



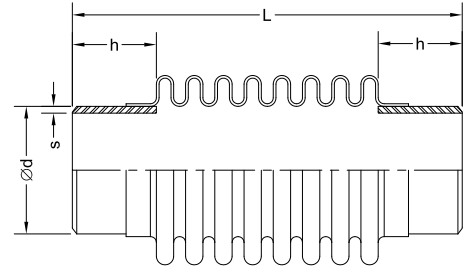
Bellevs Material  
**304<sup>ss</sup> - 316<sup>ss</sup>**  
**321<sup>ss</sup>**

Design Pressure  
**6<sub>barg</sub>**

Movements are non-concurrent

Weld End Material  
**Carbon Steel**

Design Temperature  
**400°C**



Nominal Diameter (DN)	Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		d (mm)	h (mm)	s (mm)	Effective Area (cm <sup>2</sup> )	
	Axial (+/-)	Lateral (+/-)		Axial	Lateral					
25	1"	15	6	180	62	31	33,7	50	3	18
32	1 1/4"	15	6	180	62	31	42,4	50	3	18
40	1 1/2"	15	7	185	54	31	48,3	50	3	23
50	2"	15	6	170	32	43	60,3	50	4	37
65	2 1/2"	15	6	175	34	60	76,1	50	4	58
		30	11	230	53	32				
80	3"	15	3	160	41	145	88,9	50	4	80
		30	12	260	66	37				
100	4"	15	3	190	71	301	114,3	60	5	129
		30	9	260	72	82				
125	5"	15	3	190	84	511	139,7	60	5	185
		30	8	265	78	121				
150	6"	15	2	235	105	814	165	80	5	268
		30	7	285	63	187				
200	8"	15	2	250	146	1279	219,1	80	5	451
		30	7	310	91	310				
250	10"	15	2	290	154	2049	273	100	6	682
		30	7	365	86	369				
300	12"	15	2	320	355	4380	323,9	100	6	945
		30	6	400	197	800				
		37,5	9	450	162	428				
350	14"	15	2	310	386	5669	355,6	100	6	1127
		30	6	400	214	1036				
		37,5	8	450	175	554				
400	16"	15	2	320	250	4046	406,4	100	7	1479
		30	5	370	178	1520				
		37,5	8	420	139	728				
450	18"	15	2	320	307	6177	457	100	8	1839
		30	4	370	219	2321				
		37,5	6	420	170	1111				
500	20"	15	2	320	279	6909	508	100	8	2264
		30	4	370	199	2596				
		37,5	6	420	155	1243				
600	24"	15	2	320	530	18745	610	100	8	3227
		30	4	390	331	5003				
		37,5	6	450	265	2379				
700	28"	15	2	340	419	14565	711	100	8	4372
		30	5	425	262	3797				
		37,5	5	440	262	3363				
800	32"	15	1	320	755	45102	813	100	8	5705
		30	3	380	503	14411				
		37,5	3	410	431	9278				
900	36"	15	1	335	1194	70128	914	100	8	7201
		30	3	405	796	22008				
		37,5	4	450	682	13061				
1000	40"	15	1	340	1037	70455	1016	100	8	8885
		30	2	380	829	35891				
		37,5	4	450	592	13993				

**WELD END**  
**PN6**



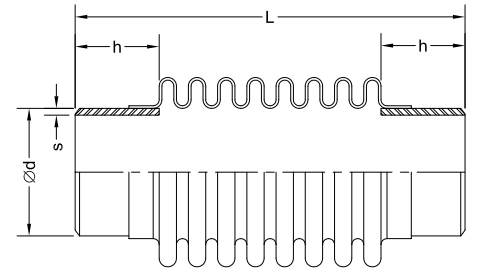
Bellows Material  
**304ss-316ss**  
**321ss**

Weld End Material  
**Carbon Steel**

Design Pressure  
**10 barg**

Design Temperature  
**400°C**

Movements are non-concurrent



Nominal Diameter (DN)	Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		d (mm)	h (mm)	s (mm)	Effective Area (cm <sup>2</sup> )
	Axial (+/-)	Lateral (+/-)		Axial	Lateral				
25 1"	15	6	180	62	31	33,7	50	3	18
32 1 1/4"	15	6	180	62	31	42,4	50	3	18
40 1 1/2"	15	7	225	93	30	48,3	50	3	23
50 2"	15	5	185	62	57	60,3	50	4	38
65 2 1/2"	15	4	185	68	95	76,1	50	4	58
	22,5	6	215	98	77				
80 3"	30	10	240	105	56	88,9	50	4	80
	15	4	185	66	124				
80 3"	22,5	6	215	90	95	88,9	50	4	80
	30	10	235	90	70				
100 4"	15	3	200	113	333	114,3	60	5	129
	22,5	5	230	88	159				
100 4"	30	7	265	109	118	114,3	60	5	129
	15	2	200	134	641				
125 5"	22,5	4	230	104	274	139,7	60	5	187
	30	7	265	107	169				
150 6"	15	3	245	152	936	165	80	5	268
	22,5	4	270	118	448				
150 6"	30	6	315	127	245	165	80	5	268
	15	3	265	211	1422				
200 8"	22,5	5	305	158	584	219,1	80	5	460
	30	7	330	140	385				
250 10"	15	2	310	292	2687	273	100	6	683
	22,5	5	360	195	888				
250 10"	30	7	395	159	499	273	100	6	683
	15	2	310	355	4380				
300 12"	22,5	3	360	254	1567	323,9	100	6	945
	30	6	395	197	840				
350 14"	15	2	320	582	8653	355,6	100	6	1141
	22,5	4	370	364	2417				
350 14"	30	5	405	323	1509	355,6	100	6	1141
	15	2	320	474	7707				
400 16"	22,5	3	360	339	3242	406	100	7	1483
	30	5	400	296	1867				
450 18"	15	1	330	587	11842	457	100	8	1841
	22,5	3	375	714	7176				
450 18"	30	4	420	555	3626	457	100	8	1841
	15	2	340	758	14195				
500 20"	22,5	3	385	649	8039	508	100	8	2268
	30	4	430	505	3733				

**PN10 WELD END**



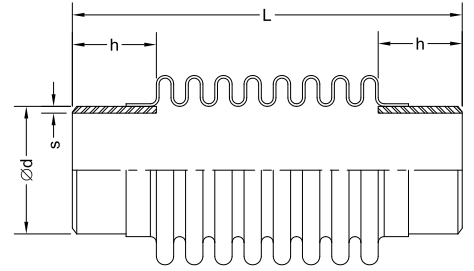
Bellows Material  
**304<sub>SS</sub> - 316<sub>SS</sub>**  
**321<sub>SS</sub>**

Design Pressure  
**16<sub>barg</sub>**

Movements are non-concurrent

Weld End Material  
**Carbon Steel**

Design Temperature  
**400°C**



Nominal Diameter (DN)		Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		d (mm)	h (mm)	s (mm)	Effective Area (cm <sup>2</sup> )
		Axial (+/-)	Lateral (+/-)		Axial	Lateral				
50	2"	15	4	185	117	109	60,3	50	4	38
		22,5	4	215	126	64				
65	2 1/2"	15	3	185	128	179	76,1	50	4	58
		22,5	7	215	124	97				
80	3"	30	8	240	182	99	88,9	50	4	80
		15	3	185	124	231				
100	4"	22,5	7	215	123	129	114,3	60	5	129
		30	9	245	166	121				
125	5"	15	3	200	145	484	139,7	60	5	186
		22,5	5	230	126	333				
150	6"	30	7	265	171	267	165	80	5	268
		15	2	245	350	2166				
200	8"	22,5	4	270	171	648	219,1	80	5	456
		30	7	315	191	379				
250	10"	15	2	265	513	3132	273	100	6	684
		22,5	4	305	338	1242				
300	12"	30	5	340	300	817	323,9	100	6	964
		15	2	310	559	5149				
350	14"	22,5	6	360	372	1517	355,6	100	6	1155
		30	10	395	335	1051				
400	16"	15	1	335	675	5823	406,4	100	7	1486
		22,5	4	410	405	1282				
450	18"	30	7	480	638	1661	457	100	8	1856
		15	1	320	1545	25149				
500	20"	22,5	4	430	858	4157	508	100	8	2274
		30	6	490	702	2184				
		15	3	350	869	11727				
		22,5	6	430	579	3504				
		30	11	530	434	1316				
		15	2	330	1048	22570				
		22,5	3	390	749	7967				
		30	6	440	582	3981				

**WELD END**  
**PN16**



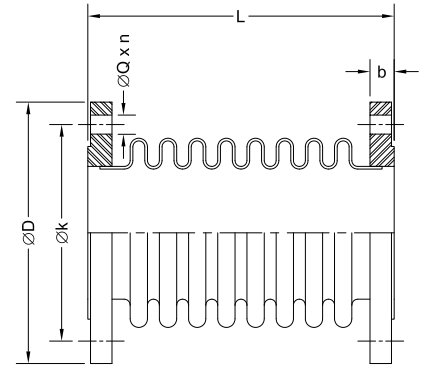
Bellows Material  
**304ss-316ss**  
**321ss**

Flange Material  
**Carbon Steel**

Design Pressure  
**6 barg**

Design Temperature  
**400°C**

Flange drilling is per PN6  
 Movements are non-concurrent



Nominal Diameter (DN)	Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		D (mm)	k (mm)	b (mm)	n	Q (mm)	Effective Area (cm <sup>2</sup> )	
	Axial (+/-)	Lateral (+/-)		Axial	Lateral							
25	1"	15	6	120	62	31	100	75	14	4	11	18
32	1 1/4"	15	6	120	62	31	120	90	14	4	14	18
40	1 1/2"	15	7	125	54	31	130	100	14	4	14	23
50	2"	15	6	110	32	43	140	110	14	4	14	37
65	2 1/2"	15	6	120	34	60	160	130	14	4	14	58
		30	11	170	53	32						
80	3"	15	3	105	41	145	190	150	16	4	18	80
		30	12	205	66	37						
100	4"	15	3	115	71	301	210	170	16	4	18	129
		30	9	185	72	82						
125	5"	15	3	120	84	511	240	200	18	8	18	185
		30	8	200	78	121						
150	6"	15	2	120	105	814	265	225	18	8	18	268
		30	7	175	63	187						
200	8"	15	2	145	146	1279	320	280	20	8	18	451
		30	7	200	91	310						
250	10"	15	2	145	154	2049	375	335	22	12	18	682
		30	7	220	86	369						
300	12"	15	2	170	355	4380	440	395	22	12	22	945
		30	6	260	197	800						
		37,5	9	310	162	428						
350	14"	15	2	165	386	5669	490	445	22	12	22	1127
		30	6	260	214	1036						
		37,5	8	310	175	554						
400	16"	15	2	180	250	4046	540	495	22	16	22	1479
		30	5	230	178	1520						
		37,5	8	280	139	728						
450	18"	15	2	180	307	6177	595	550	24	16	22	1839
		30	4	230	219	2321						
		37,5	6	280	170	1111						
500	20"	15	2	180	279	6909	645	600	24	20	22	2264
		30	4	230	199	2596						
600	24"	37,5	6	280	155	1243	755	705	24	20	26	3227
		15	2	170	530	18745						
		30	4	240	331	5003						
700	28"	37,5	6	310	265	2379	860	810	24	24	26	4372
		15	2	190	419	14565						
		30	5	270	262	3797						
800	32"	37,5	5	310	262	3363	975	920	24	24	30	5705
		15	1	170	755	45102						
		30	3	230	503	14411						
900	36"	37,5	3	280	431	9278	1075	1020	26	24	30	7201
		15	1	190	1194	70128						
		30	3	255	796	22008						
1000	40"	37,5	4	330	682	13061	1175	1120	26	28	30	8885
		15	1	165	1037	70455						
		30	2	205	829	35891						
		37,5	4	330	592	13993						

**PN6**  
**FIXED FLANGED**



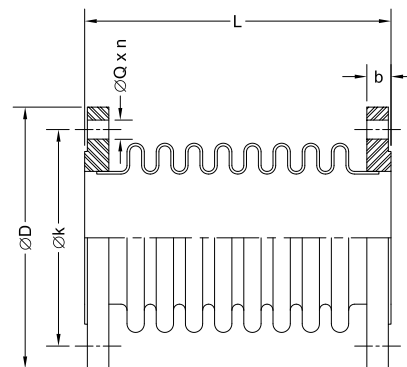
Bellows Material  
**304<sub>SS</sub> - 316<sub>SS</sub>**  
**321<sub>SS</sub>**

Flange Material  
**Carbon Steel**

Design Pressure  
**10<sub>barg</sub>**

Design Temperature  
**400°C**

Flange drilling is per PN10  
 Movements are non-concurrent



# FIXED FLANGED PN10

Nominal Diameter (DN)		Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		D (mm)	k (mm)	b (mm)	n	Q (mm)	Effective Area (cm <sup>2</sup> )
		Axial (+/-)	Lateral (+/-)		Axial	Lateral						
25	1"	15	6	125	62	31	115	85	16	4	14	18
32	1 1/4"	15	6	125	62	31	140	100	16	4	18	18
40	1 1/2"	15	7	155	93	30	150	110	16	4	18	23
50	2"	15	5	130	62	57	165	125	18	4	18	38
65	2 1/2"	15	4	130	68	95	185	145	18	4	18	58
		22,5	6	160	98	77						
		30	10	185	105	56						
		15	4	130	66	124						
80	3"	22,5	6	165	90	95	200	160	20	8	18	80
		30	10	185	90	70						
100	4"	15	3	135	113	333	220	180	20	8	18	129
		22,5	5	165	88	159						
		30	7	205	109	118						
		15	2	140	134	641						
125	5"	22,5	4	170	104	274	250	210	22	8	18	187
		30	7	210	107	169						
150	6"	15	3	145	152	936	285	240	22	8	22	268
		22,5	4	170	118	448						
		30	6	210	127	245						
		15	3	175	211	1422						
200	8"	22,5	5	210	158	584	340	295	24	8	22	460
		30	7	230	140	385						
250	10"	15	2	180	292	2687	395	350	26	12	22	683
		22,5	5	235	195	888						
		30	7	275	159	499						
		15	2	165	355	4380						
300	12"	22,5	3	205	254	1567	445	400	26	12	22	945
		30	6	245	197	840						
350	14"	15	2	170	582	8653	505	460	26	16	22	1141
		22,5	4	215	364	2417						
		30	5	255	323	1509						
		15	2	170	474	7707						
400	16"	22,5	3	210	339	3242	565	515	26	16	26	1483
		30	5	255	296	1867						
450	18"	15	1	185	587	11842	615	565	28	20	26	1841
		22,5	3	230	714	7176						
		30	4	270	555	3626						
		15	2	195	758	14195						
500	20"	22,5	3	235	649	8039	670	620	28	20	26	2268
		30	4	285	505	3733						



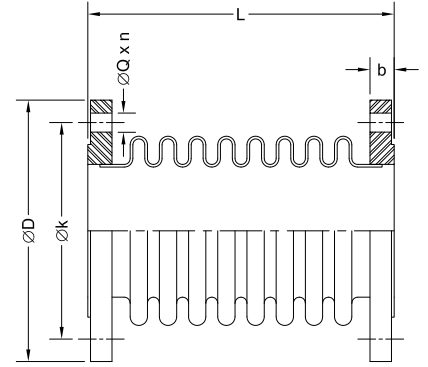
Bellows Material  
**304ss-316ss**  
**321ss**

Flange Material  
**Carbon Steel**

Design Pressure  
**16<sub>barg</sub>**

Design Temperature  
**400°C**

Flange drilling is per PN16  
 Movements are non-concurrent



Nominal Diameter (DN)		Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		D (mm)	k (mm)	b (mm)	n	Q (mm)	Effective Area (cm <sup>2</sup> )
Axial (+/-)	Lateral (+/-)	Axial	Lateral		Axial	Lateral						
50	2"	15	4	120	117	109	165	125	18	4	18	38
		22,5	4	150	126	64						
65	2 1/2"	15	3	120	128	179	185	145	18	4	18	58
		22,5	7	150	124	97						
80	3"	30	8	180	182	99	200	160	20	8	18	80
		15	3	120	124	231						
100	4"	22,5	7	150	123	129	220	180	20	8	18	129
		30	9	180	166	121						
125	5"	15	3	125	145	484	250	210	22	8	18	186
		22,5	5	155	126	333						
150	6"	30	7	190	171	267	285	240	22	8	22	268
		15	2	130	350	2166						
200	8"	22,5	4	190	171	648	340	295	24	12	22	456
		30	7	200	191	379						
250	10"	15	2	150	513	3132	405	355	26	12	26	684
		22,5	4	205	338	1242						
300	12"	30	5	230	300	817	460	410	28	12	26	964
		15	2	165	559	5149						
350	14"	22,5	6	300	405	1282	520	470	30	16	26	1155
		30	10	380	347	616						
400	16"	15	1	210	739	7601	580	525	32	16	30	1486
		22,5	4	290	850	3840						
450	18"	30	7	370	638	1661	640	585	32	20	30	1856
		15	1	210	1545	25149						
500	20"	22,5	4	310	858	4157	715	650	34	20	33	2274
		30	6	365	702	2184						
		15	3	240	869	11727						
		22,5	6	320	579	3504						
		30	11	405	434	1316						
		15	2	215	1048	22570						
		22,5	3	270	749	7967						
		30	6	330	582	3981						

**PN16**  
**FIXED FLANGED**



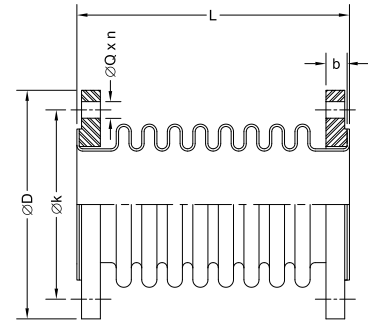
Bellows Material  
**304<sub>SS</sub> - 316<sub>SS</sub>**  
**321<sub>SS</sub>**

Flange Material  
**Carbon Steel**

Design Pressure  
**6 barg**

Design Temperature  
**400°C**

Flange drilling is per PN6  
 Movements are non-concurrent



# PN6 FLOATING FLANGED

Nominal Diameter (DN)	Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		D (mm)	k (mm)	b (mm)	n	Q (mm)	Effective Area (cm <sup>2</sup> )	
	Axial (+/-)	Lateral (+/-)		Axial	Lateral							
25	1"	15	6	120	62	31	100	75	14	4	11	18
32	1 1/4"	15	6	120	62	31	120	90	14	4	14	18
40	1 1/2"	15	7	125	54	31	130	100	14	4	14	23
50	2"	15	6	110	32	43	140	110	14	4	14	37
65	2 1/2"	15	6	120	34	60	160	130	14	4	14	58
		30	11	170	53	32						
80	3"	15	3	105	41	145	190	150	16	4	18	80
		30	12	205	66	37						
100	4"	15	3	115	71	301	210	170	16	4	18	129
		30	9	185	72	82						
125	5"	15	3	120	84	511	240	200	18	8	18	185
		30	8	200	78	121						
150	6"	15	2	120	105	814	265	225	18	8	18	268
		30	7	175	63	187						
200	8"	15	2	145	146	1279	320	280	20	8	18	451
		30	7	200	91	310						
250	10"	15	2	145	154	2049	375	335	22	12	18	682
		30	7	220	86	369						
300	12"	15	2	170	355	4380	440	395	22	12	22	945
		30	6	260	197	800						
		37,5	9	310	162	428						
350	14"	15	2	165	386	5669	490	445	22	12	22	1127
		30	6	260	214	1036						
		37,5	8	310	175	554						
400	16"	15	2	180	250	4046	540	495	22	16	22	1479
		30	5	230	178	1520						
		37,5	8	280	139	728						
450	18"	15	2	180	307	6177	595	550	24	16	22	1839
		30	4	230	219	2321						
		37,5	6	280	170	1111						
500	20"	15	2	180	279	6909	645	600	24	20	22	2264
		30	4	230	199	2596						
		37,5	6	280	155	1243						
600	24"	15	2	170	530	18745	755	705	24	20	26	3227
		30	4	240	331	5003						
		37,5	6	310	265	2379						
700	28"	15	2	190	419	14565	860	810	24	24	26	4372
		30	5	270	262	3797						
		37,5	5	310	262	3363						
800	32"	15	1	170	755	45102	975	920	24	24	30	5705
		30	3	230	503	14411						
		37,5	3	280	431	9278						
900	36"	15	1	190	1194	70128	1075	1020	26	24	30	7201
		30	3	255	796	22008						
		37,5	4	330	682	13061						
1000	40"	15	1	165	1037	70455	1175	1120	26	28	30	8885
		30	2	235	829	35891						
		37,5	4	330	592	13993						



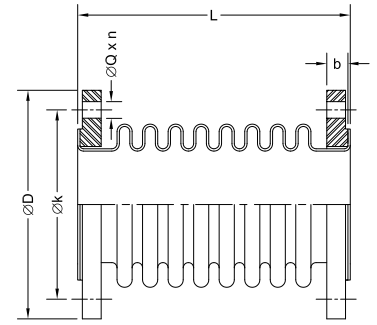
Bellows Material  
**304ss-316ss**  
**321ss**

Flange Material  
**Carbon Steel**

Design Pressure  
**10<sub>barg</sub>**

Design Temperature  
**400°C**

Flange drilling is per PN10  
 Movements are non-concurrent



Nominal Diameter (DN)	Movements (mm)		Length (L) (mm)	Spring Rates (N/mm)		D (mm)	k (mm)	b (mm)	n	Q (mm)	Effective Area (cm <sup>2</sup> )
	Axial (+/-)	Lateral (+/-)		Axial	Lateral						
25 1"	15	6	125	62	31	115	85	16	4	14	18
32 1 1/4"	15	6	125	62	31	140	100	18	4	18	18
40 1 1/2"	15	7	155	93	30	150	110	18	4	18	23
50 2"	15	5	130	62	57	165	125	20	4	18	38
65 2 1/2"	15	4	130	68	95	185	145	20	8	18	58
	22,5	6	160	98	77						
80 3"	30	10	185	105	56	200	160	20	8	18	80
	15	4	130	66	124						
80 3"	22,5	6	165	90	95	200	160	20	8	18	80
	30	10	185	90	70						
100 4"	15	3	135	113	333	220	180	22	8	18	129
	22,5	5	165	88	159						
100 4"	30	7	205	109	118	220	180	22	8	18	129
	15	2	140	134	641						
125 5"	22,5	4	170	104	274	250	210	22	8	18	187
	30	7	210	107	169						
150 6"	15	3	145	152	936	285	240	24	8	22	268
	22,5	4	170	118	448						
150 6"	30	6	210	127	245	285	240	24	8	22	268
	15	3	175	211	1422						
200 8"	22,5	5	210	158	584	340	295	24	8	22	460
	30	7	230	140	385						
250 10"	15	2	180	292	2687	395	350	26	12	22	683
	22,5	5	235	195	888						
250 10"	30	7	275	159	499	395	350	26	12	22	683
	15	2	165	355	4380						
300 12"	22,5	3	205	254	1567	445	400	26	12	22	945
	30	6	245	197	840						
350 14"	15	2	170	582	8653	505	460	26	16	22	1141
	22,5	4	215	364	2417						
350 14"	30	5	255	323	1509	505	460	26	16	22	1141
	15	2	170	474	7707						
400 16"	22,5	3	210	339	3242	565	515	26	16	26	1483
	30	5	255	296	1867						
450 18"	15	1	185	587	11842	615	565	28	20	26	1841
	22,5	3	230	714	7176						
450 18"	30	4	270	555	3626	615	565	28	20	26	1841
	15	2	195	758	14195						
500 20"	22,5	3	235	649	8039	670	620	28	20	26	2268
	30	4	285	505	3733						

**PN10 FLOATING FLANGED**





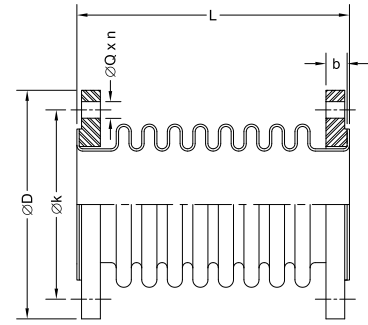
Belongs Material  
**304<sup>ss</sup> - 316<sup>ss</sup>**  
**321<sup>ss</sup>**

Flange Material  
**Carbon Steel**

Design Pressure  
**16<sup>barg</sup>**

Design Temperature  
**400°C**

Flange drilling is per PN16  
 Movements are non-concurrent



# FLOATING FLANGED PN16

Nominal Diameter (DN)		Movements (mm)		Length (L)	Spring Rates (N/mm)		D	k	b	n	Q	Effective Area
		Axial (+/-)	Lateral (+/-)	(mm)	Axial	Lateral	(mm)	(mm)	(mm)		(mm)	(cm <sup>2</sup> )
50	2"	15	4	120	117	109	165	125	18	4	4	38
		22,5	4	150	126	64						
65	2 1/2"	15	3	120	128	179	185	145	18	4	4	58
		22,5	7	150	124	97						
		30	8	180	182	99						
80	3"	15	3	120	124	231	200	160	20	8	8	80
		22,5	7	150	123	129						
		30	9	180	166	121						
100	4"	15	3	120	145	484	220	180	20	8	8	129
		22,5	4	150	146	266						
		30	8	185	161	173						
125	5"	15	3	125	168	808	250	210	22	8	8	186
		22,5	5	155	126	333						
		30	7	190	171	267						
150	6"	15	2	130	350	2166	285	240	22	8	8	268
		22,5	4	155	171	648						
		30	7	200	191	379						
200	8"	15	2	150	513	3132	340	295	24	12	12	456
		22,5	4	190	338	1242						
		30	5	230	300	817						
250	10"	15	2	165	559	5149	405	355	26	12	12	684
		22,5	4	205	372	1517						
		30	5	245	335	1051						
300	12"	15	2	200	675	5823	460	410	28	12	12	964
		22,5	6	300	405	1282						
		30	10	380	347	616						
350	14"	15	1	210	739	7601	520	470	30	16	16	1155
		22,5	4	290	850	3840						
		30	7	370	638	1661						
400	16"	15	1	210	1545	25149	580	525	32	16	16	1486
		22,5	4	310	858	4157						
		30	6	365	702	2184						
450	18"	15	3	240	869	11727	640	585	32	20	20	1856
		22,5	6	320	579	3504						
		30	11	405	434	1316						
500	20"	15	2	215	1048	22570	715	650	34	20	20	2274
		22,5	3	270	749	7967						
		30	6	330	582	3981						



Bellows Material  
**304ss-316ss**  
 321ss

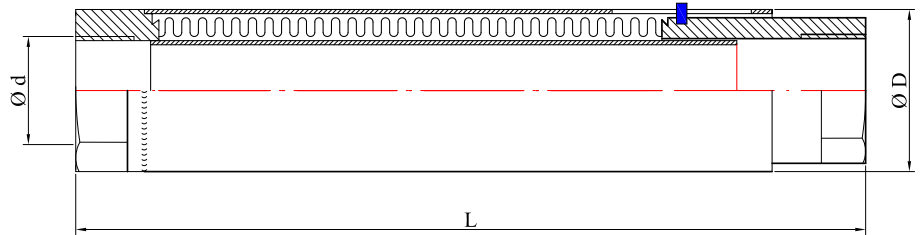
Design Pressure  
**16**<sub>barg</sub>

Design Temperature  
**400**<sup>°C</sup>

Balance Material  
**Carbon Steel**  
 304ss -316ss

Design Movement  
**(±)25 mm axial**

Nominal Diameter (DN)	DN15 (1/2")	DN20 (3/4")	DN25 (1")	DN32 (1 1/4")	DN40 (1 1/2")	DN50 (2")	DN65 (2 1/2")	DN80 (3")	DN100 (4")
Outside Diameter D (mm)	35	42	51	60	63	70	99	114	139
Length L (mm)	260	260	260	260	260	260	260	260	260



# CENTRAL HEATING SYSTEM EXPANSION JOINTS



Advantages of using expansion joints in central heating systems:

- Deformations and noise resulting from thermal stresses are prevented
- Minimum and maximum limits and pretension are observed easily with the help of limiting pin
- Internal sleeve prevents pressure losses and misalignments while external cover prevents external damages
- Installation is easy and quick



They can be used for indoor applications where aesthetic appearance is important.



Connection type is threaded inside for diameters up to and including DN50 (2")

Significant displacements due to thermal movements on central heating pipes create thermal stresses resulting in bending of pipes and irritating noise

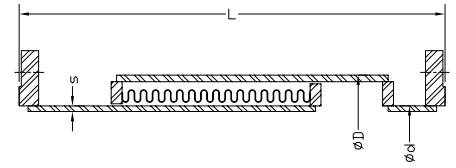


Bellows Material  
**304ss-316ss**  
**321ss**

Balance of Materials  
**Carbon Steel**

Design Temperature  
**400°C**

Weld end connections are available upon request



Nominal Diameter (DN)	Design Pressure (barg)	Length (L) (mm) Axial (+/-) (mm)				d (mm)	s (mm)	D (mm)	Effective Area (cm <sup>2</sup> )
		30	60	90	120				
25 1"	40	275	395	520	-	33,7	2,6	88,9	54
32 1 1/4"		285	405	530	-	42,4	3,2	88,9	54
40 1 1/2"		295	415	535	-	48,3	3,2	88,9	54
50 2"		300	420	555	710	60,3	3,6	114,3	89
65 2 1/2"		315	430	560	715	76,1	3,6	114,3	91
80 3"	25	315	435	585	725	88,9	4,0	139,7	141
100 4"		320	450	585	750	114,3	4,5	165,0	196
125 5"		335	465	595	765	139,7	5,0	193,7	272
150 6"		345	475	615	790	165,0	5,0	219,1	346
200 8"		395	520	685	860	219,1	4,5	323,9	572
250 10"		420	585	760	950	273,0	5,6	355,6	829



Externally pressurized expansion joints are used where there are large axial movements.

This type of design pressurizes the bellows externally, eliminating column instability concerns for the bellows.



This configuration provides an outside cover protecting bellows from external elements and inside pipe acts as a liner protecting bellows from flow medium and and streamlines the flow

**EXTERNALLY PRESSURIZED**



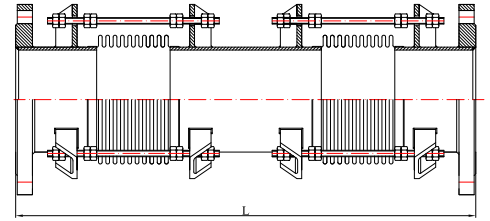
Bellevs Material  
**304<sub>SS</sub> - 316<sub>SS</sub>**  
**321<sub>SS</sub>**

Design Pressure  
**16<sub>barg</sub>**

Movements are non-concurrent

Balance of Materials  
**Carbon Steel**

Design Temperature  
**400°C**



# SEISMIC LIMIT ROD

Nominal Diameter (DN)	Type 1			Type 2			Type 3			
	Movements (mm)		Length (L)	Movements (mm)		Length (L)	Movements (mm)		Length (L)	
	Axial (+/-)	Lateral (+/-)	(mm)	Axial (+/-)	Lateral (+/-)	(mm)	Axial (+/-)	Lateral (+/-)	(mm)	
32	1 1/4"	15	25	595	15	50	620	15	75	690
40	1 1/2"	15	25	620	15	50	650	15	75	720
50	2"	15	25	580	15	50	615	15	75	690
65	2 1/2"	15	25	620	15	50	660	15	75	735
		23	25	665	23	50	705	23	75	780
		30	25	710	30	50	750	30	75	825
80	3"	15	25	700	15	50	730	15	75	790
		23	25	750	23	50	780	23	75	835
		30	25	795	30	50	830	30	75	885
100	4"	15	25	750	15	50	790	15	75	825
		23	25	805	23	50	840	23	75	860
		30	25	860	30	50	895	30	75	915
125	5"	15	25	765	15	50	810	15	75	865
		23	25	810	23	50	875	23	75	910
		30	25	875	30	50	920	30	75	950
150	6"	15	25	840	15	50	890	15	75	945
		23	25	890	23	50	940	23	75	995
		30	25	940	30	50	985	30	75	1040
200	8"	15	25	885	15	50	960	15	75	1050
		23	25	935	23	50	1015	23	75	1100
		30	25	990	30	50	1065	30	75	1150
250	10"	15	25	885	15	50	930	15	75	1040
		23	25	930	23	50	985	23	75	1095
		30	25	985	30	50	1040	30	75	1150



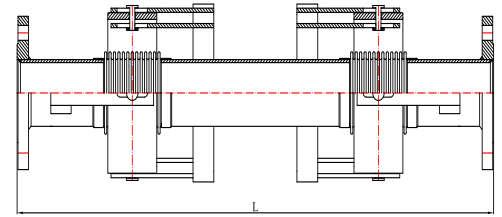
Bellows Material  
**304ss-316ss  
 321ss**

Balance of Materials  
**Carbon  
 Steel**

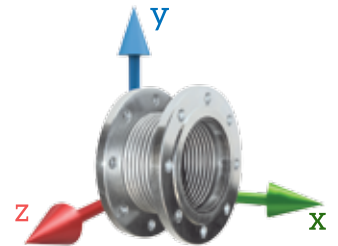
Design Pressure  
**16<sub>barg</sub>**

Design Temperature  
**400°C**

Movements are non-concurrent



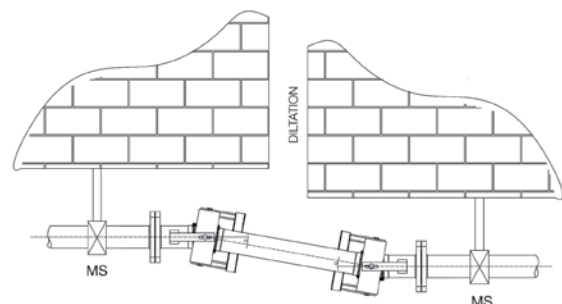
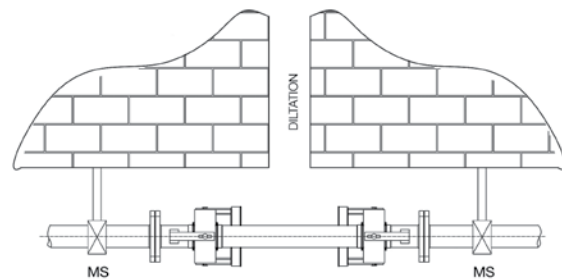
Nominal Diameter (DN)	Type 1				Length (L) (mm)	Type 2			
	Movements (mm)			Length (L) (mm)		Movements (mm)			
	Axial x (+/-)	Lateral y (+/-)	Lateral z (+/-)			Axial x (+/-)	Lateral y (+/-)	Lateral z (+/-)	
32 1 1/4"	50	100	100	750	50	200	200	750	
40 1 1/2"	50	100	100	790	50	200	200	790	
50 2"	50	100	100	790	50	200	200	790	
65 2 1/2"	50	100	100	940	50	200	200	940	
80 3"	50	100	100	940	50	200	200	940	
100 4"	50	100	100	940	50	200	200	990	
125 5"	50	100	100	940	50	200	200	1090	
150 6"	50	100	100	1100	50	200	200	1200	
200 8"	50	100	100	1130	50	200	200	1330	
250 10"	50	100	100	1130	50	200	200	1430	



In addition to thermal movements in pipe lines, there are mechanical movements due to earthquakes, ground settlements and landslides. These type of movements can cause significant damage to the piping systems in dilatation points of buildings, pipe junctions between vessels and boilers.



These mechanical movements can be absorbed by using seismic expansion joints.



MS : Main Support

# SEISMIC GIMBALS



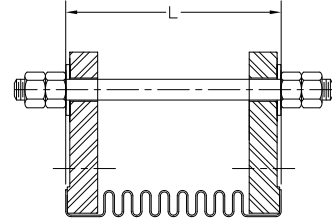
Bellows Material-Multi ply  
**304<sub>ss</sub> - 316<sub>ss</sub>**  
**321<sub>ss</sub>**

Design Pressure  
**16<sub>barg</sub>**

Movements are small vibrational movements  
 Flange drilling is per PN16

Flange Materials  
**Carbon Steel**

Design Temperature  
**400°C**



Nominal Diameter (DN)	Length (L) (mm)	Effective Area (cm <sup>2</sup> )	D (mm)	k (mm)	b (mm)	n	Q (mm)
50 2"	120	38	165	125	18	4	18
65 2 1/2"	120	58	185	145	18	4	18
80 3"	120	80	200	160	20	8	18
100 4"	120	129	220	180	20	8	18
125 5"	125	186	250	210	22	8	18
150 6"	130	268	285	240	22	8	22
200 8"	150	456	340	295	24	12	22
250 10"	165	684	405	355	26	12	26
300 12"	165	964	460	410	28	12	26



Vibration absorbing expansion joints are manufactured from multi-ply to absorb and dampen vibrations. They are ideal for pump connections, exhaust engine lines, in applications where system temperature is too high for rubber expansion joints.

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