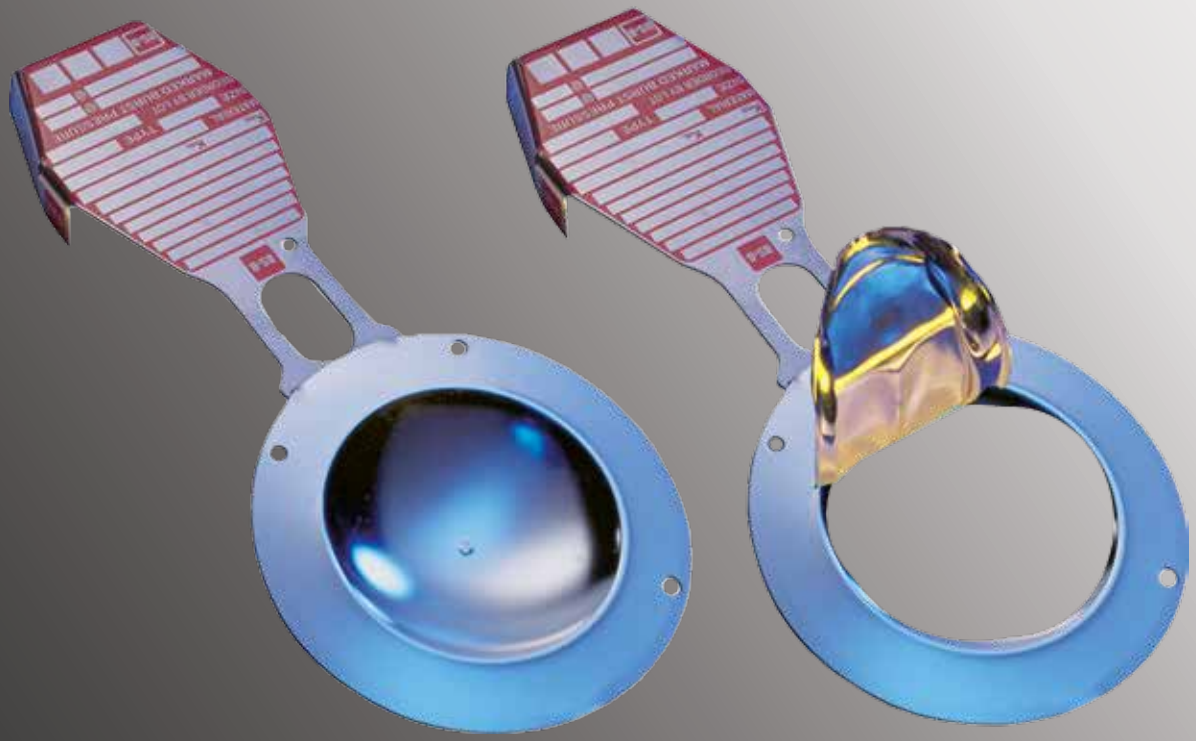
Catalog # 77-4009

BS&B®

Sure-Saf® System

CSI™ Reverse Buckling Disks



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Sure-Saf® System

CSI™ Reverse Buckling Rupture Disk

The CSI reverse buckling rupture disk combined with the type CSR-7RS safety head, called the Sure-Saf system, uniquely provides fail-safe performance to the user. The CSI rupture disk utilizes SAF® (structural apex forming) technology, the central "dimple" on the disk dome that assists burst pressure control.

Fail-Safe Protection: The CSI rupture disk was developed by BS&B in response to user requests for mistake proof reverse buckling technology. BS&B leads the rupture disk industry with reverse buckling disk technology having a damage safety ratio < 1 (Sigma EXL, Sigma, SKR , LPS, GCR). The CSI disk provides the highest level of protection against installation error by ensuring the disk will always burst at or below its rated burst pressure.

Reversal Safety Ratio < 1: Should the CSI rupture disk in its CSR-7RS safety head be accidentally installed the wrong direction, it will burst at or below its marked burst pressure.

Damage Safety Ratio < 1: If the CSI rupture disk is accidentally damaged, it will relieve pressure by bursting at or below its marked burst pressure.

Liners: Fluoropolymer film liners are available as an additional corrosion barrier attached to the inlet side of CSI rupture disks. FEP, PTFE and PFA are used. BS&B shall provide the fluoropolymer liner based upon availability and rupture disk coincident temperature, unless a customer specific requirement is defined.

Material

The CSI rupture disk is available in a variety of corrosion resistant materials. For each material, the upper temperature limit has been determined through the recommendations of material manufacturers and user experience. Other materials may be available upon request.

Maximum Recommended Temperature		
Material	°F	°C
Nickel alloy 200	750	399
316 stainless steel	900	482
Inconel® alloy 600	900	482
Monel® alloy 400	800	427
Hastelloy® alloy C-276	900	482
Fluorocarbon liner (FEP)	400	204
Fluorocarbon liner (PFA)	400	204
Fluorocarbon liner (PTFE)	500	260

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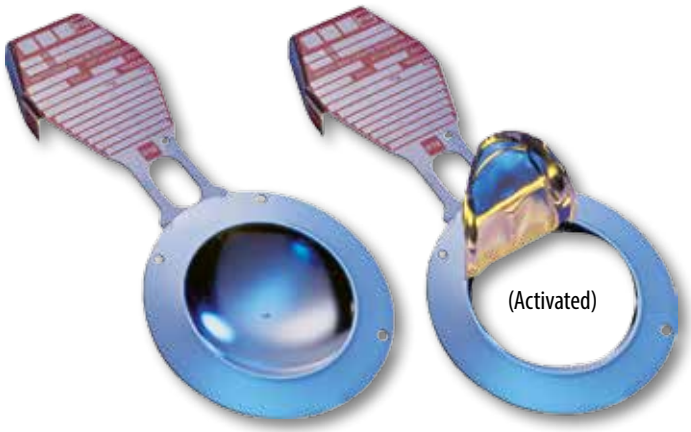


The fail-safe CSI™ reverse buckling disk

Burst Tolerance

Burst tolerance is the +/- range of pressure over which a rupture disk can be expected to burst. Burst tolerance is either +/- 5% of the marked burst pressure or +/- 2 psi (+/- 0.138bar) [for disks rated below 40 psi (2.76bar)].

Temperature

The burst pressure of each lot of CSI rupture disks is tested at the user specified temperature. Should the disk be rated above or below ambient temperature, burst testing for product certification shall be conducted at this specified burst temperature to ensure product accuracy. For applications that have operating temperatures exceeding the specified temperature, please review with BS&B.

Features

- Reverse buckling disk in sizes 1 inch (25 mm) to 8 inches (200 mm)
- Designed for non-fragmentation
- Designed for gas, liquid or multi-phase flow conditions
- Fail safe: reversal safety ratio < 1
- Fail safe: damage safety ratio < 1
- Suitable for operating pressure to 90% of the marked burst pressure (95% of the minimum burst pressure)
- Uses SAF™ technology
- Vacuum resistant
- Standard 0% MDR; optional -5% and -10% MDR
- For use in BS&B type CSR-7RS safety heads

Burst Pressure Capability

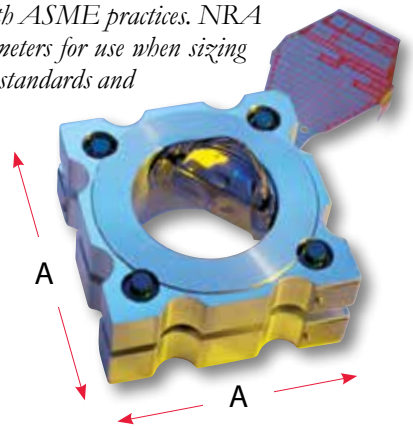
Disk Size		Nickel 200				316ss				Inconel® alloy 600				Monel® alloy 400				Hastelloy® alloy C-276			
in	mm	psig		barg		psig		barg		psig		barg		psig		barg		psig		barg	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	25	70	500	5	34	90	500	6	35	80	500	6	35	70	500	5	35	90	500	6	35
1.5	40	50	500	3	34	80	500	6	35	50	500	3	35	50	500	3	35	80	500	6	35
2	50	50	500	3	34	75	500	5	35	50	500	3	35	50	500	3	35	75	500	5	35
3	80	45	500	3	34	70	500	5	35	45	500	3	35	45	500	3	35	70	500	5	35
4	100	45	500	3	34	65	500	4	35	45	500	3	35	45	500	3	35	65	500	4	35
6	150	30	500	2	34	30	500	2	35	30	500	2	35	30	500	2	35	30	500	2	35
8	200	30	500	2	34	30	500	2	35	30	500	2	35	30	500	2	35	30	500	2	35

Minimum Net Flow Area / Net Relief Area

Disk Size		Minimum Net Flow Area (MNFA)	Net Relief Area (NRA)
in	mm	(in^2)	(cm^2)
1	25	0.86	5.55
1.5	40	1.89	12.19
2	50	3.36	21.68
3	80	7.29	47.03
4	100	11.20	72.26
6	150	22.65	146.13
8	200	42.72	275.61

In the case of the CSI rupture disk, the MNFA and the NRA are the same. MNFA is expressed in square inches to facilitate sizing calculations in line with ASME practices. NRA is expressed in square centimeters for use when sizing in line with ISO, European standards and forthcoming CEN practices.

Sure-Saf system



CSR-7RS Safety Head

The CSR-7RS safety head outlet contains an energy absorbing hinge that aligns with an unscored portion of the CSI disk perimeter that retains the CSI disk upon opening, preventing fragmentation.

Nominal Size		Safety Head Flange Rating			Safety Head Flange Thickness		Dimensions A	
in	mm	ANSI	DIN	JIS	in	mm	in	mm
1	25	150	-	-	1.50	38	2.62	67
1	25	300/600	10/16/25/40	10/16/20/30/40	1.50	38	2.88	73
1.5	40	150	-	10/16/20	1.69	43	3.38	86
1.5	40	300/600	10/16/25/40	30/40	1.69	43	3.74	95
2	50	150/300/600	10/16/25/40	10/16/20/30/40	1.88	48	4.11	105
3	80	150/300/600	16/20/25/40	10/16/20/30/40	2.19	55	5.24	133
4	100	150/300	10/16/25/40	16/20/30/40	2.88	73	6.22	158
4	100	600	-	-	2.75	70	7.6 inches OD (194mm OD)	
6	150	150/300	10/16/25/40	10/30/40	3.62	92	Round	
6	150	600	-	-	3.62	92	10.4 inches OD (264mm OD)	
8	200	150/300	-	-	3.75	95	Round	

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