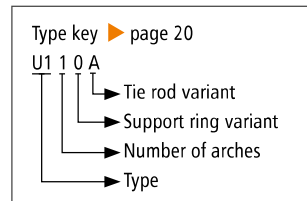


U110A

NB 100 – NB 4000



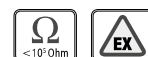
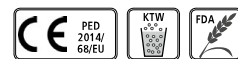
- ▶ **Type U110A**
without vacuum support ring
- ▶ **Type U111A**
with internal vacuum support ring
- ▶ **Type U112A**
with embedded vacuum support ring



Universal expansion joint with one arch









- Design:** Highly elastic, hydrodynamic, single-arch rubber bellows with full faced rubber flanges and backing flanges with support collar
Optionally with vacuum support ring
- Nominal diameters:** NB 100 to NB 4000, intermediate sizes possible
- Installation length:** Standard $L_E = 150$ to 400 mm (▶ page 56–61)
Other installation lengths on request
- Pressure:** Depending on the nominal diameter up to 40 bar
Vacuum stability on request, with vacuum support ring up to 0.05 bar absolute.
Design in accordance with Pressure Equipment Directive PED 2014/68/EU
- Movement:** For large axial, lateral and angular movements (▶ page 56–61)
- Stiffness rate:** Axial and lateral stiffness rates (▶ page 56–61)

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



Assembly instruction download
www.ditec-adam.de/en/downloads.html

Rubber bellows

Rubber	Fabric	Marking	Max.	Application
EPDM	Nylon		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDM	Kevlar		100 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMht	Kevlar		120 °C	Cooling water, hot water, seawater, acids, dilute chlorine compounds
EPDMtw	Nylon		100 °C	Drinking water
EPDMtw	Kevlar		100 °C	Drinking water
EPDMaf	Nylon		100 °C	Abrasive materials, water-sand extraction
EPDMaf	Kevlar		100 °C	Abrasive materials, water-sand extraction
EPDMbeige	Nylon		100 °C	Foodstuffs
EPDMbeige	Kevlar		100 °C	Foodstuffs
IIR	Nylon		100 °C	Hot water, acids, bases, gases
IIR	Kevlar		100 °C	Hot water, acids, bases, gases
CSM	Nylon		100 °C	Strong acids, bases, chemicals
CSM	Kevlar		100 °C	Strong acids, bases, chemicals
NBR	Nylon		100 °C	Oils, petrol, solvents, compressed air
NBR	Kevlar		100 °C	Oils, petrol, solvents, compressed air
NBRbeige	Nylon		100 °C	Oil, fatty foods
NBRbeige	Kevlar		100 °C	Oil, fatty foods
CR	Nylon		90 °C	Cooling water, slightly oily water, seawater
CR	Kevlar		90 °C	Cooling water, slightly oily water, seawater
FPM	Kevlar		180 °C	Corrosive chemicals, petroleum distillates
FPMbeige	Kevlar		180 °C	Oil, fatty foods
NR	Nylon		70 °C	Abrasive materials
Silicon	Kevlar or glass		200 °C	Air, saltwater atmosphere, 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 56–61)

Flanges

Design: Single-part or multi-part, round backing flanges with support collar and clearance holes

Flange norms: DIN, ANSI, EN, AWWA, BS, JIS, special measurements (▶ page 256)

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 covers: UV protection cover
Ground protective cover
Fire protection cover
Splash protective cover (▶ page 44)

Flow liners: Cylindrical flow liner
Conical flow liner
Telescoping flow liner (▶ page 43)

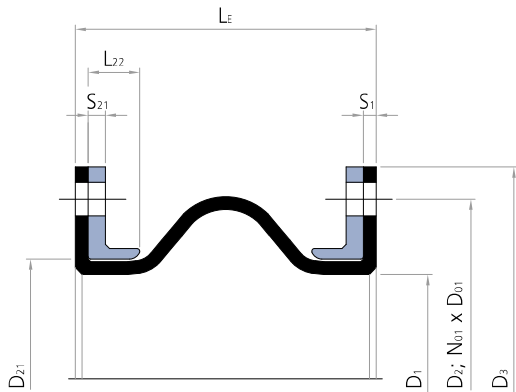
Support rings

TYPE		Vacuum support ring	Pressure	Movement
U110A		Without	Depending on the nominal diameter up to 40 bar, vacuum stability on request	▶ page 56
U111A		Medium contact, inside the arch apex	Depending on the nominal diameter up to 40 bar, for vacuum up to 0.05 bar absolute	▶ page 58
U112A		No medium contact, embedded into the arch apex of the rubber bellows	Depending on the nominal diameter up to 25 bar, for vacuum up to 0.05 bar absolute	▶ page 60

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

Planning help U110A



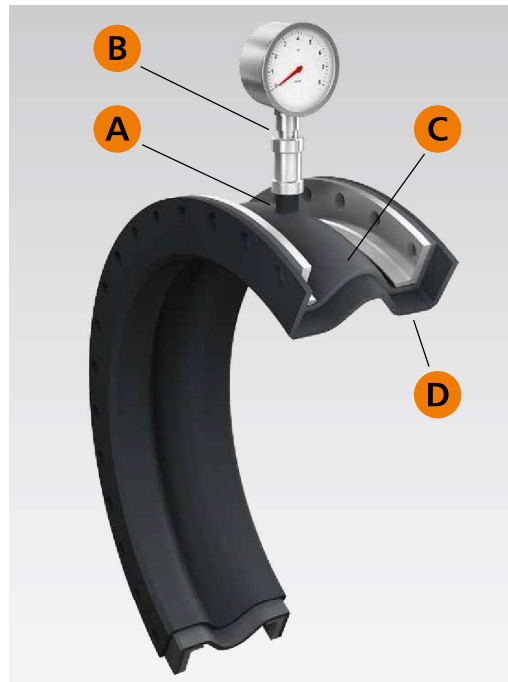
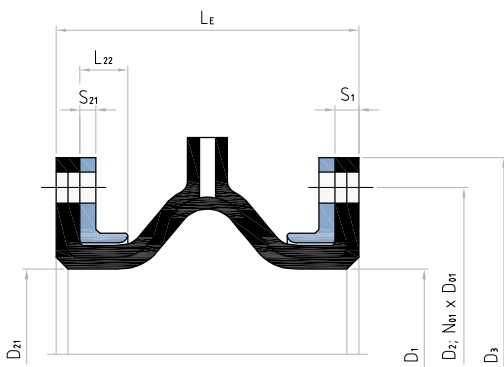
Example: Type U111A

U110A special design - 2-ply safety rubber expansion joint



- A** moulded connection port
- B** pressure gauge
- C** bellows outer ply
- D** bellows inner ply

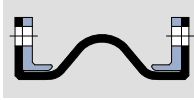
Planning help U110A special design



Design:

The expansion joint bellows reliability is critical as they generally stay on line for long periods of time between shutdowns. For this reason, bellows design incorporates a redundant pressure retaining ply combined with a leak detection hardware.

Typically the bellows is composed of two plies of a material that is capable of handling the full operating pressure alone. Both plies are vulcanized together in the flange connection area. The expansion joint is also able to withstand low pressures with a vacuum ring. The inner ply retains the pressure under normal circumstances. If the inner ply develops a leak, the outer ply then retains the pressure. If this happens the pressure between the plies is ported to a gauge that will then indicate a reading. This alerts personnel to take precautions to replace a failing bellows as soon as possible.



U110A

► without vacuum supporting ring

Installation length (L _E) at design pressure															
NB	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
100	31	10	19	11.3	177	40	20	28	21.8	254	44	20	30	21.8	260
125	31	10	19	9.1	241	40	20	28	17.7	330	44	20	30	17.7	337
150	31	10	18	7.6	314	40	20	27	14.9	415	44	20	29	14.9	423
175	31	10	18	6.5	415	40	20	27	12.9	531	44	20	29	12.9	539
200	31	10	18	5.7	491	40	20	26	11.3	616	44	20	29	11.3	625
250	31	10	18	4.6	707	40	20	26	9.1	855	44	20	28	9.1	866
300	31	10	17	3.8	973	40	20	26	7.6	1,146	44	20	27	7.6	1,158
350	31	10	17	3.3	1,288	40	20	25	6.5	1,486	44	20	27	6.5	1,500
400	31	10	17	2.9	1,605	40	20	25	5.7	1,825	44	20	27	5.7	1,840
450	31	10	17	2.5	1,987	40	20	25	5.1	2,231	44	20	26	5.1	2,248
500	31	10	17	2.3	2,402	40	20	24	4.6	2,669	44	20	26	4.6	2,688
550	31	10	16	2.1	2,827	40	20	24	4.2	3,117	44	20	26	4.2	3,137
600	31	10	16	1.9	3,349	40	20	24	3.8	3,664	44	20	26	3.8	3,685
650	31	10	16	1.8	3,848	40	20	24	3.5	4,185	44	20	26	3.5	4,208
700	31	10	16	1.6	4,465	40	20	24	3.3	4,827	44	20	25	3.3	4,852
750	31	10	16	1.5	5,027	40	20	23	3.1	5,411	44	20	25	3.1	5,437
800	31	10	16	1.4	5,741	40	20	23	2.9	6,151	44	20	25	2.9	6,179
850	31	10	16	1.3	6,362	40	20	23	2.7	6,793	44	20	25	2.7	6,822
900	31	10	16	1.3	7,163	40	20	23	2.5	7,620	44	20	25	2.5	7,651
950	31	10	16	1.2	7,854	40	20	23	2.4	8,332	44	20	25	2.4	8,365
1000	31	10	16	1.1	8,742	40	20	23	2.3	9,246	44	20	25	2.3	9,280
1050	31	10	15	1.1	9,503	40	20	23	2.2	10,029	44	20	25	2.2	10,064
1100	31	10	15	1.0	10,496	40	20	23	2.1	11,047	44	20	24	2.1	11,085
1150	31	10	15	1.0	11,310	40	20	23	2.0	11,882	44	20	24	2.0	11,921
1200	31	10	15	1.0	12,370	40	20	22	1.9	12,969	44	20	24	1.9	13,009
1250	31	10	15	0.9	13,273	40	20	22	1.8	13,893	44	20	24	1.8	13,935
1300	31	10	15	0.9	14,420	40	20	22	1.8	15,066	44	20	24	1.8	15,109
1350	31	10	15	0.8	15,394	40	20	22	1.7	16,061	44	20	24	1.7	16,106
1400	31	10	15	0.8	16,627	40	20	22	1.6	17,320	44	20	24	1.6	17,366
1450	31	10	15	0.8	17,671	40	20	22	1.6	18,385	44	20	24	1.6	18,433
1500	31	10	15	0.8	18,991	40	20	22	1.5	19,731	44	20	24	1.5	19,781
1600	31	10	15	0.7	21,512	40	20	22	1.4	22,299	44	20	24	1.4	22,352
1650	31	10	15	0.7	22,698	40	20	22	1.4	23,506	44	20	24	1.4	23,561
1700	31	10	15	0.7	24,190	40	20	22	1.3	25,025	44	20	23	1.3	25,081
1800	31	10	15	0.6	27,055	40	20	22	1.3	27,937	44	20	23	1.3	27,996
1900	31	10	15	0.6	30,018	40	20	22	1.2	30,946	44	20	23	1.2	31,009
1950	31	10	15	0.6	31,416	40	20	22	1.2	32,365	44	20	23	1.2	32,429
2000	31	10	15	0.6	33,168	40	20	21	1.1	34,143	44	20	23	1.1	34,209
2100	31	10	15	0.5	36,474	40	20	21	1.1	37,497	44	20	23	1.1	37,565
2200	31	10	14	0.5	39,938	40	20	21	1.0	41,007	44	20	23	1.0	41,079
2250	31	10	14	0.5	41,548	40	20	21	1.0	42,638	44	20	23	1.0	42,712
2300	31	10	14	0.5	43,558	40	20	21	1.0	44,675	44	20	23	1.0	44,750
2400	31	10	14	0.5	47,336	40	20	21	1.0	48,500	44	20	23	1.0	48,578
2500	31	10	14	0.5	51,271	40	20	21	0.9	52,482	44	20	23	0.9	52,563
2550	31	10	14	0.4	53,093	40	20	21	0.9	54,325	44	20	23	0.9	54,408
2600	31	10	14	0.4	55,363	40	20	21	0.9	56,621	44	20	23	0.9	56,706
2700	31	10	14	0.4	59,612	40	20	21	0.8	60,917	44	20	23	0.8	61,005
2800	31	10	14	0.4	64,018	40	20	21	0.8	65,370	44	20	22	0.8	65,461
2850	31	10	14	0.4	66,052	40	20	21	0.8	67,426	44	20	22	0.8	67,518
2900	31	10	14	0.4	68,581	40	20	21	0.8	69,981	44	20	22	0.8	70,075
3000	31	10	14	0.4	73,301	40	20	21	0.8	74,748	44	20	22	0.8	74,845
3100	31	10	14	0.4	78,179	40	20	21	0.7	79,673	44	20	22	0.7	79,773
3150	31	10	14	0.4	80,425	40	20	21	0.7	81,940	44	20	22	0.7	82,041
3200	31	10	14	0.4	83,213	40	20	21	0.7	84,754	44	20	22	0.7	84,857
3300	31	10	14	0.3	88,405	40	20	21	0.7	89,993	44	20	22	0.7	90,099
3400	31	10	14	0.3	93,753	40	20	20	0.7	95,388	44	20	22	0.7	95,498
3450	31	10	14	0.3	96,211	40	20	20	0.7	97,868	44	20	22	0.7	97,979
3600	31	10	14	0.3	104,922	40	20	20	0.6	106,651	44	20	22	0.6	106,767
3800	31	10	14	0.3	116,718	40	20	20	0.6	118,542	44	20	22	0.6	118,664
4000	31	10	14	0.3	129,143	40	20	20	0.6	131,061	44	20	22	0.6	131,190

Recommended sizes

Additional possible sizes

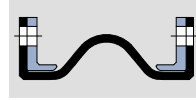
Reduction of movement for expansion joints with PTFE lining:

axial compression: -33 %; axial extension: -66 %; lateral displacement: -50 %; angular movement: -66 %.

When the axial compression and extension is changed to the mean value, it is possible to increase the angular movement (for values see type U110F).

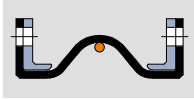
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).

For larger movements see type U120A or U123A.



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					NB
higher pressures on request					higher pressures on request					higher pressures on request					
Movement				A	Movement				A	Movement				A	
mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	mm	mm	± mm	± °	cm ²	
53	31	39	31.8	353	69	43	53	40.7	491	78	53	62	46.7	616	100
53	31	39	26.4	441	69	43	51	34.5	594	78	53	60	40.3	731	125
53	31	38	22.5	539	69	43	51	29.8	707	78	53	59	35.2	855	150
53	31	37	19.5	670	69	43	50	26.2	855	78	53	58	31.2	1,018	175
53	31	37	17.2	765	69	43	49	23.3	962	78	53	58	27.9	1,134	200
53	31	36	13.9	1,029	69	43	48	19.0	1,257	78	53	57	23.0	1,452	250
53	31	36	11.7	1,346	69	43	48	16.0	1,605	78	53	56	19.5	1,825	300
53	31	35	10.0	1,713	69	43	47	13.8	2,003	78	53	55	16.8	2,248	350
53	31	35	8.8	2,075	69	43	46	12.1	2,393	78	53	54	14.8	2,660	400
53	31	34	7.8	2,507	69	43	46	10.8	2,856	78	53	54	13.3	3,147	450
53	31	34	7.1	2,971	69	43	45	9.8	3,349	78	53	53	12.0	3,664	500
53	31	34	6.4	3,442	69	43	45	8.9	3,848	78	53	53	10.9	4,185	550
53	31	33	5.9	4,015	69	43	45	8.2	4,453	78	53	52	10.0	4,815	600
53	31	33	5.4	4,560	69	43	44	7.5	5,027	78	53	52	9.3	5,411	650
53	31	33	5.1	5,230	69	43	44	7.0	5,728	78	53	52	8.6	6,138	700
53	31	33	4.7	5,836	69	43	44	6.5	6,362	78	53	51	8.0	6,793	750
53	31	33	4.4	6,604	69	43	43	6.1	7,163	78	53	51	7.5	7,620	800
53	31	32	4.2	7,268	69	43	43	5.8	7,854	78	53	51	7.1	8,332	850
53	31	32	3.9	8,123	69	43	43	5.5	8,742	78	53	50	6.7	9,246	900
53	31	32	3.7	8,858	69	43	43	5.2	9,503	78	53	50	6.4	10,029	950
53	31	32	3.5	9,799	69	43	43	4.9	10,477	78	53	50	6.1	11,029	1000
53	31	32	3.4	10,605	69	43	42	4.7	11,310	78	53	50	5.8	11,882	1050
53	31	32	3.2	11,652	69	43	42	4.5	12,390	78	53	49	5.5	12,989	1100
53	31	32	3.1	12,509	69	43	42	4.3	13,273	78	53	49	5.3	13,893	1150
53	31	31	3.0	13,623	69	43	42	4.1	14,420	78	53	49	5.0	15,066	1200
53	31	31	2.8	14,569	69	43	42	3.9	15,394	78	53	49	4.8	16,061	1250
53	31	31	2.7	15,770	69	43	42	3.8	16,627	78	53	49	4.7	17,320	1300
53	31	31	2.6	16,787	69	43	41	3.6	17,671	78	53	49	4.5	18,385	1350
53	31	31	2.5	18,074	69	43	41	3.5	18,991	78	53	48	4.3	19,731	1400
53	31	31	2.4	19,162	69	43	41	3.4	20,106	78	53	48	4.2	20,867	1450
53	31	31	2.4	20,536	69	43	41	3.3	21,512	78	53	48	4.0	22,299	1500
53	31	31	2.2	23,154	69	43	41	3.1	24,190	78	53	48	3.8	25,025	1600
53	31	31	2.2	24,384	69	43	41	3.0	25,447	78	53	48	3.7	26,302	1650
53	31	30	2.1	25,930	69	43	41	2.9	27,026	78	53	48	3.6	27,907	1700
53	31	30	2.0	28,893	69	43	40	2.7	30,049	78	53	47	3.4	30,978	1800
53	31	30	1.9	31,952	69	43	40	2.6	33,168	78	53	47	3.2	34,143	1900
53	31	30	1.8	33,394	69	43	40	2.5	34,636	78	53	47	3.1	35,633	1950
53	31	30	1.8	35,199	69	43	40	2.5	36,474	78	53	47	3.0	37,497	2000
53	31	30	1.7	38,603	69	43	40	2.3	39,938	78	53	47	2.9	41,007	2100
53	31	30	1.6	42,164	69	43	40	2.2	43,558	78	53	46	2.8	44,675	2200
53	31	30	1.6	43,818	69	43	40	2.2	45,239	78	53	46	2.7	46,377	2250
53	31	30	1.5	45,882	69	43	40	2.1	47,336	78	53	46	2.6	48,500	2300
53	31	29	1.5	49,757	69	43	39	2.1	51,271	78	53	46	2.5	52,482	2400
53	31	29	1.4	53,789	69	43	39	2.0	55,363	78	53	46	2.4	56,621	2500
53	31	29	1.4	55,655	69	43	39	1.9	57,256	78	53	46	2.4	58,535	2550
53	31	29	1.4	57,979	69	43	39	1.9	59,612	78	53	46	2.3	60,917	2600
53	31	29	1.3	62,325	69	43	39	1.8	64,018	78	53	46	2.2	65,370	2700
53	31	29	1.3	66,829	69	43	39	1.8	68,581	78	53	45	2.2	69,981	2800
53	31	29	1.2	68,906	69	43	39	1.7	70,686	78	53	45	2.1	72,107	2850
53	31	29	1.2	71,489	69	43	39	1.7	73,301	78	53	45	2.1	74,748	2900
53	31	29	1.2	76,307	69	43	39	1.6	78,179	78	53	45	2.0	79,673	3000
53	31	29	1.1	81,282	69	43	38	1.6	83,213	78	53	45	2.0	84,754	3100
53	31	29	1.1	83,571	69	43	38	1.6	85,530	78	53	45	1.9	87,092	3150
53	31	29	1.1	86,413	69	43	38	1.5	88,405	78	53	45	1.9	89,993	3200
53	31	29	1.1	91,702	69	43	38	1.5	93,753	78	53	45	1.8	95,388	3300
53	31	29	1.0	97,148	69	43	38	1.4	99,259	78	53	45	1.8	100,941	3400
53	31	29	1.0	99,650	69	43	38	1.4	101,788	78	53	45	1.8	103,491	3450
53	31	28	1.0	108,511	69	43	38	1.4	110,741	78	53	44	1.7	112,518	3600
53	31	28	0.9	120,503	69	43	38	1.3	122,852	78	53	44	1.6	124,723	3800
53	31	28	0.9	133,123	69	43	38	1.2	135,591	78	53	44	1.5	137,556	4000

Individual fabrication possible

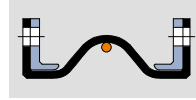


U111A
▶ with internal vacuum support ring

Installation length (L _e) at design pressure															
NB	up to 10 bar L _e = 150 mm					up to 10 bar L _e = 200 mm					up to 10 bar L _e = 250 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	±mm	±°		mm	mm	±mm	±°		mm	mm	±mm	±°	
100	31	3	19	11.3	177	40	7	28	21.8	254	44	7	30	21.8	260
125	31	3	19	9.1	241	40	7	28	17.7	330	44	7	30	17.7	337
150	31	3	18	7.6	314	40	7	27	14.9	415	44	7	29	14.9	423
175	31	3	18	6.5	415	40	7	27	12.9	531	44	7	29	12.9	539
200	31	3	18	5.7	491	40	7	26	11.3	616	44	7	29	11.3	625
250	31	3	18	4.6	707	40	7	26	9.1	855	44	7	28	9.1	866
300	31	3	17	3.8	973	40	7	26	7.6	1,146	44	7	27	7.6	1,158
350	31	3	17	3.3	1,288	40	7	25	6.5	1,486	44	7	27	6.5	1,500
400	31	3	17	2.9	1,605	40	7	25	5.7	1,825	44	7	27	5.7	1,840
450	31	3	17	2.5	1,987	40	7	25	5.1	2,231	44	7	26	5.1	2,248
500	31	3	17	2.3	2,402	40	7	24	4.6	2,669	44	7	26	4.6	2,688
550	31	3	16	2.1	2,827	40	7	24	4.2	3,117	44	7	26	4.2	3,137
600	31	3	16	1.9	3,349	40	7	24	3.8	3,664	44	7	26	3.8	3,685
650	31	3	16	1.8	3,848	40	7	24	3.5	4,185	44	7	26	3.5	4,208
700	31	3	16	1.6	4,465	40	7	24	3.3	4,827	44	7	25	3.3	4,852
750	31	3	16	1.5	5,027	40	7	23	3.1	5,411	44	7	25	3.1	5,437
800	31	3	16	1.4	5,741	40	7	23	2.9	6,151	44	7	25	2.9	6,179
850	31	3	16	1.3	6,362	40	7	23	2.7	6,793	44	7	25	2.7	6,822
900	31	3	16	1.3	7,163	40	7	23	2.5	7,620	44	7	25	2.5	7,651
950	31	3	16	1.2	7,854	40	7	23	2.4	8,332	44	7	25	2.4	8,365
1000	31	3	16	1.1	8,742	40	7	23	2.3	9,246	44	7	25	2.3	9,280
1050	31	3	15	1.1	9,503	40	7	23	2.2	10,029	44	7	25	2.2	10,064
1100	31	3	15	1.0	10,496	40	7	23	2.1	11,047	44	7	24	2.1	11,085
1150	31	3	15	1.0	11,310	40	7	23	2.0	11,882	44	7	24	2	11,921
1200	31	3	15	1.0	12,370	40	7	22	1.9	12,969	44	7	24	1.9	13,009
1250	31	3	15	0.9	13,273	40	7	22	1.8	13,893	44	7	24	1.8	13,935
1300	31	3	15	0.9	14,420	40	7	22	1.8	15,066	44	7	24	1.8	15,109
1350	31	3	15	0.8	15,394	40	7	22	1.7	16,061	44	7	24	1.7	16,106
1400	31	3	15	0.8	16,627	40	7	22	1.6	17,320	44	7	24	1.6	17,366
1450	31	3	15	0.8	17,671	40	7	22	1.6	18,385	44	7	24	1.6	18,433
1500	31	3	15	0.8	18,991	40	7	22	1.5	19,731	44	7	24	1.5	19,781
1600	31	3	15	0.7	21,512	40	7	22	1.4	22,299	44	7	24	1.4	22,352
1650	31	3	15	0.7	22,698	40	7	22	1.4	23,506	44	7	24	1.4	23,561
1700	31	3	15	0.7	24,190	40	7	22	1.3	25,025	44	7	23	1.3	25,081
1800	31	3	15	0.6	27,055	40	7	22	1.3	27,937	44	7	23	1.3	27,996
1900	31	3	15	0.6	30,018	40	7	22	1.2	30,946	44	7	23	1.2	31,009
1950	31	3	15	0.6	31,416	40	7	22	1.2	32,365	44	7	23	1.2	32,429
2000	31	3	15	0.6	33,168	40	7	21	1.1	34,143	44	7	23	1.1	34,209
2100	31	3	15	0.5	36,474	40	7	21	1.1	37,497	44	7	23	1.1	37,565
2200	31	3	14	0.5	39,938	40	7	21	1.0	41,007	44	7	23	1	41,079
2250	31	3	14	0.5	41,548	40	7	21	1.0	42,638	44	7	23	1	42,712
2300	31	3	14	0.5	43,558	40	7	21	1.0	44,675	44	7	23	1	44,750
2400	31	3	14	0.5	47,336	40	7	21	1.0	48,500	44	7	23	1	48,578
2500	31	3	14	0.5	51,271	40	7	21	0.9	52,482	44	7	23	0.9	52,563
2550	31	3	14	0.4	53,093	40	7	21	0.9	54,325	44	7	23	0.9	54,408
2600	31	3	14	0.4	55,363	40	7	21	0.9	56,621	44	7	23	0.9	56,706
2700	31	3	14	0.4	59,612	40	7	21	0.8	60,917	44	7	23	0.8	61,005
2800	31	3	14	0.4	64,018	40	7	21	0.8	65,370	44	7	22	0.8	65,461
2850	31	3	14	0.4	66,052	40	7	21	0.8	67,426	44	7	22	0.8	67,518
2900	31	3	14	0.4	68,581	40	7	21	0.8	69,981	44	7	22	0.8	70,075
3000	31	3	14	0.4	73,301	40	7	21	0.8	74,748	44	7	22	0.8	74,845
3100	31	3	14	0.4	78,179	40	7	21	0.7	79,673	44	7	22	0.7	79,773
3150	31	3	14	0.4	80,425	40	7	21	0.7	81,940	44	7	22	0.7	82,041
3200	31	3	14	0.4	83,213	40	7	21	0.7	84,754	44	7	22	0.7	84,857
3300	31	3	14	0.3	88,405	40	7	21	0.7	89,993	44	7	22	0.7	90,099
3400	31	3	14	0.3	93,753	40	7	20	0.7	95,388	44	7	22	0.7	95,498
3450	31	3	14	0.3	96,211	40	7	20	0.7	97,868	44	7	22	0.7	97,979
3600	31	3	14	0.3	104,922	40	7	20	0.6	106,651	44	7	22	0.6	106,767
3800	31	3	14	0.3	116,718	40	7	20	0.6	118,542	44	7	22	0.6	118,664
4000	31	3	14	0.3	129,143	40	7	20	0.6	131,061	44	7	22	0.6	131,190

Recommended sizes
Additional possible sizes

Reduction of movement for expansion joints with PTFE lining:
axial compression: -33 %; axial extension: -0 %; lateral displacement: -50 %; angular movement: -0 %.
When axial compression and extension are changed to the mean value, it is possible to increase the angular movement (for values see type U111F).
In the event of axial extension and simultaneous lateral displacement the above movements are reduced ▶ page 22).
For larger movements see type U121A or U124A.



Installation length (L_E) at design pressure

up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					NB
Movement					Movement					Movement					
mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²	
53	10	39	31.8	353	69	14	53	40.7	491	78	17	62	46.7	616	100
53	10	39	26.4	441	69	14	51	34.5	594	78	17	60	40.3	731	125
53	10	38	22.5	539	69	14	51	29.8	707	78	17	59	35.2	855	150
53	10	37	19.5	670	69	14	50	26.2	855	78	17	58	31.2	1,018	175
53	10	37	17.2	765	69	14	49	23.3	962	78	17	58	27.9	1,134	200
53	10	36	13.9	1,029	69	14	48	19	1,257	78	17	57	23	1,452	250
53	10	36	11.7	1,346	69	14	48	16	1,605	78	17	56	19.5	1,825	300
53	10	35	10	1,713	69	14	47	13.8	2,003	78	17	55	16.8	2,248	350
53	10	35	8.8	2,075	69	14	46	12.1	2,393	78	17	54	14.8	2,660	400
53	10	34	7.8	2,507	69	14	46	10.8	2,856	78	17	54	13.3	3,147	450
53	10	34	7.1	2,971	69	14	45	9.8	3,349	78	17	53	12	3,664	500
53	10	34	6.4	3,442	69	14	45	8.9	3,848	78	17	53	10.9	4,185	550
53	10	33	5.9	4,015	69	14	45	8.2	4,453	78	17	52	10	4,815	600
53	10	33	5.4	4,560	69	14	44	7.5	5,027	78	17	52	9.3	5,411	650
53	10	33	5.1	5,230	69	14	44	7	5,728	78	17	52	8.6	6,138	700
53	10	33	4.7	5,836	69	14	44	6.5	6,362	78	17	51	8	6,793	750
53	10	33	4.4	6,604	69	14	43	6.1	7,163	78	17	51	7.5	7,620	800
53	10	32	4.2	7,268	69	14	43	5.8	7,854	78	17	51	7.1	8,332	850
53	10	32	3.9	8,123	69	14	43	5.5	8,742	78	17	50	6.7	9,246	900
53	10	32	3.7	8,858	69	14	43	5.2	9,503	78	17	50	6.4	10,029	950
53	10	32	3.5	9,799	69	14	43	4.9	10,477	78	17	50	6.1	11,029	1000
53	10	32	3.4	10,605	69	14	42	4.7	11,310	78	17	50	5.8	11,882	1050
53	10	32	3.2	11,652	69	14	42	4.5	12,390	78	17	49	5.5	12,989	1100
53	10	32	3.1	12,509	69	14	42	4.3	13,273	78	17	49	5.3	13,893	1150
53	10	31	3	13,623	69	14	42	4.1	14,420	78	17	49	5	15,066	1200
53	10	31	2.8	14,569	69	14	42	3.9	15,394	78	17	49	4.8	16,061	1250
53	10	31	2.7	15,770	69	14	42	3.8	16,627	78	17	49	4.7	17,320	1300
53	10	31	2.6	16,787	69	14	41	3.6	17,671	78	17	49	4.5	18,385	1350
53	10	31	2.5	18,074	69	14	41	3.5	18,991	78	17	48	4.3	19,731	1400
53	10	31	2.4	19,162	69	14	41	3.4	20,106	78	17	48	4.2	20,867	1450
53	10	31	2.4	20,536	69	14	41	3.3	21,512	78	17	48	4	22,299	1500
53	10	31	2.2	23,154	69	14	41	3.1	24,190	78	17	48	3.8	25,025	1600
53	10	31	2.2	24,384	69	14	41	3	25,447	78	17	48	3.7	26,302	1650
53	10	30	2.1	25,930	69	14	41	2.9	27,026	78	17	48	3.6	27,907	1700
53	10	30	2	28,893	69	14	40	2.7	30,049	78	17	47	3.4	30,978	1800
53	10	30	1.9	31,952	69	14	40	2.6	33,168	78	17	47	3.2	34,143	1900
53	10	30	1.8	33,394	69	14	40	2.5	34,636	78	17	47	3.1	35,633	1950
53	10	30	1.8	35,199	69	14	40	2.5	36,474	78	17	47	3	37,497	2000
53	10	30	1.7	38,603	69	14	40	2.3	39,938	78	17	47	2.9	41,007	2100
53	10	30	1.6	42,164	69	14	40	2.2	43,558	78	17	46	2.8	44,675	2200
53	10	30	1.6	43,818	69	14	40	2.2	45,239	78	17	46	2.7	46,377	2250
53	10	30	1.5	45,882	69	14	40	2.1	47,336	78	17	46	2.6	48,500	2300
53	10	29	1.5	49,757	69	14	39	2.1	51,271	78	17	46	2.5	52,482	2400
53	10	29	1.4	53,789	69	14	39	2	55,363	78	17	46	2.4	56,621	2500
53	10	29	1.4	55,655	69	14	39	1.9	57,256	78	17	46	2.4	58,535	2550
53	10	29	1.4	57,979	69	14	39	1.9	59,612	78	17	46	2.3	60,917	2600
53	10	29	1.3	62,325	69	14	39	1.8	64,018	78	17	46	2.2	65,370	2700
53	10	29	1.3	66,829	69	14	39	1.8	68,581	78	17	45	2.2	69,981	2800
53	10	29	1.2	68,906	69	14	39	1.7	70,686	78	17	45	2.1	72,107	2850
53	10	29	1.2	71,489	69	14	39	1.7	73,301	78	17	45	2.1	74,748	2900
53	10	29	1.2	76,307	69	14	39	1.6	78,179	78	17	45	2	79,673	3000
53	10	29	1.1	81,282	69	14	38	1.6	83,213	78	17	45	2	84,754	3100
53	10	29	1.1	83,571	69	14	38	1.6	85,530	78	17	45	1.9	87,092	3150
53	10	29	1.1	86,413	69	14	38	1.5	88,405	78	17	45	1.9	89,993	3200
53	10	29	1.1	91,702	69	14	38	1.5	93,753	78	17	45	1.8	95,388	3300
53	10	29	1	97,148	69	14	38	1.4	99,259	78	17	45	1.8	100,941	3400
53	10	29	1	99,650	69	14	38	1.4	101,788	78	17	45	1.8	103,491	3450
53	10	28	1	108,511	69	14	38	1.4	110,741	78	17	44	1.7	112,518	3600
53	10	28	0.9	120,503	69	14	38	1.3	122,852	78	17	44	1.6	124,723	3800
53	10	28	0.9	133,123	69	14	38	1.2	135,591	78	17	44	1.5	137,556	4000

Individual fabrication possible

U110A



U112A

► with embedded vacuum support ring

Installation length (L _E) at design pressure															
NB	up to 10 bar L _E = 150 mm					up to 10 bar L _E = 200 mm					up to 10 bar L _E = 250 mm				
	Movement				A cm ²	Movement				A cm ²	Movement				A cm ²
	mm	mm	± mm	± °		mm	mm	± mm	± °		mm	mm	± mm	± °	
100	20	2	18	8.0	150	26	6	27	19.8	222	29	6	29	19.8	232
125	20	2	18	6.4	209	26	6	26	16.1	293	29	6	29	16.1	305
150	20	2	17	5.3	278	26	6	26	13.5	373	29	6	28	13.5	387
175	20	2	17	4.6	373	26	6	26	11.6	483	29	6	28	11.6	499
200	20	2	17	4.0	445	26	6	25	10.2	564	29	6	28	10.2	581
250	20	2	16	3.2	651	26	6	25	8.2	794	29	6	27	8.2	814
300	20	2	16	2.7	908	26	6	24	6.8	1,075	29	6	27	6.8	1,099
350	20	2	16	2.3	1,213	26	6	24	5.9	1,405	29	6	26	5.9	1,432
400	20	2	16	2.0	1,521	26	6	24	5.1	1,735	29	6	26	5.1	1,765
450	20	2	16	1.8	1,893	26	6	23	4.6	2,132	29	6	26	4.6	2,165
500	20	2	15	1.6	2,299	26	6	23	4.1	2,561	29	6	25	4.1	2,597
550	20	2	15	1.5	2,715	26	6	23	3.7	3,000	29	6	25	3.7	3,039
600	20	2	15	1.3	3,227	26	6	23	3.4	3,536	29	6	25	3.4	3,578
650	20	2	15	1.2	3,718	26	6	23	3.2	4,049	29	6	25	3.2	4,094
700	20	2	15	1.1	4,324	26	6	23	2.9	4,681	29	6	25	2.9	4,729
750	20	2	15	1.1	4,877	26	6	22	2.7	5,255	29	6	24	2.7	5,307
800	20	2	15	1.0	5,581	26	6	22	2.6	5,986	29	6	24	2.6	6,041
850	20	2	15	0.9	6,193	26	6	22	2.4	6,619	29	6	24	2.4	6,677
900	20	2	15	0.9	6,984	26	6	22	2.3	7,436	29	6	24	2.3	7,497
950	20	2	15	0.8	7,667	26	6	22	2.2	8,139	29	6	24	2.2	8,203
1000	20	2	15	0.8	8,544	26	6	22	2.1	9,043	29	6	24	2.1	9,110
1050	20	2	14	0.8	9,297	26	6	22	2.0	9,817	29	6	24	2	9,887
1100	20	2	14	0.7	10,279	26	6	22	1.9	10,825	29	6	24	1.9	10,899
1150	20	2	14	0.7	11,085	26	6	22	1.8	11,652	29	6	24	1.8	11,728
1200	20	2	14	0.7	12,135	26	6	21	1.7	12,728	29	6	23	1.7	12,808
1250	20	2	14	0.6	13,029	26	6	21	1.6	13,643	29	6	23	1.6	13,726
1300	20	2	14	0.6	14,166	26	6	21	1.6	14,806	29	6	23	1.6	14,892
1350	20	2	14	0.6	15,131	26	6	21	1.5	15,792	29	6	23	1.5	15,881
1400	20	2	14	0.6	16,354	26	6	21	1.5	17,041	29	6	23	1.5	17,134
1450	20	2	14	0.6	17,390	26	6	21	1.4	18,098	29	6	23	1.4	18,194
1500	20	2	14	0.5	18,699	26	6	21	1.4	19,433	29	6	23	1.4	19,532
1600	20	2	14	0.5	21,201	26	6	21	1.3	21,983	29	6	23	1.3	22,088
1650	20	2	14	0.5	22,379	26	6	21	1.2	23,181	29	6	23	1.2	23,289
1700	20	2	14	0.5	23,861	26	6	21	1.2	24,689	29	6	23	1.2	24,801
1800	20	2	14	0.4	26,706	26	6	21	1.1	27,582	29	6	23	1.1	27,700
1900	20	2	14	0.4	29,651	26	6	21	1.1	30,573	29	6	22	1.1	30,698
1950	20	2	14	0.4	31,040	26	6	21	1.1	31,984	29	6	22	1.1	32,111
2000	20	2	14	0.4	32,781	26	6	21	1.0	33,751	29	6	22	1	33,882
2100	20	2	14	0.4	36,069	26	6	20	1.0	37,086	29	6	22	1	37,223
2200	20	2	14	0.4	39,514	26	6	20	0.9	40,578	29	6	22	0.9	40,721
2250	20	2	14	0.4	41,115	26	6	20	0.9	42,200	29	6	22	0.9	42,346
2300	20	2	13	0.3	43,116	26	6	20	0.9	44,227	29	6	22	0.9	44,376
2400	20	2	13	0.3	46,875	26	6	20	0.9	48,033	29	6	22	0.9	48,188
2500	20	2	13	0.3	50,791	26	6	20	0.8	51,996	29	6	22	0.8	52,158
2550	20	2	13	0.3	52,604	26	6	20	0.8	53,831	29	6	22	0.8	53,995
2600	20	2	13	0.3	54,864	26	6	20	0.8	56,116	29	6	22	0.8	56,284
2700	20	2	13	0.3	59,094	26	6	20	0.8	60,393	29	6	22	0.8	60,568
2800	20	2	13	0.3	63,481	26	6	20	0.7	64,828	29	6	22	0.7	65,008
2850	20	2	13	0.3	65,506	26	6	20	0.7	66,874	29	6	22	0.7	67,058
2900	20	2	13	0.3	68,025	26	6	20	0.7	69,419	29	6	22	0.7	69,606
3000	20	2	13	0.3	72,727	26	6	20	0.7	74,168	29	6	22	0.7	74,361
3100	20	2	13	0.3	77,585	26	6	20	0.7	79,073	29	6	21	0.7	79,273
3150	20	2	13	0.3	79,823	26	6	20	0.7	81,332	29	6	21	0.7	81,534
3200	20	2	13	0.3	82,601	26	6	20	0.6	84,136	29	6	21	0.6	84,342
3300	20	2	13	0.2	87,773	26	6	20	0.6	89,356	29	6	21	0.6	89,568
3400	20	2	13	0.2	93,103	26	6	20	0.6	94,733	29	6	21	0.6	94,951
3450	20	2	13	0.2	95,553	26	6	20	0.6	97,203	29	6	21	0.6	97,425
3600	20	2	13	0.2	104,234	26	6	19	0.6	105,958	29	6	21	0.6	106,188
3800	20	2	13	0.2	115,993	26	6	19	0.5	117,811	29	6	21	0.5	118,054
4000	20	2	13	0.2	128,380	26	6	19	0.5	130,292	29	6	21	0.5	130,548

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 %.
When the axial compression and extension is changed to the mean value, it is possible to increase the angular movement (for values see type U112F).
In the event of axial extension and simultaneous lateral displacement the above movements are reduced (► page 22).
For larger movements see type U112A or U125A.



Installation length (L _E) at design pressure															
up to 10 bar L _E = 300 mm					up to 10 bar L _E = 350 mm					up to 10 bar L _E = 400 mm					NB
Movement					Movement					Movement					
mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²	mm	mm	± mm	± °	A cm ²	
35	9	38	30.1	320	46	13	51	38	423	51	16	60	44.4	539	100
35	9	38	24.9	405	46	13	50	32	519	51	16	59	38.1	647	125
35	9	37	21.1	499	46	13	49	27.5	625	51	16	58	33.2	765	150
35	9	36	18.3	625	46	13	48	24	765	51	16	57	29.2	919	175
35	9	36	16.2	716	46	13	48	21.3	866	51	16	56	26.1	1,029	200
35	9	35	13.1	973	46	13	47	17.3	1,146	51	16	55	21.4	1,333	250
35	9	35	10.9	1,282	46	13	46	14.6	1,479	51	16	54	18.1	1,691	300
35	9	34	9.4	1,640	46	13	45	12.6	1,863	51	16	53	15.6	2,099	350
35	9	34	8.3	1,995	46	13	45	11	2,240	51	16	53	13.8	2,498	400
35	9	33	7.3	2,419	46	13	44	9.8	2,688	51	16	52	12.3	2,971	450
35	9	33	6.6	2,875	46	13	44	8.9	3,167	51	16	52	11.1	3,473	500
35	9	33	6	3,339	46	13	44	8.1	3,653	51	16	51	10.1	3,982	550
35	9	33	5.5	3,904	46	13	43	7.4	4,243	51	16	51	9.3	4,596	600
35	9	32	5.1	4,441	46	13	43	6.8	4,803	51	16	50	8.6	5,178	650
35	9	32	4.7	5,102	46	13	43	6.4	5,489	51	16	50	8	5,890	700
35	9	32	4.4	5,701	46	13	42	5.9	6,110	51	16	50	7.4	6,533	750
35	9	32	4.1	6,461	46	13	42	5.6	6,896	51	16	50	7	7,344	800
35	9	32	3.9	7,118	46	13	42	5.2	7,574	51	16	49	6.6	8,044	850
35	9	31	3.7	7,964	46	13	42	5	8,446	51	16	49	6.2	8,942	900
35	9	31	3.5	8,692	46	13	41	4.7	9,195	51	16	49	5.9	9,712	950
35	9	31	3.3	9,625	46	13	41	4.5	10,153	51	16	49	5.6	10,696	1000
35	9	31	3.2	10,423	46	13	41	4.2	10,973	51	16	48	5.3	11,537	1050
35	9	31	3	11,461	46	13	41	4.1	12,037	51	16	48	5.1	12,628	1100
35	9	31	2.9	12,311	46	13	41	3.9	12,908	51	16	48	4.9	13,519	1150
35	9	31	2.8	13,417	46	13	41	3.7	14,040	51	16	48	4.7	14,677	1200
35	9	31	2.7	14,356	46	13	40	3.6	15,001	51	16	48	4.5	15,659	1250
35	9	30	2.6	15,548	46	13	40	3.4	16,218	51	16	47	4.3	16,902	1300
35	9	30	2.5	16,559	46	13	40	3.3	17,250	51	16	47	4.2	17,955	1350
35	9	30	2.4	17,837	46	13	40	3.2	18,554	51	16	47	4	19,285	1400
35	9	30	2.3	18,918	46	13	40	3.1	19,656	51	16	47	3.9	20,409	1450
35	9	30	2.2	20,283	46	13	40	3	21,047	51	16	47	3.7	21,825	1500
35	9	30	2.1	22,885	46	13	40	2.8	23,697	51	16	47	3.5	24,522	1600
35	9	30	2	24,108	46	13	39	2.7	24,941	51	16	46	3.4	25,787	1650
35	9	30	2	25,645	46	13	39	2.6	26,504	51	16	46	3.3	27,377	1700
35	9	30	1.8	28,592	46	13	39	2.5	29,498	51	16	46	3.1	30,419	1800
35	9	29	1.7	31,636	46	13	39	2.4	32,589	51	16	46	3	33,556	1900
35	9	29	1.7	33,071	46	13	39	2.3	34,045	51	16	46	2.9	35,033	1950
35	9	29	1.7	34,867	46	13	39	2.2	35,867	51	16	46	2.8	36,881	2000
35	9	29	1.6	38,256	46	13	39	2.1	39,303	51	16	45	2.7	40,364	2100
35	9	29	1.5	41,801	46	13	38	2	42,895	51	16	45	2.6	44,003	2200
35	9	29	1.5	43,447	46	13	38	2	44,563	51	16	45	2.5	45,692	2250
35	9	29	1.4	45,503	46	13	38	1.9	46,645	51	16	45	2.4	47,800	2300
35	9	29	1.4	49,363	46	13	38	1.9	50,551	51	16	45	2.3	51,754	2400
35	9	29	1.3	53,379	46	13	38	1.8	54,615	51	16	45	2.2	55,864	2500
35	9	29	1.3	55,238	46	13	38	1.8	56,495	51	16	45	2.2	57,766	2550
35	9	29	1.3	57,553	46	13	38	1.7	58,836	51	16	44	2.2	60,132	2600
35	9	28	1.2	61,883	46	13	38	1.7	63,213	51	16	44	2.1	64,557	2700
35	9	28	1.2	66,371	46	13	38	1.6	67,748	51	16	44	2	69,139	2800
35	9	28	1.2	68,442	46	13	37	1.6	69,840	51	16	44	2	71,252	2850
35	9	28	1.1	71,016	46	13	37	1.5	72,440	51	16	44	1.9	73,878	2900
35	9	28	1.1	75,818	46	13	37	1.5	77,289	51	16	44	1.9	78,775	3000
35	9	28	1.1	80,777	46	13	37	1.4	82,295	51	16	44	1.8	83,828	3100
35	9	28	1.1	83,060	46	13	37	1.4	84,599	51	16	44	1.8	86,153	3150
35	9	28	1	85,893	46	13	37	1.4	87,459	51	16	44	1.8	89,038	3200
35	9	28	1	91,166	46	13	37	1.4	92,779	51	16	44	1.7	94,406	3300
35	9	28	1	96,597	46	13	37	1.3	98,256	51	16	43	1.7	99,930	3400
35	9	28	1	99,091	46	13	37	1.3	100,772	51	16	43	1.6	102,467	3450
35	9	28	0.9	107,928	46	13	37	1.2	109,682	51	16	43	1.6	111,450	3600
35	9	28	0.9	119,888	46	13	37	1.2	121,736	51	16	43	1.5	123,599	3800
35	9	27	0.8	132,477	46	13	36	1.1	134,419	51	16	43	1.4	136,376	4000

Individual fabrication possible