

INSTALLATION INSTRUCTIONS FOR OUTDOOR AIR DAMPERS AND OUTDOOR AIR HOOD USED WITH LGH/LCH/KG/KC/KH/ZG/ZC/ZH 092-152 UNITS

Shipping and Packing List

Package 1 of 1 contains:

- 1- Damper assembly (motorized only)
 - 1- Slide plate (manual only)
 - 1- OAD cover panel (LGH/LCH/KG/KC/KH only)
 - 1- Carton containing:
 - 1-Lower insulated panel
 - 1-Hood top
 - 2-Hood sides (left and right)
 - 1-Hood top seal
 - 1-Top filter bracket
 - 1-Bottom filter bracket
 - 1-Filter
 - 1-Bag assembly containing:
 - 1-#10 1/2" thread forming screw
 - 2-#10 1" self drilling screws (LGH/LCH/KG/KC/KH only)
 - #10 5/8" sheet metal screws
- Motorized damper bag assembly also includes:
- 2-Wiring diagrams (qty. 1 for ZG/ZC/ZH)
 - 3-Wire harnesses (qty. 2 for ZG/ZC/ZH)
 - 1-Insertion wire tie (qty. 3 for ZG/ZC/ZH)

Application

Optional outdoor air dampers provide fresh outdoor air. See table 1 for usage.

C1DAMP20C-1 and Z1DAMP20B-2 Motorized Dampers:

Electro-mechanical units (KC/KG/KH/ZC/ZG/ZH) -

The damper opens to a set position when the blower is operating. To operate the damper only during the occupied time period, an optional thermostat or energy management system must be installed that provides an occupied signal to the unit's thermostat connection.

Units equipped with an M3 A55 Unit Controller (LGH/LCH) -

The damper opens to a set position when the blower is operating and an occupied signal is provided to the Unit Controller

C1DAMP10C-1 Manual Damper:

Damper is manually operated; damper position is manually set at installation and remains in that position.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier

⚠ CAUTION

Danger of sharp metallic edges. Can cause injury. Take care and wear protective clothing when servicing unit to avoid accidental contact with sharp edges.

TABLE 1

Unit	Type	LB #	CAT. #
LGH/LCH/KG/KC/KH092-152	Motorized	613924-03	14G28
LGH/LCH/KG/KC/KH092-152	Manual	613924-04	14G29
ZG/ZC/ZH 092-150	Motorized	613924-05	14G36
ZG/ZC/ZH 092-150	Manual	613924-06	14G37

Motorized Damper Assembly - LGH/LCH/ KG/KC/KH Units

J3 Wire Harness

- 1- Disconnect all power to unit.
- 2- *Factory-Installed Damper -*
Go to the Outdoor Air Hood section.
- 3- Open or remove the compressor access panel.
- 4- Locate the appropriate kit harness. See figure 1.
- 5- Snap J3 harness connector into the square cutout on the left side of the control box (near the capacitors). See figure 2 or 3.
- 6- *LGH/LCH Units -*
Connect the other end of the J3 harness to P262A on the A55 Unit Controller. See figure 2.
- KG/KC/KH Units -*
Connect the wires on the other end of the J3 harness to TB1.
- 7- Secure J3 harness in control box using insertion wire tie on left side of control box. See figure 2 or 3.

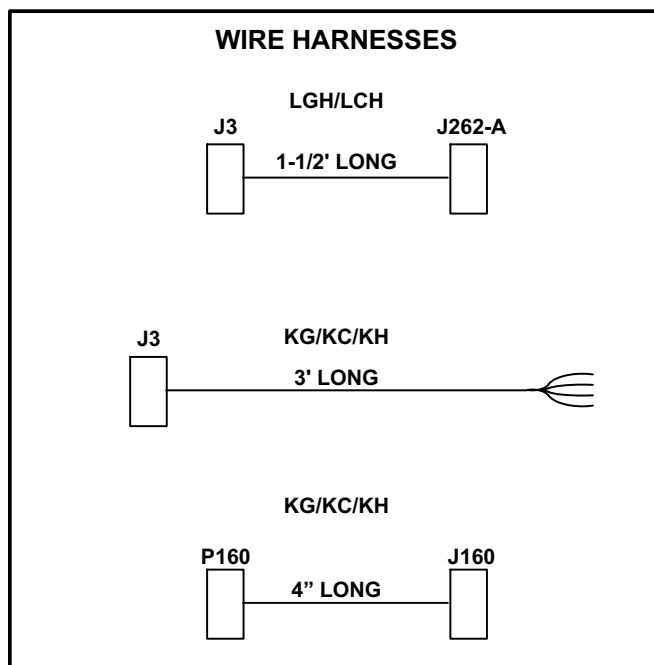


FIGURE 1

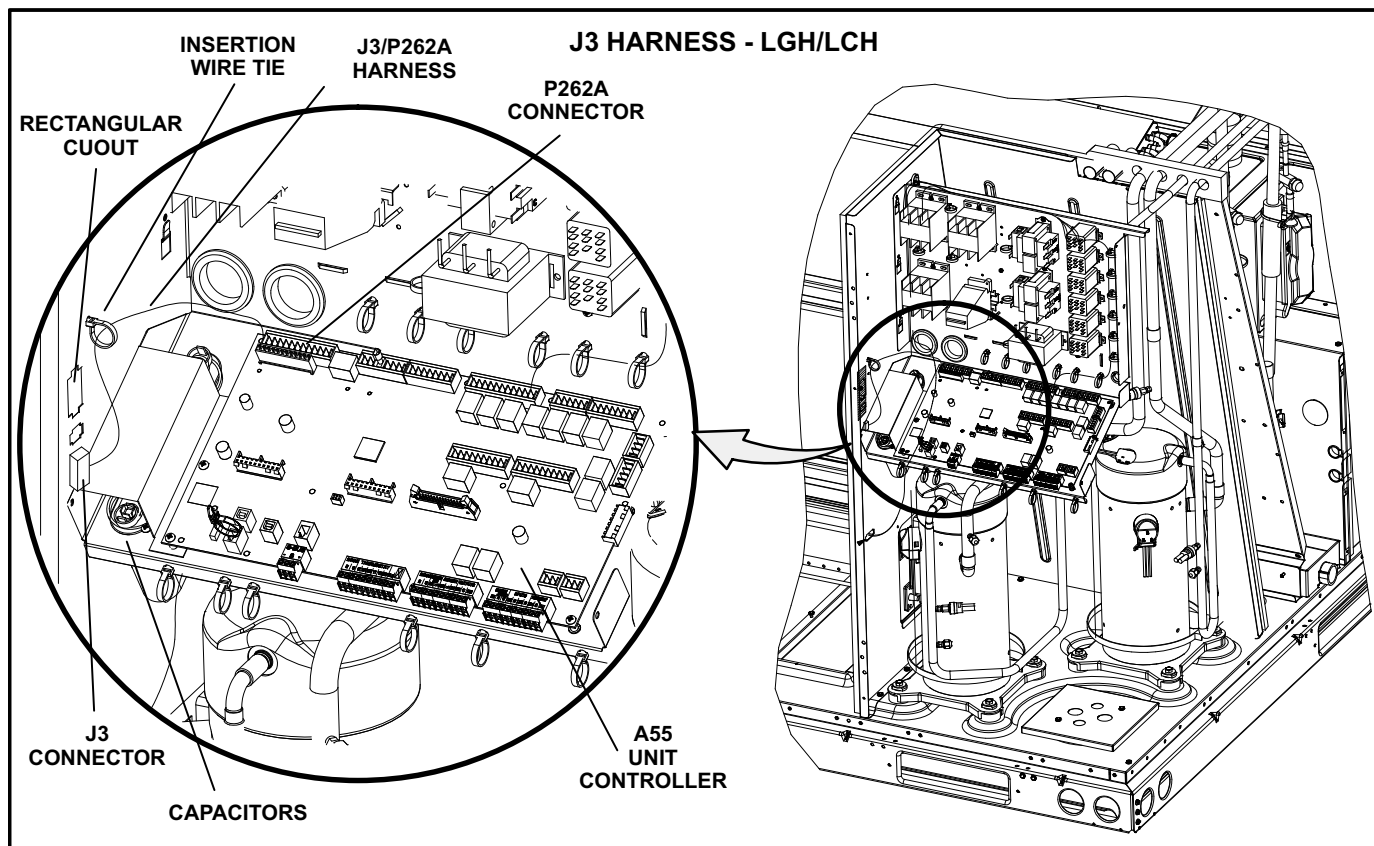


FIGURE 2

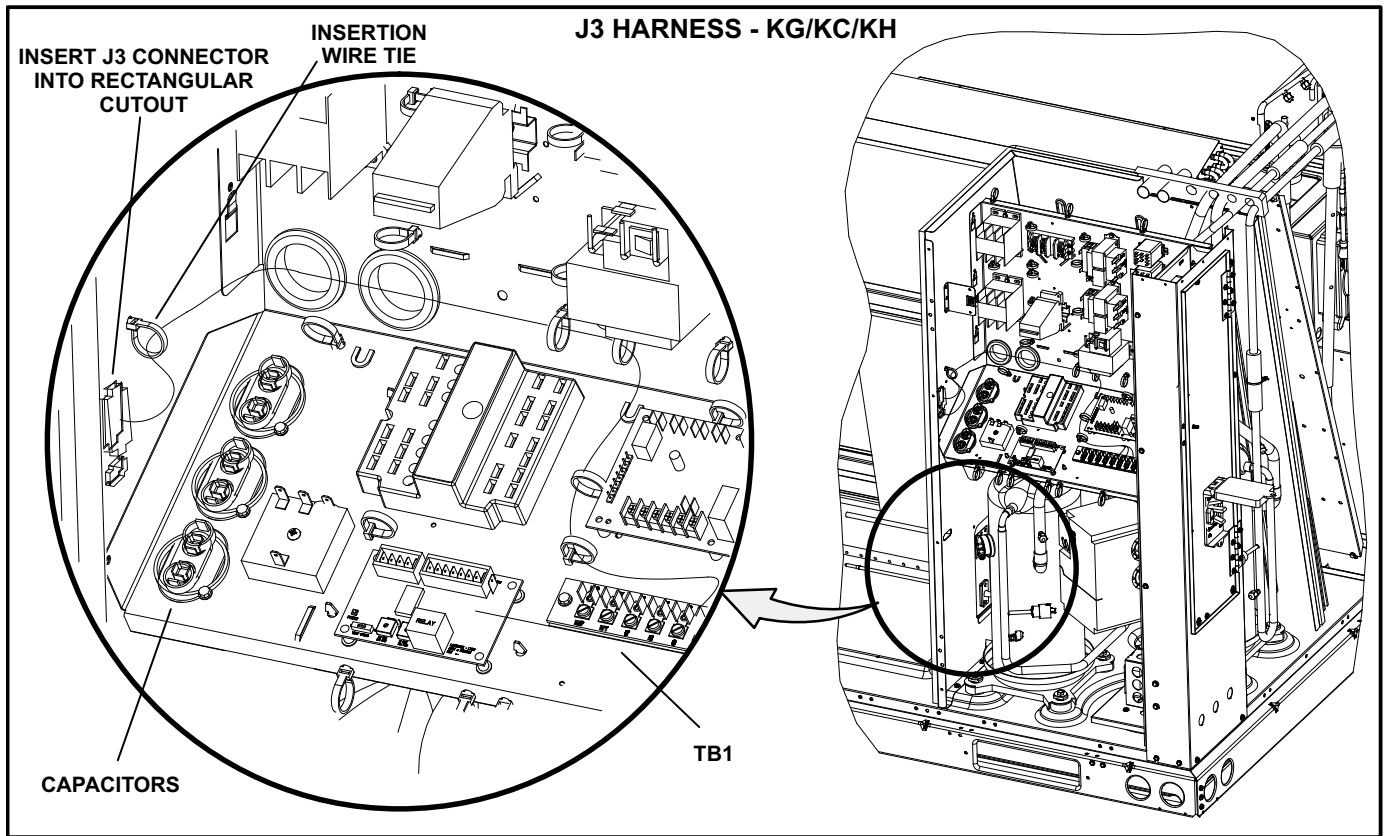


FIGURE 3

Damper

- 1- Remove and retain screws securing accessories access panel. Discard panel.
- 2- Locate insulated lower panel provided in kit. Align holes on the lower panel with holes in the unit base. Secure panel with #10 screws **EXCEPT** on 150/152 units. On 150/152 units, use retained screws. See figure 4.
- 3- Secure the motorized damper to the cover panel using #10 screws. Orient damper motor as shown in figure 4.
- 4- Install the hood top seal according to the first two steps in the *Install Outdoor Air Hood* section.
- 5- Slide the cover panel underneath the hood top seal. Secure the top of the cover panel to hood top seal with #10 screws. Secure the bottom of the cover panel with a #10 screw in the center and two one-inch screws at the corners.
- 6- Open the horizontal return air cover. See figure 4.

Actuator DIP Switch

KG/KC/KH Units -

Open the DIP switch access cover on the damper motor and adjust the setting. See figure 5.

J/P160 Harness

KG/KC/KH Units -

Locate shortest harness. See figure 1. Connect the kit jumper harness plug P160 to J3 connector (previously installed on left side of control box). Connect other end of kit harness jack J160 to the damper motor plug P4. See figure 6.

P4 Harness

LGH/LCH Units -

Connect damper motor harness plug P4 into the J3 connect (previously installed on left side of control box). See figure 6.

Wiring Diagrams

Install the applicable wiring diagram on the inside of the control compartment access panel; discard the other diagram. LGH/LCH units use the diagram showing A55 in the key list. KG/KC/KH units use the other diagram.

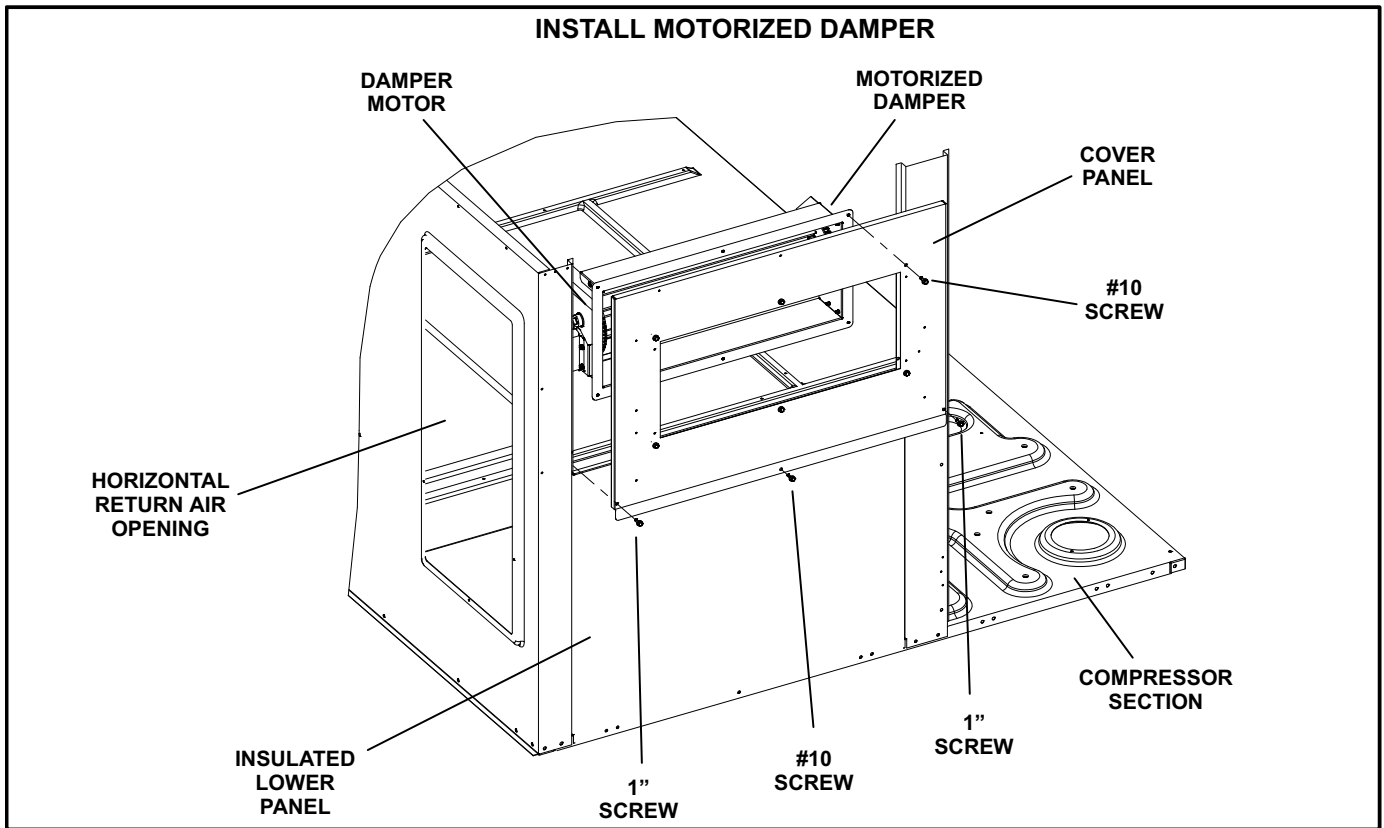


FIGURE 4

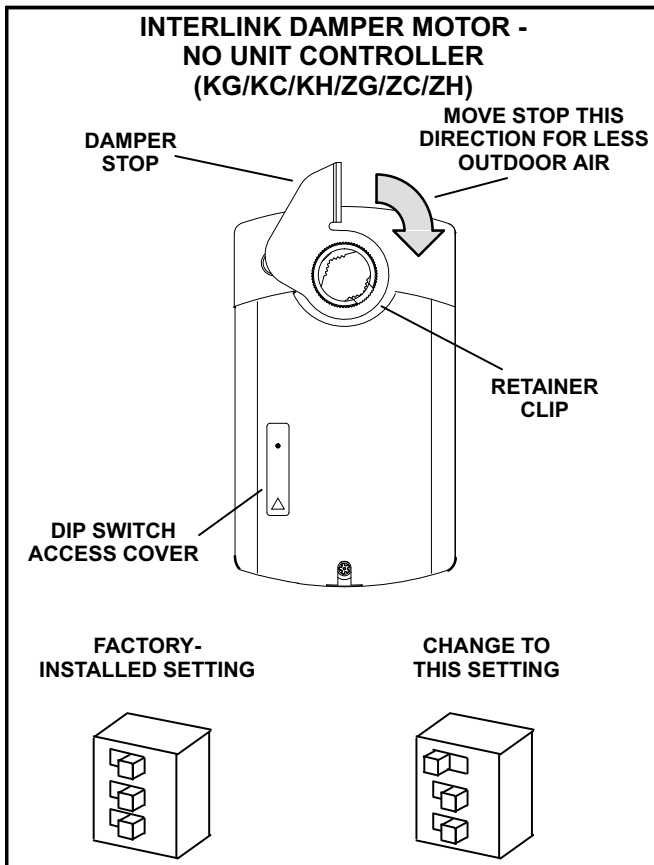


FIGURE 5

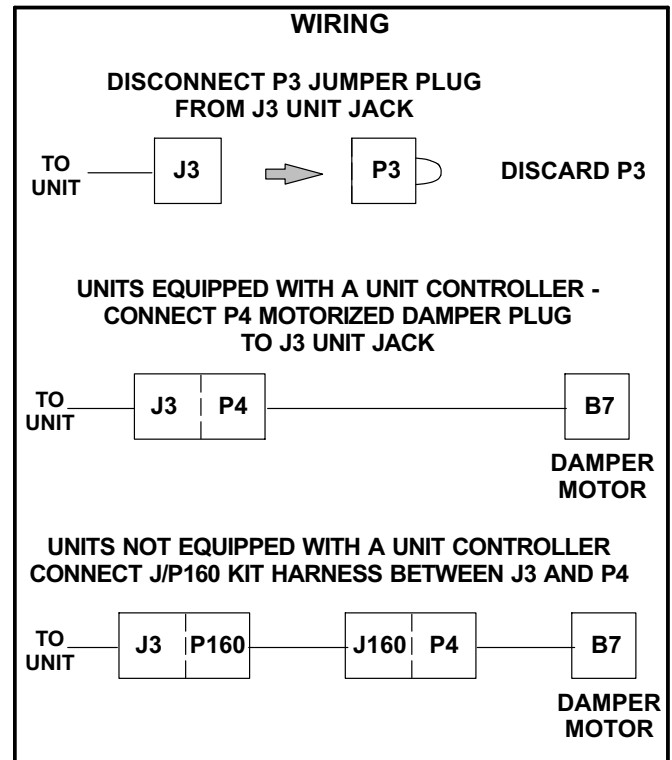


FIGURE 6

Manual Damper Assembly- LGH/LCH/ KG/KC/KH Units

- 1- Disconnect all power to unit.
- 2- *Factory-Installed Damper* -
Go to the Outdoor Air Hood section.
- 3- Remove and retain screws securing accessories access panel. Discard panel.
- 4- Locate insulated lower panel provided in kit. Align holes on the lower panel with holes in the unit base. Secure panel with #10 screws **EXCEPT** on 150/152 units. On 150/152 units, use retained screws. See figure 7.
- 5- Secure the manual slide damper to the outside of the cover panel using #10 screws.
- 6- Install the hood top seal according to the first two steps in the *Install Outdoor Air Hood* section.
- 7- Slide the cover panel underneath the hood top seal. Secure the top of the cover panel with #10 screws. Secure the bottom of the cover panel with a #10 screw in the center and two one-inch screws at the corners.
- 8- Slide the manual damper in the cover panel slots as needed.

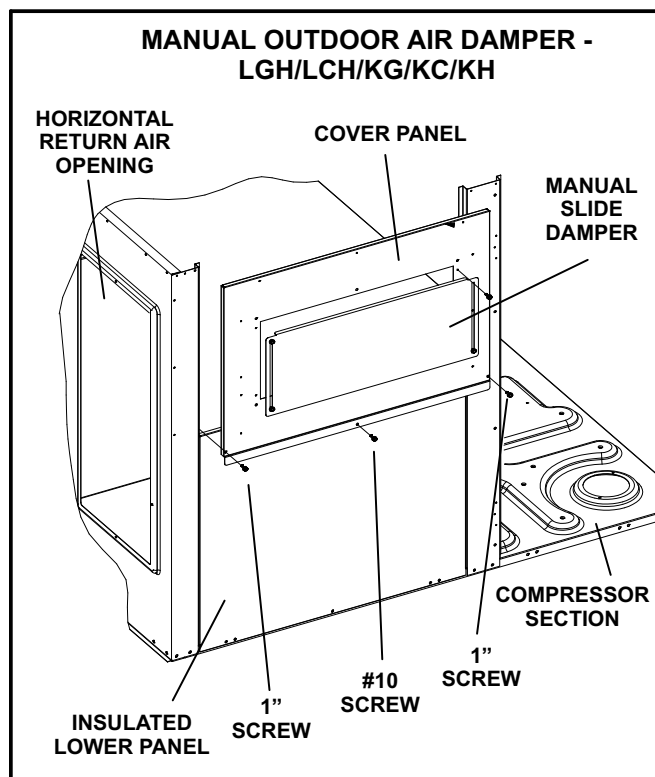


FIGURE 7

Motorized Damper Assembly - ZG/ZC/ZH Units

- 1- Disconnect all power to unit.
- 2- Remove and retain filter access panel on the back of the unit. See figure 3.
- 3- Remove and discard lower access panel.
- 4- Cut insulation from opening in insulated lower panel provided. See figure 4.
- 5- Secure the motorized damper to the insulated lower panel using #10 screws provided. See figure 9.
- 6- Locate the harness that has connectors on both ends. Connect the female jack with wires labeled J4-3 & 7 to the outdoor air damper harness plug (P4). Connect the other end of harness to J10 hanging in the upper left corner of the return air section. See figure 10 for J10 location.
- 7- Reinstall the filter access panel using retained screws.
- 8- Secure the insulated lower panel / damper assembly to the unit using #10 sheet metal screws.
- 9- Open compressor access panel on the other side of the unit. Locate the plug (P142) with wires labeled P142-2 & 3 hanging in the upper right area of the control box. See figure 11. Connect the female jack (J142) from the other kit harness to P142. Wires on the other end of the harness are marked TB1-OC and TB1-C. Connect the two wires to the appropriate terminals on TB1. Secure harness to wiring bundle shown in figure 11.
- 10- Install the wiring diagram on the inside of the compressor access panel. Reinstall the panel.

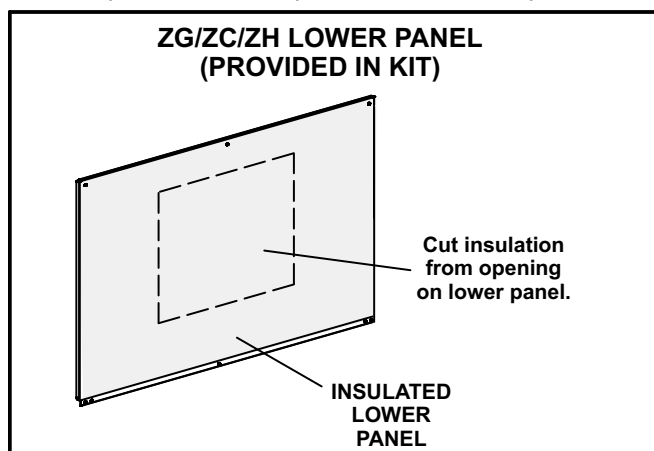


FIGURE 8

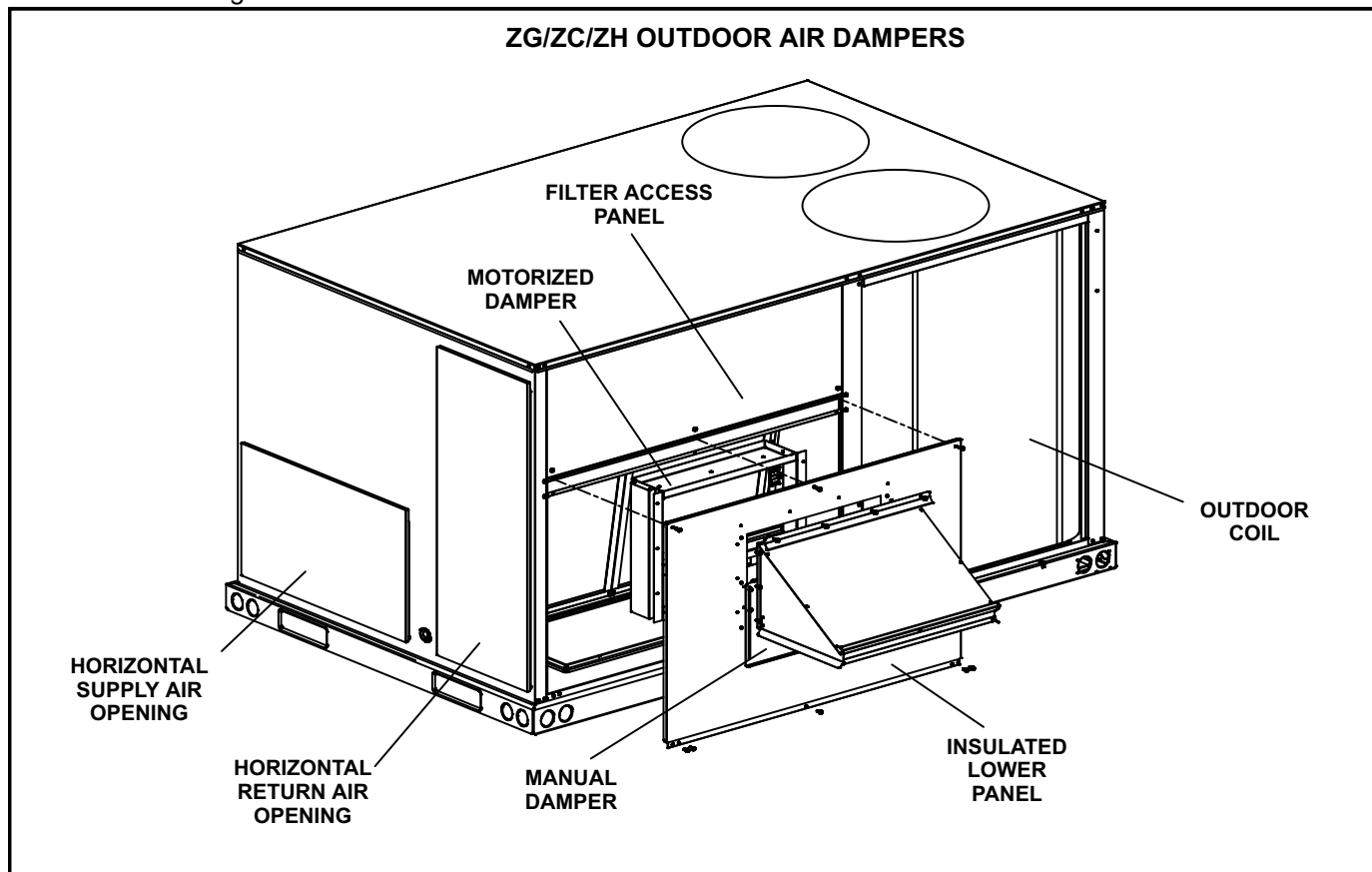


FIGURE 9

ZG/ZC/ZH RETURN AIR SECTION

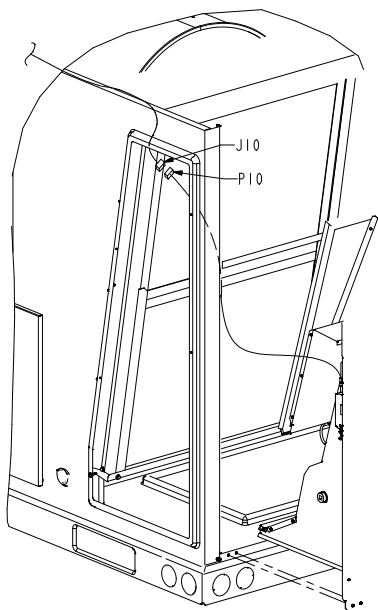


FIGURE 10

Manual Damper Assembly - ZG/ZC/ZH Units

- 1- Disconnect all power to unit.
- 2- Remove filter and lower access panel on the back of the unit. See figure 9.
- 3- Cut insulation from opening in lower panel. See figure 8.
- 4- Install the manual damper on the lower panel. See figure 9. Slide the manual damper in the cover panel slots as needed.

ZG/ZC/ZH CONTROL AREA

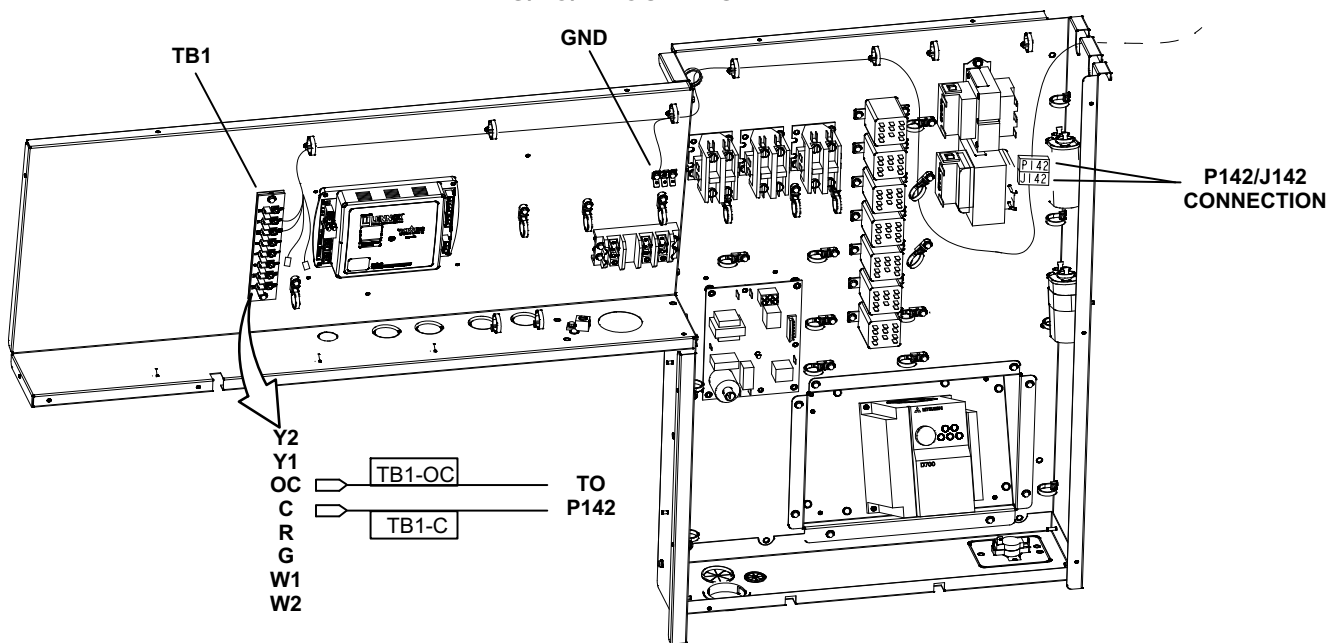


FIGURE 11

Install Outdoor Air Hood

On LGH/LCH/KG/KC/KH units equipped with factory-installed dampers, go to step 4.

Assemble hood and install as follows:

1- LGH/LCH/KG/KC/KH Only -

Remove and retain screws securing unit top panel to mullions on the left and right side of the accessory access area. See figure 12.

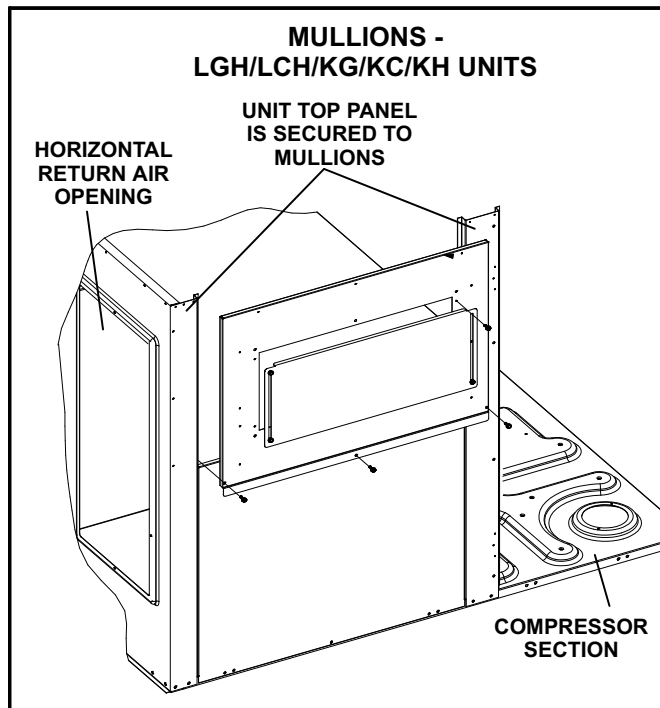


FIGURE 12

2- LGH/LCH/KG/KC/KH Only -

Slide hood top seal under unit cabinet top. Secure top seal on the ends using retained cabinet top panel screws. Install, but do not tighten, the screws on each end of the hood. See figure 13.

ZG/ZC/ZH Only -

Align four holes in top seal with holes above opening in lower panel. Secure with sheet metal screws. Install, but do not tighten, the screws. See figure 14.

3- Position the hood top edge V-channel under the corresponding V-channel on hood top seal. Slide hood from right to left until it is properly positioned. See figure 13.

4- Factory-Installed Dampers Only -

Remove screws securing hood to unit. Lift hood upward allowing the hood to slide from left to right.

5- Secure hood left side to the hood top and to the cabinet using the provided screws. See figure 15.

6- Secure the hood right side to the hood top. Do not secure the hood right side to cabinet. See figure 16.

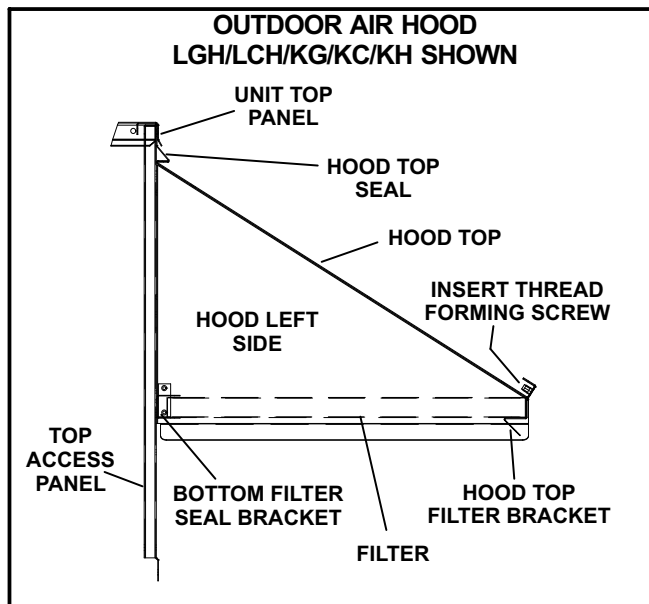


FIGURE 13

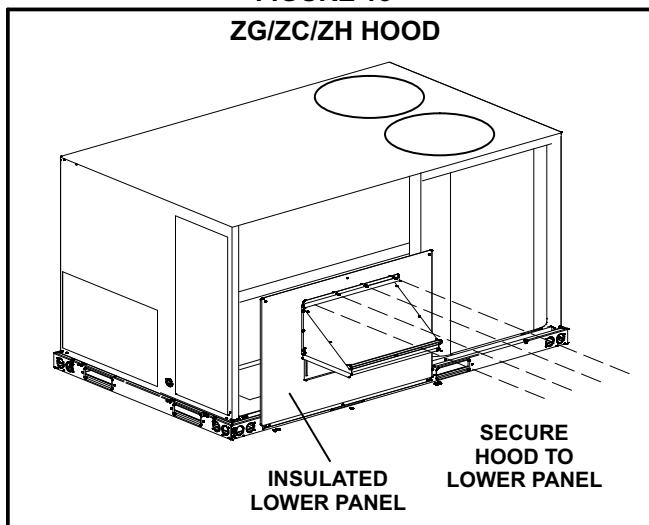


FIGURE 14

7- Align the two holes on the left hood side with the two holes in the bottom filter seal bracket. Secure using provided screws. See figure 15.

8- Secure bottom filter seal bracket to the right hood side as shown in figure 16.

9- Secure right hood side to cabinet using provided screws. See figure 16.

10- Slide filter into the slot on the bottom filter seal bracket. Secure the hood top filter bracket to the hood top using the thread forming screw provided. See figure 13.

11- Tighten hood top seal screws.

12- Seal the locations shown in figures 15 and 16 with caulk.

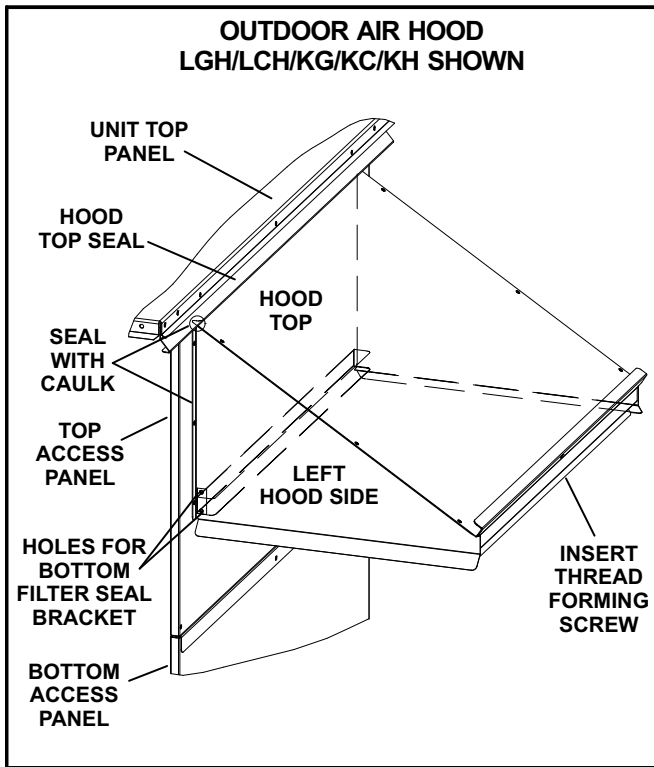


FIGURE 15

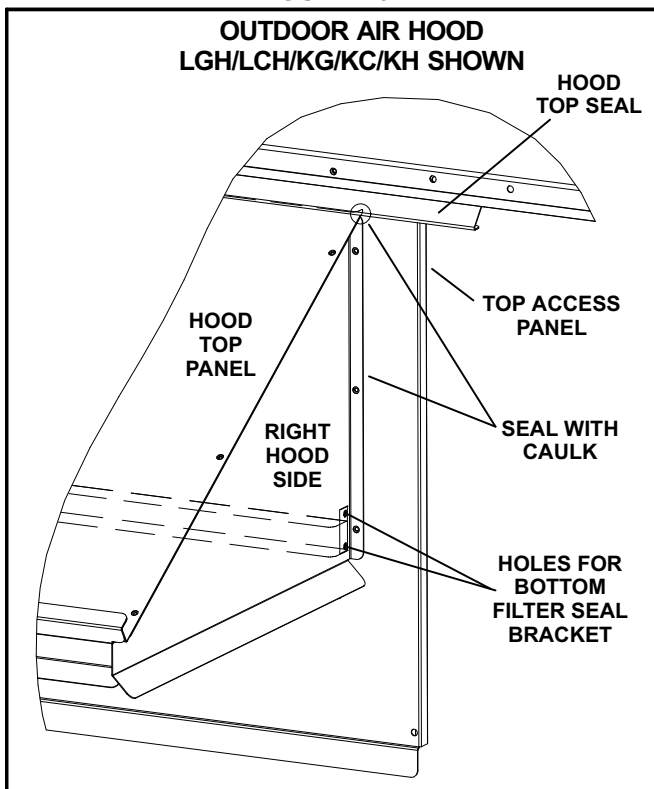


FIGURE 16

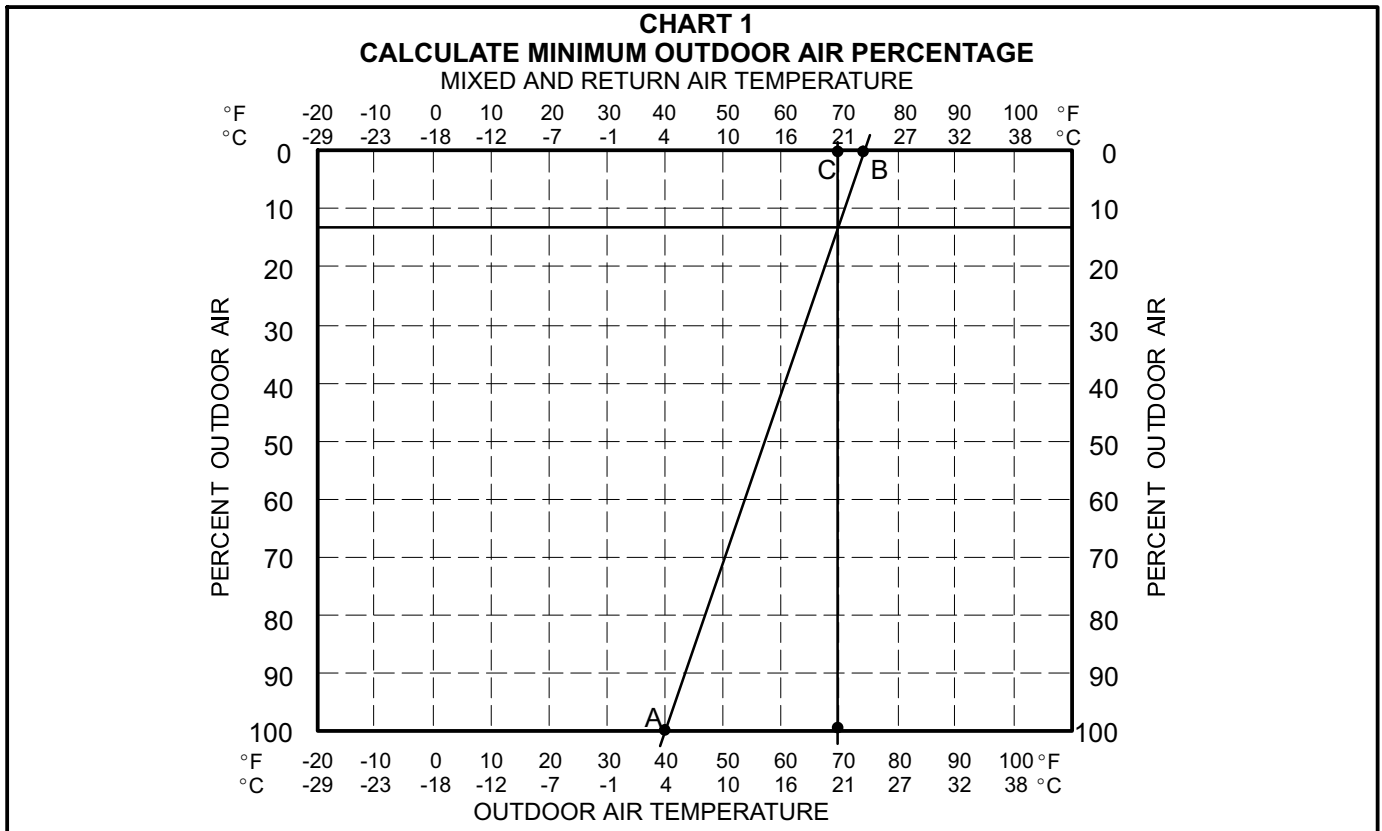
Determine Outdoor Air Percentage

Outdoor air percentage can be estimated in the same manner for both manual and motorized dampers. Measure outdoor air temperatures according to the following steps and calculate the outdoor air percentage. For motorized dampers, refer to unit specific damper adjustment details following these steps.

- 1- Measure outdoor air temperature. Mark the point on the bottom line of chart 1 and label the point "A" (40°F, 4°C shown).
- 2- Measure return air temperature. Mark that point on

the top line of chart 1 and label the point "B" (74°F, 23°C shown).

- 3- Measure mixed air (outdoor and return air) temperature. Mark that point on the top line of chart 1 and label point "C" (70°F, 21°C shown).
- 4- Draw a straight line between points A and B.
- 5- Draw a vertical line through point C.
- 6- Draw a horizontal line where the two lines meet. Read the percent of outdoor air intake on the side.
- 7- If outdoor air percentage is less or more than desired, increase or decrease minimum damper position. Then, repeat steps 2 through 7 until calculation reads desired outdoor air percentage.



Damper Minimum Position Adjustments

Units Equipped With M2 and M3 Unit Controllers

The damper minimum position or positions are adjusted using the Unit Controller input screen. For a unit equipped with more than 1 blower speed, the unit should initially be run on highest speed.

1- Field-Installed Dampers Only -

Use one of the following menus to enable the motorized damper function on the Unit Controller.

M3 Unit Controller -

SETUP > INSTALL

Navigate through the various screens until CONFIGURATION ID 1 appears. Enable set position 2 to M (motorized outdoor air damper only).

M2 Unit Controller -

SETTINGS > INSTALL > NEW M2 > DAMPER > MOAD

2- Use one of the following menu paths to set the minimum damper position.

M3 Unit Controller -

SETUP > TEST & BALANCE > DAMPER > MIN
DAMPER POSITION BLOWER ON HIGH=.%

M2 Unit Controller -

SETTINGS > SETPOINTS > DAMPER > MIN OCP
BLOWER HIGH

3- Use the *Determine Outdoor Air Percentage* section to verify the minimum damper air percentage.

4- *Units Equipped With Two Blower Speeds -*

Use one of the following menu paths to set the low speed minimum damper position.

M3 Unit Controller -

SETUP > TEST & BALANCE > DAMPER > MIN
DAMPER POSITION BLOWER ON LOW=.%

M2 Unit Controller -

SETTINGS > SETPOINTS > DAMPER > MIN OCP
BLOWER LOW

5- Use the *Determine Outdoor Air Percentage* section to verify the low speed minimum damper air percentage.

Note - For additional details, refer to Unit Controller manual shipped with unit.

Units Not Equipped With A Unit Controller

The damper motor stop is preset to provide 100% outdoor air and is adjustable in fixed increments. For units supporting more than 1 blower speed, the damper minimum set point should be determined with the blower operating at the highest speed.

- 1- To reduce the outdoor air percentage, remove retainer clip and adjust damper stop in the clockwise direction. Replace the retainer clip securing the stop arm in the new position. See figure 5.
- 2- Power the damper open by providing a blower and occupied demand to the unit thermostat connections.
- 3- Use the *Determine Outdoor Air Percentage* section to verify the minimum damper air percentage.
- 4- Repeat steps 1 through 3 until calculation reads desired outdoor air percentage. Remove the blower and occupied demand signals before adjusting damper stop.

Minimum Damper Position Range

The motorized outdoor air damper operation is optimized as shown in the shaded area of Chart 2. Unit operation during minimum damper position above this curve increases the potential for rain being drawn into the unit.

- 1- Remove the metal mesh filter from the hood. Measure the static pressure differential between the return compartment (through horizontal return air panel is recommended) and outside the unit. Operate the unit with the damper open to minimum position. Record the single blower speed pressure differential in table 2.
- 2- *Units With More Than One Blower Speed -* Repeat the static pressure measurement at each blower speed and minimum set point combination. Record the multiple blower speed pressure differential in table 2.

- 3- Read the damper percentage open.

Units Equipped With Unit Controller -

The damper percentage open was entered into the Unit Controller.

Units Not Equipped With Unit Controller -

Operate the unit with the damper open to minimum position. Measure the voltage between pins 7 and 9 from the damper motor plug P4. Calculate the percentage open from the formula:

$$\% \text{ Open} = [(\text{Measure voltage} - 2.5) / 7.0] \times 100$$

- 4- Plot the damper % open and static pressure drop on Chart 2. Plot additional blower speeds in the same manner.
- 5- Replace the metal mesh filter.

TABLE 2

Single Blower Speed		Multiple Blower Speed	
Static Pressure Differential - "w.c.	Damper % Open	Static Pressure Differential - "w.c.	Damper % Open

