

Industrial Control Damper

Application and Design

Model HCD-135 is a heavy duty flanged frame style industrial control damper with insulated airfoil blades. 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-135 extremely versatile, allowing its capabilities to be tailored to the application. Available with parallel or opposed blade action.

Ratings (See pages 2 and 3 for specific limitations)

Pressure: 4 - 8.5 in. wg (1 - 2.1 kPa)
differential pressure

Velocity: 2000 - 4000 fpm (10.2 - 20.3 m/s)

Temperature: 250°F (121°) maximum. Temperatures over 250°F (121°C) require special blade and clearance.

Standard Construction

Frame: 8 in. x 2 in. 14 ga. (203mm x 51mm x 2mm) galvanized steel channel.

Blades: Airfoil shaped, galv. steel double skin construction (14 ga. (2mm) equivalent thickness). Blades are insulated with fiberglass.

Axles: Plated steel 1/2 in. (13mm) dia.

Seals: Extruded silicone rubber blade seals. Flexible stainless steel compression type jamb seals.

Linkage: External heavy duty type with galvanized steel clevis arms and tie bars and plated steel pivot pins.

Bearings: Stainless steel sleeve.

Size Limitations:

Maximum Size: 60 in. W x 96 in. H
(1524mm W x 2438mm H)

Minimum Size: Single blade 10 in. W x 5 in. H
(254mm W x 127mm H)
Multiple blades 10 in. W x 9 in. H
(254mm W x 229mm H)

Frame Depth (C): Standard size: 8 in. (203mm)
Maximum size: 10 in. (254mm)

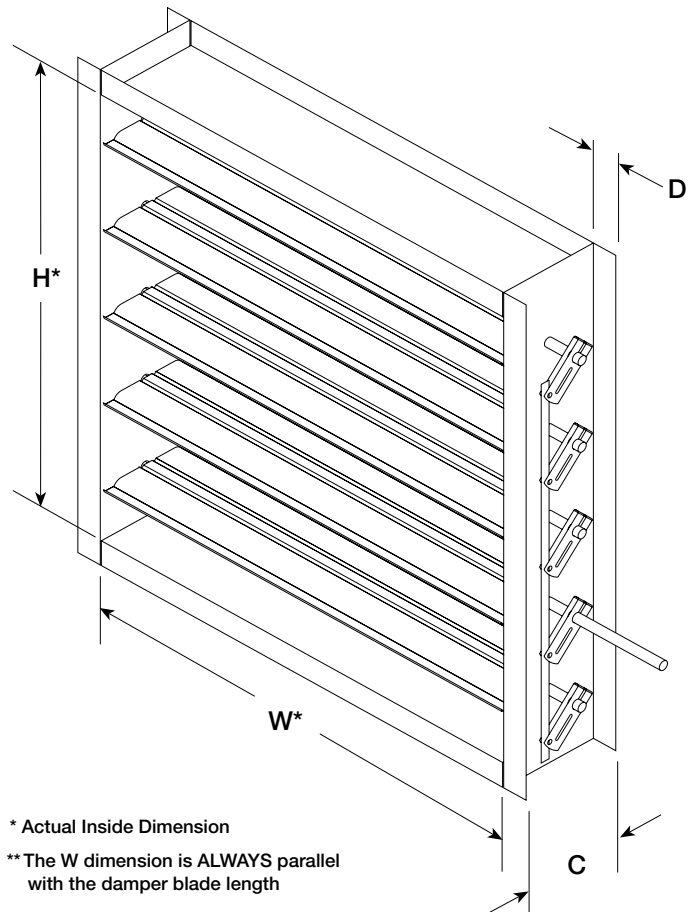
Flange Width (D): Standard size: 2 in. (51mm)
1 1/2 in. (38mm) or 2 1/2 in. (64mm)
optional

Optional Features:

- 10 or 12 ga. (3.5 or 2.7mm) galvanized frame
- 304 stainless steel frame and blade
- EPDM blade seal
- 1/2 in. (13mm) stainless steel axles
- Stainless steel linkage

Paint Options:

- Hi Pro Polyester
- Industrial Epoxy
- Epoxy
- Hi Temperature Silver
- Baked Enamel



PERFORMANCE DATA

HCD-135

Pressure Limitations

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

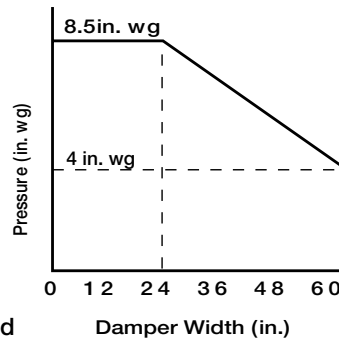
Temperature Limitations

- Blade seals: Silicone Rubber -40° to + 400°F (-40° to 204°C)
EPDM -20° to +250°F (-29° to 204°C)
- Jamb seals: Flexible stainless steel -40° to + 400°F (-40° to 204°C)

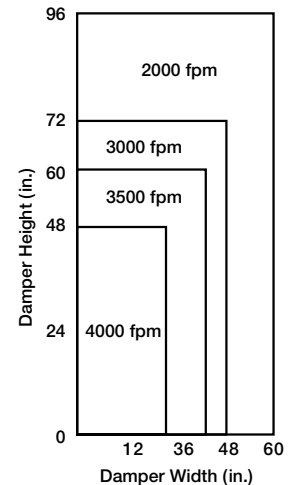
For higher temperatures, consult Greenheck

Velocity Limitations

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



Pressure Limitations



Velocity Limitations

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/ ft² (1.2 kg/m³).

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 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.

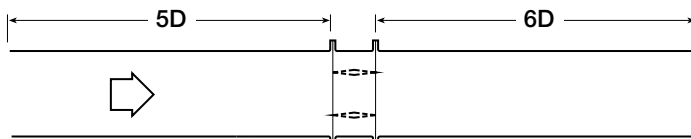


Fig. 5.3

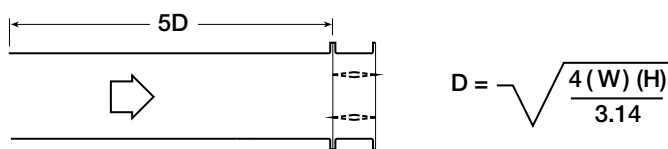


Fig. 5.2

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

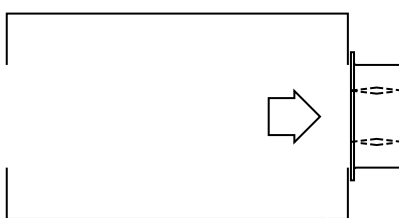
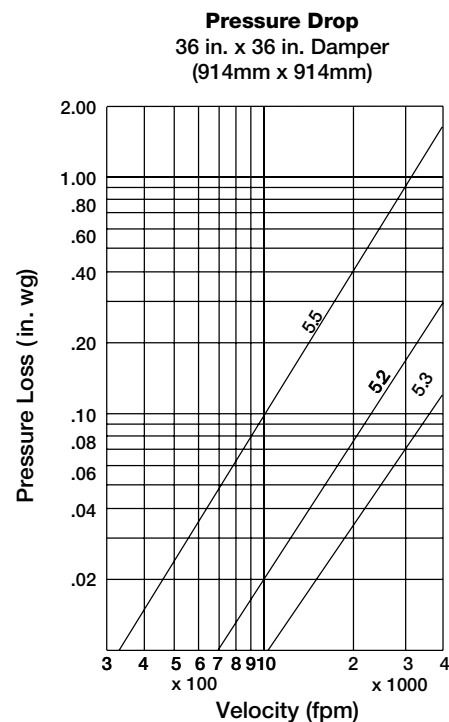
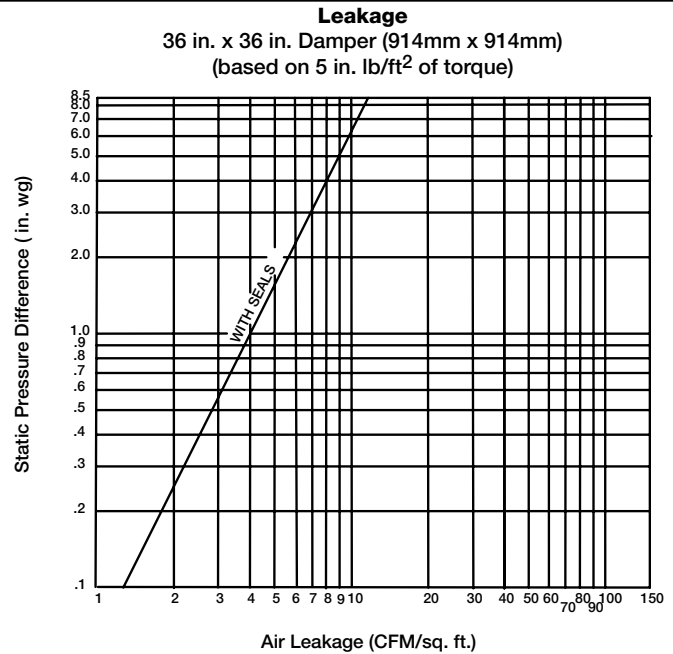
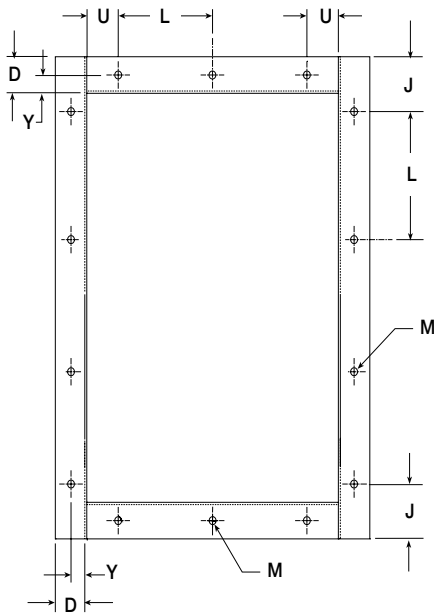


Fig. 5.5



Leakage Data

Model HCD-135 is equipped with silicone or EPDM (rubber) blade seals and flexible stainless steel jamb seals and is an extremely low leakage damper. 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./ft³ (1.2 kg/m³).



Bolt Holes are available as an option. Greenheck's standard pattern is 7/16 in. (11mm) diameter holes (M dimension) spaced 6 in. (152mm) on center (L dimension). Also, available is custom bolt hole pattern within the limitations of the chart below.

Bolt Hole Limitations

Dim.	Standard	(Min./Max.)	Description
J		(D/2 min.)	First/Last Space in Jamb
F		(1 min.)	No. of Holes in Jamb
L	6 in. (152mm)	2 in. /12 in. (51mm/305mm)	Hole Spacing
M	7/16 in. (11mm)	1/4 in. / 11/16 in. (6mm/17mm)	Mounting Hole Diameter
U		3/4 in. min. (19mm)	First/Last Space in Head/Sill
V		1 min. (25mm)	No. of Holes in Head/Sill
Y	D/2 in. (D/51mm)	3/4 in./D-3/4 in. (19mm/D -19mm)	Centerline of bolt hole from inside edge of frame

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; double skin airfoil type blades fabricated from two layers of 20 ga. (1mm) galvanized steel with insulation sandwiched between blade skins, 1/2 in. (13mm) 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 8.5 in. wg (2.1 kPa), velocities to 4000 fpm (20.3 m/s) and temperatures to 250°F (121°C). Dampers shall be equipped with blade and jamb seals for low leakage performance. Blade seals shall be silicone rubber. Jamb seals shall be flexible stainless steel. Testing and ratings to be in accordance with AMCA Standard 500-D.

Basis of design is Greenheck model HCD-135.

