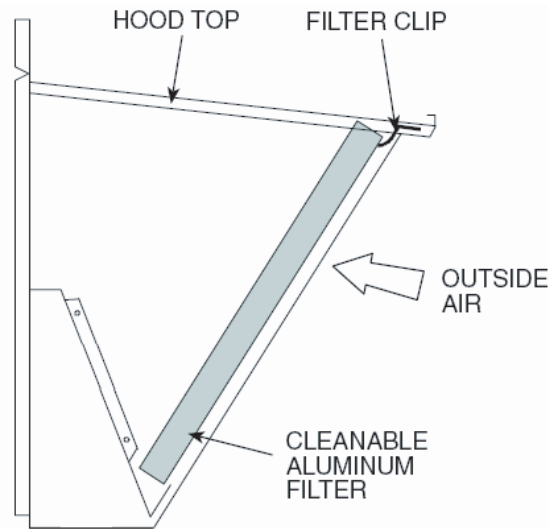


Fig. 4 - Filter Installation

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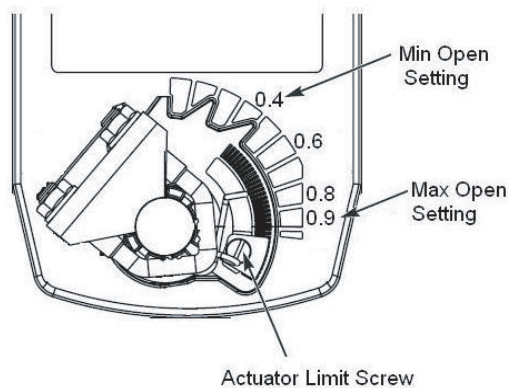


Fig. 5 - Actuator Limit Screw

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9. Install the assembled outside-air hood onto the HVAC unit, covering the damper assembly. Screw in place.
10. Install the provided aluminum filter into the hood. Lock in place with top filter clips. (See Fig. 4.)
11. Replace the top filter access panel.
12. Remove lockout tag and restore base unit to operation.

Determination of Correct Damper Position

Method 1

Use Fig. 6 or 7 to determine desired damper position setting. This method is typically used because it is the fastest method, however, it is also the least accurate method.

Method 2

For a more accurate damper position setting, a temperature balance measurement must be used because the airflow through a two position damper is a direct result of the suction pressure from the rooftop unit's indoor fan, which is affected by the static pressure of the return duct work.

1. Measure the temperature of the outdoor air and return air.
2. Using a temperature sensor, measure the temperature of the mixed air next to the indoor blower. Leave this temperature sensor in place for the rest of this procedure.
3. Calculate the appropriate mixed air temperature (T_M) using the following formula:

$$(T_o)(OA) + (T_R)(RA) = (T_M)$$

T_o = Outdoor-Air Temperature

OA = Percent of Outdoor Air

T_R = Return-Air Temperature

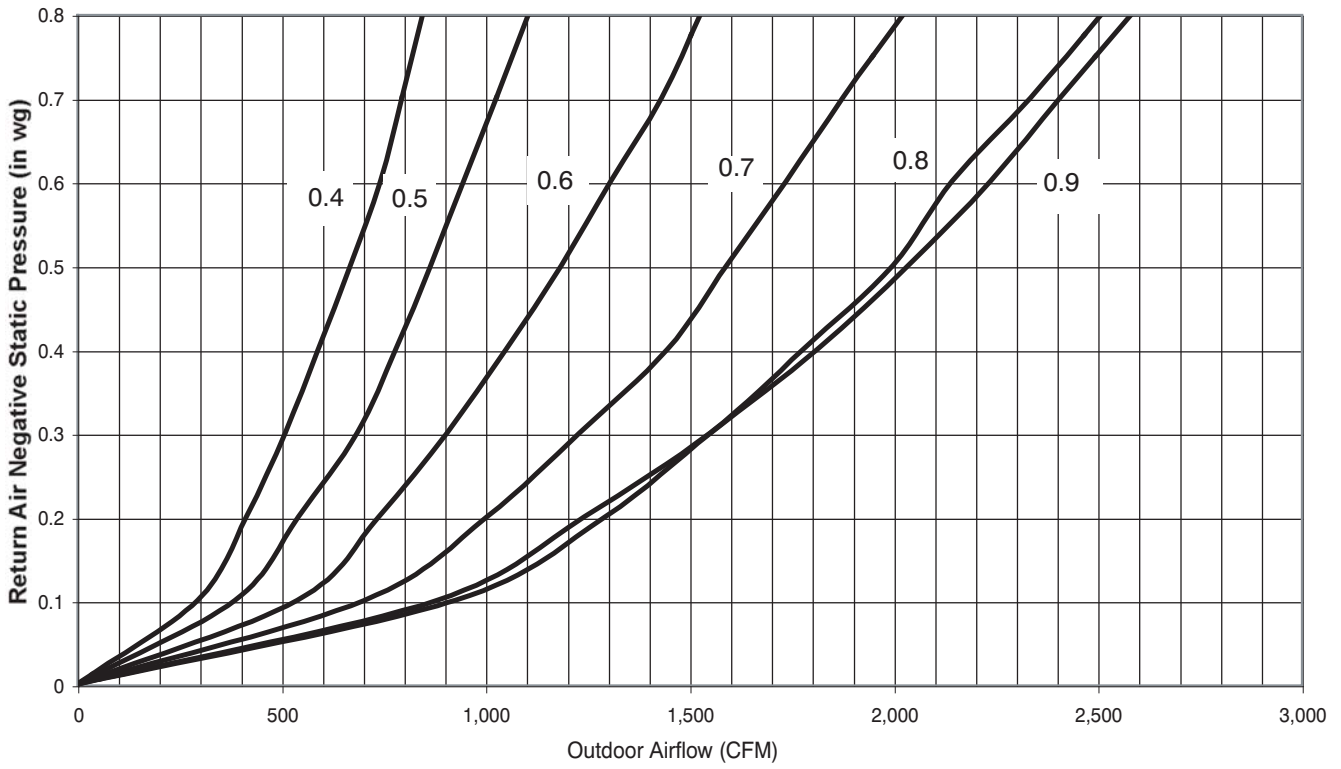
RA = Percent of Return Air

T_M = Mixed-Air Temperature

4. With the unit indoor fan operating (but no heat or compressors running) adjust the damper maximum open position setting until the measured mixed-air temperature matches the calculated value.

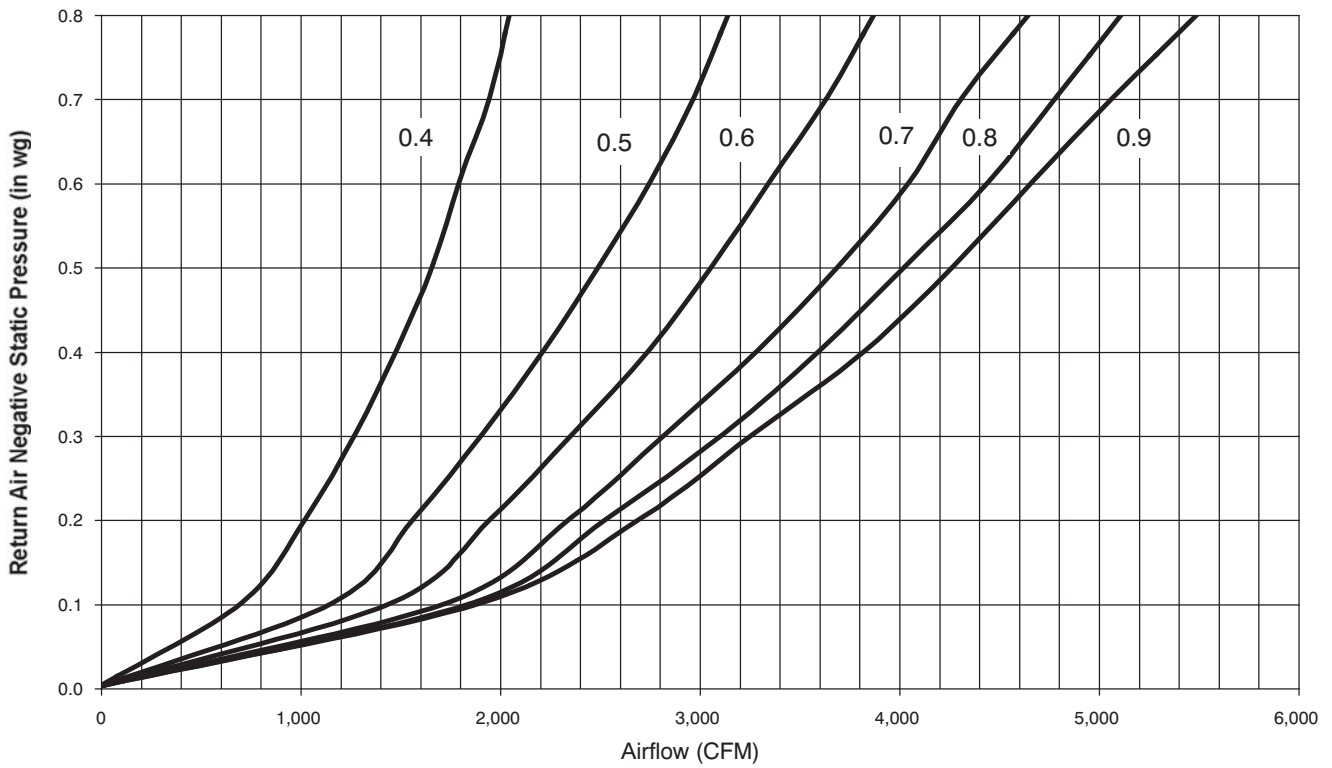
For example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60°F, and return-air temperature is 75°F then the Mixed Air temperature should be 73.5°F.

$$(60 \times .10) + (75 \times .90) = 73.5^\circ \text{F}$$



**Fig. 6 - Actuator Limit Screw Setting (2-6 Ton Units)
CRTWOPOS010A00**

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**Fig. 7 - Actuator Limit Screw Setting (7.5-12.5 Ton Units)
CRTWOPOS011A00**

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SEQUENCE OF OPERATION

Cooling

When the room thermostat calls for cooling, the compressor contactor no. 1 is energized to start compressor no. 1 and outdoor-fan motor(s). The indoor-fan motor is energized and the two-position damper moves to its field-adjusted position. On a further call for cooling, compressor contactor no. 2 is energized starting compressor no. 2 (if equipped). When the indoor-fan motor is de-energized, the two position damper moves to the fully closed position.

Heating

When the room thermostat calls for heating, the heating controls are energized as described in the base unit installation, start-up and service instructions. The indoor-fan motor is energized and the two-position damper moves to the set position. When the indoor-fan motor is de-energized, the two-position damper moves to the fully closed position.

Ventilation (Continuous Fan)

The two-position damper remains at set position as long as the indoor fan is energized. When the indoor fan is cycled off, the two-position damper moves to the fully closed position.

Low Temperature Lockout (Optional)

If desired, a temperature lockout switch can be field installed to over ride the damper signal and keep it closed if the outside air temperature falls below a specified air temperature. The recommended method is to use an outside air lockout switch or thermostat to make/break the red wire on the damper actuator harness.

NOTE: In the event of a power failure or if the disconnect to the unit is shut off, the damper will close due to the internal spring in the actuator.

SERVICE

Once each heating or cooling season or as conditions require, perform the following:

1. Inspect the two-position damper blade to ensure it is clean and moves freely.
2. Visually verify that the damper opens upon a call for cooling or heating and shuts when the unit is cycled off.
3. Inspect the actuator limit screw on the damper actuator. Verify it is still in the desired position, and that it has not slipped. Adjust as required.

WIRING DIAGRAM

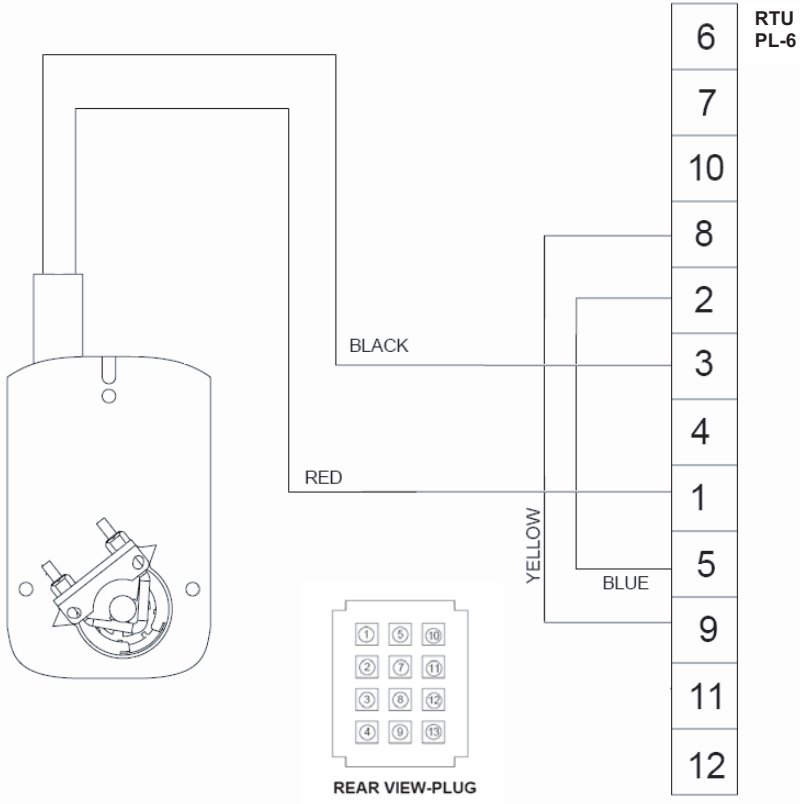


Fig. 8 - CRTWOPOS010A00 and CRTWOPOS011A00 Wiring

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