



Blast Resistant Damper (BRD)

Protecting equipment and personnel from reflected blast pressures with the Wozair BRD Blast Resistant Damper.



Blast Resistant Damper

The BRD is for use in ventilation ducts at any facility with potential for a reflected blast event to occur such as Nuclear power plants, Naval and Military installations and Industrial and Oil & Gas production facilities, mitigating the passage of blast pressure along a ventilation duct or opening.

Blades are held in an open position using a spring pack (auto reset) or holding latch (manual reset) mechanism allowing air to flow through the damper for normal operating conditions. The BRD is rated for a maximum airflow of 6 m/s but suitability for use in higher airflows can be assessed on an individual project basis.

In a blast event the rapid increase in airflow along the duct overcomes the spring pack force or holding latch causing the damper to close in approx. 20 milliseconds. Once the blast pressure decays the auto reset damper will return to its open position whereas the manual reset damper will remain closed until it is reset.

The BRD is fitted with a debris catcher grid upstream of the blades, considering the direction of the blast pressure, to prevent flying objects in the airstream from striking and impairing the operation of the blades. It can be installed in a horizontal or vertical position with the blast pressure protection in one direction only and a vertical position provided the blast pressure direction is in a downwards position.

Technical Information

Blast Pressure

Tested under maximum single blast event 1.13 barg with blast protection up to 0.5 barg for a maximum of 6 consecutive blast events. Downstream pressure less than 0.013 barg at protection pressure.

Minimum Size

8"W x 8"H x 10"D

Maximum Size

47.25"W x 47.25"H x 10"D

Explosive Atmosphere

ATEX/IECEx SGS Baseefa/SGS Fimko Oy

Reliability Assessment

Testing has been performed by VTT Expert Services and verified by DNV GL

We can offer SIL2 reliability statement if required

Materials of Construction

Casing and Flanges:

Materials

Stainless Steel 304L/316L (1.4307/1.4404)

Thickness

6G thick

Fully welded

Flange drilling detail to ISO 15138

Custom flanges as option including option for bolting to concrete wall

Blades:

Materials

Stainless Steel 304L/316L (1.4307/1.4404)

6G thick

Shafts:

Ø1" continuous solid shaft in Stainless Steel 316/316L (1.4401/1.4404)

Bearings:

Oil impregnated sintered bronze. Low temperature option to -67°F and low leakage bearing assembly option available. If selecting auto reset spring mechanism then low temperature option to -40°F.

Linkage:

Stainless Steel 316L (1.4404)

6G thick link bars arranged to provide parallel blade motion

Mechanical Options

The following options can be incorporated if required.

- Increased flange thickness
- Ceramic, Stainless Steel bearings or for chemical application PTFE bearings in place of phosphor bronze oilite (as standard)
- Transitions; various options for fitting into circular ductwork
- Earth bosses
- Lifting lugs

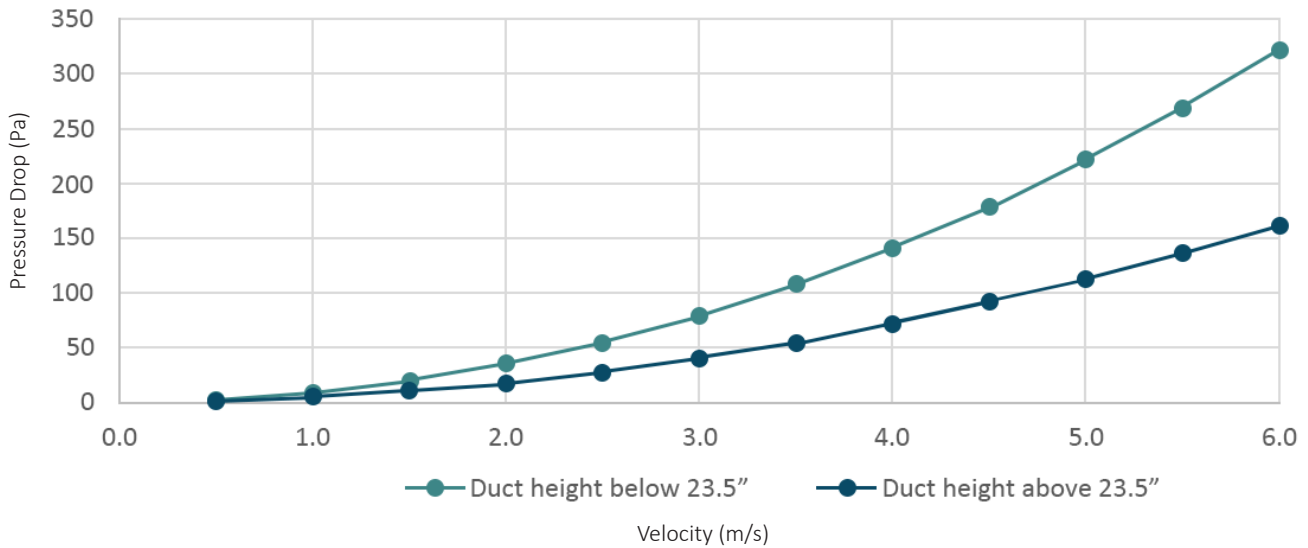


Physics of a Blast

An explosion releases energy into the atmosphere. Pressure increases almost instantaneously from ambient to a peak pressure (also referred to as Peak Overpressure) forming a pressure shock wave with highly compressed air known as the Incident Blast Wave. The minuscule rise time from ambient to peak pressure is referred as the Blast Duration.

The blast wave rapidly expands into the atmosphere spherically until equilibrium is reached, thereafter pressure decays with time and displacement. A negative pressure phase is also formed in the process as shown below. The negative pressure phase is longer in duration and is not considered critical in designing blast resistant and blast proof structures.

Pressure Drop



Weights

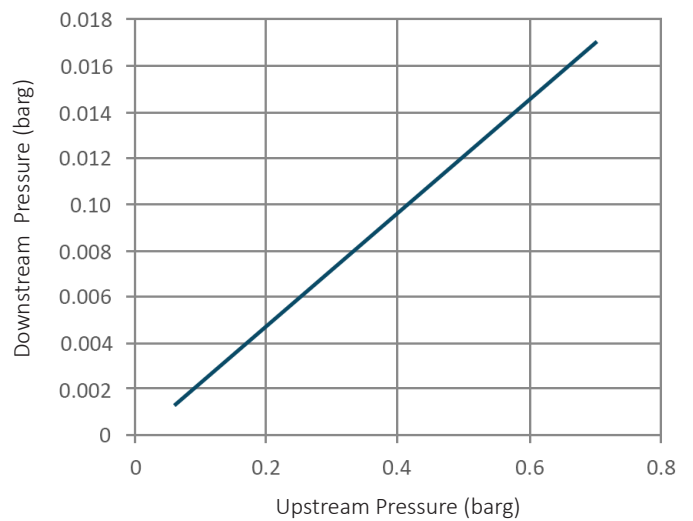
BRD Bare Shaft Damper Weight Matrix - 250D

| lb | H (in) | | | | | | | | | | | |
|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 8 | 12 | 16 | 20 | 24 | 28 | 31 | 35 | 39 | 43 | 47 | |
| W (in) | 8 | 57 | 71 | 84 | 97 | 110 | 123 | 139 | 152 | 165 | 179 | 192 |
| | 12 | 66 | 82 | 95 | 110 | 123 | 139 | 152 | 168 | 181 | 196 | 209 |
| | 16 | 77 | 93 | 108 | 121 | 137 | 152 | 168 | 183 | 198 | 214 | 229 |
| | 20 | 86 | 104 | 119 | 134 | 152 | 168 | 183 | 201 | 216 | 234 | 249 |
| | 24 | 101 | 121 | 141 | 159 | 179 | 198 | 216 | 236 | 254 | 273 | 293 |
| | 28 | 112 | 132 | 152 | 172 | 192 | 212 | 231 | 251 | 273 | 293 | 313 |
| | 31 | 130 | 152 | 174 | 198 | 220 | 243 | 267 | 289 | 311 | 335 | 357 |
| | 35 | 148 | 172 | 198 | 223 | 249 | 273 | 300 | 326 | 351 | 377 | 401 |
| | 39 | 159 | 185 | 212 | 236 | 262 | 289 | 315 | 342 | 368 | 395 | 421 |
| | 43 | 176 | 205 | 234 | 265 | 293 | 322 | 351 | 381 | 410 | 439 | 467 |
| | 47 | 187 | 218 | 247 | 278 | 309 | 337 | 368 | 399 | 428 | 459 | 489 |

Please Note:

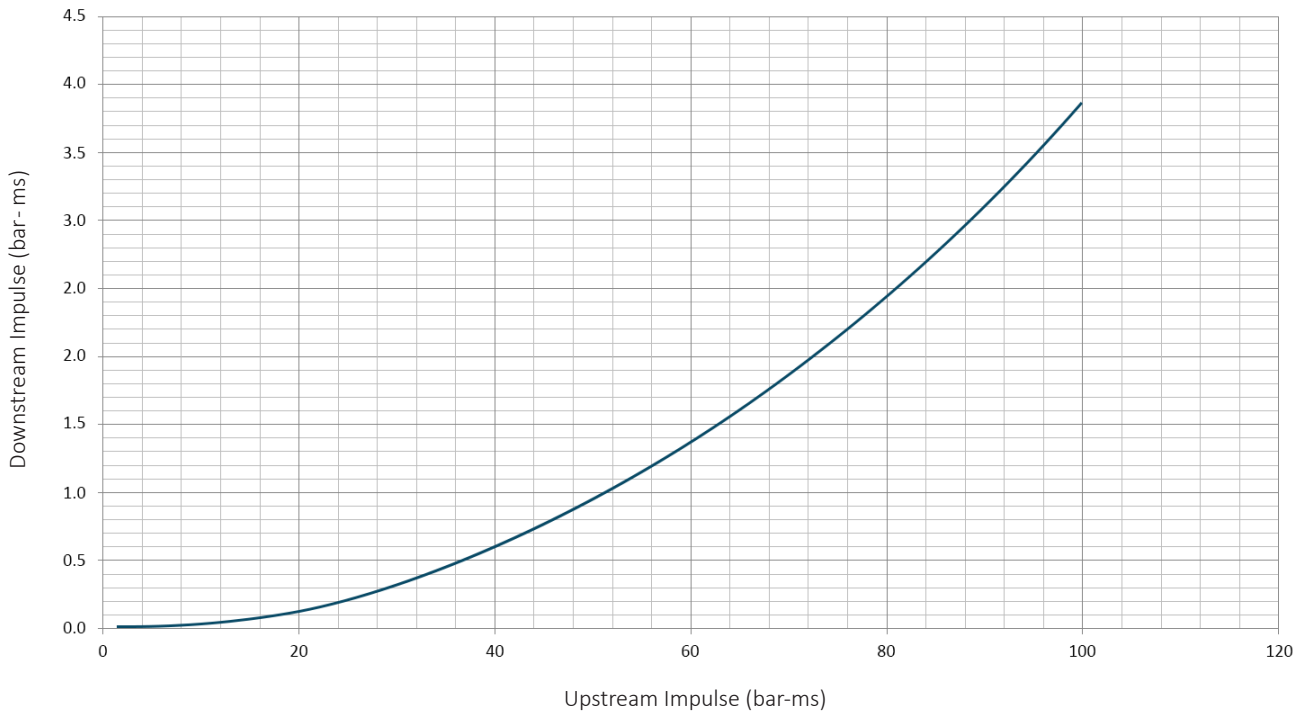
For manual or auto reset add 18lb nominally

Performance - Blast Duration

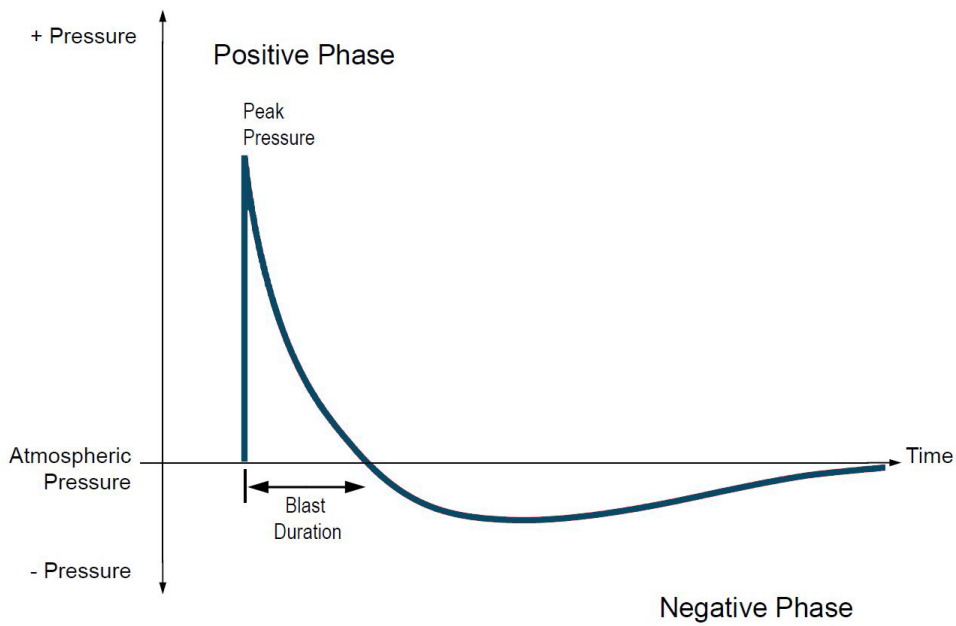


Performance - Impulsive Curve

Note: Blast Duration 40 to 70 ms



Pressure Transient

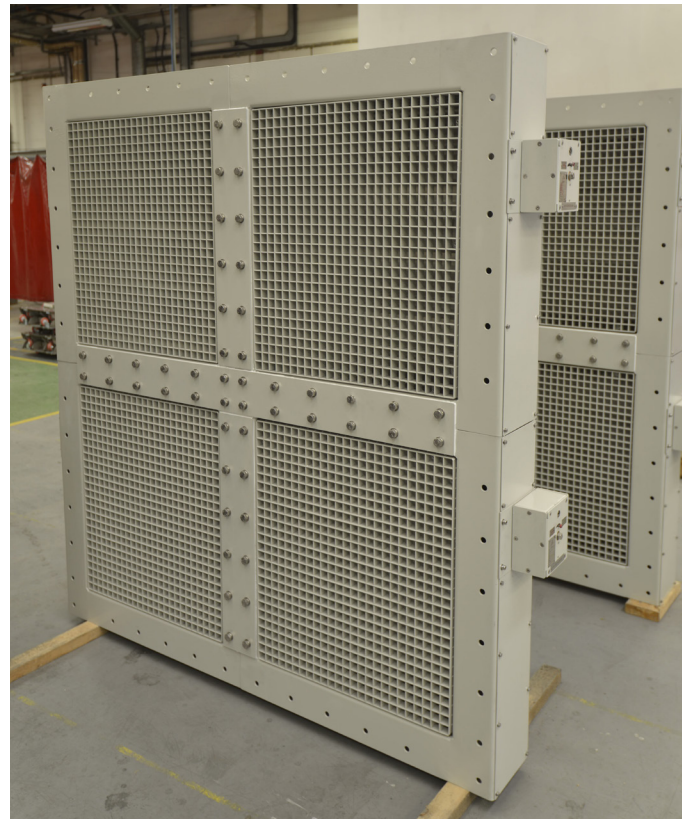
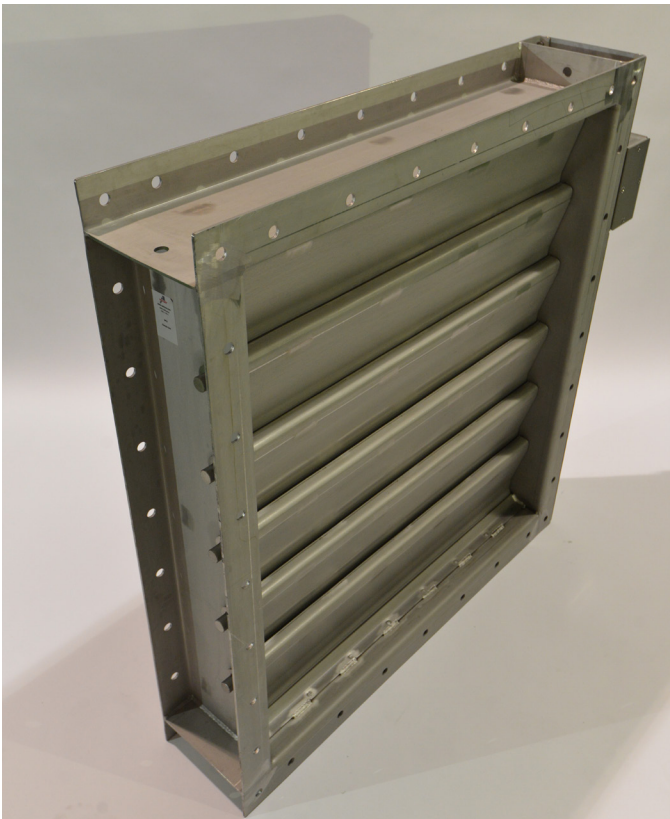


Ordering

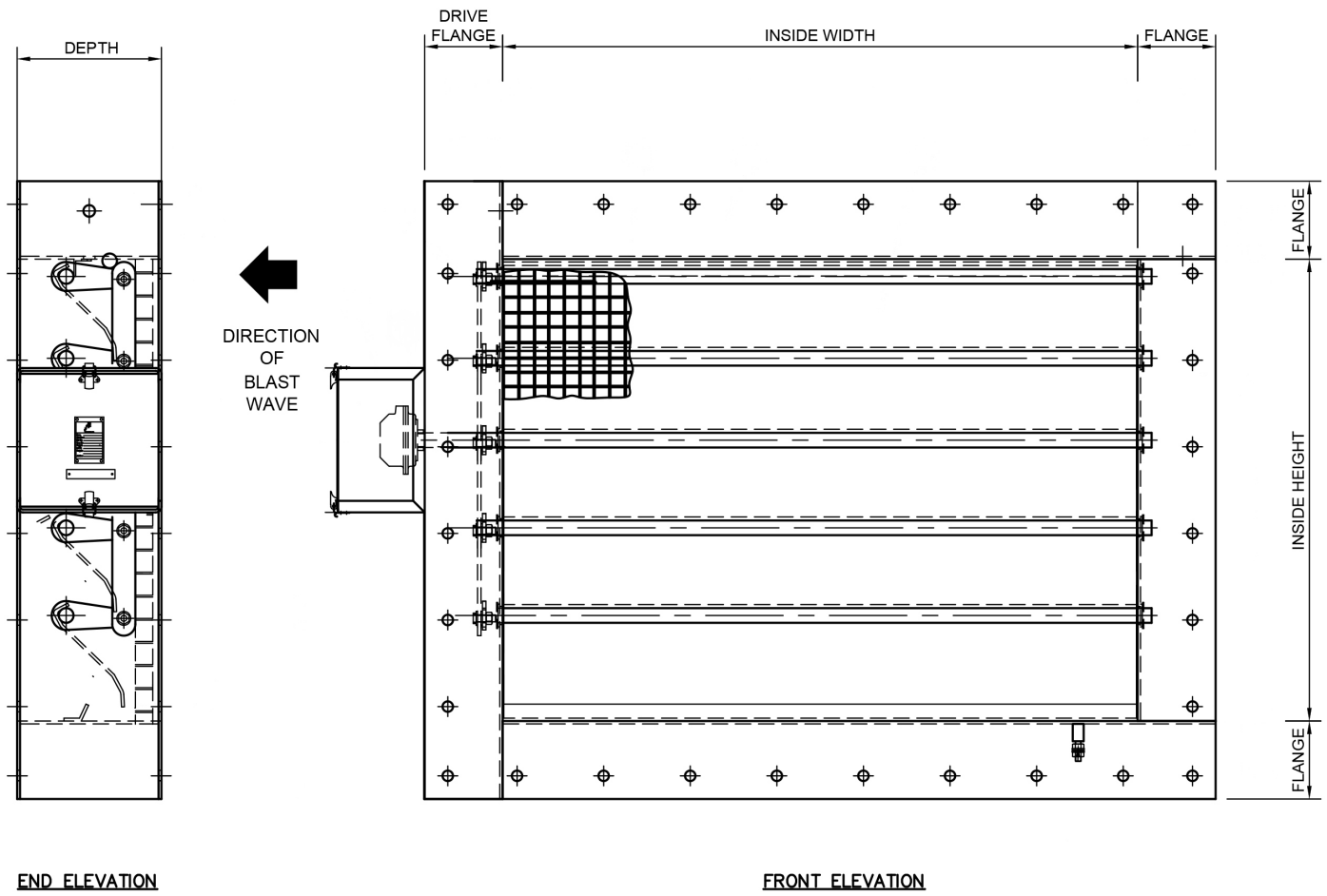
| | |
|---|------------------------|
| Type: BRD | Duct Width: 31" |
| Duct Height: 20" | Case Depth: 10" |
| Type Wozair: Blast Resistant Damper | |
| Case Material: <u>Stainless Steel</u> | |
| Low Carbon 1.4307 = 304L | |
| Low Carbon 1.4404 = 316L | |
| Case Thickness: 6G | |
| <u>Controls Options</u> | |
| HL = holding latch (suitable to minimum temperature -67°F) | |
| SP = spring pack (suitable to minimum temperature -40°F) | |
| Nominal: Clear inside duct dimensions | |
| Duct Size: 'Quote' (Width x Height) | |
| Order Code Example: BRD/316L/31W/20H/10D/6G/HL (pressure, duration, impulse and other specific requirements to be stated separately) | |



Additional Images



Dimension Drawing Example



END ELEVATION

FRONT ELEVATION

Wozair (USA) Ltd

3601 North Loop
336 West
Conroe
Texas
77304
United States of America

Phone +1 936 521 5990

Email houstonhvac@wozair.com

Wozair Limited

Grosvenor Road
Gillingham Business Park
Gillingham
Kent
ME8 0SA
United Kingdom

Phone +44 (0)1634 790 336

Email hvac@wozair.com

Wozair (Asia) Pte Ltd

2 Venture Drive
8-23 Vision Exchange
608526
Singapore

Phone +65 6890 6506

Email hvac@wozair.com.sg

Wozair Middle East

JAFZA One
Tower B, Office 1316
Jebel Ali Free Zone
Dubai, UAE
P.O. Box 262404

Phone +971 (0) 4 887 0147

Email dubaihvac@wozair.com