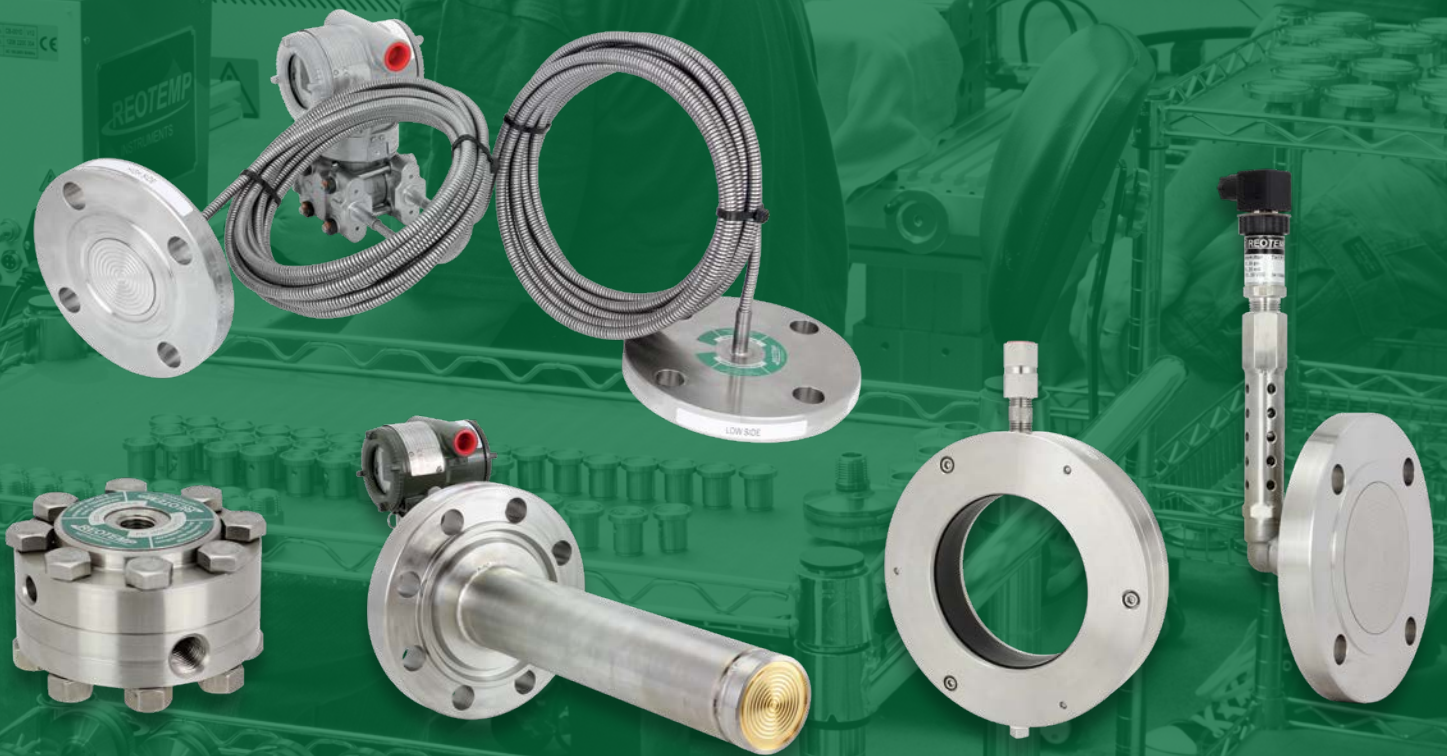
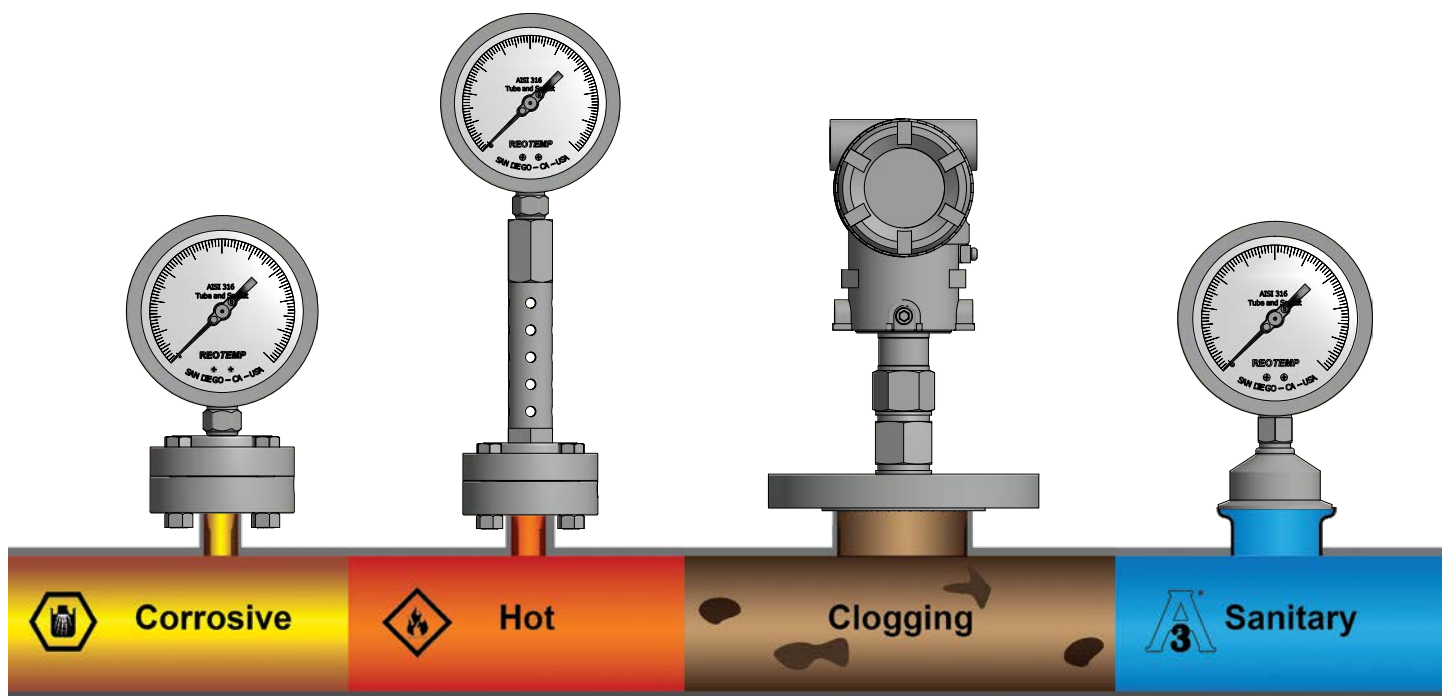


DIAPHRAGM SEALS



Manufactured in the USA under strict ISO 9001 quality standards, REOTEMP offers a broad variety of diaphragm seals for the industrial markets. REOTEMP Diaphragm Seals are carefully designed, built, and tested to maximize performance, increase instrument durability, and assure operator safety. Along with superior product quality, REOTEMP is proud to offer responsive customer service, intuitive online product configurators, and the industry's quickest lead times.

Diaphragm Seals are used in applications where the pressure sensor requires isolation from the process media. These applications may be corrosive, high temp, clogging, or require a sanitary fluid to remain captured in the piping or vessel. Rather than the process fluid interfacing with the pressure sensor, the pressure is exerted onto the flexible diaphragm and transmitted hydraulically to the instrument through the fill fluid. When properly mounted and filled a diaphragm seal assembly will have minimal effect on the instrument's performance.



APPLICATION CONSIDERATIONS

REOTEMP Diaphragm Seal Assemblies are carefully designed, built, and tested to maximize performance, increase instrument lifespan, and assure operator safety. The following should be considered when specifying a diaphragm seal:

1. Instrument Considerations

- Is there sufficient displacement to drive through its full range?
- Is the diaphragm sensitive enough for the measuring range and accuracy grade of the instrument?

2. Diaphragm Seal Mounting

- How will the diaphragm seal mount to the process? Threaded? Flanged? Clamped?
- How will the instrument mount to the diaphragm seal? Threaded? Welded?
- Will the instrument be mounted directly to the seal or with capillary?

3. Process Characteristics

- What are the pressure and temperature limits?
- Are there issues with clogging or high viscosity?
- Is there severe shock and pulsation?
- Is the process fluid compatible with the wetted material and gasket?

4. Ambient Characteristics

- Are there extreme or fluctuating ambient temperatures?
- Is the outside environment corrosive?

5. Vacuum Considerations

- Will the assembly be operating in deep vacuum (< 5psia)? If yes, contact the factory with process specifications.

Questions? If you require application assistance, please contact REOTEMP customer service or your local REOTEMP distributor.

REOTEMP SEAL FEATURES

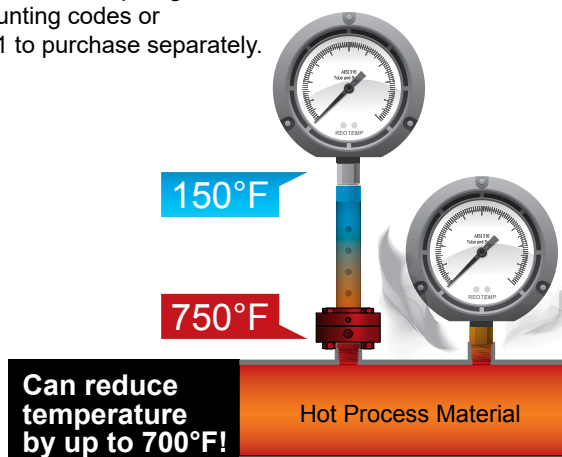
You Tube Visit reotemp.com/youtube

- ✓ In-depth Videos on our Customization Options
- ✓ Product Demonstration Videos

COOLING TOWERS

High process temperatures are damaging to pressure instrument performance and could pose an imminent safety risk. REOTEMP cooling towers provide the best option for extending instrument lifespan, improving performance and minimizing safety risk.

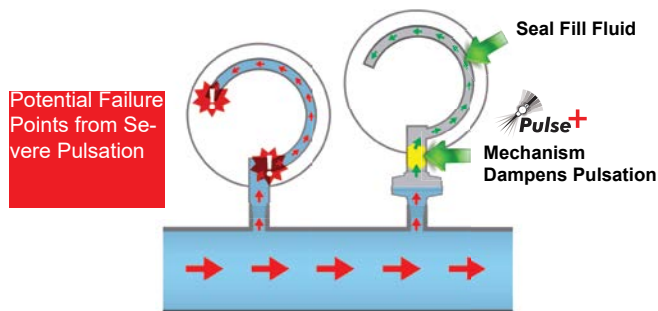
See page 57 for diaphragm seal mounting codes or page 111 to purchase separately.



PULSATION PROTECTION



Process media pulsation is one of the most common causes of pressure gauge failure. REOTEMP's proprietary diaphragm seal feature, Pulse Plus™ dramatically reduces the effects of pulsation on mechanical pressure instruments.



Specify with option code **-PP** on most diaphragm seal models when a seal is being mounted to a REOTEMP pressure gauge.

PRESSURE AND TEMPERATURE REFERENCE TABLES

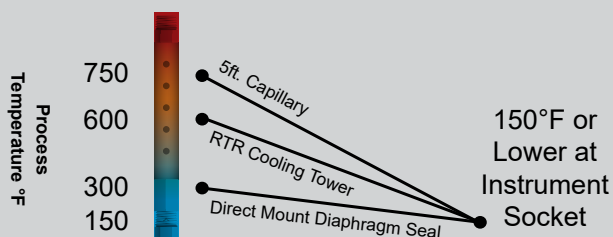
Threaded Diaphragm Seal Temperature Rating

Process Temp °F	MWP 1500 psi	MWP 2500 psi	MWP 5000 psi	MWP 10000 psi
-40 to 100	1500	2500	5000	10000
200	1290	2150	4300	8600
300	1175	1950	3900	7800
400	1090	1800	3600	7200
500	1000	1650	3300	6600
650	910	1500	3000	6000

ANSI B16.5 Flange Rating (Temperature/Pressure)

	Process Temp °F	Class 150 psi	Class 300 psi	Class 600 psi	Class 1500 psi
316SS	-40 to 100	275	720	1440	3600
	200	230	600	1200	3000
	300	205	540	1080	2700
	400	190	495	995	2485
	500	170	465	930	2330
	650	125	430	860	2150
Carbon Steel	-40 to 100	285	740	1480	3705
	200	260	675	1350	3375
	300	230	655	1315	3280
	400	200	635	1270	3170
	500	170	600	1200	2995
	650	125	535	1075	2685

Temperature Dissipation by Diaphragm Seal Mount Type



Note: Figures are approximate, based on installation with significant ambient airflow.

COMMON CONFIGURATIONS

The pressure instrument and diaphragm seal assemblies shown below are examples of completely filled and tested assemblies and their corresponding part numbers.



Instrument
PT45P1A2P20-G-T-HV (pg.7)

Seal
W51522SSS-TKDTD-AS (pg.59)

Application
The most common gauge seal assembly for threaded connections. For use with corrosive, clogging or moderately hot process media.



Instruments
PR35S1A4D25-D-T (pg.3)
TG1P25-1A4A00 (pg.101)

Seal
DSTC15SS4-TRM-AG (pg.79)

Application
For use in a sanitary or clean-in-place application where the user would like both a mechanical dial pressure gauge and electronic output on the same connection port.



Instrument
PC40S1A4M250-D-T (pg.13)

Seal
W7254R21SSS-TDTD-AS (pg.69)

Application
Low pressure gauge with a high accuracy diaphragm seal. For use with corrosive gas or liquid on a flanged connection.



Instrument
Customer Supplied In-Line Smart Pressure Transmitter

Seal
MS8QWM2XS-RTR-BH-R1 (pg.77)

Application
For use in high temperature service where a diaphragm seal is required to protect the pressure transmitter from process temperature as high as 750°F.



Instrument
PT45P1A2P17-D-T-TS (pg.7)

Seal
W51523SSC-TKA25-AS (pg.59)

Application
For use where the pressure measurement point is a long distance from where the operator can conveniently and safely read the gauge.



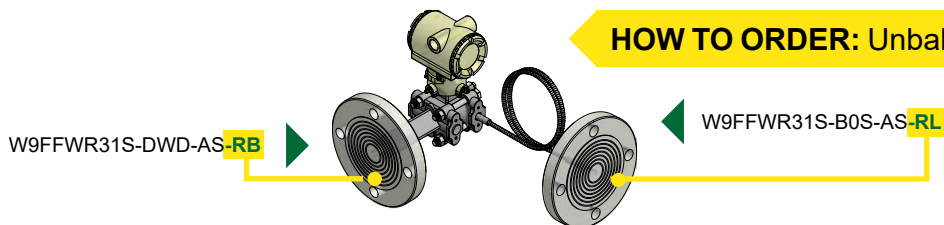
Instrument
Customer Supplied dP Transmitter

Seal
W9FFWR31S-W20-AS-RR (pg.71)

Application
For use monitoring tank level, measuring flow across an orifice plate, measuring pressure drop across a valve or filter, and other dP application. Flush diaphragm seals are most commonly used with process media that clogs or coagulates in limited flow areas and dead legs.

SMART TRANSMITTER ATTACHMENT

HOW TO ORDER: Unbalanced System Example



DIFFERENTIAL PRESSURE ASSEMBLY

Balanced System A complete assembly with one part number that includes two diaphragm seals, two capillaries, two fills, and one complete assembly calibration certificate.

Unbalanced DP System Where seal, mount, capillary, or fill is not identical. A complete assembly includes one diaphragm seal on the HP side AND one diaphragm seal on the LP side.

-RR

Identical system on HP and LP Sides, capillary exit through process connections. Capillary mounts only.

-RA

Identical system on HP and LP sides, capillary exit through face of cover flange. Capillary mounts only.

Example: W9FFWR31S-B10-AS-RA

-RH

Mount via Process Connections

Side High Pressure

-RL

Mount via Process Connections

Side Low Pressure

-RB

Mount via Face of Cover Flange

Side High Pressure

-RC

Mount via Face of Cover Flange

Side Low Pressure

GAUGE PRESSURE ASSEMBLY

In Line Pressure Transmitter

-R1

Mount to In-Line Gauge Pressure Transmitter. Direct or remote mount.

-R4

Horizontal Mount (Tank Mount) to In-Line Gauge Pressure Transmitter. Direct mount only.

Traditional Mount for Gauge Pressure Seal mount on one side only, other side is vented.

-R2

Instrument mount through process connections, HP Side. Use "R3" if mounting to LP side

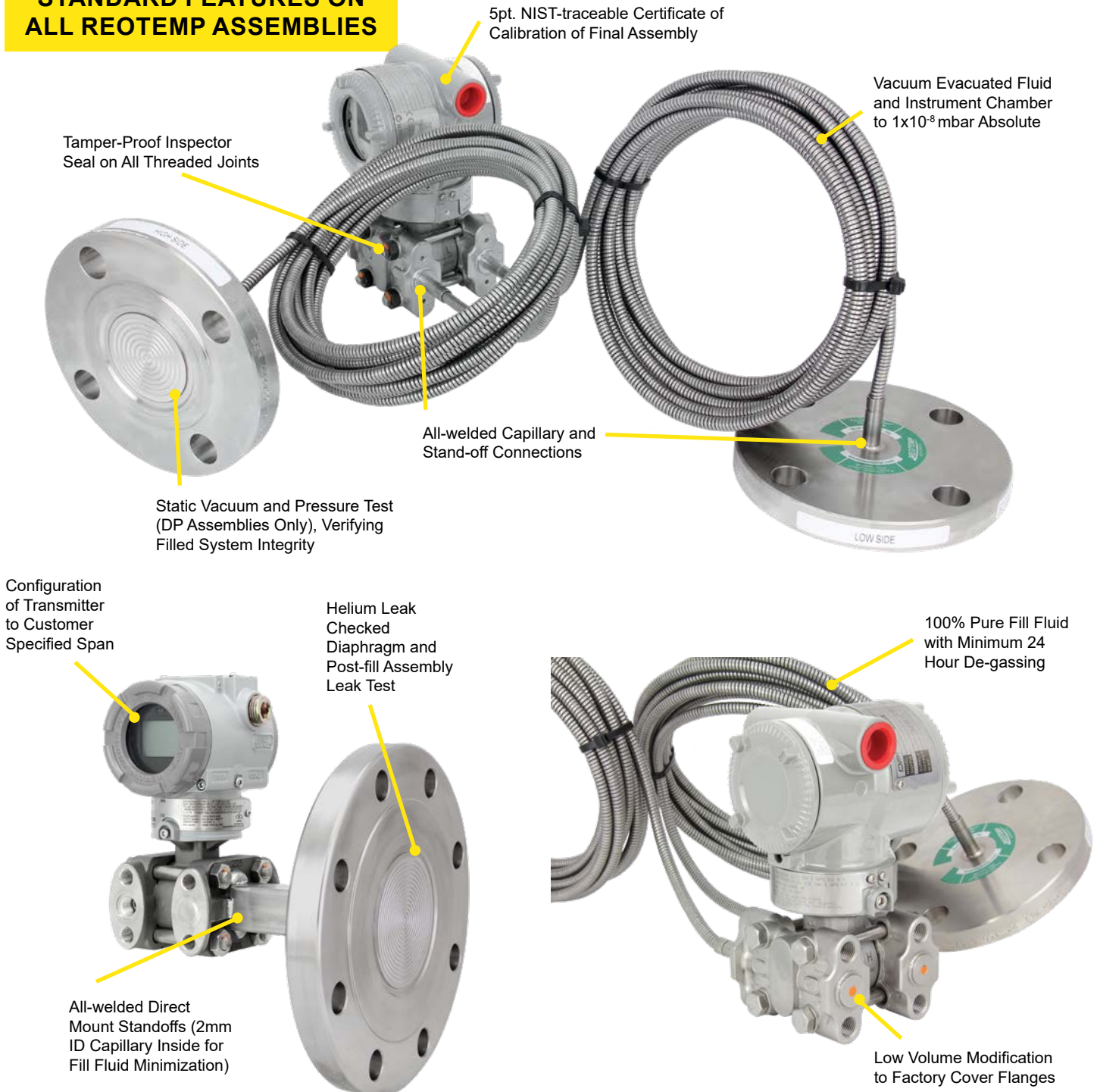
-R8

Instrument mount through face of cover flange, HP Side. Use "R9" if mounting to LP Side

DIAPHRAGM SEAL ASSEMBLY TO SMART TRANSMITTERS

REOTEMP specializes in the unique craft of assembling diaphragm seals to field transmitters for the purpose of measuring pressure, differential pressure, level, and flow. As a trusted supplier to many of the world's leading transmitter manufacturers, REOTEMP can assemble a diaphragm seal system to virtually any make or model transmitter. Every transmitter mount includes the features below to ensure superior performance and durability for every assembly. REOTEMP also offers repair, refurbishment or replacement of used transmitters with remote seals.

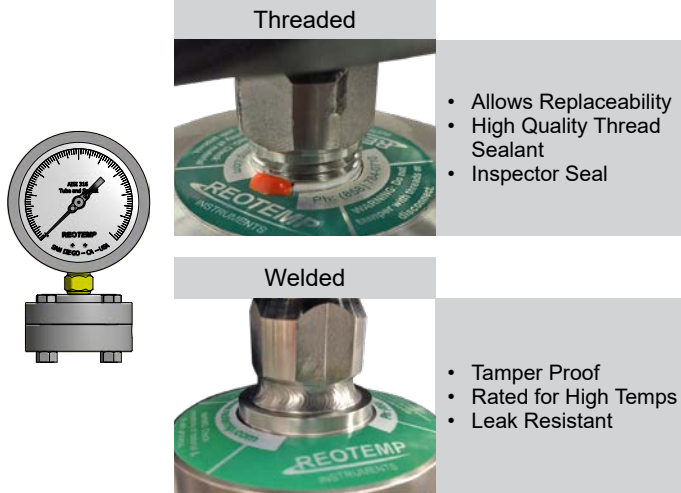
STANDARD FEATURES ON ALL REOTEMP ASSEMBLIES



INSTRUMENT MOUNTING CONFIGURATIONS

DIRECT MOUNT

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

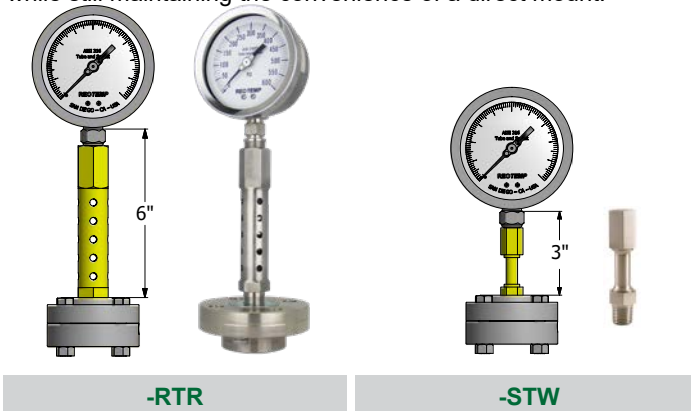


Code	Description	Max. Temp
-DTD	Threaded Instrument Connection	400°F
-DWD	Welded Instrument Connection	600°F

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.

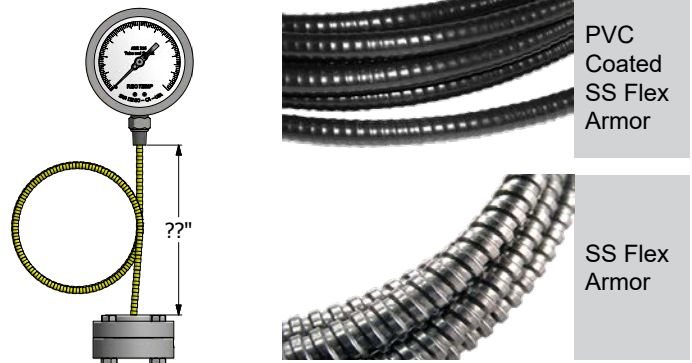


Code	Description	Max. Temp
-RTR	6" Cooling Tower	750°F
-STW	3" Cooling Standoff	600°F

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.



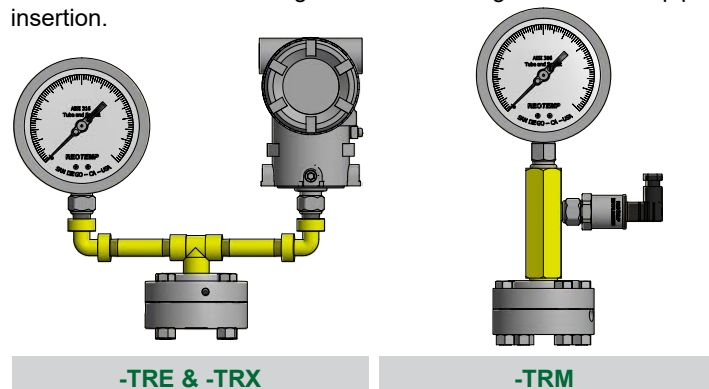
Code	Description	Max. Temp
-P??	PVC Coated SS Armor, Threaded to Seal	400°F
-W??	PVC Coated SS Armor, Welded to Seal	600°F
-A??	SS Flexible Armor, Threaded to Seal	400°F
-B??	SS Flexible Armor, Welded to Seal	750°F

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.

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
- ✓ Fill-port Leak Test
- ✓ Post-fill Static Test
- ✓ Verification of Instrument Calibration
- ✓ High-temp Pipe Sealant Used on All Threaded Joints
- (Welded Joints Upon Request)
- ✓ 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							
BH	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 M20 ⁷	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
BP	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
INERT (TYPICALLY FOR CHLORINE AND OXYGEN APPLICATIONS OR IN SILICONE-FREE ENVIRONMENTS)							
C1	Fomblin Y06 ⁴	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	1.97	.00084
C3	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							
CK	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

1 Trademark Dow Corning

2 Trademark The Dow Chemical Company

3 Trademark Halocarbon Product Corporation

4 Trademark AUSIMONT S.P.A

5 Trademark Hooker Chemical Company

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.