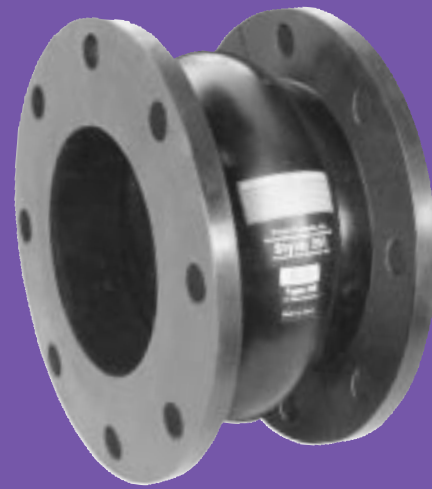


PROCO™

SERIES 251

wide-arch expansion joints



The PROCO Series 251 Wide-Arch Expansion Joint is interchangeable with and replaces handmade spool-type and spherical expansion joints. Installed between the anchor points of a piping system or next to mechanical equipment such as: Pumps, Chillers, Cooling Towers, Compressors, Blowers, Fans, Absorption Machines, etc.; specify the PROCO Series 251 to: (1) Absorb Pipe Movement/Stress, (2) Reduce System Noise, (3) Isolate Mechanical Vibration, (4) Compensate Alignment/Offset, (5) Eliminate Electrolysis, (6) Protect Against Start-Up/Surge Forces. The PROCO Series 251 is engineered for tough, demanding, industrial and commercial applications, as found in: Air Conditioning-Heating and Ventilating Systems, Chemical-Petrochemical and Industrial Process Piping Systems, Power Generating Plants, Steel Mills, Marine Services, Pulp/Paper Systems, Water-Wastewater-Sewage and Pollution Control Systems, where metallic joints/hose or old design rubber expansion joints may have been previously used or specified. Our history in the manufacture of expansion joint products dates back to 1930. PROCO Products is a member of the Rubber Expansion Joint Division, Fluid Sealing Association. When you need an engineered rubber solution to a piping system problem, call PROCO.

In the early 1930's, the U.S. Rubber Company invented the spool-type rubber expansion joint. In 1968, the spherical-type rubber expansion joint was introduced by The Metraflex Company. Today, most makers of expansion joints use similar designs for their standard products. Both designs, spherical and spool-type, had certain strengths and weaknesses. Combining the best design features of the sphere/spool-type with sophisticated manufacturing technology; PROCO has developed the Series 251 Wide-Arch Rubber Expansion Joint. Here are some of the many advantages of our Series 251:

- **Greater Movements:** The Series 251 utilizes the spherical long flowing arch for maximum movements, when compared to the narrow high arch of the spool-type design. Self-flushing, this arch is great for slurries and reduces turbulence; eliminating the need for a "filled arch".
- **Easier Sealing:** The Series 251 design utilizes the full-faced rubber/fabric flange of the spool-type joint for a quick and sure seal at the flange when compared to the small lip seal of the spherical design.
- **Less Weight:** The metal flanges of the spherical design are very heavy when compared to the Series 251 with full-faced rubber flanges and retaining rings. Less weight means less freight and ease of installation.
- **Looks Familiar:** From the outside, the Series 251 looks very much like the spool-type joint your maintenance people have used for years. They are more comfortable with the proven appearance of the spool-type when compared to the spherical-type.

High Pressure With Full Safety Factors. The PROCO Series 251 pressure ratings meet or exceed the requirements of the Rubber Expansion Joint Division, Fluid Sealing Association, for Series A and B. More importantly, our conservative ratings are fully tested and based on a minimum of four-to-one safety factor. With competitive products the safety factor is often calculated, unknown and in one case a published three-to-one. For pressure protection, specify PROCO.

Less Turbulence Or Material Entrapment. The molded integral flange of the Series 251 joins the body at a true 90 degree angle. Our product will install snug against the mating pipe flange without voids. Because this flange/body angle is difficult to form, many competitors severely radius the edge angle. The resulting void can create flow disturbance, allow for material entrapment or bacteria growth. You can avoid these problems by specifying PROCO.

Absorbs Pipe-Wall And Fluid-Borne Noise. The quiet-operating PROCO Series 251 is a replacement for "sound transmitting" metallic expansion joints and hose. Pipe-Wall sound loses energy and is absorbed as the noise carried by the piping both enters and leaves the rubber section. Fluid-Borne noise is absorbed by the volumetric expansion (breathing) of the connector. This action cushions water hammer, and smooths out pumping impulses.

Isolates Vibrations And Motion. Vibration originating from mechanical equipment is absorbed by the PROCO Series 251. Rubber connectors should be installed right after and ahead of the equipment generating the vibration, thus isolating the equipment. As most machinery vibrates in a radial direction from the main shaft, for optimum performance the PROCO connector should be installed horizontally and parallel to this shaft. Vertical and perpendicular installations are acceptable as the PROCO Wide-Arch will accept both axial and lateral movements and vibrations. Installation of the Series 251 in a system enables isolated equipment to move freely on its vibration mountings. **Note: For maximum vibration transmission reduction the piping section beyond the rubber connector must be anchored or sufficiently rigid.**

Chemical Or Abrasive Service Capability At Minimal Cost. Expensive, exotic metal expansion joints for chemical service can be replaced with the PROCO Series 251. High pressure molded with low-cost chemical resistant elastomers such as: Chlorobutyl, EPDM, Hypalon®, Neoprene and Nitrile; assures a rubber expansion joint compatible with the fluid being pumped or piped. (See Table 1) Our Neoprene products should be specified when handling abrasive slurries. Use the PROCO "Chemical to Elastomer Guide" to specify an elastomer for your requirement.

Reduces System Stress And Strain/Compensate For Misalignment. Rigid attachment of piping to critical or mechanical equipment can produce excessive loading. Thermal or mechanically created strain-stress-shock are cushioned and absorbed with the installation of a flexible low "force-to-deflect" PROCO Rubber Series 251. The PROCO Wide-Arch Joint adds a flexible component that is automatically self-correcting for misalignment created by structural movements caused by settling, expansion or ground shifts.

Wide Service Range With Low Cost. Engineered to operate up to 200 PSIG and 250°F, the PROCO Series 251 can be specified for a wide range of piping system requirements. Compared to competitive products, you will invest less money when specifying the engineered design, industrial quality PROCO Wide-Arch Expansion Joint.

Large Inventories Mean Same-Day Shipment. We maintain the largest inventory of elastomer expansion joints in the Americas. Every size cataloged item is in stock in several elastomers. We can ship your requirement when you need it. 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
International Calls 209 / 943-6088
Fax 209 / 943-0242
Email sales@procoproducts.com
Website www.procoproducts.com

Weekday office hours are 5:30 a.m. to 5:15 p.m. Pacific Time.

Table 1: Available Styles • Materials • Temperatures

For Specific Elastomer Recommendations, See: PROCO™ "Chemical To Elastomer Guide"					
PROCO™ Style Number	Type of Elastomer		Maximum Operating Temp. °F	Branding Label Color	F.S.A. Material Class
	Cover/Outside	Tube/Inside			
251/BB	Butyl	Butyl	250°	Black	STD. III
251/EE	EPDM	EPDM ³	250°	Red	STD. III
251/NH	Neoprene	Hypalon ¹	230°	Green	STD. II
251/NN	Neoprene	Neoprene ²	230°	Blue	STD. II
251/NP	Neoprene	Nitrile	230°	Yellow	STD. II

Notes: 1. Hypalon® is a trademark of DuPont Dow Elastomers, L.L.C.
2. Material NN meets all requirements of U.S.C.G.
3. In applications where pressure is less than 15 PSIG, temperature can be increased.
4. All products are reinforced with synthetic fabric and wire.

Rev. 03 6/99



Water Environment Federation
Preserving & Enhancing the Global Water Environment

Protecting Piping And Equipment Systems From Stress/Motion



INDEPENDENT SEALING DISTRIBUTORS



NATIONAL ASSOCIATION OF HOSE AND ACCESSORIES DISTRIBUTORS



FLUID SEALING ASSOCIATION

MEMBER

wide-arch expansion joints

Figure 1: Detail Of Style 251

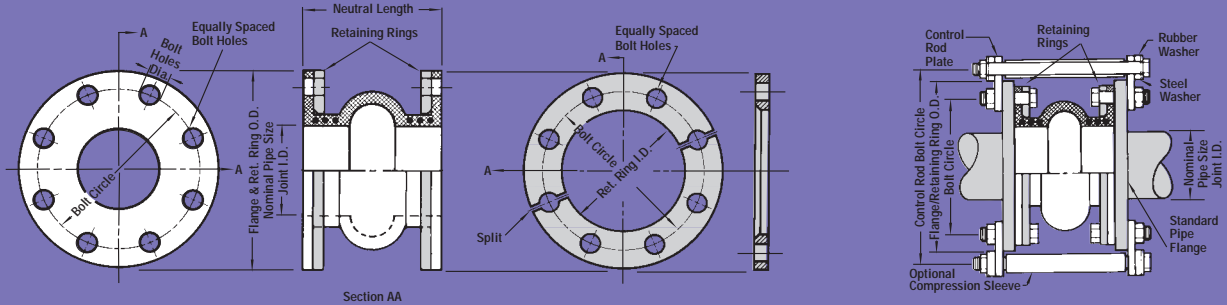


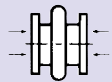
Table 2: Sizes • Movements • Pressures • Weights • Drilling

EXPANSION JOINT SIZE Nom. I.D. x Inch / (mm)	NEUTRAL LENGTH Inch / (mm)	251 Movement Capability: From Neutral Position						Operating Conditions ⁴			Weights in lbs / (kgs) ⁵			Flange Dimensions and Drilling ⁷		
		Axial Compression Inch / (mm)	Axial Extension Inch / (mm)	Lateral Deflection Inch / (mm)	Angular ¹ Deflection Degrees	Torsional ² Deflection Degrees	Thrust Factor ³ Inz / (cmz)	Positive PSIG / (Bar)	Vacuum Inches of Hg / (mm of Hg)	Joint Assembly	Retaining Ring Set	Control Unit ⁶ Assembly	O.D. of Exp. Joint / Ring Inch / (mm)	Bolt Circle Inch / (mm)	Number of Holes	Size of Holes Inch / (mm)
1 (25)	6 (150)	USE SERIES 231 PRODUCT AT THIS TIME														
1.25 (32)		USE SERIES 231 PRODUCT AT THIS TIME														
1.5 (40)		USE SERIES 231 PRODUCT AT THIS TIME														
2 (50)		1.06 (27)	.47 (12)	.59 (15)	25.2°	3°	3.1 (20)	200 (14.0)	26 (660)	2.9 (1.3)	4.0 (1.8)	2.8 (1.3)	6.0 (152.4)	4.75 (120.65)	4	0.750 (19.05)
2.5 (65)			.47 (12)	.59 (15)	20.6°	3°	4.9 (32)	200 (14.0)	26 (660)	3.5 (1.6)	4.5 (2.0)	2.8 (1.3)	7.0 (177.8)	5.50 (139.70)	4	0.750 (19.05)
3 (80)			.47 (12)	.59 (15)	17.4°	3°	7.1 (46)	200 (14.0)	26 (660)	4.3 (2.0)	5.5 (2.5)	2.8 (1.3)	7.5 (190.5)	6.00 (152.40)	4	0.750 (19.05)
4 (100)			.47 (12)	.59 (15)	13.2°	3°	12.6 (81)	200 (14.0)	26 (660)	5.7 (2.6)	8.0 (3.6)	2.8 (1.3)	9.0 (228.6)	7.50 (190.50)	8	0.750 (19.05)
5 (125)			.53 (14)	.66 (17)	12.0°	3°	19.6 (127)	200 (14.0)	26 (660)	7.0 (3.2)	8.5 (3.9)	4.0 (1.8)	10.0 (254.0)	8.50 (215.90)	8	0.875 (22.23)
6 (150)			.59 (15)	.74 (19)	11.1°	3°	28.3 (182)	200 (14.0)	26 (660)	8.2 (3.7)	9.5 (4.3)	4.0 (1.8)	11.0 (279.4)	9.50 (241.30)	8	0.875 (22.23)
8 (200)			.59 (15)	.74 (19)	8.4°	3°	50.3 (324)	180 (13.0)	26 (660)	11.7 (5.3)	14.5 (6.6)	8.0 (3.6)	13.5 (342.9)	11.75 (298.45)	8	0.875 (22.23)
10 (250)	1.65 (42)		.71 (18)	.89 (23)	8.1°	3°	78.5 (507)	150 (10.0)	26 (660)	20.1 (9.1)	17.0 (7.7)	10.0 (4.5)	16.0 (406.4)	14.25 (361.95)	12	1.000 (25.40)
12 (300)		.77 (19)	.96 (24)	7.3°	3°	113.1 (730)	150 (10.0)	26 (660)	27.8 (12.6)	24.5 (11.0)	10.0 (4.5)	19.0 (482.6)	17.00 (431.80)	12	1.000 (25.40)	
14 (350)		.75 (19)	.96 (24)	6.3°	2°	153.9 (993)	130 (9.0)	26 (660)	40.0 (18.1)	27.0 (12.3)	12.0 (5.4)	21.0 (533.4)	18.75 (476.25)	12	1.125 (28.58)	
16 (400)		.75 (19)	.96 (24)	5.9°	2°	201.1 (1297)	110 (8.0)	26 (660)	47.0 (21.3)	33.5 (15.2)	15.0 (6.8)	23.5 (596.9)	21.25 (539.75)	16	1.125 (28.58)	
18 (450)		.75 (19)	1.0 (25)	5.3°	1°	254.5 (1642)	110 (8.0)	26 (660)	56.0 (25.4)	34.0 (15.5)	16.5 (7.2)	25.0 (635.0)	22.75 (577.85)	16	1.250 (31.75)	
20 (500)		.75 (19)	1.0 (25)	4.8°	1°	314.2 (2027)	110 (8.0)	26 (660)	67.0 (30.4)	38.0 (17.3)	16.5 (7.2)	27.5 (698.5)	25.00 (635.00)	20	1.250 (31.75)	
24 (600)		1.75 (42)	.83 (21)	1.0 (25)	3.9°	1°	452.4 (2919)	100 (7.0)	26 (660)	79.0 (35.9)	48.0 (21.8)	19.0 (8.6)	32.0 (812.8)	29.50 (749.30)	20	1.375 (34.93)
30 (750)			1.0 (25)	1.0 (25)	3.8°	1°	706.9 (4560)	90 (6.0)	26 (660)	117.0 (53.1)	63.0 (28.6)	29.5 (13.3)	38.8 (984.3)	36.00 (914.40)	28	1.375 (34.93)

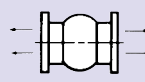
Notes:

- The degree of angular movement is based on the maximum rated extension.
- Torsional movement is expressed when the expansion joint is a neutral length.
- To determine "end thrust", multiply thrust factor by operating pressure of system.
- Pressure rating is based on 170°F operating temperature. At higher temperature the pressure rating is slightly reduced.
- Weights are approximate.
- Control unit weight consists of one rod, four washers, three nuts and two control rod plates. Multiply number of control units needed for application (as specified in the Fluid Sealing Association Technical Handbook) to determine correct weights.
- Dimensions shown are in accordance with 125/150# standards of ANSI B-16.1, B-16.24, B-16.5; AWWA C-207 Table 1 and 2 Class D.

PROCO™ Series 251 Products Are Designed To Absorb Different Movements Concurrently.



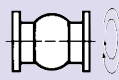
Axial Compression



Axial Elongation



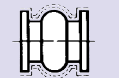
Torsional Movement
Rotation About The Centerline (Twist)



Angular Movement
Bending Of The Centerline



Lateral Movement
Shear Or Perpendicular To Centerline



Absorbing Vibration

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NATIONWIDE AND CANADA
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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.