

# CD50

Low Leakage Control Damper  
High Performance Extruded Aluminum Airfoil  
AMCA Class 1A Leakage Rated



## APPLICATION

The High-Performing Ruskin Model CD50 is designed to control and regulate air movement in medium to high velocity and pressure HVAC Systems. The CD50 has an extruded aluminum airfoil-shape blade 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 CD50 open and closed. The CD50 complies with the leakage requirements of the International Energy Conservation Code (IECC).

## STANDARD CONSTRUCTION

Frame	5" x 1" x .125" (127 x 25 x 3.2) 6063-T6 extruded aluminum.
Blades	6" (152) wide, 6063-T6 extruded aluminum airfoil. Opposed blade action is standard, parallel blade action optional.
Blade Seals	Santoprene mechanically fastened.
Jamb Seals	301 stainless steel cambered compression type.
Bearings	Lexan.
Axles	1/2" (13) plated steel hex.
Linkage	Concealed out of airstream.
Operator Shaft	1/2" (13) dia. x 6" long plated steel for single section, or two sections joined with couplers. 1" (25) dia. jackshaft for multi-section assemblies.

## PERFORMANCE RATINGS

Leakage	AMCA Class 1A (see page 2)
Velocity	Up to 6000 fpm (30.5 m/s)
Pressure	Up to 13 in. w.g. (3.25 kPa)
Temperature	-72°F to +275°F (-58°C to +135°C) with Santoprene blade seals
Torque	Opposed blades: 5 in-lbs/ft <sup>2</sup> and Parallel blades: 7 in-lb/ft <sup>2</sup>
Airflow	Both directions
R Value	1.16 (tested to ASTM C1363-2011)

## OPTIONS & ACCESSORIES

Frame	Front flange, rear or both sides with or without bolt holes.
Operator Shaft	Single-section jackshaft, 1/2" (13) or 1" (25) dia.
Sleeve/Transition	Factory installed, with or without transitions.
Linkage, Axles & Bearings	Stainless steel.
Blade Seals	Silicone -80°F to 450°F (-62°C - 232°C).
Actuators	Factory provided and installed.
Switches	SP100 blade (open/closed) switch package.
Finish	Clear Anodized.
Actuator Weather Enclosure	RUSN4X



## HIGHLIGHTS

- ▶ Class 1A Leakage performance for energy savings
- ▶ Aluminum airfoil blades for low pressure drop
- ▶ Mechanically fastened blade seals for longevity
- ▶ Shake-proof linkage for low maintenance

## DIMENSIONS & WEIGHT

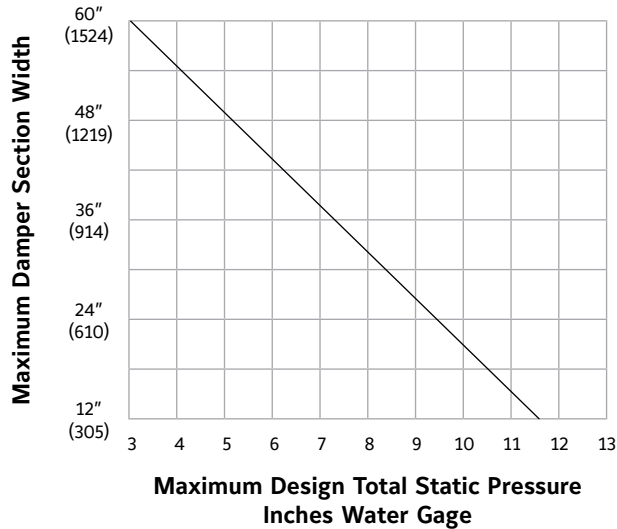
Minimum	Single blade – 6"w x 5"h (152 x 127).	
	Two blades, parallel or opposed action: 6"w x 9"h (152 x 229).	
Maximum	Section:	60" x 72" (1524 x 1829)
	Assembly:	Unlimited
(Units over 60"w or 72"h (1524 x 1829) are built in multiple equal size sections.)		
Weight	5 lbs./ft <sup>2</sup> (2.3 kg)	

Note:

- Dimensions shown in parenthesis ( ) indicate millimeters.
- Units furnished approximately 1/4" (6) smaller than given opening dimensions.

## AMCA LICENSED PERFORMANCE DATA

### PRESSURE LIMITATIONS



The CD50 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 CD50 damper with maximum section width of 36" (914).

Pressure limitations shown above allow maximum blade deflection of 1/180 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.



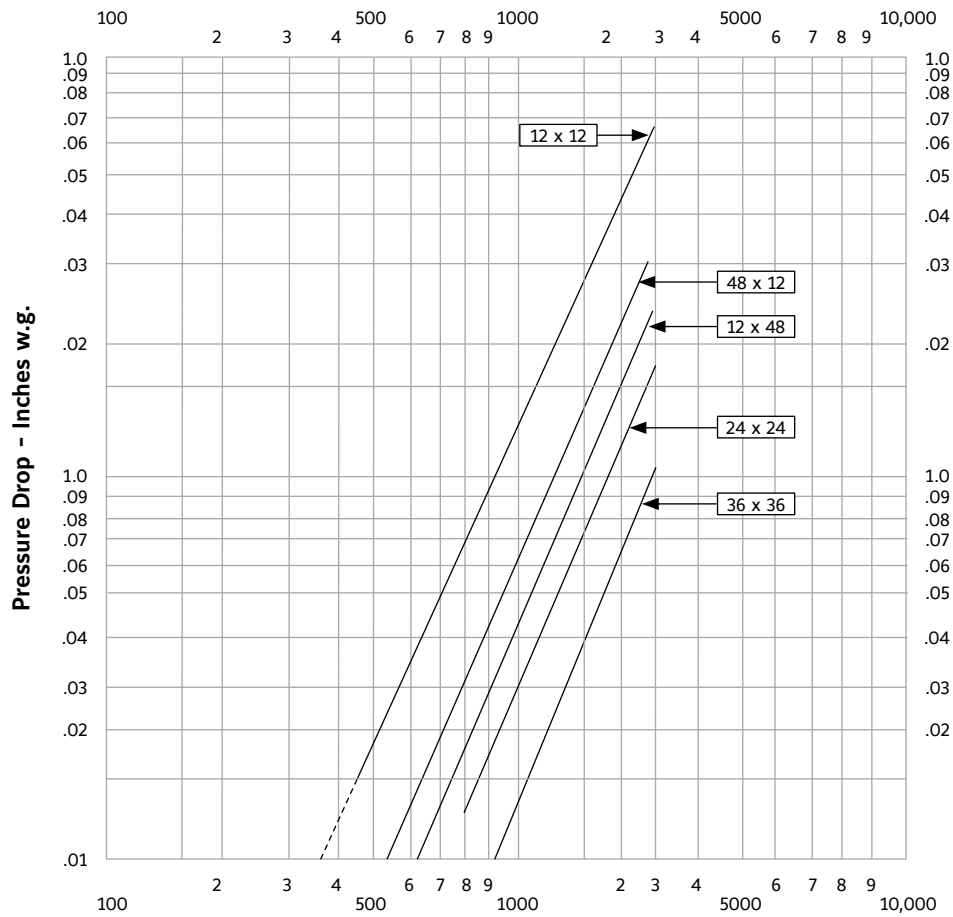
Ruskin Company certifies that the CD50 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA International Certified Ratings Seal applies to Air Performance and Air Leakage.

Pressure/Class	Leakage, L/s/m <sup>2</sup> (ft <sup>3</sup> /min/ft <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)

Damper Width (Inches)	1 IN. W.G.	4 IN. W.G.	8 IN. W.G.
12" (305)	1A	1	2
24" (610)	1A	1	2
36" (914)	1A	1	NA
48" (1219)	1A	1	NA
60" (1524)	1A	1	NA

Leakage testing conducted in accordance with AMCA Standard 500-D-98. 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>.

## VELOCITY VS. PRESSURE DROP



**Face Velocity - Feet/Minute AMCA Fig. 5.3**

CD50 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.

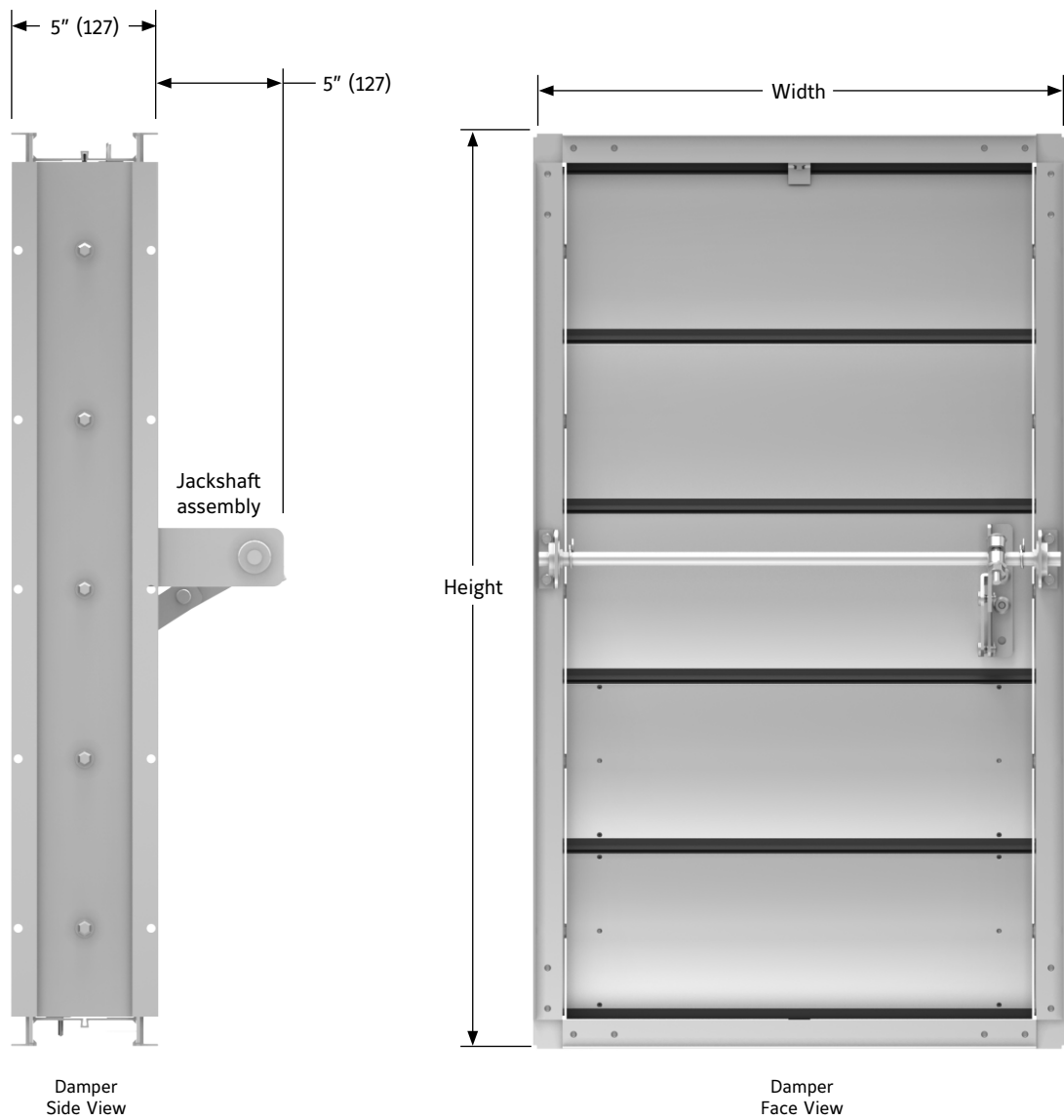
\* = Less than 10 NC

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

DIMENSIONAL INFORMATION

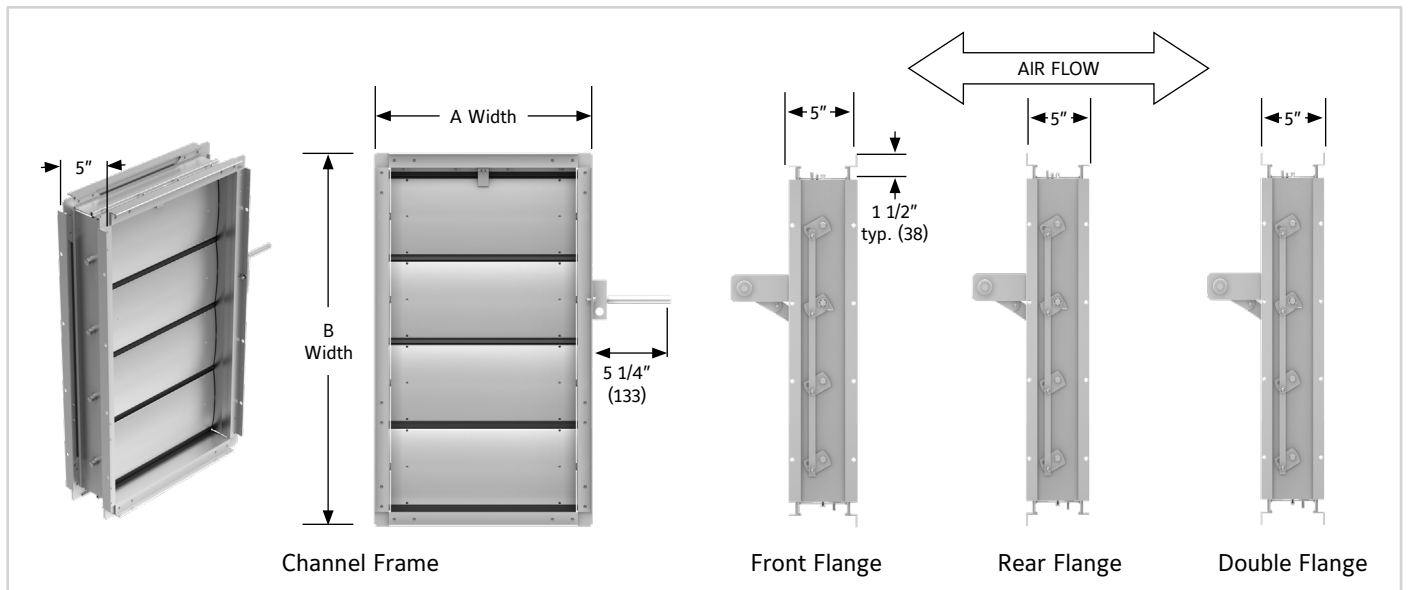
W & H dimensions are furnished with 1/4" (6) deduct standard, unless ordered actual size.

Single section shown with optional 1" (25) dia. jackshaft  
Multi-section assemblies are jackshafted standard.



## CONSTRUCTION & DIMENSIONAL INFORMATION

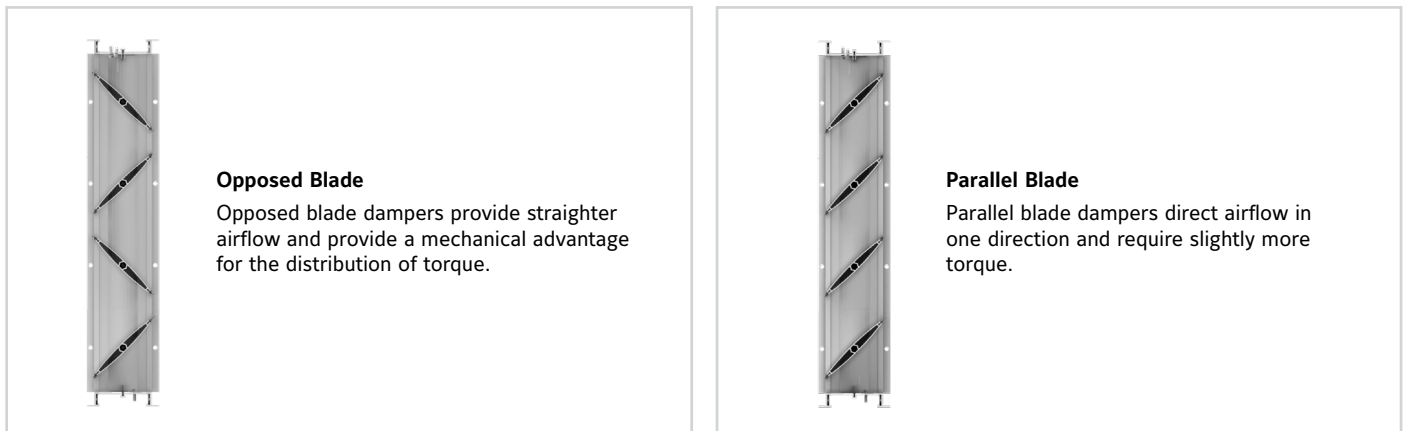
### Channel Frame and Flange Frame Options



Note: Extended shaft shown installed. Shaft screwed to corner of frame for shipping.

**Ruskin CD50** 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.

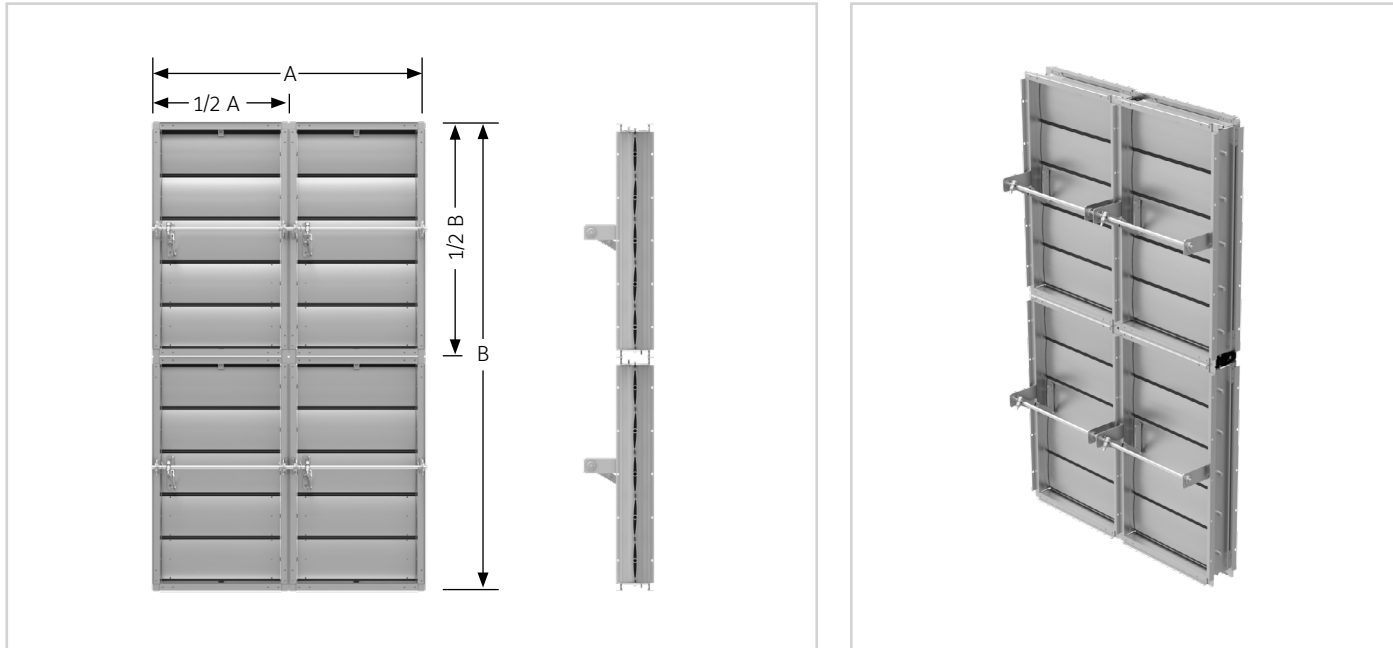
### Blade Action and Envelope Dimensions



## CONSTRUCTION & DIMENSIONAL INFORMATION

### Multi-section Dampers

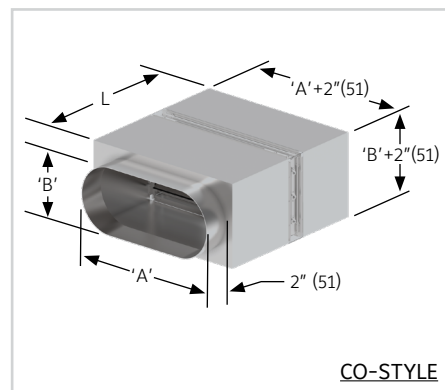
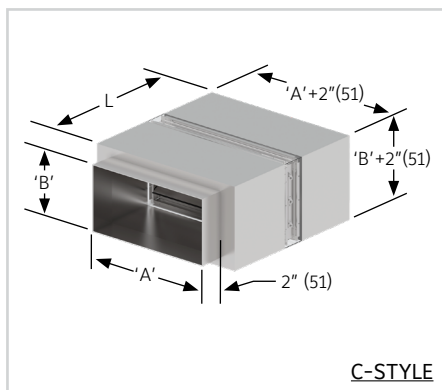
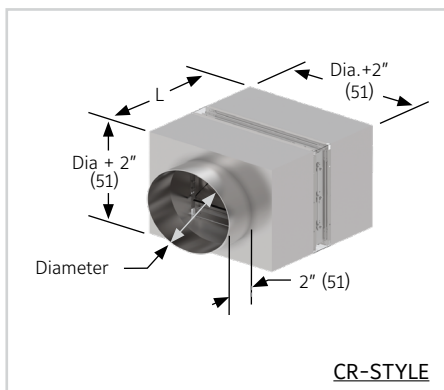
Dampers over the maximum single section size will require multiple damper sections, typically built in equal sizes. Multi-section dampers typically use jackshafts to link sections together.



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.

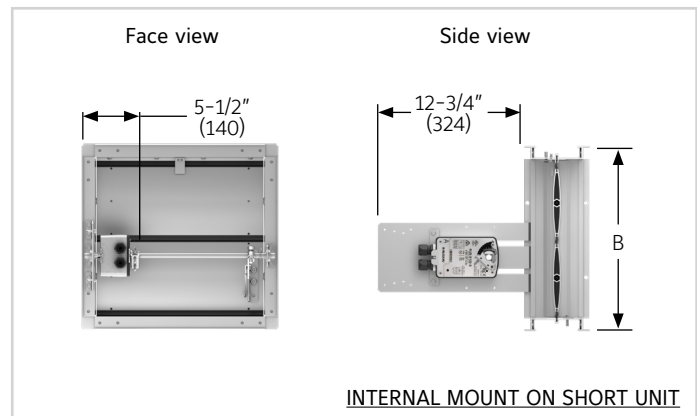
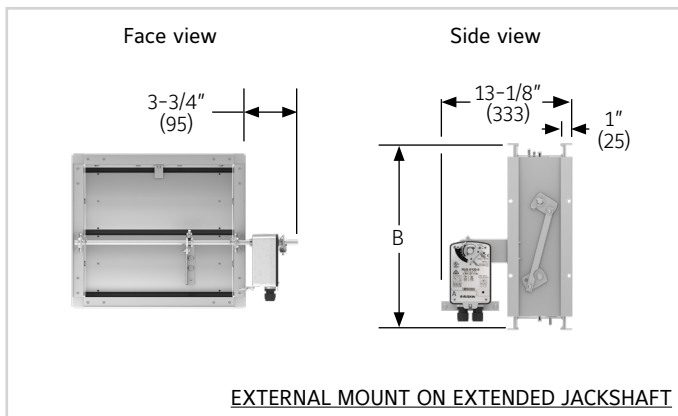
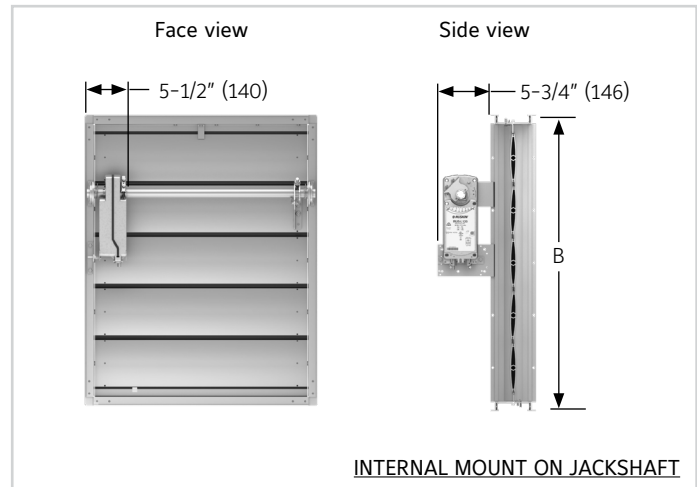
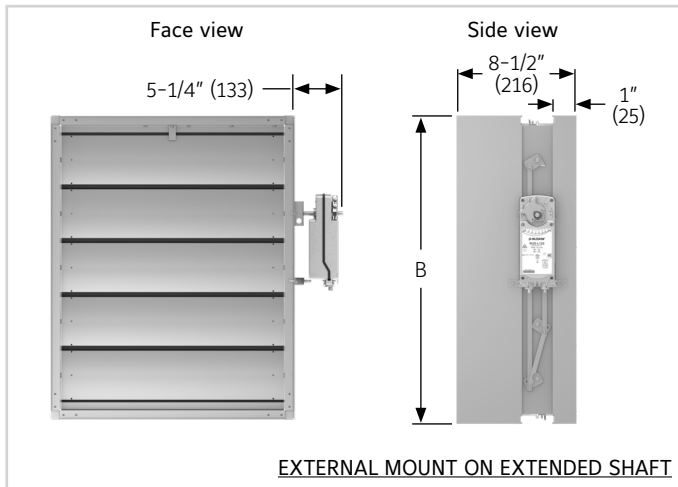
### Sleeve Transitions

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.



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 5" x 1" x .125" (minimum thickness) (127 x 25 x 3.2) 6063T5 extruded aluminum hat channel with hat mounting flanges on both sides of the frame. Each corner shall be reinforced with two die formed internal braces and machine staked for maximum rigidity. 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 shall be extruded double edge design with inflatable pocket which enables air pressure from either direction to assist in blade to blade seal off. Blades seals shall be mechanically locked in extruded blade slots, yet shall be easily replaceable in field. 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. Submittal must include leakage, maximum air flow and maximum pressure ratings based on AMCA Publication 500. Damper shall be tested and licensed in accordance with AMCA 511 for Air Performance and Air Leakage. 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 CD50.

### LINKS TO IMPORTANT DOCUMENTS

#### Document Title

O & M for Commercial Control Dampers

Standard Multi-Section Details

T-Flange Frame Option

Face Bypass Mixing Damper

Flange Frame Options

Minimum Torque Requirements for Standard Commercial Control Dampers

Basic Installation Sheet

Crank Arms, Extended Shaft and Hand Quad

#### Document Title

SP100 and SP100FK Switch Package

Replacement Parts Catalog

Limited Warranty Document

Single Section Control Damper Installation



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