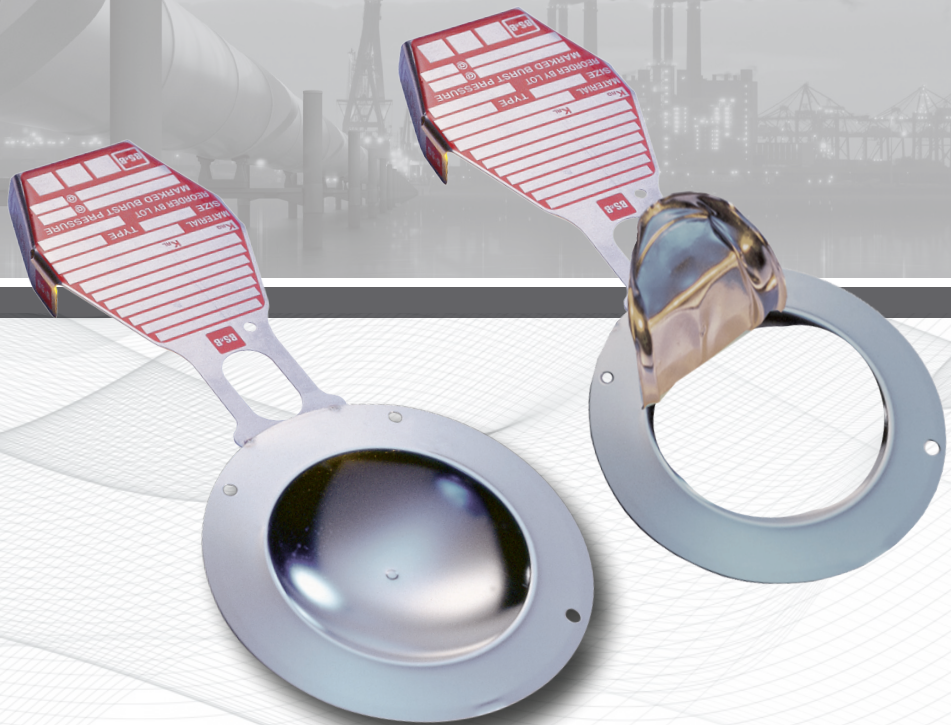


**BS&B<sup>®</sup>**



# CSI<sup>™</sup> Sure-Saf<sup>®</sup> System

Reverse Buckling Technology





## CSI™ the Sure-Saf® System Reverse Buckling Rupture Disk

The Sure-Saf® System provides optimal safety using rupture disk pressure relief technology. The CSI™ Rupture Disk combined with the CSR-7RS™ and CSI-7RS™ Safety Heads provide accuracy and reliability. This unique partnership ensures the CSI disk bursts at or below its certified burst pressure in the event that the disk is installed in the wrong direction or becomes damaged.

The CSI Rupture Disk uses SAF™ technology (structural apex forming), the central feature on the disk dome which enhances accuracy of burst pressure. At its burst pressure, the CSI Rupture Disk dome reverses and opens by shearing around a circular score line located at the perimeter of the dome. The CSR-7RS and CSI-7RS Safety Head outlets contain an energy absorbing hinge that aligns with an unscored portion of the CSI disk perimeter that retains the CSI disk upon opening, avoiding fragmentation.

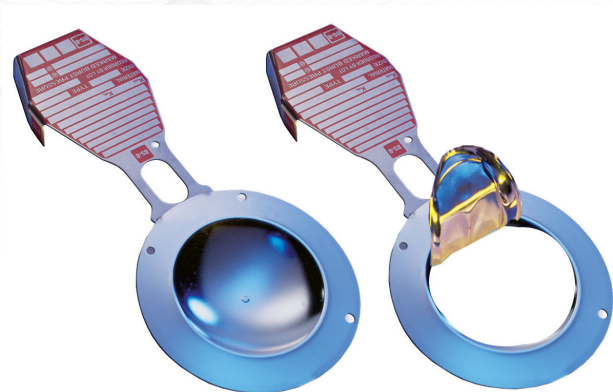
**Reversal Safety Ratio <1:** Should the CSI rupture disk in its safety head be accidentally installed the wrong direction, it will burst at or typically below its marked burst pressure.

**Damage Safety Ratio <1:** If the CSI rupture disk is accidentally damaged, it will relieve pressure by bursting at or typically 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 is standard material. PTFE above 400°F (204°C). PFA is available.

### Burst Tolerance

Marked Burst Pressure	Burst Tolerance
≤ 40 psig (2.76 barg)	± 2 psig (0.138 barg)
> 40 psig (2.76 barg)	± 5%



The Fail-safe CSI™ Reverse Buckling Disk

### Features

- Reverse buckling disk in sizes 1 inch (25mm) to 10 inches (250mm)
- 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
- US patents 6321582, 6446653, 6494074 and international patents apply
- For use in BS&B type CSR-7RS, CSI-7RS, CSI-7RS-TR and CSR-7RS-TR safety heads

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
Fluoropolymer liner (FEP)	400	204
Fluoropolymer liner (PFA)	400	204
Fluoropolymer liner (PTFE)	500	260

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## CSI™ Disk Specifications Min / Max Pressure Rating at 72°F (22°C)

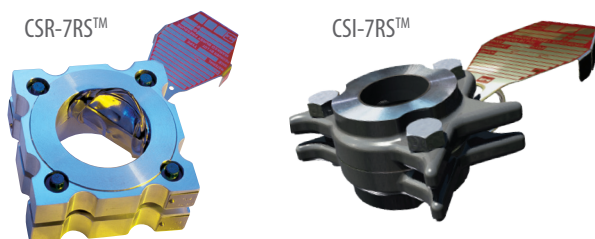
Disk Size		Nickel 200				316ss				Inconel® alloy 600				Monel® alloy 400				Hastelloy® alloy C-276			
in	mm	psig		barg		psig		barg		psig		barg		psig		barg		psig		barg	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	25	70	800	5	34.4	90	800	6	34.4	80	800	6	34.4	70	800	5	34.4	90	800	6	34.4
1.5	40	50	800	3	34.4	80	800	6	34.4	50	800	3	34.4	50	800	3	34.4	80	800	6	34.4
2	50	50	800	3	34.4	75	800	5	34.4	50	800	3	34.4	50	800	3	34.4	75	800	5	34.4
3	80	45	800	3	34.4	70	800	5	34.4	45	800	3	34.4	45	800	3	34.4	70	800	5	34.4
4	100	45	800	3	34.4	65	800	4	34.4	45	800	3	34.4	45	800	3	34.4	65	800	4	34.4
6	150	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4
8	200	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4	30	800	2	34.4
10	250	30	800	2	55.2	30	800	2	55.2	30	800	2	55.2	30	800	2	55.2	30	800	2	55.2

Consult BS&B for applications where the disk may be rated with a coincident specified temperature below the maximum process temperature to which the disk may be exposed.

## Safety Heads for CSI™ Sure-Saf® System

The CSR-7RS™ CSI-7RS™ pretorqued safety heads are designed to support the fail safe characteristics of the CSI reverse buckling disk. Both safety heads contain the energy absorbing hinge that aligns with an unscored portion of the CSI disk perimeter to retain the CSI disk upon opening, preventing fragmentation. Features include:

- Asymmetric locating pins center the disk in the safety head eliminating disk slippage and ensuring correct installation.
- Safety heads can be pretorqued in the workshop for exact calibration permitting simple and correct installation.
- For further installation assurance, a j-bolt is fitted which mates with a hole drilled in the inlet companion flange.
- Safety heads fit multiple international flange ratings including ANSI, DIN, BS, and JIS, thus reducing inventory.
- Metal-to-metal bite-type seal.
- Materials Available are 316ss, Carbon Steel, Inconel Alloy 600, Monel Alloy 400, and Hastelloy C276/Alloy C-276.
- High tensile stainless steel capscrews supplied with the CSI-7RS safety head develop the seal between the rupture disk and its holder before mounting between companion flanges.
- CSR-7RS-TR and CSI-7RS-TR option for use with high energy sealing systems such as spiral wound gaskets.
- CSI-7RS only: Light weight design takes advantage of advanced metal flow modeling to achieve its light construction and rigid strength. A unique self-centering perimeter shape centers between ASME/ANSI B16.5, EN, and JIS specification companion flanges.



## CSR-7RS Safety Head Specifications

Nominal Size		Safety Head Flange Rating			Face-to-Face Dimensions	
in	mm	ANSI	DIN	JIS	in	mm
1	25	150	-	-	1.50	38
1	25	300/600	10/16/25/40	10/16/20/30/40	1.50	38
1.5	40	150	-	10/16/20	1.69	43
1.5	40	300/600	10/16/25/40	30/40	1.69	43
2	50	150/300/600	10/16/25/40	10/16/20/30/40	1.88	48
3	80	150/300/600	16/20/25/40	10/16/20/30/40	2.19	55
4	100	150/300	10/16/25/40	16/20/30/40	2.88	73
4	100	600	-	-	2.75	70
6	150	150/300	10/16/25/40	10/30/40	3.62	92
6	150	600	-	-	3.62	92
8	200	150/300	-	-	3.75	95
10	250	150/300	-	-	4.31	109

## CSI-7RS Safety Head Specifications

Size		Safety Head Flange Rating			Face-to-Face Dimensions	
in	mm	ASME / ANSI	EN	JIS	in	mm
1	25	150/300/600	10/16/25/40	10/16/20/30/40	1.50	38
1.5	40	150/300/600	10/16/25/40	10/16/20/30/40	1.69	43
2	50	150/300/600	10/16/25/40	10/16/20/30/40	1.88	48
3	80	150/300/600	10/16/25/40	16/20/30/40	2.19	55
4	100	150/300*	10/16/25/40	16/20/30/40	2.88	73
6	150	150/300*	10/16/25/40	10/16/20/30	3.62	92
8	200	150/300*	10/16/25/40	16/20/30	3.75	95
10	250	150/300*	10/16/25/40	16/20/30	4.31	109

\* Available for ANSI 600# with adapter ring. Consult BS&B or your local representative.





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