

Outlet dampers for centrifugal fans

WHEN TO USE OPPOSED BLADE VS. PARALLEL BLADE

PARALLEL BLADE

Parallel blade dampers are usually selected for volume control from wide open to 75% of wide open. A relatively large control arm swing provides sensitive control through a relatively small change in air volume. Parallel blade dampers also offer the best first-cost selection for simple open-closed damper requirements.

OPPOSED BLADE

Opposed blade dampers are selected for applications requiring volume control over a broad range, from wide open to 25% of wide open, as the control arm swing is more proportional to the damped effect.

BEARING AND TEMPERATURE OPTIONS

STANDARD DAMPERS

Standard dampers [Illustration 1] use aluminum sleeve bushings...suitable for applications requiring infrequent modulation.

Temperature options [temperature limits refer to airstream temperatures].

300°F. maximum for standard damper with standard paint.

800°F. maximum for standard damper with high temperature paint and SST case bushings.

1000°F. maximum for standard damper with high temperature paint and SST case bushings, blades and rods.

Stuffing-box option [Illustration 2] available with sleeve bushing design only...provides for minimum leakage through damper casing.

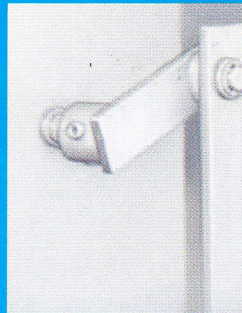


Illustration 1 - Sleeve bushing detail

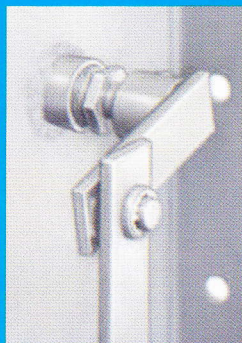


Illustration 2 - Stuffing-box option

CONSTRUCTION

Ball-bearing construction [Illustration 3] is recommended for applications requiring frequent modulation...vane

BALL - BEARING

Temperature options [temperature limits refer to airstream temperatures].

300°F. maximum for ball-bearing damper with standard paint.

800°F. maximum for ball-bearing damper with high temperature paint, SST case bushings, and heat sinks [Illustration 4].



Illustration 3 Ball bearing to 300°F



Illustration 4 Ball bearing to 800°F.

Temperature options shown pertain to outlet dampers only. The temperature capability of the fan may not be equal to that of the damper. The temperature capability of the actual fan/damper assembly is the lesser of the two components: the fan or the damper.

Outlet dampers for centrifugal fans

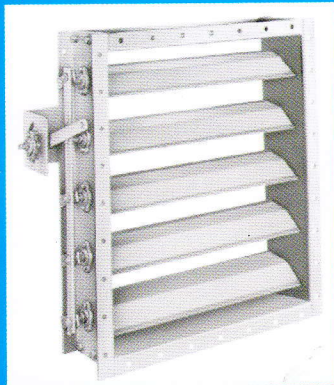
DAMPER FEATURES

Rugged construction for long service. Choice of parallel or opposed vanes to best suit dampering requirements. Choice of sleeve bushing or ball-bearing design to best suit modulation requirements. Serviceable design . . . removable linkage and removable casing side allow replacement of bearings and vanes . . . replacement part packages available.

Temperature ranges available to 1000°F. Stuffing-box option available for minimal leakage through casing. Locking quadrant furnished as standard.



**REMOVABLE
CASING DETAIL**

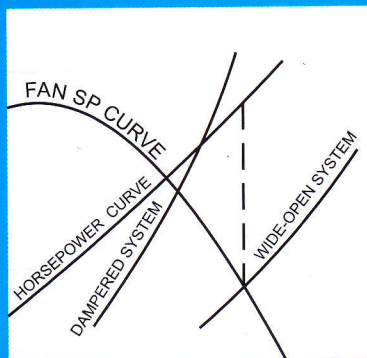


**PARALLEL BLADE
DAMPER**

THE EFFECTS OF DAMPERS ON FAN PERFORMANCE

Outlet dampers work on the principle of adding resistance to airflow. Consequently when a wide-open damper begins to close, a variable system is created causing fan performance to follow the fan's pressure curve to a new point of operation to the left of the original point. The result is lower volume and a new corresponding BHP requirement.

CURVE-1



Curve 1 shows a typical performance change when dampering a radial-bladed fan. The horsepower curve of a radial-bladed fan rises with volume; therefore, a reduction in volume yields a reduction in horsepower

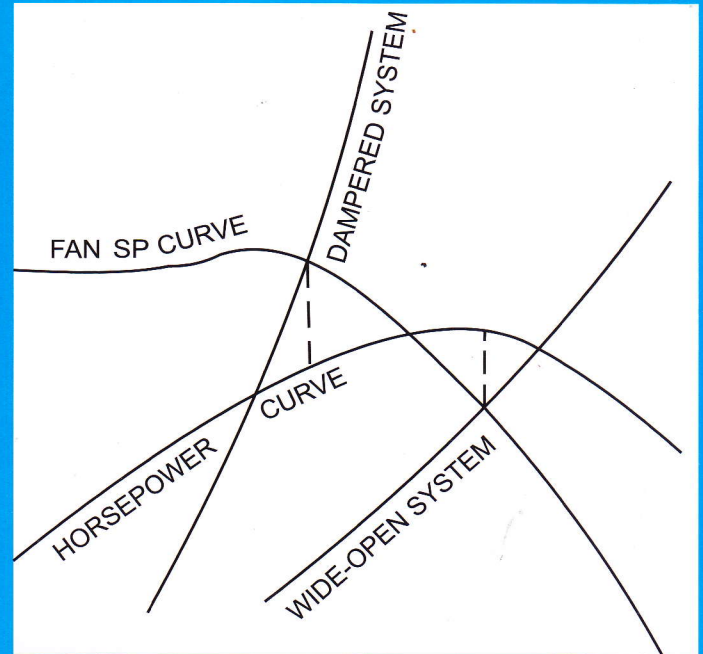


**OPPOSED BLADE
DAMPER**

Outlet dampers for centrifugal fans

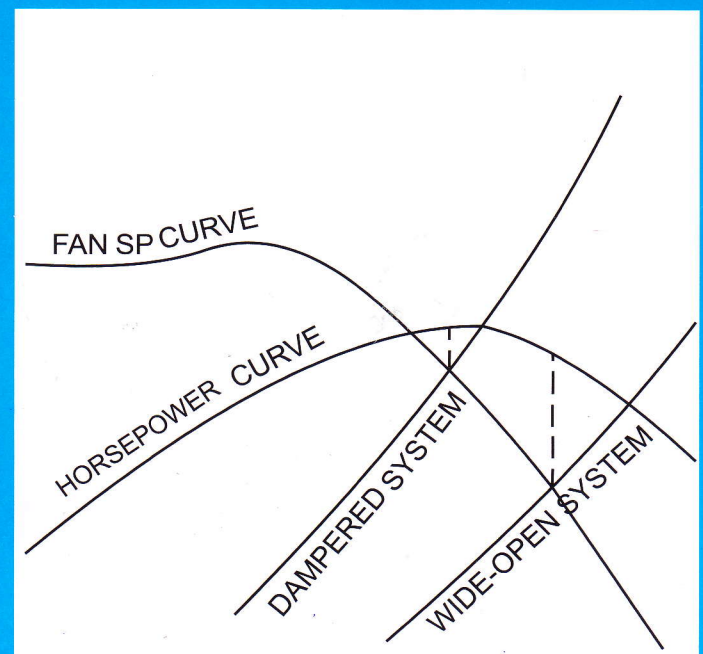
Curve 2 shows a typical performance change when dampering a back wardly inclined airfoil fan, which has a non-overloading horsepower characteristic. Since most fans of this type are selected for operation at a point near the maximum BHP, reduced volume normally produces reduced horsepower requirements.

CURVE-2



However, Curve 3 does show that dampering a “non-overloading” type fan from a point far to the right on the fan pressure curve could result in an increase in horsepower requirement. Refer to separate Engineering Letter for complete details. New York Blower Acosta Foil = , PLR, General Purpose, and AF Fans fall into this non-overloading category .

CURVE-3



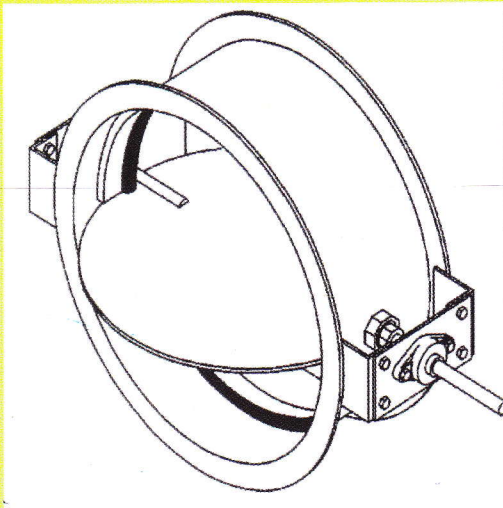
Important note:

Outlet dampers effectively move the fan's point of operation to the left on the fan's SP curve. Therefore, closing the damper fully may force the point of operation of some types of fans into an unstable region.



High Temperature Low Leak Damper

VTE makes damper, provides accurate airflow and isolation at extreme elevated temperatures. Designed for round and rectangular duct work capable of 20" w.g. will with-stand limited excursions temperatures of : 1000°C, and can be easily removed for normal maintenance. Consult VTE for actual design temperatures.

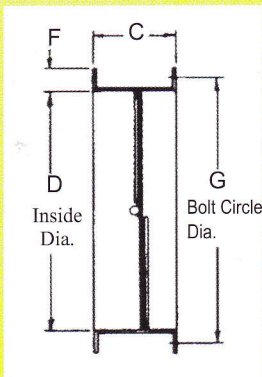


STANDARD CONSTRUCTION

CASING : Carbon Steel Casing.
BLADE : One piece Carbon Steel.
SHAFT : EN - 8, may vary with system conditions.

BEARINGS : Grease lubricated ball bearings with high temperature Grease and adjustable shaft packing mounted outboard of frame. Combination good to 500°F. Consult VTE if temperatures exceed 500°F.

FINISH : High temperature aluminum paint
SIZE : 3" diameter. Max size - 4000mm.
MAXIMUM TEMP. : Damper design for excursions to 1200°F with normal operating temperature of 500°F. Consult VTE if normal operating temperature exceeds 750°F. Dimensions in parenthesis () indicate millimeters.



Illustrated with Optical Bolt Holes.

+H = Number of Holes
 +M = Diameter of Hole

VARIATIONS

Variations to basic design are available at additional cost and include :

- Manual, electric, or pneumatic actuators
- Higher temperatures
- Special finishes
- Special materials and heavier construction
- Bolt holes in one or both flanges

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