Tag:	Engineer:
Project:	Contractor:
Location:	Architect:
Date:	Submitted by:

The ACD-44 is a low leakage control damper constructed of heavy duty extruded aluminum with airfoil type blades. The ACD-44 has been designed to meet the highest standards for commercial control dampers. The airfoil blades guarantee the lowest pressure drop and the aluminum construction ensures a long lasting, corrosion resistant control damper.

The ACD-44 is IECC (International Energy Conservation Code) compliant with a leakage rating of less than 3 cfm/ft<sup>2</sup> at 1" WG. The ACD-44 has also been tested to AMCA 500-D standards (see next page for results).

## **Standard Construction:**

**FRAME:** Extruded aluminum channel, 4"w x 1"h (102 x 25), 0.081" (2) thick 6063-T6.

**BLADES**: Extruded aluminum 4" (102) wide, double wall 0.050" (1.3) hollow airfoil profile with reinforced center.

**BEARINGS:** Nylon, press fit into frame.

AXLES: Square plated steel.

LINKAGE: 12 Ga. Galvanized steel linkage bar, concealed in frame.

**EXTENDED SHAFT:** Removable, 6" long x 1/2" dia. (152 x 13) plated steel coupled to square axle.

BLADE SEALS: Inflatable, pressure sensitive silicone.

JAMB SEALS: Flexible stainless steel, pressure sensitive. FINISH: Mill aluminum.

**<u>FINISE</u>** Will aluminum.

JACKSHAFT: 1/2" (13) diameter standard on multi sections, or single sections 32" (813) and wider.

#### MINIMUM DAMPER SIZE:

*Single Blade:* 6"w x 5"h (152 x127).

*Multi Blade:* 6"w x 8"h (152 x 203).

#### MAXIMUM DAMPER SIZE:

Single Section: 60"w x 72"h (1524 x 1829). Multi Section: Unlimited.

All dimensions shown in inches, parentheses () indicate millimeters.

## **Optional Construction:**

Blade Action:

Opposed Parallel Operators Actuators: Pneumatic or Manual Hand Quadrant Face & Bypass

*Jackshaft:* 3/4" (19) Jackshaft reinforcement *Bearings:* 

Bronze Oilite Stainless Steel

Axles: 304 Stainless Steel.

Linkage: 304 Stainless Steel (Nylon Bearings).

Flange Options:

Single Flange

Single Reversed Flange Double Flange

#### Notes:

• Dampers fabricated 1/4" (6) under ordered size unless otherwise noted

Specify parallel or opposed



As part of our continuous improvement program, we reserve the right to make further improvements without notice.

24V

Electric:

**Chain Operator** 

120V

Model ACD-44 Airfoil Blade Low Leakage Aluminum Thinline Control Damper



# **INCA**

## PERFORMANCE DATA - Model ACD-44 Airfoil Blade Low Leakage Aluminum Thinline Control Damper



## 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.





LEAKAGE at 4" W.G. = 3.8 cfm/sq.ft. (Equivalent to AMCA Class 1)



Figure 5.5

## Figure 5.5:

Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Submittal - Model ACD-44 - 0819

## SELECTION CRITERIA & LIMITATIONS - Model ACD-44 Airfoil Blade Low Leakage Aluminum Thinline Control Damper



## ACD-44 Notes:

The ACD-44 is suitable for applications with total pressures up to 3.0" w.g. and a maximum velocity of 3000 FPM. It may be used in applications exceeding 3.0" w.g. and/or exceeding 3000 FPM by reducing the damper width as seen in the above diagrams.

#### For correct damper sizing consult the factory when exceeding standard design limit of 3.0" and/or 3000 fpm.

- The ACD-44 series is not recommended for vertical blades installation.
- Always connect motors to power blade and on linkage side.
- NCA dampers are designed to be self supporting only in largest single section size. Larger size may require external bracing. Recommended bracing minimum of 8' (2438). The amount and size will depend on unit size and system pressure.

## Applicable NCA Literature:

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	
Date:	Submitted by:	

The ACD-54 is a low leakage control damper constructed of heavy duty extruded aluminum with airfoil type blades. The ACD-54 has been designed to meet the highest standards for commercial control dampers. The airfoil blades gaurantee the lowest pressure drop and the aluminum construction ensures a long lasting, corrosion resistant control damper.

The ACD-54 is IECC (International Energy Conservation Code) compliant with a leakage rating of less than 3 cfm/ft<sup>2</sup> at 1" WG. The ACD-54 has also been tested to AMCA 500-D standards (see next page for results).

## Standard Construction:

- FRAME: Extruded aluminum channel, 5"w x 1"h (127 x 25), .125" (3.1) thick 6063-T6.
- BLADES: Extruded aluminum 4" (102) wide, double wall 0.050" (1.3) hollow profile with reinforced center.
- BEARINGS: Nylon, press fit into frame.

AXLES: Square plated steel.

- LINKAGE: 12 Ga. Galvanized steel linkage bar, concealed in frame. EXTENDED SHAFT: Removable, 6" long x 1/2" dia.
- (152 x 13) plated steel coupled to square axle.
- **BLADE SEALS:** Inflatable, pressure sensitive silicone.
- JAMB SEALS: Flexible stainless steel, pressure sensitive silicone. FINISH: Mill aluminum.
- JACKSHAFT: 1/2" (13) diameter standard on multi sections, or single sections 32" (813) and wider.

#### **MINIMUM DAMPER SIZE:**

Single Blade: 6"w x 5"h (152 x127). Multi Blade: 6"w x 8"h (152 x 203).

#### **MAXIMUM DAMPER SIZE:**

Single Section: 60"w x 72"h (1524 x 1829) Multi Section: Unlimited. All dimensions shown in inches, parentheses () indicate millimeters.

## **Optional Construction:**

Blade Action: Opposed Parallel Operators Actuators: Pneumatic or 24V 120V Electric: Manual Hand Quadrant **Chain Operator** Face & Bypass Jackshaft: 3/4" (19) Jackshaft reinforcement Bearings: Bronze Oilite Stainless Steel Axles: 304 Stainless Steel. Linkage: 304 Stainless Steel (Nylon Bearings). Flange Options: Single Flange Single Reversed Flange **Double Flange** 



Model ACD-54 Airfoil Blade Low Leakage

#### Notes:

• Dampers fabricated 1/4" (6) under ordered size unless otherwise noted Specify parallel or opposed



As part of our continuous improvement program, we reserve the right to make further improvements without notice.



## PERFORMANCE DATA - Model ACD-54 Airfoil Blade Low Leakage Aluminum Control Damper





## 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.



**LEAKAGE at 1" W.G.** = 1.7 cfm/sq.ft. (Equivalent to AMCA Class 1A) **LEAKAGE at 2.5" W.G.** = 2.8 cfm/sq.ft.

LEAKAGE at 4" W.G. = 3.8 cfm/sq.ft. (Equivalent to AMCA Class 1)



Figure 5.5

#### Figure 5.5:

Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Submittal - Model ACD-54 - 1218

## SELECTION CRITERIA & LIMITATIONS - Model ACD-54 Airfoil Blade Low Leakage Aluminum Control Damper



## ACD-54 Notes:

The ACD-54 is suitable for applications with total pressures up to 3.0" w.g. and a maximum velocity of 3000 FPM. It may be used in applications exceeding 3.0" w.g. and/or exceeding 3000 FPM by reducing the damper width as seen in the above diagrams.

#### For correct damper sizing consult the factory when exceeding standard design limit of 3.0" and/or 3000 fpm.

- The ACD-54 series is not recommended for vertical blades installation.
- Always connect motors to power blade and on linkage side.
- NCA dampers are designed to be self supporting only in largest single section size. Larger size may require external bracing. Recommended bracing minimum of 8' (2438). The amount and size will depend on unit size and system pressure.

#### Applicable NCA Literature:

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	Model ACD-56
Date:	Submitted by:	Airfoil Blade Low Leakage Aluminum Control Dampe

The ACD-56 is a low leakage control damper constructed of heavy duty extruded aluminum with airfoil type blades. The ACD-56 has been designed to meet the highest standards for commercial control dampers. The airfoil blades gaurantee the lowest pressure drop and the aluminum construction ensures a long lasting, corrosion resistant control damper.

The ACD-56 is IECC (International Energy Conservation Code) compliant with a leakage rating of less than 3 cfm/ft<sup>2</sup> at 1" WG. The ACD-56 has also been tested to AMCA 500-D standards (see next page for results).

## Standard Construction:

FRAME: Extruded aluminum channel, 5" w x 1"h (127 x 25), .125" (3.1) thick 6063-T6.

- BLADES: Extruded aluminum 6" (152) wide, double wall 0.050" (1.3) hollow airfoil profile with reinforced center.
- BEARINGS: Nylon, press fit into frame.

AXLES: Square plated steel.

LINKAGE: 12 Ga. Galvanized steel linkage bar, concealed in frame. EXTENDED SHAFT: Removable, 6" long x 1/2" dia.

(152 x 13) plated steel coupled to square axle.

**BLADE SEALS:** Inflatable, pressure sensitive silicone.

**JAMB SEALS:** Flexible stainless steel, pressure sensitive silicone. FINISH: Mill.

JACKSHAFT: 1/2" (13) diameter standard on multi sections, or single sections 32" (813) and wider.

#### **MINIMUM DAMPER SIZE:**

Single Blade: 6"w x 5"h (152 x127).

Multi Blade: 6"w x 13"h (152 x 330).

#### **MAXIMUM DAMPER SIZE:**

Single Section: 60"w x 72"h (1524 x 1829) Multi Section: Unlimited.

All dimensions shown in inches, parentheses () indicate millimeters.

## **Optional Construction:**

Blade Action: Opposed Parallel Operators Actuators: Pneumatic or 24V Electric: Manual Hand Quadrant **Chain Operator** Face & Bypass Jackshaft: 3/4" (19) Jackshaft reinforcement Bearings: Bronze Oilite Stainless Steel Axles: 304 Stainless Steel. Linkage: 304 Stainless Steel (Nylon Bearings). Flange Options: Single Flange Single Reversed Flange **Double Flange** 

6" (152) Removable 1/2",Dia. Shaft 6 (152) 6 (152)3-7/8

5

н

INCA

(127)

Low Profile

(Damper 16" High or Less) (406)

## Notes:

120V

Opposed

Blade

5-3/4"

(146)

• Dampers fabricated 1/4" (6) under ordered size unless otherwise noted • Specify parallel or opposed

Parallel

Blade

(98)





## PERFORMANCE DATA - Model ACD-56 Airfoil Blade Low Leakage Aluminum Control Damper

Pressure Drop – Damper Open 24" x 24" (610 mm x 610 mm)



## 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.



Air Leakage – Damper Closed 48" x 48" (1219 mm x 1219 mm)

Tested as per AMCA Std. 500, Fig. 5.5 - leakage in CFM per sq. ft.

LEAKAGE at 1" W.G. = 1 cfm/sq.ft. (Equivalent to AMCA Class 1A) LEAKAGE at 2.5" W.G. = 1.4 cfm/sq.ft. LEAKAGE at 4" W.G. = 2 cfm/sq.ft. (Equivalent to AMCA Class 1)



## Figure 5.5:

Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Submittal - Model ACD-56 - 1218

## SELECTION CRITERIA & LIMITATIONS - Model ACD-56 Airfoil Blade Low Leakage Aluminum Control Damper



## ACD-56 Notes:

The ACD-56 is suitable for applications with total pressures up to 3.0" w.g. and a maximum velocity of 3000 FPM. It may be used in applications exceeding 3.0" w.g. and/or exceeding 3000 FPM by reducing the damper width as seen in the above diagrams.

#### For correct damper sizing consult the factory when exceeding standard design limit of 3.0" and/or 3000 fpm.

- The ACD-56 series is not recommended for vertical blades installation.
- Always connect motors to power blade and on linkage side.
- NCA dampers are designed to be self supporting only in largest single section size. Larger size may require external bracing. Recommended bracing minimum of 8' (2438). The amount and size will depend on unit size and system pressure.

#### **Applicable NCA Literature:**

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	Model ACD-56-I
Date:	Submitted by:	Insulated Airfoil Blade Low Leakage Aluminum Control Damper

The ACD-56-I is a low leakage control damper constructed of heavy duty extruded aluminum with airfoil type blades and insulation wrapped around the frame as well as in each blade. The ACD-56-I has been designed to meet the highest standards for commercial control dampers as well as minimize energy loss through the closed damper. The airfoil blades gaurantee the lowest pressure drop and the aluminum construction ensures a long lasting, corrosion resistant control damper.

The ACD-56-I is IECC (International Energy Conservation Code) compliant with a leakage rating of less than 3 cfm/ft2 at 1" WG. The ACD-56-I has also been tested to AMCA 500-D standards (see next page for results).

## Standard Construction:

FRAME: Extruded aluminum channel, 5"w x 1"h (127 x 25) on 3 sides, 5"w x 2"h (127 x 51) on 1 side (linkage side), .125" (3.1) thick 6063-T6. Insulated with Polystyrene insulation, added within channel frame.

BLADES: Extruded aluminum 6" (152) wide, double wall 0.050" (1.3) Polystyrene insulated airfoil profile with reinforced center.

BEARINGS: Nylon, press fit into frame.

AXLES: Square plated steel.

**LINKAGE:** 12 Ga. Galvanized steel linkage bar, concealed in frame.

EXTENDED SHAFT: Removable, 6" long x 1/2" dia. (152 x 13) plated steel coupled to square axle.

BLADE SEALS: Inflatable, pressure sensitive silicone.

JAMB SEALS: Flexible metal, pressure sensitive silicone.

#### FINISH: Mill.

JACKSHAFT: 1/2" (13) diameter standard on multi sections, or single sections 32" (813) and wider.

#### **MINIMUM DAMPER SIZE:**

Single Blade: 8"w x 10"h (203 x 254) Multi Blade: 8"w x 15"h (203 x 381) **MAXIMUM DAMPER SIZE:** 

Single Section: 60"w x 72"h (1524 x 1829) Multi Section: Unlimited.

All dimensions shown in inches, parentheses () indicate millimeters.

#### **Optional Construction:**

Blade Action:

Opposed Parallel

**Operators** 

Actuators: Pneumatic or Electric: 24V 120V

Manual Hand Quadrant Chain Operator

Face & Bypass

Jackshaft: 3/4" (19) Jackshaft reinforcement Bearinas:

**Bronze** Oilite Stainless Steel

Axles: 304 Stainless Steel.

Linkage: 304 Stainless Steel (Nylon Bearings).

Flange Options:

Single Flange

Single Reversed Flange

**Double Flange** 



• Dampers fabricated 1/4" (6) under ordered size unless otherwise noted · Specify parallel or opposed

Opposed

Blade

(152)

3-7/8

(98)

Parallel

Blade

5' (127)

(127

5-3/4" (146)

ENCA

6" (152)

Removable 1/2" Dia. Shaft

6 (152)





## PERFORMANCE DATA - Model ACD-56-I Insulated Airfoil Blade Low Leakage Aluminum Control Damper





## 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.



LEAKAGE at 1" W.G. = 1 cfm/sq.ft. (Equivalent to AMCA Class 1A)

LEAKAGE at 2.5" W.G. = 1.4 cfm/sq.ft. LEAKAGE at 4" W.G. = 2 cfm/sq.ft. (Equivalent to AMCA Class 1)



## Figure 5.5:

Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.





#### ACD-56-I Notes:

The ACD-56-I is suitable for applications with total pressures up to 3.0' w.g. and a maximum velocity of 3000 FPM. It may be used in applications exceeding 3.0" w.g. and/or exceeding 3000 FPM by reducing the damper width as seen in the above diagrams.

For correct damper sizing consult the factory when exceeding standard design limit of 3.0" and/or 3000 fpm.

- The ACD-56-I series is not recommended for vertical blades installation.
- Always connect motors to power blade and on linkage side.
- NCA dampers are designed to be self supporting only in largest single section size. Larger size may require external bracing. Recommended bracing minimum of 8' (2438). The amount and size will depend on unit size and system pressure.

#### Applicable NCA Literature:

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	INCA Model ZMD-AF
Date:	Submitted by:	Aluminum Zone Control Damper with Airfoil Blades
Application:         The ZMD-AF is an extruded aluminum construent control damper with airfoil type blades for log ZMD-AF can be fabricated in numerous zone as needed to fit individual applications. The Z leakage control damper sections.         Standard Construction:         FRAME: 6" (152) x 15/16" (24) x .081" (2) extruded BLADES: 6" (152) wide 6063-T5 heavy gauge of BEARINGS: Synthetic, pressed into frame JAMB SEALS: Stainless steel, compressible BLADE SEALS: Silicone, flexible wiper type ZONES: Zones are divided into 6" (152) height AXELS: 3/8" square plated steel, 6" (152) cented LINKAGE: 12 ga. steel, concealed in jamb FINISH: Mill aluminum         EXTENDED SHAFT: Removable, 6" (152) x ½" (MINIMUM SIZE: A (1 or 2) and B is 6" (152)	15/16" ->         ructed multiple zone         w pressure drop. The         e damper configurations         ZMD-AF also employs low         ed aluminum channel         extruded aluminum airfoil shape         metal type         t with built-in duct connectors         ers         (13) diameter plated steel	Damper with Airfoil Blades $A \rightarrow 1-7/8"$ $A \rightarrow 15/16"$ $A \rightarrow 15/16$ $A \rightarrow 15/1$
MAXIMUM HEIGHI: B IS 96" (2438)	o millimeters	
Optional Construction: Bearings (Stainless steel pressed into fra Insulated Deck Divider Standoff Bracket	nme)	15/16" 15/16" Tear Drop Type Linkage Concealed Within Frame
Features:	¥	
<ul> <li>Standard zone heights (B) are in multiples of Airfoil shaped blades lower pressure loss.</li> <li>Special designed zone dividers allows for d duct connections.</li> <li>Low profile zone dividers allows for low pre- loss.</li> <li>Variations of 4" increments are available at additional cost, consult factory.</li> <li>The ZMD-AF series mixing Zone Dampers he factory arranged zones, when specified. The linkage will be set for groups of blades to work from one control shaft.</li> <li>When the size of the zone is unknown, the linkage will be removed in the field for zone</li> <li>Blade operation is parallel to insure lowest leakage.</li> <li>Leakage is less than 6 cfm/sq.ft. at 1"sp. wg</li> </ul>	of 6. 'A-A' lirect an have he be sizing.	'B-B' Built-In Duct Drive Connection Low Profile Blade Stops for Reduced Pressure Divider
<b>1</b> As part of our continuous improvement program, v	ve reserve the right to make further improvements withou	t notice. Submittal - Model ZMD-AF - 0817

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	<b>NCA</b> Model TBD-B
Date:	Submitted by:	Airfoil Parallel or Opposed Blade Thermally Broken Control Damper
		(Diadaa anka)

The TBD-B is a low leakage extruded aluminum control damper with insulated thermally broken damper blades. (For thermally broken blades and frame see NCA Model TBD-BF).

The damper blades are insulated with a two part high-density polyurethane foam. The aluminum surface of the airfoil blades are thermally broken between the front and back surface of the blades. This separation between the front and back surface of the blade prevents the transfer or loss of heat or cold when the damper is fully closed. This also reduces the chance of condensation.

## Standard Construction:

- FRAME: Hat shaped, 5" wide x .081" thick (127 mm x 2 mm) nominal 6063-T6/T52 extruded aluminum.
- BLADES: Airfoil profile, 6" wide x .080" thick (152 mm x 2 mm) nominal 6063-T6/T52 extruded aluminum injected with a two part polyurethane (CFC) free foam, and debridged for thermal isolation.
- **BEARINGS:** Double-sealed with celcon inner bearing designed to eliminate any metal-to-metal or metal-to-bearing riding surfaces.
- **AXLES:** 1/2" (13 mm) diameter extruded aluminum, pin-lock design, interlocking into blade section.
- LINKAGE: Heavy gauge aluminum, concealed in frame. Crank arm permanently locked to blade axle by two stainless steel fasteners.
- **BLADE SEALS:** Extreme low temperature seal system with extruded silicone rubber that fits into a ribbed groove insert in blades.

JAMB SEALS: Flexible metal, pressure sensitive.

#### FINISH: Mill aluminum.

TEMP LIMITS: -40° F to +200° F (-40° C to +93° C)

#### MINIMUM DAMPER SIZE:

Single Blade (Parallel): 12" w x 8-7/8" h (305 mm x 225 mm). Multi Blade (Opposed): 12" w x 12" h (305 mm x 305 mm).

#### **MAXIMUM DAMPER SIZE:**

Single Section: 60"w x 72"h (1524 mm x 1829 mm) Multi Section: Unlimited.

#### **Options**:

#### **Operators:**

120V Actuator:

24V Pneumatic

Manual Quadrant.

#### Jackshafting

Auxilliary Switch

Explosion Proof Housing



#### Notes:

0

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- Dampers fabricated 1/4" (6 mm) under opening size
- Specify Parallel or Opposed
- Not recommended for blades installed vertically.
- Dampers more than one section wide or high and operated with one actuator will be jackshafted. Factory supplied actuators are shipped loose to be mounted extrenal as standard.
- Approximate damper weight is 6.5 lbs/sq.ft.



## **PERFORMANCE DATA - Model TBD-B** Airfoil Parallel or Opposed Blade Thermally Broken Control Damper (Blades Only)





Model TBD-B damper design at reduced lengths can withstand higher static pressure limits without sacrificing damper operation and performance. Static pressures above 8" WC will affect operation torgue value.

#### **Damper Limitations:**

Damper assembly Thermal Performance Rating Tested to ASTM C-1363-97: Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus and Replaces C236 and C-975 Test Methods.

			Press	ure Differ	ential	
		Width				
		12"	24"	36"	48"	60"
	12"	2	4	6	8	10
	18"	3	6	9	12	15
	24"	4	8	12	16	20
	30"	5	10	15	20	25
ht	36"	6	12	18	24	30
Heig	42"	7	14	21	28	35
	48"	8	16	24	32	40
	54"	9	18	27	36	45
	60"	10	20	30	40	50
	66"	11	22	33	44	5
	72"	12	24	36	48	60

Leakage Ratings are based on AMCA Standard 500-D-97 using test set-up Fig. 5.4. Data is based on a Leakage Correction Factor.

#### Leakage Correction Factor

Damper Width	Static Pressure in.wg						
	2"	3"	4"	5"	6"	7"	8"
12" - 60"	1.44	1.64	2.00	2.22	2.44	2.64	2.82

Use of correction factors will give leakage values at greater than 1" pressures.



#### Leakage Total cfm Leakage at 1 in. w.g. Static

2 As part of our continuous improvement program, we reserve the right to make further improvements without notice.

Tag:	Engineer:	
Project:	Contractor:	
Location:	Architect:	Model TBD-BF
Date:	Submitted by:	Airfoil Parallel or Opposed Blade Thermally Broken Control Damper
		(Diadaa and Ename)

The TBD-BF is a low leakage extruded aluminum control damper with insulated thermally broken damper blades and frame designed for Extreme Low Temperature applications. (For thermally broken blades only see NCA Model TBD-B). The extruded aluminum damper frame is thermally broken in two locations on all sides of the damper. These breaks isolate each of the three sections (interior, center and exterior) of the damper. The blades are insulated with a two part high-density polyurethane foam. Each blade is thermally broken along with the frame in order to prevent temperature transfer when the damper is fully closed.

## Standard Construction:

- FRAME: Hat shaped, 6" wide x 1 7/8" height x .125" thick (152 mm x 48 mm x 3 mm) nominal 6063-T6/T52 extruded aluminum with 2 thermal breaks filled with polyurethane and debridged for thermal isolation.
- BLADES: Airfoil profile, 6"wide x .080" thick (152 mm x 2 mm) nominal 6063-T6/T52 extruded aluminum injected with a two part polyurethane (CFC) free foam, and debridged for thermal isolation.
- **BEARINGS:** Double-sealed with celcon inner bearing designed to eliminate any metal-to-metal or metal-to-bearing riding surfaces.
- AXLES: 1/2" (13 mm) diameter extruded aluminum, pin-lock design, interlocking into blade section.
- LINKAGE: Heavy gauge aluminum, concealed in frame. Crank arm permanently locked to blade axle by two stainless steel fasteners.
- **BLADE SEALS:** Extreme low temperature seal system with extruded silicone rubber that fits into a ribbed groove insert in blades.

JAMB SEALS: Flexible metal, pressure sensitive.

#### FINISH: Mill aluminum.

TEMP LIMITS: -70° F to +200° F (-57° C to +93° C)

#### **MINIMUM DAMPER SIZE:**

Single Blade (Parallel): 8"w x 10-7/8"h (203 mm x 276 mm). Multi Blade (Opposed): 12"w x 12"h (305 mm x 305 mm).

24V

#### MAXIMUM DAMPER SIZE:

Single Section: 60" w x 72" h (1524 mm x 1829 mm) Multi Section: Unlimited.

## **Options**:

**Operators:** 

Actuator: 120V

Manual Quadrant

Jackshafting

Auxilliary Switch

Explosion Proof Housing

.125 Nominal Construction



#### Notes:

0

10

- Dampers fabricated 1/4" (6 mm) under opening size.
- Specify Parallel or Opposed.
- Not recommended for blades installed vertically.
- Dampers more than one section wide or high and operated with one actuator will be jackshafted. Factory supplied actuators are shipped loose to be mounted extrenal as standard.

Mullion (typ.) Damper Width (0.D)

· Approximate damper weight is 6.5 lbs/sq.ft.

Pneumatic

Submittal - Model TBD-BF - 0418



#### **PERFORMANCE DATA - Model TBD-BF**

Airfoil Parallel or Opposed Blade Thermally Broken Control Damper (Blades & Frame)



Model TBD-BF damper design at reduced lengths can withstand higher static pressure limits without sacrificing damper operation and performance. Static pressures above 8" WC will affect operation torque value.

Static Pressure in wg

#### **Damper Limitations:**

Damper assembly Thermal Performance Rating Tested to ASTM C-1363-97: Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus and Replaces C236 and C-975 Test Methods.

	Total cfm Leakage at 1 in.wg Static Pressure Differential								
				Width					
	12" 24" 36" 48" 48								
	12"	2	4	6	8	10			
	18"	3	6	9	12	15			
	24"	4	8	12	16	20			
	30"	5	10	15	20	25			
t	36"	6	12	18	24	30			
eigh	42"	7	14	21	28	35			
н	48"	8	16	24	32	40			
	54"	9	18	27	36	45			
	60"	10	20	30	40	50			
	66"	11	22	33	44	55			
	72"	12	24	36	48	60			

Leakage

Leakage Ratings are based on AMCA Standard 500-D-97 using test set-up Fig. 5.4. Data is based on a closing torque of 5 in.lb./sq.ft. for dampers less than 5 sq.ft. having a closing torque of 40 in.lb. damper closing torque is applies to damper operating shaft.

#### **Leakage Correction Factor**

	Damper Width 12" - 60"		5	Static F	ressur	re in.w	g	
		2"	3"	4"	5"	6"	7"	8"
		1.44	1.64	2.00	2.22	2.44	2.54	2.82

Use of correction factors will give leakage values at greater than 1" pressures.

