



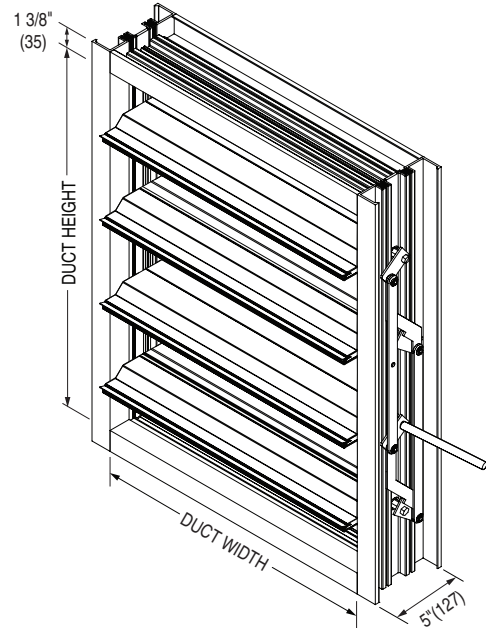
# THERMALLY BROKEN CONTROL DAMPER EXTRUDED ALUMINUM • THERMALLY BROKEN BLADES AND FRAME • HIGH PERFORMANCE MODEL: 2200TBF

AMCA  
LICENSED

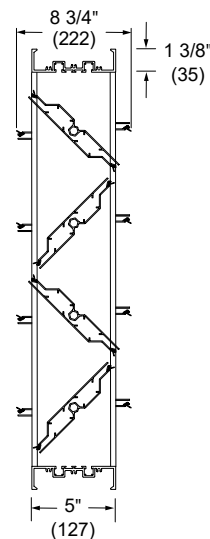
Model 2200TBF is an ultra-low leakage, high-performance thermally efficient control damper featuring extruded aluminum thermally broken insulated blades and a thermally broken frame. The 2200TBF is compliant with IECC (International Energy Construction Code) with a leakage rating of 3 cfm/ft<sup>2</sup> @ 1" w.g. (15.2 L/s/m<sup>2</sup> @ 0.25 kPa) or less. This premium damper will minimize the transfer of thermal energy and reduce condensation in extreme temperature conditions.

## STANDARD CONSTRUCTION:

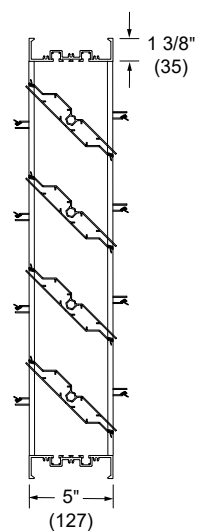
- FRAME:** 5" x 1 3/8" x 0.125" (127 x 35 x 3.2) extruded aluminum, thermally broken. Quick Connect.
- BLADES:** 6063-T6 extruded aluminum thermally broken insulated airfoil blades.
- BLADE ACTION:** Opposed or Parallel.
- LINKAGE:** Concealed side type totally enclosed within the frame and out of the air stream. Plated Steel.
- BEARINGS:** 1/2" (13) dia. dual action, synthetic.
- AXLES:** 7/16" (11) dia. plated steel, hexagonal.
- DRIVE SHAFT:** 6" (152) long x 1/2" (13) rigid drive shaft.
- BLADE SEALS:** Silicone. Mechanically fastened.
- JAMB SEALS:** Silicone. Mechanically fastened.
- TEMPERATURE RANGE:** -70°F to 200°F (-57°C to 93°C).
- LEAKAGE:** Class 1A @ 1" w.g. (0.25 kPa)  
Class 1 @ 4" w.g. (1.0 kPa)
- PRESSURE:** Up to 8 in. w.g. (2 kPa) pressure differential.
- VELOCITY:** Up to 4,000 fpm (20.3 m/s).



## ☐ OB OPPOSED BLADE



## ☐ PB PARALLEL BLADE



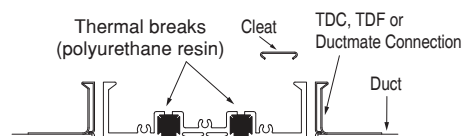
| Frame Type   |                | Quick Connect            |                            | Channel, Flange           |                             |
|--------------|----------------|--------------------------|----------------------------|---------------------------|-----------------------------|
| Blade Action |                | Parallel                 | Opposed                    | Parallel                  | Opposed                     |
| Min. Size    |                | 6" x 6"<br>(152 x 152)   | 6" x 9 1/2"<br>(152 x 241) | 8" x 8"<br>(203 x 203)    | 8" x 12 1/2"<br>(203 x 318) |
| Max. Size    | Single Section | 60" x 76" (1524 x 1930)  |                            | 60" x 78" (1524 x 1981)   |                             |
|              | Multi-Section  | 96" x 152" (2438 x 3861) |                            | 240" x 234" (6096 x 5944) |                             |

## OPTIONS:

- ☐ SSLA Type 304 Stainless Steel Linkage/Axles
- ☐ Other \_\_\_\_\_.

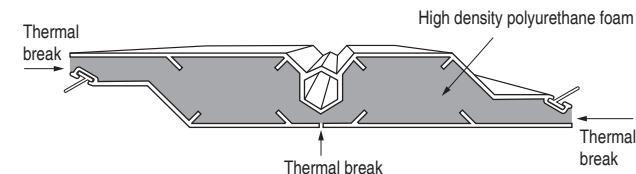
## ☐ QC Quick Connect Flange Frame:

### STANDARD:



When ordering the Quick Connect Frame, the inner dimensions of the damper frame correspond to the duct size.

### INSULATED BLADE:



## SCHEDULE TYPE:

## PROJECT:

## ENGINEER:

## CONTRACTOR:

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Dimensions are in inches (mm).

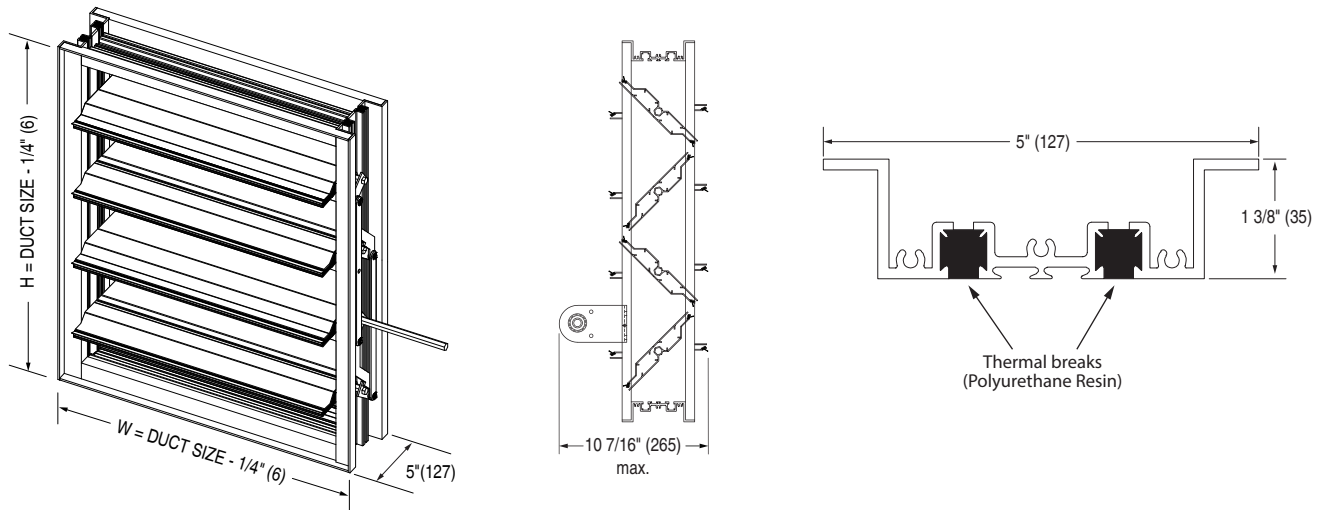
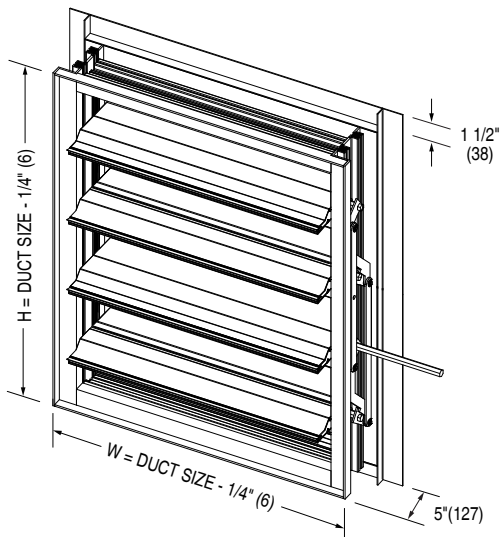
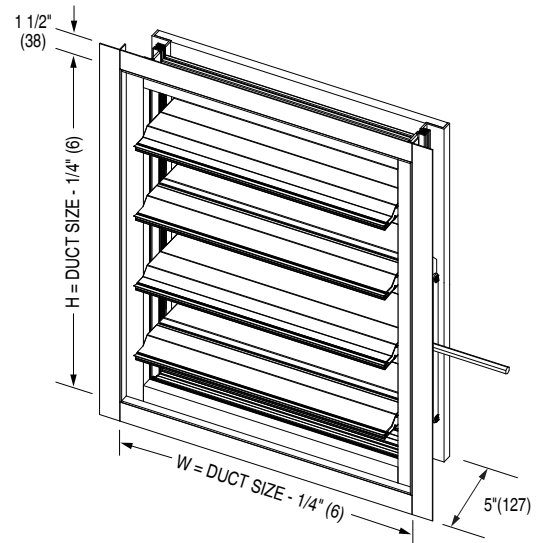
| DATE       | B SERIES | SUPERSEDES | DRAWING NO. |
|------------|----------|------------|-------------|
| 4 - 2 - 25 | 2200     | New        | 2200TBF     |

**ACTUATORS:**

A variety of electric actuators are available, factory mounted by Nailor. Dampers ordered with the QC Quick Connect frame are suitable for external actuator mounting only. Factory actuators are sized for up to 1500 fpm (8 m/s) and 2" w.g. (498 Pa) system pressure.

**FRAME OPTIONS:**
☐ **HC Hat Channel Frame**

Multiple section assemblies are supplied with jackshafts.

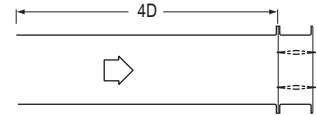

☐ **FF Front Flange**

☐ **FR Rear Flange**

**SCHEDULE TYPE:**
**PROJECT:**
**ENGINEER:**
**CONTRACTOR:**

Page 2 of 4  
 Dimensions are in inches (mm).

| DATE       | B SERIES | SUPERSEDES | DRAWING NO. |
|------------|----------|------------|-------------|
| 4 - 2 - 25 | 2200     | New        | 2200TBF     |

### AMCA PRESSURE DROP

Dampers are tested and AMCA certified in accordance with AMCA Standard 500-D.



### AMCA Figure 5.2 Half ducted (medium pressure drop)

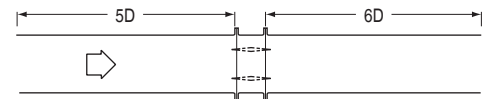
| 12 x 12 (305 mm x 305 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .05                    |
| 1000                      | .13                    |
| 1500                      | .30                    |
| 2000                      | .53                    |
| 2500                      | .83                    |
| 3000                      | 1.21                   |
| 3500                      | 1.65                   |
| 4000                      | 2.17                   |

| 24 x 24 (610 mm x 610 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .02                    |
| 1000                      | .06                    |
| 1500                      | .14                    |
| 2000                      | .24                    |
| 2500                      | .38                    |
| 3000                      | .54                    |
| 3500                      | .74                    |
| 4000                      | .97                    |

| 36 x 36 (914 mm x 914 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .01                    |
| 1000                      | .05                    |
| 1500                      | .11                    |
| 2000                      | .19                    |
| 2500                      | .29                    |
| 3000                      | .42                    |
| 3500                      | .57                    |
| 4000                      | .74                    |

| 12 x 48 (305 mm x 1219 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .06                    |
| 1000                       | .23                    |
| 1500                       | .51                    |
| 2000                       | .91                    |
| 2500                       | 1.43                   |
| 3000                       | 2.05                   |
| 3500                       | 2.79                   |
| 4000                       | 3.64                   |

| 48 x 12 (1219 mm x 305 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .03                    |
| 1000                       | .12                    |
| 1500                       | .24                    |
| 2000                       | .41                    |
| 2500                       | .64                    |
| 3000                       | .91                    |
| 3500                       | 1.23                   |
| 4000                       | 1.57                   |



### AMCA Figure 5.3 Fully ducted (lowest pressure drop)

| 12 x 12 (305 mm x 305 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .006                   |
| 1000                      | .05                    |
| 1500                      | .12                    |
| 2000                      | .21                    |
| 2500                      | .34                    |
| 3000                      | .50                    |
| 3500                      | .69                    |
| 4000                      | .91                    |

| 24 x 24 (610 mm x 610 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .007                   |
| 1000                      | .03                    |
| 1500                      | .05                    |
| 2000                      | .09                    |
| 2500                      | .14                    |
| 3000                      | .20                    |
| 3500                      | .28                    |
| 4000                      | .37                    |

| 36 x 36 (914 mm x 914 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .005                   |
| 1000                      | .02                    |
| 1500                      | .04                    |
| 2000                      | .08                    |
| 2500                      | .12                    |
| 3000                      | .18                    |
| 3500                      | .24                    |
| 4000                      | .31                    |

| 12 x 48 (305 mm x 1219 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .03                    |
| 1000                       | .10                    |
| 1500                       | .23                    |
| 2000                       | .41                    |
| 2500                       | .65                    |
| 3000                       | .95                    |
| 3500                       | 1.30                   |
| 4000                       | 1.71                   |

| 48 x 12 (1219 mm x 305 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .01                    |
| 1000                       | .05                    |
| 1500                       | .10                    |
| 2000                       | .17                    |
| 2500                       | .26                    |
| 3000                       | .37                    |
| 3500                       | .51                    |
| 4000                       | .67                    |



### AMCA Figure 5.5 Plenum mounted (highest pressure drop)

| 12 x 12 (305 mm x 305 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .06                    |
| 1000                      | .19                    |
| 1500                      | .45                    |
| 2000                      | .81                    |
| 2500                      | 1.27                   |
| 3000                      | 1.83                   |
| 3500                      | 2.51                   |
| 4000                      | 3.29                   |

| 24 x 24 (610 mm x 610 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .04                    |
| 1000                      | .19                    |
| 1500                      | .43                    |
| 2000                      | .77                    |
| 2500                      | 1.20                   |
| 3000                      | 1.72                   |
| 3500                      | 2.35                   |
| 4000                      | 3.11                   |

| 36 x 36 (914 mm x 914 mm) |                        |
|---------------------------|------------------------|
| Velocity (fpm)            | Pressure Drop (in. wg) |
| 500                       | .04                    |
| 1000                      | .16                    |
| 1500                      | .36                    |
| 2000                      | .65                    |
| 2500                      | 1.02                   |
| 3000                      | 1.48                   |
| 3500                      | 2.02                   |
| 4000                      | 2.65                   |

| 12 x 48 (305 mm x 1219 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .08                    |
| 1000                       | .31                    |
| 1500                       | .69                    |
| 2000                       | 1.22                   |
| 2500                       | 1.92                   |
| 3000                       | 2.79                   |
| 3500                       | 3.82                   |
| 4000                       | 5.0                    |

| 48 x 12 (1219 mm x 305 mm) |                        |
|----------------------------|------------------------|
| Velocity (fpm)             | Pressure Drop (in. wg) |
| 500                        | .05                    |
| 1000                       | .19                    |
| 1500                       | .43                    |
| 2000                       | .76                    |
| 2500                       | 1.18                   |
| 3000                       | 1.68                   |
| 3500                       | 2.25                   |
| 4000                       | 2.91                   |

**SCHEDULE TYPE:**

**PROJECT:**

**ENGINEER:**

**CONTRACTOR:**

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 Dimensions are in inches (mm).

**DATE**

**B SERIES**

**SUPERSEDES**

**DRAWING NO.**

4 - 2 - 25

2200

New

2200TBF



# THERMALLY BROKEN CONTROL DAMPER EXTRUDED ALUMINUM • THERMALLY BROKEN BLADES AND FRAME • HIGH PERFORMANCE MODEL: 2200TBF

## AMCA CERTIFIED AIR LEAKAGE

| Damper Width<br>inches (mm) | 1 in. wg.<br>(0.25 kPa) | 4 in. wg.<br>(1.0 kPa) | 6 in. wg.<br>(1.5 kPa) | 8 in. wg.<br>(2.0 kPa) |
|-----------------------------|-------------------------|------------------------|------------------------|------------------------|
| 12" (305)                   | 1 A                     | 1                      | 1                      | 1                      |
| 36" (914)                   | 1 A                     | 1                      | 1                      | 1                      |
| 60" (1524)                  | 1 A                     | 1                      | N/A                    | N/A                    |

Tested for leakage in accordance with ANSI/AMCA Standard 500-D, Figure 5.5.

## LEAKAGE CLASS DEFINITIONS:

Leakage Class 1A: 3 cfm/ft<sup>2</sup> @ 1 in. w.g. (0.015 L/s/ m<sup>2</sup> @ 0.25 kPa)

Leakage Class 1: 4 cfm/ft<sup>2</sup> @ 1 in. w.g. (0.20 L/s/ m<sup>2</sup> @ 1.0 kPa)

8 cfm/ft<sup>2</sup> @ 4 in. w.g. (0.41 L/s/ m<sup>2</sup> @ 1.0 kPa)

11 cfm/ft<sup>2</sup> @ 8 in. w.g. (0.61 L/s/ m<sup>2</sup> @ 2.0 kPa)

## AMCA CERTIFIED THERMAL EFFICIENCY PERFORMANCE

Model 2200TBF has a Thermal Efficiency Ratio of 910%.

A dampers thermal efficiency ratio (E) is a comparison of the thermal performance of the tested damper with that of a standard reference damper, which is a 3V blade damper with blade and jamb seals. A damper with the same thermal efficiency as the reference damper would have an E of 0%. A damper that is twice as efficient as the reference damper would have an E of 100%.

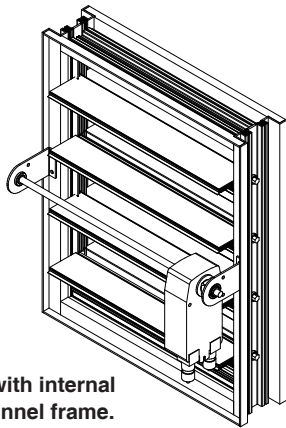
Testing was conducted in accordance with ANSI/AMCA Standard 500-D, Figure 5.10 on a 36" x 36" sample.

## TORQUE

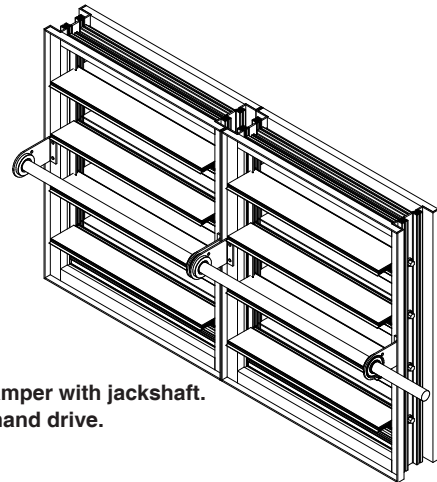
Data is based on a torque of 9.0 in.lb./ft<sup>2</sup> (0.56 N-m) applied to close and seat the damper during the tests.

## JACKSHAFTS AND MULTIPLE SECTION DAMPERS (HC Hat Channel Frame and FF, FR Flange Frames only)

Dampers larger than the maximum single section size are made up of two or more equal size sections. Single section dampers with internal mount actuators require a jackshaft. Jackshafts are 1/2" (25) or 1" (51) diameter dependent on damper size.



Single section damper with internal mount actuator. Hat channel frame.



Two section damper with jackshaft. External right hand drive.



Nailor Industries Inc. certifies that the model 2200TBF 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 Programs. The AMCA Certified Ratings Seal applies to Air Leakage, Air Performance and Energy Efficiency ratings.



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B SERIES

SUPERSEDES

DRAWING NO.

4 - 2 - 25

2200

New

2200TBF