



Ski™ Reverse Buckling Rupture Disk

Designed for variable back pressure
with no impact on burst pressures





Ski™ Reverse Buckling Rupture Disk

Resists full vacuum with no impact on burst pressures



INTRODUCTION

The Ski™ rupture disk offers the unique ability to have variable back pressure without impacting burst pressures. All preceding rupture disks are differential pressure sensitive, which means that when the pressure difference between inlet and outlet reaches the defined burst pressure, the product activates. The Ski rupture disk function is based upon the inlet side pressure in most applications.

For example, with established rupture disk technology, if the defined burst pressure is 100 psig (6.89 barg) and variable back pressure ranges from 0 to 30 psig (0 to 2.06 barg), the inlet pressure may be as high as 130 psig (8.96 barg) to activate the rupture disk. A 130 psig pressure is a safety concern, if the design pressure of the inlet side vessel is 100 psig (6.89 barg). With the SKi design, when the inlet pressure reaches 100 psig (6.89 barg), the disk will function whatever the back pressure is from 0 to 30 psig (0 to 2.06 barg).

Until now, the only way to manage back pressure influence is to install two rupture disks in a double disk assembly arrangement. The space between the two disks is then maintained at atmospheric pressure through use of an excess flow valve or similar device. This arrangement doubles up on rupture disks and safety heads, or requires a double disk safety head to accommodate two rupture disks. Ski technology achieves the same result with a single rupture disk installation.

BURST TOLERANCE

Marked Burst Pressure	Burst Tolerance
< 40 psig (2.76 barg)	+ 2 psig (0.138 barg)
> 40 psig (2.76 barg)	+ 5%

MANUFACTURING DESIGN RANGE (MDR)

The standard MDR for the SKi disk is 0%. The user's requested burst pressure will be the marked burst pressure. Optional MDR's of -5% and -10% may be selected as operating conditions permit. The MDR is applied to the minus side only of the requested burst pressure.

FEATURES

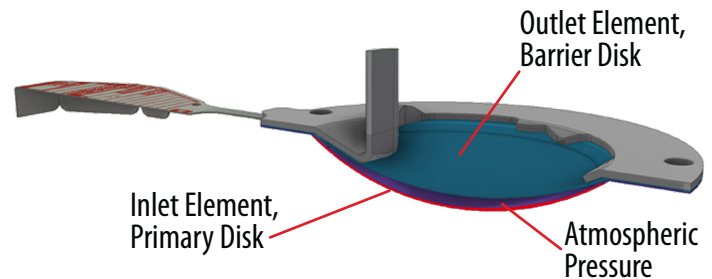
- The first reverse buckling rupture disk designed to be backpressure independent.
- Available sizes 1 inch (25mm) thru 10 inches (250mm).
- ASME (Krg 0.37, Krl 0.93) and CE approved
- Gas or liquid service.
- Full vacuum resistance
- Suitable for operating pressures up to 90% of the marked burst pressure, or 95% of the minimum burst pressure.
- Damage safety ratio < 1.
- Designed for non-fragmentation.
- Standard MDR: 0%, optional -5%, -10%.
- Withstands full vacuum.
- US patents 6321582, 6178983, 6446653, 5996605 and international patents apply.

HOW DOES SKi WORK?

Two reverse buckling rupture elements are placed together. The inlet (upstream) side rupture disk element is calibrated to the required burst pressure based upon process pressure conditions.

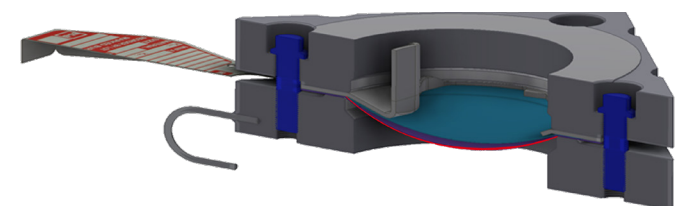
The outlet (downstream) side of the rupture element holds back the variable back pressure conditions from reaching the upstream element.

The small volume between the two rupture elements is factory set at atmospheric pressure. When the upstream burst pressure is reached, the SKi's two rupture elements open together.



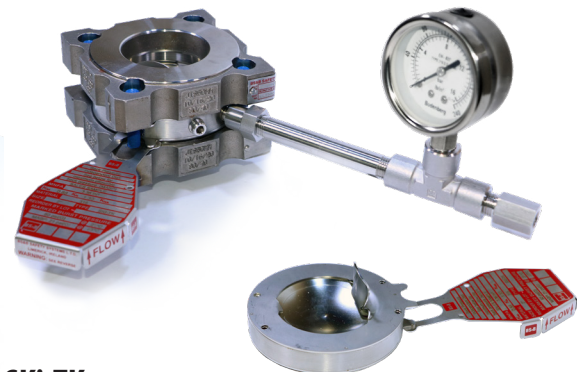
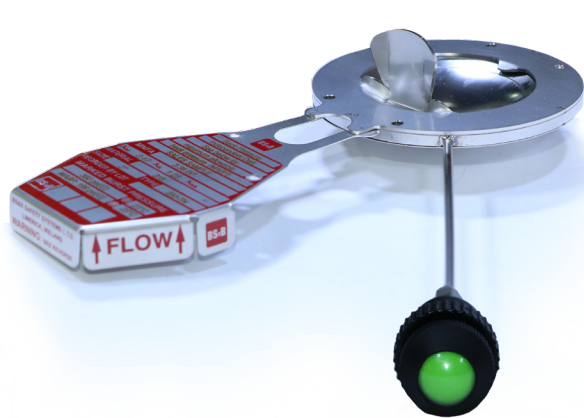
Above: Two rupture elements: Inlet element (the primary disk shown in red), and the outlet element (the barrier disk shown in blue. The atmospheric pressure between the disks is shown in purple.

Below: Pre-torqued Safety Heads in order to seal the atmospheric volume between the two elements



SKi™ Disk Specifications Pressure Ratings at 72°F (22°C) PSIG (Barg)

1-inch				1.5-inch				2-inch				3-inch				4-inch			
Burst Pressure		Maximum Back Pressure		Burst Pressure		Maximum Back Pressure		Burst Pressure		Maximum Back Pressure		Burst Pressure		Maximum Back Pressure		Burst Pressure		Maximum Back Pressure	
psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg	psig	barg
-	-	-	-	-	-	-	-	30	2.06	5	3.45	25	2.06	6	0.41	20	1.38	5	3.45
-	-	-	-	45	3.45	16	1.10	40	2.76	10	0.69	40	2.76	12	0.83	40	2.76	15	1.03
60	4.14	6	0.41	60	4.14	24	1.65	60	4.14	21	1.45	60	4.14	23	1.59	60	4.14	27	1.86
80	5.52	16	1.10	80	5.52	33	2.28	80	5.52	33	2.28	80	5.52	37	2.55	80	5.52	40	2.76
100	6.89	27	1.86	100	6.89	42	2.90	100	6.89	46	3.17	100	6.89	48	3.31	100	6.89	52	3.58
120	8.27	38	2.62	120	8.27	50	3.45	120	8.27	59	4.07	120	8.27	59	4.07	120	8.27	63	4.34
140	9.65	49	3.38	140	9.65	59	4.07	140	9.65	71	4.90	140	9.65	71	4.90	140	9.65	73	5.03
160	11.03	59	4.07	160	11.03	68	4.69	160	11.03	82	5.65	160	11.03	83	5.72	160	11.03	84	5.79
180	12.41	69	4.76	180	12.41	77	5.31	180	12.41	92	6.34	180	12.41	94	6.48	180	12.41	95	6.55
200	13.79	78	5.38	200	13.79	86	5.93	200	13.79	103	7.10	200	13.79	105	7.24	200	13.79	105	7.24
220	15.17	86	5.93	220	15.17	96	6.62	220	15.17	113	7.79	220	15.17	116	8.00	220	15.17	116	8.00
240	16.55	94	6.48	240	16.55	105	7.24	240	16.55	124	8.55	240	16.55	128	8.83	240	16.55	127	8.76
260	17.93	102	7.03	260	17.93	115	7.93	260	17.93	135	9.31	260	17.93	139	9.58	260	17.93	137	9.45
280	19.31	109	7.51	280	19.31	124	8.55	280	19.31	145	1.00	280	19.31	150	10.34	280	19.31	148	10.20
300	20.68	117	8.07	300	20.68	134	9.24	300	20.68	156	10.76	300	20.68	162	11.17	300	20.68	159	10.96
320	22.06	125	8.62	320	22.06	144	9.93	320	22.06	167	11.51	320	22.06	174	12.00	320	22.06	169	11.65
340	23.44	134	9.24	340	23.44	154	10.62	340	23.44	178	12.27	340	23.44	185	12.76	340	23.44	180	12.41
360	24.82	142	9.79	360	24.82	164	11.31	360	24.82	189	13.03	360	24.82	197	13.58	360	24.82	191	13.17
380	26.20	151	10.41	380	26.20	175	12.07	380	26.20	199	13.72	380	26.20	208	14.34	380	26.20	202	13.93
400	27.58	160	11.03	400	27.58	185	12.76	400	27.58	210	14.48	400	27.58	220	15.17	400	27.58	213	14.69
420	28.99	170	11.72	420	28.99	196	13.51	420	28.99	221	15.24	420	28.99	232	16.00	420	28.99	224	15.44
440	30.34	179	12.34	440	30.34	207	14.27	440	30.34	232	16.00	440	30.34	244	16.82	440	30.34	235	16.20
460	31.72	189	13.03	460	31.72	218	15.03	460	31.72	243	16.75	460	31.72	255	17.58	460	31.72	245	16.89
480	33.09	199	13.72	480	33.09	229	15.79	480	33.09	254	17.51	480	33.09	267	18.41	480	33.09	256	17.65
500	34.47	211	14.55	500	34.47	240	16.55	500	34.47	265	18.27	500	34.47	278	19.17	500	34.47	267	18.41



SKi-TK

The space between the two disk elements is set at atmospheric pressure, and can be measured with a pressure gauge, a try cock, free vent or suitable telltale indicator.

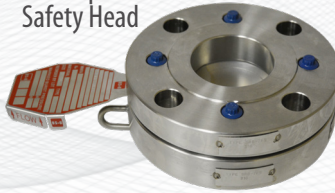
The SKi-TN provides visual confirmation that set atmospheric pressure exists between the disk elements. If a pressure event or leak occurs, the gauge moves from “green” to “red”, indicating the rupture disk needs to be replaced. The SKi can be ordered with BAS+ sensor mounted to rupture disk to alarm users that the rupture disk burst.

Safety Heads for SKi

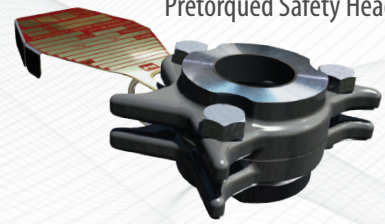
SRB-7RS™
Pretorqued
Safety Head



SRB-7FS™
Pretorqued Full-Bolted
Safety Head



SRI-7RS™
Pretorqued Safety Head



S90-7R™
Pre-assembled
insert Safety Head



TR™ option

For applications using high energy sealing systems, such as spiral wound gaskets, the torque resistant safety head option is recommended. Order with TR™ option. Safety head model names become: SRI-7RS-TR; SRB-7RS-TR; and SRB-7FS-TR.

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