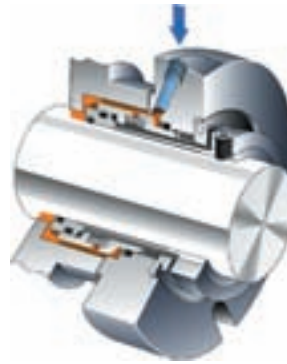




# Heavy Duty Cartridge Seals for ANSI Pumps



Safematic™ Type SB1A and SB2A



# Type SB1A

## Typical applications

Type SB1A is suitable for various media, e.g. water, oils, solvents and pulp (consistency up to 2%). Typical applications for this seal are pumps in paper and board mills, power plants and other process equipment.

Type SB1A is a versatile seal which is easy to install and service. Although the design of the seal is simple, it contains advanced technical features like patented seal face holders and elastic thrust ring.

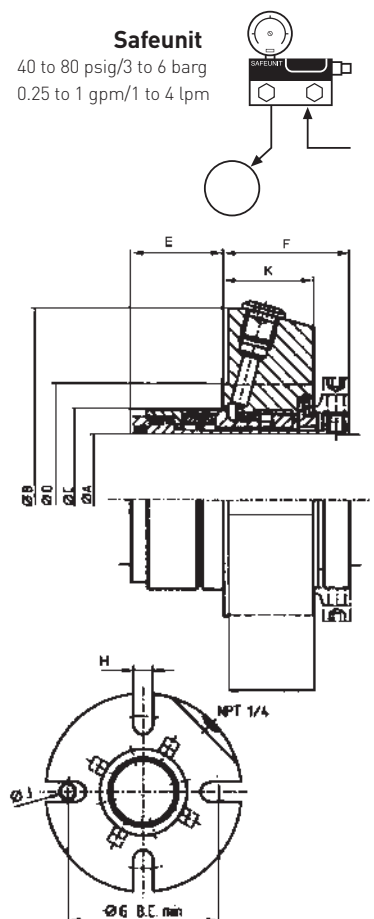
## Features

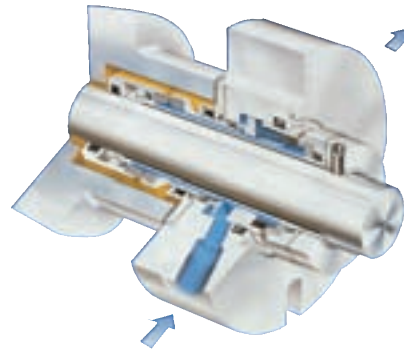
- The balanced cartridge construction makes Type SB1A suitable for a wide range of demanding applications.
- Due to the cartridge construction the seal can be easily installed.
- The seal allows a maximum of  $\pm 0.08'' / \pm 2.03$  mm axial movement and  $0.02'' / 0.50$  mm runout.

- The springs of the seal are located in the stationary housing outside of the product.
  - A flush connection is incorporated for higher consistencies.
1. Balanced design - Pressure shocks do not affect seal operation.
  2. Springs in the stationary part - Shaft misalignment will not pulsate the springs and wear out O-rings.
  3. SiC/Carbon faces as standard - Excellent pv-rating for condensate service and high speed pumps.
  4. Cartridge design - Easy installation, less human errors.
  5. No drive pins - No face cracking during start-up.
  6. Available in different materials - Covers all single seal applications.

## Seal Size

A	B	C Min	C Max	D	E	F	K	H	G J=3/8	G J=1/2
1.000	3.78	1.625	2.00	2.39	1.25	1.84	1.27	0.55	2.77	2.90
1.125	3.94	1.750	2.09	2.52	1.25	1.84	1.27	0.55	2.91	3.03
1.250	4.13	1.875	2.24	2.63	1.28	1.84	1.27	0.55	3.01	3.13
1.375	4.33	2.000	2.32	2.76	1.28	1.84	1.27	0.55	3.15	3.27
1.500	4.49	2.125	2.45	2.88	1.28	1.84	1.27	0.55	3.26	3.38
1.625	4.96	2.375	2.68	3.11	1.33	1.84	1.27	0.55	3.49	3.61
1.750	5.47	2.625	2.91	3.35	1.33	1.84	1.31	0.55	3.73	3.85
1.875	5.47	2.625	2.91	3.35	1.33	1.84	1.31	0.55	3.73	3.85
2.000	5.51	2.750	3.19	3.46	1.33	1.84	1.31	0.55	3.86	3.98
2.125	5.98	2.875	3.27	3.58	1.33	1.84	1.31	0.71	3.96	4.09
2.250	6.10	3.000	3.40	3.71	1.33	1.84	1.31	0.71	4.09	4.21
2.375	6.30	3.125	3.50	3.90	1.33	1.84	1.33	0.71	4.28	4.40
2.500	6.38	3.250	3.69	4.01	1.33	1.84	1.33	0.71	4.41	4.52
2.625	6.38	3.375	3.75	4.13	1.33	1.84	1.33	0.71	4.51	4.65
2.750	7.95	3.750	4.14	4.84	1.33	1.84	1.33	0.71	5.30	5.42
2.875	7.95	3.875	4.25	4.61	1.33	1.84	1.33	0.71	4.99	5.11
3.000	7.95	4.000	4.41	4.73	1.13	1.84	1.33	0.71	5.11	5.23
3.125	8.25	4.125	4.50	4.84	1.13	1.84	1.33	0.71	5.22	5.34
3.250	8.27	4.250	4.68	4.98	1.13	1.84	1.33	0.71	5.36	5.48
3.375	8.46	4.375	4.76	5.08	1.13	1.84	1.33	0.71	5.46	5.58
3.500	8.47	4.500	4.85	5.24	1.13	1.84	1.33	0.71	5.62	5.74
3.625	8.61	4.625	4.96	5.35	1.13	1.84	1.33	0.90	5.73	5.85
3.750	8.74	4.750	5.14	5.46	1.13	1.84	1.33	0.90	5.84	5.96
3.875	8.87	4.875	5.21	5.60	1.13	1.84	1.33	0.90	5.98	6.10
4.000	9.00	5.000	5.58	5.98	1.23	2.17	1.53	0.90	6.36	6.48
4.125	9.00	5.125	5.71	6.10	1.23	2.17	1.53	0.90	6.48	6.60
4.250	9.10	5.250	5.83	6.22	1.23	2.17	1.53	0.90	6.60	6.72
4.375	9.23	5.375	5.97	6.36	1.23	2.17	1.53	0.90	6.74	6.86
4.500	9.50	5.500	6.09	6.48	1.23	2.17	1.53	0.90	6.86	6.98
4.625	9.50	5.625	6.22	6.61	1.23	2.17	1.53	0.90	6.99	7.11
4.750	9.61	5.750	6.30	6.73	1.23	2.17	1.53	0.90	7.11	7.23
4.875	9.74	5.875	6.47	6.86	1.23	2.17	1.53	0.90	7.24	7.36
5.000	10.00	6.000	6.59	6.98	1.23	2.17	1.53	0.90	7.36	7.48





# Type SB2A

## Typical applications

Type SB2A is a specially designed double cartridge seal for severe applications. Type SB2A seal is ideal for use with fibrous and abrasive fluids, most often used in pumps in pulp mills, minerals processing and other slurry duties up to 40% solids by weight and a solids hardness of 8 Mohs. This seal can be used in major process equipment including pumps, agitators, mixers.

## Unique features of Type SB2A

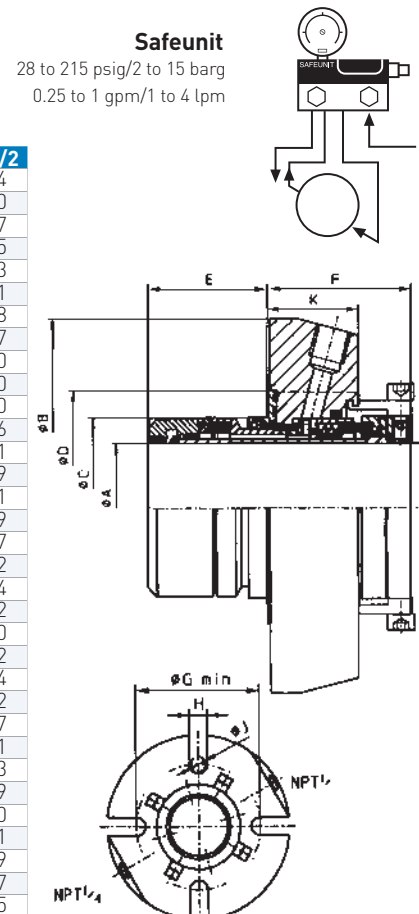
1. A patented technique is used for fastening the seal faces which ensures correct face alignment. This process allows for major temperature fluctuations without face distortion.
2. Only one set of non-rotating springs are used. The springs are isolated from the product to prevent clogging and corrosion.
3. The seal has a piston design which allows it to float with the shaft during axial movement such as during an impeller adjustment.

4. A patented PTFE slot ring is used in place of a traditional O-ring where exposed to the product. The slot ring design prevents O-ring hang up and rolling.
5. The seal face carriers are driven by machined fits to prevent seal face distortion.
6. A patented double-balanced design is used to allow operation with pressurised or non-pressurised barrier fluid.
7. This seal allows a maximum of  $\pm 0.08'' / \pm 2.03$  mm axial movement and  $0.02'' / 0.50$  mm runout.

This is technically the most advanced seal available today. In combination with the seal water control device Safeunit, the seal is a reliable and long-lasting solution.

## Seal Size

A	B	C Min	C Max	D	E	F	K	H	G J=3/8	G J=1/2
1.000	3.811	1.625	1.940	2.394	1.772	2.087	1.339	0.55	2.769	2.894
1.125	3.937	1.750	2.087	2.520	1.772	2.087	1.339	0.55	2.895	3.020
1.250	4.134	1.875	2.244	2.657	1.772	2.087	1.339	0.55	3.032	3.157
1.375	4.331	2.000	2.362	2.795	1.772	2.087	1.339	0.55	3.170	3.295
1.500	4.488	2.125	2.500	2.933	1.772	2.126	1.339	0.55	3.308	3.433
1.625	4.961	2.375	2.625	3.071	1.772	2.126	1.339	0.55	3.446	3.571
1.750	5.472	2.500	2.874	3.228	1.772	2.126	1.339	0.55	3.603	3.728
1.875	5.472	2.625	2.953	3.327	1.772	2.126	1.339	0.55	3.702	3.827
2.000	5.500	2.750	3.189	3.465	1.772	2.126	1.339	0.55	3.860	3.980
2.125	5.984	2.875	3.425	3.900	1.772	2.126	1.339	0.70	4.275	4.400
2.250	5.984	3.000	3.560	4.016	1.772	2.126	1.339	0.70	4.391	4.660
2.375	6.299	3.125	3.681	4.134	1.772	2.126	1.339	0.70	4.528	4.646
2.500	6.378	3.250	3.819	4.291	1.890	2.126	1.339	0.70	4.667	4.791
2.625	6.378	3.375	3.937	4.409	1.890	2.126	1.339	0.70	4.785	4.909
2.750	7.953	3.750	4.449	4.921	2.008	2.362	1.421	0.70	5.300	5.421
2.875	7.953	3.875	4.567	5.039	2.008	2.362	1.421	0.70	5.414	5.539
3.000	7.953	4.000	4.685	5.197	2.008	2.362	1.421	0.70	5.572	5.697
3.125	8.250	4.125	4.822	5.322	2.008	2.362	1.421	0.70	5.697	5.822
3.250	8.250	4.250	4.937	5.394	2.008	2.362	1.421	0.70	5.769	5.894
3.375	8.374	4.375	5.062	5.512	2.008	2.362	1.421	0.70	5.887	6.012
3.500	8.465	4.500	5.181	5.630	2.008	2.362	1.421	0.70	6.005	6.130
3.625	8.583	4.625	5.306	5.752	2.008	2.362	1.421	0.90	6.127	6.252
3.750	8.740	4.750	5.433	5.984	2.008	2.362	1.421	0.90	6.359	6.484
3.875	8.858	4.875	5.556	6.102	2.008	2.362	1.421	0.90	6.477	6.602
4.000	9.000	5.000	5.687	6.181	2.126	2.362	1.421	0.90	6.572	6.697
4.125	9.016	5.125	5.716	6.311	2.126	2.362	1.421	0.90	6.686	6.811
4.250	9.228	5.250	5.921	6.433	2.126	2.362	1.421	0.90	6.808	6.933
4.375	9.331	5.375	6.056	6.559	2.126	2.362	1.421	0.90	6.934	7.059
4.500	9.500	5.500	6.170	6.700	2.126	2.362	1.421	0.90	7.075	7.200
4.625	9.606	5.625	6.300	6.811	2.126	2.362	1.421	0.90	7.186	7.311
4.750	9.606	5.750	6.417	6.969	2.126	2.362	1.421	0.90	7.344	7.469
4.875	9.843	5.875	6.550	7.087	2.126	2.362	1.421	0.90	7.462	7.587
5.000	10.000	6.000	6.687	7.182	2.126	2.362	1.421	0.90	7.560	7.685



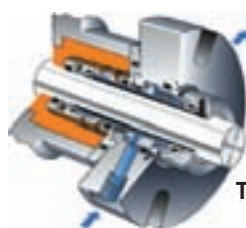


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## Mechanical Sealing Systems

Type SB2B is a specially designed double cartridge seal to be used with big bore and standard bore pumps in cooking, evaporation and causticising plants with toxic, environmentally hazardous, abrasive and effluent liquids. Type SB2S is a special variation, tailor-made seal for special applications. A wide variety of engineered designs are available.

- Fits into big bore and standard bore backplates
- Reduced inventories
- Easy to install
- Proven technology



Type SB2B



Type SB2S

Type SB2B and SB2S	
<b>Technical specification</b>	
Temperature	350°F/180°C max
Stuffing box pressure	290 psig/20 barg max
Barrier fluid pressure	220 psig/15 barg max
Speed	4,000 fpm/20 m·s <sup>-1</sup> max
<b>Materials</b>	
Seal faces	SiC/SiC (process side) SiC/Carbon (atm. side)
O-rings	PTFE against the product EPDM optional Viton® optional
Metals	AISI 329 standard Titanium, Alloy 20, Hastelloy available
Springs	Nimonic steel

Type SB2A	
<b>Technical specification</b>	
Temperature	350°F/180°C max
Stuffing box pressure	290 psig/20 barg max
Barrier fluid pressure	220 psig/15 barg max
Speed	4,000 fpm/20 m·s <sup>-1</sup> max
<b>Materials</b>	
Seal faces	SiC vs. SiC (product side) SiC vs. Carbon (atm. side)
O-rings	PTFE against the product EPDM optional Viton® optional, etc.
Metals	AISI 329 standard Titanium, Alloy 20, Hastelloy available
Springs	Nimonic steel

Criteria for installation for all types	
Shaft / Sleeve	Limits
Surface finish	63 μ inch/1.6 μm Ra
Ovality / Out of roundness (shaft)	0.002"/0.05 mm
End play / Axial float allowance	±0.08"/±2.03 mm
Runout / Out of squareness	±0.02"/±0.50 mm
Shaft squareness to housing	0.005"/0.13 mm

Type SB1A	
<b>Technical specification</b>	
Temperature	250°F/121°C max
Stuffing box pressure	290 psig/20 barg max
Speed	4,000 fpm/20 m·s <sup>-1</sup> max
<b>Materials</b>	
Seal faces	SiC vs. SiC SiC vs. Carbon
O-rings	PTFE EPDM Viton®
Metals	AISI 329 standard
Springs	Nimonic steel

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