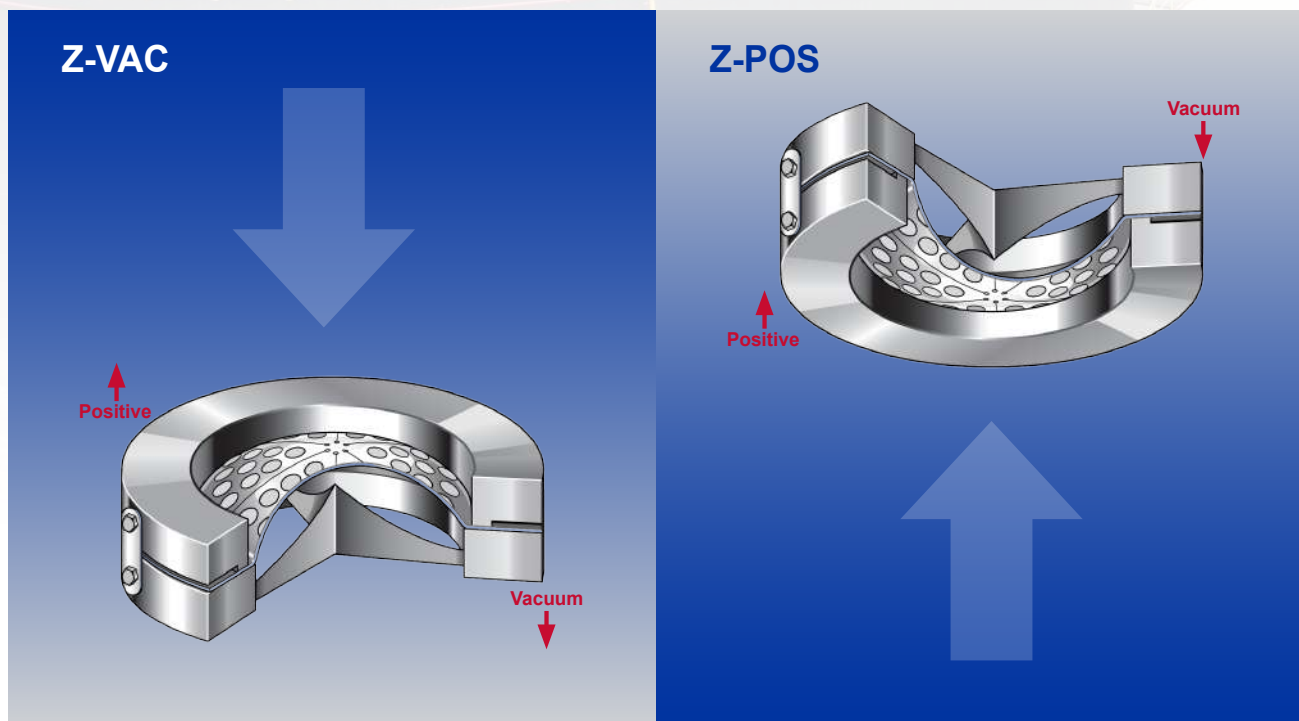# Protect your Processing or Storage Tank from Vacuum and/or Over-Pressurization in a Single Device

The ZOOK Z-VAC and Z-POS Series are a range of bi-directional rupture disk and holder assemblies designed to relieve between 1" - 109" (25 mm to 2768.6 mm) water column in one direction and 2 psig - 150 psig (0.14 barg to 10.34 barg) in the other direction uniquely protecting processing, fermentation, storage tanks and low strength vessels from vacuum implosion or over-pressure failure in a single device.

Both designs relieve ultra-low pressure settings. The Z-VAC allows ultra-low pressure relief in the vacuum direction starting at 1" (25 mm) of water column differential and features user friendly replaceable knife blades to ensure optimum performance. The Z-POS allows ultra-low pressure relief in the positive direction starting at 1" (25 mm) of water column differential.

How Does Z-VAC/Z-POS Work?

Ultra-Low pressure relief is controlled by a laser cut collapsible girdle. For Ultra-Low vacuum protection (Z-VAC) vacuum pressure pulls the Teflon seal against the girdle. For Ultra-Low over pressure protection (Z-POS) positive pressure pushes the Teflon seal against the girdle deflecting it towards the razor sharp knife-blades built into the holder. As pressure approaches the relief setting, the girdle collapses allowing the seal to be cut by the knife-blades. Laser cut holes in the mid pressure burst cap or non-opening support provide optimum flow when the rupture disk relieves in the Ultra-Low pressure direction.

Z-VAC

Positive

Vacuum

Z-POS

Vacuum

Positive

Z-VAC & Z-POS Disk

Rupture Disk Features

- Highly accurate, ultra-low burst pressures starting at 1" (25 mm) water column

- Dual-acting design, with laser cut metal top section and girdle

- Sizes 2" to 12" / 50 mm to 300 mm and above

- Standard 316 girdle for full range of vacuum pressures ensures clean opening of seal at specified pressure

- Burst ratings from 1" (25 mm) of water column to 150 psig (10.34 barg)

- Temperature ratings to 500°F (260°C)

- Permanently attached 3D stainless steel tag shows positive and vacuum flow directions

- Optional integral burst indication*

Z-VAC

Z-POS

Sanitary Fitting Disks

Sanitary fitting holders are available to allow direct connection to systems utilising ferrule connections. For more information on our ProVAC-S / ProPOS-S sanitary disks, contact a ZOOK representative.

BI Integral Indicator Available

The BI Series offers a simple and effective means of remote monitoring of the disk.

- The BI is installed on the atmospheric side of the Teflon seal protecting it from the process.

- Provides signal indication instantly upon rupture of the disk

*See table 1 on minimum burst rating requirements

Z-VAC & Z-POS Holder
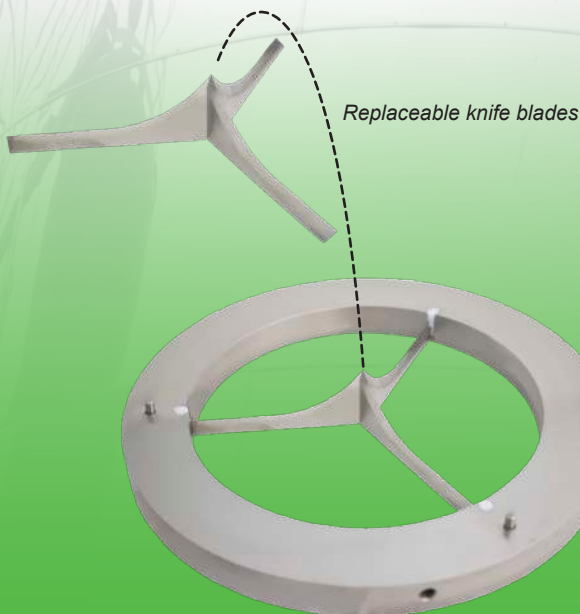
Rupture Disk Holder Features

- Designed for installation between standard pipe flanges

- Designed exclusively for use with the Z-VAC and Z-POS series rupture disks

- Replaceable knife blades ensure optimal performance

- Non-torque sensitive flat seal design

- The Z-VAC & Z-POS Holder and rupture disk are pre-assembled using side-clips

- Standard materials of construction: 316 or carbon steel. Other materials available upon request

- Permanently attached stainless steel nameplates are standard. Nameplates show positive and vacuum flow directions to provide visual verification that holder assembly is properly oriented in the piping system

Sanitary Fitting Holders

Sanitary fitting holders are ideal for high purity environments.

For more information on our ProVAC-S / ProPOS-S sanitary holders, contact a ZOOK representative.

ZOOK Differentiator

ZOOK'S Unique Replaceable Knife Blade Design

Replaceable knife blades

- Dull blades can result in collapsed tanks

- Allows higher level of safety maintenance

- Availability of spare blades on site leads to quick changeovers and greater operational safety

- Provides lower cost inventory compared to other designs

- Lower costs, less downtime, enhanced safety

- Replacement blades - easy to change
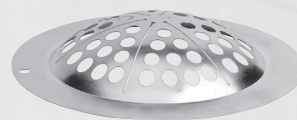
Overpressure Relief Direction

Components
Note: Z-VAC Configuration

Holder Outlet
Insert type rupture disk holder manufactured from 316 or carbon steel. Other materials also available.

Non-Opening Pressure Support
Provides protection to seal in case of positive pressure.

OPTIONS: Laser Cut Burst Cap
Provides higher pressure relief at specified rating.

Protective Ring
Provides seat area protection for seal on applications that do not require positive relief or operation.

Seal
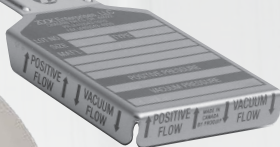Evenly distributes pressure in both the vacuum and positive pressure direction.

OPTION: Integral Burst Indication

Girdle
Standard material is 316SS. Also, available in TEFLON. Controls the standard min. to max. inches of water column negative (vacuum) pressure rating.

Holder Inlet
Insert type rupture disk holder manufactured from 316 or carbon steel.

Vacuum Relief Direction

Specifications

Table 1
Z-VAC & Z-POS Burst Ratings

| Disk Size | | Higher Pressure Relief – Burst Pressure Range – Burst Cap | | | | Ultra Low Pressure Girdle Relief – Burst Pressure Range – Metal Girdle | | | | With Integral Burst Indicator – Metal Girdle | | | | Burst Tolerance |
		psig Min	psig Max	barg Min	barg Max	InWC Min	InWC Max	mmWC Min	mmWC Max	InWC Min	InWC Max	mmWC Min	mmWC Max	
2"	50 mm	15	150	1.03	10.3	1	109	25	2768	28	109	711	2768	MAX ratings 7 to 45 InWC: minus 6 InWC MAX ratings above 45 InWC: minus 15 InWC
3"	80 mm	8	150	0.55	10.3	1	109	25	2768	20	109	508	2768	
4"	100 mm	7	125	0.48	8.62	1	64	25	1625	10	64	254	1625	
6"	150 mm	4	100	0.28	6.89	1	64	25	1625	10	64	254	1625	
8"	200 mm	3	75	0.21	5.17	1	64	25	1625	10	64	254	1625	
10"	250 mm	3	50	0.21	3.45	1	54	25	1371	10	54	254	1371	
12"	300 mm	2	40	0.14	2.76	1	54	25	1371	10	54	254	1371	
Max. Temp.		500°F (260°C)				500°F (260°C)				400°F (204°C)				

Note: Series Minimum and Maximum Pressure Ratings @ 72˚F (22˚C)

Table 2A
Z-VAC & Z-POS Series Disk with Rated Burst Cap – Manufacturing Range

Burst Pressure Range Standard (psig) Minimum	Burst Pressure Range Standard (psig) Maximum	ZOOK Manufacturing Design Range (psig) Standard Minus	Standard Plus	Reduced MDR's Half Minus	Half Plus	Quarter Minus	Quarter Plus	Zero Minus	Zero Plus	Burst Tolerance (psig)
2.0	<2.5	0.5	0.5	0.25	0.25	0.13	0.13	0.00	0.00	± 0.33
2.5	<4.0	1	1	0.50	0.50	0.25	0.25	0.00	0.00	± 0.33
4.0	<7.0	1	2	0.50	1.00	0.25	0.50	0.00	0.00	± 0.5
7.0	<11.0	1.5	2.5	0.75	1.25	0.38	0.63	0.00	0.00	± 0.8
11.0	<15.0	2	3	1.00	1.50	0.50	0.75	0.00	0.00	± 1.3
15.0	<17	2	3	1.00	1.50	0.50	0.75	0.00	0.00	± 2.0
17	<26	2	4	1.00	2.00	0.50	1.00	0.00	0.00	± 2.0
26	<40	3	5	1.50	2.50	0.75	1.25	0.00	0.00	± 2.0
40	<66	4	6	2.00	3.00	1.00	1.50	0.00	0.00	± 5%
66	<101	5	9	2.50	4.50	1.25	2.25	0.00	0.00	± 5%
101	<150	6	12	3.00	6.00	1.50	3.00	0.00	0.00	± 5%

Specifications

Table 2B
**Z-VAC & Z-POS Series Disk with Rated Burst Cap
– Total Performance Tolerance**

Burst Pressure Range (barg)		Total Performance Tolerance (barg)			
		Standard	Reduced Tolerance		
Minimum	Maximum		Better	Intermediate	Best
0.14	<0.172	± 65%	± 45%	± 35%	± 0.023 barg
0.172	<0.276	± 50%	± 30%	± 20%	± 0.035 barg
0.276	< 0.483				
0.483	< 0.759	± 50%	± 30%	± 20%	± 0.055 barg
0.759	<1.034	± 25%	± 20%	± 15%	± 0.090 barg
1.034	<1.172	± 25%	± 20%	± 15%	± 0.138 barg
1.172	< 1.793				
1.793	<2.759	± 20%	± 15%	± 10%	
2.759	<4.552	± 15%	± 10%	± 7.5%	± 5%
4.552	<6.966				
6.966	10.3	± 10%	± 7.5%	± 6.5%	± 5%

Table 3
Z-VAC & Z-POS Series Disk Holder Dimensions

Holder Nominal Size		ANSI 150 Holder OD		DIN PN10 Holder OD		Height*	
2"	50 mm	4"	101.6 mm	4.2"	107 mm	1 ¼"	31.7 mm
3"	80 mm	5 ¼"	133.3 mm	5.6"	142 mm	1 ¼"	31.7 mm
4"	100 mm	6 ¾"	171.4 mm	6.4"	162 mm	1 ¼"	31.7 mm
6"	150 mm	8 ⅝"	219.0 mm	8.6"	218 mm	1 ¼"	31.7 mm
8"	200 mm	10 ⅞"	276.2 mm	10.7"	273 mm	1 ⅜"	34.9 mm
10"	250 mm	13 ¼"	336.5 mm	12.9"	328 mm	1 ¾"	44.4 mm
12"	300 mm	16"	406.4 mm	14.9"	378 mm	1 ¾"	44.4 mm

Contact ZOOK for alternative flanges.
*Note: Holder height does not include the rupture disk
allow approximately 0.020" to 0.040" (0.5mm to 1.0mm).
Disk dome extends past holder faces and allowance
for this should be made in the installation.
Teflon - TM The Chemours Company