

## SB and SBO Series Pulsation Dampeners



### Description

The pressure fluctuations occurring in hydraulic systems can be periodic or single occurrence problems due to:

- Flow rate fluctuations from displacement pumps
- Actuation of shut-off and control valves with short opening and closing times
- Switching pumps on and off
- Sudden linking of hydraulic circuits with different pressure levels

Dampeners have two fluid connections for inline mounting. The volume of flow is directed straight at the bladder or diaphragm by diverting it in the fluid valve. This causes direct contact of the fluid flow with the bladder or diaphragm which, in an almost inertialess operation, balances the flow rate fluctuations via the gas volume. It is particularly effective with higher frequency oscillations. The gas pre-charge pressure is adjusted for the specific systems operating conditions.

### Construction

HYDAC pulsation dampeners consist of:

- The welded or forged pressure vessel in carbon steel; for chemically aggressive fluids they are available in coated carbon steel or stainless steel
- The special fluid valve with inline connection, which guides the flow into the vessels (*threaded or flange connections available*)
- The bladder or diaphragm in various compounds as listed below

### Compound Materials

Not all fluids are compatible with every elastomer at all temperatures. Therefore, HYDAC offers the following choice of elastomers:

- NBR (*Standard Nitrile*)
- LT-NBR (*Low Temperature Nitrile*)
- ECO (*Epichlorohydrin*)
- IIR (*Butyl*)
- FPM (*Fluorelastomer*)
- others (*available upon request*)

To determine which material is appropriate...

**ALWAYS REFER TO FLUID  
MANUFACTURER'S RECOMMENDATION**

### Corrosion Protection

For use with certain aggressive or corrosive fluids, or in a corrosive environment, HYDAC offers protective coatings and corrosive resistant materials (*i.e. stainless steel*) for the accumulator parts that come in contact with the fluid, or are exposed to the hostile environment.

### Mounting Position

The mounting position of hydraulic dampeners is dependent on the dampener chosen and the specific application. The preferred position is typically vertical.

### System Mounting

Dampeners should be mounted as close as possible to the pulsation source.

### Applications

Pulsation dampeners are used to:

- Reduce vibrations caused by pipes, valves, couplings, etc. in order to prevent pipe and valve damage
- Protect measurement instruments and eliminate the impaired performance caused by pulsations
- Reduce system noise
- Increase machine performance
- Allow the connection of multiple pumps to one line
- Increase the allowable rpm and feed pressure of pumps
- Reduce system breakdowns and increase the service life of the system

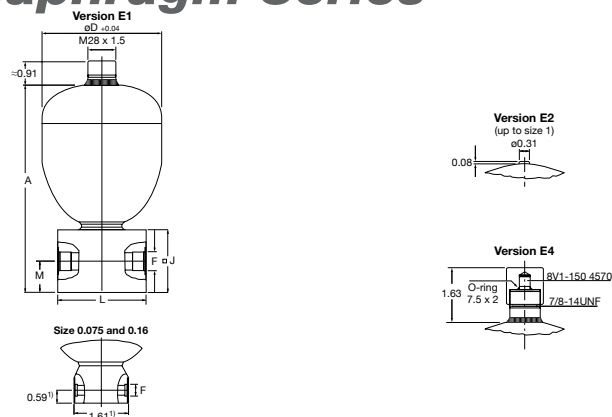
See illustration on page 25 for a graphic representation of a pressure spike with and without an accumulator being used as a shock absorber.

## Model Code

	<b>SBXXX</b>	<b>P</b>	<b>10</b>	<b>A</b>	<b>1</b>	<b>/</b>	<b>112</b>	<b>S</b>	<b>-</b>	<b>210</b>	<b>AI</b>	<b>010</b>
<b>Series</b>	_____											
SB XXX	= Bladder Style (XXX = series designation)											
SBO XXX	= Diaphragm Style (XXX = series designation)											
(see tables on following pages for most common series and size selections)												
<b>Design</b>	_____											
P	= Pulsation Dampener											
PH	= Pulsation Dampener/High Flow											
S	= Suction Stabilizer											
<b>Size</b> (in Liters, see tables on dimension pages to follow)	_____											
<b>Type of Connection</b>	_____											
A	= Threaded											
E	= Threaded (for SBO welded design only)											
F	= Flanged											
<b>Gas Port</b>	_____											
<b>For series SB</b>	_____											
1	= HYDAC gas valve version 4 (BV1-I504570)											
<b>For series SBO</b>	_____											
1	= HYDAC gas valve version 1 (M28x1.5)											
4	= HYDAC gas valve version 4 (BV1-I504570)											
6	= HYDAC gas valve version 1 (M28x1.5/ for SBO design only)											
<b>Material Code</b>	_____											
<b>Depending on Application</b>	_____											
112	= Standard for oil service (mineral oil)											
<b>Fluid Port</b>	_____											
1	= Carbon steel											
3	= Stainless steel											
6	= Low temperature carbon steel (< -20°F)											
<b>Shell</b>	_____											
0	= Synthetic coated carbon steel (internal/water service)											
1	= Carbon steel											
2	= Chemically plated carbon steel (internal/water service)											
4	= Stainless steel											
6	= Low temperature carbon steel (< -20°F)											
<b>Bladder / Diaphragm Compound</b>	_____											
2	= NBR (Buna N)											
3	= ECO (hydrin)											
4	= IIR (Butyl)											
5	= NBR (Low temperature Buna N)											
6	= FPM (Fluoro-elastomer)											
7	= Others											
<b>Country of Installation</b>	_____											
S	= USA											
(for other countries see page 2 for proper codes designation)												
<b>Maximum Work Pressure</b>	_____											
210	= 3000 psi											
345	= 5000 psi											
<b>Fluid Port Connection</b>	_____											
<b>Threaded</b>	_____											
AI	= BSPP (ISO 228)											
AK	= BSP (for sizes 0.075 & 0.16)											
CI	= SAE (ANSI B1.1)											
CK	= SAE (for sizes 0.075 & 0.16)											
<b>Flanged</b>	_____											
FI	= SAE 1 1/2" - 6000 psi (code 62)											
<b>Precharged Pressure (P0) in bar</b>	_____											

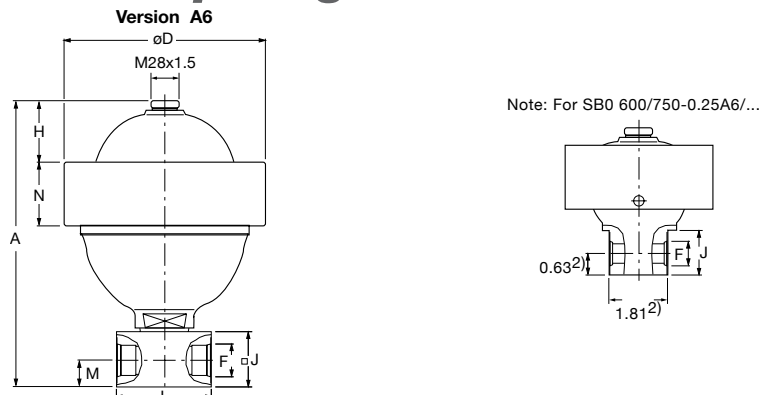
Model Codes containing RED selections are non-standard items – Contact HYDAC for information and availability  
Not all combinations are available

## SBO Welded Diaphragm Series Dimensions



Series	Size	Gas Volume (in <sup>3</sup> )	Max. working pressure		Weight (lbs)	A (in)	$\phi D^{(3)}$ (in)	Thread F		J (in)	L (in)	M (in)	Q <sup>(2)</sup> (gpm)
			psi	bar				SAE	BSP				
SBO250P	0.075	5	3600	250	2.2	4.57	2.52	9/16-18UNF	ISO 228-G1/4	-	-	-	5
SBO210P	0.16	10	3000	210	2.5	5.04	2.91	9/16-18UNF	ISO 228-G1/4	-	-	-	5
SBO210P	0.32	20	3000	210	5.8	5.96	3.66	3/4-16UNF	ISO 228-G1/2	1.97	3.15	0.99	10
SBO210P	0.5	30	3000	210	8.7	6.51	4.13	3/4-16UNF	ISO 228-G1/2	1.97	3.15	0.99	10
SBO330P	0.6	36	4700	330	12.3	7.74	4.53	1 5/16-12UNF	ISO228-G 1	2.36	4.13	1.18	40
SBO210P	0.75	45	3000	210	11.2	7.58	4.76	1 5/16-12UNF	ISO228-G 1	2.36	4.13	1.18	40
SBO200P	1	60	3000	210	12.9	8.02	5.35	1 5/16-12UNF	ISO228-G 1	2.36	4.13	1.18	40
SBO210P	2	120	3000	210	19.6	9.47	6.57	1 5/16-12UNF	ISO228-G 1	2.36	4.13	1.18	40

## SBO Threaded Diaphragm Series Dimensions



Series	Size	Gas Volume (in <sup>3</sup> )	Max. working pressure		Weight (lbs)	A (in)	$\phi D$ (in)	Thread F		H (in)	J (in)	L (in)	M (in)	N (in)	Q <sup>(2)</sup> (gpm)
			psi	bar				SAE	BSP						
SBO350P <sup>(4)</sup>	0.25	15	5000	350	11.5	6.30	4.53	3/4-16UNF	ISO 228-G1/2	0.70	1.97	3.15	0.99	2.17	10
SBO500P	0.25	15	7200	500	11.5	6.30	4.53	3/4-16UNF	ISO 228-G1/2	0.70	1.97	3.15	0.99	2.17	10
SBO600P <sup>(4)</sup>	0.25	15	8700	600	22.7	6.77	6.02	3/4-16UNF	ISO 228-G1/2	0.60	2.17	2.16	0.71	2.48	10
SBO750P	0.25	15	10000	750	22.7	6.77	6.02	3/4-16UNF	ISO 228-G1/2	0.60	2.17	2.16	0.71	2.48	10
SBO250P <sup>(4)</sup>	0.6	36	3600	250	17.6	8.31	5.51	1 5/16-12UNF	ISO228-G 1	1.77	2.36	4.13	1.18	2.24	40
SBO330P	0.6	36	4700	330	17.6	8.31	5.51	1 5/16-12UNF	ISO228-G 1	1.77	2.36	4.13	1.18	2.24	40
SBO210P	1.3	80	3000	210	23.7	10.26	6.69	1 5/16-12UNF	ISO228-G 1	2.45	2.36	4.13	1.18	2.17	40
SBO400P	1.3	80	5800	400	29.7	10.47	7.83	1 5/16-12UNF	ISO228-G 1	1.97	2.36	4.13	1.18	2.56	40
SBO180P <sup>(4)</sup>	2	120	2600	180	30.1	11.52	7.83	1 5/16-12UNF	ISO228-G 1	2.54	2.36	4.13	1.18	2.40	40
SBO250P	2	120	3600	250	34.0	11.75	6.60	1 5/16-12UNF	ISO228-G 1	2.54	2.36	4.13	1.18	2.52	40

1) For SAE threads only

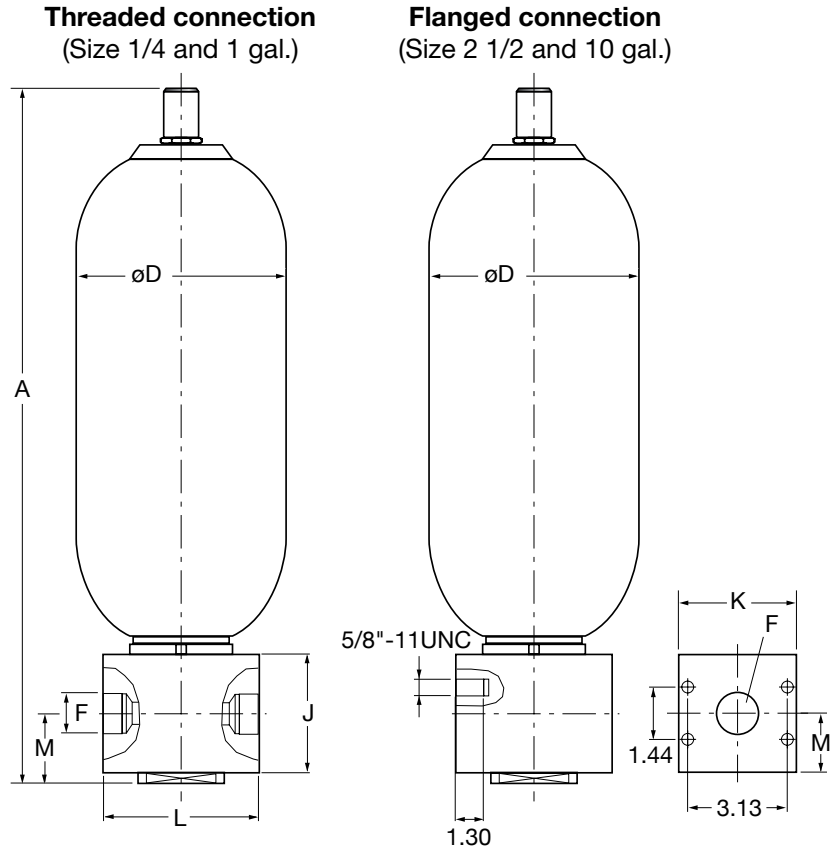
2) Pressure loss at Q (viscosity 32 cSt) approx. 50 psi

3) Diameter at electron-beam weld may be up to +0.150" larger

4) Only available in stainless steel

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.

## SB Bladder Accumulator Series Dimensions



### SB 330 P (3000 psi max. working pressure)

Size	Vol. (gal)	Gas Volume (in <sup>3</sup> )	Weight (lbs)	A (in)	øD (in)	Connection F	J (in)	K (in)	L (in)	M (in)	Q <sup>1)</sup> (gpm)
1	1/4	66	24	14.4	4.6	ISO 228-G1 1/4	3.15	3.15	4.72	2.24	80
4	1	226	40	18.0	6.6	ISO 228-G1 1/4	3.15	3.15	4.72	2.24	80
10	2 1/2	566	90	24.4	9.0	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140
20	5	1125	154	36.3	9.0	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140
32	10	2080	220	56.9	9.0	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140

### SB 600 P (5000 psi max. working pressure)

Size	Vol. (gal)	Gas Volume (in <sup>3</sup> )	Weight (lbs)	A (in)	øD (in)	Connection F	J (in)	K (in)	L (in)	M (in)	Q <sup>1)</sup> (gpm)
1	1/4	66	24	14.4	4.6	ISO 228-G1 1/4	3.15	3.15	4.72	2.24	80
4	1	226	49	18.0	6.6	ISO 228-G1 1/4	3.15	3.15	4.72	2.24	80
10	2 1/2	566	102	24.4	9.1	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140
20	5	1125	183	36.3	9.1	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140
32	10	2080	269	56.9	9.1	SAE 1 1/2" - 6000 psi (code 62 SAE)	3.94	4.50	6.69	3.35	140

1) Pressure loss at Q (viscosity 32 cSt) approx. 50 psi

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all critical dimensions should be verified by requesting a certified print.