The 700 Series Diaphragm Seals

Performance Data

This series of seal is an all welded construction which allows removal from the system without loss of fill fluid. The construction conforms to methods as described in the ASME standard B40.2, section 2.3.12. The standard upper housing is classified as Continuous Duty (see para. 2.3.2.1, ASME B40.2).

Diaphragms with a diameter of 1.4",1.9", and 2.4" (35.56, 48.26 and 60.96mm) are utilized in this series. See Table 700.1 for displacement curves and nominal ratings.

Table 700.2 indicates the volume of fill fluid within the body cavity based on 1/2" engagement of the fitting in the instrument connection. This data is provided for error calculation attributed to expansion and contraction of fill fluids under varying temperature conditions.

The filling method for this series is as defined in ASME B40.2 section 2.9.3.1.

Table 700.2 Internal Volume

Instrument connection (See Note 1)					Cubic Inches
1/4" NPTF	(6.35mm)	1.4" (35.56mm)	Diaphragm		0.171
1/2" NPTF	(12.70mm)	1.4" (35.56mm)	Diaphragm		0.410
1/4" NPTF	(6.35mm)	1.9" (48.26mm)	Diaphragm		0.187
1/2" NPTF	(12.70mm)	1.9" (48.26mm)	Diaphragm		0.420
1/4" NPTF	(6.35mm)	2.4" (60.96mm)	Diaphragm		0.220
1/2" NPTF	(12.70mm)	2.4" (60.96mm)	Diaphragm		0.444
1/4" NPTF	(6.35mm)	3.0" (76.20mm)	Diaphragm	2" Extension	0.248
1/2" NPTF	(12.70mm)	3.0" (76.20mm)	Diaphragm	2" Extension	0.329
1/4" AMINCO	(6.35mm)	3.0" (76.20mm)	Diaphragm	2" Extension	0.172
1/4" NPTF	(6.35mm)	3.0" (76.20mm)	Diaphragm	6" Extension	0.284
1/2" NPTF	(12.70mm)	3.0" (76.20mm)	Diaphragm	6" Extension	0.361
1/4" AMINCO	(6.35mm)	3.0" (76.20mm)	Diaphragm	6" Extension	0.173

Notes:

1. NPTF - as noted in subsequent sections refers to the American National Standard Dryseal Pipe Threads (ASME/ANSI B1.20.3) and applies to both internal and external threads. Although this type of pipe thread is theoretically designed to seal without the use of a sealant/lubricant, the use of one is necessary to achieve a truly leak free joint in practical applications.
2. Graph Interpretation (Displacement Bias vs. Displacement Volume): Displacement Bias versus displacement volume graphs are provided to aid the user in the selection of a diaphragm seal having minimal full span displacement bias effects. (Refer to Thermal Bias Calculation Section for additional information). **Note - This graph is not a representation of the maximum full span capability of the user's instrument.**

As indicated by the graph, the displacement bias associated with the diaphragm spring rate is proportional to the instrument's required volumetric displacement. Instruments requiring less displacement will have a lower displacement bias. The maximum displacement capability of the diaphragm seal is specified for each series (i.e., 700C) in subsequent sections of the catalog. The required volumetric displacement of the user's instruments should be below the stated maximum.

Example:
An instrument has a maximum full span displacement of 0.03 cubic inches. What is the full span displacement bias associated with the diaphragm spring rate, in inches of water, for a 2.40" diameter diaphragm?

From the graph in Table 700.2.4":
An instrument with a full span displacement of 0.03 cubic inches has a maximum displacement bias of ±29 H_2O.

Table 700.1 - 1.4" (Note 2)

Pressure vs. Displacement
1.400" Diameter Diaphragm

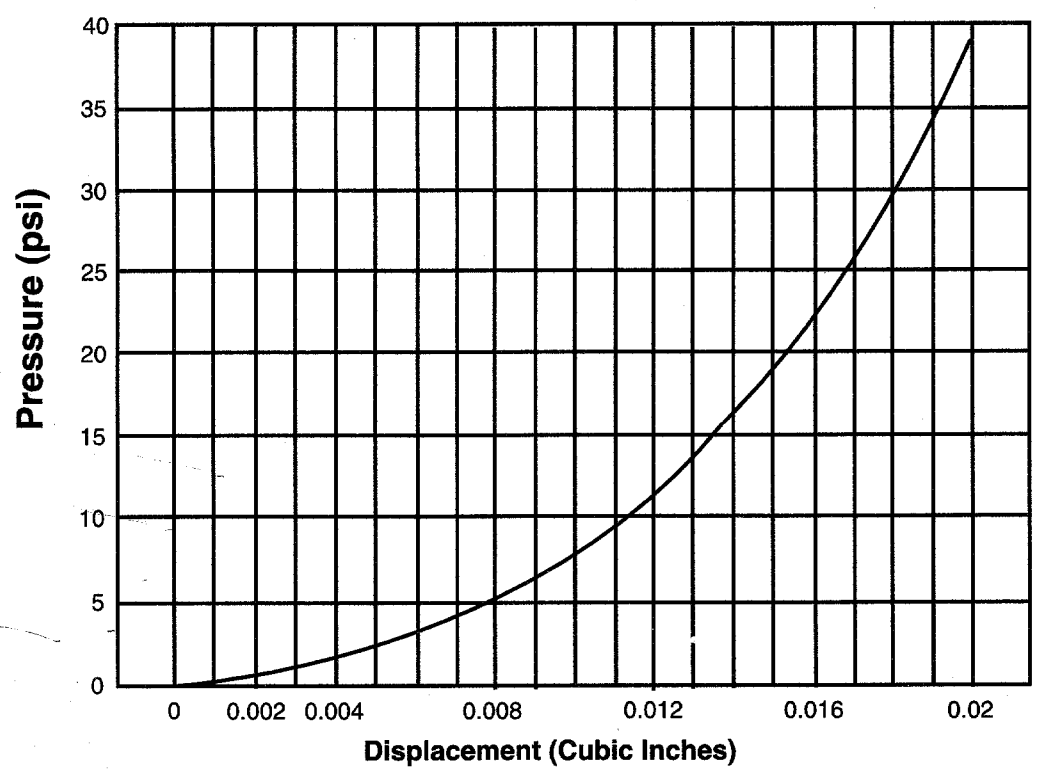

Table 700.1 - 1.9" (Note 2)

Pressure vs. Displacement
1.900" Diameter Diaphragm

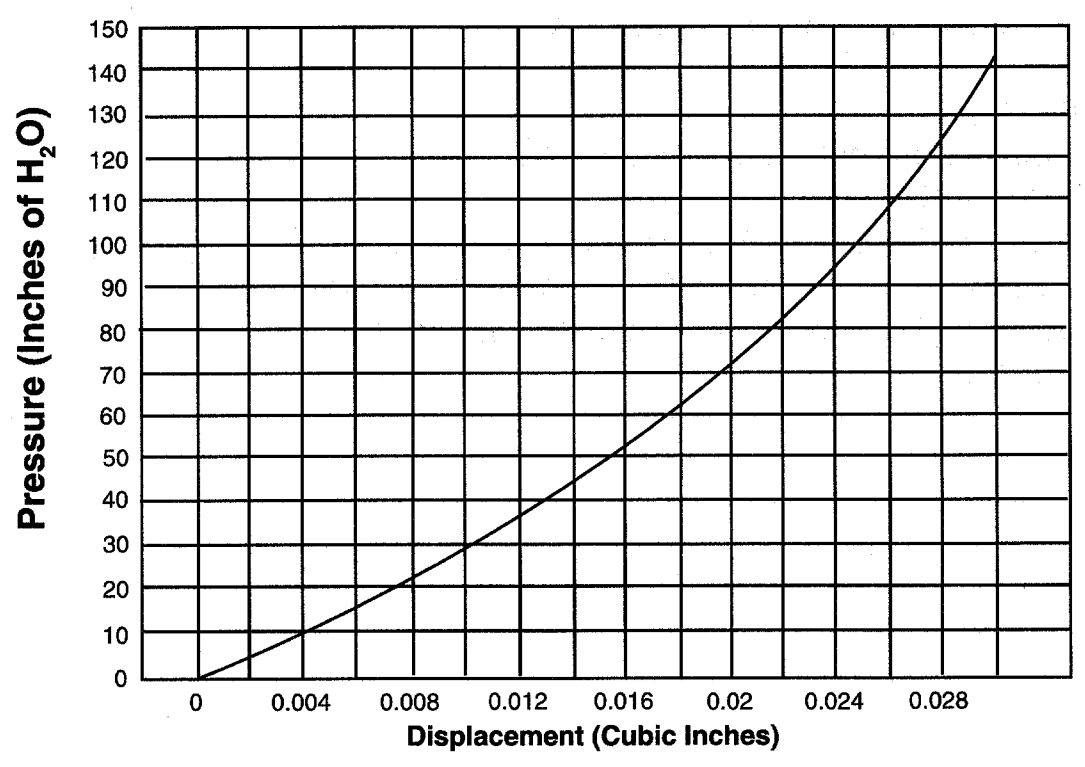

Table 700.1 - 2.4" (Note 2)

Pressure vs. Displacement
2.400" Diameter Diaphragm

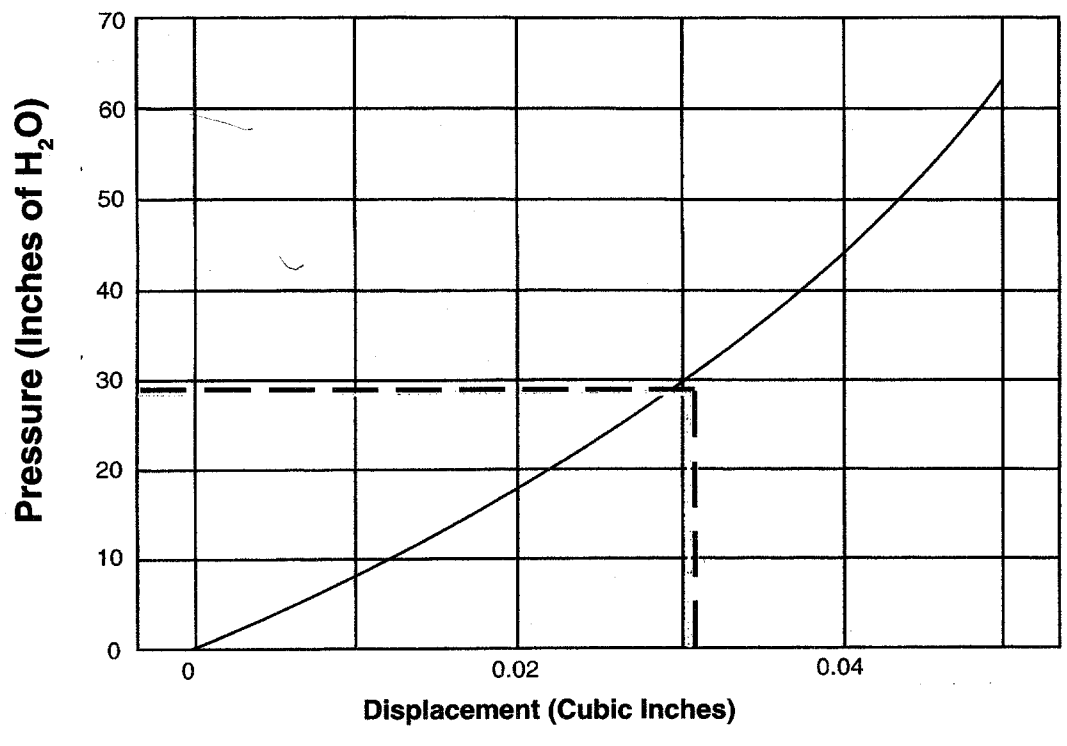

Table 700.1 - 3.0" (Note 2)

Displacement Bias vs. Displacement Volume
3.00" Diameter Diaphragm