Blast Tube Array (BTA)

Protecting equipment and personnel from reflected blast pressures with the Wozair BTA Blast Tube Array.

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DS-003-R02

Blast Tube Array

The BTA is designed to provide protection to persons and equipment during blast events, mitigating the passage of blast pressure along a ventilation system using only a static design array of Stainless Steel tubes. The unique design of the BTA carries a European Patent (no. EPO - 2024674) and USA Patent (no. US 9,920,871 B2).

It has been tested successfully with blast pressures from 0.05-10 barg, without damage. Tests have been performed by Eurofins Export Services (formerly VTT Expert Services) and have been verified by DNV GL.

The BTA is for use in ventilation system at any facility with potential for a blast event to occur such as Nuclear power plants, Naval and Military installations, and Oil & Gas production facilities and refineries.

The BTA has a fully welded casing. Welding is performed by coded welders, with NDT available on request.

Features & Benefits

The BTA has several advantages over a conventional reactive device such as:

- Maintenance free
- Suitable for use in all hazardous or safe areas
- Seismic resistant
- Installation in any orientation – vertical or horizontal duct or concrete wall
- Bi-directional airflow – consistent pressure drop regardless of airflow direction
- Bi-directional blast – consistent blast pressure attenuation regardless of blast direction

Technical Information

Blast Pressure
Blast 0.06 - 2.1 barg for a maximum of 20 consecutive blasts. Also individually tested at 5-10 barg (size 200W x 250H mm)

Minimum Size
200W x 250H x 350D mm

Maximum Size
1200W x 2000H x 350D mm

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 15138:2018
Custom flanges as option including option for bolting to concrete wall

Baffle:

Materials
Static tube array. No moving parts.

Mechanical Options

The following options can be incorporated if required.

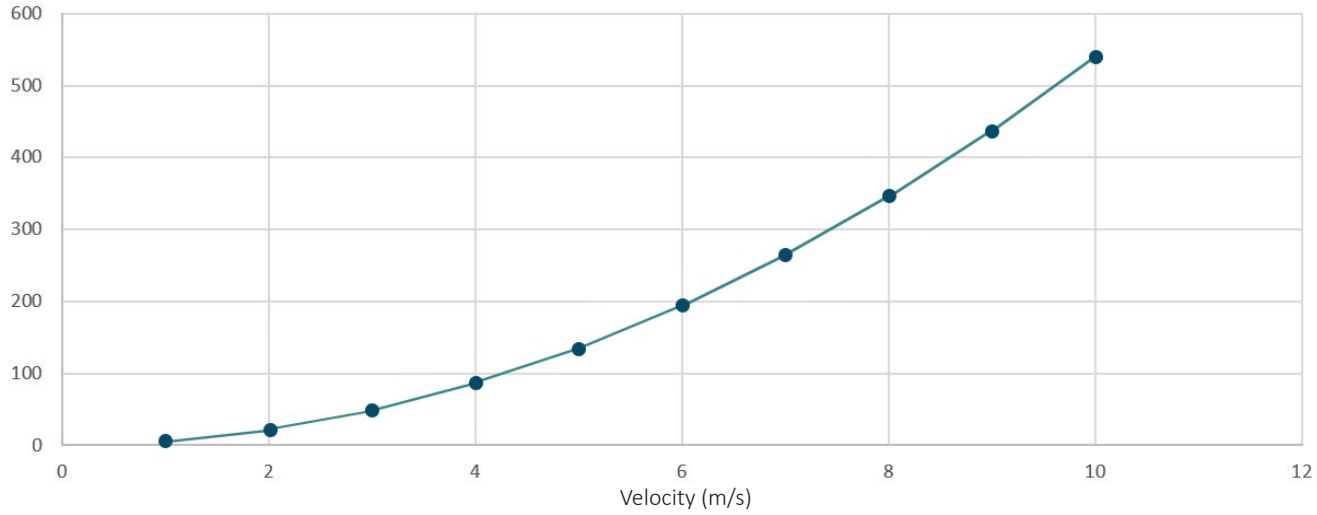
- Various options for fitting into circular ductwork
- Earth bosses
- Lifting lugs

Physics of a Blast

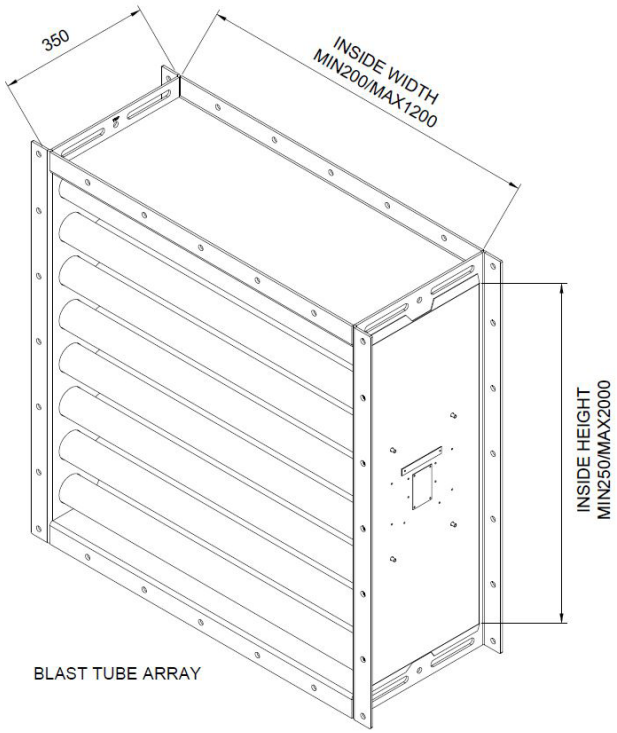
An explosion releases energy into the atmosphere. Pressure increases almost instantaneously from ambient to a peak pressure (also referred to as Peak Overpressure) forming a pressure shock wave with highly compressed air known as the Incident Blast Wave. The minuscule rise time from ambient to peak pressure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



Dimension Drawing Example



Weights

BTA Weight Matrix (Duct Mounting) - 350D

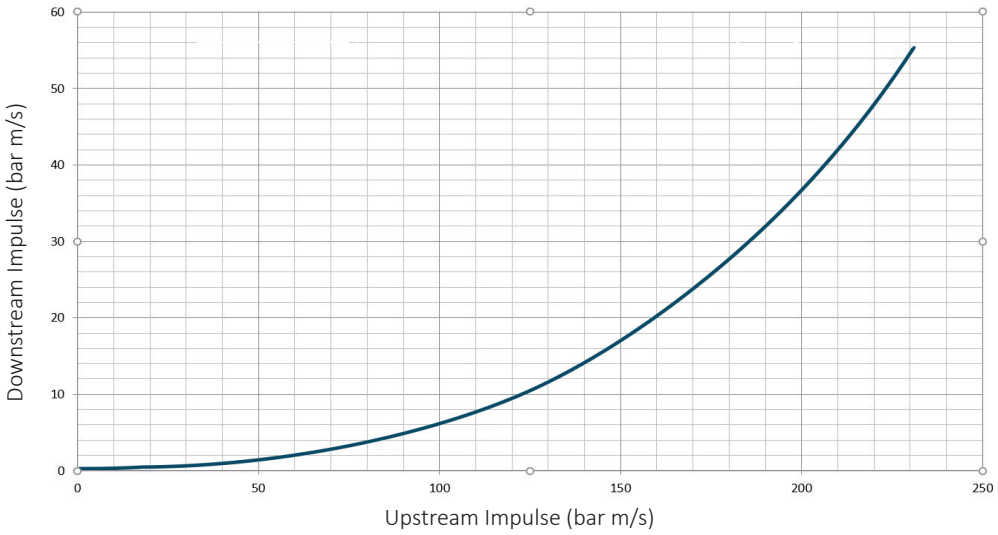
Kg		H (mm)									
		250	400	600	800	1000	1200	1400	1600	1800	2000
W (mm)	200	29	43	59	75	91	116	133	150	167	184
	300	36	53	72	91	110	140	160	180	200	220
	400	45	62	85	107	130	163	186	210	233	256
	500	53	72	98	123	149	186	213	239	266	293
	600	60	82	111	140	169	209	239	269	299	329
	700	67	91	124	156	188	233	266	299	332	365
	800	75	101	137	172	208	256	292	329	365	402
	900	82	111	150	188	227	279	319	359	398	438
	1000	89	121	163	205	247	302	345	388	431	474
	1100	106	141	187	233	279	326	372	418	464	511
	1200	114	151	200	250	299	349	398	448	497	547

BTA Weight Matrix (Wall Mounting) - 350D

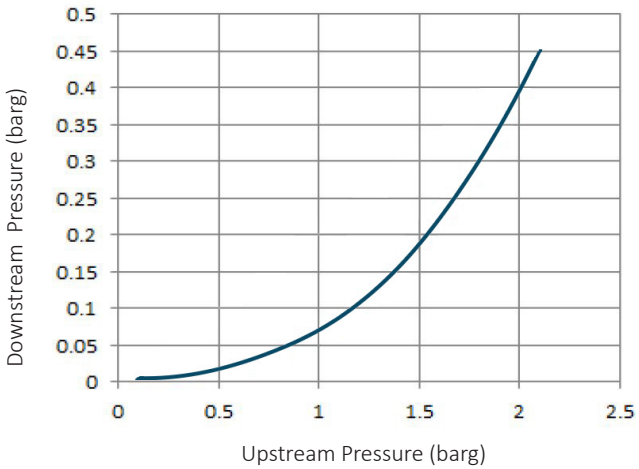
Kg		H (mm)									
		250	400	600	800	1000	1200	1400	1600	1800	2000
W (mm)	200	47	61	80	98	117	136	154	173	192	210
	300	56	72	94	116	138	160	182	204	226	247
	400	64	83	108	134	159	184	209	234	259	285
	500	73	94	123	151	180	208	237	265	293	322
	600	82	106	137	169	201	232	264	296	327	359
	700	90	117	152	187	221	256	291	326	361	396
	800	99	128	166	204	242	281	319	357	395	433
	900	108	139	180	222	263	305	346	388	429	471
	1000	116	150	195	239	284	329	374	418	463	508
	1100	125	161	209	257	305	353	401	449	497	545
	1200	134	172	223	275	326	377	428	480	531	582

Upstream/Downstream Curve

Note - Blast Duration 40 to 70 ms



Performance - Explosion Curve (short duration blast)



Ordering

Type: BTA	**Duct Width:** 1000
Duct Height: 1000	**Case Depth:** 200
Type Wozair: BTA	
Case Material: Stainless Steel Low Carbon 1.4307 = 304L Low Carbon 1.4404 = 316L **Case Thickness:** 5.0 mm	
Order Code Example: BTA/316L/5.0/1000W/1000H	

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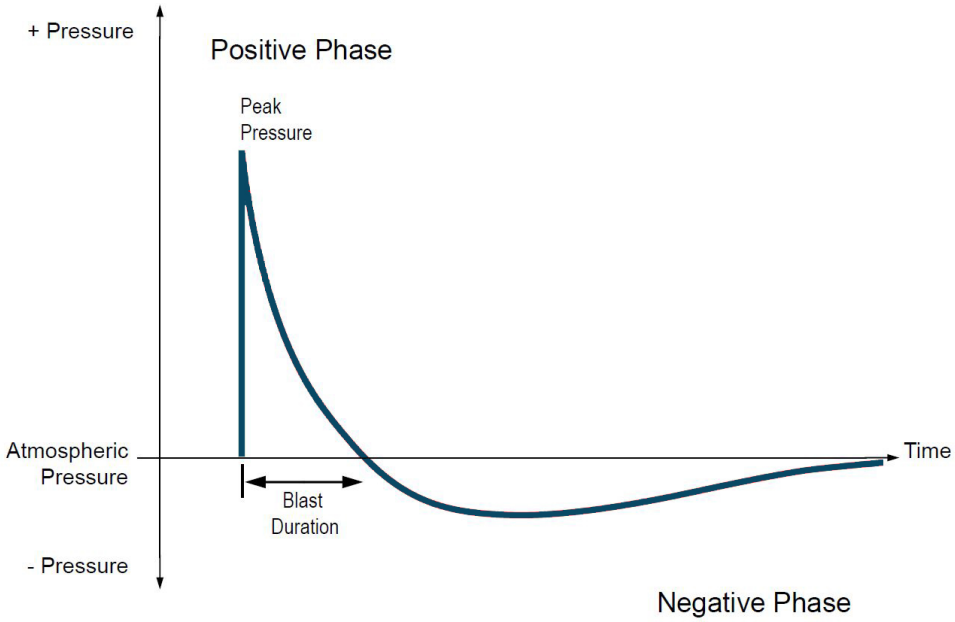
Pressure Transient of a Blast Wave



Additional Images

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