



# Model CFSD-212

## Corridor Ceiling Combination Fire Smoke Damper UL 555S Leakage Class II

### Application and Design

Model CFSD-212 is a combination fire smoke damper that is UL classified 1 hour fire rated corridor ceiling penetrations. It can also be used as a 1½ hour fire rated combination fire smoke damper. This model's operational ratings of 2,000 fpm (10.2 m/s) and 6 in. wg (1.5 kPa) far exceed the air flows and pressure differences normally encountered when installed above grilles or diffusers in corridor ceilings - providing an extra measure of safety. CFSD-212 is rated for airflow and leakage in either direction and can be used in vertical or horizontal installations.

### Ratings

#### UL 555 Fire Resistance Rating

**Fire Rating:** 1½ hour and 1 hour (corridor)

**Dynamic Closure Rating:** Actual limits are size dependent

**Velocity:** Up to 2,000 fpm (10.2 m/s)

**Pressure:** Up to 6 in. wg (1.5 kPa)

#### UL 555S Leakage Rating

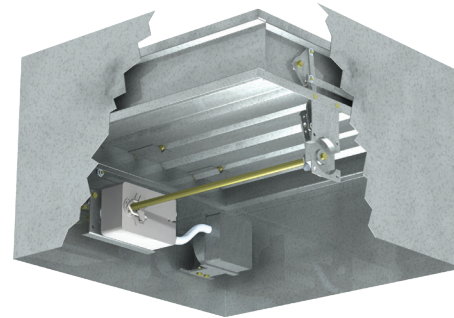
**Leakage Class:** II

**Operational Rating:** Limits are actuator dependent

**Velocity:** Up to 2,000 fpm (10.2 m/s)

**Pressure:** Up to 6 in. wg (1.5 kPa)

**Temperature:** Up to 350°F (177°C) - depending upon the actuator



W & H dimensions furnished approximately ¼ in. (6mm) undersize. Add sleeve thickness for overall sleeved damper dimension.

Model CFSD-212 meets the requirements for corridor ceiling dampers, smoke dampers, and combination fire smoke dampers established by:

**National Fire Protection Association**

NFPA Standards 80, 90A, 92, 101 & 105

**IBC International Building Codes**

**CSFM California State Fire Marshal**

Listing #: 3230-0981:105, 3225-0981: 106

Construction	Standard	Optional
Frame Material	Galvanized steel	-
Frame Material Thickness	16 ga. (1.5mm)	-
Frame Type	5 in. x 1in. (127mm x 25mm) hat channel	-
Blade Material	Galvanized steel	-
Blade Material Thickness	16 ga. (1.5mm)	-
Blade Type	3V	-
Linkage	Plated steel out of airstream, concealed in jamb	-
Axle Bearings	316SS	-
Axle Material	Plated steel	-
Blade Seals	Silicone	-
Jamb Seals	Stainless Steel	-
Closure Device	RRL	RRL/OCI, TOR, Fusible Link
Closure Temperature	165°F (74°C)	212°F (100°C), 250°F (121°C), 286°F (141°C)*, 350°F (177°C)

\* Only available with fusible link

W x H	Minimum Size			Maximum Size
	Configuration 1	Configuration 2	Configuration 3	Single Section
Inches	8 x 9	8 x 6	6 x 6	24 x 24
mm	203 x 229	203 x 152	152 x 152	610 x 610



See complete marking on product.

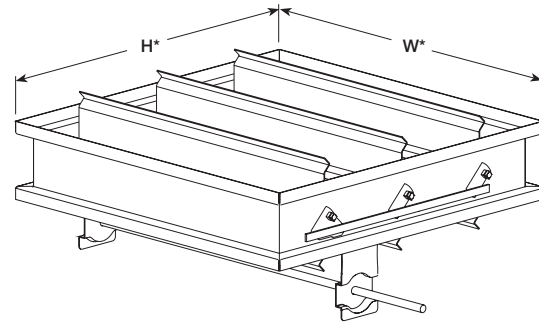
UL 555 and UL 555S  
Classification R13317

### Features:

- Frames are constructed with reinforced corners. Low profile head and sill are used on sizes less than 17 in. high (432mm).
- Blades are reinforced with 3 longitudinal structurally designed vee's

Installation instructions available at [www.greenheck.com](http://www.greenheck.com).

- Greenheck test switches (GTS-1, -2, -3, -4)
- Momentary test switch
- POC retaining angles
- RRL/OCI (Open closed indication switches)
- TOR (Temperature limited override)
- Sealed transitions and sleeves
- Transitions: R, C, O
- Clean wrap



## Pressure Drop Data

This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of .075 lb/ft<sup>3</sup>(1.201 kg/m<sup>3</sup>).

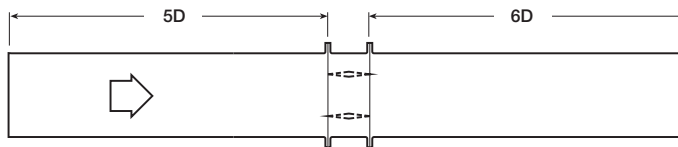
Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

### AMCA Test Figures

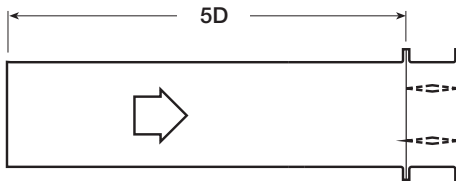
**Figure 5.3** Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

**Figure 5.2** Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.

**Figure 5.5** Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

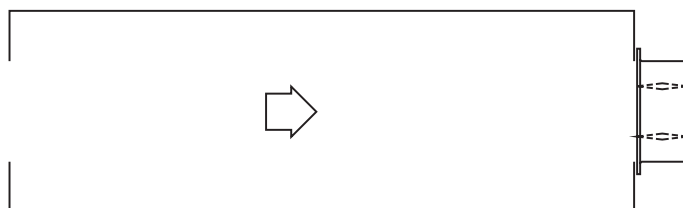


**Figure 5.3**

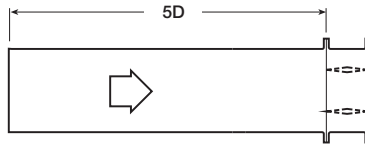


**Figure 5.2**

$$D = \sqrt{\frac{4(W)(H)}{3.14}}$$



**Figure 5.5**



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.04
1000	0.14
1500	0.31
2000	0.55
2500	0.86
3000	1.24
3500	1.69
4000	2.20

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.07
1500	0.16
2000	0.29
2500	0.45
3000	0.65
3500	0.89
4000	1.16

36 in. x 36 in. (914mm x 914mm)

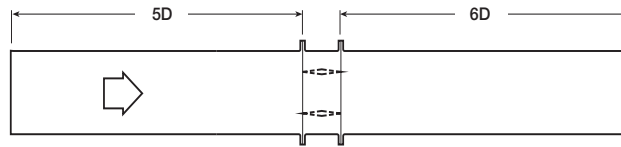
Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.09
2000	0.16
2500	0.25
3000	0.36
3500	0.49
4000	0.64

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.06
1500	0.13
2000	0.23
2500	0.36
3000	0.52
3500	0.70
4000	0.92

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.10
1500	0.23
2000	0.41
2500	0.63
3000	0.91
3500	1.24
4000	1.62



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.09
1500	0.20
2000	0.36
2500	0.56
3000	0.81
3500	1.10
4000	1.44

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.09
2000	0.16
2500	0.25
3000	0.35
3500	0.48
4000	0.63

36 in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.11
2500	0.17
3000	0.24
3500	0.33
4000	0.42

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.10
2000	0.17
2500	0.27
3000	0.39
3500	0.53
4000	0.70

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.07
1500	0.16
2000	0.29
2500	0.45
3000	0.64
3500	0.88
4000	1.14

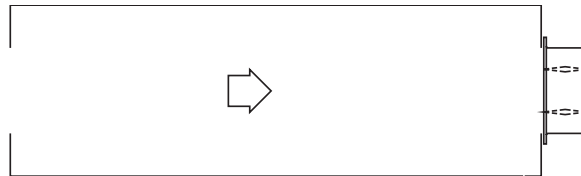


Figure 5.5

12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.06
1000	0.22
1500	0.50
2000	0.89
2500	1.39
3000	2.00
3500	2.72
4000	3.55

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.14
1500	0.31
2000	0.54
2500	0.85
3000	1.22
3500	1.66
4000	2.17

36 in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.26
2000	0.46
2500	0.73
3000	1.05
3500	1.42
4000	1.86

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.13
1500	0.30
2000	0.53
2500	0.83
3000	1.19
3500	1.62
4000	2.11

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.04
1000	0.17
1500	0.38
2000	0.67
2500	1.04
3000	1.50
3500	2.05
4000	2.67



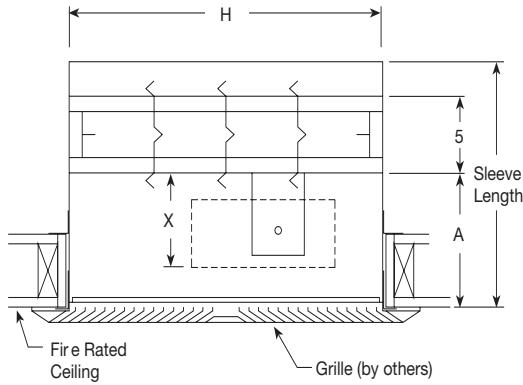
Greenheck Fan Corporation certifies that the model CFSD-212 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to air performance ratings only.

# Configurations

# Space Envelopes

CFSD-212 is available in 3 different configurations to accommodate a variety of installation and access requirements. Drawings below illustrate these different configurations and their associated dimensions.

## Configuration #1 – Fire Rated Ceiling Is The Finished Ceiling: Actuator (Internal Only) Accessible Through The Grille



### 'A' Dimension Standard

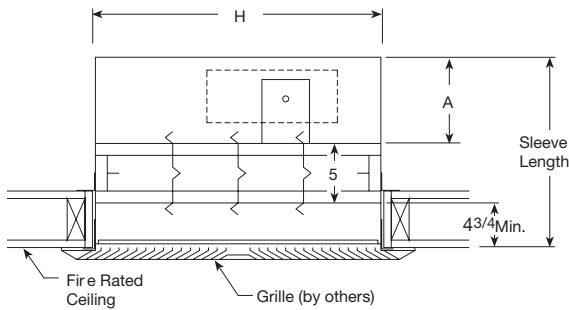
If damper height is less than 11 in. (279mm) then,

$$A = 12 + \text{grille depth} + \text{OBD}$$

If damper height is greater than or equal to 11 in. (279mm) then,

$$A = 7.188 + \text{grille depth} + \text{OBD}$$

## Configuration #2 – Fire Rated Ceiling Is The Finished Ceiling: Actuator (Internal or External) Accessible Above Finished Ceiling



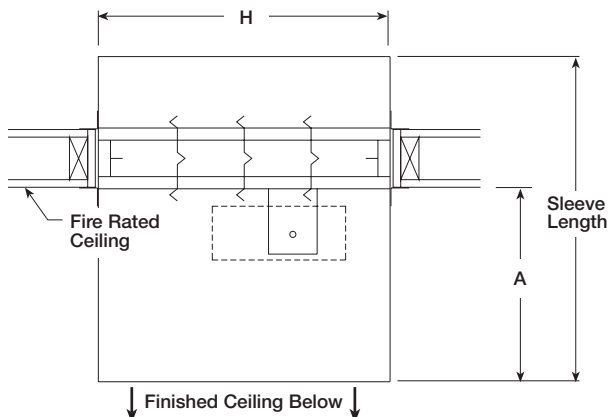
Configuration #2 is for applications where the fire rated ceiling is the finished ceiling but where access to the damper actuator is available from above the finished ceiling. Actuators can be mounted internally or externally. Clearance must be maintained between damper and grille for proper operation.

All dimensions shown are in inches (mm)

	'A' Dimension Standard	Minimum Sleeve Length
When OCI, RRL, or TOR, H dimension less than 11 in. (279mm)	12 (305)	21 (533)
All other dampers	7 3/16 (182)	16 (406)

Minimum Size Internal: 12 in. x 12 in. (305mm x 305mm)

## Configuration #3 – Fire Rated Ceiling Is Above The Finished Ceiling: Actuator (Internal or External) Accessible Through Finished Ceiling



Configuration #3 is for applications where the fire rated ceiling is above the finished ceiling. Actuators can be mounted internally or externally.

All dimensions shown are in inches (mm)

	'A' Dimension Standard	Minimum Sleeve Length
When OCI, RRL, or TOR, H dimension less than 11 in. (279mm)	12 (305)	21 (533)
All other dampers	7 3/16 (182)	16 (406)

Minimum Size Internal: 12 in. x 12 in. (305mm x 305mm)

Corridor ceiling fire smoke dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall meet the requirements of NFPA 80, 90A, 92, 101, and 105 and further shall be tested, rated and labeled in accordance with the latest edition of UL Standards 555 and 555S. Dampers shall have a UL555 fire rating of 1½ hours and be of low leakage design qualified to UL 555S Leakage Class I or dampers shall be classified by UL under the “Corridor Damper” listing with a UL 555 fire rating of 1 hour.

Each damper/actuator combination shall have a UL 555S elevated temperature rating of 250° F (121°C) minimum and shall be operational and dynamic rated to operate at maximum design air flow at its installed location. Each damper shall be supplied with an appropriate actuator installed by the damper manufacturer at the time of damper fabrication. Damper actuator shall be (specifier select one of the following) electric type for 120, 24, or 230 volt operation.

Damper blades shall be 16 ga. (1.5mm) galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle point or utilize blade stops larger than ½ in. (13mm) are unacceptable).

Damper frame shall be galvanized steel formed into a structural hat channel shape with reinforced corners. Bearings shall be 316SS sleeve type rotating in extruded holes in the damper frame. Blade edge seals shall be silicone rubber designed to inflate and provide a tighter seal against leakage as pressure on either side of the damper increases. Jamb seals shall be stainless steel compression type.

Each damper shall be equipped with a heat responsive device, RRL, and have a temperature rating of (choose one of the following) 165°F (74°C), 212°F (100°C), 250°F (121°C), or 350°F (177°C).

All UL 555 and 555S dynamic closure ratings, operational ratings, and leakage ratings shall be qualified for airflow and pressure in either direction through the damper. UL ratings shall allow for mounting damper vertically (with blades running horizontal) or horizontally.

Basis of design is Greenheck model CFSD-212.

