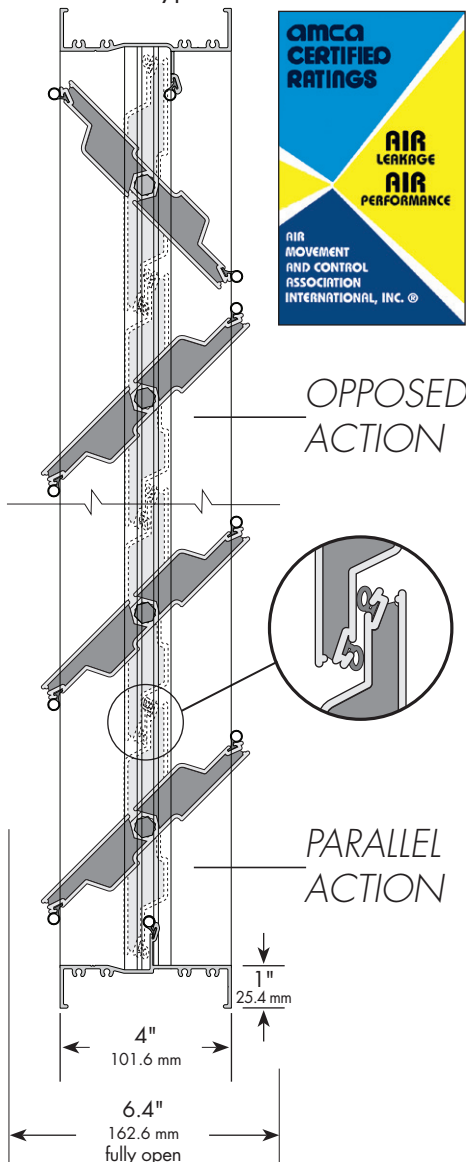


# SPECIFICATIONS

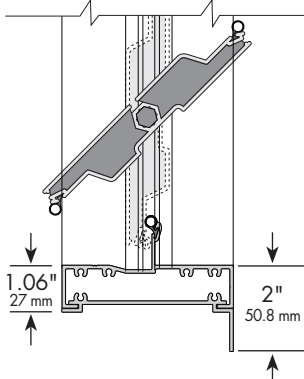
In Duct or  
Flanged to Duct  
Install Types



OPPOSED  
ACTION

PARALLEL  
ACTION

Extended Rear Flange  
Install Type



## S E R I E S 9 0 0 0 THERMALLY INSULATED DAMPER

1. Extruded aluminum (6063-T5) damper frame is not less than 0.080" (2.03 mm) in thickness. Damper frame is 4" (101.6 mm) deep x 1" (25.4 mm), with mounting flanges on both sides of frame. Damper frame has a 2" (50.8 mm) mounting flange on the rear of the damper, when ordered as Extended Rear Flange install type.
2. Blades are extruded aluminum (6063-T5) air-foil profiles, internally insulated with expanded polyurethane foam and thermally broken. Complete blade has an insulating factor of R-2.29 and a temperature index of 55 (tested to AAMA 1502.7 Test Method).
3. Blade seals are extruded EPDM. Frame seals are extruded silicone. Seals are secured in an integral slot within the aluminum extrusions. Blade and frame seals are mechanically fastened to prevent shrinkage and movement over the life of the damper.
4. Bearings are composed of a Celcon inner bearing (fixed around a 7/16" (11.11 mm) aluminum hexagon blade pivot pin) rotating within a polycarbonate outer bearing inserted in the frame. This eliminates action between metal-to-metal or metal-to-plastic riding surfaces.
5. Adjustable 7/16" (11.11 mm) hexagonal drive rod, U-bolt fastener, and hexagonal retaining nuts are zinc-plated steel. These provide a positive connection to blades and linkage.
6. Aluminum and corrosion-resistant zinc-plated steel linkage hardware is installed in the frame side, complete with cup-point trunnion screws for a slip-proof grip.
7. Dampers are designed for operation in temperatures ranging from -40°F (-40°C) to 212°F (100°C).
8. Leakage Class 1A at 1 in w.g. (0.25 kPa) static pressure differential. Standard air leakage data is certified under the AMCA Certified Ratings Program.
9. Dampers are custom made to required size, without blanking off free area.
10. Dampers are available with either opposed blade action or parallel blade action.
11. Dampers are available in three install types: i.e., Installed in Duct, Flanged to Duct, or Extended Rear Flange. (See page 4 for details)
12. Installation of dampers must be in accordance with TAMCO's current installation guidelines, provided with each damper shipment. (Note that all technical information available on TAMCO's web site at [www.tamcodampers.com](http://www.tamcodampers.com) supersedes and takes precedence over all information contained within the printed catalog.)
13. Intermediate structural support is required to resist applied pressure loads for dampers that consist of two or more sections in both height and width. (See TAMCO Aluminum Damper Installation Guidelines.)

**OPTIONS** (For each option listed, replace the specification lines above with their corresponding specification lines below.)

### SC - SEVERE COLD TEMPERATURE OPTION:

3. Blade and frame seals are extruded silicone, for reduced air leakage at colder temperatures. Blade and frame seals are secured in an integral slot within the aluminum extrusions and are mechanically fastened to prevent shrinkage and movement over the life of the damper.

### MR - MOISTURE RESISTANCE OPTION:

1. Extruded aluminum (6063-T5) damper frame is not less than 0.080" (2.03 mm) in thickness. Damper frame is 4" (101.6 mm) deep x 1" (25.4 mm), with mounting flanges on both sides of frame. Damper frame has a 2" (50.8 mm) mounting flange on the rear of the damper when ordered as Extended Rear Flange install type. Frame is assembled using stainless steel screws.
5. Adjustable 7/16" (11.11 mm) hexagonal drive rod, U-bolt fastener, and hexagonal retaining nuts are stainless steel. These provide a positive connection to blades and linkage
6. Aluminum and stainless steel linkage hardware is installed in the frame side, complete with stainless steel cup-point trunnion screws for a slip-proof grip.

### SW - SALT WATER RESISTANCE OPTION:

1. Extruded aluminum (6063-T5) damper frame is not less than 0.080" (2.03 mm) in thickness. Damper frame is 4" (101.6 mm) deep x 1" (25.4 mm), with mounting flanges on both sides of frame. Damper frame has a 2" (50.8 mm) mounting flange on the rear of the damper when ordered as Extended Rear Flange install type. Aluminum frame is clear anodized to a minimum thickness of 0.7 mil (18 microns) deep. Frame is assembled using stainless steel screws.
2. Blades are extruded aluminum (6063-T5) air-foil profiles, internally insulated with expanded polyurethane foam and are thermally broken. Complete blade has an insulating factor of R-2.29 and a temperature index of 55 (tested to AAMA 1502.7 Test Method). Extruded aluminum blades are clear anodized to a minimum thickness of 0.7 mil (18 microns) deep.
3. Blade and frame seals are extruded silicone, for reduced air leakage at colder temperatures. Blade and frame seals are secured in an integral slot within the aluminum extrusions and are mechanically fastened to prevent shrinkage and movement over the life of the damper.
5. Adjustable 7/16" (11.11 mm) hexagonal drive rod, U-bolt fastener, and hexagonal retaining nuts are stainless steel. These provide a positive connection to blades and linkage.
6. Anodized aluminum and stainless steel linkage hardware is installed in the frame side, complete with stainless steel cup-point trunnion screws for a slip-proof grip.

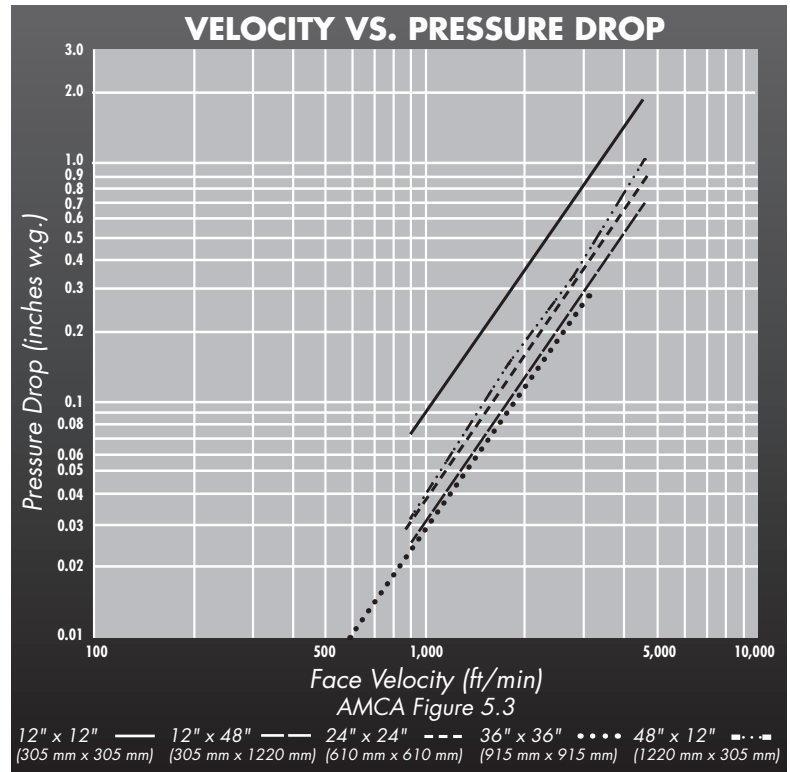
# PERFORMANCE DATA

S E R I E S 9 0 0 0 (including MR Option)

## THERMALLY INSULATED DAMPER



T.A. Morrison & Co. Inc. certifies that the TAMCO Series 9000 and Series 9000 with MR Option Thermally Insulated Dampers shown herein are 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 Certified Ratings Seal applies to air leakage and air performance ratings.



## TAMCO LEAKAGE RATING

Damper Width inches (mm)	1 in. w.g. 0.25 kPa	4 in. w.g. 1.0 kPa
0.0 to 12.0 (0 - 305)	1A	1
12.1 to 36.0 (306 to 915)	1A	1
36.1 to 48.0 (916 to 1220)	1A	1
48.1 to 60.0 (1221 to 1524)	1A	1

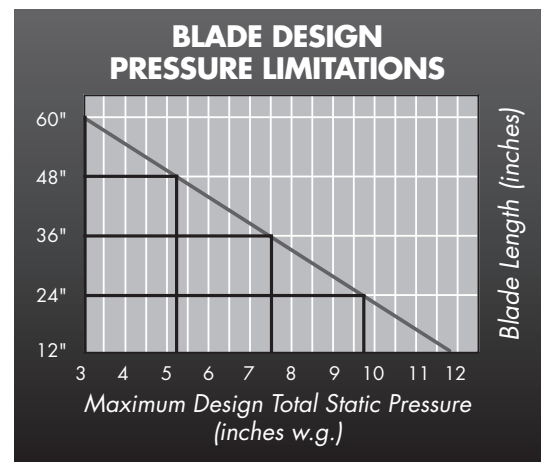
## LEAKAGE CLASS DEFINITIONS

Pressure Class	LEAKAGE ft <sup>3</sup> /min/ft <sup>2</sup> (l/s/m <sup>2</sup> )	
	1 in. w.g. 0.25 kPa	4 in. w.g. 1.0 kPa
1A	3 (15.2)	n/a
1	4 (20.3)	8 (40.6)
2	10 (50.8)	20 (102)
3	40 (203)	80 (406)

Leakage testing was conducted in accordance with ANSI/AMCA Standard 500-D, Figure 5.4. Data are based on a torque of 10.8 in-lb/ft<sup>2</sup> (13.1 N-m/m<sup>2</sup>) and a minimum of 70 in-lb (7.9 N-m) applied to close and seat the opposed blade damper during the test. Air leakage is based on operation between 32°F (0°C) and 120°F (49°C).

The following sizes of TAMCO Series 9000 dampers were tested:

12" x 48" (305 mm x 1220 mm), 36" x 36" (915 mm x 915 mm), 48" x 36" (1220 mm x 915 mm), 60" x 36" (1524 mm x 915 mm).



Series 9000 dampers, whose blade length exceeds the maximum design pressure, may be reconfigured to maintain a blade length compatible with the required system pressure by increasing the number of sections per damper and thereby reducing each damper section's blade length. Appropriate intermediate structural support will be required for all multiple-section damper assemblies. (Refer to line 13 in the specifications on page 1 and to TAMCO's Aluminum Damper Installation Guidelines.)

Example: 1 section damper of 60" w x 36" h (1524 mm x 915 mm) at 5 in. w.g. (1.24 kPa) would need to be built in 2 sections of 30" w x 36" h (762 mm x 915 mm).

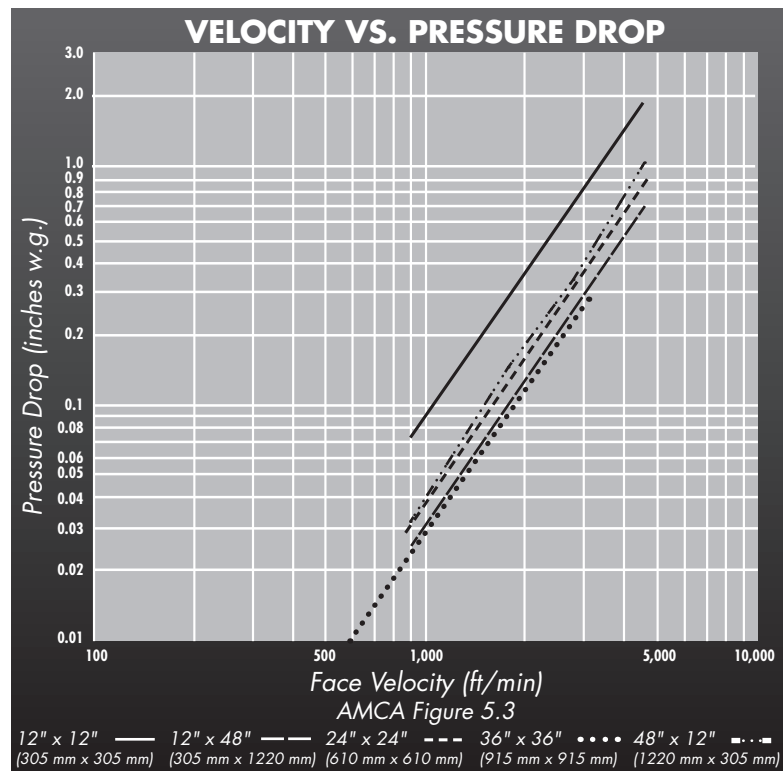
# PERFORMANCE DATA

S E R I E S 9 0 0 0 with SC or SW Options

## THERMALLY INSULATED DAMPER



T.A. Morrison & Co. Inc. certifies that the TAMCO Series 9000 and Thermally Insulated Dampers with SC or SW Options shown herein are 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 Certified Ratings Seal applies to air leakage and air performance ratings.



## TAMCO LEAKAGE CLASS RATING

Damper Width inches (mm)	1 in. w.g. 0.25 kPa	4 in. w.g. 1.0 kPa	6 in. w.g. 1.5 kPa	8 in. w.g. 2.0 kPa
0.0 to 12.0 (0 - 305)	1A	1	1	1
12.1 to 36.0 (306 to 915)	1A	1	1	1
36.1 to 48.0 (916 to 1220)	1A	1	1	1
48.1 to 60.0 (1221 to 1524)	1A	1	n/a	n/a

**\*NOTE:** TAMCO Leakage Class Rating is not provided for dampers measuring more than 48" (1220 mm) wide at 6 in. w.g. (1.5 kPa) and at 8 in. w.g. (2.0 kPa), as the recommended blade length is exceeded at these static pressures. (Refer to the Blade Design Pressure Limitations Chart.)

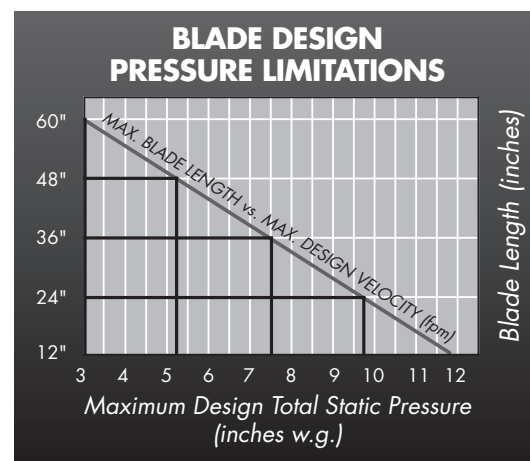
## AMCA LEAKAGE CLASS DEFINITIONS

Pressure Class	LEAKAGE CFM/ft <sup>2</sup> (l/s/m <sup>2</sup> )			
	1 in. w.g. 0.25 kPa	4 in. w.g. 1.0 kPa	6 in. w.g. 1.5 kPa	8 in. w.g. 2.0 kPa
1A	3 (15.2)	n/a	n/a	n/a
1	4 (20.3)	8 (40.6)	9.8 (49.0)	11.3 (56.6)
2	10 (50.8)	20 (102)	24.5 (125)	28.3 (288)
3	40 (203)	80 (406)	98 (497)	113 (574)

Leakage testing was conducted in accordance with ANSI/AMCA Standard 500-D, Figure 5.4. Data are based on a torque of 10.8 in-lb/ft<sup>2</sup> (13.1 N-m/m<sup>2</sup>) applied to close and seat the opposed blade damper during the test. Air leakage is based on operation between 32°F (0°C) and 120°F (49°C).

The following sizes of TAMCO Series 9000 Dampers with SC or SW Options were tested:

12" x 48" (305 mm x 1220 mm), 36" x 36" (915 mm x 915 mm), 48" x 36" (1220 mm x 915 mm), 60" x 36" (1524 mm x 915 mm).



Series 9000 dampers, whose blade length exceeds the maximum design pressure, may be reconfigured to maintain a blade length compatible with the required system pressure by increasing the number of sections per damper and thereby reducing each damper section's blade length. Appropriate intermediate structural support will be required for all multiple-section damper assemblies. (Refer to line 13 in the specifications on page 1 and to TAMCO's Aluminum Damper Installation Guidelines.)

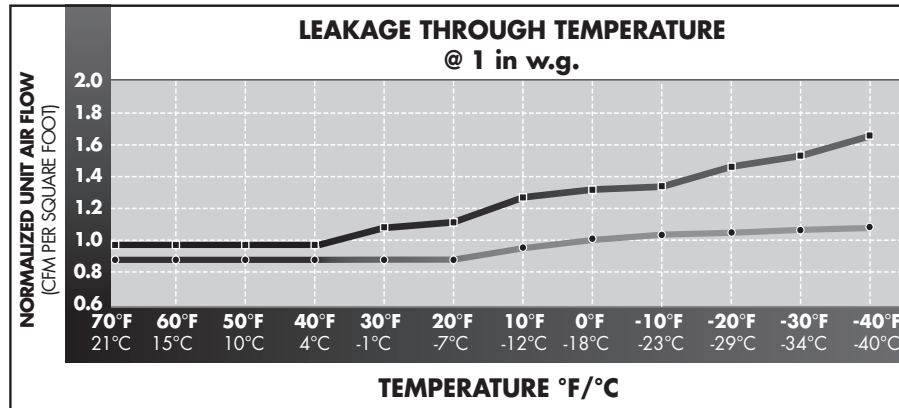
Example: 1 section damper of 60" w x 36" h (1524 mm x 915 mm) at 5 in. w.g. (1.24 kPa) would need to be built in 2 sections of 30" w x 36" h (762 mm x 915 mm).

# PERFORMANCE DATA

S E R I E S 9 0 0 0

## THERMALLY INSULATED DAMPER WITH SILICONE UPGRADE OPTIONS (SC & SW)

### STANDARD VS. SILICONE UPGRADE OPTION LEAKAGE COMPARISON GRAPH



9000 EPDM

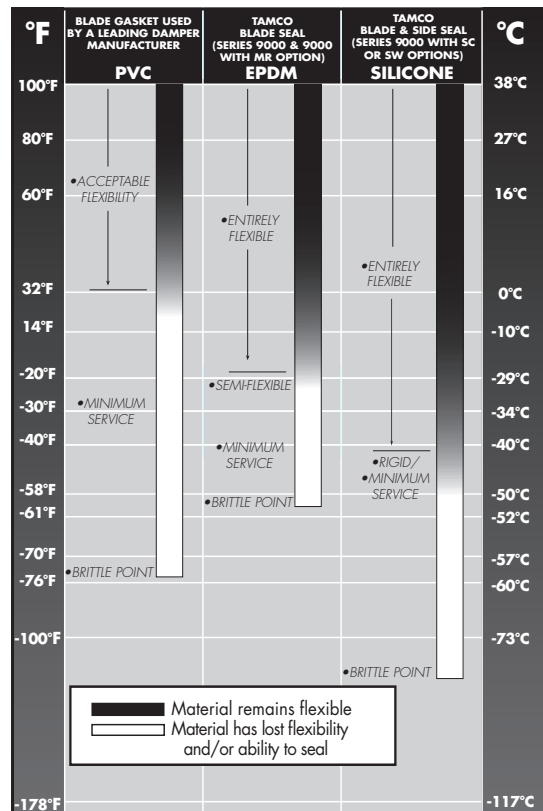
9000 SILICONE

Damper tests were conducted in a laboratory cold room to determine the effects of colder and severe cold temperatures (down to -40°F (-40°C)) on sealing gaskets and leakage rates.

*NOTE: Leakage rates shown in this graph are not licensed to bear the AMCA Seal.*

*There is no AMCA standard dealing with the testing of leakage in temperatures below 32°F (0°C).*

### G A S K E T S A N D S E A L S EFFECTS OF COLD



Minimum service temperatures and brittle points, as stated by material manufacturers.

Flexibility, rigidity, and suitability status of various materials were determined by observation and operation of dampers in both cold room and cold box environments.

# INSTALL TYPES

## S E R I E S 9 0 0 0 THERMALLY INSULATED DAMPER

*Always provide opening width and height dimensions, when ordering.*

*Width dimension is always parallel to blades.*

*Height dimension is always perpendicular to blades.*

### INSTALLED IN DUCT TYPE

*Finished damper O.D. is ½" (12.7 mm) less than opening width & height dimensions.*

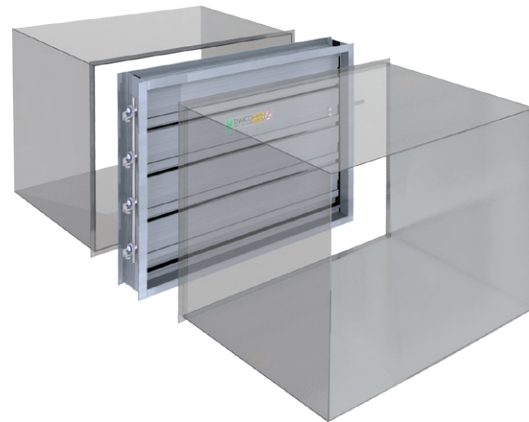
Minimum section size:	6½"w x 6¾"h	(166 mm x 172 mm)
Maximum section size:	25 ft²	(2.3 m²)
	60"w x 60"h or	(1524 mm x 1524 mm) or
	48"w x 75"h	(1220 mm x 1905 mm)



### FLANGED TO DUCT TYPE

*Finished damper O.D. is 2" (50.8 mm) greater than opening width & height dimensions*

Minimum section size:	4½"w x 4¼"h	(115 mm x 108 mm)
Maximum section size:	25 ft²	(2.3 m²)
	60"w x 60"h or	(1524 mm x 1524 mm) or
	48"w x 75"h	(1220 mm x 1905 mm)



### EXTENDED REAR FLANGE TYPE

*Finished damper O.D. is 4" (101.6 mm) greater than opening width & height dimensions*

Minimum section size:	4½"w x 4¼"h	(115 mm x 108 mm)
Maximum section size:	25 ft²	(2.3 m²)
	60"w x 60"h or	(1524 mm x 1524 mm) or
	48"w x 75"h	(1220 mm x 1905 mm)

*Extended Rear Flange install type dampers are not designed so that the front of the damper may be inserted into an opening, as the side frame members extend to the full height of the rear flange.*



**See Page 6 for Square to Round Transition Install Type**



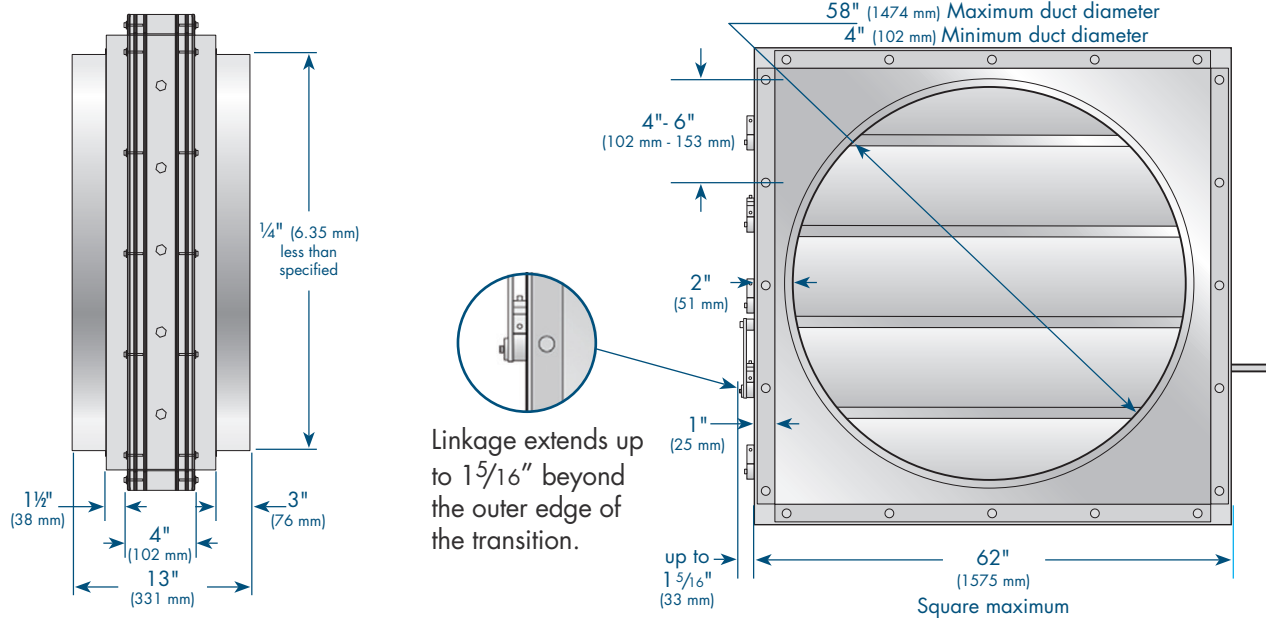
# INSTALL TYPES

## S E R I E S 9 0 0 0 THERMALLY INSULATED DAMPER

Always provide duct diameter dimension when ordering.  
If using TAMCO Connect software to submit orders, enter diameter dimension in both the width and height fields.

### SQUARE TO ROUND TRANSITION

- Transition pieces are a minimum of 18 ga. galvanized steel for Series 9000 dampers, when ordered as standard or with the SC Option.
- Transition pieces are 304 stainless steel, when Series 9000 dampers are ordered with MR or SW Options.
- Transition pieces and damper are sealed together.
- Dampers are built 4" (102 mm) larger than specified duct diameter. (Dampers are fabricated square.)
- Finished transition diameter is 1/4" (6.35 mm) less than specified duct diameter, providing clearance for mating duct which slides over round transition. This ensures free movement of damper blades.
- Minimum duct diameter: 4" (102 mm)  
Maximum duct diameter: 58" (1474 mm)  
Maximum section size: 25 ft<sup>2</sup> (2.3 m<sup>2</sup>)  
Maximum finished OD: 62"w x 62"h (1575 mm x 1575 mm)



#### Note:

- To reduce pressure drop, use Flanged to Duct mount type for sizes under 9 ft<sup>2</sup> (.83 m<sup>2</sup>).
- Suitable for operation in breathable air environments within stated temperature range.
- Dampers sized for duct openings exceeding 37 1/2" (953 mm) in height are equipped with a stiffener bar at mid-height to strengthen and maintain air leakage tolerances.
- Series 9000 dampers are *not* available as "narrow profile" type (constructed using only 4" (101.6 mm) deep blades).

#### For additional information, refer to:

- Series 9000, 9000 BF Pressure Drop
- Series 9000, 9000 BF Free Area Charts
- Aluminum Damper Standard Configurations
- Aluminum Damper Torque Requirements
- Multiple-Section Horizontal Jack Shafts
- Multiple-Section SW Horizontal Jack Shafts
- Configurations Using Vertical Jack Shafts
- Multiple-Section Damper Jumpers
- TAMCO Aluminum Damper Installation Guidelines