Producto distribuido por

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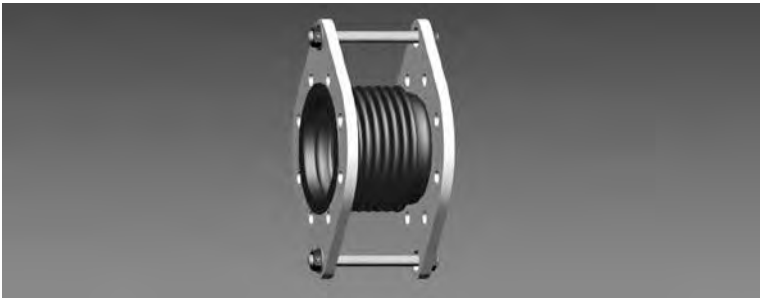
LATERAL EXPANSION JOINTS WITH FLANGES TYPE LBR, LFR



Type designation
The type designation consists of 2 parts
1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example
Type LBR: HYDRA lateral expansion joint with loose flanges, for movement in all planes
Type LFR: HYDRA lateral expansion joint with plain fixed flanges, for movement in all planes

Standard version/materials:
Multi-ply bellows made of 1.4541
Flange made of P265GH (1.0425)
Operating temperature: up to 400 °C

Type designation (example)

LBR	10	·	0150	·	102	·	0
Type	Nominal pressure (PN10)		Nominal diameter (DN150)		Movement absorption, nominal (2λ = ±51 = 102 mm)		Inner sleeve (0 = without, 1 = with)

Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions
- Type designation or order number

With material variation
- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:
- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:
- Group 1 – dangerous
- Group 2 – all other fluids

State of medium
- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:
- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

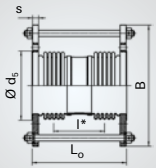
Optional:
- Category _____

Note

Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



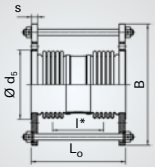
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	439805	250	6	240
50	102	.0050.102.0	439806	360	7	240
50	154	.0050.154.0	439807	470	7	240
50	196	.0050.196.0	439808	560	10	240
65	53	.0065.053.0	439809	260	7	260
65	104	.0065.104.0	439810	370	8	260
65	151	.0065.151.0	439811	470	8	260
65	204	.0065.204.0	439812	580	9	260
80	53	.0080.053.0	439813	275	10	290
80	102	.0080.102.0	439814	385	11	290
80	154	.0080.154.0	439815	495	11	290
80	201	.0080.201.0	439816	595	12	290
100	52	.0100.052.0	439817	275	11	310
100	103	.0100.103.0	439818	385	12	310
100	151	.0100.151.0	439819	485	13	310
100	204	.0100.204.0	439820	595	13	310
125	51	.0125.051.0	439821	310	15	340
125	103	.0125.103.0	439822	450	15	340
125	153	.0125.153.0	439823	580	21	340
125	203	.0125.203.0	439824	710	23	340

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
136	6	90	16	4.9	13	0
246	6	90	16	3.6	4.1	0
356	6	90	16	2.8	2	0
445	6	90	16	2.4	1.3	0
141	6	107	16	7.2	16	0
251	6	107	16	5.3	5.2	0
351	6	107	16	4.3	2.7	0
461	6	107	16	3.5	1.5	0
146	6	122	18	8.9	19	0
256	6	122	18	6.6	6.5	0
366	6	122	18	5.3	3.2	0
466	6	122	18	4.5	2	0
141	6	147	18	14	27	0
251	6	147	18	10	8.8	0
351	6	147	18	8.3	4.5	0
461	6	147	18	6.9	2.6	0
167	6	178	20	16	30	0
307	6	178	20	12	9	0
437	6	178	20	9.3	4.5	0
567	6	178	20	7.7	2.7	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



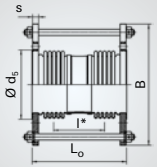
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	439825	330	18	365
150	101	.0150.101.0	439826	450	19	365
150	144	.0150.144.0	439827	570	24	365
150	195	.0150.195.0	439828	690	27	365
200	51	.0200.051.0	439829	345	25	420
200	100	.0200.100.0	439830	475	27	420
200	153	.0200.153.0	439831	605	37	420
200	198	.0200.198.0	439832	730	42	420
250	50	.0250.050.0	439833	365	35	503
250	102	.0250.102.0	439834	505	38	503
250	153	.0250.153.0	439835	635	53	503
250	212	.0250.212.0	439836	805	62	503
300	50	.0300.050.0	439837	380	48	600
300	101	.0300.101.0	439838	540	52	600
300	152	.0300.152.0	439839	690	56	600
300	196	.0300.196.0	439840	840	88	600
300	296	.0300.296.0	439841	1140	111	600
350	52	.0350.052.0	439842	410	61	650
350	102	.0350.102.0	439843	580	65	650
350	148	.0350.148.0	439844	755	89	650
350	195	.0350.195.0	439845	905	98	650
350	300	.0350.300.0	439846	1255	121	650

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
166	6	202	20	22	58	0
286	6	202	20	17	20	0
406	6	202	20	14	10	0
526	6	202	20	11	6.1	0
166	6	258	22	42	89	0
296	6	258	22	32	30	0
426	6	258	22	26	15	0
535	6	258	22	22	8.6	0
171	6	312	24	80	111	0
311	6	312	24	61	36	0
441	6	312	24	50	18	0
590	6	312	24	41	9.5	0
191	6	365	24	155	140	0
351	6	365	24	115	43	0
501	6	365	24	93	21	0
630	6	365	24	78	13	0
930	6	365	24	59	5.9	0
215	6	410	26	173	153	0
385	6	410	26	129	49	0
534	6	410	26	103	24	0
684	6	410	26	87	15	0
1034	6	410	26	65	6.6	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



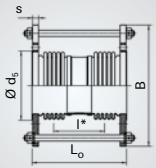
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	439847	465	80	724
400	100	.0400.100.0	439848	665	103	724
400	158	.0400.158.0	439849	865	118	724
400	200	.0400.200.0	439850	1015	129	724
400	294	.0400.294.0	439851	1415	160	724
450	50	.0450.050.0	439852	475	89	779
450	97	.0450.097.0	439853	675	114	779
450	152	.0450.152.0	439854	875	131	779
450	192	.0450.192.0	439855	1025	144	779
450	289	.0450.289.0	439856	1390	179	779
500	52	.0500.052.0	439857	495	123	865
500	104	.0500.104.0	439858	710	153	865
500	147	.0500.147.0	439859	860	168	865
500	207	.0500.207.0	439860	1060	188	865
500	289	.0500.289.0	439861	1360	217	865

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
231	6	465	28	251	232	0
410	6	465	28	187	69	0
610	6	465	28	149	33	0
760	6	465	28	130	21	0
1160	6	465	28	96	9.5	0
236	6	520	28	315	282	0
415	6	520	28	234	86	0
615	6	520	28	187	41	0
765	6	520	28	160	27	0
1120	6	520	28	122	17	0
236	6	570	32	424	389	0
425	6	570	32	313	113	0
575	6	570	32	263	64	0
775	6	570	32	219	36	0
1075	6	570	32	175	19	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



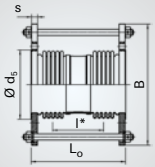
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	439862	260	9	265
50	102	.0050.102.0	439863	370	10	265
50	146	.0050.146.0	439864	465	12	265
50	202	.0050.202.0	439865	615	13	265
65	53	.0065.053.0	439866	270	11	285
65	104	.0065.104.0	439867	380	11	285
65	146	.0065.146.0	439868	480	12	285
65	201	.0065.201.0	439869	630	13	285
80	53	.0080.053.0	439870	300	13	300
80	101	.0080.101.0	439871	420	14	300
80	151	.0080.151.0	439872	540	15	300
80	202	.0080.202.0	439873	660	15	300
100	50	.0100.050.0	439874	290	14	320
100	100	.0100.100.0	439875	420	15	320
100	146	.0100.146.0	439876	550	16	320
100	203	.0100.203.0	439877	730	22	320
125	50	.0125.050.0	439878	315	19	350
125	100	.0125.100.0	439879	435	20	350
125	153	.0125.153.0	439880	555	24	350
125	200	.0125.200.0	439881	665	25	350

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
136	10	92	19	4.7	13	0
246	10	92	19	3.5	4.1	0
345	10	92	19	2.8	2.1	0
495	10	92	19	2.2	1	0
141	10	107	20	6.9	16	0
251	10	107	20	5.2	5.2	0
351	10	107	20	4.2	2.7	0
501	10	107	20	3.3	1.3	0
161	10	122	20	8.2	29	0
281	10	122	20	6.1	9.7	0
401	10	122	20	4.9	4.8	0
521	10	122	20	4.1	2.9	0
159	10	147	22	13	27	0
289	10	147	22	9.4	8.3	0
419	10	147	22	7.4	4	0
599	10	147	22	5.7	1.9	0
151	10	178	22	16	50	0
271	10	178	22	12	16	0
391	10	178	22	9.9	7.9	0
501	10	178	22	8.3	4.8	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



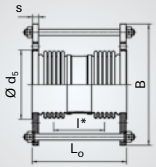
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	439882	340	25	385
150	102	.0150.102.0	439883	470	27	385
150	145	.0150.145.0	439884	590	33	385
150	195	.0150.195.0	439885	710	36	385
200	52	.0200.052.0	439886	365	34	468
200	100	.0200.100.0	439887	515	37	468
200	153	.0200.153.0	439888	675	50	468
200	206	.0200.206.0	439889	855	58	468
250	52	.0250.052.0	439890	395	48	555
250	101	.0250.101.0	439891	555	63	555
250	152	.0250.152.0	439892	715	72	555
250	198	.0250.198.0	439893	885	82	555
300	51	.0300.051.0	439894	405	66	629
300	102	.0300.102.0	439895	565	72	629
300	145	.0300.145.0	439896	715	97	629
300	196	.0300.196.0	439897	865	109	629
300	292	.0300.292.0	439898	1165	133	629
350	50	.0350.050.0	439899	420	81	689
350	100	.0350.100.0	439900	590	87	689
350	149	.0350.149.0	439901	775	111	689
350	195	.0350.195.0	439902	925	121	689
350	296	.0350.296.0	439903	1275	145	689

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
161	10	208	24	26	74	0
291	10	208	24	20	24	0
411	10	208	24	16	12	0
531	10	208	24	14	7.3	0
199	10	258	24	54	92	0
349	10	258	24	40	31	0
509	10	258	24	32	15	0
668	10	258	24	26	8	0
207	10	320	26	110	112	0
367	10	320	26	82	37	0
527	10	320	26	66	18	0
676	10	320	26	54	10	0
199	10	370	28	181	202	0
359	10	370	28	138	65	0
488	10	370	28	115	32	0
638	10	370	28	96	19	0
938	10	370	28	73	9.2	0
213	10	410	28	207	242	0
383	10	410	28	160	78	0
542	10	410	28	127	36	0
692	10	410	28	108	23	0
1042	10	410	28	81	10	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



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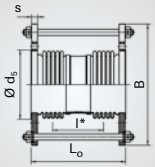
Nominal diameter	Nominal lateral movement absorption	Type LBR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	439904	515	136	785
400	106	.0400.106.0	439905	760	164	785
400	146	.0400.146.0	439906	910	177	785
400	200	.0400.200.0	439907	1110	193	785
400	287	.0400.287.0	439908	1460	222	785
450	51	.0450.051.0	439909	505	160	756
450	98	.0450.098.0	439910	710	196	756
450	153	.0450.153.0	439911	910	221	756
450	195	.0450.195.0	439912	1060	239	756
450	285	.0450.285.0	439913	1410	282	756
500	51	.0500.051.0	439914	510	182	808
500	105	.0500.105.0	439915	735	224	808
500	148	.0500.148.0	439916	885	244	808
500	207	.0500.207.0	439917	1085	270	808
500	306	.0500.306.0	439918	1485	323	808

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
251	10	465	37	266	398	0
470	10	465	37	193	108	0
620	10	465	37	163	64	0
820	10	465	37	137	38	0
1170	10	465	37	108	19	0
246	10	520	32	297	500	0
425	10	520	32	225	159	0
625	10	520	32	181	77	0
775	10	520	32	159	51	0
1125	10	520	32	121	25	0
236	10	570	34	367	581	0
435	10	570	34	271	163	0
585	10	570	34	227	94	0
785	10	570	34	189	54	0
1185	10	570	34	142	24	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



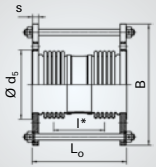
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	439919	280	10	265
50	103	.0050.103.0	439920	410	10	265
50	149	.0050.149.0	439921	530	13	265
50	199	.0050.199.0	439922	680	14	265
65	53	.0065.053.0	439923	290	12	285
65	104	.0065.104.0	439924	410	12	285
65	145	.0065.145.0	439925	520	13	285
65	198	.0065.198.0	439926	680	14	285
80	51	.0080.051.0	439927	300	13	300
80	102	.0080.102.0	439928	430	15	300
80	150	.0080.150.0	439929	550	15	300
80	205	.0080.205.0	439930	720	20	300
100	50	.0100.050.0	439931	310	16	320
100	103	.0100.103.0	439932	460	17	320
100	145	.0100.145.0	439933	590	18	320
100	202	.0100.202.0	439934	790	24	320
125	53	.0125.053.0	439935	345	21	350
125	102	.0125.102.0	439936	475	23	350
125	151	.0125.151.0	439937	595	27	350
125	196	.0125.196.0	439938	715	29	350

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
151	16	92	19	4.5	20	0
281	16	92	19	3.2	5.8	0
400	16	92	19	2.6	2.9	0
550	16	92	19	2	1.5	0
156	16	107	20	6.6	24	0
276	16	107	20	4.9	7.7	0
386	16	107	20	3.9	4	0
546	16	107	20	3.1	2	0
161	16	122	20	8.3	34	0
291	16	122	20	6.1	11	0
411	16	122	20	4.8	5.5	0
581	16	122	20	3.8	2.8	0
173	16	147	22	12	40	0
323	16	147	22	8.7	12	0
453	16	147	22	6.9	6	0
653	16	147	22	5.3	2.9	0
171	16	178	22	18	67	0
301	16	178	22	14	23	0
421	16	178	22	11	12	0
541	16	178	22	9.5	7.1	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



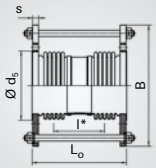
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	439939	360	30	413
150	100	.0150.100.0	439940	490	32	413
150	147	.0150.147.0	439941	630	38	413
150	190	.0150.190.0	439942	760	42	413
200	50	.0200.050.0	439943	365	43	500
200	100	.0200.100.0	439944	525	47	500
200	150	.0200.150.0	439945	675	60	500
200	200	.0200.200.0	439946	865	69	500
250	52	.0250.052.0	439947	465	71	589
250	103	.0250.103.0	439948	685	92	589
250	154	.0250.154.0	439949	885	104	589
250	207	.0250.207.0	439950	1135	120	589
300	50	.0300.050.0	439951	500	111	680
300	95	.0300.095.0	439952	670	125	680
300	145	.0300.145.0	439953	870	143	680
300	196	.0300.196.0	439954	1120	164	680
300	296	.0300.296.0	439955	1620	206	680
350	51	.0350.051.0	439956	520	151	667
350	100	.0350.100.0	439957	720	172	667
350	149	.0350.149.0	439958	920	192	667
350	199	.0350.199.0	439959	1170	218	667
350	306	.0350.306.0	439960	1720	274	667

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
181	16	208	24	33	85	0
311	16	208	24	25	30	0
451	16	208	24	20	14	0
581	16	208	24	17	8.7	0
193	16	258	26	75	137	0
353	16	258	26	55	42	0
503	16	258	26	45	21	0
672	16	258	26	36	11	0
246	16	320	32	117	216	0
445	16	320	32	85	62	0
645	16	320	32	68	31	0
895	16	320	32	55	16	0
235	16	375	37	176	236	0
405	16	375	37	136	89	0
605	16	375	37	109	42	0
855	16	375	37	88	22	0
1355	16	375	37	63	8.8	0
260	16	410	32	182	280	0
460	16	410	32	138	99	0
660	16	410	32	111	50	0
910	16	410	32	88	27	0
1460	16	410	32	62	11	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



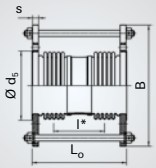
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	52	.0400.052.0	439961	555	185	723
400	94	.0400.094.0	439962	725	205	723
400	147	.0400.147.0	439963	925	227	723
400	200	.0400.200.0	439964	1125	249	723
400	309	.0400.309.0	439965	1625	305	723
450	50	.0450.050.0	439966	560	247	815
450	104	.0450.104.0	439967	780	276	815
450	155	.0450.155.0	439968	980	303	815
450	203	.0450.203.0	439969	1180	330	815
450	296	.0450.296.0	439970	1630	389	815

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
260	16	465	34	224	407	0
430	16	465	34	176	166	0
630	16	465	34	142	81	0
830	16	465	34	119	48	0
1330	16	465	34	85	19	0
260	16	520	37	307	516	0
480	16	520	37	233	171	0
680	16	520	37	192	89	0
880	16	520	37	163	54	0
1330	16	520	37	122	24	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR



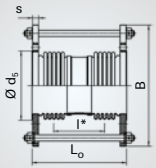
06

Nominal diameter	Nominal lateral movement absorption	Type LBR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	439971	290	10	265
50	98	.0050.098.0	439972	420	11	265
50	148	.0050.148.0	439973	590	14	265
50	205	.0050.205.0	439974	790	15	265
65	51	.0065.051.0	439975	315	13	285
65	99	.0065.099.0	439976	465	14	285
65	153	.0065.153.0	439977	665	15	285
65	195	.0065.195.0	439978	825	20	285
80	52	.0080.052.0	439979	330	16	300
80	103	.0080.103.0	439980	470	20	300
80	155	.0080.155.0	439981	640	22	300
80	193	.0080.193.0	439982	780	23	300
100	50	.0100.050.0	439983	340	21	335
100	101	.0100.101.0	439984	510	26	335
100	145	.0100.145.0	439985	670	28	335
100	192	.0100.192.0	439986	855	32	335
125	51	.0125.051.0	439987	360	30	398
125	102	.0125.102.0	439988	520	32	398
125	153	.0125.153.0	439989	710	39	398
125	196	.0125.196.0	439990	895	43	398

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
151	25	92	20	4.4	23	0
286	25	92	20	3.2	7	0
455	25	92	20	2.4	2.8	0
655	25	92	20	1.8	1.4	0
185	25	107	22	6.3	26	0
335	25	107	22	4.4	8	0
535	25	107	22	3.2	3.1	0
695	25	107	22	2.6	1.9	0
176	25	122	24	7.8	39	0
316	25	122	24	5.7	13	0
486	25	122	24	4.3	5.4	0
626	25	122	24	3.6	3.3	0
197	25	147	24	14	54	0
367	25	147	24	9.7	16	0
527	25	147	24	7.6	7.8	0
712	25	147	24	6.1	4.3	0
195	25	178	26	23	67	0
355	25	178	26	17	21	0
545	25	178	26	13	8.8	0
714	25	178	26	10	4.9	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LBR

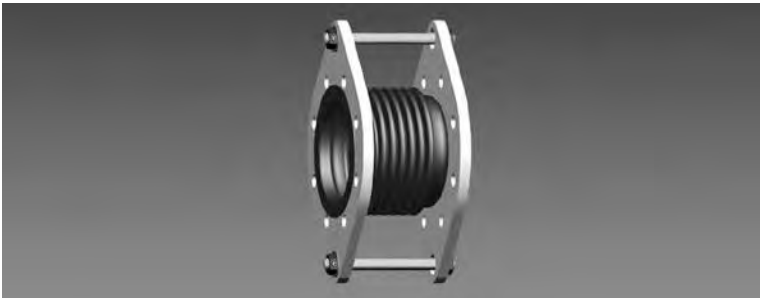


06

Nominal diameter	Nominal lateral movement absorption	Type LBR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	439991	375	40	460
150	102	.0150.102.0	439992	545	44	460
150	146	.0150.146.0	439993	745	54	460
150	194	.0150.194.0	439994	950	60	460
200	50	.0200.050.0	439995	445	66	544
200	101	.0200.101.0	439996	645	80	544
200	155	.0200.155.0	439997	915	93	544
200	195	.0200.195.0	439998	1115	103	544
250	51	.0250.051.0	439999	480	122	578
250	101	.0250.101.0	440000	700	147	578
250	149	.0250.149.0	440001	950	166	578
250	204	.0250.204.0	440002	1250	190	578
300	61	.0300.061.0	440003	620	170	634
300	110	.0300.110.0	440004	845	193	634
300	150	.0300.150.0	440005	1045	212	634
300	200	.0300.200.0	440006	1345	240	634
300	302	.0300.302.0	440007	1945	298	634
350	50	.0350.050.0	440008	550	237	735
350	100	.0350.100.0	440009	760	262	735
350	145	.0350.145.0	440010	960	285	735
350	190	.0350.190.0	440011	1210	313	735
350	291	.0350.291.0	440012	1760	375	735

Centre-to-centre distance of bellows	Flange			Spring rate		
	drilling as per DIN 1092	rim diameter	thickness			
l*	PN	d_5	s	c_r	c_λ	c_p
mm	mm	mm	cm^2	N/bar	N/mm	N/mm bar
205	25	208	28	44	85	0
375	25	208	28	33	26	0
575	25	208	28	25	11	0
764	25	208	28	20	6.1	0
241	25	258	32	79	190	0
441	25	258	32	59	59	0
690	25	258	32	44	23	0
890	25	258	32	36	14	0
251	25	320	35	113	250	0
450	25	320	35	83	74	0
700	25	320	35	64	32	0
1000	25	320	35	50	16	0
340	25	375	38	131	213	0
565	25	375	38	99	83	0
765	25	375	38	82	46	0
1065	25	375	38	65	24	0
1665	25	375	38	46	10	0
260	25	410	42	194	363	0
470	25	410	42	147	125	0
670	25	410	42	120	64	0
920	25	410	42	99	35	0
1470	25	410	42	70	14	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, SOUND INSULATING TYPE LBS



Type designation
The type designation consists of 2 parts
1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example
Type LBS: HYDRA sound insulating lateral expansion joint for absorbing vibration, with loose flanges

Standard version/materials:
Multi-ply bellows made of 1.4541
Flange made of P 265 GH (1.0425)
Operating temperature: up to 400 °C

Type designation (example)

LBS	10	·	0150	·	102	·	0
Type	Nominal pressure (PN10)		Nominal diameter (DN150)		Movement absorption, nominal (2δ = 31 mm)		Inner sleeve (0 = without, 1 = with)

Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions
- Type designation or order number

With material variation
- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:
- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:
- Group 1 – dangerous
- Group 2 – all other fluids

State of medium
- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:
- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

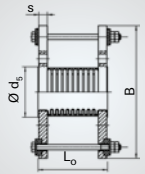
Optional:
- Category _____

Note

Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, SOUND INSULATING

Type LBS



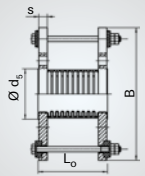
06

Nominal diameter	Nominal lateral movement absorption		Type LBS 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
	for 1000 load cycles	with vibrations					
DN	$2\lambda_N$	î	–	–	L_o	G	B
–	mm	mm	–	–	mm	kg	mm
50	18	0.5	.0050.018	459873	165	6	240
65	20	0.5	.0065.020	459874	180	7	260
80	21	0.5	.0080.021	459875	190	10	290
100	20	0.5	.0100.020	459876	190	11	310
125	19	0.5	.0125.019	459877	210	15	340
150	31	0.5	.0150.031	459878	265	17	365
200	32	0.5	.0200.032	459879	285	24	420
250	36	0.5	.0250.036	459880	330	39	503
300	40	0.5	.0300.040	459881	345	55	600
350	38	0.5	.0350.038	459882	360	69	650
400	31	0.5	.0400.031	459883	390	89	724

Flange			Spring rate			Natural frequency of bellows	
drilling DIN 1092	flange diameter	thickness				axial	radial
PN	d_5	s	c_r	c_λ	c_p	ω_α	ω_r
–	mm	mm	N/bar	N/mm	N/mm bar	Hz	Hz
06	90	16	6	77	0	200	385
06	107	16	8.7	91	0	155	340
06	122	18	11	99	0	145	325
06	147	18	17	162	0	125	345
06	178	20	21	212	0	115	355
06	202	20	25	117	0	90	355
06	258	22	48	165	0	75	325
06	312	24	83	298	0	55	285
06	365	24	153	358	0	50	250
06	410	26	179	418	0	50	270
06	465	28	268	501	0	55	335

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, SOUND INSULATING

Type LBS



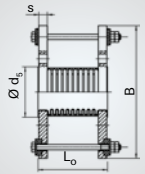
06

Nominal diameter	Nominal lateral movement absorption		Type LBS 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
	for 1000 load cycles	with vibrations					
DN	$2\lambda_N$	î	–	–	L_o	G	B
–	mm	mm	–	–	mm	kg	mm
50	18	0.5	.0050.018	459885	175	9	265
65	20	0.5	.0065.020	459886	200	12	285
80	21	0.5	.0080.021	459887	210	13	300
100	20	0.5	.0100.020	459888	210	15	320
125	19	0.5	.0125.019	459889	215	19	350
150	31	0.5	.0150.031	459890	285	26	385
200	32	0.5	.0200.032	459891	300	35	468
250	36	0.5	.0250.036	459892	345	54	555
300	40	0.5	.0300.040	459893	370	77	629
350	38	0.5	.0350.038	459895	380	93	689
400	31	0.5	.0400.031	459896	430	152	785

Flange			Spring rate			Natural frequency of bellows	
drilling DIN 1092	flange diameter	thickness				axial	radial
PN	d_5	s	c_r	c_λ	c_p	ω_a	ω_r
–	mm	mm	N/bar	N/mm	N/mm bar	Hz	Hz
16	92	19	5.7	77	0	200	385
16	107	20	8.1	136	0	160	315
16	122	20	10	146	0	150	305
16	147	22	16	236	0	125	325
16	178	22	20	364	0	115	355
16	208	24	29	191	0	90	335
10	258	24	58	266	0	75	315
10	320	26	113	339	0	55	260
10	370	28	178	532	0	45	225
10	410	28	213	620	0	40	210
10	465	37	289	1003	0	55	305

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, SOUND INSULATING

Type LBS



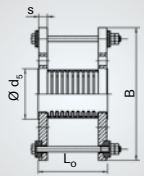
06

Nominal diameter	Nominal lateral movement absorption		Type LBS 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
	for 1000 load cycles	with vibrations					
DN	$2\lambda_N$	î	–	–	L_o	G	B
–	mm	mm	–	–	mm	kg	mm
50	18	0.5	.0050.017	459898	185	10	265
65	20	0.5	.0065.022	459899	210	12	285
80	21	0.5	.0080.020	459900	210	13	300
100	20	0.5	.0100.015	459901	200	16	320
125	19	0.5	.0125.015	459902	210	19	350
150	31	0.5	.0150.032	459903	290	29	413
200	32	0.5	.0200.033	459904	310	47	500
250	36	0.5	.0250.025	459905	355	73	589
300	40	0.5	.0300.027	459906	385	110	680
350	38	0.5	.0350.025	459907	380	151	667
400	31	0.5	.0400.033	459908	450	193	723

Flange			Spring rate			Natural frequency of bellows	
drilling DIN 1092	flange diameter	thickness				axial	radial
PN	d_5	s	c_r	c_λ	c_p	ω_α	ω_r
–	mm	mm	N/bar	N/mm	N/mm bar	Hz	Hz
16	92	19	5.5	119	0	205	360
16	107	20	7.8	130	0	140	260
16	122	20	10	178	0	145	300
16	147	22	16	402	0	135	390
16	178	22	25	573	0	130	425
16	208	24	36	220	0	90	315
16	258	26	78	421	0	70	285
16	320	32	133	499	0	85	410
16	375	37	199	741	0	70	360
16	410	32	214	1035	0	65	350
16	465	34	250	1192	0	55	275

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, SOUND INSULATING

Type LBS

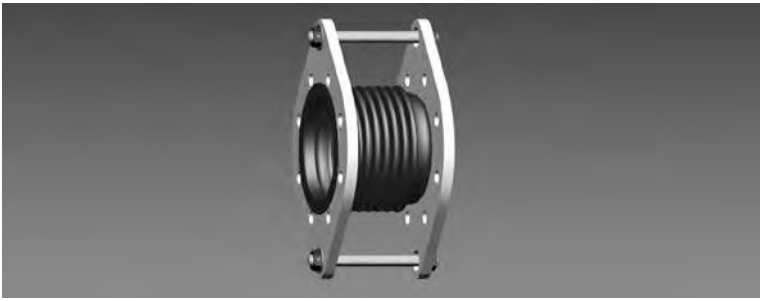


06

Nominal diameter	Nominal lateral movement absorption		Type LBS 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
	for 1000 load cycles	with vibrations					
DN	$2\lambda_N$	î	–	–	L_o	G	B
–	mm	mm	–	–	mm	kg	mm
50	18	0.5	.0050.018	459909	190	10	265
65	20	0.5	.0065.020	459911	215	14	285
80	21	0.5	.0080.021	459912	215	16	300
100	20	0.5	.0100.020	459913	215	20	335
125	19	0.5	.0125.019	459914	230	30	398
150	31	0.5	.0150.031	459915	300	43	460
200	32	0.5	.0200.032	459916	325	66	544
250	36	0.5	.0250.036	459918	370	129	578
300	40	0.5	.0300.040	459919	405	164	634
350	38	0.5	.0350.038	459920	420	242	735

Flange			Spring rate			Natural frequency of bellows	
drilling DIN 1092	flange diameter	thickness				axial	radial
PN	d_5	s	c_r	c_λ	c_p	ω_a	ω_r
–	mm	mm	N/bar	N/mm	N/mm bar	Hz	Hz
40	92	20	5.5	159	0	225	400
40	107	22	7.5	205	0	160	295
40	122	24	9.8	289	0	155	325
40	147	24	19	476	0	135	380
40	178	26	30	671	0	135	410
40	208	28	48	310	0	90	315
25	258	32	94	592	0	105	425
25	320	35	128	788	0	85	390
25	375	38	171	1344	0	75	340
25	410	42	223	1354	0	65	310

LATERAL EXPANSION JOINTS WITH FLANGES TYPE LBR, LFR



Type designation
The type designation consists of 2 parts
1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example
Type LBR: HYDRA lateral expansion joint with loose flanges, for movement in all planes
Type LFR: HYDRA lateral expansion joint with plain fixed flanges, for movement in all planes

Standard version/materials:
Multi-ply bellows made of 1.4541
Flange made of P265GH (1.0425)
Operating temperature: up to 400 °C

Type designation (example)

LBR	10	·	0150	·	102	·	0
Type	Nominal pressure (PN10)		Nominal diameter (DN150)		Movement absorption, nominal (2λ = ±51 = 102 mm)		Inner sleeve (0 = without, 1 = with)

Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions
- Type designation or order number

With material variation
- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:
- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:
- Group 1 – dangerous
- Group 2 – all other fluids

State of medium
- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:
- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

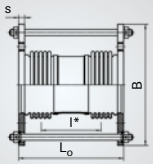
Optional:
- Category _____

Note

Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



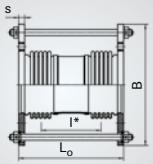
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	440013	265	6	240
50	102	.0050.102.0	440014	375	7	240
50	154	.0050.154.0	440015	485	7	240
50	196	.0050.196.0	440016	575	10	240
65	53	.0065.053.0	440017	275	8	260
65	104	.0065.104.0	440018	385	8	260
65	151	.0065.151.0	440019	485	8	260
65	204	.0065.204.0	440020	595	9	260
80	53	.0080.053.0	440021	285	10	290
80	102	.0080.102.0	440022	395	11	290
80	154	.0080.154.0	440023	505	11	290
80	201	.0080.201.0	440024	605	12	290
100	52	.0100.052.0	440025	285	11	310
100	103	.0100.103.0	440026	395	13	310
100	151	.0100.151.0	440027	495	13	310
100	204	.0100.204.0	440028	605	13	310
125	51	.0125.051.0	440029	320	16	340
125	103	.0125.103.0	440030	460	16	340
125	153	.0125.153.0	440031	590	16	340
125	203	.0125.203.0	440032	720	23	340

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
136	6	16	4.6	13	0
246	6	16	3.4	4.1	0
356	6	16	2.7	2	0
445	6	16	2.4	1.3	0
141	6	16	6.7	16	0
251	6	16	5	5.2	0
351	6	16	4.1	2.7	0
461	6	16	3.4	1.5	0
146	6	18	8.4	19	0
256	6	18	6.3	6.5	0
366	6	18	5.1	3.2	0
466	6	18	4.3	2	0
141	6	18	13	27	0
251	6	18	9.8	8.8	0
351	6	18	8	4.5	0
461	6	18	6.7	2.6	0
167	6	20	16	30	0
307	6	20	12	9	0
437	6	20	9.2	4.5	0
567	6	20	7.6	2.7	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



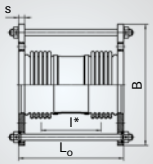
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	440033	340	19	365
150	101	.0150.101.0	440034	460	19	365
150	151	.0150.151.0	440035	580	21	365
150	202	.0150.202.0	440036	700	27	365
200	51	.0200.051.0	440037	350	26	420
200	100	.0200.100.0	440038	480	27	420
200	153	.0200.153.0	440039	610	29	420
200	198	.0200.198.0	440040	740	43	420
250	50	.0250.050.0	440041	375	36	503
250	102	.0250.102.0	440042	515	39	503
250	153	.0250.153.0	440043	645	41	503
250	212	.0250.212.0	440044	810	63	503
300	50	.0300.050.0	440045	385	50	600
300	101	.0300.101.0	440046	545	54	600
300	152	.0300.152.0	440047	695	58	600
300	196	.0300.196.0	440048	845	90	600
300	296	.0300.296.0	440049	1145	113	600
350	52	.0350.052.0	440050	415	63	650
350	102	.0350.102.0	440051	585	67	650
350	148	.0350.148.0	440052	755	89	650
350	195	.0350.195.0	440053	905	99	650
350	300	.0350.300.0	440054	1255	122	650

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
166	6	20	22	58	0
286	6	20	17	20	0
406	6	20	13	10	0
526	6	20	11	6.1	0
166	6	22	41	89	0
296	6	22	32	30	0
426	6	22	26	14	0
535	6	22	22	8.6	0
171	6	24	80	111	0
311	6	24	61	36	0
441	6	24	50	18	0
590	6	24	41	9.5	0
191	6	24	155	140	0
351	6	24	115	43	0
501	6	24	93	21	0
630	6	24	77	13	0
930	6	24	59	5.9	0
215	6	26	173	153	0
385	6	26	129	49	0
534	6	26	102	24	0
684	6	26	87	15	0
1034	6	26	64	6.6	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



06

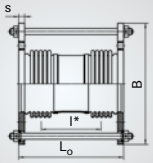
Nominal diameter	Nominal lateral movement absorption	Type LFR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	440055	460	83	724
400	100	.0400.100.0	440056	665	103	724
400	158	.0400.158.0	440057	865	119	724
400	200	.0400.200.0	440058	1015	131	724
400	294	.0400.294.0	440059	1415	162	724
450	50	.0450.050.0	440060	470	92	779
450	97	.0450.097.0	440061	675	115	779
450	152	.0450.152.0	440062	875	132	779
450	192	.0450.192.0	440063	1025	145	779
450	289	.0450.289.0	440064	1385	180	779
500	52	.0500.052.0	440065	490	127	865
500	104	.0500.104.0	440066	705	153	865
500	147	.0500.147.0	440067	855	168	865
500	207	.0500.207.0	440068	1055	188	865
500	289	.0500.289.0	440069	1355	218	865

TYPE LFR 06 ...
PN 6

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
231	6	28	251	232	0
410	6	28	187	69	0
610	6	28	149	33	0
760	6	28	130	21	0
1160	6	28	96	9.5	0
236	6	28	315	282	0
415	6	28	234	86	0
615	6	28	187	41	0
765	6	28	160	27	0
1120	6	28	122	17	0
236	6	32	424	389	0
425	6	32	313	113	0
575	6	32	268	64	0
775	6	32	223	36	0
1075	6	32	178	19	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



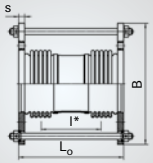
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	440070	270	9	265
50	102	.0050.102.0	440071	380	10	265
50	146	.0050.146.0	440072	475	12	265
50	202	.0050.202.0	440073	625	13	265
65	53	.0065.053.0	440074	280	11	285
65	104	.0065.104.0	440075	390	12	285
65	146	.0065.146.0	440076	490	12	285
65	201	.0065.201.0	440077	640	14	285
80	53	.0080.053.0	440078	310	14	300
80	101	.0080.101.0	440079	430	14	300
80	151	.0080.151.0	440080	550	15	300
80	202	.0080.202.0	440081	670	16	300
100	50	.0100.050.0	440082	300	14	320
100	100	.0100.100.0	440083	430	16	320
100	146	.0100.146.0	440084	560	16	320
100	203	.0100.203.0	440085	740	22	320
125	50	.0125.050.0	440086	320	19	350
125	100	.0125.100.0	440087	440	20	350
125	153	.0125.153.0	440088	560	21	350
125	200	.0125.200.0	440089	670	23	350

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
136	16	19	4.6	13	0
246	16	19	3.4	4.1	0
345	16	19	2.8	2.1	0
495	16	19	2.2	1	0
141	16	20	6.7	16	0
251	16	20	5	5.2	0
351	16	20	4.1	2.7	0
501	16	20	3.2	1.3	0
161	16	20	8	29	0
281	16	20	6	9.7	0
401	16	20	4.8	4.8	0
521	16	20	4	2.9	0
159	16	22	13	27	0
289	16	22	9.2	8.3	0
419	16	22	7.2	4	0
599	16	22	5.6	1.9	0
151	16	22	16	50	0
271	16	22	12	16	0
391	16	22	9.7	7.9	0
501	16	22	8.2	4.8	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



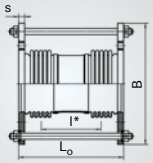
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	440090	345	26	385
150	102	.0150.102.0	440091	475	27	385
150	151	.0150.151.0	440092	595	29	385
150	202	.0150.202.0	440093	715	36	385
200	52	.0200.052.0	440094	370	35	468
200	100	.0200.100.0	440095	520	37	468
200	153	.0200.153.0	440096	680	41	468
200	206	.0200.206.0	440097	860	58	468
250	52	.0250.052.0	440098	400	50	555
250	101	.0250.101.0	440099	560	54	555
250	152	.0250.152.0	440100	720	73	555
250	198	.0250.198.0	440101	885	83	555
300	51	.0300.051.0	440102	400	68	629
300	102	.0300.102.0	440103	560	74	629
300	145	.0300.145.0	440104	710	97	629
300	196	.0300.196.0	440105	860	110	629
300	292	.0300.292.0	440106	1160	134	629
350	50	.0350.050.0	440107	415	82	689
350	100	.0350.100.0	440108	585	90	689
350	149	.0350.149.0	440109	770	111	689
350	195	.0350.195.0	440110	920	121	689
350	296	.0350.296.0	440111	1270	146	689

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
161	16	24	26	74	0
291	16	24	20	24	0
411	16	24	16	12	0
531	16	24	14	7.3	0
199	10	24	53	92	0
349	10	24	40	31	0
509	10	24	31	15	0
668	10	24	25	8	0
207	10	26	107	112	0
367	10	26	81	37	0
527	10	26	65	18	0
676	10	26	54	10	0
199	10	28	188	202	0
359	10	28	142	65	0
488	10	28	115	32	0
638	10	28	96	19	0
938	10	28	73	9.2	0
213	10	28	215	242	0
383	10	28	160	78	0
542	10	28	127	36	0
692	10	28	110	23	0
1042	10	28	81	10	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



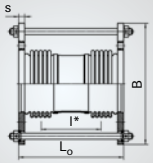
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	440112	510	139	785
400	106	.0400.106.0	440113	750	163	785
400	146	.0400.146.0	440114	900	176	785
400	200	.0400.200.0	440115	1100	193	785
400	287	.0400.287.0	440116	1450	222	785
450	51	.0450.051.0	440117	500	164	756
450	98	.0450.098.0	440118	700	196	756
450	153	.0450.153.0	440119	900	221	756
450	195	.0450.195.0	440120	1050	239	756
450	285	.0450.285.0	440121	1400	284	756
500	51	.0500.051.0	440122	505	187	808
500	105	.0500.105.0	440123	730	223	808
500	148	.0500.148.0	440124	880	243	808
500	207	.0500.207.0	440125	1080	270	808
500	306	.0500.306.0	440126	1480	325	808

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
251	10	37	266	398	0
470	10	37	193	108	0
620	10	37	163	64	0
820	10	37	137	38	0
1170	10	37	108	19	0
246	10	32	307	500	0
425	10	32	225	159	0
625	10	32	181	77	0
775	10	32	159	51	0
1125	10	32	121	25	0
236	10	34	367	581	0
435	10	34	271	163	0
585	10	34	227	94	0
785	10	34	189	54	0
1185	10	34	142	24	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



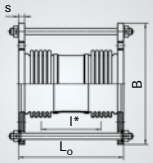
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	440127	290	10	265
50	103	.0050.103.0	440128	420	11	265
50	149	.0050.149.0	440129	535	12	265
50	199	.0050.199.0	440130	685	14	265
65	53	.0065.053.0	440131	300	11	285
65	104	.0065.104.0	440132	420	13	285
65	145	.0065.145.0	440133	530	13	285
65	198	.0065.198.0	440134	690	15	285
80	51	.0080.051.0	440135	310	14	300
80	102	.0080.102.0	440136	440	15	300
80	150	.0080.150.0	440137	560	15	300
80	205	.0080.205.0	440138	730	19	300
100	50	.0100.050.0	440139	315	16	320
100	103	.0100.103.0	440140	465	17	320
100	145	.0100.145.0	440141	595	17	320
100	202	.0100.202.0	440142	795	23	320
125	53	.0125.053.0	440143	350	22	350
125	102	.0125.102.0	440144	480	24	350
125	151	.0125.151.0	440145	600	25	350
125	196	.0125.196.0	440146	720	29	350

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
151	16	19	4.4	20	0
281	16	19	3.2	5.8	0
400	16	19	2.5	2.9	0
550	16	19	2	1.5	0
156	16	20	6.4	24	0
276	16	20	4.8	7.7	0
386	16	20	3.9	4	0
546	16	20	3	2	0
161	16	20	8.1	34	0
291	16	20	5.9	11	0
411	16	20	4.8	5.5	0
581	16	20	3.7	2.8	0
173	16	22	12	40	0
323	16	22	8.5	12	0
453	16	22	6.8	6	0
653	16	22	5.2	2.9	0
171	16	22	18	67	0
301	16	22	14	23	0
421	16	22	11	12	0
541	16	22	9.5	7.1	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



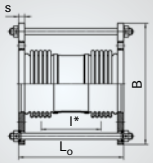
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	440147	365	31	413
150	100	.0150.100.0	440148	495	32	413
150	153	.0150.153.0	440149	635	36	413
150	194	.0150.194.0	440150	765	42	413
200	50	.0200.050.0	440151	370	44	500
200	100	.0200.100.0	440152	530	48	500
200	150	.0200.150.0	440153	680	52	500
200	200	.0200.200.0	440154	870	69	500
250	52	.0250.052.0	440155	460	73	589
250	103	.0250.103.0	440156	680	91	589
250	154	.0250.154.0	440157	880	104	589
250	207	.0250.207.0	440158	1130	121	589
300	50	.0300.050.0	440159	495	110	680
300	95	.0300.095.0	440160	665	125	680
300	145	.0300.145.0	440161	865	143	680
300	196	.0300.196.0	440162	1115	165	680
300	296	.0300.296.0	440163	1615	208	680
350	51	.0350.051.0	440164	515	151	667
350	100	.0350.100.0	440165	715	172	667
350	149	.0350.149.0	440166	915	193	667
350	199	.0350.199.0	440167	1165	220	667
350	306	.0350.306.0	440168	1715	277	667

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
181	16	24	33	85	0
311	16	24	25	30	0
451	16	24	20	14	0
581	16	24	17	8.7	0
193	16	26	75	137	0
353	16	26	55	42	0
503	16	26	45	21	0
672	16	26	36	11	0
246	16	32	117	216	0
445	16	32	87	62	0
645	16	32	69	31	0
895	16	32	55	16	0
235	16	37	176	236	0
405	16	37	136	89	0
605	16	37	109	42	0
855	16	37	88	22	0
1355	16	37	63	8.8	0
260	16	32	182	280	0
460	16	32	138	99	0
660	16	32	111	50	0
910	16	32	88	27	0
1460	16	32	62	11	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



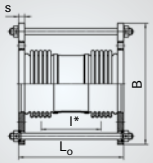
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	52	.0400.052.0	440169	545	183	723
400	94	.0400.094.0	440170	715	202	723
400	147	.0400.147.0	440171	915	225	723
400	200	.0400.200.0	440172	1115	248	723
400	309	.0400.309.0	440173	1615	306	723
450	50	.0450.050.0	440174	550	243	815
450	104	.0450.104.0	440175	770	274	815
450	155	.0450.155.0	440176	970	301	815
450	203	.0450.203.0	440177	1170	329	815
450	296	.0450.296.0	440178	1620	391	815

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
260	16	34	224	407	0
430	16	34	180	166	0
630	16	34	145	81	0
830	16	34	121	48	0
1330	16	34	86	19	0
260	16	37	316	516	0
480	16	37	239	171	0
680	16	37	195	89	0
880	16	37	165	54	0
1330	16	37	122	24	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR



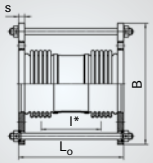
06

Nominal diameter	Nominal lateral movement absorption	Type LFR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	440179	300	10	265
50	98	.0050.098.0	440180	430	11	265
50	148	.0050.148.0	440181	600	13	265
50	205	.0050.205.0	440182	800	15	265
65	51	.0065.051.0	440183	320	14	285
65	99	.0065.099.0	440184	470	14	285
65	153	.0065.153.0	440185	670	16	285
65	195	.0065.195.0	440186	830	19	285
80	52	.0080.052.0	440187	335	16	300
80	103	.0080.103.0	440188	475	18	300
80	155	.0080.155.0	440189	645	21	300
80	193	.0080.193.0	440190	785	22	300
100	50	.0100.050.0	440191	345	22	335
100	101	.0100.101.0	440192	515	25	335
100	145	.0100.145.0	440193	675	27	335
100	192	.0100.192.0	440194	860	30	335
125	51	.0125.051.0	440195	365	30	398
125	102	.0125.102.0	440196	525	33	398
125	153	.0125.153.0	440197	715	39	398
125	196	.0125.196.0	440198	900	43	398

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
156	40	20	4.3	23	0
286	40	20	3.1	7	0
455	40	20	2.3	2.8	0
655	40	20	1.8	1.4	0
185	40	22	6.1	26	0
335	40	22	4.4	8	0
535	40	22	3.2	3.1	0
695	40	22	2.6	1.9	0
176	40	24	7.8	39	0
316	40	24	5.7	13	0
486	40	24	4.3	5.4	0
626	40	24	3.6	3.3	0
197	40	24	13	54	0
367	40	24	9.6	16	0
527	40	24	7.5	7.8	0
712	40	24	6.1	4.3	0
195	40	26	23	67	0
355	40	26	17	21	0
545	40	26	13	8.8	0
714	40	26	10	4.9	0

LATERAL EXPANSION JOINTS WITH PLAIN FIXED FLANGES, FOR MOVEMENT IN ALL PLANES

Type LFR

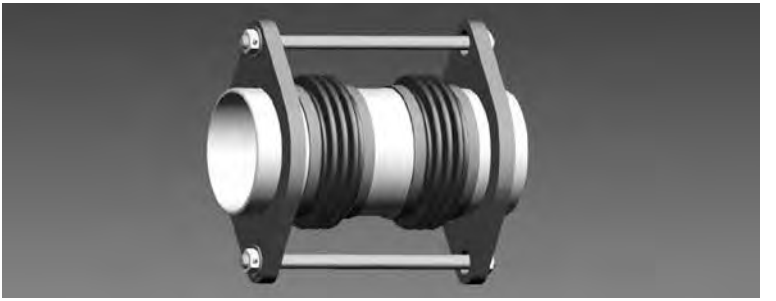


06

Nominal diameter	Nominal lateral movement absorption	Type LFR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	440199	370	42	460
150	102	.0150.102.0	440200	540	45	460
150	151	.0150.151.0	440201	740	54	460
150	194	.0150.194.0	440202	945	60	460
200	50	.0200.050.0	440203	440	68	544
200	101	.0200.101.0	440204	640	80	544
200	155	.0200.155.0	440205	910	94	544
200	195	.0200.195.0	440206	1110	104	544
250	51	.0250.051.0	440207	475	125	578
250	101	.0250.101.0	440208	695	147	578
250	149	.0250.149.0	440209	945	167	578
250	204	.0250.204.0	440210	1245	192	578
300	61	.0300.061.0	440211	610	169	634
300	110	.0300.110.0	440212	835	191	634
300	150	.0300.150.0	440213	1035	211	634
300	200	.0300.200.0	440214	1335	240	634
300	302	.0300.302.0	440215	1935	300	634
350	50	.0350.050.0	440216	545	237	735
350	100	.0350.100.0	440217	755	261	735
350	145	.0350.145.0	440218	955	285	735
350	190	.0350.190.0	440219	1205	314	735
350	291	.0350.291.0	440220	1755	378	735

Centre-to-centre distance of bellows	Flange		Spring rate		
	drilling DIN 1092	thickness			
l*	PN	s	c_r	c_λ	c_p
mm	mm	cm^2	N/bar	N/mm	N/mm bar
205	40	28	45	85	0
375	40	28	33	26	0
575	40	28	25	11	0
764	40	28	20	6.1	0
241	25	32	79	190	0
441	25	32	59	59	0
690	25	32	44	23	0
890	25	32	36	14	0
251	25	35	117	250	0
450	25	35	85	74	0
700	25	35	64	32	0
1000	25	35	50	16	0
340	25	38	131	213	0
565	25	38	101	83	0
765	25	38	83	46	0
1065	25	38	66	24	0
1665	25	38	46	10	0
260	25	42	194	363	0
470	25	42	150	125	0
670	25	42	122	64	0
920	25	42	99	35	0
1470	25	42	70	14	0

LATERAL EXPANSION JOINTS WITH WELD ENDS TYPE LRR, LRK, LRN



Type designation
The type designation consists of 2 parts
1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example
Type LRR: HYDRA lateral expansion joint with loose flanges, for movement in all planes
Type LRN: HYDRA lateral expansion joint with loose flanges, for movement in one plane
Type LRK: HYDRA lateral expansion joint with loose flanges, for movement in all planes

Standard version/materials:
Multi-ply bellow made of 1.4541
Weld ends up to DN 300: P235GH (1.0345)
Weld ends from DN 350: P265GH (1.0425)
Operating temperature: up to 400 °C

Type designation (example)

LRR	10	·	0150	·	102	·	0
Type	Nominal pressure (PN10)		Nominal diameter (DN150)		Movement absorption, nominal (2λ = ±51 = 102 mm)		Inner sleeve (0 = without, 1 = with)

Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions
- Type designation or order number

With material variation
- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:
- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:
- Group 1 – dangerous
- Group 2 – all other fluids

State of medium
- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:
- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

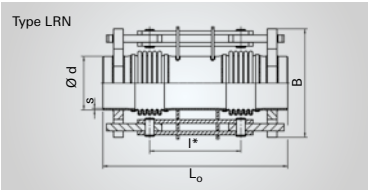
Optional:
- Category _____

Note

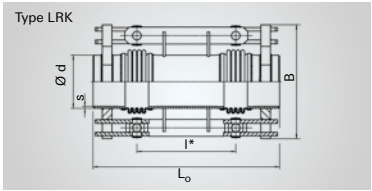
Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



06

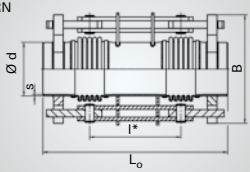
Nominal diameter	Nominal lateral movement absorption	Type LRN 06 ... LRK 06 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
600	58	.0600.058.0	440395	440221	795	206	795	235	900
600	108	.0600.108.0	440396	440222	905	222	905	252	900
600	150	.0600.150.0	440397	440223	1055	243	1055	273	900
600	205	.0600.205.0	440398	440224	1255	272	1255	301	900
600	302	.0600.302.0	440399	440225	1605	322	1605	351	900
700	53	.0700.053.0	440400	440226	835	285	835	314	1010
700	98	.0700.098.0	440401	440227	945	303	945	332	1010
700	152	.0700.152.0	440402	440228	1100	332	1100	362	1010
700	211	.0700.211.0	440403	440229	1300	371	1300	401	1010
700	299	.0700.299.0	440404	440230	1600	429	1600	459	1010
800	51	.0800.051.0	440405	440231	915	346	915	376	1120
800	98	.0800.098.0	440406	440232	1045	376	1045	407	1120
800	151	.0800.151.0	440407	440233	1210	414	1210	442	1120
800	206	.0800.206.0	440408	440234	1410	457	1410	485	1120
800	303	.0800.303.0	440409	440235	1760	532	1760	560	1120
900	52	.0900.052.0	440410	440236	1015	539	1015	590	1285
900	97	.0900.097.0	440411	440237	1145	577	1145	630	1285
900	150	.0900.150.0	440412	440238	1395	645	1395	698	1285
900	197	.0900.197.0	440413	440239	1510	679	1510	731	1285
900	295	.0900.295.0	440414	440240	1910	786	1910	838	1285

PN 06

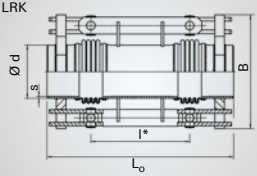
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
363	610	6	427	430	6.9
418	610	6	369	193	8.6
568	610	6	272	105	4.7
768	610	6	201	57	2.5
1118	610	6	138	27	1.2
363	711	8	573	612	9.2
418	711	8	497	276	12
545	711	8	380	135	8.1
745	711	8	278	72	4.4
1045	711	8	198	37	2.2
383	813	8	708	1050	13
448	813	8	604	458	15
580	813	8	465	227	11
780	813	8	346	125	6.1
1130	813	8	239	60	2.9
433	914	8	997	1165	13
498	914	8	865	525	16
748	914	8	575	232	7.1
830	914	8	518	157	6.9
1230	914	8	349	71	3.1

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



06

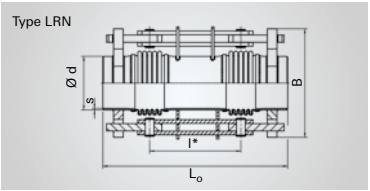
Nominal diameter	Nominal lateral movement absorption	Type LRN 06 ... LRK 06 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
1000	50	.1000.050.0	440415	440241	1035	595	1035	647	1395
1000	104	.1000.104.0	440416	440242	1220	652	1220	705	1395
1000	152	.1000.152.0	440417	440243	1390	704	1390	756	1395
1000	210	.1000.210.0	440418	440244	1640	778	1640	831	1395
1000	303	.1000.303.0	440419	440245	2040	895	2040	947	1395
1200	63	.1200.063.0	440420	440246	1155	820	1155	872	1615
1200	100	.1200.100.0	440421	440247	1320	885	1320	937	1615
1200	155	.1200.155.0	440422	440248	1540	968	1540	1020	1615
1200	206	.1200.206.0	440423	440249	1790	1068	1790	1121	1615
1200	308	.1200.308.0	440424	440250	2290	1266	2290	1318	1615
1400	49	.1400.049.0	440425	440251	1340	1161	1340	1281	1840
1400	97	.1400.097.0	440426	440252	1480	1190	1480	1311	1840
1400	149	.1400.149.0	440427	440253	1880	1386	1880	1507	1840
1400	202	.1400.202.0	440428	440254	2280	1586	2280	1706	1840
1400	307	.1400.307.0	440429	440255	3080	1981	3080	2102	1840
1600	47	.1600.047.0	440430	440256	1540	1723	1540	1926	2080
1600	103	.1600.103.0	440431	440257	1780	1817	1780	2019	2080
1600	147	.1600.147.0	440432	440258	2180	2062	2180	2264	2080
1600	190	.1600.190.0	440433	440259	2580	2307	2580	2510	2080
1600	300	.1600.300.0	440434	440260	3580	2915	3580	3117	2080

PN 06

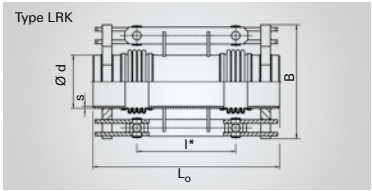
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
443	1016	8	1196	1396	16
560	1016	8	940	517	16
695	1016	8	758	280	13
945	1016	8	558	152	6.9
1345	1016	8	392	75	3.4
478	1220	10	1556	1415	25
610	1220	10	1212	687	19
795	1220	10	930	337	14
1045	1220	10	708	195	7.9
1545	1220	10	479	89	3.6
720	1420	10	1848	1848	13
740	1420	10	1797	873	24
1140	1420	10	1167	368	10
1540	1420	10	864	202	5.6
2340	1420	10	569	88	2.4
820	1620	10	2625	2089	13
940	1620	10	2288	794	20
1340	1620	10	1606	391	9.6
1740	1620	10	1237	232	5.7
2740	1620	10	786	94	2.3

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK

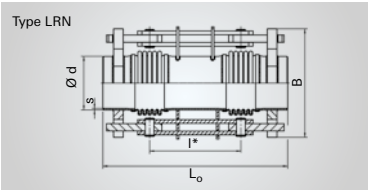


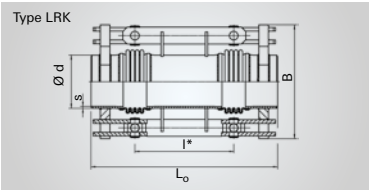
Nominal diameter	Nominal lateral movement absorption	Type LRN 06 ... LRK 06 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
1800	63	.1800.063.0	440435	440261	1480	1789	1480	2106	2280
1800	102	.1800.102.0	440436	440262	1880	2055	1880	2372	2280
1800	150	.1800.150.0	440437	440263	2380	2385	2380	2702	2280
1800	199	.1800.199.0	440438	440264	2880	2718	2880	3036	2280
1800	307	.1800.307.0	440439	440265	3980	3445	3980	3762	2280
2000	57	.2000.057.0	440440	–	1580	2681	–	–	2575
2000	101	.2000.101.0	440441	–	2080	3104	–	–	2575
2000	146	.2000.146.0	440442	–	2580	3526	–	–	2575
2000	199	.2000.199.0	440443	–	3180	4034	–	–	2575
2000	306	.2000.306.0	440444	–	4380	5045	–	–	2575

PN 06

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
640	1820	10	4219	2400	53
1040	1820	10	2598	910	20
1540	1820	10	1755	415	9.2
2040	1820	10	1325	237	5.2
3140	1820	10	861	100	2.2
640	2020	10	6472	3254	65
1140	2020	10	3637	1027	20
1640	2020	10	2529	497	9.9
2240	2020	10	1852	266	5.3
3440	2020	10	1206	113	2.3

LATERAL EXPANSION JOINT WITH WELD ENDS





06

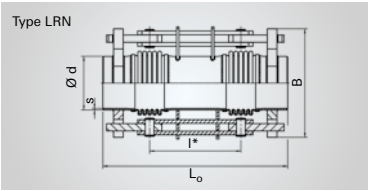
Nominal diameter	Nominal lateral movement absorption	Type LRN 10 ... LRK 10 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
600	55	.0600.055.0	440445	440266	840	264	840	295	900
600	103	.0600.103.0	440446	440267	955	287	955	317	900
600	155	.0600.155.0	440447	440268	1155	322	1155	351	900
600	207	.0600.207.0	440448	440269	1355	356	1355	386	900
600	298	.0600.298.0	440449	440270	1705	417	1705	446	900
700	52	.0700.052.0	440450	440271	900	421	900	472	1065
700	111	.0700.111.0	440451	440272	1075	470	1075	521	1065
700	152	.0700.152.0	440452	440273	1190	501	1190	553	1065
700	208	.0700.208.0	440453	440274	1390	547	1390	600	1065
700	307	.0700.307.0	440454	440275	1740	627	1740	679	1065
800	51	.0800.051.0	440455	440276	970	508	970	559	1165
800	98	.0800.098.0	440456	440277	1105	552	1105	603	1165
800	150	.0800.150.0	440457	440278	1270	604	1270	655	1165
800	204	.0800.204.0	440458	440279	1470	662	1470	713	1165
800	299	.0800.299.0	440459	440280	1820	766	1820	817	1165
900	52	.0900.052.0	440460	440281	1070	655	1070	707	1315
900	97	.0900.097.0	440461	440282	1205	704	1205	756	1315
900	146	.0900.146.0	440462	440283	1370	760	1370	813	1315
900	194	.0900.194.0	440463	440284	1570	824	1570	876	1315
900	291	.0900.291.0	440464	440285	1970	953	1970	1005	1315

PN 10

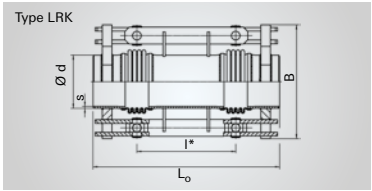
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
365	610	8	424	662	7
423	610	8	366	296	8.7
623	610	8	248	136	4
823	610	8	188	78	2.3
1173	610	8	132	38	1.1
375	711	8	698	1123	10
488	711	8	535	396	9.7
570	711	8	458	242	8.6
770	711	8	339	133	4.7
1120	711	8	233	63	2.2
385	813	10	880	1384	13
453	813	10	748	600	16
585	813	10	577	297	11
785	813	10	430	165	6.2
1135	813	10	298	79	3
435	914	10	992	1538	13
503	914	10	858	690	16
635	914	10	677	358	12
835	914	10	515	207	7
1235	914	10	348	95	3.2

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



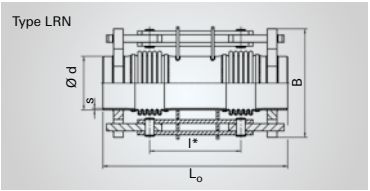
Nominal diameter	Nominal lateral movement absorption	Type LRN 10 ... LRK 10 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
1000	58	.1000.058.0	440465	440286	1260	978	1260	1099	1450
1000	102	.1000.102.0	440466	440287	1480	1072	1480	1193	1450
1000	155	.1000.155.0	440467	440288	1705	1165	1705	1282	1450
1000	212	.1000.212.0	440468	440289	2005	1281	2005	1398	1450
1000	298	.1000.298.0	440469	440290	2455	1456	2455	1573	1450
1200	51	.1200.051.0	440470	440291	1260	1292	1260	1499	1680
1200	102	.1200.102.0	440471	440292	1505	1429	1505	1633	1680
1200	151	.1200.151.0	440472	440293	1805	1582	1805	1785	1680
1200	201	.1200.201.0	440473	440294	2105	1734	2105	1937	1680
1200	300	.1200.300.0	440474	440295	2705	2038	2705	2242	1680
1400	54	.1400.054.0	440475	–	1660	2226	–	–	1975
1400	106	.1400.106.0	440476	–	1815	2296	–	–	1975
1400	155	.1400.155.0	440477	–	2215	2572	–	–	1975
1400	204	.1400.204.0	440478	–	2615	2847	–	–	1975
1400	303	.1400.303.0	440479	–	3415	3402	–	–	1975

PN 10

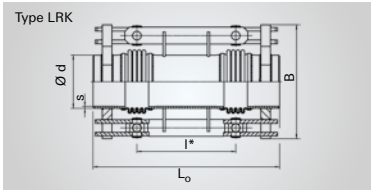
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
480	1016	10	1478	1857	18
665	1016	10	1065	772	12
853	1016	10	833	393	8.8
1153	1016	10	616	215	4.8
1603	1016	10	443	111	2.5
480	1220	10	2587	3030	26
653	1220	10	1905	1095	21
953	1220	10	1305	513	9.9
1253	1220	10	992	297	5.7
1853	1220	10	671	136	2.6
830	1420	10	2516	2287	10
858	1420	10	2431	1068	19
1258	1420	10	1658	497	9.1
1658	1420	10	1258	286	5.2
2458	1420	10	848	130	2.4

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



06

Nominal diameter	Nominal lateral movement absorption	Type LRN 16 ... LRK 16 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
500	53	.0500.053.0	440480	440296	810	250	810	280	790
500	107	.0500.107.0	440481	440297	945	276	945	306	790
500	148	.0500.148.0	440482	440298	1095	299	1095	328	790
500	203	.0500.203.0	440483	440299	1295	329	1295	359	790
500	313	.0500.313.0	440484	440300	1695	390	1695	419	790
600	53	.0600.053.0	440485	440301	945	393	945	443	945
600	99	.0600.099.0	440486	440302	1115	437	1115	487	945
600	150	.0600.150.0	440487	440303	1365	489	1365	539	945
600	202	.0600.202.0	440488	440304	1615	542	1615	592	945
600	305	.0600.305.0	440489	440305	2115	646	2115	696	945
700	54	.0700.054.0	440490	440306	1005	511	1005	562	1085
700	100	.0700.100.0	440491	440307	1180	564	1180	616	1085
700	151	.0700.151.0	440492	440308	1430	630	1430	682	1085
700	202	.0700.202.0	440493	440309	1680	696	1680	748	1085
700	304	.0700.304.0	440494	440310	2180	829	2180	881	1085
800	58	.0800.058.0	440495	440311	1120	764	1120	885	1220
800	105	.0800.105.0	440496	440312	1300	833	1300	954	1220
800	153	.0800.153.0	440497	440313	1550	918	1550	1039	1220
800	211	.0800.211.0	440498	440314	1850	1018	1850	1139	1220
800	307	.0800.307.0	440499	440315	2350	1188	2350	1309	1220

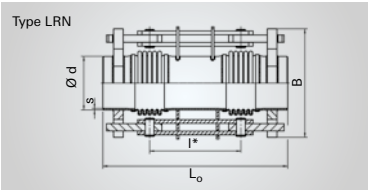
FOR MOVEMENT IN ONE PLANE TYPE LRN 16 ...
FOR MOVEMENT IN ALL PLANES TYPE LRK 16 ...

PN 16

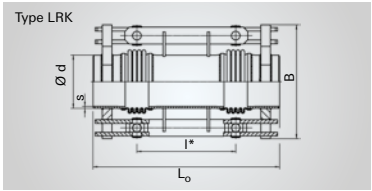
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
338	508	8	325	714	5.6
418	508	8	262	279	6.1
568	508	8	193	151	3.3
768	508	8	143	83	1.8
1168	508	8	94	36	0.8
398	610	8	487	1103	8.2
508	610	8	382	451	7.5
758	610	8	256	203	3.4
1008	610	8	192	115	1.9
1508	610	8	129	51	0.9
403	711	10	651	1332	11
515	711	10	510	543	10
765	711	10	343	246	4.6
1015	711	10	258	140	2.6
1515	711	10	173	63	1.2
460	813	10	981	1375	11
575	813	10	786	589	11
825	813	10	548	286	5.3
1125	813	10	402	154	2.9
1625	813	10	278	74	1.4

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



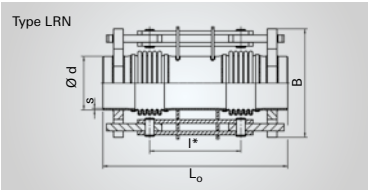
Nominal diameter	Nominal lateral movement absorption	Type LRN 16 ... LRK 16 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
900	52	.0900.052.0	440500	440316	1270	1155	1270	1362	1380
900	104	.0900.104.0	440501	440317	1455	1249	1455	1454	1380
900	157	.0900.157.0	440502	440318	1670	1349	1670	1556	1380
900	205	.0900.205.0	440503	440319	1920	1458	1920	1664	1380
900	293	.0900.293.0	440504	440320	2370	1651	2370	1857	1380
1000	51	.1000.051.0	440505	440321	1310	1279	1310	1488	1490
1000	102	.1000.102.0	440506	440322	1510	1397	1510	1603	1490
1000	154	.1000.154.0	440507	440323	1735	1510	1735	1716	1490
1000	210	.1000.210.0	440508	440324	2035	1647	2035	1853	1490
1000	303	.1000.303.0	440509	440325	2535	1873	2535	2078	1490

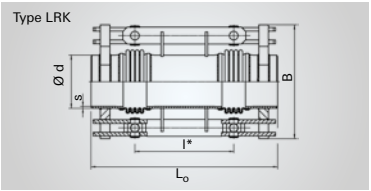
FOR MOVEMENT IN ONE PLANE TYPE LRN 16 ...
FOR MOVEMENT IN ALL PLANES TYPE LRK 16 ...

PN 16

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
535	914	10	1355	1878	8.6
653	914	10	1110	756	9.6
835	914	10	866	383	7
1085	914	10	667	227	4.2
1535	914	10	471	113	2.1
555	1016	10	1605	2466	11
680	1016	10	1308	982	12
868	1016	10	1024	502	9
1168	1016	10	761	277	5
1668	1016	10	533	136	2.4

LATERAL EXPANSION JOINT WITH WELD ENDS





06

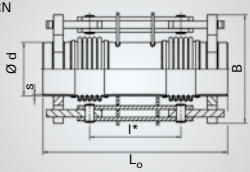
Nominal diameter	Nominal lateral movement absorption	Type LRN 25 ... LRK 25 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
400	50	.0400.050.0	440510	440326	860	217	860	247	680
400	100	.0400.100.0	440511	440327	1110	251	1110	281	680
400	153	.0400.153.0	440512	440328	1310	280	1310	310	680
400	203	.0400.203.0	440513	440329	1560	313	1560	343	680
400	295	.0400.295.0	440514	440330	2010	372	2010	401	680
450	51	.0450.051.0	440515	440331	905	331	905	382	785
450	103	.0450.103.0	440516	440332	1110	373	1110	424	785
450	154	.0450.154.0	440517	440333	1360	417	1360	468	785
450	195	.0450.195.0	440518	440334	1560	452	1560	502	785
450	297	.0450.297.0	440519	440335	2060	544	2060	595	785
500	53	.0500.053.0	440520	440336	965	385	965	436	845
500	105	.0500.105.0	440521	440337	1220	439	1220	490	845
500	150	.0500.150.0	440522	440338	1380	476	1380	528	845
500	202	.0500.202.0	440523	440339	1630	523	1630	575	845
500	305	.0500.305.0	440524	440340	2130	616	2130	668	845
600	49	.0600.049.0	440525	440341	1085	624	1085	745	1000
600	98	.0600.098.0	440526	440342	1240	684	1240	805	1000
600	151	.0600.151.0	440527	440343	1455	751	1455	872	1000
600	202	.0600.202.0	440528	440344	1705	823	1705	944	1000
600	303	.0600.303.0	440529	440345	2205	967	2205	1088	1000
700	51	.0700.051.0	440530	440346	1185	931	1185	1137	1150
700	103	.0700.103.0	440531	440347	1420	1030	1420	1235	1150
700	150	.0700.150.0	440532	440348	1670	1121	1670	1326	1150
700	207	.0700.207.0	440533	440349	1970	1234	1970	1439	1150
700	301	.0700.301.0	440534	440350	2470	1425	2470	1630	1150

PN 25

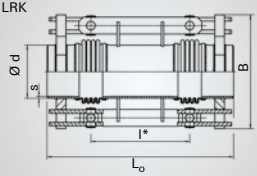
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
375	406.4	8	189	639	3.5
600	406.4	8	118	199	1.7
775	406.4	8	91	100	1.2
1025	406.4	8	69	57	0.7
1475	406.4	8	48	27	0.3
378	457	8	293	794	4.5
530	457	8	209	269	3.4
780	457	8	142	124	1.6
980	457	8	113	79	1
1480	457	8	75	35	0.4
408	508	8	338	999	5.6
635	508	8	216	325	2.8
765	508	8	179	187	2.3
1015	508	8	135	106	1.3
1515	508	8	91	48	0.6
483	610	10	541	1238	4.5
595	610	10	437	486	4.9
778	610	10	335	238	3.4
1028	610	10	253	136	2
1528	610	10	171	62	0.9
418	711	10	1046	1757	11
585	711	10	748	600	8.5
835	711	10	524	294	4.1
1135	711	10	385	159	2.2
1635	711	10	267	77	1.1

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK



06

Nominal diameter	Nominal lateral movement absorption	Type LRN 40 ... LRK 40 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
300	52	.0300.052.0	440535	440351	855	195	855	228	580
300	101	.0300.101.0	440536	440352	1045	219	1045	252	580
300	147	.0300.147.0	440537	440353	1295	248	1295	281	580
300	194	.0300.194.0	440538	440354	1545	276	1545	309	580
300	297	.0300.297.0	440539	440355	2095	339	2095	372	580
350	51	.0350.051.0	440540	440356	915	278	915	328	675
350	106	.0350.106.0	440541	440357	1135	316	1135	366	675
350	155	.0350.155.0	440542	440358	1385	355	1385	405	675
350	204	.0350.204.0	440543	440359	1635	393	1635	444	675
350	301	.0350.301.0	440544	440360	2135	471	2135	522	675
400	50	.0400.050.0	440545	440361	915	321	915	392	725
400	99	.0400.099.0	440546	440362	1170	371	1170	442	725
400	149	.0400.149.0	440547	440363	1370	410	1370	481	725
400	198	.0400.198.0	440548	440364	1620	455	1620	526	725
400	296	.0400.296.0	440549	440365	2120	552	2120	623	725
450	49	.0450.049.0	440550	440366	945	384	945	435	815
450	107	.0450.107.0	440551	440367	1210	445	1210	496	815
450	154	.0450.154.0	440552	440368	1460	495	1460	545	815
450	201	.0450.201.0	440553	440369	1710	545	1710	596	815
450	304	.0450.304.0	440554	440370	2260	655	2260	705	815
500	47	.0500.047.0	440555	440371	1140	588	1140	710	890
500	96	.0500.096.0	440556	440372	1405	664	1405	786	890
500	146	.0500.146.0	440557	440373	1755	755	1755	877	890
500	196	.0500.196.0	440558	440374	2105	846	2105	968	890
500	296	.0500.296.0	440559	440375	2805	1028	2805	1150	890

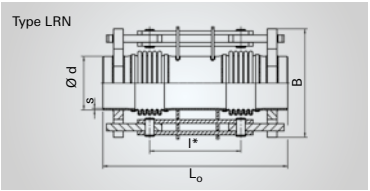
FOR MOVEMENT IN ONE PLANE TYPE LRN 40 ...
FOR MOVEMENT IN ALL PLANES TYPE LRK 40 ...

PN 40

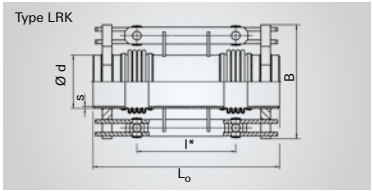
Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
418	323.9	8	109	407	1.7
563	323.9	8	81	149	1.4
813	323.9	8	56	71	0.7
1063	323.9	8	43	42	0.4
1613	323.9	8	28	18	0.2
395	355.6	8	173	479	2.3
568	355.6	8	120	155	1.7
818	355.6	8	84	75	0.8
1068	355.6	8	64	44	0.5
1568	355.6	8	44	20	0.2
383	406.4	10	233	669	3.7
610	406.4	10	146	210	1.8
785	406.4	10	113	105	1.3
1035	406.4	10	86	61	0.7
1535	406.4	10	58	28	0.3
398	457	10	281	917	4.5
605	457	10	184	264	2.9
855	457	10	131	132	1.5
1105	457	10	101	79	0.9
1655	457	10	67	35	0.4
495	508	10	370	1142	3.6
703	508	10	261	377	2.7
1053	508	10	174	168	1.2
1403	508	10	130	95	0.7
2103	508	10	87	42	0.3

LATERAL EXPANSION JOINT WITH WELD ENDS

Type LRN



Type LRK

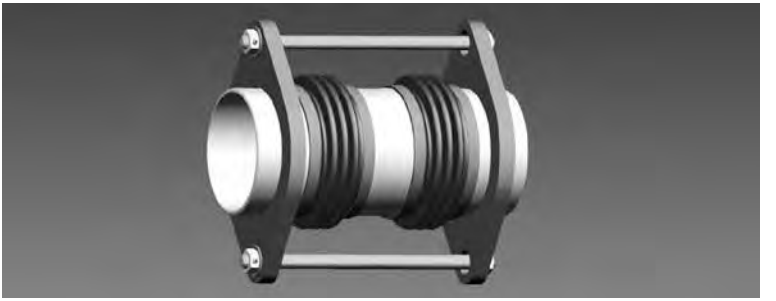


Nominal diameter	Nominal lateral movement absorption	Type LRN 63 ... LRK 63 ...	Order No. standard version		LRN		LRK		Max. width approx.
			LRN	LRK	overall length	weight approx.	overall length	weight approx.	
DN	$2\lambda_{-N}$	–	–	–	L_o	G	L_o	G	B
–	mm	–	–	–	mm	kg	mm	kg	mm
250	51	.0250.051.0	440560	440376	920	207	920	240	575
250	104	.0250.104.0	440561	440377	1215	243	1215	276	575
250	153	.0250.153.0	440562	440378	1515	279	1515	312	575
250	202	.0250.202.0	440563	440379	1815	314	1815	347	575
300	48	.0300.048.0	440564	440380	950	304	950	354	625
300	100	.0300.100.0	440565	440381	1200	350	1200	400	625
300	150	.0300.150.0	440566	440382	1500	401	1500	451	625
300	200	.0300.200.0	440567	440383	1800	453	1800	503	625
300	299	.0300.299.0	440568	440384	2400	556	2400	606	625
350	49	.0350.049.0	440569	440385	1045	367	1045	401	695
350	97	.0350.097.0	440570	440386	1260	415	1260	449	695
350	147	.0350.147.0	440571	440387	1560	473	1560	507	695
350	198	.0350.198.0	440572	440388	1860	530	1860	564	695
350	299	.0350.299.0	440573	440389	2460	644	2460	678	695
400	52	.0400.052.0	440574	440390	1170	555	1170	671	780
400	102	.0400.102.0	440575	440391	1520	652	1520	768	780
400	152	.0400.152.0	440576	440392	1920	762	1920	879	780
400	196	.0400.196.0	440577	440393	2270	861	2270	978	780
400	297	.0400.297.0	440578	440394	3070	1087	3070	1204	780

PN 63

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
385	273	10	86	357	1.8
658	273	10	50	102	0.7
958	273	10	34	48	0.3
1258	273	10	26	28	0.2
425	323.9	11	135	448	1.8
625	323.9	11	91	138	1.2
925	323.9	11	62	63	0.6
1225	323.9	11	47	36	0.3
1825	323.9	11	31	16	0.1
448	355.6	12	156	605	2.2
605	355.6	12	115	221	1.8
905	355.6	12	77	99	0.8
1205	355.6	12	58	56	0.5
1805	355.6	12	39	25	0.2
510	406.4	15	233	621	2.6
835	406.4	15	142	192	1.1
1235	406.4	15	96	88	0.5
1585	406.4	15	75	53	0.3
2385	406.4	15	50	24	0.1

LATERAL EXPANSION JOINTS WITH WELD ENDS TYPE LRR, LRK, LRN



Type designation
The type designation consists of 2 parts
1. Type series, defined by 3 letters
2. Nominal size, defined by 10 digits

Example
Type LRR: HYDRA lateral expansion joint with loose flanges, for movement in all planes
Type LRN: HYDRA lateral expansion joint with loose flanges, for movement in one plane
Type LRK: HYDRA lateral expansion joint with loose flanges, for movement in all planes

Standard version/materials:
Multi-ply bellow made of 1.4541
Weld ends up to DN 300: P235GH (1.0345)
Weld ends from DN 350: P265GH (1.0425)
Operating temperature: up to 400 °C

Type designation (example)

LRR	10	·	0150	·	102	·	0
Type	Nominal pressure (PN10)		Nominal diameter (DN150)		Movement absorption, nominal (2λ = ±51 = 102 mm)		Inner sleeve (0 = without, 1 = with)

Order text according to guideline 2014/68/EU "Pressure Equipment Directive"

Please state the following with your order:

For standard versions
- Type designation or order number

With material variation
- Type designation
- Details of the materials

According to the Pressure Equipment Directive, the following information is required for testing and documentation:

Type of pressure equipment according to Art. 1 & 2:
- Vessel - volume V [l] _____
- Piping - nominal diameter DN _____

Medium property according to Art. 13:
- Group 1 – dangerous
- Group 2 – all other fluids

State of medium
- Gaseous or liquid if PD > 0.5 bar
- Liquid if PD ≤ 0.5 bar

Design data:
- Max. allowable pressure [bar] _____
- Max./min. allowable temperature [°C] _____
- Test pressure PT [bar] _____

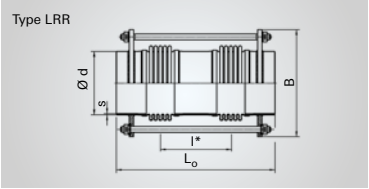
Optional:
- Category _____

Note

Tell us the dimensions that deviate from the standard and we customize the expansion joint to your specification.

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



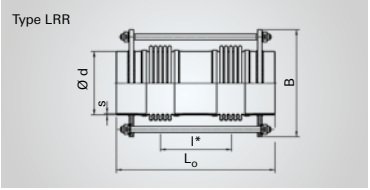
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	440579	360	5	205
50	102	.0050.102.0	440580	470	5	205
50	154	.0050.154.0	440581	580	6	205
50	196	.0050.196.0	440582	670	8	205
65	53	.0065.053.0	440583	370	6	225
65	104	.0065.104.0	440584	480	6	225
65	151	.0065.151.0	440585	580	7	225
65	204	.0065.204.0	440586	690	8	225
80	53	.0080.053.0	440587	380	6	240
80	102	.0080.102.0	440588	490	7	240
80	154	.0080.154.0	440589	600	8	240
80	201	.0080.201.0	440590	700	8	240
100	52	.0100.052.0	440591	380	8	265
100	103	.0100.103.0	440592	490	8	265
100	151	.0100.151.0	440593	590	9	265
100	204	.0100.204.0	440594	700	10	265
125	51	.0125.051.0	440595	440	9	290
125	103	.0125.103.0	440596	580	10	290
125	153	.0125.153.0	440597	710	11	290
125	203	.0125.203.0	440598	840	12	290

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
136	60.3	4	4.2	13	0
246	60.3	4	3.2	4.1	0
356	60.3	4	2.6	2	0
445	60.3	4	2.2	1.3	0
141	76.1	4	6.2	16	0
251	76.1	4	4.7	5.2	0
351	76.1	4	3.9	2.7	0
461	76.1	4	3.3	1.5	0
146	88.9	4	7.7	19	0
256	88.9	4	5.9	6.5	0
366	88.9	4	4.8	3.2	0
466	88.9	4	4.1	2	0
141	114.3	4	12	27	0
251	114.3	4	9.2	8.8	0
351	114.3	4	7.6	4.5	0
461	114.3	4	6.4	2.6	0
183	139.7	4	14	30	0
323	139.7	4	11	9	0
453	139.7	4	8.7	4.5	0
583	139.7	4	7.3	2.7	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



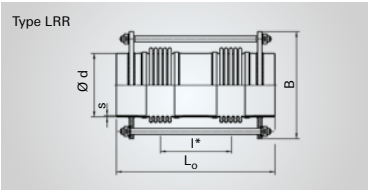
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	440599	455	15	320
150	101	.0150.101.0	440600	575	16	320
150	151	.0150.151.0	440601	695	17	320
150	202	.0150.202.0	440602	815	19	320
200	51	.0200.051.0	440603	490	23	375
200	100	.0200.100.0	440604	620	25	375
200	153	.0200.153.0	440605	750	27	375
200	198	.0200.198.0	440606	880	40	375
250	50	.0250.050.0	440607	520	37	465
250	102	.0250.102.0	440608	660	40	465
250	153	.0250.153.0	440609	790	42	465
250	212	.0250.212.0	440610	960	64	465
300	50	.0300.050.0	440611	555	49	550
300	101	.0300.101.0	440612	715	53	550
300	152	.0300.152.0	440613	865	57	550
300	196	.0300.196.0	440614	1020	89	550
300	296	.0300.296.0	440615	1320	112	550
350	52	.0350.052.0	440616	585	52	590
350	102	.0350.102.0	440617	755	56	590
350	148	.0350.148.0	440618	925	78	590
350	195	.0350.195.0	440619	1075	88	590
350	300	.0350.300.0	440620	1425	111	590

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
182	168.3	4.5	19	58	0
302	168.3	4.5	15	20	0
422	168.3	4.5	12	10	0
542	168.3	4.5	11	6.1	0
186	219.1	6.3	37	89	0
316	219.1	6.3	29	30	0
446	219.1	6.3	24	14	0
535	219.1	6.3	20	8.6	0
191	273	7.1	72	111	0
331	273	7.1	57	36	0
461	273	7.1	47	18	0
590	273	7.1	38	9.5	0
215	323.9	8	137	140	0
375	323.9	8	105	43	0
525	323.9	8	87	21	0
630	323.9	8	73	13	0
930	323.9	8	56	5.9	0
239	355.6	6	157	153	0
409	355.6	6	120	49	0
534	355.6	6	96	24	0
684	355.6	6	82	15	0
1034	355.6	6	62	6.6	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



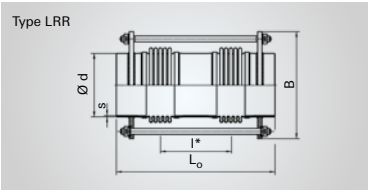
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 06...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	440621	645	75	665
400	100	.0400.100.0	440622	850	95	665
400	158	.0400.158.0	440623	1050	111	665
400	200	.0400.200.0	440624	1200	123	665
400	294	.0400.294.0	440625	1600	154	665
450	50	.0450.050.0	440626	655	84	725
450	97	.0450.097.0	440627	860	106	725
450	152	.0450.152.0	440628	1060	123	725
450	192	.0450.192.0	440629	1210	136	725
450	289	.0450.289.0	440630	1570	171	725
500	52	.0500.052.0	440631	750	128	820
500	104	.0500.104.0	440632	965	153	820
500	147	.0500.147.0	440633	1115	168	820
500	207	.0500.207.0	440634	1315	188	820
500	289	.0500.289.0	440635	1615	218	820

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
255	406.4	6	235	232	0
410	406.4	6	178	69	0
610	406.4	6	143	33	0
760	406.4	6	123	21	0
1210	406.4	6	92	9.5	0
260	457	6	286	282	0
415	457	6	218	86	0
615	457	6	176	41	0
765	457	6	155	27	0
1120	457	6	119	17	0
264	508	6	375	389	0
425	508	6	286	113	0
575	508	6	248	64	0
775	508	6	209	36	0
1075	508	6	168	19	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



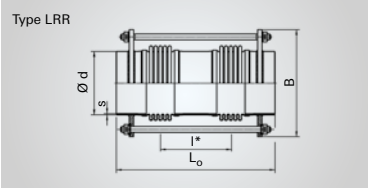
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	51	.0050.051.0	440636	360	5	205
50	102	.0050.102.0	440637	470	5	205
50	149	.0050.149.0	440638	580	6	205
50	202	.0050.202.0	440639	720	9	205
65	53	.0065.053.0	440640	370	6	225
65	104	.0065.104.0	440641	480	6	225
65	146	.0065.146.0	440642	580	7	225
65	201	.0065.201.0	440643	730	8	225
80	53	.0080.053.0	440644	420	7	240
80	101	.0080.101.0	440645	540	8	240
80	151	.0080.151.0	440646	660	9	240
80	202	.0080.202.0	440647	780	10	240
100	50	.0100.050.0	440648	410	9	265
100	100	.0100.100.0	440649	540	10	265
100	146	.0100.146.0	440650	670	11	265
100	203	.0100.203.0	440651	850	12	265
125	50	.0125.050.0	440652	435	12	290
125	100	.0125.100.0	440653	555	13	290
125	153	.0125.153.0	440654	675	14	290
125	200	.0125.200.0	440655	785	15	290

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
136	60.3	4	4.2	13	0
246	60.3	4	3.2	4.1	0
356	60.3	4	2.6	2	0
495	60.3	4	2.1	1	0
141	76.1	4	6.2	16	0
251	76.1	4	4.7	5.2	0
351	76.1	4	3.9	2.7	0
501	76.1	4	3.1	1.3	0
161	88.9	4	7.4	29	0
281	88.9	4	5.6	9.7	0
401	88.9	4	4.6	4.8	0
521	88.9	4	3.8	2.9	0
159	114.3	4	11	27	0
289	114.3	4	8.5	8.3	0
419	114.3	4	6.8	4	0
599	114.3	4	5.3	1.9	0
167	139.7	4	14	50	0
287	139.7	4	11	16	0
407	139.7	4	9	7.9	0
517	139.7	4	7.7	4.8	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



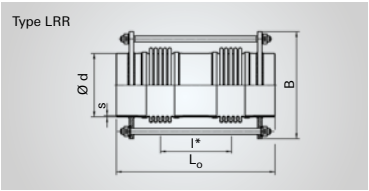
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	440656	475	17	320
150	102	.0150.102.0	440657	605	19	320
150	151	.0150.151.0	440658	725	20	320
150	202	.0150.202.0	440659	845	22	320
200	52	.0200.052.0	440660	530	29	405
200	100	.0200.100.0	440661	680	32	405
200	153	.0200.153.0	440662	840	35	405
200	206	.0200.206.0	440663	1015	52	405
250	52	.0250.052.0	440664	565	47	495
250	101	.0250.101.0	440665	725	51	495
250	152	.0250.152.0	440666	885	55	495
250	198	.0250.198.0	440667	1055	80	495
300	51	.0300.051.0	440668	590	73	575
300	102	.0300.102.0	440669	750	79	575
300	145	.0300.145.0	440670	905	102	575
300	196	.0300.196.0	440671	1055	114	575
300	292	.0300.292.0	440672	1355	139	575
350	50	.0350.050.0	440673	650	71	610
350	100	.0350.100.0	440674	820	78	610
350	149	.0350.149.0	440675	1005	99	610
350	195	.0350.195.0	440676	1155	109	610
350	296	.0350.296.0	440677	1505	134	610

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
177	168.3	4.5	23	74	0
307	168.3	4.5	18	24	0
427	168.3	4.5	15	12	0
547	168.3	4.5	13	7.3	0
219	219.1	6.3	47	92	0
369	219.1	6.3	36	31	0
529	219.1	6.3	29	15	0
668	219.1	6.3	24	8	0
227	273	7.1	97	112	0
387	273	7.1	75	37	0
547	273	7.1	61	18	0
676	273	7.1	51	10	0
223	323.9	8	162	202	0
383	323.9	8	127	65	0
488	323.9	8	104	32	0
638	323.9	8	90	19	0
938	323.9	8	70	9.2	0
237	355.6	6	193	242	0
407	355.6	6	147	78	0
542	355.6	6	119	36	0
692	355.6	6	102	23	0
1042	355.6	6	78	10	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



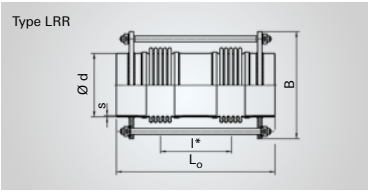
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 10...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	51	.0400.051.0	440678	715	114	700
400	106	.0400.106.0	440679	960	136	700
400	146	.0400.146.0	440680	1110	149	700
400	200	.0400.200.0	440681	1310	166	700
400	287	.0400.287.0	440682	1660	196	700
450	51	.0450.051.0	440683	715	141	690
450	98	.0450.098.0	440684	920	171	690
450	153	.0450.153.0	440685	1120	196	690
450	195	.0450.195.0	440686	1270	215	690
450	285	.0450.285.0	440687	1620	259	690
500	51	.0500.051.0	440688	720	158	740
500	105	.0500.105.0	440689	945	193	740
500	148	.0500.148.0	440690	1095	213	740
500	207	.0500.207.0	440691	1295	240	740
500	306	.0500.306.0	440692	1695	295	740

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
275	406.4	6	250	398	0
470	406.4	6	185	108	0
620	406.4	6	157	64	0
820	406.4	6	133	38	0
1170	406.4	6	105	19	0
270	457	8	279	500	0
425	457	8	214	159	0
625	457	8	174	77	0
775	457	8	151	51	0
1125	457	8	118	25	0
264	508	8	334	581	0
435	508	8	247	163	0
585	508	8	214	94	0
785	508	8	180	54	0
1185	508	8	137	24	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



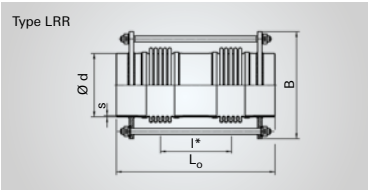
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	440693	380	5	205
50	103	.0050.103.0	440694	510	6	205
50	149	.0050.149.0	440695	630	7	205
50	199	.0050.199.0	440696	780	9	205
65	53	.0065.053.0	440697	410	8	225
65	104	.0065.104.0	440698	530	8	225
65	145	.0065.145.0	440699	640	9	225
65	198	.0065.198.0	440700	800	10	225
80	51	.0080.051.0	440701	420	9	240
80	102	.0080.102.0	440702	550	10	240
80	150	.0080.150.0	440703	670	11	240
80	205	.0080.205.0	440704	840	12	240
100	50	.0100.050.0	440705	425	10	265
100	103	.0100.103.0	440706	575	12	265
100	145	.0100.145.0	440707	705	13	265
100	202	.0100.202.0	440708	905	18	265
125	53	.0125.053.0	440709	485	17	290
125	102	.0125.102.0	440710	615	19	290
125	151	.0125.151.0	440711	735	21	290
125	196	.0125.196.0	440712	855	23	290

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
151	60.3	4	4	20	0
281	60.3	4	3	5.8	0
401	60.3	4	2.4	2.9	0
550	60.3	4	1.9	1.5	0
156	76.1	4	5.8	24	0
276	76.1	4	4.4	7.7	0
386	76.1	4	3.6	4	0
546	76.1	4	2.9	2	0
161	88.9	4	7.3	34	0
291	88.9	4	5.5	11	0
411	88.9	4	4.5	5.5	0
581	88.9	4	3.5	2.8	0
173	114.3	4	11	40	0
323	114.3	4	7.9	12	0
453	114.3	4	6.4	6	0
653	114.3	4	5	2.9	0
187	139.7	4	16	67	0
317	139.7	4	12	23	0
437	139.7	4	10	12	0
557	139.7	4	8.8	7.1	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



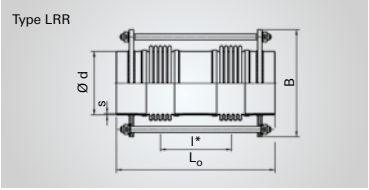
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	53	.0150.053.0	440713	515	24	350
150	100	.0150.100.0	440714	645	26	350
150	153	.0150.153.0	440715	785	29	350
150	194	.0150.194.0	440716	915	35	350
200	50	.0200.050.0	440717	545	40	435
200	100	.0200.100.0	440718	705	44	435
200	150	.0200.150.0	440719	855	48	435
200	200	.0200.200.0	440720	1045	65	435
250	52	.0250.052.0	440721	640	65	520
250	103	.0250.103.0	440722	860	83	520
250	154	.0250.154.0	440723	1060	96	520
250	207	.0250.207.0	440724	1310	112	520
300	50	.0300.050.0	440725	710	107	610
300	95	.0300.095.0	440726	880	122	610
300	145	.0300.145.0	440727	1080	140	610
300	196	.0300.196.0	440728	1330	162	610
300	296	.0300.296.0	440729	1830	206	610
350	51	.0350.051.0	440730	740	116	580
350	100	.0350.100.0	440731	940	137	580
350	149	.0350.149.0	440732	1140	158	580
350	199	.0350.199.0	440733	1390	184	580
350	306	.0350.306.0	440734	1940	242	580

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
197	168.3	4.5	29	85	0
327	168.3	4.5	23	30	0
467	168.3	4.5	19	14	0
597	168.3	4.5	16	8.7	0
213	219.1	6.3	65	137	0
373	219.1	6.3	50	42	0
523	219.1	6.3	41	21	0
672	219.1	6.3	34	11	0
266	273	7.1	106	216	0
445	273	7.1	79	62	0
645	273	7.1	64	31	0
895	273	7.1	52	16	0
235	323.9	8	156	236	0
405	323.9	8	127	89	0
605	323.9	8	103	42	0
855	323.9	8	83	22	0
1355	323.9	8	60	8.8	0
260	355.6	8	166	280	0
460	355.6	8	129	99	0
660	355.6	8	105	50	0
910	355.6	8	84	27	0
1460	355.6	8	60	11	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



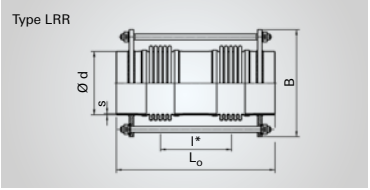
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 16...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
400	52	.0400.052.0	440735	760	141	630
400	94	.0400.094.0	440736	930	160	630
400	147	.0400.147.0	440737	1130	183	630
400	200	.0400.200.0	440738	1330	207	630
400	309	.0400.309.0	440739	1830	264	630
450	50	.0450.050.0	440740	800	198	720
450	104	.0450.104.0	440741	1020	228	720
450	155	.0450.155.0	440742	1220	255	720
450	203	.0450.203.0	440743	1420	283	720
450	296	.0450.296.0	440744	1870	346	720

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
260	406.4	8	211	407	0
430	406.4	8	168	166	0
630	406.4	8	137	81	0
830	406.4	8	115	48	0
1330	406.4	8	83	19	0
260	457	8	290	516	0
480	457	8	224	171	0
680	457	8	185	89	0
880	457	8	158	54	0
1330	457	8	118	24	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



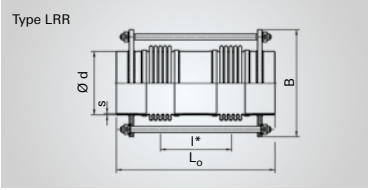
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	50	.0050.050.0	440745	410	7	205
50	98	.0050.098.0	440746	540	8	205
50	148	.0050.148.0	440747	710	10	205
50	205	.0050.205.0	440748	910	12	205
65	51	.0065.051.0	440749	430	8	225
65	99	.0065.099.0	440750	580	9	225
65	153	.0065.153.0	440751	780	11	225
65	195	.0065.195.0	440752	940	14	225
80	52	.0080.052.0	440753	440	11	240
80	103	.0080.103.0	440754	580	13	240
80	155	.0080.155.0	440755	750	15	240
80	193	.0080.193.0	440756	890	17	240
100	50	.0100.050.0	440757	475	14	265
100	101	.0100.101.0	440758	645	18	265
100	145	.0100.145.0	440759	805	20	265
100	192	.0100.192.0	440760	990	24	265
125	51	.0125.051.0	440761	515	22	320
125	102	.0125.102.0	440762	675	24	320
125	153	.0125.153.0	440763	865	27	320
125	196	.0125.196.0	440764	1050	33	320

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
156	60.3	4	3.9	23	0
286	60.3	4	2.9	7	0
455	60.3	4	2.2	2.8	0
655	60.3	4	1.7	1.4	0
185	76.1	4	5.5	26	0
335	76.1	4	4.1	8	0
535	76.1	4	3	3.1	0
695	76.1	4	2.5	1.9	0
176	88.9	4	6.9	39	0
316	88.9	4	5.2	13	0
486	88.9	4	4	5.4	0
626	88.9	4	3.4	3.3	0
197	114.3	4	12	54	0
367	114.3	4	9	16	0
527	114.3	4	7.1	7.8	0
712	114.3	4	5.8	4.3	0
211	139.7	4	20	67	0
371	139.7	4	15	21	0
561	139.7	4	12	8.8	0
714	139.7	4	9.7	4.9	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



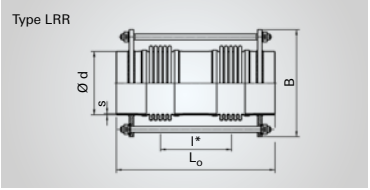
06

Nominal diameter	Nominal lateral movement absorption	Type LRR 25...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
150	51	.0150.051.0	440765	545	30	380
150	102	.0150.102.0	440766	715	34	380
150	151	.0150.151.0	440767	915	39	380
150	194	.0150.194.0	440768	1120	49	380
200	50	.0200.050.0	440769	670	64	460
200	101	.0200.101.0	440770	870	76	460
200	155	.0200.155.0	440771	1140	90	460
200	195	.0200.195.0	440772	1340	100	460
250	51	.0250.051.0	440773	690	92	495
250	101	.0250.101.0	440774	910	112	495
250	149	.0250.149.0	440775	1160	133	495
250	204	.0250.204.0	440776	1460	158	495
300	61	.0300.061.0	440777	825	144	545
300	110	.0300.110.0	440778	1050	166	545
300	150	.0300.150.0	440779	1250	186	545
300	200	.0300.200.0	440780	1550	216	545
300	302	.0300.302.0	440781	2150	274	545
350	50	.0350.050.0	440782	790	154	615
350	100	.0350.100.0	440783	1000	178	615
350	145	.0350.145.0	440784	1200	201	615
350	190	.0350.190.0	440785	1450	231	615
350	291	.0350.291.0	440786	2000	295	615

Centre-to-centre spacing of bellows	Weld end		Spring rate		
	outside diameter	wall thickness			
l*	d	s	c_r	c_λ	c_p
mm	mm	mm	N/bar	N/mm	N/mm bar
221	168.3	4.5	39	85	0
391	168.3	4.5	30	26	0
591	168.3	4.5	23	11	0
764	168.3	4.5	19	6.1	0
261	219.1	6.3	70	190	0
461	219.1	6.3	53	59	0
690	219.1	6.3	40	23	0
890	219.1	6.3	34	14	0
271	273	7.1	106	250	0
450	273	7.1	79	74	0
700	273	7.1	61	32	0
1000	273	7.1	48	16	0
340	323.9	8	118	213	0
565	323.9	8	93	83	0
765	323.9	8	78	46	0
1065	323.9	8	62	24	0
1665	323.9	8	45	10	0
260	355.6	8	179	363	0
470	355.6	8	141	125	0
670	355.6	8	116	64	0
920	355.6	8	94	35	0
1470	355.6	8	68	14	0

LATERAL EXPANSION JOINTS WITH LOOSE FLANGES, FOR MOVEMENT IN ALL PLANES

Type LRR



06

Nominal diameter	Nominal lateral movement absorption	Type LRR 40...	Order No. standard version	Overall length	Weight approx.	Max. width approx.
DN	$2\lambda_{-N}$	–	–	L_o	G	B
–	mm	–	–	mm	kg	mm
50	53	.0050.053.0	440787	440	7	205
50	100	.0050.100.0	440788	640	9	205
50	146	.0050.146.0	440789	840	11	205
50	204	.0050.204.0	440790	1090	13	205
65	49	.0065.049.0	440791	465	11	225
65	100	.0065.100.0	440792	665	14	225
65	156	.0065.156.0	440793	915	17	225
65	200	.0065.200.0	440794	1115	20	225
80	51	.0080.051.0	440795	475	13	240
80	101	.0080.101.0	440796	675	15	240
80	156	.0080.156.0	440797	925	18	240
80	188	.0080.188.0	440798	1075	22	240
100	46	.0100.046.0	440799	590	25	325
100	96	.0100.096.0	440800	830	32	325
100	146	.0100.146.0	440801	1130	39	325
100	197	.0100.197.0	440802	1430	46	325
125	46	.0125.046.0	440803	600	31	350
125	94	.0125.094.0	440804	850	37	350
125	152	.0125.152.0	440805	1200	46	350
125	193	.0125.193.0	440806	1450	53	350