D110M ⌀ 20 - 1,200 mm

> **Type D110M**
without vacuum ring

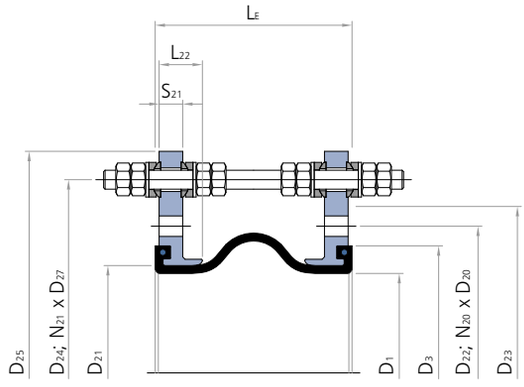
> **Type D111M**
with internal vacuum ring

> **Type D112M**
with embedded vacuum ring

Type key > page 22

D1 1 0 M
- Tie rod variant
- Support ring variant
- Number of arches
- Type

Cross section D110M



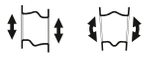
Lateral expansion joint with one arch

Design: Streamlined, single wide arch rubber bellows with self-sealing rubber bulges, have a cycle life in the tens of millions, constructed with a high-grade leak-proof tube, multiple layers of high-strength cord, a seamless cover, and swivel backing flanges with tie rods borne in spherical washers. Optional with vacuum ring. In compliance with PED 2014/68/EU, FSA Technical Handbook and ASTM F1123 - 87.

Diameters: ⌀ 20 to 1,200 mm, custom diameters possible

Length: Standard L_E = 130 to 350 mm (> page 260–262)
Custom length on request

Pressure: Up to 25 bar depending on diameter and length
Vacuum stability on request, with vacuum ring up to 0.05 bar absolute

Movement: For lateral and angular (2 tie rod design) movements*

(> page 260–262)

Spring rate: Lateral spring rates (> page 296)

*Installation gap tolerances according to axial movement capability of the expansion joint

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

Request assembly instructions at:
www.ditec-adam.de/en/contact

Standard rubber bellows

Elastomer	Fabric	Marking	°C	Application
EPDM / EPDM	PEEK		-40 | +130	Heating systems, cooling, hot air
IIR / EPDM	Polyamid		-40 | +100	Drinking water, seawater, weak acids and alkalis
NBR / CR	Polyamid		-40 | +100	Oils, fuels, gases
NBRweiß / CR	Polyamid		-40 | +100	Fat containing food, weather resistant
CSM / CSM	Polyamid		-40 | +100	Chemicals, aggresive chemical wastewater, weather resistant
NBR / CR	Polyamid		-40 | +100	Oils, fuels, gases, LPG, blast furnace gas, lubricants
CR / CR	Polyamid	–	-40 | +100	Cold- and hot water, seawater, wastewater with oleaginous corrosion protection
NBR / CR	Stahl		-40 | +100	Oils, fuels, gases, fuel ethanol blends
NBR-LT / CR	Polyamid	LT	-40 | +100	Oils, fuels, gases, LPG, for tanker and filling stations
HNBR / CR	Stahl		-40 | +100	Oils, fuels, gases, LPG, for high Temperature
EPDM / EPDM	Polyamid		-40 | +100	Seawater, weak acids and alkalis
IIR / EPDM	Polyamid		-40 | +100	Seawater, weak acids and alkalis
BR	Polyamid		-40 | +100	Sludge, dust or powder, liquids with solids, emulsions

Non-standard rubber bellows

Elastomer	Fabric	Marking	°C	Application
EPDM	Polyamid		-40 | +100	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Aramid		-40 | +100	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Aramid		-40 | +120	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMwras	Polyamid		-40 | +100	Drinking water, foodstuffs
EPDMwras	Aramid		-40 | +100	Drinking water, foodstuffs
EPDMbeige	Polyamid		-40 | +100	Foodstuffs
EPDMbeige	Aramid		-40 | +100	Foodstuffs
IIR	Polyamid		-20 | +100	Hot water, acids, bases, gases
IIR	Aramid		-20 | +100	Hot water, acids, bases, gases
CSM	Polyamid		-20 | +100	Strong acids, bases, chemicals
CSM	Aramid		-20 | +100	Strong acids, bases, chemicals
NBR	Polyamid		-30 | +100	Oils, petrol, solvents, compressed air
NBR	Aramid		-30 | +100	Oils, petrol, solvents, compressed air
NBRbeige	Polyamid		-30 | +100	Oil, fatty foods
NBRbeige	Aramid		-30 | +100	Oil, fatty foods
CR	Polyamid		-20 | +90	Cooling water, slightly oily water, seawater
CR	Aramid		-20 | +90	Cooling water, slightly oily water, seawater
FPM	Aramid		-20 | +180	Corrosive chemicals, petroleum distillates
FPMbeige	Aramid		-20 | +180	Oil, fatty foods
NR	Polyamid		-20 | +70	Abrasive materials
Silicon	Aramid Glass		-60 | +200	Air, saltwater atmosphere, foodstuffs, medical technology

Backing flanges

Design: Single-part integral swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and tie rod holders (tie rod type B, E, C, M)

Single-part swivel backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and tie rod gusset plates (tie rod type R, K, L)

Flange norms: DIN, EN, ANSI, AWWA, BS, JIS, special measurements (> page 298)

Materials: Carbon steel, stainless steel

Coating: Primed, hot-dip galvanised, special paint

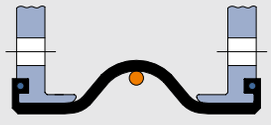
Accessories

Protective covers: Ground protective shield
Protective shield or cover
Fire protective shield (> page 58)

Flow liners: Cylindrical flow liner
Conical flow liner
Telescoping flow liner (> page 57)

Filled arch:  (> page 42)

Support rings

TYPE	Support rings	Vacuum ring	Pressure	Movement
D110M		None	Depending on the diameter up to 25 bar, vacuum stability on request	> page 260
D111M		Vacuum support ring spiral (1.4310) up to ∅ 250 mm, vacuum ring starting at ∅ 300 mm Medium contact, inside the arch	Depending on the diameter up to 25 bar, for vacuum up to 0.05 bar absolute	> page 261
D112M		No medium contact, embedded in the arch starting at ∅ 100 mm	Depending on the diameter up to 16 bar, for vacuum up to 0.05 bar absolute	> page 262

Materials	
Stainless steel	Carbon steel, embedded

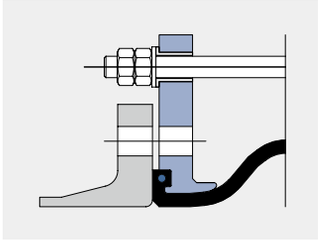
Tie rods

Example: Type D111M

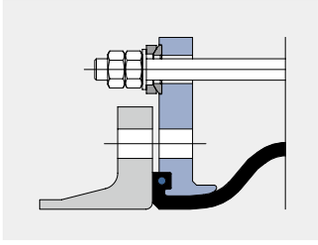
Design: Dimensioning according to design pressure (test pressure) based on the Pressure Equipment Directive

Materials: Carbon steel
Stainless steel

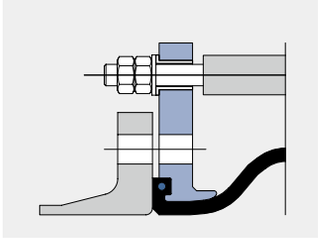
Coating: Spherical washers/ball disks: PTFE coated
Tie rods: galvanised, hot-dip galvanised or PTFE-coated



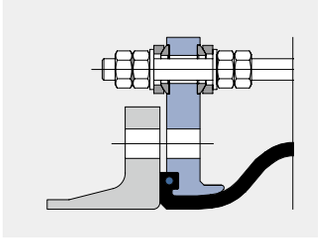
Type D110B
Tie rods mounted outside in rubber bushing to accommodate pressure thrust forces



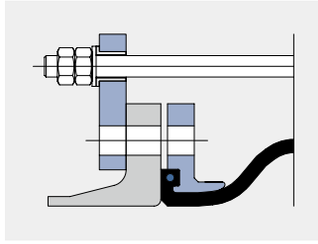
Type D110E
Tie rods mounted outside in spherical washers and ball disks to accommodate pressure thrust forces



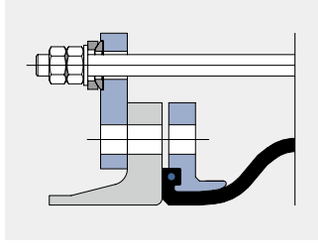
Type D110C
Tie rods mounted outside in rubber bushing and inside with compression sleeve to accommodate pressure/vacuum thrust forces



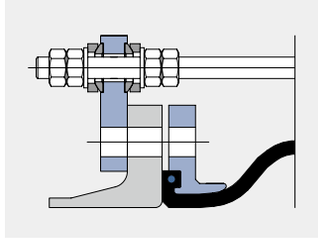
Type D110M
Tie rods mounted outside and inside in spherical washers and ball disks to accommodate pressure/ vacuum thrust forces



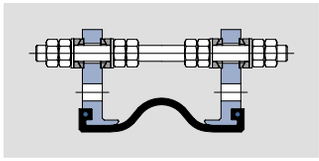
Type D110R
Gusset plates: Tie rods mounted outside in rubber bushing to accommodate pressure thrust forces



Type D110K
Gusset plates: Tie rods mounted outside in spherical washers and ball disks to accommodate pressure thrust forces



Type D110L
Gusset plates:Tie rods mounted outside and inside in spherical washers and ball disks to accommodate pressure/vacuum thrust forces



D110M

> without vacuum ring

Installation length (L_E) at design pressure

	up to 10 bar L_E = 130 mm					up to 10 bar L_E = 150 mm					up to 10 bar L_E = 175 mm				
	higher pressures on request														
∅	Movement				A	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
20	30	30	30	0	17										
25	30	30	30	0	17										
32	30	30	30	0	17										
40	30	30	30	0	18										
50	30	30	30	0	32										
65	30	30	30	0	53										
80	30	30	30	0	85	30	30	30	0	85					
100	30	30	30	0	128	30	30	30	0	128					
125	30	30	30	0	187	30	30	30	0	187					
150	30	30	30	0	259	30	30	30	0	259					
200	30	30	30	0	410						30	30	30	0	410
250	30	30	30	0	596						30	30	30	0	596
300	30	30	30	0	822						31	10	17	0	903
350											31	10	17	0	1,134
400											31	10	17	0	1,521
450											31	10	17	0	1,878
500											31	10	17	0	2,290
600											31	10	16	0	3,187
700											31	10	16	0	4,312
800											31	10	16	0	5,555
900											31	10	16	0	6,910
1000											31	10	16	0	8,462
1100											31	10	15	0	10,171
1200											31	10	15	0	12,037

Installation length (L_E) at design pressure

	up to 10 bar L_E = 200 mm					up to 10 bar L_E = 250 mm					up to 10 bar L_E = 275 mm				
	higher pressures on request														
∅	Movement				A	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	40	20	26	0	564	44	20	29	0	573	44	20	29	0	573
250	40	20	26	0	799	44	20	28	0	809	44	20	28	0	809
300	30	30	30	0	822	44	20	27	0	1,081	44	20	27	0	1,081
350	50	30	30	0	907	44	20	27	0	1,333	44	20	27	0	1,333
400	50	30	30	0	1,018	44	20	27	0	1,750	44	20	27	0	1,750
450	50	30	30	0	2,116	50	30	30	0	2,042	44	20	26	0	2,132
500	50	30	30	0	1,692	40	20	30	0	2,279	44	20	26	0	2,570
600	50	30	30	0	3,078	40	20	30	0	3,115	44	20	26	0	3,515
700	40	20	24	0	4,669	50	30	30	0	4,342	50	30	30	0	4,342
800	40	20	23	0	5,958	50	30	30	0	5,274	44	20	25	0	5,986
900	40	20	23	0	7,359	44	20	25	0	7,390	44	20	25	0	7,390
1000	40	20	23	0	8,958	44	20	25	0	8,992	44	20	25	0	8,992
1100	40	20	23	0	10,715	44	20	24	0	10,751	44	20	24	0	10,751
1200	40	20	22	0	12,628	44	20	24	0	12,668	44	20	24	0	12,668

Installation length (L_E) at design pressure

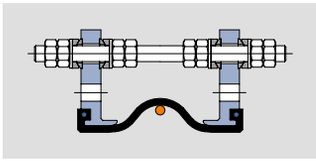
	up to 10 bar L_E = 300 mm					up to 10 bar L_E = 350 mm				
	higher pressures on request									
∅	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	53	31	37	0	707	69	43	49	0	897
250	53	31	36	0	968	69	43	48	0	1,188
300	53	31	36	0	1,263	69	43	48	0	1,514
350	53	31	35	0	1,534	69	43	47	0	1,810
400	53	31	35	0	1,979	69	43	46	0	2,290
450	53	31	34	0	2,384	69	43	46	0	2,725
500	53	31	34	0	2,846	69	43	45	0	3,217
600	53	31	33	0	3,837	69	43	45	0	4,266
700	53	31	33	0	5,064	69	43	44	0	5,555
800	53	31	33	0	6,404	69	43	43	0	6,955
900	50	30	30	0	7,379	69	43	43	0	8,462
1000	50	30	30	0	8,894	69	43	43	0	10,171
1100	53	31	32	0	11,310	69	43	42	0	12,037
1200	53	31	31	0	13,273	69	43	42	0	14,061

Standard sizes
Non-standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (> page 29).
For larger movements see type U120x.

The movement capability of the expansion joints given in the tables is determined for flange dimensions according to DIN PN10. In case of deviating flange dimensions, please contact us.

Customised products available



D111M

> with internal vacuum ring

Installation length (L_E) at design pressure

	up to 10 bar L_E = 130 mm					up to 10 bar L_E = 150 mm					up to 10 bar L_E = 175 mm				
	higher pressures on request														
	Movement				A	Movement				A	Movement				A
∅ mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
20	30	10	30	30	17										
25	30	10	30	30	17										
32	30	10	30	30	17										
40	30	10	30	35	18										
50	30	10	30	30	32										
65	30	10	30	30	53										
80	30	10	30	30	85	30	10	30	30	85					
100	30	10	30	20	128	30	10	30	20	128					
125	30	10	30	20	187	30	10	30	20	187					
150	30	10	30	20	259	30	10	30	20	259					
200	30	10	30	12	410						30	10	30	12	410
250	30	10	30	12	596						30	10	30	12	596
300	30	10	30	12	822						31	3	17	4	903
350											31	3	17	3	1,134
400											31	3	17	3	1,521
450											31	3	17	3	1,878
500											31	3	17	2	2,290
600											31	3	16	2	3,187
700											31	3	16	2	4,312
800											31	3	16	1	5,555
900											31	3	16	1	6,910
1000											31	3	16	1	8,462
1100											31	3	15	1	10,171
1200											31	3	15	1	12,037

Installation length (L_E) at design pressure

	up to 10 bar L_E = 200 mm					up to 10 bar L_E = 250 mm					up to 10 bar L_E = 275 mm				
	higher pressures on request														
	Movement				A	Movement				A	Movement				A
∅ mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	40	7	26	11	564	44	7	29	11	573	44	7	29	11	573
250	40	7	26	9	799	44	7	28	9	809	44	7	28	9	809
300	30	10	30	12	822	44	7	27	8	1,081	44	7	27	8	1,081
350	50	10	30	8	907	44	7	27	7	1,333	44	7	27	7	1,333
400	50	10	30	8	1,018	44	7	27	6	1,750	44	7	27	6	1,750
450	50	30	30	5	2,116	50	30	30	6	2,042	44	7	26	5	2,132
500	50	10	30	8	1,692	40	7	30	5	2,279	44	7	26	5	2,570
600	50	10	30	8	3,078	40	7	30	4	3,115	44	7	26	4	3,515
700	40	7	24	3	4,669	50	30	30	8	4,342	50	10	30	8	4,342
800	40	7	23	3	5,958	50	30	30	8	5,274	44	7	25	3	5,986
900	40	7	23	3	7,359	44	7	25	3	7,390	44	7	25	3	7,390
1000	40	7	23	2	8,958	44	7	25	2	8,992	44	7	25	2	8,992
1100	40	7	23	2	10,715	44	7	24	2	10,751	44	7	24	2	10,751
1200	40	7	22	2	12,628	44	7	24	2	12,668	44	7	24	2	12,668

Installation length (L_E) at design pressure

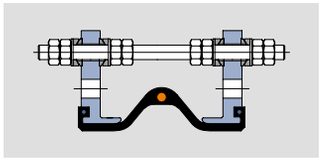
	up to 10 bar L_E = 300 mm					up to 10 bar L_E = 350 mm				
	higher pressures on request									
	Movement				A	Movement				A
∅ mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	53	10	37	17	707	69	14	49	23	897
250	53	10	36	14	968	69	14	48	19	1,188
300	53	10	36	12	1,263	69	14	48	16	1,514
350	53	10	35	10	1,534	69	14	47	14	1,810
400	53	10	35	9	1,979	69	14	46	12	2,290
450	53	10	34	8	2,384	69	14	46	11	2,725
500	53	10	34	7	2,846	69	14	45	10	3,217
600	53	10	33	6	3,837	69	14	45	8	4,266
700	53	10	33	5	5,064	69	14	44	7	5,555
800	53	10	33	4	6,404	69	14	43	6	6,955
900	50	10	30	5	7,379	69	14	43	6	8,462
1000	50	10	30	5	8,894	69	14	43	5	10,171
1100	53	10	32	3	11,310	69	14	42	5	12,037
1200	53	10	31	3	13,273	69	14	42	4	14,061

Standard sizes
Non-standard sizes

In the event of lateral displacement and simultaneous axial extension (due to installation gap tolerance) the above movements are reduced (> page 29). For larger movements see type U121x.

The movement capability of the expansion joints given in the tables is determined for flange dimensions according to DIN PN10. In case of deviating flange dimensions, please contact us.

Customised products available



D112M

> with embedded vacuum ring

Installation length (L_E) at design pressure

	up to 10 bar L_E = 130 mm					up to 10 bar L_E = 150 mm					up to 10 bar L_E = 175 mm				
	higher pressures on request														
∅	Movement				A	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
20															
25															
32															
40															
50															
65															
80															
100															
125															
150															
200											20	2	17	0	401
250											20	2	16	0	603
300											20	2	16	0	840
350											20	2	16	0	1.064
400											20	2	16	0	1.439
450											20	2	16	0	1.787
500											20	2	15	0	2.190
600											20	2	15	0	3.068
700											20	2	15	0	4.174
800											20	2	15	0	5.398
900											20	2	15	0	6.735
1000											20	2	15	0	8.268
1100											20	2	14	0	9.958
1200											20	2	14	0	11.805

Installation length (L_E) at design pressure

	up to 10 bar L_E = 200 mm					up to 10 bar L_E = 250 mm					up to 10 bar L_E = 275 mm				
	higher pressures on request														
∅	Movement				A	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	26	6	25	0	515	29	6	28	0	531	29	6	28	0	531
250	26	6	25	0	740	29	6	27	0	760	29	6	27	0	760
300	26	6	24	0	1.001	29	6	27	0	1.024	29	6	27	0	1.024
350	26	6	24	0	1.244	29	6	26	0	1.269	29	6	26	0	1.269
400	26	6	24	0	1.647	29	6	26	0	1.676	29	6	26	0	1.676
450	26	6	23	0	2.019	29	6	26	0	2.051	29	6	26	0	2.051
500	26	6	23	0	2.445	29	6	25	0	2.481	29	6	25	0	2.481
600	26	6	23	0	3.370	29	6	25	0	3.411	29	6	25	0	3.411
700	26	6	23	0	4.525	29	6	25	0	4.572	29	6	25	0	4.572
800	26	6	22	0	5.795	29	6	24	0	5.849	29	6	24	0	5.849
900	26	6	22	0	7.178	29	6	24	0	7.238	29	6	24	0	7.238
1000	26	6	22	0	8.758	29	6	24	0	8.825	29	6	24	0	8.825
1100	26	6	22	0	10.496	29	6	24	0	10.568	29	6	24	0	10.568
1200	26	6	21	0	12.390	29	6	23	0	12.469	29	6	23	0	12.469

Installation length (L_E) at design pressure

	up to 10 bar L_E = 300 mm					up to 10 bar L_E = 350 mm				
	higher pressures on request									
∅	Movement				A	Movement				A
mm	mm	mm	±mm	±°	cm²	mm	mm	±mm	±°	cm²
200	35	9	36	0	661	46	13	48	0	804
250	35	9	35	0	913	46	13	47	0	1.081
300	35	9	35	0	1.201	46	13	46	0	1.392
350	35	9	34	0	1.466	46	13	45	0	1.676
400	35	9	34	0	1.901	46	13	45	0	2.140
450	35	9	33	0	2.299	46	13	44	0	2.561
500	35	9	33	0	2.753	46	13	44	0	3.039
600	35	9	33	0	3.728	46	13	43	0	4.060
700	35	9	32	0	4.939	46	13	43	0	5.320
800	35	9	32	0	6.263	46	13	42	0	6.691
900	35	9	31	0	7.698	46	13	42	0	8.171
1000	35	9	31	0	9.331	46	13	41	0	9.852
1100	35	9	31	0	11.122	46	13	41	0	11.690
1200	35	9	31	0	13.070	46	13	41	0	13.685

Standard sizes
Non-standard sizes

In the event of axial extension and simultaneous lateral displacement the above movements are reduced (> page 29).
For larger movements see type D122x or D125x.

The movement capability of the expansion joints given in the tables is determined for flange dimensions according to DIN PN10. In case of deviating flange dimensions, please contact us.

Customised products available

D112M lateral FPM rubber expansion joints of size ∅ 400 mm
with embedded vacuum ring and stainless backing flanges,
tie-rods and bearings