

## 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

200W x 200H x 250D mm

### Maximum Size

1200W x 1200H x 250D mm

### 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

5.0 mm 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)

5 mm thick

### Shafts:

Ø25.4 mm (1") continuous solid shaft in Stainless Steel 316/316L (1.4401/1.4404)

### Bearings:

Oil impregnated sintered bronze. Low temperature option to -55°C and low leakage bearing assembly option available. If selecting auto reset spring mechanism then low temperature option to -40°C.

### Linkage:

Stainless Steel 316L (1.4404)

5.0 mm 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

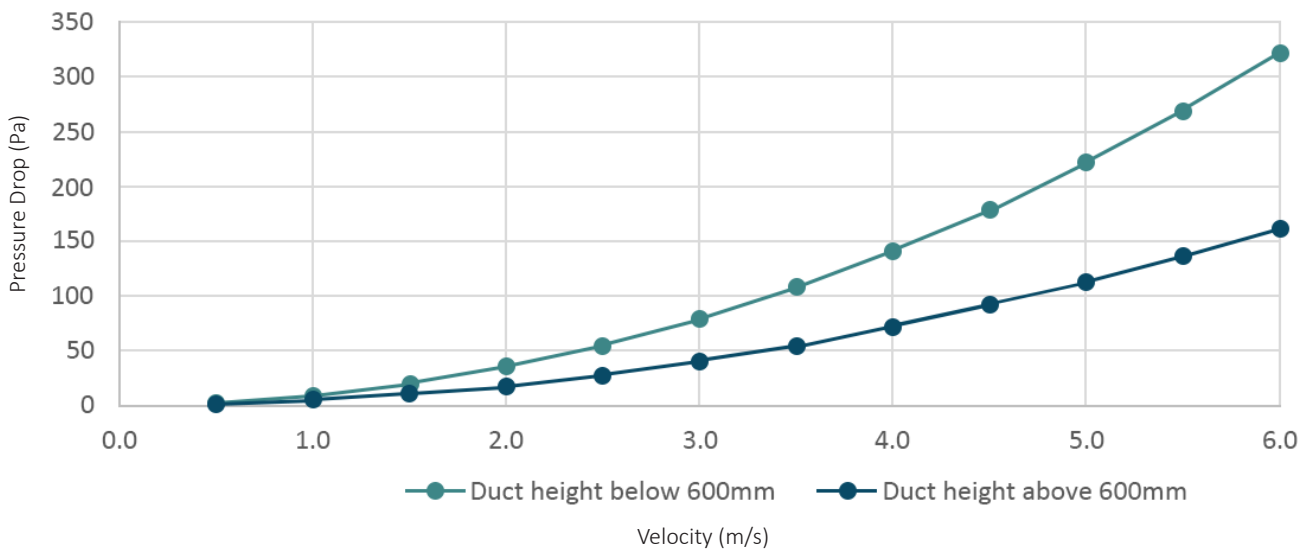


## Physics of a Blast

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 to 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

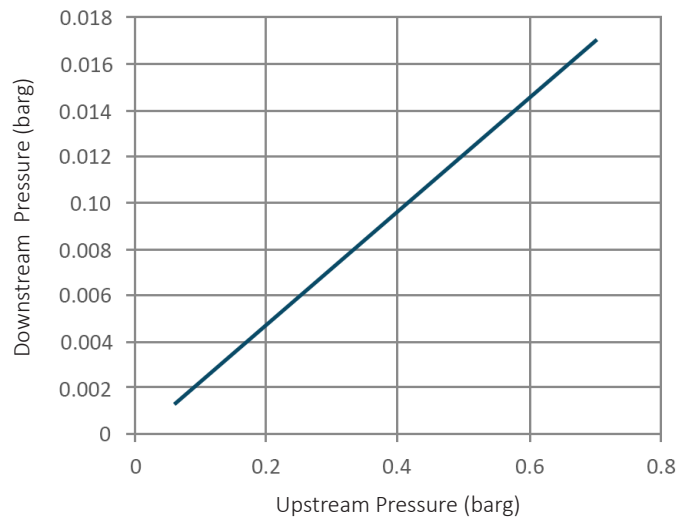
BRD Bare Shaft Damper Weight Matrix - 250D

Kg	W (mm)	H (mm)										
		200	300	400	500	600	700	800	900	1000	1100	1200
200	26	32	38	44	50	56	63	69	75	81	87	
300	30	37	43	50	56	63	69	76	82	89	95	
400	35	42	49	55	62	69	76	83	90	97	104	
500	39	47	54	61	69	76	83	91	98	106	113	
600	46	55	64	72	81	90	98	107	115	124	133	
700	51	60	69	78	87	96	105	114	124	133	142	
800	59	69	79	90	100	110	121	131	141	152	162	
900	67	78	90	101	113	124	136	148	159	171	182	
1000	72	84	96	107	119	131	143	155	167	179	191	
1100	80	93	106	120	133	146	159	173	186	199	212	
1200	85	99	112	126	140	153	167	181	194	208	222	

**Please Note:**

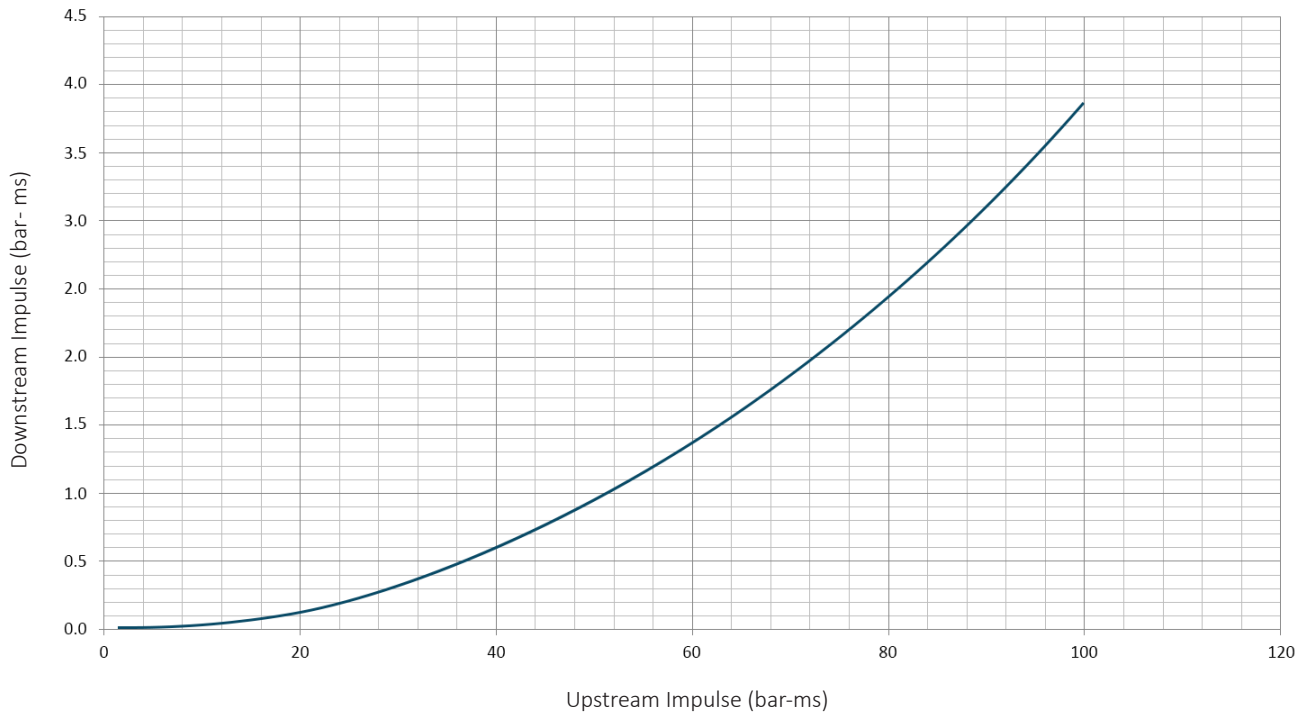
For manual or auto reset add 8kg nominally

## Performance - Blast Duration

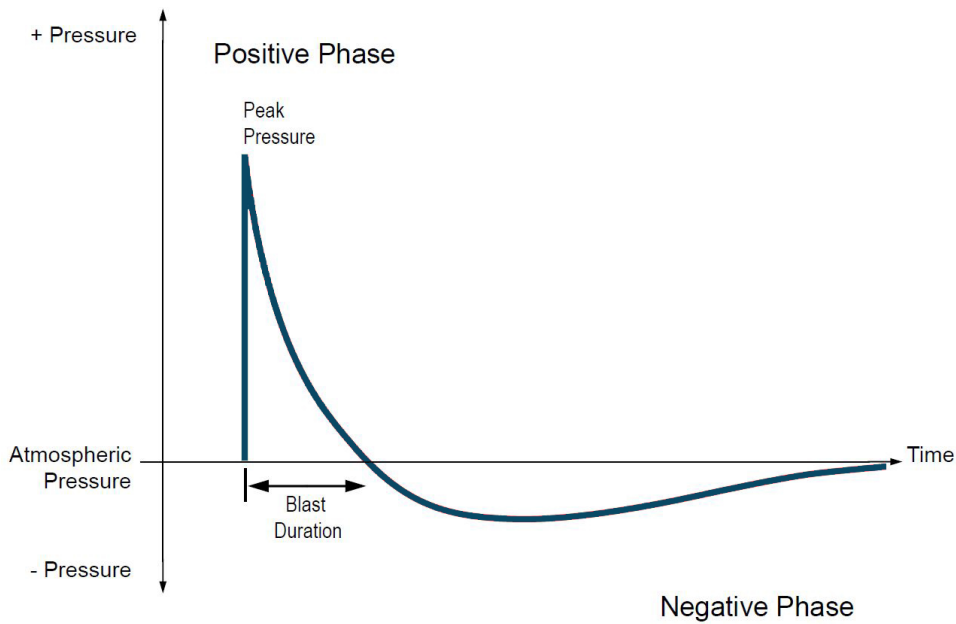


## Performance - Impulsive Curve

Note: Blast Duration 40 to 70 ms



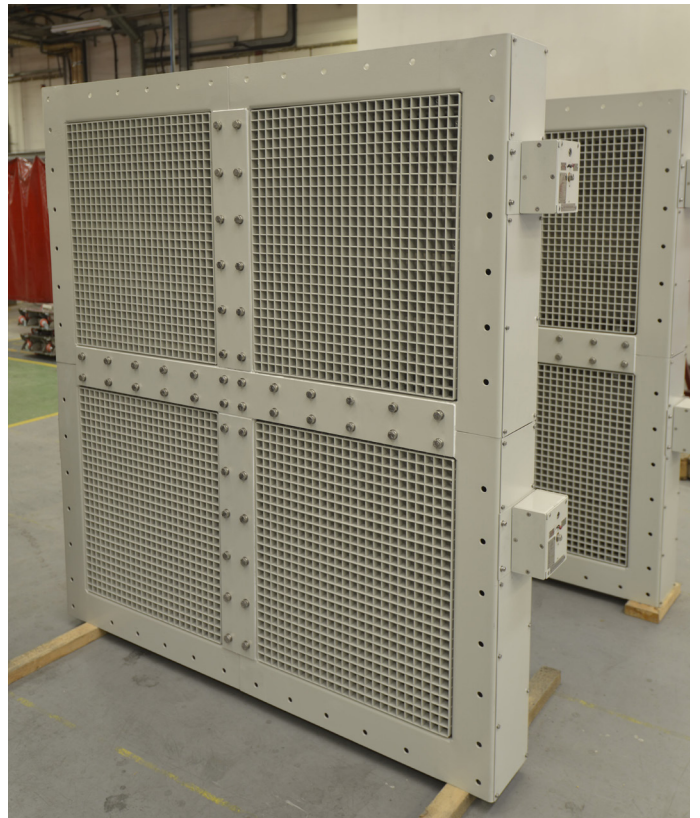
## Pressure Transient



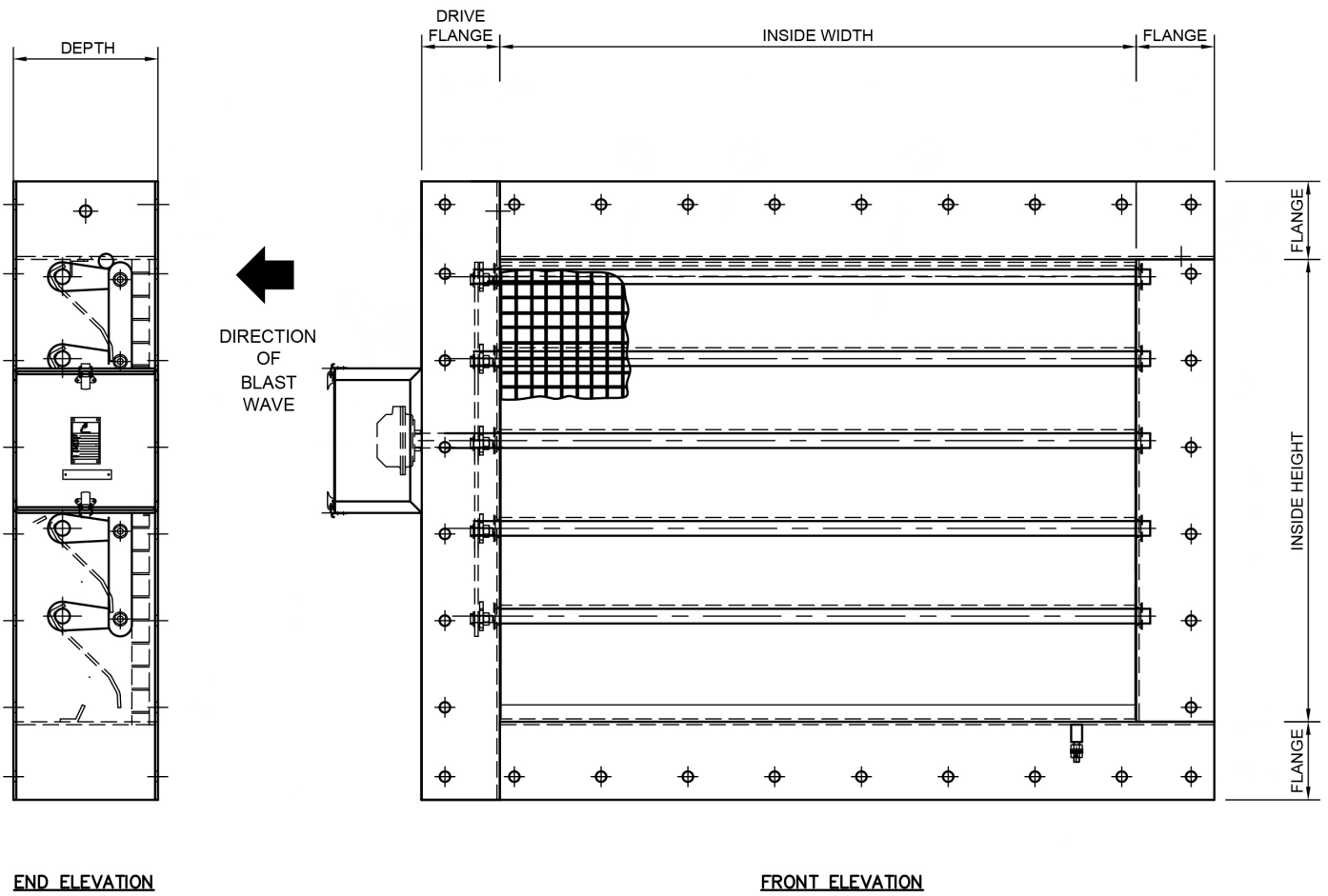
## Ordering

<b>Type:</b> BRD	<b>Duct Width:</b> 800
<b>Duct Height:</b> 500	<b>Case Depth:</b> 250
<b>Type Wozair:</b> Blast Resistant Damper	
<b>Case Material:</b> <u>Stainless Steel</u>	
Low Carbon 1.4307 = 304L	
Low Carbon 1.4404 = 316L	
<b>Case Thickness:</b> 5.0 mm	
<u>Controls Options</u>	
HL = holding latch (suitable to minimum temperature -55°C)	
SP = spring pack (suitable to minimum temperature -40°F)	
Nominal: Clear inside duct dimensions	
Duct Size: 'Quote' (Width x Height)	
<b>Order Code Example:</b> BRD/316L/800W/500H/250D/5.0/HL (pressure, duration, impulse and other specific requirements to be stated separately)	

## Additional Images



# Dimension Drawing Example



END ELEVATION

FRONT ELEVATION

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