CD450V

High-performance Control Damper
Extruded Aluminum | Vertical Airfoil Blade
Class 1A Leakage

RUSKIN
AUTHORITY IN AIR CONTROL

APPLICATION

The High-Performing Ruskin Model CD450V is designed to control and regulate air movement in medium to high velocity and pressure HVAC Systems. The CD450V has extruded aluminum vertical airfoil shape blades which offers low pressure drop when open and meets AMCA Class 1A Leakage when closed. Manual, electric or pneumatic actuators are applied to operate the damper open and closed. CD450V meets the leakage requirements of the of the International Energy Conservation Code (IECC).

STANDARD CONSTRUCTION

Frame	4" x 1" x 6063T6 extruded aluminum channel (102 x 25) (5" x 1" x 6063T6 extruded aluminum channel (127 x 25) optional)
Blades	6" (152) wide, 6063T6 extruded aluminum, airfoil shape with Celcon POM 90 end caps. Opposed blade action is standard, parallel blade action optional
Seals	Santoprene blade edge seals and finger-type Santoprene jamb seals
Bearings	Lexan with acetal copolymer bearing base
Linkage	Plated steel concealed in frame
Axles	7/16" (11) plated steel hex
Operator Shaft	7/16" (11) hex telescoping extended shaft, plated steel for single section (extends up to 8" (203) past damper frame) 1/2" (13) dia. jackshaft on multi-section assemblies under 12 1/2 ft^2 (1.16m^2) 1" (25) dia. jackshaft on multi-section assemblies over 12 1/2 ft^2 (1.16m^2)

PERFORMANCE RATINGS

Leakage	Class 1A (see page 2)
Velocity	0 to 6000 FPM (30.5 MPS) (see page 2)
Pressure	0 to 13 in. WG (3.25 kPa) (see page 2)
Temperature	-45°F to 185°F (-43°C - 85°C)
Torque	Opposed blades: 5 in-lb/ft^2 and Parallel blades: 7 in-lbs/ft^2
Airflow	Both directions

OPTIONS AND ACCESSORIES

Frame	Front, Rear or double flange with or without bolt holes
Operator Shaft	Stainless steel (1/2" (13) dia. & 1" (25) dia)
Linkage, Axles & Bearings	Stainless steel
Blade & Jamb Seals	Silicone
Face/Bypass	FBV, FBH or FBR
Actuators	Electric or Pneumatic, factory provided and installed
Switches	SP100 switch package for damper open/closed position
Finishes	Anodized
Actuator Enclosure	RUS-N4X

U.S. GREEN BUILDING COUNCIL MEMBER

ISO9001 CERTIFIED

5 YEAR LIMITED WARRANTY

FEATURES

- Airfoil blades for low pressure drop and less noise
- Mechanically fastened blade-edge seals and jamb seals for longevity
- Positive lock axles and noncorrosive bearings for durability
- Shake-proof linkage for low maintenance

FEATURES

Minimum	PB:	5" W x 6" H (127 x 152)
	OB:	9" W x 6" H (229 x 152)
Maximum	Section:	48" W x 48" H (1219 x 1219)
	Assembly:	Unlimited
Weight	5 lbs. /ft^2 (3.2 kg)	

NOTE:
Dimensions are in inches, () indicate metric units, unless otherwise indicated, Units furnished deduct 1/4" (6) than given dimensions unless specified actual size on order.

PERFORMANCE DATA

Maximum System Velocity and Pressure Data		
Damper Width	**Velocity**	**Pressure**
in. (mm)	**FPM (MPS)**	**in. WG (Pa)**
48 (1219)	4000 (20.3)	6.2 (1.5)
36 (914)	4000 (20.3)	8.5 (2.1)
24 (610)	5000 (25.4)	10.8 (2.7)
12 (305)	6000 (30.5)	13.0 (3.25)

Class	Leakage, $ft^3/min/ft^2$ ($L/s/m^2$)			
	Required Rating		Extended Ranges (Opt.)	
	1″ (0.25 kPa)	4″ (1.0 kPa)	8″ (2.0 kPa)	12″ (3.0 kPa)
1A	3 (15.2)	N/A	N/A	N/A
1	4 (20.3)	8 (40.6)	11 (55.9)	14 (71.1)
2	10 (50.8)	20 (102)	28 (142)	35 (178)
3	40 (203)	80 (406)	112 (569)	140 (711)

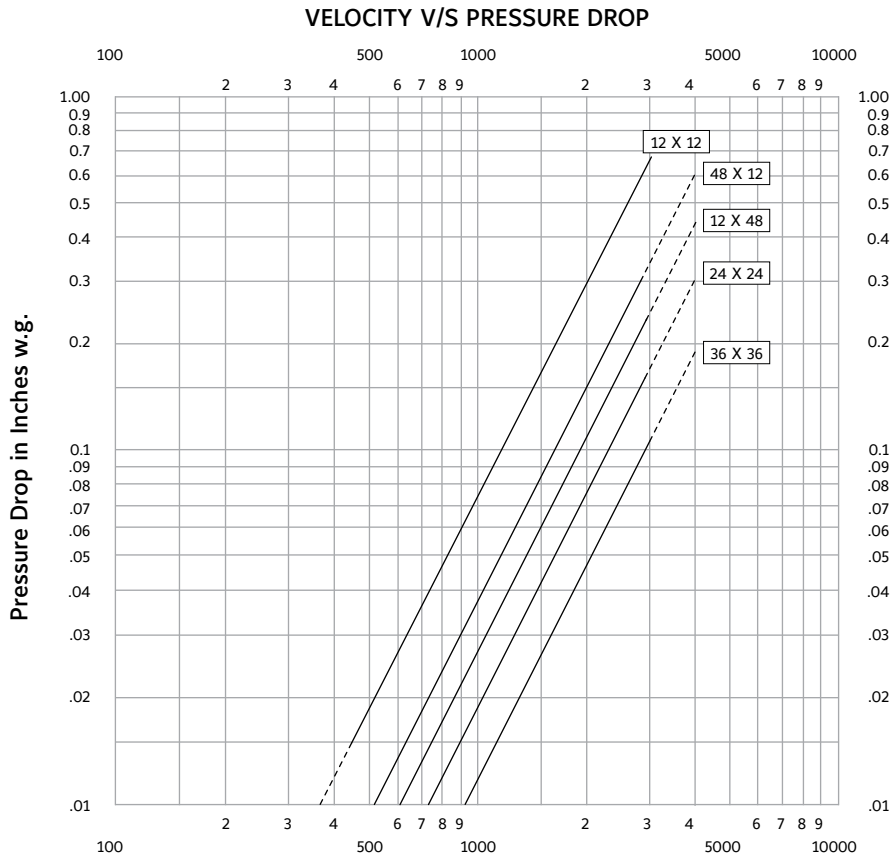
The CD450V may be used in systems with total pressures exceeding 3.5″ by reducing damper section width as indicated. Example: Maximum design total pressure of 8.5″ w.g. would require CD450V damper with maximum section width of 36″ (914).

Pressure limitations shown above allow maximum blade deflection of L/180 of span on 48″ (1219) damper widths. Deflections in other damper widths (less than 48″ (1219)) at higher pressures shown will result in blade deflection substantially less than L/180 of span.

Damper Width (Inches)	1 IN. W.G.	4 IN. W.G.	8 IN. W.G.
12″ (305)	IA	1	2
24″ (610)	IA	1	2
36″ (914)	IA	1	N/A
48″ (1219)	IA	1	N/A

Torque applied holding damper closed, 5 in. lbs./sq.ft. on opposed blade dampers and 7 in. lbs./sq.ft. on parallel blade dampers. Air leakage is based on operation between 50°F to 104°F. All data corrected to represent standard air density 0.075 lbs/ft^3.

PERFORMANCE DATA



CD450V sizes 12 x 12, 24 x 24, 48 x 12, 12 x 48, 36 x 36 (305 x 305, 610 x 610, 1219 x 305, 305 x 1219, 914 x 914)
All data corrected to represent standard air at a density of 0.075 lbs/ft^3.

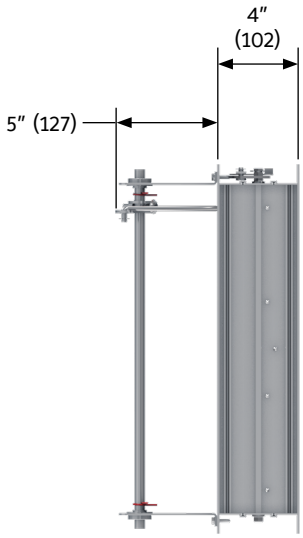
SOUND RATINGS

Damper size	Damper Full Open		Damper 75% Open		Damper 50% Open		Damper 25% Open	
	CFM	NC	CFM	NC	CFM	NC	CFM	NC
12 x 12 (305 x 305)	2000 3000 4000	17 28 35	1500 2250 3000	11 22 29	1000 1500 2000	11 19 24	500 750 1000	* * *
18 x 18 (457 x 457)	2250 4500 6750	17 33 43	1688 3375 5063	10 26 37	1125 2250 3375	21 32 40	563 1125 1688	* * 15
24 x 24 (610 x 610)	4000 8000 12000	11 32 43	3000 6000 9000	10 30 42	2000 4000 6000	26 38 46	1000 2000 3000	* 21 31

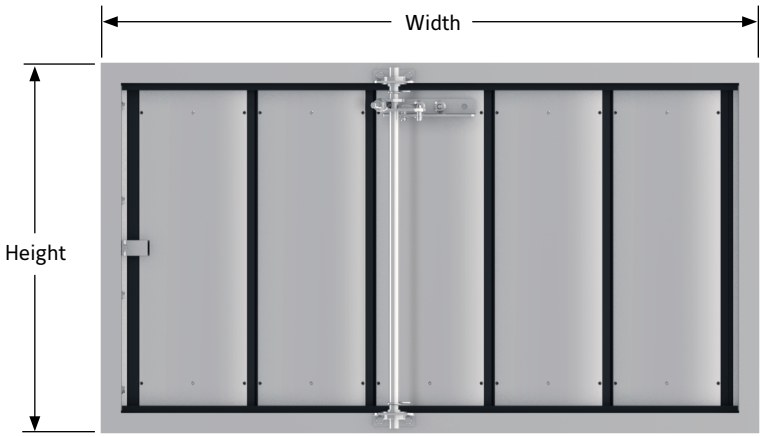
NC = Noise criteria in Decibels is based on 10db room effect and 10db of room attenuation.
* = Less than 10 NC
See ASHRAE Handbook (1977 Fundamentals, Chapter 7) for explanation of NC Ratings.

DIMENSIONAL INFORMATION

W & H dimensions are furnished with 1/4" (6) deduct standard, unless ordered actual size.



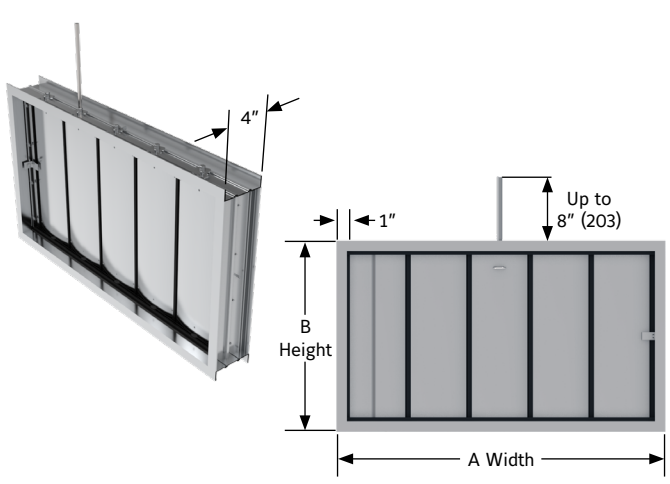
Damper Side View



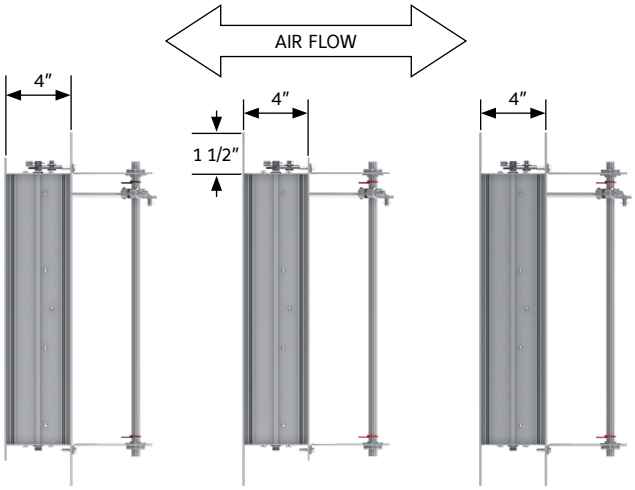
DamperFace View

CONSTRUCTION & DIMENSIONAL INFORMATION

Channel Frame and Flange Frame Options



Channel Frame



Front Flange Rear Flange Double Flange

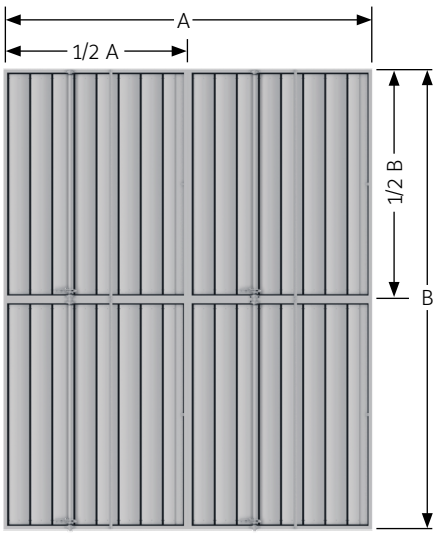
Note: Extended shaft shown installed.

Ruskin CD450V is rated for airflow in either direction, but Ruskin defines the "front" of the damper as the opposite side of the jackshaft and the "rear" as the jackshaft side. Unless specifically ordered otherwise, when looking at the concealed linkage side of the damper and the bottom blade turns clockwise to open, then the "front" surface is adjacent on the right.

CONSTRUCTION & DIMENSIONAL INFORMATION

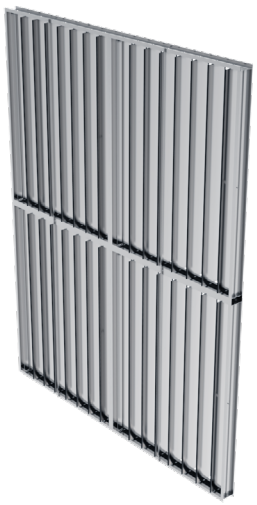
Multi-section Dampers

Dampers over the maximum single section size will require multiple damper sections, typically built in equal sizes. Multi-section dampers typically use jackshafts to link sections together. Vertical sections may be linked together with a vertical cross-over between jackshafts.



Damper face view

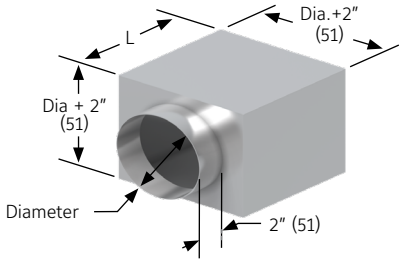
Damper side view



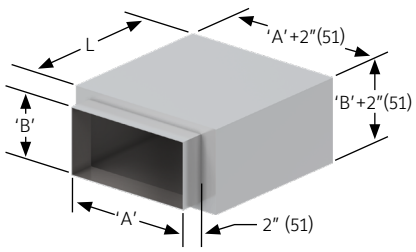
Note: Multiple section dampers are not intended to be structural supports. Additional bracing is recommended to support the damper weight and support against system pressure. Refer to Installation Instructions.

Sleeve Transitions

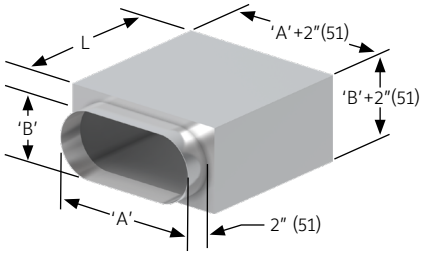
When a rectangular damper is your only option but you need to connect to a round, oval, or smaller than minimum size duct, you can use a transition to match the field-connection requirement. CR-Style is a round transition, C-Style is a step-down rectangular transition, and CO-Style is an oval transition. CR-Style is ordered by the diameter and C-Style and CO-Style are ordered by the A X B dimension shown below.



CR-STYLE



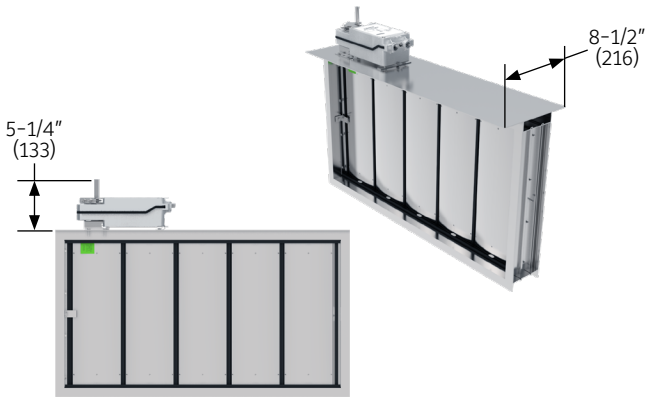
C-STYLE



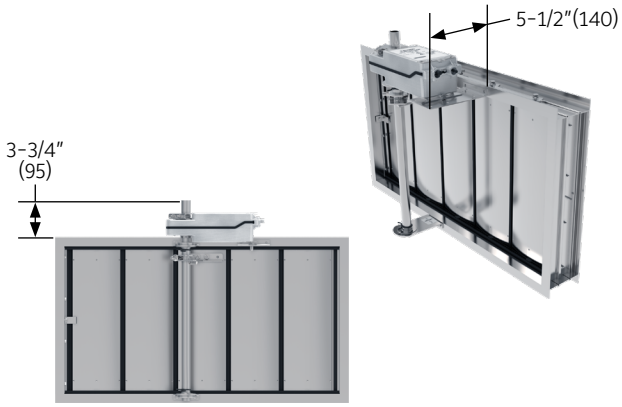
CO-STYLE

L = Sleeve Length

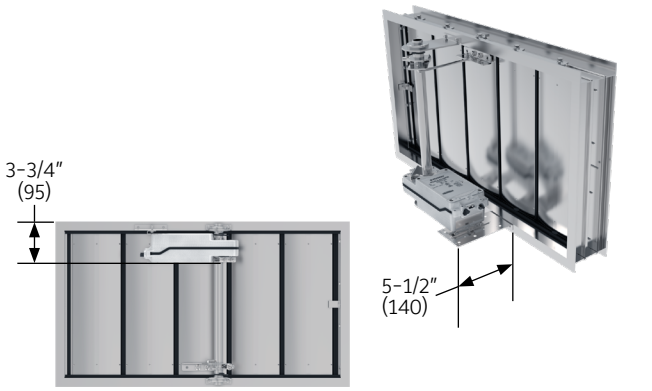
TYPICAL ACTUATOR MOUNTING DETAILS



EXTERNAL MOUNT ON EXTENDED SHAFT



EXTERNAL MOUNT ON JACSHAFT SHAFT



INTERNAL MOUNT ON JACKSHAFT

SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans, or in accordance with schedules, Low leakage dampers shall meet the following minimum construction standards: Frames shall be 4" x 1" (102 x 25) 6063T6 extruded aluminum channel. Blades shall be airfoil type extruded aluminum (maximum 6" (152) depth) with integral structural reinforcing tube running full length of each blade. Blade edge seals and finger style jamb shall be Santoprene and be mechanically locked in extruded slots. Adhesive or clip-on type blade seals are not acceptable. Bearings shall be non-corrosive molded synthetic. Axles shall be hexagonal (round not acceptable) to provide positive locking connection to blades and linkage. Linkage shall be concealed in frame. Damper widths from 12" to 60" (305 to 1524) wide shall not leak any greater than 8 cfm sq. ft. @ 4" w.g. and a maximum of 3 CFM sq. ft. @ 1" w.g. Dampers shall be in all respects equivalent to Ruskin Model CD450V.

LINKS TO IMPORTANT DOCUMENTS

Document Number	Document Title
Control Maintenance-808	O & M for Commercial Control Dampers
FPB-1007	Face Bypass Mixing Damper
SP-100	SP100 And SP100FK Switch Package
6246	Replacement Parts Catalog

RUSKIN®
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