Group 11

Steel Hoses
Expansion Joints

FLUID CONTROL®

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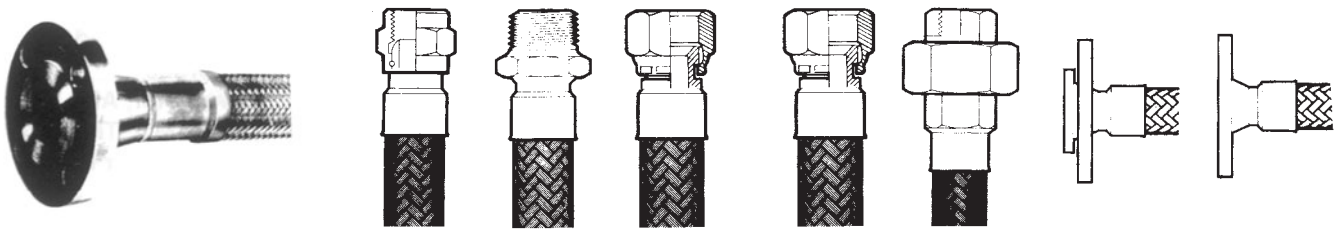
Fluid Control has Scandinavia's largest stock of steel tubes.
Our welders are certified in AISI 316, 6MO, Duplex and Titanium.

Steel hoses are as flexible as rubber hoses, and have many benefits in terms of temperature, resistance abrasion and ozone exposure.

FITTINGS ALTERNATIVES FOR BOA STEEL HOSES

Steel hoses come with fittings that are argon welded to the hose. All types of carbon steel, stainless and stainless steel fittings and flanges can in principle be welded to the steel hoses.

Fittings of other material qualities are also available.
We can offer advice on material compatibility.



On request we pressure test the hose(s) with water up to 1.5 times specified working pressure after the fittings are welded.

TECHNICAL INFORMATION:

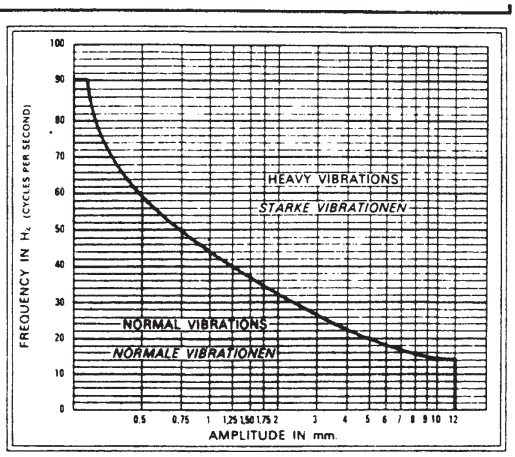
Pressure: Pr = burst pressure during "normal" conditions, e.g. that the hose is assembled straight and without motion with internal hydrostatic pressure at 20°C.
Pn = nominal pressure $\geq \frac{Pr}{4}$ = maximum working pressure under "normal" conditions.

Practical rule: $Ps = Pn \times \frac{Kt}{Ks}$

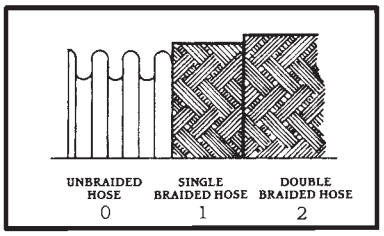
Ps = Maximum working pressure
Kt = Correction factor for use at "abnormal" temperature
Ks = The safety factor is dependent on operating conditions
All hoses are tested under normal conditions at 1.5 times working pressure.

Practical rule: P_s (Max. working pressure) = $P_r \times \frac{K_t}{K_s}$

TYPE OF FLOW	K_s = SAFETY FACTOR		
	NO VIBRATIONS	NORMAL VIBRATIONS	HEAVY VIBRATIONS
static or uniform	4	8	14
pulsatory	8	16	28
shocks	24	48	not recommended



TEMPERATURE	K_t = TEMPERATURE COEFFICIENT
20 °C	1
100 —	0,95
150 —	0,88
200 —	0,83
250 —	0,79
300 —	0,75
350 —	0,72
400 —	0,68
450 —	0,64
500 —	0,61
550 —	0,59
600 —	0,57
650 —	0,55
700 —	0,50
750 —	0,46
800 —	0,41



BOA STAINLESS STEEL HOSES
Type Parnor

Construction: Parallel corrugated flexible steel hose made from butt-welded sheet metal, AISI 316 L.
One or two layers of braiding AISI 304 L or AISI 316 L.
Temp. Range: -200°C to + 600°C, derating factors according to ISO10380
Applications: Transfer of chemicals, oil products, steam, gases etc., both pressure and vacuum, in static and moving installations. "Parnor" is made with "open" corrugations.
"BOA Parnor" holds a type approval by Det Norske Veritas.

DN [mm]	No. of braids	Ext. Dia [mm]	WP [bar]	Static [mm]	Dynamic [mm]	[kg/m]
6	0	9.8	18	10	-	0.050
	1	11.4	140	23	110	0.160
	2	13	145	25	140	0.270
8	0	13.6	14	14	-	
	1	15.2	115	28	130	0.244
	2	16.8	121	32	130	
10	0	16.2	10	16	-	0.092
	1	17.8	100	32	150	0.260
	2	19.4	105	38	150	0.430
12	0	18.6	12	24	-	0.120
	1	20.2	80	39	165	0.355
	2	21.8	97	45	165	0.590
15	0	22.5	7.5	29	-	0.150
	1	24.1	63	50	195	0.420
	2	25.7	77	58	195	0.690
20	0	28.3	4.3	35	-	0.232
	1	29.9	50	60	225	0.530
	2	31.5	68	70	225	0.830
25	0	34.8	3	42	-	0.328
	1	36.4	40	73	260	0.730
	2	38	55	85	260	1.130
32	0	43.4	3.3	51	-	0.420
	1	45.4	40	90	300	1.070
	2	47.4	55	105	300	1.720
40	0	52.4	2.2	61	-	0.500
	1	54.4	32	115	340	1.370
	2	56.4	44	130	340	2.240
50	0	64.8	2.1	73	-	0.780
	1	67.3	32	140	390	1.840
	2	69.8	45	160	390	2.900
65	0	80.9	1.3	89	-	1.310
	1	83.4	25	175	460	2.720
	2	85.9	38	200	460	4.130
80	0	99.6	1.4	108	-	1.550
	1	102.6	23	240	660	3.180
	2	105.6	38	240	660	4.810
100	0	126.5	0.5	126	-	2.260
	1	129.5	15	290	750	4.650
	2	132.5	25	290	750	7.040
125	0	152.0	0.4	147	-	3.300
	1	155.0	13	340	1000	5.900
150	0	174.0	0.3	169	-	4.700
	1	177.0	11	390	1250	7.300

Other steel qualities available on request.

LNG COUPLINGS
Liquid Gas

CONSTRUCTION:
LNG couplings for stainless steel hoses. Male and female coupling made of AISI 316 material, and brass nut of non-sparking material. Comes with viton gasket in male coupling.

Size	Male Coupling	Female Coupling	Nut	Blind Cap	Dust Plug	Dust Cap	Retainer Ring
1.1/2"	LNG-M040	LNG-F040	LNG-N040	LNG-BC040	LNG-DP040	LNG-DC040	LNG-RR040
2.1/2"	LNG-M065	LNG-F065	LNG-N065	LNG-BC065	LNG-DP065	LNG-DC065	LNG-RR065

EXHAUST EXPANSION JOINTS

CONSTRUCTION:
Standard quality AISI 321 L bellow, carbon steel pipe and flange connections. The exhaust bellows comes without inner conductors as standard, but exhaust bellows with conductors are available on request. Other bellow and connection material qualities, AISI 304, AISI 316L, Inconel, 6MO, Titanium etc. on request.

Pressure class: 2.5 bar

Temperature range: -270°C to +550°C, depending on the materials.

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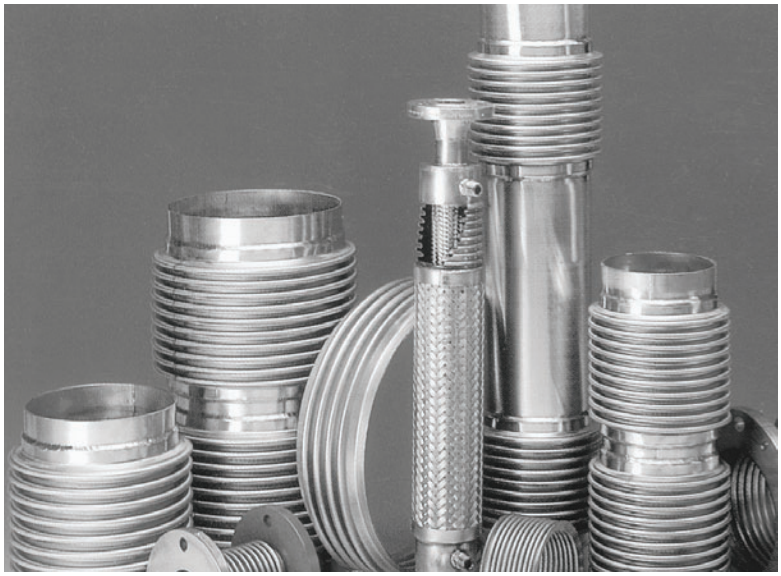
#	Nominal Diameter mm	Axial Movement mm	Pipe end OD	Approx. Total Length	
				With Pipe	With Flanges
AXR4-040	40	+/- 21	48.3	215	165
AXR4-050	50	+/- 23	60.3	215	170
AXR4-065	65	+/- 29	76.1	215	170
AXR4-080	80	+/- 30	88.9	220	180
AXR4-100	100	+/- 33	114.3	190	150
AXR4-125	125	+/- 35	139.7	220	185
AXR4-150	150	+/- 40	168.3	255	200
AXR4-200	200	+/- 44	219.1	255	285
AXR4-250	250	+/- 42	273.0	255	285
AXR4-300	300	+/- 45	323.9	290	185
AXR4-350	350	+/- 44	355.6	290	180
AXR4-400	400	+/- 65	406.4	330	220
AXR4-450	450	+/- 50	457.0	290	180
AXR4-500	500	+/- 73	508.0	340	250
AXR4-600	600	+/- 68	610.0	330	240
AXR4-700	700	+/- 63	711.2	330	230
AXR4-800	800	+/- 66	812.8	330	230
AXR4-900	900	+/- 66	914.4	330	230
AXR4-1000	1000	+/- 66	1016.0	330	230

Adaptation of building length on request.
Other variants, unions and pressure classes on request.



EXPANSION JOINTS
Pressure class PN 16

CONSTRUCTION:
Standard quality AISI 521 L bellow, carbon steel pipe and flange connections. The expansion joints comes without inner conductors as standard, but are available with conductors on request.
Other bellow and connection material qualities, AISI 304, AISI 316L, Inconel, 6MO, Titanium etc. on request.

Temperature range: -270°C to +550°C, depending on the materials.

- Delivered from our own welding workshops.
- Certified welders / workshops.

#	Nominal Diameter mm	Axial Movement mm	Pipe End OD	Approx. Total Length	
				With Pipe	With Flanges
AXR16-040	40	+/- 24	48.3	240	190
AXR16-050	50	+/- 25	60.3	240	195
AXR16-065	65	+/- 29	76.1	240	195
AXR16-080	80	+/- 37	88.9	270	230
AXR16-100	100	+/- 40	114.3	245	205
AXR16-125	125	+/- 55	139.7	275	240
AXR16-150	150	+/- 55	168.3	295	240
AXR16-200	200	+/- 62	219.1	305	330
AXR16-250	250	+/- 73	273.0	340	380
AXR16-300	300	+/- 87	323.9	415	430
AXR16-350	350	+/- 85	355.6	415	440
AXR16-400	400	+/- 97	406.4	455	485
AXR16-450	450	+/- 81	457.0	410	525
AXR16-500	500	+/- 115	508.0	485	525
AXR16-600	600	+/- 125	610.0	500	550

Adaptation of building length on request.
Other variants, unions and pressure classes on request.

EXPANSION JOINTS
Rubber

Construction: Made in different rubber qualities with color coding for identification:
Yellow ring: – For mineral oil products, fuel, gas, emulsions up to + 80°C
Red ring: – For cold and hot water up to + 100°C
Green ring: – For acids, alkalis, chemicals, etc. up to +80°C
White ring: – For drinking water and food products according to DIN 7725
Black ring: – For cold and hot water, glycol up to +70°C

Flanges: Expansion joints come with standard carbon steel flanges (CS), drilled according to DIN 2632
NT 10/16 and 150 lbs ANSI B 16.5
Stainless steel AISI 316 L and UNS S31254 (6M0) flanges on request

Pressure: All types of expansion joints are intended for normal working pressure with the following limitations:
For temperatures up to +20°C – 16 bar
For temperatures up to +50°C – 12 bar
For temperatures up to +80°C – 8 bar
The expansion joints are tested up to 25 bar

Axial Movement: To compensate for axial movement the expansion joints can be stretched 30 mm and compressed 30 mm

Standard Length: 130 mm

Lateral Movement: Sideways displacement can be compensated by 20-30 mm, depending on the diameter.
Large sideways displacement can be compensated by connecting a number of expansion joints with a short section of pipe in between.
Available with type approval.

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		Flange dimensions, mm						Yellow ring w/CS flange		Red ring w/CS flange		Black ring w/CS flange	
		DIN 2632 NT10/16			150 lbs ANSI B 16.5								
DN mm	DN inch	OD Flange mm	Bolt Circle dia. mm	Dia. Bolt mm	OD Flange mm	Bolt Circle dia. mm	Dia. Bolt mm	NT 10/16 Part No.	150 lbs Part No.	NT 10/16 Part No.	150 lbs Part No.	NT 10/16 Part No.	150 lbs Part No.
32	1.1/4	140	100	18	118	90	16	6010-032	6020-032	7010-032	7020-032	8010-032	8020-032
40	1.1/2	150	110	18	127	98	16	6010-038	6020-038	7010-038	7020-038	8010-038	8020-038
50	2	165	125	18	152	121	19	6010-050	6020-050	7010-050	7020-050	8010-050	8020-050
65	2.1/2	185	145	18	178	140	19	6010-063	6020-063	7010-063	7020-063	8010-063	8020-063
80	3	200	160	18	191	152	19	6010-075	6020-075	7010-075	7020-075	8010-075	8020-075
100	4	220	180	18	229	190	19	6010-100	6020-100	7010-100	7020-100	8010-100	8020-100
125	5	250	210	18	250	216	22	6010-125	6020-125	7010-125	7020-125	8010-125	8020-125
150	6	285	240	23	280	241	22	6010-150	6020-150	7010-150	7020-150	8010-150	8020-150
								Only NT 10		Only NT 10		Only NT 10	
200	8	340	295	23	343	298	22	6010-200	6020-200	7010-200	7020-200	8010-200	8020-200
250	10	395	350	23	406	362	26	6010-250	6020-250	7010-250	7020-250	8010-250	8020-250
300	12	445	400	23	432	432	26	6010-300	6020-300	7010-300	7020-300	8010-300	8020-300

The expansion joints are available in other dimensions on request.
When ordering expansion joints with NT 10/16 and 150 lbs stainless steel AISI 316 L flanges, add -SS after Part No.
Green ring and white ring expansion joints available on request.