

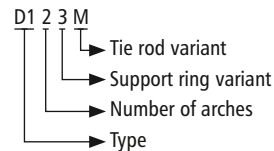
D120x (B/E/C/M/R/K/L)

NB 20 – NB 1200



- ▶ **Type D120x** (B/E/C/M/R/K/L)
without vacuum support rings
- ▶ **Type D121x** (B/E/C/M/R/K/L)
with internal vacuum support rings
- ▶ **Type D122x** (B/E/C/M/R/K/L)
with embedded vacuum support rings
- ▶ **Type D123x** (B/E/C/M/R/K/L)
without vacuum support rings,
with pressure support ring in the arch trough
- ▶ **Type D124x** (B/E/C/M/R/K/L)
with internal vacuum support rings,
with external pressure support ring in the
arch trough
- ▶ **Type D125x** (B/E/C/M/R/K/L)
with embedded vacuum support rings,
with external pressure support ring in the
arch trough

Type key ▶ page 20



Lateral expansion joint with two arches

- Design:** Highly elastic, hydrodynamic, double-arch rubber bellows with self-sealing rubber bulges and swivel backing flanges with support collar and tie rods
Optionally with vacuum support rings and/or pressure support ring in the arch trough
- Nominal diameters:** NB 200 to NB 1200, intermediate sizes possible
- Installation length:** Standard $L_E = 350$ to 650 mm (▶ page 216–218)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 10 bar
Vacuum not allowed without vacuum support rings, with vacuum support rings up to 0.05 bar absolute
Design in accordance with Pressure Equipment Directive PED 97/23/EC
- Movement:** For very large lateral movements (▶ page 216–218)
Installation gap tolerances possible in the context of axial compression and extension

Application:

Cooling water systems, desalination plants, drinking water supply, plant construction, e.g. in pipelines, on pumps, as dismantling joints, on condensers and vessels



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, white, 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 216–218)		

Flanges

Design:	Single-part swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and holder for tie rods (control unit type B, E, C, M) Single-part, round, swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and control unit plates (control unit type R, K, L)
Flange norms:	DIN, ANSI, AWWA, BS, JIS, special measurements (▶ page 280)
Materials:	Carbon steel: 1.0038 (S235JRG2) 1.0570 (S355J2G3) Stainless steel: 1.4301 (X5CrNi18-10) 1.4571 (X6CrNiMoTi17-12-2) Aluminium: AlMg3 Other materials on request
Coating:	Primed, hot-dip galvanised, special paint

Optional accessories

Protective hood:	UV protection cover Ground protective cover Fire protection cover (▶ page 50)
Flow liners:	Cylindrical flow liner Conical flow liner Telescoping flow liner (▶ page 49)

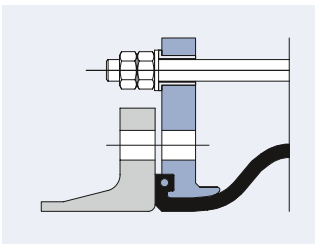
Tie rods



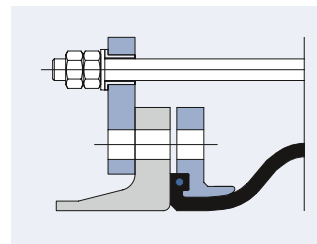
Design: Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive

Materials: Carbon steel in strength class 8.8 or stainless steel

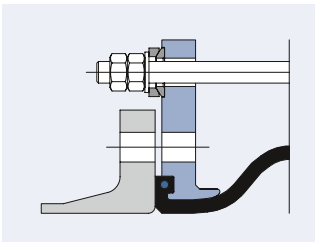
Coating: Spherical bearing and ball disks PTFE-coated
Tie rods galvanised or hot-dip galvanised



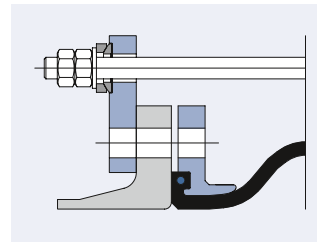
Type D120B
Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



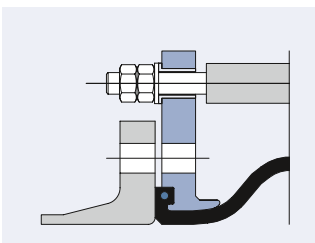
Type D120R
Control unit plates: Tie rods mounted outside in rubber bushing to accommodate reaction forces in the event of pressure (up to NB 300)



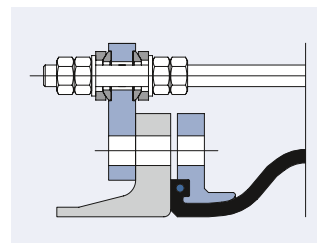
Type D120E
Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



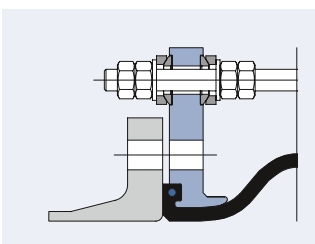
Type D120K
Control unit plates: Tie rods mounted outside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure



Type D120C
Tie rods mounted outside in rubber bushing and in the thrust limiter to accommodate stresses in the event of pressure and vacuum (up to NB 300)









Type D120L
Control unit plates: Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum



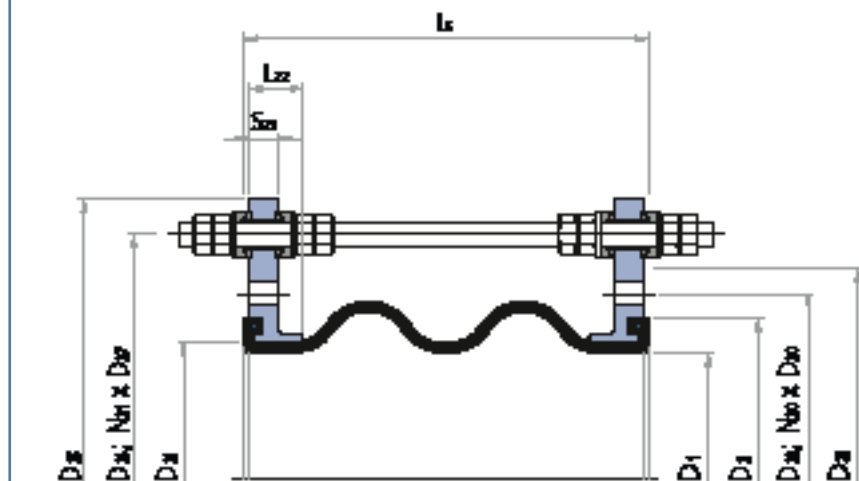
Type D120M
Tie rods mounted outside and inside in spherical bearings and ball disks to accommodate the reaction forces in the event of pressure and vacuum

Support rings

TYPE		Vacuum support ring	Pressure support ring	Pressure	Movement
D120x B/E/C/M/ R/K/L)		Without	Without	Slight pressure, slight vacuum	▶ page 216
D121x B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 217
D122x B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	Without	Slight pressure, for vacuum up to 0.05 bar absolute	▶ page 218
D123x B/E/C/M/ R/K/L)		Without	External in the arch trough	Depending on the nominal diameter up to 10 bar, slight vacuum	▶ page 216
D124x B/E/C/M/ R/K/L)		Medium contact, inside the arch apex	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	▶ page 217
D125x B/E/C/M/ R/K/L)		No medium contact, embedded into the arch apex of the rubber bellows	External in the arch trough	Depending on the nominal diameter up to 10 bar, for vacuum up to 0.05 bar absolute	▶ page 218

Materials

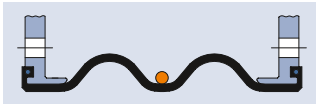
Stainless steel:	1.4301 (X5CrNi18-10) 1.4539 (X1NiCrMoCu25-20-5) 1.4571 (X6CrNiMoTi17-12-2)	Other materials on request
Carbon steel:	1.0570 (S355J2G3) rubber coated	

Planning help D120M




D120x (B/E/C/M/R/K/L)

▶ without vacuum support rings



D123x (B/E/C/M/R/K/L)

▶ without vacuum support rings, with external pressure support ring in the arch trough



Installation length (L_E) at design pressure

NB	up to 10 bar $L_E = 350$ mm					up to 10 bar $L_E = 400$ mm					up to 10 bar $L_E = 450$ mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	74	38	50	0	445	62	20	36	0	445	30	30	30	0	564
250	74	38	49	0	656	62	20	35	0	656	30	30	30	0	799
300	74	38	48	0	903	62	20	35	0	903	44	17	26	0	1,069
350	74	38	47	0	1,134	62	20	34	0	1,134	89	33	51	0	1,320
400	74	38	47	0	1,521	62	20	34	0	1,521	89	33	51	0	1,735
450	74	38	46	0	1,878	62	20	33	0	1,878	89	33	50	0	2,116
500	74	38	46	0	2,290	62	20	33	0	2,290	89	33	50	0	2,552
600	74	38	45	0	3,187	62	20	33	0	3,187	89	33	49	0	3,494
700	74	38	44	0	4,312	62	20	32	0	4,312	89	33	48	0	4,669
800	74	38	44	0	5,555	62	20	32	0	5,555	89	33	47	0	5,958
900	74	38	43	0	6,910	62	20	31	0	6,910	89	33	47	0	7,359
1000	74	38	43	0	8,462	62	20	31	0	8,462	89	33	46	0	8,958
1100	74	38	42	0	10,171	62	20	31	0	10,171	89	33	46	0	10,715
1200	74	38	42	0	12,037	62	20	31	0	12,037	89	33	46	0	12,628

Installation length (L_E) at design pressure

NB	up to 10 bar $L_E = 500$ mm					up to 10 bar $L_E = 550$ mm					up to 10 bar $L_E = 600$ mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	88	41	57	0	573	106	61	74	0	707	124	82	91	0	855
250	88	41	56	0	809	106	61	72	0	968	124	82	89	0	1,140
300	88	41	55	0	1,081	106	61	71	0	1,263	124	82	88	0	1,459
350	88	41	54	0	1,333	106	61	70	0	1,534	124	82	86	0	1,750
400	88	41	54	0	1,750	106	61	69	0	1,979	124	82	85	0	2,223
450	88	41	53	0	2,132	106	61	69	0	2,384	124	82	84	0	2,651
500	88	41	52	0	2,570	106	61	68	0	2,846	124	82	84	0	3,137
600	88	41	52	0	3,515	106	61	67	0	3,837	124	82	82	0	4,174
700	88	41	51	0	4,693	106	61	66	0	5,064	124	82	81	0	5,450
800	88	41	50	0	5,986	106	61	65	0	6,404	124	82	80	0	6,837
900	88	41	50	0	7,390	106	61	64	0	7,854	124	82	79	0	8,332
1000	88	41	49	0	8,992	106	61	64	0	9,503	124	82	79	0	10,029
1100	88	41	49	0	10,751	106	61	63	0	11,310	124	82	78	0	11,882
1200	88	41	48	0	12,668	106	61	63	0	13,273	124	82	77	0	13,893

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 only possible with guided pressure support ring.

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

Larger movements on request.

Individual fabrication possible

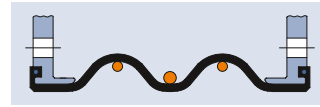
D121x (B/E/C/M/R/K/L)

▶ with internal vacuum support rings



D124x (B/E/C/M/R/K/L)

▶ with internal vacuum support rings, with external pressure support ring in the arch trough



Installation length (L _E) at design pressure															
up to 10 bar L _E = 350 mm						up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
higher pressures on request															
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	74	13	33	0	445	62	7	24	0	445	30	30	30	0	564
250	74	13	32	0	656	62	7	23	0	656	30	30	30	0	799
300	74	13	32	0	903	62	7	23	0	903	44	5	17	0	1,069
350	74	13	31	0	1,134	62	7	23	0	1,134	89	11	34	0	1,320
400	74	13	31	0	1,521	62	7	22	0	1,521	89	11	33	0	1,735
450	74	13	30	0	1,878	62	7	22	0	1,878	89	11	33	0	2,116
500	74	13	30	0	2,290	62	7	22	0	2,290	89	11	33	0	2,552
600	74	13	30	0	3,187	62	7	22	0	3,187	89	11	32	0	3,494
700	74	13	29	0	4,312	62	7	21	0	4,312	89	11	32	0	4,669
800	74	13	29	0	5,555	62	7	21	0	5,555	89	11	31	0	5,958
900	74	13	29	0	6,910	62	7	21	0	6,910	89	11	31	0	7,359
1000	74	13	28	0	8,462	62	7	21	0	8,462	89	11	31	0	8,958
1100	74	13	28	0	10,171	62	7	20	0	10,171	89	11	30	0	10,715
1200	74	13	28	0	12,037	62	7	20	0	12,037	89	11	30	0	12,628

Installation length (L _E) at design pressure															
up to 10 bar L _E = 500 mm						up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
higher pressures on request															
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	88	13	38	0	573	106	20	49	0	707	124	27	60	0	855
250	88	13	37	0	809	106	20	48	0	968	124	27	59	0	1,140
300	88	13	36	0	1,081	106	20	47	0	1,263	124	27	58	0	1,459
350	88	13	36	0	1,333	106	20	46	0	1,534	124	27	57	0	1,750
400	88	13	35	0	1,750	106	20	46	0	1,979	124	27	56	0	2,223
450	88	13	35	0	2,132	106	20	45	0	2,384	124	27	56	0	2,651
500	88	13	35	0	2,570	106	20	45	0	2,846	124	27	55	0	3,137
600	88	13	34	0	3,515	106	20	44	0	3,837	124	27	54	0	4,174
700	88	13	34	0	4,693	106	20	44	0	5,064	124	27	54	0	5,450
800	88	13	33	0	5,986	106	20	43	0	6,404	124	27	53	0	6,837
900	88	13	33	0	7,390	106	20	43	0	7,854	124	27	52	0	8,332
1000	88	13	33	0	8,992	106	20	42	0	9,503	124	27	52	0	10,029
1100	88	13	32	0	10,751	106	20	42	0	11,310	124	27	51	0	11,882
1200	88	13	32	0	12,668	106	20	41	0	13,273	124	27	51	0	13,893

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 only possible with guided pressure support ring.
In the event of lateral displacement and simultaneous axial extension the above movements are reduced (▶ page 29).
Larger movements on request.

Individual fabrication possible



D122x (B/E/C/M/R/K/L)

▶ with embedded vacuum support rings



D125x (B/E/C/M/R/K/L)

▶ with embedded vacuum support rings, with external pressure support ring in the arch trough

Installation length (L _E) at design pressure															
up to 10 bar L _E = 350 mm						up to 10 bar L _E = 400 mm					up to 10 bar L _E = 450 mm				
higher pressures on request															
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	49	13	25	0	445	41	7	18	0	445	30	30	30	0	564
250	49	13	24	0	656	41	7	18	0	656	30	30	30	0	799
300	49	13	24	0	903	41	7	17	0	903	29	5	13	0	1,069
350	49	13	24	0	1,134	41	7	17	0	1,134	59	11	26	0	1,320
400	49	13	23	0	1,521	41	7	17	0	1,521	59	11	25	0	1,735
450	49	13	23	0	1,878	41	7	17	0	1,878	59	11	25	0	2,116
500	49	13	23	0	2,290	41	7	17	0	2,290	59	11	25	0	2,552
600	49	13	22	0	3,187	41	7	16	0	3,187	59	11	24	0	3,494
700	49	13	22	0	4,312	41	7	16	0	4,312	59	11	24	0	4,669
800	49	13	22	0	5,555	41	7	16	0	5,555	59	11	24	0	5,958
900	49	13	22	0	6,910	41	7	16	0	6,910	59	11	23	0	7,359
1000	49	13	21	0	8,462	41	7	16	0	8,462	59	11	23	0	8,958
1100	49	13	21	0	10,171	41	7	15	0	10,171	59	11	23	0	10,715
1200	49	13	21	0	12,037	41	7	15	0	12,037	59	11	23	0	12,628

Installation length (L _E) at design pressure															
up to 10 bar L _E = 500 mm						up to 10 bar L _E = 550 mm					up to 10 bar L _E = 600 mm				
higher pressures on request															
NB	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	58	13	29	0	573	70	20	37	0	707	82	27	45	0	855
250	58	13	28	0	809	70	20	36	0	968	82	27	45	0	1,140
300	58	13	27	0	1,081	70	20	36	0	1,263	82	27	44	0	1,459
350	58	13	27	0	1,333	70	20	35	0	1,534	82	27	43	0	1,750
400	58	13	27	0	1,750	70	20	35	0	1,979	82	27	43	0	2,223
450	58	13	26	0	2,132	70	20	34	0	2,384	82	27	42	0	2,651
500	58	13	26	0	2,570	70	20	34	0	2,846	82	27	42	0	3,137
600	58	13	26	0	3,515	70	20	33	0	3,837	82	27	41	0	4,174
700	58	13	25	0	4,693	70	20	33	0	5,064	82	27	41	0	5,450
800	58	13	25	0	5,986	70	20	33	0	6,404	82	27	40	0	6,837
900	58	13	25	0	7,390	70	20	32	0	7,854	82	27	40	0	8,332
1000	58	13	25	0	8,992	70	20	32	0	9,503	82	27	39	0	10,029
1100	58	13	24	0	10,751	70	20	32	0	11,310	82	27	39	0	11,882
1200	58	13	24	0	12,668	70	20	31	0	13,273	82	27	39	0	13,893

 Recommended sizes
 Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
 axial compression: -0 %; axial extension: -0 %; lateral displacement: -0 %.
 In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (▶ page 29).
 Larger movements on request.

Individual fabrication possible



Universal expansion joint, type U124A
NB 800, 6 bar