

# CD450

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



## APPLICATION

The High-Performing Ruskin Model CD450 is designed to control and regulate air movement in medium to high velocity and pressure HVAC Systems. The CD450 has extruded aluminum 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. CD450 meets the leakage requirements of the of the International Energy Conservation Code (IECC).

## STANDARD CONSTRUCTION

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

## PERFORMANCE RATINGS

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

## OPTIONS AND ACCESSORIES

<b>Frame</b>	Front, Rear or double flange with or without bolt holes
<b>Operator Shaft</b>	Stainless steel (1/2" (13) dia. & 1" (25) dia)
<b>Linkage, Axles &amp; Bearings</b>	Stainless steel
<b>Blade &amp; Jamb Seals</b>	Silicone
<b>Couplers</b>	Used to join 2 damper sections up to 30 sq.ft.
<b>Face/Bypass</b>	FBV, FBH or FBR
<b>Actuators</b>	Electric or Pneumatic, factory provided and installed
<b>Switches</b>	SP100 switch package for damper open/closed position
<b>Finishes</b>	Anodized
<b>Actuator Enclosure</b>	RUS-N4X



## 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

<b>Minimum</b>	PB:	6" W x 5" H (152 x 127)
	OB:	6" W x 9" H (152 x 229)
<b>Maximum</b>	Section:	60" W x 72" H (1524 x 1829)
	Assembly:	Unlimited
<b>Weight</b>		5 lbs. /ft <sup>2</sup> (3.2 kg)

Important: The CD450 is designed for horizontal blade orientation, but can be used in a vertical blade orientation as long as damper size does not exceed 48" W x 48" H (1219 x 1219). For larger sizes see model CD450V.

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)
60 (1524)	3000 (15.2)	3.5 (0.9)
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 <sup>3</sup> /min/ft <sup>2</sup> (L/s/m <sup>2</sup> )			
	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)

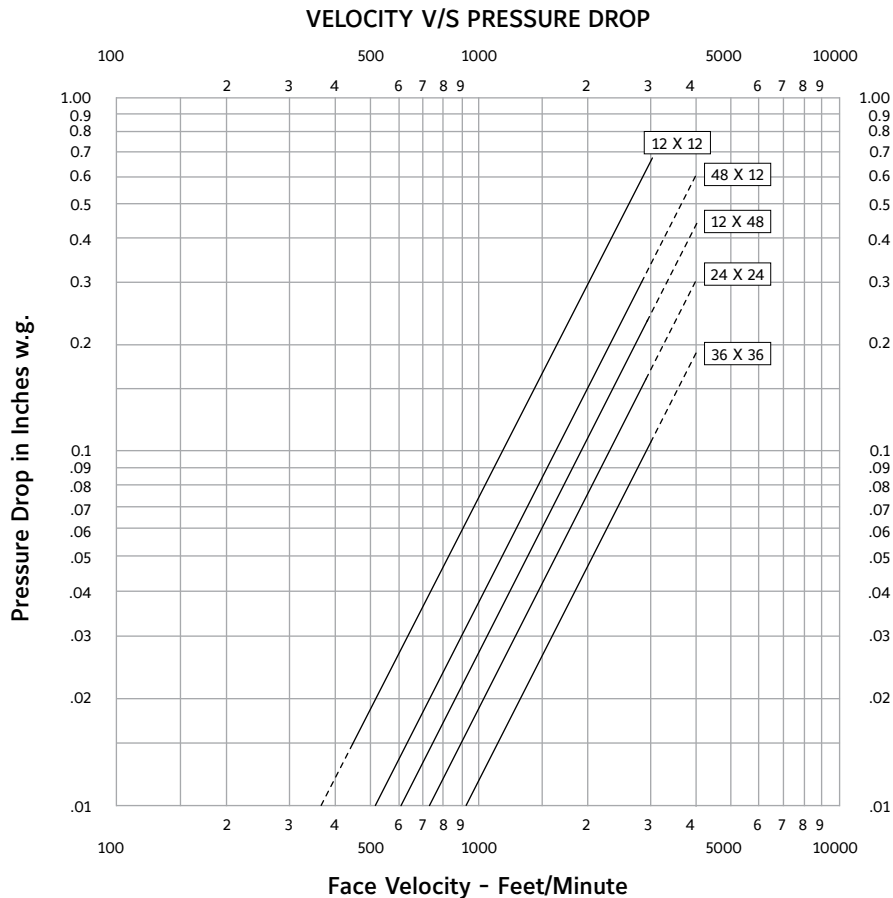
The CD450 may be used in systems with total pressures exceeding 3.5" by reducing damper section width as indicated. Example: Maximum design total pressure of 8.5" w.g. would require CD450 damper with maximum section width of 36" (914).

Pressure limitations shown above allow maximum blade deflection of L/180 of span on 60" (1524) 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
60" (1524)	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<sup>3</sup>.

## PERFORMANCE DATA



CD450 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<sup>3</sup>.

## 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	17	1500	11	1000	11	500	*
	3000	28	2250	22	1500	19	750	*
	4000	35	3000	29	2000	24	1000	*
18 x 18 (457 x 457)	2250	17	1688	10	1125	21	563	*
	4500	33	3375	26	2250	32	1125	*
	6750	43	5063	37	3375	40	1688	15
24 x 24 (610 x 610)	4000	11	3000	10	2000	26	1000	*
	8000	32	6000	30	4000	38	2000	21
	12000	43	9000	42	6000	46	3000	31

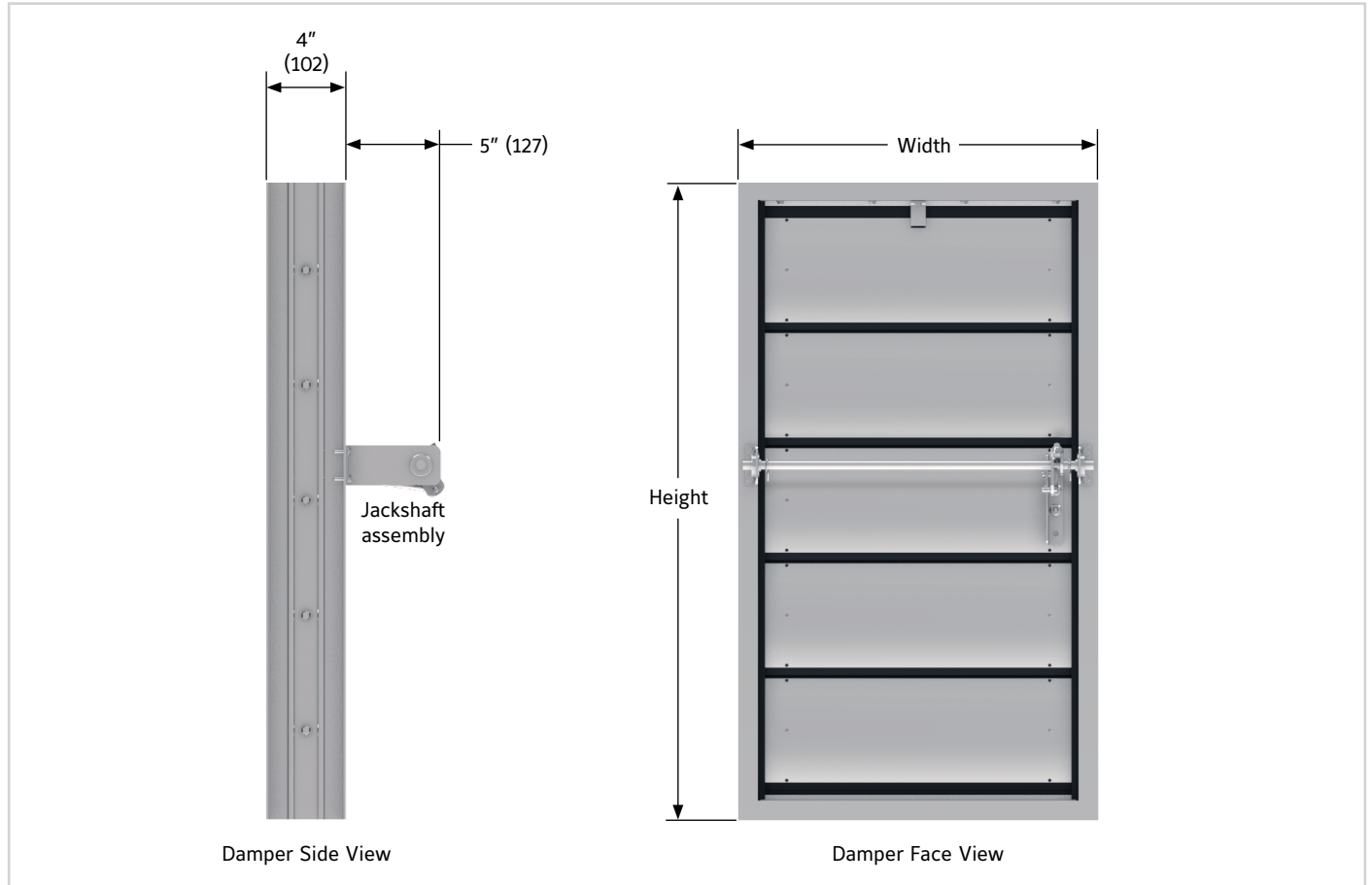
NC = Noise criteria in Decibels is based on 10db room effect and 10db of room attenuation.

\* = Less than 10 NC

See ASHRAE Handbook (1977 Fundamentals, Chapter 7) for explanation of NC Ratings.

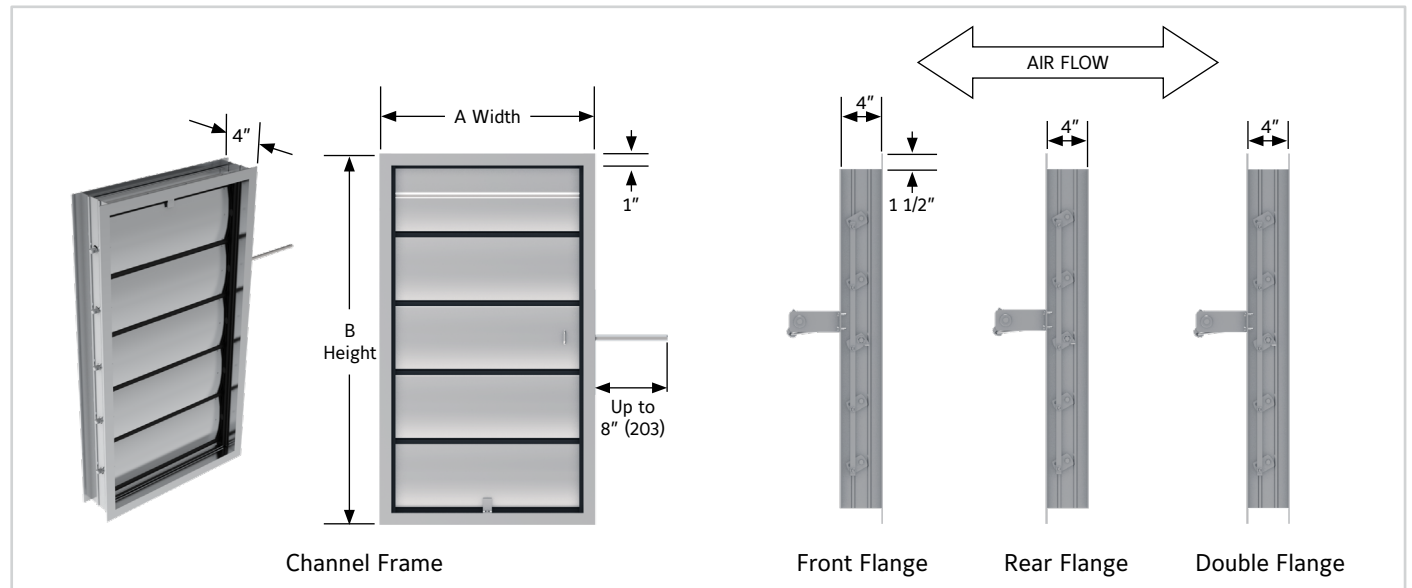
## DIMENSIONAL INFORMATION

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



## CONSTRUCTION & DIMENSIONAL INFORMATION

### Channel Frame and Flange Frame Options



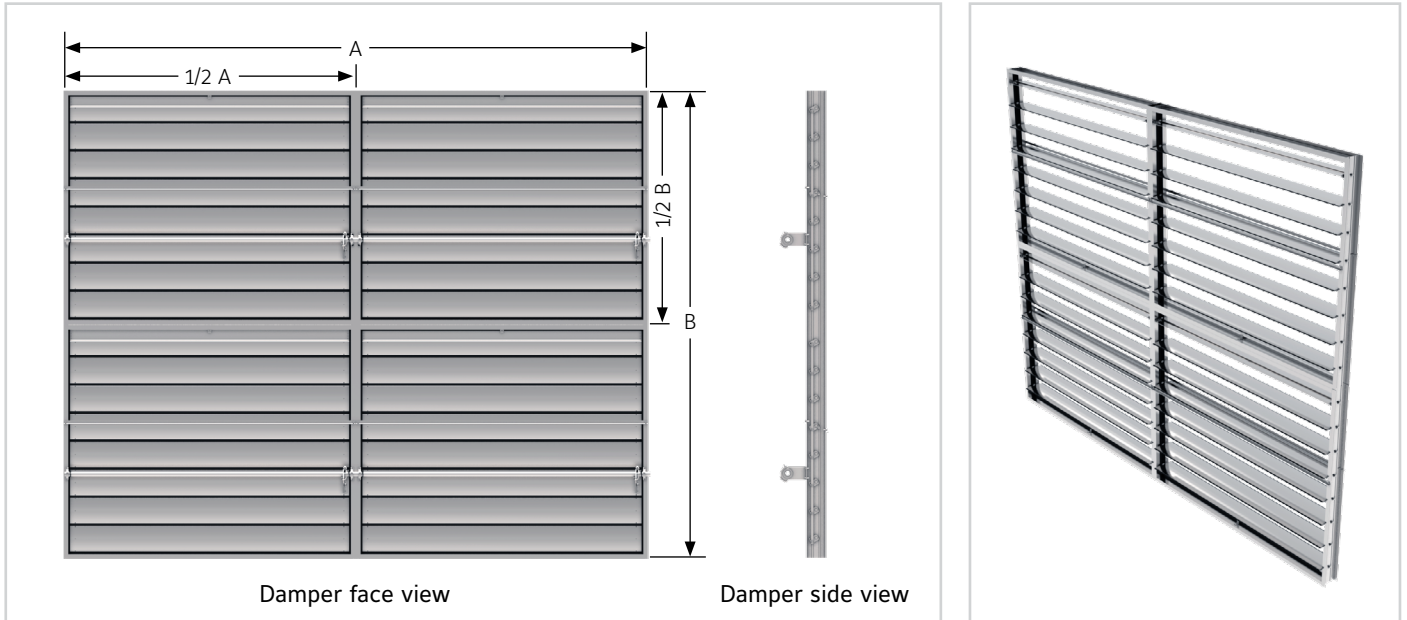
Note: Extended shaft shown installed.

**Ruskin CD450** 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.



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.

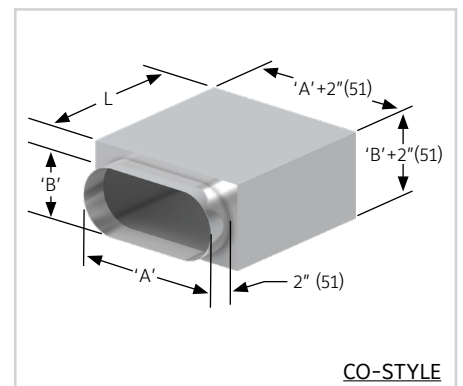
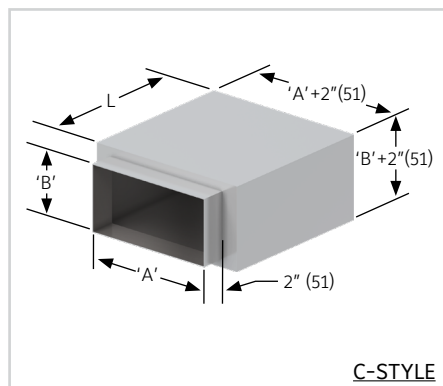
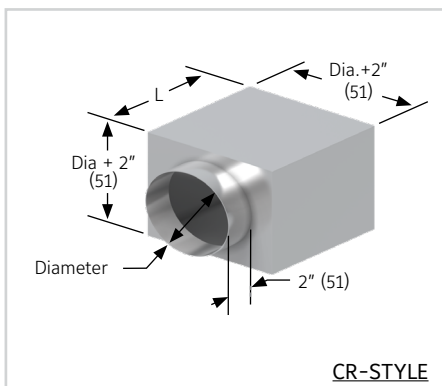
### Coupler Option

Coupler option allows two damper sections to be joined together without the use of a jackshaft.  
(Damper size must fall within one of the maximum size ranges: 120" w x 36" h, 96" w x 45" or 72" w x 60" h)



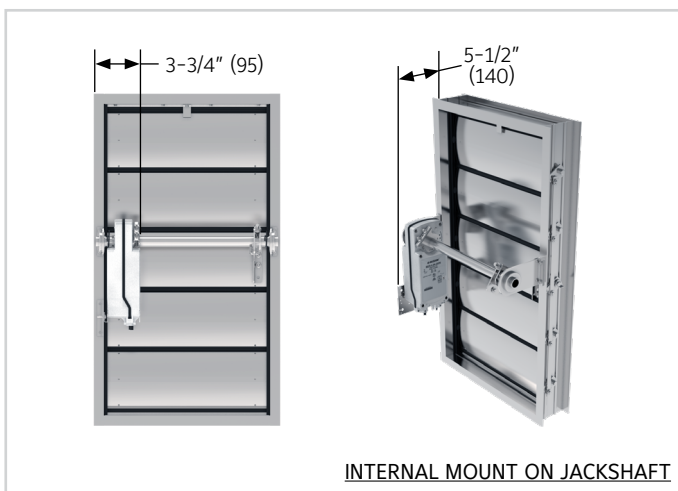
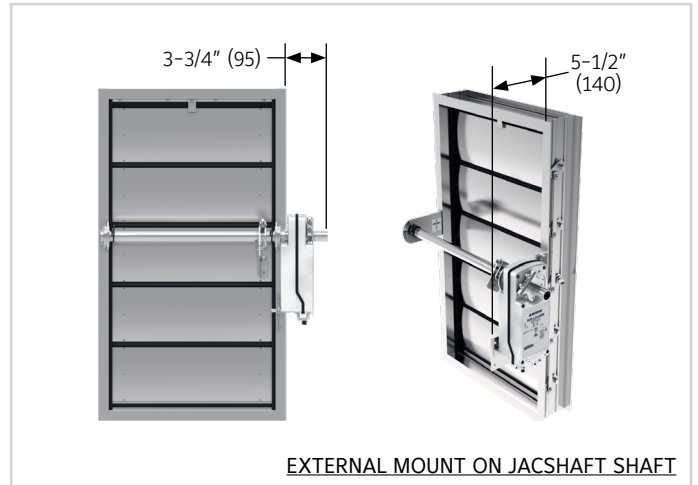
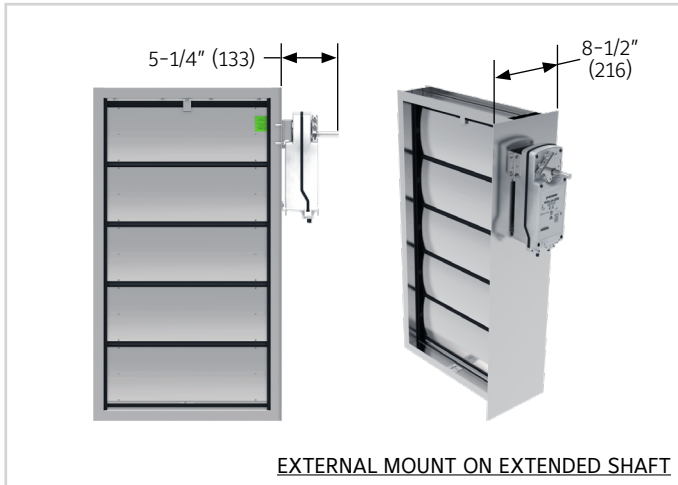
### Sleeve Transitions

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.



L = Sleeve Length

## TYPICAL ACTUATOR MOUNTING DETAILS



## 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 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 CD450.

### **i** 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



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