

AXIAL EXPANSION JOINT with swivel flanges

Type AN B-B

TYPE AN B-B ≥ DN 100



TYPE AN B-B ≤ DN 80



Design type AN B-B

HKS axial expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with rotating, standardised swivel flanges in line with EN 1092-1 type 02.

Materialcombination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows/collar	Flange	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo · Incoloy 825)		-196 °C bis 450 °C

1) Chemical resistance depends on temperature and medium and has to be tested or requested.
 2) Take into account the pressure derating factors of the nominal pressures through operating temperature.
 3) Unalloyed steel components receive a base coat for corrosion protection.

Special versions

On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

- › Inner sleeve, telescopic inner sleeve or conical inner sleeve
- › External protective sleeve or telescopic inner sleeve

On customer request:

- › Flanges in line with ASME, JIS, BS
- › With special coating, galvanised or hot galvanised
- › Connection variants with weld end or fixed flanges

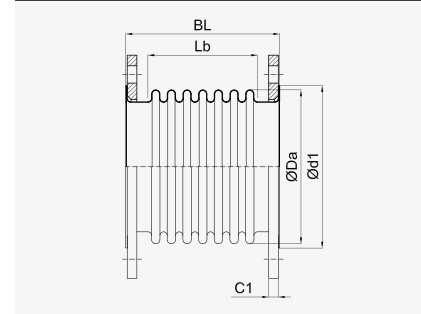
Tasks

- › Absorption of axial movements
- › Low-vibration and low-noise connection of pipes
- › Compensation of installation inaccuracies
- › Reduction of forces and moments in connections

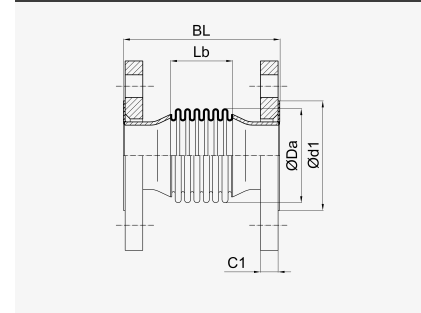
Areas of application

- › Mechanical engineering, plant engineering, apparatus building, pipeline constructions and ship building
- › Food processing industry
- › Gas and water supply, building and heating technology
- › Energy and offshore technology, oil and gas production
- › Chemical and pharmaceutical industry, acid-production
- › Paper, textile, cellulose and paint industry
- › Steel and smelting industry, cement and brick kilns, flue gas desulphurisation plants

DN 100 - DN 1400



DN 50 - DN 80



Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, load information and corrosive ambient influences.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows			Lateral movement absorption nominal	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm

AXIAL EXPANSION JOINT with swivel flanges · type AN B-B · nominal pressure PN 2.5

50	21	105	3.5	6	90	16	84	44	42.5	4	138	582
50	43	150	3.6	6	90	16	84	88	42.5	17	69	73
50	62	185	3.8	6	90	16	84	124	42.5	34	49	26
65	27	100	4.4	6	110	16	105	41	66.4	3	106	813
65	61	150	4.7	6	110	16	105	90	66.4	19	49	77
65	75	220	5.5	6	110	16	105	160	65.5	43	105	52
80	26	115	6.8	6	128	18	117	53	86.1	4	157	937
80	65	220	7.4	6	128	18	118	158	86.6	32	101	67
80	99	300	8.5	6	128	18	118	240	86	75	105	30
100	48	150	6.9	6	148	18	142	93	127	11	94	267
100	76	205	7.2	6	148	18	142	146	127	28	60	69
100	100	255	7.9	6	148	18	142	194	127	50	69	45
125	49	140	9.1	6	178	20	174	74	191	7	86	571
125	89	200	9.4	6	178	20	174	134	191	25	48	98
125	145	375	14	6	178	20	176	269	191	83	102	52
150	48	170	11	6	202	20	207	66	274	5	91	1104
150	84	220	11	6	202	20	207	115	274	17	52	206
150	168	385	16	6	202	20	209	276	274	82	94	64
200	64	180	15	6	258	22	265	72	457	6	70	1164
200	114	235	15	6	258	22	264	126	455	19	43	231
200	192	370	22	6	258	22	266	260	456	69	88	113
250	72	190	19	6	312	24	321	77	689	6	73	1624
250	124	245	20	6	312	24	319	135	685	18	46	329
250	210	395	28	6	312	24	322	276	687	65	94	161
300	57	180	25	6	365	24	375	62	954	3	95	4609
300	133	260	26	6	365	24	372	143	946	18	48	424
300	226	415	36	6	365	24	374	292	948	63	99	211
350	62	155	35	6	415	26	410	66	1145	3	88	4379
350	124	220	36	6	415	26	409	132	1144	14	45	559
350	228	360	46	6	415	26	412	264	1145	52	96	300
400	84	225	43	6	465	28	464	95	1481	6	134	4233
400	126	270	44	6	465	28	464	142	1481	13	89	1255
400	190	395	49	6	465	28	464	264	1481	38	89	360
450	72	210	52	6	520	30	519	77	1863	3	163	9792
450	144	290	54	6	520	30	519	154	1863	15	82	1224
450	227	370	60	6	520	30	515	264	1845	41	90	451
500	78	220	56	6	570	30	576	83	2299	3	140	8908
500	156	300	58	6	570	30	576	166	2299	15	70	1114
500	234	395	65	6	570	30	571	256	2276	37	86	571
600	81	235	73	6	670	32	681	87	3263	3	144	11961
600	136	290	75	6	670	32	681	144	3263	10	86	2584

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows			Lateral movement absorption nominal	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	Ae	Δy	CΔx	CΔy
-	mm	mm	kg	-	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	224	410	83	6	670	32	681	263	3259	30	91	816
700	86	255	108	6	775	40	781	92	4361	3	169	16907
700	172	350	112	6	775	40	781	183	4361	14	85	2114
700	230	410	119	6	775	40	788	247	4401	25	91	1251
800	96	285	148	6	880	44	897	102	5729	3	215	22524
800	160	350	152	6	880	44	897	170	5729	10	129	4866
800	224	420	156	6	880	44	897	238	5729	20	92	1773
900	96	290	178	6	980	48	999	102	7168	3	233	30574
900	160	360	182	6	980	48	999	170	7168	9	140	6604
900	224	430	187	6	980	48	999	238	7168	18	100	2407
1000	98	305	207	6	1080	52	1101	108	8779	3	257	36926
1000	131	345	210	6	1080	52	1101	144	8779	5	193	15578
1000	238	455	223	6	1080	52	1102	255	8784	19	86	2212
1200	114	340	275	6	1280	60	1319	122	12618	3	324	53127
1200	190	420	284	6	1280	60	1319	202	12618	10	195	11476
1200	228	460	285	6	1280	60	1304	243	12471	14	122	4912
1400	109	345	383	6	1480	72	1519	122	16949	2	403	88783
1400	181	430	393	6	1480	72	1519	202	16949	8	242	19178
1400	228	470	394	6	1480	72	1502	243	16760	12	159	8652
AXIAL EXPANSION JOINT with swivel flanges - type AN B-B - nominal pressure PN 6												
50	21	105	3.5	6	90	16	84	44	42.5	4	138	582
50	35	135	3.6	6	90	16	84	73	42.5	11	83	126
50	49	210	4.2	6	90	16	84	146	41.8	32	163	61
65	26	100	4.4	6	110	16	105	41	66.4	3	106	813
65	45	155	4.6	6	110	16	100	96	62.8	15	84	111
65	66	205	5.3	6	110	16	105	142	65.5	34	119	75
80	25	115	6.8	6	128	18	117	53	86.1	4	157	937
80	47	175	7.2	6	128	18	118	116	86.6	17	138	170
80	79	230	8.1	6	128	18	118	169	85.5	42	139	80
100	52	165	7	6	148	18	141	106	127	14	86	186
100	63	185	7.4	6	148	18	142	125	127	20	107	168
100	87	280	9.2	6	148	18	144	213	127	48	173	93
125	37	125	9	6	178	20	174	60	191	4	108	1115
125	69	210	9.8	6	178	20	174	108	191	15	91	283
125	98	290	12	6	178	20	176	185	191	38	149	158
150	47	190	11	6	202	20	207	84	274	7	151	1118
150	72	240	11	6	202	20	205	135	271	17	109	310
150	131	360	18	6	202	20	210	263	274	61	221	168
200	49	185	15	6	258	22	265	74	456	4	150	2408
200	80	240	16	6	258	22	262	129	450	14	105	540
200	141	340	25	6	258	22	267	240	455	46	222	334
250	51	190	20	6	312	24	318	79	683	4	182	3844
250	87	250	21	6	312	24	317	138	680	13	111	762
250	147	350	29	6	312	24	322	242	686	40	196	438

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows			Lateral movement absorption nominal	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
300	64	225	27	6	365	24	375	106	954	6	222	3596
300	90	270	28	6	365	24	375	149	954	12	159	1311
300	133	345	33	6	365	24	374	222	947	28	180	661
350	58	185	37	6	415	26	410	92	1145	4	254	6656
350	109	275	39	6	415	26	408	183	1137	17	147	956
350	165	335	49	6	415	26	411	248	1141	35	201	712
400	60	195	43	6	465	28	462	96	1473	4	275	8366
400	106	265	45	6	465	28	462	168	1473	13	157	1561
400	174	380	58	6	465	28	463	260	1470	34	211	874
450	63	240	55	6	520	30	520	106	1863	4	365	11625
450	111	320	58	6	520	30	520	185	1863	14	209	2169
450	204	385	75	6	520	30	522	261	1863	36	221	1153
500	70	250	59	6	570	30	574	114	2288	4	347	11739
500	124	335	63	6	570	30	574	199	2288	15	199	2191
500	200	405	82	6	570	30	579	278	2299	34	253	1442
600	79	290	86	6	670	32	684	152	3268	6	553	14912
600	127	380	92	6	670	32	684	244	3268	15	346	3641
600	209	385	97	6	670	32	681	250	3251	27	202	2006
700	70	280	121	6	775	40	790	128	4401	3	661	33891
700	124	380	129	6	775	40	790	224	4401	12	378	6324
700	221	415	137	6	775	40	784	263	4364	25	212	2560
800	69	310	166	6	880	44	899	144	5729	3	1092	57589
800	114	350	176	6	880	44	900	184	5729	8	669	21598
800	224	420	177	6	880	44	893	252	5684	22	216	3685
900	72	290	200	6	980	48	1005	111	7194	2	1095	123392
900	120	360	212	6	980	48	1005	184	7194	7	657	26653
900	224	435	224	6	980	48	999	259	7143	20	253	5145
1000	83	300	234	6	1080	52	1115	117	8875	3	955	119469
1000	111	340	241	6	1080	52	1115	156	8875	5	717	50401
1000	204	420	253	6	1080	52	1109	233	8822	14	337	10452
1200	90	335	368	6	1295	60	1321	129	12618	3	1032	150837
1200	180	460	395	6	1295	60	1321	257	12618	12	516	18855
1200	228	470	409	6	1295	60	1322	264	12618	15	368	12693
1400	85	365	558	6	1510	72	1521	129	16949	2	1291	253285
1400	171	490	589	6	1510	72	1521	257	16949	9	646	31661
1400	228	500	611	6	1510	72	1522	264	16949	13	455	21094

AXIAL EXPANSION JOINT with swivel flanges · type AN B-B · nominal pressure PN 10

50	27	120	6.1	16	102	20	84	59	42.5	7	104	246
50	36	150	6.3	16	102	20	84	87	42.1	14	126	136
50	42	190	6.6	16	102	20	84	129	41.8	24	185	89
65	20	95	7.1	16	122	20	105	33	66.4	2	133	1588

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows			Lateral movement absorption nominal	Adjustment force rate		
				Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral	
				DN	Δx	BL	G	PN	d1		C1	Da	Lb
-	mm	mm	kg	-	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
65	34	135	7.5	16	122	20	105	76	65.5	9	223	490	
65	47	165	7.7	16	122	20	105	104	65.5	17	162	189	
80	24	115	8.1	16	138	20	117	53	86.1	4	157	937	
80	44	160	8.6	16	138	20	118	99	86	13	185	311	
80	56	180	9	16	138	20	118	121	85.5	21	194	217	
100	31	130	9.5	16	158	22	142	66	127	5	132	731	
100	49	220	11	16	158	22	142	154	127	19	215	220	
100	82	305	14	16	158	22	145	238	127	51	341	146	
125	37	140	12	16	188	22	174	76	191	6	178	1122	
125	49	170	13	16	188	22	173	107	189	11	144	457	
125	89	275	17	16	188	22	177	205	191	38	301	262	
150	39	160	16	16	212	24	207	86	274	5	269	1894	
150	67	195	17	16	212	24	207	124	273	14	168	573	
150	99	315	22	16	212	24	210	202	274	35	288	368	
200	47	170	21	10	268	24	262	94	451	6	254	2473	
200	85	270	24	10	268	24	264	159	453	18	213	731	
200	115	310	28	10	268	24	268	197	456	31	264	596	
250	57	240	28	10	320	26	322	123	689	7	307	2690	
250	86	265	30	10	320	26	322	147	689	14	229	1388	
250	138	380	41	10	320	26	325	264	688	41	355	667	
300	50	250	35	10	370	26	377	135	954	6	658	6630	
300	92	365	39	10	370	26	377	247	954	21	359	1076	
300	134	335	43	10	370	26	377	218	949	27	295	1124	
350	63	230	51	10	430	30	407	140	1133	7	345	3845	
350	103	280	53	10	430	30	405	191	1126	17	257	1524	
350	155	365	67	10	430	30	414	268	1144	36	362	1099	
400	52	225	65	10	482	32	466	126	1481	5	699	12446	
400	104	350	71	10	482	32	466	252	1481	20	350	1556	
400	164	380	83	10	482	32	466	280	1474	35	377	1351	
450	71	270	80	10	532	36	521	164	1863	7	531	7089	
450	107	350	85	10	532	36	521	245	1863	17	354	2101	
450	166	465	116	10	532	36	523	352	1854	40	649	1854	
500	78	290	96	10	585	38	575	176	2286	8	514	7305	
500	104	345	99	10	585	38	575	234	2286	15	386	3082	
500	181	405	115	10	585	38	574	288	2274	32	387	2022	
600	76	350	134	10	685	42	684	188	3268	7	851	15137	
600	114	445	142	10	685	42	684	281	3268	16	567	4485	
600	193	425	152	10	685	42	679	299	3232	29	402	2773	
700	63	285	196	10	800	50	792	140	4401	3	1697	73569	
700	114	420	215	10	800	50	787	279	4371	14	1007	10839	
700	198	420	215	10	800	50	787	279	4371	24	393	4232	
AXIAL EXPANSION JOINT with swivel flanges · type AN B-B · nominal pressure PN 16													
50	23	115	6.1	16	102	20	84	52	42.5	5	118	367	
50	28	130	6.2	16	102	20	84	70	42.1	8	158	265	

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows			Lateral movement absorption nominal	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
50	33	165	6.5	16	102	20	84	104	41.8	15	231	173
65	24	115	7.1	16	122	20	100	56	62.8	4	144	556
65	29	125	7.4	16	122	20	105	66	65.5	6	254	731
65	37	145	7.6	16	122	20	105	85	65.5	11	198	344
80	22	130	8.1	16	138	20	114	68	83.2	4	211	741
80	32	135	8.4	16	138	20	118	75	86	7	247	736
80	44	160	8.8	16	138	20	118	97	85.5	13	243	424
100	34	160	9.8	16	158	22	141	96	127	8	206	546
100	43	180	11	16	158	22	142	116	127	13	249	452
100	57	210	12	16	158	22	144	144	127	21	324	378
125	24	130	13	16	188	22	174	63	191	3	394	3682
125	42	175	13	16	188	22	174	110	190	9	237	720
125	59	240	15	16	188	22	175	172	190	21	370	453
150	26	180	17	16	212	24	208	71	274	3	539	5677
150	50	210	17	16	212	24	206	141	272	12	303	791
150	68	265	19	16	212	24	208	154	272	18	333	731
200	34	215	24	16	268	26	267	100	457	4	737	6419
200	61	295	26	16	268	26	267	180	457	15	410	1101
200	97	320	31	16	268	26	268	206	453	27	440	903
250	36	235	35	16	320	29	323	106	689	4	795	9295
250	58	300	36	16	320	29	323	170	689	11	497	2270
250	105	345	43	16	320	29	324	216	684	25	468	1309
300	31	225	45	16	378	32	376	90	952	2	1019	23048
300	81	415	54	16	378	32	377	279	954	21	598	1404
300	124	435	69	16	378	32	381	300	954	35	697	1416
350	32	200	64	16	438	35	408	96	1134	2	1094	25676
350	84	375	74	16	438	35	412	273	1145	20	597	1753
350	135	425	91	16	438	35	415	317	1142	37	685	1488
400	50	265	86	16	490	38	466	156	1481	5	1064	12361
400	90	395	93	16	490	38	465	286	1477	19	613	2114
400	137	415	111	16	490	38	470	300	1481	31	698	2193
450	57	290	109	16	550	42	521	168	1862	6	979	12327
450	95	400	116	16	550	42	521	280	1860	18	603	2728
450	151	445	138	16	550	42	524	320	1857	33	691	2391
500	52	255	146	16	610	46	573	124	2273	3	1230	35165
500	104	380	155	16	610	46	573	247	2273	15	615	4396
500	144	405	175	16	610	46	582	272	2299	24	707	4193

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

AXIAL EXPANSION JOINT for low pressure (PN1)

Type AN B-B



Design type AN B-B

HKS axial expansion joint with compact size, consisting of multi-convolution and multi-layered metal bellows with rotating, standardised swivel flanges according to DIN 86044.

Materialcombination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows/collar	Flange	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	-10 °C bis 300 °C ⁴⁾
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12) 1.4878 (X8CrNiTi18-10)		bis 900 °C ⁵⁾ bis 800 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		-196 °C bis 450 °C

1. Chemical resistance depends on temperature and medium and has to be tested or requested.
2. Take into account the pressure derating factors of the nominal pressures through operating temperature.
3. Unalloyed steel components receive a base coat for corrosion protection.
4. Exhaust gases from an operating pressure of 0.5 bar to max. 550 °C
5. Exhaust gases from an operating pressure of 0.5 bar to max. 1000 °C

Special versions

On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

- › Inner sleeve, telescopic inner sleeve or conical inner sleeve
- › External protective sleeve or telescopic inner sleeve

On customer request:

- › Flanges in line with EN 1092-1, ASME, JIS, BS
- › With special coating, galvanised or hot galvanised
- › Connection variants with weld end or fixed flanges

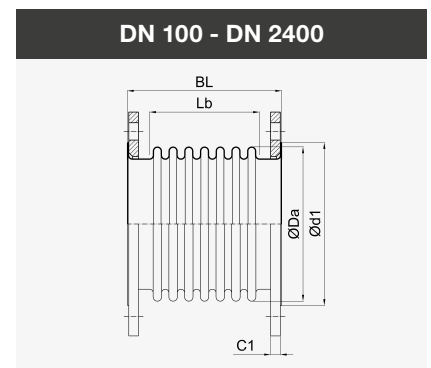
Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, load information and corrosive ambient influences.

Tasks

- › Absorption of axial movements
- › Low-vibration and low-noise connection of pipes
- › Compensation of installation inaccuracies
- › Reduction of forces and moments in connections

Areas of application

- › Mechanical and plant engineering, engine and ship building
- › Gas supply, building and heating technology
- › Energy and offshore technology, oil and gas production
- › Chemical industry
- › Steel and smelting industry, cement and brick kilns, flue gas desulphurisation plants



Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange in line with DIN 86044		Bellows			Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				Outer diameter of collar durchm.	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral	Axial	Lateral
				DN	Δx	BL	G	d1		C1	Da	Lb	Ae
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz

AXIAL EXPANSION JOINT with swivel flanges · type AN B-B · nominal pressure PN 1

100	39	140	5.8	148	14	140	80	126	8	124	473	236	378
100	86	235	6.2	148	14	140	172	126	38	57	47	122	90
100	119	300	6.4	148	14	140	238	126	74	42	18	91	48
125	58	130	7	178	14	172	89	190	11	79	362	163	285
125	117	225	7.5	178	14	172	178	190	44	40	46	88	77
125	149	300	7.9	178	14	170	252	187	81	35	20	72	44
150	49	150	7.9	202	14	205	66	272	5	100	1196	172	488
150	122	250	8.6	202	14	205	164	272	35	40	77	80	91
150	184	340	11	202	14	205	255	271	84	41	33	57	41
175	51	360	13	232	16	234	69	360	5	109	1569	130	405
175	129	365	19	232	16	234	172	360	34	44	101	71	88
175	186	370	23	232	16	234	250	360	72	46	51	55	47
200	67	160	12	258	16	263	72	455	6	75	1244	123	412
200	117	210	12	258	16	263	126	455	20	43	233	78	149
200	186	340	15	258	16	263	258	454	66	46	60	53	50
250	72	160	14	312	16	319	77	686	6	79	1741	112	432
250	144	235	15	312	16	319	154	686	24	40	218	63	121
250	206	355	18	312	16	319	275	685	63	49	85	48	52
300	51	160	19	365	16	374	63	952	3	208	9712	151	842
300	138	265	21	365	16	374	167	952	21	78	513	67	141
300	210	365	23	365	16	372	271	947	54	54	133	47	60
350	56	160	24	415	16	408	68	1141	3	202	9735	133	758
350	132	250	26	415	16	408	157	1141	18	87	767	68	166
350	210	385	28	415	16	403	292	1126	53	62	157	47	61
400	63	170	27	465	16	462	71	1476	3	193	10823	119	734
400	106	210	28	465	16	462	118	1476	9	116	2338	81	298
400	212	330	31	465	16	462	236	1476	38	58	293	44	82
450	72	170	31	520	16	517	77	1857	3	175	10508	105	668
450	120	220	32	520	16	517	128	1857	10	105	2270	70	268
450	216	325	35	520	16	517	231	1857	34	59	390	42	90
500	78	175	34	570	16	574	83	2292	3	149	9501	90	589
500	130	230	36	570	16	574	138	2292	11	90	2053	60	235
500	234	345	39	570	16	574	249	2292	35	50	352	36	78
550	79	185	48	620	20	627	84	2755	3	148	11009	84	596
550	132	240	49	620	20	627	140	2755	10	89	2378	56	238
550	237	355	53	620	20	625	252	2746	33	54	442	35	83
600	81	190	52	670	20	680	87	3260	3	147	12239	80	599
600	136	245	54	670	20	680	144	3260	10	89	2644	53	239
600	244	360	57	670	20	675	260	3235	32	61	553	36	90
650	84	190	52	720	20	730	89	3785	3	158	14403	79	624
650	140	250	54	720	20	730	148	3785	9	95	3111	53	249
650	252	370	58	720	20	725	267	3758	32	65	651	36	93

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange in line with DIN 86044		Bellows			Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				Outer diameter of collar durchm.	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral	Axial	Lateral
				DN	Δx	BL	G	d1		C1	Da	Lb	Ae
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz
700	86	195	60	775	20	786	92	4391	3	139	13941	70	577
700	144	255	62	775	20	786	152	4391	9	83	3012	46	229
700	230	345	66	775	20	786	244	4391	24	52	736	31	95
800	96	205	71	880	20	895	102	5715	3	229	24019	73	614
800	128	240	73	880	20	895	136	5715	6	172	10133	58	365
800	224	340	79	880	20	893	238	5702	20	106	2020	37	135
900	96	205	80	980	20	1000	102	7179	3	223	29264	67	633
900	128	240	82	980	20	1000	136	7179	6	167	12346	53	375
900	224	340	88	980	20	994	238	7134	18	117	2792	37	150
1000	102	210	89	1080	20	1110	108	8859	3	192	27706	58	572
1000	136	245	92	1080	20	1112	144	8875	6	136	11048	44	327
1000	204	320	97	1080	20	1106	216	8825	13	108	3891	35	171
1100	108	215	98	1180	20	1216	114	10697	3	197	30925	56	576
1100	144	255	102	1180	20	1218	152	10715	6	140	12345	42	328
1100	216	330	107	1180	20	1210	228	10642	14	118	4592	34	178
1200	114	220	107	1280	20	1316	120	12608	3	213	35511	55	590
1200	152	260	111	1280	20	1318	160	12628	6	151	14179	42	336
1200	228	340	116	1280	20	1310	240	12549	14	127	5271	34	182
1300	114	220	115	1380	20	1416	120	14677	3	228	44227	55	633
1300	152	260	119	1380	20	1416	160	14677	5	171	18659	43	373
1300	228	340	124	1380	20	1410	240	14613	13	136	6562	34	195
1400	114	220	123	1480	20	1516	120	16903	3	242	54251	55	676
1400	152	260	128	1480	20	1516	160	16903	5	182	22887	43	398
1400	190	300	132	1480	20	1516	200	16903	8	146	11719	36	264
1500	120	230	126	1580	20	1620	126	19335	3	230	53458	51	640
1500	160	270	131	1580	20	1620	168	19335	5	173	22553	40	377
1500	200	310	135	1580	20	1620	210	19335	8	138	11547	33	250
1600	120	230	128	1690	20	1720	126	21878	3	243	63915	50	667
1600	160	270	133	1690	20	1720	168	21878	5	183	26965	39	393
1600	200	310	138	1690	20	1720	210	21878	8	146	13806	32	261
1800	120	230	157	1890	20	1920	126	27436	2	269	88710	49	741
1800	160	270	163	1890	20	1920	168	27436	4	202	37425	39	437
1800	200	310	169	1890	20	1920	210	27436	7	162	19162	32	290
2000	134	255	183	2090	20	2120	152	33615	3	492	137898	58	794
2000	179	305	191	2090	20	2120	202	33615	5	369	58176	45	468
2000	224	355	198	2090	20	2120	252	33615	9	295	29786	37	310
2200	132	255	200	2295	20	2320	152	40429	2	533	179684	57	858
2200	177	305	208	2295	20	2320	202	40429	5	400	75805	44	506
2200	221	355	217	2295	20	2320	252	40429	8	320	38812	37	336
2400	131	255	218	2495	20	2520	152	47870	2	573	229144	56	928
2400	174	305	226	2495	20	2520	202	47870	4	430	96670	44	547
2400	218	355	236	2495	20	2520	252	47870	7	344	49495	37	363

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. x and y have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.



AXIAL EXPANSION JOINT with fixed flanges

Type AN F-F



Design type AN F-F

HKS axial expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with standardised fixed flanges in line with EN 1092-1 type 01.

Materialcombination ¹⁾	Bauteil		Permitted operating temperature TS ²⁾
	Metal bellows	Flange	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo · Incoloy 825)		-196 °C bis 450 °C

1) Chemical resistance depends on temperature and medium and has to be tested or requested.
 2) Take into account the pressure derating factors of the nominal pressures through operating temperature.
 3) Unalloyed steel components receive a base coat for corrosion protection.

Special versions

On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

- › Inner sleeve, telescopic inner sleeve or conical inner sleeve
- › External protective sleeve or telescopic inner sleeve

On customer request:

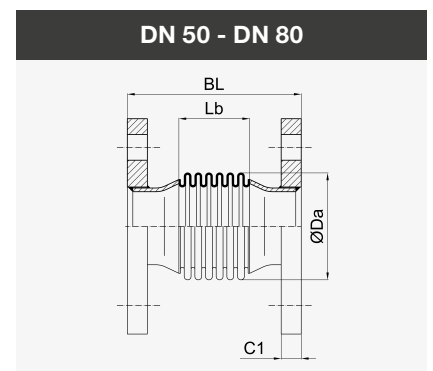
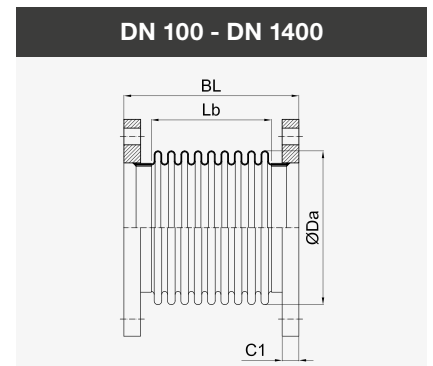
- › Flanges in line with ASME, JIS, BS
- › With special coating, galvanised or hot galvanised
- › Connection variants with weld end or swivel flanges

Tasks

- › Absorption of axial movements
- › Low-vibration and low-noise connection of pipes
- › Compensation of installation inaccuracies
- › Reduction of forces and moments in connections

Areas of application

- › Mechanical engineering, plant engineering, apparatus building, pipeline constructions and ship building
- › Food processing industry
- › Gas, water supply, building and heating technology
- › Energy and offshore technology, oil and gas production
- › Chemical and pharmaceutical industry, acid production
- › Paper, textile, cellulose and paint industry
 Steel and smelting industry, cement and brick kilns, flue gas desulphurisation plants



Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, load information and corrosive ambient influences.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm

AXIAL EXPANSION JOINT with fixed flanges - type AN F-F - nominal pressure PN 2.5

50	21	105	3.5	6	16	84	44	42.5	4	138	582
50	43	150	3.6	6	16	84	88	42.5	17	69	73
50	62	185	3.7	6	16	84	124	42.5	34	49	26
65	27	100	4.3	6	16	105	41	66.4	3	106	813
65	61	150	4.5	6	16	105	90	66.4	19	49	77
65	75	220	5.4	6	16	105	160	65.5	43	105	52
80	26	115	6.6	6	18	117	53	86.1	4	157	937
80	65	220	7.3	6	18	118	158	86.6	32	101	67
80	99	305	8.3	6	18	118	240	86	75	105	30
100	54	150	7.1	6	18	142	93	125	13	76	211
100	84	205	7.4	6	18	141	146	125	32	49	56
100	103	240	7.9	6	18	142	180	125	48	61	45
125	54	135	9.3	6	20	174	74	189	8	72	472
125	92	195	9.7	6	20	172	134	187	26	45	91
125	154	360	14	6	20	175	269	188	89	91	45
150	53	160	11	6	20	207	66	271	6	78	933
150	93	210	11	6	20	207	115	271	19	45	175
150	169	350	16	6	20	208	258	271	78	88	68
200	67	170	16	6	22	265	72	453	6	61	1011
200	113	225	16	6	22	261	126	447	19	43	229
200	192	340	21	6	22	266	240	453	64	82	122
250	72	180	20	6	24	321	77	684	6	65	1425
250	124	235	21	6	24	317	135	676	18	46	323
250	212	355	28	6	24	323	255	684	60	86	173
300	57	170	26	6	24	375	62	948	3	85	4080
300	133	250	27	6	24	370	143	935	18	49	422
300	229	375	36	6	24	375	269	945	59	91	226
350	62	140	36	6	26	408	66	1136	3	84	4146
350	124	210	37	6	26	407	132	1132	14	45	551
350	228	340	46	6	26	411	264	1138	52	89	276
400	88	210	44	6	28	464	95	1474	6	121	3812
400	132	255	45	6	28	464	142	1474	14	81	1130
400	191	345	49	6	28	462	264	1467	38	90	359
450	72	165	52	6	30	510	76	1823	3	106	6410
450	144	240	53	6	30	510	152	1823	15	53	802
450	216	355	61	6	30	518	238	1847	35	80	497
500	78	200	58	6	30	576	83	2291	3	128	8150
500	156	285	60	6	30	576	166	2291	15	64	1019
500	208	345	66	6	30	575	228	2282	29	77	644
600	81	220	76	6	32	678	87	3240	3	147	12133

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	136	275	78	6	32	678	144	3240	10	88	2621
600	229	395	85	6	32	679	263	3242	31	89	790
700	86	240	110	6	40	779	92	4336	3	170	16911
700	172	330	114	6	40	779	183	4336	14	85	2114
700	230	395	121	6	40	788	247	4389	25	84	1159
800	96	265	151	6	44	897	102	5712	3	203	21271
800	160	330	155	6	44	897	170	5712	10	122	4595
800	224	400	160	6	44	897	238	5712	20	87	1675
900	96	270	182	6	48	997	102	7138	3	232	30388
900	160	340	187	6	48	997	170	7138	9	140	6564
900	224	410	192	6	48	997	238	7138	18	100	2393
1000	102	285	213	6	52	1099	108	8747	3	255	36494
1000	136	320	215	6	52	1099	144	8747	6	192	15396
1000	238	435	238	6	52	1113	259	8857	19	107	2694
1200	114	315	287	2.5	60	1317	122	12585	3	319	52047
1200	190	395	296	2.5	60	1317	202	12585	10	191	11243
1200	228	440	309	2.5	60	1319	246	12598	14	135	5353
1400	111	340	386	2.5	72	1518	122	16921	3	385	84679
1400	186	420	397	2.5	72	1518	202	16921	8	231	18291
1400	260	500	407	2.5	72	1518	283	16921	16	165	6666
AXIAL EXPANSION JOINT with fixed flanges · type AN F-F · nominal pressure PN 6											
50	21	105	3.5	6	16	84	44	42.5	4	138	582
50	35	135	3.5	6	16	84	73	42.5	11	83	126
50	49	210	4.1	6	16	84	146	41.8	32	163	61
65	26	100	4.3	6	16	105	41	66.4	3	106	813
65	45	155	4.5	6	16	100	96	62.8	15	84	111
65	66	205	5.2	6	16	105	142	65.5	34	119	75
80	25	115	6.6	6	18	117	53	86.1	4	157	937
80	47	180	7.1	6	18	118	116	86.6	17	138	170
80	79	235	7.9	6	18	118	169	85.5	42	139	80
100	52	165	7.2	6	18	139	106	123	14	85	179
100	64	185	7.5	6	18	141	125	124	21	102	155
100	88	255	9	6	18	143	198	125	46	161	98
125	39	120	9.2	6	20	173	60	188	4	93	950
125	70	170	9.8	6	20	172	108	187	16	88	269
125	97	260	12	6	20	176	168	189	35	138	176
150	51	180	11	6	20	207	84	271	7	130	947
150	71	210	12	6	20	207	118	270	15	96	355
150	133	355	18	6	20	209	263	269	62	214	159
200	50	170	16	6	22	263	74	449	5	148	2324
200	80	225	17	6	22	260	129	443	14	104	527
200	152	335	25	6	22	268	240	451	50	194	290
250	51	180	20	6	24	316	79	673	4	181	3771

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
250	87	240	21	6	24	315	138	671	13	112	756
250	147	345	29	6	24	320	242	677	40	195	430
300	69	215	28	6	24	375	106	948	7	199	3196
300	96	255	29	6	24	375	149	948	13	142	1165
300	134	305	33	6	24	376	200	947	25	162	734
350	60	170	37	6	26	409	92	1135	4	245	6368
350	109	260	40	6	26	405	183	1124	17	148	952
350	165	330	48	6	26	409	248	1129	35	201	701
400	61	180	44	6	28	460	96	1459	4	273	8254
400	107	250	46	6	28	460	168	1459	13	156	1541
400	176	350	56	6	28	465	234	1471	31	189	969
450	67	225	56	6	30	520	106	1856	4	333	10573
450	117	305	59	6	30	520	185	1856	14	191	1973
450	210	380	74	6	30	521	261	1852	37	211	1094
500	71	235	61	6	30	572	114	2271	5	346	11612
500	125	320	64	6	30	572	199	2271	15	198	2167
500	210	395	81	6	30	579	278	2291	35	233	1325
600	87	280	81	6	32	673	148	3210	6	336	9394
600	140	370	85	6	32	673	237	3210	17	210	2294
600	209	380	96	6	32	679	250	3231	27	201	1988
700	74	275	119	6	40	790	128	4389	4	616	31483
700	130	370	128	6	40	790	224	4389	12	352	5875
700	221	410	135	6	40	782	263	4341	26	211	2540
800	83	300	160	6	44	896	141	5699	4	595	32624
800	134	340	165	6	44	892	178	5667	9	364	12419
800	224	420	185	6	44	900	258	5715	22	264	4338
900	75	280	197	6	48	1005	111	7179	2	1030	115832
900	126	355	210	6	48	1005	184	7179	8	618	25020
900	224	430	222	6	48	1000	259	7141	20	224	4545
1000	86	295	231	6	52	1115	117	8859	3	903	112707
1000	115	335	239	6	52	1115	156	8859	5	677	47549
1000	204	410	251	6	52	1107	233	8789	14	336	10395
1200	93	325	364	6	60	1321	129	12596	3	983	143400
1200	186	455	392	6	60	1321	257	12596	12	492	17925
1200	228	460	409	6	60	1321	264	12589	15	357	12315
1400	88	355	554	6	72	1521	129	16926	2	1221	239375
1400	176	485	586	6	72	1521	257	16926	10	611	29922
1400	225	525	588	6	72	1508	300	16772	15	448	15954
AXIAL EXPANSION JOINT with fixed flanges · type AN F-F · nominal pressure PN 10											
50	27	125	6	16	20	84	59	42.5	7	104	246
50	36	150	6,2	16	20	84	87	42,1	14	126	136

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
50	42	195	6.5	16	20	84	129	41.8	24	185	89
65	20	100	6.9	16	20	105	33	66.4	2	133	1588
65	34	140	7.3	16	20	105	76	65.5	9	223	490
65	47	170	7.5	16	20	105	104	65.5	17	162	189
80	24	120	7.9	16	20	117	53	86.1	4	157	937
80	44	165	8.4	16	20	118	99	86	13	185	311
80	56	185	8.8	16	20	118	121	85.5	21	194	217
100	32	130	9.3	16	22	140	66	124	5	128	687
100	50	205	11	16	22	142	140	125	18	192	234
100	84	285	13	16	22	145	221	125	49	302	148
125	39	140	12	16	22	173	76	188	6	160	987
125	48	170	12	16	22	170	107	184	11	145	448
125	93	270	16	16	22	176	205	187	41	276	236
150	42	155	16	16	24	207	86	271	6	231	1610
150	67	190	17	16	24	205	124	267	14	166	556
150	101	310	21	16	24	209	202	269	36	274	344
200	47	165	21	10	24	260	94	444	6	253	2415
200	85	230	23	10	24	262	159	445	18	214	722
200	114	305	28	10	24	266	197	448	31	266	589
250	60	235	28	10	26	321	123	683	8	279	2423
250	92	260	30	10	26	322	147	684	15	203	1225
250	137	375	41	10	26	323	264	678	41	356	661
300	51	245	35	10	26	377	135	948	6	591	5917
300	97	360	39	10	26	376	247	947	22	332	989
300	134	330	42	10	26	375	218	938	28	293	1106
350	64	225	49	10	30	405	140	1121	7	343	3786
350	103	275	52	10	30	403	191	1114	17	256	1501
350	155	360	65	10	30	412	268	1132	36	360	1082
400	55	220	63	10	32	466	126	1474	5	636	11261
400	106	345	69	10	32	464	252	1470	20	339	1495
400	164	345	79	10	32	468	252	1474	31	345	1528
450	75	265	78	10	36	521	164	1856	8	486	6461
450	112	345	83	10	36	520	245	1854	18	330	1945
450	168	425	111	10	36	525	320	1856	36	596	2060
500	79	285	93	10	38	573	176	2270	8	512	7225
500	106	340	96	10	38	573	234	2270	15	384	3048
500	182	365	111	10	38	578	256	2281	28	343	2280
600	80	345	131	10	42	684	188	3258	7	789	13996
600	121	440	140	10	42	684	281	3258	17	526	4147
600	194	425	150	10	42	683	266	3242	26	358	3139
700	76	270	185	10	50	790	135	4383	4	901	41715
700	153	405	202	10	50	790	269	4383	18	451	5215
700	205	415	211	10	50	787	279	4356	25	373	4002

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C1	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm

AXIAL EXPANSION JOINT with fixed flanges · type AN F-F · nominal pressure PN 16

50	23	115	6	16	20	84	52	42.5	5	118	367
50	28	135	6.1	16	20	84	70	42.1	8	158	265
50	33	170	6.4	16	20	84	104	41.8	15	231	173
65	24	120	7	16	20	100	56	62.8	4	144	556
65	29	130	7.3	16	20	105	66	65.5	6	254	731
65	37	150	7.4	16	20	105	85	65.5	11	198	344
80	22	135	8	16	20	114	68	83.2	4	211	741
80	32	140	8.3	16	20	118	75	86	7	247	736
80	44	160	8.6	16	20	118	97	85.5	13	243	424
100	33	160	9.5	16	22	139	96	123	8	207	533
100	44	260	12	16	22	144	198	125	22	487	298
100	57	210	11	16	22	143	144	124	21	315	357
125	24	125	12	16	22	172	63	186	3	403	3658
125	41	175	13	16	22	172	110	185	9	238	704
125	59	220	14	16	22	176	155	188	19	332	498
150	27	140	16	16	24	207	71	270	3	497	5150
150	49	210	17	16	24	204	141	266	12	304	776
150	68	225	19	16	24	206	154	266	18	330	709
200	36	210	24	16	26	267	100	453	5	652	5628
200	63	290	26	16	26	265	180	451	15	388	1029
200	96	295	30	16	26	269	183	453	24	396	1028
250	39	235	34	16	29	323	106	684	4	708	8224
250	62	295	36	16	29	323	170	684	11	443	2008
250	105	345	43	16	29	322	216	675	25	465	1284
300	31	220	44	16	32	374	90	941	2	1013	22656
300	82	410	53	16	32	375	279	942	21	601	1393
300	131	430	68	16	32	381	300	947	37	642	1297
350	33	195	62	16	35	406	96	1122	2	1088	25279
350	85	370	72	16	35	411	273	1134	20	588	1709
350	135	415	88	16	35	413	317	1130	37	682	1465
400	53	260	83	16	38	466	156	1474	6	969	11200
400	90	390	90	16	38	463	286	1463	19	616	2102
400	144	410	108	16	38	470	300	1474	33	644	2012
450	58	280	106	16	42	519	168	1848	6	966	12076
450	94	395	113	16	42	518	280	1844	18	605	2716
450	151	440	135	16	42	522	320	1842	33	688	2363
500	52	250	142	16	46	571	124	2256	3	1226	34784
500	105	370	152	16	46	571	247	2256	16	613	4348
500	151	400	172	16	46	582	272	2291	25	655	3869

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

AXIAL EXPANSION JOINT with welding neck flanges

Type AN V-V



Tasks

- › Absorption of axial movements
- › Low-vibration and low-noise connection of pipes
- › Compensation of installation inaccuracies
- › Reduction of forces and moments in connections

Areas of application

- › Mechanical engineering, plant engineering, apparatus building, pipeline constructions and ship building
- › Food processing industry
- › Gas, water supply, building and heating technology
- › Energy and offshore technology, oil and gas production
- › Chemical and pharmaceutical industry, acid production
- › Paper, textile, cellulose and paint industry
- › Steel and smelting industry, cement and brick kilns, flue gas desulphurisation plants

Design type AN V-V

HKS axial expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with standardised welding neck flanges in line with EN 1092-1 type 11.

Materialcombination ¹⁾	Bauteil		Permitted operating temperature TS ²⁾
	Metal bellows	Flange	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		-196 °C bis 450 °C

- 1) Chemical resistance depends on temperature and medium and has to be tested or requested.
- 2) Take into account the pressure derating factors of the nominal pressures through operating temperature.
- 3) Unalloyed steel components receive a base coat for corrosion protection.

Special versions

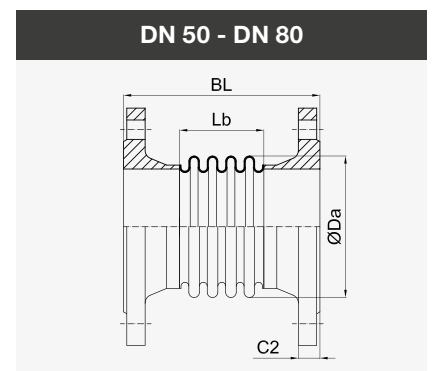
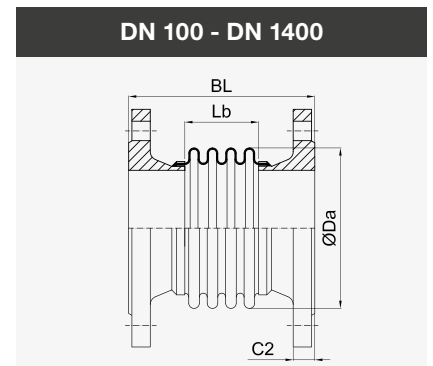
On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

- › Inner sleeve, telescopic inner sleeve or conical inner sleeve
- › External protective sleeve or telescopic inner sleeve

On customer request:

- › Flanges in line with ASME, JIS, BS
- › With special coating, galvanised or hot galvanised
- › Connection variants with weld end, swivel or fixed flanges



Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, load information and corrosive ambient influences.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm

AXIAL EXPANSION JOINT with welding neck flanges · type AN V-V · nominal pressure PN 2.5

50	25	130	3	6	14	84	52	42.5	5	118	367
50	47	175	3.2	6	14	84	95	42.5	20	64	58
50	62	200	3.3	6	14	84	124	42.5	34	49	26
65	27	120	3.7	6	14	105	41	66.4	3	106	813
65	61	170	3.9	6	14	105	90	66.4	19	49	77
65	75	240	4.8	6	14	105	160	65.5	43	105	52
80	26	140	6	6	16	117	53	86.1	4	157	937
80	65	245	6.6	6	16	118	158	86.6	32	101	67
80	94	315	7.6	6	16	118	229	86	68	110	35
100	48	210	7.7	6	16	142	119	132	14	122	215
100	91	390	8.8	6	16	142	300	132	70	106	30
100	128	435	11	6	16	143	345	133	113	136	29
125	49	185	11	6	18	174	89	196	9	108	509
125	96	325	12	6	18	174	228	197	46	92	67
125	150	465	15	6	18	176	370	199	116	132	37
150	52	180	13	6	18	207	82	280	7	104	824
150	99	300	14	6	18	207	202	281	35	93	122
150	168	460	20	6	18	209	365	284	107	159	65
200	73	200	19	6	20	265	90	465	9	75	814
200	135	280	21	6	20	265	168	466	30	64	201
200	191	430	26	6	20	266	320	468	83	108	94
250	80	220	26	6	22	321	96	698	8	77	1112
250	156	420	30	6	22	321	300	700	52	104	154
250	220	475	37	6	22	323	352	705	86	137	149
300	73	205	33	6	22	375	82	965	5	92	2545
300	134	290	34	6	22	372	164	958	20	55	377
300	225	460	44	6	22	376	336	969	71	114	187
350	83	215	43	6	22	410	88	1158	6	84	2375
350	150	325	46	6	22	410	202	1159	26	81	437
350	228	440	54	6	22	412	312	1164	61	114	261
400	66	200	49	6	22	464	70	1496	3	105	6155
400	132	270	50	6	22	464	140	1496	14	53	770
400	212	400	57	6	22	465	269	1500	43	94	373
450	72	205	57	6	22	518	76	1877	3	97	6074
450	151	310	61	6	22	519	180	1881	18	88	975
450	224	395	66	6	22	520	264	1884	40	93	478
500	77	220	66	6	24	576	83	2319	3	171	11023
500	154	305	69	6	24	576	166	2319	15	86	1378
500	222	430	79	6	24	577	290	2325	39	143	753
600	81	230	94	6	30	682	87	3291	3	167	14042

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force/rate	
				Borehole pattern acc. to EN 1092	Sheet thick- ness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	163	315	97	6	30	682	173	3291	14	84	1756
600	228	435	103	6	30	681	292	3287	34	98	722
700	79	245	115	6	30	788	93	4430	3	292	28893
700	158	340	120	6	30	788	185	4430	12	146	3612
700	237	430	125	6	30	788	278	4430	29	98	1071
800	94	255	138	6	30	897	102	5762	3	256	26977
800	158	325	142	6	30	897	170	5762	10	154	5827
800	252	425	148	6	30	897	272	5762	26	96	1423
900	96	250	169	6	30	1002	102	7231	3	247	32657
900	160	320	174	6	30	1002	170	7231	9	148	7054
900	256	420	181	6	30	1002	272	7231	24	93	1723
1000	98	260	212	6	30	1113	110	8920	3	353	50398
1000	164	330	218	6	30	1113	182	8920	9	212	10886
1000	230	405	225	6	30	1113	255	8920	18	152	3968
1200	107	310	226	2.5	32	1319	122	12672	3	379	62348
1200	143	350	230	2.5	32	1319	162	12672	6	284	26303
1200	251	470	243	2.5	32	1319	283	12672	18	163	4908
1400	100	315	286	2.5	38	1519	122	17011	2	473	104415
1400	133	355	291	2.5	38	1519	162	17011	4	355	44050
1400	233	475	306	2.5	38	1519	283	17011	14	203	8220
AXIAL EXPANSION JOINT with welding neck flanges · type AN V-V · nominal pressure PN 6											
50	24	130	3	6	14	84	52	42.5	5	118	367
50	35	150	3.1	6	14	84	73	42.5	11	83	126
50	49	225	3.7	6	14	84	146	41.8	32	163	61
65	26	120	3.7	6	14	105	41	66.4	3	106	813
65	45	175	3.9	6	14	100	96	62.8	15	84	111
65	66	220	4.6	6	14	105	142	65.5	34	119	75
80	25	140	6	6	16	117	53	86.1	4	157	937
80	51	215	6.5	6	16	118	127	86.6	20	126	131
80	79	255	7.3	6	16	118	169	85.5	42	139	80
100	37	185	7.6	6	16	142	93	132	8	156	457
100	58	295	8.3	6	16	141	204	131	30	167	100
100	89	395	11	6	16	144	304	134	69	247	68
125	39	170	11	6	18	174	74	196	6	129	879
125	67	300	12	6	18	174	203	197	28	194	177
125	99	415	16	6	18	176	317	200	65	293	111
150	39	165	12	6	18	207	66	280	4	130	1609
150	87	485	19	6	18	209	387	283	59	356	129
150	132	460	21	6	18	210	364	286	83	302	125
200	54	205	20	6	20	265	92	465	6	161	1686
200	92	265	21	6	20	266	154	467	19	154	579
200	141	415	29	6	20	268	306	472	58	279	270
250	48	200	26	6	22	321	79	699	4	209	4528
250	98	320	29	6	22	321	200	699	21	161	537

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
250	148	365	34	6	22	323	242	705	39	199	457
300	66	230	34	6	22	375	104	966	6	161	2731
300	121	275	36	6	22	374	152	963	17	123	988
300	176	465	50	6	22	378	339	976	56	274	444
350	70	240	44	6	22	407	112	1151	6	170	2970
350	124	310	48	6	22	409	186	1157	19	151	962
350	167	375	54	6	22	411	248	1163	35	202	727
400	57	230	51	6	22	464	96	1498	4	317	9820
400	120	375	56	6	22	465	244	1500	22	212	1018
400	174	365	61	6	22	466	234	1505	31	197	1030
450	66	235	59	6	22	519	104	1882	4	283	9375
450	115	315	62	6	22	519	182	1882	14	162	1750
450	183	410	73	6	22	521	280	1890	34	229	1055
500	67	250	69	6	24	577	114	2322	4	395	13546
500	147	340	75	6	24	577	203	2325	18	204	2193
500	220	450	90	6	24	579	310	2331	41	250	1156
600	72	260	97	6	30	683	119	3295	4	391	17526
600	145	380	103	6	30	683	237	3295	17	196	2191
600	223	430	121	6	30	685	290	3309	33	264	1980
700	79	315	124	6	30	790	160	4437	5	666	22034
700	142	440	134	6	30	790	288	4437	18	370	3778
700	217	415	137	6	30	790	263	4442	25	220	2708
800	94	330	149	6	30	899	176	5770	6	581	20662
800	182	405	158	6	30	899	250	5773	17	275	4881
800	256	450	174	6	30	900	296	5782	29	243	3058
900	100	335	181	6	34	1004	176	7240	6	566	25262
900	170	450	209	6	34	1005	295	7252	17	528	8424
900	231	450	209	6	34	1005	295	7252	23	311	4955
1000	77	320	225	6	38	1114	152	8934	3	1158	85455
1000	136	430	242	6	38	1114	266	8934	11	662	15945
1000	235	435	251	6	38	1115	272	8940	19	303	7001
1200	84	380	339	6	42	1320	168	12688	3	1237	106141
1200	162	465	362	6	42	1321	257	12696	10	643	23638
1200	219	465	362	6	42	1321	257	12696	14	379	13926
1400	79	400	531	6	56	1520	168	17030	3	1562	179882
1400	139	525	556	6	56	1520	294	17030	9	893	33564
1400	238	530	568	6	56	1521	300	17039	16	404	14637
AXIAL EXPANSION JOINT with welding neck flanges · type AN V-V · nominal pressure PN 10											
50	27	150	5.3	16	18	84	59	42.5	7	104	246
50	32	170	5.4	16	18	84	78	42.1	11	140	186
50	42	220	5.8	16	18	84	129	41.8	24	185	89

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

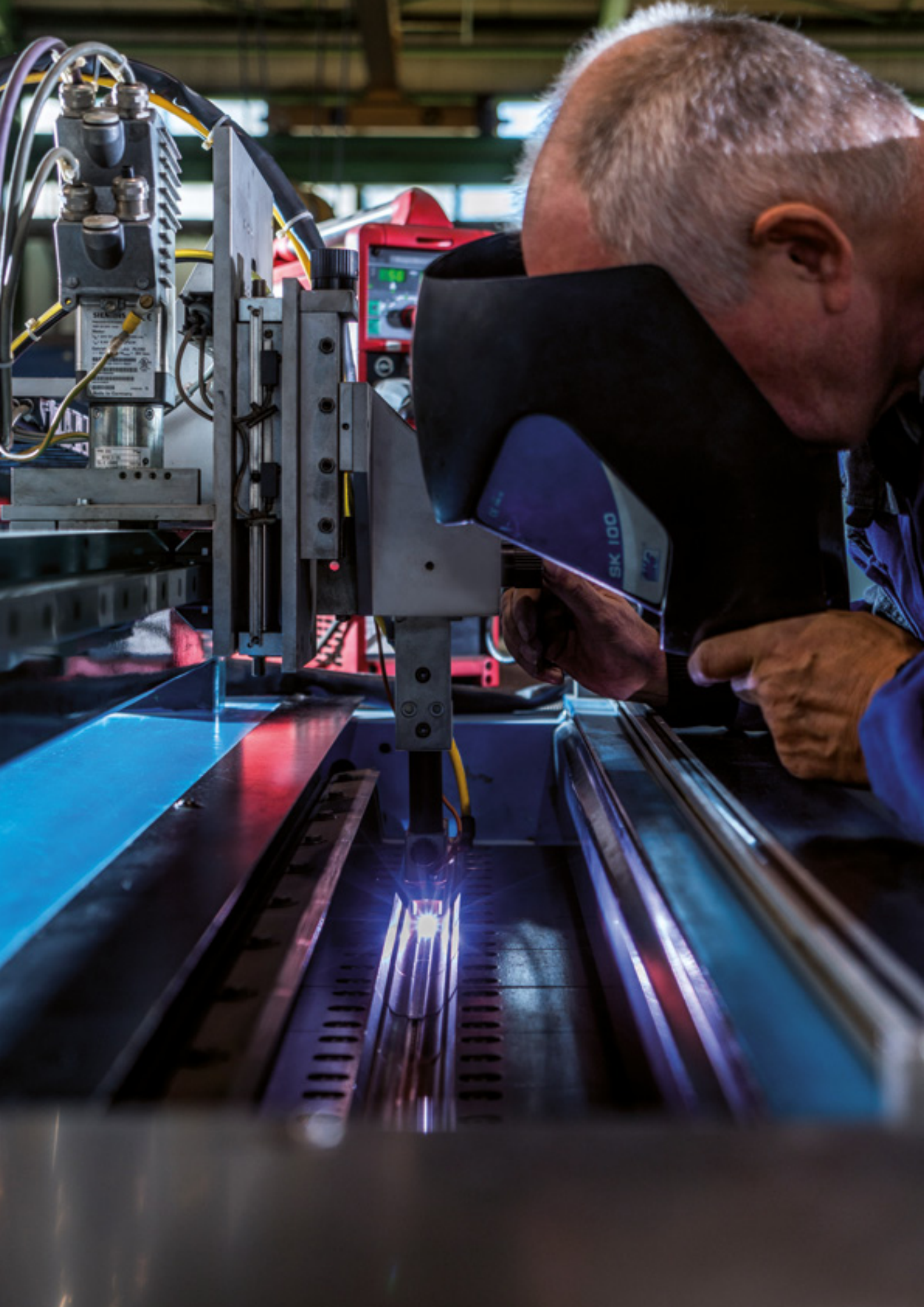
No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force/rate	
				Borehole pattern acc. to EN 1092	Sheet thick- ness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
65	25	135	6.2	16	18	105	41	66.4	3	106	813
65	34	170	6.6	16	18	105	76	65.5	9	223	490
65	47	195	6.9	16	18	105	104	65.5	17	162	189
80	19	145	8	16	20	117	42	86.1	2	197	1829
80	44	200	8.5	16	20	118	99	86	13	185	311
80	56	225	8.9	16	20	118	121	85.5	21	194	217
100	30	185	9.9	16	20	142	80	132	6	182	726
100	54	295	12	16	20	143	188	133	25	275	199
100	78	395	14	16	20	144	288	134	57	387	119
125	30	190	14	16	22	174	76	197	4	275	1785
125	55	285	15	16	22	174	172	197	19	233	297
125	92	410	20	16	22	177	298	201	57	425	184
150	38	195	17	16	22	207	84	281	5	222	1678
150	68	270	19	16	22	206	159	280	19	213	452
150	102	395	24	16	22	210	283	286	50	388	264
200	44	220	26	10	24	265	94	466	5	296	2977
200	84	305	28	10	24	266	179	468	20	250	703
200	114	385	34	10	24	267	262	470	40	353	463
250	57	260	35	10	26	321	120	700	7	259	2396
250	92	325	38	10	26	322	189	703	19	260	974
250	132	475	50	10	26	325	336	710	49	472	566
300	49	245	40	10	26	373	106	962	4	342	5580
300	91	315	44	10	26	376	178	970	15	282	1651
300	144	490	59	10	26	379	353	976	48	473	708
350	72	300	57	10	26	411	163	1162	10	320	2686
350	111	380	63	10	26	412	244	1165	23	337	1256
350	151	485	75	10	26	413	349	1168	45	472	866
400	55	270	67	10	26	464	122	1497	5	442	8473
400	118	400	75	10	26	464	256	1498	23	346	1509
400	161	480	89	10	26	468	336	1511	41	455	1161
450	62	310	81	10	28	521	164	1887	6	710	9599
450	114	365	85	10	28	521	221	1889	17	355	2621
450	171	475	101	10	28	523	330	1896	38	443	1470
500	73	325	93	10	28	578	176	2326	7	594	8585
500	117	445	99	10	28	575	292	2316	20	392	2032
500	180	470	115	10	28	579	320	2331	35	430	1866
600	80	350	121	10	30	684	183	3299	7	590	11165
600	144	485	141	10	30	685	320	3308	23	529	3263
600	192	500	148	10	30	683	332	3298	32	445	2542
700	75	370	175	10	35	790	197	4442	6	1061	23222
700	145	475	191	10	35	791	303	4447	19	553	5134
700	204	485	200	10	35	792	314	4449	28	422	3652
AXIAL EXPANSION JOINT with welding neck flanges · type AN V-V · nominal pressure PN 16											
50	23	145	5.2	16	18	84	52	42.5	5	118	367

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force rate	
				Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
50	28	160	5.3	16	18	84	70	42.1	8	158	265
50	33	195	5.6	16	18	84	104	41.8	15	231	173
65	24	150	6.3	16	18	100	56	62.8	4	144	556
65	29	160	6.6	16	18	105	66	65.5	6	254	731
65	37	175	6.7	16	18	105	85	65.5	11	198	344
80	22	170	8.1	16	20	114	68	83.2	4	211	741
80	32	175	8.4	16	20	118	75	86	7	247	736
80	44	200	8.7	16	20	118	97	85.5	13	243	424
100	34	230	11	16	20	142	123	132	10	264	442
100	47	315	12	16	20	143	210	133	25	461	266
100	64	395	14	16	20	145	289	135	47	681	210
125	27	190	14	16	22	173	76	196	4	298	1919
125	45	290	15	16	22	175	176	198	16	378	460
125	74	355	18	16	22	177	242	201	37	523	343
150	30	200	18	16	22	207	86	281	4	404	2928
150	52	350	21	16	22	209	240	283	21	575	542
150	75	370	23	16	22	210	260	285	34	558	448
200	35	220	26	16	24	266	96	467	4	494	4772
200	62	365	30	16	24	265	240	465	20	516	795
200	96	400	35	16	24	268	274	471	35	588	706
250	35	245	37	16	26	320	102	696	3	597	7621
250	69	450	46	16	26	323	308	705	23	786	1115
250	108	530	60	16	26	327	390	714	46	973	872
300	47	315	51	16	28	377	157	971	6	807	6077
300	80	505	60	16	28	377	348	971	26	748	1144
300	121	565	77	16	28	381	408	984	46	938	1058
350	53	335	74	16	30	412	168	1164	7	721	5673
350	96	475	84	16	30	412	308	1166	25	665	1567
350	126	570	101	16	30	416	404	1176	43	940	1298
400	51	325	91	16	32	466	152	1502	5	797	9998
400	93	355	94	16	32	463	182	1495	12	430	3698
400	133	560	123	16	32	470	390	1519	39	917	1749
450	57	365	111	16	34	521	196	1890	7	1151	10805
450	106	455	120	16	34	522	288	1893	20	638	2778
450	130	440	122	16	34	521	270	1890	23	584	2891
500	48	320	140	16	36	578	150	2329	4	1344	26564
500	97	470	150	16	36	578	300	2329	17	672	3321
500	142	510	173	16	36	582	340	2346	29	892	3455
AXIAL EXPANSION JOINT with welding neck flanges · type AN V-V · nominal pressure PN 25											
50	16	140	5.9	40	20	84	44	42.1	3	252	1084
50	20	150	5.9	40	20	84	52	42.1	4	210	628

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

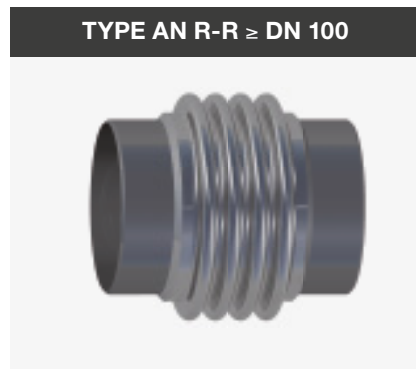
No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Flange		Bellows			Lateral movement absorption	Adjustment force/rate	
				Borehole pattern acc. to EN 1092	Sheet thick- ness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	C2	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	cm ²	mm	N/mm	N/mm
50	24	175	6.1	40	20	84	78	41.8	8	308	410
65	20	155	7.7	40	22	105	48	65.5	3	356	2006
65	28	170	7.9	40	22	105	66	65.5	6	254	731
65	32	165	7.9	40	22	105	59	65.1	6	234	855
80	20	175	10	40	24	118	55	86	3	462	2553
80	28	195	11	40	24	118	77	86	6	330	931
80	31	190	11	40	24	118	73	85.5	7	323	1004
100	25	225	14	40	24	141	96	131	6	356	982
100	36	295	15	40	24	143	165	133	15	587	547
100	52	370	17	40	24	145	238	135	31	826	376
125	24	235	20	40	26	175	96	198	4	692	2829
125	39	355	22	40	26	175	219	198	17	740	586
125	53	360	23	40	26	177	221	200	24	744	583
150	29	255	26	40	28	207	106	281	5	594	2851
150	43	355	28	40	28	209	203	283	15	679	895
150	64	455	34	40	28	212	303	288	33	1077	646
200	26	260	38	25	30	267	100	468	3	1112	9930
200	52	305	39	25	30	267	143	469	10	532	2334
200	78	460	51	25	30	271	298	478	31	1174	1208
250	28	285	53	25	32	322	106	701	3	1228	14615
250	50	370	56	25	32	322	191	701	10	682	2506
250	81	395	61	25	32	325	216	710	19	733	2128
300	26	300	70	25	34	377	116	973	2	2140	29534
300	59	440	76	25	34	377	256	973	14	973	2774
300	86	410	79	25	34	378	227	975	18	762	2756
350	36	350	107	25	38	412	149	1166	4	1589	15972
350	69	380	109	25	38	410	180	1160	10	761	5246
350	102	545	128	25	38	415	346	1173	30	1159	2173
400	36	380	137	25	40	463	156	1494	4	1803	21124
400	77	465	144	25	40	466	242	1505	14	828	4088
400	108	550	161	25	40	470	330	1518	27	1106	2942
450	42	370	168	25	46	523	150	1898	4	2392	38509
450	85	520	181	25	46	523	300	1898	17	1196	4814
450	115	540	190	25	46	525	320	1905	24	1074	3813
500	40	380	210	25	48	580	128	2338	3	2504	68208
500	80	510	222	25	48	580	256	2338	12	1252	8526
500	121	560	235	25	48	582	306	2343	22	1025	4897

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.



AXIAL EXPANSION JOINT with welding ends

Type AN R-R



Design type AN R-R

HKS axial expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with welding ends (weld end) made of standardised pipes in line with EN 10216/10217 ff or rolled sheet metal in line with EN 10028 ff.

Materialcombination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows	Flange	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	-10 °C bis 400 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		-196 °C bis 450 °C

- 1) Chemical resistance depends on temperature and medium and has to be tested or requested.
- 2) Take into account the pressure derating factors of the nominal pressures through operating temperature.
- 3) Unalloyed steel components receive a base coat for corrosion protection.

Special versions

On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

- › Inner sleeve, telescopic inner sleeve or conical inner sleeve
- › External protective sleeve or telescopic inner sleeve

On customer request:

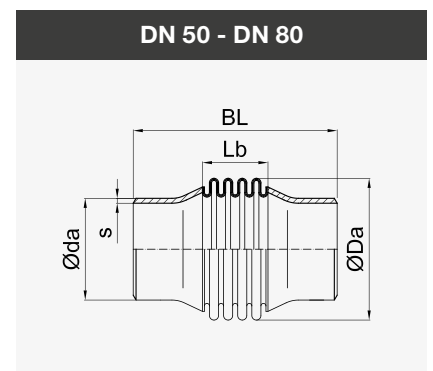
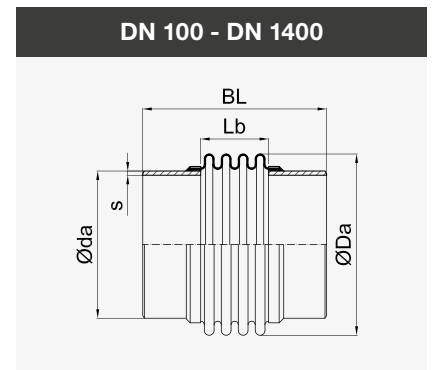
- › With 30° groove or special dimensions
- › With special coating, galvanised or hot galvanised
- › Connection variants with swivel, fixed, welding neck flanges or screw fitting (threaded nipple, fittings)

Tasks

- › Absorption of axial movements
- › Low-vibration and low-noise connection of pipes
- › Compensation of installation inaccuracies
- › Reduction of forces and moments in connections

Areas of application

- › Mechanical engineering, plant engineering, apparatus building, pipeline constructions and ship building
- › Food processing industry
- › Gas, water supply, building and heating technology
- › Energy and offshore technology, oil and gas production
- › Chemical and pharmaceutical industry, acid production
- › Paper, textile, cellulose and paint industry
- › Steel and smelting industry, cement and brick kilns, flue gas desulphurisation plants



Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, load information and corrosive ambient influences.

Nominal diameter	Axial movement absorption nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force rate	
				External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm

AXIAL EXPANSION JOINT with welding ends - type AN R-R - nominal pressure PN 2.5

50	25	155	0.6	60.3	2.9	84	52	42.5	5	118	367
50	47	195	0.7	60.3	2.9	84	95	42.5	20	64	58
50	62	225	0.8	60.3	2.9	84	124	42.5	34	49	26
65	27	140	0.7	76.1	2.9	105	41	66.4	3	106	813
65	61	190	0.9	76.1	2.9	105	90	66.4	19	49	77
65	75	260	1.8	76.1	2.9	105	160	65.5	43	105	52
80	26	155	0.9	88.9	3.2	117	53	86.1	4	157	937
80	65	260	1.6	88.9	3.2	118	158	86.6	32	101	67
80	94	330	2.5	88.9	3.2	118	229	86	68	110	35
100	48	220	1.8	114.3	3.6	142	119	132	14	122	215
100	91	400	3	114.3	3.6	142	300	132	70	106	30
100	128	445	4.7	114.3	3.6	143	345	133	113	136	29
125	49	190	2.3	139.7	4.0	174	89	196	9	108	509
125	96	330	3.5	139.7	4.0	174	228	197	46	92	67
125	150	470	6.8	139.7	4.0	176	370	199	116	132	37
150	52	195	3.1	168.3	4.5	207	82	280	7	104	824
150	99	315	4.4	168.3	4.5	207	202	281	35	93	122
150	168	475	11	168.3	4.5	209	365	284	107	159	65
200	73	210	5.5	219.1	6.3	265	90	465	9	75	814
200	135	290	7.1	219.1	6.3	265	168	466	30	64	201
200	191	440	13	219.1	6.3	266	320	468	83	108	94
250	80	220	7	273	6.3	321	96	698	8	77	1112
250	156	420	12	273	6.3	321	300	700	52	104	154
250	220	475	19	273	6.3	323	352	705	86	137	149
300	73	215	9.4	323.9	7.1	375	82	965	5	92	2545
300	134	295	11	323.9	7.1	372	164	958	20	55	377
300	225	470	20	323.9	7.1	376	336	969	71	114	187
350	83	230	13	355.6	8.0	410	88	1158	6	84	2375
350	150	345	15	355.6	8.0	410	202	1159	26	81	437
350	228	455	23	355.6	8.0	412	312	1164	61	114	261
400	66	220	15	406.4	8.0	464	70	1496	3	105	6155
400	132	290	16	406.4	8.0	464	140	1496	14	53	770
400	212	420	23	406.4	8.0	465	269	1500	43	94	373
450	72	235	18	457	8.0	518	76	1877	3	97	6074
450	151	340	21	457	8.0	519	180	1881	18	88	975
450	224	425	26	457	8.0	520	264	1884	40	93	478
500	77	245	20	508	8.0	576	83	2319	3	171	11023
500	154	325	23	508	8.0	576	166	2319	15	86	1378
500	222	450	34	508	8.0	577	290	2325	39	143	753
600	81	250	25	610	8.0	682	87	3291	3	167	14042

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	163	335	28	610	8.0	682	173	3291	14	84	1756
600	228	455	34	610	8.0	681	292	3287	34	98	722
700	79	255	30	711	8.0	788	93	4430	3	292	28893
700	158	345	35	711	8.0	788	185	4430	12	146	3612
700	237	440	40	711	8.0	788	278	4430	29	98	1071
800	94	265	35	813	8.0	897	102	5762	3	256	26977
800	158	330	39	813	8.0	897	170	5762	10	154	5827
800	252	435	45	813	8.0	897	272	5762	26	96	1423
900	96	265	39	914	8.0	1002	102	7231	3	247	32657
900	160	330	44	914	8.0	1002	170	7231	9	148	7054
900	256	435	51	914	8.0	1002	272	7231	24	93	1723
1000	98	270	46	1016	8.0	1113	110	8920	3	353	50398
1000	164	345	53	1016	8.0	1113	182	8920	9	212	10886
1000	230	415	60	1016	8.0	1113	255	8920	18	152	3968
1200	107	285	56	1219	8.0	1319	122	12672	3	379	62348
1200	143	325	61	1219	8.0	1319	162	12672	6	284	26303
1200	251	445	73	1219	8.0	1319	283	12672	18	163	4908
1400	100	285	65	1422	8.0	1519	122	17011	2	473	104415
1400	133	325	70	1422	8.0	1519	162	17011	4	355	44050
1400	233	445	85	1422	8.0	1519	283	17011	14	203	8220

AXIAL EXPANSION JOINT with welding ends · type AN R-R · nominal pressure PN 6

50	24	155	0.6	60.3	2.9	84	52	42.5	5	118	367
50	35	175	0.7	60.3	2.9	84	73	42.5	11	83	126
50	49	250	1.2	60.3	2.9	84	146	41.8	32	163	61
65	26	140	0.7	76.1	2.9	105	41	66.4	3	106	813
65	45	195	0.9	76.1	2.9	100	96	62.8	15	84	111
65	66	245	1.6	76.1	2.9	105	142	65.5	34	119	75
80	25	155	0.9	88.9	3.2	117	53	86.1	4	157	937
80	51	230	1.4	88.9	3.2	118	127	86.6	20	126	131
80	79	270	2.2	88.9	3.2	118	169	85.5	42	139	80
100	37	195	1.7	114.3	3.6	142	93	132	8	156	457
100	58	305	2.4	114.3	3.6	141	204	131	30	167	100
100	89	405	4.5	114.3	3.6	144	304	134	69	247	68
125	39	175	2.2	139.7	4.0	174	74	196	6	129	879
125	67	305	3.6	139.7	4.0	174	203	197	28	194	177
125	99	420	7.1	139.7	4.0	176	317	200	65	293	111
150	39	175	3	168.3	4.5	207	66	280	4	130	1609
150	87	500	9.1	168.3	4.5	209	387	283	59	356	129
150	132	475	12	168.3	4.5	210	364	286	83	302	125
200	54	215	5.9	219.1	6.3	265	92	465	6	161	1686
200	92	275	7.6	219.1	6.3	266	154	467	19	154	579
200	141	425	16	219.1	6.3	268	306	472	58	279	270
250	48	200	7.1	273	6.3	321	79	699	4	209	4528
250	98	320	9.7	273	6.3	321	200	699	21	161	537

No- mi- nal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- gated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
250	148	365	15	273	6.3	323	242	705	39	199	457
300	66	235	11	323.9	7.1	375	104	966	6	161	2731
300	121	285	13	323.9	7.1	374	152	963	17	123	988
300	176	470	26	323.9	7.1	378	339	976	56	274	444
350	70	255	13	355.6	8.0	407	112	1151	6	170	2970
350	124	325	17	355.6	8.0	409	186	1157	19	151	962
350	167	390	23	355.6	8.0	411	248	1163	35	202	727
400	57	250	16	406.4	8.0	464	96	1498	4	317	9820
400	120	395	22	406.4	8.0	465	244	1500	22	212	1018
400	174	385	27	406.4	8.0	466	234	1505	31	197	1030
450	66	265	20	457	8.0	519	104	1882	4	283	9375
450	115	345	22	457	8.0	519	182	1882	14	162	1750
450	183	440	34	457	8.0	521	280	1890	34	229	1055
500	67	275	23	508	8.0	577	114	2322	4	395	13546
500	147	365	29	508	8.0	577	203	2325	18	204	2193
500	220	470	44	508	8.0	579	310	2331	41	250	1156
600	72	280	28	610	8.0	683	119	3295	4	391	17526
600	145	400	34	610	8.0	683	237	3295	17	196	2191
600	223	450	52	610	8.0	685	290	3309	33	264	1980
700	79	320	39	711	8.0	790	160	4437	5	666	22034
700	142	450	49	711	8.0	790	288	4437	18	370	3778
700	217	425	52	711	8.0	790	263	4442	25	220	2708
800	94	340	45	813	8.0	899	176	5770	6	581	20662
800	182	410	55	813	8.0	899	250	5773	17	275	4881
800	256	460	71	813	8.0	900	296	5782	29	243	3058
900	100	340	52	914	8.0	1004	176	7240	6	566	25262
900	170	455	79	914	8.0	1005	295	7252	17	528	8424
900	231	455	79	914	8.0	1005	295	7252	23	311	4955
1000	77	315	60	1016	8.0	1114	152	8934	3	1158	85455
1000	136	430	77	1016	8.0	1114	266	8934	11	662	15945
1000	235	435	86	1016	8.0	1115	272	8940	19	303	7001
1200	84	330	83	1219	10.0	1320	168	12688	3	1237	106141
1200	162	420	106	1219	10.0	1321	257	12696	10	643	23638
1200	219	420	106	1219	10.0	1321	257	12696	14	379	13926
1400	79	330	96	1422	10.0	1520	168	17030	3	1562	179882
1400	139	455	120	1422	10.0	1520	294	17030	9	893	33564
1400	238	460	132	1422	10.0	1521	300	17039	16	404	14637
AXIAL EXPANSION JOINT with welding ends · type AN R-R · nominal pressure PN 10											
50	27	160	0.6	60.3	2.9	84	59	42.5	7	104	246
50	32	180	0.7	60.3	2.9	84	78	42.1	11	140	186
50	42	230	1.1	60.3	2.9	84	129	41.8	24	185	89
65	25	140	0.7	76.1	2.9	105	41	66.4	3	106	813

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- ga- ted length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
65	34	175	1.1	76.1	2.9	105	76	65.5	9	223	490
65	47	205	1.3	76.1	2.9	105	104	65.5	17	162	189
80	19	145	0.9	88.9	3.2	117	42	86.1	2	197	1829
80	44	200	1.4	88.9	3.2	118	99	86	13	185	311
80	56	220	1.8	88.9	3.2	118	121	85.5	21	194	217
100	30	180	1.7	114.3	3.6	142	80	132	6	182	726
100	54	290	2.9	114.3	3.6	143	188	133	25	275	199
100	78	390	4.9	114.3	3.6	144	288	134	57	387	119
125	30	180	2.4	139.7	4.0	174	76	197	4	275	1785
125	55	275	3.4	139.7	4.0	174	172	197	19	233	297
125	92	400	7.8	139.7	4.0	177	298	201	57	425	184
150	38	195	3.3	168.3	4.5	207	84	281	5	222	1678
150	68	270	4.6	168.3	4.5	206	159	280	19	213	452
150	102	395	9.7	168.3	4.5	210	283	286	50	388	264
200	44	215	6.2	219.1	6.3	265	94	466	5	296	2977
200	84	300	8.8	219.1	6.3	266	179	468	20	250	703
200	114	385	14	219.1	6.3	267	262	470	40	353	463
250	57	240	8.2	273	6.3	321	120	700	7	259	2396
250	92	310	12	273	6.3	322	189	703	19	260	974
250	132	460	24	273	6.3	325	336	710	49	472	566
300	49	240	11	323.9	7.1	373	106	962	4	342	5580
300	91	310	15	323.9	7.1	376	178	970	15	282	1651
300	144	485	30	323.9	7.1	379	353	976	48	473	708
350	72	305	16	355.6	8.0	411	163	1162	10	320	2686
350	111	385	22	355.6	8.0	412	244	1165	23	337	1256
350	151	490	34	355.6	8.0	413	349	1168	45	472	866
400	55	275	18	406.4	8.0	464	122	1497	5	442	8473
400	118	410	26	406.4	8.0	464	256	1498	23	346	1509
400	161	490	40	406.4	8.0	468	336	1511	41	455	1161
450	62	325	25	457	8.0	521	164	1887	6	710	9599
450	114	380	29	457	8.0	521	221	1889	17	355	2621
450	171	490	45	457	8.0	523	330	1896	38	443	1470
500	73	335	28	508	8.0	578	176	2326	7	594	8585
500	117	455	34	508	8.0	575	292	2316	20	392	2032
500	180	480	50	508	8.0	579	320	2331	35	430	1866
600	80	345	34	610	8.0	684	183	3299	7	590	11165
600	144	480	54	610	8.0	685	320	3308	23	529	3263
600	192	495	61	610	8.0	683	332	3298	32	445	2542
700	75	360	51	711	10.0	790	197	4442	6	1061	23222
700	145	465	67	711	10.0	791	303	4447	19	553	5134
700	204	475	76	711	10.0	792	314	4449	28	422	3652
AXIAL EXPANSION JOINT with welding ends · type AN R-R · nominal pressure PN 16											
50	23	155	0.6	60.3	2.9	84	52	42.5	5	118	367
50	28	170	0.7	60.3	2.9	84	70	42.1	8	158	265

No- mi- nal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- gated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
50	33	205	1	60.3	2.9	84	104	41.8	15	231	173
65	24	155	0.7	76.1	2.9	100	56	62.8	4	144	556
65	29	165	1	76.1	2.9	105	66	65.5	6	254	731
65	37	185	1.2	76.1	2.9	105	85	65.5	11	198	344
80	22	170	0.9	88.9	3.2	114	68	83.2	4	211	741
80	32	175	1.2	88.9	3.2	118	75	86	7	247	736
80	44	200	1.6	88.9	3.2	118	97	85.5	13	243	424
100	34	225	2	114.3	3.6	142	123	132	10	264	442
100	47	310	3.4	114.3	3.6	143	210	133	25	461	266
100	64	390	5.7	114.3	3.6	145	289	135	47	681	210
125	27	180	2.4	139.7	4.0	173	76	196	4	298	1919
125	45	280	3.7	139.7	4.0	175	176	198	16	378	460
125	74	345	6.8	139.7	4.0	177	242	201	37	523	343
150	30	200	3.6	168.3	4.5	207	86	281	4	404	2928
150	52	350	6.7	168.3	4.5	209	240	283	21	575	542
150	75	370	8.9	168.3	4.5	210	260	285	34	558	448
200	35	220	6.6	219.1	6.3	266	96	467	4	494	4772
200	62	360	11	219.1	6.3	265	240	465	20	516	795
200	96	395	16	219.1	6.3	268	274	471	35	588	706
250	35	225	8.2	273	6.3	320	102	696	3	597	7621
250	69	430	17	273	6.3	323	308	705	23	786	1115
250	108	510	31	273	6.3	327	390	714	46	973	872
300	47	290	14	323.9	7.1	377	157	971	6	807	6077
300	80	480	24	323.9	7.1	377	348	971	26	748	1144
300	121	540	40	323.9	7.1	381	408	984	46	938	1058
350	53	310	18	355.6	8.0	412	168	1164	7	721	5673
350	96	450	28	355.6	8.0	412	308	1166	25	665	1567
350	126	545	45	355.6	8.0	416	404	1176	43	940	1298
400	51	305	21	406.4	8.0	466	152	1502	5	797	9998
400	93	335	23	406.4	8.0	463	182	1495	12	430	3698
400	133	540	52	406.4	8.0	470	390	1519	39	917	1749
450	57	360	29	457	8.0	521	196	1890	7	1151	10805
450	106	450	37	457	8.0	522	288	1893	20	638	2778
450	130	430	40	457	8.0	521	270	1890	23	584	2891
500	48	310	29	508	8.0	578	150	2329	4	1344	26564
500	97	460	39	508	8.0	578	300	2329	17	672	3321
500	142	500	62	508	8.0	582	340	2346	29	892	3455
AXIAL EXPANSION JOINT with welding ends · type AN R-R · nominal pressure PN 25											
50	16	145	0.6	60.3	2.9	84	44	42.1	3	252	1084
50	20	155	0.6	60.3	2.9	84	52	42.1	4	210	628
50	24	180	0.9	60.3	2.9	84	78	41.8	8	308	410

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.

No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- gated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
65	20	150	0.9	76.1	2.9	105	48	65.5	3	356	2006
65	28	165	1	76.1	2.9	105	66	65.5	6	254	731
65	32	160	1.1	76.1	2.9	105	59	65.1	6	234	855
80	20	155	1.1	88.9	3.2	118	55	86	3	462	2553
80	28	180	1.3	88.9	3.2	118	77	86	6	330	931
80	31	175	1.4	88.9	3.2	118	73	85.5	7	323	1004
100	25	195	1.9	114.3	3.6	141	96	131	6	356	982
100	36	265	3	114.3	3.6	143	165	133	15	587	547
100	52	340	5	114.3	3.6	145	238	135	31	826	376
125	24	200	2.9	139.7	4.0	175	96	198	4	692	2829
125	39	320	4.8	139.7	4.0	175	219	198	17	740	586
125	53	320	6.2	139.7	4.0	177	221	200	24	744	583
150	29	215	4	168.3	4.5	207	106	281	5	594	2851
150	43	315	6.1	168.3	4.5	209	203	283	15	679	895
150	64	415	12	168.3	4.5	212	303	288	33	1077	646
200	26	220	7.2	219.1	6.3	267	100	468	3	1112	9930
200	52	265	8.6	219.1	6.3	267	143	469	10	532	2334
200	78	420	21	219.1	6.3	271	298	478	31	1174	1208
250	28	230	9.8	273	7.1	322	106	701	3	1228	14615
250	50	310	13	273	7.1	322	191	701	10	682	2506
250	81	340	18	273	7.1	325	216	710	19	733	2128
300	26	250	15	323.9	8.0	377	116	973	2	2140	29534
300	59	385	21	323.9	8.0	377	256	973	14	973	2774
300	86	360	23	323.9	8.0	378	227	975	18	762	2756
350	36	290	19	355.6	8.0	412	149	1166	4	1589	15972
350	69	320	21	355.6	8.0	410	180	1160	10	761	5246
350	102	485	40	355.6	8.0	415	346	1173	30	1159	2173
400	36	310	25	406.4	10.0	463	156	1494	4	1803	21124
400	77	395	32	406.4	10.0	466	242	1505	14	828	4088
400	108	480	49	406.4	10.0	470	330	1518	27	1106	2942
450	42	310	34	457	10.0	523	150	1898	4	2392	38509
450	85	460	46	457	10.0	523	300	1898	17	1196	4814
450	115	480	56	457	10.0	525	320	1905	24	1074	3813
500	40	290	36	508	10.0	580	128	2338	3	2504	68208
500	80	420	48	508	10.0	580	256	2338	12	1252	8526
500	121	470	61	508	10.0	582	306	2343	22	1025	4897

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately. Δx and Δy have to be reduced proportionately for simultaneous movement absorption. The sum of all parts must not exceed 100 %.