

### Application and Design

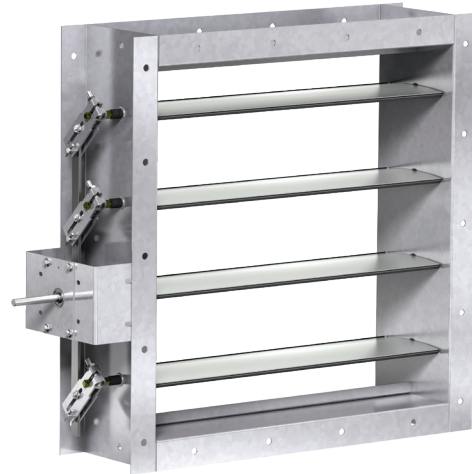
Model HCD-140 is a heavy duty industrial control damper with a flanged frame. It is designed to control airflow and provide shut off in HVAC or industrial process control systems. A variety of optional features makes model HCD-140 extremely versatile, allowing its capabilities to be tailored to the application. This model is available with parallel or opposed blade action.

### Ratings (see page 2 and 3 for specific limitations)

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

**Velocity:** Up to 6000 fpm (30.5 m/s)

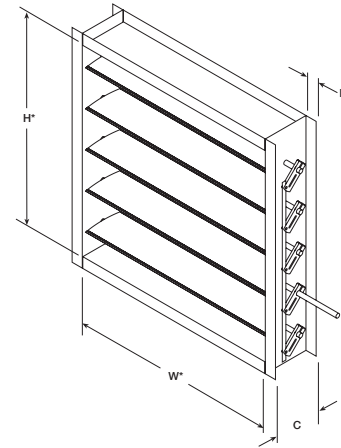
**Temperature:** -40 to 250°F (-40 to 121°C)



Optional actuator mounting bracket shown

### Standard Construction

	Standard	Optional
<b>Frame Depth (C)</b>	8 in. (203mm)	10 in. (254mm)
<b>Frame Material</b>	Galvanized Steel	304SS, 316SS
<b>Frame Type</b>	Flanged Channel	
<b>Frame Thickness</b>	14 ga. (2mm)	10 ga. (3.5mm) 12 ga. (2.7mm)
<b>Flange Width (D)</b>	2 in. (51mm)	1½ in. (38mm) 2½ in. (64mm) 3 in. (76mm)
<b>Blade Action</b>	Parallel	Opposed
<b>Blade Material</b>	Aluminum	-
<b>Blade Seals</b>	Silicone	EPDM
<b>Blade Thickness</b>	.062 in. (1.6mm)	-
<b>Blade Type</b>	Extruded Airfoil	
<b>Linkage</b>	Plated Steel	304SS, 316SS
<b>Jamb Seals</b>	None	301SS, 316SS
<b>Axle Diameter</b>	½ in. (12.7mm)	-
<b>Axle Bearing</b>	Stainless Steel Sleeve	-
<b>Axle Material</b>	Plated Steel	304SS, 316SS
<b>Axle Seals</b>	None	-
<b>Paint Finishes</b>	None	Hi Pro Polyester, Hi Temperature Silver, Industrial Epoxy
<b>Mounting Holes</b>	None	Standard; Standard with corner holes



\* Actual Inside Dimension. 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.

### Features:

- Wide range of actuators available

### Options:

- Round transitions
- Vertical Blade Orientation

### Size Limitations

W x H	Minimum Size	Maximum Size	
		Single Section	Multi - Section
<b>Inches</b>	6½ x 4	60 x 96	120 x 96
<b>mm</b>	165 x 102	1524 x 2438	3048 x 2438

## Pressure Limitations

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

## Temperature Limitations

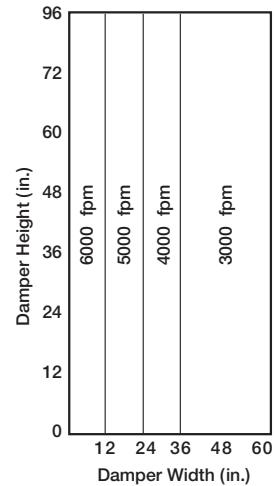
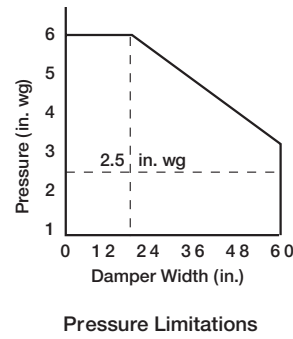
**Blade seals:** Silicone -40° to 400°F (-40° to 204°C)  
EPDM -20° to 250°F (-29° to 121°C)

**Jamb seals:** Flexible stainless steel -40° to 400°F  
(-40° to 204°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.

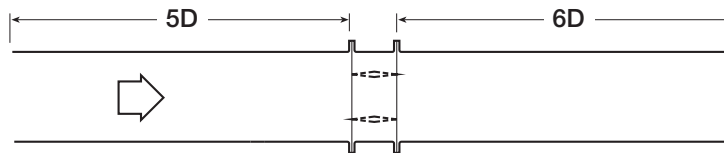


Fig. 5.3

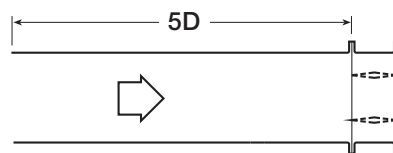


Fig. 5.2

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

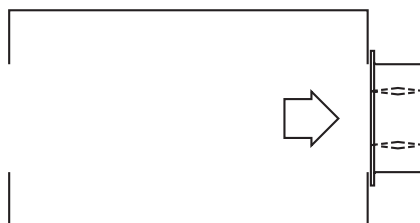
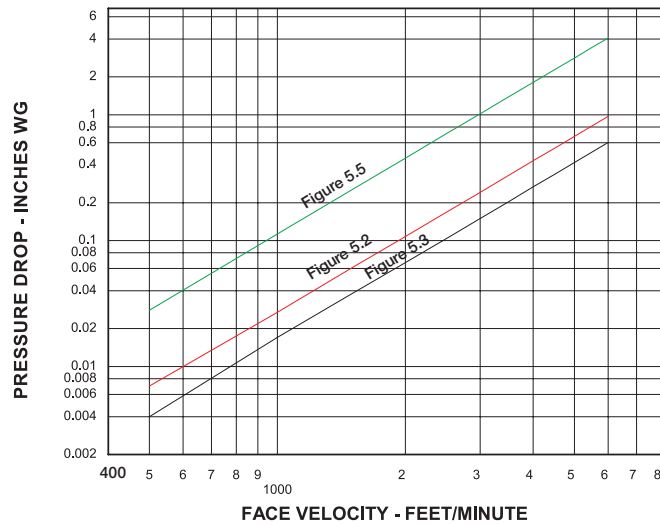


Fig. 5.5

## Pressure Drop

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

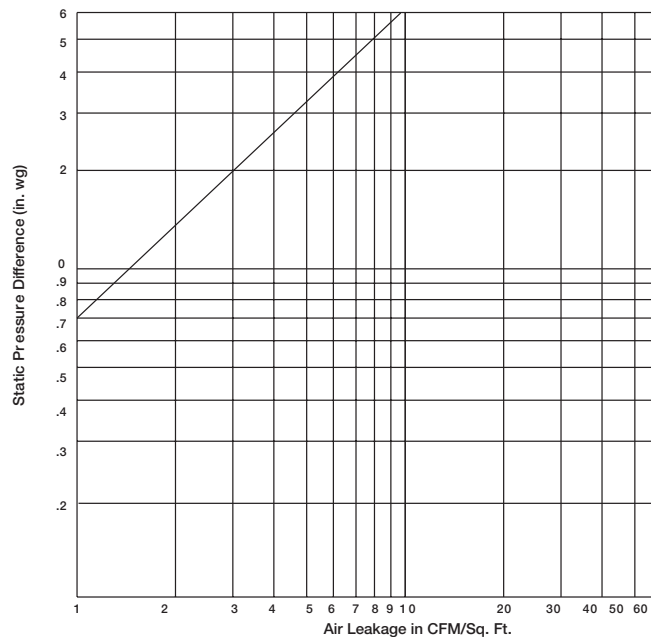


## Leakage Data

Damper leakage (with blades fully closed) varies based on the type of low leakage seals applied. Model HCD-140 is available with no jamb seals (standard) or with stainless steel jamb seals and EPDM, or silicone rubber 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>).

## Leakage

36 x 36 in. (914mm x 914mm) Damper  
(based on 5 in. lb/ft<sup>2</sup> of torque)

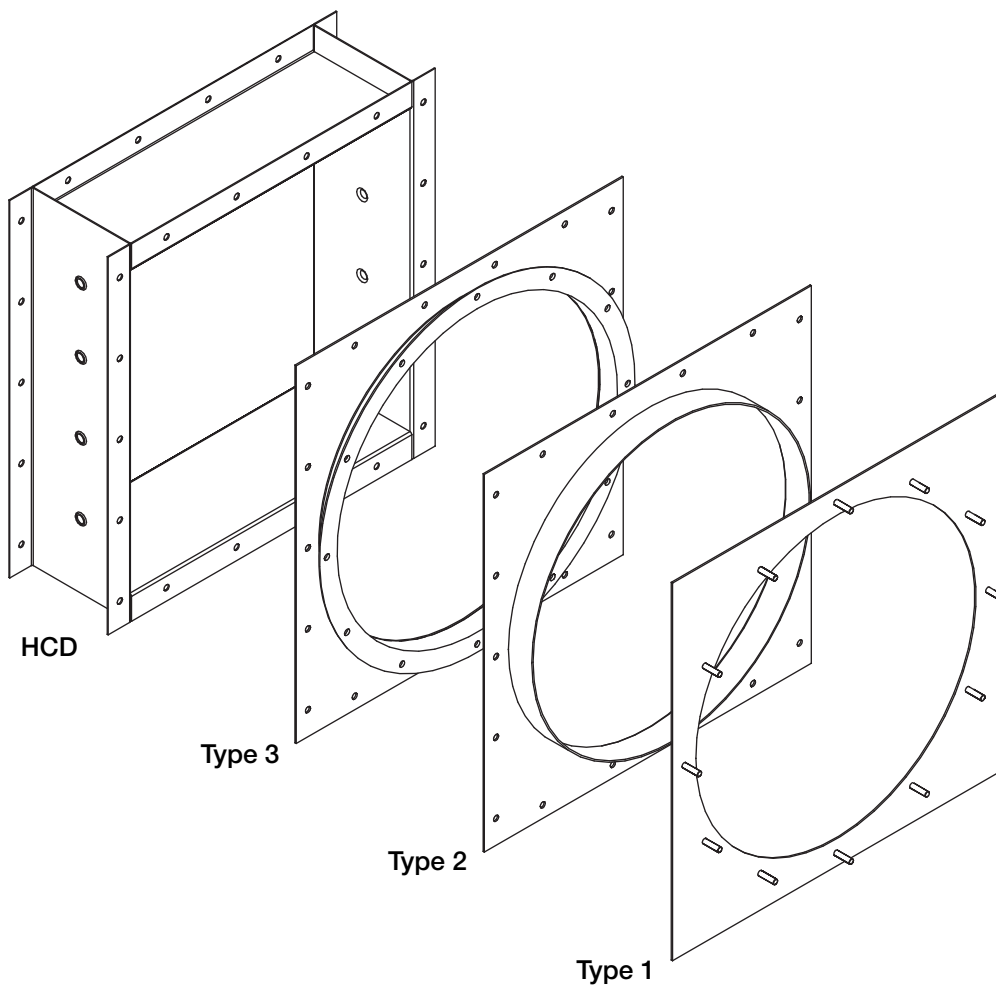


## Transition Type

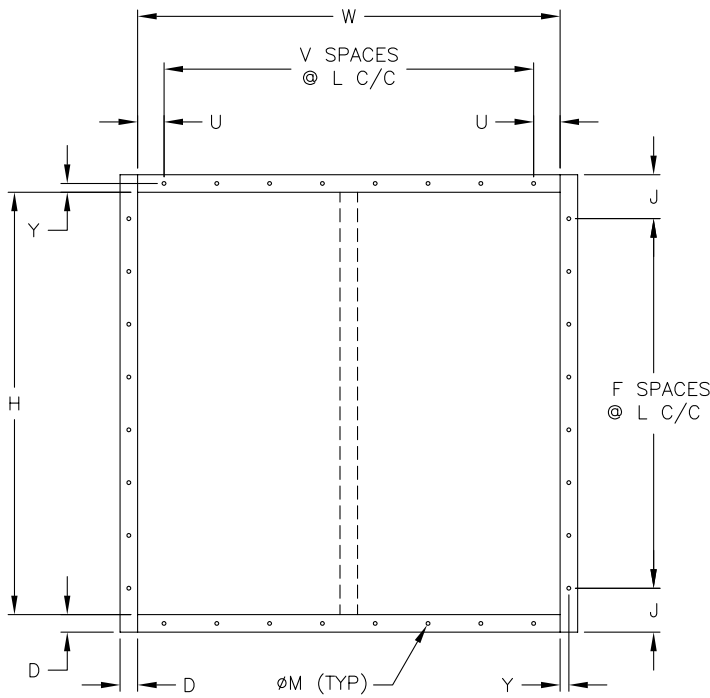
Type 1: Transition plate with hole in the center at selected diameter. Weld studs/thread studs are welded to the plate in a circular mounting hole pattern. Transition plate is stitch welded to the damper flange.

Type 2: Transition plate with hole in the center at selected diameter. A rolled collar measuring 2 in. (51mm) long is welded to the transition plate opening. Collar is undersized 1/8 inch (3mm) in diameter to slide into existing duct work. Transition plate is bolted to the damper flange.

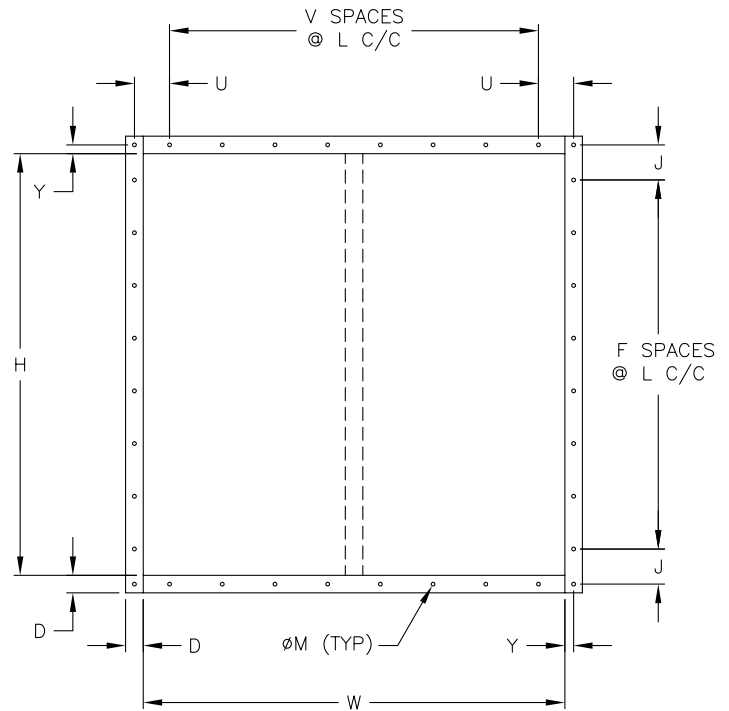
Type 3: Transition plate with hole in the center at selected diameter. A rolled angle ring at selected diameter is welded to the transition plate. Transition plate is bolted to the damper flange.



Bolt holes are available as an option. The standard pattern is 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

## Specifications

Industrial grade control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules.

Dampers shall consist of: a 14 ga. (2mm) galvanized steel channel frame with 8 in. (203mm) minimum depth and 2 in. (51mm) flanges; airfoil type blades of heavy gauge extruded aluminum; 1/2 in. (12.7mm) dia. plated steel axles turning in stainless steel sleeve bearings; and external (out of the airstream) blade-to-blade linkage.

Damper manufacturer's printed application and performance data including pressure, velocity, and

temperature limitations shall be submitted for approval showing damper suitable for pressures to 6 in. wg (1.5 kPa), velocities to 6,000 fpm (30.5 m/s) and temperatures to 250°F (121°C).

Specifier may add the following:

Damper shall be equipped with blade and jamb seals for low leakage performance. Blade seals shall be Silicone rubber for 250°F (121°C) maximum temperature. Testing and ratings shall be per AMCA Standard 500-D.

Basis of design is model HCD-140.

