

PROCO™

SERIES

240/242

molded expansion joints



PROCO Series 240 and Series 242 Non-Metallic Expansion Joints are designed for tough demanding industrial applications as found in: Air Conditioning-Heating and Ventilating Systems, Chemical-Petrochemical and Industrial Process Piping Systems, Power Generating Systems, Marine Services, Pulp & Paper Systems, Water-Waste-water-Sewage and Pollution Control Systems. Installed next to mechanical equipment or between the anchor points of a piping system, specify the PROCO Series 240 or 242 to: (1) Absorb Pipe/Movement/Stress, (2) Reduce System Noise, (3) Isolate Vibration, (4) Compensate Alignment/Offset, (5) Eliminate Electrolysis, (6) Protect Against Start-Up/Surge Forces. Our history in the manufacturing of expansion joint products dates back to 1930. When you need an engineered rubber solution to a piping system problem, call PROCO.

Spherical Shapes-Stronger-More Efficient. Featuring an engineered molded style single or twin sphere designed bellows, the PROCO Series 240 and Series 242 are inherently stronger than the conventional hand-built Spool Type arch. Internal pressure within a sphere is exerted in all directions, distributing forces evenly over a larger area. The spherical design "flowing-arch" reduces turbulence, sediment buildup, thrust area and the effects of thrust on the piping system equipment when compared to the "high-arch" design of hand-built standard products.

Greater Movements Are Available with the PROCO Series 240 and Series 242 when compared to the movements of conventional hand-built products. Axial compression, elongation, deflection and angular movements in the system are more readily absorbed by spherical types. These products are more forgiving and can be compressed or extended to install in non-standard openings, caused by equipment shifting or settling (Pre-compressing/extending the expansion joints for installation, may result in reduced pressure, vacuum and movement capabilities of the expansion joints. See Tables 2 and 3.)

Easy Installation With Alignable Metallic Flanges. The floating metallic flanges freely rotate on the bellows, compensating for mating flange misalignment, thus speeding up installation time (see Figures 1, 2, 3 & 4). Gaskets are also not required with the Series 240 or Series 242, provided the expansion joints are mated against a flat face flange as required in the installation instructions.

Less System Strain With Thin Wall Design. Manufactured by high pressure molding of elastomer and high-tensile fabric reinforcement, the Series 240 and Series 242 have a thinner wall section and lighter weight when compared to conventional hand-built products. Lower spring forces are therefore required, reducing piping/flange/equipment stress-strain-damage. PROCO Styles 240-C and 240-A are acceptable for use with plastic piping systems where even lower deflection forces are required.

Specifications Met. The PROCO Series 240 and Series 242 are designed to meet or exceed the pressure, movement and dimensional rating of the Spool Type arch as shown in the Rubber Expansion Joint Division, Fluid Sealing Association "Technical Handbook - Sixth Edition" Tables IV & V.

Absorbs Vibration-Noise-Shock. The PROCO quiet operating Series 240 and Series 242 are a replacement for "sound transmitting" metallic expansion joints. Sound loses energy traveling axially through the elastomer bellows. Water hammer pumping impulses and water-borne noises are cushioned and absorbed by the molded lightweight thin-wall structure. Install the Series 240 or Series 242 in a system to enable isolated equipment to move freely on its vibration mountings; or to reduce vibration transmission when the piping section beyond the expansion joint is anchored or sufficiently rigid.

Flange Materials/Drilling. All PROCO Spherical 240 and 242 connectors are furnished complete with plated carbon steel flanges for corrosion protection. Series 240 and 242 Neoprene connectors — 12' and below — are tapped to ANSI 125/150# drilling. All other connectors come with standard drilled holes to the ANSI 125/150# standards (see Table 7 and Figures 3 & 4). Stainless steel flanges and other drilling standards such as: ANSI 250/300#, BS-10, DIN NP-10 and DIN NP-16 are also available from stock and are listed on Table 7. JIS-5K and JIS-10K are also available upon request.

Chemical Service Capability At Minimal Cost. Expensive, exotic metal expansion joints for chemical service can be replaced with the PROCO Series 240 or Series 242. Molded with low cost chemical resistant elastomers such as Neoprene, Nitrile, Hypalon®, EPDM and Chlorobutyl insures an expansion joint is compatible with the fluid being pumped or piped. (See Table 1 below). Use the PROCO "Chemical/Rubber Guide" to specify an elastomer recommendation compatible for your requirement.

Wide Service Range With Low Cost. Engineered to operate up to 300 PSIG and 265°F, the PROCO Series 240 and Series 242 can be specified for a wide range of piping requirements. Compared to conventional hand-built Spool Type arch, you will invest less money when specifying the mass-produced, consistent high quality, molded single or twin sphere expansion joints.

Large Inventories Mean Same-Day Shipment. PROCO maintains the largest inventory of spherical expansion joints in the Americas. Every size listed is in stock in several elastomers and comes with a choice of drilling patterns. Shipment is based on customer need. PROCO can ship same day as order placement. In fact, when it comes to rubber expansion joints, **if PROCO doesn't have your requirement...nobody does!**

Information • Ordering • Pricing • Delivery. Day or night, weekends and holidays ... the PROCO phones are monitored 24 hours around the clock. When you have a question, you can call us. Toll-Free Phone 800 / 344-3246 USA/CANADA
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Weekday office hours are 5:30 a.m. to 5:15 p.m. (Pacific Time)

**Protecting Piping And
Equipment Systems
From Stress/Motion**

Table 1: Available Styles • Materials

For Specific Elastomer Recommendations, See: PROCO™ "Chemical To Elastomer Guide"								
240-A	240-C	240-A/D/E/M	242-A,B,C	PROCO™ Material Code ¹	Cover Elastomer ²	Tube Elastomer	Maximum Operating Temp. °F	Identifying Color Band/Label
	X	X	X	/BB	Chlorobutyl	Chlorobutyl	250°	Black
	X	X	X	/EE	EPDM	EPDM	250°	Red
	X			/EE-9	EPDM	EPDM	265°	Red
	X			/ET-9 ³	EPDM	Teflon®	265°	Red
	X			/HH	Hypalon®	Hypalon®	230°	Green
		X	X	/NH	Neoprene	Hypalon®	230°	Green
		X	X	/NJ	Neoprene	FDA-Nitrile	230°	White
		X	X	/NN	Neoprene	Neoprene	230°	Blue
X	X	X	X	/NP	Neoprene	Nitrile	230°	Yellow
X	X			/NT ³	Neoprene	Teflon®	230°	

NOTES: Hypalon® is a registered trademark of DuPont Dow Elastomers. Teflon® is a registered trademark of the DuPont Company.

1. All elastomers include nylon reinforcing, except EE-9 which is steel cord.

All materials meet or exceed the Rubber Expansion Joint Division, Fluid Sealing Association-REJ Division requirements for Standard Class I and II. EE-9 also meets Special Class II. For more information see The FSA Technical Handbook, Table 1.

Materials NN, NP and NH meet all requirements of U.S.C.G.

EPDM Materials good for up to 300°F for pressures 15 PSI or less.

2. Expansion joint "cover" (outside) can be Hypalon® painted on special order.

3. Products with Teflon® "tube" (inside) are not to be used for vacuum service.

series 240 single sphere expansion joints

Table 2: Sizes • Movements • Pressures • Flange Standards • Weights

NOMINAL PIPE	PROCO	240 Movement Capability: From Neutral Position ²						Pressure ⁴		Standard Flange Bolting Dimensions					Weight in lbs ⁸			
		Size I.D.	Neutral Length	Style Number ¹	Axial Compression Inches	Axial Extension Inches	Lateral Deflection Inches	Angular Deflection Degrees	Thrust ³ Factor	Positive ⁵ PSIG	Vacuum ⁶ Inches of Hg	Flange O.D. Inches	Bolt Circle Inches	Number of Holes	Size of Holes Inches	Bolt Hole ⁷ Thread	Exp. Joint & Flanges	Control Unit Set (2 Rod)
1	240-AV	6.00			0.500	0.375	0.500	37	4.43	225	26	4.25	3.13	4	0.625	1/2-13 UNC	3.8	3.3
1.25	240-D	3.74			0.312	0.188	0.312	17		235	26				0.625	—	4.6	
	240-C	5.00			1.063	1.250	1.188	45	6.34	225	21	4.63	3.5	4	0.625	—	5.0	3.3
	240-E	5.00			0.500	0.375	0.500	31		225	26				0.625	—	5.0	
	240-AV	6.00			0.500	0.375	0.500	31		225	26				0.625	1/2-13 UNC	5.0	
1.5	240-D	3.74			0.375	0.188	0.312	14		225	26				0.625	—	5.4	
	240-M	4.00			0.375	0.188	0.312	14		225	26				0.625	—	5.5	
	240-C	5.00			1.063	1.250	1.188	45	6.49	235	18	5.0	3.88	4	0.625	—	5.1	4.6
	240-AV	6.00			0.500	0.375	0.500	27		225	26				0.625	1/2-13 UNC	6.1	
2	240-M	4.00			0.375	0.188	0.312	11		225	26				0.750	—	8.3	6.3
	240-D	4.13			0.375	0.188	0.312	11		225	26				0.750	—	8.5	6.3
	240-C	5.00			1.063	1.250	1.188	45	7.07	235	18	6.0	4.75	4	0.750	—	7.1	6.3
	240-E	5.00			0.375	0.375	0.500	20		225	26				0.750	—	8.5	6.3
	240-A	6.00			1.188	1.188	1.188	45		235	18				0.750	—	7.1	6.3
	240-AV	6.00			0.500	0.375	0.500	20		225	26				0.750	5/8-11 UNC	11.0	7.6
2.5	240-M	4.00			0.375	0.188	0.375	8		225	26				0.750	—	12.0	
	240-D	4.53			0.500	0.250	0.375	11		225	26				0.750	—	12.3	
	240-C	5.00			1.063	1.250	1.188	45	11.05	235	18	7.0	5.5	4	0.750	—	10.6	7.6
	240-E	5.00			0.500	0.375	0.500	17		225	26				0.750	—	12.0	
	240-A	6.00			1.188	1.188	1.188	43		235	18				0.750	—	12.0	
	240-AV	6.00			0.500	0.375	0.500	17		225	26				0.750	5/8-11 UNC	12.3	
3	240-C	5.00			1.063	1.250	1.188	40		235	15				0.750	—	13.3	8.3
	240-E	5.14			0.500	0.375	0.500	14		225	26				0.750	—	14.0	8.3
	240-D	5.14			0.500	0.375	0.500	14		225	26				0.750	—	14.0	8.3
	240-A	6.00			1.188	1.188	1.188	38	13.36	235	15	7.5	6.0	4	0.750	—	13.8	8.3
	240-HW	6.00			0.500	0.375	0.500	14		300	26				0.750	—	17.5	8.3
	240-AV	8.00			0.500	0.375	0.500	14		225	26				0.750	5/8-11 UNC	14.0	8.3
3.5	240-AV	6.00			0.500	0.375	0.500	12	18.67	225	26	8.5	7.0	8	0.750	5/8-11 UNC	17.6	7.4
4	240-C	5.00			1.063	1.250	1.188	32		235	15				0.750	—	16.5	7.4
	240-E	5.00			0.750	0.500	0.500	14		225	26				0.750	—	17.0	7.4
	240-D	5.32			0.750	0.500	0.500	14		225	26				0.750	—	17.1	7.4
	240-A	6.00			1.188	1.188	1.188	30	22.69	235	15	9.0	7.5	8	0.750	—	17.5	7.4
	240-HW	6.00			0.750	0.500	0.500	14		300	26				0.750	—	26.0	7.4
	240-AV	8.00			0.750	0.500	0.500	14		225	26				0.750	5/8-11 UNC	18.3	7.4
5	240-C	5.00			1.063	1.250	1.188	27		235	10				0.875	—	20.3	8.3
	240-E	5.00			0.750	0.500	0.500	11		225	26				0.875	—	22.0	8.3
	240-A	6.00			1.188	1.188	1.188	25	30.02	235	10	10.0	8.5	8	0.875	—	21.8	8.3
	240-AV	6.00			0.750	0.500	0.500	11		225	26				0.875	3/4-10 UNC	22.8	8.3
	240-D	6.69			0.750	0.500	0.500	11		225	10				0.875	—	23.6	8.5
	240-AV	8.00			0.750	0.500	0.500	11		225	26				0.875	3/4-10 UNC	25.0	10.8
6	240-C	5.00			1.063	1.250	1.188	23		225	8				0.875	—	22.6	10.4
	240-E	5.00			0.750	0.500	0.500	9		225	26				0.875	—	26.0	10.4
	240-A	6.00			1.188	1.188	1.188	21	41.28	235	10	11.0	9.5	8	0.875	—	24.0	10.4
	240-HW	6.00			0.750	0.500	0.500	9		300	26				0.875	—	39.0	10.4
	240-AV	6.00			0.750	0.500	0.500	9		225	26				0.875	3/4-10 UNC	26.8	10.4
	240-D	7.09			0.750	0.500	0.500	9		225	26				0.875	—	29.0	10.6
240-AV	8.00			0.750	0.500	0.500	9		225	26				0.875	3/4-10 UNC	29.1	10.8	
8	240-C	5.00			1.063	1.188	1.188	17		235	8				0.875	—	35.5	13.4
	240-E	5.00			0.750	0.500	0.500	7		225	26				0.875	—	40.0	13.4
	240-A	6.00			1.188	1.188	1.188	16	63.62	235	8	13.5	11.75	8	0.875	—	38.5	13.4
	240-HW	6.00			0.750	0.500	0.500	7		300	26				0.875	—	70.0	13.4
	240-AV	6.00			0.750	0.500	0.500	7		225	26				0.875	3/4-10 UNC	40.6	13.4
	240-D	8.07			1.000	0.563	0.875	8		225	26				0.875	—	41.3	14.0
10	240-C	5.00			1.063	1.188	1.188	14		235	6				1.000	—	49.3	21.0
	240-E	5.00			1.000	0.625	0.750	7		225	26				1.000	—	56.0	21.0
	240-A	8.00			1.188	1.188	1.188	13		235	6				1.000	—	53.6	21.3
	240-AV	8.00			1.000	0.625	0.750	7		225	26				1.000	7/8-9 UNC	56.6	21.3
	240-HW	8.00			1.000	0.625	0.750	7	103.87	225	26	16.0	14.25	12	1.000	—	57.0	22.0
	240-AV	9.00			1.000	0.625	0.750	7		275	26				1.000	7/8-9 UNC	56.0	22.0
240-D	9.45			1.000	0.625	0.875	7		225	26				1.000	—	58.5	22.0	
240-AV	10.00			1.000	0.625	0.750	7		225	26				1.000	7/8-9 UNC	60.5	26.5	
12	240-C	5.00			1.063	1.250	1.188	12		235	6				1.000	—	73.4	26.5
	240-E	5.00			1.000	0.625	0.750	6		225	26				1.000	—	74.0	26.5
	240-A	8.00			1.188	1.188	1.188	11		235	6				1.000	—	80.0	27.0
	240-HW	8.00			1.000	0.625	0.750	6	137.89	225	26	19.0	17.0	12	1.000	—	100.0	27.0
	240-AV	8.00			1.000	0.625	0.750	6		225	26				1.000	7/8-9 UNC	83.0	27.0
	240-D	10.24			1.000	0.625	0.875	6		225	26				1.000	—	88.0	27.0
14	240-HW	8.00			1.000	0.625	0.750	5		200	26	21.0	18.75	12	1.125	—	162.0	28.0
	240-AV	8.00			1.000	0.625	0.750	5	182.65	150	26				1.125	—	115.0	28.0
	240-M	9.00			1.000	0.625	0.750	5		150								

series 242 twin sphere expansion joints

Table 3: Sizes • Movements • Pressures • Flange Standards • Weights

NOMINAL PIPE	PROCO	242 Movement Capability: From Neutral Position ²						Pressure ⁴		Standard Flange Bolting Dimensions				Weight in lbs ⁸				
		Size I.D.	Neutral Length	Style Number ¹	Axial Compression Inches	Axial Extension Inches	Lateral Deflection Inches	Angular Deflection Degrees	Thrust ³ Factor	Positive ⁵ PSIG	Vacuum ⁶ Inches of Hg	Flange O.D. Inches	Bolt Circle Inches	Number of Holes	Size of Holes Inches	Bolt Hole ⁷ Thread	Exp. Joint & Flanges	Control Unit Set (2 Rod)
1		10.00	242-C		2.000	1.188	1.750	45	4.43	225	26	4.25	3.13	4	0.625	—	5.2	3.6
1.25		7.0	242-A		2.000	1.188	1.750	45	6.34	225	26	4.63	3.5	4	0.625	1/2-13 UNC	5.3	3.5
		7.0	242-HA							300					0.625	—	6.5	3.5
		10.00	242-C							225					0.625	—	6.2	3.6
1.5		6.00	242-B		2.000	1.188	1.750	45	6.49	225	26	5.0	3.88	4	0.625	—	6.1	4.6
		6.00	242-HB							300					0.625	—	7.6	4.6
		7.00	242-A							225					0.625	1/2-11 UNC	6.8	4.8
		7.00	242-HA							300					0.625	—	8.3	4.8
	10.00	242-C							225					0.625	—	7.7	5.1	
2		6.00	242-B		2.000	1.188	1.750	45	7.07	225	26	6.0	4.75	4	0.750	—	9.0	6.6
		6.00	242-HB							300					0.750	—	10.5	6.6
		7.00	242-A							225					0.750	5/8-11 UNC	9.0	7.0
		7.00	242-HA							300					0.750	—	10.5	7.0
	10.00	242-C							235					0.750	—	10.2	7.3	
2.5		6.00	242-B		2.000	1.188	1.750	43	11.05	225	26	7.0	5.5	4	0.750	—	12.9	7.6
		6.00	242-HB							300					0.750	—	15.3	7.6
		7.00	242-A							225					0.750	5/8-11 UNC	13.3	8.0
		7.00	242-HA							300					0.750	—	15.8	8.0
	10.00	242-C							225					0.750	—	14.5	8.4	
3		7.00	242-A		2.000	1.188	1.750	38	13.36	225	26	7.5	6.0	4	0.750	5/8-11 UNC	14.3	8.6
		7.00	242-HA							300					0.750	—	18.2	8.6
		9.00	242-B							225					0.750	—	15.2	9.0
		10.00	242-C							300					0.750	—	15.8	9.1
	12.00	242-C							225					0.750	—	16.0	9.9	
3.5		10.00	242-C		2.000	1.188	1.750	34	18.67	225	26	8.5	7.0	8	0.750	—	20.6	8.1
4		9.00	242-A		2.000	1.375	1.562	34	22.69	225	26	9.0	7.5	8	0.750	5/8-11 UNC	20.3	8.0
		9.00	242-HA							300					0.750	—	26.4	8.0
		10.00	242-C							225					0.750	—	21.3	8.2
		12.00	242-C							225					0.750	3/4-10 UNC	22.0	8.2
5		9.00	242-A		2.000	1.375	1.562	29	30.02	225	26	10.0	8.5	8	0.875	—	24.5	8.3
		9.00	242-HA							300					0.875	—	31.4	8.3
		10.00	242-C							225					0.875	—	25.5	9.1
		12.00	242-C							225					0.875	—	26.0	9.1
6		9.00	242-A		2.000	1.375	1.562	25	41.28	225	26	11.0	9.5	8	0.875	3/4-10 UNC	29.5	11.7
		9.00	242-HA							300					0.875	—	38.6	11.7
		10.00	242-C							225					0.875	—	30.5	11.9
		12.00	242-C							225					0.875	—	31.0	12.0
	14.00	242-C							225					0.875	—	32.0	12.0	
8		9.00	242-B		2.375	1.375	1.375	19	63.62	225	26	13.5	11.75	8	0.875	—	42.3	14.5
		9.00	242-HB							300					0.875	—	55.4	14.5
		10.00	242-C							225					0.875	—	43.4	15.0
		12.00	242-C							225					0.875	—	44.0	15.2
		13.00	242-A							225					0.875	3/4-10 UNC	43.8	15.4
		13.00	242-HA							300					0.875	—	57.5	15.4
	14.00	242-C							225					0.875	—	46.0	16.0	
10		12.00	242-B		2.375	1.375	1.375	15	103.87	225	26	16.0	14.25	12	1.000	—	64.1	23.5
		12.00	242-HB							275					1.000	—	86.5	23.5
		13.00	242-A							225					1.000	7/8-9 UNC	65.5	24.5
		13.00	242-HA							275					1.000	—	88.4	24.5
		14.00	242-C							225					1.000	—	66.7	24.5
12		12.00	242-B		2.375	1.375	1.375	13	137.89	225	26	19.0	17.00	12	1.000	—	94.0	30.0
		12.00	242-HB							275					1.000	—	110.0	30.0
		13.00	242-A							225					1.000	7/8-9 UNC	95.0	31.0
		13.00	242-HA							275					1.000	—	110.0	31.0
		14.00	242-C							225					1.000	—	99.1	31.0
14		12.00	242-C		1.750	1.118	1.118	9	182.65	150	26	19.0	18.75	12	1.125	—	110.0	30.5
		13.75	242-A							150					1.125	—	112.0	32.0
		13.75	242-HA							200					1.125	—	144.0	32.0
16		12.00	242-C		1.750	1.118	1.118	8	240.53	125	26	23.5	21.25	16	1.125	—	124.0	28.8
		12.00	242-HC							175					1.125	—	160.0	28.8
		13.75	242-A							125					1.125	—	132.0	30.8
		13.75	242-HA							175					1.125	—	170.2	30.8
18		12.00	242-C		1.750	1.118	1.118	7	298.65	125	26	25.0	22.75	16	1.250	—	138.0	35.1
		13.75	242-A							125					1.250	—	146.0	36.1
		13.75	242-HA							175					1.250	—	181.2	36.1
20		12.00	242-C		1.750	1.118	1.118	7	363.05	125	26	27.5	25.0	20	1.250	—	172.0	35.0
		13.75	242-A							125					1.250	—	182.0	35.5
		13.75	242-HA							175					1.250	—	182.0	35.5
22		12.00	242-C		1.750	1.118	1.118	6	433.74	115	26	29.5	27.25	20	1.375	—	181.0	35.5
24		12.00	242-C		1.750	1.118	1.118	5	510.70	110	26	32.5	29.5	20	1.375	—	190.0	47.0
		13.75	242-A							110					1.375	—	220.0	48.0
		13.75	242-HA							160					1.375	—	266.2	48.0
26		12.00	242-C		1.750	1.118	1.118	5	593.96	110	26	34.25	31.75	24	1.375	—	243.0	52.0
30		12.00	242-C		1.750	1.118	1.118	4	779.31	110	26	38.75	36.0	28	1.375	—	270.0	62.0

Standard PROCO Style 242-A Expansion Joints shown in Bold Type are considered Standards and inventoried in large quantities.

- NOTES: 1. "HA", "HB", and "HC" denote Heavy Weight Construction.
 2. Movements stated are non-concurrent.
 3. To determine End Thrust: Multiply Thrust Factor by Operating Pressure of System. This is End Thrust in pounds.
 4. Pressure rating is based on 170°F operating temperature. The pressure rating is reduced slightly at higher temperatures.
 5. Pressures shown are maximum "operating pressure." Test pressure is 1.5 times "operating pressure." Burst pressure is approximately 4 times "operating pressure."
 6. Vacuum rating is based on neutral installed length, without external load. Products should not be installed "extended" on vacuum applications.
 7. Style 240-AV/NN (Neoprene elastomer only) expansion joints 1.25" I.D. - 12.0" I.D. come with tapped holes in lieu of drilled holes.
 8. All expansion joints are furnished complete with flanges. Control units are required on applications where movements could exceed rated capabilities.

Installation Note:

Install at the neutral length dimension as shown in Tables 2 & 3. Make sure the mating flanges are **FLAT-FACE TYPE**. When attaching beaded end flanged expansion joints to raised face flanges, the use of ring gaskets are required to prevent metal flange faces from cutting rubber bead during installation. **Care must be taken when pushing the joint into the breach between the mating flanges so as not to roll the leading edge of the joint out of its flange groove.**

Precompression Note:

Joint must be precompressed approximately 1/8" to 3/16" in order to obtain a correct installed face-to-face dimension.



control units



Table 4: Control Units/Unanchored

Control Units must be installed when pressures (test + design + surge + operating) exceed rating below:

Pipe Size	Series 240 P.S.I.G.	Series 242 P.S.I.G.
1" thru 4"	180	135
5" thru 10"	135	135
12" thru 14"	90	90
16" thru 24"	45	45
26" thru 30"	35	35

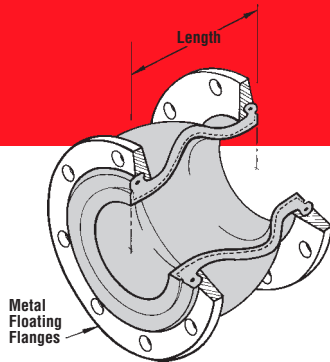


Figure 1.
Style 240
Single Sphere Connector

Table 5: Control Units

Control Rod Plate O.D. (in)	Control Rod Plate Thickness (in)	Rod Diameter ² (in)	Nominal Pipe Size (in)	Maximum Surge or Test Pressure of System/PSIG ³		
				Number of Rods Required:		
				2	3	4
8.375	0.375	0.625	1	949	—	—
8.750	0.375	0.625	1.25	830	—	—
9.125	0.375	0.625	1.5	510	—	—
10.125	0.375	0.625	2	661	—	—
11.125	0.375	1.000	2.5	529	—	—
11.625	0.375	1.000	3	441	—	—
12.625	0.375	1.000	3.5	365	547	729
13.125	0.375	1.000	4	311	467	622
14.125	0.500	1.000	5	235	353	470
15.125	0.500	1.000	6	186	278	371
19.125	0.500	1.000	8	163	244	326
21.625	0.750	1.000	10	163	244	325
24.625	0.750	1.000	12	160	240	320
26.625	0.750	1.000	14	112	167	223
30.125	0.750	1.250	16	113	170	227
31.625	0.750	1.250	18	94	141	187
34.125	0.750	1.250	20	79	118	158
36.125	1.000	1.250	22	85	128	171
38.625	1.000	1.250	24	74	110	147
40.825	1.000	1.250	26	62	93	124
44.125	1.250	1.500	28	65	98	130
46.375	1.250	1.500	30	70	105	141

NOTES: 1. Control Rod Plate O.D. installed dimension is based on a maximum O.D. PROCO would supply. (See Figures 3 & 4)
2. Control Rod diameter is based on a maximum diameter PROCO would use to design a Control Rod.
3. Rod pressure ratings are based on metal conforming to F.S.A. standards and dimensions.

Table 6: Special Construction Pressures

Pipe Size	Series 240 & 242 Heavyweight P.S.I.G.
1" thru 8"	300
10" thru 12"	275
14"	200
16" thru 20"	175
22" thru 30"	160

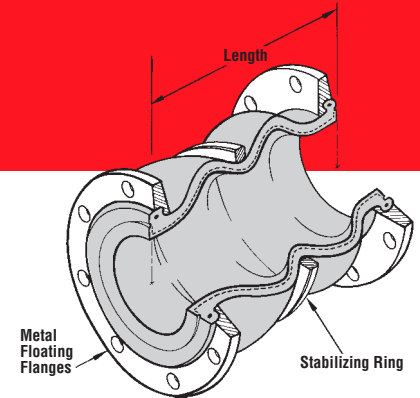
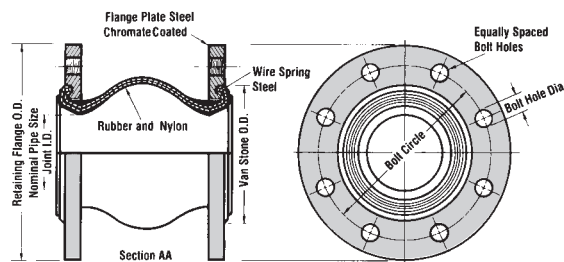


Figure 2.
Style 242
Twin Sphere Connector

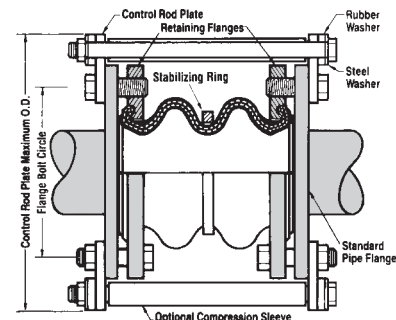
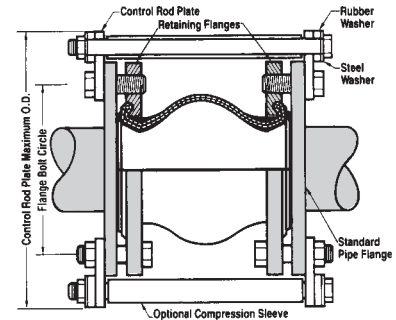
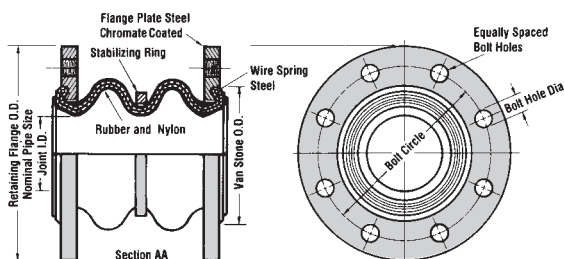
Style 240 Single Sphere Connector

Figure 3.



Style 242 Twin Sphere Connector

Figure 4.



Control Rod/Unit Applications. Control unit assemblies are designed to absorb static pressure thrust developed at the expansion joint. When used in this manner, control unit assemblies are an additional safety factor, minimizing possible failure of the expansion joint or damage to equipment. (See Tables 4 & 5).

- 1. Anchored Systems:** Control unit assemblies are not required in piping systems that are anchored on both sides of the expansion joint, provided piping movements are within the rated movements as shown in Tables 2 & 3.
- 2. Unanchored Systems:** Control unit assemblies are always required in unanchored systems. Additionally, control unit assemblies must be used when maximum pressure exceeds the limits shown in Table 4 & 5, or the movement exceeds the rated movements as shown in Tables 2 & 3.

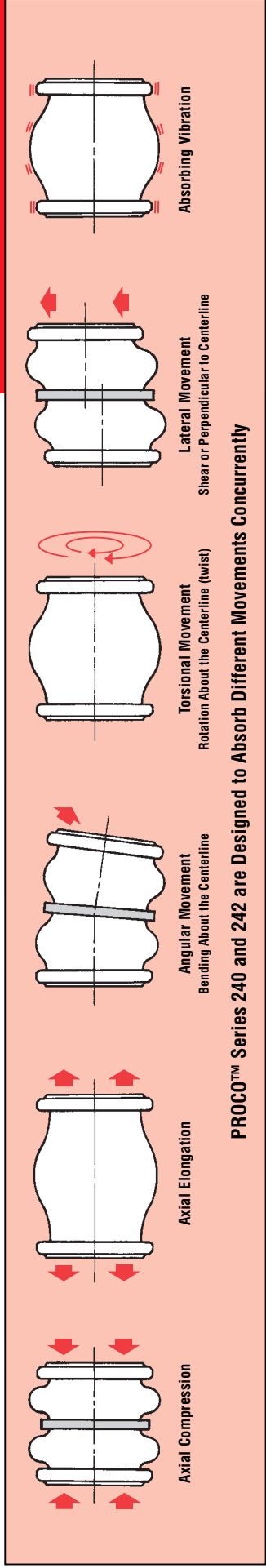
- 3. Spring-Mounted Equipment:** Control unit assemblies are always recommended for spring-mounted equipment. Additionally, control unit assemblies must be used when maximum pressure exceeds the limits shown in Tables 4 & 5, or the movement exceeds the rated movements as shown in Tables 2 & 3.

Special Applications. Certain Style 240 (Single Sphere) and 242 (Twin Sphere) expansion joints are available in High-Pressure Designs. For specific pressures, see Table 6. Style designations are listed as 240-HW (sizes stocked in Table 2) and 242-HA, 242-HB & 242-HC (sizes stocked in Table 3.) The High-Pressure Design is recommended when the connector is to be installed into ANSI 250/300# piping systems.

drilling for series 240 and series 242 expansion joints

Table 7: Flange Drilling

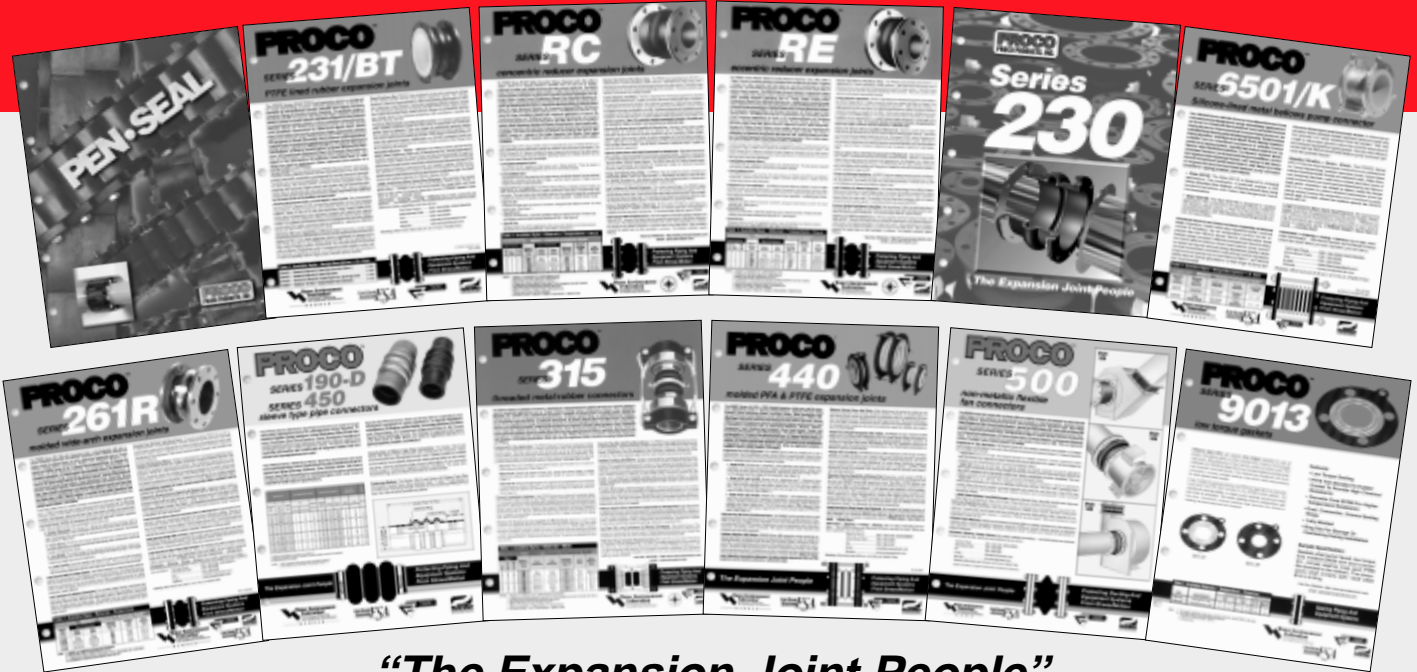
NOMINAL PIPE SIZE	American 128/150# Conforms to ANSI B16.3 and B16.5					American 250/300# Conforms to ANSI B16.3 and B16.5					British Standard 10:1962 Conforms to BS 10 Table E					Metric Series Conforms to I.S.O. 2084-1974 Table NP10 Holes to I.S.O. /R-273					Metric Series Conforms to I.S.O. 2084-1974 Table NP16 Holes to I.S.O. /R-273					
	Flange Thickness	Flange O.D.	Bolet Circle	No. of Holes	Drilled Hole Size	Threaded Hole Size	Flange Thickness	Flange O.D.	Bolet Circle	No. of Holes	Hole Size	Flange Thickness	Flange O.D.	Bolet Circle	No. of Holes	Flange Thickness	Flange O.D.	Bolet Circle	No. of Holes	Hole Size	Flange Thickness	Flange O.D.	Bolet Circle	No. of Holes	Hole Size	
1	0.55	4.25	3.13	4	0.62	1/2 - 13 UNC	0.63	4.88	3.5	4	0.75	0.59	4.5	3.25	4	0.62	4.53	3.35	4	0.55	0.63	4.53	3.35	4	0.55	
25	14.0	108.0	79.4	4	15.9		16.0	124.0	88.9	4	19.1	15.0	114.0	82.6	4	15.9	16.0	115.0	85.0	4	14.0	16.0	115.0	85.0	4	14.0
1.25	0.55	4.63	3.5	4	0.62	1/2 - 13 UNC	0.63	5.25	3.88	4	0.75	0.59	4.75	3.44	4	0.62	5.51	3.94	4	0.71	0.63	5.51	3.94	4	0.71	
32	14.0	118.0	88.9	4	15.9		16.0	133.0	98.4	4	19.1	15.0	121.0	87.3	4	15.9	16.0	140.0	85.0	4	18.0	16.0	140.0	100.0	4	18.0
1.5	0.55	5.0	3.88	4	0.62	1/2 - 13 UNC	0.63	6.12	4.50	4	0.88	0.59	5.25	3.88	4	0.62	6.91	4.33	4	0.71	0.63	6.91	4.33	4	0.71	
40	14.0	127.0	98.4	4	15.9		16.0	156.0	114.3	4	22.2	15.0	133.0	98.4	4	15.9	16.0	150.0	110.0	4	18.0	16.0	150.0	110.0	4	18.0
2	0.63	6.0	4.75	4	0.75	5/8 - 11 UNC	0.71	6.50	5.00	8	0.75	0.63	6.0	4.5	4	0.75	6.50	4.92	4	0.71	0.71	6.50	4.92	4	0.71	
50	16.0	152.0	120.7	4	19.1		18.0	165.0	127.0	8	19.1	16.0	152.0	114.3	4	19.1	18.0	165.0	125.0	4	18.0	18.0	165.0	125.0	4	18.0
2.5	0.71	7.0	5.5	4	0.75	5/8 - 11 UNC	0.71	7.5	5.88	8	0.88	0.71	6.5	5.0	4	0.75	7.25	5.71	4	0.71	0.71	7.25	5.71	4	0.71	
65	18.0	178.0	139.7	4	19.1		18.0	191.0	149.2	8	22.2	18.0	165.0	127.0	4	19.1	18.0	185.0	145.0	4	18.0	18.0	185.0	145.0	4	18.0
3	0.71	7.5	6.0	4	0.75	5/8 - 11 UNC	0.79	8.25	6.62	8	0.88	0.71	7.25	5.75	4	0.75	7.87	6.3	8	0.71	0.79	7.87	6.30	8	0.71	
80	18.0	191.0	152.4	4	19.1		20.0	210.0	168.2	8	22.2	18.0	184.0	146.1	4	19.1	20.0	200.0	160.0	8	18.0	20.0	200.0	160.0	8	18.0
3.5	0.71	8.5	7.0	8	0.75	5/8 - 11 UNC	0.79	9.0	7.25	8	0.88	0.71	8.0	6.5	8	0.75	9.0	7.09	8	0.71	—	—	—	—	—	
90	18.0	216.0	177.8	8	19.1		20.0	229.0	184.2	8	22.2	18.0	203.0	165.1	8	19.1	20.0	220.0	180.0	8	18.0	20.0	220.0	180.0	8	18.0
4	0.71	9.0	7.5	8	0.75	5/8 - 11 UNC	0.79	10.0	7.88	8	0.88	0.71	8.5	7.0	8	0.75	10.0	8.27	8	0.71	0.79	8.66	7.09	8	0.71	
100	18.0	229.0	190.5	8	19.1		20.0	254.0	200.0	8	22.2	18.0	216.0	177.8	8	19.1	20.0	220.0	180.0	8	18.0	20.0	220.0	180.0	8	18.0
5	0.79	10.0	8.5	8	0.88	3/4 - 10 UNC	0.87	11.0	9.25	8	0.88	0.79	10.0	8.25	8	0.75	11.0	9.84	8	0.71	0.87	9.84	8.27	8	0.71	
125	20.0	254.0	215.9	8	22.2		22.0	279.0	235.0	8	22.2	20.0	254.0	209.6	8	19.1	22.0	250.0	210.0	8	18.0	22.0	250.0	210.0	8	18.0
6	0.87	11.0	9.5	8	0.88	3/4 - 10 UNC	0.87	12.5	10.62	12	0.88	0.87	11.0	9.25	8	0.88	11.22	9.45	8	0.87	0.87	11.22	9.45	8	0.87	
150	22.0	279.0	241.3	8	22.2		22.2	318.0	269.9	12	22.2	22.2	279.0	235.0	8	22.2	22.2	285.0	240.0	8	22.0	22.2	285.0	240.0	8	22.0
8	0.87	13.5	11.75	8	0.88	3/4 - 10 UNC	0.95	15.0	13.0	12	1.00	0.87	13.25	11.5	8	0.88	13.39	11.61	8	0.87	0.87	13.39	11.61	12	0.87	
200	22.0	343.0	295.5	8	22.2		24.0	381.0	330.2	12	25.4	22.2	337.0	292.1	8	22.2	22.0	340.0	295.0	8	22.0	22.0	340.0	295.0	12	22.0
10	0.95	16.0	14.25	12	1.00	7/8 - 9 UNC	1.02	17.5	15.25	16	1.13	0.95	11.60	14.0	12	0.88	1.02	15.55	13.78	12	0.87	1.02	15.94	13.98	12	1.02
250	24.0	406.0	362.0	12	25.4		26.0	445.0	387.4	16	28.6	24.0	406.0	355.6	12	22.2	26.0	395.0	350.0	12	22.0	26.0	405.0	355.0	12	26.0
12	0.95	19.0	17.0	12	1.00	7/8 - 9 UNC	1.02	20.5	17.75	16	1.25	0.95	18.0	16.0	12	1.00	1.02	17.52	15.75	12	0.87	1.02	18.11	16.14	12	1.02
300	24.0	483.0	431.8	12	25.4		26.0	521.0	450.9	16	31.8	24.0	457.0	406.4	12	25.4	26.0	460.0	410.0	12	22.0	26.0	460.0	410.0	12	26.0
14	1.02	21.0	18.75	12	1.13	1 - 8 UNC	1.10	23.0	20.25	20	1.25	1.02	20.75	18.5	12	1.00	1.10	19.88	18.11	16	0.87	1.10	20.47	18.50	16	1.02
350	26.0	533.0	476.3	12	28.6		28.0	584.0	514.4	20	31.8	26.0	527.0	469.9	12	25.4	28.0	505.0	460.0	16	22.0	28.0	520.0	470.0	16	26.0
16	1.10	23.5	21.25	16	1.13	1 - 8 UNC	1.18	25.5	22.5	20	1.38	1.10	22.75	20.5	12	1.00	1.18	22.24	20.28	16	1.02	1.18	22.83	20.67	16	1.18
400	28.0	597.0	538.8	16	28.6		30.0	648.0	571.5	20	34.9	28.0	578.0	520.7	12	25.4	30.0	585.0	515.0	16	26.0	30.0	580.0	525.0	16	30.0
18	1.18	25.0	22.75	16	1.25	1 1/8 - 7 UNC	1.18	28.0	24.75	24	1.38	1.18	25.25	23.0	16	1.00	1.18	24.21	22.24	20	1.02	1.18	25.20	23.03	20	1.18
450	30.0	635.0	577.9	16	31.8		30.0	711.0	628.7	24	34.9	30.0	641.0	564.2	16	25.4	30.0	615.0	565.0	20	26.0	30.0	640.0	568.0	20	30.0
20	1.18	27.5	25.0	20	1.25	1 1/8 - 7 UNC	1.18	30.5	27.0	24	1.38	1.18	27.75	25.25	16	1.00	1.18	26.38	24.41	20	1.02	1.18	28.15	25.59	20	1.30
500	30.0	699.0	635.0	20	31.8		30.0	775.0	665.8	24	34.9	30.0	705.0	641.4	16	25.4	30.0	670.0	620.0	20	26.0	30.0	715.0	650.0	20	33.0
22	1.18	29.5	27.25	20	1.38	1 1/4 - 7 UNC	1.18	33.0	29.5	24	1.38	1.18	30.0	27.5	16	1.13	1.18	28.74	26.57	20	1.18	1.18	30.51	27.95	20	1.30
550	30.0	749.0	692.2	20	34.9		30.0	838.0	743.0	24	34.9	30.0	762.0	698.5	16	28.6	30.0	730.0	675.0	20	30.0	30.0	775.0	710.0	20	33.0
24	1.18	32.06	29.5	20	1.38	1 1/4 - 7 UNC	1.18	36.0	32.0	24	1.62	1.18	32.5	29.75	16	1.25	1.18	30.71	28.54	20	1.18	1.18	33.07	30.31	20	1.42
600	30.0	813.0	749.3	20	34.9		30.0	914.0	812.8	24	41.3	30.0	826.0	755.7	16	31.8	30.0	780.0	725.0	20	30.0	30.0	840.0	770.0	20	36.0
26	1.26	34.25	31.75	24	1.38	1 1/4 - 7 UNC	1.26	38.25	34.5	28	1.75	—	—	—	—	—	1.26	32.87	30.71	24	1.18	1.26	33.86	31.10	24	1.42
650	32.0	870.0	805.5	24	34.9		32.0	972.0	876.0	28	44.5	—	—	—	—	—	32.0	835.0	780.0	24	30.0	32.0	860.0	790.0	24	36.0
30	1.26	38.75	36.0	28	1.38	1 1/4 - 7 UNC	1.26	43.0	39.25	28	2.00	1.26	39.25	36.5	20	1.38	1.26	37.99	35.43	24	1.30	1.26	38.19	35.43	24	1.42
750	32.0	984.0	914.4	28	34.9		32.0	1092.0	997.0	28	50.8	32.0	997.0	927.1	20	34.9	32.0	965.0	900.0	24	33.0	32.0	970.0	900.0	24	36.0



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Warning: Expansion joints may operate in pipelines or equipment carrying fluids and/or gases at elevated temperatures and pressures. Normal precautions should be taken to make sure these parts are installed correctly and inspected regularly. Precautions should be taken to protect personnel in the event of leakage or splash. Note: Piping must be properly aligned and anchored to prevent damage to an expansion joint. Movement must not exceed specified ratings and control units are always recommended to prevent damage in the event other anchoring in the system fails. Properties applications shown throughout this data sheet are typical. This information does not constitute a warranty or representation and we assume no legal responsibility or obligation with respect thereto and the use to which such information may be put. Your specific application should not be undertaken without independent study and evaluation for suitability.