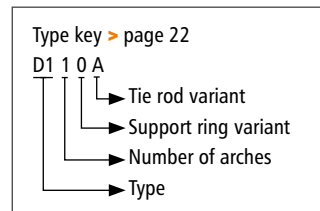


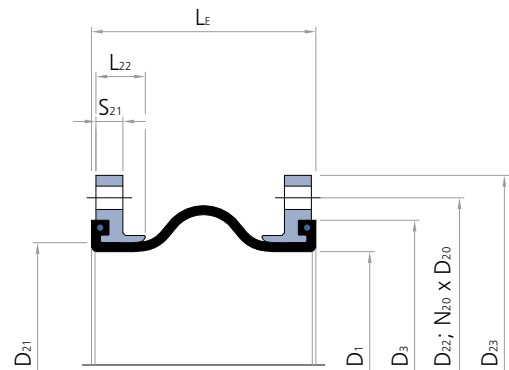
## D110A $\varnothing$ 20 - 1,200 mm



- > **Type D110A**  
without vacuum ring
- > **Type D111A**  
with internal vacuum ring
- > **Type D112A**  
with embedded vacuum ring



Cross section D110A



## Universal expansion joint with one arch

**Design:** Streamlined, single wide arch rubber bellows with seal-sealing rubber bulges, designed to compensate all directional movements, 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. Optional with vacuum ring. In compliance with PED 2014/68/EU, FSA Technical Handbook and ASTM F1123 - 87.

**Diameters:**  $\varnothing$  20 to 1,200 mm, custom diameters possible

**Length:** Standard  $L_E = 130$  to  $350$  mm (> page 157–159)  
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 axial, lateral and angular movements















**Spring rate:** Axial and lateral spring rates (> page 296)

**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](http://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
EPDM/EPDM	Polyamid		-30   +90	Seawater, weak acids and alkalis
NBR / CR	Polyamid		-20   +90	Oils, fuels, gases
NBRweiß / CR	Polyamid		-20   +90	Fat containing food, weather resistant
CSM / CSM	Polyamid		-20   +100	Chemicals, aggressive chemical wastewater, weather resistant
NBR / CR	Polyamid		-20   +90	Oils, fuels, gases, LPG, blast furnace gas, lubricants
IIR / EPDM	Polyamid		-40   +90	Seawater, weak acids and alkalis
CR / CR	Polyamid	–	-25   +90	Cold- and hot water, seawater, wastewater with oleaginous corrosion protection
NBR / CR	Stahl		-20   +90	Oils, fuels, gases, fuel ethanol blends
NBR-LT / CR	Polyamid		-40   +90	Oils, fuels, gases, LPG, for tanker and filling stations
HNBR / CR	Stahl		-35   +100	Oils, fuels, gases, LPG, high Temperature
BR	Polyamid		-50   +70	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

## 156 Universal expansion joints with swivel flanges

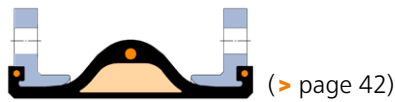
### Backing flanges

- Design:** Single-part, swivel, round backing flanges with support collar, clearance holes and groove to accept the rubber bulges
- 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 cover (> page 58)
- Flow liners:** Cylindrical flow liner  
Conical flow liner  
Telescoping flow liner (> page 57)

**Filled arch:**



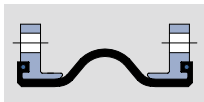
### Support rings

TYPE	Support rings	Vacuum ring	Pressure	Movement
D110A		None	Depending on the diameter up to 25 bar, vacuum stability on request	> page 157
D111A		Vacuum spirals up to $\varnothing$ 250 mm, vacuum ring starting at $\varnothing$ 300 mm Medium contact, inside the arch	Depending on the diameter up to 25 bar, for vacuum up to 0.05 bar absolute	> page 158
D112A		No medium contact, embedded in the arch starting at $\varnothing$ 100 mm	Depending on the diameter up to 16 bar, for vacuum up to 0.05 bar absolute	> page 159

#### Materials

Stainless steel

Carbon steel, embedded



# D110A

> without vacuum ring



Installation length (L <sub>E</sub> ) at design pressure																
∅ mm	up to 10 bar L <sub>E</sub> = 130 mm					up to 10 bar L <sub>E</sub> = 150 mm					up to 10 bar L <sub>E</sub> = 175 mm					
	Movement					Movement					Movement					
	mm	mm	mm	±mm	±°	A cm <sup>2</sup>	mm	mm	±mm	±°	A cm <sup>2</sup>	mm	mm	±mm	±°	A cm <sup>2</sup>
20	30	30	30	30.0	17											
25	30	30	30	30.0	17											
32	30	30	30	30.0	17											
40	30	30	30	35.0	18											
50	30	30	30	30.0	32											
65	30	30	30	30.0	53											
80	30	30	30	30.0	85	30	30	30	30.0	85						
100	30	30	30	20.0	128	30	30	30	20.0	128						
125	30	30	30	20.0	187	30	30	30	20.0	187						
150	30	30	30	20.0	259	30	30	30	20.0	259						
200	30	30	30	12.0	410						30	30	30	12.0	410	
250	30	30	30	12.0	596						30	30	30	12.0	596	
300	30	30	30	12.0	822						31	10	17	3.8	903	
350											31	10	17	3.3	1,134	
400											31	10	17	2.9	1,521	
450											31	10	17	2.5	1,878	
500											31	10	17	2.3	2,290	
600											31	10	16	1.9	3,187	
700											31	10	16	1.6	4,312	
800											31	10	16	1.4	5,555	
900											31	10	16	1.3	6,910	
1000											31	10	16	1.1	8,462	
1100											31	10	15	1.0	10,171	
1200											31	10	15	1.0	12,037	

Installation length (L <sub>E</sub> ) at design pressure															
∅ mm	up to 10 bar L <sub>E</sub> = 200 mm					up to 10 bar L <sub>E</sub> = 250 mm					up to 10 bar L <sub>E</sub> = 275 mm				
	Movement					Movement					Movement				
	mm	mm	mm	±mm	±°	A cm <sup>2</sup>	mm	mm	±mm	±°	A cm <sup>2</sup>	mm	mm	±mm	±°
200	40	20	26	11.3	564	44	20	29	11.3	573	44	20	29	11.3	573
250	40	20	26	9.1	799	44	20	28	9.1	809	44	20	28	9.1	809
300	30	30	30	12.0	822	44	20	27	7.6	1,081	44	20	27	7.6	1,081
350	50	30	30	8.0	1,176	44	20	27	6.5	1,333	44	20	27	6.5	1,333
400	50	30	30	8.0	1,547	44	20	27	5.7	1,750	44	20	27	5.7	1,750
450	50	30	30	8.0	2,042	50	30	30	8.0	2,042	44	20	26	5.1	2,132
500	50	30	30	8.0	2,279	40	20	30	6.0	2,279	44	20	26	4.6	2,570
600	50	30	30	8.0	3,115	40	20	30	6.0	3,115	44	20	26	3.8	3,515
700	40	20	24	3.3	4,669	50	30	30	8.0	4,342	50	30	30	8.0	4,342
800	40	20	23	2.9	5,958	50	30	30	6.0	5,274	44	20	25	2.9	5,986
900	40	20	23	2.5	7,359	44	20	25	2.5	7,390	44	20	25	2.5	7,390
1000	40	20	23	2.3	8,958	44	20	25	2.3	8,992	44	20	25	2.3	8,992
1100	40	20	23	2.1	10,715	44	20	24	2.1	10,751	44	20	24	2.1	10,751
1200	40	20	22	1.9	12,628	44	20	24	1.9	12,668	44	20	24	1.9	12,668

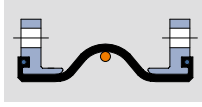
Installation length (L <sub>E</sub> ) at design pressure										
∅ mm	up to 10 bar L <sub>E</sub> = 300 mm					up to 10 bar L <sub>E</sub> = 350 mm				
	Movement					Movement				
	mm	mm	mm	±mm	±°	A cm <sup>2</sup>	mm	mm	±mm	±°
200	53	31	37	17.2	707	69	43	49	23.3	897
250	53	31	36	19.0	968	69	43	48	19.0	1,188
300	53	31	36	16.0	1,263	69	43	48	16.0	1,514
350	53	31	35	13.8	1,534	69	43	47	13.8	1,810
400	53	31	35	12.1	1,979	69	43	46	12.1	2,290
450	53	31	34	10.8	2,384	69	43	46	10.8	2,725
500	53	31	34	9.8	2,846	69	43	45	9.8	3,217
600	53	31	33	8.2	3,837	69	43	45	8.2	4,266
700	53	31	33	7.0	5,064	69	43	44	7.0	5,555
800	53	31	33	6.1	6,404	69	43	43	6.1	6,955
900	50	30	30	5.0	7,379	69	43	43	5.5	8,462
1000	50	30	30	5.0	8,894	69	43	43	4.9	10,171
1100	53	31	32	4.5	11,310	69	43	42	4.5	12,037
1200	53	31	31	4.1	13,273	69	43	42	4.1	14,061

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 D120A and D123A.

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**



**D111A**

> with internal vacuum ring

Installation length (L <sub>E</sub> ) at design pressure															
∅ mm	up to 10 bar L <sub>E</sub> = 130 mm					up to 10 bar L <sub>E</sub> = 150 mm					up to 10 bar L <sub>E</sub> = 175 mm				
	Movement				A cm <sup>2</sup>	Movement				A cm <sup>2</sup>	Movement				A cm <sup>2</sup>
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
20	30	10	30	30.0	17										
25	30	10	30	30.0	17										
32	30	10	30	30.0	17										
40	30	10	30	35.0	18										
50	30	10	30	30.0	32										
65	30	10	30	30.0	53										
80	30	10	30	30.0	85	30	10	30	30.0	85					
100	30	10	30	20.0	128	30	10	30	20.0	128					
125	30	10	30	20.0	187	30	10	30	20.0	187					
150	30	10	30	20.0	259	30	10	30	20.0	259					
200	30	10	30	12.0	410						30	10	30	12	410
250	30	10	30	12.0	596						30	10	30	12	596
300	30	10	30	12.0	822						31	3	17	3.8	903
350											31	3	17	3.3	1,134
400											31	3	17	2.9	1,521
450											31	3	17	2.5	1,878
500											31	3	17	2.3	2,290
600											31	3	16	1.9	3,187
700											31	3	16	1.6	4,312
800											31	3	16	1.4	5,555
900											31	3	16	1.3	6,910
1000											31	3	16	1.1	8,462
1100											31	3	15	1	10,171
1200											31	3	15	1	12,037

Installation length (L <sub>E</sub> ) at design pressure															
∅ mm	up to 10 bar L <sub>E</sub> = 200 mm					up to 10 bar L <sub>E</sub> = 250 mm					up to 10 bar L <sub>E</sub> = 275 mm				
	Movement				A cm <sup>2</sup>	Movement				A cm <sup>2</sup>	Movement				A cm <sup>2</sup>
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
200	40	7	26	11.3	564	44	7	29	11.3	573	44	7	29	11.3	573
250	40	7	26	9.1	799	44	7	28	9.1	809	44	7	28	9.1	809
300	30	10	30	12	822	44	7	27	7.6	1,081	44	7	27	7.6	1,081
350	50	10	30	8	1,176	44	7	27	6.5	1,333	44	7	27	6.5	1,333
400	50	10	30	8	1,547	44	7	27	5.7	1,750	44	7	27	5.7	1,750
450	50	30	30	8	2,042	50	10	30	8	2,042	44	7	26	5.1	2,132
500	50	10	30	8	2,279	40	7	30	6	2,279	44	7	26	4.6	2,570
600	50	10	30	8	3,115	40	7	30	6	3,115	44	7	26	3.8	3,515
700	40	7	24	3.3	4,669	50	10	30	8	4,342	50	10	30	8	4,342
800	40	7	23	2.9	5,958	50	10	30	6	5,274	44	7	25	2.9	5,986
900	40	7	23	2.5	7,359	44	7	25	2.5	7,390	44	7	25	2.5	7,390
1000	40	7	23	2.3	8,958	44	7	25	2.3	8,992	44	7	25	2.3	8,992
1100	40	7	23	2.1	10,715	44	7	24	2.1	10,751	44	7	24	2.1	10,751
1200	40	7	22	1.9	12,628	44	7	24	1.9	12,668	44	7	24	1.9	12,668

Installation length (L <sub>E</sub> ) at design pressure										
∅ mm	up to 10 bar L <sub>E</sub> = 300 mm					up to 10 bar L <sub>E</sub> = 350 mm				
	Movement				A cm <sup>2</sup>	Movement				A cm <sup>2</sup>
	mm	mm	±mm	±°		mm	mm	±mm	±°	
200	53	10	37	17.2	707	69	14	49	23.3	897
250	53	10	36	13.9	968	69	14	48	19	1,188
300	53	10	36	11.7	1,263	69	14	48	16	1,514
350	53	10	35	10	1,534	69	14	47	13.8	1,810
400	53	10	35	8.8	1,979	69	14	46	12.1	2,290
450	53	10	34	7.8	2,384	69	14	46	10.8	2,725
500	53	10	34	7.1	2,846	69	14	45	9.8	3,217
600	53	10	33	5.9	3,837	69	14	45	8.2	4,266
700	53	10	33	5.1	5,064	69	14	44	7	5,555
800	53	10	33	4.4	6,404	69	14	43	6.1	6,955
900	50	10	30	5	7,379	69	14	43	5.5	8,462
1000	50	10	30	5	8,894	69	14	43	4.9	10,171
1100	53	10	32	3.2	11,310	69	14	42	4.5	12,037
1200	53	10	31	3	13,273	69	14	42	4.1	14,061

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 D121A or D124A.

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**



# D112A

> with embedded vacuum ring



Installation length (L <sub>E</sub> ) at design pressure															
∅ mm	up to 10 bar L <sub>E</sub> = 130 mm					up to 10 bar L <sub>E</sub> = 150 mm					up to 10 bar L <sub>E</sub> = 175 mm				
	higher pressures on request														
	Movement				A	Movement				A	Movement				A
	mm	mm	±mm	±°	cm <sup>2</sup>	mm	mm	±mm	±°	cm <sup>2</sup>	mm	mm	±mm	±°	cm <sup>2</sup>
20															
25															
32															
40															
50															
65															
80															
100															
125															
150															
200											20	2	17	4	401
250											20	2	16	3.2	603
300											20	2	16	2.7	840
350											20	2	16	2.3	1,064
400											20	2	16	2	1,439
450											20	2	16	1.8	1,787
500											20	2	15	1.6	2,190
600											20	2	15	1.3	3,068
700											20	2	15	1.1	4,174
800											20	2	15	1	5,398
900											20	2	15	0.9	6,735
1000											20	2	15	0.8	8,268
1100											20	2	14	0.7	9,958
1200											20	2	14	0.7	11,805

Installation length (L <sub>E</sub> ) at design pressure															
∅ mm	up to 10 bar L <sub>E</sub> = 200 mm					up to 10 bar L <sub>E</sub> = 250 mm					up to 10 bar L <sub>E</sub> = 275 mm				
	higher pressures on request														
	Movement				A	Movement				A	Movement				A
	mm	mm	±mm	±°	cm <sup>2</sup>	mm	mm	±mm	±°	cm <sup>2</sup>	mm	mm	±mm	±°	cm <sup>2</sup>
200	26	6	25	10.2	515	29	6	28	10.2	531	29	6	28	10.2	531
250	26	6	25	8.2	740	29	6	27	8.2	760	29	6	27	8.2	760
300	26	6	24	6.8	1,001	29	6	27	6.8	1,024	29	6	27	6.8	1,024
350	26	6	24	5.9	1,244	29	6	26	5.9	1,269	29	6	26	5.9	1,269
400	26	6	24	5.1	1,647	29	6	26	5.1	1,676	29	6	26	5.1	1,676
450	26	6	23	4.6	2,019	29	6	26	4.6	2,051	29	6	26	4.6	2,051
500	26	6	23	4.1	2,445	29	6	25	4.1	2,481	29	6	25	4.1	2,481
600	26	6	23	3.4	3,370	29	6	25	3.4	3,411	29	6	25	3.4	3,411
700	26	6	23	2.9	4,525	29	6	25	2.9	4,572	29	6	25	2.9	4,572
800	26	6	22	2.6	5,795	29	6	24	2.6	5,849	29	6	24	2.6	5,849
900	26	6	22	2.3	7,178	29	6	24	2.3	7,238	29	6	24	2.3	7,238
1000	26	6	22	2.1	8,758	29	6	24	2.1	8,825	29	6	24	2.1	8,825
1100	26	6	22	1.9	10,496	29	6	24	1.9	10,568	29	6	24	1.9	10,568
1200	26	6	21	1.7	12,390	29	6	23	1.7	12,469	29	6	23	1.7	12,469

Installation length (L <sub>E</sub> ) at design pressure										
∅ mm	up to 10 bar L <sub>E</sub> = 300 mm					up to 10 bar L <sub>E</sub> = 350 mm				
	higher pressures on request									
	Movement				A	Movement				A
	mm	mm	±mm	±°	cm <sup>2</sup>	mm	mm	±mm	±°	cm <sup>2</sup>
200	35	9	36	16.2	661	46	13	48	21.3	804
250	35	9	35	13.1	913	46	13	47	17.3	1,081
300	35	9	35	10.9	1,201	46	13	46	14.6	1,392
350	35	9	34	9.4	1,466	46	13	45	12.6	1,676
400	35	9	34	8.3	1,901	46	13	45	11	2,140
450	35	9	33	7.3	2,299	46	13	44	9.8	2,561
500	35	9	33	6.6	2,753	46	13	44	8.9	3,039
600	35	9	33	5.5	3,728	46	13	43	7.4	4,060
700	35	9	32	4.7	4,939	46	13	43	6.4	5,320
800	35	9	32	4.1	6,263	46	13	42	5.6	6,691
900	35	9	31	3.7	7,698	46	13	42	5	8,171
1000	35	9	31	3.3	9,331	46	13	41	4.5	9,852
1100	35	9	31	3	11,122	46	13	41	4.1	11,690
1200	35	9	31	2.8	13,070	46	13	41	3.7	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 D122A or D125A.

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.

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