

Steel compensator - Type SA-10

Axial compensator DN 15 – DN 3400



Structure type SA-10

- Vacuum-proof axial compensator consisting of a stainless steel bellows and welded pipe ends (welding ends)

Steel bellows PN 2,5 / PN 6 / PN 10 / PN 16

- Multiple convolution bellows in various stainless steel grades
- One ply or multi-ply structure

Material grade *	Material No. as per DIN EN	Temperature**	Possible uses
Stainless steel	1.4541	-196 °C up to +550 °C	Low temperature, acids, lyes, gases, fertilizers
	1.4404, 1.4571		
Heat-resistant steel	1.4828	+900 °C	Hot gases, steam, air
	1.4878	+800 °C	Hot gases, steam, air
Nickel-based alloy	2.4858 (Incoloy 825)	+450 °C	Sulphuric acid, phosphoric acid, petrol, oil, gases

* Check or inquire about the resistance of material grades to temperature and medium.
** Check or inquire about reduction in pressure by temperature.

Welding ends

Version

- Welded pipe ends

Dimensions

Standard: see tables

Others: DIN EN, ANSI, BS etc.

Materials

Standard: 1.0305 (St 35.8),
1.0038 (S235JR),
1.4541

Others: stainless steel, etc.

Corrosion protection

Standard: anti-corrosion primed
Others: special varnish, etc.

Note

Please comply with the general technical instructions regarding reaction force, moving force, fixed point load, installation instructions, etc.

Subject to technical alterations and deviations resulting from the manufacturing process.

Applications

- for compensating axial movement
- for reducing tension, damping noise and oscillation in pipes and their system components, e.g.
 - compressors
 - motors
 - turbines
 - machines
 - process plants
- for installation in
 - industrial applications
 - exhaust systems
 - heating installations
 - gas supply lines

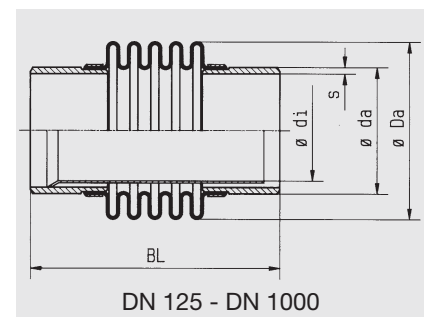
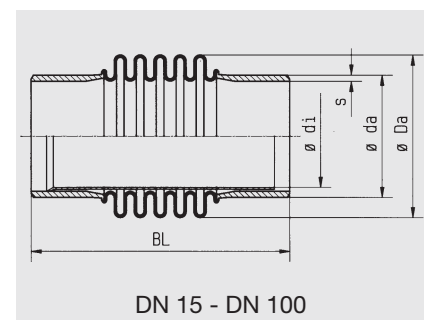
Special designs

Other sizes (DN), lengths or pressure ratings on request.

Accessories

- Internal guide sleeve
- Protective tube

Versions



Type SA-10

Certificates

- CE (DGR 97/23/EC) Bureau Veritas Germanischer Lloyd
 American Bureau of Shipping DVGW (DN 32 - DN 200) Lloyd's Register of Shipping

Pressure rate **PN 2,5** standard program

DN	BL	Δax_{tot} Axial movement	C_{ax} Axial spring rate	Δlat_{tot} Lateral movement	C_{lat} Lateral spring rate	A* Effective bellows cross sectional area cm ²	ϕD_a Bellows outer ϕ mm	$\phi d_a \times s$ Pipe connection mm	Weight approx. kg
	mm	mm	N/mm	mm	N/mm		mm	mm	
15	175	20	30	11	15	7	36	21.3x2.0	0.2
20	175	20	30	11	15	7	36	26.9x2.3	0.3
25	185	25	28	13	17	10	42	33.7x2.6	0.4
32	185	28	16	22	12	15	51	42.4x2.6	0.5
40	190	30	18	20	15	22	61	48.3x2.6	0.6
50	205	40	18	20	17	34	76	60.3x2.9	0.7
65	230	52	15	22	16	50	91	76.1x2.9	1.0
80	240	60	27	18	43	75	111	88.9x3.2	1.4
100	240	64	23	20	43	111	134	114.3x3.6	2.0
125	270	72	26	21	49	175	168	139.7x4.0	3.3
150	300	80	28	21	62	247	197	168.3x4.5	3.9
200	300	86	36	19	118	425	253	219.1x6.3	6.0
250	300	96	50	19	208	623	302	273.0x6.3	8.0
300	245	41	185	-	-	992	386	323.9x7.1	10.0
	370	112	74	21	375	-	-	-	16.0
350	245	40	201	-	-	1179	418	355.6x8.0	14.0
	370	107	80	19	477	-	-	-	19.0
400	245	39	226	-	-	1509	469	406.4x8.0	16.0
	370	105	90	17	676	-	-	-	21.0
450	245	38	251	-	-	1881	520	457x8.0	18.0
	370	100	100	15	923	-	-	-	24.0
500	245	38	276	-	-	2284	570	508x8.0	20.0
	370	98	110	13	1220	-	-	-	26.0
600	245	37	328	-	-	3230	672	610x8.0	24.0
	370	94	131	11	2015	-	-	-	31.0
700	245	37	380	-	-	4338	774	711x8.0	28.0
	370	92	152	9	3095	-	-	-	36.0
800	245	42	431	-	-	5597	875	813x8.0	32.0
	370	106	172	8	4487	-	-	-	41.0
900	245	42	482	-	-	7016	976	914x10.0	43.0
	370	105	193	7	6240	-	-	-	54.0
1000	245	41	533	-	-	8612	1078	1016x10.0	48.0
	370	104	213	6	8423	-	-	-	59.0
1200	245	41	636	-	-	12294	1282	1219x10.0	58.0
	370	103	254	-	-	-	-	-	72.0
1400	245	41	739	-	-	16536	1484	1422x10.0	68.0
	370	103	296	-	-	-	-	-	84.0
1600	245	41	843	-	-	21541	1686	1626x10.0	77.0
	370	102	337	-	-	-	-	-	95.0
1800	245	41	946	-	-	27145	1889	1819x10.0	87.0
	370	102	379	-	-	-	-	-	107.0
2000	245	41	1043	-	-	33429	2094	2032x10.0	97.0
	370	102	417	-	-	-	-	-	119.0
2200	245	41	1153	-	-	40331	2297	2235x10.0	106.0
	370	102	461	-	-	-	-	-	131.0
2400	245	40	1256	-	-	47880	2500	2438x10.0	116.0
	370	102	502	-	-	-	-	-	143.0
2600	255	44	1956	-	-	55220	2683	2620x10.0	125.0
	400	110	783	-	-	-	-	-	154.0
2800	255	44	2103	-	-	63864	2883	2820x10.0	135.0
	400	110	841	-	-	-	-	-	166.0
3000	255	44	2249	-	-	73136	3083	3020x10.0	144.0
	400	110	900	-	-	-	-	-	177.0
3200	255	44	2396	-	-	83037	3283	3220x10.0	154.0
	400	110	958	-	-	-	-	-	189.0
3400	255	44	2542	-	-	93566	3483	3420x10.0	163.0
	400	110	1017	-	-	-	-	-	201.0

Table values refer to +20 °C, bellows material 1.4541, 1000 cycles. Please inquire for deviating values.
 For pure axial movement: inner diameter of internal guide sleeve mentioned in tables PN 6, PN 10, PN 16.
 If Δax and Δlat occur simultaneously, the table values must be reduced accordingly. The sum of all shares must not exceed 100 %.
 *Effective bellows cross sectional area is a theoretical value.

Steel compensator - Type SA-10

Axial compensator

Pressure rate **PN 6** standard program

DN	BL mm	$\Delta a_{x_{tot}}$ Axial move- ment mm	C_{ax} Axial spring rate N/mm	A* Effective bellows cross sectional area cm ²	$\varnothing D_a$ Bellows outer \varnothing mm	$\varnothing d_i$ Guide sleeve inner \varnothing mm	$\varnothing d_a \times s$ Pipe connection mm	Weight approx. kg
15	175	24	49	7,5	38	14	21.3x2.0	0.3
20	175	24	49	7.5	38	18	26.9x2.3	0.3
25	185	20	45	16	54	24	33.7x2.6	0.5
32	185	20	45	16	54	30	42.4x2.6	0.5
40	190	26	67	25	66	39	48.3x2.8	0.6
50	205	34	87	36	79	51	60.3x2.9	1.0
65	230	36	102	55	96	65	76.1x2.9	1.3
80	230	40	80	80	115	78	88.9x3.2	1.6
100	240	40	95	115	137	100	114.3x3.6	2.2
125	270	50	79	178	171	123	139.7x4.0	3.3
150	300	50	135	245	197	150	168.3x4.5	4.3
200	300	70	164	423	253	199	219.1x6.3	7.8
250	300	66	199	622	302	252	273.0x6.3	8.3
300	250	19	700	996	387	296	323.9x7.1	14.0
	390	49	280					20.0
350	250	19	762	1183	419	327	355.6x8.0	16.0
	390	48	305					22.0
400	250	19	864	1513	470	378	406.4x8.0	19.0
	390	48	346					26.0
450	250	19	967	1885	521	428	457x8.0	21.0
	390	48	387					29.0
500	250	19	1069	2289	571	479	508x8.0	23.0
	390	47	427					32.0
600	250	18	1274	3236	673	581	610x8.0	28.0
	390	46	510					39.0
700	250	19	1479	4345	775	682	711x8.0	32.0
	390	47	592					45.0
800	250	19	1681	5605	876	784	813x8.0	37.0
	390	46	672					51.0
900	250	19	1885	7025	977	881	914x10.0	48.0
	390	46	754					65.0
1000	250	18	2092	8622	1079	984	1016x10.0	54.0
	390	45	837					72.0
1200	255	26	2505	12306	1283	1178	1219x10.0	64.0
	390	66	1002					86.0
1400	255	26	2914	16598	1485	1386	1422x10.0	75.0
	390	66	1166					100.0
1600	255	26	3326	21583	1689	1588	1626x10.0	86.0
	390	66	1330					114.0
1800	255	25	3735	27192	1892	1795	1819x10.0	96.0
	390	63	1494					127.0
2000	260	22	7890	33461	2096	1995	2032x12.0	107.0
	410	56	3156					143.0

Table values refer to +20 °C, bellows material 1.4541, 1000 cycles. Please inquire for deviating values.
*Effective bellows cross sectional area is a theoretical value.



Pressure rate **PN 10** standard program

DN	BL	Δax_{tot} Axial move- ment	C_{ax} Axial spring rate	A* Effective bellows cross sectional area	σD_a Bellows outer σ	σd_i Guide sleeve inner σ	$\sigma d_a \times s$ Pipe connection	Weight
	mm	mm	N/mm	cm ²	mm	mm	mm	approx. kg
15	175	24	49	7,5	38	14	21.3x2.0	0.3
20	175	24	49	7.5	38	18	26.9x2.3	0.3
25	185	20	45	16	54	24	33.7x2.6	0.5
32	185	20	45	16	54	30	42.4x2.6	0.5
40	190	26	67	25	66	39	48.3x2.8	0.6
50	205	34	87	36	79	51	60.3x2.9	1.0
65	230	36	102	55	96	65	76.1x2.9	1.3
80	230	40	80	80	115	78	88.9x3.2	1.6
100	240	40	95	115	137	100	114.3x3.6	2.2
125	270	50	79	178	171	123	139.7x4.0	3.3
150	300	50	135	245	197	150	168.3x4.5	4.3
200	300	70	164	423	253	199	219.1x6.3	7.8
250	300	66	199	622	302	252	273.0x6.3	8.3
300	250	19	700	996	387	296	323.9x7.1	14.0
	390	49	280					20.0
350	250	19	762	1183	419	327	355.6x8.0	16.0
	390	48	305					22.0
400	250	19	864	1513	470	378	406.4x8.0	19.0
	390	48	346					26.0
450	250	19	967	1885	521	428	457x8.0	21.0
	390	48	387					29.0
500	250	19	1069	2289	571	479	508x8.0	23.0
	390	47	427					32.0
600	250	18	1274	3236	673	581	610x8.0	28.0
	390	46	510					39.0
700	250	19	1479	4345	775	682	711x8.0	32.0
	390	47	592					45.0
800	250	19	1681	5605	876	784	813x8.0	37.0
	390	46	672					51.0
900	250	19	1885	7025	977	881	914x10.0	48.0
	390	46	754					65.0
1000	250	18	2092	8622	1079	984	1016x10.0	54.0
	390	45	837					72.0

Pressure rate **PN 16** standard program

DN	BL	Δax_{tot} Axial move- ment	C_{ax} Axial spring rate	A* Effective bellows cross sectional area	σD_a Bellows outer σ	σd_i Guide sleeve inner σ	$\sigma d_a \times s$ Pipe connection	Weight
	mm	mm	N/mm	cm ²	mm	mm	mm	approx. kg
15	175	24	49	7.5	38	14	21.3x2.0	0.3
20	175	24	49	7.5	38	18	26.9x2.3	0.3
25	185	20	45	16	54	24	33.7x2.6	0.5
32	185	20	45	16	54	30	42.4x2.6	0.5
40	190	26	67	25	66	39	48.3x2.8	0.6
50	205	34	87	36	79	51	60.3x2.9	1.0
65	230	36	102	55	96	64	76.1x2.9	1.5
80	230	40	80	80	116	78	88.9x3.2	1.95
100	240	40	95	115	137	99	114.3x4.0	2.8
125	270	50	79	178	171	123	139.7x4.0	3.3
150	300	50	135	245	197	150	168.3x4.5	4.3
200	300	70	164	423	253	199	219.1x6.3	7.8
250	300	52	421	622	302	252	273.0x6.3	8.3
300	260	22	1319	998	388	296	323.9x7.1	15.0
	410	56	527					23.0
350	260	22	1438	1185	420	327	355.6x8.0	17.0
	410	55	575					25.0
400	260	21	1636	1516	471	378	406.4x8.0	20.0
	410	54	654					29.0
450	260	21	1833	1888	522	428	457x8.0	24.0
	410	54	733					35.0
500	260	21	2025	2293	572	479	508x8.0	28.0
	410	53	810					40.0

Table values refer to +20 °C, bellows material 1.4541, 1000 cycles. Please inquire for deviating values.
*Effective bellows cross sectional area is a theoretical value.