HIGH ACCURACY THREADED DIAPHRAGM SEALS

Reotemp's High Accuracy and High Displacement Threaded Diaphragm Seals are ideal for applications where high sensitivity or large fluid displacement is key to proper instrument performance. Designed with a diaphragm welded to the upper housing, the lower housing is detachable from the seal body allowing for easy clean-out of the process cavity without losing system fill. The High Accuracy Threaded Diaphragm Seal is most commonly mounted to Smart Transmitters (Gauge, Differential, and Absolute pressure), low pressure capsule gauges, mechanical DP gauges, and mechanical pressure switches.

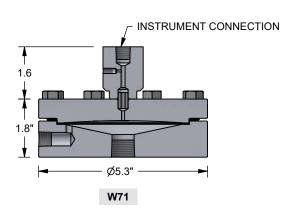


FEATURES / BENEFITS

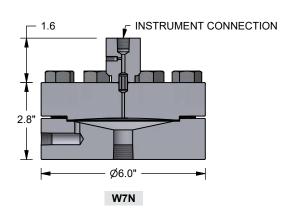
- Extra Large 4.1" Diaphragm for Maximum Sensitivity
- · Wide Variety of Wetted Material Options
- 100% Helium Leak Tested Diaphragm Welds
- Easy Cleanout Design with Multiple Flush Port Options

SPECIFICATIONS							
Diaphragm	316/316L SS, Hast C-276, Tantalum, Monel A400, Nickel 201, or Others						
Lower Housing	,	last C-276, Mone 3, 304/304L SS,	,				
Gasket	See Gasket Sel	ection Guide p.8	35				
Upper Housing	,	316/316L SS, 304/304L SS, Monel A400, Titanium, or Others					
Process Temperature Limits	Maximum Temperature 750°F, See Gasket Selection Guide p.85, Fill Fluid Guide Page 90, and Instrument Mounting Configurations Page 84 for exact Temperature Limits						
Ambient Temperature Limits	Determined by	the pressure inst	trument.				
Minimum	2.5" & 3.5	30" H ₂ O					
Recommended Span	4", 4.5", &	30" H ₂ O					
	Transmitter (G	auge Pressure)	15" H ₂ O				
	Transmitter (Diffe	Transmitter (Differential Pressure)					
	Differential Pr (D40/42/	100" H ₂ O					
Weight	W71	11.5lbs					
	W7N 23lbs						
	W/N	23108					

HIGH ACCURACY THREADED DIAPHRAGM SEALS



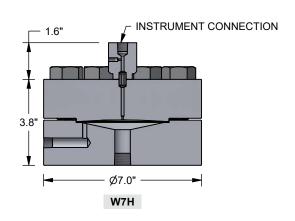
W71 Maximum Working Pressure (All Pressure in psi)										
Process Temperature (°F)	Grade 8 Bolts	316SS Bolts	NACE B7M Bolts	316SS B8M SH Bolts						
100	1500	750	1290	1290						
200	1290	645	1110	1110						
300	1165	585	1000	1000						
400	1070	535	920	920						
500	995	500	855	855						
600	940	470	805	805						
650	920	460	790	790						
700	905	455	780	780						
750	890	445	765	765						



	W7N Maximum Working Pressure (All Pressure in psi)											
Process Temperature (°F)	Grade 8 Bolts	316SS Bolts	NACE B7M Bolts	316SS B8M SH Bolts								
100	4000	2000	3500	3500								
200	3440	1720	3010	3010								
300	3105	1555	2720	2720								
400	2850	1430	2495	2495								
500	2650	1330	2320	2320								
600	2500	1255	2185	2185								
650	2450	1230	2140	2140								
700	2410	1210	2105	2105								
750	2365	1190	2065	2065								

Note: All drawings depict a single 1/4" NPT Flush Port (optional). Drawing are not to scale. Contact Reotemp customer service for more detailed drawings. All dimensions are nominal

HIGH ACCURACY THREADED DIAPHRAGM SEALS

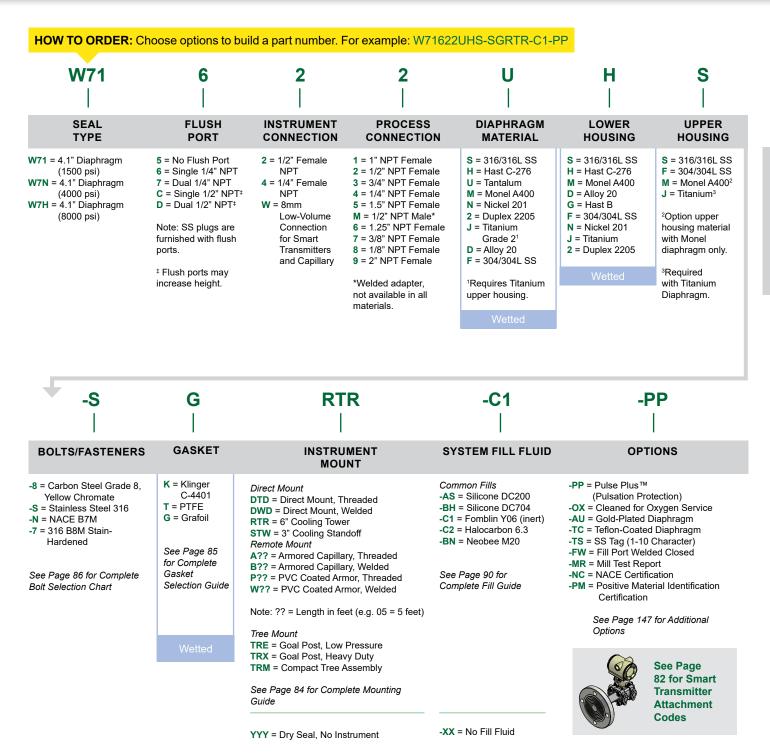


Note: All drawings depict a single 1/4" NPT Flush Port (optional). Drawing are not to scale. Contact Reotemp customer service for more detailed drawings. All dimensions are nominal

W7H Maximum Working Pressure (All Pressure in psi)										
Process Temperature (°F)	Grade 8 Bolts	316SS Bolts	NACE B7M Bolts	316SS B8M SH Bolts						
100	8,000	4,000	7,000	7000						
200	6,885	3,440	6,025	6,025						
300	6,220	3,105	5,440	5,440						
400	5,710	2,850	4,995	4,995						
500	5,315	2,650	4,645	4,645						
600	5,010	2,500	4,380	4,380						
650	4,910	2,450	4,295	4,295						
700	4,830	2,410	4,225	4,225						
750	4,740	2,365	4,150	4,150						

Threaded Series W7

HIGH ACCURACY THREADED DIAPHRAGM SEALS



Diaphragm Seals

INSTRUMENT MOUNTING CONFIGURATIONS

DIRECT MOUNT

Direct Mounting a pressure gauge, switch, or transmitter is the most common diaphragm seal assembly.



- Allows Replaceability
- High Quality Thread Sealant
- Inspector Seal



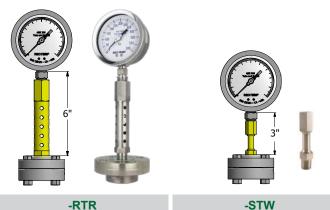
- Tamper Proof
- · Rated for High Temps
- Leak Resistant

Code	Description	Max. Temp
-DTD	Threaded Instrument Connection	400°F
-DWD	Welded Instrument Connection	600°F

Assembly Notes: Welded connection recommended for pressure exceeding 1,500 psi for purposes of leak prevention.

COOLING ELEMENTS

Used in either high temp or cold temp applications, Cooling Elements mounted above diaphragm seals quickly normalize fluid temperature toward ambient. This protects the pressure instrument while still maintaining the convenience of a direct mount.

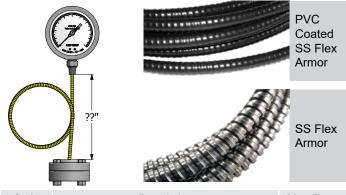


Code	Description	Max. Temp
-RTR	6" Cooling Tower	750°F
-STW	3" Cooling Standoff	600°F

Assembly Notes: Cooling elements are welded to diaphragm seal. Instruments are threaded to cooling element unless specified. All lengths are nominal.

REMOTE MOUNT

Remote Mounting a pressure instrument using flexible capillary is a common mounting method when the point of measurement is in a hazardous or inconvenient location.

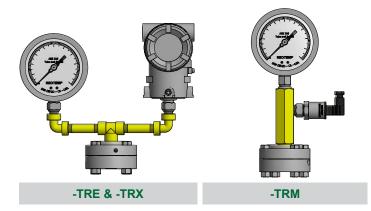


Code	Description	Max. Temp					
-P??	PVC Coated SS Armor, Threaded to Seal	400°F					
-W??	PVC Coated SS Armor, Welded to Seal	600°F					
-A??	SS Flexible Armor, Threaded to Seal	400°F					
-B??	SS Flexible Armor, Welded to Seal	750°F					
Note: ?? = Length in feet (e.g. 05 = 5 feet)							

Assembly Notes: Capillary has a 2mm inner diameter unless specified differently by customer. Ambient temp limit of PVC coated armor is 250°F. Standard instrument connection is threaded (Smart Transmitters are welded), unless specified by customer.

TREE ASSEMBLIES

Tree Assemblies offer the ability to mount two pressure instruments onto one diaphragm seal, allowing the user to gain both a local indication and a remote signal without adding an additional pipe insertion.



Code	Description	Max. Temp
-TRE	Goal Post, Low Pressure Assembly (Max. 150 psi)	400°F
-TRX	Goal Post, Heavy Duty (Max. 3,000 psi)	600°F
-TRM	Compact Tree Assembly (Max. 3,000 psi)	600°F

Assembly Notes: Threaded joints are fully welded for consistent instrument orientation. Instrument connections are threaded unless specified by customer. Diaphragm seal must displace enough fluid to drive both instruments.

Diaphragm Seals

GASKET SELECTION GUIDE

Gasket selection depends on your process temperature, reactivity and other varioables. For most applications Klinger is standard however suitibility for process is determined by the customer.

GASKET SELECTION CHART

Code	Material	Maximum Temperature (°F)	Minimum Temperature (°F)	Description	Common Applications	Cost
К	Klinger C4401	500°F	-110°F	Compressed aramid synthetic fiber reinforced with a nitrile binder. Excellent sealability and general purpose use	Mild inorganic and organic acids, concentrated and diluted alkalies, water, brine, industrial gases, oils, refrigerants, petroleum and derivates	-
5	Silver Ag 3N5	750°F	-150°F	(Preferred choice for high temp, low temp, and high pressure applications) 99.95% pure silver (Ag) sheet. Exceptional sealability and use in extreme temperature and pressure applications. Only gasket that can be re-used in certain conditions	Extreme Temperatures and Pressures, Cryogenics, Nuclear, Deep Vacuum, Solvents, Alcohols, Steam, Silicone, Vegetable and Petroleum oils, Fuels	\$\$
Y	Gylon 3510	500°F	-150°F	(Preferred choice for most corrosive applications) PTFE filled with barium sulfate. Good Sealability as well as improved relaxation and cold flow resistance versus PTFE	Strong caustics, hydrocarbons, steam, chlorine, moderate acids, cryogenics, aluminum fluoride	\$\$
Т	Virgin PTFE	400°F	-150°F	Polytetrafluoroethylene Resin. Exceptional chemical resistance. Poor cold flow and relaxation properties	Inert to nearly all chemicals	\$
Z	Kalrez	620°F	30°F	High temperature resistant perfluoroelastomer with excellent tensile strength, sealability, and elasticity	Oxidizing and Reactive Chemicals, Steam, Alcohols, Aldehydes, Ethers, Esters, Ketones, Acids and Bases	\$\$
С	Top Chem 2000	450°F	-150°F	PTFE filled with silicone carbide (SiC). Excellent Sealability and improved relaxation resistance over PTFE	Strong acids and alkalines, Steam, Motor fuel and oils, Aromates, Esters, Ketones, Alcohols	\$\$
M	EPDM	200°F	-20°F	Ethylene Propylene Diene Monomer Rubber. Good elasticity, Tensile Strength, and Sealability. Exhibits limited elevated temperature resistance.	Silicone and Vegetable oils, Ketones, Esters, Alkalies, Most Acids, Water	\$
V	Viton	400°F	-10°F	Fluorinated synthetic polymer or fluoroelastomer that contains excellent elasticity, tensile strength, and sealability as well as good medium temperature resistance	Variety of acids and bases, animal and vegetable oils, hydrocarbons	\$
G	Grafoil	750°F	-40°F	Made of pure compressed homogenous graphite flake with a corrosion inhibitor. Contains no binders or resins. Very fragile with very low tensile strength and elasticity	Elevated temperature processes, aggressive and corrosive chemicals, Nuclear	\$
В	Buna-N	200°F	-20°F	Also known as NBR, is a black nitrile synthetic rubber compound with excellent elasticity, tensile strength, and abrasion resistance, but exhibits poor elevated temperature characteristics	Petroleum-Based and Synthetic Oils, Alcohols, Hydraulic Fluids, Fuels, Water, Silicone Greases, Solvents	\$

Re-use: Re-use subject to gasket condition and presence of corrosion or pitting on mating parts. Only recommended for up to three re-use cycles. Re-assembly of the diaphragm seal to be performed per Reotemp standards and procedures to ensure proper seating.

Max Working Pressure: Gasket Selection does not impact the MWP of the configured diaphragm seal.

Process Compatibility: The listed common applications are to be used as a guide only. Actual chemical compatibility of the process with the chosen gasket material should be approved by qualified personnel.

BOLT SELECTION GUIDE

BOLT SELECTION

Code	Material	Specifications	Description	Common Applications	Cost
8	Grade 8 Steel	ASTM A354 Gr. BD or Gr. 8 Zinc Chromate Coating	General purpose use bolt offered as our standard. Contains the highest strength and pressure rating of all other fasteners. Highest susceptibility to corrosive atmospheric conditions.	Standard applications of non-corrosive processes where possible outgassing through the gasket is minimal and atmospheric conditions are suitable. petroleum and derivates	-
S	316SS	ASTM A193 Gr. B8M CL.1 or ASTM F593G/H 316	Contains the lowest strength and pressure rating of all other fasteners. Exhibits excellent resistance to corrosive atmospheres.	Used most often in low process pressure applications where corrosive elements are present in the surrounding air and process outgassing is possible.	\$
N	NACE B7M	ASTM A193 Gr. B7M NACE Electroless Nickel Coating	This fastener conforms to NACE MR0175/ MR0103 standards. Contains good strength and retains an acceptable pressure rating.	Specialty bolt offered for sour gas H2S service where sulfide corrosion cracking can occur. Recommended for use in raw petroleum and gas extraction.	\$\$
7	316SS B8M SH	ASTM 193 Gr. B8M CL.2 Strain Hardened (SH)	Combines high strength and a good pressure rating in one. Primarily used when upgrading bolts prevents jumping to a new pressure seal class and corrosive elements are present in the air.	High pressure applications where process outgassing through gaskets is expected, and fastener resistance to corrosive environments is critical.	\$\$

Max Working Pressure: Fastener selection does impact the maximum working pressure of the assembly. See pressure rating tables to verify process suitability. Process Compatibility: Compatibility of fastener material with process outgassing and atmospheric conditions is the responsibility of the user.

FILL GUIDE

Diaphragm seals are designed to protect pressure instruments from hot process media and corrosive chemicals while minimizing any negative effect on instrument accuracy and durability. A well-made diaphragm seal can achieve this goal only if it is properly assembled, filled, and tested. Reotemp's highly trained technicians use state-of-the-art equipment so that every diaphragm seal assembly is filled and tested to assure optimal instrument performance:

- ✓ 24-hour Minimum Fluid De-gassing
- ✓ Evacuated Instrument Chamber Up to 10-8
 mbar Absolute
- ✓ Complete Fill Integrity Check

DIAPHRAGM SEALS

- √ Fill-port Leak Test
- ✓ Post-fill Static Test
- ✓ Verification of Instrument Calibration
- ✓ High-temp Pipe Sealant Option for Joints
- √ Tamper-proof (Inspection Seal) Lacquer used on All Threaded Joints
- Sturdy Diaphragm Packaging Protection

Part Number Code	Name	Description	Temperature Range (Vacuum Service <5psia)	Pulse ^{+™}	Viscosity cst @ ~77°F	Specific Gravity @ ~77°F	Thermal Expansion cc/cc/°C
		STANDARD FILL FLUID					
AS	Silicone DC200 ¹	This is the standard fill fluid for most diaphragm seal applications.	-40°F to 400°F (-40°F to 250°F)	Yes	20	0.94	.00104
		HIGH TEMP SILICONE					
ВН	Silicone DC704 ¹	Standard for Smart Transmitters and capillary systems. Performs well in applications with high temperature and a deep vacuum.	0°F to 650°F (0°F to 450°F)	No	44	1.07	.00077
B1	Silicone DC710 ¹	Highest temperature rating; ideal for gauge seal assemblies. Too thick for capillary assemblies. Response time can become very slow in cold conditions.	50°F to 750°F (50°F to 400°F)	Yes	500	1.11	.00043
C8	Syltherm 800 ²	Low viscosity allows it to perform well in both low and high temperatures. Not recommended for vacuum service or at high temperatures when under low static pressure.	-40°F to 750°F (-40°F to 150°F)	No	9.5	0.93	.00136
B5	Silicone DC705 ¹	Performs very well in high temperatures when under vacuum. The high viscosity and freezing point of this fluid makes it a poor choice for cold or outdoor installations without heat tracing.	50°F to 675°F (50°F to 550°F)	Yes	175	1.09	.00096
B2	Silicone DC550 ¹	Similar high temperature performance as DC705, however it performs better at lower temperatures.	-40°F to 575°F (-40°F to 400°F)	No	125	1.07	.00076
		FOOD GRADE					
AG	Glycerin USP	This is the standard fill fluid for most gauge seal assemblies for food, beverage, and pharmaceutical applications. Its high viscosity will cause very slow response at times in low temperature and outdoor installations.	60°F to 450°F (Not Suitable)	Yes	1100	1.26	.00061
BN	NEOBEE M207	Low viscosity and a wide temperature range makes this the standard sanitary fill fluid for Smart Transmitters and capillary systems.	-10°F to 400°F (-10°F to 200°F)	No	10	0.92	.00101
BS	Food Grade Silicone	Highest temperature limit for food grade fluids. Because of its high viscosity it does not perform well in low temperatures.	20°F to 550°F (20°F to 250°F)	Yes	350	0.97	.00096
ВР	Propylene Glycol	This is the fill fluid used when Glycol is called for on the customer specification. It has a very narrow temperature range.	0°F to 200°F (Not Suitable)	No	2.85	1.03	.00073
	INE	RT (TYPICALLY FOR CHLORINE AND OXYGEN APPLICATIONS O	R IN SILICONE-	REE ENVIR	RONMENTS)	
C1	Fomblin Y06⁴	Ideal inert fluid for transmitter applications. Relatively high vapor pressure above 200°F. Not recommended for use in high temperature situations with low static pressure.	-40°F to 450°F (0°F to 250°F)	No	71	1.88	.00086
C2	Halocarbon 6.3 ³	Standard inert fluid used in gauge seal assemblies.	-40°F to 400°F (-40°F to 200°F)	Yes	6.3	1.87	.00084
С3	Halocarbon 1.8 ³	Typically used in low temperature applications because of its low viscosity.	-110°F to 220°F (-100°F to 100°F)	No	1.8	1.82	.00084
C4	Fluorolube FS-5 ⁵	Similar performance to Halocarbon 6.3, however not suitable for vacuum service.	-40°F to 450°F (Not Suitable)	No	5	1.86	.00087
		SPECIALTY					
СК	Krytox 1506 ⁶	Specialty fill fluid, inert.	-40°F to 350°F (-40°F to 300°F)	No	62	1.88	.00095
BE	Ethylene Glycol	Occasionally used in annular (O-ring) seal assemblies.	-25°F to 320°F (Not Suitable)	No	30	1.10	.00062
СТ	Syltherm XLT ²	Used for very low process temperatures.	-150°F to 500°F (Not Suitable)	No	1.4	0.85	.00168

- 1 Trademark Dow Corning
- 3 Trademark Halocarbon Product Corporation
- 5 Trademark Hooker Chemical Company

- 2 Trademark The Dow Chemical Company
- 4 Trademark AUSIMONT S.P.A
- 6 Trademark The Chemours Company FC, LLC
- 7 Trademark Stepan Specialty Products

Note: PulsePlus™ fill fluids may have different physical properties than specified. Chemical composition and temperature ranges do not vary.

DIAPHRAGM SEAL OPTIONS



N/A Indicates the option is not available

- ✓ Check Stock
- ✓ Get Price
- ✓ Configure Part #
- ✓ Download PDF Data Sheets

		MS4 MS6 MS8	W5 W6 W7	T5 T6 V5	W9FF W9FR	W9XT	W9FP	DSTC75	DSTC15 AND LARGER	DSTF05	DSTF75 AND LARGER	OR	DXFR					
	PULSATION PROTI	ECTION	(ONLY	AVAIL	ABLE WI	TH REO	EMP PR	ESSURE G	AUGE MOU	NTED TO S	EAL)							
-PP	Pulse Plus™	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	✓	✓	N/A					
					DIAPHR	AGM CO	ATING											
-AU	Gold Plated Diaphragm	N/A	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	N/A					
-TC	Teflon Coated Diaphragm PTFE	N/A	✓	N/A	✓	✓	✓	N/A	✓	N/A	✓	N/A	N/A					
-EP	Electropolished Diaphragm	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	N/A	N/A					
						FILL												
-FW	Fill Port Welded Closed	STD1	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A					
-VF	Fill for Vacuum Service	N/A	✓	N/A	✓	✓	✓	N/A	✓	N/A	✓	N/A	N/A					
					CLEANII	NG AND	FINISH											
-DG	Degreased, Shipped in Sealed Bag	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓					
-ox	Cleaned for Oxygen Service per ASME B40.1	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	✓					
-OY	Cleaned for Oxygen Service per MIL-STD-1330D	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	✓					
				- 1	PLUG FO	R FLUSI	PORT											
-GS	1/4" SS Plug Installed	STD	STD	STD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
-JS	1/2" SS Plug Installed	N/A	STD	STD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
-GH	1/4" Hast C Plug Installed	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
-JH	1/2" Hast C Plug Installed	N/A	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
-GM	1/4" Monel Plug Installed	N/A	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
-JM	1/2" Monel Plug Installed	N/A	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓					
					TA	G OPTIO	N											
-TS	Stainless Steel Tag (1-10 Characters)							✓										
-TM	Stainless Steel Tag (11-80 Characters)							✓										
-TP	Paper Tag							✓										
				C	ERTIFIC	ATION O	PTIONS											
-NC	Certificate of NACE Compliance	✓	✓	N/A	✓	✓	✓	N/A	N/A	✓	✓	N/A	✓					
-CM	General Material Conformance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
-MR	MTR - Mill Test Report Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓					
-РМ	PMI - Positive Material Identification Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓					
-нт	Hydrostatic Test per ASME B31.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A					
-HL	Helium Leak Test Certificate	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	N/A					
✓ lı	ndicates that the option is available								1 5	10								