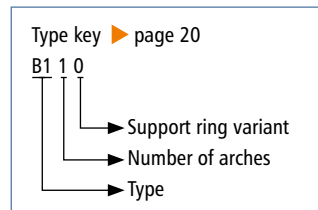


B110

NB 50 – NB 1500



- ▶ **Type B110**
without vacuum support ring
- ▶ **Type B111**
with internal vacuum support ring
- ▶ **Type B112**
with embedded vacuum support ring

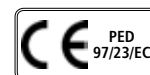


Universal expansion joint with one arch

Design:	Hydrodynamic, single-arch rubber bellows with sleeves for clamped fixing Optionally with vacuum support ring
Nominal diameters:	NB 50 to NB 1500, intermediate sizes possible
Installation length:	= Installation gap + 2 x fixing width Standard installation gaps $L_0 = 125$ to 250 mm (▶ page 143–145) Other installation gaps on request
Fixing width:	Depends on pressure, nominal diameter and clamp design, at least 40 mm
Pressure:	Depending on the nominal diameter and installation length up to 6 bar Vacuum-proof up to 0.8 bar absolute, with vacuum support ring up to 0.05 bar absolute Design in accordance with Pressure Equipment Directive PED 97/23/EC
Movement:	For axial, lateral and angular movements (▶ page 143–145) For axial extension or vacuums, the expansion joint can be drawn from the pipeline (groove as needed at the pipeline end)

Application:

Power plants, plant construction, food processing, wastewater treatment plants, industrial facilities, e. g. to disconnect pipelines, on oscillating conveyor systems, on sieving machines



Rubber bellows

Rubber grades			Carrier
up to 100 °C:	EPDM	Cooling water, hot water, seawater, acids, dilute chlorine compounds	Nylon fabric Polyester fabric Kevlar fabric Glass fibre fabric Steel mesh
	EPDM, drinking water approved	Drinking water	
	EPDM, beige, food grade	Foodstuffs	
	EPDM, abrasion-resistant	Abrasive materials, Water-sand extraction	
	EPDM, insulating	Electrical systems construction	
	IIR	Hot water, acids, bases, gases	
	CSM	Strong acids, bases, chemicals	
	NBR	Oils, petrol, solvents, compressed air	
	NBR, bright, food grade	Oil, fatty foods	
up to 80 °C:	CR	Cooling water, slightly oily water, seawater	
up to 70 °C:	NR	Abrasive materials	
up to 150 °C:	HNBR	Oils, petrol, solvents, compressed air	
up to 180 °C:	FPM	Corrosive chemicals, petroleum distillates	
up to 200 °C:	Silicon (Q)	Air, saltwater atmosphere	
	Silicon (Q), white, food grade	Foodstuffs, medical technology	
PTFE lining:	Permanently embedded against chemical attacks on the interior at the rubber bellows, available starting at NB 300. Take the restriction of the listed movement into account (▶ page 143–145)		

Fastening clamps

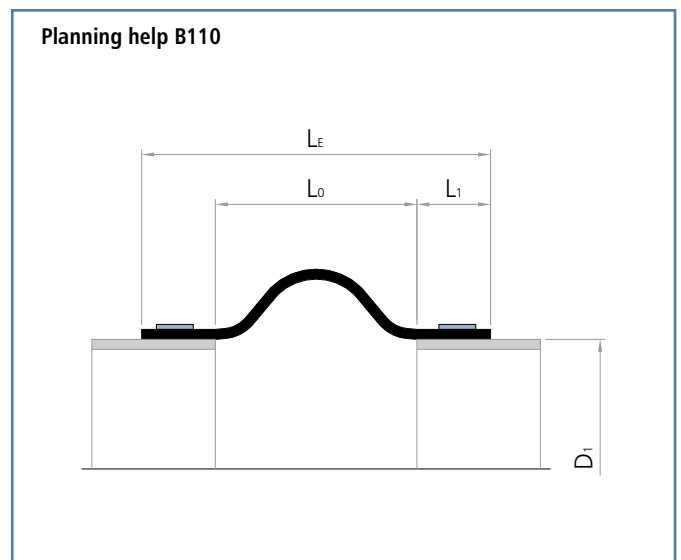
Design:	Depending on pressure and nominal diameters, endless clamp belt, screw thread belt, small clamps or hinge bolt clamps. At higher pressures, 2 adjacent clamps per fastening side	
Width:	Endless clamp belt:	¾"
	Screw thread belt:	½"
	Small clamp:	depending on Ø: 9–12 mm
	Hinge bolt clamp:	depending on Ø: 18–30 mm
Materials:	Endless clamp belt with screw lugs (tongs):	1.7300
	Screw thread belt with threaded screw lugs:	1.4310
	Small clamp, belt and housing:	1.4016 (Screw steel galvanised)
	Hinge bolt clamp, belt and housing:	1.4016 (Screw steel galvanised)

Support rings

TYPE		Vacuum support ring	Pressure	Movement
B110		Without	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.8 bar absolute	▶ page 143
B111		Medium contact, inside the arch apex	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	▶ page 144
B112		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 6 bar, for vacuum up to 0.05 bar absolute	▶ page 145

Materials

Stainless steel: 1.4301 (X5CrNi18-10) Other materials on request
 1.4539 (X1NiCrMoCu25-20-5)
 1.4571 (X6CrNiMoTi17-12-2)
 Carbon steel: 1.0570 (S355J2G3) rubber coated




Installation gap

NB	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	31	10	20	21.8	96	40	20	30	38.7	155	44	20	32	38.7	159
65	31	10	20	17.1	125	40	20	29	31.6	191	44	20	32	31.6	196
80	31	10	20	14.0	152	40	20	29	26.6	224	44	20	31	26.6	229
100	31	10	19	11.3	212	40	20	28	21.8	297	44	20	30	21.8	303
125	31	10	19	9.1	283	40	20	28	17.7	379	44	20	30	17.7	386
150	31	10	18	7.6	374	40	20	27	14.9	484	44	20	29	14.9	492
175	31	10	18	6.5	466	40	20	27	12.9	588	44	20	29	12.9	597
200	31	10	18	5.7	569	40	20	26	11.3	703	44	20	29	11.3	712
250	31	10	18	4.6	819	40	20	26	9.1	979	44	20	28	9.1	990
300	31	10	17	3.8	1,098	40	20	26	7.6	1,281	44	20	27	7.6	1,294
350	31	10	17	3.3	1,292	40	20	25	6.5	1,490	44	20	27	6.5	1,504
400	31	10	17	2.9	1,636	40	20	25	5.7	1,858	44	20	27	5.7	1,873
450	31	10	17	2.5	2,020	40	20	25	5.1	2,267	44	20	26	5.1	2,283
500	31	10	17	2.3	2,445	40	20	24	4.6	2,715	44	20	26	4.6	2,734
550	31	10	16	2.1	2,911	40	20	24	4.2	3,205	44	20	26	4.2	3,225
600	31	10	16	1.9	3,417	40	20	24	3.8	3,735	44	20	26	3.8	3,757
650	31	10	16	1.8	3,964	40	20	24	3.5	4,305	44	20	26	3.5	4,329
700	31	10	16	1.6	4,551	40	20	24	3.3	4,917	44	20	25	3.3	4,941
750	31	10	16	1.5	5,178	40	20	23	3.1	5,568	44	20	25	3.1	5,595
800	31	10	16	1.4	5,847	40	20	23	2.9	6,260	44	20	25	2.9	6,288
850	31	10	16	1.3	6,555	40	20	23	2.7	6,993	44	20	25	2.7	7,023
900	31	10	16	1.3	7,305	40	20	23	2.5	7,766	44	20	25	2.5	7,798
1000	31	10	16	1.1	8,925	40	20	23	2.3	9,434	44	20	25	2.3	9,469
1100	31	10	15	1.0	10,496	40	20	23	2.1	11,047	44	20	24	2.1	11,085
1200	31	10	15	1.0	12,370	40	20	22	1.9	12,969	44	20	24	1.9	13,009
1300	31	10	15	0.9	14,420	40	20	22	1.8	15,066	44	20	24	1.8	15,109
1400	31	10	15	0.8	16,627	40	20	22	1.6	17,320	44	20	24	1.6	17,366
1500	31	10	15	0.8	18,991	40	20	22	1.5	19,731	44	20	24	1.5	19,781

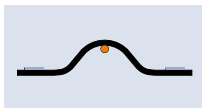
Installation gap

NB	L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
50	53	31	42	51.1	233	60	32	46	52.0	255	69	43	56	59.8	347
65	53	31	41	43.6	278	60	32	45	44.6	302	69	43	55	52.9	402
80	53	31	40	37.8	317	60	32	44	38.7	343	69	43	54	47.1	448
100	53	31	39	31.8	402	60	32	44	32.6	431	69	43	53	40.7	549
125	53	31	39	26.4	498	60	32	43	27.1	530	69	43	51	34.5	659
150	53	31	38	22.5	617	60	32	42	23.1	653	69	43	51	29.8	796
175	53	31	37	19.5	734	60	32	41	20.1	773	69	43	50	26.2	928
200	53	31	37	17.2	861	60	32	41	17.7	903	69	43	49	23.3	1,070
250	53	31	36	13.9	1,164	60	32	40	14.4	1,213	69	43	48	19.0	1,405
300	53	31	36	11.7	1,492	60	32	39	12.0	1,548	69	43	48	16.0	1,764
350	53	31	35	10.0	1,717	60	32	39	10.4	1,777	69	43	47	13.8	2,008
400	53	31	35	8.8	2,111	60	32	38	9.1	2,176	69	43	46	12.1	2,431
450	53	31	34	7.8	2,545	60	32	38	8.1	2,617	69	43	46	10.8	2,896
500	53	31	34	7.1	3,019	60	32	38	7.3	3,097	69	43	45	9.8	3,400
550	53	31	34	6.4	3,534	60	32	37	6.6	3,619	69	43	45	8.9	3,946
600	53	31	33	5.9	4,090	60	32	37	6.1	4,181	69	43	45	8.2	4,532
650	53	31	33	5.4	4,686	60	32	37	5.6	4,783	69	43	44	7.5	5,158
700	53	31	33	5.1	5,322	60	32	36	5.2	5,426	69	43	44	7.0	5,825
750	53	31	33	4.7	5,999	60	32	36	4.9	6,110	69	43	44	6.5	6,533
800	53	31	33	4.4	6,717	60	32	36	4.6	6,834	69	43	43	6.1	7,281
850	53	31	32	4.2	7,475	60	32	36	4.3	7,598	69	43	43	5.8	8,069
900	53	31	32	3.9	8,274	60	32	36	4.1	8,404	69	43	43	5.5	8,898
1000	53	31	32	3.5	9,993	60	32	35	3.7	10,136	69	43	43	4.9	10,678
1100	53	31	32	3.2	11,652	60	32	35	3.3	11,805	69	43	42	4.5	12,390
1200	53	31	31	3.0	13,623	60	32	35	3.1	13,789	69	43	42	4.1	14,420
1300	53	31	31	2.7	15,770	60	32	34	2.8	15,948	69	43	42	3.8	16,627
1400	53	31	31	2.5	18,074	60	32	34	2.6	18,265	69	43	41	3.5	18,991
1500	53	31	31	2.4	20,536	60	32	34	2.4	20,739	69	43	41	3.3	21,512

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 29).
For larger movements see type B120 or B123.

Individual fabrication possible



B111

▶ with internal vacuum support ring



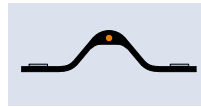
Installation gap															
	L ₀ = 125 mm					L ₀ = 150 mm					L ₀ = 175 mm				
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	31	3	20	6.8	96	40	7	30	15.6	155	44	7	32	15.6	159
65	31	3	20	5.3	125	40	7	29	12.2	191	44	7	32	12.2	196
80	31	3	20	4.3	152	40	7	29	9.9	224	44	7	31	9.9	229
100	31	3	19	3.4	212	40	7	28	8.0	297	44	7	30	8.0	303
125	31	3	19	2.7	283	40	7	28	6.4	379	44	7	30	6.4	386
150	31	3	18	2.3	374	40	7	27	5.3	484	44	7	29	5.3	492
175	31	3	18	2.0	466	40	7	27	4.6	588	44	7	29	4.6	597
200	31	3	18	1.7	569	40	7	26	4.0	703	44	7	29	4.0	712
250	31	3	18	1.4	819	40	7	26	3.2	979	44	7	28	3.2	990
300	31	3	17	1.1	1,098	40	7	26	2.7	1,281	44	7	27	2.7	1,294
350	31	3	17	1.0	1,292	40	7	25	2.3	1,490	44	7	27	2.3	1,504
400	31	3	17	0.9	1,636	40	7	25	2.0	1,858	44	7	27	2.0	1,873
450	31	3	17	0.8	2,020	40	7	25	1.8	2,267	44	7	26	1.8	2,283
500	31	3	17	0.7	2,445	40	7	24	1.6	2,715	44	7	26	1.6	2,734
550	31	3	16	0.6	2,911	40	7	24	1.5	3,205	44	7	26	1.5	3,225
600	31	3	16	0.6	3,417	40	7	24	1.3	3,735	44	7	26	1.3	3,757
650	31	3	16	0.5	3,964	40	7	24	1.2	4,305	44	7	26	1.2	4,329
700	31	3	16	0.5	4,551	40	7	24	1.1	4,917	44	7	25	1.1	4,941
750	31	3	16	0.5	5,178	40	7	23	1.1	5,568	44	7	25	1.1	5,595
800	31	3	16	0.4	5,847	40	7	23	1.0	6,260	44	7	25	1.0	6,288
850	31	3	16	0.4	6,555	40	7	23	0.9	6,993	44	7	25	0.9	7,023
900	31	3	16	0.4	7,305	40	7	23	0.9	7,766	44	7	25	0.9	7,798
1000	31	3	16	0.3	8,925	40	7	23	0.8	9,434	44	7	25	0.8	9,469
1100	31	3	15	0.3	10,496	40	7	23	0.7	11,047	44	7	24	0.7	11,085
1200	31	3	15	0.3	12,370	40	7	22	0.7	12,969	44	7	24	0.7	13,009
1300	31	3	15	0.3	14,420	40	7	22	0.6	15,066	44	7	24	0.6	15,109
1400	31	3	15	0.2	16,627	40	7	22	0.6	17,320	44	7	24	0.6	17,366
1500	31	3	15	0.2	18,991	40	7	22	0.5	19,731	44	7	24	0.5	19,781

Installation gap															
	L ₀ = 200 mm					L ₀ = 225 mm					L ₀ = 250 mm				
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	53	10	42	21.8	233	60	11	46	23.7	255	69	14	56	29.2	347
65	53	10	41	17.1	278	60	11	45	18.7	302	69	14	55	23.3	402
80	53	10	40	14.0	317	60	11	44	15.4	343	69	14	54	19.3	448
100	53	10	39	11.3	402	60	11	44	12.4	431	69	14	53	15.6	549
125	53	10	39	9.1	498	60	11	43	10.0	530	69	14	51	12.6	659
150	53	10	38	7.6	617	60	11	42	8.3	653	69	14	51	10.6	796
175	53	10	37	6.5	734	60	11	41	7.2	773	69	14	50	9.1	928
200	53	10	37	5.7	861	60	11	41	6.3	903	69	14	49	8.0	1,070
250	53	10	36	4.6	1,164	60	11	40	5.0	1,213	69	14	48	6.4	1,405
300	53	10	36	3.8	1,492	60	11	39	4.2	1,548	69	14	48	5.3	1,764
350	53	10	35	3.3	1,717	60	11	39	3.6	1,777	69	14	47	4.6	2,008
400	53	10	35	2.9	2,111	60	11	38	3.1	2,176	69	14	46	4.0	2,431
450	53	10	34	2.5	2,545	60	11	38	2.8	2,617	69	14	46	3.6	2,896
500	53	10	34	2.3	3,019	60	11	38	2.5	3,097	69	14	45	3.2	3,400
550	53	10	34	2.1	3,534	60	11	37	2.3	3,619	69	14	45	2.9	3,946
600	53	10	33	1.9	4,090	60	11	37	2.1	4,181	69	14	45	2.7	4,532
650	53	10	33	1.8	4,686	60	11	37	1.9	4,783	69	14	44	2.5	5,158
700	53	10	33	1.6	5,322	60	11	36	1.8	5,426	69	14	44	2.3	5,825
750	53	10	33	1.5	5,999	60	11	36	1.7	6,110	69	14	44	2.1	6,533
800	53	10	33	1.4	6,717	60	11	36	1.6	6,834	69	14	43	2.0	7,281
850	53	10	32	1.3	7,475	60	11	36	1.5	7,598	69	14	43	1.9	8,069
900	53	10	32	1.3	8,274	60	11	36	1.4	8,404	69	14	43	1.8	8,898
1000	53	10	32	1.1	9,993	60	11	35	1.3	10,136	69	14	43	1.6	10,678
1100	53	10	32	1.0	11,652	60	11	35	1.1	11,805	69	14	42	1.5	12,390
1200	53	10	31	1.0	13,623	60	11	35	1.1	13,789	69	14	42	1.3	14,420
1300	53	10	31	0.9	15,770	60	11	34	1.0	15,948	69	14	42	1.2	16,627
1400	53	10	31	0.8	18,074	60	11	34	0.9	18,265	69	14	41	1.1	18,991
1500	53	10	31	0.8	20,536	60	11	34	0.8	20,739	69	14	41	1.1	21,512

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -0 %; lateral displacement: -25 %; angular movement: -0 %.
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (▶ page 29).
For larger movements see type B121 or B124.

Individual fabrication possible


Installation gap

NB	$L_0 = 125 \text{ mm}$					$L_0 = 150 \text{ mm}$					$L_0 = 175 \text{ mm}$				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	20	3	10	6.8	96	26	7	15	15.6	155	29	7	16	15.6	159
65	20	3	10	5.3	125	26	7	15	12.2	191	29	7	16	12.2	196
80	20	3	10	4.3	152	26	7	14	9.9	224	29	7	15	9.9	229
100	20	3	10	3.4	212	26	7	14	8.0	297	29	7	15	8.0	303
125	20	3	9	2.7	283	26	7	14	6.4	379	29	7	15	6.4	386
150	20	3	9	2.3	374	26	7	14	5.3	484	29	7	15	5.3	492
175	20	3	9	2.0	466	26	7	13	4.6	588	29	7	14	4.6	597
200	20	3	9	1.7	569	26	7	13	4.0	703	29	7	14	4.0	712
250	20	3	9	1.4	819	26	7	13	3.2	979	29	7	14	3.2	990
300	20	3	9	1.1	1,098	26	7	13	2.7	1,281	29	7	14	2.7	1,294
350	20	3	9	1.0	1,292	26	7	13	2.3	1,490	29	7	14	2.3	1,504
400	20	3	8	0.9	1,636	26	7	12	2.0	1,858	29	7	13	2.0	1,873
450	20	3	8	0.8	2,020	26	7	12	1.8	2,267	29	7	13	1.8	2,283
500	20	3	8	0.7	2,445	26	7	12	1.6	2,715	29	7	13	1.6	2,734
550	20	3	8	0.6	2,911	26	7	12	1.5	3,205	29	7	13	1.5	3,225
600	20	3	8	0.6	3,417	26	7	12	1.3	3,735	29	7	13	1.3	3,757
650	20	3	8	0.5	3,964	26	7	12	1.2	4,305	29	7	13	1.2	4,329
700	20	3	8	0.5	4,551	26	7	12	1.1	4,917	29	7	13	1.1	4,941
750	20	3	8	0.5	5,178	26	7	12	1.1	5,568	29	7	13	1.1	5,595
800	20	3	8	0.4	5,847	26	7	12	1.0	6,260	29	7	13	1.0	6,288
850	20	3	8	0.4	6,555	26	7	12	0.9	6,993	29	7	12	0.9	7,023
900	20	3	8	0.4	7,305	26	7	12	0.9	7,766	29	7	12	0.9	7,798
1000	20	3	8	0.3	8,925	26	7	11	0.8	9,434	29	7	12	0.8	9,469
1100	20	3	8	0.3	10,496	26	7	11	0.7	11,047	29	7	12	0.7	11,085
1200	20	3	8	0.3	12,370	26	7	11	0.7	12,969	29	7	12	0.7	13,009
1300	20	3	8	0.3	14,420	26	7	11	0.6	15,066	29	7	12	0.6	15,109
1400	20	3	8	0.2	16,627	26	7	11	0.6	17,320	29	7	12	0.6	17,366
1500	20	3	7	0.2	18,991	26	7	11	0.5	19,731	29	7	12	0.5	19,781

Installation gap

NB	$L_0 = 200 \text{ mm}$					$L_0 = 225 \text{ mm}$					$L_0 = 250 \text{ mm}$				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
50	35	10	21	21.8	233	40	11	23	23.7	255	46	14	28	29.2	347
65	35	10	20	17.1	278	40	11	23	18.7	302	46	14	27	23.3	402
80	35	10	20	14.0	317	40	11	22	15.4	343	46	14	27	19.3	448
100	35	10	20	11.3	402	40	11	22	12.4	431	46	14	26	15.6	549
125	35	10	19	9.1	498	40	11	21	10.0	530	46	14	26	12.6	659
150	35	10	19	7.6	617	40	11	21	8.3	653	46	14	25	10.6	796
175	35	10	19	6.5	734	40	11	21	7.2	773	46	14	25	9.1	928
200	35	10	18	5.7	861	40	11	20	6.3	903	46	14	25	8.0	1,070
250	35	10	18	4.6	1,164	40	11	20	5.0	1,213	46	14	24	6.4	1,405
300	35	10	18	3.8	1,492	40	11	20	4.2	1,548	46	14	24	5.3	1,764
350	35	10	18	3.3	1,717	40	11	19	3.6	1,777	46	14	23	4.6	2,008
400	35	10	17	2.9	2,111	40	11	19	3.1	2,176	46	14	23	4.0	2,431
450	35	10	17	2.5	2,545	40	11	19	2.8	2,617	46	14	23	3.6	2,896
500	35	10	17	2.3	3,019	40	11	19	2.5	3,097	46	14	23	3.2	3,400
550	35	10	17	2.1	3,534	40	11	19	2.3	3,619	46	14	22	2.9	3,946
600	35	10	17	1.9	4,090	40	11	18	2.1	4,181	46	14	22	2.7	4,532
650	35	10	17	1.8	4,686	40	11	18	1.9	4,783	46	14	22	2.5	5,158
700	35	10	16	1.6	5,322	40	11	18	1.8	5,426	46	14	22	2.3	5,825
750	35	10	16	1.5	5,999	40	11	18	1.7	6,110	46	14	22	2.1	6,533
800	35	10	16	1.4	6,717	40	11	18	1.6	6,834	46	14	22	2.0	7,281
850	35	10	16	1.3	7,475	40	11	18	1.5	7,598	46	14	22	1.9	8,069
900	35	10	16	1.3	8,274	40	11	18	1.4	8,404	46	14	22	1.8	8,898
1000	35	10	16	1.1	9,993	40	11	18	1.3	10,136	46	14	21	1.6	10,678
1100	35	10	16	1.0	11,652	40	11	17	1.1	11,805	46	14	21	1.5	12,390
1200	35	10	16	1.0	13,623	40	11	17	1.1	13,789	46	14	21	1.3	14,420
1300	35	10	16	0.9	15,770	40	11	17	1.0	15,948	46	14	21	1.2	16,627
1400	35	10	15	0.8	18,074	40	11	17	0.9	18,265	46	14	21	1.1	18,991
1500	35	10	15	0.8	20,536	40	11	17	0.8	20,739	46	14	21	1.1	21,512

Recommended sizes

Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:

axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %; angular movement: -0 %.

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 29).

For larger movements see type B122 or B125.

Individual fabrication possible