

# AMCA Publication 502-06 (R2009)

Damper Application Manual  
for Heating, Ventilating, and  
Air Conditioning



**AIR MOVEMENT AND CONTROL  
ASSOCIATION INTERNATIONAL, INC.**

The International Authority on Air System Components

# AMCA Publication 502-06 (R2009)

## Damper Application Manual for Heating, Ventilating, and Air Conditioning

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## AMCA Publications

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## Related AMCA Documents

### Related Publications

AMCA Publication 11	<i>Certified Ratings Program Operating Manual</i>
AMCA Publication 111	<i>Laboratory Accreditation Program</i>
AMCA Standard 500-D	<i>Laboratory Methods of Testing Dampers for Rating</i>
AMCA Standard 500-L	<i>Laboratory Methods of Testing Louvers for Rating</i>
AMCA Publication 501	<i>Application Manual for Louvers</i>
AMCA Publication 503	<i>Fire, Ceiling and Smoke Damper Application Manual</i>
AMCA Standard 510	<i>Methods of Testing Heavy Duty Dampers for Rating</i>
AMCA Publication 511	<i>Certified Ratings Program for Air Control Devices</i>
AMCA Standard 520	<i>Laboratory Methods of Testing Actuators</i>

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# Damper Application Manual for Heating, Ventilating, and Air Conditioning

## 1. Scope

The purpose of this publication is to provide information and important points to be considered when designing or specifying heating, ventilating, and air conditioning (HVAC) installations requiring dampers for use in temperatures from -28 °C to 121 °C (-20 °F to +250 °F), pressures to 2500 Pa (10 in. wg) and velocities to 25.4 m/s (5000 fpm). It is not the intent of this manual to be used for detailed specifications, rather it serves as a guide toward understanding the various types of dampers available and items to be considered for their proper use. For dampers classified as fire dampers, radiation dampers and smoke dampers, see AMCA Publication 503.

## 2. Damper Applications

Dampers are used when it is necessary to control pressure, temperature or flow in an air system. The following are functional categories of dampers in HVAC systems.

### 2.1 Volume control damper

Use volume control dampers when it is necessary to regulate flow at a specific location in an air system. These dampers are commonly single blade, parallel blade or opposed blade type. Manual, pneumatic and electric actuators, or other devices, are available to control the dampers.

### 2.2 Temperature control damper

Use pairs of temperature control dampers when it is necessary to control temperature at a specific location in an air system. This is usually accomplished by regulating two airstreams of different temperature. These damper pairs are commonly single blade, parallel blade, or opposed blade type linked together, or controlled together, in a face and bypass or mixing arrangement. Care should be taken when selecting opposed blade dampers in this application as they increase the plenum pressure when both dampers are at mid-stroke. Pneumatic or electric actuators are available to control the dampers.

### 2.3 Pressure control damper

Use pressure control dampers when it is necessary to control pressure at a specific location in an air system. These dampers are commonly single blade, parallel blade, or opposed blade type. Pneumatic, electric or manual actuators are available to control the dampers.

## 3. Damper Designs

### 3.1 Frames

Damper frames can generally be categorized as "u-channel", "hat channel", or "flat" type (see Figures 3.1A, 3.1B and 3.1C). They are often fabricated smaller than the clear opening (typically 6.4 mm (1/4 in.) less) for ease of installation. "Flanged" frame dampers (see Figure 3.1D) are generally fabricated to mate the damper flange with a duct flange.



Figure 3.1A  
U-Channel Frame

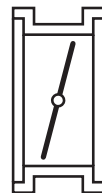


Figure 3.1B  
Hat Channel Frame



Figure 3.1C  
Flat Frame

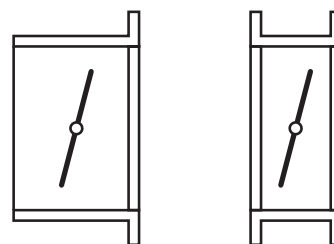


Figure 3.1D  
Flanged Frames