RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

CBS8BL

HEAVY DUTY BLAST SUPPRESSION DAMPERS

STANDARD CONSTRUCTION

FRAME
12" x 2" x 10ga (305 x 51 x 3.5) galvanized steel channel.

BLADES
Double-skin, airfoil type; minimum 14ga (2.0) galvanized steel with a 7" (178) maximum width.

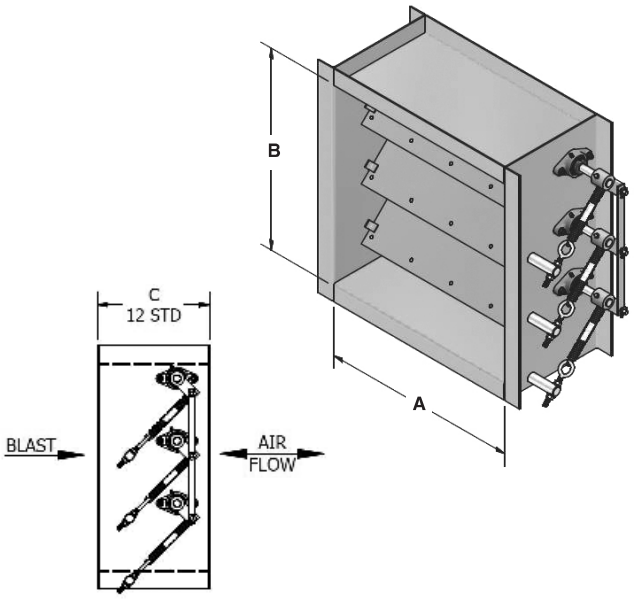
AXLES
Minimum 3/4" diameter plated steel.

BEARINGS
2-bolt flange relubricable ball bearings bolted to the frame.

FINISH
Mill galvanized.

LINKAGE
3/4" wide x 3/16" thick plated steel.

AUTOMATIC BLADE LOCK
Ruskin's "Over-Center" linkage mechanism designed to lock blades in the closed position after the blast subsides; blades must be manually reset.



DESIGN VARIATIONS

- Customized flange dimensions (F) to meet installation requirements.
- Blade Seals (EPDM, Silicone)
- 304-grade & 316-grade stainless steel
- Carbon steel construction finished with Primer
- Available without Automatic Blade Lock mechanism, upon Request
- Round Flanged Transitions on one or both sides of damper

CBS8BL SELECTION GUIDELINES			
Peak Reflected Blast Pressure (PSI)*	**Minimum Size (I.D.)**	**Maximum Single Section Size (I.D.)**	**Multiple Section Assemblies**
Above 1.6 thru 44.0	6" x 6"	36" x 96"	Multi-Section Configurations & Customized Ship-Section Sizes are Available to meet Project Specific Requirements.

* *An explosion or blast is best defined as a sudden release of energy and the initial force of the explosion or blast creates a wave of compressed air that emanates from the source in all directions. The face or front of any object that the force first encounters is most commonly referred to as "side-on" or "incident-side" pressure. Then there is a second event where the pressure from the explosion or blast force recedes or returns to the point of origin. This is the* ***"reflected" pressure****. Typically, reflected pressure is at least twice the amount of incident pressure.*

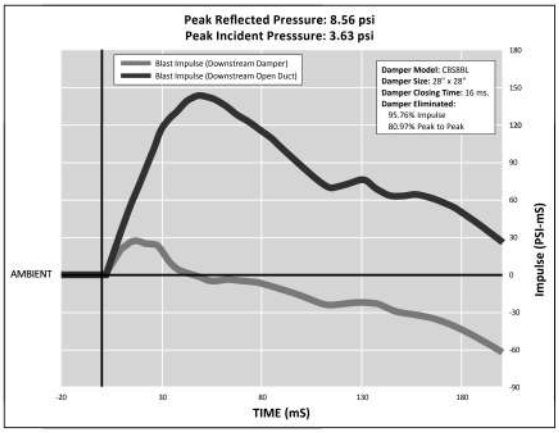
QTY	Model	Max Peak Pressure (psi) Reflected ❑ or Side-On ❑ (Please Specify)	Dimensions										Mounting Orientation (Note 2 below)	Installation Arrangement (Note 3 below)	Max NORMAL CFM or FPM (Note 4 below)	Max NORMAL Static Pressure (in.wg) (Note 5 below)	VARIATIONS
			A	B	C	F	G	H	J	K	L	M					

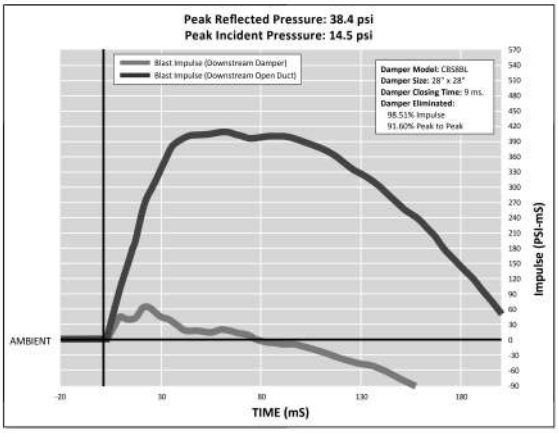
Information Required when Selecting the Proper Blast Damper Design

1. Peak Reflected (or Side-on) Blast Pressure
2. Mounting Orientation
   - A) HAFCB - Horizontal Airflow Counterblast;
   - B) HAFWB - Horizontal Airflow with Blast;
   - C) VAFUCB - Vertical Airflow UP counterblast;
   - D) VAFDCB - Vertical Airflow DOWN counterblast;
   - E) VAFUWB - Vertical Airflow UP with Blast;
   - F) VAFDWB - Vertical Airflow DOWN with Blast
3. Installation Arrangement: A) Ducted upstream & downstream; (Go to #4) B) Open to atmosphere (Go to #5)
4. If 3A: Maximum NORMAL airflow volume or velocity to which damper will be subjected
5. If 3B: Maximum NORMAL static pressure

NOTE: ***Springs will be sized to hold blades open to 2" wg ABOVE maximum NORMAL conditions unless specified otherwise.***

PERFORMANCE DATA: Shock Tube Testing





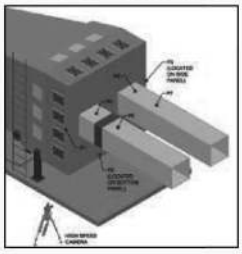
Ruskin blast damper charts below hightlight results of independent third party lab testing of model CBS8BL to peak reflected pressures of 8.56 psi and 38.4 psi, respectively. The results show that Ruskin's CBS8BL dramatically reduces the blast impulse, thus protecting downstream equipment and components.

Certified by 3rd Party Testing

The Ruskin model CBS8BL blast damper performance has been evaluated by an independent firm via blast testing in shock tubes using several test configurations. The data shown above is representative of the results of the testing. The testing included simultaneously applying blast load to two duct openings, with one duct protected by a damper and the other unprotected.

The shock tube is a test apparatus that consists of two major sections: a driver section and an expansion section. Blast pressures are generated when an aluminum rupture disk placed between the two sections fails due to pressure in the driver section. A shock wave then travels down the expansion section and loads the test specimen at the end of the expansion section. The target end of the shock tube was fitted with a semi-rigid test wall having two 28-inch square openings. The test wall represents an exterior building wall with openings leading to ductwork within the building.

This two-duct configuration included two 10-foot lengths of ducting attached behind the test wall fitted on the target end of the shock tube. One duct included an installed CBS8BL blast damper and one duct was unobstructed.

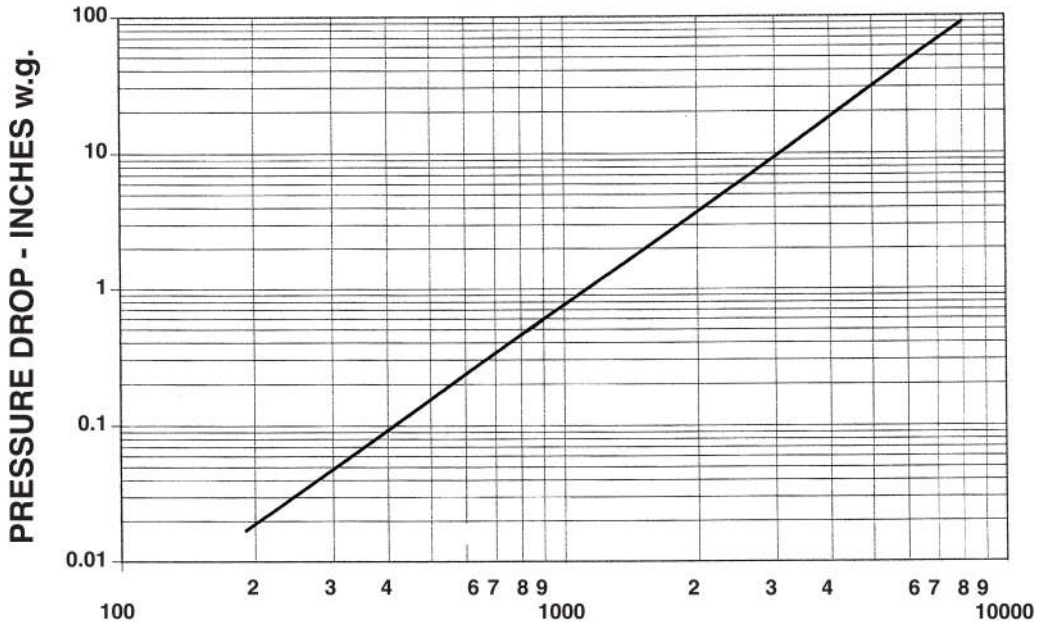


The effectiveness of the blast damper was determined by comparing pressure measurements in the duct with the damper to measurements in the duct without the damper.

PERFORMANCE DATA: PRESSURE DROP

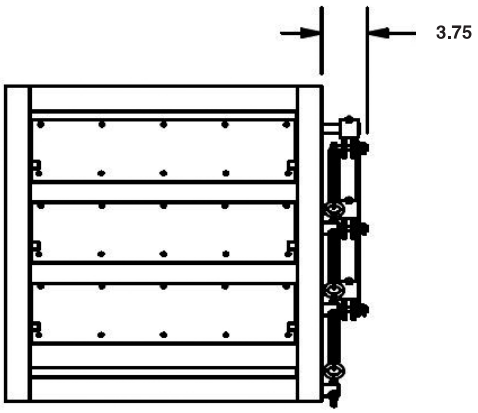
PRESSURE DROP

Based on testing per AMCA Standard 500 using Test Setup Apparatus figure 5.5 (damper installed on bulkhead).

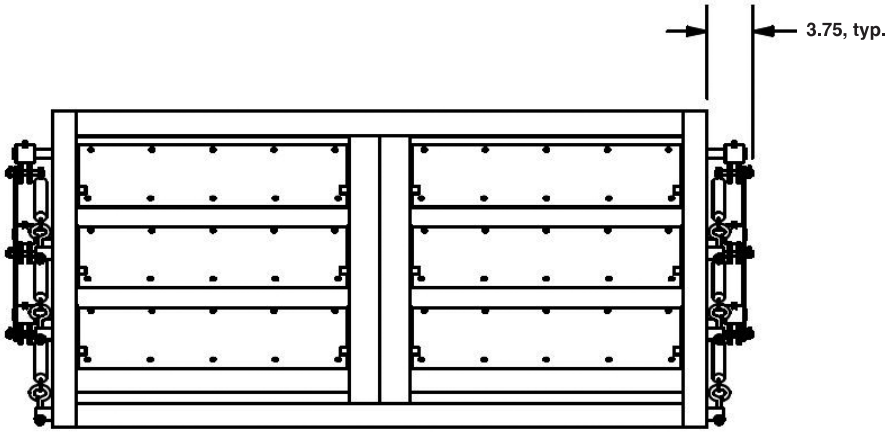


FACE VELOCITY (FPM)

TYPICAL CBS8BL PERFORMANCE



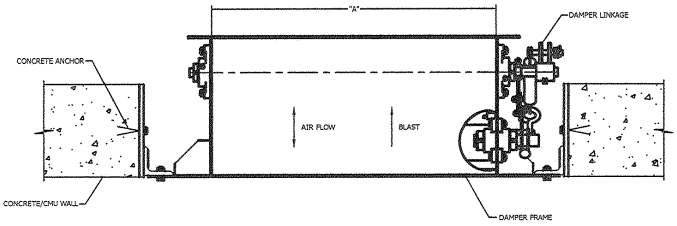
Single Section Configuration

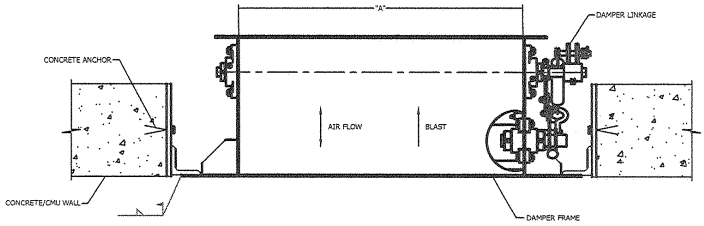


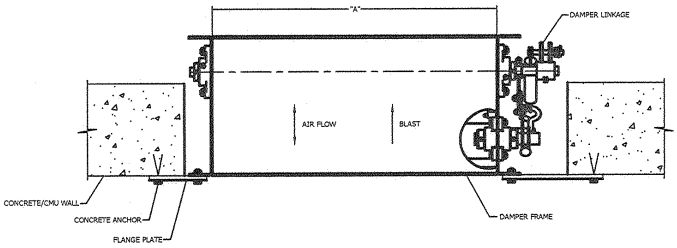
2-Section Wide Configuration

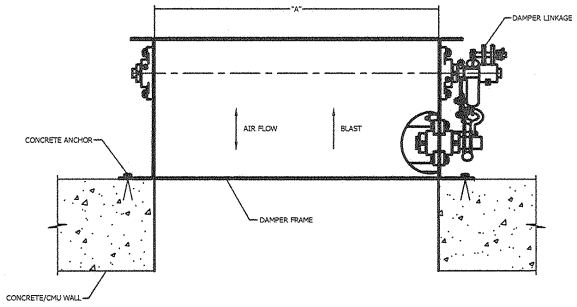
CONCEPTUAL CONCRETE/CMU INSTALLATION DETAILS

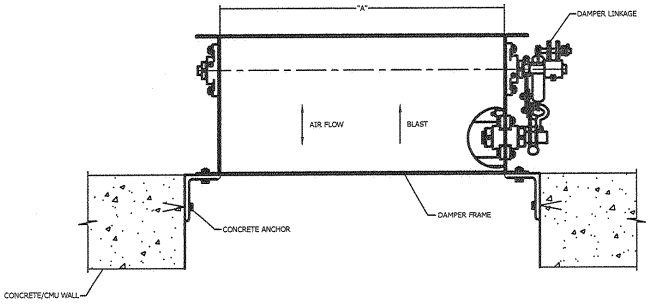
***Single Section with springs on 1 side only.**

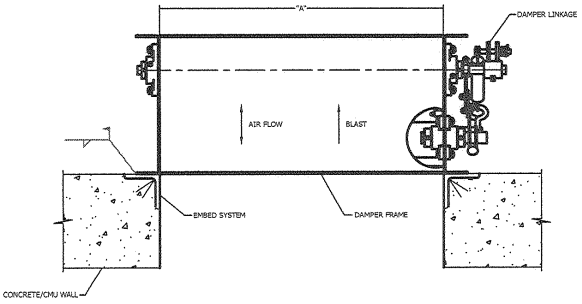












SUGGESTED SPECIFICATION

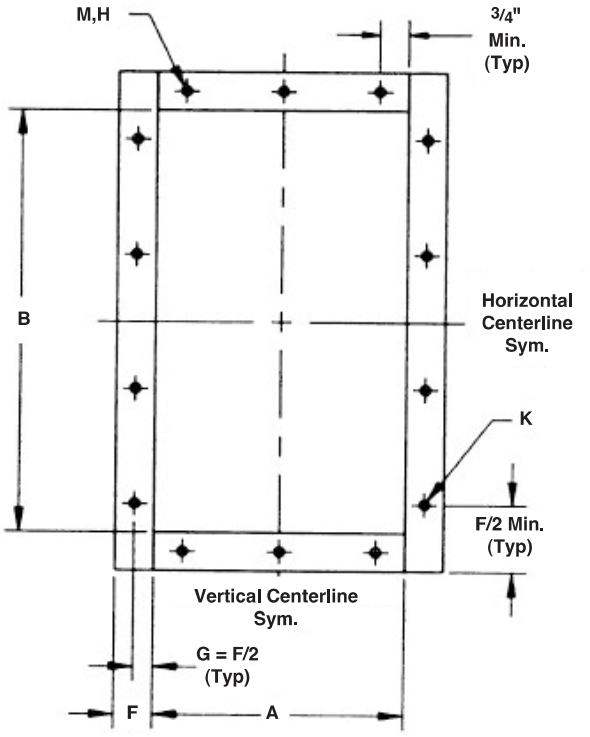
Furnish and install, at locations shown in plans or in accordance with schedules, industrial grade blast suppression dampers meeting the following construction standards. Blast suppression damper shall be manufactured in an ISO9001 certified factory. Frame shall be 12" wide x minimum 10ga thick (305x3.5) galvanized steel channel with minimum 2" (51) flanges. Frame shall be all welded construction. Sleeve or channel with inner frame is not acceptable. The damper shall have galvanized steel double-skin, airfoil shaped blades of 7" (178) maximum width x 14 gage (2) minimum thickness. Axles shall be minimum ¾" (19) diameter continuous plated steel welded to the blade. Bearings shall be 2-bolt flange relubricable ball bearings bolted to the exterior of the damper frame. Linkage shall be minimum 3/16" thick x ¾" wide (4.8x19) steel bar located on side of damper out of the airstream. Linkage pivot pins shall be plated cold-rolled steel or stainless steel. Bronze pins or bushings are not acceptable.

Linkage shall include externally mounted extension springs with adjustable tension to keep damper open until a blast event of specified pressure forces the blades closed. The damper's blade locking mechanism will secure the blade in the closed position following the initial blast event. Damper must be manually reset to the open position after the locking mechanism has secured the damper in the closed position.

Damper shall be designed to withstand reflected blast pressure of ____*____ psi with blades closed.** (***Refer to Ruskin CBS8BL blast ratings and corresponding sizing guidelines).

Submittal must include pressure drop and maximum pressure data based on AMCA Publication 500 testing. Damper performance data shall have be validated by testing to the "Shock Tube" method by independent lab testing. Blast suppression dampers shall be, in all respects, equivalent to **Ruskin model CBS8BL**.

SQUARE AND RECTANGULAR DAMPERS



F = 2" Standard (1 1/2" - 3" Optional)

H = No. of Bolt Holes (6" Center to Center)

K = No. of Bolt Holes (6" Center to Center)

M = Hole Dimension (7/16" Diameter Standard)

NOTES:

① When H or K are one hole, locate hole on centerline.

② To calculate "H" & "K" on damper with standard construction (2" flanges):

$$\text{"H"} = \frac{A - 1.5}{6} \qquad \text{"K"} = \frac{B + 2}{6}$$

Drop any decimal and add one (1) to determine number of holes.

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