

## Application

Model HCD-524 is a heavy duty industrial control damper with a flanged frame for high temperature applications. It is designed to control airflow and provide shut off in HVAC or industrial process control systems. A variety of optional features makes model HCD-524 extremely versatile, allowing its capabilities to be tailored to the application.

## Damper Ratings

### Velocity

Up to 5000 fpm (25.4 m/s)

### Pressure

Up to 45 in. wg (11.2 kPa) - pressure differential

### Temperature

-40°F to 1000°F (-40°C to 538°C). Consult factory for temperatures.

## Construction

|                                 | Standard                        | Optional                               |
|---------------------------------|---------------------------------|--|
| <b>Frame Depth</b>              | 12 in. (305 mm)                 |  |
| <b>Frame Material</b>           | Painted                         | 304SS<br>316SS                         |
| <b>Frame Material Thickness</b> | 10 ga. (3.5 mm)                 | 7 ga. (4.8 mm)                         |
| <b>Frame Type</b>               | Flanged channel                 |  |
| <b>Flange Width (D)</b>         | 2 in. (51 mm)                   | 2½ in. (64 mm)<br>3 in. (76 mm)        |
| <b>Blade Material</b>           | Painted                         | 304SS<br>316SS                         |
| <b>Blade Thickness</b>          | 10 ga. (3.5mm)                  | .188 in. (4.8 mm)                      |
| <b>Blade Type</b>               | High Temp Airfoil               |  |
| <b>Blade Action</b>             | Opposed                         |  |
| <b>Blade Seals</b>              | None                            | Fiberglass<br>Ceramic                  |
| <b>Linkage</b>                  | Plated steel                    | 304SS<br>316SS                         |
| <b>Jamb Seals</b>               | None                            | Fiberglass<br>Ceramic                  |
| <b>Axle Diameter</b>            | 1 in. (25 mm)                   |  |
| <b>Axle Bearings</b>            | Outboard Ball                   | Outboard Carbon                        |
| <b>Axle Material</b>            | Plated steel                    | 303SS<br>316SS                         |
| <b>Axle Seals</b>               | Double Gland                    | Outboard Double Gland*                 |
| <b>Paint Finishes</b>           | Hi Temperature<br>Flame Control | None                                   |
| <b>Mounting Holes</b>           | None                            | Standard<br>Standard with corner holes |



The W dimension is ALWAYS parallel with the damper blade length. Damper linkage and axles may extend beyond the damper flange based on the configuration of selectable options. Consult factory for dimensions.

## Size Limitations

| W x H         | Minimum Size | Maximum Size   |
|---------------|--------------|----------------|
|               |              | Single Section |
| <b>Inches</b> | 6½ x 8       | 60 x 60        |
| <b>mm</b>     | 165 x 203    | 1524 x 1524    |

## Options Available:

- Wide range of actuators available
- Vertical Blade Orientation
- Bolt holes in flanges

\*Outboard Double Gland assembly allows for 3 in. of insulation.

# Performance Data

## Pressure Limitations

The chart at the right shows conservative pressure limitations based on a maximum blade deflection of w/360.

## Temperature Limitations

**Blade seals:** Fiberglass -60° to 800°F (-51° to 427°C)

Ceramic -60° to 1000°F (-51° to 538°C)

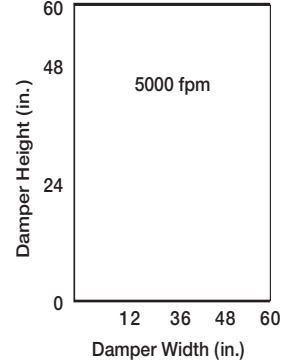
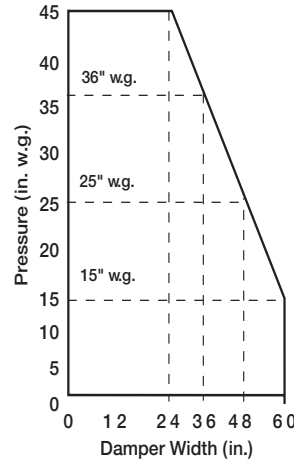
**Jamb seals:** Fiberglass -60° to 800°F (-51° to 427°C)

Ceramic -60° to 1000°F (-51° to 538°C)

For higher temperatures, consult factory.

## Velocity Limitations

The chart at far right shows velocity limitations based on damper size.



## Pressure Drop Data

This pressure drop data 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> (1.2 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 the 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 the 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 the high entrance and exit losses due to the sudden changes of area in the system.

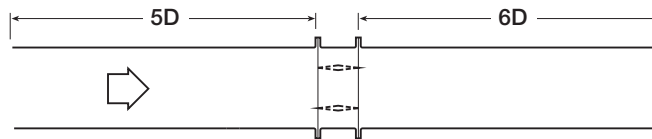


Fig. 5.3

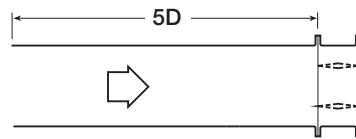


Fig. 5.2

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

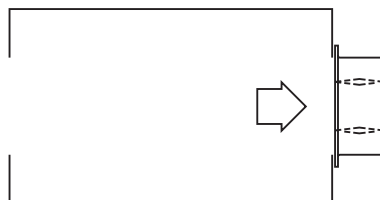
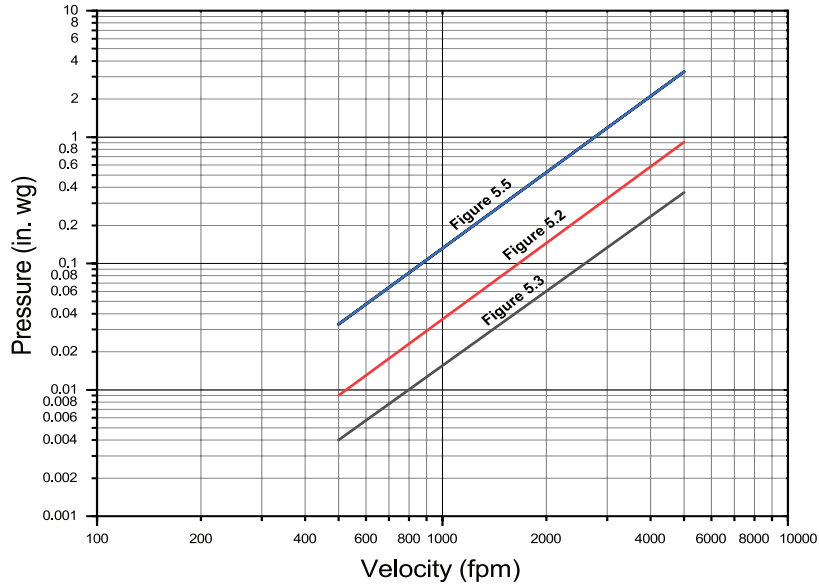


Fig. 5.5

**Estimated Pressure Drop**

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

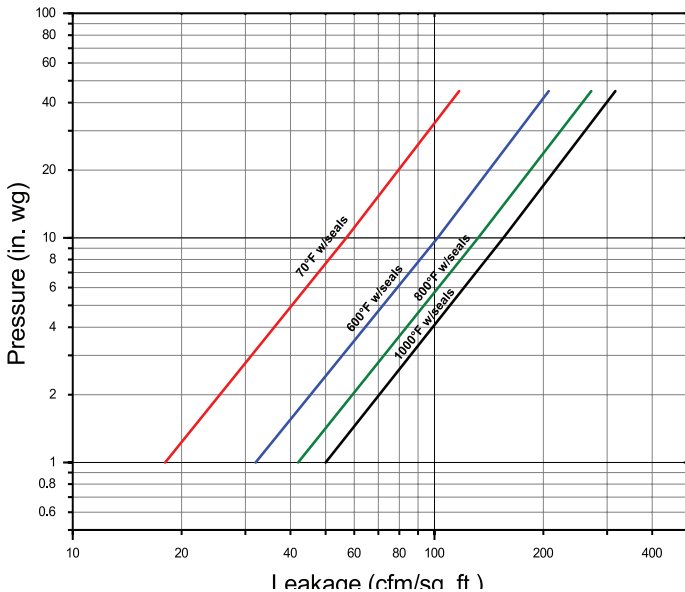


**Leakage Data**

Damper leakage (with blades fully closed) varies based on the type of low leakage seals applied. Model HCD-524 is available with no jamb and blade seals (standard) or with optional fiberglass or ceramic jamb and blade seals. Leakage testing was conducted in accordance with AMCA Standard 500-D and is expressed as CFM per sq. ft. of damper face area. All data has been corrected to represent standard air at a density of .075 lb/ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

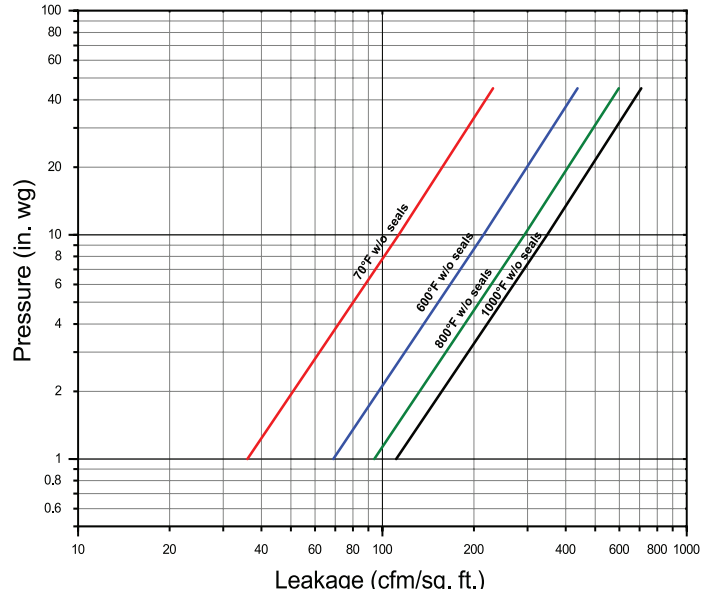
**Estimated Leakage (with seals)**

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



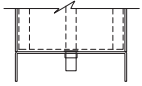
**Estimated Leakage (without seals)**

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

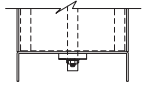


# Bearings

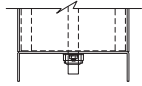
Sleeve Bearing



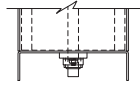
O-Ring Shaft Seal



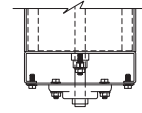
External Mounted Bronze Sleeve Bearing



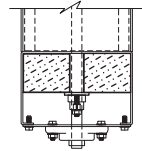
O-Ring Shaft Seal with Outboard Mounted Bearing (Optional)



Double Gland Stuffing Box with Outboard Mounted Bearing (Optional)



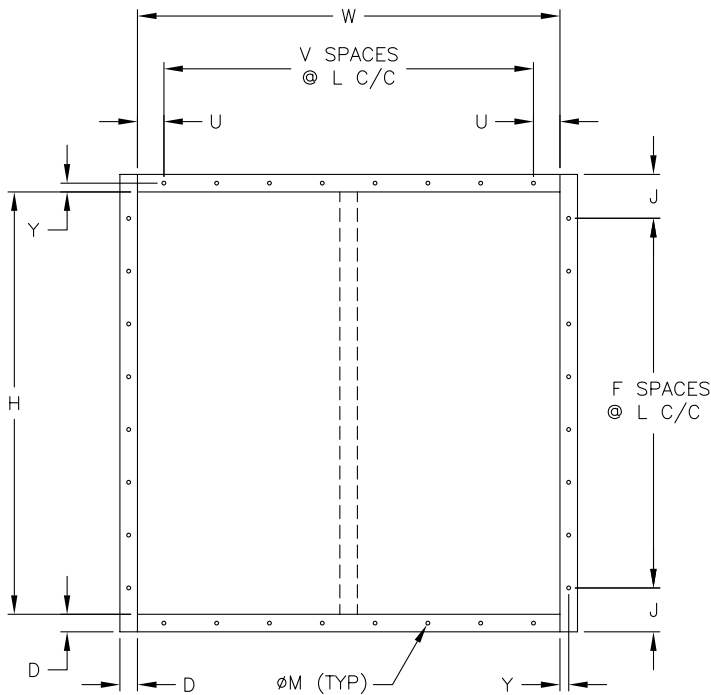
Insulated Outboard Double Gland Stuffing Box with Outboard Mounted Bearing (Optional)\*



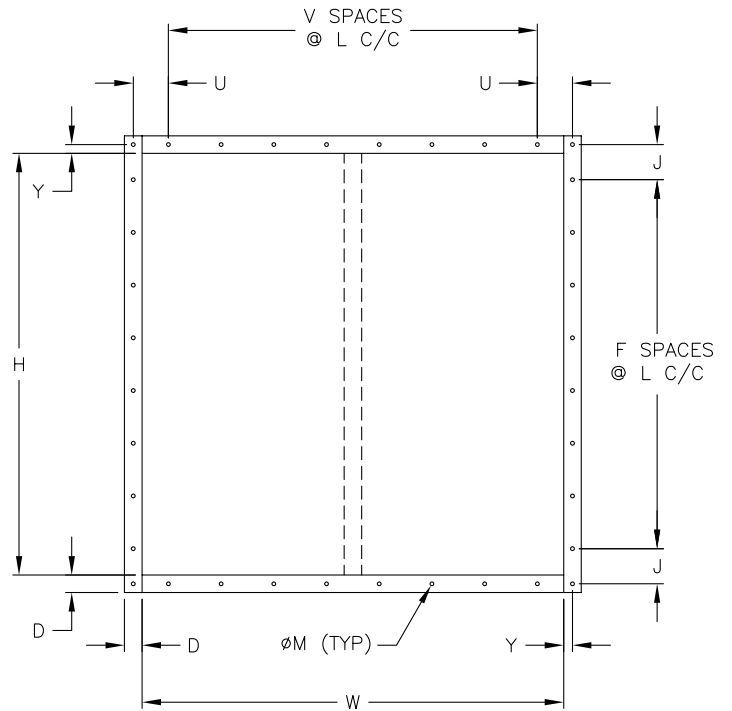
\*Allows for 3 in. of insulation.

# Mounting Holes

Bolt holes are available as an option. The standard pattern is  $\frac{7}{16}$  in. (11mm) diameter holes (M dimension) spaced 6 in. (152mm) on center (L dimension). Custom bolt hole patterns are available. Contact factory for the limitations.



Standard Mounting Hole Pattern  
Typical for single or double wide panel



Standard Mounting Hole Pattern with Corner Holes  
Typical for single or double wide panel



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