

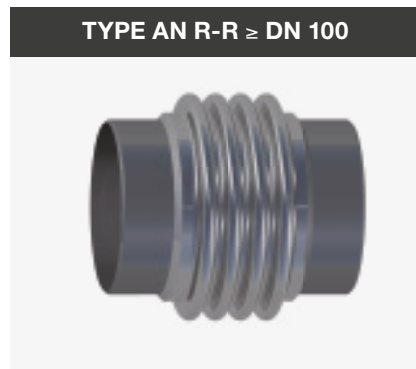
No- minal dia- meter	Axial mo- vement absorp- tion nominal	Length	Weight	Welding end		Bellows			Lateral movement absorption	Adjustment force/rate	
				External diameter	Wall thickness	External diameter	Corru- gated length	Effective diameter		Axial	Lateral
DN	Δx	BL	G	do	s	Da	Lb	Ae	Δy	C Δx	C Δy
-	mm	mm	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 %.



AXIAL EXPANSION JOINT for low pressure (PN1)

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 (pipe nozzle) 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	Pipe	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	-10 °C bis 400 °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:

- › With 30° groove or special dimensions
- › With special coating, galvanised or hot galvanised
- › Connection variants with swivel, fixed or welding neck flanges

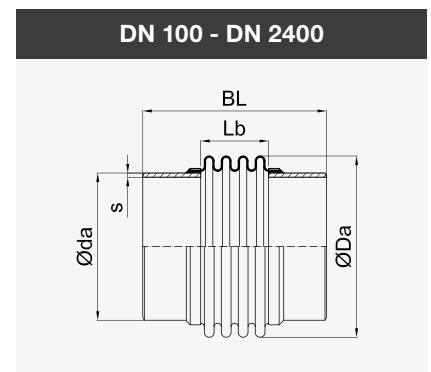
Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information, 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	Welding end		Bellows			Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral	Axial	Lateral
DN	Δx	BL	G	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz

AXIAL EXPANSION JOINT with welding ends · type AN R-R · nominal pressure PN 1

100	44	210	1.4	114.3	2.0	142	106	132	11	137	307	260	319
100	88	315	1.8	114.3	2.0	142	212	132	47	69	39	135	83
100	121	395	2.1	114.3	2.0	142	291	132	90	50	15	99	44
125	67	220	1.8	139.7	2.0	174	119	196	16	81	215	165	220
125	118	310	2.3	139.7	2.0	174	208	196	51	46	41	96	73
125	152	370	2.6	139.7	2.0	174	267	196	85	36	19	76	45
150	64	210	2.2	168.3	2.0	207	99	280	11	87	477	167	320
150	119	295	2.7	168.3	2.0	207	181	280	37	48	78	94	98
150	168	450	4.5	168.3	2.0	207	336	281	99	56	27	66	37
175	65	215	2.5	196	2.0	234	104	367	10	103	677	169	355
175	119	310	3.9	196	2.0	234	196	368	35	87	159	96	107
175	173	390	3.8	196	2.0	234	276	367	73	39	36	66	52
200	76	210	2.9	219.1	2.0	265	90	465	9	75	814	137	371
200	152	300	3.7	219.1	2.0	265	180	465	37	38	102	71	96
200	213	455	6.2	219.1	2.0	265	332	465	96	45	37	51	37
250	67	200	3.4	273	2.0	321	77	698	5	97	2172	149	579
250	152	295	4.5	273	2.0	321	173	698	29	43	191	70	120
250	211	435	7.4	273	2.0	321	314	699	73	53	71	51	48
300	76	215	4.3	323.9	2.0	375	82	965	5	92	2545	130	562
300	153	295	5.4	323.9	2.0	375	164	965	23	46	319	68	147
300	211	355	6.2	323.9	2.0	375	225	965	45	34	123	50	78
350	83	230	4.9	355.6	2.0	410	88	1158	6	84	2375	115	503
350	145	295	5.9	355.6	2.0	410	154	1158	19	48	444	68	170
350	208	360	6.9	355.6	2.0	410	220	1158	39	34	152	48	84
400	66	220	5.6	406.4	2.0	464	70	1496	3	105	6155	132	831
400	132	290	6.8	406.4	2.0	464	140	1496	14	53	770	69	219
400	220	385	8.4	406.4	2.0	464	232	1496	38	32	167	42	80
450	67	240	7.2	457	2.0	519	77	1881	3	204	12374	146	932
450	158	340	9.8	457	2.0	519	180	1881	19	88	975	66	180
450	226	420	12	457	2.0	519	256	1881	39	61	335	46	89
500	78	245	11	508	3.0	576	83	2319	3	171	11023	122	802
500	156	330	13	508	3.0	576	166	2319	15	86	1378	63	209
500	234	410	15	508	3.0	576	249	2319	35	57	409	43	94
550	79	245	12	559	3.0	629	84	2784	3	169	12698	114	811
550	158	330	14	559	3.0	629	168	2784	14	85	1588	59	211
550	237	415	17	559	3.0	629	252	2784	33	57	471	40	95
600	81	250	13	610	3.0	682	87	3291	3	167	14042	107	807
600	163	335	16	610	3.0	682	173	3291	14	84	1756	56	210
600	244	420	19	610	3.0	682	260	3291	32	56	521	37	94
650	84	250	14	660	3.0	732	89	3819	3	179	16499	106	839
650	140	310	16	660	3.0	732	148	3819	9	108	3564	66	312
650	224	400	19	660	3.0	732	237	3819	25	67	871	42	124

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	Welding end		Bellows			Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter		Axial	Lateral	Axial	Lateral
-	mm	mm	kg	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz
700	86	255	15	711	3.0	788	92	4428	3	156	15826	93	770
700	144	315	18	711	3.0	788	152	4428	9	94	3419	58	286
700	230	405	21	711	3.0	788	244	4428	24	59	835	36	113
800	96	265	19	813	3.0	897	102	5762	3	256	26977	96	807
800	160	330	23	813	3.0	897	170	5762	10	154	5827	59	299
800	256	435	29	813	3.0	897	272	5762	27	96	1423	37	118
900	96	265	22	914	3.0	1002	102	7231	3	247	32657	87	823
900	160	330	26	914	3.0	1002	170	7231	9	148	7054	54	305
900	256	435	33	914	3.0	1002	272	7231	24	93	1723	34	121
1000	102	270	25	1016	3.0	1112	108	8917	3	210	30635	73	728
1000	170	340	30	1016	3.0	1112	180	8917	9	126	6618	45	269
1000	238	415	36	1016	3.0	1112	252	8917	18	90	2412	32	139
1100	108	275	27	1120	3.0	1218	114	10761	3	216	34081	70	723
1100	180	350	34	1120	3.0	1218	190	10761	9	130	7362	43	267
1100	252	430	40	1120	3.0	1218	266	10761	19	93	2683	31	137
1200	114	280	30	1220	3.0	1318	120	12678	3	233	39088	69	738
1200	190	360	37	1220	3.0	1318	200	12678	9	140	8443	43	273
1200	266	440	44	1220	3.0	1318	280	12678	19	100	3077	31	140
1300	114	280	32	1320	3.0	1418	120	14752	3	249	48631	69	792
1300	152	320	36	1320	3.0	1418	160	14752	5	187	20517	52	451
1300	228	400	44	1320	3.0	1418	240	14752	13	125	6079	35	204
1400	114	280	35	1420	3.0	1518	120	16984	3	265	59599	69	845
1400	152	320	39	1420	3.0	1518	160	16984	5	199	25144	52	482
1400	228	400	47	1420	3.0	1518	240	16984	12	133	7450	35	218
1500	120	290	38	1520	3.0	1622	126	19421	3	251	58496	63	794
1500	160	330	42	1520	3.0	1622	168	19421	5	188	24678	48	452
1500	240	415	51	1520	3.0	1622	252	19421	12	126	7312	32	204
1600	120	290	40	1620	3.0	1722	126	21970	3	265	69889	63	841
1600	160	330	45	1620	3.0	1722	168	21970	5	199	29485	48	479
1600	240	415	55	1620	3.0	1722	252	21970	12	133	8737	32	217
1800	120	290	45	1820	3.0	1922	126	27539	2	293	96886	62	934
1800	160	330	50	1820	3.0	1922	168	27539	4	220	40874	47	532
1800	240	415	61	1820	3.0	1922	252	27539	10	147	12111	32	241
2000	128	315	63	2020	4.0	2123	152	33742	3	534	150369	72	991
2000	171	365	70	2020	4.0	2123	202	33742	5	401	63437	54	564
2000	256	465	85	2020	4.0	2123	303	33742	12	267	18797	37	255
2200	126	315	69	2220	4.0	2323	152	40568	2	578	195770	71	1079
2200	168	365	77	2220	4.0	2323	202	40568	4	434	82591	54	614
2200	210	415	86	2220	4.0	2323	252	40568	7	347	42287	44	398
2400	125	315	75	2420	4.0	2523	152	48022	2	622	249522	71	1167
2400	166	365	84	2420	4.0	2523	202	48022	4	467	105267	54	664
2400	208	415	93	2420	4.0	2523	252	48022	7	374	53897	43	431

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 %.



UNIVERSAL EXPANSION JOINT with swivel flanges

Type AM B-B



Tasks

- › Absorption of axial and lateral 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 AM B-B

HKS universal expansion joint with compact design, consisting of two multi-convolution and multi-layered metal bellows with middle pipe made of standard pipes in line with EN 10216/10217 ff or rolled from sheet metal in line with EN 10028 ff and rotating, standardised swivel flanges in line with EN 1092-1 type 02.

Material combination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows, collar	Flange, middle pipe	
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

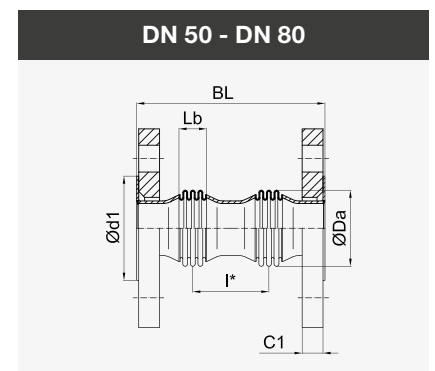
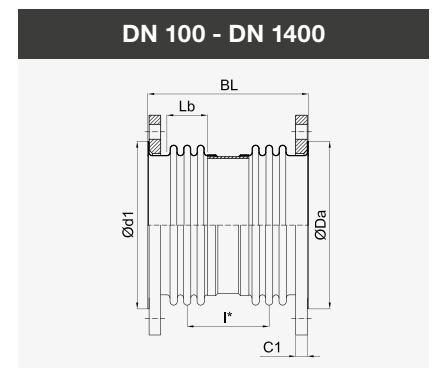
On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

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



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	
				Bore-hole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	l*	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm

UNIVERSAL EXPANSION JOINT with swivel flanges · type AM B-B · nominal pressure PN 2.5

50	21	155	3.6	6	90	16	84	22	71	42.5	16	138	70
50	37	350	4.3	6	90	16	84	44	243	42.1	105	126	6
50	46	540	5.1	6	90	16	84	69	408	41.8	222	173	3
65	33	160	4.6	6	110	16	105	25	74	66.4	20	89	65
65	53	350	5.3	6	110	16	100	56	230	62.8	112	72	6
65	71	535	6.6	6	110	16	105	76	400	65.5	265	112	3
80	31	175	7	6	128	18	117	32	81	86.1	18	131	103
80	65	360	7.7	6	128	18	114	90	209	83.2	98	79	9
80	90	550	9.5	6	128	18	118	109	378	86	260	116	5
100	41	190	7.4	6	148	18	142	40	89	127	21	110	104
100	69	370	8.4	6	148	18	142	66	246	127	107	66	9
100	100	565	9.9	6	148	18	142	97	406	127	263	69	4
125	60	205	9.9	6	178	20	174	45	94	191	26	72	91
125	97	395	12	6	178	20	174	92	201	191	92	75	21
125	131	585	14	6	178	20	174	128	353	190	228	87	9
150	74	255	12	6	202	20	207	50	104	274	30	61	91
150	99	425	13	6	202	20	207	66	255	274	97	46	12
150	144	600	17	6	202	20	207	124	373	273	224	84	11
200	100	275	17	6	258	22	265	54	114	457	32	47	96
200	132	455	19	6	258	22	264	92	252	455	105	63	28
200	181	630	25	6	258	22	267	120	400	457	203	92	17
250	108	290	21	6	312	24	321	58	117	689	30	49	143
250	149	475	26	6	312	24	321	120	240	689	87	94	66
250	188	660	33	6	312	24	322	147	397	689	192	115	31
300	115	305	28	6	365	24	375	62	126	954	29	48	168
300	164	505	34	6	365	24	375	128	257	954	87	93	79
300	207	700	42	6	365	24	376	156	420	954	190	113	38
350	114	295	40	6	415	26	410	68	137	1145	29	93	333
350	151	500	43	6	415	26	410	90	319	1145	84	70	49
350	200	725	51	6	415	26	411	116	516	1145	163	81	22
400	126	345	47	6	465	28	464	71	145	1481	30	89	366
400	168	550	52	6	465	28	464	95	324	1481	80	67	59
400	224	755	64	6	465	28	465	150	470	1481	179	117	49
450	144	370	58	6	520	30	519	77	156	1863	32	82	363
450	162	565	65	6	520	30	519	104	324	1863	80	111	121
450	227	780	72	6	520	30	515	132	542	1845	160	90	35
500	156	380	63	6	570	30	576	83	162	2299	33	70	354
500	205	590	77	6	570	30	577	116	336	2299	82	138	171
500	262	800	93	6	570	30	578	178	497	2299	185	149	85

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 move- ment absorp- tion nominal	Length	Weight	Flange			Bellows				Lateral movement absorp- tion nominal	Adjustment force rate	
				Bore- hole pattern acc. to EN 1092	Collar diami- ter	Sheet thick- ness	External diami- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	I*	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	-	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	156	405	85	6	670	32	682	88	167	3268	29	127	859
600	207	615	92	6	670	32	682	117	346	3268	74	95	159
600	237	825	112	6	670	32	684	154	534	3268	139	180	128
700	172	430	123	6	775	40	788	93	172	4401	28	121	1037
700	230	640	131	6	775	40	788	124	353	4401	70	91	195
700	265	860	162	6	775	40	790	162	542	4401	130	172	160
800	192	465	163	6	880	44	897	102	182	5729	28	108	1068
800	256	665	186	6	880	44	898	140	340	5729	69	117	349
800	315	875	211	6	880	44	899	178	528	5729	127	154	194
900	192	475	195	6	980	48	999	102	182	7168	25	117	1449
900	247	685	214	6	980	48	1003	138	357	7194	63	130	443
900	320	895	253	6	980	48	1004	178	538	7194	115	150	229
1000	204	500	234	6	1080	52	1113	110	189	8875	25	150	2130
1000	278	710	275	6	1080	52	1114	186	336	8875	62	201	913
1000	340	920	295	6	1080	52	1114	188	548	8875	113	131	236
1200	181	530	326	2.5	1280	60	1320	124	203	12618	20	361	6225
1200	241	740	338	2.5	1280	60	1320	165	374	12618	52	271	1454
1200	302	955	360	2.5	1280	60	1320	206	546	12618	98	217	557
1400	171	555	430	2.5	1480	72	1520	124	203	16949	16	454	10508
1400	228	765	457	2.5	1480	72	1520	165	374	16949	43	340	2454
1400	285	980	484	2.5	1480	72	1520	206	546	16949	80	272	940
UNIVERSAL EXPANSION JOINT with swivel flanges · type AM B-B · nominal pressure PN 6													
50	21	155	3.6	6	90	16	84	22	71	42.5	16	138	70
50	36	350	4.3	6	90	16	84	44	243	42.1	102	126	6
50	46	540	5.1	6	90	16	84	69	408	41.8	222	173	3
65	32	160	4.6	6	110	16	105	25	74	66.4	20	89	65
65	45	345	5.3	6	110	16	100	48	237	62.8	100	84	6
65	61	535	6.5	6	110	16	105	66	405	65.5	235	127	4
80	30	175	7	6	128	18	117	32	81	86.1	17	131	103
80	62	365	8.4	6	128	18	118	77	226	86	104	165	17
80	71	550	9.3	6	128	18	118	88	402	86	227	145	5
100	40	190	7.4	6	148	18	142	40	89	127	20	110	104
100	70	385	10	6	148	18	143	105	215	127	85	234	38
100	87	580	12	6	148	18	144	107	406	127	225	173	9
125	56	205	9.9	6	178	20	174	45	94	191	24	72	91
125	86	405	14	6	178	20	175	100	199	191	79	185	52
125	108	605	17	6	178	20	176	124	383	191	207	199	16
150	57	260	12	6	202	20	207	51	105	274	23	126	184
150	83	445	15	6	202	20	208	71	270	274	97	136	32
150	121	630	21	6	202	20	210	122	411	274	211	240	24
200	66	285	18	6	258	22	265	57	116	457	23	176	348
200	93	465	21	6	258	22	266	96	256	457	75	172	73
200	126	650	27	6	258	22	267	104	444	457	178	192	28

Nominal diameter	Axial movement absorption nominal	Length	Weight	Flange			Bellows				Lateral movement absorption nominal	Adjustment force rate	
				Bore-hole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	PN	d1	C1	Da	Lb	l*	Ae	Δy	$C_{\Delta x}$	$C_{\Delta y}$
-	mm	mm	kg	-	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
250	71	295	23	6	312	24	321	60	120	689	20	188	527
250	127	485	29	6	312	24	323	85	284	689	84	145	76
250	146	680	39	6	312	24	324	137	436	689	169	269	60
300	78	315	31	6	365	24	375	64	128	954	20	185	628
300	110	505	36	6	365	24	376	108	273	954	64	182	141
300	152	700	46	6	365	24	377	116	471	954	153	201	54
350	87	300	41	6	415	26	410	69	138	1144	22	175	612
350	101	510	47	6	415	26	411	93	322	1145	68	208	142
350	165	725	59	6	415	26	411	124	514	1141	165	201	55
400	83	355	51	6	465	28	465	74	148	1481	20	268	1060
400	130	555	64	6	465	28	466	152	281	1481	60	292	317
400	178	750	81	6	465	28	468	140	490	1481	151	341	131
450	95	375	62	6	520	30	520	80	159	1863	22	243	1050
450	141	575	77	6	520	30	521	111	340	1863	77	260	257
450	182	780	90	6	520	30	522	116	536	1863	122	249	101
500	89	380	74	6	570	30	578	88	167	2299	19	456	2174
500	124	590	83	6	570	30	578	89	373	2299	63	298	306
500	194	800	93	6	570	30	576	120	555	2290	124	194	91
600	96	400	96	6	670	32	684	92	171	3268	18	461	2983
600	127	610	107	6	670	32	684	122	351	3268	53	346	559
600	209	825	122	6	670	32	681	125	564	3251	111	202	129

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 %.

UNIVERSAL EXPANSION JOINT for low pressure (PN1) Type AM B-B



Design type AM B-B

HKS universal expansion joint with compact design, consisting of two multi-convolution and multi-layered metal bellows with middle pipe made of standard pipes in line with EN 10216/10217 ff or rolled from sheet metal in line with EN 10028 ff and rotating, standardised swivel flanges in line with DIN 86044.

Materialcombination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows/collar	Flange, middle pipe	
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

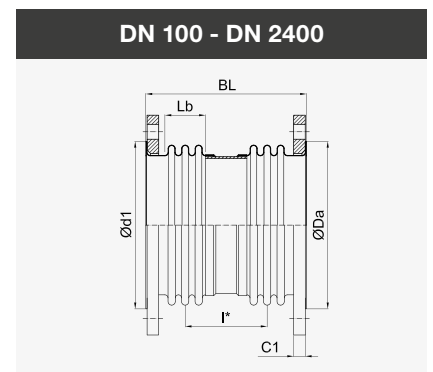
Expansion joints with a nominal pressure ≤ 0.5 bar are not subject to the stipulations of the Pressure Equipment Directive (PED) 97/23/EC. Subject to deviations of the components from the ideal shape due to manufacturing (geometric imperfection). Observe manufacturer's information, installation information,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

Tasks

- › Absorption of axial and lateral 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



No- minal dia- meter	Axial move- ment absorp- tion 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	Sheet thick- ness	External diami- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral	Axial	Lateral
DN	Δx	BL	G	d1	C1	Da	Lb	l*	Ae	Δy	C Δx	C Δy	f Δx	f Δy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz

UNIVERSAL EXPANSION JOINT with swivel flanges · type AM B-B · nominal pressure PN 1

100	39	180	6	148	14	140	40	89	126	20	124	116	104	408
100	79	320	6.7	148	14	140	80	189	126	88	62	14	54	106
100	119	460	7.3	148	14	140	119	288	126	203	42	4	36	47
125	58	195	7.3	178	14	172	45	94	190	25	79	100	72	311
125	117	335	8.2	178	14	172	89	193	190	107	40	12	38	81
125	153	480	9.6	178	14	172	152	272	189	190	51	8	34	43
150	73	245	8.5	202	14	205	50	104	272	29	67	99	56	259
150	147	480	11	202	14	205	99	288	272	176	34	7	25	59
150	196	665	13	202	14	205	136	436	271	358	39	4	21	35
175	77	255	12	232	16	234	52	106	360	27	73	135	53	271
175	155	485	14	232	16	234	104	288	360	160	37	10	25	63
175	186	715	17	232	16	234	125	494	360	309	46	5	20	43
200	100	265	13	258	16	263	54	114	455	32	50	103	40	219
200	160	500	17	258	16	263	111	290	454	146	54	18	26	71
200	186	730	19	258	16	263	129	503	454	293	46	6	19	44
250	108	270	16	312	16	319	58	117	686	30	53	153	36	230
250	176	500	20	312	16	319	118	282	685	125	57	30	24	76
250	206	720	23	312	16	319	138	487	685	254	49	9	18	48
300	103	295	22	365	16	374	63	127	952	27	104	360	41	285
300	207	490	26	365	16	374	125	259	952	112	52	44	22	76
300	241	685	29	365	16	374	146	435	952	214	45	14	16	48
350	113	275	28	415	16	408	68	137	1141	29	101	361	39	270
350	189	495	32	415	16	408	112	312	1141	110	61	44	21	90
350	246	695	35	415	16	406	157	466	1133	229	50	16	16	48
400	127	290	31	465	16	462	71	145	1476	31	97	395	34	260
400	169	460	34	465	16	462	95	294	1476	75	73	76	22	128
400	219	635	38	465	16	457	142	421	1459	166	63	32	18	68
450	144	310	36	520	16	517	77	156	1857	33	88	390	30	234
450	192	450	39	520	16	517	103	272	1857	70	66	100	21	122
450	240	590	42	520	16	517	128	388	1857	121	53	40	16	75
500	156	355	40	570	16	574	83	162	2292	33	75	378	25	201
500	208	490	43	570	16	574	111	270	2292	70	56	106	18	107
500	251	625	46	570	16	568	138	378	2267	120	59	57	16	77
550	158	365	54	620	20	627	84	164	2755	31	74	443	23	204
550	211	500	58	620	20	627	112	272	2755	65	56	125	16	109
550	240	635	61	620	20	617	140	410	2709	119	69	69	16	84
600	163	370	59	670	20	680	87	166	3260	30	74	505	22	205
600	217	505	63	670	20	680	116	275	3260	63	56	143	16	110
600	242	645	66	670	20	668	144	384	3199	109	75	98	16	90
650	168	375	64	720	20	730	89	168	3785	29	79	609	22	214
650	200	655	71	720	20	711	148	418	3683	93	112	145	19	111
650	224	515	68	720	20	730	119	278	3785	61	59	173	16	114

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 move- ment absorp- tion 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	Sheet thick- ness	External diame- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral	Axial	Lateral
				DN	Δx	BL	G	d1	C1		Da	Lb	I*	Ae
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz
700	172	380	68	775	20	786	92	171	4391	28	70	603	19	199
700	230	530	74	775	20	786	122	291	4391	61	52	162	14	105
700	268	680	78	775	20	772	152	412	4309	106	74	114	14	88
800	192	405	82	880	20	895	102	182	5715	29	115	1139	21	221
800	256	535	89	880	20	895	136	281	5715	60	86	367	15	122
800	320	670	96	880	20	895	170	380	5715	99	69	163	12	77
900	192	405	92	980	20	1000	102	182	7179	25	112	1387	19	228
900	256	550	101	980	20	1000	136	296	7179	55	84	406	14	124
900	320	700	109	980	20	1000	170	410	7179	93	67	172	11	78
1000	204	415	103	1080	20	1112	108	188	8875	25	91	1298	16	199
1000	272	570	113	1080	20	1112	144	304	8875	55	68	385	12	109
1000	340	720	123	1080	20	1110	180	420	8859	92	58	173	9	70
1100	216	430	114	1180	20	1216	114	194	10697	25	99	1597	16	207
1100	288	585	125	1180	20	1216	152	312	10697	55	74	479	12	112
1100	360	740	136	1180	20	1216	190	430	10697	92	60	205	9	70
1200	228	445	123	1280	20	1316	120	200	12608	25	107	1903	16	212
1200	304	605	135	1280	20	1316	160	320	12608	55	80	577	11	115
1200	380	765	147	1280	20	1316	200	440	12608	93	64	248	9	72
1300	228	445	133	1380	20	1418	120	200	14699	23	108	2243	15	220
1300	304	605	146	1380	20	1418	160	320	14699	51	81	680	11	120
1300	380	765	160	1380	20	1418	200	440	14699	86	65	292	9	75
1400	228	445	143	1480	20	1518	120	200	16926	21	115	2752	15	235
1400	304	615	158	1480	20	1518	160	330	16926	49	86	788	11	127
1400	380	785	173	1480	20	1518	200	460	16926	83	69	329	8	79
1500	240	455	154	1580	20	1622	126	206	19360	21	109	2812	14	223
1500	320	630	170	1580	20	1622	168	338	19360	49	82	814	10	120
1500	400	805	185	1580	20	1618	210	470	19310	84	73	381	8	80
1600	240	455	164	1690	20	1722	126	206	21904	20	116	3362	14	235
1600	320	640	183	1690	20	1722	168	348	21904	48	87	923	10	126
1600	400	825	200	1690	20	1720	210	490	21878	82	73	399	8	80
1800	240	455	184	1890	20	1922	126	206	27465	18	128	4668	14	261
1800	320	650	206	1890	20	1922	168	358	27465	44	96	1215	10	138
1800	400	845	226	1890	20	1920	210	510	27436	75	81	513	8	88
2000	279	510	218	2090	20	2123	152	231	33654	21	231	8088	16	279
2000	372	680	241	2090	20	2123	202	351	33654	44	173	2701	12	154
2000	465	850	265	2090	20	2123	252	472	33654	75	139	1215	9	98
2200	275	510	239	2295	20	2323	152	231	40471	19	250	10541	16	303
2200	367	690	266	2295	20	2323	202	361	40471	41	188	3346	12	166
2200	458	870	294	2295	20	2323	252	492	40471	71	150	1468	9	104
2400	272	510	260	2495	20	2523	152	231	47917	17	270	13444	16	328
2400	362	700	291	2495	20	2523	202	371	47917	38	202	4062	11	178
2400	453	890	323	2495	20	2523	252	512	47917	68	162	1739	9	111

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 %.

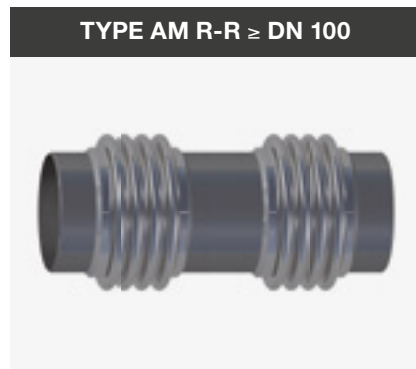


M2

M3

UNIVERSAL EXPANSION JOINT with welding ends

Type AM R-R



Tasks

- › Absorption of axial and lateral 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 AM R-R

HKS universal expansion joint with compact design, consisting of two multi-convolution and multi-layered metal bellows with welding ends (pipe nozzles) 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	Welding end, middle pipe	
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

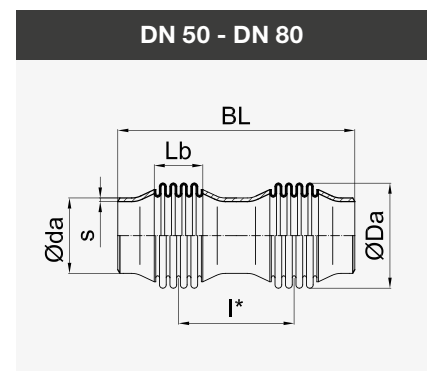
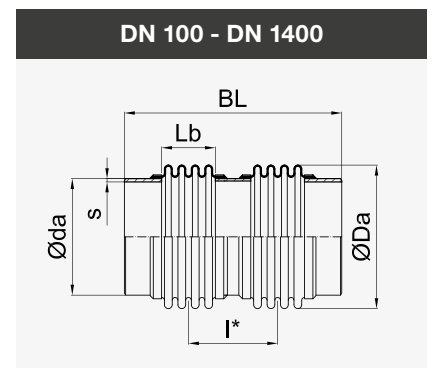
On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

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)



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.

No- minal dia- meter	Axial move- ment absorp- tion nominal	Length	Weight	Welding end		Bellows				Lateral movement absorption	Adjustment force rate	
				External diame- ter	Wall thick- ness	Exter- nal diame- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	da	s	Da	Lb	l*	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm

UNIVERSAL EXPANSION JOINT with welding ends · type AM R-R · nominal pressure PN 2.5

50	21	195	0.8	60.3	2.9	84	22	71	42.5	16	138	70
50	43	295	1.1	60.3	2.9	84	44	148	42.5	69	69	9
50	58	390	1.5	60.3	2.9	84	59	228	42.5	146	52	3
65	33	200	1	76.1	2.9	105	25	74	66.4	20	89	65
65	55	385	2	76.1	2.9	105	41	240	66.4	111	53	4
65	71	570	3.4	76.1	2.9	105	76	395	65.5	261	112	3
80	31	215	1.3	88.9	3.2	117	32	81	86.1	18	131	103
80	65	400	2.1	88.9	3.2	114	90	209	83.2	98	79	9
80	90	585	4.2	88.9	3.2	118	109	373	86	256	116	5
100	43	260	2.5	114.3	3.6	142	53	102	132	24	137	99
100	77	425	4	114.3	3.6	142	97	226	132	100	122	19
100	123	600	6.4	114.3	3.6	143	165	335	133	229	142	10
125	49	240	3.2	139.7	4.0	174	45	94	196	21	108	140
125	83	425	5.6	139.7	4.0	174	77	247	197	101	100	20
125	137	630	9.3	139.7	4.0	176	168	358	199	225	146	14
150	63	265	4.5	168.3	4.5	207	50	104	280	25	87	132
150	99	460	7.3	168.3	4.5	207	101	245	281	96	93	26
150	140	655	12	168.3	4.5	208	182	362	283	192	155	20
200	87	290	8.1	219.1	6.3	265	54	114	465	29	62	132
200	116	485	14	219.1	6.3	265	92	272	465	100	81	31
200	157	680	21	219.1	6.3	266	159	398	468	193	141	26
250	97	300	11	273	6.3	321	58	117	698	27	65	191
250	125	500	17	273	6.3	321	120	260	700	79	130	80
250	174	705	26	273	6.3	322	168	413	703	180	146	37
300	110	320	15	323.9	7.1	375	62	126	965	28	62	220
300	146	520	24	323.9	7.1	375	104	284	966	90	81	59
300	214	725	37	323.9	7.1	377	157	436	971	204	118	37
350	124	345	19	355.6	8.0	410	66	136	1158	31	56	205
350	157	545	28	355.6	8.0	411	163	242	1162	68	160	175
350	210	750	46	355.6	8.0	412	144	464	1164	189	124	42
400	112	370	24	406.4	8.0	464	71	145	1497	27	114	471
400	149	570	38	406.4	8.0	464	95	324	1497	80	85	75
400	221	770	51	406.4	8.0	465	175	445	1502	169	137	63
450	129	395	29	457	8.0	519	77	156	1881	29	102	459
450	173	590	43	457	8.0	519	103	327	1881	80	77	83
450	267	790	61	457	8.0	520	164	463	1883	177	110	59
500	154	410	32	508	8.0	576	83	162	2319	33	86	438
500	214	605	45	508	8.0	577	171	270	2322	73	132	235
500	266	800	67	508	8.0	577	174	464	2325	172	119	78
600	163	415	39	610	8.0	682	87	166	3291	30	84	579
600	195	625	59	610	8.0	683	148	313	3295	68	157	312

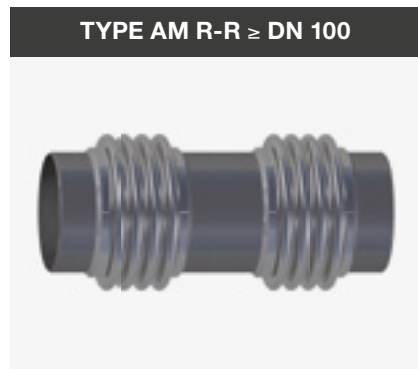
Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 2.5 - PN 16 and a design temperature of 20 °C for the standard material combination 1.4541 / S235JR. For other materials, operating pressure and 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 move- ment absorp- tion nominal	Length	Weight	Welding end		Bellows				Lateral movement absorption	Adjustment force rate	
				External diame- ter	Wall thick- ness	Exter- nal diame- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	da	s	Da	Lb	I*	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
600	245	830	87	610	8.0	683	151	516	3298	134	141	108
700	158	425	48	711	8.0	788	93	172	4430	25	146	1263
700	210	635	72	711	8.0	788	124	348	4430	69	110	245
700	286	850	112	711	8.0	790	164	524	4442	127	176	176
800	189	445	56	813	8.0	897	102	182	5762	28	128	1279
800	256	655	91	813	8.0	898	140	355	5769	71	144	399
800	320	870	130	813	8.0	899	180	530	5776	128	154	195
900	189	445	64	914	8.0	999	102	182	7209	25	137	1707
900	256	670	106	914	8.0	1003	140	370	7239	65	139	446
900	320	895	152	914	8.0	1004	180	555	7246	118	149	215
1000	197	460	76	1016	8.0	1113	110	189	8920	24	177	2519
1000	263	700	116	1016	8.0	1113	146	390	8920	66	133	471
1000	340	930	171	1016	8.0	1114	188	578	8930	118	159	261
1200	209	485	92	1219	8.0	1317	122	201	12654	23	200	3540
1200	278	715	137	1219	8.0	1317	162	391	12654	64	150	744
1200	377	955	204	1219	8.0	1320	208	583	12684	115	171	389
1400	206	570	131	1422	8.0	1520	165	244	17021	23	408	6397
1400	280	775	195	1422	8.0	1520	167	446	17025	61	266	1379
1400	351	980	243	1422	8.0	1520	208	608	17025	102	213	599
UNIVERSAL EXPANSION JOINT with welding ends · type AM R-R · nominal pressure PN 6												
50	21	195	0.8	60.3	2.9	84	22	71	42.5	16	138	70
50	35	295	1.2	60.3	2.9	84	37	156	42.5	61	83	9
50	46	390	1.8	60.3	2.9	84	69	218	41.8	108	173	10
65	32	200	1	76.1	2.9	105	25	74	66.4	20	89	65
65	45	385	1.9	76.1	2.9	100	48	237	62.8	100	84	6
65	61	575	3.4	76.1	2.9	105	66	405	65.5	235	127	4
80	30	215	1.3	88.9	3.2	117	32	81	86.1	17	131	103
80	57	400	2.8	88.9	3.2	118	62	236	86	104	148	15
80	79	585	4.4	88.9	3.2	118	85	399	85.5	253	139	5
100	31	230	2.4	114.3	3.6	142	40	89	132	15	182	178
100	57	415	3.8	114.3	3.6	142	96	215	132	70	166	29
100	89	605	6.7	114.3	3.6	144	152	352	134	178	247	16
125	47	240	3.2	139.7	4.0	174	45	94	196	20	108	140
125	78	450	6.2	139.7	4.0	175	96	251	198	93	177	34
125	100	650	11	139.7	4.0	176	159	388	200	182	293	24
150	59	265	4.5	168.3	4.5	207	50	104	280	23	87	132
150	82	470	9	168.3	4.5	208	110	249	283	79	258	71
150	103	680	14	168.3	4.5	209	111	455	283	202	194	17
200	65	295	8.5	219.1	6.3	265	56	115	465	22	134	278
200	92	495	16	219.1	6.3	266	77	296	467	90	154	51
200	121	700	24	219.1	6.3	267	104	474	470	187	214	28
250	72	300	11	273	6.3	321	59	118	699	20	140	406
250	100	515	19	273	6.3	322	123	272	701	67	216	122
250	131	735	30	273	6.3	323	106	506	703	175	172	30
300	67	325	16	323.9	7.1	375	64	128	968	17	249	858

No- minal dia- meter	Axial move- ment absorp- tion nominal	Length	Weight	Welding end		Bellows				Lateral movement absorption	Adjustment force rate	
				External diame- ter	Wall thick- ness	Exter- nal diame- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral
DN	Δx	BL	G	da	s	Da	Lb	l*	Ae	Δy	C Δx	C Δy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm
300	118	545	28	323.9	7.1	376	111	301	970	77	225	147
300	145	770	44	323.9	7.1	378	168	468	975	147	359	98
350	77	350	21	355.6	8.0	410	69	138	1160	20	223	795
350	124	575	35	355.6	8.0	409	93	337	1157	87	151	95
350	163	800	52	355.6	8.0	411	149	508	1163	171	240	67
400	85	370	25	406.4	8.0	464	72	147	1498	20	211	862
400	121	600	44	406.4	8.0	465	100	350	1502	77	239	181
400	157	830	63	406.4	8.0	466	130	550	1505	162	256	80
450	84	400	31	457	8.0	520	80	159	1884	19	315	1374
450	141	635	51	457	8.0	520	108	363	1886	82	213	188
450	183	860	73	457	8.0	521	140	560	1890	164	229	87
500	100	415	35	508	8.0	577	86	165	2322	21	263	1308
500	154	655	54	508	8.0	578	176	315	2326	63	297	401
500	189	900	86	508	8.0	579	216	520	2332	134	381	198
600	84	425	47	610	8.0	684	92	171	3299	15	590	3860
600	168	680	68	610	8.0	684	183	337	3299	62	295	496
600	208	940	109	610	8.0	685	224	554	3308	133	378	246

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 %.

UNIVERSAL EXPANSION JOINT for low pressure (PN1) **Type AM R-R**



Design type AM R-R

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

Tasks

- › Absorption of axial and lateral 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

Materialcombination ¹⁾	Component		Permitted operating temperature TS ²⁾
	Metal bellows	Welding end, middle pipe	
Standard ³⁾	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	-10 °C bis 400 °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

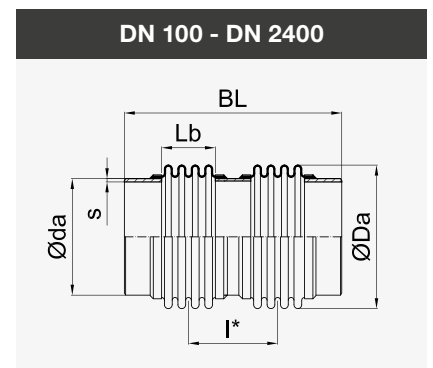
On request, other expansion joints are available with other Nominal diameters, pressure stages and lengths which exceed the standard listed in the tables.

Expansions:

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

On customer request:

- › With 30° groove or special dimensions
- › With special coating, galvanised or hot galvanised
- › Connection variants with swivel, fixed or welding neck 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	Welding end		Bellows				Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter		Axial	Lateral	Axial	Lateral
				DN	Δx	BL	G	da	s		Da	Lb	l*	Ae
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz

UNIVERSAL EXPANSION JOINT with welding ends · type AM R-R · nominal pressure PN 1

100	44	260	1.9	114.3	2.0	142	53	102	132	25	137	99	112	337
100	77	385	2.5	114.3	2.0	142	93	192	132	83	78	17	63	108
100	121	545	3.2	114.3	2.0	142	146	295	132	200	50	5	41	45
125	67	270	2.4	139.7	2.0	174	60	109	196	32	81	77	74	242
125	101	420	3.3	139.7	2.0	174	89	228	196	110	54	13	42	92
125	152	570	4.2	139.7	2.0	174	134	333	196	241	36	4	28	42
150	64	265	2.9	168.3	2.0	207	50	104	280	25	87	132	71	333
150	108	430	4.1	168.3	2.0	207	82	237	280	104	52	16	37	104
150	168	610	6.1	168.3	2.0	207	168	328	281	209	56	9	31	42
175	65	270	3.4	196	2.0	234	52	106	367	23	103	196	71	366
175	108	455	5	196	2.0	234	86	256	367	99	62	22	36	111
175	173	640	6.6	196	2.0	234	138	387	367	238	39	6	23	45
200	91	290	4.1	219.1	2.0	265	54	114	465	31	62	132	49	275
200	152	470	5.9	219.1	2.0	265	90	260	465	114	38	16	26	86
200	190	655	8.7	219.1	2.0	265	148	387	465	229	51	10	23	47
250	101	300	5.1	273	2.0	321	58	117	698	28	65	191	44	283
250	169	475	7.3	273	2.0	321	96	256	698	101	39	25	24	91
250	211	675	11	273	2.0	321	157	396	699	211	53	15	21	49
300	90	320	7	323.9	2.0	375	63	127	966	23	134	468	53	368
300	150	500	11	323.9	2.0	375	104	264	966	85	81	68	29	122
300	210	685	14	323.9	2.0	375	146	405	966	186	58	21	20	60
350	103	345	8.6	355.6	2.0	410	68	137	1159	26	121	437	46	328
350	172	525	12	355.6	2.0	410	112	272	1159	91	73	69	26	111
350	241	705	16	355.6	2.0	410	157	406	1159	193	52	22	18	55
400	116	370	11	406.4	2.0	464	71	145	1497	28	114	471	40	308
400	194	550	15	406.4	2.0	464	118	278	1497	91	68	80	23	106
400	272	725	19	406.4	2.0	464	166	405	1497	189	49	27	16	53
450	135	395	13	457	2.0	519	77	156	1881	31	102	459	35	275
450	181	555	17	457	2.0	519	103	292	1881	74	77	103	23	134
450	271	730	21	457	2.0	519	154	413	1881	160	51	34	15	62
500	156	410	17	508	3.0	576	83	162	2319	33	86	438	30	241
500	208	575	21	508	3.0	576	111	300	2319	75	65	101	19	118
500	260	740	25	508	3.0	576	138	438	2319	132	52	39	14	71
550	158	410	18	559	3.0	629	84	164	2784	31	85	511	28	244
550	211	575	23	559	3.0	629	112	302	2784	70	64	118	18	120
550	264	740	28	559	3.0	629	140	440	2784	123	51	45	13	72
600	163	415	20	610	3.0	682	87	166	3291	30	84	579	26	244
600	217	585	26	610	3.0	682	116	305	3291	68	63	135	17	120
600	272	750	31	610	3.0	682	144	444	3291	119	51	52	13	72
650	168	420	22	660	3.0	732	89	168	3819	29	90	697	26	254
650	224	590	28	660	3.0	732	119	308	3819	66	67	163	17	125
650	280	760	34	660	3.0	732	148	448	3819	115	54	63	13	75

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 move- ment absorp- tion nominal	Length	Weight	Welding end		Bellows				Lateral movement absorption	Adjustment force rate		Characteristic frequency of the bellows	
				External diameter	Wall thick- ness	External diami- ter	Corru- gated length	Bellows centre distance	Effective diameter		Axial	Lateral	Axial	Lateral
				DN	Δx	BL	G	da	s		Da	Lb	l*	Ae
-	mm	mm	kg	mm	mm	mm	mm	mm	cm ²	mm	N/mm	N/mm	Hz	Hz
700	172	425	24	711	3.0	788	92	171	4428	28	78	684	23	236
700	230	585	30	711	3.0	788	122	301	4428	62	59	172	15	118
700	288	765	37	711	3.0	788	152	452	4428	111	47	63	11	70
800	192	445	31	813	3.0	897	102	182	5762	28	128	1279	25	261
800	256	615	39	813	3.0	897	136	316	5762	65	96	331	17	134
800	320	790	47	813	3.0	897	170	460	5762	113	77	127	13	81
900	192	445	35	914	3.0	1002	102	182	7231	25	124	1548	23	268
900	256	625	45	914	3.0	1002	136	326	7231	59	93	378	15	136
900	320	800	55	914	3.0	1002	170	470	7231	103	74	148	11	82
1000	204	460	41	1016	3.0	1112	108	188	8917	25	105	1518	19	239
1000	272	640	52	1016	3.0	1112	144	334	8917	59	79	378	13	122
1000	340	820	63	1016	3.0	1112	180	480	8917	101	63	149	10	74
1100	216	470	45	1120	3.0	1218	114	194	10761	25	108	1759	19	239
1100	288	655	58	1120	3.0	1218	152	342	10761	58	81	445	12	122
1100	360	840	70	1120	3.0	1218	190	490	10761	101	65	176	9	74
1200	228	480	49	1220	3.0	1318	120	200	12678	25	117	2094	18	244
1200	304	670	63	1220	3.0	1318	160	350	12678	59	88	537	12	125
1200	380	860	77	1220	3.0	1318	200	500	12678	101	70	214	9	76
1300	228	480	53	1320	3.0	1418	120	200	14752	23	125	2606	18	262
1300	304	680	69	1320	3.0	1418	160	360	14752	56	94	634	12	132
1300	380	880	84	1320	3.0	1418	200	520	14752	97	75	247	9	80
1400	228	480	57	1420	3.0	1518	120	200	16984	21	133	3193	18	279
1400	304	690	75	1420	3.0	1518	160	370	16984	53	100	738	12	140
1400	380	900	92	1420	3.0	1518	200	540	16984	93	80	282	9	84
1500	240	495	63	1520	3.0	1622	126	206	19421	21	126	3243	17	264
1500	320	710	82	1520	3.0	1622	168	378	19421	54	94	763	11	132
1500	400	920	101	1520	3.0	1622	210	550	19421	94	76	293	8	80
1600	240	495	67	1620	3.0	1722	126	206	21970	20	133	3875	17	279
1600	320	720	88	1620	3.0	1722	168	388	21970	52	100	868	11	138
1600	400	940	109	1620	3.0	1722	210	570	21970	91	80	327	8	83
1800	240	495	75	1820	3.0	1922	126	206	27539	18	147	5372	17	310
1800	320	730	99	1820	3.0	1922	168	398	27539	47	110	1146	11	152
1800	400	960	124	1820	3.0	1922	210	590	27539	83	88	424	8	91
2000	256	545	102	2020	4.0	2123	152	231	33742	19	267	9382	19	333
2000	342	765	131	2020	4.0	2123	202	401	33742	47	201	2458	13	170
2000	427	985	160	2020	4.0	2123	252	572	33742	87	161	987	10	103
2200	253	545	112	2220	4.0	2323	152	231	40568	17	289	12214	19	362
2200	337	775	145	2220	4.0	2323	202	411	40568	44	217	3058	13	183
2200	421	1005	178	2220	4.0	2323	252	592	40568	81	174	1205	10	110
2400	250	545	122	2420	4.0	2523	152	231	48022	16	311	15568	19	392
2400	333	785	160	2420	4.0	2523	202	421	48022	41	234	3728	13	196
2400	417	1025	197	2420	4.0	2523	252	612	48022	77	187	1442	9	118

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 %.