

## Standard Installation

### Ceiling Radiation Dampers Models: 289, RCU, L89, A89, 291, RCI, L91, A91, 293, RC4, L93, A93, 295, RDU, L95, A95, 297, RDI,

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#### APPLICATION

These ceiling radiation dampers provide the required heat radiation protection of HVAC membrane penetrations (not through penetrations) of rated floor-ceiling and roof-ceiling assemblies. These dampers are normally mounted above steel grilles or diffusers. These UL Classified ceiling dampers can be used in any floor-ceiling or roof-ceiling design that is approved to use a hinged door type damper over an HVAC penetration - consult Underwriters Laboratories Fire Resistance Directory (FRD) for detailed information pertaining to each specific design.

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#### PANEL SIZE LIMITATIONS

Model	Orientation	Horizontal
	Assembly	Max Panel
	L89, RCU, A89, 289	100 sq. in. 18"W x 10"H
	L91, RCI, A91, 291	18"W x 18"H
	L93, RC4, A93, 293	24"W x 24"H
	L95, RDU, A95, 295	10"dia.
	L97, RDI, A97, 297	20"dia.

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#### SUPPLEMENTAL INSTALLATION INSTRUCTIONS/SUBMITTAL DATA

Thermal Blankets

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#### RATINGS/APPROVALS

- A. Approved for use in duct drop or ductless installations.
- B. Approved for use in restrained or unrestrained assemblies rated at 2 hours or less.
- C. Tested in accordance to and complies with the requirements of UL Standard 555C.
- D. CSFM Listed, 3226-1328:105.
- E. NYC, MEA #110-99-M.
- F. These dampers are eligible to be installed as a substitute in assemblies shown with hinge door type dampers with exposed or concealed grid suspension systems and in "hard" ceilings of gypsum wallboard or plaster.
- G. These dampers are eligible to be installed in the following wood joist assembly UL Designs: L005, L201, L202, L206, L210, L211 and L212.

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#### LIMITATIONS

- A. UL classification does not cover these dampers for general installation in any floor or ceiling design. These dampers are intended for use only in those UL fire resistive designs that indicate the use of the hinged door type damper.
- B. UL certification does not include the use of these dampers to limit the migration of smoke.
- C. These dampers are not tested to close against airflow.
- D. The size of the duct outlet shall be no larger than the maximum size of the damper.

## INSTALLATION

1. **General:** Three specific types of installations will be detailed. The general installation requirements listed below pertain to all three of these specific installations.
  - A. Dampers mounted into and supported by the ceiling grid system (Lay-In) - See Figures 1 and 2.
  - B. Dampers mounted to and supported by the ductwork (Surface Mount) - See Figures 3 and 4.
  - C. Dampers supported by the structure above (Surface Mount) - See Figures 5 and 6.
2. **Blades:** The ceiling dampers are shipped with the blades in the closed position. During installation the blades must be manually opened and the free end of the fuse link attached to the adjacent blade.
3. **Sleeve:** Installations that require an extended upper frame to protect the damper blades from interference during closing may have a field provided sleeve. This sleeve is to be attached to the damper frame in the same manner as required for the duct drop to the damper frame.
4. **Ducts:** Duct outlets should be located in the field of an acoustical panel; however, where it is necessary to cut a main runner or cross tee, a vertical #12 SWG hanger wire shall support each cut end. A  $\frac{1}{2}$ " clearance shall be maintained between the duct outlet and each cut end of a main runner or cross tee. The duct outlet shall be located so that no more than one main runner or cross tee is cut per opening. Class 0 or Class 1 flexible air ducts or air ducts bearing the UL listing mark may be used. A steel strap or #16 SWG wire shall be used to connect the flex air duct to the damper assembly. The flexible duct shall be supported on 6' centers maximum with steel straps and/or #12 SWG steel hanger wire and shall be at least 4" above the top of the ceiling membrane.
5. **Hanger Wires:** Hanger wires shall be a minimum of #12 SWG for all damper supports, installed vertically and not splayed. Hanger wires are to be directly connected to the structural members of the floor or roof about the dampers. A minimum of four wires, one at each corner, are required for square and rectangular dampers/duct drops. A minimum of three wires equally spaced are required for round dampers/duct drops.
6. **Clearance:** A maximum of  $\frac{1}{8}$ " on each side ( $\frac{1}{4}$ " total) clearance may exist between the ceiling damper and the tee bars of a grid support or between the ceiling damper and the duct drop.
7. **Location:** The distance between the exposed surface of the ceiling and the lower surface of the damper blades shall not exceed 5" in any type of installation.
8. **Connections:** The grille or diffuser is mounted to the duct drop or ceiling damper using a minimum #8 steel sheet metal screws,  $\frac{3}{16}$ " diameter steel rivets,  $\frac{1}{4}$ " tact welds. Screws and rivets shall be located a minimum of  $\frac{3}{16}$ " from the edge of the grill/diffuser, ceiling damper or duct drop. Spacing of fasteners shall be at least three equally spaced for round diffusers and 8" on center maximum per side for square/rectangular diffusers with at least one fastener on each side. Grille/diffuser to overlap the ceiling damper or duct drop by a minimum of  $\frac{9}{16}$ ".

Ceiling damper-to-duct drop method of attachment and overlap shall be identical to instructions to mount the grille or diffuser to the duct drop.

The ceiling damper and the grille/diffuser can be individually connected to the duct drop, or the grille/diffuser can be attached to the ceiling damper and that assembly attached to the duct drop.

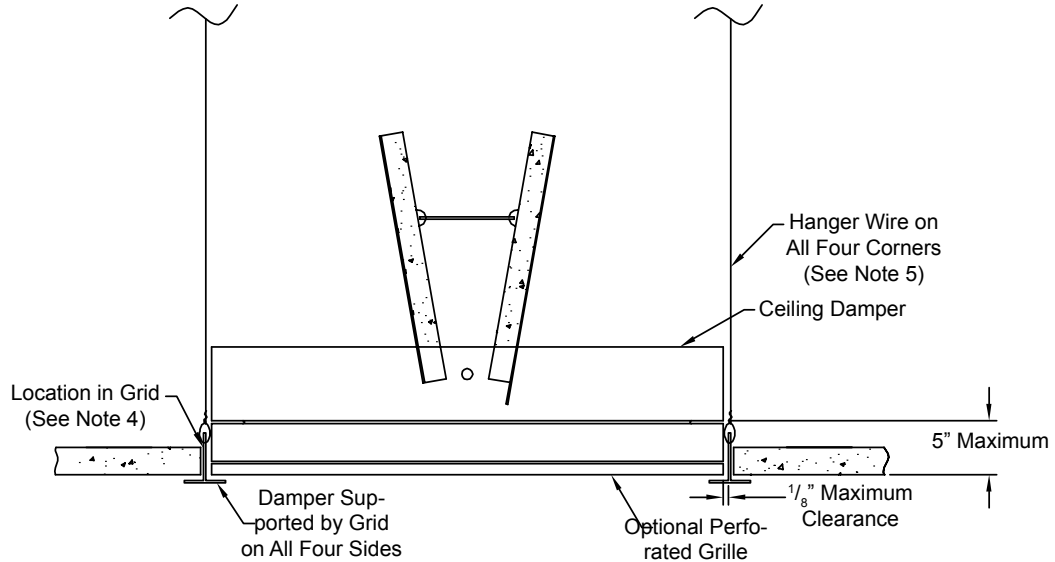
The mounting fasteners must not interfere with the operation of the damper blades.
9. **Thermal Blankets:** In order to maintain the UL rating of ceiling assemblies that utilize a sloped or tapered top diffuser/grille or when the opening in the ceiling membrane is more than 1" larger than the ceiling damper, a thermal blanket is required. The thermal blanket shall be a minimum of  $\frac{1}{4}$ " thick ceramic fiber material with a density of 8 lbs./cu.ft. This blanket shall insulate the exterior area of the diffuser/grille and up to the plane of the damper blades. The thermal blanket is retained by #16 SWG steel wire.
10. **Grille/Diffuser:** The frame of the grille and the frame and top pan of the diffuser are to be of steel, the core can be of materials other than steel.
11. **Opposed Blade Dampers:** Opposed blade dampers may be utilized in any ceiling damper installation. The opposed blade damper may be installed into any ceiling damper with an extended lower frame or directly to the duct drop below the damper. No installation shall exceed the 5" distance allowed between the exposed surface of the ceiling and the lower surface of the damper blades.
12. **Ceiling:** For actual ceiling construction, refer to details for a particular design in the UL Fire Resistance Directory (FRD).



## Ceiling Damper Supported by a Grid System (Lay-In)

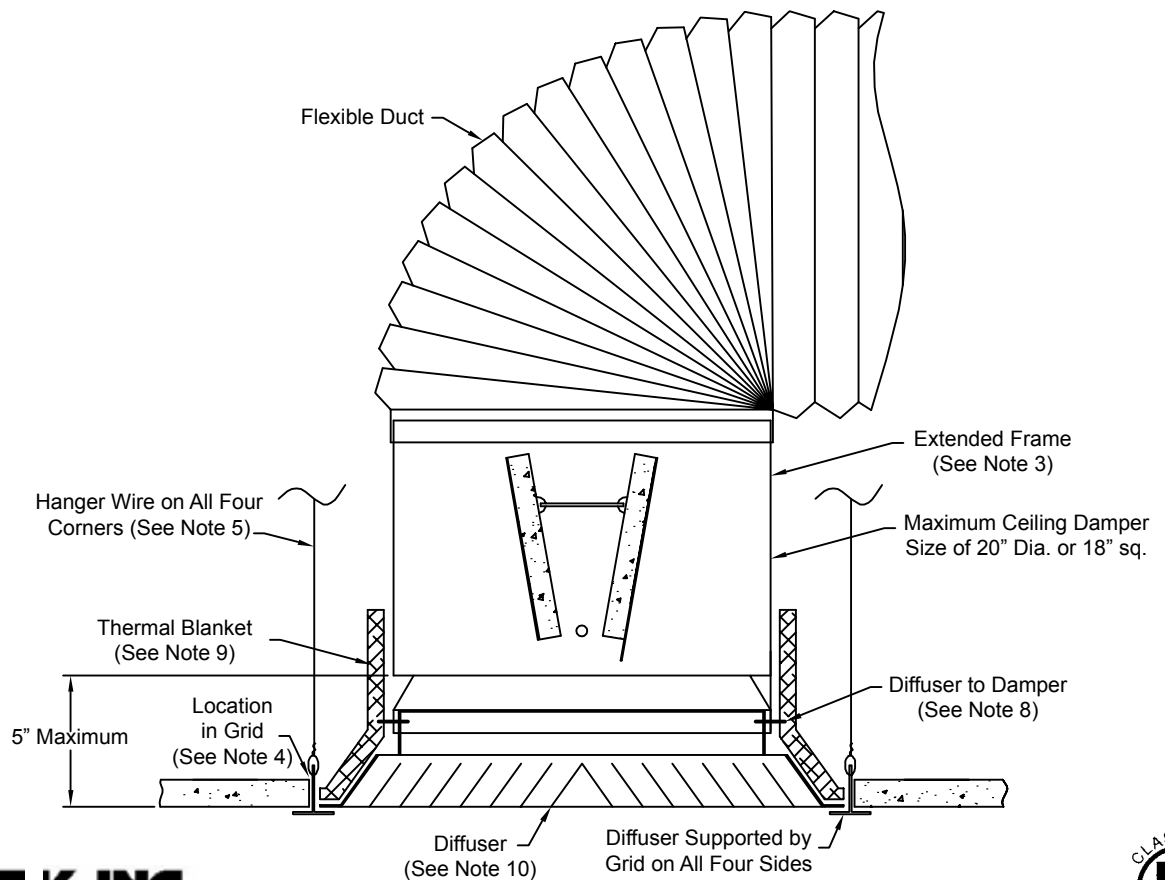
The ceiling damper in this type of installation is supported by the ceiling grid (normally steel T-Bar). The ceiling damper can fill the opening and rests directly on the grid system (See Figure 1) or the ceiling damper mounts onto the reduced neck of a lay-in diffuser that rests directly on the grid system (See Figure 2). The grid system opening can be as large as 24"W x 24"H.

**Figure 1 - Ceiling Damper That Fills Grid Opening**  
Shown unducted; can also be ducted



**Figure 2 - Ceiling Damper on Neck of Diffuser**

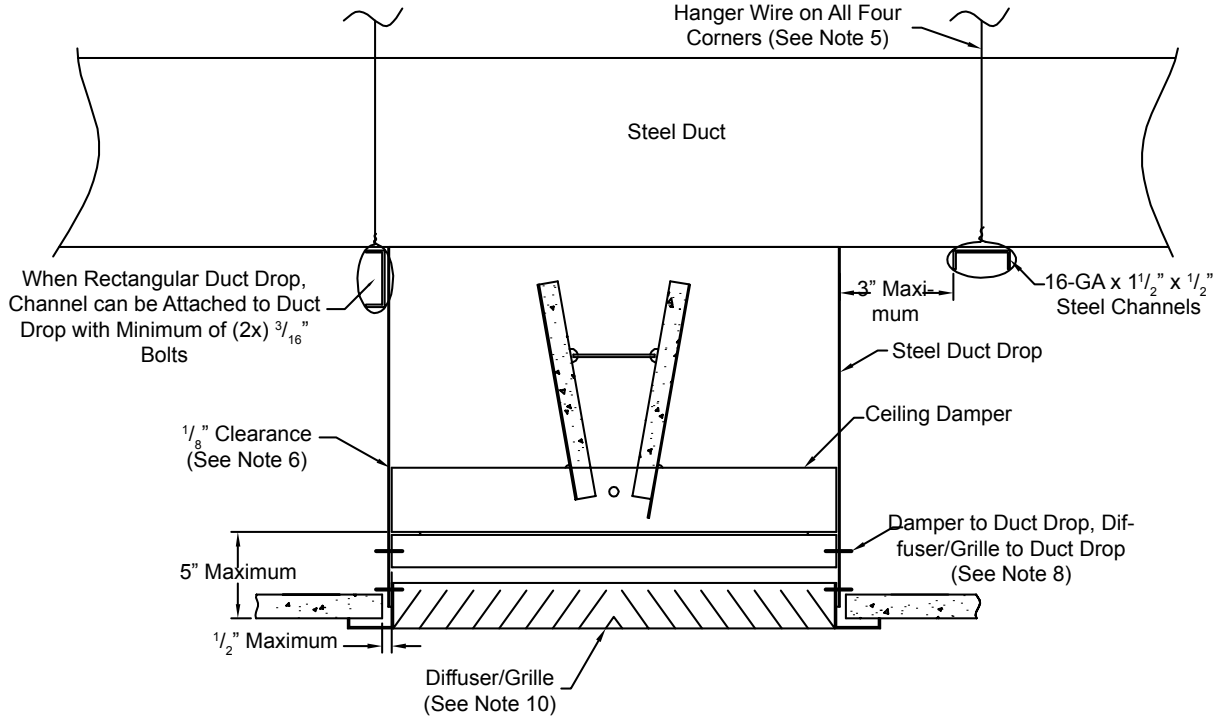
Shown with flex duct; can also be connected to a steel duct drop or unducted



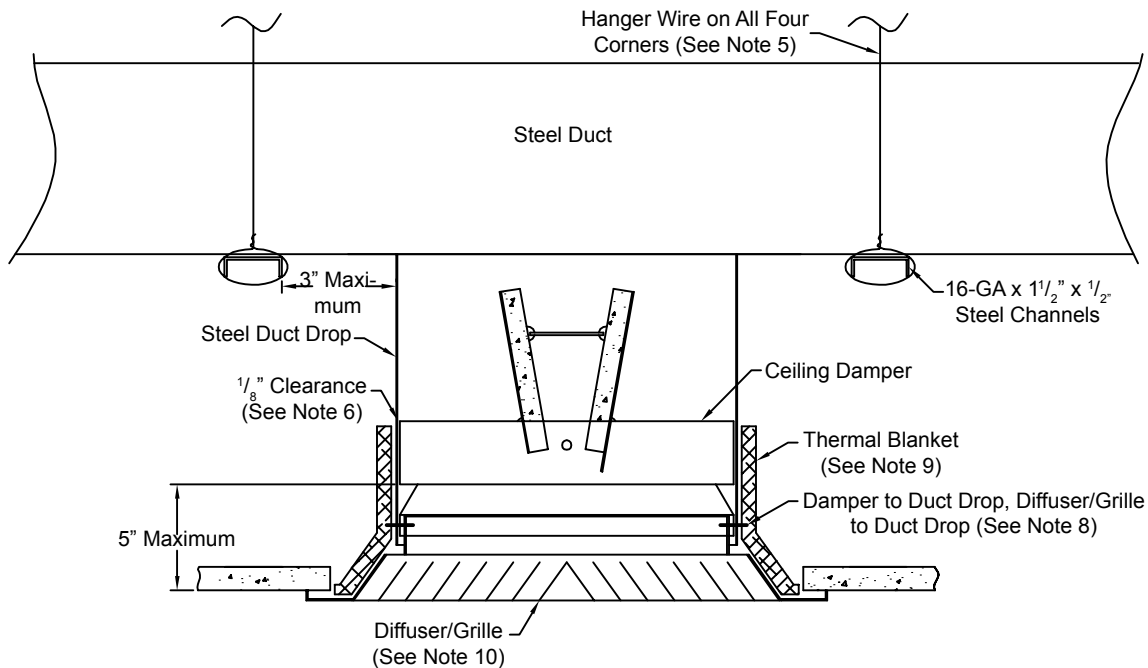
## Ceiling Damper Supported by Ductwork (Surface Mount)

The main duct above the damper supports the ceiling damper in this type of installation. The ceiling damper can fill the ceiling opening (See Figure 3) or the ceiling damper mounts onto the reduced neck of a surface mounted diffuser (See Figure 4). The opening can be as large as 24"W x 24"H. The steel flange (minimum of 1") of the diffuser or grille is to overlap and support the bottom surface of the ceiling membrane.

**Figure 3 - Ceiling Damper that Fills Ceiling Opening**



**Figure 4 - Ceiling Damper on Neck of Diffuser**

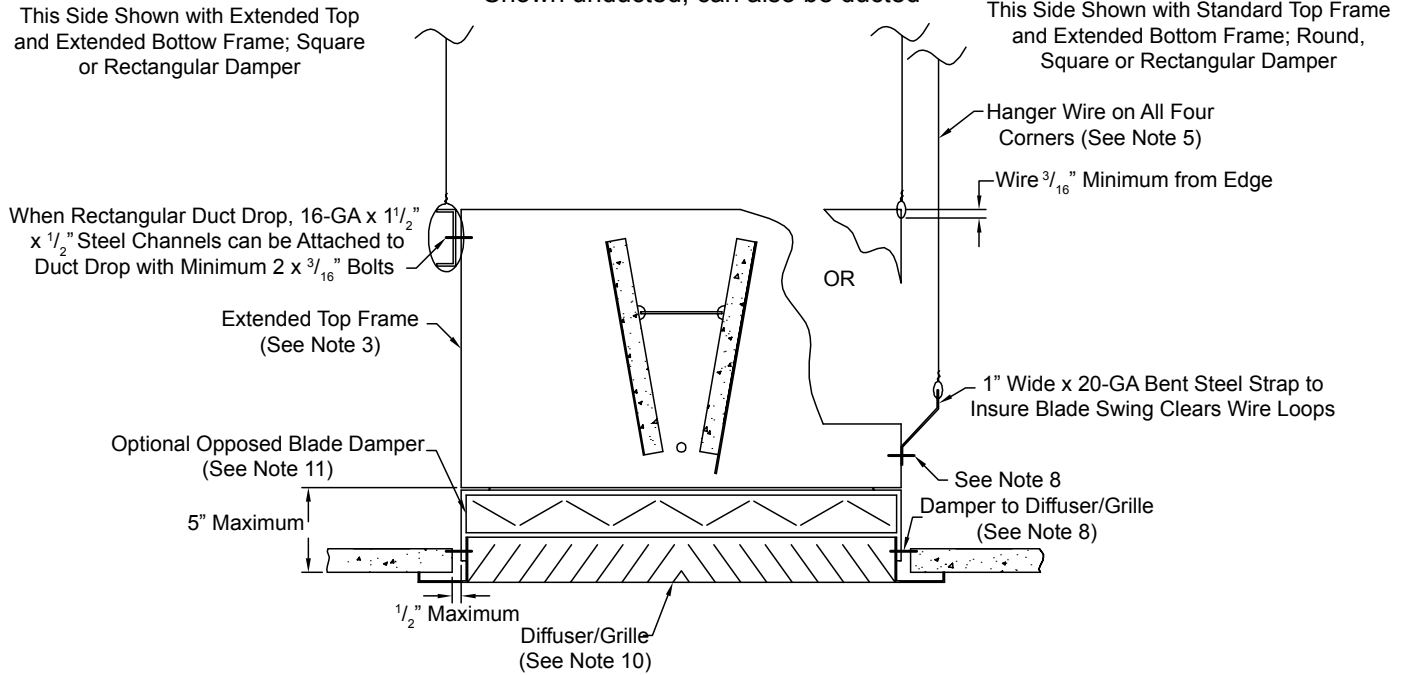


**Ceiling Damper Supported by Structure (Surface Mount)**

The ceiling damper in this type of installation is supported by the floor or roof structure above the damper. The ceiling damper can fill the ceiling opening (See Figure 5) or the ceiling damper mounts onto the reduced neck of a surface mounted diffuser (See Figure 6). The opening can be as large as 24"W x 24"H. The steel flange (minimum of 1") of the diffuser or grille is to overlap and support the bottom surface of the ceiling membrane

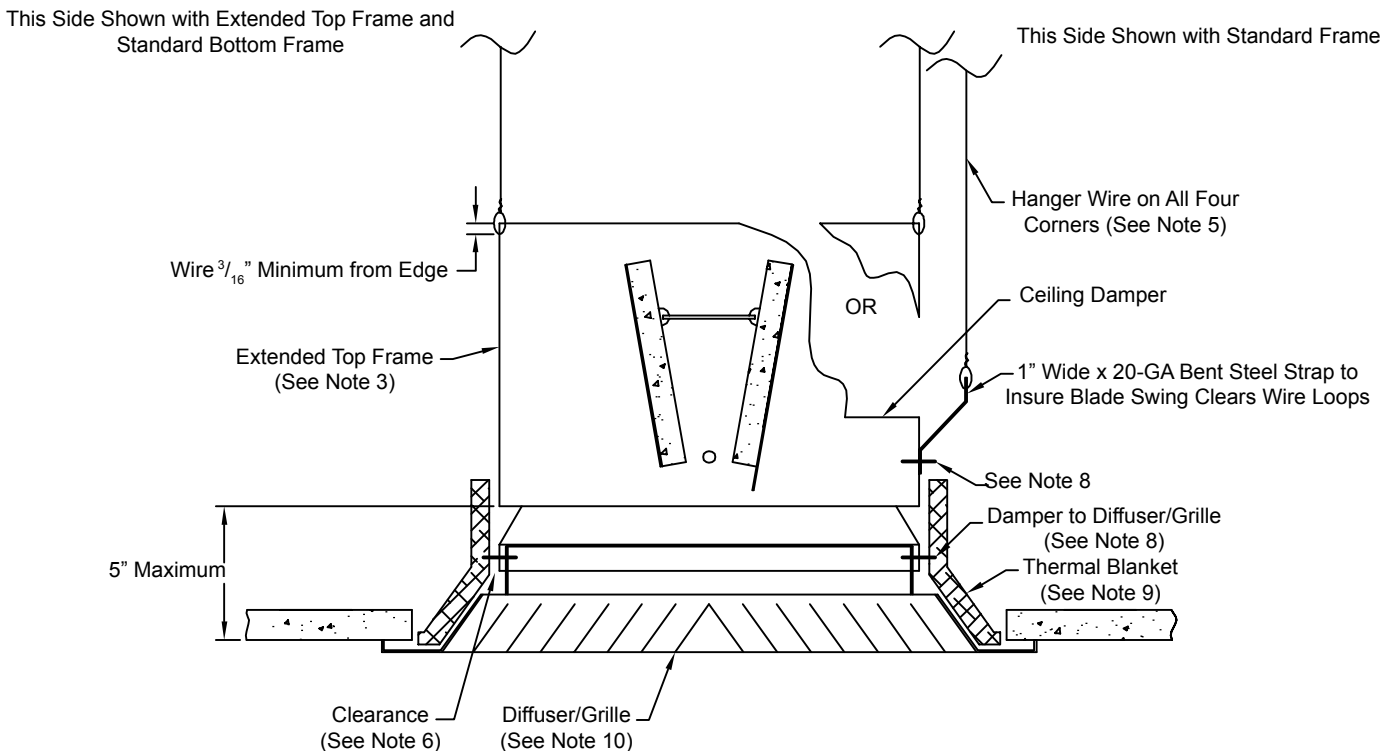
**Figure 5 - Ceiling Damper that Fills Ceiling Opening**

Shown unducted; can also be ducted



**Figure 6 - Ceiling Damper on Neck of Diffuser**

Shown unducted; can also be connected to a steel duct drop or flexible duct



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