D110F ⌀ 20 - 1,200 mm

> **Type D110F**
without vacuum ring

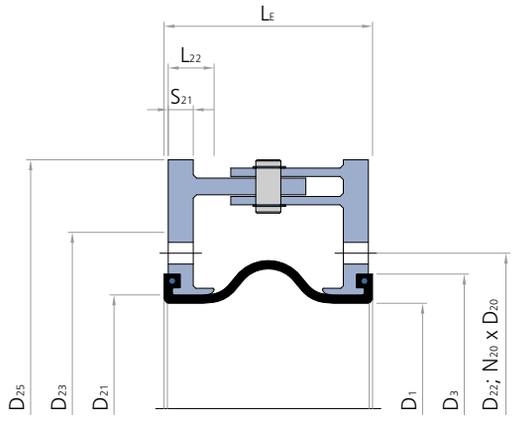
> **Type D111F**
with internal vacuum ring

> **Type D112F**
with embedded vacuum ring

Type key > page 22

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

Cross section D110F



Angular expansion joint with one arch

Design: Streamlined, single wide arch rubber bellows with self-sealing rubber bulges, designed to compensate angular movement in one plane only, 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 single-part backing flanges connected over a pair of hinge plates and pins. 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 291–293)
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 angular movements

(> page 291–293)

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, oval backing flanges with support collar, clearance holes, groove to accommodate the rubber bulges and consisting of a pair of hinge plates connected with pins (type F)

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)

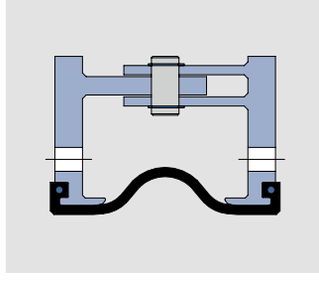
Filled arch:  (> page 42)

Hinge

Design: Dimensions according to design pressure (test pressure)

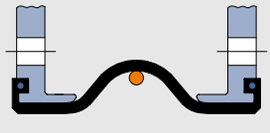
Materials: Carbon steel, stainless steel

Coating: Galvanised or hot-dip galvanised

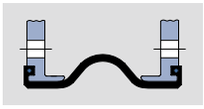


Type D110F
Hinge for angular movements on one plane with plates and pins to absorb the reaction forces from pressure and vacuum. Rotation axis in the center of the installation gap

Support rings

TYPE	Support ring	Vacuum ring	Pressure	Movement
D110F		None	Depending on the diameter up to 25 bar, vacuum stability on request	> page 291
D111F		Vacuum spiral up to ∅ 250 mm, vacuum ring starting from ∅ 300 mm Medium contact, inside the arch	Depending on the diameter up to 25 bar, for vacuum up to 0.05 bar absolute	> page 292
D112F		No medium contact, embedded in the arch starting from ∅ 100 mm	Depending on the diameter up to 16 bar, for vacuum up to 0.05 bar absolute	> page 293

Materials	
Stainless steel	Carbon steel, embedded



D110F

> 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		up to 10 bar L_E = 200 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
20	30.0	17						
25	30.0	17						
32	30.0	17						
40	35.0	18						
50	30.0	32						
65	30.0	53						
80	30.0	85	30.0	85				
100	20.0	128	20.0	128				
125	20.0	187	20.0	187				
150	20.0	259	20.0	259				
200	12.0	410			12.0	409	16.7	564
250	12.0	596			12.0	599	13.5	799
300	12.0	822			7.8	903	12.0	822
350					6.7	1,134	8.0	907
400					5.9	1,521	8.0	1,018
450					5.2	1,878	7.6	2,116
500					4.7	2,290	8.0	1,692
600					3.9	3,187	8.0	3,078
700					3.4	4,312	4.9	4,669
800					2.9	5,555	4.3	5,958
900					2.6	6,910	3.8	7,359
1000					2.3	8,462	3.4	8,958
1100					2.1	10,171	3.1	10,715
1200					2.0	12,037	2.9	12,628

Installation length (L_E) at design pressure

	up to 10 bar L_E = 250 mm		up to 10 bar L_E = 275mm		up to 10 bar L_E = 300 mm		up to 10 bar L_E = 350 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200	17.7	573	17.7	573	22.8	707	29.2	897
250	14.4	809	14.4	809	18.6	968	24.1	1,188
300	12.0	1,081	12.0	1,081	15.6	1,263	20.5	1,514
350	10.4	1,333	10.4	1,333	13.5	1,534	17.7	1,810
400	9.1	1,750	9.1	1,750	11.9	1,979	15.6	2,290
450	6.0	1,801	8.1	2,132	10.6	2,384	14.0	2,725
500	7.3	2,570	7.3	2,570	9.5	2,846	12.6	3,217
600	6.1	3,515	6.1	3,515	8	3,837	10.6	4,266
700	8.0	4,019	8.0	4,019	6.8	5,064	9.1	5,555
800	8.0	5,436	4.6	5,986	6	6,404	8.0	6,955
900	4.1	7,390	4.1	7,390	5	6,706	7.1	8,462
1000	3.7	8,992	3.7	8,992	5	8,231	6.4	10,171
1100	3.3	10,751	3.3	10,751	4.4	11,310	5.8	12,037
1200	3.1	12,668	3.1	12,668	4	13,273	5.3	14,061

Standard sizes
Non-standard sizes

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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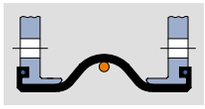

D111F

> 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		up to 10 bar L_E = 200 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
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25	30.0	17						
32	30.0	17						
40	35.0	18						
50	30.0	32						
65	30.0	53						
80	30.0	85	30.0	85				
100	20.0	128	20.0	128				
125	20.0	187	20.0	187				
150	20.0	259	20.0	259				
200	12.0	410			12.0	409	13.2	564
250	12.0	596			12.0	599	10.6	799
300	12.0	822			6.5	903	12.0	822
350					5.5	1,134	8.0	907
400					4.9	1,521	8.0	1,018
450					4.3	1,878	6.0	2,116
500					3.9	2,290	8.0	1,692
600					3.2	3,187	8.0	3,078
700					2.8	4,312	3.8	4,669
800					2.4	5,555	3.4	5,958
900					2.2	6,910	3.0	7,359
1000					1.9	8,462	2.7	8,958
1100					1.8	10,171	2.4	10,715
1200					1.6	12,037	2.2	12,628

Installation length (L_E) at design pressure

	up to 10 bar L_E = 250 mm		up to 10 bar L_E = 275 mm		up to 10 bar L_E = 300 mm		up to 10 bar L_E = 350 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
20								
25								
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40								
50								
65								
80								
100								
125								
150								
200	14.3	573	14.3	573	17.5	707	22.5	897
250	11.5	809	11.5	809	14.1	968	18.4	1,188
300	9.6	1,081	9.6	1,081	11.9	1,263	15.5	1,514
350	8.3	1,333	8.3	1,333	10.2	1,534	13.3	1,810
400	7.3	1,750	7.3	1,750	9	1,979	11.7	2,290
450	6.0	1,801	6.5	2,132	8	2,384	10.5	2,725
500	5.8	2,570	5.8	2,570	7.2	2,846	9.4	3,217
600	4.9	3,515	4.9	3,515	6	3,837	7.9	4,266
700	8.0	4,019	8.0	4,019	5.1	5,064	6.8	5,555
800	8.0	5,436	3.6	5,986	4.5	6,404	5.9	6,955
900	3.2	7,390	3.2	7,390	5	6,706	5.3	8,462
1000	2.9	8,992	2.9	8,992	5	8,231	4.7	10,171
1100	2.7	10,751	2.7	10,751	3.3	11,310	4.3	12,037
1200	2.4	12,668	2.4	12,668	3	13,273	4.0	14,061

Standard sizes
Non-standard sizes

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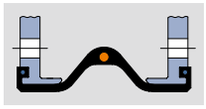

D112F

> 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		up to 10 bar L_E = 200 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200					6.3	401	9.1	515
250					5	603	7.3	740
300					4.2	840	6.1	1,001
350					3.6	1,064	5.2	1,244
400					3.1	1,439	4.6	1,647
450					2.8	1,787	4.1	2,019
500					2.5	2,190	3.7	2,445
600					2.1	3,068	3.1	3,370
700					1.8	4,174	2.6	4,525
800					1.6	5,398	2.3	5,795
900					1.4	6,735	2	7,178
1000					1.3	8,268	1.8	8,758
1100					1.1	9,958	1.7	10,496
1200					1.1	11,805	1.5	12,390

Installation length (L_E) at design pressure

	up to 10 bar L_E = 250 mm		up to 10 bar L_E = 275 mm		up to 10 bar L_E = 300 mm		up to 10 bar L_E = 350 mm	
	higher pressures on request							
∅ mm	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²	Movement ±°	A cm²
20								
25								
32								
40								
50								
65								
80								
100								
125								
150								
200	9.9	531	9.9	531	12.4	661	16.4	804
250	8	760	8	760	10	913	13.3	1,081
300	6.7	1,024	6.7	1,024	8.3	1,201	11.1	1,392
350	5.7	1,269	5.7	1,269	7.2	1,466	9.6	1,676
400	5	1,676	5	1,676	6.3	1,901	8.4	2,140
450	4.4	2,051	4.4	2,051	5.6	2,299	7.5	2,561
500	4	2,481	4	2,481	5	2,753	6.7	3,039
600	3.3	3,411	3.3	3,411	4.2	3,728	5.6	4,060
700	2.9	4,572	2.9	4,572	3.6	4,939	4.8	5,320
800	2.5	5,849	2.5	5,849	3.1	6,263	4.2	6,691
900	2.2	7,238	2.2	7,238	2.8	7,698	3.8	8,171
1000	2	8,825	2	8,825	2.5	9,331	3.4	9,852
1100	1.8	10,568	1.8	10,568	2.3	11,122	3.1	11,690
1200	1.7	12,469	1.7	12,469	2.1	13,070	2.8	13,685

Standard sizes
Non-standard sizes

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