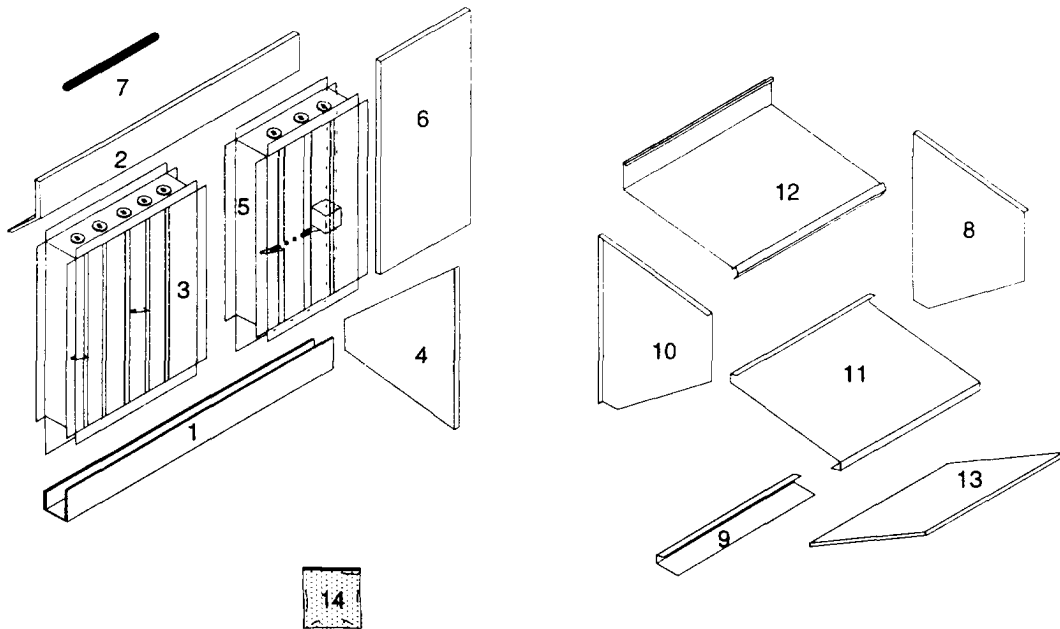


Economizer Damper and Hood* Installation for 15, 20, and 25 Ton Rooftop Units

This instruction provides the necessary information to properly field-install economizer dampers and hood assembly on 15, 20, and 25 ton single package rooftop unit.

The damper accessory provides the return air and outdoor air dampers and actuator for economizer operations. Contained in this kit are all rain hood components.

Kit Includes



Box #	Item #	Description	Box #	Item #	Description
1	1	Bottom Track	3	8	Economizer Hood Right Side Panel
1	2	Top Flange	3	9	Lower Filter Bracket
1	3	Return Air (RA) Damper	3	10	Economizer Hood Left Side Panel
1	4	Return Air/Outdoor Air (RA/OA) Divider	3	11	Economizer Hood Middle Section
2	5	Outdoor Air (OA) Damper with Actuator	3	12	Economizer Hood Top
2	6	Damper Extension (20 and 25 Ton Units)	3	13	Economizer Filters
1	7	Linkage Rod	1	14	Electronics Sub-Package
			3		Bag of Screws

NOTE: To ease installation, read all instructions prior to assembling economizer kit.

Tools Required

5/16 inch hex socket driver
 7/16 inch hex socket driver
 3/8 inch hex socket driver
 drill, for self drilling screws (recommend cordless)
 socket drive extension
 hammer
 awl

Damper Assembly Procedures



CAUTION: When installing dampers, use care to avoid damage to filters or coils located in the adjacent compartment.

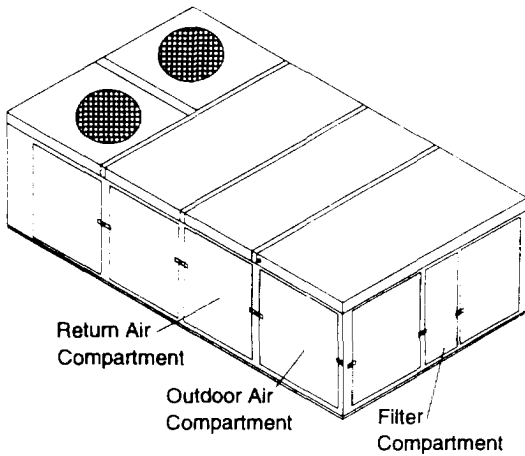


Figure 1: Rooftop Unit

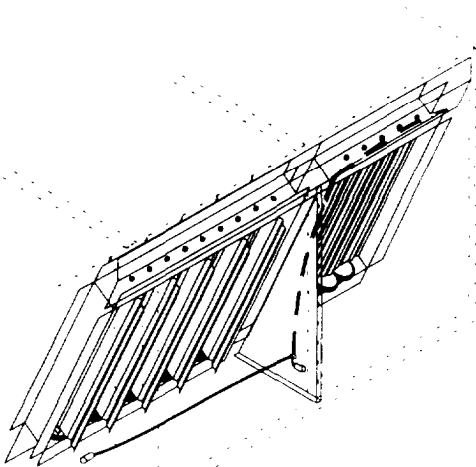


Figure 2: Installed Components

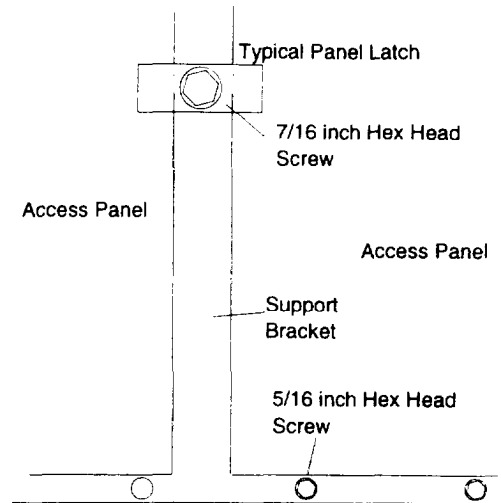


Figure 3: Panel Latch

1. Remove the three access panels (two OA and one RA shown in Figure 1) by using a 7/16 inch hex socket to loosen the screws securing the rotating latches and a 5/16 inch hex socket to remove the four screws on the bottom of each panel.
 On 15 and 20 ton units, also remove the filter access panel.

Note: Retain the "O" rings which provide the seal between the panel and unit bottom.



WARNING: If the return air duct cover has been removed, install a covering over the open hole to prevent personal injury or equipment damage.

2. Remove the support brackets on 20 and 25 ton rooftop units:

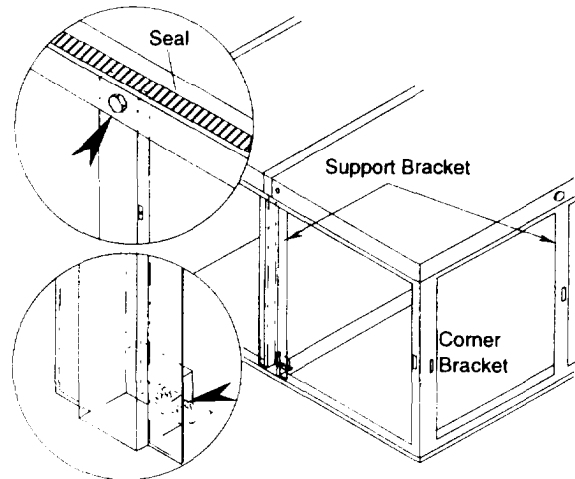



Figure 4: Removing Support Bracket

- Use a 5/16 inch hex socket to remove the top screws securing the support bracket located between the return air and outdoor air compartments.
- Use a 5/16 inch hex socket to remove the top screws securing the corner support bracket.
- Use a 3/8 inch hex socket to remove the two inside top and bottom screws. Save the screws and bracket for installation later.

 **CAUTION:** Lift the roof when removing the support bracket to prevent tearing the roof seal.

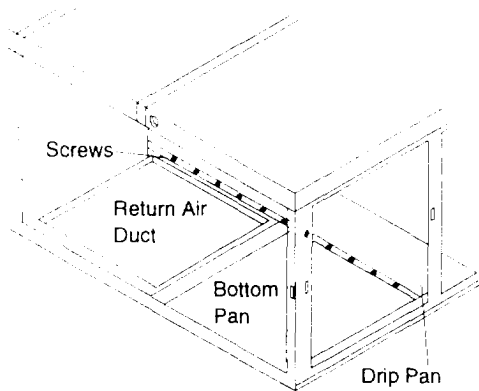


Figure 5: RA Duct and Screw Locations

- Remove the RA duct panel covering the RA opening if it has not already been removed by the installing contractor.
3. Install the bottom track:
- Refer to Figure 5 and remove the 8 screws for 15 ton or 11 screws for 20 and 25 ton units securing the drip and bottom pans along the bottom inside of the unit. Save the screws for installation later.

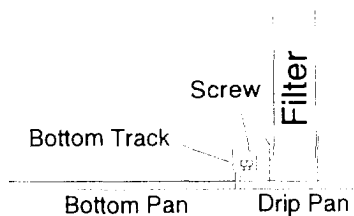


Figure 6: Installing Bottom Track

- Position the bottom track so that clearance holes in the bottom track match the unit hole pattern. Use an awl to align the holes.

- Use the screws previously removed to secure the bottom track to the drip and bottom pan flange.
4. Remove the RA damper and the top flange from their packing materials.

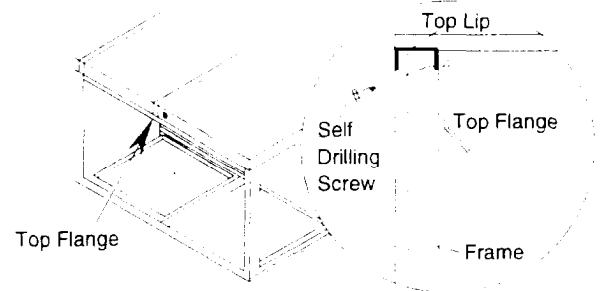


Figure 7: Installing Top Flange

5. Install the RA damper:
- Inside the top lip, align the holes of the top flange with the holes in the lip.
 - Use the self drilling screws provided to secure the top flange to the lip. Install the screws from outside the unit as shown in Figure 7.

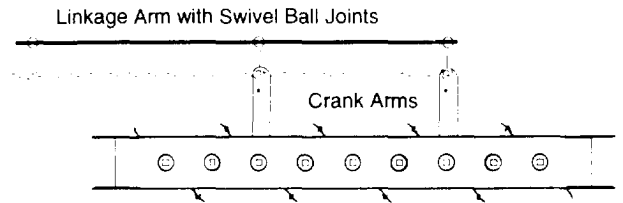


Figure 8: Connecting Linkage

- Remove the nuts attached to the swivel ball joints on the linkage arm. Retain for future use.
- Align the two swivel ball joints attached to the linkage arm with the crank arms attached to the RA damper blades.
- Insert the swivel ball joints into the **top holes** of the crank arms and secure with nuts.
- Use two 7/16 inch wrenches to tighten and secure the swivel ball joints.

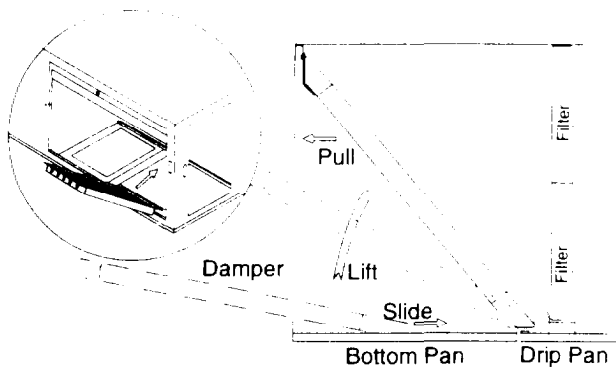


Figure 9: Installing Return Air Damper

- With the blue identification label facing up in the lower left corner of the damper, position the lower edge of the damper on the bottom pan.
- Slide the RA damper on the edge of the bottom pan until the bottom flange of the damper is past the bottom track.
- Lift the RA damper up past the top flange and pull the RA damper towards you until the damper is positioned in the bottom track.
- Rest the RA damper on the top flange.

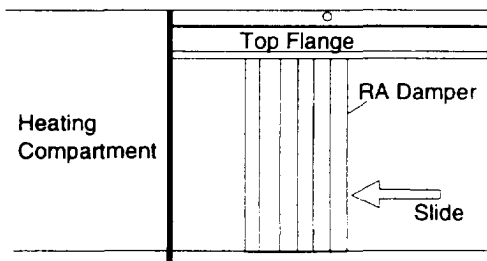


Figure 10: Positioning Return Air Damper

- Slide the RA damper to the left until the seal contacts the heating compartment wall.

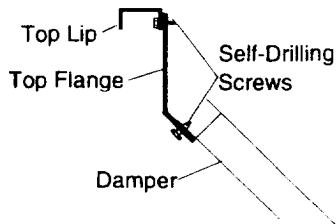


Figure 11: Securing Damper To Top Flange

- Fasten the damper to the top flange using pilot holes and self drilling screws provided. Refer to Figure 11. No fastening to the bottom track is required.

6. Install the OA damper:

- Remove the outdoor air damper from the packing material.

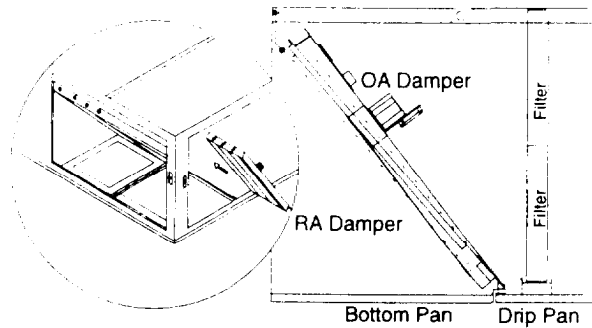


Figure 12: Installing OA Damper

- With the blue identification label facing up in the lower left corner of the damper, set the bottom of the OA damper into the bottom track from the filter access area.
- Lift the top of the OA damper up past the top flange and push the damper towards the RA damper along the bottom track, and rest it on the top flange.

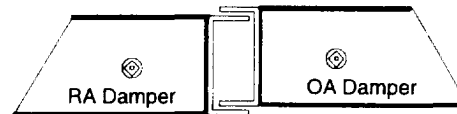


Figure 13: Initial Damper Frame Alignment

- To aid the installation of the damper assembly, slide the OA damper to the left until the frame overlaps the RA damper frame as shown in Figure 13.

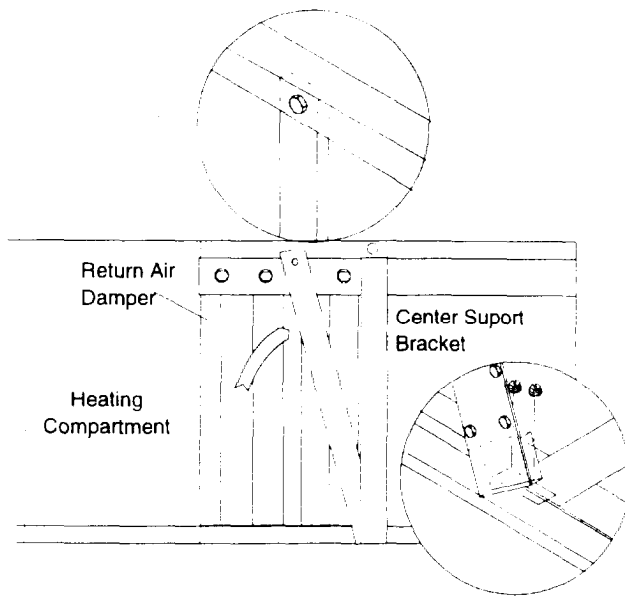


Figure 14: Re-Installing Center Support Bracket

7. On 20 and 25 ton units, install the two support brackets previously removed:
 - With the support bracket at an angle to the base, insert the slot between the two bracket pieces over the lip of the flange

CAUTION: Lift the roof when installing the support brackets to prevent tearing the roof seal.

- Align the bottom holes, lift the roof and rotate the bracket to a vertical position.
- Use the screws previously removed from each bracket to secure.

8. securing the OA damper:

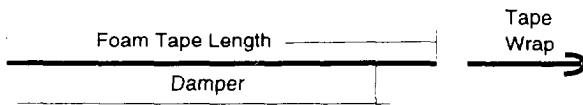


Figure 15: Foam Tape Installation Location

- Using the 1/8 inch foam tape supplied, measure and cut a length that will fit the long edge of the damper frame that will rest against the access panel.

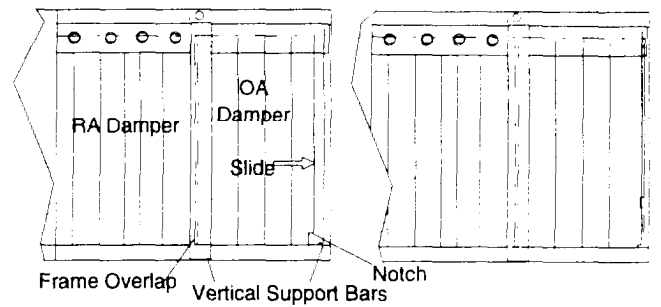


Figure 16: Positioning OA Damper

- From the OA compartment near the filters, pull the OA damper towards you aligning the notch in the damper flange with the support bar.

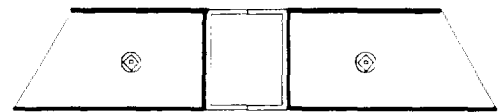


Figure 17: Damper Frame Alignment

Note: At this time, the RA and OA damper frames will not overlap.

- Fasten the OA damper to the top flange using the self-drilling screws and pilot holes provided. Use an awl to align the holes.

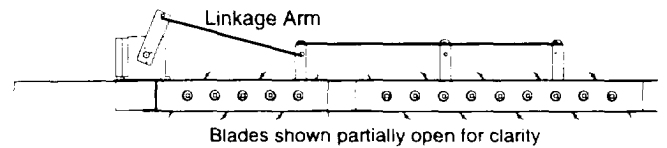


Figure 18: Connecting Linkage Rod

- Remove and keep the nut attached to the swivel ball joint on the linkage arm.
- Align the swivel ball joint attached to the actuator linkage arm with the crank arm attached to the damper blade. This procedure will open the RA damper blades while the OA damper blades will remain in the closed position.
- Insert the swivel ball joint into the bottom hole of the crank arms and secure with nut.
- Use two 7/16 inch wrenches to tighten and secure the swivel ball joint.

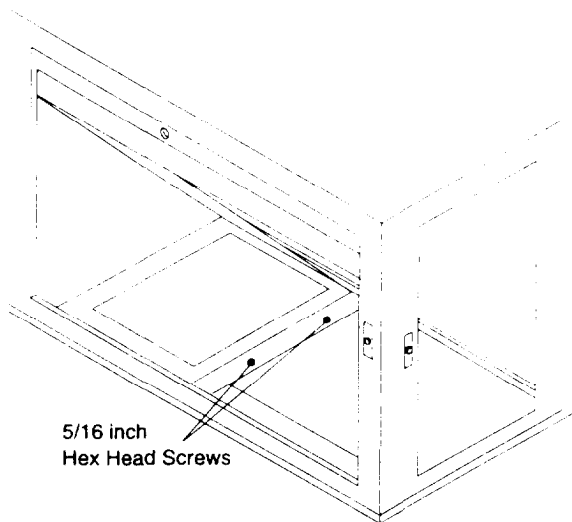


Figure 19: Flange Screws

9. Use a 5/16 inch driver to remove the 2 screws located in the floor flange between the return air and outdoor air compartments and save for future use.

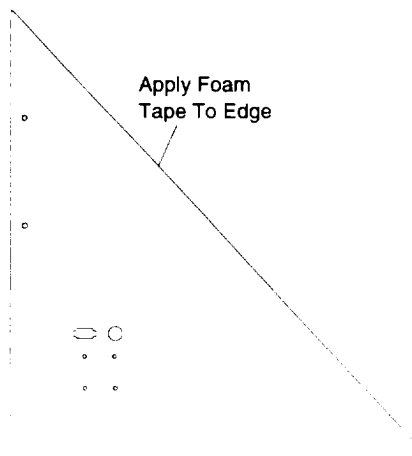


Figure 20: Applying Tape To Divider

10. Install the RA/OA divider:

- Remove the return air/outdoor air divider from its packing material.
- Using the 1/8 inch foam tape supplied, apply a length that will fit on the diagonal edge of the RA/OA divider.

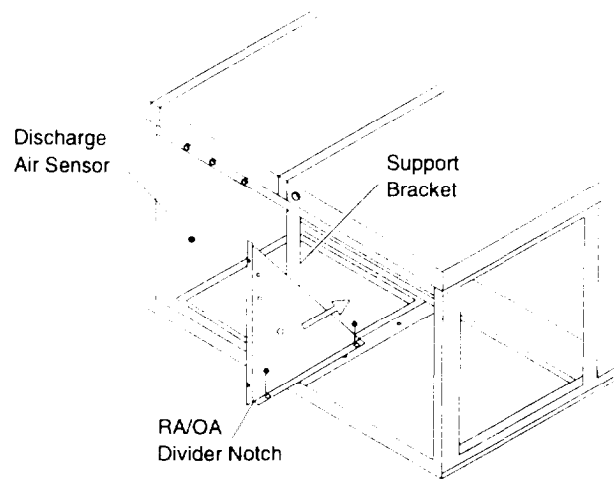


Figure 21: Installing Divider

- Slide the divider into position against the return air damper.
- Use the 2 screws removed in step 9 to secure the RA/OA divider to the floor flange.
- Use two self drilling screws to secure the OA/RA divider to the support bracket.
- Use 4 self-drilling screws to secure the RA/OA divider to the RA damper frame using the pilot holes provided.
- Fill the gap at the base of the divider with one inch foam tape provided.
- On single enthalpy units, mount the enthalpy sensor to the metal surface on the RA/OA divider. On dual enthalpy units, mount the second enthalpy sensor on the insulation surface. Use two self-tapping screws to secure.

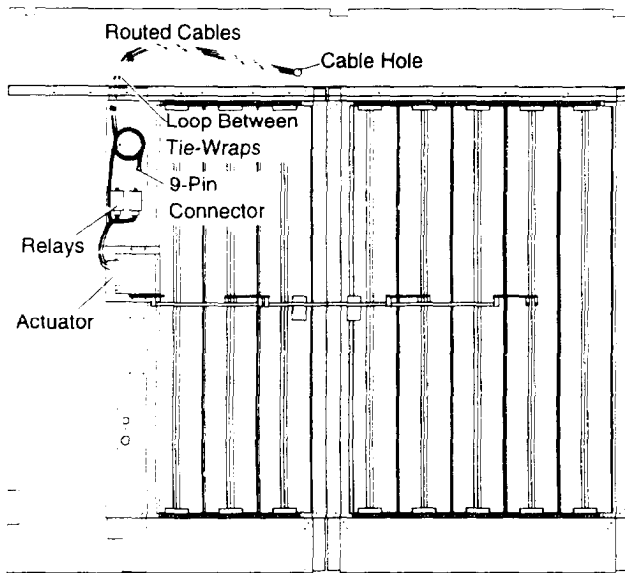


Figure 22: Installing Cable Assemblies

11. Mounting sensors and wire harness

- Cut the wire tie securing the cable harness to the damper.
- Insert the 9 pin connector to the unit economizer plug near the filters.

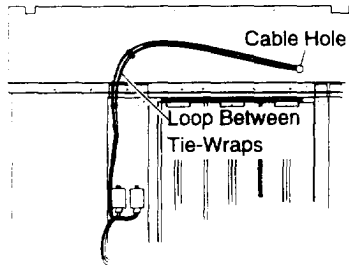


Figure 23: Routing Cables

- Uncoil the remaining wiring harness and route through the round hole in the top flange. Allow the wires to hang in the OA compartment.

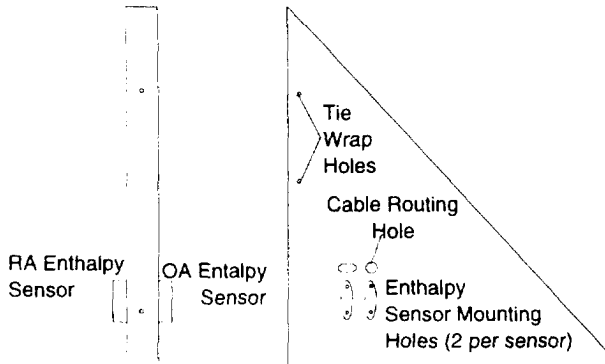


Figure 24: Component Location on RA/OA Divider

- Route the long wires through the round hole in the RA/OA divider.

Table 1: Sensor Connection Table

Sensor Type	Wire Connection		Logic Module
	15 & 20 Ton	25 Ton	
Enthalpy:			
O.A. (+)	431 (PR)	428 (BK)	+ _O
O.A. (-)	432 (R)	429 (W)	S _O
R.A. (+)	433 (BL)	430 ((R)	+ _R
R.A. (-)	434 (O)	431 (BL)	S _R
Discharge Air Temperature	2 Leads	2-pin Mate-N-Lock	T T1
25 Ton Harness	None	417 (BR) 432 (BL) 434 (PR) 426 (R) 421 (Y)	TR TR1 1 3 2

- Make all wiring connections as shown in Table 1.

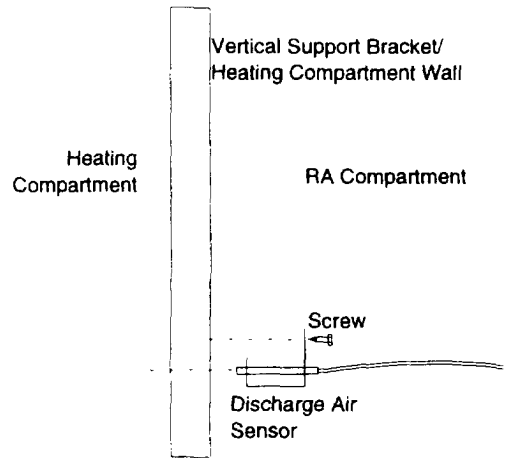


Figure 25: Installing Discharge Air Sensor

- Locate the discharge air sensor mounting location on the heating section wall. Mount the sensor bracket provided using one self-tapping sheet metal screw.

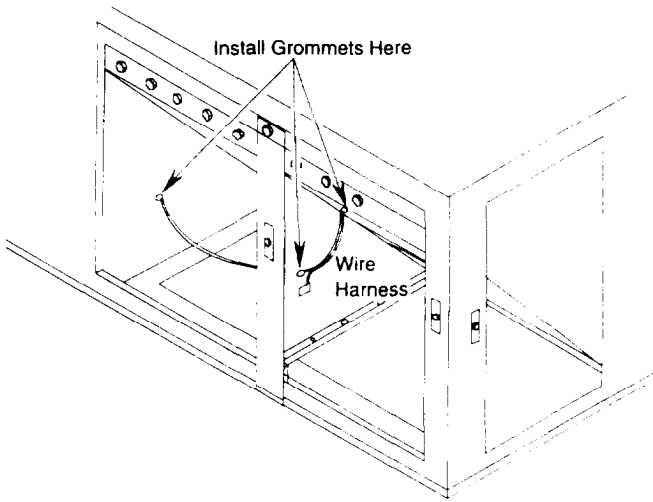


Figure 26: Grommet Installation Locations

- Insert the wire harness into split grommets and push the grommets through each hole that the wires pass.
- Use tie wraps to bundle the wires and secure to the top flange and RA/OA divider as shown in Figure 23 on page 7.

IMPORTANT: When securing the wire harness, insert a loop between the two tie wraps so that the wire harness does not rub on the damper frames during operation.

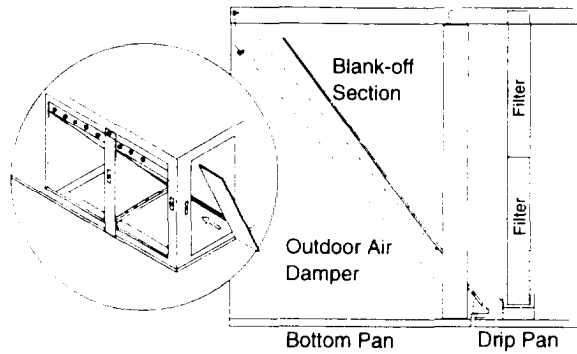


Figure 27: Installing Blank-Off Section

12. For 20 and 25 ton units only:

- Remove the blank-off section from the packaging.
- Using the 1/8 inch foam tape supplied, apply a length that will fit on the long edge of the blank-off section which contacts the access panel.
- Insert the blank-off section through the side access opening of the OA compartment.
- Use the pilot holes on the top flange for the self drilling screws provided to secure the top of the blank-off section to the top flange.
- Install one inch foam tape around the cut-out for the vertical support bracket.

13. Damper assembly is now complete. Proceed to the hood assembly instructions.

Economizer Hood Assembly Procedures

Note: If the dampers were field installed, proceed to Step 2. If dampers were factory installed, start with Step 1.

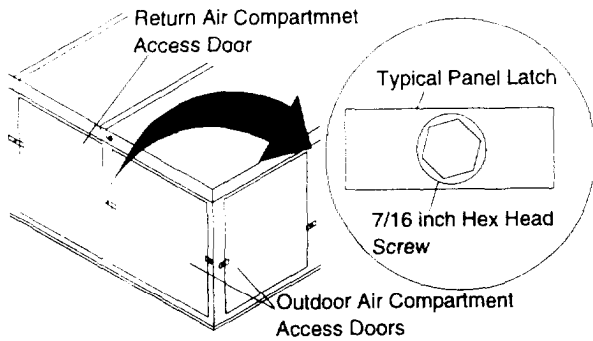


Figure 28: Access To Dampers

1. Remove the three access panels (return air compartment and two outdoor air compartment) by using a 7/16 inch hex socket to loosen the screws securing the rotating latches.

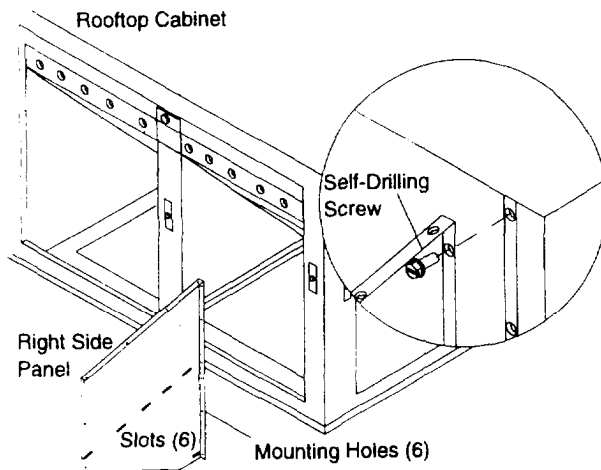


Figure 29: Right Side Panel

2. Remove the economizer hood box from the unit and remove the right side panel from the packing material.
3. Install the economizer hood right side panel against the lip of the vertical corner of the rooftop unit matching the holes in the right side panel with the holes in the frame.
4. Insert and fasten six self drilling screws supplied with the hood kit. Use a 5/16 inch driver to tighten screws.

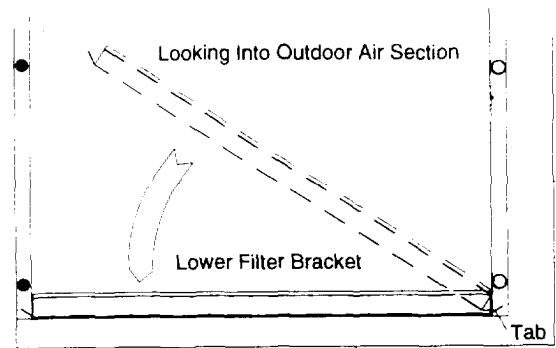


Figure 30: Installing Hood Lower Filter Bracket

5. Remove the lower filter bracket from the packing material.
6. Angle the lower filter bracket to insert the right tab into the slot in the right side panel and lower the hood bottom resting it on the frame of the rooftop unit.

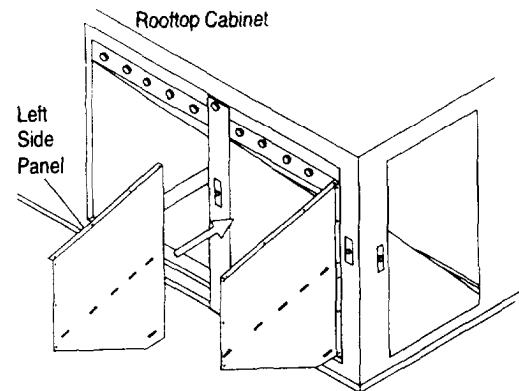


Figure 31: Left Side Panel Location

7. Remove the economizer hood left side panel from the packing material.

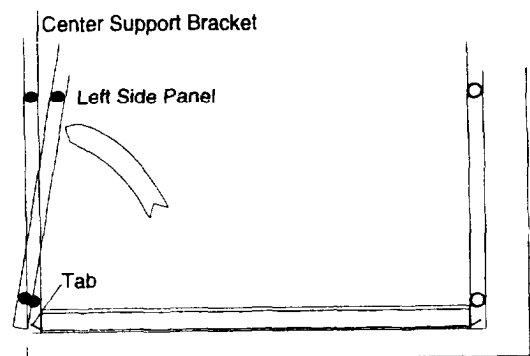


Figure 32: Aligning Left Side Panel

8. Tilt the left side panel towards the right as shown in Figure 32 and position the side panel so that the tab from the lower filter bracket can be inserted into the slot in the side panel.

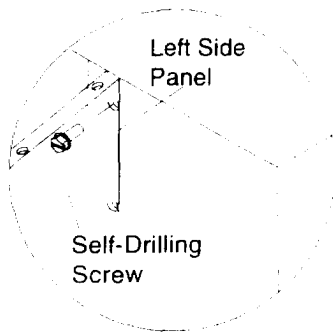


Figure 33: Securing Left Side Panel

9. Return the left side panel to the vertical position and align the holes in the left side panel with the holes in the center support bracket.
10. Insert and fasten six self drilling screws supplied with the hood kit to secure the side panel to the center support bracket. Use a 5/16 inch driver to tighten screws.

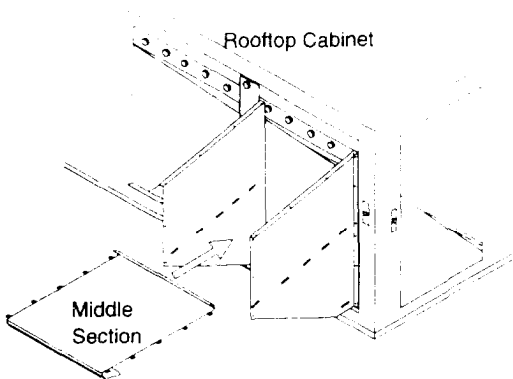


Figure 34: Economizer Hood Middle Section

11. Remove the economizer hood middle section from the packing material.

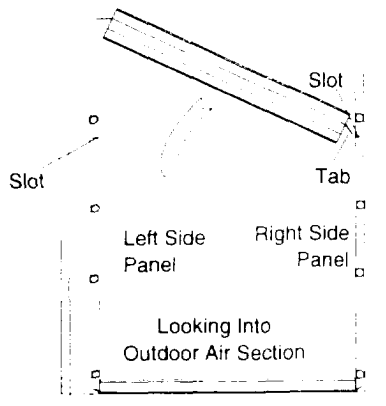


Figure 35: Installing Middle Section To Right Side

12. Insert the tabs of the middle section into the slots of the right side panel.

Note: The tabs are bent slightly down from the factory to facilitate retaining position.

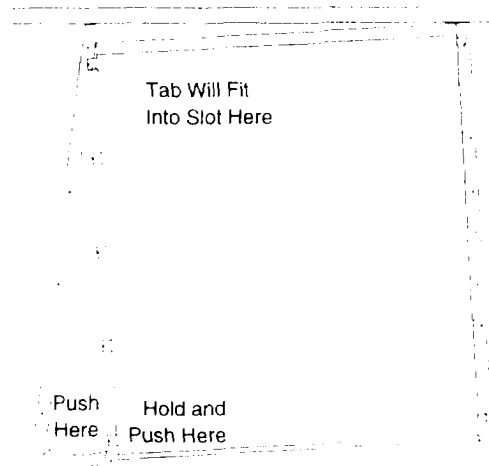


Figure 36: Installing Middle To Left Side

13. Push the left side panel to the left and raise the middle section until the back tab fits into the slot in the left side panel.
14. As the left side panel and middle sections are being guided towards each other, insert each tab into the corresponding slot.

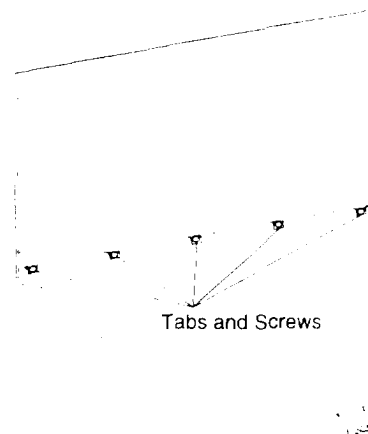


Figure 37: Securing Tabs

15. Bend the two tabs of the lower filter bracket up and bend all of the tabs from the middle section down.
16. Install and tighten the self drilling screws into the pilot hole of each tab.
17. Remove the economizer hood top from the packing material.

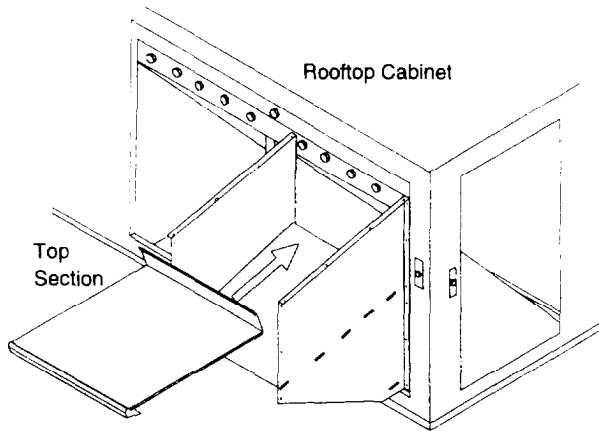


Figure 38: Top Section Location

17. Lift the hood top and lay the edges on the right and left side panels and push the hood top towards the rooftop unit frame.

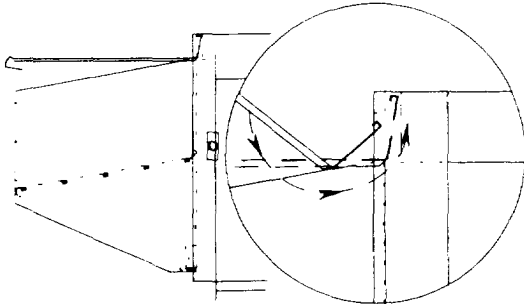


Figure 39: Installing Top Section

18. As the top nears the frame, lift the hood top and continue pushing until the edge of the top clears the top lip as shown in Figure 39.
19. Lower the hood top making sure that the edge of the hood top catches the lip of the frame as shown in Figure 39.
20. Install the self drilling screws along the top first and then along the hood top to the side panels. Manually tighten the screws to prevent stripping the holes in the sheet metal.



CAUTION: Care must be taken when using cordless drivers that the screws do not strip the metal pieces.

Note If the barometric damper is to be installed, do not install the screws on the left side at this time.

21. Seal all seams and tab edges with silicone caulk (not provided).

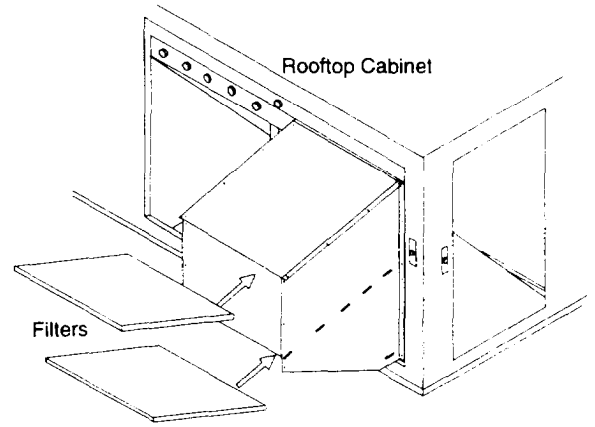


Figure 40: Installing Filters

22. Install the filters inside the top and bottom sections of the economizer hood assembly.

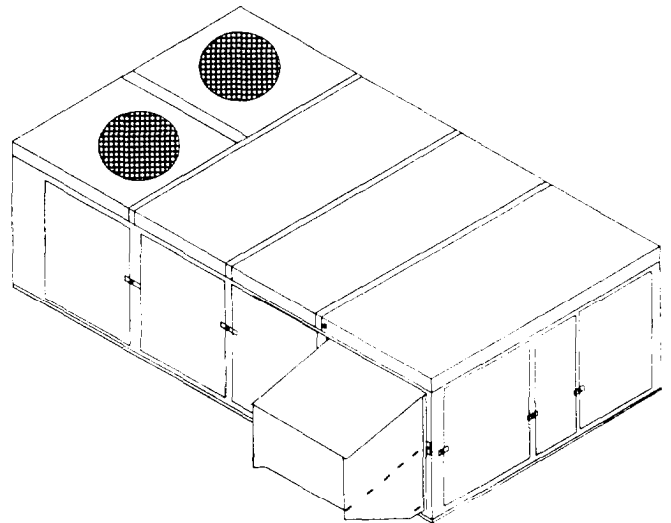


Figure 41: Completed Assembly

23. Install and secure the right side OA, filter, and RA access panels.

NOTES