

FLEXOLL EXPANSION JOINTS CATALOGUE



ООО «ТИ-Системс» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ
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Flexoll established by 10 years experienced professional team to provide qualified product and technical services to HVAC,gas,oil,steam and industrial markets.Together with experience;strong production capability and marketing facilities;aims to develop new products.The target of Flexoll is to be wellknown brand name in worldwire markets with technical knowledge,machines,experienced human resources who introduces new products,to be solution partner for customers worldwire projects.Flexoll accepts high quality management and as a strategy to provide the trust and customer satisfaction.Flexoll has already started to expand sales and marketing organization throughout Worldwire and developing the first steps of being wellknown brand name.Flexoll is volunteer to support customers and solve their problems for tough competition markets and continue new investments.

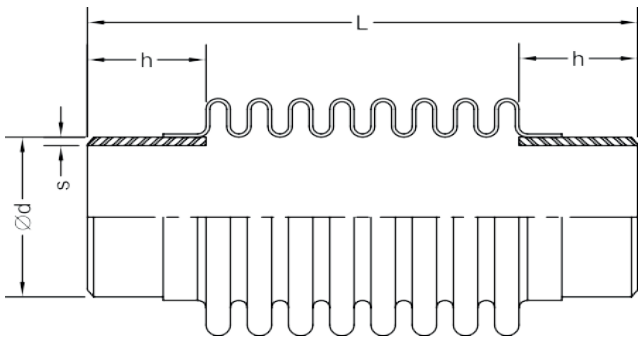




Flexoll manufactures expansion joints and flexible hoses. Flexoll can manufacture hoses 304ss and 316 ss material and braid material 304ss and in order to expansion joints 304ss, 310ss and nickel alloys. Expansion joints are designed in accordance with latest EJMA standards. We use leading CAD, CAM and CAE softwares and various proprietary software based on our experience and testing. All expansion joints and flexible hoses are visually and pressure tested before shipping.



WELD END TYPE/PN6



Standart Bellows Material: 304ss(309ss/316ss/316tiss/321ss Etc. Optional)

Design Pressure: 6 Barg

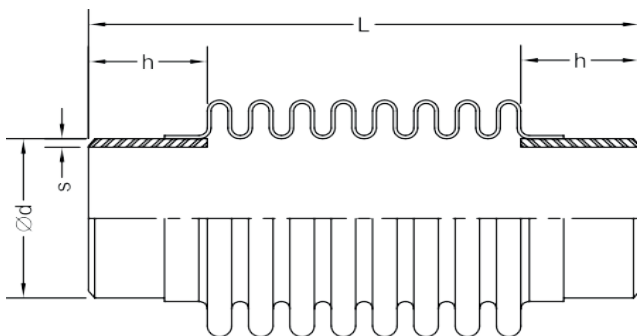
Weld End Material: Carbon Steel(304ss/316ss/321ss Etc. Optional)

Design Temperature: 450 °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 ²)
		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
		22,5	10	225	50	26				
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				
		37,5	8	385	77	267				
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				

WELD END TYPE/PN10



Standart Bellows Material:304ss(309ss/316ss/316tiss/321ss Etc. Optional)

Design Pressure:10 Barg

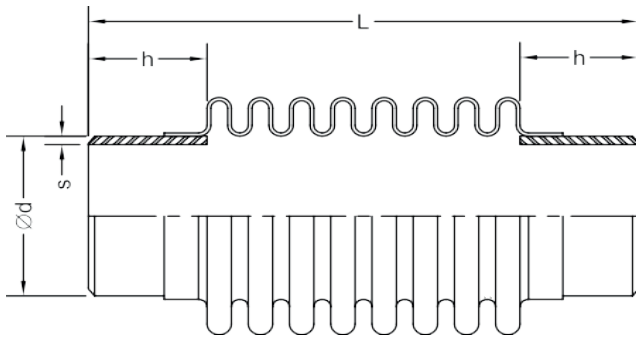
Weld End Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

Design Temperature:450 °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 ²)
	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	6	50	4	38
	22,5	8	215	106	55				
65 2 1/2"	15	4	185	68	95	76,1	50	4	58
	22,5	6	215	98	77				
	30	10	240	105	56				
80 3"	15	4	185	66	124	88,9	50	4	80
	22,5	6	215	90	95				
	30	10	235	90	70				
100 4"	15	3	200	113	333	114,3	60	5	129
	22,5	5	230	88	159				
	30	7	265	109	118				
125 5"	15	2	200	134	641	139,7	60	5	187
	22,5	4	230	104	274				
	30	7	265	107	169				
150 6"	15	3	245	152	936	165	80	5	268
	22,5	4	270	118	448				
	30	6	315	127	245				
200 8"	15	3	265	211	1422	219,1	80	5	460
	22,5	5	305	158	584				
	30	7	330	140	385				
250 10"	15	2	310	292	2687	273	100	6	683
	22,5	5	360	195	888				
	30	7	395	159	499				
300 12"	15	2	310	355	4380	323,9	100	6	945
	22,5	3	360	254	1567				
	30	6	395	197	840				
350 14"	15	2	320	582	8653	355,6	100	6	1141
	22,5	4	370	364	2417				
	30	5	405	323	1509				
400 16"	15	2	320	474	7707	406	100	7	1483
	22,5	3	360	339	3242				
	30	5	400	296	1867				
450 18"	15	1	330	587	11842	457	100	8	1841
	22,5	3	375	714	7176				
	30	4	420	555	3626				
500 20"	15	2	340	758	14195	508	100	8	2268
	22,5	3	385	649	8039				

WELD END TYPE/PN16



Standart Bellows Material:304ss(309ss/316ss/316tiss/321ss Etc. Optional)

Design Pressure:16 Barg

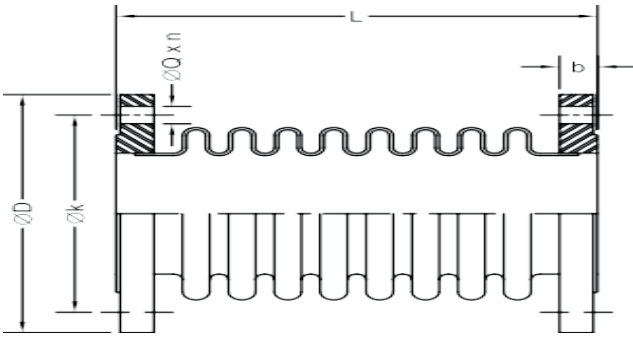
Weld End Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

Design Temperature:450 °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 ²)
		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
		22,5	8	215	106	55				
65	2 1/2"	15	4	185	68	95	76,1	50	4	58
		22,5	6	215	98	77				
		30	10	240	105	56				
80	3"	15	4	185	66	124	88,9	50	4	80
		22,5	6	215	90	95				
		30	10	235	90	70				
100	4"	15	3	200	113	333	114,3	60	5	129
		22,5	5	230	88	159				
		30	7	265	109	118				
125	5"	15	2	200	134	641	139,7	60	5	187
		22,5	4	230	104	274				
		30	7	265	107	169				
150	6"	15	3	245	152	936	165	80	5	268
		22,5	4	270	118	448				
		30	6	315	127	245				
200	8"	15	3	265	211	1422	219,1	80	5	460
		22,5	5	305	158	584				
		30	7	330	140	385				
250	10"	15	2	310	292	2687	273	100	6	683
		22,5	5	360	195	888				
		30	7	395	159	499				
300	12"	15	2	310	355	4380	323,9	100	6	945
		22,5	3	360	254	1567				
		30	6	395	197	840				
350	14"	15	2	320	582	8653	355,6	100	6	1141
		22,5	4	370	364	2417				
		30	5	405	323	1509				
400	16"	15	2	320	474	7707	406	100	7	1483
		22,5	3	360	339	3242				
		30	5	400	296	1867				
450	18"	15	1	330	587	11842	457	100	8	1841
		22,5	3	375	714	7176				
		30	4	420	555	3626				
500	20"	15	2	340	758	14195	508	100	8	2268
		22,5	3	385	649	8039				

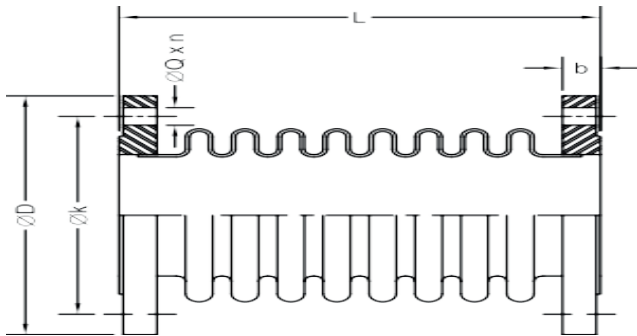
FIXED FLANGED TYPE-PN6



Standart Bellows Material:304ss(309ss/316ss/316tiss/321ss Etc. Optional)
 Design Pressure:6 Barg
 Fixed Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)
 Design Temperature:450 °C
 Movements Are Non-Concurrent
 Flanges Drilling Is PN6

Nominal Diameter(DN)		Movements(mm)		Length(L) mm	Spring Rates(N/mm)		D(mm)	k (mm)	b (mm)	n	Q(mm)	Effective Area(cm ²)
		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
		22,5	10	155	50	26						
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						
		37,5	2	145	154	2049						
250	10"	30	7	220	86	369	375	335	22	12	18	682
		37,5	8	240	77	267						
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						

FIXED FLANGED TYPE-PN10



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure:10 Barg

Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

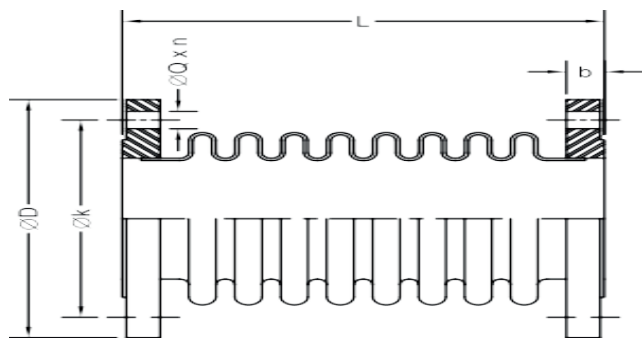
Design Temperature:450 °C

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 ²)
		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
		22,5	8	155	106	55						
65	2 1/2"	15	4	130	68	95	185	145	18	4	18	58
		22,5	6	160	98	77						
80	3"	15	4	130	66	124	200	160	20	8	18	80
		22,5	6	165	90	95						
100	4"	30	10	185	105	56	220	180	20	8	18	129
		15	3	135	113	333						
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						
200	8"	30	6	210	127	245	340	295	24	8	22	460
		15	3	175	211	1422						
250	10"	22,5	5	235	158	584	395	350	26	12	22	683
		30	7	275	140	385						
300	12"	15	2	180	292	2687	445	400	26	12	22	945
		22,5	3	205	254	1567						
350	14"	30	6	245	197	840	505	460	26	16	22	1141
		15	2	170	582	8653						
400	16"	22,5	4	215	364	2417	565	515	26	16	26	1483
		30	5	255	323	1509						
450	18"	15	2	170	474	7707	615	565	28	20	26	1841
		22,5	3	210	339	3242						
500	20"	30	5	255	296	1867	670	620	28	20	26	2268
		15	1	185	587	11842						
500	20"	22,5	3	235	714	7176	670	620	28	20	26	2268
		30	4	270	555	3626						
500	20"	15	2	195	758	14195	670	620	28	20	26	2268
		22,5	3	235	649	8039						

FIXED FLANGED TYPE-PN16



Standart Bellows Material: 304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure: 16 Barg

Flange Material: Carbon Steel(304ss/316ss/321ss Etc. Optional)

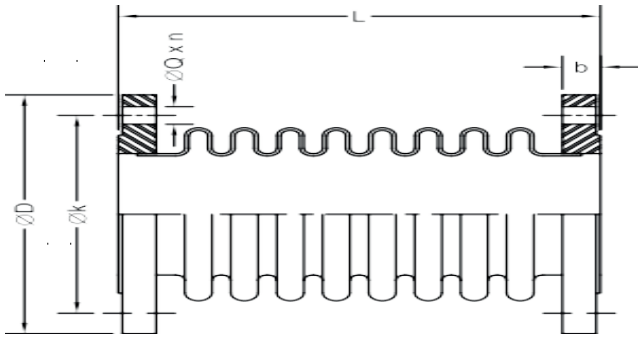
Design Temperature: 450 °C

Flange Drilling Is Per PN16

Movements Are Non-Concurrent

Nominal Diameter(DN)		Movements(mm)		Length(L) mm	Spiring Rates(N/mm)		D(mm)	k(mm)	b(mm)	n	Q(mm)	Effective Area(cm ²)
		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	4	150	146	266						
150	6"	30	8	185	161	173	285	240	22	8	22	268
		15	3	125	168	808						
200	8"	22,5	5	155	126	333	340	295	24	12	22	456
		30	7	190	171	267						
250	10"	15	2	130	350	2166	405	355	26	12	26	684
		22,5	4	205	171	648						
300	12"	30	5	230	300	817	460	410	28	12	26	964
		15	2	200	675	5823						
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						

FLOATING FLANGED TYPE-PN6



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure:6 Barg

Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

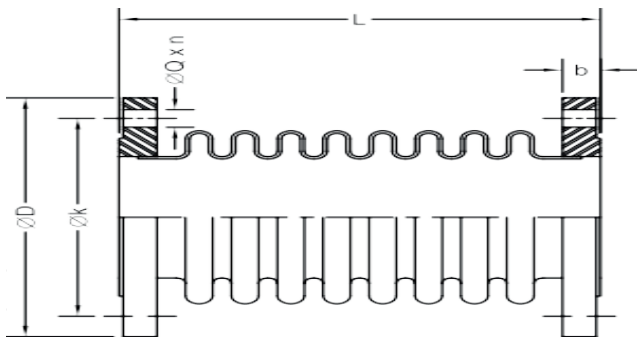
Design Temperature:450 °C

Flange Drilling Is Per PN6

Movements Are Non-Concurrent

Nominal Diameter(DN)	Movements(mm) Axial(+/-) Lateral(+/-)	Length(L) mm	Spring Rates(N/mm)		D(mm)	k (mm)	b (mm)	n	Q(mm)	Effective Area(cm ²)
			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
	22,5 10	155	50	26						
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"	37,5 8	240	77	267	440	395	22	12	22	945
	15 2	170	355	4380						
	30 6	260	197	800						
350 14"	37,5 9	310	162	428	490	445	22	12	22	1127
	15 2	165	386	5669						
	30 6	260	214	1036						
400 16"	37,5 8	310	175	554	540	495	22	16	22	1479
	15 2	180	250	4046						
	30 5	230	178	1520						
450 18"	37,5 8	280	139	728	595	550	24	16	22	1839
	15 2	180	307	6177						
	30 4	230	219	2321						
500 20"	37,5 6	280	170	1111	645	600	24	20	22	2264
	15 2	180	279	6909						
	30 4	230	199	2596						
	37,5 6	280	155	1243						

FLOATING FLANGED TYPE-PN10



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure:10 Barg

Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

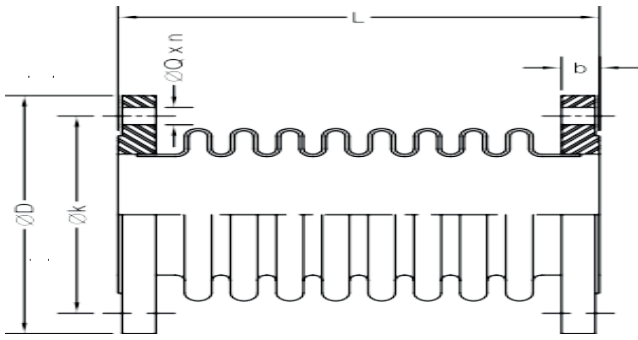
Design Temperature:450 °C

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 ²)
		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
		22,5	8	155	106	55						
65	2 1/2"	15	4	130	68	95	185	145	18	4	18	58
		22,5	6	160	98	77						
80	3"	15	4	130	66	124	200	160	20	8	18	80
		22,5	6	165	90	95						
100	4"	15	3	135	113	333	220	180	20	8	18	129
		22,5	5	165	88	159						
125	5"	15	2	140	134	641	250	210	22	8	18	187
		22,5	4	170	104	274						
150	6"	15	3	145	152	936	285	240	22	8	22	268
		22,5	4	170	118	448						
200	8"	15	3	175	211	1422	340	295	24	8	22	460
		22,5	5	210	158	584						
250	10"	15	2	180	292	2687	395	350	26	12	22	683
		22,5	5	235	195	888						
300	12"	15	2	165	355	4380	445	400	26	12	22	945
		22,5	3	205	254	1567						
350	14"	15	2	170	582	8653	505	460	26	16	22	1141
		22,5	4	215	364	2417						
400	16"	15	2	170	474	7707	565	515	26	16	26	1483
		22,5	3	210	339	3242						
450	18"	15	1	185	587	11842	615	565	28	20	26	1841
		22,5	3	230	714	7176						
500	20"	15	2	195	758	14195	670	620	28	20	26	2268
		22,5	3	235	649	8039						

FLOATING FLANGED TYPE-PN16



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure:16 Barg

Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)

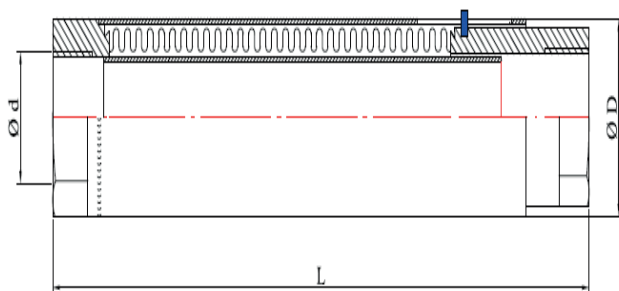
Design Temperature:450 °C

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 ²)
		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						
		30	8	180	182	99						
80	3"	15	3	120	124	231	200	160	20	8	18	80
		22,5	7	150	123	129						
		30	9	180	166	121						
100	4"	15	3	120	145	484	220	180	20	8	18	129
		22,5	4	150	146	266						
		30	8	185	161	173						
125	5"	15	3	125	168	808	250	210	22	8	18	186
		22,5	5	155	126	333						
		30	7	190	171	267						
150	6"	15	2	130	350	2166	285	240	22	8	22	268
		22,5	4	155	171	648						
		30	7	200	191	379						
200	8"	15	2	150	513	3132	340	295	24	12	22	456
		22,5	4	190	338	1242						
		30	5	230	300	817						
250	10"	15	2	165	559	5149	405	355	26	12	26	684
		22,5	4	205	372	1517						
		30	5	245	335	1051						
300	12"	15	2	200	675	5823	460	410	28	12	26	964
		22,5	6	300	405	1282						
		30	10	380	347	616						
350	14"	15	1	210	739	7601	520	470	30	16	26	1155
		22,5	4	290	850	3840						
		30	7	370	638	1661						
400	16"	15	1	210	1545	25149	580	525	32	16	30	1486
		22,5	4	310	858	4157						
		30	6	365	702	2184						
450	18"	15	3	240	869	11727	640	585	32	20	30	1856
		22,5	6	320	579	3504						
		30	11	405	434	1316						
500	20"	15	2	215	1048	22570	715	650	34	20	33	2274
		22,5	3	270	749	7967						

CENTRAL HEATING SYSTEM PIPE EXPANSION JOINT



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Design Pressure:16 Barg

Balance Of Materials:Carbon Steel

Design Temperature:450 °C

Design Movement:50 mm Compression

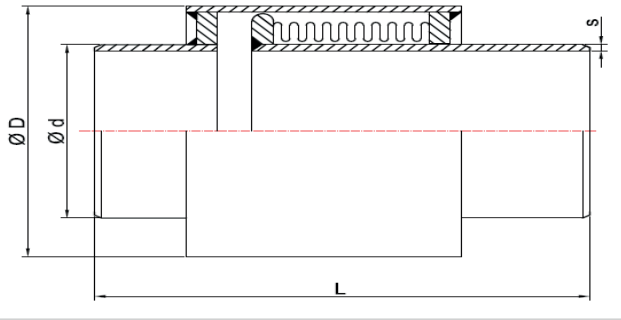
Connection Type Is Threaded Inside For Diameters Up To DN50(2")

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

Pipe expansion joints provide axial movement absorption and maintain the pipeline security. A heating pipeline system at 90/70°C causes approximately 3 mm of movement for each floor of the buildings. For the buildings higher than 10 floors, use of the pipe expansion joints becomes compulsory in order to absorb total expansion amount. Pipe expansion joint application must be repeated for every 10 floors.



EXTERNALLY PRESSURIZED EXPANSION JOINT

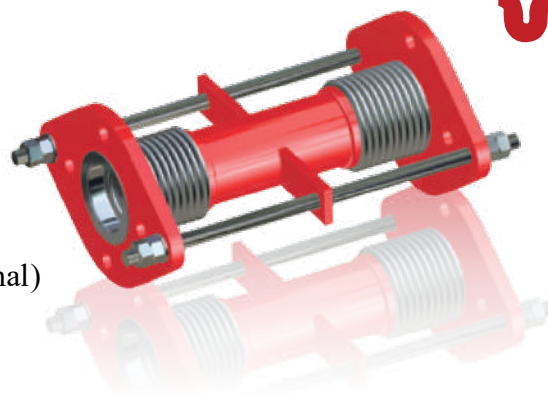
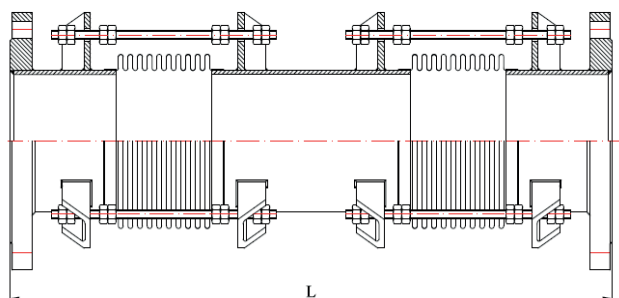


Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)
 Design Temperature:450 °C
 Weld End And Ring Materials:Carbon Steel
 Flanged Connections Are Available Upon Request

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

External pressurized expansion joints are being used as an alternative for axial type of expansion joints, which movement capability is limited. Externally pressurized expansion joints are preferred to use for long and straight pipelines in order to reduce the number of expansion joints requirement. Externally pressurized expansion joints can be used for all type of flow media and pipeline systems.

SEISMIC EXPANSION JOINTS WITH LIMIT RODS



Standart Bellows Material:304ss(309ss/316ss/321ss Etc. Optional)

Balance Of Materials:Carbon Steel

Design Temperature:450 °C

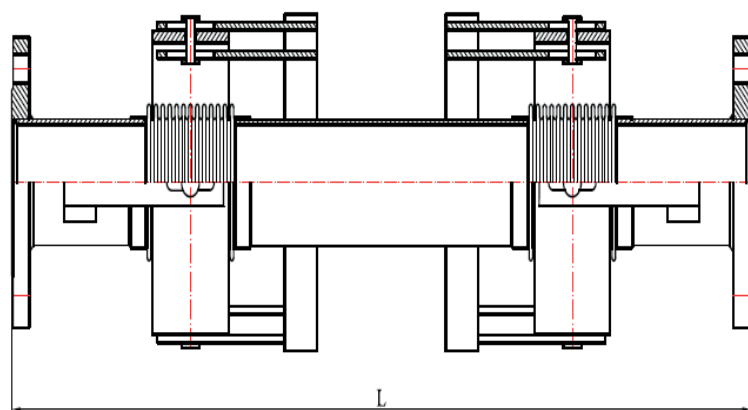
Design Pressure:16 Barg

Movements Are Non-Concurrent

Nominal Diameter(DN)		Type 1			Type 2			Type 3		
		Axial(+/-)	Lateral(+/-)	Length(L) (mm)	Axial(+/-)	Lateral(+/-)	Length(L) (mm)	Axial(+/-)	Lateral(+/-)	Length(L) (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
80	3"	30	25	710	30	50	750	30	75	825
		15	25	700	15	50	730	15	75	790
100	4"	23	25	750	23	50	780	23	75	835
		30	25	795	30	50	830	30	75	885
125	5"	15	25	750	15	50	790	15	75	825
		23	25	805	23	50	840	23	75	860
150	6"	30	25	860	30	50	895	30	75	915
		15	25	765	15	50	810	15	75	865
200	8"	23	25	810	23	50	875	23	75	910
		30	25	875	30	50	920	30	75	950
250	10"	15	25	840	15	50	890	15	75	945
		23	25	890	23	50	940	23	75	995
300	12"	30	25	940	30	50	985	30	75	1040
		15	25	885	15	50	960	15	75	1050
350	14"	23	25	935	23	50	1015	23	75	1100
		30	25	990	30	50	1065	30	75	1150
400	16"	15	25	885	15	50	930	15	75	1040
		23	25	930	23	50	985	23	75	1095
450	18"	30	25	985	30	50	1040	30	75	1150

This type of expansion joints are used to absorb lateral movements in all planes. Also, with a special positioning of two tie rods at 180 degrees, the expansion joints becomes able to absorb some lateral and angular deflections at the same time. The amount of lateral deflection depends on the convolution number of the bellows on each side of the expansion joint. This amount can also be increased by changing the length of the intermediate pipe. The tie rods are also effective to prevent possible torsion forces.

SEISMIC EXPANSION JOINTS WITH GIMBALS



Standard Bellows Material: 304ss (309ss/316ss/321ss Etc. Optional)

Balance of materials: Carbon Steel

Design Temperature: 450 °C

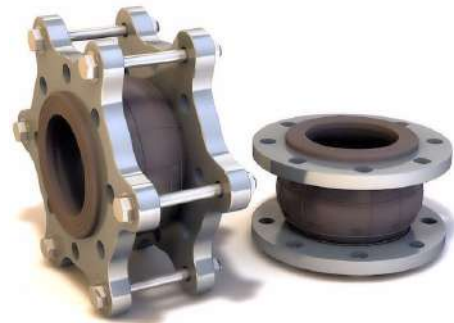
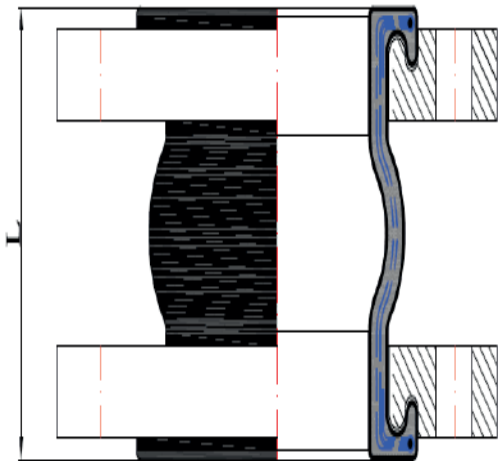
Design Pressure: 16 barg

Movements Are Non-Concurrent

Nominal Diameter (DN)	Type 1				Type 2			
	Axial x(+/-)	Movements (mm) Lateral y(+/-) Lateral z(+/-)		Length (L) (mm)	Axial x(+/-)	Movements (mm) Lateral y(+/-) Lateral z(+/-)		Length (L) (mm)
32 11/4"	50	100	100	750	50	200	200	750
40 11/2"	50	100	100	790	50	200	200	790
50 2"	50	100	100	790	50	200	200	790
65 21/2"	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

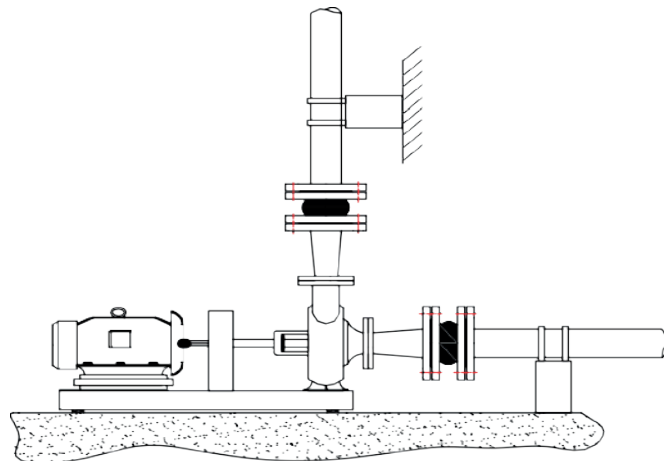
Gimbal type expansion joints are designed to permit angular rotation in any plane by the use of two pairs of hinges affixed to a common floating gimbal ring. Simply, a double gimbal expansion joint is consisted of two single gimbal expansion joints and an intermediate pipe connects them each other. The advantage of this arrangement is the ability to absorb a large lateral movement in any plane at each end. Because the gimbals are attached to each end of the bellows, the thermal expansion of the intermediate pipe will not be absorbed by the universal but must be accepted by the adjacent piping.

RUBBER EXPANSION JOINT



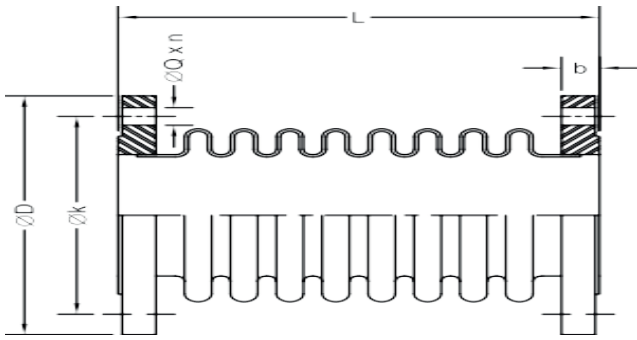
Best Solution To Vibration ,noise and misalignments problems
 Up To 16 bar pressure and 110 °C temperature working conditions
 Nylon-cord carcassed rubber construction
 Flanged construction with integral self-sealing profile
 Flanges are electro galvanised carbon steel material

Nominal Diameter (DN)		Length (L) (mm)
25	1"	100
32	1 1/4"	100
40	1 1/2"	100
50	2"	100
65	2 1/2"	100
80	3"	100
100	4"	100
125	5"	120
150	6"	120
200	8"	120
250	10"	130
300	12"	210
350	14"	210
400	16"	220
450	18"	220
500	20"	270
600	24"	300
700	28"	300



Rubber expansion joints can absorb vibration, noise and elongation in the pipeline. Due to its soft structure, it can absorb all type movements. It prevents thermal elongation and protects the pipeline from water hammer. There is no need any additional gasket due to rubber material and it is very easy to install with floating flanges. Rubber expansion joints are used up to 10 bar to metal wire reinforcements.

VIBRATION ABSORBERS



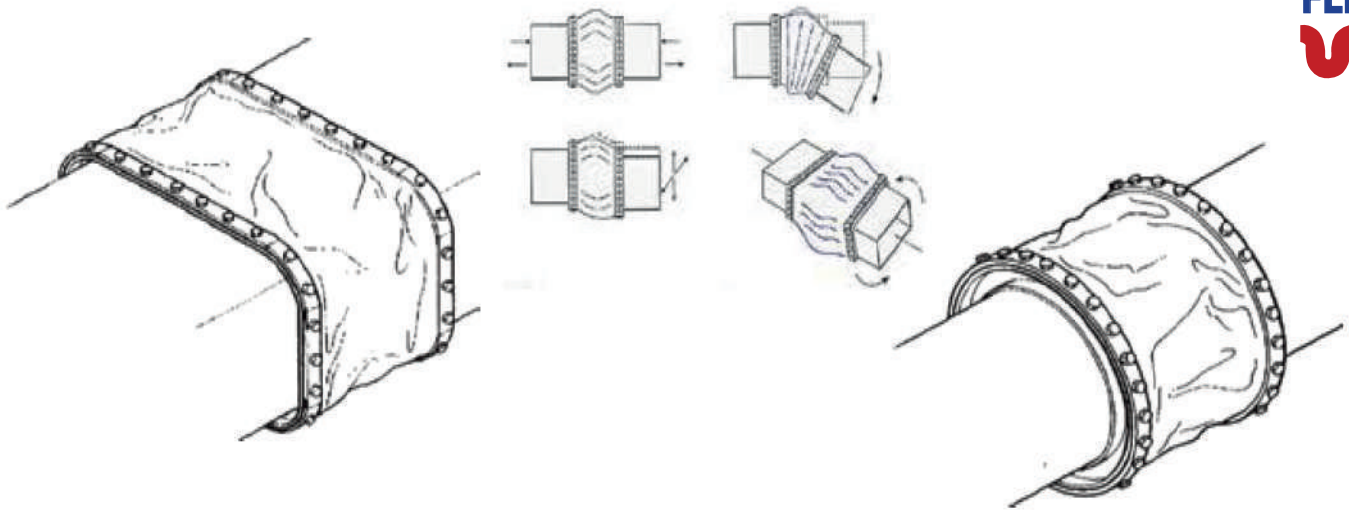
Standard Bellows Material: 2 ply 304ss(309ss/316ss/321ss Etc. Optional)
 Flange Material: Carbon Steel
 Design pressure: 16 barg
 Design Temperature: 450 °C
 Movements are small vibrational movements
 Flange drilling is per PN16

Nominal Diameter (DN)	Length (L) (mm)	Effective Area (cm ²)	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

Besides of compensating thermal expansions, the most important function of expansion joints is to solve the problems caused by the system vibration. Expansion joints are very effective especially on compensating the vibrations with high frequency and low oscillation.



FABRIC EXPANSION JOINTS



Type	Section	Design Conditions	Description
A		Pmax 1 bar Tmax 350 °C Tmin -30 °C	Nominal Diameter 300-8000 mm Axial Movement 0,3 x LE Lateral Movement 0,2 x LE
B		Pmax 1 bar Tmax 850 °C Tmin -30 °C	Nominal Diameter 50 - 10000 mm Axial Movement 0,25 x LE Lateral Movement 0,15 x LE
C		Pmax 1 bar Tmax 350 °C Tmin -30 °C	Nominal Diameter 300-8000 mm Axial Movement 0,5 x LE Lateral Movement 0,2 x LE
D		Pmax 1 bar Tmax 350 °C Tmin -30 °C	Nominal Diameter 50 - 10000 mm Axial Movement 0,3 x LE Lateral Movement 0,2 x LE
E		Pmax 1 bar Tmax 550 °C Tmin -30 °C	Nominal Diameter 300 - 4500 mm Axial Movement 0,7 x LE Lateral Movement 0,2 x LE
F		Pmax 1 bar Tmax 650 °C Tmin -30 °C	Nominal Diameter 300 - 8000 mm Axial Movement 0,7 x LE Lateral Movement 0,2 x LE
G		Pmax 1 bar Tmax 850 °C Tmin -30 °C	Nominal Diameter 300 - 4500 mm Axial Movement 0,6 x LE Lateral Movement 0,2 x LE

They can be designed and manufactured in various types in accordance with required operating conditions.



Advantages
High vibration and noise elimination
Compensation on thermal expansion
High flexibility
Working temperature up to 850°C
Minimum reaction force

Layers of Fabric Expansion Joints

- 1-Reinforcing layer for layer
- 2-Flexible outer layer
- 3-Sealing Layer
- 4-High temperature heat insulation layer.
- 5-Heat insulation layer
- 6-Strength and resistance layer



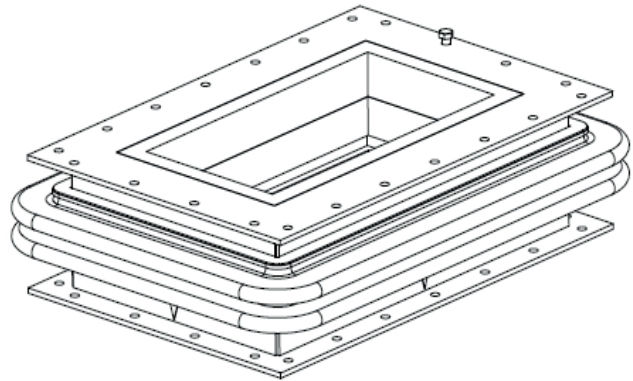
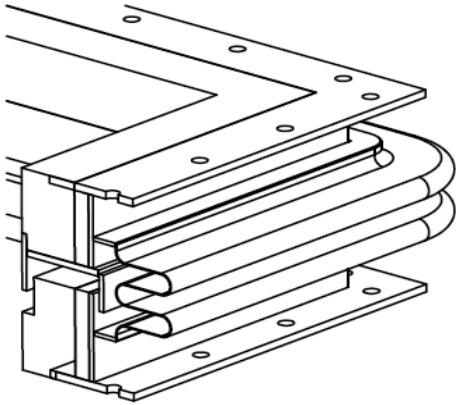
PRESSURE BALANCED EXPANSION JOINTS



Large axial forces are experienced on the main supports of the high pressure piping systems due to the high internal pressures. To compensate these large axial forces, heavy-duty support constructions are required. Also if the piping is not on the ground level, it is very hard to construct those supports for the elevated pipelines. The pressure balanced expansion joints are used to relieve loads on critical equipment such as pumps, turbines, compressors, tanks etc.

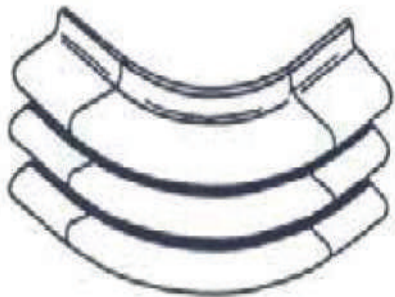


RECTANGULAR EXPANSION JOINT



Rectangular expansion joints are used when duct cross-sections are rectangular instead of circular. Types of rectangular expansion joints are named according to the corner design as ;

ROUNDED CORNER



SINGLE MITER CORNER



CAMERA CORNER



The jackets are manufactured by sewing of the rock wool and glass fiber fabric covered by silicon with the threads made of inflammable aramid fiber according to the sizes of the armatures. Side smocking threads are either glass fiber or propylene depending on temperature of the environment. Self adhesive bands (Velcro fasteners) are used for connections of the tips of the jackets.

- * They minimize the heat losses of the pipe line armatures.
- * Prevent the perspiration and condensation on the armatures of the cooling systems.
- * They are not single use type as the other insulation materials; they have a long life.
- * Their assembly and disassembly is quick and simple. Their installation cost is low.
- * There is no danger of fire due to the fact that they are completely made of inflammable fabric and thread, they are weather and water proof.

The maximum temperature allowed for the insulation fabric in standard jackets is approximately 280 °C. The fabrics which can resist to temperature up to approximately 850 °C are used for the special applications. As the temperature of the non-insulated valve surface is observed by thermal cameras as 142,8 °C, the temperature of the valve surface insulated by valve jacket is observed as 34,3 °C. Since the glass fiber fabric covered by silicon which is used on the inner and outer surfaces is resistive to ozone, water and weak acids, they could be used for a long period. There is no danger of deterioration of the insulation wool by getting wet.



LENS TYPE EXPANSION JOINT



Lens bellows can be the right answer to piping, ducting and vessel thermal growth problems over that of conventional thin walled metal bellows.

22

One of the advantages of a thick convolution is ability to hold up to mechanical damage. Dents and gouges create stress risers in thin bellows which results in fatigue cracks over time. Cracking of any type is very difficult to weld repair on thin bellows but it can be performed by plant maintenance staff on thick walled bellows.

Thicker wall also holds up better to corrosion attacks. An additional benefit is the common use of carbon steel material. Stainless steel or nickel alloys is the preferred material for thin walled bellows. Drain couplings can also be added to the bottom of the flanged and flued bellows convolution to prevent condensate build up. Thick walled, high convolution is durable and lasts for a long time.



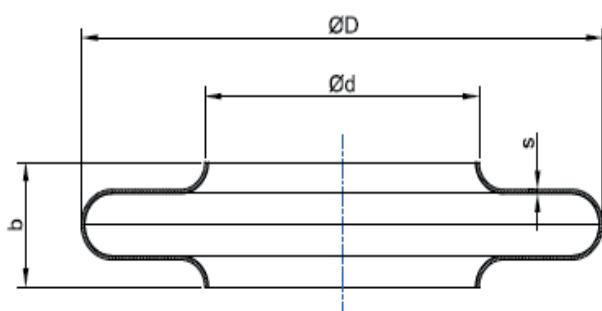
ООО «ТИ-Системс» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

Интернет: www.tisys.ru www.tisys.kz www.tisys.by www.ти-системс.рф

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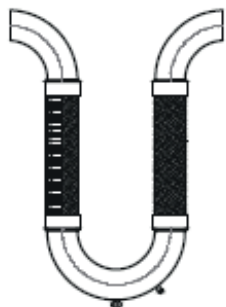
Эл. почта: info@tisys.ru info@tisys.kz info@tisys.by

LENS TYPE EXPANSION JOINT



Nominal Diameter (DN)	d (mm)	D(mm)	b (mm)	Thickness (s) (mm)	
300	12"	323,9	600	120	2-4
350	14"	355,6	650	120	2-4
400	16"	406,4	700	120	2-4
450	18"	457,2	750	120	2-4
500	20"	508	800	120-160	2-4
600	24"	610	900	120-160	2-4
700	28"	711	1000	120-160	2-4
800	32"	813	1100	120-160	2-4
900	36"	914	1200	120-160	2-4
1000	40"	1016	1300	120-160	2-4
1100	44"	1120	1480	160	2-4
1200	48"	1220	1580	160	2-4
1300	52"	1320	1680	160	2-4
1400	56"	1420	1780	160	2-4
1500	60"	1520	1880	160	2-4
1600	64"	1620	2020	160	2-4
1700	68"	1720	2120	160	2-4
1800	72"	1820	2220	160	2-4
1900	76"	1920	2320	160	2-4
2000	80"	2020	2500	160	2-6
2100	84"	2120	2600	160	2-6
2200	88"	2220	2700	160	2-6
2300	92"	2320	2800	160	2-6
2400	96"	2420	2900	160	2-6
2500	100"	2520	3000	160	2-6
2600	104"	2620	3100	160	2-6
2700	108"	2720	3200	160	2-6
2800	112"	2820	3300	160	2-6
2900	116"	2920	3400	160	2-6
3000	120"	3020	3500	160	2-6

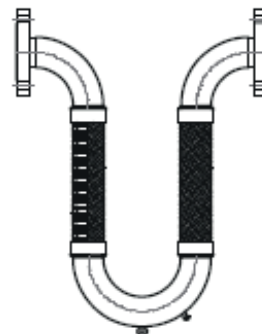
OMEGA U/V FLEX DILATATION FLEX EXPANSION JOINT



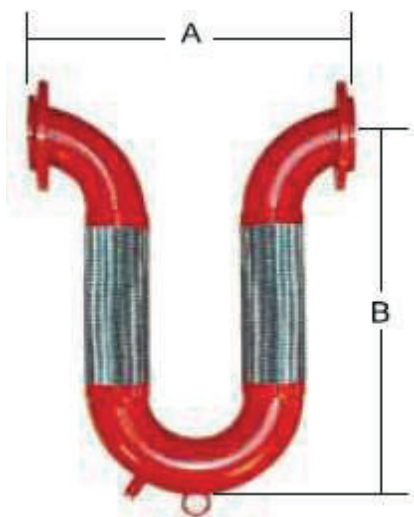
WELDING ENDS



THREADED



FLANGED



Hose Material:304/316L

Braid Material:304ss

Elbow Material:St37

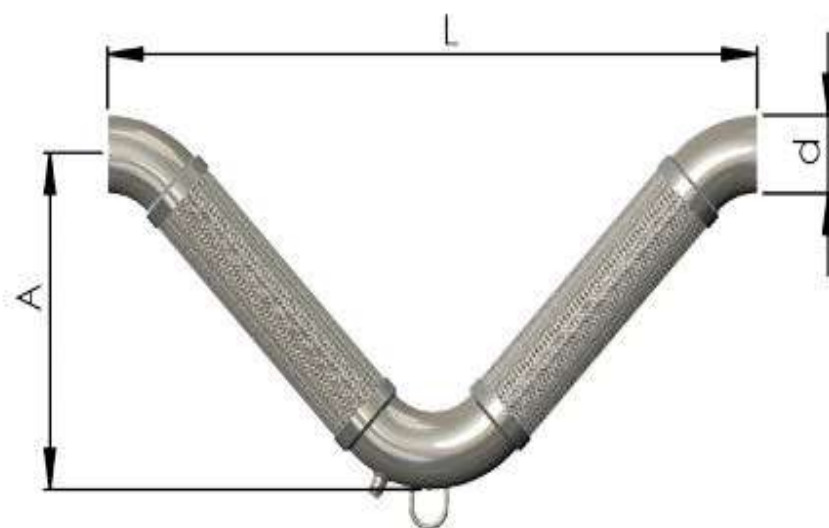
Flange Material:St37

Pipe Material:St37

Pressure:16 Barg

Design Temperature:550 °C

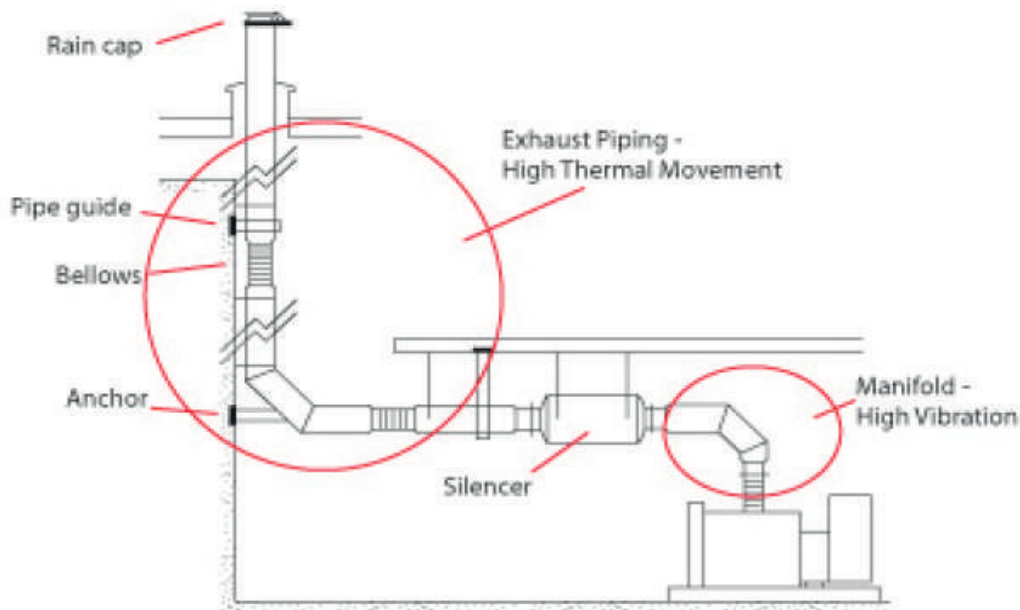
Movements:100 mm (X/Y/Z Direction)



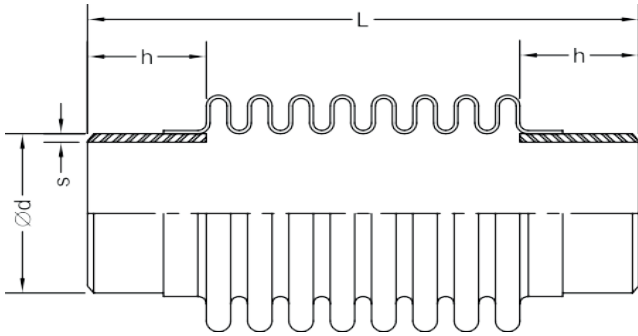
EXHAUST EXPANSION JOINTS



Bellows and expansion joints are typically used to connect engines to silencers. They are ideal where space is limited, but strength is a consideration to absorb heat, expansion and vibration.



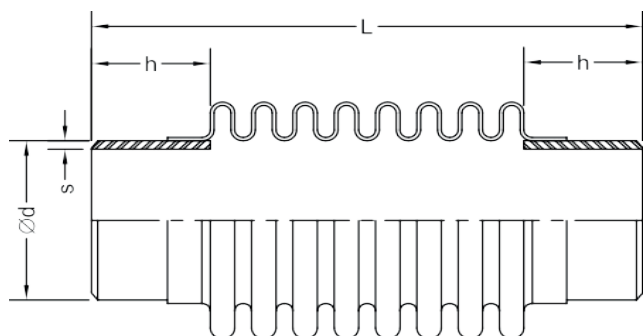
TYPE EXH-1



Standard Bellows Material: 2 ply 321ss
 Weld End Material: Carbon Steel
 Design Pressure: 2,5 barg
 Design Temperature: 550 °C
 Movements Are Non-Concurrent

Nominal Diameter(DN)	Movements(mm) Axial(+/-) Lateral(+/-)	Length(L) mm	Spring Rates(N/mm)		d(mm)	h(mm)	s(mm)	Effective Area(cm ²)
			Axial	Lateral				
25 1"	19 16	225	40	13	33,7	50	3	20
32 1 1/4"	19 16	225	40	13	42,4	50	3	20
40 1 1/2"	19 16	225	45	18	48,3	50	3	24
50 2"	24 14	225	36	16	60,3	50	4	37
65 2 1/2"	25 12	225	41	27	76,1	50	4	58
80 3"	30 13	225	37	33	88,9	50	4	80
100 4"	35 11	225	36	52	114,3	50	5	128
125 5"	35 10	225	40	84	139,7	50	5	186
150 6"	47 11	225	28	82	165	50	5	268
200 8"	50 8	225	31	148	219,1	50	5	451
250 10"	56 8	225	30	221	273	50	6	681
300 12"	50 6	225	65	640	323,9	50	6	955
350 14"	50 5	225	69	813	355,6	50	6	1139
400 16"	55 5	225	57	850	406	50	7	1479
450 18"	58 5	225	32	593	457	50	8	1838
500 20"	60 5	225	60	1383	508	50	8	2264

TYPE EXH-2



Standard Bellows Material: 2 ply 321ss

Weld End Material: Carbon Steel

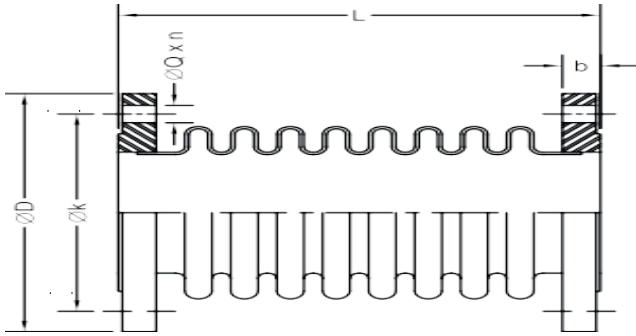
Design Pressure: 2,5 barg

Design Temperature: 550 °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 ²)
	Axial(+/-)	Lateral(+/-)		Axial	Lateral				
32 1 1/4"	24	70	500	50	1	42,4	50	3	18
40 1 1/2"	27	70	500	60	1	48,3	50	3	24
50 2"	32	68	500	51	2	60,3	50	4	37
65 2 1/2"	37	62	500	50	3	76,1	50	4	58
80 3"	42	68	500	50	3	88,9	50	4	79
100 4"	48	58	500	52	6	114,3	50	5	126
125 5"	52	55	500	51	8	139,7	50	5	184
150 6"	62	56	500	53	16	165	50	5	268
200 8"	77	57	500	52	26	219,1	50	5	453
250 10"	73	41	500	52	28	273	50	6	665
300 12"	90	49	500	57	60	323,9	50	6	951
350 14"	96	48	500	54	46	355,6	50	6	1140
400 16"	102	36	500	52	100	406	50	7	1480
450 18"	94	30	500	63	94	457	50	8	1840
500 20"	104	30	500	56	169	508	50	8	2265

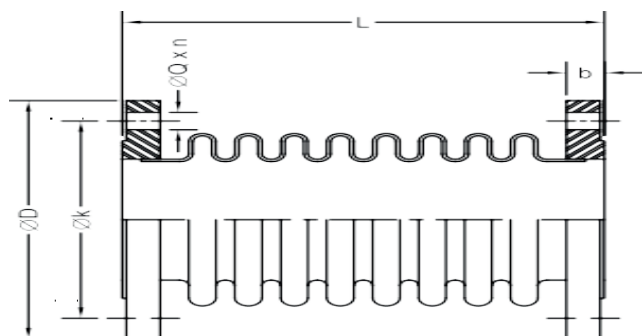
TYPE EXH-3



Standart Bellows Material:321ss
 Design Pressure:2,5 Barg
 Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)
 Design Temperature:550 °C
 Rotating Flange Drilling Is Per DIN86044
 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 ²)
	Axial(+/-)	Lateral(+/-)		Axial	Lateral						
32 1 1/4"	19	16	250	40	13	140	100	16	4	18	18
40 1 1/2"	19	16	250	45	18	150	110	16	4	18	23
50 2"	24	14	250	36	16	165	125	16	4	18	38
65 2 1/2"	25	12	250	41	27	185	145	16	4	18	58
80 3"	30	13	250	37	33	200	160	16	8	18	80
100 4"	35	11	250	36	52	220	180	16	8	18	129
125 5"	35	10	250	40	84	250	210	16	8	18	187
150 6"	47	11	250	28	82	285	240	16	8	22	268
200 8"	50	8	250	31	148	320	280	16	8	22	460
250 10"	56	8	250	30	221	375	335	16	12	22	683
300 12"	50	6	250	65	640	440	395	16	12	22	945
350 14"	50	5	250	69	813	490	445	16	12	22	1141
400 16"	55	5	250	57	850	540	495	16	16	22	1483
450 18"	58	5	250	32	593	595	550	16	16	22	1841
500 20"	60	5	250	60	1383	645	600	16	20	22	2268

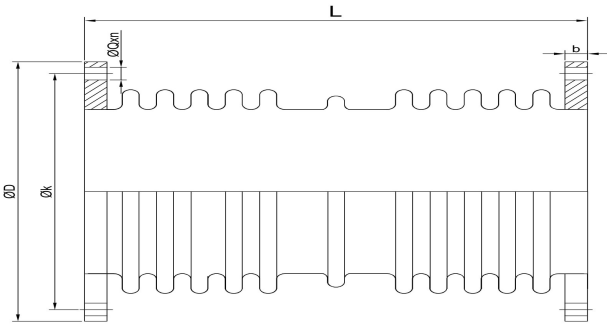
TYPE EXH-4



Standart Bellows Material:321ss
 Design Pressure:2,5 Barg
 Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)
 Design Temperature:550 °C
 Fixed Flange Drilling Is Per DIN86044
 Movements Are Non-Concurrent

Nominal Diameter(DN)	Movements(mm) Axial(+/-) Lateral(+/-)	Length(L) mm	Spring Rates(N/mm)		D(mm)	k (mm)	b (mm)	n	Q(mm)	Effective Area(cm ²)
			Axial	Lateral						
32 1 1/4"	19 16	250	40	13	140	100	16	4	18	18
40 1 1/2"	19 16	250	45	18	150	110	16	4	18	23
50 2"	24 14	250	36	16	165	125	16	4	18	38
65 2 1/2"	25 12	250	41	27	185	145	16	4	18	58
80 3"	30 13	250	37	33	200	160	16	8	18	80
100 4"	35 11	250	36	52	220	180	16	8	18	129
125 5"	35 10	250	40	84	250	210	16	8	18	187
150 6"	47 11	250	28	82	285	240	16	8	22	268
200 8"	50 8	250	31	148	320	280	16	8	22	460
250 10"	56 8	250	30	221	375	335	16	12	22	683
300 12"	50 6	250	65	640	440	395	16	12	22	945
350 14"	50 5	250	69	813	490	445	16	12	22	1141
400 16"	55 5	250	57	850	540	495	16	16	22	1483
450 18"	58 5	250	32	593	595	550	16	16	22	1841
500 20"	60 5	250	60	1383	645	600	16	20	22	2268

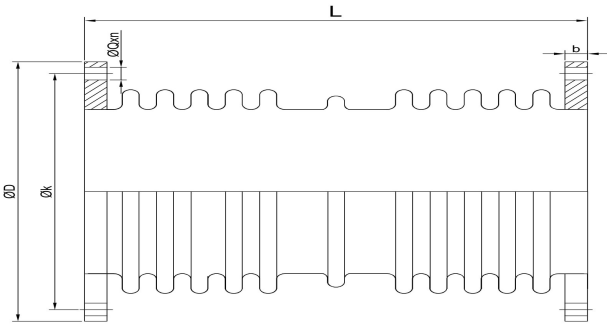
TYPE EXH-5



Standart Bellows Material:321ss
 Design Pressure:2,5 Barg
 Flange Material:Carbon Steel(304ss/316ss/321ss Etc.Optional)
 Design Temperature:550 °C
 Rotating Flange Drilling Is Per DIN86044
 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 ²)
	Axial(+/-)	Lateral(+/-)		Axial	Lateral						
32 1 1/4"	24	70	500	50	1	140	100	16	4	18	18
40 1 1/2"	27	70	500	60	1	150	110	16	4	18	23
50 2"	32	68	500	51	2	165	125	16	4	18	38
65 2 1/2"	37	62	500	50	3	185	145	16	4	18	58
80 3"	42	68	500	50	3	200	160	16	8	18	80
100 4"	48	58	500	52	6	220	180	16	8	18	129
125 5"	52	55	500	51	8	250	210	16	8	18	187
150 6"	62	56	500	53	16	285	240	16	8	22	268
200 8"	77	57	500	52	26	320	280	16	8	22	460
250 10"	73	41	500	52	28	375	335	16	12	22	683
300 12"	90	49	500	57	60	440	395	16	12	22	945
350 14"	96	48	500	54	46	490	445	16	12	22	1141
400 16"	102	36	500	52	100	540	495	16	16	22	1483
450 18"	94	30	500	63	94	595	550	16	16	22	1841
500 20"	104	30	500	56	169	645	600	16	20	22	2268

TYPE EXH-6



Standart Bellows Material: 321ss
 Design Pressure: 2,5 Barg
 Flange Material: Carbon Steel (304ss/316ss/321ss Etc. Optional)
 Design Temperature: 550 °C
 Fixed Flange Drilling Is Per DIN86044
 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 ²)
	Axial (+/-)	Lateral (+/-)		Axial	Lateral						
32 1 1/4"	24	70	500	50	1	140	100	16	4	18	18
40 1 1/2"	27	70	500	60	1	150	110	16	4	18	23
50 2"	32	68	500	51	2	165	125	16	4	18	38
65 2 1/2"	37	62	500	50	3	185	145	16	4	18	58
80 3"	42	68	500	50	3	200	160	16	8	18	80
100 4"	48	58	500	52	6	220	180	16	8	18	129
125 5"	52	55	500	51	8	250	210	16	8	18	187
150 6"	62	56	500	53	16	285	240	16	8	22	268
200 8"	77	57	500	52	26	320	280	16	8	22	460
250 10"	73	41	500	52	28	375	335	16	12	22	683
300 12"	90	49	500	57	60	440	395	16	12	22	945
350 14"	96	48	500	54	46	490	445	16	12	22	1141
400 16"	102	36	500	52	100	540	495	16	16	22	1483
450 18"	94	30	500	63	94	595	550	16	16	22	1841
500 20"	104	30	500	56	169	645	600	16	20	22	2268

TYPE EXH-7



Specifications	Inner Diameter:DN40-DN500 Total Length:100 mm-500 mm Braid Type : Metal Wired or Metal Mesh Design Type : Axial Type Pipe Joint or Universal Pipe Joint High Vibrational Capacity, High Temperature withstanding Capacity, Comparatively Lower Costs, Easy to Install.
Material	Exhaust Flexible Element Material : Stainless Steel 304, 316 Outer Braid Material : Stainless Steel 304

Braided expansion joints are constructed with a corrugated inner bellows and braided cover that helps increasing the pressure resistance rating and provides end limitations that annihilate the need for additional control assemblies.



