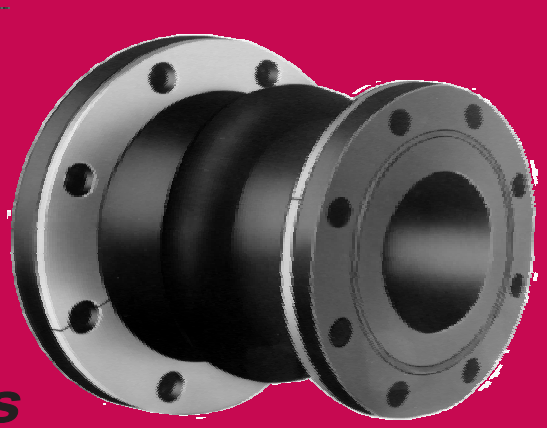
PROCO™ RC SERIES

concentric reducer expansion joints



The PROCO Series RC-221 Rubber Concentric Reducer Expansion Joint, often called a "Taper", serves as a reducing element to transition from one pipe size to another. Concentric in design, each flange-end shares the same common center-line. The PROCO Rubber Reducer is engineered to replace metallic or rubber-lined reducers used to provide unequal diameter connections of: piping and/or operating equipment applications such as: Pumps, Chillers, Cooling Towers, Compressors, Blowers, Fans, Absorption Machines, etc. Installed next to mechanical equipment or between the anchor points of a piping system, specify the PROCO Series RC-221 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 RC-221 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 reducers used in conjunction with metal hose or expansion joints may have been previously used or specified. Our history in manufacture of expansion joint products dates back to 1930. PROCO Products is a member of the Rubber Expansion Joint Division, Fluid Sealing Association. When a rubber expansion joint is needed to solve a piping system problem, call PROCO.

Traditional design when using a metallic reducer incorporates the use of a flexible element such as an expansion joint or metal hose to absorb the vibrations and movements of the system. The PROCO Series RC-221 Reducer combines the basic shape and dimensions of the metal reducer and the movement-sound reduction-vibration-absorbing features of a flexible element into one unit. Here are some of the many advantages:

- **Less System Installation Space:**
  The PROCO RC-221 replaces a metal reducer and a flexible element. Thus less space is required and valves of other equipment can be more conveniently located.
- **Less Installation Cost:**
  The PROCO RC-221 costs less then the metal reducer and flexible element that are replaced. Additionally, standard joints (as listed in Table 1 and the "stock" section in Table 2) can be shipped same day as order placement.

Engineered For Your Application: The PROCO Rubber Reducer materials consist of rubber and fabric which are formed and cured in a heated compression mold using an exclusive high-pressure press. The thick outer-cover and interior-tube are of an elastomer especially compounded to satisfy the Chemical-Temperature requirement of your application. Available styles include:

- **Style RC-221:**
  Features one Open Arch for maximum movement, and good noise-vibration control. Our most popular style. (See Figure 1)
- **Style-RCFA-221:**
  Features one Filled Arch, is generally specified for slurry or abrasive services. Provides noise and vibration control but less movement than Style RC-221. (See Figure 2)

Absorbs Pipe-Wall And Fluid-Borne Noise. The PROCO quiet-operating Series RC-221 is a replacement for "sound transmitting" metallic reducers. Pipe-Wall sound loses energy and is absorbed as the noise carried by the piping enters and exits 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 RC-221. Rubber connectors should be installed right after and ahead of the equipment generating the vibration, thus isolating the equipment. 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 also acceptable as the PROCO Reducer will accept both axial and lateral movements and vibration. Installations of the Series RC-221 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 or rubber lined reducers for chemical service can be replaced with the PROCO Rubber Reducer. Fabricated with low-cost chemical resistant elastomers such as: Chlorobutyl, EPDM, Hypalon, Neoprene and Nitrile; insures a rubber connector compatible with the fluid being pumped or piped. (See Table 1) Our Neoprene, Natural/Gum and filled arch 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 Reducer. The PROCO Style RC-221 adds a flexible component that is automatically self-correcting for misalignment created by structural movements caused by settling, expansion or ground shifts.

Flange And Retaining Ring Drilling. All PROCO rings are coated to prevent corrosion and dimensionally drilled to ANSI 125/150# standards. In accordance with ANSI, all bolt hole pairs "straddle" the center line. Hole drilling on center line, other drilling standards or materials such as: 304 or 316 Stainless and Bronze are available on special order.

Less Turbulence Or Material Entrapment. The molded integral flange of the PROCO Rubber Reducer 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 this edge angle. The resulting void can create flow turbulence, allow for material entrapment and/or bacteria growth. Avoid these problems by specifying PROCO.

Exclusive Sealing Bead Means A Quick Seal. We have built an "O-Ring" on each flange-face of the Series RC-221. Available only from PROCO, our product seals faster with less torque at installation and less long-term maintenance. For exclusive design features, specify PROCO.

High Pressure With Full Safety Factors. We have assigned conservative pressure ratings to the Series RC-221. However, the ratings meet or exceed the requirements of the Rubber Expansion Joint Division, Fluid Sealing Association, for Series A, B, and C. More importantly, our conservative ratings are fully tested and based on a minimum four-to-one safety factor. With competitive products the safety factor is often calculated or unknown. For pressure protection, specify PROCO.

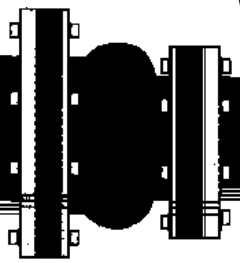
Table 1: Available Styles • Materials • Temperatures • Stock

For Specific Elastomer Recommendations, See: PROCO™ "Chemical to Elastomer Guide"

Style Numbers		PROCO™ Material Code	Type of Elastomer		Maximum[4] Operating Temp. °F	PROCO™ Branding Label Color	F.S.A. Material Class
RC-221	RCFA-221		Cover/ Outside	Tube/ Inside			
S	S	/BB	Butyl	Butyl	250°	Black	Special II
X	X	/EE	EPDM	EPDM	250°	Red	Special II
X	X	/NH	Neoprene	Hypalon[1]	230°	Green	Standard II
X[7]	X[7]	/NN[3]	Neoprene	Neoprene	230°	Blue	Standard II
X	X	/NP	Neoprene	Nitrile	230°	Yellow	Standard II
X	X	/NR	Neoprene	Natural[2]	180°	White	Standard I

NOTES:
1. Hypalon is a trademark of E.I. duPont Nemours & Co.
2. Filled Arch is Tan-Gum, Open Arch is Black-Natural.
3. Material NN meets all requirements of U.S.C.G.
4. In applications where pressure is less than 15 PSIG, temperature may be increased.
5. All products are reinforced with synthetic fabric plies.
6. Material Availability: X=Special Order, S=Standard Stock.
7. Certain sizes in stock, call for availability.
8. To Order, provide: 1. Size (I.D. x Length), 2. Style Number, 3. Material Code.

Visit Our Website: http://www.procoproducts.com
email: sales@procoproducts.com



Protecting Piping And Equipment Systems From Stress/Motion

Water Environment Federation — Preserving & Enhancing the Global Water Environment

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NAHAD

Fluid Sealing Association FSA

concentric reducer expansion joints

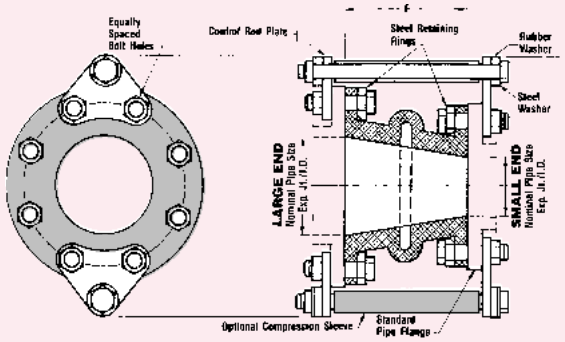

Figure 1: Style RC-221 Single Open Arch

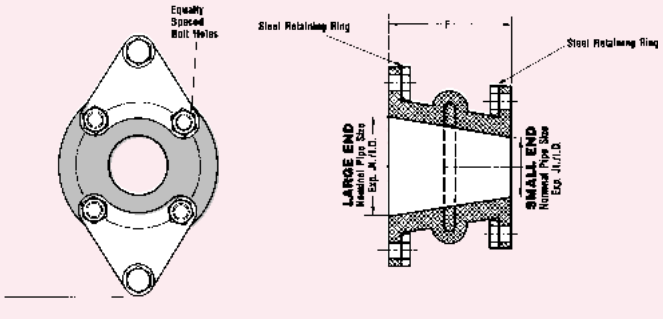

Figure 2: Style RCFA-221 Single Filled Arch

Concentric Joint Size	Stock		RC-221 Open Arch Capacity: From Neutral Position						Weight/Pounds			Stock		RCFA-221 Filled Arch Capability: From Neutral Position						Weight/Pounds			Pressure	
I.D. x I.D. x Length	/BB Butyl	/NN Neoprene	Axial Compression	Axial Extension	±Lateral Deflection	±Angular Deflection[1]	Torsional Movement[2]	Thrust Factor[3]	Expansion Joint Open Arch	Retaining Ring Set	Control Rod Set	/BB Butyl	/NN Neoprene	Axial Compression	Axial Extension	±Lateral Deflection	±Angular Deflection[1]	Torsional Movement[2]	Thrust Factor[3]	Expansion Joint Filled Arch	Retaining Ring Set	Control Rod Set	Positive Pressure	Vacuum
			Inches	Inches	Inches	Degree	Degree							Inches	Inches	Inches	Degree	Degree					PSIG	In. Hg
2 x 1 x 6*	S	X	.5	.25	.5	18.4°	3°	12.69	3	3	6	X	X	.25	.125	.3	9.5°	1.8°	3.14	3	3	6	200	26
2 x 1.5 x 6*	S	X	.5	.25	.5	15.9°	3°	14.32	3	3	6	X	S	.25	.125	.3	8.1°	1.8°	3.14	3	3	6	200	26
2.5 x 1.5 x 6*	S	X	.5	.25	.5	14.1°	3°	16.04	4	3	7	X	X	.25	.125	.3	7.2°	1.8°	4.97	4	3	7	200	26
2.5 x 2 x 6*	S	X	.5	.25	.5	12.5°	3°	17.87	3	4	7	S	X	.25	.125	.3	6.4°	1.8°	4.97	3	4	7	200	26
3 x 1 x 6*	X	X	.5	.25	.5	14.0°	3°	16.04	4	4	7	X	X	.25	.125	.3	6.4°	1.8°	7.06	4	4	7	200	26
3 x 1.5 x 6*	S	X	.5	.25	.5	12.5°	3°	17.87	4	4	7	S	X	.25	.125	.3	6.4°	1.8°	7.06	4	4	7	200	26
3 x 2 x 6*	S	S	.5	.25	.5	11.3°	3°	19.79	4	4	7	S	S	.25	.125	.3	5.7°	1.8°	7.06	4	4	7	200	26
3 x 2.5 x 6*	S	X	.5	.25	.5	10.3°	3°	21.81	5	5	7	X	X	.25	.125	.3	5.2°	1.8°	7.06	5	5	7	200	26
4 x 2 x 6*	S	S	.5	.25	.5	9.5°	3°	23.93	5	5	7	S	S	.25	.125	.3	4.8°	1.8°	12.57	5	5	7	200	26
4 x 2 x 7*	S	S	.5	.25	.5	9.5°	3°	23.93	5	5	7	X	S	.25	.125	.3	4.8°	1.8°	12.57	5	5	7	200	26
4 x 2.5 x 6*	S	S	.5	.25	.5	8.7°	3°	26.14	5	6	8	X	S	.25	.125	.3	4.4°	1.8°	12.57	5	6	8	200	26
4 x 2.5 x 7*	S	X	.5	.25	.5	8.7°	3°	26.14	6	6	8	X	X	.25	.125	.3	4.4°	1.8°	12.57	6	6	8	200	26
4 x 3 x 6*	S	X	.5	.25	.5	8.1°	3°	28.46	6	6	8	S	S	.25	.125	.3	4.1°	1.8°	12.57	6	6	8	200	26
4 x 3 x 7*	S	X	.5	.25	.5	8.1°	3°	28.46	6	6	8	X	S	.25	.125	.3	4.1°	1.8°	12.57	6	6	8	200	26
5 x 3 x 6*	S	X	.5	.25	.5	7.1°	3°	33.38	6	6	10	X	X	.25	.125	.3	3.6°	1.8°	19.63	6	6	10	190	26
5 x 4 x 6*	S	X	.5	.25	.5	6.3°	3°	38.70	8	7	10	X	S	.25	.125	.3	3.2°	1.8°	19.63	8	7	10	190	26
5 x 4 x 8*	S	X	.5	.25	.5	6.3°	3°	38.70	8	7	10	X	X	.25	.125	.3	3.2°	1.8°	19.63	9	7	10	190	26
6 x 2 x 8*	S	X	.5	.25	.5	7.1°	3°	33.38	8	6	12	X	S	.25	.125	.3	3.6°	1.8°	28.27	9	6	12	190	26
6 x 2.5 x 6*	S	X	.5	.25	.5	6.7°	3°	35.99	6	7	12	X	X	.25	.125	.3	3.4°	1.8°	28.27	6	7	12	190	26
6 x 3 x 6*	S	S	.5	.25	.5	6.3°	3°	38.70	7	7	12	S	S	.25	.125	.3	3.2°	1.8°	28.27	7	7	12	190	26
6 x 3 x 8*	X	X	.5	.25	.5	6.3°	3°	38.70	9	7	13	X	X	.25	.125	.3	3.2°	1.8°	28.27	10	7	13	190	26
6 x 3 x 9*	S	S	.5	.25	.5	6.3°	3°	38.70	9	7	13	X	S	.25	.125	.3	3.2°	1.8°	28.27	10	7	13	190	26
6 x 4 x 6*	S	S	.5	.25	.5	5.7°	3°	44.41	8	7	11	S	S	.25	.125	.3	2.9°	1.8°	28.27	8	7	11	190	26
6 x 4 x 8*	S	X	.5	.25	.5	5.7°	3°	44.41	9	7	11	X	S	.25	.125	.3	2.9°	1.8°	28.27	9	7	11	190	26
6 x 4 x 9*	S	S	.5	.25	.5	5.7°	3°	44.41	11	7	11	X	X	.25	.125	.3	2.9°	1.8°	28.27	12	7	11	190	26
6 x 5 x 6*	S	S	.5	.25	.5	5.2°	3°	50.51	9	8	11	S	S	.25	.125	.3	2.6°	1.8°	28.27	9	8	11	190	26
6 x 5 x 9*	S	S	.5	.25	.5	5.2°	3°	50.51	12	8	12	X	X	.25	.125	.3	2.6°	1.8°	28.27	13	8	12	190	26
8 x 3 x 6*	S	X	.75	.375	.5	7.8°	3°	56.64	9	9	19	X	S	.375	.188	.3	3.9°	1.8°	50.27	10	9	19	190	26
8 x 4 x 6*	S	S	.75	.375	.5	7.1°	3°	63.51	10	9	19	S	S	.375	.188	.3	3.6°	1.8°	50.27	10	9	19	190	26
8 x 4 x 8*	S	X	.75	.375	.5	7.1°	3°	63.51	11	9	20	S	X	.375	.188	.3	3.6°	1.8°	50.27	12	9	20	190	26
8 x 4 x 10*	X	X	.75	.375	.5	7.1°	3°	63.51	15	9	21	X	X	.375	.188	.3	3.6°	1.8°	50.27	17	9	21	190	26
8 x 4 x 11*	S	S	.75	.375	.5	7.1°	3°	63.51	15	9	21	X	X	.375	.188	.3	3.6°	1.8°	50.27	17	9	21	190	26
8 x 5 x 6*	S	X	.75	.375	.5	6.6°	3°	70.77	10	10	18	X	X	.375	.188	.3	3.3°	1.8°	50.27	11	10	18	190	26
8 x 5 x 11*	S	S	.75	.375	.5	6.6°	3°	70.77	15	10	21	X	X	.375	.188	.3	3.3°	1.8°	50.27	16	10	21	190	26
8 x 6 x 6*	S	S	.75	.375	.5	6.1°	3°	78.42	12	10	18	S	S	.375	.188	.3	3.1°	1.8°	50.27	12	10	18	190	26
8 x 6 x 8*	S	S	.75	.375	.5	6.1°	3°	78.42	14	10	18	S	S	.375	.188	.3	3.1°	1.8°	50.27	14	10	18	190	26
8 x 6 x 11*	S	S	.75	.375	.5	6.1°	3°	78.42	18	10	20	X	S	.375	.188	.3	3.1°	1.8°	50.27	18	10	20	190	26
10 x 5 x 8*	S	X	.75	.375	.5	5.7°	3°	86.46	19	11	27	X	X	.375	.188	.3	2.9°	1.8°	78.54	21	11	27	190	26
10 x 6 x 8*	S	X	.75	.375	.5	5.4°	3°	94.90	15	11	26	S	S	.375	.188	.3	2.8°	1.8°	78.54	15	11	26	190	26
10 x 6 x 12*	S	S	.75	.375	.5	5.4°	3°	94.90	21	11	28	X	S	.375	.188	.3	2.8°	1.8°	78.54	22	11	28	190	26
10 x 8 x 6*	S	X	.75	.375	.5	4.8°	3°	112.95	14	13	25	S	X	.375	.188	.3	2.4°	1.8°	78.54	14	13	25	190	26
10 x 8 x 8*	S	S	.75	.375	.5	4.8°	3°	112.95	18	13	25	X	S	.375	.188	.3	2.4°	1.8°	78.54	20	13	25	190	26
10 x 8 x 12*	S	X	.75	.375	.5	4.8°	3°	112.95	20	13	28	X	X	.375	.188	.3	2.4°	1.8°	78.54	23	13	28	190	26
12 x 6 x 8*	S	S	.75	.375	.5	4.8°	3°	112.95	19	15	29	S	S	.375	.188	.3	2.4°	1.8°	113.10	22	15	29	190	26
12 x 6 x 14*	S	X	.75	.375	.5	4.8°	3°	112.95	30	15	31	X	X	.375	.188	.3	2.4°	1.8°	113.10	35	15	31	190	26
12 x 8 x 6*	S	S	.75	.375	.5	4.3°	3°	132.57	19	17	28	S	S	.375	.188	.3	2.2°	1.8°	113.10	19	17	28	190	26
12 x 8 x 8*	S	S	.75	.375	.5	4.3°	3°	132.57	24	17	29	S	S	.375	.188	.3	2.2°	1.8°	113.10	24	17	29	190	26
12 x 8 x 14*	S	X	.75	.375	.5	4.3°	3°	132.57	30	17	30	X	X	.375	.188	.3	2.2°	1.8°	113.10	35	17	30	190	26
12 x 10 x 8*	S	S	.75	.375	.5	3.9°	3°	153.77	23	18	24	S	S	.375	.188	.3	1.9°	1.8°	113.10	24	18	24	190	26
12 x 10 x 14*	S	X	.75	.375	.5	3.9°	3°	153.77	35	18	26	X	X	.375	.188	.3	1.9°	1.8°	113.10	38	18	26	190	26
14 x 8 x 8*	S	X	.75	.375	.5	3.9°	2°	177.09	22	18	29	X	X	.375	.188	.3	1.9°	1.2°	153.94	22	18	29	130	26
14 x 10 x 8*	S	S	.75	.375	.5	3.6°	2°	201.46	30	19	29	S	S	.375	.188	.3	1.8°	1.2°	153.94	32	19	29	130	26
14 x 10 x 10*	X	X	.75	.375	.5	3.6°	2°	201.46	31	19	30	X	X	.375	.188	.3	1.8°	1.2°	153.94	25	19	33	130	26
14 x 12 x 8*	S	S	.75	.375	.5	3.3°	2°	227.40	32	23	27	S	X	.375	.188	.3	1.7°	1.2°	153.94	33	23	27	130	26
16 x 10 x 8*	S	X	.75	.375	.5	3.3°	2°	227.40	31	21	36	S	X	.375	.188	.3	1.7°	1.2°	201.06	31	21	36	110	26
16 x 10 x 10*	X	S	.75	.375	.5	3.3°	2°	227.40	34	21	39	X	X	.375	.188	.3	1.7°	1.2°	201.06	35	21	39	110	26
16 x 12 x 8*	S	X	.75	.375	.5	3.1°	2°	254.92	36	25	36	S	S	.375	.188	.3	1.5°	1.2°	201.06	39	25	36	110	26
16 x 14 x 8*	S	X	.75	.375	.5	2.9°	2°	284.00	38	26	37	S	S	.375	.188	.3	1.4°	1.2°	201.06	42	26	37	110	26
18 x 12 x 8*	S	X	.75	.375	.5	2.9°	1°	284.00	37	26	37	S	X	.375	.188	.3	1.4°	0.6°	254.47	37	26	37	110	26
18 x 12 x 12*	X	X	.75	.375	.5	2.9°	1°	284.00	41	27	42	X	X	.375	.188	.3	1.4°	0.6°	254.47	41	27	42	110	26
18 x 14 x 8*	S	X	.75	.375	.5	2.7°	1°	314.65	41	27	37	X	S	.375	.188	.3	1.3°	0.6°	254.47	41	27	37	110	26
18 x 16 x 8*	S	X	.75	.375	.5	2.5°	1°	346.88	40	29	34	X	S	.375	.188	.3	1.2°	0.6°	254.47	40	29	34	110	26

For Sizes Not Shown: I.D. x I.D. • U-Type, Double or Triple Arch • Contact Factory for Proco Series 100.

PROCO EXPANSION JOINTS

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NATIONWIDE AND CANADA

INTERNATIONAL

NOTES: *This length meets length required by ANSI B-16, B-16.24 and B-16.5. Lengths of all sizes meet F.S.A. specifications.

1. The amount of Angular Movement is based on the maximum allowable Extension Movement from Neutral. Angular Movement can be increased, if it is in conjunction with Compression Movement.
2. Torsional Movement is expressed when the expansion joint is at Neutral.
3. To determine End-Thrust: multiply Thrust Factor by operating pressures of system. This total is End Thrust in P.S.I.G.
4. Pressure rating is based on 170°F Operating Temperature. At higher temperatures, the pressure is slightly reduced. Minimum Burst Pressures is 4:1.

Distributed by:

Rev 11/99

PROCO™ RE SERIES

eccentric reducer expansion joints

The PROCO Series RE-221 Rubber Eccentric Reducer Expansion Joint, often called a "Taper", serves as a reducing element to transition from one pipe size to another. Eccentric in design, the rubber expansion joint body tapers on one side transitioning two different flange sizes. Eccentric Reducer Expansion Joints are often located on the suction side of a pump to reduce cavitation. The PROCO Rubber Eccentric Reducer is engineered to replace metallic or rubber-lined reducers used to provide unequal diameter connections of: piping and/or operating equipment applications such as: Pumps, Chillers, Cooling Towers, Compressors, Blowers, Fans, Absorption Machines, etc. Installed next to mechanical equipment or between the anchor points of a piping system, specify the PROCO Series RE-221 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 RE-221 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-Waste-water-Sewage and Pollution Control Systems, where metallic reducers used in conjunction with metal hose or expansion joints may have been previously used or specified. Our history in manufacture of expansion joint products dates back to 1930. PROCO Products is a member of the Rubber Expansion Joint Division, Fluid Sealing Association. When a rubber expansion joint is needed to solve a piping system problem, call PROCO.

Traditional design when using a metallic reducer incorporates the use of a flexible element such as an expansion joint or metal hose to absorb the vibrations and movements of the system. The PROCO Series RE-221 Reducer combines the basic shape and dimensions of the metal reducer and the movement-sound reduction vibration-absorbing features of a flexible element into one unit. Here are some of the many advantages:

- **Less System Installation Space:**

  The PROCO RE-221 replaces a metal reducer and a flexible element. Thus less space is required and valves of other equipment can be more conveniently located.

- **Less Installation Cost:**

  The PROCO RE-221 costs less then the metal reducer and flexible element that are replaced. Additionally, standard joints (as listed in Table 1 and the "stock" section in Table 2) can be shipped same day as order placement.

Engineered For Your Application: The PROCO Eccentric Reducer materials consist of rubber and fabric which are formed and cured in a heated compression mold using an exclusive high-pressure press. The thick outer-cover and interior-tube are of an elastomer especially compounded to satisfy the Chemical-Temperature requirement of your application. Available styles include:

- **Style RE-221:**
  Features one Open Arch for maximum movement, and good noise-vibration control. Our most popular style. (See Figure 1)
- **Style-REFA-221:**
  Features one Filled Arch, is generally specified for slurry or abrasive services. Provides noise and vibration control but less movement than Style RE-221. (See Figure 2)

Table 1: Available Styles • Materials • Temperatures • Stock

For Specific Elastomer Recommendations, See: PROCO™ "Chemical to Elastomer Guide"

Style Numbers		PROCO™ Material Code	Type of Elastomer		Maximum[4] Operating Temp. °F	PROCO™ Branding Label Color	F.S.A. Material Class
RE-221	REFA-221		Cover/ Outside	Tube/ Insi de			
S	S	/BB	Butyl	Butyl	250°	Black	Special II
X	X	/EE	EPDM	EPDM	250°	Red	Special II
X	X	/NH	Neoprene	Hypalon[1]	230°	Green	Standard II
X[7]	X[7]	/NN[3]	Neoprene	Neoprene	230°	Blue	Standard II
X	X	/NP	Neoprene	Nitrile	230°	Yellow	Standard II
X	X	/NR	Neoprene	Natural[2]	180°	White	Standard I

NOTES: 1. Hypalon is a trademark of E.I. DuPont Dow Elastomers
2. Filled Arch is Tan-Gum, Open Arch is Black-Natural.
3. Material NN meets all requirements of U.S.C.G.
4. In applications where pressure is less than 15 PSIG, temperature may be increased.
5. All products are reinforced with synthetic fabric plies.
6. Material Availability: X=Special Order, S=Standard Stock.
7. Certain sizes in stock, call for availability.
8. To Order, provide: 1. Size (I.D. x I.D. x Length), 2. Style Number, 3. Material Code.

Absorbs Pipe-Wall And Fluid-Borne Noise. The PROCO quiet-operating Series RE-221 is a replacement for "sound transmitting" metallic reducers. Pipe-Wall sound loses energy and is absorbed as the noise carried by the piping enters and exits 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 RE-221. Rubber connectors should be installed right after and ahead of the equipment generating the vibration, thus isolating the equipment. 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 also acceptable as the PROCO Reducer will accept both axial and lateral movements and vibration. Installations of the Series RE-221 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 or rubber lined reducers for chemical service can be replaced with the PROCO Rubber Reducer. Fabricated with low-cost chemical resistant elastomers such as: Chlorobutyl, EPDM, Hypalon, Neoprene and Nitrile; insures a rubber connector compatible with the fluid being pumped or piped. (See Table 1) Our Neoprene, Natural/Gum and filled arch 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 Reducer. The PROCO Style RE-221 adds a flexible component that is automatically self-correcting for misalignment created by structural movements caused by setting, expansion or ground shifts.

Flange And Retaining Ring Drilling. All PROCO rings are coated to prevent corrosion and dimensionally drilled to ANSI 125/150# standards. In accordance with ANSI, all bolt hole pairs are "straddle" the center line. Hole drilling on center line, other drilling standards or materials such as: 304 or 316 Stainless and Bronze are available on special order.

Less Turbulence Or Material Entrapment. The molded integral flange of the PROCO Rubber Reducer 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 this edge angle. The resulting void can create flow turbulence, allow for material entrapment and/or bacteria growth. Avoid these problems by specifying PROCO.

Exclusive Sealing Bead Means A Quick Seal. We have built an "O-Ring" on each flange-face of the Series RE-221. Available only from PROCO, our product seals faster with less torque at installation and less long-term maintenance. For exclusive design features, specify PROCO.

High Pressure With Full Safety Factors. We have assigned conservative pressure ratings to the Series RE-221. However, the ratings meet or exceed the requirements of the Rubber Expansion Joint Division, Fluid Sealing Association, for Series A, B, and C. More importantly, our conservative ratings are fully tested and based on a minimum four-to-one safety factor. With competitive products the safety factor is often calculated or unknown. For pressure protection, specify PROCO.

Visit Our Website:http://www.procoproducts.com
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Protecting Piping And Equipment Systems From Stress/Motion

Water Environment Federation

Fluid Sealing Association FSA

NAPHAD

eccentric reducer expansion joints

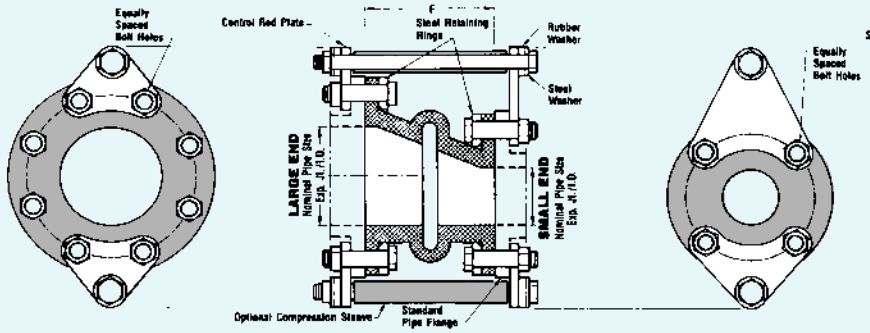

Figure 1: Style RE-221
Single Open Arch

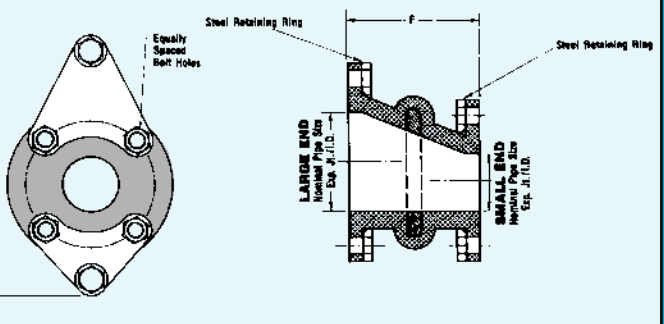

Figure 2: Style REFA-221
Single Filled Arch

Table 2: Sizes • Movements • Pressures • Weights

Eccentric Joint Size	Stock		RE-221 Open Arch Capacity: From Neutral Position						Weight/Pounds			Stock		REFA-221 Filled Arch Capability: From Neutral Position						Weight/Pounds			Pressure	
	/BB Butyl	/NN Neoprene	Axial Compression	Axial Extension	±Lateral Deflection	±Angular Deflection[1]	Torsional Movement[2]	Thrust Factor[3]	Expansion Joint	Retaining Ring Set	Control Rod Set	/BB Butyl	/NN Neoprene	Axial Compression	Axial Extension	±Lateral Deflection	±Angular Deflection[1]	Torsional Movement[2]	Thrust Factor[3]	Expansion Joint	Retaining Ring Set	Control Rod Set	Positive Pressure	Vacuum
I.D. x I.D. x Length			Inches	Inches	Inches	Degree	Degree		Open Arch					Inches	Inches	Inches	Degree	Degree		Filled Arch			PSIG	In. Hg
2 x 1 x 6*	X	X	.5	.25	.5	18.4°	3°	12.69	3	3	6	X	X	.25	.125	.3	9.5°	1.8°	3.14	3	3	6	200	26
2 x 1.5 x 6*	S	X	.5	.25	.5	15.9°	3°	14.32	3	3	6	X	X	.25	.125	.3	8.1°	1.8°	3.14	3	3	6	200	26
2.5 x 1.5 x 6*	S	X	.5	.25	.5	14.0°	3°	16.04	3	3	7	X	S	.25	.125	.3	6.4°	1.8°	4.97	3	3	7	200	26
3 x 1.5 x 6	S	X	.5	.25	.5	12.5°	3°	17.87	4	4	7	X	X	.25	.125	.3	6.4°	1.8°	7.06	4	4	7	200	26
3 x 2 x 6*	S	S	.5	.25	.5	11.3°	3°	19.79	4	4	7	S	S	.25	.125	.3	5.7°	1.8°	7.06	4	4	7	200	26
3 x 2.5 x 6*	S	X	.5	.25	.5	10.3°	3°	21.81	5	5	7	X	X	.25	.125	.3	5.2°	1.8°	7.06	5	5	7	200	26
4 x 2 x 6*	S	S	.5	.25	.5	9.5°	3°	23.93	5	5	7	S	X	.25	.125	.3	4.8°	1.8°	12.57	5	5	7	200	26
4 x 2 x 8	S	X	.5	.25	.5	9.5°	3°	23.93	6	5	7	X	X	.25	.125	.3	4.8°	1.8°	12.57	6	5	7	200	26
4 x 2 x 9*	X	X	.5	.25	.5	9.5°	3°	23.93	6	5	7	X	X	.25	.125	.3	4.8°	1.8°	12.57	6	5	7	200	26
4 x 2.5 x 6*	S	X	.5	.25	.5	8.7°	3°	26.14	6	6	8	X	S	.25	.125	.3	4.4°	1.8°	12.57	6	6	8	200	26
4 x 2.5 x 8*	X	X	.5	.25	.5	8.7°	3°	26.14	6	6	8	X	X	.25	.125	.3	4.4°	1.8°	12.57	6	6	8	200	26
4 x 3 x 6*	S	S	.5	.25	.5	8.1°	3°	28.46	6	6	8	S	S	.25	.125	.3	4.1°	1.8°	12.57	6	6	8	200	26
4 x 3 x 7	S	X	.5	.25	.5	8.1°	3°	28.46	6	6	8	X	X	.25	.125	.3	4.1°	1.8°	12.57	6	6	8	200	26
5 x 4 x 6*	S	X	.5	.25	.5	6.3°	3°	38.70	9	7	10	X	X	.25	.125	.3	3.2°	1.8°	19.63	11	7	10	190	26
6 x 3 x 6	S	X	.5	.25	.5	6.3°	3°	38.70	8	7	12	S	S	.25	.125	.3	3.2°	1.8°	28.27	9	7	12	190	26
6 x 3 x 8	X	X	.5	.25	.5	6.3°	3°	38.70	9	7	13	X	X	.25	.125	.3	3.2°	1.8°	28.27	11	7	13	190	26
6 x 3 x 12*	S	S	.5	.25	.5	6.3°	3°	38.70	10	7	14	S	S	.25	.125	.3	3.2°	1.8°	28.27	13	7	14	190	26
6 x 4 x 6*	S	X	.5	.25	.5	5.7°	3°	44.41	8	7	11	X	X	.25	.125	.3	2.9°	1.8°	28.27	8	7	11	190	26
6 x 4 x 7	S	X	.5	.25	.5	5.7°	3°	44.41	9	7	12	X	X	.25	.125	.3	2.9°	1.8°	28.27	11	7	12	190	26
6 x 4 x 8	S	X	.5	.25	.5	5.7°	3°	44.41	9	7	11	X	X	.25	.125	.3	2.9°	1.8°	28.27	11	7	11	190	26
6 x 4 x 9	S	X	.5	.25	.5	5.7°	3°	44.41	10	7	11	X	X	.25	.125	.3	2.9°	1.8°	28.27	12	7	11	190	26
6 x 5 x 6*	S	S	.5	.25	.5	5.2°	3°	50.51	8	8	11	S	S	.25	.125	.3	2.6°	1.8°	28.27	9	8	11	190	26
8 x 4 x 6	S	X	.75	.375	.5	7.1°	3°	63.51	8	8	19	X	X	.375	.188	.3	3.6°	1.8°	50.27	9	9	19	190	26
8 x 4 x 15*	X	X	.75	.375	.5	7.1°	3°	63.51	11	9	23	X	X	.375	.188	.3	3.6°	1.8°	50.27	11	9	23	190	26
8 x 6 x 6*	S	S	.75	.375	.5	6.1°	3°	78.42	11	10	18	X	S	.375	.188	.3	3.1°	1.8°	50.27	11	10	18	190	26
8 x 6 x 8	S	X	.75	.375	.5	6.1°	3°	78.42	14	10	18	X	X	.375	.188	.3	3.1°	1.8°	50.27	15	10	18	190	26
8 x 6 x 11	S	X	.75	.375	.5	6.1°	3°	78.42	19	10	20	X	X	.375	.188	.3	3.1°	1.8°	50.27	22	10	20	190	26
10 x 6 x 12	S	X	.75	.375	.5	5.4°	3°	94.90	23	11	28	X	X	.375	.188	.3	2.8°	1.8°	78.54	26	11	28	190	26
10 x 6 x 15*	X	X	.75	.375	.5	5.4°	3°	94.90	25	11	31	X	X	.375	.188	.3	2.8°	1.8°	78.54	29	11	31	190	26
10 x 8 x 8	S	X	.75	.375	.5	4.8°	3°	112.95	19	13	25	S	X	.375	.188	.3	2.4°	1.8°	78.54	22	13	25	190	26
10 x 8 x 9*	X	X	.75	.375	.5	4.8°	3°	112.95	19	13	25	X	X	.375	.188	.3	2.4°	1.8°	78.54	22	13	25	190	26
10 x 8 x 12	X	X	.75	.375	.5	4.8°	3°	112.95	20	13	25	X	X	.375	.188	.3	2.4°	1.8°	78.54	23	13	25	190	26
12 x 6 x 12*	X	X	.75	.375	.5	4.8°	3°	112.95	27	15	31	X	X	.375	.188	.3	2.4°	1.8°	113.10	29	15	31	190	26
12 x 8 x 8	X	S	.75	.375	.5	3.9°	3°	153.77	24	18	24	X	S	.375	.188	.3	1.9°	1.8°	113.10	25	18	24	190	26
12 x 8 x 12	S	S	.75	.375	.5	3.9°	3°	153.77	24	18	24	S	S	.375	.188	.3	1.9°	1.8°	113.10	25	18	24	190	26
12 x 10 x 8*	S	X	.75	.375	.5	3.9°	3°	153.77	24	18	24	S	S	.375	.188	.3	1.9°	1.8°	113.10	25	18	24	190	26
12 x 10 x 9*	X	X	.75	.375	.5	3.9°	3°	153.77	25	18	24	X	X	.375	.188	.3	1.9°	1.8°	113.10	27	18	24	190	26
12 x 10 x 14	S	X	.75	.375	.5	3.9°	3°	153.77	30	18	26	X	X	.375	.188	.3	1.9°	1.8°	113.10	34	18	26	190	26
14 x 10 x 8	S	X	.75	.375	.5	3.6°	2°	201.46	36	19	29	X	S	.375	.188	.3	1.8°	1.2°	153.94	38	19	29	130	26
14 x 10 x 15*	X	X	.75	.375	.5	3.6°	2°	201.46	42	19	33	X	X	.375	.188	.3	1.8°	1.2°	153.94	45	19	33	130	26
14 x 12 x 8*	S	X	.75	.375	.5	3.3°	2°	227.40	40	23	27	X	X	.375	.188	.3	1.7°	1.2°	153.94	40	23	27	130	26
14 x 12 x 9*	X	X	.75	.375	.5	3.3°	2°	227.40	41	23	28	X	X	.375	.188	.3	1.7°	1.2°	153.94	42	23	28	130	26
16 x 14 x 8*	S	X	.75	.375	.5	2.9°	2°	284.00	36	26	37	S	X	.375	.188	.3	1.4°	1.2°	201.06	40	26	37	110	26
16 x 14 x 9*	X	X	.75	.375	.5	2.9°	2°	284.00	39	26	37	X	X	.375	.188	.3	1.4°	1.2°	201.06	41	26	37	110	26
18 x 14 x 8	S	X	.75	.375	.5	2.5°	1°	346.88	43	29	34	S	X	.375	.188	.3	1.2°	0.6°	254.47	43	29	34	110	26
18 x 16 x 10*	X	X	.75	.375	.5	2.5°	1°	346.88	44	29	35	X	X	.375	.188	.3	1.2°	0.6°	254.47	45	29	35	110	26

For Sizes Not Shown: I.D. x I.D. • U-Type, Double or Triple Arch • Contact Factory for Proco Series 100.

NOTES: *This length meets length required by ANSI B-16, B-16.24 and B-16.5. Lengths of all sizes meet F.S.A. specifications.

1. The amount of Angular Movement is based on the maximum allowable Extension Movement from Neutral. Angular Movement can be increased, if it is in conjunction with Compression Movement.
2. Torsional Movement is expressed when the expansion joint is at Neutral.
3. To determine End-Thrust: multiply Thrust Factor by operating pressures of system. This total is End Thrust in P.S.I.G.
4. Pressure rating is based on 170° F Operating Temperature. At higher temperatures, the pressure is slightly reduced. Minimum Burst Pressures is 4:1.

PROCO EXPANSION JOINTS

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Rev. 11/99