

ROCK CREEK WRRF PRIMARY CLARIFIER No. 4 TREATMENT EXPANSION CLEAN WATER SERVICES

APRIL 2025

SECTION 17401

PRESSURE/VACUUM MEASUREMENT: DIAPHRAGM AND ANNULAR SEALS

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DATA SHEET

HANDLING AND INSTALLATION

WARRANTY AND EVALUATION POLICY



OPTIMAL CONTROL SYSTEMS, INC.

2324 Three Lakes Road SE

Albany, OR 97322

Phone: (541) 967-9323

Fax: (541) 967-9485

Project No. 0523-23SSE

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EQUIPMENT SUPPLIER'S CERTIFICATE OF PROPER INSTALLATION

OWNER Clean Water Services

PROJECT Rock Creek WWRP Primary Clarifier No. 4 Treatment Expansion

CONTRACT NO. 7012

EQUIPMENT SPECIFICATION SECTION 17401

EQUIPMENT DESCRIPTION Diaphragm Seal

Hoyt Day, Authorized representative of
(Print Name)

Reotemp

(Print Manufacturer's Name)

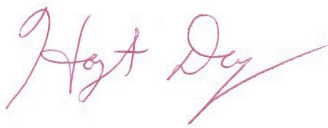
hereby CERTIFY that Reotemp Diaphragm Seal, Model No. MS8, Part No.
(print equipment name and model with serial no.)

MS8PTAM2FP18-SDDDASXGT, Serial No. N/A, Tag No. 200PI5205

installed for the subject project has (have) been installed in a satisfactory manner, has (have) been tested and adjusted, and is (are) ready for final acceptance testing and operation on :

Date: 2024.12.5

Time: 11:00

CERTIFIED BY: 
(Signature of Manufacturer's Representative)

Date: 2024.12.5

EQUIPMENT SUPPLIER'S CERTIFICATE OF PROPER INSTALLATION

OWNER Clean Water Services

PROJECT Rock Creek WWRP Primary Clarifier No. 4 Treatment Expansion

CONTRACT NO. 7012

EQUIPMENT SPECIFICATION SECTION 17401

EQUIPMENT DESCRIPTION Annular Seal

Hoyt Day _____, Authorized representative of
(Print Name)

Reotemp _____
(Print Manufacturer's Name)

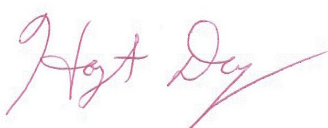
hereby CERTIFY that Reotemp Annular Seal, Model No. ORR, Part No.
(print equipment name and model with serial no.)

DSXMC1//ORRCS1040-DWD-AS-X-R1, Serial No. N/A, Tag No. 350PIT1203

installed for the subject project has (have) been installed in a satisfactory manner, has (have) been tested and adjusted, and is (are) ready for final acceptance testing and operation on :

Date: 2024.12.5

Time: 11:00

CERTIFIED BY: 
(Signature of Manufacturer's Representative)

Date: 2024.12.5

EQUIPMENT SUPPLIER'S CERTIFICATE OF PROPER INSTALLATION

OWNER Clean Water Services

PROJECT Rock Creek WWRP Primary Clarifier No. 4 Treatment Expansion

CONTRACT NO. 7012

EQUIPMENT SPECIFICATION SECTION 17401

EQUIPMENT DESCRIPTION Annular Seal

Hoyt Day _____, Authorized representative of
(Print Name)

Reotemp

(Print Manufacturer's Name)

hereby CERTIFY that Reotemp Annular Seal, Model No. ORR, Part No.

(print equipment name and model with serial no.)

DSXMC1//ORRCS1040-DWD-AS-X-R1, Serial No. N/A, Tag No. 350PIT1105

installed for the subject project has (have) been installed in a satisfactory manner, has (have) been tested and adjusted, and is (are) ready for final acceptance testing and operation on :

Date: 2024.12.5

Time: 11:00

CERTIFIED BY: _____

(Signature of Manufacturer's Representative)

Date: 2024.12.5

EQUIPMENT SUPPLIER'S CERTIFICATE OF PROPER INSTALLATION

OWNER Clean Water Services

PROJECT Rock Creek WWRP Primary Clarifier No. 4 Treatment Expansion

CONTRACT NO. 7012

EQUIPMENT SPECIFICATION SECTION 17401

EQUIPMENT DESCRIPTION Annular Seal

Hoyt Day, Authorized representative of
(Print Name)

Reotemp

(Print Manufacturer's Name)

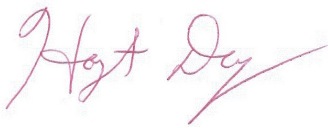
hereby CERTIFY that Reotemp Annular Seal, Model No. ORR, Part No.
(print equipment name and model with serial no.)

DSXMC1//ORRCS1040-DWD-AS-X-R1, Serial No. N/A, Tag No. 350PIT1106

installed for the subject project has (have) been installed in a satisfactory manner, has (have) been tested and adjusted, and is (are) ready for final acceptance testing and operation on :

Date: 2024.12.5

Time: 11:00

CERTIFIED BY: 
(Signature of Manufacturer's Representative)

Date: 2024.12.5

CWS INSTRUMENT CALIBRATION SHEET

Project Name: Rock Creek WWRF Primary Clarifier No. 4 Treatment Expansion	Owner Project No.: 7012
Project Owner: Clean Water Services	Regulatory Agency Project No.:
Project No.:0523-23SSE	Date:2024.12.5
Control Loop No.: N/A	
Instrument Tag No.: 200PI5205	Transmitter/gauge span: 0-100 PSI
Manufacturer: Reotemp	
Model No.: MS8	
Serial No.: N/A	

TRANSMITTERS AND INDICATORS

	Increasing Input			Decreasing Input		
% of Span	Input PSI	Output PSI	Error (% of span)	Input	Output	Error
0%						
25%						
50%						
75%						
100%						
Other (if applicable)	25	25	0			
Other (if applicable)						

Maximum allowable error (per Contract Documents) 0.075%

Remarks: Observed PSI on System

CALIBRATION EQUIPMENT UTILIZED

Device Type	MFR/Model No.	Accuracy	Nist Traceability?

Certified by: Hoyt Day

Date Certified:2024.12.5

CWS INSTRUMENT CALIBRATION SHEET

Project Name: Rock Creek WWRF Primary Clarifier No. 4 Treatment Expansion	Owner Project No.: 7012
Project Owner: Clean Water Services	Regulatory Agency Project No.:
Project No.: 0523-23SSE	Date: 2024.12.5
Control Loop No.: N/A	
Instrument Tag No.: 350PIT1203	Transmitter/gauge span:
Manufacturer: Reotemp	
Model No.: ORR	
Serial No.: N/A	

TRANSMITTERS AND INDICATORS

	Increasing Input			Decreasing Input		
% of Span	Input PSI	Output PSI	Error (% of span)	Input	Output	Error
0%						
25%						
50%						
75%						
100%						
Other (if applicable)						
Other (if applicable)						

Maximum allowable error (per Contract Documents) 0.075%

Remarks: Annular Seal

CALIBRATION EQUIPMENT UTILIZED

Device Type	MFR/Model No.	Accuracy	Nist Traceability?

Certified by: Hoyt Day

Date Certified: 2024.12.5

CWS INSTRUMENT CALIBRATION SHEET

Project Name: Rock Creek WWRF Primary Clarifier No. 4 Treatment Expansion	Owner Project No.: 7012
Project Owner: Clean Water Services	Regulatory Agency Project No.:
Project No.: 0523-23SSE	Date: 2024.12.5
Control Loop No.: N/A	
Instrument Tag No.: 350PIT1105	Transmitter/gauge span:
Manufacturer: Reotemp	
Model No.: ORR	
Serial No.: N/A	

TRANSMITTERS AND INDICATORS

	Increasing Input			Decreasing Input		
% of Span	Input PSI	Output PSI	Error (% of span)	Input	Output	Error
0%						
25%						
50%						
75%						
100%						
Other (if applicable)						
Other (if applicable)						

Maximum allowable error (per Contract Documents) 0.075%

Remarks: Annular Seal

CALIBRATION EQUIPMENT UTILIZED

Device Type	MFR/Model No.	Accuracy	Nist Traceability?

Certified by: Hoyt Day

Date Certified: 2024.12.5

CWS INSTRUMENT CALIBRATION SHEET

Project Name: Rock Creek WWRF Primary Clarifier No. 4 Treatment Expansion	Owner Project No.: 7012
Project Owner: Clean Water Services	Regulatory Agency Project No.:
Project No.: 0523-23SSE	Date: 2024.12.5
Control Loop No.: N/A	
Instrument Tag No.: 350PIT1106	Transmitter/gauge span:
Manufacturer: Reotemp	
Model No.: ORR	
Serial No.: N/A	

TRANSMITTERS AND INDICATORS

	Increasing Input			Decreasing Input		
% of Span	Input PSI	Output PSI	Error (% of span)	Input	Output	Error
0%						
25%						
50%						
75%						
100%						
Other (if applicable)						
Other (if applicable)						

Maximum allowable error (per Contract Documents) 0.075%

Remarks: Annular Seal

CALIBRATION EQUIPMENT UTILIZED

Device Type	MFR/Model No.	Accuracy	Nist Traceability?

Certified by: Hoyt Day

Date Certified: 2024.12.5

EQUIPMENT INFORMATION SHEET						Page 1			
EQUIP. DESCRIPTION - Diaphragm Seal				DATE INSTALLED		DATE STARTED			
EQUIP. TAG - 200PI5205				EST. COST \$502		EST. LIFE			
EQUIP. LOCATION - Alum Feed Pump 5				SPECIFICATION # 17401					
MFR - Reotemp						PHONE NUMBERS 800-648-7737			
ADDRESS 10656 Roselle Street, San Diego, CA 92121									
VENDOR Field Instruments & Controls, Inc.						360-896-9910			
7509 S 5th St., Suite 112, Ridgefield, WA 98642									
MAINTENANCE REQUIREMENTS		LUBE CODE		W	M	Q	S	A	HOURS
Compare with a master test gauge for calibration.				Dependent on severity of service.					
COD E	LUBRICANT TYPE	MANUFACTURER	CODE	LUBRICANT TYPE	MANUFACTURER				
1									
2									
3									

EQUIPMENT INFORMATION SHEET						Page 2	
RECOMMENDED SPARE PARTS				ELECTRICAL NAMEPLATE DATA			
PART NO.	PART NAME	QUANTITY	EQUIP. Diaphragm Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 200PI5205		
			MODEL NO. MS8		FRAME NO.		
			HP	VOLT.	AMP.	HZ	
			Phase	RPM	Service Factor	DUTY	
			CODE	Insulation	Design	TYPE	
			NEMA 4X	Enclosure	Misc.	RATING IP65	
			MECHANICAL NAMEPLATE DATA				
			EQUIP. Diaphragm Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 200PI5205		
			MODEL NO. MS8		MOUNTING POS		
			HP	RPM	CAP	SIZE	
			TDH	IMP.SZ	BELT NO.	Output Tor.	
			PSI 0-100	NEMA 4X	GEAR RATIO		

EQUIPMENT INFORMATION SHEET						Page 3				
EQUIP. DESCRIPTION - Annular Seal					DATE INSTALLED		DATE STARTED			
EQUIP. TAG - 350PIT1203					EST. COST \$1,084		EST. LIFE			
EQUIP. LOCATION - Primary Scum Pump 3					SPECIFICATION # 17401					
MFR - Reotemp							PHONE NUMBERS 800-648-7737			
ADDRESS 10656 Roselle Street, San Diego, CA 92121										
VENDOR Field Instruments & Controls, Inc.							360-896-9910			
7509 S 5th St., Suite 112, Ridgefield, WA 98642										
MAINTENANCE REQUIREMENTS			LUBE CODE		W	M	Q	S	A	HOURS
No regular maintenance suggested.										
CODE	LUBRICANT TYPE	MANUFACTURER	CODE	LUBRICANT TYPE	MANUFACTURER					
1										
2										
3										

EQUIPMENT INFORMATION SHEET						Page 4	
RECOMMENDED SPARE PARTS				ELECTRICAL NAMEPLATE DATA			
PART NO.	PART NAME	QUANTITY	EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1203		
			MODEL NO. ORR		FRAME NO.		
			HP	VOLT.	AMP.	HZ	
			Phase	RPM	Service Factor	DUTY	
			CODE	Insulation	Design	TYPE	
			NEMA	Enclosure	Misc.	RATING	
			MECHANICAL NAMEPLATE DATA				
			EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1203		
			MODEL NO. ORR		MOUNTING POS		
			HP	RPM	CAP	SIZE	
			TDH	IMP.SZ	BELT NO.	Output Tor.	
			PSI	NEMA	GEAR RATIO		

EQUIPMENT INFORMATION SHEET						Page 5				
EQUIP. DESCRIPTION - Annular Seal					DATE INSTALLED		DATE STARTED			
EQUIP. TAG - 350PIT1105					EST. COST \$1,084		EST. LIFE			
EQUIP. LOCATION - Primary Sludge Pump 5					SPECIFICATION # 17401					
MFR - Reotemp							PHONE NUMBERS 800-648-7737			
ADDRESS 10656 Roselle Street, San Diego, CA 92121										
VENDOR Field Instruments & Controls, Inc.							360-896-9910			
7509 S 5th St., Suite 112, Ridgefield, WA 98642										
MAINTENANCE REQUIREMENTS			LUBE CODE		W	M	Q	S	A	HOURS
No regular maintenance suggested.										
CODE	LUBRICANT TYPE	MANUFACTURER	CODE	LUBRICANT TYPE	MANUFACTURER					
1										
2										
3										

EQUIPMENT INFORMATION SHEET						Page 6	
RECOMMENDED SPARE PARTS				ELECTRICAL NAMEPLATE DATA			
PART NO.	PART NAME	QUANTITY	EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1105		
			MODEL NO. ORR		FRAME NO.		
			HP	VOLT.	AMP.	HZ	
			Phase	RPM	Service Factor	DUTY	
			CODE	Insulation	Design	TYPE	
			NEMA	Enclosure	Misc.	RATING	
			MECHANICAL NAMEPLATE DATA				
			EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1105		
			MODEL NO. ORR		MOUNTING POS		
			HP	RPM	CAP	SIZE	
			TDH	IMP.SZ	BELT NO.	Output Tor.	
			PSI	NEMA	GEAR RATIO		

EQUIPMENT INFORMATION SHEET						Page 7				
EQUIP. DESCRIPTION - Annular Seal					DATE INSTALLED		DATE STARTED			
EQUIP. TAG - 350PIT1106					EST. COST \$1,084		EST. LIFE			
EQUIP. LOCATION - Primary Sludge Pump 6					SPECIFICATION # 17401					
MFR - Reotemp							PHONE NUMBERS 800-648-7737			
ADDRESS 10656 Roselle Street, San Diego, CA 92121										
VENDOR Field Instruments & Controls, Inc.							360-896-9910			
7509 S 5th St., Suite 112, Ridgefield, WA 98642										
MAINTENANCE REQUIREMENTS			LUBE CODE		W	M	Q	S	A	HOURS
No regular maintenance suggested.										
CODE	LUBRICANT TYPE	MANUFACTURER	CODE	LUBRICANT TYPE	MANUFACTURER					
1										
2										
3										

EQUIPMENT INFORMATION SHEET						Page 8	
RECOMMENDED SPARE PARTS				ELECTRICAL NAMEPLATE DATA			
PART NO.	PART NAME	QUANTITY	EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1106		
			MODEL NO. ORR		FRAME NO.		
			HP	VOLT.	AMP.	HZ	
			Phase	RPM	Service Factor	DUTY	
			CODE	Insulation	Design	TYPE	
			NEMA	Enclosure	Misc.	RATING	
				MECHANICAL NAMEPLATE DATA			
			EQUIP. Annular Seal				
			Manufacturer: Reotemp				
			SERIAL NO. N/A		ID NO. 350PIT1106		
			MODEL NO. ORR		MOUNTING POS		
			HP	RPM	CAP	SIZE	
			TDH	IMP.SZ	BELT NO.	Output Tor.	
			PSI	NEMA	GEAR RATIO		

Bill of Materials



Project: Rock Creek WRRF Primary Clarifier No. 4 Treatment Expansion
Specification Section(s): Section 17401 – Pressure/Vacuum Measurement: Diaphragm and Annular Seals
Date: April 2025

Item No.	Qty.	Tag(s)	Description	Manufacturer	Part Number	Serial Number
001	1	200PI5205	Diaphragm Seal-Pressure Gauge Assembly, 100psi	Reotemp	MS8PTAM2FP18-SDDDASXGT	—
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
012						
013						
014						
015						
016						
017						
018						
019						
020						
021						
022						
023						
024						
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031						
032						
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036						
037						
038						
039						
040						

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ALL-WELDED PROCESS SEAL GAUGE

REOTEMP's All-Welded Pressure Seal Gauge offers superior diaphragm seal safety and performance at an economical price. Combined with a gauge or transmitter, the tamper-resistant all-welded diaphragm seal reduces potential leak points, making it ideal for installations where process integrity and worker safety are paramount. Combined with PulsePlus™ protection, the Series MS8 can potentially triple the life of your gauge or transmitter.



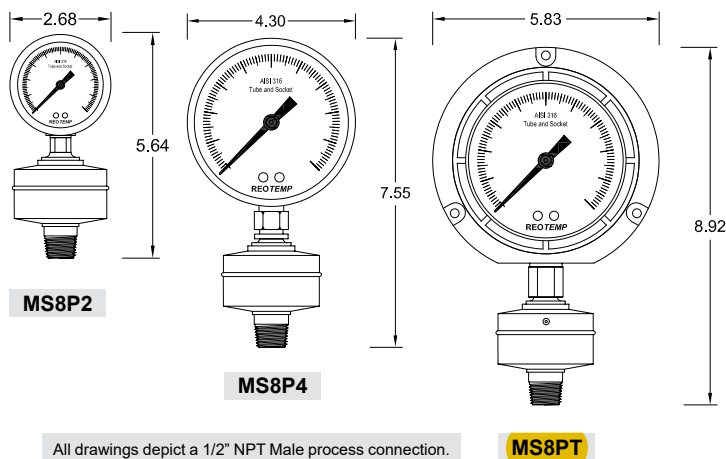
FEATURES / BENEFITS

- Increases the Life of the Gauge by Up to 3x
- Reduce/Eliminate Fugitive Emissions
- Available Up to 5,000 psi
- Eliminate Potential Leak Points
- Tamper Resistant
- Compliant to NACE MR0175, MR0103



SPECIFICATIONS

Accuracy	With appropriate pressure range, seal gauge accuracy is gauge accuracy plus 0.5%. (May be subject to thermal error. Consult factory with questions.)
Ambient Limits	-40°F/150°F
Process Limits with Diaphragm Seal	-40°F/400°F (Direct Mount)* -110°F/750°F (Remote Mount or Cooling Tower)* *Exact limits depend on diaphragm seal and fill fluids.
Wetted Materials	Diaphragm, Lower and Process Connection: 316LSS or Hast. C-276 Gasket: None
Lens	Tempered Safety Glass, Plastic or Laminated Safety Glass
Other Materials	Upper Housing: 316SS
Fillable	Yes
Maximum Working Pressure	See table left.
Environmental Protection	NEMA 4X/IP65
Weight	0.6 lbs (Seal Only)



All drawings depict a 1/2" NPT Male process connection. See online configurator for specific assembly drawings.

DIAPHRAGM SEAL MAX WORKING PRESSURE (AT 100°F)

		316SS	Hast. C-276	Monel
Male	1/4" NPT	5,000 psi	2,000 psi	2,000 psi
	1/2" NPT	5,000 psi	2,000 psi	2,000 psi
	3/4" NPT	2,000 psi	n/a	n/a
	1" NPT	2,000 psi	n/a	n/a
Female	1/4" NPT	2,500 psi	n/a	n/a
	1/2" NPT	2,500 psi	n/a	n/a
Flanged	Based on ANSI flange rating.			

Note: Maximum working pressure is lesser of proof pressure and 130% of gauge range.

ALL-WELDED PROCESS SEAL GAUGE

Visit reotemp.com

- ✓ Check Stock
- ✓ Configure Part #

- ✓ Get Price
- ✓ Download PDF Data Sheets

HOW TO ORDER: Choose options to build a part number. For example: **MS8PTAM3XP23-SDDDASPGT-HV**

MS8PT	A	M3	X	P23	-S
PRESSURE INSTRUMENT	GAUGE MOUNT	PROCESS CONNECTION	FLUSH CONNECTION	PRESSURE RANGE	WETTED MATERIAL
<p><i>Solid Front/ Blowout Back Process Gauges</i></p> <p>MS8PT = 4.5" Phenolic Process</p> <p>MS8PS = 4.5" Stainless Safety Gauge</p> <p><i>Industrial All Stainless Steel Gauges</i></p> <p>MS8P6 = 6" SS</p> <p>MS8P4 = 4" SS</p> <p>MS8P3 = 3.5" SS</p> <p>MS8P2 = 2.5" SS</p> <p><i>Hinged-Ring Process Gauge</i></p> <p>MS8PI = 4.5" Aluminum Case, SS internals</p>	<p>A = Bottom</p> <p>C = Back (4", 4.5", 6") Lower Back (2.5", 3.5") Center Back</p> <p>E = Back/ Front Flange (Panel Mount) (4", 4.5", 6") Lower Back (2.5", 3.5") Center Back</p>	<p><i>Threaded</i></p> <p>M2 = 1/2" male NPT</p> <p>M4 = 1/4" male NPT</p> <p>M3 = 3/4" male NPT</p> <p>M1 = 1" male NPT</p> <p>F2 = 1/2" female NPT</p> <p>F4 = 1/4" female NPT</p> <p>F3 = 3/4" female NPT</p> <p><i>Flanged</i></p> <p>R01 = 1/2"x150# ANSI RF</p> <p>R03 = 1/2"x300/600# ANSI RF</p> <p>RT1 = 3/4"x150# ANSI RF</p> <p>RT3 = 3/4"x300/600# ANSI RF</p> <p>R11 = 1"x150# ANSI RF</p> <p>R13 = 1"x300# ANSI RF</p> <p>RH1 = 1.5"x150# ANSI RF</p> <p>RH3 = 1.5"x300# ANSI RF</p>	<p>X = No Flush</p> <p>F = Single 1/4" Flush (Ships with Plug Installed)</p>	<p><i>Common Ranges</i></p> <p>P03 = -30" inHg/0/30 psi</p> <p>P15 = 15 psi</p> <p>P16 = 30 psi</p> <p>P17 = 60 psi</p> <p>P18 = 100 psi</p> <p>P20 = 200 psi</p> <p>P21 = 300 psi</p> <p>P22 = 400 psi</p> <p>P23 = 600 psi</p> <p>P25 = 1,000 psi</p> <p>P31 = 2,000 psi</p> <p>P32 = 3,000 psi</p> <p>P34 = 5,000 psi</p> <p><i>Available Ranges</i></p> <p>■ 15 psi to 6,000 psi</p> <p>■ Gauge Pressure, Vacuum, or Compound</p> <p><i>Standard Units</i></p> <p>■ psi ■ psi/bar</p> <p>Note: Minimum Span for 4" Gauges and Greater is 30 psi</p> <p><i>For Additional Range Codes See Page 45</i></p>	<p>-S = 316L SS</p> <p>-H = Hast. C-276</p> <p>-M = Monel 400[†]</p> <p>-Z = Hastelloy C-276 Diaphragm, 316SS Lower Body^{**}</p> <p>-F = 304L SS</p> <p>Note: see maximum working pressure table on previous page for available process connections.</p> <p>[†]Furnished with Monel upper housing.</p> <p>^{**}Max working pressure is the same as all 316SS.</p>

DDD	AS	P	G	T	-HV
SEAL MOUNTING	SEAL FILL	PULSATION PROTECTION	CASE FILL	LENS	OPTIONS
<p>DDD = Direct</p> <p>RTR = Cooling Tower</p> <p>B?? = Armored 316 SS Capillary (5-40 ft.)</p> <p>W?? = PVC Coated Armored 316 SS Capillary</p> <p>Note: ?? = Length in feet (e.g. 05 = 5 feet)</p> <p>Note: Capillary connection is welded unless otherwise specified.</p>	<p>AS = Silicone DC200</p> <p>AG = Glycerin</p> <p>C1 = Fomblin Y06</p> <p>BH = Silicone DC704</p> <p>C2 = Halocarbon 6.3</p> <p>See 58 for Complete Fill Guide</p>	<p>X = None</p> <p>P = Pulse Plus[™] (Pulsation Protection)</p>	<p>D = Dry</p> <p>G = Glycerin</p> <p>W = Glycerin Water (65/35)</p> <p>S = Silicone</p> <p>I = Inert</p> <p>Note: MS8PI is not fillable.</p>	<p>T = Tempered Safety Glass</p> <p>S = Laminated Safety Glass</p> <p>P = Plastic</p>	<p>-HV = Hi-Vis[™] Dial</p> <p>-C3 = 3 Point Calibration Certificate</p> <p>-TS = Stainless Steel Tag</p> <p>-OX = Cleaned for O₂ Service</p> <p>-CN = NACE Certificate</p> <p>-PM = Positive Material Identification Certification</p> <p>-MM = Monel Wetted Gauge</p> <p>See Pages 50 & 83 for Additional Options</p>

PRESSURE GAUGE RANGES AND CODES

VACUUM/COMPOUND RANGES

psi		Dual Scale & psi & Metric						Single Scale-Metric					
"Hg/0/psi		psi & bar		psi & kg/cm ²		psi & kPa		bar		kg/cm ²		kPa	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
P01	-30"Hg/0	D01	"Hg & -1/0 bar	G01	"Hg & -1/0 kg/cm ²	L01	"Hg & -100/0 kPa	B00	-1/0 bar	K00	-1/0 kg/cm ²	A00	-100/0 kPa
P02	-30/0/15	D02	psi & -1/0/1	G02	psi & -1/0/1	L02	psi & -100/0/100	B01	-1/0/1	K01	-1/0/1	A01	-100/0/100
P03	-30/0/30	D03	psi & -1/0/2	G03	psi & -1/0/2	L03	psi & -100/0/200	B02	-1/0/2	K02	-1/0/2	A02	-100/0/200
P04	-30/0/60	D04	psi & -1/0/4	G04	psi & -1/0/4	L04	psi & -100/0/400	B04	-1/0/4	K04	-1/0/4	A04	-100/0/400
P05	-30/0/100	D05	psi & -1/0/7	G05	psi & -1/0/7	L05	psi & -100/0/700	B07	-1/0/7	K07	-1/0/7	A07	-100/0/700
P06	-30/0/160	D06	psi & -1/0/11	G06	psi & -1/0/11	L06	psi & -100/0/1,100	B011	-1/0/11	K011	-1/0/11	A011	-100/0/1,100
P07	-30/0/200	D07	psi & -1/0/14	G07	psi & -1/0/14	L07	psi & -100/0/1,400	B014	-1/0/14	K014	-1/0/14	A014	-100/0/1,400
P08	-30/0/300	D08	psi & -1/0/20	G08	psi & -1/0/20	L08	psi & -100/0/2,000	B020	-1/0/20	K020	-1/0/20	A020	-100/0/2,000

PRESSURE RANGES

psi		Dual Scale & psi & Metric						Single Scale-Metric					
psi		psi & bar		psi & kg/cm ²		psi & kPa		bar		kg/cm ²		kPa	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
P14	0-10 psi	D14	psi & .7 bar	G14	psi & .7 kg/cm ²	L14	psi & 70 kPa						
P15	0-15	D15	psi & 0-1	G15	psi & 0-1	L15	psi & 0-100	B1	0-1 bar	K1	0-1 kg/cm ²	A1	0-100 kPa
P16	0-30	D16	psi & 0-2	G16	psi & 0-2	L16	psi & 0-200	B2	0-2	K2	0-2	A2	0-200
P17	0-60	D17	psi & 0-4	G17	psi & 0-4	L17	psi & 0-400	B4	0-4	K4	0-4	A4	0-400
P18	0-100	D18	psi & 0-7	G18	psi & 0-7	L18	psi & 0-700	B7	0-7	K7	0-7	A7	0-700
P19	0-160	D19	psi & 0-11	G19	psi & 0-11	L19	psi & 0-1,100	B11	0-11	K11	0-11	A11	0-1,100
P20	0-200	D20	psi & 0-14	G20	psi & 0-14	L20	psi & 0-1,400	B14	0-14	K14	0-14	A14	0-1,400
P21	0-300	D21	psi & 0-20	G21	psi & 0-20	L21	psi & 0-2,000	B20	0-20	K20	0-20	A20	0-2,000
P22	0-400	D22	psi & 0-28	G22	psi & 0-28	L22	psi & 0-2,800	B28	0-28	K28	0-28	A28	0-2,800
P23	0-600	D23	psi & 0-40	G23	psi & 0-40	L23	psi & 0-4,000	B40	0-40	K40	0-40	A40	0-4,000
P24	0-800	D24	psi & 0-55	G24	psi & 0-55	L24	psi & 0-5,500	B55	0-55	K55	0-55	A55	0-5,500
P25	0-1,000	D25	psi & 0-70	G25	psi & 0-70	L25	psi & 0-7,000	B70	0-70	K70	0-70	A70	0-7,000
P30	0-1,500	D30	psi & 0-100	G30	psi & 0-100	L30	psi & 0-10,000	B100	0-100	K100	0-100	A100	0-10,000
P31	0-2,000	D31	psi & 0-140	G31	psi & 0-140	L31	psi & 0-14,000	B140	0-140	K140	0-140	A140	0-14,000
P32	0-3,000	D32	psi & 0-200	G32	psi & 0-200	L32	psi & 0-20,000	B200	0-200	K200	0-200	A200	0-20,000
P33	0-4,000	D33	psi & 0-280	G33	psi & 0-280	L33	psi & 0-28,000	B280	0-280	K280	0-280	A280	0-28,000
P34	0-5,000	D34	psi & 0-350	G34	psi & 0-350	L34	psi & 0-35,000	B350	0-350	K350	0-350	A350	0-35,000
P35	0-6,000	D35	psi & 0-400	G35	psi & 0-400	L35	psi & 0-40,000	B400	0-400	K400	0-400	A400	0-40,000
P36	0-8,000	D36	psi & 0-550	G36	psi & 0-550	L36	psi & 0-55,000	B550	0-550	K550	0-550	A550	0-55,000
P37	0-10,000	D37	psi & 0-700	G37	psi & 0-700	L37	psi & 0-70,000	B700	0-700	K700	0-700	A700	0-70,000
P38	0-15,000	D38	psi & 0-1,000	G38	psi & 0-1,000	L38	psi & 0-100,000	B1K	0-1,000	K1K	0-1,000	A1K	0-100,000
P39	0-20,000	D39	psi & 0-1,400	G39	psi & 0-1,400	L39	psi & 0-140,000						
P40	0-30,000	D40	psi & 0-2,000	G40	psi & 0-2,000	L40	psi & 0-200,000						
P41	0-40,000	D41	psi & 0-2,800	G41	psi & 0-2,800	L41	psi & 0-280,000						
P42	0-50,000	D42	psi & 0-3,500	G42	psi & 0-3,500	L42	psi & 0-350,000						



Don't See The Range You Need? REOTEMP has thousands of specialty dial ranges available and will work with you to create a custom range, just contact REOTEMP customer service.

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	1.87	.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.

PRESSURE GAUGE OPTIONS

		Heavy-Duty Industrial Gauges				Process Gauges			Stainless Steel Case Industrial Gauges			Commercial Gauges		Low Pressure Capsule Gauges			Test Gauges
Part #	Description	PR25	PR35	PR40	PR60	PT45P	PT45T	PI45	PM	PG**C	PG**S	PD15/20/25	PD35/40	PC25N	PC25S	PC40/45/60	PL60/45
CASE FILL OPTIONS																	
-G	Glycerin Filled Case	✓	✓	✓	✓	✓	✓	N/A	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A
-W	Glycerin Water Filled Case (65/35)	✓	✓	✓	✓	✓	✓	N/A	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A
-S	Silicone Filled Case	✓	✓	✓	✓	✓	✓	N/A	✓	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A
-T	Teflon-coated Movement (No case fill)	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓
-I	Inert Case Fill	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LENS OPTIONS																	
-P	Plastic Lens	STD	✓	✓	✓	✓	✓	STD	STD	STD	✓	✓	MQ	✓	✓	✓	✓
-T	Tempered Safety Glass Lens	✓	STD	STD	STD	STD	STD	N/A	N/A	N/A	STD	N/A	N/A	N/A	STD	STD	STD
-S	Laminated Safety Glass Lens	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	✓	N/A	N/A	N/A	✓	✓	✓
-G	Plain Glass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MQ	MQ	N/A	MQ	STD	N/A	N/A	N/A	N/A
POINTER OPTIONS																	
-RP	Red Pointer	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	N/A	N/A	✓	✓	✓
-MP	Min/Max Pointer (Drag Hand)†	✓	N/A	✓	✓	✓	N/A	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A
-MQ	Min/Max Pointer (Tamper-proof)†	✓	N/A	✓	✓	✓	N/A	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A
-RH	Red Set Hand (Manual Adjustment)	N/A	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-EC	Electrical Contacts	N/A	N/A	✓	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DIAL OPTIONS																	
-CL	Custom Logo Dial	✓	✓	✓	✓	✓	✓	✓	MQ	MQ	✓	MQ	MQ	MQ	✓	✓	✓
-HV	Hi-Vis Dial	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	N/A	N/A	✓	✓	N/A
-CB	Color Band	✓	✓	✓	✓	✓	✓	✓	MQ	MQ	✓	MQ	MQ	MQ	✓	✓	N/A
-CP	Color Pie	✓	✓	✓	✓	✓	✓	✓	MQ	MQ	✓	MQ	MQ	MQ	✓	✓	N/A
-DM	Dial Marking	✓	✓	✓	✓	✓	✓	✓	MQ	MQ	✓	MQ	MQ	✓	✓	✓	✓
-LP	Removable Lens Protector	N/A	N/A	N/A	N/A	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CALIBRATION OPTIONS																	
-R1	Upgrade to 1% FS Accuracy	✓	✓	STD	STD	N/A	N/A	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A
-R2	Upgrade to 0.5% FS Accuracy	N/A	N/A	✓	✓	STD	STD	STD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-R5	Upgrade to 1.5% FS Accuracy	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	N/A
-C1	1pt. NIST Calibration Cert	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
-C3	3pt. NIST Calibration Cert	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
-C5	5pt. NIST Calibration Cert	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
-CX	10pt. NIST Calibration Cert	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	STD
-CS	Calibration Sticker (No logged pts.)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A
TAG OPTION																	
-TS	Stainless Steel Tag (1-10 Characters)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-TM	Stainless Steel Tag (11-80 characters)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-TP	Paper Tag	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CERTIFICATION OPTIONS																	
-CM	General Material Conformance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-NC	Certificate of NACE Compliance	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓
-PM	Positive Material Identification Certificate (PMI)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-HT	Hydrostatic Test per ASME B31.3 (5 min)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-LC	Argon Leak Check Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLEANING OPTIONS																	
-DG	Degreased - Wiped Clean of Oils, Shipped in Sealed Bag	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	N/A	✓	✓	✓	✓
-OX	Cleaned for Oxygen Service per ASME B40.1	✓	✓	✓	✓	✓	✓	✓	MQ	MQ	✓	MQ	MQ	✓	✓	✓	✓
-OY	Cleaned for Oxygen Service per MIL-STD-1330D	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	N/A	✓	✓	✓	✓
OTHER OPTIONS																	
-NR	No Restrictor Screw	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	N/A
-FI	Dry Gauge Shipped with Fill Plug Installed	N/A	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

✓ Indicates that the option is available with the model.

N/A Indicates the option is not available with this model.

STD Indicates standard options with no additional cost.

MQ Minimum order quantity applies.

†This option is only available with a plastic lens.

DIAPHRAGM SEAL OPTIONS



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DIAPHRAGM SEALS

		MS4 MS6 MS8	W5 W6 W7	T5 T6 V5	W9FF W9FR	W9XT	W9FP	DSTC75	DSTC15 AND LARGER	DSTF05	DSTF75 AND LARGER	OR	DXFR
PULSATION PROTECTION (ONLY AVAILABLE WITH REOTEMP PRESSURE GAUGE MOUNTED TO SEAL)													
-PP	Pulse Plus™	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	✓	✓	N/A
DIAPHRAGM COATING													
-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
CLEANING 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	✓
PLUG FOR FLUSH 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	✓
TAG OPTION													
-TS	Stainless Steel Tag (1-10 Characters)								✓				
-TM	Stainless Steel Tag (11-80 Characters)								✓				
-TP	Paper Tag								✓				
CERTIFICATION OPTIONS													
-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	✓
-PM	PMI - Positive Material Identification Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓
-HT	Hydrostatic Test per ASME B31.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
-HL	Helium Leak Test Certificate	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	N/A

✓ Indicates that the option is available

N/A Indicates the option is not available

¹ Standard on MS8, available on MS4 & MS6.



INSTRUMENTS

Installation & Operating Instructions For

MS8



MS8PT, MS8PR, MS8Q
All Welded Seal Gauge

1. INSTRUCTIONS CONTENT

This instructions manual contains installation, operation, and maintenance instructions for the MS8 Series of All-Welded Diaphragm Seals assembled to pressure measurement instruments. American National Standard ANSI B40.100 contains valuable information including installation, operation, calibration, and safe operating usage. It is highly recommended that anyone using, installing or calibrating pressure gauges and other instrumentation with diaphragm seals be familiar with these industry standards.

1. INSTALLATION

MS8 assemblies mounted directly on piping should be assembled with reasonable care. Always use the wrench grip provided above the diaphragm seal to secure it to the thread fitting. Do not use the pressure gauge case as a means of tightening the connection. Consistent with industry standards, the use of pipe thread sealant is highly recommended when installing the gauge into the threaded connection.

MS8 assemblies should be located where they will not be subjected to abnormally high or low temperatures. The following table outlines the temperature limits of the MS8 Series dependent on the seal fill fluid

Seal Fill	Operating		Not to Exceed
	Min	Max	
Sil. DC200	-50F	450F	550F
Glycerine	30F	300F	350F
Hi-Temp	30F	600F	700F
Inert	-40F	400F	400F

If the normal operating temperature of the process is over the stated limit, cooling elements may be applicable. Please consult the factory.

2. OPERATION

Slowly admit pressure into the assembly to avoid a pulsation shock. If the MS8 assembly includes a pressure gauge the maximum pressure at which the assembly should continuously operate should not exceed 75% of the full scale. The pressure gauge selected with the assembly should be twice the intended operating pressure.

The maximum pressure for the MS8 Diaphragm Seal is 5000psi at 100F. Do not exceed this pressure.

Please consult the factory for instruments that can handle process pressure exceeding 5,000psi.

3. MAINTENANCE

Dependent upon the severity of the service, MS8 assemblies should be removed from service at intervals and compared with a master test gauge for calibration. If the assembly includes a repairable pressure gauge, minor corrections can be made by resetting the pointer.

If the chamber between the connection and the diaphragm becomes dirty or clogged, take care when washing out the debris. Be careful not to poke the sensitive diaphragm which can result in a tear or wrinkle in the thin metal. If a damage occurs to the diaphragm the assembly will not operate properly and cannot be repaired.

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WARRANTY & EVALUATION POLICY

REOTEMP warrants all pressure and temperature measurement products against defective workmanship or materials under normal use and service for the following periods after the date of shipment.

FIVE YEAR WARRANTY

- Process Grade Bimetal Thermometers (3", 4", and 5" dial sizes)

THREE YEAR WARRANTY

- Industrial Pressure and Differential Pressure Gauges
- Valves and Manifolds

ONE YEAR WARRANTY

- Diaphragm Seals
- Pressure Transmitters and Switches
- OEM Bimetal Thermometers
- Digital Thermometers
- Remote Reading Thermometers
- Thermowells
- Accessories and Other Items

REOTEMP's liability is limited to repair or replacement at the factory, shipping charges prepaid. This warranty does not cover deterioration from normal wear and tear, exposure to corrosive materials, exposure to temperatures or pressures in excess of those recommended, excessive vibration, forces, or abrasion which cause deformation of component parts. This warranty is expressly in lieu of any other warranty, expressed or implied. REOTEMP shall not be liable for any defect or consequential damages arising out of any defects or from any cause whatsoever. Suitability of product for the customer's application rests with the customer; REOTEMP does not warrant suitability of its products for the application chosen by the customer.

REOTEMP will only accept shipments with returned product that are accompanied with a return authorization issued by REOTEMP. Please respect the health and safety of our employees by cleaning goods before return, disclosing any chemicals or foreign substance that may be on returned product and enclosing MSDS information. Handling and cleaning fees may apply.

REOTEMP reserves the right to make product improvements and change its specifications stated throughout the catalog at any time without notification. Please contact the factory on all critical dimensions and specifications for verification.

REOTEMP'S GUIDING PRINCIPLES

- > Provide industry leading customer satisfaction with a focus on fast turnaround, friendly service and keeping it easy to do business with REOTEMP. Make it Quick and Easy!
- > Focus on manufacturing quality instruments, continuous improvement and adding value to our product and services.
- > Build long-lasting and rewarding relationships with the people we do business with.
- > Maintain an enjoyable, fulfilling work environment for our employees.
- > Build a strong REOTEMP brand and reputation in the industrial markets where we compete.
- > Achieve planned, sustained growth in our target markets both in the US and internationally.



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Bill of Materials



Project: Rock Creek WRRF Primary Clarifier No. 4 Treatment Expansion
Specification Section(s): Section 17401 – Pressure/Vacuum Measurement: Diaphragm and Annular Seals
Date: April 2025

Item No.	Qty.	Tag(s)	Description	Manufacturer	Part Number	Serial Number
001	1	350PIT1203	Annular Seal, 4"	Reotemp	DSXMCII/ORRCS1040 -DWD-AS-X-R1	—
002	1	350PIT1105	Annular Seal, 4"	Reotemp	DSXMCII/ORRCS1040 -DWD-AS-X-R1	—
003	1	350PIT1106	Annular Seal, 4"	Reotemp	DSXMCII/ORRCS1040 -DWD-AS-X-R1	—
004						
005						
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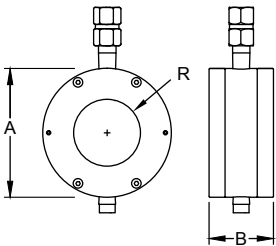
ISOLATION FLOW THRU RING SEAL

DIAPHRAGM SEALS



ORR

The Reotemp Isolation Flow Thru Ring Seal boasts an In-Line Flow-Thru design ideal for waste water, slurries, or abrasives. Mounted between pipe flanges or threaded in-line, it has a tough but sensitive elastomer lining. One unique feature of this seal is the ability to mount multiple instruments on one seal.



SPECIFICATIONS

Materials	Body: Carbon Steel, 316 SS	
Wetted Materials	End Flange: Carbon Steel, 316 SS. Diaphragm/Sleeve: Buna-N, PTFE EPDM, Natural Rubber and more.	
Process	Sleeve Material	Limit
Temperature Limits	Buna-N	225°F
	Viton	400°F
	PTFE	350°F
	EPDM	300°F
	Natural Rubber	212°F

Ambient Temperature Limits	Determined by the pressure instrument.
----------------------------	----------------------------------------

Maximum Working Pressure	ASME B16.5 Class 150# or 300#
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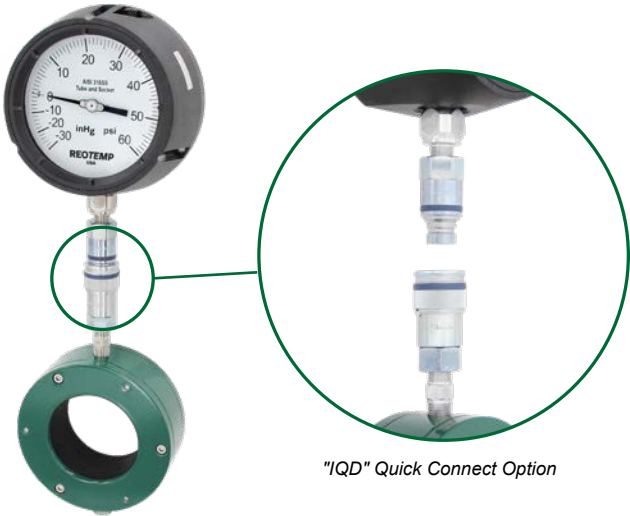
Wetted Materials End Flanges	End Flanges	Max Size
	316L	20"
	Carbon Steel	20"
	Hastelloy C-276	6"
	Titanium	6"
	Alloy 20	6"
	Kynar (VDF)	6"
	PTFE (25% Glass Filled)	6"
	PVC	6"
	CPVC	6"

All Non-Metallic End Flanges Rated to 150 PSIG Max

Diaphragm/Sleeve	Buna N	20"
	Viton A	20"
	PTFE	10"
	EPDM	20"
	Natural Rubber	20"

Nominal Pipe Size (in)	A OD (in)	B ID (in)	C Thickness (in)	Approx. Weight (lbs)
2	4	2.07	2.00	4
3	5.25	3.07	2.00	6
4	6.75	4.03	1.50	8
5	7.63	5.05	1.50	9
6	8.63	6.07	1.50	10
8	10.88	7.98	1.50	15
10	13.25	10.02	1.50	21
12	16.00	12.00	1.75	39
14	17.63	13.25	1.75	48
16	20.13	15.25	1.75	62
18	21.50	17.25	1.75	58
20	23.75	19.25	1.75	69

Custom dimensions are available if your application requires. Choose -RV as option code. Alternate manufacturers dimensions may differ from above.



"IQD" Quick Connect Option

ISOLATION FLOW THRU RING SEAL

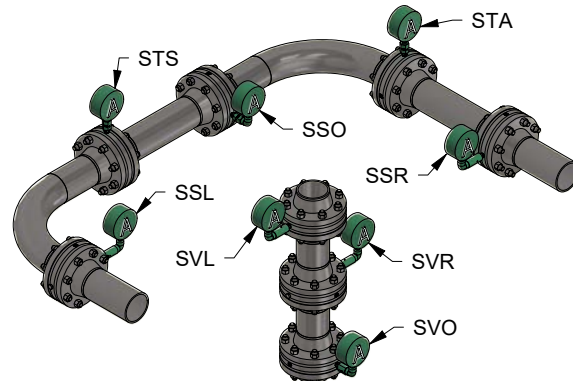
Liner/Sleeve Selection Chart			
Sleeve Material	Chemical Resistance	Max Temp.	Durability/Abrasion
Buna N	Most common in Wastewater market. Limited chemical compatability.	225°F	Is an industry standard material that carries a medium/low abrasion resistance.
Viton	Good chemical resistance that can be utilized in many applications. Limited chemical compatability.	400°F	Offers the best combination of temperature and high abrasion resistance.
EPDM	Medium level of chemical resistance. Specialized material that performs very well in specific process medias.	300°F	Offers medium abrasion resistance.
Natural Rubber	Often used in mining applications due to excellent wear properties, however, contains poor resistance to a variety of chemicals. Specialized material that performs very well in specific process medias.	212°F	Offers the highest resistance to abrasion out of the materials listed. NR is a tough material with a high durometer and stiffness.
PTFE	Offers the best chemical resistance of all listed liners.	350°F	Soft material subject to plastic deformation and cold flow. Very low resistance to abrasion.

HOW TO ORDER: Choose options to build a part number. For example: ORRCC2020-D-GTS-AG-TSX-TS

ORR	C	C	2	020	-D	-GTS
MODEL	BODY	END FLANGE	DIAPHRAGM/ SLEEVE	PIPE SIZE	INSTRUMENT REMOVAL	MOUNTING
ORR = Ring Seal, Flanged Wafer	C = Carbon Steel (Green Epoxy Coated) S = 316 SS	C* = Carbon Steel (Green Epoxy Coated) S = 316 SS D = Carpenter 20 H = Hast C-276 J = Titanium G = Solid Glass-Filled Teflon K = Kynar Z = PVC W = CPVC Wetted *Carbon Steel Not Available with SS Body	1 = Buna 2 = Viton 3 = PTFE 4 = EPDM 5 = Natural Rubber Wetted	020 = 2" Flanged 030 = 3" Flanged 040 = 4" Flanged 060 = 6" Flanged 080 = 8" Flanged 100 = 10" Flanged 120 = 12" Flanged 140 = 14" Flanged 160 = 16" Flanged 180 = 18" Flanged 200 = 20" Flanged	-D = IQD at Base of Assembly -N = Needle Valve at Base of Assembly -B = One IQD Under Each Instrument -V = One Needle Valve Under Each Instrument -X = No IQD or Needle Valve	Direct Mounts - See Page 109 for Complete Direct Mounting Guide Remote Mounts (Single Instrument Only) A?? = Armored Capillary, Threaded B?? = Armored Capillary, Welded (N/A with Carbon Steel Body) P?? = PVC Coated Armor, Threaded W?? = PVC Coated Armor, Welded (N/A with Carbon Steel Body) YYY = No Mount (Dry Seal)
-AG	-T	S	X	-TS		
FILL FLUID	INSTRUMENT A	INSTRUMENT B	INSTRUMENT C	OPTIONS		
-AS = Silicone DC200 -AG = Glycerin USP -BP = Propylene Glycol See Page 78 for Complete Fill Guide -XX = No Fill Fluid	-T = Smart Transmitter -S = Switch -G = Gauge -D = "Stick" Transducer -X = No Instrument	T = Smart Transmitter S = Switch G = Gauge D = "Stick" Transducer X = No Instrument	T = Smart Transmitter S = Switch G = Gauge D = "Stick" Transducer X = No Instrument	-RV = Red-Valve Dimensions (for drop-in replacements) -PP = PulsePlus Pulsation Dampening (available with Reotemp Pressure Gauges Only) -MR = Certificate of Material Traceability (MTR) -US = American Iron & Steel (AIS) Compliant Material -PM = Certificate of Positive Material Identification (PMI) for metallic parts only -HT = Hydrostatic Testing per ASME B31.3 -TS = SS Tag (1-10 Characters)		

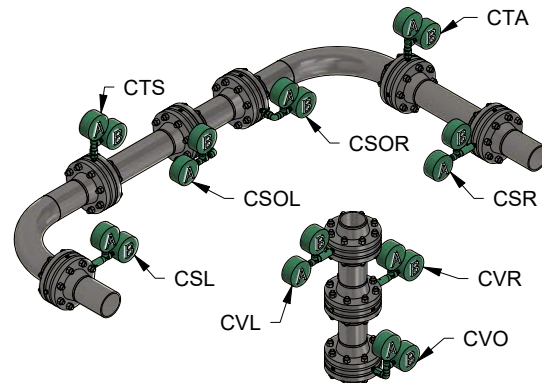
INTRUMENT-TO-PIPE MOUNT CODES

Single Instrument Orientations	
Horizontal Pipe Mounts	Vertical Pipe Mounts
STS	SVL
STA	SVR
SSO	SVO
SSR	
SSL	



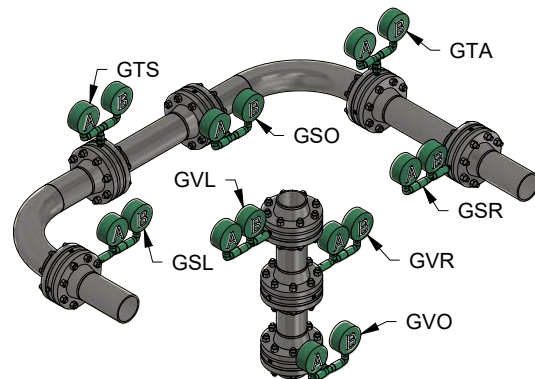
Custom Single Mount Per Customer dwg - Use Code "SCU"

Compact (2 Instrument Orientations)	
Horizontal Pipe Mounts	Vertical Pipe Mounts
CTS	CVL
CTA	CVO
CSR	CVR
CSL	
CSOR	
CSOL	

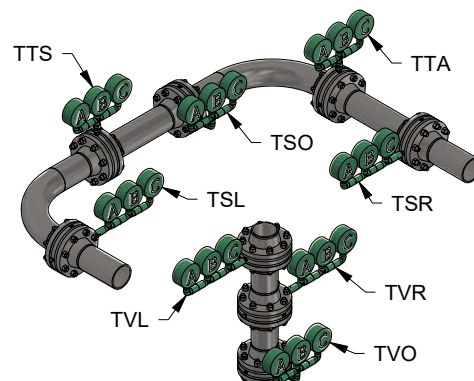


Custom Dual Mount Per Customer dwg - Use Code "CCU"

Goalpost (2 Instrument Orientations)	
Horizontal Pipe Mounts	Vertical Pipe Mounts
GTS	GVL
GTA	GVO
GSO	GVR
GSR	
GSL	



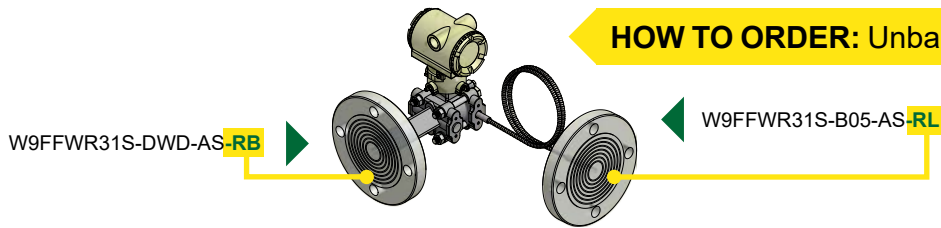
Trident (3 Instrument Orientations)	
Horizontal Pipe Mounts	Vertical Pipe Mounts
TTS	TVL
TTA	TVO
TSO	TVR
TSR	
TSL	



Custom Triple Mount Per Customer dwg - Use Code "TCU"

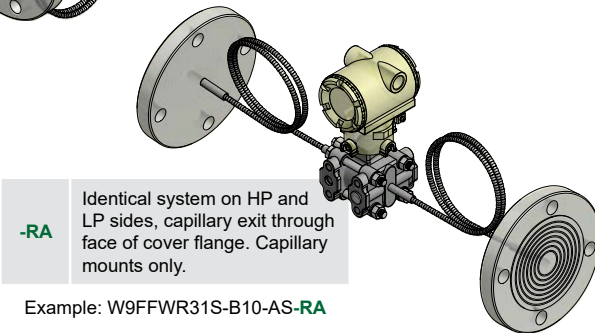
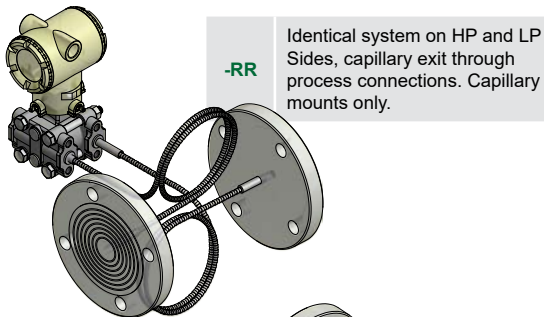
SMART TRANSMITTER ATTACHMENT

HOW TO ORDER: Unbalanced System Example

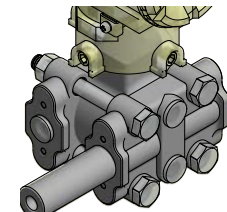


DIFFERENTIAL PRESSURE ASSEMBLY

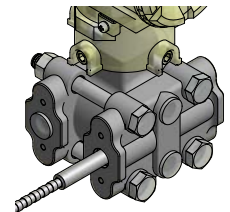
Balanced System A complete assembly with one part number that includes two diaphragm seals, two capillaries, two fills, and one complete assembly calibration certificate.



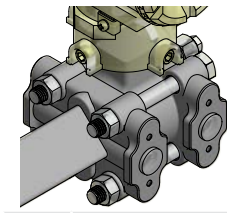
Unbalanced DP System Where seal, mount, capillary, or fill is not identical. A complete assembly includes one diaphragm seal on the HP side AND one diaphragm seal on the LP side.



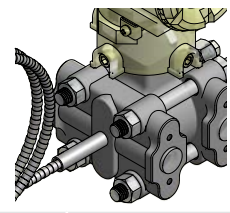
-RH Mount via Process Connections
Side High Pressure



-RL Mount via Process Connections
Side Low Pressure



-RB Mount via Face of Cover Flange
Side High Pressure



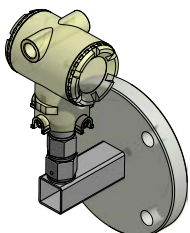
-RC Mount via Face of Cover Flange
Side Low Pressure

GAUGE PRESSURE ASSEMBLY

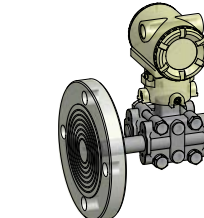
In Line Pressure Transmitter



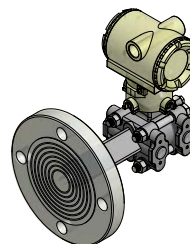
-R1 Mount to In-Line Gauge Pressure Transmitter. Direct or remote mount.



-R4 Horizontal Mount (Tank Mount) to In-Line Gauge Pressure Transmitter. Direct mount only.



-R2 Instrument mount through process connections, HP Side. Use "R3" if mounting to LP side

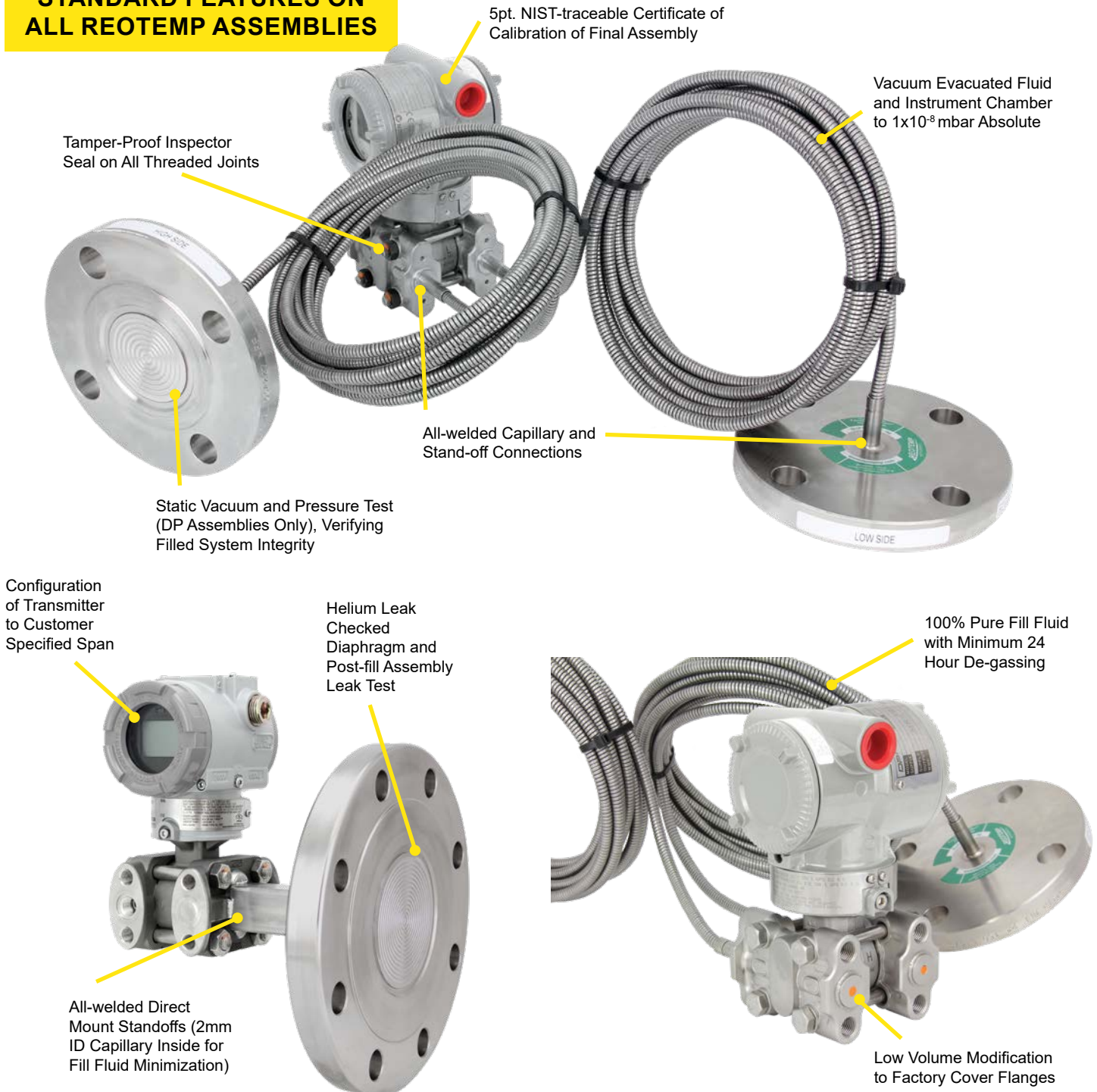


-R8 Instrument mount through face of cover flange, HP Side. Use "R9" if mounting to LP Side

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.

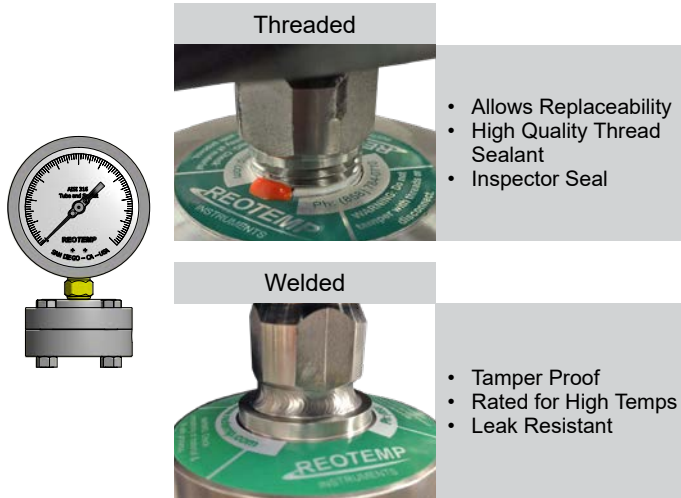
STANDARD FEATURES ON ALL REOTEMP ASSEMBLIES



INSTRUMENT MOUNTING CONFIGURATIONS

DIRECT MOUNT

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

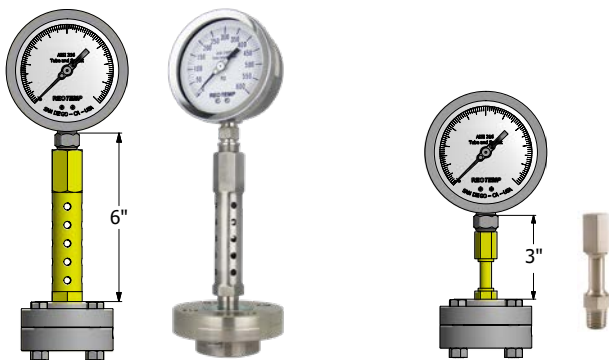


Code	Description	Max. Temp
-DTD	Threaded Instrument Connection	400°F
-DWD	Welded Instrument Connection	600°F

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.

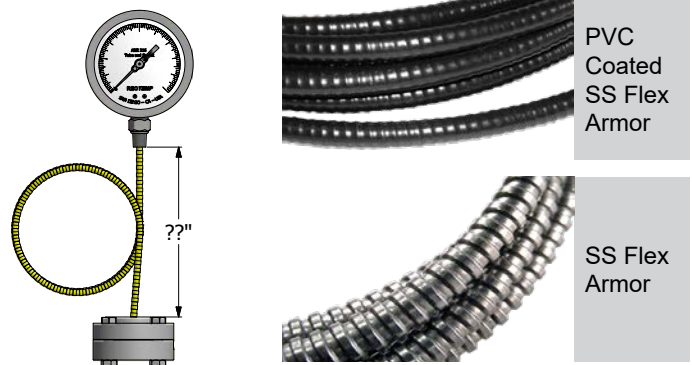


Code	Description	Max. Temp
-RTR	6" Cooling Tower	750°F
-STW	3" Cooling Standoff	600°F

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.



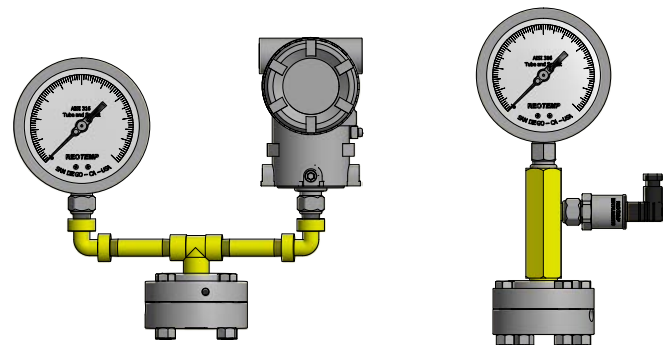
Code	Description	Max. Temp
-P??	PVC Coated SS Armor, Threaded to Seal	400°F
-W??	PVC Coated SS Armor, Welded to Seal	600°F
-A??	SS Flexible Armor, Threaded to Seal	400°F
-B??	SS Flexible Armor, Welded to Seal	750°F

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	1.87	.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

3 Trademark Halocarbon Product Corporation

5 Trademark Hooker Chemical Company

7 Trademark Stepan Specialty Products

2 Trademark The Dow Chemical Company

4 Trademark AUSIMONT S.P.A

6 Trademark The Chemours Company FC, LLC

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

DIAPHRAGM SEAL OPTIONS



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✓ Configure Part #

✓ Download PDF Data Sheets

DIAPHRAGM SEALS

		MS4 MS6 MS8	W5 W6 W7	T5 T6 V5	W9FF W9FR	W9XT	W9FP	DSTC75	DSTC15 AND LARGER	DSTF05	DSTF75 AND LARGER	OR	DXFR
PULSATION PROTECTION (ONLY AVAILABLE WITH REOTEMP PRESSURE GAUGE MOUNTED TO SEAL)													
-PP	Pulse Plus™	✓	✓	✓	✓	✓	N/A	N/A	✓	N/A	✓	✓	N/A
DIAPHRAGM COATING													
-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	STD ¹	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
-VF	Fill for Vacuum Service	N/A	✓	N/A	✓	✓	✓	N/A	✓	N/A	✓	N/A	N/A
CLEANING 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	✓
PLUG FOR FLUSH 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	✓
TAG OPTION													
-TS	Stainless Steel Tag (1-10 Characters)							✓					
-TM	Stainless Steel Tag (11-80 Characters)							✓					
-TP	Paper Tag							✓					
CERTIFICATION OPTIONS													
-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	✓
-PM	PMI - Positive Material Identification Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓
-HT	Hydrostatic Test per ASME B31.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
-HL	Helium Leak Test Certificate	✓	✓	N/A	✓	✓	✓	✓	✓	✓	✓	N/A	N/A

✓ Indicates that the option is available

N/A Indicates the option is not available

¹ Standard on MS8, available on MS4 & MS6.

Handling & Installation For Ring Seal Assembly

Principle of Operation

Obtaining accurate pressure readings on wastewater treatment and slurry lines is difficult because the solids present in the process media block pressure elements such as gauges, switches and transmitters.

Isolation rings consist of an inner flexible liner installed inside two end plates and center section. The assembly is mounted between flanges within the process piping. The space between this rubber membrane, housing ring and pressure instrument is filled with silicone (or other fill fluids as per customer specification). As the process media flows through the isolation ring, it presses against the flexible liner causing it to expand or contract. The pressure which is exerted by the media is subsequently transferred via the fill fluid to the pressure instrument (gauge, switch or transmitter).

The inside diameter of the ring assembly is based on ASME B36.10 pipe specifications and is sized so that it matches the adjacent pipe. This enables the isolation ring to be continually cleaned by the motion of the process fluid without any resultant build-up caused by step changes in the pipe's inner diameter

Maintenance

The isolation ring is fitted with pressure instruments such as gauges, transmitters and switches. Please refer to Reotemp literature and pressure instruments Installation, Operation and Maintenance guide found on reotemp.com for these products and accessories.

The isolation ring also has a modular male-female IQD (Instrument Quick Disconnect) fitting which allows removal of the instrument assembly minimizing subsequent fill fluid leakage from the isolator ring. The pressure instrument assembly is fitted with the male adapter of the IQD fitting which is inserted into the female portion which is affixed to the isolation ring. Refer to picture below.

If removing the entire assembly of isolation ring and instrument(s), first turn off the process media supply into the pipe where the isolation ring is fitted. Once the system has been depressurized, the instrument(s) may be safely removed. If the isolation ring is to remain fitted, then it is possible to remove only the instruments through disconnecting the IQD, once the line is depressurized.

Press the collar down and in quick fashion, lift and remove the IQD and the instrument in an inverted and upright position. Now that the instrument has been removed, you can tend to calibrations or necessary repairs. The female IQD fitting is equipped with a spring actuated shut-off which allows the isolation ring to remain in-line and not interrupt the operation of the process. The system may now be turned on.

Note: Repeat the above process when installing a new instrument with a IQD fitting.



Storage

Correct storage of the isolation ring extends the service life. Flexible liners are perishable if the following precautions are not taken prior to installation.

1. Keep isolation rings cool. They can be stored in an unheated area but allow maximum ventilation in storage areas subject to high ambient temperatures. Trailers and storage sheds can become very hot during summer months. Avoid these locations where possible.
2. Avoid direct sunlight. UV light deteriorates some flexible liner materials. Leave the isolation ring in its box. Avoid ozone.
3. Do not store isolation rings near electrical equipment.
4. If the isolation ring already has instruments installed, carefully choose a storage location so these external devices are not physically damaged.

Installation

1. Safety Considerations
 - a. Pressure isolation rings often handle chemically reactive (e.g., chlorine) and abrasive fluids. Applications such as these can result in the flexible liner wearing out over time.
 - b. Make sure that the fitted pressure instruments (gauges, switches, transmitters) have pressure & temperature ratings suitable for actual operating conditions. Verify the lowest pressure rating of either the isolation ring or instrument exceeds the design pressure of the process. In addition, verify the flexible liner material's minimum and maximum operating temperature exceeds the process operating temperature range.
 - c. The flexible liner must be chemically compatible and temperature compatible with the process fluid.
2. Inspect the isolation ring prior to installation. Do not install if damaged. The isolation ring should not exhibit any indication of leakage and the flexible liner should be free of cuts or punctures.
3. The isolation ring can be installed at any altitude with liquid flow in either direction. Install in a straight pipe run at least 5 pipe diameters from tees and elbows where possible.
4. To install, sandwich the isolation ring between two flanges in the process pipeline. Center as carefully as possible. Install gaskets on both sides of the isolation ring. Fastener torque and assembly sequence should be performed according to company or plant specifications.

Operating Instructions

1. Isolation rings are vacuum filled at the factory.
 - a. Do not disassemble the isolation ring without Factory Authorized Approval.
 - b. Do not remove the male or female portion of the IQD fitting from the isolation ring stem or instrument tree.
2. To attach a pressure instrument with the IQD fitting to the Ring seal, the isolation ring and instrument assembly must be pre-assembled, and vacuum filled prior to attaching it to the isolation ring.
 - a. Instruments should not be attached to an isolation ring installed in a process pipe while the system is pressurized.
 - b. Depress the male portion of the IQD into the female side until the parts mate, you'll hear a click once properly connected.
 - c. The instrument assembly may be rotated 360 degrees to face any direction.
3. To remove pressure instruments from the isolation ring containing an IQD, it is not necessary to uninstall the isolation ring from the process piping.
 - a. In order to minimize any slight fill fluid loss, stop the upstream process altogether by turning the system off to depressurize.

- b. The interruption will be brief as the IQD and instrument removal is a very quick and straight forward procedure.
 - c. Depress the male portion of the IQD into the female side until the parts mate, you'll hear a click once properly connected.
 - d. Press the collar down and in quick fashion, lift and remove the IQD and the instrument in an inverted and upright position.
 - e. The female IQD fitting is equipped with a spring actuated shut-off which allows the isolation ring to remain in-line and not interrupt the operation of the process.
 - f. The system may now be turned back on.
4. Flexible liner and module seal replacement:
- a. Shut down the upstream process.
 - b. Remove isolation ring from the process line.
 - c. Remove screws from end plate.
 - d. Remove end plates.
 - e. Remove old liner.
 - f. Clean all components thoroughly.
 - g. Collapse new liner, push through the center section and work seal lips into housing grooves.
 - h. Reinstall end plates.
 - i. Replace end plate screws.
 - j. Evacuation, filling, and calibration of the isolation ring assembly should be performed in combination with the instruments as a completed unit.
5. To attach the IQD fitting to pressure instruments:
- a. Attach the pressure gauge or other instrument to the IQD fitting.
 - b. Connect the instrument assembly to the vacuum filling system.
 - c. Evacuate all the air from the instrument assembly and fill with fill fluid.
 - d. Detach the instrument assembly from the filling system.
 - e. The instrument assembly can now be attached to an isolation ring or stored for future use.

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WARRANTY & EVALUATION POLICY

REOTEMP warrants all pressure and temperature measurement products against defective workmanship or materials under normal use and service for the following periods after the date of shipment.

FIVE YEAR WARRANTY

- Process Grade Bimetal Thermometers (3", 4", and 5" dial sizes)

THREE YEAR WARRANTY

- Industrial Pressure and Differential Pressure Gauges
- Valves and Manifolds

ONE YEAR WARRANTY

- Diaphragm Seals
- Pressure Transmitters and Switches
- OEM Bimetal Thermometers
- Digital Thermometers
- Remote Reading Thermometers
- Thermowells
- Accessories and Other Items

REOTEMP's liability is limited to repair or replacement at the factory, shipping charges prepaid. This warranty does not cover deterioration from normal wear and tear, exposure to corrosive materials, exposure to temperatures or pressures in excess of those recommended, excessive vibration, forces, or abrasion which cause deformation of component parts. This warranty is expressly in lieu of any other warranty, expressed or implied. REOTEMP shall not be liable for any defect or consequential damages arising out of any defects or from any cause whatsoever. Suitability of product for the customer's application rests with the customer; REOTEMP does not warrant suitability of its products for the application chosen by the customer.

REOTEMP will only accept shipments with returned product that are accompanied with a return authorization issued by REOTEMP. Please respect the health and safety of our employees by cleaning goods before return, disclosing any chemicals or foreign substance that may be on returned product and enclosing MSDS information. Handling and cleaning fees may apply.

REOTEMP reserves the right to make product improvements and change its specifications stated throughout the catalog at any time without notification. Please contact the factory on all critical dimensions and specifications for verification.

REOTEMP'S GUIDING PRINCIPLES

- > Provide industry leading customer satisfaction with a focus on fast turnaround, friendly service and keeping it easy to do business with REOTEMP. Make it Quick and Easy!
- > Focus on manufacturing quality instruments, continuous improvement and adding value to our product and services.
- > Build long-lasting and rewarding relationships with the people we do business with.
- > Maintain an enjoyable, fulfilling work environment for our employees.
- > Build a strong REOTEMP brand and reputation in the industrial markets where we compete.
- > Achieve planned, sustained growth in our target markets both in the US and internationally.



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