LATERAL EXPANSION JOINT with swivel flanges **Type RN B-B**

TYPE RN B-B ≥ DN 100

TYPE RN B-B ≤ DN 80

Design type RN B-B

HKS lateral 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 and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Component			Permitted operating temperature TS [2]
	Metal bellows, collar	Flange	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	8.8 [5]	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

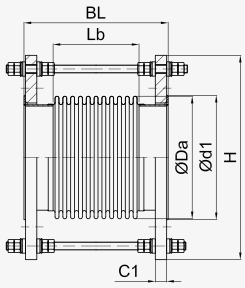
Tasks

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

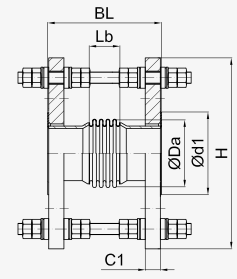
Areas of application

› 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

DN 100 - DN 400



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange			Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	d1	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with swivel flanges · **type RN B-B · nominal pressure PN 6**											
50	7	120	7.1	262	6	90	16	84	59	42.5	246
50	18	175	7.5	262	6	90	16	84	112	41.8	137
50	28	200	7.7	262	6	90	16	84	138	41.8	73
65	7	120	8.8	282	6	110	16	105	59	65.1	855
65	21	175	9.2	282	6	110	16	105	113	65.5	146
65	34	205	9.4	282	6	110	16	105	142	65.5	75
80	8	150	12	312	6	128	18	114	90	83.2	313
80	22	185	13	312	6	128	18	118	124	86	159
80	39	235	13	312	6	128	18	118	175	86	78
100	5	125	13	332	6	148	18	142	66	127	731
100	23	210	13	332	6	148	18	142	150	127	133
100	36	250	14	332	6	148	18	142	188	127	106
125	10	155	18	362	6	178	20	174	89	191	331
125	22	260	19	362	6	178	20	174	156	191	236
125	42	320	21	362	6	178	20	175	216	191	138
150	14	220	21	387	6	202	20	207	118	274	408
150	34	305	23	387	6	202	20	208	201	274	226
150	52	345	26	387	6	202	20	208	250	272	168
200	11	220	29	442	6	258	22	265	111	456	714
200	31	310	33	442	6	258	22	265	198	455	353
200	54	365	39	442	6	258	22	267	262	453	269
250	13	250	40	503	6	312	24	317	138	680	762
250	39	365	49	503	6	312	24	323	260	689	420
250	52	400	54	503	6	312	24	324	297	689	371
300	16	290	55	580	6	365	24	375	170	954	878
300	37	385	65	580	6	365	24	376	274	952	534
300	51	425	71	580	6	365	24	378	312	954	461
350	14	250	72	630	6	415	26	410	160	1145	1242
350	35	355	82	630	6	415	26	412	269	1144	660
350	48	425	90	630	6	415	26	413	308	1145	576
400	16	290	108	680	6	465	28	460	192	1465	1176
400	34	405	121	680	6	465	28	464	282	1474	805
400	46	445	129	680	6	465	28	465	322	1473	726
LATERAL EXPANSION JOINT with swivel flanges · **type RN B-B · nominal pressure PN 10**											
50	7	120	11	287	16	102	20	84	59	42.5	246
50	18	175	12	287	16	102	20	84	112	41.8	137
50	24	190	12	287	16	102	20	84	129	41.8	89
65	5	110	14	307	16	122	20	105	49	66.4	471
65	11	145	14	307	16	122	20	105	85	65.5	344
65	17	165	14	307	16	122	20	105	104	65.5	189
80	6	140	15	322	16	138	20	114	79	83.2	467
80	14	170	16	322	16	138	20	118	109	86	320
80	21	190	16	322	16	138	20	118	131	86	185

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 16 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange			Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	d1	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
100	7	145	18	342	16	158	22	142	80	127	423
100	21	230	19	342	16	158	22	141	168	126	194
100	32	260	20	342	16	158	22	143	195	127	167
125	8	155	22	372	16	188	22	174	92	191	649
125	24	235	24	372	16	188	22	175	166	191	293
125	44	295	26	372	16	188	22	176	224	190	220
150	11	190	29	407	16	212	24	207	121	274	691
150	35	330	34	407	16	212	24	210	220	274	367
150	48	365	37	407	16	212	24	211	255	274	297
200	12	205	40	480	10	268	24	262	132	451	902
200	32	330	47	480	10	268	24	268	216	457	562
200	49	415	54	480	10	268	24	270	302	457	449
250	13	280	54	535	10	320	26	322	164	689	1135
250	37	410	65	535	10	320	26	324	297	689	625
250	44	405	67	535	10	320	26	322	288	680	608
300	16	295	67	597	10	370	26	373	178	945	1361
300	39	395	81	597	10	370	26	378	278	949	881
300	51	470	95	597	10	370	26	381	354	954	858
LATERAL EXPANSION JOINT with swivel flanges · **type RN B-B · nominal pressure PN 16**											
50	5	115	11	287	16	102	20	84	52	42.5	367
50	10	145	12	287	16	102	20	84	86	41.8	299
50	15	165	12	287	16	102	20	84	104	41.8	173
65	3	110	14	307	16	122	20	100	48	62.8	883
65	6	125	14	307	16	122	20	105	66	65.5	731
65	11	145	14	307	16	122	20	105	85	65.5	344
80	4	130	15	322	16	138	20	114	68	83.2	741
80	9	150	16	322	16	138	20	118	88	86	624
80	13	160	16	322	16	138	20	118	97	85.5	424
100	6	145	18	342	16	158	22	142	82	127	818
100	15	185	19	342	16	158	22	144	122	127	494
100	35	285	22	342	16	158	22	145	219	127	241
125	9	175	23	378	16	188	22	174	110	190	720
125	15	200	24	378	16	188	22	175	133	191	589
125	41	330	30	378	16	188	22	179	260	191	347
150	10	235	32	425	16	212	24	208	124	274	1060
150	26	330	37	425	16	212	24	210	220	274	600
150	37	370	40	425	16	212	24	212	260	274	479
200	15	295	46	480	16	268	26	267	180	457	1101
200	26	355	51	480	16	268	26	266	238	453	783
200	34	370	55	480	16	268	26	270	256	457	741
250	11	300	67	557	16	320	29	323	170	689	2270
250	24	415	73	557	16	320	29	321	286	684	982
250	42	440	86	557	16	320	29	326	312	686	899

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 16 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.


NEBEZPEČÍ
PÁDU
NAPOUSTENI KAPALINY

LATERAL EXPANSION JOINT with fixed flanges **Type RN F-F**

TYPE RN F-F ≥ DN 100

TYPE RN F-F ≤ DN 80

Design type RN F-F

HKS lateral 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 and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Component			Permitted operating temperature TS [2]
	Metal bellows	Flange	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	8.8 [5]	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

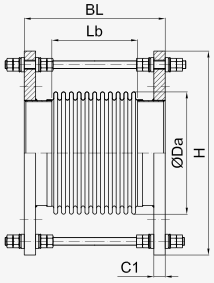
Tasks

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

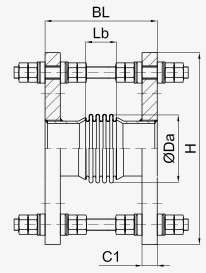
Areas of application

› 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

DN 100 - DN 800



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with fixed flanges · **type RN F-F · nominal pressure PN 6**										
50	7	120	7.1	262	6	16	84	59	42.5	246
50	18	175	7.6	262	6	16	84	112	41.8	137
50	28	200	7.8	262	6	16	84	138	41.8	73
65	7	120	8.2	282	6	16	105	57	66.4	297
65	21	175	8.9	282	6	16	105	113	65.5	146
65	34	205	9.2	282	6	16	105	142	65.5	75
80	8	155	12	312	6	18	114	90	83.2	313
80	23	200	13	312	6	18	118	137	86.6	103
80	34	225	13	312	6	18	118	164	86	95
100	12	150	13	332	6	18	142	93	125	211
100	21	195	14	332	6	18	142	136	125	143
100	43	270	15	332	6	18	143	210	125	104
125	13	200	19	362	6	20	174	107	189	339
125	27	235	19	362	6	20	173	172	187	169
125	50	335	22	362	6	20	176	241	189	131
150	15	210	21	387	6	20	207	118	270	355
150	33	305	23	387	6	20	206	212	269	196
150	55	405	26	387	6	20	207	313	269	132
200	14	225	29	442	6	22	260	129	443	527
200	36	360	35	442	6	22	267	260	453	321
200	57	380	39	442	6	22	266	281	450	247
250	13	240	41	503	6	24	315	138	671	756
250	39	400	49	503	6	24	323	297	684	375
250	54	400	53	503	6	24	323	297	681	352
300	13	255	56	580	6	24	375	149	948	1165
300	37	380	64	580	6	24	374	274	941	531
300	51	420	70	580	6	24	376	312	941	467
350	14	235	72	630	6	26	409	160	1135	1189
350	37	420	89	630	6	26	413	308	1139	867
350	57	435	95	630	6	26	414	322	1139	558
400	13	250	108	680	6	28	460	168	1459	1541
400	31	370	119	680	6	28	466	256	1474	886
400	43	410	127	680	6	28	467	295	1474	768
450	14	305	132	735	6	30	520	185	1856	1973
450	32	365	140	735	6	30	517	276	1842	1024
450	39	410	149	735	6	30	522	288	1856	1029
500	15	320	142	785	6	30	572	199	2271	2167
500	29	385	152	785	6	30	574	267	2274	1310
500	40	430	161	785	6	30	575	308	2272	1140
600	13	340	190	907	6	32	673	208	3210	3424
600	27	410	202	907	6	32	679	278	3233	1793

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	cm²	N/mm
600	37	430	222	907	6	32	686	299	3258	1973
700	9	340	291	1028	6	40	790	192	4389	9329
700	23	405	301	1028	6	40	789	260	4382	2596
700	27	420	312	1028	6	40	788	271	4367	2478
800	10	375	370	1143	6	44	896	212	5699	9667
800	18	445	378	1143	6	44	896	282	5699	4078
800	23	445	380	1143	6	44	892	285	5666	3052
LATERAL EXPANSION JOINT with fixed flanges · **type RN F-F · nominal pressure PN 10**										
50	7	125	11	287	16	20	84	59	42.5	246
50	16	170	12	287	16	20	84	104	41.8	173
50	24	195	12	287	16	20	84	129	41.8	89
65	5	120	13	307	16	20	100	56	62.8	556
65	11	150	14	307	16	20	105	85	65.5	344
65	17	170	14	307	16	20	105	104	65.5	189
80	6	135	15	322	16	20	118	67	87	429
80	14	175	16	322	16	20	118	109	86	320
80	21	195	16	322	16	20	118	131	86	185
100	10	160	18	342	16	22	142	96	125	410
100	23	235	19	342	16	22	143	173	125	204
100	39	280	21	342	16	22	144	219	125	148
125	11	170	22	372	16	22	170	107	184	448
125	30	255	24	372	16	22	176	190	189	269
125	49	340	27	372	16	22	177	276	189	188
150	12	190	28	407	16	24	207	121	271	587
150	31	345	32	407	16	24	208	240	270	292
150	47	390	35	407	16	24	210	280	271	250
200	12	200	39	480	10	24	260	132	444	880
200	35	400	48	480	10	24	267	292	453	427
200	52	410	54	480	10	24	270	302	453	396
250	11	255	53	535	10	26	321	143	683	1526
250	33	420	63	535	10	26	323	308	684	629
250	47	430	70	535	10	26	326	318	684	592
300	13	285	66	597	10	26	373	173	940	1450
300	33	400	78	597	10	26	378	288	948	887
300	39	390	80	597	10	26	376	278	939	867
350	14	270	94	657	10	30	405	186	1121	1598
350	30	370	107	657	10	30	413	282	1139	1126
350	42	415	116	657	10	30	415	327	1139	949
400	13	295	141	705	10	32	466	202	1474	2750
400	30	390	153	705	10	32	467	295	1474	1299
400	36	410	161	705	10	32	469	313	1474	1435
450	14	320	180	767	10	36	521	218	1856	2726
450	27	390	193	767	10	36	522	288	1856	1740
450	36	425	211	767	10	36	525	320	1856	2060
500	11	310	207	822	10	38	573	205	2270	4550

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	cm²	N/mm
500	25	385	221	822	10	38	579	278	2291	2240
500	33	450	244	822	10	38	582	306	2291	2718
600	9	330	286	948	10	42	673	213	3206	7322
600	23	445	308	948	10	42	685	288	3258	3006
600	26	425	311	948	10	42	683	266	3242	3139
700	10	365	445	1087	10	50	790	230	4387	10532
700	18	405	455	1087	10	50	790	269	4383	5215
700	25	415	464	1087	10	50	787	279	4356	4002
LATERAL EXPANSION JOINT with fixed flanges · **type RN F-F · nominal pressure PN 16**										
50	3	110	11	287	16	20	84	44	42.5	582
50	8	135	11	287	16	20	84	70	42.1	265
50	15	170	12	287	16	20	84	104	41.8	173
65	3	115	13	307	16	20	100	48	62.8	883
65	6	130	14	307	16	20	105	66	65.5	731
65	11	150	14	307	16	20	105	85	65.5	344
80	3	120	15	322	16	20	114	56	83.2	1281
80	8	150	15	322	16	20	118	85	86.6	441
80	13	160	16	322	16	20	118	97	85.5	424
100	8	160	18	342	16	22	139	96	123	533
100	22	260	20	342	16	22	144	198	125	298
100	34	300	22	342	16	22	145	236	125	253
125	9	175	23	378	16	22	172	110	185	704
125	20	250	25	378	16	22	176	185	189	430
125	34	305	27	378	16	22	176	240	187	321
150	10	190	31	425	16	24	207	124	270	961
150	28	355	36	425	16	24	209	250	271	448
150	40	365	40	425	16	24	211	260	270	428
200	12	270	45	480	16	26	267	160	453	1374
200	24	330	50	480	16	26	267	216	451	857
200	42	385	58	480	16	26	271	273	452	684
250	9	275	66	557	16	29	323	149	684	2997
250	29	415	79	557	16	29	325	288	684	1121
250	42	440	85	557	16	29	324	312	677	890
300	8	290	91	628	16	32	374	157	941	4228
300	28	435	107	628	16	32	379	303	948	1425
300	37	430	114	628	16	32	381	300	947	1297
350	8	265	122	688	16	35	406	168	1122	4717
350	26	395	139	688	16	35	414	295	1139	1827
350	37	415	147	688	16	35	413	317	1130	1465
400	8	285	184	732	16	38	466	182	1474	7053
400	19	345	191	732	16	38	466	242	1470	2494
400	33	410	209	732	16	38	470	300	1474	2012

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	cm²	N/mm
450	9	310	243	808	16	42	519	196	1848	7605
450	23	415	261	808	16	42	523	300	1856	2873
450	33	440	272	808	16	42	522	320	1842	2363
500	8	320	307	883	16	46	570	210	2255	8986
500	19	405	316	883	16	46	569	278	2247	3340
500	30	435	338	883	16	46	579	306	2276	3062
600	12	380	501	1032	16	55	686	233	3258	10729
600	19	445	512	1032	16	55	686	299	3258	5048
600	22	450	512	1032	16	55	680	303	3223	4369
LATERAL EXPANSION JOINT with fixed flanges · **type RN F-F · nominal pressure PN 25**										
50	3	110	11	287	40	20	84	44	42.1	1084
50	6	135	11	287	40	20	84	69	41.8	584
50	8	145	11	287	40	20	84	78	41.8	410
65	2	105	15	307	40	22	105	38	65.5	3918
65	4	125	15	307	40	22	105	57	65.5	1161
65	6	135	15	307	40	22	105	66	65.5	731
80	3	125	18	322	40	24	118	55	86	2553
80	5	135	18	322	40	24	118	66	86	1478
80	7	140	18	322	40	24	118	73	85.5	1004
100	7	165	24	363	40	26	140	98	123	861
100	25	275	27	363	40	26	145	202	125	401
100	36	340	29	363	40	26	146	270	125	299
125	9	200	34	410	40	28	169	128	182	907
125	20	285	37	410	40	28	175	212	187	569
125	31	330	40	410	40	28	177	255	187	475
150	11	230	43	440	40	30	208	148	271	1191
150	25	360	49	440	40	30	211	234	271	792
150	38	405	53	440	40	30	213	279	270	620
200	10	255	64	512	25	32	267	167	453	2286
200	24	340	70	512	25	32	266	251	447	1145
200	39	425	82	512	25	32	273	295	451	988
250	9	270	92	593	25	35	322	176	681	3575
250	22	360	100	593	25	35	323	264	678	1650
250	40	480	118	593	25	35	326	336	677	1290
300	8	275	128	677	25	38	373	186	936	5238
300	19	355	139	677	25	38	379	252	948	2462
300	34	430	157	677	25	38	383	322	948	1900
350	12	315	180	747	25	42	405	205	1116	4249
350	19	380	190	747	25	42	412	268	1132	2720
350	30	425	208	747	25	42	418	308	1139	2548
400	10	320	285	788	25	48	468	196	1473	8381
400	19	405	292	788	25	48	464	280	1461	3339
400	30	450	314	788	25	48	472	320	1474	3023
450	13	365	385	862	25	54	525	224	1856	9016
450	21	430	395	862	25	54	525	288	1856	4242

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows			Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	cm²	N/mm
450	30	485	411	862	25	54	525	340	1846	3474
500	14	390	458	922	25	58	581	238	2284	9165
500	20	425	460	922	25	58	574	272	2254	5330
500	27	480	482	922	25	58	582	324	2282	4521

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

LATERAL EXPANSION JOINT with welding ends **Type RN R-R**

TYPE RN R-R ≥ DN 100

TYPE RN R-R ≤ DN 80

Design type RN R-R

HKS lateral 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 and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Component			Permitted operating temperature TS [2]
	Metal bellows	Pipe tabs	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	8.8 [5]	-10 °C bis 400 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

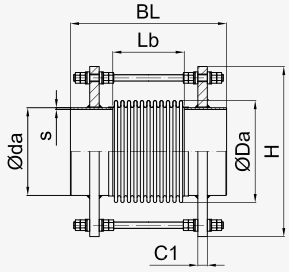
Tasks

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

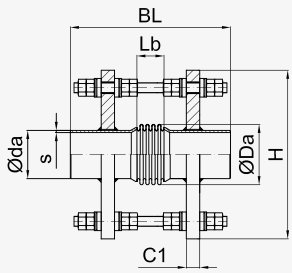
Areas of application

› 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

DN 100 - DN 800



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Welding end		Bellows			Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with welding ends · **type RN R-R · nominal pressure PN 6**										
50	5	285	3.1	206	60.3	2.9	84	52	42.5	367
50	17	325	3.4	206	60.3	2.9	84	95	42.1	102
50	28	370	3.8	206	60.3	2.9	84	138	41.8	73
65	7	290	3.8	227	76.1	2.9	105	57	66.4	297
65	18	335	4.5	227	76.1	2.9	105	104	65.5	189
65	34	375	4.8	227	76.1	2.9	105	142	65.5	75
80	6	310	4.6	236	88.9	3.2	114	79	83.2	467
80	23	370	5.1	240	88.9	3.2	118	137	86.6	103
80	39	405	5.8	240	88.9	3.2	118	175	86	78
100	6	310	6.5	264	114.3	3.6	142	80	132	726
100	27	420	7.3	264	114.3	3.6	142	191	132	115
100	45	475	8.3	265	114.3	3.6	143	245	133	89
125	12	335	8.5	296	139.7	4.0	174	104	196	321
125	33	450	10	296	139.7	4.0	174	219	197	142
125	53	515	12	297	139.7	4.0	175	283	198	110
150	10	330	11	329	168.3	4.5	207	99	280	477
150	43	485	15	330	168.3	4.5	208	255	283	184
150	61	540	17	331	168.3	4.5	209	308	284	152
200	13	360	18	387	219.1	6.3	265	129	465	615
200	36	470	22	388	219.1	6.3	266	238	467	305
200	63	575	29	390	219.1	6.3	268	346	472	237
250	12	380	30	449	273	6.3	321	138	699	845
250	29	475	34	450	273	6.3	322	231	703	534
250	47	565	39	451	273	6.3	323	324	704	337
300	12	385	40	514	323.9	7.1	374	146	963	1067
300	36	540	50	517	323.9	7.1	377	297	972	610
300	52	600	56	518	323.9	7.1	378	360	975	481
350	16	425	49	550	355.6	8.0	410	183	1160	1114
350	34	535	57	552	355.6	8.0	412	293	1165	727
350	51	600	65	553	355.6	8.0	413	359	1169	558
400	16	435	66	604	406.4	8.0	464	192	1498	1228
400	35	550	77	606	406.4	8.0	466	308	1504	806
400	45	590	85	607	406.4	8.0	467	349	1508	776
450	16	455	77	660	457	8.0	520	212	1884	1902
450	33	545	86	661	457	8.0	521	304	1889	1009
450	43	585	95	662	457	8.0	522	346	1893	957
500	18	470	86	717	508	8.0	577	228	2322	1694
500	32	540	96	718	508	8.0	578	296	2326	1213
500	41	550	104	719	508	8.0	579	310	2331	1156
600	14	495	136	836	610	8.0	684	244	3299	4710
600	24	500	140	836	610	8.0	684	250	3304	2376

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Welding end		Bellows			Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm²	N/mm
600	39	575	152	835	610	8.0	683	322	3297	1577
700	14	510	170	958	711	8.0	790	256	4437	5380
700	25	545	176	958	711	8.0	790	292	4440	2439
700	34	555	188	959	711	8.0	791	305	4448	2251
800	16	545	228	1067	813	8.0	899	282	5770	5045
800	23	545	231	1067	813	8.0	899	285	5773	3270
800	29	560	245	1068	813	8.0	900	296	5782	3058
LATERAL EXPANSION JOINT with welding ends · **type RN R-R · nominal pressure PN 10**										
50	5	285	3.1	206	60.3	2.9	84	52	42.5	367
50	14	320	3.3	206	60.3	2.9	84	87	42.1	136
50	24	360	3.8	206	60.3	2.9	84	129	41.8	89
65	5	280	3.8	227	76.1	2.9	105	49	66.4	471
65	11	315	4.3	227	76.1	2.9	105	85	65.5	344
65	17	335	4.5	227	76.1	2.9	105	104	65.5	189
80	6	300	4.6	240	88.9	3.2	118	67	87	429
80	13	335	4.9	240	88.9	3.2	118	106	86.6	226
80	21	360	5.4	240	88.9	3.2	118	131	86	185
100	8	325	6.5	264	114.3	3.6	142	93	132	457
100	22	405	7.6	265	114.3	3.6	143	173	133	252
100	38	460	8.7	266	114.3	3.6	144	228	134	161
125	12	355	8.8	296	139.7	4.0	174	122	197	436
125	30	445	11	297	139.7	4.0	175	216	199	241
125	39	480	13	298	139.7	4.0	176	247	200	236
150	15	395	15	329	168.3	4.5	207	155	281	503
150	37	505	19	331	168.3	4.5	209	264	284	283
150	50	525	21	332	168.3	4.5	210	283	286	264
200	10	375	25	405	219.1	6.3	265	132	466	1085
200	30	520	30	407	219.1	6.3	267	280	468	453
200	58	635	40	410	219.1	6.3	270	395	475	382
250	14	425	34	462	273	6.3	322	184	701	1142
250	28	540	38	463	273	6.3	323	297	703	635
250	42	605	45	464	273	6.3	324	365	707	553
300	14	445	53	528	323.9	7.1	376	195	969	1359
300	27	565	59	528	323.9	7.1	376	314	969	795
300	48	605	70	531	323.9	7.1	379	353	976	708
350	13	435	61	563	355.6	8.0	411	186	1162	1799
350	36	610	76	565	355.6	8.0	413	359	1169	937
350	45	600	79	565	355.6	8.0	413	349	1168	866
400	12	435	67	602	406.4	8.0	462	196	1491	2267
400	32	590	85	607	406.4	8.0	467	349	1508	1305
400	41	590	102	608	406.4	8.0	468	336	1511	1161
450	15	495	103	673	457	8.0	521	245	1887	2845
450	29	540	112	674	457	8.0	522	288	1892	1684
450	38	580	121	675	457	8.0	523	330	1896	1470
500	14	485	114	730	508	8.0	578	234	2326	3622

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Welding end		Bellows			Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm²	N/mm
500	26	530	124	730	508	8.0	578	278	2327	2150
500	35	570	133	731	508	8.0	579	320	2331	1866
600	11	510	174	852	610	8.0	684	250	3304	8522
600	23	580	186	853	610	8.0	685	320	3308	3263
600	32	595	192	851	610	8.0	683	332	3298	2542
700	11	525	234	982	711	10.0	790	263	4442	9797
700	15	530	240	983	711	10.0	791	269	4447	7310
700	28	575	255	984	711	10.0	792	314	4449	3652
LATERAL EXPANSION JOINT with welding ends · **type RN R-R · nominal pressure PN 16**										
50	5	285	3.1	206	60.3	2.9	84	52	42.5	367
50	10	315	3.5	206	60.3	2.9	84	86	41.8	299
50	15	335	3.6	206	60.3	2.9	84	104	41.8	173
65	3	280	3.8	222	76.1	2.9	100	48	62.8	883
65	6	295	4.1	227	76.1	2.9	105	66	65.5	731
65	11	315	4.3	227	76.1	2.9	105	85	65.5	344
80	4	300	4.5	236	88.9	3.2	114	68	83.2	741
80	9	320	5	240	88.9	3.2	118	88	86	624
80	13	330	5.2	240	88.9	3.2	118	97	85.5	424
100	8	350	8.4	264	114.3	3.6	142	109	132	615
100	25	450	9.9	265	114.3	3.6	143	210	133	266
100	37	500	12	266	114.3	3.6	144	256	134	217
125	10	355	12	303	139.7	4.0	175	112	198	908
125	23	435	14	304	139.7	4.0	176	194	200	486
125	34	500	16	305	139.7	4.0	177	258	201	355
150	9	360	17	347	168.3	4.5	207	121	281	1067
150	22	450	19	349	168.3	4.5	209	207	284	583
150	44	540	24	351	168.3	4.5	211	297	287	400
200	15	450	32	407	219.1	6.3	267	200	468	1242
200	29	530	37	408	219.1	6.3	268	281	472	731
200	44	600	42	410	219.1	6.3	270	348	474	563
250	9	415	41	470	273	6.3	318	164	692	2061
250	27	550	51	476	273	6.3	324	297	707	1031
250	41	620	58	478	273	6.3	326	366	710	795
300	14	485	68	545	323.9	7.1	377	224	971	2085
300	27	575	76	546	323.9	7.1	378	312	974	1283
300	46	670	92	549	323.9	7.1	381	408	984	1058
350	12	480	77	580	355.6	8.0	412	216	1164	2669
350	25	570	86	580	355.6	8.0	412	308	1166	1567
350	34	615	103	607	355.6	8.0	415	354	1174	1387
400	12	480	90	616	406.4	8.0	464	227	1497	3205
400	27	615	111	620	406.4	8.0	468	364	1512	2248
400	33	620	112	619	406.4	8.0	467	370	1508	1681

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Welding end		Bellows			Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm²	N/mm
450	12	515	132	689	457	8.0	521	252	1890	5084
450	25	620	151	691	457	8.0	523	360	1898	2786
450	31	625	152	690	457	8.0	522	365	1891	2134
500	14	530	149	746	508	8.0	578	270	2329	4555
500	21	555	182	773	508	8.0	581	292	2339	4153
500	29	600	197	774	508	8.0	582	340	2346	3455
600	13	530	228	872	610	10.0	680	256	3282	7778
600	19	590	234	871	610	10.0	679	320	3275	4222
600	25	610	253	878	610	10.0	686	336	3313	4044
LATERAL EXPANSION JOINT with welding ends · **type RN R-R · nominal pressure PN 25**										
50	4	295	3.9	206	60.3	2.9	84	52	42.1	628
50	6	300	3.4	206	60.3	2.9	84	69	41.8	584
50	8	310	3.4	206	60.3	2.9	84	78	41.8	410
65	3	295	4.9	225	76.1	2.9	103	53	64.1	2028
65	4	305	5	225	76.1	2.9	103	63	64.1	1174
65	6	305	5.1	227	76.1	2.9	105	66	65.5	731
80	3	295	5.9	240	88.9	3.2	118	55	86	2553
80	5	305	6	240	88.9	3.2	118	66	86	1478
80	7	315	6.2	240	88.9	3.2	118	73	85.5	1004
100	8	370	9.2	270	114.3	3.6	142	126	132	741
100	20	435	11	272	114.3	3.6	144	192	134	514
100	42	550	14	274	114.3	3.6	146	306	137	306
125	10	395	16	314	139.7	4.0	174	144	197	884
125	21	455	19	317	139.7	4.0	177	203	201	731
125	37	570	23	319	139.7	4.0	179	320	203	442
150	9	390	20	346	168.3	4.5	206	141	279	1322
150	25	510	25	350	168.3	4.5	210	260	285	705
150	37	610	29	351	168.3	4.5	211	361	287	518
200	11	440	38	419	219.1	6.3	267	180	468	1703
200	20	500	42	419	219.1	6.3	267	238	470	1269
200	38	635	54	423	219.1	6.3	271	372	478	911
250	9	450	54	488	273	7.1	320	191	697	2834
250	26	610	73	493	273	7.1	325	336	710	1400
250	34	610	78	495	273	7.1	327	338	714	1356
300	9	480	87	569	323.9	8.0	377	209	973	5065
300	23	600	99	571	323.9	8.0	379	328	979	2116
300	35	680	111	573	323.9	8.0	381	408	984	1578
350	10	495	97	604	355.6	8.0	412	224	1166	4733
350	24	620	111	605	355.6	8.0	413	349	1168	2157
350	34	685	133	608	355.6	8.0	416	404	1178	1877
400	13	515	158	656	406.4	10.0	464	242	1496	4708
400	20	555	171	661	406.4	10.0	469	284	1513	3413
400	27	600	181	662	406.4	10.0	470	330	1518	2942
450	13	540	186	715	457	10.0	523	270	1898	6603
450	23	625	204	717	457	10.0	525	352	1906	4241

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Welding end		Bellows			Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	cm²	N/mm
450	26	645	217	719	457	10.0	527	374	1913	4710
500	12	530	203	771	508	10.0	579	256	2332	9028
500	18	590	210	771	508	10.0	579	320	2331	4661
500	22	620	247	774	508	10.0	582	340	2346	5162

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

LATERAL EXPANSION JOINT with swivel flanges **Type RM B-B**

TYPE RM B-B ≥ DN 100

TYPE RM B-B ≤ DN 80

Design type RM B-B

HKS lateral 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 and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Component			Permitted operating temperature TS [2]
	Metal bellows, collar	Flange, middle pipe	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	8.8 [5]	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8 and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

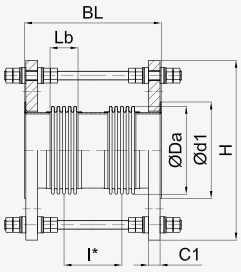
Tasks

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

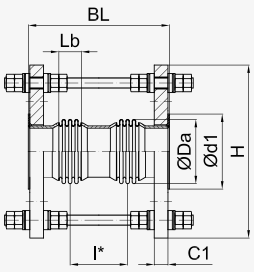
Areas of application

› 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

DN 100 - DN 400



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange			Bellows				Lateral adjustment force rate
					Borehole patter nacc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	d1	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with swivel flanges · **type RM B-B · nominal pressure PN 6**												
50	51	250	7.6	262	6	90	16	84	30	160	42.5	11
50	102	345	8	262	6	90	16	84	37	247	42.5	4
50	199	550	8.9	262	6	90	16	84	44	444	42.1	2
65	53	235	9	282	6	110	16	105	33	143	66.4	14
65	106	390	9.8	282	6	110	16	100	40	290	62.8	5
65	206	580	12	282	6	110	16	105	48	473	65.5	4
80	54	320	13	312	6	128	18	114	45	215	83.2	18
80	101	400	14	312	6	128	18	118	55	285	86	16
80	203	580	15	312	6	128	18	118	66	456	86	6
100	50	290	14	332	6	148	18	142	40	190	127	25
100	102	405	15	332	6	148	18	141	53	293	127	8
100	205	660	17	332	6	148	18	143	130	465	127	8
125	51	285	19	362	6	178	20	174	45	175	191	28
125	100	465	21	362	6	178	20	174	61	301	191	15
125	205	635	23	362	6	178	20	175	80	450	191	8
150	51	360	22	387	6	202	20	207	51	206	274	51
150	101	485	24	387	6	202	20	205	68	313	271	19
150	200	725	27	387	6	202	20	207	86	536	273	9
200	51	400	32	442	6	258	22	265	57	232	457	94
200	100	520	34	442	6	258	22	265	76	336	457	34
200	202	730	39	442	6	258	22	265	99	519	455	17
250	50	380	45	503	6	312	24	319	82	182	683	162
250	100	525	49	503	6	312	24	321	105	305	686	77
250	215	810	57	503	6	312	24	323	130	575	689	29
300	50	430	60	580	6	365	24	375	85	225	954	160
300	101	590	71	580	6	365	24	377	114	364	954	114
300	205	905	73	580	6	365	24	374	111	671	947	24
350	51	430	78	630	6	415	26	408	92	247	1137	168
350	100	605	82	630	6	415	26	408	92	422	1137	59
350	201	955	92	630	6	415	26	408	116	746	1138	25
400	51	470	118	680	6	465	28	461	122	247	1467	279
400	102	715	132	680	6	465	28	466	152	442	1481	136
400	201	950	141	680	6	465	28	463	130	700	1470	40
LATERAL EXPANSION JOINT with swivel flanges · **type RM B-B · nominal pressure PN 10**												
50	51	255	12	287	16	102	20	84	30	165	42.5	11
50	103	395	13	287	16	102	20	84	35	300	42.1	5
50	204	560	13	287	16	102	20	84	44	454	42.1	2
65	53	285	14	307	16	122	20	100	32	192	62.8	14
65	106	415	15	307	16	122	20	105	38	318	65.5	10
65	205	585	16	307	16	122	20	105	48	478	65.5	4
80	54	320	16	322	16	138	20	114	45	215	83.2	18
80	102	450	17	322	16	138	20	118	44	344	86	14
80	204	660	19	322	16	138	20	118	55	545	86	5

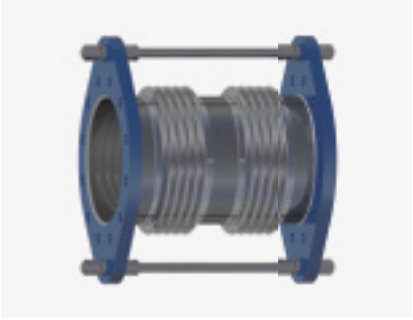
Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 16 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange			Bellows				Lateral adjustment force rate
					Borehole patter nacc. to EN 1092	Collar diameter	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	d1	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	mm	cm²	N/mm
100	51	310	19	342	16	158	22	142	40	205	127	21
100	102	470	21	342	16	158	22	142	55	355	127	11
100	204	735	23	342	16	158	22	143	101	571	127	7
125	51	325	24	372	16	188	22	174	46	216	191	39
125	101	435	25	372	16	188	22	174	64	304	190	23
125	200	665	28	372	16	188	22	175	83	513	191	11
150	50	365	31	407	16	212	24	207	52	242	274	66
150	101	510	32	407	16	212	24	206	69	369	272	24
150	203	705	37	407	16	212	24	208	96	496	273	18
200	51	415	45	480	10	268	24	266	77	227	457	117
200	102	560	48	480	10	268	24	264	80	370	453	45
200	203	815	53	480	10	268	24	265	102	602	453	22
250	52	420	59	535	10	320	26	320	84	219	684	197
250	101	595	65	535	10	320	26	321	108	373	684	89
250	204	835	74	535	10	320	26	324	114	604	689	39
300	51	445	74	597	10	370	26	373	89	239	945	240
300	102	645	81	597	10	370	26	374	114	414	945	106
300	203	900	92	597	10	370	26	378	120	660	954	45
LATERAL EXPANSION JOINT with swivel flanges · **type RM B-B · nominal pressure PN 16**												
50	51	300	12	287	16	102	20	84	22	217	42.5	8
50	103	395	13	287	16	102	20	84	35	300	42.1	5
50	201	665	14	287	16	102	20	84	43	563	41.8	3
65	52	340	15	307	16	122	20	100	24	254	62.8	11
65	101	490	16	307	16	122	20	105	29	399	65.5	8
65	204	705	17	307	16	122	20	105	38	608	65.5	3
80	50	360	16	322	16	138	20	114	34	264	83.2	16
80	102	475	17	322	16	138	20	118	43	373	86.6	8
80	204	775	19	322	16	138	20	118	44	669	86	4
100	50	310	20	342	16	158	22	142	58	188	127	56
100	105	455	23	342	16	158	22	144	80	310	127	34
100	203	690	24	342	16	158	22	142	96	526	125	12
125	53	370	26	378	16	188	22	175	64	239	191	66
125	103	490	27	378	16	188	22	175	67	357	191	27
125	197	745	30	378	16	188	22	175	86	591	190	13
150	53	395	35	425	16	212	24	206	71	256	272	79
150	101	565	39	425	16	212	24	209	76	381	274	45
150	201	790	44	425	16	212	24	208	100	580	271	22
200	51	425	50	480	16	268	26	264	82	227	452	188
200	102	610	57	480	16	268	26	268	108	388	457	95
200	200	870	65	480	16	268	26	270	116	636	457	44
250	53	480	74	557	16	320	29	320	87	267	683	221
250	105	705	84	557	16	320	29	324	114	459	689	111
250	209	1090	94	557	16	320	29	324	114	844	689	34

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 16 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

LATERAL EXPANSION JOINT with fixed flanges **Type RM F-F**

TYPE RM F-F ≥ DN 100



TYPE RM F-F ≤ DN 80

Design type RM F-F

HKS lateral 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 standardised fixed flanges in line with EN 1092-1 type 01 and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Bauteil			Permitted operating temperature TS [2]
	Metal bellows, collar	Flange, middle pipe	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	8.8 [5]	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

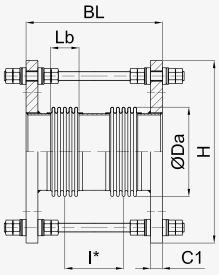
Tasks

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

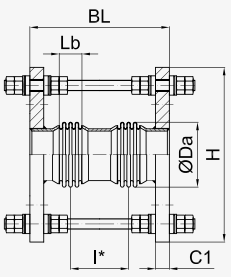
Areas of application

› 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

DN 100 - DN 800



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with fixed flanges · **type RM F-F · nominal pressure PN 6**											
50	51	250	7.7	262	6	16	84	30	160	42.5	11
50	102	345	8.1	262	6	16	84	37	247	42.5	4
50	199	550	9	262	6	16	84	44	444	42.1	2
65	51	230	8.8	282	6	16	105	33	138	66.4	15
65	102	380	9.5	282	6	16	100	40	280	62.8	6
65	200	565	11	282	6	16	105	48	458	65.5	4
80	52	275	13	312	6	18	117	42	167	86.1	19
80	100	410	14	312	6	18	118	53	293	86.6	10
80	201	545	15	312	6	18	118	62	422	86	5
100	52	275	14	332	6	18	139	53	163	123	25
100	102	415	16	332	6	18	142	84	269	125	18
100	202	555	17	332	6	18	142	87	407	125	7
125	52	285	20	362	6	20	173	61	161	188	44
125	101	445	22	362	6	20	174	78	273	189	21
125	206	590	23	362	6	20	172	80	450	186	8
150	51	340	23	387	6	20	207	69	179	271	74
150	102	430	25	387	6	20	208	71	266	271	28
150	205	615	27	387	6	20	206	92	427	267	14
200	52	360	33	442	6	22	265	76	186	451	97
200	102	475	36	442	6	22	263	99	279	447	57
200	203	700	41	442	6	22	265	123	478	449	25
250	51	385	45	503	6	24	321	80	205	683	127
250	104	520	50	503	6	24	319	105	315	677	72
250	215	730	56	503	6	24	323	110	520	684	29
300	51	420	61	580	6	24	374	85	225	943	155
300	101	570	70	580	6	24	377	114	349	948	110
300	200	750	75	580	6	24	377	116	526	946	41
350	54	415	78	630	6	26	405	92	247	1124	167
350	103	550	87	630	6	26	412	122	347	1139	123
350	202	765	93	630	6	26	409	124	559	1129	46
400	50	460	119	680	6	28	465	98	248	1474	265
400	100	595	129	680	6	28	466	128	353	1474	149
400	202	855	142	680	6	28	467	134	604	1474	66
450	50	475	141	735	6	30	519	106	251	1853	303
450	100	585	147	735	6	30	516	108	388	1840	132
450	203	915	162	735	6	30	517	138	688	1842	55
500	51	505	153	785	6	30	571	114	269	2265	346
500	101	635	165	785	6	30	578	119	399	2291	184
500	202	900	184	785	6	30	575	154	624	2272	91
600	51	560	206	907	6	32	673	119	309	3210	430
600	101	695	222	907	6	32	684	124	439	3258	219

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
600	200	980	249	907	6	32	680	160	690	3232	110
700	50	615	317	1028	6	40	790	128	338	4389	719
700	102	750	329	1028	6	40	789	130	470	4382	258
700	201	1150	374	1028	6	40	788	202	802	4369	139
800	51	655	401	1143	6	44	896	141	351	5699	832
800	100	820	438	1143	6	44	900	184	474	5715	484
800	201	1095	454	1143	6	44	900	148	788	5715	134
LATERAL EXPANSION JOINT with fixed flanges · **type RM F-F · nominal pressure PN 10**											
50	51	260	12	287	16	20	84	30	165	42.5	11
50	102	350	12	287	16	20	84	44	244	42.1	6
50	203	600	13	287	16	20	84	52	482	41.8	3
65	52	285	14	307	16	20	100	32	187	62.8	15
65	103	370	15	307	16	20	105	48	258	65.5	12
65	202	575	16	307	16	20	105	49	459	65.1	3
80	51	305	16	322	16	20	118	43	198	86.6	27
80	103	415	17	322	16	20	118	55	295	86	15
80	203	555	18	322	16	20	118	61	431	85.5	6
100	51	305	20	342	16	22	141	55	185	125	34
100	102	420	21	342	16	22	143	58	298	125	18
100	200	620	22	342	16	22	141	58	498	123	5
125	50	310	24	372	16	22	174	63	183	188	59
125	101	425	25	372	16	22	172	64	299	185	23
125	202	665	27	372	16	22	173	83	518	186	10
150	50	335	30	407	16	24	204	69	199	266	76
150	102	495	33	407	16	24	208	73	313	271	36
150	202	710	38	407	16	24	210	100	500	271	23
200	51	380	43	480	10	24	257	76	236	436	100
200	100	530	49	480	10	24	267	82	342	453	64
200	206	750	55	480	10	24	267	108	533	450	29
250	51	410	59	535	10	26	318	84	214	674	201
250	102	540	64	535	10	26	323	88	338	682	88
250	201	800	73	535	10	26	323	114	574	681	40
300	51	440	75	597	10	26	377	92	237	948	296
300	101	580	83	597	10	26	376	120	350	942	152
300	200	900	100	597	10	26	380	154	634	948	74
350	50	415	104	657	10	30	412	98	228	1139	350
350	100	575	113	657	10	30	413	103	383	1139	162
350	199	945	127	657	10	30	411	154	704	1133	60
400	51	505	151	705	10	32	464	126	286	1470	364
400	107	700	165	705	10	32	467	134	474	1474	180
400	200	990	183	705	10	32	469	142	752	1474	90
450	50	475	191	767	10	36	516	111	261	1836	484
450	100	690	210	767	10	36	522	144	444	1856	236
450	200	1010	233	767	10	36	524	152	752	1856	105

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
500	51	475	227	822	10	38	573	124	244	2265	747
500	103	685	254	822	10	38	581	162	412	2291	363
500	210	1025	285	822	10	38	582	170	710	2291	149
600	50	595	323	948	10	42	685	128	308	3258	932
600	102	775	354	948	10	42	687	168	448	3258	448
600	202	1090	392	948	10	42	688	176	756	3258	191
700	51	605	482	1087	10	50	790	135	335	4383	1066
700	102	800	520	1087	10	50	791	176	486	4376	534
700	201	1120	571	1087	10	50	794	184	794	4389	227
LATERAL EXPANSION JOINT with fixed flanges · **type RM F-F · nominal pressure PN 16**											
50	52	265	12	287	16	20	84	35	165	42.1	16
50	102	410	13	287	16	20	84	43	303	41.8	8
50	202	610	13	287	16	20	84	52	492	41.8	3
65	52	275	15	307	16	20	105	38	173	65.5	31
65	103	420	15	307	16	20	103	53	303	64.1	10
65	199	695	17	307	16	20	105	39	589	65.1	3
80	51	310	16	322	16	20	118	43	203	86.6	26
80	102	465	17	322	16	20	118	44	354	86	13
80	202	635	18	322	16	20	118	49	524	85.5	5
100	51	310	20	342	16	22	140	58	188	123	54
100	103	465	21	342	16	22	141	75	325	123	24
100	202	720	24	342	16	22	142	94	564	124	10
125	50	340	25	378	16	22	174	64	214	188	70
125	101	475	27	378	16	22	173	67	347	186	28
125	200	680	31	378	16	22	176	92	522	187	18
150	51	380	35	425	16	24	204	71	241	266	87
150	102	540	38	425	16	24	209	76	356	271	44
150	200	805	46	425	16	24	212	108	588	271	32
200	50	435	53	480	16	26	268	87	237	453	274
200	100	590	56	480	16	26	267	108	368	451	96
200	201	915	66	480	16	26	269	137	667	453	42
250	51	495	78	557	16	29	324	92	277	684	334
250	101	660	83	557	16	29	324	114	419	684	119
250	209	1065	99	557	16	29	325	144	794	684	49
300	51	525	106	628	16	32	378	96	296	948	406
300	101	710	114	628	16	32	377	120	460	945	144
300	202	1115	135	628	16	32	379	152	832	948	63
350	51	495	138	688	16	35	413	103	293	1139	460
350	101	690	151	688	16	35	415	109	479	1139	217
350	200	995	165	688	16	35	414	136	756	1136	74
400	51	520	202	732	16	38	467	108	308	1474	527
400	101	700	209	732	16	38	460	108	488	1449	177

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
400	200	1060	236	732	16	38	466	142	812	1466	86
450	51	545	265	808	16	42	520	116	316	1848	627
450	100	740	285	808	16	42	524	122	502	1856	293
450	204	1060	316	808	16	42	522	160	780	1842	131
500	51	595	333	883	16	46	571	124	344	2256	717
500	100	750	355	883	16	46	581	130	490	2290	333
500	201	1120	391	883	16	46	574	170	820	2254	155
600	50	655	538	1032	16	55	686	133	373	3258	1167
600	101	855	561	1032	16	55	683	135	575	3240	396
600	200	1225	637	1032	16	55	690	186	886	3258	245
LATERAL EXPANSION JOINT with fixed flanges · **type RM F-F · nominal pressure PN 25**											
50	50	305	12	287	40	20	84	35	205	41.8	22
50	99	460	13	287	40	20	85	43	353	42.4	11
50	204	700	14	287	40	20	85	51	581	42.4	4
65	51	315	16	307	40	22	105	29	219	65.5	26
65	101	495	17	307	40	22	105	30	400	65.1	7
65	199	790	19	307	40	22	103	42	682	64.1	3
80	51	305	19	322	40	24	118	37	202	85.5	43
80	102	480	20	322	40	24	118	37	377	85.5	13
80	201	830	22	322	40	24	118	37	727	85.5	4
100	51	345	27	363	40	26	141	60	215	123	67
100	104	560	30	363	40	26	145	84	404	125	40
100	204	805	32	363	40	26	145	101	631	125	14
125	51	370	37	410	40	28	173	69	224	185	106
125	102	540	41	410	40	28	177	92	372	188	53
125	201	800	43	410	40	28	176	74	649	187	15
150	51	430	47	440	40	30	208	74	274	271	113
150	101	655	51	440	40	30	209	96	476	271	53
150	200	910	58	440	40	30	210	128	698	268	30
200	51	495	71	512	25	32	267	84	324	453	198
200	102	630	75	512	25	32	267	87	457	451	80
200	201	990	87	512	25	32	269	114	784	453	37
250	50	480	102	593	25	35	323	92	292	681	323
250	101	715	115	593	25	35	326	98	473	684	143
250	205	1185	130	593	25	35	325	120	920	684	44
300	52	545	144	677	25	38	374	96	346	936	374
300	101	765	160	677	25	38	379	126	536	948	179
300	201	1255	182	677	25	38	373	152	1002	930	60
350	51	575	197	747	25	42	405	103	363	1116	441
350	101	730	211	747	25	42	414	109	509	1136	201
350	200	1135	241	747	25	42	416	144	874	1139	92
400	50	600	308	788	25	48	468	112	362	1473	695
400	101	865	327	788	25	48	464	140	600	1461	239
400	201	1130	366	788	25	48	472	160	840	1474	145
450	51	610	415	862	25	54	525	128	338	1856	1103

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
450	101	790	430	862	25	54	522	128	518	1842	369
450	200	1195	482	862	25	54	525	170	880	1846	171
500	51	625	489	922	25	58	581	136	336	2284	1272
500	100	830	522	922	25	58	584	144	534	2291	570
500	201	1275	568	922	25	58	577	180	940	2259	194

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / S235JR / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

LATERAL EXPANSION JOINT with welding ends **Type RM R-R**

TYPE RM R-R ≥ DN 100

TYPE RM R-R ≤ DN 80

Design type RM R-R

HKS lateral expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with middle pipe and welding ends (pipe nozzle) made of standard pipes in line with EN 10216/10217 ff or rolled sheet metal in line with EN 10028 ff and tension rods for absorbing the axial reaction forces.

Materialcombination [1]	Component			Permitted operating temperature TS [2]
	Metal bellows	pipe	Tension rods [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	8.8 [5]	-10 °C bis 400 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		A4 [4]	-196 °C bis 550 °C
Heat resistant steel	1.4828 (X15CrNiSi20-12)		[4]	bis 900 °C
Nickel-base alloy	2.4858 (NiCr21Mo - Incoloy 825)		[4]	-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. Selection of the Material combination depending on installation and ambient conditions.
   Placement of the inner fixing only under operating conditions with vacuum (negative pressure).
5. Standard version with threaded rods/nuts made of 8.8/8 and spherical/conical washers made of case-hardened steel. All components are galvanised.

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

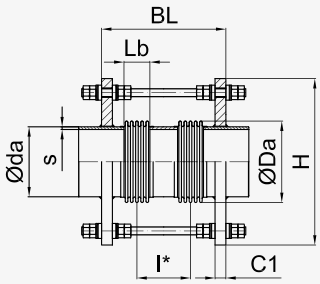
Tasks

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

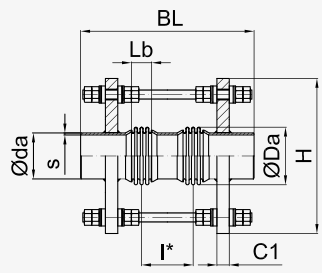
Areas of application

› Mechanical engineering, plant engineering, apparatus building, pipeline constructions and ship building
› Food processing industry
› Gas 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 1800



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. The figures include inner and outer tie rods for operating conditions with excess pressure and negative pressure. The inner tie rod is omitted when only inner excess pressure is present.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with welding ends · **type RM R-R · nominal pressure PN 6**											
50	51	420	3.7	206	60.3	2.9	84	30	160	42.5	11
50	102	515	4	206	60.3	2.9	84	37	247	42.5	4
50	201	725	5	206	60.3	2.9	84	44	449	42.1	2
65	51	400	4.4	227	76.1	2.9	105	33	138	66.4	15
65	101	525	5.4	227	76.1	2.9	105	48	248	65.5	12
65	202	740	6.6	227	76.1	2.9	105	49	459	65.1	3
80	52	435	5.4	240	88.9	3.2	118	45	160	87	19
80	102	525	6.3	240	88.9	3.2	118	62	232	86	15
80	202	675	7.4	240	88.9	3.2	118	75	370	86	5
100	50	465	7.7	264	114.3	3.6	142	66	166	132	32
100	99	590	9.3	264	114.3	3.6	142	69	289	132	17
100	201	780	12	264	114.3	3.6	142	83	468	132	6
125	51	460	11	296	139.7	4.0	174	62	167	197	54
125	100	560	13	297	139.7	4.0	175	80	250	198	27
125	202	815	16	297	139.7	4.0	175	96	486	198	10
150	52	470	14	328	168.3	4.5	206	68	168	280	66
150	97	605	17	330	168.3	4.5	208	88	283	282	37
150	201	840	22	331	168.3	4.5	209	92	517	283	16
200	51	510	23	385	219.1	6.3	263	74	204	461	81
200	100	665	28	387	219.1	6.3	265	94	339	465	39
200	201	850	36	389	219.1	6.3	267	100	520	468	19
250	51	550	36	446	273	6.3	318	79	229	692	104
250	101	720	43	449	273	6.3	321	100	380	699	49
250	204	955	55	451	273	6.3	323	106	606	703	21
300	51	575	50	510	323.9	7.1	370	84	249	954	128
300	100	765	60	513	323.9	7.1	373	106	416	962	60
300	200	1005	76	515	323.9	7.1	375	112	652	966	26
350	51	585	60	550	355.6	8.0	410	92	252	1160	188
350	101	805	74	551	355.6	8.0	411	116	446	1162	82
350	200	1015	93	551	355.6	8.0	411	124	649	1163	35
400	50	595	79	604	406.4	8.0	464	96	256	1498	220
400	101	820	96	605	406.4	8.0	465	122	457	1500	95
400	200	1070	121	606	406.4	8.0	466	130	700	1505	50
450	50	625	89	654	457	8.0	514	104	279	1863	264
450	101	845	108	657	457	8.0	517	132	472	1874	112
450	200	1095	138	661	457	8.0	521	140	715	1890	54
500	50	630	102	717	508	8.0	577	114	274	2322	369
500	101	925	133	718	508	8.0	578	146	536	2326	180
500	201	1120	161	719	508	8.0	579	155	725	2331	70
600	51	635	149	833	610	8.0	681	121	261	3285	561
600	108	880	180	835	610	8.0	683	154	474	3294	224

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
600	201	1245	232	835	610	8.0	683	161	831	3297	78
700	51	680	196	958	711	8.0	790	130	300	4440	816
700	101	905	221	954	711	8.0	786	162	492	4414	293
700	202	1350	296	959	711	8.0	791	168	928	4447	96
800	47	685	220	1062	813	8.0	894	143	293	5742	1122
800	98	990	311	1068	813	8.0	900	184	544	5781	521
800	201	1380	386	1069	813	8.0	901	190	930	5789	136
900	50	845	327	1189	914	8.0	997	141	441	7188	1020
900	100	1115	371	1189	914	8.0	997	176	676	7188	351
900	200	1500	461	1192	914	8.0	1000	184	1054	7213	121
1000	51	865	388	1306	1016	8.0	1114	152	452	8934	1553
1000	100	1140	440	1306	1016	8.0	1114	190	690	8934	540
1000	200	1475	507	1300	1016	8.0	1108	233	983	8880	216
1200	50	845	578	1537	1219	10.0	1321	172	402	12696	2283
1200	100	1100	648	1537	1219	10.0	1321	214	614	12696	795
1200	202	1665	847	1539	1219	10.0	1323	222	1172	12712	299
1400	50	915	724	1739	1422	10.0	1523	178	468	17058	3793
1400	100	1360	869	1738	1422	10.0	1522	220	870	17053	1301
1400	200	1865	1054	1739	1422	10.0	1523	222	1372	17058	367
1600	51	1100	960	1942	1626	10.0	1726	184	634	22102	4428
1600	100	1480	1108	1942	1626	10.0	1726	230	970	22102	1527
1600	200	2000	1365	1944	1626	10.0	1728	240	1480	22128	569
1800	50	1055	1143	2144	1829	12.0	1928	192	582	27760	6841
1800	101	1430	1340	2144	1829	12.0	1928	240	910	27760	2267
1800	201	2010	1645	2144	1829	12.0	1928	288	1438	27760	764
LATERAL EXPANSION JOINT with welding ends · **type RM R-R · nominal pressure PN 10**											
50	52	430	3.8	206	60.3	2.9	84	35	165	42.1	16
50	102	520	4.1	206	60.3	2.9	84	44	244	42.1	6
50	201	760	5.3	206	60.3	2.9	84	52	477	41.8	3
65	51	435	4.8	227	76.1	2.9	105	38	168	65.5	33
65	103	535	5.4	227	76.1	2.9	105	48	258	65.5	12
65	202	740	6.6	227	76.1	2.9	105	49	459	65.1	3
80	50	460	5.9	240	88.9	3.2	118	44	184	86	46
80	101	575	6.8	240	88.9	3.2	118	55	290	86	15
80	203	720	7.9	240	88.9	3.2	118	61	431	85.5	6
100	51	485	8.1	263	114.3	3.6	141	53	203	131	29
100	100	690	11	264	114.3	3.6	142	68	388	132	13
100	201	880	13	263	114.3	3.6	141	69	579	131	5
125	51	485	11	293	139.7	4.0	171	62	192	194	55
125	100	690	14	296	139.7	4.0	174	78	378	197	22
125	201	870	17	298	139.7	4.0	176	84	554	199	12
150	51	550	18	329	168.3	4.5	207	69	239	281	77
150	101	755	22	330	168.3	4.5	208	88	423	282	33
150	200	875	25	330	168.3	4.5	208	92	542	282	16
200	50	550	30	404	219.1	6.3	264	76	236	464	105

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
200	100	745	37	405	219.1	6.3	265	96	406	466	46
200	202	995	46	406	219.1	6.3	266	123	633	467	25
250	50	615	42	462	273	6.3	322	82	292	701	166
250	100	805	49	461	273	6.3	321	102	462	699	57
250	201	1080	62	462	273	6.3	322	130	710	701	31
300	50	645	65	528	323.9	7.1	376	87	307	969	200
300	100	870	76	525	323.9	7.1	373	108	508	962	69
300	200	1065	90	529	323.9	7.1	377	116	696	971	40
350	51	655	76	562	355.6	8.0	410	93	313	1159	214
350	101	810	88	564	355.6	8.0	412	122	437	1165	128
350	201	1150	115	565	355.6	8.0	413	128	768	1169	57
400	50	725	93	606	406.4	8.0	466	101	381	1502	386
400	100	965	110	606	406.4	8.0	466	126	596	1502	127
400	201	1080	125	605	406.4	8.0	465	135	705	1501	70
450	50	740	125	673	457	8.0	521	109	379	1887	434
450	101	975	144	673	457	8.0	521	136	586	1887	147
450	200	1170	168	674	457	8.0	522	144	774	1892	77
500	50	725	137	730	508	8.0	578	117	357	2326	500
500	101	975	158	727	508	8.0	575	146	576	2316	171
500	201	1140	190	731	508	8.0	579	160	730	2331	118
600	48	830	211	852	610	8.0	684	125	445	3304	872
600	101	990	234	853	610	8.0	685	160	570	3308	335
600	203	1265	272	851	610	8.0	683	166	836	3298	132
700	50	775	282	983	711	10.0	791	135	380	4447	1174
700	99	1010	319	983	711	10.0	791	168	578	4447	410
700	201	1475	413	985	711	10.0	793	176	1036	4456	174
800	50	865	381	1093	813	10.0	901	152	442	5789	1859
800	100	1140	434	1093	813	10.0	901	190	680	5789	637
800	201	1465	503	1094	813	10.0	902	192	1002	5792	210
900	50	885	528	1222	914	15.0	1006	152	462	7261	2098
900	100	1170	614	1222	914	15.0	1006	190	710	7261	720
900	202	1525	737	1223	914	15.0	1007	192	1062	7264	228
1000	50	890	607	1308	1016	15.0	1116	160	450	8951	2319
1000	101	1170	700	1308	1016	15.0	1116	200	690	8951	800
1000	200	1615	858	1302	1016	15.0	1110	202	1132	8897	259
1200	50	940	807	1540	1219	15.0	1324	184	474	12728	4157
1200	100	1240	933	1540	1219	15.0	1324	230	730	12728	1426
1200	200	1715	1135	1540	1219	15.0	1324	276	1156	12728	481
LATERAL EXPANSION JOINT with welding ends · **type RM R-R · nominal pressure PN 16**											
50	52	430	3.8	206	60.3	2.9	84	35	165	42.1	16
50	102	575	4.5	206	60.3	2.9	84	43	303	41.8	8
50	202	775	5.3	206	60.3	2.9	84	52	492	41.8	3

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

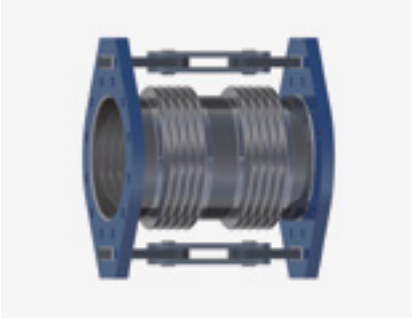
Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
65	51	465	4.9	225	76.1	2.9	103	42	192	64.1	31
65	101	550	5.6	227	76.1	2.9	105	39	279	65.1	10
65	201	835	6.9	225	76.1	2.9	103	53	553	64.1	4
80	51	475	5.8	240	88.9	3.2	118	43	203	86.6	26
80	101	625	7	240	88.9	3.2	118	44	349	86	13
80	202	805	8.4	240	88.9	3.2	118	49	524	85.5	5
100	51	510	11	263	114.3	3.6	141	56	216	131	43
100	102	695	13	265	114.3	3.6	143	72	382	133	21
100	200	880	15	265	114.3	3.6	143	75	565	133	9
125	51	520	14	302	139.7	4.0	174	64	214	197	73
125	101	775	18	303	139.7	4.0	175	80	455	198	25
125	202	1030	22	303	139.7	4.0	175	83	703	199	10
150	50	590	21	348	168.3	4.5	208	71	281	282	94
150	101	790	24	346	168.3	4.5	206	88	458	280	32
150	201	960	30	350	168.3	4.5	210	101	616	286	26
200	50	670	40	407	219.1	6.3	267	80	340	468	176
200	101	880	46	407	219.1	6.3	267	100	530	468	59
200	201	1055	55	408	219.1	6.3	268	88	718	472	29
250	51	720	55	475	273	6.3	323	85	385	703	217
250	100	945	64	475	273	6.3	323	106	586	703	76
250	201	1140	75	476	273	6.3	324	114	774	707	39
300	50	750	83	545	323.9	7.1	377	90	400	971	269
300	101	995	96	545	323.9	7.1	377	112	622	971	90
300	201	1210	112	546	323.9	7.1	378	120	830	974	47
350	51	755	97	579	355.6	8.0	411	96	396	1163	296
350	101	990	112	579	355.6	8.0	411	120	610	1163	102
350	201	1350	140	580	355.6	8.0	412	154	934	1166	57
400	50	830	121	618	406.4	8.0	466	104	474	1505	476
400	100	1110	143	618	406.4	8.0	466	130	730	1505	162
400	201	1460	173	619	406.4	8.0	467	134	1074	1508	60
450	50	745	156	690	457	8.0	522	116	371	1893	679
450	99	970	175	690	457	8.0	522	144	564	1893	237
450	196	1395	221	692	457	8.0	524	152	982	1899	106
500	51	770	173	744	508	8.0	576	124	384	2318	752
500	101	1070	230	772	508	8.0	580	160	650	2338	346
500	200	1365	262	773	508	8.0	581	162	942	2339	119
600	50	855	288	878	610	10.0	686	133	453	3314	1245
600	100	1135	328	878	610	10.0	686	166	696	3314	426
600	201	1480	381	878	610	10.0	686	168	1038	3313	141
700	50	890	364	1007	711	10.0	791	140	480	4446	1486
700	101	1200	417	1007	711	10.0	791	174	754	4446	485
700	201	1710	501	1005	711	10.0	789	209	1229	4433	167
LATERAL EXPANSION JOINT with welding ends · **type RM R-R · nominal pressure PN 25**											
50	50	470	4	206	60.3	2.9	84	35	205	41.8	22
50	102	645	5.7	207	60.3	2.9	85	43	363	42.4	10

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
50	204	875	6.6	207	60.3	2.9	85	51	581	42.4	4
65	51	490	6	227	76.1	2.9	105	29	219	65.5	26
65	101	670	7	227	76.1	2.9	105	30	400	65.1	7
65	202	975	8.5	225	76.1	2.9	103	42	692	64.1	3
80	51	480	7.2	240	88.9	3.2	118	37	202	85.5	43
80	102	655	8.4	240	88.9	3.2	118	37	377	85.5	13
80	201	1005	11	240	88.9	3.2	118	37	727	85.5	4
100	50	545	12	271	114.3	3.6	143	58	248	133	61
100	100	875	15	271	114.3	3.6	143	72	562	133	19
100	199	1170	18	271	114.3	3.6	143	75	855	133	8
125	51	620	19	315	139.7	4.0	175	64	304	198	70
125	100	920	24	316	139.7	4.0	176	84	584	199	35
125	200	1155	27	316	139.7	4.0	176	86	816	199	12
150	51	700	26	349	168.3	4.5	209	74	374	283	119
150	100	905	30	349	168.3	4.5	209	92	562	283	43
150	202	1100	35	350	168.3	4.5	210	100	750	286	23
200	50	700	47	418	219.1	6.3	266	80	360	467	164
200	100	1010	58	419	219.1	6.3	267	104	644	470	75
200	200	1310	69	420	219.1	6.3	268	108	938	472	29
250	50	820	73	491	273	7.1	323	88	468	705	279
250	100	1100	86	491	273	7.1	323	110	730	705	92
250	200	1430	103	492	273	7.1	324	114	1054	707	36
300	50	855	110	569	323.9	8.0	377	93	493	973	337
300	100	1155	128	569	323.9	8.0	377	116	766	973	113
300	201	1510	152	570	323.9	8.0	378	120	1120	975	42
350	51	845	136	606	355.6	8.0	414	108	458	1173	620
350	100	1110	154	606	355.6	8.0	414	134	694	1173	217
350	200	1445	178	607	355.6	8.0	415	136	1026	1174	71
400	50	845	197	660	406.4	10.0	468	112	462	1512	742
400	101	1130	224	660	406.4	10.0	468	140	720	1512	246
400	201	1475	260	661	406.4	10.0	469	142	1062	1513	81
450	50	850	219	715	457	10.0	523	120	460	1898	835
450	100	1120	248	715	457	10.0	523	150	700	1898	291
450	200	1680	306	711	457	10.0	519	180	1230	1882	95
500	51	765	262	774	508	10.0	582	136	346	2344	1355
500	100	1080	302	774	508	10.0	582	170	630	2346	490
500	201	1590	340	770	508	10.0	578	204	1114	2326	162

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH / 8.8. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

LATERAL EXPANSION JOINT with fixed flanges **Type LM F-F**

TYPE LM F-F ≥ DN 100



TYPE LM F-F ≤ DN 80

Tasks

- Absorption of one-sided lateral movements
- Reduction of tensions in the pipe system
- 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

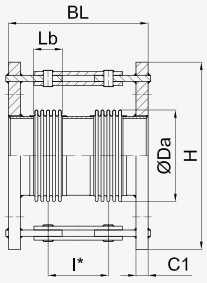
Design type LM F-F

HKS lateral 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 standardised fixed flanges in line with EN 1092-1 type 01 and double joint tensioners for absorbing the axial reaction forces.

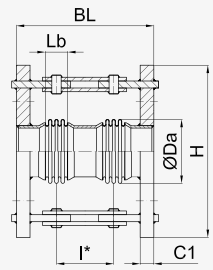
Materialcombination [1]	Component		Permitted operating temperature TS [2]
	Metal bellows, collar	Flange, middle pipe, joint tensioners [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0038 (S235JR)	-10 °C bis 300 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-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.
4. Selection of the Material combination depending on installation and ambient conditions.

DN 100 - DN 800



DN 50 - DN 80



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	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with fixed flanges · **type LM F-F · nominal pressure PN 6**											
50	51	250	8.6	256	6	16	84	30	160	42.5	11
50	102	345	9.2	256	6	16	84	37	247	42.5	4
50	199	550	11	256	6	16	84	44	444	42.1	2
65	51	230	9.9	276	6	16	105	33	138	66.4	15
65	102	380	11	276	6	16	100	40	280	62.8	6
65	200	565	13	276	6	16	105	48	458	65.5	4
80	52	275	14	306	6	18	117	42	167	86.1	19
80	100	410	15	306	6	18	118	53	293	86.6	10
80	201	545	17	306	6	18	118	62	422	86	5
100	52	275	16	326	6	18	139	53	163	123	25
100	102	415	17	326	6	18	142	84	269	125	18
100	202	555	19	326	6	18	142	87	407	125	7
125	52	285	21	356	6	20	173	61	161	188	44
125	101	445	23	356	6	20	174	78	273	189	21
125	206	590	25	356	6	20	172	80	450	186	8
150	51	340	25	381	6	20	207	69	179	271	74
150	102	430	27	381	6	20	208	71	266	271	28
150	205	615	30	381	6	20	206	92	427	267	14
200	52	360	39	448	6	22	265	76	186	451	97
200	102	475	43	448	6	22	263	99	279	447	57
200	203	700	49	448	6	22	265	123	478	449	25
250	51	385	56	517	6	24	321	80	205	683	127
250	104	520	62	517	6	24	319	105	315	677	72
250	215	730	71	517	6	24	323	110	520	684	29
300	51	420	75	592	6	24	374	85	225	943	155
300	101	570	87	592	6	24	377	114	349	948	110
300	200	750	95	592	6	24	377	116	526	946	41
350	54	415	93	642	6	26	405	92	247	1124	167
350	103	550	105	642	6	26	412	122	347	1139	123
350	202	765	114	642	6	26	409	124	559	1129	46
400	50	460	123	700	6	28	465	98	248	1474	265
400	100	595	136	700	6	28	466	128	353	1474	149
400	202	855	155	700	6	28	467	134	604	1474	66
450	50	475	147	755	6	30	519	106	251	1853	303
450	100	585	155	755	6	30	516	108	388	1840	132
450	203	915	178	755	6	30	517	138	688	1842	55
500	51	505	162	805	6	30	571	114	269	2265	346
500	101	635	177	805	6	30	578	119	399	2291	184
500	202	900	202	805	6	30	575	154	624	2272	91
600	51	560	249	955	6	32	673	119	309	3210	430
600	101	695	273	955	6	32	684	124	439	3258	219

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 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.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
600	200	980	312	955	6	32	680	160	690	3232	110
700	50	615	398	1082	6	40	790	128	338	4389	719
700	102	750	419	1082	6	40	789	130	470	4382	258
700	201	1150	493	1082	6	40	788	202	802	4369	139
800	51	655	502	1197	6	44	896	141	351	5699	832
800	100	820	550	1197	6	44	900	184	474	5715	484
800	201	1095	585	1197	6	44	900	148	788	5715	134
LATERAL EXPANSION JOINT with fixed flanges · **type LM F-F · nominal pressure PN 10**											
50	51	260	13	281	16	20	84	30	165	42.5	11
50	102	350	14	281	16	20	84	44	244	42.1	6
50	203	600	16	281	16	20	84	52	482	41.8	3
65	52	285	15	301	16	20	100	32	187	62.8	15
65	103	370	16	301	16	20	105	48	258	65.5	12
65	202	575	18	301	16	20	105	49	459	65.1	3
80	51	305	17	316	16	20	118	43	198	86.6	27
80	103	415	18	316	16	20	118	55	295	86	15
80	203	555	20	316	16	20	118	61	431	85.5	6
100	51	305	21	336	16	22	141	55	185	125	34
100	102	420	23	336	16	22	143	58	298	125	18
100	200	620	25	336	16	22	141	58	498	123	5
125	50	310	26	366	16	22	174	63	183	188	59
125	101	425	27	366	16	22	172	64	299	185	23
125	202	665	31	366	16	22	173	83	518	186	10
150	50	335	36	413	16	24	204	69	199	266	76
150	102	495	40	413	16	24	208	73	313	271	36
150	202	710	47	413	16	24	210	100	500	271	23
200	51	380	51	482	10	24	257	76	236	436	100
200	100	530	58	482	10	24	267	82	342	453	64
200	206	750	67	482	10	24	267	108	533	450	29
250	51	410	74	547	10	26	318	84	214	674	201
250	102	540	81	547	10	26	323	88	338	682	88
250	201	800	94	547	10	26	323	114	574	681	40
300	51	440	96	605	10	26	377	92	237	948	296
300	101	580	108	605	10	26	376	120	350	942	152
300	200	900	132	605	10	26	380	154	634	948	74
350	50	415	126	665	10	30	412	98	228	1139	350
350	100	575	138	665	10	30	413	103	383	1139	162
350	199	945	161	665	10	30	411	154	704	1133	60
400	51	505	177	755	10	32	464	126	286	1470	364
400	107	700	199	755	10	32	467	134	474	1474	180
400	200	990	227	755	10	32	469	142	752	1474	90
450	50	475	221	815	10	36	516	111	261	1836	484
450	100	690	250	815	10	36	522	144	444	1856	236
450	200	1010	288	815	10	36	524	152	752	1856	105

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
500	51	475	261	870	10	38	573	124	244	2265	747
500	103	685	297	870	10	38	581	162	412	2291	363
500	210	1025	344	870	10	38	582	170	710	2291	149
600	50	595	394	1002	10	42	685	128	308	3258	932
600	102	775	437	1002	10	42	687	168	448	3258	448
600	202	1090	497	1002	10	42	688	176	756	3258	191
700	51	605	580	1135	10	50	790	135	335	4383	1066
700	102	800	637	1135	10	50	791	176	486	4376	534
700	201	1120	716	1135	10	50	794	184	794	4389	227
LATERAL EXPANSION JOINT with fixed flanges · **type LM F-F · nominal pressure PN 16**											
50	52	265	13	281	16	20	84	35	165	42.1	16
50	102	410	14	281	16	20	84	43	303	41.8	8
50	202	610	16	281	16	20	84	52	492	41.8	3
65	52	275	16	301	16	20	105	38	173	65.5	31
65	103	420	17	301	16	20	103	53	303	64.1	10
65	199	695	19	301	16	20	105	39	589	65.1	3
80	51	310	18	316	16	20	118	43	203	86.6	26
80	102	465	20	316	16	20	118	44	354	86	13
80	202	635	21	316	16	20	118	49	524	85.5	5
100	51	310	22	336	16	22	140	58	188	123	54
100	103	465	24	336	16	22	141	75	325	123	24
100	202	720	27	336	16	22	142	94	564	124	10
125	50	340	30	378	16	22	174	64	214	188	70
125	101	475	32	378	16	22	173	67	347	186	28
125	200	680	38	378	16	22	176	92	522	187	18
150	51	380	43	427	16	24	204	71	241	266	87
150	102	540	48	427	16	24	209	76	356	271	44
150	200	805	59	427	16	24	212	108	588	271	32
200	50	435	67	492	16	26	268	87	237	453	274
200	100	590	74	492	16	26	267	108	368	451	96
200	201	915	89	492	16	26	269	137	667	453	42
250	51	495	100	565	16	29	324	92	277	684	334
250	101	660	109	565	16	29	324	114	419	684	119
250	209	1065	135	565	16	29	325	144	794	684	49
300	51	525	147	650	16	32	378	96	296	948	406
300	101	710	162	650	16	32	377	120	460	945	144
300	202	1115	197	650	16	32	379	152	832	948	63
350	51	495	179	710	16	35	413	103	293	1139	460
350	101	690	198	710	16	35	415	109	479	1139	217
350	200	995	223	710	16	35	414	136	756	1136	74
400	51	520	269	802	16	38	467	108	308	1474	527
400	101	700	290	802	16	38	460	108	488	1449	177

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 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.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
400	200	1060	344	802	16	38	466	142	812	1466	86
450	51	545	321	862	16	42	520	116	316	1848	627
450	100	740	355	862	16	42	524	122	502	1856	293
450	204	1060	408	862	16	42	522	160	780	1842	131
500	51	595	396	937	16	46	571	124	344	2256	717
500	100	750	428	937	16	46	581	130	490	2290	333
500	201	1120	490	937	16	46	574	170	820	2254	155
600	50	655	630	1080	16	55	686	133	373	3258	1167
600	101	855	671	1080	16	55	683	135	575	3240	396
600	200	1225	780	1080	16	55	690	186	886	3258	245
LATERAL EXPANSION JOINT with fixed flanges · **type LM F-F · nominal pressure PN 25**											
50	50	305	14	281	40	20	84	35	205	41.8	22
50	99	460	15	281	40	20	85	43	353	42.4	11
50	204	700	16	281	40	20	85	51	581	42.4	4
65	51	315	18	301	40	22	105	29	219	65.5	26
65	101	495	20	301	40	22	105	30	400	65.1	7
65	199	790	22	301	40	22	103	42	682	64.1	3
80	51	305	24	328	40	24	118	37	202	85.5	43
80	102	480	27	328	40	24	118	37	377	85.5	13
80	201	830	32	328	40	24	118	37	727	85.5	4
100	51	345	32	363	40	26	141	60	215	123	67
100	104	560	37	363	40	26	145	84	404	125	40
100	204	805	41	363	40	26	145	101	631	125	14
125	51	370	46	412	40	28	173	69	224	185	106
125	102	540	51	412	40	28	177	92	372	188	53
125	201	800	57	412	40	28	176	74	649	187	15
150	51	430	62	452	40	30	208	74	274	271	113
150	101	655	71	452	40	30	209	96	476	271	53
150	200	910	82	452	40	30	210	128	698	268	30
200	51	495	94	520	25	32	267	84	324	453	198
200	102	630	102	520	25	32	267	87	457	451	80
200	201	990	122	520	25	32	269	114	784	453	37
250	50	480	141	615	25	35	323	92	292	681	323
250	101	715	163	615	25	35	326	98	473	684	143
250	205	1185	196	615	25	35	325	120	920	684	44
300	52	545	230	707	25	38	374	96	346	936	374
300	101	765	261	707	25	38	379	126	536	948	179
300	201	1255	319	707	25	38	373	152	1002	930	60
350	51	575	288	777	25	42	405	103	363	1116	441
350	101	730	314	777	25	42	414	109	509	1136	201
350	200	1135	372	777	25	42	416	144	874	1139	92
400	50	600	363	842	25	48	468	112	362	1473	695
400	101	865	400	842	25	48	464	140	600	1461	239
400	201	1130	457	842	25	48	472	160	840	1474	145

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					Borehole pattern acc. to EN 1092	Sheet thickness	External diameter	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	PN	C1	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	-	mm	mm	mm	mm	cm²	N/mm
450	51	610	488	910	25	54	525	128	338	1856	1103
450	101	790	519	910	25	54	522	128	518	1842	369
450	200	1195	609	910	25	54	525	170	880	1846	171
500	51	625	566	970	25	58	581	136	336	2284	1272
500	100	830	618	970	25	58	584	144	534	2291	570
500	201	1275	704	970	25	58	577	180	940	2259	194

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 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.

LATERAL EXPANSION JOINT with welding ends **Type LM R-R**

TYPE LM R-R ≥ DN 100

TYPE LM R-R ≤ DN 80

Tasks

- Absorption of one-sided lateral movements
- Reduction of tensions in the pipe system
- 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

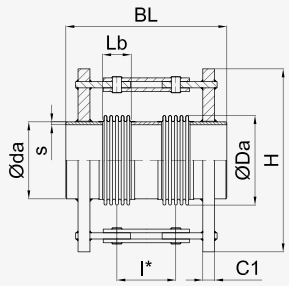
Design type LM R-R

HKS lateral expansion joint with compact design, consisting of multi-convolution and multi-layered metal bellows with middle pipe and welding ends (pipe nozzle) made of standard pipes in line with EN 10216/10217 ff or rolled sheet metal in line with EN 10028 ff and double joint tensioners for absorbing the axial reaction forces.

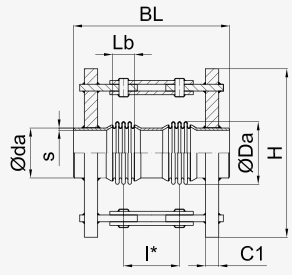
Materialcombination [1]	Component		Permitted operating temperature TS [2]
	Metal bellows	Welding end, middle pipe, joint tensioners [4]	
Standard [3]	1.4541 (X6CrNiTi18-10)	1.0345 (P235GH)	-10 °C bis 400 °C
Stainless steel	1.4541 (X6CrNiTi18-10) 1.4571 (X6CrNiMoTi17-12-2) 1.4404 (X2CrNiMo17-12-2)		-196 °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.
4. Selection of the Material combination depending on installation and ambient conditions.

DN 100 - DN 1800



DN 50 - DN 80



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	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	Outside-durchmesser	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
LATERAL EXPANSION JOINT with welding ends · **type LM R-R · nominal pressure PN 6**											
50	51	400	5.3	200	60.3	2.9	84	30	160	42.5	11
50	102	495	6.1	200	60.3	2.9	84	37	247	42.5	4
50	201	705	7.8	200	60.3	2.9	84	44	449	42.1	2
65	51	385	6	221	76.1	2.9	105	33	138	66.4	15
65	101	510	7.5	221	76.1	2.9	105	48	248	65.5	12
65	202	720	9.5	221	76.1	2.9	105	49	459	65.1	3
80	52	420	7.2	234	88.9	3.2	118	45	160	87	19
80	102	510	8.5	234	88.9	3.2	118	62	232	86	15
80	202	655	11	234	88.9	3.2	118	75	370	86	5
100	50	465	9.7	258	114.3	3.6	142	66	166	132	32
100	99	590	12	258	114.3	3.6	142	69	289	132	17
100	201	780	15	258	114.3	3.6	142	83	468	132	6
125	51	460	13	290	139.7	4.0	174	62	167	197	54
125	100	560	15	291	139.7	4.0	175	80	250	198	27
125	202	815	19	291	139.7	4.0	175	96	486	198	10
150	52	470	17	322	168.3	4.5	206	68	168	280	66
150	97	605	20	324	168.3	4.5	208	88	283	282	37
150	201	840	27	325	168.3	4.5	209	92	517	283	16
200	51	510	29	391	219.1	6.3	263	74	204	461	81
200	100	665	36	393	219.1	6.3	265	94	339	465	39
200	201	860	50	395	219.1	6.3	267	100	520	468	19
250	51	550	49	460	273	6.3	318	79	229	692	104
250	101	720	59	463	273	6.3	321	100	380	699	49
250	204	955	74	465	273	6.3	323	106	606	703	21
300	51	575	67	522	323.9	7.1	370	84	249	954	128
300	100	765	81	525	323.9	7.1	373	106	416	962	60
300	200	1005	103	527	323.9	7.1	375	112	652	966	26
350	51	585	79	562	355.6	8.0	410	92	252	1160	188
350	101	805	97	563	355.6	8.0	411	116	446	1162	82
350	200	1015	120	563	355.6	8.0	411	124	649	1163	35
400	50	595	99	624	406.4	8.0	464	96	256	1498	220
400	101	820	122	625	406.4	8.0	465	122	457	1500	95
400	200	1070	154	626	406.4	8.0	466	130	700	1505	50
450	50	635	129	674	457	8.0	514	104	279	1863	264
450	101	855	154	677	457	8.0	517	132	472	1874	112
450	200	1105	191	681	457	8.0	521	140	715	1890	54
500	50	640	148	737	508	8.0	577	114	274	2322	369
500	101	935	186	738	508	8.0	578	146	536	2326	180
500	201	1130	220	739	508	8.0	579	155	725	2331	70
600	51	635	219	881	610	8.0	681	121	261	3285	561
600	108	890	290	883	610	8.0	683	154	474	3294	224

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	Outside-durchmesser	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
600	201	1255	363	883	610	8.0	683	161	831	3297	78
700	51	690	346	1012	711	8.0	790	130	300	4440	816
700	101	915	390	1008	711	8.0	786	162	492	4414	293
700	202	1360	501	1013	711	8.0	791	168	928	4447	96
800	47	695	397	1116	813	8.0	894	143	293	5742	1122
800	98	990	479	1122	813	8.0	900	184	544	5781	521
800	201	1380	586	1123	813	8.0	901	190	930	5789	136
900	50	855	596	1237	914	8.0	997	141	441	7188	1020
900	100	1125	670	1237	914	8.0	997	176	676	7188	351
900	200	1510	802	1240	914	8.0	1000	184	1054	7213	121
1000	51	875	694	1354	1016	8.0	1114	152	452	8934	1553
1000	100	1150	777	1354	1016	8.0	1114	190	690	8934	540
1000	200	1485	884	1348	1016	8.0	1108	233	983	8880	216
1200	50	855	1205	1641	1219	10.0	1321	172	402	12696	2283
1200	100	1110	1331	1641	1219	10.0	1321	214	614	12696	795
1200	202	1675	1658	1643	1219	10.0	1323	222	1172	12712	299
1400	50	935	1685	1843	1422	10.0	1523	178	468	17058	3793
1400	100	1380	1942	1842	1422	10.0	1522	220	870	17053	1301
1400	200	1885	2256	1843	1422	10.0	1523	222	1372	17058	367
1600	51	1120	2427	2086	1626	10.0	1726	184	634	22102	4428
1600	100	1500	2698	2086	1626	10.0	1726	230	970	22102	1527
1600	200	2020	3126	2088	1626	10.0	1728	240	1480	22128	569
1800	50	1075	3076	2328	1829	12.0	1928	192	582	27760	6841
1800	101	1450	3426	2328	1829	12.0	1928	240	910	27760	2267
1800	201	2030	3969	2328	1829	12.0	1928	288	1438	27760	764
LATERAL EXPANSION JOINT with welding ends · **type LM R-R · nominal pressure PN 10**											
50	52	410	5.4	200	60.3	2.9	84	35	165	42.1	16
50	102	500	6.1	200	60.3	2.9	84	44	244	42.1	6
50	201	740	8.2	200	60.3	2.9	84	52	477	41.8	3
65	51	420	6.7	221	76.1	2.9	105	38	168	65.5	33
65	103	520	7.6	221	76.1	2.9	105	48	258	65.5	12
65	202	720	9.5	221	76.1	2.9	105	49	459	65.1	3
80	50	440	7.8	234	88.9	3.2	118	44	184	86	46
80	101	560	9.1	234	88.9	3.2	118	55	290	86	15
80	203	705	11	234	88.9	3.2	118	61	431	85.5	6
100	51	485	11	257	114.3	3.6	141	53	203	131	29
100	100	690	14	258	114.3	3.6	142	68	388	132	13
100	201	880	17	257	114.3	3.6	141	69	579	131	5
125	51	485	14	287	139.7	4.0	171	62	192	194	55
125	100	690	18	290	139.7	4.0	174	78	378	197	22
125	201	870	22	292	139.7	4.0	176	84	554	199	12
150	51	550	25	335	168.3	4.5	207	69	239	281	77
150	101	755	31	336	168.3	4.5	208	88	423	282	33
150	200	875	35	336	168.3	4.5	208	92	542	282	16
200	50	550	41	406	219.1	6.3	264	76	236	464	105

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	Outside-durchmesser	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
200	100	745	50	407	219.1	6.3	265	96	406	466	46
200	202	995	63	408	219.1	6.3	266	123	633	467	25
250	50	625	67	474	273	6.3	322	82	292	701	166
250	100	805	71	473	273	6.3	321	102	462	699	57
250	201	1090	97	474	273	6.3	322	130	710	701	31
300	50	645	92	536	323.9	7.1	376	87	307	969	200
300	100	870	109	533	323.9	7.1	373	108	508	962	69
300	200	1065	130	537	323.9	7.1	377	116	696	971	40
350	51	655	105	570	355.6	8.0	410	93	313	1159	214
350	101	810	122	572	355.6	8.0	412	122	437	1165	128
350	201	1150	158	573	355.6	8.0	413	128	768	1169	57
400	50	745	167	656	406.4	8.0	466	101	381	1502	386
400	100	985	195	656	406.4	8.0	466	126	596	1502	127
400	201	1100	214	655	406.4	8.0	465	135	705	1501	70
450	50	750	201	721	457	8.0	521	109	379	1887	434
450	101	985	233	721	457	8.0	521	136	586	1887	147
450	200	1180	268	722	457	8.0	522	144	774	1892	77
500	50	735	260	800	508	8.0	578	117	357	2326	500
500	101	985	302	797	508	8.0	575	146	576	2316	171
500	201	1150	346	801	508	8.0	579	160	730	2331	118
600	48	840	357	906	610	8.0	684	125	445	3304	872
600	101	1000	393	907	610	8.0	685	160	570	3308	335
600	203	1275	453	905	610	8.0	683	166	836	3298	132
700	50	795	516	1031	711	10.0	791	135	380	4447	1174
700	99	1030	579	1031	711	10.0	791	168	578	4447	410
700	201	1495	725	1033	711	10.0	793	176	1036	4456	174
800	50	875	626	1141	813	10.0	901	152	442	5789	1859
800	100	1150	710	1141	813	10.0	901	190	680	5789	637
800	201	1475	815	1142	813	10.0	902	192	1002	5792	210
900	50	905	947	1286	914	15.0	1006	152	462	7261	2098
900	100	1190	1079	1286	914	15.0	1006	190	710	7261	720
900	202	1545	1261	1287	914	15.0	1007	192	1062	7264	228
1000	50	910	1263	1436	1016	15.0	1116	160	450	8951	2319
1000	101	1190	1419	1436	1016	15.0	1116	200	690	8951	800
1000	200	1635	1681	1430	1016	15.0	1110	202	1132	8897	259
1200	50	960	1651	1644	1219	15.0	1324	184	474	12728	4157
1200	100	1260	1851	1644	1219	15.0	1324	230	730	12728	1426
1200	200	1735	2172	1644	1219	15.0	1324	276	1156	12728	481
LATERAL EXPANSION JOINT with welding ends · **type LM R-R · nominal pressure PN 16**											
50	52	410	5.4	200	60.3	2.9	84	35	165	42.1	16
50	102	560	6.7	200	60.3	2.9	84	43	303	41.8	8
50	202	755	8.4	200	60.3	2.9	84	52	492	41.8	3

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	Outside-durchmesser	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
65	51	445	6.8	219	76.1	2.9	103	42	192	64.1	31
65	101	530	7.8	221	76.1	2.9	105	39	279	65.1	10
65	201	820	11	219	76.1	2.9	103	53	553	64.1	4
80	51	460	8.4	234	88.9	3.2	118	43	203	86.6	26
80	101	605	11	234	88.9	3.2	118	44	349	86	13
80	202	785	13	234	88.9	3.2	118	49	524	85.5	5
100	51	510	17	269	114.3	3.6	141	56	216	131	43
100	102	695	20	271	114.3	3.6	143	72	382	133	21
100	200	880	24	271	114.3	3.6	143	75	565	133	9
125	51	520	21	302	139.7	4.0	174	64	214	197	73
125	101	775	26	303	139.7	4.0	175	80	455	198	25
125	202	1030	32	303	139.7	4.0	175	83	703	199	10
150	50	590	32	350	168.3	4.5	208	71	281	282	94
150	101	790	38	348	168.3	4.5	206	88	458	280	32
150	201	960	46	352	168.3	4.5	210	101	616	286	26
200	50	670	59	419	219.1	6.3	267	80	340	468	176
200	101	880	70	419	219.1	6.3	267	100	530	468	59
200	201	1055	82	420	219.1	6.3	268	88	718	472	29
250	51	720	84	483	273	6.3	323	85	385	703	217
250	100	945	99	483	273	6.3	323	106	586	703	76
250	201	1140	116	484	273	6.3	324	114	774	707	39
300	50	750	135	567	323.9	7.1	377	90	400	971	269
300	101	995	158	567	323.9	7.1	377	112	622	971	90
300	201	1210	183	568	323.9	7.1	378	120	830	974	47
350	51	755	164	611	355.6	8.0	411	96	396	1163	296
350	101	990	193	611	355.6	8.0	411	120	610	1163	102
350	201	1350	241	612	355.6	8.0	412	154	934	1166	57
400	50	850	255	688	406.4	8.0	466	104	474	1505	476
400	100	1130	299	688	406.4	8.0	466	130	730	1505	162
400	201	1480	359	689	406.4	8.0	467	134	1074	1508	60
450	50	755	265	744	457	8.0	522	116	371	1893	679
450	99	980	303	744	457	8.0	522	144	564	1893	237
450	196	1405	383	746	457	8.0	524	152	982	1899	106
500	51	790	316	798	508	8.0	576	124	384	2318	752
500	101	1090	378	802	508	8.0	580	160	650	2338	346
500	200	1385	434	803	508	8.0	581	162	942	2339	119
600	50	875	503	926	610	10.0	686	133	453	3314	1245
600	100	1155	573	926	610	10.0	686	166	696	3314	426
600	201	1500	666	926	610	10.0	686	168	1038	3313	141
700	50	910	692	1071	711	10.0	791	140	480	4446	1486
700	101	1220	795	1071	711	10.0	791	174	754	4446	485
700	201	1730	964	1069	711	10.0	789	209	1229	4433	167
LATERAL EXPANSION JOINT with welding ends · **type LM R-R · nominal pressure PN 25**											
50	50	450	5.8	200	60.3	2.9	84	35	205	41.8	22
50	102	620	7.4	201	60.3	2.9	85	43	363	42.4	10

Nominal diameter	Lateral movement absorption nominal	Length	Weight	Outside dimensions	Flange		Bellows				Lateral adjustment force rate
					External diameter	Wall thickness	Outside-durchmesser	Corrugated length	Bellows centre distance	Effective diameter	
DN	Δy	BL	G	H	da	s	Da	Lb	l*	Ae	CΔy
-	mm	mm	kg	mm	mm	mm	mm	mm	mm	cm²	N/mm
50	204	845	9.2	201	60.3	2.9	85	51	581	42.4	4
65	51	460	8.8	221	76.1	2.9	105	29	219	65.5	26
65	101	645	11	221	76.1	2.9	105	30	400	65.1	7
65	202	950	14	219	76.1	2.9	103	42	692	64.1	3
80	51	455	13	246	88.9	3.2	118	37	202	85.5	43
80	102	630	16	246	88.9	3.2	118	37	377	85.5	13
80	201	980	22	246	88.9	3.2	118	37	727	85.5	4
100	50	545	18	271	114.3	3.6	143	58	248	133	61
100	100	875	24	271	114.3	3.6	143	72	562	133	19
100	199	1170	30	271	114.3	3.6	143	75	855	133	8
125	51	620	31	317	139.7	4.0	175	64	304	198	70
125	100	920	40	318	139.7	4.0	176	84	584	199	35
125	200	1155	46	318	139.7	4.0	176	86	816	199	12
150	51	700	46	361	168.3	4.5	209	74	374	283	119
150	100	905	54	361	168.3	4.5	209	92	562	283	43
150	202	1100	63	362	168.3	4.5	210	100	750	286	23
200	50	700	76	426	219.1	6.3	266	80	360	467	164
200	100	1010	96	427	219.1	6.3	267	104	644	470	75
200	200	1310	115	428	219.1	6.3	268	108	938	472	29
250	50	830	135	513	273	7.1	323	88	468	705	279
250	100	1110	160	513	273	7.1	323	110	730	705	92
250	200	1440	191	514	273	7.1	324	114	1054	707	36
300	50	855	220	599	323.9	8.0	377	93	493	973	337
300	100	1155	262	599	323.9	8.0	377	116	766	973	113
300	201	1510	317	600	323.9	8.0	378	120	1120	975	42
350	51	845	250	636	355.6	8.0	414	108	458	1173	620
350	100	1110	289	636	355.6	8.0	414	134	694	1173	217
350	200	1445	341	637	355.6	8.0	415	136	1026	1174	71
400	50	855	289	690	406.4	10.0	468	112	462	1512	742
400	101	1140	340	690	406.4	10.0	468	140	720	1512	246
400	201	1485	404	691	406.4	10.0	469	142	1062	1513	81
450	50	870	393	763	457	10.0	523	120	460	1898	835
450	100	1140	452	763	457	10.0	523	150	700	1898	291
450	200	1700	573	759	457	10.0	519	180	1230	1882	95
500	51	785	530	862	508	10.0	582	136	346	2344	1355
500	100	1100	623	862	508	10.0	582	170	630	2346	490
500	201	1620	768	858	508	10.0	578	204	1114	2326	162

Design: All table values were determined with 1000 nominal stress cycles with nominal operating load. The design is based on operating (nominal) pressures PN 6 - PN 25 and design temperature 20 °C for the standard material combination 1.4541 / P235GH. For other materials, operating pressure and movement absorption have to be adapted with factors or requested separately.