

MINIMUM AND MAXIMUM PRESSURES FOR DIAPHRAGM SEALS

PIP #: DS-PI-82

Applicable to:
Diaphragm
Seals and
Isolation Rings

Diaphragm Seal and Isolation Ring Displacement Guide

To ensure that a diaphragm seal properly transmits pressure, the seal’s diaphragm must provide sufficient displacement to drive the sensing element of the instrument(s) attached. As a general guideline, the lower the pressure to be measured, the larger the sensing elements are. Therefore, each diaphragm’s maximum displacement will correspond to a minimum span for a given class of instrument.

Table 1 below provides a simple lookup for the minimum span allowable for pressure instruments when attached to different diaphragm seal models. Contact Ashcroft for guidance when attaching multiple instruments to a single diaphragm seal. It is important to note that unless otherwise noted, the values found within the tables are minimum and maximum spans, not ranges. For example, both a 30 psi gauge and a Vac/15 psi gauge have the same overall span of 30 psi.

Model	Material	2.5" and 3.5" Gauges	4.5" and Larger Gauges		Low Pressure Gauges	Low Pressure Gauges	Differential Gauges		Digital Gauges and Transducers	Switches	
		1009, 1290	Duragauge, 1009	1259, 1209, T5500, T6500	1187, 1188, 1189	P5500, P6500	5503	1132	DG25, 2X74, A2, etc.	All switches (values refer to minimum setpoint)	
100, 200, 300, 400, 500 –Series	Metallic Diaphragms	15 psi	30 psi	30 psi	N/A	N/A	N/A	N/A	15 psi	6 psi	
	Viton and Kalrez Diaphragms	15 psi	15 psi	15 psi	10 IWC	N/A	10 psid	30 psid	15 psi	10 IWC (B-series) 20 IWC (all others)	
	PTFE diaphragms	15 psi	15 psi	15 psi	N/A	N/A	N/A	N/A	15 psi	6 psi	
700-Series	Metallic Diaphragm	15 psi	15 psi	15 psi	30 IWC (VAC ranges N/A)	N/A	60 IW (3 psi)*	N/A	15 psi	30 IWC	
510/511-Series	Metallic Diaphragm	30 psi	30 psi	15 psi	N/A	N/A	N/A	N/A	15 psi	6 psi	
		100 psi (XHP)	100 psi (XHP)	100 psi (XHP)							
330 Flush Mini Seal	Metallic Diaphragm	60 psi	N/A	N/A	N/A	N/A	N/A	N/A	15 psi	6 psi	
310/315 Mini Seal	Metallic Diaphragm	15 psi	N/A	N/A	N/A	N/A	N/A	N/A	15 psi	6 psi	
311/312 Midi Seal	Metallic Diaphragm	15 psi	30 psi	30 psi	N/A	N/A	N/A	N/A	15 psi	6 psi	
320 Tri-clamp Seal	Metallic Diaphragm	15 psi	15 psi (2" only)	15 psi (2" only)	N/A	N/A	N/A	N/A	15 psi	6 psi	
80, 81, 82	Elastomeric	15 psi	15 psi	15 psi	N/A	N/A	N/A	N/A	15 psi	6 psi	
Isolation Rings											
DF Seals	1"	Metallic Diaphragms	160 psi	160 psi	160 psi	N/A	N/A	N/A	N/A	15 psi	6 psi
	1½"		60 psi	60 psi	60 psi	N/A	N/A	N/A	N/A	15 psi	6 psi
	2"+		15 psi	15 psi	15 psi	N/A	N/A	N/A	N/A	15 psi	6 psi
P5500/P6500	Integral Metallic Diaphragm	N/A	N/A	N/A	N/A	10 IWC	N/A	N/A	N/A	N/A	

Table 1 - Minimum Pressures for Diaphragm Seals

*Refer to 5503 datasheet for special ordering requirements for ranges less than 10 psi.

Diaphragm Seal and Isolation Ring Maximum Allowable Working Pressures

Table 2 below contains the maximum pressures for the various types of seals. Instruments attached to a seal must have a range less than or equal to the seal’s maximum pressure.

	Seal Model	Diaphragm and Lower Housing Material	MAWP	MAWP with XHP Option
Threaded, Clamped, and Weld-in Seals	100, 101, 200, 201, 300, 301, 104, 204, 105, 205, 107, 207, 108, 208	All-metallic construction	2,500 psi	5,000 psi*
		Viton or Kalrez Diaphragm	500 psi	N/A
		PTFE diaphragm	2,500 psi	N/A
		PVC or PVDF lower housing	200 psi	N/A
	400		2,500 psi	9,000 psi**
	401		2,500 psi	5,000 psi
	500, 501		500 psi	N/A
	510		1,500 psi	10,000 psi
	511		1,500 psi	5,000 psi
	311/312		1,000 psi	N/A
	310/315		2,500 psi	N/A
	740/741		750 psi	N/A
	330		3,000 psi	N/A
320		Per clamp mfr.	N/A	
Flanged Seals	102, 103, 106, 202, 203, 206, 302, 303	All-metallic construction	Per ASME B16.5 Flange Class	
		Viton or Kalrez Diaphragm	Lower of 500 psi or ASME B16.5 Flange Class	
		PTFE diaphragm	Lower of 2,500 psi or ASME B16.5 Flange Class	
		PVDF lower housing	Lower of 200 psi or ASME B16.5 Flange Class	
		PVC lower housing	Lower of 75 psi or ASME B16.5 Flange Class	
		PTFE lower housing	Lower of 270 psi or ASME B16.5 Flange Class	
	402/403, DF		Per ASME B16.5 Flange Class	
702/703		Lower of 750 psi or ASME B16.5 Flange Class		
Isolation Rings	80 and 81 Flanged Isolation Rings		Per ASME B16.5 Flange Class	
	82 Threaded Isolation Rings		150 psi	

Table 2 – Maximum Pressures for Diaphragm Seals

*5000 psi MAWP applies only to 100,101, 200, 201 Seals. XHP not applicable to others.

**5000 psi when combined with XSE option