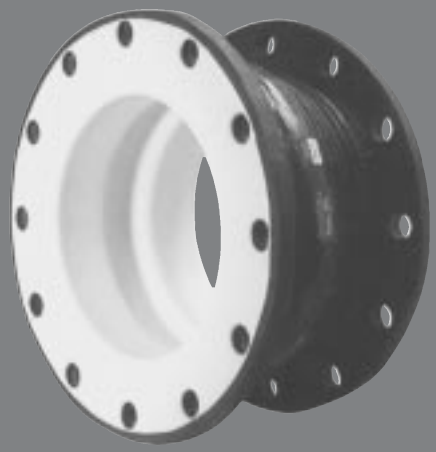
PROCO™



SERIES 251/BT

PTFE and FEP lined rubber expansion joints

The PROCO Series 251/BT PTFE and FEP lined expansion joints are designed for tough demanding corrosive chemical applications, as found in: Chemical & Petrochemical Process Facilities and Highly Corrosive Industiral Piping & Pollution Control Systems. The greatest usage of the the Series 251/BT is found in the Pulp and Paper Industry where the ability to resist corrosive attack at elevated temperature and pressure is unmatched by metallic, plastic or other competitive expansion joints. PROCO's Series 251 PTFE or FEP lined expansion joints can easily handle such pulp/paper applications as: White-Green-Black liquor, bleach plant chlorination and caustic extraction stages. Chemically resistant against the entire pH range, PROCO Series 251 PTFE and FEP expansion joints are designed to handle practically every chemical plant application. Installed next to mechanical equipment or between anchor points of a piping system, specify the PROCO 251/BT to: (1) Absorb Pipe Movements/Stress, (2) Reduce System Noise, (3) Isolate Mechanical Vibrations, (4) Compensate Alignment/ Offset, (5) Eliminate Electrolytic Action and Electrolysis, (6) Protect Against Start-Up/Surge Forces. Our history in the manufacture of expansion joints dates back to 1930. When you need an engineered rubber expansion joint solution to a piping problem, call PROCO.

Series 251/BT replaces Series FEP. The new and improved PROCO Series 251/BT will replace the PROCO Series FEP lined rubber expansion joint. (Series FEP products will be available in certain sizes. Contact Proco for information.) This new hand-built product has been completely re-engineered to provide improved strength, flexibility and movement capabilities. Manufactured utilizing tire cord industry technology, the Series 251/BT combines woven polyester fabric and polyester tire cord into a fabric matrix and bonded with a Chlorobutyl elastomer that is reinforced with wire and bonded to a PTFE or FEP liner to create a product with greater operating performance.

Greater Movements with a Lower/Wider Arch Profile. The movements for the PROCO Series 251/BT exceed the specification of the Fluid Sealing Association's, Rubber Expansion Joint Division Technical Handbook (Sixth Edition), Table V. Due to a new and improved lower, wider profile arch, more axial compression and extension coupled with lateral and angular movements can be obtained without increasing the face-to-face requirements. For greater movements based on re-engineering and new product construction for highly corrosive piping installations, specify the PROCO Series 251/BT PTFE and FEP lined expansion joints.

Chemical Service Capability at Minimal Cost. Expensive, exotic metal expansion joint for low temperature service can be replaced with the PROCO Series 251/BT PTFE and FEP lined expansion joints. Engineered to operate up to 225 PSIG and 250°F, the PROCO Series 251/BT can be specified for a wide range of piping system requirements. Our standard stock is furnished with an exterior Chlorobutyl cover. Other elastomer covers are available on special order. Compared to metal, plastic or other rubber-backed competitive products, you will invest less and have access to in-stock availability with the high quality PROCO Series 251/BT.

Specifications Met. PROCO has assigned conservative pressure ratings to the Series 251/BT and FEP lined rubber expansion joints. The ratings, however, meet the requirements of the Fluid Sealing Association's, Rubber Expansion Joint Division Technical Handbook (Sixth Edition), Series C. The pressure ratings for the Series 251/BT PTFE and FEP lined rubber expansion joints have been fully tested and are based on a minimum four-to-one safety factor. For pressure protection with confidence, specify the PROCO Series 251/BT.

Prevents Electrolysis and Electrolytic Action. In Chemical applications when metallic expansion joints are used, they are generally of a metal dissimilar from the pipeline. This may create an electrolytic galvanic action that could be destructive to the connector equipment or piping system. The use of the rubber-backed PROCO 251/BT PTFE and FEP lined expansion joints prevents this potential hazard. Additionally, our 251/BT expansion joints are non-conductive and eliminate the metal-to-metal contact at the flange face thus stopping electrolysis.

Absorbs Vibration • Noise • Shock. The PROCO Series 251/BT PTFE and FEP lined rubber expansion joints are a replacement for "sound transmitting" metallic expansion joints. Sound loses energy traveling axially through an expansion joint. Water hammer, pumping impulses, water-borne noises and other forms of strain-stress-shock are cushioned and absorbed by the PTFE or FEP lined/rubber elastomer expansion joint, not related to piping. Install the Series 251/BT in a system to reduce vibration transmission when the piping section beyond the expansion joint is anchored or sufficiently rigid. For quiet, stress-free systems specify the PROCO Series 251/BT.

Large Inventories Mean Same-Day Shipment. We maintain the largest inventory of expansion joints in the world. Rubber, PTFE or FEP Lined, Plastic or Metal Hose — PROCO can ship the products you need when you need them! In fact, when it comes to expansion joints, **if PROCO doesn't have them in stock … 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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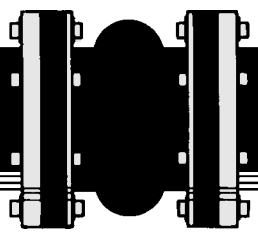
Email ..... sales@procoproducts.com
Website ..... www.procoproducts.com

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

Table 1: Available Styles • Design Descriptions • I.D. Sizes	
#251/BT — Standard Single-Arch, Spool-Type Joint (See Table 2)	1"-48"
#151 — Special Non-Standard Length Single-Arch, Spool-Type Joint	1"-48"
#152 — Special Non-Standard Double-Arch, Spool-Type Joint	1"-48"
#153 — Special Non-Standard Triple-Arch, Spool-Type Joint	1"-48"
#310 — Standard "No-Arch" Flanged Rubber Pipe Connectors	1"-12"



Rev. 01 11/00

Protecting Piping And Equipment Systems From Stress/Motion

Water Environment Federation® Preserving & Enhancing the Global Water Environment MEMBER

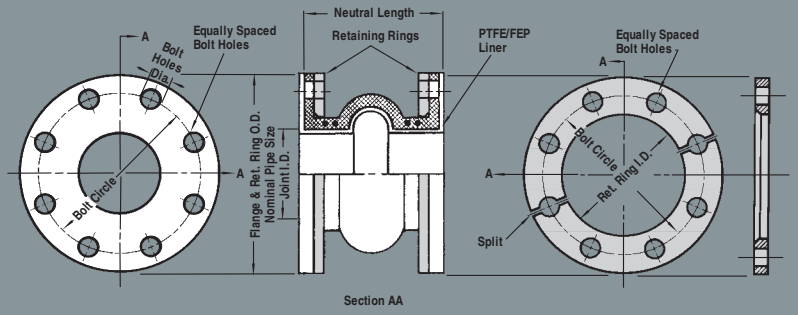
FLUID SEALING ASSOCIATION FSA

ISD INDEPENDENT SEALING DISTRIBUTORS

NAHAD NATIONAL ASSOCIATION OF HOSE AND ACCESSORIES DISTRIBUTORS

PTFE & FEP lined rubber expansion joints

Figure 1: Detail Of Style 251/BT



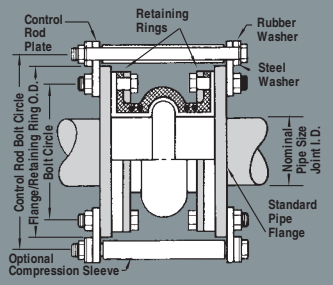


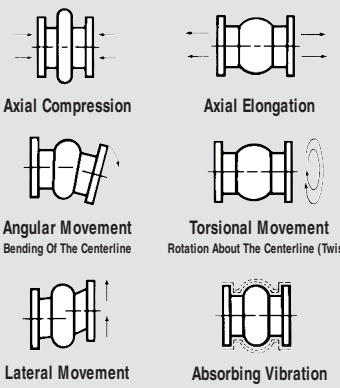
Table 2: Sizes • Movements • Pressures • Weights • Drilling

EXPANSION JOINT SIZE Nom. I.D. x Inch / (mm)		NEUTRAL LENGTH Inch / (mm)		251/BT 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] Rotation Degrees	Thrust Factor [3] In2 / (cm2)	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 [9, 10]	(25)	6	(150)	1.0 (25)	0.5 (13)	0.7 (17)	35.8°	1°	0.8 (5)	225 (15.5)	26 (660)	3.0 (1.4)	2.0 (0.8)	2.3 (1.0)	4.3 (108.0)	3.13 (79.5)	4	0.625 (15.88)
1.5 [9]	(40)				0.5 (13)	0.7 (17)	29.9°	1°	1.8 (11)	225 (15.5)	26 (660)	6.0 (2.7)	2.5 (1.1)	2.3 (1.0)	5.0 (127.0)	3.88 (98.6)	4	0.625 (15.88)
2 [9]	(50)				0.5 (13)	0.7 (17)	25.2°	1°	3.1 (20)	225 (15.5)	26 (660)	7.0 (3.2)	4.0 (1.8)	2.8 (1.3)	6.0 (152.4)	4.75 (120.65)	4	0.750 (19.05)
2.5 [9]	(65)				0.5 (13)	0.7 (17)	20.6°	1°	4.9 (32)	225 (15.5)	26 (660)	7.5 (3.4)	4.5 (2.0)	2.8 (1.3)	7.0 (177.8)	5.50 (139.7)	4	0.750 (19.05)
3	(80)				0.5 (13)	0.7 (17)	17.4°	1°	7.1 (46)	225 (15.5)	26 (660)	9.5 (4.3)	5.5 (2.5)	2.8 (1.3)	7.5 (190.5)	6.00 (152.4)	4	0.750 (19.05)
4	(100)				0.5 (13)	0.7 (17)	13.2°	1°	12.6 (81)	225 (15.5)	26 (660)	13.0 (5.9)	8.0 (3.6)	2.8 (1.3)	9.0 (228.6)	7.50 (190.5)	8	0.750 (19.05)
5	(125)				0.5 (13)	0.7 (17)	12.0°	1°	19.6 (127)	225 (15.5)	26 (660)	14.0 (6.4)	8.5 (3.9)	4.0 (1.8)	10.0 (254.0)	8.50 (215.9)	8	0.875 (22.23)
6	(150)				0.5 (13)	0.7 (17)	11.1°	1°	28.3 (182)	225 (15.5)	26 (660)	16.0 (7.3)	9.5 (4.3)	4.0 (1.8)	11.0 (279.4)	9.50 (241.3)	8	0.875 (22.23)
8	(200)			1.5 (38)	0.7 (17)	1.0 (25)	8.4°	1°	50.3 (324)	225 (15.5)	26 (660)	20.0 (9.1)	14.5 (6.6)	8.0 (3.6)	13.5 (342.9)	11.75 (298.4)	8	0.875 (22.23)
10	(250)	8	(200)		0.7 (17)	1.0 (25)	8.1°	1°	78.5 (507)	225 (15.5)	26 (660)	28.0 (12.7)	17.0 (7.7)	10.0 (4.5)	16.0 (406.4)	14.25 (362.0)	12	1.000 (25.40)
12	(300)				0.7 (17)	1.0 (25)	7.3°	1°	113.1 (730)	225 (15.5)	26 (660)	44.0 (20.0)	24.5 (11.0)	10.0 (4.5)	19.0 (482.6)	17.00 (431.8)	12	1.000 (25.40)
14	(350)				0.7 (17)	1.0 (25)	6.3°	1°	153.9 (993)	150 (10.0)	26 (660)	50.0 (22.7)	27.0 (12.3)	12.0 (5.4)	21.0 (533.4)	18.75 (476.3)	12	1.125 (28.58)
16	(400)				0.7 (17)	1.0 (25)	5.9°	1°	201.1 (1297)	150 (10.0)	26 (660)	59.0 (26.8)	33.5 (15.2)	15.0 (6.8)	23.5 (596.9)	21.25 (539.8)	16	1.125 (28.58)
18	(450)				0.7 (17)	1.0 (25)	5.3°	1°	254.5 (1642)	150 (10.0)	26 (660)	68.0 (30.8)	34.0 (15.5)	16.5 (7.2)	25.0 (635.0)	22.75 (577.9)	16	1.250 (31.75)
20	(500)			1.7 (44)	0.7 (17)	1.0 (25)	4.8°	1°	314.2 (2027)	150 (10.0)	26 (660)	79.0 (35.8)	38.0 (17.3)	16.5 (7.2)	27.5 (698.5)	25.00 (635.0)	20	1.250 (31.75)
24	(600)	10	(250)		0.7 (17)	1.0 (25)	3.9°	1°	452.4 (2919)	150 (10.0)	26 (660)	91.0 (41.3)	48.0 (21.8)	20.0 (9.0)	32.0 (812.8)	29.50 (749.3)	20	1.375 (34.93)
30	(750)				0.7 (17)	1.0 (25)	3.8°	1°	706.9 (4560)	125 (8.8)	26 (660)	129.0 (58.5)	63.0 (28.6)	29.5 (13.3)	38.8 (984.3)	36.00 (914.4)	28	1.375 (34.93)
36	(900)				0.7 (17)	1.0 (25)	3.1°	1°	1017.9 (6567)	125 (8.8)	26 (660)	160.0 (72.6)	76.0 (34.5)	43.0 (19.5)	46.0 (1168.4)	42.75 (1085.9)	32	1.625 (41.28)
48	(1200)	12	(300)		0.7 (17)	1.0 (25)	2.7°	1°	1809.6 (11675)	100 (7.0)	26 (660)	244.0 (110.7)	132.0 (59.9)	44.0 (20.0)	59.5 (1511.3)	56.00 (1142.4)	44	1.625 (41.28)

Notes:

1. The degree of angular movement is based on the maximum rated extension.
2. Torsional movement is expressed when the expansion joint is a neutral length.
3. To determine "end thrust", multiply thrust factor by operating pressure of system.
4. Pressure rating is based on 170°F operating temperature. At higher temperature the pressure rating is slightly reduced.
5. Weights are approximate.
6. 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.
7. 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.
8. 1" I.D. through 12" I.D. have white PTFE liners. 12" I.D. through 48" I.D. have clear FEP liners.
9. Teflon liner extends to bolt holes' center line only.
10. Available in filled arch configuration only.

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



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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.