H.S. WHITE CORPORATION
Marine and Industrial Specialists

Metal Bellows Expansion Joints Technical Data

Short Style Specification Chart Style 55

SLP-Short Style Low Pressure
SMP-Short Style Medium Pressure
SHP-Short Style High Pressure

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-current Movements (in.)			Spring Rates (lbs./in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	SLP SMP SHP	50 150 300	6 6 6	11 11 15	0.64	0.16	0.1	681 681 681	945 945 945
2.5	SLP SMP SHP	50 150 300	6 6 6.5	15 15 21	0.64	0.16	0.1	664 664 1,253	1,304 1,304 2,469
3	SLP SMP SHP	50 150 300	6 6 7	17 17 27	0.64	0.16	0.1	703 703 1,343	1,962 1,962 3,760
3.5	SLP SMP SHP	50 150 300	6 6 7	23 23 35	0.64	0.16	0.1	728 728 1,342	2,132 2,132 3,938
4	SLP SMP SHP	50 150 300	7 7 7.5	27 27 45	0.64	0.16	0.1	756 756 1,410	2,740 2,740 5,118
5	SLP SMP SHP	50 150 300	8 8 8	31 31 58	1.04	0.26	0.1	564 581 2,150	3,088 2,328 10,931
6	SLP SMP SHP	50 150 300	8 8 9	40 40 81	1.04	0.26	0.2 0.1 0.1	337 744 2,846	1,973 3,975 14,368
8	SLP SMP SHP	50 150 300	9 9.5 11	63 64 123	1.28	0.32	0.2 0.1 0.1	250 901 2,833	1,307 4,720 14,893
10	SLP SMP SHP	50 150 300	9.5 9.5 11	89 91 169	1.28	0.32	0.1	397 1,346 4,119	3,273 11,120 34,129
12	SLP SMP SHP	50 150 300	10 10 12	132 134 242	1.28	0.32	0.1	309 1,534 7,148	3,075 14,342 62,597
14	SLP SMP SHP	50 150 300	10.5 10.5 12.5	184 189 348	1.28	0.32	0.1	356 1,899 3,797	4,181 20,721 41,651
16	SLP SMP SHP	50 150 300	11 11 13	202 206 400	1.28	0.32	0.1	651 2,452 4,887	9,449 35,626 59,981
18	SLP SMP SHP	50 150 300	12 12 14	267 272 524	1.44	0.36	0.1	559 2,380 4,721	10,229 43,365 72,641
20	SLP SMP SHP	50 150 300	12 12 14	342 347 665	1.44	0.36	0.1	753 2,960 5,818	17,181 67,035 132,337
22	SLP SMP SHP	50 150 300	12 12.5 14.5	379 389 779	1.44	0.36	0.1	599 3,248 6,380	16,035 83,910 139,960
24	SLP SMP SHP	50 150 300	13 13 15	455 461 992	1.44	0.36	0.1	898 3,544 6,958	28,938 108,343 180,225

SLP-Short Style Low Pressure
SMP-Short Style Medium Pressure
SHP-Short Style High Pressure

Short Style Specification Chart Style 22

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-concurrent Movements (in.)			Spring Rates (lbs./in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	SLP SMP SHP	50 150 300	6	2 4 4	0.64	0.16	0.1	681 681 681	945 945 945
2.5	SLP SMP SHP	50 150 300	7	3 3 3	0.64	0.16	0.1	664 664 1,253	1,304 1,304 2,469
3	SLP SMP SHP	50 150 300	9	4 4 4	0.64	0.16	0.1	703 703 1,343	1,952 1,952 3,760
3.5	SLP SMP SHP	50 150 300	9	4 4 4	0.64	0.16	0.1	728 728 1,342	2,132 2,132 3,938
4	SLP SMP SHP	50 150 300	9	5 5 5	0.64	0.16	0.1	756 756 1,410	2,740 2,740 5,118
5	SLP SMP SHP	50 150 300	10	7 7 8	1.04	0.26	0.1	564 581 2,150	3,088 2,328 10,931
6	SLP SMP SHP	50 150 300	10	9 9 10	1.04	0.26	0.2 0.1 0.1	337 744 2,846	1,973 3,975 14,368
8	SLP SMP SHP	50 150 300	10	9 10 12	1.28	0.32	0.2 0.1 0.1	250 901 2,833	1,307 4,720 14,893
10	SLP SMP SHP	50 150 300	10	12 14 15	1.28	0.32	0.1	397 1,346 4,119	3,273 11,120 34,129
12	SLP SMP SHP	50 150 300	10	15 17 22	1.28	0.32	0.1	309 1,534 7,148	3,075 14,342 62,597
14	SLP SMP SHP	50 150 300	12	18 23 31	1.28	0.32	0.1	356 1,899 3,797	4,181 20,721 41,651
16	SLP SMP SHP	50 150 300	12	22 26 34	1.28	0.32	0.1	651 2,452 4,887	9,449 35,626 59,981
18	SLP SMP SHP	50 150 300	12	25 30 40	1.44	0.36	0.1	559 2,380 4,721	10,229 43,365 72,641
20	SLP SMP SHP	50 150 300	14	41 46 61	1.44	0.36	0.1	753 2,960 5,818	17,181 67,035 132,337
22	SLP SMP SHP	50 150 300	14	41 51 68	1.44	0.36	0.1	599 3,248 6,380	16,035 83,910 139,960
24	SLP SMP SHP	50 150 300	14	50 55 74	1.44	0.36	0.1	898 3,544 6,958	28,938 108,343 180,225
30 36 40	DS	50	14	56 67 72	1.44	0.36	0.2	960 1,100 1,490	175000 248000 380000
42 46 48	DS	50	14	84 98 170	1.60	0.40	0.2	1,680 1,742 3,600	410000 470000 500000
50 52 54	DS	25	14	179 210 218	1.60	0.40	0.2	2,500 3,215 3,605	174900 318000 604000
60 66 72	DS	25	14	242 283 309	1.60	0.40	0.1	4,200 4,400 4,750	780000 1,300,500 2,800,300
84 86 108	DS	15	14	395 460 491	1.60	0.40	0.1	5,478 6,300 7,210	4,610,000 12,100,000 18,400,000
126 132 144	DS	15	14	565 600 660	1.60	0.40	0.08	8,008 8,715 9,430	19,500,000 21,000,000 25,000,100

Short Style Specification Chart Style 44 and 66

SLP-Short Style Low Pressure
SMP-Short Style Medium Pressure
SHP-Short Style High Pressure

Style 44

Style 66

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-concurrent Movements (in.)			Spring Rates (lbs./in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	SLP SMP SHP	50 150 300	6	10 10 10	0.64	0.16	0.1	681 681 681	945 945 945
2.5	SLP SMP SHP	50 150 300	6	13 13 13	0.64	0.16	0.1	664 664 1,253	1,304 1,304 2,469
3	SLP SMP SHP	50 150 300	6	13 13 13	0.64	0.16	0.1	703 703 1,343	1,962 1,962 3,760
3.5	SLP SMP SHP	50 150 300	6	20 20 20	0.64	0.16	0.1	728 728 1,342	2,132 2,132 3,938
4	SLP SMP SHP	50 150 300	7	18 18 18	0.64	0.16	0.1	756 756 1,410	2,740 2,740 5,118
5	SLP SMP SHP	50 150 300	8	21 21 22	1.04	0.26	0.1	564 581 2,150	3,088 2,328 10,931
6	SLP SMP SHP	50 150 300	8	26 26 27	1.04	0.26	0.2 0.1 0.1	337 744 2,846	1,973 3,975 14,368
8	SLP SMP SHP	50 150 300	8	46 37 40	1.28	0.32	0.2 0.1 0.1	250 901 2,833	1,307 4,720 14,893
10	SLP SMP SHP	50 150 300	8	46 48 50	1.28	0.32	0.1	397 1,346 4,119	3,273 11,120 34,129
12	SLP SMP SHP	50 150 300	9	76 78 84	1.28	0.32	0.1	309 1,534 7,148	3,075 14,342 62,597
14	SLP SMP SHP	50 150 300	9	107 112 121	1.28	0.32	0.1	356 1,899 3,797	4,181 20,721 41,651
16	SLP SMP SHP	50 150 300	9	138 142 152	1.28	0.32	0.1	651 2,452 4,887	9,449 35,626 59,981
18	SLP SMP SHP	50 150 300	10	149 154 166	1.44	0.36	0.1	559 2,380 4,721	10,229 43,365 72,641
20	SLP SMP SHP	50 150 300	10	191 196 214	1.44	0.36	0.1	753 2,960 5,818	17,181 67,035 132,337
22	SLP SMP SHP	50 150 300	10	219 229 249	1.44	0.36	0.1	599 3,248 6,380	16,035 83,910 139,960
24	SLP SMP SHP	50 150 300	11	265 271 292	1.44	0.36	0.1	898 3,544 6,958	28,938 108,343 180,225
30 36 40	DS	50	11	377 497 602	1.44	0.36	0.2	960 1,100 1,490	175,000 248,000 380,000
42 46 48	DS	50	11	641 750 810	1.60	0.40	0.2	1,680 1,742 3,600	410,000 470,000 500,000
50 52 54	DS	25	11	900 1,008 1,061	1.60	0.40	0.2	2,500 3,215 3,605	174,900 318,000 604,000
60 66 72	DS	25	11	1,347 1,591 1,799	1.60	0.40	0.1	4,200 4,400 4,750	780,000 1,300,500 2,800,300
84 86 108	DS	15	11	2,137 3,916 3,200	1.60	0.40	0.1	5,478 6,300 7,210	4,610,000 12,100,000 18,400,000
126 132 144	DS	15	11	4,400 4,700 5,200	1.60	0.40	0.08	8,008 8,715 9,430	19,500,000 21,000,000 25,000,100

Long Style Specification Chart Style 55

LLP-Long Style Low Pressure
LMP-Long Style Medium Pressure
LHP-Long Style High Pressure

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-concurrent Movements (in.)			Spring Rates (lbs./in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	LLP	50	8	11	1.60	0.40	0.5	389	180
	LMP	150	8	11			0.3	483	219
	LHP	300	8	15	0.96	0.24	0.3	1,052	471
2.5	LLP	50	10	15	1.60	0.40	0.5	279	105
	LMP	150	10	15			0.3	688	253
	LHP	300	10.5	22	1.20	0.30	0.2	1,403	896
3	LLP	50	9.5	17	1.60	0.40	0.6	312	166
	LMP	150	9.5	18			0.4	721	379
	LHP	300	11	28	1.20	0.30	0.3	1,474	778
3.5	LLP	50	10	23	1.60	0.40	0.6	336	228
	LMP	150	8.5	24			0.4	589	686
	LHP	300	9.5	36	1.28	0.32	0.3	1,209	1,284
4	LLP	50	10	28	1.60	0.40	0.6	378	342
	LMP	150	10	28			0.4	743	671
	LHP	300	11	47	1.28	0.32	0.3	1,564	1,412
5	LLP	50	11	33	2.40	0.60	0.5	242	249
	LMP	150	11.5	34			0.5	922	862
	LHP	300	13	61	1.60	0.40	0.4	1,760	1,601
6	LLP	50	12	41	2.40	0.60	0.75	260	369
	LMP	150	12	43			0.6	762	1,003
	LHP	300	13	87	1.76	0.44	0.45	1,924	2,292
8	LLP	50	13	67	3.20	0.80	0.75	541	951
	LMP	150	13	69			0.55	1,014	1,788
	LHP	300	15	126	2.08	0.52	0.4	1,846	3,240
10	LLP	50	12.5	91	3.20	0.80	0.6	263	856
	LMP	150	12.5	97			0.45	984	3,344
	LHP	300	14	173	2.08	0.52	0.3	2,318	6,826
12	LLP	50	14.5	136	3.20	0.80	0.8	335	1,015
	LMP	150	15	141			0.5	1,144	3,311
	LHP	300	16.5	251	2.08	0.52	0.3	11,532	3,971
14	LLP	50	15	189	2.88	0.72	0.7	359	1,291
	LMP	150	15	195			0.5	1,055	3,850
	LHP	300	16	358			0.4	2,373	8,924
16	LLP	50	15.5	206	2.88	0.72	0.7	362	1,676
	LMP	150	15.5	213			0.4	1,362	6,318
	LHP	300	16.5	411			0.4	3,054	14,233
18	LLP	50	15.5	272	2.88	0.72	0.5	419	2,415
	LMP	150	16	279			0.35	1,588	9,163
	LHP	300	17	537			0.3	3,257	19,258
20	LLP	50	15	342	2.88	0.72	0.4	428	3,761
	LMP	150	15	349			0.3	1,721	14,290
	LHP	300	17	673			0.3	3,134	26,708
22	LLP	50	16.5	387	2.88	0.72	0.6	346	3,068
	LMP	150	17	399			0.25	2,430	24,241
	LHP	300	18.5	793			0.25	3,012	49,988
24	LLP	50	15	460	2.88	0.72	0.2	641	10,432
	LMP	150	15	468			0.2	2,531	38,408
	LHP	300	17.5	1,007			0.2	4,970	75,699

Long Style Specification Chart Style 22

LLP-Long Style Low Pressure
LMP-Long Style Medium Pressure
LHP-Long Style High Pressure

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-concurrent Moments (in.)			Spring Rates (lbs.in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	LLP LMP LHP	50 150 300	10	2 6 6	1.60 0.96	0.40 0.24	0.5 0.3 0.3	389 483 1,052	180 219 471
2.5	LLP LMP LHP	50 150 300	10	2 2 3	1.60 1.20	0.40 0.24	0.5 0.3 0.2	279 688 1,403	105 253 896
3	LLP LMP LHP	50 150 300	10	3 4 3	1.60 1.20	0.40 0.30	0.6 0.4 0.3	312 721 1,474	166 379 778
3.5	LLP LMP LHP	50 150 300	10	3 5 5	1.60 1.28	0.40 0.30	0.6 0.4 0.3	336 589 1,209	228 686 1,284
4	LLP LMP LHP	50 150 300	10	4 4 5	1.60 1.28	0.40 0.32	0.6 0.4 0.3	378 743 1,564	342 671 1,412
5	LLP LMP LHP	50 150 300	14	9 9 10	2.40 1.60	0.60 0.40	0.5 0.5 0.4	242 922 1,760	249 862 1,601
6	LLP LMP LHP	50 150 300	14	11 12 14	2.40 1.76	0.60 0.44	0.75 0.6 0.45	260 762 1,924	369 1,003 2,292
8	LLP LMP LHP	50 150 300	17	21 23 23	3.20 2.08	0.80 0.52	0.75 0.55 0.4	541 1,014 1,846	951 1,788 3,240
10	LLP LMP LHP	50 150 300	17	29 34 33	3.20 2.08	0.80 0.52	0.6 0.45 0.3	263 984 2,318	856 3,344 6,826
12	LLP LMP LHP	50 150 300	17	30 34 40	3.20 2.08	0.80 0.52	0.8 0.5 0.3	335 1,144 11,532	1,015 3,311 3,971
14	LLP LMP LHP	50 150 300	17	25 31 45	2.88	0.72	0.7 0.5 0.4	359 1,055 2,373	1,291 3,850 8,924
16	LLP LMP LHP	50 150 300	17	29 35 50	2.88	0.72	0.7 0.4 0.4	362 1,362 3,054	1,676 6,318 14,233
18	LLP LMP LHP	50 150 300	17	33 39 61	2.88	0.72	0.5 0.35 0.3	419 1,588 3,257	2,415 9,163 19,258
20	LLP LMP LHP	50 150 300	17	40 46 70	2.88	0.72	0.4 0.3 0.3	428 1,721 3,134	3,761 14,290 26,708
22	LLP LMP LHP	50 150 300	18	47 57 83	2.88	0.72	0.6 0.25 0.25	346 2,730 6,012	3,068 24,241 49,988
24	LLP LMP LHP	50 150 300	18	65 71 97	2.88	0.72	0.2 0.2 0.2	641 2,531 4,970	10,432 38,408 75,699
30 36 40	DL	50	18	130 157 173	3.20	0.80	0.2	960 1,160 1,300	64,500 132,000 158,000
42 46 48	DL	50	18	182 200 210	3.20	0.80	0.2	1,186 1,244 2,400	230,000 260,000 368,000
50 52 54	DL	25	18	220 250 265	3.20	0.80	0.3	1,440 2,200 2,290	45,500 80,100 90,900
60 66 72	DL	25	18	288 350 380	3.20	0.80	0.2	2,580 2,840 3,100	115,000 150,500 225,000
84 86 108	DL	15	18	490 640 660	3.20	0.80	0.15	3,610 4,150 4,670	1,500,000 1,900,000 2,300,000
126 132 144	DL	15	18	730 810 900	3.20	0.80	0.1	5,100 5,650 6,100	2,800,000 3,200,000 3,600,000

Long Style Specification Chart Styles 44 and 66

LLP-Long Style Low Pressure
LMP-Long Style Medium Pressure
LHP-Long Style High Pressure


Style 44


Style 66

Size (in.)	Series	Pressure (PSIG)	O.A.L.	Weight (lbs.)	Non-concurrent Movements (in.)			Spring Rates (lbs.in.)	
					Comp.	Ext.	Lateral	Axial	Lateral
2	LLP LMP LHP	50 150 300	8	10 10 10	1.60 0.96	0.40 0.24	0.5 0.3 0.3	389 483 1,052	180 219 471
2.5	LLP LMP LHP	50 150 300	8	13 13 14	1.60 1.20	0.40 0.30	0.5 0.3 0.2	279 688 1,403	105 253 896
3	LLP LMP LHP	50 150 300	8	13 14 14	1.60 1.20	0.40 0.30	0.6 0.4 0.3	312 721 1,474	166 379 778
3.5	LLP LMP LHP	50 150 300	8	20 21 21	1.60 1.28	0.40 0.32	0.6 0.4 0.3	336 589 1,209	228 686 1,284
4	LLP LMP LHP	50 150 300	8	19 19 20	1.60 1.28	0.40 0.32	0.6 0.4 0.3	378 743 1,564	342 671 1,412
5	LLP LMP LHP	50 150 300	11	23 24 25	2.40 1.60	0.60 0.40	0.5 0.5 0.4	242 922 1,760	249 862 1,601
6	LLP LMP LHP	50 150 300	12	27 29 33	2.40 1.76	0.60 0.44	0.75 0.6 0.45	260 762 1,924	369 1,003 2,292
8	LLP LMP LHP	50 150 300	12	50 42 43	3.20 2.08	0.80 0.52	0.75 0.55 0.4	541 1,014 1,846	951 1,788 3,240
10	LLP LMP LHP	50 150 300	12	48 54 54	3.20 2.08	0.80 0.52	0.6 0.45 0.3	263 984 2,318	856 3,344 6,826
12	LLP LMP LHP	50 150 300	12	80 85 93	3.20 2.08	0.80 0.52	0.8 0.5 0.3	335 1,144 11,532	1,015 3,311 3,971
14	LLP LMP LHP	50 150 300	12	112 118 131	2.88	0.72	0.7 0.5 0.4	359 1,055 2,373	1,291 3,850 8,924
16	LLP LMP LHP	50 150 300	12	142 149 163	2.88	0.72	0.7 0.4 0.4	362 1,362 3,054	1,676 6,318 14,233
18	LLP LMP LHP	50 150 300	12	154 161 179	2.88	0.72	0.5 0.35 0.3	419 1,588 3,257	2,415 9,163 19,258
20	LLP LMP LHP	50 150 300	12	191 198 222	2.88	0.72	0.4 0.3 0.3	428 1,721 3,134	3,761 14,290 26,708
22	LLP LMP LHP	50 150 300	13	227 239 263	2.88	0.72	0.6 0.25 0.25	346 2,730 6,012	3,068 24,241 49,988
24	LLP LMP LHP	50 150 300	13	270 278 307	2.88	0.72	0.2 0.2 0.2	641 2,531 4,970	10,432 38,408 75,699
30 36 40	DL	50	13	350 530 626	3.20	0.80	0.2	960 1,160 1,300	64,500 132,000 158,000
42 46 48	DL	50	13	730 806 930	3.20	0.80	0.2	1,186 1,244 2,400	230,000 260,000 368,000
50 52 54	DL	25	13	980 1,100 1,150	3.20	0.80	0.3	1,440 2,200 2,290	45,500 80,100 90,900
60 66 72	DL	25	13	1,433 1,650 1,850	3.20	0.80	0.2	2,580 2,840 3,100	115,000 150,500 225,000
84 86 108	DL	15	13	2,240 4,100 4,600	3.20	0.80	0.15	3,610 4,150 4,670	1,500,000 1,900,000 2,300,000
126 132 144	DL	15	13	5,050 5,400 6,600	3.20	0.80	0.1	5,100 5,650 6,100	2,800,000 3,200,000 3,600,000

Universal Tied Expansion Joints

Unaflex® Universal Tied Expansion Joints are capable of absorbing greater lateral movements than standard bellows type expansion joints. Bellows manufactured of 321 Stainless steel. Assembly designed in accordance with EJMA standards. Available with optional liners or covers. Working temperature 500°F Working pressure up to 150 PSI.

- Standard bellows material: A/SA240 321ss
- Design Temperature: 500°F
- Design Pressure: Up to 150 psig
- Standard end connections are 150# drill plate flanges (AWWA Class D C207)
- Overall lengths are based on 150# drilling standard plate flange thicknesses.
- Overall length may change if other type of flanges are requested.

Optional liners and covers are available upon request.

Fixed 150# Plate Flanges

Nominal Size (in.)	Lateral Mvmt. (in.)	O.A.L. (in.)	Lateral Spring Rt (lbs./in.)	Added Mvmt. per 1" add'l length	Number of Rods	For Nipple Ends Add to Flange Unit O.A.L.	Nominal Size (in.)	Lateral Mvmt. (in.)	O.A.L. (in.)	Lateral Spring Rt (lbs./in.)	Added Mvmt. per 1" add'l length	Number of Rods	For Nipple Ends Add to Flange Unit O.A.L.
2	1.5 3.8 5.4	16 22 28 40 52 64	22 18 10	0.188	2	4	10	0.6875 1.375 2.1875 3.875 5.625 7.375	16 22 28 40 52 64	1572 518 249 94 48 30	0.128	2	6
2.5	1.4 3.3 4.6	14 22 28 40 52 64	28 20 10	0.157	2	4	12	1.1875 1.875 3.250 4.750 6.1875 7.750	22.5 28.5 40.5 52.5 64.5 76.5	805 386 147 76 47 31	0.110	2	8
3	1.3 3.1 4.5	16 22 28 40 52 64	32 12 10	0.152	2	4	14	1.1875 1.875 3.375 4.875 6.375 7.875	22.5 28.5 40.5 52.5 64.5 76.5	818 395 149 78 47 32	0.102	4	8
4	1.0 2.6 3.7	16 22 28 40 52 64	44 17 11	0.151	2	4	16	.9375 1.4375 2.5625 3.75 4.9375 6.125	13 29 41 53 65 77	1435 689 262 136 83 56	0.100	4	8
5	2.0 3.0 4.0	16 22 28 40 52 64	50 22 12	0.182	2	4	18	1.375 2.0 3.3125 4.75 6.125 7.5625	24 30 42 54 66 78	1460 757 308 165 103 70	0.098	4	8
6	1.5 3.5 4.0	16 22 28 40 52 64	100 60 15	0.152	2	6	20	1.3125 1.875 3.125 4.4375 5.75 7.0625	24 30 42 54 66 78	1817 961 397 215 134 92	0.092	4	10
8	1.5 3.5 4.0	16 22 28 40 52 64	120 80 30	0.138	2	6	24	.75 1.1875 2.125 3.0 3.9375 4.9375	25 31 43 55 67 79	4205 2056 795 417 256 173	0.079	4	10
							30	.8125 1.1875 1.9375 2.625 3.4375 4.1875	26 32 44 56 68 80	4818 2696 1187 663 423 293	0.073	4	10

All data is for reference. Specific requirements should be sent to the factory for engineering review.

Externally Pressurized-Type EXS Single

Nominal Size (in.)	Pressure (PSIG) at 600 deg F	O.A.L. (in.)	Axial Movements		Axial Spring Rates (lbs./in.)	
			Compression	Extension	150 PSIG Style	300 PSIG Style
2	150 300	25 34 42	4 6 8	1 2 2	190 130 97	388 260 194
2.5	150 300	25 34 40	4 6 8	1 2 2	120 80 72	240 160 125
3	150 300	25 34 40	4 6 8	1 2 2	150 90 85	380 230 190
4	150 300	25 34 40	4 6 8	1 2 2	185 116 94	540 340 270
5	150 300	25 34 40	4 6 8	1 2 2	390 270 210	990 670 490
6	150 300	27 35 42	4 6 8	1 2 2	470 315 250	1,180 800 590
8	150 300	27 35 42	4 6 8	1 2 2	650 410 325	1,450 850 710
10	150 300	27 35 42	4 6 8	1 2 2	780 490 390	1,740 1,015 870
12	150 300	29 37 45	4 6 8	1 2 2	980 610 520	2,020 1,213 1,050
14	150 300	29 37 45	4 6 8	1 2 2	1,940 1,220 980	3,896 2,370 1,930
16	150 300	29 37 45	4 6 8	1 2 2	2,180 1,370 1,080	4,320 2,630 2,152

All technical data subject to change without notice
Please see use, installation, precautions and technical pages

Externally Pressurized-Type EXD Double

Nominal Size (in.)	Pressure (PSIG) at 600 deg F	O.A.L.	Axial Movements (in.)		Axial Spring Rates (lbs./in.)	
			Compression	Extension	150 PSIG Style	300 PSIG Style
2	150 300	40 60 72	8 12 16	2 4 4	190 130 97	388 260 194
2.5	150 300	40 60 72	8 12 16	2 4 4	120 80 72	240 160 125
3	150 300	40 60 72	8 12 16	2 4 4	150 90 85	380 230 190
4	150 300	40 60 72	8 12 16	2 4 4	185 116 94	540 340 270
5	150 300	40 60 72	8 12 16	2 4 4	390 270 210	990 670 490
6	150 300	40 60 72	8 12 16	2 4 4	470 315 250	1,180 800 590
8	150 300	40 60 72	8 12 16	2 4 4	650 410 325	1,450 850 710
10	150 300	40 60 72	8 12 16	2 4 4	780 490 390	1,740 1,015 870
12	150 300	46 64 76	8 12 16	2 4 4	980 610 520	2,020 1,213 1,050
14	150 300	46 64 76	8 12 16	2 4 4	1,940 1,220 980	3,896 2,370 1,930
16	150 300	46 64 76	8 12 16	2 4 4	2,180 1,370 1,080	4,320 2,630 2,152

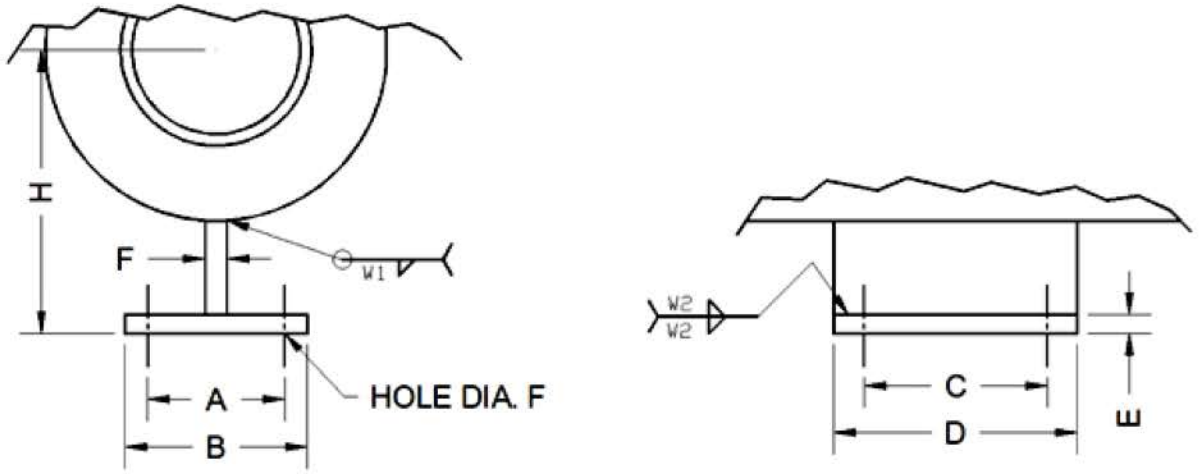
All technical data subject to change without notice
Please see use, installation, precautions and technical pages

Externally Pressurized-Anchor Dimensions

Externally pressurized expansion joints are capable of absorbing large axial movements at higher pressures due to their bellows being pressurized externally. Absorbing large axial movements require high number of convolutions and this, in turn, increases the bellows instability. By pressurizing the bellows externally, while keeping the unit pressurized internally, bellows column instability problem is eliminated. This type of design also protects the bellows from outside medium, any possible damage during shipping, handling and installation, and from high flow velocities.

Standard end connections are 150# drilling plate flanges (AWWA Class D C207).

Overall lengths are based on 150# drilling standard plate flange thicknesses. Overall length may change if other type of flanges are requested.



Nom. Dia.	A	B	C	D	E	F	H	Hole Dia.	W1	W2
1.5"	1.5"	2.5"	7"	8	3/8"	3/8"	5.25"	1/2'	3/16"	3/16"
2"-3.5"	2.75"	4"	6.75"	8	3/8"	3/8"	7.31"	5/8"	3/16"	3/16"
4"-6"	4.5"	6.25"	6"	8	1/2"	1/2"	9.38"	7/8"	1/4"	1/4"
8"-10"	5.25"	8"	9.25"	12	1/2"	1/2"	12"	1 3/8"	1/4"	1/4"
12"-14"	5.25"	8"	9.25"	12	3/4"	3/4"	13"	1 3/8"	3/8"	3/8"
16"	5.5"	10"	11.5"	16	1	1	16"	2 1/4"	1/2"	1/2"

All technical data subject to change without notice
Please see use, installation, precautions and technical pages

For sizes 18" and larger consult factory with application details. Units can be provided with pipe nipples, other types of flanges, anchor bases and other accessories. Anchors are not designed for pressure forces.

Specific requirements should be sent to the factory for engineering review. Spring rates shown are for **EACH** bellows.

Units come with 3/8" diameter 3000# threaded coupling drains as a standard.

Series 5000 BPC Bellows Pump Connector Assemblies
Metal Bellows Pump Connector Dimensions

Dash Number	Nominal I.D. (in.)	Overall Length (in.)	Flange Thickness (in.)
-032	2	3-1/2	5/8
-040	2-1/2	3-1/2	5/8
-048	3	4	5/8
-056	3-1/2	4	5/8
-064	4	4-1/2	5/8
-080	5	4-1/2	5/8
-096	6	5	5/8
-128	8	5	5/8
-160	10	6	3/4
-192	12	6	3/4
-224	14	8	1
-256	16	8	1

All technical data subject to change without notice
Please see use, installation, precautions and technical pages

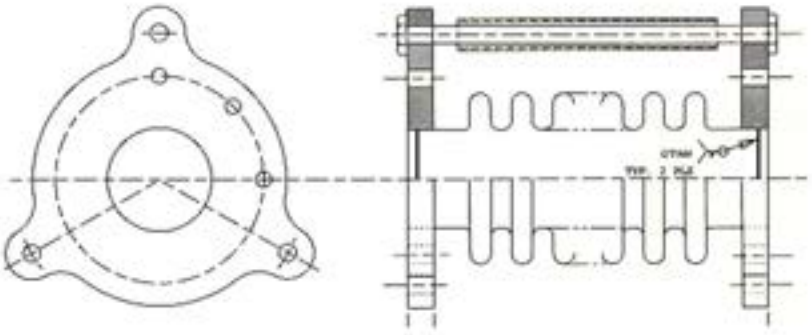
Series 5000 BPC Pump Connector

Standard Operating Specifications
Max. Operating Pressure: 150 PSI
Max Operating Temperature: 500°F

Movements:
Axial Compression
(2" ND to 8" ND): 0.5"

Axial Extension
(10" ND to 16" ND): 0.75"

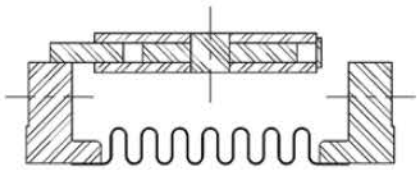
Lateral Offset
(All sizes): 0.13"



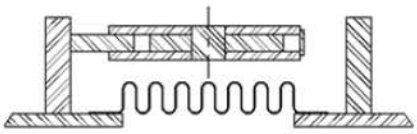
Flanges to mate with ANSI B16.5 150# flange drilling.

If flow velocity exceeds 25 feet per second, UNAFLEX® recommends adding a liner.

Gimbal Short Style Type 22, 55
Standard Sizes 2" through 24" diameter



Type 55
All SH units come with ANSI B16.5 300# flanges
Design Temperature 500 deg F.



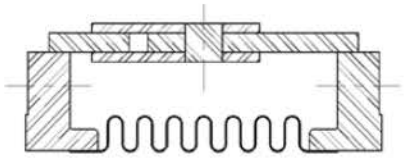
Type22
Actual gimbal hardware may look different than shown Movements in two planes: +/-7 degrees in each plane

Nominal Size (in.)	Series	Pressure (PSIG)	RFSO Flange Type 55 Overall Length (in.)	Welding Nipples Type 22 Overall Length (in.)	Movements (deg.)	Angular Spring Rate (in.-lbs./deg)
2	SL	50	5.25	14.75	+/-10	12
	SM	150	5.25	14.75	+/-10	12
	SH	300	5.75	14.75	+/-10	22
2.5	SL	50	5.50	14.75	+/-10	16
	SM	150	5.50	14.75	+/-10	16
	SH	300	6.25	14.75	+/-10	30
3	SL	50	5.75	14.75	+/-10	24
	SM	150	5.75	14.75	+/-10	24
	SH	300	6.75	14.75	+/-10	55
3.5	SL	50	6.00	15.00	+/-10	33
	SM	150	6.00	15.00	+/-10	33
	SH	300	7.50	15.25	+/-10	68
4	SL	50	6.25	15.00	+/-10	42
	SM	150	6.25	15.00	+/-10	42
	SH	300	7.75	15.25	+/-10	87
5	SL	50	6.50	15.00	+/-10	47
	SM	150	7.00	15.50	+/-10	49
	SH	300	7.75	15.13	+/-10	109
6	SL	50	7.25	15.50	+/-10	40
	SM	150	7.50	15.63	+/-10	89
	SH	300	8.50	15.75	+/-10	180
8	SL	50	9.00	16.75	+/-10	58
	SM	150	9.00	16.75	+/-10	175
	SH	300	11.00	17.50	+/-10	387
10	SL	50	9.50	16.88	+/-10	120
	SM	150	10.75	18.25	+/-10	373
12	SL	50	10.00	16.88	+/-10	140
	SM	150	10.25	17.00	+/-10	483
14	SL	50	10.25	16.88	+/-10	177
	SM	150	10.50	17.13	+/-10	657

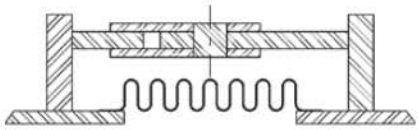
Gimbal Long Style Type 22, 55
Standard Sizes 2" through 24" diameter

Nominal Size (in.)	Series	Pressure (PSIG)	RFSO Flange Type 55 Overall Length (in.)	Welding Nipples Type 22 Overall Length (in.)	Movements (deg.)	Angular Spring Rate (in.-lbs./deg)
2	LL	50	7.50	16.88	+/-10	7
	LM	150	7.50	16.88	+/-10	15
	LH	300	8.00	16.88	+/-10	31
2.5	LL	50	9.25	18.50	+/-10	14
	LM	150	9.25	18.50	+/-10	29
	LH	300	10.50	19.00	+/-10	52
3	LL	50	9.25	18.38	+/-10	14
	LM	150	9.50	18.50	+/-10	42
	LH	300	10.50	18.50	+/-10	69
3.5	LL	50	9.50	18.50	+/-10	16
	LM	150	8.00	17.00	+/-10	45
	LH	300	9.50	17.25	+/-10	78
4	LL	50	9.50	18.25	+/-10	21
	LM	150	9.50	18.25	+/-10	69
	LH	300	10.50	18.00	+/-10	111
5	LL	50	10.75	19.25	+/-10	38
	LM	150	11.25	19.63	+/-10	101
	LH	300	13.00	20.25	+/-10	253
6	LL	50	11.00	19.25	+/-10	57
	LM	150	11.25	19.63	+/-10	174
	LH	300	13.00	20.13	+/-10	318
8	LL	50	13.00	20.50	+/-10	102
	LM	150	13.00	20.50	+/-10	270
	LH	300	13.75	20.00	+/-10	502
10	LL	50	12.00	19.50	+/-10	144
	LM	150	12.50	20.00	+/-10	377
	LH	300	14.00	20.00	+/-10	856
12	LL	50	14.50	21.25	+/-10	215
	LM	150	14.75	21.75	+/-10	810
	LH	300	15.50	20.00	+/-10	1,258
14	LL	50	14.50	21.25	+/-10	297
	LM	50	15.00	21.50	+/-10	897
	LH	300	15.00	21.00	+/-10	1,381
16	LL	50	15.00	21.25	+/-10	388
	LM	150	15.00	21.00	+/-10	1,326
18	LL	50	15.50	29.25	+/-10	561
	LM	150	16.00	29.00	+/-10	1,182
20	LL	50	15.00	28.25	+/-10	421
	LM	150	16.50	29.00	+/-10	1,413
22	LL	50	16.25	29.13	+/-10	665
	LM	150	18.50	30.00	+/-10	1,822
24	LL	50	15.75	28.25	+/-10	756
	LM	150	19.00	30.00	+/-10	2,323

Hinged Short Style Type 22, 55
Standard Sizes 2" through 24" diameter



Type 55
All SH units come with ANSI B16.5 300# flanges
Design Temperature 500 deg F.



Type 22
Actual hinge hardware may look different than shown

Nominal Size (in.)	Series	Pressure (PSIG)	RFSO Flange Type 55 Overall Length (in.)	Welding Nipples Type 22 Overall Length (in.)	Movements (deg.)	Angular Spring Rate (in.-lbs./deg)
2	SL	50	5.25	14.75	+/-10	12
	SM	150	5.25	14.75	+/-10	12
	SH	300	5.75	14.75	+/-10	22
2.5	SL	50	5.50	14.75	+/-10	16
	SM	150	5.50	14.75	+/-10	16
	SH	300	6.25	14.75	+/-10	30
3	SL	50	5.75	14.75	+/-10	24
	SM	150	5.75	14.75	+/-10	24
	SH	300	6.75	14.75	+/-10	55
3.5	SL	50	6.00	15.00	+/-10	33
	SM	150	6.00	15.00	+/-10	33
	SH	300	7.50	15.25	+/-10	68
4	SL	50	6.25	15.00	+/-10	42
	SM	150	6.25	15.00	+/-10	42
	SH	300	7.75	15.25	+/-10	87
5	SL	50	6.50	15.00	+/-10	47
	SM	150	7.00	15.50	+/-10	49
	SH	300	7.75	15.13	+/-10	109
6	SL	50	7.25	15.50	+/-10	40
	SM	150	7.50	15.63	+/-10	89
	SH	300	8.50	15.75	+/-10	180
8	SL	50	9.00	16.75	+/-10	58
	SM	150	9.00	16.75	+/-10	175
	SH	300	11.00	17.50	+/-10	387
10	SL	50	9.50	16.88	+/-10	120
	SM	150	10.75	18.25	+/-10	373
12	SL	50	10.00	16.88	+/-10	140
	SM	150	10.25	17.00	+/-10	483
14	SL	50	10.25	16.88	+/-10	177
	SM	150	10.50	17.13	+/-10	657

Hinged Long Style Type 22, 55
Standard Sizes 2" through 24" diameter

Nominal Size (in.)	Series	Pressure (PSIG)	RFSO Flange Type 55 Overall Length (in.)	Welding Nipples Type 22 Overall Length (in.)	Movements (deg.)	Angular Spring Rate (in.-lbs./deg)
2	LL	50	7.50	16.88	+/-10	7
	LM	150	7.50	16.88	+/-10	15
	LH	300	8.00	16.88	+/-10	31
2.5	LL	50	9.25	18.50	+/-10	14
	LM	150	9.25	18.50	+/-10	29
	LH	300	10.50	19.00	+/-10	52
3	LL	50	9.25	18.38	+/-10	14
	LM	150	9.50	18.50	+/-10	42
	LH	300	10.50	18.50	+/-10	69
3.5	LL	50	9.50	18.50	+/-10	16
	LM	150	8.00	17.00	+/-10	45
	LH	300	9.50	17.25	+/-10	78
4	LL	50	9.50	18.25	+/-10	21
	LM	150	9.50	18.25	+/-10	69
	LH	300	10.50	18.00	+/-10	111
5	LL	50	10.75	19.25	+/-10	38
	LM	150	11.25	19.63	+/-10	101
	LH	300	13.00	20.25	+/-10	253
6	LL	50	11.00	19.25	+/-10	57
	LM	150	11.25	19.63	+/-10	174
	LH	300	13.00	20.13	+/-10	318
8	LL	50	13.00	20.50	+/-10	102
	LM	150	13.00	20.50	+/-10	270
	LH	300	13.75	20.00	+/-10	502
10	LL	50	12.00	19.50	+/-10	144
	LM	150	12.50	20.00	+/-10	377
	LH	300	14.00	20.00	+/-10	856
12	LL	50	14.50	21.25	+/-10	215
	LM	150	14.75	21.75	+/-10	810
	LH	300	15.50	20.00	+/-10	1,258
14	LL	50	14.50	21.25	+/-10	297
	LM	50	15.00	21.50	+/-10	897
	LH	300	15.00	21.00	+/-10	1,381
16	LL	50	15.00	21.25	+/-10	388
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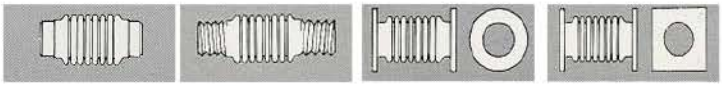
18	LL	50	15.50	29.25	+/-10	561
	LM	150	16.00	29.00	+/-10	1,182
20	LL	50	15.00	28.25	+/-10	421
	LM	150	16.50	29.00	+/-10	1,413
22	LL	50	16.25	29.13	+/-10	665
	LM	150	18.50	30.00	+/-10	1,822
24	LL	50	15.75	28.25	+/-10	756
	LM	150	19.00	30.00	+/-10	2,323

Tube-Flex Engine Exhaust Expansion Joints

Style U-100 Expansion Joints



Type W Pipe Size	Type T Max. Operating Pressure at 70F	Type FP Standard Length (in.)	Type SFP Part Number
1"	40	18	7001
1-1/4"	24	18	7101
1-1/2"	20	18	7201
2"	15	18	7002
3"	8	18	7003
4"	5	18	7004
5"	3	18	7005
6"	3	18	7006
8"	3	18	7008
10"	2	18	7010
12"	2	18	7012

Pressure Thrust

When a bellows is pressurized, it reacts causing a load equal to its effective area X working pressure along its longitudinal axis. These loads must be considered when designing the system arrangement and appropriate anchors.

Size	Eff. Area Sq. in.	Size	Eff. Area Sq. in.	Size	Eff. Area Sq. in.
2	6.3	18	290	52	2,290
2-1/2	9.6	20	354	54	2,460
3	12.0	22	426	60	3,025
4	20	24	500	66	3,635
5	30	30	775	72	4,300
6	43.0	36	1,090	84	5,800
8	72.0	40	1,350	96	7,550
10	110	42	1,470	108	9,510
12	150	46	1,775	126	13,200
14	180	48	1,940	132	14,110
16	234	50	2,125	144	16,750